CKD

Energy efficiency and large flow rate

New product

2port pilot operated solenoid valve for compressed air
Compact air blow valve EXA Series

2 PORT PILOT OPERATED SOLENOID VALVE FOR COMPRESSED AIR EXA SERIES

CKD Corporation

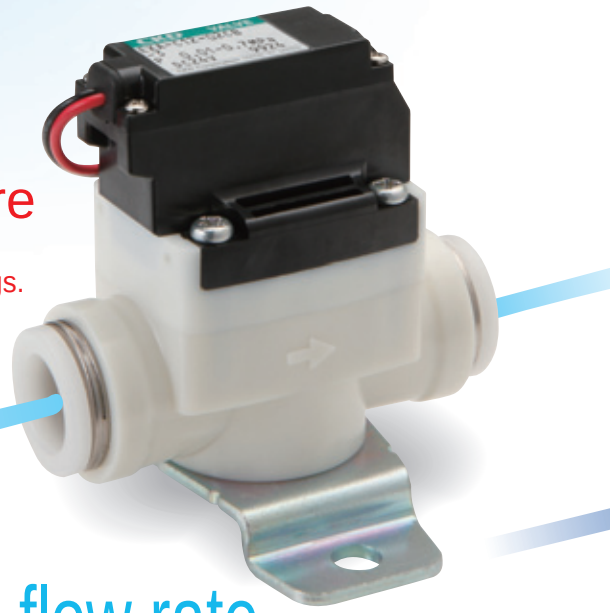
CC-1007A 2

Energy efficiency and

Flow **450**ℓ/min or more

Estimated figure in the condition of primary pressure : 0.5MPa and secondary pressure :Atmospheric with Φ6 push-in fittings.

Power **0.6**W

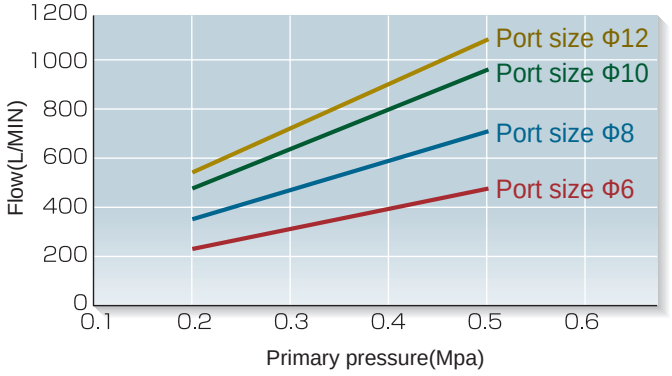


Energy efficiency and large flow rate

Realizing energy efficiency and low power consumption at once with a low wattage(0.6V) 3 way pilot valve.(Can be directly operated from PC)

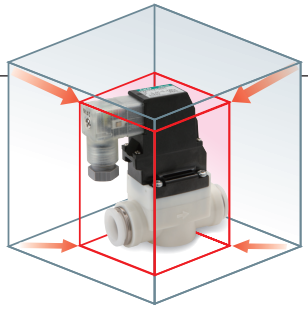
Contributes to space and energy efficiency

Secondary flow in the atmospheric pressure



Compact, light weight

Weight reduced by optimization of materials. Now, the volume has been reduced by 70%, weight by 30%.



Compared to CKD's conventional models

Up to **30**% smaller

Up to **70**% lighter

Standard push-in fitting

Reduce man hours with built in push-in fitting.

Applicable tube O.D.

Φ6, Φ8, Φ10, Φ12

Flow is subject to change depending on piping conditions. Check the flow with the actual product.

RoHS

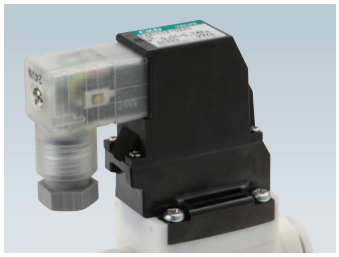
large flow rate

2port pilot operated solenoid valve for compressed air

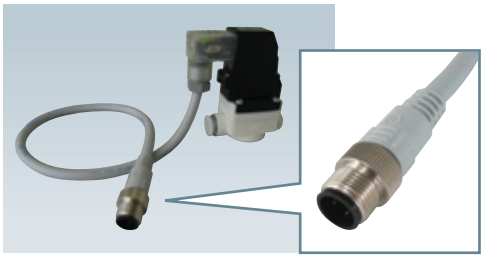
EXA Series

Option

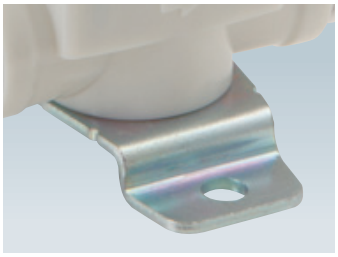
1 DIN terminal box (IPx5)



2 DIN terminal box with M12 connector cable(24VDC only)



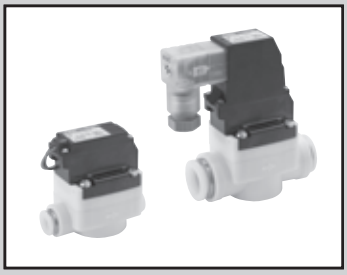
3 Mounting plate



Variation

1 Modular connection with air unit CXU Series and FRL 1000 Series available

Consult with CKD regarding NO(normally open type) and manifold specifications.



2 port pilot operated solenoid valve for compressed air

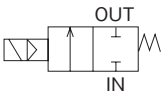
EXA Series

- NC (normally closed) type
- Port size: Push-in joint Φ6, Φ8, Φ10, Φ12
- Diaphragm structure

RoHS

JIS symbol

NC (normally closed) type



Specifications

Descriptions		EXA-C6	EXA-C8	EXA-C10	EXA-C12
Working fluid		Compressed air			
Working pressure differential	MPa	0.01 to 0.7			
Max. working pressure	MPa	0.7			
Withstanding pressure (water)	MPa	1.05			
Fluid temperature	°C	0 to 55 (to be unfrozen)			
Ambient temperature	°C	-5 to 55			
Atmosphere		Does not contact water, corrosive or flammable gas.			
Valve structure		Pilot operated diaphragm structure			
Internal leakage	cm^3/min	2 or less			
External leakage	cm^3/min	2 or less			
Mounting attitude		Free			
Port size		Push-in joint Φ6	Push-in joint Φ8	Push-in joint Φ10	Push-in joint Φ12
C (dm^3/ (s/bar))		1.6	3.0	3.3	3.6
b		0.45	0.33	0.26	0.20
Weight *2	g	56	57	68	69
Electric specifications					
Rated voltage		100VAC(50/60Hz), 24VDC,12VDC Note 1			
Apparent power	VA	1.2			
Power consumption	W / DC	0.6			
Heat proof class		B			
Protective structure (IEC standards: 529)		Lead wire type: IPX0, with DIN terminal box: IPX5			

Note 1: Voltage fluctuation range is ±10%
Note 2: Plus 20g for DIN terminal box.

How to order

EXA - C6 - 0 2C B - 1

- Model no.
- A Applicable tube outer diameter
- B Sealant
- C Coil option
- D Other options
- E Voltage

<Example of model number>
EXA-C6-02CB-1
Model: Compact air blow valve EXA

A Applicable tube outer diameter : Φ6
B Sealant: H-NBR
C Coil option: Lead wire
D Other options: Mounting plate
E Voltage: 100 VAC

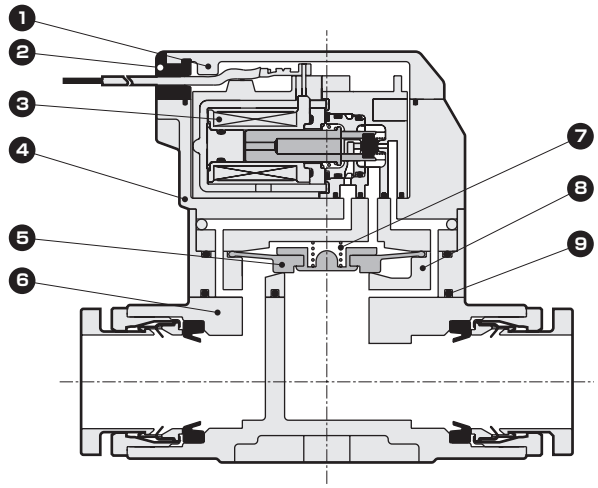
Coil option	Voltage 1	3	4
2C	●	●	●
2G	●		
2GS		●	●
2H	●		
2HS		●	●
2KS		●	

Select from the circle mark above.

Symbol		Descriptions
A Applicable tube outer diameter		
C6		Φ6
C8		Φ8
C10		Φ10
C12		Φ12
B Sealant		
0		H-NBR
C Coil option Note 1		
2C	Standard	Lead wire (without light and surge suppressor)
2G	Option	DIN terminal box (Pg7), without indicator light
2GS		DIN terminal box (Pg7), with/without indicator light
2H		DIN terminal box(Pg7). with indicator light inside terminal box
2HS		DIN terminal box(Pg7). with indicator light and surge suppressor inside terminal box
2KS		DIN terminal box with indicator light and surge suppressor inside terminal box
D Other options		
Blank		None
B		Mounting plate
E Voltage Note 1		
1		100VAC
3		24VDC
4		12VDC

Refer to the table on the left for available combinations of coil options and voltage.

Internal structure and parts list

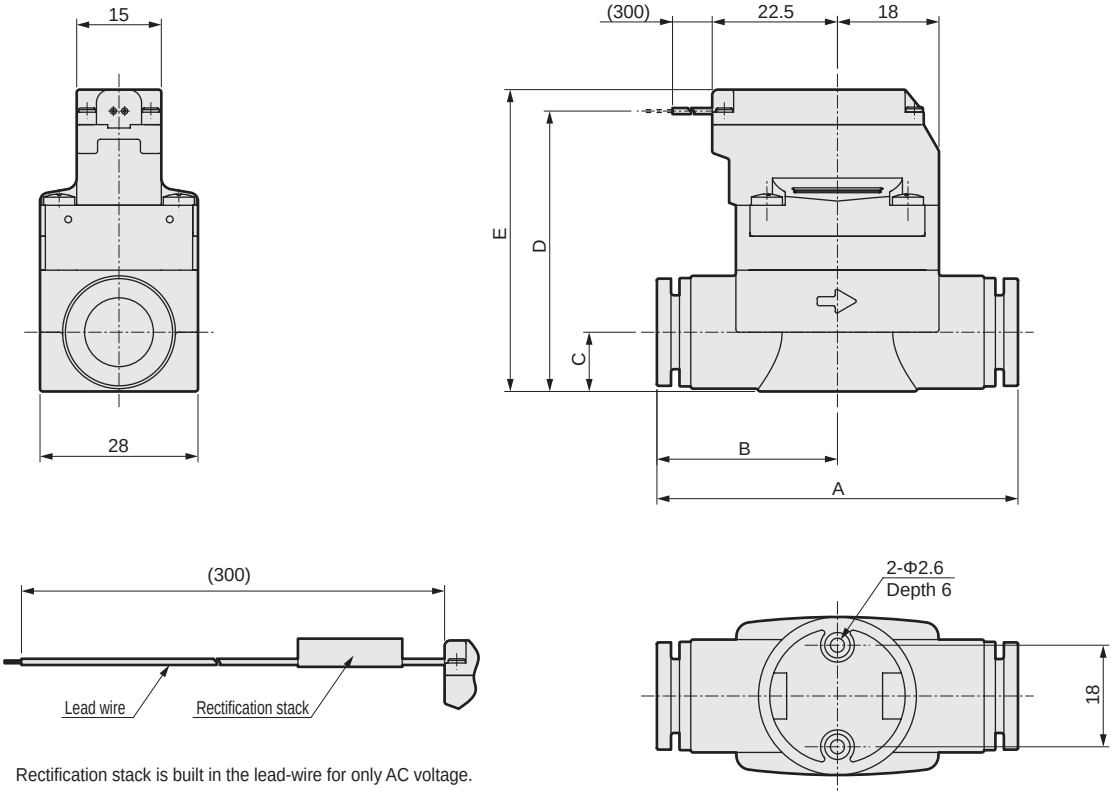


No.	Parts name	Material	
1	Guard (Note 1)	PBT	PBT
2	Bush	NBR	Nitrile rubber
3	Coil assembly	-	-
4	Stuffing	PPS	Polyphenylene sulfide
5	Diaphragm assembly	H-NBR/PPS	Hydrogenated nitrile rubber/ polyphenylene sulfide
6	Main body	PBT	PBT
7	Spring	SUS	Stainless steel
8	Valve body	PBT	PBT
9	Gasket	H-NBR	Hydrogenated nitrile rubber

Note 1: PA66, polyamide will be used if DIN terminal box is attached.

Dimensions

● Lead wire type
EXA-*-*2C



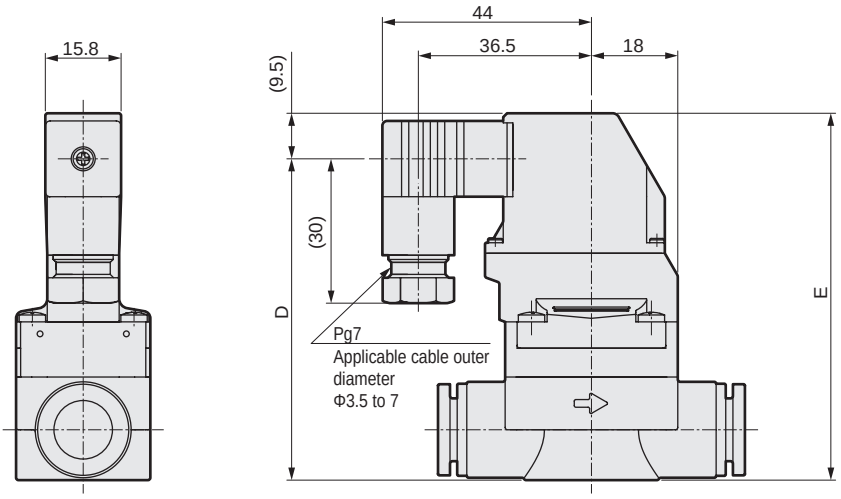
Rectification stack is built in the lead-wire for only AC voltage.

Model no.	A	B	C	D	E
EXA-C6	52	28	8	45	48.5
EXA-C8	53	28.5	8	45	48.5
EXA-C10	62	31	11.5	51	54.5
EXA-C12	64	32	11.5	51	54.5

* This drawing shows the exterior dimensions for Φ10

Optional dimensions

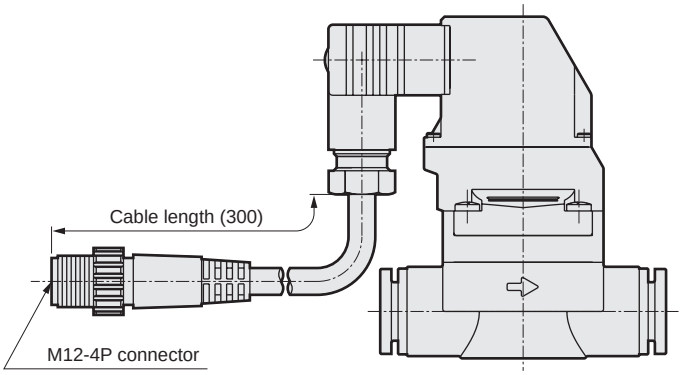
● DIN terminal box (Pg7)
EXA-*-* 2G
2GS
2H
2HS



Model no.	D	E
EXA-C6	62	71.5
EXA-C8	62	71.5
EXA-C10	68	77.5
EXA-C12	68	77.5

* This drawing shows the exterior dimensions for Φ10

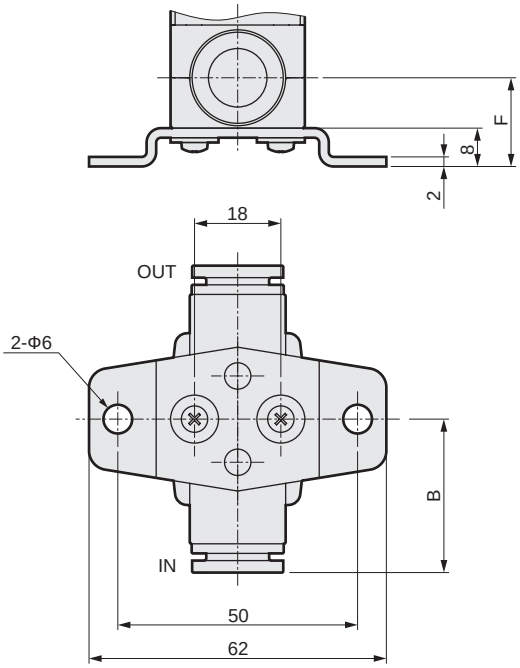
● With indicator light with DIN terminal box M12 connector lead
EXA-*-*2KS



Connector pin array

PIN No.	Applications
1PIN	(Does not use.)
2PIN	(Does not use.)
3PIN	Power supply-
4PIN	Power supply +

● Mounting plate
EXA-*-**B



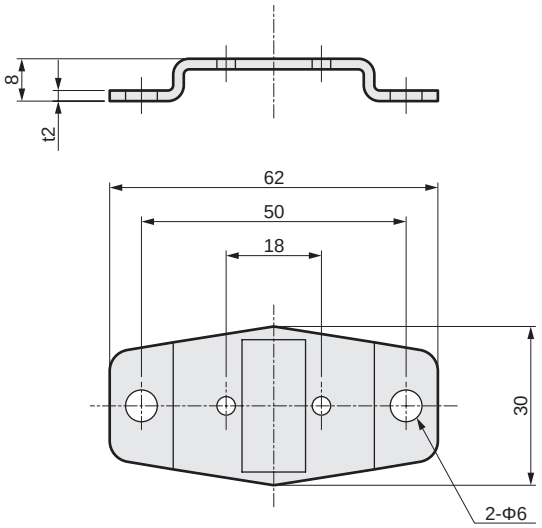
Model no.	B	F
EXA-C6	28	16
EXA-C8	28.5	16
EXA-C10	31	19.5
EXA-C12	32	19.5

* This drawing shows the exterior dimensions for Φ10

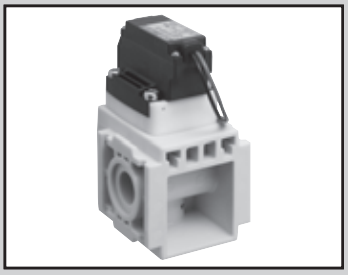
Optional dimensions

● Mounting plate kit
Model no.: EXA-MOUNT-PLATE-KIT

Below parts is provided as set.
- Mounting plate (below): 1 piece
- Plain washer: 2 pieces
- Set screw: 2 pieces



- Use the specified tightening torque mounting plate.
  Tightening torque: 0.54 to 0.66N•m



2 port pilot operated solenoid valve for compressed air

CXU10-EXA Series

- N.C. (normally closed) type, diaphragm structure type
- Modular connection with 1000 Series
- Ideal for modular component blow valves

No screw Open type

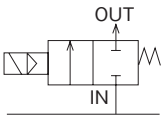
IN side Gasket

RoHS

Expanding manifold Possible

JIS symbol

●NC (normally closed) type



Specifications

Descriptions		CXU10-EXA			
Working fluid		Compressed air			
Working pressure differential range	MPa	0.01 to 0.7			
Max. working pressure	MPa	0.7			
Withstanding pressure	MPa	1.05			
Fluid temperature	°C	0 to 55			
Ambient temperature	°C	-5 to 55			
Atmosphere		Does not contact water, corrosive or flammable gas.			
Valve structure		Pilot operated diaphragm structure			
Valve leakage	cm^3/min	10 or less			
Mounting attitude		Free			
Port size (IN)		None			
Port size (OUT)		Push-in joint Φ6	Push-in joint Φ6L type	Push-in joint Φ8	Push-in joint Φ8L type
C (dm^3/ (s/bar)) Note 2		1.6		3.0	
b		0.37		0.32	
Weight	g Note 3	98	95	98	100
Electric specifications					
Rated voltage		100 VAC (50/60Hz), 24 VDC Note 1			
Apparent power	VA	1.2			
Power consumption	W DC	0.6			
Heat proof class		B			
Protective structure (IEC standards: 529)		Lead wire type: IPX0, with DIN terminal box: IPX5			

Note 1: Voltage fluctuation range is ±10%
Note 2: Effective sectional area S and sonic conductance C are converted as S ≒ 5.0 x C.
Note 3: Models with DIN terminal box weighs +20g more.

How to order

CXU10-EXA- C6 - 2C - 1

- Model no.
- Ⓐ Port size (OUT)
- Ⓑ Coil option
- Ⓒ Voltage

Symbol	Descriptions
Ⓐ Port size	
C6	Φ6 push-in joint
CL6	Φ6 push-in joint L type
C8	Φ8 push-in joint
CL8	Φ8 push-in joint L type

Ⓑ Coil option Note 1, 2		
2C	**Standard**	Lead wire (without light and surge suppressor)
2H	**Option**	DIN terminal box(Pg7). with indicator light inside terminal box
2HS		DIN terminal box(Pg7). with indicator light and surge suppressor inside terminal box

Ⓒ Voltage Note 1	
1	100VAC
3	24VDC

Coil option	Voltage 1	Voltage 3
2C	●	●
2H	●	
2HS		●

Select from the circle mark above.

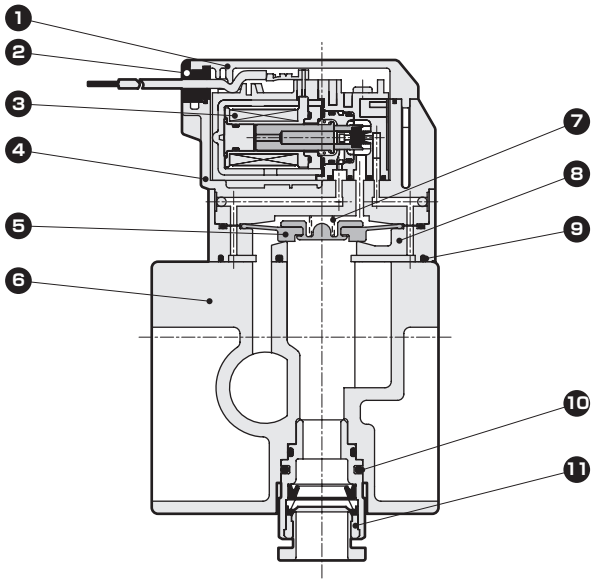
Note on model no. selection

Refer to the above table for available combinations of coil options and voltage.
Contact CKD for models with M12 connector cable.

Refer to "Air unit CXU Series (No.CC-901)".Because this product is a valve air unit of CXU Series.

Internal structure and parts list

● CXU10-EXA

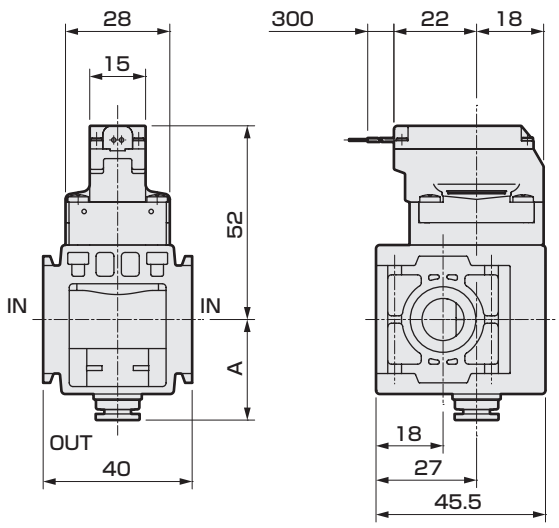


No.	Parts name	Material	
1	Guard (Note 1)	PBT	PBT
2	Bush	NBR	Nitrile rubber
3	Coil assembly	-	-
4	Stuffing	PPS	Polyphenylene sulfide
5	Diaphragm assembly	H-NBR/PPS	Hydrogenated nitrile rubber/ polyphenylene sulfide
6	Body	PA66	Polyamide resin
7	Spring	SUS	Stainless steel
8	Valve body	PBT	PBT
9	Gasket	H-NBR	Hydrogenated nitrile rubber
10	Pin	SUS	Stainless steel
11	Fitting		

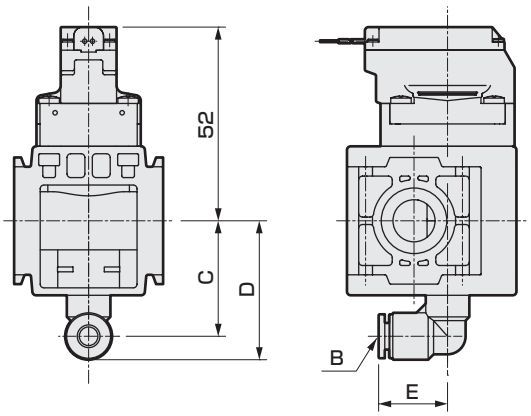
Note 1:PA66, polyamide will be used if DIN terminal box is attached.

Dimensions

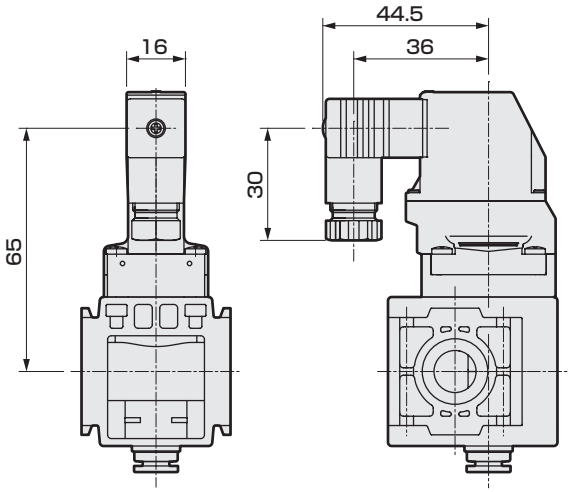
● Grommet lead wire type
CXU10-EXA-*-2C-*
Cartridge fitting: straight type



Elbow type fitting

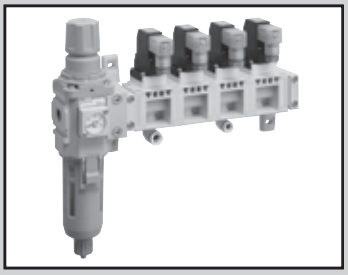


● With DIN terminal box (Pg11) type
CXU10-EXA-*-2HS-*



Option dimensions

Option	A	B	C	D	E
C6	27	Push-in joint Φ6	-	-	-
CL6	-	Push-in joint Φ6	31	37	18.5
C8	27	Push-in joint Φ8	-	-	-
CL8	-	Push-in joint Φ8	32	39	21



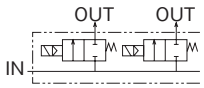
2 port pilot operated solenoid valve for compressed air
Manifold model no.

CXU10-GEXA Series

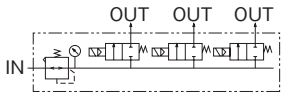
●NC (normally closed) type
●Order in manifolds with a regulator connected

Easy Manifold

JIS symbol



(example) CXU10-EXA-C6-R-3-2C-3



Specifications

Descriptions		CXU10-GEXA3			
Working fluid		Compressed air			
Working pressure differential	MPa	0.01 to 0.7			
Max. working pressure	MPa	0.7			
Withstanding pressure	MPa	1.05			
Fluid temperature	°C	0 to 55			
Ambient temperature	°C	-5 to 55			
Atmosphere		Does not contact water, corrosive or flammable gas.			
Valve structure		Pilot operated diaphragm structure			
Valve leakage	cm^3/min. (ANR)	10 or less			
Mounting attitude		Free			
Port size (IN)		IN: Rc3/8			
Port size (OUT)		Push-in joint Φ6	Push-in joint Φ6L type	Push-in joint Φ8	Push-in joint Φ8L type
C (dm^3/ (s/bar)) Note 2		1.6		3.0	
b		0.37		0.32	
Electric specifications					
Rated voltage		100VAC, 24VDC			
Rated electric power	VA	1.2			
Power consumption	W / DC	0.6			
Heat proof class		B			
Protective structure (IEC standards: 529)		Lead wire type: IPX0, with DIN terminal box: IPX5			

Note 1: Voltage fluctuation range is ±10%
Note 2: Effective sectional area S and sonic conductance C are converted as S ≒ 5.0 x C.

Regulator specifications		
Set pressure range	MPa	0.05 to 0.7 Note 3
Relief		With relief mechanism
Port size		Rc1/4
Filter specifications		
Filtration rating	μm	5
Drain capacity	cm^3	12.0
Port size		Rc1/4

Note 3: Set pressure range will be limited by the working pressure of CXU10-EXA.

Weight

(Unit: kg)

Descriptions	Descriptions
FR component (T type bracket, joiner, etc.., , including)	
A: piping adapter	0.21
R: regulator	0.58
RT8: regulator (without pressure gauge)	0.57
W: Filter•regulator	0.70
WT8: Filter•regulator (without pressure gauge)	0.69
2 port solenoid valve	
CXU10-EXA (discrete valve + joiner) Note 4	0.11

Note 4: Models with DIN terminal box weighs +20g more.

Weight is calculable from FR unit and total number of 2 port valves.

Refer to "Air unit CXU Series (No.CC-901)".Because this product is a valve air unit of CXU Series.

How to order

CXU10-GEXA- C6 - R - 3 - 2C - 3

- Model no.
- A Port size (OUT)
- B FR component options
- C Solenoid valve station qty.
- D Coil option
- E Rated voltage

Symbol		Descriptions
A Port size (OUT)		
C6		Φ6 push-in joint
CL6		Φ6 push-in joint L type
C8		Φ8 push-in joint
CL8		Φ8 push-in joint L type
B FR component options		
Component options Note 1	A	Piping adapter (Rc3/8)
	R	Regulator (R2000-10-W-X2, Note 2)
	RT8	Regulator (R2000-10-W-T8X2, Note 2) Without pressure gauge (port Rc1/4 open)
	W	Filter regulator (W2000-10-W-F1, Note 2)
	WT8	Filter regulator (W2000-10-W-F1T8, Note 2) Without pressure gauge (port Rc1/4 open)
Direction	Blank	IN side left
	X	IN side right
C Solenoid valve station qty.		
1 to 4		1 station to 4 station
D Coil option Note 3, 4		
2C	Standard	Lead wire (without light and surge suppressor)
2H	Option	DIN terminal box(Pg7). with indicator light inside terminal box
2HS		DIN terminal box(Pg7). with indicator light and surge suppressor inside terminal box
E Rated voltage		
1		100VAC
3		24VDC

Note on model no. selection

Note 1: Standard filter•regulator is NC automatic drain type. Select A unless component option R, RT8, W, WT8 is selected.
Multiple FR device options cannot be selected.
Note 2: Model no. for IN side Left (FR device direction option "No symbol").
Note 3: Refer to the table on the right for available combinations of coil options and voltage.
Note 4: Contact CKD for models with M12 connector cable.

Coil option	Voltage	
	1	3
2C	●	●
2H	●	
2HS		●

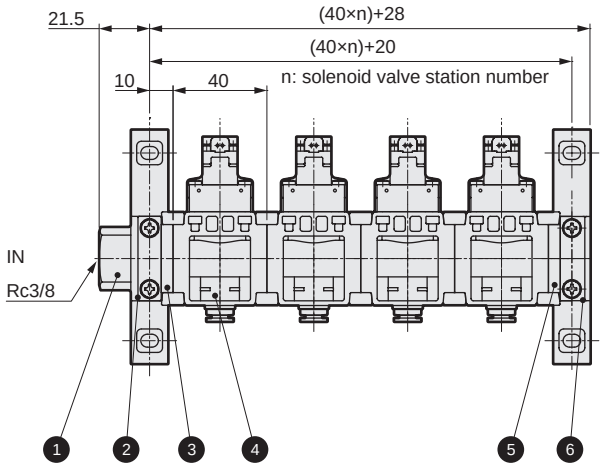
Select from the circle mark above.

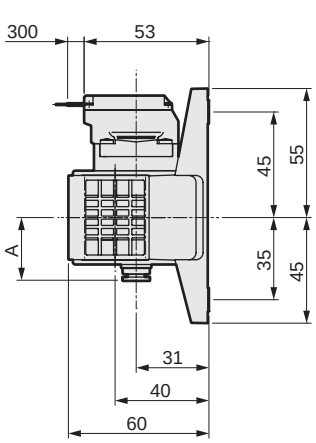
Internal structure

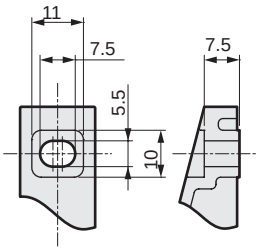
Model	Listed catalog and page no.
CXU10-EXA	Page 6
CXU10-TA	Catalog No. CC-901
CXU10-MA	Catalog No. CC-901
R2000	Catalog No. CB-024S
W2000	Catalog No. CB-024S

Dimensions

● Grommet lead wire type
CXU10-GEXA-*-A-*-2C-*
Cartridge fitting: straight type







Enlarged view of bracket section

Configuration table

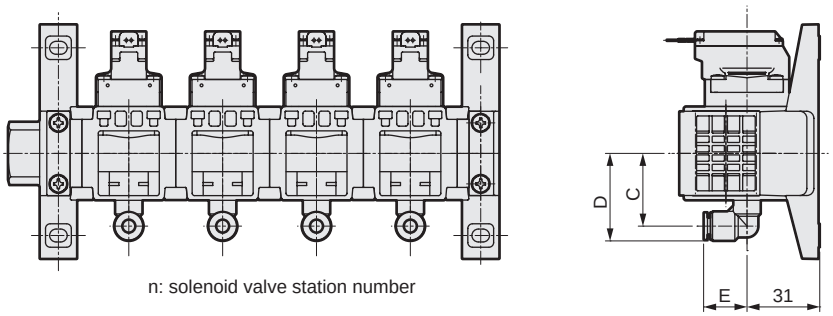
No.	Product name	Model no.
1	Piping adapter Note 1	(FR component options -A)
2	T type bracket	B110-W
3	Turn adapter	CXU10-TA-00
4	2 port pilot operated solenoid valve	CXU10-EXA-*
5	Turn adapter	CXU10-TA-00
6	Masking adapter	CXU10-MA-00-B

Note 1: The final product may differ depending on FR component options.

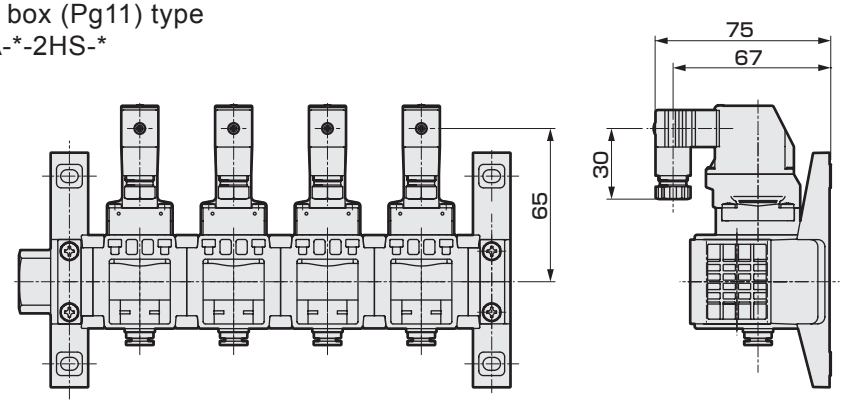
Option dimensions

Model no.	A	B	C	D	E
C6	27	Push-in joint Φ6	-	-	-
CL6	-	Push-in joint Φ6	31	37	18.5
C8	27	Push-in joint Φ8	-	-	-
CL8	-	Push-in joint Φ8	32	39	21

Elbow type fitting

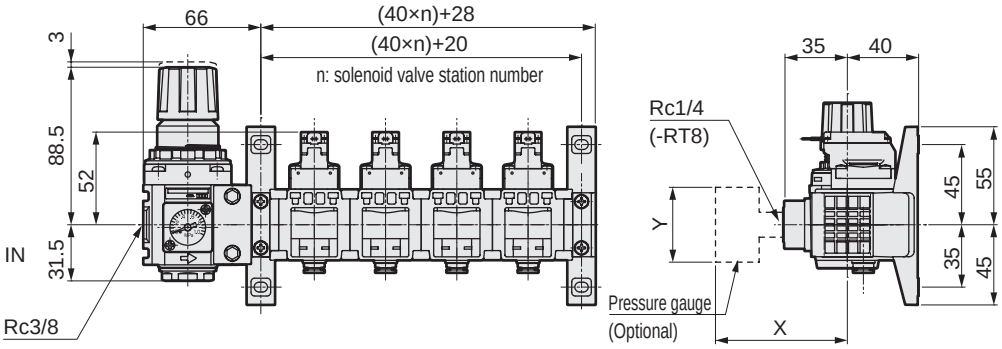


● With DIN terminal box (Pg11) type
CXU10-GEXA-*-A-*-2HS-*



Dimensions

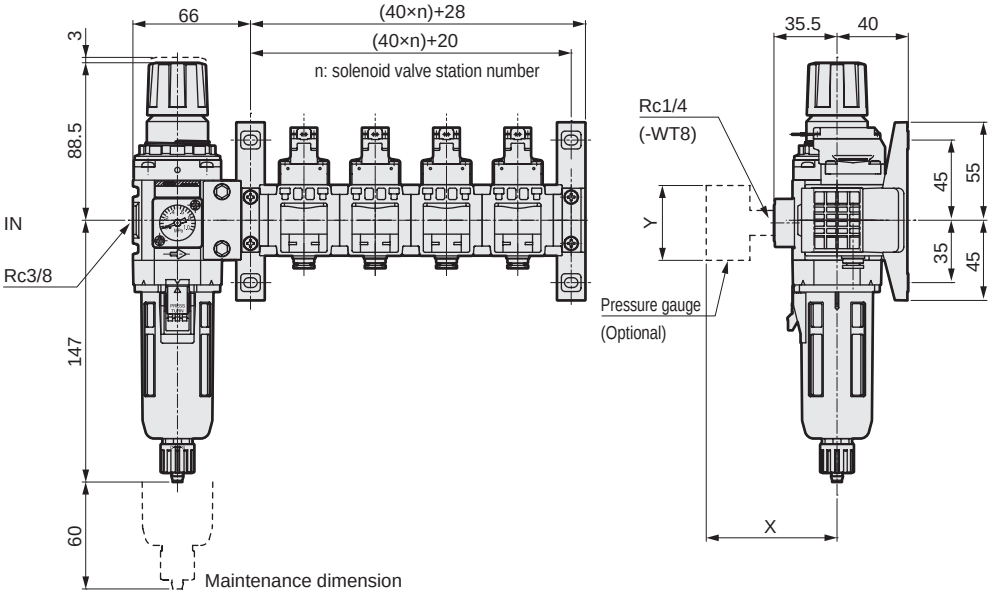
● F.R. component option: regulator type
CXU10-GEXA-*-$^{R}_{RT8}$ -*-*-*



Pressure gauge dimensions

Pressure gauge (Optional)	X	Y
G49D	(73.5)	Φ43.5
G59D	(76)	Φ52
G40D	(75.5)	Φ42.5
G50D	(75.5)	Φ52.5
G41D	(74)	Φ42
G52D	(79)	Φ52.5

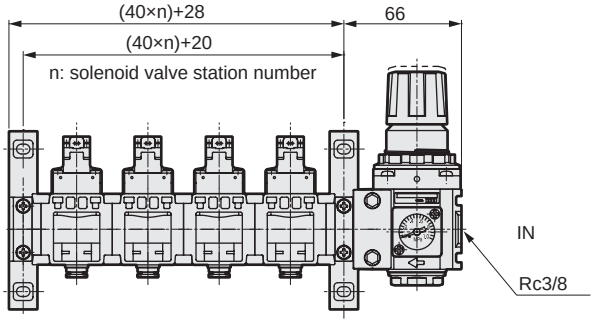
● F.R. component option: filter regulator type
CXU10-GEXA-*-$^{W}_{WT8}$ -*-*-*



Pressure gauge dimensions

Pressure gauge (Optional)	X	Y
G49D	(73.5)	Φ43.5
G59D	(76)	Φ52
G40D	(75.5)	Φ42.5
G50D	(75.5)	Φ52.5
G41D	(74)	Φ42
G52D	(79)	Φ52.5

● F.R. components option: reverse flow
CXU10-GEXA-*-$^{R}_{RT8}$ X-*-*-*



When reverse flow option X is selected, the IN side and FR device are on the right. The drawing at left is for the regulator.

Safety precautions

Always read this section before starting use.

When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices is secured. It is important to select, use, handle, and maintain the product appropriately to ensure that the CKD product is used safely. 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 in handling.

2 Use this product in accordance of specifications.

This product must be used within its stated specifications. It must not be modified or machined.
This product is intended for use as a general-purpose industrial device or part. It is not intended for use outdoors or for use under the following conditions or environment.
(Note that this product can be used when CKD is consulted prior to use and the customer consents to CKD product specifications. The customer must provide safety measures to avoid risks in the event of problems.)
Use for special applications requiring safety including nuclear energy, railroad, aviation, ship, vehicle, medical equipment, equipment or applications coming into contact with beverage or food, amusement equipment, emergency shutoff circuits, press machine, brake circuits, or for safeguard.
Use for applications where life or assets could be adversely affected, and special safety measures are required.

3 Observe corporate standards and regulations, etc., related to the safety of device design and control, etc.

ISO4414, JIS B8370 (pneumatic system rules)
JFPS2008 (principles for pneumatic cylinder selection and use)
Including High Pressure Gas Maintenance Law, Occupational Safety and Sanitation Laws, other safety rules, body standards and regulations, etc.

4 Do not handle, pipe, or remove devices before confirming safety.

Inspect and service the machine and devices after confirming safety of the entire system related to this product.
Note that there may be hot or charged sections even after operation is stopped.
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 enough attention to possible water leakage and leakage of electricity.
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 warnings and cautions on the pages below to prevent accidents.

■ The precautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

⚠ **DANGER:** When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency to a warning.

⚠ **WARNING:** When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.

⚠ **CAUTION:** When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as “CAUTION” may lead to serious results depending on the situation.
In any case, important information that must be observed is explained.

Disclaimer

1 Term of warranty

"Warranty Period" is one (1) year from the first delivery to the customer.

2 Scope of warranty

In case any defect 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, according to its own judgment.
Note that the following faults are excluded from the warranty term:
(1)Product abuse/misuse contrary to conditions/environment recommended in its catalogs/specifications
(2) Failure caused by other than the delivered product
(3) Use other than original design purposes.
(4) Third-party repair/modification
(5) Failure caused by reason that is unforeseeable with technology put into practical use at the time of delivery
(6) Failure attributable to force majeure.
In no event shall CKD be liable for business interruptions, loss of profits, personal injury, costs of delay or for any other special, indirect, incidental or consequential losses, costs or damages.

3 Compatibility confirmation

In no event shall CKD be liable for merchantability or fitness for a particular purpose, notwithstanding any disclosure to CKD of the use to which the product is to be put.

Safety precautions

Fluid control components: warning, cautions

Always read this section before starting use.
Read safety precautions [General purpose valves CB-03-1S)] [Air unit CXU Series(CC-901)]

Specific precautions: 2 port pilot operated solenoid valve EXA Series

Design & Selection

1. Confirmation of specifications

⚠WARNING

■Use within the product's specific specification range.
Use with pressure or temperature exceeding the specification range may result in damage or operation faults. (Refer to the specifications.).
Consult with CKD when using fluids other than compressed air

■Working fluid
Active gases are not applicable.
Consult with our sales office when using it.

2. Design for Safety

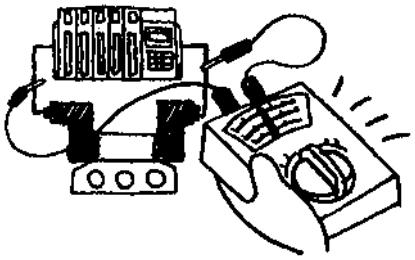
⚠WARNING

■Take measures to protect personnel and equipment against injury or damage if this product fails.

⚠CAUTION

■Check leakage current to prevent other fluid control components from malfunctioning due to leakage current.
- When using a programmable controller, etc., the solenoid valve could malfunction because of leakage current.
  The value affected by leakage current differs with the solenoid valve.

Programmable controller



When 100VAC	2.0mA or less
When 12VDC	1.5mA or less
When 24VDC	1.8mA or less

■Observe the following precautions when using nylon tubes or urethane tubes for piping material.
- Use flame resistant tubes where spatter could scatter.
- When using the standard push-in joint on the spiral tube, fix the base of the tube with a hose band. The tube will rotate and holding force will drop if not fixed.

3. Working environment

■Use the clean air.
- The product could break or malfunction if used with compressed air containing chemicals, synthetic oils containing organic solvents, salt, or corrosive gases, etc.
- Maintain the ozone concentration in the compressed air below 0.1ppm. Increase in ozone concentration will result in deficiencies such as malfunctions and leakage.

■DIN terminal box connection type protection property symbol (IPX5)
IP X5 (IEC 60529 (IEC 529: 1989-11)) standards are applied to the test. Avoid use in condition which water or coolant could directly contact the valve.

Explanation of protection property symbols and examination method of IPX5

● Protective structure

Note: IP-X5 is a test based on the following standard

■ IEC () standards

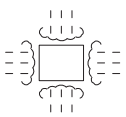
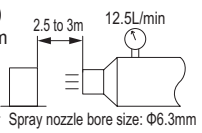
(IEC60529 (IEC529: 1989-11))

IP − □ □

Protection property symbols (International Protection)

1st characteristic number
(protection grade for foreign solid)

2nd characteristic number (protective class against entry of water)

Grade	Degree of protection		Overview of test method (fresh water is used to do.)
5	Protection against powerful jets 	No harmful effects occur even when water is sprayed with nozzles from all directions.	Using the following test device, spray water for 1 minute per 1 m² of test sample (exterior) surface area from all directions, for a total of 3 minutes or more. 

4. Durability

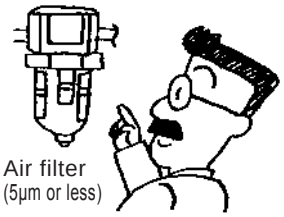
⚠WARNING

■Use in continuous energizing could deteriorate the solenoid valve's performance. Contact CKD for such applications.

5. Pneumatics pressure source

⚠CAUTION

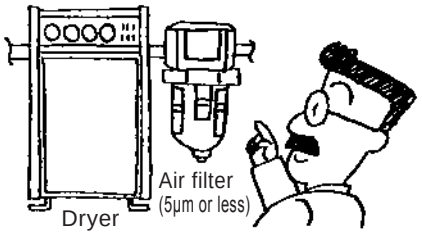
■Install the air filter just before the circuit using the pneumatic component.



■Do not supply other than compressed air.

■Use clean compressed air that does not contain corrosive gases.

■Use dry compressed air that does not cause condensation in piping.



- Drainage will form if the temperature drops in the pneumatic piping or pneumatic components.
- Operation faults could occur if drainage enters the air flow path in pneumatic components or if it temporarily blocks passage.
- Drainage could cause rust, making the pneumatic device fail.

■Use compressed air that does not contain oxidized oil, tar, carbon, etc., from the air compressor.

- If oxidized oil, tar, or carbon enter the air compressor and solidify, resistance at the sliding section will increase, and could lead to operation faults.

■Use compressed air that does not contain solid foreign matter.

- Solid foreign matter in compressed air could enter the air compressor and cause wear, sticking. or leakage at the sliding section.

6. Surge suppressor

⚠CAUTION

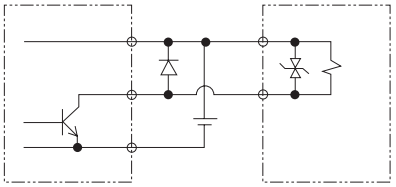
■ The surge suppressor enclosed with the solenoid valve is to protect the output contact for that solenoid valve's drive. There is no significant protection for the other peripheral devices, and devices could be damaged or malfunction by the surge. Surge generated by other devices could be absorbed, resulting in damage or accidents such as burning. Note the following points.

- The surge suppressor functions to limit a solenoid valve surge voltage, which can reach several hundred V, to a low voltage level that the output contact can withstand. This may be insufficient for the output circuit, however, and could result in damage or malfunction. Check that the surge suppressor is adequate for the surge voltage limit of the solenoid valve used, the output device withstand voltage, and circuit configuration, and the degree of return delay time. Provide separate surge measures if necessary. Reverse voltage surge generated at OFF is suppressed to the following levels by the solenoid valve with surge suppressor of this product.

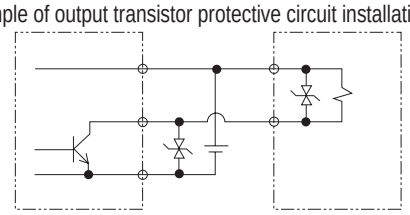
Rated voltage	Reverse voltage value when power turned OFF
DC12V	Approx. 27V
DC24V	Approx. 47V

- When using the NPN output unit, a surge voltage equivalent to the voltage above plus the power voltage surge could be applied. Provide contact protection circuit.

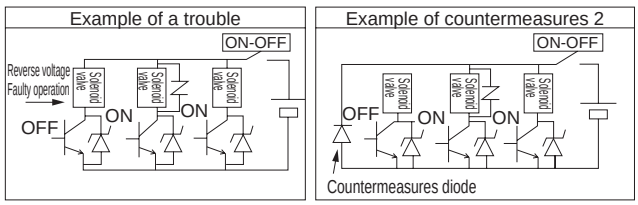
(example of output transistor protective circuit installation 1)



(example of output transistor protective circuit installation 2)



- if another device or solenoid valve is connected in parallel to the solenoid valve, the inverse voltage surge generated when the valve is OFF would apply to those devices. Even when using the solenoid valve for the surge suppressor for 24 VDC, surge voltage may reach minus several ten V depending on the model. This reverse polarity voltage could damage or cause other devices connected in parallel to malfunction. Avoid parallel connection with a device having weak reverse polarity voltage. (Example: LED indicator.) When driving several solenoid valves in parallel, the surge from other solenoid valves could enter the surge suppressor of one solenoid valve with a surge suppressor. Depending on the current value, that surge suppressor could burn.



- The surge suppressor incorporated in the solenoid valve often short-circuits if damaged by excessive voltage or current the other solenoid valves. After such damage, large current flows when output is turned on, and in the worst case, the output circuit or solenoid valve is damaged or fires start. Do not leave the solenoid valve energized in a faulty state. Provide an over current protection circuit on the power or drive circuit, or use a power supply with over current protection so that no large current flows continuously.

7. 100VAC specifications

⚠CAUTION

■For 100 VAC, all wave rectified circuit is incorporated.

When using an SSR to turn the solenoid valve on and off, a solenoid valve reset fault may occur depending on the SSR.
Take care when selecting the SSR. (Consult with the relay or PLC manufacturer.)

Installation & Adjustment

1. Installation

⚠WARNING

■Do not support valves with piping when installing valves.
- Install and fix the valve body.

■Avoid washing with water or solvents or painting after installation.
- Resin parts could be damaged.

■Do not remove the solenoid valve's packaging or the piping port's dust-proof seal until just before piping.
- If the dust-proof seal is removed from the piping port before pipes are connected, foreign matter could enter the solenoid valve from the piping port and could lead to faults or malfunctions.

■Make sure that the joint and tube are not twisted or pulled, and that moment load is not applied.

■Check that tubing is not worn or damaged.
- Tubing could be crushed, ruptured, or dislocated.

2. Confirmation before operation

⚠CAUTION

■When supplying compressed air for the first time after connecting pipes, do not apply high pressure suddenly.
- Tube may come off and fly out, causing an accident.

■When supplying compressed air for the first time after connecting piping, confirm that no air is leaking from any pipe connections.
- Apply a leakage detection agent on pipe connections with a brush, and check for air leaks.

3. Piping

■Pipe so that piping connection does not deviate by the device's movement, vibration, tension, etc.
- When using the push in joint, cut the tube at right angles using a dedicated tool.
- Confirm that the tube has been inserted properly, and make sure that there is no tension during use. The tube could be dislocated or damaged if there is any tension.

■Make sure that the joint and tube are not twisted or pulled, and that moment load is not applied.

■Use the designated tube.
- Mount an insert sleeve especially when using extremely flexible urethane tubing.

■Securely insert the tube to the tube end, and make sure that the tube cannot be pulled off.

■Cut the tube at right angles using a dedicated cutting tool.

4. Lead wire wiring

⚠CAUTION

■Wire in a suitable method for the lead wire.

The used lead wires are as follows.

Electric connection symbol	Descriptions	Conductor size	Conductor cross-section areas	Isolator outer diameter	Sheath outer diameter
Blank	Grommet lead wire	AWG#24	0.22 or equivalent	1.42	-

5. DIN terminal box

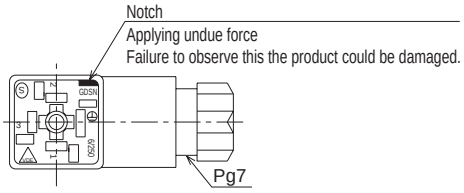
⚠WARNING

■Turn power OFF before disassembling or assembling the terminal box. There is a risk of electric shock.

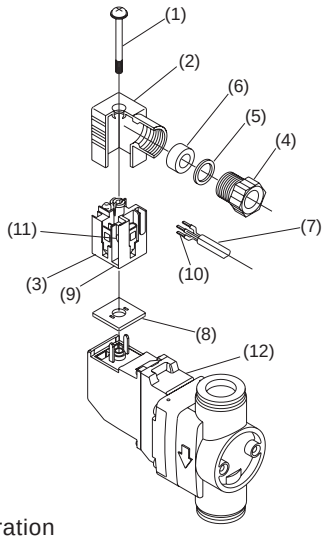
⚠CAUTION

■Disassembling
- Loosen the screw (1), and pull the cover (2) in the direction of screw (1). The connector will come off the coil assembly (12).
- Pull the screw (1) out of the cover (2).
- There is a notch (9) (next to GDSN mark) on the bottom of the terminal block (3). Insert a small flat-tip screwdriver between the housing (2) and terminal block (3), and twist it. The terminal block (3) will come off the cover (2). (Refer to Fig. 1.) Remove the terminal box without applying excessive force. may result in damage
- Remove the cable gland (4), and remove the washer (5) and rubber packing (6).

Fig.1



Deal drawing



■Wiring

● Wiring preparation

- Applicable dimensions for cable (7) are VCTF2 (3) core (ø3.5 to 7) specified in JISC3306.
- Strip 10mm of the cable's lead sheath.
- Either twisted wires or single conductors are connected.
- When using twisted wires, avoid connecting soldered wires.
- When using a crimping sleeve (10) on the end of the twisted wire, use the Japan Weidmuller H0.5/6 (0.3 to 0.5 mm^2), H0.75/6 (0.75 mm^2) or another equivalent product. The crimping sleeve must be prepared by the user. The crimping sleeve must be prepared by the user.

● Wiring

- Pass the cable gland (4), washer (5) and rubber packing (6) in order through the cable (7), and insert into cover (2).
- Connect to terminal 1 and 2. There is no polarity.There is no polarity.
- Recommended tightening torque is 0.2 to 0.25N•m.

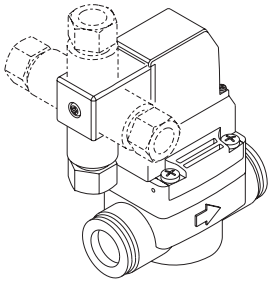
■Assembly

● Set the wired terminal gland(3) on cover(2)
(Press in until it clicks.)
The terminal block can be set in four directions.(Fig2)

● Set the rubber packing (6) and washer (5) in order into the cover (2) cable lead-in port, and then securely tighten the cable gland (4).
Reference tightening torque of cable gland is 1.0 to 1.5N•m.
Check that the cable cannot be pulled out.

● Set the gasket (8) between the bottom of the terminal block (3) and the coil assembly (12) plug, and insert the connector.
Insert the screw (1) from the top of the cover (2) and tighten.
Remarks: Recommended tightening torque of a screw is 0.2 to 0.25 N•m.

Fig.2



During Use & Maintenance

1. Common

⚠CAUTION

■Use in the continuous energizing state could promote a drop in the solenoid valve's performance. The following uses are the same as continuous energizing:

● During intermittent energizing, it takes longer than non-energizing.

● During intermittent energizing, one energizing session exceeds 30 min.

Consider heat dissipation when installing.
Consult with CKD when using this device in continuous energizing.

■Instantaneous leakage

When using the 2 port pilot operated solenoid valve, sudden application of pressure (e.g. starting up compressor) could momentarily open a closed valve and cause fluid to leak.

■Disassembly

Do not disassemble this valve. Disassembling this valve may drop the valve performance.

■Do not touch coils or actuators with hands or otherwise while power is on or immediately after turning power on.The solenoid valve's coil and actuator will heat up when electricity is passed through them.

■Differential pressure

Keep the differential pressure with the valve open above 0.01MPa in the following situations.

● If a restriction, such as a nozzle is attached to the secondary side.

● When several solenoid valves is connected to the pipe in parallel (modular connection) and open them at the same time , due to the source pressure drop pressure difference between primary and secondary is hard to arise.

■Take care that secondary pressure is maintained when the solenoid valve is opened and primary pressure is lower than secondary pressure.(When closing, the flow direction secondary to primary)

■Install in a manner tension will not be applied to the coil section lead wire.

■■Hold the product body when carrying the product. (Do not hold onto the lead wire)

■When the regulator and solenoid valve are directly connected, the parts could mutually vibrate causing resonance and chattering.

■If the piping cross-section area on the fluid inlet is reduced, the operation may become unstable due to a differential pressure fault during valve operation. Use a pipe that matches the port size on the supply side.

■Depending on the working conditions, the operation of the solenoid valve may become unstable if left unused for a long period.
Always have a trial run before using.

Related products

Air unit CXU Series

Catalog No. CC-901

Air unit modularized and combined with various pneumatic equipments such as filter regulator and valve.

■No more piping or problems

- ●Chore piping design and job not required
  Installation space is also reduced with the elimination of piping and tubes.
- ●No-threaded structure prevent external leakage and foreign particle when piping.

■Flexible combination

- ●Vertical and horizontal pipes can be arranged versatility. Solenoid valve is also direct available.
- ●Due to module connection type, change in air component and easy expansion

Small size flow sensor RAPIFLOW® FSM2 Series

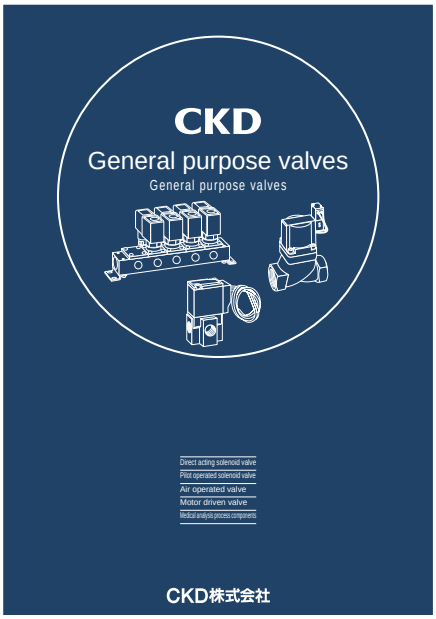
Catalog No. CC-886

Line-up for needs was achieved.

■Innovated new product! Both direction flow measurement is possible.
■The flow range is enlarged
■Large flow rate with compact body
■Improved precision
■Dual display/2 color indicator
■Auto reference

General purpose valves

Catalog No. CB-03-1S

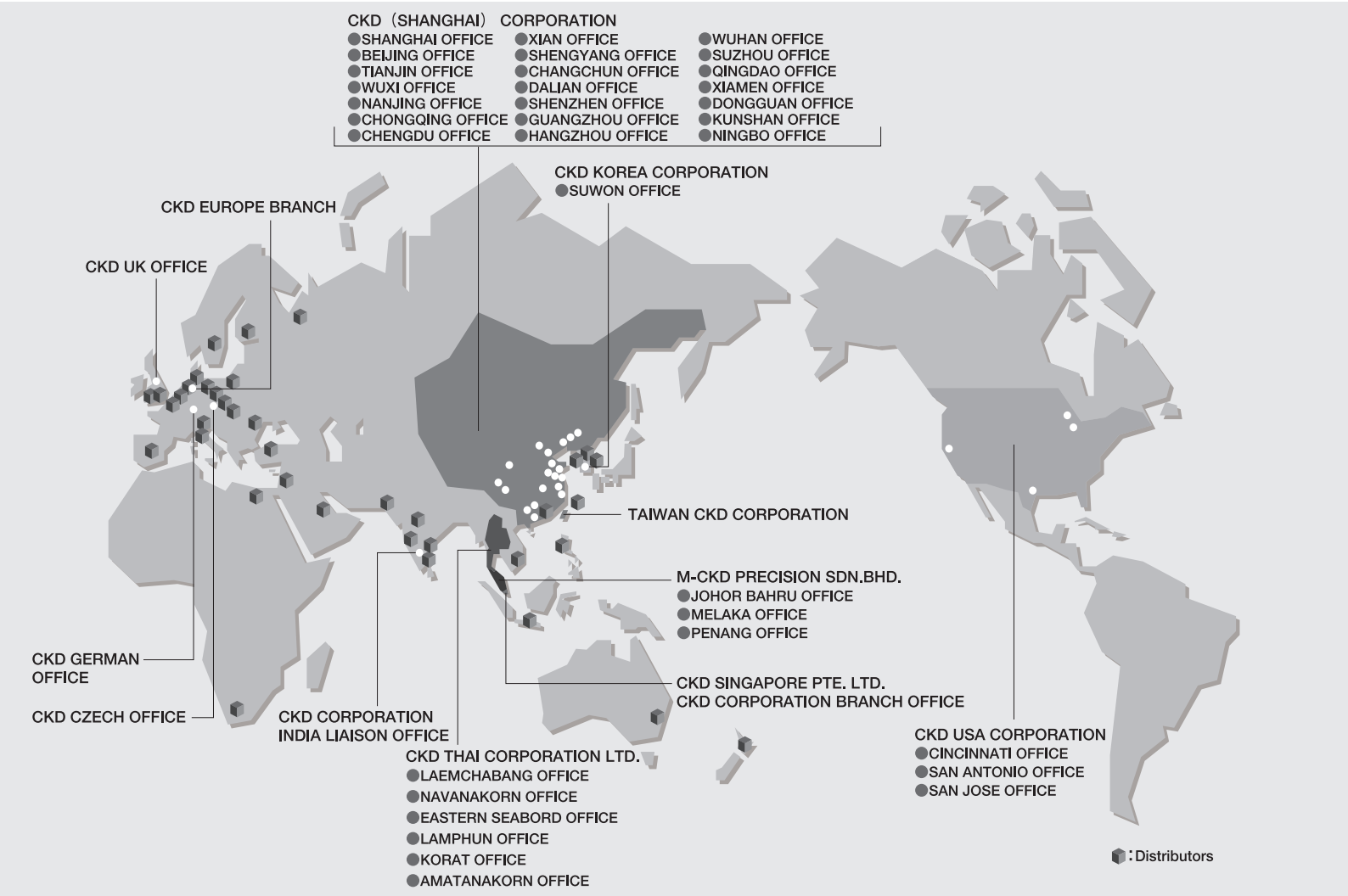


■High quality, wide variation

■Best suited fluid control components for the requirement is available.

- ●Direct acting 2, 3 port solenoid valve
- ●Pilot operated 2 port solenoid valve
- ●Air operated type 2, 3 port valve
- ●Motor driven type 2, 3 port valve
- ●Explosion proof type 2, 3 port solenoid valve
- ●Medical analysis process components

WORLD-NETWORK



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2011.3.DAC