

# Equipment related to rechargeable batteries P4\* Series

 Material  
restrictions

 Countermeasures  
for dust generation

 Countermeasures  
for dust

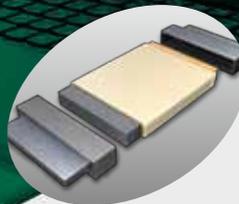
 DRY Dry  
environment



Winding



Stacking



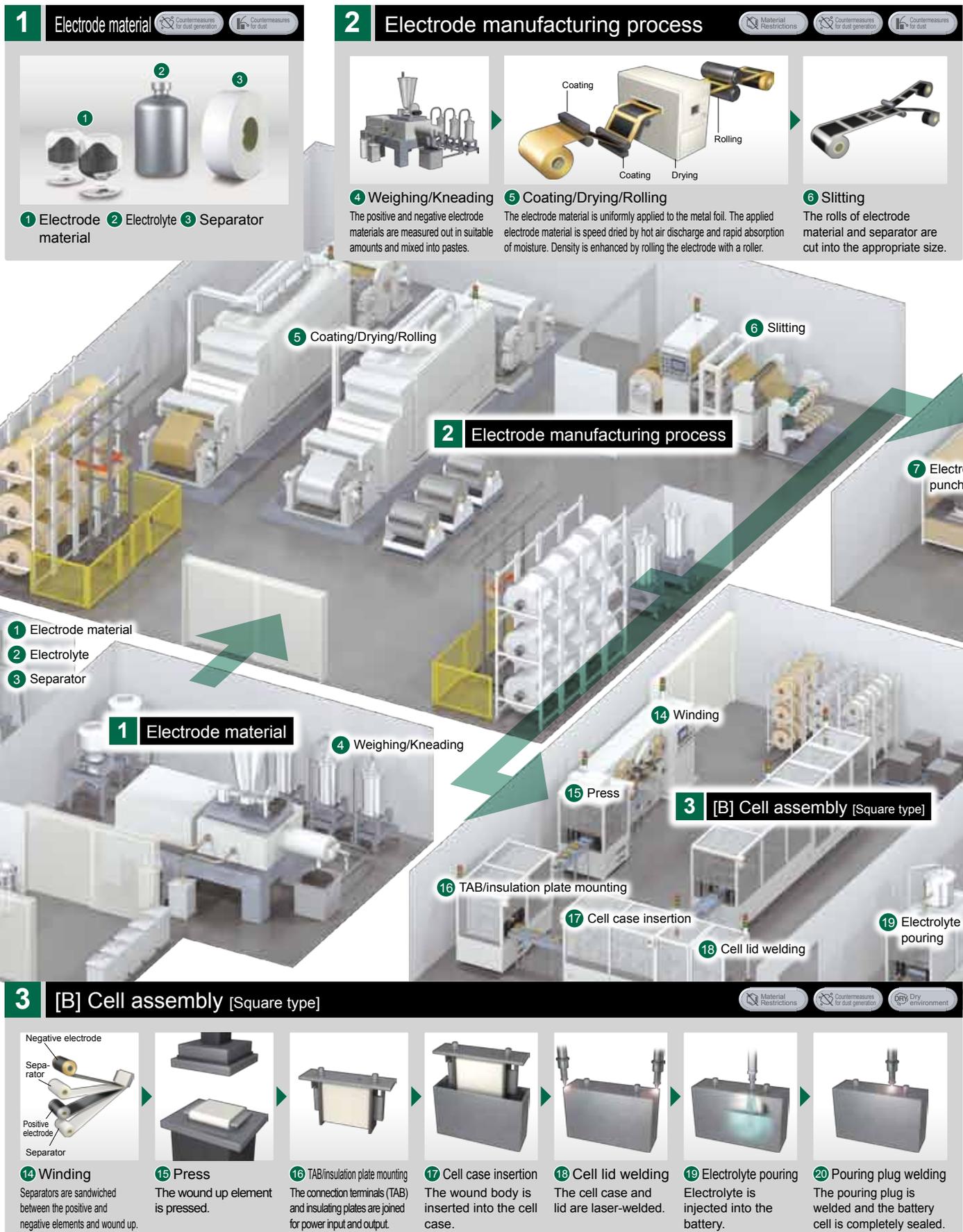
TAB Welding



Immersion

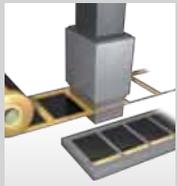
# Compatible with rechargeable battery manufacturing processes

Each manufacturing process in the manufacturing of rechargeable batteries requires support for a variety of environments, such as dust/explosion-proof/vacuum/ultra-dry and material restrictions.

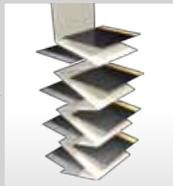


# Equipment related to rechargeable batteries P4\* Series

## 3 [A] Cell assembly [Laminate type]



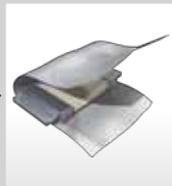
**7 Electrode punching**  
The positive and negative electrode plates are punched into a predetermined size with a mold.



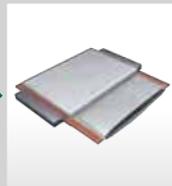
**8 Stacking**  
The electrode and separator are alternately stacked with high speed and high-precision.



**9 TAB welding**  
The connection terminals (TAB) are joined for power input and output.



**10 Laminate**  
The electrode laminate is wrapped with exterior coating.



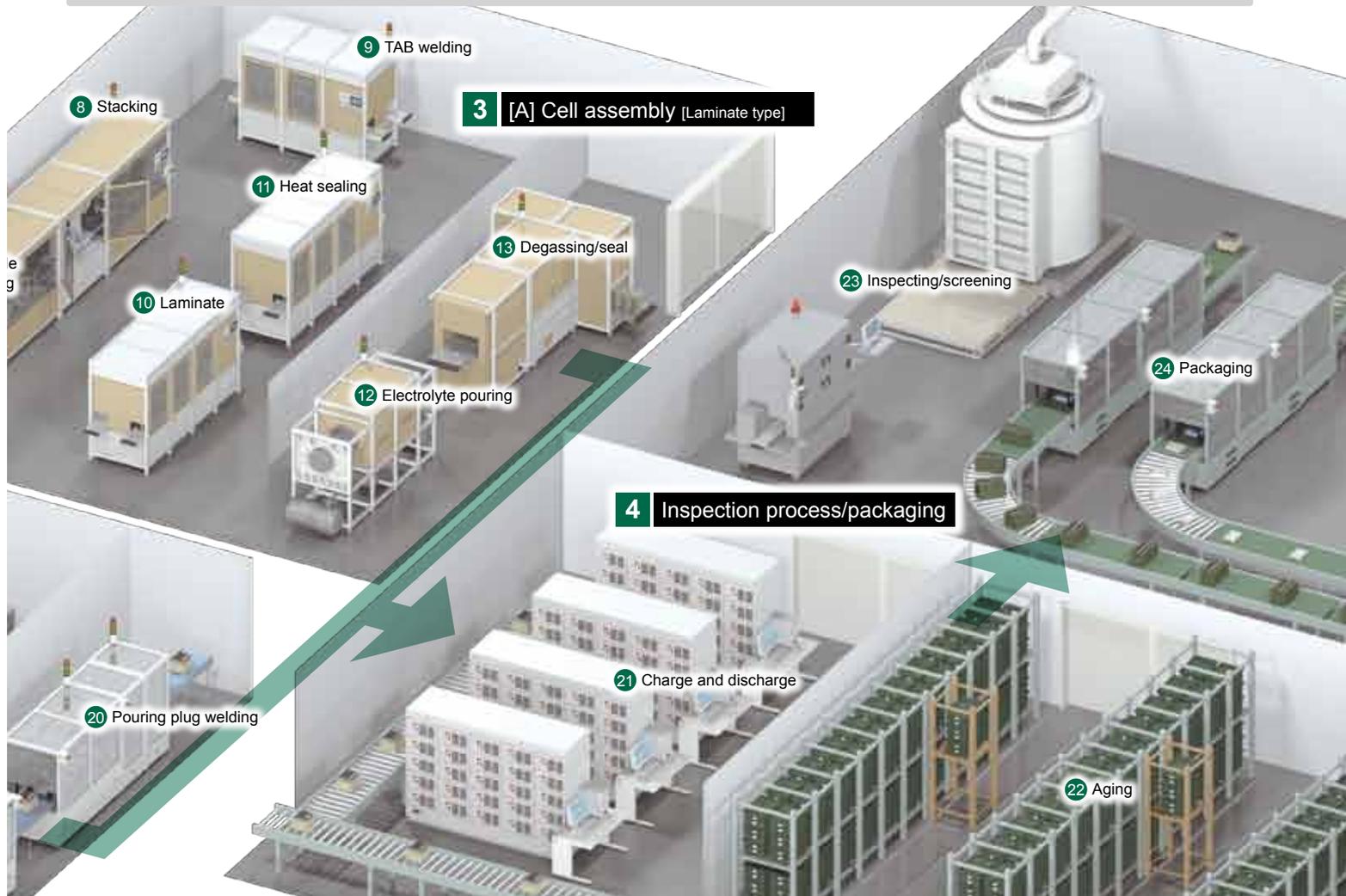
**11 Heat sealing**  
Heat is applied to adhere the 3 sides of the cell.



**12 Electrolyte pouring**  
Electrolyte is injected into the battery.



**13 Degassing/seal**  
The generated gas is removed, and heat is applied to seal the battery cell.



## 4 Inspection process/packaging



**21 Charge and discharge**  
The battery is activated by repeatedly charging and discharging.



**22 Aging**  
The fully charged battery cell is left at a predetermined temperature for a fixed period.



**23 Inspecting/screening**  
Various performances as a product are determined.



**24 Packaging**  
The batteries are stacked and attached in the case.

CKD responds to the needs of rechargeable battery manufacturing, with products conforming to production safety in the manufacturing process, from electrode manufacturing to packaging.

## Material Restrictions Component material limitation

Limited use of inappropriate material and surface treatment in the rechargeable battery manufacturing process. Product failure of rechargeable batteries is reduced.

- Cu** Limited copper material
- Zn** Limited zinc material
- Ni** Limited nickel-based material
- EZn** Limited zinc plating
- ENi** Limited electrolytic nickel plating

## Countermeasures for dust Long service life even in dusty environments

Strong dust-proof mechanisms such as scraper/rod packing are used. Suppresses dust entry into the cylinder.

## Countermeasures for dust generation Suppresses dust generation of metal wear powder

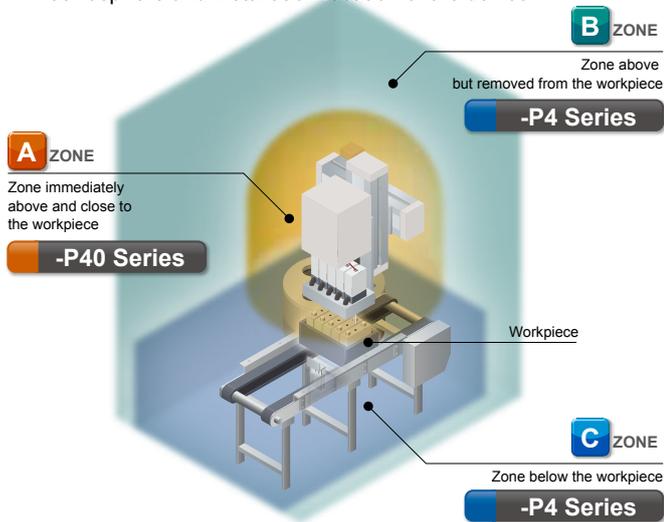
Equipped with a local exhaust function (vacuum treatment port). Prevents contamination to the electrodes or cell by not leaking the metal wear powder outside.

## DRY Dry environment Long service life even in ultra-dry environments

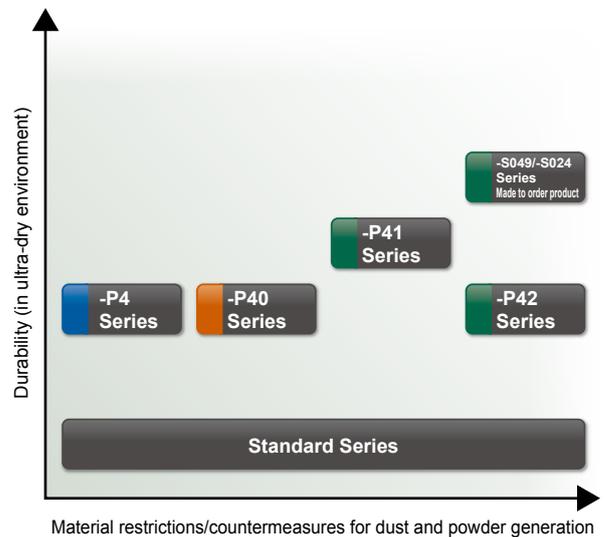
Ultra-dry environment compatible grease is used. Retains the smooth operation of the sliding part for long periods, even in dry environments.

### Series Zoning

Compatible models are available in 2 grades according to the atmosphere and installation location of the device.



### Series Overview



### Series Variation

	-P4 Series Flow path part Material restrictions	-P40 Series All parts Material restrictions	-P41 Series Countermeasures for dry air	-P42 Series Countermeasures for dust generation	-S049/-S024 Series Made to order product Countermeasures for dust
Pneumatic actuators	●	●	●	●	●
Pneumatic valves	●	●			
Clean air components	●	▲			
Vacuum components	●				
Fluid control components	●	●			
Related pneumatic products	●	●			

# Equipment related to rechargeable batteries P4\* Series

## Material limitations for the flow path part/sliding part

\* Small amounts present in the alloy are excluded.

### -P4 Series

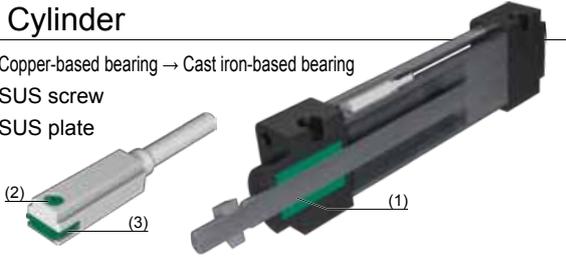
Same mounting size as standard



The use of copper, zinc, and nickel-based materials and electrolytic nickel plating is limited in the construction of the flow path part and sliding part.

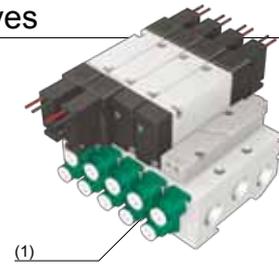
#### Cylinder

- (1) Copper-based bearing → Cast iron-based bearing
- (2) SUS screw
- (3) SUS plate



#### Pneumatic valves

- (1) SUS fitting



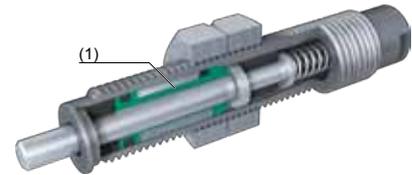
#### Regulator

- (1) Exhaust port



#### Shock absorber

- (1) Aluminum



## Material limitations for all parts

\* Electrical components (coil, circuit, wiring section, etc.) are excluded.  
\* Small amounts present in the alloy are excluded.

### -P40 Series

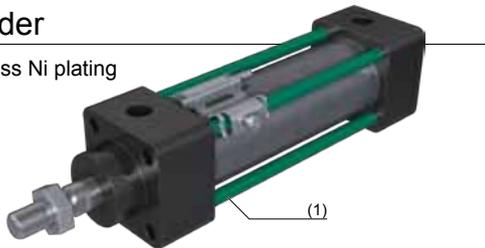
Same mounting size as standard



The use of copper, zinc, and nickel-based materials, zinc plating, and electrolytic nickel plating is limited in the construction of all parts.

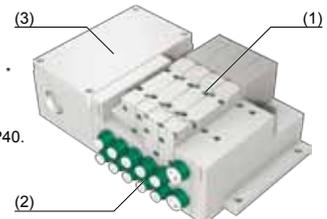
#### Cylinder

- (1) Electroless Ni plating



#### Pneumatic valves

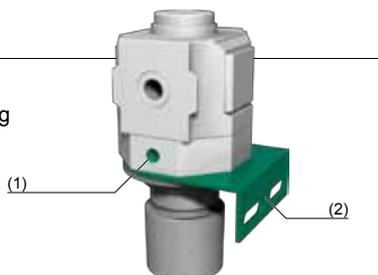
- (1) SUS screw
- (2) SUS fitting
- (3) Electric circuit unit IP65 \*



\* D sub-connector specification is IP40.

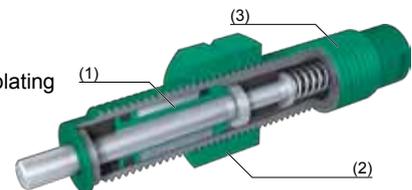
#### Regulator

- (1) Exhaust port
- (2) Electroless Ni plating



#### Shock absorber

- (1) Aluminum
- (2) SUS nut
- (3) Hard chrome plating



## Ultra-dry environment durability test, cleared 20 million cycles

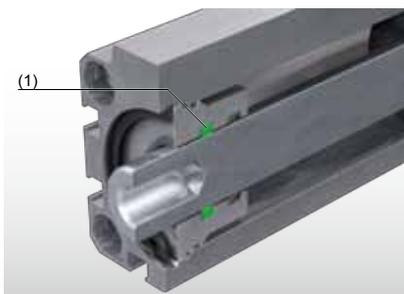
\* Based on CKD test conditions.

### -P41 Series



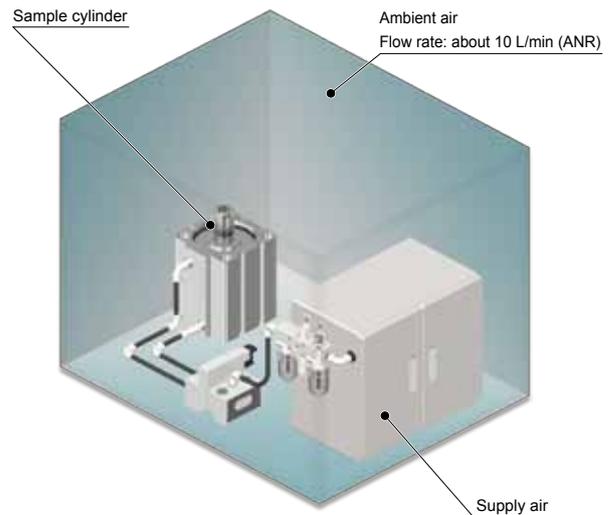
A fiber assemblage (lubricator) soaked with grease is added to P40 specifications. Enables stable supply of lubrication to the sliding section over a long period of time and achieves long service life in ultra-dry environments. In addition, SUS is used in piston rods.

#### Cylinder



(1) Countermeasures for dry air (lubricator)

\* Dimensions differ from the standard.



#### Test method

The cylinder is installed vertically upward. Durability test is conducted by operating in ultra-dry environments.

#### Test conditions

Supply pressure	0.5 MPa
Cylinder speed	300 mm/s
Supply air atm dew point	-61°C
Ambient environment atm dew point	-61°C
Load	No load

## 1/5 or less dust generation rate achieved

\* Our standard cylinder comparison

### -P42 Series



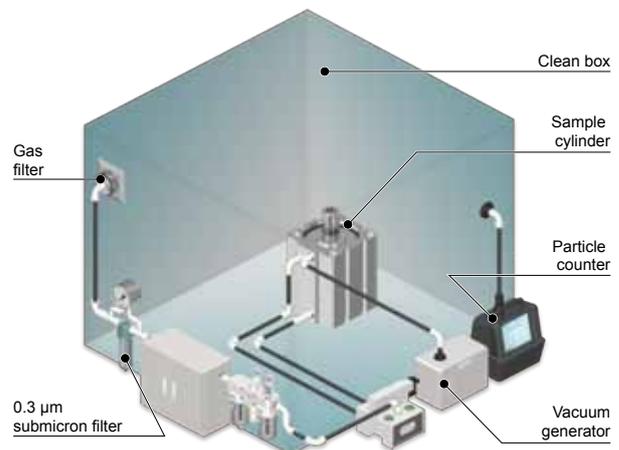
Local exhaust function (vacuum treatment port) is added to P40 specifications. Prevents metal powder from contaminating the electrode and cell, and reduces product failure of rechargeable batteries. In addition, SUS is used in piston rods.

#### Cylinder



(1) Vacuum treatment

\* Dimensions differ from the standard.



#### Test method

The cylinder is operated in a clean box, and dust generation rate is measured.

#### Test conditions

Supply pressure	0.5 MPa
Cylinder speed	200 mm/s
Frequency	30 cpm
Load	No load

## 2 types of dust countermeasures to choose from

\* This series is a made to order product. Contact CKD for compatible models.

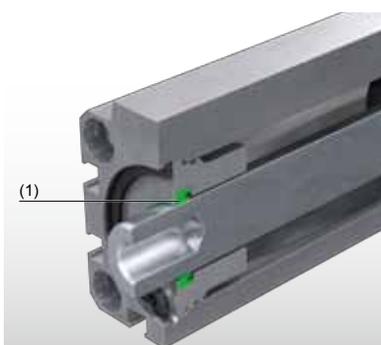
### -S049/-S024 Series



Select from two types: "-S049 Series" to introduce countermeasures for dust without design changes to the existing system and "-S024 Series" to introduce stronger countermeasures for dust.  
\* -S024 Series is dry environment compatible.

#### -S049 Series

Same mounting size as standard



(1) Scraper and rod packing integrated

- Long service life is achieved by changing the standard rod packing material and shape.
- Compatible with standard product dimensions, space saving is achieved without the need for design change.
- Also compatible with dimensions of other products.

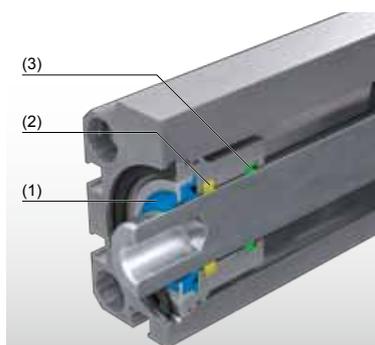
#### Test method

The cylinder is installed vertically upward. It is operated embedded in dust by covering the rod metal section with the tube.

#### Test conditions

Supply pressure	0.5 MPa
Cylinder speed	200 mm/s
Frequency	30 cpm
Load	No load

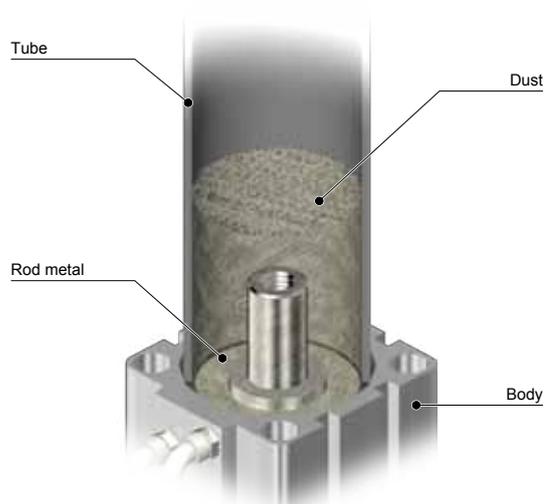
#### -S024 Series



(1) Rubber scraper  
(2) Lubricator  
(3) Rod packing

\* Dimensions differ from the standard.

- Long service life is achieved by introducing an effective countermeasure for particle generation: rubber scraper (SCB) + lubricator + rod packing structure.
- Proven track record in dusty environments such as source processes.



Type	Sample No.	Durability course (10,000 times)							
		0	10	30	50	75	100	125	150
Standard products	Standard-1	○	■	○	■	○	■	○	■
	Standard-2	○	■	○	■	○	■	○	■
-S049 Series (compatible with standard product dimensions)	S049-1	○	■	○	■	○	■	○	■
	S049-2	○	■	○	■	○	■	○	■
-S024 Series (rubber scraper)	S024-1	○	■	○	■	○	■	○	■
	S024-2	○	■	○	■	○	■	○	■

## Dry air supply

Super heatless dryer

**SHD** Series



High polymer membrane air dryer

**SU** Series



Super dryer (High polymer membrane air dryer)

**SD** Series



2, 3-port solenoid valve for dry air

**AB/ADK-Z** Series



## Fluid supply

Air operated valve for chemical liquids

**AMD** part **3R** Series



Clean cylinder valve

**LAD** Series



Air operated ball valve

**CHB/CHG** Series



## Tension control

Air bearing actuator

**LBC** Series



Precision regulator

**RP/RPE** Series



Electro pneumatic regulator

**EVD/EVR** Series



Pneumatic cylinder  
Low friction

**SCM-U/SCG-U/  
SSD2-KU** Series



# Equipment related to rechargeable batteries P4\* Series

## Explosion-proof environment

Diaphragm cylinder valve

**NAD** Series



Air operated 3-port valve

**NAP11** Series



Pilot operated explosion-proof 5-port valve

**4F\*\*0E** Series



Contact CKD for model numbers.

## Vacuum control

Valve for high vacuum

**AVB** Series



Valve for process gas

**AGD\*R** Series



Vacuum components

**SELVACS** Series



## Suction transport

Precise suction plate

**PVP** Series



Fine buffer

**FBU2** Series



Direct acting 3-port valve

**3QR** Series



Assembling/inspection process

Compact cylinder

**SSD2** Series



Guided cylinder

**STG** Series



Rodless cylinder

**SRL3** Series



Compact cylinder

**SMG** Series



Twin rod cylinder

**STR2** Series



Linear slide cylinder  
Standard model

**LCR** Series



Linear slide cylinder  
Ultra-high-rigidity model

**LCG** Series



Table rotary actuator

**GRC** Series



Compact wide parallel hand

**HMF** Series



Linear guide hand  
with rubber cover

**LHAG** Series



Pilot operated  
3, 5-port valve

**4G** Series



Direct acting 3-port valve

**3QR** Series



# Equipment related to rechargeable batteries P4\* Series

## Labor-saving

Direct drive actuator

**AX** Series



Does not conform to the standards of P4 Series as defined by CKD.

Electric actuator Ball screw drive/  
low dust specifications

**ETS/ECS** Series



Electric actuator Belt drive

**ETV** Series



Does not conform to the standards of P4 Series as defined by CKD.

## Electrolyte/pouring-related

Valve for process gas

**AGD\*R** Series



Pneumatic piping components



Valve for high vacuum

**AVB** Series



## Air blow-related

General purpose 2, 3-port solenoid  
valve

**AB-Z/AG-Z/ADK-Z** Series



Compact flow rate sensor

**FSM2** Series



# Pneumatic actuators

Note Metal wear powder (copper-based metal is not included) from the mounting part will occur in oscillation mounting formats such as clevis mounting.  
To order a switch, refer to the switch compatibility table on Intro Pages 21 to 24 and order using the listed order model No.

## Standard

\*1: Zinc plating is used for the sealing washer.  
\*2: Zinc plating is used for the cushion packing.

are listed in this catalog.

● : Standard ○ : Made to order ▲ : Contact CKD : Not applicable

**SCPD3**

Pencil shaped cylinder



Page 1

How to order		SCPD3-[Variation]L-[Mounting]-[Bore size]-[Stroke length]-[Switch]-[Number]-[Option]P4[Accessories]										
Applicable bore size		Double acting/ single rod	Double acting/ high load	Single acting/ push	Single acting/ pull	Double acting/ double rod	Double acting/ fine speed	Double acting/ low speed	Double acting/ heat resistance	Double acting/ rubber-air cushioned	Double acting/ rotation-stop	Double acting/ with valve
			K	SCPS3	SCPH3	D	F	O	T	*C	M	V
ø6 to 16	P4	●		○	○	○	○	○	○	○	○	
	P40	●		○	○	○	○	○	○	○	○	
	P41											
	P42	▲				▲	▲	▲		▲		

**CMK2**

Small bore size cylinder



Page 3

How to order		CMK2-[Variation]-[Mounting]-[Bore size][Cushion]-[Stroke length]-[Switch]-[Number]-[Option]-P4[Accessories]															
Applicable bore size		Double acting/ single rod	Double acting/ position locking	Single acting/ push	Single acting/ pull	Double acting/ double rod	Double acting/ back to back	Stroke adjustable (push)	Stroke adjustable (pull)	Double acting/ fine speed	Double acting/ heat resistance	Double acting/ rubber-air cushioned	Double acting/ with speed controller	Double acting/ rotation-stop	Double acting/ coolant proof	Double acting/ low hydraulic	Double acting/ air cushion
			Q	S	SR	D	B	P	R	F	T	*C	Z	M	G2/G3	H	C
ø20 to 40	P4	●	●	○	○	○	○	○	○	○	▲	○	○	▲			○
	P40	●	●	○	○	○	○	○	○	○	▲	○	▲	▲			○ *2
	P41	▲	▲			▲	▲	▲	▲	▲	▲	▲	▲	▲			▲ *2
	P42																

**SCM**

Round shaped cylinder



Page 5

How to order		SCM-[Variation]-[Mounting]-[Bore size][Cushion]-[Stroke length]-[Switch]-[Number]-[Switch mounting][Option]-P4[Accessories]															
Applicable bore size		Double acting/ single rod	Double acting/ position locking	Single acting/ push	Single acting/ pull	Double acting/ double rod	Double acting/ back to back	Double acting/ two-stage	Stroke adjustable (push)	Stroke adjustable (pull)	Double acting/ low speed	Double acting/ low friction	Double acting/ heat resistance	Double acting/ rubber scraper	Double acting/ tandem	Double acting/ direct mounting foot	Double acting/ rotation-stop
			Q	X	Y	D	B	W	P	R	O	U	T	G	W4	LD	M
ø20 to 100	P4	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	▲
	P40	● *2	● *2	○	○	○ *2	○	○	○	○ *1	○	○	○ *2	○	○	○	▲
	P41	▲ *2	▲ *2			▲ *2	▲	▲	▲	▲ *1				▲ *2	▲	▲	
	P42	▲ *2	▲ *2			▲ *2	▲	▲	▲	▲ *1	▲	▲			▲	▲	

**SCG**

Tie rod cylinder



Page 7

How to order		SCG-[Variation]-[Mounting]-[Bore size][Cushion]-[Stroke length]-[Switch]-[Number]-[Option]-P4[Accessories]									
Applicable bore size		Double acting/ single rod	Double acting/ position locking	Double acting/ double rod	Double acting/ low speed	Double acting/ low friction	Double acting/ rubber scraper	Double acting/ rotation-stop	Double acting/ coolant proof	Double acting/ anti-spatter adherence	
			Q	D	O	U	G	M	G2/G3	G1/G4	
ø32 to 100	P4	●	●	○	○	○					
	P40	● *2	● *2	○ *2	○	○ *2					
	P41	▲ *2	▲ *2	▲ *2		▲ *2					

**SCS2**

Selex cylinder



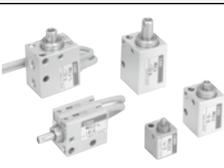
Page 9

How to order		SCS2-N-[Mounting]-[Bore size][Cushion]-[Stroke length]-[Option]P4[Accessories]									
Applicable bore size		Double acting/ lubrication	Double acting/ no lubrication	Double acting/ with switch	Stroke adjustable (push)	Double acting/ heat resistance	Double acting/ double rod	Double acting/ back to back	Double acting/ two-stage	Double acting/ low hydraulic	Double acting/ rubber scraper
			N	LN	P	T	D	B	W	H	G
ø125 to 250	P4		○	○	▲	▲	▲	▲	▲		▲

## Space saving structure

**MDC2**

Small direct mounting cylinder



Page 11

How to order		MDC2-L-[Bore size]-[Stroke length]-[Switch]-[Number]-P4			
Applicable bore size		Double acting/ single rod	Single acting/ push	Single acting/ pull	Double acting/ fine speed
			X	Y	F
ø6 to 10	P4	●	○	○	○
	P40	●	○	○	○
	P41				
	P42	▲			▲

# Pneumatic actuators

Note Metal wear powder (copper-based metal is not included) from the mounting part will occur in oscillation mounting formats such as clevis mounting.  
To order a switch, refer to the switch compatibility table on Intro Pages 21 to 24 and order using the listed order model No.

## Space saving structure

are listed in this catalog.  
● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

**SSD2** 

Compact cylinder



Page 13

How to order		SSD2-[Variation]L-[Bore size]-[Stroke length]-[Switch]-[Number]-[Option]P4□-[Mounting bracket]-[Accessories]																	
Applicable bore size		Double acting/ single rod	Double acting/ single rod high load	Double acting/ single rod long stroke length	Single acting/ push	Single acting/ pull	Double acting/ rubber-air cushioned high load	Double acting/ position locking	Double acting/ double rod	Double acting/ back to back	Double acting/ two-stage	Double acting/ fine speed	Double acting/ low speed	Double acting/ low friction/ high load	Double acting/ heat resistance	Double acting/ fluoro rubber	Double acting/ rubber scraper	Double acting/ rotation-stop	
			K		X	Y	KC	Q	D	B	W	F	O	KU	T1	T2	G	M	
ø12 to 200	P4	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	▲
	P40	●	●	○	○	○	○	○	○	○	▲	○	○	○	○	○	○	○	▲
	P41	▲	▲	▲			▲	▲	▲	▲	▲							▲	
	P42	▲	▲	▲			▲	▲	▲	▲	▲	▲	▲	▲			▲		

**SSD** 

Compact cylinder



Page 17

How to order		SSD-[Variation]L-[Bore size]-[Stroke length]-[Switch]-[Number]-[Option]P4□-[Mounting bracket]-[Accessories]															
Applicable bore size		Double acting/ single rod	Double acting/ position locking	Single acting/ push	Single acting/ pull	Double acting/ double rod	Double acting/ back to back	Double acting/ two-stage	Double acting/ fine speed	Double acting/ low speed	Double acting/ heat resistance	Double acting/ rubber scraper	Double acting/ anti-spatter adherence	Double acting/ coolant proof	Double acting/ anti-spatter adherence	Double acting/ rotation-stop	
			Q	X	Y	D	B	W	F	O	T	G	G1/G4	G2/G3	DG1 DG4	M	
ø12 to 160	P4	●	●	○	○	○	○	○	○	○	○	○					▲
	P40	●	●	○	○	○	○	○	○	○	○	○					▲
	P41	▲	▲			▲	▲	▲				▲					
	P42	▲	▲			▲	▲	▲	▲	▲							

**SSD-K** 

Compact cylinder High load



Page 19

How to order		SSD-K[Variation]L-[Bore size]-[Stroke length]-[Switch]-[Number]-[Option]P4□-[Mounting bracket]-[Accessories]						
Applicable bore size		Double acting/ single rod	Double acting/ fine speed	Double acting/ low friction	Double acting/ rubber-air cushioned	Double acting/ rubber scraper	Double acting/ anti-spatter adherence	Double acting/ coolant proof
			F	U	*C	G	G1/G4	G2/G3
ø12 to 160	P4	●	○	○	○	○		
	P40	●	○	○	○	○		
	P41	▲			▲	▲		
	P42	▲	▲	▲	▲			

**SSG** 

Guided super compact cylinder



Page 21

How to order		SSG-L-[Bore size]-[Stroke length]-[Switch]-[Number]-P4□	
Applicable bore size		Double acting	
ø12 to 100	P4	●	
	P40	●	
	P41		
	P42		

**MSD/MSDG**

Small compact cylinder



Page 23

How to order		MSD/MSDG-L-[Bore size]-[Stroke length]-[Switch]-[Number]-[Piping port position]P4□									
Applicable bore size		Double acting/ single rod	Double acting/ single rod high load	Single acting/ push	Single acting/ pull	Double acting/ fine speed	Applicable bore size		Double acting/ guided	Double acting/ guided/ fine speed	
			K	X	Y	F					
MSD ø6 to 16	P4	●	●	○	○	○	MSDG ø6 to 16	P4	●	○	
	P40	●	●	○	○	○			P40	●	○

**SMG**

Compact cylinder



Page 27

How to order		SMG-L-[Mounting]-[Bore size]-[Stroke length]-[Switch]-[Number]-P4□				
Applicable bore size		Double acting/ single rod	Single acting/ push	Single acting/ pull	Double acting/ fine speed	Double acting/ rotation-stop
			X	Y	F	M
ø6 to 32	P4	●	○	○	▲	○
	P40	●	○	○	▲	○
	P41					
	P42	▲			▲	▲

# Pneumatic actuators

Note Metal wear powder (copper-based metal is not included) from the mounting part will occur in oscillation mounting formats such as clevis mounting. To order a switch, refer to the switch compatibility table on Intro Pages 21 to 24 and order using the listed order model No.

## Space saving structure

 are listed in this catalog.  
● : Standard ○ : Made to order ▲ : Contact CKD  : Not applicable

**FC\***  
Flat cylinder



Page 29

How to order		FCD/FCS/FCH-L-[Bore size]-[Stroke length]-[Switch]-[Number]-[Option]P4□			
Applicable bore size		Double acting/ single rod	Single acting/ push	Single acting/ pull	Double acting/ double rod
		FCD	FCS	FCH	FCD-D
ø25 to 63	P4	○	○	○	○
	P40	○	○	○	○

**STK**  
Stopper cylinder



Page 31

How to order		STK-[Bore size]-[Stroke length]-[Switch]-[Number]-[Option]P4□			
Applicable bore size		Double acting/ single rod	Single acting/ push	Single acting/ pull	Contact CKD for other variations.
			X	Y	
ø20 to 50	P4	●		○	
	P40	●		○	

**MVC**  
Small cylinder with suction pad



Page 33

How to order		MVC-[Bore size]-[Stroke length]-[Switch]-[Number]-[Pad]-[Buffer]-P4□	
Applicable bore size		Double acting	
ø6, ø10	P4	●	
	P40	●	

## With brake

**ULK/ULKP**  
Brake cylinder



Page 35

How to order		ULK-[Mounting]-[Bore size]-[Stroke length]-[Switch]-[Number]-[Option]-P4□[Accessories]	
Applicable bore size		Double acting	Double acting/ with solenoid valve
			V
ø16 to 40	P4	▲	
	P40	▲	

Note: Standard grease used

**USSD**  
Position locking compact cylinder



Page 39

How to order		USSD-L-[Bore size]-[Stroke length]-[Lock direction]-[Switch]-[Number]-[Option]-P4□-[Mounting bracket]	
Applicable bore size		Double acting	Double acting/ high load
			K
ø20 to 100	P4	○	○
	P40	○	○

Note: Standard grease used

## Combined functions

**STG-B/M**   
Guided cylinder



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How to order		STG-[Bearing]-[Bore size]-[Stroke length]-[Switch]-[Number]-[Option]P4□							
Applicable bore size		Double acting/ single rod	Double acting/ position locking	Double acting/ rubber-air cushioned	Double acting/ air cushioned	Double acting/ rubber scraper	Double acting/ coil scraper	Double acting/ coolant proof	Double acting/ anti-splatter adherence
			Q	*C	C	G	G1	G2/G3	G4
ø12 to 100	P4	●	●	○	○	○			
	P40	●	●	○	○	○			
	P41	▲	▲	▲	▲	▲			
	P42	▲	▲	▲	▲				

\*1: Not compatible with STG-K.

\*2: Port plugs of ø12 and ø16 are changed from FPL-M5 to hexagon socket head and female thread. Sealant is required when the plug position is changed.

# Pneumatic actuators

Note Metal wear powder (copper-based metal is not included) from the mounting part will occur in oscillation mounting formats such as clevis mounting.  
To order a switch, refer to the switch compatibility table on Intro Pages 21 to 24 and order using the listed order model No.

 are listed in this catalog.  
● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## Combined functions

**LCR** 

Linear slide cylinder

How to order LCR-[Variation]-[Bore size]-[Stroke length]-[Switch]-[Number]-[Option]P4□

Applicable bore size		Double acting/ single rod	Double acting/ position locking	Double acting/ fine speed
			Q	F
ø6 to 25	P4	●	●	●
	P40	●	●	●
	P41	□	□	□
	P42	▲	▲	▲

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\*1: Even when P40 is selected for the external stopper option, electrolytic nickel plating is used for the stopper part.

**LCG** 

Linear slide cylinder

How to order LCG-[Variation]-[Bore size]-[Stroke length]-[Switch]-[Number]-[Option]P4□

Applicable bore size		Double acting/ single rod	Double acting/ position locking
			Q
ø6 to 25	P4	●	●
	P40	●	●
	P41	□	□
	P42	▲	▲

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\*1: Even when P40 is selected for the external stopper option, electrolytic nickel plating is used for the stopper part.  
\*2: If P4 is chosen, rust proofing (option code: U) is recommended for LCG-20, 25. (P40 of ø20, ø25 are rust proofed.)

**LCW**

Linear slide cylinder

How to order LCW-[Variation]-[Bore size]-[Stroke length]-[Piping direction]-[Switch]-[Number]-[Option]P4□

Applicable bore size		Double acting/ single rod	Double acting/ position locking
			Q
ø12 to 20	P4	▲	▲
	P40	▲	▲
	P41	□	□
	P42	□	□

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\*1: P4 is not available for shock absorber.

**LCX** 

Linear slide cylinder

How to order LCX-[Bore size]-[Stroke length]-[Switch]-[Number]-[Option]P4□

Applicable bore size		Double acting/ single rod
ø25/ 32	P4	●
	P40	●

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\*1: Even when P40 is selected for the external stopper option, electrolytic nickel plating is used for the stopper part.

**STR2**

Twin rod cylinder

How to order STR2-[Bearing][Variation]-[Bore size]-[Stroke length]-[Switch]-[Number]-[Option]P4□

Applicable bore size		Double acting/ single rod	Double acting/ position locking	Double acting/ fine speed	Double acting/ low speed	Double acting/ double rod
			Q	F	O	D
ø6 to 32	P4	●	●	○	○	○
	P40	●	●	○	○	○
	P41	□	□	□	□	□
	P42	▲	▲	▲	▲	▲

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**UCA2** 

Unit cylinder

How to order UCA2-[Fixing method]-[Bore size]-[Stroke length]-[Switch]-[Number]-[Option]P4□

Applicable bore size		Metal bush bearing	Ball bearing
			B
ø10 to 32	P4	●	●
	P40	●	●

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# Pneumatic actuators

Note: To order a switch, refer to the switch compatibility table on Intro Pages 21 to 24 and order using the listed order model No.

## Combined functions

are listed in this catalog.  
● : Standard ○ : Made to order ▲ : Contact CKD  : Not applicable

**STA2**  
Stopper cylinder



Page 58

How to order		STA2-[Variation]-[Bore size]-[Stroke length]-[Switch]-[Number]-[Option]P4			
Applicable bore size	P4	Double acting	Double acting/ spring integrated		
		▲	Y1		
ø50	P4	▲	▲		

## Rodless

**SRL3**  
Rodless cylinder



Page 60

How to order		SRL3-[Variation]-[Mounting]-[Bore size][Cushion]-[Stroke length]-[Switch]-[Number]-[Option]P4 <input type="checkbox"/>				
Applicable bore size	P4	Double acting/ standard	Double acting/ position locking	Double acting/ resin guide	Resin guide/ position locking	
		●	●	Q	G	GQ
ø12 to 100	P40	●	●			

\*1: Port plugs of ø12 and ø16 are changed from FPL-M5 to hexagon socket head and female thread. Sealant is required when the plug position is changed.

**SRM3**  
Rodless cylinder with high precision guide



Page 62

How to order		SRM3-[Variation]-[Mounting]-[Bore size][Cushion]-[Stroke length]-[Switch]-[Number]-[Option]P4 <input type="checkbox"/>			
Applicable bore size	P4	Double acting/ standard	Double acting/ position locking		
		●	●	Q	
ø25/32/40/63	P40	●	●		

\*1: Square nut, a standard attachment, is not attached.  
\*2: The grease nipple is not assembled.  
\*3: If the switch model No. is not selected, select "CO" (for reed switch), "C1" (for proximity switch) after [Stroke length].

**MRL2**   
Magnet rodless cylinder



Page 64

How to order		MRL2-[Variation]-[Mounting]-[Bore size][Cushion]-[Stroke length]-[Switch]-[Number]-[Option]P4 <input type="checkbox"/>			
Applicable bore size	P4	Double acting/ basic			
		●			
ø6 to 32	P40	●			

\*1: Port plugs of ø6, ø10, and ø16 are changed from FPL-M5 to hexagon socket head and female thread. Sealant is required when the plug position is changed.  
\*2: Electrolytic nickel plating is used in the magnet.

**MRG2**  
Magnet rodless cylinder with high precision guide



Page 66

How to order		MRG2-[Variation]-[Mounting]-[Bore size][Cushion]-[Stroke length]-[Switch]-[Number]-[Option]P4 <input type="checkbox"/>			
Applicable bore size	P4	Double acting/ basic			
		●			
ø10/16/25	P40	▲			

\*1: Port plugs of ø10 and ø16 are changed from FPL-M5 to hexagon socket head and female thread. Sealant is required when the plug position is changed.  
\*2: Electrolytic nickel plating is used in the magnet.

## Rotary actuator

**GRC**  
Table rotary actuator



Page 68

How to order		GRC-[K]-[Torque size]-[Angle]-[Switch]-[Number]-[Option]P4 <input type="checkbox"/>				
Applicable size	P4	Standard	High accuracy	Fine speed	High accuracy/ fine speed	
		●	●	▲	KF	▲
Torque 0.5 to 8.1 N·m	P40	● (*1)	● (*1)	▲	▲	
	P41					
	P42	▲	▲	▲	▲	

\*1: Even when P40 is selected for the external stopper option, electrolytic nickel plating is used for the stopper part.  
\*2: Zinc plating is used in part of the bearings - the sealing washer of the angle adjustment unit.

**SFR/SFRT**  
Fine speed fan rotary actuator



Page 70

How to order		SFR-[Size]-[Oscillating angle]-[Switch]-[Number]-P4	
Applicable bore size	P4	Shaft	Table
		SFR	SFRT
Torque 0.35 to 2.71 N·m	P4	●	●

# Pneumatic actuators

Note: To order a switch, refer to the switch compatibility table on Intro Pages 21 to 24 and order using the listed order model No.

## Hand/chuck



are listed in this catalog.

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

HAP		How to order HAP-[Size]-[Option]-[Switch]-[Number]-P4□				
Parallel hand		Applicable bore size	Double acting	Single acting Normally open	Single acting Normally closed	
					O	C
Page 72		ø20/25/40	P4	●	●	●
			P40	●	●	●

BHA		How to order BHA-[Size]-[Option]-[Switch]-[Number]-P4□				
Compact cross roller parallel hand		Applicable bore size	Double acting	Single acting Normally open	Single acting Normally closed	
					O	C
Page 74		ø12/16/20/25	P4	●	●	●
			P40	●	●	●

LHA		How to order LHA-[Size]-[Option]-[Switch]-[Number]-P4□				
Linear guide hand		Applicable bore size	Double acting	Single acting Normally open	Single acting Normally closed	
					O	C
Page 76		ø6 to 32	P4	●	●	●
			P40	●	●	●

LHAG 		How to order LHAG-[Size]-[Option]-[Switch]-[Number]-P4□				
Linear guide hand (with rubber cover)		Applicable bore size	Double acting	Single acting/ Normally open	Single acting/ Normally closed	
					O	C
Page 78		ø12 to 32	P4	●	●	●
			P40	●	●	●

BHG		How to order BHG-[Size]-[Option]-[Switch]-[Number]-P4□				
Compact cross roller parallel hand (with rubber cover)		Applicable bore size	Double acting	Single acting Normally open	Single acting Normally closed	
					O	C
Page 80		ø12/16/20/25	P4	●	●	●
			P40	●	●	●

# Pneumatic actuators

Note: To order a switch, refer to the switch compatibility table on Intro Pages 21 to 24 and order using the listed order model No.

## Hand/chuck

 are listed in this catalog.

● : Standard ○ : Made to order ▲ : Contact CKD  : Not applicable

<b>HKP</b>	How to order	HKP-[Size]-[Option]-[Switch]-[Number]-P4□				
Cross roller parallel hand 	Applicable bore size	Double acting	Single acting Normally open	Single acting Normally closed	Rubber cover (nitrile rubber)	
			O	C	G	
	ø32 to 80	P4	●	●	●	●
		P40	●	●	●	●
Page 82	Note: 80 cs is double acting only					
<b>HCP</b>	How to order	HCP-[Size]-[Option]-[Switch]-[Number]-P4□				
Lateral parallel hand 	Applicable bore size	Double acting				
	ø12/20/32	P4	●			
		P40	●			
Page 84						
<b>HLBG</b>	How to order	HLBG-[Size]-[Switch]-[Number]-P4□				
Bearing thin parallel hand (with rubber cover) 	Applicable bore size	Double acting				
	ø12/15/20	P4	●			
		P40	●			
Page 86						
<b>HMF</b>	How to order	HMF-[Size]-[Option]-[Switch]-[Number]-P4□				
Compact wide parallel hand 	Applicable bore size	Double acting				
		Standard	Long stroke 1	Long stroke 2		
			L1	L2		
	ø12×2 to ø40×2	P4	●	●	●	
		P40	●	●	●	
Page 88						
<b>HLC</b>	How to order	HLC-[Size]-[Option]-[Switch]-[Number]-P4□				
Thin long stroke parallel hand 	Applicable bore size	Double acting				
	ø8×2 to ø30×2	P4	●			
		P40	●			
Page 90						
<b>HLD</b>	How to order	HLD-[Size]-[Switch]-[Number]-P4□				
Ultra thin parallel hand 	Applicable bore size	Double acting				
	ø8×4 to ø20×4	P4	●			
		P40	●			
Page 93						

# Pneumatic actuators

Note: To order a switch, refer to the switch compatibility table on Intro Pages 21 to 24 and order using the listed order model No.



are listed in this catalog.

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## Hand/chuck

**HMD**  
Thin wide angle hand



Page 95

How to order		HMD-[Size]-[Switch]-[Number]-P4□	
Applicable bore size	/	Double acting	
		Standard	
ø16/25	P4	●	
	P40	●	

**BHE**  
Centering hand



Page 97

How to order		BHE-[Size]-[Option]-[Switch]-[Number]-P4□			
Applicable bore size	/	Double acting			
		Standard	Open stroke adjustment mechanism	Close stroke adjustment mechanism	Open/close stroke adjust mech
ø12 to 32	P4	●	●	●	●
	P40	●	●	●	●

**CKG**  
3-way jaw bearing chuck (with rubber cover)



Page 99

How to order		CKG-[Size]-[Option]G-[Switch]-[Number]-P4□		
Applicable bore size	/	Double acting	Single acting Normally open	Single acting Normally closed
			O	C
ø16/25/32/40/50	P4	●	●	●
	P40	●	●	●

**CKL2**  
Powerful chuck



Page 101

How to order		CKL2-[Size]-[Option]-[Switch]-[Number]-P4□		
Applicable bore size	/	Double acting	Single acting Normally open	Single acting Normally closed
			O	C
ø20/25/32/40/50/63/80/100	P4	●	●	●
	P40	●	●	●

**CKLB2**  
2-way powerful chuck



Page 103

How to order		CKLB2-[Size]-[Option]-[Switch]-[Number]-P4□		
Applicable bore size	/	Double acting	Single acting Normally open	Single acting Normally closed
			O	C
ø20/25/32/40/50/63/80/100	P4	●	●	●
	P40	●	●	●

## X/Z Module

● : Standard ○ : Made to order ▲ : Contact CKD

**HRL-1**  
Guided cylinder (single axis unit)



Page 108

How to order		HRL-1-[Load capacity]-[Stroke length]-[Switch]-[Number]-P4□	
Applicable bore size	/	Basic	
ø20 to 63	P4	●	
	P40	▲	
	P41		

# Pneumatic actuators

Note: To order a switch, refer to the switch compatibility table on Intro Pages 21 to 24 and order using the listed order model No.

## Low friction cylinder

\*1: Zinc plating is used for the sealing washer.  
\*2: Zinc plating is used for the cushion packing.

are listed in this catalog.  
● : Standard ○ : Made to order ▲ : Contact CKD  : Not applicable

SCM-U		How to order SCM-U-[Mounting]-[Bore size][Cushion]-[Stroke length]-[Switch]-[Number]-[Switch mounting][Option]P4□[Accessories]															
Applicable bore size		Double acting/ single rod	Double acting/ position locking	Single acting/ push	Single acting/ pull	Double acting/ double rod	Double acting/ back to back	Double acting/ two-stage	Stroke adjustable (push)	Stroke adjustable (pull)	Double acting/ low speed	Double acting/ low friction	Double acting/ heat resistance	Double acting/ rubber scraper	Double acting/ tandem	Double acting/ direct mounting foot	Double acting/ rotation-stop
			Q	X	Y	D	B	W	P	R	O	U	T	G	W4	LD	M
ø20 to 100	P4	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	▲
	P40	●*2	●	○	○	○*2	○	○	○	○	○	○	○*2	○	○	○	▲
	P41	▲*2	▲			▲*2	▲	▲	▲	▲*1				▲	▲	▲	
	P42	▲*2	▲			▲*2	▲	▲	▲	▲*1				▲	▲	▲	

SCG-U		How to order SCG-U-[Mounting]-[Bore size][Cushion]-[Stroke length]-[Switch]-[Number]-[Option]P4□[Accessories]									
Applicable bore size		Double acting/ single rod	Double acting/ position locking	Double acting/ double rod	Double acting/ low speed	Double acting/ low friction	Double acting/ rubber scraper	Double acting/ rotation-stop	Double acting/ coolant proof	Double acting/ anti-spatter adherence	
			Q	D	O	U	G	M	G2/G3	G1/G4	
ø32 to 100	P4	●	●	○	○	○					
	P40	●	●	○	○	○					
	P41	▲	▲	▲			▲				

SSD2-KU		How to order SSD2-KUL-[Bore size]-[Stroke length]-[Switch]-[Number]-[Option]P4□-[Mounting bracket]-[Accessories]																
Applicable bore size		Double acting/ single rod	Double acting/ single rod high load	Double acting/ single rod long stroke length	Single acting/ push	Single acting/ pull	Double acting/ rubber-air cushioned high load	Double acting/ position locking	Double acting/ double rod	Double acting/ back to back	Double acting/ two-stage	Double acting/ fine speed	Double acting/ low speed	Double acting/ low friction/ high load	Double acting/ heat resistance	Double acting/ packing fluoro rubber	Double acting/ rubber scraper	Double acting/ rotation-stop
			K		X	Y	KC	Q	D	B	W	F	O	KU	T1	T2	G	M
ø12 to 200	P4	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	▲	▲
	P40	●	●	○	○	○	○	○	○	▲	○	○	○	○	○	○	▲	▲
	P41	▲	▲	▲			▲	▲	▲	▲							▲	
	P42	▲	▲	▲			▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	

## Related products

NCK		How to order NCK-[Mounting]-[Series]-[Option]-P4□		
Applicable size		Basic		
		P4	●	
All sizes	P40	●		

FJ		How to order FJ-*3-P4/FJ-*4-P4/FJ-*5-P4		
Applicable size		Basic	Foot	Flange
FJ-*3 FJ-*4 FJ-*5	P4	●	●	●
	P40	▲	▲	▲
FJ-*6 to 45	P4	Supports P4 specifications as standard		
	P40	▲		

FCK		How to order FCK-[Series]-[Option]-P4			
Applicable size		Low speed	Medium speed	High speed	
		L	M	H	
FCK*-0.15 to 8.1	P4	●	●	●	

FK		How to order FK-[Thread size]-P40	
Applicable size		Male thread	Female thread
		N	
All sizes	P4	Supports P4 specifications as standard	
	P40	●	●

PVP		How to order PVP-[Shape]-[Porous material size]-[Vacuum port position]-[Option]		
Applicable size		Note: Supports P4 specifications as standard		

LBC		How to order LBC-[Thrust]
Applicable size		Note: Supports P4 specifications as standard













# Cylinder switch T/F/M/K Series

\* There are bore sizes which cannot be combined.



F\*S



F\*V

F\*H



F\*YV  
F3PV



F\*YH  
F3PH



## Specifications (F Series)

Descriptions	Reed 2-wire		Proximity 2-wire		Proximity 3-wire	Proximity 3-wire	Proximity 3-wire
	F0H/V	F2H/V / F2S	F2YH/F2YV	F3H/V / F3S	F3PH/V	F3YH/F3YV	
Applications	Dedicated for programmable controller				For programmable controller, relay		
Output method	-				NPN output	PNP output	NPN output
Power supply voltage	-				10 to 28 VDC	4.5 to 28 VDC	10 to 28 VDC
Load voltage	24 VDC	10 to 30 VDC	24 VDC ±10%	30 VDC or less			
Load current	5 to 20 mA (*1)				50 mA or less		
Current consumption	-				10 mA or less with 24 VDC		
Internal voltage drop	4 V or less				0.5 V or less	0.5 V or less at 30 mA	0.5 V or less
Indicator lamp	Yellow LED (Lit when ON) *3		Red/green LED (Lit when ON)	Yellow LED *3 (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)	
Leakage current	1 mA or less				10 µA or less		
Lead wire length	1 m (oil resistant vinyl cabtyre cable 2-conductor 0.15 mm <sup>2</sup> )				1 m (oil resistant vinyl cabtyre cable 3-conductor 0.15 mm <sup>2</sup> )		
Shock resistance	294 m/s <sup>2</sup>	980 m/s <sup>2</sup>					
Insulation resistance	20 MΩ and over with 500 VDC megger						
Withstand voltage	No failure after 1 minute of 1,000 VAC application.						
Ambient temperature	-10 to +60°C						
Degree of protection	IEC Standard IP67, JIS C0920 (water-tight), oil resistance						
Contact protection circuit *4	None		-				
Weight	1 m:10 g 3 m:29 g		-		1 m:10 g 3 m:29 g		

\*1: Max. load current: 20 mA at 25°C. The current is lower than 20 mA if the operating ambient temperature around the switch is higher than 25°C. (5 to 10 mA at 60°C)

\*2: With F2S and F3S, if mounting two switches in one groove to enable detection at both ends, mount them so that their set screws face outward.

\*3: Indicator lamps for F2S and F3S are red.

\*4: Refer to page 373 for contact protective measures.

### [How to order switch]

If you order switches for the P4 Series separately, do as follows.

SW-□□□-P4 Example SW-T2H-P4

(\*1) When ordering Low-Voltage Directive compliant products separately, do as follows.

SW-□□□-ST-P4 Example SW-T5H-ST-P4

(\*2) If you order products with resin connector separately, do as follows.

Applies to the above T2H, T2YH, T2WH, K2YH, M2WV, F2H only.

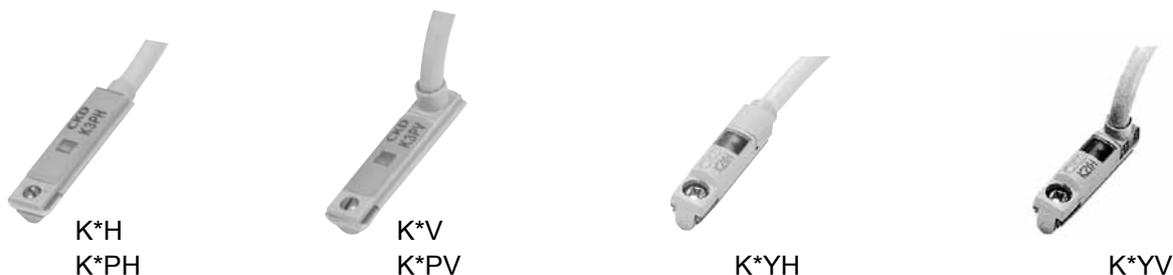
SW-□□□-P4J Example SW-T2H-P4J

### [Incorporated switch]

For cylinder specification P4 and P40, switch indicating "P4" is supplied. Cylinder mountable switch differs according to each cylinder. Refer to the switch compatibility table on Intro Pages 21 to 24.

Example: GRC: Reed switch TO\*, T5\* cannot be installed.

SRM3: Proximity 1-color display T2\*, T3\* cannot be installed.



## Specifications (K Series)

Descriptions	Proximity 2-wire		Proximity 3-wire		
	K2H/K2V	K2YH/K2YV	K3H/V (NPN output)	K3PH/V (PNP output)	K3YH/V (2-color display)
Applications	Dedicated for programmable controller		For programmable controller, relay		
Output method	-		NPN output	PNP output	NPN output
Power supply voltage	-		10 to 28 VDC		
Load voltage	10 to 30 VDC		30 VDC or less		
Load current	5 to 20 mA (*1)		50 mA or less		
Current consumption	-		10 mA or less with 24 VDC	10 mA or less with 24 VDC	10 mA or less with 24 VDC
Internal voltage drop	4 V or less		0.5 V or less		
Indicator lamp	RED LED (Lit when ON)	Red/green LED (Lit when ON)	RED LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)
Leakage current	1 mA or less		10 µA or less		
Lead wire length	1 m (oil resistant vinyl cabtyre cable 2-conductor 0.2 mm <sup>2</sup> )	1 m (oil resistant vinyl cabtyre cable 2-conductor 0.3 mm <sup>2</sup> )	1 m (oil resistant vinyl cabtyre cable 3-conductor 0.2 mm <sup>2</sup> )		1 m (oil resistant vinyl cabtyre cable 3-conductor 0.2 mm <sup>2</sup> )
Shock resistance	980 m/s <sup>2</sup>				
Insulation resistance	20 MΩ and over with 500 VDC megger	100 MΩ and over at 500 VDC megger	20 MΩ and over with 500 VDC megger		100 MΩ and over at 500 VDC megger
Withstand voltage	No failure after 1 minute of 1,000 VAC application.				
Ambient temperature	-10 to +60°C				
Degree of protection	IEC Standard IP67, JIS C0920 (water-tight), oil resistance				
Weight	1 m:18 g 3 m:49 g 5 m:80 g	1 m:31 g 3 m:85 g 5 m:139 g	1 m:18 g 3 m:49 g 5 m:80 g		1 m:31 g 3 m:85 g 5 m:142 g

Descriptions	Reed 2-wire			
	K0H/K0V		K5H/K5V	
Applications	For programmable controller, relay		For programmable controller, relay, IC circuit (without indicator lamp), serial connection	
Power supply voltage	-			
Load voltage	12/24 VDC	110 VAC	5/12/24 VDC	110 VAC
Load current	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Current consumption	-			
Internal voltage drop	3 V or less		0.1 V or less (*3)	
Indicator lamp	RED LED (Lit when ON)		Without indicator lamp	
Leakage current	0 mA			
Lead wire length	1 m (oil resistant vinyl cabtyre cable 2-conductor 0.2 mm <sup>2</sup> )			
Shock resistance	294 m/s <sup>2</sup>			
Insulation resistance	20 MΩ and over with 500 VDC megger			
Withstand voltage	No failure after 1 minute of 1,000 VAC application.			
Ambient temperature	-10 to +60°C			
Degree of protection	IEC Standard IP67, JIS C0920 (water-tight), oil resistance			
Contact protection circuit *4	None			
Weight	1 m:18 g 3 m:49 g 5 m:80 g			

\*1: The above max. load current is the value at 25°C. The current is lower than 20 mA if the operating ambient temperature around the switch is higher than 25°C. (5 to 10 mA at 60°C)

\*2: Installation of K3PH, K3PV onto compatible cylinders is made to order.

\*3: Internal resistance 0.5 Ω or less.

\*4: Refer to page 373 for contact protective measures.



M\*V



M\*H

## Specifications (M Series)

Descriptions	Proximity 2-wire		Proximity 3-wire		
	M2V/M2H	M2WV (2-color display)	M3H/V (NPN output)	M3PH/V (PNP output)	M3WV (2-color display)
Applications	Dedicated for programmable controller		For programmable controller, relay, IC circuit, compact solenoid valve		
Output method	-		NPN output	PNP output	NPN output
Power supply voltage	-		4.5 to 28 VDC		10 to 28 VDC
Load voltage	10 to 30 VDC		30 VDC or less		
Load current	5 to 30 mA		100 mA or less	100 mA or less	100 mA or less
Current consumption	-		10 mA or less with 24 VDC	10 mA or less with 24 VDC	15 mA or less with 24 VDC
Internal voltage drop	4 V or less		0.5 V or less		
Indicator lamp	Red LED (Lit when ON)	Red/green LED (Lit when ON)	Red LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)
Leakage current	1 mA or less		10 μA or less	0.05 mA or less	10 μA or less
Lead wire length	1 m (oil resistant vinyl cabtyre cable 2-conductor 0.2 mm <sup>2</sup> )		1 m (oil resistant vinyl cabtyre cable 3-conductor 0.15 mm <sup>2</sup> )		
Shock resistance	980 m/s <sup>2</sup>				
Insulation resistance	100 MΩ and over at 500 VDC megger				
Withstand voltage	No failure after 1 minute of 1,000 VAC application.				
Ambient temperature	-10 to +60°C				
Degree of protection	IEC Standard IP67, JIS C0920 (water-tight), oil resistance				
Weight	1 m:22 g 3 m:57 g 5 m:93 g		1 m:22 g 3 m:57 g 5 m:93 g		

Descriptions	Reed 2-wire			
	M0V/M0H		M5V/M5H	
Applications	For programmable controller, relay		For programmable controller, relay, IC circuit (No indicator lamp), serial connection	
Power supply voltage	-			
Load voltage	12/24VDC	110 VAC	5/12/24 VDC	110 VAC
Load current	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Current consumption	-			
Internal voltage drop	3 V or less		0.1 V or less (*4)	
Indicator lamp	Red LED (Lit when ON)		Without indicator lamp	
Leakage current	0 mA			
Lead wire length	1 m (oil resistant vinyl cabtyre cable 2-conductor 0.2 mm <sup>2</sup> )			
Shock resistance	294 m/s <sup>2</sup>			
Insulation resistance	100 MΩ and over at 500 VDC megger			
Withstand voltage	No failure after 1 minute of 1,000 VAC application.			
Ambient temperature	-10 to +60°C			
Degree of protection	IEC Standard IP67, JIS C0920 (water-tight), oil resistance			
Contact protection circuit *5	None			
Weight	1 m:22 g 3 m:57 g 5 m:93 g			

\*1: M\*H is available for SRL3, SRG3, and SRT3.

\*2: Refer to the switch compatibility table on Intro Pages 21 to 24 for switch model numbers that can be equipped on cylinders.

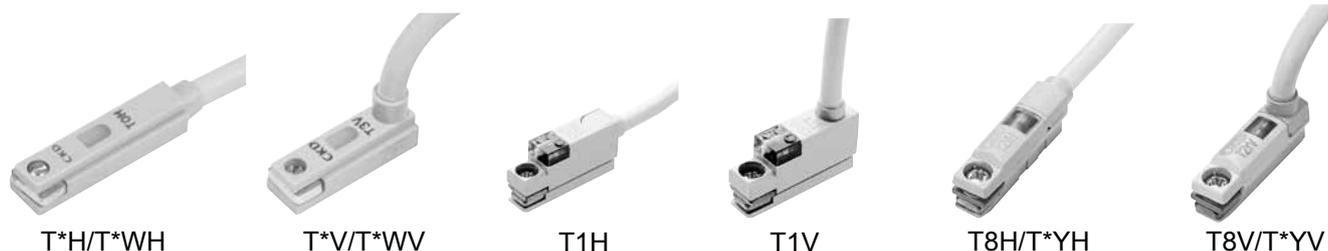
\*3: Contact CKD separately for cylinder switch with connector.

\*4: Internal resistance 0.5 Ω or less.

\*5: Refer to page 373 for contact protective measures.



(excluding T1 and T8)



## Specifications (T Series)

Descriptions	Proximity 2-wire						Proximity 3-wire							
	T1H/T1V	T2H/T2V	T2HR3/T2VR3 (Bending resistant lead wire)	T2JH/T2JV (Off-delay)	T2YH/T2YV (2-color display)	T2WH/T2WV (2-color display)	T3H/T3V	T3PH/T3PV (PNP output)	T3YH/T3YV (2-color display)	T3WH/T3WV (2-color display)				
Applications	For programmable controller, relay, compact solenoid valve						Dedicated for programmable controller				For programmable controller, relay			
Output method							-				NPN output   PNP output   NPN output   NPN output			
Power supply voltage							-				10 to 28 VDC			
Load voltage	85 to 265 VAC		10 to 30 VDC			24 VDC ±10%	30 VDC or less							
Load current	5 to 100 mA		5 to 20 mA (*1)				100 mA or less		50 mA or less					
Current consumption	-		-				10 mA or less with 24 VDC		10 mA or less with 24 VDC		10 mA or less with 24 VDC			
Internal voltage drop	10% or less of load voltage		4 V or less				0.5 V or less							
Off-delay time	-		200±50 ms				-							
Indicator lamp	Red LED (Lit when ON)						Red/green LED (Lit when ON)		Red/green LED (Lit when ON)		Red LED (Lit when ON)   Yellow LED (Lit when ON)		Red/green LED (Lit when ON)	
Leakage current	1 mA or less with 100 VAC, 2 mA or less with 200 VAC		1 mA or less				10 µA or less							
Lead wire length	1 m (oil resistant vinyl cabtyre cable 2-conductor 0.3 mm <sup>2</sup> )		1 m (oil resistant vinyl cabtyre cable 2-conductor 0.2 mm <sup>2</sup> )	3 m (elasticity, oil resistant vinyl cabtyre cable 2-conductor 0.2 mm <sup>2</sup> )	1 m (oil resistant vinyl cabtyre cable 2-conductor 0.3 mm <sup>2</sup> )		1 m (oil resistant vinyl cabtyre cable 2-conductor 0.2 mm <sup>2</sup> )	1 m (oil resistant vinyl cabtyre cable 3-conductor 0.2 mm <sup>2</sup> )		1 m (oil resistant vinyl cabtyre cable 3-conductor 0.3 mm <sup>2</sup> )	1 m (oil resistant vinyl cabtyre cable 3-conductor 0.2 mm <sup>2</sup> )			
Shock resistance	980 m/s <sup>2</sup>													
Insulation resistance	100 MΩ and over at 500 VDC megger		20 MΩ and over with 500 VDC megger		100 MΩ and over at 500 VDC megger		20 MΩ and over with 500 VDC megger	20 MΩ and over with 500 VDC megger		100 MΩ and over at 500 VDC megger	100 MΩ and over at 500 VDC megger	20 MΩ and over with 500 VDC megger		
Withstand voltage	No failure after 1 minute of 1,500 VAC application.		No failure after 1 minute of 1,000 VAC application.											
Ambient temperature	-10 to +60°C													
Degree of protection	IEC Standard IP67, JIS C0920 (water-tight), oil resistance													
Weight	1 m:33 g 3 m:87 g 5 m:142 g		1 m:18 g 3 m:49 g 5 m:80 g		1 m:33 g 3 m:87 g 5 m:142 g		1 m:18 g 3 m:49 g 5 m:80 g	1 m:18 g 3 m:49 g 5 m:80 g	1 m:33 g 3 m:87 g 5 m:142 g	1 m:18 g 3 m:49 g 5 m:80 g	1 m:18 g 3 m:49 g 5 m:80 g			

Descriptions	Reed 2-wire								
	T0H/T0V		T5H/T5V			T8H/T8V			
Applications	For programmable controller, relay		For programmable controller, relay, IC circuit (without indicator lamp), serial connection			For programmable controller, relay			
Power supply voltage	-								
Load voltage	12/24 VDC		110 VAC	5/12/24 VDC		110 VAC	12/24 VDC	110 VAC	220 VAC
Load current	5 to 50 mA		7 to 20 mA	50 mA or less		20 mA or less	5 to 50 mA	7 to 20 mA	7 to 10 mA
Current consumption	-								
Internal voltage drop	3 V or less		0.1 V or less (*5)			4 V or less			
Indicator lamp	Red LED (Lit when ON)		Without indicator lamp			Red LED (Lit when ON)			
Leakage current	0 mA								
Lead wire length	1 m (oil resistant vinyl cabtyre cable 2-conductor 0.2 mm <sup>2</sup> )					1 m (oil resistant vinyl cabtyre cable 2-conductor 0.3 mm <sup>2</sup> )			
Shock resistance	294 m/s <sup>2</sup>								
Insulation resistance	20 MΩ and over with 500 VDC megger					100 MΩ and over at 500 VDC megger			
Withstand voltage	No failure after 1 minute of 1,000 VAC application.					No failure after 1 minute of 1,500 VAC application			
Ambient temperature	-10 to +60°C								
Degree of protection	IEC Standard IP67, JIS C0920 (water-tight), oil resistance								
Contact protection circuit *6	None					Yes			
Weight	1 m:18 g 3 m:49 g 5 m:80 g					1 m:33 g 3 m:87 g 5 m:142 g			

\*1: The above max. load current is 20 mA at 25°C. The current is lower than 20 mA if the operating ambient temperature around the switch is higher than 25°C. (5 to 10 mA at 60°C)

\*2: T2HR3, T2VR3, T3PH and T3PV switches are available as made to order when installed onto compatible cylinders.

\*3: T2JH and T2JV switches are available as made to order when installed onto SRL3 (ø32 to ø100), MRL2, LCR, UCAC2 or Hand-chuck.

\*4: Switch types are limited depending on cylinder. Refer to Intro Pages 21 to 24 for details.

\*5: Internal resistance 0.5 Ω or less.

\*6: Refer to page 373 for contact protective measures.

## Pneumatic valves

### Pilot operated 3, 5-port valve

 are listed in this catalog.

● : Standard ○ : Made to order ▲ : Contact CKD  : Not applicable



How to order	
Single unit	$\frac{3}{4}$ GA[Size][Switching section]0R-[Bore size]-[Wiring][Option]-[Voltage]-P4
Manifold Replacement valve	$\frac{3}{4}$ GA[Size][Switching section]9R-[Bore size]-[Wiring][Option]-[Voltage]-P4
M4G Series (Metal base)	M $\frac{3}{4}$ G $\frac{A}{B}$ [Size][Switching section]0R-[Bore size]-[Wiring][Option][Mounting]-[Station No.]-[Voltage]-P4
MN4G Series (Block manifold)	MN $\frac{3}{4}$ G $\frac{A}{B}$ [Size][Switching section]0R-[Bore size]-[Wiring][Option]-[Station No.]-[Voltage]-P4
Single unit (Large flow rate)	4G $\frac{A}{B}$ 4[Switching section]0-[Bore size]-[Wiring][Option]-[Voltage]-P4

	4G1 Series	4G2 Series	4G3 Series	4G4 Series	Note: Flow characteristics of base piping.
Flow characteristics C[dm <sup>3</sup> /(s·bar)]	1.1 to 1.3	2.2 to 2.6	3.4 to 4.2	12 to 15	

	4G Series		M4G Series *5) *6)			MN4G Series *7) *9)	
	Push-in fitting Straight (Model No.: C□)	Screw-in (Model No.: M5, 06, 08)	Push-in fitting Straight (Model No.: C□)	Push-in fitting Elbow (Model No.: CL□, CD□)	Screw-in (Model No.: M5, 06, 08)	Push-in fitting Straight (Model No.: C□)	Push-in fitting Elbow (Model No.: CL□, CD□)
P4	● *8)	●	● *8)		●	● *8)	

\*1: Base piping (B) single units and 4GA1-M5 are standard products and equivalent to P4 specifications.

\*2: Copper-free material applies to flow rate part.

\*3: Refer to "Pneumatic Valves (Catalog No. CB-023SA)" for serial communication specifications.

\*4: Push-in fitting elbow is not supported.

\*5: Due to the attached M5 plug change, external pilot is available with P4 specification with or without fitting.

\*6: In-stop valve spacer and spacer pilot check valve are not supported.

\*7: External pilot specification is not available as standard.

\*8: The following are not supported for push-in fitting straight.

$\frac{3}{4}$  G  $\frac{A}{B}$  1, MN4G  $\frac{A}{B}$  1:CF, C18

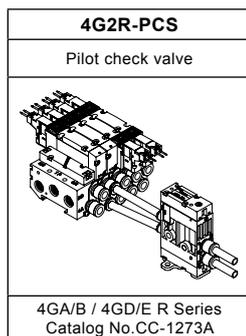
$\frac{3}{4}$  GA3:C6, C10

$\frac{3}{4}$  GB3:C6

$\frac{3}{4}$  GA4:C10, C12

\*9: Atmosphere opening type cannot be selected for MN4G end block and supply and exhaust block.

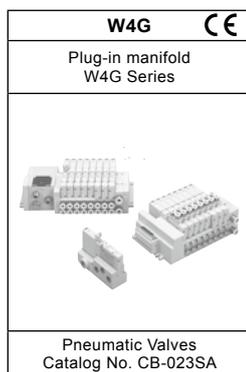
\*10: Contact CKD for European Standards compliant products.



How to order	
Single unit	4G2R-PCS-[Port size]-[Option]-P4
	4G2R-PCS-P4 Pilot check valve
P4	●

\*1: Residual pressure release mechanism is not available.

### Pilot operated 3, 5-port valve



How to order	
Single unit	W4G $\frac{B}{2}$ [Size][Switching section]0-[Bore size]-[Wiring][Option]-[Voltage]-P40
Manifold Replacement valve	W $\frac{3}{4}$ G $\frac{A}{B}$ [Size][Switching section]9-[Bore size]-[Option]-[Voltage]-P40
Individual wiring manifold	MW $\frac{3}{4}$ G $\frac{A}{B}$ [Size][Switching section]0-[Bore size]-[Wiring][Option]-[Station No.]-[Voltage]-P40
Reduced wiring manifold	

	W4G2 Series	W4G4 Series
Flow characteristics C[dm <sup>3</sup> /(s·bar)]	2.1 to 2.5	6.4 to 7.3

	MW4G $\frac{A}{2}$ 2 Series	MW4G $\frac{B}{2}$ 4 Series
Electrical connections	R1, T10, T20, T30, T51, T8D*, T8G*	R1, T10, T6D1, T6G1, T7EC*
Manual override	Blank, M	
Available options	H, A, F, Z6	H, A, F, Z1, Z3

	W4G2 Series	W4G4 Series	
	Push-in fitting Straight (Model No.: C□)	Screw-in fitting (Model No.: 08, 10)	Push-in fitting Straight (Model No.: C□)
P40	●	●	● * Excluding C12

\*1: Refer to "Pneumatic Valves (Catalog No. CB-023SA)" for serial communication specifications.

\*2: M12 connector is resin connector.

\*3: End block atmosphere release/common exhaust type is not available.

\*4: Manifold external pilot specification is not available as standard.

\*5: Maximum size is C10 for push-in fitting straight.

\*6: Push-in fitting elbow is not applicable.

\*7: The degree of protection is equivalent to IP40 for T30 and T51.

\*8: T7EC\* M12 connector and T8G\* FG terminal are copper-based metal + nickel plating.

\*9: Contact CKD when ordering parts only.

\*10: Contact CKD for other options.

\*11: Attachments cannot be selected from the manifold specifications sheet. Contact CKD separately.

\*12: Contact CKD for European Standards compliant products.

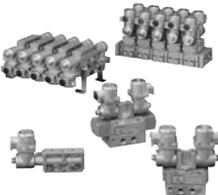
# Pneumatic valves

## Pilot operated 3, 5-port valve

 are listed in this catalog.  
● : Standard ○ : Made to order ▲ : Contact CKD  : Not applicable

<b>W4G2-PC</b> Spacer pilot check valve  Pneumatic Valves Catalog No. CB-023SA	How to order				
	Single unit	W4G2-PC-P40			
	<table border="1"> <tr> <td></td> <td>W4G2-PC-P40 Spacer pilot check valve</td> </tr> <tr> <td>P40</td> <td>●</td> </tr> </table>			W4G2-PC-P40 Spacer pilot check valve	P40
	W4G2-PC-P40 Spacer pilot check valve				
P40	●				
*1: Residual pressure release mechanism is not available.					

## Pilot operated explosion-proof 5-port valve

<b>4F**0E</b> Explosion-proof solenoid valve  Pneumatic Valves Catalog No. CB-023SA	How to order					
	Single unit	Contact CKD for model numbers.				
	Manifold replacement valve (4F3)	Contact CKD for model numbers.				
	Manifold replacement valve (4F4 to 7)	Contact CKD for model numbers.				
	M4F**E Series (Individual wiring manifold)	Contact CKD for model numbers.				
<table border="1"> <tr> <td></td> <td>4F**E Series</td> </tr> <tr> <td>P4</td> <td>▲</td> </tr> </table>			4F**E Series	P4	▲	
	4F**E Series					
P4	▲					

<b>4F**0EX</b> Pilot operated explosion-proof 5-port valve  Separate catalog Catalog No. CC-1159A	How to order					
	Single unit	Contact CKD for model numbers.				
	Manifold replacement valve (4F3)	Contact CKD for model numbers.				
	Manifold replacement valve (4F4 to 7)	Contact CKD for model numbers.				
	M4F**E Series (Individual wiring manifold)	Contact CKD for model numbers.				
<table border="1"> <tr> <td></td> <td>4F**E Series</td> </tr> <tr> <td>P4</td> <td>▲</td> </tr> </table>			4F**E Series	P4	▲	
	4F**E Series					
P4	▲					

<b>3QRA/B</b>  Direct acting 3-port solenoid valve  Page 139	How to order	
	Single unit	3QRB1[Switching position section]0-M5-[Connection method][Flow rate]-[Voltage]
	Replacement valve	3QRA1[Switching position section]9-M5-[Connection method][Flow rate]-[Voltage]
		3QRB1[Switching position section]9-00-[Connection method][Flow rate]-[Voltage]
Manifold	M3QRA1[Switching position section]0-M5-[Connection method][Flow rate]-[Station No.]-[Voltage]	
Note: Supports P4 specifications as standard		

# Pneumatic auxiliary components

## Clean air components

are listed in this catalog.

● : Standard ○ : Made to order ▲ : Contact CKD  : Not applicable

**SU300<sub>E</sub>-W/SU400<sub>E</sub>-W**  
Super dryer (High polymer membrane air dryer)



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How to order	SU301 <sub>E</sub> /302 <sub>E</sub> /401 <sub>E</sub> /402 <sub>E</sub> -[Inlet air pressure]-W-[Option]-P4 <sub>□</sub>
	SU
Port size	Rc3/8
P4	●
P40	▲

\*1: Applicable only for common exhaust.  
\*2: Auto-drain is not available.

**SD300<sub>E</sub>-W/SD400<sub>E</sub>-W**  
Super dryer (High polymer membrane air dryer)



Page 141

How to order	SD30 <sub>□□</sub> /SD40 <sub>□□</sub> -[Inlet air pressure]-W-[Option]-P4 <sub>□</sub>
	SD
Port size	Rc3/8
P4	●
P40	▲

\*1: Applicable only for common exhaust.

**SU3000-W/SU4000-W**  
Super dryer (High polymer membrane air dryer)



Page 147

How to order	SU30 <sub>□□</sub> /SU40 <sub>□□</sub> -[Outlet air atmospheric dew point]-[Inlet air pressure]-W-[Option]-P4 <sub>□</sub>
	SU
Port size	Rc3/8, 1/2
P4	●
P40	▲

\*1: Applicable only for common exhaust.  
\*2: Auto-drain is not available.

**SD**  
Super dryer (High polymer membrane air dryer)



Page 149

How to order	SD30 <sub>□□</sub> /SD4 <sub>□□□□</sub> -[Outlet air atmospheric dew point]-[Inlet air pressure]-[Option]-P4 <sub>□</sub>
	SD
Port size	Rc3/8, 1/2
P4	●
P40	▲

\*1: Applicable only for common exhaust.

**SHD**  
Desiccant air dryer



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How to order	Contact CKD for models
	SHD
P4	▲

**AF2**  
Medium main line filter



Page 155

How to order	AF2-[Flow rate classification][Element][Bore size]-P4
	AF2
Port size	Rc1, 1 1/4, 1/2, 2, 2 1/2
P4	▲

**AF3000/AF5000**  
Large main line filter



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How to order	AF3 <sub>□□□</sub> /AF5 <sub>□□□□</sub> -[Bore size]-[Option]-P4
	AF3000/AF5000
Port size	Flange 2B, 3B, 4B, 6B, 8B
P4	▲

# Pneumatic auxiliary components

## Clean air components

 are listed in this catalog.

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

**RB500**

Compact regulator



Page 168

How to order	RB500-[Direction][Bore size]-NT[Option]P4□	
	RB500 -N	
Port size	Push-in fitting $\varnothing 4/\varnothing 6$	
P4	●	
P40	▲	

- \*1: Pressure gauge/pressure sensor must be ordered separately. (Pressure gauge option is "T" only)  
\*2: Non-relief only is available.  
\*3: Only straight direction is available for fittings.  
\*4: For pressure adjustment springs without gas contact and pressure adjustment screw units in P40, zinc plating is used.

**RP1000/2000**

Precision regulator



Page 169

How to order	RP1000/2000-[Bore size]-[Pressure range]P4□-[Bracket]	
	RP1000	RP2000
Port size	Rc1/4	Rc3/8
P4	●	●
P40	▲	▲

- \*1: Pressure gauge/pressure sensor must be ordered separately. (Attachment options not available.)  
\*2: RP1000 dimensions are different from the standard dimensions.  
\*3: Zinc plating is used for pressure adjustment springs without gas contact in P40.  
\*4: Dimensions are different from the standard products. There are mounting restrictions because of bleed port connection. Check the dimensions for each case.

**RPE**

Precision regulator



Page 173

How to order	RPE1000-[Port size]-[Pressure range]-[Option]P4-[Bracket]	
	RPE1000	
P4	●	

- \*1: Pressure gauge/pressure sensor must be ordered separately. (Attachment options not available.)  
\*2: RPE1000 dimensions are different from the standard dimensions.

**EVD** 

Electro pneumatic regulator



Page 175

How to order	EVD-1/3-[Pressure specifications]-[Input specifications/Port size]-[Option]-3-P4□	
	EVD-1100/1500/1900	EVD-3100/3500/3900
Port size	Rc1/4	Rc1/4, Rc3/8
P4	●	●
P40	▲	●

- Note: Bracket option for EVD-1500/1900-\*P4 is blank or L11 (L type, wall mounting for exhaust fittings).  
Standard B1 and L1 types cannot be selected.

**F1000/F2000/F3000/  
F4000/F6000/F8000**

Filter



Page 180

How to order	F1000/2000/3000/4000/6000/8000-[Bore size]-W-[Option]P4□-[Bracket]					
	F1000-W	F2000-W	F3000-W	F4000-W	F6000-W	F8000-W
Port size	Rc1/8, 1/4	Rc1/4, 3/8	Rc1/4, 3/8	Rc1/4, 3/8, 1/2	Rc3/4,1	Rc3/4,1
P4	●	●	●	●	●	●
P40		●	●	●	●	

- \*1: Auto-drain is not available.  
\*2: Metal bowl is not available.

**M1000/M2000/M3000/  
M4000/M6000/M8000**

Oil mist filter



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How to order	M1000/2000/3000/4000/6000/8000-[Bore size]-W-[Option]P4□-[Bracket]					
	M1000-W	M2000-W	M3000-W	M4000-W	M6000-W	M8000-W
Port size	Rc1/8, 1/4	Rc1/4, 3/8	Rc1/4, 3/8	Rc1/4, 3/8, 1/2	Rc3/4,1	Rc3/4,1
P4	●	●	●	●	●	●
P40		●	●	●	●	

- \*1: Auto-drain is not available.  
\*2: Metal bowl is not available.  
\*3: With M4000 differential pressure indicator option is not available.

**R1000/R2000/R3000/  
R4000/R6000/R8000**

Regulator  
Reverse regulator



Page 185

How to order	R1□00/2□00/3□00/4□00/6□00/8□00-[Bore size]-W-[Option T6/T8]P4□-[Bracket]					
	R1000-W R1100-W	R2000-W R2100-W	R3000-W R3100-W	R4000-W R4100-W	R6000-W R6100-W	R8000-W R8100-W
Port size	Rc1/8, 1/4	Rc1/4, 3/8	Rc1/4, 3/8	Rc1/4, 3/8, 1/2	Rc3/4,1	Rc3/4,1
P4	●	●	●	●	●	●
P40		▲	▲	▲	▲	

- \*1: Pressure gauge/pressure sensor must be ordered separately. (Pressure gauge option is "T", "T8", "T6" only)  
\*2: R1 option is not available.  
\*3: R6000 dimensions are different from the standard dimensions.  
\*4: For pressure adjustment springs without gas contact and pressure adjustment screw units in P40, zinc plating is used.  
\*5: R2 option is not available.  
\*6: For R1000, R1100, R8000, and R8100, only non-relief (option code: N) is available.

# Pneumatic auxiliary components

## Clean air components

are listed in this catalog.

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

**W1000/W2000/W3000/  
W4000/W8000**

Filter/Regulator  
Reverse regulator/Regulator



Page 195

How to order	W1□00/2□00/3□00/4□00/8□00-[Bore size]-W-[Option T6/T8]P4□-[Bracket]				
	W1000-W W1100-W	W2000-W W2100-W	W3000-W W3100-W	W4000-W W4100-W	W8000-W W8100-W
Port size	Rc1/8, 1/4	Rc1/4, 3/8	Rc1/4, 3/8	Rc1/4, 3/8, 1/2	Rc3/4, 1
P4	●	●	●	●	●
P40		▲	▲	▲	

\*1: Pressure gauge/pressure sensor must be ordered separately. (Pressure gauge option is "T", "T8", "T6" only)

\*2: Auto-drain is not available.

\*3: Metal bowl is not available.

\*4: R1 option is not available.

\*5: For pressure adjustment springs without gas contact and pressure adjustment screw units in P40, zinc plating is used.

\*6: R2 option is not available.

\*7: For W1000, W1100, W8000, and W8100, only non-relief (option code: N) is available.

**FX**

Drain separator



Page 205

How to order	FX1004/1011/1037-[Port size]-W-[Option]-P4-[Attachment]		
	FX1004	FX1011	FX1037
Port size	Rc1/4, 3/8	Rc1/4, 3/8, 1/2	Rc3/4, 1
P4	●	●	●
P40	▲	▲	▲

\*1: Auto-drain is not available.

\*2: Metal bowl is not available.

**G40D/G41D/G49D/G59D**

Pressure gauge



Page 209

How to order	G40D/G41D/G49D/G59D-[Bore size]-P[Pressure]-P4			
	G40D	G41D	G49D	G59D
	Display ø42.5 with safety marker	Display ø42 with limit marker	Display ø42	Display ø52
Port size	R1/8	R1/8, 1/4	R1/8	1/4
P4	●	●	●	●

**FCS500/FCS1000**

Inline clean filter



Page 212

How to order	FCS500/FCS1000-[H push-in fitting bore size]-[Attachment]-P40			
	FCS500		FCS1000	
Port size	Push-in fitting ø4 to 8	Screw type/ SUS type (P9)	Push-in fitting ø8 to 12	Screw type/ SUS type (P9)
P4		Supports P4 specifications as standard		Supports P4 specifications as standard
P40	▲	Supports P40 specifications as standard	▲	Supports P40 specifications as standard

**P4100** CE

Pressure switch



Page 213

How to order	P4100-[Bore size][Branch direction]-W-P4-[Attachment]-[Lead wire length]		
	P1100	P4100	P8100
Port size	Rc1/8, 1/4	Rc1/4, 3/8, 1/2	Rc3/4, 1
P4	▲	●	▲

\*1: The atmospheric pressure inlet port is M5.

\*2: Fitting attachment option for atmospheric introduction port is not available.

**APS** CE

Compact mechanical pressure switch



Page 215

How to order	APS-[Piping port position/Bore size/Scale plate direction] [Lead wire length]-[Option]-P4□	
	APS	
Port size	Rc1/8	
P4	●	

\*1: The atmospheric pressure inlet port is M5.

\*2: Fitting attachment option for atmospheric introduction port is not available.

# Pneumatic auxiliary components

## Clean air components

 are listed in this catalog.

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

**PPX** 

Digital pressure sensor



Page 217

How to order	PPX-R10P-6M-J-P40/PPX-R10N-6M-J-P40	
	PPX	
Port size	Rc1/8, M5 female thread	
P4	Supports P4 specifications as standard	
P40	● Product is limited to the above model numbers	

\*1: Bracket mounting is not possible for P40.

\*2: P40 is compatible only with PPX-R10P-6M-J-P40/PPX-R10N-6M-J-P40.

\*3: P40 connector must be ordered separately. PPX-C2-FL401967-P40

**FSM2**

Compact flow rate sensor (RAPIFLOW)



Page 219

How to order	FSM2-[Output][Analog output][Flow direction][Flow rate range]-[Port size][Gas type][Cable][Brackets][Traceability]-[Clean-room specifications]
--------------	--

\*1: Stainless steel body and aluminum body are P4 compatible as standard.

\*2: Resin body and products with needle valve are not P4 compatible.

**V3301**

Slow start valve



Page 226

How to order	V3301-[Bore size]-W-[Manual operation/Electrical connection]-[Voltage]-P4□-[Attachment options]	
	V3301	
Port size	Rc1/4 to Rc1/2	
P4	▲	(*1) (*2)
P40	▲	(*1) (*2)

\*1: Only LS is available for electrical connection.

\*2: Valve is vertical mounting.

**V3000/V3010/V6010**

Shut-off valve



Page 227

How to order	V3000/V3010/V6010-[Bore size]-W-[Option]-P4□-[Attachment]	
	V3000/V3010	V6010
Port size	Rc1/4 to Rc1/2	Rc3/4, Rc1
P4	●	●
P40	▲	▲

\*1: In P40, parts without gas contact use zinc plating.

**2QV**

Quick valve



Page 229

How to order	2QV-[Bore size]-P4
	2QV
Port size	ø4, ø6, ø8, ø10, ø12
P4	▲

## Speed controller

**SCL2/SCD2**

Speed controller Line type



Page 230

How to order	SCL2-[Body size]-[Compatible tube O.D.]-P4 * Needle valve is not currently supported.
	SCL2/SCD2
Port size	ø4, ø6, ø8, ø10
P4	●

Note: Only ● part of the table below is supported.

		Body size			
		04	06	08	10
Compatible tube O.D.	H44	●			
	H66		●		
	H88			●	
	H1010				●

**SC3W**

Speed controller, elbow



Page 232

How to order	SC3W-[Piping size]-[Compatible tube O.D.]-[Option]-P4
	SC3W
Port size	M3, M5, R1/8, 1/4, 3/8, 1/2
P4	●

\*1: The product dimensions of pipe size M5 are different from the standard SC3W.

\*2: Compatible tube O.D. 3 (ø3, 2) is not available.

\*3: Option is meter-in only.

# Pneumatic auxiliary components

## Speed controller

 are listed in this catalog.

● : Standard ○ : Made to order ▲ : Contact CKD  : Not applicable

**DSC**

Speed controller with adjusting dial



Page 234

How to order		
Standard	DSC-[Port size]-[Compatible tube O.D.]-[Control method][Flow rate]-P4	
Compact	DSC-C-[Port size]-[Compatible tube O.D.]-[Control method][Flow rate]-P4	
How to order	DSC-[Port size]-[Compatible tube O.D.]-[Control method][Flow rate]-P4	
	DSC	
Port size	M5, R1/8, 1/4, 3/8, 1/2	
P4	●	

**SC3F/SCLF**

Speed controller  
Polypropylene resin



Page 237

How to order	SC3F/SCLF-[Piping size]-[Compatible tube O.D.]-[Option]-P4	
	SC3F	SCLF
Port size	M3, M5, R1/8, R1/4, R3/8, R1/2	ø4, ø6, ø8, ø10, ø12
P4	●	●

## Other auxiliary valves

**FPV**

Block valve



Page 239

How to order	FPV-[Port size]-[Compatible tube O.D.]-FLNo.
	FPV
Port size	M5, R1/8, 1/4, 3/8, 1/2
P4	▲

**QEL**

Quick exhaust valve Line type



Page 240

How to order	QEL-[Tube O.D.]-P4
	QEL
Port size	ø4, ø6
P4	▲

\*1: Applicable only for type with exhaust port fitting.

**QEV2**

Quick exhaust valve



Page 241

How to order	QEV2-[Port size]-[Option][Accessory]
	QEV2
Port size	Rc1/8 to 1
P4	Standard compliance

**SHV2**

Shuttle valve



Page 243

How to order	SHV2-[Port size]-[Option][Accessory]
	SHV2
Port size	Rc1/8 to 1
P4	Standard compliance

Note: Select a fluoro rubber specification

**CHV2**

Check valve



Page 245

How to order	CHV2-[Port size]-[Flow rate]-[Option][Accessory]
	CHV2
Port size	Rc1/8 to 1 1/2
P4	Standard compliance

Note: Select a fluoro rubber specification

## Pneumatic auxiliary components

### Other auxiliary valves

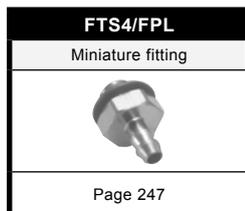
 are listed in this catalog.

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable



How to order	HMV/HSV[Switching position section]2-[Port size]-4[Piping]	
	HMV	HSV
Port size	Rc1/4	Rc1/4, 3/8, 1/2, 3/4
P4		▲

### Fittings/tubes

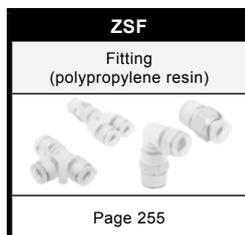


How to order	FTS4-M3-P4, FPL-M5-P4	
	FTS4	FPL
Port size	M3	M5
P4	▲	▲

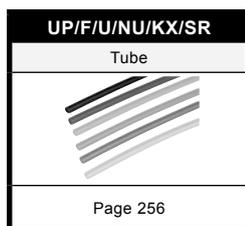
Note: M3 gasket dimensions are different from the standard dimensions.



How to order	ZW-[Shape][Compatible tube O.D.]-[Piping size]-P4	
	ZW	
Port size	ø4, ø6, ø8, ø10, ø12	
P4	●	



How to order	ZSF-[Shape][Compatible tube O.D.]-[Piping size]-P4	
	ZSF	
Port size	ø4, ø6, ø8, ø10, ø12	
P4	●	



How to order	Tube type-[Size]-[Option]	
	UP/F/U/NU/KX/SR	
O.D.	ø1.8, ø3.2, ø4, ø6, ø8, ø10, ø12, ø15	
P4	Standard compliance	

# Pneumatic auxiliary components

## Fittings/tubes

 are listed in this catalog.

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

**ET**

Fluoro resin tube

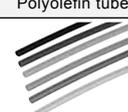


Page 261

How to order	ET-[Size]-[Option]
	ET
O.D.	ø4, ø6, ø8, ø10, ø12
P4	Standard compliance

**PFH/S**

Polyolefin tube



Page 262

How to order	PF[Type]-[Size]-[Option]-P4
	PFH/S
O.D.	ø4, ø6, ø8, ø10, ø12
P4	●

## Vacuum components

**VFA1000/3000/4000**

Vacuum filter



Page 263

How to order	VFA1000/3000/4000-[Bore size]-[Option]-P4-[Attachment]		
	VFA1000	VFA3000	VFA4000
Port size	Rc1/8, 1/4	Rc1/4, 3/8	Rc3/8, 1/2
P4	●	●	●

Note: Metal bowl is not available.

**VRA2000**

Vacuum regulator



Page 264

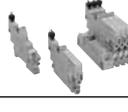
How to order	VRA2000-[Bore size]-[Option]P4
	VRA2000
Port size	Rc1/4, 3/8
P4	●

\*1: Available pressure gauge is PPX only.

\*2: Pressure gauge/pressure sensor must be ordered separately. (Attachment options not available.)

**VSX/VSXM**

Vacuum ejector (SELVACS)



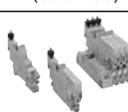
Page 265

How to order		
Single unit	VSX-[Vacuum characteristics][Nozzle diameter][Valve]-[Port]-3-[Switch specifications]-[Mounting method]-P4	
Manifold	VSXM-[Vacuum characteristics][Nozzle diameter][Valve]-[Port]-3-[Station No.]-[Switch specifications]-P4	
	VSX	VSXM
Port size	ø4, ø6	ø4, ø6, ø8, ø10
P4	●	▲

\*1: Applicable only for common exhaust.

**VSXP/VSXPM**

Vacuum switching unit (SELVACS)



Vacuum system equipment SELVACS  
Catalog No. CC-796A

How to order		
Single unit	VSXP-[Valve]-[Port]-3-[Switch specifications]-[Mounting method]-P4	
Manifold	VSXPM-[Valve]-[Port]-3-[Station No.]-[Switch specifications]-P4	
	VSXP	VSXPM
Port size	ø4, ø6	ø4, ø6, ø8, ø10
P4	●	▲

\*1: Applicable only for 2-way valve.

**VSP**

Suction pad



Page 268

How to order	VSP-[Holder shape/Pad diameter/Pad material]-[Port size]-P4
	VSP
P4	▲

\*1: Holder shape is only available for fixed type.

\*2: Free holder and position locking valve are not supported.

\*3: For pad material, only S, U, F, SE, FS and Blank are supported.

\*4: Pad shapes K, F, Q cannot be selected.

## Pneumatic auxiliary components

### Vacuum components

 are listed in this catalog.

● : Standard ○ : Made to order ▲ : Contact CKD  : Not applicable

**VSFU**

Vacuum filter (SELVACS)



Page 269

How to order	VSFU-[Filter size]-[Bore size]-P4, FSL[Filter size]-[Bore size]-[Bracket]-P4	
	VSFU	FSL
Port size	ø4, ø6, ø8, ø10	ø4, ø6, ø8, ø10
P4	●	▲

**FBU2**

Fine buffer



Page 270

How to order	FBU2-[External dimensions]-[Bearing precision]-[Pressing pressure]-[Buffer stroke]-[Tail shape]-[Head shape]	
	FBU2	
P4	Standard compliance	

## Fluid control components

### Fluid control components

**AB3/AB4-Z  
GAB3/GAB4-Z**

General purpose valve  
For dry air



Page 273

How to order		
Single unit	AB[Model No.]-[Bore size]-[Orifice]-[Body material/Seal combination][Coil][Option]ZP4□-[Voltage]	
Manifold	GAB[Model No.][Thread]-[Orifice]-[Station No.]-[Body material/Seal combination][Coil][Option]ZP4□-[Voltage]	
	AB3/AB4-Z GAB3/GAB4-Z	
Classification	Direct acting 2-port valve for dry air	
Body material	Stainless steel	
P4	●	
P40	●	

\*1: Body material Select from stainless steel products.  
\*2: Body material/Seal combination code M only.  
\*3: Pipe material is SUS316.

**AG3/AG4-Z  
GAG3/GAG4-Z**

General purpose valve  
For dry air



Page 277

How to order		
Single unit	AG[Model No.][Bore size]-[Orifice]-[Body material/Seal combination][Coil][Option]ZP4□-[Voltage]	
Manifold	GAG[Model No.][NO port size][Thread]-[Orifice]-[Station No.]-[Body material/Seal combination][Coil][Option]ZP4□-[Voltage]	
	AG3/AG4-Z GAG3/GAG4-Z	
Classification	Direct acting 3-port valve for dry air	
Body material	Stainless steel	
P4	●	
P40	●	

\*1: Body material Select from stainless steel products.  
\*2: Body material/Seal combination code M only.  
\*3: Pipe material is SUS316.

**ADK11-Z**

General purpose valve  
For dry air



Page 283

How to order	ADK11-[Bore size]-[Body material/Seal combination][Coil][Option]ZP4□-[Voltage]	
	ADK11-Z	
Classification	Pilot kick 2-port valve for dry air	
Body material	Stainless steel	
P4	●	
P40	●	

\*1: Body material Select from stainless steel products.  
\*2: Body material/Seal combination code M only.  
\*3: Pipe material is SUS316.

**CHB**

Air operated  
2-port ball valve



Page 285

How to order	CHB-[Bore size]-[Body material]-P4	
	CHB-N	
Port size	Rc3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2	
P4	●	

Note: Body material code N only.

# Fluid control components

## Fluid control components

 are listed in this catalog.  
 ● : Standard ○ : Made to order ▲ : Contact CKD  : Not applicable

**CHG**

Air operated 3-port ball valve



Page 287

How to order	CHG-[Bore size]-[Body material]-P4
	CHG-N
Port size	Rc1/2, 3/4, 1, 1 1/4, 1 1/2, 2
P4	●

Note: Body material code N only.

**SAB/SVB**

Air operated 2-port valve



Page 289

How to order	SAB/SVB[Actuation][Fluid category]-[Port size][Thread]-[Body/Sealant combination][Other options]-[Assembly direction]-P4
	SAB/SVB
Port size	Rc1/4 to Rc2, 32 flange, 40 flange, 50 flange
P4	●

**NAD**

Air operated 2-port valve Diaphragm



Page 298

How to order	NAD[Actuation]-[Bore size]-[Body/Sealant][Option]-P4
	NAD
Port size	Rc3/8
P4	●

**LAD**

Clean cylinder valve



Page 300

How to order	LAD[Actuation]-[Bore size]-[Material combination][Option]-P4
	LAD
Port size	Rc3/8, 1/2, 3/4, 1
P4	●

**NP13/NP14** 

3-port solenoid valve for air



Page 302

How to order	NP1[Actuation]-[Bore size]-1[Coil][Option]-[Voltage]-P4
	NP13/NP14
Bore size	Rc3/8 to Rc1
P4	●

\*1: Coil option is 2G, 2H, 2GS, 2HS only.  
 \*2: Voltage: 24 VDC only.  
 \*3: Rc1 1/4 to Rc2 are made to order.

**NAP11**

Air operated 3-port valve



Page 304

How to order	NAP11-[Bore size]-[Body/sealant combination]-P4
	NAP11
Port size	Rc3/8 to 2
P4	●

**NVP11** 

Air operated 3-port valve with solenoid valve



Page 305

How to order	NVP11-[Bore size]-[Body/sealant combination][Coil housing][Option]-[Voltage]-P4
	NVP11
Port size	Rc3/8 to 2
P4	●

\*1: Coil option is 2G, 2H, 2GS, 2HS only.  
 \*2: Voltage: 24 VDC only.  
 \*3: Rc1 1/4 to Rc2 are made to order.

## Fluid control components

 are listed in this catalog.

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

**SNP**  
3-port solenoid valve with spool position detection



Page 306

How to order	SNP-[Station No.]-[Port size]-[Sealant][Coil option][Limit switch][Bracket][Silencer]-[Voltage]-P4	
	SNP	
Port size	Rc3/8, 1/2, 3/4	
P4	●	

**HVB**  
Solenoid valve for high vacuum



Page 309

How to order	HVB2 to 5 Series HVB[Series size]12-[Connection method]-[Orifice]-[Coil option][Mounting plate]-[Voltage]	
	HVB6, 7 Series HVB[Series size]12-[Connection method]-[Orifice]-[Thermal class]-[Option]-[Voltage]	
	HVB2 to 5	HVB6, 7
P4	Standard compliance	

\*1: Fluorine grease is used.

\*2: Refer to this volume for the connection method.

## Wet Fine system

**AMD\*\*3R**  
Air operated valve for chemical liquids



Page 313

How to order	AMD[Size][Actuation]3R-[Connection method]-[Actuator option][Body option][Operating port direction][Mounting method]				
	AMDZ*3R	AMD0*3R	AMD3*3R	AMD4*3R	AMD5*3R
Connection	1/4"	1/4", 3/8"	3/8", 1/2"	3/4"	1"

\*1: P4 compliant as standard.

\*2: Refer to Wet Fine System/High Purity Chemical Liquid System (Catalog No. CB-031A) for details of the AMDZ\*3R, 0\*3R, 4\*3R and 5\*3R specifications.

## Dry Fine system

**AGD\*R**  
Air operated valve for process gas



Page 315

How to order	AGD0*R-*X****, AGD**R-*X****		
	AGD0*R	AGD1*R	AGD2*R
Port size	1/4" double barbed fitting, 1/4" JXR fitting	1/4" double barbed fitting, 1/4" JXR fitting	3/8" double barbed fitting, 3/8" JXR fitting
P4	▲	▲	▲

Note: Use after checking the compatibility of the working fluid with the wetted part materials.

**AVB**  
Air operated valve for high vacuum



Page 317

How to order	AVB**7-X****, AVB**3-X****	
	AVB**7	AVB**3
Port size	NW16, NW25, NW40, NW50, NW63	NW25, NW40, NW50, NW80
P4	▲	

Note: Use after checking the compatibility of the working fluid with the gas-contacting materials.

## Electric actuator

**ETS/ECS**  
Electric actuator



Page 319

How to order	ETS-[Body size]-[Screw lead][Stroke length]-[Motor mounting method][Mounted motor specification][Motor size][Brake] [Origin sensor][Limit sensor][Grease nipple][Positioning pin hole]-[Special specifications]-[Anti-rust treatment]-P4	
	ETS	ECS
P4	●	●

# Electric actuators

# Peripheral devices



are listed in this catalog.

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

Does not conform to the standards of P4 Series as defined by CKD. Contact CKD for details.

**JSC3/JSC4**  
Large bore size cylinder



Page 325

How to order	JSC3-[Brake release pressure]-[Mounting]-[Bore size][Port thread][Cushion]-[Stroke length]-[Switch model No.]-[Number of switches]-[Option][Accessory]	
	JSC3	JSC4
Bore size	ø40, 50, 63, 80, 100	ø125, 140, 160, 180

**EVR**  
High precision electro pneumatic regulator



Page 330

How to order	EVR-2[Pressure control range][Body]-[Input signal][Port size]-[Option]
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**EVS2**  
Electro pneumatic regulator



Page 334

How to order	EVS2-[Pressure control range]-[Input signal][Port size][Analog output]-[Cable option]-3
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**FAC**  
Clean exhaust filter



Page 335

How to order	FAC10/100-[Port size] FAC3000-[Port size]-[Attachment]			
	FAC10	FAC100	FAC200	FAC3000
Port size	ø4, 6, 8, 10	R1/8, 1/4	R3/8, 1/2	Rc3/8, 1/2
P4	Standard compliance			
P40	▲			

**SMW2**  
Metering valve with silencer



Page 339

How to order	SMW2-[Port size]
	SMW2
Port size	R1/8, 1/4
P4	Standard compliance
P40	▲

**FA**  
Exhaust cleaner



Page 340

How to order	FA[Series classification]31-[Port size]-[Option]
	FA
Port size	Rc3/8 to 2
P4	Standard compliance



are listed in this catalog.

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## Peripheral devices

Does not conform to the standards of P4 Series as defined by CKD. Contact CKD for details.

<b>AX*000T</b> ABSODEX high response  Page 341	How to order	AX1/2/4[Torque size][Driver type]-[Mounting base]-[Cable length]-[Brake]-[Driver power voltage]-[Positioning pin hole]-[Body surface treatment]-[Interface]		
		AX1000T	AX2000T	AX4000T
	Torque (N·m)	22, 45, 75, 150, 210	6, 12, 18	9, 22, 45, 75, 150, 300, 500, 1000

<b>AX6000M</b> ABSODEX compact  Page 353	How to order	AX6[Torque size]MU-[Mounting base]-[Cable length]-[Interface]	
		AX6000M	
	Torque (N·m)	1.2, 3	

<b>AX7000X</b> ABSODEX high precision  Page 356	How to order	AX7[Torque size]XS-[Mounting base]-[Cable length]-[Driver power voltage]-[Interface specification]	
		AX7000X	
	Torque (N·m)	22, 45	

<b>ETV/ECV</b> Electric actuator  Page 360	How to order	ETV/ECV-[Body size]-[Lead equivalent][Stroke length]-[Motor mounting method][Mounted motor specification][Motor size][Drive belt][Origin sensor][Limit sensor][Grease nipple][Positioning pin hole]
--	--------------	---

# INDEX

## Variation list

Pneumatic actuators	Dry Fine system
Pneumatic valves	Flow rate sensors for water
Pneumatic auxiliary components	Electric actuators
Fluid control components	Peripheral devices
Wet Fine system	

## Detailed specifications/How to order

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		Small bore size cylinder	<b>CMK2</b>	Stainless steel tube for high corrosion resistance	3
		Round shaped cylinder	<b>SCM</b>	Smart type with wide range of bore sizes/options	5
		Tie rod cylinder	<b>SCG</b>	Eco-friendly tie rod cylinder	7
		Large bore size cylinder	<b>SCS2</b>	Wide range of choices and high rigidity	9
	Space saving	Small direct mounting cylinder	<b>MDC2</b>	Can be mounted directly from 4 directions	11
		Compact cylinder	<b>SSD2</b>	Compact with wide range of bore sizes/options	13
		Compact cylinder	<b>SSD2 Large bore size</b>	Compact Large bore size	15
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		Compact cylinder High load	<b>SSD-K</b>	Compact with wide range of bore sizes/options	19
		Guided super compact cylinder	<b>SSG</b>	Equipped with space-saving guide rod/plate	21
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		Position locking compact cylinder	<b>USSD</b>	Equipped with position locking function	39
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		Linear slide cylinder	<b>LCX</b>	Integrated linear guide (thin/lightweight/high-rigidity)	52
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		Unit cylinder	<b>UCA2</b>	Stable position accuracy with double rod structure	56
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		Rodless cylinder with high precision guide	<b>SRM3</b>	High precision LM guide is used in 2-axis. Rigidity also improved	62
		Magnet rodless cylinder	<b>MRL2</b>	Rodless and space-saving	64
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	Hand/chuck	Parallel hand	<b>HAP</b>	Lightweight and compact	72
		Compact cross roller parallel hand	<b>BHA</b>	High precision with cross roller guide	74
		Linear guide hand	<b>LHA</b>	High precision hand with linear guide	76
		Linear guide hand (with rubber cover)	<b>LHAG</b>	Improved environmental resistance as it has a rubber cover	78
		Compact cross roller parallel hand (with rubber cover)	<b>BHG</b>	Improved environmental resistance as it has a rubber cover	80
		Cross roller parallel hand (with rubber cover)	<b>HKP</b>	Improved environmental resistance as it has a rubber cover	82
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		Bearing thin parallel hand	<b>HLBG</b>	Improved environmental resistance as it has a rubber cover	86
		Compact wide parallel hand	<b>HMF</b>	Small, lightweight and compact	88
		Thin long stroke parallel hand	<b>HLC</b>	Thin long stroke length linear guide	90
		Ultra thin parallel hand	<b>HLD</b>	Ultra-thin with high rigidity	93
		Thin wide angle hand	<b>HMD</b>	180° wide angle opening and closing is possible	95
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	Subclassification	Series	Series	Explanation	Page	
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		Super dryer (High polymer membrane air dryer)	SU*00D-W/SD*00D-W	High polymer membrane air dryer unit	144	
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		Precision regulator	RP1000/2000	Large relief control with high performance and long service life	169	
		Precision regulator	RPE	Energy saving type precision regulator	173	
		Electro pneumatic regulator	EVD	High precision/high response pressure control is possible	175	
		Filter	F*000	Effectively removes dust and moisture	180	
		Oil mist filter	M*000	Effectively removes oil and oil mist	183	
		Regulator Reverse regulator	R**00	Stable set pressure is supplied	185	
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		Bracket/joiner	B**0-W/J*00-W	Supports various modularization of FR	208	
		Pressure gauge	G4*D/G59D	A variety of pressure gauges are available	209	
		Inline clean filter	FCS500/FCS1000	Compact, lightweight, large flow rate	212	
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		Shut-off valve	V3000/V3010/V6010	Ideal for preventing accidents due to residual pressure in pneumatic lines	227	
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			Speed controller Line type (polypropylene resin)	SCLF-P4	Uses PP resin	238
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	Vacuum filter	VFA*000	Long service life with a 2-stage structure composed of baffle and element	263		
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		Clean cylinder valve	LAD	Large flow rate clean cylinder valve	300	
		3-port solenoid valve for air	NP13/NP14	Large flow rate 3-port valve	302	
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		Solenoid valve for high vacuum	HVB	High vacuum retention	309	
		Wet Fine system	Air operated valve for chemical liquids	AMD3R	All-in-one model	313
		Dry Fine system	Air operated valve for process gas	AGD*R	Zero particle generation with optimal seal structure and improved surface accuracy	315
			Air operated valve for high vacuum	AVB	Long service life molded bellows are used	317
		Electric actuator	Electric actuator	ETS/ECS	Diverse lineup to match applications	319
			Peripheral devices	Brake cylinder	JSC3/JSC4	Reliable brake unit is incorporated
	Electro pneumatic regulator	EVR		High precision/Easy operation	330	
Electro pneumatic regulator	EVS2	Compact, lightweight, high-performance		334		
Clean exhaust filter Plug	FAC10	Plug exhaust filter compliant with class 10		335		
Clean exhaust filter Silencer	FAC100/FAC200	Silencer exhaust filter compliant with class 10		336		
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Pneumatic Cylinders I  
Catalog No. CB-029SA

Pencil shaped cylinder Double acting/single rod

# SCPD3 Series

● Bore size:  $\phi 6/\phi 10/\phi 16$

JIS symbol



## Specifications

Descriptions	SCPD3 SCPD3-L		
	$\phi 6$	$\phi 10$	$\phi 16$
Bore size mm	$\phi 6$	$\phi 10$	$\phi 16$
Actuation	Double acting		
Working fluid	Compressed air		
Max. working pressure MPa	1.0		
Min. working pressure MPa	0.15	0.1	
Proof pressure MPa	1.6		
Ambient temperature °C	-10 to 60 (no freezing)		
Port size	M5		
Stroke tolerance mm	+1.0 0		
Working piston speed mm/s	50 to 750		
Cushion	Rubber cushion		
Lubrication	Not available		
Allowable absorbed energy J	0.012	0.041	0.162

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Available stroke length (mm)	Min. stroke length (mm)	
SCPD3	$\phi 6$	15/30/45/60	100	105	5
	$\phi 10$		200	210	
	$\phi 16$		260	270	

Note: The custom stroke length is available in 1 mm increments.

## How to order switch mounting bracket

P4	SCPD3-T-[Bore size]
P40	SCPD3-T-[Bore size]-P40

## How to order mounting bracket P4

Bore size	$\phi 6$	$\phi 10$	$\phi 16$
Mounting bracket			
Foot (LS)	P2-LS-6	P2-LS-10	P2-LS-16
Flange (FA)	P2-FA-6	P2-FA-10	P2-FA-16

Note: The foot (LS) type mounting bracket is provided as 1 pc./set.

## Brackets for rotation stop (M)

Bore size (mm)	$\phi 10$	$\phi 16$
Mounting bracket		
Foot (LS)	P2-LS-10M	P2-LS-16M
Flange (FA)	P2-FA-10M	P2-FA-16M

Note: The foot (LS) type mounting bracket is provided as 1 pc./set.

## How to order mounting bracket P40

Bore size	$\phi 6$	$\phi 10$	$\phi 16$
Mounting bracket			
Foot (LS)	P2-LS-6-P40	P2-LS-10-P40	P2-LS-16-P40
Flange (FA)	P2-FA-6-P40	P2-FA-10-P40	P2-FA-16-P40

Note: The foot mounting bracket is provided as 1 pc./set.

## Brackets for rotation stop (M)

Bore size (mm)	$\phi 10$	$\phi 16$
Mounting bracket		
Foot (LS)	P2-LS-10M-P40	P2-LS-16M-P40
Flange (FA)	P2-FA-10M-P40	P2-FA-16M-P40

Note: The foot (LS) type mounting bracket is provided as 1 pc./set.

### Compatibility table by variation

Applicable bore size		Double acting/single rod	Double acting/high load	Single acting/push	Single acting/pull	Double acting/double rod	Double acting/fine speed	Double acting/low speed	Double acting/heat resistance	Double acting/rubber-air cushioned	Double acting/rotation-stop (*6)	Double acting/with valve
			K	SCPS3	SCPH3	D	F	O	T	*C	M	V
ø6 to 16	P4	●		○	○	○	○	○	○	○	○	
	P40	●		○	○	○	○	○	○	○	○	
	P41											
	P42	▲				▲	▲	▲		▲		

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

### How to order

Without switch

**SCPD3** - **00** - **10** - **15** - **O** ————— **P4** **P40** **Y**

With switch

**SCPD3-L** - **00** - **10** - **15** - **O** - **SW11** - **R** - **P4** **P40** **Y**

**A** Model No.

**B** Mounting  
\*1

**C** Bore size

**D** Stroke length

**E** Head side port direction  
\*1

**F** Switch model No.  
\*2, \*5

**G** Switch quantity

**H** Accessory  
\*3

Code	Content
<b>A Model No.</b>	
<b>SCPD3</b>	Double acting
<b>SCPD3-L</b>	Double acting/with switch

<b>B Mounting</b>		Bore size (ø)		
		6	10	16
<b>00</b>	Basic	●	●	●
<b>LS</b>	Axial foot (one side) (rod side)	●	●	●
<b>FA</b>	Rod side flange	●	●	●
<b>CB</b>	Clevis bracket (pin and snap ring attached)	□	●	●

<b>C Bore size (mm)</b>	
<b>6</b>	ø6
<b>10</b>	ø10
<b>16</b>	ø16

<b>D Stroke length (mm)</b>			
Bore size	Stroke length	Available stroke length	Custom stroke length
ø6	<b>5 to 100</b>	<b>105</b>	In 1 mm increments
ø10	<b>5 to 200</b>	<b>210</b>	
ø16	<b>5 to 260</b>	<b>270</b>	

<b>E Head side port direction</b>	
<b>Blank</b>	Vertical
<b>O</b>	Axial direction

<b>F Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	

<b>G Switch quantity</b>	
<b>R</b>	1 on rod side
<b>H</b>	1 on head side
<b>D</b>	2
<b>T</b>	3

<b>H Accessory</b>		Bore size (ø)		
		6	10	16
<b>I</b>	Rod eye	□	●	●
<b>Y</b>	Rod clevis (pin and snap ring attached)	□	●	●
<b>B1</b>	Eye bracket	□	●	●
<b>B2</b>	Clevis bracket	□	●	●

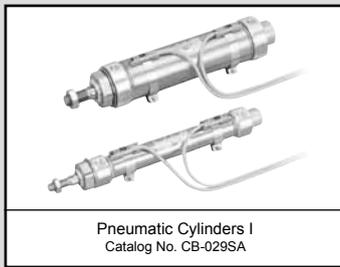
### ⚠ Precautions for model No. selection

- \*1: "CB" mounting is not available when the port direction is "O" (axial direction).
- \*2: Magnet is not built into the type without switch.
- \*3: "I" and "Y" cannot be selected together.
- \*4: Copper and PTFE free as standard.
- \*5: Switches are shipped with the product.
- \*6: Bore size 6 of rotation-stop is not available.

### Related products

Speed controller					
Model No.	Appearance	Port size (Rc or R)	Compatible tube O.D.		Page
		M5	4(ø4)	6(ø6)	
SC3W-M5- *-P4		●	●	●	232

Specify the compatible tube O.D. code for \*.



Pneumatic Cylinders I  
Catalog No. CB-029SA

Small bore size cylinder  
Double acting/single rod

# CMK2 Series

● Bore size:  $\phi 20/\phi 25/\phi 32/\phi 40$

JIS symbol ● Double acting cylinder single rod



## Specifications

Descriptions		CMK2			
Bore size	mm	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$
Actuation		Double acting			
Working fluid		Compressed air			
Max. working pressure	MPa	1.0			
Min. working pressure	MPa	0.1			
Proof pressure	MPa	1.6			
Ambient temperature	$^{\circ}\text{C}$	-10 to 60 (no freezing)			
Port size		Rc1/8			
Stroke tolerance	mm	$^{+2.0}_0$ (Up to 200), $^{+2.4}_0$ (More than 200)			
Working piston speed	mm/s	50 to 500			
Cushion		Rubber cushion			
Lubrication		Not available			
Allowable absorbed energy	J	0.166	0.308	0.424	0.639

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
$\phi 20$	25/50/75/100/150/ 200/250/300	750	5
$\phi 25$			
$\phi 32$			
$\phi 40$			

\*1: The custom stroke length is available in 1 mm increments.

\*2: One side foot (LS) has the max. stroke length of 50 mm.

## How to order switch mounting bracket

P4	CMK2-T-[Bore size]
P40	CMK2-T-[Bore size]-P40

## How to order mounting bracket P4

Bore size (mm)	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$
Mounting bracket				
Axial foot (LB/LS)	M1-LB-20	M1-LB-30	M1-LB-30	M1-LB-30
Flange (FA/FB)	M1-FA-20	M1-FA-30	M1-FA-30	M1-FA-30
Trunnion (TA/TB)	M1-TA-20	M1-TA-30	M1-TA-30	M1-TA-40
Eye bracket (CA)	M1-CA-20	M1-CA-30	M1-CA-30	M1-CA-30
Clevis bracket (CB)	M1-CB-20	M1-CB-30	M1-CB-30	M1-CB-30

\*1: Regarding mounting brackets, mounting nuts and toothed washers are attached with the axial foot type and flange type. Trunnions are supplied with mounting nuts.

\*2: For axial foot types (two-sided), 2 sets of "M1-LB0\*\* or [Bore size]" in the table above are required.

## How to order mounting bracket P40

Bore size (mm)	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$
Mounting bracket				
Axial foot (LB/LS)	M1-LB-20-P40	M1-LB-25-P40	M1-LB-30-P40	M1-LB-30-P40
Flange (FA/FB)	M1-FA-20-P40	M1-FA-25-P40	M1-FA-30-P40	M1-FA-30-P40
Trunnion (TA/TB)	M1-TA-20-P40	M1-TA-25-P40	M1-TA-30-P40	M1-TA-30-P40
Eye bracket (CA)	M1-CA-20-P40	M1-CA-25-P40	M1-CA-30-P40	M1-CA-30-P40
Clevis bracket (CB)	M1-CB-20-P40	M1-CB-25-P40	M1-CB-30-P40	M1-CB-30-P40

\*1: For axial foot types (two-sided), 2 sets of "M1-LB-\*\* or [Bore size]-P40" in the table above are required.

\*2: Regarding mounting brackets, mounting nuts are attached with the axial foot type, flange type and trunnion type.

### Compatibility table by variation

Applicable bore size		Double acting/ single rod	Double acting/ position locking	Single acting/ push	Single acting/ pull	Double acting/ double rod	Double acting/ back to back	Stroke adjustable (push)	Stroke adjustable (pull)	Double acting/ fine speed	Double acting/ heat resistance	Double acting/ rubber-air cushioned	Double acting/ with speed controller	Double acting/ rotation-stop	Double acting/ coolant proof	Double acting/ low hydraulic	Double acting/ air cushion
			Q	S	SR	D	B	P	R	F	T	*C	Z	M	G2/G3	H	C
ø20 to 40	P4	●	●	○	○	○	○	○	○	○	▲	○	○	▲			○
	P40	●	●	○	○	○	○	○	○*1	○	▲	○	▲	▲			○*2
	P41	▲	▲			▲	▲	▲	▲*1			▲	▲				▲*2
	P42																

\*1: Zinc plating is used for the sealing washer.  
\*2: Zinc plating is used for the cushion packing.

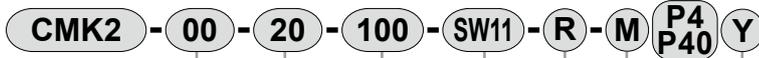
● : Standard  
○ : Made to order  
▲ : Contact CKD  
□ : Not applicable

### How to order

Without switch



With switch



A Mounting \*1

B Bore size

C Stroke length

D Switch model No.

E Switch quantity \*4

F Option

G Accessory \*2

### ⚠ Precautions for model No. selection

- \*1: One side foot (LS) has the max. stroke length of 50 mm.
- \*2: "I" and "Y" cannot be selected together.
- \*3: Refer to "Pneumatic Cylinders I (Catalog No. CB-029SA)" for custom specifications of rod end form.
- \*4: Up to three switches can be installed. If four or more switches are required, switch mounting brackets for the extra switches must be prepared separately.
- \*5: For 20 or 25 bore size, the rod is stainless steel as standard and the rod nut is zinc chromate. If a stainless steel rod nut is necessary, select the "M" option code.

### Related products

Speed controller						
Model No.	Appearance	Port size (Rc or R)	Compatible tube O.D.			Page
		1/8	4(ø4)	6(ø6)	8(ø8)	
SC3W-6- *-P4		●	●	●	●	232

Specify the compatible tube O.D. code for \*.

Code	Content	
<b>A Mounting</b>		
00	Basic	
LB	Axial foot (both sides)	
LS	Axial foot (one side)	
FA	Rod side flange	
FB	Head side flange	
CA	Eye bracket	
CC	Eye bracket integrated	
CB	Clevis bracket (pin and split washer pin attached)	
TA	Rod side trunnion	
TB	Head side trunnion	
<b>B Bore size (mm)</b>		
20	ø20 *5	
25	ø25 *5	
32	ø32	
40	ø40	
<b>C Stroke length (mm)</b>		
Bore size	Stroke length *2	Custom stroke length
ø20	5 to 750	In 1 mm increments
ø25	5 to 750	
ø32	5 to 750	
ø40	5 to 750	
<b>D Switch model No.</b>		
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.		
<b>E Switch quantity</b>		
R	1 on rod side	
H	1 on head side	
D	2	
T	3	
<b>F Option</b>		
M	Piston rod, rod nut material (stainless steel) *5	
V	Boss cutoff	
<b>G Accessory</b>		
I	Rod eye	
Y	Rod clevis (pin and split washer pin attached)	
B2	Clevis bracket (pin and snap ring attached)	



Pneumatic Cylinders I  
Catalog No. CB-029SA

Round shaped cylinder Double acting/single rod

# SCM Series

● Bore size:  $\phi 20/\phi 25/\phi 32/\phi 40/\phi 50/\phi 63/\phi 80/\phi 100$

JIS symbol



## Specifications

Descriptions		SCM							
Bore size	mm	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$
Actuation		Double acting							
Working fluid		Compressed air							
Max. working pressure	MPa	1.0							
Min. working pressure	MPa	0.1				0.05			
Proof pressure	MPa	1.6							
Ambient temperature	°C	-10 to 60 (no freezing)							
Port size	With rubber cushion	Rc1/8				Rc1/4	Rc3/8	Rc1/2	
	With air cushion	M5	Rc1/8			Rc1/4	Rc3/8	Rc1/2	
Stroke tolerance	With rubber cushion	+1.4 (to 1000) 0		+1.4 (to 1500) 0	+2.3 (to 1000), +2.7 (to 1500) 0				
	With air cushion	+1.4 (to 1000) 0		+1.4 (to 1500) 0	+1.4 (to 1000), +1.8 (to 1500) 0				
Working piston speed	mm/s	30 to 1000 (Operate within the allowable absorbed energy.)							
Cushion		Either rubber cushion or air cushion can be selected.							
Effective air cushion length	mm	8.1	8.1	8.6	8.6	13.4	13.4	15.4	15.4
Lubrication		Not available							
Allowable absorbed energy	With rubber cushion	0.1	0.2	0.5	0.9	1.6	1.6	3.3	5.8
	With air cushion	0.8	1.2	2.5	3.7	8.0	14.4	25.4	45.6
	Without cushion	-	-	-	-	0.057	0.057	0.112	0.153

\*1: The values of "No cushion" of allowable absorbed energy are the allowable absorbed energy of either the head side for air cushion code "R" or the rod side for air cushion code "H".  
\*2: Without any cushion, this product cannot absorb large energy generated by an external load. Provide a shock absorber on the outside.

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
$\phi 20$	25, 50, 75, 100, 125, 150, 200, 250, 300	1000	10
$\phi 25$			
$\phi 32$			
$\phi 40$		1500	
$\phi 50$			
$\phi 63$			
$\phi 80$			
$\phi 100$			

\*1: The custom stroke length is available in 1 mm increments.

## How to order switch mounting bracket

	[Rail] Mounting rail	[Band] Mounting bracket set + Band
P4	SCM-T-[Bore size]	SCM-Z-[Bore size]
P40	-[Stroke length]	SCM-Z-[Bore size]-P40

\*1: Indicate X if the stroke length exceeds 300 mm. If exceeding 300 mm, a short rail (with 100 mm switch adjustment travel distance) will be included per switch.  
\*2: If indicating X when ordering mounting rails only, order the same number of rails as that of applicable switches.

## How to order mounting bracket P4

Bore size (mm)	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$
Foot (LB)	SCM-LB-20	SCM-LB-25	SCM-LB-32	SCM-LB-40	SCM-LB-50	SCM-LB-63	SCM-LB-80	SCM-LB-100
Flange (FA/FB)	SCM-FA-20	SCM-FA-25	SCM-FA-32	SCM-FA-40	SCM-FA-50	SCM-FA-63	SCM-FA-80	SCM-FA-100
Eye bracket (CA)	SCM-CA-20	SCM-CA-25	SCM-CA-32	SCM-CA-40	SCM-CA-50	SCM-CA-63	-	-
Clevis bracket (CB)	-	-	-	-	-	-	SCM-CB-80	SCM-CB-100
Trunnion (TA/TB)	SCM-TA-20	SCM-TA-25	SCM-TA-32	SCM-TA-40	SCM-TA-50	SCM-TA-63	-	-

## How to order mounting bracket P40

Bore size (mm)	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$
Foot (LB)	SCM-LB-20-P40	SCM-LB-25-P40	SCM-LB-32-P40	SCM-LB-40-P40	SCM-LB-50-P40	SCM-LB-63-P40	SCM-LB-80-P40	SCM-LB-100-P40
Flange (FA/FB)	SCM-FA-20-P40	SCM-FA-25-P40	SCM-FA-32-P40	SCM-FA-40-P40	SCM-FA-50-P40	SCM-FA-63-P40	SCM-FA-80-P40	SCM-FA-100-P40
Eye bracket (CA)	SCM-CA-20-P40	SCM-CA-25-P40	SCM-CA-32-P40	SCM-CA-40-P40	SCM-CA-50-P40	SCM-CA-63-P40	-	-
Clevis bracket (CB)	-	-	-	-	-	-	SCM-CB-80-P40	SCM-CB-100-P40
Trunnion (TA/TB)	SCM-TA-20-P40	SCM-TA-25-P40	SCM-TA-32-P40	SCM-TA-40-P40	SCM-TA-50-P40	SCM-TA-63-P40	-	-

\*1: All mounting brackets have mounting bolts attached.  
\*2: The foot mounting bracket is provided as 2 pcs./set.

## Compatibility table by variation

Applicable bore size		Double acting/ single rod	Double acting/ position locking	Single acting/ push	Single acting/ pull	Double acting/ double rod	Double acting/ back to back	Double acting/ two-stage	Stroke adjustable (push)	Stroke adjustable (pull)	Double acting/ low speed	Double acting/ low friction	Double acting/ heat resistance	Double acting/ rubber scraper	Double acting/ tandem	Double acting/ direct mounting foot	Double acting/ rotation-stop
			Q	X	Y	D	B	W	P	R	O	U	T	G	W4	LD	M
ø20 to 100	P4	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	▲
	P40	●*2	●*2	○	○	○*2	○	○	○	○*1	○	○	○*2	○	○	○	▲
	P41	▲*2	▲*2			▲*2	▲	▲	▲	▲*1				▲*2	▲	▲	
	P42	▲*2	▲*2			▲*2	▲	▲	▲	▲*1	▲	▲			▲	▲	

● : Standard  
 ○ : Made to order  
 ▲ : Contact CKD  
 □ : Not applicable

\*1: Zinc plating is used for the sealing washer.  
 \*2: Zinc plating is used for the cushion packing. (excluding ø50, ø63)

## How to order

Without switch

SCM - LB - 40 B - 100 - M P4 P40 I

With switch

SCM - LB - 40 B - 100 - SW11 - D - M P4 P40 I

A Mounting \*1

B Bore size

C Cushion

D Stroke length

E Switch model No. \*3

F Switch quantity

G Switch mounting

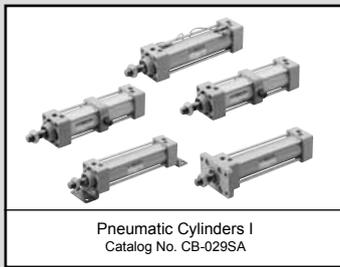
H Option \*4

I Accessory \*5

Code	Content								
<b>A Mounting</b>									
	Bore size (ø)	20	25	32	40	50	63	80	100
00	Basic	●	●	●	●	●	●	●	●
LB	Axial foot	●	●	●	●	●	●	●	●
FA	Rod side flange	●	●	●	●	●	●	●	●
FB	Head side flange	●	●	●	●	●	●	●	●
CA	Eye bracket	●	●	●	●	●	●	●	●
CB	Clevis bracket (pin and snap ring attached)							●	●
TA	Rod side trunnion	●	●	●	●	●	●	●	●
TB	Head side trunnion	●	●	●	●	●	●	●	●
<b>B Bore size (mm)</b>									
20	ø20								
25	ø25								
32	ø32								
40	ø40								
50	ø50								
63	ø63								
80	ø80								
100	ø100								
<b>C Cushion</b>									
B	With two-sided air cushion								
R	Rod side air cushioned								
H	Head side air cushioned								
D	With two-sided rubber cushion								
<b>D Stroke length (mm)</b>									
	Bore size	Stroke length *2			Custom stroke length				
	ø20 to ø32	10 to 1000			In 1 mm increments				
	ø40 to ø100	10 to 1500							
<b>E Switch model No.</b>									
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.									
<b>F Switch quantity</b>									
R	1 on rod side								
H	1 on head side								
D	2								
T	3								
4	4 (when there are more than 4 switches, indicate switch quantity.)								
<b>G Switch mounting</b>									
Blank	Rail method								
Z	Band method								
<b>H Option</b>									
Q	Switch rail attached at shipment								
M	Piston rod, rod nut material (stainless steel)								
<b>I Accessory</b>									
	Bore size (ø)	20	25	32	40	50	63	80	100
I	Rod eye	●	●	●	●	●	●	●	●
Y	Rod clevis (pin and snap ring attached)	●	●	●	●	●	●	●	●
B1	Eye bracket							●	●
B2	Clevis bracket	●	●	●	●	●	●	●	●

## ⚠ Precautions for model No. selection

- \*1: Mounting bracket will be shipped with the product.
- \*2: Refer to the previous page for the min. stroke length.
- \*3: SW19, SWBW, SWCC, SWDK, SWDL, and SWDM cannot be mounted when the bore size is from ø20 to ø40 and switch mounting is the rail type.
- \*4: "Q" (switch rail attached at shipment) is not available for "Z" switch mounting.
- \*5: "I" and "Y" cannot be selected together.
- \*6: Refer to "Pneumatic Cylinders I (Catalog No. CB-029SA)" for custom specifications of rod end form.
- \*7: Switches are shipped with the product. Contact CKD if assembling before shipment is necessary.
- \*8: Speed controllers are available as a related product. Contact CKD for details.



Pneumatic Cylinders I  
Catalog No. CB-029SA

Tie rod cylinder Double acting/single rod

# SCG Series

● Bore size:  $\phi 32/\phi 40/\phi 50/\phi 63/\phi 80/\phi 100$

JIS symbol



## Specifications

Descriptions		SCG					
Bore size	mm	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	1.0					
Min. working pressure	MPa	0.05					
Proof pressure	MPa	1.6					
Ambient temperature	$^{\circ}\text{C}$	-10 to 60 (no freezing)					
Port size		Rc1/8	Rc1/4		Rc3/8		Rc1/2
Stroke tolerance	mm	With rubber cushion ${}^{+1.4}_0$ (to 1000), ${}^{+1.8}_0$ (1001 to 1500)					
		With air cushion ${}^{+1.0}_0$ (to 360), ${}^{+1.4}_0$ (361 to 1000), ${}^{+1.8}_0$ (1001 to 1500)					
Working piston speed	mm/s	30 to 1000 (Operate within the allowable absorbed energy.)					
Cushion		Either air cushion or rubber cushion can be selected					
Effective air cushion length	mm	8.6	8.6	13.4	13.4	15.4	15.4
Lubrication		Not available					
Allowable absorbed energy	J	0.5	0.9	1.6	1.6	3.3	5.8
		2.5	3.7	8.0	14.4	25.4	45.6

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Available stroke length (mm)	Min. stroke length (mm)
$\phi 32$	25/50/75/100 150/200/250 300/350/400 450/500	600	700	1
$\phi 40$			800	
$\phi 50$			1200	
$\phi 63$			1200	
$\phi 80$			1400	
$\phi 100$			1500	

\*1: The custom stroke length is available in 1 mm increments.

\*2: If the max. stroke length is exceeded, product specifications may not be met, depending on operating conditions. Contact CKD in this case.

## How to order switch mounting bracket

P4	SCG-T-[Bore size]
P40	SCG-T-[Bore size]-P40

## How to order mounting bracket P4

Bore size (mm)	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$
Mounting bracket						
Foot (LB)	SCG-LB-32	SCG-LB-40	SCG-LB-50	SCG-LB-63	SCG-LB-80	SCG-LB-100
Flange (FA) (FB) *1	SCG-FA-32	SCG-FA-40	SCG-FA-50	SCG-FA-63	SCG-FA-80	SCG-FA-100
Eye bracket (CA)	SCG-CA-32	SCG-CA-40	SCG-CA-50	SCG-CA-63	SCG-CA-80	SCG-CA-100
Clevis bracket (CB)	SCG-CB-32-P4	SCG-CB-40-P4	SCG-CB-50-P4	SCG-CB-63-P4	SCG-CB-80-P4	SCG-CB-100-P4

## How to order mounting bracket P40

Bore size (mm)	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$
Mounting bracket						
Foot (LB)	SCG-LB-32-P40	SCG-LB-40-P40	SCG-LB-50-P40	SCG-LB-63-P40	SCG-LB-80-P40	SCG-LB-100-P40
Flange (FA) (FB) *1	SCG-FA-32-P40	SCG-FA-40-P40	SCG-FA-50-P40	SCG-FA-63-P40	SCG-FA-80-P40	SCG-FA-100-P40
Eye bracket (CA)	SCG-CA-32-P40	SCG-CA-40-P40	SCG-CA-50-P40	SCG-CA-63-P40	SCG-CA-80-P40	SCG-CA-100-P40
Clevis bracket (CB)	SCG-CB-32-P40	SCG-CB-40-P40	SCG-CB-50-P40	SCG-CB-63-P40	SCG-CB-80-P40	SCG-CB-100-P40

Note: The foot mounting bracket (LB) is provided as 2 pcs./set.

## Compatibility table by variation

Applicable bore size		Double acting/ single rod	Double acting/ position locking	Double acting/ double rod	Double acting/ low speed	Double acting/ low friction	Double acting/ rubber scraper	Double acting/ rotation-stop	Double acting/ coolant proof	Double acting/ anti-spatter adherence
			Q	D	O	U	G	M	G2/G3	G1/G4
ø32 to 100	P4	●	●	○	○	○	○			
	P40	● Note	● Note	○ Note	○	○	○ Note			
	P41	▲ Note	▲ Note	▲ Note			▲ Note			

Note: Zinc plating is used for the cushion packing.

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

Without switch

SCG - LB - 40 B - 100 - M P4 P40 I

With switch

SCG - LB - 40 B - 100 - SW11 - R - M P4 P40 I

Model No.

A Mounting  
\*1

B Bore size

C Cushion

D Stroke length

E Switch model No.

F Switch quantity  
\*2

G Option

H Accessory  
\*3

### ⚠ Precautions for model No. selection

\*1: Mounting bracket will be shipped with the product. Trunnion types (TA, TB, TC) are assembled at shipment.

\*2: When selecting TA or TB mounting, the switch quantity is limited to "H" (1 on head side) for TA, and "R" (1 on rod side) for TB.

\*3: "I" and "Y" cannot be selected together.

### Related products

Speed controller		Port size (Rc or R)										Page
Model No.	Appearance	1/8	1/4	3/8	1/2	4(ø4)	6(ø6)	8(ø8)	10(ø10)	12(ø12)		
SC3W-6*-P4		●				●	●	●				
SC3W-8*-P4			●				●	●	●			
SC3W-10*-P4				●				●	●	●		
SC3W-15*-P4					●				●	●	●	

Specify the compatible tube O.D. code for \*.

Code	Content			
<b>A Mounting</b>				
00	Basic			
LB	Axial foot			
FA	Rod side flange			
FB	Head side flange			
CA	Eye bracket			
CB	Clevis bracket (pin and split pin attached)			
TA	Rod side trunnion			
TB	Head side trunnion			
TC	Intermediate trunnion			
<b>B Bore size (mm)</b>				
32	ø32			
40	ø40			
50	ø50			
63	ø63			
80	ø80			
100	ø100			
<b>C Cushion</b>				
B	Two-sided air cushion (basic)			
D	Two-sided rubber cushion			
Note: The rubber cushioned type has a longer total length than the air cushioned type.				
<b>D Stroke length (mm)</b>				
Bore size	Stroke length *2	Available stroke length	Custom stroke length	
ø32	1 to 600	700	In 1 mm increments	
ø40		800		
ø50		1200		
ø63		1 to 700		1400
ø80		1 to 800		1500
ø100				
<b>E Switch model No.</b>				
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.				
<b>F Switch quantity</b>				
R	1 on rod side			
H	1 on head side			
D	2			
T	3			
<b>G Option</b>				
M	Piston rod, rod nut material (stainless steel)			
<b>H Accessory</b>				
I	Rod eye			
Y	Rod clevis (pin and split pin attached)			
B1	Eye bracket			
B2	Clevis bracket (pin and split pin attached)			
B3	Eye bracket			
B4	Trunnion No. 2 bracket (2 pcs./set)			



Medium bore size cylinder  
Double acting/single rod/no-lubrication

# SCS2 Series

● Bore size:  $\varnothing 125/\varnothing 140/\varnothing 160/\varnothing 180/\varnothing 200/\varnothing 250$

JIS symbol



## Specifications

Descriptions		SCS2-N/SCS2-LN					
		$\varnothing 125$	$\varnothing 140$	$\varnothing 160$	$\varnothing 180$	$\varnothing 200$	$\varnothing 250$
Bore size	mm	$\varnothing 125$	$\varnothing 140$	$\varnothing 160$	$\varnothing 180$	$\varnothing 200$	$\varnothing 250$
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	1.0					
Min. working pressure	MPa	0.05					
Proof pressure	MPa	1.6					
Ambient temperature	$^{\circ}\text{C}$	-5 to 60 (no freezing)					
Port size		Rc1/2	Rc3/4			Rc1	
Stroke tolerance	mm	$^{+1.0}_0$ (to 300), $^{+1.4}_0$ (to 1000), $^{+1.8}_0$ (to 1200)					
Working piston speed	mm/s	20 to 1000 (Operate within the absorbed energy.)					
Cushion		Air cushion					
Effective air cushion length	mm	21.6	21.6	21.6	21.6	26.6	26.6
Lubrication		Not available					
Allowable absorbed energy	Cushioned	63.5	91.5	116	152	233	362
	Without cushion	0.371	0.386	0.386	0.958	1.08	2.32
Without any cushion, this product cannot absorb large energy generated by an external load. We recommend using an external shock absorber.							

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Available stroke length (mm)	Min. stroke length (mm)	Trunnion min. stroke length (mm)
$\varnothing 125$	50/75/100/150/200/ 250/300	800	2000	1	23
$\varnothing 140$					25
$\varnothing 160$					27
$\varnothing 180$					28
$\varnothing 200$					28
$\varnothing 250$					28

\*1: The custom stroke length is available in 1 mm increments.

\*2: If the max. stroke length is exceeded, product specifications may not be met, depending on operating conditions. Contact CKD in this case.

## Compatibility table by variation

Applicable bore size		Double acting/lubrication	Double acting/no lubrication	Double acting/with switch	Stroke adjustable (push)	Double acting/heat resistance	Double acting/double rod	Double acting/back to back	Double acting/two-stage	Double acting/low hydraulic	Double acting/rubber scraper
			N	LN	P	T	D	B	W	H	G
ø125 to 250	P4		○	○	▲	▲	▲	▲	▲		▲

● : Standard ○ : Made to order ▲ : Contact CKD ◻ : Not applicable

## How to order

● No-lubrication without switch

**SCS2-N** — **LB** — **125** **B** — **50** — **P4** **Y**

● No-lubrication with switch

**SCS2-LN** — **LB** — **125** **B** — **50** — **SW11** — **R** — **P4** **Y**

Model No.

**A** Mounting  
\*1

**B** Bore size

**C** Cushion

**D** Stroke length

**E** Switch model No.

**F** Switch quantity

**G** Option  
\*2

**H** Accessory  
\*3

Code	Content		
<b>A Mounting</b>			
00	Basic		
LB	Axial foot		
FA	Rod side flange		
FB	Head side flange		
CA	Eye bracket		
CB	Clevis bracket (pin and snap ring attached)		
TC	Intermediate trunnion		
TA	Rod side trunnion		
TB	Head side trunnion		
<b>B Bore size (mm)</b>			
125	ø125		
140	ø140		
160	ø160		
180	ø180		
200	ø200		
250	ø250		
<b>C Cushion</b>			
B	Both sides cushioned		
R	Rod side cushioned		
H	Head side cushioned		
N	Without cushion		
<b>C Stroke length (mm)</b>			
Bore size	Stroke length	Available stroke length	Custom stroke length
ø125 to ø140	1 to 800	2000	In 1 mm increments
ø160	1 to 800	1947	
ø180	1 to 900	1525	
ø200	1 to 945	945	
ø250	1 to 751	751	
<b>E Switch model No.</b>			
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.			
<b>F Switch quantity</b>			
R	1 on rod side		
H	1 on head side		
D	2		
T	3		
4	4		
<b>G Option</b>			
M	Piston rod, rod nut material (stainless steel)		
Blank	Cushion needle position (standard)		
R	Cushion needle position R		
S	Cushion needle position S		
T	Cushion needle position T		
<b>H Accessory</b>			
I	Rod eye		
Y	Rod clevis (pin and snap ring attached)		
B1	Eye bracket		
B2	Clevis bracket (pin and snap ring attached)		

## ⚠ Precautions for model No. selection

\*1: Supporting hole is available as made to order for ø125 to 160 only. Contact CKD for details.

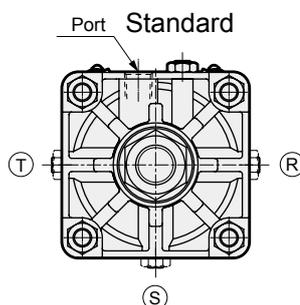
\*2: Check below for the cushion needle position indication.

\*3: "I" and "Y" cannot be selected together.

\*4: Made to order. Contact CKD for details.

## Cushion needle position

(Needle position with the port on the top when viewed from the rod end)





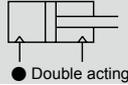
Pneumatic Cylinders I  
Catalog No. CB-029SA

Compact direct mounting cylinder Double acting/single rod

# MDC2 Series

● Bore size:  $\varnothing 6$ ,  $\varnothing 8$ ,  $\varnothing 10$

JIS symbol



## Specifications

Descriptions	MDC2/MDC2-L (with switch)		
	$\varnothing 6$	$\varnothing 8$	$\varnothing 10$
Bore size mm	$\varnothing 6$	$\varnothing 8$	$\varnothing 10$
Actuation	Double acting		
Working fluid	Compressed air		
Max. working pressure MPa	0.7		
Min. working pressure MPa	0.15		0.1
Proof pressure MPa	1.05		
Ambient temperature °C	-10 to 60 (no freezing) *1		
Port size	M3		M5
Stroke tolerance mm	+0.5 0		
Working piston speed mm/s	50 to 500		
Cushion	No		
Lubrication	Not available		
Allowable absorbed energy J	This product cannot absorb the energy generated by an external load mounted on the cylinder. When using the product with no load, separately provide a shock absorber on the outside.		

\*1: When using the proximity switch, use the cylinder at 40°C or less.

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length with two switches (mm)		Min. stroke length with one switch (mm)	
			Reed switch	Proximity switch	Reed switch	Proximity switch
$\varnothing 6$	4/6/8	8	6	4(8)	4	4
$\varnothing 8$	4/6/8	8	8	4(8)	4	4
$\varnothing 10$	4/6/10	10	6	4(10)	4	4

\*1: Products with stroke length other than standard stroke length are not available.

\*2: For F2Y, F3Y or F3P, the min. stroke length will be the dimensions in ( ).

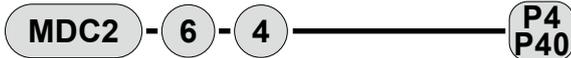
## Compatibility table by variation

Applicable bore size		Double acting/ single rod	Single acting/ push	Single acting/ pull	Double acting/ fine speed
			X	Y	F
ø6 to 10	P4	●	○	○	○
	P40	●	○	○	○
	P41				
	P42	▲			▲

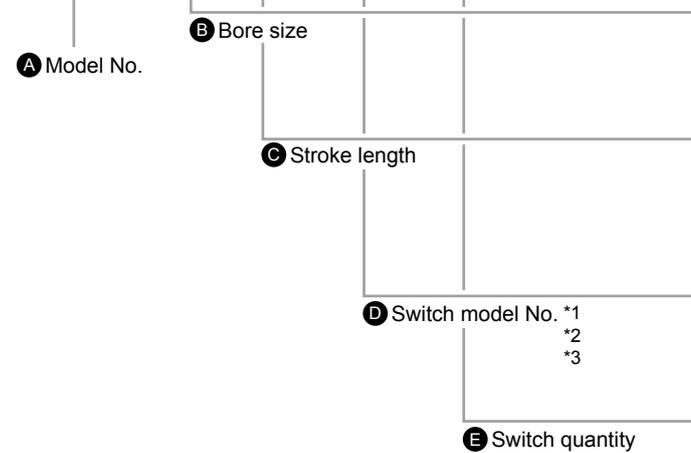
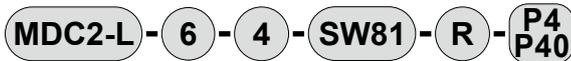
● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

● Without switch



● With switch



Code	Content	
<b>A Model No.</b>		
MDC2	Double acting/single rod	Without switch
MDC2-L	Double acting/single rod	With switch
<b>B Bore size</b>		
6	ø6	
8	ø8	
10	ø10	
<b>C Stroke length (mm)</b>		
4	4(ø6 to ø10)	
6	6(ø6 to ø10)	
8	8(ø6, ø8)	
10	10(ø10)	
<b>D Switch model No.</b>		
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.		
<b>E Switch quantity</b>		
R	1 on rod side	
H	1 on head side	
D	2	

## ⚠ Precautions for model No. selection

- \*1: Min. stroke length with two reed switches is 6 mm for ø6, 8 mm for ø8, or 6 mm for ø10.
- \*2: For MDC2 with reed switch, the cylinder cannot be mounted on a magnetic substance (iron plate, etc.). Otherwise, this could lead to switch detection malfunction.
- \*3: When using MDC2-L-6 with reed switch, use a non-magnetic bolt (stainless steel hexagon socket head cap screw, etc.) for cylinder mounting bolt. Otherwise, this could lead to switch detection malfunction.

## Related products

Speed controller							Page
Model No.	Appearance	Port size (Rc or R)			Compatible tube O.D.		
		M3	M5	1/8	4(ø4)	6(ø6)	
SC3W-M3- *-P4		●			●		
SC3W-M5- *-P4			●		●	●	

Specify the compatible tube O.D. code for \*.



Pneumatic Cylinders I  
Catalog No. CB-029SA

Compact cylinder Double acting/single rod

# SSD2 Series

● Bore size:  $\phi 12/\phi 16/\phi 20/\phi 25/\phi 32/\phi 40/\phi 50/\phi 63/\phi 80/\phi 100$

JIS symbol



## Specifications

Descriptions		SSD2 SSD2-L (with switch)									
		$\phi 12$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$
Bore size	mm	$\phi 12$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$
Actuation		Double acting									
Working fluid		Compressed air									
Max. working pressure	MPa	1.0									
Min. working pressure	MPa	0.1					0.05				
Proof pressure	MPa	1.6									
Ambient temperature	$^{\circ}\text{C}$	-10 to 60 (no freezing)									
Port size		M5				Rc1/8 *1		Rc1/4		Rc3/8	
Stroke tolerance	mm With rubber cushion	$+2.0$ 0									
	mm Without cushion	$+1.0$ 0									
Working piston speed	mm/s	50 to 500					50 to 300				
Cushion		With or without cushion can be selected									
Lubrication		Not available									
Allowable absorbed energy	J With rubber cushion	0.03	0.05	0.10	0.16	0.16	0.44	0.75	0.78	2.51	3.92
	J Without cushion	0.004	0.01	0.016	0.021	0.025	0.092	0.1	0.12	0.27	0.56

\*1: The  $\phi 32$  bore size with a 5 mm stroke and without a switch has a port size of M5.

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
$\phi 12$	5/10/15/20/	30	1
$\phi 16$	25/30		
$\phi 20$	5/10/15/20/25/	50	
$\phi 25$	30/35/40/45/50		
$\phi 32$	5/10/15/20/25/30/	100	
$\phi 40$	35/40/45/50/75/100		
$\phi 50$	10/15/20/25		
$\phi 63$	30/35/40/45/50/		
$\phi 80$	75/100		
$\phi 100$			

\*1: If the stroke exceeds the max. stroke length, consult with CKD.

## [Stroke length table]

Stroke length (mm)	Applicable bore size									
	12	16	20	25	32	40	50	63	80	100
5	●	●	●	●	●	●	●			
10	●	●	●	●	●	●	●	●	●	●
15	●	●	●	●	●	●	●	●	●	●
20	●	●	●	●	●	●	●	●	●	●
25	●	●	●	●	●	●	●	●	●	●
30	●	●	●	●	●	●	●	●	●	●
35			●	●	●	●	●	●	●	●
40			●	●	●	●	●	●	●	●
45			●	●	●	●	●	●	●	●
50			●	●	●	●	●	●	●	●
75					●	●	●	●	●	●
100					●	●	●	●	●	●
Min. stroke length (mm) *1	1									
Max. stroke length (mm)	30	50	100							
Custom stroke length *2	In 1 mm increments									

\*1: Less than 5 mm for 1-color display switch and less than 10 mm for the 2-color display, off-delay, AC magnetic field proof, T1\* or T8\* switch are not available. Refer to "Pneumatic Cylinders I (Catalog No. CB-029SA)" for the min. stroke length with switch.

\*2: The total length when using a custom stroke length is the same as that when using the next longer standard stroke length.

## Compatibility table by variation

Applicable bore size		Double acting/ single rod	Double acting/ single rod high load	Double acting/ single rod long stroke length	Single acting/ push	Single acting/ pull	Double acting/ rubber-air cushioned high load	Double acting/ position locking	Double acting/ double rod	Double acting/ back to back	Double acting/ two-stage	Double acting/ fine speed	Double acting/ low speed	Double acting/ low friction/ high load	Double acting/ heat resistance	Double acting/ packing fluoro rubber	Double acting/ rubber scraper	Double acting/ rotation-stop
			K		X	Y	KC	Q	D	B	W	F	0	KU	T1	T2	G	M
ø12 to 200	P4	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	▲
	P40	●	●	○	○	○	○	○	○	▲	○	○	○	○	○	○	○	▲
	P41	▲	▲	▲			▲	▲	▲	▲							▲	
	P42	▲	▲	▲			▲	▲	▲	▲	▲	▲	▲	▲		▲		

● : Standard  
 ○ : Made to order  
 ▲ : Contact CKD  
 □ : Not applicable

Space saving

## How to order

Without switch



With switch



A Model No.

B Bore size

C Cushion

D Stroke length

E Switch model No.

- \*1
- \*2
- \*3
- \*8
- \*9

F Switch quantity

G Option \*4

H Mounting bracket

- \*5
- \*6

I Accessory

- \*7

Code	Content										
<b>A Model No.</b>											
SSD2	Double acting/single rod										
SSD2-L	Double acting/single rod/with switch										
<b>B Bore size (mm)</b>											
12	ø12										
16	ø16										
20	ø20										
25	ø25										
32	ø32										
40	ø40										
50	ø50										
63	ø63										
80	ø80										
100	ø100										
<b>C Cushion</b>											
Blank	Without cushion										
D	With rubber cushion										
<b>D Stroke length (mm)</b>											
Refer to the stroke length table.											
<b>E Switch model No.</b>											
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.											
<b>F Switch quantity</b>											
R	1 on rod side										
H	1 on head side										
D	2										
<b>G Option</b>											
	Bore size (mm)	12	16	20	25	32	40	50	63	80	100
Blank	Rod end female thread	●	●	●	●	●	●	●	●	●	●
	Rod end male thread	●	●	●	●	●	●	●	●	●	●
M *4	Piston rod material (stainless steel)	●	●	●	●	●	●	●	●	●	●
		●	●	●	●	●	●	●	●	●	●
		●	●	●	●	●	●	●	●	●	●
<b>H Mounting bracket</b>											
Blank	Without mounting bracket										
LB	Axial foot										
CB	Clevis bracket (pin and snap ring attached)										
FA	Rod side flange										
FB	Head side flange										
<b>I Accessory (available when rod end male thread "N" is selected)</b>											
I	Rod eye										
Y	Rod clevis (pin and snap ring attached)										

## ⚠ Precautions for model No. selection

- \*1: The T2YD\* switch cannot be mounted on the ø12 and ø16 bore sizes.
- \*2: The T8\* switch cannot be mounted on the ø12 to ø32 bore sizes.
- \*3: The F type switch can only be mounted on the piping port surface of bore sizes ø20 and ø25.
- \*4: Piston rod of ø12 to ø25 is stainless steel as standard. C type snap ring is stainless steel instead of steel. The rod end male thread nut is stainless steel.
- \*5: The mounting bracket is attached at shipment.
- \*6: The projection dimension of piston rod WF when LB or FA is selected is different from that of the standard. Refer to "Pneumatic Cylinders I (Catalog No. CB-029SA)" for details. The number of the specified protruding dimension will be added at the end of the model No. printed on the metal plate on the body.
- \*7: "I" and "Y" cannot be selected together.
- \*8: The F type switch with L type lead wire on ø20 models cannot be selected on stroke lengths 15 mm or under.
- \*9: Switches are shipped with the product. Contact CKD if assembling before shipment is necessary.
- \*10: 5 m lead wire for the F switch is a made to order product.

## Related products

Speed controller								
Model No.	Appearance	Port size (Rc or R)			Compatible tube O.D.			Page
		M5	1/8	1/4	4(ø4)	6(ø6)	8(ø8)	
SC3W-M5- *-P4		●			●	●		232
SC3W-6- *-P4			●		●	●		
SC3W-8- *-P4				●		●	●	

Specify the compatible tube O.D. code for \*.



Compact cylinder Double acting/single rod (large bore size)

# SSD2 Series

● Bore size:  $\phi 125/\phi 140/\phi 160/\phi 180/\phi 200$

JIS symbol



## Specifications

Descriptions	SSD2 SSD2-L (with switch)				
	$\phi 125$	$\phi 140$	$\phi 160$	$\phi 180$	$\phi 200$
Bore size mm	$\phi 125$	$\phi 140$	$\phi 160$	$\phi 180$	$\phi 200$
Actuation	Double acting				
Working fluid	Compressed air				
Max. working pressure MPa	1.0			0.7	
Min. working pressure MPa	0.05				
Proof pressure MPa	1.6			1.05	
Ambient temperature $^{\circ}\text{C}$	-10 to 60 (no freezing)				
Port size	Rc3/8			Rc1/2	
Stroke tolerance mm	$+2.0$ 0				
Working piston speed mm/s	50 to 300			20 to 300	
Cushion	With rubber cushion (standard)				
Lubrication	Not available				
Allowable absorbed energy J	With rubber cushion	6.52	6.52	7.78	12.4
	Without cushion	-			

## Stroke length

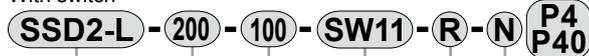
Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
$\phi 125$	10, 20, 30, 40, 50 75, 100, 125, 150 175, 200, 250, 300	300	1
$\phi 140$			
$\phi 160$			
$\phi 180$			
$\phi 200$			

### How to order

Without switch



With switch



**A** Model No.

**B** Bore size

**C** Stroke length

**D** Switch model No.  
\*3

**E** Switch quantity

**F** Option

### ⚠ Precautions for model No. selection

- \*1: Less than 5 mm for 1-color display switch and less than 10 mm for the 2-color display, off-delay, AC magnetic field proof, T1\* or T8\* switch are not available. Refer to "Pneumatic Cylinders I (Catalog No. CB-029SA)" for the number of installed switches and the minimum stroke length.
- \*2: Total length dimension with custom stroke length is handled as the custom stroke dedicated length.
- \*3: Switches are shipped with the product. Contact CKD if assembling before shipment is necessary.

### Related products

Speed controller											
Model No.	Appearance	Port size (Rc or R)				Compatible tube O.D.					Page
		1/8	1/4	3/8	1/2	4(ø4)	6(ø6)	8(ø8)	10(ø10)	12(ø12)	
SC3W-10- *P4				●				●	●	●	232
SC3W-15- *P4				●				●	●		

Specify the compatible tube O.D. code for \*

Code	Content					
<b>A Model No.</b>						
<b>SSD2</b>	Double acting/single rod					
<b>SSD2-L</b>	Double acting/single rod/with switch					
<b>B Bore size (mm)</b>						
<b>125</b>	ø125					
<b>140</b>	ø140					
<b>160</b>	ø160					
<b>180</b>	ø180					
<b>200</b>	ø200					
<b>C Stroke length (mm)</b>						
	<b>Applicable bore size</b>					
	ø125    ø140    ø160    ø180    ø200					
Standard stroke length	10	●	●	●	●	●
	20	●	●	●	●	●
	30	●	●	●	●	●
	40	●	●	●	●	●
	50	●	●	●	●	●
	75	●	●	●	●	●
	100	●	●	●	●	●
	125	●	●	●	●	●
	150	●	●	●	●	●
	175	●	●	●	●	●
	200	●	●	●	●	●
	250	●	●	●	●	●
300	●	●	●	●	●	
Min. stroke length (mm) *1	1					
Max. stroke length (mm)	300					
Custom stroke length *2	In 1 mm increments					
<b>D Switch model No.</b>						
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.						
<b>E Switch quantity</b>						
<b>R</b>	1 on rod side					
<b>H</b>	1 on head side					
<b>D</b>	2					
<b>F Option</b>						
<b>Blank</b>	Rod end female thread					
<b>N</b>	Rod end male thread					



Pneumatic Cylinders I  
Catalog No. CB-029SA

Compact cylinder Double acting/single rod

# SSD Series

● Bore size:  $\phi 12/\phi 16/\phi 20/\phi 25/\phi 32/\phi 40/\phi 50/\phi 63/\phi 80/\phi 100/\phi 125/\phi 140/\phi 160$

JIS symbol



## Specifications

Descriptions	SSD SSD-L (with switch)													
	$\phi 12$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$	$\phi 125$	$\phi 140$	$\phi 160$	
Bore size mm														
Actuation	Double acting													
Working fluid	Compressed air													
Max. working pressure MPa	1.0													
Min. working pressure MPa	0.1							0.05						
Proof pressure MPa	1.6													
Ambient temperature °C	-10 to 60 (no freezing)													
Port size	M5				Rc 1/8			Rc 1/4		Rc 3/8				
Stroke tolerance mm	With rubber cushion													
	Without cushion													
Working piston speed mm/s	50 to 500							50 to 300						
	With or without cushion can be selected												With rubber cushion (standard)	
Lubrication	Not available													
Allowable absorbed energy J	With rubber cushion													
	Without cushion													

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
$\phi 12$	5, 10, 15, 20, 25, 30	*1) 30	1
$\phi 16$			
$\phi 20$			
$\phi 25$			
$\phi 32$	5, 10, 15, 20, 25, 30, 40, 50	*1) 50	
$\phi 40$			
$\phi 50$			
$\phi 63$			
$\phi 80$	5, 10, 20, 30, 40, 50	*1) 50	
$\phi 100$			
$\phi 125$	10, 20, 30, 40		
$\phi 140$	50, 60, 70, 80	300	
$\phi 160$	90, 100		

\*1) For  $\phi 12$  to  $\phi 100$ , if the standard stroke is exceeded, the high load type is used. Refer to page 19 for specifications.

[Stroke length table]

Stroke length (mm)	Applicable bore size													
	$\phi 12$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$	$\phi 125$	$\phi 140$	$\phi 160$	
5	●	●	●	●	●	●	●	●	●	●	●	●	●	
10	●	●	●	●	●	●	●	●	●	●	●	●	●	
15	●	●	●	●	●	●	●	●	●	●	●	●	●	
20	●	●	●	●	●	●	●	●	●	●	●	●	●	
25	●	●	●	●	●	●	●	●	●	●	●	●	●	
30	●	●	●	●	●	●	●	●	●	●	●	●	●	
40			●	●	●	●	●	●	●	●	●	●	●	
50			●	●	●	●	●	●	●	●	●	●	●	
60											●	●	●	
70											●	●	●	
80											●	●	●	
90											●	●	●	
100											●	●	●	
Min. stroke length (mm) *1	1													
Max. stroke length (mm)	30				50						300			
Custom stroke length *2	In 1 mm increments													

\*1: Less than 5 mm for 1-color display switch and less than 10 mm for the 2-color display, off-delay, AC magnetic field proof, T1\* or T8\* switch are not available. Refer to "Pneumatic Cylinders I (Catalog No. CB-029SA)" for the number of installed switches and the minimum stroke length.

\*2: Total length when using a custom stroke length is different between  $\phi 12$  to  $\phi 100$  and  $\phi 125$  to  $\phi 160$  as below. Please be careful. The dimensions of the total length with the custom stroke length [ $\phi 12$  to  $\phi 100$ ] are handled the same as the next longer standard stroke length. Total length dimension with custom stroke length [ $\phi 125$  to  $\phi 160$ ] is handled as the custom stroke dedicated length.

## How to order mounting bracket P4

Bore size (mm)	$\phi 12$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$	$\phi 125$	$\phi 140$	$\phi 160$
Foot (LB)	SSD-LB-12	SSD-LB-16	SSD-LB-20	SSD-LB-25	SSD-LB-32	SSD-LB-40	SSD-LB-50	SSD-LB-63	SSD-LB-80	SSD-LB-100	SSD-LB-125	SSD-LB-140	SSD-LB-160
Foot (LB2)	SSD-LB2-12	SSD-LB2-16	SSD-LB2-20	SSD-LB2-25	SSD-LB2-32	SSD-LB2-40	SSD-LB2-50	SSD-LB2-63	SSD-LB2-80	SSD-LB2-100	-	-	-
Flange (FA/FB)	SSD-FA-12	SSD-FA-16	SSD-FA-20	SSD-FA-25	SSD-FA-32	SSD-FA-40	SSD-FA-50	SSD-FA-63	SSD-FA-80	SSD-FA-100	-	-	-
Clevis bracket (CB)	SSD-CB-12	SSD-CB-16	SSD-CB-20	SSD-CB-25	SSD-CB-32	SSD-CB-40	SSD-CB-50	SSD-CB-63	SSD-CB-80	SSD-CB-100	SSD-CB-125	SSD-CB-140	SSD-CB-160
Clevis bracket (CB2)	SSD-CB2-12	SSD-CB2-16	SSD-CB2-20	SSD-CB2-25	SSD-CB2-32	SSD-CB2-40	SSD-CB2-50	SSD-CB2-63	SSD-CB2-80	SSD-CB2-100	-	-	-

\*1: The foot mounting bracket is provided as 2 pcs./set.

\*2: Specify -P40 at the end of the model No. for P40 Series mounting brackets.

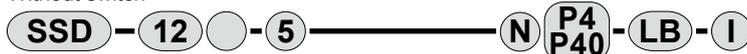
## Compatibility table by variation

Applicable bore size		Double acting/single rod	Double acting/position locking	Single acting/push	Single acting/pull	Double acting/double rod	Double acting/back to back	Double acting/two-stage	Double acting/fine speed	Double acting/low speed	Double acting/heat resistance	Double acting/rubber scraper	Double acting/anti-spatter adherence	Double acting/coolant proof	Double acting/double rod/anti-spatter adherence	Double acting/rotation-stop
			Q	X	Y	D	B	W	F	O	T	G	G1/G4	G2/G3	DG1 DG4	M
ø12 to 160	P4	●	●	○	○	○	○	○	○	○	○	○				▲
	P40	●	●	○	○	○	○	○	○	○	○	○				▲
	P41	▲	▲			▲	▲	▲				▲				
	P42	▲	▲			▲	▲	▲	▲	▲						

● : Standard  
 ○ : Made to order  
 ▲ : Contact CKD  
 □ : Not applicable

## How to order

Without switch



With switch



2-color display/off-delay, with T1\* switch (ø12/ø16 only)



**A** Model No.

**B** Bore size

**C** Cushion

**D** Stroke length

**E** Switch model No.

- \*1
- \*2
- \*9

**F** Switch quantity

**G** Option

- \*3

**H** Mounting bracket

- \*5
- \*6
- \*10

**I** Accessory

- \*6

### Precautions for model No. selection

- \*1: Strong magnetic field proof switch cannot be installed on ø12 and ø16.
- \*2: T8\* switch cannot be installed on ø12 to ø32.
- \*3: Piston rod of ø12 to ø25 is stainless steel as standard. C type snap ring is stainless steel instead of steel. The rod end male thread nut is stainless steel.
- \*4: The mounting bracket is attached at shipment.
- \*5: The projection dimension of piston rod WF when LB2 or FA is selected is different from that of the standard. Dimensions are in "Pneumatic Cylinders I (Catalog No. CB-029SA)" and the number of the specified projection dimension will be added at the end of the model No. printed on the metal plate on the body.
- \*6: "I" and "Y" cannot be selected together.
- \*7: Refer to "Pneumatic Cylinders I (Catalog No. CB-029SA)" for custom specifications of rod end form.
- \*8: Refer to "Pneumatic Cylinders I (Catalog No. CB-029SA)" for combinations of variations and options.
- \*9: Switches are shipped with the product. Contact CKD if assembling before shipment is necessary.
- \*10: Only LB and CB are available for ø125 to ø160.

### Related products

Speed controller											
Model No.	Appearance	Port size (Rc or R)				Compatible tube O.D.				Page	
		M5	1/8	1/4	3/8	4(ø4)	6(ø6)	8(ø8)	10(ø10)	12(ø12)	
SC3W-M5-*.P4		●				●	●				232
SC3W-6-*.P4			●			●	●	●			
SC3W-8-*.P4				●			●	●	●		
SC3W-10-*.P4					●		●	●	●		

Specify the compatible tube O.D. code for \*.

Code	Content													
<b>A Model No.</b>														
SSD	Double acting/single rod													
SSD-L	Double acting/single rod/with switch													
SSD-L1	ø12, ø16 2-color display, off-delay, with T1* switch													
<b>B Bore size (mm)</b>														
12	ø12													
16	ø16													
20	ø20													
25	ø25													
32	ø32													
40	ø40													
50	ø50													
63	ø63													
80	ø80													
100	ø100													
125	ø125													
140	ø140													
160	ø160													
<b>C Cushion</b>														
Blank	Without cushion (with rubber cushion for ø125 and over)													
D	With rubber cushion (ø12 to ø100)													
<b>D Stroke length (mm)</b>														
Refer to the stroke length table.														
<b>E Switch model No.</b>														
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.														
<b>F Switch quantity</b>														
R	1 on rod side													
H	1 on head side													
D	2													
<b>G Option</b>														
	Bore size (mm)	12	16	20	25	32	40	50	63	80	100	125	140	160
Blank	Rod end female thread	●	●	●	●	●	●	●	●	●	●	●	●	●
N	Rod end male thread	●	●	●	●	●	●	●	●	●	●	●	●	●
P6	Copper and PTFE free specifications	Supported as standard												
S	Dedicated unit for custom stroke length	●	●	●	●	●	●	●	●	●	●	●	●	●
M	Piston rod material (stainless steel)	●	●	●	●	●	●	●	●	●	●	●	●	Supported as standard
<b>H Mounting bracket</b>														
LB	Axial foot													
LB2	Axial foot (compact)													
CB	Clevis bracket (pin and snap ring attached)													
CB2	Clevis bracket (compact) (pin and snap ring attached)													
FA	Rod side flange													
FB	Head side flange													
<b>I Accessory (available when rod end male thread "N" is selected)</b>														
I	Rod eye													
I2	Rod eye (compact)													
Y	Rod clevis (pin and snap ring attached)													
Y2	Rod clevis (compact) (pin and snap ring attached)													



Compact cylinder Double acting/single rod/high load

# SSD-K Series

● Bore size:  $\phi 12/\phi 16/\phi 20/\phi 25/\phi 32/\phi 40/\phi 50/\phi 63/\phi 80/\phi 100$

JIS symbol



## Specifications

Descriptions	SSD-K SSD-KL (with switch)											
	Bore size	mm	$\phi 12$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$
Actuation		Double acting										
Working fluid		Compressed air										
Max. working pressure	MPa	1.0										
Min. working pressure	MPa	0.1					0.05					
Proof pressure	MPa	1.6										
Ambient temperature	°C	-10 to 60 (no freezing)										
Port size		M5				Rc1/8		Rc1/4		Rc3/8		
Stroke tolerance	mm	+2.0 0										
Working piston speed	mm/s	50 to 500						50 to 300				
Cushion		Rubber cushion										
Lubrication		Not available										
Allowable absorbed energy	J	0.04	0.09	0.16	0.16	0.40	0.63	0.98	1.56	2.51	3.92	

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
$\phi 12$	5, 10, 15, 20, 25, 30, 40, 50	*2) 100	1
$\phi 16$		*2) 200	
$\phi 20$	10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100	300	
$\phi 25$			
$\phi 32$			
$\phi 40$			
$\phi 50$			
$\phi 63$	10, 20, 30, 40, 50, 60, 70, 80, 90, 100		
$\phi 80$			
$\phi 100$			

- \*1) The custom stroke length is available in 1 mm increments. However, the total length is the same as that of the next longer standard stroke length.
- \*2) Stroke length over standard to maximum is available in increments of 10.  
(Example)  $\phi 16$ : 60, 70, 80, 90, 100
- \*3) From 101 to 200 for  $\phi 20$ , 151 to 300 for  $\phi 25$  to  $\phi 50$ , or 201 to 300 for  $\phi 63$  to  $\phi 100$ , internal structure and total length are different in some products.

## [Stroke length table]

Stroke length (mm)	Applicable bore size									
	$\phi 12$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$
5	●	●	●							
10	●	●	●	●	●	●	●	●	●	●
15	●	●	●	●	●	●	●			
20	●	●	●	●	●	●	●	●	●	●
25	●	●	●	●	●	●	●			
30	●	●	●	●	●	●	●	●	●	●
40	●	●	●	●	●	●	●	●	●	●
50	●	●	●	●	●	●	●	●	●	●
60				●	●	●	●	●	●	●
70				●	●	●	●	●	●	●
80				●	●	●	●	●	●	●
90				●	●	●	●	●	●	●
100				●	●	●	●	●	●	●
Min. stroke length (mm) *1	1									
Max. stroke length (mm)	100	200	300							
Custom stroke length *2	In 1 mm increments									

- \*1: Less than 5 mm with 1-color display switch and less than 10 mm with the 2-color display, off-delay, AC magnetic field proof, T1\* or T8\* switch are not available. Refer to "Pneumatic Cylinders I (Catalog No. CB-029SA)" for the number of installed switches and the minimum stroke length.
- \*2: The total length is the same as that of the next longer standard stroke length.

## How to order mounting bracket P4

Bore size (mm)	$\phi 12$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$
Foot (LB)	SSD-LB-12	SSD-LB-16	SSD-LB-20	SSD-LB-25	SSD-LB-32	SSD-LB-40	SSD-LB-50	SSD-LB-63	SSD-LB-80	SSD-LB-100
Foot (LB2)	SSD-LB2-12	SSD-LB2-16	SSD-LB2-20	SSD-LB2-25	SSD-LB2-32	SSD-LB2-40	SSD-LB2-50	SSD-LB2-63	SSD-LB2-80	SSD-LB2-100
Flange (FA/FB)	SSD-FA-12	SSD-FA-16	SSD-FA-20	SSD-FA-25	SSD-FA-32	SSD-FA-40	SSD-FA-50	SSD-FA-63	SSD-FA-80	SSD-FA-100
Clevis bracket (CB)	SSD-CB-12	SSD-CB-16	SSD-CB-20	SSD-CB-25	SSD-CB-32	SSD-CB-40	SSD-CB-50	SSD-CB-63	SSD-CB-80	SSD-CB-100
Clevis bracket (CB2)	SSD-CB2-12	SSD-CB2-16	SSD-CB2-20	SSD-CB2-25	SSD-CB2-32	SSD-CB2-40	SSD-CB2-50	SSD-CB2-63	SSD-CB2-80	SSD-CB2-100

- \*1: The foot mounting bracket is provided as 2 pcs./set.  
\*2: Specify -P40 at the end of the model No. for P40 Series mounting brackets.

## Compatibility table by variation

Applicable bore size		Double acting/ single rod	Double acting/ fine speed	Double acting/ low friction	Double acting/ rubber-air cushioned	Double acting/ rubber scraper	Double acting/ anti-spatter adherence	Double acting/ coolant proof
			F	U	*C	G	G1/G4	G2/G3
ø12 to 160	P4	●	○	○	○	○		
	P40	●	○	○	○	○		
	P41	▲			▲	▲		
	P42	▲	▲	▲	▲			

● : Standard ○ : Made to order ▲ : Contact CKD ◻ : Not applicable

## How to order

Without switch



With switch



A Bore size

B Stroke length

C Switch model No.

\*1

\*8

D Switch quantity

E Option

\*2

F Mounting bracket

\*3

\*4

G Accessory

\*5

### Precautions for model No. selection

- \*1: AC magnetic field proof switch and T8\* switch cannot be installed on ø12 and ø16.
- \*2: Piston rod of ø12 to ø25 is stainless steel as standard. C type snap ring is stainless steel instead of steel. The rod end male thread nut is stainless steel.
- \*3: The mounting bracket is attached at shipment.
- \*4: The projection dimension of piston rod WF when LB2 or FA is selected is different from that of the standard. Refer to "Pneumatic Cylinders I (Catalog No. CB-029SA)" for dimensions. The number of the specified protruding dimension will be added at the end of the model No. printed on the metal plate on the body.
- \*5: "I" and "Y" cannot be selected together.
- \*6: Refer to "Pneumatic Cylinders I (Catalog No. CB-029SA)" for custom specifications of rod end form.
- \*7: Refer to "Pneumatic Cylinders I (Catalog No. CB-029SA)" for combinations of variations and options.
- \*8: Switches are shipped with the product. Contact CKD if assembling before shipment is necessary.

Code	Content
<b>A Bore size (mm)</b>	
12	ø12
16	ø16
20	ø20
25	ø25
32	ø32
40	ø40
50	ø50
63	ø63
80	ø80
100	ø100
<b>B Stroke length (mm)</b>	
Refer to the stroke length table.	
<b>C Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>D Switch quantity</b>	
R	1 on rod side
H	1 on head side
D	2
<b>E Option</b>	
<b>Bore size (ø)</b>	12 16 20 25 32 40 50 63 80 100
Blank	Rod end female thread ● ● ● ● ● ● ● ● ● ●
N	Rod end male thread ● ● ● ● ● ● ● ● ● ●
S	Dedicated unit for custom stroke length ● ● ● ● ● ● ● ● ● ●
M	Piston rod material (stainless steel) ● ● ● ● ● ● ● ● ● ●
<b>F Mounting bracket</b>	
LB	Axial foot
LB2	Axial foot (compact)
CB	Clevis bracket (pin and snap ring attached)
CB2	Clevis bracket (compact) (pin and snap ring attached)
FA	Rod side flange
FB	Head side flange
<b>G Accessory (available when rod end male thread "N" is selected)</b>	
I	Rod eye
I2	Rod eye (compact)
Y	Rod clevis (pin and snap ring attached)
Y2	Rod clevis (compact) (pin and snap ring attached)

### Related products

Model No.	Appearance	Port size (Rc or R)				Compatible tube O.D.				Page
		M5	1/8	1/4	3/8	4(ø4)	6(ø6)	8(ø8)	10(ø10)	
SC3W-M5- *P4		●				●	●			
SC3W-6- *P4			●			●	●	●		
SC3W-8- *P4				●			●	●	●	
SC3W-10- *P4					●			●	●	●

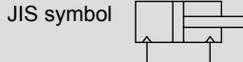
Specify the compatible tube O.D. code for \*.



Guided super compact cylinder Double acting/single rod

# SSG Series

● Bore size:  $\phi 12/\phi 16/\phi 20/\phi 25/\phi 32/\phi 40/\phi 50/\phi 63/\phi 80/\phi 100$



## Specifications

Descriptions		SSG																												
Bore size	mm	$\phi 12$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$																			
Actuation		Double acting																												
Working fluid		Compressed air																												
Max. working pressure	MPa	1.0																												
Min. working pressure	MPa	0.15					0.1																							
Proof pressure	MPa	1.6																												
Ambient temperature	°C	-10 to 60 (no freezing)																												
Port size		M5				Rc1/8 *1		Rc1/4		Rc3/8																				
Stroke tolerance	mm	$\begin{matrix} +1.0 \\ 0 \\ +2.0 \\ 0 \end{matrix}$																												
	Without cushion																													
With rubber cushion																														
Working piston speed	mm/s	50 to 500					50 to 300																							
Cushion		With a rubber cushion or without can be selected.																												
Lubrication		Not available																												
Allowable absorbed energy	J	<table border="1"> <tr> <td>0.004</td> <td>0.01</td> <td>0.016</td> <td>0.021</td> <td>0.025</td> <td>0.092</td> <td>0.1</td> <td>0.12</td> <td>0.27</td> <td>0.56</td> </tr> <tr> <td>0.03</td> <td>0.05</td> <td>0.10</td> <td>0.16</td> <td>0.44</td> <td>0.75</td> <td>0.78</td> <td>2.51</td> <td>3.92</td> </tr> </table>										0.004	0.01	0.016	0.021	0.025	0.092	0.1	0.12	0.27	0.56	0.03	0.05	0.10	0.16	0.44	0.75	0.78	2.51	3.92
	0.004											0.01	0.016	0.021	0.025	0.092	0.1	0.12	0.27	0.56										
0.03	0.05	0.10	0.16	0.44	0.75	0.78	2.51	3.92																						
Without cushion																														
With rubber cushion																														

\*1: The  $\phi 32$  bore size with a 5 mm stroke and without a switch has a port size of M5.

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
$\phi 12$	5/10/15/20/25/30	30	1
$\phi 16$			
$\phi 20$	5/10/15/20/25/30/35/40/45/50	50	
$\phi 25$			
$\phi 32$	5/10/15/20/25/30/35/40/45/50/75/100	100	
$\phi 40$			
$\phi 50$	10/15/20/25/30/35/40/45/50/75/100		
$\phi 63$			
$\phi 80$			
$\phi 100$			

\*1: The custom stroke length is available in 1 mm increments. The dimensions of the total length with the custom stroke length are handled the same as the next longer standard stroke length.

## Related products

		Speed controller										
Model No.	Appearance	Port size (Rc or R)				Compatible tube O.D.					Page	
		M5	1/8	1/4	3/8	4( $\phi 4$ )	6( $\phi 6$ )	8( $\phi 8$ )	10( $\phi 10$ )	12( $\phi 12$ )		
SC3W-M5-*P4		●				●	●				232	
SC3W-6-*P4			●			●	●	●				
SC3W-8-*P4				●			●	●	●			
SC3W-10-*P4					●		●	●	●	●		

Specify the compatible tube O.D. code for \*.

## Compatibility table by variation

Applicable bore size	Double acting	
	P4	P40
ø12 to 100	P4	●
	P40	●
	P41	□
	P42	□

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

Without switch

**SSG** - **12** **D** - **10** - **P4**  
**P40**

With switch

**SSG-L** - **12** **D** - **10** - **SW11** - **R** - **P4**  
**P40**

2-color display/off-delay, with T1\* switch (ø12/ø16 only)

**SSG-L1** - **12** **D** - **10** - **SW31** - **R** - **P4**  
**P40**

**A** Model No.

**B** Bore size

**C** Cushion

**D** Stroke length

The custom stroke length is available in increments of 1 mm. (Less than 5 mm with switch is not available) Note that the dimensions of the total length with the custom stroke length are handled the same as the longer standard stroke length.

**E** Switch model No.

\*1  
\*2  
\*3  
\*4  
\*5

**F** Switch quantity

Code	Content
<b>A Model No.</b>	
<b>SSG</b>	Double acting/single rod
<b>SSG-L</b>	Double acting/single rod/with switch
<b>SSG-L1</b>	ø12, ø16 2-color display, off-delay, with T1* switch
<b>B Bore size (mm)</b>	
<b>12</b>	ø12
<b>16</b>	ø16
<b>20</b>	ø20
<b>25</b>	ø25
<b>32</b>	ø32
<b>40</b>	ø40
<b>50</b>	ø50
<b>63</b>	ø63
<b>80</b>	ø80
<b>100</b>	ø100
<b>C Cushion</b>	
<b>Blank</b>	Without cushion
<b>D</b>	With two-sided rubber cushion
<b>D Stroke length (mm)</b>	
	<b>Bore size (ø)</b>
	<b>12 16 20 25 32 40 50 63 80 100</b>
<b>5</b>   5	● ● ● ● ● ● ● ● ● ●
<b>10</b>   10	● ● ● ● ● ● ● ● ● ●
<b>15</b>   15	● ● ● ● ● ● ● ● ● ●
<b>20</b>   20	● ● ● ● ● ● ● ● ● ●
<b>25</b>   25	● ● ● ● ● ● ● ● ● ●
<b>30</b>   30	● ● ● ● ● ● ● ● ● ●
<b>35</b>   35	● ● ● ● ● ● ● ● ● ●
<b>40</b>   40	● ● ● ● ● ● ● ● ● ●
<b>45</b>   45	● ● ● ● ● ● ● ● ● ●
<b>50</b>   50	● ● ● ● ● ● ● ● ● ●
<b>75</b>   75	● ● ● ● ● ● ● ● ● ●
<b>100</b>   100	● ● ● ● ● ● ● ● ● ●
<b>E Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>F Switch quantity</b>	
<b>R</b>	1 on rod side
<b>H</b>	1 on head side
<b>D</b>	2
<b>T</b>	3

## ⚠ Precautions for model No. selection

- \*1: The T0\* and T5\* switches cannot be mounted on the 5 mm stroke length of the ø12 and ø16 bore sizes.
- \*2: The T2YD\* switch cannot be mounted on the ø12 and ø16 bore sizes.
- \*3: The T8\* switch cannot be mounted on the ø12 to ø32 bore sizes.
- \*4: The F type switch can only be mounted on the piping port surface of bore size ø25.
- \*5: Switches are shipped with the product. Contact CKD if assembling before shipment is necessary.

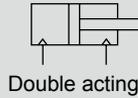


Small compact cylinder Double acting/single rod

# MSD Series

● Bore size:  $\varnothing 6/\varnothing 8$

JIS symbol



## Specifications

Descriptions		MSD MSD-L (with switch)
Bore size	mm	$\varnothing 6, \varnothing 8$
Actuation		Double acting
Working fluid		Compressed air
Max. working pressure	MPa	1.0
Min. working pressure	MPa	0.15
Proof pressure	MPa	1.6
Ambient temperature	°C	-10 to 60 (no freezing)
Port size		M3
Stroke tolerance	mm	+0.5 0
Working piston speed	mm/s	50 to 500
Cushion		No
Lubrication		Not available
Allowable absorbed energy	J	This product cannot absorb the energy generated by an external load mounted on the cylinder. When using the product with no load, separately provide a shock absorber on the outside.

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length with two switches (mm)		Min. stroke length with one switch (mm)	
			Reed switch	Proximity switch	Reed switch	Proximity switch
$\varnothing 6$	5/10/15/20/25/30	30	10	5(10)	5	5
$\varnothing 8$	5/10/15/20/25/30	30	10	5(10)	5	5

\*1: Products with stroke length other than standard stroke length are not available.

\*2: For F2Y, F3Y or F3P, the min. stroke length will be the dimensions in ( ).

## Compatibility table by variation

Applicable bore size		Double acting/ single rod	Double acting/ single rod high load	Single acting/ push	Single acting/ pull	Double acting/ fine speed
			K	X	Y	F
MSD ø6 to 16	P4	●	●	○	○	○
	P40	●	●	○	○	○

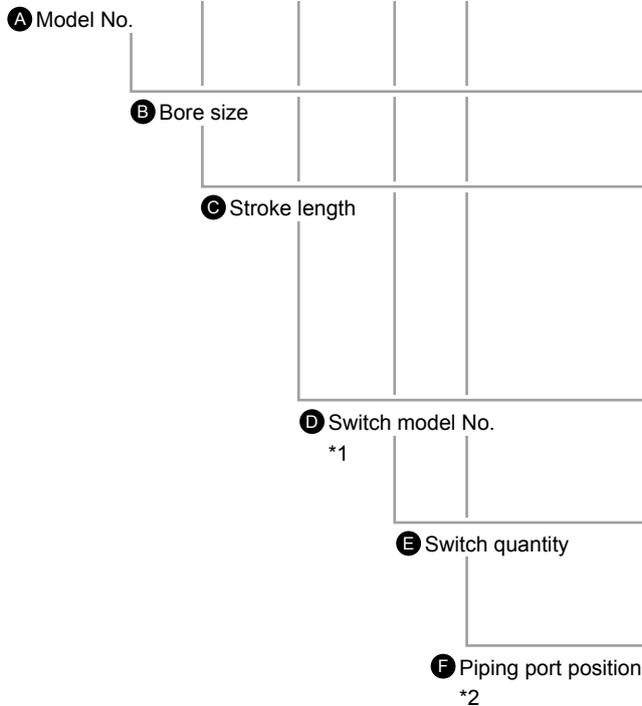
● : Standard ○ : Made to order ▲ : Contact CKD ◻ : Not applicable

## How to order

● Without switch



● With switch



Code	Content	
<b>A Model No.</b>		
MSD	Double acting/single rod	Without switch
MSD-L		With switch
<b>B Bore size (mm)</b>		
6	ø6	
8	ø8	
<b>C Stroke length (mm)</b>		
5	5	
10	10	
15	15	
20	20	
25	25	
30	30	
<b>D Switch model No.</b>		
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.		
<b>E Switch quantity</b>		
R	1 on rod side	
H	1 on head side	
D	2	
<b>F Piping port position</b>		
Blank	Body side surface port	
R	Rear common port	

## ⚠ Precautions for model No. selection

\*1: For ø6 or ø8 with switch, use a non-magnetic (stainless steel, etc.) mounting bolt.

\*2: For rear common port, body side installation is possible. Note that 2 bolts are used for rod side mounting and head side mounting.

## Related products

Speed controller								
Model No.	Appearance	Port size (Rc or R)			Compatible tube O.D.			Page
		M3	M5	1/8	4(ø4)	6(ø6)	8(ø8)	
SC3W-M3- *-P4		●			●			232

Specify the compatible tube O.D. code for \*.



Small guided compact cylinder  
Double acting/guided/with switch

# MSDG-L Series

● Bore size:  $\varnothing 6/\varnothing 8/\varnothing 12/\varnothing 16$



## Specifications

Descriptions		MSDG-L (with switch)			
Bore size	mm	$\varnothing 6$	$\varnothing 8$	$\varnothing 12$	$\varnothing 16$
Actuation		Double acting			
Working fluid		Compressed air			
Max. working pressure	MPa	1.0			
Min. working pressure	MPa	0.2	0.15		0.1
Proof pressure	MPa	1.6			
Ambient temperature	$^{\circ}\text{C}$	5 to 60			
Port size	Body side surface port	M3		M5	
	Rear common port	M3		M3	
Stroke tolerance	mm	+2.0 0			
Working piston speed	mm/s	50 to 500			
Cushion		With rubber cushion			
Lubrication		Not available			
Allowable absorbed energy	J	0.004	0.014	0.044	0.110

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length with two switches (mm)		Min. stroke length with one switch (mm)	
			Reed switch	Proximity switch	Reed switch	Proximity switch
$\varnothing 6$	5/10/15/20/25/30	30	10	5	5	5
$\varnothing 8$	5/10/15/20/25/30	30	10	5	5	5
$\varnothing 12$	5/10/15/20/25/30	30	10	5	5	5
$\varnothing 16$	5/10/15/20/25/30	30	10	5	5	5

Note: Products with stroke length other than standard stroke length are not available.

## Compatibility table by variation

Applicable bore size		Double acting/ guided	Double acting/ guided/ fine speed
			F
MSDG ø6 to 16	P4	●	○
	P40	●	○

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

● With switch

**MSDG-L** - **6** - **30** - **SW81** - **D** - **R** **P4**  
**P40**

Double acting/  
guided

**A** Bore size

**B** Stroke length

**C** Switch model No.

\*1

\*2

**D** Switch quantity

**E** Piping port position  
\*3

Code	Content
<b>A Bore size (mm)</b>	
<b>6</b>	ø6
<b>8</b>	ø8
<b>12</b>	ø12
<b>16</b>	ø16
<b>B Stroke length (mm)</b>	
<b>5</b>	5
<b>10</b>	10
<b>15</b>	15
<b>20</b>	20
<b>25</b>	25
<b>30</b>	30
<b>C Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>D Switch quantity</b>	
<b>R</b>	1 on rod side
<b>H</b>	1 on head side
<b>D</b>	2
<b>E Piping port position</b>	
<b>Blank</b>	Body side surface port
<b>R</b>	Rear common port

## ⚠ Precautions for model No. selection

- \*1: For ø6 or ø8 with switch, use a non-magnetic (stainless steel, etc.) mounting bolt.
- \*2: For ø12 or ø16 with proximity switch, use a non-magnetic (stainless steel, etc.) through bolt.
- \*3: For rear common port, body side installation is possible.

## Related products

Speed controller							
Model No.	Appearance	Port size (Rc or R)			Compatible tube O.D.		Page
		M3	M5	1/8	4(ø4)	6(ø6)	
SC3W-M3- *-P4		●			●		232
SC3W-M5- *-P4			●		●	●	

Specify the compatible tube O.D. code for \*.



Pneumatic Cylinders I  
Catalog No. CB-029SA

Compact cylinder Double acting/single rod

# SMG Series

● Bore size:  $\phi 6/\phi 10/\phi 16/\phi 20/\phi 25/\phi 32$

JIS symbol



Double acting



## Specifications

Descriptions	SMG SMG-L (with switch)						
	mm	$\phi 6$	$\phi 10$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$
Bore size	mm	$\phi 6$	$\phi 10$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	0.7					
Min. working pressure	MPa	0.12	0.06			0.05	
Proof pressure	MPa	1.05					
Ambient temperature	$^{\circ}\text{C}$	-10 to 60 (no freezing)					
Port size		M5					Rc1/8
Stroke tolerance	mm	+1.5 0					
Working piston speed	mm/s	50 to 500					
Cushion		With rubber cushion					
Lubrication		Not available					
Allowable absorbed energy	J	0.012	0.036	0.1	0.1	0.19	0.5

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Min. stroke length (mm)
$\phi 6$	5, 10, 15, 20, 25, 30, 40, 50, 60	5
$\phi 10$		
$\phi 16$	5, 10, 15, 20, 25, 30, 40, 50, 60, 70, 80, 90, 100	
$\phi 20$		
$\phi 25$		
$\phi 32$		

\*1: The custom stroke length is available in 5 mm increments.

## Compatibility table by variation

Applicable bore size		Double acting/ single rod	Single acting/ push	Single acting/ pull	Double acting/ fine speed	Double acting/ rotation-stop
			X	Y	F	M
ø6 to 32	P4	●	○	○	▲	○
	P40	●	○	○	▲	○
	P41					
	P42	▲			▲	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

Without switch

**SMG** - **32** - **25** - **P4**  
**P40**

With switch

**SMG-L** - **32** - **25** - **SW51** - **R** - **P4**  
**P40**

**A** Model No.

**B** Bore size

**C** Stroke length

**D** Switch model No.

**E** Switch quantity

Code	Content						
<b>A Model No.</b>							
<b>SMG</b>	Double acting						
<b>SMG-L</b>	Double acting/with switch						
<b>B Bore size (mm)</b>							
<b>6</b>	ø6						
<b>10</b>	ø10						
<b>16</b>	ø16						
<b>20</b>	ø20						
<b>25</b>	ø25						
<b>32</b>	ø32						
<b>C Stroke length (mm)</b>							
	<b>Applicable bore size</b>						
	ø6						
	ø10						
	ø16						
	ø20						
	ø25						
	ø32						
<b>Standard stroke length</b>	<b>5</b>	●	●	●	●	●	●
	<b>10</b>	●	●	●	●	●	●
	<b>15</b>	●	●	●	●	●	●
	<b>20</b>	●	●	●	●	●	●
	<b>25</b>	●	●	●	●	●	●
	<b>30</b>	●	●	●	●	●	●
	<b>40</b>	●	●	●	●	●	●
	<b>50</b>	●	●	●	●	●	●
	<b>60</b>	●	●	●	●	●	●
	<b>70</b>				●	●	●
	<b>80</b>				●	●	●
	<b>90</b>				●	●	●
<b>100</b>				●	●	●	
<b>D Switch model No.</b>							
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.							
<b>E Switch quantity</b>							
<b>R</b>	1 on rod side						
<b>H</b>	1 on head side						
<b>D</b>	2						

## ⚠ Precautions for model No. selection

\*1: Copper and PTFE free as standard.

## Related products

Speed controller							
Model No.	Appearance	Port size (Rc or R)		Compatible tube O.D.			Page
		M5	1/8	4(ø4)	6(ø6)	8(ø8)	
SC3W-M5- *-P4		●		●	●		232
SC3W-6- *-P4			●	●	●	●	

Specify the compatible tube O.D. code for \*.



Pneumatic Cylinders I  
Catalog No. CB-029SA

Flat compact cylinder Double acting/single rod

# FCD Series

● Bore size:  $\phi 25/\phi 32/\phi 40/\phi 50/\phi 63$



## Specifications

Descriptions	FCD FCD-L				
	$\phi 25$ or equiv.	$\phi 32$ or equiv.	$\phi 40$ or equiv.	$\phi 50$ or equiv.	$\phi 63$ or equiv.
Bore size mm	$\phi 25$ or equiv.	$\phi 32$ or equiv.	$\phi 40$ or equiv.	$\phi 50$ or equiv.	$\phi 63$ or equiv.
Actuation	Double acting				
Working fluid	Compressed air				
Max. working pressure MPa	0.7				
Min. working pressure MPa	0.07				
Proof pressure MPa	1.05				
Ambient temperature °C	-10 to 60 (no freezing)				
Port size	M5		Rc1/8		Rc1/4
Stroke tolerance mm	+0.5 0 (to 50)				
Working piston speed mm/s	50 to 500				
Cushion	No				
Lubrication	Not available				
Allowable absorbed energy J	0.015	0.02	0.026	0.04	0.05

## Rotation-stop precision/Allowable torque

Descriptions	$\phi 25$ or equiv.	$\phi 32$ or equiv.	$\phi 40$ or equiv.	$\phi 50$ or equiv.	$\phi 63$ or equiv.
Non-rotating accuracy *2	$\pm 1^\circ$	$\pm 0.8^\circ$	$\pm 0.5^\circ$	$\pm 0.5^\circ$	$\pm 0.5^\circ$
Allowable torque N·m	1	1.6	2.5	3.9	5.9

\*1: Avoid applying rotation torque with impact, or with violent changes in torque load direction.

\*2: "Non-rotating accuracy" is the value when a torque load equivalent to 10% of "allowable torque" is applied to the end of the piston rod.

## Stroke length

Model No.	Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
FCD	$\phi 25, \phi 32$ $\phi 40, \phi 50$ $\phi 63$ or equiv.	5/10/15/20/25 30/40/50	50	1

\*1: The custom stroke length is available in 1 mm increments.

\*2: The min. stroke length varies depending on switch mounting method. Refer to the following table.

## Min. stroke length with switch

1		2	
Rod side mount	Head side mount	Different surface mounting	Same surface mounting
10 mm		15 mm	35 mm ( $\phi 25/32/40/50$ ) 30 mm ( $\phi 63$ )

## Compatibility table by variation

Applicable bore size		Double acting/ single rod	Single acting/ push	Single acting/ pull	Double acting/ double rod
		FCD	FCS	FCH	FCD-D
ø25 to 63	P4	○	○	○	○
	P40	○	○	○	○

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

Without switch

**FCD** - **25** - **10** - **N** **P4**  
**P40**

With switch

**FCD-L** - **25** - **10** - **SW71** - **R** - **N** **P4**  
**P40**

**A** Model No.

**B** Bore size

**C** Stroke length

**D** Switch model No.

**E** Switch quantity

**F** Option

Code	Content	
<b>A Model No.</b>		
<b>FCD</b>	Double acting	
<b>FCD-L</b>	Double acting/with switch	
<b>B Bore size (mm)</b>		
<b>25</b>	ø25	
<b>32</b>	ø32	
<b>40</b>	ø40	
<b>50</b>	ø50	
<b>63</b>	ø63	
<b>C Stroke length (mm)</b>		
<b>Bore size</b>	<b>Stroke length *1</b>	<b>Custom stroke length</b>
ø25 to ø63	<b>1 to 50</b>	<b>In 1 mm increments</b>
<b>D Switch model No.</b>		
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.		
<b>E Switch quantity</b>		
<b>R</b>	1 on rod side	
<b>H</b>	1 on head side	
<b>D</b>	2	
<b>T</b>	3	
<b>F Option</b>		
<b>Blank</b>	Rod end female thread	
<b>M</b>	Piston rod, rod nut material (stainless steel)	
<b>N</b>	Rod end male thread	
<b>R</b>	With spigot	

## ⚠ Precautions for model No. selection

\*1: Made to order. Contact CKD for details.

## Related products

		Speed controller							
Model No.	Appearance	Port size (Rc or R)			Compatible tube O.D.				Page
		M5	1/8	1/4	4(ø4)	6(ø6)	8(ø8)	10(ø10)	
SC3W-M5- *-P4		●			●	●			232
SC3W-6- *-P4			●		●	●	●		
SC3W-8- *-P4				●		●	●	●	

Specify the compatible tube O.D. code for \*.



Pneumatic Cylinders I  
Catalog No. CB-029SA

Stopper cylinder Double acting/round rod end form

# STK Series

● Bore size:  $\varnothing 20/\varnothing 32/\varnothing 40/\varnothing 50$

JIS symbol



Double acting



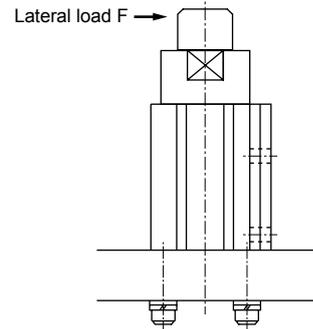
## Specifications

Descriptions	STK				
	Bore size	$\varnothing 20$	$\varnothing 32$	$\varnothing 40$	$\varnothing 50$
Bore size	mm	$\varnothing 20$	$\varnothing 32$	$\varnothing 40$	$\varnothing 50$
Actuation		Double acting			
Working fluid		Compressed air			
Max. working pressure	MPa	1.0			
Min. working pressure	MPa	0.15	0.1		
Proof pressure	MPa	1.6			
Ambient temperature	$^{\circ}\text{C}$	-10 to 60 (no freezing)			
Port size		M5	Rc1/8	Rc1/4	
Stroke tolerance	mm	+2.0 0			
Working piston speed	mm/s	50 to 500			
Cushion		With rubber cushion			
Lubrication		Not available			
Rod end form		Round rod type			
Allowable absorbed energy	J	Refer to the following figure.			

## Allowable lateral load

Unit: N

Bore size	Stroke length				
	10	15	20	25	30
$\varnothing 20$	106.5	99.4	93.2	-	-
$\varnothing 32$	272.8	254.6	238.7	-	-
$\varnothing 40$	-	-	371.3	352.1	334.8
$\varnothing 50$	-	-	582.8	552.8	525.8

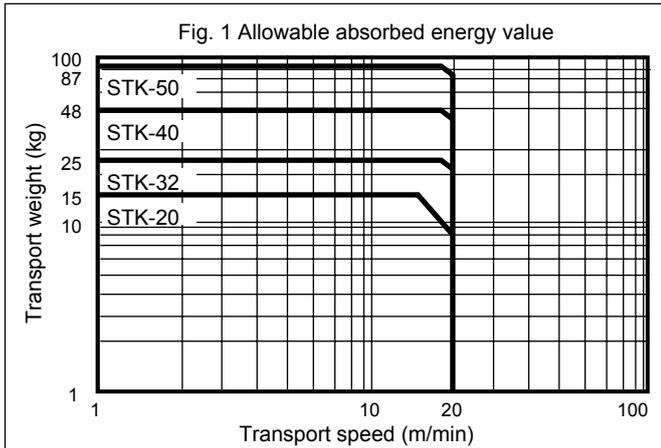


## Stroke length

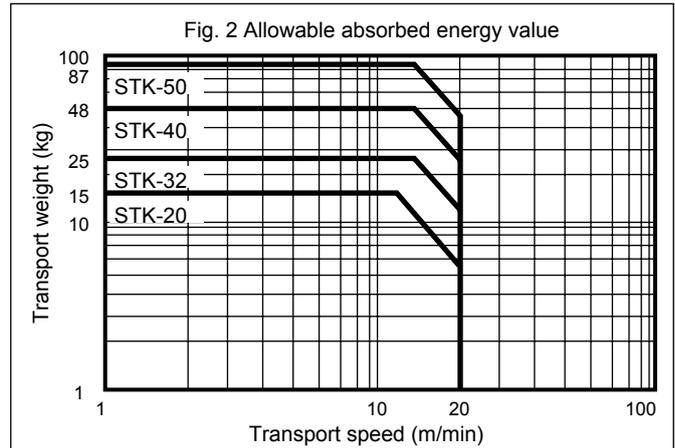
Bore size (mm)	Stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Min. stroke with switch (mm)
$\varnothing 20$	10, 15, 20	20	10	10
$\varnothing 32$				
$\varnothing 40$	20, 25, 30	30	20	20
$\varnothing 50$				

Note: Products other than standard stroke length are made to order products.

### A. Rod side mount



### B. Head side mount



(Note) Rod end form: Compatible with all round rod types/chamfered types/rollers.





Pneumatic Cylinders I  
Catalog No. CB-029SA

Small cylinder with suction pad Double acting

# MVC Series

● Bore size:  $\phi 6$ ,  $\phi 10$



## Specifications

Descriptions	MVC	
Bore size mm	$\phi 6$	$\phi 10$
Actuation	Double acting	
Working fluid	Compressed air	
Max. working pressure MPa	0.7	
Min. working pressure MPa	0.15	0.1
Proof pressure MPa	1.05	
Vacuum port pressure	-101 kPa to 0.6 MPa *1	
Ambient temperature °C	0 to 60 (no freezing) *2	
Port size	M3	M5
Stroke tolerance mm	+1.0 0	
Working piston speed mm/s	50 to 500	
Cushion	Rubber cushion	
Non-rotating accuracy degree	$\pm 0.5$ (*3)	
Lubrication	Not available	
Applicable pad	Refer to "How to order" on the following page or the table below for details.	
Allowable absorbed energy J	0.0046	0.035

With buffer specifications Specifications other than below are the same as at left.

Descriptions	MVC-*-*B
Buffer stroke length mm	4
Buffer part spring load N	When set: 1.3 Operating: 1.62 (buffer stroke length of 4 mm operating)
Non-rotating accuracy (reference value) degree	$\pm 2.6$ ( $\phi 6$ ), $\pm 2.0$ ( $\phi 10$ ) (*3)

- \*1: Use the cylinder within buffer stroke length of 4 mm. Otherwise, malfunctions may result.  
 \*2: The value of non-rotating accuracy indicates the value of the pull end (pull). As the value of the push end (push) varies depending on the stroke length, contact CKD separately.  
 \*3: Initial value at the pull end.
- \*1: Application of pressure from the vacuum port can be performed only at vacuum burst. In addition, use burst pressure equal to the cylinder working pressure or less for this process.  
 \*2: When using MVC with proximity switch, use the cylinder at an ambient temperature of 40°C or less. Otherwise, this could lead to switch detection malfunction.  
 \*3: Initial value at the pull end.

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length with two switches (mm)		Min. stroke length with one switch (mm)	
			Reed switch	Proximity switch	Reed switch	Proximity switch
$\phi 6$	5/10/15/20/25/30	30	10	5(10)	5	5
$\phi 10$	5/10/15/20/25/30	30	10	5(10)	5	5

- \*1: Products with stroke length other than standard stroke length are not available.  
 \*2: For F2Y, F3Y or F3P, the min. stroke length is the dimensions in ( ).

## Theoretical lifting force

● Circular pad

(N)

Pad diameter ( $\phi$ mm)	2	3.5	5	6	8	10
Suction area (cm <sup>2</sup> )	0.031	0.096	0.196	0.282	0.502	0.785
Vacuum pressure						
-93.3KPa	0.284	0.873	1.765	2.550	4.511	7.061
-80.8KPa	0.245	0.745	1.569	2.158	3.923	6.080
-66.7KPa	0.206	0.618	1.275	1.863	3.236	5.099
-53.4KPa	0.167	0.500	0.981	1.471	2.550	4.021
-40.0KPa	0.118	0.373	0.785	1.079	1.961	3.040

Values in table are calculated values.

## Pad material and characteristics

Descriptions	Hardness	Tensile strength	Tearing strength	Stretch	Heat resistance temperature	Oil	Sunlight	Ozone	Acid	Alkali	Abrasion	Electrical insulation property	Gas permeation resistance
Material	HS	N/cm <sup>2</sup>	N/cm <sup>2</sup>	%	°C	resistance	resistance	resistance	resistance	resistance	resistance	property	resistance
Nitrile rubber (NBR)	50° to 90°	686 to 1961	313 to 490	150 to 620	-26 to 120	○	×	×	△	○	○	×	○
Silicone rubber (SI)	54° to 80°	441 to 784	117 to 411	100 to 300	-60 to 250	△	○	○	△	○	×	○	×
Urethane rubber (U)	50° to 80°	686 to 4315	588 to 1961	310 to 750	-20 to 75	△	○	○	×	×	○	○	○
Fluoro rubber (FKM)	58° to 90°	931 to 1765	166 to 470	100 to 350	-10 to 230	○	○	○	○	△	○	○	○

This table shows the general characteristics of synthetic rubber available from CKD.

○: Ideal for use ○: Suitable for use △: Suitable for use under some conditions ×: Unsuitable for use

## Compatibility table by variation

Applicable bore size		Double acting
		MVC
ø6, ø10	P4	●
	P40	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

● Without switch

**MVC** - **6** - **10** - **P2A** - **B** - **P4**  
**P40**

● With switch

**MVC** - **6** - **10** - **SW81** - **R** - **P2A** - **B** - **P4**  
**P40**

Model No.

**A** Bore size

**B** Stroke length

**C** Switch model No.

**D** Switch quantity

**E** Pad type

**F** Buffer

Code	Content
<b>A Bore size (mm)</b>	
<b>6</b>	ø6
<b>10</b>	ø10
<b>B Stroke length (mm)</b>	
5,10,15,20,25,30	
<b>C Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>D Switch quantity</b>	
<b>R</b>	1 on rod side
<b>H</b>	1 on head side
<b>D</b>	2
<b>E Pad type</b>	
<b>Blank</b>	Without pad
<b>P2A</b>	Material: Nitrile rubber
<b>P3.5A</b>	
<b>P5A</b>	
<b>P6A</b>	
<b>P8A</b>	
<b>P10A</b>	Material: Urethane rubber
<b>P2AU</b>	
<b>P3.5AU</b>	
<b>P5AU</b>	
<b>P6AU</b>	
<b>P8AU</b>	Material: Silicone rubber
<b>P10AU</b>	
<b>P2AS</b>	
<b>P3.5AS</b>	
<b>P5AS</b>	
<b>P6AS</b>	Material: Fluoro rubber
<b>P8AS</b>	
<b>P10AS</b>	
<b>P2AF</b>	
<b>P3.5AF</b>	
<b>P5AF</b>	Material: Fluoro rubber
<b>P6AF</b>	
<b>P8AF</b>	
<b>P10AF</b>	
<b>F Buffer</b>	
<b>Blank</b>	Without buffer
<b>B</b>	With buffer

## Related products

Model No.	Appearance	Speed controller				Page
		Port size (Rc or R)		Compatible tube O.D.		
		M3	M5	4(ø4)	6(ø6)	
SC3W-M3- *-P4		●		●		232
SC3W-M5- *-P4			●	●	●	

Specify the compatible tube O.D. code for \*.

\* Consult with CKD as support is also available for pad types other than the above.



Brake cylinder Double acting/single rod

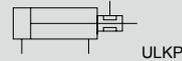
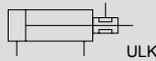
# ULK Series

Brake cylinder Double acting/single rod

# ULKP Series

● Bore size:  $\varnothing 16/\varnothing 20/\varnothing 25/\varnothing 32/\varnothing 40$

JIS symbol ● Double acting



## Specifications

Descriptions		ULKP/ULKP-L		ULK			
Bore size	mm	$\varnothing 16$		$\varnothing 20$	$\varnothing 25$	$\varnothing 32$	$\varnothing 40$
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure		1.0					
Min. working pressure	Brake section	0.3					
	Cylinder section	0.15					
Proof pressure		1.6					
Ambient temperature		-10 to 60 (no freezing)					
Port size	Brake section	M5		Rc1/8			
	Cylinder	M5		Rc1/8			
Stroke tolerance	mm	$+1.0$ $0$		$+2.0$ $0$ (to 200)	$+2.4$ $0$ (201 to)		
Working piston speed		50 to 500					
Cushion		Rubber cushion					
Lubrication		Not available					
Stopping accuracy		$\pm 1.5$ (300 mm/s, no load) *1		$\pm 1.0$ (300 mm/s, no load)			
Holding force		160		251	393	643	1005
Allowable absorbed energy		0.162		0.166	0.308	0.424	0.639

\*1: If the brake section is left pressurized, a delayed response may occur resulting in misalignment of the stop position.

## Stroke length

Model No.	Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
ULKP/ULKP-L	$\varnothing 16$	15/30/45/60	260	5
ULK	$\varnothing 20$	25/50/75/100/150 200/250/300	700	5
	$\varnothing 25$			
	$\varnothing 32$			
	$\varnothing 40$			

\*1: The custom stroke length is available in 1 mm increments.

## Related products

Speed controller					
Model No.	Appearance	Port size	Compatible tube		Page
		(Rc or R)	O.D.		
		M5	4( $\varnothing 4$ )	6( $\varnothing 6$ )	
SC3W-M5- *-P4		●	●	●	232

Specify the compatible tube O.D. code for \*.

## Compatibility table by variation

Applicable bore size	P4	▲
	P40	▲

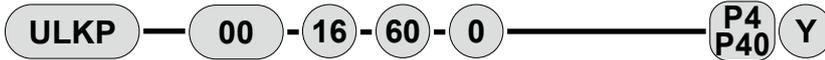
● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

Note: Standard grease used

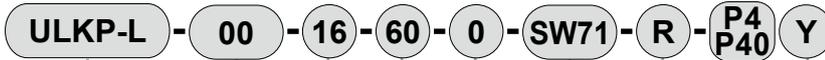
With  
brake

## How to order

Without switch



With switch



Ⓜ Accessory

Ⓐ Model

Ⓑ Mounting

Ⓒ Bore size

Ⓓ Stroke length

Ⓔ Head side port direction

Ⓕ Switch model No.

Ⓖ Switch quantity  
\*2

Code	Content	
<b>Ⓐ Model</b>		
ULKP	Double acting	
ULKP-L	Double acting with switch	
<b>Ⓑ Mounting</b>		
00	Basic	
LS	Axial foot (one side) (rod side)	
FA	Rod side flange	
CB	Clevis bracket	
<b>Ⓒ Bore size</b>		
16	ø16	
<b>Ⓓ Stroke length</b>		
Bore size	Stroke length *1	Custom stroke length
ø16	5 to 260	In 1 mm increments
<b>Ⓔ Head side port direction</b>		
Blank	Vertical	
0	Axial direction (*1)	
<b>Ⓕ Switch model No.</b>		
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.		
<b>Ⓖ Switch quantity</b>		
R	1 on rod side	
H	1 on head side	
D	2	
T	3	
<b>Ⓜ Accessory</b>		
I	Rod eye	
Y	Rod clevis (pin, washer, split pin attached)	
B1	Eye bracket	
B2	Clevis bracket (pin, snap ring attached)	

### ⚠ Precautions for model No. selection

\*1: CB mounting is not available for port direction/axial direction.

\*2: "I" and "Y" cannot be selected together.

\*3: Made to order. Contact CKD for details.

## How to order

Without solenoid valve

**ULK** - **00** - **20** - **100** - **SW11** - **R** - **V** **P4**  
**P40** **I**

Model No.

**A** Mounting

**B** Bore size

**C** Stroke length

**D** Switch model No.

**E** Switch quantity  
\*2

**F** Option

**G** Accessory  
\*1

Code	Content	
<b>A Mounting</b>		
00	Basic	
LB	Axial foot	
FA	Rod side flange	
CA	Eye bracket	
CC	Eye bracket integrated	
TA	Rod side trunnion	
TB	Head side trunnion	
<b>B Bore size (mm)</b>		
20	ø20	
25	ø25	
32	ø32	
40	ø40	
<b>C Stroke length (mm)</b>		
Bore size	Stroke length	Custom stroke length
ø20	5 to 700	In 1 mm increments
ø25	5 to 700	
ø32	5 to 700	
ø40	5 to 700	
<b>D Switch model No.</b>		
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.		
<b>E Switch quantity</b>		
R	1 on rod side	
H	1 on head side	
D	2	
T	3	
<b>F Option</b>		
M	Piston rod, rod nut material (stainless steel)	
V	Boss cutoff	
<b>G Accessory</b>		
I	Rod eye	
Y	Rod clevis (pin, washer, split pin attached)	
B2	Clevis bracket (pin, snap ring attached)	

### ⚠ Precautions for model No. selection

- \*1: "I" and "Y" cannot be selected together.
- \*2: Up to three switches can be installed. If four or more switches are required, switch mounting brackets for the extra switches must be prepared separately.
- \*3: Refer to "Pneumatic Cylinders I (Catalog No. CB-030SA)" for custom specifications of rod end form.
- \*4: Made to order. Contact CKD for details.

### Related products

Speed controller						
Model No.	Appearance	Port size	Compatible tube			Page
		(Rc or R)	O.D.			
		1/8	4(ø4)	6(ø6)	8(ø8)	
SC3W-6- *-P4		●	●	●	●	232

Specify the compatible tube O.D. code for \*.

### How to order ULKP Series mounting bracket P4/P40

Bore size (mm)	P4	P40
Mounting bracket	ø16	ø16
Foot (LS)	P2-LS-16	P2-LS-16-P40
Flange (FA)	P2-FA-16	P2-FA-16-P40

Note: The foot mounting bracket is provided as 1 pc./set.

With  
brake

### How to order ULK Series mounting bracket P4

Bore size (mm)	ø20	ø25	ø32	ø40
Mounting bracket				
Axial foot (LB)	M1-LB-20	M1-LB-30	M1-LB-30	M1-LB-30
Flange (FA)	M1-FA-20	M1-FA-30	M1-FA-30	M1-FA-30
Eye bracket (CA)	M1-CA-20	M1-CA-30	M1-CA-30	M1-CA-30
Trunnion (TA/TB)	M1-TA-20	M1-TA-30	M1-TA-30	M1-TA-40

\*1: Regarding mounting brackets, mounting nuts and toothed washers are attached with the axial foot type and flange type. Trunnions are supplied with mounting nuts.

\*2: For axial foot types (two-sided), 2 sets of "M1-LB0\*\* or [Bore size]" in the table above are required.

### How to order ULK Series mounting bracket P40

Bore size (mm)	ø20	ø25	ø32	ø40
Mounting bracket				
Axial foot (LB)	M1-LB-20-P40	M1-LB-30-P40	M1-LB-30-P40	M1-LB-30-P40
Flange (FA)	M1-FA-20-P40	M1-FA-30-P40	M1-FA-30-P40	M1-FA-30-P40
Eye bracket (CA)	M1-CA-20-P40	M1-CA-30-P40	M1-CA-30-P40	M1-CA-30-P40
Trunnion (TA/TB)	M1-TA-20-P40	M1-TA-30-P40	M1-TA-30-P40	M1-TA-40-P40

\*1: For axial foot types (two-sided), 2 sets of "M1-LB-\*\* or [Bore size]-P40" in the table above are required.

\*2: Regarding mounting brackets, mounting nuts are attached with the axial foot type, flange type and trunnion type.



Position locking compact cylinder

# USSD/USSD-K Series

● Bore size:  $\phi 20/\phi 25/\phi 32/\phi 40/\phi 50/\phi 63/\phi 80/\phi 100$

JIS symbol



## Common specifications

Descriptions		USSD/USSD-K							
Bore size	mm	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$
Actuation		Double acting							
Working fluid		Compressed air							
Max. working pressure	MPa	1.0							
Min. working pressure	MPa	0.25 (no load) Note							
Proof pressure	MPa	1.6							
Ambient temperature	$^{\circ}\text{C}$	-10 to 60 (no freezing)							
Port size		M5		Rc1/8		Rc1/4		Rc3/8	
Stroke tolerance	mm	USSD: $^{+1.0}_0$				USSD-K: $^{+2.0}_0$			
Working piston speed	mm/s	50 to 500				50 to 300			
Cushion		USSD: None, USSD-K: Rubber cushion							
Lubrication		Not available							
Lock force	N	150	235	386	603	943	1497	2464	3847
Option		Rod end male thread (N)							
Allowable absorbed energy	Without cushion	0.016	0.021	0.025	0.092	0.1	0.12	0.27	0.56
	With cushion	0.157	0.157	0.402	0.628	0.98	1.56	2.51	7.92

Note: Depending on the installation condition, piston rod may start moving at 0.05 MPa. Therefore, pay attention to residual and exhaust pressure.

## Individual specifications

Model No.	USSD (double acting single rod)	USSD-K (double acting single rod/high load)
Stroke tolerance	mm	mm
	+1.0 0	+2.0 0
Cushion	No	Rubber cushion

## Stroke length

Model	Bore size (mm)	Standard stroke length (mm) (*4)	Max. stroke length (mm)	Min. stroke length (mm)	Min. stroke with switch (mm)
USSD	$\phi 20$	5, 10, 15, 20, 25, 30	30	1 (*3)	5 (*4)
	$\phi 25, \phi 32, \phi 40, \phi 50$	5, 10, 15, 20, 25, 30, 40, 50	50		
	$\phi 63, \phi 80, \phi 100$	5, 10, 20, 30, 40, 50	200 (*1)		
USSD-K	$\phi 20$	5, 10, 15, 20, 25, 30, 40, 50	200 (*1)	1 (*3)	5 (*4)
	$\phi 25, \phi 32, \phi 40, \phi 50$	10, 15, 20, 25, 30, 40, 50 60, 70, 80, 90, 100	300 (*1)		
	$\phi 63, \phi 80, \phi 100$	10, 20, 30, 40, 50, 60, 70 80, 90, 100			

\*1: Stroke length over standard to maximum is available in increments of 10. (Example) USSD-K-20: 60, 70, 80, 90, 100 .....

Dimensions of custom stroke length (example: 64 mm stroke length) are the same as the following increment of stroke length (example: 70 mm stroke length).

\*2: The custom stroke length is available in 1 mm increments. However, the total length is the same as that of the next longer standard stroke length.

\*3: The min. stroke length is available from 1 mm. Take into account the stroke tolerance when placing an order.

\*4: Less than 10 mm is not available for 2-color display, off-delay, strong magnetic field proof, or with T1\* or T8\* switch.

## Dimensions for ordering mounting bracket P4

Bore size (mm)	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$
Mounting bracket								
Foot (LB)	USSD-LB-20	USSD-LB-25	USSD-LB-32	USSD-LB-40	USSD-LB-50	USSD-LB-63	USSD-LB-80	USSD-LB-100
Clevis bracket (CB)	SSD-CB-20	SSD-CB-25	SSD-CB-32	SSD-CB-40	SSD-CB-50	SSD-CB-63	SSD-CB-80	SSD-CB-100

\*1: The foot mounting bracket is provided as 2 pcs./set.

## Related products

Speed controller										
Model No.	Appearance	Port size (Rc or R)				Compatible tube O.D.				Page
		M5	1/8	1/4	3/8	4( $\phi 4$ )	6( $\phi 6$ )	8( $\phi 8$ )	10( $\phi 10$ )	
SC3W-M5*-P4		●				●	●			232
SC3W-6*-P4			●			●	●			
SC3W-8*-P4				●			●	●	●	
SC3W-10*-P4					●		●	●	●	

Specify the compatible tube O.D. code for \*.

### Compatibility table by variation

Applicable bore size		Double acting		Double acting/high load
			K	
ø20 to 100	P4	○	○	● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable Note: Standard grease used
	P40	○	○	

### How to order

● Without switch

**USSD-K** - 20 - 5 - F - N - **P4**/**P40** - **LB**

● With switch

**USSD-KL** - 20 - 5 - F - **SW11** - R - N - **P4**/**P40** - **LB**

**A** Model No.

**B** Bore size (mm)

**C** Stroke length (mm)

**D** Lock direction

**E** Switch model No.

\*2

\*3

**F** Switch quantity

**G** Option

**H** Mounting bracket

\*1

\*3

Code	Content
<b>A Model No.</b>	
<b>USSD</b>	Double acting
<b>USSD-L</b>	Double acting/with switch
<b>USSD-K</b>	Double acting/high load
<b>USSD-KL</b>	Double acting/high load/with switch
<b>B Bore size (mm)</b>	
<b>20</b>	ø20
<b>25</b>	ø25
<b>32</b>	ø32
<b>40</b>	ø40
<b>50</b>	ø50
<b>63</b>	ø63
<b>80</b>	ø80
<b>100</b>	ø100
<b>C Stroke length (mm)</b>	
Refer to the stroke length table.	
<b>D Lock direction</b>	
<b>F</b>	Forward locking
<b>B</b>	Backward locking
<b>E Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>F Switch quantity</b>	
<b>R</b>	1 on rod side
<b>H</b>	1 on head side
<b>D</b>	2
<b>G Option</b>	
<b>Blank</b>	Rod end female thread
<b>N</b>	Rod end male thread
<b>H Mounting bracket</b>	
<b>LB</b>	Axial foot
<b>CB</b>	Clevis bracket (pin and snap ring attached)

### Stroke length

Series	Stroke length (mm)	Bore size (mm)									
		ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100		
USSD	Standard stroke length	5	●	●	●	●	●	●	●	●	
		10	●	●	●	●	●	●	●	●	
		15	●	●	●	●	●	●	●	●	
		20	●	●	●	●	●	●	●	●	
		25	●	●	●	●	●	●	●	●	
		30	●	●	●	●	●	●	●	●	
		40	●	●	●	●	●	●	●	●	
		50	●	●	●	●	●	●	●	●	
		Min. stroke length *5		1							
		Custom stroke length *5, *2		1							
USSD-K	Standard stroke length	5	●	●	●	●	●	●	●	●	
		10	●	●	●	●	●	●	●	●	
		15	●	●	●	●	●	●	●	●	
		20	●	●	●	●	●	●	●	●	
		25	●	●	●	●	●	●	●	●	
		30	●	●	●	●	●	●	●	●	
		40	●	●	●	●	●	●	●	●	
		50	●	●	●	●	●	●	●	●	
		60	●	●	●	●	●	●	●	●	
		70	●	●	●	●	●	●	●	●	
80	●	●	●	●	●	●	●	●			
90	●	●	●	●	●	●	●	●			
100	●	●	●	●	●	●	●	●			
Min. stroke length *5		1									
Custom stroke length *5, *2		1									

### ⚠ Precautions for model No. selection

- \*1: The mounting bracket is attached at shipment.
- \*2: T8\* switch cannot be mounted for USSD-\*L with bore size ø20 to ø32.
- \*3: Switches and mounting brackets are shipped with the product.  
Contact CKD if assembling before shipment is necessary.
- \*4: Made to order. Contact CKD for details.
- \*5: The total length is the same as that of the next longer standard stroke length.  
(Less than 5 mm with switch is not available)  
Less than 10 mm with 2-color display, off-delay T1\* or T8\* switch is not available.



Guided cylinder Double acting/single rod

# STG-M/B Series

- Bore size:  $\phi 12/\phi 16/\phi 20/\phi 25/\phi 32/\phi 40/\phi 50/\phi 63/\phi 80/\phi 100$



## Specifications

Descriptions		STG-M/B									
Bore size	mm	$\phi 12$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$
Actuation		Double acting									
Working fluid		Compressed air									
Max. working pressure	MPa	1.0									
Min. working pressure	MPa	0.15					0.1				
Proof pressure	MPa	1.6									
Ambient temperature	$^{\circ}\text{C}$	-10 to 60 (no freezing)									
Port size		M5		Rc1/8				Rc1/4		Rc3/8	Rc3/8
Stroke tolerance	mm	+2.0 0									
Working piston speed	mm/s	50 to 500						50 to 300			
Cushion		With rubber cushion									
Lubrication		Not available									
Allowable absorbed energy	J	0.056	0.088	0.157	0.157	0.401	0.627	0.980	1.560	2.510	3.92

## Stroke length

Bore size	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Min. stroke with switch (mm)
$\phi 12$	10/20/30/40/50/75/100	250	5	5(10) *2
$\phi 16$	125/150/175/200/250			
$\phi 20$	20/30/40/50/75/100/125			
$\phi 25$	150/175/200/250/300/350/400			
$\phi 32$	25/50/75/100 125/150/175 200/250/300 350/400			
$\phi 40$				
$\phi 50$				
$\phi 63$				
$\phi 80$				
$\phi 100$				

\*1: The custom stroke length is available in 5 mm increments. However, the total dimensions are the same as the longer standard stroke length. A dedicated body with dimensions matched to the stroke length is available. Contact CKD for details.

\*2: For types with one or two switches. The value in ( ) is the min. stroke length for switches of the 2-color display and AC magnetic field proof.

## Related products

Speed controller											
Model No.	Appearance	Port size (Rc or R)				Compatible tube O.D.					Page
		M5	1/8	1/4	3/8	4( $\phi 4$ )	6( $\phi 6$ )	8( $\phi 8$ )	10( $\phi 10$ )	12( $\phi 12$ )	
SC3W-M5- *-P4		●				●	●				232
SC3W-6- *-P4			●			●	●	●			
SC3W-8- *-P4				●			●	●	●		
SC3W-10- *-P4					●		●	●	●		

Specify the compatible tube O.D. code for \*.

## Compatibility table by variation

Applicable bore size		Double acting/ single rod	Double acting/ position locking	Double acting/ rubber-air cushioned	Double acting/ air cushioned	Double acting/ rubber scraper	Double acting/ coil scraper	Double acting/ coolant proof	Double acting/ anti-spatter adherence
		Q	*C	C	G	G1	G2/G3	G4	
ø12 to 100	P4	●	●	○	○	○			
	P40	●	●	○	○	○			
	P41	▲	▲	▲	▲	▲			
	P42	▲	▲	▲	▲				

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Not compatible with STG-K.

\*2: Port plugs of ø12 and ø16 are changed from FPL-M5 to hexagon socket head and female thread. Sealant is required when the plug position is changed.

## How to order

Without switch

STG - M - 32 - 25 - P4 P40

With switch

STG - M - 32 - 25 - SW11 - R - P4 P40

Model No.

A Bearing

B Bore size

C Stroke length

D Switch model No.  
\*1 \*2

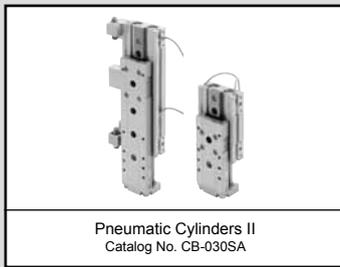
E Switch quantity

Code	Content									
<b>A Bearing</b>										
M	Metal bush bearing									
B	Ball bearing									
<b>B Bore size (mm)</b>										
12	ø12									
16	ø16									
20	ø20									
25	ø25									
32	ø32									
40	ø40									
50	ø50									
63	ø63									
80	ø80									
100	ø100									
<b>C Stroke length (mm)</b>										
	Applicable bore size									
	ø12	ø16	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
Standard stroke length	10	●	●							
	20	●	●	●	●					
	25					●	●	●	●	●
	30	●	●	●	●					
	40	●	●	●	●					
	50	●	●	●	●	●	●	●	●	●
	75	●	●	●	●	●	●	●	●	●
	100	●	●	●	●	●	●	●	●	●
	125	●	●	●	●	●	●	●	●	●
	150	●	●	●	●	●	●	●	●	●
	175	●	●	●	●	●	●	●	●	●
200	●	●	●	●	●	●	●	●	●	
250	●	●	●	●	●	●	●	●	●	
300			●	●	●	●	●	●	●	
350			●	●	●	●	●	●	●	
400			●	●	●	●	●	●	●	
Min. stroke length *5		5(10)								
Custom stroke length *3, *4		In 5 mm increments								
<b>D Switch model No.</b>										
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.										
<b>E Switch quantity</b>										
R	1 on rod side									
H	1 on head side									
D	2									
T	3									

### ⚠ Precautions for model No. selection

- \*1: T8H/V switch cannot be installed on STG-12 or 16.
- \*2: Switches are shipped with the product.
- \*3: The total dimensions are the same as the longer standard stroke length.
- \*4: A dedicated body with dimensions matched to the stroke length is available. Contact CKD for details.
- \*5: The value in ( ) is the min. stroke length for switches of the 2-color display and AC magnetic field proof.

Combined functions

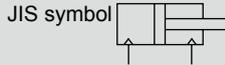


Pneumatic Cylinders II  
Catalog No. CB-030SA

Linear slide cylinder Double acting/single rod

# LCR Series

● Bore size:  $\phi 6/\phi 8/\phi 12/\phi 16/\phi 20/\phi 25$



## Specifications

Descriptions		LCR					
Bore size	mm	$\phi 6$	$\phi 8$	$\phi 12$	$\phi 16$	$\phi 20$	$\phi 25$
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	0.7					
Min. working pressure	MPa	0.15 (*1)					
Proof pressure	MPa	1.05					
Ambient temperature	°C	-10 to 60 (no freezing)					
Port size	Main body side	M3	M5			Rc1/8	
	Main body back	-	M3			M5	Rc1/8
Stroke tolerance	mm	+2.0 0 (*2)					
Working piston speed	mm/s	50 to 500 (*3)					
Cushion		With rubber cushion					
Lubrication		Not available					
Allowable absorbed energy	J	Refer to the following table.					

\*1: 0.2 MPa when using  $\phi 6$  shock absorber stopper.

\*2: Note that there will be a slight gap between the end plate and floating bush if no stopper is attached.

\*3: Keep within 50 to 200 mm/s when using a stroke adjusting stopper.

\*4: The stroke adjusting stopper for 0.3 MPa and over working pressure is the metal sealing type.

## Stroke length

Bore size (mm)	Standard stroke length (mm)
$\phi 6$	10, 20, 30, 40, 50
$\phi 8$	10, 20, 30, 40, 50, 75
$\phi 12$	10, 20, 30, 40, 50, 75, 100
$\phi 16$	10, 20, 30, 40, 50, 75, 100, 125
$\phi 20$	10, 20, 30, 40, 50, 75, 100, 125, 150
$\phi 25$	10, 20, 30, 40, 50, 75, 100, 125, 150

Note: Products with stroke lengths other than the above are not available.

**With buffer specifications** Specifications other than those below are same as the above common specifications.

Descriptions		Content					
Bore size	mm	$\phi 6$	$\phi 8$	$\phi 12$	$\phi 16$	$\phi 20$	$\phi 25$
Buffer stroke length	mm	4		9		10	
Buffer part	When set N	3	5	10	13	17	21
Spring load	Operating N	7	8	14	20	25	29

\*1: In the type with buffer, adjusting the rod side stroke length will shorten the buffer stroke length and increase the spring load when set.

\*2: Keep the buffer stroke length less than the stroke length above. Otherwise, malfunctions or damage may result.

## LCR allowable absorbed energy (Eo)

Bore size	Standard (J)	With stroke adjusting stopper (J)	With shock absorber stopper (J)
$\phi 6$	0.025	0.0032	0.14
$\phi 8$	0.058	0.0032	0.25
$\phi 12$	0.112	0.014	0.25
$\phi 16$	0.176	0.043	0.65
$\phi 20$	0.314	0.055	1.3
$\phi 25$	0.314	0.14	1.3

## Related products

		Speed controller										
Model No.	Appearance	Port size (Rc or R)					Compatible tube O.D.					Page
		M3	M5	1/8	1/4	3/8	4( $\phi 4$ )	6( $\phi 6$ )	8( $\phi 8$ )	10( $\phi 10$ )	12( $\phi 12$ )	
SC3W-M3-*P4		●	●				●					232
SC3W-M5-*P4			●				●	●				
SC3W-6-*P4				●			●	●	●			

Specify the compatible tube O.D. code for \*.

## Compatibility table by variation

Applicable bore size		Double acting/ single rod	Double acting/ position locking	Double acting/ fine speed
			Q	F
ø6 to 25	P4	●	●	●
	P40	●	●	●
	P41			
	P42	▲	▲	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Even when P40 is selected for the external stopper option, electrolytic nickel plating is used for the stopper part.

## How to order

Without switch

LCR - 8 - 40 - S506 DTBLN P4 P40

With switch

LCR - 12 - 40 - SW81 - R - S506 DTBLN P4 P40

Model No.

A Bore size

B Stroke length

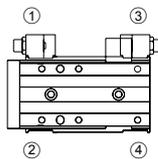
D Switch quantity

F Option

C Switch model No.

E Stopper

● Stopper position



## ⚠ Precautions for model No. selection

- \*1: The port positions of the standard without stopper are ① and ③ in the figure below.
- \*2: Can be selected for the type with stopper only.
- \*3: Refer to the selection table on page 46 for combinations of options.
- \*4: A1\*\*, A2\*\*, A5\*\* and A6\*\* of ø6 to ø8 with 10 mm stroke length or less and ø12 to ø25 with 20 mm stroke length or less are made to order since adjustment is not possible with the standard stopper.
- \*5: When two switches are necessary for the type with S\*\*\* or A\*\*\* of ø6 to ø8 with 30 mm stroke length or less, select the F □ H type switch.
- \*6: Select when using rear piping.
- \*7: Can be selected only when using stroke adjusting stopper (S) and one side mixed type (C).
- \*8: When two switches are necessary or a switch is installed on the head side of W3 to 6 (two-sided combined stopper) of ø6 (all stroke lengths), ø8 with 20 or 30 mm stroke length, ø12 with 30 to 50 mm stroke length or ø16 with 30 to 50 mm stroke length, select the axial lead wire.
- \*9: Cannot be selected when choosing two-sided combined type (W).
- \*10: The adjustable stroke range when choosing two-sided combined type (W) is ø6: 9 mm, ø8: 13.5 mm, ø12: 14.5 mm, ø16: 15 mm, ø20: 13 mm, ø25: 10 mm.
- \*11: The stroke adjusting stopper for 0.3 MPa and over working pressure is the metal sealing type.

Code	Content
<b>A Bore size</b>	
6	ø6
8	ø8
12	ø12
16	ø16
20	ø20
25	ø25

B Stroke length (mm)		Bore size (ø)					
		6	8	12	16	20	25
10	10	●	●	●	●	●	●
20	20	●	●	●	●	●	●
30	30	●	●	●	●	●	●
40	40	●	●	●	●	●	●
50	50	●	●	●	●	●	●
75	75		●	●	●	●	●
100	100			●	●	●	●
125	125				●	●	●
150	150					●	●

C Switch model No.	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	

D Switch quantity	
R	1 on rod side
H	1 on head side
D	2

E Stopper	
Refer to "Stopper" on page 45.	

F Option	
Blank	Port on stopper: without port
D	Port on stopper: side and bottom ports *2, *9
Blank	Stopper block material: steel
T	Stopper block material: steel (nitriding) *2

B With buffer *3	
B	Without switch groove
BL	With switch groove

Plug attached	
Blank	No
N	With side piping port plug (not available for ø6, ø25) *6

## [ (E) Stopper ]

Code	Content	Code	Content																																																												
<b>(E) Stopper</b>		<b>C One side hybrid stopper mix (shock absorber stopper, stroke adjusting stopper)</b>																																																													
Blank	No option	C1**	A1+S3																																																												
<b>S Stroke adjusting stopper</b>		C2**	A2+S4																																																												
S1**	Stopper position ① (can be changed to ④)	C3**	A3+S1																																																												
S2**	Stopper position ② (can be changed to ③)	C4**	A4+S2																																																												
S3**	Stopper position ③ (can be changed to ②)	** part Adjustable stroke range ● Compatible with all. ▲ Compatible with some. *7																																																													
S4**	Stopper position ④ (can be changed to ①)																																																														
S5**	Stopper position ①, ③	<table border="1"> <thead> <tr> <th rowspan="2"></th> <th rowspan="2">Protruding end</th> <th rowspan="2">Return end</th> <th colspan="4">Stopper model No.</th> </tr> <tr> <th>S</th> <th>A</th> <th>W</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>Blank</td> <td>5 mm or none</td> <td>5 mm or none</td> <td>●</td> <td></td> <td></td> <td>●</td> </tr> <tr> <td>02</td> <td>15 mm or none</td> <td>15 mm or none</td> <td>●</td> <td></td> <td></td> <td>●</td> </tr> <tr> <td>03</td> <td>25 mm or none</td> <td>25 mm or none</td> <td>●</td> <td></td> <td></td> <td>●</td> </tr> <tr> <td>04</td> <td>15 mm</td> <td>5 mm</td> <td>▲</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>05</td> <td>25 mm</td> <td>5 mm</td> <td>▲</td> <td></td> <td></td> <td>-</td> </tr> <tr> <td>06</td> <td>5 mm</td> <td>15 mm</td> <td>▲</td> <td></td> <td></td> <td>-</td> </tr> <tr> <td>07</td> <td>5 mm</td> <td>25 mm</td> <td>▲</td> <td></td> <td></td> <td>-</td> </tr> </tbody> </table>			Protruding end	Return end	Stopper model No.				S	A	W	C	Blank	5 mm or none	5 mm or none	●			●	02	15 mm or none	15 mm or none	●			●	03	25 mm or none	25 mm or none	●			●	04	15 mm	5 mm	▲	-	-	-	05	25 mm	5 mm	▲			-	06	5 mm	15 mm	▲			-	07	5 mm	25 mm	▲			-
	Protruding end	Return end	Stopper model No.																																																												
			S	A	W	C																																																									
Blank	5 mm or none	5 mm or none	●			●																																																									
02	15 mm or none	15 mm or none	●			●																																																									
03	25 mm or none	25 mm or none	●			●																																																									
04	15 mm	5 mm	▲	-	-	-																																																									
05	25 mm	5 mm	▲			-																																																									
06	5 mm	15 mm	▲			-																																																									
07	5 mm	25 mm	▲			-																																																									
S6**	Stopper position ②, ④																																																														
<b>A Shock absorber stopper</b>																																																															
A1**	Stopper position ① (can be changed to ④)																																																														
A2**	Stopper position ② (can be changed to ③)																																																														
A3**	Stopper position ③ (can be changed to ②)																																																														
A4**	Stopper position ④ (can be changed to ①)																																																														
A5**	Stopper position ①, ③																																																														
A6**	Stopper position ②, ④																																																														
<b>W Two-sided combined double stopper (shock absorber stopper, metal stopper) *8/*10</b>																																																															
W1**	A1 + metal stopper																																																														
W2**	A2 + metal stopper																																																														
W3**	A3 + metal stopper																																																														
W4**	A4 + metal stopper																																																														
W5**	A5 + metal stopper																																																														
W6**	A6 + metal stopper																																																														

Note: When changing the stopper position from the head side to the rod side, the stopper must be purchased separately according to the stroke length and adjustable stroke length. Refer to "Precautions when purchasing the stopper separately" on the following page. A1, A2 and adjustable stroke length of 15 mm and 25 mm may not be available depending on the stroke length.

## Stopper model No. selection method

### 1 Stopper combination table

Model No. - [ ① Stopper type ] [ ② Stopper position ] [ ③ ] Example) LCR-8-40- [ S ] [ 5 ] 06

	Stopper model No. [ ① ]			
	Stroke adjustable (one side)	Shock absorber (one side)	Two-sided combined double stopper	One side hybrid stopper mix
	[S]	[A]	[W]	[C]
Stopper position model No. [ ② ]	[1]	[A1]	[W1]	[C1]
	[2]	[A2]	[W2]	[C2]
	[3]	[A3]	[W3]	[C3]
	[4]	[A4]	[W4]	[C4]
	[5]	[A5]	[W5]	
	[6]	[A6]	[W6]	

▲ shows the piping direction.  
If two-sided combined type (W) is selected, the stopper bracket comes with piping on both sides, ▲ (piping direction) and the reverse side stopper bracket comes with a plug.

■ : Shock absorber stopper  
▒ : Stroke adjusting stopper (adjusting range 5 mm)  
▓ : Metal adjusting stopper (adjusting range 15 mm)

### LCR Double acting/single rod selection table

(Combination with stroke adjusting stopper, shock absorber stopper)

● : Available — : Not available

Model No.	Stopper type		Stroke adjustable																																		
	Stopper code		S1						S2						S3						S4						S5						S6				
			Adjustment length code																																		
		Bore size	Stroke length	Blank	02	03	04	05	06	07	Blank	02	03	04	05	06	07																				
LCR	ø6,ø8	10	●	-	-	●	-	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-					
		20 or more	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-					
	ø12 to ø25	10	●	-	-	●	-	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-					
		20	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-					
		30 or more	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				
	LCR-B, BL	ø6,ø8	10	●	-	-	●	-	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-				
20 or more			●	-	-	●	-	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-					
ø12 to ø25		10	●	-	-	●	-	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-					
		20	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-					
		30 or more	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-	●	●	-					

Combined functions

Model No.	Stopper type		Shock absorber						Two-sided combined double stopper						One side hybrid stopper mix																
	Stopper code		A1	A2	A3	A4	A5	A6	W1	W2	W3	W4	W5	W6	C1				C2			C3			C4						
			Adjustment length code																												
		Bore size	Stroke length	Blank	02	03	Blank	02	03	Blank	02	03	Blank	02	03	Blank	02	03	Blank	02	03	Blank	02	03	Blank	02	03	Blank	02	03	
LCR	ø6,ø8	10	-	-	●	●	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	-	-	●	-	-				
		20 or more	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	ø12 to ø25	10	-	-	●	●	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	-	-	●	-	-				
		20	-	-	●	●	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	-	●	●	-	●	●	-	
		30 or more	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	LCR-B, BL	ø6,ø8	10	-	-	●	●	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	-	-	●	-	-			
20 or more			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
ø12 to ø25		10	-	-	●	●	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	-	-	●	-	-				
		20	-	-	●	●	-	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	-	●	●	-	●	●	-	
		30 or more	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

The table above also applies to combinations with option code D (with port on stopper) or T (steel stopper block (nitriding)).



Pneumatic Cylinders II  
Catalog No. CB-030SA

Linear slide cylinder Double acting/single rod

# LCG Series

● Bore size:  $\phi 6/\phi 8/\phi 12/\phi 16/\phi 20/\phi 25$



## Specifications

Descriptions		LCG					
Bore size	mm	$\phi 6$	$\phi 8$	$\phi 12$	$\phi 16$	$\phi 20$	$\phi 25$
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	0.7					
Min. working pressure	MPa	0.15 (*1)					
Proof pressure	MPa	1.05					
Ambient temperature	°C	-10 to 60 (no freezing)					
Port size	Main body side	M3	M5			Rc1/8	
	Main body back	M3			M5	Rc1/8	
Stroke tolerance	mm	+2.0 0 (*2)					
Working piston speed	mm/s	50 to 500 (*3)					
Cushion		With rubber cushion					
Lubrication		Not available					
Allowable absorbed energy	J	Refer to the following table.					

\*1: 0.2 MPa when using  $\phi 6$  shock absorber stopper.

\*2: Note that there will be a slight gap between the end plate and floating bush if no stopper is attached.

\*3: Keep within 50 to 200 mm/s when using a stroke adjusting stopper.

\*4: The stroke adjusting stopper for 0.3 MPa and over working pressure is the metal sealing type.

## Stroke length

Bore size (mm)	Standard stroke length (mm)
$\phi 6$	10, 20, 30, 40, 50
$\phi 8$	10, 20, 30, 40, 50, 75
$\phi 12$	10, 20, 30, 40, 50, 75, 100
$\phi 16$	10, 20, 30, 40, 50, 75, 100, 125
$\phi 20$	10, 20, 30, 40, 50, 75, 100, 125, 150
$\phi 25$	10, 20, 30, 40, 50, 75, 100, 125, 150

Note: Products with stroke lengths other than the above are not available.

**With buffer specifications** Specifications other than the below are same as the above common specifications.

Descriptions		Content					
Bore size	mm	$\phi 6$	$\phi 8$	$\phi 12$	$\phi 16$	$\phi 20$	$\phi 25$
Buffer stroke length	mm	4		9		10	
Buffer part	When set N	3	5	10	13	17	21
spring load	Operating N	7	8	14	20	25	29

\*1: In the type with buffer, adjusting the rod side stroke length will shorten the buffer stroke length and increase the spring load when set.

\*2: Keep the buffer stroke length less than the stroke length above. Otherwise, malfunctions or damage may result.

## LCG allowable absorbed energy (Eo)

Bore size	Standard (J)	With stroke adjusting stopper (J)	With shock absorber stopper (J)
$\phi 6$	0.025	0.0032	0.14
$\phi 8$	0.058	0.0032	0.25
$\phi 12$	0.112	0.014	0.25
$\phi 16$	0.176	0.043	0.65
$\phi 20$	0.314	0.055	1.3
$\phi 25$	0.314	0.14	1.3

## Related products

		Speed controller						
Model No.	Appearance	Port size (Rc or R)			Compatible tube O.D.			Page
		M3	M5	1/8	4( $\phi 4$ )	6( $\phi 6$ )	8( $\phi 8$ )	
SC3W-M3*-P4		●			●			232
SC3W-M5*-P4			●		●	●		
SC3W-6*-P4				●	●	●	●	

Specify the compatible tube O.D. code for \*.

## Compatibility table by variation

Applicable bore size		Double acting/ single rod	Double acting/ position locking
		P	Q
ø6 to 25	P4	●	●
	P40	●	●
	P41	□	□
	P42	▲	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Even when P40 is selected for the external stopper option, electrolytic nickel plating is used for the stopper part.

\*2: If P4 is chosen, rust proofing (option code: U) is recommended for LCG-20, 25. (P40 of ø20, ø25 are rust proofed.)

## How to order (ø6 to ø16)

Without switch



With switch



Model No.

A Bore size

B Stroke length

D Switch quantity

C Switch model No.  
\*8

E Option

## ⚠ Precautions for model No. selection

\*1: The port positions of the standard without stopper are ① and ③ in the figure below.

\*2: Combination of the stroke adjusting stopper and shock absorber stopper is made to order.

\*3: Can be selected for the type with stopper only.

\*4: Refer to the selection table below for combinations of options.

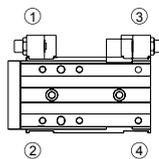
\*5: A1\*\*, A2\*\*, A5\*\* and A6\*\* of ø6 to ø8 with 10 mm stroke length or less and ø12/ø16 with 20 mm stroke length or less are made to order since adjustment is not possible with the standard stopper.

\*6: When two switches are necessary for the type with S\*\*\* or A\*\*\* of ø6 to ø8 with 30 mm stroke length or less, select the F□H type switch.

\*7: The anti-rust type is made to order.

\*8: The stroke adjusting stopper for 0.3 MPa and over working pressure is the metal sealing type.

● Stopper position



Code	Content	
<b>A Bore size</b>		
6	ø6	
8	ø8	
12	ø12	
16	ø16	
<b>B Stroke length (mm)</b>		
		Bore size (ø)
		6 8 12 16
10	10	● ● ● ●
20	20	● ● ● ●
30	30	● ● ● ●
40	40	● ● ● ●
50	50	● ● ● ●
75	75	● ● ● ●
100	100	● ● ● ●
125	125	● ● ● ●
<b>C Switch model No.</b>		
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.		
<b>D Switch quantity</b>		
R	1 on rod side	
H	1 on head side	
D	2	
<b>E Option</b>		
Blank	No option	
<b>S Stroke adjusting stopper</b>		
5 mm stroke adjustment on one side *2, *4		
S1**	Stopper position ① (can be changed to ④)	
S2**	Stopper position ② (can be changed to ③)	
S3**	Stopper position ③ (can be changed to ②)	
S4**	Stopper position ④ (can be changed to ①)	
S5**	Stopper position ①, ③	
S6**	Stopper position ②, ④	
<b>A Shock absorber stopper</b> *2, *4		
A1**	Stopper position ① (can be changed to ④)	
A2**	Stopper position ② (can be changed to ③)	
A3**	Stopper position ③ (can be changed to ②)	
A4**	Stopper position ④ (can be changed to ①)	
A5**	Stopper position ①, ③	
A6**	Stopper position ②, ④	
<b>** part</b>		
Blank	Port on stopper: without port	
D	Port on stopper: side and bottom ports *3	
Blank	Stopper block material: steel	
T	Stopper block material: steel (nitriding) *3	
<b>B With buffer</b> *4		
B	Without switch groove	
BL	With switch groove	
<b>Plug attached</b>		
Blank	No	
N	With side piping port plug (not available for ø6)	

## LCG Double acting/single rod selection table

(Combination with stroke adjusting stopper, shock absorber stopper)

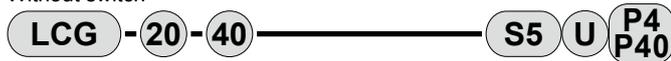
○: Available — : Not available

Model No. code	Option code		Stroke adjusting stopper						Shock absorber stopper						
	Bore size	Stroke length	S1	S2	S3	S4	S5	S6	A1	A2	A3	A4	A5	A6	
LCG	ø6, ø8	10	○	○	○	○	○	○	○	-	-	○	○	-	-
		20 or more	○	○	○	○	○	○	○	○	○	○	○	○	○
LCG -B, BL	ø12 to ø25	10 to 20	○	○	○	○	○	○	○	-	-	○	○	-	-
		30 or more	○	○	○	○	○	○	○	○	○	○	○	○	○

The table above also applies to combinations with option code D (with port on stopper) or T (steel stopper block (nitriding)).

## How to order (ø20, ø25)

Without switch



With switch



Model No.

**A** Bore size

**D** Switch quantity

**F** Anti-rust treatment

**B** Stroke length

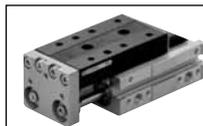
**C** Switch model No.

**E** Option

### ⚠ Precautions for model No. selection

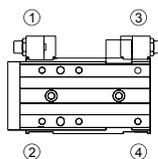
- \*1: The port positions of the standard without stopper are ① and ③ in the figure below.
- \*2: Combination of the stroke adjusting stopper and shock absorber stopper is made to order.
- \*3: Can be selected for the type with stopper only.
- \*4: Refer to the selection table below for combinations of options.
- \*5: A1\*\*, A2\*\*, A5\*\* and A6\*\* with 20 mm stroke length or less are made to order since adjustment is not possible with the standard stopper.
- \*6: The table is alloy steel.  
To prevent rust, select "U" for an environment where the temperature and humidity is high or condensation may occur on the product surface.
- \*7: The stroke adjusting stopper for 0.3 MPa and over working pressure is the metal sealing type.

### Anti-rust (ø20, 25)



The table and rail surface rustproofing reduces rust in high-humidity environments and near ionizers.  
The table and rail are black.

● Stopper position



### Related products

Speed controller								
Model No.	Appearance	Port size (Rc or R)			Compatible tube O.D.			Page
		M3	M5	1/8	4(ø4)	6(ø6)	8(ø8)	
SC3W-M3- *-P4		●			●			232
SC3W-M5- *-P4			●		●	●		
SC3W-6- *-P4				●	●	●	●	

Specify the compatible tube O.D. code for \*.

## LCG Double acting/single rod selection table

(Combination with stroke adjusting stopper, shock absorber stopper)

○: Available — : Not available

Model No. code	Option code		Stroke adjusting stopper						Shock absorber stopper					
	Bore size	Stroke length	S1	S2	S3	S4	S5	S6	A1	A2	A3	A4	A5	A6
LCG	ø6, ø8	10	○	○	○	○	○	○	-	-	○	○	-	-
		20 or more	○	○	○	○	○	○	○	○	○	○	○	○
	ø12 to ø25	10 to 20	○	○	○	○	○	○	-	-	○	○	-	-
		30 or more	○	○	○	○	○	○	○	○	○	○	○	○

The table above also applies to a combination with option code D (with port on the stopper) or T (alloy steel stopper block (nitriding)).

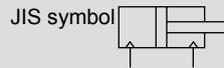
Code	Content
<b>A Bore size</b>	
20	ø20
25	ø25
<b>B Stroke length (mm)</b>	
10	10
20	20
30	30
40	40
50	50
75	75
100	100
125	125
150	150
<b>C Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>D Switch quantity</b>	
R	1 on rod side
H	1 on head side
D	2
<b>E Option</b>	
Blank	No option
<b>S Stroke adjusting stopper</b>	
5 mm stroke adjustment on one side *2, *4	
S1**	Stopper position ① (can be changed to ④)
S2**	Stopper position ② (can be changed to ③)
S3**	Stopper position ③ (can be changed to ②)
S4**	Stopper position ④ (can be changed to ①)
S5**	Stopper position ①, ③
S6**	Stopper position ②, ④
<b>A Shock absorber stopper</b> *2, *4	
A1**	Stopper position ① (can be changed to ④)
A2**	Stopper position ② (can be changed to ③)
A3**	Stopper position ③ (can be changed to ②)
A4**	Stopper position ④ (can be changed to ①)
A5**	Stopper position ①, ③
A6**	Stopper position ②, ④
<b>** part</b>	
Blank	Port on stopper: without port
D	Port on stopper: side and bottom ports *3
Blank	Stopper block material: steel
T	Stopper block material: steel (nitriding) *3
<b>B With buffer</b> *4	
B	Without switch groove
BL	With switch groove
<b>Plug attached</b>	
Blank	No
N	With side piping port plug (not available for ø25)
<b>F Anti-rust treatment</b>	
Blank	No
U	Anti-rust treatment (guide only) *6



Linear slide cylinder Double acting/single rod

# LCW Series

● Bore size:  $\phi 12/\phi 16/\phi 20$



## Specifications

Descriptions	LCW		
	$\phi 12$	$\phi 16$	$\phi 20$
Bore size mm	$\phi 12$	$\phi 16$	$\phi 20$
Actuation	Double acting		
Working fluid	Compressed air		
Max. working pressure MPa	0.7		
Min. working pressure MPa	0.15 (*1)		
Proof pressure MPa	1.05		
Ambient temperature $^{\circ}\text{C}$	-10 to 60 (no freezing) (*2)		
Port size	M5		
Working piston speed mm/s	50 to 500 (*3)		
Cushion	Rubber cushion		
Lubrication	Not available		
Allowable absorbed energy J	Refer to the following table.		

\*1: Use at a pressure of 0.4 MPa and over when using a metal stopper with rubber cushion in order to allow metal contact at the end of the stroke.

\*2: Operate at  $-5$  to  $60^{\circ}\text{C}$  when using a shock absorber stopper.

\*3: Keep within 50 to 200 mm/s when using a metal stopper with rubber cushion.

## Stroke length

Bore size (mm)	Standard stroke length (mm)
$\phi 12$	30/50/75
$\phi 16$	
$\phi 20$	

Note: Products with stroke lengths other than the above are not available.

## LCW allowable absorbed energy

Bore size (mm)	Rubber cushion (standard) (J)	Metal type with rubber cushion (J)	Shock absorber (J)
$\phi 12$	0.027	0.0053	0.054
$\phi 16$	0.055	0.0053	0.11
$\phi 20$	0.11	0.043	0.22

## Adjustable stroke range

(Unit: mm)

Bore size (mm)	Standard rubber cushion				Metal type with rubber cushion				Shock absorber	
	Standard stroke length		Custom stroke compatible (S)		Standard stroke length (M)		Custom stroke compatible (MS)		Standard stroke length (A)	
	PUSH side	PULL side	PUSH side	PULL side	PUSH side	PULL side	PUSH side	PULL side	PUSH side	PULL side
$\phi 12$	10	10	28	10	9	11.5	28	11.5	4	6.5
$\phi 16$	7.5	7.5	25	7.5	6	8.5	25	8.5	1.5	3.5
$\phi 20$	8	8	25	8	7.5	12	25	12	12.5	17

## Compatibility table by variation

Applicable bore size		Double acting/ single rod	Double acting/ position locking
			Q
ø12 to 20	P4	▲	▲
	P40	▲	▲
	P41		
	P42		

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: P4 is not available for shock absorber.

## How to order

**LCW** - **16** - **30** - **R** - **SW81** - **R** - **S** **P4**  
**P40**

**A** Bore size

**B** Stroke length

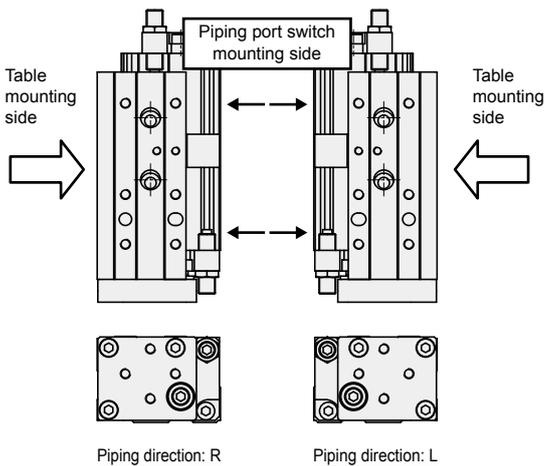
**C** Piping direction

**D** Switch model No.

**E** Switch quantity

**F** Stopper

Code	Content
<b>A Bore size (mm)</b>	
12	ø12
16	ø16
20	ø20
<b>B Stroke length (mm)</b>	
30	30
50	50
75	75
<b>C Piping direction</b>	
R	Right from rod side
L	Left from rod side
<b>D Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>E Switch quantity</b>	
R	1 on rod side
H	1 on head side
D	2
<b>F Stopper</b>	
Blank	Cushion stopper
S	Rubber cushioned long stopper (custom stroke compatible)
M	Metal stopper with rubber cushion
MS	Long metal stopper with rubber cushion (custom stroke compatible)



\*1: Made to order. Contact CKD for details.

## Related products

		Speed controller										
Model No.	Appearance	Port size (Rc or R)				Compatible tube O.D.						Page
		M5	1/8	1/4	3/8	4(ø4)	6(ø6)	8(ø8)	10(ø10)	12(ø12)		
SC3W-M5- *-P4		●				●	●					232

Specify the compatible tube O.D. code for \*.



Linear slide cylinder Double acting/single rod

# LCX Series

● Bore size:  $\varnothing 25/\varnothing 32$

JIS symbol 



## Specifications

Descriptions	LCX	
Bore size mm	$\varnothing 25$	$\varnothing 32$
Actuation	Double acting	
Working fluid	Compressed air	
Max. working pressure MPa	0.7	
Min. working pressure MPa	0.15	
Proof pressure MPa	1.05	
Ambient temperature °C	-10 to 60 (no freezing) (*1)	
Port size	M5	
Stroke tolerance mm	+2.0 0 (*2)	
Working piston speed mm/s	20 to 500 (*3)	
Cushion	With rubber cushion	
Lubrication	Not available	
Allowable absorbed energy J	Refer to the following.	

\*1: Contact CKD if the use environment is always cold (5°C or below) or hot (40°C and above).

\*2: Note that there will be a slight gap between the end plate and floating bush if no stopper is attached.

\*3: Keep within 20 to 200 mm/s when using a metal stopper.

## Stroke length

Bore size (mm)	Standard stroke length (mm)
$\varnothing 25$	10, 20, 30, 40, 50
$\varnothing 32$	10, 20, 30, 40, 50

Note: Products with stroke lengths other than the above are not available.

## LCX allowable absorbed energy ( $E_0$ )

Bore size	Standard (J)	Cushion stopper (J)	Metal stopper (J)	Shock absorber stopper (J)
$\varnothing 25$	0.34	0.14	0.07	1.3
$\varnothing 32$				

Combined functions

## Compatibility table by variation

Applicable bore size	Double acting/ single rod	
ø25/ 32	P4	●
	P40	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Even when P40 is selected for the external stopper option, electrolytic nickel plating is used for the stopper part.

## How to order

Without switch



With switch



Model No.

▲ Bore size

▲ Stroke length

▲ Switch model No.

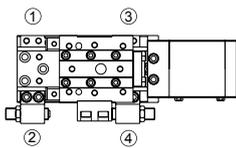
▲ Switch quantity

▲ Stopper

## ⚠ Precautions for model No. selection

- \*1: The steel stopper block (nitriding) (code: T) is recommended for a metal stopper.
- \*2: Combination of the rubber cushion stopper, metal stopper and shock absorber stopper is made to order.
- \*3: Keep within 20 to 200 mm/s when using a metal stopper.
- \*4: Can be selected for the type with stopper only.
- \*5: A5\* and A6\* cannot be selected for 10 mm stroke length.
- \*6: The positioning hole enables assembling of the crossed unit and two-stage unit without adjusting the position. Use a positioning bolt as well.

● Stopper position



## Related products

Speed controller											
Model No.	Appearance	Port size (Rc or R)				Compatible tube O.D.				Page	
		M5	1/8	1/4	3/8	4(ø4)	6(ø6)	8(ø8)	10(ø10)		12(ø12)
SC3W-M5- *-P4		●				●	●				232

Specify the compatible tube O.D. code for \*.

Code	Content
<b>A Bore size</b>	
25	ø25
32	ø32
<b>B Stroke length (mm)</b>	
10	10
20	20
30	30
40	40
50	50
<b>C Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>D Switch quantity</b>	
R	1 on rod side
H	1 on head side
D	2
<b>E Stopper</b>	
Blank	Without stopper
<b>S Rubber cushion stopper</b> *2	
S1*	Stopper position ① (can be changed to ④)
S2*	Stopper position ② (can be changed to ③)
S3*	Stopper position ③ (can be changed to ②)
S4*	Stopper position ④ (can be changed to ①)
S5*	Stopper position ①, ③
S6*	Stopper position ②, ④
<b>M Metal stopper</b> *1, *2, *3	
M1*	Stopper position ① (can be changed to ④)
M2*	Stopper position ② (can be changed to ③)
M3*	Stopper position ③ (can be changed to ②)
M4*	Stopper position ④ (can be changed to ①)
M5*	Stopper position ①, ③
M6*	Stopper position ②, ④
<b>A Shock absorber stopper</b> *2, *5	
A1*	Stopper position ① (can be changed to ④)
A2*	Stopper position ② (can be changed to ③)
A3*	Stopper position ③ (can be changed to ②)
A4*	Stopper position ④ (can be changed to ①)
A5*	Stopper position ①, ③
A6*	Stopper position ②, ④
<b>* part</b>	
Blank	Stopper block material: steel
T	Stopper block material: steel (nitriding) *4



Twin rod cylinder Double acting/standard

# STR2-M<sub>B</sub> Series

● Bore size:  $\phi 6/\phi 10/\phi 16/\phi 20/\phi 25/\phi 32$

JIS symbol



## Specifications

Descriptions		STR2-M (metal bush bearing) STR2-B (ball bearing)					
Bore size	mm	$\phi 6$	$\phi 10$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	0.7					
Min. working pressure	MPa	0.2	0.15			0.1	
Proof pressure	MPa	1.05					
Ambient temperature	°C	-10 to 60 (no freezing)					
Port size		M5					Rc1/8
Stroke tolerance	mm	+2.0 0					
Adjustable stroke range	mm	0 to -5					
Working piston speed	mm/s	50 to 500					
Non-rotating accuracy	STR2-M	$\pm 0.4^\circ$	$\pm 0.3^\circ$			$\pm 0.2^\circ$	
	STR2-B	$\pm 0.2^\circ$	$\pm 0.1^\circ$			$\pm 0.3^\circ$	
Piston rod bearing	STR2-M	Metal bush bearing					
	STR2-B	Ball bearing					
Cushion		Rubber cushion					
Lubrication		Not available					
Allowable absorbed energy	PUSH	0.008	0.061	0.181	0.303	0.68	1.3
	PULL	0.059	0.083	0.083	0.127	0.237	0.311

## Stroke length

Bore size	Stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Min. stroke with switch (mm)
$\phi 6$	10, 20, 30, 40, 50	50	5	10
$\phi 10$				
$\phi 16$	10, 20, 30, 40, 50 60, 70, 80, 90, 100	100		
$\phi 20$				
$\phi 25$				
$\phi 32$				

\*1: In the case of rear piping:

- $\phi 16$ : 70
- $\phi 20/\phi 25$ : 60
- $\phi 32$ : 50

\*2: The custom stroke length is available in 1 mm increments.

However, the total length is the same as that of the next longer standard stroke length.

Combined functions

## Compatibility table by variation

Applicable bore size		Double acting/ single rod	Double acting/ position locking	Double acting/ fine speed	Double acting/ low speed	Double acting/ double rod
		Q	F	O	D	
ø6 to 32	P4	●	●	○	○	○
	P40	●	●	○	○	○
	P41	■	■	■	■	■
	P42	▲	▲	▲	▲	▲

● : Standard ○ : Made to order ▲ : Contact CKD ■ : Not applicable

## How to order

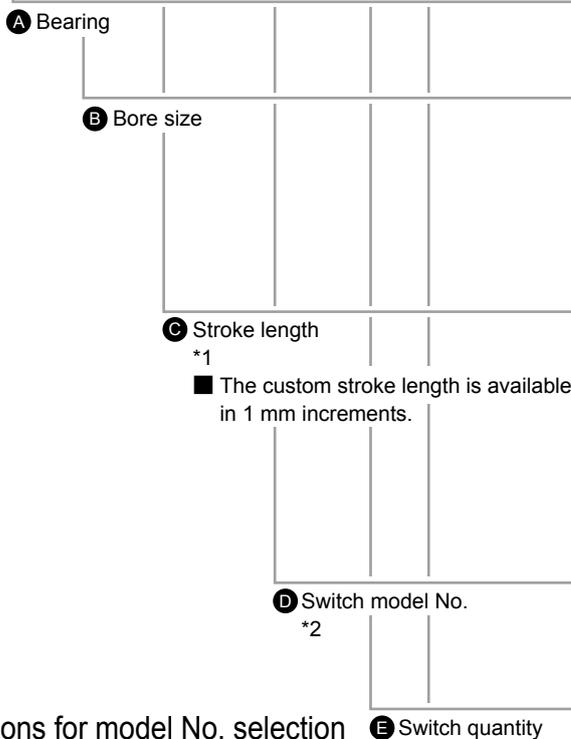
Without switch

STR2 - M - 16 - 30 - R - P4/P40

With switch

STR2 - M - 16 - 30 - SW51 - R - R - P4/P40

Model No.



### ⚠ Precautions for model No. selection

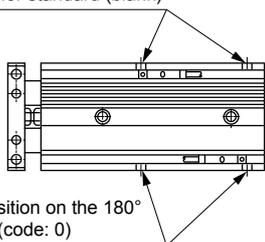
\*1: Max. stroke length of rear piping "R"

- ø6/10 : 50 mm
- ø16 : 70 mm
- ø20/25: 60 mm
- ø32 : 50 mm.

\*2: STR2-B-6 and 10 are not compatible with a reed switch.

\*3: The piping port positions for "O" are as shown in the figure below.

Piping port positions for standard (blank)



Piping port position on the 180° opposite side (code: 0)

\*4: In the case of G thread, ports on the opposite side (option "O") are not available. Rather than plug sealing, they are simply not provided.

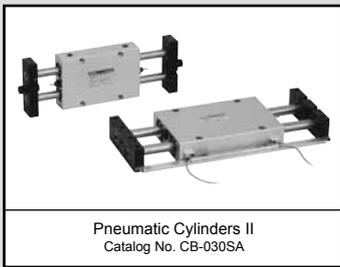
(The standard ports are not provided in the case of option "O".)

Code	Content	
<b>A Bearing</b>		
M	Metal bush bearing	
B	Ball bearing	
<b>B Bore size (mm)</b>		
6	ø6	
10	ø10	
16	ø16	
20	ø20	
25	ø25	
32	ø32	
<b>C Stroke length (mm)</b>		
Bore size	Stroke length	Custom stroke length
ø6	5 to 50	In 1 mm increments
ø10	5 to 50	
ø16	5 to 100	
ø20	5 to 100	
ø25	5 to 100	
ø32	5 to 100	
<b>D Switch model No.</b>		
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.		
<b>E Switch quantity</b>		
R	1 on rod side	
H	1 on head side	
D	2	
<b>F Option</b>		
O	Piping port position on the 180° opposite side	
R	Rear piping	

## Related products

Speed controller								
Model No.	Appearance	Port size (Rc or R)			Compatible tube O.D.			Page
		M3	M5	1/8	4(ø4)	6(ø6)	8(ø8)	
SC3W-M5- *P4			●		●	●		232
SC3W-6- *P4				●	●	●	●	

Specify the compatible tube O.D. code for \*.



Unit cylinder Ball bearing/with switch

# UCA2-B Series

● Bore size:  $\phi 10/\phi 16/\phi 25/\phi 32$

JIS symbol



## Specifications

Descriptions	UCA2-B UCA2-BL (with switch)			
	$\phi 10$	$\phi 16$	$\phi 25$	$\phi 32$
Bore size mm	$\phi 10$	$\phi 16$	$\phi 25$	$\phi 32$
Actuation	Double acting			
Working fluid	Compressed air			
Max. working pressure MPa	1.0			
Min. working pressure MPa	0.15		0.1	
Proof pressure MPa	1.5			
Ambient temperature °C	-10 to 60 (no freezing)			
Port size	M5		Rc1/8	
Stroke tolerance mm	+1.0 0			
Working piston speed mm/s	30 to 300			
Non-rotating accuracy *1	$\pm 0.04^\circ$	$\pm 0.03^\circ$	$\pm 0.015^\circ$	$\pm 0.015^\circ$
Max. operating frequency Cycle/min.	30			
Cushion	Shock absorber integrated			
Lubrication	Not available			
Allowable absorbed energy J	0.25	0.65	2.4	4.5

\*1: Value when stroke length = 0 (excluding deflection of the piston rod)

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Min. stroke with switch (mm)
$\phi 10$	25/50/75/100	100	25	10: With 1 switch 20: With 2 switches 75: With 3 switches
$\phi 16$	25/50/75/100	200		
$\phi 25$	125/150/175/200			
$\phi 32$				

Note: Products with stroke length other than standard stroke length are not available.

Combined functions

# UCA2-B Series

## Compatibility table by variation

Applicable bore size		Metal bush bearing	Ball bearing
			B
ø10 to 32	P4	●	●
	P40	●	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

Without switch

UCA2-B - X - 10 - 25 - P1A P4 P40

With switch

UCA2-BL - X - 10 - 25 - SW11 - RA - P1A P4 P40

Ⓐ Fixing method

Ⓑ Bore size

Ⓒ Stroke length

Ⓓ Switch model No.

\*1

Ⓔ Switch quantity

\*2

Ⓕ Option

\*3

Code	Content				
<b>Ⓐ Fixing method</b>					
X	Body fixing				
Y	Plate fixing				
<b>Ⓑ Bore size (mm)</b>					
10	ø10				
16	ø16				
25	ø25				
32	ø32				
<b>Ⓒ Stroke length (mm)</b>					
<b>Bore size (ø)</b>		10	16	25	32
25	25	●	●	●	●
50	50	●	●	●	●
75	75	●	●	●	●
100	100	●	●	●	●
125	125	□	●	●	●
150	150	□	●	●	●
175	175	□	●	●	●
200	200	□	●	●	●
<b>Ⓓ Switch model No.</b>					
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.					
<b>Ⓔ Switch quantity</b>					
RA	1	Plate A side			
RB		Plate B side			
D	2				
T	3				
<b>Ⓕ Option</b>					
P1A	Single adjusting stopper	Plate A side			
P1B	stopper	Plate B side			
P2	Double adjusting stoppers				

## ⚠ Precautions for model No. selection

\*1: Magnet is not built into the type without switch.

For specifications with switch but without switch installed, a magnet and magnet rail are mounted but a switch rail is not.

\*2: Min. stroke length with three switches: 75 (mm)

\*3: Difference between side A and side B is described in the dimensions.

## Related products

Speed controller						Page
Model No.	Appearance	Port size (Rc or R)		Compatible tube O.D.		
		M5	1/8	4(ø4)	6(ø6)	8(ø8)
SC3W-M5- *-P4		●		●	●	232
SC3W-6- *-P4			●	●	●	

Specify the compatible tube O.D. code for \*.



# Stopper cylinder STA2 Series

● Bore size:  $\varnothing 50$



## Specifications

\* Made to order product.

Descriptions		STA2
Bore size	mm	$\varnothing 50$
Stroke length	mm	30
Actuation		Double acting / Double acting/spring integrated
Working fluid		Compressed air
Max. working pressure	MPa	1.0
Min. working pressure	MPa	0.2 (Refer to Fig. 2)
Proof pressure	MPa	1.5
Ambient temperature	$^{\circ}\text{C}$	-5 to 60 (no freezing)
Port size		Rc1/8
Cushion		Head side rubber cushioned
Lubrication		Not available
Allowable absorbed energy		Refer to the following table
Weight	g	1800

Combined  
functions

Fig. 1 Allowable absorbed energy value

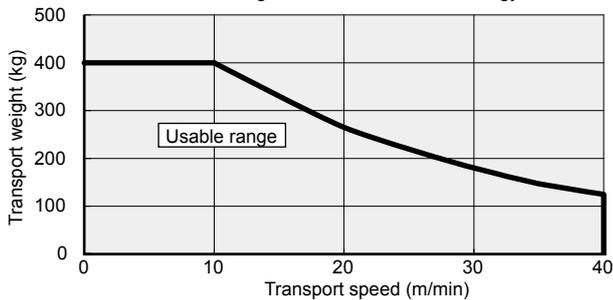
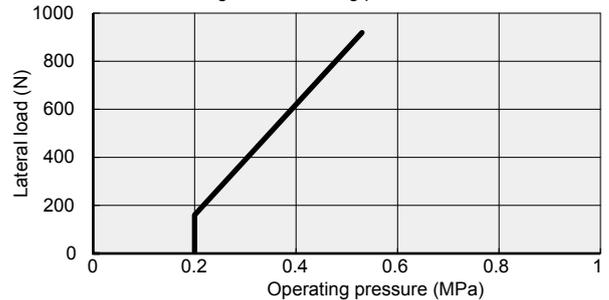


Fig. 2 Min. working pressure for lateral load



## Compatibility table by variation

Applicable bore size	P4	Double acting	Double acting/spring integrated
		▲	▲
ø50	P4	▲	▲

● : Standard ○ : Made to order ▲ : Contact CKD ◻ : Not applicable

## How to order

● Without switch

**STA2** - **50** - **30** - **F** - **P4**

● With switch

**STA2** - **50** - **30** - **SW11** - **R** - **F** - **P4**

**A** Model No.

**B** Bore size

**C** Stroke length

**D** Switch model No.

**E** Switch quantity

**F** Roller material

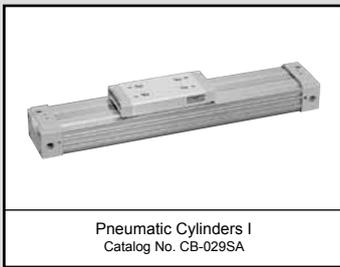
Code	Content
<b>A Model No.</b>	
<b>STA2</b>	Double acting
<b>STA2-Y1</b>	Double acting/spring integrated
<b>B Bore size (mm)</b>	
<b>50</b>	ø50
<b>C Stroke length (mm)</b>	
<b>30</b>	30
<b>D Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>E Switch quantity</b>	
<b>R</b>	1 on rod side
<b>H</b>	1 on head side
<b>D</b>	2
<b>T</b>	3
<b>F Roller material</b>	
<b>Blank</b>	Resin
<b>F</b>	Steel

\*1: Made to order. Contact CKD for details.

## Related products

Speed controller						
Model No.	Appearance	Port size (Rc or R)	Compatible tube O.D.			Page
		1/8	4(ø4)	6(ø6)	8(ø8)	
SC3W-6- *-P4		●	●	●	●	232

Specify the compatible tube O.D. code for \*.



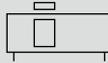
Pneumatic Cylinders I  
Catalog No. CB-029SA

Rodless cylinder Double acting

# SRL3 Series

- Bore size:  $\varnothing 12$ ,  $\varnothing 16$ ,  $\varnothing 20$ ,  $\varnothing 25$ ,  $\varnothing 32$   
 $\varnothing 40$ ,  $\varnothing 50$ ,  $\varnothing 63$ ,  $\varnothing 80$ ,  $\varnothing 100$  or equiv.

JIS symbol



## Specifications

Descriptions		SRL3									
Bore size	mm	$\varnothing 12$	$\varnothing 16$	$\varnothing 20$	$\varnothing 25$	$\varnothing 32$	$\varnothing 40$	$\varnothing 50$	$\varnothing 63$	$\varnothing 80$	$\varnothing 100$
Actuation		Double acting									
Working fluid		Compressed air									
Max. working pressure	MPa	0.7									
Min. working pressure	MPa	0.2			0.1				0.05		
Proof pressure	MPa	1.05									
Ambient temperature	°C	5 to 60									
Port size		M5	Rc1/8			Rc1/4		Rc3/8		Rc1/2	
Stroke tolerance	mm	$^{+2.0}_0$ (to 1000), $^{+2.5}_0$ (to 3000), $^{+3.0}_0$ (to 5000)									
Working piston speed	mm/s	50 to 2000 (standard piping) (*1)									
Cushion		Air cushion									
Lubrication		Not available									

\*1: For common port piping, the working piston speed varies depending on the stroke length. Contact CKD.

## Allowable absorbed energy

Bore size (mm)	Cushioned		Without cushion	With shock absorber (initial set point)	
	Allowable absorbed energy (J)	Cushion stroke (mm)	Allowable absorbed energy (J)	Absorbed energy (J)	Effective stroke length (mm)
$\varnothing 12$ or equiv.	0.03	14.5	0.003	2.4	5.5
$\varnothing 16$ or equiv.	0.22	19.2	0.007	2.4	5.5
$\varnothing 20$ or equiv.	0.59	22.2	0.010	5.7	7
$\varnothing 25$ or equiv.	1.40	20.9	0.015	10	9
$\varnothing 32$ or equiv.	2.57	23.5	0.030	18	13
$\varnothing 40$ or equiv.	4.27	23.9	0.050	50	16.5
$\varnothing 50$ or equiv.	9.13	24.9	0.072	86	21
$\varnothing 63$ or equiv.	17.4	29.6	0.138	86	21
$\varnothing 80$ or equiv.	40	45.8	0.393	143	25
$\varnothing 100$ or equiv.	67	45.8	0.622	143	25

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
$\varnothing 12$ or equiv.	200/300 400/500 600/700 800/900 1000	5000	1
$\varnothing 16$ or equiv.			
$\varnothing 20$ or equiv.			
$\varnothing 25$ or equiv.			
$\varnothing 32$ or equiv.			
$\varnothing 40$ or equiv.			
$\varnothing 50$ or equiv.			
$\varnothing 63$ or equiv.			
$\varnothing 80$ or equiv.			
$\varnothing 100$ or equiv.			

\* The custom stroke length is available in 1 mm increments.

Rodless

## Related products

Speed controller												
Model No.	Appearance	Port size (Rc or R)					Compatible tube O.D.					Page
		M5	1/8	1/4	3/8	1/2	4( $\varnothing 4$ )	6( $\varnothing 6$ )	8( $\varnothing 8$ )	10( $\varnothing 10$ )	12( $\varnothing 12$ )	
SC3W-M5*-P4		●					●	●				232
SC3W-6*-P4			●				●	●	●			
SC3W-8*-P4				●				●	●	●		
SC3W-10*-P4					●				●	●	●	
SC3W-15*-P4						●				●	●	

Specify the compatible tube O.D. code for \*.

## Compatibility table by variation

Applicable bore size		Double acting/standard	Double acting/position locking	Double acting/resin guide	Resin guide/position locking
			Q	G	GQ
ø12 to 100	P4	●	●		
	P40	●	●		

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Port plugs of ø12 and ø16 are changed from FPL-M5 to hexagon socket head and female thread. Sealant is required when the plug position is changed.

## How to order

Without switch

**SRL3** - **00** - **12** **B** - **200** - **B** **P4**  
**P40**

With switch

**SRL3** - **00** - **12** **B** - **200** - **SW40** - **R** - **B** **P4**  
**P40**

**A** Mounting  
\*1, \*2

**B** Bore size

**C** Cushion

**D** Stroke length

**E** Switch model No.

**F** Switch quantity

## Option selection table

● : Available □ : Not available

Option	Option																			
	Code	A	A1	A2	A3	Y	Y1	L*	N*	H	U	Blank	R	B	T	D	S	X		
A	Both-side full stroke length adjustable, with shock absorber	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
A1	R side full stroke length adjustable, with shock absorber	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
A2	L side full stroke length adjustable, with shock absorber	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
A3	Full stroke length adjustable with adjusting bracket to be added later	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Y	Floating fitting	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Y1	Thin floating fitting	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
L*	Intermediate support bracket (for 00, LB)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
N*	Intermediate support bracket (for LB1)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
H	Larger thread for table installation	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
U	Height adjustment plate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Blank		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
R	Port position R, cushion needle position F (common port)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
B	Port position F, cushion needle position B (common port)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
T	Port position R, cushion needle position B (common port)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
D	Port position D, cushion needle position F	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
S	Port position D, cushion needle position D	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
X	Port position F, cushion needle position F (common port)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	

\*1: Some combinations are not available depending on the bore size. Be sure to check the **G** Option in "How to order".

\*2: LB1 with port position D is not possible. (ø25, ø32)

Code	Content	
<b>A Mounting</b>		
00	Basic	
LB	Axial foot	
LB1	Axial foot (ø12 to ø32 only)	
<b>B Bore size (mm)</b>		
12	ø12	
16	ø16	
20	ø20	
25	ø25	
32	ø32	
40	ø40	
50	ø50	
63	ø63	
80	ø80	
100	ø100	
<b>C Cushion</b>		
B	Both sides cushioned	
R	R side cushioned	
L	L side cushioned	
N	Without cushion	
<b>D Stroke length (mm)</b>		
Bore size	Stroke length *3	Custom stroke length
ø12 to ø100	1 to 5000	In 1 mm increments
<b>E Switch model No.</b>		
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.		
<b>F Switch quantity</b>		
R	1 on R side	
L	1 on L side	
D	2	
T	3	
4	4 (when there are more than 4 switches, indicate switch quantity.)	
<b>G Option</b>		
	Bore size (ø)	12 16 20 25 32 40 50 63 80 100
A	Both-side full stroke length adjustable, with shock absorber	● ● ● ● ● ● ● ● ● ●
A1	R side full stroke length adjustable, with shock absorber	● ● ● ● ● ● ● ● ● ●
A2	L side full stroke length adjustable, with shock absorber	● ● ● ● ● ● ● ● ● ●
A3	Full stroke length adjustable with adjusting bracket to be added later	● ● ● ● ● ● ● ● ● ●
Y	Floating fitting	● ● ● ● ● ● ● ● ● ●
Y1	Thin floating fitting	● ● ● ● ● ● ● ● ● ●
L*	Intermediate support bracket (for 00, LB)	● ● ● ● ● ● ● ● ● ●
N*	Intermediate support bracket (for LB1)	● ● ● ● ● ● ● ● ● ●
H	Larger thread for table installation	● ● ● ● ● ● ● ● ● ●
U	Height adjustment plate	● ● ● ● ● ● ● ● ● ●
Blank		● ● ● ● ● ● ● ● ● ●
R	Port position R (Standard)	● ● ● ● ● ● ● ● ● ●
	Port position R (Common port)	● ● ● ● ● ● ● ● ● ●
B	Port position F (Standard)	● ● ● ● ● ● ● ● ● ●
	Port position F (Common port)	● ● ● ● ● ● ● ● ● ●
T	Port position R (Common port)	● ● ● ● ● ● ● ● ● ●
	Port position D (Common port)	● ● ● ● ● ● ● ● ● ●
D	Port position D (Standard)	● ● ● ● ● ● ● ● ● ●
	Port position D (Common port)	● ● ● ● ● ● ● ● ● ●
S	Port position D (Standard)	● ● ● ● ● ● ● ● ● ●
	Port position D (Common port)	● ● ● ● ● ● ● ● ● ●
X	Port position F (Standard)	● ● ● ● ● ● ● ● ● ●
	Port position F (Common port)	● ● ● ● ● ● ● ● ● ●

## ⚠ Precautions for model No. selection

\*1: Mounting bracket will be shipped assembled with the product.

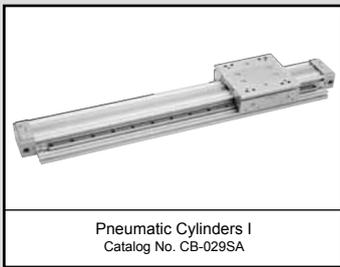
\*2: For 12, 16, 20, 25 and 32 bore sizes with option code "R" or "T", the mounting type will be "00" or "LB1".  
(Piping with "LB" is not possible for option codes "R" and "T".)

\*3: "" of L\* and N\* indicates the number of sets. When more than one set are necessary, specify "L2" (for LB) or "N2" (for LB1). 2 pcs./set

\*4: In the case of the standard with ø12 to ø25, remove the cover, attach a flat nut and install the full stroke length adjusting bracket. A flat nut is attached to option "A3" to enable retrofitting the full stroke length adjusting bracket without removing the cover.

\*5: In "H", the thread size for ø12 and ø16 will be "M4" and that for ø20 will be "M5".

\*6: Check the option combinations in "Option selection table".



High precision guided rodless cylinder

# Double acting **SRM3** Series

# Double acting/position locking **SRM3-Q** Series

● Bore size:  $\varnothing 25/\varnothing 32/\varnothing 40/\varnothing 63$  equiv.



## Specifications

Descriptions	SRM3				SRM3-Q			
	Standard/with switch				Position locking/with switch			
Bore size mm	$\varnothing 25$ or equiv.	$\varnothing 32$ or equiv.	$\varnothing 40$ or equiv.	$\varnothing 63$ or equiv.	$\varnothing 25$ or equiv.	$\varnothing 32$ or equiv.	$\varnothing 40$ or equiv.	$\varnothing 63$ or equiv.
Actuation	Double acting				Double acting/position locking			
Working fluid	Compressed air							
Max. working pressure MPa	0.7							
Min. working pressure MPa	0.15		0.1		0.15		0.1	
Proof pressure MPa	1.05							
Ambient temperature °C	5 to 60							
Port size	Cylinder body port	Rc1/8	Rc1/4	Rc3/8	Rc1/8	Rc1/4	Rc3/8	
	Position locking port	-			Rc1/8			
Stroke tolerance mm	$^{+2.0}_0$ (to 1000)				$^{+2.5}_0$ (to 2000)			
Working piston speed mm/s	50 to 1500 (*1, *2)							
Cushion	Air cushion							
Lubrication	Not available							
Repeatability mm	$\pm 0.03$							
Position locking mechanism	-				Attached to R side of cover			
Holding force N	-				Max. thrust x 0.7			

\*1: For common port piping, working piston speed varies depending on stroke length. Contact CKD.

\*2: (1) When the piston moves at 500 to 1500 mm/s, reduce the speed when entering the position locking mechanism to 500 mm/s or less.

(2) To reduce the speed, add an external shock absorber or deceleration circuit.

(3) Apply grease regularly to the sliding part of the lock lever.

## Allowable absorbed energy

Bore size (mm)	Cushioned		Without cushion	With shock absorber (initial set point)	
	Allowable absorbed energy (J)	Cushion stroke (mm)	Allowable absorbed energy (J)	Absorbed energy (J)	Effective stroke length (mm)
$\varnothing 25$ or equiv.	1.40	20.9	0.015	10	9
$\varnothing 32$ or equiv.	2.57	23.5	0.030	18	13
$\varnothing 40$ or equiv.	4.27	23.9	0.050	50	16.5
$\varnothing 63$ or equiv.	17.4	29.6	0.138	86	21

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
$\varnothing 25, \varnothing 32$ or equiv.	200, 300, 400, 500, 600, 700, 800, 900, 1000	1000	50
$\varnothing 40, \varnothing 63$ or equiv.	200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000	2000	80

Note: The custom stroke length is available in 1 mm increments.

Rodless

## Compatibility table by variation

Applicable bore size		Double acting/standard	Double acting/position locking
			Q
ø25/32/40/63	P4	●	●
	P40	●	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Square nut, a standard attachment, is not attached.

\*2: The grease nipple is not assembled.

\*3: If the switch model No. is not selected, select "C0" (for reed switch), "C1" (for proximity switch) after [Stroke length].

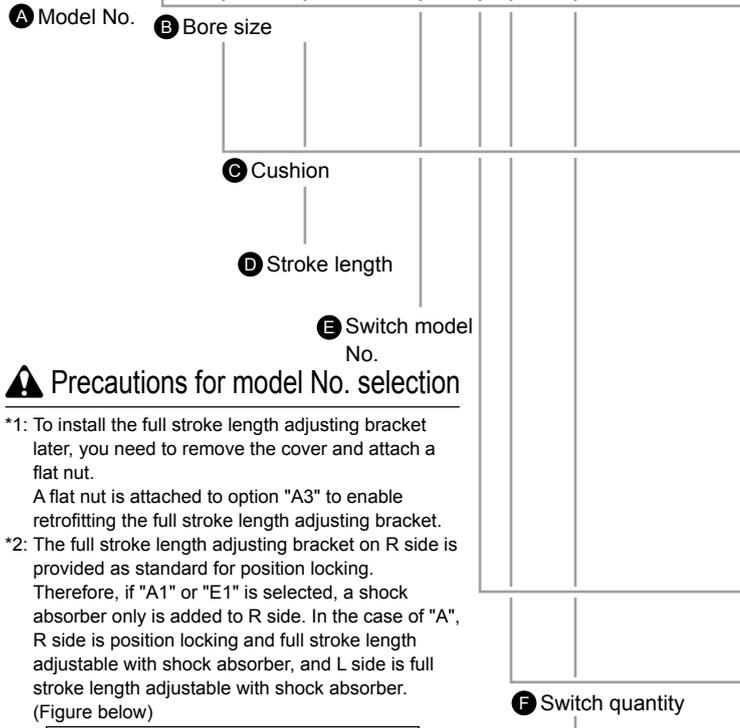
## How to order

Without switch

**SRM3** - **25** **B** - **500** - **C0** - **A** **P4**  
**P40**

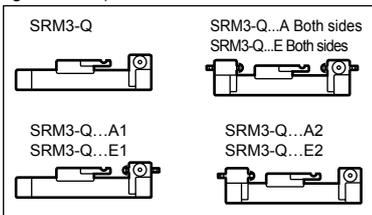
With switch

**SRM3** - **25** **B** - **500** - **SW40** - **R** - **A** **P4**  
**P40**



### ⚠ Precautions for model No. selection

- \*1: To install the full stroke length adjusting bracket later, you need to remove the cover and attach a flat nut. A flat nut is attached to option "A3" to enable retrofitting the full stroke length adjusting bracket.
- \*2: The full stroke length adjusting bracket on R side is provided as standard for position locking. Therefore, if "A1" or "E1" is selected, a shock absorber only is added to R side. In the case of "A", R side is position locking and full stroke length adjustable with shock absorber, and L side is full stroke length adjustable with shock absorber. (Figure below)



- \*3: Copper and PTFE free as standard. (Except for type with shock absorber)
- \*4: The built-in magnet cannot be changed after shipment.

Code	Content					
<b>A Model No.</b>						
SRM3	Standard					
SRM3-Q	Position locking					
<b>B Bore size (mm)</b>						
25	ø25					
32	ø32					
40	ø40					
63	ø63					
<b>C Cushion</b>						
B	Both sides cushioned					
R	R side cushioned					
L	L side cushioned					
N	Without cushion					
<b>D Stroke length (mm)</b>						
Bore size	Stroke length	Custom stroke length				
ø25	50 to 1000	In 1 mm increments				
ø32	50 to 1000					
ø40	80 to 2000					
ø63	80 to 2000					
<b>E Switch model No.</b>						
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.						
<b>* Select only when the switch model No. is not specified *6</b>						
C0	With integrated magnet for reed switch					
C1	With integrated magnet for proximity switch					
<b>F Switch quantity</b>						
R	1 on R side					
L	1 on L side					
D	2					
T	3					
4	4 (when there are more than 4 switches, indicate switch quantity.)					
<b>G Option</b>						
Option	Bore size (ø)					
		25	32	40	63	
Full stroke length adjustable	A	With shock absorber on both sides	●	●	●	●
	A1	With shock absorber on R side	●	●	●	●
	A2	With shock absorber on L side	●	●	●	●
	A3	Adjusting bracket to be added later	●	●	●	●
	E	With light-load shock absorber on both sides	●	●	●	●
	E1	With light-load shock absorber on R side	●	●	●	●
E2	With light-load shock absorber on L side	●	●	●	●	
Blank	F (Standard)	●	●	●	●	
	R (Common port)	●	●	●	●	
	B	●	●	●	●	
	T (Common port)	●	●	●	●	
	D	●	●	●	●	
Port position	F (Standard)	●	●	●	●	
	R (Common port)	●	●	●	●	
Cushion needle position	B	●	●	●	●	
	D	●	●	●	●	

## Related products

Speed controller											
Model No.	Appearance	Port size (Rc or R)				Compatible tube O.D.				Page	
		M5	1/8	1/4	3/8	4(ø4)	6(ø6)	8(ø8)	10(ø10)		12(ø12)
SC3W-6*-P4			●			●	●	●			232
SC3W-8*-P4				●			●	●	●		
SC3W-10*-P4					●			●	●	●	

Specify the compatible tube O.D. code for \*.



## Magnet rodless cylinder

- Basic (guide combined) **MRL2-(F)** Series
- Simplified guide 1-piston **MRL2-G(F)** Series
- Simplified guide 2-piston **MRL2-W(F)** Series
- Bore size:  $\phi 6$ ,  $\phi 10$ ,  $\phi 16$ ,  $\phi 20$ ,  $\phi 25$ ,  $\phi 32$

JIS symbol



## Specifications

Descriptions		MRL2(L,F) , MRL2-G(L,F) , MRL2-W(L,F)					
		$\phi 6$	$\phi 10$	$\phi 16$	$\phi 20$	$\phi 25$	$\phi 32$
Bore size	mm						
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	0.7					
Min. working pressure	MPa	0.3 (*1)			0.2		
Proof pressure	MPa	1.05					
Ambient temperature	°C	-10 to 60 (fine speed: 5 to 60) (no freezing)					
Port size		M5				Rc1/8	
Stroke tolerance	mm	$+1.5$ $0$ (to 1000)			$+2.0$ $0$ (to 1500)		
Working piston speed	mm/s	50 to 500 (fine speed: 1 to 200)					
Cushion		Rubber cushion					
Lubrication		Not available					
Magnet holding force (*2)	N	19	63	166	294	350	574
Adjustable stroke range (single side) (*3) mm		3	4	6	8.5	10	10

\*1: The value for MRL2-G-6-C (with shock absorber) is 0.4.

\*2: The simplified guide 2-piston (W) will be a 2-fold value.

\*3: The stroke length of MRL2 (basic) cannot be adjusted.

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Max. stroke with switch (mm)	Max. stroke length (mm) of common piping with switch	Max. stroke length of fine speed (mm)	Min. stroke length (mm)
$\phi 6$	50,100,150,200	300	200	-	300	1
$\phi 10$	50,100,150,200,250,300	500	300	300	500	
$\phi 16$	100,150,200,250,300, 400,500	1000	500	500	800	
$\phi 20$	200,250,300,350, 400,500,600,700	1500	700	700	800	
$\phi 25$	200,250,300,350, 400,500,600,700	1500	700	700	800	
$\phi 32$	200,250,300,350, 400,500,600,700	1500	700	700	700	

■ The custom stroke length is available in 1 mm increments.

Rodless

# MRL2/MRL2-G Series

## Compatibility table by variation

Applicable bore size	Double acting/basic		
		P4	P40
ø6 to 32		●	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Port plugs of ø6, ø10, and ø16 are changed from FPL-M5 to hexagon socket head and female thread. Sealant is required when the plug position is changed.

\*2: Electrolytic nickel plating is used in the magnet.

## How to order

Without switch



With switch



A Model No.

B Bore size

C Cushion  
\*2

D Stroke length  
\*3

E Switch model No.

F Switch quantity

G Option  
\*4

### ⚠ Precautions for model No. selection

\*1: When the cushion is a rubber cushion (blank), the port thread will be the following.  
NPT thread: NN G thread: GN

\*2: In the case of MRL2-G and W with the "C" rubber-air cushion, the stopper protrudes from the end plate by approximately 1 mm at shipment. Note that the rubber-air cushion may not function if the stopper is moved to adjust the stroke length.

\*3: Refer to the following table for the max. stroke length with switch.

\*4: When selecting common piping with "R" switch, select the model No. with switch (MRL2-\*L).

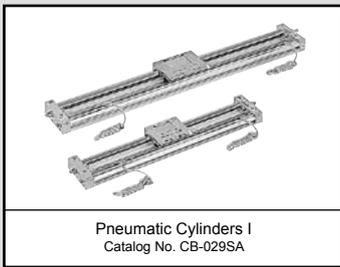
Bore size (mm)	Max. stroke length with switch (mm)
ø6	200
ø10	300
ø16	500
ø20	700
ø25	700
ø32	700

Code	Content	
<b>A Model No.</b>		
Basic	MRL2	Without switch
	MRL2-L	With switch
Simplified guide 1-piston	MRL2-G	Without switch
	MRL2-GL	With switch
Simplified guide 2-piston	MRL2-W	Without switch
	MRL2-WL	With switch
<b>B Bore size (mm)</b>		
6	ø6	
10	ø10	
16	ø16	
20	ø20	
25	ø25	
32	ø32	
<b>C Cushion</b>		
Blank	Rubber cushion	
C	Rubber-air cushion	
<b>D Stroke length (mm)</b>		
Bore size	Stroke length *4	Custom stroke length
ø6	1 to 300	In 1 mm increments
ø10	1 to 500	
ø16	1 to 1000	
ø20 to ø32	1 to 1500	
<b>E Switch model No.</b>		
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.		
<b>F Switch quantity</b>		
R	1 on R side	
L	1 on L side	
D	2	
T	3	
4	4 (when there are more than 4 switches, indicate switch quantity.)	
<b>G Option</b>		
C	With shock absorber (basic cannot be selected.)	
S	With scraper (fine speed cannot be selected)	
R	With switch Common piping (basic and ø6 cannot be selected.)	

## Related products

Speed controller							
Model No.	Appearance	Port size (Rc or R)		Compatible tube O.D.			Page
		M5	1/8	4(ø4)	6(ø6)	8(ø8)	
SC3W-M5-*P4		●		●	●		232
SC3W-6-*P4			●	●	●		

Specify the compatible tube O.D. code for \*.

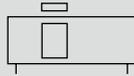


Magnet rodless cylinder with high precision guide

# MRG2 Series

● Bore size:  $\varnothing 10$ ,  $\varnothing 16$ ,  $\varnothing 25$

JIS symbol



## Specifications

Descriptions		MRG2		
Bore size	mm	$\varnothing 10$	$\varnothing 16$	$\varnothing 25$
Actuation		Double acting		
Working fluid		Compressed air		
Max. working pressure	MPa	0.7		
Min. working pressure	MPa	0.3 (Note)	0.2	
Proof pressure	MPa	1.05		
Ambient temperature	$^{\circ}\text{C}$	5 to 60		
Port size		M5		Rc1/8
Stroke tolerance	mm	+1.5 0		
Working piston speed	mm/s	50 to 1000		
Cushion		Shock absorber		
Lubrication		Not available		
Magnet holding force	N	63	166	350
Allowable absorbed energy	J	2.1	5.3	8.7

Note: Due to resistance of the shock absorber, it will take time to reach the stroke end. Take this into consideration upon use.

Note: Products other than standard stroke length are made to order products.

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	Min. stroke with switch (mm)
$\varnothing 10$	50, 100, 150, 200, 300	300	50	50 (with 2 pcs.)
$\varnothing 16$	50, 100, 150, 200, 300, 400, 500	500		
$\varnothing 25$	50, 100, 150, 200, 300, 400, 500, 600, 700	700		

Note: Products other than standard stroke length are made to order products.

Rodless

## Compatibility table by variation

Applicable bore size	Double acting/basic		
		P4	P40
ø10/16/25		●	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Port plugs of ø10 and ø16 are changed from FPL-M5 to hexagon socket head and female thread. Sealant is required when the plug position is changed.

\*2: Electrolytic nickel plating is used in the magnet.

## How to order

MRG2 - 10 - 100 - SW11 - D - A P4 P40

A Bore size

B Stroke length

C Switch model No.

D Switch quantity

E Option  
\*1

Code	Content			
<b>A Bore size (mm)</b>				
10	ø10			
16	ø16			
25	ø25			
<b>B Stroke length (mm)</b>				
	<b>Bore size ø (mm)</b>	<b>10</b>	<b>16</b>	<b>25</b>
50	50	●	●	●
100	100	●	●	●
150	150	●	●	●
200	200	●	●	●
300	300	●	●	●
400	400	□	●	●
500	500	□	●	●
600	600	□	□	●
700	700	□	□	●
<b>C Switch model No.</b>				
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.				
<b>D Switch quantity</b>				
R	1 on R side			
L	1 on L side			
D	2			
T	3			
4	4 (when there are more than 4 switches, indicate switch quantity.)			
<b>E Option</b>				
A	With both-sided full stroke length adjustable brackets			
A1	With R side full stroke length adjusting bracket			
A2	With L side full stroke length adjusting bracket			

## ⚠ Precautions for model No. selection

\*1: The full stroke length adjustable brackets cannot be retrofitted.

## Related products

Model No.	Appearance	Port size (Rc or R)		Compatible tube O.D.			Page
		M5	1/8	4(ø4)	6(ø6)	8(ø8)	
SC3W-M5- *-P4		●		●	●		232
SC3W-6- *-P4			●	●	●	●	

Specify the compatible tube O.D. code for \*.



Table rotary actuator  
Basic/high accuracy

# GRC/GRC-K Series

● Size: 5/10/20/30/50/80

JIS symbol



## Specifications

Descriptions		GRC-5	GRC-10 GRC-K-10	GRC-20 GRC-K-20	GRC-30 GRC-K-30	GRC-50 GRC-K-50	GRC-80 GRC-K-80	
Size		5	10	20	30	50	80	
Theoretical torque *1	N·m	0.5	1.0	2.0	3.0	5.2	8.1	
Actuation		Rack and pinion mechanism						
Working fluid		Compressed air						
Max. working pressure	MPa	1.0						
Min. working pressure *2	Basic	0.10						
	MPa High accuracy	-	0.15		0.10			
	With external shock absorber	0.25	0.20	0.15				
Proof pressure	MPa	1.6						
Ambient temperature	°C	0 to 60 (no freezing)						
Port size		M5				Rc1/8		
Cushion	Basic/high accuracy	Rubber cushion						
	With external shock absorber	Shock absorber						
	Shock absorber model No.	NCK-0.3		NCK-0.7		NCK-1.2	NCK-2.6	
Allowable absorbed energy	Basic/high accuracy	0.005	0.008	0.03		0.04	0.11	
	J With external shock absorber *6	0.46	0.59	1.15	1.71	2.33	2.78	
Shock absorber stroke	mm	3.5	3.5	5	5	5.5	6.5	
Lubrication		Not available						
Volumetric capacity *3	cm <sup>3</sup>	90°	1.3	3.5	7.0	10.5	18.1	28.3
		180°	3.4	6.6	13.4	20.0	34.4	53.7
Oscillating angle adjusting range *4	Basic/high accuracy	90°	0° to 100°					
		180°	90° to 190°					
	With external shock absorber	90°	90° ± 6°					
		180°	180° ± 6°					
Oscillating time adjusting range *5 *7	s/90°	0.2 to 1.5						
Table deflection (reference value)	Basic	±0.17°			±0.23°	±0.26°	±0.32°	
	High accuracy	-	±0.026°					

\*1: The theoretical torque is value at working pressure 0.5 MPa.

\*2: To push through the rubber cushion integrated in basic and high accuracy type, 0.3 MPa and over working pressure is required.

\*3: Volumetric capacity is value within oscillating angle adjusting range when max. oscillating angle.

\*4: Oscillating angle adjusting range is value when adjusted by both side stopper bolts (shock absorber).

\*5: Oscillating time adjusting range is value at working pressure 0.5 MPa.

\*6: The values in the table indicate the absorbed energy at the maximum oscillation speed.

\*7: For the type with shock absorber, the time until the unit hits the end of shock absorber (end of rod). (Not the oscillating time until the unit reaches the stroke end of the shock absorber.)

Rotary actuator

# GRC/GRC-K Series

## Compatibility table by variation

Applicable size		Standard	High accuracy	Fine speed	High accuracy/ fine speed
			K	F	KF
Torque 0.5 to 8.1 N·m	P4	●	●	▲	▲
	P40	● (*1)	● (*1)	▲	▲
	P41				
	P42	▲	▲	▲	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Even when P40 is selected for the external stopper option, electrolytic nickel plating is used for the stopper part.

\*2: Zinc plating is used in part of the bearings - the sealing washer of the angle adjustment unit.

## How to order

● Without switch

GRC - 10 - 90 - A1 P4 P40

● With switch

GRC - 30 - 180 - SW11 - R - A2 P4 P40

A Model No.

B Size

C Oscillating angle

D Switch model No.

E Switch quantity

F Option

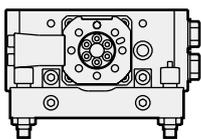
## ⚠ Precautions for model No. selection

- \*1: Port position of basic/high accuracy type is provided on the side surface. Other ports are plugged.
- \*2: The external shock absorber cannot be retrofitted onto the basic/high accuracy type. Select the A3 type as an option if retrofitting.
- \*3: If an external shock absorber is retrofit on the A3 type, the features will be the same as the A1 type. Consult CKD for A2 type.

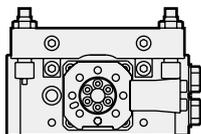
Code	Content		
<b>A Model No.</b>			
GRC	Basic		
GRC-K	High accuracy		
<b>B Size (0.5 MPa)</b>			
Model No.	Theoretical torque	GRC	GRC-K
5	0.5 [N·m]	●	-
10	1.0 [N·m]	●	●
20	2.0 [N·m]	●	●
30	3.0 [N·m]	●	●
50	5.2 [N·m]	●	●
80	8.1 [N·m]	●	●
<b>C Oscillating angle</b>			
90	90°		
180	180°		
<b>D Switch model No.</b>			
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.			
<b>E Switch quantity</b>			
R	With clockwise rotation detection 1 piece		
L	With counterclockwise rotation detection 1 piece		
D	2		
<b>F Option</b>			
Blank	Hexagon socket set screw stopper with urethane		
<b>A With external shock absorber</b>			
A1	Installation position ①		
A2	Installation position ②		
A3	External shock absorber retrofitting (mounting groove machined)		

## External shock absorber mounting drawing

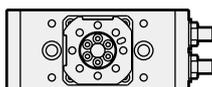
GRC-\*-A1  
(Installation position①)



GRC-\*-A2  
(Installation position②)



GRC-\*-A3  
(Installation position③)



## Related products

Model No.	Appearance	Port size (Rc or R)			Compatible tube O.D.			Page
		M3	M5	1/8	4(ø4)	6(ø6)	8(ø8)	
SC3W-M5- *-P4			●		●	●		232
SC3W-6- *-P4				●	●	●	●	

Specify the compatible tube O.D. code for \*.



Fine speed fan rotary actuator Shaft

# SFR Series

Fine speed fan rotary actuator Table

# SFRT Series

● Size: 3/10/20

JIS symbol



## Specifications

Descriptions		SFR-3	SFR-10	SFR-20	SFRT-3	SFRT-10	SFRT-20
Size		3	10	20	3	10	20
Effective torque *1	90°	0.47	1.44	2.71	0.47	1.44	2.71
	N·m 180°	0.35	1.08	2.03	0.35	1.08	2.03
Working fluid		Compressed air					
Actuation	90°	Vane					
	180°	Vane, pinion gear combined					
Max. working pressure	MPa	0.7					
Min. working pressure	MPa	0.1					
Proof pressure	MPa	1.05					
Ambient temperature °C		0 to 60 (no freezing)					
Port size		M5					
Allowable absorbed energy	mJ	0.8	1.7	3.5	1.3	6.3	9.6
Lubrication		Not available					
Volumetric capacity	cm <sup>3</sup>	3.7	9.1	19.4	3.7	9.1	19.4
Product weight	90° g	70	120	250	200	350	560
	180° g	120	220	430	230	430	690
Allowable radial load *2	N	40	50	300	40	50	60
Allowable thrust load *2	N	13	16	20	30	60	80
Allowable moment	N·m	-			0.7	0.9	2.9
Oscillating angle adjusting range	90°	-			90°±5°		
	180°	-			180°±5°		
Oscillating time adjusting range	sec/90°	0.07 to 1.5					
Table deflection	mm	-			0.03		
Backlash (SFR-180 type only) *3		1.5° or less	2.5° or less	2.5° or less	-	-	-

\*1: Effective torque is when at working pressure 0.5 MPa.

\*2: Allowable radial load and allowable thrust load of SFR is not the dynamic load value.

\*3: The backlash value is for reference.

\* Oscillating angle of SFR-□-180 shaft is 190°.

Rotary actuator

# SFR/SFRT Series

## Compatibility table by variation

Applicable bore size	P4	Shaft	Table
		SFR	SFRT
Torque 0.35 to 2.71 N·m		●	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

● Without switch

**SFR** - **10** - **90** ————— **P4**

● With switch

**SFRT** - **20** - **180** - **SWAP** - **D** - **P4**

**A** Model No.

**B** Size

**C** Oscillating angle

**D** Switch model No.

**E** Switch quantity

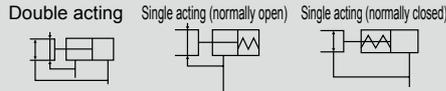
Code	Content
<b>A Model No.</b>	
<b>SFR</b>	Shaft
<b>SFRT</b>	Table
<b>B Size</b>	
<b>Size</b>	<b>Effective torque (at 0.5 MPa)</b>
<b>3</b>	0.3 [N·m]
<b>10</b>	1.0 [N·m]
<b>20</b>	2.0 [N·m]
<b>C Oscillating angle</b>	
<b>90</b>	90°
<b>180</b>	180°
<b>D Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>E Switch quantity</b>	
<b>R</b>	With clockwise rotation detection 1 piece
<b>L</b>	With counterclockwise rotation detection 1 piece
<b>D</b>	2



Parallel hand Double acting/single acting

# HAP-<sup>2</sup>/<sub>4</sub>CS Series

● Operating stroke length: 16, 26, 41 mm



## Specifications

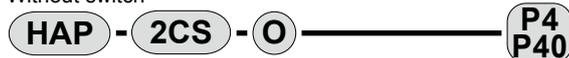
Descriptions	HAP			
	2CS	3CS	4CS	
Size	2CS	3CS	4CS	
Bore size	mm	ø20	ø25	ø40
Actuation	Double acting/single acting			
Working fluid	Compressed air			
Max. working pressure	MPa	0.7		
Min. working pressure	MPa	0.3		
Ambient temperature	°C	5 to 60		
Port size	M5		Rc1/8	
Operating stroke length	mm	16	26	41
Rod diameter	mm	ø10	ø14	ø16
Capacity of reciprocation	cm <sup>3</sup>	4.4	10.8	47.4
Repeatability	mm	±0.03		
Product weight	kg	0.28	0.58	1.52
Lubrication	Not available			

## Compatibility table by variation

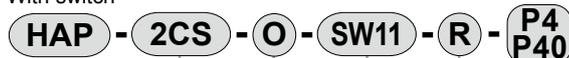
Applicable bore size		Double acting	Single acting Normally open	Single acting Normally closed
			O	C
ø20/ 25/40	P4	●	●	●
	P40	●	●	●

## How to order

Without switch



With switch



A Size

B Option  
\*1

C Switch model  
No.

D Switch quantity

Code	Content
<b>A Size</b>	
2CS	
3CS	
4CS	
<b>B Option</b>	
<b>Blank</b>	Standard (double acting)
<b>O</b>	Single acting (normally open)
<b>C</b>	Single acting (normally closed)
<b>Y1</b>	With attachment Material (S50C)
<b>Y2</b>	With attachment Material (MC nylon)
<b>C Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>D Switch quantity</b>	
<b>R</b>	1 on open side
<b>H</b>	1 on closed side
<b>D</b>	2

## ⚠ Precautions for model No. selection

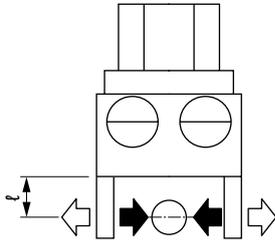
\*1: For option Y1 and Y2 attachments, two are attached on delivery.

Hand/  
chuck

## Gripping power performance data

The gripping power in the opening/closing directions with attachment length  $l$  of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

- Open direction (↔) --- (shown with broken line)
- Closed direction (→) — (shown with continuous line)

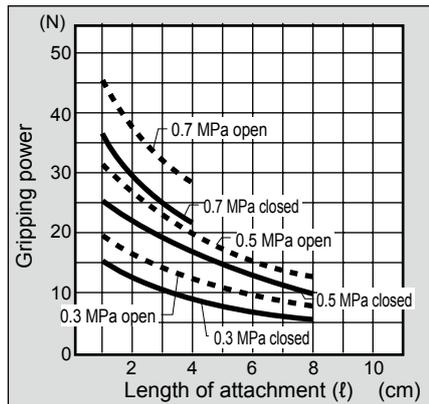


(Note) O type gripping power decreases approximately 20 to 30% in the closed direction compared to the double acting type.

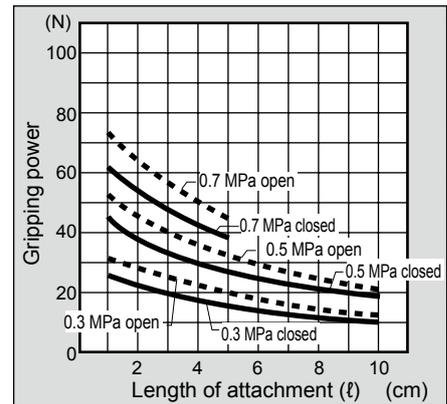
C type gripping power decreases approximately 10 to 20% in the open direction compared to the double acting type.

When making a selection, read the precautions for design and selection on page 107.

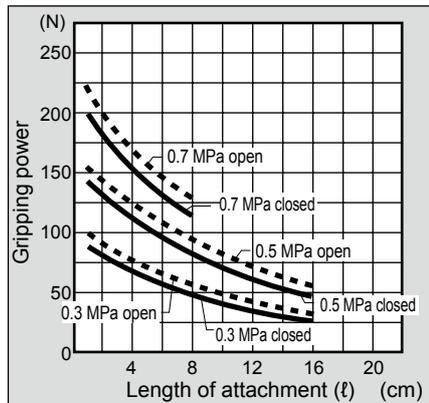
● HAP-2CS



● HAP-3CS



● HAP-4CS

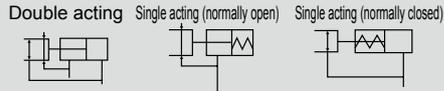




Compact cross roller parallel hand Double acting/single acting

# BHA Series

● Operating stroke length: 5, 9, 11, 15 mm



## Specifications

Descriptions		BHA			
		01CS1	03CS1	04CS1	05CS1
Size		01CS1	03CS1	04CS1	05CS1
Bore size	mm	ø12	ø16	ø20	ø25
Actuation		Double acting/single acting			
Working fluid		Compressed air			
Max. working pressure	MPa	0.7			
Min. working pressure	MPa	0.1			
	Double acting				
	Normally open				
	Normally closed	0.3			
Ambient temperature	°C	5 to 60			
Port size		M3		M5	
Operating stroke length	mm	5	9	11	15
Rod diameter	mm	ø6	ø8	ø10	ø12
Capacity of reciprocation	cm <sup>3</sup>	0.32	1.58	2.89	6.32
Repeatability	mm	±0.01			
Product weight	kg	0.100	0.145	0.253	0.420
Lubrication		Not available			

## How to order

Without switch

**BHA** - **01CS1** - **O** ————— **P4 P40**

With switch

**BHA** - **01CS1** - **O** - **SW11** - **R** - **P4 P40**

**A** Size

**B** Option  
\*1

**C** Switch model No.

**D** Switch quantity

Code	Content
<b>A Size</b>	
<b>01CS1</b>	
<b>03CS1</b>	
<b>04CS1</b>	
<b>05CS1</b>	
<b>B Option</b>	
<b>Blank</b>	Standard (double acting)
<b>O</b>	Single acting (normally open)
<b>C</b>	Single acting (normally closed)
<b>Y1</b>	With attachment Material (S50C)
<b>Y2</b>	With attachment Material (MC nylon)
<b>C Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>D Switch quantity</b>	
<b>R</b>	1 on open side
<b>H</b>	1 on closed side
<b>D</b>	2

## Compatibility table by variation

Applicable bore size		Single acting		
		Double acting	Normally open	Normally closed
ø12/16/ 20/25	P4	●	●	●
	P40	●	●	●

## ⚠ Precautions for model No. selection

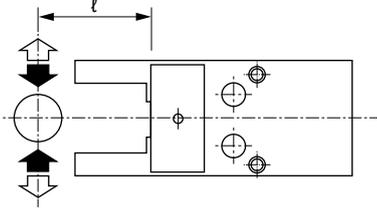
\*1: For option Y1 and Y2 attachments, two are included on delivery.

Hand/  
chuck

## Gripping power performance data

The gripping power in the opening/closing directions with attachment length  $\ell$  of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

- Open direction (↺) --- (shown with broken line)
- Closed direction (↻) — (shown with continuous line)

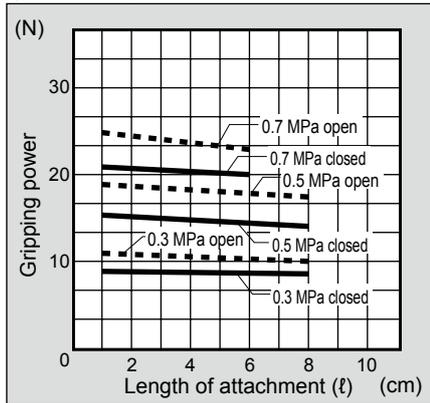


(Note) O type gripping power decreases approximately 20 to 30% in the closed direction compared to the double acting type.

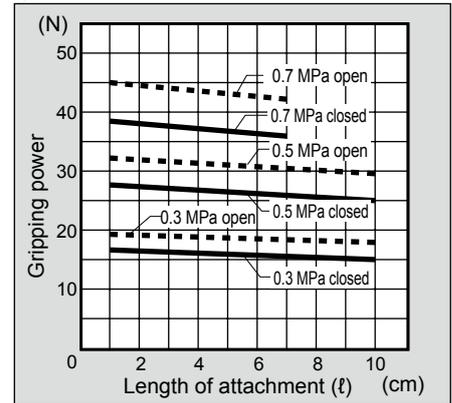
C type gripping power decreases approximately 10 to 20% in the open direction compared to the double acting type.

When making a selection, read the precautions for design and selection on page 107.

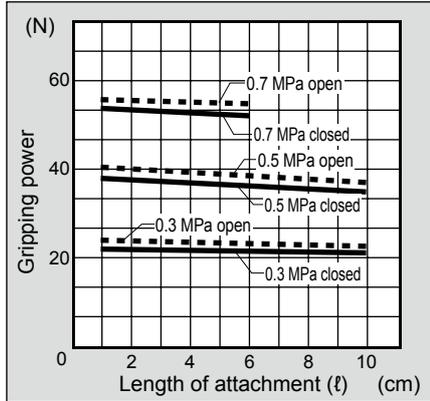
● BHA-01CS1



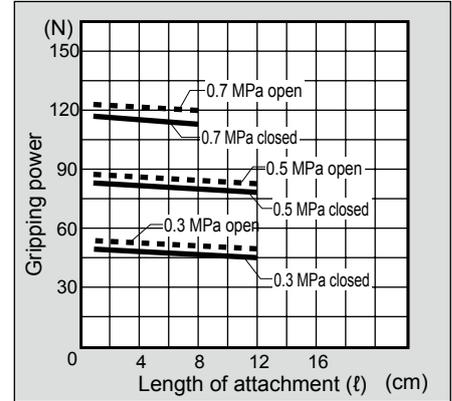
● BHA-03CS1



● BHA-04CS1



● BHA-05CS1

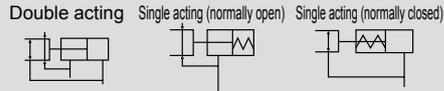




Linear guide hand Double acting/single acting

# LHA Series

● Operating stroke length: 4, 5, 9, 11, 15, 20 mm



## Specifications

Descriptions	LHA					
	006CS	01CS	03CS	04CS	05CS	06CS
Size	006CS	01CS	03CS	04CS	05CS	06CS
Bore size mm	ø6	ø12	ø16	ø20	ø25	ø32
Actuation	Double acting/single acting					
Working fluid	Compressed air					
Max. working pressure MPa	0.7					
Min. working pressure MPa	Double acting	0.15			0.1	
	Single acting			0.3		
Ambient temperature °C	5 to 60					
Port size	M3			M5		
Operating stroke length mm	4	5	9	11	15	20
Rod diameter mm	ø3	ø6	ø8	ø10	ø12	ø16
Capacity of reciprocation cm <sup>3</sup>	0.10	0.32	1.58	2.89	6.32	14.07
Repeatability mm	±0.01					
Product weight kg	0.04	0.085	0.15	0.36	0.52	0.82
Lubrication	Not available					

## How to order

Without switch

LHA - 03CS - O ————— P4 P40

With switch

LHA - 03CS - O - SW81 - R - P4 P40

A Size

B Option

C Switch model No.

D Switch quantity

Code	Content
<b>A Size</b>	
006CS	
01CS	
03CS	
04CS	
05CS	
06CS	
<b>B Option</b>	
Blank	Standard (double acting)
O	Single acting (normally open)
C	Single acting (normally closed)
<b>C Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>D Switch quantity</b>	
R	1 on open side
H	1 on closed side
D	2

## ⚠ Precautions for model No. selection

\*1: Only the LHA-006CS is provided with the F switch.

## Compatibility table by variation

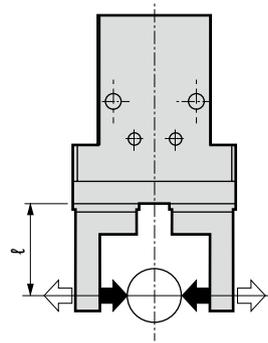
Applicable bore size		Double acting	Single acting Normally open	Single acting Normally closed
			O	C
ø6 to 32	P4	●	●	●
	P40	●	●	●

## Gripping power performance data

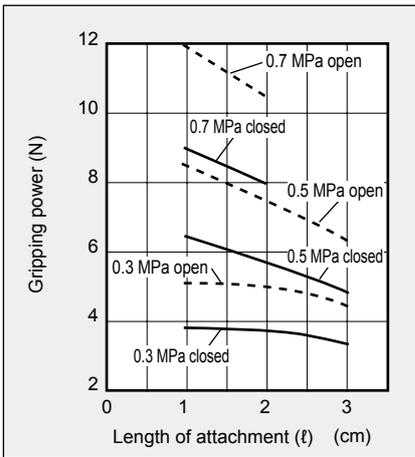
The gripping power in the opening/closing directions with attachment length  $l$  of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

- Open direction ( ← ) ----- (shown with broken line)
- Closed direction ( → ) ————— (shown with continuous line)

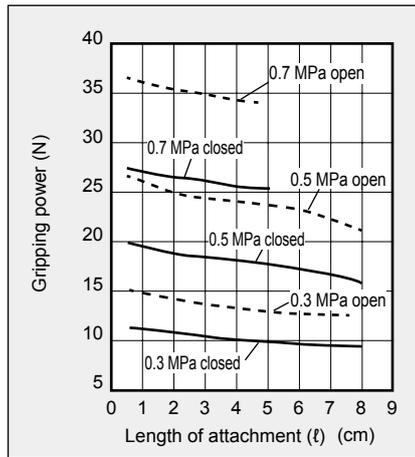
(Note) O type gripping power decreases approximately 20 to 30% in the closed direction compared to the double acting type.  
 C type gripping power decreases approximately 10 to 20% in the open direction compared to the double acting type.  
 When making a selection, read the precautions for design and selection on page 107.



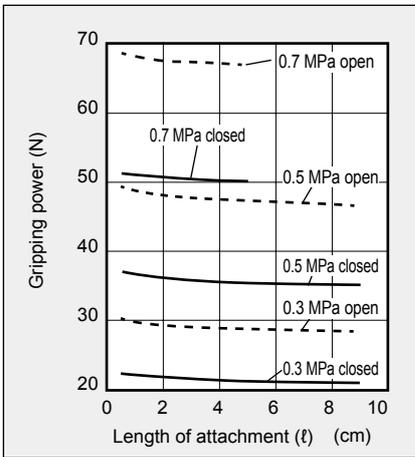
● LHA-006CS



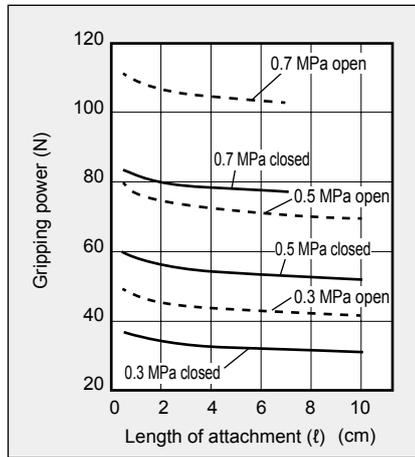
● LHA-01CS



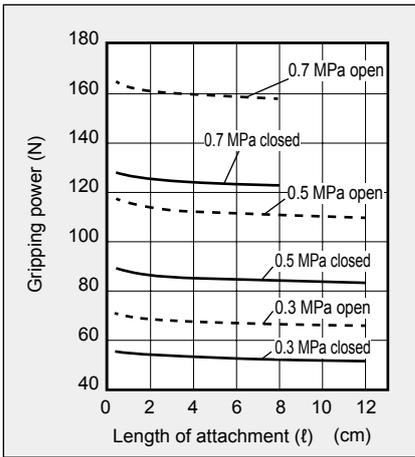
● LHA-03CS



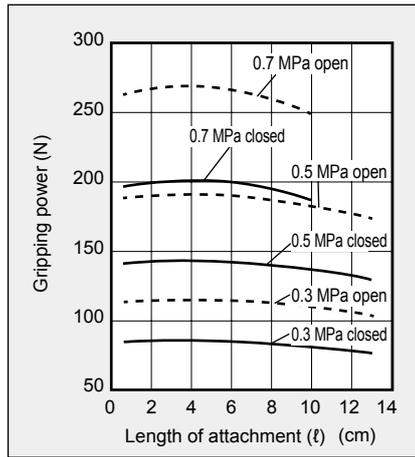
● LHA-04CS



● LHA-05CS



● LHA-06CS

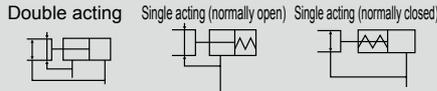




Linear guide hand with rubber cover Double acting/single acting

# LHAG Series

● Operating stroke length: 5, 9, 11, 15, 20 mm



## Specifications

Descriptions	LHAG				
Size	01CS	03CS	04CS	05CS	06CS
Bore size mm	ø12	ø16	ø20	ø25	ø32
Actuation	Double acting/single acting				
Working fluid	Compressed air				
Max. working pressure MPa	0.7				
Min. working pressure MPa	0.2				
Double acting					
Single acting	0.3				
Ambient temperature °C	5 to 60				
Port size	M3		M5		
Operating stroke length mm	5	9	11	15	20
Rod diameter mm	ø6	ø8	ø10	ø12	ø16
Capacity of reciprocation cm <sup>3</sup>	0.32	1.58	2.89	6.32	14.07
Repeatability mm	±0.01				
Product weight kg	0.09	0.17	0.37	0.57	0.9
Lubrication	Not available				

Hand/  
chuck

## How to order

Without switch

**LHAG** - **03CS** - **O** - **P4 P40**

With switch

**LHAG** - **03CS** - **O** - **SW11** - **R** - **P4 P40**

Model No.

**A** Size

**B** Option

**C** Switch model No.

**D** Switch quantity

Code	Content
<b>A Size</b>	
<b>01CS</b>	
<b>03CS</b>	
<b>04CS</b>	
<b>05CS</b>	
<b>06CS</b>	
<b>B Option</b>	
<b>Blank</b>	Standard (double acting with nitrile rubber guard)
<b>O</b>	Single acting (normally open)
<b>C</b>	Single acting (normally closed)
<b>F</b>	Fluoro rubber guard
<b>T</b>	Silicone rubber guard
<b>C Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>D Switch quantity</b>	
<b>R</b>	1 on open side
<b>H</b>	1 on closed side
<b>D</b>	2

## Compatibility table by variation

Applicable bore size		Actuation		
		Double acting	Single acting/ Normally open	Single acting/ Normally closed
ø12 to 32	P4	●	●	●
	P40	●	●	●

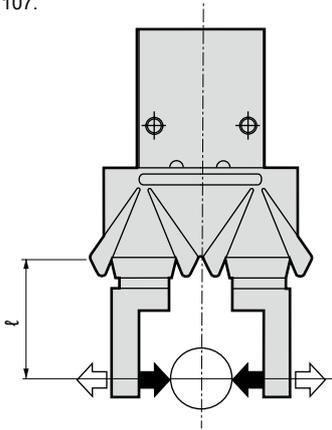
● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable

## Gripping power performance data

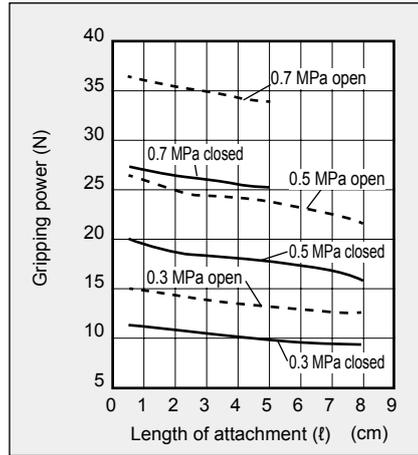
The gripping power in the opening/closing directions with attachment length  $\ell$  of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

- Open direction ( ← ) ----- (shown with broken line)
- Closed direction ( → ) ————— (shown with continuous line)

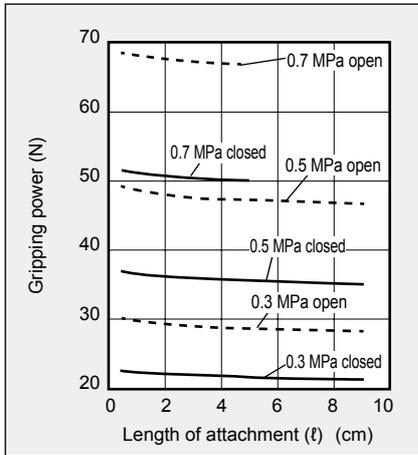
(Note) O type gripping power decreases approximately 20 to 30% in the closed direction compared to the double acting type.  
 C type gripping power decreases approximately 10 to 20% in the open direction compared to the double acting type.  
 When making a selection, read the precautions for design and selection on page 107.



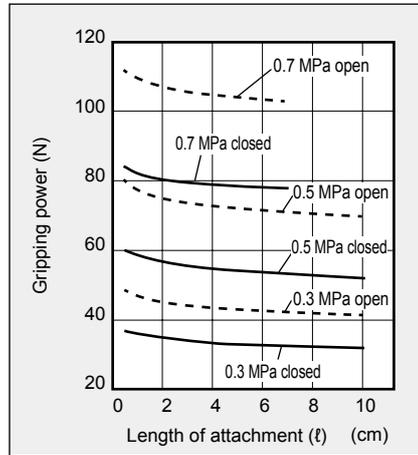
● LHAG-01CS



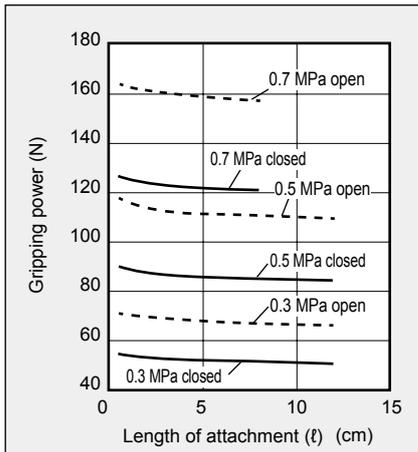
● LHAG-03CS



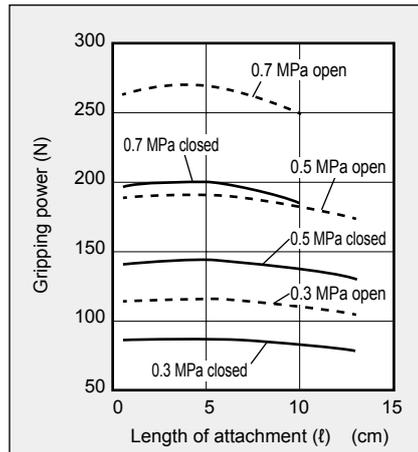
● LHAG-04CS



● LHAG-05CS



● LHAG-06CS

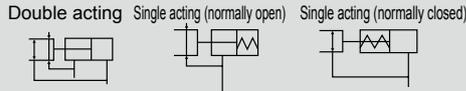




Compact cross roller parallel hand with rubber cover  
Double acting/single acting

# BHG Series

● Operating stroke length: 5, 9, 11, 15 mm



## Specifications

Descriptions		BHG			
		01CS	03CS	04CS	05CS
Size		01CS	03CS	04CS	05CS
Bore size	mm	ø12	ø16	ø20	ø25
Actuation		Double acting/single acting			
Working fluid		Compressed air			
Max. working pressure	MPa	0.7			
Min. working pressure	Double acting	0.15			
	Normally open	0.3			
	Normally closed				
Ambient temperature	°C	5 to 60			
Port size		M3		M5	
Operating stroke length	mm	5	9	11	15
Rod diameter	mm	ø6	ø8	ø10	ø12
Capacity of reciprocation	cm <sup>3</sup>	0.32	1.58	2.89	6.32
Repeatability	mm	±0.01			
Product weight	kg	0.118	0.165	0.238	0.455
Lubrication		Not available			

## How to order

Without switch

**BHG** - **01CS** - **O** - **P4**  
**P40**

With switch

**BHG** - **01CS** - **O** - **SW11** - **R** - **P4**  
**P40**

**A** Size

**B** Option  
\*1

**C** Switch model No.

**D** Switch quantity

## Compatibility table by variation

Applicable bore size		Double acting	Single acting Normally open	Single acting Normally closed
			O	C
ø12/16/ 20/25	P4	●	●	●
	P40	●	●	●

● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable

Code	Content
<b>A Size</b>	
01CS	
03CS	
04CS	
05CS	
<b>B Option</b>	
<b>Blank</b>	Standard (double acting)
<b>O</b>	Single acting (normally open)
<b>C</b>	Single acting (normally closed)
<b>Y1</b>	With attachment Material (S50C)
<b>Y2</b>	With attachment Material (MC nylon)
<b>C Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>D Switch quantity</b>	
<b>R</b>	1 on open side
<b>H</b>	1 on closed side
<b>D</b>	2

## ⚠ Precautions for model No. selection

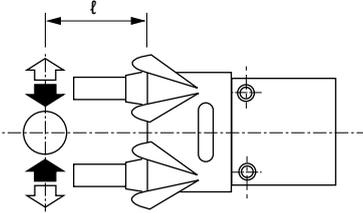
\*1: For option Y1 and Y2 attachments, two are included on delivery.

Hand/  
chuck

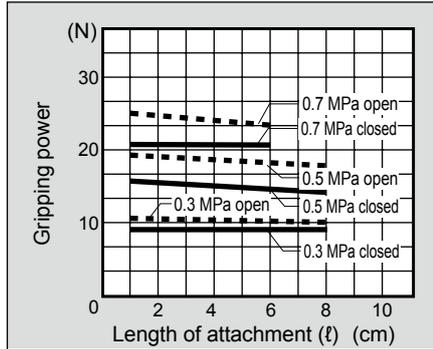
## Gripping power performance data

The gripping power in the opening/closing directions with attachment length  $\ell$  of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

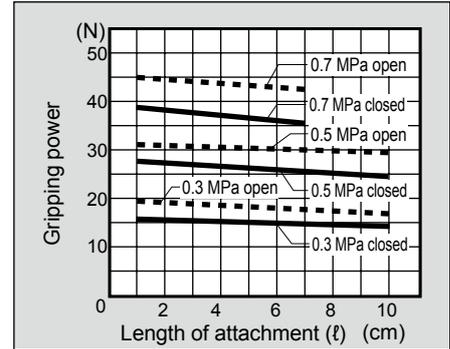
- Open direction (◁) ----- (shown with broken line)
- Closed direction (▸) ——— (shown with continuous line)



● BHG-01CS

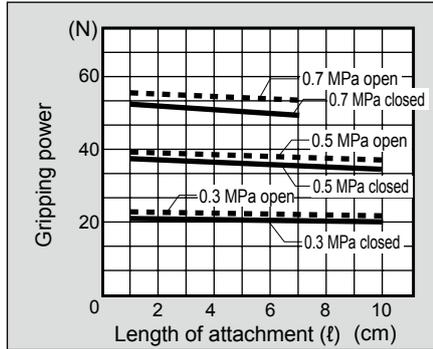


● BHG-03CS

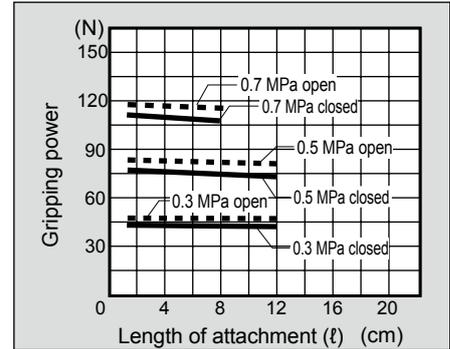


(Note) O type gripping power decreases approximately 20 to 30% in the closed direction compared to the double acting type.  
 C type gripping power decreases approximately 10 to 20% in the open direction compared to the double acting type.  
 When making a selection, read the precautions for design and selection on page 107.

● BHG-04CS



● BHG-05CS

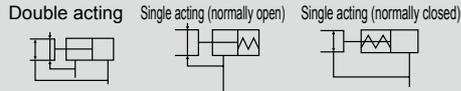




Cross roller parallel hand Double acting/single acting

# HKP Series

● Operating stroke length: 24, 30, 36, 40, 60 mm



**NEW**

## Specifications

Descriptions		HKP				
Size		32CS	40CS	50CS	63CS	80CS
Bore size	mm	ø32	ø40	ø50	ø63	ø80
Actuation		Double acting/single acting				Double acting
Working fluid		Compressed air				
Max. working pressure	MPa	0.7				
Min. working pressure Note	MPa	0.1				0.3
	Double acting					
	Normally open	0.3				-
	Normally closed					
Ambient temperature	°C	5 to 60				
Port size		M5	Rc1/8			Rc1/4
Operating stroke length	mm	24	30	36	40	60
Rod diameter	mm	ø16	ø20	ø28	ø32	ø16
Capacity of reciprocation	cm <sup>3</sup>	25.3	49.5	89.4	162.9	354.5
Repeatability	mm	±0.01				
Product weight	kg	1.36	1.95	4.2	5.4	10.6
Lubrication		Not available				

Note: When a rubber cover (option) is attached, the min. working pressure is 0.15 MPa for double acting and 0.35 MPa for normally open/normally closed.

## Compatibility table by variation

Applicable bore size		Double acting	Single acting Normally open	Single acting Normally closed	Rubber cover (nitrile rubber)
			O	C	G
ø32 to 80	P4	●	●	●	●
	P40	●	●	●	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

Without switch



With switch



A Size

B Option

C Switch model No.

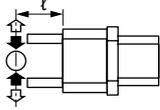
D Switch quantity

Code	Content					
<b>A Size</b>						
32CS						
40CS						
50CS						
63CS						
80CS						
<b>B Option</b>						
	Size	32CS	40CS	50CS	63CS	80CS
Blank	Standard (double acting)	●	●	●	●	●
O	Single acting (normally open)	●	●	●	●	□
C	Single acting (normally closed)	●	●	●	●	□
G	With rubber cover (nitrile rubber)	●	●	●	●	□
<b>C Switch model No.</b>						
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.						
<b>D Switch quantity</b>						
R	1 on open side					
H	1 on closed side					
D	2					

## Gripping power performance data

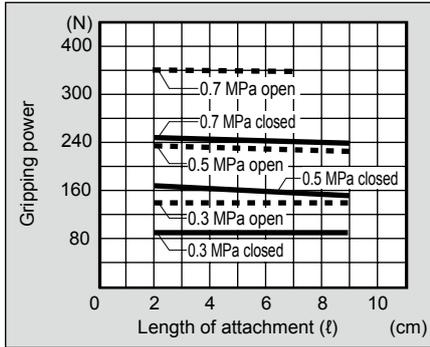
The gripping power in the opening/closing directions with attachment length  $\ell$  of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

- Open direction (←) ..... (shown with broken line)
- Closed direction (→) ——— (shown with continuous line)

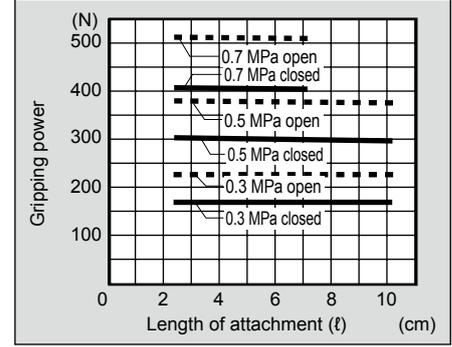


(Note) O type gripping power decreases approximately 20 to 30% in the closed direction compared to double acting.  
 C type gripping power decreases approximately 10 to 20% in the open direction compared to the double acting type.  
 When making a selection, read the precautions for design and selection on page 107.

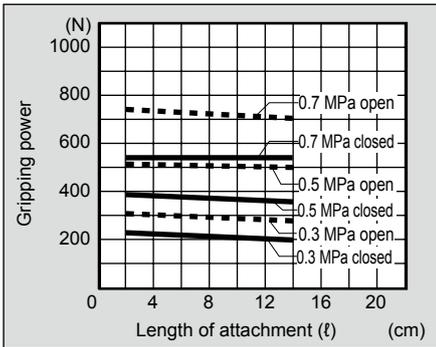
● HKP-32CS



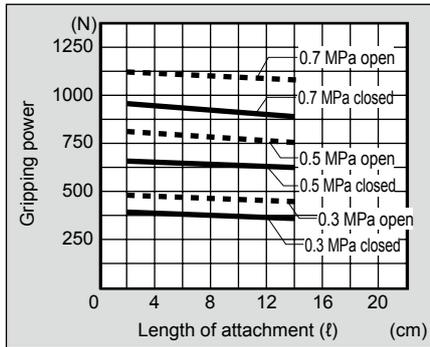
● HKP-40CS



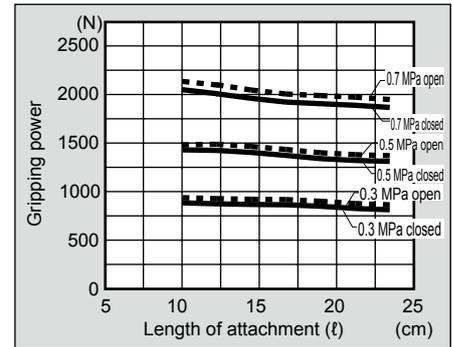
● HKP-50CS



● HKP-63CS



● HKP-80CS





Lateral parallel hand Double acting

# HCP Series

● Operating stroke length: 20, 30, 40 mm

Double acting



## Specifications

Descriptions	HCP		
	2CS	3CS	4CS
Size	2CS	3CS	4CS
Bore size mm	ø12	ø20	ø32
Actuation	Double acting		
Working fluid	Compressed air		
Max. working pressure MPa	0.7		
Min. working pressure MPa	0.3		
Ambient temperature °C	5 to 60		
Port size	M5		Rc1/8
Operating stroke length mm	20	30	40
Rod diameter mm	ø10	ø12	ø16
Capacity of reciprocation cm <sup>3</sup>	2.3	9.4	32.1
Repeatability mm	±0.05		
Product weight kg	0.52	0.98	1.90
Lubrication	Not available		

Hand/  
chuck

## Compatibility table by variation

Applicable bore size	Double acting	
	P4	P40
ø12/ 20/32	●	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

Without switch

HCP - 2CS - Y1 - P4/P40

With switch

HCP - 2CS - Y1 - SW11 - R - P4/P40

A Size

B Option  
\*1

C Switch model No.

D Switch quantity

Code	Content
<b>A Size</b>	
2CS	
3CS	
4CS	
<b>B Option</b>	
Blank	Standard (double acting)
Y1	With attachment Material (S50C)
Y2	With attachment Material (MC nylon)
<b>C Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>D Switch quantity</b>	
R	1 on open side
H	1 on closed side
D	2

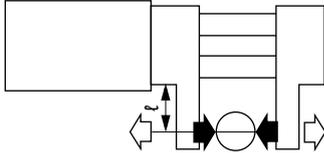
### ⚠ Precautions for model No. selection

\*1: For option Y1 and Y2 attachments, two are included on delivery.

## Gripping power performance data

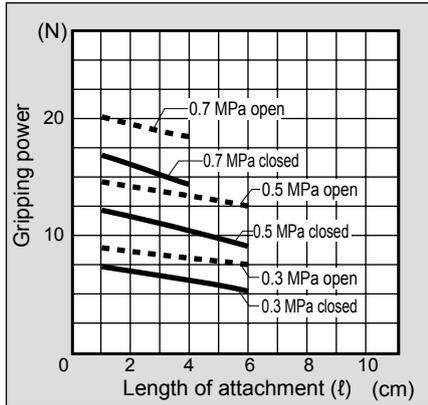
The gripping power in the opening/closing directions with attachment length  $\ell$  of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

- Open direction (↔) ---- (shown with broken line)
- Closed direction (→) ---- (shown with continuous line)

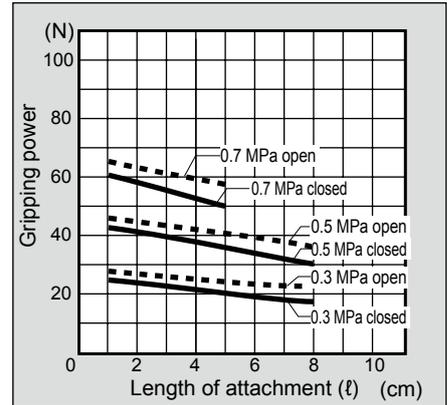


(Note) When making a selection, read the precautions for design and selection on page 107.

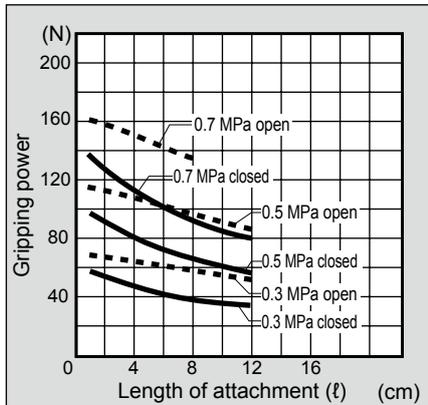
### ● HCP-2CS



### ● HCP-3CS



### ● HCP-4CS





Thin parallel hand with rubber cover (bearing guide) Double acting

# HLBG Series

● Operating stroke length: 13, 18, 23 mm

Double acting



## Specifications

Descriptions	HLBG-12CS	HLBG-15CS	HLBG-20CS
Bore size mm	ø12	ø15	ø20
Actuation	Double acting		
Working fluid	Compressed air		
Max. working pressure MPa	0.7		
Min. working pressure MPa	0.2		
Ambient temperature °C	5 to 60		
Port size	M5		
Operating stroke length mm	13	18	23
Capacity of reciprocation cm <sup>3</sup>	1.47	3.18	7.22
Repeatability mm	±0.01		
Product weight kg	0.24	0.42	0.75
Lubrication	Not available		

## Compatibility table by variation

Applicable bore size		Double acting
ø12/15/ 20	P4	●
	P40	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

With switch

**HLBG** - **12CS** - **SW51** - **R** - **P4 P40**

Model No.

**A** Size

**B** Switch model No.

**C** Switch quantity

Code	Content
<b>A Size</b>	
<b>12CS</b>	
<b>15CS</b>	
<b>20CS</b>	
<b>B Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>C Switch quantity</b>	
<b>R</b>	1 on open side
<b>H</b>	1 on closed side
<b>D</b>	2

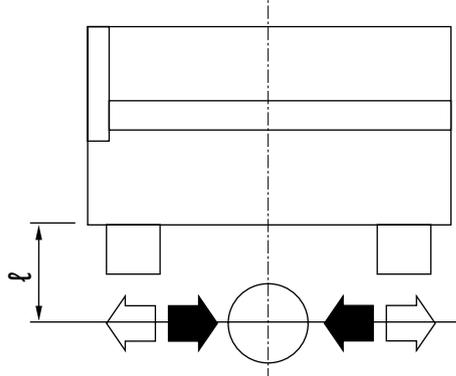
Hand/  
chuck

## Gripping power performance data

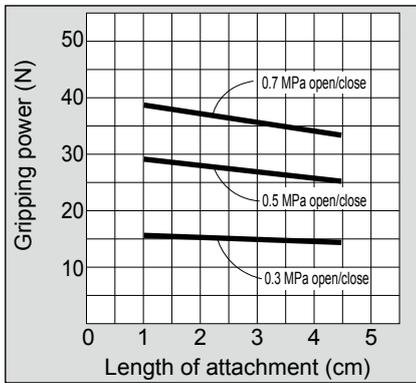
The gripping power in the opening/closing directions with attachment length  $l$  of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

- Both open direction (↔) and closed direction (←) (shown with continuous line)

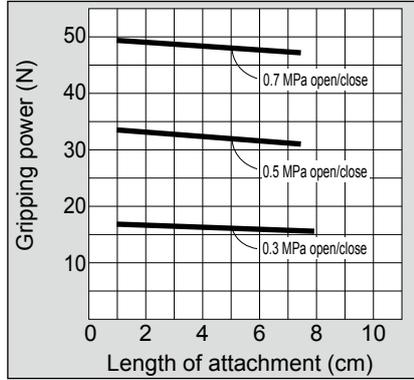
(Note) When making a selection, read the precautions for design and selection on page 107.



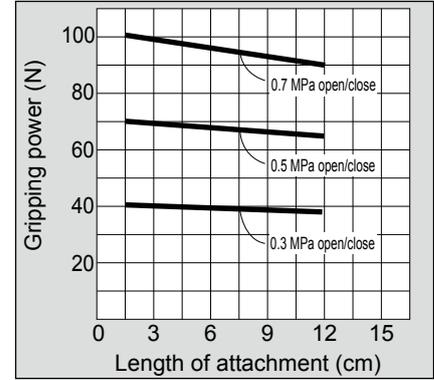
● HLBG-12CS



● HLBG-15CS



● HLBG-20CS





Compact wide parallel hand (standard/long stroke)

# HMF Series

- Operating stroke length: Standard 30, 40, 50, 70, 100 mm  
Long stroke: 60, 80, 100, 120, 160, 200 mm

Double acting



## Specifications

Descriptions	HMF-12CS	HMF-16CS			HMF-20CS			HMF-25CS			HMF-32CS			HMF-40CS		
		Standard	L1	L2	Standard	L1	L2	Standard	L1	L2	Standard	L1	L2	Standard	L1	L2
Bore size mm	ø12×2	ø16×2			ø20×2			ø25×2			ø32×2			ø40×2		
Working fluid	Compressed air															
Max. working pressure MPa	0.7															
Min. working pressure MPa	0.3															
Ambient temperature °C	5 to 60															
Port size	M5										Rc1/8					
Operating stroke length mm	20	30	60	80	40	80	100	50	100	120	70	120	160	100	160	200
Rod diameter mm	ø6	ø8			ø10			ø12			ø16			ø20		
Capacity of reciprocation cm <sup>3</sup>	3.4	9.1	18.1	24.1	18.8	37.6	47.0	37.7	75.4	90.5	84.4	145	193	226	301	377
Repeatability mm	±0.1															
Product weight kg	0.31	0.54	0.95	1.12	0.90	1.58	1.77	1.7	2.16	2.3	2.8	3.8	4.8	5.7	7.8	8.8
Lubrication	Not available															

Hand/  
chuck

## Compatibility table by variation

Applicable bore size		Double acting			
		Standard	Long stroke 1		Long stroke 2
			L1	L2	
ø12×2 to ø40×2	P4	●	●	●	
	P40	●	●	●	

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

**HMF - 32CS - L1 - SW11 - R - P4 P40**

Ⓐ Size

Ⓑ Option  
\*1

Ⓒ Switch model No.

Ⓓ Switch quantity

Code	Content
<b>Ⓐ Size</b>	
12CS	
16CS	
20CS	
25CS	
32CS	
40CS	
<b>Ⓑ Option</b>	
Blank	Standard
L1	Long stroke 1
L2	Long stroke 2
<b>Ⓒ Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>Ⓓ Switch quantity</b>	
R	1 on open side
H	1 on closed side
D	2

## ⚠ Precautions for model No. selection

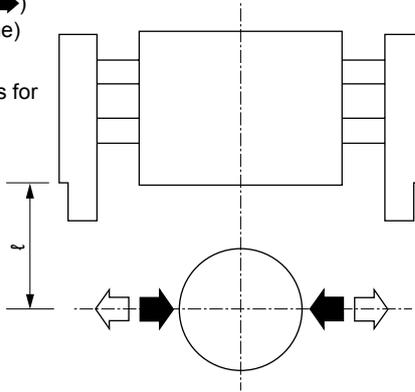
\*1: 12CS is not available for long stroke "L1", "L2".

## Gripping power performance data

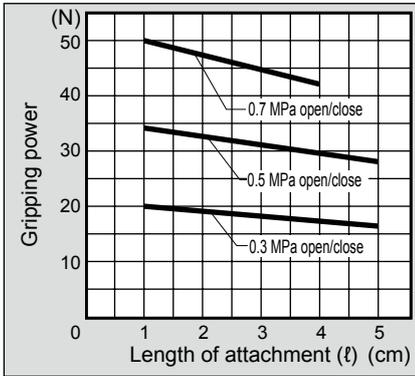
The gripping power with attachment length  $\ell$  of hand and a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

- Both open direction (◀) and closed direction (▶) — (shown with continuous line)

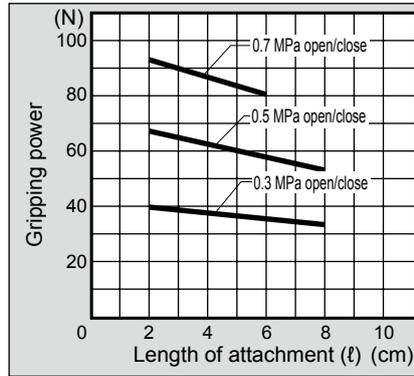
(Note) When making a selection, read the precautions for design and selection on page 107.



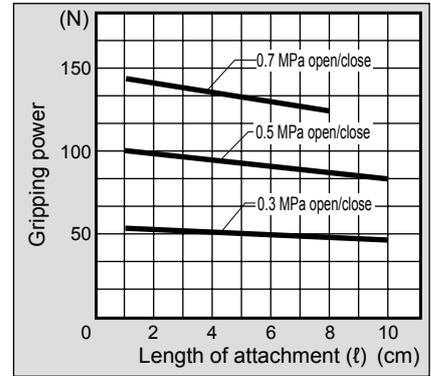
● HMF-12CS



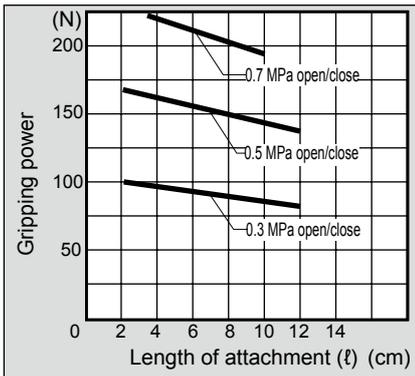
● HMF-16CS



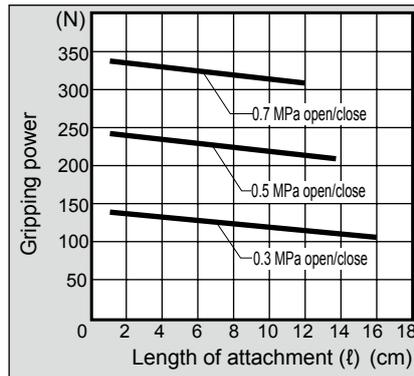
● HMF-20CS



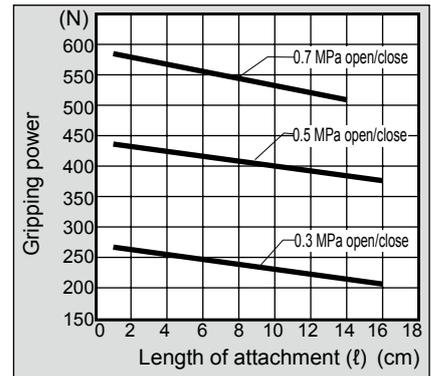
● HMF-25CS



● HMF-32CS



● HMF-40CS





Thin long stroke parallel hand Double acting  
(Standard/long stroke 1)

# HLC Series

- Operating stroke length: Standard 20, 30, 40, 50, 60, 70 mm  
Long stroke 1 60, 80, 100, 120, 140 mm

Double acting



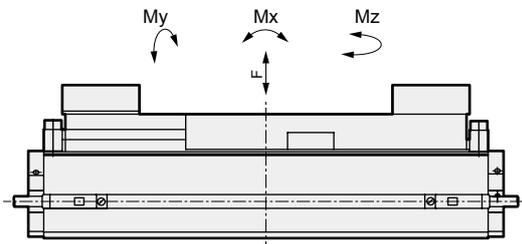
## Specifications

Descriptions	HLC											
	08CS		12CS		16CS		20CS		25CS		30CS	
Size	Standard		Standard	L1	Standard	L1	Standard	L1	Standard	L1	Standard	L1
Bore size mm	ø8×2		ø12×2		ø16×2		ø20×2		ø25×2		ø30×2	
Working fluid	Compressed air											
Max. working pressure MPa	0.7											
Min. working pressure MPa	0.2											
Ambient temperature °C	5 to 60											
Port size	M3						M5					
Operating stroke length mm	20	30	60	40	80	50	100	60	120	70	140	
Capacity of reciprocation cm <sup>3</sup>	2.0	6.8	13.6	16.1	32.2	31.4	62.8	58.9	117.8	99	198	
Repeatability: mm	±0.01						±0.03					
Product weight kg	0.14	0.29	0.44	0.71	0.85	1.03	1.4	1.62	2.23	2.74	3.69	
Lubrication	Not available											

Hand/  
chuck

## HLC allowable load and allowable moment (static)

Allowable load and allowable moment	F	Mx	Mz	My
Model No.	N	N·m	N·m	N·m
HLC-08CS	102	10	8.5	1.6
HLC-12CS	151	11.9	8.2	4.68
HLC-12CS-L1	151	11.9	8.2	4.68
HLC-16CS	325	27.5	25.6	7.96
HLC-16CS-L1	325	27.5	25.6	10.6
HLC-20CS	306	29.9	27	10.6
HLC-20CS-L1	306	29.9	27	11.2
HLC-25CS	423	105.1	96.4	19.7
HLC-25CS-L1	423	105.1	96.4	19.7
HLC-30CS	694	109.3	116.5	33.3
HLC-30CS-L1	694	109.3	116.5	43.1



## Compatibility table by variation

Applicable bore size	Double acting	
	P4	P40
ø8×2 to ø30×2	●	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

**HLC** - **20CS** - **L1** - **SW11** - **R** - **P4 P40**

Ⓐ Size

Ⓑ Option  
\*1

Ⓒ Switch model No.

Ⓓ Switch quantity

Code	Content						
<b>Ⓐ Size</b>							
<b>08CS</b>							
<b>12CS</b>							
<b>16CS</b>							
<b>20CS</b>							
<b>25CS</b>							
<b>30CS</b>							
<b>Ⓑ Option</b>							
	<b>Size</b>	<b>08CS</b>	<b>12CS</b>	<b>16CS</b>	<b>20CS</b>	<b>25CS</b>	<b>30CS</b>
<b>Blank</b>	Standard	●	●	●	●	●	●
<b>L1</b>	Long stroke 1	□	●	●	●	●	●
<b>Ⓒ Switch model No.</b>							
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.							
<b>Ⓓ Switch quantity</b>							
<b>R</b>	1 on open side						
<b>H</b>	1 on closed side						
<b>D</b>	2						

## ⚠ Precautions for model No. selection

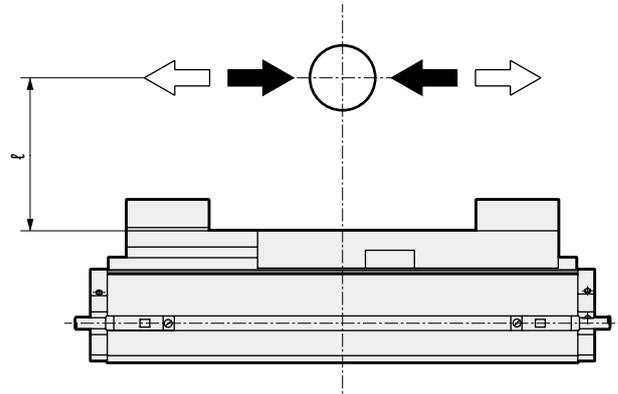
\*1: 08CS is not available for long stroke "L1", "L2".

### Gripping power performance data

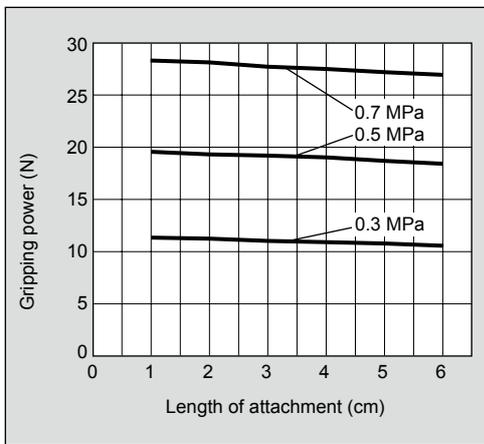
The gripping power with attachment length  $l$  of hand and a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

- Both open direction (⇐) and closed direction (⇒) (shown with continuous line)

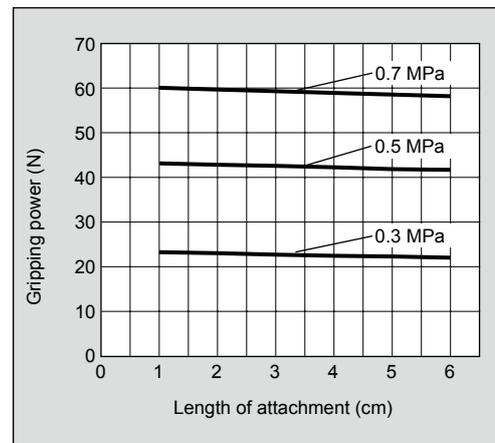
(Note) When making a selection, read the precautions for design and selection on page 107.



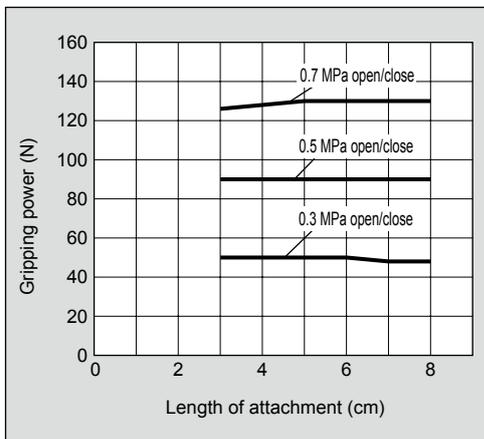
#### ● HLC-08CS



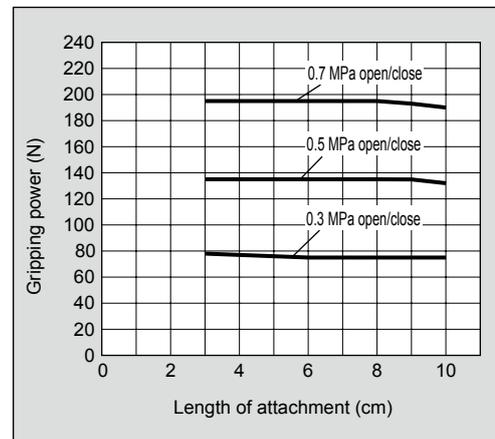
#### ● HLC-12CS



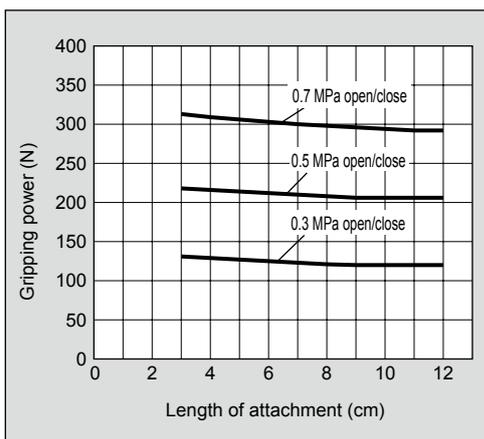
#### ● HLC-16CS



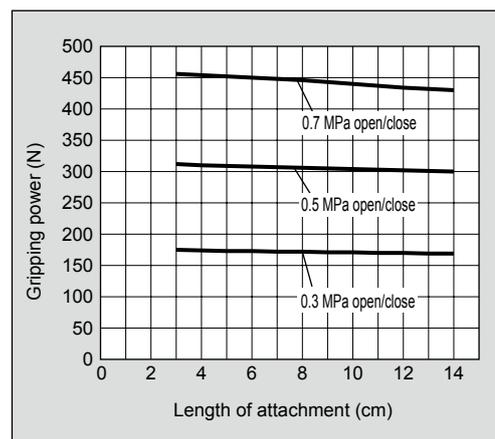
#### ● HLC-20CS



#### ● HLC-25CS



#### ● HLC-30CS



Hand/  
chuck



Ultra thin parallel hand

# HLD Series

● Operating stroke length: ø12, 16, 20, 30 mm



## Specifications

Descriptions	HLD			
	08CS	12CS	16CS	20CS
Size	08CS	12CS	16CS	20CS
Bore size mm	ø8×4	ø12×4	ø16×4	ø20×4
Working fluid	Compressed air			
Max. working pressure MPa	0.7			
Min. working pressure MPa	0.2			
Ambient temperature °C	5 to 60			
Port size	M3		M5	
Operating stroke length mm	12	16	20	30
Capacity of reciprocation cm <sup>3</sup>	3.2	7.8	19.8	43.3
Repeatability: mm	±0.01			
Product weight kg	0.23	0.29	0.62	1.05
Lubrication	Not available			

## Compatibility table by variation

Applicable bore size	Double acting		
		●	○
ø8×4 to ø20×4	P4	●	
	P40	●	

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

**HLD** - **08CS** - **SW11** - **R** - **P4**  
**P40**

Ⓐ Size

Ⓑ Switch model No.

Ⓒ Switch quantity

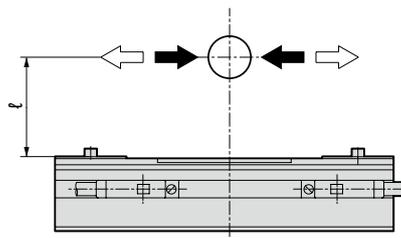
Code	Content
<b>Ⓐ Size</b>	
<b>08CS</b>	
<b>12CS</b>	
<b>16CS</b>	
<b>20CS</b>	
<b>Ⓑ Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>Ⓒ Switch quantity</b>	
<b>R</b>	1 on open side
<b>H</b>	1 on closed side
<b>D</b>	2

### Gripping power performance data

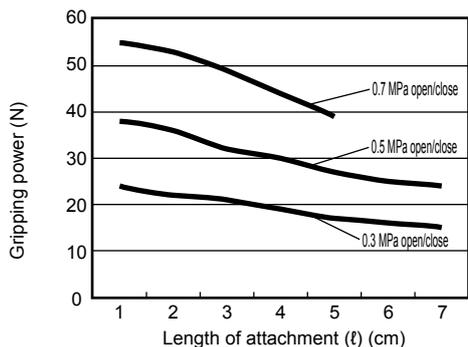
The gripping power with attachment length  $l$  of hand and a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

- Both open direction (◁) and closed direction (▷) (shown with continuous line)

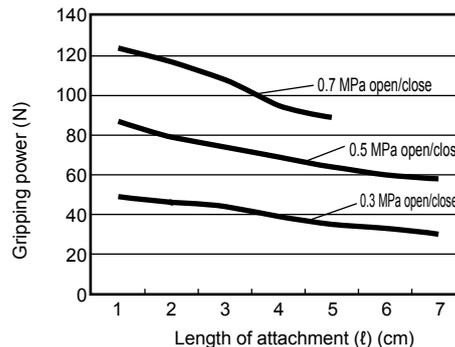
(Note) When making a selection, read the precautions for design and selection on page 107.



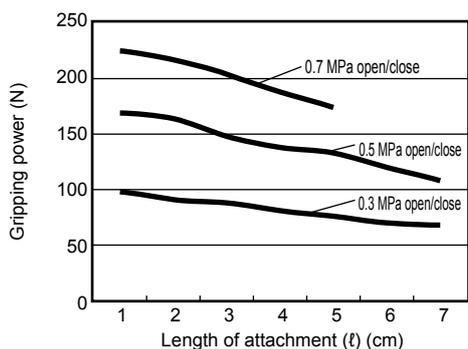
#### ● HLD-08CS



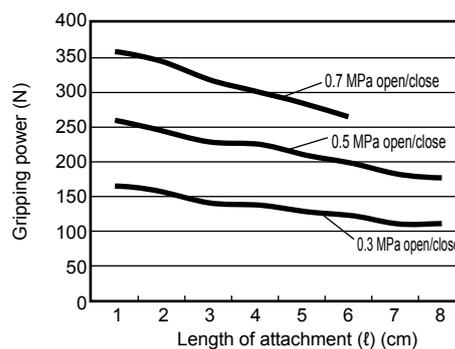
#### ● HLD-12CS



#### ● HLD-16CS



#### ● HLD-20CS



Hand/  
chuck



# Thin wide angle hand HMD Series

● Open/close angle: -4° to 184°

Double acting



## Specifications

Descriptions	HMD	
	16CS	25CS
Size	16CS	25CS
Bore size mm	ø16	ø25
Actuation	Double acting	
Working fluid	Compressed air	
Max. working pressure MPa	0.7	
Min. working pressure MPa	0.3	
Ambient temperature °C	5 to 60	
Port size	M3	M5
Open/close angle °	-4 to 184	
Rod diameter mm	ø6	ø8
Capacity of reciprocation cm <sup>3</sup>	5.8	19.4
Repeatability mm	±0.2	
Product weight kg	0.13	0.38
Lubrication	Not available	

## Compatibility table by variation

Applicable bore size		Double acting	
		P4	Standard
ø16/25	P4	●	●
	P40	●	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

Without switch

HMD - 16CS - P4 P40

With switch

HMD - 16CS - SW11 - R - P4 P40

Model No.

Ⓐ Size

Ⓑ Switch model No.

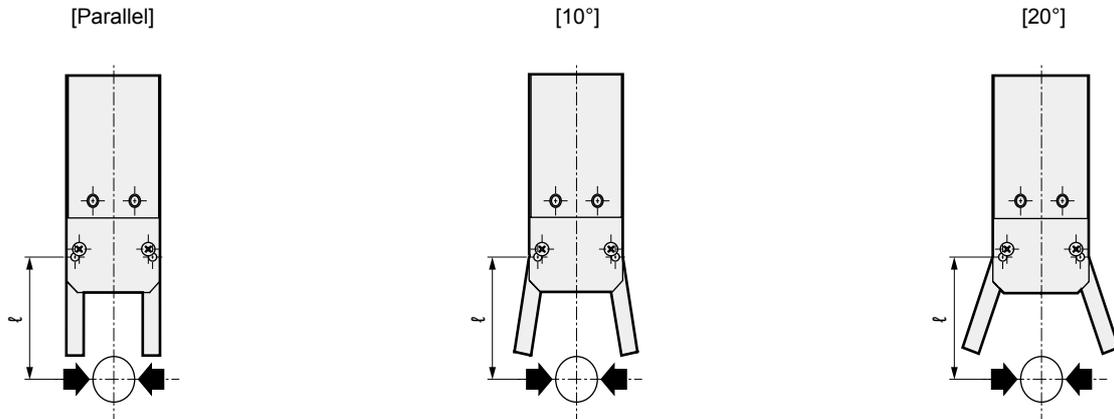
Ⓒ Switch quantity

Code	Content
<b>Ⓐ Size</b>	
16CS	
25CS	
<b>Ⓑ Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>Ⓒ Switch quantity</b>	
R	1 on open side
H	1 on closed side
D	2

### Gripping power performance data

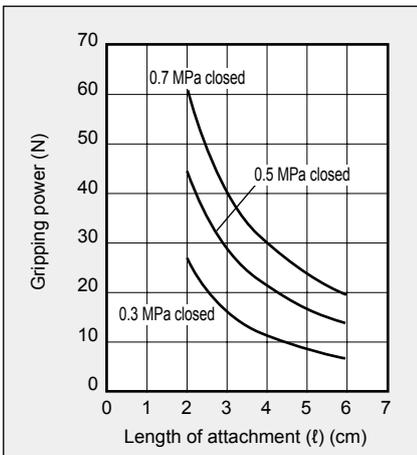
The gripping power with attachment length  $l$  of hand and a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

· Closed direction (➡) (shown with continuous line)

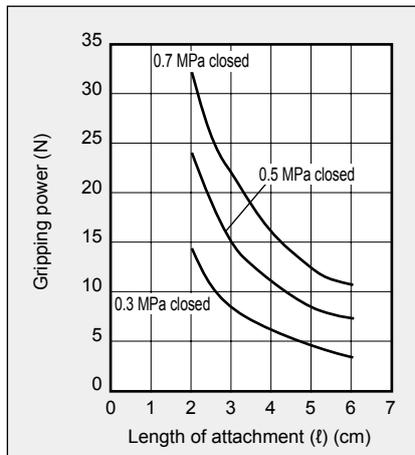


(Note) When making a selection, read the precautions for design and selection on page 107.

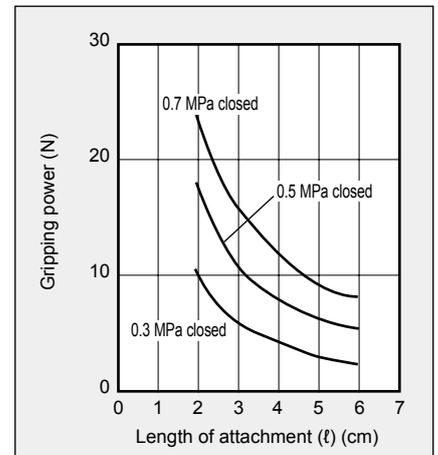
● HMD-16CS



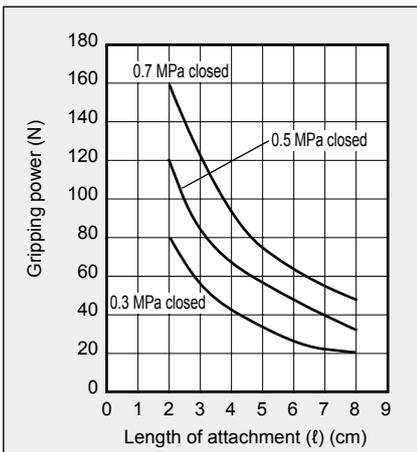
● HMD-16CS



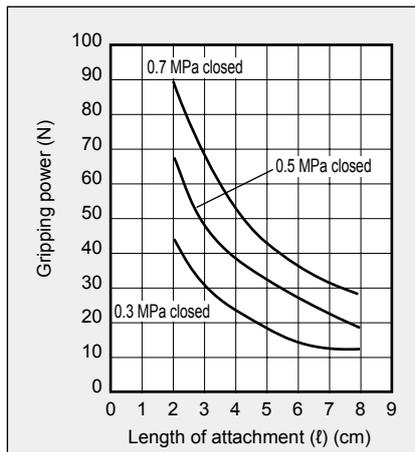
● HMD-16CS



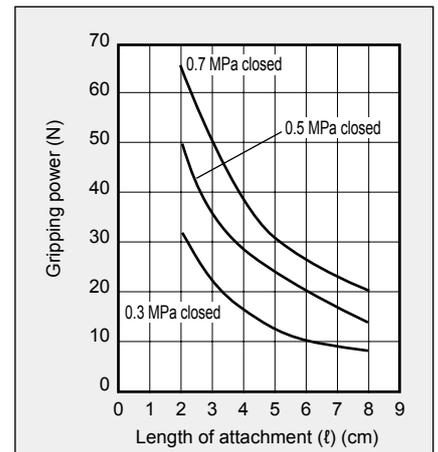
● HMD-25CS



● HMD-25CS



● HMD-25CS





Centering hand

# BHE Series

● Operating stroke length: 7, 10, 14, 16, 22 mm

Double acting



## Specifications

Descriptions	BHE-01CS	BHE-03CS	BHE-04CS	BHE-05CS	BHE-06CS
Bore size mm	ø12	ø16	ø20	ø25	ø32
Working fluid	Compressed air				
Max. working pressure MPa	0.7				
Min. working pressure MPa	0.2				
Ambient temperature °C	5 to 60				
Port size	M3			M5	
Operating stroke length mm	7	10	14	16	22
Rod diameter mm	ø6	ø8	ø10	ø12	ø16
Repeatability mm	±0.01				
Centering precision mm	±0.05				
Product weight kg	0.108	0.154	0.260	0.438	1.040
Lubrication	Not available				

## Compatibility table by variation

Applicable bore size		Double acting			
		Standard	Open stroke adjustment mechanism	Close stroke adjustment mechanism	Open and close stroke adjustment mechanism
			D	E	DE
ø12 to 32	P4	●	●	●	●
	P40	●	●	●	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

**BHE** - **03CS** - **D** - **SW11** - **R** - **P4**  
**P40**

**A** Size

**B** Option

**C** Switch model No.

**D** Switch quantity

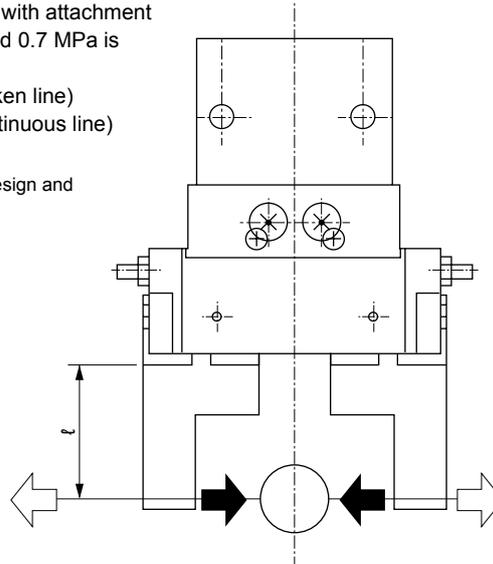
Code	Content
<b>A Size</b>	
01CS	
03CS	
04CS	
05CS	
06CS	
<b>B Option</b>	
Blank	Standard
D	Open stroke adjustment mechanism
E	Close stroke adjustment mechanism
DE	Open and close stroke adjustment mechanism
<b>C Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>D Switch quantity</b>	
R	1 on open side
H	1 on closed side
D	2

### Gripping power performance data

The gripping power in the opening/closing directions with attachment length  $l$  of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

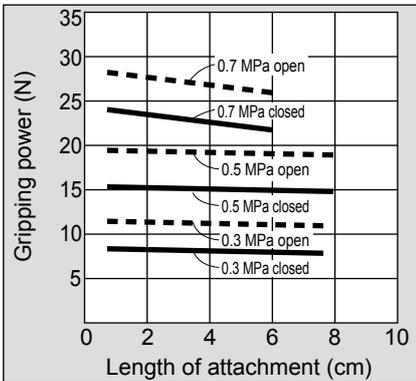
- Open direction (←) - - - - - (shown with broken line)
- Closed direction (→) ——— (shown with continuous line)

(Note) When making a selection, read the precautions for design and selection on page 107.

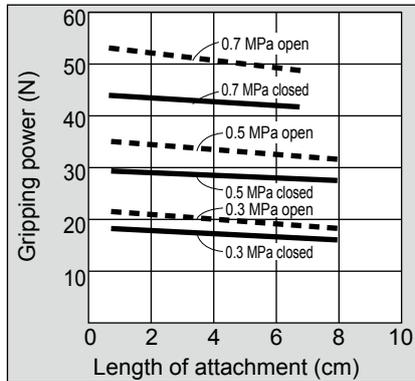


Hand/  
chuck

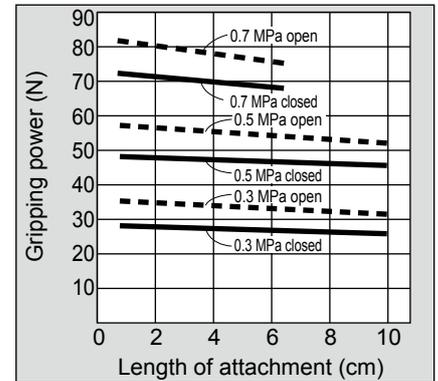
● BHE-01CS



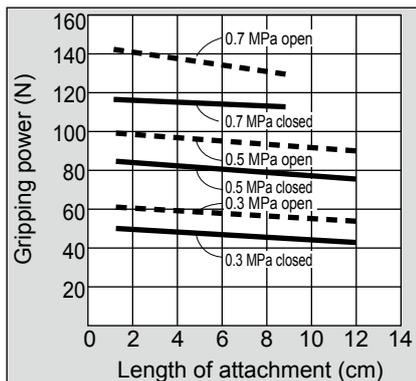
● BHE-03CS



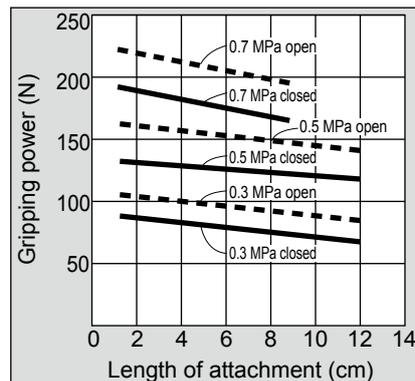
● BHE-04CS



● BHE-05CS



● BHE-06CS

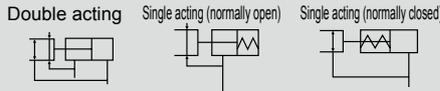




3-way finger bearing chuck Double acting/single acting

# CKG Series

● Operating stroke length: 6, 8, 11, 16 mm



## Specifications

Descriptions		CKG				
Size		16CS	25CS	32CS	40CS	50CS
Bore size	mm	ø16	ø25	ø32	ø40	ø50
Actuation		Double acting/single acting				
Working fluid		Compressed air				
Max. working pressure	MPa	0.7				
Min. working pressure <sup>Note</sup>	Double acting	0.1				
	Normally open	0.3				
	Normally closed					
Ambient temperature	°C	5 to 60				
Port size		M5				
Operating stroke length	mm	6		8	11	16
Rod diameter	mm	ø9	ø10	ø14	ø18	ø20
Capacity of reciprocation	cm <sup>3</sup>	1.0	2.2	5.1	10.1	36.1
Repeatability	mm	±0.01				
Product weight	kg	0.24	0.47	0.80	1.4	2.3
Lubrication		Not available				

Note: When a rubber cover (option) is attached, the min. working pressure is 0.2 MPa for 16CS and 0.15 MPa for 25CS to 50CS.

## How to order

Without switch



With switch



**A** Size

**B** Option  
\*1, \*2

## Compatibility table by variation

Applicable bore size		Double acting	Single acting Normally open	Single acting Normally closed
			O	C
ø16/25/ 32/40/50	P4	●	●	●
	P40	●	●	●

● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable

## ⚠ Precautions for model No. selection

\*1: Y11 and Y21 are available for CKG-16CS, while Y11, Y12, Y21 and Y22 are available for CKG-25CS to 40CS, and Y11 and Y21 are available for CKG-50CS.

\*2: For option Y11, Y12, Y21 and Y22 attachments, three are attached on delivery.

**C** Switch model No.

**D** Switch quantity

Code	Content
<b>A Size</b>	
16CS	
25CS	
32CS	
40CS	
50CS	

<b>B Option</b>	
<b>Blank</b>	Standard (double acting)
<b>O</b>	Single acting (normally open)
<b>C</b>	Single acting (normally closed)
<b>G</b>	With rubber cover (nitrile rubber)
<b>Y11</b>	With attachment Material (S50C) External chuck (Attachment No.: 540 to 710)
<b>Y12</b>	With attachment Material (S50C) Internal chuck (Attachment No.: 610 to 630)
<b>Y21</b>	With attachment Material (MC nylon) External chuck (Attachment No.: 510 to 540, 710)
<b>Y22</b>	With attachment Material (MC nylon) Internal chuck (Attachment No.: 610 to 630)

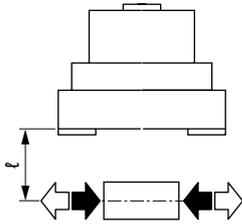
<b>C Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	

<b>D Switch quantity</b>	
<b>R</b>	1 on open side
<b>H</b>	1 on closed side
<b>D</b>	2

### Gripping power performance data

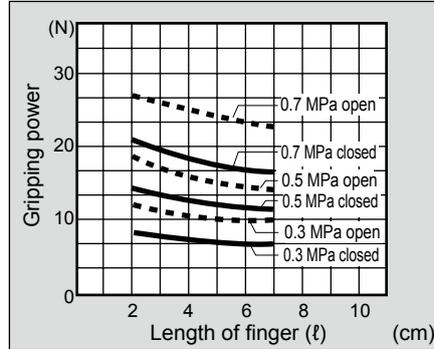
The gripping power in the opening/closing directions with finger length  $\ell$  of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

- Open direction (↔) ----- (shown with broken line)
- Closed direction (➡) ————— (shown with continuous line)

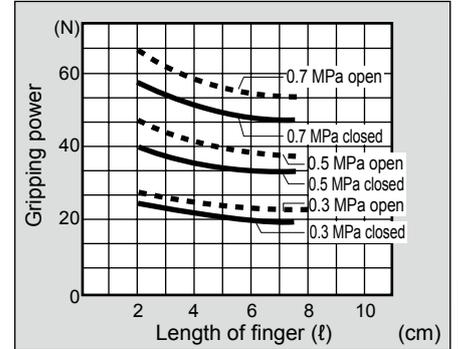


(Note) O type gripping power decreases approximately 20 to 30% in the closed direction compared to the double acting type. C type gripping power decreases approximately 10 to 20% in the open direction compared to the double acting type. When making a selection, read the precautions for design and selection on page 107.

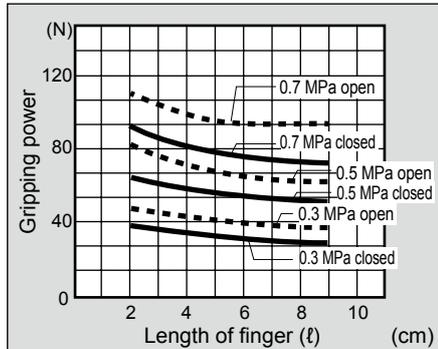
● CKG-16CS



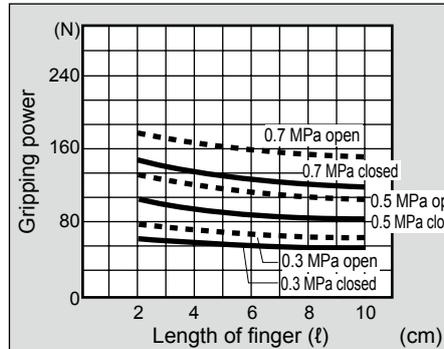
● CKG-25CS



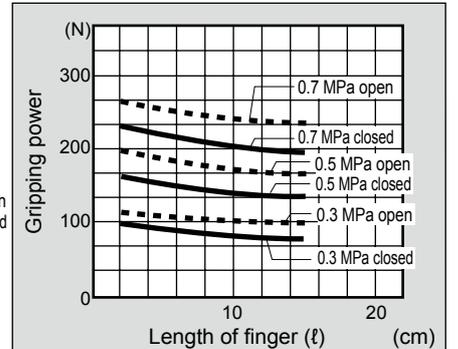
● CKG-32CS



● CKG-40CS



● CKG-50CS

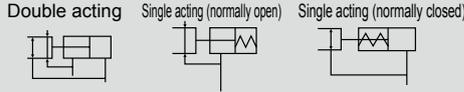


Hand/  
chuck



# Powerful chuck CKL2 Series

● Operating stroke length: 5, 6, 8, 10, 12, 16, 20, 23 mm

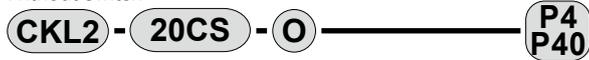


## Specifications

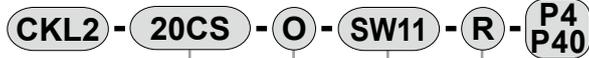
Descriptions	CKL2							
Size	20CS	25CS	32CS	40CS	50CS	63CS	80CS	100CS
Bore size mm	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
Working fluid	Compressed air							
Max. working pressure MPa	0.7							
Min. working pressure MPa	0.3							
Ambient temperature °C	5 to 60							
Port size	M5					Rc1/8		
Operating stroke length mm	5	6	8	10	12	16	20	23
Rod diameter mm	ø6	ø8	ø10	ø12	ø14	ø16		ø20
Capacity of reciprocation cm <sup>3</sup>	1.8	3.3	7.7	15.6	28.3	60.3	118.2	215.5
Repeatability mm	±0.01							
Product weight kg	0.12	0.19	0.26	0.38	0.59	1.02	2.02	3.45
Lubrication	Not available							

## How to order

Without switch



With switch



A Size

B Option  
\*1, \*2

C Switch model No.  
\*3

D Switch quantity

Code	Content
<b>A Size</b>	
20CS	
25CS	
32CS	
40CS	
50CS	
63CS	
80CS	
100CS	
<b>B Option</b>	
Blank	Standard (double acting)
O	Single acting (normally open)
C	Single acting (normally closed)
Y1	With attachment Material (S50C)
Y2	With attachment Material (MC nylon)
<b>C Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>D Switch quantity</b>	
R	1 on open side
H	1 on closed side
D	2

## Compatibility table by variation

Applicable bore size		Double acting	Single acting Normally open	Single acting Normally closed
			O	C
ø20/25/ 32/40/50/ 63/80/100	P4	●	●	●
	P40	●	●	●

● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable

## ⚠ Precautions for model No. selection

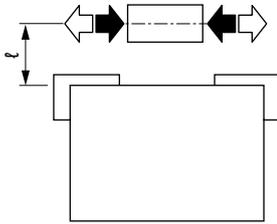
\*1: Attachment is commonly used for internal and external diameter chuck.

\*2: For option Y1 and Y2 attachments, three are attached on delivery.

### Gripping power performance data

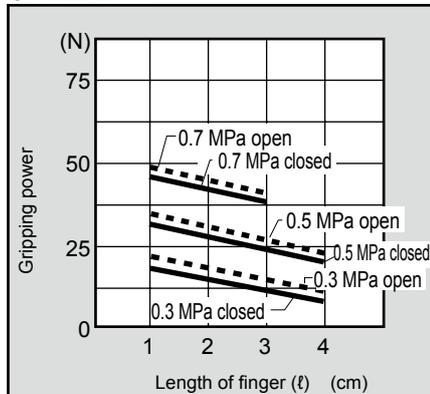
The gripping power in the opening/closing directions with finger length  $l$  of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

- Open direction (←) - - - - (shown with broken line)
- Closed direction (→) ——— (shown with continuous line)

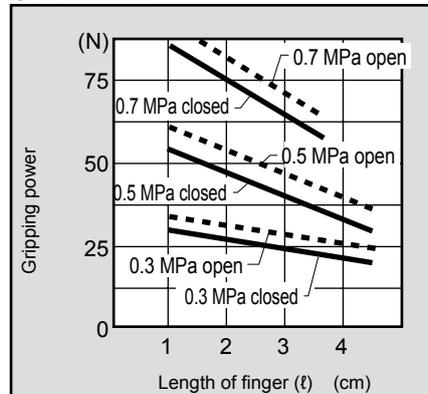


(Note) O type gripping power decreases approximately 20 to 30% in the closed direction compared to the double acting type.  
 C type gripping power decreases approximately 10 to 20% in the open direction compared to the double acting type.  
 When making a selection, read the precautions for design and selection on page 107.

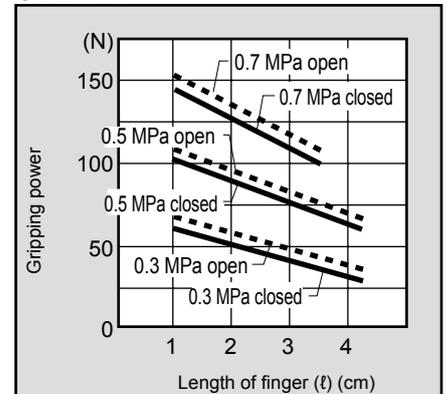
● CKL2-20CS



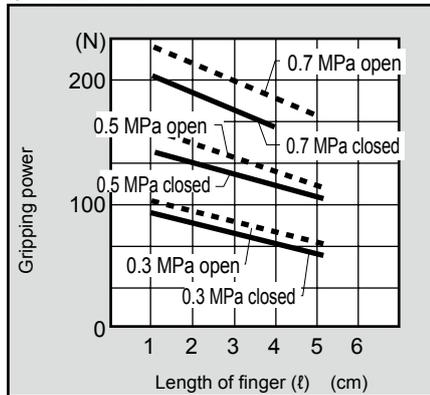
● CKL2-25CS



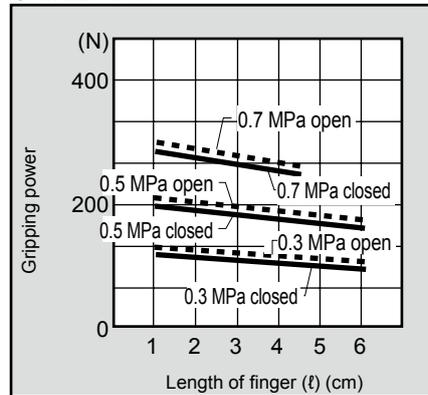
● CKL2-32CS



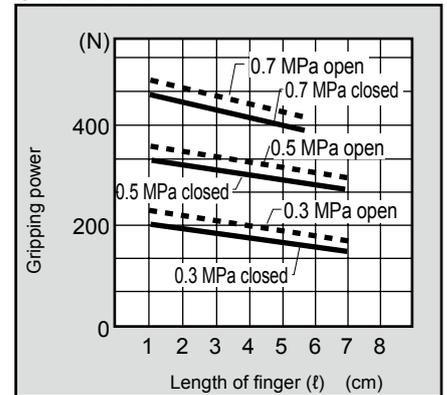
● CKL2-40CS



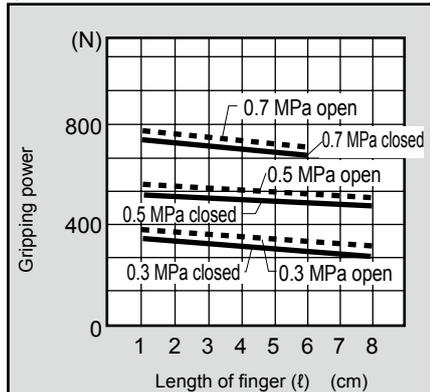
● CKL2-50CS



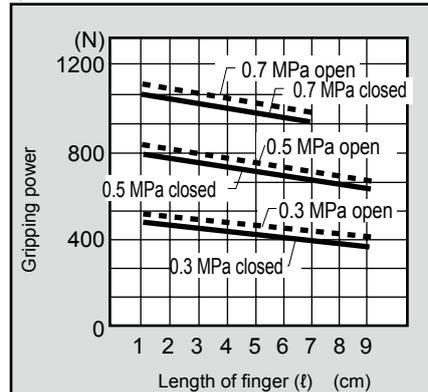
● CKL2-63CS



● CKL2-80CS



● CKL2-100CS



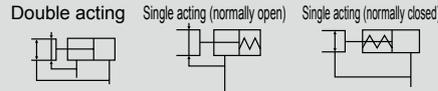
Hand/  
chuck



2-way powerful chuck

# CKLB2 Series

● Operating stroke length: 5, 6, 8, 10, 12, 16, 20, 23 mm



## Specifications

Descriptions	CKLB2-20CS	CKLB2-25CS	CKLB2-32CS	CKLB2-40CS	CKLB2-50CS	CKLB2-63CS	CKLB2-80CS	CKLB2-100CS
Bore size mm	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
Working fluid	Compressed air							
Max. working pressure MPa	0.7							
Min. working pressure MPa	0.3							
Ambient temperature °C	5 to 60							
Port size	M5						Rc1/8	
Operating stroke length mm	5	6	8	10	12	16	20	23
Rod diameter mm	ø6	ø8	ø10	ø12	ø14	ø16	ø16	ø20
Capacity of reciprocation cm <sup>3</sup>	1.8	3.3	7.7	15.6	28.3	60.3	118.2	215.5
Repeatability mm	±0.01							
Product weight kg	0.13	0.20	0.32	0.38	0.58	1.00	2.00	3.53
Lubrication	Not available							

## How to order

**CKLB2** - **20CS** - **O** - **SW11** - **R** - **P4 P40**

**A** Size

**B** Option  
\*1, \*2

**C** Switch model No.

**D** Switch quantity

Code	Content
<b>A Size</b>	
20CS	
25CS	
32CS	
40CS	
50CS	
63CS	
80CS	
100CS	
<b>B Option</b>	
Blank	Standard (double acting)
O	Single acting (normally open)
C	Single acting (normally closed)
Y1	With attachment Material: S45C
Y2	With attachment Material: MC nylon
<b>C Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>D Switch quantity</b>	
R	1 on open side
H	1 on closed side
D	2

## Compatibility table by variation

Applicable bore size		Double acting	Single acting Normally open	Single acting Normally closed
			O	C
ø20/25/ 32/40/50/ 63/80/100	P4	●	●	●
	P40	●	●	●

● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable

## ⚠ Precautions for model No. selection

\*1: Attachment is commonly used for internal and external diameter chuck.

\*2: For option Y1 and Y2 attachments, two are attached on delivery.

### Gripping power performance data

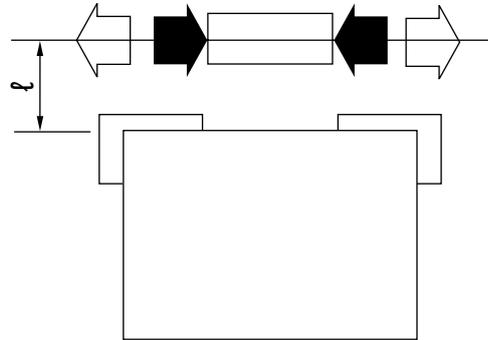
The gripping power in the opening/closing directions with finger length  $l$  of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

- Open direction (←) ----- (shown with broken line)
- Closed direction (→) ————— (shown with continuous line)

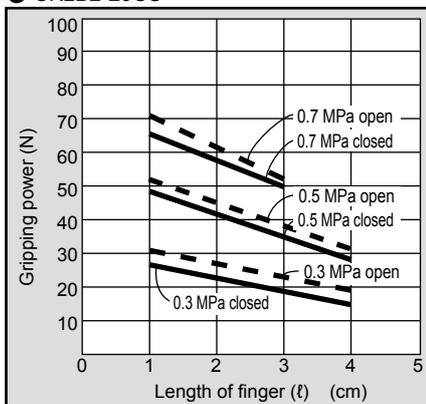
(Note) O type gripping power decreases approximately 20 to 30% in the closed direction compared to the double acting type.

C type gripping power decreases approximately 10 to 20% in the open direction compared to the double acting type.

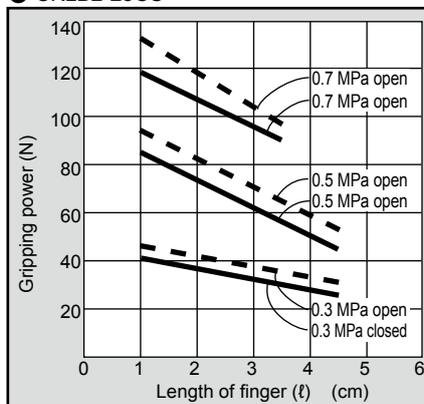
When making a selection, read the precautions for design and selection on page 107.



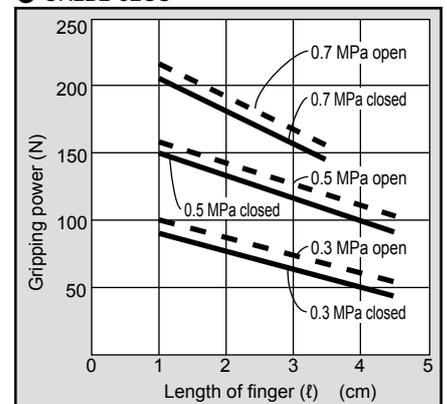
● CKLB2-20CS



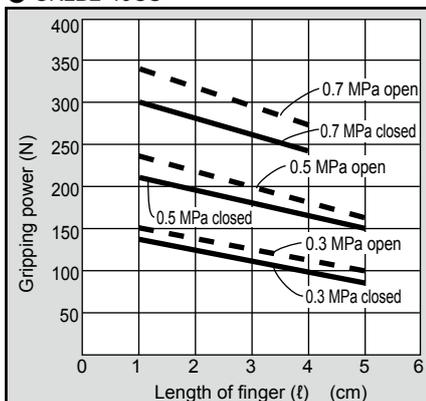
● CKLB2-25CS



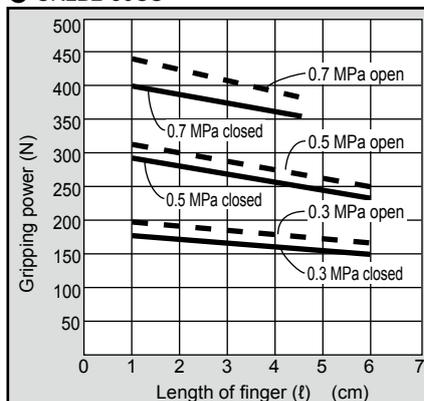
● CKLB2-32CS



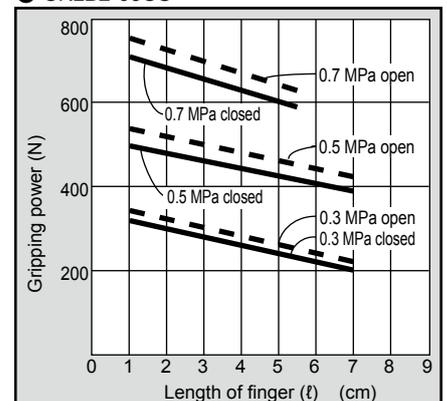
● CKLB2-40CS



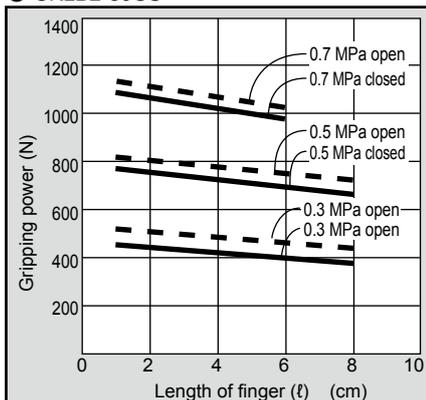
● CKLB2-50CS



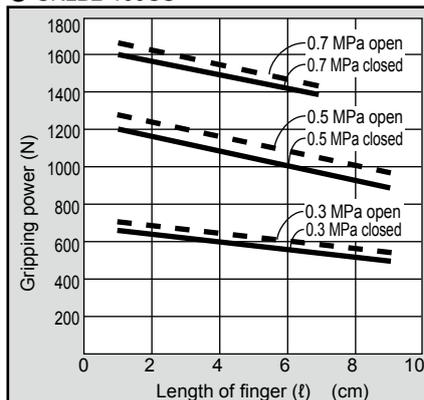
● CKLB2-63CS



● CKLB2-80CS



● CKLB2-100CS



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**MEMO**

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MEMO

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Hand/  
druck



# Safety Precautions

Be sure to read this section before use.

Refer to General Catalog for general information of the cylinder and the cylinder switch.

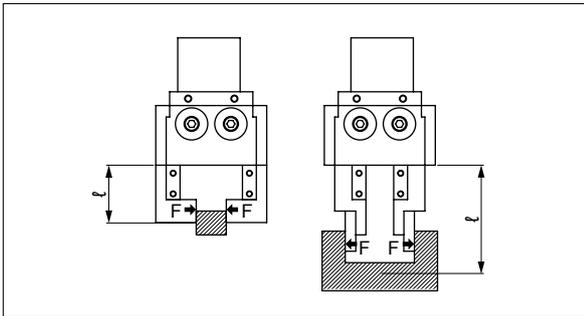
## Product-specific cautions: Hand Series

### Design/selection

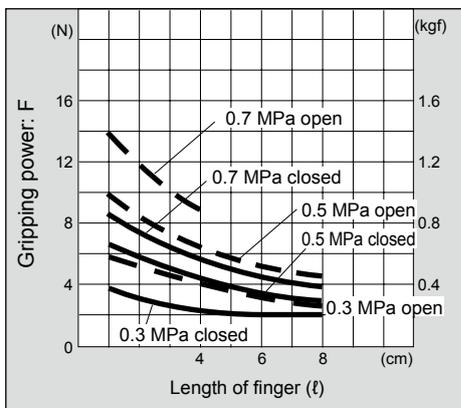
#### Hand/chuck

##### ■ Precautions for gripping power

- Gripping power represents the force holding the workpiece, as shown in the figure below.



- Performance data indicates the gripping power at hand finger length  $l$  at a supply pressure of 0.15 to 0.7 MPa.



- To find the gripping power from performance data, if the distance from the attachment to the workpiece center of gravity when manufactured is  $l$ , gripping power  $F$  is  
When  $l = l_1$   $F = F_1$   
When  $l = l_2$   $F = F_2$  Refer to the upper right figure is expressed as above.

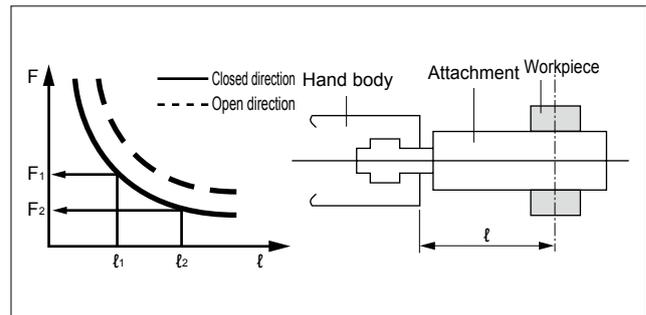
- When mounting an L-shaped finger, select length as shown below.  
Example: If the L-shape is 30 mm in the master key direction and 30 mm at a 90° angle, assume the attachment length is 60 mm.
- Length of finger should be within the numerical value given in the gripping power performance data table of each model.
- Max. working length of finger should be within the performance data.  
When transferring workpiece (weight  $W_L$ ), the reference is as below.

$$W_L \times 9.8 \times 5 < (F \times N) \text{ [holding only]}$$

$$W_L \times 9.8 \times 10 < (F \times N) \text{ [normal transport]}$$

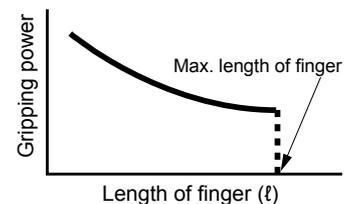
$$W_L \times 9.8 \times 20 < (F \times N) \text{ [sudden accelerated transport]}$$

$W_L$  : Weight of workpiece [kg]  
 $F$  : Gripping power [N]  
 $N$  : Number of fingers [pcs.]



- Use attachments as short and lightweight as possible. If the attachment is long and heavy, inertia increases when opening and closing. This may cause play in the master key, and adversely affect durability.

- Length of attachment should be within the numerical values of performance data.
- The weight of the attachment affects durability, so check that the weight is less than the following value:  
 $W < 1/4H$  (1 pc.)  
 $W$ : Weight of attachment  
 $H$ : Product weight of Hand





Hybrid robot  
Single axis unit

# HRL-1 Series

● Load capacity: 5, 10, 15, 25, 50, 65 kg



## Specifications

Descriptions		HRL-1□-05	HRL-1□-10	HRL-1□-15	HRL-1□-15H	HRL-1□-25	HRL-1□-50	HRL-1□-65
Load capacity (vertical) *1 kg		5	10	15		25	50	65
Basic cylinder		SCM-00-20D	SCM-00-25D	SCM-00-32D		SCM-00-40D	SCM-00-50D	SCM-00-63B
Bore size	mm	20	25	32		40	50	63
Guide rod diameter	mm	13	13	16	20	20	25	30
Speed	mm/s	50 to 500						
Working pressure	MPa	0.3 to 0.7						
Adjustable stroke range *2 mm		0 to -10 mm (push side)						
Shock absorber *3		NCK-00-0.7-P4		NCK-00-1.2-P4		NCK-00-12-P4		
Product weight	Basic	2 + (0.0033 × stroke length)	2.1 + (0.0037 × stroke length)	2.8 + (0.0051 × stroke length)	2.9 + (0.0069 × stroke length)	10.8 + (0.0081 × stroke length)	11.9 + (0.0122 × stroke length)	13.3 + (0.02 × stroke length)
	Long body	2.3 + (0.0033 × stroke length)	2.4 + (0.0037 × stroke length)	3.1 + (0.0051 × stroke length)	3.2 + (0.0069 × stroke length)	12.5 + (0.0081 × stroke length)	13.6 + (0.0122 × stroke length)	15 + (0.02 × stroke length)
Movable part weight	Basic	0.9 + (0.0025 × stroke length)	0.9 + (0.0027 × stroke length)	1.3 + (0.0041 × stroke length)	1.6 + (0.0059 × stroke length)	4.1 + (0.0066 × stroke length)	5.2 + (0.0102 × stroke length)	6.1 + (0.0137 × stroke length)
	Long body	1.0 + (0.0025 × stroke length)	1.0 + (0.0027 × stroke length)	1.5 + (0.0041 × stroke length)	1.8 + (0.0059 × stroke length)	4.4 + (0.0066 × stroke length)	5.7 + (0.0102 × stroke length)	6.8 + (0.0137 × stroke length)
Speed controller *4		SC3W-6-6-P4				SC3W-6-8-P4	SC3W-8-8-P4	

\*1: Load capacity varies with air pressure, speed and absorption energy. (Value is for reference.)

\*2: Adjustable stroke is not available for pulled side.

\*3: The shock absorber is built into the body. Use within the following allowable shock absorber tolerance values at the working speed and working air pressure.

· HRL-1□F-05/10/15/15H Pull side: 70% or less

· HRL-1□F-25/50/65 Pull side: 65% or less

· Other than the above: 74% or less

\*4: The speed controller is an attachment.

X/Z Module

## Compatibility table by variation

Applicable bore size	Basic	
	ø20 to 63	P4
	P40	▲
	P41	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

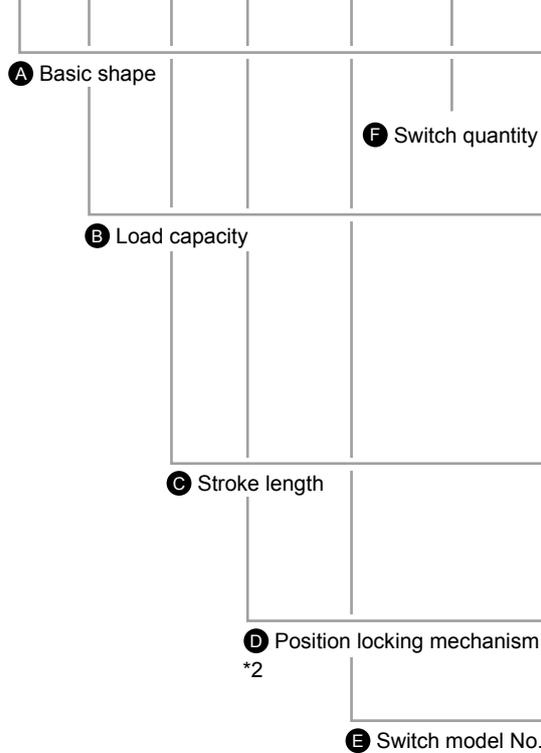
## How to order

Without switch \*1

**HRL-1** (L) - (05) - (350) - (Q) ———— (P4)

With switch

**HRL-1** (L) - (05) - (350) - (Q) - (SW11) - (R) - (P4)



Code	Content
<b>A Basic shape</b>	
Blank	Basic
L	Long body
F	Basic front flange
LF	Long body front flange
<b>B Load capacity (vertical)</b>	
05	5 kg
10	10 kg
15	15 kg
15H	
25	25 kg
50	50 kg
65	65 kg
<b>C Stroke length (mm)</b>	
[Basic body shape]	
50, 75, 100, 125, 150, 200, 250, 300	
[Long body shape]	
350, 400, 450, 500, 550, 600	
<b>D Position locking mechanism</b>	
Blank	No
Q	Yes
<b>E Switch model No.</b>	
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.	
<b>F Switch quantity</b>	
R	1 on rod side
H	1 on head side
D	2
T	3

### ⚠ Precautions for model No. selection

\*1: When without switch is selected, with/without cylinder switch rail depends on whether position locking is selected.

Without position locking mechanism: Without switch rail

With position locking mechanism: With switch rail

\*2: The position locking mechanism can be installed on the head side of the cylinder only.



Pneumatic Cylinders I  
Catalog No. CB-029SA

Round shaped cylinder Double acting/low friction

# SCM-U Series

- Bore size:  $\varnothing 20/\varnothing 25/\varnothing 32/\varnothing 40$   
 $\varnothing 50/\varnothing 63/\varnothing 80/\varnothing 100$

JIS symbol



## Specifications

Descriptions		SCM-U								
Bore size	mm	$\varnothing 20$	$\varnothing 25$	$\varnothing 32$	$\varnothing 40$	$\varnothing 50$	$\varnothing 63$	$\varnothing 80$	$\varnothing 100$	
Actuation		Double acting/low friction								
Working fluid		Compressed air								
Max. working pressure	MPa	0.7								
Min. working pressure	MPa	0.03								
Proof pressure	MPa	1.0								
Ambient temperature	$^{\circ}\text{C}$	5 to 60								
Port size		Rc1/8				Rc1/4		Rc3/8	Rc1/2	
Stroke tolerance	mm	$^{+1.4}_0$ (to 1000)			$^{+1.4}_0$ (to 1500)		$^{+2.3}_0$ (to 1000), $^{+2.7}_0$ (to 1500)			
Working piston speed	mm/s	10 to 1000 (Operate within the allowable absorbed energy.)								
Cushion		Rubber cushion								
Lubrication		Not available								
Allowable absorbed energy	J	0.1	0.2	0.5	0.9	1.6	1.6	3.3	5.8	
Internal leakage	l/min	5							8	

Low friction cylinder

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)	*1: The custom stroke length is available in 1 mm increments.
$\varnothing 20$	25, 50, 75, 100, 125, 150, 200, 250, 300	1000	10	
$\varnothing 25$				
$\varnothing 32$				
$\varnothing 40$				
$\varnothing 50$		1500		
$\varnothing 63$				
$\varnothing 80$				
$\varnothing 100$				

## How to order switch mounting bracket

	[Rail] Mounting rail	[Band] Mounting bracket set + Band
P4	SCM-T-[Bore size]	SCM-Z-[Bore size]
P40	-[Stroke length]	SCM-Z-[Bore size]-P40

- \*1: Indicate  $\times$  if the stroke length exceeds 300 mm.  
If exceeding 300 mm, a short rail (with 100 mm switch adjustment travel distance) will be included per switch.
- \*2: If indicating  $\times$  when ordering mounting rails only, order the same number of rails as that of applicable switches.

## How to order mounting bracket P4

Bore size (mm)	$\varnothing 20$	$\varnothing 25$	$\varnothing 32$	$\varnothing 40$	$\varnothing 50$	$\varnothing 63$	$\varnothing 80$	$\varnothing 100$
Mounting bracket								
Foot (LB)	SCM-LB-20	SCM-LB-25	SCM-LB-32	SCM-LB-40	SCM-LB-50	SCM-LB-63	SCM-LB-80	SCM-LB-100
Flange (FA/FB)	SCM-FA-20	SCM-FA-25	SCM-FA-32	SCM-FA-40	SCM-FA-50	SCM-FA-63	SCM-FA-80	SCM-FA-100
Eye bracket (CA)	SCM-CA-20	SCM-CA-25	SCM-CA-32	SCM-CA-40	SCM-CA-50	SCM-CA-63	-	-
Clevis bracket (CB)	-	-	-	-	-	-	SCM-CB-80	SCM-CB-100
Trunnion (TA/TB)	SCM-TA-20	SCM-TA-25	SCM-TA-32	SCM-TA-40	SCM-TA-50	SCM-TA-63	-	-

## How to order mounting bracket P40

Bore size (mm)	$\varnothing 20$	$\varnothing 25$	$\varnothing 32$	$\varnothing 40$	$\varnothing 50$	$\varnothing 63$	$\varnothing 80$	$\varnothing 100$
Mounting bracket								
Foot (LB)	SCM-LB-20-P40	SCM-LB-25-P40	SCM-LB-32-P40	SCM-LB-40-P40	SCM-LB-50-P40	SCM-LB-63-P40	SCM-LB-80-P40	SCM-LB-100-P40
Flange (FA/FB)	SCM-FA-20-P40	SCM-FA-25-P40	SCM-FA-32-P40	SCM-FA-40-P40	SCM-FA-50-P40	SCM-FA-63-P40	SCM-FA-80-P40	SCM-FA-100-P40
Eye bracket (CA)	SCM-CA-20-P40	SCM-CA-25-P40	SCM-CA-32-P40	SCM-CA-40-P40	SCM-CA-50-P40	SCM-CA-63-P40	-	-
Clevis bracket (CB)	-	-	-	-	-	-	SCM-CB-80-P40	SCM-CB-100-P40
Trunnion (TA/TB)	SCM-TA-20-P40	SCM-TA-25-P40	SCM-TA-32-P40	SCM-TA-40-P40	SCM-TA-50-P40	SCM-TA-63-P40	-	-

- \*1: All mounting brackets have mounting bolts attached.  
\*2: The foot mounting bracket is provided as 2 pcs./set.

## Compatibility table by variation

Applicable bore size		Double acting/single rod	Double acting/position locking	Single acting/push	Single acting/pull	Double acting/double rod	Double acting/back to back	Double acting/two-stage	Stroke adjustable (push)	Stroke adjustable (pull)	Double acting/low speed	Double acting/low friction	Double acting/heat resistance	Double acting/rubber scraper	Double acting/tandem	Double acting/direct mounting foot	Double acting/rotation-stop	
		Q	X	Y	D	B	W	P	R	O	U	T	G	W4	LD	M		
ø20 to 100	P4	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	▲
	P40	●*2	●	○	○	○*2	○	○	○	○*1	○	○	○*2	○	○	○	○	▲
	P41	▲*2	▲			▲*2	▲	▲	▲	▲*1				▲	▲	▲		
	P42	▲*2	▲			▲*2	▲	▲	▲	▲*1	▲	▲			▲	▲		

● : Standard  
 ○ : Made to order  
 ▲ : Contact CKD  
 □ : Not applicable

\*1: Zinc plating is used for the sealing washer.  
 \*2: Zinc plating is used for the cushion packing. (excluding ø50, ø63)

## How to order

Without switch

SCM-U-LB-40-D-100-M-P4-P40-I

With switch

SCM-U-LB-40-D-100-SW11-D-○-M-P4-P40-I

A Mounting

Rubber cushion

B Bore size

C Stroke length

D Switch model No.  
\*2

E Switch quantity

F Switch mounting

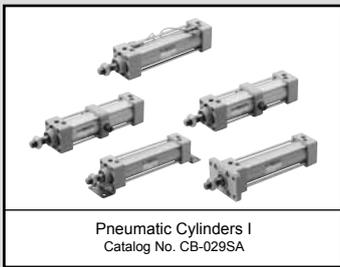
G Option  
\*3

H Accessory  
\*4

### ⚠ Precautions for model No. selection

- \*1: Mounting bracket will be shipped with the product.
- \*2: Switch model No. SW19 and SWDK cannot be mounted when the bore size is from ø20 to ø40 and switch mounting is the rail type.
- \*3: "Q" (switch rail attached at shipment) is not available for "Z" switch mounting.
- \*4: "I" and "Y" cannot be selected together.
- \*5: Switches are shipped with the product. Contact CKD if assembling before shipment is necessary.
- \*6: Made to order. Contact CKD for details.

Code	Content								
<b>A Mounting</b>									
	Bore size (ø)	20	25	32	40	50	63	80	100
00	Basic	●	●	●	●	●	●	●	●
LB	Axial foot	●	●	●	●	●	●	●	●
FA	Rod side flange	●	●	●	●	●	●	●	●
FB	Head side flange	●	●	●	●	●	●	●	●
CA	Eye bracket	●	●	●	●	●	●		
CB	Clevis bracket (pin and snap ring attached)							●	●
TA	Rod side trunnion	●	●	●	●	●	●		
TB	Head side trunnion	●	●	●	●	●	●		
<b>B Bore size (mm)</b>									
20	ø20								
25	ø25								
32	ø32								
40	ø40								
50	ø50								
63	ø63								
80	ø80								
100	ø100								
<b>C Stroke length (mm)</b>									
	Bore size	Stroke length	Custom stroke length						
	ø20 to ø32	10 to 1000	In 1 mm increments						
	ø40 to ø100	10 to 1500	In 1 mm increments						
<b>D Switch model No.</b>									
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.									
<b>E Switch quantity</b>									
R	1 on rod side								
H	1 on head side								
D	2								
T	3								
4	4 (when there are more than 4 switches, indicate switch quantity.)								
<b>F Switch mounting</b>									
Blank	Rail method								
Z	Band method								
<b>G Option</b>									
Q	Switch rail attached at shipment								
M	Piston rod, rod nut material (stainless steel)								
<b>H Accessory</b>									
	Bore size (ø)	20	25	32	40	50	63	80	100
I	Rod eye	●	●	●	●	●	●	●	●
Y	Rod clevis (pin and snap ring attached)	●	●	●	●	●	●	●	●
B1	Eye bracket							●	●
B2	Clevis bracket	●	●	●	●	●	●		



Tie rod cylinder  
Double acting/low friction (constant friction when pressurized)

# SCG-U Series

● Bore size:  $\varnothing 32/\varnothing 40/\varnothing 50/\varnothing 63/\varnothing 80/\varnothing 100$



## Specifications

Descriptions		SCG-U					
Bore size	mm	$\varnothing 32$	$\varnothing 40$	$\varnothing 50$	$\varnothing 63$	$\varnothing 80$	$\varnothing 100$
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	0.7					
Min. working pressure	MPa	0.03					
Proof pressure	MPa	1.0					
Ambient temperature	$^{\circ}\text{C}$	5 to 60					
Port size		Rc1/8	Rc1/4		Rc3/8		Rc1/2
Stroke tolerance	mm	$^{+1.0}_0$ (to 360), $^{+1.4}_0$ (361 to 800)					
Working piston speed	mm/s	10 to 1000 (Operate within the allowable absorbed energy.)					
Cushion		No					
Lubrication		Not available					
Internal leakage	l/min	5				8	
Allowable absorbed energy	J	0.018	0.032	0.057	0.057	0.112	0.153
		Without any cushion, this product cannot absorb large energy generated by an external load. We recommend using an external shock absorber.					

Low friction cylinder

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
$\varnothing 32$	25/50/75/100 150/200/250 300/350/400 450/500	600	1
$\varnothing 40$			
$\varnothing 50$			
$\varnothing 63$			
$\varnothing 80$			
$\varnothing 100$		700	
		800	

\*1: The custom stroke length is available in 1 mm increments.

\*2: If the max. stroke length is exceeded, product specifications may not be met, depending on operating conditions. Contact CKD in this case.

## How to order switch mounting bracket

P4	SCG-T-[Bore size]
P40	SCG-T-[Bore size]-P40

## How to order mounting bracket P4

Bore size (mm)	$\varnothing 32$	$\varnothing 40$	$\varnothing 50$	$\varnothing 63$	$\varnothing 80$	$\varnothing 100$
Foot (LB)	SCG-LB-32	SCG-LB-40	SCG-LB-50	SCG-LB-63	SCG-LB-80	SCG-LB-100
Flange (FA) (FB) *1	SCG-FA-32	SCG-FA-40	SCG-FA-50	SCG-FA-63	SCG-FA-80	SCG-FA-100
Eye bracket (CA)	SCG-CA-32	SCG-CA-40	SCG-CA-50	SCG-CA-63	SCG-CA-80	SCG-CA-100
Clevis bracket (CB)	SCG-CB-32-P4	SCG-CB-40-P4	SCG-CB-50-P4	SCG-CB-63-P4	SCG-CB-80-P4	SCG-CB-100-P4

## How to order mounting bracket P40

Bore size (mm)	$\varnothing 32$	$\varnothing 40$	$\varnothing 50$	$\varnothing 63$	$\varnothing 80$	$\varnothing 100$
Foot (LB)	SCG-LB-32-P40	SCG-LB-40-P40	SCG-LB-50-P40	SCG-LB-63-P40	SCG-LB-80-P40	SCG-LB-100-P40
Flange (FA) (FB) *1	SCG-FA-32-P40	SCG-FA-40-P40	SCG-FA-50-P40	SCG-FA-63-P40	SCG-FA-80-P40	SCG-FA-100-P40
Eye bracket (CA)	SCG-CA-32-P40	SCG-CA-40-P40	SCG-CA-50-P40	SCG-CA-63-P40	SCG-CA-80-P40	SCG-CA-100-P40
Clevis bracket (CB)	SCG-CB-32-P40	SCG-CB-40-P40	SCG-CB-50-P40	SCG-CB-63-P40	SCG-CB-80-P40	SCG-CB-100-P40

\*1: The foot mounting bracket (LB) is provided as 2 pcs./set.

## Compatibility table by variation

Applicable bore size		Double acting/ single rod	Double acting/ position locking	Double acting/ double rod	Double acting/ low speed	Double acting/ low friction	Double acting/ rubber scraper	Double acting/ rotation-stop	Double acting/ coolant proof	Double acting/ anti-spatter adherence
		Q	D	O	U	G	M	G2/G3	G1/G4	
ø32 to 100	P4	●	●	○	○	○	○			
	P40	●	●	○	○	○	○			
	P41	▲	▲	▲			▲			

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

Without switch

**SCG-U** - **LB** - **32** **N** - **100** - **M** **P4** **P40** **I**

With switch

**SCG-U** - **LB** - **32** **N** - **100** - **SW11** - **R** - **M** **P4** **P40** **I**

Model No.

**A** Mounting  
\*1

**B** Bore size

**C** Cushion

**D** Stroke length

**E** Switch model No.

**F** Switch quantity  
\*2

**G** Option

**H** Accessory  
\*3

### ⚠ Precautions for model No. selection

\*1: Mounting bracket will be shipped with the product.  
(Trunnion types are assembled at shipment.)

\*2: When selecting TA or TB mounting, the switch quantity is limited to "H" (1 on head side) for TA, and "R" (1 on rod side) for TB.

\*3: "I" and "Y" cannot be selected together.

\*4: Made to order. Contact CKD for details.

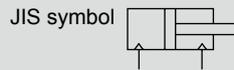
Code	Content	
<b>A Mounting</b>		
00	Basic	
LB	Axial foot	
FA	Rod side flange	
FB	Head side flange	
CA	Eye bracket	
CB	Clevis bracket (pin and split pin attached)	
TA	Rod side trunnion	
TB	Head side trunnion	
TC	Intermediate trunnion	
<b>B Bore size (mm)</b>		
32	ø32	
40	ø40	
50	ø50	
63	ø63	
80	ø80	
100	ø100	
<b>C Cushion</b>		
N	Without cushion	
<b>D Stroke length (mm)</b>		
Bore size	Stroke length	Custom stroke length
ø32	1 to 600	In 1 mm increments
ø40		
ø50		
ø63		
ø80	1 to 700	
ø100	1 to 800	
<b>E Switch model No.</b>		
Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.		
<b>F Switch quantity</b>		
R	1 on rod side	
H	1 on head side	
D	2	
T	3	
<b>G Option</b>		
M	Piston rod, rod nut material (stainless steel)	
<b>H Accessory</b>		
I	Rod eye	
Y	Rod clevis (pin and split pin attached)	
B1	Eye bracket	
B2	Clevis bracket (pin and split pin attached)	
B3	Eye bracket	
B4	Trunnion No. 2 bracket (2 pcs./set)	



Compact cylinder Double acting/high load/low friction

# SSD2-KU Series

- Bore size:  $\varnothing 20/\varnothing 25/\varnothing 32/\varnothing 40$   
 $\varnothing 50/\varnothing 63/\varnothing 80/\varnothing 100$



## Specifications

Descriptions	SSD2-KU SSD2-KUL (with switch)							
	$\varnothing 20$	$\varnothing 25$	$\varnothing 32$	$\varnothing 40$	$\varnothing 50$	$\varnothing 63$	$\varnothing 80$	$\varnothing 100$
Bore size mm								
Actuation	Double acting							
Working fluid	Compressed air							
Max. working pressure MPa	0.7							
Min. working pressure MPa	0.03							
Proof pressure MPa	1.0							
Ambient temperature °C	5 to 60							
Port size	M5		Rc1/8		Rc1/4		Rc3/8	
Stroke tolerance mm	+2.0 0							
Working piston speed mm/s	10 to 500				10 to 300			
Cushion	Rubber cushion							
Lubrication	Not available							
Allowable absorbed energy J	0.16	0.16	0.40	0.63	0.98	1.56	2.51	3.92
Internal leakage $\ell/\text{min}$	5						8	

Low friction cylinder

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
$\varnothing 20$	5/10/15/20/25	50	5
$\varnothing 25$	30/35/40/45/50		
$\varnothing 32$	5/10/15/20/25/30/	100	
$\varnothing 40$	35/40/45/50/75/100		
$\varnothing 50$	10/15/20/25		
$\varnothing 63$	30/35/40/45/50		
$\varnothing 80$	75/100		
$\varnothing 100$			

\*1: When using the type with switch, refer to the table of the min. stroke length with switch.

## Compatibility table by variation

Applicable bore size		Double acting/ single rod	Double acting/ single rod high load	Double acting/ single rod long stroke length	Single acting/ push	Single acting/ pull	Double acting/ rubber-air cushioned high load	Double acting/ position locking	Double acting/ double rod	Double acting/ back to back	Double acting/ two-stage	Double acting/ fine speed	Double acting/ low speed	Double acting/ low friction/ high load	Double acting/ heat resistance	Double acting/ packing fluoro rubber	Double acting/ rubber scraper	Double acting/ rotation-stop
			K		X	Y	KC	Q	D	B	W	F	O	KU	T1	T2	G	M
ø12 to 200	P4	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	▲	▲
	P40	●	●	○	○	○	○	○	○	▲	○	○	○	○	○	○	▲	▲
	P41	▲	▲	▲			▲	▲	▲	▲							▲	
	P42	▲	▲	▲			▲	▲	▲	▲	▲	▲	▲	▲		▲		

● : Standard  
 ○ : Made to order  
 ▲ : Contact CKD  
 □ : Not applicable

### How to order

Without switch

SSD2-KU - 20 - 10 - N P4 P40 - LB - I

With switch

SSD2-KUL - 20 - 10 - SW11 - R - N P4 P40 - LB - I

A Bore size

B Stroke length  
\*1, \*2

C Switch model No

\*3  
\*4  
\*5

D Switch quantity

E Option  
\*6

F Mounting bracket  
\*7

G Accessory  
\*8

Code	Content
<b>A Bore size (mm)</b>	
20	ø20
25	ø25
32	ø32
40	ø40
50	ø50
63	ø63
80	ø80
100	ø100

B Stroke length (mm)	Applicable bore size							
	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
Standard stroke length	5	●	●	●	●			
	10	●	●	●	●	●	●	●
	15	●	●	●	●	●	●	●
	20	●	●	●	●	●	●	●
	25	●	●	●	●	●	●	●
	30	●	●	●	●	●	●	●
	35	●	●	●	●	●	●	●
	40	●	●	●	●	●	●	●
	45	●	●	●	●	●	●	●
	50	●	●	●	●	●	●	●
75			●	●	●	●	●	
100			●	●	●	●	●	
Min. stroke length (mm)	1							
Max. stroke length (mm)	50		100					
Custom stroke length *2	In 1 mm increments							

#### C Switch model No.

Refer to the compatibility table on Intro Pages 21 to 24 for switch model No.

#### D Switch quantity

R	1 on rod side
H	1 on head side
D	2

#### E Option

Blank	Rod end female thread
N	Rod end male thread
M *6	Piston rod material (stainless steel)

#### F Mounting bracket

Blank	Without mounting bracket
LB	Axial foot
CB	Clevis bracket (pin and snap ring attached)
FA	Rod side flange
FB	Head side flange

#### G Accessory (available when rod end male thread "N" is selected)

I	Rod eye
Y	Rod clevis (pin and snap ring attached)

### ⚠ Precautions for model No. selection

- \*1: Less than 5 mm for 1-color display switch and less than 10 mm for the 2-color display, off-delay, strong magnetic field proof, T1\* or T8\* switch are not available.
- \*2: The total length is the same as that of the next longer standard stroke length.
- \*3: The F switch can only be mounted on the piping port surface of bore sizes ø20 and ø25.
- \*4: The F switch with L lead wire on ø20 models cannot be selected on stroke lengths 10 mm or under.
- \*5: Switches are shipped with the product. Contact CKD if assembling before shipment is necessary.
- \*6: Piston rod of ø20 and ø25 is stainless steel as standard. C snap ring is stainless steel instead of steel. The rod end male thread nut is stainless steel.
- \*7: The mounting bracket is attached at shipment.
- \*8: "I" and "Y" cannot be selected together.
- \*9: The projection dimension of piston rod WF when LB or FA is selected is different from that of the standard. Refer to "Pneumatic Cylinders I (Catalog No. CB-029SA)" for dimensions. The number of the specified protruding dimension will be added at the end of the model No. printed on the metal plate on the body.
- \*10: 5 m lead wire for the F switch is a made to order product.
- \*11: Made to order. Contact CKD for details.

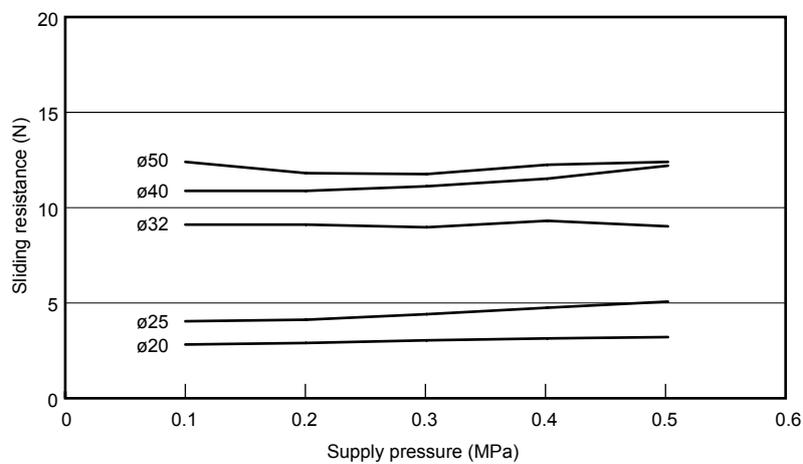
## Low friction cylinder sliding resistance value

Values are measured under the following conditions. As the values vary with the installation method, pressurizing direction, etc., they are not guaranteed.

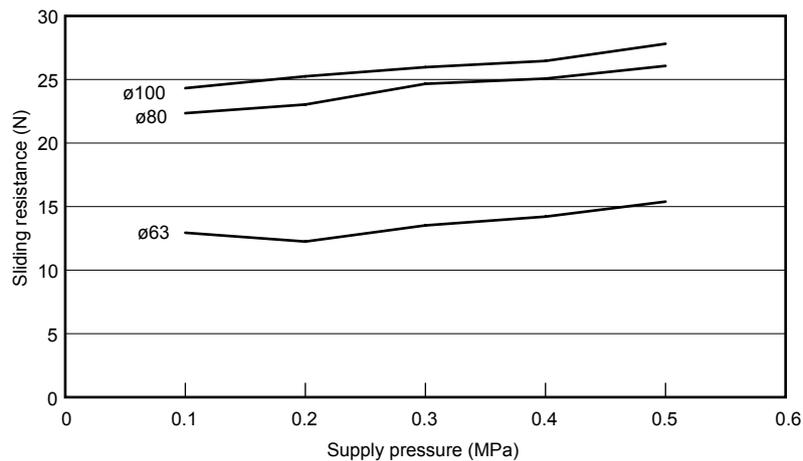
[Test conditions]

Cylinder	SCM-U
Cylinder mounting direction	Vertical
Cylinder speed	10 mm/min (driven by external motor)
Cylinder pressurizing direction	Head side (the rod side is open to atmosphere)

Sliding resistance (ø20 to ø50)



Sliding resistance (ø63 to ø100)



Low friction cylinder

---

**MEMO**

---



# Shock absorber NCK Series

● Max. absorbed energy: 1 to 200 J



## Specifications

Descriptions	NCK								
	0.1	0.3	0.7	1.2	2.6	7	12	20	
Series									
Type/Classification	Spring return without adjuster								
Max. absorbed energy	J	1	3	7	12	26	70	120	200
O.D. thread size	mm	M8×0.75		M10×1.0	M12×1.0	M14×1.5	M20×1.5	M25×1.5	M27×1.5
Stroke length	mm	4.5	6	8	10	15	20	25	30
Max. absorbed energy per hour	kJ/hr.	4.8	6.3	12.6	21.6	39.0	84.0	86.4	108.0
Max. colliding speed	m/s	1.0	1.5		2.0		2.5	3.0	
Max. operating frequency	Cycle/min.	80	35	30		25	20	12	9
Ambient temperature	°C	-10 to 80							
Max. load (resistance)	N	525	1150	2010	2750	4000	7980	10950	15380
Return time	S	0.3 or less					0.4 or less		0.5 or less
Weight	kg	0.009	0.012	0.02	0.04	0.07	0.2	0.3	0.45
Return spring force	When extended	N		2.9	2.0	2.9	5.9	9.8	16.3
	When compressed	N		4.5	4.3	5.9	11.8	21.6	33.3

Related products

## Compatibility table by variation

Applicable size	Basic	
	All sizes	P4
	P40	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

**NCK** - **00** - **0.7** - **N1** - **P4**  
**P40**

**A** Mounting

**B** Series

**C** Option  
\*1

Code	Content
<b>A Mounting</b>	
<b>00</b>	Basic
<b>FA</b>	Flange
<b>B Series (max. energy value)</b>	
<b>0.1</b>	1 J
<b>0.3</b>	3 J
<b>0.7</b>	7 J
<b>1.2</b>	12 J
<b>2.6</b>	26 J
<b>7</b>	70 J
<b>12</b>	120 J
<b>20</b>	200 J
<b>C Option</b>	
<b>Blank</b>	Standard
<b>N1</b>	With stop nut
<b>C</b>	Capped

## ⚠ Precautions for model No. selection

\*1: 3 hexagon nuts are provided for N1 specifications products.



Shock absorber

# FCK Series

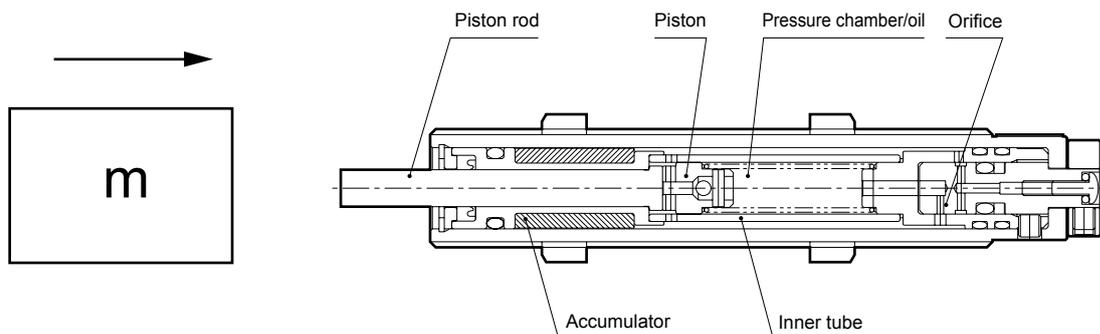
● Max. absorbed energy: 1.5 to 79.3 J



## Specifications

Descriptions		FCK										
Series		0.15	0.18	0.3	0.5	0.4	0.6	1	3	5	6.5	8.1
Type/Classification		Spring return with adjuster										
Max. absorbed energy J		1.5	1.8	2.9	4.9	3.9	5.9	9.8	29.4	49	63.7	79.3
O.D. thread size mm		M10×1.0		M12×1.0		M14×1.5		M16×1.5	M20×1.5	M25×1.5		M27×1.5
Stroke length mm		8		10				12	16	30	40	25
Max. absorbed energy per hour kJ/hr.		3.5		5.9		8.8		14.1	20.6	29.4	38.2	32.3
Max. colliding speed	L m/s	0.3 to 1	—	0.3 to 1	—	0.3 to 1	—	0.3 to 1				
	M m/s	—	0.3 to 2	—	0.3 to 2	—	0.3 to 2	0.3 to 2				
	H m/s	—	0.7 to 3	—	0.7 to 3	—	0.7 to 3	0.7 to 3				
Max. operating frequency (20°C) Cycle/min.		60										
Ambient temperature °C		-5 to 70										
Max. load (resistance)	L N	637		1,470		1,813		2,646	4,900		6,370	
	M N	637		1,470		1,813		2,646	3,528	3,920		6,370
	H N	637		1,470		1,813		2,646	3,528	3,920		6,370
Return time S		0.5 or less										
Product weight	Without cap g	26.5		44		68		108	180	406	—	411
	With cap g	27		47		73		117	202	436	459	460
Return spring force	When extended N	2.9		4.9		4.5		5.4	12.0	16.6	23.8	16.2
	When compressed N	5.9		9.8				14.7	18.0	33.1	71.4	27.2

## Operational principle



If an object collides with the piston rod, that action is transmitted to the oil in the pressure chamber attached by the piston and inner tube.

Oil in pressure chamber flows out from orifice provided in inner tube.

Resistance  $F$  shown by following formula occurs at that time.

$$F = av^2 + bv + cx \quad (v \text{ is colliding speed, and } x \text{ is travel stroke. } a, b, \text{ and } c \text{ are constants.})$$

Item No. 1 shows the speed square resistance, which is a significant part of the resistance as a whole.

Item No. 2 shows the viscosity resistance, which is a significant part of the resistance if the colliding speed is low.

Item No. 3 shows return force of piston rod. (Can usually be ignored, as the value is miniscule compared to Items 1 and 2.)

The product of resistance generated at this time and the piston rod stroke is the shock absorber absorption energy. The shock absorber realizes ideal impact absorption by controlling Items 1 and 2.

## Compatibility table by variation

Applicable size	P4	Low speed	Medium speed	High speed
		L	M	H
FCK-0.15 to 8.1		●	●	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

● Low speed

**FCK-L** - **0.15** - **C** - P4

● Medium speed

**FCK-M** - **0.18** - **C** - P4

● High speed

**FCK-H** - **0.18** - **C** - P4

Ⓐ Model No.

Ⓑ Series (max. energy absorption)

Ⓒ Option  
\*1

		Ⓐ Model No.		
		Low speed	Medium speed	High speed
		FCK-L	FCK-M	FCK-H
Ⓑ Series (max. energy absorption)				
<b>0.15</b>	1.5 J	●	□	□
<b>0.18</b>	1.8 J	□	●	●
<b>0.3</b>	2.9 J	●	□	□
<b>0.4</b>	3.9 J	●	□	□
<b>0.5</b>	4.9 J	□	●	●
<b>0.6</b>	5.9 J	□	●	●
<b>1</b>	9.8 J	●	●	●
<b>3</b>	29.4 J	●	●	●
<b>5</b>	49 J	●	●	●
<b>6.5</b>	63.7 J	●	●	●
<b>8.1</b>	79.3 J	●	●	●
Ⓒ Option				
<b>Blank</b>	Without cap	●	●	●
<b>C</b>	Capped	●	●	●

Related products

\* 1: Without cap is not available for 6.5 (63.7 J).

□ indicates not available.



Pneumatic Cylinders I  
Catalog No. CB-029SA

Floating fitting

# FJ Series

● Compatible cylinder diameter:  $\varnothing 20$  to  $\varnothing 200$



## Specifications

Descriptions Model No.	Nominal port size of thread x pitch	Max. working tension and compression (kN) *1			Allowable eccentricity (mm)	Oscillating angle	Operating ambient temperature range
		Basic	Flange	Foot			
FJ-*- 3	M3×0.5	0.019	—	—	0.5	±5°	-10 to 60°C
4	M4×0.7	0.053	—	—	0.5		
5	M5×0.8	0.121	—	—	0.5		
6	M6×1.0	1.08	—	—	0.75		
8	M8×1.0	1.08	1.08	1.08	0.75		
8-1.25	M8×1.25	1.08	1.08	1.08	0.75		
10	M10×1.25	2.45	2.45	2.45	0.75		
12-1.25	M12×1.25	2.45	2.45	2.45	0.75		
12	M12×1.5	2.45	2.45	2.45	0.75		
14	M14×1.5	5.88	5.88	5.88	1.0		
16	M16×1.5	10.8	10.8	10.8	1.5		
18	M18×1.5	10.8	10.8	10.8	1.5		
22	M22×1.5	17.6	17.6	17.6	2.0		
26	M26×1.5	27.5	27.5	27.5	3.0		
30	M30×1.5	60.8	60.8	60.8	3.0		
36	M36×1.5	87.3	87.3	87.3	4.0		
40	M40×1.5	87.3	87.3	87.3	4.0		
45	M45×1.5	108	108	108	4.0		

\*1: Max. working tension and compression shows static load.

\*2: FJ-8-1.25 and FJ-12-1.25 are optional products. FJ-36, 40 and 45 are made to order products.

\*3: FJ-6 to 45 are P4 compliant products as standard.

## How to order

**FJ** - **0** - **3** - **P4**

**A** Mounting

**B** Nominal port size of thread x pitch

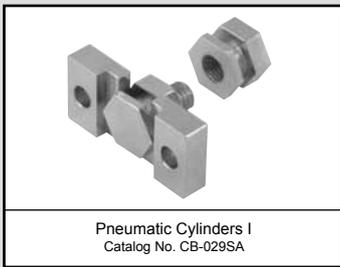
Code	Content
<b>A</b>	<b>Mounting</b>
<b>0</b>	Basic
<b>L</b>	Foot
<b>F</b>	Flange

B Nominal port size of thread x pitch		Mounting		
		O	L	F
<b>3</b>	M3×0.5	●		
<b>4</b>	M4×0.7	●		
<b>5</b>	M5×0.8	●		
<b>6</b>	M6×1.0	●		
<b>8</b>	M8×1.0	●	●	●
<b>8-1.25</b>	M8×1.25	●	●	●
<b>10</b>	M10×1.25	●	●	●
<b>12-1.25</b>	M12×1.25	●	●	●
<b>12</b>	M12×1.5	●	●	●
<b>14</b>	M14×1.5	●	●	●
<b>16</b>	M16×1.5	●	●	●
<b>18</b>	M18×1.5	●	●	●
<b>22</b>	M22×1.5	●	●	●
<b>26</b>	M26×1.5	●	●	●
<b>30</b>	M30×1.5	●	●	●
<b>36</b>	M36×1.5	●	●	●
<b>40</b>	M40×1.5	●	●	●
<b>45</b>	M45×1.5	●	●	●

## Compatibility table by variation

Applicable size	Basic			
	Basic	Foot	Flange	
FJ-*-3 FJ-*-4 FJ-*-5	P4	●	●	●
	P40	▲	▲	▲
FJ-*-6 to 45	P4	Supports P4 specifications as standard		
	P40	▲		

● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable



Simplified floating fitting

# FK Series

● Cylinder bore size:  $\varnothing 6$  to  $\varnothing 100$

P4 compliant  
as standard



## Specifications

Model No.		Allowable load *1 (N)	Allowable eccentricity (mm)	Backlash amount in thrust direction (mm)
Male thread	Female thread			
FK-M3-N	FK-M3	63	±0.3	0.1 to 0.3
FK-M4-N	FK-M4	110		
FK-M5-N	FK-M5	179		
FK-M6-N	FK-M6	253		
FK-M8-N	FK-M8 × 1.0	462		
—	FK-M8 × 1.25	462		
FK-M10-N	FK-M10	734		
—	FK-M12	1069		
—	FK-M14	1466		
FK-M16-N	FK-M16	2003		
—	FK-M18	2448		
FK-M20-N	—	3130		
—	FK-M22	3896		
—	FK-M26	6219		
—	—	—		

\*1: Allowable load indicates static load.

## How to order

● Simplified floating fitting



Model No.

Ⓐ Thread size

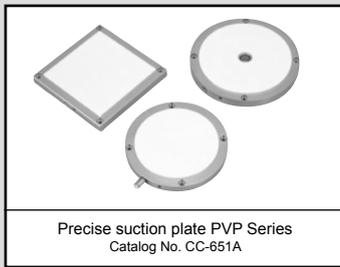
## Compatibility table by variation

Applicable size		Male thread	Female thread
		N	
All sizes	P4	Supports P4 specs as standard	
	P40	●	●

● : Standard  
 ○ : Made to order  
 ▲ : Contact CKD  
 □ : Not applicable

Code	Content	
<b>Ⓐ Thread size</b>		
M3-N	M3 × 0.5	Male thread
M4-N	M4 × 0.7	
M5-N	M5 × 0.8	
M6-N	M6 × 1.0	
M8-N	M8 × 1.25	
M10-N	M10 × 1.5	
M16-N	M16 × 2.0	
M20-N	M20 × 2.5	
M3	M3 × 0.5	Female thread
M4	M4 × 0.7	
M5	M5 × 0.8	
M6	M6 × 1.0	
M8 × 1.0	M8 × 1.0	
M8 × 1.25	M8 × 1.25	
M10	M10 × 1.25	
M12	M12 × 1.5	
M14	M14 × 1.5	
M16	M16 × 1.5	
M18	M18 × 1.5	
M22	M22 × 1.5	
M26	M26 × 1.5	

Related products



Precise suction plate PVP Series  
Catalog No. CC-651A

# Precise suction plate PVP Series

P4 compliant  
as standard



## Specifications

Descriptions		PVP-R-36-18 PVP-C-50 PVP-S-50-50	PVP-R-85-27 PVP-R-118-18 PVP-C-75 PVP-C-100 PVP-C-113 PVP-C-138 PVP-S-100-100	PVP-C-187  PVP-S-150-150 PVP-S-200-250		
Product	Suction surface	Flatness	2	3	4	
		$\mu\text{m}$ (*1)	Parallelism	5	10	15
	Flatness of reference surface	$\mu\text{m}$	10	10	10	
	Air leakage volume	$\ell/\text{min}(\text{ANR})$	0.4	0.6	1	
	Vacuum differential pressure	$\text{kPa}$ (*2)	40 or more			
	Working pressure	$\text{MPa}$	0.2 or less (clean air)			
	Ambient temperature	$^{\circ}\text{C}$	5 to 40			
	Ambient humidity	$\%RH$ (*3)	65 or less			
Porous material	Material	Polychlorotrifluoroethylene resin				
	Porosity	$\%$	40 $\pm$ 5			
	Shore D hardness degree	$^{\circ}$	60 $\pm$ 15			
Base material	Material	Corrosion-resistant aluminum alloy				
	Surface-treated	(*4)	No			

\*1: This accuracy is the measurement value left as is for 24 hours in the constant temperature room at 23°C.

Accuracy may deviate from that specified at a temperature other than 23°C.

The value is measured by placing the product without load on a table, measuring straightness in two or more directions and using the maximum value.

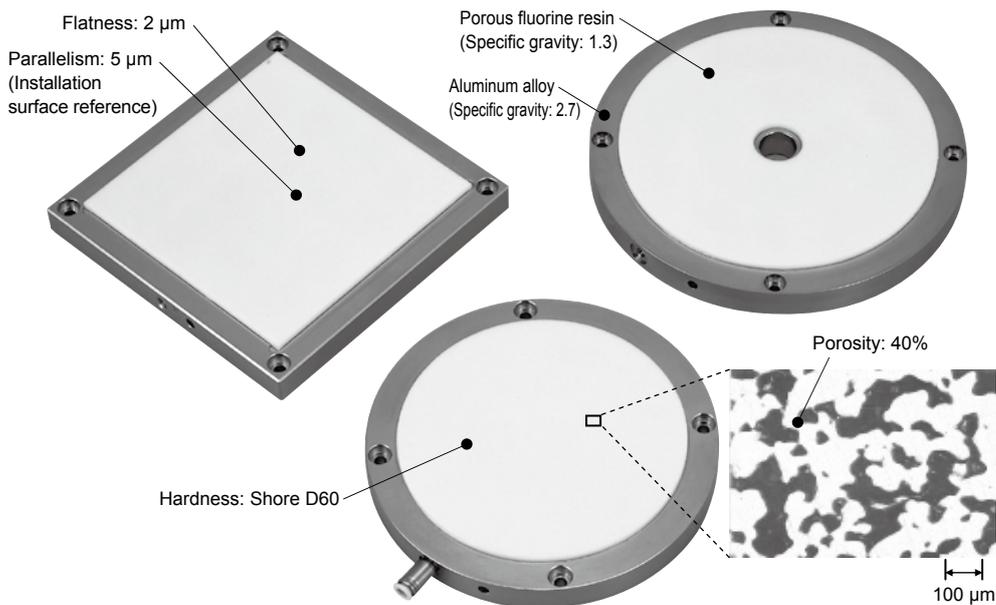
This is not the usual flatness measurement method, but has been used because multi-porous material has indentations.

\*2: Indicates vacuum source pressure drop when a workpiece is suctioned with the entire multi-porous surface.

\*3: In humidity exceeding 65% RH, suction surface accuracy may deviate from the specified value.

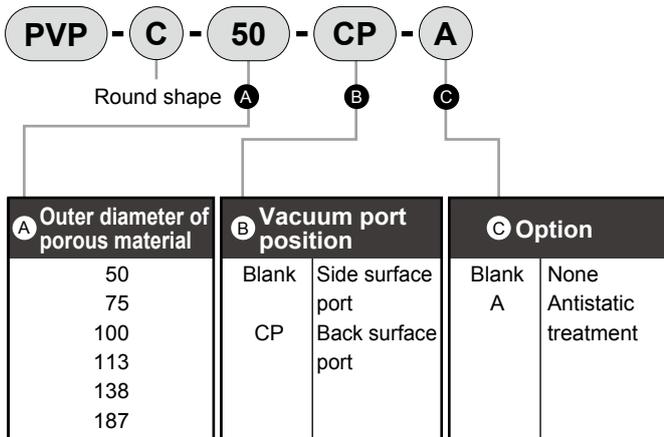
\*4: This product's body is made of corrosion-resistant aluminum alloy.

Surface treatment (alumite, electroless nickel plating, etc.) is made to order.

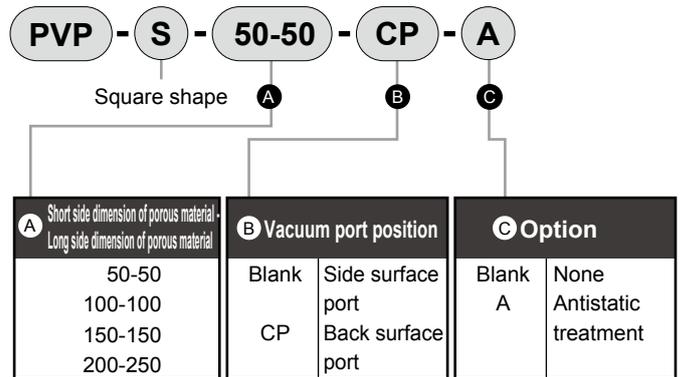


How to order

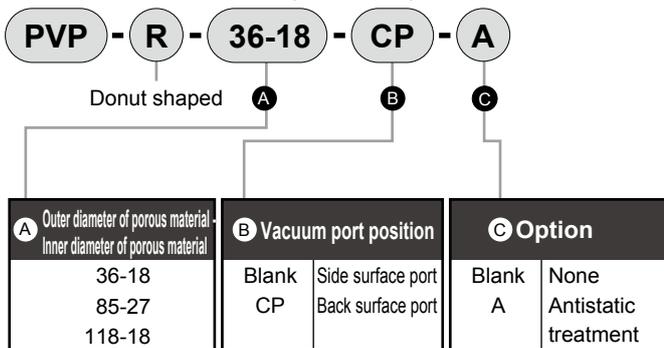
● How to order the round suction plate



● How to order the square suction plate



● How to order the donut shaped suction plate



Related products

Suction area/weight table

Model No.	Suction area (cm <sup>2</sup> )	Weight (g)
PVP-R-36-18	8	80
PVP-R-85-27	51	290
PVP-R-118-18	107	520
PVP-C-50	20	140
PVP-C-75	44	250
PVP-C-100	79	390
PVP-C-113	100	490
PVP-C-138	149	680
PVP-C-187	275	1,170
PVP-S-50-50	25	160
PVP-S-100-100	100	490
PVP-S-150-150	225	980
PVP-S-200-250	500	2,030



Air bearing actuator  
Single acting/push  
**LBC Series**

P4 compliant  
as standard



**Specifications**

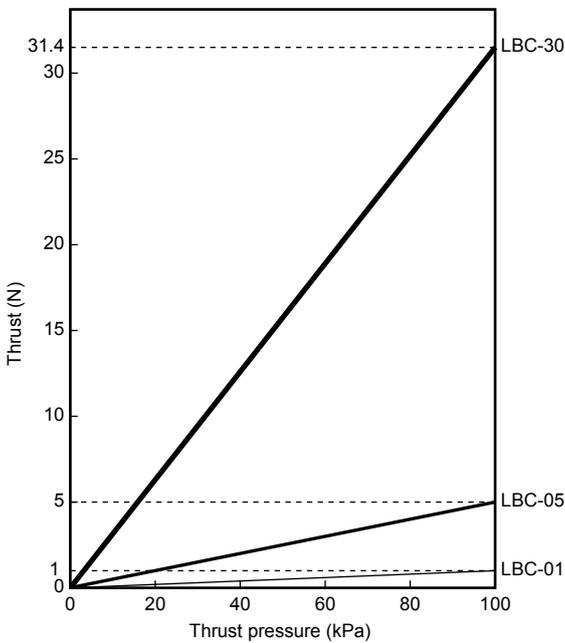
Descriptions		LBC-01	LBC-05	LBC-30
Actuation		Single acting/push (*1)		
Working fluid		Clean compressed air (JIS B 8392-1: 2003 Grade 1.3.2 or equivalent)		
Working pressure MPa	Air bearing port	0.3 to 0.5		
	Thrust port	0.002 to 0.1		
Ambient temperature	°C	5 to 35		
Proof pressure	MPa	0.75		
Pressurized area	mm <sup>2</sup>	10	50	314
Thrust range	N	0.02 to 1.0	0.1 to 5.0	0.6 to 31.4
Stroke length	mm	5 <sup>+1</sup> <sub>0</sub>		30 <sup>+1</sup> <sub>0</sub>
Allowable lateral load	N	1.2	0.8	4.0
Weight	g	50	45	345
Movable part weight (*2)	g	5	4.5	65
Bearing part air consumption (*3)	ℓ/min	2.5 or less	2.5 or less	7.5 or less

\*1: Rod return mechanism is not available.

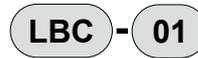
\*2: Movable part weight indicates the total weight of rod, stopper and cross headed flat head screw.

\*3: Value when bearing pressure is 0.5 MPa

**Thrust characteristics**



**How to order**



A Thrust

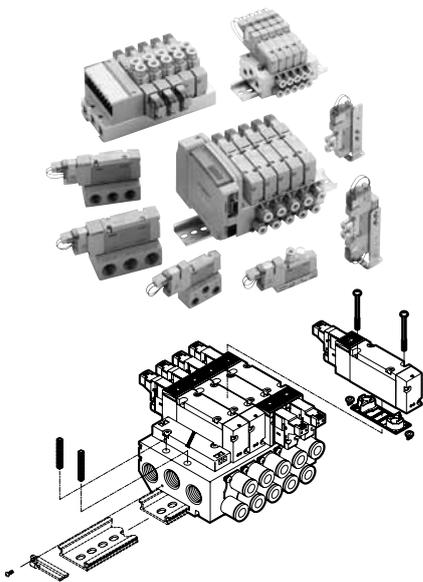
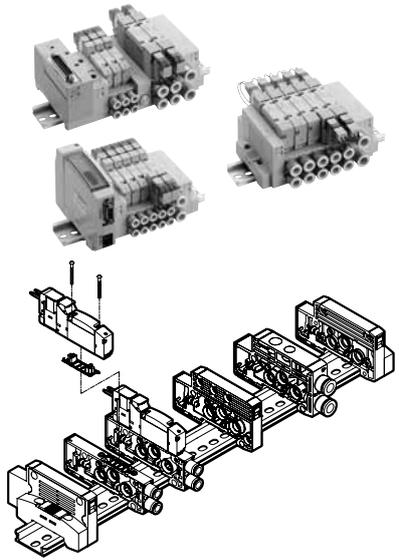
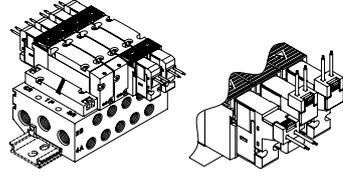
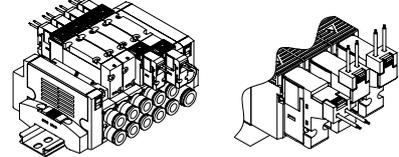
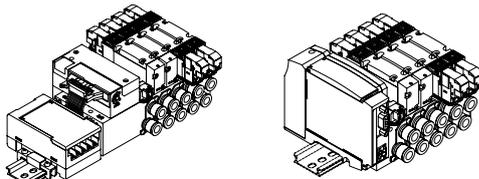
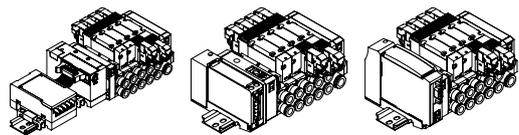
Code	Content
A Thrust	
01	1N
05	5N
30	30N

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MEMO

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Related  
products

Series		M4GB* Series	MN4GB* Series
Specifications		Metal base manifold	Block manifold (resin base)
Appearance			
Features		<ul style="list-style-type: none"> <li>Manifold base is metal</li> <li>Supports female thread piping</li> </ul>	<ul style="list-style-type: none"> <li>Manifold base is resin</li> <li>Bases can be extended</li> <li>Tag plate can be installed</li> <li>Ideal for installing inside panels and decreasing weight</li> <li>Mixture of different pressures is possible with partition blocks</li> <li>Mixing of 4G1/4G2 Series is possible</li> </ul>
Wiring method	Individual wiring method	 <p><u>M4GB-(blank)/E2*</u></p>	 <p><u>MN4GB-(blank)/E2*</u></p>
	Reduced wiring method	 <p><u>M4GB-T6*</u>      <u>M4GB-T8*</u></p>	 <p><u>MN4GB-T6*</u>      <u>MN4GB-T7*</u>      <u>MN4GB-T8*</u></p>
Page		<ul style="list-style-type: none"> <li>● Discrete base piping (4GB*R) How to order <span style="float: right;">Page 128</span></li> <li>● Metal base manifold Individual wiring (M4GB1-E2*) Manifold specifications sheet <span style="float: right;">Page 129</span></li> <li>● Metal base manifold Individual wiring (M4GB2-E2*) Manifold specifications sheet <span style="float: right;">Page 130</span></li> <li>● Metal base manifold Individual wiring (M4GB3-E2*) Manifold specifications sheet <span style="float: right;">Page 131</span></li> <li>● Metal base manifold Individual wiring specifications Dimensions <span style="float: right;">CB-023SA</span></li> <li>● Metal base manifold Reduced wiring serial transmission (M4GB1-T6*/T8*) Manifold specifications sheet <span style="float: right;">Page 132</span></li> <li>● Metal base manifold Reduced wiring serial transmission (M4GB2-T6*/T8*) Manifold specifications sheet <span style="float: right;">Page 133</span></li> <li>● Metal base manifold Reduced wiring serial transmission (M4GB3-T6*/T8*) Manifold specifications sheet <span style="float: right;">Page 134</span></li> <li>● Metal base manifold Reduced wiring serial transmission specification Dimensions <span style="float: right;">CB-023SA</span></li> <li>● Resin block manifold Individual wiring (MN4GB1-E2*) Manifold specifications sheet <span style="float: right;">Page 135</span></li> <li>● Resin block manifold Individual wiring (MN4GB2-E2*) Manifold specifications sheet <span style="float: right;">Page 136</span></li> <li>● Resin block manifold Individual wiring specifications Dimensions <span style="float: right;">CB-023SA</span></li> <li>● Resin block manifold Reduced wiring serial transmission (MN4GB1-T6*/T7*/T8*) Manifold specifications sheet <span style="float: right;">Page 137</span></li> <li>● Resin block manifold Reduced wiring serial transmission (MN4GB2-T6*/T7*/T8*) Manifold specifications sheet <span style="float: right;">Page 138</span></li> <li>● Resin block manifold Reduced wiring serial transmission Dimensions <span style="float: right;">CB-023SA</span></li> </ul> <p>* Contact CKD for manifold specifications sheet other than the above.</p>	

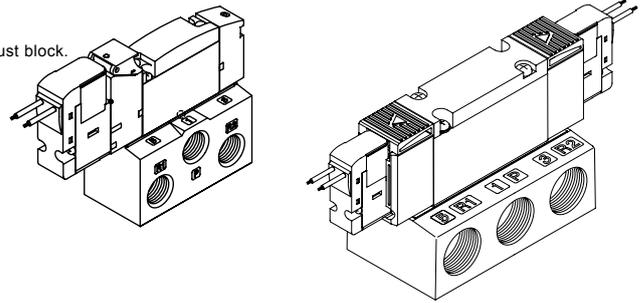
Note) 4GA Series is compatible as well.

## Compatibility table by variation

	4G Series		M4G Series *5) *6)			MN4G Series *7) *9)	
	Push-in fitting Straight (Model No.: C□)	Screw-in (Model No.: M5, 06, 08)	Push-in fitting Straight (Model No.: C□)	Push-in fitting elbow (Model No.: CL□, CD□)	Screw-in (Model No.: M5, 06, 08)	Push-in fitting Straight (Model No.: C□)	Push-in fitting elbow (Model No.: CL□, CD□)
P4	● *8)	●	● *8)		●	● *8)	

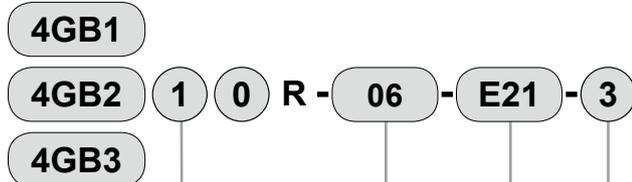
- : Standard
- : Made to order
- ▲ : Contact CKD
- : Not applicable

- \*1: Base piping (B) single units and 4GA1-M5 are standard products and equivalent to P4 specifications.
- \*2: Copper-free material applies to flow rate part.
- \*3: Refer to Pneumatic Valves CB-023SA for serial communication specifications.
- \*4: Push-in fitting elbow is not supported.
- \*5: Due to the attached M5 plug change, external pilot is available with P4 specification with or without fitting.
- \*6: In-stop valve spacer and spacer pilot check valve are not supported.
- \*7: External pilot specification is not available as standard.
- \*8: The following are not supported for push-in fitting straight.
  - <sup>3</sup>G<sup>A</sup><sub>B</sub> 1, MN4G<sup>A</sup><sub>B</sub> 1: CF, C18
  - <sup>4,0</sup>GA3: C6, C10
  - <sup>4,0</sup>GB3: C6
  - <sup>4</sup>GA4: C10, C12
- \*9: Atmosphere opening type cannot be selected for MN4G end block and supply and exhaust block.
- \*10: Contact CKD for European Standards compliant products.



## Discrete valve: Base piping

### How to order



● A Model No.

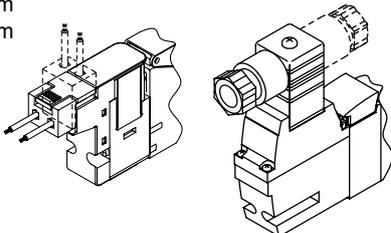
● B Solenoid position

● C Port size

● D Electrical connections

● E Voltage

- Lead wire length
- 300 mm
- 500 mm
- 1 m
- 2 m
- 3 m



Code	Content	
<b>A Model No.</b>		
4GB1	Compatible with operating cylinders up to ø40 max	
4GB2	Compatible with operating cylinders up to ø80 max	
4GB3	Compatible with operating cylinders up to ø100 max	
<b>B Solenoid position</b>		
1	2-position single	
2	2-position double	
3	3-position all ports closed	
4	3-position ABR connection	
5	3-position PAB connection	
<b>C Port size</b>		
Port	Port A/B	Compatibility
06	Rc1/8	4GB1 Series
08	Rc1/4	4GB2, 4GB3 Series
10	Rc3/8	4GB3 Series
<b>D Electrical connections</b>		
Blank	Grommet lead wire (300 mm)	
E2	E connector, lead wire 300 mm with lamp/surge suppressor	
E20	E connector, lead wire 500 mm with lamp/surge suppressor	
E21	E connector, lead wire 1 m with lamp/surge suppressor	
E22	E connector, lead wire 2 m with lamp/surge suppressor	
E23	E connector, lead wire 3 m with lamp/surge suppressor	
B	DIN terminal box (Pg7) with lamp/surge suppressor	
<b>E Voltage</b>		
1	100 VAC (rectifier integrated)	
2	200 VAC (rectifier integrated) (*2)	
3	24 VDC	
4	12 VDC	

Pilot operated 3-port valve Pneumatic valves

- \*1: Discrete valve: Base piping is equivalent to P4 specifications as standard.
- \*2: DIN terminal box only is supported.

M4GB1 Series / Cylinder bore size **MAX $\phi$ 40**

Metal base manifold  
Individual wiring with lamp/surge suppressor

Date issued / /  
Company \_\_\_\_\_  
Contact \_\_\_\_\_  
Order No. \_\_\_\_\_

Manifold model No.

**M4GB1**  **0R** -  - **E21 D** -  - **3** - **P4**

↓ Solenoid position    
 ↓ Port size    
 ↓ Electrical connections    
 ↓ Station No.    
 ↓ 24 VDC

[Solenoid position]	
<b>8</b>	Mix
<b>1</b>	2-position single
<b>2</b>	2-position double
<b>3</b>	3-position all ports closed
<b>4</b>	3-position ABR connection
<b>5</b>	3-position PAB connection

[Port size]	
<b>CX</b>	Mix
<b>C4</b>	$\phi$ 4 push-in
<b>C6</b>	$\phi$ 6 push-in

[Electrical connections]		
<b>Blank</b>	Grommet lead wire (300 mm)	
<b>E2</b>	E connector, lead wire 300 mm	with lamp/surge suppressor
<b>E20</b>	E connector, lead wire 500 mm	with lamp/surge suppressor
<b>E21</b>	E connector, lead wire 1 m	with lamp/surge suppressor
<b>E22</b>	E connector, lead wire 2 m	with lamp/surge suppressor
<b>E23</b>	E connector, lead wire 3 m	with lamp/surge suppressor

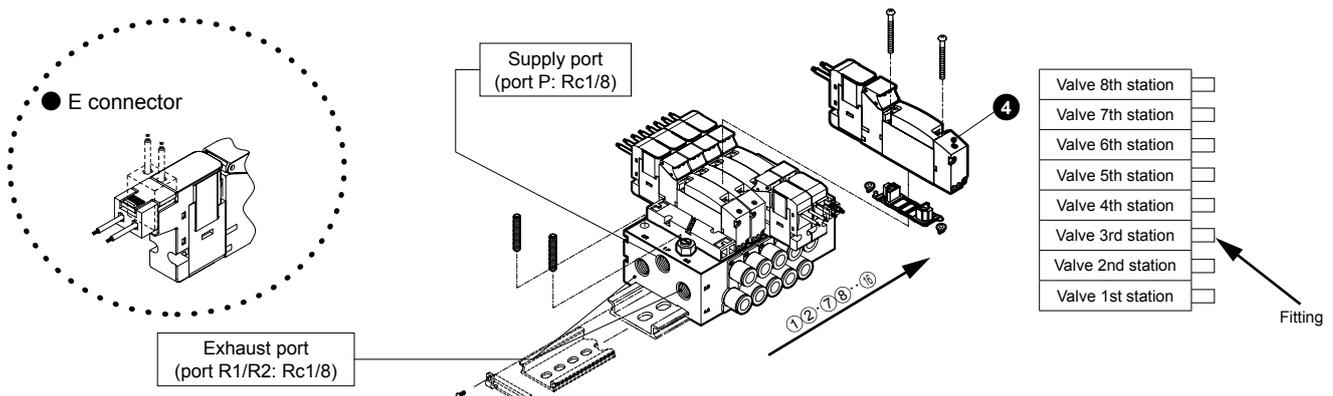
\* CAUTION  
 · Port size M5 type is P4 specifications as standard  
 · Cannot be mixed with push-in

Note: Refer to "Pneumatic Valves" (Catalog No. CB-023SA) for electrical connection details.

### Specifications Table

\* Fill in  $\bigcirc$  where needed

Name	Valve installation position																Quantity
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Solenoid valve	4GB119R 2-position single																
	4GB129R 2-position double																
	4GB139R 3-position all ports closed																
	4GB149R 3-position ABR connection																
	4GB159R 3-position PAB connection																
Masking plate	4G1R-MP																
Push-in fitting	$\phi$ 4 push-in fitting <b>C4</b>																
	$\phi$ 6 push-in fitting <b>C6</b>																
* $\bigcirc$ in layout position for mixed fittings only																	
Blanking plug	GWP: <input type="text"/> -B     Port A/B push-in fitting plug (select from $\phi$ 4, $\phi$ 6)																
	GWP: <input type="text"/> -B     Port A/B push-in fitting plug (select from $\phi$ 4, $\phi$ 6)																
DIN rail length L2	<input type="text"/>																
Notes	*1: When solenoid valve only is prepared separately Model No. 4GB1: <input type="text"/> 9R-00: <input type="text"/> -3 Solenoid position     Electrical connections																1: 2-position single 2: 2-position double 3: 3-position all ports closed 4: 3-position ABR connection 5: 3-position PAB connection



M4GB2 Series / Cylinder bore size

## MAX $\varnothing$ 80

Date issued / /

Company

Contact

Order No.

Metal base manifold  
Individual wiring with lamp/surge suppressor

Manifold model No.

**M4GB2**  **0R** -  - **E21** **D** -  - **3** - **P4**

↓ Solenoid position
↓ Port size
↓ Electrical connections
↓ Station No.
↓ 24 VDC

[Solenoid position]	
<b>8</b>	Mix
<b>1</b>	2-position single
<b>2</b>	2-position double
<b>3</b>	3-position all ports closed
<b>4</b>	3-position ABR connection
<b>5</b>	3-position PAB connection

[Port size]	
<b>CX</b>	Mix
<b>C4</b>	$\varnothing$ 4 push-in
<b>C6</b>	$\varnothing$ 6 push-in
<b>C8</b>	$\varnothing$ 8 push-in

[Electrical connections]	
<b>Blank</b>	Grommet lead wire (300 mm)
<b>E2</b>	E connector, lead wire 300 mm with lamp/surge suppressor
<b>E20</b>	E connector, lead wire 500 mm with lamp/surge suppressor
<b>E21</b>	E connector, lead wire 1 m with lamp/surge suppressor
<b>E22</b>	E connector, lead wire 2 m with lamp/surge suppressor
<b>E23</b>	E connector, lead wire 3 m with lamp/surge suppressor
<b>B</b>	DIN terminal box (Pg7) with lamp/surge suppressor

\* CAUTION  
 · Port size 06 (Rc1/8) type is P4 specifications as standard  
 · Cannot be mixed with push-in

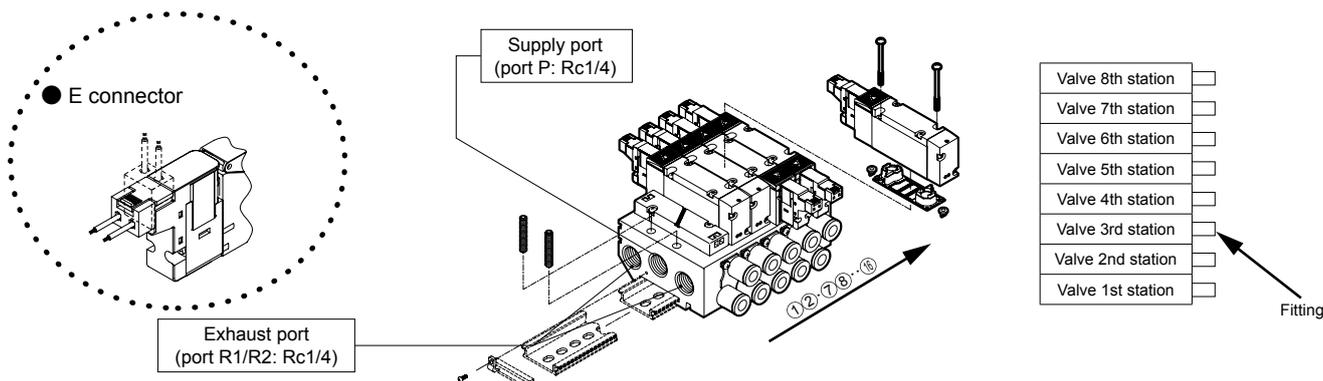
Note: Refer to "Pneumatic Valves" (Catalog No. CB-023SA) for electrical connection details.

### Specifications Table

\* Fill in  where needed

Name		Valve installation position																Quantity
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Solenoid valve	<b>4GB219R</b> 2-position single																	
	<b>4GB229R</b> 2-position double																	
	<b>4GB239R</b> 3-position all ports closed																	
	<b>4GB249R</b> 3-position ABR connection																	
	<b>4GB259R</b> 3-position PAB connection																	
Masking plate	<b>4G2R-MP</b>																	
Push-in fitting	$\varnothing$ 4 push-in fitting																	
	$\varnothing$ 6 push-in fitting																	
	$\varnothing$ 8 push-in fitting																	
* <input type="radio"/> in layout position for mixed fittings only																		
Blanking plug	<b>GWP</b> <input type="text"/> - <b>B</b>	Port A/B push-in fitting plug (select from $\varnothing$ 4, $\varnothing$ 6, $\varnothing$ 8)																
	<b>GWP</b> <input type="text"/> - <b>B</b>	Port A/B push-in fitting plug (select from $\varnothing$ 4, $\varnothing$ 6, $\varnothing$ 8)																
DIN rail length <b>L2</b>	<input type="text"/>	Fill in the left box only for non-standard lengths																
Notes	*1: When solenoid valve only is prepared separately Model No. 4GB2- <input type="text"/> 9R-00- <input type="text"/> -3 Solenoid position Electrical connections																	

1: 2-position single  
 2: 2-position double  
 3: 3-position all ports closed  
 4: 3-position ABR connection  
 5: 3-position PAB connection



Pilot operated 3-port valve

M4GB3 Series / Cylinder bore size **MAX $\varnothing$ 100**

Metal base manifold  
Individual wiring with lamp/surge suppressor

Date issued / /  
Company \_\_\_\_\_  
Contact \_\_\_\_\_  
Order No. \_\_\_\_\_

Manifold model No.

**M4GB3**  **0R** -  - **E21** **D** -  - **3** - **P4**

↓
↓
↓
↓
↓

Solenoid position
Port size
Electrical connections
Station No.
24 VDC

[Solenoid position]	
<b>8</b>	Mix
<b>1</b>	2-position single
<b>2</b>	2-position double
<b>3</b>	3-position all ports closed
<b>4</b>	3-position ABR connection
<b>5</b>	3-position PAB connection

[Port size]	
<b>CX</b>	Mix
<b>C6</b>	$\varnothing$ 6 push-in
<b>C8</b>	$\varnothing$ 8 push-in
<b>C10</b>	$\varnothing$ 10 push-in

[Electrical connections]		
<b>Blank</b>	Grommet lead wire (300 mm)	
<b>E2</b>	E connector, lead wire 300 mm	with lamp/surge suppressor
<b>E20</b>	E connector, lead wire 500 mm	with lamp/surge suppressor
<b>E21</b>	E connector, lead wire 1 m	with lamp/surge suppressor
<b>E22</b>	E connector, lead wire 2 m	with lamp/surge suppressor
<b>E23</b>	E connector, lead wire 3 m	with lamp/surge suppressor
<b>B</b>	DIN terminal box (Pg7) with lamp/surge suppressor	

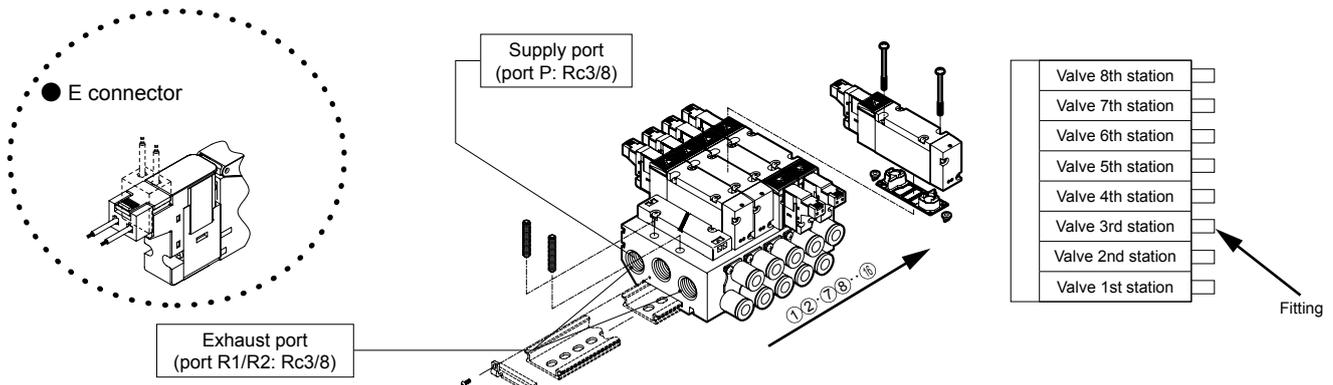
\* CAUTION  
 · Port size 08 (Rc1/4) is P4 specifications as standard  
 · Cannot be mixed with push-in

Note: Refer to "Pneumatic Valves" (Catalog No. CB-023SA) for electrical connection details.

### Specifications Table

\* Fill in  where needed

Name		Valve installation position																Quantity	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
Solenoid valve	<b>4GB319R</b> 2-position single																		
	<b>4GB329R</b> 2-position double																		
	<b>4GB339R</b> 3-position all ports closed																		
	<b>4GB349R</b> 3-position ABR connection																		
	<b>4GB359R</b> 3-position PAB connection																		
Masking plate	<b>4G3R-MP</b>																		
	$\varnothing$ 8 push-in fitting																		
	$\varnothing$ 10 push-in fitting																		
* <input type="radio"/> in layout position for mixed fittings only																			
Blanking plug	<b>GWP</b> : <input type="text"/> - <b>B</b>																		
	<b>GWP</b> : <input type="text"/> - <b>B</b>																		
DIN rail length <b>L2</b>	<input type="text"/>																		
Notes	*1: When solenoid valve only is prepared separately Model No. 4GB3 <input type="text"/> 9R-00- <input type="text"/> -3 Solenoid position Electrical connections																		



## M4GB1 Series / Cylinder bore size **MAXØ40**

Reduced wiring metal base manifold (serial transmission)

Date issued      /      /  
 Company \_\_\_\_\_  
 Contact \_\_\_\_\_  
 Order No. \_\_\_\_\_

Manifold model No.

**M4GB1**  **0R** -  - **D**  **E**  **D** -  - **3** - **P4**

Solenoid position      Port size      Station No.      24 DC

[Solenoid position]	
8	Mix
1	2-position single
2	2-position double
3	3-position all ports closed
4	3-position ABR connection
5	3-position PAB connection

[Port size]	
CX	Mix
C4	ø4 push-in
C6	ø6 push-in

[D] Reduced wiring connection		
T6A0	UNIWIRESYSTEM	NPN 8 points
T6A1		NPN 16 points
T6C0	CompoBus/S	NPN 8 points
T6C1		NPN 16 points
T6E0	S-LINK	NPN 8 points
T6E1		NPN 16 points
T6G1	CC-Link	NPN 16 points
T6J0	UNIWIRESYSTEM H	NPN 8 points
T6J1	SYSTEM	NPN 16 points
T8G1		NPN 16 points
T8G2	CC-Link	NPN 32 points
T8GP1	(thin)	PNP 16 points
T8GP2		PNP 32 points
T8P1	PROFIBUS-DP	NPN 16 points
T8P2	(thin)	NPN 32 points

[D] Reduced wiring connection		
T8PP1	PROFIBUS-DP	PNP 16 points
T8PP2	(thin)	PNP 32 points
T8EC1	EtherCAT	NPN 16 points
T8EC2		NPN 32 points
T8ECP1	(thin)	PNP 16 points
T8ECP2		PNP 32 points
T8EN1		NPN 16 points
T8EN2	EtherNet/IP	NPN 32 points
T8ENP1	(thin)	PNP 16 points
T8ENP2		PNP 32 points

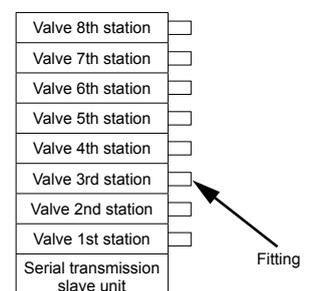
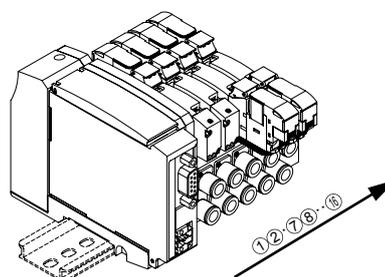
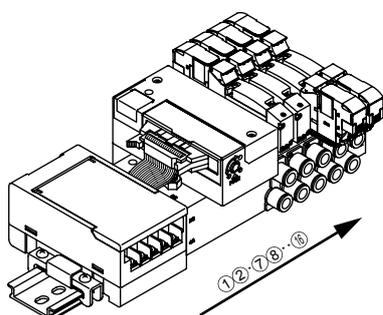
[E] Terminal/connector pin array	
Blank	Standard wiring
W	Double wiring

\* CAUTION  
 Port size M5 is P4 specifications as standard  
 Cannot be mixed with push-in

### Specifications Table

\* Fill in ○ where needed

Name	Valve installation position																Quantity
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Solenoid valve	4GB119R 2-position single																
	4GB129R 2-position double																
	4GB139R 3-position all ports closed																
	4GB149R 3-position ABR connection																
	4GB159R 3-position PAB connection																
	4G1R-MP <input type="text"/> Masking plate																
Push-in fitting	ø4 push-in fitting <b>C4</b>																
	ø6 push-in fitting <b>C6</b>																
* Print ○ in layout position for mixed fittings only																	
Blanking plug	GWP <input type="text"/> -B      Port A/B push-in fitting plug (select from ø4, ø6)																
	GWP <input type="text"/> -B      Port A/B push-in fitting plug (select from ø4, ø6)																
DIN rail length	L2= <input type="text"/> Fill in the left box only for non-standard lengths																
Notes	*1: Wiring block is 4GR-OPP3-* (serial transmission slave unit) 4GR-OPP7-* *2: When solenoid valve only is prepared separately Model No. 4GB1 <input type="text"/> 9R-00-A2N-3 Solenoid position																
	1: 2-position single 2: 2-position double 3: 3-position all ports closed 4: 3-position ABR connection 5: 3-position PAB connection																



M4GB2 Series / Cylinder bore size **MAXØ80**  
 Reduced wiring metal base manifold (serial transmission)

Date issued / /  
 Company \_\_\_\_\_  
 Contact \_\_\_\_\_  
 Order No. \_\_\_\_\_

Manifold model No.

**M4GB2**  **0R** -  -  **D E D** -  - **3 - P4**

Solenoid position      Port size      Station No.      24 DC

[Solenoid position]	
<b>8</b>	Mix
<b>1</b>	2-position single
<b>2</b>	2-position double
<b>3</b>	3-position all ports closed
<b>4</b>	3-position ABR connection
<b>5</b>	3-position PAB connection

[Port size]	
<b>CX</b>	Mix
<b>C4</b>	ø4 push-in
<b>C6</b>	ø6 push-in
<b>C8</b>	ø8 push-in

D Reduced wiring connection		
<b>T6A0</b>	UNIWIRESYSTEM	NPN 8 points
<b>T6A1</b>		NPN 16 points
<b>T6C0</b>	CompoBus/S	NPN 8 points
<b>T6C1</b>		NPN 16 points
<b>T6E0</b>	S-LINK	NPN 8 points
<b>T6E1</b>		NPN 16 points
<b>T6G1</b>	CC-Link	NPN 16 points
<b>T6J0</b>	UNIWIRESYSTEM H	NPN 8 points
<b>T6J1</b>		NPN 16 points
<b>T8G1</b>	CC-Link (thin)	NPN 16 points
<b>T8G2</b>		NPN 32 points
<b>T8GP1</b>	CC-Link (thin)	PNP 16 points
<b>T8GP2</b>		PNP 32 points
<b>T8P1</b>	PROFIBUS-DP	NPN 16 points
<b>T8P2</b>	(thin)	NPN 32 points

D Reduced wiring connection		
<b>T8PP1</b>	PROFIBUS-DP (thin)	PNP 16 points
<b>T8PP2</b>		PNP 32 points
<b>T8EC1</b>	EtherCAT (thin)	NPN 16 points
<b>T8EC2</b>		NPN 32 points
<b>T8ECP1</b>	EtherCAT (thin)	PNP 16 points
<b>T8ECP2</b>		PNP 32 points
<b>T8EN1</b>	EtherNet/IP (thin)	NPN 16 points
<b>T8EN2</b>		NPN 32 points
<b>T8ENP1</b>	EtherNet/IP (thin)	PNP 16 points
<b>T8ENP2</b>		PNP 32 points

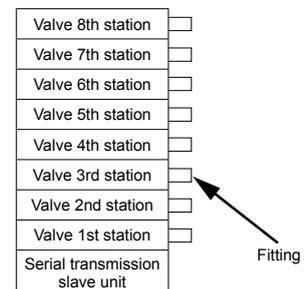
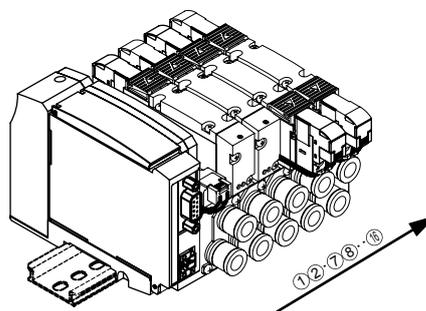
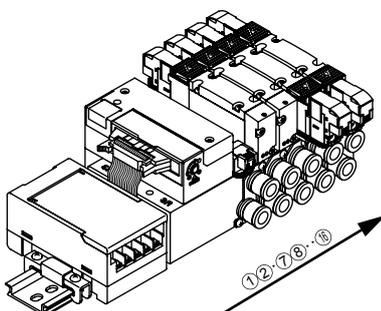
E Terminal/connector pin array	
<b>Blank</b>	Standard wiring
<b>W</b>	Double wiring

\* CAUTION  
 · Port size 06 (Rc1/8) is P4 specifications as standard  
 · Cannot be mixed with push-in

### Specifications Table

\* Fill in ○ where needed

Name	Valve installation position																Quantity	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
Solenoid valve	4GB219R 2-position single																	
	4GB229R 2-position double																	
	4GB239R 3-position all ports closed																	
	4GB249R 3-position ABR connection																	
	4GB259R 3-position PAB connection																	
	4G2R-MP <input type="text"/> Masking plate																	
Push-in fitting	ø4 push-in fitting	<b>C4</b>																
	ø6 push-in fitting	<b>C6</b>																
	ø8 push-in fitting	<b>C8</b>																
* Print ○ in layout position for mixed fittings only																		
Blanking plug	GWP: <input type="text"/> -B		Port A/B push-in fitting plug (select from ø4, ø6, ø8)															
	GWP: <input type="text"/> -B		Port A/B push-in fitting plug (select from ø4, ø6, ø8)															
DIN rail length	L2: <input type="text"/>		Fill in the left box only for non-standard lengths															
Notes	*1: Wiring block is 4GR-OPP3-* (serial transmission slave unit) 4GR-OPP7-* *2: When solenoid valve only is prepared separately Model No. 4GB2 <input type="text"/> 9-00-A2N-3 Solenoid position <input type="text"/>																	
																	1: 2-position single 2: 2-position double 3: 3-position all ports closed 4: 3-position ABR connection; 5: 3-position PAB connection;	



M4GB3 Series / Cylinder bore size

# MAX $\phi$ 100

Reduced wiring metal base manifold (serial transmission)

Date issued / /

Company

Contact

Order No.

Manifold model No.

**M4GB3**  **0R** -  -  **D**  **E D** -  - **3** - **P4**

↓ Solenoid position
↓ Port size
↓ Station No.
↓ 24 DC

[Solenoid position]	
<b>8</b>	Mix
<b>1</b>	2-position single
<b>2</b>	2-position double
<b>3</b>	3-position all ports closed
<b>4</b>	3-position ABR connection
<b>5</b>	3-position PAB connection

[Port size]	
<b>CX</b>	Mix
<b>C6</b>	$\phi$ 6 push-in
<b>C8</b>	$\phi$ 8 push-in
<b>C10</b>	$\phi$ 10 push-in

D Reduced wiring connection		
<b>T6A0</b>	UNIWIRESYSTEM	NPN 8 points
<b>T6A1</b>		NPN 16 points
<b>T6C0</b>	CompoBus/S	NPN 8 points
<b>T6C1</b>		NPN 16 points
<b>T6E0</b>	S-LINK	NPN 8 points
<b>T6E1</b>		NPN 16 points
<b>T6G1</b>	CC-Link	NPN 16 points
<b>T6J0</b>	UNIWIRESYSTEM H	NPN 8 points
<b>T6J1</b>		NPN 16 points
<b>T8G1</b>	CC-Link (thin)	NPN 16 points
<b>T8G2</b>		NPN 32 points
<b>T8GP1</b>	CC-Link (thin)	PNP 16 points
<b>T8GP2</b>		PNP 32 points
<b>T8P1</b>	PROFIBUS-DP (thin)	NPN 16 points
<b>T8P2</b>		NPN 32 points

D Reduced wiring connection		
<b>T8PP1</b>	PROFIBUS-DP (thin)	PNP 16 points
<b>T8PP2</b>		PNP 32 points
<b>T8EC1</b>	EtherCAT (thin)	NPN 16 points
<b>T8EC2</b>		NPN 32 points
<b>T8ECP1</b>	EtherNet/IP (thin)	PNP 16 points
<b>T8ECP2</b>		PNP 32 points
<b>T8EN1</b>	EtherNet/IP (thin)	NPN 16 points
<b>T8EN2</b>		NPN 32 points
<b>T8ENP1</b>	EtherNet/IP (thin)	PNP 16 points
<b>T8ENP2</b>		PNP 32 points

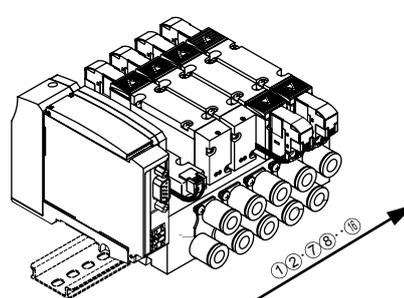
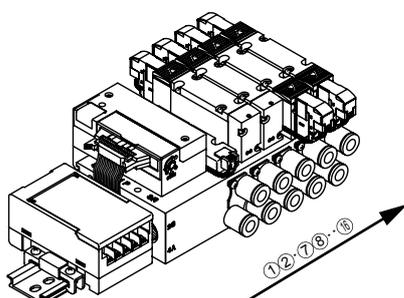
E Terminal/connector pin array	
<b>Blank</b>	Standard wiring
<b>W</b>	Double wiring

\* CAUTION  
 Port size 08 (Rc1/4) is P4 specifications as standard

### Specifications Table

\* Fill in  $\bigcirc$  where needed

Name	Valve installation position																Quantity		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			
Solenoid valve	<b>Wiring block</b>																		
																		<b>4GB319R</b> 2-position single	
																		<b>4GB329R</b> 2-position double	
																		<b>4GB339R</b> 3-position all ports closed	
																		<b>4GB349R</b> 3-position ABR connection	
																		<b>4GB359R</b> 3-position PAB connection	
<b>4G3R-MP</b> <input type="text"/> Masking plate																			
$\phi$ 8 push-in fitting <b>C8</b>																			
$\phi$ 10 push-in fitting <b>C10</b>																			
* Print $\bigcirc$ in layout position for mixed fittings only																			
Blanking plug	<b>GWP</b> <input type="text"/> - <b>B</b>		Port A/B push-in fitting plug (select from $\phi$ 6, $\phi$ 8, $\phi$ 10)																
	<b>GWP</b> <input type="text"/> - <b>B</b>		Port A/B push-in fitting plug (select from $\phi$ 6, $\phi$ 8, $\phi$ 10)																
DIN rail length	<b>L2=</b> <input type="text"/>		Fill in the left box only for non-standard lengths																
Notes	*1: Wiring block is 4GR-OPP3-* (serial transmission slave unit) 4GR-OPP7-* *2: When solenoid valve only is prepared separately Model No. 4GB3 <input type="text"/> 9-00-A2N-3 Solenoid position																		
<div style="border: 1px dashed black; padding: 5px; display: inline-block;">                         1: 2-position single                          2: 2-position double                          3: 3-position all ports closed                          4: 3-position ABR connection                          5: 3-position PAB connection                     </div>																			



- Valve 8th station
  - Valve 7th station
  - Valve 6th station
  - Valve 5th station
  - Valve 4th station
  - Valve 3rd station
  - Valve 2nd station
  - Valve 1st station
  - Serial transmission slave unit
- Fitting

MN4GB1 Series / Cylinder bore size

## MAXØ40

Date issued / /

Company

Contact

Order No.

Resin block manifold  
Individual wiring with lamp/surge suppressor

Manifold model No.

**MN4GB1**  **0R** -  - **E21** -  - **3** - **P4**

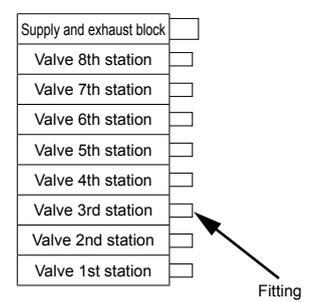
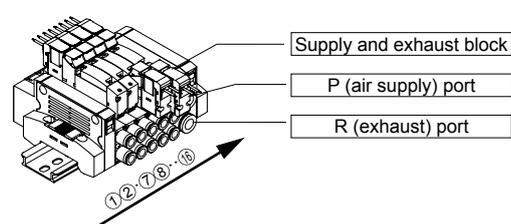
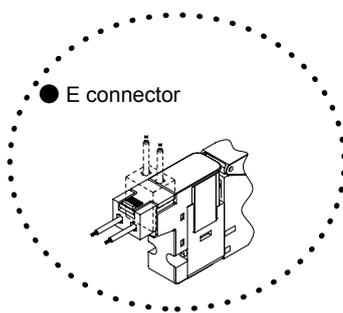
Solenoid position      Port size      Electrical connections      Station No.      24 VDC

[Solenoid position]		[Port size]		[Electrical connections]	
<b>8</b>	Mix	<b>CX</b>	Mix	<b>Blank</b>	Grommet lead wire (300 mm)
<b>1</b>	2-position single	<b>C4</b>	ø4 push-in	<b>E2</b>	E connector, lead wire 300 mm with lamp/surge suppressor
<b>2</b>	2-position double	<b>C6</b>	ø6 push-in	<b>E20</b>	E connector, lead wire 500 mm with lamp/surge suppressor
<b>3</b>	3-position all ports closed			<b>E21</b>	E connector, lead wire 1 m with lamp/surge suppressor
<b>4</b>	3-position ABR connection			<b>E22</b>	E connector, lead wire 2 m with lamp/surge suppressor
<b>5</b>	3-position PAB connection			<b>E23</b>	E connector, lead wire 3 m with lamp/surge suppressor

### Specifications Table

\* Fill in  where needed

Name	Valve installation position																Quantity		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			
Solenoid valve	End block																Supply and exhaust block	End block	
																			4GB119R 2-position single
																			4GB129R 2-position double
																			4GB139R 3-position all ports closed
																			4GB149R 3-position ABR connection
4GB159R 3-position PAB connection																			
Push-in fitting	End block																Supply and exhaust block	End block	
																			ø4 push-in fitting <b>C4</b>
	End block																Supply and exhaust block	End block	
ø6 push-in fitting <b>C6</b>																			
* Print <input type="radio"/> in layout position for mixed fittings only																			
Blanking plug	End block																Supply and exhaust block	End block	
																			GWP: <input type="text"/> -B Port A/B push-in fitting plug (select from ø4, ø6)
	End block																Supply and exhaust block	End block	
GWP: <input type="text"/> -B Port A/B push-in fitting plug (select from ø4, ø6)																			
DIN rail length	End block																Supply and exhaust block	End block	
L2= <input type="text"/> Fill in the left box only for non-standard lengths																			
Tag plate	End block																Supply and exhaust block	End block	
N4G1R-TAG-PLATE-B <input type="text"/> Yes None																			
Supply and exhaust B	End block																Supply and exhaust block	End block	
N4G1R-Q- <input type="text"/> -P4 Supply and exhaust port size selection (ø6, ø8)																			
Supply and exhaust B 2 attached	End block																Supply and exhaust block	End block	
Change the <input checked="" type="checkbox"/> in the box to <input type="checkbox"/> in order to use both ends of the supply and exhaust block <span style="float: right;">⇨</span> <input type="checkbox"/>																			
Notes	End block																Supply and exhaust block	End block	
Supply and exhaust block is N4G1R-Q-*P4 (air supply, exhaust with ø6, ø8 push-in fitting) *1: When solenoid valve only is prepared separately Model No. 4GB1 <input type="text"/> 9R-00- <input type="text"/> -3 Solenoid position      Electrical connections																			



MN4GB2 Series / Cylinder bore size

## MAXØ80

Date issued / /

Company

Contact

Order No.

Resin block manifold  
Individual wiring with lamp/surge suppressor

Manifold model No.

**MN4GB2**  **0R** -  - **E21** -  - **3** - **P4**

Solenoid position

Port size Electrical connections Station No. 24 VDC

[Solenoid position]	
<b>8</b>	Mix
<b>1</b>	2-position single
<b>2</b>	2-position double
<b>3</b>	3-position all ports closed
<b>4</b>	3-position ABR connection
<b>5</b>	3-position PAB connection

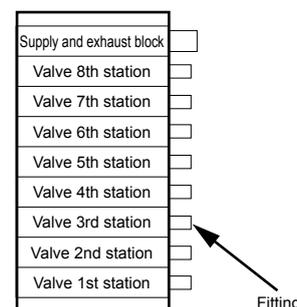
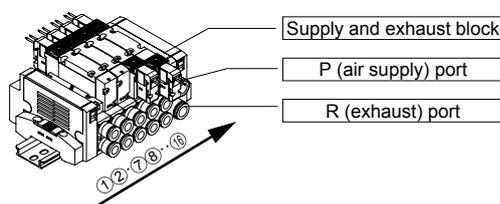
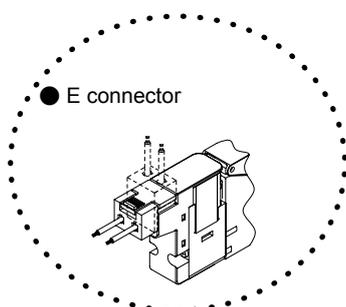
[Port size]	
<b>CX</b>	Mix
<b>C4</b>	ø4 push-in
<b>C6</b>	ø6 push-in
<b>C8</b>	ø8 push-in

[Electrical connections]		
<b>Blank</b>	Grommet lead wire (300 mm)	
<b>E2</b>	E connector, lead wire 300 mm	with lamp/surge suppressor
<b>E20</b>	E connector, lead wire 500 mm	with lamp/surge suppressor
<b>E21</b>	E connector, lead wire 1 m	with lamp/surge suppressor
<b>E22</b>	E connector, lead wire 2 m	with lamp/surge suppressor
<b>E23</b>	E connector, lead wire 3 m	with lamp/surge suppressor
<b>B</b>	DIN terminal box (Pg7) with lamp/surge suppressor	

### Specifications Table

\* Fill in  where needed

Name	Valve installation position															Quantity			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				
Solenoid valve	End block															Supply and exhaust block	End block		
Push-in fitting	End block															Supply and exhaust block	End block	ø4 push-in fitting <b>C4</b>	
																		ø6 push-in fitting <b>C6</b>	
																		ø8 push-in fitting <b>C8</b>	
* Print <input type="radio"/> in layout position for mixed fittings only																			
Blanking plug	End block															Supply and exhaust block	End block	G <input type="text"/> -B	Port A/B push-in fitting plug (select from ø4, ø6, ø8)
																		G <input type="text"/> -B	Port A/B push-in fitting plug (select from ø4, ø6, ø8)
DIN rail length	End block															Supply and exhaust block	End block	L2= <input type="text"/>	Fill in the left box only for non-standard lengths
Tag plate																		<b>N4G2R-TAG-PLATE-B</b>	
Supply and exhaust B	End block															Supply and exhaust block	End block	<b>N4G2R-Q-</b> <input type="text"/> -P4	Supply and exhaust port size selection (ø8, ø10)
Supply and exhaust B 2 attached																		Change the × in the box to <input type="radio"/> in order to use both ends of the supply and exhaust block	<input type="radio"/> ← → <input type="radio"/>
Notes	End block															Supply and exhaust block	End block	Supply and exhaust block is N4G2R-Q-*P4 (air supply, exhaust with ø8, ø10 push-in fitting)	
*1: When solenoid valve only is prepared separately Model No. 4GB2- <input type="text"/> 9R-00- <input type="text"/> -3																		Solenoid position	Electrical connections



Pilot operated 3-port valve

MN4GB1 Series / Cylinder bore size

## MAX $\varnothing$ 40

Reduced wiring resin block manifold (serial transmission)

Manifold model No.

Date issued / /

Company

Contact

Order No.

**MN4GB1**  **0R** -  -  **D**  **E** -  - **3** - **P4**

Solenoid position

Port size

Station No. 24 VDC

[Solenoid position]	
8	Mix
1	2-position single only
2	2-position double only
3	3-position all ports closed
4	3-position ABR connection
5	3-position PAB connection

[Port size]	
CX	Mix
C4	$\varnothing$ 4 push-in
C6	$\varnothing$ 6 push-in

D Reduced wiring connection		
T6A0	UNIWIRESYSTEM	NPN 8 points
T6A1		NPN 16 points
T6C0	CompoBus/S	NPN 8 points
T6C1		NPN 16 points
T6E0	S-LINK	NPN 8 points
T6E1		NPN 16 points
T6G1	CC-Link	NPN 16 points
T6J0	UNIWIRESYSTEM	NPN 8 points
T6J1	SYSTEM	NPN 16 points
T7C0	CompoBus/S	NPN 8 points
T7C1		NPN 16 points
T7D1	DeviceNet (thin)	NPN 16 points
T7E0	S-Link (thin)	NPN 8 points
T7E1		NPN 16 points
T7G1	CC-Link (thin)	NPN 16 points
T7L1	SAVE NET (thin)	NPN 16 points
T7S1	CompoNet (thin)	NPN 16 points
T7SP1		NPN 16 points
T8G1	CC-Link (thin)	NPN 16 points
T8G2	CC-Link (thin)	NPN 32 points

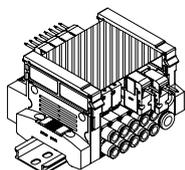
D Reduced wiring connection		
T8GP1	CC-Link (thin)	PNP 16 points
T8GP2		PNP 32 points
T8P1	PROFIBUS-DP (thin)	NPN 16 points
T8P2		NPN 32 points
T8PP1		PNP 16 points
T8PP2		PNP 32 points
T8EC1	EtherCAT (thin)	NPN 16 points
T8EC2		NPN 32 points
T8ECP1	EtherNet/IP (thin)	PNP 16 points
T8ECP2		PNP 32 points
T8EN1	EtherNet/IP (thin)	NPN 16 points
T8EN2		NPN 32 points
T8ENP1		PNP 16 points
T8ENP2		PNP 32 points

E Terminal/connector pin array	
Blank	Standard wiring
W	Double wiring

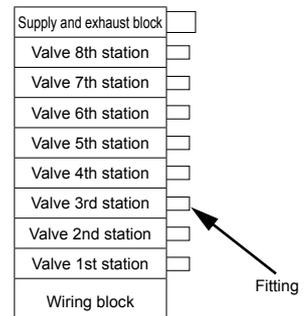
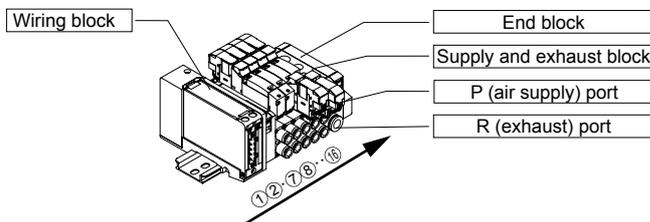
### Specifications Table

\* Fill in  $\bigcirc$  where needed

Name	Valve installation position																Quantity		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			
Solenoid valve	4GB119R 2-position single																Wiring block	Supply and exhaust block	End block
	4GB129R 2-position double																		
	4GB139R 3-position all ports closed																		
	4GB149R 3-position ABR connection																		
	4GB159R 3-position PAB connection																		
	N4GB1R-MP																		
Push-in fitting	$\varnothing$ 4 push-in fitting																C4		
	$\varnothing$ 6 push-in fitting																C6		
* Print $\bigcirc$ in layout position for mixed fittings only																			
Blanking plug	GWP: <input type="text"/> -B																Port A/B push-in fitting plug (select from $\varnothing$ 4, $\varnothing$ 6)		
	GWP: <input type="text"/> -B																Port A/B push-in fitting plug (select from $\varnothing$ 4, $\varnothing$ 6)		
DIN rail length	L2= <input type="text"/>																Fill in the left box only for non-standard lengths		
Tag plate	N4G1R-TAG-PLATE-B <input type="text"/>																Yes	None	
Supply and exhaust block	N4G1R-Q- <input type="text"/> -P4																Supply and exhaust port size selection ( $\varnothing$ 6, $\varnothing$ 8)		
Supply and exhaust block 2 attached	Change the $\times$ in the box to $\bigcirc$ in order to use both ends of the supply and exhaust block																<input type="checkbox"/> $\rightarrow$ <input type="checkbox"/>		
Notes	Supply and exhaust block is N4G1R-Q-6-P4 (air supply, exhaust with $\varnothing$ 6 push-in fitting) N4G1R-Q-8-P4 (air supply, exhaust with $\varnothing$ 8, push-in fitting)																		
	*2: When solenoid valve only is prepared separately Model No. 4GB1 <input type="text"/> 9R-00-A2N-3 Solenoid position $\rightarrow$																1: 2-position single 2: 2-position double 3: 3-position all ports closed 4: 3-position ABR connection 5: 3-position PAB connection		



With tag plate



MN4GB2 Series / Cylinder bore size

## MAXØ80

Reduced wiring resin block manifold (serial transmission)

Manifold model No.

Date issued / /

Company

Contact

Order No.

**MN4GB2**  **0R** -  - **D** **E** -  - **3** - **P4**

Solenoid position

Port size

Station No. 24 VDC

[Solenoid position]	
<b>8</b>	Mix
<b>1</b>	2-position single only
<b>2</b>	2-position double only
<b>3</b>	3-position all ports closed
<b>4</b>	3-position ABR connection
<b>5</b>	3-position PAB connection

[Port size]	
<b>CX</b>	Mix
<b>C4</b>	ø4 push-in
<b>C6</b>	ø6 push-in
<b>C8</b>	ø8 push-in

D Reduced wiring connection		
<b>T6A0</b>	UNIWIRESYSTEM	NPN 8 points
<b>T6A1</b>	UNIWIRESYSTEM	NPN 16 points
<b>T6C0</b>	CompoBus/S	NPN 8 points
<b>T6C1</b>	CompoBus/S	NPN 16 points
<b>T6E0</b>	S-LINK	NPN 8 points
<b>T6E1</b>	S-LINK	NPN 16 points
<b>T6G1</b>	CC-Link	NPN 16 points
<b>T6J0</b>	UNIWIRESYSTEM H	NPN 8 points
<b>T6J1</b>	UNIWIRESYSTEM H	NPN 16 points
<b>T7C0</b>	CompoBus/S	NPN 8 points
<b>T7C1</b>	CompoBus/S	NPN 16 points
<b>T7D1</b>	DeviceNet (thin)	NPN 16 points
<b>T7E0</b>	S-LINK	NPN 8 points
<b>T7E1</b>	S-LINK (thin)	NPN 16 points
<b>T7G1</b>	CC-Link (thin)	NPN 16 points
<b>T7L1</b>	SAVE NET (thin)	NPN 16 points
<b>T7S1</b>	CompoNet (thin)	NPN 16 points
<b>T7SP1</b>	CompoNet (thin)	NPN 16 points
<b>T8G1</b>	CC-Link	NPN 16 points
<b>T8G2</b>	CC-Link (thin)	NPN 32 points

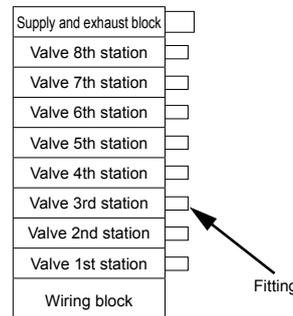
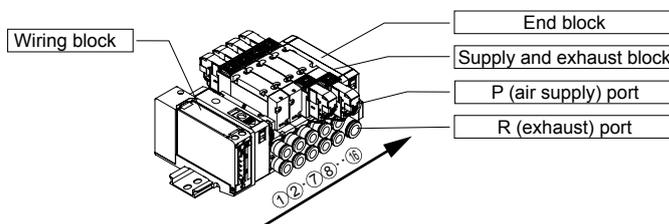
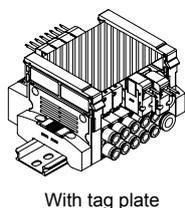
D Reduced wiring connection		
<b>T8GP1</b>	CC-Link (thin)	PNP 16 points
<b>T8GP2</b>	CC-Link (thin)	PNP 32 points
<b>T8P1</b>	PROFIBUS-DP (thin)	NPN 16 points
<b>T8P2</b>		NPN 32 points
<b>T8PP1</b>	PROFIBUS-DP (thin)	PNP 16 points
<b>T8PP2</b>		PNP 32 points
<b>T8EC1</b>	EtherCAT (thin)	NPN 16 points
<b>T8EC2</b>		NPN 32 points
<b>T8ECP1</b>	EtherCAT (thin)	PNP 16 points
<b>T8ECP2</b>		PNP 32 points
<b>T8EN1</b>	EtherNet/IP (thin)	NPN 16 points
<b>T8EN2</b>		NPN 32 points
<b>T8ENP1</b>	EtherNet/IP (thin)	PNP 16 points
<b>T8ENP2</b>		PNP 32 points

E Terminal/connector pin array	
<b>Blank</b>	Standard wiring
<b>W</b>	Double wiring

### Specifications Table

\* Fill in ○ where needed

Name	Valve installation position																Supply and exhaust block	End block	Quantity				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16							
Solenoid valve	4GB219R 2-position single																Wiring block						
	4GB229R 2-position double																						
	4GB239R 3-position all ports closed																						
	4GB249R 3-position ABR connection																						
	4GB259R 3-position PAB connection																						
Push-in fitting	ø4 push-in fitting																Wiring block						
	ø6 push-in fitting																						
	ø8 push-in fitting																						
* Print ○ in layout position for mixed fittings only																							
Blanking plug	GWP <input type="text"/> -B																Port A/B push-in fitting plug (select from ø4, ø6, ø8)						
	GWP <input type="text"/> -B																Port A/B push-in fitting plug (select from ø4, ø6, ø8)						
DIN rail length	L2= <input type="text"/>																Fill in the left box only for non-standard lengths						
Tag plate	N4G2R-TAG-PLATE-B																				Yes	None	
Supply and exhaust block	N4G2R-Q- <input type="text"/> -P4																Supply and exhaust port size selection (ø8, ø10)						
Supply and exhaust block 2 attached	Change the × in the box to ○ in order to use both ends of the supply and exhaust block																				×		
Notes	Supply and exhaust block is N4G2R-Q-8-P4 (air supply, exhaust with ø8 push-in fitting)																						
	N4G2R-Q-10-P4 (air supply, exhaust with ø10 push-in fitting)																						
*2: When solenoid valve only is prepared separately Model No. 4GB2- <input type="text"/> 9R-00-A2N-3																Solenoid position							
																<ul style="list-style-type: none"> <li>1: 2-position single</li> <li>2: 2-position double</li> <li>3: 3-position all ports closed</li> <li>4: 3-position ABR connection</li> <li>5: 3-position PAB connection</li> </ul>							



Pilot operated 3-port valve



Pneumatic Valves  
Catalog No. CB-023SA

# Direct acting 3-port valve

Discrete valve body piping/sub-plate piping

## 3QRA/3QRB Series

Individual wiring manifold Body piping/sub-plate piping

## M3QRA/M3QRB Series

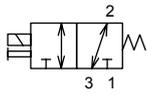
●Cylinder bore size:  $\varnothing 6$  to  $\varnothing 25$

P4 compliant  
as standard



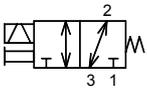
### JIS symbol

●2-position universal  
(self-reset)



Port numbers 1, 2 and 3 are  
Port 1: P, NC  
Port 2: A, COM  
Port 3: R, NO

(self-hold)



Port numbers 1, 2 and 3 are  
Port 1: P, NC  
Port 2: A, COM  
Port 3: R, NO

### Common specifications

Descriptions	Content
Valve and operation	Direct acting poppet valve
Working fluid	Compressed air, low vacuum
Max. working pressure MPa	0.70
Min. working pressure MPa	Low vacuum: -100 kPa
Proof pressure MPa	1.05 (low vacuum: -101 kPa)
Max. working pressure differential MPa	0.70
Ambient temperature °C	-5 to 50 (no freezing)
Fluid temperature °C	5 to 50
Lubrication	Not available *
Degree of protection	Dust-proof
Vibration resistance $m/s^2$	50 or less
Shock resistance $m/s^2$	300 or less
Atmosphere	Cannot be used in corrosive gas environment.

\* Lubrication will deteriorate the performance.

### Electrical specifications

Descriptions	Standard specifications	Large flow rate specifications H	
		Intermittent *1	Continuous
Rated voltage V/DC	24/12		
Energizing rate	Intermittent *1   Continuous		
Voltage fluctuation range	±10%		
Starting current A	24 VDC	-	0.13
	12 VDC	-	0.27
Holding current A	24 VDC	0.08	0.10
	12 VDC	0.17	0.20
Power consumption W	2.0	2.4 *2	
Thermal class	B		

\*1: Limit energizing within 5 minutes and energization ratio to 50% or less. Min. time of excitation for self-holding is 50 ms.

\*2: 3.2 W for 20 ms after start.

### Individual specifications

Descriptions	3QRA11	3QRB11	3QRA12	3QRB12	M3QRA11	M3QRB11	M3QRA12	M3QRB12	
Port size	Port 1	M5				Rc1/8			
	Port 2	M5				M5			
	Port 3	M5				Rc1/8			
Response time *1 ON/OFF ms	4±1/1.5±1		5 or less		4±1/1.5±1		5 or less		
Weight g	24	27	28	31	19 (single solenoid valve)		23 (single solenoid valve)		

\*1: Response time is the value for continuous operation under the condition of 0.5 MPa supply pressure at 20°C.

### Flow characteristics

Model No.	Option	Port 1 → 2		Port 2 → 1		Port 2 → 3		Port 3 → 2	
		C[dm <sup>3</sup> /(s·bar)]	S (reference value) [mm <sup>2</sup> ]	C[dm <sup>3</sup> /(s·bar)]	S (reference value) [mm <sup>2</sup> ]	C[dm <sup>3</sup> /(s·bar)]	S (reference value) [mm <sup>2</sup> ]	C[dm <sup>3</sup> /(s·bar)]	S (reference value) [mm <sup>2</sup> ]
3QRA1	Blank	0.30	1.5	0.32	1.6	0.32	1.6	0.30	1.5
	H	0.36	1.8	0.38	1.9	0.38	1.9	0.36	1.8
3QRB1	Blank	0.30	1.5	0.34	1.7	0.36	1.8	0.34	1.7
	H	0.36	1.8	0.40	2.0	0.40	2.0	0.40	2.0
M3QRA1	Blank	0.30	1.5	0.32	1.6	0.32	1.6	0.30	1.5
	H	0.36	1.8	0.38	1.9	0.38	1.9	0.36	1.8
M3QRB1	Blank	0.30	1.5	0.34	1.7	0.36	1.8	0.34	1.7
	H	0.36	1.8	0.40	2.0	0.40	2.0	0.40	2.0

### How to order

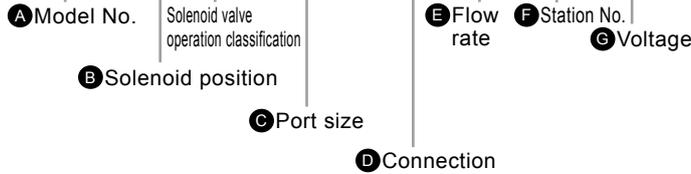
· Single solenoid valve



· Single solenoid valve



· Manifold



### ⚠ Precautions for model No. selection

- \*1: For connection with the grommet lead wire (300 mm), "2", 2-position single solenoid (self-hold) for **B** solenoid position, and "H", large flow rate for **E** flow rate are not selectable.
- \*2: For "2", 2-position single solenoid (self-hold) for **B** solenoid position, "H" for **E** flow rate and "4" for **G** voltage are not selectable.
- \*3: Combination with a masking plate.  
Combination of A and B types is not available.  
Solenoid positions "1" and "2" cannot be mixed.

### How to order masking plate kit

#### 3QR1 - MP - KIT

\* Gasket/mounting screw attached

Code	Content	A Model No.			
		Single unit		Manifold	
		3QRA1	3QRB1	M3QRA1	M3QRB1
<b>B Solenoid position</b>					
1	2-position single (self-reset)	●	●	●	●
2	2-position single (self-hold) *2	●	●	●	●
8	Mix manifold *3			●	●
<b>C Port size</b>					
M5	M5	●	●	●	●
<b>D Connection</b>					
Grommet lead wire					
Blank	Grommet lead wire (300 mm) *1	●	●	●	●
C connector (lead wire lateral direction)					
C2	Lead wire (300 mm) with surge suppressor/lamp	●	●	●	●
C20	Lead wire (500 mm) with surge suppressor/lamp	●	●	●	●
C21	Lead wire (1000 mm) with surge suppressor/lamp	●	●	●	●
C22	Lead wire (2000 mm) with surge suppressor/lamp	●	●	●	●
C3	Without lead wire, with surge suppressor/lamp	●	●	●	●
D connector (lead wire upward direction)					
D2	Lead wire (300 mm) with surge suppressor/lamp	●	●	●	●
D20	Lead wire (500 mm) with surge suppressor/lamp	●	●	●	●
D21	Lead wire (1000 mm) with surge suppressor/lamp	●	●	●	●
D22	Lead wire (2000 mm) with surge suppressor/lamp	●	●	●	●
D3	Without lead wire, with surge suppressor/lamp	●	●	●	●
<b>E Flow rate</b>					
Blank	Standard 2 W	●	●	●	●
H	Large flow rate 3.2 W → 2.4 W	●	●	●	●
<b>F Station No.</b>					
2	2 stations			●	●
to					
20	20 stations			●	●
<b>G Voltage</b>					
3	24 VDC	●	●	●	●
4	12 VDC	●	●	●	●

Pilot operated  
3-port valve



Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

## Super dryer combination Super dryer

# SU300E/SU400E/SD300E/SD400E-W Series

E Series, with small air loss and filter-like usability

- Reduces operation costs through energy-saving moisture removal with a purge ratio of 10%.
- 3 types of units are available. Appropriate system is available according to applications.

- Processing air flow rate: 75 to 450 ℓ/min (ANR)  
(0.7 MPa, atmospheric dew point -15°C)



## Specifications

Descriptions	SU301E	SU302E	SU401E	SU402E	SU301E	SU302E	SU401E	SU402E	SU301E	SU302E	SU401E	SU402E	SD301E	SD302E	SD401E	SD402E			
	*-W-C1	*-W-C1	*-W-C1	*-W-C1	*-W-C2	*-W-C2	*-W-C2	*-W-C2	*-W-C3	*-W-C3	*-W-C3	*-W-C3	*-W	*-W	*-W	*-W			
Appearance																			
	Simple & space saving structure unit that removes moisture from the air from which solid impurities have already been removed. (*1)				Unit supplying clean dry air with line not requiring pressure adjustment.				A unit that supplies pressure-adjusted clean dry air just by supplying compressed air.				Discrete super dryer enabling easy system configuration with peripheral devices due to modular design.						
Configuration	Oil mist filter Super dryer				Air filter Oil mist filter (with differential pressure gauge) Super dryer				Air filter Oil mist filter (with differential pressure gauge) Super dryer Regulator				Super dryer						
Range of working conditions	Working fluid																		
	Compressed air																		
	Inlet air pressure MPa																		
	0.4 to 1.0																		
	Proof pressure MPa																		
1.5																			
Inlet air temperature °C																			
5 to 50																			
Ambient temperature °C																			
5 to 50																			
Outlet air atmospheric dew point °C																			
-15																			
Standard rating	Inlet air flow ℓ/min (ANR)																		
	75	150	300	450	75	150	300	450	75	150	300	450	75	150	300	450			
	Outlet air flow ℓ/min (ANR)																		
	67	135	270	405	67	135	270	405	67	135	270	405	67	135	270	405			
	Purge flow rate ℓ/min (ANR)																		
	8	15	30	45	8	15	30	45	8	15	30	45	8	15	30	45			
	Inlet air pressure dew point °C																		
	25																		
Inlet air pressure MPa																			
0.7																			
Inlet air temperature °C																			
25																			
Ambient temperature °C																			
25																			
Air filter	Filtration μm				—				5				—						
Oil mist filter	Oil removal mg/m <sup>3</sup>				0.1 (approximately 0.1 ppm) (when the inlet air is 30°C)				—				—						
Regulator	Set pressure range MPa				—				0.05 to 0.85				—						
	Relief pressure MPa				—				Setting pressure plus 0.05				—						
Standard accessories				Bracket				Differential pressure gauge/bracket				Pressure gauge/differential pressure gauge/bracket				—			

\*1: An oil mist filter cannot be controlled with a differential pressure gauge for C1. Replace the oil mist filter mantle every year.

\*2: Purge flow rate in standard rating section is also the same value at 0.5 MPa.

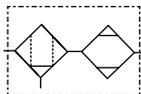
\*3: Drainage is manual discharge.

## JIS symbol

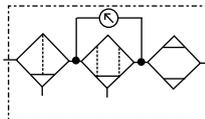
SD301E to 402E-\*



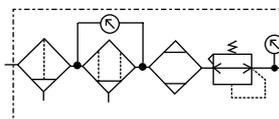
SU301E to 402E-\*C1



SU301E to 402E-\*C2

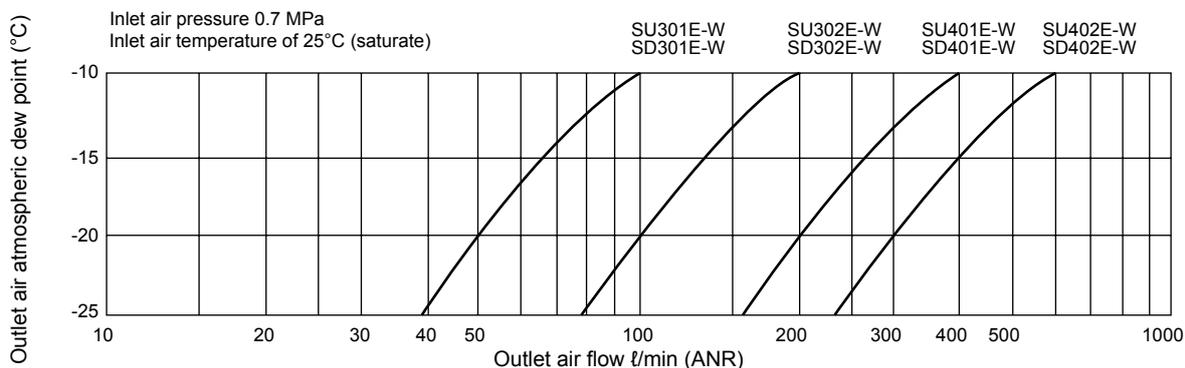


SU301E to 402E-\*C3

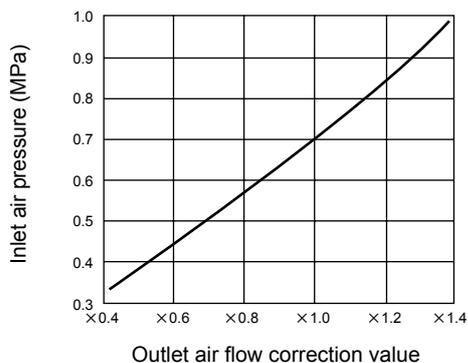


## Dew point performance Refer to page 151 for selection guide and compensation method

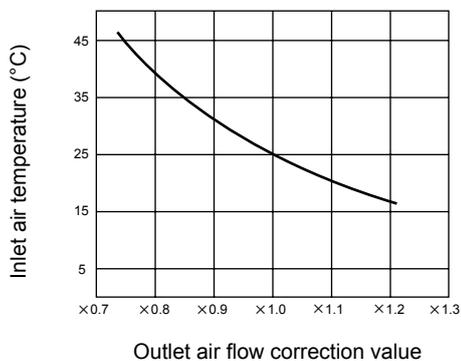
● Dew point performance curve



Inlet pressure - outlet air flow rate correction curve



Inlet temperature - outlet air flow rate correction curve



# SU<sup>3</sup>400E/SD<sup>3</sup>400E-W Series

## Compatibility table by variation

	SU
Port size	Rc3/8
P4	●
P40	▲

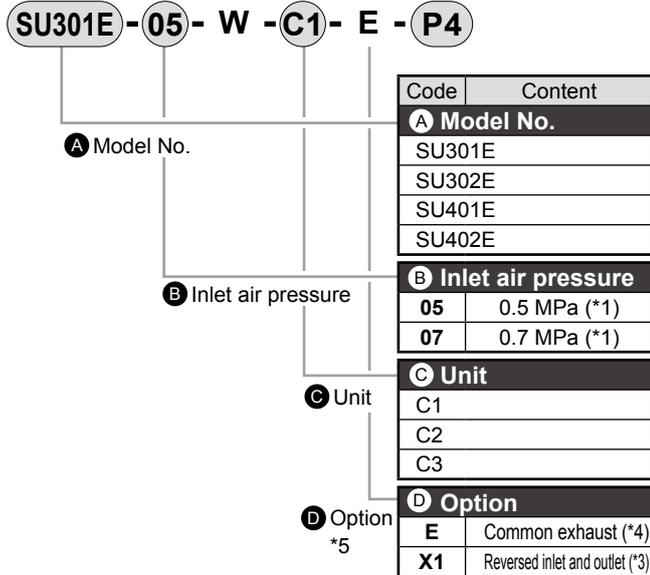
● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Applicable only for common exhaust.

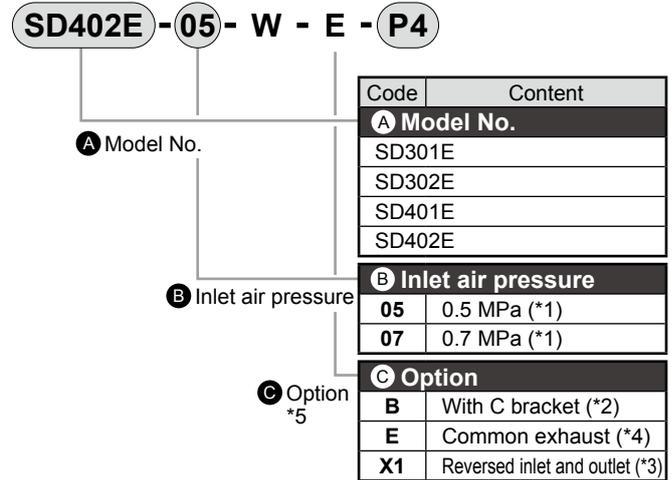
\*2: Auto-drain is not available.

## How to order

### ● Super dryer combination



### ● Super dryer



## ⚠ Precautions for model No. selection

- \*1: If inlet air pressure is less than 0.7 MPa, indicate 05, while 0.7 MPa and over, indicate 07.
- \*2: If fixed by C bracket, a modular unit with peripheral devices is not possible.
- \*3: Viewed from the front, standard products have an air inlet on the left port and an air outlet on the right port. For "X1", an air inlet is provided on the right port, with an air outlet provided on the left port.
- \*4: In size of exhaust port, Rc1/8 is provided for 300 Series, while Rc1/4 for 400 Series.
- \*5: When ordering several options, indicate the required options in alphabetical order.



Super dryer combination Super dryer

# SU300D/SU400D/SD300D/SD400D-W Series

Slim body and high performance D series

- Small and powerful removal performance. Appropriate for integrating in devices.
- 3 types of units are available. Appropriate system is available according to applications.
- Processing air flow rate: 125 to 750 ℓ/min (ANR)  
(0.7 MPa, atmospheric dew point -20°C)



## Specifications

Descriptions		SU301D *-W-C1	SU302D *-W-C1	SU401D *-W-C1	SU402D *-W-C1	SU301D *-W-C2	SU302D *-W-C2	SU401D *-W-C2	SU402D *-W-C2	SU301D *-W-C3	SU302D *-W-C3	SU401D *-W-C3	SU402D *-W-C3	SD301D *-W	SD302D *-W	SD401D *-W	SD402D *-W
Appearance																	
		Simple & space saving structure unit that removes moisture from the air from which solid impurities have already been removed. (*1)				Unit supplying clean dry air with line not requiring pressure adjustment.				A unit that supplies pressure-adjusted clean dry air just by supplying compressed air.				Discrete super dryer enabling easy system configuration with peripheral devices due to modular design.			
Configuration		Oil mist filter Super dryer				Air filter Oil mist filter (with differential pressure gauge) Super dryer				Air filter Oil mist filter (with differential pressure gauge) Super dryer Regulator				Super dryer			
Range of working conditions	Working fluid	Compressed air															
	Inlet air pressure MPa	0.4 to 1.0															
	Proof pressure MPa	1.5															
	Inlet air temperature °C	5 to 50															
	Ambient temperature °C	5 to 50															
Standard rating	Outlet air atmospheric dew point °C	-20															
	Inlet air flow ℓ/min (ANR)	125	250	500	750	125	250	500	750	125	250	500	750	125	250	500	750
	Outlet air flow ℓ/min (ANR)	100	200	400	600	100	200	400	600	100	200	400	600	100	200	400	600
	Purge flow rate ℓ/min (ANR)	25	50	100	150	25	50	100	150	25	50	100	150	25	50	100	150
	Inlet air pressure dew point °C	25															
	Inlet air pressure MPa	0.7															
	Inlet air temperature °C	25															
	Ambient temperature °C	25															
Air filter	Filtration μm	—				5								—			
Oil mist filter	Oil removal mg/m <sup>3</sup>	0.1 (approximately 0.1 ppm) (when the inlet air is 30°C)															
Regulator	Set pressure range MPa	—				0.05 to 0.85								—			
	Relief pressure MPa	—				Setting pressure plus 0.05								—			
Standard accessories		Bracket				Differential pressure gauge/bracket				Pressure gauge/differential pressure gauge/bracket				—			

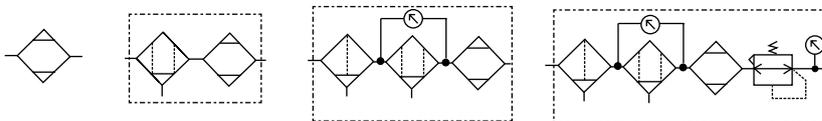
\*1: An oil mist filter cannot be controlled with a differential pressure gauge for C1. Replace the oil mist filter mantle every year.

\*2: Purge flow rate in standard rating section is also the same value at 0.5 MPa.

\*3: Drainage is manual discharge.

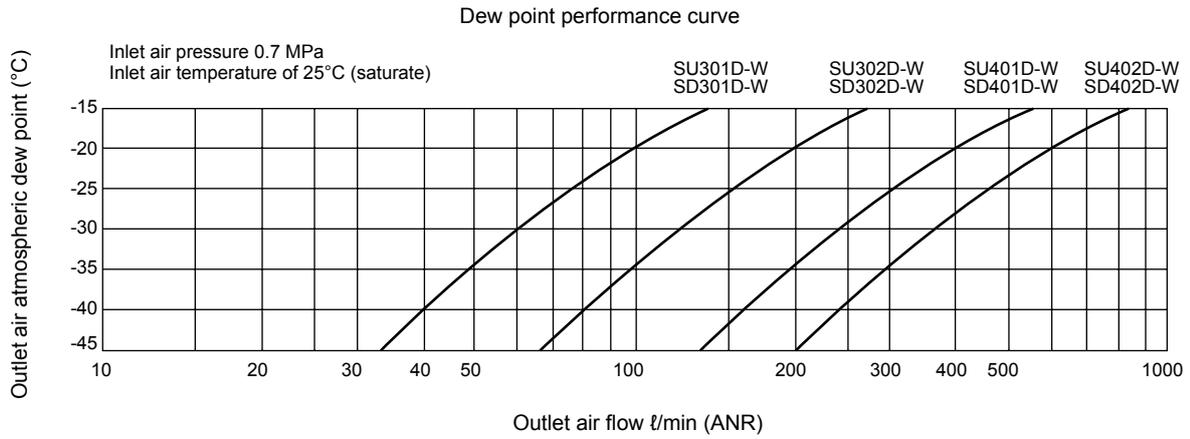
## JIS symbol

SD301D to 402D-\* SU301D to 402D-\*C1 SU301D to 402D-\*C2 SU302D to 402D-\*C3

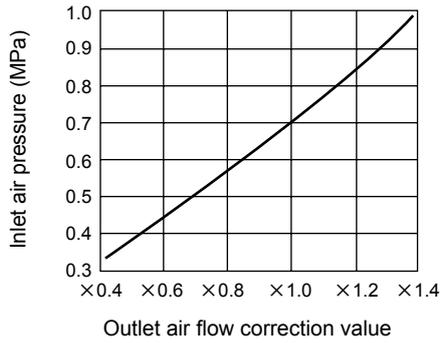


Clean air  
components

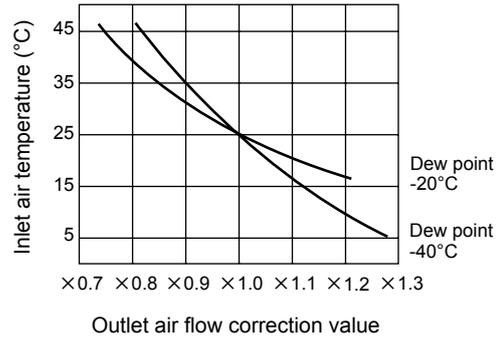
● Dew point performance curve



Inlet pressure - outlet air flow rate correction curve



Inlet temperature - outlet air flow rate correction curve



## Compatibility table by variation

	SU
Port size	Rc3/8
P4	●
P40	▲

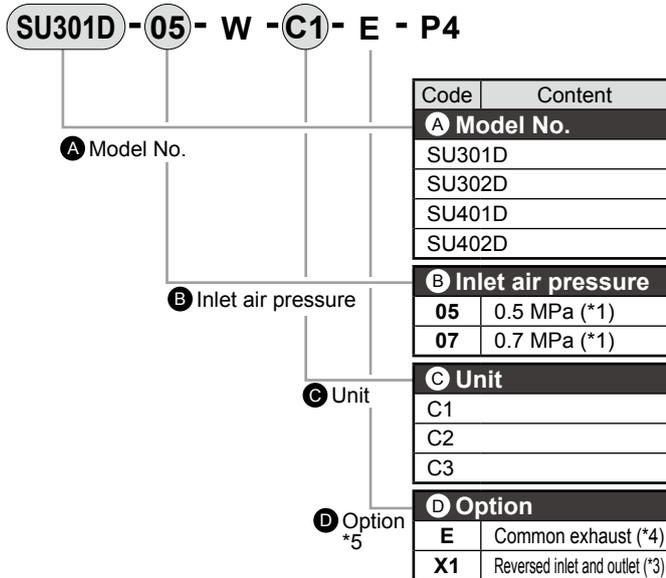
● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Applicable only for common exhaust.

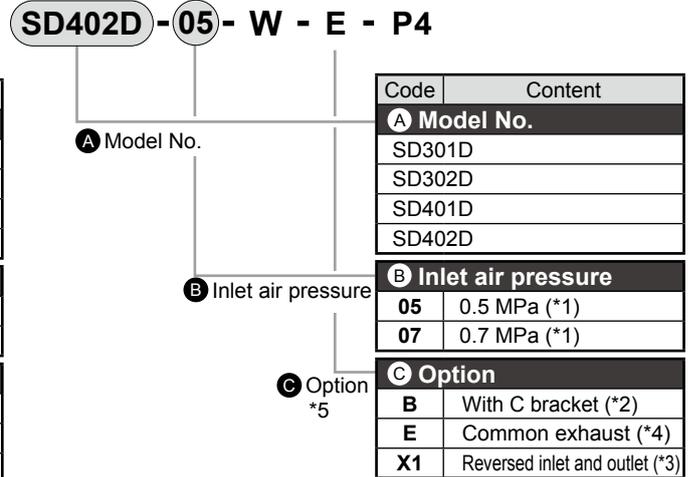
\*2: Auto-drain is not available.

## How to order

● Super dryer combination

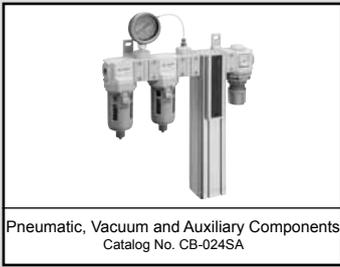


● Super dryer



## ⚠ Precautions for model No. selection

- \*1: If inlet air pressure is less than 0.7 MPa, indicate 05, while 0.7 MPa and over, indicate 07.
- \*2: If fixed by C bracket, modular connection with peripheral devices is not possible.
- \*3: Viewed from the front, standard products have an air inlet on the left port and an air outlet on the right port. For "X1", an air inlet is provided on the right port, with an air outlet provided on the left port.
- \*4: In size of exhaust port, Rc1/8 is provided for 300 Series, while Rc1/4 for 400 Series.
- \*5: When ordering several options, indicate the required options in alphabetical order.



Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

Super dryer combination

# SU3000/SU4000-W Series

Easily and stably supplying ultra dry air.

- Ultra dry air with atmospheric dew point  $-60^{\circ}\text{C}$  is obtained just by piping to a pneumatic source.
- All in one unit with superior installability.
- Processing air flow rate: 35 to 1500  $\text{l}/\text{min}$  (ANR)  
(at 0.7 MPa and  $-40^{\circ}\text{C}$  atmospheric dew point)

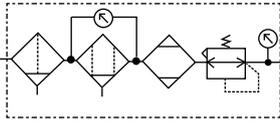


## Specifications

Descriptions		SU 3015-A-W	SU 3025-A-W	SU 3035-A-W	SU 3050-A-W	SU 3075-A-W	SU 4100-A-W	SU 3015-B-W	SU 3025-B-W	SU 3050-B-W	SU 4050-B-W	SU 4100-B-W	
Range of working conditions	Working fluid	Compressed air											
	Inlet air pressure MPa	0.4 to 1.0											
	Proof pressure MPa	1.5											
	Inlet air temperature $^{\circ}\text{C}$	5 to 50											
	Ambient temperature $^{\circ}\text{C}$	5 to 50											
Standard rating	Outlet air atmospheric dew point $^{\circ}\text{C}$	-20						-40					
	Inlet air flow $\text{l}/\text{min}$ (ANR)	125	300	490	760	1200	1500	35	90	230	410	890	
	Outlet air flow $\text{l}/\text{min}$ (ANR)	100	240	390	610	960	1260	25	65	170	300	650	
	Purge flow rate $\text{l}/\text{min}$ (ANR)	25	60	100	150	240	240	10	25	60	110	240	
	Inlet air pressure dew point $^{\circ}\text{C}$	25											
	Inlet air pressure MPa	0.7											
	Inlet air temperature $^{\circ}\text{C}$	25											
	Ambient temperature $^{\circ}\text{C}$	25											
	Air filter	Filtration $\mu\text{m}$	5										
	Oil mist filter	Oil removal $\text{mg}/\text{m}^3$	0.1 (approximately 0.1 ppm) (when the inlet air is $30^{\circ}\text{C}$ )										
Regulator	Set pressure range MPa	0.05 to 0.85											
	Relief pressure MPa	Setting pressure plus 0.05											
Standard accessories		Pressure gauge/differential pressure gauge/bracket											

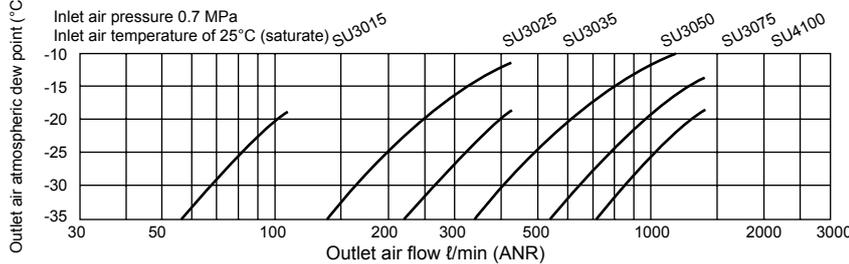
\*1: Drainage is manual discharge.

## JIS symbol

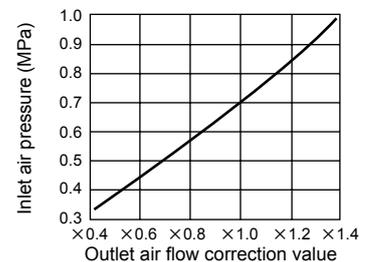


## Dew point performance Refer to page 151 for selection guide and compensation method.

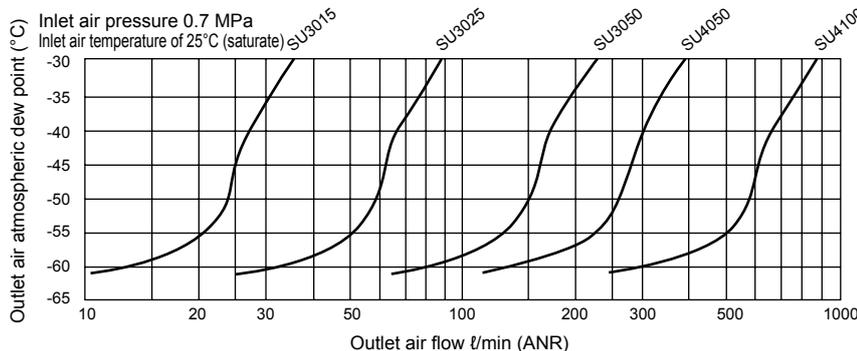
### ● Dew point performance curve ( $-20^{\circ}\text{C}$ specifications)



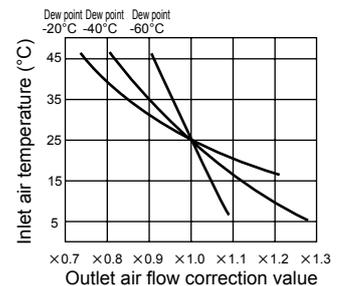
### ● Inlet pressure - outlet air flow rate correction curve



### ● Dew point performance curve ( $-40^{\circ}\text{C}$ , $-60^{\circ}\text{C}$ specifications)



### ● Inlet temperature - outlet air flow rate correction curve



### Compatibility table by variation

	SU
Port size	Rc3/8, 1/2
P4	●
P40	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Applicable only for common exhaust.

### How to order

● Super dryer combination

**SU3015 - A 05 - W - E - P4**

● A Model No.

● B Outlet air atmospheric dew point

● C Inlet air pressure

● D Option  
\*6

Code	Content
<b>A Model No.</b>	
SU3015	
SU3025	
SU3035	
SU3050	
SU3075	
SU4050	
SU4100	
<b>B Outlet air atmospheric dew point</b>	
A	-20°C
B	-40°C, -60°C (*5)
<b>C Inlet air pressure</b>	
05	0.5 MPa (*1)
07	0.7 MPa (*1)
<b>D Option</b>	
E	Common exhaust (*3)
X1	Reversed inlet and outlet (*2)

### ⚠ Precautions for model No. selection

- \*1: If inlet air pressure is less than 0.7 MPa, indicate 05, while 0.7 MPa and over, indicate 07.
- \*2: Viewed from the front, standard products have an air inlet on the left port and an air outlet on the right port. For "X1", an air inlet is provided on the right port, with an air outlet provided on the left port.
- \*3: Size of exhaust port is Rc1/2.
- \*4: Purge flow rate in standard rating section is also the same value at 0.5 MPa.
- \*5: If outlet atmospheric dew point is -60°C, model No. is "B" as at -40°C.
- \*6: When ordering several options, indicate the required options in alphabetical order.

Clean air components



Super dryer (High polymer membrane air dryer)

# SD3000/SD4000 Series

Modular design for easy system expansion with peripheral devices

- Quickly supplies ultra dry air of -60°C atmospheric dew point.
- Suitable for a wide range of applications with 1.5 MPa max. working pressure.
- Processing air flow rate: 35 to 890 ℓ/min (ANR)  
(at 0.7 MPa and -40°C atmospheric dew point)



## Specifications

Descriptions		SD3015	SD3025	SD3035	SD3050	SD3075	SD4050	SD4075	SD4100	
Range of working conditions	Working fluid	Compressed air								
	Inlet air pressure	MPa 0.4 to 1.5								
	Proof pressure	MPa 2.25								
	Inlet air temperature	°C 5 to 50								
	Ambient temperature	°C 5 to 50								
Standard rating	Inlet air pressure dew point	°C 25								
	Inlet air pressure	MPa 0.7								
	Inlet air temperature	°C 25								
Outlet air atmospheric dew point	-20°C	Inlet air flow ℓ/min (ANR)	125	300	490	760	1200	680	1100	1500
		Outlet air flow ℓ/min (ANR)	100	240	390	610	960	570	930	1260
		Purge flow rate ℓ/min (ANR)	25	60	100	150	240	110	170	240
	-40°C	Inlet air flow ℓ/min (ANR)	35	90	150	230	370	410	650	890
		Outlet air flow ℓ/min (ANR)	25	65	110	170	270	300	480	650
		Purge flow rate ℓ/min (ANR)	10	25	40	60	100	110	170	240
	-60°C	Inlet air flow ℓ/min (ANR)	20	55	90	140	220	240	380	520
		Outlet air flow ℓ/min (ANR)	10	30	50	80	120	130	210	280
		Purge flow rate ℓ/min (ANR)	10	25	40	60	100	110	170	240

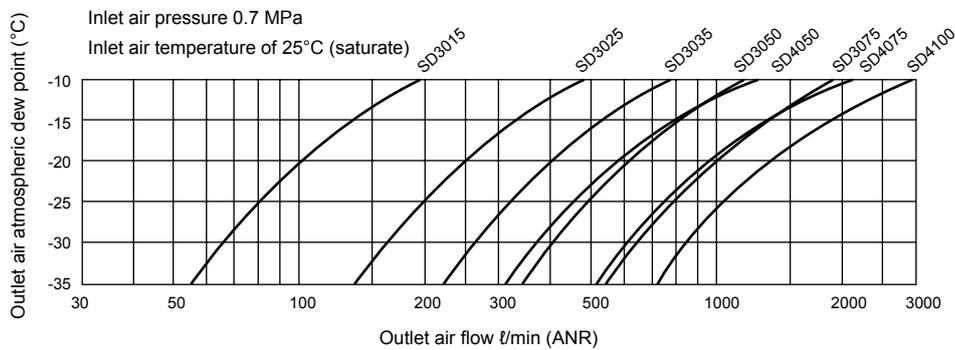
## JIS symbol



## Dew point performance

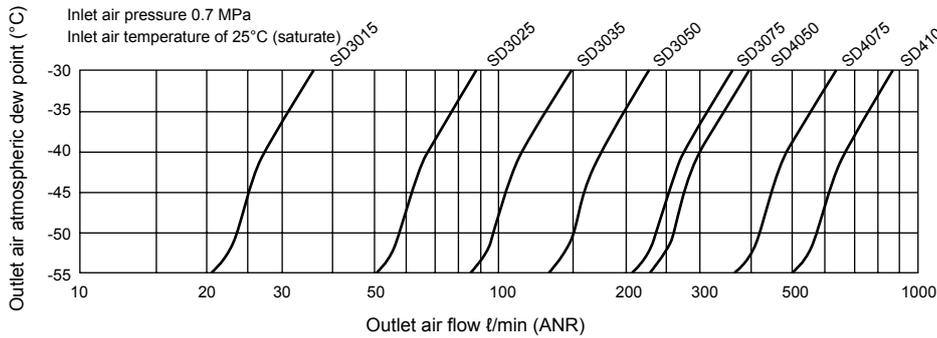
Refer to page 151 for selection guide and compensation method.

- Dew point performance curve (-20°C specifications)

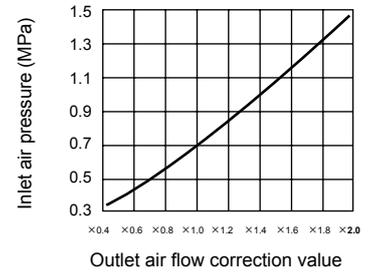


Dew point performance Refer to page 151 for selection guide and compensation method.

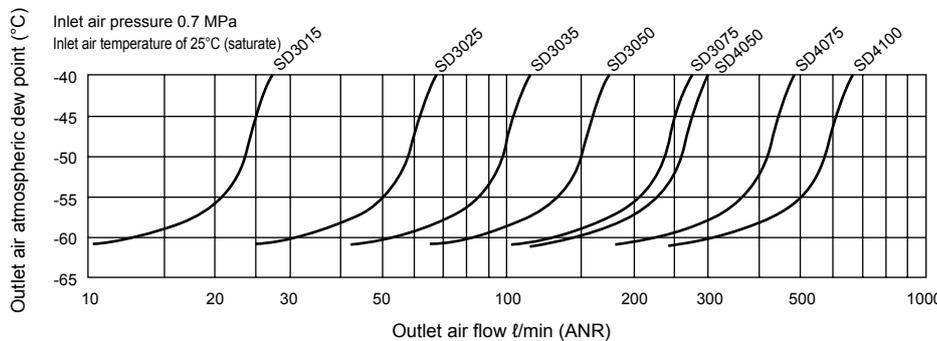
● Dew point performance curve (-40°C specifications)



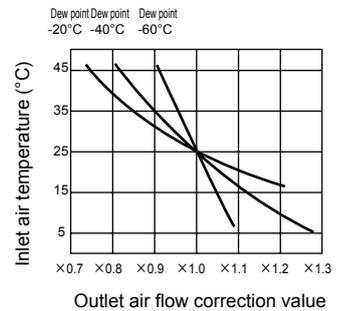
● Inlet pressure - outlet air flow rate correction curve



● Dew point performance curve (-60°C specifications)



● Inlet temperature - outlet air flow rate correction curve



● Super dryer

How to order

SD3015 - A 05 - E - P4

A Model No.

Compatibility table by variation

	SD
Port size	Rc3/8, 1/2
P4	●
P40	▲

\*1: Applicable only for common exhaust.

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

⚠ Precautions for model No. selection

- \*1: Select 05 if the inlet air pressure is less than 0.7 MPa, and 07 if it is 0.7 MPa and over and less than 1.4 MPa.
- \*2: 1.4 MPa inlet air pressure and -20°C outlet air atmospheric dew point cannot be selected together. As the atmospheric dew point will be -14°C when the inlet air temperature is 25°C and the pressure is 1.4 MPa, there is no point in using the dryer. Select -40°C or -60°C.
- \*3: Viewed from the front, a standard product has an air inlet on the left port, while an air outlet on the right port. For "X1", air inlet is provided on the right port, while air outlet is provided on the left port.
- \*4: Size of exhaust port is Rc1/2.
- \*5: When ordering several options, indicate the required options in alphabetical order.

B Outlet air atmospheric dew point

C Inlet air pressure

\*1  
\*2

D Option

\*3  
\*4  
\*5

Code	Content
<b>A Model No.</b>	
SD3015	
SD3025	
SD3035	
SD3050	
SD3075	
SD4050	
SD4075	
SD4100	
<b>B Outlet air atmospheric dew point</b>	
A	-20°C
B	-40°C
C	-60°C
<b>C Inlet air pressure</b>	
05	0.5 MPa
07	0.7 MPa
14	1.4 MPa (not available for the outlet air atmospheric dew point "A" (-20°C))
<b>D Option</b>	
B	With bracket
E	Common exhaust (*4)
X1	Reversed inlet and outlet (*3)

Clean air components

## Selection guide

[Selection guide]

Each performance curve shows the relation of the outlet air flow and the outlet air atmospheric dew point of each model at an inlet pressure of 0.7 MPa and inlet air temperature of 25°C (saturate). Select the model according to the intersection of the required dew point and required flow rate shown on the right.

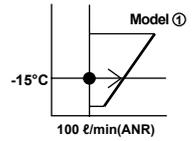
[Flow rate compensation method]

If the inlet pressure and inlet temperature differ from the rated values, the outlet air flow rate that can be supplied will change. Use each compensation curve and compensate in this case.

(Rated outlet air flow rate) x (correction value) = (conditional outlet air flow rate)

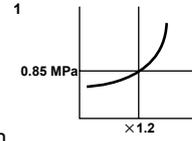
In addition, when the inlet air is the air which comes through the refrigeration air dryer, regardless of actual temperature, select the model with inlet air temperature of 10°C.

(Example) Required dew point of -15°C  
When the required flow rate is 100 l/min (ANR), the model (1) located on the right side of an intersection point can be selected.

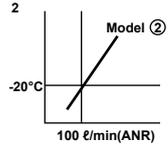


(Example) Inlet pressure of 0.85 MPa  
Required dew point of -20°C  
When the required flow rate is 120 l/min (ANR)

1. Obtain compensation (in this case 1.2) from the pressure flow rate compensation curve.



2. Model (2) has an outlet atmospheric dew point of -20°C and outlet air flow rate of 100 l/min, allowing up to a 1.2-fold rate of 120 l/min (ANR); therefore model (2) is selectable.

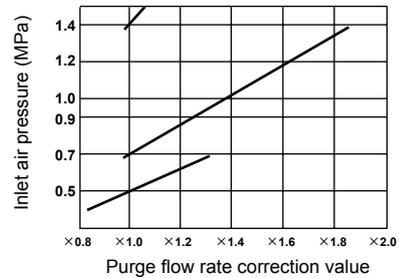


## Purge flow rate

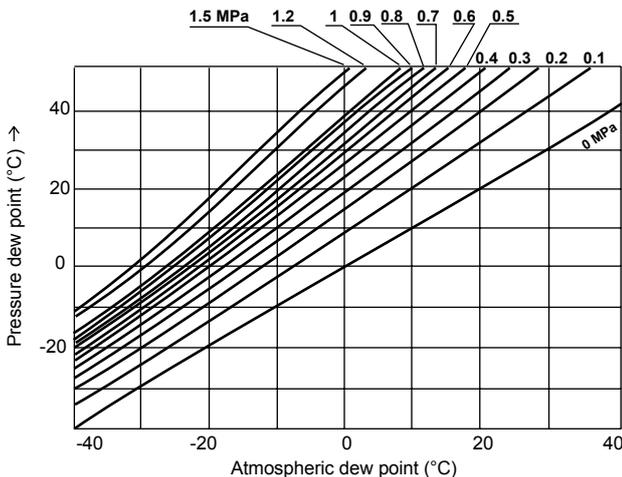
The purge flow rate is shown in the specifications.

Make sure that the flow rate including the purge flow rate as well as the outlet side operating air flow rate can be supplied from the inlet. If the inlet air pressure differs from the rated value, the purge flow rate will be obtained by multiplying the rated purge flow rate with the compensation value shown on the right.

Inlet pressure - purge flow rate correction curve

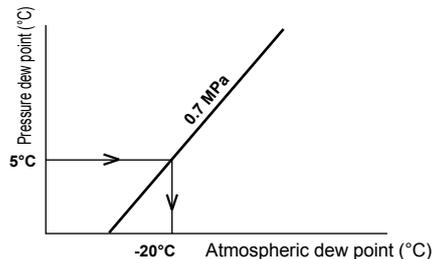


## Pressure dew point - atmospheric dew point conversion table



### Reading pressure dew point - atmospheric dew point conversion table

This table is used to convert the pressure dew point at each pressure into an atmospheric dew point, or vice versa.  
Example: Obtain the atmospheric dew point when the pressure is 0.7 MPa and the pressure dew point is 5°C.



According to the above table, when the pressure is 0.7 MPa, the 5°C pressure dew point is converted into a -20°C atmospheric dew point.

## Measuring the working air flow rate

If the working flow rate is not clear when selecting the super dryer model, measure the flow rate.

The pneumatic flow rate sensor "FLUEREX Flow Sensor Tester Kit" with functions such as cumulative display, peak display, peak value hold, and analog output is handy for measuring the flow rate.

### ● FLUEREX Flow Sensor Tester Kit FLUEREX PFK SERIES





Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

Desiccant air dryer (heatless dryer)

# SHD Series

JIS symbol



## Specifications

Descriptions	SHD3025	SHD3045	SHD3075	SHD3100	SHD3125	SHD3150	SHD3200	SHD3240
Working fluid	Compressed air							
Inlet air pressure range MPa	0.4 to 1.0							
Inlet air temperature range °C	5 to 50							
Ambient temperature °C	0 to 40							
Rated conditions	Inlet air temperature °C							
	35 (no water drops)							
	Ambient temperature °C							
	25							
	Inlet air pressure MPa							
0.7								
Inlet air flow rate m <sup>3</sup> /min (ANR)								
2.5      4.5      7.5      10      12.5      15      20      24								
Outlet pressure dew point °C								
-20, -40, -60								
Average purge rate %								
-20°C:14 / -40°C:16.5 / -60°C:23								
Desiccant cylinder module quantity	1	2	3	4	5	6	8	10
Regenerating method	Self-regeneration non-heating system							
Desiccant	Activated alumina, synthetic zeolite							
Dew point sensor	G type: Electrostatic capacitance temperature and humidity sensor / M type: Dew point meter (Electrostatic capacitance polymer sensor)							
Power supply	Single-phase 100/200 VAC 50/60 Hz							
Power consumption	15W							
Port size Rc	1	1	1 1/2	1 1/2	2	2	2 1/2	2 1/2
Weight kg	120	180	240	300	370	430	550	670

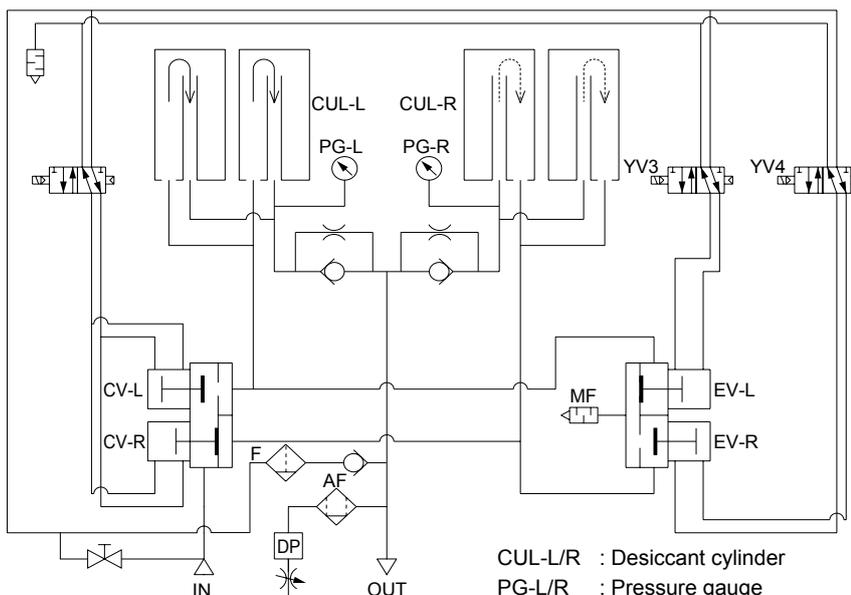
\*1: The standard paint color is quality cool white (Munsell No. 5 GY 7.5/0.5).

\*2: Attach the included accessory filters on the inlet side and the outlet side. Filters may be required for the sake of the system. In such cases, please prepare them separately.

\*3: ANR shows conditions where 20°C atmospheric pressure and relative humidity 65%.

\*4: Contact CKD for the model No. of accessory filters.

## Functions



- CUL-L/R : Desiccant cylinder
- PG-L/R : Pressure gauge
- CV-L/R : Inlet switching valve
- EV-L/R : Exhaust switching valve
- (L/R indicates the left and right sides.)
- MF : Silencer
- AF : Dew point sensor protection filter
- DP : Dew point sensor
- YV1 : Valve for inlet switching valve
- YV3/4 : Valve for exhaust switching

Moist compressed air coming in from IN goes through the valve CV and enters desiccant cylinder CUL-L. The moist compressed air evenly flows within the desiccant cylinder, the water vapor within the compressed air is suctioned by the desiccant, and once transformed into ultra dry air, comes out of the OUTlet via the check valve. Part of the ultra dry air that has been reduced in pressure via the orifice enters the desiccant cylinder CUL-R, is used for the regeneration drying of the desiccant of CUL-R, and is then released into the air. Part of the air exiting the OUTlet is guided to the dew point sensor DP for its dew point to be measured. Depending on the dew point, it will be in energy-saving mode in which the switching time is extended. (After the removal process ends, both cylinders are kept in an increased state of pressure and the switching time is extended.)

Clean air components

## How to order

SHD3 045 - G 07 - 40 - E - AC100V - S \* \*

Model No.

\* Contact CKD for model No.

**A** Flow rate classification

**B** Sensor  
\*1

**C** Inlet air pressure

**D** Outlet pressure dew point

**E** Option  
\*3

**F** Voltage

Code	Content
<b>A Flow rate classification</b>	
025	2.5 m <sup>3</sup> /min(ANR)
045	4.5 m <sup>3</sup> /min(ANR)
075	7.5 m <sup>3</sup> /min(ANR)
100	10 m <sup>3</sup> /min(ANR)
125	12.5 m <sup>3</sup> /min(ANR)
150	15 m <sup>3</sup> /min(ANR)
200	20 m <sup>3</sup> /min(ANR)
240	24 m <sup>3</sup> /min(ANR)
<b>B Sensor</b>	
G	Temperature and humidity sensor
M	Dew point meter
<b>C Inlet air pressure</b>	
04	0.4 MPa
05	0.5 MPa
06	0.6 MPa
07	0.7 MPa
08	0.8 MPa
09	0.9 MPa
10	1 MPa
<b>D Outlet pressure dew point</b>	
20	-20°C
40	-40°C
60	-60°C
<b>E Option</b>	
E	Standard (AF2000 attached)
E1	Without accessory filter
E2	AF4000 Series attached
F	Color specification
G	Voltage specification
H	English language specifications
L	Foundation bolt nut (SS400)
L1	Foundation bolt nut (SUS304)
<b>F Voltage</b>	
	100 VAC
	200 VAC

## Compatibility table by variation

	SHD
P4	▲

● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable

## ⚠ Precautions for model No. selection

- \*1: With "G" sensor, it is not possible to select the "-60°C" specification for the outlet pressure dew point. In addition, the dew point display value of the "G" type is of an accuracy to serve as a guide, as accuracy will be lowered in particular in the low dew point range. When prioritizing dew point management, use of the "M" type is recommended.
- \*2: Unit performance may not be attained if used at less than the selected pressure. Always select the model No. for the working pressure.
- \*3: When ordering several options, indicate the required options in alphabetical order.
- \*4: Made to order. Contact CKD for details.

	Dew point sensor	Rated dew point °C (*1)	Energy-saving/setting dew point °C (*2)
SHD3000 Series	-G	-20	-10
		-40	-20
		-40	-40
	-M	-20	-20
		-40	-40
		-60	-60

\*1: Default setting (purge amount setting)

\*2: Configured by the user  
Arbitrary configuration at 3 steps is possible depending on the applications or conditions of use

(When the load is smaller than the rating, the unit will enter the energy conservation operating mode at this configured temperature.)

## Selection guide

**Max. flow rate table** Values are with an inlet temperature of 35°C.

Model No.	SHD3025	SHD3045	SHD3075	SHD3100	SHD3125	SHD3150	SHD3200	SHD3240
Inlet air flow rate	2.5	4.5	7.5	10	12.5	15	20	24

\*1: The -20, -40, and -60°C specifications will be of the same air flow rate.

Unit: m<sup>3</sup>/min (ANR)

### ● Selection method

The above flow rate table lists values for when the inlet pressure is 0.7 MPa and the inlet air temperature is 35°C. When conditions differ, determine the specifications by using the coefficient table and curve listed below.

Inlet air flow rate = (Inlet flow rate of max. flow rate table (\*2)) x (Pressure coefficient) x (Temperature coefficient)

Purge flow rate (\*3) = (Inlet flow rate of max. flow rate table (\*2)) x (Purge rate for each dew point (\*4))

Outlet air flow rate = (Inlet air flow rate) - (Purge flow rate)

\*2: These are values from the above table and are values decided based on the model No.

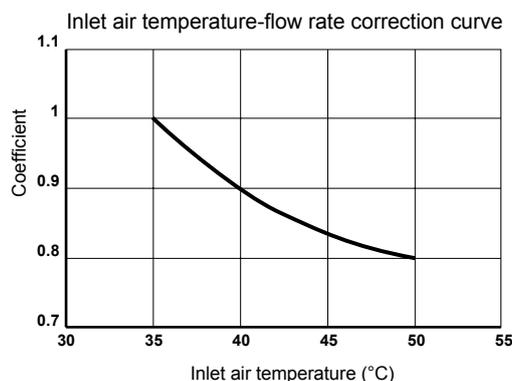
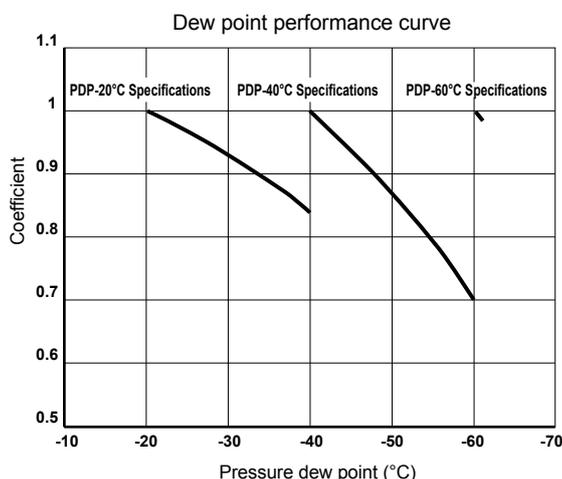
\*3: The average value is listed.

\*4: 14% for -20°C specifications, 16.5% for -40°C specifications, 23% for -60°C specifications.

\*5: Abbreviation for PDP (pressure dew point).

**Pressure coefficient table** (be sure to make a selection with the pressure that will be used)

Inlet air pressure (MPa)	0.4	0.5	0.6	0.7	0.8	0.9	1
Coefficient	0.63	0.75	0.88	1.00	1.13	1.25	1.38



(Example)

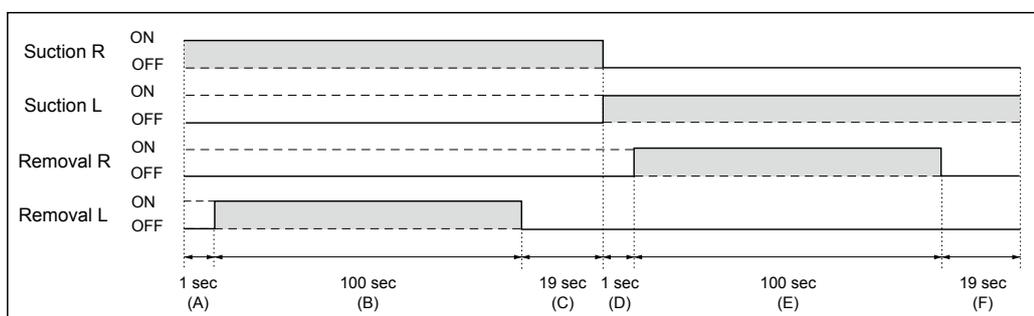
Air flow rate of SHD3045 when pressure is 0.6 MPa, pressure dew point is -40°C, and inlet air temperature is 50°C

Inlet air flow rate = 4.5 × 0.88 × 0.8 = 3.168 m<sup>3</sup>/min

Purge flow rate = 4.5 × 0.165 = 0.743 m<sup>3</sup>/min

Outlet air flow rate = 3.168 - 0.743 = 2.425 m<sup>3</sup>/min

### Time chart



The normal processes are listed on the left. During energy conservation, the state (C, F) after the removal has been completed will be retained. After this, as soon as the dew point degrades, switching will resume to return to the normal processes.

B and E indicate removal (regeneration) time; C and F indicate rising pressure time.

### When a heatless dryer is installed

- Model numbers SHD3075 through SHD3240 come provided with a class-2 pressure vessel certificate. Keep this while using the components. (Applications to the Labor Standards Supervision Office are no longer required in Japan.)
- When starting a test after the installation of this unit, operate the unit for the period of time designated below with a flow rate that is approximately 10 to 20% of the flow rate that will be used.

Pressure dew point (°C) (*6)	-20	-30	-40	-60
(Reference) Atmospheric dew point (°C)	-40	-48	-57	-74
Time (h)	6	12	24	72

\*6: The pressure dew point is for when the pressure is 0.7 MPa.

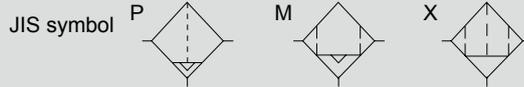


Medium main line filter

# AF2 Series

Ideal for solid particle removing, oil removing and deodorizing applications.

● Processing air flow rate: 4.95 to 24.1 m<sup>3</sup>/min (ANR) (when at 0.7 MPa)



## Specifications

Descriptions	AF2-05□25A	AF2-08□32A	AF2-11□40A	AF2-13□50A	AF2-20□50A	AF2-24□65A
Processing air flow rate m <sup>3</sup> /min (ANR)	4.95	7.93	11.3	12.8	19.8	24.1
Working fluid	Compressed air					
Working pressure MPa	0.1 to 1.0					
Proof pressure MPa	1.5					
Port size Rc	1	1 1/4	1 1/2	2		2 1/2
Weight kg	2.2	6	5.9	5.7	6.9	13
Pop-up indicator	Standard (Excluding X type)					
Drain discharger	Integrated (NO: with exhaust when not pressurized. Excluding X type)					
Drain outlet bore size Rc	1/8 (Excluding X type)					

□ indicates series name.

Descriptions	P type	M type	X type
Working ambient temperature °C	5 to 60		
Filtration μm	1	0.01	Suction by activated carbon
Secondary side oil concentration mg/m <sup>3</sup>	0.3	0.01	0.003
Initial pressure drop MPa	0.0055	0.0085	0.0115
Regular pressure drop MPa	0.0125	0.0125	-

\*1: Processing air flow rate is the atmospheric pressure conversion value where the inlet pressure is 0.7 MPa.

\*2: ANR indicates conditions of 20°C atmospheric pressure and relative humidity 65%.

\*3: The secondary side oil concentration is the value when the inlet air temperature is 21°C.

\*4: The drain discharger is NO. Air is purged with initial drainage until pressure reaches 0.1 MPa.

\*5: The P/M elements must be replaced after one year or when the pop-up indicator turns red, whichever is faster.

\*6: Replace the X element after 1000 hours (at 21°C) or when the deodorizing effect is lost.

\*7: The X type has a ball valve (G1/4) at the discharge outlet.

\*8: The initial pressure drop is 0.008 MPa for AF2-20P50A and 0.011 MPa for AF2-20M50A.

## How to order

**AF2 - 05 P 25A - P4**

**A** Flow rate classification

**B** Element

**C** Bore size

Code	Content
<b>A Flow rate classification</b>	
05	4.95 m <sup>3</sup> /min (ANR)
08	7.93 m <sup>3</sup> /min (ANR)
11	11.3 m <sup>3</sup> /min (ANR)
13	12.8 m <sup>3</sup> /min (ANR)
20	19.8 m <sup>3</sup> /min (ANR)
24	24.1 m <sup>3</sup> /min (ANR)
<b>B Element</b>	
P	P type (solid/oil removing filter)
M	M type (high-performance solid/oil removing filter)
X	X type (odor removing filter)
<b>C Bore size</b>	
25A	Rc1
32A	Rc1 1/4
40A	Rc1 1/2
50A	Rc2
65A	Rc2 1/2

### ⚠ Note on model No. selection

\*1: The unit's performance may not be attained if used at less than the selected pressure. Always select the model No. with the working pressure.

### Flow rate compensation coefficient

Pressure (MPa)	Compensation coefficient
0.1	0.38
0.2	0.53
0.3	0.65
0.4	0.76
0.5	0.84
0.6	0.92
0.7	1.0
0.8	1.07
0.9	1.13
1.0	1.19

If working pressure is other than 0.7 MPa, multiply processing air flow rate by the above coefficient.



Main line filter

# AF3000P Series

Appropriate for large pre-filter.

● Processing air flow rate: 16 to 256 m<sup>3</sup>/min (ANR)

JIS symbol



## Specifications

Descriptions	AF3016 P-50	AF3032 P-80	AF3048 P-100	AF3064 P-100	AF3080 P-150	AF3096 P-150	AF3128 P-150	AF3160 P-200	AF3192 P-200	AF3256 P-200
Processing air flow rate m <sup>3</sup> /min (ANR)	16	32	48	64	80	96	128	160	192	256
Working fluid	Compressed air									
Working pressure MPa	0.07 to 1.0									
Proof pressure MPa	1.5									
Ambient temperature °C	5 to 60									
Filtration μm	3									
Pressure drop	Initial MPa	Within 0.005								
	Normal MPa	0.005 to 0.02								
	Element replacement MPa	0.07								
Element quantity	1	2	3	4	5	6	8	10	12	16
Port size (*1) flange	2B	3B	4B	4B	6B	6B	6B	8B	8B	8B
Weight kg	45	95	98	130	160	190	250	260	300	350
Differential pressure gauge	Contact CKD for details.									
Drain discharger	No									

\*1: Flange is 10K flange.

\*2: Processing air flow rate is the atmospheric pressure conversion value where the inlet pressure is 0.7 MPa and initial pressure drop is 0.005 MPa.

\*3: ANR indicates conditions of 20°C atmospheric pressure and relative humidity 65%.

## How to order

**AF3 016 P - 50 - F - P4**

**A** Flow rate classification

## Compatibility table by variation

AF3000	
Port size	Flange 2B, 3B, 4B, 6B, 8B
P4	▲

● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable

## Bore size/flow rate classification table

Flow rate classification	Bore size									
	016	032	048	064	080	096	128	160	192	256
50	●									
80		●								
100			●	●						
150					●	●	●			
200								●	●	●

**B** Bore size

**C** Option \*3

Code	Content
<b>A Flow rate classification</b>	
016	16 m <sup>3</sup> /min(ANR)
032	32 m <sup>3</sup> /min(ANR)
048	48 m <sup>3</sup> /min(ANR)
064	64 m <sup>3</sup> /min(ANR)
080	80 m <sup>3</sup> /min(ANR)
096	96 m <sup>3</sup> /min(ANR)
128	128 m <sup>3</sup> /min(ANR)
160	160 m <sup>3</sup> /min(ANR)
192	192 m <sup>3</sup> /min(ANR)
256	256 m <sup>3</sup> /min(ANR)

<b>B Bore size</b>	
Refer to the bore size/flow rate classification table on the left.	

<b>C Option</b>	
Blank	No
F	Specified color paint
H	English language specifications
K	Companion flange attached
L	Foundation bolt/nut attached (*2)
L1	Stainless steel foundation bolt/nut attached (*2)
O	Outdoors
X1	IN/OUT reverse direction (*1)
Y2	Product photo

## Precautions for model No. selection

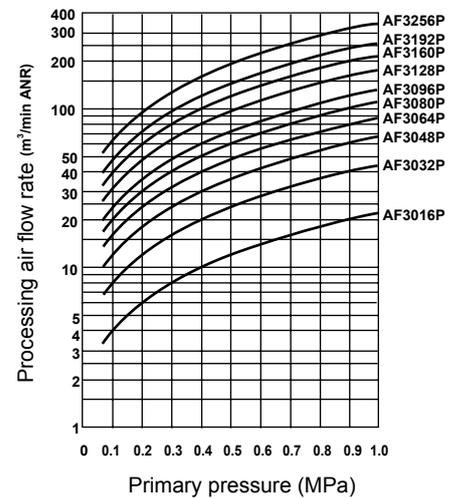
\*1: Viewed from the front, standard products have an air inlet on the left port and an air outlet on the right port. For "X1", air inlet is provided on the right port, while air outlet is provided on the left port.

\*2: Available for AF3032P to AF3256P.

\*3: When ordering several options, indicate the required options in alphabetical order.

\*4: Made to order. Contact CKD for details.

## Flow characteristics



**⚠ Note on selection**

- Never use model numbers found to be below the point of intersection of the selection conditions.
- When the point of intersection found according to selecting conditions and flow characteristics curves are on the same line, the service life may be shortened, so select a model that is one size larger.
- Unit performance may not be attained if used at less than the selected pressure. Always select the model No. for the working pressure.



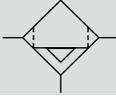
Micro alescercy

# AF3000S Series

Protects expensive pneumatic components

● Flow rate range: 16 to 256 m<sup>3</sup>/min (ANR)

JIS symbol



## Specifications

Descriptions	AF3016 S-50	AF3032 S-80	AF3048 S-100	AF3064 S-100	AF3080 S-150	AF3096 S-150	AF3128 S-150	AF3160 S-200	AF3192 S-200	AF3256 S-200
Processing air flow rate m <sup>3</sup> /min (ANR)	16	32	48	64	80	96	128	160	192	256
Working fluid	Compressed air									
Working pressure MPa	0.07 to 1.0									
Proof pressure MPa	1.5									
Ambient temperature °C	5 to 60									
Filtration μm	0.3									
Secondary side oil concentration mg/m <sup>3</sup>	1.0 (inlet air 30°C)									
Pressure drop	Initial MPa	Within 0.01								
	Normal MPa	0.01 to 0.03								
	Element replacement MPa	0.07								
Element quantity	1	2	3	4	5	6	8	10	12	16
Port size (*1) flange	2B	3B	4B	4B	6B	6B	6B	8B	8B	8B
Weight kg	45	95	98	130	160	190	250	260	300	350
Differential pressure gauge	Contact CKD for details.									
Drain discharger	No									

\*1: Flange is 10K flange.

\*2: Processing air flow rate is the atmospheric pressure conversion value where the inlet pressure is 0.7 MPa and initial pressure drop is 0.01 MPa.

\*3: ANR indicates conditions of 20°C atmospheric pressure and relative humidity 65%.

## How to order

AF3 016 S-50 - P4

Ⓐ Flow rate classification

### Compatibility table by variation

AF3000	
Port size	Flange 2B, 3B, 4B, 6B, 8B
P4	▲

● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable

### Bore size/flow rate classification table

Flow rate classification	Bore size									
	016	032	048	064	080	096	128	160	192	256
50 Flange 2B	●									
80 Flange 3B		●								
100 Flange 4B			●	●						
150 Flange 6B					●	●	●			
200 Flange 8B								●	●	●

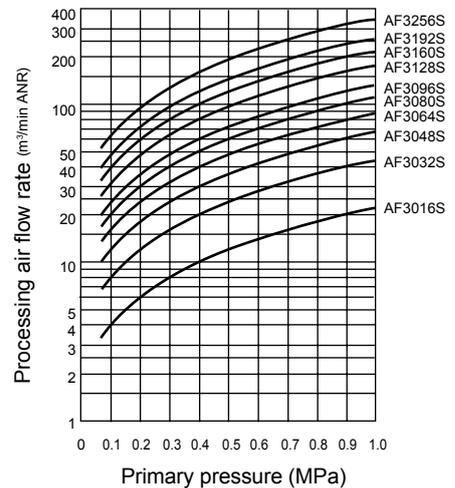
### ⚠ Precautions for model No. selection

\*1: Viewed from the front, standard products have an air inlet on the left port and an air outlet on the right port.  
For "X1", air inlet is provided on the right port, while air outlet is provided on the left port.

\*2: Available for AF3032S to AF3256S.  
\*3: Made to order. Contact CKD for details.

Code	Content
<b>Ⓐ Flow rate classification</b>	
016	16 m <sup>3</sup> /min(ANR)
032	32 m <sup>3</sup> /min(ANR)
048	48 m <sup>3</sup> /min(ANR)
064	64 m <sup>3</sup> /min(ANR)
080	80 m <sup>3</sup> /min(ANR)
096	96 m <sup>3</sup> /min(ANR)
128	128 m <sup>3</sup> /min(ANR)
160	160 m <sup>3</sup> /min(ANR)
192	192 m <sup>3</sup> /min(ANR)
256	256 m <sup>3</sup> /min(ANR)
<b>Ⓑ Bore size</b>	
Refer to the bore size/flow rate classification table on the left.	
<b>Ⓒ Option</b>	
Blank	No
F	Specified color paint
H	English language specifications
K	Companion flange attached
L	Foundation bolt/nut attached (*2)
L1	Stainless steel foundation bolt/nut attached (*2)
O	Outdoors
X1	IN/OUT reverse direction (*1)
Y2	Product photo

## Flow characteristics



### ⚠ Note on selection

- Never use model numbers found to be below the point of intersection of the selection conditions.
- When the point of intersection found according to selecting conditions and flow characteristics curves are on the same line, the service life may be shortened, so select a model that is one size larger.
- The oil removing ratio drops if the inlet air temperature is 30°C or more. Maintain the inlet air temperature at 30°C or less.
- Unit performance may not be attained if used at less than the selected pressure. Always select the model No. for the working pressure.



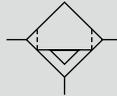
Micro alescer

# AF3000M Series

For pneumatic pressure circuits which are susceptible to oil

● Flow rate range: 16 to 256 m<sup>3</sup>/min (ANR)

JIS symbol



## Specifications

Descriptions	AF3016 M-50	AF3032 M-80	AF3048 M-100	AF3064 M-100	AF3080 M-150	AF3096 M-150	AF3128 M-150	AF3160 M-200	AF3192 M-200	AF3256 M-200
Processing air flow rate m <sup>3</sup> /min (ANR)	16	32	48	64	80	96	128	160	192	256
Working fluid	Compressed air									
Working pressure MPa	0.07 to 1.0									
Proof pressure MPa	1.5									
Ambient temperature °C	5 to 60									
Filtration μm	0.01									
Secondary side oil concentration mg/m <sup>3</sup>	0.1 (inlet air 30°C)									
Pressure drop	Initial MPa	Within 0.01								
	Normal MPa	0.02 to 0.04								
	Element replacement MPa	0.07								
Element quantity	1	2	3	4	5	6	8	10	12	16
Port size (*1) flange	2B	3B	4B	4B	6B	6B	6B	8B	8B	8B
Weight kg	45	95	98	130	160	190	250	260	300	350
Differential pressure gauge	Contact CKD for details.									
Drain discharger	No									

\*1: Flange is 10K flange.

\*2: Processing air flow rate is the atmospheric pressure conversion value where the inlet pressure is 0.7 MPa and initial pressure drop is 0.01 MPa.

\*3: ANR indicates conditions of 20°C atmospheric pressure and relative humidity 65%.

## How to order

AF3 016 M - 50 - P4

A Flow rate classification

## Compatibility table by variation

AF3000	
Port size	Flange 2B, 3B, 4B, 6B, 8B
P4	▲

● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable

## Bore size/flow rate classification table

Bore size	016	032	048	064	080	096	128	160	192	256
50 Flange 2B	●									
80 Flange 3B		●								
100 Flange 4B			●	●						
150 Flange 6B					●	●	●			
200 Flange 8B								●	●	●

B Bore size

C Option \*3

## Precautions for model No. selection

\*1: Viewed from the front, standard products have an air inlet on the left port and an air outlet on the right port. For "X1", air inlet is provided on the right port, while air outlet is provided on the left port.

\*2: Available for AF3032M to AF3256M.

\*3: When ordering several options, indicate the required options in alphabetical order.

\*4: Made to order. Contact CKD for details.

Code	Content
<b>A Flow rate classification</b>	
016	16 m <sup>3</sup> /min(ANR)
032	32 m <sup>3</sup> /min(ANR)
048	48 m <sup>3</sup> /min(ANR)
064	64 m <sup>3</sup> /min(ANR)
080	80 m <sup>3</sup> /min(ANR)
096	96 m <sup>3</sup> /min(ANR)
128	128 m <sup>3</sup> /min(ANR)
160	160 m <sup>3</sup> /min(ANR)
192	192 m <sup>3</sup> /min(ANR)
256	256 m <sup>3</sup> /min(ANR)

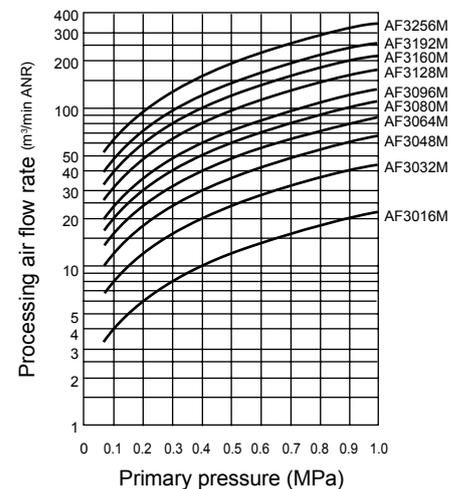
## B Bore size

Refer to the bore size/flow rate classification table on the left.

## C Option

Blank	No
F	Specified color paint
H	English language specifications
K	Companion flange attached
L	Foundation bolt/nut attached (*2)
L1	Stainless steel foundation bolt/nut attached (*2)
O	Outdoors
X1	IN/OUT reverse direction (*1)
Y2	Product photo

## Flow characteristics



## Note on selection

- Never use model numbers found to be below the point of intersection of the selection conditions.
- When the point of intersection found according to selecting conditions and flow characteristics curves are on the same line, the service life may be shortened, so select a model that is one size larger.
- The oil removing ratio drops if the inlet air temperature is 30°C or more. Maintain the inlet air temperature at 30°C or less.
- Unit performance may not be attained if used at less than the selected pressure. Always select the model No. for the working pressure.



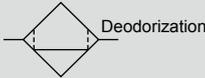
Micro alescer

# AF3000X Series

For pneumatic pressure circuits which are susceptible to odors

● Flow rate range: 16 to 256 m<sup>3</sup>/min (ANR)

JIS symbol



## Specifications

Descriptions	AF3016 X-50	AF3032 X-80	AF3048 X-100	AF3064 X-100	AF3080 X-150	AF3096 X-150	AF3128 X-150	AF3160 X-200	AF3192 X-200	AF3256 X-200
Processing air flow rate m <sup>3</sup> /min (ANR)	16	32	48	64	80	96	128	160	192	256
Working fluid	Compressed air									
Working pressure MPa	0.07 to 1.0									
Proof pressure MPa	1.5									
Ambient temperature °C	5 to 30									
Filtration method	Suction by activated carbon									
Secondary side oil concentration mg/m <sup>3</sup>	0.03 (inlet air 30°C)									
Pressure drop MPa	Within 0.01									
Element quantity	1	2	3	4	5	6	8	10	12	16
Port size (*1) flange	2B	3B	4B	4B	6B	6B	6B	8B	8B	8B
Weight kg	45	95	98	130	160	190	250	260	300	350
Differential pressure gauge	Contact CKD for details.									
Drain discharger	No									

\*1: Flange is 10K flange.

\*2: Processing air flow rate is the atmospheric pressure conversion value where the inlet pressure is 0.7 MPa and initial pressure drop is 0.01 MPa.

\*3: ANR indicates conditions of 20°C atmospheric pressure and relative humidity 65%.

## How to order

AF3 016 X - 50 - P4

A Flow rate classification

B Bore size

C Option

Bore size/flow rate classification table

B Bore size		016	032	048	064	080	096	128	160	192	256
50	Flange 2B	●									
80	Flange 3B		●								
100	Flange 4B			●	●						
150	Flange 6B					●	●	●			
200	Flange 8B								●	●	●

## Compatibility table by variation

AF3000	
Port size	Flange 2B, 3B, 4B, 6B, 8B
P4	▲

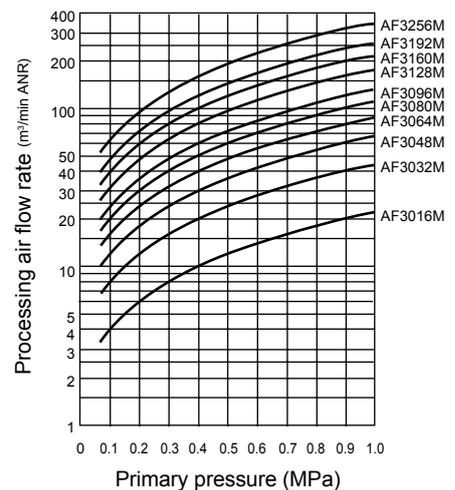
● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable

Code	Content
<b>A Flow rate classification</b>	
016	16 m <sup>3</sup> /min(ANR)
032	32 m <sup>3</sup> /min(ANR)
048	48 m <sup>3</sup> /min(ANR)
064	64 m <sup>3</sup> /min(ANR)
080	80 m <sup>3</sup> /min(ANR)
096	96 m <sup>3</sup> /min(ANR)
128	128 m <sup>3</sup> /min(ANR)
160	160 m <sup>3</sup> /min(ANR)
192	192 m <sup>3</sup> /min(ANR)
256	256 m <sup>3</sup> /min(ANR)
<b>B Bore size</b>	
Refer to the bore size/flow rate classification table on the left.	
<b>C Option</b>	
Blank	No
F	Specified color paint
H	English language specifications
K	Companion flange attached
L	Foundation bolt/nut attached (*2)
L1	Stainless steel foundation bolt/nut attached (*2)
O	Outdoors
X1	IN/OUT reverse direction (*1)
Y2	Product photo

## Flow characteristics

Flow characteristics are the same as the AF3000M type.

Be sure to use the AF3000M type as a pre-filter.



## Precautions for model No. selection

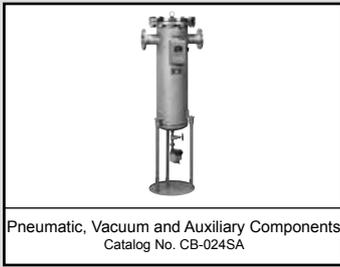
\*1: Viewed from the front, standard products have an air inlet on the left port and an air outlet on the right port.

For "X1", air inlet is provided on the right port, while air outlet is provided on the left port.

\*2: Available for AF3032X to AF3256X.

\*3: Unit performance may not be attained if used at less than the selected pressure. Always select the model No. for the working pressure.

\*4: Made to order. Contact CKD for details.



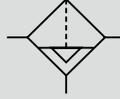
Main line filter

# AF5000P Series

For air dryer pre-filter

● Flow rate range: 16 to 256 m<sup>3</sup>/min (ANR)

JIS symbol



## Specifications

Model No.	AF5016P-50	AF5032P-80	AF5048P-100	AF5064P-100	AF5080P-150	AF5096P-150	AF5128P-150	AF5160P-200	AF5192P-200	AF5256P-200
Descriptions										
Processing air flow rate (*2. *3.) m <sup>3</sup> /min(ANR)	16	32	48	64	80	96	128	160	192	256
Working fluid	Compressed air									
Working pressure MPa	0.08 to 1.0									
Proof pressure MPa	1.5									
Ambient temperature °C	5 to 60									
Filtration μm	3									
Pressure drop	Initial MPa	Within 0.005								
	Normal MPa	0.01								
	Element replacement MPa	0.035								
Element quantity	1	2	3	4	5	6	8	10	12	16
Port size (*1) flange	2B	3B	4B	4B	6B	6B	6B	8B	8B	8B
Weight kg	38	76	78	107	140	167	223	232	269	330
Differential pressure switch										
Operating pressure differential MPa	0.04±0.01									
Contact	1 pole a contact									
Max. contact current A	0.5									
Max. contact voltage VDC	200									
Max. contact capacitance W	10									
Max. contact resistance (including reed switch) mΩ	300									
Drain discharger	No									

\*1: Flange is 10K flange.

\*2: Processing air flow rate is the atmospheric pressure conversion value where the inlet pressure is 0.7 MPa and initial pressure drop is 0.005 MPa.

\*3: ANR indicates conditions of 20°C atmospheric pressure and relative humidity 65%.

## Flow rate compensation coefficient

If the working pressure is other than 0.7 MPa, multiply the processing air flow rate by the above coefficient.

Pressure (MPa)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Compensation coefficient	0.38	0.53	0.65	0.76	0.85	0.93	1.0	1.07	1.13	1.2

Clean air  
components

# AF5000P Series

## Compatibility table by variation

AF5000	
Port size	Flange 2B, 3B, 4B, 6B, 8B
P4	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

AF5 **016** P - **50** - **X1** - P4

Ⓐ Flow rate classification

Ⓑ Bore size

Ⓒ Option \*1  
\*2  
\*4

Code	Content										
<b>Ⓐ Flow rate classification m<sup>3</sup>/min (ANR)</b>											
<b>016</b>	16										
<b>032</b>	32										
<b>048</b>	48										
<b>064</b>	64										
<b>080</b>	80										
<b>096</b>	96										
<b>128</b>	128										
<b>160</b>	160										
<b>192</b>	192										
<b>256</b>	256										
<b>Ⓑ Bore size</b>											
	<b>Flow rate classification</b>	<b>016</b>	<b>032</b>	<b>048</b>	<b>064</b>	<b>080</b>	<b>096</b>	<b>128</b>	<b>160</b>	<b>192</b>	<b>256</b>
<b>50</b>	Flange 2B	●	-	-	-	-	-	-	-	-	-
<b>80</b>	Flange 3B	-	●	-	-	-	-	-	-	-	-
<b>100</b>	Flange 4B	-	-	●	●	-	-	-	-	-	-
<b>150</b>	Flange 6B	-	-	-	-	●	●	●	-	-	-
<b>200</b>	Flange 8B	-	-	-	-	-	-	-	●	●	●
<b>Ⓒ Option</b>											
<b>Blank</b>	Standard products										
<b>E</b>	Without drain discharger										
<b>K</b>	Companion flange attached										
<b>H</b>	English language specifications										
<b>H2</b>	Stainless steel nameplate										
<b>L</b>	Foundation bolt/nut attached (SS400) (*1)										
<b>L1</b>	Foundation bolt/nut attached (SUS304) (*1)										
<b>X1</b>	IN/OUT reverse direction (*2)										
<b>Y2</b>	Product photo										

## ⚠ Precautions for model No. selection

\*1: "L" and "L1" are applicable to AF5032P to AF5256P.

\*2: Viewed from the front, a standard product has an air inlet on the left port, while an air outlet on the right port.

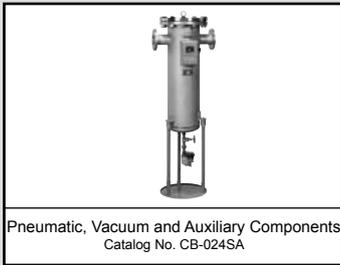
For "X1", an air inlet is provided on the right port, while an air outlet is provided on the left port.

\*3: Unit performance may not be attained if used at less than the selected pressure.

Always select the model No. for the working pressure.

\*4: When ordering several options, indicate the required options in alphabetical order.

\*5: Made to order. Contact CKD for details.

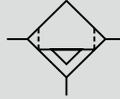


Micro alescer

# AF5000S Series

Protects expensive pneumatic components  
● Flow rate range: 16 to 256 m<sup>3</sup>/min (ANR)

JIS symbol



## Specifications

Model No.	AF5016S-50	AF5032S-80	AF5048S-100	AF5064S-100	AF5080S-150	AF5096S-150	AF5128S-150	AF5160S-200	AF5192S-200	AF5256S-200
Descriptions										
Processing air flow rate (*2. *3.) m <sup>3</sup> /min(ANR)	16	32	48	64	80	96	128	160	192	256
Working fluid	Compressed air									
Working pressure	MPa 0.08 to 1.0									
Proof pressure	MPa 1.5									
Ambient temperature	°C 5 to 60									
Filtration	μm 0.3									
Secondary side oil concentration	mg/m <sup>3</sup> 0.5 (at inlet air 21°C or less)									
Pressure drop	Initial	MPa 0.007								
	Normal	MPa 0.014								
	Element replacement	MPa 0.035								
Element quantity	1	2	3	4	5	6	8	10	12	16
Port size (*1) flange	2B	3B	4B	4B	6B	6B	6B	8B	8B	8B
Weight	kg 38	76	78	107	140	167	223	232	269	330
Differential pressure switch										
Operating pressure differential	MPa 0.04±0.01									
Contact	1 pole a contact									
Max. contact current	A 0.5									
Max. contact voltage	VDC 200									
Max. contact capacitance	W 10									
Max. contact resistance (including reed switch)	mΩ 300									
Drain discharger	No									

\*1: Flange is 10K flange.

\*2: Processing air flow rate is the atmospheric pressure conversion value where the inlet pressure is 0.7 MPa and initial pressure drop is 0.007 MPa.

\*3: ANR indicates conditions of 20°C atmospheric pressure and relative humidity 65%.

## Flow rate compensation coefficient

If the working pressure is other than 0.7 MPa, multiply the processing air flow rate by the above coefficient.

Pressure (MPa)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Compensation coefficient	0.38	0.53	0.65	0.76	0.85	0.93	1.0	1.07	1.13	1.2

Clean air components

# AF5000S Series

## Compatibility table by variation

AF5000	
Port size	Flange 2B, 3B, 4B, 6B, 8B
P4	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

AF5 **016** S - **50** - **X1** - P4

Ⓐ Flow rate classification

Ⓑ Bore size

Ⓒ Option \*1  
\*2  
\*4

Code	Content										
<b>Ⓐ Flow rate classification m<sup>3</sup>/min (ANR)</b>											
<b>016</b>	16										
<b>032</b>	32										
<b>048</b>	48										
<b>064</b>	64										
<b>080</b>	80										
<b>096</b>	96										
<b>128</b>	128										
<b>160</b>	160										
<b>192</b>	192										
<b>256</b>	256										
<b>Ⓑ Bore size</b>											
	<b>Flow rate classification</b>	<b>016</b>	<b>032</b>	<b>048</b>	<b>064</b>	<b>080</b>	<b>096</b>	<b>128</b>	<b>160</b>	<b>192</b>	<b>256</b>
<b>50</b>	Flange 2B	●	-	-	-	-	-	-	-	-	-
<b>80</b>	Flange 3B	-	●	-	-	-	-	-	-	-	-
<b>100</b>	Flange 4B	-	-	●	●	-	-	-	-	-	-
<b>150</b>	Flange 6B	-	-	-	-	●	●	●	-	-	-
<b>200</b>	Flange 8B	-	-	-	-	-	-	-	●	●	●
<b>Ⓒ Option</b>											
<b>Blank</b>	Standard products										
<b>E</b>	Without drain discharger										
<b>K</b>	Companion flange attached										
<b>H</b>	English language specifications										
<b>H2</b>	Stainless steel nameplate										
<b>L</b>	Foundation bolt/nut attached (SS400) (*1)										
<b>L1</b>	Foundation bolt/nut attached (SUS304) (*1)										
<b>X1</b>	IN/OUT reverse direction (*2)										
<b>Y2</b>	Product photo										

## ⚠ Precautions for model No. selection

\*1: "L" and "L1" are applicable to AF5032S to AF5256S.

\*2: Viewed from the front, a standard product has an air inlet on the left port, while an air outlet on the right port.

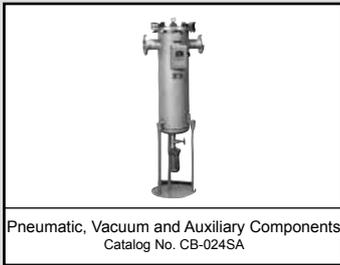
For "X1", an air inlet is provided on the right port, while an air outlet is provided on the left port.

\*3: Unit performance may not be attained if used at less than the selected pressure.

Always select the model No. for the working pressure.

\*4: When ordering several options, indicate the required options in alphabetical order.

\*5: Made to order. Contact CKD for details.



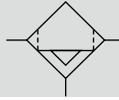
Micro alescer

# AF5000M Series

For pneumatic pressure circuits which are susceptible to oil

● Flow rate range: 16 to 256 m<sup>3</sup>/min (ANR)

JIS symbol



## Specifications

Model No.	AF5016M-50	AF5032M-80	AF5048M-100	AF5064M-100	AF5080M-150	AF5096M-150	AF5128M-150	AF5160M-200	AF5192M-200	AF5256M-200
Descriptions										
Processing air flow rate (*2. *3.) m <sup>3</sup> /min(ANR)	16	32	48	64	80	96	128	160	192	256
Working fluid	Compressed air									
Working pressure MPa	0.08 to 1.0									
Proof pressure MPa	1.5									
Ambient temperature °C	5 to 60									
Filtration μm	0.01									
Secondary side oil concentration mg/m <sup>3</sup>	0.01 (at inlet air 21°C or less)									
Pressure drop	Initial MPa	0.01								
	Normal MPa	0.02								
	Element replacement MPa	0.035								
Element quantity	1	2	3	4	5	6	8	10	12	16
Port size (*1) flange	2B	3B	4B	4B	6B	6B	6B	8B	8B	8B
Weight kg	38	76	78	107	140	167	223	232	269	330
Differential pressure switch										
Operating pressure differential MPa	0.04±0.01									
Contact	1 pole a contact									
Max. contact current A	0.5									
Max. contact voltage VDC	200									
Max. contact capacitance W	10									
Max. contact resistance (including reed switch) mΩ	300									
Drain discharger	No									

\*1: Flange is 10K flange.

\*2: Processing air flow rate is the atmospheric pressure conversion value where the inlet pressure is 0.7 MPa and initial pressure drop is 0.01 MPa.

\*3: ANR indicates conditions of 20°C atmospheric pressure and relative humidity 65%.

## Flow rate compensation coefficient

If the working pressure is other than 0.7 MPa, multiply the processing air flow rate by the above coefficient.

Pressure (MPa)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Compensation coefficient	0.38	0.53	0.65	0.76	0.85	0.93	1.0	1.07	1.13	1.2

Clean air components

# AF5000M Series

## Compatibility table by variation

AF5000	
Port size	Flange 2B, 3B, 4B, 6B, 8B
P4	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

AF5 **016** M - **50** - **X1** - P4

Ⓐ Flow rate classification

Ⓑ Bore size

Ⓒ Option \*1  
\*2  
\*4

Code	Content
<b>Ⓐ Flow rate classification m<sup>3</sup>/min (ANR)</b>	
016	16
032	32
048	48
064	64
080	80
096	96
128	128
160	160
192	192
256	256

<b>Ⓑ Bore size</b>		016	032	048	064	080	096	128	160	192	256
Flow rate classification											
50	Flange 2B	●	-	-	-	-	-	-	-	-	-
80	Flange 3B	-	●	-	-	-	-	-	-	-	-
100	Flange 4B	-	-	●	●	-	-	-	-	-	-
150	Flange 6B	-	-	-	-	●	●	●	-	-	-
200	Flange 8B	-	-	-	-	-	-	-	●	●	●

<b>Ⓒ Option</b>	
Blank	Standard products
E	Without drain discharger
K	Companion flange attached
H	English language specifications
H2	Stainless steel nameplate
L	Foundation bolt/nut attached (SS400) (*1)
L1	Foundation bolt/nut attached (SUS304) (*1)
X1	IN/OUT reverse direction (*2)
Y2	Product photo

## ⚠ Precautions for model No. selection

- \*1: "L" and "L1" are applicable to AF5032M to AF5256M.
- \*2: Viewed from the front, a standard product has an air inlet on the left port, while an air outlet on the right port. For "X1", an air inlet is provided on the right port, while an air outlet is provided on the left port.
- \*3: Unit performance may not be attained if used at less than the selected pressure. Always select the model No. for the working pressure.
- \*4: When ordering several options, indicate the required options in alphabetical order.
- \*5: Made to order. Contact CKD for details.



Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

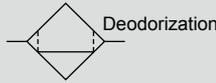
Micro alescer

# AF5000X Series

For pneumatic pressure circuits which are susceptible to odors

● Flow rate range: 16 to 256 m<sup>3</sup>/min (ANR)

JIS symbol



## Specifications

Model No.	AF5016X-50	AF5032X-80	AF5048X-100	AF5064X-100	AF5080X-150	AF5096X-150	AF5128X-150	AF5160X-200	AF5192X-200	AF5256X-200
Descriptions										
Processing air flow rate (*2. *3.) m <sup>3</sup> /min(ANR)	16	32	48	64	80	96	128	160	192	256
Working fluid	Compressed air									
Working pressure MPa	0.08 to 1.0									
Proof pressure MPa	1.5									
Ambient temperature °C	5 to 30									
Filtration method	Suction by activated carbon									
Secondary side oil concentration mg/m <sup>3</sup>	0.003 (at inlet air 21°C or less)									
Initial pressure drop MPa	Within 0.007									
Element quantity	1	2	3	4	5	6	8	10	12	16
Port size (*1) flange	2B	3B	4B	4B	6B	6B	6B	8B	8B	8B
Weight kg	38	76	78	107	140	167	223	232	269	330

\*1: Flange is 10K flange.

\*2: Processing air flow rate is the atmospheric pressure conversion value where the inlet pressure is 0.7 MPa and initial pressure drop is 0.007 MPa.

\*3: ANR indicates conditions of 20°C atmospheric pressure and relative humidity 65%.

## Flow rate compensation coefficient

If the working pressure is other than 0.7 MPa, multiply the processing air flow rate by the above coefficient.

Pressure (MPa)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Compensation coefficient	0.38	0.53	0.65	0.76	0.85	0.93	1.0	1.07	1.13	1.2

# AF5000X Series

## Compatibility table by variation

AF5000	
Port size	Flange 2B, 3B, 4B, 6B, 8B
P4	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

AF5 **016** X - **50** - **X1** - P4

Ⓐ Flow rate classification

Ⓑ Bore size

Ⓒ Option \*1  
\*2  
\*4

Code	Content
<b>Ⓐ Flow rate classification m<sup>3</sup>/min (ANR)</b>	
<b>016</b>	16
<b>032</b>	32
<b>048</b>	48
<b>064</b>	64
<b>080</b>	80
<b>096</b>	96
<b>128</b>	128
<b>160</b>	160
<b>192</b>	192
<b>256</b>	256

<b>Ⓑ Bore size</b>		016	032	048	064	080	096	128	160	192	256
<b>50</b>	Flange 2B	●	-	-	-	-	-	-	-	-	-
<b>80</b>	Flange 3B	-	●	-	-	-	-	-	-	-	-
<b>100</b>	Flange 4B	-	-	●	●	-	-	-	-	-	-
<b>150</b>	Flange 6B	-	-	-	-	●	●	●	-	-	-
<b>200</b>	Flange 8B	-	-	-	-	-	-	-	●	●	●

<b>Ⓒ Option</b>	
<b>Blank</b>	Standard products
<b>K</b>	Companion flange attached
<b>H</b>	English language specifications
<b>H2</b>	Stainless steel nameplate
<b>L</b>	Foundation bolt/nut attached (SS400) (*1)
<b>L1</b>	Foundation bolt/nut attached (SUS304) (*1)
<b>X1</b>	IN/OUT reverse direction (*2)
<b>Y2</b>	Product photo

## ⚠ Precautions for model No. selection

\*1: "L" and "L1" are applicable to AF5032X to AF5256X.

\*2: Viewed from the front, a standard product has an air inlet on the left port, while an air outlet on the right port. For "X1", an air inlet is provided on the right port, while an air outlet is provided on the left port.

\*3: Unit performance may not be attained if used at less than the selected pressure. Always select the model No. for the working pressure.

\*4: When ordering several options, indicate the required options in alphabetical order.

\*5: Made to order. Contact CKD for details.

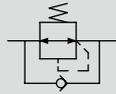


# Compact regulator RB500 Series

Compact, space saving structure and reverse flow function integrated.

● Port size: Push-in fitting  $\varnothing 4, \varnothing 6$

JIS symbol



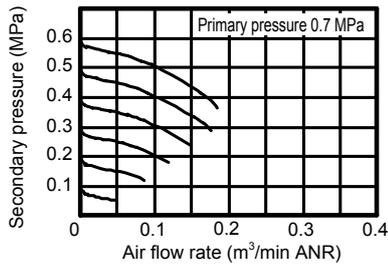
## Specifications

Descriptions		RB500
Working fluid		Compressed air
Max. working pressure MPa		1.0
Proof pressure MPa		1.5
Ambient/fluid temperatures °C		5 to 60
Set pressure MPa		0.05 to 0.7 (*1)
Pressure relief		Non-relief
Port size	IN-OUT	Push-in fitting: $\varnothing 4/\varnothing 6$
	GAUGE	Rc1/8
Weight g		68

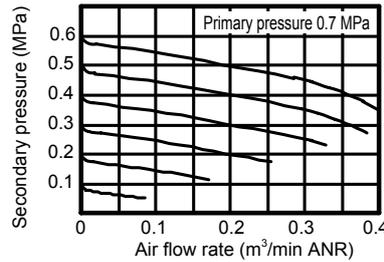
\*1: Low pressure specifications are 0.05 to 0.35.

## Flow characteristics

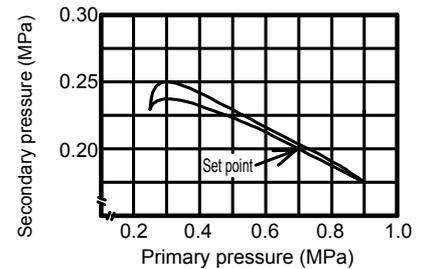
● RB500-SSC4



● RB500-SSC6



## Pressure characteristics



## Compatibility table by variation

RB500 -N	
Port size	Push-in fitting $\varnothing 4/\varnothing 6$
P4	●
P40	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Pressure gauge/pressure sensor must be ordered separately.  
(Pressure gauge option is "T" only)

\*2: Non-relief only is available.

\*3: Only straight direction is available for fittings.

\*4: For pressure adjustment springs without gas contact and pressure adjustment screw units in P40, zinc plating is used.

## How to order



Model No.

A Connection

B Option

Code	Content	
<b>A Connection</b>		
Direction	IN	S Straight
	OUT	S Straight
Bore size	C4	$\varnothing 4$
	C6	$\varnothing 6$
<b>B Option</b>		
Panel mount	Blank	Without nut
	*1 P	With nut
Pressure range	Blank	0.05 to 0.7 MPa
	L	0.05 to 0.35 MPa
Pressure relief	N	Non-relief
Pressure gauge	T	No pressure gauge (gauge port Rc1/8)

## ⚠ Precautions for model No. selection

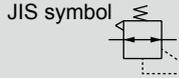
\*1: Indicate option code "P" for panel mounting.

Clean air  
components



# Precision regulator RP1000 Series

● Port size: Rc1/4



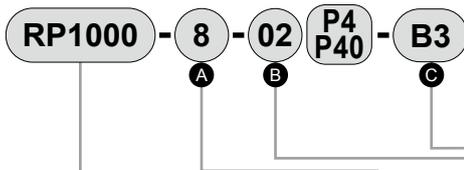
## Specifications

Descriptions	RP1000-8-02	RP1000-8-04	RP1000-8-07	
Working fluid	Compressed clean air (according to the recommended air circuit described in "Pneumatic, Vacuum and Auxiliary Components" (catalog No. CB-024SA))			
Max. working pressure	MPa	1.0		
Min. working pressure	MPa	Set pressure +0.1 *1		
Proof pressure	MPa	1.5		
Ambient/fluid temperatures	°C	-5 to 60 (no freezing) *3		
Set pressure	MPa	0.003 to 0.2	0.005 to 0.4	0.005 to 0.7
Sensitivity	Within 0.1% of full scale			
Repeatability	Within ±0.5% of full scale			
Air consumption *2	l/min(ANR)	1.3 or less		3.4 or less
Port size	Rc1/4			
Pressure gauge port size	Rc1/8			
Weight	g	250		

\*1: Flow rate of the secondary side is to be zero. For RP1000-8-04, if the set pressure is 0.3 MPa and over, increase +0.2 MPa in the set pressure.

\*2: Conditions where the primary pressure is 0.7 MPa. Air is normally released from the bleed port.

## How to order



Model  
RP1000: Precision regulator

A Port size		B Set pressure range		C Other attachments	
8	Rc1/4	02	MAX.0.2 MPa	Blank	Without attachment
		04	MAX.0.4 MPa	B3	L bracket
		07	MAX.0.7 MPa		

## Compatibility table by variation

	RP1000
Port size	Rc1/4
P4	●
P40	▲

● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable

\*1: Pressure gauge/pressure sensor must be ordered separately. (Attachment options not available.)

\*2: RP1000 dimensions are different from the standard dimensions.

\*3: Zinc plating is used for pressure adjustment springs without gas contact in P40.

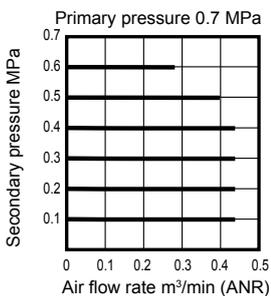
\*4: Dimensions are different from the standard products. There are mounting restrictions because of bleed port connection. Check the dimensions for each case.

## Flow characteristics

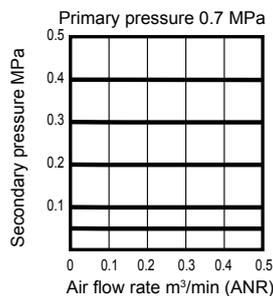
\*1: Bracket is attached.

\*2: One R1/8 plug and a dedicated fitting for the bleed port are attached with the product.

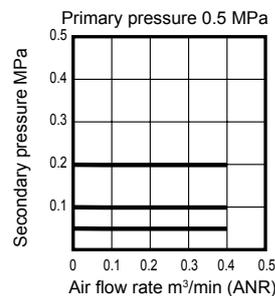
### ● RP1000-8-07



### ● RP1000-8-04

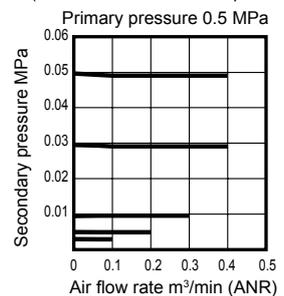


### ● RP1000-8-02



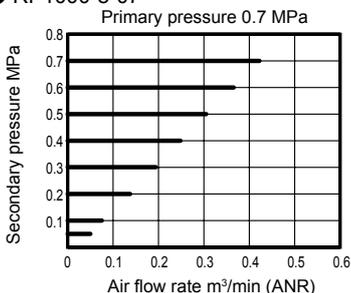
### ● RP1000-8-02

(Flow characteristics at low pressure)

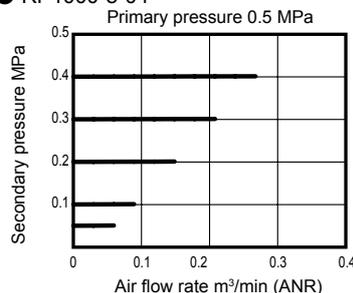


## Relief flow characteristics

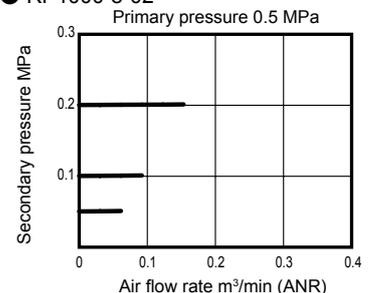
### ● RP1000-8-07

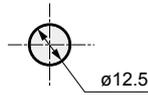
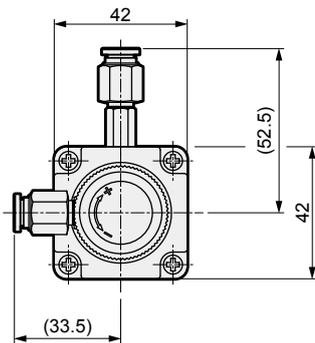


### ● RP1000-8-04

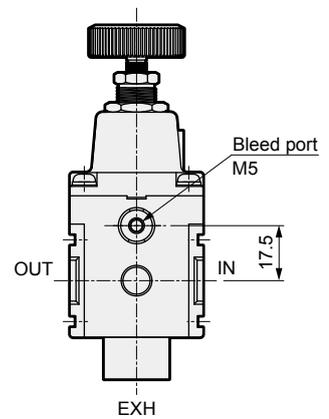
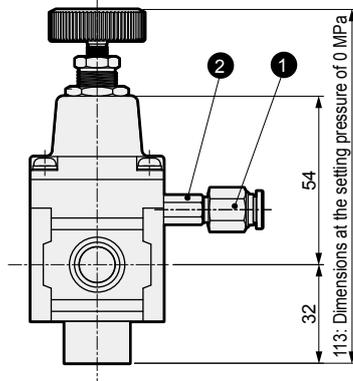
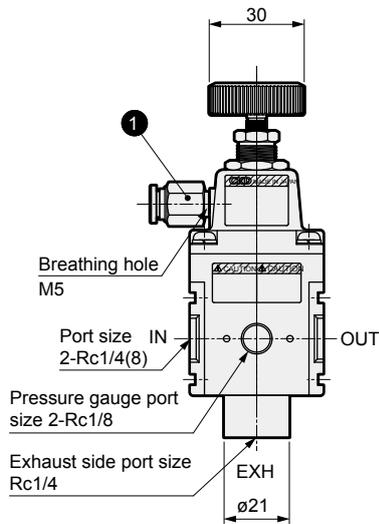


### ● RP1000-8-02





Panel cut dimension  
(Panel plate thickness: max. 4 mm)



## Parts list

Part number	Part name
(1)	Two fittings (ZSP-C6-M5)
(2)	Bleed port extension fitting



# Precision regulator RP2000 Series

● Port size: Rc1/4 Rc3/8

JIS symbol



## Specifications

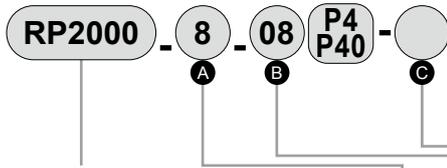
Descriptions	RP2000-8-08	RP2000-10-08
Working fluid	Compressed clean air (according to the recommended air circuit described in "Pneumatic, Vacuum and Auxiliary Components" (catalog No. CB-024SA))	
Max. working pressure	MPa	1.0
Min. working pressure	MPa	Set pressure +0.1 *1
Proof pressure	MPa	1.5
Ambient/fluid temperatures	°C	-5 to 60 (no freezing)
Set pressure	MPa	0.03 to 0.85
Sensitivity		Within 0.2% of full scale
Repeatability		Within ±0.5% of full scale
Air consumption	ℓ/min (ANR)	5 or less *2
Port size	Rc1/4	Rc3/8
Exhaust side port size		Rc3/8
Pressure gauge port size		Rc1/8
Weight	g	470

\*1: Flow rate of the secondary side is to be zero.

\*2: Conditions where the primary pressure is 0.7 MPa and set pressure is 0.3 MPa. Consumed air is released from the bleed port and EXH port, while air is normally released from the bleed port.

So, air consumption is the total of consumption volume released from the bleed port and EXH port. Air is released at 1 ℓ/min (ANR) or less from EXH port.

## How to order



Model  
RP2000: Precision regulator

## Compatibility table by variation

	RP2000
Port size	Rc3/8
P4	●
P40	▲

● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable

\*1: Pressure gauge/pressure sensor must be ordered separately. (Attachment options not available.)  
\*2: RP1000 dimensions are different from the standard dimensions.  
\*3: Zinc plating is used for pressure adjustment springs without gas contact in P40.  
\*4: Dimensions are different from the standard products. There are mounting restrictions because of bleed port connection. Check the dimensions for each case.

A Port size		B Set pressure range		C Other attachments	
8	Rc1/4	08	MAX.0.85MPa	Blank	Without attachment
10	Rc3/8			B	C bracket

\*1: If an Rc1/2 port size is required, use a pipe adaptor set (model No.: A400-15-W).

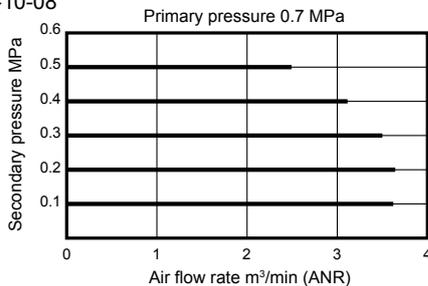
\*2: Attachment is attached.

\*3: The pipe adaptor set and C bracket cannot be used together.

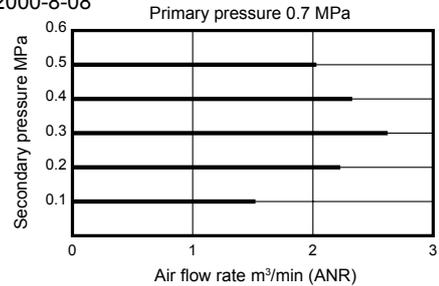
\*4: One R1/8 plug and a dedicated fitting for the bleed port are attached with the product.

## Flow characteristics

● RP2000-10-08

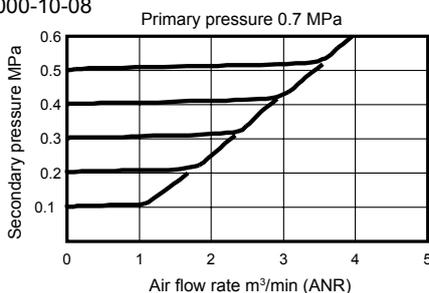


● RP2000-8-08

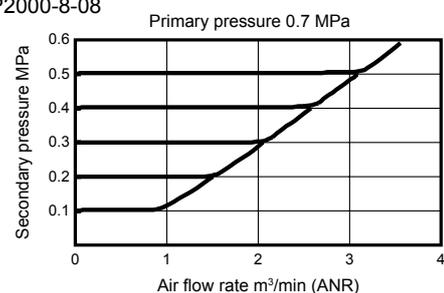


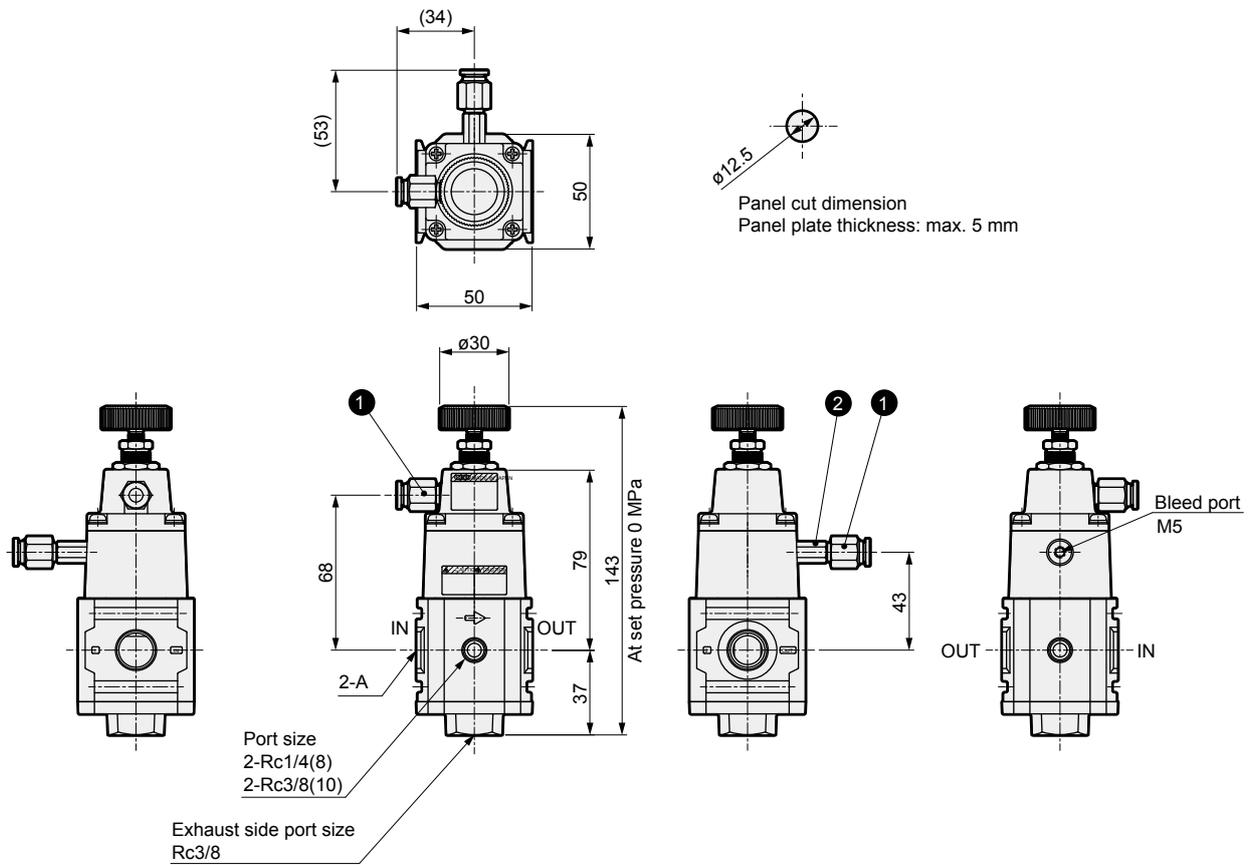
## Relief flow characteristics

● RP2000-10-08



● RP2000-8-08





## Parts list

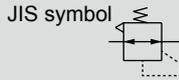
Part number	Part name
(1)	Two fittings (ZSP-C6-M5)
(2)	Bleed port extension fitting



Precision regulator

# RPE1000 Series

● Port size: Rc1/4



## Specifications

Descriptions		RPE1000-8-07
Working fluid		Compressed clean air (according to the recommended air circuit described in the single unit catalog (catalog No. CC-1072A))
Max. working pressure	MPa	1.0
Min. working pressure	MPa	Set pressure +0.1 *1
Proof pressure	MPa	1.5
Ambient/fluid temperatures	°C	-5 to 60 (no freezing)
Set pressure	MPa	0.01 to 0.7
Sensitivity		Within 0.2% of full scale
Repeatability		Within ±0.5% of full scale
Air consumption *2	ℓ /min (ANR)	0.2 or less
Port size		Rc1/4
Pressure gauge port size		Rc1/8
Weight	g	250 *3

\*1: Flow rate of the secondary side is to be zero.

\*2: Conditions where the primary pressure is 0.7 MPa and air is consumed in the secondary side. When there is no air consumption, 1 ℓ/min or less air from the EXH port is released from the bleed port.

\*3: For weight when ● attachment is included, add the following weight. Bracket: 30 g

## Compatibility table by variation

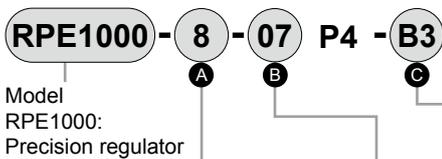
	RPE1000
P4	●

\*1: Pressure gauge/pressure sensor must be ordered separately.  
(Attachment options not available.)

\*2: RPE1000 dimensions are different from the standard dimensions.

● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable

## How to order

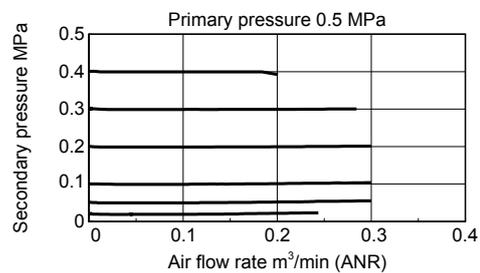
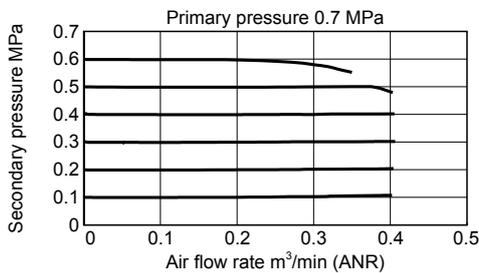


A Port size		B Set pressure range		C Other attachments	
8	Rc1/4	07	MAX.0.7 MPa	Blank	Without attachment
				B3	L bracket (B131)

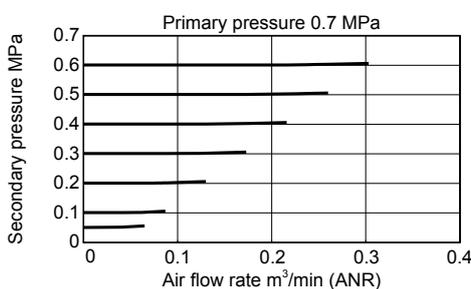
\*1: Bracket is attached.

\*2: One R1/8 plug is attached with the product.

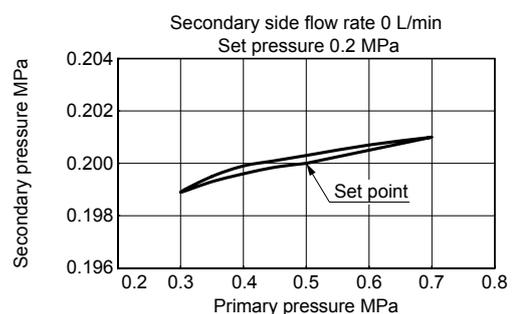
## Flow characteristics

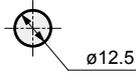
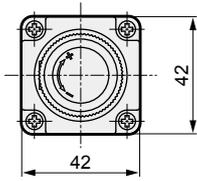


## Relief flow characteristics

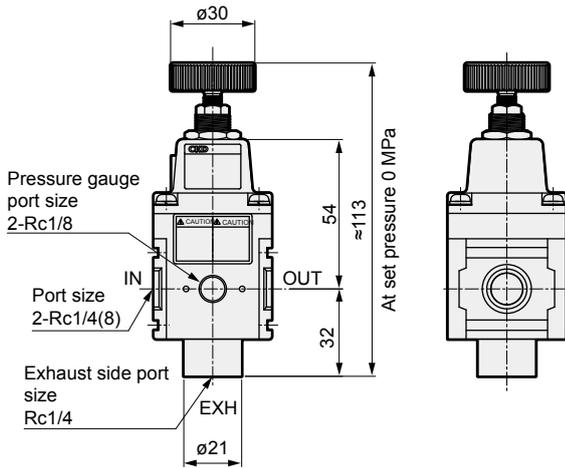


## Pressure characteristics





Panel cut dimension  
(panel plate thickness: max. 5 mm)



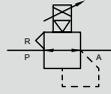


Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

# Digital electro pneumatic regulator

## EVD-1000 Series

JIS symbol



### Specifications

Descriptions	EVD-1100-*08 <input type="checkbox"/>	EVD-1100-P08 <input type="checkbox"/>	EVD-1500-*08 <input type="checkbox"/>	EVD-1500-P08 <input type="checkbox"/>	EVD-1900-*08 <input type="checkbox"/>	EVD-1900-P08 <input type="checkbox"/>
	Analog (*...0/1/2)	Parallel	Analog (*...0/1/2)	Parallel	Analog (*...0/1/2)	Parallel
Working fluid	Clean compressed air (JIS B 8392-1: 2012 Grade 1.3.2 or equivalent)					
Max. working pressure	160 kPa		700 kPa		1000 kPa	
Min. working pressure	Set pressure +50 kPa			Set pressure +100 kPa		
Proof pressure	Inlet	240 kPa		1050 kPa		1500 kPa
	Output side	150 kPa		750 kPa		1350 kPa
Pressure control range *1	0 to 100 kPa		0 to 500 kPa		0 to 900 kPa	
Power supply voltage	24 VDC ± 10% (stabilized power supply with ripple rate 1% or less)					
Current consumption	0.15 A or less (0.6 A or less rush current when the power is turned ON)					
Input signal (input impedance)	0 to 10 VDC(6.7 kΩ)	10 bit	0 to 10 VDC(6.7 kΩ)	10 bit	0 to 10 VDC(6.7 kΩ)	10 bit
	0 to 5 VDC(10 kΩ)		0 to 5 VDC(10 kΩ)		0 to 5 VDC(10 kΩ)	
	4 to 20 mADC(250 Ω)		4 to 20 mADC(250 Ω)		4 to 20 mADC(250 Ω)	
Preset input	8 points	No	8 points	No	8 points	No
Output signal *2	Output accuracy: ±6% F.S. or less, analog output: 1 to 5 VDC (connecting load impedance 500 kΩ and over) Switch output: NPN or PNP open collector output, 30 V or less and 50 mA or less, voltage drop 2.4 V or less, PLC/relay compatible					
Error output signal	NPN or PNP open collector output, 30 V or less and 50 mA or less, voltage drop 2.4 V or less, PLC/relay compatible					
Direct memory setting	1 to 100 kPa		5 to 500 kPa		9 to 900 kPa	
	(Min. setting width 1 kPa/setting resolution 1 kPa)		(Min. setting width 1 kPa/setting resolution 1 kPa)		(Min. setting width 1 kPa/setting resolution 2 kPa)	
Pressure display	Display method	7-segment LED 3 digits, indicator accuracy: ±2% F.S. or less				
	Display range	0 to 100 kPa		0 to 500 kPa		0 to 900 kPa
	Display resolution	1 kPa		1 kPa		1 kPa
Hysteresis *3	0.5% F.S. or less					
Linearity *3	±0.3% F.S. or less					
Resolution *3	0.2% F.S. or less					
Repeatability *3	0.3% F.S. or less					
Temperature characteristics	Zero point fluctuation	0.15% F.S./°C or less				
	Span fluctuation	0.07% F.S./°C or less				
Max. flow rate (ANR) *4	60 l/min		400 l/min			
Step response *5	No load		0.2 sec. or less			
Vibration resistance	98 m/s <sup>2</sup> or less					
Ambient temperature	5 to 50°C					
Fluid temperature	5 to 50°C					
Port size	Rc1/4					
Mounting orientation	Free					
Weight	250 g					
Protection circuit	Power reverse connection protection, switch output reverse connection protection, switch output load short-circuit protection					

\*1: There is 1% F.S. or less residual pressure when the input signal is 0%. (EVD-1100: 1 kPa, EVD-1500: 5 kPa, EVD-1900: 9 kPa)

\*2: Select the analog output or switch output.

\*3: The condition of the values above is: 24 ± 0.1 VDC power supply voltage, 25 ± 3°C ambient temperature, no load, working pressure of +50 kPa max. control pressure (EVD-1100)/+100 kPa (EVD-1500, 1900), and 10 to 90% control pressure.

In addition, when the secondary side is a closed circuit, pressure fluctuations will occur if the product is used for blowing or for similar applications.

\*4: The characteristics where working pressure is maximum and control pressure is maximum are shown.

\*5: The value above is obtained at the max. working pressure and when the step amount changes from

50% F.S. → 100% F.S.
50% F.S. → 60% F.S.
50% F.S. → 40% F.S.

## How to order

EVD-1 **500** - **0** **08** **AN** - **C1L11** - **3** - **P4**  
**P40**

**A** Pressure control range

**B** Input signal

**C** Port size

**D** Output signal

● Discrete option (cable) model No.

EVD- **C1**

**E** Option

● Discrete option (bracket) model No.

EVL- **L11**

**E** Option

## Compatibility table by variation

	EVD-1100/1500/1900
Port size	Rc1/4
P4	●
P40	▲

Note: Bracket option for EVD-1500/1900\*-P4 is blank or L11 (L type, wall mounting for exhaust fittings). Standard B1 and L1 types cannot be selected.

● : Standard ○ : Made to order  
 ▲ : Contact CKD □ : Not applicable

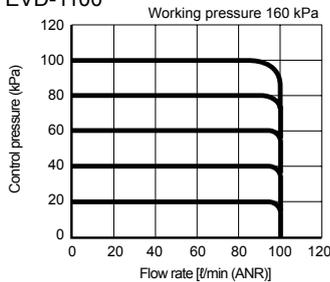
Code	Content
<b>A Pressure control range *1</b>	
100	0 to 100 kPa
500	0 to 500 kPa
900	0 to 900 kPa
<b>B Input signal</b>	
0	0 to 10 VDC
1	0 to 5 VDC
2	4 to 20 mADC
P	Parallel 10 bit
<b>C Port size</b>	
08	Rc1/4
<b>D Output signal</b>	
AN	1 to 5 VDC analog, error (NPN)
AP	1 to 5 VDC analog, error (PNP)
SN	Switch (NPN), error (NPN)
SP	Switch (PNP), error (PNP)
<b>E Option</b>	
<b>Cable option</b>	
Blank	No
C1	Analog 9-conductor, 1 m cable
C3	Analog 9-conductor, 3 m cable
P1	Parallel 15-conductor, 1 m cable
P3	Parallel 15-conductor, 3 m cable
<b>Bracket option attached</b>	
Blank	No
L11	L bracket, wall mounted for exhaust fitting
<b>F Power supply voltage</b>	
3	24 VDC

\*1: There is 1% F.S. or less residual pressure when the input signal is 0%.

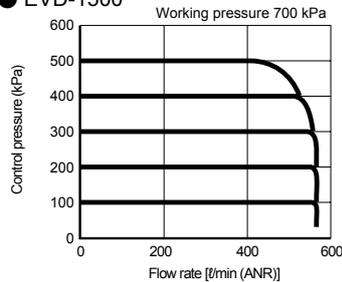
\*2: Bracket option of EVD-1500/1900\*-P4 is blank or L11 (L type, wall mounting for exhaust fittings). Standard B1 and L1 types cannot be selected.

## Flow characteristics

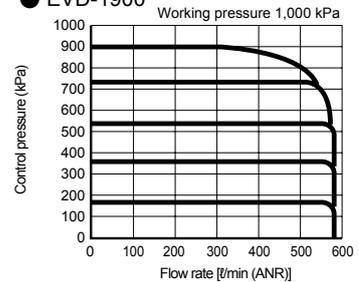
### ● EVD-1100



### ● EVD-1500

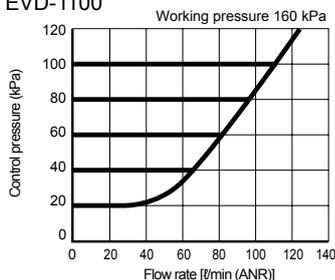


### ● EVD-1900

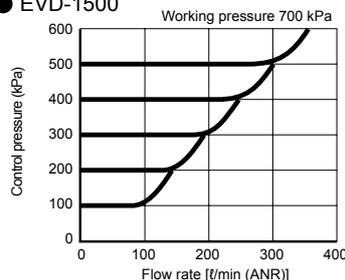


## Relief characteristics

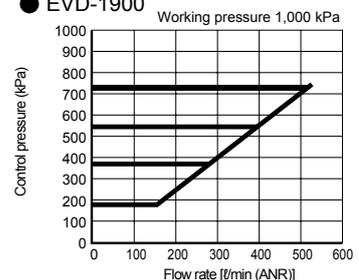
### ● EVD-1100



### ● EVD-1500



### ● EVD-1900



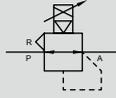


Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

# Digital electro pneumatic regulator

## EVD-3000 Series

JIS symbol



### Specifications

Descriptions	EVD-3100-*08 <input type="checkbox"/>	EVD-3100-P08 <input type="checkbox"/>	EVD-3500-*08 <input type="checkbox"/>	EVD-3500-P08 <input type="checkbox"/>	EVD-3900-*08 <input type="checkbox"/>	EVD-3900-P08 <input type="checkbox"/>
	EVD-3100-*10 <input type="checkbox"/>	EVD-3100-P10 <input type="checkbox"/>	EVD-3500-*10 <input type="checkbox"/>	EVD-3500-P10 <input type="checkbox"/>	EVD-3900-*10 <input type="checkbox"/>	EVD-3900-P10 <input type="checkbox"/>
	Analog (*...0/1/2)	Parallel	Analog (*...0/1/2)	Parallel	Analog (*...0/1/2)	Parallel
Working fluid	Clean compressed air (JIS B 8392-1:2012 Grade 1.3.2 or equivalent)					
Max. working pressure	160 kPa		700 kPa		1000 kPa	
Min. working pressure	Set pressure +50 kPa			Set pressure +100 kPa		
Proof pressure	Inlet	240 kPa		1050 kPa		1500 kPa
	Output side	150 kPa		750 kPa		1350 kPa
Pressure control range *1	0 to 100 kPa		0 to 500 kPa		0 to 900 kPa	
Power supply voltage	24 VDC ± 10% (stabilized power supply with ripple rate 1% or less)					
Current consumption	0.15 A or less (0.6 A or less rush current when the power is turned ON)					
Input signal (input impedance)	0 to 10 VDC(6.7 kΩ) 0 to 5 VDC(10 kΩ) 4 to 20 mADC(250 Ω)	10 bit	0 to 10 VDC(6.7 kΩ) 0 to 5 VDC(10 kΩ) 4 to 20 mADC(250 Ω)	10 bit	0 to 10 VDC(6.7 kΩ) 0 to 5 VDC(10 kΩ) 4 to 20 mADC(250 Ω)	10 bit
Preset input	8 points	No	8 points	No	8 points	No
Output signal *2	Output accuracy: ±6% F.S. or less, analog output: 1 to 5 VDC (connecting load impedance 500 kΩ and over) Switch output: NPN or PNP open collector output, 30 V or less and 50 mA or less, voltage drop 2.4 V or less, PLC/relay compatible					
Error output signal	NPN or PNP open collector output, 30 V or less and 50 mA or less, voltage drop 2.4 V or less, PLC/relay compatible					
Direct memory setting	1 to 100 kPa (Min. setting width 1 kPa/setting resolution 1 kPa)		5 to 500 kPa (Min. setting width 1 kPa/setting resolution 1 kPa)		9 to 900 kPa (Min. setting width 1 kPa/setting resolution 2 kPa)	
Pressure display	Display method	7-segment LED 3 digits, indicator accuracy: ±2% F.S. or less				
	Display range	0 to 100 kPa		0 to 500 kPa		0 to 900 kPa
	Display resolution	1 kPa		1 kPa		1 kPa
Hysteresis *3	0.5% F.S. or less					
Linearity *3	±0.3% F.S. or less					
Resolution *3	0.2% F.S. or less					
Repeatability *3	0.3% F.S. or less					
Temperature characteristics	Zero point fluctuation	0.15% F.S./°C or less				
	Span fluctuation	0.07% F.S./°C or less				
Max. flow rate (ANR) *4	700 l/min		1500 l/min			
Step response *5	No load	0.2 sec. or less				
Vibration resistance	98 m/s <sup>2</sup> or less					
Ambient temperature	5 to 50°C					
Fluid temperature	5 to 50°C					
Port size	IN, OUT port	Port size option 08: Rc1/4, 10: Rc3/8				
	EXH port	Rc3/8				
Mounting orientation	Free					
Weight	450 g					
Protection circuit	Power reverse connection protection, switch output reverse connection protection, switch output load short-circuit protection					

\*1: There is 1% F.S. or less residual pressure when the input signal is 0%. (EVD-3100: 1 kPa, EVD-3500: 5 kPa, EVD-3900: 9 kPa)

\*2: Select the analog output or switch output.

\*3: The condition of the values above is: 24 ± 0.1 VDC power supply voltage, 25 ± 3°C ambient temperature, no load, working pressure of +50 kPa max. control pressure (EVD-3100)/+100 kPa (EVD-3500, 3900), and 10 to 90% control pressure. In addition, when the secondary side is a closed circuit, pressure fluctuations will occur if the product is used for blowing or for similar applications.

\*4: The characteristics where working pressure is maximum and control pressure is maximum are shown.

\*5: The value above is obtained at the max. working pressure and when the step amount changes from

50% F.S. → 100% F.S.
50% F.S. → 60% F.S.
50% F.S. → 40% F.S.

## Compatibility table by variation

	EVD-3100/3500/3900
Port size	Rc1/4, Rc3/8
P4	●
P40	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

EVD-3 **500** - **0** **08** **AN** - **C1B3** - **3** - **P4**  
**P40**

**A** Pressure control range

**B** Input signal

**C** Port size (IN, OUT)

**D** Output signal

**E** Option

**F** Power supply voltage

● Discrete option (cable, bracket) model No.

EVD- **C1**

**E** Option

Code	Content
<b>A Pressure control range *1</b>	
<b>100</b>	0 to 100 kPa
<b>500</b>	0 to 500 kPa
<b>900</b>	0 to 900 kPa
<b>B Input signal</b>	
<b>0</b>	0 to 10 VDC
<b>1</b>	0 to 5 VDC
<b>2</b>	4 to 20 mADC
<b>P</b>	Parallel 10 bit
<b>C Port size (IN, OUT)</b>	
<b>08</b>	Rc1/4
<b>10</b>	Rc3/8
<b>D Output signal</b>	
<b>AN</b>	1 to 5 VDC analog, error (NPN)
<b>AP</b>	1 to 5 VDC analog, error (PNP)
<b>SN</b>	Switch (NPN), error (NPN)
<b>SP</b>	Switch (PNP), error (PNP)
<b>E Option</b>	
<b>Cable option</b>	
<b>Blank</b>	No
<b>C1</b>	Analog 9-conductor, 1 m cable
<b>C3</b>	Analog 9-conductor, 3 m cable
<b>P1</b>	Parallel 15-conductor, 1 m cable
<b>P3</b>	Parallel 15-conductor, 3 m cable
<b>Bracket option attached</b>	
<b>Blank</b>	No
<b>B3</b>	B bracket, floor mounted
<b>L3</b>	L bracket, wall mounted
<b>F Power supply voltage</b>	
<b>3</b>	24 VDC

\*1: There is 1% F.S. or less residual pressure when the input signal is 0%.

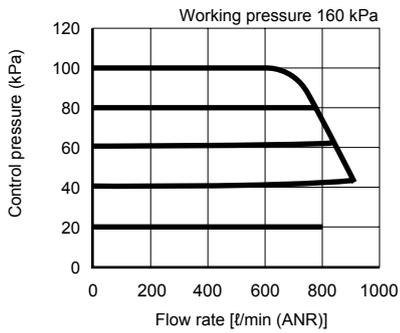
\*2: Made to order. Contact CKD for details.

Clean air components

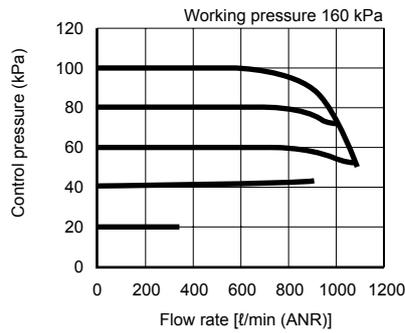
# EVD-3000 Series

## Flow characteristics

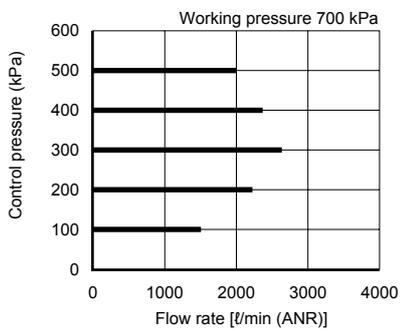
● EVD-3100-□08



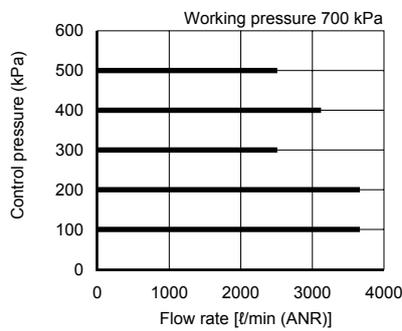
● EVD-3100-□10



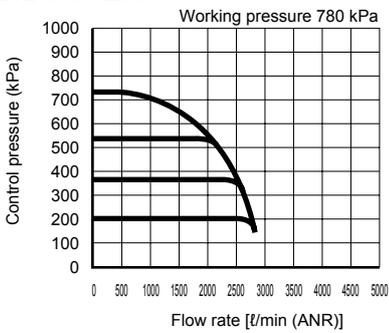
● EVD-3500-□08



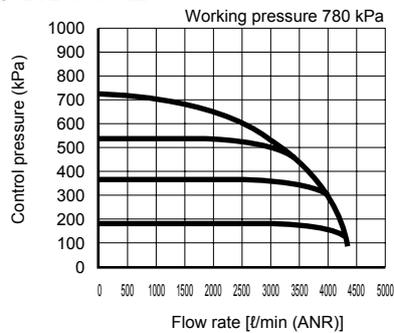
● EVD-3500-□10



● EVD-3900-□08

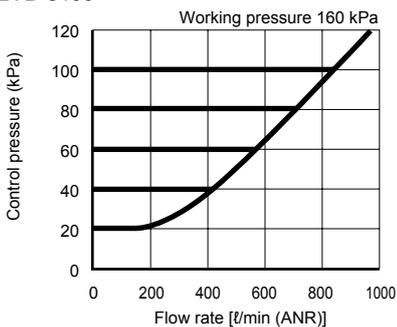


● EVD-3900-□10

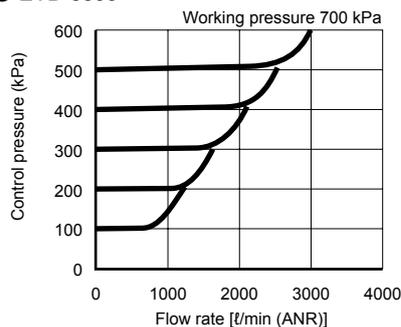


## Relief characteristics

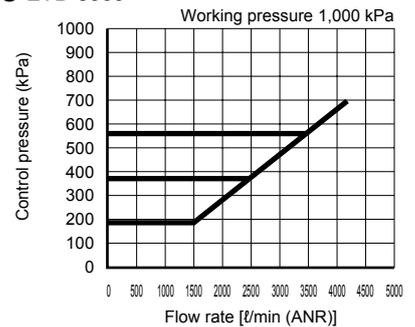
● EVD-3100



● EVD-3500



● EVD-3900





Air filter

# F1000/F2000/F3000 F4000/F6000/F8000-W Series

New Series using 5 µm elements for dust removal and tar removal.  
0.3 µm tar removing element (excluding F1000 Series) ● Port size: 1/8 to 1

JIS symbol



## Specifications

Descriptions	F1000-W	F2000-W	F3000-W	F4000-W	F6000-W	F8000-W
Appearance						
Working fluid	Compressed air					
Max. working pressure MPa	1.0					
Proof pressure MPa	1.5					
Ambient/fluid temperatures °C	5 to 60					
Filtration µm	5		5 or 0.3			
Drain capacity cm <sup>3</sup>	12	25	45	80	80	80 (Note)
Port size Rc	1/8, 1/4 (3/8 uses an adaptor)	1/4, 3/8 (1/2 uses an adaptor)		1/4, 3/8, 1/2 (3/4 uses an adaptor)	3/4, 1 (1 1/4 uses an adaptor)	3/4, 1 (1 1/4 uses an adaptor)
Weight kg	0.087	0.24	0.25	0.45	0.9	1.16
Standard accessories	Bowl guard					

Note: Up to 170 cm<sup>3</sup> is stored with the manual drain cock only.

Clean air  
components

# Air Filter Series

## Compatibility table by variation

	F1000-W	F2000-W	F3000-W	F4000-W	F6000-W	F8000-W
Port size	Rc1/8, 1/4	Rc1/4, 3/8	Rc1/4, 3/8	Rc1/4, 3/8, 1/2	Rc3/4, 1	Rc3/4, 1
P4	●	●	●	●	●	●
P40		●	●	●	●	

- : Standard
- : Made to order
- ▲ : Contact CKD
- : Not applicable

\*1: Auto-drain is not available.  
\*2: Metal bowl is not available.

## How to order



**A** Model No.

**B** Port size

**C** Option

**D** Pipe adaptor set (attachments)

**E** Bracket (attached)

\* Refer to "Pneumatic, Vacuum and Auxiliary Components" (catalog No.CB-024SA) for options.

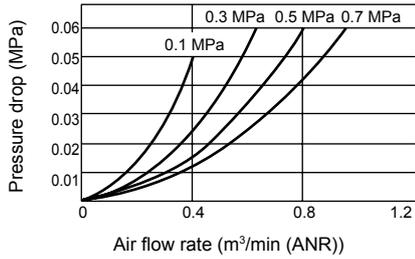
		<b>A Model No.</b>					
		F1000	F2000	F3000	F4000	F6000	F8000
<b>B Port size</b>							
<b>6</b>	Rc1/8	●					
<b>8</b>	Rc1/4	●	●	●	●		
<b>10</b>	Rc3/8		●	●	●		
<b>15</b>	Rc1/2				●		
<b>20</b>	Rc3/4					●	●
<b>25</b>	Rc1					●	●
<b>C Option</b>							
<b>Drainage *3</b>	<b>Blank</b> With manual drain cock	●	●	●	●	●	●
<b>Bowl material *4</b>	<b>Blank</b> Polycarbonate bowl	●	●	●	●	●	●
	<b>Z</b> Nylon bowl	●	●	●	●	●	●
<b>Element</b>	<b>Blank</b> 5 μm	●	●	●	●	●	●
	<b>Y</b> 0.3 μm (submicron)			●	●	●	●
<b>Flow direction</b>	<b>Blank</b> Standard flow (left → right)	●	●	●	●	●	●
	<b>X1</b> Reverse flow (right → left)	●	●	●	●	●	●
<b>D Pipe adaptor set (attached) *1, *2</b>							
<b>Blank</b>	Not attached	●	●	●	●	●	●
<b>A6*W</b>	1/8 pipe adaptor set	●					
<b>A8*W</b>	1/4 pipe adaptor set	●	●	●	●		
<b>A10*W</b>	3/8 pipe adaptor set	●	●	●	●		
<b>A15*W</b>	1/2 pipe adaptor set		●	●	●		
<b>A20*W</b>	3/4 pipe adaptor set				●	●	●
<b>A25*W</b>	1 pipe adaptor set					●	●
<b>A32*W</b>	1 1/4 pipe adaptor set					●	●
<b>E Bracket (attached) Page 208</b>							
<b>Blank</b>	Not attached	●	●	●	●	●	●
<b>BW</b>	C bracket	●	●	●	●	●	●

## ⚠ Precautions for model No. selection

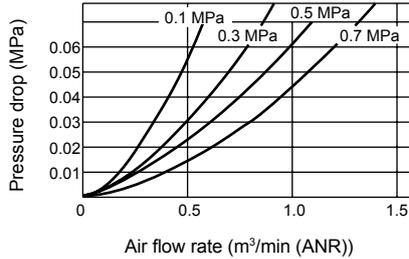
- \*1: The pipe adaptor set and C bracket cannot be used together.
- \*2: The joiner set is attached with the pipe adaptor set.
- \*3: Auto-drain is not available.
- \*4: Metal bowl is not available.

## Flow characteristics

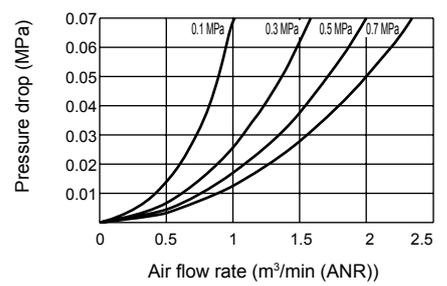
● F1000-6-W



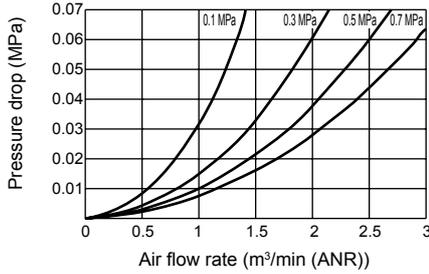
● F1000-8-W



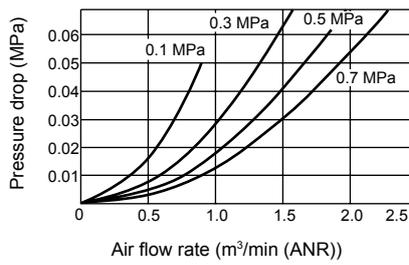
● F2000-8-W



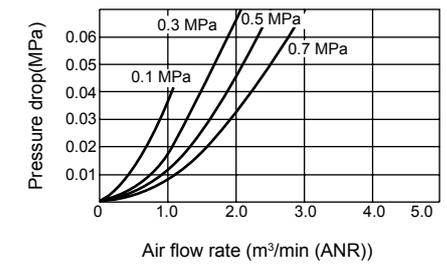
● F2000-10-W



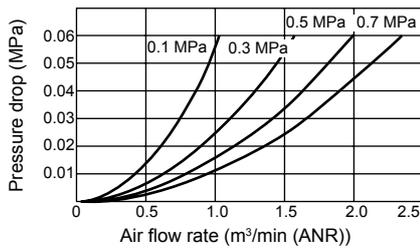
● F3000-8-W



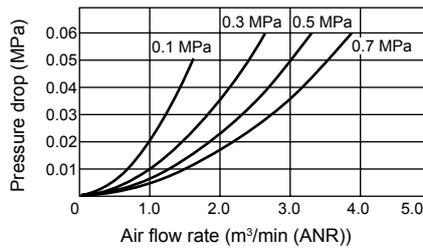
● F3000-10-W



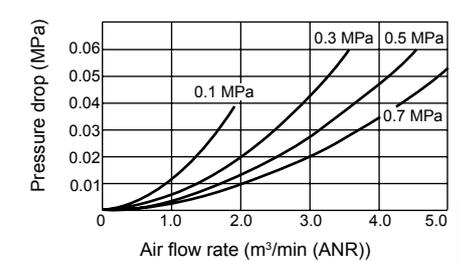
● F4000-8-W



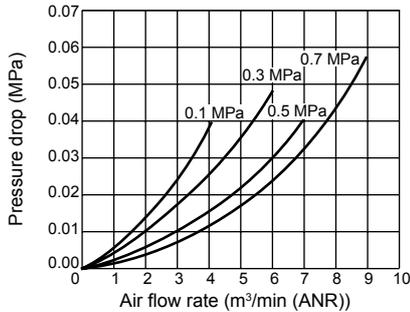
● F4000-10-W



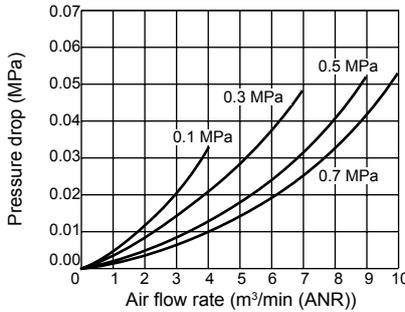
● F4000-15-W



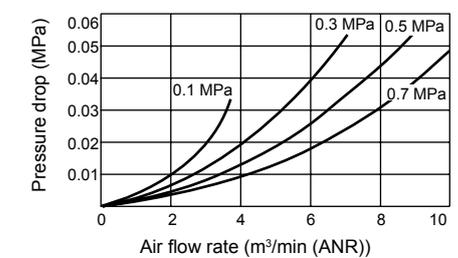
● F6000-20-W



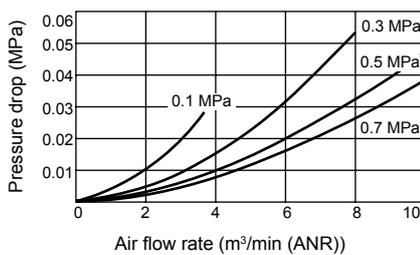
● F6000-25-W



● F8000-20-W



● F8000-25-W

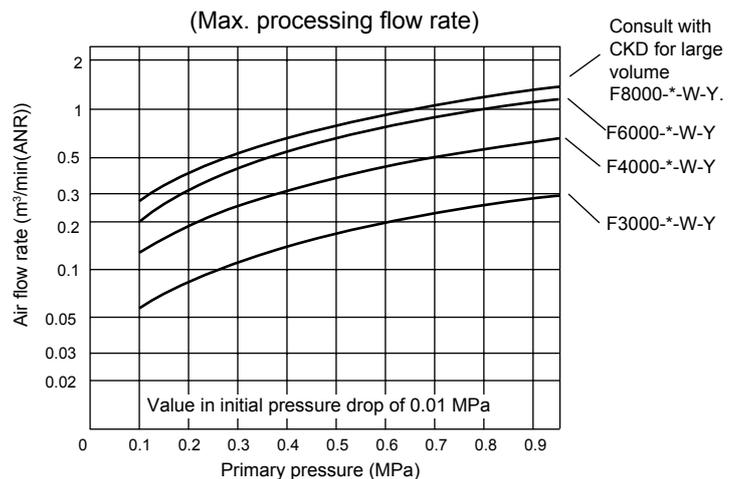


F3000

F4000

● F6000 \*-W-Y (0.3 µm element)

F8000



Clean air components



Oil mist filter

# M1000/M2000/M3000 M4000/M6000/M8000-W Series

Ideal for circuits susceptible to oil, including measuring, and instrumentation circuits.

● Port size: 1/8 to 1

JIS symbol



## Specifications

Descriptions	M1000-W	M2000-W	M3000-W	M4000-W	M6000-W	M8000-W
Appearance						
Working fluid	Compressed air					
Working pressure MPa	0.1 to 1.0					
Proof pressure MPa	1.5					
Drain capacity cm <sup>3</sup>	3	25	45	80	80	80
Port size Rc	1/8, 1/4 (3/8 uses an adaptor)	1/4, 3/8 (1/2 uses an adaptor)		1/4, 3/8, 1/2 (3/4 uses an adaptor)	3/4, 1 (1 1/4 uses an adaptor)	3/4, 1 (1 1/4 uses an adaptor)
Weight kg	0.096	0.25	0.28	0.52	0.95	1.35
Standard accessories	Bowl guard					

Mantle option name	Blank (M type)	S (S type)	X (X type)
Max. processing flow rate	M1000-□-W: 150 M2000-□-W: 250 M3000-□-W: 360 M4000-□-W: 825	M5000-S: 150 M6000-S: 310 M3000-S: 450 M4000-S: 1000	M6000-X: 1400 M8000-X: 2900
l/min(ANR)			
Primary pressure 0.7 MPa	M6000-□-W: 1270 M8000-□-W: 2600		
Ambient/fluid temperatures °C	5 to 60		5 to 30
Filtration μm	0.01 (nominal)		0.3
Secondary side oil concentration mg/m <sup>3</sup>	0.01 or less (0.1 or less after oil saturation) *2, *3		0.003 or less *4
Mantle (element) change	1 year (6000 hours) or pressure drop 0.1 MPa		- *5

\*1: Use within the max. processing flow rate.

If the max. processing flow rate is exceeded temporarily, or if the filter is installed at a location with high levels of pulsation, the mantle could be damaged or oil or drainage, etc., could splatter to the secondary side and result in a terminal malfunction.

\*2: The secondary oil concentration is the value when the primary oil concentration is 30 mg/m<sup>3</sup> and inlet air temperature is 21°C.

\*3: Install an oil mist filter (S type) as a pre-filter on the primary side to prevent early clogging.

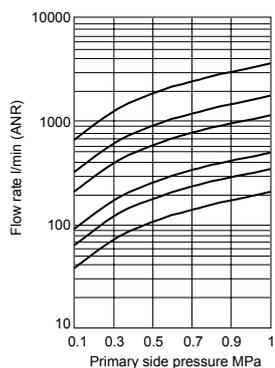
\*4: When an oil mist filter (M Series M type) is installed on the primary side.

\*5: The mantle (element) replacement period differs depending on the odor density in compressed air, and thus cannot be clearly indicated.

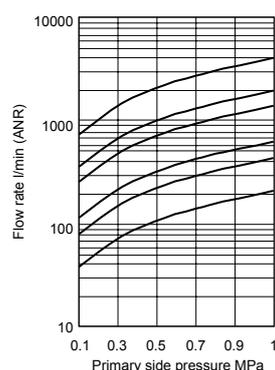
Consider the total period from initial installation to when the smell of oil is confirmed as the effective deodorizing period, and replace at the same time as the M type or control with usage time. (When the inlet temperature is 21°C, replace at the control time or 1,000 hours, whichever comes first)

Keep the primary air temperature at 30°C or less. The deodorizing effect will drop if temperature is high, so provide heat dissipation measures.

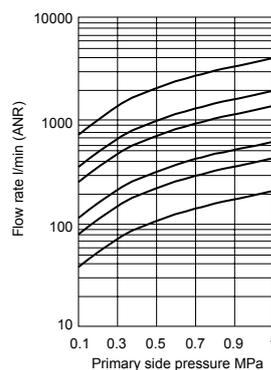
● M\*000-W-M



● M\*000-W-S

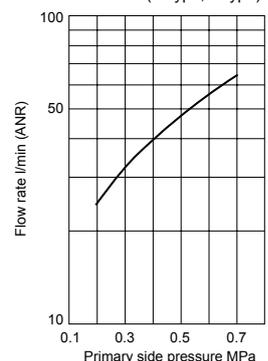


● M\*000-W-X



● M1000-W-F1

With auto-drain (M type, S type)



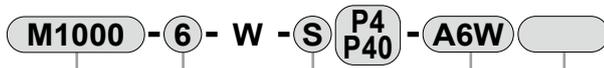
### Compatibility table by variation

	M1000-W	M2000-W	M3000-W	M4000-W	M6000-W	M8000-W
Port size	Rc1/8, 1/4	Rc1/4, 3/8	Rc1/4, 3/8	Rc1/4, 3/8, 1/2	Rc3/4, 1	Rc3/4, 1
P4	●	●	●	●	●	●
P40		●	●	●	●	

- : Standard
- : Made to order
- ▲ : Contact CKD
- : Not applicable

\*1: Auto-drain is not available.  
 \*2: Metal bowl is not available.  
 \*3: With M4000 differential pressure indicator option is not available.

### How to order



**A** Model No.

**B** Port size

**C** Option

**D** Pipe adaptor set (attachments)

**E** Bracket (attached)

\* Refer to "Pneumatic, Vacuum and Auxiliary Components" (catalog No.CB-024SA) for options.

		<b>A Model No.</b>					
		M1000	M2000	M3000	M4000	M6000	M8000
<b>B Port size</b>							
<b>6</b>	Rc1/8	●					
<b>8</b>	Rc1/4	●	●	●	●		
<b>10</b>	Rc3/8		●	●	●		
<b>15</b>	Rc1/2				●		
<b>20</b>	Rc3/4					●	●
<b>25</b>	Rc1					●	●
<b>C Option</b>							
Drain discharge	<b>Blank</b>	With manual drain cock *3	●	●	●	●	●
Bowl material *4	<b>Blank</b>	Polycarbonate bowl	●	●	●	●	●
	<b>Z</b>	Nylon bowl	●	●	●	●	●
Mantle (Element)	<b>Blank</b>	M type (nominal 0.01 μm; remaining oil 0.01 mg/m <sup>3</sup> )	●	●	●	●	●
	<b>S</b>	S type (nominal 0.3 μm; remaining oil 0.5 mg/m <sup>3</sup> )	●	●	●	●	●
	<b>X</b>	X type (deodorization; remaining oil 0.003 mg/m <sup>3</sup> )	●	●	●	●	●
Flow direction	<b>Blank</b>	Standard flow (left → right)	●	●	●	●	●
	<b>X1</b>	Reverse flow (right → left)	●	●	●	●	●
<b>D Pipe adaptor set (attached)</b>							
	<b>Blank</b>	Not attached	●	●	●	●	●
	<b>A6*W</b>	1/8 pipe adaptor set	●				
	<b>A8*W</b>	1/4 pipe adaptor set	●	●	●		
	<b>A10*W</b>	3/8 pipe adaptor set	●	●	●		
	<b>A15*W</b>	1/2 pipe adaptor set		●	●		
	<b>A20*W</b>	3/4 pipe adaptor set				●	●
	<b>A25*W</b>	1 pipe adaptor set					●
	<b>A32*W</b>	1 1/4 pipe adaptor set					●
<b>E Bracket (attached)</b>							
	<b>Blank</b>	Not attached	●	●	●	●	●
	<b>BW</b>	C bracket	●	●	●	●	●

Clean air components

### ⚠ Precautions for model No. selection

- \*1: The pipe adaptor set and C bracket cannot be used together.
- \*2: The joiner set is attached with the pipe adaptor set.
- \*3: Auto-drain is not available.
- \*4: Metal bowl is not available.



Regulator

# R1000/R2000/R3000 R4000/R6000/R8000-W Series

Compact, pressure gauge embedded.

● Port size: 1/8 to 1

JIS symbol 



## Specifications

Descriptions	R1000-W	R2000-W	R3000-W	R4000-W	R6000-W	R8000-W
Working fluid	Compressed air					
Max. working pressure MPa	1.0					
Proof pressure MPa	1.5					
Ambient/fluid temperatures °C	5 to 60					
Set pressure MPa	0.05 to 0.85					
Pressure relief	With relief mechanism (R1000, R8000 are non-relief only)					
Port size Rc	1/8, 1/4 (3/8 uses an adaptor)	1/4, 3/8 (1/2 uses an adaptor)	1/4, 3/8 (1/2 uses an adaptor)	1/4, 3/8, 1/2 (3/4 uses an adaptor)	3/4, 1 (1 1/4 uses an adaptor)	3/4, 1 (1 1/4 uses an adaptor)
Weight kg	0.16	0.29	0.51	0.75	1.1	1.6
Standard accessories	Panel mounting nut					

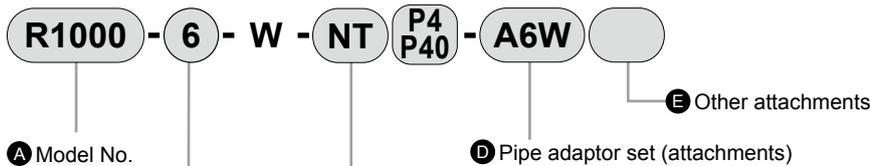
### Compatibility table by variation

	R1000-W	R2000-W	R3000-W	R4000-W	R6000-W	R8000-W
Port size	Rc1/8, 1/4	Rc1/4, 3/8	Rc1/4, 3/8	Rc1/4, 3/8, 1/2	Rc3/4, 1	Rc3/4, 1
P4	●	●	●	●	●	●
P40		▲	▲	▲	▲	

- : Standard
- : Made to order
- ▲ : Contact CKD
- : Not applicable

- \*1: Pressure gauge/pressure sensor must be ordered separately. (Pressure gauge option is "T", "T8", "T6" only)
- \*2: R1 option is not available.
- \*3: R6000 dimensions are different from the standard dimensions.
- \*4: For pressure adjustment springs without gas contact and pressure adjustment screw units in P40, zinc plating is used.
- \*5: R2 option is not available.
- \*6: For R1000 and R8000, only non-relief (option code: N) is available.

### How to order



\* Refer to "Pneumatic, Vacuum and Auxiliary Components" (catalog No. CB-024SA) for options.

		A Model No.					
		R1000	R2000	R3000	R4000	R6000	R8000
Code	Content						
B Port size							
6	Rc1/8	●					
8	Rc1/4	●	●	●	●		
10	Rc3/8		●	●	●		
15	Rc1/2				●		
20	Rc3/4					●	●
25	Rc1					●	●
C Option		*1					
Pressure range	Blank	0.05 to 0.85 MPa	●	●	●	●	●
	L	0.05 to 0.35 MPa	●	●	●	●	●
Pressure relief	Blank	With relief mechanism		●	●	●	●
	N	Non-relief	●	●	●	●	●
Pressure gauge	T	Pressure gauge port (1/4) is assembled sealed	●	●	●	●	●
	T8	Pressure gauge port (1/4) is left open	●	●	●	●	●
	T6	Pressure gauge port (1/8) is left open	●	●	●	●	●
Flow direction	Blank	Standard flow (left → right)	●	●	●	●	●
	X1	Reverse flow (right → left)	●	●	●	●	●
D Pipe adaptor set (attached)		*2, *3					
Blank	Not attached	●	●	●	●	●	●
A6*W	1/8 pipe adaptor set	●					
A8*W	1/4 pipe adaptor set	●	●	●	●		
A10*W	3/8 pipe adaptor set	●	●	●	●		
A15*W	1/2 pipe adaptor set		●	●	●		
A20*W	3/4 pipe adaptor set				●	●	●
A25*W	1 pipe adaptor set					●	●
A32*W	1 1/4 pipe adaptor set					●	●
E Other attachments		Page 208					
Blank	Not attached	●	●	●	●	●	●
BW	C bracket	●	●	●	●	●	●
B3W	L bracket	*4	●	●	●	●	
B4W	B bracket	*5	●				

### ⚠ Precautions for model No. selection

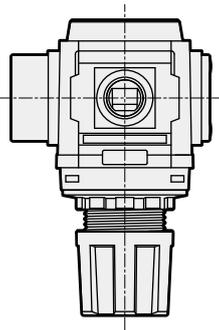
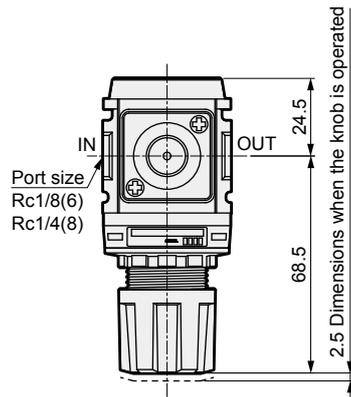
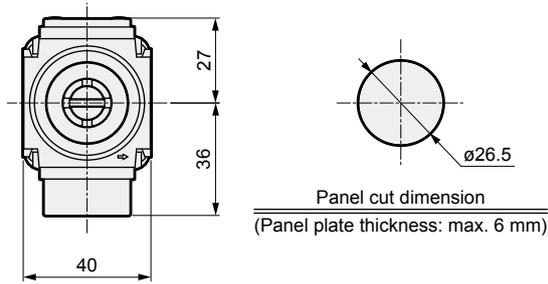
- \*1: When selecting options for several items, list options in order from the top.
- \*2: The pipe adaptor set and C bracket cannot be used together.
- \*3: The joiner set is attached with the pipe adaptor set.
- \*4: For details on mounting the L bracket, refer to [2. Regulator](#) of "⚠ Cautions and Installation & Adjustment" described in the "Pneumatic, Vacuum and Auxiliary Components" (Catalog No. CB-024SA).
- \*5: Refer to "Pneumatic, Vacuum and Auxiliary Components (Catalog No. CB-024SA)" for B type brackets.

Clean air components

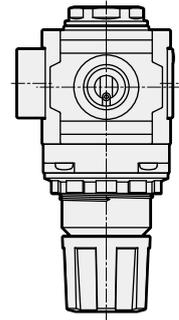
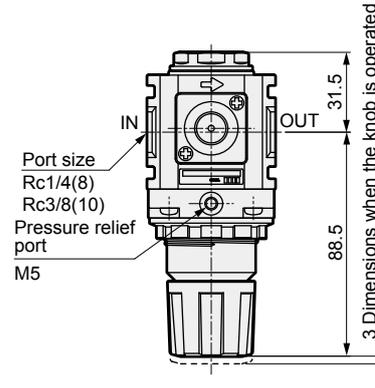
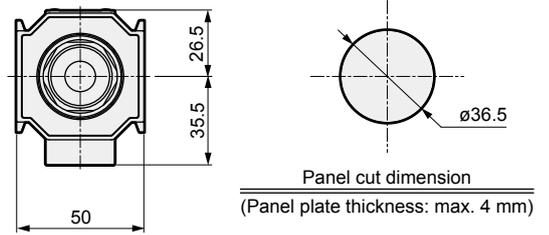


### Dimensions

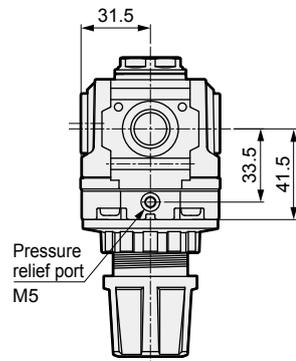
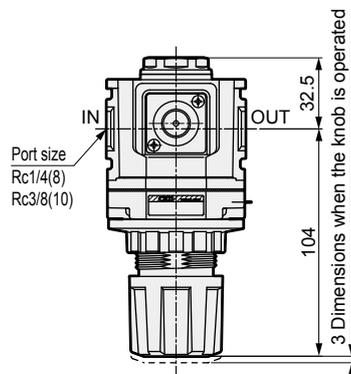
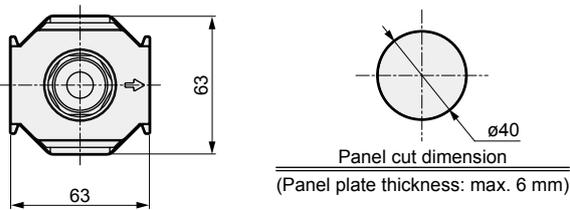
#### ● R1000-\*-W-\*P4-\*



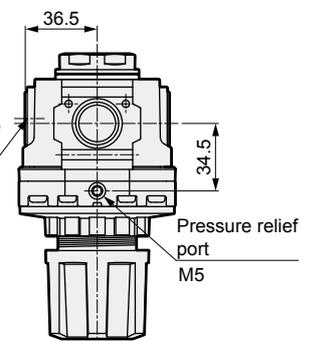
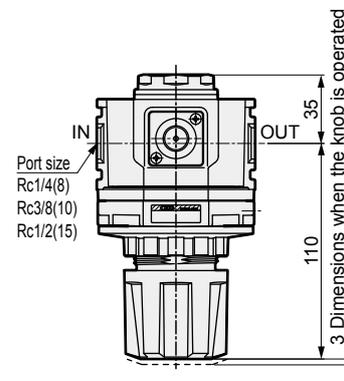
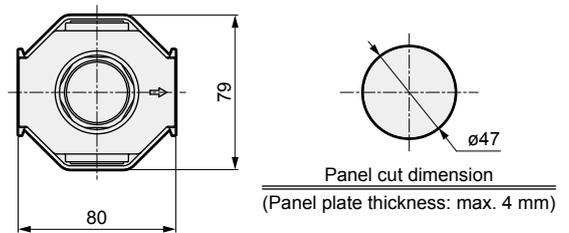
#### ● R2000-\*-W-\*P4-\*



#### ● R3000-\*-W-\*P4-\*



#### ● R4000-\*-W-\*P4-\*

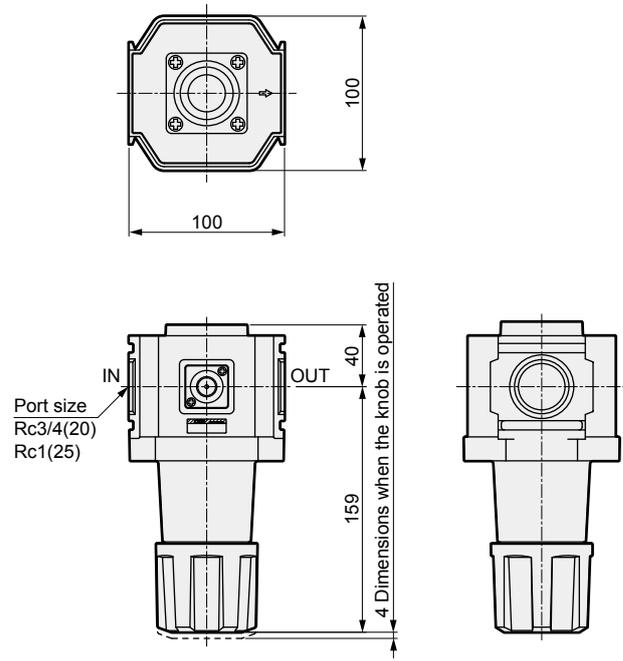
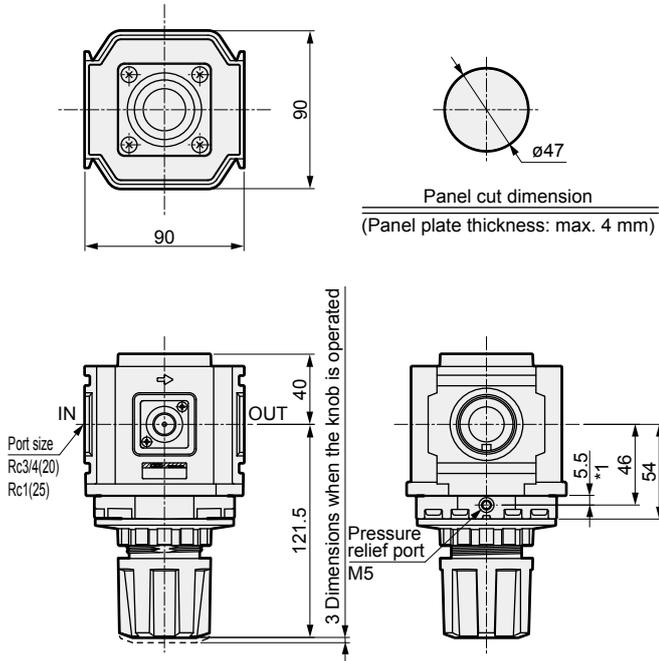


# Regulator Series

## Dimensions

● R6000-\*-W-\*P4-\*

● R8000-\*-W-\*P4-\*





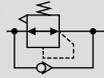
Reverse regulator

## R1100/R2100/R3100 R4100/R6100/R8100-W Series

From secondary pressure to primary side with reverse flow function built in.

● Port size: 1/8 to 1

JIS symbol



### Specifications

Descriptions	R1100-W	R2100-W	R3100-W	R4100-W	R6100-W	R8100-W
Working fluid	Compressed air					
Max. working pressure MPa	1.0					
Proof pressure MPa	1.5					
Ambient/fluid temperatures °C	5 to 60					
Set pressure (*1) MPa	0.05 to 0.85					
Pressure relief	With relief mechanism (R1100, R8100 are non-relief only)					
Port size Rc	1/8, 1/4 (3/8 uses an adaptor)	1/4, 3/8 (1/2 uses an adaptor)	1/4, 3/8 (1/2 uses an adaptor)	1/4, 3/8, 1/2 (3/4 uses an adaptor)	3/4, 1 (1 1/4 uses an adaptor)	3/4, 1 (1 1/4 uses an adaptor)
Weight kg	0.16	0.29	0.51	0.75	1.1	1.6
Standard accessories	Panel mounting nut					

\*1: Refer to the set pressure range for the back pressure on the following page when selecting the model.

\*2: Check that the primary pressure is at least 0.05 MPa more than the secondary pressure.

# Regulator Series

## Compatibility table by variation

	R1100-W	R2100-W	R3100-W	R4100-W	R6100-W	R8100-W
Port size	Rc1/8, 1/4	Rc1/4, 3/8	Rc1/4, 3/8	Rc1/4, 3/8, 1/2	Rc3/4, 1	Rc3/4, 1
P4	●	●	●	●	●	●
P40		▲	▲	▲	▲	

- : Standard
- : Made to order
- ▲ : Contact CKD
- : Not applicable

\*1: Pressure gauge/pressure sensor must be ordered separately. (Pressure gauge option is "T", "T8", "T6" only)

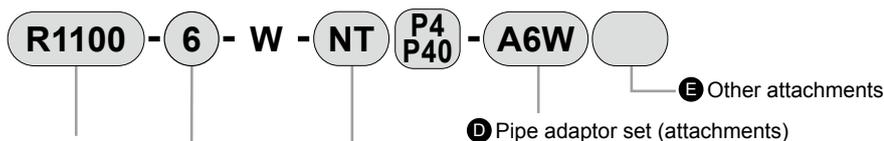
\*2: R1 option is not available.

\*3: For pressure adjustment springs without gas contact and pressure adjustment screw units in P40, zinc plating is used.

\*4: R2 option is not available.

\*5: For R1100 and R8100, only non-relief (option code: N) is available.

## How to order



\* Refer to "Pneumatic, Vacuum and Auxiliary Components" (catalog No. CB-024SA) for options.

		A Model No.					
		R1100	R2100	R3100	R4100	R6100	R8100
Code	Content						
B Port size							
6	Rc1/8	●					
8	Rc1/4	●	●	●	●		
10	Rc3/8		●	●	●		
15	Rc1/2				●		
20	Rc3/4					●	●
25	Rc1					●	●
C Options		*1, *2					
Pressure range	Blank	0.05 to 0.85 MPa	●	●	●	●	●
	L	0.05 to 0.35 MPa *3	●	●	●	●	●
Pressure relief	Blank	With relief mechanism		●	●	●	
	N	Non-relief	●	●	●	●	●
Pressure gauge	T	Pressure gauge port (1/4) is assembled sealed	●	●	●	●	●
	T8	Pressure gauge port (1/4) is left open	●	●	●	●	●
	T6	Pressure gauge port (1/8) is left open	●	●	●	●	●
Flow direction	Blank	Standard flow (left → right)	●	●	●	●	●
	X1	Reverse flow (right → left)	●	●	●	●	●
D Pipe adaptor set (attached)		*3, *4					
Blank	Not attached	●	●	●	●	●	●
A6*W	1/8 pipe adaptor set	●					
A8*W	1/4 pipe adaptor set	●	●	●	●		
A10*W	3/8 pipe adaptor set	●	●	●	●		
A15*W	1/2 pipe adaptor set		●	●	●		
A20*W	3/4 pipe adaptor set				●	●	●
A25*W	1 pipe adaptor set					●	●
A32*W	1 1/4 pipe adaptor set					●	●
E Other attachments		Page 208					
Blank	Not attached	●	●	●	●	●	●
BW	C bracket	●	●	●	●	●	●
B3W	L bracket *5	●	●	●	●	●	
B4W	B bracket *6		●				

## ⚠ Precautions for model No. selection

\*1: When selecting options for several items, list options in order from the top.

\*2: Positions of check valve and pressure gauge mounting port cannot be changed. If the IN and OUT directions must be reversed, indicate "X1" at the end of the option field.

\*3: The pipe adaptor set and C bracket cannot be used together.

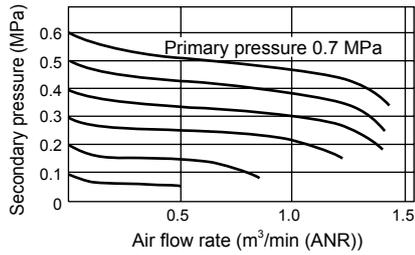
\*4: The joiner set is attached with the pipe adaptor set.

\*5: For details on mounting the L bracket, refer to (2. Regulator) of "⚠ Cautions and Installation & Adjustment" described in the "Pneumatic, Vacuum and Auxiliary Components" (Catalog No. CB-024SA).

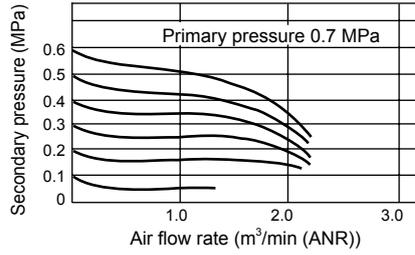
\*6: Refer to "Pneumatic, Vacuum and Auxiliary Components (Catalog No. CB-024SA)" for B brackets.

## Flow characteristics

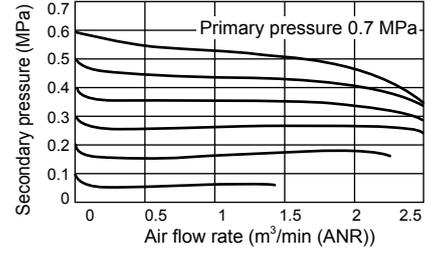
● R1100-6-W



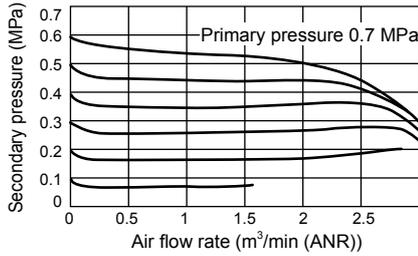
● R1100-8-W



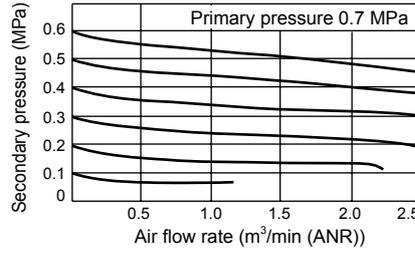
● R2100-8-W



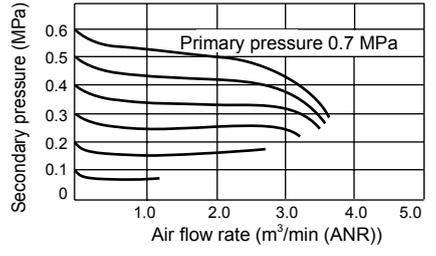
● R2100-10-W



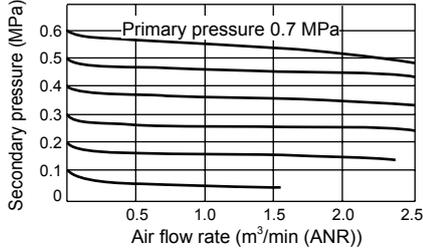
● R3100-8-W



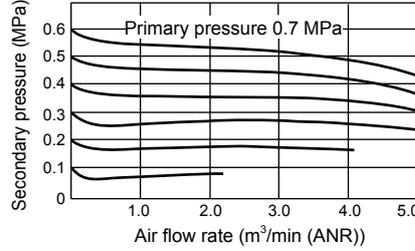
● R3100-10-W



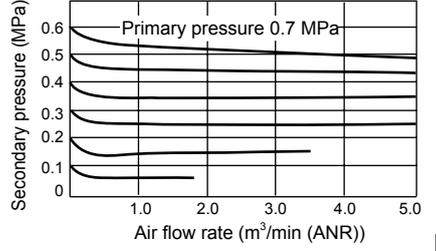
● R4100-8-W



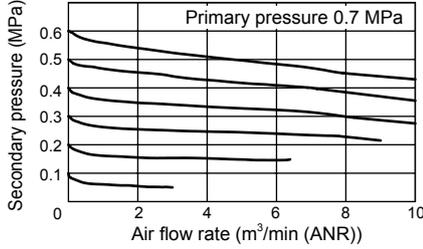
● R4100-10-W



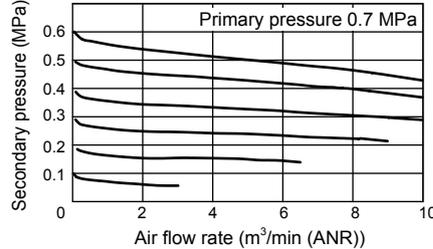
● R4100-15-W



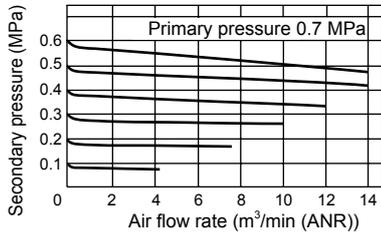
● R6100-20-W



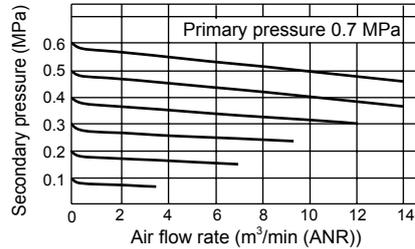
● R6100-25-W



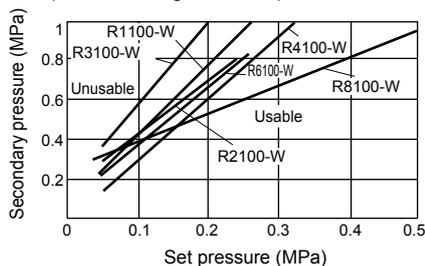
● R8100-20-W



● R8100-25-W



● Set pressure range to back pressure



Note: The area above the graph line shows the unusable range and that below the graph line shows the usable range.

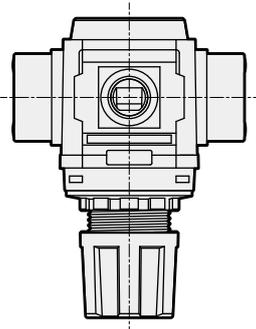
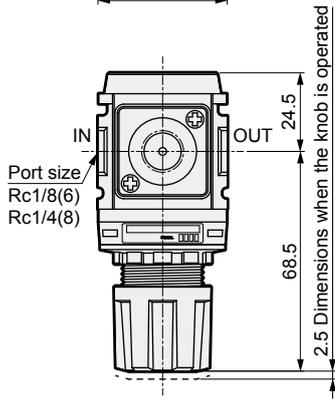
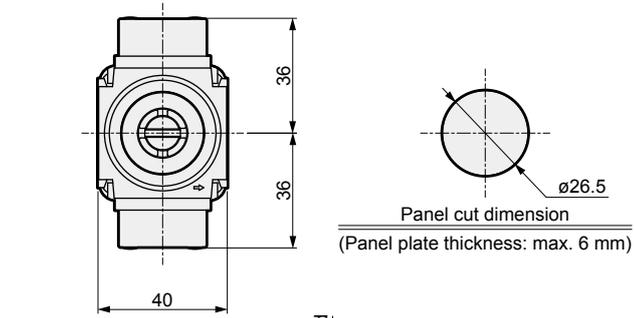
Example: If R4100-W is set to the set pressure 0.2 MPa and the secondary back pressure is 0.6 MPa and over, the secondary pressure will not be released to the primary side.

Clean air components

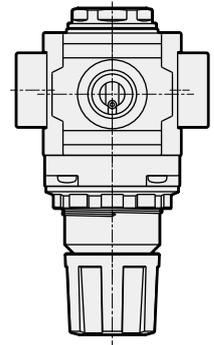
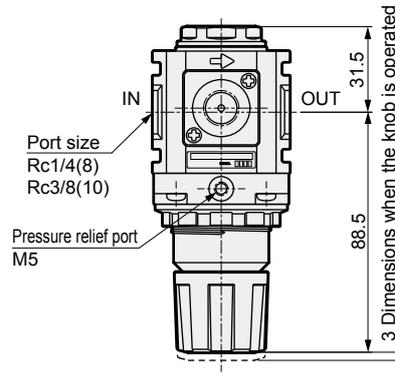
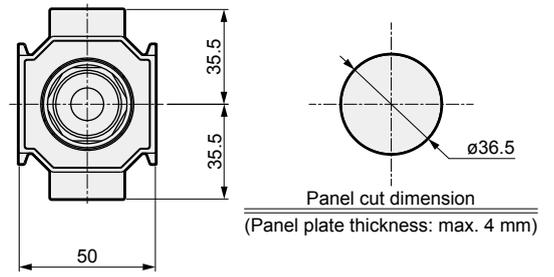
# Regulator Series

## Dimensions

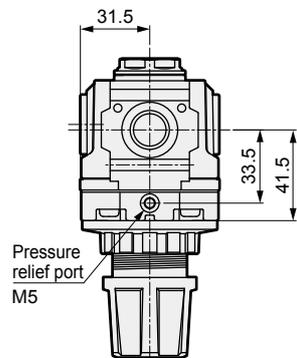
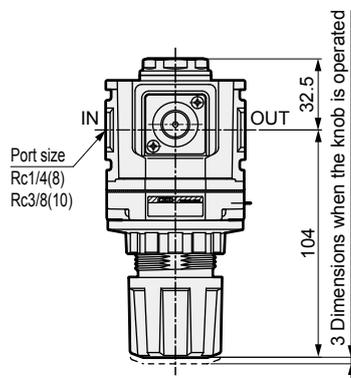
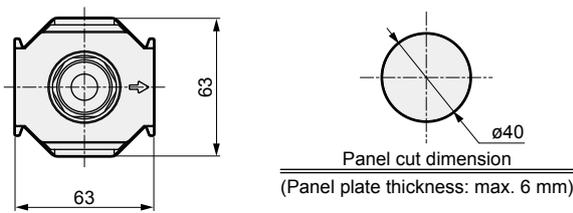
● R1100-\*-W-\*P4-\*



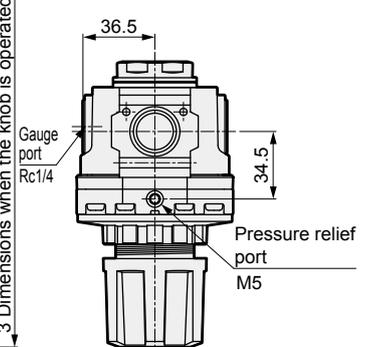
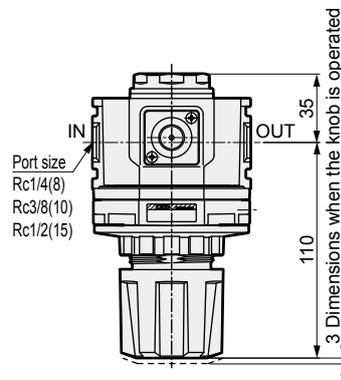
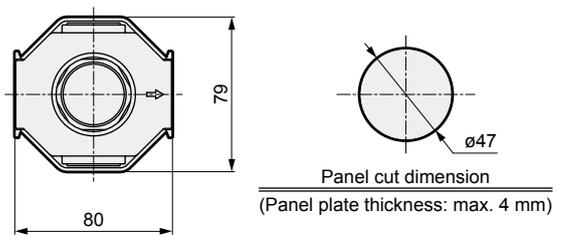
● R2100-\*-W-\*P4-\*



● R3100-\*-W-\*P4-\*



● R4100-\*-W-\*P4-\*

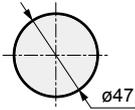
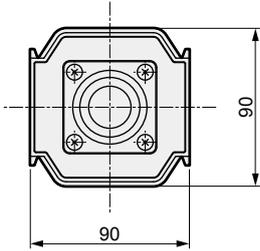


### Dimensions

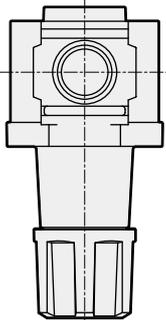
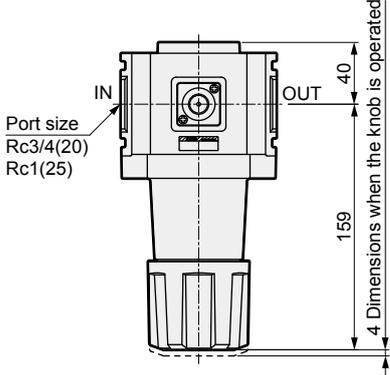
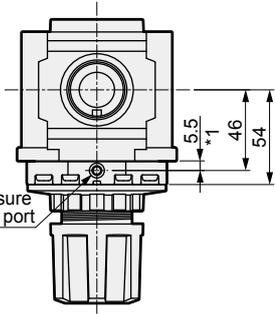
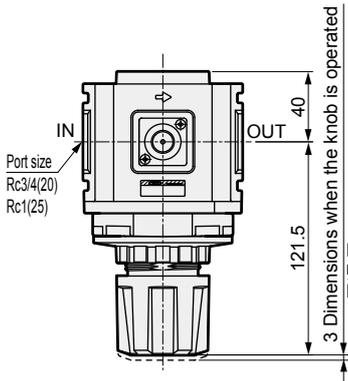
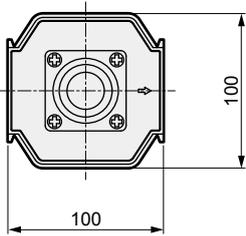


●R6100-\*-W-\*P4-\*

●R8100-\*-W-\*P4-\*



Panel cut dimension  
(Panel plate thickness: max. 4 mm)





Filter/regulator

# W1000/W2000/W3000/W4000/W8000-W Series

New Series using 5 µm elements for dust removal, and 0.3 µm elements for tar removal.

● Port size: 1/8 to 1

JIS symbol



## Specifications

Descriptions	W1000-W	W2000-W	W3000-W	W4000-W	W8000-W
Working fluid	Compressed air				
Max. working pressure MPa	1.0				
Proof pressure MPa	1.5				
Ambient/fluid temperatures °C	5 to 60				
Filtration µm	5		5 or 0.3		
Set pressure MPa	0.05 to 0.85	0.05 to 0.85			
Pressure relief	With relief mechanism (W1000, W8000 are non-relief only)				
Drain capacity cm <sup>3</sup>	12	25	45	80	80 (Note)
Port size Rc	1/8, 1/4 (3/8 uses an adaptor)	1/4, 3/8 (1/2 uses an adaptor)	1/4, 3/8	1/4, 3/8, 1/2 (3/4 uses an adaptor)	3/4, 1 (1 1/4 uses an adaptor)
Weight kg	0.175	0.40	0.65	1.0	2.0
Standard accessories	Bowl guard				

Note: Up to 170 cm<sup>3</sup> is stored with the manual drain cock only.

### Compatibility table by variation

	W1000-W	W2000-W	W3000-W	W4000-W	W8000-W
Port size	Rc1/8, 1/4	Rc1/4, 3/8	Rc1/4, 3/8	Rc1/4, 3/8, 1/2	Rc3/4, 1
P4	●	●	●	●	●
P40		▲	▲	▲	

- : Standard
- : Made to order
- ▲ : Contact CKD
- : Not applicable

- \*1: Pressure gauge/pressure sensor must be ordered separately. (Pressure gauge option is "T", "T8", "T6" only)
- \*2: Auto-drain is not available.
- \*3: Metal bowl is not available.
- \*4: R1 option is not available.
- \*5: For pressure adjustment springs without gas contact and pressure adjustment screw units in P40, zinc plating is used.
- \*6: R2 option is not available.
- \*7: For W1000 and W8000, only non-relief (option code: N) is available.

### How to order



A Model No.

B Port size

C Option

D Pipe adaptor set (attachments)

E Other attachments

\* Refer to "Pneumatic, Vacuum and Auxiliary Components" (catalog No. CB-024S) for options.

		A Model No.				
		W1000	W2000	W3000	W4000	W8000
B Port size						
6	Rc1/8	●				
8	Rc1/4	●	●	●	●	
10	Rc3/8		●	●	●	
15	Rc1/2				●	
20	Rc3/4					●
25	Rc1					●
C Option		*1				
Drain discharge	Blank	Manual drain cock	●	●	●	●
Bowl material	Blank	Polycarbonate bowl	●	●	●	●
	Z	Nylon bowl	●	●	●	●
Element	Blank	5 μm	●	●	●	●
	Y	0.3 μm (submicron)			●	●
Pressure range	Blank	0.05 to 0.85 MPa	●	●	●	●
	L	0.05 to 0.35 MPa	●	●	●	●
Pressure relief	Blank	With relief mechanism		●	●	●
	N	Non-relief	●	●	●	●
Pressure gauge	T	Pressure gauge port (1/4) is assembled sealed	●	●	●	●
	T8	Pressure gauge port (1/4) is left open	●	●	●	●
	T6	Pressure gauge port (1/8) is left open	●	●	●	●
Flow direction	Blank	Standard flow (left → right)	●	●	●	●
	X1	Reverse flow (right → left)	●	●	●	●
D Pipe adaptor set (attached)		*2, *3				
Blank	Not attached	●	●	●	●	●
A6*W	1/8 pipe adaptor set	●				
A8*W	1/4 pipe adaptor set		●	●	●	
A10*W	3/8 pipe adaptor set	●	●	●	●	
A15*W	1/2 pipe adaptor set		●	●	●	
A20*W	3/4 pipe adaptor set				●	●
A25*W	1 pipe adaptor set					●
A32*W	1 1/4 pipe adaptor set					●
E Other attachments		Page 208				
Blank	Not attached	●	●	●	●	●
BW	C bracket	●	●	●	●	●
B3W	L bracket	*4	●	●	●	●

Clean air components

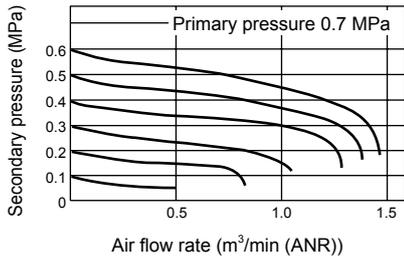
### ⚠ Precautions for model No. selection

- \*1: Select options for the drainage, bowl material, element, and regulator. When selecting options for several items, list options in order from the top.
- \*2: The pipe adaptor set and C bracket cannot be used together.
- \*3: The joiner set is attached with the pipe adaptor set.
- \*4: For details on mounting the L bracket, refer to **2. Regulator** of "▲ Cautions and Installation & Adjustment" in the "Pneumatic, Vacuum and Auxiliary Components" (Catalog No. CB-024SA).

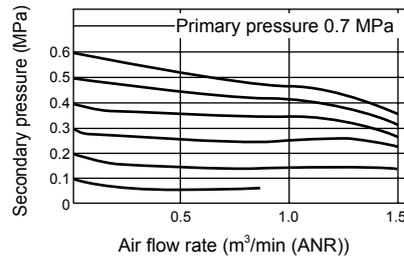
# Filter/Regulator Series

## Flow characteristics

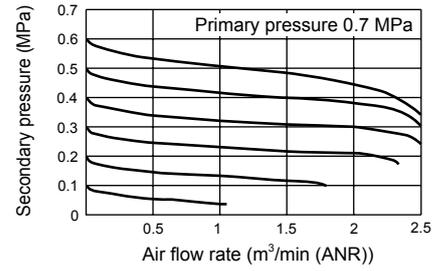
● W1000-6-W



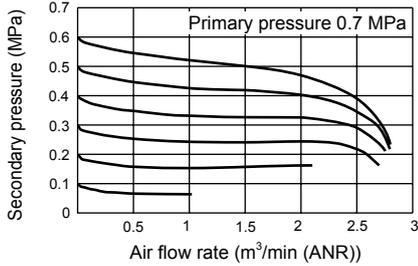
● W1000-8-W



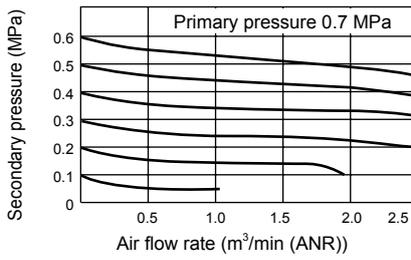
● W2000-8-W



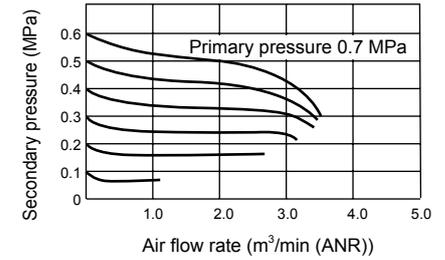
● W2000-10-W



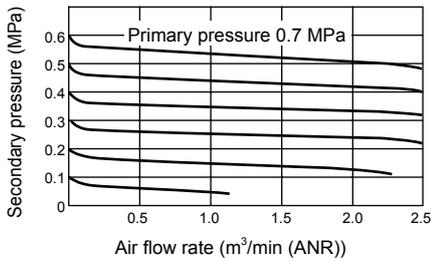
● W3000-8-W



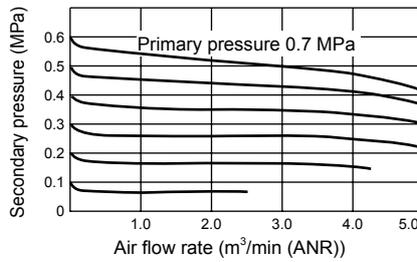
● W3000-10-W



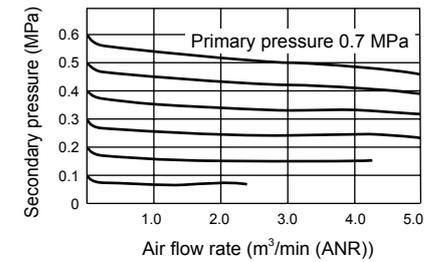
● W4000-8-W



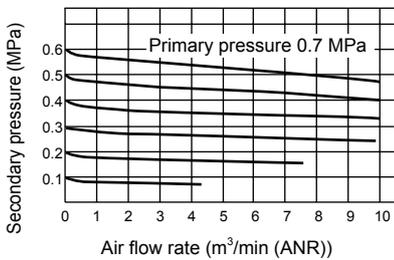
● W4000-10-W



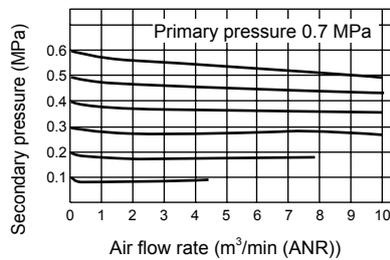
● W4000-15-W



● W8000-20-W

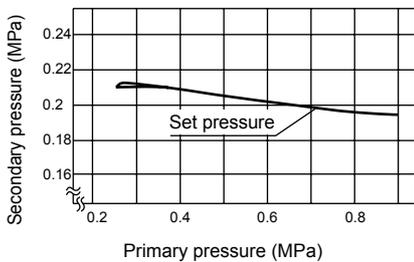


● W8000-25-W

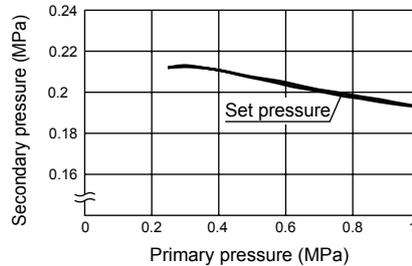


## Pressure characteristics

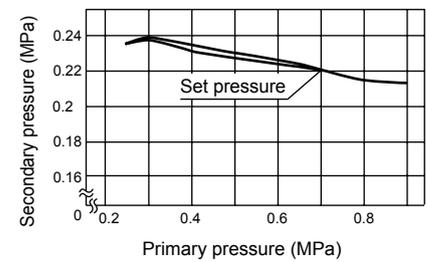
● W1000-W



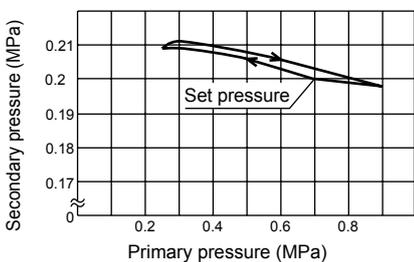
● W2000-W



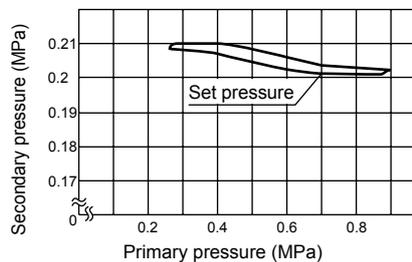
● W3000-W



● W4000-W

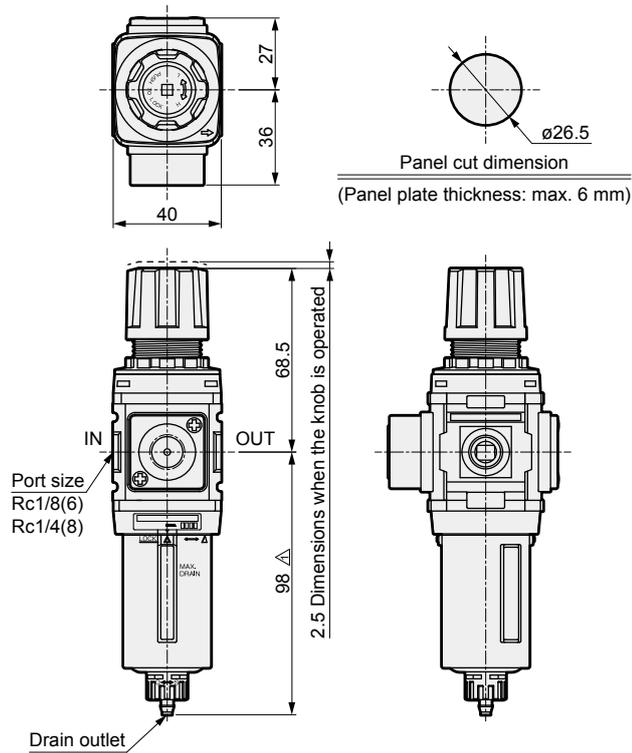


● W8000-W

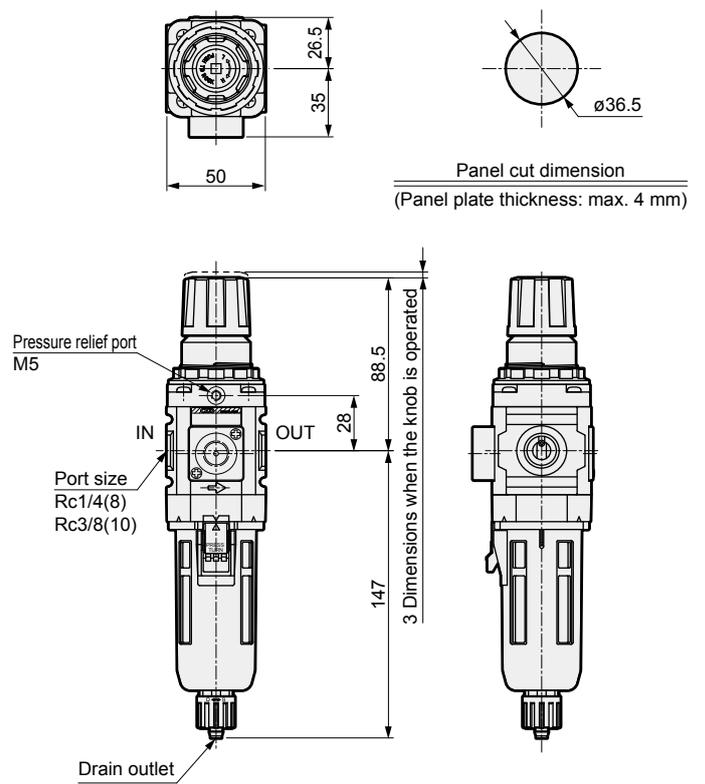


### Dimensions

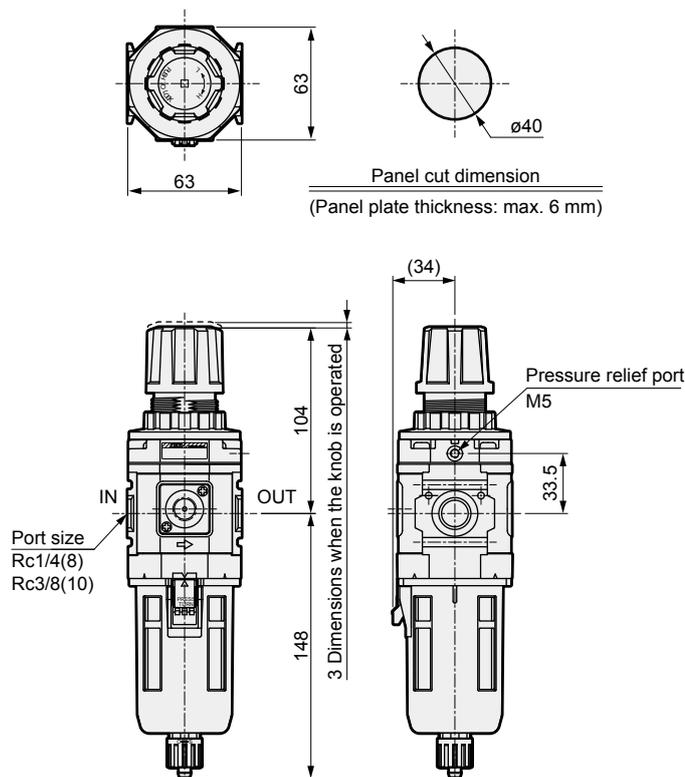
#### ●W1000-\*-W-\*P4\*



#### ●W2000-\*-W-\*P4\*



#### ●W3000-\*-W-\*P4\*

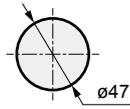
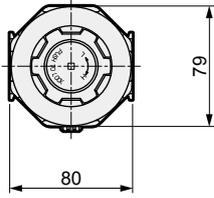


# Filter/Regulator Series

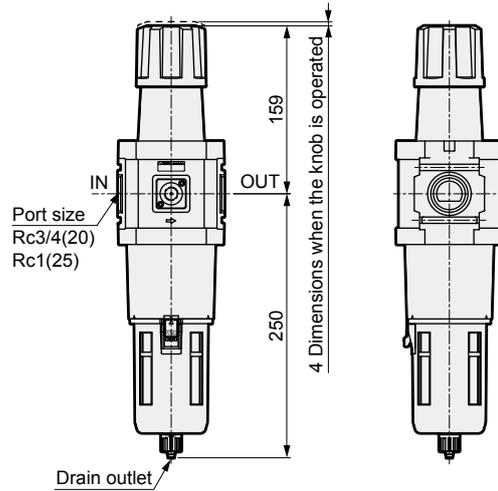
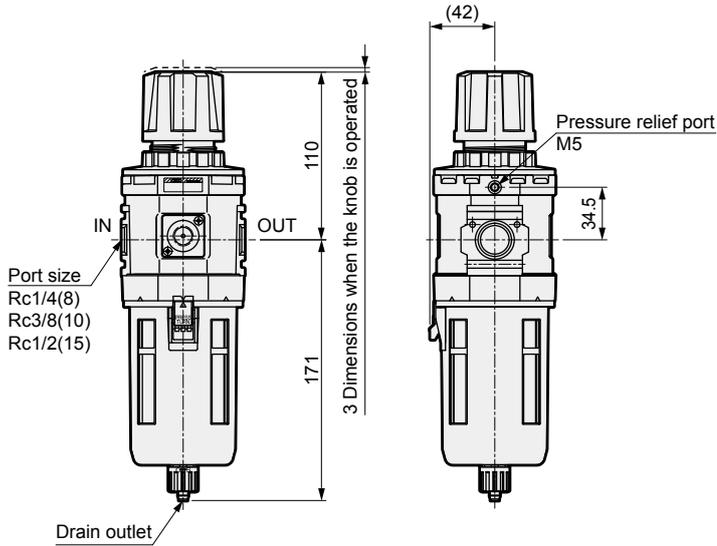
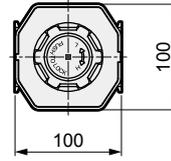
## Dimensions

●W4000-\*-W-\*P4-\*

●W8000-\*-W-\*P4-\*



Panel cut dimension  
(Panel plate thickness: max. 4 mm)





Reverse filter/regulator

# W1100/W2100/W3100/W4100/W8100-W Series

Introducing the 5 µm dust removing element and 0.3 µm tar removing element with reverse flow function to the lineup.

● Port size: 1/8 to 1

JIS symbol



## Specifications

Descriptions	W1100-W	W2100-W	W3100-W	W4100-W	W8100-W
Working fluid	Compressed air				
Max. working pressure MPa	1.0				
Proof pressure MPa	1.5				
Ambient/fluid temperatures °C	5 to 60				
Filtration µm	5		5 or 0.3		
Set pressure MPa	0.05 to 0.85	0.05 to 0.85			
Pressure relief	With relief mechanism (W1100, W8100 are non-relief only)				
Drain capacity cm <sup>3</sup>	12	25	45	80	80 (*1)
Port size Rc	1/8, 1/4 (3/8 uses an adaptor)	1/4, 3/8 (1/2 uses an adaptor)	1/4, 3/8	1/4, 3/8, 1/2 (3/4 uses an adaptor)	3/4, 1 (1 1/4 uses an adaptor)
Weight kg	0.175	0.40	0.65	1.0	2.0
Standard accessories	Pressure gauge and bowl guard				

\*1: Up to 170 cm<sup>3</sup> is stored with the manual drain cock only.

\*2: Check that the primary pressure is at least 0.05 MPa more than the secondary pressure.

\*3: Refer to the set pressure range for the back pressure given on the following page when selecting the model.

# Filter/Regulator Series

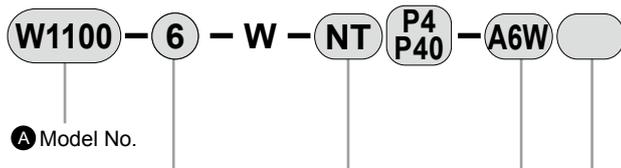
## Compatibility table by variation

	W1100-W	W2100-W	W3100-W	W4100-W	W8100-W
Port size	Rc1/8, 1/4	Rc1/4, 3/8	Rc1/4, 3/8	Rc1/4, 3/8, 1/2	Rc3/4, 1
P4	●	●	●	●	●
P40		▲	▲	▲	

- : Standard
- : Made to order
- ▲ : Contact CKD
- : Not applicable

- \*1: Pressure gauge/pressure sensor must be ordered separately. (Pressure gauge option is "T", "T8", "T6" only)
- \*2: Auto-drain is not available.
- \*3: Metal bowl is not available.
- \*4: R1 option is not available.
- \*5: For pressure adjustment springs without gas contact and pressure adjustment screw units in P40, zinc plating is used.
- \*6: R2 option is not available.
- \*7: For W1100 and W8100, only non-relief (option code: N) is available.

## How to order



A Model No.

B Port size

C Option

D Pipe adaptor set (attachments)

E Other attachments

\* Refer to "Pneumatic, Vacuum and Auxiliary Components" (catalog No. CB-024SA) for options.

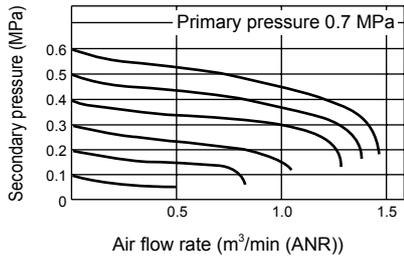
		A Model No.				
		W1100	W2100	W3100	W4100	W8100
B Port size						
6	Rc1/8	●				
8	Rc1/4	●	●	●	●	
10	Rc3/8		●	●	●	
15	Rc1/2				●	
20	Rc3/4					●
25	Rc1					●
C Options		*1, *2				
Drain discharge	Blank	Manual drain cock	●	●	●	●
Bowl material	Blank	Polycarbonate bowl	●	●	●	●
	Z	Nylon bowl	●	●	●	●
Element	Blank	5 μm	●	●	●	●
	L	0.05 to 0.35 MPa	●	●	●	●
Pressure relief	Blank	With relief mechanism		●	●	●
	N	Non-relief	●	●	●	●
Pressure gauge	T	Pressure gauge port (1/4) is assembled sealed	●	●	●	●
	T8	Pressure gauge port (1/4) is left open	●	●	●	●
	T6	Pressure gauge port (1/8) is left open	●	●	●	●
Flow direction	Blank	Standard flow (left → right)	●	●	●	●
	X1	Reverse flow (right → left)	●	●	●	●
D Pipe adaptor set (attached)		*3, *4				
Blank	Not attached	●	●	●	●	●
A6*W	1/8 pipe adaptor set	●				
A8*W	1/4 pipe adaptor set	●	●	●	●	
A10*W	3/8 pipe adaptor set	●	●	●	●	
A15*W	1/2 pipe adaptor set		●	●	●	
A20*W	3/4 pipe adaptor set				●	●
A25*W	1 pipe adaptor set					●
A32*W	1 1/4 pipe adaptor set					●
E Other attachments		Page 208				
Blank	Not attached	●	●	●	●	●
BW	C bracket	●	●	●	●	●
B3W	L bracket	*5	●	●	●	●

## ⚠ Precautions for model No. selection

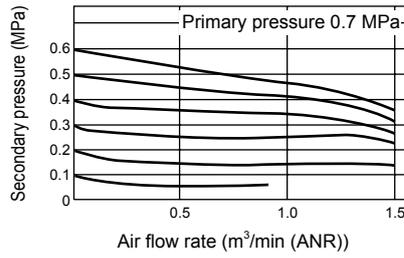
- \*1: Select options for the drainage, bowl material, element, and regulator. When selecting options for several items, list options in order from the top.
- \*2: **Positions of check valve and pressure gauge cannot be changed. If the IN and OUT directions must be reversed, indicate "X1" at the end of the option field.**
- \*3: The pipe adaptor set and C bracket cannot be used together.
- \*4: The joiner set is attached with the pipe adaptor set.
- \*5: For details on mounting the L bracket, refer to 2 of "2. Regulator" of "▲ Cautions and Installation & Adjustment" in the "Pneumatic, Vacuum and Auxiliary Components" (Catalog No. CB-024SA).

## Flow characteristics

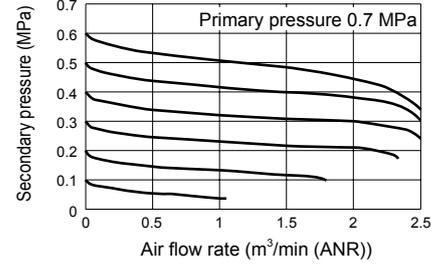
● W1100-6-W



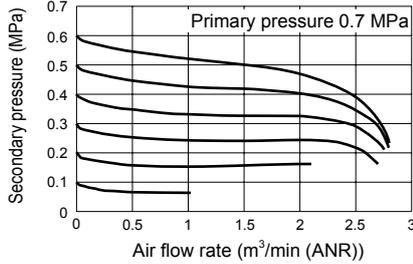
● W1100-8-W



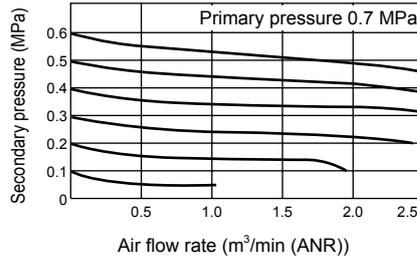
● W2100-8-W



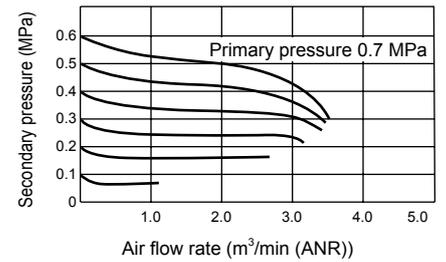
● W2100-10-W



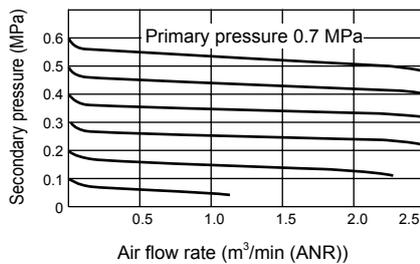
● W3100-8-W



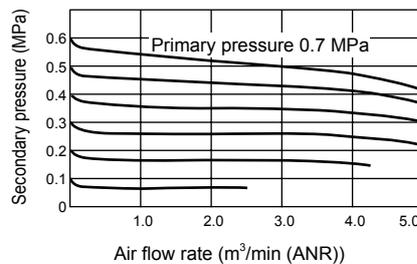
● W3100-10-W



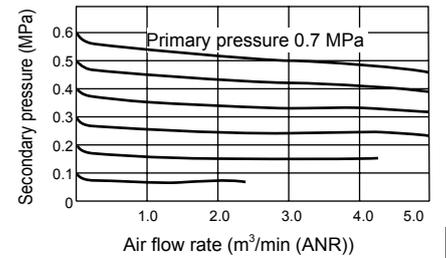
● W4100-8-W



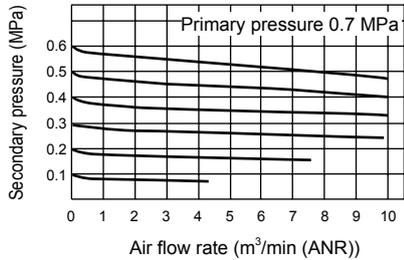
● W4100-10-W



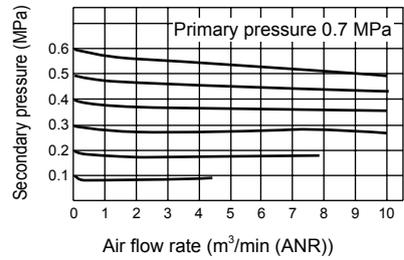
● W4100-15-W



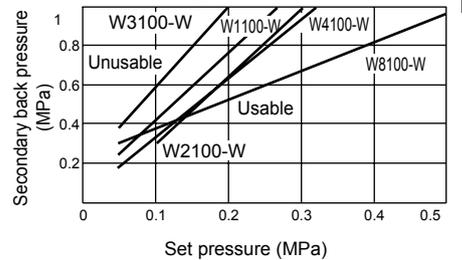
● W8100-20-W



● W8100-25-W



● Set pressure range to back pressure

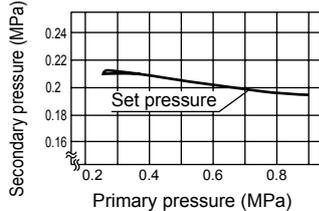


Note: The area above the graph line shows the unusable range and that below the graph line shows the usable range.

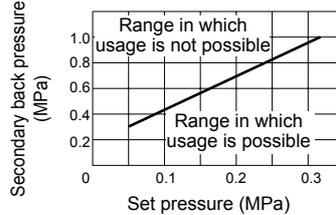
Example: If the set pressure of W4100-W is set to 0.2 MPa and the secondary back pressure is set to 0.6 MPa or more, the secondary side pressure will not be released to the primary side.

## Pressure characteristics

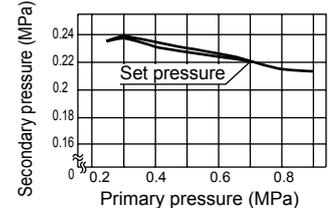
● W1100-W



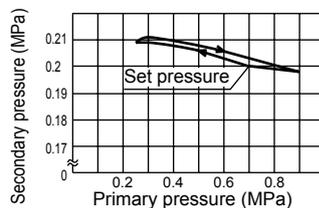
● W2100-W



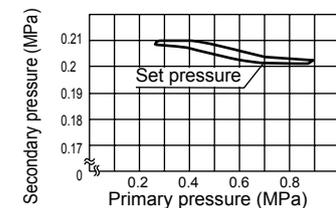
● W3100-W



● W4100-W



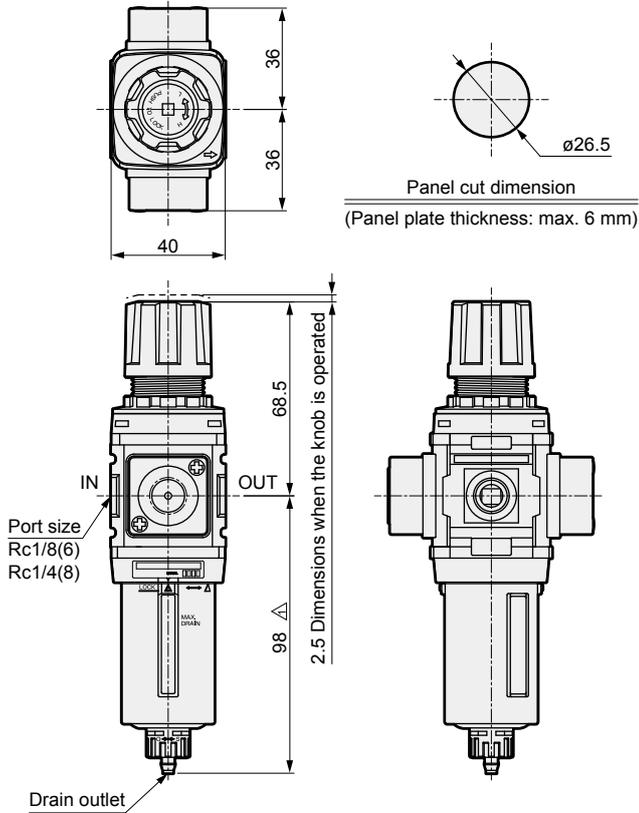
● W8100-W



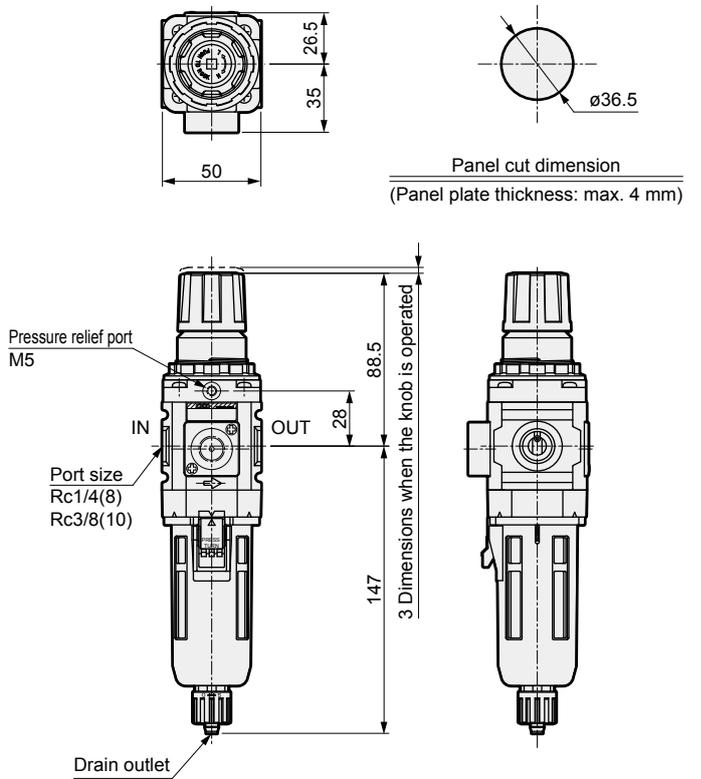
# Filter/Regulator Series

## Dimensions

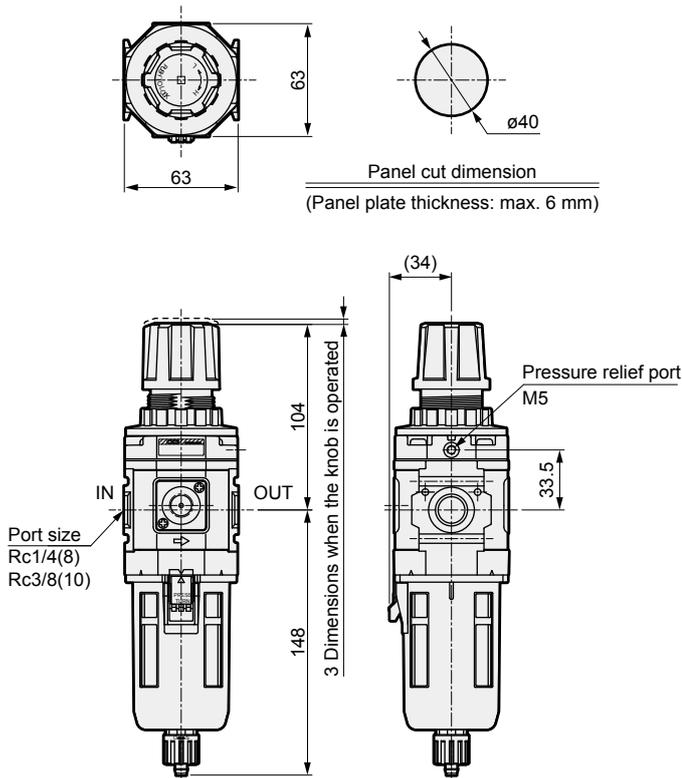
●W1100-\*-W-\*P4-\*



●W2100-\*-W-\*P4-\*

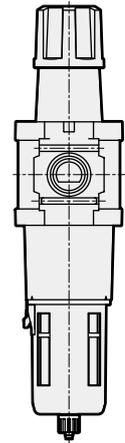
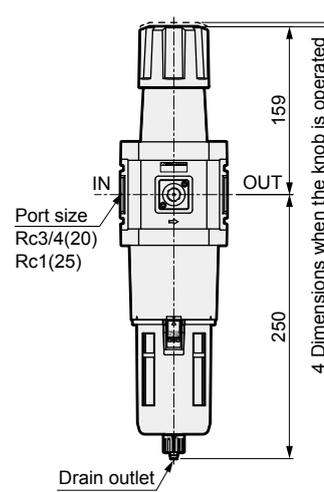
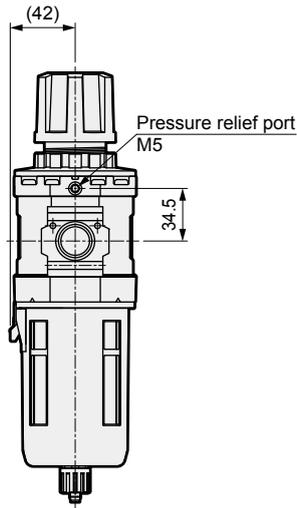
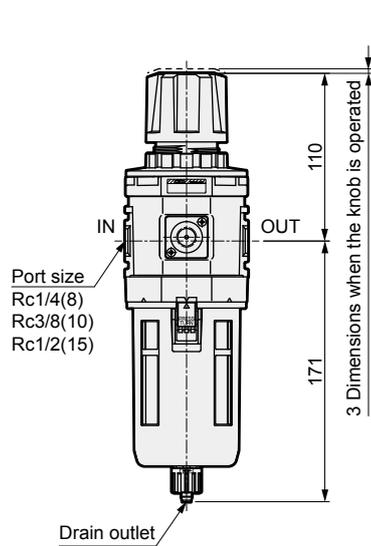
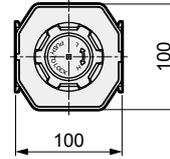
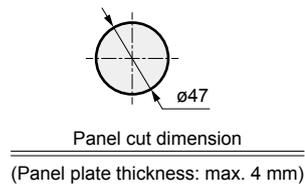
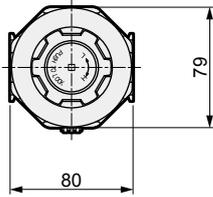


●W3100-\*-W-\*P4-\*



●W4100-\*-W-\*P4-\*

●W8100-\*-W-\*P4-\*





Drain separator FX Series

# FX Series

With no need for element, 99% water separation efficiency is achieved

JIS symbol



## Overview

The cyclone effect causes water droplets in the compressed air to strike the inner wall of the bowl; this gathers and enlarges them, removing 99% or more of the moisture.

Ideal for easy drainage from air piping.

## Features

- Lightweight compact drain separator
- Water separation efficiency 99%
- Compatible compressor 0.75 kW to 37 kW
- Modular connection of FX1004 and FX1011 to F.R.L. 3000 and 4000 Series and FX1037 to 6000 and 8000 Series is possible.

## Specifications

Descriptions		FX1004	FX1011	FX1037
Working fluid		Compressed air		
Working pressure	MPa	0.1 to 1.0		
Proof pressure	MPa	1.5		
Ambient/fluid temperatures	°C	5 to 60		
Water separation efficiency	%	99 *2		
Max. processing flow rate *1	L/min (ANR)	550	1800	6100
Port size	Rc	1/4, 3/8	1/4, 3/8, 1/2	3/4, 1
Product weight	kg	0.3	0.5	1.2

\*1: At inlet pressure 0.7 MPa.

\*2: Water separation efficiency during max. processing flow rate. (Evaporated water droplets (water vapor) cannot be separated)

## Compatibility table by variation

	FX1004	FX1011	FX1037
Port size	Rc1/4, 3/8	Rc1/4, 3/8, 1/2	Rc3/4, 1
P4	●	●	●
P40	▲	▲	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Auto-drain is not available.  
\*2: Metal bowl is not available.

## How to order

**FX1004** - **8** - **W** - **Z** - **P4** / **P40** - **BW**

Ⓐ Model No.

Ⓑ Port size

Ⓒ Option

Ⓓ Attachment

		Ⓐ Model No.			
		FX1004	FX1011	FX1037	
Code	Content				
<b>Ⓑ Port size</b>					
<b>8</b>	Rc1/4	●	●	□	
<b>10</b>	Rc3/8	●	●	□	
<b>15</b>	Rc1/2	□	●	□	
<b>20</b>	Rc3/4	□	□	●	
<b>25</b>	Rc1	□	□	●	
<b>Ⓒ Option *1</b>					
Drain discharge	<b>Blank</b>	Manual drain cock	●	●	●
Bowl	<b>Blank</b>	Polycarbonate bowl	●	●	●
material	<b>Z</b>	Nylon bowl	●	●	●
Flow	<b>Blank</b>	Standard flow (left → right)	●	●	●
Direction	<b>X1</b>	Reverse flow (right → left)	●	●	●
<b>Ⓓ Other attachments *2, *3</b>					
	<b>Blank</b>	Not attached	●	●	●
	<b>A8*W</b>	1/4 pipe adaptor set	●	●	□
	<b>A10*W</b>	3/8 pipe adaptor set	●	●	□
	<b>A15*W</b>	1/2 pipe adaptor set	●	●	□
	<b>A20*W</b>	3/4 pipe adaptor set	□	●	●
	<b>A25*W</b>	1 pipe adaptor set	□	□	●
	<b>A32*W</b>	1 1/4 pipe adaptor set	□	□	●
	<b>BW</b>	C bracket	●	●	●

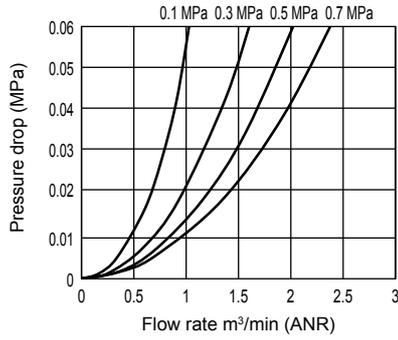
Clean air components

## ⚠ Precautions for model No. selection

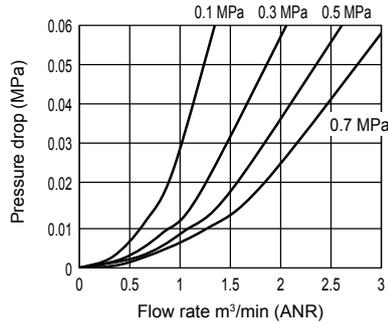
- \*1: Select options for the bowl material and flow direction. When selecting options for several items, list options in order from the top.
- \*2: The pipe adaptor set and C bracket cannot be used together.
- \*3: The joiner set is attached with the pipe adaptor set.

## Flow characteristics

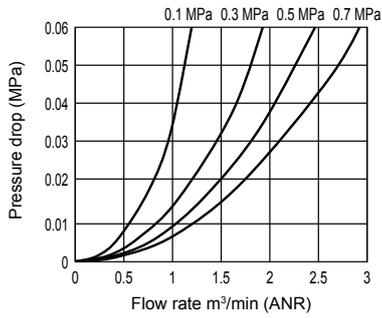
● FX1004-8-W



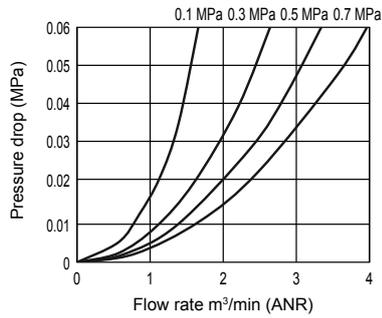
● FX1004-10-W



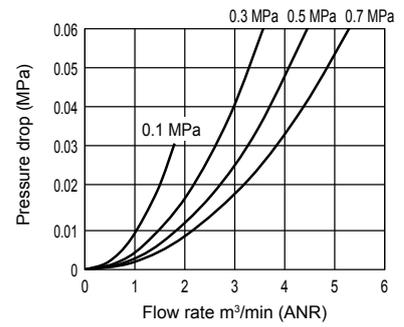
● FX1011-8-W



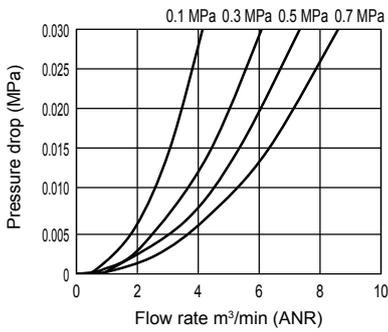
● FX1011-10-W



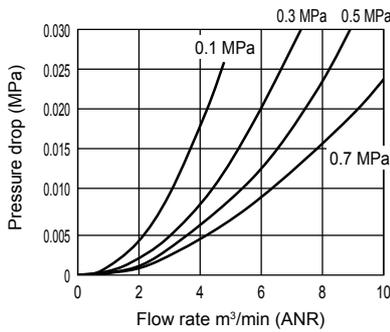
● FX1011-15-W



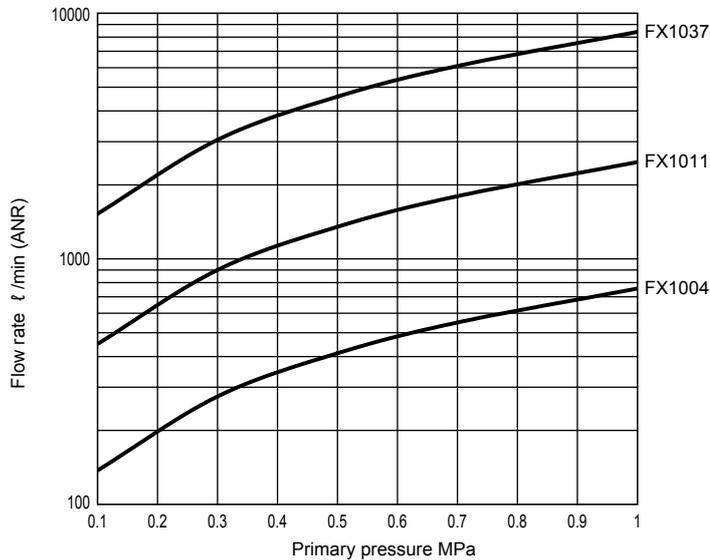
● FX1037-20-W

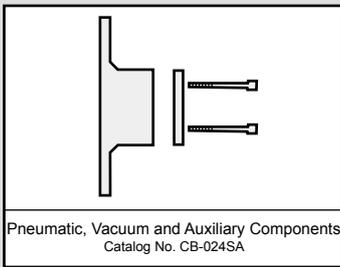


● FX1037-25-W



### Max. processing flow rate





Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

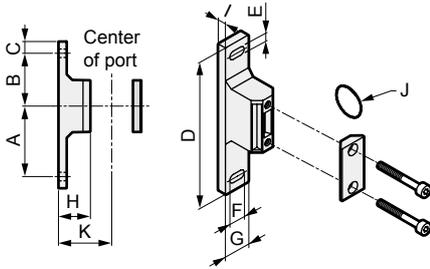
# Bracket B-W/B Series Joiner J-W Series

P4 compliant  
as standard



## Dimensions and applications

### T bracket set



Material: Polyamide resin (B110-W)  
Aluminum alloy die-casting (B310 to B810-W)  
Painting (B310 to B810-W)

● Model No.: B110-W / B310-W / B410-W / B810-W

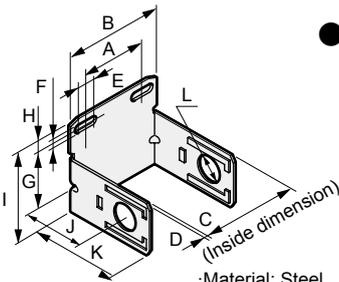
● Applications



Note: Select B410-W when using the 3000-W Series and 4000-W Series combined.

Model No.	Compatibility	A	B	C	D	E	F	G	H	I	J	K	Weight (kg)
B110-W	1000 Series	45	35	10	100	5.5	7.5	16	25	7.5	JASO-2013	40	0.024
B310-W	2000 Series	60	45	10	125	7	14	22	27	7	JISB2401-P21	45	0.086
	3000 Series												
B410-W	4000 Series	60	45	10	125	7	14	22	37	7	JISB2401-P21	55	0.094
B810-W	6000 Series	70	50	15	150	9	14	27	37	8	AS568-127	65	0.169
	8000 Series												

### C bracket



Material: Steel  
Zinc plated

● Applications

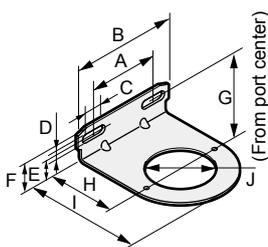
● Model No.: B120/B220/B320/B420/B620/B820

● Attachment: BW



Model No.	Compatibility	A	B	C	D	E	F	G	H	I	J	K	L	Weight (kg)
B120	1000 Series	44	68	40	t2.0	10	6.5	35	8.5	61.5	40	60	ø19.5	0.1
B220	2000 Series	28	54	50	t2.3	10	7	33	8	63	45	69	17.3	0.15
B320	3000 Series	34.5	67	63	t2.3	16.5	7	45	8.5	75.5	45	69	ø21.7	0.17
B420	4000 Series	55	84	80	t2.3	14.0	7	45	8.5	75.5	55	79	ø21.7	0.21
B620	6000 Series	68	104	90	t2.3	16	9	54	11	97.5	60	97	ø35	0.34
B820	8000 Series	68	104	100	t2.3	16	9	50	11	93.5	65	102	ø35	0.36

### L bracket



Material: Steel  
Zinc plated

● Applications

● Model No.: B130 / B230 / B330 / B430

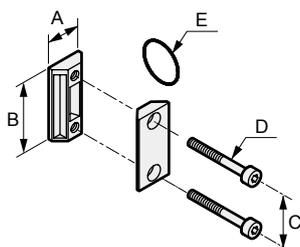
● Attachment: B3W

Loosen the mounting nut to remove the knob. After inserting the L bracket, fix it by the mounting nut. Press the knob in manually after fixing.



Model No.	Compatibility	A	B	C	D	E	F	G	H	I	J	Others	Weight (kg)
B130	1000 Series	44	68	10	6.5	16	24.5	45	40	59	ø26.5		0.04
B230	2000 Series	28	54	10	7	18	26	52	45	69	38		0.06
B330	3000 Series	34.5	67	16.5	7	17.5	26	58 (63.5)	45	76	ø40	Numbers in ( ) are W3000/3100	0.07
B430	4000 Series	55	84	14	7	17.5	26	58	55	94	ø47		0.11
	6000 Series												

### Joiner set



Material: Polyamide resin (J100-W)  
Aluminum alloy die-casting (J400 to J800-W)  
Painting (J400, J800-W)

● Applications

● Model No.: C1000-J100-W

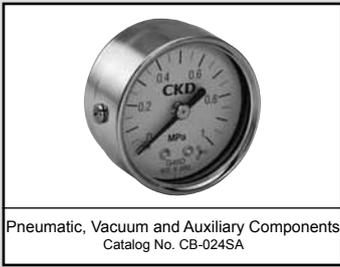
C4000-J400-W

C8000-J800-W



Model No.	Compatibility	A	B	C	D	E	Weight (kg)
C1000-J100-W	1000 Series	10	36	26	M3.5	JASO-2013	0.011
C4000-J400-W	2000 Series	21	44	32	M5	JIS B2401-P21	0.036
	3000 Series						
	4000 Series						
C8000-J800-W	6000 Series	26	65	50	M6	AS568-127	0.094
	8000 Series						

Clean air  
components



Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

General-use pressure gauge

# G41D/G49D/G59D Series

● Port size: R1/8, R1/4

JIS symbol



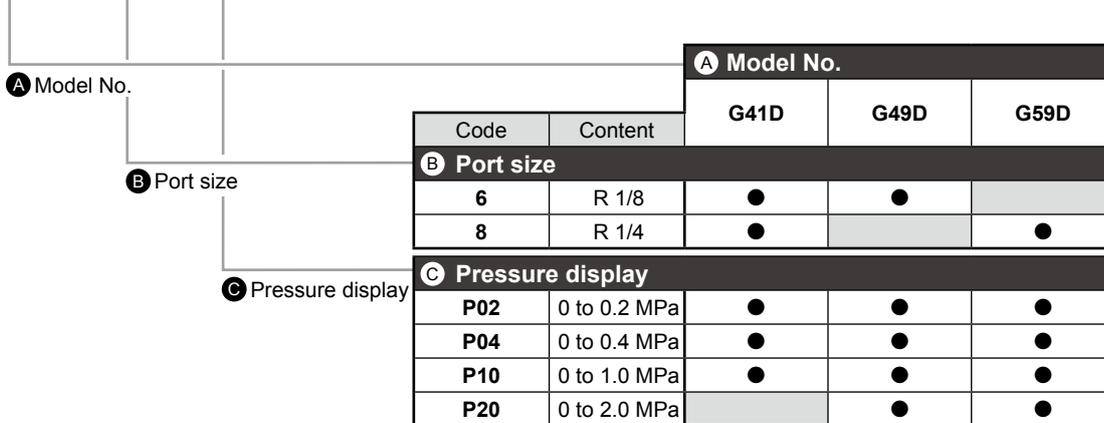
## Specifications

Descriptions	G49D	G59D	G41D
Working fluid	Liquid or gas (non-corrosive)		Compressed air
Fluid temperature °C	5 to 60		
Ambient temperature °C	5 to 60		
Accuracy	JIS Grade 3 or equivalent (±3% F.S) *1		
Shape	DT type (rear side screw, stock section square)		
Display size	ø42	ø52	ø42
Material	Stock/Bourdon tube	Stainless steel	
	Housing	Steel plate + chrome plating	Stainless steel
	Lens	Glass	Polycarbonate resin
Pressure range MPa	0 to 0.2		0 to 0.2
	0 to 0.4		0 to 0.4
	0 to 1.0		0 to 1.0
	0 to 2.0		
Port size R	1/8	1/4	1/8, 1/4
Weight g	90	140	82

\*1: The guaranteed indicator accuracy temperature is 20±15°C.

## How to order

**G49D - 6 - P02 - P4**

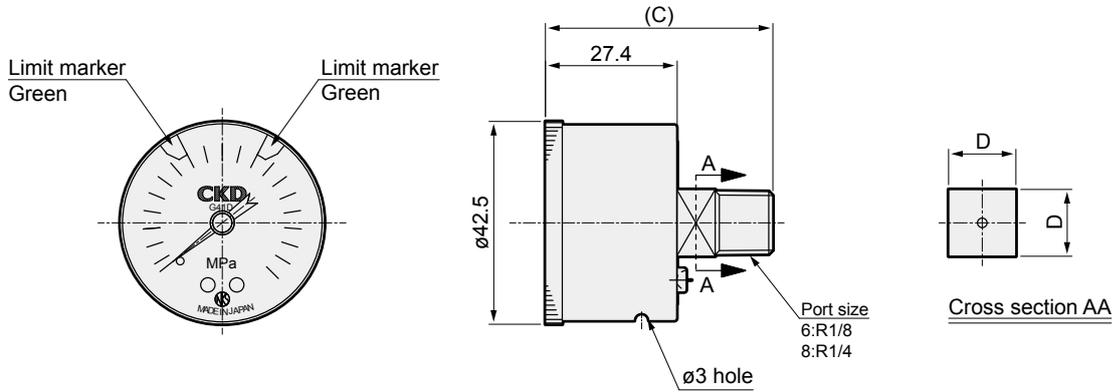


## Compatibility table by variation

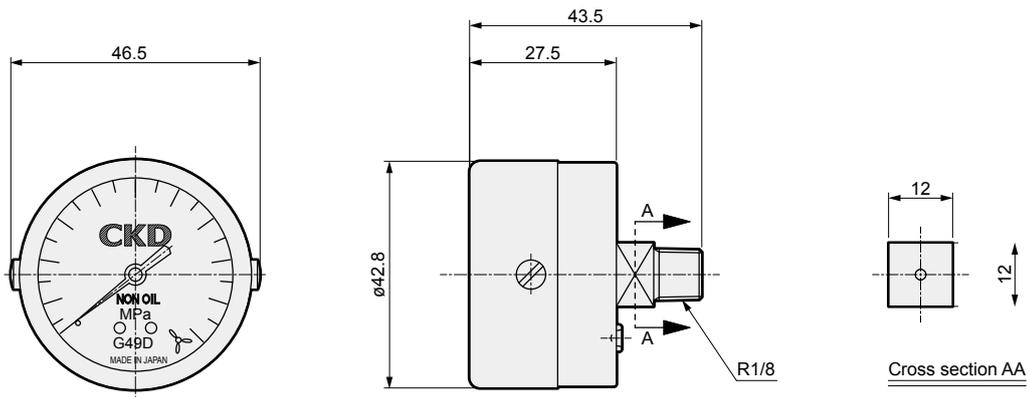
	G41D	G49D	G59D
	Display ø42 with limit marker	Display ø42	Display ø52
Port size	R1/8, 1/4	R1/8	1/4
P4	●	●	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

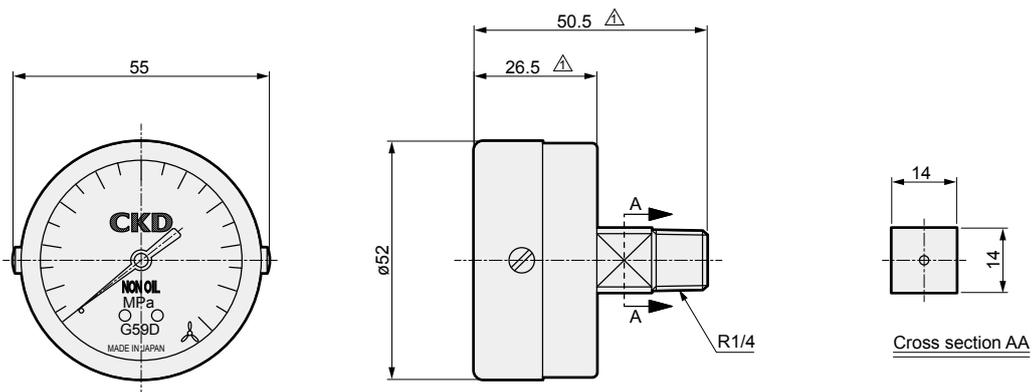
● G41D-\*-P4

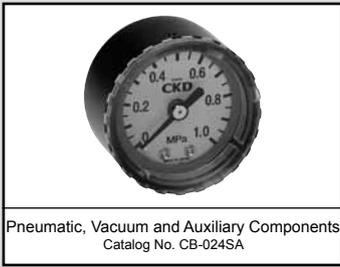


● G49D-6-\*-P4



● G59D-8-\*-P4





Pressure gauge with safety marker

# G40D Series

Easy visual inspection control due to green and red zone display.

● Port size: R1/8

JIS symbol



## Specifications

Descriptions	G40D	
	P10	P04
Working fluid	Compressed air	
Full scale MPa	1.0	0.4
Safety marker setting range MPa	0.15 to 1.0	0.06 to 0.4
Max. setting width MPa	0.45	0.18
Ambient temperature °C	5 to 60	
Fluid temperature °C	5 to 60	
Port size	R1/8	
Accuracy *1	Full scale ±3%	
Weight	g 85	

\*1: The guaranteed indicator accuracy temperature is 20±15°C.

## Compatibility table by variation

G40D	
	Display ø42.5 with safety marker
Port size	R1/8
P4	●

● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable

## How to order

**G40D - 6 - P10 - P4**

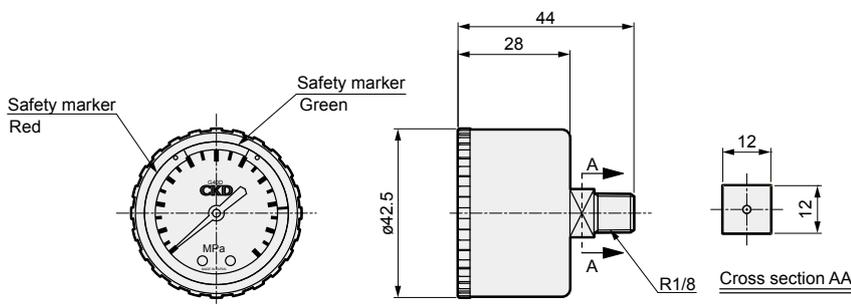
**A** Model No.

**B** Port size

**C** Pressure display

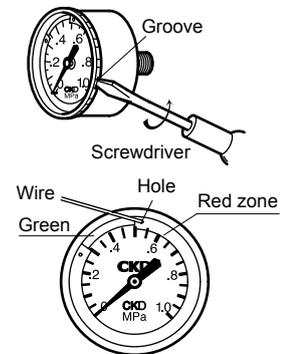
Code	Content
<b>A Model No.</b>	
<b>G40D</b>	Pressure gauge with safety marker
<b>B Port size</b>	
<b>6</b>	R1/8
<b>C Pressure display</b>	
<b>P10</b>	For 0 to 1.0 MPa
<b>P04</b>	For 0 to 0.4 MPa

## Dimensions and materials



## How to adjust pressure range

When removing the transparent face



Part name	Material
Bourdon tube/stock	Stainless steel
Housing	Steel plate + paint
Lens	Polyamide resin
Mark	PBT resin

Remove the transparent face and insert a needle into the hole in the red zone to move the red zone marker. After adjustment, always reattach the transparent face before supplying pneumatic pressure.



Inline clean filter

# FCS500/FCS1000 Series

● Port size: Rc1/8 to Rc1/4

JIS symbol



P4 compliant  
as standard



## Specifications

Descriptions	Stainless steel		Stainless steel (made to order)
	FCS500-66-P90 FCS500-66-P94	FCS500-88-P90 FCS500-88-P94	FCS1000-(*1)(*2)-P90 FCS1000-(*1)(*2)-P94
Working fluid	Compressed air, N <sub>2</sub>		
IN side bore size (*1)	Rc1/8	Rc1/4	Select from Rc1/4 and Rc3/8
OUT side bore size (*2)	Rc1/8	Rc1/4	
Proof pressure MPa	2.25 (compressed air), 1.5 (N <sub>2</sub> )		
Differential resistant pressure MPa	0.5		
Working pressure MPa	-0.095 to 1.5 (compressed air), -0.095 to 0.99 (N <sub>2</sub> )		
Ambient/fluid temperatures °C	5 to 45		
Filtration μm	0.01 (removal efficiency 99.99%)		
Processing flow rate ℓ/min (ANR) *1	50	80	300 to 400 *1
Weight g	100	100	0.5
Material	Body	Stainless steel	
	Case	Stainless steel	
	Element	Polypropylene + urethane	
Assembling/inspection/packaging	Integrated production in cleanroom		
Cleaning	Degreasing		

\*1: Initial flow rate at primary pressure 0.7 MPa and pressure drop 0.03 MPa.

\*2: Maximum working pressure varies with working temperature. Check graphs showing the relationship of working temperature and maximum working pressure.

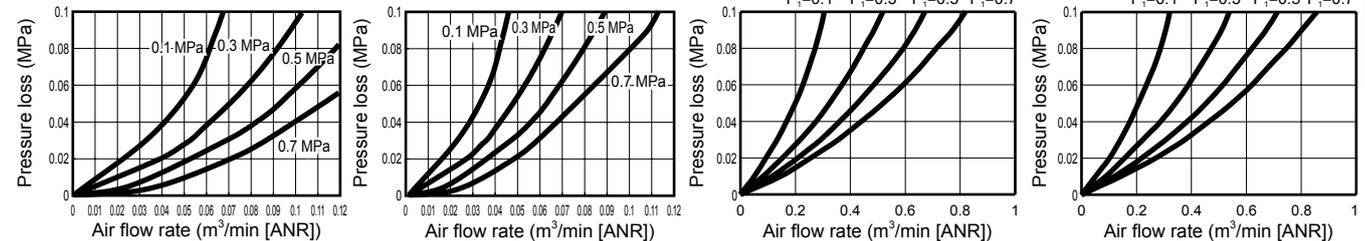
## Flow characteristics

● FCS500-88-P90/P94

● FCS500-66-P90/P94

● FCS1000-88-P90/P94

● FCS1000-1010-P90/P94



● Stainless steel

**FCS500** - **88** - **B** - **P90**

Model No. (Clean-room specifications)  
(oil-prohibited specifications)

**A** Port size

**B** Attached

**C** Clean-room specifications

A Port size	
66	IN side/OUT side port size Rc1/8
88	IN side/OUT side port size Rc1/4
B Attached	
Blank	No
B	Bracket, mounting screw
C Clean-room specifications	
Structure/treatment	Material restrictions
P90 Stainless steel material used Oil-free treatment	-
P94 Stainless steel material used Oil-free treatment	Use of copper-, silicon-, or halogen-based materials (e.g. fluorine, chlorine, or bromine) is not possible.

Note: " P94 " is made to order.

**FCS1000** - **8** **8** - **P90**

Model No. (Clean-room specifications)  
(oil-prohibited specifications)

**A** IN side port size

**B** OUT side port size

**C** Clean-room specifications

A IN side port size	
8	Rc1/4
10	Rc3/8
B OUT side port size	
8	Rc1/4
10	Rc3/8
C Clean-room specifications	
Structure/treatment	Material restrictions
P90 Stainless steel material used Oil-free treatment	-
P94 Stainless steel material used Oil-free treatment	Use of copper-, silicon-, or halogen-based materials (e.g. fluorine, chlorine, or bromine) is not possible.

Note: " P94 " is made to order.

Clean air  
components

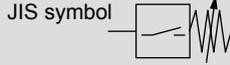


Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

Reed switch compact mechanical pressure switch

# P1100-W/P4100-W/P8100-W Series

· Compatible with module connection to rotary actuator F.R.L.

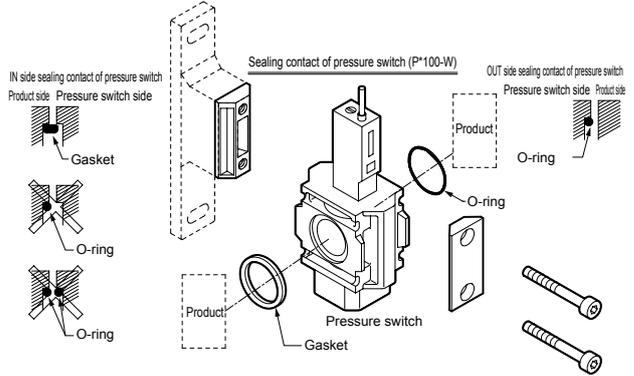


## Specifications

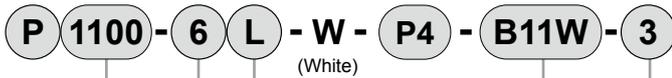
Descriptions	P1100-W	P4100-W	P8100-W
Working fluid	Compressed air		
Max. working pressure MPa	1.0		
Set pressure MPa	0.1 to 0.6		
Hysteresis MPa	0.08 or less		
Repeatability MPa	±0.02 or less		
Contact array	1a *1		
Wiring	Lead wire (oil resistant vinyl cabtyre cable 2-conductor 0.2 mm <sup>2</sup> )		
Ambient/fluid temperatures	5 to 60°C		
Degree of protection *2	IP20 or equivalent		
Product weight (excluding joiner) kg	0.13	0.19	0.41

\*1: The contact turns ON if air pressure exceeding the scale set pressure is applied.  
\*2: Note that when connecting a fitting into the atmospheric pressure inlet port and extending the tube until water does not enter, IP65 or equivalent is applied. Not for outdoor use.

## How to assemble (P1100-W, P4100-W, P8100-W)



## How to order (modular design)



**A** Series model No.

**B** Port size

**C** Branch direction

**D** Attachment

**E** Length of lead wire

## Compatibility table by variation

	P1100	P4100	P8100
Port size	Rc1/8, 1/4	Rc1/4, 3/8, 1/2	Rc3/4, 1
P4		●	

\*1: The atmospheric pressure inlet port is M5.  
\*2: Fitting attachment option for atmospheric introduction port is not available.

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## ⚠ Precautions for model No. selection

\*1: This is used for intermediate connection of the module series so the module connection section is not threaded.  
\*2: A masking plug matching the port size is attached.  
\*3: When piping the P□100-W single unit, use piping adapter A□00-W.  
(The horizontal direction port does not have threads.)

Code	Content
<b>A Series model No.</b>	
<b>1100</b>	1000-W Series modular design
<b>4100</b>	2000-W, 3000-W, 4000-W Series modular design
<b>8100</b>	6000-W, 8000-W Series modular design

<b>B Port size</b>		1100	4100	8100
<b>6</b>	Rc1/8	●		
<b>8</b>	Rc1/4	●	●	
<b>10</b>	Rc3/8		●	
<b>15</b>	Rc1/2		●	
<b>20</b>	Rc3/4			●
<b>25</b>	Rc1			●

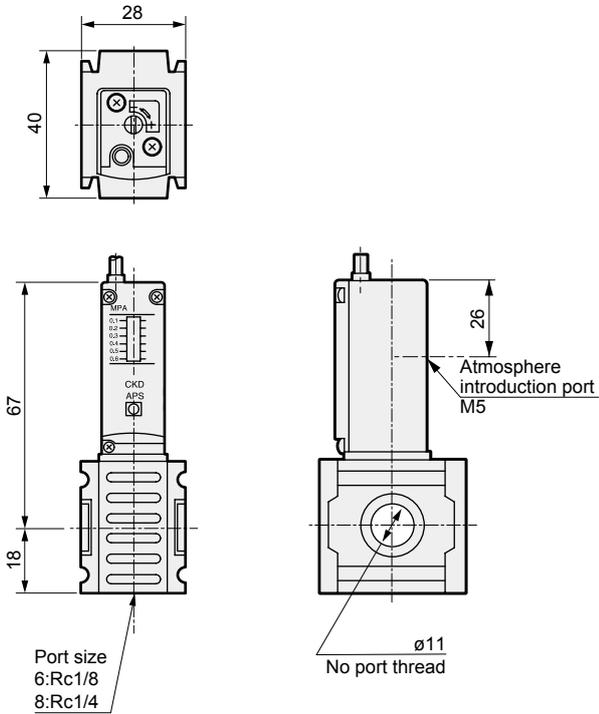
<b>C Branch direction *1</b>		
Blank *2	L	R

<b>D Attachment</b>		1100	4100	8100
<b>Blank</b>	Joiner set, gasket	●	●	●
<b>B11W</b>	T bracket, gasket	●		
<b>B31W</b>	T bracket, gasket		●	
<b>B41W</b>	T bracket, gasket		●	
<b>B81W</b>	T bracket, gasket			●

<b>E Length of lead wire</b>	
<b>Blank</b>	1 m
<b>3</b>	3 m
<b>5</b>	5 m

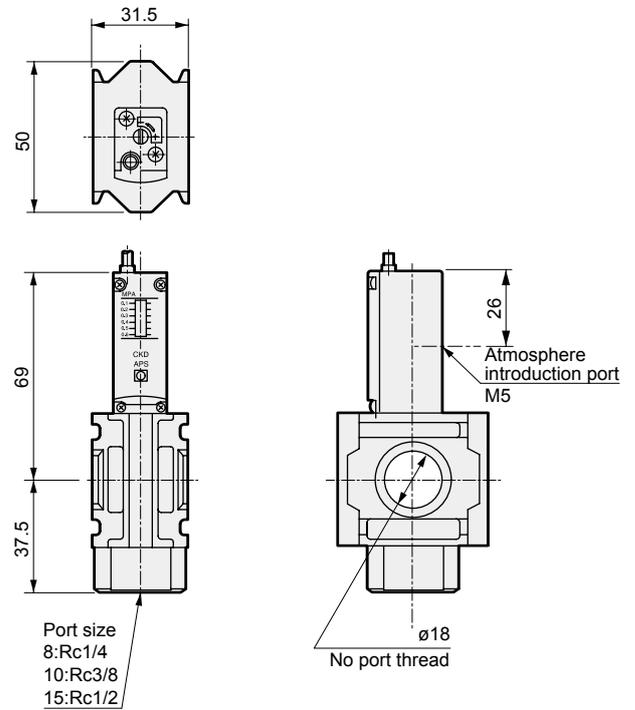
Dimensions 

● P1100-W



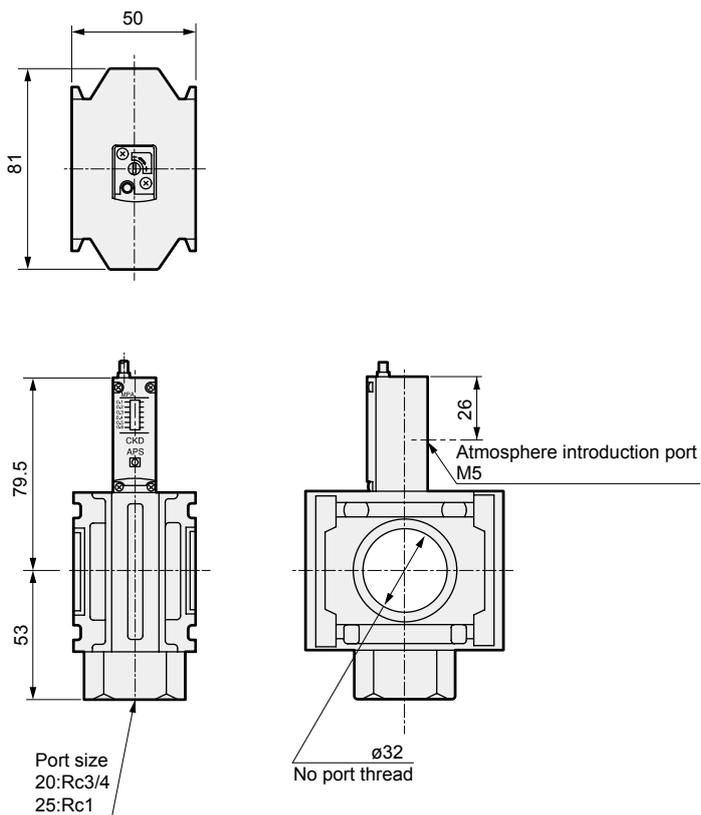
Weight 126 g

● P4100-W



Weight 190 g

● P8100-W



Weight 467 g



Compact mechanical pressure switch

# APS-W Series

● General purpose discrete specifications (APS)

JIS symbol



## Specifications

Descriptions	APS-W
Working fluid	Compressed air
Max. working pressure MPa	1.0
Set pressure MPa	0.1 to 0.6
Hysteresis MPa	0.08 or less
Repeatability MPa	±0.02 or less
Contact array	1a *1
Wiring	Lead wire (oil resistant vinyl cabtyre cable 2-conductor 0.2 mm <sup>2</sup> )
Ambient/fluid temperatures	5 to 60°C
Degree of protection *2	IP20 or equivalent
Weight g	69

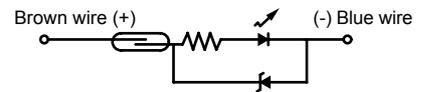
\*1: The contact turns ON if air pressure exceeding the scale set pressure is applied.

\*2: However, mounting direction is to be vertical. Note that when connecting a fitting into the atmospheric pressure inlet port and extending the tube until water does not enter, IP65 or equivalent is applied. Not for outdoor use.

### Wiring section specifications

Load voltage	12/24 VDC	100 VAC
Load current	5 to 50 mA	7 to 20 mA
Internal voltage drop	3 V or less	
Lamp	LED (Lit when ON)	
Max. shock	294 m/s <sup>2</sup>	
Insulation resistance	20 MΩ and over at 500 VDC megger	
Withstand voltage	No failure after 1 minute of 1,000 VAC application.	

### Internal circuit diagram



## Compatibility table by variation

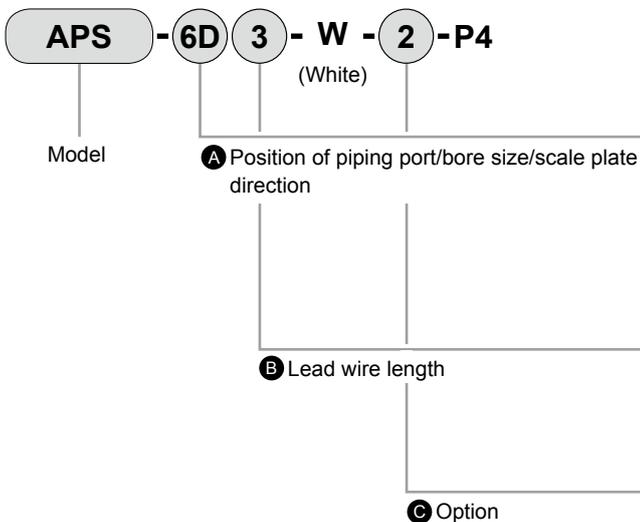
	APS
Port size	Rc1/8
P4	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: The atmospheric pressure inlet port is M5.

\*2: Fitting attachment option for atmospheric introduction port is not available.

## How to order



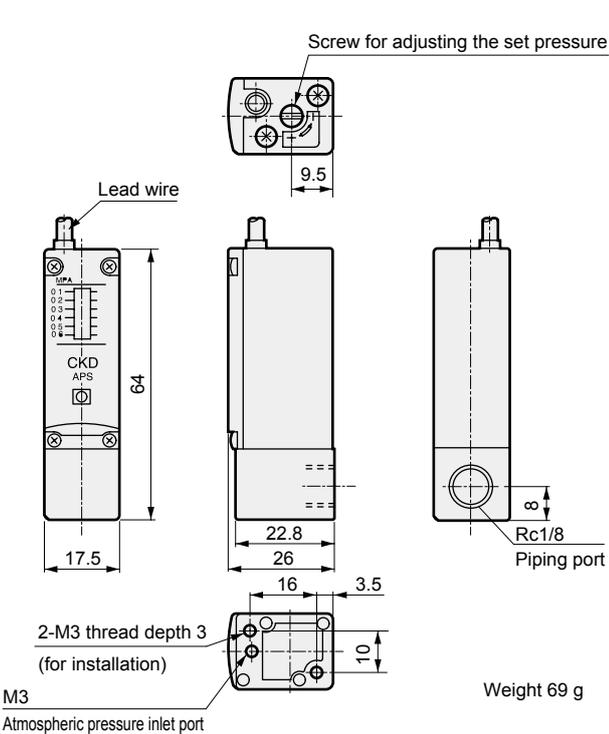
Code	Content
<b>A Position of piping port/bore size/scale plate direction</b>	
<b>6B</b>	Back surface Rc1/8, vertical *1
<b>6D</b>	Bottom surface Rc1/8, vertical
<b>6F</b>	Back surface flange, vertical
<b>6L</b>	Both side surfaces Rc1/8, vertical *1
<b>6Y</b>	Back surface flange, horizontal
<b>B Lead wire length</b>	
<b>Blank</b>	1 m
<b>3</b>	3 m
<b>5</b>	5 m
<b>C Option</b>	
<b>Blank</b>	No
<b>1</b>	DIN rail bracket attached (6D) only
<b>2</b>	Nipple attached (6D) only

\*1: When installing, be careful not to block the atmospheric release port.

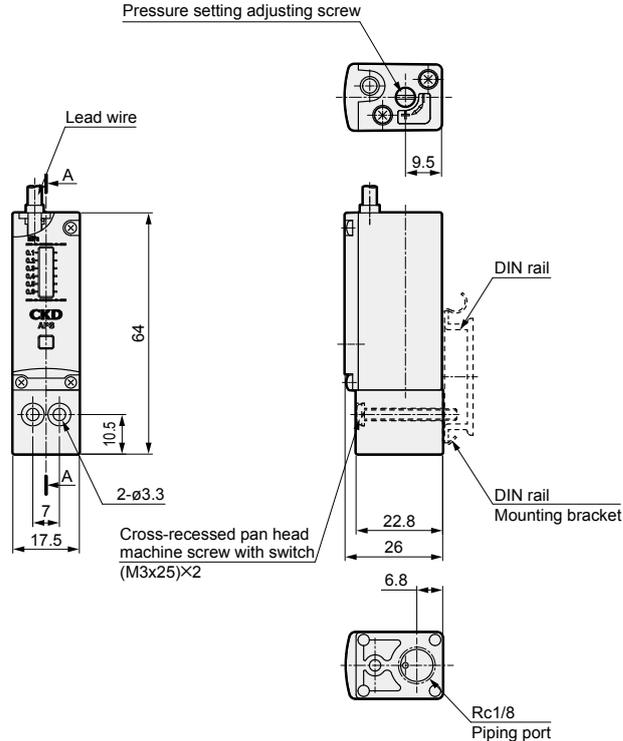
Dimensions



● APS-6B-W\*-P4

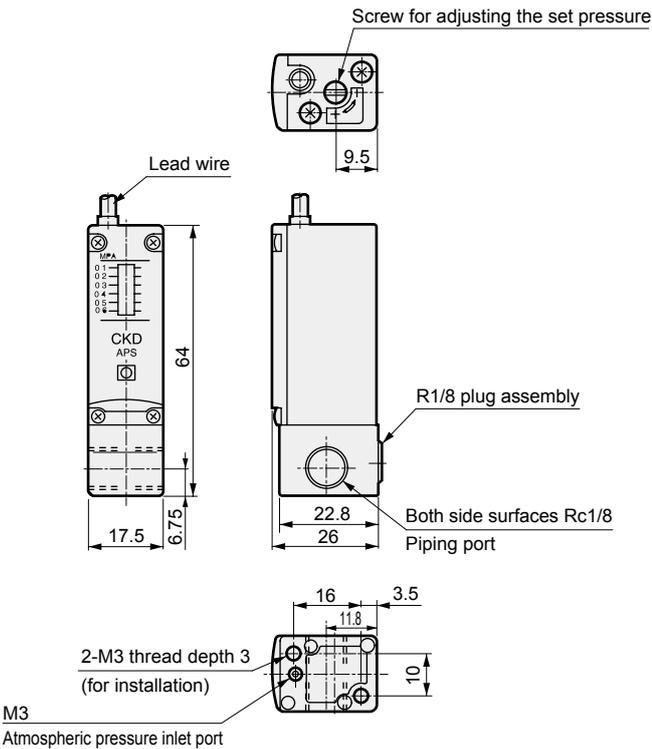


● APS-6D-W\*-P4



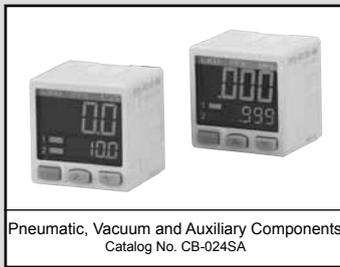
Note: When installing on the bottom, be careful not to block the atmospheric release port.

● APS-6L-W\*-P4



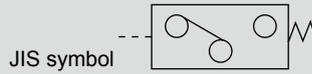
Note: When installing on the bottom, be careful not to block the atmospheric release port.

Clean air components



Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

# Digital pressure sensor PPX Series



P4 compliant  
as standard



## Specifications

Descriptions	Standard		High-function	
	For low pressure PPX-R01□	For high pressure PPX-R10□	For low pressure PPX-R01□H	For high pressure PPX-R10□H
Kind of pressure	Gauge pressure			
Rated pressure	-100.0 to +100.0 kPa	-0.100 to +1.000 MPa	-100.0 to +100.0 kPa	-0.100 to +1.000 MPa
Set pressure	-101.0 to +101.0 kPa	-0.101 to +1.010 MPa	-101.0 to +101.0 kPa	-0.101 to +1.010 MPa
Proof pressure	500 kPa	1.5 MPa	500 kPa	1.5 MPa
Applicable fluid	Air/non-corrosive gas			
Power supply voltage	12 to 24 VDC ±10% Ripple P-P 10% or less			
Power consumption	Normal: 720 mW or less (current consumption 30 mA or less at 24 V power supply voltage) ECO mode: 480 mW or less at STD (current consumption 20 mA or less at power supply voltage 24 V), 360 mW or less at FULL (current consumption 15 mA or less at power supply voltage 24 V)			
Comparison outputs (comparison output 1, comparison output 2)	[NPN output] NPN transistor/open collector · Max. inrush current: 100 mA · Applied voltage: 30 VDC or less (comparison output - 0 V interval) · Residual voltage: 2 V or less (at inrush current 100 mA)		[PNP output] PNP transistor/open collector · Max. output current: 100 mA · Applied voltage: 30 VDC or less (comparison output +V interval) · Residual voltage: 2 V or less (at outflow current 100 mA)	
	Output operation	Select NO/NC with key operation		
Output mode	EASY mode/hysteresis mode/window comparator mode			
Hysteresis	Min. 1 digit (variable)			
Repeatability	±0.1% F.S. (within ±2 digits)	±0.2% F.S. (within ±2 digits)	±0.1% F.S. (within ±2 digits)	±0.2% F.S. (within ±2 digits)
Response time	2.5 ms, 5 ms, 10 ms, 25 ms, 50 ms, 100 ms, 250 ms, 500 ms, 1000 ms, 5000 ms Select by key operation			
Short-circuit protection	Equipped			
External input (auto reference function /remote zero adjustment function)	_____	_____	[NPN output] ON voltage: 0.4 VDC or less OFF voltage: 5 to 30 VDC or release Input impedance: 10 kΩ Input time: 1 ms and over	[PNP output] ON voltage: 5V to +VDC OFF voltage: 0.6 VDC or less or release Input impedance: 10 kΩ Input time: 1 ms and over
Analog voltage output	_____	_____	Output voltage: 1 to 5 V Zero point: Within 3 V ± 5% F.S. Span: Within 4 V ± 5% F.S. Linearity: Within ±1% F.S. Output impedance: 1 kΩ	Output voltage: 0.6 to 5 V Zero point: Within 1 V ± 5% F.S. Span: Within 4.4 V ± 5% F.S. Linearity: Within ±1% F.S. Output impedance: 1 kΩ
Analog current output	_____	_____	Output current: 4 to 20 mA Zero point: Within 12 mA ±5% F.S. Span: Within 16 mA ±5% F.S. Linearity: Within ±1% F.S. Load resistance: 250 Ω (max.)	Output voltage: 2.4 to 20 mA Zero point: Within 4 mA ±5% F.S. Span: Within 17.6 mA ±5% F.S. Linearity: Within ±1% F.S. Load resistance: 250 Ω (max.)
Display	4-digit + 4-digit 3-color LCD display (display updating cycle: 250 ms, 500 ms, 1000 ms select by key operation)			
Display pressure range	-101.0 to +101.0 kPa	-0.101 to +1.010 MPa	-101.0 to +101.0 kPa	-0.101 to +1.010 MPa
Indicator lamp	Orange LED (comparison output 1 operation indicator lamp, comparison output 2 operation indicator lamp: Lit when comparison output is ON)		Orange LED (comparison output 1 operation indicator lamp: Lit when comparison output is ON, analog voltage output operation indicator lamp: Lit at setup)	
Environment conditions	Degree of protection	IP40(IEC)		
	Ambient temperature	-10 to +50°C, at the time of storage: -10 to +60°C		
	Ambient humidity	35 to 85% RH (no condensation, freezing), store: 35 to 85% RH		
	Withstand voltage	1000 VAC for 1 minute applied to all charged sections/between cases		
	Insulation resistance	50 MΩ and over with 500 VDC megger all charged sections/between cases		
	Vibration resistance	Durability 10 to 500 Hz compound amplitude 3 mm 2 hours each in XYZ directions (when mounted on panel: durability 10 to 150 Hz compound amplitude 0.75 mm 2 hours each in XYZ directions)		
Shock resistance	Durability 100 m/S <sup>2</sup> (approx. 10 G) 3 times each in XYZ directions			
Temperature characteristics (+20°C as reference)	±0.5% F.S. or less	Within ±1% F.S.	±0.5% F.S. or less	Within ±1% F.S.
Port size	*1 M5 female thread + R (PT) 1/8 male thread			
Material	Case: PBT (glass fiber included), LCD display part: acrylic resin, pressure port: SUS 303, mounting screw part: copper alloy (nickel plating), switch part: silicone rubber			
Connection	Connector			
Wire length	When the wire is extended, up to 100 m permissible with 0.3 mm <sup>2</sup> and over cable (less than 30 m when CE Marking-compliant)			
Unit change function	Only supported for overseas (-KA) (MPa, kPa, kgf/cm <sup>2</sup> , bar, psi, mmHg, inchHg)			
Weight	Body weight: approx. 40 g, weight including package: 130 g			
Accessory	*2 PPX-C2 (2 m cable with connector): 1 pc. Unit seal label (KA with unit change): MPa, kPa, kgf/cm <sup>2</sup> , bar, psi, mmHg, inchHg			

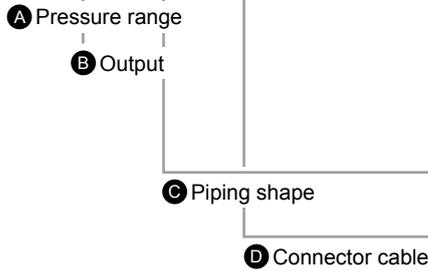
\*1: Refer to Table 1 on the next page for export use.

\*2: For (- J), connector cable is not attached.

### How to order

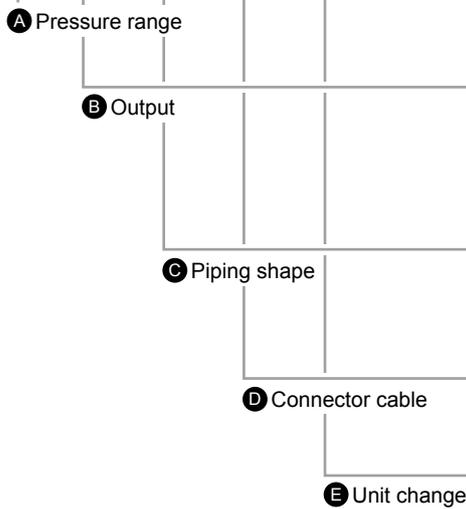
[How to order for domestic market]

PPX - **R01** - **N** - **6M** -



[How to order for foreign market]

PPX - **R01** - **N** - **6M** - **KA**



Code	Content
<b>A Pressure range</b>	
R01	-100.0 to 100.0 kPa
R10	-0.100 to 1.000 MPa
<b>B Output</b>	
N	NPN transistor output 2 point (Standard)
P	PNP transistor output 2 point (Standard)
NH	NPN transistor output 1 point + analog voltage output or external input (high-function)
PH	PNP transistor output 1 point + analog voltage output or external input (high-function)
<b>C Piping shape</b>	
6M	R1/8, M5 female thread
<b>D Connector cable</b>	
Blank	2 m connector cable attached
J *1	Without connector cable

\*1: Selectable only when "N" or "P" is selected for **B** output.

In compliance with the new Measurement Law, export models with unit select function cannot be used in Japan.

Code	Content
<b>A Pressure range</b>	
R01	-100.0 to 100.0 kPa
R10	-0.100 to 1.000 MPa
<b>B Output</b>	
N	NPN transistor output 2 point (Standard)
P	PNP transistor output 2 point (Standard)
NH	NPN transistor output 1 point + analog voltage output or external input (high-function)
PH	PNP transistor output 1 point + analog voltage output or external input (high-function)
<b>C Piping shape</b>	
6M *1	R1/8, M5 female thread
6N	NPT1/8, M5 female thread
6G *2	G1/8, M5 female thread
<b>D Connector cable</b>	
Blank	2 m connector cable attached
J *3	Without connector cable
<b>E Unit change</b>	
KA	With unit change function

\*1: Only "N" or "NH" can be selected for **B** output.

\*2: Selectable only when "P" or "PH" is selected for **B** output.

\*3: Selectable only when "N" or "P" is selected for **B** output.

### Compatibility table by variation

	PPX
Port size	Rc1/8, M5 female thread
P4	Supports P4 specifications as standard
P40	● Product is limited to the model number indicated in *2

\*1: Bracket mounting is not possible for P40.

\*2: P40 is compatible only with PPX-R10P-6M-J-P40/PPX-R10N-6M-J-P40.

\*3: P40 Connector must be ordered separately. PPX-C2-FL401967-P40

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

Destination	Switch output		Unit	Unit change function	Unit seal label Attached *1	Piping port
	NPN	PNP				
Domestic	○	○	kPa/MPa	-	-	R1/8(M5)
Asia	○	-	kPa/MPa	○	○	R1/8(M5)
Europe	-	○	kPa/MPa	○	○	G1/8(M5)
North America	○	○	kPa/MPa	○	○	NPT1/8(M5)

\*1: Refer to "Pneumatic, Vacuum and Auxiliary Components" (Catalog No. CB-024SA) for the attached unit seal.

[Table 1]

Type	Model No.	Port size	Output	Remarks
Standard	PPX-R01N-6M-(J)-KA	M5 female thread + R (PT) 1/8 male thread	NPN transistor/open collector	For Asia
	PPX-R10N-6M-(J)-KA			
High-function	PPX-R01NH-6M-KA			
	PPX-R10NH-6M-KA			
Standard	PPX-R01P-6G-(J)-KA	M5 female thread + G1/8 male thread	PNP transistor/open collector	For Europe
	PPX-R10P-6G-(J)-KA			
High-function	PPX-R01PH-6G-KA			
	PPX-R10PH-6G-KA			
Standard	PPX-R01N-6N-(J)-KA	M5 female thread + NPT1/8 male thread	NPN transistor/open collector	For North America
	PPX-R01P-6N-(J)-KA		PNP transistor/open collector	
	PPX-R10N-6N-(J)-KA		NPN transistor/open collector	
	PPX-R10P-6N-(J)-KA		PNP transistor/open collector	
High-function	PPX-R01NH-6N-KA		NPN transistor/open collector	
	PPX-R01PH-6N-KA		PNP transistor/open collector	
	PPX-R10NH-6N-KA		NPN transistor/open collector	
	PPX-R10PH-6N-KA		PNP transistor/open collector	



Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

Small flow rate sensor (RAPIFLOW)  
Integrated display/separated display

# FSM2 Series

- Aluminum body (flow rate range: 500 l/min, 1000 l/min)
- Stainless steel body (flow rate range: 500 ml/min to 200 l/min)

P4 compliant  
as standard



## Integrated display (stainless steel body) specifications



\* With needle valve

Descriptions		Integrated display (stainless steel body)										
		FSM2-[*1][*2][*3][*4]-[*5][*6][*7]-[*8]										
		Full scale flow rate	005	010	020	050	100	200	500	101	201	
Flow rate *1	* 4	005	500 ml/min	●								
		010	1 l/min		●							
		020	2 l/min			●						
		050	5 l/min				●					
		100	10 l/min					●				
		200	20 l/min						●			
		500	50 l/min							●		
		101	100 l/min								●	
Port size/ body material	* 5	S06	Rc1/8 Stainless steel	●	●	●	●	●	●	(Not for carbon dioxide)		
		S08	Rc1/4 Stainless steel							●	●	
		SM5	M5 Stainless steel (made to order)	●	●	●	●	●	●	(Not for carbon dioxide)		●
		4 digit + 4 digit 2 color LCD										
Flow rate display *1, *2	Display range	*3	F	0 to 500 ml/min	0 to 1000 ml/min	0 to 2.00 l/min	0 to 5.00 l/min	0 to 10.00 l/min	0 to 20.0 l/min	0 to 50.0 l/min	0 to 100.0 l/min	0 to 200 l/min
			R	-500 to 500 ml/min	-1000 to 1000 ml/min	-2.00 to 2.00 l/min	-5.00 to 5.00 l/min	-10.00 to 10.00 l/min	-20.0 to 20.0 l/min	-50.0 to 50.0 l/min	-100.0 to 100.0 l/min	-200 to 200 l/min
		Display resolution	1 ml/min			0.01 l/min			0.1 l/min			1 l/min
Integrating functions *3		Display range	9999999 ml			99999.99 l			999999.9 l			9999999 l
		Display resolution	1 ml			0.01 l			0.1 l			1 l
		Integrated pulse output rate	5 ml	10 ml	0.02 l	0.05 l	0.1 l	0.2 l	0.5 l	1 l	2 l	
Working conditions *4	Applicable fluid	*6	Blank	Clean air (JIS B 8392-1:2012 1.1.1 to 5.6.2), compressed air (JIS B 8392-1:2012 1.1.1 to 1.6.2), nitrogen gas								
			AR	Argon								
			C2	Carbon dioxide								
	Max. working pressure	1.0 MPa										
Min. working pressure	-0.09 MPa											
Proof pressure	1.5 MPa											
Operating ambient temperature/humidity	0 to 50°C, 90% RH or less											
Fluid temperature	0 to 50°C (no condensation)											
Accuracy *5	Working range	Uni-direction: 3 to 100% F.S., bi-direction: -100 to -3% F.S., 3 to 100% F.S.										
	Linearity (display/analog output)	Within ±3% F.S. (Secondary side released to atmosphere)										
	Pressure characteristics	Within ±5% F.S. (-0.09 to 0.7 MPa, where secondary side is released to atmosphere)										
	Temperature characteristics	Within ±0.2% F.S./°C (15 to 35°C, base temperature 25°C)										
Reproducibility (repeatability)	Within ±1% F.S.											
Response time	*6 50 ms or less											
Output	Switch output	*1	N	Output 2 points (NPN open collector output, 50 mA or less, voltage drop 2.4 V or less)								
			P	Output 2 points (PNP open collector output, 50 mA or less, voltage drop 2.4 V or less)								
Analog output	*2	V	1 to 5 V voltage output 1 point (connecting load impedance 50 kΩ and over) *7									
		A	4 to 20 mA current output 1 point (connecting load impedance 0 to 300 Ω)									
Power supply voltage *8	*2	V	12 to 24 VDC(10.8 to 26.4 V)									
		A	24 VDC(21.6 to 26.4 V)									
Current consumption	*9 50 mA or less											
Lead wire	ø3.7, AWG26 or equivalent x 5-conductor (connector), insulator outer diameter ø1.0											
Functions	Flow rate display, flow rate display peak hold, switch output, analog output, etc.											
Mounting	Mounting orientation	Unrestricted in vertical/horizontal direction										
	Straight piping section	Not required										
Degree of protection	IEC standards IP40 or equivalent											
Protection circuit	*10 Power reverse connection protection, switch output reverse connection protection, switch output load short-circuit protection											
EMC Directive	EN55011, EN61000-6-2, EN61000-4-2/3/4/6/8											
Weight (main body only)	*5	S06	Approx. 95 g									
		S08	Approx. 115 g									
		SM5	Approx. 140 g									
Clean-room specifications	*8	P70	Anti-dust generation *11									
		P80	Oil free *12									

### Integrated display (aluminum body) specification

\* Products with needle valves are not P4 compliant.



P4 compliant  
as standard

Descriptions		Integrated display (aluminum body) FSM2-[*1][*2][*3][*4]-[*5][*6]-[*7]		
		Full scale flow rate	501	102
Flow rate *1	*4	501	500 ℓ/min	●
		102	1000 ℓ/min	●
Port size/ body material	*5	A15	Rc1/2 / aluminum	●
Flow rate display *1, *2	Display		4 digit + 4 digit 2 color LCD	
	Display range	*3	F	0 to 500 ℓ/min
			R	-500 to 500 ℓ/min
Display resolution		1 ℓ/min		
Integrating functions *3	Display range		9999999 ℓ	
	Display resolution		1 ℓ	
	Integrated pulse output rate		5 ℓ	10 ℓ
Working conditions	Applicable fluids		*4 Clean air (JIS B 8392-1:2012 1.1.1 to 5.6.2), compressed air (JIS B 8392-1:2012 1.1.1 to 1.6.2), nitrogen gas	
	Max. working pressure		0.7 MPa	
	Min. working pressure		-0.09 MPa	
	Proof pressure		1 MPa	
	Operating ambient temperature/humidity		0 to 50°C, 90% RH or less	
	Fluid temperature		0 to 50°C (no condensation)	
Accuracy*5	Working range		Uni-direction: 3 to 100% F.S., bi-direction: -100 to -3% F.S., 3 to 100% F.S.	
	Linearity (display/analog output)		Within ±3% F.S. (Secondary side released to atmosphere)	
	Pressure characteristics		Within ±5% F.S. (-0.09 to 0.7 MPa, where secondary side is released to atmosphere)	
	Temperature characteristics		Within ±0.2% F.S./°C (15 to 35°C, base temperature 25°C)	
	Reproducibility (repeatability)		Within ±1% F.S.	
Response time		*6 50 ms or less		
Output	Switch output	*1	N	Output 2 points (NPN open collector output, 50 mA or less, voltage drop 2.4 V or less)
			P	Output 2 points (PNP open collector output, 50 mA or less, voltage drop 2.4 V or less)
Analog output	*2	V	1 to 5 V voltage output 1 point (connecting load impedance 50 kΩ and over) *7	
		A	4 to 20 mA current output 1 point (connecting load impedance 0 to 300 Ω)	
Power supply voltage *8	*2	V	12 to 24 VDC(10.8 to 26.4 V)	
		A	24 VDC(21.6 to 26.4 V)	
Current consumption		*9 50 mA or less		
Lead wire		ø3.7, AWG26 or equivalent x 5-conductor (connector), insulator outer diameter ø1.0		
Functions		Flow rate display, flow rate display peak hold, switch output, analog output, etc.		
Mounting	Mounting orientation		Unrestricted in vertical/horizontal direction	
	Straight piping section		Not required	
Degree of protection		IEC standards IP40 or equivalent		
Protection circuit		*10 Power reverse connection protection, switch output reverse connection protection, switch output load short-circuit protection		
EMC Directive		EN55011, EN61000-6-2, EN61000-4-2/3/4/6/8		
Weight (main body only)	*5	A15	Approx. 155 g	
Clean-room specifications	*7	P70	Anti-dust generation *11	
		P80	Oil free *12	

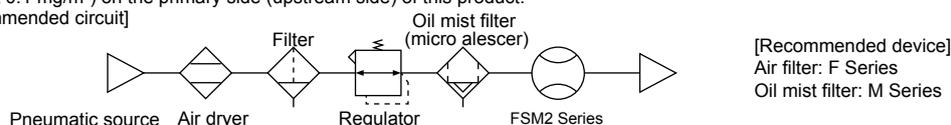
\*1: The value converted to volumetric flow rate at standard condition (20°C 1 barometric pressure (101 kPa) relative humidity 65%).

\*2: The flow rate display is rounded off at approx. ±1% F.S. or less (forced zero).

\*3: The accumulated flow is a calculated (reference) value. It is reset when the power is turned OFF.

\*4: Use dry gas which does not contain corrosive elements such as chlorine, sulfur or acids, and which is clean and does not contain dust or oil mist. When using compressed air, use clean air that complies with JIS B 8392-1:2012 Class 1.1.1 to 1.6.2. Compressed air from the compressor contains drainage (water, oil oxides, foreign matter, etc.). To maintain the function of this product, install a filter, air dryer (min. pressure dew point 10°C or less), and oil mist filter (max. oil content 0.1 mg/m<sup>3</sup>) on the primary side (upstream side) of this product.

[Recommended circuit]



\*5: Calibration of this product is performed within specified range. Accuracy conditions: Temperature 25 ±3°C, power supply voltage 24±0.01 VDC. F.S. stands for full scale flow rate.

\*6: Response time can be set in seven steps from 50 ms. or less to approx. 1.5 s.

\*7: The output impedance of the analog output section is approx. 1 kΩ. If the impedance of the connecting load is small, output and error increase. Check error with the impedance of the connecting load before using.

\*8: The power supply voltage specifications differ for the voltage output and current output.

\*9: Current for when 24 VDC is connected, and no load is applied. The current consumption will vary depending on how the load is connected.

\*10: This product's protection circuit is effective only for specific misconnections and load short-circuits. It does not provide protection for all misconnections.

\*11: [P70] Anti-dust generation (product surface is degreased and cleaned before packing. Heat sealed into antistatic bag in clean bench (Class 1000 and over).)

\*12: [P80] Oil-free (In addition to P70 specifications, gas-contact sections are degreased and cleaned. Refer to "Pneumatic, Vacuum and Auxiliary Components" (Catalog No. CB-024SA) for gas-contact section materials.)



P4 compliant  
as standard

## Separated display (stainless steel body) specifications

Descriptions		Separated display (stainless steel body)									
		FSM2-A[*1][*2][*3][*4][*5]-[*6]									
		Full scale flow rate	005	010	020	050	100	200	500	101	201
Flow rate *1	* 3	005	500 ml/min	●							
		010	1 l/min		●						
		020	2 l/min			●					
		050	5 l/min				●				
		100	10 l/min					●			
		200	20 l/min						●		
		500	50 l/min							●	
		101	100 l/min								●
	201	200 l/min								●	
Port size/ body material	* 4	S06	Rc1/8 Stainless steel	●	●	●	●	●	●	(Not for carbon dioxide)	
		S08	Rc1/4 Stainless steel							●	●
		SM5	M5 Stainless steel (made to order)	●	●	●	●	●	●	(Not for carbon dioxide)	
Flow direction		*2	F	Uni-direction							
			R	Bi-direction							
Working conditions	Applicable fluid *2		*5	Blank	Clean air (JIS B 8392-1:2012 1.1.1 to 5.6.2), compressed air (JIS B 8392-1:2012 1.1.1 to 1.6.2), nitrogen gas						
				AR	Argon						
				C2	Carbon dioxide						
	Max. working pressure				1.0 MPa						
	Min. working pressure				-0.09 MPa						
Proof pressure				1.5 MPa							
Operating ambient temperature/humidity				0 to 50°C, 90% RH or less							
Fluid temperature				0 to 50°C (no condensation)							
Accuracy*3	Working range			Uni-direction: 3 to 100% F.S., bi-direction: -100 to -3% F.S., 3 to 100% F.S.							
	Linearity (analog output)			Within ±3% F.S. (Secondary side released to atmosphere)							
	Pressure characteristics			Within ±5% F.S. (-0.09 to 0.7 MPa, where secondary side is released to atmosphere)							
	Temperature characteristics			Within ±0.2% F.S./°C (15 to 35°C, base temperature 25°C)							
	Reproducibility (repeatability)			Within ±1% F.S.							
Response time				50 ms or less							
Display				Flow bar display							
Output	Analog output	*1	V	1 to 5 V voltage output 1 point (connecting load impedance 50 kΩ and over) *4							
			A	4 to 20 mA current output 1 point (connecting load impedance 0 to 300 Ω)							
Power supply voltage *5		*1	V	12 to 24 VDC(10.8 to 26.4 V)							
			A	24 VDC(21.6 to 26.4 V)							
Current consumption			*6	50 mA or less							
Lead wire				ø3.7, AWG26 or equivalent x 4-conductor (connector), insulator outer diameter ø1.0							
Functions				Analog output, flow bar display, error display							
Mounting	Mounting orientation			Unrestricted in vertical/horizontal direction							
	Straight piping section			Not required							
Degree of protection				IEC standards IP40 or equivalent							
Protection circuit			*7	Power reverse connection protection							
EMC Directive				EN55011, EN61000-6-2, EN61000-4-2/3/4/6/8							
Weight (main body only)	*4	S06		Approx. 85 g							
		S08		Approx. 105 g							
		SM5		Approx. 130 g							
Clean-room specifications	*6	P70		Anti-dust generation *8							
		P80		Oil free *9							

### Separated display (aluminum body) specifications

\* Products with needle valves are not P4 compliant.



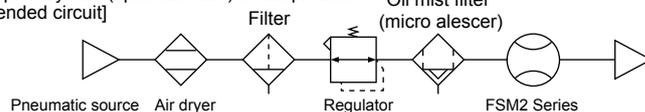
P4 compliant  
as standard

Descriptions		Separated display (aluminum body) FSM2-A[*1][*2][*3]-[*4]-[*5]	
		Full scale flow rate	501 102
Flow rate *1	* 3	501	500 l/min
		102	1000 l/min
Port size/ body material	* 4	A15	Rc1/2 / aluminum
Flow direction		*2	F R
			Uni-direction Bi-direction
Working conditions	Applicable fluid		*2 Clean air (JIS B 8392-1:2012 1.1.1 to 5.6.2), compressed air (JIS B 8392-1:2012 1.1.1 to 1.6.2), nitrogen gas
	Max. working pressure		0.7 MPa
	Min. working pressure		-0.09 MPa
	Proof pressure		1 MPa
	Operating ambient temperature/humidity		0 to 50°C, 90% RH or less
Accuracy*3	Fluid temperature		0 to 50°C (no condensation)
	Working range		Uni-direction: 3 to 100% F.S., bi-direction: -100 to -3% F.S., 3 to 100% F.S.
	Linearity (analog output)		Within ±3% F.S. (Secondary side released to atmosphere)
	Pressure characteristics		Within ±5% F.S. (-0.09 to 0.7 MPa, where secondary side is released to atmosphere)
	Temperature characteristics		Within ±0.2% F.S./°C (15 to 35°C, base temperature 25°C)
Reproducibility (repeatability)		Within ±1% F.S.	
Response time		50 ms or less	
Display		Flow bar display	
Output	Analog output	*1	V A
			1 to 5 V voltage output 1 point (connecting load impedance 50 kΩ and over) *4 4 to 20 mA current output 1 point (connecting load impedance 0 to 300 Ω)
Power supply voltage *5		*1	V A
			12 to 24 VDC(10.8 to 26.4 V) 24 VDC(21.6 to 26.4 V)
Current consumption		*6	50 mA or less
Lead wire		ø3.7, AWG26 or equivalent x 4-conductor (connector), insulator outer diameter ø1.0	
Functions		Analog output, flow bar display, error display	
Mounting	Mounting orientation		Unrestricted in vertical/horizontal direction
	Straight piping section		Not required
Degree of protection		IEC standards IP40 or equivalent	
Protection circuit		*7	Power reverse connection protection
EMC Directive		EN55011, EN61000-6-2, EN61000-4-2/3/4/6/8	
Weight (main body only)		*4	A15
			Approx. 145 g
Clean-room specifications		*5	P70 P80
			Anti-dust generation *8 Oil free *9

\*1: The value converted to volumetric flow rate at standard condition (20°C 1 barometric pressure (101 kPa) relative humidity 65%).

\*2: Use dry gas which does not contain corrosive elements such as chlorine, sulfur or acids, and which is clean and does not contain dust or oil mist. When using compressed air, use clean air that complies with JIS B 8392-1:2012 Class 1.1.1 to 1.6.2. Compressed air from the compressor contains drainage (water, oil oxides, foreign matter, etc.). To maintain the function of this product, install a filter, air dryer (min. pressure dew point 10°C or less), and oil mist filter (max. oil content 0.1 mg/m<sup>3</sup>) on the primary side (upstream side) of this product.

[Recommended circuit]



[Recommended device]  
Air filter: F Series  
Oil mist filter: M Series

\*3: Calibration of this product is performed within specified range. Accuracy conditions: Temperature 25 ±3°C, power supply voltage 24±0.01 VDC. F.S. stands for full scale flow rate.

\*4: The output impedance of the analog output section is approx. 1 kΩ. If the impedance of the connecting load is small, output and error increase. Check error with the impedance of the connecting load before using.

\*5: The power supply voltage specifications differ for the voltage output and current output.

\*6: Current for when 24 VDC is connected, and no load is applied. The current consumption will vary depending on how the load is connected.

\*7: This product's protection circuit is effective only for specific misconnections and load short-circuits. It does not provide protection for all misconnections.

\*8: [P70] Anti-dust generation (product surface is degreased and cleaned before packing. Heat sealed into antistatic bag in clean bench (Class 1000 and over).)

\*9: [P80] Oil-free (In addition to P70 specifications, gas-contact sections are degreased and cleaned. Refer to "Pneumatic, Vacuum and Auxiliary Components" (Catalog No. CB-024SA) for gas-contact section materials.)

## Separated display specifications

Descriptions				Separated display FSM2-D-[*1][*2]- □ -[*3]	
Settable flow rate range		*1	mℓ	5, 10, 50, 100, 500	
			ℓ	1, 2, 4, 5, 10, 12, 20, 25, 32, 50, 100, 200, 500, 1000, 1500	
Operating ambient temperature/humidity				0 to 50°C	
Display				4 digit + 4 digit 2 color LCD	
Input voltage				1 to 5 V	
Output	Switch output	*1	N	Output 2 points (NPN open collector output, 50 mA or less, voltage drop 2.4 V or less)	
			P	Output 2 points (PNP open collector output, 50 mA or less, voltage drop 2.4 V or less)	
	Analog output	*2	V	1 to 5 V voltage output 1 point (connecting load impedance 50 kΩ and over) *6	
			A	4 to 20 mA current output 1 point (connecting load impedance 0 to 300 Ω)	
Power supply voltage		*2	V	12 to 24 VDC(10.8 to 26.4 V)	
			A	24 VDC(21.6 to 26.4 V)	
Current consumption		*2	40 mA or less (when 24 VDC is connected, and no load is connected)		
Lead wire				ø3.7, AWG26 or equivalent x 5-conductor (connector), insulator outer diameter ø1.0	
Functions				Flow rate display, flow rate display peak hold, switch output, analog output	
Degree of protection				IEC standards IP40 or equivalent	
Protection circuit		*3	Power reverse connection protection		
EMC Directive				EN55011, EN61000-6-2, EN61000-4-2/3/4/6/8	
Accessory				1 sensor connection connector (e-con), conforming cable AWG24 to 26, insulator outer diameter ø1.0 to 1.2	
Weight (main body only)				Approx. 40 g	
Clean-room specifications		*4 *3	P70	Anti-dust generation	

\*1: The flow rate range, flow direction and gas type are automatically recognized only when the FSM2 separated display. (Default state)

The FSM-H Series, FSM-V Series and WFK3000 Series flow rate ranges are supported in addition to the FSM2 Series, but automatic recognition is supported only with the FSM2 Series. Always set the product's flow rate range, flow direction and gas type before use.

The connectable flow rate ranges are shown in "Display by flow rate range" below.

When the sensor section is changed, the previous flow rate range settings, etc., will still be recorded. Always reset the settings before using.

\*2: Current for when 24 VDC is connected, and no load is connected. The current consumption will vary depending on how the load is connected.

\*3: This product's protection circuit is effective only for specific misconnections and load short-circuits. It does not provide protection for all misconnections.

\*4: [P70] Anti-dust generation (product surface is degreased and cleaned before packing. Heat sealed into antistatic bag in clean bench (Class 1000 and over).)

\*5: When connecting to the FSM-V Series or WFK3000 Series, the cable size is different so a separate compatible sensor connection connector (e-con) will be required. Contact your nearest CKD sales office or dealer.

The attached sensor connection connector (e-con) can be used with the FSM Series and FSM-H Series.

\*6: The output impedance of the analog output section is approx. 1 kΩ. If the impedance of the connecting load is small, output and error increase. Check error with the impedance of the connecting load before using.

## Display for each flow rate range

Flow rate display	Display range	Uni-direction	0 to 500 ml/min	0 to 1000 ml/min	0 to 2.00 ℓ/min	0 to 4.00 ℓ/min	0 to 5.00 ℓ/min	0 to 10.00 ℓ/min	0 to 12.0 ℓ/min	0 to 20.0 ℓ/min	0 to 25.0 ℓ/min	0 to 32.0 ℓ/min	0 to 50.0 ℓ/min	0 to 100.0 ℓ/min	0 to 200 ℓ/min	0 to 500 ℓ/min	0 to 1000 ℓ/min	0 to 1.50 m <sup>3</sup> /min	0 to 5.00 mℓ/min	0 to 10.00 mℓ/min	0 to 50.0 mℓ/min	0 to 100.0 mℓ/min
		Bi-direction	-500 to 500 ml/min	-1000 to 1000 ml/min	-2.00 to 2.00 ℓ/min	-	-5.00 to 5.00 ℓ/min	-10.00 to 10.00 ℓ/min	-	-20.0 to 20.0 ℓ/min	-	-	-50.0 to 50.0 ℓ/min	-100.0 to 100.0 ℓ/min	-200 to 200 ℓ/min	-500 to 500 ℓ/min	-1000 to 1000 ℓ/min	-1.50 to 1.50 m <sup>3</sup> /min	-5.00 to 5.00 mℓ/min	-10.00 to 10.00 mℓ/min	-50.0 to 50.0 mℓ/min	-100.0 to 100.0 mℓ/min
Integrating functions	Display resolution	1 mℓ/min		0.01 ℓ/min				0.1 ℓ/min				1 ℓ/min				0.01 m <sup>3</sup> /min	0.01 mℓ/min		0.1 mℓ/min			
	Display range	9999999 mℓ		99999.99 ℓ				999999.9 ℓ				9999999 ℓ				99999.99 m <sup>3</sup>	99999.99 mℓ		999999.9 mℓ			
	Display resolution	1 mℓ		0.01 ℓ				0.1 ℓ				1 ℓ				0.01 m <sup>3</sup>	0.01 mℓ		0.1 mℓ			
	Integrated pulse output rate	5 mℓ	10 mℓ	0.02 ℓ	0.04 ℓ	0.05 ℓ	0.1 ℓ	0.12 ℓ	0.2 ℓ	0.25 ℓ	0.32 ℓ	0.5 ℓ	1 ℓ	2 ℓ	5 ℓ	10 ℓ	15 ℓ	0.05 mℓ	0.1 mℓ	0.5 mℓ	1 mℓ	

\*1: The flow rate display is rounded off at approx. ±1% F.S. or less (forced zero).

\*2: The accumulated flow is a calculated (reference) value. It is reset when the power is turned OFF.

\* The corresponding sensor is the voltage output (1 to 5 V). If the current output or other voltage output is connected, it will not operate properly.

## How to order

- Integrated display, separated display

**FSM2 - A V R 005 - S06 AR 1 B K - P70**

**A** Output

**B** Analog output  
\*2

**C** Flow direction

**D** Flow rate

\* Refer to the table on the following page for the flow rate range, port size (body material), and gas combinations.

**E** Port size (body material)  
\*3

**F** Gas

**G** Cable

**H** Bracket

**I** Traceability

**J** Clean-room specifications

Code	Content
<b>A Output</b>	
A *1	Separated display (analog output 1 point only)
N	Integrated display (switch output (NPN) 2 points, analog output 1 point)
P	Integrated display (switch output (PNP) 2 points, analog output 1 point)
<b>B Analog output</b>	
V	Voltage output (1 to 5 V)
A	Current output (4 to 20 mA)
<b>C Flow direction</b>	
F	Uni-direction
R	Bi-direction
<b>D Flow rate range (full scale flow rate)</b>	
005	500 ml/min
010	1 l/min
020	2 l/min
050	5 l/min
100	10 l/min
200	20 l/min
500	50 l/min
101	100 l/min
201	200 l/min
501	500 l/min
102	1000 l/min
<b>E Port size (body material)</b>	
S06	Rc1/8 (stainless steel)
S08	Rc1/4 (stainless steel)
A15	Rc1/2 (aluminum)
SM5	M5 (stainless steel) (made to order)
<b>F Gas</b>	
Blank	Air, nitrogen gas
AR	Argon
C2	Carbon dioxide
<b>G Cable</b>	
Blank	No
1	1 m
3	3 m
<b>H Bracket</b>	
Blank	No
B	With bracket
P *1	Panel mounting kit
<b>I Traceability</b>	
Blank	No
T	Traceability certification with series variation diagram and company certification
K	With company certification
<b>J Clean-room specifications</b>	
Blank	No
P70	Anti-dust generation
P80	Oil free

Clean air components

## ⚠ Precautions for model No. selection

\*1: For the **A** Output "A", the **H** Panel mounting option "P" cannot be selected.

The separated display is not attached with the **A** Output "A".

\*2: When using the FSM2-D for the separated display with separated display, select "V".

\*3: For the **E** Port size "A15", the **H** Panel mounting option "P" cannot be selected.

\*4: Products with needle valves are not P4 compliant.

# FSM2 Series

For flow rate range, port size (body material)

		E Port size (body material)			
		S06	S08	A15	SM5
D Flow rate range	005	●○△			●○△
	010	●○△			●○△
	020	●○△			●○△
	050	●○△			●○△
	100	●○△			●○△
	200	●○△			●○
	500	●○	●○△		
	101		●○△		
	201		●		
	501			●	
102			●		

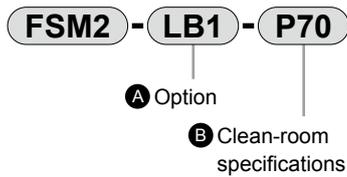
F Gas  
 ● : Air, nitrogen gas  
 ○ : Argon  
 △ : Carbon dioxide  
 □ : Not available

Combination of port size and clean-room specifications

		E Port size (body material)			
		S06	S08	A15	SM5
K Clean-room specifications	P70	●	●	●	●
	P80	●	●	●	●

● : Available

Discrete option model No.

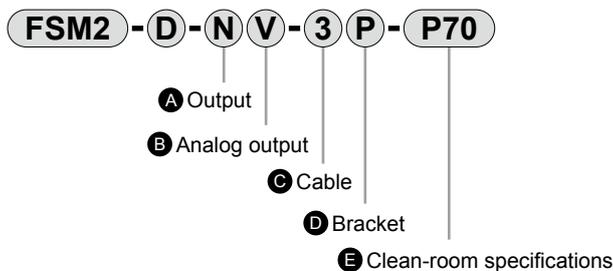


Code	Content
A Option	
LB1	Bracket (for Rc1/8, Rc1/4, M5)
LB2	Bracket (for Rc1/2)
KHS	Panel mounting kit (for integrated display, for separated display) *
C51	5-conductor cable 1 m (for integrated display and separated)
C53	5-conductor cable 3 m (for integrated display and separated)
C41	4-conductor cable 1 m (for separated display)
C43	4-conductor cable 3 m (for separated display)

Code	Content
B Clean-room specifications	
Blank	No
P70	Anti-dust generation

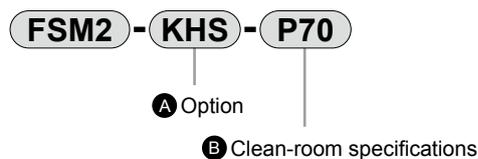
\* The panel mounting kit cannot be mounted on the FSM2-□-A15□.

● Separated display



Code	Content
A Output	
N	Switch output (NPN) 2 points, analog output 1 point
P	Switch output (PNP) 2 points, analog output 1 point
B Analog output	
V	Voltage output (1 to 5 V)
A	Current output (4 to 20 mA)
C Cable	
Blank	No
1	1 m
3	3 m
D Bracket	
Blank	No
P	Panel mounting kit
E Clean-room specifications	
Blank	No
P70	Anti-dust generation

Discrete option model No.



Code	Content
A Option	
KHS	Panel mounting kit set
C51	5-conductor cable 1 m (for integrated display and separated)
C53	5-conductor cable 3 m (for integrated display and separated)
EC	Sensor connection connector (e-con) 5-pc set
B Clean-room specifications	
Blank	No
P70	Anti-dust generation

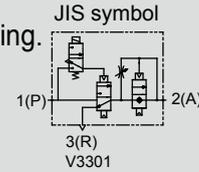
**CAUTION** The corresponding sensor is the voltage output (1 to 5 V). If the current output or other voltage output is connected, it doesn't operate properly. Use the FSM2-AV □ when using the FSM2.



# Slow start valve V3301-W Series

Ensuring safety when starting and stopping.

- Port size: Rc1/4 to Rc1/2



## Specifications

Descriptions		V3301-W/V3321-W		
Actuation		Pilot operated soft spool valve		
Working fluid		Compressed air (excluding ultra-dry compressed air) *1		
Working pressure MPa		0.2 to 1.0		
Proof pressure MPa		1.5		
Ambient/fluid temperatures °C		5 to 60		
Port size	1(P)/2(A) port	Rc1/4	Rc3/8	Rc1/2
	3(R) port	Rc3/8		
	Gauge port	Rc1/4		
Effective cross-sectional area mm <sup>2</sup>	Low speed air supply	6		
	High speed air supply	40	64	76
	High speed exhaust	50	74	78
Response time		0.2 sec or less		
Lubrication		No lubrication *2		
Weight g		V3301-W:635 V3321-W:515		
Solenoid valve specifications		V3301-W		
Rated voltage V		AC100(50/60 Hz)	AC200(50/60 Hz)	DC24
Starting current A		0.076/0.058	0.038/0.030	0.092
Holding current A		0.038/0.029	0.019/0.015	
Power consumption W		2.2/1.7	2.2/1.7	2.2
Temperature rise K		40 or less		
Voltage fluctuation range		±10%		
Insulation class		Class B		
Electrical connections		Grommet lead wire/terminal box		

\*1: Consult with CKD when using ultra dry compressed air.

\*2: Use turbine oil Class 1 ISO VG32 for lubrication.

## Compatibility table by variation

		V3301	
Port size		Rc1/4 to Rc1/2	
P4		▲	(*1) (*2)
P40		▲	(*1) (*2)

\*1: Only LS is available for electrical connection.

\*2: Valve is vertical mounting.

\*3: Product dimensions are standard.

● : Standard ○ : Made to order

▲ : Contact CKD □ : Not applicable

## How to order

● Solenoid valve **V3301** - **08** - W - FL (White)

Ⓐ Port size

Code	Content
Ⓐ Port size	
1(P)/2(A) port	
08	Rc1/4
10	Rc3/8
15	Rc1/2

⚠ \*1: Select the reverse regulator (R\*100-W) or reverse filter regulator (W\*100-W) when installing the V3301-W onto the primary side of the regulator or filter regulator.

\*2: Made to order. Contact CKD for details.



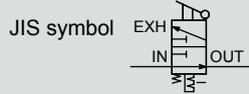
Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

Shut-off valve

# V3000-W Series

One action exhaust operation. Ideal for preventing accidents due to residual pressure in pneumatic lines.

● Port size: 1/8 to 1/2

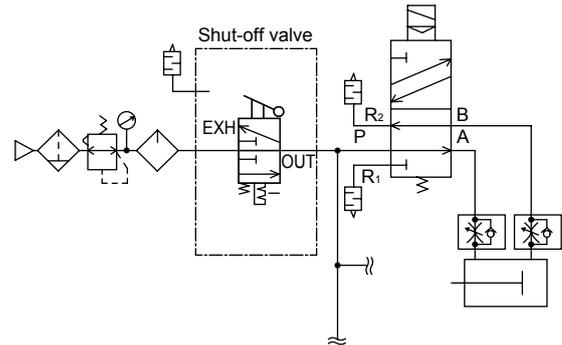


## Specifications

Descriptions		V3000-8-W	V3000-10-W	V3000-15-W
Working fluid		Compressed air		
Max. working pressure MPa		1.0		
Proof pressure MPa		1.5		
Ambient/fluid temperatures °C		5 to 60		
Operation lever switching angle		90°		
Operating force	Pushing force N	80		
	Torque N·m	2		
Valve section leakage cm <sup>3</sup> /min (ANR)		10		
External leakage cm <sup>3</sup> /min (ANR)		10		
Port size	IN-OUT	1/4	3/8	1/2
	(Rc)	3/8		
Weight kg		0.25		
Effective cross-sectional area (mm <sup>2</sup> )	IN/OUT	40	70	85
	OUT / EXH	40	50	50

## Applications

Explanation: For safety, release compressed air in the pneumatic circuit from the shut-off valve before repairing or adjusting the solenoid valve or air cylinder, etc.



## Compatibility table by variation

V3000	
Port size	Rc1/4 to Rc1/2
P4	●
P40	●

● : Standard ○ : Made to order ▲ : Contact CKD ◻ : Not applicable

\*1: In P40, parts without gas contact use zinc plating.

## How to order

● Rotary actuator F.R.L.3000, 4000 Series



● A Port size

● B Option

● C Attachment

Code	Content
<b>A Port size</b>	
8	Rc1/4
10	Rc3/8
15	Rc1/2
<b>B Option</b>	
Blank	Standard flow (left → right)
X1	IN/OUT reverse flow (right → left)
<b>C Other attachments</b> *1, *2	
Blank	Without attachment
A8*W	1/4 pipe adaptor set
A10*W	3/8 pipe adaptor set
A15*W	1/2 pipe adaptor set
A20*W	3/4 pipe adaptor set
BW	C bracket

## ⚠ Precautions for model No. selection

\*1: The pipe adaptor set and C bracket cannot be used together.

\*2: The joiner set is attached with the pipe adaptor set.

⚠ Select the reverse regulator (R\*100-W) or reverse filter regulator (W\*100-W) when installing the V3000-W onto the primary side of the regulator or filter regulator.

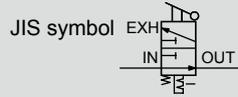


Shut-off valve with locking hole (OSHA compliant)

# V3010-W/V6010-W Series

Ideal for preventing accidents due to residual pressure in pneumatic lines.

● Port size: 1/4 to 1



## Specifications

Descriptions		V3010-8-W	V3010-10-W	V3010-15-W	V6010-20-W	V6010-25-W
Working fluid		Compressed air				
Max. working pressure MPa		1.0				
Proof pressure MPa		1.5				
Ambient/fluid temperatures °C		5 to 60				
Operation lever switching angle		90°				
Operating force	Pushing force N	80 or less				
	Torque N·m	2.5 or less				
Valve seat leakage cm <sup>3</sup> /min (ANR)		10 or less				
External leakage cm <sup>3</sup> /min (ANR)		10 or less				
Port size (Rc)	IN-OUT	1/4	3/8	1/2	Rc3/4	Rc1
	EXH	3/8			Rc1/2	
Weight kg		0.3			0.8	
Effective cross-sectional area (mm <sup>2</sup> )	IN→OUT	40	70	85	145	150
	OUT→EXH	40	50	50	105	110

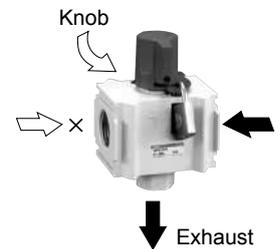
## Usage methods

● Regular use



● For maintenance

A lock is set where residual pressure is released.



## OSHA (Occupational Safety and Health Administration)

OSHA establishes the US safety standards for employees.

### [Lockout/Tagout Regulation]

When serving or maintaining machinery, the air source shall be closed with a shut-off valve (shut-off valve), and residual pressure shall be discharged. If a third party inadvertently operates the valve during such operation and compressed air is applied, the cylinder, etc., could move suddenly and injure personnel. This standard states that, "All valves used for such purposes shall have a key or a structure which can be locked with a key."

### ⚠ Precautions for model No. selection

\*1: The pipe adaptor set and C bracket cannot be used together.

\*2: The joiner set is attached with the pipe adaptor set.

⚠ Select the reverse regulator (R\*100-W) or reverse filter regulator (W\*100-W) when installing the V\*010-W onto the primary side of the regulator or filter regulator.

## How to order

● Rotary actuator F.R.L.2000, 3000, 4000 Series



● Rotary actuator F.R.L.6000, 8000 Series



A Model No.

B Port size

C Option

D Attachment

## Compatibility table by variation

	V3010	V6010
Port size	Rc1/4 to Rc1/2	Rc3/4, Rc1
P4	●	●
P40	●	●

\*1: For P40, parts without gas contact use zinc plating.

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

Code	Content	A Model No.	
		V3010	V6010
<b>B Port size</b>			
8	Rc1/4	●	
10	Rc3/8	●	
15	Rc1/2	●	
20	Rc3/4		●
25	Rc1		●
<b>C Option</b>			
Blank	No	●	●
X1	IN/OUT reverse flow (right → left)	●	●
<b>D Other attachments</b> *1, *2			
Blank	Without attachment	●	●
A8W	1/4 pipe adaptor set	●	
A10W	3/8 pipe adaptor set	●	
A15W	1/2 pipe adaptor set	●	
A20W	3/4 pipe adaptor set	●	●
A25W	1 pipe adaptor set	●	●
A32W	1 1/4 pipe adaptor set		●
BW	C bracket	●	●

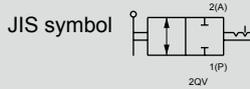


Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

Quick valve

# 2QV Series

● Port size: Push-in fitting  $\varnothing 4$ ,  $\varnothing 6$ ,  $\varnothing 8$ ,  $\varnothing 10$ ,  $\varnothing 12$ , R1/8 to R1/2



## Specifications

Descriptions	2QV
Working fluid	Air
Max. working pressure MPa	1.0
Min. working pressure kPa	-100 (*1)
Proof pressure MPa	1.5
Fluid temperature °C	0 to 60
Ambient temperature °C	0 to 60
Switching angle °	90
Tube used	Soft nylon tube (tube F-15**) Urethane tube (tube U-95**, NU-**)
Mounting orientation	Arbitrary

\*1: When using urethane tube (U-95\*\*, NU-\*\*) at vacuum, use an insert ring.

\*2: Lubricant is used, so oil-prohibited specification is not available.

## How to order

● Quick valve

**2 QV - 04-04 - P4**

Ⓐ Port size  
(port P) - (port A)

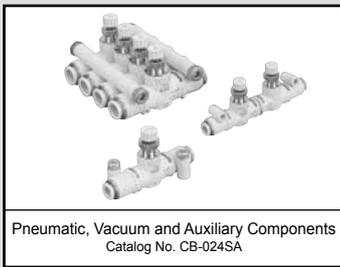
## Compatibility table by variation

	2QV
Port size	$\varnothing 4$ , $\varnothing 6$ , $\varnothing 8$ , $\varnothing 10$ , $\varnothing 12$
P4	▲

● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable

		Code	Content		
		2	2-way valve		
		Ⓐ Port size (port P) - (port A)			
		IN side - OUT side		Bracket *	
Standard	04-04	Push-in fitting $\varnothing 4$ - Push-in fitting $\varnothing 4$		2QV-P1	
	06-06	Push-in fitting $\varnothing 6$ - Push-in fitting $\varnothing 6$			
	08S-08S	Push-in fitting $\varnothing 8$ - Push-in fitting $\varnothing 8$			
	08-08	Push-in fitting $\varnothing 8$ - Push-in fitting $\varnothing 8$		2QV-P2	
	10-10	Push-in fitting $\varnothing 10$ - Push-in fitting $\varnothing 10$			
	12-12	Push-in fitting $\varnothing 12$ - Push-in fitting $\varnothing 12$			
Option	6A-04	R1/8	- Push-in fitting $\varnothing 4$	2QV-P1	
	6A-06	R1/8	- Push-in fitting $\varnothing 6$		
	8A-06	R1/4	- Push-in fitting $\varnothing 6$		
	8A-08S	R1/4	- Push-in fitting $\varnothing 8$	2QV-P2	
	10A-08	R3/8	- Push-in fitting $\varnothing 8$		
	10A-10	R3/8	- Push-in fitting $\varnothing 10$		
	15A-10	R1/2	- Push-in fitting $\varnothing 10$	2QV-P2	
	15A-12	R1/2	- Push-in fitting $\varnothing 12$		
	04-6A	Push-in fitting $\varnothing 4$	- R1/8		2QV-P1
	06-6A	Push-in fitting $\varnothing 6$	- R1/8		
	06-8A	Push-in fitting $\varnothing 6$	- R1/4		
	08S-8A	Push-in fitting $\varnothing 8$	- R1/4	2QV-P2	
	08-10A	Push-in fitting $\varnothing 8$	- R3/8		
	10-10A	Push-in fitting $\varnothing 10$	- R3/8		
	10-15A	Push-in fitting $\varnothing 10$	- R1/2	2QV-P2	
12-15A	Push-in fitting $\varnothing 12$	- R1/2			
6A-6A	R1/8	- R1/8	2QV-P1		
8A-8A	R1/4	- R1/4			
10A-10A	R3/8	- R3/8		2QV-P2	
15A-15A	R1/2	- R1/2			

\* Note that this may differ according to the body size.



Speed controller Inline with push-in fitting

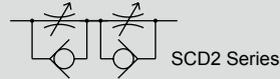
# SCL2 Series

In/out speed controller Inline with push-in fitting

# SCD2 Series

Port size:  $\varnothing 4/\varnothing 6/\varnothing 8/\varnothing 10$  (SCL2 only)

JIS symbol



## Specifications

### ● Speed controller Inline SCL2

Model No.		SCL2-04	SCL2-06	SCL2-08	SCL2-10
Compatible tube O.D.	mm	$\varnothing 4$	$\varnothing 6$	$\varnothing 8$	$\varnothing 10$
Working fluid		Compressed air			
Max. working pressure	MPa	1.0			
Min. working pressure	MPa	0.1			
Proof pressure	MPa	1.5			
Fluid temperature	$^{\circ}\text{C}$	5 to 60 (no freezing. *3)			
Ambient temperature	$^{\circ}\text{C}$	0 to 60 (no freezing)			
Weight	g	11.5	16	33	57
Dial value (needle position)		12 [15]			
Free flow	Flow rate $\ell/\text{min}$ (ANR)	130	300	550	1100
	Effective cross-sectional area $\text{mm}^2$	1.9	4.5	8	16.5
Controlled flow	Flow rate $\ell/\text{min}$ (ANR)	130 [13]	300 [13]	550	1100
	Effective cross-sectional area $\text{mm}^2$	1.9 [0.2]	4.5 [0.2]	8	16.5

### ● In/out speed controller Inline SCD2

Model No.		SCD2-04	SCD2-06	SCD2-08
Compatible tube O.D.	mm	$\varnothing 4$	$\varnothing 6$	$\varnothing 8$
Working fluid		Compressed air		
Max. working pressure	MPa	1.0		
Min. working pressure	MPa	0.1		
Proof pressure	MPa	1.5		
Fluid temperature	$^{\circ}\text{C}$	5 to 60 (no freezing. *3)		
Ambient temperature	$^{\circ}\text{C}$	0 to 60 (no freezing)		
Weight	g	21.5	29	64
Dial value (needle position)		12 [15]		
Flow rate	$\ell/\text{min}$ (ANR)	100 [13]	250 [13]	400
Effective cross-sectional area	$\text{mm}^2$	1.5 [0.2]	3.7 [0.2]	6

\*1: Flow rate is the atmospheric pressure conversion at 0.5 MPa.

\*2: Values in [ ] are for fine speed.

\*3: Freezing may occur due to adiabatic expansion depending on the air quality (dew point).

# SCL2/SCD2 Series

## Compatibility table by variation

SCL2/SCD2	
Port size	ø4, ø6, ø8, ø10
P4	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

- Speed controller Inline

**SCL2 - 04 - H44 - P4**

- In/out speed controller Inline

**SCD2 - 04 - H44 - P4**

Model No.

**A** Body size

**B** Compatible tube O.D.

Refer to the table at right for body size, compatible tube O.D., and flow characteristic combinations.

Code	Content
<b>A Body size</b>	
<b>04</b>	M5 thread equivalent
<b>06</b>	1/8 thread equivalent
<b>08</b>	1/4 thread equivalent
<b>10</b>	3/8 thread equivalent * SCL2 only
<b>B Compatible tube O.D.</b>	
<b>H44</b>	ø4
<b>H66</b>	ø6
<b>H88</b>	ø8
<b>H1010</b>	ø10 * SCL2 only

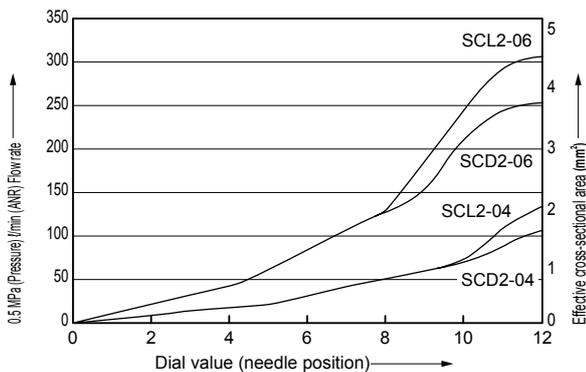
Combination of body size, compatible tube O.D., and flow characteristics

		<b>A Body size</b>			
		<b>04</b>	<b>06</b>	<b>08</b>	<b>10</b>
<b>B Compatible tube O.D.</b>	<b>H44</b>	ø4	●	□	□
	<b>H66</b>	ø6	□	●	□
	<b>H88</b>	ø8	□	□	●
	<b>H1010</b>	ø10	□	□	□

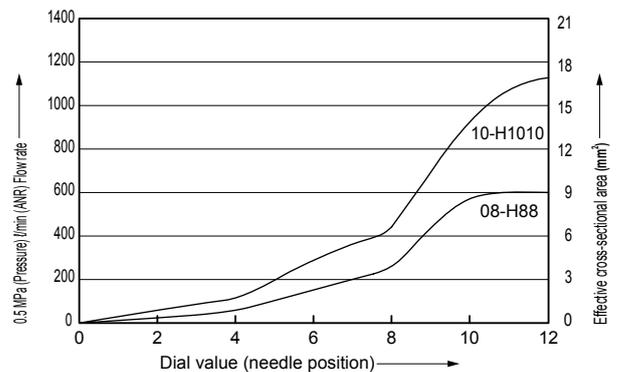
□ Not available

## Flow characteristics

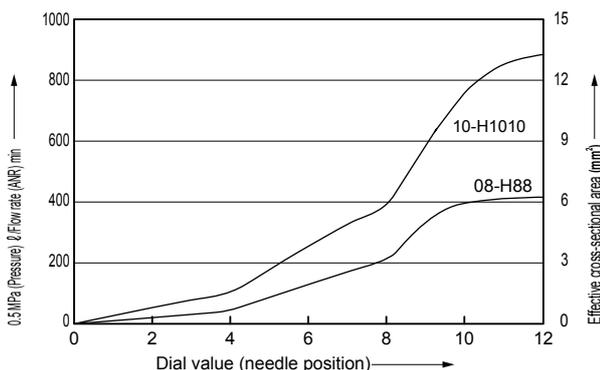
- Standard  
SCL2-04, SCL2-06, SCD2-04, SCD2-06



- Standard  
SCL2-08, SCL2-10



- Standard  
SCD2-08, SCD2-10





Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

Speed controller Elbow with push-in fitting

# SC3W Series

● Port size: M3, M5, R1/8 to R1/2

JIS symbol



(Meter-out)



(Meter-in)



## Specifications

Descriptions	SC3W																	
	SC3W-M3		SC3W-M5		SC3W-6			SC3W-8			SC3W-10				SC3W-15			
Compatible tube O.D. mm	ø4		ø4	ø6	ø4	ø6	ø8	ø6	ø8	ø10	ø6	ø8	ø10	ø12	ø10	ø12		
Working fluid	Compressed air																	
Max. working pressure MPa	1.0																	
Min. working pressure MPa	0.05																	
Proof pressure MPa	1.5																	
Fluid temperature °C	5 to 60 (no freezing. *3)																	
Ambient temperature °C	0 to 60 (no freezing)																	
Port size	M3		M5		R1/8			R1/4			R3/8				R1/2			
Weight g	5.7		8.8	9.6	25	26	27	50	51	54	63.7	75	78	81	134	138		
Dial value (needle position)	10 (14) or more		10 (16) or more		10 (15) or more			13 or more			13 or more				14 or more			
Free flow	Flow rate ℓ/min (ANR)	27(20)		87(80)		210(210)		270(270)		270	470	500	530	650	1000	1100	1500	1600
	Effective cross-sectional area mm <sup>2</sup>	0.4(0.3)		1.3(1.2)		3.2(3.2)		4.0(4.0)		4.0	7	7.5	8	10	15	16	22	24
Controlled flow	Flow rate ℓ/min (ANR)	20(5.9)		80(6.7)		190(13)		240(13)		240	430	470	470	650	930	1000	1500	1600
	Effective cross-sectional area mm <sup>2</sup>	0.3(0.08)		1.2(0.1)		2.8(0.2)		3.6(0.2)		3.6	6.5	7	7.0	10	14	15	22	24

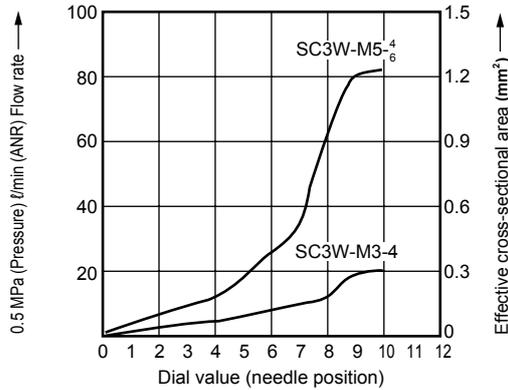
\*1: Flow rate is the atmospheric pressure conversion value at pressure 0.5 MPa.

\*2: Values in ( ) indicate low speed.

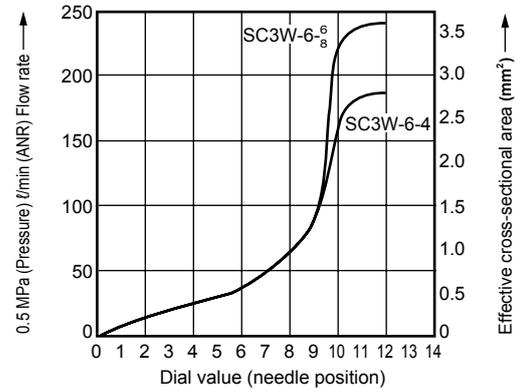
\*3: Freezing may occur due to adiabatic expansion depending on the air quality (dew point).

## Flow characteristics

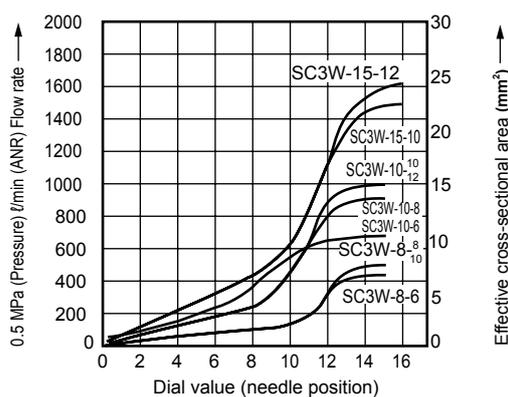
● Standard (port size M3, M5)



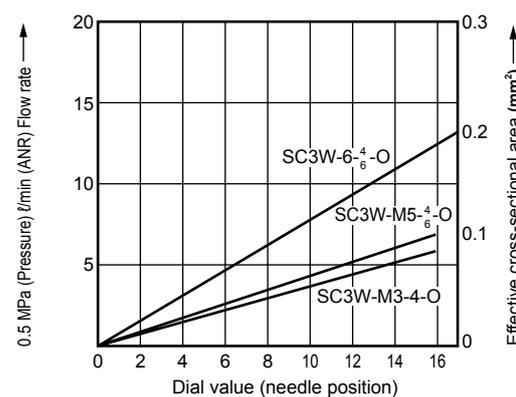
● Standard (port size 6)



● Standard (port size 8, 10, 15)



● Low speed



Speed controller

## Compatibility table by variation

	SC3W
Port size	M3, M5, R1/8, 1/4, 3/8, 1/2
P4	●

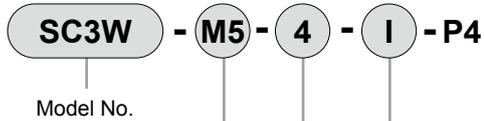
● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: The product dimensions of pipe size M5 are different from the standard SC3W.

\*2: Compatible tube O.D. 3 (ø3, 2) is not available.

\*3: Option is meter-in only.

## How to order



Ⓐ Port size

Ⓑ Compatible tube O.D.

Ⓒ Option

Code	Content						
<b>Ⓐ Port size</b>							
<b>M3</b>	M3×0.5						
<b>M5</b>	M5×0.8						
<b>6</b>	R1/8						
<b>8</b>	R1/4						
<b>10</b>	R3/8						
<b>15</b>	R1/2						
<b>Ⓑ Compatible tube O.D.</b>							
		Piping size					
		M3	M5	6	8	10	15
<b>4</b>	ø4	●	●	●	□	□	□
<b>6</b>	ø6	□	●	●	●	●	□
<b>8</b>	ø8	□	□	●	●	●	□
<b>10</b>	ø10	□	□	□	●	●	●
<b>12</b>	ø12	□	□	□	□	●	●
<b>Ⓒ Option</b>							
<b>Blank</b>	Meter-out						
<b>I</b>	Meter-in (Push ring color: black)						

□ indicates not available.

## ⚠ Precautions for model No. selection

Note: The options are listed in alphabetical order.

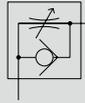


Speed controller with adjusting dial

# DSC Series

● Port size: M5, R1/8 to R1/2

JIS symbol



(Meter-out)



(Meter-in)



## Specifications

### ● Compact

Descriptions		DSC-C-M5			DSC-C-6		
Compatible tube O.D.	mm	ø4	ø6	ø4	ø6	ø8	
Port size		M5			R1/8		
Working fluid		Compressed air					
Max. working pressure	MPa	1.0					
Min. working pressure	MPa	0.05					
Proof pressure	MPa	1.5					
Fluid temperature	°C	5 to 60 (no freezing. *2)					
Ambient temperature	°C	0 to 60 (no freezing)					
Needle control range		1 to 7 rotations					
Weight	g	11.5	12	22	23	24	
Free flow	Flow rate L/min(ANR)	100		210		270	
	Effective cross-sectional area mm <sup>2</sup>	1.5		3.2		4	
Controlled flow (Standard flow rate)	Flow rate L/min(ANR)	60		160		200	
	Effective cross-sectional area mm <sup>2</sup>	0.9		2.4		3	
Controlled flow (Low flow rate)	Flow rate L/min(ANR)	20		60			
	Effective cross-sectional area mm <sup>2</sup>	0.3		0.9			
Controlled flow (Fine flow rate)	Flow rate L/min(ANR)	6.7		13		-	
	Effective cross-sectional area mm <sup>2</sup>	0.1		0.2		-	

### ● Standard

Descriptions		DSC-6			DSC-8			DSC-10				DSC-15							
Compatible tube O.D.	mm	ø4	ø6	ø8	ø6	ø8	ø10	ø6	ø8	ø10	ø12	ø10	ø12						
Port size		R1/8			R1/4			R3/8				R1/2							
Working fluid		Compressed air																	
Max. working pressure	MPa	1.0																	
Min. working pressure	MPa	0.05																	
Proof pressure	MPa	1.5																	
Fluid temperature	°C	5 to 60 (no freezing. *2)																	
Ambient temperature	°C	0 to 60 (no freezing)																	
Needle control range		1 to 10 rotations																	
Weight	g	33	34	35	45	46	48	60	61	64	65	95	97						
Free flow	Flow rate L/min(ANR)	210		270		470		530		670		1000		1070		1470		1600	
	Effective cross-sectional area mm <sup>2</sup>	3.2		4		7		8		10		15		16		22		24	
Controlled flow (Standard flow rate)	Flow rate L/min(ANR)	160		200		320		400		400		700		800		1120		1200	
	Effective cross-sectional area mm <sup>2</sup>	2.4		3		5		6		6		10.5		12		17		17.5	
Controlled flow (Low flow rate)	Flow rate L/min(ANR)	60			130			270				400							
	Effective cross-sectional area mm <sup>2</sup>	0.9			2			4				6							

\*1: Flow rate is the atmospheric pressure conversion value at pressure 0.5 MPa.

\*2: Freezing may occur due to adiabatic expansion depending on the air quality (dew point).

## How to order

**DSC** - **C** - **6** - **6** - **I** **L** - **P4**

**A** Product size

**B** Port size

**C** Compatible tube O.D.

**D** Control method

**E** Flow rate

Code	Content
<b>A Product size</b>	
<b>Blank</b>	Standard
<b>-C</b>	Compact
<b>B Port size</b>	
<b>M5</b>	M5
<b>6</b>	R1/8
<b>8</b>	R1/4
<b>10</b>	R3/8
<b>15</b>	R1/2
<b>C Compatible tube O.D.</b>	
<b>4</b>	ø4
<b>6</b>	ø6
<b>8</b>	ø8
<b>10</b>	ø10
<b>12</b>	ø12
<b>D Control method</b>	
<b>Blank</b>	Meter-out
<b>I</b>	Meter-in (Push ring color: black)
<b>E Flow rate</b>	
<b>Blank</b>	Standard flow rate
<b>L</b>	Low flow rate
<b>F</b>	Fine flow rate (compact only)

### Port size - compatible tube O.D. - flow rate combination

Product size	Compact		Standard			
	M5	R1/8	R1/8	R1/4	R3/8	R1/2
ø4	◎	◎	○			
ø6	◎	◎	○	○	○	
ø8		○	○	○	○	
ø10				○	○	○
ø12					○	○

○: Flow rate "F" (fine flow rate) cannot be selected

◎: Flow rate "F" (fine flow rate) can be selected

### Compatibility table by variation

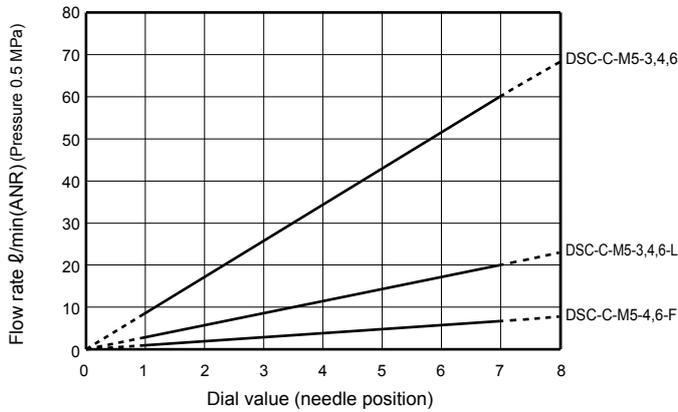
	DSC
Port size	M5, R1/8, 1/4, 3/8, 1/2
P4	●

● : Standard ○ : Made to order ▲ : Contact CKD ◻ : Not applicable

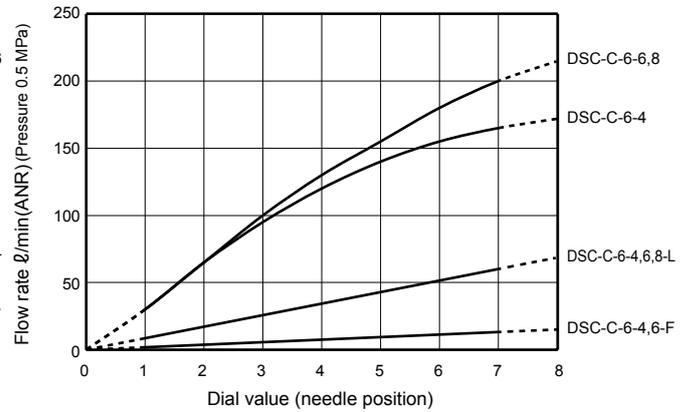
## Flow characteristics

### ● Compact

#### ● DSC-C-M5-\*

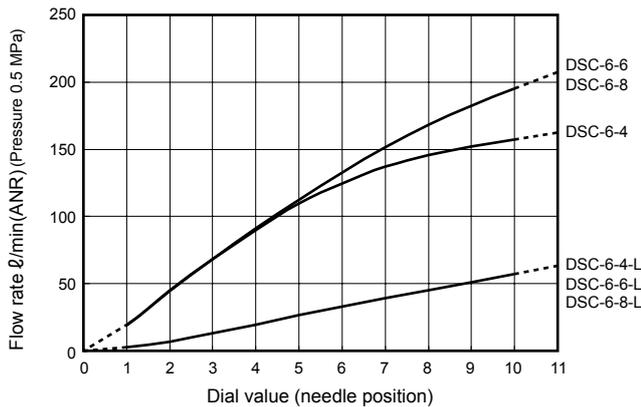


#### ● DSC-C-6-\*

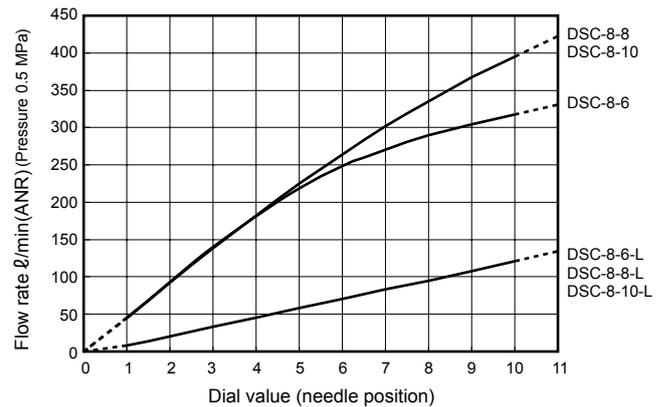


### ● Standard

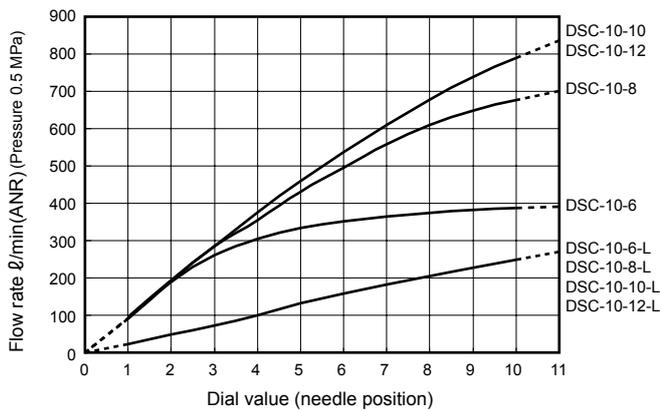
#### ● DSC-6-\*



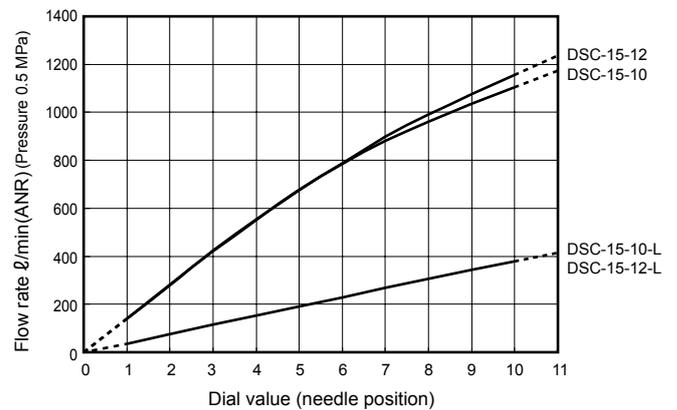
#### ● DSC-8-\*



#### ● DSC-10-\*



#### ● DSC-15-\*



Note: The flow characteristics may differ depending on the piping conditions around the unit and the temperature change.

Speed controller



PP (polypropylene resin) Speed controller, elbow

# SC3F-P4 Series

- For air drive components
- Port size: M3, M5, R1/8 to R1/2

JIS symbol



P4 compliant  
as standard



## Specifications

Model No.	SC3F-P4																														
	SC3F-M3			SC3F-M5			SC3F-6			SC3F-8			SC3F-10			SC3F-15															
Compatible tube O.D.	mm	ø4			ø4			ø6			ø4			ø6			ø8														
Working fluid		Air																													
Max. working pressure	MPa	1.0 (*1)											0.9 (*1)																		
Min. working pressure	MPa	0.1																													
Guaranteed proof pressure	MPa	1.5 (*2)											1.35 (*2)																		
Operating ambient temperature range	°C	0 to 60 (no freezing) (*3)																													
Port size	Rc	M3			M5			R1/8			R1/4			R3/8			R1/2														
Product weight	g	7.8		7		8		18		19		22		38		41		44		67		69		71		74		106		109	
Dial value (needle position)		7 or more						12 or more						13 or more																	

\*1: The max. working pressure is the value at 20°C. When using in other temperature ranges, refer to the "Relation of operating ambient temperature and max. working pressure" in the single unit catalog.

\*2: The proof pressure is the value at 20°C. The proof pressure is 1.5 times the maximum working pressure.

\*3: Freezing may occur by adiabatic expansion depending on the air quality (dew point).

## Flow rate and effective cross-sectional area

Model No.	SC3F-P4																						
	SC3F-M3			SC3F-M5			SC3F-6			SC3F-8			SC3F-10			SC3F-15							
Compatible tube O.D.	mm	ø4			ø4			ø6			ø4			ø6			ø8						
Free flow	Flow rate	ℓ/min(ANR)		40		55		200		230		390		400		600		800		840		1380	
	Effective cross-sectional area	mm <sup>2</sup>		0.6		0.8		3		3.4		5.8		5.9		8.8		12		12.4		20.5	
Controlled flow	Flow rate	ℓ/min(ANR)		65		70		150		270		550		850		920		1450		1600			
	Effective cross-sectional area	mm <sup>2</sup>		0.95		1		2.2		4		8		12.5		13.5		21.5		23.5			

\*1: Flow rate is the atmospheric pressure conversion value at pressure 0.5 MPa.

\*2: The effective cross-sectional area lists the value converted from the flow rate.

## How to order

**SC3F - 8 - 8 - I - P4**

Model No.

Ⓐ Piping size

Ⓑ Compatible tube O.D.

Ⓒ Option

Code	Content
<b>Ⓐ Piping size</b>	
<b>M3</b>	M3×0.5
<b>M5</b>	M5×0.8
<b>6</b>	R1/8
<b>8</b>	R1/4
<b>10</b>	R3/8
<b>15</b>	R1/2

		Piping size					
		M3	M5	6	8	10	15
<b>4</b>	ø4	●	●	●			
<b>6</b>	ø6		●	●	●	●	
<b>8</b>	ø8			●	●	●	
<b>10</b>	ø10				●	●	●
<b>12</b>	ø12					●	●

<b>Ⓒ Option</b>	
<b>Blank</b>	Meter-out control
<b>I</b>	Meter-in control (made to order)

indicates not available.

## Control method

	Meter-out control	Meter-in control
JIS symbol		
	Male thread side	Male thread side



PP (polypropylene resin) Speed controller Line type

# SCLF-P4 Series

- For air drive components
- Port size  $\varnothing 4$ ,  $\varnothing 6$ ,  $\varnothing 8$ ,  $\varnothing 10$ ,  $\varnothing 12$



P4 compliant as standard



## Specifications

Model No.	SCLF-H44S-P4		SCLF-H66S-P4		SCLF-H88S-P4		SCLF-H1010S-P4		SCLF-H1212S-P4		
Descriptions											
Applicable tube diameter	mm	$\varnothing 4$	$\varnothing 6$	$\varnothing 8$	$\varnothing 10$	$\varnothing 12$					
Working fluid	Air										
Max. working pressure	MPa	0.9 (*1)									
Min. working pressure	MPa	0.05									
Guaranteed proof pressure	MPa	1.35 (*2)									
Operating ambient temperature range	$^{\circ}\text{C}$	0 to 60 (no freezing) (*3)									
Product weight	g	10	15	26	44	62					
Dial value (needle position)		10 or more		11 or more		8 or more					

\*1: The max. working pressure is the value at 20 $^{\circ}\text{C}$ . When using in other temperature ranges, refer to the "Relation of operating ambient temperature and max. working pressure" given below.

\*2: The proof pressure is the value at 20 $^{\circ}\text{C}$ . The proof pressure is 1.5 times the maximum working pressure.

\*3: Freezing may occur by adiabatic expansion depending on the air quality (dew point).

## Flow rate and effective cross-sectional area

Model No.	SCLF-P4					
	SCLF-H44S-P4	SCLF-H66S-P4	SCLF-H88S-P4	SCLF-H1010S-P4	SCLF-H1212S-P4	
Compatible tube O.D.	mm	$\varnothing 4$	$\varnothing 6$	$\varnothing 8$	$\varnothing 10$	$\varnothing 12$
Free flow	Flow rate $\ell/\text{min}(\text{ANR})$	145	310	50	950	1380
	Effective cross-sectional area $\text{mm}^2$	2.1	4.6	8.2	14	20.5
Controlled flow	Flow rate $\ell/\text{min}(\text{ANR})$	95	250	410	880	1300
	Effective cross-sectional area $\text{mm}^2$	1.4	3.7	6.0	13	19

\*1: Flow rate is the atmospheric pressure conversion value at pressure 0.5 MPa.

\*2: The effective cross-sectional area lists the value converted from the flow rate.

## How to order

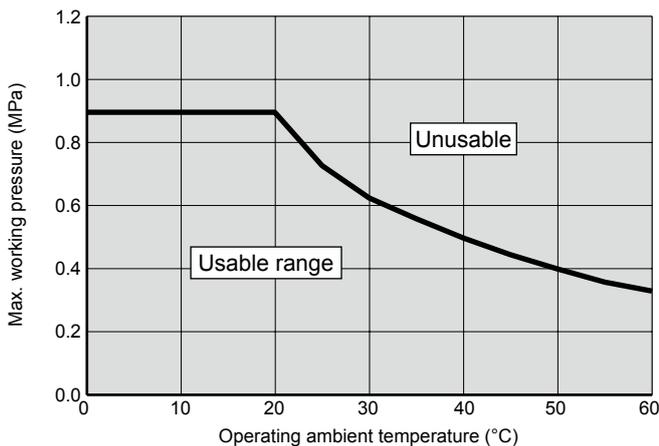
**SCLF - H66S - P4**

Union made of PP  
Straight  
Speed controller

**A** Compatible tube O.D.

Code	Content
<b>A</b> Compatible tube O.D.	
H44	$\varnothing 4$
H66	$\varnothing 6$
H88	$\varnothing 8$
H1010	$\varnothing 10$
H1212	$\varnothing 12$

## Relation of operating ambient temperature and max. working pressure





Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

Block valve

# FPV Series

● Port size: (Rc or R) 1/4 to 1/2

JIS symbol

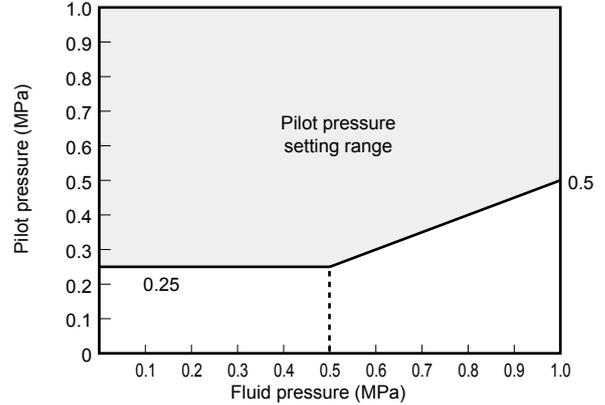


## Features

- Compact valve ideal for position locking dropping and for cylinder braking.
- Compact and lightweight  
75% smaller and 50% lighter on average compared with our conventional models.
- Variety of bore sizes available  
Series variations from M5 to R1/2 bore sizes enable direct cylinder installation.

## Pilot pressure

Set pilot air pressure within the specified range.



## Specifications

Descriptions	FPV-M5	FPV-6A			FPV-8A			FPV-10A			FPV-15A		
Port size	M5	R1/8			R1/4			R3/8			R1/2		
Main side compatible tube O.D.	ø6	ø6	ø8	Rc1/8	ø6	ø8	Rc1/4	ø8	ø10	Rc3/8	ø10	ø12	Rc1/2
Pilot side compatible tube O.D.		ø4		M5	ø4		M5	ø4		Rc1/8	ø4		Rc1/8
Working fluid	Compressed air												
Max. working pressure MPa	1.0												
Min. working pressure MPa	0												
Proof pressure MPa	1.5												
Pilot pressure MPa	Refer to the above table.												
Fluid temperature °C	5 to 60												
Ambient temperature °C	0 to 60 (no freezing)												
Weight g	28	26	36	50	51	68	90	93	120	143	145	192	
Effective cross-sectional area mm <sup>2</sup>	1.3	5			10			17			27		

## How to order

**FPV - 6A - 06 - FL No.**

A Port size

B Compatible tube O.D.

A Port size		A Piping port size				
M5	M5	M5	6A	8A	10A	15A
6A	R1/8					
8A	R1/4					
10A	R3/8					
15A	R1/2					

B Compatible tube O.D.		A Piping port size				
		M5	6A	8A	10A	15A
06	ø6	●	●	●		
08	ø8		●	●	●	
10	ø10				●	●
12	ø12					●
6A	Rc1/8		●			
8A	Rc1/4			●		
10A	Rc3/8				●	
15A	Rc1/2					●

Not available

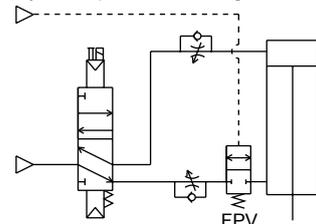
Note: Made to order. Contact CKD for details.

## Compatibility table by variation

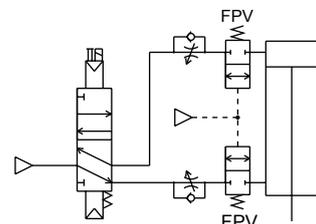
	FPV	
Port size	M5, R1/8, 1/4, 3/8, 1/2	● : Standard ○ : Made to order ▲ : Contact CKD ■ : Not applicable
P4	▲	

## Applications

- Used for cylinder position locking circuit



- Used for cylinder braking circuit



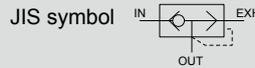


Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

Quick exhaust valve Line type

# QEL Series

- Piping bore size:  $\phi 4/\phi 6$



## Features

- Compact and space saving inline Atmosphere release with built-in  $\phi 4/\phi 6$  push-in fitting and type with exhaust port fitting are available
- Standard ozone-resistant materials  
Ozone-proof materials for degradation prevention are used as standard for the valving element
- Ecological products  
All substances which adversely affect the global environment have been eliminated from the materials in RoHS Directive compliant products

## Specifications

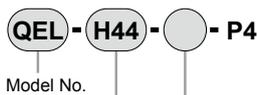
Model No.		QEL-H44	QEL-H66
Descriptions			
Working fluid		Compressed air	
Max. working pressure	MPa	0.7	
Min. working pressure	MPa	0.1	
Min. working pressure	MPa	0.05	
Proof pressure (at room temperature)	MPa	1.35	
Working ambient temperature °C		5 to 60 (no freezing)	
Port size	IN, OUT	$\phi 4$	$\phi 6$
	EXH	$\phi 4$	$\phi 6$
Product weight	g	5.2	7.6
Mounting orientation		Unrestricted	
Effective cross-sectional area	IN→OUT mm <sup>2</sup>	1.8	4
	OUT→EXH mm <sup>2</sup>	1.8	4

## Compatibility table by variation

	QEL
Port size	$\phi 4, \phi 6$
P4	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable  
\*1: Applicable only for type with exhaust port fitting.

## How to order



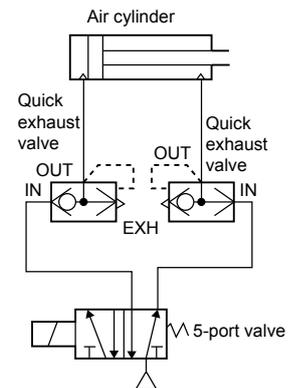
A Compatible tube O.D.

B Option

Code	Content
<b>A</b>	<b>Compatible tube O.D</b>
H44	$\phi 4$
H66	$\phi 6$
<b>B</b>	<b>Option</b>
Blank	Type with exhaust port fitting

Note: Made to order. Contact CKD for details.

## Applications



Other auxiliary valves

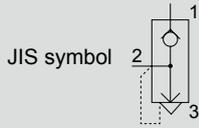


Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

Quick exhaust valve

# QEV2 Series

- Port size: Rc1/8 to Rc1



P4 compliant  
as standard



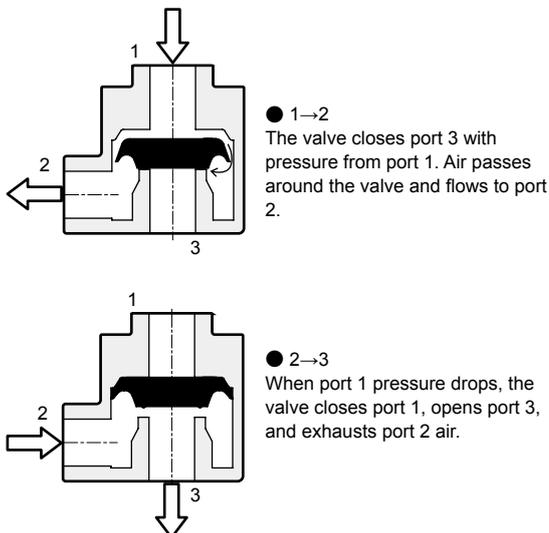
## Features

- Large flow rate design realizing outstanding exhaust
- Variety of bore sizes available  
Series includes piping bore sizes Rc1/8 to Rc1
- Wide range of options
  - Fluoro rubber specifications available as options
  - Mounting bracket available (small bore)
- Eco-friendly product
  - Eco-friendly design is free of lead and hexavalent chrome
  - Paint-free
  - Waste sorting is simplified

## Specifications

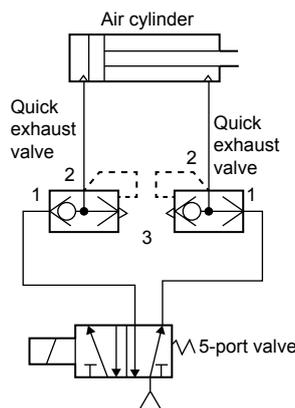
Model No.	QEV2-6	QEV2-8	QEV2-10	QEV2-15	QEV2-20	QEV2-25	
Descriptions							
Working fluid	Compressed air						
Max. working pressure MPa	1.0						
Min. working pressure MPa	0.05						
Proof pressure MPa	1.5						
Fluid temperature °C	5 to 60						
Ambient temperature °C	0 to 60 (no freezing)						
Port size	1, 2	1/8	1/4	3/8	1/2	3/4	1
	Rc 3	1/4	1/4	1/2	1/2	1	1
Weight g	80	78	250	250	710	660	
Mounting bracket weight g	15		-				
Mounting orientation	Unrestricted						
Effective cross-sectional area mm <sup>2</sup>	1→2	25	35	90	105	205	275
	2→3	30	40	100	115	280	330

## Operational explanation

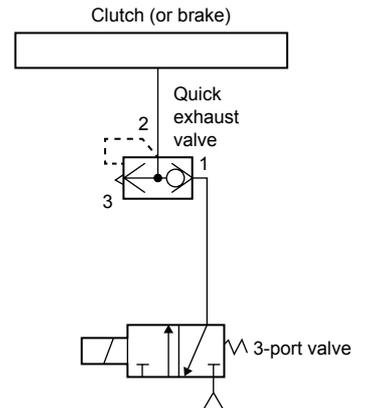


## Applications

① Use to increase exhaust speed of air cylinder



② Use to increase exhaust speed of clutch (or brake)



## Compatibility table by variation

QEV2	
Port size	Rc1/8 to 1
P4	Standard compliance

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

● Quick exhaust valve

QEV2 - 6 - A P

Model No.

Ⓐ Port size

Ⓑ Option

Ⓒ Accessory

Code	Content
<b>Ⓐ Port size</b>	
6	Rc1/8
8	Rc1/4
10	Rc3/8
15	Rc1/2
20	Rc3/4
25	Rc1
<b>Ⓑ Option</b>	
Blank	No option
A	Fluoro rubber specifications
<b>Ⓒ Accessory</b>	
Blank	No
P	Mounting bracket attached

\*1: Mounting bracket is attached for QEV2-6 and QEV2-8 only.

\*2: P4 compliant as standard.



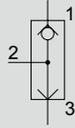
Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

## Shuttle valve

# SHV2 Series

- Port size: Rc1/8 to Rc1

JIS symbol



P4 compliant  
as standard



## Features

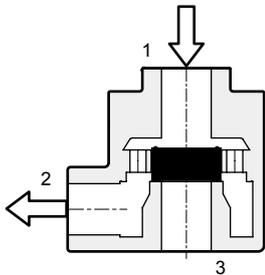
- **Variety of bore sizes available**  
Series includes piping bore sizes Rc1/8 to Rc1
- **Wide range of options**
  - Fluoro rubber specifications available as options
  - Mounting bracket available (small bore)
- **Eco-friendly product**
  - Eco-friendly design is free of lead and hexavalent chrome
  - Paint-free
  - Waste sorting is simplified

## Specifications

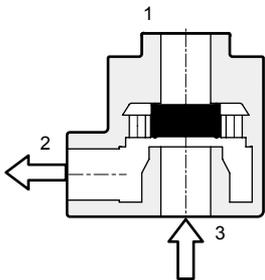
Model No.	SHV2-6	SHV2-8	SHV2-10	SHV2-15	SHV2-20	SHV2-25	
<b>Descriptions</b>							
Working fluid	MPa Compressed air						
Max. working pressure	MPa 1.0						
Min. working pressure	MPa 0.05						
Min. working differential pressure	MPa 0.05						
Proof pressure	°C 1.5						
Fluid temperature	°C 5 to 60						
Ambient temperature	0 to 60 (no freezing)						
Port size	Rc 1/8	Rc 1/4	Rc 3/8	Rc 1/2	Rc 3/4	Rc 1	
Weight	g 86	g 82	g 270	g 270	g 760	g 700	
Mounting bracket weight	g 15		-				
Mounting orientation	Unrestricted						
Effective cross-sectional area	mm <sup>2</sup> 1→2	20	28	90	105	205	245
	mm <sup>2</sup> 3→2	22	32	95	115	210	250
Min. required flow rate *1	l/min 20		l/min 30		l/min 100		l/min 150

\*1: The valve may not change completely if the flow rate is less than this value.

## Operational explanation



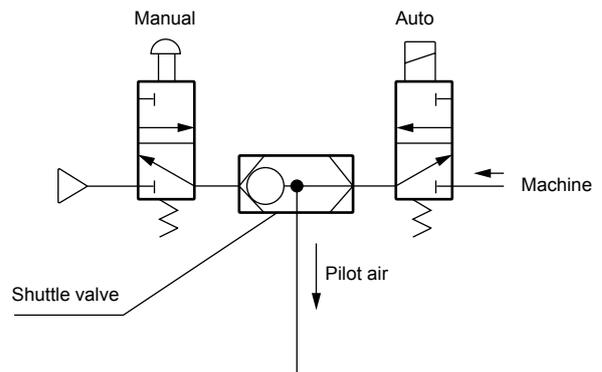
- 1→2  
The valve closes port 3 with pressure from port 1. Air flows to port 2.



- 3→2  
The valve closes port 1 with pressure from port 3. Air flows to port 2.

## Applications

- ① Switching manual/auto



## Compatibility table by variation

	SHV2
Port size	Rc1/8 to 1
P4	Standard compliance

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable  
 Note: Select a fluoro rubber specification

## How to order

● Shuttle valve



Model No.

Ⓐ Port size

Ⓑ Option

Ⓒ Accessory

Code	Content
<b>Ⓐ Port size</b>	
<b>6</b>	Rc1/8
<b>8</b>	Rc1/4
<b>10</b>	Rc3/8
<b>15</b>	Rc1/2
<b>20</b>	Rc3/4
<b>25</b>	Rc1
<b>Ⓑ Option</b>	
<b>A</b>	Fluoro rubber specifications
<b>Ⓒ Accessory</b>	
<b>Blank</b>	No
<b>P</b>	Mounting bracket attached

\*1: Mounting bracket is attached for SHV2-6 and SHV2-8 only.

\*2: P4 compliant as standard.



Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

Check valve

# CHV2 Series

Completely prevents reverse flow of fluid such as compressed air. Ten types of wide variations.

● Port size: Rc<sup>1</sup>/<sub>8</sub> to Rc1 <sup>1</sup>/<sub>2</sub>

JIS symbol



P4 compliant  
as standard



## Features

- Ample variations  
Series are available for piping port sizes Rc<sup>1</sup>/<sub>8</sub> to Rc1 <sup>1</sup>/<sub>2</sub>.
- Compact and lightweight
- Wide range of options  
Fluoro rubber specifications and oil-prohibited specifications available as options. An installation bracket is available for small bore sizes.
- Neat shape
- Eco-friendly product  
Products can be sorted and processed for recycling.

## Specifications

Model No.	CHV2-6	CHV2-8-J	CHV2-8	CHV2-10-J	CHV2-10	CHV2-15	CHV2-20	CHV2-25	CHV2-32	CHV2-40
Working fluid	Compressed air									
Max. working pressure MPa	1									
Min. working pressure MPa	0.03									
Proof pressure MPa	1.5									
Cracking pressure MPa	0.02									
Fluid temperature °C	5 to 60									
Ambient temperature °C	0 to 60 (no freezing)									
Port size Rc	1/8	1/4		3/8		1/2	3/4	1	1 1/4	1 1/2
Weight g	47	81		140		265		875		
Mounting plate weight g	10	15		-						
Effective cross-sectional area mm <sup>2</sup>	28	55	60	94	110	220	250	700	730	

## How to order



Model No.

A Port size

Compact  
small flow rate  
\*1

\*1: Small flow compact (J) is only for port size Rc<sup>1</sup>/<sub>4</sub> (8) and Rc<sup>3</sup>/<sub>8</sub> (10).

\*2: The options are listed in alphabetical order. (AP8)

\*3: Mounting plate is attached for CHV2-6, CHV2-8-J, CHV2-8 and CHV2-10-J only.

\*4: P4 compliant as standard.

B Option  
\*2

C Accessory  
\*3

Code	Content
<b>A Port size</b>	
6	Rc <sup>1</sup> / <sub>8</sub>
8	Rc <sup>1</sup> / <sub>4</sub>
10	Rc <sup>3</sup> / <sub>8</sub>
15	Rc <sup>1</sup> / <sub>2</sub>
20	Rc <sup>3</sup> / <sub>4</sub>
25	Rc1
32	Rc1 1/4
40	Rc1 1/2
<b>B Option</b>	
A	Fluoro rubber specifications
<b>C Accessory</b>	
Blank	No
P	With mounting plate

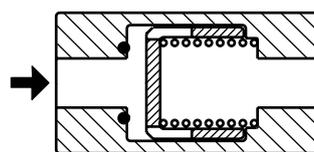
## Compatibility table by variation

	CHV2
Port size	Rc <sup>1</sup> / <sub>8</sub> to 1 1/2
P4	Standard compliance

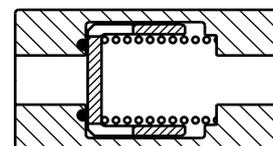
Note: Select a fluoro rubber specification

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## Operational principle



If pressurized in the direction of the arrow on the side body, the valve fully opens and the flow turns to free flow.



If pressurized in the reverse direction of arrow on the side body, the valve closes and flow is interrupted.



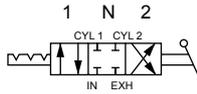
# Manual selector valve HMV/HSV Series



## JIS symbol

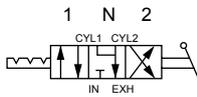
- HMVC2, HSVC2  
(All ports closed)

Switching position



- HMVO2, HSVO2  
(ABR connection)

Switching position



## Common specifications

Descriptions	HMV <sub>02</sub>		HSV <sub>02</sub>			
	Valve and operation	Rotary sliding valve				
Working fluid	Compressed air					
Max. working pressure	MPa	0.97				
Min. working pressure	MPa	0				
Proof pressure	MPa	1.5				
Ambient temperature	°C	5 to 50				
Fluid temperature	°C	5 to 50				
Lubrication	Not required					
Degree of protection	Dust-proof					
Operating angle	°					
Port size	Rc	1/4	1/4	3/8	1/2	3/4
Weight	kg	0.7	2.0	1.9	1.9	1.8

## Flow characteristics

Model No.	Port size Rc	IN→CYL1/CYL2		CYL1/CYL2→EXH	
		C[dm <sup>3</sup> /(s·bar)]	b	C[dm <sup>3</sup> /(s·bar)]	b
HMV <sub>02</sub>	1/4	1.5	0.31	1.6	0.28
HSV <sub>02</sub>	1/4	7.2	0.74	7.2	0.73
	3/8	10.2	0.32	10.1	0.34
	1/2	10.0	0.32	10.2	0.33
	3/4	10.3	0.36	10.2	0.36

\*1: Effective cross-sectional area S and sonic conductance C are converted as  $S \approx 5.0 \times C$ .

## How to order

- Miniature

HMV C 2 - 8 - 4 H - P4

- Standard

HSV C 2 - 10 - 4 H - P4

A Model No.

B Solenoid position

C Port size

D Piping

## Compatibility table by variation

	HMV	HSV
Port size	Rc1/4	Rc1/4, 3/8, 1/2, 3/4
P4		▲

\*1: The handle and handle head have non-standard surface treatment.

\*2: Made to order. Contact CKD for details.

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

		A Model No.	
		HMV	HSV
Code	Content		
B Solenoid position			
C	3-position all ports closed	●	●
O	3-position ABR connection	●	●
C Port size			
8	Rc1/4	●	●
10	Rc3/8	□	●
15	Rc1/2	□	●
20	Rc3/4 (vertical piping not available.)	□	●
D Piping			
H	Side piping	●	●
V	Vertical piping (not compatible with a port size of Rc3/4.)	●	●

\*: Zinc alloy die-casting (surface treatment: trivalent chromate) is used in the body.

Other auxiliary valves



Miniature fitting

# FTS4/FPL Series

● Port size: M3~1/8



## Specifications

Descriptions	F
Working fluid	Compressed air
Max. working pressure MPa	0.7 or less
Ambient/fluid temperatures °C	-5 to 60 (no freezing)
Tube used	Soft nylon tube (model No. FH-3224, F-1504, F-1506) Urethane tube (model No. U-9504, U-9506) Note

Note: Use urethane tube within 0 to 60°C.

(Refer to page 247 for tube dimensions and working pressure.)

## Compatibility table by variation

	FTS4	FPL
Port size	M3	M5
P4	▲	▲

● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable

Note: M3 gasket dimensions are different from the standard dimensions.

## How to order

• Straight, compatible tube O.D.  $\varnothing 3.2$ ,  $\varnothing 4$  port size M3

**FTS4** – **M3** – **P4**

• Plug, port size M5

**FPL** – **M5** – **P4**

\*1: Refer to "Pneumatic, Vacuum and Auxiliary Components" (catalog No. CB-024SA) for details on model combinations.

\*2: Sales unit is 10 pcs./bag.

Sales unit of each model is 10 pcs./1 bag.

\*3: Made to order. Contact CKD for details.



Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

Fitting, stainless steel series

# ZW Series

- Port size: M5 to R1/2
- Compatible tube:  $\varnothing 4$  to  $\varnothing 12$



## Specifications

Descriptions	ZW
Working fluid	Compressed air
Max. working pressure MPa	1.0
Negative pressure kPa	-100 *2
Ambient temperature °C	-10 to 60 (no freezing)
Tube used	Soft nylon tube (F-15**)
	Urethane tube (U-92**, U-95**, NU-**) *1

\*1: Refer to "Pneumatic, Vacuum and Auxiliary Components" (catalog No. CB-024SA) for tube dimensions, ambient temperature and working pressure.

\*2: Use an insert ring when using urethane tube (U-92\*\*, U-95\*\*, NU-\*\*) under vacuum pressure.  
(Made to order. Contact CKD for details.)

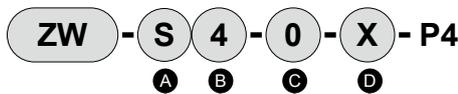
## Compatibility table by variation

Port size	ZW
Port size	$\varnothing 4$ , $\varnothing 6$ , $\varnothing 8$ , $\varnothing 10$ , $\varnothing 12$
P4	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

\* Refer to Pneumatic, Vacuum and Auxiliary Components (CB-024SA) for model combinations.



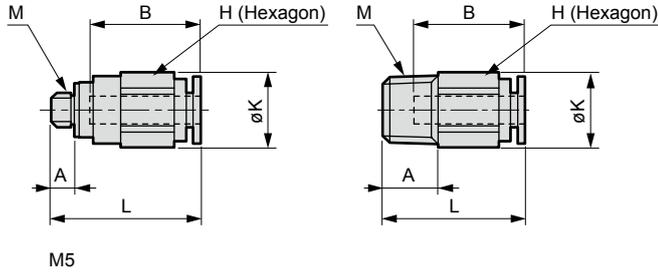
A Shape		B Compatible tube O.D.		C Port size		D Other combinations	
S	Straight	4	$\varnothing 4$	M5	M5×0.8	D	D type
L	Elbow	6	$\varnothing 6$	6	R1/8	X	Bulkhead
T	Tee	8	$\varnothing 8$	8	R1/4	Note: Sales unit is one piece.	
TR	Tetrapod	10	$\varnothing 10$	10	R3/8		
Y	Y tee	12	$\varnothing 12$	15	R1/2		
FY	FY	44	$\varnothing 4/\varnothing 4$	0	No thread		
WY	Double Y	46	$\varnothing 4/\varnothing 6$	4P	Plug for $\varnothing 4$		
C	Cap	48	$\varnothing 4/\varnothing 8$	6P	Plug for $\varnothing 6$		
MF	Manifold	64	$\varnothing 6/\varnothing 4$	8P	Plug for $\varnothing 8$		
		66	$\varnothing 6/\varnothing 6$	10P	Plug for $\varnothing 10$		
		68	$\varnothing 6/\varnothing 8$	12P	Plug for $\varnothing 12$		
		610	$\varnothing 6/\varnothing 10$				
		86	$\varnothing 8/\varnothing 6$				
		88	$\varnothing 8/\varnothing 8$				
		810	$\varnothing 8/\varnothing 10$				
		108	$\varnothing 10/\varnothing 8$				
		1010	$\varnothing 10/\varnothing 10$				
		1012	$\varnothing 10/\varnothing 12$				
		1210	$\varnothing 12/\varnothing 10$				
		1212	$\varnothing 12/\varnothing 12$				

Fittings/  
tubes

## Dimensions: Single straight/bulkhead/straight/different diameter straight

### Single straight

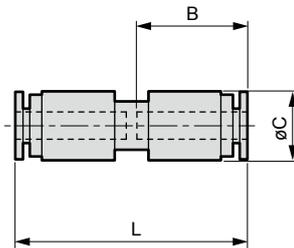
● ZW-S□-□-P4



Model No.	Compatible tube O.D. ø	M	H	K	L	A	B	Min. bore size	Eff. x-sectional area mm <sup>2</sup>
ZW-S 4-M5-P4	4	M5×0.8	10	11	21.5	3.4	16	2.5	4
ZW-S 4- 6-P4		R1/8	10	11	20.5	8	16	2.5	4
ZW-S 4- 8-P4		R1/4	14	15.8	19.5	11	16	2.5	4
ZW-S 6-M5-P4	6	M5×0.8	12	13.5	23	3.4	17.5	2.5	4.4
ZW-S 6- 6-P4		R1/8	12	13.5	23	8	17.5	4	10.3
ZW-S 6- 8-P4		R1/4	14	15.8	23.5	11	17.5	4	10.3
ZW-S 6-10-P4	R3/8	17	19.1	21.5	12	17.5	4	10.3	
ZW-S 8- 6-P4	8	R1/8	14	15.8	28	8	19	5	17.5
ZW-S 8- 8-P4		R1/4	14	15.8	27	11	19	6	22.4
ZW-S 8-10-P4		R3/8	17	19.1	22.5	12	19	6	22.4
ZW-S10- 6-P4	10	R1/8	17	19.1	31	8	21.5	5	17.5
ZW-S10- 8-P4		R1/4	17	19.1	32.5	11	21.5	8	30.5
ZW-S10-10-P4		R3/8	17	19.1	28.5	12	21.5	8	30.5
ZW-S10-15-P4	R1/2	22	24	26.5	15	21.5	8	30.5	
ZW-S12- 8-P4	12	R1/4	19	21.4	35.5	11	23	8	35.5
ZW-S12-10-P4		R3/8	19	21.4	30.5	12	23	10	40
ZW-S12-15-P4		R1/2	22	24	29.5	15	23	10	40

### Straight

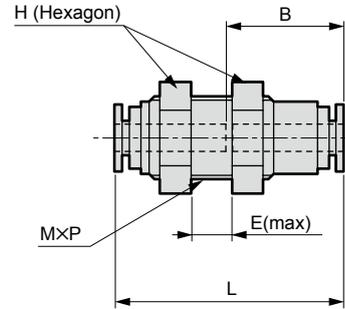
● ZW-S□-0-P4



Model No.	Compatible tube O.D. ø	L	B	C	Min. bore size	Eff. x-sectional area mm <sup>2</sup>
ZW-S 4-0-P4	4	33.5	16	10	2.5	4
ZW-S 6-0-P4	6	36.5	17.5	12.5	4	10
ZW-S 8-0-P4	8	39.5	19	14.5	6	22
ZW-S10-0-P4	10	45	21.5	17.5	8	30
ZW-S12-0-P4	12	47.5	23	20	10	35

### Bulkhead

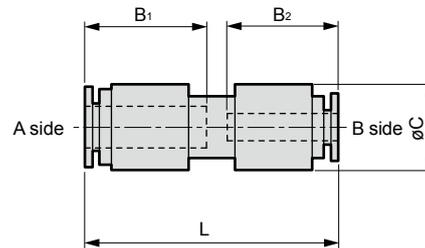
● ZW-S□-□-X-P4



Model No.	Compatible tube O.D. ø	H	L	B	E	MXP	Mounting hole diameter	Min. bore size	Eff. x-sectional area mm <sup>2</sup>
ZW-S 4-0-X-P4	4	14	33	16	7.5	M12×1	13	2.5	4
ZW-S 6-0-X-P4	6	17	36	17.5	9.5	M14×1	15	4	10
ZW-S 8-0-X-P4	8	19	39	19	12.5	M16×1	17	6	22
ZW-S10-0-X-P4	10	23	44.5	21.5	18	M20×1	21	8	30
ZW-S12-0-X-P4	12	26	47	23	20.5	M22×1	23	9	35

### Different diameter straight

● ZW-S□-0-P4

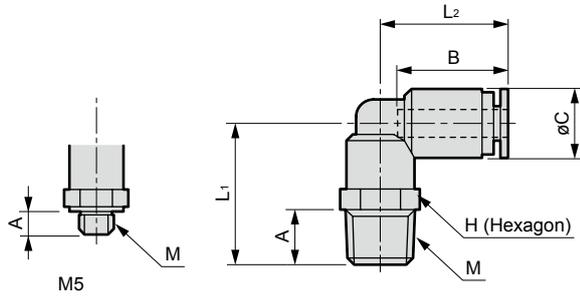


Model No.	Compatible tube O.D. ø		L	B <sub>1</sub>	B <sub>2</sub>	C	Min. bore size	Eff. x-sectional area mm <sup>2</sup>
	A side	B side						
ZW-S 46-0-P4	6	4	36.5	17.5	16	12.5	2.5	4
ZW-S 68-0-P4	8	6	39.5	19	17.5	14.5	4	10
ZW-S 810-0-P4	10	8	45	21.5	19	17.5	6	22
ZW-S1012-0-P4	12	10	47.5	23	21.5	20	8	30

## Dimensions: Single elbow/elbow/double tee/D tee

### Single elbow

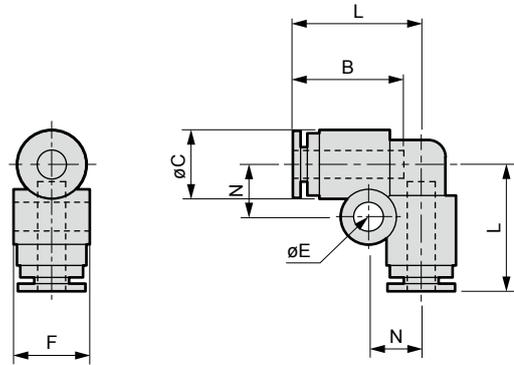
● ZW-L□-□-P4



Model No.	Compatible tube O.D. ø	M	H	L <sub>1</sub>	L <sub>2</sub>	A	B	C	Min. bore size	Eff. x-sectional area mm <sup>2</sup>
ZW-L 4-M5-P4	4	M5×0.8	8	15	18	3.4	16	10	2.5	3.2
ZW-L 4- 6-P4		R1/8	10	20.5	18.5	8	16	10	2.5	3.2
ZW-L 4- 8-P4		R1/4	14	24	18.5	11	16	10	2.5	3.2
ZW-L 6-M5-P4	6	M5×0.8	10	15	20	3.4	17.5	12.5	2.5	4.2
ZW-L 6- 6-P4		R1/8	12	24	21	8	17.5	12.5	4	8
ZW-L 6- 8-P4		R1/4	14	27.5	21	11	17.5	12.5	4	8
ZW-L 6-10-P4	R3/8	17	29	21	12	17.5	12.5	4	8	
ZW-L 8- 6-P4	8	R1/8	14	25.5	23.5	8	19	14.5	6	18
ZW-L 8- 8-P4		R1/4	14	28.5	23.5	11	19	14.5	6	18
ZW-L 8-10-P4		R3/8	17	30	23.5	12	19	14.5	6	18
ZW-L10- 6-P4	10	R1/8	17	28	27	8	21.5	17.5	6.5	24.3
ZW-L10- 8-P4		R1/4	17	31	27	11	21.5	17.5	8	27
ZW-L10-10-P4		R3/8	17	32.5	27	12	21.5	17.5	8	27
ZW-L10-15-P4	R1/2	22	35.5	27	15	21.5	17.5	8	27	
ZW-L12- 8-P4	12	R1/4	19	33	29.5	11	23	20	8.5	33
ZW-L12-10-P4		R3/8	19	34.5	29.5	12	23	20	9	35
ZW-L12-15-P4	R1/2	22	37.5	29.5	15	23	20	9	35.5	

### Elbow

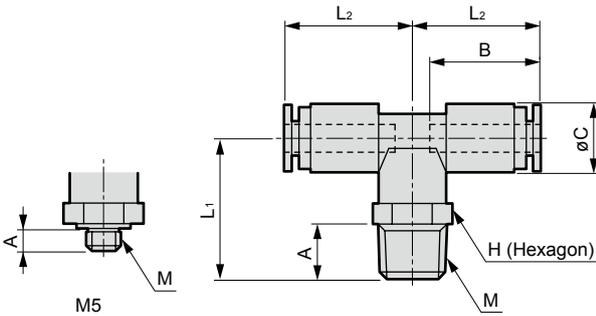
● ZW-L□-0-P4



Model No.	Compatible tube O.D. ø	L	B	C	N	E	F	Min. bore size	Eff. x-sectional area mm <sup>2</sup>
ZW-L 4-0-P4	4	18.5	16	10	7.5	4.2	11	2.5	3
ZW-L 6-0-P4	6	21	17.5	12.5	8.5	4.2	13.5	4	7.5
ZW-L 8-0-P4	8	23.5	19	14.5	9.5	4.2	15.5	6	17
ZW-L10-0-P4	10	27	21.5	17.5	11	4.2	18.5	8	25.5
ZW-L12-0-P4	12	29.5	23	20	12	4.2	21	10	34

### Double tee

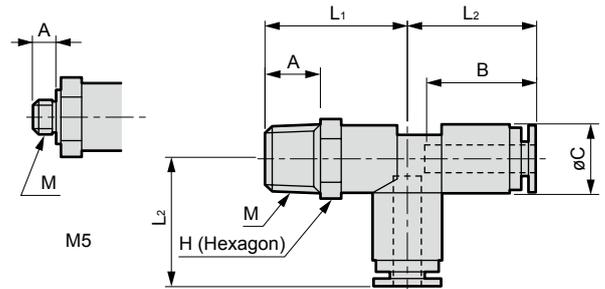
● ZW-T□-□-P4



Model No.	Compatible tube O.D. ø	M	H	L <sub>1</sub>	L <sub>2</sub>	A	B	C	Min. bore size	Eff. x-sectional area mm <sup>2</sup>
ZW-T 4-M5-P4	4	M5×0.8	10	16.5	18.5	3.4	16	10	2.5	4.3
ZW-T 4- 6-P4		R1/8	10	20.5	18.5	8	16	10	2.5	4.3
ZW-T 4- 8-P4		R1/4	14	24	18.5	11	16	10	2.5	4.3
ZW-T 6-M5-P4	6	M5×0.8	12	20	21	3.4	17.5	12.5	2.5	4.3
ZW-T 6- 6-P4		R1/8	12	24	21	8	17.5	12.5	4	10.5
ZW-T 6- 8-P4		R1/4	14	27.5	21	11	17.5	12.5	4	10.5
ZW-T 6-10-P4	R3/8	17	29	21	12	17.5	12.5	4	10.5	
ZW-T 8- 6-P4	8	R1/8	14	25.5	23.5	8	19	14.5	6	23.5
ZW-T 8- 8-P4		R1/4	14	28.5	23.5	11	19	14.5	6	23.5
ZW-T 8-10-P4		R3/8	17	30	23.5	12	19	14.5	6	23.5
ZW-T10- 8-P4	10	R1/4	17	31	27	11	21.5	17.5	8	33.5
ZW-T10-10-P4		R3/8	17	32.5	27	12	21.5	17.5	8	33.5
ZW-T10-15-P4		R1/2	22	35.5	27	15	21.5	17.5	8	33.5
ZW-T12- 8-P4	12	R1/4	19	33	29.5	11	23	20	8.5	37
ZW-T12-10-P4		R3/8	19	34.5	29.5	12	23	20	9	41
ZW-T12-15-P4	R1/2	22	37.5	29.5	15	23	20	9	41	

### D tee

● ZW-T□-□-D-P4



Model No.	Compatible tube O.D. ø	M	H	L <sub>1</sub>	L <sub>2</sub>	A	B	C	Min. bore size	Eff. x-sectional area mm <sup>2</sup>
ZW-T 4-M5-D-P4	4	M5×0.8	10	16.5	18.5	3.4	16	10	2.5	4.3
ZW-T 4- 6-D-P4		R1/8	10	20.5	18.5	8	16	10	2.5	4.3
ZW-T 4- 8-D-P4		R1/4	14	24	18.5	11	16	10	2.5	4.3
ZW-T 6-M5-D-P4	6	M5×0.8	12	19.5	21	3.4	17.5	12.5	2.5	4.3
ZW-T 6- 6-D-P4		R1/8	12	24	21	8	17.5	12.5	4	10.5
ZW-T 6- 8-D-P4		R1/4	14	27.5	21	11	17.5	12.5	4	10.5
ZW-T 6-10-D-P4	R3/8	17	29	21	12	17.5	12.5	4	10.5	
ZW-T 8- 6-D-P4	8	R1/8	14	25.5	23.5	8	19	14.5	6	23.5
ZW-T 8- 8-D-P4		R1/4	14	28.5	23.5	11	19	14.5	6	23.5
ZW-T 8-10-D-P4		R3/8	17	30	23.5	12	19	14.5	6	23.5
ZW-T10- 8-D-P4	10	R1/4	17	31	27	11	21.5	17.5	8	33.5
ZW-T10-10-D-P4		R3/8	17	32.5	27	12	21.5	17.5	8	33.5
ZW-T10-15-D-P4		R1/2	22	35.5	27	15	21.5	17.5	8	33.5
ZW-T12- 8-D-P4	12	R1/4	19	33	29.5	11	23	20	8.5	37
ZW-T12-10-D-P4		R3/8	19	34.5	29.5	12	23	20	9	41
ZW-T12-15-D-P4	R1/2	22	37.5	29.5	15	23	20	9	41	

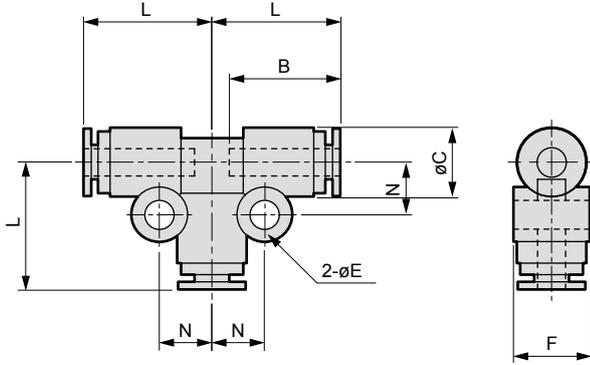
Fittings/  
tubes

# ZW-P4 Series

## Dimensions: Tee/different diameter tee/Y tee/double Y tee

### Tee

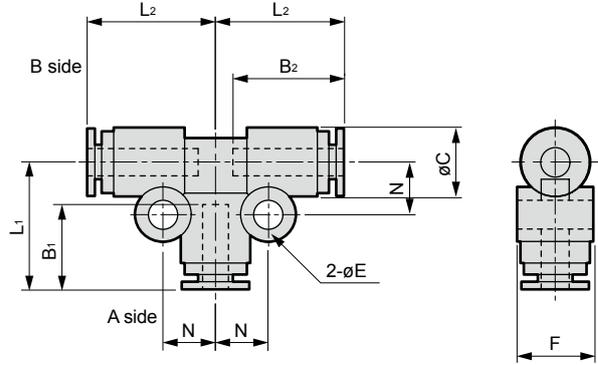
● ZW-T□-0-P4



Model No.	Compatible tube O.D. ø	L	B	C	E	F	N	Min. bore size	Eff. x-sectional area mm <sup>2</sup>
ZW-T 4-0-P4	4	18.5	16	10	4.2	11	7.5	2.5	3.6
ZW-T 6-0-P4	6	21	17.5	12.5	4.2	13.5	8.5	4	9.7
ZW-T 8-0-P4	8	23.5	19	14.5	4.2	15.5	9.5	6	22
ZW-T10-0-P4	10	27	21.5	17.5	4.2	18.5	11	8	30
ZW-T12-0-P4	12	29.5	23	20	4.2	21	12	10	35.5

### Different diameter tee

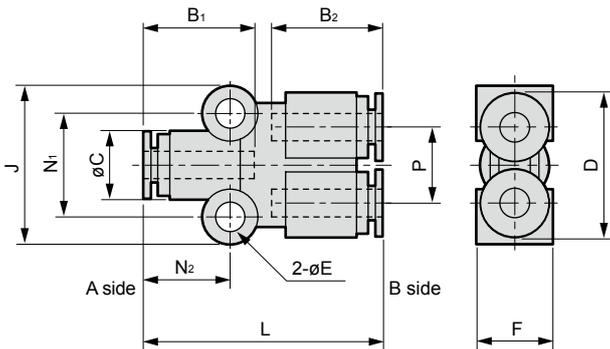
● ZW-T□-0-P4



Model No.	Compatible tube O.D. ø		L <sub>1</sub>	L <sub>2</sub>	B <sub>1</sub>	B <sub>2</sub>	C	E	F	N	Min. bore size	Eff. x-sectional area mm <sup>2</sup>
	A side	B side										
ZW-T 46-0-P4	4	6	21	21	16	17.5	12.5	4.2	13.5	8.5	2.5	3.6
ZW-T 68-0-P4	6	8	23.5	23.5	17.5	19	14.5	4.2	15.5	9.5	4	9.7
ZW-T 810-0-P4	8	10	27.5	27	19	21.5	17.5	4.2	18.5	11	6	22
ZW-T1012-0-P4	10	12	29.5	29.5	21.5	23	20	4.2	21	12	8	30

### Y tee

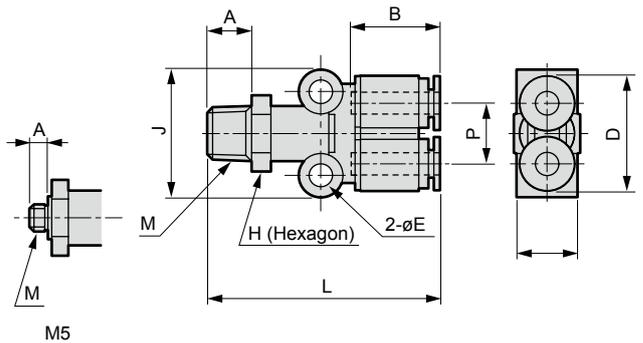
● ZW-Y□-0-P4



Model No.	Compatible tube O.D. ø		L	B <sub>1</sub>	B <sub>2</sub>	C	D	E	F	J	N <sub>1</sub>	N <sub>2</sub>	P	Eff. x-sectional area mm <sup>2</sup>
	A side	B side												
ZW-Y 44-0-P4	4	4	34.5	16	16	10	21	4.2	11	23	15	12.5	11	3.6
ZW-Y 66-0-P4	6	6	37.5	17.5	17.5	12.5	26	4.2	13.5	25.5	17.5	14	13.5	10.5
ZW-Y 88-0-P4	8	8	40.5	19	19	14.5	30	4.2	15.5	27	19	15	15.5	23
ZW-Y1010-0-P4	10	10	48	21.5	21.5	17.5	36	4.2	18.5	30	22	18	18.5	38
ZW-Y1212-0-P4	12	12	53	23	23	20	41	4.2	21	32	24	19.5	21	50
ZW-Y 64-0-P4	6	4	37.5	17.5	16	12.5	26	4.2	13.5	25.5	17.5	14	13.5	5.4
ZW-Y 86-0-P4	8	6	40.5	19	17.5	14.5	30	4.2	15.5	27	19	15	15.5	14.3
ZW-Y 108-0-P4	10	8	48	21.5	19	17.5	36	4.2	18.5	30	22	18	18.5	21.1
ZW-Y1210-0-P4	12	10	53	23	21.5	20	41	4.2	21	32	24	19.5	21	35.5

### Double Y tee

● ZW-Y□-□-0-P4

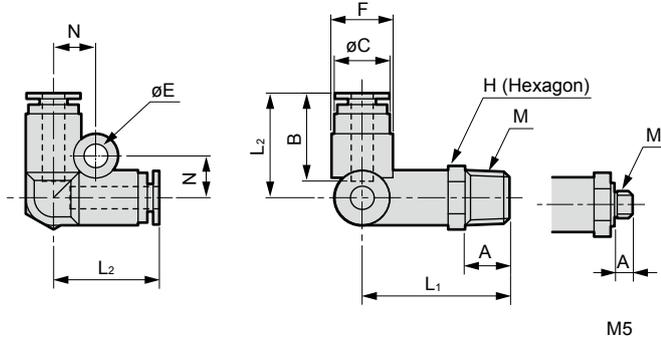


Model No.	Compatible tube O.D. ø	M	H	L	A	B	D	E	F	J	P	Eff. x-sectional area mm <sup>2</sup>
ZW-Y 4-M5-P4	4	M5x0.8	12	38	3.4	16	21	4.2	11	23	11	4.5
ZW-Y 4- 6-P4		R1/8	12	42	8	16	21	4.2	11	23	11	5.5
ZW-Y 4- 8-P4		R1/4	14	45.5	11	16	21	4.2	11	23	11	5.5
ZW-Y 6-M5-P4	6	M5x0.8	14	41	3.4	17.5	26	4.2	13.5	25.5	13.5	4.5
ZW-Y 6- 6-P4		R1/8	14	46	8	17.5	26	4.2	13.5	25.5	13.5	17.5
ZW-Y 6- 8-P4		R1/4	14	49	11	17.5	26	4.2	13.5	25.5	13.5	17.5
ZW-Y 6-10-P4	R3/8	17	50.5	12	17.5	26	4.2	13.5	25.5	13.5	17.5	
ZW-Y 8- 6-P4	8	R1/8	17	49	8	19	30	4.2	15.5	27	15.5	25.5
ZW-Y 8- 8-P4		R1/4	17	52	11	19	30	4.2	15.5	27	15.5	25.5
ZW-Y 8-10-P4		R3/8	17	53.5	12	19	30	4.2	15.5	27	15.5	25.5
ZW-Y10- 8-P4	10	R1/4	19	59.5	11	21.5	36	4.2	18.5	30	18.5	35
ZW-Y10-10-P4		R3/8	19	61	12	21.5	36	4.2	18.5	30	18.5	38.5
ZW-Y10-15-P4		R1/2	22	64	15	21.5	36	4.2	18.5	30	18.5	38
ZW-Y12- 8-P4	12	R1/4	22	64.5	11	23	41	4.2	21	32	21	37
ZW-Y12-10-P4		R3/8	22	66	12	23	41	4.2	21	32	21	37
ZW-Y12-15-P4		R1/2	22	69	15	23	41	4.2	21	32	21	40.5

## Dimensions: Tetrapod (with R)/FY (with R)/double Y (with R)/tetrapod

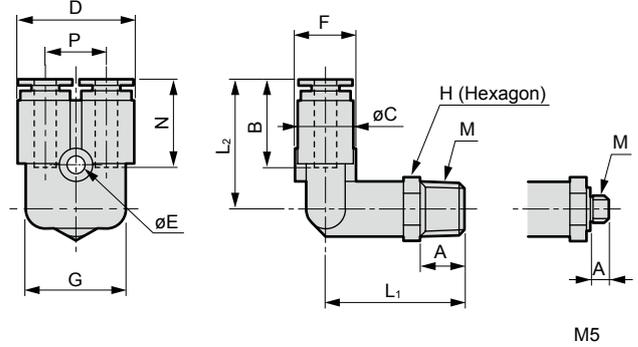
### Tetrapod (with R)

● ZW-TR□-□-P4



### FY (with R)

● ZW-FY□-□-P4

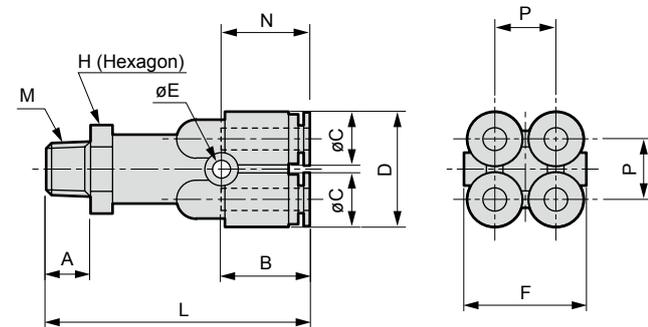


Model No.	Compatible tube O.D. ø	M	H	L <sub>1</sub>	L <sub>2</sub>	A	B	C	E	F	N	Min. bore size	Eff. x-sectional area mm <sup>2</sup>
ZW-TR 4-M5-P4	M5×0.8	10	22.5	19	3.4	16	10	4.2	11	7.5	2.5	4.3	
ZW-TR 4- 6-P4	R1/8	10	26.5	19	8	16	10	4.2	11	7.5	2.5	4.5	
ZW-TR 4- 8-P4	R1/4	14	30	19	11	16	10	4.2	11	7.5	2.5	4.5	
ZW-TR 6-M5-P4	M5×0.8	14	25	21.5	3.4	17.5	12.5	4.2	13.5	8.5	2.5	4.3	
ZW-TR 6- 6-P4	R1/8	14	30	21.5	8	17.5	12.5	4.2	13.5	8.5	4	10.5	
ZW-TR 6- 8-P4	R1/4	14	33	21.5	11	17.5	12.5	4.2	13.5	8.5	4	10.5	
ZW-TR 6-10-P4	R3/8	17	34.5	21.5	12	17.5	12.5	4.2	13.5	8.5	4	10.5	
ZW-TR 8- 6-P4	R1/8	17	32.5	24	8	19	14.5	4.2	15.5	9.5	6	23.5	
ZW-TR 8- 8-P4	R1/4	17	35.5	24	11	19	14.5	4.2	15.5	9.5	6	23.5	
ZW-TR 8-10-P4	R3/8	17	37	24	12	19	14.5	4.2	15.5	9.5	6	23.5	
ZW-TR10- 8-P4	R1/4	19	39.5	27.5	11	21.5	17.5	4.2	18.5	13	8	35.5	
ZW-TR10-10-P4	R3/8	19	41	27.5	12	21.5	17.5	4.2	18.5	13	8	35.5	
ZW-TR10-15-P4	R1/2	22	44	27.5	15	21.5	17.5	4.2	18.5	13	8	35.5	
ZW-TR12- 8-P4	R1/4	22	41.5	30	11	23	20	4.2	21	14	8.5	37.5	
ZW-TR12-10-P4	R3/8	22	43	30	12	23	20	4.2	21	14	8.5	37.5	
ZW-TR12-15-P4	R1/2	22	46	30	15	23	20	4.2	21	14	8.5	37.5	

Model No.	Compatible tube O.D. ø	M	H	L <sub>1</sub>	L <sub>2</sub>	A	B	C	D	E	F	G	N	P	Min. bore size	Eff. x-sectional area mm <sup>2</sup>
ZW-FY 4-M5-P4	M5×0.8	10	21	23.5	3.4	16	10	21	3.2	11	18	15.5	11	2.5	4.5	
ZW-FY 4- 6-P4	R1/8	10	25	23.5	8	16	10	21	3.2	11	18	15.5	11	2.5	4.6	
ZW-FY 4- 8-P4	R1/4	14	28.5	23.5	11	16	10	21	3.2	11	18	15.5	11	2.5	4.6	
ZW-FY 6-M5-P4	M5×0.8	14	23	27	3.4	17.5	12.5	26	4.2	13.5	22.5	17	13.5	2.5	4.5	
ZW-FY 6- 6-P4	R1/8	14	28	27	8	17.5	12.5	26	4.2	13.5	22.5	17	13.5	4	10.5	
ZW-FY 6- 8-P4	R1/4	14	31	27	11	17.5	12.5	26	4.2	13.5	22.5	17	13.5	4	10.5	
ZW-FY 6-10-P4	R3/8	17	32.5	27	12	17.5	12.5	26	4.2	13.5	22.5	17	13.5	4	10.5	
ZW-FY 8- 6-P4	R1/8	17	30.5	29	8	19	14.5	30	4.2	15.5	26.5	18	15.5	6	23	
ZW-FY 8- 8-P4	R1/4	17	33.5	29	11	19	14.5	30	4.2	15.5	26.5	18	15.5	6	23	
ZW-FY 8-10-P4	R3/8	17	35	29	12	19	14.5	30	4.2	15.5	26.5	18	15.5	6	23	
ZW-FY10- 8-P4	R1/4	19	37.5	33	11	21.5	17.5	36	4.2	18.5	31.5	20	18.5	8	34.4	
ZW-FY10-10-P4	R3/8	19	39	33	12	21.5	17.5	36	4.2	18.5	31.5	20	18.5	8	34.4	
ZW-FY10-15-P4	R1/2	22	42	33	15	21.5	17.5	36	4.2	18.5	32.5	20	18.5	8	34.4	
ZW-FY12- 8-P4	R1/4	22	39.5	35.5	11	23	20	41	4.2	21	37	21.5	21	8.5	37.5	
ZW-FY12-10-P4	R3/8	22	41	35.5	12	23	20	41	4.2	21	37	21.5	21	8.5	37.5	
ZW-FY12-15-P4	R1/2	22	44	35.5	15	23	20	41	4.2	21	37	21.5	21	8.5	37.5	

### Double Y (with R)

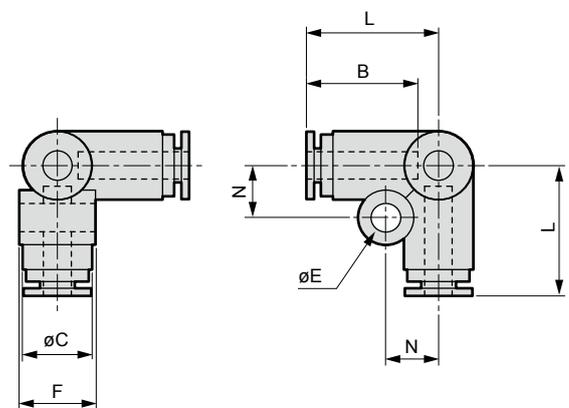
● ZW-WY□-□-P4



Model No.	Compatible tube O.D. ø	M	H	L	A	B	C	D	E	F	N	P	Eff. x-sectional area mm <sup>2</sup>
ZW-WY4- 6-P4	R1/8	14	47.5	8	16	10	21	3.2	22	15.5	11	9.7	
ZW-WY4- 8-P4	R1/4	14	50.5	11	16	10	21	3.2	22	15.5	11	9.7	
ZW-WY6- 6-P4	R1/8	17	51.5	8	17.5	12.5	26	3.2	27	17	13.5	23	

### Tetrapod

● ZW-TR□-0-P4



Model No.	Compatible tube O.D. ø	L	B	C	E	F	N	Min. bore size	Eff. x-sectional area mm <sup>2</sup>
ZW-TR 4-0-P4	4	19	16	10	4.2	11	7.5	2.5	4
ZW-TR 6-0-P4	6	21.5	17.5	12.5	4.2	13.5	8.5	4	9.5
ZW-TR 8-0-P4	8	24	19	14.5	4.2	15.5	9.5	6	12.5
ZW-TR10-0-P4	10	27.5	21.5	17.5	4.2	18.5	13	8	29.5
ZW-TR12-0-P4	12	30	23	20	4.2	21	14	10	35.5

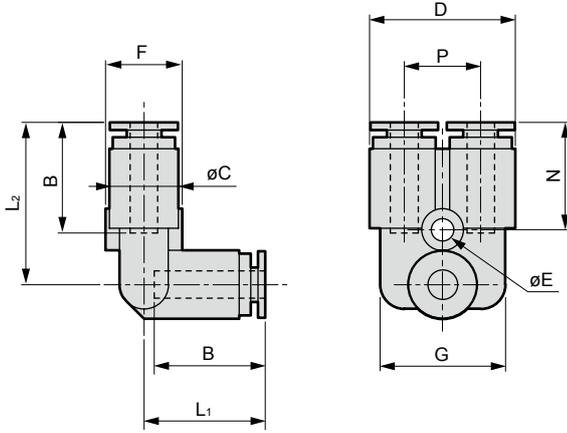
Fittings/  
tubes

# ZW-P4 Series

## Dimensions: FY double Y cap/manifold (single/with R)

FY

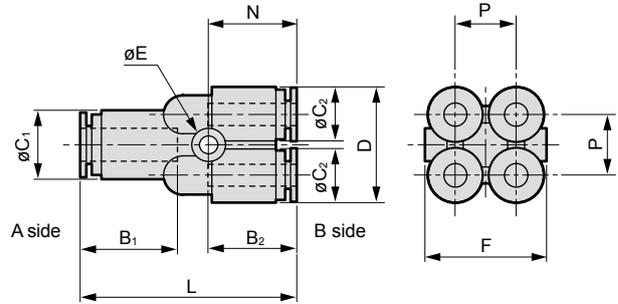
● ZW-FY□-0-P4



Model No.	Compatible tube O.D. $\phi$	L <sub>1</sub>	L <sub>2</sub>	B	C	D	E	F	G	N	P	Min. bore size	Eff. x-sectional area mm <sup>2</sup>
ZW-FY 4-0-P4	4	17.5	23.5	16	10	21	3.2	11	18	15.5	11	2.5	4
ZW-FY 6-0-P4	6	19.5	27	17.5	12.5	26	4.2	13.5	22.5	17	13.5	4	10
ZW-FY 8-0-P4	8	22	29	19	14.5	30	4.2	15.5	26.5	18	15.5	6	21
ZW-FY10-0-P4	10	25.5	33	21.5	17.5	36	4.2	18.5	31.5	20	18.5	8	29
ZW-FY12-0-P4	12	28	35.5	23	20	41	4.2	21	37	21.5	21	10	35.5

Double Y

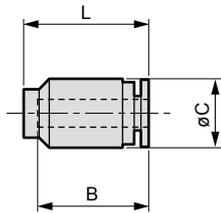
● ZW-WY□-0-P4



Model No.	Compatible tube O.D. $\phi$		L	B <sub>1</sub>	B <sub>2</sub>	C <sub>1</sub>	C <sub>2</sub>	D	E	F	N	P	Eff. x-sectional area mm <sup>2</sup>
	A side	B side											
ZW-WY64-0-P4	6	4	39	17.5	16	12.5	10	21	3.2	22	15.5	11	9
ZW-WY86-0-P4	8	6	43	19	17.5	14.5	12.5	26	3.2	27	17	13.5	22

Cap

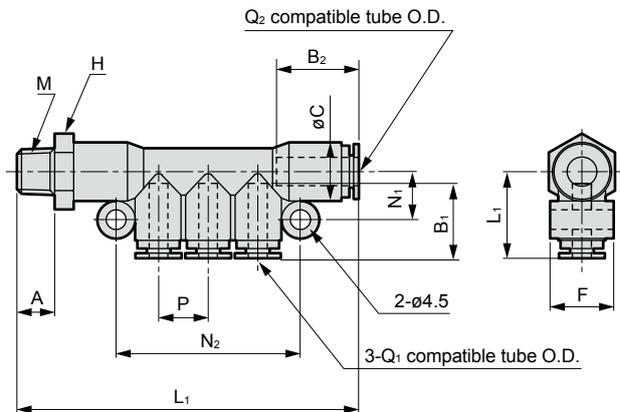
● ZW-C□-P4



Model No.	Compatible tube O.D. $\phi$	B	$\phi C$	L
ZW-C 4-P4	4	16	10	18
ZW-C 6-P4	6	17.5	12.5	19.5
ZW-C 8-P4	8	19	14.5	21
ZW-C10-P4	10	21.5	17.5	24
ZW-C12-P4	12	23	20	26

Manifold (single/with R)

● ZW-MF□-□-P4

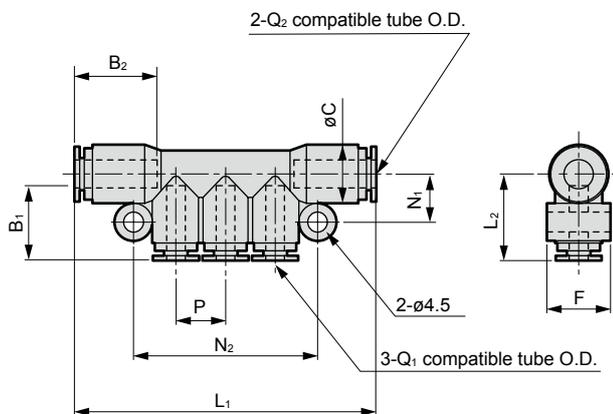


Model No.	Compatible tube O.D. $\phi$		M	H	L <sub>1</sub>	L <sub>2</sub>	A	B <sub>1</sub>	B <sub>2</sub>	C	F	N <sub>1</sub>	N <sub>2</sub>	P	Eff. x-sectional area mm <sup>2</sup>
	Q1	Q2													
ZW-MF 46- 6-P4	4	6	R1/8	14	72.5	18.5	8	16	17.5	12.5	13.5	10.5	39	10.5	8.3
ZW-MF 48- 8-P4	4	8	R1/4	17	77.5	19.5	11	16	19	14.5	15.5	11.5	39	10.5	24.2
ZW-MF 68- 8-P4	6	8	R1/4	17	84.5	21	11	17.5	19	14.5	15.5	11.5	46.5	13	24.2
ZW-MF810-10-P4	8	10	R3/8	19	97.5	23.5	12	19	21.5	17.5	18.5	13	52.5	15	35.5

### Dimensions: Manifold (single)/plug reducer

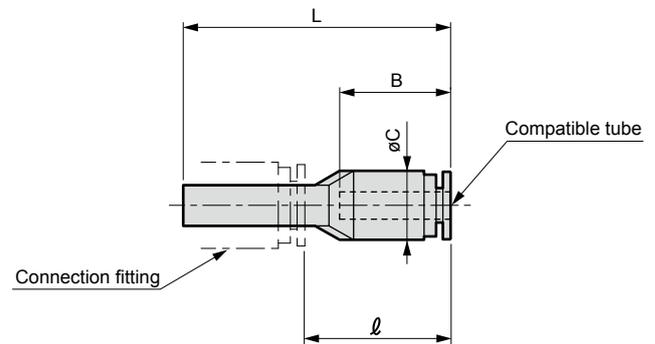
#### Manifold (single)

● ZW-MF□-0-P4



#### Plug reducer

● ZW-S□-□P-P4

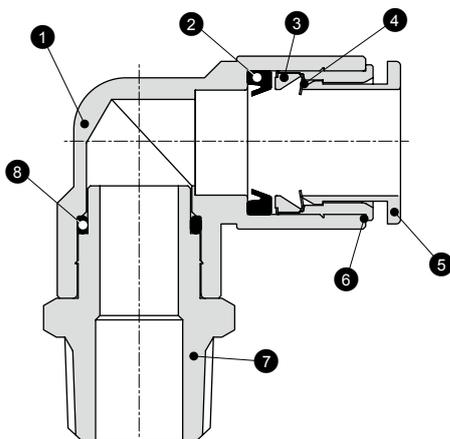


Model No.	Compatible tube O.D. ∅		L <sub>1</sub>	L <sub>2</sub>	B <sub>1</sub>	B <sub>2</sub>	C	F	N <sub>1</sub>	N <sub>2</sub>	P	Eff x-sectional area mm <sup>2</sup>
	Q <sub>1</sub>	Q <sub>2</sub>										
ZW-MF 46-0-P4	4	6	64	18.5	16	17.5	12.5	13.5	10.5	39	10.5	7.9
ZW-MF 48-0-P4	4	8	66	19.5	16	19	14.5	15.5	11.5	39	10.5	22
ZW-MF 68-0-P4	6	8	73	21	17.5	19	14.5	15.5	11.5	46.5	13	22
ZW-MF610-0-P4	6	10	78.5	22	17.5	21.5	17.5	18.5	13	46.5	13	30
ZW-MF810-0-P4	8	10	84.5	23.5	19	21.5	17.5	18.5	13	52.5	15	30

Model No.	Compatible tube O.D. ∅	Fitting port size ∅	L	∅*	B	C	Min. bore size	Eff x-sectional area mm <sup>2</sup>
ZW-S 4- 6P-P4	4	6	38.5	21	16	10	2.3	3.5
ZW-S 4- 8P-P4		8	40.4	21.5	16	10	3	5.6
ZW-S 4-10P-P4		10	42	20.5	16	12.5	3	5.6
ZW-S 6- 4P-P4	6	4	42	26	17.5	12.5	2.3	3.5
ZW-S 6- 8P-P4		8	41	22	17.5	12.5	4	10
ZW-S 6-10P-P4		10	42	20	17.5	12.5	4	10
ZW-S 6-12P-P4	8	12	44	21	17.5	14.5	4	10
ZW-S 8-10P-P4		10	44.5	22.5	19	14.5	6	22
ZW-S 8-12P-P4		12	44	21	19	14.5	6	22
ZW-S10-12P-P4	10	12	48	25	21.5	17.5	8	30

\* Dimensions for CKD connection fittings (ZW-P4 Series).

### Internal structure and parts list



No.	Part name	Material
1	Body *1	Stainless steel
		Polybutylene terephthalate (flame-resistant resin *2)
2	Packing	Hydrogenated nitrile rubber
3	Chuck holder	Polyetherimide
4	Chuck	Stainless steel
5	Push ring	Polybutylene terephthalate (flame-resistant resin *2)
6	Outer ring	Stainless steel
7	Drive-in nipple	Stainless steel
8	O-ring	Nitrile rubber

\*1: The body of the single straight and bulkhead is stainless steel.

\*2: Equivalent to UL94 standards V-0



Pneumatic piping components  
Catalog No. CC-1101A

PP (polypropylene resin) fitting

# ZSF-P4 Series

- For blow circuit
- Grease-free specifications
- Port size: M3, M5, R1/8 to R1/2
- Compatible tube O.D.  $\varnothing 4$  to  $\varnothing 12$

P4 compliant  
as standard



## Specifications

Descriptions	ZSF-P4
Working fluid	Air (*1)
Max. working pressure MPa	1.0 (*2)
Working vacuum pressure kPa	-100
Guaranteed proof pressure MPa	1.5 (*3)
Working ambient temperature °C	0 to 60 (no freezing) (*4)

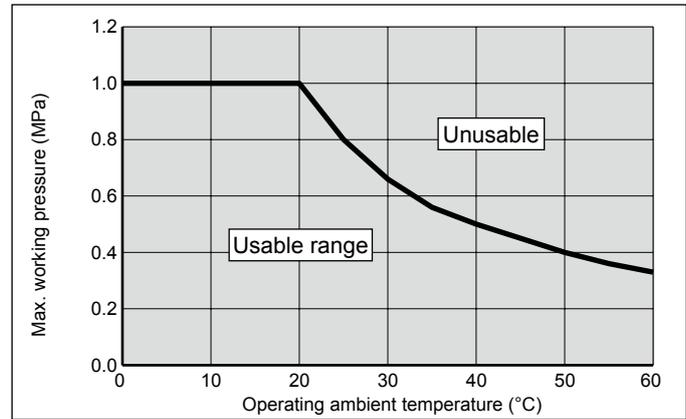
\*1: Rubber EPDM material is used, so this product cannot be used with fluids that contain mineral oil.

\*2: The max. working pressure is the value at 20°C. When using in other temperature ranges, refer to the "Relation of operating ambient temperature and max. working pressure" shown in the figure at right.

\*3: The proof pressure is the value at 20°C. The proof pressure is 1.5 times the maximum working pressure.

\*4: Freezing may occur due to adiabatic expansion depending on the air quality (dew point).

## Relation of operating ambient temperature and max. working pressure



How to order \* Refer to "Pneumatic, Vacuum and Auxiliary Components" (Catalog No. CB-024SA) for model combinations.

ZSF - **C** - **4** - **6** - P4  
A B C

A Shape	
C	Straight
U	Union straight
L	Elbow
V	Union elbow
B	Tee
E	Union tee
G	Different diameter union straight
D	Branch tee
Y	Union Y
EG	Different diameter union tee
X	Branch Y
W	Different diameter union Y
BP	Plug
MP	Bulkhead union
J	Reducer

B Compatible tube O.D.	
4	$\varnothing 4$
6	$\varnothing 6$
8	$\varnothing 8$
10	$\varnothing 10$
12	$\varnothing 12$

C Piping size *1	
M3	M3×0.5
M5	M5×0.8
6	R1/8
8	R1/4
10	R3/8
15	R1/2

\*1: If the compatible tube size is **C**, select from the **B** table.

\* Sales unit is 10 pcs.

# UP.F.U.NU.KX.SR Tube

O.D. 1.8/3.2/4/6/8/10/12/15 mm

- Tubes can be selected according to applications  
A great variety of tubes are available according to the purpose and applications.  
Furthermore, they are highly reliable, meeting needs of space saving and complex piping, etc.

Antistatic tube	Soft nylon tube	New urethane tube	Urethane tube	Coiling tube
 <p>O.D. x I.D. (mm)</p> <p>3.2×1.8</p> <p>4×2.5</p> <p>6×4</p> <p>8×5</p> <p>10×6.5</p> <p>12×8</p>	<p>Manufacturer of colors other than white: Aoi Co., Ltd.</p>  <p>O.D. x I.D. (mm)</p> <p>3.2×2.0</p> <p>3.2×2.4</p> <p>4×2.5</p> <p>6×4</p> <p>8×6</p> <p>10×7.5</p> <p>12×9</p> <p>15×11.5</p> <p>16×12</p>	 <p>O.D. x I.D. (mm)</p> <p>4×2.5</p> <p>6×4.5</p> <p>8×6</p> <p>10×7.5</p> <p>12×9</p>	<p>Aoi Co., Ltd.</p>  <p>O.D. x I.D. (mm)</p> <p>3.2×1.8</p> <p>4×2</p> <p>6×4</p> <p>8×5</p> <p>10×6.5</p> <p>12×8</p>	<p>Aoi Co., Ltd.</p>  <p>O.D. x I.D. (mm)</p> <p>6×4</p> <p>8×6</p> <p>10×7.5</p> <p>12×9.2</p>
Flame-resistant tube	Tube cutter			
<p>Aoi Co., Ltd.</p>  <p>O.D. x I.D. (mm)</p> <p>4×2.3</p> <p>6×3.8</p> <p>8×5.5</p> <p>10×7</p> <p>12×8.5</p>	<p>Aoi Co., Ltd.</p> 			

## Tube cutter

Aoi Co., Ltd.  
AZ-1200

### Features

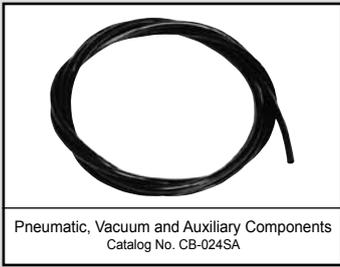
- (1) Sharp cutting edge for right-angle cut prevents air trouble.
- (2) Extremely lightweight and compact.
- (3) Easy blade replacement.

### Applicable material

- Nylon tube
- Urethane tube
- PTFE tube
- Other plastic tubes

## Sharp edge





Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

Tube

# F.U.NU.KX.SR Series

Wide bore size available according to purposes and applications.  
Highly reliable piping tubes.

- Outer diameter: 3.2/4/6/8/10/12/15/16 mm

P4 compliant  
as standard

## Soft nylon tube

Manufacturer of colors other than white: Aoi Co., Ltd.

The soft nylon tube is very flexible compared to the conventional nylon tubes, and optimal for piping in small or complicated spaces. The tube also has sufficient characteristics such as cold resistance, weather resistance, oil resistance and chemical resistance, etc.

### How to order

**FH-3224 - W**

Size of soft nylon tube  
ø3.2 x ø2.4

For miniature fitting.

A Tube color	
Blank	Black
W	White

**F-15 04 - 20 - W**

Soft nylon tube

A	B		C				
Tube size (O.D.)	Length per roll		Tube color				
32	ø3.2	10	ø10	20	20 m	Blank	Black (standard)
04	ø4	12	ø12	100	100 m	W	White (standard)
06	ø6	15	ø15			R	Red
08	ø8	16	ø16			BU	Blue
						Y	Yellow
						G	Green
						O	Orange

Note: If tube color is white "W", length per roll 100 m is not available.

Note: Use the FH-3224 for miniature fitting. F-1532 cannot be used.

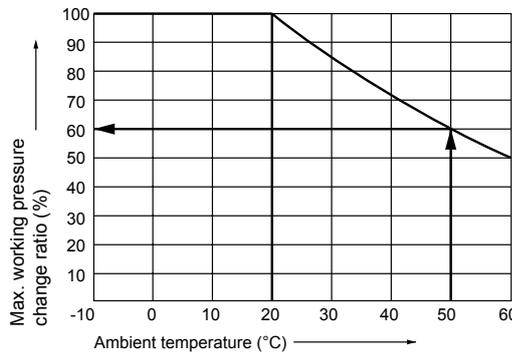
### Specifications

This table indicates the value at 20°C.

Descriptions	FH-3224	F-1532	F-1504	F-1506	F-1508	F-1510	F-1512	F-1515	F-1516
Working fluid	Compressed air								
O.D. x I.D. mm x mm	3.2×2.4	3.2×2.0	4×2.5	6×4	8×6	10×7.5	12×9	15×11.5	16×12
Ambient temperature °C	-10 to 60 (no freezing)								
Burst pressure MPa		5.39		4.9	3.9	3.43		2.94	3.3
Max. working pressure MPa		1.76		1.67	1.27	1.18		1	1.1
Durometer hardness	HDD 63		HDD 52						
Min. bending radius (JIS B 8381) mm	13	4.5	5	8	15	20	26	43	46
Min. mounting radius mm	21	7	10	20	30	40	55	80	90
Tube color	White/black		White (20 m only)/black/red/blue/yellow/green/orange			White/black		Black	
Standard length per roll m	20		20/100			20/100 (only black)		20/100	

\* Outer diameter dimension tolerance may vary within ±0.1 mm.

### Relation of ambient temperature and max. working pressure



(Example) Tube F-1504 (ø4 x ø2.5)  
If ambient temperature is 50°C, max. working pressure is 60% of max. working pressure of 20°C.

$$1.76 \times \frac{60}{100} \approx 1.06(\text{MPa})$$



## New urethane tube

Due to the adoption of a new manufacturing process, larger inner diameter and increased strength are realized simultaneously with the same outer diameter. This piping tube is also used for larger flow rates. Also economical.

### Common specifications

Descriptions	Content
Working fluid	Air
Ambient temperature °C	0 to 60
Burst pressure MPa	4 (at 20°C)
Max. working pressure MPa	1.0 (at 20°C)
Working vacuum pressure kPa	-100

### Specifications

Descriptions	NU-04	NU-06	NU-08	NU-10	NU-12
O.D. x I.D. mm x mm	4×2.5	6×4.5	8×6	10×7.5	12×9
Burst pressure MPa	4 to 2.4				
Ambient temperature °C	0 to 60 (no freezing)				
Durometer hardness (JIS K7215)	HDD 64				
Min. bending radius (JIS B 8381) mm	8	16	24	30	36
Min. mounting radius mm	12	26	36	42	52
Outer diameter accuracy mm	+0.1 -0.1			+0.1 -0.15	
Weight g/m	10	15	28	42	62
Tube color	Black/white				
Length per roll m	20/100 (only black)				

Note: Refer to "Pneumatic, Vacuum and Auxiliary Components" (Catalog No.CB-024SA) for relation of the tube length to the effective cross-sectional area.

### How to order



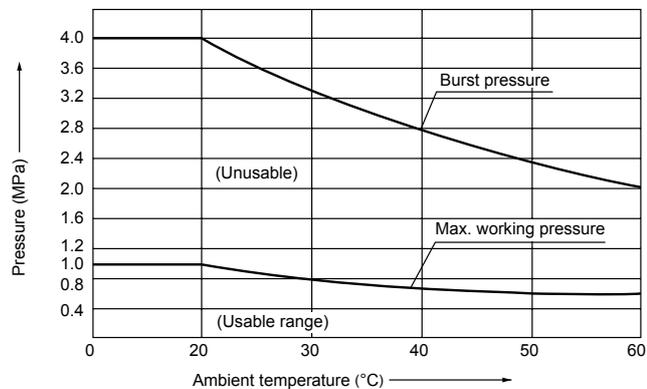
A	Tube size (O.D.)	B	Length per roll	C	Tube color
04	ø4	20	20 m	Blank	Black (standard)
06	ø6	100	100 m	w	White (standard)
08	ø8	Note: If color is white "W", length per roll 100 m is not available.			
10	ø10				
12	ø12				

Clean-room specifications (Catalog No. CB-033SA)

- Anti-dust generation structure for use in cleanrooms

NU ..... - P80

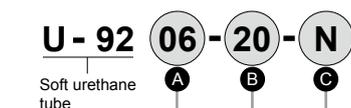
### Relation of ambient temperature and pressure (use/burst)



## Soft urethane tube

Aoi Co., Ltd.

### How to order



A	Compatible tube O.D. size	B	Length per roll	C	Tube color		
04	ø4	20	20 m	Blank	Black		
06	ø6	100	100 m	N	Transparent		
08	ø8	Note: If color is white "W", length per roll 100 m is not available.					
10	ø10						
12	ø12						
						PW	Pure white
						R	Red
						BU	Blue
						Y	Yellow
		G	Green				
		O	Orange				

Clean-room specifications

(Catalog No. CB-033SA)

U-92 ..... - P80

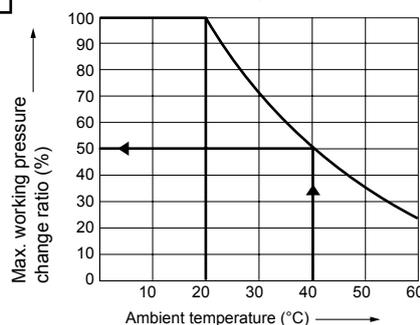
### Specifications

This table indicates the value at 20°C.

Descriptions	U-9204	U-9206	U-9208	U-9210	U-9212
Working fluid	Compressed air				
O.D. x I.D. mm x mm	4×2	6×3.7	8×5	10×6.5	12×8
Burst pressure MPa	4.1	2.9	2.8	2.6	2.6
Max. working pressure MPa	1.3	0.9	0.9	0.8	0.8
Durometer hardness JIS K7215	HDA 92				
Min. bending radius mm	4	10	11	13	16.5
Min. mounting radius mm	8	17	25	30	36
Tube color	Black/transparent/red/blue/yellow/green/orange/pure white				
Standard length per roll m	20/100				

### Relation of ambient temperature and max. working pressure

The max. working pressure at 20°C is 100%.



When the temperature rises, the constant pressure gradually drops. Special consideration must be given for the ambient temperature.

(Example) In U-9208, the max. working pressure at an ambient temperature of 40°C is 50% of that at 20°C.

$$0.9 \times \frac{50}{100} \approx 0.45(\text{MPa})$$

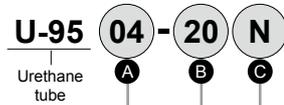
Fittings/  
tubes

## Urethane tube

Aoi Co., Ltd.

Since urethane tube has high mechanical strength, the tube strongly endures external force, and also has flexibility. This is widely used in general pneumatic lines, etc.

### How to order



A Compatible tube O.D. size		B Length per roll		C Tube color	
32	ø3.2	20	20 m	Blank	Black
04	ø4	100	100 m	N	Transparent
06	ø6				
08	ø8				
10	ø10				
12	ø12				

Note: Indicate tube color in the remarks on the order slip.

Clean-room specifications (Catalog No. CB-033SA)

U-95 ..... - P80

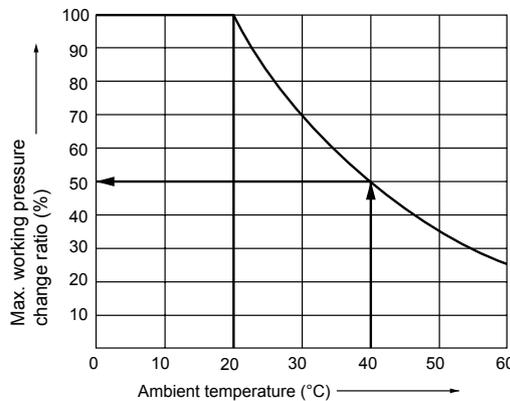
### Specifications

This table indicates the value at 20°C.

Descriptions	U-9532	U-9504	U-9506	U-9508	U-9510	U-9512
Working fluid	Compressed air					
O.D. x I.D. mm x mm	3.2×1.8	4×2	6×4	8×5	10×6.5	12×8
Ambient temperature °C	0 to 60 (no freezing)					
Burst pressure MPa	6.1	5.2	3.2	3.6	3.4	3.2
Max. working pressure MPa	1.5	1.7	1.0	1.2	1.1	1.0
Durometer hardness JIS K 7215	HDA 97					
Min. bending radius (JIS B 8381) mm	4	5	13	14	16	20
Min. mounting radius mm	7	10	20	30	40	50
Tube color	Transparent/black					
Standard length per roll m	20	20/100			20	

\* The O.D. tolerance of U-9506 and smaller model No. is  $+0.1$ <sub>-0.15</sub> mm, and that of U-9508 and larger model No. is  $+0.1$ <sub>-0.2</sub> mm.

### Relation of ambient temperature and max. working pressure



When the temperature rises, the constant pressure gradually drops. Special consideration must be given for the ambient temperature. (Example) In U-9506, the max. working pressure at an ambient temperature of 40°C is 50% of that at 20°C.

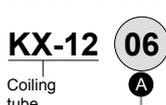
$$1.0 \times \frac{50}{100} \approx 0.5(\text{MPa})$$

## Coiling tube

Aoi Co., Ltd.

A coiling tube is a coil-like manufactured extensible tube. Unlike conventional products, fittings are easily installed and the coil contracts and expands very smoothly due to the straight section provided with the specified length in the direction of expansion and contraction. Durability of coil end is also excellent.

### How to order

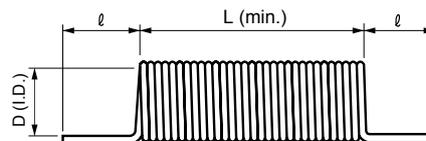


A O.D. size	
06	ø6
08	ø8
10	ø10
12	ø12

### Specifications

Descriptions	KX-1206	KX-1208	KX-1210	KX-1212
O.D. x I.D. mm x mm	6×4	8×6	10×7.5	12×9.2
Ambient temperature °C	-10 to 60 (no freezing)			
Working extension m	2.5			
D mm	50	70		90
L mm	250	240	290	275
ℓ	100			
Tube color	Orange			

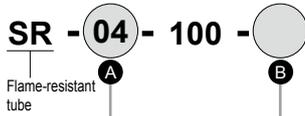
\* The O.D. tolerance is  $+0.07$ <sub>-0.1</sub> mm.  
\* Tube is made of hard nylon.



### Flame-resistant tube

Revolutionary tube made using flame-resistant materials. Even if welding sparks, etc., come into contact, the tube will not continue to burn. (UL standard 94V-0 or equivalent: self-extinguishing property)

#### How to order



A Compatible tube O.D. size		B Tube color	
04	ø4	Blank	Black
06	ø6	R	Red
08	ø8	BU	Blue
10	ø10	G	Green
12	ø12		

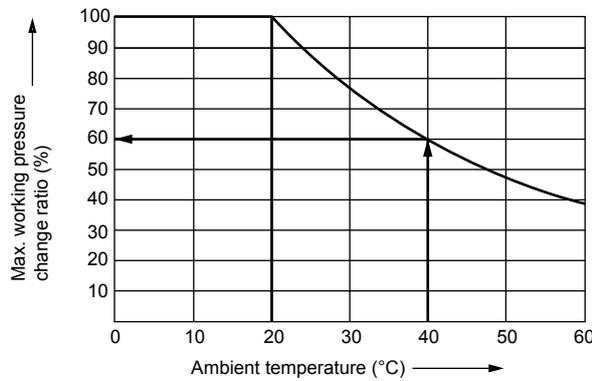
Note: Indicate tube color in the remarks on the order slip.

#### Specifications

Descriptions	SR-04	SR-06	SR-08	SR-10	SR-12
O.D. x I.D. mm x mm	4×2	6×3.8	8×5.5	10×7	12×8.5
Ambient temperature °C	0 to 60 (no freezing)				
Burst pressure MPa	4.8	4.3	3.4	3.3	3.3
Max. working pressure MPa	1.6	1.4	1.1	1.1	1.1
Min. bending radius mm	15	22	30	40	50
Tube color	Black/red/blue/green				
Standard length per roll m	100				

This table indicates the value at 20°C.

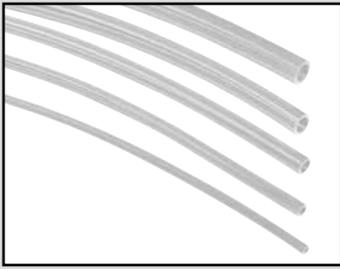
#### Relation of ambient temperature and max. working pressure



When the temperature rises, the constant pressure gradually drops. Special consideration must be given for the ambient temperature.

(Example) In SR-06, the max. working pressure at an ambient temperature of 40°C is 60% of that at 20°C.

$$1.4 \times \frac{60}{100} \approx 0.84(\text{MPa})$$



Fluoro resin tube

# ET Series

● O.D.: 4 mm, 6 mm, 8 mm, 10 mm, 12 mm

P4 compliant  
as standard



## Features

- Fluorine resin (FEP) tube with excellent cost performance
- 8 size variations are set (O.D.: ø4 to ø12)

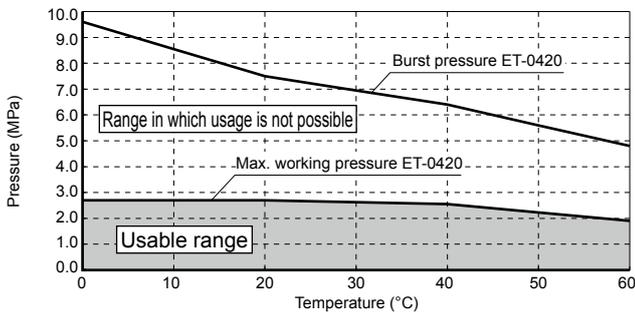
## Specifications

Descriptions	ET-0420	ET-0425	ET-0640	ET-0860	ET-1075	ET-1080	ET-1290	ET-1210
O.D. x I.D. mmXmm	4X2	4X2.5	6X4	8X6	10X7.5	10X8	12X9	12X10
Working fluid	Air							
Max. working pressure (*1) MPa	2.7	1.6	1.6	1	1	0.7	1	0.7
Burst pressure (*1) MPa	7.5	4.6	4.6	3.3	3.3	2.1	3.3	2.1
Operating vacuum pressure kPa	-100							
Operating ambient temperature range °C	-20 to 80 (no freezing)							
Min. bending radius (JIS B 8381) mm	7	14	14	27	40	50	47	67
Min. installation radius mm	10	20	30	55	60	100	80	150
Material	Fluorine resin (FEP)							
Compatible tube fitting	Fitting ZSP, ZSF Series							

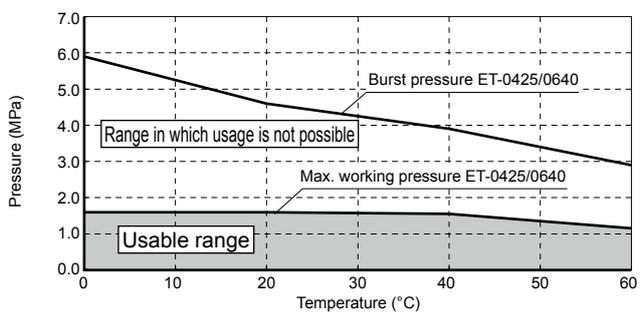
\*1: The max. working pressure and burst pressure are the values at 20°C. When using in other temperature ranges, refer to the graph of "Relation of operating ambient temperature and pressure (use/burst)".

## Relation of operating ambient temperature and pressure (use burst)

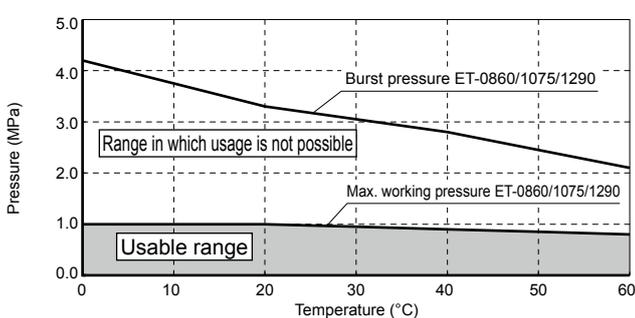
●ET-0420-\*



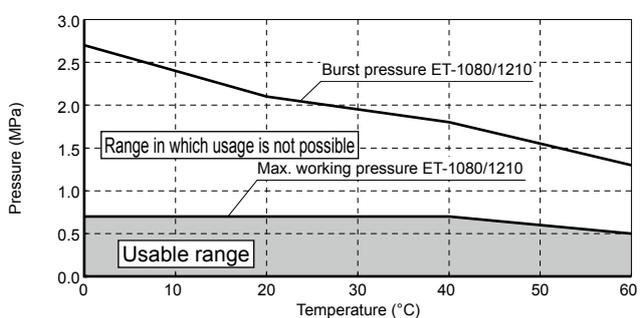
●ET-0425/0640-\*



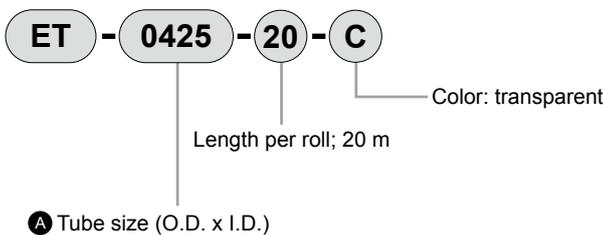
●ET-0860/1075/1290-\*



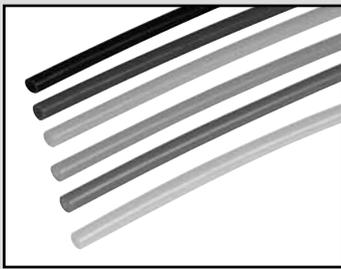
●ET-1080/1210-\*



## How to order



Code	Content
<b>A Tube size (O.D. x I.D.)</b>	
0420	ø4 × ø2
0425	ø4 × ø2.5
0640	ø6 × ø4
0860	ø8 × ø6
1075	ø10 × ø7.5
1080	ø10 × ø8
1290	ø12 × ø9
1210	ø12 × ø10



# Polyolefin tube PFH/S Series

● O.D.: 4 mm, 6 mm, 8 mm, 10 mm, 12 mm

P4 compliant  
as standard



## Features

- Uses polyolefin-based resin suitable for clean environments
- 2 types of hardness, standard and soft, can be selected
- O.D.:  $\varnothing 4$ ,  $\varnothing 6$ ,  $\varnothing 8$ ,  $\varnothing 10$ ,  $\varnothing 12$
- 6 tube colors as standard.

## Specifications

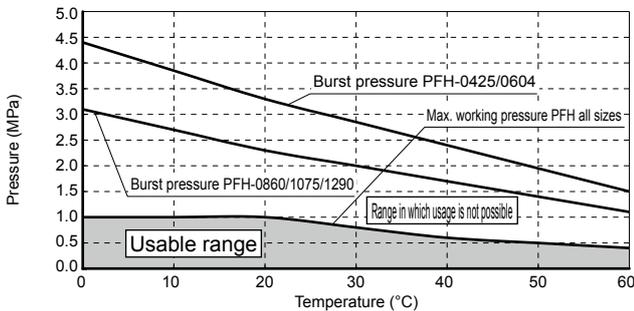
Descriptions	PFH-0425	PFH-0640	PFH-0860	PFH-1075	PFH-1290	PFS-0425	PFS-0640	PFS-0850	PFS-1065	PFS-1280
O.D. x I.D. mmXmm	4X2.5	6X4	8X6	10X7.5	12X9	4X2.5	6X4	8X5	10X6.5	12X8
Working fluid	Air (*1)									
Max. working pressure (*2) MPa	1.0					0.8				
Burst pressure (*2) MPa	3.3		2.3			2.1				
Operating vacuum pressure kPa	-100									
Operating ambient temperature range °C	0 to 60 (no freezing)									
Min. bending radius (JIS B 8381) mm	7	12	23	27	33	7	12	12	18	20
Min. installation radius mm	15	25	37	46	54	15	25	25	29	41
Material	Polyolefin-based resin									
Compatible tube fitting	Fitting ZSP, ZSF Series									

\*1: Polyolefin-based resin is not suitable for piping in general pneumatic circuits, since it is susceptible to mineral oil.

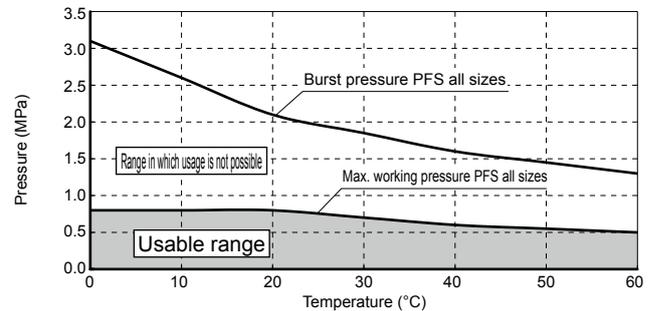
\*2: The max. working pressure and burst pressure are the values at 20°C. When using in other temperature ranges, refer to the graph of "Relation of operating ambient temperature and pressure (use/burst)".

## Relation of operating ambient temperature and pressure (use burst)

● PFH: Polyolefin tube standard



● PFS: Polyolefin tube soft



## How to order

PF H - 0425 - 100 - CW - P4

A Type

Length per roll; 100 m

B Tube size (O.D. x I.D.)

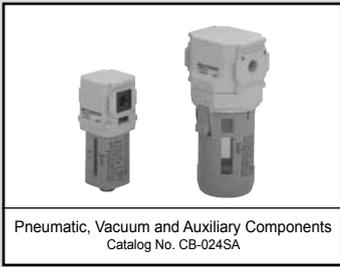
C Color

Model No.

PFH PFS

Code	Content	PFH	PFS
<b>A Type</b>			
H	Standard	●	
S	Soft		●
<b>B Tube size (O.D. x I.D.)</b>			
0425	$\varnothing 4 \times \varnothing 2.5$	●	●
0640	$\varnothing 6 \times \varnothing 4$	●	●
0850	$\varnothing 8 \times \varnothing 5$		●
0860	$\varnothing 8 \times \varnothing 6$	●	
1065	$\varnothing 10 \times \varnothing 6.5$		●
1075	$\varnothing 10 \times \varnothing 7.5$	●	
1280	$\varnothing 12 \times \varnothing 8$		●
1290	$\varnothing 12 \times \varnothing 9$	●	
<b>C Color</b>			
B	Black	●	●
CW	Transparent white	●	●
CR	Transparent red	●	●
CB	Transparent blue	●	●
CG	Transparent green	●	●
CY	Transparent yellow	●	●

Fittings/  
tubes



Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

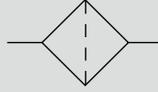
Vacuum filter

# VFA1000/3000/4000 Series

Removing dust & moisture from air when absorbing air by vacuum pump or ejector

● Port size: Rc1/8 to Rc1/2

JIS symbol



## Specifications

Model No.	VFA1000		VFA3000		VFA4000	
Working pressure kPa	-100 to 0					
Proof pressure MPa	0.5					
Ambient/fluid temperatures °C	5 to 50					
Bowl capacity cm <sup>3</sup>	10		45		80	
Port size Rc	1/8	1/4	1/4	3/8	3/8	1/2
Weight kg	0.1		0.3		0.5	
Recommended flow rate *1 Q /min (ANR)	60	80	100	200	250	400

\*1: Flow rate applies where initial pressure loss is 3 kPa or less (at standard element used).

\*2: or standard element, 40 μm of mesh (average) is used in filtration section (material: polyamide), while options include filtration rating 5 μm fiber (material: polypropylene).

## Compatibility table by variation

	VFA1000	VFA3000	VFA4000
Port size	Rc1/8, 1/4	Rc1/4, 3/8	Rc3/8, 1/2
P4	●	●	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

Note: Metal bowl is not available.

## How to order

**VFA3000** - **8** - **Y5** **P4** - **B**

**A** Model No.

**B** Port size

**C** Option

**D** Attachment

Code		Content	VFA1000	VFA3000	VFA4000
<b>B Port size</b>					
<b>6</b>		Rc1/8	●	□	□
<b>8</b>		Rc1/4	●	●	□
<b>10</b>		Rc3/8	□	●	●
<b>15</b>		Rc1/2	□	□	●
<b>C Option</b>					
Bowl material	<b>Blank</b>	Polyamide (nylon)	●	●	●
	<b>Blank</b>	40 μm Polyamide	●	●	●
Element	<b>Y5</b>	5 μm Polypropylene	●	●	●
	<b>Blank</b>		□	□	□
<b>D Attachment</b>					
	<b>Blank</b>	No	●	●	●
	<b>B</b>	C bracket	●	●	●

## Model No. of single bracket

Model No.	Bracket model No.
VFA1000	B120
VFA3000	B320
VFA4000	B420

## ⚠ Precautions for model No. selection

\*1: Indicate options for bowl material and element in order.

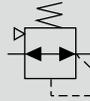


Vacuum regulator

# VRA2000 Series

● Port size: Rc1/4, Rc3/8, G1/4, G3/8, 1/4NPT, 3/8NPT

JIS symbol



## Specifications

Model No.	VRA2000-8	VRA2000-10
Set pressure kPa	-100 to -1	
Ambient/fluid temperatures °C	5 to 50	
Balance leak flow rate ℓ/min (ANR)	1 *3	
Max. flow rate ℓ/min (ANR)	200 *1	
Port size	IN/OUT	1/4      3/8
	Gauge	1/8
Weight kg	0.29	

\*1: The max. flow rate is the flow rate when the secondary side is completely closed and the primary pressure is at -101.3 kPa, and then, after adjusting the secondary pressure to -100 kPa, the secondary side is fully opened.

\*2: Available only for port size Rc.

\*3: Flow rate when primary pressure is set to -95 kPa or less and secondary pressure to -45 kPa while closed.

## Compatibility table by variation

	VRA2000
Port size	Rc1/4, 3/8
P4	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Available pressure gauge is PPX only.

\*2: Pressure gauge/pressure sensor must be ordered separately.  
(Attachment options not available.)

## How to order

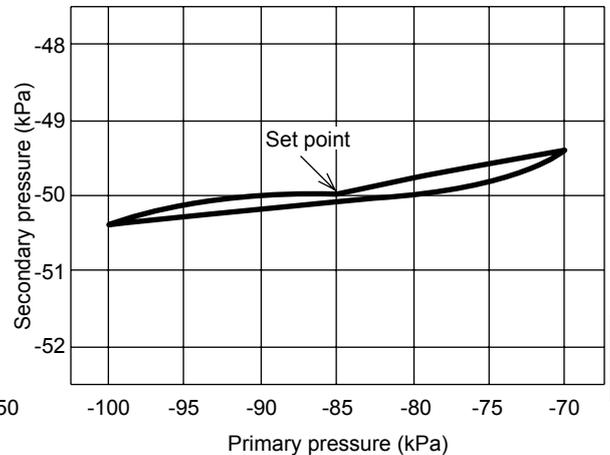
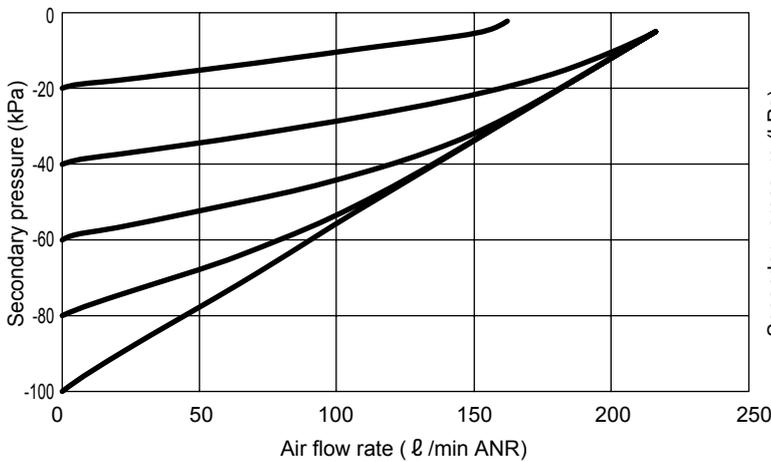
VRA2000 - 8 - P4 - B

A Port size

B Option (attachment)

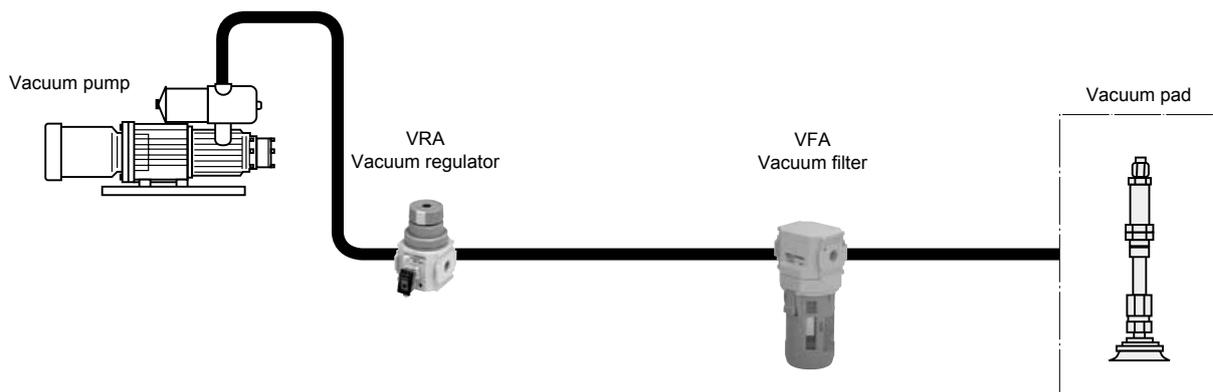
Code	Content
<b>A Port size</b>	
8	Rc1/4
10	Rc3/8
<b>B Option</b>	
Blank	No
B	C bracket
B3	L bracket
B4	B bracket

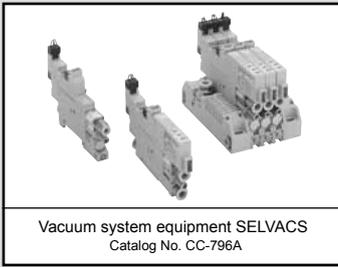
## Characteristic curve



\*1: The primary side vacuum pump is measured with using discharge rate 500 ℓ/min.

## Applications





Vacuum ejector unit which is lightweight and compact in appearance and has a high-cycle vacuum system

# VSX Series

- Nozzle diameter:  $\varnothing 0.5$ ,  $\varnothing 0.7$ ,  $\varnothing 1.0$



## Specifications

Descriptions	VSX
Working fluid	Air
Working pressure range MPa	0.3 to 0.7
Working ambient temperature °C	5 to 50

## Ejector characteristics

Model No.	Nozzle diameter (mm)	Rated supply pressure (MPa)	Achieved vacuum pressure (-kPa)	Intake flow rate (ℓ/min (ANR))	Air consumption rate (ℓ/min (ANR))
VSX-H05... Atmospheric release Common exhaust	0.5	0.5	90.4	7	11.5
VSX-L05... Atmospheric release Common exhaust			66.5	12	
VSX-E05... Atmospheric release Common exhaust	0.7	0.35	90.4	3	8
VSX-H07... Atmospheric release Common exhaust		0.5	0.5	93.1	13
VSX-L07...S Atmospheric release	66.5			24	
VSX-L07...J Common exhaust	1.0	0.35	90.4	22	17
VSX-E07... Atmospheric release Common exhaust				10.5	
VSX-H10...S Atmospheric release	0.5	0.5	93.1	24	46
VSX-H10...J Common exhaust				20	
VSX-L10...S Atmospheric release	0.35	0.35	90.4	26	34
VSX-E10...S Atmospheric release				20	
VSX-E10...J Common exhaust				19	

Note: Values in table are representative values. Suction flow rate differs with the vacuum piping conditions (vacuum port size, pipe length).

## Solenoid valve specifications

- Pilot valve

Descriptions	Vacuum generating valve		Vacuum break valve	
Actuation	Direct operation			
Valve structure	Elastic sealing, poppet valve			
Rated voltage	24 VDC	100 VAC	24 VDC	100 VAC
Allowable voltage fluctuation range	24 VDC $\pm 10\%$	100 VAC $\pm 10\%$	24 VDC $\pm 10\%$	100 VAC $\pm 10\%$
Surge protective circuit	Varistor	Bridge diode	Varistor	Bridge diode
Power consumption	1.2 W (with LED)	1.5 VA (with LED)	1.2 W (with LED)	1.5 VA (with LED)
Manual operation	Push non-locking			
Operation display	At coil excitation operation: Red LED lights			
	Connector (cable length: 500 mm)			
Connection	Red: 24 VDC Black: COM	Blue	Red: 24 VDC Black: COM	Blue

- Main valve

Descriptions	Vacuum generating valve
Actuation	Pneumatically actuated by pilot valve
Valve structure	Elastic sealing, poppet valve
Proof pressure	1.05 MPa
Valve	Normally closed
Lubrication	Not required
Effective cross-sectional area	Air supply port size $\varnothing 4$ : 3.5 mm <sup>2</sup>
	Air supply port size $\varnothing 6$ : 4.5 mm <sup>2</sup>

**Vacuum pressure switch specifications**

Descriptions	With digital display		Without display
	With 2-point switch output (-DW)	With analog output (-DA)	Analog output only (-A0)
Shipment default	-50 kPa (SW1), -10 kPa (SW2)	-50 kPa	-
Current consumption	40 mA or less		15 mA or less
Pressure detection method	Diffused semiconductor pressure switch		
Working pressure range	-100 to 0 kPa		
Set pressure range	-99 to 0 kPa		-
Proof pressure	0.2 MPa		
Storage temperature range	-20 to 80°C (atmospheric pressure, humidity 60% RH or less)		
Operating temperature range	0 to 50°C (no freezing)		
Operating humidity range	35 to 85% RH (no condensation)		
Power supply voltage	12 to 24 VDC ±10% ripple (P-P) 10% or less		
Degree of protection	IEC standards IP40 or equivalent		
Pressure setting points	2	1	-
Operation precision	±3% F.S. max.(at Ta=25°C)		-
Hysteresis	Fixed (2% F.S. or less)	Variable (Approx. 0 to 15% F.S.)	-
Switch output	NPN open collector output 30 V 80mA or less Residual voltage 0.8 V or less		-
Analog output	Output voltage	1 to 5 V	
	Zero point voltage	1±0.1 V	
	Span voltage	4±0.1 V	
	Output current	1 mA or less (load resistance 5 kΩ and over)	
	LIN/HYS	-	±0.5% F.S.max.
Display	0 to -99 kPa (2-digit red LED display)		-
Display frequency	Approx. 4 times/second		-
Display accuracy	±3% F.S. ±2digit		-
Resolution	1digit		-
Operation display	SW1: Red LED lights at set pressure and over SW2: Green LED lights at set pressure and over	Red LED lights at set pressure and over	-
Function	1. MODE change-over switch (ME or S1 or S2)	1. MODE change-over switch (ME or SW)	-
	2. S1 set trimmer (2/3 rotation trimmer)	2. SW set trimmer (2/3 rotation trimmer)	-
	3. S2 set trimmer (2/3 rotation trimmer)	3. HYS set trimmer (Approx. 0 to 15% F.S.)	-

**Vacuum break function specifications**

Valve	Break air flow rate
Normally closed	0 to 7.5 ℓ /min(ANR)
Self-hold	0.2 to 2 ℓ /min(ANR)

\*1: Value at supply pressure of 0.5 MPa.

\*2: Note that for self-hold, the valve response specifications cannot be met outside the above flow rate setting range.

\*3: The burst air flow rate will vary with the diameter and length (piping resistance, etc.) of the vacuum side piping.

**Vacuum filter specifications**

Descriptions	Vacuum filter
Element material	PVF (Polyvinyl formal)
Filtration degree	10 μm
Filter surface area	502 mm <sup>2</sup>
Replacement filter element model No.	VSX-E

## Compatibility table by variation

	VSX	VSXM
Port size	ø4, ø6	ø4, ø6, ø8, ø10
P4	▲	▲

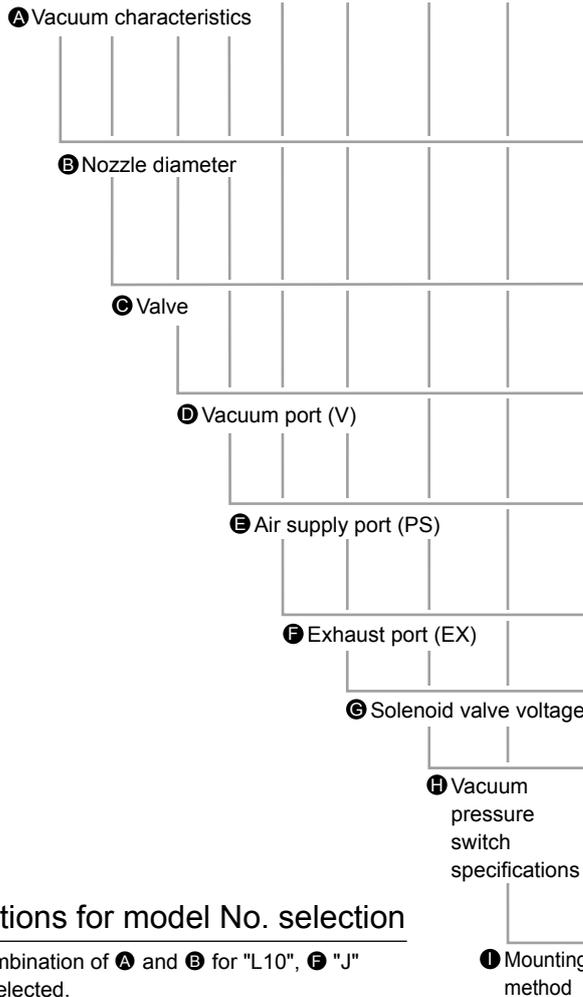
● : Standard ○ : Made to order  
 ▲ : Contact CKD □ : Not applicable

\*1: Applicable only for common exhaust.

## How to order (single unit)

● 10.5 mm width integrated vacuum ejector unit, single unit

**VSX - H 07 D - 6 6 J - 3 - DW - D - P4**



Code	Content
<b>A Vacuum characteristics *1</b>	
H	High vacuum/medium flow rate
L	Medium vacuum/large flow rate
E	High vacuum/low flow rate
<b>B Nozzle diameter *1</b>	
05	ø0.5
07	ø0.7
10	ø1.0
<b>C Valve</b>	
B	Normally closed
D	Self-hold
<b>D Vacuum port (V)</b>	
4	ø4 push-in fitting
6	ø6 push-in fitting
<b>E Air supply port (PS)</b>	
4	ø4 push-in fitting
6	ø6 push-in fitting
<b>F Exhaust port (EX) *1</b>	
J	ø6 push-in fitting common exhaust
<b>G Solenoid valve voltage</b>	
3	24 VDC
<b>H Vacuum pressure switch specifications</b>	
Blank	Without vacuum pressure switch
DW	With digital display, NPN output 2 points
DA	With digital display, NPN output 1 point + analog output
AO	Analog output
<b>I Mounting method</b>	
D	DIN rail mount
Blank	Direct mount

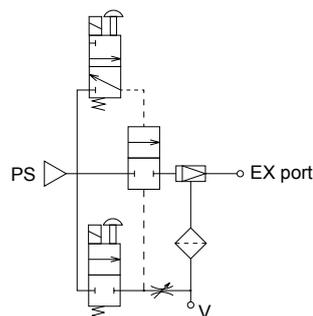
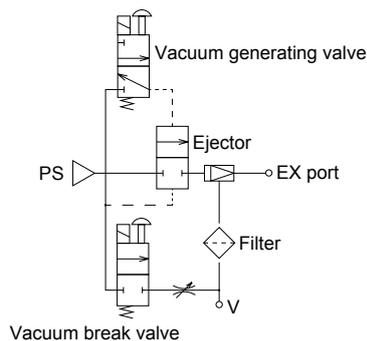
## ⚠ Precautions for model No. selection

\*1: With the combination of **A** and **B** for "L10", **F** "J" cannot be selected.

## Circuit diagram

● Normally closed

● Self-hold





Vacuum system equipment SELVACS  
Catalog No. CC-796A

# Suction pad VSP Series

Pad shape		Pad size	Pad material
<b>Standard compact / general: VSP-*RM/*R</b> Ideal for thick and flat workpieces		ø0.7, ø1, ø2, ø3, ø4, ø6, ø8, ø10, ø15, ø20, ø25, ø30, ø40, ø50, ø60, ø80, ø100, ø150, ø200	Silicone, urethane, fluorine, antistatic silicone rubber
<b>Standard deep: VSP-*A</b> Ideal for adsorption of round ball, etc.		ø15, ø20, ø25, ø30, ø40, ø50, ø60, ø80, ø100	
<b>Sponge: VSP-*S</b> Ideal for workpieces with concave-convex surface such as external wall material		ø10, ø15, ø20, ø25, ø30, ø35, ø50, ø70, ø100	Chloroprene
<b>Bellows: VSP-*B</b> Ideal for soft workpieces such as paper or plastic		ø10, ø20, ø30, ø40, ø50, ø80	Silicone, antistatic silicone rubber
<b>Multi-stage bellows: VSP-*W</b> Ideal for transporting tilted workpieces or plastic packaging products		ø10, ø20, ø30, ø40, ø50	Silicone
<b>Oval: VSP-*E</b> Ideal for workpieces such as IC base whose adsorption space is limited		4×10, 4×20, 4×30, 5×10, 5×20, 5×30, 6×10, 6×20, 6×30, 8×20, 8×30	Silicone
<b>Soft: VSP-*L</b> Ideal for retrieving molded products or for transporting fragile workpieces		ø4, ø6, ø8, ø10, ø15, ø20, ø30, ø40	Silicone, fluorosilicone rubber, antistatic silicone rubber
<b>Soft bellows: VSP-*LB</b> Ideal for retrieving molded products or for adsorption of paper, etc.		ø6, ø8, ø10, ø15, ø20	Silicone
<b>Type for thin objects: VSP-*P</b> Ideal for transport of thin workpieces such as copy paper and plastic, etc.		ø8, ø10, ø15, ø20	Fluorosilicone rubber

## Compatibility table by variation

	VSP
P4	▲

- \*1: Holder shape is only available for fixed type.  
 \*2: Free holder and position locking valve are not supported.  
 \*3: For pad material, only S, V, F, SE, FS, and Blank are supported.  
 \*4: Pad shapes O, K, F, Q cannot be selected.

- : Standard  
 ○ : Made to order  
 ▲ : Contact CKD  
 □ : Not applicable



Vacuum filter compatible with various vacuum pipes  
Vacuum filter

# VSFU Series

● Port size: M5,  $\phi 4$ ,  $\phi 6$ ,  $\phi 8$ ,  $\phi 10$ ,  $\phi 12$



## Specifications

Descriptions	VSFU
Working fluid	Air
Working pressure range kPa	-100 to 0
Filtration accuracy $\mu\text{m}$	10
Working ambient temperature $^{\circ}\text{C}$	0 to 60 (no freezing)

## Compatibility table by variation

	VSFU
Port size	$\phi 4$ , $\phi 6$ , $\phi 8$ , $\phi 10$
P4	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

● Compact union

**VSFU - 3 - 1010 - P4**

Ⓐ Filter size

Ⓑ Vacuum side port size - Pad side port size

● Filter size - port size combination table

Port size Model No.	44	66	88	1010	M55
VSFU-1S	●	●	□	□	●
VSFU-1L	●	●	□	□	●
VSFU-2	●	●	□	□	□
VSFU-3	□	●	●	●	□

Code	Content
<b>Ⓐ Filter size</b>	
<b>1S</b>	Filtration area 2.8 cm <sup>2</sup> (element length: 15 mm)
<b>1L</b>	Filtration area 4.7 cm <sup>2</sup> (element length: 25 mm)
<b>2</b>	Filtration area 7.5 cm <sup>2</sup>
<b>3</b>	Filtration area 12.5 cm <sup>2</sup>
<b>Ⓑ Vacuum side port size - Pad side port size</b>	
<b>44</b>	Push-in fitting $\phi 4$ - Push-in fitting $\phi 4$
<b>66</b>	Push-in fitting $\phi 6$ - Push-in fitting $\phi 6$
<b>88</b>	Push-in fitting $\phi 8$ - Push-in fitting $\phi 8$
<b>1010</b>	Push-in fitting $\phi 10$ - Push-in fitting $\phi 10$
<b>M55</b>	M5 $\times$ 0.8-M5 $\times$ 0.8

● Maintenance part model No.

· Bracket

**VSFU - 3 - B**

Ⓐ Size

Code	Content
<b>Ⓐ Size</b>	
<b>1</b>	Filter size 1S, 1L common
<b>2</b>	For filter size 2
<b>3</b>	For filter size 3

· Filter element

**VSFU - 3 - E**

Ⓐ Filter size

Code	Content
<b>Ⓐ Filter size</b>	
<b>1S</b>	Filtration area 2.8 cm <sup>2</sup> (element length: 15 mm)
<b>1L</b>	Filtration area 4.7 cm <sup>2</sup> (element length: 25 mm)
<b>2</b>	Filtration area 7.5 cm <sup>2</sup>
<b>3</b>	Filtration area 12.5 cm <sup>2</sup>



Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

# Fine buffer

## FBU2 Series

O.D.: M8, M12,  $\phi 7$ ,  $\phi 12$   
Load capacity: 30, 80 g

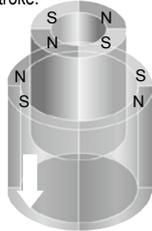
P4 compliant  
as standard



### Uniform pressure

If the magnets in the movable shaft and fixed shaft are misaligned, a diagonal line of magnetic force appears and power is generated as the axial force tries to return. Pressure due to magnetic force is selected from the 3 ranges of 0.2 N, 0.5 N and 1.0 N depending on the model. All are nearly constant regardless of the stroke.

Magnetic return force  
constant in the axial direction

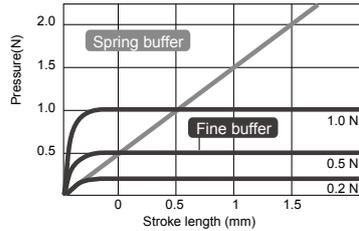


### Clean & long life

No metal contact compared with spring buffers, for an ultra-low dust generation rate.  
No spring fatigue for long service life and stable performance.

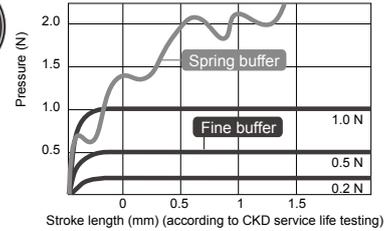
#### Pressure characteristics

At initial operation



Long service life,  
maintenance-free

After 1 million operation cycles



### Specifications

Descriptions	FBU2-7D		FBU2-8M	FBU2-12D		FBU2-12M
	S	H/HV	S	S	H/HV	S
O.D.	$\phi 7h7$		M8×0.75	$\phi 12h7$		M12×1
Appearance	S/H	HV		S/H	HV	
Buffer pressure	N		N	N		N
	0.1 to 0.2		0.1 to 0.2	0.4 to 0.6, 0.9 to 1.1		0.4 to 0.6, 0.9 to 1.1
Pressure variation *1	±15% or less					
Buffer stroke length	2	6	2	6	2	6
Operating ambient temperature °C	5 to 50		5 to 50	5 to 50		5 to 50
Bearing clearance mm	0.2 or less		0.2 or less	0.2 or less		0.2 or less
Max. holding torque *2	N·cm			N·cm		N·cm
	0.25 and over (reference value)			*3		*3
Return positioning accuracy	X-Y	mm	mm	mm	mm	mm
		±0.1 or less	±0.05 or less	±0.1 or less	±0.1 or less	±0.1 or less
	*4	Z	mm	±0.1 or less		
		$\theta$	°	3 or less		
Load capacity	g			g		
	30 or less			80 or less		

\*1: Indicates pressure fluctuations within the stroke. Pressure is not proportional to the stroke.

\*2: If a rotary torque exceeding the max. holding torque is applied on the moving axis, the moving axis will step out and rotate 180°.

\* Holding torque: Force which can return to the original position even if force is applied in  $\theta$  direction (Fig. 1) and moving axis position deviates.

\*3: Refer to the table at right for FBU2-12M/12D holding torque.

\*4: Refer to the figure below (Fig. 1) for return positioning accuracy. The figure shows buffer return accuracy.

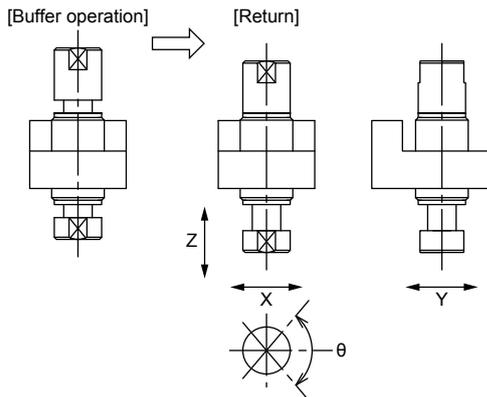
\*5: Consult with CKD for requirements not complying with specifications.

\*6: Load capacity indicates the max. load (jig and adsorbent) mounted on the head piece.

[FBU2-12M/12D max. holding torque (reference value)]

Pressure (N)	Stroke length (mm)	Holding torque (N·cm)
0.5	2	0.5 or more
	6	0.5 or more
	16	1.2 or more
1	2	1.2 or more
	6	1.2 or more
	16	2.5 or more

Indicates the holding torque at the outer end.



(Fig. 1) Return detailed drawing

Vacuum  
components

# FBU2 Series

## How to order

**FBU2** - **12D** - **S** - **10** - **6** - **T3** - **H3**

Model No.

**A** O.D.

**B** Bearing precision

**C** Pressure

**D** Buffer stroke length

**E** Tailpiece shape

**F** Head piece shape

Model No.

FBU2-7D

FBU2-8M

FBU2-12D

FBU2-12M

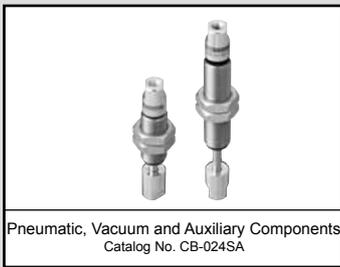
Code	Content	FBU2-7D	FBU2-8M	FBU2-12D	FBU2-12M
<b>A O.D.</b>					
7D	ø7h7 spigot	●			
8M	M8 x 0.75 full thread		●		
12D	ø12h7 spigot			●	
12M	M12 x 1 full thread				●
<b>B Bearing precision</b>					
S	Standard (bearing clearance 0.2 mm or less)	●	●	●	●
H	High precision (bearing clearance 0.05 mm or less)	●		●	
HV	Internal flow path high precision (bearing clearance 0.05 mm or less)	●		●	
<b>C Pressure (N)</b>					
02	0.2	●	●		
05	0.5			●	●
10	1.0			●	●
<b>D Buffer stroke length (mm)</b>					
2	2	●	●	●	●
6	6	●	●	●	●
16	16			●	●
<b>E Tailpiece shape</b>					
TB	Without hole	●	●	●	●
T3	M3 female thread depth 3	●	●	●	●
T5	M5 female thread depth 4			●	●
<b>F Head piece shape</b>					
HB	Without hole	●	●	●	●
H3	M3 female thread depth 3	●	●	●	●
H5	M5 female thread depth 4			●	●

Combination of bearing precision, buffer stroke, tailpiece shape, and head piece shape

		<b>B Bearing precision</b>		
		S	H	HV
<b>D Buffer stroke length</b>	2	●	●	●
	6	●	●	●
	16	●		
<b>E Tailpiece shape</b>	TB	●	●	●
	T3	●	●	
	T5	●	●	
<b>F Head piece shape</b>	HB	●	●	
	H3	●	●	●
	H5	●	●	●

Model No. of single mounting bracket for spigot

<b>A O.D.</b>	<b>Model No. of single bracket</b>	
	L installation	Straight installation
7D	FBU2- 7D-B1	FBU2- 7D-B2
12D	FBU2- 12D-B1	FBU2- 12D-B2



Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

Fine buffer

# FBU2-SU Series

Outer diameter: M12, full thread  
Load capacity: 200 g

P4 compliant  
as standard

RoHS

## Specifications

Descriptions		FBU2-SU
O.D.		M12×1
Buffer pressure	N	0.4 to 0.6, 0.9 to 1.1
Pressure variation *1)		±15% or less
Buffer stroke length	mm	2, 6, 16
Operating ambient temperature °C		5 to 50
Bearing clearance mm		0.2 or less
Max. holding torque N·cm		*2)
Return positioning accuracy	X-Y mm	±0.1 or less
	*3) Z mm	±0.1 or less
	θ °	3 or less
Load capacity g		200 or less

\*1: Indicates pressure fluctuations within the stroke. Pressure is not proportional to the stroke.

\*2: If a rotary torque exceeding the max. holding torque is applied on the moving axis, the moving axis will step out and rotate 180°.

\* Holding torque: Force which can return to the original position even if force is applied in θ direction (Fig. 1) and moving axis position deviates.

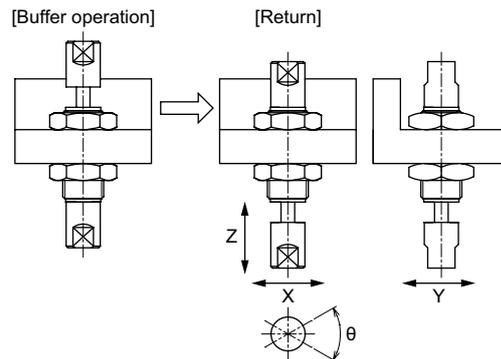
\*3: Refer to the figure below for return positioning accuracy. The figure shows buffer return accuracy.

\*4: Consult with CKD for requirements not complying with specifications.

[FBU2-SU max. holding torque (reference value)]

Pressure (N)	Stroke length (mm)	Holding torque (N·cm)
0.5	2	0.5 or more
	6	0.5 or more
	16	1.2 or more
1	2	1.2 or more
	6	1.2 or more
	16	2.5 or more

Indicates the holding torque at the outer end.



## How to order

**FBU2 - SU** - **05** - **6** - **T3** - **H3**

Model No.

**A** Pressure

**B** Buffer stroke length

**C** Tail shape

**D** Head shape

Code	Content
<b>A Pressure (N)</b>	
05	0.5
10	1.0
<b>B Buffer stroke length (mm)</b>	
2	2
6	6
16	16
<b>C Tail shape</b>	
TB	Without hole
T3	M3 female thread depth 3
T4	M4 female thread depth 4
T5	M5 female thread depth 4
T6	M6 female thread depth 5
<b>D Head shape</b>	
HB	Without hole
H3	M3 female thread depth 3
H4	M4 female thread depth 4
H5	M5 female thread depth 4
H6	M6 female thread depth 5

Vacuum  
components



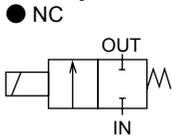
2-port direct acting solenoid valve for dry air  
(General purpose valve)

# AB31/AB41-Z Series

- NC
- Port size: Rc1/8 to Rc1/2



## JIS symbol



## Common specifications

Descriptions	Standard specifications
Working fluid	For dry air (atmospheric dew point -60°C and over)/inert gas/low vacuum [ $1.33 \times 10^2$ Pa (abs)]
Working pressure differential MPa	0 to 4 (refer to max. working pressure differential in individual specifications.)
Max. working pressure MPa	5
Proof pressure (water pressure) MPa	25
Fluid temperature °C	-10 to 45 (no freezing)
Ambient temperature °C	-10 to 45
Thermal class	Class 130 (B)
Atmosphere	Place free of corrosive gas and explosive gas
Valve structure	Direct acting poppet structure
Valve seat leakage $\text{cm}^3/\text{min}$ (ANR)	0.2 or less
Mounting orientation	Unrestricted

## Individual specifications

Descriptions Model No.	Port size	Orifice size (mm)	Max. working pressure differential (MPa)	Rated voltage	Power consumption (W)		Weight (kg)
					AC	DC	
AB31- <sup>01</sup> / <sub>02</sub> -1-*****Z	Rc1/8 Rc1/4	1.5	2.5	100 VAC 50/60 Hz	17	14	0.45
-2-*****Z		2.0	1.5				
-3-*****Z		3.0	0.5				
-4-*****Z		3.5	0.35				
-5-*****Z		4.0	0.2				
-6-*****Z		5.0	0.12				
AB41- <sup>02</sup> / <sub>03</sub> -1-*****Z	Rc1/4 Rc3/8	1.5	4.0	200 VAC 50/60 Hz	17	14	0.57 (Rc1/4)
-2-*****Z		2.0	2.5				
-3-*****Z		3.0	0.9				
-4-*****Z		3.5	0.6				
-5-*****Z		4.0	0.4				
-6-*****Z		5.0	0.2				
-7-*****Z		7.0	0.1				
AB41- <sup>03</sup> / <sub>04</sub> -8-*****Z	Rc3/8 / Rc1/2	10.0	0.03				0.68

\*1: The model numbers above show the basic port size (Rc). Refer to How to order for other combinations.

\*2: The port size model No. is 01 for Rc1/8 (6A), 02 for Rc1/4 (8A), 03 for Rc3/8 (10A) and 04 for Rc1/2 (15A).

\*3: The voltage fluctuation range must be within  $\pm 10\%$  of the rated voltage.

\*4: The leakage current must be less than or equal to the values shown below.

\*5: When using at low vacuum, vacuum the OUT port side.

Leakage current	Voltage	100 VAC	200 VAC	12 VDC	24 VDC	48 VDC	100 VDC
	Model No.						
	AB31-*_*-*****Z	10 mA or less	5 mA or less	40 mA or less	20 mA or less	10 mA or less	5 mA or less
	AB41-*_*-*****Z	10 mA or less	5 mA or less	40 mA or less	20 mA or less	10 mA or less	5 mA or less

## Compatibility table by variation

AB3/AB4-Z	
Classification	Direct acting 2-port valve for dry air
Body material	Stainless steel
P4	●
P40	●

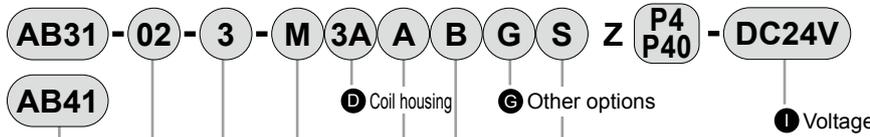
● : Standard ○ : Made to order ▲ : Contact CKD ◻ : Not applicable

\*1: Body material Select from stainless steel products.

\*2: Body material/Seal combination code M only.

\*3: Pipe material is SUS316.

## How to order



						Model No.		
						AB31	AB41	AB41 Large flow rate
Code	Content	Code	Content	Code	Content			
<b>A Port size</b>								
01	Rc 1/8	1G	G 1/8	1N	1/8NPT	●		
02	Rc 1/4	2G	G 1/4	2N	1/4NPT	●	●	
03	Rc 3/8	3G	G 3/8	3N	3/8NPT		●	●
04	Rc 1/2	4G	G 1/2	4N	1/2NPT			●
<b>B Orifice size</b>								
1	ø1.5					●	●	
2	ø2					●	●	
3	ø3					●	●	
4	ø3.5					●	●	
5	ø4					●	●	
6	ø5					●	●	
7	ø7						●	
8	ø10							●
<b>C Body/sealant combination</b>								
	Body	Seal	Treatment	Remarks				
M	Stainless steel	Fluoro rubber	Oil-prohibited	—		●	●	●

The combinations indicated with ● in the above table are available.

For Items ④ to ①, the combinations indicated with codes are available. Note that if options for Items ⑤ to ⑧ are not required, they should be left blank.

④ Coil housing			⑤ Manual override (locking)	⑥ Mounting plate	⑦ Other options		⑧ With surge suppressor	① Rated voltage	
Content					Conduit (conduit piping)			Content	
					CTC-19	G1/2			
3A	Open frame	Lead wire	A	B	G	H	S	12 VDC, 24 VDC, 48 VDC, 100 VDC	
3I		HP terminal box (IP65 or equivalent) (G1/2)						12 VDC, 24 VDC, 100 VDC	
3J		HP terminal box with lamp (IP65 or equivalent) (G1/2)							
5A	Open frame	Lead wire	A	B	G	H		100 VAC, 200 VAC	
5I		HP terminal box (IP65 or equivalent) (G1/2)							
5J		HP terminal box with lamp (IP65 or equivalent) (G1/2)							

⚠ Refer to the following cautions for Items ④ to ①.

3A 5A		<ul style="list-style-type: none"> <li>● Open frame grommet lead wire 300 mm</li> <li>● 5A (diode integrated)</li> </ul>
3I 3J 5I 5J		<ul style="list-style-type: none"> <li>● Open frame HP terminal box (IP65 or equivalent)</li> <li>● 5I, 5J (diode integrated)</li> </ul>

G H		<ul style="list-style-type: none"> <li>● Conduit</li> <li>● G(CTC19)</li> <li>● H(G1/2)</li> </ul>
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Refer to "General Purpose Valves" (Catalog No. CB-03-1SA) for details on coil selection.

## ⚠ Precautions for model No. selection

### Notes for Item ④

\*1: Coils for 5A, 5I, 5J have a diode to convert AC to DC voltage. Voltage of less than 100 VAC is not available.

### Notes for Items ⑤ to ⑧

\*2: Manual override (Item ⑤ A) cannot be mounted on the low pressure large flow rate AB41-03/04-8.

\*3: For ⑦, select an option from G and H.

\*4: The surge suppressor is attached with the lead wire coil. When selecting a coil with a terminal box, the surge suppressor is mounted in the terminal box.

\*5: Surge suppressor is incorporated as standard in the coil with diode.

### Notes for Item ①

\*6: 100 VAC coil is compatible with 100 VAC 50/60 Hz, and 200 VAC coil is compatible with 200 VAC 50/60 Hz.

\*7: For voltages other than above, contact CKD.

\*8: The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.



## Compatibility table by variation

	GAB3/GAB4-Z
Classification	Direct acting 2-port valve for dry air
Body material	Stainless steel
P4	●
P40	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Body material Select from stainless steel products.

\*2: Body material/Seal combination code M only.

\*3: Pipe material is SUS316.

## How to order

● Common supply (port C pressurization)

**GAB312** - **1** - **5** - **M** **5A** **A** **G** **S** **Z** **P4** **P40** - **AC100V**

● Individual supply (port A pressurization)

**GAB352**

● Common supply (port C pressurization)

**GAB412**

● Individual supply (port A pressurization)

**GAB452**

Model No.

		Model No.				
		GAB312	GAB412			
		GAB352	GAB452			
Code	Content					
<b>A Orifice size</b>						
1	ø1.5	●	●			
2	ø2	●	●			
3	ø3	●	●			
4	ø3.5	●	●			
5	ø4	●	●			
6	ø5	●	●			
7	ø7	●	●			
<b>B Manifold station No.</b>						
2	2					
to	to	●	●			
10	10 stations					
0	Actuator only	●	●			
<b>C Body/sealant combination</b>						
	Body	Seal	Treatment	Remarks		
M	Stainless steel	Fluoro rubber	Oil free	—	●	●

The combinations indicated with ● in the above table are available.

For Items (D) to (H), the combinations indicated with codes can be manufactured. Note that if options for Items (E) to (G) are not required, it should be blank.

<b>D Coil housing</b>			<b>E</b>	<b>F Other options</b>		<b>G</b>	<b>H Rated voltage</b>
Content			Manual override (locking)	Conduit (conduit piping)		With surge suppressor	Content
				CTC-19	G1/2		
<b>3A</b>	Open frame	Lead wire	A	G	H	S	12 VDC, 24 VDC, 48 VDC, 100 VDC
<b>3I</b>		HP terminal box (IP65 or equivalent) (G1/2)					
<b>3J</b>		HP terminal box with lamp (IP65 or equivalent) (G1/2)					
<b>5A</b>	Open frame	Lead wire	A	G	H		100 VAC, 200 VAC
<b>5I</b>		HP terminal box (IP65 or equivalent) (G1/2)					
<b>5J</b>		HP terminal box with lamp (IP65 or equivalent) (G1/2)					

**3A**  
**5A**



- Open frame grommet lead wire 300 mm
- 5A (diode integrated)

**3I**  
**3J**  
**5I**  
**5J**



- Open frame HP terminal box (IP65 or equivalent)
- 5I, 5J (diode integrated)

▲ Refer to the following cautions for Items (D) to (H).

**G**  
**H**



- Conduit
- G(CTC19)
- H(G1/2)

Refer to "General Purpose Valves" (Catalog No. CB-03-1SA) for details on coil selection.

## ▲ Precautions for model No. selection

\*1: Orders for only the masking plate and sub-plate are also available. Contact CKD for details.

Notes for Item (B)

\*2: For 11 or more manifold station No., contact CKD.

Notes for Item (D)

\*3: Coils for 5A, 5I, 5J have a diode to convert AC to DC voltage.

Notes for Items (F) to (G)

\*4: For Item (F), select an option from G and H.

\*5: The surge suppressor is attached with the lead wire coil. When selecting a coil with a terminal box, the surge suppressor is mounted in the terminal box.

\*6: Surge suppressor is incorporated as standard in the coil with diode.

Notes for Item (H)

\*7: 100 VAC coil is compatible with 100 VAC 50/60 Hz, and 200 VAC coil is compatible with 200 VAC 50/60 Hz.

\*8: For voltages other than above, contact CKD.

\*9: The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.



3-port direct acting solenoid valve for dry air  
(General purpose valve)

# AG3\*/AG4\*-Z Series

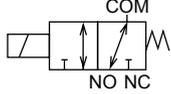
- Universal, NC pressurization, NO pressurization
- Port size: Rc1/8, Rc1/4, Rc3/8



## JIS symbol

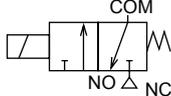
- AG31/41-Z

: Universal



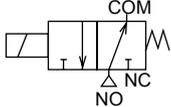
- AG33/43-Z

: NC pressurization



- AG34/44-Z

: NO pressurization



## Common specifications

Descriptions	Standard specifications
Working fluid	For dry air (atmospheric dew point -60°C and over)/inert gas/low vacuum [1.33 x 10 <sup>2</sup> Pa (abs)]
Working pressure differential MPa	0 to 1 (refer to max. working pressure differential in individual specifications.)
Proof pressure (water pressure) MPa	25
Fluid temperature °C	-10 to 45 (no freezing)
Ambient temperature °C	-10 to 45
Thermal class	Class 130 (B)
Atmosphere	Place free of corrosive gas and explosive gas
Valve structure	Direct acting poppet structure
Valve seat leakage cm <sup>3</sup> /min (ANR)	0.2 or less
Mounting orientation	Unrestricted

## Individual specifications

Descriptions Model No.	Port size	Orifice size (mm)		Max. working pressure differential (MPa)	Max. working pressure MPa	Rated voltage	Power consumption (W)		Weight (kg)
		TOP	BODY				AC	DC	
<b>Universal</b>									
AG31- <sup>01</sup> / <sub>02</sub> -1-*****Z	Rc1/8	1.5	1.5	0.7	1	100 VAC 50/60 Hz	17	14	0.45
AG31- <sup>02</sup> / <sub>03</sub> -2-*****Z	Rc1/4	2.0	2.0	0.4					
AG41- <sup>02</sup> / <sub>03</sub> -1-*****Z	Rc1/4	2.0	2.0	0.65					
AG41- <sup>02</sup> / <sub>03</sub> -2-*****Z	Rc3/8	2.3	2.3	0.4					
<b>NC pressurization</b>									
AG33- <sup>01</sup> / <sub>02</sub> -1-*****Z	Rc1/8	1.5	1.5	1.0	1	200 VAC 50/60 Hz	17	14	0.45
AG33- <sup>02</sup> / <sub>03</sub> -2-*****Z	Rc1/4	2.0	2.0	0.7					
AG43- <sup>02</sup> / <sub>03</sub> -4-*****Z	Rc1/4	3.0	3.0	0.7					
AG43- <sup>02</sup> / <sub>03</sub> -5-*****Z	Rc3/8	3.5	3.0	0.4					
<b>NO pressurization</b>									
AG34- <sup>01</sup> / <sub>02</sub> -1-*****Z	Rc1/8	1.5	1.5	1.0	1.5	12 VDC 24 VDC 48 VDC 100 VDC			0.45
AG34- <sup>02</sup> / <sub>03</sub> -2-*****Z	Rc1/4	2.0	2.0	0.45					
AG44- <sup>02</sup> / <sub>03</sub> -1-*****Z	Rc1/4	2.0	2.0	0.75					
AG44- <sup>02</sup> / <sub>03</sub> -3-*****Z	Rc3/8	2.0	3.0	0.7					
AG44- <sup>02</sup> / <sub>03</sub> -4-*****Z	Rc3/8	3.0	3.0	0.25					0.57 (Rc1/4) 0.59 (Rc3/8)

\*1: The model numbers above show the basic port size (Rc). Refer to How to order for other combinations.

\*2: The port size model No. is 01 for Rc1/8 (6A), 02 for Rc1/4 (8A) and 03 for Rc3/8 (10A).

\*3: The voltage fluctuation range must be within ±10% of the rated voltage.

\*4: The leakage current must be less than or equal to the values shown below.

\*5: When using at low vacuum, vacuum the NO port side of NC pressurization type or the NC port side of NO pressurization type.

Leakage current	Voltage	100 VAC	200 VAC	12 VDC	24 VDC	48 VDC	100 VDC
	Model No.						
	AG31/33/34-*****Z	6 mA or less	3 mA or less	40 mA or less	20 mA or less	10 mA or less	5 mA or less
	AG41/43/44-*****Z	8 mA or less	4 mA or less	40 mA or less	20 mA or less	10 mA or less	5 mA or less

### Compatibility table by variation

AG3/AG4-Z	
Classification	Direct acting 3-port valve for dry air
Body material	Stainless steel
P4	●
P40	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Body material Select from stainless steel products.

\*2: Body material/Seal combination code M only.

\*3: Pipe material is SUS316.

### How to order

● Universal

AG31 - 02 - 2 - M 3A A B G S Z P4 P40 - DC24V

AG41

● NC pressurization

AG33

AG43

● NO pressurization

AG34

AG44

Model No.

D Coil housing    E Other options  
 E Manual override (locking)  
 F Mounting plate    H With surge suppressor    I Voltage

A Port size

B Orifice size

C Body/sealant combination

Code						Content						Model No.											
A Port size												AG31	AG41	AG33	AG43	AG34	AG44						
01	Rc1 / 8	1G	G 1 / 8	1N	1 / 8NPT	●	●	●	●	●	●												
02	Rc1 / 4	2G	G 1 / 4	2N	1 / 4NPT	●	●	●	●	●	●	●	●	●	●	●							
03	Rc3 / 8	3G	G 3 / 8	3N	3 / 8NPT		●		●		●		●		●								
B Orifice size																							
		AG31		AG41		AG33		AG43		AG34		AG44											
		TOP	BODY	TOP	BODY	TOP	BODY	TOP	BODY	TOP	BODY	TOP	BODY										
1		ø1.5	ø1.5	ø2.0	ø2.0	ø1.5	ø1.5	-	-	ø1.5	ø1.5	ø2.0	ø2.0	●	●	●					●	●	
2		ø2.0	ø2.0	ø2.3	ø2.3	ø2.0	ø2.0	-	-	ø2.0	ø2.0	-	-	●	●	●					●		
3		-	-	-	-	-	-	-	-	-	-	ø2.0	ø3.0									●	
4		-	-	-	-	-	-	ø3.0	ø3.0	-	-	ø3.0	ø3.0									●	●
5		-	-	-	-	-	-	ø3.5	ø3.0	-	-	-	-										
C Body/sealant combination																							
		Body		Seal		Treatment		Remarks															
M		Stainless steel		Fluoro rubber		Oil free		—		●	●	●	●	●	●	●	●	●	●	●	●	●	

The combinations indicated with ● in the above table are available.

For Items ④ to ①, the combinations indicated with codes are available. Note that if options for Items ⑤ to ⑧ are not required, they should be left blank.

D Coil housing			E	F	G Other options		H	I Rated voltage
Content			Manual override (locking)	Mounting plate	Conduit (conduit piping)		With surge suppressor	Content
					CTC-19	G 1 / 2		
3A	Open frame	Lead wire	A	B	G	H	S	12 VDC, 24 VDC, 48 VDC, 100 VDC
3I		HP terminal box (IP65 or equivalent) (G1/2)						
3J		HP terminal box with lamp (IP65 or equivalent) (G1/2)						
5A	Open frame	Lead wire	A	B	G	H		100 VAC, 200 VAC
5I		HP terminal box (IP65 or equivalent) (G1/2)						
5J		HP terminal box with lamp (IP65 or equivalent) (G1/2)						

Refer to the following cautions for Items ④ to ①.

3A 5A



- Open frame grommet lead wire 300 mm
- 5A (diode integrated)

3I 3J 5I 5J



- Open frame HP terminal box (IP65 or equivalent)
- 5I, 5J (diode integrated)

G H



- Conduit
- G(CTC19)
- H(G1/2)

Refer to "General Purpose Valves" (Catalog No. CB-03-1SA) for details on coil selection.

### Precautions for model No. selection

#### Notes for Item ④

\*1: Coils for 5A, 5I, 5J have a diode to convert AC to DC voltage. Voltage of less than 100 VAC is not available.

#### Notes for Items ⑤ to ⑧

- \*2: For ⑤, select an option from G and H.
- \*3: The surge suppressor is attached with the lead wire coil. When selecting a coil with a terminal box, the surge suppressor is mounted in the terminal box.
- \*4: Surge suppressor is incorporated as standard in the coil with diode.

#### Notes for Item ①

- \*5: 100 VAC coil is compatible with 100 VAC 50/60 Hz, and 200 VAC coil is compatible with 200 VAC 50/60 Hz.
- \*6: For voltages other than above, contact CKD.
- \*7: The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.



Direct acting 3-port solenoid valve for dry air, manifold/actuator (general purpose valve)

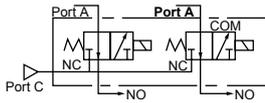
# GAG31\*/GAG35\*/GAG41\*/GAG45\* -Z Series

- Universal
- Common supply/individual exhaust, common supply/separate flow

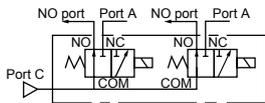


## Manifold circuit configuration Common specifications

- GAG31\*/41\*-Z  
(common supply/individual exhaust)



- GAG35\*/45\*-Z  
(common supply/separate flow)



Descriptions	Standard specifications
Working fluid	For dry air (atmospheric dew point -60°C and over)/inert gas/low vacuum [1.33 x 10 <sup>2</sup> Pa (abs)]
Working pressure differential MPa	0 to 1 (refer to max. working pressure differential in individual specifications.)
Max. working pressure MPa	1
Proof pressure (water pressure) MPa	10
Fluid temperature °C	-10 to 45 (no freezing)
Ambient temperature °C	-10 to 45
Thermal class	Class 130 (B)
Atmosphere	Place free of corrosive gas and explosive gas
Valve structure	Direct acting poppet structure
Valve seat leakage cm <sup>3</sup> /min (ANR)	0.2 or less
Mounting orientation	Unrestricted

## Individual specifications

Descriptions Model No.	NO port size	Orifice size (mm)		Max. working pressure differential (MPa)	Rated voltage	Power consumption (W)	
		TOP	BODY			AC50/60 Hz	DC
GAG 311-1-Z	Rc1/8	1.5	1.5	0.7	100 VAC 50/60 Hz	17	14
351-2-Z		2.0	2.0	0.4			
GAG 312-1-Z	Rc1/4	1.5	1.5	0.7	200 VAC 50/60 Hz		
352-2-Z		2.0	2.0	0.4			
GAG 412-1-Z	Rc1/4	2.0	2.0	0.65	12 VDC 24 VDC 48 VDC 100 VDC		
452-2-Z		2.3	2.3	0.4			
GAG 413-1-Z	Rc3/8	2.0	2.0	0.65			
453-2-Z		2.3	2.3	0.4			

\*1: The model numbers above are for the basic NO port size and orifice size. Refer to How to order for other combinations.

\*2: For the sizes of ports A and C, refer to "How to order and Dimensions" ("General Purpose Valves" (Catalog No. CB-03-1SA)).

\*3: The voltage fluctuation range must be within ±10% of the rated voltage.

\*4: When using in a continuously energized state, use fluoro rubber seal.

\*5: The leakage current must be less than or equal to the values shown below.

Leakage current	Voltage	100 VAC	200 VAC	12 VDC	24 VDC	48 VDC	100 VDC
	Model No.						
	GAG31*-*****Z	6 mA or less	3 mA or less	40 mA or less	20 mA or less	10 mA or less	5 mA or less
	GAG41*-*****Z	8 mA or less	4 mA or less	40 mA or less	20 mA or less	10 mA or less	5 mA or less

### Compatibility table by variation

GAG3/GAG4-Z	
Classification	Direct acting 3-port valve for dry air
Body material	Stainless steel
P4	●
P40	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Body material Select from stainless steel products.

\*2: Body material/Seal combination code M only.

\*3: Pipe material is SUS316.

### How to order

● Common supply/individual exhaust (port C pressurization)

**GAG31** 1 - 1 - 7 - M 5A A G S Z **P4** **P40** - AC100V

● Common supply/separate flow (port C pressurization)

**GAG35** 1

● Common supply/individual exhaust (port C pressurization)

**GAG41** 2

● Common supply/separate flow (port C pressurization)

**GAG45** 2

Model No.

Ⓐ NO port size

Ⓑ Orifice size

Ⓒ Manifold station No.  
\*2

Ⓓ Body/sealant combination

Ⓔ Coil housing

Ⓕ With surge suppressor

Ⓖ Manual override (locking)

Ⓘ Rated voltage

Ⓙ Other options

		Model No.				
		GAG3**	GAG4**			
Code		Content				
Ⓐ NO port size						
1	1/8	●	□			
2	1/4	●	●			
3	3/8	□	●			
Ⓑ Orifice size						
		GAG3**		GAG4**		
		TOP	BODY	TOP	BODY	
1	ø1.5	ø1.5	ø1.5	ø2.0	ø2.0	
2	ø2.0	ø2.0	ø2.0	ø2.3	ø2.3	
Ⓒ Manifold station No.						
2	2	●	●			
to	to					
10	10 stations	●	●			
0	Actuator only	●	●			
Ⓓ Body/sealant combination						
	Body	Seal	Treatment	Remarks		
M	Stainless steel	Fluoro rubber	Oil free	—	●	●

The combinations indicated with ● in the above table are available.

For Items (E) to (I), the combinations indicated with codes are available. Note that if options for Items (F) to (H) are not required, they should be left blank.

Ⓔ Coil housing			Ⓖ Manual override (locking)	Ⓙ Other options		Ⓕ With surge suppressor	Ⓘ Rated voltage
Content			A	Conduit (conduit piping)		S	Content
				CTC-19	G 1 / 2		
3A	Open frame	Lead wire	A	G	H		12 VDC, 24 VDC, 48 VDC, 100 VDC
3I		HP terminal box (IP65 or equivalent) (G1/2)					
3J		HP terminal box with lamp (IP65 or equivalent) (G1/2)					
5A	Open frame	Lead wire	A	G	H		100 VAC, 200 VAC
5I		HP terminal box (IP65 or equivalent) (G1/2)					
5J		HP terminal box with lamp (IP65 or equivalent) (G1/2)					

⚠ Refer to the following cautions for Items (E) to (I).

3A 5A		<ul style="list-style-type: none"> <li>● Open frame grommet lead wire 300 mm</li> <li>● 5A (diode integrated)</li> </ul>
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G H		<ul style="list-style-type: none"> <li>● Conduit</li> <li>● G(CTC19)</li> <li>● H(G1/2)</li> </ul>
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3I 3J 5I 5J		<ul style="list-style-type: none"> <li>● Open frame HP terminal box (IP65 or equivalent)</li> <li>● 5I, 5J (diode integrated)</li> </ul>
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Refer to "General Purpose Valves" (Catalog No. CB-03-1SA) for details on coil selection.

### ⚠ Precautions for model No. selection

\*1: Orders for only the masking plate and sub-plate are also available. Contact CKD for details.

Notes for Item (C)

\*2: For 11 or more manifold station No., contact CKD.

Notes for Item (E)

\*3: Coils for 5A, 5I, 5J have a diode to convert AC to DC voltage.

Notes for Items (G) to (H)

\*4: For Item (C), select an option from G and H.

\*5: The surge suppressor is attached with the lead wire coil. When selecting a coil with a terminal box, the surge suppressor is mounted in the terminal box.

\*6: Surge suppressor is incorporated as standard in the coil with diode.

Notes for Item (I)

\*7: 100 VAC coil is compatible with 100 VAC 50/60 Hz, and 200 VAC coil is compatible with 200 VAC 50/60 Hz.

\*8: For voltages other than above, contact CKD.

\*9: The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.



Direct acting 3-port solenoid valve for dry air, manifold/actuator (general purpose valve)

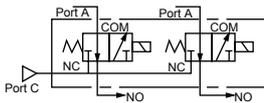
# GAG33\*/GAG43\*-Z Series

- NC pressurization
- Common supply/individual exhaust



## JIS symbol

- GAG33\*/GAG43\*-Z  
(common supply/individual exhaust)



## Common specifications

Descriptions	Standard specifications
Working fluid	For dry air (atmospheric dew point -60°C and over)/inert gas/low vacuum [ $1.33 \times 10^2$ Pa (abs)]
Working pressure differential MPa	0 to 1 (refer to max. working pressure differential in individual specifications.)
Max. working pressure MPa	1
Proof pressure (water pressure) MPa	10
Fluid temperature °C	-10 to 45 (no freezing)
Ambient temperature °C	-10 to 45
Thermal class	Class 130 (B)
Atmosphere	Place free of corrosive gas and explosive gas
Valve structure	Direct acting poppet structure
Valve seat leakage cm <sup>3</sup> /min (ANR)	0.2 or less
Mounting orientation	Unrestricted

## Individual specifications

Descriptions Model No.	NO port size	Orifice size (mm)		Max. working pressure differential (MPa)	Rated voltage	Power consumption (W)	
		TOP	BODY			AC50/60 Hz	DC
GAG331-1-Z -2-Z	Rc1/8	1.5	1.5	1.0	100 VAC 50/60 Hz	17	14
		2.0	2.0	0.7			
GAG332-1-Z -2-Z	Rc1/4	1.5	1.5	1.0	200 VAC 50/60 Hz	17	14
		2.0	2.0	0.7			
GAG432-4-Z -5-Z	Rc1/4	3.0	3.0	0.7	12 VDC 24 VDC 48 VDC 100 VDC	17	14
		3.5	3.0	0.4			
GAG433-4-Z -5-Z	Rc3/8	3.0	3.0	0.7	12 VDC 24 VDC 48 VDC 100 VDC	17	14
		3.5	3.0	0.4			

\*1: The model numbers above are for the basic NO port size (Rc) and orifice size. Refer to How to order for other combinations.

\*2: For the sizes of ports A and C, refer to "How to order and Dimensions" ("General Purpose Valves" (Catalog No. CB-03-1SA)).

\*3: The voltage fluctuation range must be  $\pm 10\%$  of the rated voltage.

\*4: The leakage current must be less than or equal to the values shown below.

\*5: When using at low vacuum, vacuum the NO port side.

Leakage current	Voltage	100 VAC	200 VAC	12 VDC	24 VDC	48 VDC	100 VDC
	Model No.						
	GAG33*-*****Z	6 mA or less	3 mA or less	40 mA or less	20 mA or less	10 mA or less	5 mA or less
	GAG43*-*****Z	8 mA or less	4 mA or less	40 mA or less	20 mA or less	10 mA or less	5 mA or less

## Compatibility table by variation

GAG3/GAG4-Z	
Classification	Direct acting 3-port valve for dry air
Body material	Stainless steel
P4	●
P40	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Body material Select from stainless steel products.

\*2: Body material/Seal combination code M only.

\*3: Pipe material is SUS316.

## How to order

● Common supply/individual exhaust (port C pressurization)

GAG33 1 - 2 - 6 - M 5A A G S Z P4 P40 - AC100V

GAG43

E Coil housing H With surge suppressor  
 F Manual override (locking) I Rated voltage  
 G Other options

Model No.

A NO port size

B Orifice size

C Manifold station No.  
\*2

D Body/sealant combination

Model No.	
GAG33*	GAG43*

Code	Content				GAG33*	GAG43*
<b>A NO port size</b>						
1	1/8				●	
2	1/4				●	●
3	3/8					●
<b>B Orifice size</b>						
	GAG33*		GAG43*			
	TOP	BODY	TOP	BODY		
1	ø1.5	ø1.5	-	-	●	
2	ø2.0	ø2.0	-	-	●	
4	-	-	ø3.0	ø3.0		●
5	-	-	ø3.5	ø3.0		●
<b>C Manifold station No.</b>						
2	2				●	●
to	to					
10	10 stations					
0	Actuator only				●	●
<b>D Body/sealant combination</b>						
	Body	Seal	Treatment	Remarks		
M	Stainless steel	Fluoro rubber	Oil free	—	●	●

The combinations indicated with ● in the above table are available.

For Items (E) to (I), the combinations indicated with codes are available. Note that if options (F) to (H) are not required, they should be blank.

E Coil housing			F	G Other options		H	I Rated voltage
Content			Manual override (locking)	Conduit (conduit piping)		With surge suppressor	Content
				CTC-19	G1/2		
3A	Open frame	Lead wire	A	G	H	S	12 VDC, 24 VDC, 48 VDC, 100 VDC
3I		HP terminal box (IP65 or equivalent) (G1/2)					
3J		HP terminal box with lamp (IP65 or equivalent) (G1/2)					
5A	Open frame	Lead wire	A	G	H		100 VAC, 200 VAC
5I		HP terminal box (IP65 or equivalent) (G1/2)					
5J		HP terminal box with lamp (IP65 or equivalent) (G1/2)					

⚠ Refer to the following cautions for Items (E) to (I).

3A 5A		<ul style="list-style-type: none"> <li>Open frame grommet lead wire 300 mm</li> <li>5A (diode integrated)</li> </ul>
3I 3J 5I 5J		<ul style="list-style-type: none"> <li>Open frame HP terminal box (IP65 or equivalent)</li> <li>5I, 5J (diode integrated)</li> </ul>

G H		<ul style="list-style-type: none"> <li>Conduit</li> <li>G(CTC19)</li> <li>H(G1/2)</li> </ul>
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Refer to "General Purpose Valves" (Catalog No. CB-03-1SA) for details on coil selection.

## ⚠ Precautions for model No. selection

\*1: Orders for only the masking plate and sub-plate are also available. Contact CKD for details.

Notes for Item (C)

\*2: For 11 or more manifold station No., contact CKD.

Notes for Item (E)

\*3: Coils for 5A, 5I, 5J have a diode to convert AC to DC voltage.

Notes for Items (G) to (H)

\*4: For Item (G), select an option from G and H.

\*5: The surge suppressor is attached with the lead wire coil. When selecting a coil with a terminal box, the surge suppressor is mounted in the terminal box.

\*6: Surge suppressor is incorporated as standard in the coil with diode.

Notes for Item (I)

\*7: 100 VAC coil is compatible with 100 VAC 50/60 Hz, and 200 VAC coil is compatible with 200 VAC 50/60 Hz.

\*8: For voltages other than above, contact CKD.

\*9: The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.



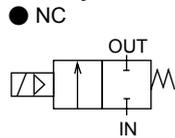
Pilot kick 2-port solenoid valve for dry air  
(general purpose valve)

# ADK11-Z Series

- NC
- Port size: Rc1/4 to Rc1
- Diaphragm drive



## JIS symbol



## Common specifications

Descriptions	Standard specifications
Working fluid	For dry air (atmospheric dew point -60°C and over)/inert gas/low vacuum [1.33 x 10 <sup>3</sup> Pa (abs)]
Working pressure differential MPa	0 to 0.7 (refer to max. working pressure differential in individual specifications.)
Max. working pressure MPa	2
Proof pressure (water pressure) MPa	4
Fluid temperature °C	5 to 40 (no freezing)
Ambient temperature °C	-10 to 40
Thermal class	Class 130 (B)
Atmosphere	Place free of corrosive gas and explosive gas
Valve structure	Pilot kick poppet/diaphragm drive
Valve seat leakage cm <sup>3</sup> /min (ANR)	1 or less (8A/10A: at 0.02 to 0.7 MPa, 15A to 25A: at 0.02 to 0.6 MPa)*
Mounting orientation	Unrestricted

\* When used at a pressure less than 0.02 MPa, the sealant may be unstable. Contact CKD in this case.

## Individual specifications

Descriptions Model No.	Port size	Orifice size (mm)	Min. working pressure differential (MPa)	Max. working pressure differential (MPa)	Rated voltage	Power consumption (W)		Weight (kg)
						AC	DC	
ADK11-8A-****Z	Rc 1/4	12	0	0.7	100 VAC 50/60 Hz 200 VAC 50/60 Hz 12 VDC 24 VDC 48 VDC 100 VDC	17	14	0.8
-10A-****Z	Rc 3/8	12		0.7				0.8
-15A-****Z	Rc 1/2	16		0.6				1.0
-20A-****Z	Rc 3/4	23		0.6				1.1
-25A-****Z	Rc 1	28		0.6				1.5

\*1: The model numbers above show the basic port size (Rc). Refer to How to order for other combinations.

\*2: The voltage fluctuation range must be within ±10% of the rated voltage.

\*3: The leakage current must be less than or equal to the values shown below.

Leakage current	Voltage	100 VAC	200 VAC	12 VDC	24 VDC	48 VDC	100 VDC
	Model No.						
	ADK11-8A to 25A-****Z	10 mA or less	5 mA or less	40 mA or less	20 mA or less	10 mA or less	5 mA or less

## Compatibility table by variation

ADK11-Z	
Classification	Pilot kick 2-port valve for dry air
Body material	Stainless steel
P4	●
P40	●

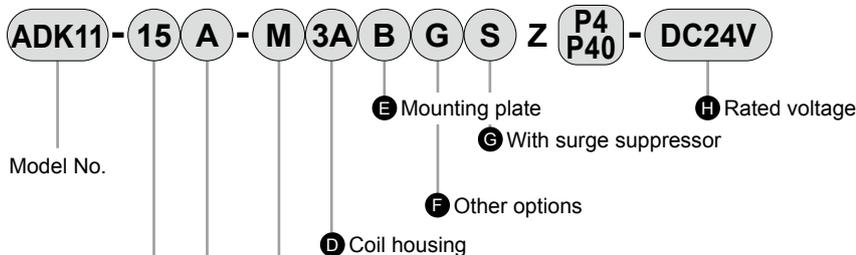
● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Body material Select from stainless steel products.

\*2: Body material/Seal combination code M only.

\*3: Pipe material is SUS316.

## How to order



Code	Content			
<b>A Port size</b>				
8	1/4			
10	3/8			
15	1/2			
20	3/4			
25	1			
<b>B Thread</b>				
A	Rc			
G	G			
N	NPT			
<b>C Body/sealant combination</b>				
	<b>Body</b>	<b>Seal</b>	<b>Treatment</b>	<b>Remarks</b>
M	Stainless steel	Fluoro rubber	Oil free	—

For Items (D) to (H), the combinations indicated with codes are available. Note that if options for Items (E) to (G) are not required, they should be left blank.

<b>D Coil housing</b>		<b>E</b>	<b>F Other options</b>		<b>G</b>	<b>H Rated voltage</b>	
Content		Mounting plate	Conduit (conduit piping)		With surge suppressor	Content	
			CTC-19	G 1 / 2			
<b>3A</b>	Open frame		B	<b>G</b>			<b>H</b>
<b>3I</b>		HP terminal box (IP65 or equivalent) (G1/2)				12 VDC, 24 VDC, 100 VDC	
<b>3J</b>	HP terminal box with lamp (IP65 or equivalent) (G1/2)						
<b>5A</b>	Open frame (diode integrated)	B	<b>G</b>	<b>H</b>		100 VAC, 200 VAC	
<b>5I</b>			HP terminal box (IP65 or equivalent) (G1/2)				
<b>5J</b>			HP terminal box with lamp (IP65 or equivalent) (G1/2)				

⚠ Refer to the following cautions for (D) to (H).

<b>3A</b> <b>5A</b>		<ul style="list-style-type: none"> <li>● Open frame grommet lead wire 300 mm</li> <li>● 5A (diode integrated)</li> </ul>
------------------------	---	--

<b>G</b> <b>H</b>		<ul style="list-style-type: none"> <li>● Conduit</li> <li>● G(CTC19)</li> <li>● H(G1/2)</li> </ul>
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<b>3I</b> <b>3J</b> <b>5I</b> <b>5J</b>		<ul style="list-style-type: none"> <li>● Open frame HP terminal box (IP65 or equivalent)</li> <li>● 5I, 5J (diode integrated)</li> </ul>
--	---	--

Refer to "General Purpose Valves" (Catalog No. CB-03-1SA) for details on coil selection.

## ⚠ Precautions for model No. selection

### Notes for Item (D)

\*1: Coils for 5A, 5I, 5J have a diode to convert AC to DC voltage. Voltage of less than 100 VAC is not available.

### Notes for Items (E) to (G)

\*2: For (E), select an option from G and H.

\*3: The surge suppressor is attached with the lead wire coil. When selecting a coil with a terminal box, the surge suppressor is mounted in the terminal box.

\*4: Surge suppressor is incorporated as standard in the coil with diode.

### Notes for Item (H)

\*5: 100 VAC coil is compatible with 100 VAC 50/60 Hz, and 200 VAC coil is compatible with 200 VAC 50/60 Hz.

\*6: For voltages other than above, contact CKD.

\*7: The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.



Air operated 2-port ball valve  
(compact rotary valve)

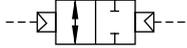
# CHB Series

● Port size: Rc3/8 to Rc2



## JIS symbol

● CHB  
(double acting)



## Common specifications

Descriptions	Double acting	
	CHB (Standard bore)	
Actuation	Air operated: Double acting	
Working fluid	Water/air/oil (500 mm <sup>2</sup> /s or less)	
Working pressure MPa	0 to 1.0	
Proof pressure (water pressure) MPa	2.0	
Fluid temperature °C	0 to 80 (no freezing)	
Ambient temperature °C	-10 to 60 (no freezing)	
Working environment	Indoors	
Valve seat leakage cm <sup>3</sup> /min	0 (water pressure initial value 1 MPa)	
Mounting orientation	Unrestricted	
Frequency times/min	1 or less	
Rotary actuator	Pilot fluid	Compressed air
	Lubrication	Not required (use turbine oil class 1 ISO VG32 if necessary for lubrication)
	Proof pressure (water pressure) MPa	1.5
	Working pressure MPa	0.35 to 0.7
	Fluid temperature °C	5 to 60
	Port size	Rc1/8

## Individual specifications

Descriptions	Port size	Orifice size (mm)	Cv	Weight (kg)	
				Double acting	
Model No.					
Standard bore	CHB-10	Rc3/8	10	10	1.0
	CHB-15	Rc1/2	10	6	1.0
	CHB-20	Rc3/4	15	16	1.2
	CHB-25	Rc1	20	29	1.3
	CHB-32	Rc1 <sup>1</sup> / <sub>4</sub>	25	50	2.1
	CHB-40	Rc1 <sup>1</sup> / <sub>2</sub>	32	98	2.6
	CHB-50	Rc2	40	125	3.3

## Compatibility table by variation

	CHB-N
Port size	Rc3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2
P4	●

Note: Body material code N only.

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

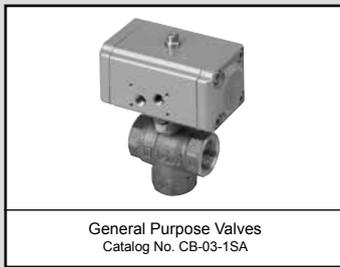
**CHB - 15 - N - P4**

Model No.

Ⓐ Port size

Ⓑ Body material

Code	Content
<b>Ⓐ Port size</b>	
10	Rc3/8
15	Rc1/2
20	Rc3/4
25	Rc1
32	Rc1 1/4
40	Rc1 1/2
50	Rc2
<b>Ⓑ Body material</b>	
N	Stainless steel Oil-prohibited specifications



Air operated 3-port ball valve  
(compact rotary valve)

# CHG Series

● Port size: Rc1/2 to Rc2



## JIS symbol

● CHG (double acting)



## Common specifications

Descriptions		CHG (double acting)
Actuation		Air operated: Double acting
Working fluid		Water/air/oil (500 mm <sup>2</sup> /s or less)
Working pressure MPa		0 to 1.0
Proof pressure (water pressure) MPa		2.0
Fluid temperature °C		0 to 80 (no freezing)
Ambient temperature °C		-10 to 60 (no freezing)
Working environment		Indoors
Valve seat leakage cm <sup>3</sup> /min		0 (water pressure initial value 1 MPa)
Mounting orientation		Unrestricted
Frequency times/min		1 or less
Pressurization direction		Port C pressurization only
Flow path shape		Multi-fluid type (90° rotation switching)
Rotary actuator	Pilot fluid	Compressed air
	Lubrication	Not required (use turbine oil class 1 ISO VG32 if necessary for lubrication)
	Proof pressure (water pressure) MPa	1.5
	Working pressure MPa	0.35 to 0.7
	Fluid temperature °C	5 to 60
	Port size	Rc1/8

## Individual specifications

Descriptions Model No.	Port size	Orifice size (mm)	Cv	Weight (kg)
				Double acting
CHG-15	Rc1/2	10	3	1.0
CHG-20	Rc3/4	14	6	1.2
CHG-25	Rc1	19	11	1.4
CHG-32	Rc1 <sup>1</sup> / <sub>4</sub>	23	16	2.2
CHG-40	Rc1 <sup>1</sup> / <sub>2</sub>	30	28	2.7
CHG-50	Rc2	38	47	3.5

## Compatibility table by variation

	CHG-N
Port size	Rc1/2, 3/4, 1, 1 1/4, 1 1/2, 2
P4	●

Note: Body material code N only.

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

**CHG - 20 - N - P4**

Model No.

**A** Port size

**B** Body material

Code	Content
<b>A Port size</b>	
15	Rc1/2
20	Rc3/4
25	Rc1
32	Rc1 1/4
40	Rc1 1/2
50	Rc2
<b>B Body material</b>	
N	Stainless steel/oil-prohibited specifications



Air operated 2-port valve  
(cylinder valve)

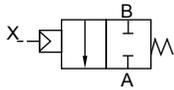
# SAB\*A Series

- NC (normally closed) NO (normally open), double acting
- Port size: Rc1/4 to Rc2, 32 to 50 flange
- Working fluid: Air, gas

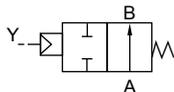


## JIS symbol

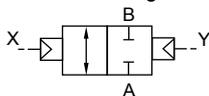
- NC (normally closed)



- NO (normally open)



- Double acting



## Common specifications

Descriptions	SAB1A	SAB2A	SAB3A
Actuation	NC (normally closed)	NO (normally open)	Double acting
Working fluid	Air/gas (*1)		
Working pressure MPa	0 to 0.9	0 to 1	
Proof pressure (water pressure) MPa	2.0		
Fluid temperature °C	-10 to 90 (no freezing)		
Ambient temperature °C	-10 to 60		
Valve seat leakage cm <sup>3</sup> /min	0.12 or less (pneumatic pressure)		
Mounting orientation	Unrestricted		
Pilot fluid	Air		
Pilot pressure MPa	0.35 to 0.7	Refer to the following page.	

\*1: Refer to the working fluid check list described in "General Purpose Valves" (catalog No. CB-03-1SA).

## Individual specifications

Descriptions Model No.	Port size	Orifice size (mm)	C [dm <sup>3</sup> /(s·bar)]	b	S (mm <sup>2</sup> )	Allowable back pressure (MPa)	Pilot port size	Weight (kg)
<b>NC (normally closed)</b>								
SAB1A-8A	Rc 1/4	10	8.3	0.4	-	0.5	Rc 1/8	0.3
SAB1A-10A	Rc 3/8	10	11	0.4	-			0.3
SAB1A-15A	Rc 1/2	15	-	-	120	0.1		0.6
SAB1A-20A	Rc 3/4	16	-	-	150			0.8
SAB1A-25A	Rc 1	20	-	-	240			1.1
SAB1A-32A	Rc 1 1/4	26	-	-	390			2.2
SAB1A-32F	32 flange	26	-	-	390			5.2
SAB1A-40A	Rc 1 1/2	32	-	-	610			3.2
SAB1A-40F	40 flange	32	-	-	610			6.3
SAB1A-50A	Rc 2	42	-	-	920			5.2
SAB1A-50F	50 flange	42	-	-	920	9.1		
<b>NO (normally open)</b>								
SAB2A-8A	Rc 1/4	10	8.9	0.4	-	0.1	Rc 1/8	0.3
SAB2A-10A	Rc 3/8	10	12	0.3	-			0.3
SAB2A-15A	Rc 1/2	15	-	-	140	0.05		0.6
SAB2A-20A	Rc 3/4	16	-	-	180			0.8
SAB2A-25A	Rc 1	20	-	-	280			1.1
SAB2A-32A	Rc 1 1/4	26	-	-	450			2.2
SAB2A-32F	32 flange	26	-	-	450			5.2
SAB2A-40A	Rc 1 1/2	32	-	-	680			3.2
SAB2A-40F	40 flange	32	-	-	680			6.3
SAB2A-50A	Rc 2	42	-	-	1020			5.2
SAB2A-50F	50 flange	42	-	-	1020	9.1		
<b>Double acting (*1)</b>								
SAB3A-8A	Rc 1/4	10	8.3(8.9)	0.4	-	1	Rc 1/8	0.3
SAB3A-10A	Rc 3/8	10	11(12)	0.4(0.3)	-			0.3
SAB3A-15A	Rc 1/2	15	-	-	120(140)			0.6
SAB3A-20A	Rc 3/4	16	-	-	150(180)			0.8
SAB3A-25A	Rc 1	20	-	-	240(280)			1.1
SAB3A-32A	Rc 1 1/4	26	-	-	390(450)			2.2
SAB3A-32F	32 flange	26	-	-	390(450)			5.2
SAB3A-40A	Rc 1 1/2	32	-	-	610(680)			3.2
SAB3A-40F	40 flange	32	-	-	610(680)			6.3
SAB3A-50A	Rc 2	42	-	-	920(1020)			5.2
SAB3A-50F	50 flange	42	-	-	920(1020)			9.1

\*1: ( ) for C, b and S columns of double acting show the flow rates when port A is pressurized.

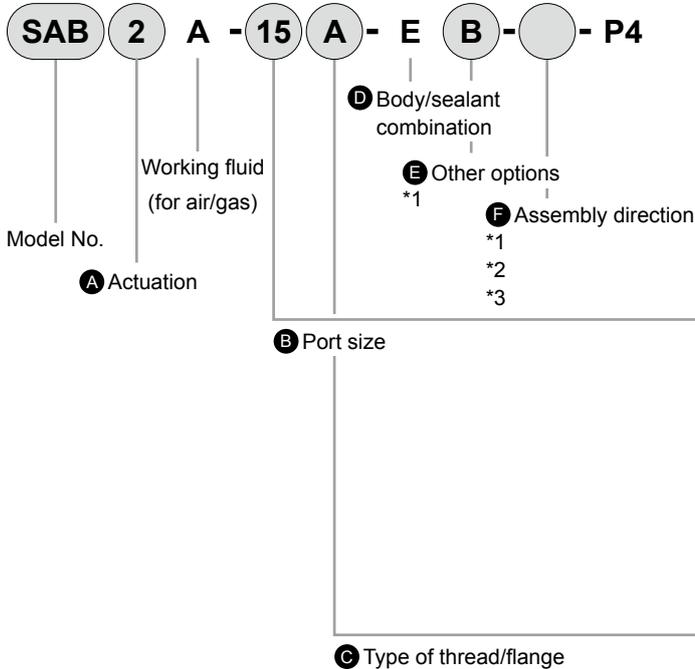
\*2: Effective cross-sectional area S and sonic conductance C are converted as  $S \approx 5.0 \times C$ .

## Compatibility table by variation

SAB	
Port size	Rc1/4 to Rc2, 32 flange, 40 flange, 50 flange
P4	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order



Code	Content		
<b>A Actuation</b>			
1	NC (normally closed)		
2	NO (normally open)		
3	Double acting		
<b>B Port size</b>			
8	1/4		
10	3/8		
15	1/2		
20	3/4		
25	1		
32	1 1/4, 32 (Flange)		
40	1 1/2, 40 (Flange)		
50	2, 50 (Flange)		
<b>C Type of thread/flange</b>			
A	Rc(8A to 50A)		
F	Flange (32F to 50F)		
<b>D Body/sealant combination</b>			
		<b>Body</b>	<b>Seal</b>
E	Option	Stainless steel	Fluoro rubber
<b>E Other options</b>			
Blank	No option		
B	Mounting plate *1		
<b>F Assembly direction</b>			
Blank	No option		
R	Mounting plate assembly position reversed		
<b>Code</b>	B (with mounting plate)	B-R *2	
<b>Direction</b>	No rotation	Mounting plate reversed	
<b>Layout</b>			

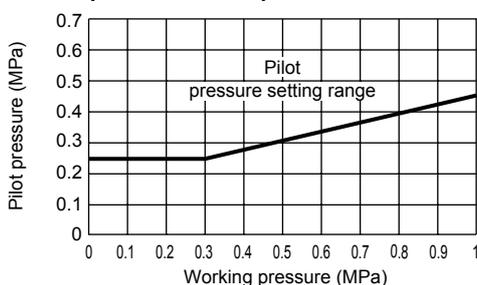
## ⚠ Precautions for model No. selection

- \*1: The mounting plate (Item **E** B) can be mounted only on the female thread of port sizes 8 to 32.
- \*2: Reversed mounting plate (Item **F** B-R) is available for port sizes 15 to 32.
- \*3: Clockwise when viewed from above with port A on the right.
- \*4: Made to order. Contact CKD for details.

## ■ Pilot pressure

Set pilot air pressure within the specified range. Set the pilot pressure for the SAB/SVB Series NO and double acting as shown in the graph below. If the product is used with a pressure below the range shown in the graph, sealant failure may occur; if the product is used with a pressure above the range shown in the graph, durability may be compromised. The NC is recommended when the pilot pressure cannot be controlled.

## ● SAB<sub>3</sub><sup>2W</sup>A Series/SVB<sub>2</sub><sup>W</sup>A Series



← shows pilot port IN.

Fluid control components



Air operated 2-port valve  
(cylinder valve)

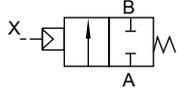
# SAB\*V Series

- NC (normally closed) NO (normally open) double acting
- Port size: Rc1/4 to Rc2, 32 to 50 flange
- Working fluid: Low vacuum

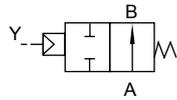


## JIS symbol

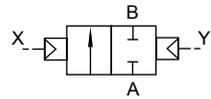
- NC (normally closed)



- NO (normally open)



- Double acting



## Common specifications

Descriptions	SAB1V	SAB2V	SAB3V
Actuation	NC (normally closed)	NO (normally open)	Double acting
Working fluid	Low vacuum (air, water) (*1)		
Working pressure Pa (abs)	1.3 x 10 <sup>2</sup> to 7 x 10 <sup>5</sup> (refer to working pressure in individual specifications.)		
Proof pressure (water pressure) MPa	2.0		
Fluid temperature °C	-10 to 60 (no freezing) (*2)		
Ambient temperature °C	-10 to 60		
Valve seat leakage Pa·m <sup>3</sup> /s He	1.33 x 10 <sup>-3</sup> or less		
Pilot fluid	Air		
Mounting orientation	Unrestricted		

\*1: Refer to the working fluid check list in General Purpose Valves (CB-03-1SA).

## Individual specifications

Descriptions Model No.	Port size	Orifice size (mm)	C [dm <sup>3</sup> /(s·bar)]	b	S (mm <sup>2</sup> )	Working pressure Pa (abs)			Pilot pressure (MPa)			Pilot port size	Weight (kg)		
						NC	NO	Double acting	NC	NO	Double acting		NC	NO	Double acting
SAB*V-8A	Rc1/4	10	8.9	0.4	-	1.3 × 10 <sup>2</sup> to 7 × 10 <sup>5</sup>	1.3 × 10 <sup>2</sup> to 1 × 10 <sup>6</sup>	0.35 to 0.7	(*1)	Rc1/8	0.3				
SAB*V-10A	Rc3/8	10	12	0.3	0.3										
SAB*V-15A	Rc1/2	15	-	-	0.6										
SAB*V-20A	Rc3/4	16	-	-	0.8										
SAB*V-25A	Rc1	20	-	-	1.1										
SAB*V-32A	Rc1 1/4	26	-	-	1.3 × 10 <sup>2</sup> to 5 × 10 <sup>5</sup>	1.3 × 10 <sup>2</sup> to 1 × 10 <sup>6</sup>	0.25 to 0.7	(*1)	Rc1/8	2.3	2.2	2.2			
SAB*V-32F	32 flange	26	-	-						5.3	5.2	5.2			
SAB*V-40A	Rc1 1/2	32	-	-						3.4	3.2	3.2			
SAB*V-40F	40 flange	32	-	-						6.5	6.3	6.3			
SAB*V-50A	Rc2	42	-	-						5.5	5.2	5			
SAB*V-50F	50 flange	42	-	-	9.4	9.1	8.9								

\*1: Refer to page 290 for pilot air pressure for the NO and double acting types.

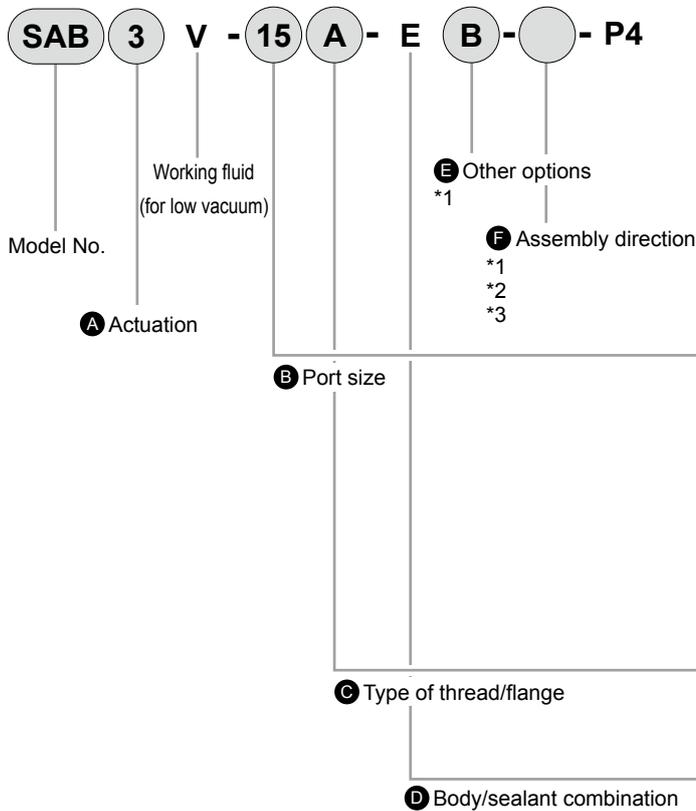
\*2: Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 x C.

## Compatibility table by variation

SAB	
Port size	Rc1/4 to Rc2, 32 flange, 40 flange, 50 flange
P4	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

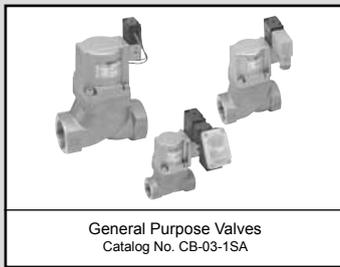


Code	Content	
<b>A Actuation</b>		
1	NC (normally closed)	
2	NO (normally open)	
3	Double acting	
<b>B Port size</b>		
8	1/4	
10	3/8	
15	1/2	
20	3/4	
25	1	
32	1 1/4, 32 (Flange)	
40	1 1/2, 40 (Flange)	
50	2, 50 (Flange)	
<b>C Type of thread/flange</b>		
A	Rc(8A to 50A)	
F	Flange (32F to 50F)	
<b>D Body/sealant combination</b>		
	<b>Body</b>	<b>Seal</b>
E	Option	Stainless steel Fluoro rubber
<b>E Other options</b>		
Blank	No option	
B	Mounting plate *2	
<b>F Assembly direction</b>		
Blank	No option	
R	Mounting plate assembly position reversed	
<b>Code</b>	B (with mounting plate)	B-R *2
<b>Direction</b>	No rotation	Mounting plate reversed
<b>Layout</b>		

## ⚠ Precautions for model No. selection

- \*1: The mounting plate (Item **E** B) can be mounted only on the female thread of port sizes 8 to 32.
- \*2: Reversed mounting plate (Item **F** B-R) is available for port size 15 to 32.
- \*3: Clockwise when viewed from above with port A on the right.

← shows pilot port IN.



Air operated 2-port valve with solenoid valve  
(cylinder valve)

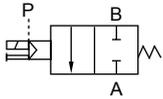
# SVB\*A Series

- NC, NO
- Port size: Rc1/4 to Rc2, 32 to 50 flange
- Working fluid: Air, inert gas

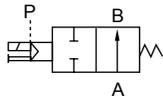


## JIS symbol

● NC



● NO



## Common specifications

Descriptions	SVB1A	SVB2A
Actuation	NC	NO
Working fluid	Air/inert gas (*1)	
Working pressure MPa	0 to 0.9	0 to 1
Proof pressure (water pressure) MPa	2.0	
Fluid temperature °C	-10 to 60 (no freezing)	
Ambient temperature °C	-10 to 60	
Valve seat leakage cm <sup>3</sup> /min	0.12 or less (pneumatic pressure)	
Pilot fluid	Air	
Pilot pressure MPa	0.35 to 0.7	Refer to the following page
Mounting orientation	Unrestricted	
*1: Refer to the working fluid check list described in "General Purpose Valves" (catalog No. CB-03-1SA).		
Electrical specifications		
Rated voltage	24 VDC	
Power consumption (W) DC	2.0	
Thermal class	Class 130 (B)	
Degree of protection (IEC standards 529)	Grommet lead wire	IPX2
	With DIN terminal box (Pg9)	IPX5
	With T terminal box (G1/2)	IPX5

\*1: Use the product within ±10% of the rated voltage.

## Individual specifications

Descriptions Model No.	Port size	Orifice size (mm)	C [dm <sup>3</sup> /(s·bar)]	b	S (mm <sup>2</sup> )	Allowable back pressure (MPa)	Pilot port size	Weight (kg)
<b>NC (normally closed)</b>								
SVB1A-8A	Rc1/4	10	8.3	0.4	-	0.5	Rc1/8	0.5
SVB1A-10A	Rc3/8	10	11	0.4	-			0.5
SVB1A-15A	Rc1/2	15	-	-	120	0.1		0.8
SVB1A-20A	Rc3/4	16	-	-	150			1
SVB1A-25A	Rc1	20	-	-	240			1.3
SVB1A-32A	Rc1 1/4	26	-	-	390			2.4
SVB1A-32F	32 flange	26	-	-	390			5.4
SVB1A-40A	Rc1 1/2	32	-	-	610			3.4
SVB1A-40F	40 flange	32	-	-	610			6.5
SVB1A-50A	Rc2	42	-	-	920			5.4
SVB1A-50F	50 flange	42	-	-	920	9.3		
<b>NO (normally open)</b>								
SVB2A-8A	Rc1/4	10	8.9	0.4	-	0.1	Rc1/8	0.5
SVB2A-10A	Rc3/8	10	12	0.3	-			0.5
SVB2A-15A	Rc1/2	15	-	-	140			0.8
SVB2A-20A	Rc3/4	16	-	-	180			1
SVB2A-25A	Rc1	20	-	-	280			1.3
SVB2A-32A	Rc1 1/4	26	-	-	450	0.05		2.4
SVB2A-32F	32 flange	26	-	-	450			5.4
SVB2A-40A	Rc1 1/2	32	-	-	680			3.4
SVB2A-40F	40 flange	32	-	-	680			6.5
SVB2A-50A	Rc2	42	-	-	1020			5.4
SVB2A-50F	50 flange	42	-	-	1020	9.3		

\*1: Refer to the following page for pilot air pressure for NO.

\*2: Effective cross-sectional area S and sonic conductance C are converted as  $S \approx 5.0 \times C$ .

## Compatibility table by variation

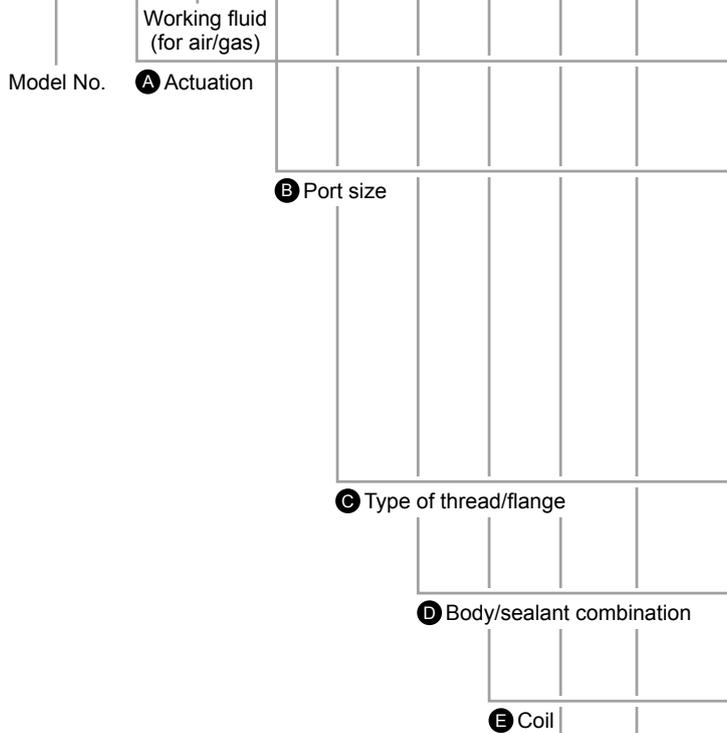
SVB	
Port size	Rc1/4 to Rc2, 32 flange, 40 flange, 50 flange
P4	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

● With solenoid valve

SVB 1 A - 15 A - E 2G S - DC24V - P4



Code	Content		
<b>A Actuation</b>			
1	NC		
2	NO		
<b>B Port size</b>			
8	1/4		
10	3/8		
15	1/2		
20	3/4		
25	1		
32	1 1/4, 32 (Flange)		
40	1 1/2, 40 (Flange)		
50	2, 50 (Flange)		
<b>C Type of thread/flange</b>			
A	Rc (8A to 50A)		
F	Flange (32F to 50F)		
<b>D Body/sealant combination</b>			
		<b>Body</b>	<b>Seal</b>
E	Option	Stainless steel	Fluoro rubber
<b>E Coil</b>			
2C	Standard	Grommet lead wire	
2G	Option	With DIN terminal box (Pg9)	
2H		DIN terminal box with lamp (Pg9)	
3T		With T terminal box (G1/2)	
3R		T terminal box with lamp (G1/2)	
<b>F Other options</b>			
Blank	No option		
S	With surge suppressor		
B	Mounting plate *1		
<b>G Assembly direction</b>			
Blank	No option		
X	Cylinder cover rotated 90°		
Y	Cylinder cover rotated 180°		
Z	Cylinder cover rotated 270°		
R	Coil reversed 180° [With solenoid valve] Mounting plate/coil reversed 180° [With solenoid valve]		
Refer to page 297 for the layout drawing.			
<b>H Voltage</b>			
DC24V	24 VDC		

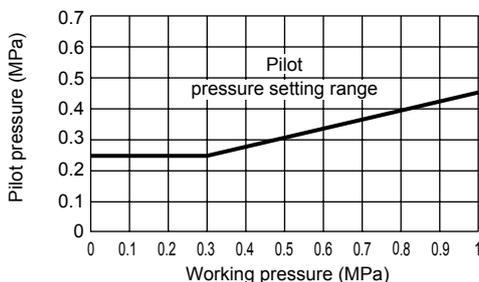
### ⚠ Precautions for model No. selection

- \*1: The mounting plate (Item F B) can be mounted only on the female thread of port sizes 8 to 32.
- \*2: To add both the surge suppressor and mounting plate options, specify Item F as SB.
- \*3: The surge suppressor is attached with the lead wire coil. When selecting a coil with a terminal box, the surge suppressor is mounted in the terminal box.
- \*4: Manual override (non-locking) is provided as standard.
- \*5: Made to order. Contact CKD for details.

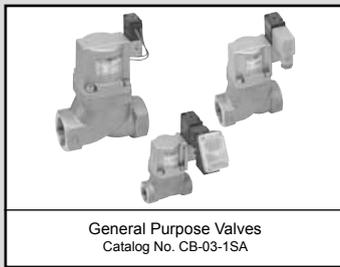
### ■ Pilot pressure

Set pilot air pressure within the specified range. Set the pilot pressure for the SAB/SVB Series NO and double acting as shown in the graph below. If the product is used with a pressure below the range shown in the graph, sealant failure may occur; if the product is used with a pressure above the range shown in the graph, durability may be compromised. The NC is recommended when the pilot pressure cannot be controlled.

### ● SAB<sub>3</sub><sup>2</sup><sub>A</sub> Series/SVB2<sub>3</sub><sup>2</sup><sub>A</sub> Series



Fluid control components



Air operated 2-port valve with solenoid valve  
(cylinder valve)

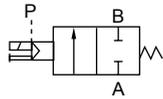
# SVB\*V Series

- NC, NO
- Port size: Rc1/4 to Rc2, 32 to 50 flange
- Working fluid: Low vacuum

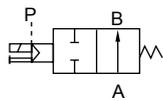


## JIS symbol

● NC



● NO



## Common specifications

Descriptions	SVB1V	SVB2V
Actuation	NC	NO
Working fluid	Low vacuum (air, water) (*1)	
Working pressure Pa (abs)	1.3 x 10 <sup>2</sup> to 7 x 10 <sup>5</sup> (refer to working pressure range in individual specifications.)	
Proof pressure (water pressure) MPa	2.0	
Fluid temperature °C	-10 to 60 (no freezing)	
Ambient temperature °C	-10 to 60	
Valve seat leakage Pa·m <sup>3</sup> /s He	1.33 x 10 <sup>-3</sup> or less	
Pilot fluid	Air	
Mounting orientation	Unrestricted	

\*1: Refer to the working fluid check list described in "General Purpose Valves" (catalog No. CB-03-1SA).

Electrical specifications		
Rated voltage	24 VDC	
Power consumption (W)   DC	2.0	
Thermal class	Class 130 (B)	
Degree of protection (IEC standards 529)	Grommet lead wire	IPX2
	With DIN terminal box (Pg9)	IPX5
	With T terminal box (G1/2)	IPX5

\*1: Use the product within ±10% of the rated voltage.

## Individual specifications

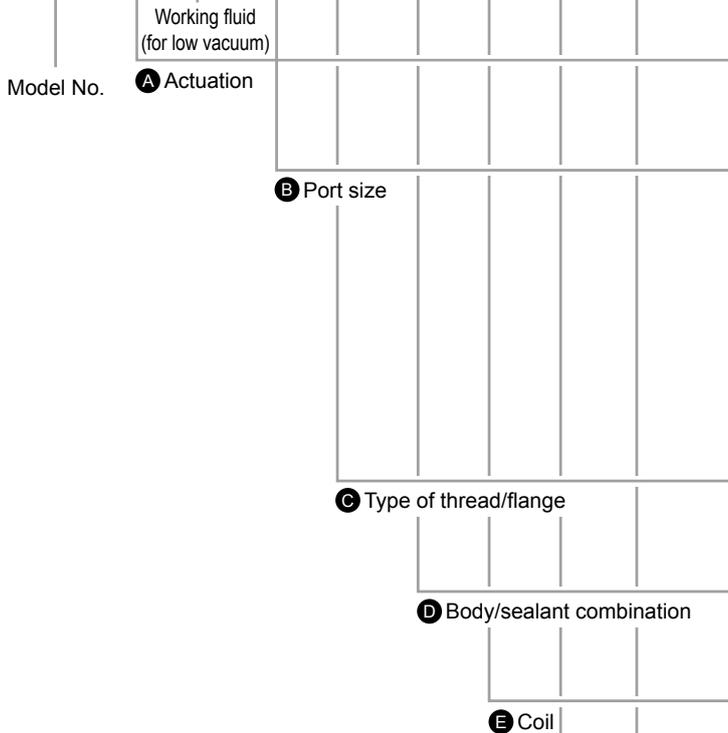
Descriptions Model No.	Port size	Orifice size (mm)	C (dm <sup>3</sup> /(s·bar))	b	S (mm <sup>2</sup> )	Working pressure Pa (abs)		Pilot pressure (MPa)		Pilot port size	Weight (kg)	
						NC	NO	NC	NO		NC	NO
SVB*V-8A	Rc 1/4	10	8.3	0.4	-	1.3 × 10 <sup>2</sup> to 7 × 10 <sup>5</sup>	1.3 × 10 <sup>2</sup> to 1 × 10 <sup>6</sup>	0.35 to 0.7	(*1)	Rc 1/8	0.5	
SVB*V-10A	Rc 3/8	10	12	0.3	0.5							
SVB*V-15A	Rc 1/2	15	-	-	0.8							
SVB*V-20A	Rc 3/4	16	-	-	1							
SVB*V-25A	Rc 1	20	-	-	1.3							
SVB*V-32A	Rc 1 1/4	26	-	-	1.3 × 10 <sup>2</sup> to 5 × 10 <sup>5</sup>	1.3 × 10 <sup>2</sup> to 1 × 10 <sup>6</sup>	0.25 to 0.7	(*1)	Rc 1/8	2.5	2.4	
SVB*V-32F	32 flange	26	-	-						450	5.5	5.4
SVB*V-40A	Rc 1 1/2	32	-	-						680	3.6	3.4
SVB*V-40F	40 flange	32	-	-						680	6.7	6.5
SVB*V-50A	Rc 2	42	-	-						1020	5.7	5.4
SVB*V-50F	50 flange	42	-	-						1020	9.6	9.3

\*1: Refer to the following page for pilot air pressure for NO.

## How to order

● With solenoid valve

SVB 1 V - 15 A - E 2G S - DC24V - P4



Code	Content		
<b>A Actuation</b>			
1	NC		
2	NO		
<b>B Port size</b>			
8	1/4		
10	3/8		
15	1/2		
20	3/4		
25	1		
32	1 1/4, 32 (Flange)		
40	1 1/2, 40 (Flange)		
50	2, 50 (Flange)		
<b>C Type of thread/flange</b>			
A	Rc (8A to 50A)		
F	Flange (32F to 50F)		
<b>D Body/sealant combination</b>			
		<b>Body</b>	<b>Seal</b>
E	Option	Stainless steel	Fluoro rubber
<b>E Coil</b>			
2C	Standard	Grommet lead wire	
2G	Option	With DIN terminal box (Pg9)	
2H		DIN terminal box with lamp (Pg9)	
3T		With T terminal box (G1/2)	
3R		T terminal box with lamp (G1/2)	
<b>F Other options</b>			
Blank	No option		
S	With surge suppressor		
B	Mounting plate *1		
<b>G Assembly direction</b>			
Blank	No option		
X	Cylinder cover rotated 90°		
Y	Cylinder cover rotated 180°		
Z	Cylinder cover rotated 270°		
R	Coil reversed 180° [With solenoid valve] Mounting plate/coil reversed 180° [With solenoid valve]		
Refer to page 297 for the layout drawing.			
<b>H Voltage</b>			
DC24V	24 VDC		

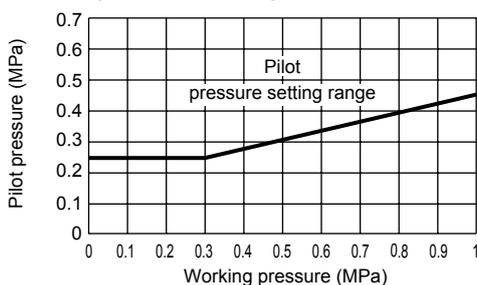
### ⚠ Precautions for model No. selection

- \*1: The mounting plate (Item **F** B) can be mounted only on the female thread of port sizes 8 to 32.
- \*2: To add both the surge suppressor and mounting plate options, specify Item **F** as SB.
- \*3: The surge suppressor is attached with the lead wire coil. When selecting a coil with a terminal box, the surge suppressor is mounted in the terminal box.
- \*4: Manual override (non-locking) is provided as standard.
- \*5: Made to order. Contact CKD for details.

### ■ Pilot pressure

Set pilot air pressure within the specified range. Set the pilot pressure for the SAB/SVB Series NO and double acting as shown in the graph below. If the product is used with a pressure below the range shown in the graph, sealant failure may occur; if the product is used with a pressure above the range shown in the graph, durability may be compromised. The NC is recommended when the pilot pressure cannot be controlled.

### ● SAB<sup>2W</sup>/<sub>3A</sub> Series/SVB2<sup>W</sup>/<sub>A</sub> Series



### Compatibility table by variation

		SVB
Port size		Rc1/4 to Rc2, 32 flange, 40 flange, 50 flange
P4		▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

Fluid control components

# SVB\* A/V Series

## Item ③ Assembly direction

SVB [With solenoid valve] *6					
Code	Blank (standard)	X	Y	Z	R
Direction	No rotation	Cylinder cover rotated 90°	Cylinder cover rotated 180°	Cylinder cover rotated 270°	Coil reversed
Layout					

SVB [With solenoid valve] *1/6					
Code	B (with mounting plate)	B-X	B-Y *7	B-Z *7	B-R *8
Direction	No rotation	Cylinder cover rotated 90°	Cylinder cover rotated 180° Mounting plate reversed	Cylinder cover rotated 270° Mounting plate reversed	Coil reversed Mounting plate reversed
Layout					

\*6: Clockwise rotating angle when viewed from above with port A on the right.

← shows pilot port IN.

\*7: The mounting plate will be reversed 180° and attached.

\*8: The mounting plate for port size 10A is installed at the bottom, so only the coil position is reversed.



Diaphragm cylinder valve, single unit

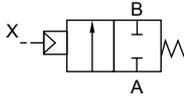
# NAD\*V Series

- NC (normally closed) NO (normally open) double acting
- Port size: Rc3/8
- Working fluid: Low vacuum

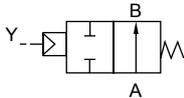


## JIS symbol

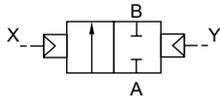
- NC (normally closed)



- NO (normally open)



- Double acting



## Specifications

Descriptions	NAD1V-10	NAD2V-10	NAD3V-10
Actuation	NC (normally closed)	NO (normally open)	Double acting
Working fluid	Low vacuum (air/water)		
Fluid viscosity mm <sup>2</sup> /s	500 or less		
Working pressure	1.3 x 10 <sup>2</sup> to 5 x 10 <sup>5</sup> Pa (abs) (secondary pressure 4 x 10 <sup>5</sup> Pa (abs) or less)		
Proof pressure (water pressure) MPa	1.0		
Fluid temperature °C	-10 to 50 (no freezing)		
Ambient temperature °C	-10 to 50		
Valve seat leakage	1.33 x 10 <sup>-3</sup> Pa·m <sup>3</sup> /sHe or less		
Port size	Rc3/8		
Orifice size mm	7		
Cv	1.1		
C [dm <sup>3</sup> /(s·bar)]	4.4		
b	0.1		
Weight kg	0.32		
Mounting orientation	Unrestricted		
Pilot fluid	Air		
Pilot pressure MPa	0.4 to 0.5		
Pilot port size	Rc1/8		

\*1: Effective cross-sectional area S and sonic conductance C are converted as  $S \approx 5.0 \times C$ .

## How to order

**NAD** **1** **V** - **10** - **R** **B** - **P4**

Model No.

Working fluid  
(for low vacuum)

**A** Actuation

**B** Port size

**C** Body/sealant combination

**D** Other options

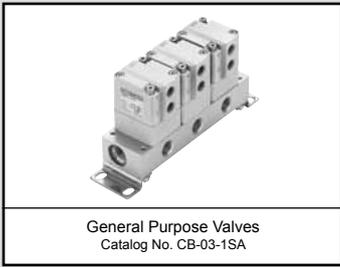
Code	Content	
<b>A Actuation</b>		
1	NC (normally closed)	
2	NO (normally open)	
3	Double acting	
<b>B Port size</b>		
10	Rc3/8	
<b>C Body/sealant combination</b>		
	Body	Seal
R	Stainless steel	Ethylene propylene rubber
<b>D Other options</b>		
Blank	No option	
B	Mounting plate	

Fluid control components

## Compatibility table by variation

	NAD
Port size	Rc3/8
P4	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable



Diaphragm cylinder valve, manifold

# GNAD\*V Series

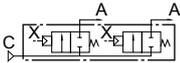
- NC (normally closed) NO (normally open) double acting
- Port size: Rc1/4, Rc3/8
- Working fluid: Low vacuum



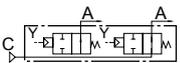
## JIS symbol

- Common supply (port C pressurization)

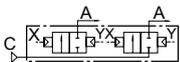
NC (normally closed)



NO (normally open)

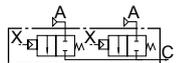


Double acting

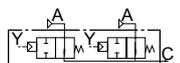


- Individual supply (port A pressurization)

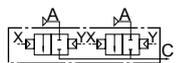
NC (normally closed)



NO (normally open)



Double acting



## Specifications

Descriptions	GNAD1V-1/5	GNAD2V-1/5	GNAD3V-1/5
Actuation	NC (normally closed)	NO (normally open)	Double acting
Working fluid	Low vacuum (air/water)		
Fluid viscosity mm <sup>2</sup> /s	500 or less		
Working pressure	1.3 x 10 <sup>2</sup> to 5 x 10 <sup>5</sup> Pa (abs) (secondary pressure 4 x 10 <sup>5</sup> Pa (abs) or less)		
Proof pressure (water pressure) MPa	1.0		
Fluid temperature °C	-10 to 50 (no freezing)		
Ambient temperature °C	-10 to 50		
Valve seat leakage	1.33 x 10 <sup>-3</sup> Pa·m <sup>3</sup> /sHe or less		
Orifice size mm	7		
Cv	0.7		
C [dm <sup>3</sup> /(s·bar)]	3.4		
b	-		
Mounting orientation	Unrestricted		
Pilot fluid	Air		
Pilot pressure MPa	0.4 to 0.5		
Pilot port size	Rc1/8		

\*1: Effective cross-sectional area S and sonic conductance C are converted as  $S \approx 5.0 \times C$ .

## How to order

**GNAD** **1** **V** - **1** - **3** - **R** - **P4**

Model No.

Working fluid (for low vacuum)

**A** Actuation

**B** Air supply category

**C** Manifold station No.

**D** Sub-plate/body/sealant combination

Code	Content		
<b>A Actuation</b>			
1	NC (normally closed)		
2	NO (normally open)		
3	Double acting		
<b>B Air supply category</b>			
1	Common supply		
5	Individual supply		
<b>C Manifold station No.</b>			
2	2 stations		
to	to		
10	10 stations		
0	Actuator only		
<b>D Sub-plate/body/sealant combination</b>			
	Sub-plate	Body	Seal
R	Stainless steel	Stainless steel	Ethylene propylene rubber
3	Aluminum	Polypropylene	Ethylene propylene rubber

## Compatibility table by variation

	NAD
Port size	Rc1/4, Rc3/8
P4	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable



General Purpose Valves  
Catalog No. CB-03-1SA

## Diaphragm cylinder valve

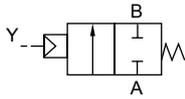
# LAD Series

- NC (normally closed) NO (normally open) double acting
- Port size: Rc3/8, Rc1/2, Rc3/4, Rc1
- Working fluid: Pure water, water, air, N<sub>2</sub> gas

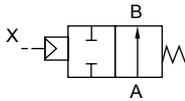


### JIS symbol

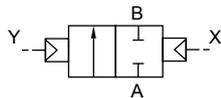
- NC (normally closed)



- NO (normally open)



- Double acting



### Common specifications (PTFE diaphragm)

Descriptions	LAD1	LAD2	LAD3
Actuation	NC (normally closed)	NO (normally open)	Double acting
Working fluid	Water, pure water, air, N <sub>2</sub> gas, non-corrosive/non-absorbable fluid (*1)		
Fluid temperature °C	5 to 90 (*2)		
Proof pressure (water pressure) MPa	0.9		
Working pressure (A→B) MPa	0 to 0.3		
Valve seat leakage cm <sup>3</sup> /min	0 (water pressure), 1 or less (pneumatic pressure)		
Back pressure MPa	0 to 0.1		
Ambient temperature °C	0 to 60		
Mounting orientation	Unrestricted		
Operating section	Pilot fluid	Air	
	Pilot pressure MPa	0.3 to 0.5	0.3 to 0.4
	Pilot port size	Rc1/8 (*3)	

\*1: Check the compatibility of product structural materials, working fluids and atmosphere.

Strong acids and highly absorbable fluids cannot be used.

\*2: 5 to 100°C for stainless steel body (SCS13).

\*3: With stainless steel stiffening ring.

### Individual specifications (PTFE diaphragm)

Descriptions Model No.	Port size	Orifice size mm	Cv	Frequency cycle/min.	Weight kg	
					PPS body	SCS13 body
LAD*-10A	Rc3/8	8	1.7	30 or less	0.15	0.3
LAD*-15A	Rc1/2	12	3.3	20 or less	0.28	0.6
LAD*-20A	Rc3/4	20	8.5	20 or less	0.55	1.1
LAD*-25A	Rc1	20	8.5	20 or less	0.60	1.2

### Common specifications (EPDM diaphragm)

Descriptions	LAD1	LAD2	LAD3
Actuation	NC (normally closed)	NO (normally open)	Double acting
Working fluid	Water, air, N <sub>2</sub> gas, non-corrosive/non-absorbable fluid (*1)		
Fluid temperature °C	0 to 60 (no freezing)		
Proof pressure (water pressure) MPa	1.5 (refer to proof pressure in individual specifications.)		
Working pressure (A→B) MPa	0 to 0.5 (refer to working pressure range in individual specifications.)		
Valve seat leakage cm <sup>3</sup> /min	0 (water pressure), 0.12 or less (pneumatic pressure)		
Back pressure MPa	0 to 0.1		
Ambient temperature °C	0 to 60		
Mounting orientation	Unrestricted		
Operating section	Pilot fluid	Air	
	Pilot pressure MPa	0.3 to 0.5	0.3 to 0.4
	Pilot port size	Rc1/8 (*2)	

\*1: Check the compatibility of product structural materials, working fluids and atmosphere.

Strong acids and highly absorbable fluids cannot be used.

\*2: With stainless steel stiffening ring.

### Individual specifications (EPDM diaphragm)

Descriptions Model No.	Port size	Proof pressure (water pressure) MPa	Working pressure (A→B) MPa	Orifice size mm	Cv	Frequency cycle/min.	Weight kg	
							PPS body	SCS13 body
LAD*-10A	Rc3/8	1.5	0.5	8	1.7	30 or less	0.15	0.3
LAD*-15A	Rc1/2	1.5	0.5	12	3.3	20 or less	0.28	0.6
LAD*-20A	Rc3/4	1.2	0.4	20	8.5	20 or less	0.55	1.1
LAD*-25A	Rc1	1.2	0.4	20	8.5	20 or less	0.60	1.2

## Compatibility table by variation

LAD	
Port size	Rc3/8, 1/2, 3/4, 1
P4	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

**LAD** **1** - **15A** - **C** **B** - **P4**

Model No.

**A** Actuation

**B** Port size

**C** Material combination

**D** Other options

Code	Content	
<b>A Actuation</b>		
<b>1</b>	NC (normally closed)	
<b>2</b>	NO (normally open)	
<b>3</b>	Double acting	
<b>B Port size</b>		
<b>10A</b>	Rc3/8	
<b>15A</b>	Rc1/2	
<b>20A</b>	Rc3/4	
<b>25A</b>	Rc1	
<b>C Material combination</b>		
	Body	Diaphragm
<b>P</b>	PPS	EPDM
<b>C</b>	PPS	PTFE
<b>R</b>	SCS13	EPDM
<b>F</b>	SCS13	PTFE
<b>D Other options</b>		
<b>Blank</b>	No option	
<b>B</b>	Mounting plate	

Note: For the "indicator" option, contact CKD.



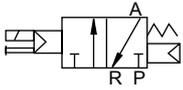
# Internal pilot 3-port valve with solenoid valve NP13/NP14 Series

- NC, NO
- Port size: Rc3/8 to Rc2

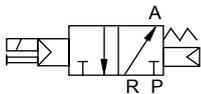


## JIS symbol

● NC



● NO



## Common specifications

Descriptions	NP13	NP14
Actuation	NC	NO
Fluid pressure supply port	Port P	Port R
Working fluid	Compressed air	
Proof pressure MPa	1.2	
Working pressure MPa	0.2 to 0.8	
Fluid temperature °C	5 to 60	
Ambient temperature °C	10 A to 25 A: -5 to 60 and 32 A to 50 A: -5 to 40 for both NP13/NP14	
Thermal class	Class 130 (B)	
Lubrication	No lubrication (use turbine oil Class 1 ISO VG32 for lubrication)	
Valve seat leakage cm <sup>3</sup> /min	1 or less (at pneumatic pressure 0.2 to 0.8 MPa)	
Valve structure	Internal pilot balance poppet structure	
Mounting orientation	Unrestricted	

## Individual specifications

Descriptions Model No.	Port size		Orifice size (mm)	Response time (ms)	Rated voltage	Power consumption (W)		Weight (kg)
	P, A ports	Port R				DC		
NC (port P pressurization)								
NP13-10A	Rc3/8	Rc1/2	14.8 or equiv.	30 or less (*1)	24 VDC	4		0.7
NP13-15A	Rc1/2							0.7
NP13-20A	Rc3/4	Rc1	25.4 or equiv.	60 or less (*1)				1.5
NP13-25A	Rc1					1.5		
NP13-32A	Rc1 <sup>1</sup> / <sub>4</sub>	Rc2	41.4 or equiv.	120 or less (*1)		8		4.5
NP13-40A	Rc1 <sup>1</sup> / <sub>2</sub>							4.5
NP13-50A	Rc2				4.4			
NO (port R pressurization)								
NP14-10A	Rc3/8	Rc1/2	14.8 or equiv.	30 or less (*1)	24 VDC	4		0.7
NP14-15A	Rc1/2							0.7
NP14-20A	Rc3/4	Rc1	25.4 or equiv.	60 or less (*1)				1.5
NP14-25A	Rc1					1.5		
NP14-32A	Rc1 <sup>1</sup> / <sub>4</sub>	Rc2	41.4 or equiv.	120 or less (*1)		8		4.5
NP14-40A	Rc1 <sup>1</sup> / <sub>2</sub>							4.5
NP14-50A	Rc2				4.4			

\*1: The response times are values with supply pressure of 0.5 MPa, without lubrication, and with the power ON.

They depend on the pressure and the lubricant quality.

\*2: Use the product within ±10% of the rated voltage.

# NP13/NP14 Series

## Flow characteristics

Model No.	P→A				A→R			
	C[dm <sup>3</sup> /(s·bar)]	b	Cv	S(mm <sup>2</sup> )	C[dm <sup>3</sup> /(s·bar)]	b	Cv	S(mm <sup>2</sup> )
NC (port P pressurization)								
NP13-10A	15	0.31	3.4	-	16	0.28	3.4	-
NP13-15A	18	0.29	3.6	-	17	0.26	3.6	-
NP13-20A	35	0.27	8.4	-	41	0.21	8.6	-
NP13-25A	-	-	8.6	200	-	-	9.0	210
NP13-32A	-	-	25.8	600	-	-	26.2	610
NP13-40A	-	-	27.0	630	-	-	26.6	620
NP13-50A	-	-	28.2	660	-	-	27.0	630
Model No.	R→A				A→P			
	C[dm <sup>3</sup> /(s·bar)]	b	Cv	S(mm <sup>2</sup> )	C[dm <sup>3</sup> /(s·bar)]	b	Cv	S(mm <sup>2</sup> )
NO (port R pressurization)								
NP14-10A	15	0.31	3.4	-	15	0.33	3.4	-
NP14-15A	17	0.30	3.6	-	18	0.31	3.6	-
NP14-20A	41	0.21	8.6	-	35	0.27	8.4	-
NP14-25A	-	-	9.0	210	-	-	8.6	200
NP14-32A	-	-	26.2	610	-	-	25.8	600
NP14-40A	-	-	26.6	620	-	-	27.0	630
NP14-50A	-	-	27.0	630	-	-	28.2	660

\*1: Effective cross-sectional area S and sonic conductance C are converted as  $S \approx 5.0 \times C$ .

## Compatibility table by variation

	NP13/NP14
Bore size	Rc3/8 to Rc1
P4	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

\*1: Coil option is 2G, 2H, 2GS, 2HS only.

\*2: Voltage: 24 VDC only.

\*3: Rc1 1/4 to Rc2 are made to order.

## How to order

NP1 3 - 15A - 1 2G S - 3 - P4

Model No.

A Actuation

B Port size

C Body/sealant combination

D Coil housing

\*1

E Other options

\*2

F Rated voltage

Code	Content	
<b>A Actuation</b>		
3	NC	
4	NO	
<b>B Port size</b>		
10A	Rc3/8	
15A	Rc1/2	
20A	Rc3/4	
25A	Rc1	
32A	Rc1 1/4 (made to order)	
40A	Rc1 1/2 (made to order)	
50A	Rc2 (made to order)	
<b>C Body/sealant combination</b>		
	Body	Seal
1	Aluminum	Nitrile rubber
<b>D Coil housing</b>		
2G	Option	DIN terminal box (Pg thread)
2H		DIN terminal box with lamp (Pg thread)
<b>E Other options</b>		
Blank	No option	
S	With surge suppressor	
<b>F Rated voltage</b>		
3	24 VDC	

## ⚠ Precautions for model No. selection

\*1: Pg thread of the DIN terminal box is Pg9 for port size 10 A to 25 A, and Pg11 for 32 A to 50 A.

\*2: The surge suppressor is mounted in the terminal box when the coil is with terminal box.

\*3: Manual override (non-locking) is provided as standard.



Air operated 3-port valve

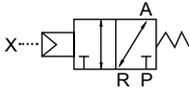
# NAP11 Series

- Universal
- Port size: Rc3/8 to Rc2



## JIS symbol

- Universal



## Common specifications

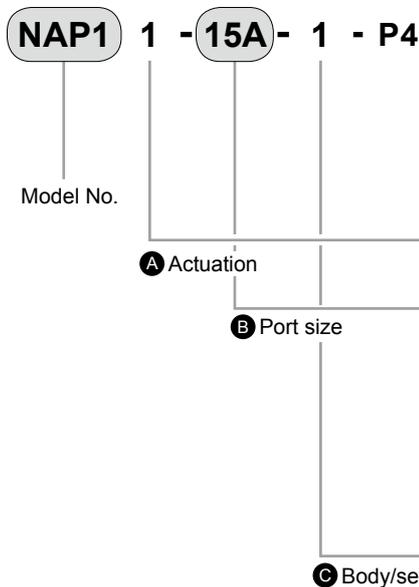
Descriptions	NAP11
Actuation	Universal
Working fluid	Compressed air, low vacuum
Proof pressure MPa	1.2
Working pressure MPa	0 to 0.8 (1.3 x 10 <sup>2</sup> to 8 x 10 <sup>5</sup> Pa (abs) when used in vacuum)
Fluid temperature °C	5 to 60
Ambient temperature °C	-5 to 60
Lubrication	No lubrication (use turbine oil Class 1 ISO VG32 for lubrication)
Valve seat leakage cm <sup>3</sup> /min	1 or less (at pneumatic pressure 0.02 to 0.8 MPa)
Valve structure	External pilot balance poppet structure
Mounting orientation	Unrestricted
Pilot fluid	Air
Pilot pressure MPa	0.35 to 0.7
Pilot port size (port X)	Rc1/8

## Individual specifications

Descriptions Model No.	Port size		Orifice size (mm)	Response time (ms)	Weight (kg)
	P, A ports	Port R			
NAP11-10A	Rc3/8	Rc1/2	14.8 or equiv.	30 or less (*1)	0.6
NAP11-15A	Rc1/2				
NAP11-20A	Rc3/4	Rc1	25.4 or equiv.	60 or less (*1)	1.4
NAP11-25A	Rc1				
NAP11-32A	Rc1 1/4	Rc2	41.4 or equiv.	120 or less (*1)	4.2
NAP11-40A	Rc1 1/2				
NAP11-50A	Rc2				

\*1: The response times are values with supply pressure of 0.5 MPa, without lubrication, and with the power ON. They depend on the pressure and the lubricant quality.

## How to order



## Compatibility table by variation

NAP11	
Port size	Rc3/8 to 2
P4	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

Code	Content	
<b>A Actuation</b>		
1	Universal	
<b>B Port size</b>		
10A	Rc3/8	
15A	Rc1/2	
20A	Rc3/4	
25A	Rc1	
32A	Rc1 1/4	
40A	Rc1 1/2	
50A	Rc2	
<b>C Body/sealant combination</b>		
	Body	Seal
1	Aluminum	Nitrile rubber

Fluid control components



Air operated 3-port valve with solenoid valve

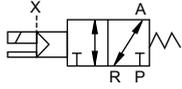
# NVP11 Series

- Universal
- Port size: Rc3/8 to Rc2



## JIS symbol

- Universal



## Common specifications

Descriptions	NVP11
Actuation	Universal
Working fluid	Compressed air, low vacuum
Proof pressure MPa	1.2
Working pressure MPa	0 to 0.8 (1.3 x 10 <sup>2</sup> to 8 x 10 <sup>5</sup> Pa (abs) when used in vacuum)
Fluid temperature °C	5 to 60
Ambient temperature °C	10 A to 25 A: -5 to 60 and 32 A to 50 A: -5 to 40
Thermal class	Class 130 (B)
Lubrication	No lubrication (use turbine oil Class 1 ISO VG32 for lubrication)
Valve seat leakage cm <sup>3</sup> /min	1 or less (at pneumatic pressure 0.02 to 0.8 MPa)
Valve structure	External pilot balance poppet structure
Mounting orientation	Unrestricted
Pilot fluid	Air
Pilot pressure MPa	0.35 to 0.7
Pilot port size (port X)	Rc1/8

## Individual specifications

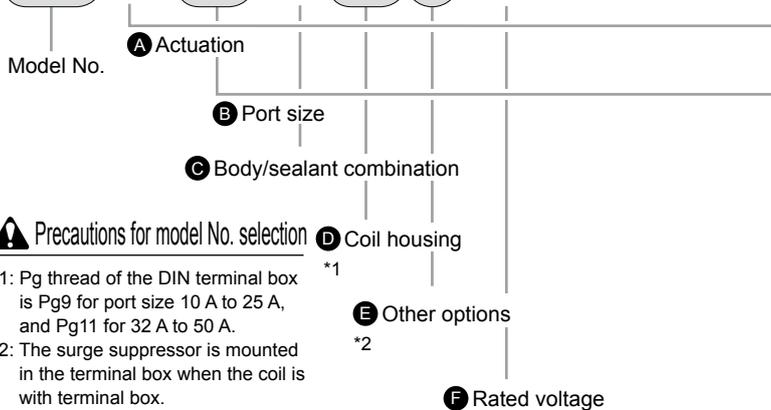
Descriptions	Port size		Orifice size (mm)	Response time (ms)	Rated voltage	Power consumption (W)		Weight (kg)
	P, A ports	Port R				DC		
<b>NVP11-10A</b>	Rc3/8	Rc1/2	14.8 or equiv.	30 or less (*1)	24 VDC	4		0.7
<b>NVP11-15A</b>	Rc1/2							0.7
<b>NVP11-20A</b>	Rc3/4	1.5						
<b>NVP11-25A</b>	Rc 1	Rc 1	25.4 or equiv.	60 or less (*1)		8		1.5
<b>NVP11-32A</b>	Rc1 1/4							4.5
<b>NVP11-40A</b>	Rc1 1/2	Rc 2	41.4 or equiv.	120 or less (*1)				8
<b>NVP11-50A</b>	Rc 2				4.4			

\*1: The response times are values with supply pressure of 0.5 MPa, without lubrication, and with the power ON. They depend on the pressure and the lubricant quality.

\*2: Use the product within ±10% of the rated voltage.

## How to order

**NVP1 1 - 15A - 1 2G S - 3 - P4**



### Precautions for model No. selection

\*1: Pg thread of the DIN terminal box is Pg9 for port size 10 A to 25 A, and Pg11 for 32 A to 50 A.

\*2: The surge suppressor is mounted in the terminal box when the coil is with terminal box.

\*3: Manual override (non-locking) is provided as standard.

Code	Content	
<b>A Actuation</b>		
1	Universal	
<b>B Port size</b>		
10A	Rc 3/8	
15A	Rc 1/2	
20A	Rc 3/4	
25A	Rc 1	
32A	Rc1 1/4 (made to order)	
40A	Rc1 1/2 (made to order)	
50A	Rc2 (made to order)	
<b>C Body/sealant combination</b>		
	Body	Seal
1	Aluminum	Nitrile rubber
<b>D Coil housing</b>		
2G	Option	DIN terminal box (Pg thread)
2H		DIN terminal box with lamp (Pg thread)
<b>E Other options</b>		
Blank	No option	
S	With surge suppressor	
<b>F Rated voltage</b>		
3	Standard	24 VDC

## Compatibility table by variation

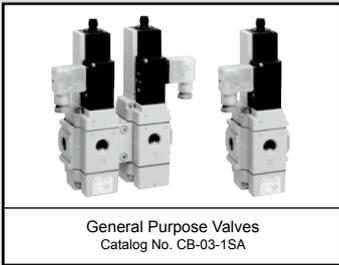
	NVP11
Port size	Rc3/8 to 2
P4	●

- : Standard
- : Made to order
- ▲ : Contact CKD
- : Not applicable

\*1: Coil option is 2G, 2H, 2GS, 2HS only.

\*2: Voltage: 24 VDC only.

\*3: Rc1 1/4 to Rc2 are made to order.



3-port solenoid valve with spool position detection

# SNP Series

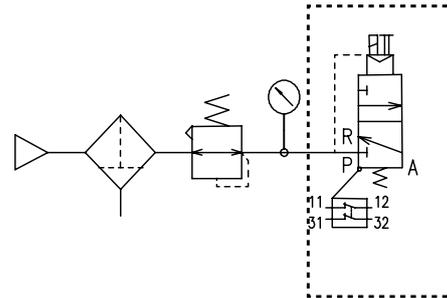
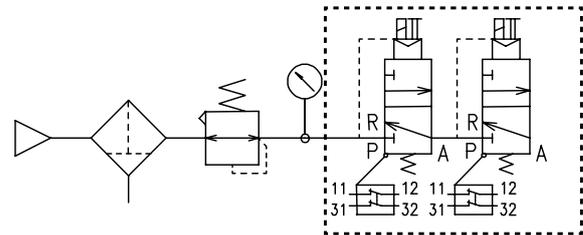
● Port size: Rc3/8 to 3/4

## Spool position detection for reliable open/close detection Module connection also allows double cutoff.

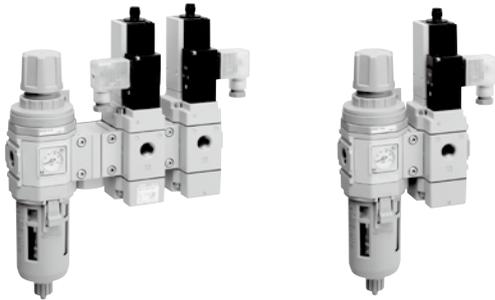
### Features

- ◆ Serves as electromagnetic shut-off valve for pneumatic system.
- ◆ Signal output of the valve's open/close state is possible by detecting the main valve spool position with the safety limit switch.
- ◆ Two modules can be connected to configure a double breaker circuit.
- ◆ Can be modular-integrated into the F.R.L. unit. Reduces piping space.

### Example of system circuit



### Unit configuration example



## Specifications

Model	SNP		
Port size	Rc3/8	Rc1/2	Rc3/4
Actuation	NC		
Fluid pressure supply port	Port P		
Working fluid	Compressed air		
Proof pressure MPa	1.05		
Working pressure range MPa	0.2 to 0.7		
Fluid temperature °C	5 to 60		
Ambient temperature °C	-5 to 60		
Weight kg	0.8(1.7) *1	1.8(3.7) *1	
Orifice size mm	14.8 or equiv.	25.4 or equiv.	
Valve seat leakage	1 or less (at pneumatic pressure 0.2 to 0.7 MPa)		
Valve structure	Internal pilot balance poppet structure		
Mounting orientation	Unrestricted		

\*1: Values in ( ) are the weight for modules

\*2: External pilot also supported. Contact CKD for details.

## Electrical specifications

Rated voltage (*2)	24 VDC		
Power consumption (W) DC	2.0		
Thermal class	B		
Degree of protection (IEC standards 529)	DIN terminal box (Pg 9)	IPX5	
	DIN terminal box (M12-4P connector)		

\*3: The voltage range must be within  $\pm 10\%$  of the rated voltage.

\*4: Contact CKD for details on reliability data (B10).

## Limit switch specifications

Limit switch specifications		
Manufacturer model	D4N-1B31	D4N-9B31
Terminal	Pg13.5	M12-4P connector
Contact resistance	25 mΩ or less	
Minimum applicable load	5 VDC 1 mA resistance load	
Rated insulation voltage V	300	
Insulation resistance MΩ	100	
Electric shock protection class	Class II	
Pollution degree (working environment)	3 (EN60947-5-1)	
Conditional short-circuit current A	100	

\* Refer to the manufacturer's catalog for details.

## Flow characteristics

Model No.		P→A		A→R	
		C[dm <sup>3</sup> /(s/bar)]	S(mm <sup>2</sup> )	C[dm <sup>3</sup> /(s/bar)]	S(mm <sup>2</sup> )
Single unit	SNP-10A	13	64	14	70
	SNP-15A	15	76	16	80
	SNP-20A	34	170	36	180
2 stations	SNP-10A	10	50	14	70
	SNP-15A	12	59	16	80
	SNP-20A	26	130	36	180

## Compatibility table by variation

	SNP
Port size	Rc3/8, 1/2, 3/4
P4	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

**SNP** - **1R** - **15A** - **0** **2HS** **L** **B3** **S2** - **3** - **P4**

Ⓐ Station No.

Ⓑ Port size

Ⓒ Sealant

Ⓓ Coil option

Ⓔ Limit switch

Ⓕ Bracket \*1, \*2

Ⓖ Silencer

Ⓗ Voltage

Code	Content			
<b>Ⓐ Station No.</b>				
<b>1R</b>	Single unit (terminal box right-facing)			
<b>1L</b>	Single unit (terminal box left-facing)			
<b>2</b>	2 (2 modules)			
<b>Ⓑ Port size</b>				
<b>10A</b>	Rc3/8			
<b>15A</b>	Rc1/2			
<b>20A</b>	Rc3/4			
<b>Ⓒ Sealant</b>				
<b>0</b>	NBR			
<b>Ⓓ Coil option</b>				
<b>2G</b>	DIN terminal box			
<b>2HS</b>	DIN terminal box with lamp/surge suppressor			
<b>2J</b>	DIN terminal box (M12-4P connector)			
<b>2KS</b>	DIN terminal box with lamp/surge suppressor (M12-4P connector)			
<b>Ⓔ Limit switch</b>				
<b>L</b>	Pg13.5 (D4N-1B31: OMRON)			
<b>M</b>	M12-4P connector (D4N-9B31: OMRON)			
<b>Ⓕ Bracket *1</b>				
		10A	15A	20A
<b>Blank</b>	No option	●	●	●
<b>B3</b>	With bracket (2000 Series, 3000 Series)	●	●	□
<b>B4</b>	With bracket (4000 Series)	●	●	□
<b>B8</b>	With bracket (8000 Series)	□	□	●
<b>Ⓖ Silencer</b>				
<b>Blank</b>	No option			
<b>S2</b>	Resin			
<b>Ⓗ Voltage</b>				
<b>3</b>	24 VDC			

## ⚠ Precautions for model No. selection

\*1: The bracket can be selected when Ⓐ station No. is "2".

\*2: The bracket option "B8" can be selected only for 20A.

\*3: Silencer is attached to the product.



Solenoid valve for high vacuum

# HVB<sup>2345</sup>12 Series

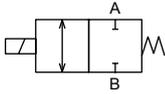
- Orifice:  $\phi 1$ ,  $\phi 2$ ,  $\phi 3$ ,  $\phi 4.5$ ,  $\phi 6$
- NC

P4 compliant  
as standard



## JIS symbol

- NC



## Common specifications

Descriptions	HVB*12
Working fluid	Air/vacuum/inert gas (*1)
Proof pressure MPa	5.0
Fluid temperature °C	5 to 55
Ambient temperature °C	0 to 55 (no freezing)
Thermal class	Class 130 (B)
Voltage fluctuation range	Rated voltage $\pm 10\%$
Atmosphere	No explosive or corrosive atmospheres
Valve structure	Direct acting poppet structure
Valve seat leakage Pa·m <sup>3</sup> /sHe	$1.0 \times 10^{-9}$ or less (*2)
External leakage Pa·m <sup>3</sup> /sHe	$1.0 \times 10^{-9}$ or less
Mounting orientation	Unrestricted
Durability	2 million times

## Individual specifications

Descriptions Model No.	Port size (*3)	Orifice size (mm)	Cv (*5)	Working pressure Pa (abs) (*10)	Max. working pressure differential (*6) (MPa)	Back pressure (*7) (MPa)	Rated voltage	Power consumption (W)		Weight (*9)(kg)	
								AC	DC		
<b>NC</b>											
HVB212	1/4" JXR male fitting	1	0.04	$1.0 \times 10^{-6}$ to $1.0 \times 10^6$	1.0	0.6	100 VAC 50/60 Hz	4.3	4	0.16	
	1/4" double barbed fitting NPT 1/8, Rc1/8										2
HVB312	1/4" JXR male fitting	2	0.17	$1.0 \times 10^{-6}$ to $0.8 \times 10^6$	0.8	0.5		6.5	6	0.29	
	1/4" double barbed fitting NPT 1/8, 1/4, Rc1/8, 1/4										3
HVB412	1/4" JXR male fitting	3	0.33	$1.0 \times 10^{-6}$ to $1.0 \times 10^6$	1.0	0.4		200 VAC 50/60 Hz	8.3	8 (*8)	
	1/4" double barbed fitting NPT 1/4, Rc1/4										4.5
	3/8" JXR male fitting 3/8" double barbed fitting NPT 3/8, Rc3/8	6	1.05	$1.0 \times 10^{-6}$ to $0.2 \times 10^6$	0.1	0.05					
HVB512	1/4" JXR male fitting							4.5	0.6	$1.0 \times 10^{-6}$ to $0.8 \times 10^6$	0.8
	1/4" double barbed fitting NPT 1/4, Rc1/4	6	1.05	$1.0 \times 10^{-6}$ to $0.3 \times 10^6$	0.3	0.15					
	3/8" JXR male fitting 3/8" double barbed fitting NPT 3/8, Rc3/8										

\*1 : The number of durability times may become much lower depending on the degree of dryness.

\*2 : Value when port A is on the vacuum side.

\*3 : JXR fitting can be connected to VCR fitting.

\*4 : The leakage current must be less than or equal to the values shown below.

\*5 : Cv shown in the table are values for NPT connection.

\*6 : The max. working pressure differential is the difference between port B (high-pressure side) and port A (low-pressure side).

\*7 : Atmospheric pressure at port B that can be applied from port A.

\*8 : 8.6 (W) for 12 VDC.

\*9 : Weights shown in the table are for grommet lead wire/NPT connection.

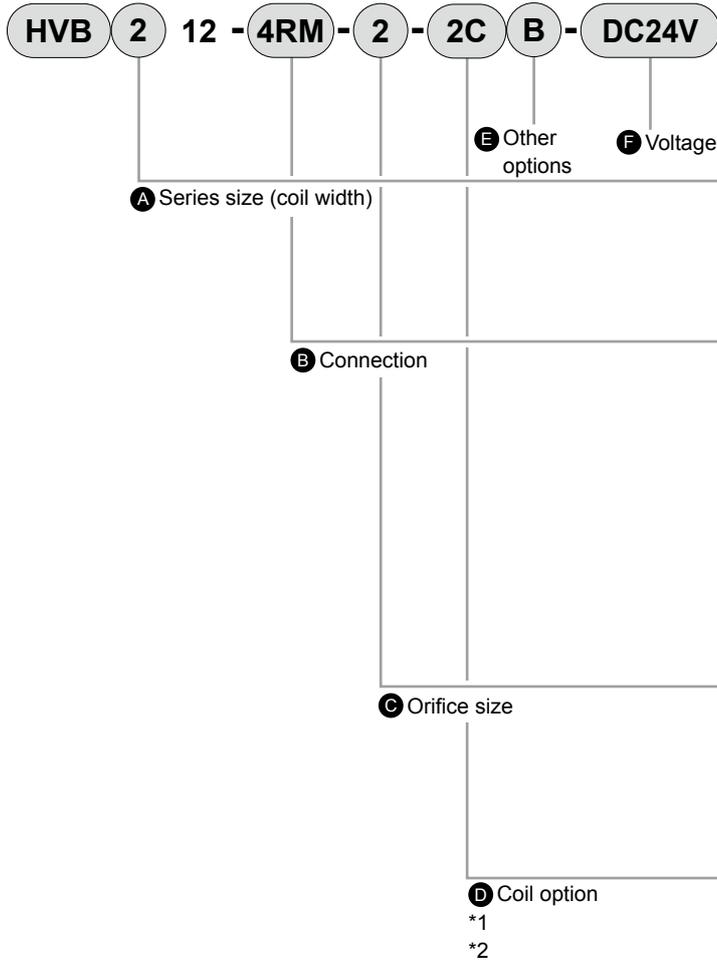
\*10: The working pressure range vacuum does not guarantee the vacuum attainment time or that the vacuum will not change.

\*11: FKM is used for sealant material, so consider the generation of discharge gas during use.

\*12: Grease for high vacuum is used on the O-rings of gas contacting parts.

Leakage current	Voltage	100 VAC	200 VAC	24 VDC	12 VDC
	Model No.				
	HVB*12	2 mA or less	1 mA or less	1 mA or less	2 mA or less

## How to order



		Model No.			
		HVB212	HVB312	HVB412	HVB512
Code	Content				
<b>A Series size</b>					
2	22 mm	●			
3	28 mm		●		
4	34 mm			●	
5	40 mm				●
<b>B Connection (refer to Table 1)</b>					
4RM	1/4" JXR male fitting	●	●	●	●
6RM	3/8" JXR male fitting			●	●
4S	1/4" double barbed fitting	●	●	●	●
6S	3/8" double barbed fitting			●	●
6N	NPT 1/8	●	●		
8N	NPT 1/4		●	●	●
10N	NPT 3/8			●	●
6	Rc1/8	●	●		
8	Rc1/4		●	●	●
10	Rc3/8			●	●
<b>C Orifice size (refer to Table 1)</b>					
Z	ø1	●			
2	ø2	●	●		
3	ø3		●	●	
5	ø4.5			●	●
6	ø6			●	●
<b>D Coil option</b>					
For AC					
2CR	Standard Grommet lead wire/with full-wave rectifier	●	●	●	●
For DC					
2C	Standard Grommet lead wire	●	●	●	●
2CS	Option Grommet lead wire with surge suppressor	●	●	●	●
2G	Option With DIN terminal box (Pg11)	●	●	●	●
2HS	Option With DIN terminal box with lamp/surge suppressor (Pg11)	●	●	●	●
<b>E Other options</b>					
Blank	Standard No	●	●	●	●
B	Option Mounting plate	●	●	●	●
<b>F Voltage</b>					
AC100V	100 VAC 50/60 Hz	●	●	●	●
AC200V	200 VAC 50/60 Hz	●	●	●	●
DC24V	24 VDC	●	●	●	●
DC12V	12 VDC	●	●	●	●

Table 1: Table of fitting and orifice size combination

	Connection			Orifice size					
	Fitting	Size		Z	2	3	5	6	
HVB212	4RM	JXR male	1/4"	●	●				
	4S	Double barbed	1/4"	●	●				
	6N	NPT	1/8"	●	●				
	6	Rc	1/8"	●	●				
HVB312	4RM	JXR male	1/4"		●	●			
	4S	Double barbed	1/4"		●	●			
	6N	NPT	1/8"		●	●			
	8N	NPT	1/4"		●	●			
	6	Rc	1/8"		●	●			
	8	Rc	1/4"		●	●			
HVB412	4RM	JXR male	1/4"			●	●		
	6RM	JXR male	3/8"					●	
	4S	Double barbed	1/4"			●	●		
	6S	Double barbed	3/8"					●	
	8N	NPT	1/4"			●	●		
	10N	NPT	3/8"					●	
	8	Rc	1/4"			●	●		
HVB512	10	Rc	3/8"					●	
	4RM	JXR male	1/4"				●		
	6RM	JXR male	3/8"					●	
	4S	Double barbed	1/4"				●		
	6S	Double barbed	3/8"					●	
	8N	NPT	1/4"				●		
	10N	NPT	3/8"					●	
8	Rc	1/4"				●			
10	Rc	3/8"					●		

Select from the combinations indicated with ● above.

\*1: Surge suppressor is included as standard in the locations with full-wave rectifier.

\*2: For HVB212 Item 2G/2HS, the compact terminal box (Pg9) is used.



Solenoid valve for high vacuum

# HVB<sup>6</sup><sub>7</sub>12 Series

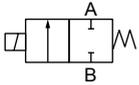
- NC
- Port size: Flange ø48, ø52

P4 compliant  
as standard

RoHS

## JIS symbol

- NC



## Specifications

Model No.	HVB612-12F				HVB712-15F			
	-8B	-8H	-12B	-12B	-12H	-15B	-15H	
Descriptions	Vacuum and inert gas (*1)							
Working fluid	Vacuum and inert gas (*1)							
Working pressure Pa(abs)	1.3×10 <sup>-6</sup> to 2.0×10 <sup>5</sup>	1.3×10 <sup>-6</sup> to 3.0×10 <sup>5</sup>	1.3×10 <sup>-6</sup> to 1.0×10 <sup>5</sup>	1.3×10 <sup>-6</sup> to 1.5×10 <sup>5</sup>	1.3×10 <sup>-6</sup> to 3.0×10 <sup>5</sup>	1.3×10 <sup>-6</sup> to 1.0×10 <sup>5</sup>	1.3×10 <sup>-6</sup> to 1.0×10 <sup>5</sup>	
Max. working pressure differential (*7) MPa	0.2	0.3	0.1	0.15	0.3	0.1	0.1	
Orifice size mm	8		12	12		15		
Cv	Straight		1.8	2.7	3.2		4.3	
	L direction		2.1	3.2	3.6		4.7	
Back pressure (*2) MPa	0.1		0.02	0.1		0.02	0.1	
Valve seat leakage Pa·m <sup>3</sup> /s (He)	1.0 x 10 <sup>-9</sup> or less (*6)							
External leakage Pa·m <sup>3</sup> /s (He)	1.0 x 10 <sup>-9</sup> or less							
Proof pressure MPa	0.5							
Fluid temperature °C	5 to 55							
Ambient temperature °C	0 to 55							
Frequency times/min. or less	10							
Mounting orientation	Unrestricted							
Port size	ø48 flange				ø52 flange			
Weight kg	1.15				2.0			
<b>Electrical specifications</b>								
Rated voltage	100/200 VAC (50/60Hz), 24 VDC							
Voltage fluctuation range	Rated voltage ±10%							
Power consumption W	14.3	28	14.3	19	AC:32.5 DC:40	19	AC:32.5 DC:40	
Thermal class	B	H	B	B	H	B	H	
Temperature rise K	75	125	75	75	125	75	125	

\*1: The number of durability times may become much lower depending on the degree of dryness.

\*2: Atmospheric pressure at port B that can be applied from port A.

(Reverse vacuum is not possible with HVB612-12F-12B and HVB712-15F-15B.)

\*3: Grease for high vacuum is used on the O-rings of gas contacting parts.

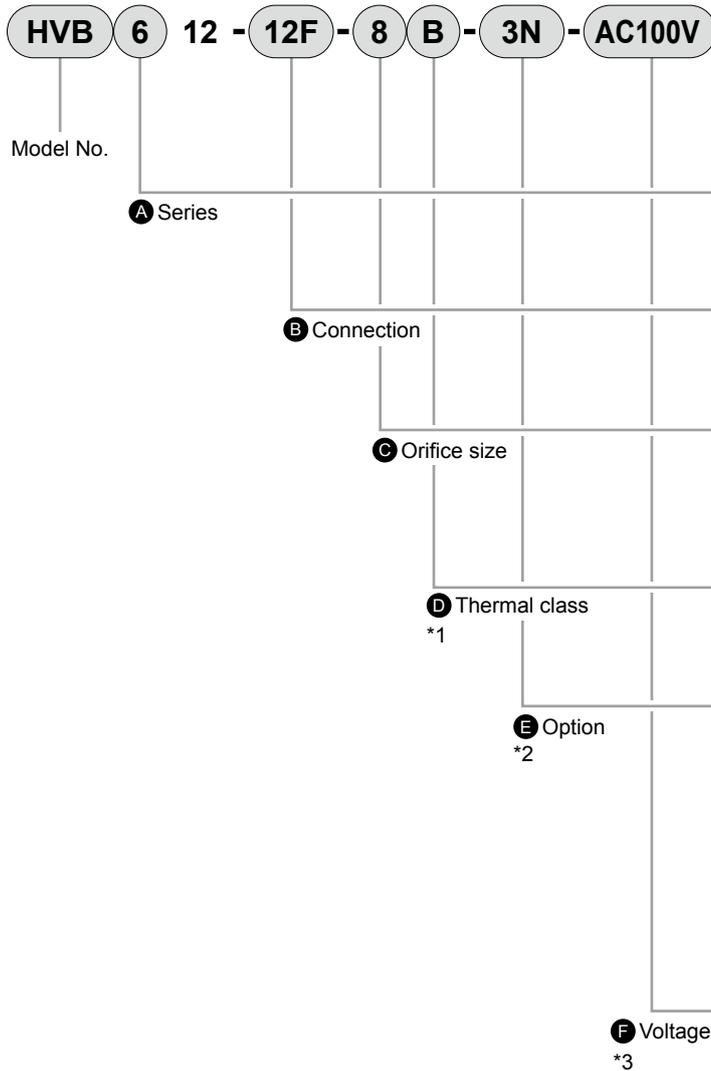
\*4: The working pressure vacuum does not guarantee the vacuum attainment time or that the vacuum will not change.

\*5: FKM is used for sealant material, so consider the generation of discharge gas during use.

\*6: Value when port A is on the vacuum side.

\*7: The max. working pressure differential is the difference between port B (high-pressure side) and port A (low-pressure side).

## How to order

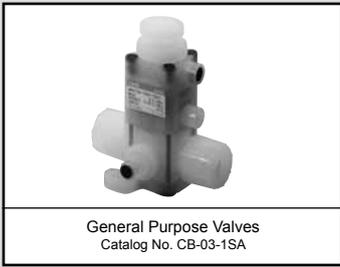


Model No.	
HVB612	HVB712

Code	Content	HVB612	HVB712
<b>A Series size</b>			
6	60 mm	●	
7	70 mm		●
<b>B Connection</b>			
12F	Flange ø48	●	
15F	Flange ø52		●
<b>C Orifice size</b>			
8	ø8	●	
12	ø12	●	●
15	ø15		●
<b>D Thermal class</b>			
B	Class 130 (B)	●	●
H	Class 180 (H)	●	●
<b>E Option</b>			
Blank	No	●	●
3M	HP terminal box G1/2	●	●
3N	HP terminal box with lamp G1/2	●	●
F	With companion flange	●	●
3MF	HP terminal box G1/2 + companion flange	●	●
3NF	HP terminal box with lamp G1/2 + Companion flange	●	●
<b>F Voltage</b>			
AC100V	100 VAC (50/60 Hz) with full-wave rectifier	●	●
AC200V	200 VAC (50/60 Hz) with full-wave rectifier	●	●
DC24V	24 VDC	●	●

### ⚠ Precautions for model No. selection

- \*1: For Item **D** H, HVB612 with orifice size ø12 is not available.
- \*2: For 3M/3N/3MF/3NF of Item **E** with H selected for Item **D**, AC voltage is not available.
- \*3: Surge suppressor is included as standard in the models with full-wave rectifier.



Air operated valve for chemical liquids

# AMD3\*3R Series

P4 compliant  
as standard

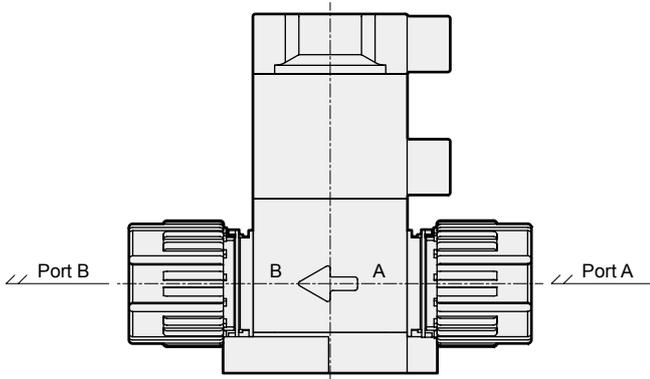


## Specifications

Descriptions	AMD3*3R				
	N (normal body)			B (body with bypass)	
Working fluid	Chemical liquids, pure water, air, N <sub>2</sub> gas (*1)				
Fluid temperature °C	5 to 120 (*3, *4)			5 to 90	
Proof pressure MPa	1.0				
Working pressure (A→B) MPa	0 to 0.5			Refer to figure below for "Working pressure"	
Working pressure (B→A) MPa	0 to 0.5			Refer to figure below for "Working pressure"	
Valve seat leakage cm <sup>3</sup> /min	0 (water pressure)				
Back pressure MPa	0 to 0.5			Refer to figure below for "Working pressure"	
Ambient temperature °C	0 to 60 (0 to 50 when sensor attached)				
Frequency	30 times/min. or less				
Mounting orientation	Unrestricted				
Connection	O.D. ø10/ø12 tube connection (fitting integrated) O.D. 3/8" / 1/2" tube connection (fitting integrated)				
Orifice size (*5)	ø6	ø7	ø8	ø9	ø10
Cv (*6)	0.7	1	1.25	1.6	1.8
Bypass orifice size	-			ø2.3	
Operating section	Operating pressure MPa	NC/NO: 0.35 to 0.5 Double acting: 0.3 to 0.4			
	Operating port	Rc1/8 (operation ports used NC: port Y NO: port X Double acting: ports X, Y)			
Sensor	Refer to General Purpose Valves (catalog No. CB-03-1SA).				

- \*1: Check the compatibility of product structural materials, working fluids and atmosphere. (Refer to the compatibility check list described in the General Purpose Valves (catalog No. CB-03-1SA).)  
Body with bypass cannot be used for hydrofluoric acid or chemical liquids containing hydrofluoric acid.
- \*2: Refer to Wet Fine System/High Purity Chemical Liquid System (Catalog No. CB-031A) for flow characteristics.
- \*3: For hydrofluoric acid or chemical liquids containing hydrofluoric acid, use within the range of 5 to 80°C.
- \*4: 5 to 100°C if the connection is F-LOCK60 Series fitting.
- \*5: Check the orifice size of each model in How to order.
- \*6: Cv is the value at 23°C temperature.

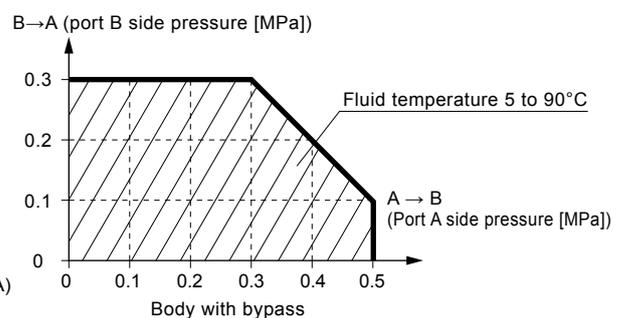
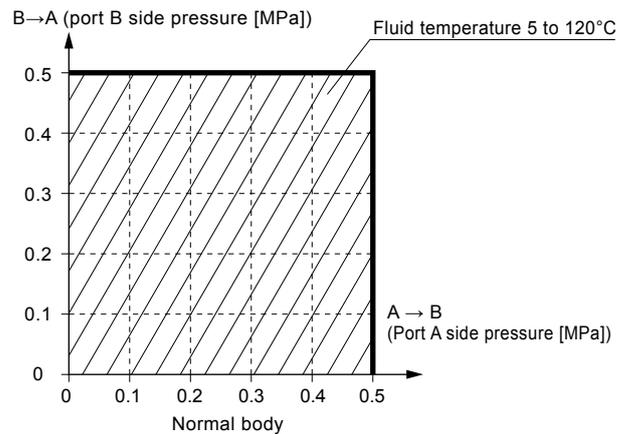
## Structure and parts list



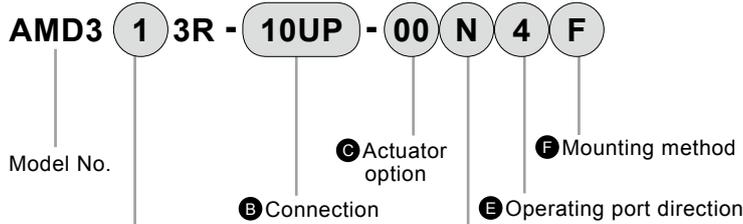
Part name	Material
Actuator	PVDF and others
Diaphragm	PTFE
Body	PFA, PTFE
Mounting plate	PVDF

\*Refer to Wet Fine System/High Purity Chemical Liquid System (Catalog No. CB-031A) for details of the AMDZ\*3R, 0\*3R, 4\*3R and 5\*3R specifications.

## Working pressure



### How to order



A Actuation	
1	NC (normally closed)
2	NO (normally open)
3	Double acting

		B Connection (*1)								
		10UP	10BUP	12UP	15BUP	10UR	10BUR	12UR	15BUR	
		Super 300 Pillar fitting P Series integrated				F-LOCK 60 Series fitting integrated				
		ø10 x ø8 tube connection	3/8" x 1/4" tube connection	ø12 x ø10 tube connection	1/2" x 3/8" tube connection	ø10 x ø8 tube connection	3/8" x 1/4" tube connection	ø12 x ø10 tube connection	1/2" x 3/8" tube connection	
Code	Content	Orifice size								
		ø8	ø10	ø7	ø6	ø9				
C Actuator option										
00	ON/OFF only (with indicator)	●	●	●	●	●	●	●	●	●
10	With flow rate adjustment	●	●	●	●	●	●	●	●	●
With sensor	Transistor									
	Cable direction (*2)									
	Cable length									
A1	NPN Operating port side	1 m	●	●	●	●	●	●	●	●
A3		3 m	●	●	●	●	●	●	●	●
B1	NPN Opposite side to operating port	1 m	●	●	●	●	●	●	●	●
B3		3 m	●	●	●	●	●	●	●	●
C1	PNP Operating port side	1 m	●	●	●	●	●	●	●	●
D1		Opposite side to operating port	1 m	●	●	●	●	●	●	●
D Body option										
		Body material								
N	Normal body	PFA	PFA	PTFE	PTFE	PTFE		PTFE		
B	Body with bypass	PTFE	PFA	PTFE	PTFE	PTFE		PTFE		
E Operating port direction (*2)										
4	<p>With valve viewed from above, ← indicates fluid flow direction and ⇐ operating port direction.</p>	●	●	●	●	●	●	●	●	●
1		●	●	●	●	●	●	●	●	●
2		●	●	●	●	●	●	●	●	●
3		●	●	●	●	●	●	●	●	●
F Mounting method (*2)										
F	Flange mounting	●	●	●	●	●	●	●	●	●
H	4-point flange mounting	●	●	●	●	●	●	●	●	●
X	Bottom mounting	●	●	●	●	●	●	●	●	●

### ! Precautions for model No. selection

\*1: Made to order if F-LOCK60 Series fitting and body material are PTFE.  
Contact CKD for other connection methods.

\*2: Refer to external dimensions of Wet Fine System/High Purity Chemical Liquid System (Catalog No. CB-031A) for operating port direction, sensor cable direction, and mounting plate.

Wet  
Fine system



Air operated valve for process gas

# AGD0<sub>1</sub><sup>2</sup>R Series

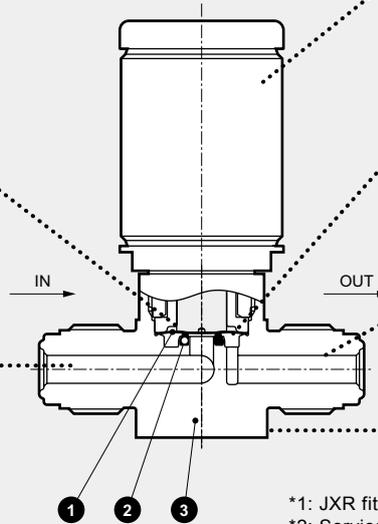
- Metal diaphragm
- Compact

Dry Fine System/high purity gas control system components  
Catalog No. CB-035A



## Basic performance is maintained while saving more space.

- It can be used continuously at 80°C
- Zero particle generation is achieved with optimal seal structure and improved surface roughness
- Electrolytic polishing specification



- Slim actuator with an outer diameter of ø26
- Ni-Co alloy diaphragm with high corrosion resistance and long service life (track record of 4 million times <sup>\*2</sup>)
- Connection uses JXR fitting <sup>\*1</sup> as standard
- □21 mm compact body

### Gas contact part materials

No.	Part name	Material
1	Diaphragm	Ni-Co alloy
2	Valve seat	PCTFE
3	Body	SUS316L

\*1: JXR fitting can be connected to VCR fitting.  
\*2: Service life when the working fluid is inert gas within the specified range and does not contain solids such as reaction products.

### Compatibility table by variation

AGD0*R	
Port size	1/4" double barbed fitting, 1/4" JXR fitting
P4	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

Note: Use after checking the compatibility of the working fluid with the wetted part materials.

AGD0 **1** R - **4R** - X ○

Code	Content
<b>A Actuation</b>	
1	NC (normally closed)
2	NO (normally open)
<b>B Connection</b>	
4RM	1/4" JXR male fitting
4R	1/4" JXR female fitting

### ⚠ Precautions for model No. selection

Made to order. Contact CKD for details.

### ⚠ Safety precautions

To ensure correct and safe use of this product, read the precautions described in Dry Fine System/high purity gas control system components (Catalog No. CB-035A).

### Specifications

Descriptions	AGD01R	AGD02R
Working fluid	Inert gas/process gas	
Working pressure Pa(abs)-MPa(G)	1.3 x 10 <sup>-6</sup> to 0.99	
Fluid temperature °C	5 to 80	
Operating ambient temperature °C	5 to 80	
Storage ambient temperature °C	-10 to 80	
Valve seat leakage Pa·m <sup>3</sup> /s (He)	1.0 x 10 <sup>-10</sup> or less	
External leakage Pa·m <sup>3</sup> /s (He)	2.8 x 10 <sup>-12</sup> or less	
Cv (23°C, under pressurization)	0.1	
Connection	1/4" JXR male fitting 1/4" JXR female fitting	
Actuation	NC (normally closed)	NO (normally open)
Operating pressure MPa	0.4 to 0.6	0.4 to 0.5
Operating port	M5	
Weight kg	0.15 *1	

\*1: Values with AGD01R-4RM (1/4" JXR male fitting).



Air operated valve for process gas

# AGD1<sup>1</sup><sub>2</sub>R Series

# AGD2<sup>1</sup><sub>2</sub>R Series

- Metal diaphragm
- Standard



## Specifications

Descriptions	AGD1*R	AGD2*R
Working fluid	Inert gas/process gas	
Working pressure Pa(abs)-MPa(G)	1.3 x 10 <sup>-6</sup> to 0.99	
Fluid temperature °C	5 to 80	
Operating ambient temperature °C	5 to 80	
Storage ambient temperature °C	-10 to 80	
Valve seat leakage Pa·m <sup>3</sup> /s (He)	1.0 x 10 <sup>-10</sup> or less	
External leakage Pa·m <sup>3</sup> /s (He)	2.8 x 10 <sup>-12</sup> or less	
Cv (23°C, under pressurization)	0.3	0.65
Connection	1/4" JXR male fitting 1/4" JXR female fitting 1/4" double barbed fitting	3/8" JXR male fitting 3/8" JXR female fitting 3/8" double barbed fitting
Actuation	NC (normally closed) NO (normally open)	NC (normally closed) NO (normally open)
Operating pressure MPa	NC:0.4 to 0.6 NO:0.4 to 0.5	NC:0.4 to 0.6 NO:0.4 to 0.5
Operating port	M5	
Weight kg	0.26 *1	0.59 *1

\*1: Values with AGD11R-4RM (1/4" JXR male fitting), AGD21R-6RM (3/8" JXR male fitting).

## ⚠ Safety precautions

To ensure correct and safe use of this product, read the precautions described in Dry Fine System/high purity gas control system components (Catalog No. CB-035A).

## Compatibility table by variation

	AGD1*R	AGD2*R
Port size	1/4" double barbed fitting, 1/4" JXR fitting	3/8" double barbed fitting, 3/8" JXR fitting
P4	▲	▲

● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable

Note: Use after checking the compatibility of the working fluid with the wetted part materials.

## How to order

AGD1 **1** R- **4R** -X **○**

Model No.

Ⓐ Actuation

Ⓑ Connection

Code	Content
<b>Ⓐ Actuation</b>	
<b>1</b>	NC (normally closed)
<b>2</b>	NO (normally open)
<b>Ⓑ Connection</b>	
<b>4RM</b>	1/4" JXR male fitting
<b>4R</b>	1/4" JXR female fitting
<b>4S</b>	1/4" double barbed fitting

AGD2 **1** R- **6R** -X **○**

Model No.

Ⓐ Actuation

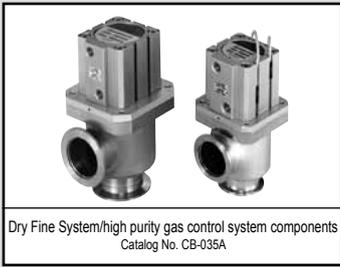
Ⓑ Connection

Code	Content
<b>Ⓐ Actuation</b>	
<b>1</b>	NC (normally closed)
<b>2</b>	NO (normally open)
<b>Ⓑ Connection</b>	
<b>6RM</b>	3/8" JXR male fitting
<b>6R</b>	3/8" JXR female fitting
<b>6S</b>	3/8" double barbed fitting

Dry Fine system

## ⚠ Precautions for model No. selection

Made to order. Contact CKD for details.



Air operated valve for high vacuum NC

# AVB\*13 Series

- Molded bellows method ● Stainless steel body compact

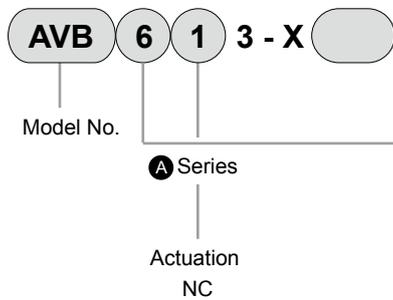


## Specifications

Descriptions	AVB513	AVB613	AVB713	AVB813
Working fluid	Vacuum and inert gas			
Working pressure Pa (abs)	1.3 x 10 <sup>-6</sup> to 1×10 <sup>5</sup>			
Max. working differential pressure MPa	0.1			
Valve seat leakage Pa·m <sup>3</sup> /s (He)	1.3 x 10 <sup>-10</sup> or less			
External leakage Pa·m <sup>3</sup> /s (He)	1.3 x 10 <sup>-11</sup> or less			
Proof pressure MPa	0.3			
Fluid temperature °C	5 to 60			
Ambient temperature °C	0 to 60 (no freezing)			
Orifice size mm	ø24	ø40	ø50	ø80
Stroke length mm	10	20	22	32
Conductance *1 ℓ/s	13	52	80	242
Connection	NW25	NW40	NW50	NW80
Operating pressure MPa	0.4 to 0.6			
JIS symbol				

\*1: The conductance value is the theoretical calculation value in the molecular region, and not the actual measured value.  
\*2: Grease for vacuum is applied to the O-rings of outer seal parts.

## How to order



Code	Content
<b>A Series</b>	
5	Orifice size ø24
6	Orifice size ø40
7	Orifice size ø50
8	Orifice size ø80

## ⚠ Precautions for model No. selection

- \*1: Switch must be ordered separately
- \*2: Refer to Intro Pages 21 to 24 for switches.
- \*3: Made to order. Contact CKD for details.

## Compatibility table by variation

	AVB**3
Port size	NW25, NW40, NW50, NW80
P4	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

Note: Use after checking the compatibility of the working fluid with the gas-contacting materials.



Dry Fine System/high purity gas control system components  
Catalog No. CB-035A

Air operated valve for high vacuum NC

# AVB\*17 Series

- Molded bellows method Aluminum body



## Specifications

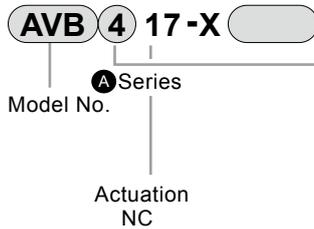
Descriptions	AVB217	AVB317	AVB417	AVB517	AVB617
Working fluid	Vacuum and inert gas				
Working pressure Pa (abs)	1.3 x 10 <sup>-6</sup> to 1 x 10 <sup>-5</sup>				
Max. working differential pressure MPa	0.1				
Valve seat leakage Pa·m <sup>3</sup> /s (He)	1.3 x 10 <sup>-10</sup> or less				
External leakage Pa·m <sup>3</sup> /s (He)	1.3 x 10 <sup>-11</sup> or less				
Proof pressure MPa	0.3				
Fluid temperature °C	5 to 60 (5 to 150) *1				
Ambient temperature °C	0 to 60 (no freezing)				
Orifice size mm	ø17	ø24	ø39	ø48	ø68
Conductance *2 ℓ/s	5	13	43	74	166
Connection	NW16	NW25	NW40	NW50	NW63
Operating pressure MPa	0.4 to 0.6				
Weight kg	0.4	0.5	1.2	2.0	3.5
JIS symbol	 NC				

\*1: The values in ( ) are for high temperature specifications.

\*2: The conductance value is the theoretical calculation value in the molecular region, and not the actual measured value.

\*3: Grease for vacuum is applied to the O-rings of outer seal parts.

## How to order



Code	Content
<b>A Series</b>	
2	Orifice size ø17
3	Orifice size ø24
4	Orifice size ø39
5	Orifice size ø48
6	Orifice size ø68

## ⚠ Precautions for model No. selection

\*1: Switch must be ordered separately

\*2: Refer to Intro Pages 21 to 24 for switches.

\*3: Contact CKD regarding operating port positions and switch mounting positions.

\*4: Made to order. Contact CKD for details.

## Compatibility table by variation

	AVB**7
Port size	NW16, NW25, NW40, NW50, NW63
P4	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

Note: Use after checking the compatibility of the working fluid with the gas-contacting materials.



Electric actuator Slider

# ETS Series

● Applicable motor capacity: 100 W/200 W/400 W/750 W



## Specifications

Descriptions	Applicable motor size: 100 W														
	Model														
	ETS-05			ETS-06			ETS-10				ETS-12				
Ball screw size mm	ø12			ø12			ø16				ø16				
Ball screw accuracy grade	C7														
Screw lead mm	2	5	10	2	5	10	5	10	16	20	5	10	16	20	
Repeatability mm	±0.02														
Max. load capacity *1	Horizontal kg	10	10	5	30	30	15	50	30	22	18	50	30	22	18
	Vertical kg	7	3	1.5	15	10	5	12	8	5	3	12	8	5	3
Max. speed *1 mm/s	100	250	500	100	250	500	250	500	800	1000	250	500	800	1000	
Stroke length *2 mm	50 to 800			50 to 800			50 to 1050				50 to 1050				
Thrust N	854	341	170	854	341	170	341	170	106	85	341	170	106	85	

Descriptions	Applicable motor size: 200 W																
	Model																
	ETS-10				ETS-12				ETS-13				ETS-14				
Ball screw size mm	ø16				ø16				ø16				ø16				
Ball screw accuracy grade	C7																
Screw lead mm	5	10	16	20	5	10	16	20	5	10	16	20	5	10	16	20	
Repeatability mm	±0.02																
Max. load capacity *1	Horizontal kg	50	30	22	18	50	30	22	18	70	47	30	24	95	75	44	35
	Vertical kg	12	8	5	3	12	8	5	3	12	12	6	4	27	18	7	6
Max. speed *1 mm/s	250	500	800	1000	250	500	800	1000	250	500	800	1000	250	500	800	1000	
Stroke length *2 mm	50 to 1050				50 to 1050				50 to 1050				50 to 1050				
Thrust N	683	341	213	174	683	341	213	174	683	341	213	174	683	341	213	174	

Descriptions	Applicable motor size: 400 W												
	Model												
	ETS-13				ETS-14				ETS-17				
Ball screw size mm	ø16				ø16				ø20				
Ball screw accuracy grade	C7												
Screw lead mm	5	10	16	20	5	10	16	20	5	10	20	40	
Repeatability mm	±0.02												
Max. load capacity *1	Horizontal kg	70	47	30	24	110	88	48	40	120	110	75	35
	Vertical kg	17	12	6	4	33	22	10	8	40	30	14	7
Max. speed *1 mm/s	250	500	800	1000	250	500	800	1000	250	500	1000	2000	
Stroke length *2 mm	50 to 1050				50 to 1050				50 to 1250				
Thrust N	1388	694	483	347	1388	694	483	347	1388	694	483	347	

Descriptions	Applicable motor size: 750 W								
	Model								
	ETS-17				ETS-22				
Ball screw size mm	ø20				ø25		ø20		
Ball screw accuracy grade	C7								
Screw lead mm	5	10	20	40	5	10	25	40	
Repeatability mm	±0.02								
Max. load capacity *1	Horizontal kg	120	120	83	50	150	150	120	60
	Vertical kg	50	40	25	10	55	45	20	10
Max. speed *1 mm/s	250	500	1000	2000	250	500	1250	2000	
Stroke length *2 mm	50 to 1250				50 to 1500				
Thrust N	2100	1050	525	260	2100	1050	420	260	

## Compatibility table by variation

	ETS
P4	●

\*1: Acceleration and deceleration time is the value at 0.2 sec.

\*2: Stroke length is 50 pitch.

● : Standard ○ : Made to order  
▲ : Contact CKD □ : Not applicable

## How to order

ETS - 06 - 05 040 - E M 1 B C B D P - M - U - P4

Model No.

**A** Body size

**B** Screw lead

**C** Stroke length

**D** Motor mounting method

**E** Mounted motor specification

**F** Motor capacity

**G** Brake

**H** Origin sensor

**I** Limit sensor

**J** Grease nipple

**K** Positioning pin hole

**M** Anti-rust treatment  
**L** Special specifications

Code	Content
<b>A Body size (mm)</b>	
05	Width 51 x height 54
06	Width 65 x height 56
10	Width 102 x height 66
12	Width 102 x height 70
13	Width 135 x height 78
14	Width 135 x height 78
17	Width 170 x height 97
22	Width 220 x height 122

Code	Content
<b>B Screw lead</b>	
02	2 mm
05	5 mm
10	10 mm
16	16 mm
20	20 mm
25	25 mm
40	40 mm

Code	Content
<b>C Stroke length</b>	
010 to 150	100 mm to 1500 mm (50 mm pitch) Display is 1/10.

Code	Content
<b>D Motor mounting method</b>	
E	External direct mounting
B	Built-in *

Code	Content
<b>E Mounted motor specification</b>	
M	Select the mounted motor specification from the table below.
Y	
P	

Code	Content
<b>F Motor capacity (refer to table 2 on the next page)</b>	
1	100 W
2	200 W
4	400 W
8	750 W

Code	Content
<b>G Brake</b>	
N	None
B	With brake *

Code	Content
<b>H Origin sensor (1 pc)</b>	
N	None
A	Inside motor side
B	Inside motor opposite side
C	Outside motor side (attached at shipment)
D	Outside motor opposite side (attached at shipment)

Code	Content
<b>I Limit sensor (2 pcs)</b>	
N	None
A	Inside
B	Outside (attached at shipment)

Code	Content
<b>J Grease nipple</b>	
N	Body mounting direction standard/without grease nipple
D	Body mounting direction bottom/without grease nipple
R	Right
L	Left

Code	Content
<b>K Positioning pin hole</b>	
N	None
P	Yes

Code	Content
<b>L Special specifications</b>	
M *1	Magnetic slider (magnetic iron type sliding washer)

Code	Content
<b>M Anti-rust treatment</b>	
N	None
U	Yes (RAYDENT treatment)

### [Example of model No.]

ETS-06-05040-EM1BCBDN-M-U-P4

**A** Body size: Width 65 × height 56 mm

**B** Screw lead: 5 mm

**C** Stroke length: 400 mm

**D** Motor mounting method: External direct mounting

**E** Mounted motor specifications: Manufactured by Mitsubishi Electric Co., Ltd.

**F** Motor capacity: 100 W

**G** Brake: Yes

**H** Origin sensor: Outside motor side

**I** Limit sensor: Outside

**J** Grease nipple: Mounting direction bottom/without

**K** Positioning pin hole: Yes

**L** Special specifications: Magnetic slider

**M** Anti-rust treatment: Yes

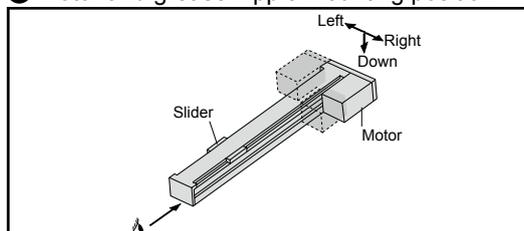
\* Actuator is the same as the type with no brake except when the motor mounting method is "B (built-in)".

**G** Select "N" for all types with brakes.

**E** Mounted motor specification

Manufacturer	100 W	200 W	400 W	750 W
Mitsubishi Electric Corporation	M	M	M	M
Delta Electronics Co., Ltd.	M	M	M	M
Sanyo Denki Co., Ltd.	M	M	M	-
YASKAWA Electric Corporation	Y	Y	Y	Y
Keyence Corporation	Y	Y	Y	Y
Panasonic Co., Ltd.	P	P	P	P
OMRON Corporation	M	P	P	P

### **J** Motor and grease nipple mounting position



\*1 : **A** Body size: "05," "06" only.



Electric Actuator Motorless General  
Catalog No. CB-055A

Electric actuator Low dust generation

# ECS Series

● Applicable motor capacity: 100 W/200 W/400 W/750 W



## Specifications

Descriptions	Applicable motor capacity: 100 W															Applicable motor capacity: 200 W			
	Model																		
	ECS-05			ECS-06			ECS-10				ECS-12				ECS-14				
Ball screw size mm	12			12			16				16				16				
Ball screw accuracy grade	C7																		
Screw lead mm	2	5	10	2	5	10	5	10	16	20	5	10	16	20	5	10	16	20	
Repeatability mm	±0.02																		
Max. load capacity	Horizontal kg	10	10	5	30	30	15	50	30	22	18	50	30	22	18	95	75	44	35
	*1 Vertical kg	7	3	1.5	15	10	5	12	8	5	3	12	8	5	3	27	18	7	6
Max. speed *1 mm/s	100	250	500	100	250	500	250	500	800	1000	250	500	800	1000	250	500	800	1000	
Stroke length *2 mm	50 to 800			50 to 800			50 to 1050				50 to 1050				50 to 1050				
Thrust N	825	330	165	854	341	170	341	170	106	85	341	170	106	85	683	341	213	174	

\*1: Acceleration and deceleration time is the value at 0.2 sec.

\*2: Stroke length is 50 pitch.

Descriptions	Applicable motor capacity: 400 W								Applicable motor capacity: 750 W								
	Model																
	ECS-14				ECS-17				ECS-17				ECS-22				
Ball screw size mm	16				20				20				25		20		
Ball screw accuracy grade	C7																
Screw lead mm	5	10	16	20	5	10	20	40	5	10	20	40	5	10	25	40	
Repeatability mm	±0.02																
Max. load capacity	Horizontal kg	110	88	48	40	120	110	75	35	120	120	83	50	150	150	120	60
	*1 Vertical kg	33	22	10	8	40	30	14	7	50	40	25	10	55	45	20	10
Max. speed *1 mm/s	250	500	800	1000	250	500	1000	2000	250	500	1000	2000	250	500	1250	2000	
Stroke length *2 mm	50 to 1050				50 to 1250				50 to 1250				50 to 1500				
Thrust N	1388	694	433	347	1388	694	347	174	2100	1050	525	260	2100	1050	420	260	

\*1: Acceleration and deceleration time is the value at 0.2 sec.

\*2: Stroke length is 50 pitch.

## Compatibility table by variation

	ECS
P4	●

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

## How to order

**ECS** - **06** - **05** **010** - **E** **M** **1** **B** **C** **B** **N** **P** - **M** - **U** - **P4**

Model No.

**A** Body size

**B** Screw lead

**C** Stroke length

**D** Motor mounting method

**E** Mounted motor specification

**F** Motor capacity

**G** Brake

**H** Origin sensor

**I** Limit sensor

**J** Grease nipple

**K** Positioning pin hole

**M** Anti-rust treatment  
**L** Special specifications

Code	Content
<b>A Body size (mm)</b>	
05	Width 51 x height 54
06	Width 65 x height 56
10	Width 102 x height 78.5
12	Width 102 x height 82.5
14	Width 135 x height 91
17	Width 170 x height 107
22	Width 220 x height 138

Code	Content
<b>B Screw lead</b>	
02	2 mm
05	5 mm
10	10 mm
16	16 mm
20	20 mm
25	25 mm
40	40 mm

Code	Content
<b>C Stroke length</b>	
010 to 150	100 mm to 1500 mm (50 mm pitch) Display is 1/10.

Code	Content
<b>D Motor mounting method</b>	
E	External direct mounting
B	Built-in *

Code	Content
<b>E Mounted motor specification</b>	
M	Select the mounted motor
Y	specification from the table below.
P	

Code	Content
<b>F Motor capacity</b>	
1	100 W
2	200 W
4	400 W
8	750 W

Code	Content
<b>G Brake</b>	
N	None
B	With brake *

Code	Content
<b>H Origin sensor (1 pc)</b>	
N	None
A	Inside motor side
B	Inside motor opposite side
C	Outside motor side (attached at shipment)
D	Outside motor opposite side (attached at shipment)

Code	Content
<b>I Limit sensor (2 pcs)</b>	
N	None
A	Inside
B	Outside (attached at shipment)

Code	Content
<b>J Grease nipple</b>	
N	Body mounting direction standard/without
R	Right
L	Left

Code	Content
<b>K Positioning pin hole</b>	
N	None
P	Yes

Code	Content
<b>L Special specifications</b>	
M *1	Magnetic slider (magnetic iron sliding washer)

Code	Content
<b>M Anti-rust treatment</b>	
N	None
U	Yes (RAYDENT treatment)

### [Example of model No.]

ECS-06-05010-EM1BCBN-M-U-P4

**A** Body size: Width 65 × height 54 mm

**B** Screw lead: 5 mm

**C** Stroke length: 100 mm

**D** Motor mounting method: External direct mounting

**E** Mounted motor specifications: Manufactured by Mitsubishi Electric Co., Ltd.

**F** Motor capacity: 100 W

**G** Brake: With brake

**H** Origin sensor: Outside motor side

**I** Limit sensor: Outside

**J** Grease nipple: Mounting direction standard

**K** Positioning pin hole: Yes

**L** Special specifications: Magnetic slider

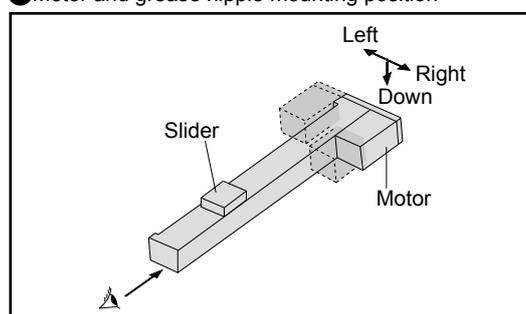
**M** Anti-rust treatment: Yes

\* Actuator is the same as the type with no brake except when the motor mounting method is "B (built-in)". **G** Select "N" for all types with brakes.

**E** Mounted motor specification

Manufacturer	100 W	200 W	400 W	750 W
Mitsubishi Electric Corporation	M	M	M	M
Delta Electronics Co., Ltd.	M	M	M	M
Sanyo Denki Co., Ltd.	M	M	M	-
YASKAWA Electric Corporation	Y	Y	Y	Y
Keyence Corporation	Y	Y	Y	Y
Panasonic Corporation	P	P	P	P
OMRON Corporation	M	P	P	P

**J** Motor and grease nipple mounting position



\*1 : **A** Body size: "05," "06" only.

# ETS/ECS Model Selection Check Sheet → CKD (Contact \_\_\_\_\_)

Fill in the form and send to the nearest CKD Sales Office. We will respond with the model selection results.

Customer:

Company		Department	
Name		E-mail	
TEL		FAX	

Selecting conditions:

Desired model	ETS - ECS		
Basic specifications	Max. stroke length:	mm, ball screw lead:	mm
Operating conditions	Travel stroke:	mm, travel time:	sec
	Set speed:	mm/s	
	Set acceleration/deceleration:	mm/s <sup>2</sup> (set acceleration/deceleration time: sec)	
	Repeatability: ±	mm	
Load conditions	Mounting orientation: Horizontal (upward) / Horizontal (side) / Vertical / Other		
	Load weight:	kg	
	Overhang (distance from the slider center to the load center of gravity): A direction mm, B direction mm, C direction mm		
	Pressing load: No / Yes ( N) Operating / Stopped Direction of the force applied to slider center ( )		
Working environment	Ambient temperature:	°C, ambient humidity:	%
	Atmosphere:		
Motor used	Manufacturer: _____, Model No.:		
	Motor capacity:	W	
Remarks			

# Peripheral devices

Not compliant with the standards of P4 Series as defined by CKD.  
Contact CKD for details.

	Page
Brake cylinder JSC3/JSC4	325
Electro pneumatic regulator EVR	330
Electro pneumatic regulator EVS2	334
Clean exhaust filter FAC	335
Metering valve with silencer SMW2	339
Exhaust cleaner FA	340
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Electric actuator Belt ETV	360
Electric actuator Low dust generation belt ECV	363



Brake cylinder Double acting, single rod/double acting, no-lubrication

# JSC3/JSC4-N Series

- Bore size:  
JSC3:  $\phi 40/\phi 50/\phi 63/\phi 80/\phi 100$   
JSC4:  $\phi 125/\phi 140/\phi 160/\phi 180$

JIS symbol



## Specifications

Descriptions		JSC3 (with switch)					JSC3-S (with switch)					JSC4-N					
Bore size	mm	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$	$\phi 125$	$\phi 140$	$\phi 160$	$\phi 180$		
Actuation		Double acting					Double acting/low pressure release					Double acting					
Working fluid		Compressed air															
Max. working pressure	MPa	1.0															
Min. working pressure	Brake section	0.3					0.25					0.3					
	Cylinder	0.1					0.1					0.05					
Proof pressure	MPa	1.6															
Ambient temperature	$^{\circ}\text{C}$	-10 to 60 (no freezing)					-10 to 60 (no freezing)					-5 to 60 (no freezing)					
Port size	Brake section	Rc1/8		Rc1/4		Rc3/8		Rc1/8		Rc1/4		Rc3/8		Rc1/2			
	Cylinder	Rc1/4		Rc3/8		Rc1/2		Rc1/4		Rc3/8		Rc1/2		Rc1/2		Rc3/4	
Stroke tolerance	mm	$^{+0.9}_0$ (to 360) $^{+1.4}_0$ (to 1000)					$^{+1.0}_0$ (to 360) $^{+1.4}_0$ (to 1000)					$^{+1.0}_0$ (to 300), $^{+1.4}_0$ (to 1000), $^{+1.8}_0$ (to 2000)					
Working piston speed	mm/s	50 to 1000 (Operate within the allowable absorbed energy.)															
Cushion		Air cushion															
Effective air cushion length	mm	14.6	16.6	20.6	23.6	14.6	16.6	20.6	23.6	21.6							
Lubrication		Not required (use turbine oil class 1 ISO VG32 if necessary for lubrication)															
Holding force	N	980	1569	2451	3922	6178	784	1255	1961	3138	4941	9600	12000	15800	20000		
Allowable absorbed energy	Cushioned	4.29	8.37	15.8	27.9	49.8	4.29	8.37	15.8	27.9	49.8	63.6	91.5	116	152		
	Without cushion	0.067	0.079	0.079	0.201	0.301	0.067	0.079	0.079	0.201	0.301	0.371	0.386	0.386	0.958		
		Note: Without any cushion, this product cannot absorb large energy generated by an external load. We recommend using an external shock absorber.															

## Stroke length

Bore size (mm)		Standard stroke length (mm)	Max. stroke length (mm)	Available stroke length (mm)	Min. stroke length (mm)
JSC3	$\phi 40$	50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500	600	1600	1
	$\phi 50$			2000	
	$\phi 63$			2500	
	$\phi 80$				
	$\phi 100$				
JSC4	$\phi 125$	50, 75, 100, 150, 200, 250, 300	800	2000	1
	$\phi 140$				
	$\phi 160$				
	$\phi 180$				

\*1: If the max. stroke length is exceeded, product specifications may not be met, depending on operating conditions.

Refer to "Pneumatic Cylinders II" (Catalog No. CB-030SA) for details.

The custom stroke length is available in 1 mm increments.

\*2: The max. stroke length available for  $\phi 63$  to  $\phi 100$  bore size models with bellows is 2000 mm.

### How to order (ø40 to ø100)

Without switch (built-in magnet for switch)

**JSC3** - **LB** - **40** - **B** - **50** - **S** **I**

With switch (built-in magnet for switch)

**JSC3** - **LB** - **40** - **B** - **50** - **T0H** - **R** - **S** **I**

With strong magnetic field proof (for H0, H0Y switches) switch (built-in magnet for switch)

**JSC3** - **L2** - **LB** - **40** - **B** - **50** - **H0** - **R** - **S** **I**

Model No.

**A** Brake release pressure

**B** Mounting  
**C** Bore size  
\*1

**D** Port thread

**E** Cushion

**F** Stroke length \*2  
\*3  
\*4

**G** Switch model No.  
\* indicates the lead wire length.

**H** Switch quantity  
\*5

**I** Option  
\*7

**J** Accessory  
\*8

Code	Content		
<b>A Brake release pressure</b>			
Blank	Standard (0.3 MPa)		
S	Low pressure release (0.25 MPa)		
<b>B Mounting</b>			
00	Basic		
LB	Axial foot		
FA	Rod side flange		
FB	Head side flange		
FC	Head side special flange		
CA	Eye bracket		
CB	Clevis bracket (pin and snap ring attached)		
TC	Intermediate trunnion		
TA	Rod side trunnion		
TB	Head side trunnion		
<b>C Bore size (mm)</b>			
40	ø40		
50	ø50		
63	ø63		
80	ø80		
100	ø100		
<b>D Port thread</b>			
Blank	Rc thread		
N	NPT thread (made to order)		
G	G thread (made to order)		
<b>E Cushion</b>			
B	Both sides cushioned		
R	Rod side cushioned		
H	Head side cushioned		
N	Without cushion		
<b>F Stroke length (mm)</b>			
Bore size	Stroke length *4	Available stroke length	Custom stroke length
ø40	1 to 600	1600	In 1 mm increments
ø50	1 to 600	2000	
ø63	1 to 600	2500	
ø80	1 to 700	2500	
ø100	1 to 800	2500	
<b>G Switch model No.</b>			
Refer to the switch model numbers on the following page.			
<b>* Lead wire length</b>			
Blank	1 m (standard)		
3	3 m (option)		
5	5 m (option)		
<b>H Switch quantity</b>			
R	1 on rod side		
H	1 on head side		
D	2		
T	3		
4	4 (when there are more than 4 switches, indicate switch quantity.)		
<b>I Option</b>			
		Max. ambient temperature	Instantaneous max. temperature
J	Bellows	100°C	200°C
L	Bellows	250°C	400°C
M	Piston rod, rod nut material (stainless steel)		
Blank	Cushion needle position R (standard)		
S	Cushion needle position S		
T	Cushion needle position T		
G	With indicator		
<b>J Accessory</b>			
I	Rod eye		
Y	Rod clevis (pin and snap ring attached)		
B1	Eye bracket		
B2	Clevis bracket (pin and snap ring attached)		
B3	Eye bracket		
B4	Trunnion No. 2 bracket (2 pcs./set)		

### ⚠ Precautions for model No. selection

- \*1: Mounting bracket will be shipped assembled with the product.  
(Head side special flange is attached separately)
- \*2: Refer to "Pneumatic Cylinders II" (Catalog No. CB-030SA) when max. stroke length is exceeded.
- \*3: The max. stroke length available for ø63 to ø100 bore size models with bellows is 2000 mm.
- \*4: Refer to "Pneumatic Cylinders II" (Catalog No. CB-030SA) for the min. stroke length with switch.
- \*5: When selecting TA or TB mounting, the switch quantity is limited to "H" (1 on head side) for TA, and "R" (1 on rod side) for TB.
- \*6: For S, T, and G position indications, check the respective dimensions.
- \*7: When selecting TA or TB mounting form, the position of the cushion needle cannot be changed. (Cushion needle position S is used with no symbol.)
- \*8: "I" and "Y" cannot be selected together.
- \*9: Refer to "Pneumatic Cylinders I (Catalog No. CB-030SA)" for custom specifications of rod end form.

## [G] Switch model No.

T switch						
Axial lead wire	Radial lead wire	Contact	Voltage		Display	Lead wire
			AC	DC		
TOH*	TOV*	Reed	●	●	1-color display	2-wire
T5H*	T5V*		●	●	Without indicator lamp	
T8H*	T8V*		●	●	1-color display	
T1H*	T1V*	Proximity	●		1-color display	2-wire
T2H*	T2V*			●		3-wire
T3H*	T3V*			●		
T2WH*	T2WV*			●	2-color display	2-wire
T2YH*	T2YV*			●		3-wire
T3WH*	T3WV*			●		
T3YH*	T3YV*			●	1-color display (made to order)	3-wire
T3PH*	T3PV*			●		
T2YD*	-			●	2-color display	2-wire
T2YDT*	-			●	AC magnetic field	2-wire
T2JH*	T2JV*			●	1-color display off-delay	2-wire
H switch						
HO*	-	Reed	●	●	Strong magnetic field proof	2-wire
HOY*	-		●	●	Strong magnetic field 2-color display	

### How to order brake unit

**JSC3 - 40 - BRAKE-UNIT**

Bore size (Item © on the previous page)

● Mounting type FA

**JSC3 - FA - 40 - BRAKE-UNIT**

Bore size (Item © on the previous page)

### How to order mounting bracket

● ø40 to ø100

Bore size (mm)	ø40	ø50	ø63	ø80	ø100
Mounting bracket					
Foot (LB) *1	JSC3-40-LB	JSC3-50-LB	JSC3-63-LB	JSC3-80-LB	JSC3-100-LB
Flange (FB)	JSC3-40-FB	JSC3-50-FB	JSC3-63-FB	JSC3-80-FB	JSC3-100-FB
Eye bracket (CA)	S1-CA-40	S1-CA-50	S1-CA-63	S1-CA-80	S1-CA-100
Clevis bracket (CB) *2	S1-CB-40	S1-CB-50	S1-CB-63	S1-CB-80	S1-CB-100

\*1: The foot mounting bracket is provided as 2 pcs./set.

\*2: A pin and a snap ring are attached.

\*3: All mounting brackets have mounting bolts attached.

### How to order (ø125 to 180)

Without switch (without magnet for switch)

**JSC4-N** - **LB** - **125** - **B** - **50** - **S** **I**

With switch (built-in magnet for switch)

**JSC4-LN** - **LB** - **125** - **B** - **50** - **T0H** - **R** - **S** **I**

**A** Mounting  
\*1

**B** Bore size

**C** Port thread

**D** Cushion

**E** Stroke length

**F** Switch model No.  
\* indicates the lead wire length.

**G** Switch quantity  
\*3

**H** Option

**I** Accessory  
\*4

### ⚠ Precautions for model No. selection

- \*1: Mounting bracket will be shipped assembled with the product.
- \*2: Refer to Pneumatic Cylinders II (Catalog No. CB-030SA) for the min. stroke length with switch.
- \*3: When selecting TA or TB mounting, the switch quantity is limited to "H" (1 on head side) for TA, and R (1 on rod side) for TB.
- \*4: "I" and "Y" cannot be selected together.

### How to order brake unit

**JSC4** - **125** - **BRAKE-UNIT**

Bore size

Code	Content				
<b>A Mounting</b>					
LB	Axial foot				
FA	Rod side flange				
FB	Head side flange				
CA	Eye bracket				
CB	Clevis bracket (pin and snap ring attached)				
TC	Intermediate trunnion				
TA	Rod side trunnion				
TB	Head side trunnion				
<b>B Bore size (mm)</b>					
125	ø125				
140	ø140				
160	ø160				
180	ø180				
<b>C Port thread</b>					
Blank	Rc thread				
N	NPT thread (made to order)				
G	G thread (made to order)				
<b>D Cushion</b>					
B	Both sides cushioned				
R	Rod side cushioned				
H	Head side cushioned				
N	Without cushion				
<b>E Stroke length (mm)</b>					
Bore size	Stroke length	Available stroke length	Custom stroke length		
ø125	1 to 800	2000	In 1 mm increments		
ø140	1 to 800	2000			
ø160	1 to 800	2000			
ø180	1 to 900	2000			
<b>F Switch model No.</b>					
Axial lead wire	Radial lead wire	Contact	Voltage	Indicator	Lead wire
			AC DC		
T0H*	T0V*	Reed	● ●	1-color display	2-wire
T5H*	T5V*		● ●	Without indicator lamp	
T8H*	T8V*		● ●	1-color display	3-wire
T1H*	T1V*		●	1-color display	
T2H*	T2V*			display	
T3H*	T3V*			●	1-color display (PNP output) (made to order)
T3PH*	T3PV*	Proximity	●	2-color display	2-wire
T2WH*	T2WV*		●	display	3-wire
T2YH*	T2YV*		●	1-color display off-delay	2-wire
T3WH*	T3WV*		●	2-color display for AC magnetic field	2-wire
T3YH*	T3YV*		●		
T2JH*	T2JV*		●		
T2YD*	-				
T2YDT*	-				
<b>* Lead wire length</b>					
Blank	1 m (standard)				
3	3 m (option)				
5	5 m (option)				
<b>G Switch quantity</b>					
R	1 on rod side				
H	1 on head side				
D	2				
T	3				
4	4				
<b>H Option</b>					
		Max. ambient temperature	Instantaneous max. temperature		
J	Bellows	60°C	100°C		
K	Bellows	100°C	200°C		
L	Bellows	250°C	400°C		
M	Piston rod, rod nut material (stainless steel)				
Blank	Cushion needle position (standard)	Standard			
R	Cushion needle position R	T  R			
S	Cushion needle position S	S			
T	Cushion needle position T	S			
C2	With cushion section check valve				
<b>I Accessory</b>					
I	Rod eye				
Y	Rod clevis (pin and snap ring attached)				
B1	Eye bracket				
B2	Clevis bracket				

● ø40 to ø100

## Material of mounting bracket

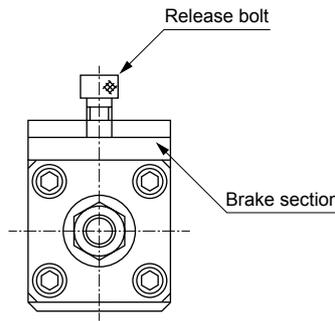
Mounting	Material	Remarks
LB	Steel	Paint
FA/FB	Steel	Paint
CA/CB	Cast iron	Paint
TC	Cast iron	Paint

## Release bolt size (hexagon socket head cap screw)

Bore size	Size	
	JSC3	JSC3-V
ø40/ø50	M10×8	M10×29
ø63	M12×9	M12×30
ø80	M14×10	M14×31
ø100	M16×12	M16×40

JSC3, JSC4

## How to release the brake manually



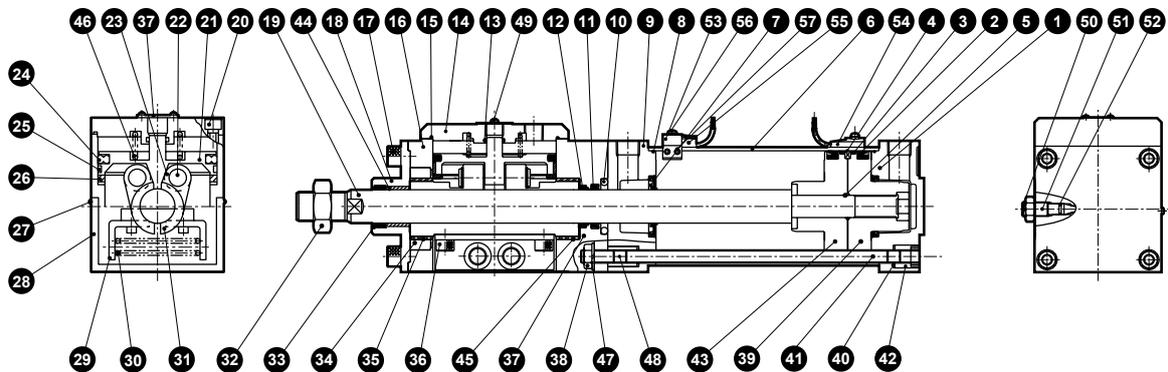
Note: How to release the brake

· The brakes are released by turning the release bolt (attached with product) two or three times to screw it into the female thread (next to brake release port) on top of the brake.

(Always remove the release bolt during normal use.)

· To manually release the brake, always use the release bolt attached with the product. Using any other bolt may prevent the brake from functioning properly.

## Internal structure and parts list



No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Head cover	Aluminum alloy die-casting	Paint	28	Cover	Steel	Paint
2	Piston packing	Nitrile rubber		29	Spring holder	Steel	Zinc chromate
3	Wear ring	Polyacetal resin		30	Spring	Steel	
4	Magnet	Plastic		31	Brake shoe metal	Cast iron	Nickeling
5	Piston gasket	Nitrile rubber		32	Rod nut	Steel	Zinc chromate
6	Cylinder tube	Aluminum alloy	Hard alumite	33	Dust wiper	Nitrile rubber	
7	Cushion packing	Nitrile rubber, steel		34	DU ring	Steel	Black finish
8	Cylinder gasket	Nitrile rubber		35	Bush	Oil impregnated bearing alloy	
9	Rod cover	Aluminum alloy die-casting	Paint	36	Hexagon socket head cap screw	Alloy steel	Black finish
10	Metal seal	Nitrile rubber		37	Dust cover	Aluminum alloy	Paint
11	Rod packing	Nitrile rubber		38	Hexagon nut	Steel	Black finish
12	Dust wiper	Nitrile rubber		39	Piston H	Aluminum alloy die-casting	
13	Cap gasket A	Nitrile rubber		40	Tie rod	Steel	Zinc chromate
14	Body cap	Cast iron	Nitriding	41	Conical spring washer	Steel	Black finish
15	Cap gasket B	Nitrile rubber		42	Round nut	Steel	Zinc chromate
16	Brake body	Aluminum alloy casting	Alumite	43	Piston R	Aluminum alloy die-casting	
17	Hexagon socket head cap screw	Alloy steel	Black finish	44	Bush B	Oil impregnated bearing alloy	
18	Rod metal	Steel	Manganese phosphate	45	Thrust washer		
19	Piston rod	Steel	Industrial chrome plating	46	Spring	Steel	Paint
20	Hexagon socket head cap screw	Alloy steel	Black finish	47	Toothed washer	Steel	Black finish
21	Brake piston	Cast iron	Manganese phosphate	48	Hexagon socket set screw	Alloy steel	Black finish
22	Parallel pin	Steel		49	Cross-recessed pan head machine screw with captive washer	Steel	Zinc chromate
23	Bearing			50	Cushion needle	Copper alloy	Nickeling
24	Piston packing B	Nitrile rubber		51	Needle nut	Copper alloy	Nickeling
25	Wear ring	Polyacetal resin		52	Needle gasket	Nitrile rubber	
26	Cushion rubber	Urethane rubber		<b>With switch</b>			
27	Cross-recessed pan head machine screw	Steel	Zinc chromate	53	Switch mounting base	Aluminum alloy	
				54	Switch holder	Aluminum alloy	
				55	Cross-recessed pan head machine screw	Steel	Zinc chromate
				56	Hexagon socket set screw	Alloy steel	Black finish
				57	Cylinder switch		

## Consumable parts list

Bore size (mm)	Kit No.	Consumable parts No.
ø40	JSC3-40K	2 3 7 8
ø50	JSC3-50K	10 11 12 33 52
ø63	JSC3-63K	
ø80	JSC3-80K	
ø100	JSC3-100K	

Note: Never disassemble the brake section, as the powerful spring installed can be dangerous.

Note: Specify the kit No. when placing an order.

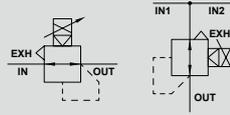


Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

High precision electro pneumatic regulator

# EVR Series

JIS symbol



## Specifications

Model No.	EVR-2100 (2109)		EVR-2200 (2209)		EVR-2300 (2309)		EVR-2400 (2409)		
<b>Descriptions</b>									
Working fluid	Clean compressed air (JIS B8392-1:2012 (ISO 8573-1:2010) [1:3:2])								
Max. working pressure	200 kPa		400 kPa		450 kPa		600 kPa		
Min. working pressure	Set pressure +50 kPa								
Proof pressure	Inlet	300 kPa		600 kPa		650 kPa		900 kPa	
	Output side	150 kPa		300 kPa		450 kPa		600 kPa	
Pressure control range *1	5 to 100 kPa		5 to 200 kPa		5 to 300 kPa		5 to 400 kPa		
Power supply voltage	24 VDC ± 10% (stabilized power supply with ripple rate 1% or less)								
Current consumption	0.1 A or less								
Input signal (input impedance)	0-10 V(6 kΩ)								
	0-5 V(10 kΩ)								
	4 to 20 mA or 1 to 5 V (250 Ω)								
Analog output (load impedance)	1 to 5 VDC (10 kΩ and over)								
Performance *2 (Setting 1)	Hysteresis	0.3 kPa or less		0.6 kPa or less		1.5 kPa or less		1.5 kPa or less	
	Linearity	Within ±0.5 kPa		Within ±1.0 kPa		Within ±2.5 kPa		Within ±2.5 kPa	
	Resolution	0.1 kPa or less		0.2 kPa or less		0.5 kPa or less		0.5 kPa or less	
	Repeatability	0.2 kPa or less		0.4 kPa or less		1.0 kPa or less		1.0 kPa or less	
Temperature characteristics (Setting 1) Reference temperature 25°C	Zero point fluctuation	±0.06 kPa/°C		±0.12 kPa/°C		±0.30 kPa/°C		±0.30 kPa/°C	
	Span fluctuation	±0.06 kPa/°C		±0.12 kPa/°C		±0.30 kPa/°C		±0.30 kPa/°C	
Max. flow rate (ℓ/min (ANR))	250		400		480		600		
Step response (Setting 1)   No load *3	0.2 sec. or less								
Ambient temperature	5 to 50°C								
Mounting orientation	Free								
Degree of protection	IP64 or equivalent (body), IP67 (cable connector) *4								
Weight	300 g(320 g)								

Model No.	EVR-2500 (2509)		EVR-2600 (2609)		EVR-2700 (2709)		EVR-2800 (2809)		EVR-2900 (2909)		
<b>Descriptions</b>											
Working fluid	Clean compressed air (JIS B8392-1:2012 (ISO 8573-1:2010) [1.3.2])										
Max. working pressure	700 kPa		750 kPa		850 kPa		950 kPa		1,000 kPa		
Min. working pressure	Set pressure +50 kPa										
Proof pressure	Inlet	1,050 kPa		1,120 kPa		1,200 kPa		1,400 kPa		1,500 kPa	
	Output side	750 kPa		900 kPa		1,050 kPa		1,200 kPa		1,350 kPa	
Pressure control range *1	5 to 500 kPa		10 to 600 kPa		10 to 700 kPa		10 to 800 kPa		10 to 900 kPa		
Power supply voltage	24 VDC ± 10% (stabilized power supply with ripple rate 1% or less)										
Current consumption	0.1 A or less										
Input signal (input impedance)	0-10 V(6 kΩ)										
	0-5 V(10 kΩ)										
	4 to 20 mA or 1 to 5 V (250 Ω)										
Analog output (load impedance)	1 to 5 VDC (10 kΩ and over)										
Performance *2 (Setting 1)	Hysteresis	1.5 kPa or less				3.0 kPa or less					
	Linearity	Within ±2.5 kPa				Within ±5.0 kPa					
	Resolution	0.5 kPa or less				0.9 kPa or less					
	Repeatability	1.0 kPa or less				1.8 kPa or less					
Temperature characteristics (Setting 1) Reference temperature 25°C	Zero point fluctuation	±0.30 kPa/°C				±0.60 kPa/°C					
	Span fluctuation	±0.30 kPa/°C				±0.60 kPa/°C					
Max. flow rate (ℓ/min (ANR))	800		850		900		950		1,000		
Step response (Setting 1)   No load *3	0.2 sec. or less										
Ambient temperature	5 to 50°C										
Mounting orientation	Free										
Degree of protection	IP64 or equivalent (body), IP67 (cable connector) *4										
Weight	300 g(320 g)										

\*1: 1% F.S. or less input signal stops control.

\*2: The condition of the values above is: 24 ± 0.1 VDC power supply voltage, 25 ± 3°C ambient temperature, no load, working pressure from +0.05 MPa max. control pressure to the max. working pressure, and 10 to 100% control pressure.

In addition, when the secondary side is a closed circuit, pressure fluctuations will occur if the regulator is used for blowing or for similar applications.

\*3: Working pressure: Max. working pressure, step amount:   
 50% F.S. → 100% F.S.   
 50% F.S. → 60% F.S.   
 50% F.S. → 40% F.S.

\*4: The degree of protection of body IP64 is applied only when installed with facing connector upward.

## How to order

**EVR-2** (50) (0) - (0) (8) - (E2) - (S1) (C)

**A** Pressure control range

**B** Body

**C** Input signal

**D** Port size

**E** Option

### ⚠ Precautions for model No. selection

\*1: Port size: Port size of IN port and OUT port. E2 exhaust option will be supplied with "8G" and "8N".

\*2: 9 (manifold) body and B (B bracket) cannot be selected together.

● Discrete option (cable, exhaust, bracket) model No.

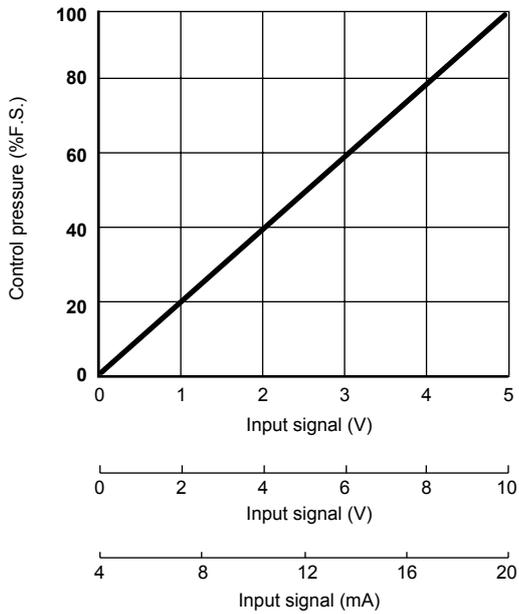
**EVR-S1**

**E** Option

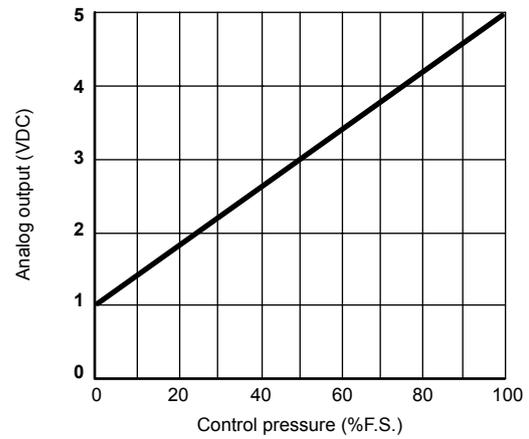
(Note) Discrete exhaust option model No. for Rc1/4 is EVR-E.

Code	Content	
<b>A Pressure control range</b>		
10	5 to 100 kPa	
20	5 to 200 kPa	
30	5 to 300 kPa	
40	5 to 400 kPa	
50	5 to 500 kPa	
60	10 to 600 kPa	
70	10 to 700 kPa	
80	10 to 800 kPa	
90	10 to 900 kPa	
<b>B Body</b>		
0	Single unit	
9	Manifold	
<b>C Input signal</b>		
0	0-10 VDC	
1	0-5 VDC	
2	4 to 20 mADC or 1 to 5 VDC	
<b>D Port size</b>		
8	Rc1/4	
8G	G1/4 (*1)	
8N	NPT1/4 (*1)	
<b>E Option</b>		
<b>Exhaust option</b>		
Blank	Rc1/4 port	
E2	With silencer	
<b>Cable option</b>		
Blank	No	
S1	Straight	1 m attached
S3		3 m attached
L1	L type	1 m attached
L3		3 m attached
<b>Bracket option</b>		
Blank	No	
C	C bracket attached	
B	B bracket attached (*2)	

## I/O characteristics

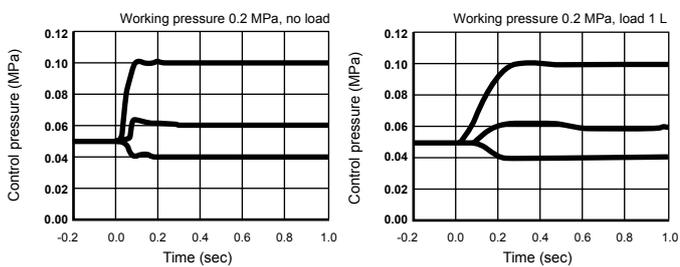


## Analog output

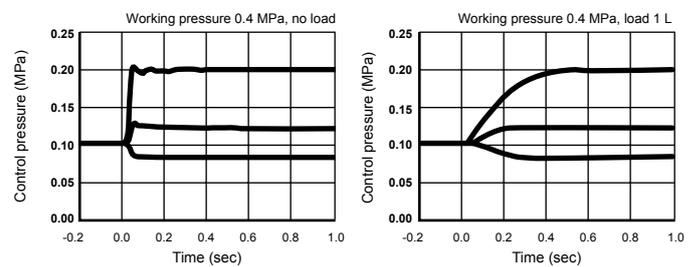


## Step response characteristics (Setting 1)

### ● EVR-2100

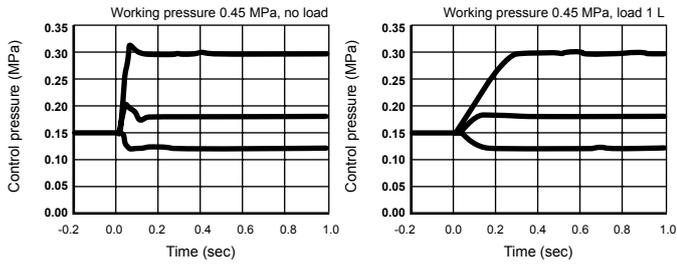


### ● EVR-2200

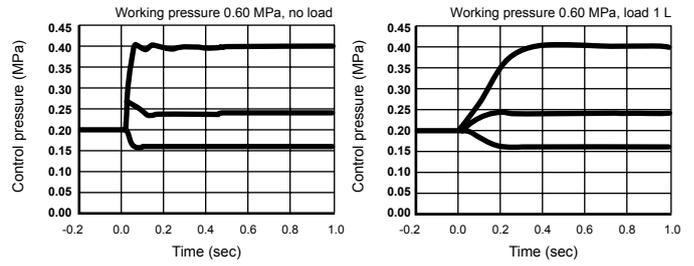


## Step response characteristics (Setting 1)

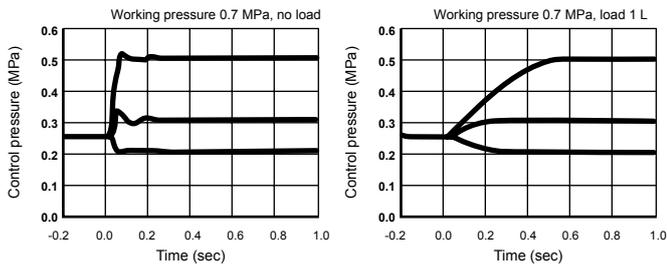
### ● EVR-2300



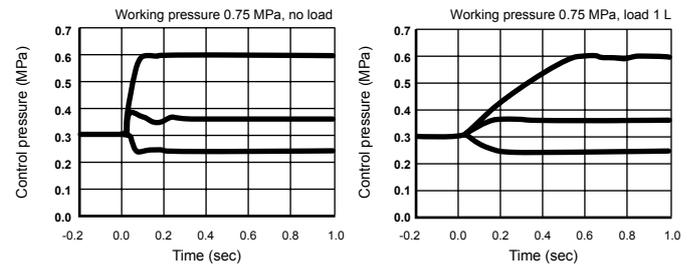
### ● EVR-2400



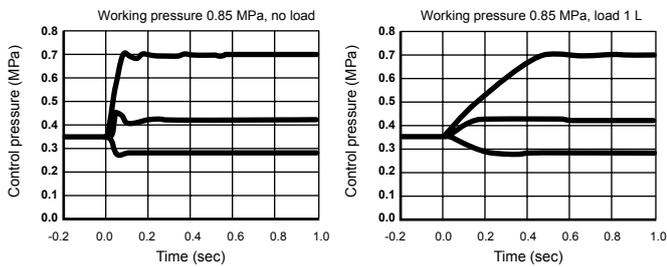
### ● EVR-2500



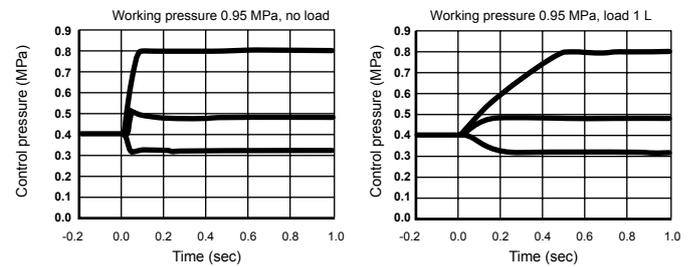
### ● EVR-2600



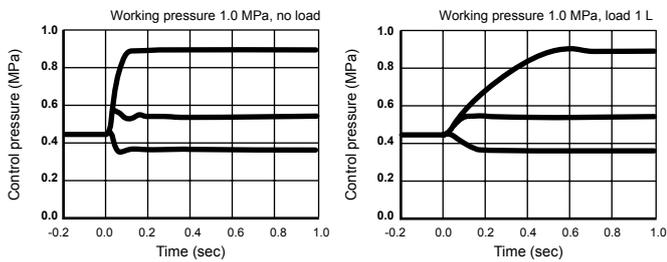
### ● EVR-2700



### ● EVR-2800



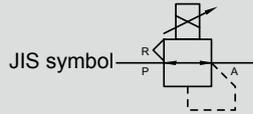
### ● EVR-2900





Electro pneumatic regulator (solenoid valve)

# EVS2 Series



## Specifications

Descriptions		EVS2-100	EVS2-500
Working fluid		Clean compressed air (JIS B83921-1:2012 (ISO 8573-1:2010) [1:3:2] equivalent)	
Max. working pressure		200 kPa	0.7 MPa
Min. working pressure		Set pressure + max. control pressure x 0.1	
Proof pressure	Inlet	300 kPa	1.05 MPa
	Output side	150 kPa	0.75 MPa
Pressure control range (*1)		1 to 100 kPa	0.005 to 0.5 MPa
Power supply voltage		24 VDC ± 10% (stabilized power supply with ripple rate of 1% or less)	
Current consumption		0.1 A or less (0.6 A rush current when power is ON)	
Input signal (input impedance)	0	0 to 10 VDC (6.7 kΩ)	
	1	0 to 5 VDC (10 kΩ)	
	2	4 to 20 mADC (250 Ω)	
	3	0 to 20 mADC (250 Ω)	
Analog output (connecting load impedance)	AV	1 to 5 VDC (50 kΩ)	
	AA	4 to 20 mADC (300 Ω or less)	
Accuracy (*2)	Hysteresis	0.4% F.S. or less	
	Linearity	±0.5% F.S. or less	
	Resolution	0.1% F.S. or less	
	Repeatability	0.3% F.S. or less	
Temperature characteristics	Zero point fluctuation	0.12% F.S./°C or less	
	Span fluctuation	0.07% F.S./°C or less	
Max. flow rate (*3)		2 L/min(ANR)	8 L/min(ANR)
Step response (*4)	No load	0.1 s or less	
	15 cm <sup>3</sup> Load	0.5 s or less	
Operating ambient temperature, fluid temperature		0 to 50°C	
Storage ambient temperature		-20 to 60°C	
Operating ambient humidity		45 to 90% RH (no condensation)	
Storage ambient humidity		96% RH or less	
Mounting orientation		Free	
Boundary dimension		W30XD50XH39	
Port size	H4	ø4 push-in fitting	
	H6	ø6 push-in fitting	
Weight		90 g	

\*1: 1% F.S. or less input signal cannot be controlled.

\*2: The condition of the values is: 24.0 ± 0.1 VDC power supply voltage, 25 ± 3°C ambient temperature, within the working pressure, and 10% to 100% of set pressure range.

\*3: Working pressure: Maximum working pressure, Control pressure: Maximum control pressure.

\*4: Working pressure: Max. working pressure, step amount:   
 50% F.S. → 100% F.S.   
 50% F.S. → 60% F.S.   
 50% F.S. → 40% F.S.

\*5: The specification values above are obtained in a static state only. The control pressure may differ if air is consumed on the output side.

## How to order

**EVS2 - 100 - 1 H4 AV - C11 - 3**

Model No.

**A** Pressure control range

**B** Input signal

**C** Port size

**D** Analog output

**E** Cable option

Code	Content
<b>A Pressure control range</b>	
<b>100</b>	1 to 100 kPa
<b>500</b>	0.005 to 0.5 MPa
<b>B Input signal</b>	
<b>0</b>	0 to 10 VDC
<b>1</b>	0 to 5 VDC
<b>2</b>	4 to 20 mADC
<b>3</b>	0 to 20 mADC
<b>C Port size</b>	
<b>H4</b>	Push-in fitting ø4
<b>H6</b>	Push-in fitting ø6
<b>D Analog output</b>	
<b>AV</b>	1 to 5 V
<b>AA</b>	4 to 20 mA
<b>E Cable option</b>	
<b>Blank</b>	No
<b>C11</b>	1 m (straight)
<b>C13</b>	3 m (straight)

## Precautions for model No. selection

Note: How to order an option only:

**EV2000 - Cable option code**



Clean exhaust filter

# FAC10 Series

● Port size: ø4, ø6, ø8, ø10

Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA



## Specifications

Model No.	FAC10-4P	FAC10-6P	FAC10-8P	FAC10-10P
Working fluid	Compressed air			
Max. working pressure MPa	0.1			
Min. working pressure MPa	0			
Proof pressure MPa	0.3			
Ambient/fluid temperatures °C	5 to 45			
Port size	ø4	ø6	ø8	ø10
Weight g	2		3	
Filtration µm	0.01 (removal efficiency 99.99% and over)			
Secondary side cleanliness	0.1 µm or larger particles are completely (100%) eliminated *1			
Max. processing flow rate ℓ/min (ANR)	4	10	20	35

\*1: Maximum processing flow rate for measurement, or 28.3 ℓ/min (ANR) when the maximum processing flow rate is 28.3 ℓ/min. (ANR) or more

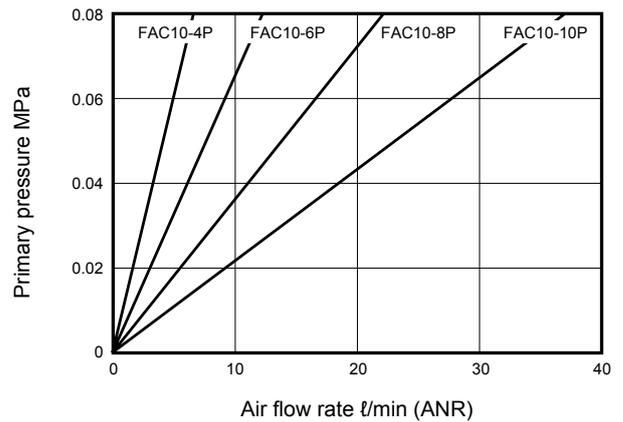
## How to order

**FAC10 - 4P**

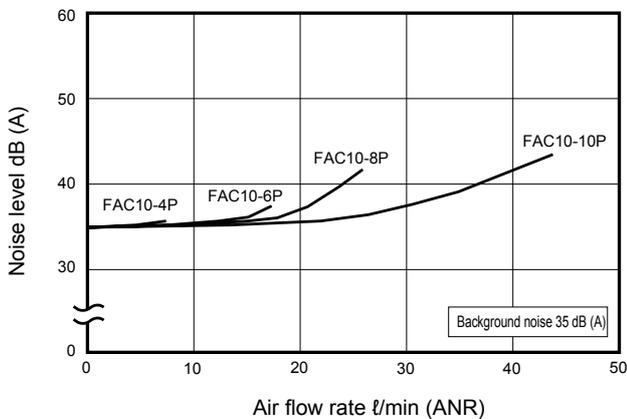
Ⓑ Port size

Code	Content
<b>Ⓑ Port size</b>	
<b>4P</b>	ø4
<b>6P</b>	ø6
<b>8P</b>	ø8
<b>10P</b>	ø10

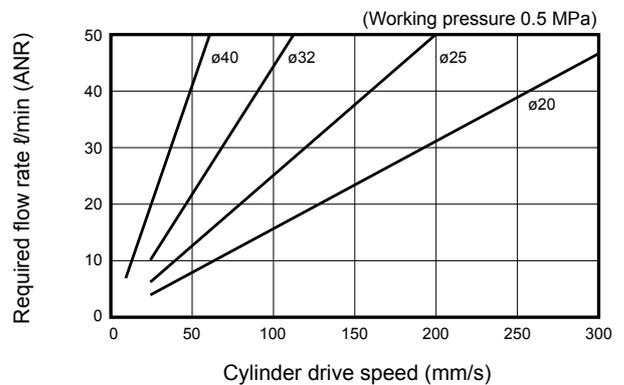
## Flow characteristics



## Noise level



## Selection guide



The clean exhaust filter model is selected based on the working circuit's required flow rate.

- (1) Calculate the required flow rate for the actuator being used.
- (2) Multiply the calculated required flow rate by 1.4.
- (3) Select a model having a processing flow rate exceeding the required flow rate multiplied by 1.4.

The above graphs show the required flow rate multiplied by 1.4 for each air cylinder size. Use this graph to select a model.



Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

Clean exhaust filter

# FAC100/FAC200 Series

● Port size: R1/8, R1/4, R3/8, R1/2



## Specifications

Model No.	FAC100	FAC200
Working fluid	Compressed air	
Max. working pressure MPa	0.1	
Min. working pressure MPa	0	
Proof pressure MPa	0.3	
Ambient/fluid temperatures °C	5 to 40	
Port size	R 1/8, R1/4	R 3/8, R1/2
Weight g	65	85
Filtration µm	0.01 (removal efficiency 99.99% and over)	
Secondary side cleanliness	0.1 µm or larger particles are completely (100%) eliminated *1	
Max. processing flow rate ℓ/min (ANR)	100	200

\*1: Flow rate at the time of measurement: 28.3 ℓ/min (ANR).

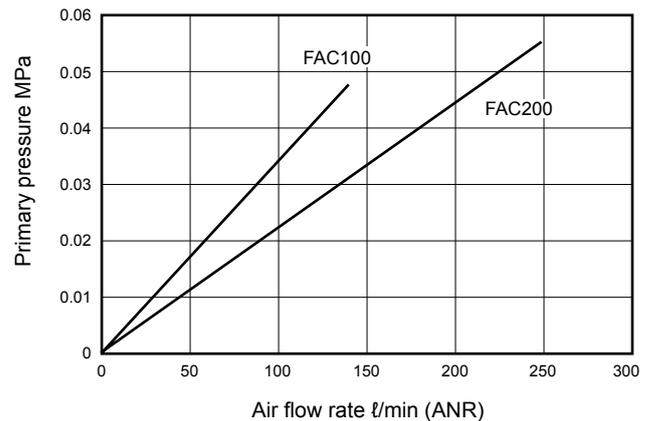
## How to order

**FAC100 - 8A**

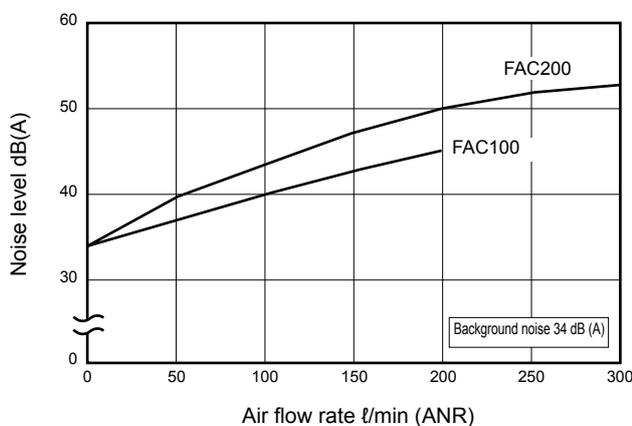
● A Model No. ● B Port size

		A Model No.	
Code	Content	FAC100	FAC200
B Port size			
6A	R1/8	●	
8A	R1/4	●	
10A	R3/8		●
15A	R1/2		●

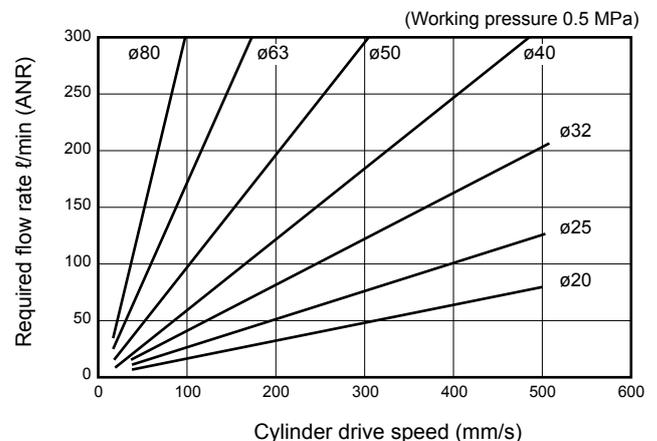
## Flow characteristics



## Noise level



## Selection guide



The clean exhaust filter model is selected based on the working circuit's required flow rate.

- (1) Calculate the required flow rate for the actuator being used.
- (2) Multiply the calculated required flow rate by 1.4.
- (3) Select a model having a processing flow rate exceeding the required flow rate multiplied by 1.4.

The above graphs show the required flow rate multiplied by 1.4 for each air cylinder size.

Use this graph to select a model.



Clean exhaust filter

# FAC3000 Series

● Port size: Rc3/8, Rc1/2



## Specifications

Model No.	FAC3000	
Working fluid	Compressed air	
Max. working pressure	MPa	0.1
Min. working pressure	MPa	0
Proof pressure	MPa	0.3
Ambient/fluid temperatures	°C	5 to 45
Port size	Rc3/8, Rc1/2	
Weight	kg	0.29
Filtration	µm	0.01 (removal efficiency 99.99% and over)
Attachment weight	kg	0.17
Secondary side cleanliness	0.1 µm or larger particles are completely (100%) eliminated *1	
Max. processing flow rate	ℓ/min (ANR)	600

\*1: Flow rate at the time of measurement: 28.3 ℓ/min (ANR).

## How to order

**FAC3000** - **10** - **B**

Model No.

**A** Port size

**B** Attachment

Code	Content
<b>A Port size</b>	
<b>10</b>	Rc3/8
<b>15</b>	Rc1/2
<b>B Other attachments</b>	
<b>Blank</b>	Without attachment
<b>B</b>	C bracket: B320-P70

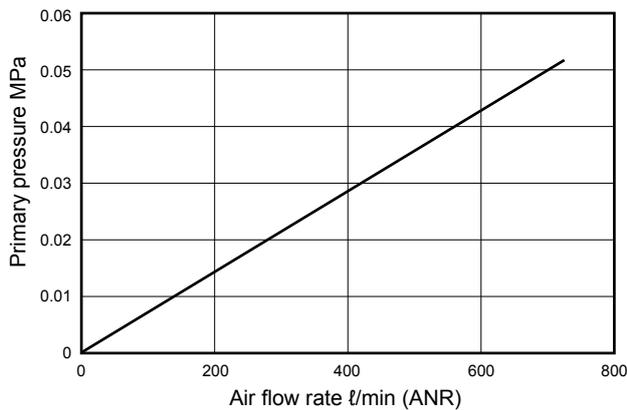
Note: Two attachments are included, one R1/8 plug and one plug corresponding to the connection port size (R3/8 or R1/2).

Model No. of single bracket

**B320-P70**

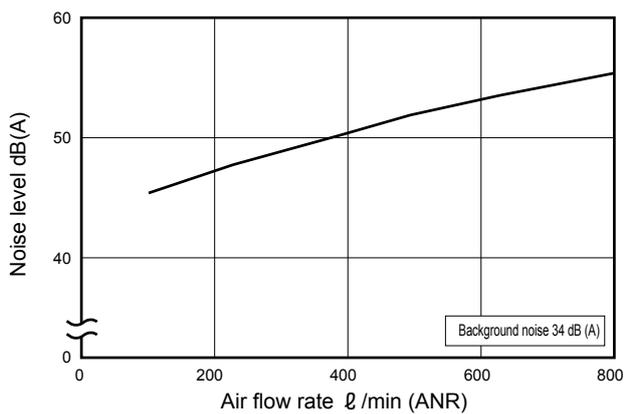
## Flow characteristics

● FAC3000



## Noise level

● FAC3000

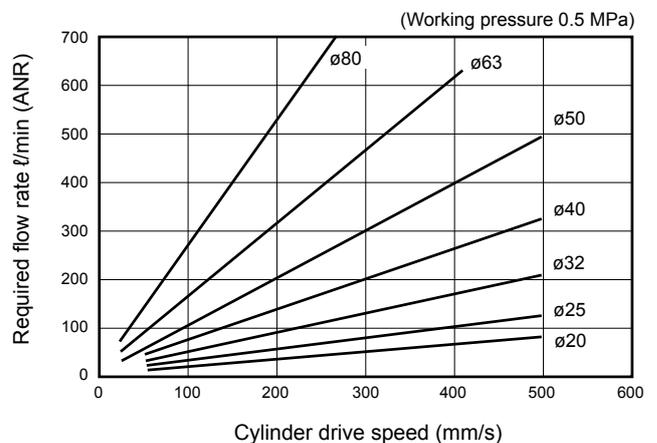


## Selection guide

The clean exhaust filter model is selected based on the working circuit's required flow rate.

- (1) Calculate the required flow rate for the actuator being used.
- (2) Multiply the calculated required flow rate by 1.4.
- (3) Select a model having a processing flow rate exceeding the required flow rate multiplied by 1.4.

The graph at right shows the required flow rate multiplied by 1.4 for each air cylinder size. Use this graph to select a model.



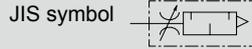


Pneumatic, Vacuum and Auxiliary Components  
Catalog No. CB-024SA

Metering valve with silencer

# SMW2 Series

● Port size: R1/8 to R1/4



## Features

- Compact/lightweight/high flow rate  
Volume reduced by 50%, and weight reduced by 80% compared with conventional series, while max. effective cross-sectional area in the class is achieved.
- Noise reduction effect 23dB (A) and over P.P. sintering element with high damping effect integrated into the body to maintain low noise level.
- Uses a push lock needle  
Knob with push lock mechanism enables easy and secure locking.
- Environmental friendly design  
By using plastic material only, sorting at disposal is eliminated.

## Specifications

Descriptions	SMW2-6A	SMW2-8A
Working fluid	Compressed air	
Max. working pressure MPa	0.7	
Min. working pressure MPa	0	
Proof pressure MPa	1.05	
Fluid temperature °C	5 to 60	
Ambient temperature °C	-10 to 60 (no freezing)	
Ambient humidity %RH	85 or less	
Port size R	1/8	1/4
Weight g	4.5	5
Cylinder bore size mm	ø20 to ø50	ø32 to ø75
Dial value (needle position)	9	
Noise reduction effect (*2) dB [A]	23 or more	28 or more
Flow rate (*1) ℓ/min (ANR)	370	660
Effective cross-sectional area mm <sup>2</sup>	5.6	9.9

\*1: Flow rate is the atmospheric pressure conversion at 0.5 MPa.

\*2: Noise reduction effect at maximum flow rate is shown.

## Compatibility table by variation

	SMW2
Port size	R1/8, 1/4
P4	Standard compliance
P40	▲

● : Standard ○ : Made to order ▲ : Contact CKD □ : Not applicable

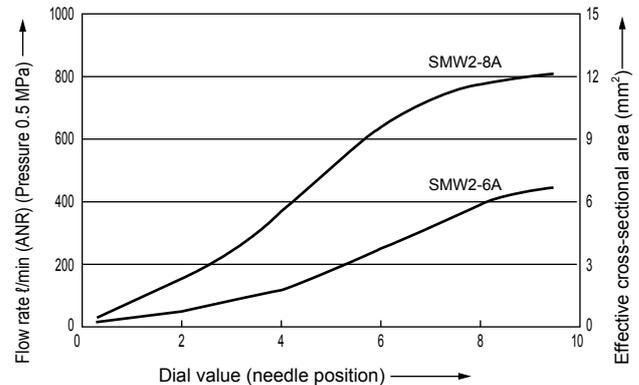
## How to order

**SMW2 - 6A**

Code	Content
<b>A Port size</b>	
<b>6A</b>	R1/8
<b>8A</b>	R1/4

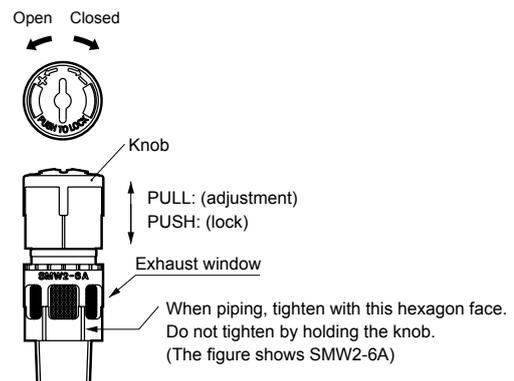
\* P4 compliant as standard.

## Flow characteristics



## Usage methods

- The needle lock is released when the knob is pulled, and is locked when pressed.
- Pull the knob and release the lock before adjusting the flow rate.  
The knob opens when turned to the left and closes when turned to the right.
- Return the knob to the closed state, and gradually open it to adjust speed.
- After adjusting speed, press the knob and confirm that the needle is locked.





Exhaust cleaner

# FA Series

Exhaust noise and oil mist have been minimized.

● Port size: Rc3/8 to Rc2

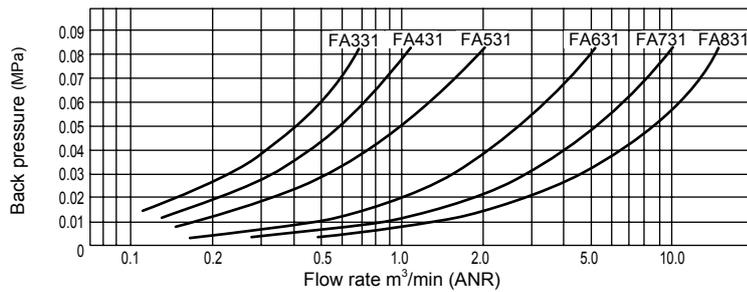
JIS symbol



## Specifications

Descriptions	FA331-10A	FA431-15A	FA531-20A	FA631-25A	FA731-40A	FA831-50A
Port size Rc	3/8	1/2	3/4	1	1 1/2	2
Effective cross-sectional area mm <sup>2</sup>	16	33	55	165	330	550
Max. processing flow rate m <sup>3</sup> /min (ANR)	0.3	0.6	1	3	6	10
Fluid temperature	5 to 65°C (no freezing)					
Ambient temperature	0 to 65°C (no freezing)					
Noise reduction effect	35 dB and over (at the max. processing flow rate in oil saturated state)					
Oil mist collection efficiency	99.9% and over					
Oil storage capacity cm <sup>3</sup>	80	130	150	250	350	550
Weight kg	0.2	0.3	0.4	0.6	1.1	1.5
Bracket No. (option)	B351-10A	B451-15A	B551-20A	B651-25A	-	-

## Flow characteristics



## Selection guide

Select an exhaust cleaner based on the air consumption in the circuit being used.

- (1) Calculate the air consumption for the actuator being used.
- (2) Multiply the calculated air consumption by 1.4.
- (3) Select a model that has a flow rate exceeding the air consumption multiplied by 1.4.

The figure below shows the air consumption when multiplied by 1.4 for each air cylinder size. Use this graph to select a model.

## Compatibility table by variation

FA	
Port size	Rc3/8 to 2
P4	Standard compliance

- : Standard
- : Made to order
- ▲ : Contact CKD
- : Not applicable

## How to order



Exhaust cleaner  
A Series code

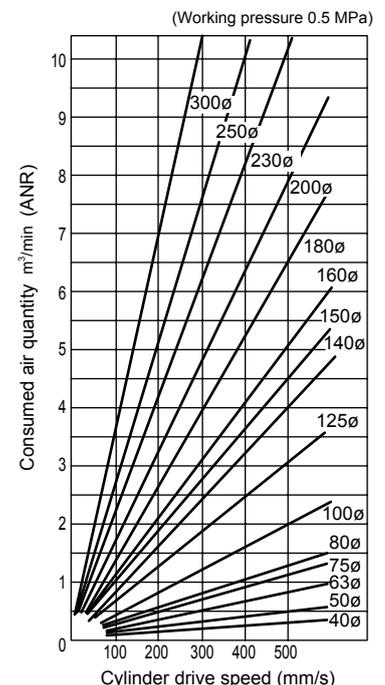
B Port size  
\*1

C Option  
\*2

Code	Content								
<b>A Series code</b>									
3	Compact								
4	Standard								
5	Large								
6	Large								
7	Large bore size								
8	Large bore size								
<b>B Port size</b>									
	Series	3	4	5	6	7	8		
10A	Rc <sup>3</sup> / <sub>8</sub>	●							
15A	Rc <sup>1</sup> / <sub>2</sub>		●						
20A	Rc <sup>3</sup> / <sub>4</sub>			●					
25A	Rc1				●				
40A	Rc <sup>1</sup> / <sub>2</sub>					●			
50A	Rc2							●	
<b>C Option</b>									
Blank	Not attached	●	●	●	●	●	●	●	●
B	Bracket	●	●	●	●	●	●	●	●

### Precautions for model No. selection

- \*1: If port size NPT thread is required, do not indicate nominal size A. (Example) FA431-15
- \*2: Bracket option is not available for FA731 and FA831.
- \*3: P4 compliant as standard.



Peripheral devices



ABSODEX

# AX1000T Series

High accuracy specifications (index accuracy, output shaft runout, etc.)  
Compatible function allows free combination of driver, actuator, and cable

- Max. torque: 22/45/75/150/210 N·m
- Supported driver: TS/TH driver



## Actuator specifications

Descriptions		AX1022T	AX1045T	AX1075T	AX1150T	AX1210T
Max. output torque	N·m	22	45	75	150	210
Continuous output torque	N·m	7	15	25	50	70
Max. rotation speed	rpm	240 (*1)		140 (*1)	120 (*1)	
Allowable axial load	N	600		2200		
Allowable moment load	N·m	19	38	70	140	170
Output shaft moment of inertia	kg·m <sup>2</sup>	0.00505	0.00790	0.03660	0.05820	0.09280
Allowable moment of load inertia	kg·m <sup>2</sup>	0.6	0.9	4.0	6.0	10.0
Index accuracy (*3)	sec	±15				
Repeatability (*3)	sec	±5				
Output shaft friction torque	N·m	2.0		8.0		
Resolution	P/rev	540672				
Motor insulation class		Class F				
Motor withstand voltage		1500 VAC 1 min.				
Motor insulation resistance		10 MΩ and over 500 VDC				
Operating ambient temperature		0 to 45°C (0 to 40°C: *4)				
Operating ambient humidity		20 to 85% RH, no condensation				
Storage ambient temperature		-20 to 80°C				
Storage ambient humidity		20 to 90% RH, no condensation				
Atmosphere		No corrosive gas, explosive gas, or dust				
Weight	kg	8.9 (10.8) *2	12.0 (13.9) *2	23.0 (27.1) *2	32.0 (36.1) *2	44.0 (48.1) *2
Output shaft runout (*3)	mm	0.01				
Output shaft surface runout (*3)	mm	0.01				
Degree of protection		IP20				

\*1: Use at a speed of 80 rpm or less during continuous rotation operation.

\*2: Numbers in ( ) represent the actuator weight with mounting base option.

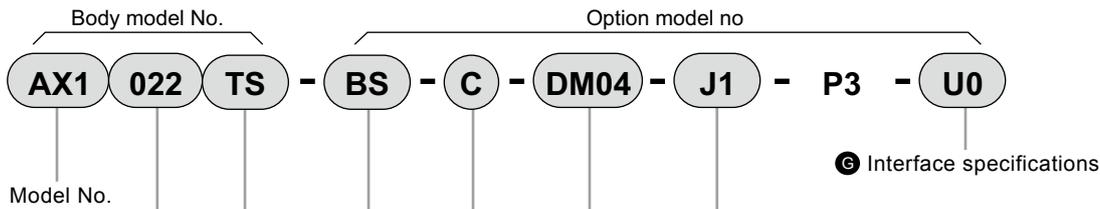
\*3: Refer to the "Glossary" in ABSODEX Products (Catalog No. CB-054A) for index accuracy, repeatability, output shaft runout and output shaft surface runout.

\*4: When using as a UL certified product, the maximum temperature is 40°C.

Always read the precautions described in ABSODEX Products (Catalog No. CB-054A) before use.

### How to order

- Set model No. (actuator, driver, cable)



**A** Size (max. torque)

**B** Driver \*1

**C** Mounting base

**D** Connector mounting direction

**E** Cable length \*3

**F** Driver power voltage \*1

Code	Content
<b>A Size (max. torque)</b>	
022	22 N·m
045	45 N·m
075	75 N·m
150	150 N·m
210	210 N·m

<b>B Driver</b>	
TS	With TS driver
TH	With TH driver

<b>C Mounting base</b>	
Blank	Standard (without mounting base)
BS	With mounting base

<b>D Connector mounting direction</b>	
Blank	Standard (connector horizontal mounting)
C	Connector downward mounting

<b>E Cable length</b>	
DM00	Without cable
DM02	2 m
DM04	4 m (standard length)
DM06	6 m
DM08	8 m
DM10	10 m
DM15	15 m
DM20	20 m

<b>F Driver power voltage</b>	
Refer to the driver power voltage compatibility table at left.	

<b>G Interface specifications:</b>	
U0	Parallel I/O (NPN specifications)
U1	Parallel I/O (PNP specifications)
U2	CC-Link
U3	PROFIBUS-DP
U4	DeviceNet
U5	EtherCAT
U6	EtherNet/IP

### ⚠ Precautions for model No. selection

\*1: Select the driver according to the compatibility table below.

Driver power voltage compatibility table

Driver Model	TS driver		TH driver
	3-phase/single-phase 200 VAC to 230 VAC	Single-phase 100 VAC to 115 VAC	3-phase/single-phase 200 VAC to 230 VAC
AX1022T	Blank	J1	
AX1045T	Blank	J1	
AX1075T	Blank *2		
AX1150T			Blank *2
AX1210T			Blank *2

\*2: For models with maximum torque 75 N·m or more, the calculation of torque limit region is different from the usual when used at single-phase 200 VAC. Contact CKD to determine usability.

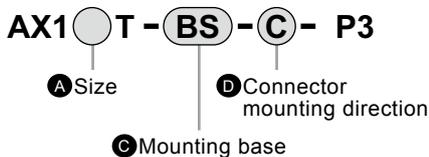
\*3: Cable is a movable cable.

For cable external dimensions, refer to ABSODEX Products (Catalog No. CB-054A).

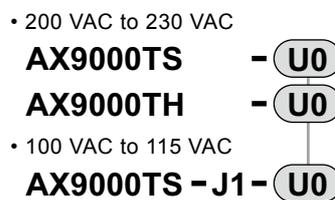
\*4: The lower surface positioning pin hole cannot be used if the "BS" option for **C** Mounting base is selected. The surface is treated with electroless nickel plating.

\*5: Positioning pin holes may not be surface treated.

- Actuator body discrete model No.

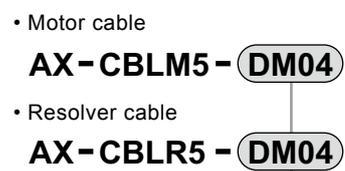


- Driver discrete model No.



**G** Interface specifications

- Cable discrete model No.

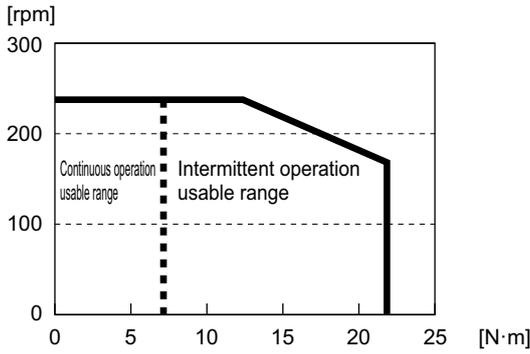


**E** Cable length  
(Note: "DM04" when cable length is 4 m)

\* Made to order products are CE, UL/cUL, and RoHS non-compliant. Contact CKD as needed.

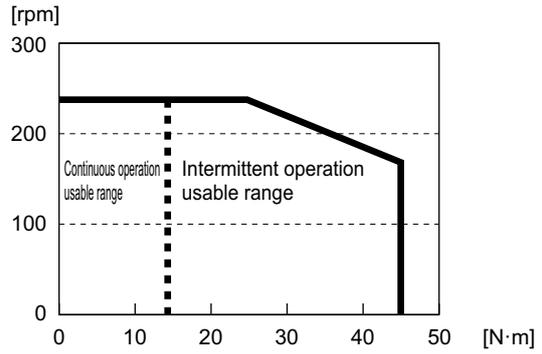
## Speed/maximum torque characteristics

### ● AX1022T



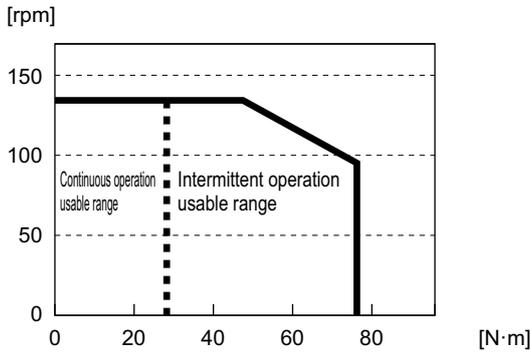
\* The graph shows the characteristics of three-phase 200 VAC.

### ● AX1045T



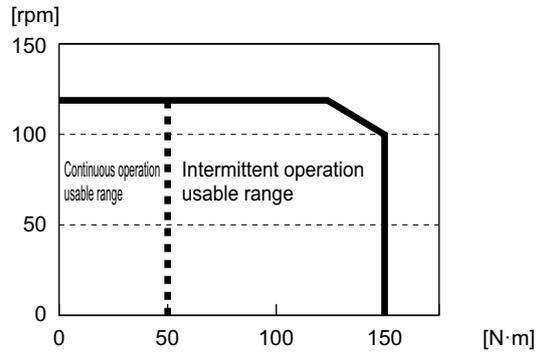
\* The graph shows the characteristics of three-phase 200 VAC.

### ● AX1075T



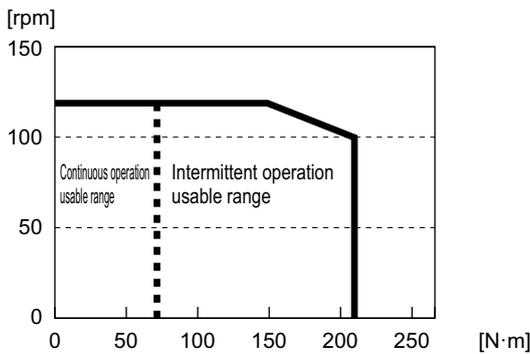
\* The graph shows the characteristics of three-phase 200 VAC.

### ● AX1150T



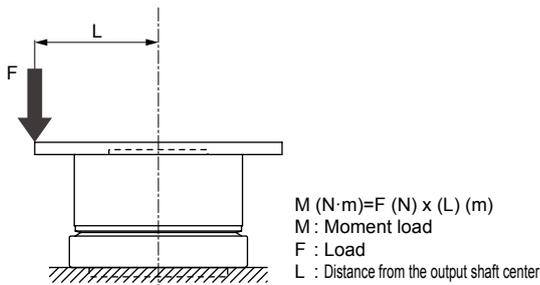
\* The graph shows the characteristics of three-phase 200 VAC.

### ● AX1210T

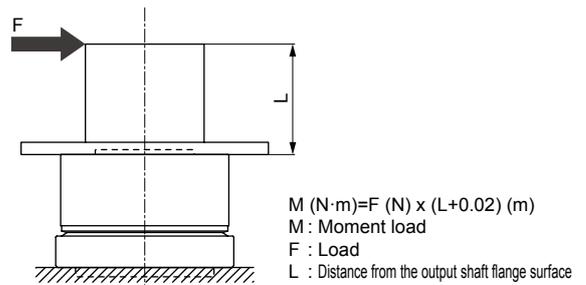


\* The graph shows the characteristics of three-phase 200 VAC.

(Note) Moment load (simple formula)

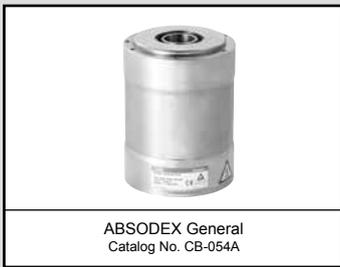


(Fig. a)



(Fig. b)

Always read the precautions described in ABSODEX Products (Catalog No. CB-054A) before use.



ABSODEX

# AX2000T Series

High-speed rotation (max. rotation speed 300 rpm),  
compact with small diameter, large hollow diameter (ø30)  
Compatible function allows free combination of driver, actuator, and cable

- Max. torque: 6/12/18 N·m
- Supported driver: TS driver



## Actuator specifications

Descriptions	AX2006T	AX2012T	AX2018T
Max. output torque N·m	6	12	18
Continuous output torque N·m	2	4	6
Max. rotation speed rpm	300 (*1)		
Allowable axial load N	1000		
Allowable moment load N·m	40		
Output shaft moment of inertia kg·m <sup>2</sup>	0.00575	0.00695	0.00910
Allowable moment of load inertia kg·m <sup>2</sup>	0.3	0.4	0.5
Index accuracy (*3) sec	±30		
Repeatability (*3) sec	±5		
Output shaft friction torque N·m	0.6		0.7
Resolution P/rev	540672		
Motor insulation class	Class F		
Motor withstand voltage	1500 VAC 1 min.		
Motor insulation resistance	10 MΩ and over 500 VDC		
Operating ambient temperature	0 to 45°C (0 to 40°C: *4)		
Operating ambient humidity	20 to 85% RH, no condensation		
Storage ambient temperature	-20 to 80°C		
Storage ambient humidity	20 to 90% RH, no condensation		
Atmosphere	No corrosive gas, explosive gas, or dust		
Weight kg	4.7 (6.0) *2	5.8 (7.1) *2	7.5 (8.8) *2
Output shaft runout (*3) mm	0.03		
Output shaft surface runout (*3) mm	0.03		
Degree of protection	IP20		

\*1: Use at a speed of 80 rpm or less during continuous rotation operation.

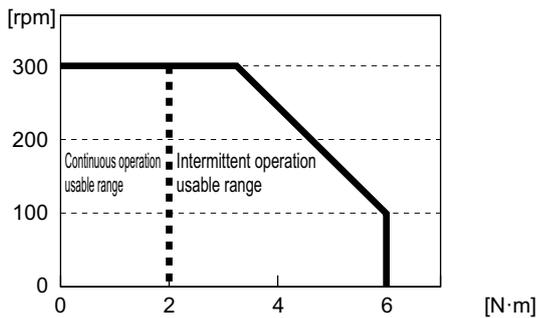
\*2: Numbers in ( ) represent the actuator weight with mounting base option.

\*3: Refer to the "Glossary" in ABSODEX Products (Catalog No. CB-054A) for index accuracy, repeatability, output shaft runout and output shaft surface runout.

\*4: When using as a UL certified product, the maximum temperature is 40°C.

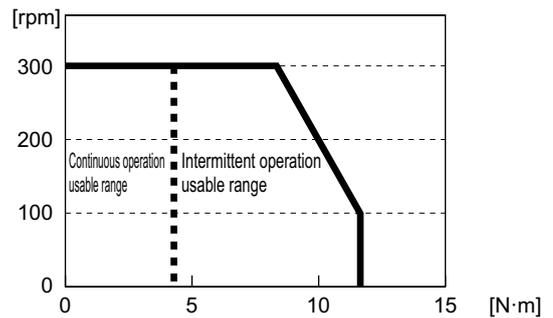
## Speed/maximum torque characteristics

### ● AX2006T



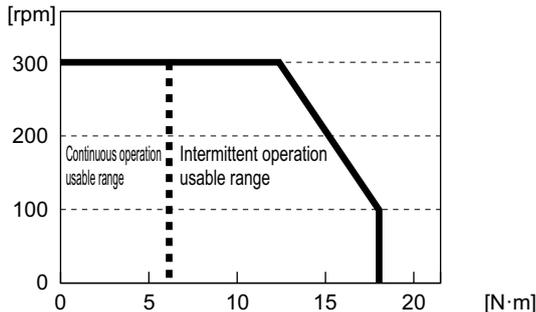
\* The graph shows the characteristics of three-phase 200 VAC.

### ● AX2012T



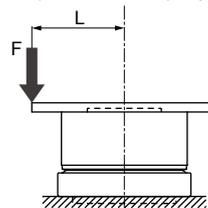
\* The graph shows the characteristics of three-phase 200 VAC.

### ● AX2018T



\* The graph shows the characteristics of three-phase 200 VAC.

(Note) Moment load (simple formula)



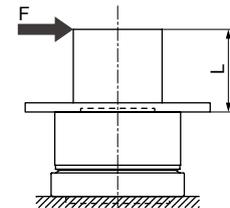
(Fig. a)

$$M \text{ (N·m)} = F \text{ (N)} \times L \text{ (m)}$$

M: Moment load

F: Load

L: Distance from the output shaft center



(Fig. b)

$$M \text{ (N·m)} = F \text{ (N)} \times (L + 0.02) \text{ (m)}$$

M: Moment load

F: Load

L: Distance from the output shaft flange surface

⚠ Always read the precautions described in ABSODEX Products (Catalog No. CB-054A) before use.





ABSODEX

# AX4000T Series

Supports large moment of inertia load

Compatible function allows free combination of driver, actuator, and cable  
Large hollow diameter is convenient for cable wiring and piping,  
abundant options available

- Max. torque: 9/22/45/75 N·m
- Supported driver: TS driver



## Actuator specifications

Descriptions		AX4009T	AX4022T	AX4045T	AX4075T
Max. output torque	N·m	9	22	45	75
Continuous output torque	N·m	3	7	15	25
Max. rotation speed	rpm	240 (*1)			140 (*1)
Allowable axial load	N	800	3700		20000
Allowable moment load	N·m	40	60	80	200
Output shaft moment of inertia	kg·m <sup>2</sup>	0.009	0.0206	0.0268	0.1490
Allowable moment of load inertia	kg·m <sup>2</sup>	0.35 (1.75) (*2)	0.60 (3.00) (*2)	0.90 (5.00) (*2)	5.00 (25.00) (*2)
Index accuracy (*5)	sec	±30			
Repeatability (*5)	sec	±5			
Output shaft friction torque	N·m	0.8	3.5		10.0
Resolution	P/rev	540672			
Motor insulation class		Class F			
Motor withstand voltage		1500 VAC 1 min.			
Motor insulation resistance		10 MΩ and over 500 VDC			
Operating ambient temperature		0 to 45°C (0 to 40°C: *5)			
Operating ambient humidity		20 to 85% RH, no condensation			
Storage ambient temperature		-20 to 80°C			
Storage ambient humidity		20 to 90% RH, no condensation			
Atmosphere		No corrosive gas, explosive gas, or dust			
Weight	kg	5.5	12.3 (14.6) *3	15.0 (17.3) *3	36.0 (41.0) *3
Total weight when brake is set	kg	-	16.4 (18.7) *3	19.3 (21.6) *3	54.0 (59.0) *3
Output shaft runout (*5)	mm	0.03			
Output shaft surface runout (*5)	mm	0.05			
Degree of protection		IP20			

\*1: Use at a speed of 80 rpm or less during continuous rotation operation.

\*2: When using in load conditions up to those given in ( ), set parameter 72 (integral gain magnification) = 0.3 (reference value).

\*3: Numbers in ( ) represent the actuator weight with mounting base option.

\*4: Contact CKD whenever using continuous rotation operation in combination with parameter 72 (integral gain magnification).

\*5: Refer to the "Glossary" in ABSODEX Products (Catalog No. CB-054A) for index accuracy, repeatability, output shaft runout and output shaft surface runout.

\*6: When using as a UL certified product, the maximum temperature is 40°C.

## Electromagnetic brake specifications (option)

Compatibility		AX4022T/AX4045T	AX4075T
Descriptions			
Type		Non-backlash dry non-excitation	
Rated voltage	V	24 VDC	
Power capacity	W	30	55
Rated current	A	1.25	2.30
Static friction torque	N·m	35	200
Armature release time (brake on)	msec	50 (reference value)	50 (reference value)
Armature suction time (brake off)	msec	150 (reference value)	250 (reference value)
Retention accuracy	minutes	45 (reference value)	
Max. operating frequency	times/min.	60	40

\*1: During output shaft rotation, the electromagnetic brake disc and fixed part may cause a scraping sound.

\*2: For travel after brake off, you must change the parameter delay time by the above-mentioned armature suction time.

\*3: Though it is a non-backlash, holding a constant position is difficult if load is applied in the rotation direction.

\*4: The armature makes contact with the electromagnetic brake fixed part while the electromagnetic brake is operating, causing the sound.

\*5: The electromagnetic brake can be manually released by uniformly tightening the bolts in the manual release tap (3 locations).

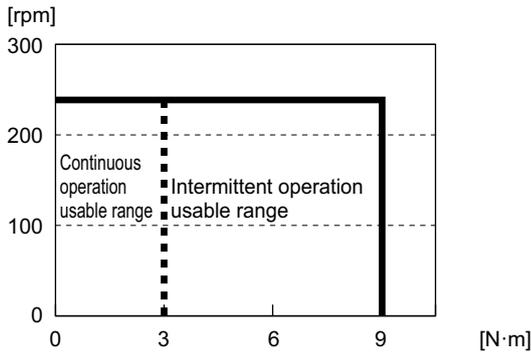
Lightly fasten three bolts evenly, and stop tightening when there is clearance in the clamp disc part. Once the manual release work is over, be sure to promptly remove the 3 bolts and confirm that the brakes work and that the output shaft is retained.

Always read the precautions described in ABSODEX Products (Catalog No. CB-054A) before use.



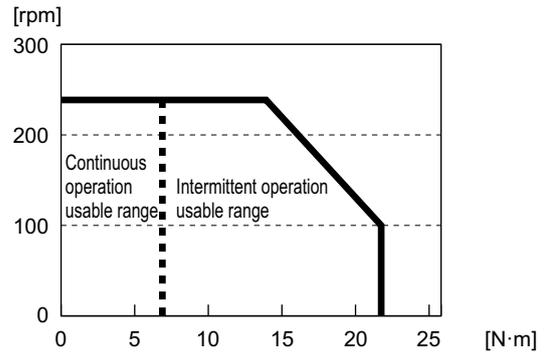
## Speed/maximum torque characteristics

● AX4009T



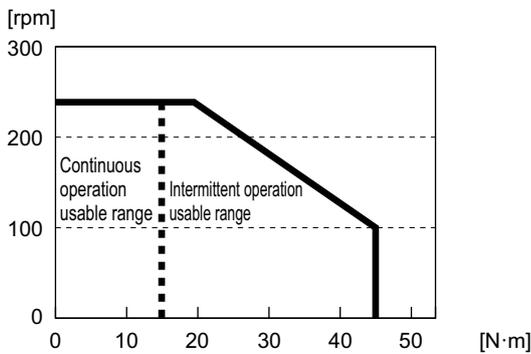
\* The graph shows the characteristics of three-phase 200 VAC.

● AX4022T



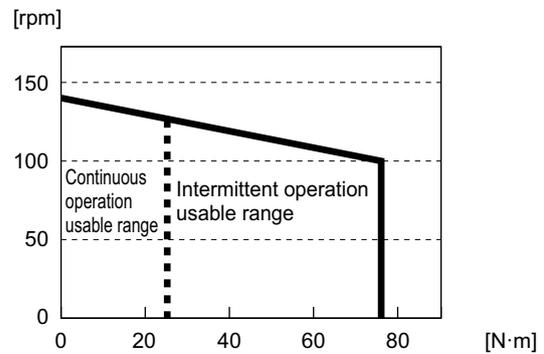
\* The graph shows the characteristics of three-phase 200 VAC.

● AX4045T



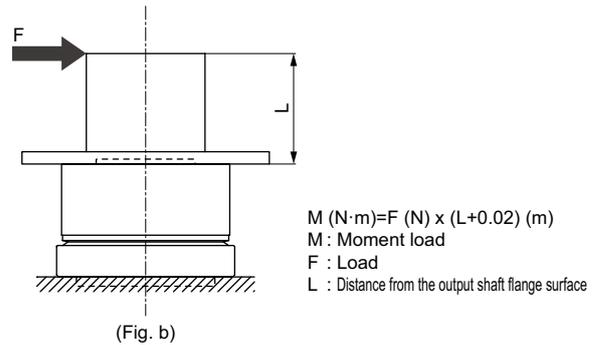
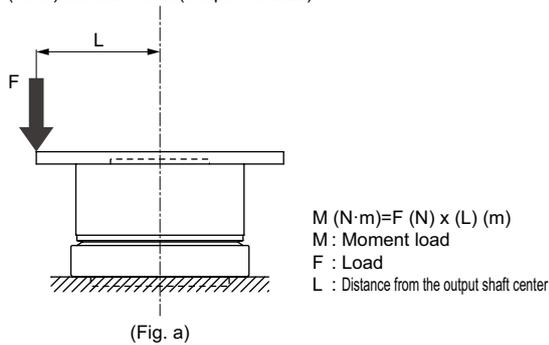
\* The graph shows the characteristics of three-phase 200 VAC.

● AX4075T



\* The graph shows the characteristics of three-phase 200 VAC.

(Note) Moment load (simple formula)



⚠ Always read the precautions described in ABSODEX Products (Catalog No. CB-054A) before use.



ABSODEX

# AX4000T Series

Supports large moment of inertia load  
Compatible function allows free combination of driver, actuator, and cable  
Large hollow diameter is convenient for cable wiring and piping,  
abundant options available

- Max. torque: 150/300/500/1000 N·m
- Supported driver: TH driver



## Actuator specifications

Descriptions		AX4150T	AX4300T	AX4500T	AX410WT
Max. output torque	N·m	150	300	500	1000
Continuous output torque	N·m	50	100	160	330
Max. rotation speed	rpm	100 (*1)		70	30
Allowable axial load	N	20000			
Allowable moment load	N·m	300	400	500	400
Output shaft moment of inertia	kg·m <sup>2</sup>	0.2120	0.3260	0.7210	2.7200
Allowable moment of load inertia	kg·m <sup>2</sup>	75.00 (*2)	180.00 (*2)	300.00 (*2)	600.00 (*2)
Index accuracy (*4)	sec	±30			
Repeatability (*4)	sec	±5			
Output shaft friction torque	N·m	10.0		15.0	20.0
Resolution	P/rev	540672			
Motor insulation class		Class F			
Motor withstand voltage		1500 VAC 1 min.			
Motor insulation resistance		10 MΩ and over 500 VDC			
Operating ambient temperature		0 to 45°C (0 to 40°C: *4)			
Operating ambient humidity		20 to 85% RH, no condensation			
Storage ambient temperature		-20 to 80°C			
Storage ambient humidity		20 to 90% RH, no condensation			
Atmosphere		No corrosive gas, explosive gas, or dust			
Weight	kg	44.0 (49.0) *3	66.0 (74.0) *3	115.0 (123.0) *3	198.0 (217.0) *3
Total weight when brake is set	kg	63.0 (68.0) *3	86.0 (94.0) *3	-	-
Output shaft runout (*4)	mm	0.03			
Output shaft surface runout (*4)	mm	0.05			0.08
Degree of protection		IP20			

\*1: Use at a speed of 80 rpm or less during continuous rotation operation.

\*2: Settings when shipped support large moments of inertia.

\*3: Numbers in ( ) represent the actuator weight with mounting base option.

\*4: Refer to the "Glossary" in ABSODEX Products (Catalog No. CB-054A) for index accuracy, repeatability, output shaft runout and output shaft surface runout.

\*5: When using as a UL certified product, the maximum temperature is 40°C.

## Electromagnetic brake specifications (option)

Descriptions	Compatibility	AX4150T/AX4300T
Type		Non-backlash dry non-excitation
Rated voltage	V	24 VDC
Power capacity	W	55
Rated current	A	2.30
Static friction torque	N·m	200
Armature release time (brake on)	msec	50 (reference value)
Armature suction time (brake off)	msec	250 (reference value)
Retention accuracy	minutes	45 (reference value)
Max. operating frequency	times/min.	40

\*1: During output shaft rotation, the electromagnetic brake disc and fixed part may cause a scraping sound.

\*2: For travel after brake off, you must change the parameter delay time by the above-mentioned armature suction time.

\*3: Though it is a non-backlash, holding a constant position is difficult if load is applied in the rotation direction.

\*4: The armature makes contact with the electromagnetic brake fixed part while the electromagnetic brake is operating, causing the sound.

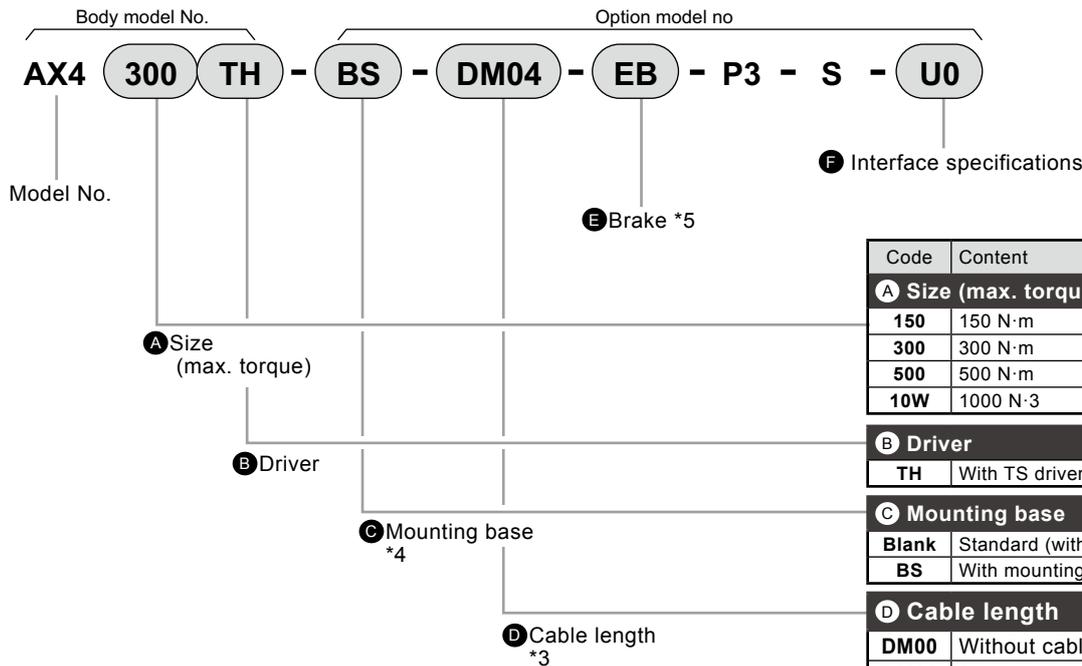
\*5: The electromagnetic brake can be manually released by uniformly tightening the bolts in the manual release tap (3 locations).

Lightly fasten three bolts evenly, and stop tightening when there is clearance in the clamp disc part. Once the manual release work is over, be sure to promptly remove the 3 bolts and confirm that the brakes work and that the output shaft is retained.

**⚠** Always read the precautions described in ABSODEX Products (Catalog No. CB-054A) before use.

## How to order

- Set model No. (actuator, driver, cable)



Code	Content
<b>A Size (max. torque)</b>	
150	150 N·m
300	300 N·m
500	500 N·m
10W	1000 N·3
<b>B Driver</b>	
TH	With TS driver
<b>C Mounting base</b>	
Blank	Standard (without mounting base)
BS	With mounting base
<b>D Cable length</b>	
DM00	Without cable
DM02	2 m
DM04	4 m (standard length)
DM06	6 m
DM08	8 m
DM10	10 m
DM15	15 m
DM20	20 m

<b>E Brake</b>	
Blank	Standard (without electromagnetic brake)
EB	Negative-actuated electromagnetic brake

<b>F Interface specifications:</b>	
U0	Parallel I/O (NPN specifications)
U1	Parallel I/O (PNP specifications)
U2	CC-Link
U3	PROFIBUS-DP
U4	DeviceNet
U5	EtherCAT
U6	EtherNet/IP

## ⚠ Precautions for model No. selection

- \*1: Select the driver according to the compatibility table below.

Driver power voltage compatibility table

Model	Driver	TH driver
		Three-phase/single-phase 200 VAC to 230 VAC
AX4150T		Blank *2
AX4300T		Blank *2
AX4500T		Blank *2
AX410WT		Blank *2

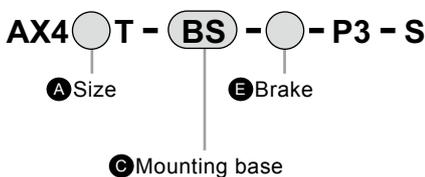
- \*2: The calculation of torque limit region is different from the usual when used at single-phase 200 VAC. Contact CKD to determine usability.
- \*3: Cable is a movable cable.  
For cable external dimensions, refer to ABSODEX Products (Catalog No. CB-054A).
- \*4: The lower surface positioning pin hole cannot be used if the "BS" option for **C** Mounting base is selected. The surface is treated with electroless nickel plating.
- \*5: For options, select according to the "Option compatibility table" below.

Option compatibility table

	AX4150T	AX4300T	AX4500T	AX410WT
Electromagnetic brake (-EB)	○	○	×	×

- \*6: Positioning pin holes may not be surface treated.
- \*7: The body surface is treated with electroless nickel plating.

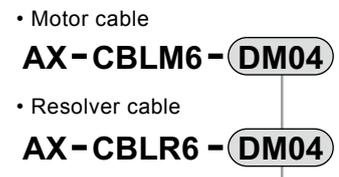
- Actuator body discrete model No.



- Driver discrete model No.  
• 200 VAC to 230 VAC



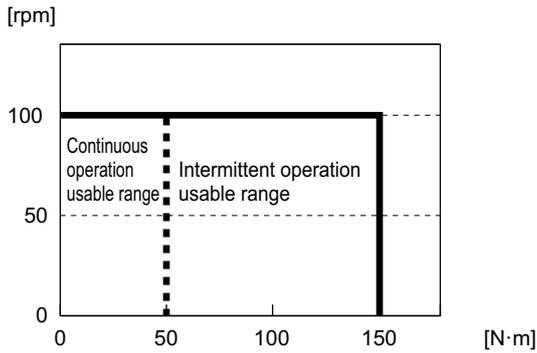
- Cable discrete model No.



\* Made to order products are CE, UL/cUL, and RoHS non-compliant. Contact CKD as needed.

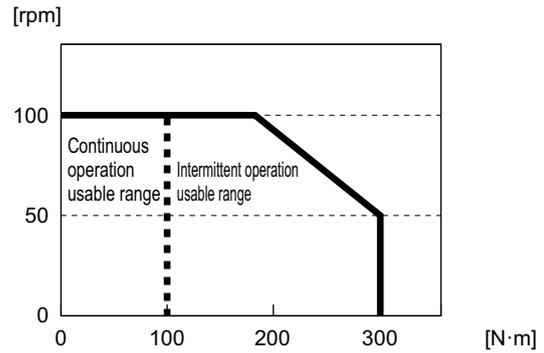
## Speed/maximum torque characteristics

### ● AX4150T



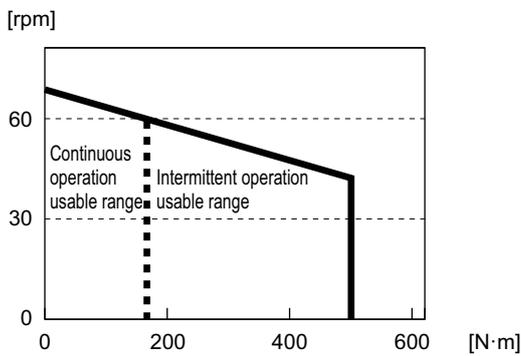
\* The graph shows the characteristics of three-phase 200 VAC.

### ● AX4300T



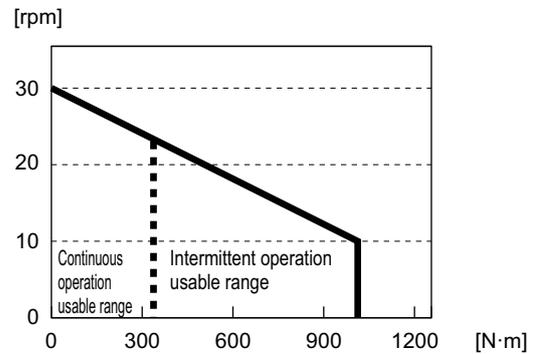
\* The graph shows the characteristics of three-phase 200 VAC.

### ● AX4500T



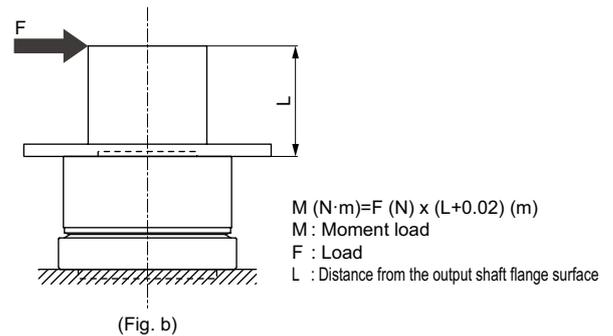
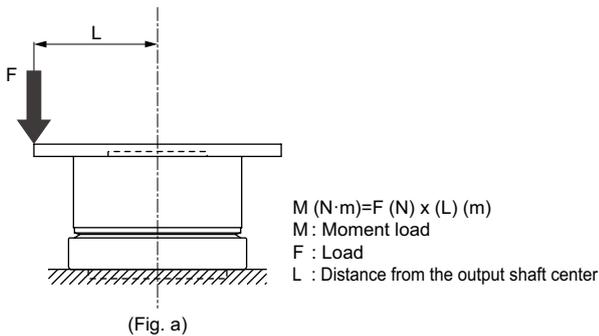
\* The graph shows the characteristics of three-phase 200 VAC.

### ● AX410WT



\* The graph shows the characteristics of three-phase 200 VAC.

(Note) Moment load (simple formula)



**⚠** Always read the precautions described in ABSODEX Products (Catalog No. CB-054A) before use.



ABSODEX (for AX1000T/AX2000T/AX4000T Series)

# TS/TH driver

Interface specifications: Parallel I/O (NPN), Parallel I/O (PNP)  
CC-Link, PROFIBUS-DP, DeviceNet  
EtherCAT, EtherNet/IP



## Features

- Power supply is divided into main power supply and control power supply
- Wiring method is changed from terminal block to connector
- Small/lightweight (resin body adopted)
- 7-segment LED 2-digit display
- Supports encoder output (parallel I/O only)
- Serial communication options available
- Monitoring functions such as position information, alarm status, etc. (U2, U3, U4, U5, U6 options only)

## How to order

- 200 VAC to 230 VAC

**AX9000TS** - U0

**AX9000TH** - U0

- 100 VAC to 115 VAC

**AX9000TS-J1** - U0

Interface specifications  
U0: Parallel I/O (NPN)  
U1: Parallel I/O (PNP)  
U2 : CC-Link  
U3 : PROFIBUS-DP  
U4 : DeviceNet  
U5 : EtherCAT  
U6 : EtherNet/IP

## General specifications

Descriptions	Model	
	TS driver AX9000TS	TH driver AX9000TH
Power supply voltage	Main power supply	Three-phase, single-phase 200 VAC ±10% to 230 VAC ±10% (*1) 100 VAC ±10% to 115 VAC ±10% (J1 option) (*2) (*3)
	Control power	200 VAC ±10% to 230 VAC ±10% 100 VAC ±10% to 115 VAC ±10% (J1 option) (*2) (*3)
Power frequency	50/60 Hz	
Rated input current	200 VAC: 1.8 A 100 VAC: 2.4 A	200 VAC: 5.0 A
Rated output current	1.9 A	5.0 A
Structure	Driver and controller integrated (open)	
Operating ambient temperature	0 to 50°C	
Operating ambient humidity	20 to 90% RH (no condensation)	
Storage ambient temperature	-20 to 65°C	
Storage ambient humidity	20 to 90% RH (no condensation)	
Atmosphere	No corrosive gas or dust	
Anti-noise	1000 V (P-P), pulse width 1 μsec, rising 1 nsec impulse noise test, induction noise (capacitive coupling)	
Vibration resistance	4.9 m/s <sup>2</sup>	
Weight	Approx. 1.6 kg	Approx. 2.1 kg
Degree of protection	IP2X (excluding CN4, CN5)	

- \*1) For models with maximum torque of 75 N·m or more, the calculation of torque limit region is different from the usual when used at single-phase 200 VAC. Contact CKD to determine usability.  
\*2) If 200 to 230 VAC is connected by mistake when using power voltage 100 to 115 VAC specifications (-J1 option), the driver internal circuit will be damaged.  
\*3) For models with maximum torque of 75 N·m or more, "-J1" cannot be selected.  
\*4) If the main power is cut OFF while the actuator is rotating, the rotation may continue due to inertia.  
\*5) After the main power supply is cut OFF, the motor may rotate due to the residual voltage of the driver.

## Breaker capacity

TS driver

Actuator model No.	Driver model No.	Rush current (A)		Breaker capacity
		Single-phase 100 V	Single-phase/three-phase 200 V	Rated current (A)
AX2006T	AX9000TS	16 (*1)	56 (*1)	10
AX1022T, AX2012T, AX2018T				
AX4009T, AX4022T				
AX1045T, AX4045T				
AX1075T, AX4075T				

\*1) The value of the rush current is a representative value at 115 VAC and 230 VAC.

TH driver

Actuator model No.	Driver model No.	Rush current (A)	Breaker capacity
		Three-phase 200 V	Rated current (A)
AX1150T, AX4150T	AX9000TH	56 (*1)	20
AX1210T, AX4300T			
AX4500T			
AX410WT			

\*1) The value of the rush current is a representative value at 230 VAC.

## Performance specifications

Descriptions	Content
No. of control axes	1 axis, 540672 pulse/1 rotation
Angle setting unit	° (degree), pulse, indexing No.
Angle min. setting unit	0.001°, 1 pulse
Speed setting unit	sec, rpm
Speed setting range	0.01 to 100 sec. / 0.11 to 300 rpm (*1)
Equal divisions	1 to 255
Max. command value	7-digit numeric input ±9999999
Timer	0.01 sec to 99.99 sec
Programming language	NC
Programming method	Set the data through RS-232C port with an interactive terminal, PC, etc.
Operation mode	Auto, MDI, jog, single block, servo OFF, pulse train input mode
Coordinates	Absolute, incremental
Acceleration curve	[5 types] Modified Sine (MS), Modified Constant Velocity (MC/MC2), Modified Trapezoid (MT), Trapezoid (TR)
Status display	LED display CHARGE: Main power POWER: Control power
Operation display	Display with 7-segment LED (2 digits)
Communication interface	RS-232C compliant
I/O signal	Refer to interface specification pages.
Program capacity	Approx. 6000 characters (256)
Electronic thermal	Overheating protection for actuator

\*1) Maximum rotation speed differs depending on the actuator connected.



ABSODEX

# AX6000M Series

Minimum size of 80 mm diameter

Compatible function allows free combination of driver, actuator, and cable

● Max. torque: 1/2/3 N·m

● Supported driver: MU driver



## Actuator specifications

Descriptions		AX6001M	AX6003M
Max. output torque	N·m	1.2	3.0
Continuous output torque	N·m	0.4	1.0
Max. rotation speed	rpm	240 (*1)	
Allowable axial load	N	600	
Allowable moment load	N·m	5	
Output shaft moment of inertia	kg·m <sup>2</sup>	0.00034	0.00059
Allowable moment of load inertia	kg·m <sup>2</sup>	0.034	0.059
Index accuracy (*3)	sec	±90	
Repeatability (*3)	sec	±10	
Output shaft friction torque	N·m	0.13	0.22
Resolution	P/rev	540672	
Motor insulation class		Class A	
Motor withstand voltage		550 VAC 1 minute	
Motor insulation resistance		10 MΩ and over 500 VDC	
Operating ambient temperature		0 to 40°C	
Operating ambient humidity		20 to 85% RH, no condensation	
Storage ambient temperature		-10 to 65°C	
Storage ambient humidity		20 to 90% RH, no condensation	
Atmosphere		No corrosive gas, explosive gas, or dust	
Weight	kg	1.2 (1.4) *2	1.8 (2.0) *2
Output shaft runout (*3)	mm	0.03	
Output shaft surface runout (*3)	mm	0.05	
Degree of protection		IP20	

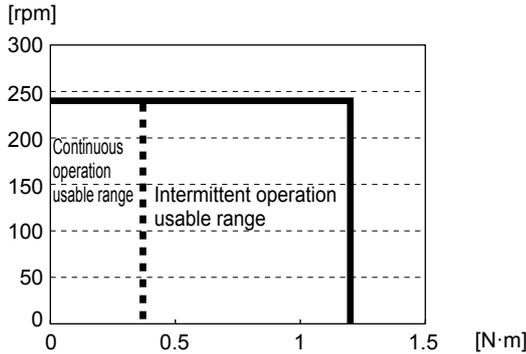
\*1: Use at a speed of 80 rpm or less during continuous rotation operation.

\*2: Numbers in ( ) represent the actuator weight with mounting base option.

\*3: Refer to the "Glossary" in ABSODEX Products (Catalog No. CB-054A) for index accuracy, repeatability, output shaft runout and output shaft surface runout.

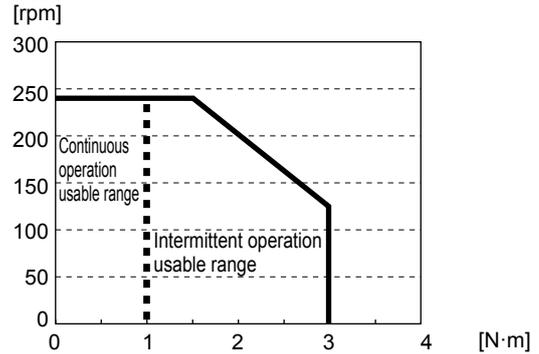
## Speed/maximum torque characteristics

● AX6001M



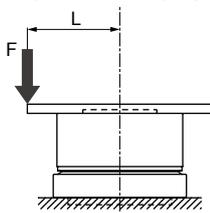
\* The graph shows the characteristics when 24 VDC (ambient temperature: 25°C) is connected.

● AX6003M



\* The graph shows the characteristics when 24 VDC (ambient temperature: 25°C) is connected.

(Note) Moment load (simple formula)



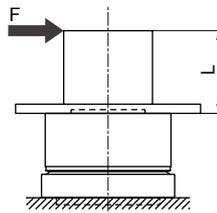
(Fig. a)

$$M \text{ (N·m)} = F \text{ (N)} \times L \text{ (m)}$$

M : Moment load

F : Load

L : Distance from the output shaft center



(Fig. b)

$$M \text{ (N·m)} = F \text{ (N)} \times (L + 0.02) \text{ (m)}$$

M : Moment load

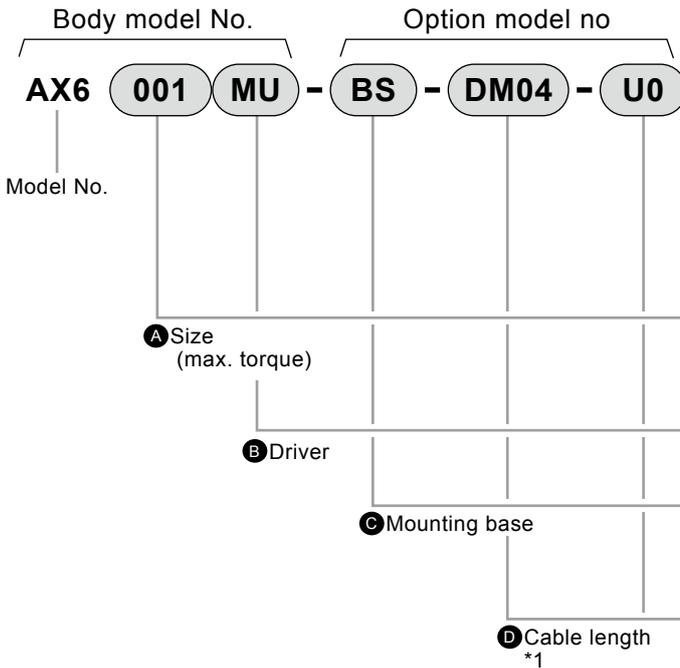
F : Load

L : Distance from the output shaft flange surface

⚠ Always read the precautions described in ABSODEX Products (Catalog No. CB-054A) before use.

## How to order

- Set model No. (actuator, driver, cable)

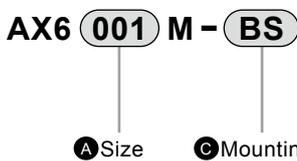


Code	Content
<b>A Size (max. torque)</b>	
<b>001</b>	1.2 N·m
<b>003</b>	3.0 N·m
<b>B Driver</b>	
<b>MU</b>	With MU driver
<b>C Mounting base</b>	
<b>Blank</b>	Standard (without mounting base)
<b>BS</b>	With mounting base
<b>D Cable length</b>	
<b>DM00</b>	Without cable
<b>DM02</b>	2 m
<b>DM04</b>	4 m
<b>DM06</b>	6 m
<b>DM08</b>	8 m
<b>DM10</b>	10 m
<b>E Interface specifications:</b>	
<b>U0</b>	Parallel I/O (NPN specifications)
<b>U1</b>	Parallel I/O (PNP specifications)

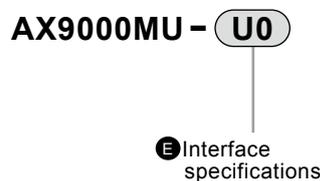
### ⚠ Precautions for model No. selection

- \*1: Cable is a movable cable.  
For cable external dimensions, refer to ABSODEX Products (Catalog No. CB-054A).  
Body lead-out cable is not a movable cable.
- \*2: The lower surface positioning pin hole cannot be used if the "BS" option for **C** Mounting base is selected. The surface is treated with electroless nickel plating.
- \*3: Positioning pin holes may not be surface treated.
- \*4: The rotating part surface is treated with electroless nickel plating.  
The fixed section is made of stainless steel.

Actuator body discrete model No.

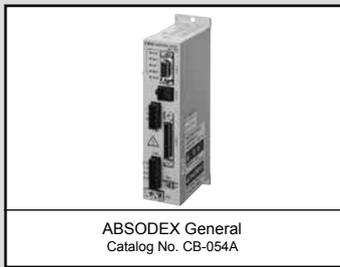


Driver discrete model No.



Cable discrete model No.

- Motor cable  
**AX-CBLM8** -   **DM04**
  - Resolver cable  
**AX-CBLR8** -   **DM04**
- D** Cable length  
(Note: "DM04" when cable length is 4 m)



ABSODEX (for AX6000M Series)

# MU driver

Interface specifications: Parallel I/O (NPN)  
Parallel I/O (PNP)



## Features

- Ultra-compact/lighter weight (resin body adopted)
- Easy wiring with connector

## How to order

**AX9000MU - U0**

**AX9000MU - U1**

Interface specifications  
U0: Parallel I/O (NPN)  
U1: Parallel I/O (PNP)

## General specifications

Descriptions		Content MU driver AX9000MU
Power supply voltage	Main power supply	24 VDC ±10%
	Control power	24 VDC ±10%
Structure		Driver and controller integrated
Operating ambient temperature		0 to 50°C
Operating ambient humidity		20 to 90% RH (no condensation)
Storage ambient temperature		-10 to 65°C
Storage ambient humidity		20 to 90% RH (no condensation)
Atmosphere		No corrosive gas or dust
Anti-noise		1000 V (P-P), pulse width 1 µsec, rising/falling time 1 nsec Impulse noise test, induction noise (capacitive coupling)
Vibration resistance		4.9 m/s <sup>2</sup>
Weight		Approx. 0.5 kg
Degree of protection		IP2X

## Performance specifications

Descriptions	Content
No. of control axes	1 axis, 540,672 pulse/1 rotation
Angle setting unit	° (degree), pulse, indexing No.
Angle min. setting unit	0.001°, 1 pulse
Speed setting unit	sec, rpm
Speed setting range	0.01 to 100 sec. / 0.11 to 240 rpm
Equal divisions	1 to 255
Max. command value	7-digit numeric input ±9,999,999 pulse
Timer	0.01 sec to 99.99 sec
Programming language	NC
Programming method	Set data through RS-232C port with a PC.
Operation mode	Auto, MDI, jog, single block, servo OFF, pulse train input mode
Coordinates	Absolute, incremental
Acceleration curve	[5 types] Modified Sine (MS), Modified Constant Velocity (MC/MC2) Modified Trapezoid (MT), Trapezoid (TR)
Status display	RUN: Normal operating state
	ALM2: Alarm 2 state
	ALM1: Alarm 1 state
	SERVO: Servo state
	CHARGE: Charge state
Communication interface	RS-232C compliant
I/O signal	Refer to interface specification pages.
Program capacity	Approx. 6000 characters (256)
Electronic thermal	Overheating protection for actuator

## Power capacity

Actuator model No.	Driver model No.	Rated input current	Max. input current
AX6001M, AX6003M	AX9000MU	3.3 A	10 A

**⚠** Always read the precautions described in ABSODEX Products (Catalog No. CB-054A) before use.

Made to order products are CE and RoHS non-compliant. Contact CKD as needed.



ABSODEX

# AX7000X Series

High-end model equipped with high-resolution encoder  
Compatible function allows free combination of driver, actuator, and cable

● Maximum torque: 22/45 N·m

● Supported driver: XS driver



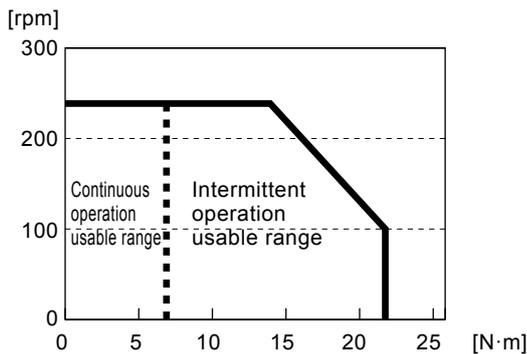
## Actuator specifications

Descriptions		AX7022X	AX7045X
Max. output torque	N·m	22	45
Continuous output torque	N·m	7	15
Max. rotation speed	rpm	240 (*1)	
Allowable axial load	N	400	
Allowable moment load	N·m	20	
Output shaft moment of inertia	kg·m <sup>2</sup>	0.0182	0.0254
Allowable moment of load inertia	kg·m <sup>2</sup>	0.60	0.90
Index accuracy (*3)	sec	±30	
Repeatability (*3)	sec	±2	
Output shaft friction torque	N·m	2.5	
Resolution	P/rev	4,194,304	
Motor insulation class		Class F	
Motor withstand voltage		1500 VAC 1 min.	
Motor insulation resistance		10 MΩ and over 500 VDC	
Operating ambient temperature		0 to 40°C	
Operating ambient humidity		20 to 85% RH, no condensation	
Storage ambient temperature		-20 to 80°C	
Storage ambient humidity		20 to 90% RH, no condensation	
Atmosphere		No corrosive gas, explosive gas, or dust	
Weight	kg	10.0 (12.9) *2	13.2 (16.1) *2
Output shaft runout (*3)	mm	0.03	
Output shaft surface runout (*3)	mm	0.03	
Degree of protection		IP20	

\*1: Use at a speed of 80 rpm or less during continuous rotation operation. \*2: Numbers in ( ) represent the actuator weight with mounting base option.  
\*3: Refer to the "Glossary" in ABSODEX Products (Catalog No. CB-054A) for index accuracy, repeatability, output shaft runout and output shaft surface runout.

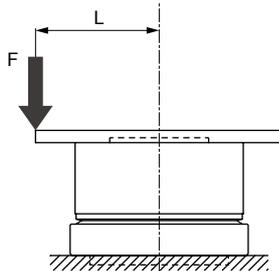
## Speed/maximum torque characteristics

● AX7022X



\* The graph shows the characteristics of three-phase 200 VAC.

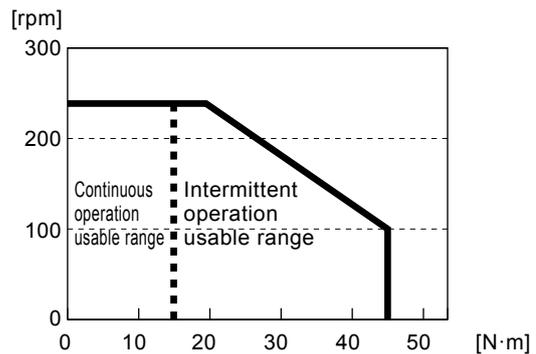
(Note) Moment load (simple formula)



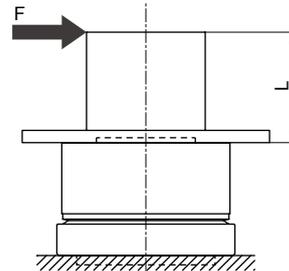
(Fig. a)

$M \text{ (N·m)} = F \text{ (N)} \times L \text{ (m)}$   
M : Moment load  
F : Load  
L : Distance from the output shaft center

● AX7045X



\* The graph shows the characteristics of three-phase 200 VAC.



(Fig. b)

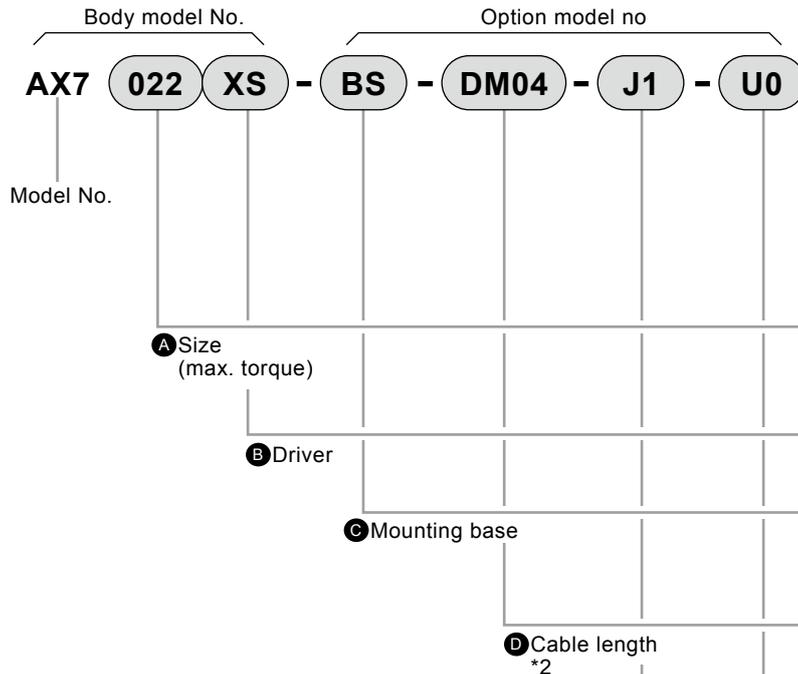
$M \text{ (N·m)} = F \text{ (N)} \times (L + 0.02) \text{ (m)}$   
M : Moment load  
F : Load  
L : Distance from the output shaft flange surface

⚠ Always read the precautions described in ABSODEX Products (Catalog No. CB-054A) before use.

# AX7000X Series

## How to order

- Set model No. (actuator, driver, cable)



Code	Content
<b>A Size (max. torque)</b>	
022	22 N·m
045	45 N·m
<b>B Driver</b>	
XS	With XS driver
<b>C Mounting base</b>	
Blank	Standard (without mounting base)
BS	With mounting base
<b>D Cable length</b>	
DM00	Without cable
DM02	2 m
DM04	4 m
DM06	6 m
DM08	8 m
DM10	10 m
DM15	15 m
DM20	20 m
<b>E Driver power voltage</b>	
Blank	Single-phase/three-phase 200 VAC to 230 VAC
J1	Single-phase 100 VAC to 115 VAC
<b>F Interface specifications:</b>	
U0	Parallel I/O (NPN)
U2	CC-Link
U4	DeviceNet

## ⚠ Precautions for model No. selection

\*1: Select the driver according to the compatibility table below.

### Driver power voltage compatibility table

Model \ Driver	XS driver	
	Three-phase/single-phase 200 VAC to 230 VAC	Single-phase 100 VAC to 115 VAC
AX7022X	Blank	J1
AX7045X	Blank	J1

\*2: Cable is a movable cable.

For cable external dimensions, refer to ABSODEX Products (Catalog No. CB-054A).

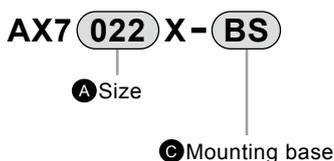
Body lead-out cable is not a movable cable.

\*3: The lower surface positioning pin hole cannot be used if the "BS" option for **C** Mounting base is selected. The surface is treated with electroless nickel plating.

\*4: Positioning pin holes may not be surface treated.

\*5: The body surface of AX7022X and AX7045X is treated with electroless nickel plating.

- Actuator body discrete model No.



- Driver discrete model No.

• 200 VAC to 230 VAC

**AX9000XS - U0**

• 100 VAC to 115 VAC

**AX9000XS-J1-U0**

**F** Interface specifications

- Cable discrete model No.

• Motor cable

**AX-CBLM6-DM04**

• Encoder cable

**AX-CBLR10-DM04**

**D** Cable length  
(Note: "DM04" when cable length is 4 m)

\* Made to order products are RoHS non-compliant. Contact CKD as needed.



ABSODEX (for AX7000X Series)

# XS driver

Interface specifications: Parallel I/O (NPN)  
CC-Link  
DeviceNet



## Features

- Power supply is divided into main power supply and control power supply
- Small/lightweight (resin body adopted)
- 7-segment LED 2-digit display
- Supports encoder output (parallel I/O only)
- Serial communication options available
- Drive condition setting and command are possible (CC-Link and DeviceNet only) depending on the host controller

## How to order

- 200 VAC to 230 VAC

**AX9000XS - U0**

- 100 VAC to 115 VAC

**AX9000XS-J1-U0**

Interface specifications  
U0 : Parallel I/O (NPN)  
U2 : CC-Link  
U4 : DeviceNet

## General specifications

Descriptions		Model
		XS driver AX9000XS
Power supply voltage	Main power supply	Three-phase, single-phase 200 VAC ±10% to 230 VAC ±10% 100 VAC ±10% to 115 VAC ±10% (J1 option) (*1)
	Control power	200 VAC ±10% to 230 VAC ±10% 100 VAC ±10% to 115 VAC ±10% (J1 option) (*1)
Power frequency		50/60 Hz
Rated input current		200 VAC: 1.8 A 100 VAC: 2.4 A
Rated output current		1.9 A
Structure		Driver and controller integrated (open)
Operating ambient temperature		0 to 50°C
Operating ambient humidity		20 to 90% RH (no condensation)
Storage ambient temperature		-20 to 65°C
Storage ambient humidity		20 to 90% RH (no condensation)
Atmosphere		No corrosive gas or dust
Anti-noise		1000 V (P-P), pulse width 1 µsec, rising 1 nsec Impulse noise test, induction noise (capacitive coupling)
Vibration resistance		4.9 m/s <sup>2</sup>
Weight		Approx. 1.6 kg
Degree of protection		IP2X (excluding CN4, CN5)

- \*1) If 200 to 230 VAC is connected by mistake when using power voltage 100 to 115 VAC specifications (-J1 option), the driver internal circuit will be damaged.  
\*2) If the main power is cut OFF while the actuator is rotating, the rotation may continue due to inertia.  
\*3) After the main power supply is cut OFF, the motor may rotate due to the residual voltage of the driver.

## Performance specifications

Descriptions	Content
No. of control axes	1 axis, 4194304 pulse/1 rotation
Angle setting unit	° (degree), pulse, indexing No.
Angle min. setting unit	0.001°, 1 pulse
Speed setting unit	sec, rpm
Speed setting range	0.01 to 100 sec / 0.11 to 240 rpm
Equal divisions	1 to 255
Max. command value	8-digit numeric input ±99999999
Timer	0.01 sec to 99.99 sec
Programming language	NC
Programming method	Set data through RS-232C port with a PC, etc.
Operation mode	Auto, MDI, jog, single block, servo OFF, pulse train input mode, network operation mode
Coordinates	Absolute, incremental
Acceleration curve	[5 types] Modified Sine (MS), Modified Constant Velocity (MC/MC2), Modified Trapezoid (MT), Trapezoid (TR)
Status display	LED display CHARGE = Main power POWER = Control power
Operation display	Display with 7-segment LED (2 digits)
Communication interface	RS-232C compliant
I/O signal	Refer to interface specification pages.
Program capacity	Approx. 6000 characters (256)
Electronic thermal	Overheating protection for actuator

## Breaker capacity

Actuator model No.	Driver model No.	Rush current (A)		Breaker capacity
		Single-phase 100 V	Single-phase/three-phase 200 V	Rated current (A)
AX7022X, AX7045X	AX9000XS	16 (*1)	56 (*1)	10

\*1) The value of the rush current is a representative value at 115 VAC and 230 VAC.

Always read the precautions described in ABSODEX Products (Catalog No. CB-054A) before use.

\* Made to order products are RoHS non-compliant.

<b>ABSODEX Model Selection Specification Check Sheet</b>		(Note) For chain drive or gear drive, contact CKD.	
<b>Table direct drive</b>			
Company	Name		
Department			
TEL	FAX		

**■ Operating conditions**

1. Indexing 2. Oscillating

Travel angle  $\Psi$  (°)  or indexing No.

Travel time  $t_t$  (s)

Cycle time  $t_o$  (s)  Cycle time = travel time + stop time

(Note) Indexing time is travel time + settling time.  
Though the settling time depends on working conditions, it is approximately 0.025 to 0.20 seconds.

**■ Load conditions**

**Table**

Material 1. Steel 2. Aluminum

Exterior Dt (mm)

Thickness ht (mm)

Weight m1 (kg)

**Workpiece**

Quantity nw (pcs)

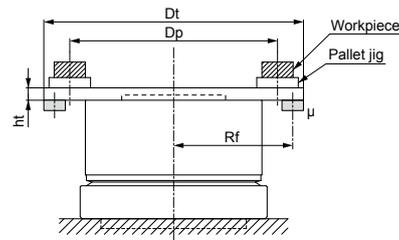
Maximum weight mw (kg/pc)

Mounting center Dp (mm)

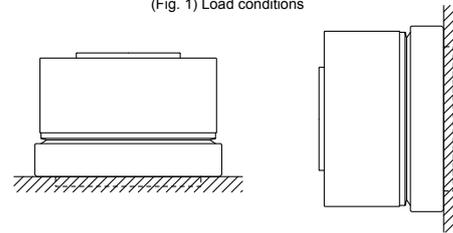
**Pallet jig**

Quantity np (pcs)

Maximum weight mp (kg/pc)



(Fig. 1) Load conditions



(Fig. 2) Mounting direction: Horizontal (Fig. 3) Mounting direction: Vertical

**■ Other load conditions**

**Mounting direction**

1. Horizontal (Fig. 2) 2. Vertical (Fig. 3)

**External work**

1. No 2. Yes

(Note) Eccentric load due to gravity during vertical mounting, external load due to crimping work, etc.

**Table underside support**

1. No 2. Yes

Coefficient of friction  $\mu$

Action radius Rf (mm)

**Equipment rigidity**

1. High 2. Low (Note)

(Note) Use of spline, when unable to fix directly to equipment (Fig. 4), when there are mechanisms such as chucks on the table, etc.

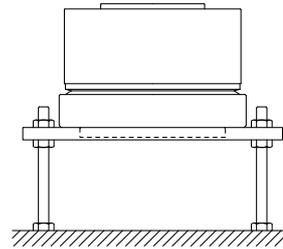
**Extension by table shaft**

1. No 2. Yes (Fig. 5)

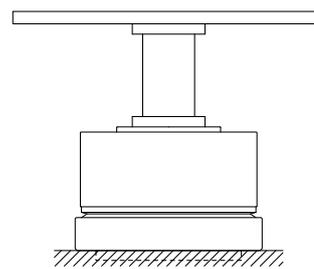
**Movable actuator**

1. No 2. Yes

(Note) When the actuator is movable by mounting on an X-Y table or hoist mechanism, etc.  
(Note) If selecting "2" for any items, contact CKD.



(Fig. 4) Mounting rigidity: Low



(Fig. 5) Extension by shaft

(Note) For more accurate model selection, we recommend that you attach reference drawings giving an overview of the equipment.



## Electric actuator Belt ETV Series

● Applicable motor capacity: 100 W/200 W/400 W/750 W



### Specifications

[Applicable motor capacity: 100 W]

Descriptions		Model		
		ETV-05	ETV-06	ETV-10
Belt width	mm	9	12	15
Lead	mm	40	40	32
Repeatability	mm	±0.08		±0.04
Max. load capacity *1	Horizontal kg	3	3	10
	Vertical kg	-	-	-
Max. speed *1	mm/s	2000	2000	1600
Stroke length *2	mm	100 to 800	100 to 800	100 to 2550
Thrust	N	42	42	61

\*1: The value when acceleration/deceleration time is 0.4 sec.

\*2: Stroke length is 50 pitch.

[Applicable motor capacity: 200 W]

Descriptions		Model
		ETV-14
Belt width	mm	22
Lead	mm	40
Repeatability	mm	±0.04
Max. load capacity *1	Horizontal kg	25
	Vertical kg	-
Max. speed *1	mm/s	2000
Stroke length *2	mm	100 to 3050
Thrust	N	100

\*1: The value when acceleration/deceleration time is 0.4 sec.

\*2: Stroke length is 50 pitch.

[Applicable motor capacity: 400 W]

Descriptions		Model
		ETV-17
Belt width	mm	30
Lead	mm	40
Repeatability	mm	±0.04
Max. load capacity *1	Horizontal kg	45
	Vertical kg	-
Max. speed *1	mm/s	2000
Stroke length *2	mm	100 to 3500
Thrust	N	204

\*1: The value when acceleration/deceleration time is 0.4 sec.

\*2: Stroke length is 50 pitch.

[Applicable motor capacity: 750 W]

Descriptions		Model
		ETV-22
Belt width	mm	50
Lead	mm	40
Repeatability	mm	±0.04
Max. load capacity *1	Horizontal kg	85
	Vertical kg	-
Max. speed *1	mm/s	2000
Stroke length *2	mm	100 to 3500
Thrust	N	367

\*1: The value when acceleration/deceleration time is 0.4 sec.

\*2: Stroke length is 50 pitch.

#### CAUTION:

This product does not have a motor mounted. The user must prepare, mount, and adjust the motor and driver.

The maximum speed is based on the assumption that the motor mounted will have 3000 rpm output.

Thrust and maximum load capacity are at speeds assuming that the motor mounted will output the rated torque.

## How to order

ETV - 06 - 40 010 - D M 1 X C B D P

Model No.

**A** Body size

**B** Lead

**C** Stroke length

**D** Motor mounting method

[Example of model No.]

ETV-06-40010-DM1XCBDN

**A** Body size: Width 65 × height 56 mm

**B** Lead: 40 mm

**C** Stroke length: 100 mm

**D** Motor mounting method: Downward mounting

**E** Mounted motor specifications: Mitsubishi Electric Co., Ltd. **E** Mounted motor specification

**F** Motor capacity: 100 W

**G** Drive belt: Standard (rubber)

**H** Origin sensor: Outside motor side

**I** Limit sensor: Outside

**J** Grease nipple: Mounting direction bottom/without

**K** Positioning pin hole: None

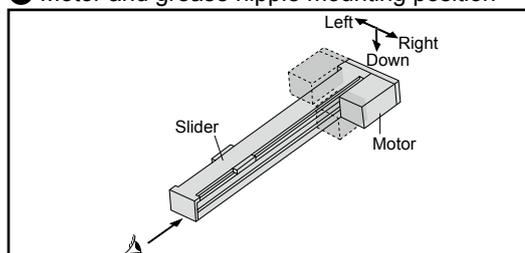
\* For **A** Body size "05" and "06",

**G** Belt "L" cannot be selected.

**E** Mounted motor specification (refer to table 3 on the next page)

Manufacturer	100 W	200 W	400 W	750 W
Mitsubishi Electric Corporation	M	M	M	M
Delta Electronics Co., Ltd.	M	M	M	M
Sanyo Denki Co., Ltd.	M	M	M	-
YASKAWA Electric Corporation	Y	Y	Y	Y
Keyence Corporation	Y	Y	Y	Y
Panasonic Co., Ltd.	P	P	P	P
OMRON Corporation	M	P	P	P

**J** Motor and grease nipple mounting position



Code	Content
<b>A Body size (mm)</b>	
05	Width 50 x height 54
06	Width 65 x height 56
10	Width 102 x height 66
14	Width 135 x height 93
17	Width 170 x height 108
22	Width 220 x height 134
<b>B Lead (refer to table 1 on the next page)</b>	
32	32 mm
40	40 mm
<b>C Stroke length (refer to table 1 on the next page)</b>	
010	100 mm to 3500 mm
to 350	(50 mm pitch) Display is 1/10.
<b>D Motor mounting method (refer to table 2 on the next page)</b>	
U	Upward mounting
D	Downward mounting
R	Right mounting
S	Upper right mounting
T	Lower right mounting
L	Left mounting
V	Upper left mounting
W	Lower left mounting
<b>E Mounted motor specification</b>	
M	Select the mounted motor specification from the table below.
Y	
P	
<b>F Motor capacity (refer to table 2 on the next page)</b>	
1	100 W
2	200 W
4	400 W
8	750 W
<b>G Belt</b>	
X	Standard (rubber)
L	Low dust generation (urethane) *
<b>H Origin sensor (1 pc) (refer to table 4 on the next page)</b>	
N	None
C	Outside motor side (attached at shipment)
D	Outside motor opposite side (attached at shipment)
<b>I Limit sensor (2 pcs) (refer to table 4 on the next page)</b>	
N	None
B	Outside (attached at shipment)
<b>J Grease nipple (refer to table 5 on the next page)</b>	
N	Body mounting direction standard/without
D	Body mounting direction bottom/without
R	Right
L	Left
<b>K Positioning pin hole</b>	
N	None
P	Yes

**H** Origin sensor

**I** Limit sensor

**J** Grease nipple

**K** Positioning pin hole

**Table 1** **B** Lead and **C** Stroke length

Model	<b>B</b> Lead (mm)		<b>C</b> Stroke length (mm) (50 mm pitch)
	32	40	
ETV-05	-	○	100-800
ETV-06	-	○	100-800
ETV-10	○	-	100-2550
ETV-14	-	○	100-3050
ETV-17	-	○	100-3500
ETV-22	-	○	100-3500

**Table 2** **D** Motor mounting method and **F** Motor capacity

Model	<b>D</b> Motor mounting method									<b>F</b> Motor capacity			
	U Upper	D Lower	R Right	S Upper right	T Lower right	L Left	V Upper left	W Lower left	1 100 W	2 200 W	4 400 W	8 750 W	
ETV-05	○	○	-	-	-	-	-	-	○	-	-	-	
ETV-06	○	○	-	-	-	-	-	-	○	-	-	-	
ETV-10	-	-	○	○	○	○	○	○	○	-	-	-	
ETV-14	-	-	○	○	○	○	○	○	-	○	-	-	
ETV-17	-	-	○	○	○	○	○	○	-	-	○	-	
ETV-22	-	-	○	○	○	○	○	○	-	-	-	○	

**Table 3** **E** Mounted motor specifications and recommended motor model number/rated output

<b>E</b> Manufacturer	Motor (without brake)	Motor (with brake)	Rated output	<b>E</b> Manufacturer	Motor (without brake)	Motor (with brake)	Rated output
Mitsubishi Electric Corporation	HG-KR13	HG-KR13B	100 W	Keyence Corporation	SV-M010□□	SV-B010□□	100 W
	HG-KR23	HG-KR23B	200 W		SV-M020□□	SV-B020□□	200 W
	HG-KR43	HG-KR43B	400 W		SV-M040□□	SV-B040□□	400 W
	HG-KR73	HG-KR73B	750 W		SV-M075□□	SV-B075□□	750 W
Delta Electronics (Japan), Inc. Corporation	ECMA-C10401ES	ECMA-C10401FS	100 W	Panasonic Co., Ltd.	MSMD012G1A	MSMD012G1B	100 W
	ECMA-C10602ES	ECMA-C10602FS	200 W		MSMD022G1A	MSMD022G1B	200 W
	ECMA-C10604ES	ECMA-C10604FS	400 W		MSMD042G1A	MSMD042G1B	400 W
	ECMA-C10807ES	ECMA-C10807FS	750 W		MSMD082G1A	MSMD082G1B	750 W
Sanyo Denki Co., Ltd.	R2AA04010FX	R2AA04010FC	100 W	OMRON Corporation	R88M-K10030H	R88M-K10030H-B	100 W
	R2AA06020FX	R2AA06020FC	200 W		R88M-K20030□	R88M-K20030□-B	200 W
	R2AA06040HX	R2AA06040HC	400 W		R88M-K40030□	R88M-K40030□-B	400 W
	-	-	750 W		R88M-K75030H	R88M-K75030H-B	750 W
YASKAWA Electric Corporation	SGMJV-01ADA21	SGMJV-01ADA2C	100 W	* Contact CKD for mounting other than the above recommended motor model numbers and products of other motor manufacturers.			
	SGMJV-02ADA21	SGMJV-02ADA2C	200 W				
	SGMJV-04ADA21	SGMJV-04ADA2C	400 W				
	SGMJV-08ADA21	SGMJV-08ADA2C	750 W				

\* Contact CKD regarding other motor manufacturers and models.

**Table 4** **H** Origin sensor and **I** Limit sensor

Model	<b>H</b> Origin sensor (1 pc)			<b>I</b> Limit sensor (2 pcs)	
	None *1	Outside		None *1	Outside
		Motor side	Motor opposite side		
ETV-05	○	○	○	○	○
ETV-06	○	○	○	○	○
ETV-10	○	○	○	○	○
ETV-14	○	○	○	○	○
ETV-17	○	○	○	○	○
ETV-22	○	○	○	○	○

\*1: Origin sensor and limit sensor are available as a set. Select "None" for both of them if selecting it for either.  
Example: Set of origin sensor "None" + limit sensor "Outside" is not available.

\*2: The user can adjust the sensor position. (Attached at shipment)

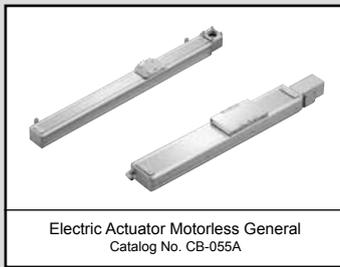
**Table 5** **J** Motor mounting method and options

Model	<b>J</b> Option								
	U Upper	D Lower	R Right	S Upper right	T Lower right	L Left	V Upper left	W Lower left	
ETV-05	N only (body mounting direction: standard (bottom only))								
ETV-06	N: Body mounting direction: standard (top side ø4.5 spot face), D: Body mounting direction: bottom side from bottom surface M5								
ETV-10 to 22	-			N/L			N/R		

\*1: The grease nipple is not assembled for ETV-05, 06.

\*2: ETV-06 has an indication of the body mounting direction. Select "N": mounting direction standard or "D": mounting direction bottom.

\*3: As for ETV-10 to 22, the grease nipple is optional. Select "N": None, "R": Right, or "L": Left.



Electric Actuator Motorless General  
Catalog No. CB-055A

Electric actuator Low dust generation belt

# ECV Series

● Applicable motor capacity: 100 W/200 W/400 W/750 W



## Specifications

[Applicable motor capacity: 100 W]

Descriptions		Model		
		ECV-05	ECV-06	ECV-10
Belt width	mm	9	12	15
Lead	mm	40	40	32
Repeatability	mm	±0.08		±0.04
Max. load capacity *1	Horizontal	kg	3	3
	Vertical	kg	-	-
Max. speed *1	mm/s	2000	2000	1600
Stroke length *2	mm	100 to 800	100 to 800	100 to 2550
Thrust	N	42	42	61

\*1: The value when acceleration/deceleration time is 0.4 sec.

\*2: Stroke length is 50 pitch.

[Applicable motor capacity: 200 W]

Descriptions		Model	
		ECV-14	
Belt width	mm	22	
Lead	mm	40	
Repeatability	mm	±0.04	
Max. load capacity *1	Horizontal	kg	25
	Vertical	kg	-
Max. speed *1	mm/s	2000	
Stroke length *2	mm	100 to 3050	
Thrust	N	100	

\*1: The value when acceleration/deceleration time is 0.4 sec.

\*2: Stroke length is 50 pitch.

[Applicable motor capacity: 400 W]

Descriptions		Model	
		ECV-17	
Belt width	mm	30	
Lead	mm	40	
Repeatability	mm	±0.04	
Max. load capacity *1	Horizontal	kg	45
	Vertical	kg	-
Max. speed *1	mm/s	2000	
Stroke length *2	mm	100 to 3500	
Thrust	N	204	

\*1: The value when acceleration/deceleration time is 0.4 sec.

\*2: Stroke length is 50 pitch.

[Applicable motor capacity: 750 W]

Descriptions		Model	
		ECV-22	
Belt width	mm	50	
Lead	mm	40	
Repeatability	mm	±0.04	
Max. load capacity *1	Horizontal	kg	85
	Vertical	kg	-
Max. speed *1	mm/s	2000	
Stroke length *2	mm	100 to 3400	
Thrust	N	367	

\*1: The value when acceleration/deceleration time is 0.4 sec.

\*2: Stroke length is 50 pitch.

### CAUTION:

This product does not have a motor mounted.

The user must prepare, mount, and adjust the motor and driver.

The maximum speed is based on the assumption that the motor mounted will have 3000 rpm output.

Thrust and maximum load capacity are values assuming that the motor mounted will output the rated torque.

## How to order

ECV - 06 - 40 010 - D M 1 X C B N N

Model No.

**A** Body size

**B** Lead

**C** Stroke length

**D** Motor mounting method

**E** Mounted motor specification

**F** Motor capacity

**G** Belt

**H** Origin sensor

**I** Limit sensor

**J** Grease nipple

**K** Positioning pin hole

Code	Content
<b>A Body size (mm)</b>	
05	Width 50 x height 54
06	Width 65 x height 56
10	Width 108 x height 78.5
14	Width 135 x height 91
17	Width 170 x height 107
22	Width 220 x height 138
<b>B Lead (refer to table 1 on the next page)</b>	
32	32 mm
40	40 mm
<b>C Stroke length (refer to table 1 on the next page)</b>	
010 to 350	100 mm to 3500 mm (50 mm pitch) Display is 1/10.
<b>D Motor mounting method (refer to table 2 on the next page)</b>	
U	Upward mounting
D	Downward mounting
R	Right mounting
S	Upper right mounting
T	Lower right mounting
L	Left mounting
V	Upper left mounting
W	Lower left mounting
<b>E Mounted motor specification</b>	
M	Select the mounted motor specification from the table below.
Y	
P	
<b>F Motor capacity (refer to table 2 on the next page)</b>	
1	100 W
2	200 W
4	400 W
8	750 W
<b>G Belt</b>	
X	Standard (rubber)
L	Low dust generation (urethane) *
<b>H Origin sensor (1 pc) (refer to table 4 on the next page)</b>	
N	None
C	Outside motor side (attached at shipment)
D	Outside motor opposite side (attached at shipment)
<b>I Limit sensor (2 pcs) (refer to table 4 on the next page)</b>	
N	None
B	Outside (attached at shipment)
<b>J Grease nipple (refer to table 5 on the next page)</b>	
N	Body mounting direction standard/without
R	Right
L	Left
<b>K Positioning pin hole</b>	
N	None
P	Yes

### [Example of model No.]

ECV-06-40010-DM1XCBNN

**A** Body size: Width 65 × height 56 mm

**B** Lead: 40 mm

**C** Stroke length: 100 mm

**D** Motor mounting method: Downward mounting

**E** Mounted motor specifications: Manufactured by Mitsubishi Electric Co., Ltd.

**F** Motor capacity: 100 W

**G** Belt: Standard (rubber)

**H** Origin sensor: Outside motor side

**I** Limit sensor: Outside

**J** Grease nipple: Mounting direction standard

**K** Positioning pin hole: None

\* For **A** Body size "05" and "06", **G** Belt "L" cannot be selected.

**E** Mounted motor specification (refer to table 3 on the next page)

Manufacturer	100 W	200 W	400 W	750 W
Mitsubishi Electric Corporation	M	M	M	M
Delta Electronics Co., Ltd.	M	M	M	M
Sanyo Denki Co., Ltd.	M	M	M	-
YASKAWA Electric Corporation	Y	Y	Y	Y
Keyence Corporation	Y	Y	Y	Y
Panasonic Co., Ltd.	P	P	P	P
OMRON Corporation	M	P	P	P

**J** Motor and grease nipple mounting position

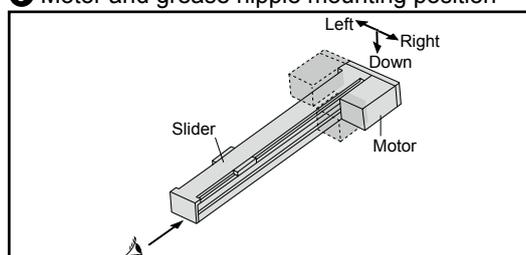


Table 1 **B** Lead and **C** Stroke length

Model	<b>B</b> Lead (mm)		<b>C</b> Stroke length (mm) (50 mm pitch)
	32	40	
ECV-05	-	○	100-800
ECV-06	-	○	100-800
ECV-10	○	-	100-2550
ECV-14	-	○	100-3050
ECV-17	-	○	100-3500
ECV-22	-	○	100-3400

Table 2 **D** Motor mounting method and **F** Motor capacity

Model	<b>D</b> Motor mounting method									<b>F</b> Motor capacity			
	U Upper	D Lower	R Right	S Upper right	T Lower right	L Left	V Upper left	W Lower left	1 100 W	2 200 W	4 400 W	8 750 W	
ECV-05	○	○	-	-	-	-	-	-	○	-	-	-	
ECV-06	○	○	-	-	-	-	-	-	○	-	-	-	
ECV-10	-	-	○	○	○	○	○	○	○	-	-	-	
ECV-14	-	-	○	○	○	○	○	○	-	○	-	-	
ECV-17	-	-	○	○	○	○	○	○	-	-	○	-	
ECV-22	-	-	○	○	○	○	○	○	-	-	-	○	

Table 3 **E** Mounted motor specifications and recommended motor model number/rated output

<b>E</b> Manufacturer	Motor (without brake)	Motor (with brake)	Rated output	<b>E</b> Manufacturer	Motor (without brake)	Motor (with brake)	Rated output
Mitsubishi Electric Corporation	HG-KR13	HG-KR13B	100 W	Keyence Corporation	SV-M010□□	SV-B010□□	100 W
	HG-KR23	HG-KR23B	200 W		SV-M020□□	SV-B020□□	200 W
	HG-KR43	HG-KR43B	400 W		SV-M040□□	SV-B040□□	400 W
	HG-KR73	HG-KR73B	750 W		SV-M075□□	SV-B075□□	750 W
Delta Electronics (Japan), Inc. Corporation	ECMA-C10401ES	ECMA-C10401FS	100 W	Panasonic Co., Ltd.	MSMD012G1A	MSMD012G1B	100 W
	ECMA-C10602ES	ECMA-C10602FS	200 W		MSMD022G1A	MSMD022G1B	200 W
	ECMA-C10604ES	ECMA-C10604FS	400 W		MSMD042G1A	MSMD042G1B	400 W
	ECMA-C10807ES	ECMA-C10807FS	750 W		MSMD082G1A	MSMD082G1B	750 W
Sanyo Denki Co., Ltd.	R2AA04010FX	R2AA04010FC	100 W	OMRON Corporation	R88M-K10030H	R88M-K10030H-B	100 W
	R2AA06020FX	R2AA06020FC	200 W		R88M-K20030□	R88M-K20030□-B	200 W
	R2AA06040HX	R2AA06040HC	400 W		R88M-K40030□	R88M-K40030□-B	400 W
	-	-	750 W		R88M-K75030H	R88M-K75030H-B	750 W
YASKAWA Electric Corporation	SGMJV-01ADA21	SGMJV-01ADA2C	100 W	* Contact CKD for mounting other than the above recommended motor model numbers and products of other motor manufacturers.			
	SGMJV-02ADA21	SGMJV-02ADA2C	200 W				
	SGMJV-04ADA21	SGMJV-04ADA2C	400 W				
	SGMJV-08ADA21	SGMJV-08ADA2C	750 W				

\* Contact CKD regarding other motor manufacturers, models and details.

Table 4 **H** Origin sensor and **I** Limit sensor

Model	<b>H</b> Origin sensor (1 pc)			<b>I</b> Limit sensor (2 pcs)	
	None *1	Outside		None *1	Outside
	Motor side	Motor opposite side			
ECV-05	○	○	○	○	○
ECV-06	○	○	○	○	○
ECV-10	○	○	○	○	○
ECV-14	○	○	○	○	○
ECV-17	○	○	○	○	○
ECV-22	○	○	○	○	○

\*1: Origin sensor and limit sensor are available as a set. Select "None" for both of them if selecting it for either.  
Example: Set of origin sensor "None" + limit sensor "Outside" is not available.

\*2: The user can adjust the sensor position. (Attached at shipment)

Table 5 **J** Motor mounting method and options

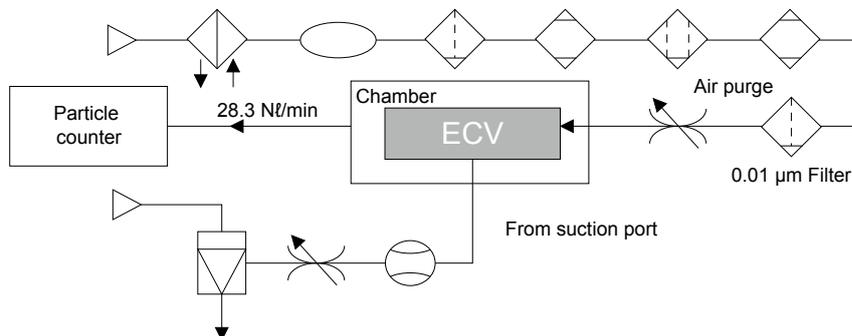
Model	<b>J</b> Option								
	U Upper	D Lower	R Right	S Upper right	T Lower right	L Left	V Upper left	W Lower left	
ECV-05/06	N only (body mounting direction: standard)								
ECV-10 to 22	-			N/L			N/R		

\*1: The grease nipple is not attached for ECV-05 and 06.

\*2: As for ECV-10 to 22, the grease nipple is optional. Select "N": None, "R": Right, or "L": Left.

### Dust generation characteristics Reference data

#### Test circuit



#### Measuring method

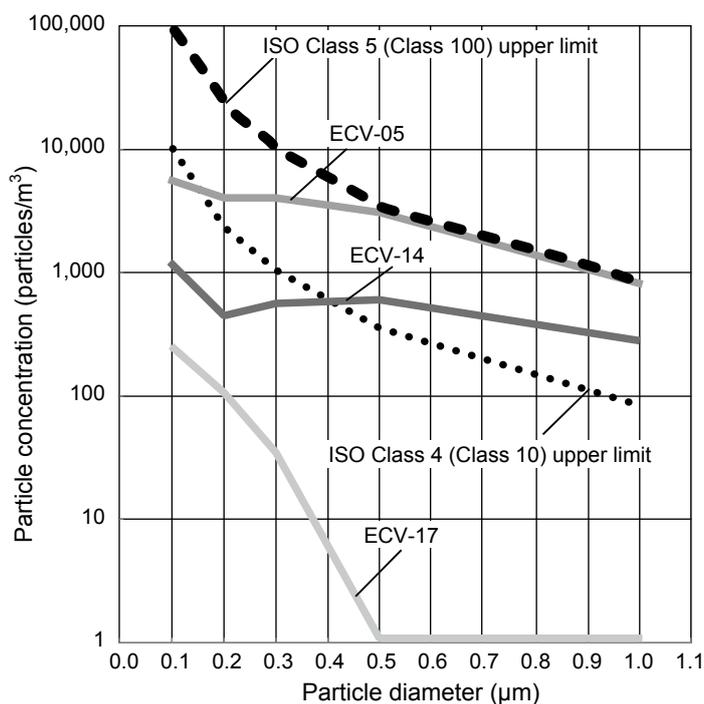
- (1) Set a test sample in the acrylic resin chamber.
- (2) Supply clean air at the same flow rate as the particle counter intake rate (28.3 Nl/min).
- (3) Place the chamber in an ISO class 4 (class 10) clean bench.
- (4) Activate the test sample, and measure changes in particle concentration over time during the specified measurement time.
- (5) Test sample operating speed

#### Measuring conditions

Descriptions		Content
Test sample	Model No.	Operating speed 800 mm/sec for ECV-05-40040
		Operating speed 800 mm/sec for ECV-14-40040
		Operating speed 800 mm/sec for ECV-17-40040
Test sample	Acceleration/deceleration time	0.4 sec
	Air intake	30.0 Nl/min for ECV-05-40040
60.0 Nl/min for ECV-14-40040		
80.0 Nl/min for ECV-17-40040		
Chamber	Internal capacity	28.3 Nl
Particle counter	Name	Laser dust monitor
	Min. measurable particle diameter	0.1 µm
	Intake	28.3 Nl/min
Setting conditions	Sampling	10 min
	Interval	40 min
	Measurement time	50 h

#### Dust generation data

The values in the data are measured values under the above conditions, and are not guaranteed.



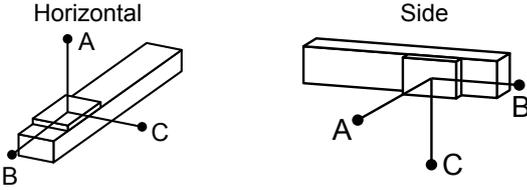
# ETV/ECV Model Selection Check Sheet → CKD (Contact \_\_\_\_\_)

Fill in the form and send to the nearest CKD Sales Office. We will respond with the model selection results.

Customer:

Company		Department	
Name		E-mail	
TEL		FAX	

Selecting conditions:

Desired model	ETV- ECV-		
Basic specifications	Max. stroke length:	mm	belt lead: mm
Operating conditions	Travel stroke:	mm	travel time: sec
	Set speed:	mm/s	
	Set acceleration/deceleration:	mm/s <sup>2</sup>	(set acceleration/deceleration time: sec)
	Repeatability: ±	mm	
Load conditions	Mounting orientation: Horizontal (upward) / Horizontal (side) / Other		
			
	Load weight:	kg	
	Overhang (distance from the slider center to the load center of gravity):	A direction mm, B direction mm, C direction mm	mm
	Pressing load: No / Yes ( N) Operating / Stopped Direction of the force applied to slider center ( )		
Working environment	Ambient temperature:	°C	ambient humidity: %
	Atmosphere:		
Motor used	Manufacturer:	, Model No.:	
	Motor capacity:	W	
Remarks			

### Theoretical thrust table (double acting)

(Unit: N)

Bore size (mm)	Compatible models	Operating direction	Working pressure MPa												
			0.05	0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
ø4	MDC2	Push	-	-	-	2.51	3.77	5.03	6.28	7.54	8.80	-	-	-	
		Pull	-	-	-	1.88	2.83	3.77	4.71	5.65	6.60	-	-	-	
	SCPD3	Push	-	-	-	5.65	8.48	11.3	14.1	17.0	19.8	22.6	25.4	28.3	
		Pull	-	-	-	4.24	6.36	8.48	10.6	12.7	14.8	17.0	19.1	21.2	
	MDC2	Push	-	-	-	5.65	8.48	11.3	14.1	17.0	19.8	-	-	-	
		Pull	-	-	-	3.14	4.71	6.28	7.85	9.42	11.0	-	-	-	
	MSD/MSD-K MSDG-L	Push	-	-	-	5.65	8.48	11.3	14.1	17.0	19.8	22.6	25.4	28.3	
		Pull	-	-	-	3.14	4.71	6.28	7.85	9.42	11.0	12.6	14.1	15.7	
	MVC	Push	-	-	-	5.65	8.48	11.3	14.1	17.0	19.8	-	-	-	
		Pull	-	-	-	3.14	4.71	6.28	7.85	9.42	11.0	-	-	-	
	SMG	Push	-	-	-	5.65	8.48	11.3	14.1	17.0	19.8	-	-	-	
		Pull	-	-	-	4.24	6.36	8.48	10.6	12.7	14.8	-	-	-	
MRL2/MRL2-G	Push	-	-	-	-	8.48	11.3	14.1	17.0	19.8	-	-	-		
	Pull	-	-	-	-	8.48	11.3	14.1	17.0	19.8	-	-	-		
MRL2-W	Push	-	-	-	-	17.0	22.6	28.3	33.9	39.6	-	-	-		
	Pull	-	-	-	-	17.0	22.6	28.3	33.9	39.6	-	-	-		
STR2	Push	-	-	-	11.3	17.0	22.6	28.3	33.9	39.6	-	-	-		
	Pull	-	-	-	6.28	9.42	12.6	15.7	18.8	22.0	-	-	-		
LCR	Push	-	-	8.48	11.3	17.0	22.6	28.3	33.9	39.6	-	-	-		
	Pull	-	-	6.36	8.48	12.7	17.0	21.2	25.4	29.7	-	-	-		
LCG	Push	-	-	8.48	11.3	17.0	22.6	28.3	33.9	39.6	-	-	-		
	Pull	-	-	6.36	8.48	12.7	17.0	21.2	25.4	29.7	-	-	-		
ø6	MDC2	Push	-	-	-	10.1	15.1	20.1	25.1	30.2	35.2	-	-	-	
		Pull	-	-	-	6.13	9.19	12.3	15.3	18.4	21.4	-	-	-	
	MSD/MSD-K MSDG-L	Push	-	-	-	10.1	15.1	20.1	25.1	30.2	35.2	40.2	45.2	50.3	
		Pull	-	-	-	6.13	9.19	12.3	15.3	18.4	21.4	24.5	27.6	30.6	
	LCR	Push	-	-	15.1	20.1	30.2	40.2	50.3	60.3	70.4	-	-	-	
		Pull	-	-	11.3	15.1	22.6	30.2	37.7	45.2	52.8	-	-	-	
	LCG	Push	-	-	15.1	20.1	30.2	40.2	50.3	60.3	70.4	-	-	-	
		Pull	-	-	11.3	15.1	22.6	30.2	37.7	45.2	52.8	-	-	-	
	ø8	SCPD3	Push	-	7.85	11.8	15.7	23.6	31.4	39.3	47.1	55.0	62.8	70.7	78.5
			Pull	-	6.60	9.90	13.2	19.8	26.4	33.0	39.6	46.2	52.8	59.4	66.0
		MDC2	Push	-	7.85	11.8	15.7	23.6	31.4	39.3	47.1	55.0	-	-	-
			Pull	-	5.03	7.54	10.1	15.1	20.1	25.1	30.2	35.2	-	-	-
MVC		Push	-	7.85	11.8	15.7	23.6	31.4	39.3	47.1	55.0	-	-	-	
		Pull	-	5.03	7.54	10.1	15.1	20.1	25.1	30.2	35.2	-	-	-	
SMG		Push	-	7.85	11.8	15.7	23.6	31.4	39.3	47.1	55.0	-	-	-	
		Pull	-	6.60	9.90	13.2	19.8	26.4	33.0	39.6	46.2	-	-	-	
MRL2/MRL2-G		Push	-	-	-	-	23.6	31.4	39.3	47.1	55.0	-	-	-	
		Pull	-	-	-	-	23.6	31.4	39.3	47.1	55.0	-	-	-	
MRL2-W		Push	-	-	-	-	47.1	62.8	78.5	94.2	1.10 × 10 <sup>2</sup>	-	-	-	
		Pull	-	-	-	-	47.1	62.8	78.5	94.2	1.10 × 10 <sup>2</sup>	-	-	-	
MRG2	Push	-	-	-	-	23.6	31.4	39.3	47.1	55.0	-	-	-		
	Pull	-	-	-	-	23.6	31.4	39.3	47.1	55.0	-	-	-		
STR2	Push	-	-	-	31.4	47.1	62.8	78.5	94.2	1.10 × 10 <sup>2</sup>	-	-	-		
	Pull	-	-	-	20.1	30.2	40.2	50.3	60.3	70.4	-	-	-		
UCA2	Push	-	-	-	20.1	30.2	40.2	50.3	60.3	70.4	80.4	90.5	1.01 × 10 <sup>2</sup>		
	Pull	-	-	-	20.1	30.2	40.2	50.3	60.3	70.4	80.4	90.5	1.01 × 10 <sup>2</sup>		
ø10	MSD-K/ MSDG-L	Push	-	11.3	17.0	22.6	33.9	45.2	56.5	67.9	79.2	90.5	1.02 × 10 <sup>2</sup>	1.13 × 10 <sup>2</sup>	
		Pull	-	8.48	12.7	17.0	25.4	33.9	42.4	50.9	59.4	67.9	76.3	84.8	
	SSD/SSD2	Push	-	11.3	17.0	22.6	33.9	45.2	56.5	67.9	79.2	90.5	1.02 × 10 <sup>2</sup>	1.13 × 10 <sup>2</sup>	
		Pull	-	8.48	12.7	17.0	25.4	33.9	42.4	50.9	59.4	67.9	76.3	84.8	
	SSG	Push	-	-	17.0	22.6	33.9	45.2	56.5	67.9	79.2	90.5	1.02 × 10 <sup>2</sup>	1.13 × 10 <sup>2</sup>	
		Pull	-	-	12.7	17.0	25.4	33.9	42.4	50.9	59.4	67.9	76.3	84.8	
	SRL3	Push	-	-	-	27.7	41.5	55.3	69.1	83.0	96.8	-	-	-	
		Pull	-	-	-	27.7	41.5	55.3	69.1	83.0	96.8	-	-	-	
	LCR	Push	-	-	33.9	45.2	67.9	90.5	1.13 × 10 <sup>2</sup>	1.36 × 10 <sup>2</sup>	1.58 × 10 <sup>2</sup>	-	-	-	
		Pull	-	-	25.4	33.9	50.9	67.9	84.8	1.02 × 10 <sup>2</sup>	1.19 × 10 <sup>2</sup>	-	-	-	
	LCG	Push	-	-	33.9	45.2	67.9	90.5	1.13 × 10 <sup>2</sup>	1.36 × 10 <sup>2</sup>	1.58 × 10 <sup>2</sup>	-	-	-	
		Pull	-	-	25.4	33.9	50.9	67.9	84.8	1.02 × 10 <sup>2</sup>	1.19 × 10 <sup>2</sup>	-	-	-	
LCW	Push	-	-	17	23	34	45	57	68	79	-	-	-		
	Pull	-	-	13	17	25	34	42	51	59	-	-	-		
STG	Push	-	-	17.0	22.6	33.9	45.2	56.5	67.9	79.2	90.5	1.02 × 10 <sup>2</sup>	1.13 × 10 <sup>2</sup>		
	Pull	-	-	12.7	17.0	25.4	33.9	42.4	50.9	59.4	67.9	76.3	84.8		
ø16	SCPD3/ULKP	Push	-	20.1	30.2	40.2	60.3	80.4	1.01 × 10 <sup>2</sup>	1.21 × 10 <sup>2</sup>	1.41 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	1.81 × 10 <sup>2</sup>	2.01 × 10 <sup>2</sup>	
		Pull	-	18.1	27.2	36.3	54.4	72.6	90.7	1.09 × 10 <sup>2</sup>	1.27 × 10 <sup>2</sup>	1.45 × 10 <sup>2</sup>	1.63 × 10 <sup>2</sup>	1.81 × 10 <sup>2</sup>	

# Technical data 2

## Theoretical thrust table (double acting)

(Unit: N)

Bore size (mm)	Compatible models	Operating direction	Working pressure MPa											
			0.05	0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø16	MSD-K/ MSDG-L	Push	-	20.1	30.2	40.2	60.3	80.4	1.01 × 10 <sup>2</sup>	1.21 × 10 <sup>2</sup>	1.41 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	1.81 × 10 <sup>2</sup>	2.01 × 10 <sup>2</sup>
		Pull	-	15.1	22.6	30.2	45.2	60.3	75.4	90.5	1.06 × 10 <sup>2</sup>	1.21 × 10 <sup>2</sup>	1.36 × 10 <sup>2</sup>	1.51 × 10 <sup>2</sup>
	SMG	Push	-	20.1	30.2	40.2	60.3	80.4	1.01 × 10 <sup>2</sup>	1.21 × 10 <sup>2</sup>	1.41 × 10 <sup>2</sup>	-	-	-
		Pull	-	17.3	25.9	34.6	51.8	69.1	86.4	1.04 × 10 <sup>2</sup>	1.21 × 10 <sup>2</sup>	-	-	-
	STG	Push	-	-	30.2	40.2	60.3	80.4	1.01 × 10 <sup>2</sup>	1.21 × 10 <sup>2</sup>	1.41 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	1.81 × 10 <sup>2</sup>	2.01 × 10 <sup>2</sup>
		Pull	-	-	22.6	30.2	45.2	60.3	75.4	90.5	1.06 × 10 <sup>2</sup>	1.21 × 10 <sup>2</sup>	1.36 × 10 <sup>2</sup>	1.51 × 10 <sup>2</sup>
	MRL2/MRL2-G	Push	-	-	-	40.2	60.3	80.4	1.01 × 10 <sup>2</sup>	1.21 × 10 <sup>2</sup>	1.41 × 10 <sup>2</sup>	-	-	-
		Pull	-	-	-	40.2	60.3	80.4	1.01 × 10 <sup>2</sup>	1.21 × 10 <sup>2</sup>	1.41 × 10 <sup>2</sup>	-	-	-
	MRL2-W	Push	-	-	-	80.4	1.21 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	2.01 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	2.81 × 10 <sup>2</sup>	-	-	-
		Pull	-	-	-	80.4	1.21 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	2.01 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	2.81 × 10 <sup>2</sup>	-	-	-
	MRG2	Push	-	-	-	40.2	60.3	80.4	1.01 × 10 <sup>2</sup>	1.21 × 10 <sup>2</sup>	1.41 × 10 <sup>2</sup>	-	-	-
		Pull	-	-	-	40.2	60.3	80.4	1.01 × 10 <sup>2</sup>	1.21 × 10 <sup>2</sup>	1.41 × 10 <sup>2</sup>	-	-	-
	STR2	Push	-	40.2	60.3	80.4	1.21 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	2.01 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	2.81 × 10 <sup>2</sup>	-	-	-
		Pull	-	24.5	36.8	49.0	73.5	98.0	1.23 × 10 <sup>2</sup>	1.47 × 10 <sup>2</sup>	1.72 × 10 <sup>2</sup>	-	-	-
	UCA2	Push	-	-	-	49.0	73.5	98.0	1.23 × 10 <sup>2</sup>	1.47 × 10 <sup>2</sup>	1.72 × 10 <sup>2</sup>	1.96 × 10 <sup>2</sup>	2.21 × 10 <sup>2</sup>	2.45 × 10 <sup>2</sup>
		Pull	-	-	-	49.0	73.5	98.0	1.23 × 10 <sup>2</sup>	1.47 × 10 <sup>2</sup>	1.72 × 10 <sup>2</sup>	1.96 × 10 <sup>2</sup>	2.21 × 10 <sup>2</sup>	2.45 × 10 <sup>2</sup>
	SSD/SSD2	Push	-	20.1	30.2	40.2	60.3	80.4	1.01 × 10 <sup>2</sup>	1.21 × 10 <sup>2</sup>	1.41 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	1.81 × 10 <sup>2</sup>	2.01 × 10 <sup>2</sup>
		Pull	-	15.1	22.6	30.2	45.2	60.3	75.4	90.5	1.06 × 10 <sup>2</sup>	1.21 × 10 <sup>2</sup>	1.36 × 10 <sup>2</sup>	1.51 × 10 <sup>2</sup>
	SSG	Push	-	-	30.2	40.2	60.3	80.4	1.01 × 10 <sup>2</sup>	1.21 × 10 <sup>2</sup>	1.41 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	1.81 × 10 <sup>2</sup>	2.01 × 10 <sup>2</sup>
		Pull	-	-	22.6	30.2	45.2	60.3	75.4	90.5	1.06 × 10 <sup>2</sup>	1.21 × 10 <sup>2</sup>	1.36 × 10 <sup>2</sup>	1.51 × 10 <sup>2</sup>
SRL3	Push	-	-	-	43.2	64.8	86.4	1.08 × 10 <sup>2</sup>	1.30 × 10 <sup>2</sup>	1.51 × 10 <sup>2</sup>	-	-	-	
	Pull	-	-	-	43.2	64.8	86.4	1.08 × 10 <sup>2</sup>	1.30 × 10 <sup>2</sup>	1.51 × 10 <sup>2</sup>	-	-	-	
LCR	Push	-	-	60.3	80.4	1.21 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	2.01 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	2.81 × 10 <sup>2</sup>	-	-	-	
	Pull	-	-	51.8	69.1	1.04 × 10 <sup>2</sup>	1.38 × 10 <sup>2</sup>	1.73 × 10 <sup>2</sup>	2.07 × 10 <sup>2</sup>	2.42 × 10 <sup>2</sup>	-	-	-	
LCG	Push	-	-	60.3	80.4	1.21 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	2.01 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	2.81 × 10 <sup>2</sup>	-	-	-	
	Pull	-	-	51.8	69.1	1.04 × 10 <sup>2</sup>	1.38 × 10 <sup>2</sup>	1.73 × 10 <sup>2</sup>	2.07 × 10 <sup>2</sup>	2.42 × 10 <sup>2</sup>	-	-	-	
LCW	Push	-	-	30	40	60	80	101	121	141	-	-	-	
	Pull	-	-	26	35	52	69	86	104	121	-	-	-	
ø20	CMK2/ULK SSD2/SSD	Push	-	31.4	47.1	62.8	94.2	1.26 × 10 <sup>2</sup>	1.57 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.20 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	2.83 × 10 <sup>2</sup>	3.14 × 10 <sup>2</sup>
		Pull	-	23.6	35.3	47.1	70.7	94.2	1.18 × 10 <sup>2</sup>	1.41 × 10 <sup>2</sup>	1.65 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.12 × 10 <sup>2</sup>	2.36 × 10 <sup>2</sup>
	SSG	Push	-	-	47.1	62.8	94.2	1.26 × 10 <sup>2</sup>	1.57 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.20 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	2.83 × 10 <sup>2</sup>	3.14 × 10 <sup>2</sup>
		Pull	-	-	35.3	47.1	70.7	94.2	1.18 × 10 <sup>2</sup>	1.41 × 10 <sup>2</sup>	1.65 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.12 × 10 <sup>2</sup>	2.36 × 10 <sup>2</sup>
	USSD/ USSD-K	Push	-	-	-	- (*1)	94.2	1.26 × 10 <sup>2</sup>	1.57 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.20 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	2.83 × 10 <sup>2</sup>	3.14 × 10 <sup>2</sup>
		Pull	-	-	-	- (*1)	70.7	94.2	1.18 × 10 <sup>2</sup>	1.41 × 10 <sup>2</sup>	1.65 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.12 × 10 <sup>2</sup>	2.36 × 10 <sup>2</sup>
	SMG	Push	-	31.4	47.1	62.8	94.2	1.26 × 10 <sup>2</sup>	1.57 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.20 × 10 <sup>2</sup>	-	-	-
		Pull	-	26.4	39.6	52.8	79.2	1.06 × 10 <sup>2</sup>	1.32 × 10 <sup>2</sup>	1.58 × 10 <sup>2</sup>	1.85 × 10 <sup>2</sup>	-	-	-
	MRL2/MRL2-G	Push	-	-	-	62.8	94.2	1.26 × 10 <sup>2</sup>	1.57 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.20 × 10 <sup>2</sup>	-	-	-
		Pull	-	-	-	62.8	94.2	1.26 × 10 <sup>2</sup>	1.57 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.20 × 10 <sup>2</sup>	-	-	-
	MRL2-W	Push	-	-	-	1.26 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	3.14 × 10 <sup>2</sup>	3.77 × 10 <sup>2</sup>	4.40 × 10 <sup>2</sup>	-	-	-
		Pull	-	-	-	1.26 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	3.14 × 10 <sup>2</sup>	3.77 × 10 <sup>2</sup>	4.40 × 10 <sup>2</sup>	-	-	-
	STR2	Push	-	62.8	94.2	1.26 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	3.14 × 10 <sup>2</sup>	3.77 × 10 <sup>2</sup>	4.40 × 10 <sup>2</sup>	-	-	-
		Pull	-	40.2	60.3	80.4	1.21 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	2.01 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	2.81 × 10 <sup>2</sup>	-	-	-
	LCR	Push	-	-	94.2	1.26 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	3.14 × 10 <sup>2</sup>	3.77 × 10 <sup>2</sup>	4.40 × 10 <sup>2</sup>	-	-	-
		Pull	-	-	79.2	1.06 × 10 <sup>2</sup>	1.58 × 10 <sup>2</sup>	2.11 × 10 <sup>2</sup>	2.64 × 10 <sup>2</sup>	3.17 × 10 <sup>2</sup>	3.69 × 10 <sup>2</sup>	-	-	-
	LCG	Push	-	-	94.2	1.26 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	3.14 × 10 <sup>2</sup>	3.77 × 10 <sup>2</sup>	4.40 × 10 <sup>2</sup>	-	-	-
		Pull	-	-	79.2	1.06 × 10 <sup>2</sup>	1.58 × 10 <sup>2</sup>	2.11 × 10 <sup>2</sup>	2.64 × 10 <sup>2</sup>	3.17 × 10 <sup>2</sup>	3.69 × 10 <sup>2</sup>	-	-	-
	LCW	Push	-	-	47	63	94	126	157	188	220	-	-	-
		Pull	-	-	40	53	79	106	132	158	185	-	-	-
STG	Push	-	-	47.1	62.8	94.2	1.26 × 10 <sup>2</sup>	1.57 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.20 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	2.83 × 10 <sup>2</sup>	3.14 × 10 <sup>2</sup>	
	Pull	-	-	35.3	47.1	70.7	94.2	1.18 × 10 <sup>2</sup>	1.41 × 10 <sup>2</sup>	1.65 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.12 × 10 <sup>2</sup>	2.36 × 10 <sup>2</sup>	
STK/STK-M	Push	-	-	-	62.8	94.2	1.26 × 10 <sup>2</sup>	1.57 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.20 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	2.83 × 10 <sup>2</sup>	3.14 × 10 <sup>2</sup>	
	Pull	-	-	-	40.2	60.3	80.4	1.01 × 10 <sup>2</sup>	1.21 × 10 <sup>2</sup>	1.41 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	1.81 × 10 <sup>2</sup>	2.01 × 10 <sup>2</sup>	
STK-Y1/STK- MY1	Push	-	-	-	-	94.2	1.26 × 10 <sup>2</sup>	1.57 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.20 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	2.83 × 10 <sup>2</sup>	3.14 × 10 <sup>2</sup>	
	Pull	-	-	-	-	45.6	65.7	85.8	1.06 × 10 <sup>2</sup>	1.26 × 10 <sup>2</sup>	1.46 × 10 <sup>2</sup>	1.66 × 10 <sup>2</sup>	1.86 × 10 <sup>2</sup>	
SCM	Push	-	31.4	47.1	62.8	94.2	1.26 × 10 <sup>2</sup>	1.57 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.20 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	2.83 × 10 <sup>2</sup>	3.14 × 10 <sup>2</sup>	
	Pull	-	26.4	39.6	52.8	79.2	1.06 × 10 <sup>2</sup>	1.32 × 10 <sup>2</sup>	1.58 × 10 <sup>2</sup>	1.85 × 10 <sup>2</sup>	2.11 × 10 <sup>2</sup>	2.38 × 10 <sup>2</sup>	2.64 × 10 <sup>2</sup>	
SRL3	Push	-	-	-	62.9	94.4	1.26 × 10 <sup>2</sup>	1.57 × 10 <sup>2</sup>	1.89 × 10 <sup>2</sup>	2.20 × 10 <sup>2</sup>	-	-	-	
	Pull	-	-	-	62.9	94.4	1.26 × 10 <sup>2</sup>	1.57 × 10 <sup>2</sup>	1.89 × 10 <sup>2</sup>	2.20 × 10 <sup>2</sup>	-	-	-	
ø25	CMK2/ULK SSD2/SSD	Push	-	49.1	73.6	98.2	1.47 × 10 <sup>2</sup>	1.96 × 10 <sup>2</sup>	2.45 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.44 × 10 <sup>2</sup>	3.93 × 10 <sup>2</sup>	4.42 × 10 <sup>2</sup>	4.91 × 10 <sup>2</sup>
		Pull	-	37.8	56.7	75.6	1.13 × 10 <sup>2</sup>	1.51 × 10 <sup>2</sup>	1.89 × 10 <sup>2</sup>	2.27 × 10 <sup>2</sup>	2.64 × 10 <sup>2</sup>	3.02 × 10 <sup>2</sup>	3.40 × 10 <sup>2</sup>	3.78 × 10 <sup>2</sup>
	SSG	Push	-	-	73.6	98.2	1.47 × 10 <sup>2</sup>	1.96 × 10 <sup>2</sup>	2.45 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.44 × 10 <sup>2</sup>	3.93 × 10 <sup>2</sup>	4.42 × 10 <sup>2</sup>	4.91 × 10 <sup>2</sup>
		Pull	-	-	56.7	75.6	1.13 × 10 <sup>2</sup>	1.51 × 10 <sup>2</sup>	1.89 × 10 <sup>2</sup>	2.27 × 10 <sup>2</sup>	2.64 × 10 <sup>2</sup>	3.02 × 10 <sup>2</sup>	3.40 × 10 <sup>2</sup>	3.78 × 10 <sup>2</sup>
	USSD/ USSD-K	Push	-	-	-	- (*1)	1.47 × 10 <sup>2</sup>	1.96 × 10 <sup>2</sup>	2.45 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.44 × 10 <sup>2</sup>	3.93 × 10 <sup>2</sup>	4.42 × 10 <sup>2</sup>	4.91 × 10 <sup>2</sup>
		Pull	-	-	-	- (*1)	1.13 × 10 <sup>2</sup>	1.51 × 10 <sup>2</sup>	1.89 × 10 <sup>2</sup>	2.27 × 10 <sup>2</sup>	2.64 × 10 <sup>2</sup>	3.02 × 10 <sup>2</sup>	3.40 × 10 <sup>2</sup>	3.78 × 10 <sup>2</sup>
	SMG	Push	-	49.1	73.6	98.2	1.47 × 10 <sup>2</sup>	1.96 × 10 <sup>2</sup>	2.45 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.44 × 10 <sup>2</sup>	-	-	-
		Pull	-	41.2	61.9	82.5	1.24 × 10 <sup>2</sup>	1.65 × 10 <sup>2</sup>	2.06 × 10 <sup>2</sup>	2.47 × 10 <sup>2</sup>	2.89 × 10 <sup>2</sup>	-	-	-

\*1: The min. starting pressure for USSD and USSD-K is 0.25 MPa. Refer to Pneumatic Cylinders II (Catalog No. CB-030SA) for the theoretical thrust at 0.25 MPa.

Theoretical thrust table (double acting)

(Unit: N)

Bore size (mm)	Compatible models	Operating direction	Working pressure MPa											
			0.05	0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø25	MRL2/MRL2-G	Push	-	-	-	98.2	1.47 × 10 <sup>2</sup>	1.96 × 10 <sup>2</sup>	2.45 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.44 × 10 <sup>2</sup>	-	-	-
		Pull	-	-	-	98.2	1.47 × 10 <sup>2</sup>	1.96 × 10 <sup>2</sup>	2.45 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.44 × 10 <sup>2</sup>	-	-	-
	MRL2-W	Push	-	-	-	1.96 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.93 × 10 <sup>2</sup>	4.91 × 10 <sup>2</sup>	5.89 × 10 <sup>2</sup>	6.87 × 10 <sup>2</sup>	-	-	-
		Pull	-	-	-	1.96 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.93 × 10 <sup>2</sup>	4.91 × 10 <sup>2</sup>	5.89 × 10 <sup>2</sup>	6.87 × 10 <sup>2</sup>	-	-	-
	MRG2	Push	-	-	-	98.2	1.47 × 10 <sup>2</sup>	1.96 × 10 <sup>2</sup>	2.45 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.44 × 10 <sup>2</sup>	-	-	-
		Pull	-	-	-	98.2	1.47 × 10 <sup>2</sup>	1.96 × 10 <sup>2</sup>	2.45 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.44 × 10 <sup>2</sup>	-	-	-
	LCR	Push	-	-	1.47 × 10 <sup>2</sup>	1.96 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.93 × 10 <sup>2</sup>	4.91 × 10 <sup>2</sup>	5.89 × 10 <sup>2</sup>	6.87 × 10 <sup>2</sup>	-	-	-
		Pull	-	-	1.24 × 10 <sup>2</sup>	1.65 × 10 <sup>2</sup>	2.47 × 10 <sup>2</sup>	3.30 × 10 <sup>2</sup>	4.12 × 10 <sup>2</sup>	4.95 × 10 <sup>2</sup>	5.77 × 10 <sup>2</sup>	-	-	-
	LCG	Push	-	-	1.47 × 10 <sup>2</sup>	1.96 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.93 × 10 <sup>2</sup>	4.91 × 10 <sup>2</sup>	5.89 × 10 <sup>2</sup>	6.87 × 10 <sup>2</sup>	-	-	-
		Pull	-	-	1.24 × 10 <sup>2</sup>	1.65 × 10 <sup>2</sup>	2.47 × 10 <sup>2</sup>	3.30 × 10 <sup>2</sup>	4.12 × 10 <sup>2</sup>	4.95 × 10 <sup>2</sup>	5.77 × 10 <sup>2</sup>	-	-	-
	LCX	Push	-	-	74	99	148	197	246	296	345	-	-	-
		Pull	-	-	57	76	114	152	190	228	266	-	-	-
	STG	Push	-	-	73.6	98.2	1.47 × 10 <sup>2</sup>	1.96 × 10 <sup>2</sup>	2.45 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.44 × 10 <sup>2</sup>	3.93 × 10 <sup>2</sup>	4.42 × 10 <sup>2</sup>	4.91 × 10 <sup>2</sup>
		Pull	-	-	56.7	75.6	1.13 × 10 <sup>2</sup>	1.51 × 10 <sup>2</sup>	1.89 × 10 <sup>2</sup>	2.27 × 10 <sup>2</sup>	2.64 × 10 <sup>2</sup>	3.02 × 10 <sup>2</sup>	3.40 × 10 <sup>2</sup>	3.78 × 10 <sup>2</sup>
	STR2	Push	-	98.2	1.47 × 10 <sup>2</sup>	1.96 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.93 × 10 <sup>2</sup>	4.91 × 10 <sup>2</sup>	5.89 × 10 <sup>2</sup>	6.87 × 10 <sup>2</sup>	-	-	-
		Pull	-	67.4	1.01 × 10 <sup>2</sup>	1.35 × 10 <sup>2</sup>	2.02 × 10 <sup>2</sup>	2.70 × 10 <sup>2</sup>	3.37 × 10 <sup>2</sup>	4.04 × 10 <sup>2</sup>	4.72 × 10 <sup>2</sup>	-	-	-
	UCA2	Push	-	67.4	1.01 × 10 <sup>2</sup>	1.35 × 10 <sup>2</sup>	2.02 × 10 <sup>2</sup>	2.70 × 10 <sup>2</sup>	3.37 × 10 <sup>2</sup>	4.04 × 10 <sup>2</sup>	4.72 × 10 <sup>2</sup>	5.39 × 10 <sup>2</sup>	6.06 × 10 <sup>2</sup>	6.74 × 10 <sup>2</sup>
		Pull	-	67.4	1.01 × 10 <sup>2</sup>	1.35 × 10 <sup>2</sup>	2.02 × 10 <sup>2</sup>	2.70 × 10 <sup>2</sup>	3.37 × 10 <sup>2</sup>	4.04 × 10 <sup>2</sup>	4.72 × 10 <sup>2</sup>	5.39 × 10 <sup>2</sup>	6.06 × 10 <sup>2</sup>	6.74 × 10 <sup>2</sup>
	SCM	Push	-	49.1	73.6	98.2	1.47 × 10 <sup>2</sup>	1.96 × 10 <sup>2</sup>	2.45 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.44 × 10 <sup>2</sup>	3.93 × 10 <sup>2</sup>	4.42 × 10 <sup>2</sup>	4.91 × 10 <sup>2</sup>
		Pull	-	41.2	61.9	82.5	1.24 × 10 <sup>2</sup>	1.65 × 10 <sup>2</sup>	2.06 × 10 <sup>2</sup>	2.47 × 10 <sup>2</sup>	2.89 × 10 <sup>2</sup>	3.30 × 10 <sup>2</sup>	3.71 × 10 <sup>2</sup>	4.12 × 10 <sup>2</sup>
SRL3	Push	-	54.2	81.4	1.08 × 10 <sup>2</sup>	1.63 × 10 <sup>2</sup>	2.17 × 10 <sup>2</sup>	2.71 × 10 <sup>2</sup>	3.25 × 10 <sup>2</sup>	3.80 × 10 <sup>2</sup>	-	-	-	
	Pull	-	54.2	81.4	1.08 × 10 <sup>2</sup>	1.63 × 10 <sup>2</sup>	2.17 × 10 <sup>2</sup>	2.71 × 10 <sup>2</sup>	3.25 × 10 <sup>2</sup>	3.80 × 10 <sup>2</sup>	-	-	-	
FCD	Push	-	49.3	73.9	98.5	1.48 × 10 <sup>2</sup>	1.97 × 10 <sup>2</sup>	2.46 × 10 <sup>2</sup>	2.96 × 10 <sup>2</sup>	3.45 × 10 <sup>2</sup>	-	-	-	
	Pull	-	37.9	56.9	75.9	1.14 × 10 <sup>2</sup>	1.52 × 10 <sup>2</sup>	1.90 × 10 <sup>2</sup>	2.28 × 10 <sup>2</sup>	2.66 × 10 <sup>2</sup>	-	-	-	
SCG	Push	40.2	80.4	1.21 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	3.22 × 10 <sup>2</sup>	4.02 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	5.63 × 10 <sup>2</sup>	6.43 × 10 <sup>2</sup>	7.24 × 10 <sup>2</sup>	8.04 × 10 <sup>2</sup>	
	Pull	34.6	69.1	1.04 × 10 <sup>2</sup>	1.38 × 10 <sup>2</sup>	2.07 × 10 <sup>2</sup>	2.76 × 10 <sup>2</sup>	3.46 × 10 <sup>2</sup>	4.15 × 10 <sup>2</sup>	4.84 × 10 <sup>2</sup>	5.53 × 10 <sup>2</sup>	6.22 × 10 <sup>2</sup>	6.91 × 10 <sup>2</sup>	
SSD/SSD2	Push	-	80.4	1.21 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	3.22 × 10 <sup>2</sup>	4.02 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	5.63 × 10 <sup>2</sup>	6.43 × 10 <sup>2</sup>	7.24 × 10 <sup>2</sup>	8.04 × 10 <sup>2</sup>	
	Pull	-	60.3	90.5	1.21 × 10 <sup>2</sup>	1.81 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	3.02 × 10 <sup>2</sup>	3.62 × 10 <sup>2</sup>	4.22 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	5.43 × 10 <sup>2</sup>	6.03 × 10 <sup>2</sup>	
CMK2/ULK SCM	Push	-	80.4	1.21 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	3.22 × 10 <sup>2</sup>	4.02 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	5.63 × 10 <sup>2</sup>	6.43 × 10 <sup>2</sup>	7.24 × 10 <sup>2</sup>	8.04 × 10 <sup>2</sup>	
	Pull	-	69.1	1.04 × 10 <sup>2</sup>	1.38 × 10 <sup>2</sup>	2.07 × 10 <sup>2</sup>	2.76 × 10 <sup>2</sup>	3.46 × 10 <sup>2</sup>	4.15 × 10 <sup>2</sup>	4.84 × 10 <sup>2</sup>	5.53 × 10 <sup>2</sup>	6.22 × 10 <sup>2</sup>	6.91 × 10 <sup>2</sup>	
USSD/ USSD-K	Push	-	-	-	- (*1)	2.41 × 10 <sup>2</sup>	3.22 × 10 <sup>2</sup>	4.02 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	5.63 × 10 <sup>2</sup>	6.43 × 10 <sup>2</sup>	7.24 × 10 <sup>2</sup>	8.04 × 10 <sup>2</sup>	
	Pull	-	-	-	- (*1)	1.81 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	3.02 × 10 <sup>2</sup>	3.62 × 10 <sup>2</sup>	4.22 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	5.43 × 10 <sup>2</sup>	6.03 × 10 <sup>2</sup>	
SMG	Push	-	80.4	1.21 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	3.22 × 10 <sup>2</sup>	4.02 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	5.63 × 10 <sup>2</sup>	-	-	-	
	Pull	-	69.1	1.04 × 10 <sup>2</sup>	1.38 × 10 <sup>2</sup>	2.07 × 10 <sup>2</sup>	2.76 × 10 <sup>2</sup>	3.46 × 10 <sup>2</sup>	4.15 × 10 <sup>2</sup>	4.84 × 10 <sup>2</sup>	-	-	-	
MRL2/MRL2-G	Push	-	-	-	1.61 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	3.22 × 10 <sup>2</sup>	4.02 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	5.63 × 10 <sup>2</sup>	-	-	-	
	Pull	-	-	-	1.61 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	3.22 × 10 <sup>2</sup>	4.02 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	5.63 × 10 <sup>2</sup>	-	-	-	
MRL2-W	Push	-	-	-	3.22 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	6.43 × 10 <sup>2</sup>	8.04 × 10 <sup>2</sup>	9.65 × 10 <sup>2</sup>	1.13 × 10 <sup>3</sup>	-	-	-	
	Pull	-	-	-	3.22 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	6.43 × 10 <sup>2</sup>	8.04 × 10 <sup>2</sup>	9.65 × 10 <sup>2</sup>	1.13 × 10 <sup>3</sup>	-	-	-	
UCA2	Push	-	1.21 × 10 <sup>2</sup>	1.81 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	3.62 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	6.03 × 10 <sup>2</sup>	7.24 × 10 <sup>2</sup>	8.44 × 10 <sup>2</sup>	9.65 × 10 <sup>2</sup>	1.09 × 10 <sup>3</sup>	1.21 × 10 <sup>3</sup>	
	Pull	-	1.21 × 10 <sup>2</sup>	1.81 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	3.62 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	6.03 × 10 <sup>2</sup>	7.24 × 10 <sup>2</sup>	8.44 × 10 <sup>2</sup>	9.65 × 10 <sup>2</sup>	1.09 × 10 <sup>3</sup>	1.21 × 10 <sup>3</sup>	
LCX	Push	-	-	116	155	233	310	388	466	543	-	-	-	
	Pull	-	-	99	133	199	265	332	398	464	-	-	-	
SRL3	Push	-	81.4	1.22 × 10 <sup>2</sup>	1.63 × 10 <sup>2</sup>	2.44 × 10 <sup>2</sup>	3.26 × 10 <sup>2</sup>	4.07 × 10 <sup>2</sup>	4.88 × 10 <sup>2</sup>	5.70 × 10 <sup>2</sup>	-	-	-	
	Pull	-	81.4	1.22 × 10 <sup>2</sup>	1.63 × 10 <sup>2</sup>	2.44 × 10 <sup>2</sup>	3.26 × 10 <sup>2</sup>	4.07 × 10 <sup>2</sup>	4.88 × 10 <sup>2</sup>	5.70 × 10 <sup>2</sup>	-	-	-	
FCD	Push	-	77.6	1.16 × 10 <sup>2</sup>	1.55 × 10 <sup>2</sup>	2.33 × 10 <sup>2</sup>	3.10 × 10 <sup>2</sup>	3.88 × 10 <sup>2</sup>	4.66 × 10 <sup>2</sup>	5.43 × 10 <sup>2</sup>	-	-	-	
	Pull	-	57.5	86.3	1.15 × 10 <sup>2</sup>	1.73 × 10 <sup>2</sup>	2.30 × 10 <sup>2</sup>	2.88 × 10 <sup>2</sup>	3.45 × 10 <sup>2</sup>	4.03 × 10 <sup>2</sup>	-	-	-	
STG	Push	-	80.4	1.21 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	3.22 × 10 <sup>2</sup>	4.02 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	5.63 × 10 <sup>2</sup>	6.43 × 10 <sup>2</sup>	7.24 × 10 <sup>2</sup>	8.04 × 10 <sup>2</sup>	
	Pull	-	60.3	90.5	1.21 × 10 <sup>2</sup>	1.81 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	3.02 × 10 <sup>2</sup>	3.62 × 10 <sup>2</sup>	4.22 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	5.43 × 10 <sup>2</sup>	6.03 × 10 <sup>2</sup>	
STK/STK-M	Push	-	80.4	1.21 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	3.22 × 10 <sup>2</sup>	4.02 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	5.63 × 10 <sup>2</sup>	6.43 × 10 <sup>2</sup>	7.24 × 10 <sup>2</sup>	8.04 × 10 <sup>2</sup>	
	Pull	-	49.0	73.5	98.0	1.47 × 10 <sup>2</sup>	1.96 × 10 <sup>2</sup>	2.45 × 10 <sup>2</sup>	2.94 × 10 <sup>2</sup>	3.43 × 10 <sup>2</sup>	3.92 × 10 <sup>2</sup>	4.41 × 10 <sup>2</sup>	4.90 × 10 <sup>2</sup>	
STK-Y1/STK-MY1	Push	-	80.4	1.21 × 10 <sup>2</sup>	1.61 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	3.22 × 10 <sup>2</sup>	4.02 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	5.63 × 10 <sup>2</sup>	6.43 × 10 <sup>2</sup>	7.24 × 10 <sup>2</sup>	8.04 × 10 <sup>2</sup>	
	Pull	-	17.6	42.1	66.6	1.16 × 10 <sup>2</sup>	1.65 × 10 <sup>2</sup>	2.14 × 10 <sup>2</sup>	2.63 × 10 <sup>2</sup>	3.12 × 10 <sup>2</sup>	3.61 × 10 <sup>2</sup>	4.10 × 10 <sup>2</sup>	4.59 × 10 <sup>2</sup>	
STR2	Push	-	1.61 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	3.22 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	6.43 × 10 <sup>2</sup>	8.04 × 10 <sup>2</sup>	9.65 × 10 <sup>2</sup>	1.13 × 10 <sup>3</sup>	-	-	-	
	Pull	-	1.21 × 10 <sup>2</sup>	1.81 × 10 <sup>2</sup>	2.41 × 10 <sup>2</sup>	3.62 × 10 <sup>2</sup>	4.83 × 10 <sup>2</sup>	6.03 × 10 <sup>2</sup>	7.24 × 10 <sup>2</sup>	8.44 × 10 <sup>2</sup>	-	-	-	
SCG	Push	62.8	1.26 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	3.77 × 10 <sup>2</sup>	5.03 × 10 <sup>2</sup>	6.28 × 10 <sup>2</sup>	7.54 × 10 <sup>2</sup>	8.80 × 10 <sup>2</sup>	1.01 × 10 <sup>3</sup>	1.13 × 10 <sup>3</sup>	1.26 × 10 <sup>3</sup>	
	Pull	52.8	1.06 × 10 <sup>2</sup>	1.58 × 10 <sup>2</sup>	2.11 × 10 <sup>2</sup>	3.17 × 10 <sup>2</sup>	4.22 × 10 <sup>2</sup>	5.28 × 10 <sup>2</sup>	6.33 × 10 <sup>2</sup>	7.39 × 10 <sup>2</sup>	8.44 × 10 <sup>2</sup>	9.50 × 10 <sup>2</sup>	1.06 × 10 <sup>3</sup>	
JSC3 SCM/SSD	Push	-	1.26 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	3.77 × 10 <sup>2</sup>	5.03 × 10 <sup>2</sup>	6.28 × 10 <sup>2</sup>	7.54 × 10 <sup>2</sup>	8.80 × 10 <sup>2</sup>	1.01 × 10 <sup>3</sup>	1.13 × 10 <sup>3</sup>	1.26 × 10 <sup>3</sup>	
	Pull	-	1.06 × 10 <sup>2</sup>	1.58 × 10 <sup>2</sup>	2.11 × 10 <sup>2</sup>	3.17 × 10 <sup>2</sup>	4.22 × 10 <sup>2</sup>	5.28 × 10 <sup>2</sup>	6.33 × 10 <sup>2</sup>	7.39 × 10 <sup>2</sup>	8.44 × 10 <sup>2</sup>	9.50 × 10 <sup>2</sup>	1.06 × 10 <sup>3</sup>	
USSD/ USSD-K	Push	-	-	-	- (*1)	3.77 × 10 <sup>2</sup>	5.03 × 10 <sup>2</sup>	6.28 × 10 <sup>2</sup>	7.54 × 10 <sup>2</sup>	8.80 × 10 <sup>2</sup>	1.01 × 10 <sup>3</sup>	1.13 × 10 <sup>3</sup>	1.26 × 10 <sup>3</sup>	
	Pull	-	-	-	- (*1)	3.17 × 10 <sup>2</sup>	4.22 × 10 <sup>2</sup>	5.28 × 10 <sup>2</sup>	6.33 × 10 <sup>2</sup>	7.39 × 10 <sup>2</sup>	8.44 × 10 <sup>2</sup>	9.50 × 10 <sup>2</sup>	1.06 × 10 <sup>3</sup>	
CMK2/ULK	Push	-	1.26 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	3.77 × 10 <sup>2</sup>	5.03 × 10 <sup>2</sup>	6.28 × 10 <sup>2</sup>	7.54 × 10 <sup>2</sup>	8.80 × 10 <sup>2</sup>	1.01 × 10 <sup>3</sup>	1.13 × 10 <sup>3</sup>	1.26 × 10 <sup>3</sup>	
	Pull	-	1.10 × 10 <sup>2</sup>	1.65 × 10 <sup>2</sup>	2.21 × 10 <sup>2</sup>	3.31 × 10 <sup>2</sup>	4.41 × 10 <sup>2</sup>	5.51 × 10 <sup>2</sup>	6.62 × 10 <sup>2</sup>	7.72 × 10 <sup>2</sup>	8.82 × 10 <sup>2</sup>	9.92 × 10 <sup>2</sup>	1.10 × 10 <sup>3</sup>	
CMA2/JSM2	Push	-	1.26 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>									

# Technical data 4

## Theoretical thrust table (double acting)

(Unit: N)

Bore size (mm)	Compatible models	Operating direction	Working pressure MPa												
			0.05	0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
ø40	FCD	Push	-	1.29 × 10 <sup>2</sup>	1.94 × 10 <sup>2</sup>	2.58 × 10 <sup>2</sup>	3.87 × 10 <sup>2</sup>	5.16 × 10 <sup>2</sup>	6.45 × 10 <sup>2</sup>	7.75 × 10 <sup>2</sup>	9.04 × 10 <sup>2</sup>	-	-	-	
		Pull	-	1.09 × 10 <sup>2</sup>	1.63 × 10 <sup>2</sup>	2.18 × 10 <sup>2</sup>	3.27 × 10 <sup>2</sup>	4.36 × 10 <sup>2</sup>	5.45 × 10 <sup>2</sup>	6.54 × 10 <sup>2</sup>	7.63 × 10 <sup>2</sup>	-	-	-	
	STG	Push	-	1.26 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	3.77 × 10 <sup>2</sup>	5.03 × 10 <sup>2</sup>	6.28 × 10 <sup>2</sup>	7.54 × 10 <sup>2</sup>	8.80 × 10 <sup>2</sup>	1.01 × 10 <sup>3</sup>	1.13 × 10 <sup>3</sup>	1.26 × 10 <sup>3</sup>	
		Pull	-	1.06 × 10 <sup>2</sup>	1.58 × 10 <sup>2</sup>	2.11 × 10 <sup>2</sup>	3.17 × 10 <sup>2</sup>	4.22 × 10 <sup>2</sup>	5.28 × 10 <sup>2</sup>	6.33 × 10 <sup>2</sup>	7.39 × 10 <sup>2</sup>	8.44 × 10 <sup>2</sup>	9.50 × 10 <sup>2</sup>	1.06 × 10 <sup>3</sup>	
	STK/STK-M	Push	-	1.26 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	3.77 × 10 <sup>2</sup>	5.03 × 10 <sup>2</sup>	6.28 × 10 <sup>2</sup>	7.54 × 10 <sup>2</sup>	8.80 × 10 <sup>2</sup>	1.01 × 10 <sup>3</sup>	1.13 × 10 <sup>3</sup>	1.26 × 10 <sup>3</sup>	
		Pull	-	76.6	1.15 × 10 <sup>2</sup>	1.53 × 10 <sup>2</sup>	2.30 × 10 <sup>2</sup>	3.06 × 10 <sup>2</sup>	3.83 × 10 <sup>2</sup>	4.59 × 10 <sup>2</sup>	5.36 × 10 <sup>2</sup>	6.13 × 10 <sup>2</sup>	6.89 × 10 <sup>2</sup>	7.66 × 10 <sup>2</sup>	
	STK-Y1/STK-MY1	Push	-	1.26 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	3.77 × 10 <sup>2</sup>	5.03 × 10 <sup>2</sup>	6.28 × 10 <sup>2</sup>	7.54 × 10 <sup>2</sup>	8.80 × 10 <sup>2</sup>	1.01 × 10 <sup>3</sup>	1.13 × 10 <sup>3</sup>	1.26 × 10 <sup>3</sup>	
		Pull	-	32.2	70.5	1.09 × 10 <sup>2</sup>	1.85 × 10 <sup>2</sup>	2.62 × 10 <sup>2</sup>	3.38 × 10 <sup>2</sup>	4.15 × 10 <sup>2</sup>	4.92 × 10 <sup>2</sup>	5.68 × 10 <sup>2</sup>	6.45 × 10 <sup>2</sup>	7.21 × 10 <sup>2</sup>	
ø50	SCG	Push	98.2	1.96 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.93 × 10 <sup>2</sup>	5.89 × 10 <sup>2</sup>	7.85 × 10 <sup>2</sup>	9.82 × 10 <sup>2</sup>	1.18 × 10 <sup>3</sup>	1.37 × 10 <sup>3</sup>	1.57 × 10 <sup>3</sup>	1.77 × 10 <sup>3</sup>	1.96 × 10 <sup>3</sup>	
		Pull	82.5	1.65 × 10 <sup>2</sup>	2.47 × 10 <sup>2</sup>	3.30 × 10 <sup>2</sup>	4.95 × 10 <sup>2</sup>	6.60 × 10 <sup>2</sup>	8.25 × 10 <sup>2</sup>	9.90 × 10 <sup>2</sup>	1.15 × 10 <sup>3</sup>	1.32 × 10 <sup>3</sup>	1.48 × 10 <sup>3</sup>	1.65 × 10 <sup>3</sup>	
	SSD2/JSC3 SCM/SSD	Push	-	1.96 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.93 × 10 <sup>2</sup>	5.89 × 10 <sup>2</sup>	7.85 × 10 <sup>2</sup>	9.82 × 10 <sup>2</sup>	1.18 × 10 <sup>3</sup>	1.37 × 10 <sup>3</sup>	1.57 × 10 <sup>3</sup>	1.77 × 10 <sup>3</sup>	1.96 × 10 <sup>3</sup>	
		Pull	-	1.65 × 10 <sup>2</sup>	2.47 × 10 <sup>2</sup>	3.30 × 10 <sup>2</sup>	4.95 × 10 <sup>2</sup>	6.60 × 10 <sup>2</sup>	8.25 × 10 <sup>2</sup>	9.90 × 10 <sup>2</sup>	1.15 × 10 <sup>3</sup>	1.32 × 10 <sup>3</sup>	1.48 × 10 <sup>3</sup>	1.65 × 10 <sup>3</sup>	
	USSD/ USSD-K	Push	-	-	-	- (*1)	5.89 × 10 <sup>2</sup>	7.85 × 10 <sup>2</sup>	9.82 × 10 <sup>2</sup>	1.18 × 10 <sup>3</sup>	1.37 × 10 <sup>3</sup>	1.57 × 10 <sup>3</sup>	1.77 × 10 <sup>3</sup>	1.96 × 10 <sup>3</sup>	
		Pull	-	-	-	- (*1)	4.95 × 10 <sup>2</sup>	6.60 × 10 <sup>2</sup>	8.25 × 10 <sup>2</sup>	9.90 × 10 <sup>2</sup>	1.15 × 10 <sup>3</sup>	1.32 × 10 <sup>3</sup>	1.48 × 10 <sup>3</sup>	1.65 × 10 <sup>3</sup>	
	SRL3	Push	-	1.99 × 10 <sup>2</sup>	2.98 × 10 <sup>2</sup>	3.98 × 10 <sup>2</sup>	5.96 × 10 <sup>2</sup>	7.95 × 10 <sup>2</sup>	9.94 × 10 <sup>2</sup>	1.19 × 10 <sup>3</sup>	1.39 × 10 <sup>3</sup>	-	-	-	
		Pull	-	1.99 × 10 <sup>2</sup>	2.98 × 10 <sup>2</sup>	3.98 × 10 <sup>2</sup>	5.96 × 10 <sup>2</sup>	7.95 × 10 <sup>2</sup>	9.94 × 10 <sup>2</sup>	1.19 × 10 <sup>3</sup>	1.39 × 10 <sup>3</sup>	-	-	-	
	FCD	Push	-	1.93 × 10 <sup>2</sup>	2.90 × 10 <sup>2</sup>	3.86 × 10 <sup>2</sup>	5.80 × 10 <sup>2</sup>	7.73 × 10 <sup>2</sup>	9.66 × 10 <sup>2</sup>	1.16 × 10 <sup>3</sup>	1.35 × 10 <sup>3</sup>	-	-	-	
		Pull	-	1.62 × 10 <sup>2</sup>	2.43 × 10 <sup>2</sup>	3.24 × 10 <sup>2</sup>	4.85 × 10 <sup>2</sup>	6.47 × 10 <sup>2</sup>	8.09 × 10 <sup>2</sup>	9.71 × 10 <sup>2</sup>	1.13 × 10 <sup>3</sup>	-	-	-	
	STG	Push	-	1.96 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.93 × 10 <sup>2</sup>	5.89 × 10 <sup>2</sup>	7.85 × 10 <sup>2</sup>	9.82 × 10 <sup>2</sup>	1.18 × 10 <sup>3</sup>	1.37 × 10 <sup>3</sup>	1.57 × 10 <sup>3</sup>	1.77 × 10 <sup>3</sup>	1.96 × 10 <sup>3</sup>	
		Pull	-	1.65 × 10 <sup>2</sup>	2.47 × 10 <sup>2</sup>	3.30 × 10 <sup>2</sup>	4.95 × 10 <sup>2</sup>	6.60 × 10 <sup>2</sup>	8.25 × 10 <sup>2</sup>	9.90 × 10 <sup>2</sup>	1.15 × 10 <sup>3</sup>	1.32 × 10 <sup>3</sup>	1.48 × 10 <sup>3</sup>	1.65 × 10 <sup>3</sup>	
	STK/STK-M	Push	-	1.96 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.93 × 10 <sup>2</sup>	5.89 × 10 <sup>2</sup>	7.85 × 10 <sup>2</sup>	9.82 × 10 <sup>2</sup>	1.18 × 10 <sup>3</sup>	1.37 × 10 <sup>3</sup>	1.57 × 10 <sup>3</sup>	1.77 × 10 <sup>3</sup>	1.96 × 10 <sup>3</sup>	
		Pull	-	1.26 × 10 <sup>2</sup>	1.88 × 10 <sup>2</sup>	2.51 × 10 <sup>2</sup>	3.77 × 10 <sup>2</sup>	5.03 × 10 <sup>2</sup>	6.28 × 10 <sup>2</sup>	7.54 × 10 <sup>2</sup>	8.80 × 10 <sup>2</sup>	1.01 × 10 <sup>3</sup>	1.13 × 10 <sup>3</sup>	1.26 × 10 <sup>3</sup>	
	STK-Y1/STK-MY1	Push	-	1.96 × 10 <sup>2</sup>	2.95 × 10 <sup>2</sup>	3.93 × 10 <sup>2</sup>	5.89 × 10 <sup>2</sup>	7.85 × 10 <sup>2</sup>	9.82 × 10 <sup>2</sup>	1.18 × 10 <sup>3</sup>	1.37 × 10 <sup>3</sup>	1.57 × 10 <sup>3</sup>	1.77 × 10 <sup>3</sup>	1.96 × 10 <sup>3</sup>	
		Pull	-	40.9	1.04 × 10 <sup>2</sup>	1.67 × 10 <sup>2</sup>	2.92 × 10 <sup>2</sup>	4.18 × 10 <sup>2</sup>	5.44 × 10 <sup>2</sup>	6.69 × 10 <sup>2</sup>	7.95 × 10 <sup>2</sup>	9.21 × 10 <sup>2</sup>	1.05 × 10 <sup>3</sup>	1.17 × 10 <sup>3</sup>	
ø63	SCG	Push	1.56 × 10 <sup>2</sup>	3.12 × 10 <sup>2</sup>	4.68 × 10 <sup>2</sup>	6.23 × 10 <sup>2</sup>	9.35 × 10 <sup>2</sup>	1.25 × 10 <sup>3</sup>	1.56 × 10 <sup>3</sup>	1.87 × 10 <sup>3</sup>	2.18 × 10 <sup>3</sup>	2.49 × 10 <sup>3</sup>	2.81 × 10 <sup>3</sup>	3.12 × 10 <sup>3</sup>	
		Pull	1.40 × 10 <sup>2</sup>	2.80 × 10 <sup>2</sup>	4.20 × 10 <sup>2</sup>	5.61 × 10 <sup>2</sup>	8.41 × 10 <sup>2</sup>	1.12 × 10 <sup>3</sup>	1.40 × 10 <sup>3</sup>	1.68 × 10 <sup>3</sup>	1.96 × 10 <sup>3</sup>	2.24 × 10 <sup>3</sup>	2.52 × 10 <sup>3</sup>	2.80 × 10 <sup>3</sup>	
	SSD2/SSG/JSC3 SCM/SSD	Push	-	3.12 × 10 <sup>2</sup>	4.68 × 10 <sup>2</sup>	6.23 × 10 <sup>2</sup>	9.35 × 10 <sup>2</sup>	1.25 × 10 <sup>3</sup>	1.56 × 10 <sup>3</sup>	1.87 × 10 <sup>3</sup>	2.18 × 10 <sup>3</sup>	2.49 × 10 <sup>3</sup>	2.81 × 10 <sup>3</sup>	3.12 × 10 <sup>3</sup>	
		Pull	-	2.80 × 10 <sup>2</sup>	4.20 × 10 <sup>2</sup>	5.61 × 10 <sup>2</sup>	8.41 × 10 <sup>2</sup>	1.12 × 10 <sup>3</sup>	1.40 × 10 <sup>3</sup>	1.68 × 10 <sup>3</sup>	1.96 × 10 <sup>3</sup>	2.24 × 10 <sup>3</sup>	2.52 × 10 <sup>3</sup>	2.80 × 10 <sup>3</sup>	
	USSD/ USSD-K	Push	-	-	-	- (*1)	9.35 × 10 <sup>2</sup>	1.25 × 10 <sup>3</sup>	1.56 × 10 <sup>3</sup>	1.87 × 10 <sup>3</sup>	2.18 × 10 <sup>3</sup>	2.49 × 10 <sup>3</sup>	2.81 × 10 <sup>3</sup>	3.12 × 10 <sup>3</sup>	
		Pull	-	-	-	- (*1)	8.41 × 10 <sup>2</sup>	1.12 × 10 <sup>3</sup>	1.40 × 10 <sup>3</sup>	1.68 × 10 <sup>3</sup>	1.96 × 10 <sup>3</sup>	2.24 × 10 <sup>3</sup>	2.52 × 10 <sup>3</sup>	2.80 × 10 <sup>3</sup>	
	SRL3	Push	-	3.14 × 10 <sup>2</sup>	4.70 × 10 <sup>2</sup>	6.27 × 10 <sup>2</sup>	9.41 × 10 <sup>2</sup>	1.25 × 10 <sup>3</sup>	1.57 × 10 <sup>3</sup>	1.88 × 10 <sup>3</sup>	2.20 × 10 <sup>3</sup>	-	-	-	
		Pull	-	3.14 × 10 <sup>2</sup>	4.70 × 10 <sup>2</sup>	6.27 × 10 <sup>2</sup>	9.41 × 10 <sup>2</sup>	1.25 × 10 <sup>3</sup>	1.57 × 10 <sup>3</sup>	1.88 × 10 <sup>3</sup>	2.20 × 10 <sup>3</sup>	-	-	-	
	FCD	Push	-	3.18 × 10 <sup>2</sup>	4.77 × 10 <sup>2</sup>	6.36 × 10 <sup>2</sup>	9.53 × 10 <sup>2</sup>	1.27 × 10 <sup>3</sup>	1.59 × 10 <sup>3</sup>	1.91 × 10 <sup>3</sup>	2.22 × 10 <sup>3</sup>	-	-	-	
		Pull	-	2.86 × 10 <sup>2</sup>	4.30 × 10 <sup>2</sup>	5.73 × 10 <sup>2</sup>	8.59 × 10 <sup>2</sup>	1.15 × 10 <sup>3</sup>	1.43 × 10 <sup>3</sup>	1.72 × 10 <sup>3</sup>	2.00 × 10 <sup>3</sup>	-	-	-	
	STG	Push	-	3.12 × 10 <sup>2</sup>	4.68 × 10 <sup>2</sup>	6.23 × 10 <sup>2</sup>	9.35 × 10 <sup>2</sup>	1.25 × 10 <sup>3</sup>	1.56 × 10 <sup>3</sup>	1.87 × 10 <sup>3</sup>	2.18 × 10 <sup>3</sup>	2.49 × 10 <sup>3</sup>	2.81 × 10 <sup>3</sup>	3.12 × 10 <sup>3</sup>	
		Pull	-	2.80 × 10 <sup>2</sup>	4.20 × 10 <sup>2</sup>	5.61 × 10 <sup>2</sup>	8.41 × 10 <sup>2</sup>	1.12 × 10 <sup>3</sup>	1.40 × 10 <sup>3</sup>	1.68 × 10 <sup>3</sup>	1.96 × 10 <sup>3</sup>	2.24 × 10 <sup>3</sup>	2.52 × 10 <sup>3</sup>	2.80 × 10 <sup>3</sup>	
	ø80	SCG	Push	2.51 × 10 <sup>2</sup>	5.03 × 10 <sup>2</sup>	7.54 × 10 <sup>2</sup>	1.01 × 10 <sup>3</sup>	1.51 × 10 <sup>3</sup>	2.01 × 10 <sup>3</sup>	2.51 × 10 <sup>3</sup>	3.02 × 10 <sup>3</sup>	3.52 × 10 <sup>3</sup>	4.02 × 10 <sup>3</sup>	4.52 × 10 <sup>3</sup>	5.03 × 10 <sup>3</sup>
			Pull	2.27 × 10 <sup>2</sup>	4.54 × 10 <sup>2</sup>	6.80 × 10 <sup>2</sup>	9.07 × 10 <sup>2</sup>	1.36 × 10 <sup>3</sup>	1.81 × 10 <sup>3</sup>	2.27 × 10 <sup>3</sup>	2.72 × 10 <sup>3</sup>	3.17 × 10 <sup>3</sup>	3.63 × 10 <sup>3</sup>	4.08 × 10 <sup>3</sup>	4.54 × 10 <sup>3</sup>
		SSD2/SSG/JSC3 SCM/SSD	Push	-	5.03 × 10 <sup>2</sup>	7.54 × 10 <sup>2</sup>	1.01 × 10 <sup>3</sup>	1.51 × 10 <sup>3</sup>	2.01 × 10 <sup>3</sup>	2.51 × 10 <sup>3</sup>	3.02 × 10 <sup>3</sup>	3.52 × 10 <sup>3</sup>	4.02 × 10 <sup>3</sup>	4.52 × 10 <sup>3</sup>	5.03 × 10 <sup>3</sup>
			Pull	-	4.54 × 10 <sup>2</sup>	6.80 × 10 <sup>2</sup>	9.07 × 10 <sup>2</sup>	1.36 × 10 <sup>3</sup>	1.81 × 10 <sup>3</sup>	2.27 × 10 <sup>3</sup>	2.72 × 10 <sup>3</sup>	3.17 × 10 <sup>3</sup>	3.63 × 10 <sup>3</sup>	4.08 × 10 <sup>3</sup>	4.54 × 10 <sup>3</sup>
USSD/ USSD-K		Push	-	-	-	- (*1)	1.51 × 10 <sup>3</sup>	2.01 × 10 <sup>3</sup>	2.51 × 10 <sup>3</sup>	3.02 × 10 <sup>3</sup>	3.52 × 10 <sup>3</sup>	4.02 × 10 <sup>3</sup>	4.52 × 10 <sup>3</sup>	5.03 × 10 <sup>3</sup>	
		Pull	-	-	-	- (*1)	1.36 × 10 <sup>3</sup>	1.81 × 10 <sup>3</sup>	2.27 × 10 <sup>3</sup>	2.72 × 10 <sup>3</sup>	3.17 × 10 <sup>3</sup>	3.63 × 10 <sup>3</sup>	4.08 × 10 <sup>3</sup>	4.54 × 10 <sup>3</sup>	
SRL2		Push	-	5.06 × 10 <sup>2</sup>	7.60 × 10 <sup>2</sup>	1.01 × 10 <sup>3</sup>	1.52 × 10 <sup>3</sup>	2.03 × 10 <sup>3</sup>	2.53 × 10 <sup>3</sup>	3.04 × 10 <sup>3</sup>	3.54 × 10 <sup>3</sup>	-	-	-	
		Pull	-	5.06 × 10 <sup>2</sup>	7.60 × 10 <sup>2</sup>	1.01 × 10 <sup>3</sup>	1.52 × 10 <sup>3</sup>	2.03 × 10 <sup>3</sup>	2.53 × 10 <sup>3</sup>	3.04 × 10 <sup>3</sup>	3.54 × 10 <sup>3</sup>	-	-	-	
STG		Push	-	5.03 × 10 <sup>2</sup>	7.54 × 10 <sup>2</sup>	1.01 × 10 <sup>3</sup>	1.51 × 10 <sup>3</sup>	2.01 × 10 <sup>3</sup>	2.51 × 10 <sup>3</sup>	3.02 × 10 <sup>3</sup>	3.52 × 10 <sup>3</sup>	4.02 × 10 <sup>3</sup>	4.52 × 10 <sup>3</sup>	5.03 × 10 <sup>3</sup>	
		Pull	-	4.54 × 10 <sup>2</sup>	6.80 × 10 <sup>2</sup>	9.07 × 10 <sup>2</sup>	1.36 × 10 <sup>3</sup>	1.81 × 10 <sup>3</sup>	2.27 × 10 <sup>3</sup>	2.72 × 10 <sup>3</sup>	3.17 × 10 <sup>3</sup>	3.63 × 10 <sup>3</sup>	4.08 × 10 <sup>3</sup>	4.54 × 10 <sup>3</sup>	
ø100		SCG	Push	3.93 × 10 <sup>2</sup>	7.85 × 10 <sup>2</sup>	1.18 × 10 <sup>3</sup>	1.57 × 10 <sup>3</sup>	2.36 × 10 <sup>3</sup>	3.14 × 10 <sup>3</sup>	3.93 × 10 <sup>3</sup>	4.71 × 10 <sup>3</sup>	5.50 × 10 <sup>3</sup>	6.28 × 10 <sup>3</sup>	7.07 × 10 <sup>3</sup>	7.85 × 10 <sup>3</sup>
			Pull	3.57 × 10 <sup>2</sup>	7.15 × 10 <sup>2</sup>	1.07 × 10 <sup>3</sup>	1.43 × 10 <sup>3</sup>	2.14 × 10 <sup>3</sup>	2.86 × 10 <sup>3</sup>	3.57 × 10 <sup>3</sup>	4.29 × 10 <sup>3</sup>	5.00 × 10 <sup>3</sup>	5.72 × 10 <sup>3</sup>	6.43 × 10 <sup>3</sup>	7.15 × 10 <sup>3</sup>
		SSD2/SSG/JSC3 SCM/SSD	Push	-	7.85 × 10 <sup>2</sup>	1.18 × 10 <sup>3</sup>	1.57 × 10 <sup>3</sup>	2.36 × 10 <sup>3</sup>	3.14 × 10 <sup>3</sup>	3.93 × 10 <sup>3</sup>	4.71 × 10 <sup>3</sup>	5.50 × 10 <sup>3</sup>	6.28 × 10 <sup>3</sup>	7.07 × 10 <sup>3</sup>	7.85 × 10 <sup>3</sup>
			Pull	-	7.15 × 10 <sup>2</sup>	1.07 × 10 <sup>3</sup>	1.43 × 10 <sup>3</sup>	2.14 × 10 <sup>3</sup>	2.86 × 10 <sup>3</sup>	3.57 × 10 <sup>3</sup>	4.29 × 10 <sup>3</sup>	5.00 × 10 <sup>3</sup>	5.72 × 10 <sup>3</sup>	6.43 × 10 <sup>3</sup>	7.15 × 10 <sup>3</sup>
		USSD/ USSD-K	Push	-	-	-	- (*1)	2.36 × 10 <sup>3</sup>	3.14 × 10 <sup>3</sup>	3.93 × 10 <sup>3</sup>	4.71 × 10 <sup>3</sup>	5.50 × 10 <sup>3</sup>	6.28 × 10 <sup>3</sup>	7.07 × 10 <sup>3</sup>	7.85 × 10 <sup>3</sup>
			Pull	-	-	-	- (*1)	2.14 ×							



# Safety Precautions

Be sure to read this section before use.

When designing and manufacturing equipment using CKD products, the manufacturer is obligated to ensure that the safety of the mechanism, pneumatic control circuit and/or water control circuit and the system that runs the electrical controls are secured.

It is important to select, use, handle and maintain CKD products appropriately to ensure their safe usage.

Observe warnings and precautions to ensure device safety.

Check that device safety is ensured, and manufacture a safe device.

## WARNING

- 1** This product is designed and manufactured as a general industrial machine part. It must be handled by an operator having sufficient knowledge and experience.
  - 2** Use this product in accordance with specifications.  
This product must be used within its stated specifications. In addition, never modify or additionally machine this product. This product is intended for use in general industrial machinery equipment or parts. It is not intended for use outdoors (except for products with outdoor specifications) or for use under the following conditions or environments. (Note that this product can be used when CKD is consulted prior to its usage and the customer consents to CKD product specifications. The customer should provide safety measures to avoid danger in the event of problems.)
    - ①** Use for applications requiring safety, including nuclear energy, railways, aircraft, marine vessels, vehicles, medical devices, devices or applications in contact with beverages or foodstuffs, amusement devices, emergency cutoff circuits, press machines, brake circuits, or safety devices or applications.
    - ②** Use for applications where life or assets could be significantly affected, and special safety measures are required.
  - 3** Observe organization standards and regulations, etc., related to the safety of the device design and control, etc.  
ISO4414, JIS B 8370 (General rules for pneumatic systems)  
JFPS2008 (Principles for pneumatic cylinder selection and use)  
Including the High Pressure Gas Safety Act, Industrial Safety and Health Act, other safety rules, organization standards and regulations, etc.
  - 4** Do not handle, pipe, or remove devices before confirming safety.
    - ①** Inspect and service the machine and devices after confirming safety of all systems related to this product.
    - ②** Note that there may be hot or charged sections even after operation is stopped.
    - ③** When inspecting or servicing the device, turn OFF the energy source (air supply or water supply), and turn OFF power to the facility. Discharge any compressed air from the system, and pay attention to possible water leakage and leakage of electricity.
    - ④** When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.
  - 5** Observe the warnings and cautions on the following pages to prevent accidents.
- Precautions are ranked as "DANGER", "WARNING", and "CAUTION" in this section.

 **DANGER:** In the case where the product operation is mishandled and/or when the urgency of a dangerous situation is high, it may lead to fatalities or serious injuries.

 **WARNING:** A dangerous situation may occur if handling is mistaken, leading to fatal or serious injuries.

 **CAUTION:** A dangerous situation may occur if handling is mistaken, leading to minor injuries or property damage.

Note that some items indicated with "CAUTION" may lead to serious results depending on the conditions. All items contain important information and must be observed.

## Limited warranty and disclaimer

- 1** **Warranty period**  
This warranty is valid for one (1) year after delivery to the customer's designated site.
- 2** **Scope of warranty**  
In case any defect clearly attributable to CKD is found during the warranty period, CKD shall, at its own discretion, repair the defect or replace the relevant product in whole or in part and at no cost, according to its own judgment. Note that the following failures are excluded from the warranty scope:
  - (1) Failures due to use outside the conditions and environments set forth in the catalog or these specifications.
  - (2) Failures resulting from factors other than this product.
  - (3) Failures caused by improper use of the product.
  - (4) Failures resulting from modifications or repairs made without CKD consent.
  - (5) Failures caused by matters that could not be predicted with the technologies in practice when the product was delivered.
  - (6) Failures resulting from natural disasters or accidents for which CKD is not liable.The warranty covers the actual delivered product, as a single unit, and does not cover any damages resulting from losses induced by malfunctions in the delivered product.
- 3** **Compatibility check**  
The customer is responsible for confirming the compatibility of CKD products with the customer's systems, machines and equipment.

 Always read the precautions described in each catalog before use.

## Design/selection

### ⚠ WARNING

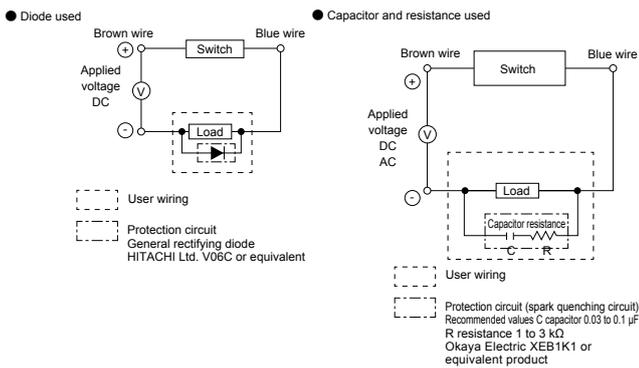
- Application, load current, voltage, temperature, impact, environment, etc., outside the specifications will result in damage or operation faults. Use the device as instructed in the specifications.
- Never use this product in an explosive gas atmosphere. The cylinder switch does not have an explosive-proof structure. Never use in an explosive gas atmosphere as explosions or fires could result.

### ⚠ CAUTION

- Take care when using this product for an interlock circuit.
 

When using the cylinder switch for an interlock signal requiring high reliability, provide a double interlock by installing a mechanical protection function or a switch (sensor) other than a cylinder switch as a guard if problems occur. Regularly inspect and confirm that the interlock activates correctly.
- Pay attention to the contact capacity.
 

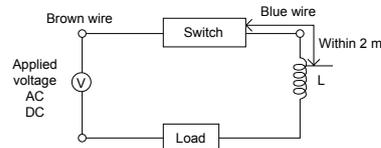
Do not use a load that exceeds the switch's specified voltage and current. This may lead to failure.
- Pay attention to the contact protection circuit. (Reed switch)
  - When an inductive load (relay or solenoid valve) is connected, a surge voltage is generated when the switch is turned OFF. Provide a contact protection circuit.



- When a capacious load (capacitor) is connected, starting current is generated when the switch is turned ON. Provide a contact protection circuit.
- If the wiring increases, the wiring capacity will be reached and a rush current will occur, damaging the switch or shortening the service life. Provide a contact protection circuit if the wiring length exceeds what is in Table 1. If using at 200 VAC with T8, contact CKD since the usable wiring length may be shortened.

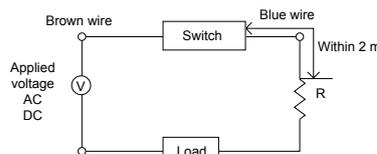
Switch	Voltage	Wiring length
M, T, K, H, V, F, ETO	DC	50 m
M, T, K, H, V, ETO	AC	10 m
RO, 5, 6, EO	DC	100 m
RO, 5, EO	AC	10 m
R4	AC	50 m

#### ● Choke coil used



- Choke coil  
L = Several hundred μH to several mH  
Item with outstanding high frequency characteristics

#### ● Resistance used



- Rush current limiting resistor  
R = Largest resistor tolerated by load circuit side

- Avoid using in an environment constantly exposed to water.
  - Insulation failure can cause malfunctions.
- Avoid using this product in environments containing oil or chemicals.
  - The cylinder switch may be adversely affected (insulation failure, malfunction caused by swelling of the filled resin, hardening of lead wire sheath, etc.) if used in an environment containing oil, coolant, cleaning fluid, or chemicals. Consult with CKD.
  - A coolant proof cylinder switch is available. Refer to "Guide to pneumatic devices compatible with coolants" (No. CC-N-375A) for details.

- Do not use in a high-impact environment.
 

For reed switch, if a strong impact (294 m/s<sup>2</sup> or more) is applied while in use, the contact may malfunction by momentarily (1 ms or less) being connected or disconnected. It may be necessary to use a proximity switch depending on the working environment. Consult with CKD.

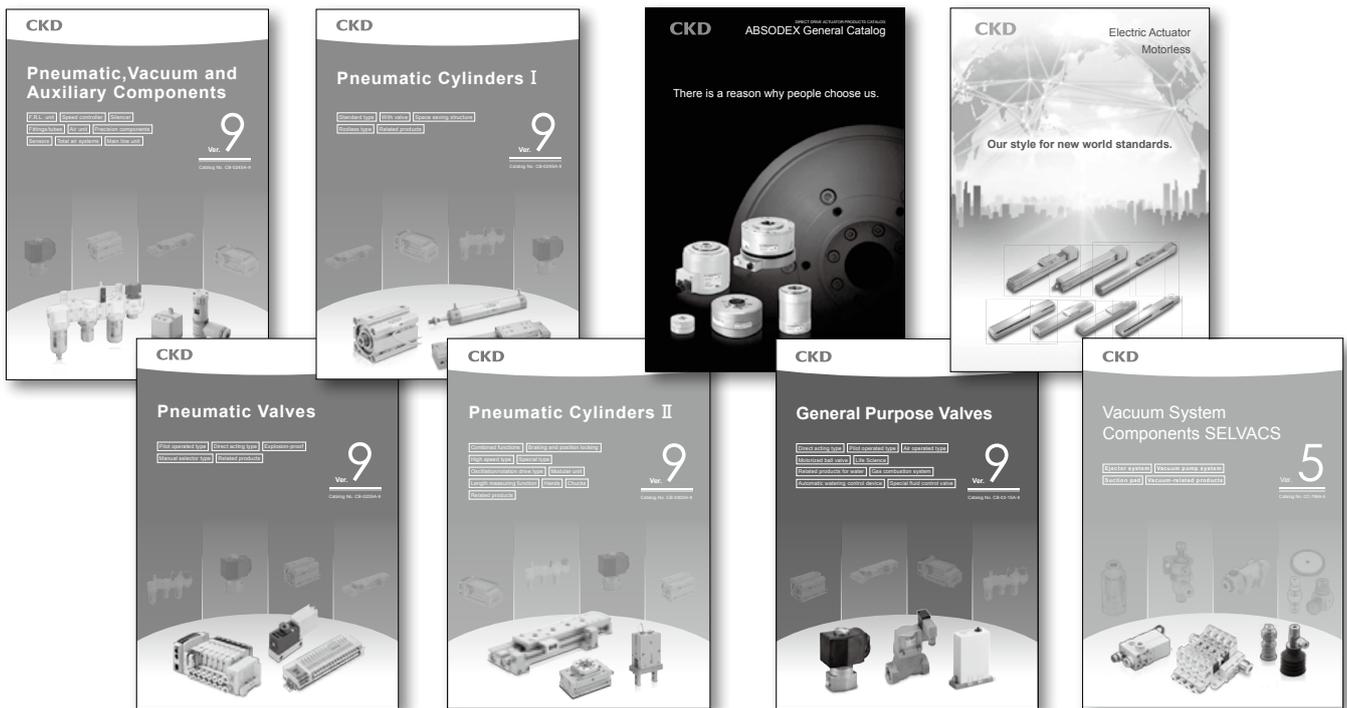
- Do not use this product in surge generating areas.
 

If there are devices and components (solenoid lifters, high frequency induction furnace, motors, etc.) around the cylinder with proximity switch that generate a large surge, consider surge protection of the source as it may lead to deterioration or damage of the switch internal circuit element.

- Be careful of accumulation of iron powder and contact with magnetic substances.
 

If a large amount of iron chips such as cutting chips or welding spatter accumulate or if magnetic objects (material attracted to magnets) contact the cylinder with a cylinder switch, the cylinder will be demagnetized and cylinder switch operations may be inhibited.

## Catalogs



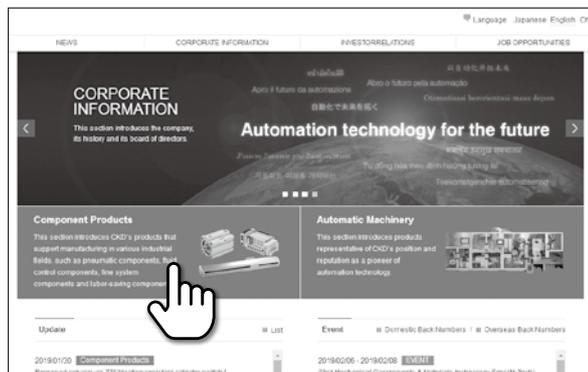
Eight different catalogs are available.

- Pneumatic Valves (Catalog No. CB-023SA)
  - Pneumatic Cylinders I/II (Catalogs No. CB-029SA and CB-030SA)
  - General Purpose Valves (Catalog No. CB-03-1SA)
  - Pneumatic, Vacuum and Auxiliary Components (Catalog No. CB-024SA)
  - Vacuum system equipment SELVACS (Catalog No. CC-796A)
  - ABSODEX Products (Catalog No. CB-054A)
  - Electric Actuator Motorless General (Catalog No. CB-055A)
- Please do not hesitate to make use of these resources, through application with your sales officer or nearest CKD sales office.

## Home page

Catalog PDFs and CAD data of CKD products are available for download.

 <https://www.ckd.co.jp/english>



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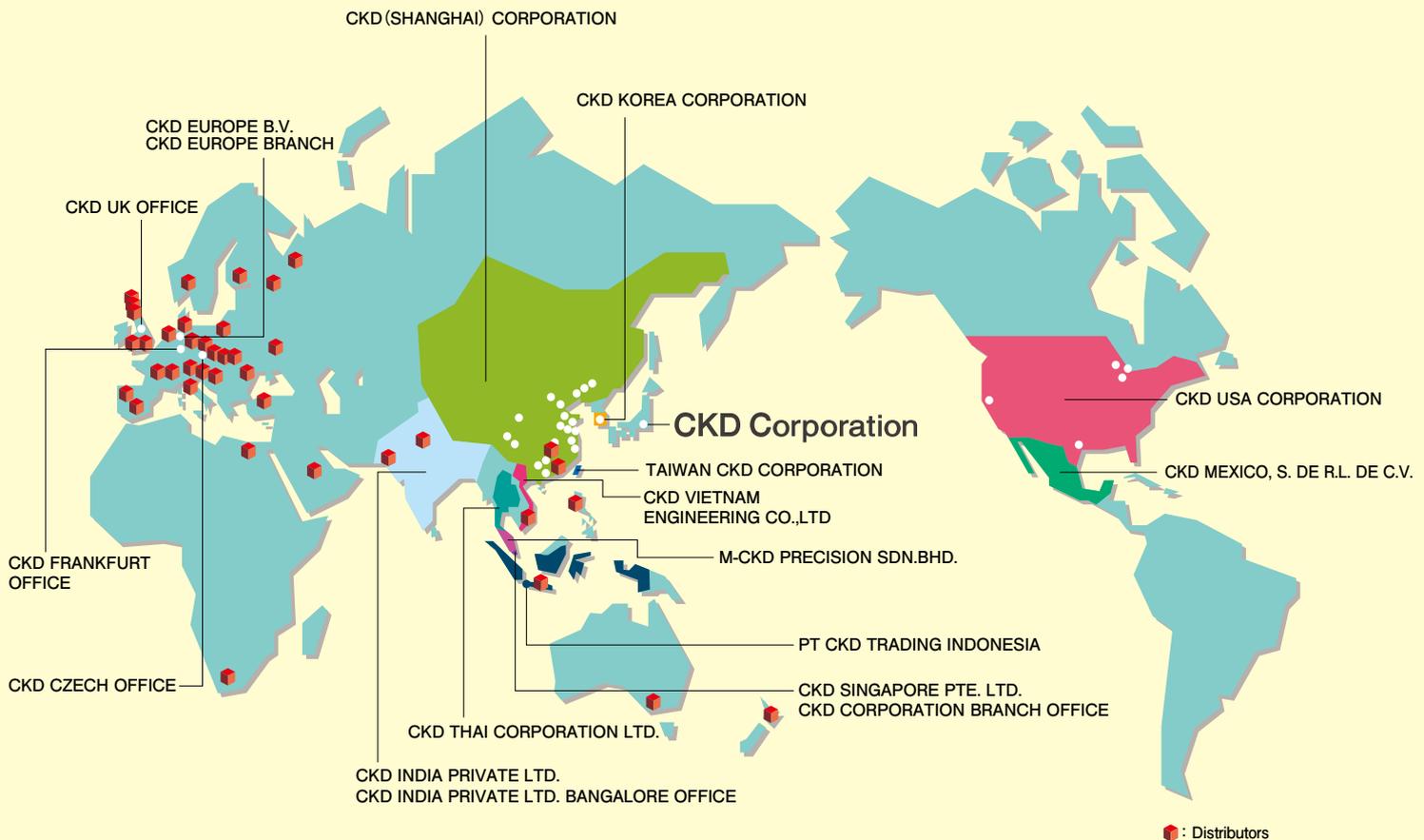
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