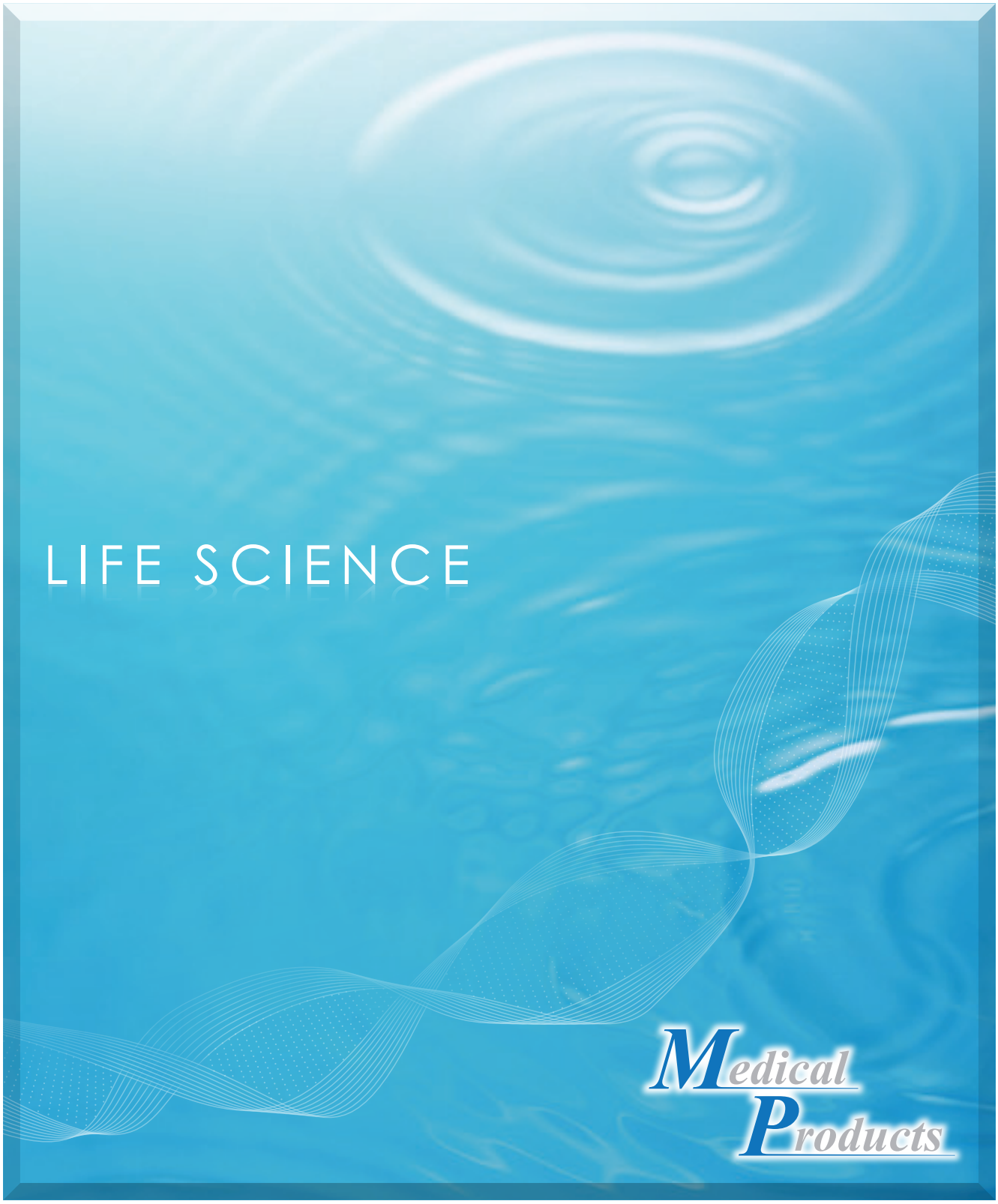
CKD

High purity and high precision medical component/analysis process components

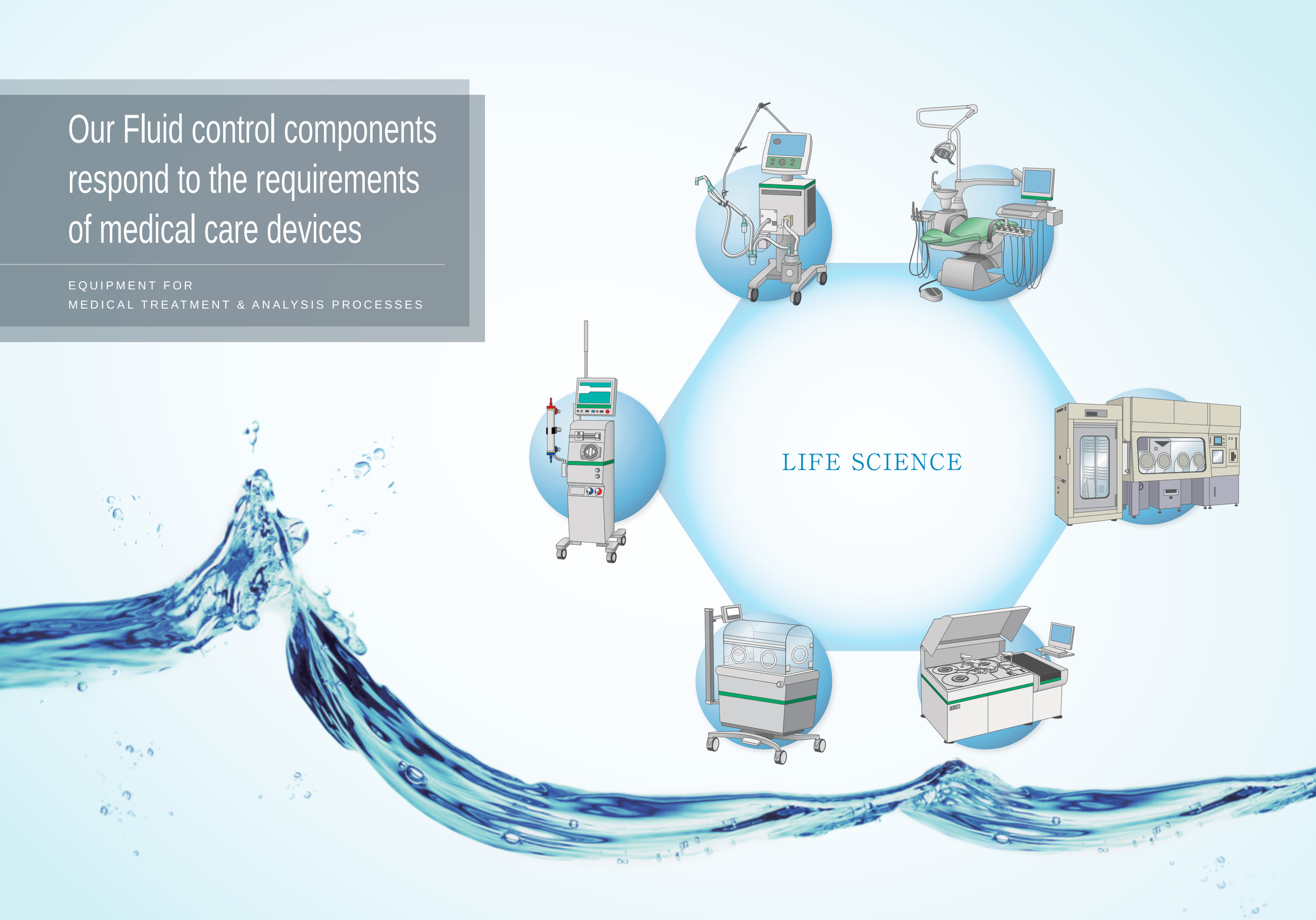
Components for Life Science



CKD Corporation
CC-1055A 4

Our Fluid control components respond to the requirements of medical care devices

EQUIPMENT FOR
MEDICAL TREATMENT & ANALYSIS PROCESSES



Components for Life Science

			Model	No. of Ports	Material		Fluid					
					Seal	Body	Pure water	Normal saline	Reagent	Waste liquid	Cleaning solution	
Solenoid valve	Metal-free	Diaphragm	MR10R	2/3	FKM	PEEK	●	●	●	●	●	
			MR16	2/3	FKM EPDM	PEEK	●	●	●	●	●	
			MKB3	2	FKM EPDM	PPS	●	●	●	●	●	
			MAB1	2	PTFE	PTFE	●	●	●	●	●	
			MAG1	3	PTFE	PTFE	●	●	●	●	●	
			MYB1	2	FKM	PPS	●	●	●	●	●	
			MYG1	3	FKM	PPS	●	●	●	●	●	
			MYB2	2	FKM	PPS	●	●	●	●	●	
			MYG2	3	FKM	PPS	●	●	●	●	●	
			MYB3	2	FKM	PPS	●	●	●	●	●	
			MYG3	3	FKM	PPS	●	●	●	●	●	
			MEB2	2	PTFE FFKM	PPS	●	●	●	●	●	
			MEG2	3	PTFE FFKM	PPS	●	●	●	●	●	
			MJB3	2	FKM	PPS PSU	●	●	●	●	●	
			EMB21	2	PTFE	SUS316	●					
						PTFE	●	●	●	●	●	
			EMB41/51	2	PTFE	PTFE	●	●	●	●	●	
		Lever Type	HMTB1	2	NBR FKM EPDM	PPS	●	●	●		●	
			HMTG1	3			●	●	●		●	
	High corrosion resistance	Poppet	USB2/3	2	NBR FKM	PPS	●					
			USG2/3	3	NBR FKM	PPS	●					
			UMB1	2	FKM	SUS304 or equiv.	●					
			UMG1	3	FKM	SUS304 or equiv.	●					
			HB	2	NBR FKM PTFE	SUS316	●					
	General purpose		USB2/3	2	NBR (FKM)	C3604 SUS304						
			USG2/3	3	NBR (FKM)	C3604 SUS304						
pinch Valve	Metal-free		HYN	2/3	-	-	●	●	●	●	●	

Note: Check the compatibility between working fluid and body/sealant materials when selecting.

	Orifice size (mm)																		Page
	0.5	0.9	1	1.2	1.5	1.6	1.8	2	2.3	3	3.2	4	5	6	7	8	10	12	15	
			●																	10
						●														15
					●															21
						● 1.6 Equivalent														25
						● 1.6 Equivalent														25
								● 2.0 Equivalent												28
								● 2.0 Equivalent												28
										● 3.0 Equivalent										31
										● 3.0 Equivalent										31
													● 5.0 Equivalent							35
													● 5.0 Equivalent							35
										● 3.0 Equivalent										38
										● 3.0 Equivalent										38
										●										41
										●										43
														●		●	●	●	●	45
						●														49
						●														49
			●			●			●											53
			●		●	●														53
		●																		57
		●																		57
			●		●	●			●	●	●	●			●					59
			●	●	●	●	●		●		●									63
			●	●	●		●	●												67
			● Tube Bore size							● Tube Bore size				● Tube Bore size						71

Safety Precautions

Be sure to read this section before 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.

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.)

❶ 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.
❷ 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 device design and control, etc.

ISO4414, JIS B 8370 (Pneumatics fluid power - General rules and safety requirements for systems and their components)
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.

❶ Inspect and service the machine and devices after confirming safety of all systems related to this product.
❷ Note that there may be hot or charged sections even after operation is stopped.
❸ 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.
❹ 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 in the following pages 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, and when there is a high degree of emergency to a warning.

WARNING: If handled incorrectly, a dangerous situation may occur, resulting in death or serious injury.

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.
Every item provides important information and must be observed.

Warranty

1 Warranty period

The product specified herein is warranted for one (1) year from the date of delivery to the location specified by the customer.

2 Warranty coverage

If the product specified herein fails for reasons attributable to CKD within the warranty period specified above, CKD will promptly provide a replacement for the faulty product or a part thereof or repair the faulty product at one of CKD's facilities free of charge.
However, following failures are excluded from this warranty:

1) Failure caused by handling or use of the product under conditions and in environments not conforming to those stated in the catalog, the Specifications, or the Instruction Manual.
2) Failure caused by use of the product exceeding its durability (cycles, distance, time, etc.) or caused by consumable parts.
3) Failure not caused by the product.
4) Failure caused by use not intended for the product.
5) Failure caused by modifications/alterations or repairs not carried out by CKD.
6) Failure caused by reasons unforeseen at the level of technology available at the time of delivery.
7) Failure caused by acts of nature and disasters beyond control of CKD.

The warranty stated herein covers only the delivered product itself. Any loss or damage induced by failure of the delivered product is excluded from this warranty.
Note: For details on the durability and consumable parts, contact your nearest CKD sales office.

3 Compatibility check

The customer is responsible for confirming the compatibility of CKD products with the customer's systems, machines and equipment.

Safety precautions

Fluid Control Components: Warnings and Cautions

Be sure to read this section before use.

Precautions for each model series and for individual products

Components for Life Science

Design/selection

⚠WARNING

1 Ambient environment

Take appropriate safeguards when using this product in places where it may be exposed to water drops.

2 Do not disassemble the product

Once disassembled, the product may not satisfy the required performance any longer even if reassembled.

⚠CAUTION

① Check the compatibility of product component materials and working fluids. Do not allow fluid to come into contact with the product body.

② Do not use for strong acids such as hydrochloric acid, hydrofluoric acid or nitric acid.

③ Do not use for sodium hypochlorite (soda). (Some models are excluded.)

④ Carefully select the solenoid valve, taking the chemical liquid characteristics into consideration. (Presence of crystal deposits when chemical liquids dry, effect on solenoid valve component materials if chemical liquids evaporate, etc.)

⑤ When using these components for a chemical liquid having a low boiling point, such as hexane, the chemical liquid in the solenoid valve could evaporate due to heating of the coils, and cause bubbles, etc., in the solenoid valve and pipe. Use an AMD type air operated valve for chemical liquids if formation of bubbles, etc., poses a problem.

⑥ When using the solenoid valve with negative pressure, such as for dispensing control, air may be sucked into the solenoid valve depending on the type of chemical liquid, type of connection fitting, and type of tube, etc. Check carefully before starting use.

⑦ Use a smoothed power supply with sufficient margin against power consumption for the power supply.

■ Working pressure and proof pressure

Working pressure and proof pressure are as listed below. Carefully select the model with full understanding.

Working pressure: Pressure at which the valve opens and closes normally.

Proof pressure: Pressure which the valve can withstand without any decrease in its function or performance. The catalog specifications are satisfied, even when pressure exceeding the working pressure is temporarily applied, upon return to the working pressure.

Mounting, piping and wiring

⚠WARNING

1 Always flush the piping before installing the solenoid valve.

Any foreign materials or foreign matter in the fluid may prevent the solenoid valve from functioning correctly. When there is contamination, install a filter on the primary side of the solenoid valve according to the circuit used.

2 For products that have an arrow displayed, ensure that the piping is performed so that the flow of the fluid is consistent with the direction of the arrow.

⚠CAUTION

1 Refer to the table below for the piping tightening torque.

Note that if the solenoid valve body is made of resin, a PP or fluororesin fitting must be used. The port could be damaged if a metal fitting is used.

[Stainless steel solenoid valve]

Piping nominal diameter	Recommended tightening torque [N·m]
M5	2.1 to 3
Rc1/8	18 to 20
Rc1/4	23 to 25
Rc3/8	31 to 33

[PPS/PEEK solenoid valve]

Piping nominal diameter	Recommended tightening torque [N·m]
M5,M6 1/4-28UNF	0.10 to 0.15
Rc1/8	0.5 to 0.8
Rc1/4	1.0 to 1.5
Rc3/8	1.0 to 1.5

[Fluorine resin solenoid valve]

Piping nominal diameter	Recommended tightening torque [N·m]
M6	0.05 to 0.08
Rc1/4	0.7 to 1.0
Rc3/8,R3/8	1.0 to 1.5
Rc1/2,R1/2	1.5 to 2.0
R 3/4	2.0 to 2.5

2 When using vertical piping on the secondary side, keep it within 2 m in height. Use tubing or piping with the same or larger bore size as the orifice size to fix the pipe.

3 Do not hold the lead wire while handling.

Do not pull the lead wires.

[Precautions for each model]

MR10R/MR16 Safety precautions

⚠CAUTION

① Check the compatibility of product component materials and working fluids.

② Do not use for hydrochloric acid, hydrofluoric acid or nitric acid. Contact CKD when the effective chlorine concentration of sodium hypochlorite (soda) is more than 0.1%. For 0.1% or less effective chlorine concentration, perform functional testing according to your application before use.

③ Foreign matter, etc., inside the piping may cause malfunction and valve seat leakage. Make sure to flush the piping.

④ When using vertical piping on the secondary side, keep it within 2 m in height. Use tubing or piping with the same or larger bore size as the orifice size to fix the pipe.

⑤ Do not disassemble.Once disassembled, the product may not satisfy the required performance any longer even if reassembled.

⑥ If the product is bent with the mounting plate fixed, the body will be damaged, and external leakage will occur. Do not apply load to the mounting plate.

Fluid Control Components: Warnings and Cautions

Be sure to read this section before use.

Precautions for each model series and for individual products

[Precautions for each model]

MKB3 Safety precautions

⚠CAUTION

① Slide the product in the piping direction by pulling the lever to remove from the mounting plate.
② Do not disassemble the product.
③ Foreign matter, etc., inside the piping may cause malfunction and valve seat leakage. Always flush the piping before installing the valve.
④ When using vertical piping on the secondary side, keep it within 2 m in height. Use tubing or piping with the same or larger bore size as the orifice size to fix the pipe.
⑤ Do not hold the lead wire while handling.

MAB1/MAG1 Safety precautions

⚠CAUTION

① Foreign matter in the piping and the environment during piping work could damage the valve seat or diaphragm seal, and lead to leaks. Always flush the piping before installing the valve.
② When using strong acids, such as hydrochloric acid, hydrofluoric acid or nitric acid, or sodium hypochlorite (soda), use an AMD type air operated valve for chemical liquids.
③ Consult with CKD if the secondary piping is laid at a high level or extremely restricted.
④ Do not disassemble the product. Once disassembled, the product may not satisfy the required performance any longer even if reassembled.

MYB$\frac{1}{3}$/MYG$\frac{1}{3}$/MEB2/MEG2 Safety precautions

⚠CAUTION

① Check the compatibility of product component materials and working fluids. Do not allow fluid to come into contact with the product body.
② Foreign matter in the piping and the environment during piping work could damage the valve seat or diaphragm seal, and lead to leaks.Always flush the piping before installing the valve.
③ When using strong acids, such as hydrochloric acid, hydrofluoric acid or nitric acid, or sodium hypochlorite (soda) or solvents, use an AMD type air operated valve for chemical liquids.
④ Leakage current from the control circuit must be less than that specified for each voltage.
⑤ Contact CKD if the secondary piping is vertical and long (2 m or higher) or extremely restricted.
⑥ Do not disassemble the product.
Once disassembled, the product may not satisfy the required performance any longer even if reassembled.

MJB3 Safety precautions

⚠CAUTION

① Check the compatibility of product component materials and working fluids.
② Piping foreign materials may cause malfunction and valve seat leakage. Always flush the valve before installing it.
③ Do not use for hydrochloric acid, hydrofluoric acid or nitric acid. Contact CKD when the effective chlorine concentration of sodium hypochlorite (soda) is more than 0.1%. For 0.1% or less effective chlorine concentration, perform functional testing according to your application before use.
④ Do not apply excessive force on the fitting when connecting or disconnecting the tube.
⑤ Recommended tube
Material: silicone rubber, size: I.D. x O.D. = ø5 x ø11
⑥ Do not disassemble the product.
Once disassembled, the product may not satisfy the required performance any longer even if reassembled.
⑦ Recommended tightening torque of mounting screw (M3) for fixing product 0.6 to 0.7N·m

EMB21 Safety precautions

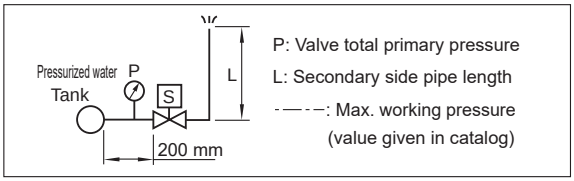
⚠CAUTION

① Foreign matter in the piping and the environment during piping work could damage the valve seat or diaphragm seal, and lead to leaks.
② Consult with CKD if the secondary piping is laid at a high level.
③ When using strong acids, such as hydrochloric acid, hydrofluoric acid or nitric acid, or sodium hypochlorite (soda), use an AMD type air operated valve for chemical liquids.
④ Do not disassemble the product. Once disassembled, the product may not satisfy the required performance any longer even if reassembled.

EMB41/EMB51 Safety precautions

⚠CAUTION

① Foreign matter in the piping and the environment during piping work could damage the valve seat or diaphragm seal, and lead to leaks. Always flush the piping before installing the valve.
② Use VCTF-0.75 (2-conductor: O.D. 6.6) vinyl cord for equipment (JISC3306) for the lead-out wires
③ Consult with CKD if the secondary piping is laid at a high level.
④ When using strong acids, such as hydrochloric acid, hydrofluoric acid or nitric acid, or sodium hypochlorite (soda) or solvents, use an AMD type air operated valve for chemical liquids.
⑤ In particular, the working pressure changes according to the OUT side piping conditions, so refer to the characteristics in the graph at right before use (note that the fluid is water).



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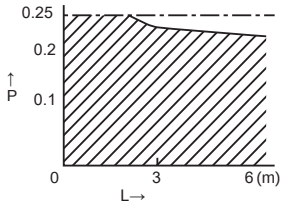

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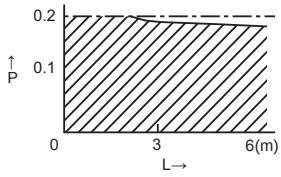

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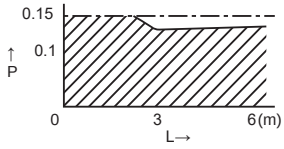

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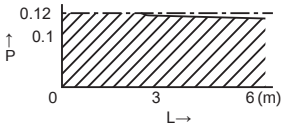

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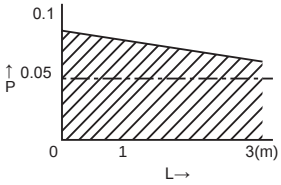


Fluid Control Components: Warnings and Cautions

Be sure to read this section before use.

[Precautions for each model]

HMTB/HMTG Safety precautions

⚠CAUTION

① Use direct current (excluding rectified alternating current).

② Do not apply excessive force on the fitting when connecting or disconnecting the tube.

③ Do not disassemble the product.
Once disassembled, the product may not satisfy the required performance any longer even if reassembled.

④ Do not use for hydrochloric acid, hydrofluoric acid or nitric acid.
When using sodium hypochlorite (soda), select FKM for the sealant material. (EPDM will deteriorate over long-term use even with tap water levels of residual chlorine)
Contact CKD when the effective chlorine concentration of sodium hypochlorite (soda) is more than 0.1%. For 0.1% or less effective chlorine concentration, perform functional testing according to your application before use.

UMB/UMG Safety precautions

⚠CAUTION

① Do not disassemble the product.
Once disassembled, the product may not satisfy the required performance any longer even if reassembled.

② Do not apply torque exceeding 0.3 N·m on the mounting bolt (M3).

③ Protect the product against contact with water. Water could cause insulation or operation faults.

④ When using strong acids, such as hydrochloric acid, hydrofluoric acid or nitric acid, or sodium hypochlorite (soda) or solvents, use an AMD type air operated valve for chemical liquids.

HB Safety precautions

⚠CAUTION

① Foreign matter, etc., inside the piping may cause malfunction and valve seat leakage. Always flush the piping before installing the valve.

② Do not disassemble the product. Once disassembled, the product may not satisfy the required performance any longer even if reassembled.

③ When using strong acids, such as hydrochloric acid, hydrofluoric acid or nitric acid, or sodium hypochlorite (soda) or solvents, use an AMD type air operated valve for chemical liquids.

HYN Safety precautions

⚠CAUTION

① For the DC type, use a high-capacity power supply. A full-wave or half wave rectified bridge is affected by ripples, so always use a stabilized power supply.

② Securely insert the tube to the prescribed position.

③ Depending on the working fluid, the silicone tube may not be resistant to chemical liquids, or chemical liquids may adhere to it. Check this before use.

④ Do not expose the coil to water.

⑤ If a silicone tube is left attached for long periods, it could stick and prevent the tube from opening. If the tube sticks, replace the tube or un-stick the tube by applying pressure or by hand.

⑥ Do not apply higher pressure than the working pressure. Otherwise the tube may dislocate.

Safety precautions

Fluid Control Components: Warnings and Cautions

Be sure to read this section before use.

Precautions for each model series: product-specific cautions

Compact direct acting 2, 3-port solenoid valves USB/G2/USB/G3

Design/selection

⚠WARNING

1 Working fluids

①When using this valve for dry air, the life can be shortened considerably due to wear. Use a valve intended for dry air.

②This valve cannot be used for maintaining vacuum. Consult with CKD when the vacuum needs to be maintained.

⚠CAUTION

1 Continuous energizing

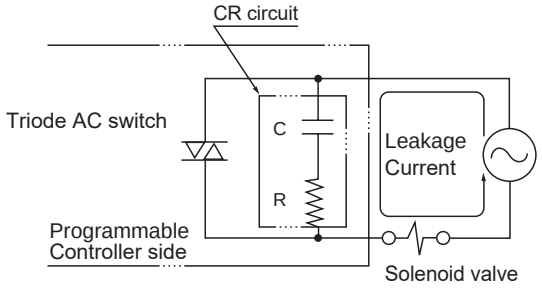
Consult with CKD when using the 3-port valve in a continuously energized state.

2 Fluid viscosity

The fluid viscosity must be 50 mm²/s or less. Malfunctions could occur if the viscosity is higher than 50 mm²/s.

3 Leakage current from other fluid control components

When operating the solenoid valve with a programmable controller, etc., check that the output leakage current from the programmable controller is within the following specifications. This may result in malfunction.



Voltage / Model No.	AC		AC diode		DC	
	100V	200V	100V	200V	12V	24V
USB, USG	–	–	0.2mA or less	0.1mA or less	2mA or less	1mA or less

Mounting, piping and wiring

⚠CAUTION

1 Piping

Always hold the socket with a wrench, etc., if the NO side is a socket.

Maintenance

⚠CAUTION

1 In the case of USB/USG

When disassembling or assembling, tighten the core assembly and socket with the following tightening torques.

Model No.	Core assembly tightening torque	Socket tightening torque
USB2	10 to 22 N·m	-
USG2	10 to 22 N·m	-
USB3	18 to 32 N·m	-
USG3	18 to 32 N·m	4 to 8 N·m

[Precautions for each model]

USB/USG (resin body)

⚠CAUTION

1 Metal comes into contact with the fluid. (Not a metal-free valve)

2 When coupling pipes to a solenoid valve, ensure that the valve does not become bent. Do not use metal fittings because they could damage the port. Use a PP or fluorine resin fitting. Do not apply external force to the coil. Refer to the recommended fitting tightening torque below. When connecting tubes to a solenoid valve, ensure that the tube is inserted straight into the barbed fitting. At this time, ensure that the valve does not become bent.

3 Do not apply external force to the coil.

The mounting force (holding force) differs according to the material and dimensions of the tube. Always make sure that there are no problems regarding leakage or attachment before use.

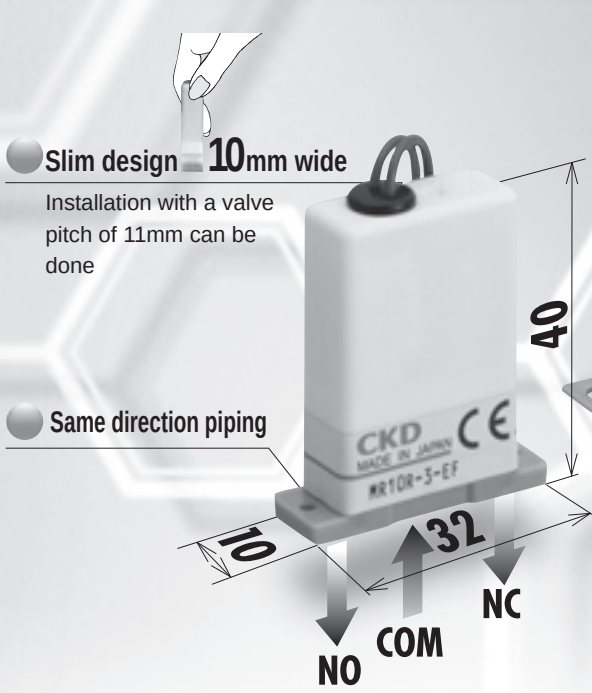
If necessary, take measures such as using a tube retainer.

MEMO

MR10R Series

Working pressure 0.2 MPa, miniature, space-saving.

Attains high analysis accuracy and impressive control of trace amounts of chemical liquids.



Slim design 10mm wide

Installation with a valve pitch of 11mm can be done

Same direction piping

Compatible with CE marking

Volumetric capacity 19μℓ

Material coming in contact with the liquids

Body / connecting adaptor: PEEK
Diaphragm valve: FKM

Environment Analysis Equipment

Bio-related Equipment

Medical Analysis Equipment

Ideal for the dispensing process of analysis equipment.

2, 3-port solenoid valve MR10R series for chemical liquids
that has eliminated metal by using resin and rubber as the materials for wetted parts.
Valve with excellent overall performance **including slimness / space-saving, excellent installability, safe structure, reliability, long service life design.**

10 million times long service life

These test results are based on CKD test conditions.

Volumetric capacity 19μℓ

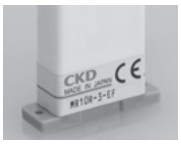
Washing inside the solenoid valve is easy. Wasted reagents can also be reduced.

Designed to suppress heat generation

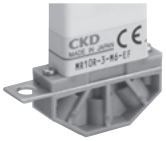
Minimizes the impact on analysis accuracy of coil heat generation, and also implements power-saving.

Piping method 2 types

Select according to your application

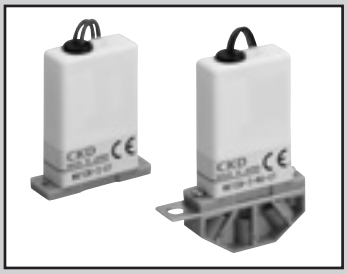


● Actuator type



● Direct piping type

2-port valve and 3-port valve have the same shape



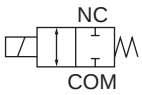
Metal-free 2, 3-port solenoid valve for chemical liquids

MR10R Series

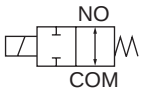
- NC(open when energized), NO(Closed when energized), universal
- Working fluid: Water, pure water, chemical liquids
- Port size: M5, M6, 1/4-28UNF

JIS symbol

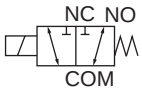
- 2-port: NC



- 2-port: NO



- 3-port: Universal



Specifications

Item		2-port		3-port
		MR10R-2NC	MR10R-2NO	MR10R-3
Actuation		NC (open when energized)	NO	Universal
Working fluid		Water, Pure water, Chemical liquids (fluids that do not corrode wetted part materials)		
Proof pressure MPa		0.4 (water pressure)		
Working pressure MPa		-0.08 to 0.2		
Fluid temperature °C		5 to 50		
Ambient temperature °C		5 to 50		
Atmosphere		explosive / No corrosive atmospheres		
Valve seat leakage cm^3/min		0 (water pressure)		
Port size		M5, M6, 1/4-28UNF		
Orifice size mm		1		
Cv		0.03		
Volumetric capacity µℓ		19 (*1)		
Valve structure		Diaphragm direct acting (rocker)		
Mounting orientation		Unrestricted (*2)		
Weight g		18 (Actuator), 22 (direct piping)		
Electrical specifications				
Rated voltage		24 VDC/12 VDC		
Voltage fluctuation range		±5%		
Power consumption W	When starting	3.6 (24 VDC)/4.2 (12 VDC) (*3)		
	When holding	1		
Leakage current mA		1.0 or less (24 VDC)/2.0 or less (12 VDC) (*4)		
Thermal class		Class 130 (B)		

*1: Volume of wetted parts formed by the body and diaphragm. Note that piping volume is excluded.
*2: Install vertically so that the coil where little fluid accumulates is at the top.
*3: Time from energizing to 50 ms.
*4: The leakage current from the control circuit must be equal to or less than the values shown in the table.
*5: For 0.1% or less effective chlorine concentration of sodium hypochlorite (soda), perform functional testing according to your application before use. Do not use effective chlorine concentration exceeding 0.1%.
*6: As this product has an integrated electronic circuit board, do not use it in very humid atmospheres.
*7: Solenoid valve has polarity. Connect the red lead wire to the plus (+) side.
*8: After the solenoid valve is completely switched OFF, set an interval of 1 seconds or more before switching it ON the next time.
*9: Make sure to read the safety precautions on pages 3 to 8 before use.

How to order

MR10R - 2NC - M6 - EF - DC24V

Model No.
Ⓐ No. of Ports/type
Ⓑ Port size
Ⓒ Material combination
Ⓓ Voltage

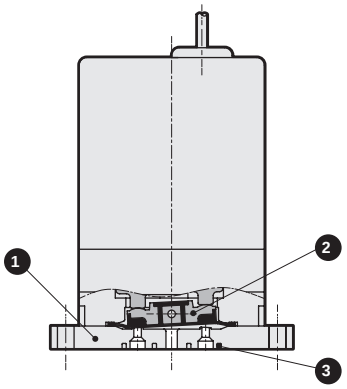
Code	Description
Ⓐ No. of Ports/type	
2NC	2-port/NC(Open when energized)Model
2NO	2-port/NO(Closed when energized)Model
3	3-port/universal
Ⓑ Port size	
Blank	Actuator
M5	M5(Direct piping)
M6	M6(Direct piping)
4U	1/4-28UNF(Direct piping)

Ⓒ Material combination		
	Body material	Sealant
EF	PEEK	FKM

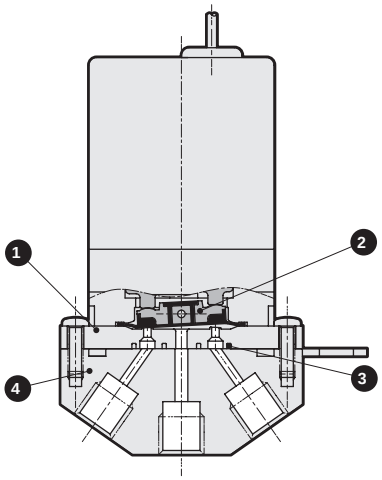
Code	Description
Ⓓ Voltage	
DC24V	24 VDC
DC12V	12 VDC

Internal structure and main part material

● Actuator



● Direct piping

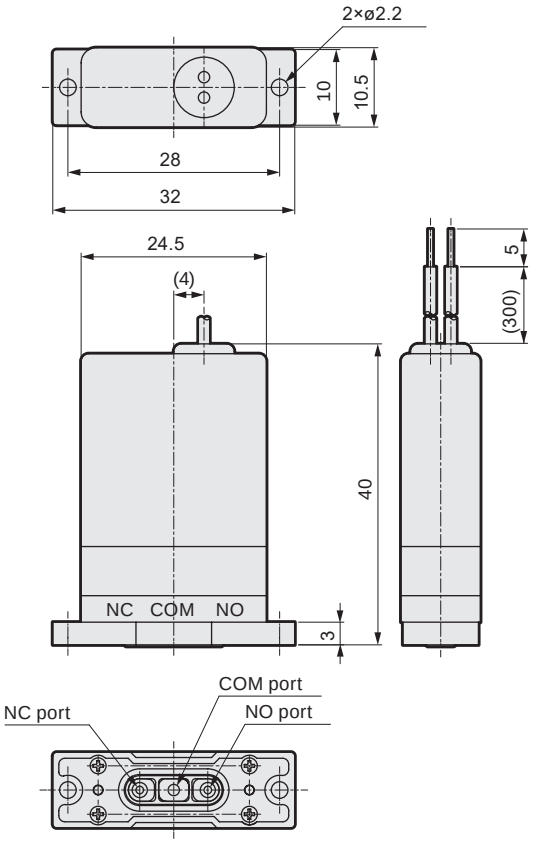


Cannot be disassembled

Part No.	Part name	Material	
1	Body	PEEK	Polyether ether ketone
2	Diaphragm	FKM	Fluoro rubber
3	Packing	FKM	Fluoro rubber
4	Connection adaptor	PEEK	Polyether ether ketone

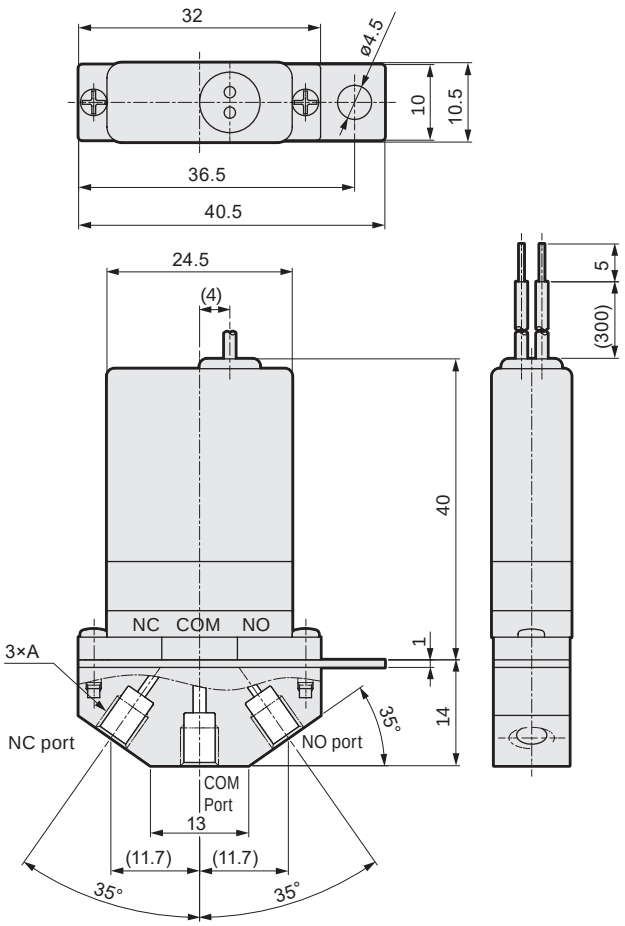
Dimensions

● Actuator



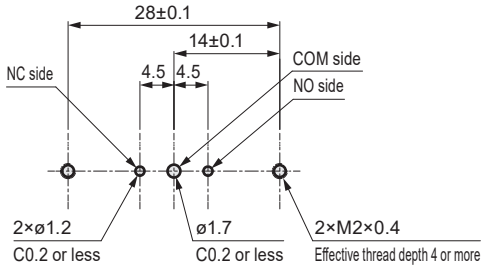
Note:When MR10R-2NC, no hole machined for NO port.
When MR10R-2NO, no hole machined for NC port.

● Direct piping



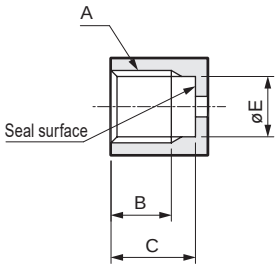
Note:The NO port is plugged when MR10R-2NC and the NC port is plugged when MR10R-2NO

● Actuator installation dimensions



* Surface roughness Rz6.3 or less
* Recommended thread size: M2 length 6 mm
* Various connection adapters and manifolds are available as required. Contact CKD for details.

● Port size dimensions



Model No.	A	B	C	E
MR10R-*-M5	M5	5	7	4.1
MR10R-*-M6	M6	5	7	4.9
MR10R-*-4U	1/4-28UNF	5	7	5.36

MEMO

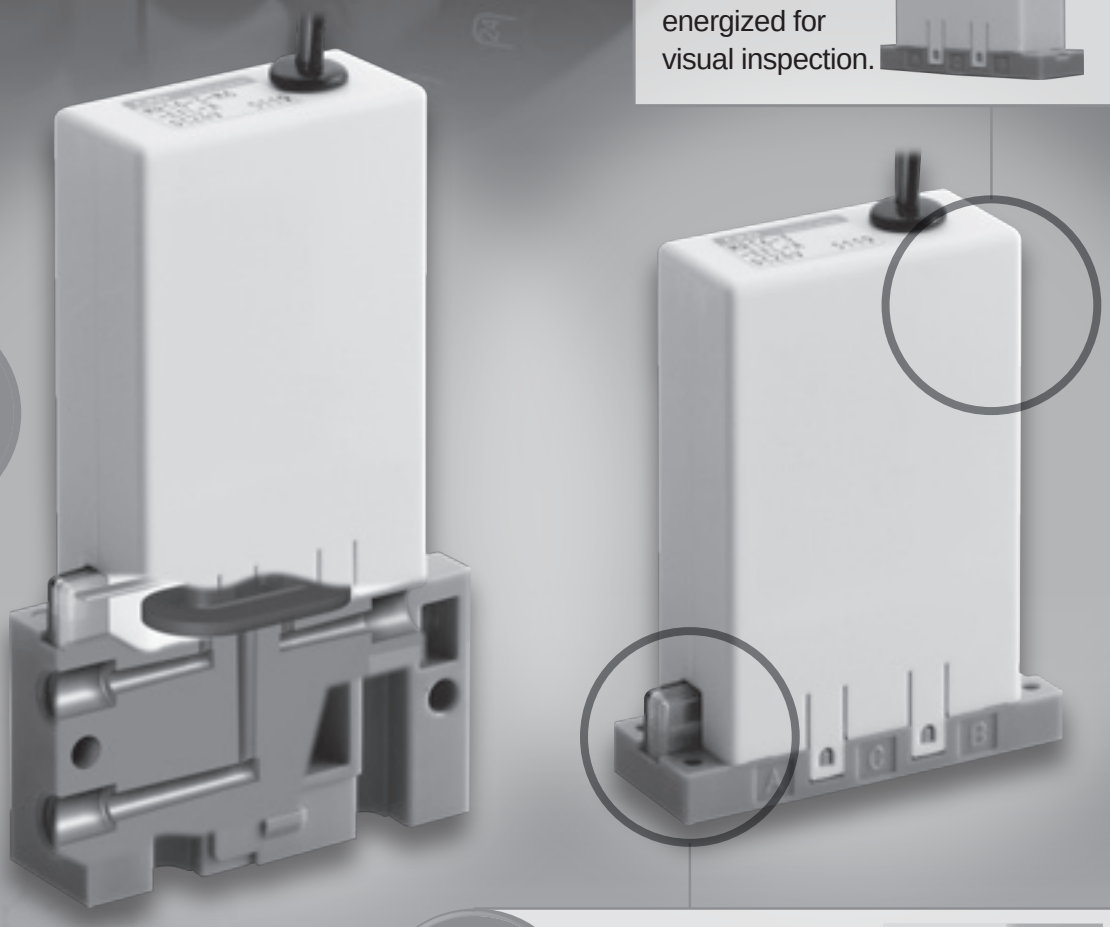
First in the industry!

New rocker valve with indicator!

Visible.

LED lamp equipped as standard

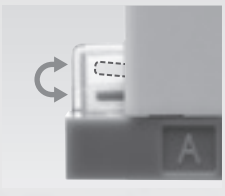
LED lights when energized for visual inspection.



Volumetric capacity 50μℓ

First in the industry

Built-in mechanical indicator makes valve open/closed status directly visible!



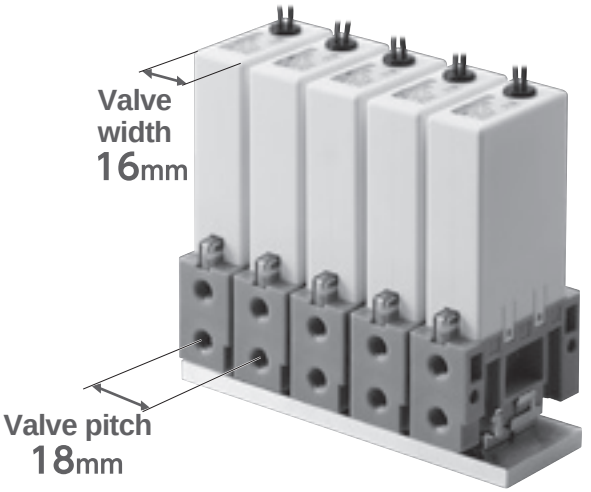
Compact metal-free 2, 3-port solenoid valve

MR16 Series

Space saving

Width: 16 mm, valve pitch: 18 mm

Actuator can be installed at a valve pitch of 17 mm.



[Unit: mm]

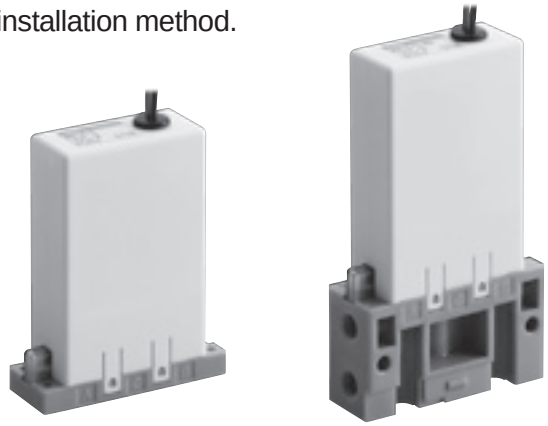
Body	Product width	Valve pitch
Actuator	16	17
Direct piping	16.4	17*
Direct piping (with mounting plate)	16.5	18

* 16.4 mm if direct pipings are linked together.

Selectable body

Actuator and direct piping are available

Body can be selected to suit the installation method.



Actuator　　Direct piping

Wide pressure range

Can be used with max. pressure of 0.3 MPa and with negative pressure

Internal volume is reduced to 50 μℓ to achieve high pressure. Supports negative pressure when syringes or discharged liquids are replaced.

Working pressure (MPa)	−0.08 to 0.3

Highly corrosion-resistant metal-free structure

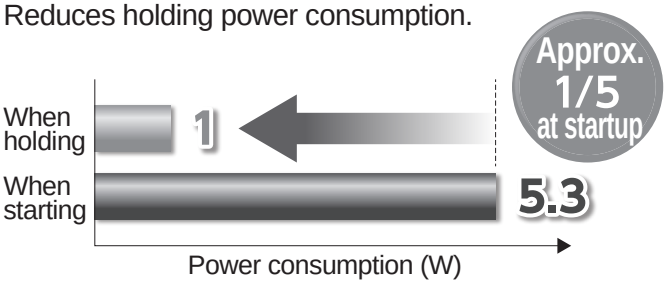
Adopts PEEK resin for the body

Features a highly corrosion-resistant resin/ rubber material for wetted parts to enable use with various fluids.

Body material	PEEK
Sealant	FKM, EPDM

Energy saving circuit equipped as standard

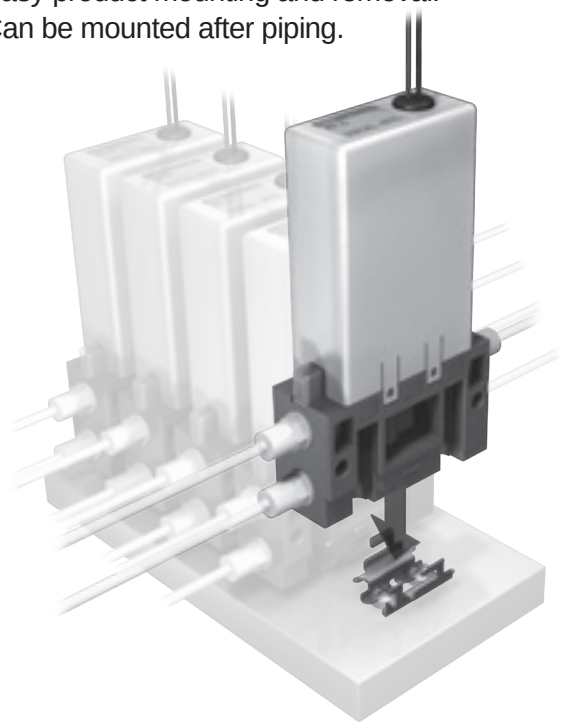
Reduces heat generated by the coil and prevents thermal effects on fluids.
Reduces holding power consumption.

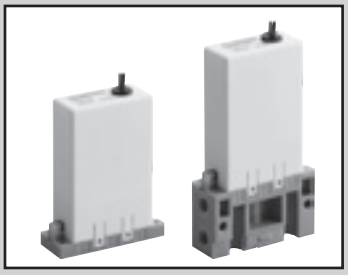


Easy maintenance

One-touch attachment structure

Easy product mounting and removal.
Can be mounted after piping.





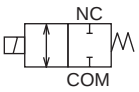
Metal-free 2, 3-port solenoid valve

MR16 Series

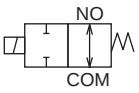
- NC(open when energized), NO(Closed when energized), universal
- Working fluid: Water, pure water, chemical liquids
- Port size: M6 , 1/4-28UNF

JIS symbol

- 2-port: NC



- 2-port: NO



- 3-port: Universal

Specifications

Item		2-port		3-port
		MR16-2NC	MR16-2NO	MR16-3
Actuation		NC (open when energized)	NO	Universal
Working fluid		Water/pure water/chemical liquids (fluids that do not corrode wetted part materials)		
Proof pressure	MPa	0.45(water pressure)		
Working pressure	MPa	-0.08 to 0.3		
Fluid temperature	°C	5 to 40		
Ambient temperature	°C	5 to 45		
Atmosphere		No explosive or corrosive atmospheres		
Valve seat leakage	cm^3/min	0 (water pressure)		
Port size		M6 , 1/4-28UNF		
Orifice size	mm	1.6		
Cv		0.05		
Volumetric capacity	μℓ	50 (*1)		
Valve structure		Diaphragm direct acting (rocker)		
Mounting orientation		Unrestricted (*2)		
Weight	g	75 (actuator), 85 (direct piping)		
Electrical specifications				
Rated voltage		24 VDC / 12 VDC		
Voltage fluctuation range		±10%		
Power consumption W	When starting	5.3 (*3)		
	When holding	1		
Leakage current	mA	1.0 or less (24VDC) , 2.0 or less (12 VDC) (*4)		
Thermal class		Class 130 (B)		

*1: Volume of wetted parts formed by the body and diaphragm. Note that piping volume is excluded.
*2: Install vertically so that the coil where little fluid accumulates is at the top.
*3: Time from energizing to 100 ms.
*4: The leakage current from the control circuit must be equal to or less than the values shown in the table.
*5: When using sodium hypochlorite (soda), select FKM for the diaphragm material. (EPDM will deteriorate over long-term use even with tap water levels of residual chlorine) For 0.1% or less effective concentration, perform functional testing according to your application before use. Do not use effective chlorine concentration exceeding 0.1%.
*6: As this product has an integrated electronic circuit board, do not use it in very humid atmospheres.
*7: As this product generates noise from incorporating electronic oscillator circuits, use noise countermeasures on the same power line.
*8: Solenoid valve has polarity. Connect the red lead wire to the plus (+) side.
*9: After the solenoid valve is completely switched OFF, set an interval of 1 seconds or more before switching it ON the next time.
*10: For the mounting plate option, slide the product in the piping direction by pulling the lever to remove from the mounting plate.
*11: Make sure to read the safety precautions on pages 3 to 8 before use.

How to order

MR16 - 2NC - M6 - EF L B - A - DC24V

Model No.

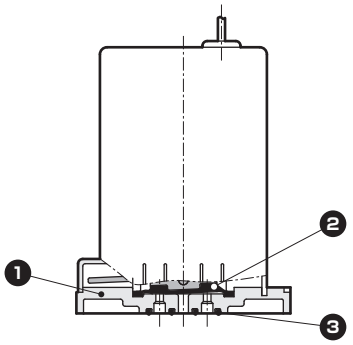
Ⓐ No. of Ports/type
Ⓑ Port size
Ⓒ Material combination
Ⓓ With circuit board option
Ⓔ With mounting plate option *1
Ⓕ Indicator direction *2
Ⓖ Voltage

Code	Description	
Ⓐ No. of Ports/type		
2NC	2-port/NC	
2NO	2-port/NO	
3	3-port/universal	
Ⓑ Port size		
Blank	Actuator	
M6	M6 (direct piping)	
4U	1/4-28UNF (direct piping)	
Ⓒ Material combination		
	Body material	Sealant
EF	PEEK	FKM
EE	PEEK	EPDM
Ⓓ With circuit board option		
L	With lamp/energy saving board	
Ⓔ With mounting plate option		
Blank	Without mounting plate	
B	With mounting plate	
Ⓕ Indicator direction		
A	Port A side	
B	Port B side	
Ⓖ Voltage		
DC24V	24 VDC	
DC12V	12 VDC	

*1: "B" can be selected only for port size "M6" and "4U".
*2: If No. of Ports/type is "2NC", only "A" can be selected, and if "2NO", only "B" can be selected. If it is "3", either A or B can be selected.

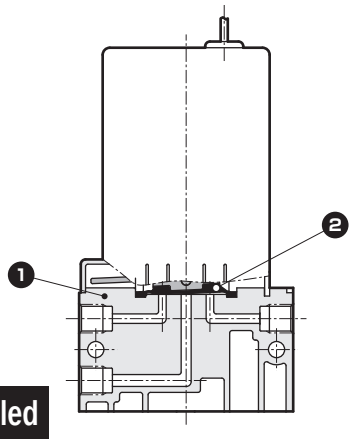
Internal structure and main part material

● Actuator



Cannot be disassembled

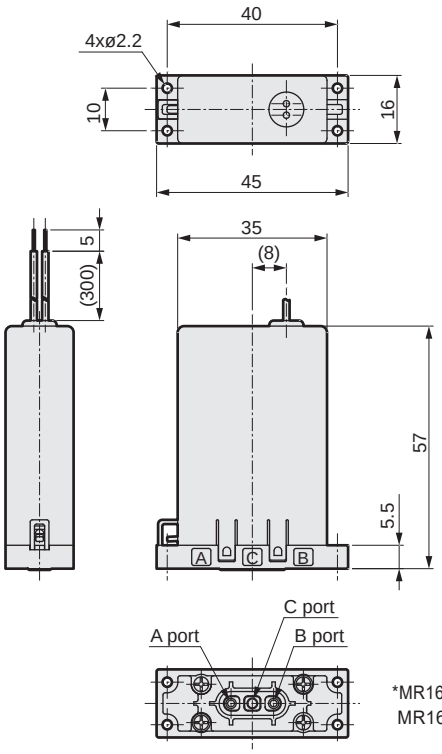
● Direct piping



Part No.	Part name	Material	
1	Body	PEEK	Polyether ether ketone
2	Diaphragm	FKM, EPDM	Fluoro rubber, ethylene propylene rubber
3	Gasket	FKM, EPDM	Fluoro rubber, ethylene propylene rubber

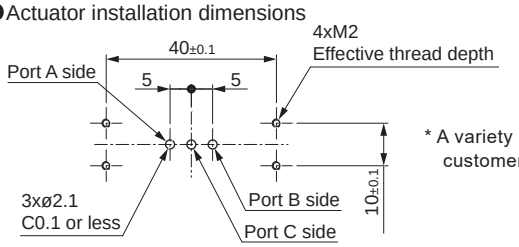
Dimensions

● Actuator



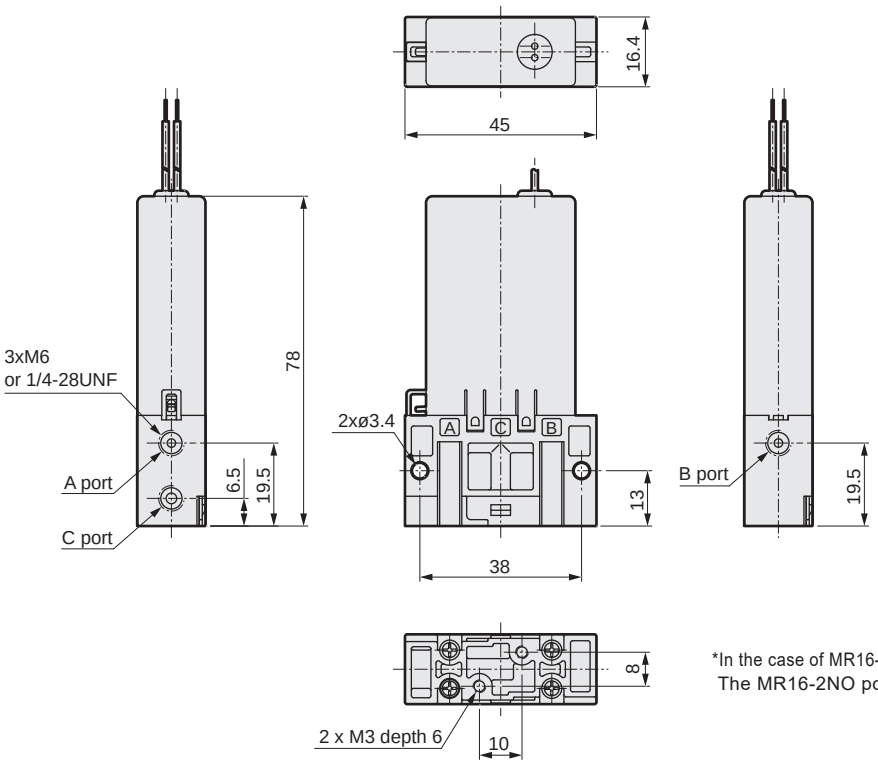
*MR16-2NC has no hole machined for port B and "B" is not indicated.
MR16-2NO has no hole machined for port A and "A" is not indicated.

● Actuator installation dimensions



* A variety of manifolds are available in response to customer demand. Contact CKD for details.

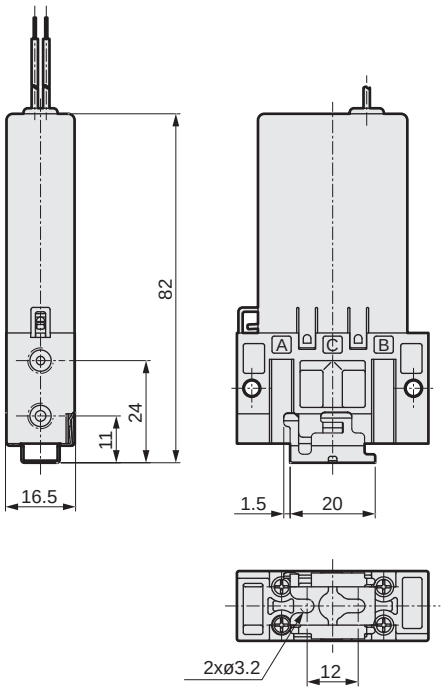
● Direct piping



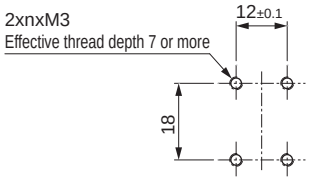
*In the case of MR16-2NC, port B is plugged and "B" is not indicated.
The MR16-2NO port A is plugged and "A" is not indicated.

Dimensions

● Direct piping (with mounting plate)

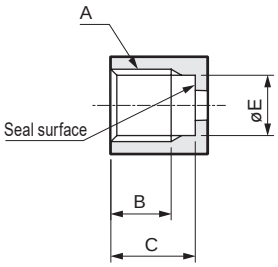


● Direct piping (with mounting plate) installation dimensions



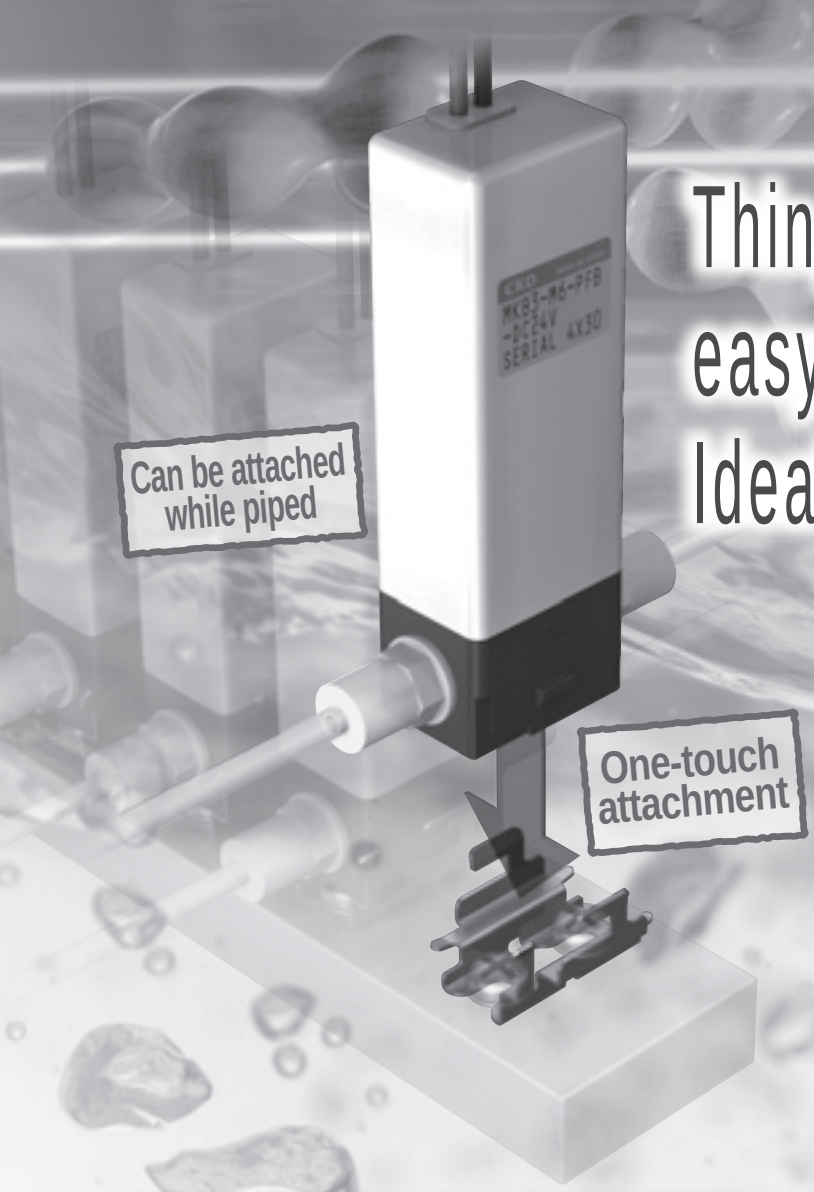
● Machining drawing when installing MR16 in parallel. (n: Station No.)

● Port size dimensions



Model No.	A	B	C	E
MR16-*-M6	M6	5	7	4.9
MR16-*-4U	1/4-28UNF	5	7	5.36

Thin, space-saving, easy maintenance. Ideal for medical devices.

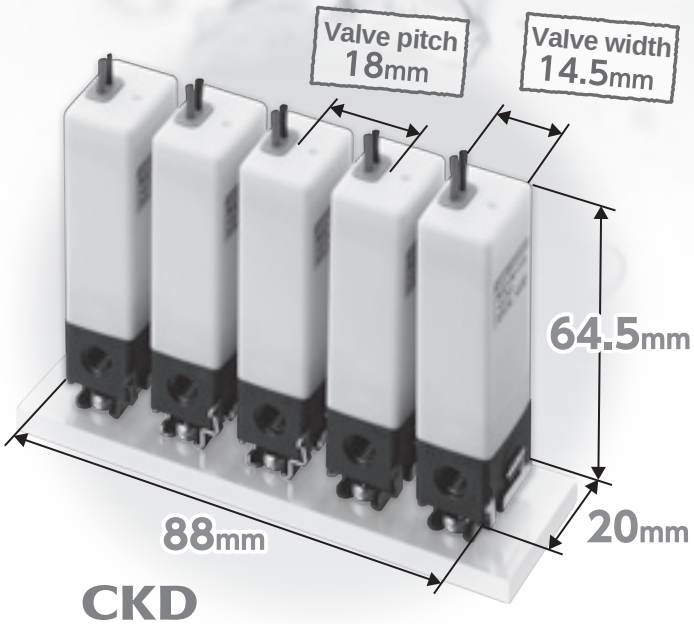


Metal-free 2-port solenoid valve

MKB3 Series

Thin and compact design makes high density installation possible

Achieves 14.5 mm thinness.
Our unique mounting method makes parallel installation at a fine pitch possible.



Easy maintenance

One-touch attachment structure

Easy product mounting and removal.
Can be mounted after piping.

Patent pending

Wide pressure range

Can be used with negative pressures

Supports negative pressure when syringes or discharged liquids are replaced.

Working pressure (MPa)	**−0.08 to 0.25**
Back pressure (MPa)	**0 to 0.25**

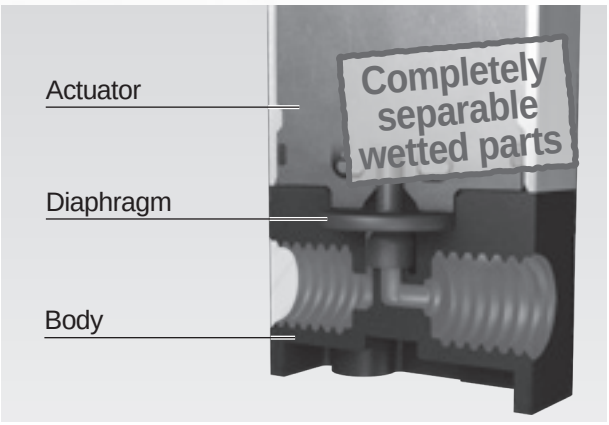
Energy saving board (with lamp) can be selected

Built-in energy saving board reduces heat generated by the coil and prevents thermal effects on fluids.
Reduces power consumption when energized.
The lamp allows the energizing status to be checked.

Metal-free diaphragm structure

Completely separable actuator and wetted parts.
Uses a highly corrosion-resistant resin/rubber material for wetted parts.
Our unique diaphragm structure achieves high durability.

Body material	**PPS**
Diaphragm material	**FKM, EPDM**

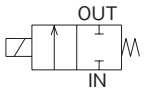


Metal-free 2-port solenoid valve

MKB3 Series

- NC (Normally Closed)
- Working fluid: Water/pure water/chemical liquids
- Port size: M6/1/4-28UNF

JIS symbol



Specifications

Item			MKB3
Actuation			NC (open when energized)
Working fluid			Water/Pure water/Chemical liquids (fluids that do not corrode wetted part materials)
Proof pressure	MPa		0.5(water pressure)
Working pressure	MPa		-0.08 to 0.25
Back pressure	MPa		0 to 0.25
Fluid temperature	°C		5 to 50
Ambient temperature	°C		5 to 50
Atmosphere			No explosive or corrosive atmospheres
Valve seat leakage	cm^3/min		0(water pressure)
Port size			M6,1/4-28UNF
Orifice size	mm		1.5
Cv			0.04
Valve structure			Diaphragm direct acting valve
Mounting orientation			Unrestricted
Weight	g		50
Electrical specifications			
Rated voltage			24 VDC/12 VDC
Voltage fluctuation range			±5%
Power consumption W		Standard	2.5
	Energy saving With circuit	When starting	2.5(*2)
		When holding	1
Leakage current	mA		1.0 or less(24 VDC)/2.0 or less(12 VDC)(*3)
Thermal class			Class 130(B)

*1: When using sodium hypochlorite (soda), select FKM for the diaphragm material. (EPDM will deteriorate over long-term use even with tap water levels of residual chlorine) For 0.1% or less effective concentration, perform functional testing according to your application before use. Do not use effective chlorine concentration exceeding 0.1%.
*2: Time from energizing to 200ms.
*3: The leakage current from the control circuit must be equal to or less than the values shown in the table.
*4: As this product has an integrated electronic circuit board, do not use it in very humid atmospheres.
*5: Solenoid valve has polarity. Connect the red lead wire to the plus (+) side. (With circuit board option: for L)
*6: After the solenoid valve is completely switched OFF, set an interval of one second or more before switching it ON the next time. (With circuit board option: for L)
*7: For the mounting plate option, slide the product in the piping direction by pulling the lever to remove from the mounting plate.
*8: Make sure to read the safety precautions on pages 3 to 8 before use.

How to order

MKB3 - M6 - PF L B - DC24V

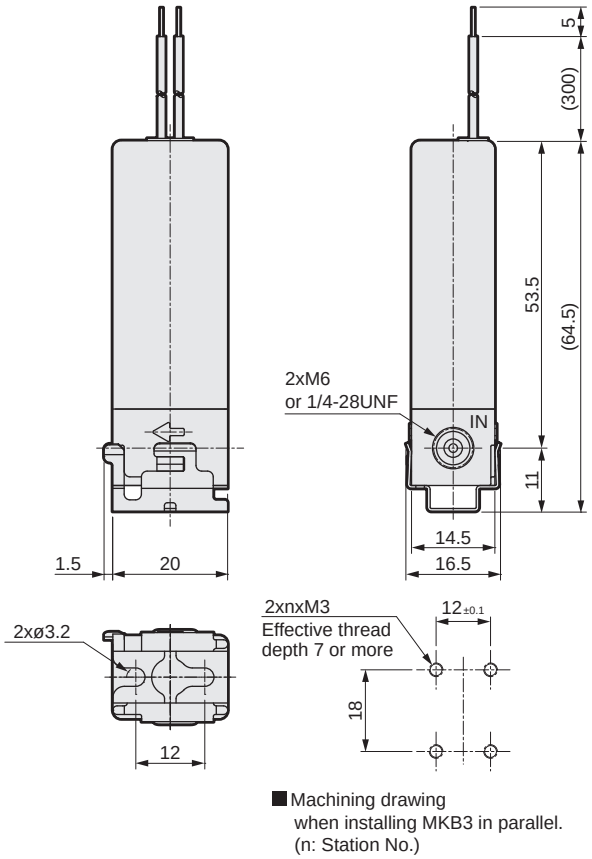
- MKB3 — Model No.
- M6 — Ⓐ Port size
- PF — Ⓑ Material combination
- L — Ⓒ With circuit board option
- B — Ⓓ With mounting plate option
- DC24V — Ⓔ Voltage

Code	Description	
Ⓐ Port size		
M6	M6	
4U	1/4-28UNF	
Ⓑ Material combination		
	Body material	Diaphragm material
PF	PPS	FKM
PE	PPS	EPDM
Ⓒ With circuit board option		
Blank	No option	
L	With lamp/energy saving board	
Ⓓ With mounting plate option		
B	With mounting plate(Standard)*1	
N	Without mounting plate Note2	
Ⓔ Voltage		
DC24V	24 VDC	
DC12V	12 VDC	

*1: Mounting plate is included.
*2: Cannot be installed with solenoid Discrete without mounting plate.

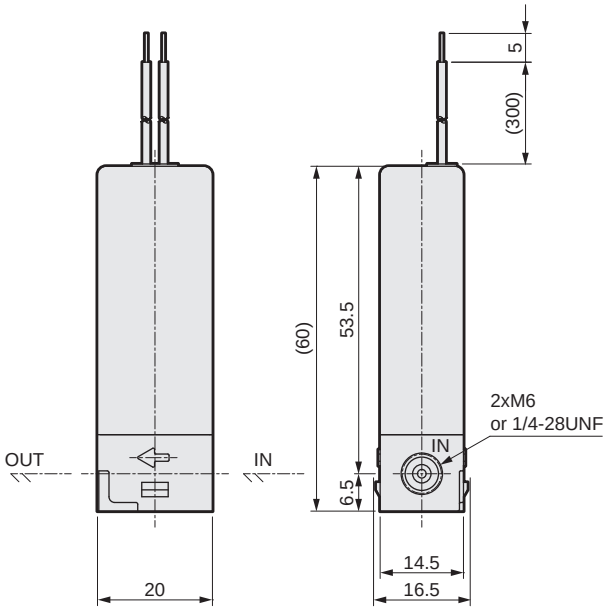
Dimensions

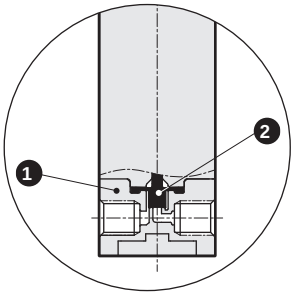
● With mounting plate(Standard)



■ Machining drawing
when installing MKB3 in parallel.
(n: Station No.)

● Without mounting plate



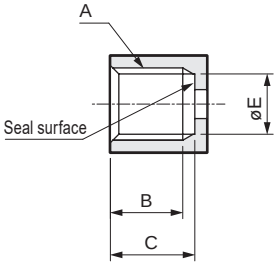


Cannot be disassembled

Main part material

Part No.	Part name	Material	
❶	Body	PPS	Polyphenylene sulfide
❷	Diaphragm	FKM, EPDM	Fluoro rubber, ethylene propylene rubber

● Port size dimensions



Model No.	A	B	C	E
MKB3-M6	M6	6	7	4.9
MKB3-4U	1/4-28UNF	6	7	5.36

MEMO

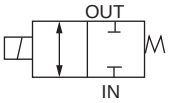
Metal-free 2, 3-port solenoid valve

MAB1/MAG1 Series

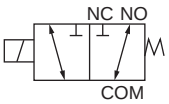
- NC, universal
- Working fluid: Water/pure water/chemical liquids
- Port size: M6

JIS symbol

● MAB1 (2-port)
: NC



● MAG1 (3-port)
: Universal



Specifications

Item	MAB1-M6-DC24V	MAG1-M6-DC24V
Working fluid	Water/pure water/chemical liquids (fluids that do not corrode wetted part materials)	
Proof pressure MPa	0.45 (water pressure)	
Working pressure MPa	See table below	See table below
Fluid temperature °C	5 to 60	
Ambient temperature °C	0 to 50	
Atmosphere	No explosive or corrosive atmospheres	
Valve seat leakage cm^3/min	0 (water pressure)	
Port size	M6	
Orifice size mm	1.6 or equiv.	
Cv	0.045	
Mounting orientation	Unrestricted	
Weight kg	0.13	
Electrical specifications		
Rated voltage	24 VDC	
Voltage fluctuation range	±10%	
Power consumption W	2.3	
Leakage current mA	2.4 or less (*1)	
Thermal class	Class 130 (B)	

Working pressure MPa

Conditions	Fluid flow direction	Working pressure range of each port	
		IN	OUT
IN Positive pressure	IN→OUT	0 to 0.3	0 to 0.1
OUT Positive pressure	OUT→IN	0 to 0.1	0 to 0.1
IN Negative pressure	OUT→IN	−0.05 to 0	−0.05 to 0

Conditions	Fluid flow direction	Working pressure range of each port		
		COM	NC	NO
COM Positive pressure	COM→NO or NC	0 to 0.3	0 to 0.1	0 to 0.1
NC Positive pressure	NC→COM	0 to 0.1	0 to 0.1	0 to 0.1
NO Positive pressure	NO→COM	0 to 0.1	0 to 0.1	0 to 0.1
COM Negative pressure	NO or NC→COM	−0.05 to 0	−0.05 to 0	−0.05 to 0

*1: The leakage current from the control circuit must be equal to or less than the values shown in the table.
*2: Make sure to read the safety precautions on pages 3 to 8 before use.

How to order

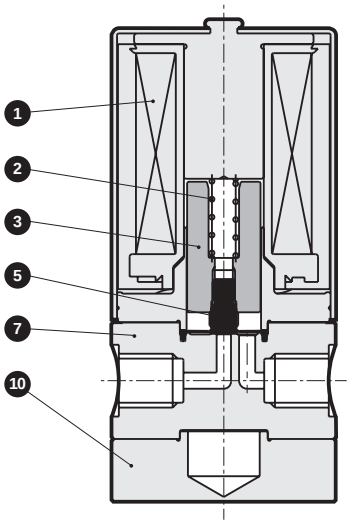
MA(B)1 - M6 - DC24V

- (A) No. of Ports
- Model No.

Code	Description
(A) No. of Ports	
B	2-port valve
G	3-port valve

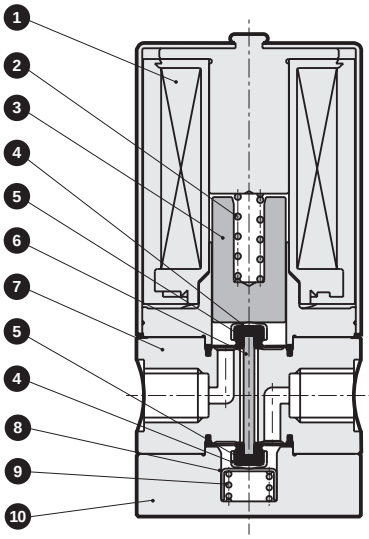
Internal structure and parts list

● MAB1-M6-DC24V



Cannot be disassembled

● MAG1-M6-DC24V

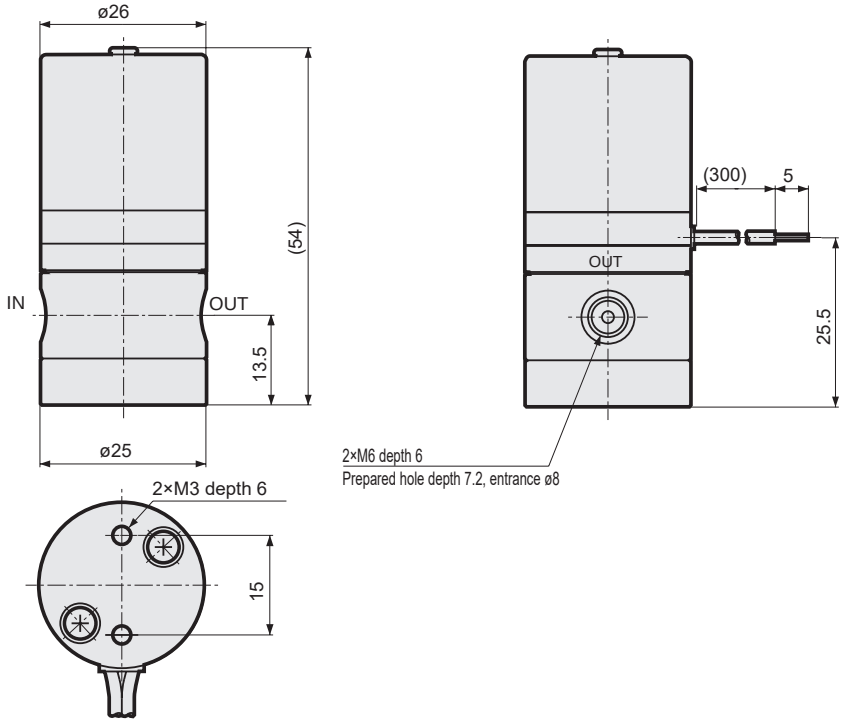


Cannot be disassembled

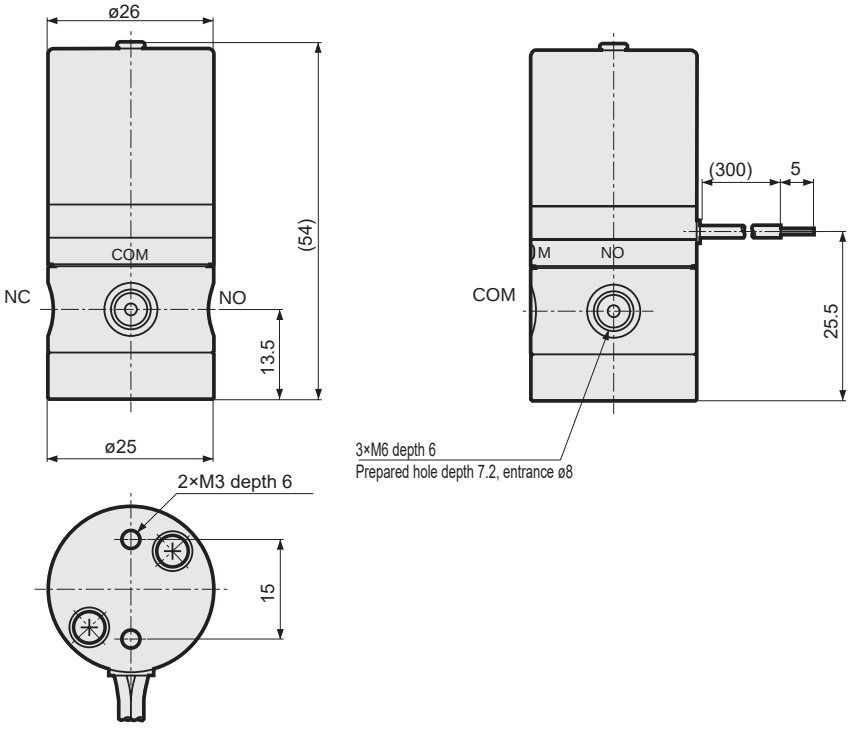
Part No.	Part name	Material		Part No.	Part name	Material	
1	Coil assembly	—	—	6	Rod	—	Ceramic
2	Spring	SUS304	Stainless steel	7	Body	PTFE	Tetrafluoroethylene resin
3	Plunger	SUY	Iron	8	Spring holder	SUS304	Stainless steel
4	Cap	SUS304	Stainless steel	9	Spring	SUS304	Stainless steel
5	Diaphragm	PTFE	Tetrafluoroethylene resin	10	Mounting plate	SUS303	Stainless steel

Dimensions CAD

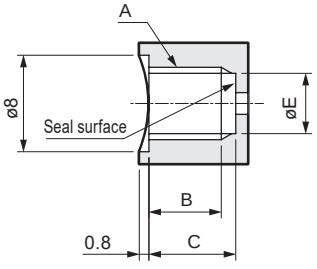
● MAB1-M6-DC24V



● MAG1-M6-DC24V



● Port size dimensions



Model No.	A	B	C	E
MAB1	M6	6	7.2	4.9
MAG1	M6	6	7.2	4.9

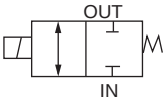
Metal-free 2, 3-port solenoid valve

MYB1/MYG1 Series

- NC, universal
- Working fluid: Water/pure water/chemical liquids
- Port size: M6

JIS symbol

● MYB1 (2-port)
: NC



● MYG1 (3-port)
: Universal

Specifications

Item		MYB1-M6	MYG1-M6
Working fluid		Water/pure water/chemical liquids (fluids that do not corrode wetted part materials)	
Proof pressure	MPa	0.3(water pressure)	
Working pressure	MPa	See table below	See table below
Fluid temperature	°C	5 to 60	
Ambient temperature	°C	0 to 50	
Atmosphere		No explosive or corrosive atmospheres	
Valve seat leakage	cm^3/min	0 (water pressure)	
Port size		M6	
Orifice size	mm	2.0 or equiv.	
Cv		0.1	
Mounting orientation		Unrestricted	
Weight	kg	0.14	
Electrical specifications			
Rated voltage		12 VDC/24 VDC/100 VAC(50/60Hz)	
Voltage fluctuation range		±10%	
Power consumption	AC	3.8	
	W DC	3.0	
Leakage current	mA	2 or less (12 VDC)/1 or less (24 VDC)/1.5 or less (100 VAC) (*1)	
Thermal class		Class 130 (B)	

Working pressure MPa

Conditions	Fluid flow direction	Working pressure range of each port IN	Working pressure range of each port OUT
IN Positive pressure	IN→OUT	0 to 0.2	0 to 0.1
OUT Positive pressure	OUT→IN	0 to 0.1	0 to 0.1
IN Negative pressure	OUT→IN	−0.05 to 0	−0.05 to 0

Conditions	Fluid flow direction	Working pressure range of each port COM	NC	NO
COM Positive pressure	COM → NO or NC	0 to 0.2	0 to 0.1	0 to 0.1
NC Positive pressure	NC→COM	0 to 0.1	0 to 0.1	0 to 0.1
NO Positive pressure	NO→COM	0 to 0.1	0 to 0.1	0 to 0.1
COM Negative pressure	NO or NC → COM	−0.05 to 0	−0.05 to 0	−0.05 to 0

*1: The leakage current from the control circuit must be equal to or less than the values shown in the table.
*2: Make sure to read the safety precautions on pages 3 to 8 before use.

How to order

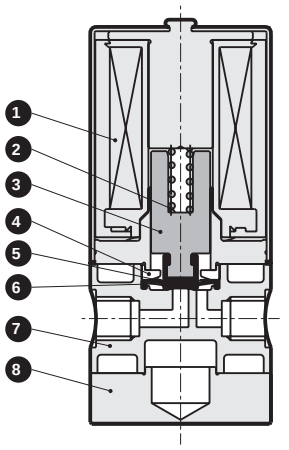
MY B 1 - M6 - DC12V

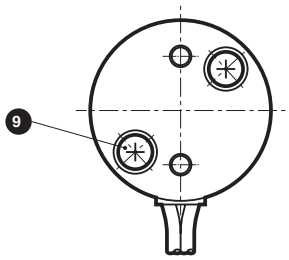
- A No. of Ports
- B Orifice size
- C Port size
- D Rated voltage

Code	Description
A No. of Ports	
B	2-port
G	3-port
B Orifice size	
1	ø2
C Port size	
M6	M6
D Rated voltage	
DC12V	12 VDC
DC24V	24 VDC
AC100V	100 VAC (50/60 Hz)

Internal structure and parts list

● MYB1-M6

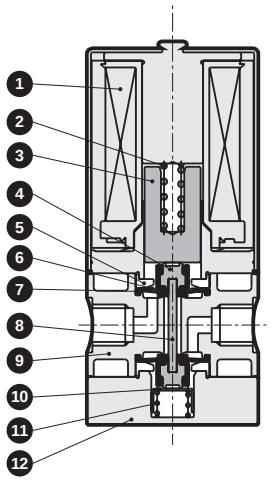


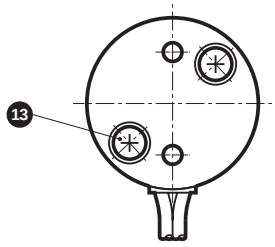


Cannot be disassembled

Part No.	Part name	Material	
1	Coil assembly	Class B molded coil	
2	Spring	SUS304	Stainless steel
3	Plunger	SUS405 or equiv.	Stainless steel
4	Diaphragm adaptor	PPS	Polyphenylene sulfide
5	Protective sheet	PTFE	Tetrafluoroethylene resin
6	Diaphragm	FKM	Fluoro rubber
7	Body	PPS	Polyphenylene sulfide
8	Mounting plate	SUS303	Stainless steel
9	Cross-recessed pan head machine screw with captive spring washer	SUSXM7	Stainless steel

● MYG1-M6



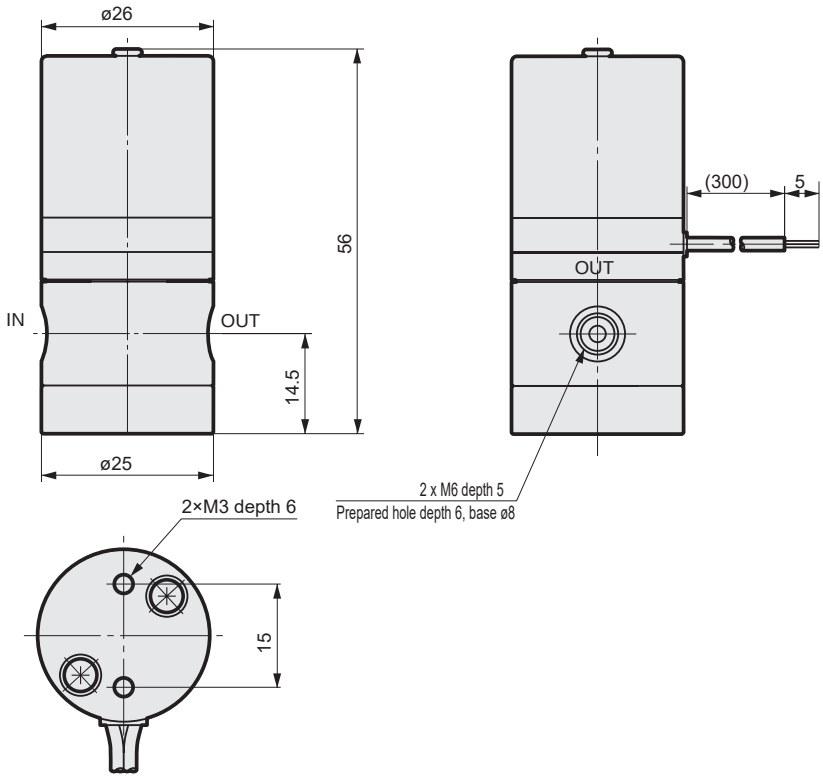


Cannot be disassembled

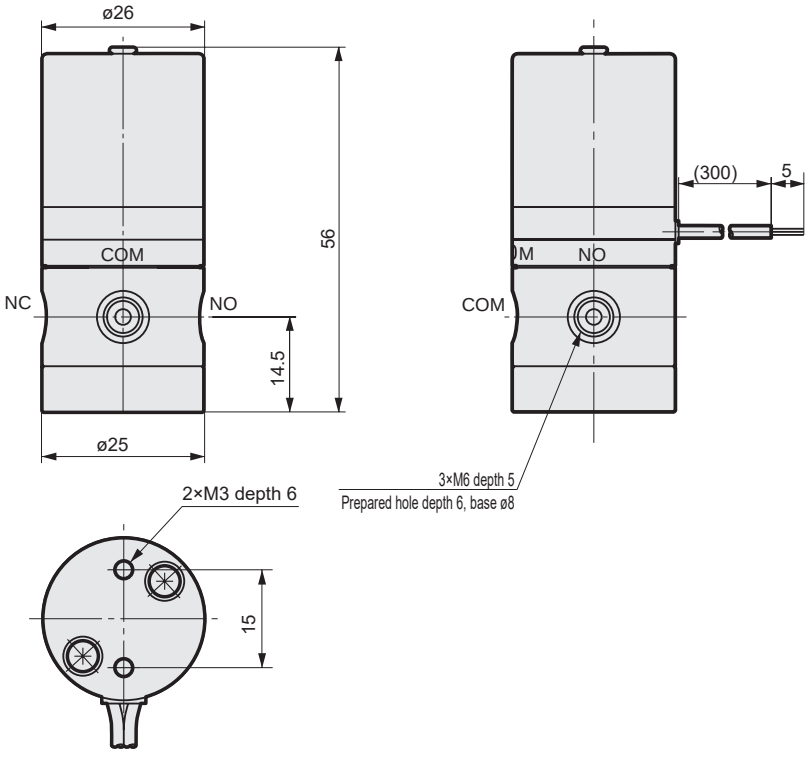
Part No.	Part name	Material	
1	Coil assembly	Class B molded coil	
2	Spring	SUS304	Stainless steel
3	Plunger	SUY	Iron
4	Spacer	PPS	Polyphenylene sulfide
5	Diaphragm adaptor	PPS	Polyphenylene sulfide
6	Protective sheet	PTFE	Tetrafluoroethylene resin
7	Diaphragm	FKM	Fluoro rubber
8	Rod	Ceramic	
9	Body	PPS	Polyphenylene sulfide
10	Spring holder	SUS304	Stainless steel
11	Spring	SUS304	Stainless steel
12	Mounting plate	SUS303	Stainless steel
13	Cross-recessed pan head machine screw with captive spring washer	SUSXM7	Stainless steel

Dimensions

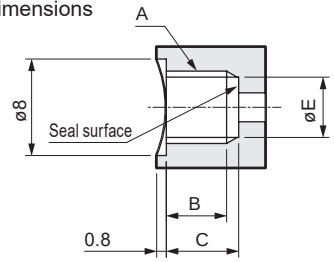
● MYB1-M6



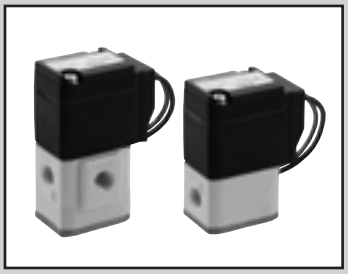
● MYG1-M6



● Port size dimensions



Model No.	A	B	C	E
MYB1	M6	5	6	4.9
MYG1	M6	5	6	4.9



Metal-free 2, 3-port solenoid valve

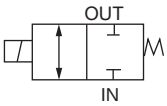
MYB2/MYG2 Series

- NC, universal
- Working fluid: Water/pure water/chemical liquids
- Port size: Rc1/8

RoHS CAD

JIS symbol

● MYB2 (2-port)
: NC



● MYG2 (3-port)
: Universal

Specifications

Item	MYB2-6	MYG2-6
Working fluid	Water/pure water/chemical liquids (fluids that do not corrode wetted part materials)	
Proof pressure MPa	0.3 (water pressure)	

Working pressure MPa

Conditions	Fluid flow direction	Working pressure of each port (MPa) IN	OUT
IN Positive pressure	IN→OUT	0 to 0.2	0 to 0.1
OUT Positive pressure	OUT→IN	0 to 0.1	0 to 0.1
IN Negative pressure	OUT→IN	−0.05 to 0	−0.05 to 0

Conditions	Fluid flow direction	Working pressure of each port (MPa) COM	NC	NO
COM Positive pressure	COM → NO or NC	0 to 0.2	0 to 0.1	0 to 0.1
NC Positive pressure	NC→COM	0 to 0.1	0 to 0.1	0 to 0.1
NO Positive pressure	NO→COM	0 to 0.1	0 to 0.1	0 to 0.1
COM Negative pressure	NO or NC → COM	−0.05 to 0	−0.05 to 0	−0.05 to 0

Fluid temperature °C	5 to 60	
Ambient temperature °C	0 to 50	
Atmosphere	No explosive or corrosive atmospheres	
Valve seat leakage cm^3/min	0 (water pressure)	
Port size	Rc1/8	
Orifice size mm	3.0 or equiv.	
Cv	0.18	
Mounting orientation	Unrestricted	
Weight kg	0.22	0.24
Electrical specifications		
Rated voltage	24 VDC, 100 VAC(50/60Hz)	
Voltage fluctuation range	±10%	
Power consumption W	5.5	
Starting current A	1 or less	
Leakage current mA	24 VDC: 1 or less, 100 VAC: 6 or less (*1)	
Thermal class	Class 130 (B)	

*1: The leakage current from the control circuit must be equal to or less than the values shown in the table.
*2: As this product generates noise from incorporating electronic oscillator circuits, use noise countermeasures on the same power line.
*3: After the solenoid valve is completely switched OFF, set an interval of 0.5 seconds or more before switching it ON the next time.
*4: Make sure to read the safety precautions on pages 3 to 8 before use.

How to order

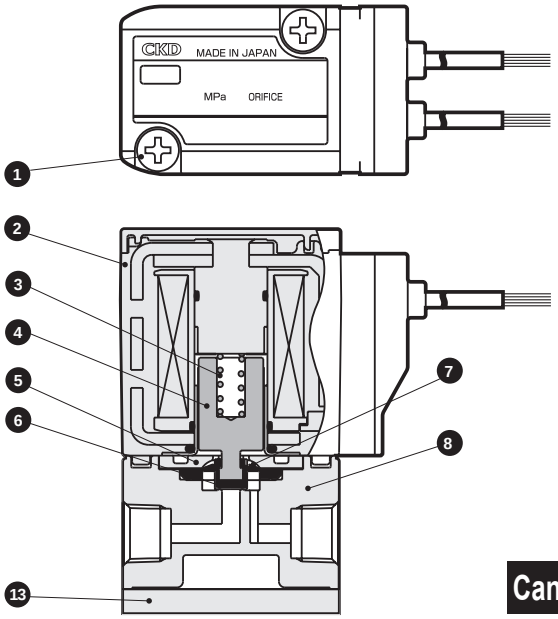
MY B 2 − 6 − DC24V

Ⓐ No. of Ports
Ⓑ Orifice size
Ⓒ Port size
Ⓓ Rated voltage

Code	Description
Ⓐ No. of Ports	
B	2-port
G	3-port
Ⓑ Orifice size	
2	ø3
Ⓒ Port size	
6	Rc1/8
Ⓓ Rated voltage	
DC24V	24 VDC
AC100V	100 VAC (50/60 Hz)

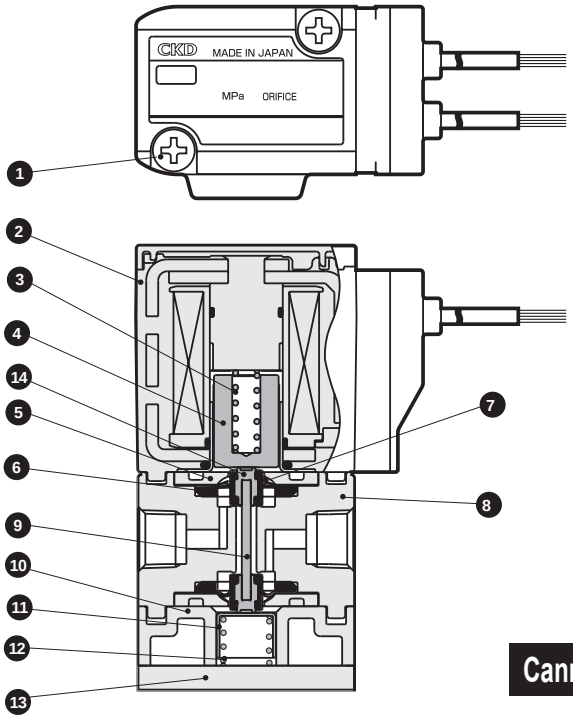
Internal structure and parts list

● MYB2 (2-port valve)



Cannot be disassembled

● MYG2 (3-port valve)

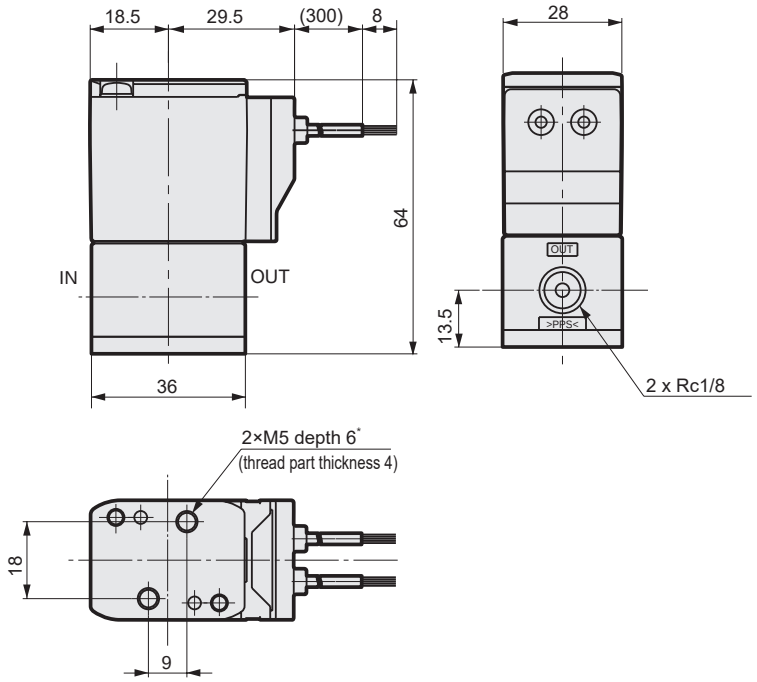


Cannot be disassembled

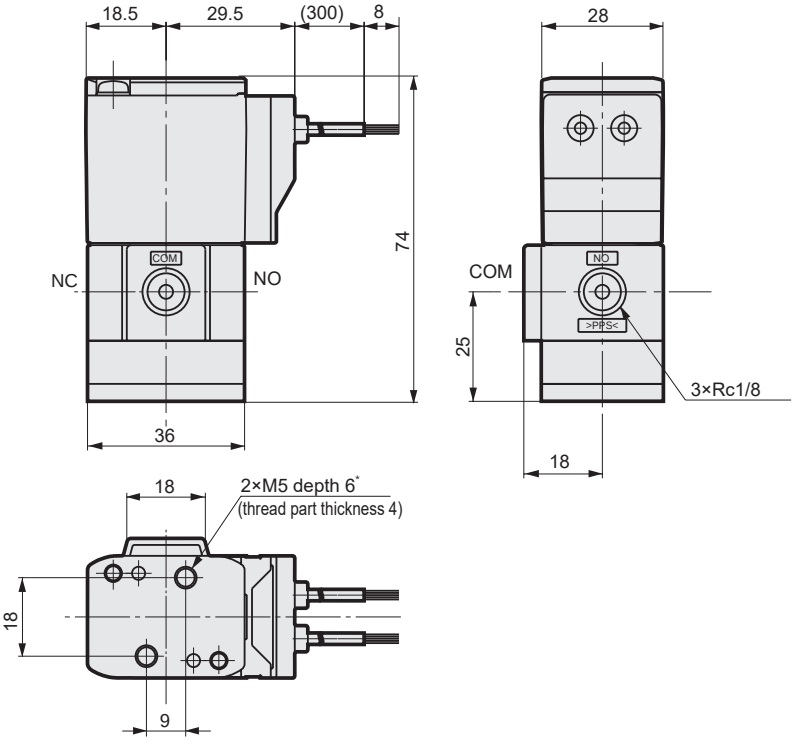
Part No.	Part name	Material		Part No.	Part name	Material	
1	Cross-recessed pan head machine screw	SUSXM7	Stainless steel	8	Body	PPS	Polyphenylene sulfide
2	Coil assembly	Class B molded coil		9	Rod	Ceramic	
3	Spring	SUS304	Stainless steel	10	Base	PPS	Polyphenylene sulfide
4	Plunger	SUS405 or equiv.	Stainless steel	11	Spring holder	SUS304	Stainless steel
5	Diaphragm adaptor	PPS	Polyphenylene sulfide	12	Spring	SUS304	Stainless steel
6	Diaphragm	FKM	Fluoro rubber	13	Mounting plate	SUS304	Stainless steel
7	Protective sheet	PTFE	Tetrafluoroethylene resin	14	Cap	PPS	Polyphenylene sulfide

Dimensions CAD

● MYB2 (2-port valve)

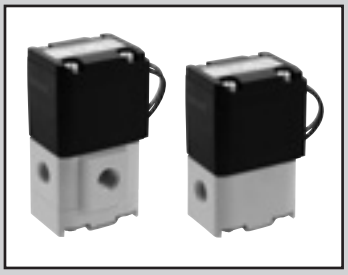


● MYG2 (3-port valve)



*When the mounting 2×M5 is 6 mm or more from the bottom of the mounting plate, the screws will fit into the body or base and may cause cracks. Make sure that the length of the fitting is 6 mm or less from the bottom of the mounting plate.

MEMO



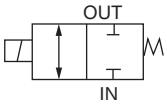
Metal-free 2, 3-port solenoid valve

MYB3/MYG3 Series

- NC, universal
- Working fluid: Water/pure water/chemical liquids
- Port size: Rc1/8, Rc1/4, Rc3/8

JIS symbol

● MYB3 (2-port)
: NC



● MYG3 (3-port)
: Universal

Specifications

Item	MYB3	MYG3
Working fluid	Water/pure water/chemical liquids (fluids that do not corrode wetted part materials)	
Proof pressure MPa	0.3(water pressure)	

Working pressure MPa

Conditions	Fluid flow direction	Working pressure range of each port IN	Working pressure range of each port OUT
IN Positive pressure	IN→OUT	0 to 0.2	0 to 0.1
OUT Positive pressure	OUT→IN	0 to 0.1	0 to 0.1
IN Negative pressure	OUT→IN	−0.05 to 0	−0.05 to 0

Conditions	Fluid flow direction	Working pressure range of each port COM	NC	NO
COM Positive pressure	COM → NO or NC	0 to 0.2	0 to 0.1	0 to 0.1
NC Positive pressure	NC→COM	0 to 0.1	0 to 0.1	0 to 0.1
NO Positive pressure	NO→COM	0 to 0.1	0 to 0.1	0 to 0.1
COM Negative pressure	NO or NC → COM	−0.05 to 0	−0.05 to 0	−0.05 to 0

Fluid temperature °C	5 to 60		
Ambient temperature °C	0 to 50		
Atmosphere	No explosive or corrosive atmospheres		
Valve seat leakage cm^3/min	0 (water pressure)		
Port size	Rc1/8, Rc1/4, Rc3/8		
Orifice size mm	5.0 or equiv.		
Cv	0.5		
Mounting orientation	Unrestricted		
Weight kg	0.55	0.6	
Electrical specifications			
Rated voltage	12 VDC/24 VDC/100 VAC(50/60Hz)		
Voltage fluctuation range	±10%		
Power consumption W	AC	11	
	DC	11.5	
Leakage current mA	2 or less (12 VDC)/1 or less (24 VDC)/2 or less (100 VAC) (*1)		
Thermal class	Class 130 (B)		

*1: The leakage current from the control circuit must be equal to or less than the values shown in the table.
*2: Make sure to read the safety precautions on pages 3 to 8 before use.

How to order

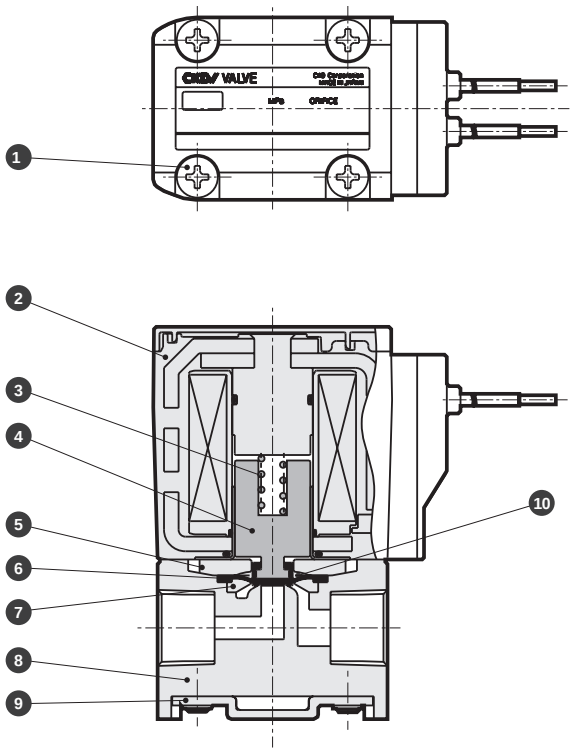
MY B 3 - 6 - DC12V

Ⓐ No. of Ports
Ⓑ Orifice size
Ⓒ Port size
Ⓓ Rated voltage

Code	Description
Ⓐ No. of Ports	
B	2-port
G	3-port
Ⓑ Orifice size	
3	ø5
Ⓒ Port size	
6	Rc1/8
8	Rc1/4
10	Rc3/8
Ⓓ Rated voltage	
DC12V	12 VDC
DC24V	24 VDC
AC100V	100 VAC (50/60 Hz)

Internal structure and parts list

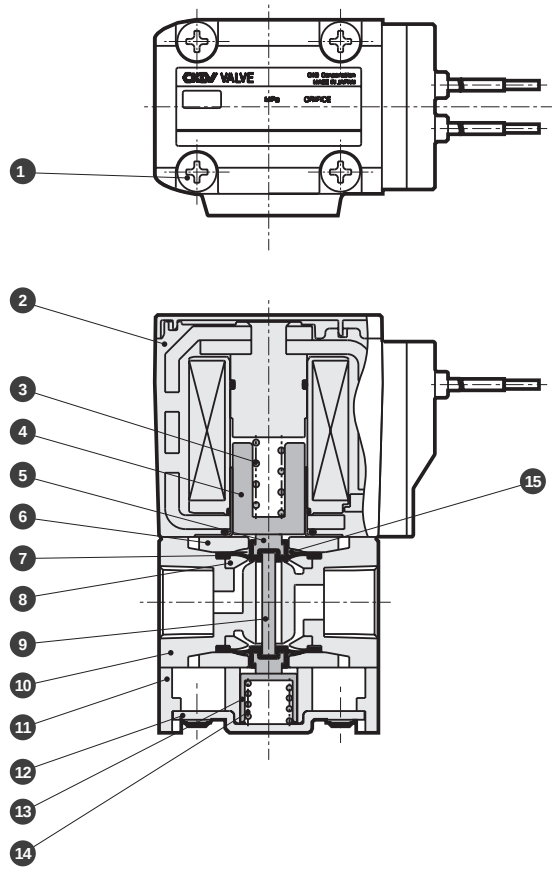
● MYB3



Cannot be disassembled

Part No.	Part name	Material	
1	Cross-recessed pan head machine screw	SUSXM7	Stainless steel
2	Coil assembly	Class B molded coil	
3	Spring	SUS304	Stainless steel
4	Plunger	SUS405 or equiv.	Stainless steel
5	Diaphragm adaptor	PPS	Polyphenylene sulfide
6	Diaphragm	FKM	Fluoro rubber
7	Diaphragm adaptor	PPS	Polyphenylene sulfide
8	Body	PPS	Polyphenylene sulfide
9	Mounting plate	SUS304	Stainless steel
10	Protective sheet	PTFE	Tetrafluoroethylene resin

● MYG3



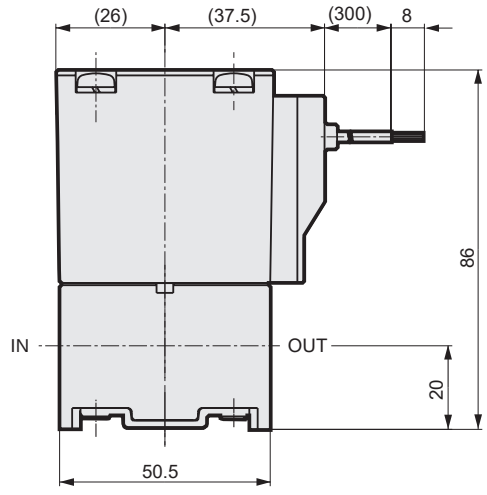
Cannot be disassembled

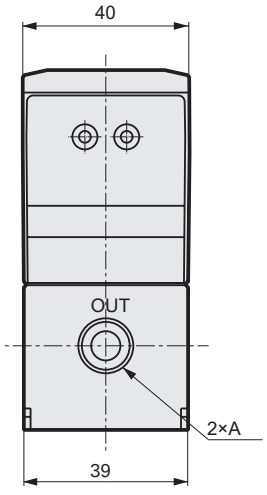
Part No.	Part name	Material	
1	Cross-recessed pan head machine screw	SUSXM7	Stainless steel
2	Coil assembly	Class B molded coil	
3	Spring	SUS304	Stainless steel
4	Plunger	SUS405 or equiv.	Stainless steel
5	Spacer	PPS	Polyphenylene sulfide
6	Diaphragm adaptor	PPS	Polyphenylene sulfide
7	Diaphragm	FKM	Fluoro rubber
8	Diaphragm adaptor	PPS	Polyphenylene sulfide
9	Rod	Ceramic	
10	Body	PPS	Polyphenylene sulfide
11	Base	PPS	Polyphenylene sulfide
12	Mounting plate	SUS304	Stainless steel
13	Spring holder	SUS304	Stainless steel
14	Spring	SUS304	Stainless steel
15	Protective sheet	PTFE	Tetrafluoroethylene resin

Dimensions CAD

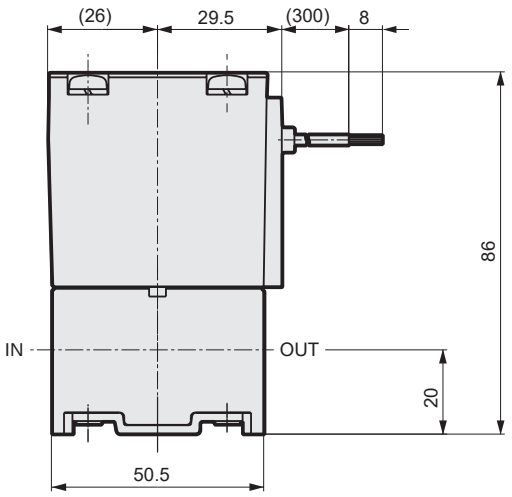
● MYB3

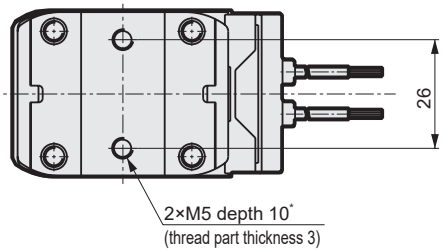
[For AC]



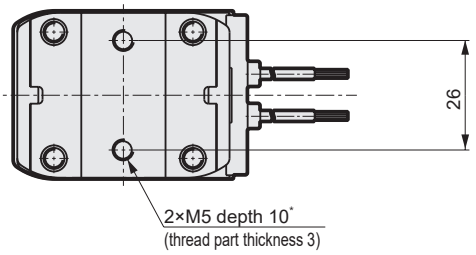


[For DC]



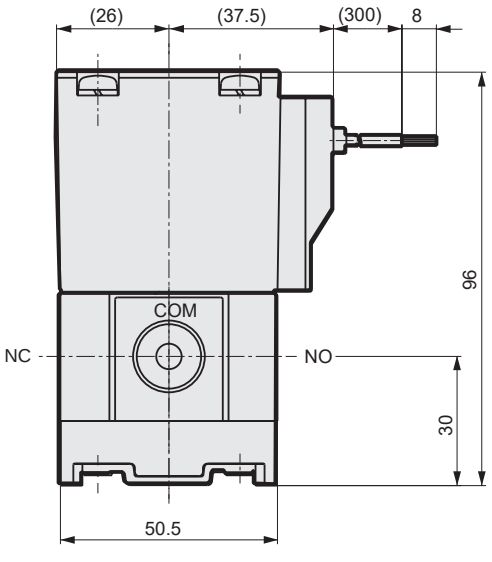


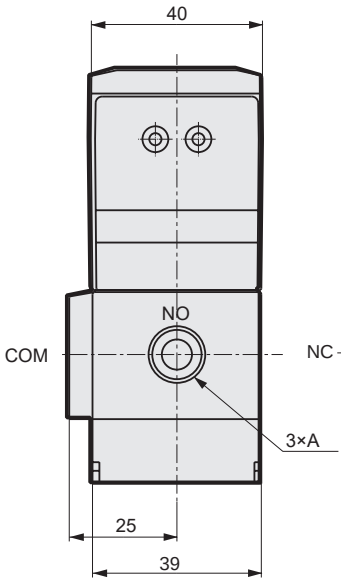
Model No.	A
MYB3-6	Rc1/8
MYB3-8	Rc1/4
MYB3-10	Rc3/8



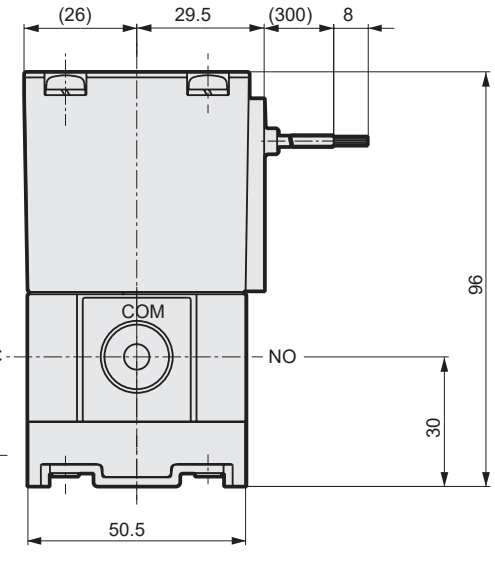
● MYG3

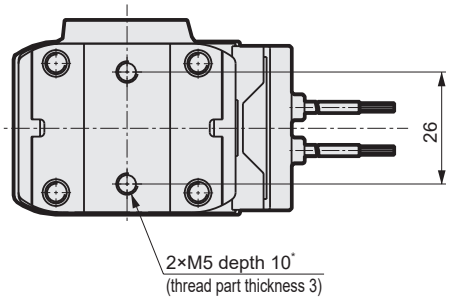
[For AC]



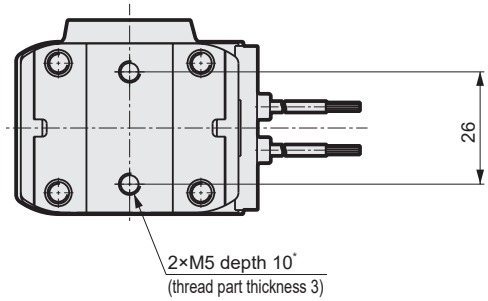


[For DC]

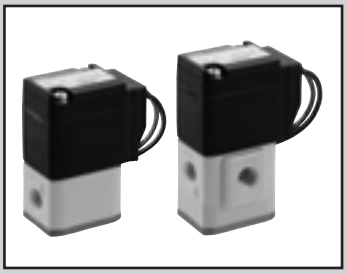




Model No.	A
MYG3-6	Rc1/8
MYG3-8	Rc1/4
MYG3-10	Rc3/8



*When the mounting 2×M5 is 6 mm or more from the bottom of the mounting plate, the screws will fit into the body or base and may cause cracks. Make sure that the length of the fitting is 6 mm or less from the bottom of the mounting plate.



Metal-free 2, 3-port solenoid valve

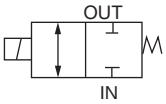
MEB2/MEG2 Series

- NC, universal
- Working fluid: Water/pure water/chemical liquids
- Port size: Rc1/8

RoHS CAD

JIS symbol

● MEB2 (2-port)
: NC



● MEG2 (3-port)
: Universal

Specifications

Item	MEB2-6	MEG2-6
Working fluid	Water/pure water/chemical liquids (fluids that do not corrode wetted part materials)	
Proof pressure MPa	0.3(water pressure)	
Working pressure MPa	See table below	See table below
Fluid temperature °C	0 to 60 (no freezing)	
Ambient temperature °C	0 to 50	
Atmosphere	No explosive or corrosive atmospheres	
Valve seat leakage cm^3/min	0 (water pressure)	
Port size	Rc1/8	
Orifice size mm	3.0 or equiv.	
Cv	0.18	
Mounting orientation	Unrestricted	
Weight kg	0.22	0.24
Electrical specifications		
Rated voltage	24 VDC/100 VAC (50/60Hz)	
Voltage fluctuation range	±10%	
Power consumption W	5.5	
Starting current A	1 or less	
Leakage current mA	24 VDC: 1 or less, 100 VAC: 6 or less (*1)	
Thermal class	Class 130 (B)	

Working pressure MPa

Conditions	Fluid flow direction	Working pressure range of each port	
		IN	OUT
IN Positive pressure	IN→OUT	0 to 0.2	0 to 0.1
OUT Positive pressure	OUT→IN	0 to 0.1	0 to 0.1
IN Negative pressure	OUT→IN	−0.05 to 0	−0.05 to 0

Conditions	Fluid flow direction	Working pressure range of each port		
		COM	NC	NO
COM Positive pressure	COM → NO or NC	0 to 0.2	0 to 0.1	0 to 0.1
NC Positive pressure	NC→COM	0 to 0.1	0 to 0.1	0 to 0.1
NO Positive pressure	NO→COM	0 to 0.1	0 to 0.1	0 to 0.1
COM Negative pressure	NO or NC → COM	−0.05 to 0	−0.05 to 0	−0.05 to 0

*1: The leakage current from the control circuit must be equal to or less than the values shown in the table.
*2: As this product generates noise from incorporating electronic oscillator circuits, use noise countermeasures on the same power line.
*3: After the solenoid valve is completely switched OFF, set an interval of 0.5 seconds or more before switching it ON the next time.
*4: Make sure to read the safety precautions on pages 3 to 8 before use.

How to order

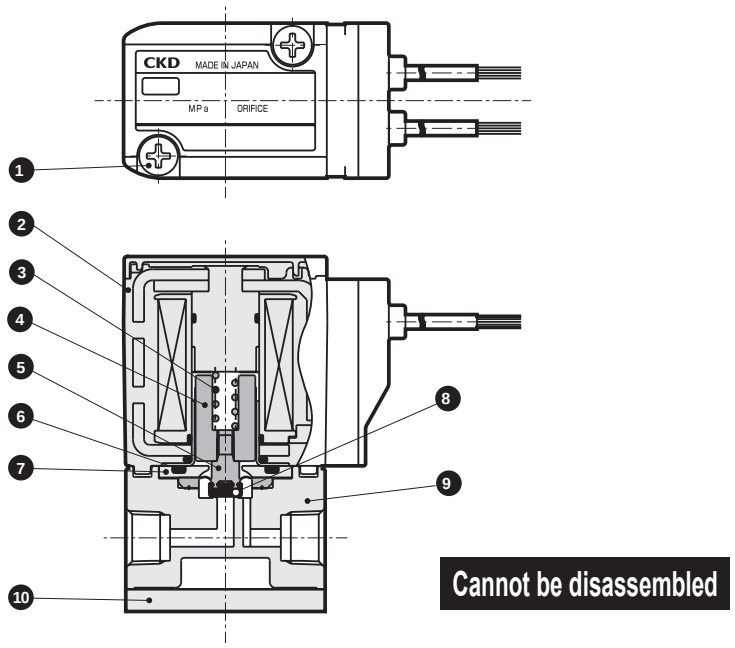
ME B 2 − 6 − DC24V

- A No. of Ports
- B Orifice size
- C Port size
- D Rated voltage

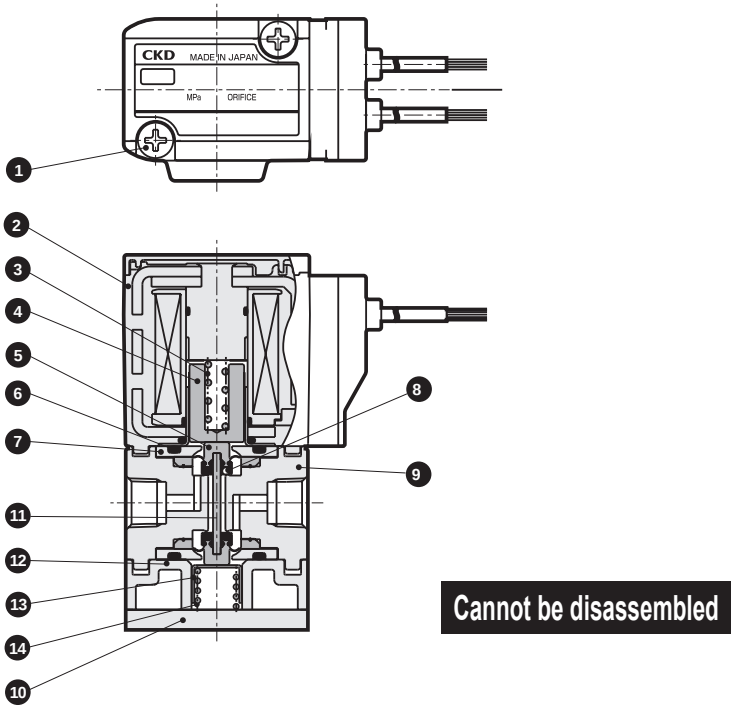
Code	Description
A No. of Ports	
B	2-port
G	3-port
B Orifice size	
2	ø3
C Port size	
6	Rc1/8
D Rated voltage	
DC24V	24 VDC
AC100V	100 VAC (50/60 Hz)

Internal structure and parts list

● MEB2 (2-port valve)



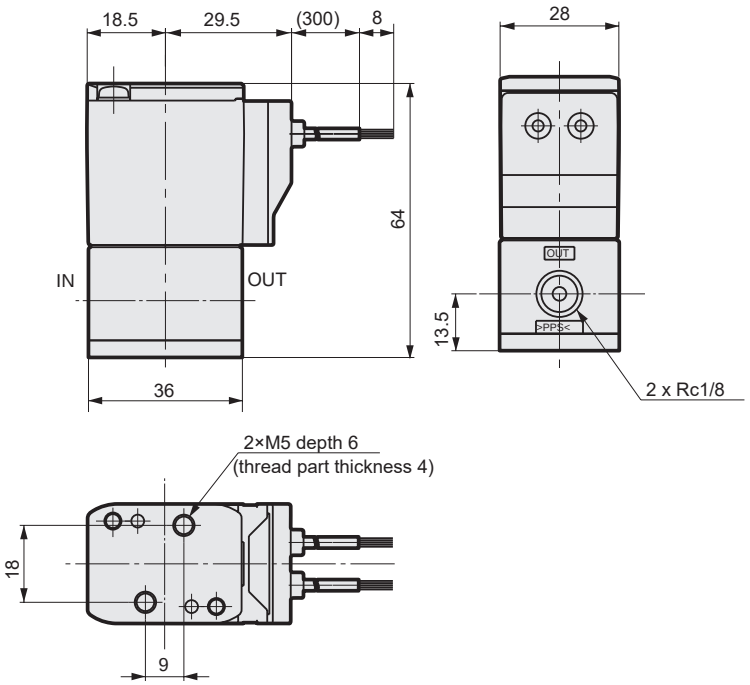
● MEG2 (3-port valve)



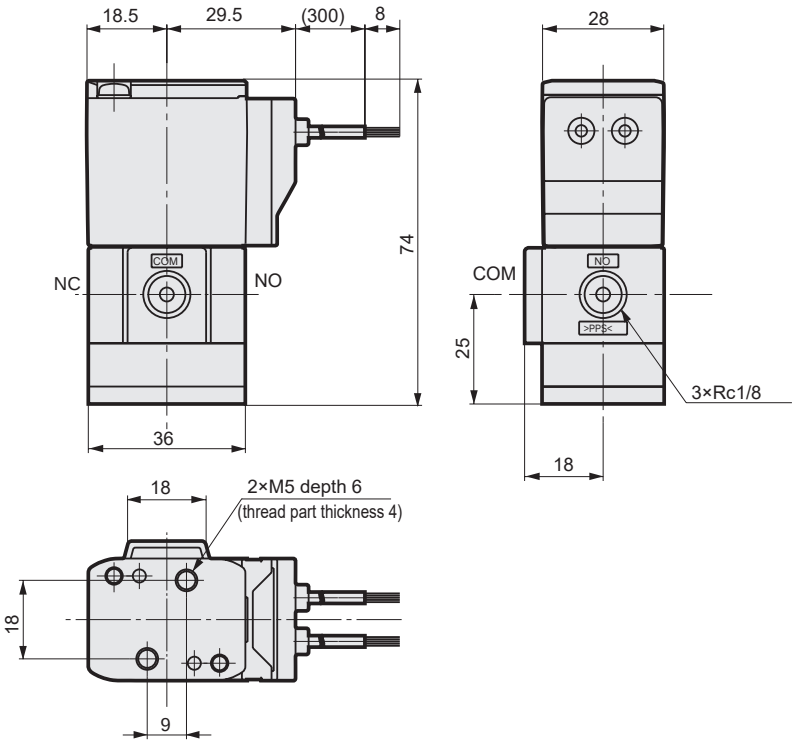
Part No.	Part name	Material		Part No.	Part name	Material	
1	Cross-recessed pan head machine screw	SUSXM7	Stainless steel	8	Valve seat	FFKM	Perfluoroelastomer
2	Coil assembly	Class B molded coil		9	Body	PPS	Polyphenylene sulfide
3	Spring	SUS304	Stainless steel	10	Mounting plate	SUS304	Stainless steel
4	Plunger	SUS405 or equiv.	Stainless steel	11	Rod	Ceramic	
5	Diaphragm	PTFE	Tetrafluoroethylene resin	12	Base	PPS	Polyphenylene sulfide
6	O-ring	FKM	Fluoro rubber	13	Spring holder	SUS304	Stainless steel
7	Diaphragm adaptor	PPS	Polyphenylene sulfide	14	Spring	SUS304	Stainless steel

Dimensions

● MEB2 (2-port valve)



● MEG2 (3-port valve)



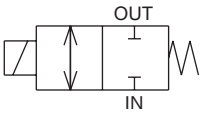
*When the mounting 2×M5 is 6 mm or more from the bottom of the mounting plate, the screws will fit into the body or base and may cause cracking. Make sure that the length of the fitting is 6 mm or less from the bottom of the mounting plate.

Metal-free 2-port solenoid valve

MJB3 Series

- NC (normally closed)
- Working fluid: Water/pure water/chemical liquids
- Port size:Tube connection porting O.D. x I.D. = ø8 x ø4

JIS symbol



Specifications

Item	MJB3-4TN
Working fluid	Water, pure water, chemical liquids (fluids that do not corrode wetted part materials)
Proof pressure MPa	0.23 (water pressure)
Working pressure MPa	IN→OUT -0.06 to 0.15 When OUT port has negative pressure, the IN port is open to the atmosphere. OUT→IN -0.06 to 0.15 When IN port has negative pressure, the OUT port is open to the atmosphere.
Fluid temperature °C	0 to 90 (no freezing)
Ambient temperature °C	0 to 40
Atmosphere	No explosive or corrosive atmospheres
Valve seat leakage cm^3/min	0 (water pressure)
Port size	Tube connection porting O.D. x I.D. = ø8 x ø4
Orifice size mm	3
Cv	0.2
Mounting orientation	Unrestricted
Weight kg	0.15
Electrical specifications	
Rated voltage	24 VDC
Voltage fluctuation range	±10%
Power consumption W	5.1
Leakage current mA	1 or less (*1)
Thermal class	Class 130 (B)

*1: The leakage current from the control circuit must be equal to or less than the values shown in the table.
*2: For 0.1% or less effective concentration of sodium hypochlorite (soda), perform functional testing according to your application before use. Do not use effective chlorine concentration exceeding 0.1%.
*3: Do not apply excessive force on the fitting when connecting or disconnecting the tube.
*4: Recommended tube
Material: Silicone rubber, size: O.D x I.D = ø11 x ø5
*5: Make sure to read the safety precautions on pages 3 to 8 before use.

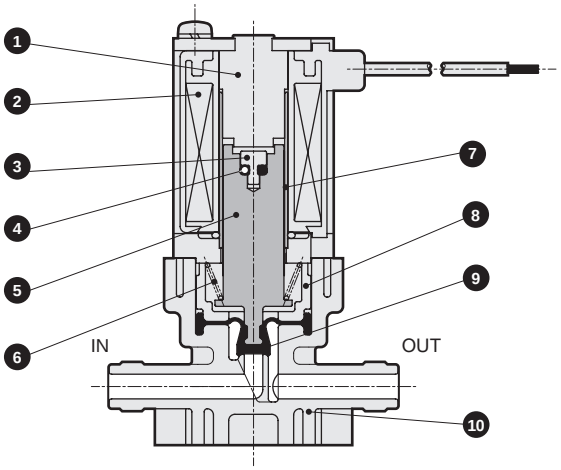
How to order

MJB3 - 4TN - P F - DC24V

- MJB3: Model No.
- 4TN: Ⓐ Port size
- P: Ⓑ Body material
- F: Ⓒ Sealant
- DC24V: Ⓓ Voltage

Code	Description
Ⓐ Port size	
4TN	Port I.D. ø4
Ⓑ Body material	
P	PPS
S	PSU
Ⓒ Sealant	
F	FKM
Ⓓ Voltage	
DC24V	24 VDC

Internal structure and parts list

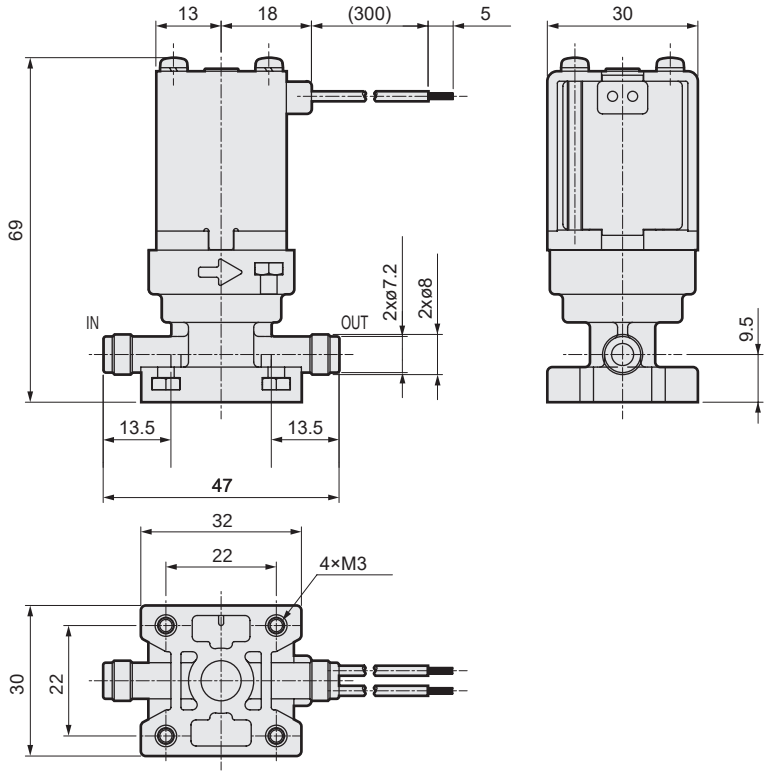


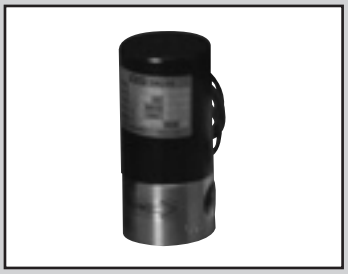
Cannot be disassembled

Part No.	Part name	Material	
1	Core A	SUM	Steel
2	Coil assembly	Class B molded coil	
3	Rod	PPS	Polyphenylene sulfide
4	O-ring	FKM	Fluoro rubber
5	Plunger	SUS405 or equiv.	Stainless steel
6	Spring	SUS304	Stainless steel
7	Guide pipe	SUS304	Stainless steel
8	Diaphragm holder	PPS	Polyphenylene sulfide
9	Diaphragm	FKM	Fluoro rubber
10	Body	PPS (PSU)	Polyphenylene sulfide (Polysulfone)

( ) shows options.

Dimensions





Metal-free 2-port solenoid valve

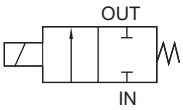
EMB21 Series

- NC (normally closed)
- Working fluid: Water/pure water/chemical liquids
- Port size: Rc1/4

RoHS

JIS symbol

- NC (normally closed)



Specifications

Item		EMB21
Working fluid		Water/pure water/chemical liquids (fluids that do not corrode wetted part materials)
Working pressure MPa		−0.05 to 0.3
Back pressure MPa		0 to 0.1
Proof pressure MPa		0.6 (water pressure)
Fluid temperature °C		5 to 80
Ambient temperature °C		0 to 60 (no freezing)
Valve seat leakage cm^3/min		0 (water pressure)
Port size		Rc1/4 (*1)
Orifice size mm		3
Cv		0.18
Mounting orientation		Unrestricted
Weight kg		0.32 (0.43 for SUS316 body)
Frequency cycles/min.		60 or less
Electrical specifications		
Rated voltage		100 VAC (50/60Hz), 200 VAC (50/60Hz), 24 VDC
Voltage fluctuation range		-10 to +10% of rated voltage
Power consumption	100 VAC	4.6
	200 VAC	5.4
	24 VDC	4.5
Leakage current mA		2 or less
Thermal class		Class 130 (B)

*1:Do not use metal fittings with the PTFE body because they could damage the port. Wrap PTFE sealing tape two or three times around a fitting which is compatible with the JIS B 0203 pipe taper screw. For tightening fluoro resin fittings, refer to the recommended tightening torque below.
Recommended tightening torque: 0.7 to 1.0 N·m (PTFE), 1.0 to 1.5 N·m (SUS316)

*2: Make sure to read the safety precautions on pages 3 to 8 before use.

How to order

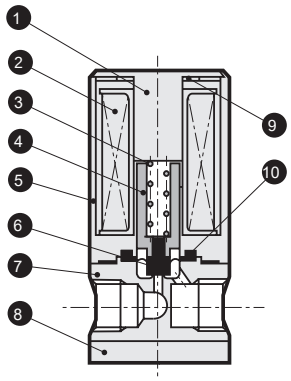
EMB21 - 8 - 5 - D - AC100V

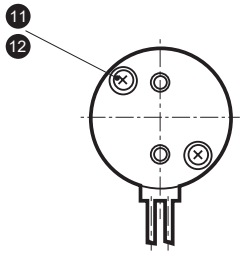
- EMB21: Model No.
- 8: Port size Rc1/4
- 5
- D: Ⓐ Body material
- AC100V: Ⓑ Rated voltage

Code	Description
Ⓐ Body material	
Blank	PTFE
D	SUS316
Ⓑ Rated voltage	
AC100V	100 VAC (50/60 Hz)
AC200V	200 VAC (50/60 Hz)
DC24V	24 VDC

Internal structure and parts list

● EMB21 Series



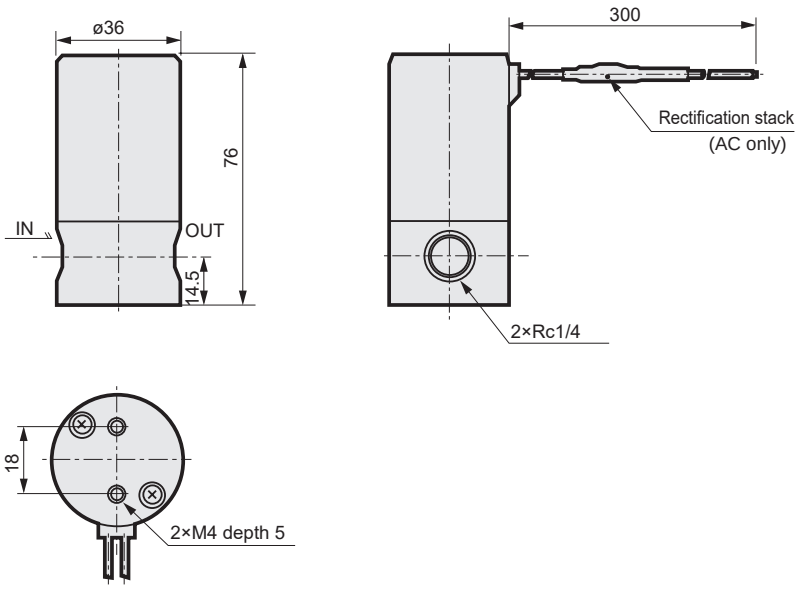


Cannot be disassembled

Part No.	Part name	Material	
1	Core A	SUM22	Steel
2	Coil assembly	-	
3	Cylindrical spring	SUS304	Stainless steel
4	Plunger	SUS405 or equiv.	Stainless steel
5	Core B	SUM22	Steel
6	Diaphragm	PTFE	Tetrafluoroethylene resin
7	Body	PTFE	Tetrafluoroethylene resin
8	Mounting plate	SUS303	Stainless steel
9	Gasket	FKM	Fluoro rubber
10	Gasket	FKM	Fluoro rubber
11	Cross-recessed pan head machine screw	SUS304	Stainless steel
12	Spring washer	SUS304	Stainless steel

Dimensions

● EMB21-8-5-*



Metal-free 2-port solenoid valve

EMB41/51 Series

- NC (normally closed)
- Working fluid: Water/pure water/chemical liquids
- Port size: Rc3/8, Rc1/2

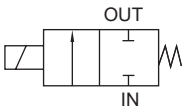
Export controlled items

* Subject: Port size 15

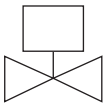
RoHS

JIS symbol

● NC (normally closed)



Mounting orientation



Common specifications

Item	EMB41/51
Working fluid	Water/pure water/chemical liquids (fluids that do not corrode wetted part materials)
Working pressure MPa	0 to 0.25 (refer to working pressure in individual specifications.)
Proof pressure MPa	0.4 (water pressure)
Fluid temperature °C	5 to 60
Valve seat leakage cm^3/min	0 (water pressure)
Mounting orientation	Vertical direction with the coil on top
Frequency cycles/min.	60 or less
Electrical specifications	
Rated voltage	100 VAC (50/60Hz), 200 VAC(50/60Hz), 24 VDC
Voltage fluctuation range	-10 to +10% of rated voltage
Leakage current mA	2 or less
Mounting wire	VCTF-0.75 (2-conductor)

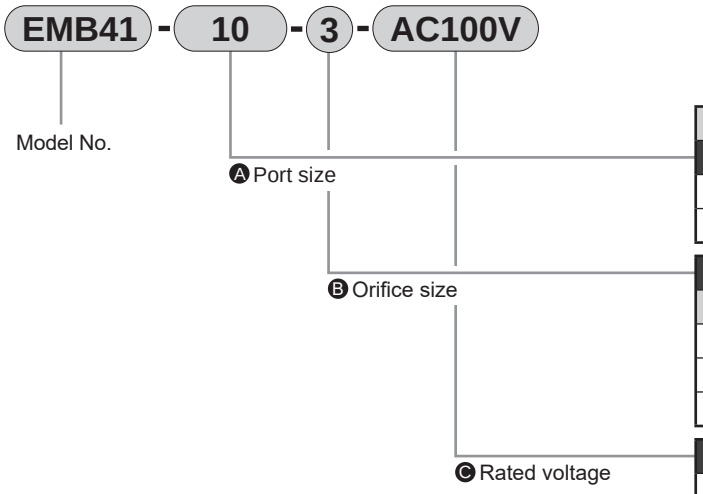
Note: Always read the safety precautions on pages 3 to 8 before use.

Individual specifications

Item / Model No.	Port size (*1)	Orifice size (mm)	Cv	Working pressure (MPa)	Back pressure (MPa)	Circumferenceambient temperature(°C)	Power consumption (W)	Weight (kg)
EMB41-10-3	Rc3/8	6	0.68	0 to 0.25	0.1	0 to 50	11	0.86
EMB41-10-5		8	0.83	0 to 0.2	0.07			
EMB51-10-3	Rc3/8	10	2.05	0 to 0.15	0.06	0 to 55	16	2.05
EMB51-15-4	Rc1/2	12	2.7	0 to 0.12				
EMB51-15-5		15	3.6	0 to 0.05	0.03			

*1:Do not use metal fittings because they could damage the port. Wrap PTFE sealing tape two or three times around a fitting which is compatible with the JIS B 0203 pipe taper screw. For tightening fluoro resin fittings, refer to the recommended tightening torque below.
Recommended tightening torque: Rc3/8: 1.0 to 1.5 N·m, Rc1/2: 1.5 to 2.0 N·m

How to order



Code	Description	Model No. EMB41	Model No. EMB51	
A Port size				
10	Rc 3/8	●	●	
15	Rc 1/2			●
B Orifice size				
	EMB41 / **EMB51**			
3	ø6 / ø10	●	●	
4	- / ø12			●
5	ø8 / ø15	●		●
C Rated voltage				
AC100V	100 VAC (50/60 Hz)	●	●	●
AC200V	200 VAC (50/60 Hz)	●	●	●
DC24V	24 VDC	●	●	●

[Example of model No.]

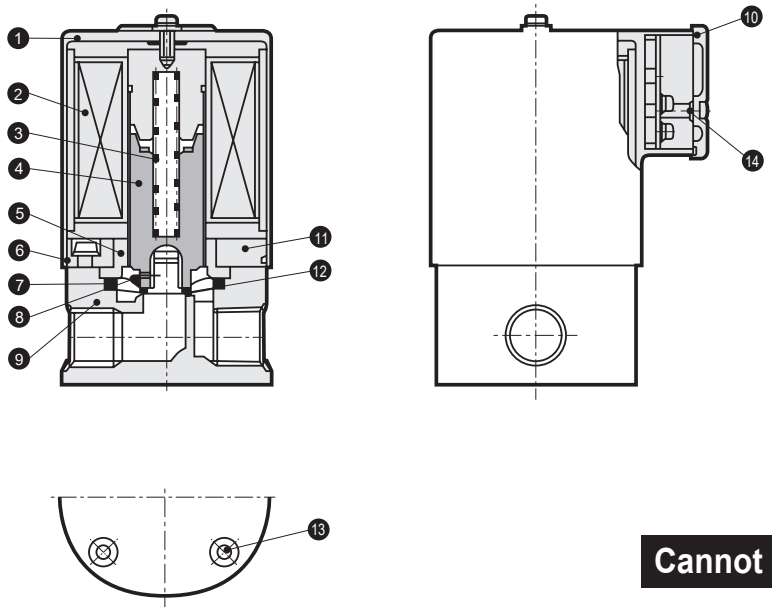
EMB51-15-5-AC200V

Model: EMB51

A Port size : Rc1/2
B Orifice size : ø15
C Rated voltage : 200 VAC (50/60 Hz)

Internal structure and parts list

● EMB41/51 Series

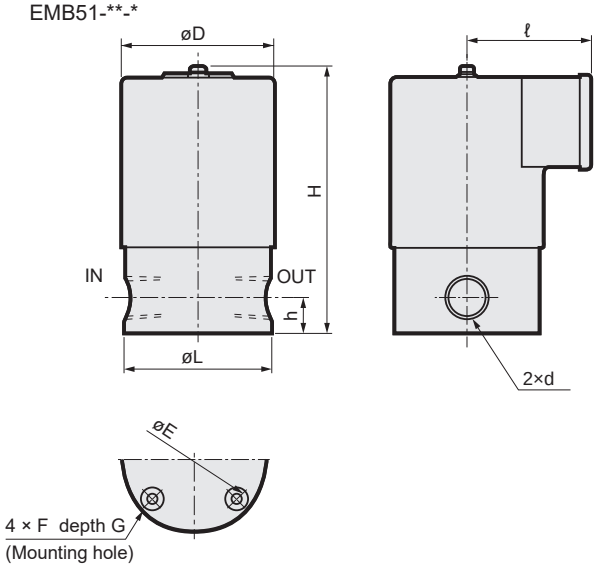


Cannot be disassembled

Part No.	Part name	Material		Part No.	Part name	Material	
1	Cover	PP	Polypropylene	9	Body	PTFE	Tetrafluoroethylene resin
2	Coil assembly	-		10	Gasket	FKM	Fluoro rubber
3	Spring	SUS304	Stainless steel	11	Stuffing	A + 5056	Aluminum
4	Plunger	SUS405 or equiv.	Stainless steel	12	Rubber spacer	FKM	Fluoro rubber
5	Core assembly	SUS403/SUS316	Stainless steel	13	Embedded nut	SUS303	Stainless steel
6	O-ring	FKM	Fluoro rubber	14	Gasket	FKM	Fluoro rubber
7	Diaphragm	PTFE	Tetrafluoroethylene resin				
8	Double diaphragm	PTFE	Tetrafluoroethylene resin				

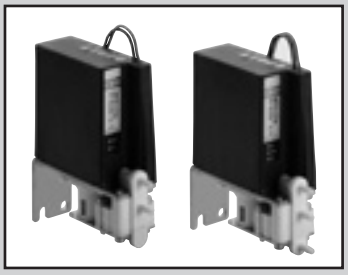
Dimensions

● EMB41-**-*
EMB51-**-*



Model No.	D	d	E	F-G	H	h	L	ℓ
EMB41-10-3	54	Rc3/8	41	M4-8	110	14	54	50
EMB41-10-5	54	Rc3/8	41	M4-8	110	14	54	50
EMB51-10-3	74	Rc3/8	56	M5-12	136	22	70	60
EMB51-15-4	74	Rc1/2	56	M5-12	136	22	70	60
EMB51-15-5	74	Rc1/2	56	M5-12	136	22	70	60

MEMO



Compact metal-free lever 2, 3-port solenoid valve for medical equipment

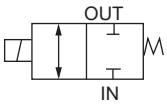
HMTB1/HMTG1 Series

- NC, universal
- Working fluid: Water/pure water/chemical liquids
- Port size: ø2 barbed fitting

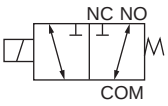
RoHS CAD

JIS symbol

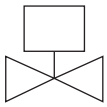
● HMTB1 (2-port)
: NC



● HMTG1 (3-port)
: Universal



Mounting orientation



Specifications

Item		HMTB1	HMTG1
Working fluid		Water/pure water/chemical liquids (fluids that do not corrode wetted part materials)	
Proof pressure	MPa	0.6 (water pressure)	
Working pressure	MPa	IN→OUT:-0.05 to 0.3 OUT→IN:-0.05 to 0.15	COM→NC/NO: −0.05 to 0.3 NC/NO→COM: −0.05 to 0.15
Fluid temperature	°C	5 to 40	
Ambient temperature	°C	0 to 55	
Port size		ø2 barbed fitting	
Orifice size	mm	1.6	
Cv		0.05	
Mounting orientation		Vertical position with coil on top	
Weight	kg	0.21	
Frequency	cycles/min.	60 or less	
Electrical specifications			
Rated voltage		24 VDC / 12 VDC	
Voltage fluctuation range		±10%	
Temperature rise	K	30	
Power consumption	When starting	9.6 (*1)	
	When holding	2.4	
Leakage current	mA	5 or less (*2)	
Thermal class		Class 120 (E)	

*1: Time from energizing to 200 ms.
*2: The leakage current from the control circuit must be equal to or less than the values shown in the table.
*3: Use direct current (excluding rectified alternating current).
*4: When starting and switching retention, noise is generated temporarily. Check the compatibility of the control circuit.
*5: Do not apply excessive force on the fitting when connecting or disconnecting the tube.
*6: Solenoid valve has polarity. Connect the red lead wire to the plus (+) side.
*7: After the solenoid valve is completely switched ON or OFF, set an interval of 0.5 seconds or more before switching it the next time.
*8: Make sure to read the safety precautions on pages 3 to 8 before use.

How to order

HMT **B** 1 - 2TN - **PN** - **DC12V**

- HMT: Model No.
- B: Ⓐ No. of Ports
- PN: Ⓑ Material
- DC12V: Ⓒ Rated voltage

Code	Description	
Ⓐ No. of Ports		
B	2-port valve	
G	3-port valve	
Ⓑ Material		
	Body	**Seal**
PN	PPS	NBR
PF	PPS	FKM
PE	PPS	EPDM
Ⓒ Rated voltage		
DC12V	12 VDC	
DC24V	24 VDC	

[Example of model No. 1]

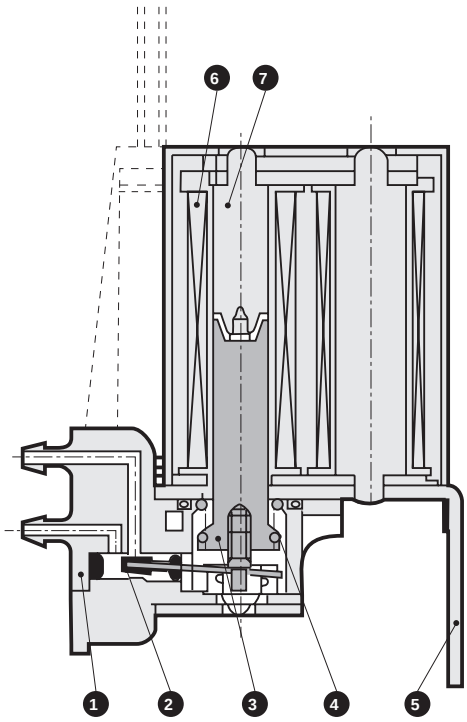
HMTB1-2TN-PF-DC24V

Model: HMTB1

Ⓐ No. of Ports : 2-port valve
Ⓑ Material : Body - PPS, sealant - FKM
Ⓒ Rated voltage : 24 VDC

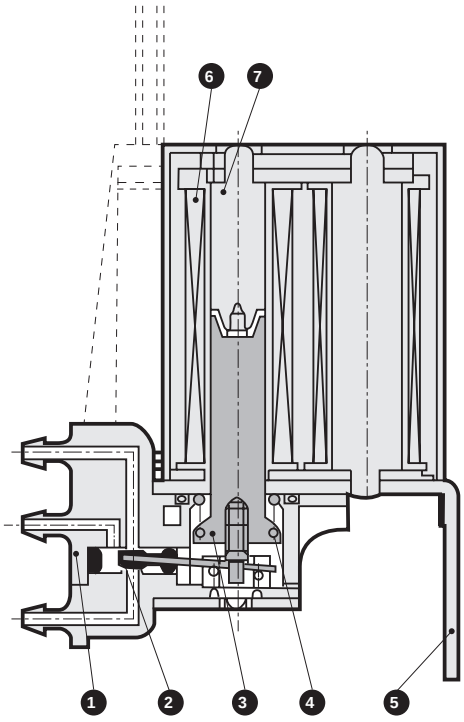
Internal structure and parts list

● HMTB1 (2-port)



Cannot be disassembled

● HMTG1 (3-port)

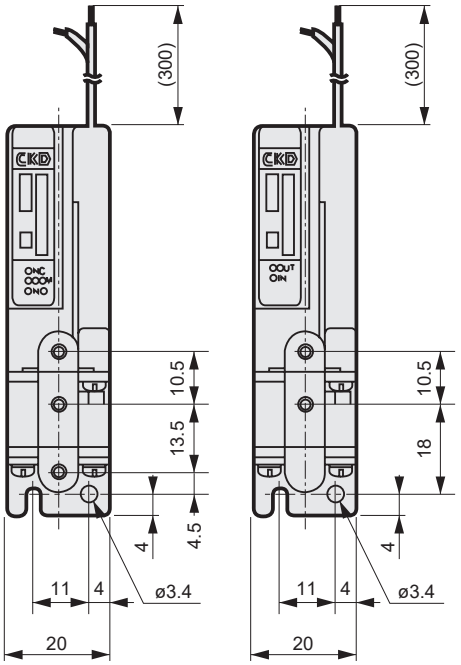


Cannot be disassembled

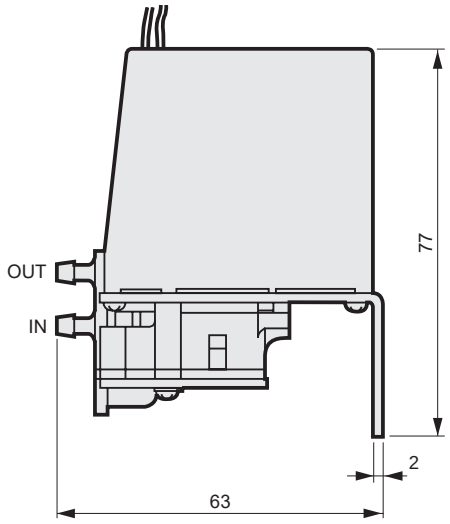
Part No.	Part name	Material		Part No.	Part name	Material	
1	Body	PPS	Polyphenylene sulfide	5	Frame	SUS430	Stainless steel
2	Valve seat packing	NBR, FKM, EPDM	Nitrile rubber, fluoro rubber, ethylene propylene rubber	6	Coil assembly	—	
3	Plunger assembly	SUS430/SUS304	Stainless steel	7	Core assembly	SUM22, SPC	Steel
4	Spring	SUS304	Stainless steel				

Dimensions

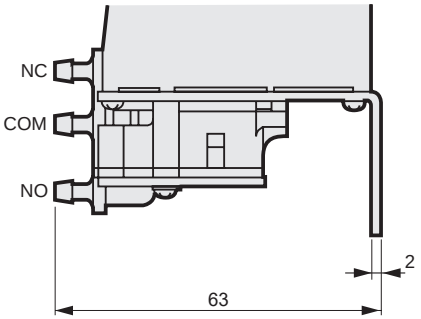
● HMTG1 (3-port)



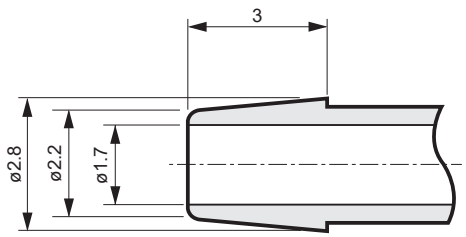
● HMTB1 (2-port)



● HMTG1 Series
(3-port)



Barbed fitting dimensions



Note: Do not apply extreme lateral load to the barbed fitting.
(Allowable lateral load) 0.2 N·m or less

MEMO

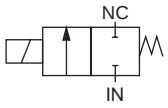
Compact Direct acting 2, 3-port solenoid valve

US(Resin body) Series

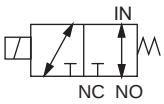
- NC, universal
- Port size: M6, barbed fitting(Compatible tube diameter ø6×ø4),1/4-28UNF

JIS symbol

- USB(2-port valve)
  :NC (open when energized)



- USG(3-port valve)
  : Universal



Common specifications

Item	USB/USG
Working fluid	Refer to the working fluid in individual specifications.
Working pressure differential MPa	0 to 0.9 (refer to max. working pressure differential in individual specifications.)
Proof pressure MPa	1.5(US*2), 2(US*3)(water pressure)
Fluid temperature °C	0 to 60 (no freezing)
Ambient temperature °C	0 to 50
Thermal class	Class 130 (B)
Atmosphere	No explosive or corrosive atmospheres
Valve seat leakage cm^3/min	0.2 or less(in air)
Port size	1/4-28UNF M6/barbed fitting (compatible tube diameter ø6×ø4)
Mounting orientation	Unrestricted
Rated voltage	24 VDC/12 VDC
Treatment	Oil-prohibited

Individual specifications

Item / Model No.		Working fluid	Orifice size [mm]	Cv	C[dm^3/(s·bar)]	b	Max. working pressure differential [MPa]	Power consumption [W]
2-port valve: Item Wetted metal material: 2 (equivalent to SUS316)								
USB2- *	-1	Water/pure water (*1)	1	0.03	0.13	0.36	0.6	3
	-2		1.5	0.06	0.27	0.28	0.3	3
USB3- *	-1		1.6	0.08	0.32	0.30	0.7	4
	-2		2.3	0.13	0.45	0.30	0.3	4
3-port valve: Item Wetted metal material: 2 (equivalent to SUS316)								
USG2- *	-1	Water/pure water (*1)	1	0.03	0.13	0.36	0.6 (0.2 for NO pressurization)	3
	-2		1.5	0.06	0.27	0.28	0.3 (when NO pressurized 0.1)	3
USG3- *	-1		1.6	0.08	0.32	0.30	0.2 (0.08 for NO pressurization)	4
2-port valve: Item Wetted metal material: 1 (equivalent to SUS405)								
USB2- *	-1	Air/water/ dry air/ low vacuum (1.33 x 10^2Pa(abs)) (*1)	1	0.03	0.13	0.36	0.7	3
	-2		1.5	0.06	0.27	0.28	0.3	3
USB3- *	-1		1.6	0.08	0.32	0.30	0.9	4
	-2		2.3	0.13	0.45	0.30	0.3	4
3-port valve: Item Wetted metal material: 1 (equivalent to SUS405)								
USG2- *	-1	Air/water/ dry air/ low vacuum (1.33 x 10^2Pa(abs)) (*1)	1	0.03	0.13	0.36	0.7 (0.3 for NO pressurization)	3
	-2		1.5	0.06	0.27	0.28	0.3 (when NO pressurized 0.1)	3
USG3- *	-1		1.6	0.08	0.32	0.30	0.3 (when NO pressurized 0.1)	4

*1: Check the compatibility between the wetted part material and working fluid before using chemical liquid for washing.
*2: When using a 3-port valve in a continuously energized state, select FKM for the sealant material.
*3: Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 × C.
*4: When using a 2-port valve at low vacuum, vacuum the NC port side.
*5: Make sure to read the safety precautions on pages 3 to 8 before use.

How to order

USB2 - M6 - 1 - S 2 - DC24V

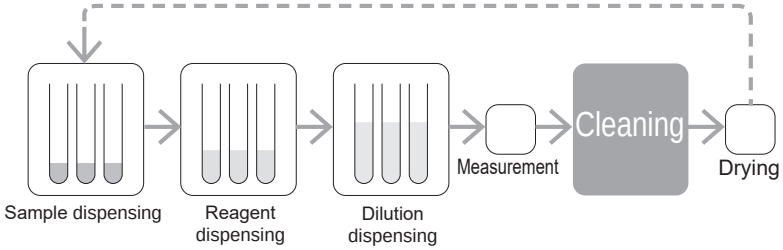
- Ⓐ Model No.
- Ⓑ Port size
- Ⓒ Orifice size
- Ⓓ Body/sealant
- Ⓔ Wetted metal material
- (*2) Ⓕ Voltage

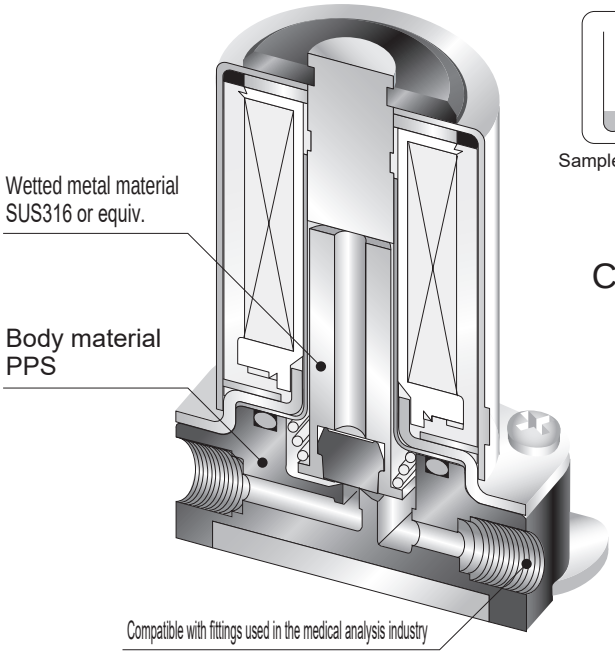
Code	Description	Ⓐ Model No. 2-port valve USB2	2-port valve USB3	3-port valve USG2	3-port valve USG3
Ⓑ Port size					
M6	M6	●	●	●(*1)	●
T6	Barbed fitting	●	●	●	●
4U	1/4-28UNF	●			
Ⓒ Orifice size					
1	Refer to text at right	ø1	ø1.6	ø1	ø1.6
2	Refer to text at right	ø1.5	ø2.3	ø1.5	
Ⓓ Body/sealant					
	Body / Seal				
G	PPS / NBR	●	●	●	●
S	PPS / FKM	●	●	●	●
Ⓔ Wetted metal material					
1	SUS405 or equiv.	●	●	●	●
2	SUS316 or equiv.	●	●	●	●
Ⓕ Voltage					
	DC12V	●	●	●	●
	DC24V	●	●	●	●

⚠ Precautions for model No. selection

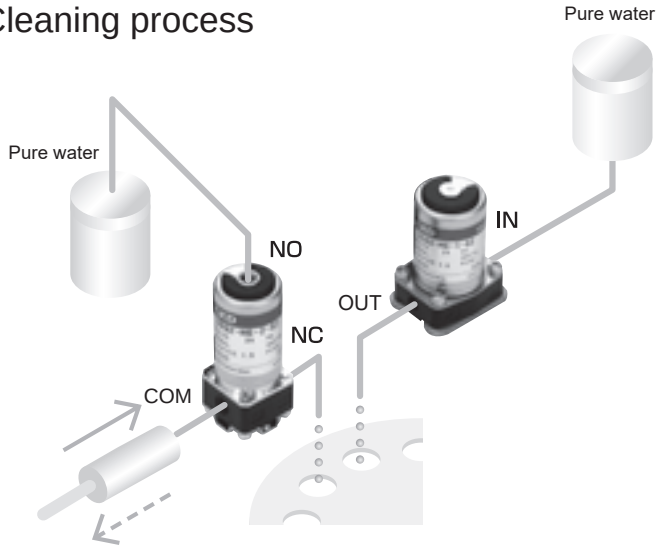
*1: NO port of USG2 is M5.
*2: 12 VDC, For voltages other than 24 VDC, contact CKD.

Applications



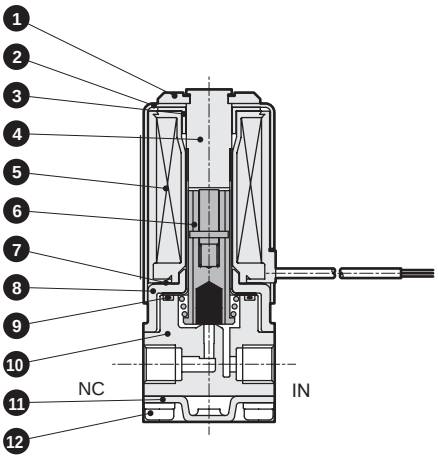


Cleaning process

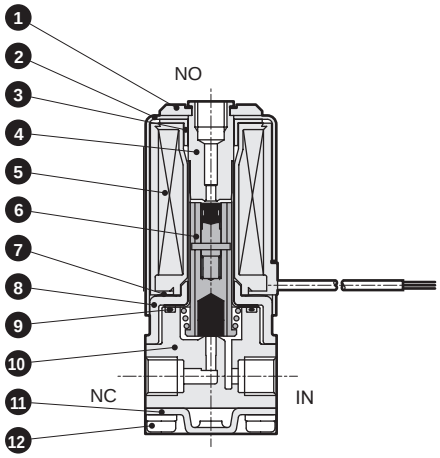


Internal structure and parts list

● USB2



● USG2

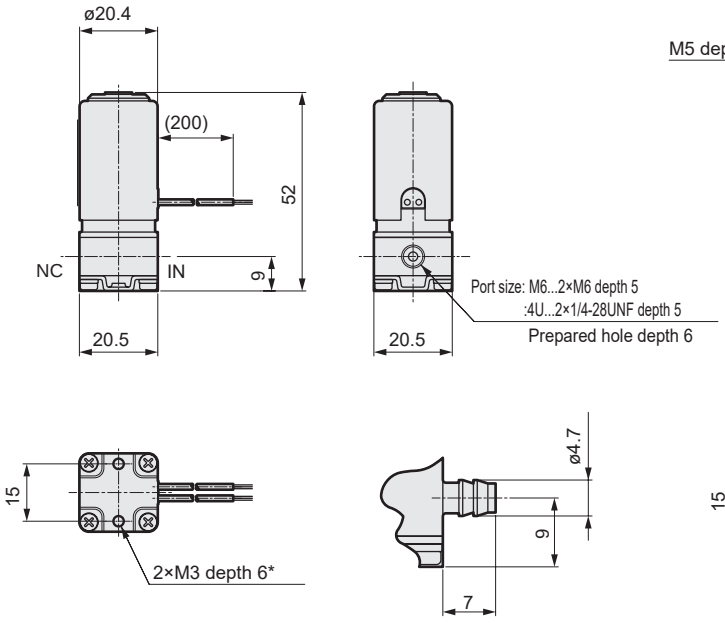


Part No.	Part name	Material	Part No.	Part name	Material
1	Clip	PBT	7	Wave washer	S65C
2	Bonnet	SPC	8	Core B	SPC
3	Sub core	SPC	9	O-ring	NBR (FKM)
4	Core assembly	SUS316 or equivalent (SUS405 or equivalent), SUS316L	10	Body	PPS
5	Coil assembly	-	11	Retainer plate	SPC
6	Plunger assembly	SUS316 or equivalent (SUS405 or equivalent), NBR (FKM)	12	Pan head machine screw	SWRM

Materials in ( ) are selectable based on options.

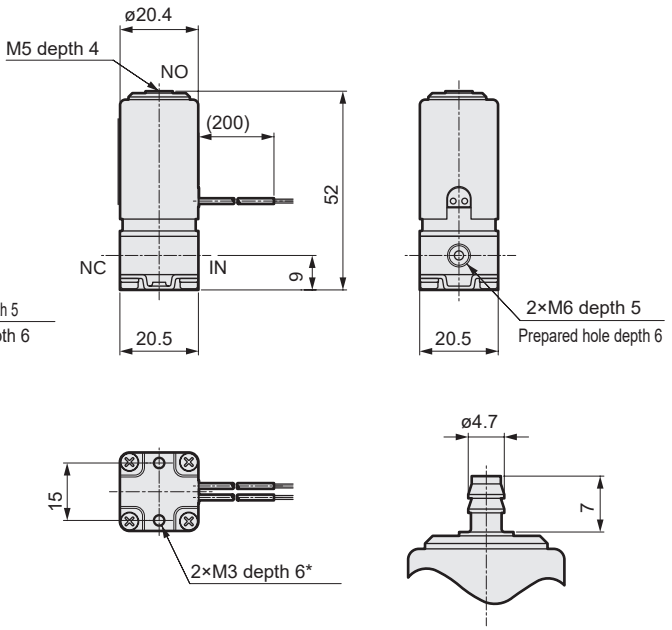
Dimensions

● USB2



[For option code "T6"]
Barbed fitting dimensions

● USG2

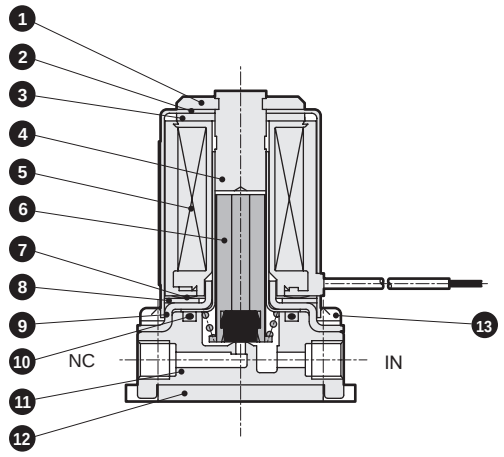


[For option code "T6"]
Barbed fitting dimensions of NO port
(IN and NC ports are the same as the 2-port valve)

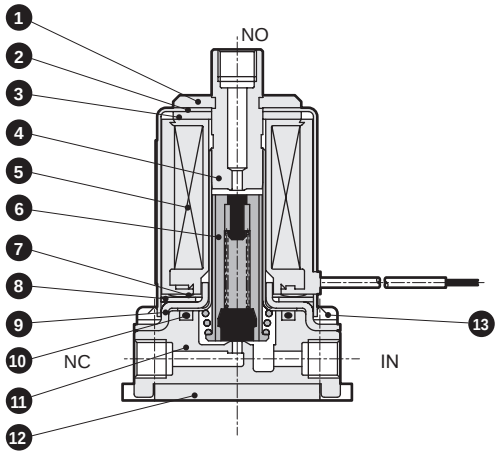
* Keep the product screw insertion depth to within 6 mm.

Internal structure and parts list

● USB3



● USG3

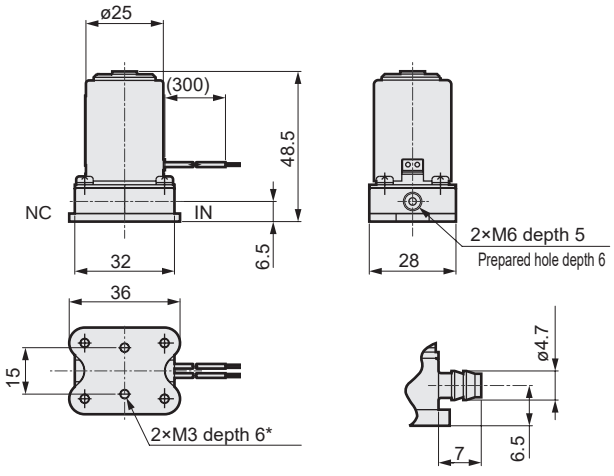


Part No.	Part name	Material	Part No.	Part name	Material
1	Clip	PBT	8	Sub core	SPC
2	Bonnet	SPC	9	Core B	SPC
3	Bonnet piece	SPC	10	O-ring	NBR (FKM)
4	Core assembly	SUS316 or equivalent (SUS405 or equivalent), SUS316L	11	Body	PPS
5	Coil assembly	-	12	Retainer plate	SPC
6	Plunger assembly	SUS316 or equivalent (SUS405 or equivalent), NBR (FKM)	13	Pan head machine screw	SWRM
7	Wave washer	S65C			

Materials in ( ) are selectable based on options.

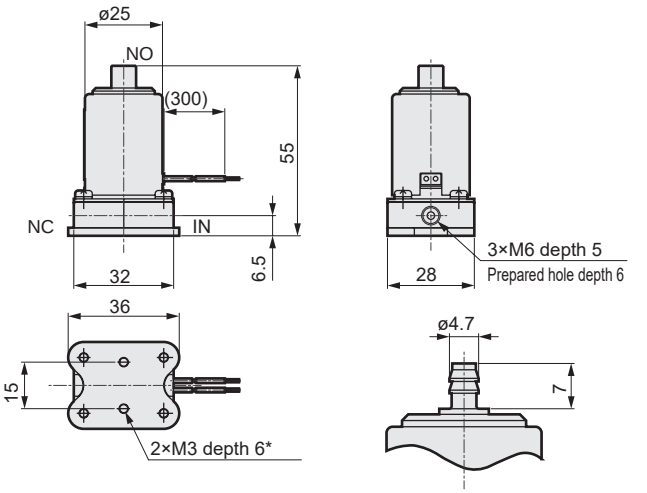
Dimensions

● USB3



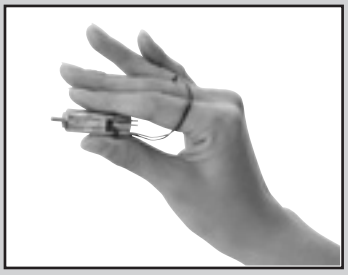
[For option code "T6"]
Barbed fitting dimensions

● USG3



[For option code "T6"]
Barbed fitting dimensions of NO port
(IN and NC ports are the same as the 2-port valve)

* Keep the product screw insertion depth to within 6 mm.



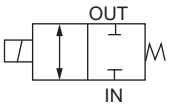
Miniature direct acting 2, 3-port solenoid valve

UMB1/ UMG1Series

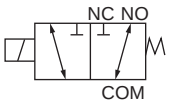
- NC, universal
- Working fluid: Water/pure water
- Port size: O.D. ø1.26 × I.D. ø0.9
  Stainless steel pipe

JIS symbol

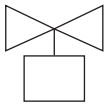
● UMB1 (2-port)
: NC



● UMG1 (3-port)
: Universal



Mounting orientation



Specifications

Item	UMB1	UMG1
Working fluid	Water/pure water	
Proof pressure MPa	0.6 (water pressure)	
Working pressure MPa	0 to 0.2	
Fluid temperature °C	5 to 55	
Ambient temperature °C	0 to 55	
Valve seat leakage cm^3/min	0 (water pressure)	
Port size	Stainless steel pipe with O.D. ø1.26 x I.D. ø0.9	
Orifice size mm	0.9	
Cv	0.01	
Mounting orientation	Vertical direction with the coil down	
Weight kg	0.03	
Volumetric capacity µℓ	80 (*1)	
Response time ms	8 or less	
Electrical specifications		
Rated voltage	24 VDC/12 VDC	
Voltage fluctuation range	±10%	
Power consumption W	1.5	
Leakage current mA	0.4 or less (24VDC)/0.7 or less (12 VDC) (*2)	
Thermal class	Class 130 (B)	

*1: Volume of wetted parts formed by the body and main valving element. Note that piping volume is excluded.
*2: The leakage current from the control circuit must be equal to or less than the values shown in the table.
*3: Do not apply torque exceeding 0.3 N·m on the mounting bolt (M3).
*4: Make sure to read the safety precautions on pages 3 to 8 before use.

How to order

UM B 1 – T1 – DC12V

Model No.

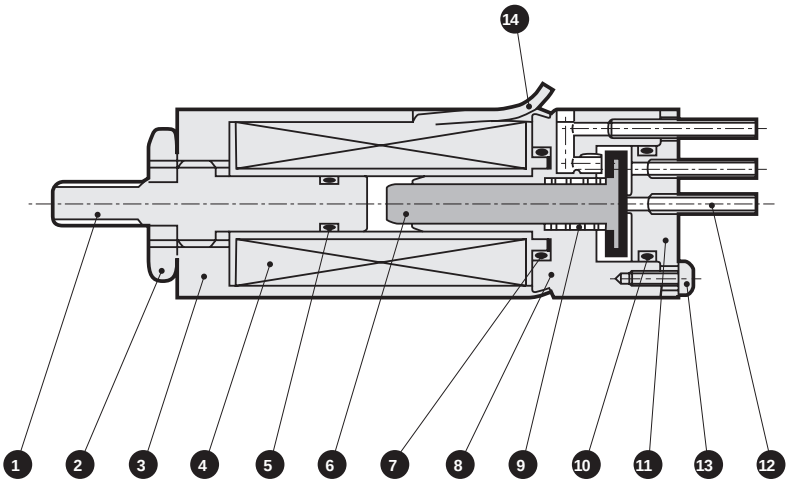
Ⓐ No. of Ports

Ⓑ Rated voltage

Code	Description
Ⓐ No. of Ports	
B	2-port valve
G	3-port valve
Ⓑ Rated voltage	
DC12V	12 VDC
DC24V	24 VDC

Internal structure and parts list

● UMG1-T1

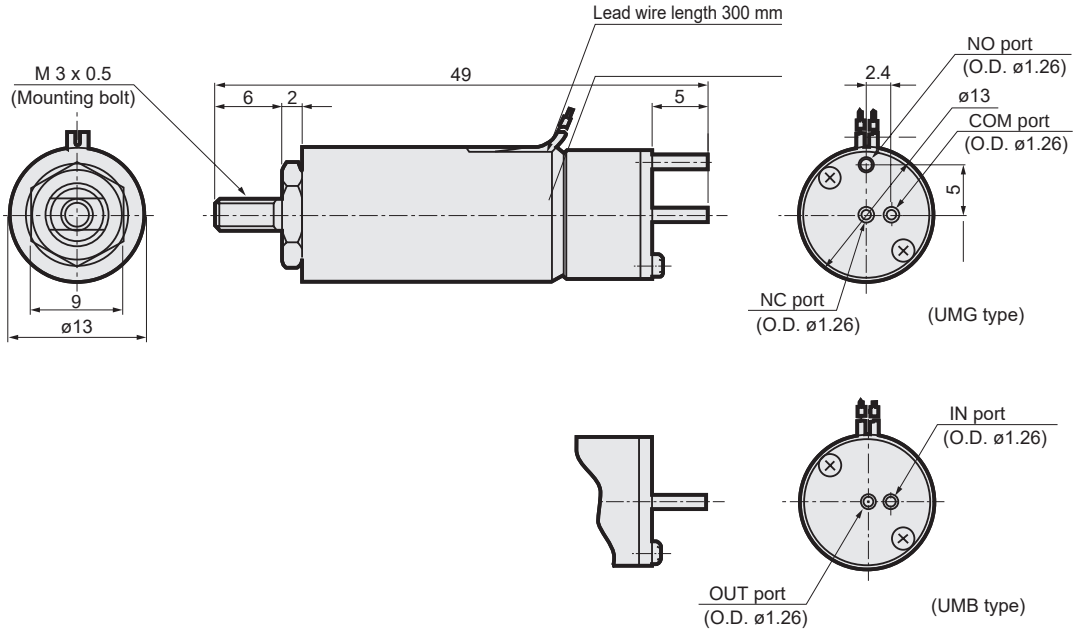


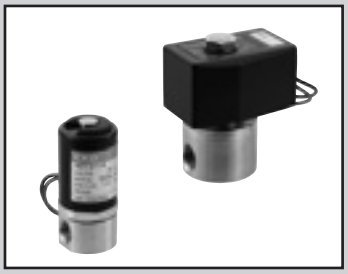
Cannot be disassembled

Part No.	Part name	Material		Part No.	Part name	Material	
1	Core A	SUS304 or equiv.	Stainless steel	8	Body	SUS304 or equiv.	Stainless steel
2	Hexagon nut	SWRM3	Steel	9	Spring	SUS304	Stainless steel
3	Bonnet	SUYB	Iron	10	O-ring	FKM	Fluoro rubber
4	Coil	- (Wetted parts: PBT)	(Polybutylene terephthalate)	11	Cap	SUS304 or equiv.	Stainless steel
5	O-ring	FKM	Fluoro rubber	12	Connection pipe	SUS304	Stainless steel
6	Plunger	SUS304 or equiv., FKM	Stainless steel, fluoro rubber	13	Cross-recessed pan head machine screw	SUS304	Stainless steel
7	O-ring	FKM	Fluoro rubber	14	Lead wire	-	

Dimensions CAD

● UMB1-T1
● UMG1-T1





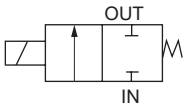
High corrosion resistant direct acting 2-port solenoid valve

HB Series

- NC (normally closed)
- Working fluid: Water/pure water/chemical liquids
- Port size: M5, Rc1/8, Rc1/4, Rc3/8

JIS symbol

● NC (normally closed)



Common specifications

Item	HB11/21/31/41
Working fluid	Water/pure water/chemical liquids (fluids that do not corrode wetted part materials)
Proof pressure MPa	1.5(HB11), 2(HB21/31/41)(water pressure)
Working pressure MPa	0 to 0.7 (refer to working pressure in individual specifications.)
Fluid temperature °C	-10 to 60 (no freezing)
Valve seat leakage cm^3/min	0 (water pressure), PTFE sealant: 300 or less (air)
Mounting orientation	Unrestricted
Treatment	Oil-prohibited
Electrical specifications	
Rated voltage	100 VAC (50/60 Hz), 200 VAC (50/60 Hz), 12 VDC, 24 VDC

*1: The AC rated voltage will be converted to DC by the diode integrated into the coil.
*2: Make sure to read the safety precautions on pages 3 to 8 before use.

Individual specifications

Item / Model No.	Connection Bore size	Orifice size (mm)	Cv	Working pressure (MPa)	Ambient temperature° (°C)	Power consumption (w)	Weight (kg)
HB11-M5-1	M5	1.0	0.03	0 to 0.7	−20 to 50	AC: 4 DC: 3	0.10
HB11-M5-2		1.5	0.06	0 to 0.3			
HB21-6-1	Rc1/8	1.6	0.09	0 to 0.7		4	0.16
HB21-6-2		2.3	0.18	0 to 0.3			
HB21-6-3		3.2	0.3	0 to 0.08			
HB31-6-3	Rc1/4	3.0	0.31	0 to 0.4	−20 to 60	11	0.52
HB31-8-3							
HB41-8-5		4.0	0.48				0.69
HB41-10-5	Rc3/8						
HB41-8-7	Rc1/4	7.0	0.82	0 to 0.08			
HB41-10-7	Rc3/8						

How to order

HB11
HB21
HB31 - **6** - **3** - **L** - **5A** - **AC100V**
HB41

Model No.

Ⓐ Port size

Ⓑ Orifice size

Ⓒ Seal

Ⓓ Coil system

Ⓔ Rated voltage *2

Code	Description	Model No. HB11	HB21	HB31	HB41
Ⓐ Port size					
M5	M5	●			
6	Rc1/8		●	●	
8	Rc1/4			●	●
10	Rc3/8				●
Ⓑ Orifice size					
	HB11 / HB21 / HB31 / HB41				
1	ø1 / ø1.6 / - / -	●	●		
2	ø1.5 / ø2.3 / - / -	●	●		
3	- / ø3.2 / ø3 / -		●	●	
5	- / - / - / ø4				●
7	- / - / - / ø7				●
Ⓒ Seal					
L	NBR	●	●	●	●
M	FKM	●	●	●	●
N	PTFE		●	●	●
Ⓓ Coil system					
Blank	Compact	●	●		
5 A	Open frame lead wire (diode integrated) for AC voltage			●	●
3 A	Open frame lead wire for DC voltage			●	●
Ⓔ Rated voltage					
AC100V	100 VAC (50/60 Hz)	●	●	●	●
AC200V	200 VAC (50/60 Hz)	●	●	●	●
DC12V	12 VDC	●	●	●	●
DC24V	24 VDC	●	●	●	●

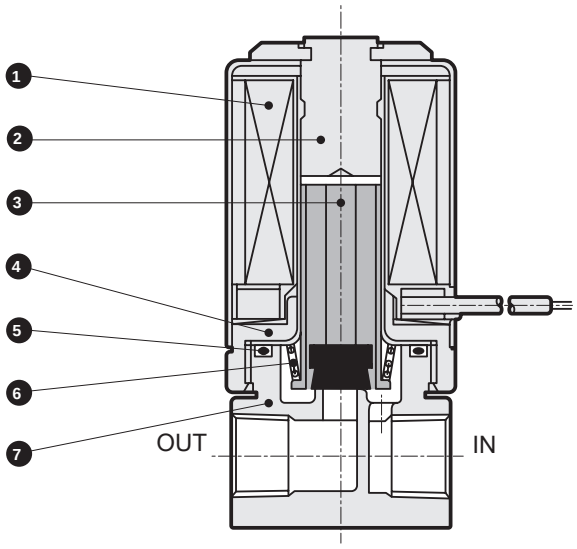
*1: The combinations indicated with ● above are available.
*2: If Item Ⓓ is 5A, it is 100 VAC or 200 VAC, and for 3A, it is 12 VDC or 24 VDC.

[Example of model No.]
HB41-8-5-L-3A-DC24V
Model: HB41

Ⓐ Port size : Rc1/4
Ⓑ Orifice size : ø4
Ⓒ Seal : NBR
Ⓓ Coil variation : Open frame lead wire
Ⓔ Rated voltage : 24 VDC

Internal structure and parts list

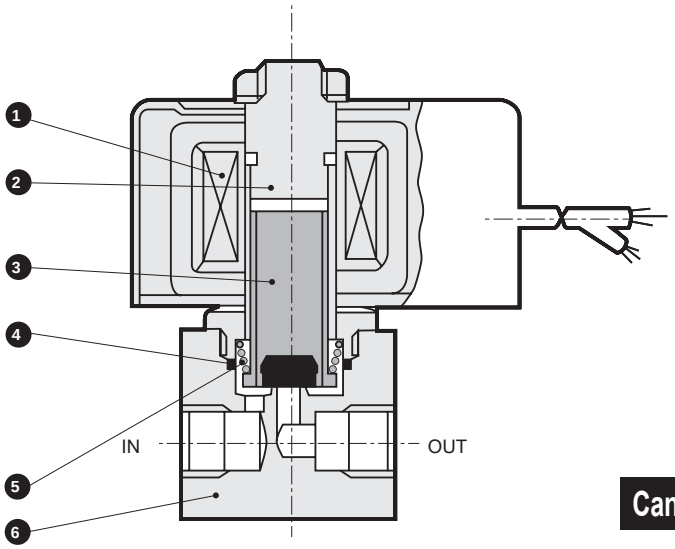
● HB11
● HB21



Cannot be disassembled

Part No.	Part name	Material	
1	Coil assembly	—	—
2	Core assembly	SUS316 or equiv.	Stainless steel
3	Plunger assembly	SUS316 or equivalent/NBR (FKM/PTFE)	Stainless steel, nitrile rubber (fluoro rubber/tetrafluoroethylene resin)
4	Core B	SUM22	Steel
5	O-ring	NBR (FKM/PTFE)	Nitrile rubber (fluoro rubber/tetrafluoroethylene resin)
6	Spring	SUS316	Stainless steel
7	Body	SUS316	Stainless steel

● HB31
● HB41

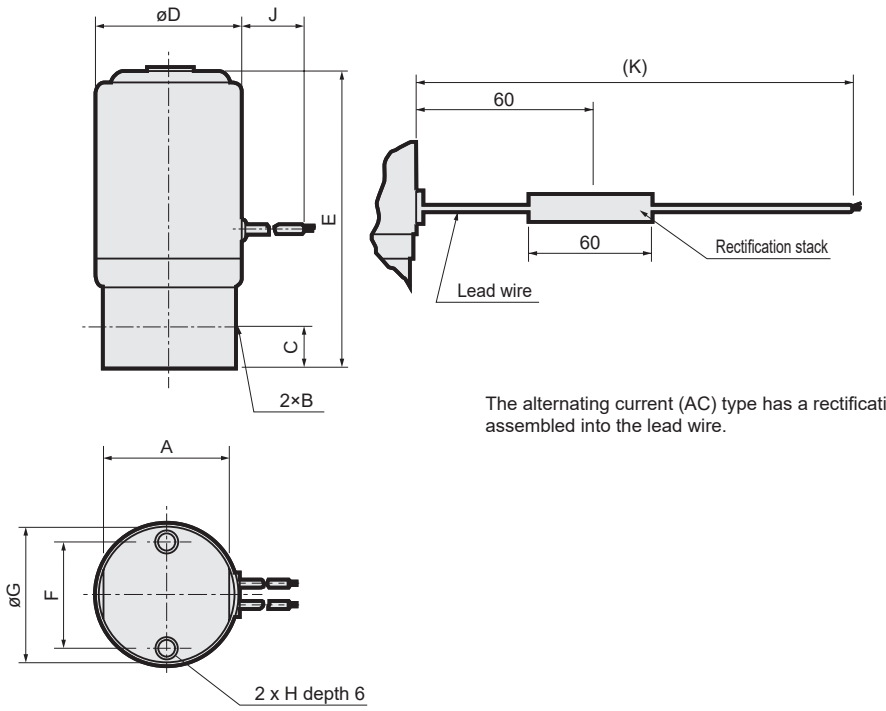


Cannot be disassembled

Part No.	Part name	Material	
1	Coil assembly	—	—
2	Core assembly	SUS316 or equiv.	Stainless steel
3	Plunger assembly	SUS316 or equivalent/NBR (FKM/PTFE)	Stainless steel, nitrile rubber (fluoro rubber/tetrafluoroethylene resin)
4	O-ring	NBR (FKM/PTFE)	Nitrile rubber (fluoro rubber/tetrafluoroethylene resin)
5	Spring	SUS316	Stainless steel
6	Body	SUS316	Stainless steel

Dimensions

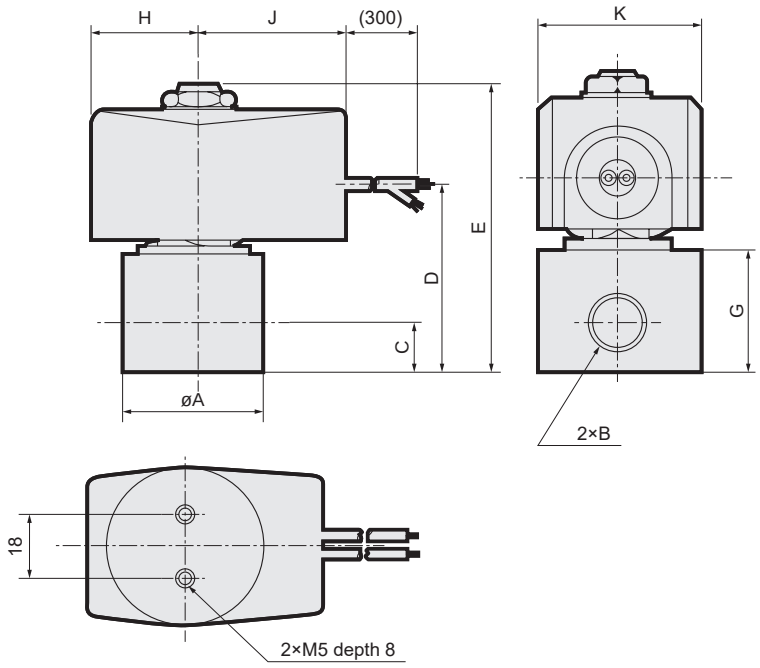
- HB11
- HB21



The alternating current (AC) type has a rectification stack assembled into the lead wire.

Model No.	A	B	C	D	E	F	G	H	J	K
HB11	18	M5 x 0.8	5	20.4	47	15	20	M3 x 0.5	200	250
HB21	23	Rc1/8	8	25	55	18	25	M4 x 0.7	300	300

- HB31
- HB41



Model No.	A	B	C	D	E	G	H	J	K
HB31- $^{6}_{8}$	37.5	Rc1/8 Rc1/4	11	50.5	75	31	24	38	38
HB41-8-5	37.5	Rc1/4	11	52	80.5	31	28	42	46
HB41 $^{-8-7}_{-10-5}$	45	Rc1/4 Rc3/8	12	55	83.5	34	28	42	46

Compact direct acting 2-port solenoid valve

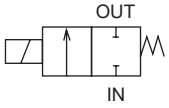
USB2 Series

- NC (normally closed)
- Working fluids: Air, water, dry air, low vacuum
- Port size: M5

RoHS CAD

JIS symbol

● NC (normally closed)



Specifications

Item		USB2-M5-1	USB2-M5-2
Working fluid		Air/water/dry air/low vacuum (1.33x10²Pa(abs))	
Working pressure differential MPa		0 to 0.7	0 to 0.3
Proof pressure MPa		1.5	
Fluid temperature °C		−10 to 60(no freezing)	
Ambient temperature °C		−20 to 50	
Valve seat leakage cm³/min		0.2andDown(in air)	
Mounting orientation		Unrestricted	
Weight kg		0.07	
Port size		M5	M5
Orifice size mm		1	1.5
Cv		0.03	0.06
C[dm³/(s·bar)]		0.13	0.28
b		0.57	0.46
Electrical specifications			
Rated voltage		12 VDC, 24 VDC(Option: 100 VAC 50/60Hz, 200 VAC 50/60Hz)	
Voltage fluctuation range		±10%	
Power consumption W	DC	3	
	AC	4	
Thermal class		Class 130 (B)	

*1: If the solenoid valve is not operated for long periods with water, the high corrosion resistant solenoid valve HB Series (page 59) is recommended.
*2: Formula to calculate sonic conductance C from effective cross-sectional area S is S≈5.0xC.
*3: When using at low vacuum, vacuum the OUT port side.
*4: Make sure to read the safety precautions on pages 3 to 8 before use.

How to order

USB2 - M5 - 1 - 0 - DC24V

- USB2: Model No.
- M5: Port size M5
- 1: Ⓐ Orifice size
- 0: Ⓑ Body/Sealant combination
- DC24V: Ⓒ Rated voltage

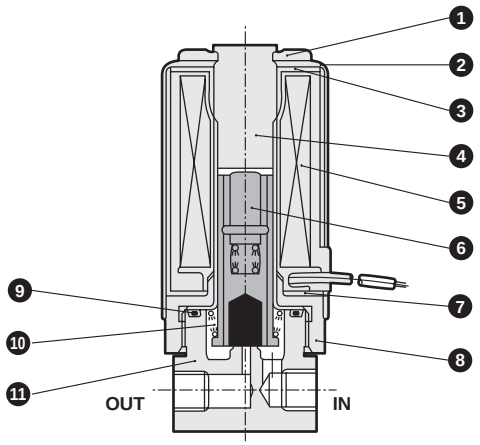
Code	Description
Ⓐ Orifice size	
1	ø1.0
2	ø1.5

Ⓑ Body/sealant combination			
	Body	**Seal**	**Treatment**
Blank	Stainless steel	Nitrile rubber	-
L			Oil-prohibited
0	Copper alloy		-

Ⓒ Rated voltage		
DC12V	Standard	12 VDC
DC24V		24 VDC
AC100V	Option	100 VAC 50/60Hz
AC200V		200 VAC 50/60Hz

Internal structure and parts list

● USB2-M5

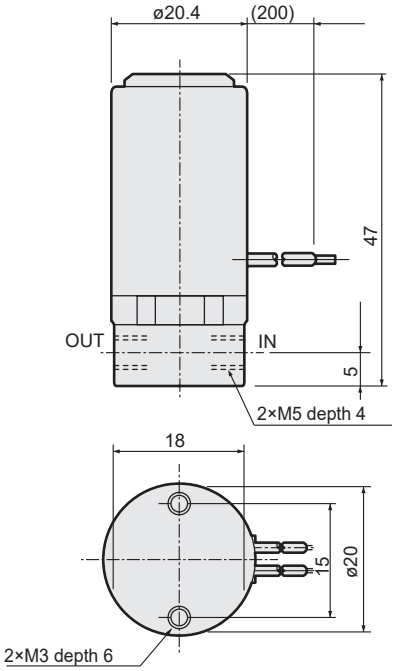


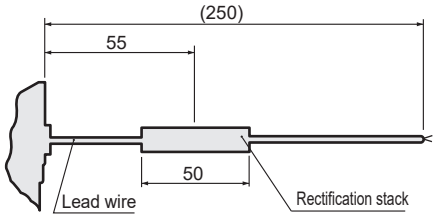
Part No.	Part name	Material	
1	Clip	PBT	Polybutylene terephthalate
2	Bonnet	SPC	Steel
3	Sub core	SPC	Steel
4	Core assembly	SUS405 or equiv., SUS316L	Stainless steel
5	Coil assembly	-	-
6	Plunger assembly	SUS405 or equiv., SUS303, NBR	Stainless steel, nitrile rubber
7	Wave washer	S65CM	Steel
8	Core B	SUM22	Free-cutting steel
9	O-ring	NBR	Nitrile rubber
10	Plunger spring	SUS304	Stainless steel
11	Body	SUS303(C3604)	Stainless steel (Copper alloy)

( ) shows options.

Dimensions CAD

● USB2-M5





At alternating current (AC), a rectification stack is assembled into the lead wire for the alternating current (AC) type.

Compact direct acting 2-port solenoid valve

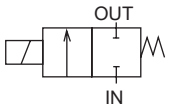
USB3 Series

- NC (normally closed)
- Working fluids: Air, water, dry air, low vacuum
- Port size: Rc1/8

RoHS CAD

JIS symbol

- NC (normally closed)



Specifications

Item		USB3-6-1	USB3-6-2	USB3-6-3
Working fluid		Air, Water, Dry air, Low vacuum (1.33 x 10^2Pa (abs))		
Working pressure differential MPa		0 to 0.9	0 to 0.4	0 to 0.1
Proof pressure MPa		2		
Fluid temperature °C		−10 to 60 (no freezing)		
Ambient temperature °C		−20 to 50		
Valve seat leakage cm^3/min		0.2 or less (air)		
Mounting orientation		Unrestricted		
Weight kg		0.13		
Port size		Rc1/8	Rc1/8	Rc1/8
Orifice size mm		1.6	2.3	3.2
Cv		0.09	0.18	0.3
C[dm^3/(s·bar)]		0.34	0.64	1.2
b		0.56	0.51	0.48
Electrical specifications				
Rated voltage		12 VDC, 24 VDC (Option: 100 VAC 50/60Hz, 200 VAC 50/60Hz)		
Voltage fluctuation range		±10%		
Power consumption W	DC	4		
	AC	4		
Thermal class		Class 120 (E)(Molded coil: Class 130 (B))		

*1: If the solenoid valve is not operated for long periods with water, the high corrosion resistant solenoid valve HB Series (page 59) is recommended.
*2: Formula to calculate sonic conductance C from effective cross-sectional area S is S≈5.0xC.
*3: When using at low vacuum, vacuum the OUT port side.
*4: Make sure to read the safety precautions on pages 3 to 8 before use.

How to order

USB3 - 6 - 1 - B - DC24V

- USB3: Model No.
- 6: Port size Rc1/8
- 1: Ⓐ Orifice size
- B: Ⓑ Body/sealant/coil combination
- DC24V: Ⓒ Rated voltage

Code	Description
Ⓐ Orifice size	
1	ø1.6
2	ø2.3
3	ø3.2

Ⓑ Body/sealant/coil combination

		Body	Seal	Coil	Treatment
Blank	Standard	Copper alloy	Nitrile rubber	Taped	-
B	Option		Fluoro rubber	Mold Coil	Vacuum inspection (Note)
V					
D		Stainless steel	Nitrile rubber		-
E			Fluoro rubber		
W					Vacuum inspection (Note)
H		Copper alloy	Nitrile rubber	Taped	Oil-prohibited
J			Fluoro rubber	Mold Coil	
L		Stainless steel	Nitrile rubber		
M			Fluoro rubber		

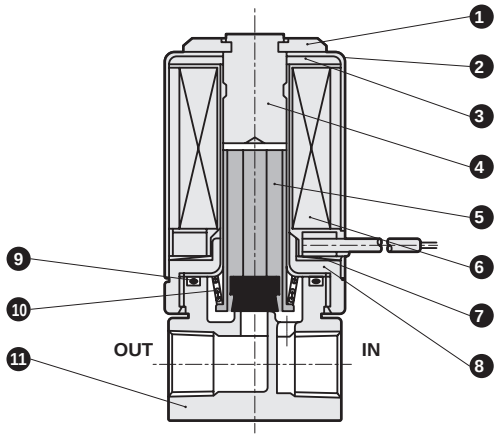
Ⓒ Rated voltage

DC12V	Standard	12 VDC
DC24V		24 VDC
AC100V	Option	100 VAC 50/60Hz
AC200V		200 VAC 50/60Hz

Note: Option code: For V and W, vacuum inspection is performed with "leakage amount: 1.33x10^{-6} Pa·m^3s or less".

Internal structure and parts list

● USB3-6

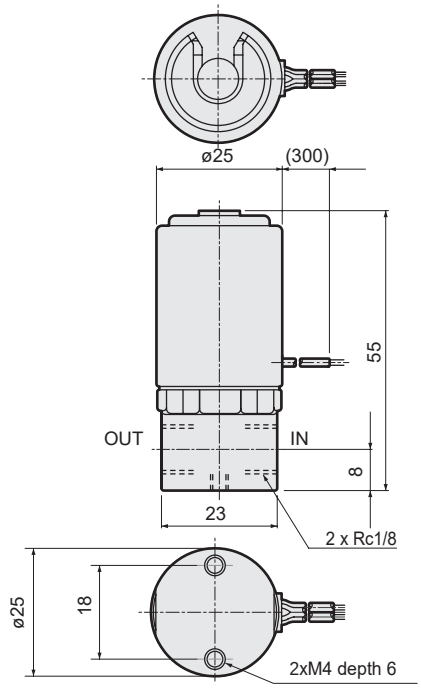


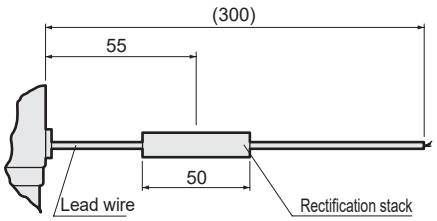
Part No.	Part name	Material	
1	Clip	PBT	Polybutylene terephthalate
2	Bonnet	SPC	Steel
3	Bonnet piece	SPC	Steel
4	Core assembly	SUS316, SUS405 or equivalent	Stainless steel
5	Plunger assembly	SUS405 or equivalent, NBR (FKM)	Stainless steel, nitrile rubber (fluoro rubber)
6	Coil assembly	-	-
7	Wave washer	S65CM	Steel
8	Core B	SUM22	Free-cutting steel
9	O-ring	NBR(FKM)	Nitrile rubber(Fluoro rubber)
10	Plunger spring	SUS304	Stainless steel
11	Body	C3604(SUS303)	Copper alloy(Stainless steel)

( ) shows options.

Dimensions CAD

● USB3-6





At alternating current (AC), a rectification stack is assembled into the lead wire for the alternating current (AC) type.

Compact Direct acting 3-port solenoid valve

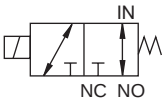
USG2 Series

- Universal
- Working fluids: Air, water, dry air, low vacuum
- Port size: M5

RoHS CAD

JIS symbol

● Universal



Specifications

Item		USG2-M5-1	USG2-M5-2
Working fluid		Air/water/dry air/low vacuum (1.33 × 10^2Pa(abs))	
Working pressure differential MPa		0 to 0.7 (0 to 0.3 when NO pressurized)	0 to 0.3 (0 to 0.1 when NO pressurized)
Proof pressure MPa		1.5	
Fluid temperature °C		−10 to 60 (no freezing)	
Ambient temperature °C		−20 to 50	
Valve seat leakage cm^3/min		0.2 or less (air)	
Mounting orientation		Unrestricted	
Weight kg		0.07	
Port size		M5	M5
Orifice size mm		1	1.5
Cv		0.03	0.06
C[dm^3/(s·bar)]		0.13	0.28
b		0.57	0.46
Electrical specifications			
Rated voltage		12 VDC, 24 VDC (Option: 100 VAC 50/60 Hz, 200 VAC 50/60 Hz)	
Voltage fluctuation range		±10%	
Power consumption W	DC	3	
	AC	4	
Thermal class		Class 130 (B)	

*1: Contact CKD if the solenoid valve is not operated for long periods with water.
*2: Contact CKD when using in a continuously energized state.
*3: Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 × C.
*4: Make sure to read the safety precautions on pages 3 to 8 before use.

How to order

USG2 - M5 - 1 - 0 - DC24V

- USG2 — Model No.
- M5 — Port size M5
- 1 — Ⓐ Orifice size
- 0 — Ⓑ Body/sealant combination
- DC24V — Ⓒ Rated voltage

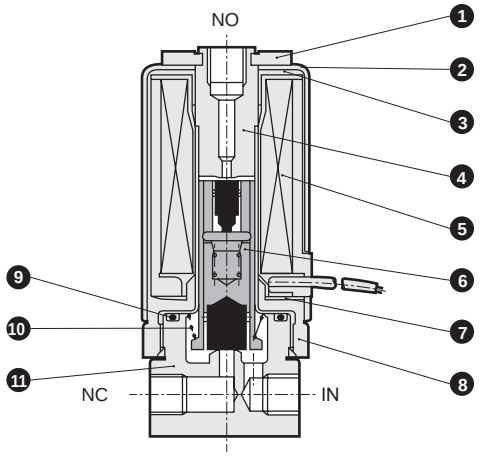
Code	Description
Ⓐ Orifice size	
1	ø1.0
2	ø1.5

Ⓑ Body/sealant combination		
	Body	Seal
Blank	Stainless steel	Nitrile rubber
0	Copper alloy	Nitrile rubber

Ⓒ Rated voltage		
DC12V	Standard	12 VDC
DC24V		24 VDC
AC100V	Option	100 VAC 50/60Hz
AC200V		200 VAC 50/60Hz

Internal structure and parts list

● USG2-M5

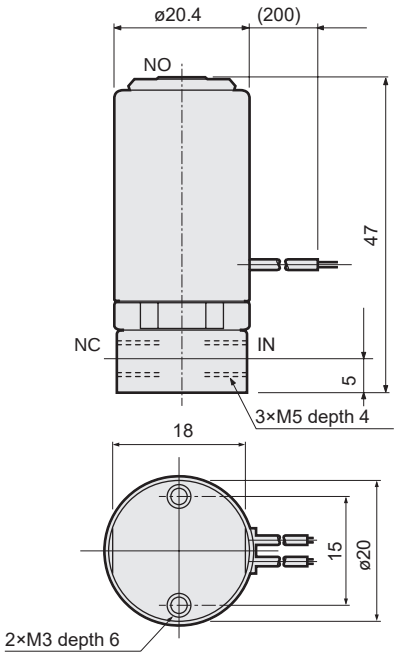


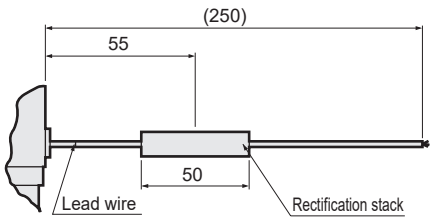
Part No.	Part name	Material	
1	Clip	PBT	Polybutylene terephthalate
2	Bonnet	SPC	Steel
3	Sub core	SPC	Steel
4	Core assembly	SUS316, SUS405 or equivalent	Stainless steel
5	Coil assembly	-	-
6	Plunger assembly	SUS405 or equivalent, NBR	Stainless steel, nitrile rubber
7	Wave washer	S65CM	Steel
8	Core B	SUM22	Free-cutting steel
9	O-ring	NBR	Nitrile rubber
10	Plunger spring	SUS304	Stainless steel
11	Body	SUS303(C3604)	Stainless steel (copper alloy)

( ) shows options.

Dimensions CAD

● USG2-M5





At alternating current (AC), a rectification stack is assembled into the lead wire for the alternating current (AC) type.

Compact direct acting 3-port solenoid valve

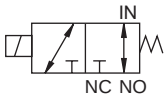
USG3 Series

- Universal
- Working fluids: Air, water, dry air, low vacuum
- Port size: Rc1/8

RoHS CAD

JIS symbol

● Universal



Specifications

Item		USG3-6-1	USG3-6-2
Working fluid		Air/water/dry air/low vacuum (1.33 × 10^2Pa(abs))	
Working pressure differential MPa		0 to 0.7 (0 to 0.3 when NO pressurized)	0 to 0.3 (0 to 0.1 when NO pressurized)
Proof pressure MPa		2	
Fluid temperature °C		−10 to 60 (no freezing)	
Ambient temperature °C		−20 to 50	
Valve seat leakage cm^3/min		0.2 or less (air)	
Mounting orientation		Unrestricted	
Weight kg		0.14	
Port size		Rc1/8	Rc1/8
Orifice size mm		1.2	1.8
Cv		0.05	0.1
C[dm^3/(s·bar)]		0.19	0.42
b		0.57	0.5
Electrical specifications			
Rated voltage		12 VDC, 24 VDC (Option: 100 VAC 50/60 Hz, 200 VAC 50/60 Hz)	
Voltage fluctuation range		±10%	
Power consumption W	DC	4	
	AC	4	
Thermal class		Class 120 (E)(Molded coil: Class 130 (B))	

*1: Contact CKD if the solenoid valve is not operated for long periods with water.
*2: When using a product with continuous energization, select FKM for the sealant material.
*3: Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 × C.
*4: Make sure to read the safety precautions on pages 3 to 8 before use.

How to order

USG3 - 6 - 1 - B - DC24V

- Model No.
- Port size: Rc1/8
- A Orifice size
- B Body/sealant/coil Combination
- C Rated voltage

Code	Description
A Orifice size	
1	ø1.2
2	ø1.8

B Body/sealant/coil combination

		Body	Seal	Coil	Treatment
Blank	Standard	Copper alloy	Nitrile rubber	Taped	-
B	Option		Fluoro rubber	Molded coil	
V					Vacuum inspection(Note)
D		Stainless steel	Nitrile rubber		-
E			Fluoro rubber		
W					Vacuum inspection(Note)
H		Copper alloy	Nitrile rubber	Taped	Oil-prohibited
J			Fluoro rubber	Molded coil	
L		Stainless steel	Nitrile rubber		
M			Fluoro rubber		

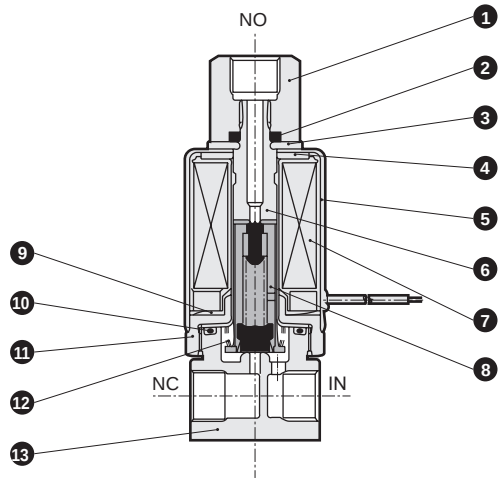
C Rated voltage

DC12V	Standard	12 VDC
DC24V		24 VDC
AC100V	Option	100 VAC 50/60Hz
AC200V		200 VAC 50/60Hz

Note: For option codes V and W, vacuum inspection is performed with "leakage amount: 1.33×10^{-6}Pa·m^3/s or less".

Internal structure and parts list

● USG3-6

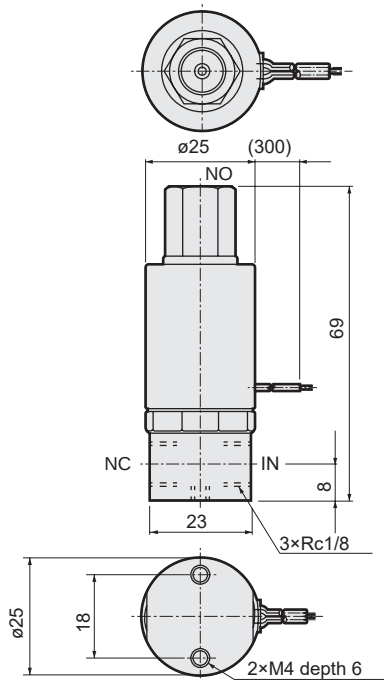


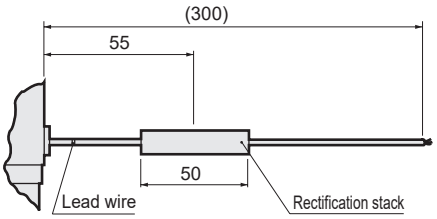
Part No.	Part name	Material	
1	Socket	C3604 (SUS303)	Copper alloy (stainless steel)
2	O-ring	NBR (FKM)	Nitrile rubber (fluoro rubber)
3	Washer	SPC	Steel
4	Bonnet piece	SPC	Steel
5	Bonnet	SPC	Steel
6	Core assembly	SUS316, SUS405 or equivalent	Stainless steel
7	Coil assembly	-	-
8	Plunger assembly	SUS405 or equivalent, NBR (FKM)	Stainless steel, nitrile rubber (fluoro rubber)
9	Wave washer	S65CM	Steel
10	O-ring	NBR (FKM)	Nitrile rubber (fluoro rubber)
11	Core B	SUM22	Free-cutting steel
12	Plunger spring	SUS304	Stainless steel
13	Body	C3604 (SUS303)	Copper alloy (stainless steel)

( ) shows options.

Dimensions CAD

● USG3-6





At alternating current (AC), a rectification stack is assembled into the lead wire for the alternating current (AC) type.

Direct acting 2, 3-port valve
(pinch valve for high purity fluids)

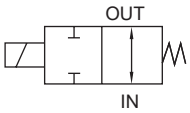
HYN Series

- NO, NC, universal
- Working fluid: Water/pure water/chemical liquids
- Tube attachment/removal method, compatible tube: ø3×ø1, ø5×ø3, ø8×ø6

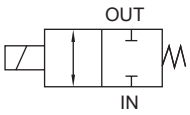
RoHS CAD

JIS symbol

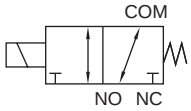
- 2-port valve
  : NO



- 2-port valve
  : NC



- 3-port
  : Universal



Common specifications

Item	HYN-3		HYN-5		HYN-8	
	AC	DC	AC	DC	AC	DC
Working fluid	Water/pure water/chemical liquids (fluids that do not corrode wetted part materials)					
Working pressure MPa	0 to 0.05 (refer to working pressure in individual specifications.)					
Fluid temperature °C	5 to 50					
Ambient temperature°C	0 to 40 (no freezing)					
Frequency cycles/min.	60 or less					
Mounting orientation	Unrestricted (*1)					
Electrical specifications						
Rating	Continuous	Continuous	Intermittent (*2)	Continuous	Intermittent (*2)	Continuous
Rated voltage	100V (50/60 Hz)	12V 24V	100 (50/60 Hz)	12V 24V	100 (50/60 Hz)	12V 24V
Voltage fluctuation range	±10%					
Leakage current mA	2 or less (*3)					

*1: Avoid vertical mounting with the coil down to prevent fluid intrusion into the coil during abnormalities such as tube rupture.
*2: When using intermittent rating, keep the max. continuous power ON time within 10 minutes and the DUTY ratio one half or less.
*3: The leakage current from the control circuit must be equal to or less than the values shown in the table.
*4: For tightening torque of the mounting screw, refer to the recommended tightening torque below.
Recommended tightening torque: HYN-3 0.2 to 0.4N·m, HYN-5, 8 0.5 to 0.7N·m
*5: The performance may not be satisfied if a tube other than the recommended ones is used.
*6: When starting and switching retention, noise is generated temporarily. Check the compatibility of the control circuit.
*7: Solenoid valve has polarity. Connect the red lead wire to the plus (+) side.
*8: After the solenoid valve is completely switched ON or OFF, set an interval of 0.5 seconds or more before switching it the next time.
*9: Make sure to read the safety precautions on pages 3 to 8 before use.

Individual specifications

Item / Model No.	Compatible tube (*1) (silicone tube)	Working pressure (MPa)	Power consumption 12/24 VDC (w)		Max. current 100 VAC (A)		Heat resistance Class	Weight (kg)
			Starting (*2))	Holding	Starting (*2))	Holding		
HYN-3	ø3×ø1	0 to 0.05	15	4	0.26	0.06	Class 120 (E)	0.18
HYN-5	ø5×ø3		30	8	0.55	0.14	Class 130 (B)	0.36
HYN-8	ø8 x ø6	0 to 0.02	30	8				0.37

*1: Use the recommended tubes below.
*2: Time from energizing to 200 ms.

Tube model No.	Tube size (O.D.) x (I.D.) x (length)
HYN-3-1-5000	ø3×ø1×5m
HYN-5-3-5000	ø5×ø3×5m
HYN-8-6-5000	ø8×ø6×5m

How to order

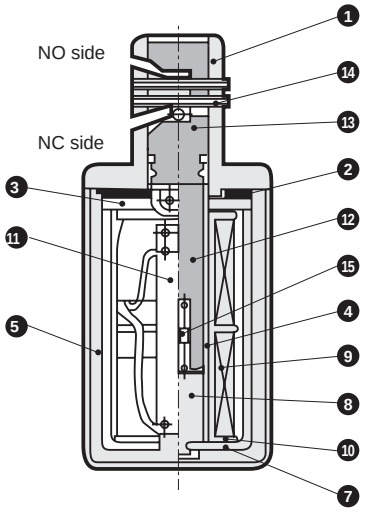
HYN – 3 – DC12V

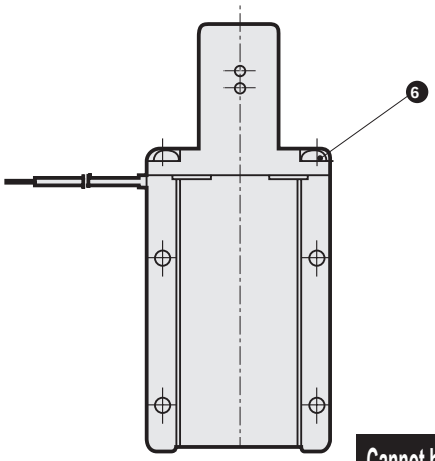
- HYN: Model No.
- 3: Ⓐ Tube used
- DC12V: Ⓑ Rated voltage

Code	Description
Ⓐ Tube used	
3	ø3×ø1
5	ø5×ø3
8	ø8 x ø6
Ⓑ Rated voltage	
AC100V	100 VAC (50/60 Hz)
DC12V	12 VDC
DC24V	24 VDC

Internal structure and parts list

● HYN



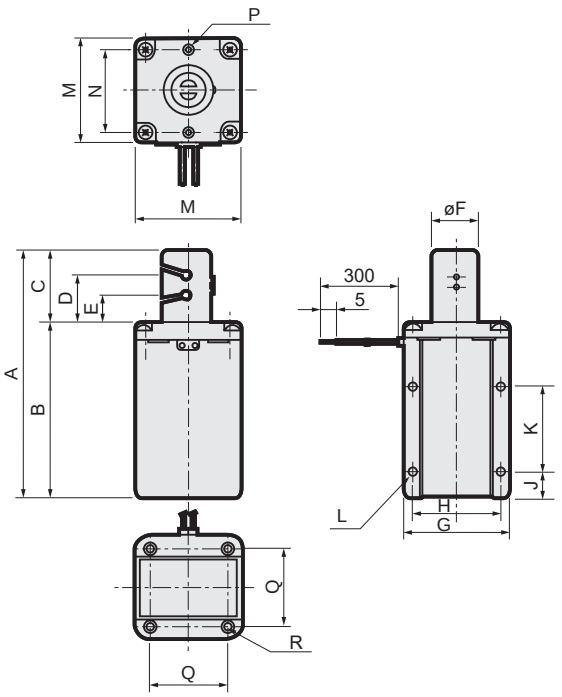


Cannot be disassembled

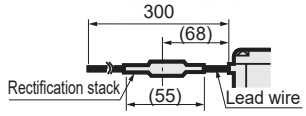
Part No.	Part name	Material		Part No.	Part name	Material	
1	Valve A	POM	Acetal resin	9	Coil	–	–
2	Packing	NBR	Nitrile rubber	10	Bobbin	PET	Polyethylene
3	Frame B	SPC	Steel	11	Wiring section assembly	–	–
4	Plunger guide	C2700	Copper	12	Plunger	SUS405	Stainless steel
5	Cover	PA	Polyamide	13	Valve B	POM	Polyacetal resin
6	Tapping screw	SUS304	Stainless steel	14	Spring pin	SUS420	Stainless steel
7	Frame A	SPC	Steel	15	Return spring	SUS304	Stainless steel
8	Stopper	SUS405	Stainless steel				

Dimensions CAD

● HYN



● For alternating current (AC)



The alternating current (AC) type has a rectification stack assembled into the lead wire.

Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
HYN-3	81.5	57.5	24	17	10	16	34	28	9	28	4×M3 depth 7	34	28	2×M3 depth 5	-	-
HYN-5	98	65	33	23	13	25	43	36.5	11	36.5	4×M4 depth 7	43	-	-	36.5	4×M4 depth 7
HYN-8	103	65	38	27	14	30	43	36.5	11	36.5	4×M4 depth 7	43	-	-	36.5	4×M4 depth 7

Related products

Solenoid Valve for Sterilizer

Pilot kick solenoid valve SPK Series for steam

Catalog No. CB-03-1SA

Pilot kick solenoid valves specialized for steam control

- Durability count 1 million cycles
  Durability is greatly improved by optimizing the solenoid mechanism
- Improved exterior sealing performance
  by adopting square ring seal made from PTFE that is resistant to high-temperature steam
- Low power consumption
  Lower wattage achieved by improving the efficiency of the pilot valve for steam

Silent solenoid valve for low pressure steam FSB Series Made-to-order

Catalog No. CB-03-1SA

Silent, low temperature steam, direct acting solenoid valve for hot water

- Prevents buzzing noise
  Coil with full-wave rectifier prevents buzzing noise
- Silent specifications
  Impact absorption structure reduces absorbed sound
- Heat resistance specifications
  Thermal class equivalent coil used
- High sealability
  Realizes high sealing performance by adopting a high-temperature compatible rubber seal

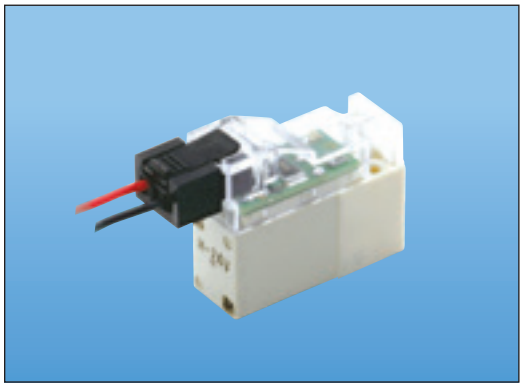
Oxygen concentrator

Pilot operated solenoid valve for compressed air EXA Series Made-to-order

Compact, large flow rate and dedicated manifold enabling compact oxygen concentrator

- Compact and lightweight
  Four solenoid valves compactly integrated into a lightweight resin manifold
- Piping work-hour reduction
  Integrated fitting reduces piping hours
- Low power consumption
  Power consumption is 0.6W per solenoid valve

Pneumatic compact 3-port valve for oxygen 3QB Series Made-to-order



Can be used safely for oxygen with oil-prohibited processing

- Compact and lightweight
  Valve width 10 mm and discrete weight 12.5g
- Long service life
  Nominal life of 20 million cycles or more (in an oxygen-using environment)
- Customization
  Customizable to suit your needs

Related products

ANALYZER/INSPECTION Component

Air operated fine pinch valve HYA Series

Catalog No. CC-1508

Ideal for environments requiring sterilization, such as single-use processes in medical product manufacturing

■ For biopharmaceutical manufacturing processes
As it is an air operated system, it has a simple structure and heat is not generated. Ideal for single use.

■ Easy maintenance
Tube holder function at the slit. Tube attachment/removal is easy.

■ Compatible with a wide range of tubes
Achieves high sealing load with pneumatic drive. Compatible with various tubes.

ABSODEX compact AX6000M Series

Catalog No. CB-054A

■ Space saving
In addition to the smallest external dimension in the industry, the product is in a concentric circular shape (rotation axis and fixing axis are the same), making it possible to design a compact space saving unit

■ Flexible
Since the program creation function is rich in content, you can manipulate operations in any way you desire
Furthermore, it supports simple operation setting such as automatic creation of point specification programs

■ High reliability & maintenance-free
Direct drive system (gearless) that provides stable operation without the need to worry about gear damage under excessive loads or changes in precision due to gear abrasion

Solenoid valve for gas

Proportional control valve A2-6500 Series

Made-to-order

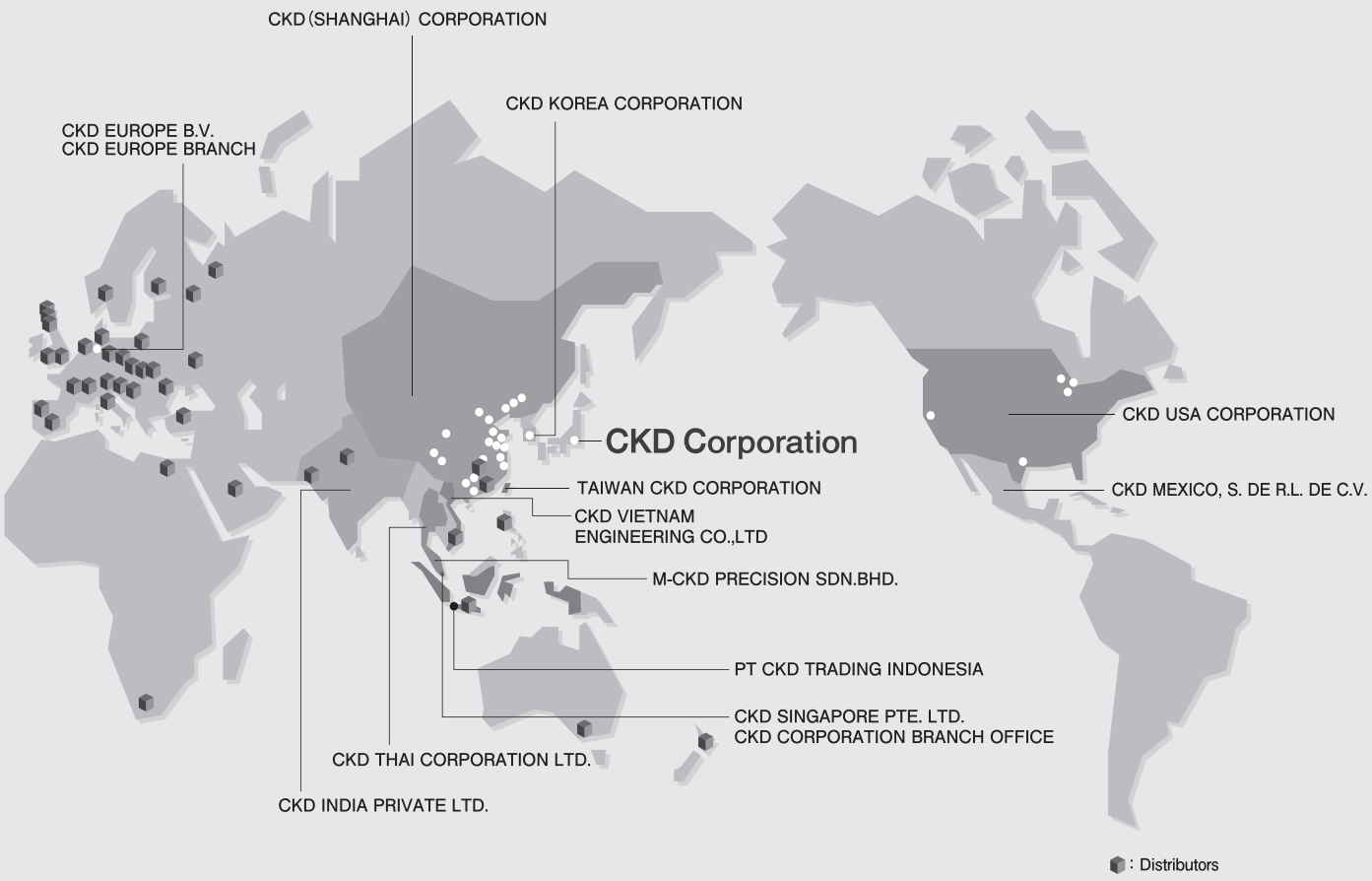
Catalog No. CB-03-1SA

■ Capable of controlling various gases
Working fluids: Compressed air, inert gas

■ Proportional control
Variable flow rate control in proportion to current

■ Wide range of applications
Multi-step flow rate control and appropriate flow rate control contribute to energy conservation and elimination of waste of equipment

WORLD-NETWORK



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2022.4