

Components for Life Science

COMPONENTS FOR LIFE SCIENCE



Meets requests for high purity and high accuracy in biochemistry and physicality analysis.

Control various fluids through extraction, dispensing, cleaning, and disposal, in high purity.

In recent years, medicine has greatly advanced. This advance has increased the need for highly functional, performing and accurate biomedical inspections and devices in clinical medicine. CKD has set 5 functional goals (described in below) and provided control valves to meet these needs for medical analysis devices. Take advantages of them!

Silence

In consideration of hospital environments, the valves drive extremely quietly.

AMENITY

(appropriate environment)

CKD medical technology which function medical devices and analysis equipment

VARIETY

(deals with various types)

Wide variation

A wide range of models for various reagents and testing liquids.

PURENESS

(maintains high purity)

High corrosion resistance

Highly corrosion resistant materials has been incorporated to ensure the purity of inspection fluid.

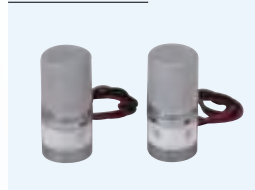
EQUIPMENT FOR MEDICAL TREATMENT & ANALYSIS PROCESS

(Primary applications and process)

System	Process	Controlled flow
Biochemistry analysis equipment	Sampling	RO water
Blood cell counter	Dispensing control	Reagent
Dialysis equipment	Water supply	Cleaning agent
Water examination equipment	Cleaning agent control	Dialysate
	Waste fluid, waste water	Normal saline

Metal free solenoid valve

MAB/MAG



MYB/MYG



MEB/MEG



Residual liquid

To improve accuracy and reliability of various inspections, fluid accumulation is minimized.

STABILITY

(accuracy of safety)

High corrosion resistant solenoid valve

UMB/UMG



USB/USG

(resin body type)



HB



Low volumetric capacity

MR10



HMTB/HMTG



Compact, and general purpose

USB/USG

(metal body type)



Pinch valve

HYN



RELIABILITY

(reliable functions)

Maintenance free

The life of the parts has been increased, and a maintenance-free design has been incorporated to improve the reliability of the devices.

Series variation

Medical analysis process components

			Model	No. of port	Material		Fluid					
					Sealant	Body	Purewater	Normal saline	Reagent	Waste liquid	Cleaning liquid	
Solenoid valve	Metal free for chemical liquid	Diaphragm type	MR10	2/3	FKM	PEEK	●	●	●	●	●	
			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 FKM	PPS	●	●	●	●	●	
			MEG2	3	PTFE FKM	PPS	●	●	●	●	●	
			Lever type	HMTB1	2	NBR FKM	PPS	●	●	●		●
	HMTG1	3		EPDM	●	●		●		●		
	High corrosion resistant	Poppet type	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 type	USB2/3	2	NBR (FKM)	C3604 SUS304						
USG2/3			3	NBR (FKM)	C3604 SUS304							
Pinch valve	Metal free type	HYN	2/3	-	-	●	●	●	●	●		

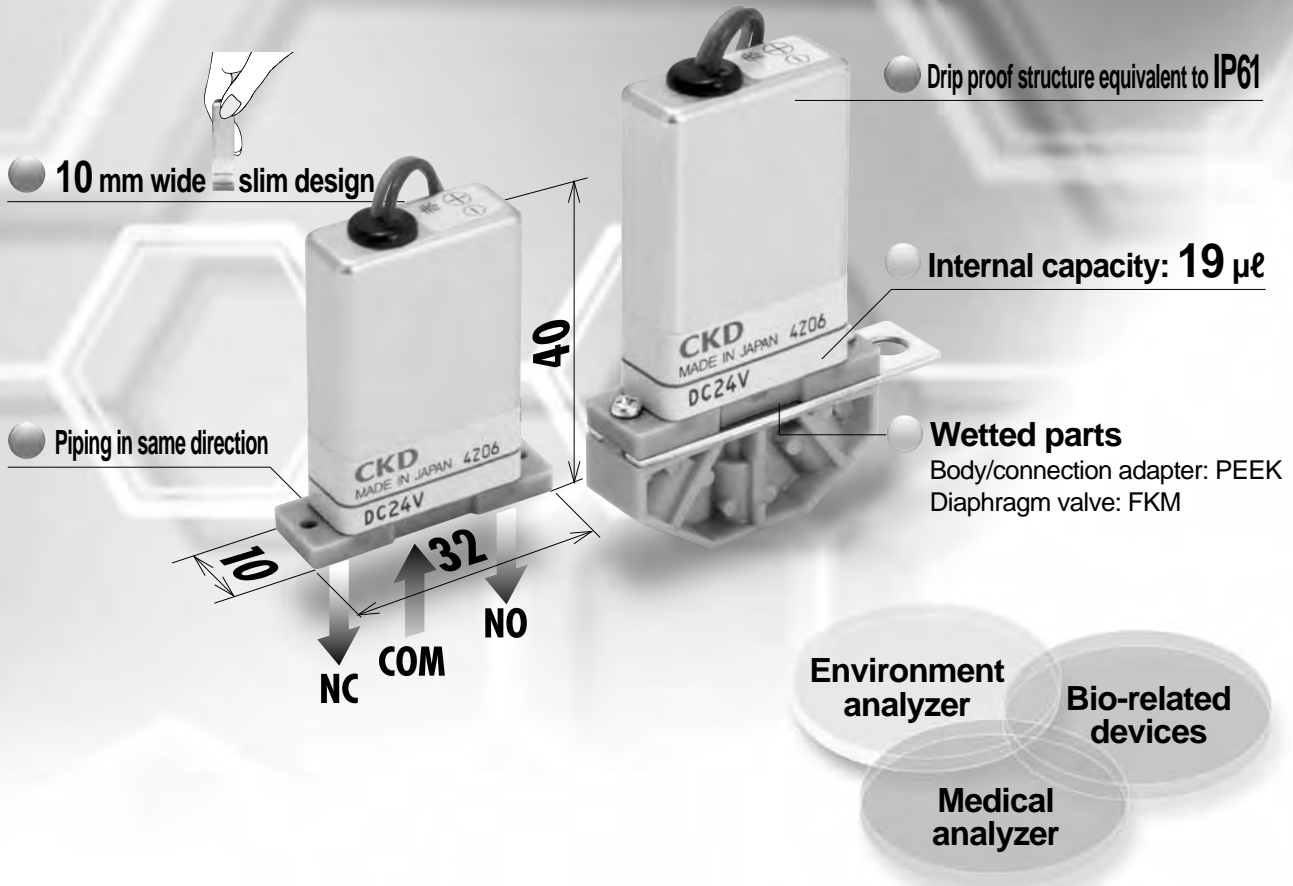
Note: Check the compatibility between working fluid and body/sealant materials when selecting.

Orifice (φ/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		
		●																		3
					● 1.6 or equiv.															7
					● 1.6 or equiv.															7
							● 2.0 or equiv.													10
							● 2.0 or equiv.													10
									● 3.0 or equiv.											13
									● 3.0 or equiv.											13
													● 5.0 or equiv.							17
													● 5.0 or equiv.							17
									● 3.0 or equiv.											20
									● 3.0 or equiv.											20
					●															23
					●															23
		●		●	●			●												27
		●		●	●															27
	●																			31
	●																			31
		●		●	●			●	●	●	●				●					33
		●	●	●	●	●		●		●										37/39
		●	●	●		●	●													41/43
● Tube ID		● Tube ID							● Tube ID				● Tube ID							45

MR10 Series

Extracompact space saving with slim 10 mm profile

Highly accurate analysis controls even minute amounts of chemical liquids.



Ideal for analyzer dispensing

Metal sections have been eliminated from this metal-free, compact MR10 Series 2, 3 port solenoid valve for chemical liquids. Resin and rubber are used for wetted parts.

The slim console, space-saving design, outstanding installation, safety, reliability, and long-life design ensure high overall performance.

● Long-life up to 10 million times

Results of tests under CKD test conditions

● Internal capacity: 19 µl

The inside of the solenoid valve is easy to wash. Reagent wastes are reduced.

● Heat-suppressing design

The effect of heat radiated from the coils onto the analysis frequency is minimized, and power is conserved.

● Two piping methods

Select piping suited to your application.



● Same shape adopted for 2 port valve and 3 port valve



Compact metal free 2, 3 port solenoid valve for chemical liquid

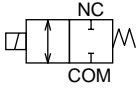
MR10 Series

- NC (normally closed) type, NO (normally open) type, universal type
- Working fluid: water, pure water, chemical liquids
- Port size: M5, M6

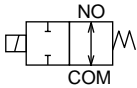


JIS symbol

- 2 port: NC (normally closed) type



- 2 port: NO (normally open) type



- 3 port: universal type



Specifications

Item	2 port		3 port
	MR10-2NC	MR10-2NO	MR10-3
Actuation	NC (normally closed) type	NO (normally open) type	Universal type
Working fluid	Water, pure water, chemical liquids (fluids that do not corrode materials at wetted parts)		
Working pressure MPa (*2)	-0.05 to 0.1		
Sealing pressure MPa (*3)	-0.05 to 0.2		
Withstanding pressure (water) MPa	0.4 (water pressure)		
Fluid temperature °C	5 to 50		
Ambient temperature °C	5 to 50		
Valve seat leakage cm ³ /min.	0 (water pressure)		
Cv flow factor	0.03		
Orifice mm	1		
Volumetric capacity μl (*4)	19		
Protection grade	Equivalent to IP61		
Valve structure	Diaphragm type direct acting (rocker type)		
Mounting attitude (*5)	Free		
Weight g	18		
Durability (*6)	10 million times		
Electric specifications			
Voltage (*7)	24 VDC/12 VDC		
Allowable voltage fluctuation	± 5%		
Power consumption W	Starting	3.6 (24 VDC)/4.2 (12 VDC)	
	(*8) Holding	1	
Leakage current mA (*9)	1.0 or less (24 VDC)/2.0 or less (12 VDC)		
Heat proof class	Class 130 (B)		

*1: Read the safety precautions for MR10 (page 49).

*2: Pressure range at which the solenoid valve can be switched ON or OFF.

*3: Pressure range at which the valve seat can be sealed.

*4: Volume of wetted parts formed by the product and diaphragm. Note that piping volume is excluded.

*5: Install vertically so that the coil where little fluid accumulates is at the top.

*6: These test results are based on CKD test conditions.

*7: A solenoid valve has polarity. Connect the red lead wire to the plus (+) side.

*8: Time from energizing to 50 ms.

*9: Keep leakage current from the control circuit within the range.

*10: Do not use for hydrochloric acid, hydrofluoric acid, nitric acid or sodium hypochlorite (soda).

MR10 Series

How to order

● Direct piping type

MR10 - 2NC - 5 - DC24V

● Actuator type

MR10 - 2NC - DC24V

Model no.

A No. of port, type

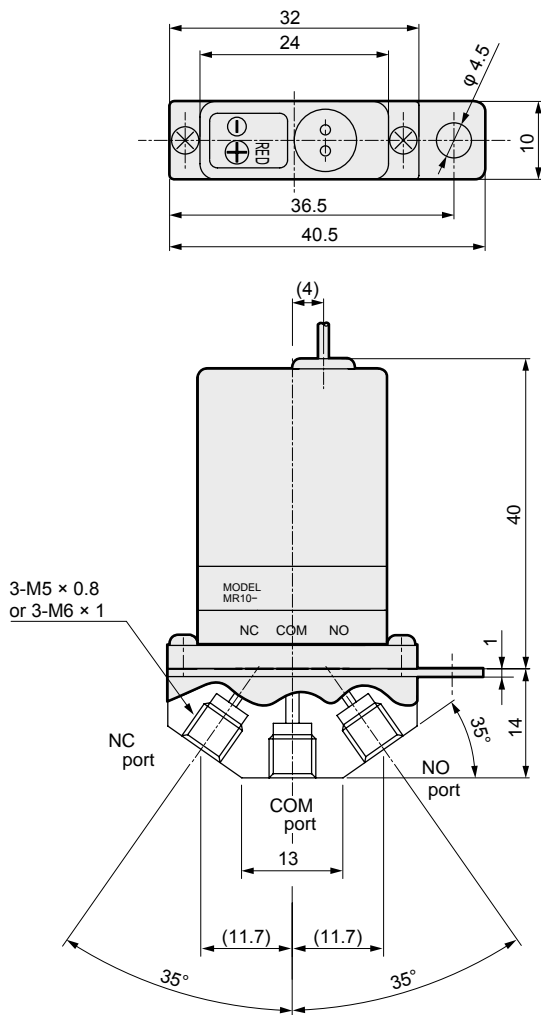
B Port size

C Rated voltage

Symbol	Descriptions
A No. of port, type	
2NC	2 port, NC (normally closed) type
2NO	2 port, NO (normally open) type
3	3 port, universal type
B Port size	
Blank	Actuator type
5	M5
6	M6
C Rated voltage	
DC24V	24 VDC
DC12V	12 VDC

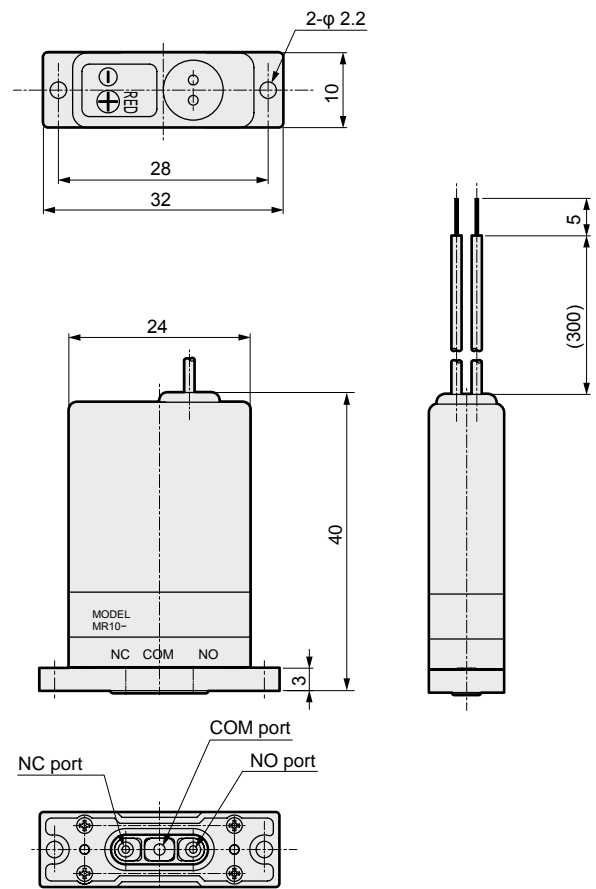
Dimensions

● Direct piping type



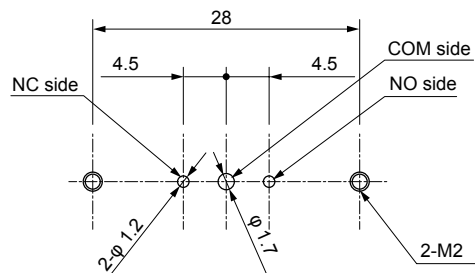
Note: The MR10-2NC's NO port is plugged.
The MR10-2NO's NC port is plugged.

● Actuator type



Note: The MR10-2NC has no hole machined for the NO port.
The MR10-2NO has no hole machined for the NC port.

● Mounting dimensions of actuator



* Different adaptors and manifolds are custom-made.
Consult with CKD for details.

● Main part materials

Parts name		Material	
Wetted parts	Diaphragm	FKM	Fluoro rubber
	Body	PEEK	Polyether ether ketone
	Packing seal	FKM	Fluoro rubber
	Connection adaptor	PEEK	Polyether ether ketone



Metal free 2, 3 port solenoid valve for chemical liquid

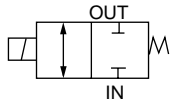
MAB1/MAG1 Series

- NC (normally closed) type, universal type
- Working fluid: water, pure water, chemical liquids
- Port size: M6

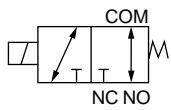


JIS symbol

- MAB1 (2 port)
: NC (normally closed) type



- MAG1 (3 port)
: universal type



Specifications

Item	MAB1-M6-DC24V				MAG1-M6-DC24V				
Working fluid	Water, pure water, chemical liquids (fluids that do not corrode materials at wetted parts)								
Working pressure MPa	Conditions	Fluid flow direction	Working pressure of each port		Conditions	Fluid flow direction	Working pressure of each port		
			IN	OUT			COM	NC	NO
	IN positive	IN → OUT	0 to 0.3	0 to 0.1	COM positive	COM → NO or NC	0 to 0.3	0 to 0.1	0 to 0.1
	OUT positive	OUT → IN	0 to 0.1	0 to 0.1	NC positive	NC → COM	0 to 0.1	0 to 0.1	0 to 0.1
	IN negative	OUT → IN	-0.05 to 0	-0.05 to 0	NO positive	NO → COM	0 to 0.1	0 to 0.1	0 to 0.1
					COM negative	NO or NC → COM	-0.05 to 0	-0.05 to 0	-0.05 to 0
Proof pressure	MPa 0.45 (water pressure)								
Fluid temperature	°C 5 to 60								
Ambient temperature	°C 0 to 50 (no freezing)								
Atmosphere	Not in explosive or corrosive environment								
Valve seat leakage	cm ³ /min. 0 (water pressure)								
Port size	M6 (*4)								
Orifice	mm Equivalent to 1.6								
Cv flow factor	0.045								
Mounting attitude	Free								
Weight	kg 0.13								
Electric specifications									
Voltage	24 VDC								
Voltage fluctuation range	-10 to +10% of rated voltage								
Power consumption	W 2.3								
Leakage current	mA 2.4 or less (*6)								
Heat proof class	Class 130 (B)								

*1: Read the safety precautions for MAB1/MAG1 (page 49).

*2: Before starting use, check the compatibility between the materials of the product and working fluid.
Working fluids must not adhere to the product body.

*3: Foreign matter etc. inside the piping may cause malfunction and valve seat leakage. Always flush the piping before installing the valve.

*4: Do not use metal joints because they could damage the port. Use a PP or fluorine resin joint.

Wrap PTFE sealing tape two to three times around the joint. Tighten the joint with the recommended tightening torque below. Recommended tightening torque: 0.05 to 0.08 N·m

*5: Do not use for hydrochloric acid, hydrofluoric acid, nitric acid or sodium hypochlorite (soda).

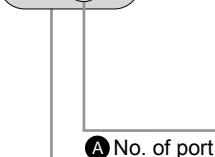
*6: Keep leakage current from the control circuit within the range.

*7: When standing the secondary piping, do not make it higher than 2 m. Use tubing or piping with the same or larger bore size as the orifice to fix the pipe.

*8: Do not disassemble the product.

How to order

MA B 1 - M6 - DC24V

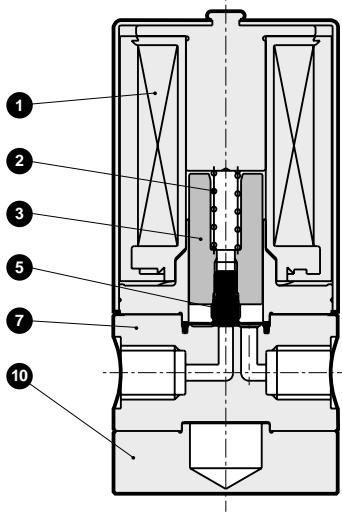


Model no.

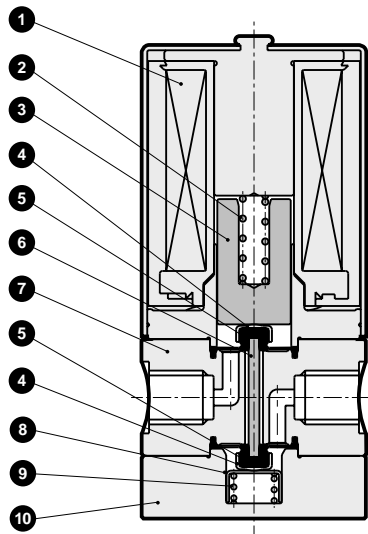
Symbol	Descriptions
A No. of port	
B	2 port valve
G	3 port valve

Internal structure and parts list

● MAB1-M6-DC24V



● MAG1-M6-DC24V



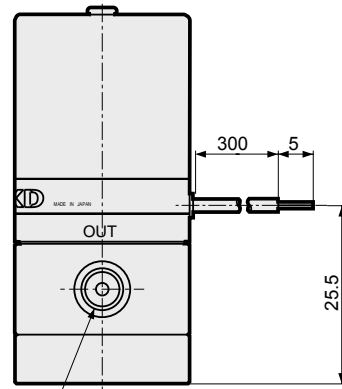
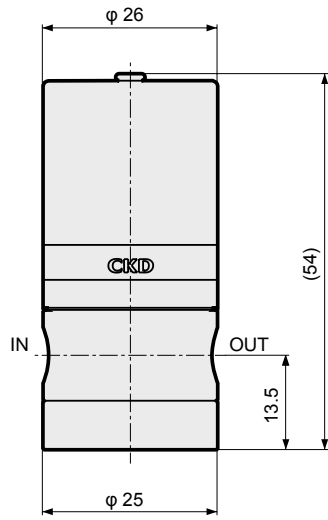
No.	Parts name	Material	No.	Parts name	Material
1	Coil assembly	-	6	Rod	- Ceramic
2	Spring	SUS304	7	Body	PTFE Tetrafluoroethylene resin
3	Plunger	SUY	8	Spring holder	SUS304
4	Cap	SUS304	9	Spring	SUS304
5	Diaphragm	PTFE	10	Mounting plate	SUS303

MAB1/MAG1 Series

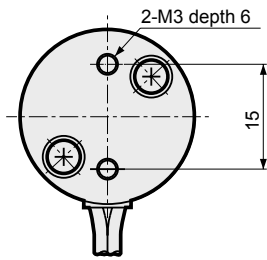
Dimensions



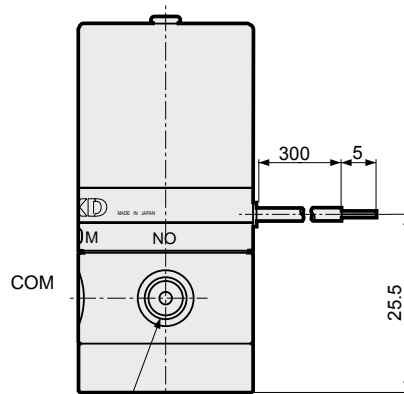
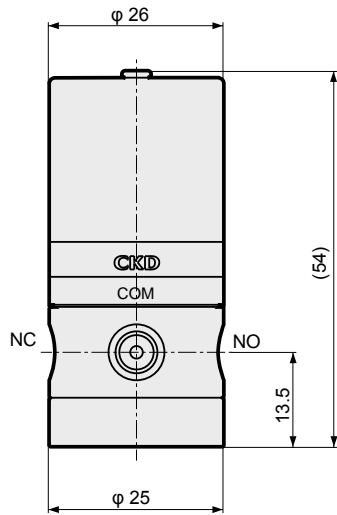
● MAB1-M6-DC24V



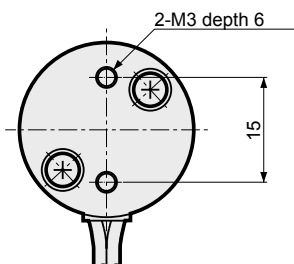
2-M6 depth 6
Prepared hole depth 7.2
entrance φ 8



● MAG1-M6-DC24V



3-M6 depth 6
Prepared hole depth 7.2
entrance φ 8





Metal free 2, 3 port solenoid valve for chemical liquid

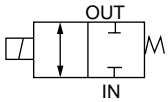
MYB1/MYG1 Series

- NC (normally closed) type, universal type
- Working fluid: water, pure water, chemical liquids
- Port size: M6

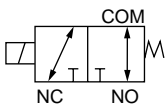


JIS symbol

- MYB1 (2 port)
: NC (normally closed) type



- MYG1 (3 port)
: universal type



Specifications

Item	MYB1-M6	MYG1-M6							
Working fluid	Water, pure water, chemical liquids (fluids that do not corrode materials at wetted parts)								
Working pressure MPa	Conditions	Fluid flow direction	Working pressure of each port	Conditions	Fluid flow direction	Working pressure of each port			
			IN	OUT		COM	NC	NO	
	IN positive	IN → OUT	0 to 0.2	0 to 0.1	COM positive	COM → NO or NC	0 to 0.2	0 to 0.1	0 to 0.1
	OUT positive	OUT → IN	0 to 0.1	0 to 0.1	NC positive	NC → COM	0 to 0.1	0 to 0.1	0 to 0.1
	IN negative	OUT → IN	-0.05 to 0	-0.05 to 0	NO positive	NO → COM	0 to 0.1	0 to 0.1	0 to 0.1
					COM negative	NO or NC → COM	-0.05 to 0	-0.05 to 0	-0.05 to 0
Proof pressure MPa	0.3 (water pressure)								
Fluid temperature °C	5 to 60								
Ambient temperature °C	0 to 50 (no freezing)								
Atmosphere	Not in explosive or corrosive environment								
Valve seat leakage cm ³ /min.	0 (water pressure)								
Port size	M6 (*4)								
Orifice	Equivalent to 2.0								
Cv flow factor	0.1								
Mounting attitude	Free								
Weight	0.14								
Electric specifications									
Voltage	12 VDC, 24 VDC, 100 VAC (50/60 Hz)								
Voltage fluctuation range	-10 to +10% of rated voltage								
Power consumption	AC	3.8							
	DC	3.0							
Leakage current mA	2 or less (12 VDC) / 1 or less (24 VDC) / 1.5 or less (100 VAC) (*6)								
Heat proof class	Class 130 (B)								

*1: Read the safety precautions for MYB1/MYG1 (page 49).

*2: Before starting use, check the compatibility between the materials of the product and working fluid.
Working fluids must not adhere to the product body.

*3: Foreign matter etc. inside the piping may cause malfunction and valve seat leakage. Always flush the piping before installing the valve.

*4: Do not use metal joints because they could damage the port. Use a PP or fluorine resin joint.

Wrap PTFE sealing tape two to three times around the joint. Tighten the joint with the recommended tightening torque below. Recommended tightening torque: 0.10 to 0.15 N·m

*5: Do not use for hydrochloric acid, hydrofluoric acid, nitric acid or sodium hypochlorite (soda).

*6: Keep leakage current from the control circuit within the range.

*7: When standing the secondary piping, do not make it higher than 2 m. Use tubing or piping with the same or larger bore size as the orifice to fix the pipe.

*8: Do not disassemble the product.

How to order

MY B 1 - M6 - DC12V

A No. of port

B Orifice

C Port size

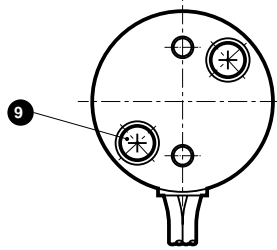
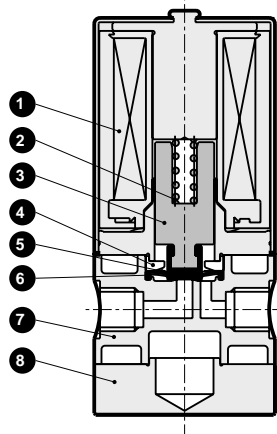
D Rated voltage

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

MYB1/MYG1 Series

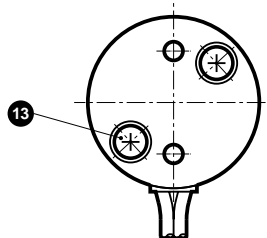
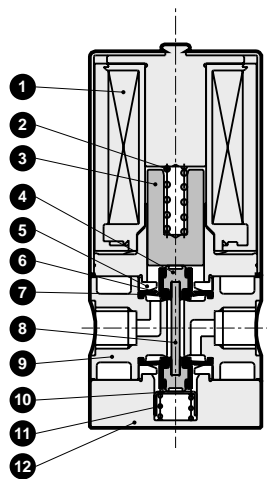
Internal structure and parts list

● MYB1-M6



No.	Parts name	Material
1	Coil assembly	Class B molded coil
2	Spring	SUS304 Stainless steel
3	Plunger	SUS405 Stainless steel
4	Diaphragm receiving	PPS Polyphenylene sulfide
5	Protection seat	PTFE Tetrafluoroethylene resin
6	Diaphragm	FKM Fluoro rubber
7	Body	PPS Polyphenylene sulfide
8	Mounting plate	SUS303 Stainless steel
9	Spring washer assembled cross headed pan head machine screw	SUSXM7 Stainless steel

● MYG1-M6

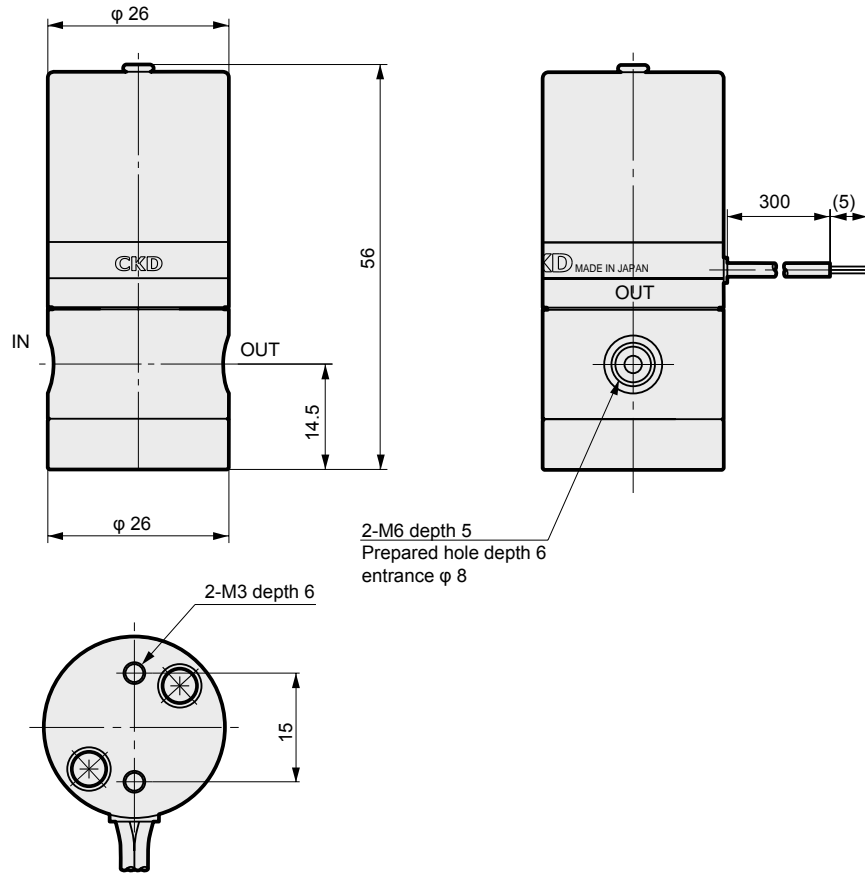


No.	Parts name	Material
1	Coil assembly	Class B molded coil
2	Spring	SUS304 Stainless steel
3	Plunger	SUY Iron
4	Spacer	PPS Polyphenylene sulfide
5	Diaphragm receiving	PPS Polyphenylene sulfide
6	Protection seat	PTFE Tetrafluoroethylene resin
7	Diaphragm	FKM Fluoro rubber
8	Rod	Ceramic
9	Body	PPS Polyphenylene sulfide
10	Spring holder	SUS304 Stainless steel
11	Spring	SUS304 Stainless steel
12	Mounting plate	SUS303 Stainless steel
13	Spring washer assembled cross headed pan head machine screw	SUSXM7 Stainless steel

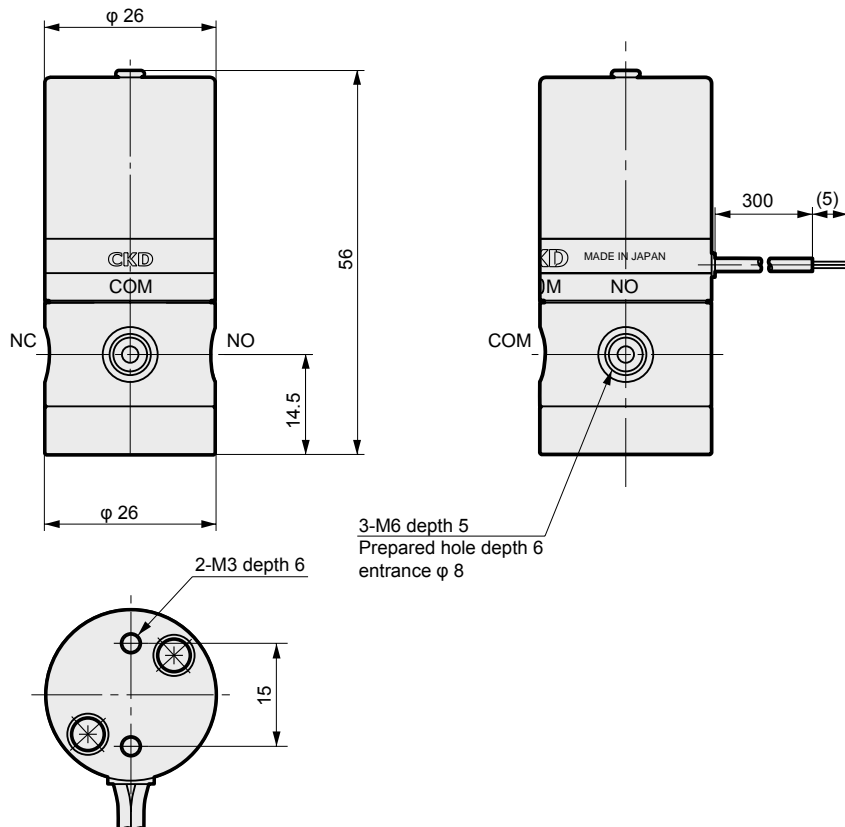
Dimensions



● MYB1-M6



● MYG1-M6





Metal free 2, 3 port solenoid valve for chemical liquid

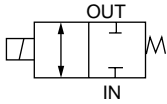
MYB2/MYG2 Series

- NC (normally closed) type, universal type
- Working fluid: water, pure water, chemical liquids
- Port size: Rc1/8

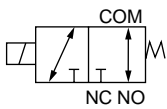


JIS symbol

- MYB2 (2 port)
: NC (normally closed) type



- MYG2 (3 port)
: universal type



Specifications

Item	MYB2-6	MYG2-6							
Working fluid	Water, pure water, chemical liquids (fluids that do not corrode materials at wetted parts)								
Working pressure MPa	Conditions	Fluid flow direction	Working pressure of each port (MPa)	Conditions	Fluid flow direction	Working pressure of each port (MPa)			
	IN positive	IN → OUT	0 to 0.2	0 to 0.1	COM positive	COM → NO or NC	0 to 0.2	0 to 0.1	0 to 0.1
	OUT positive	OUT → IN	0 to 0.1	0 to 0.1	NC positive	NC → COM	0 to 0.1	0 to 0.1	0 to 0.1
	IN negative	OUT → IN	-0.05 to 0	-0.05 to 0	NO positive	NO → COM	0 to 0.1	0 to 0.1	0 to 0.1
				COM negative	NO or NC → COM	-0.05 to 0	-0.05 to 0	-0.05 to 0	
Proof pressure	MPa		0.3 (water pressure)						
Fluid temperature	°C		5 to 60						
Ambient temperature	°C		0 to 50 (no freezing)						
Atmosphere			Not in explosive or corrosive environment						
Valve seat leakage	cm ³ /min.		0 (water pressure)						
Port size			Rc1/8 (*4)						
Orifice	mm		Equivalent to 3.0						
Cv flow factor			0.18						
Mounting attitude			Free						
Weight	kg	0.22		0.24					
Electric specifications									
Voltage	V	24 VDC, 100 VAC (50/60 Hz)							
Voltage fluctuation range		-10 to + 10% of rated voltage							
Power consumption	W	5.5							
Rush current	A	1 or less							
Leakage current	mA	24 VDC: 1 or less, 100 VAC: 6 or less (*6)							
Heat proof class		Class 130 (B)							

*1: Read the safety precautions for MYB2/MYG2 (page 49).

*2: Before starting use, check the compatibility between the materials of the product and working fluid.
Working fluids must not adhere to the product body.

*3: Foreign matter etc. inside the piping may cause malfunction and valve seat leakage. Always flush the piping before installing the valve.

*4: Do not use metal joints because they could damage the port. Use a PP or fluorine resin joint.

Wrap PTFE sealing tape two or three times around a joint which is compatible with the JIS B 0203 pipe taper screw.

Tighten the joint with the recommended tightening torque below.

Recommended tightening torque: 0.5 to 0.8 N·m

*5: Do not use for hydrochloric acid, hydrofluoric acid, nitric acid or sodium hypochlorite (soda).

*6: Keep leakage current from the control circuit within the range.

*7: When standing the secondary piping, do not make it higher than 2 m. Use tubing or piping with the same or larger bore size as the orifice to fix the pipe.

*8: Do not disassemble the product.

*9: As this product, incorporating electronic oscillator circuits, generates noise, noise prevention should be taken on the same power supply wire.

How to order

MY B 2 - 6 - DC24V

A No. of port

B Orifice

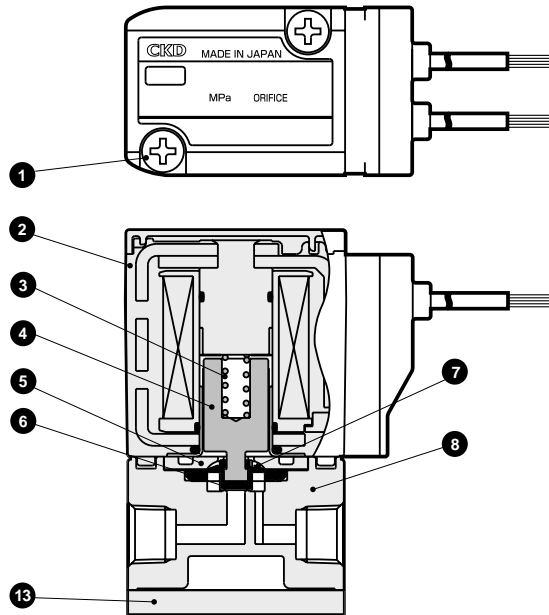
C Port size

D Rated voltage

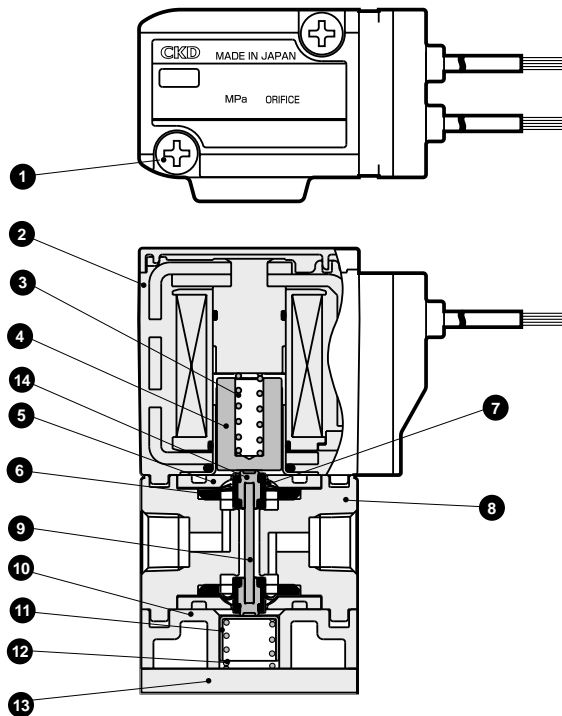
Symbol	Descriptions
A	No. of port
B	2 port
G	3 port
B	Orifice
2	φ 3
C	Port size
6	Rc1/8
D	Rated voltage
DC24V	24 VDC
AC100V	100 VAC (50/60 Hz)

Internal structure and parts list

● MYB2 (2 port valve)



● MYG2 (3 port valve)



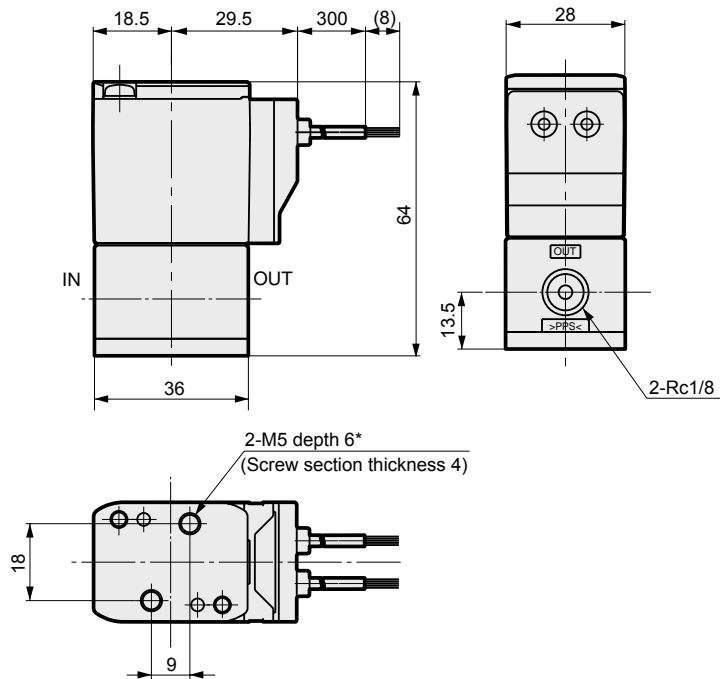
No.	Parts name	Material	No.	Parts name	Material
1	Cross headed pan head machine screw	SUSXM7 : Stainless steel	8	Body	PPS : Polyphenylene sulfide
2	Coil assembly	Class B mode coil	9	Rod	Ceramic
3	Spring	SUS304 : Stainless steel	10	Base	PPS : Polyphenylene sulfide
4	Plunger	SUS405 : Stainless steel	11	Spring holder	SUS304 : Stainless steel
5	Diaphragm receiving	PPS : Polyphenylene sulfide	12	Spring	SUS304 : Stainless steel
6	Diaphragm	FKM : Fluoro rubber	13	Mounting plate	SUS304 : Stainless steel
7	Protection seat	PTFE : Tetrafluoroethylene resin	14	Cap	PPS : Polyphenylene sulfide

MYB2/MYG2 Series

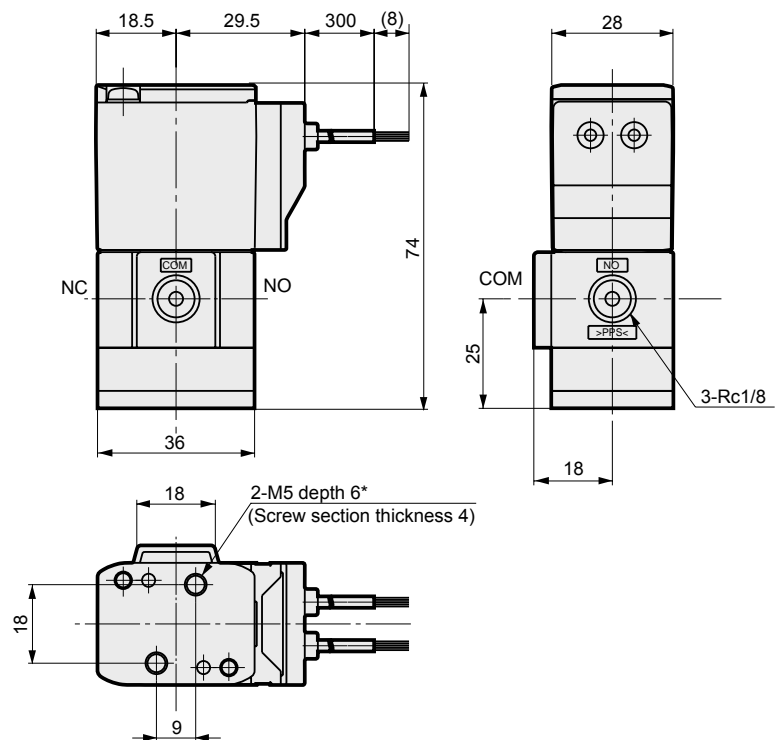
Dimensions



● MYB2 (2 port valve)

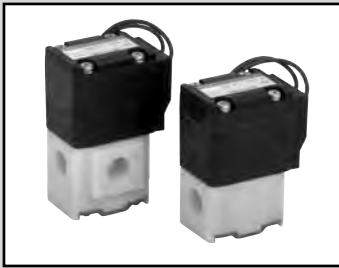


● MYG2 (3 port valve)



* When a set screw end in fixing holes 2-M5 is more than 6 mm from the bottom of the mounting plate, the screw cuts into the body or base, leading to cracking. The screw end must be 6 mm or less from the bottom of the mounting plate.

MEMO



Metal free 2, 3 port solenoid valve for chemical liquid

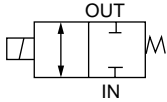
MYB3/MYG3 Series

- NC (normally closed) type, universal type
- Working fluid: water, pure water, chemical liquids
- Port size: R1/8, R1/4, R3/8

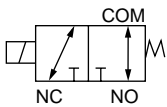


JIS symbol

- MYB3 (2 port)
: NC (normally closed) type



- MYG3 (3 port)
: universal type



Specifications

Item	MYB3	MYG3							
Working fluid	Water, pure water, chemical liquids (fluids that do not corrode materials at wetted parts)								
Working pressure MPa	Conditions	Fluid flow direction	Working pressure of each port	Conditions	Fluid flow direction	Working pressure of each port			
	IN positive	IN → OUT	0 to 0.2	0 to 0.1	COM positive	COM → NO or NC	0 to 0.2	0 to 0.1	0 to 0.1
	OUT positive	OUT → IN	0 to 0.1	0 to 0.1	NC positive	NC → COM	0 to 0.1	0 to 0.1	0 to 0.1
	IN negative	OUT → IN	-0.05 to 0	-0.05 to 0	NO positive	NO → COM	0 to 0.1	0 to 0.1	0 to 0.1
				COM negative	NO or NC → COM	-0.05 to 0	-0.05 to 0	-0.05 to 0	
Proof pressure	MPa		0.3 (water pressure)						
Fluid temperature	°C		5 to 60						
Ambient temperature	°C		0 to 50 (no freezing)						
Atmosphere			Not in explosive or corrosive environment						
Valve seat leakage	cm ³ /min.		0 (water pressure)						
Port size			Rc1/8, Rc1/4, Rc3/8 (*4)						
Orifice	mm		Equivalent to 5.0						
Cv flow factor			0.5						
Mounting attitude			Free						
Weight	kg	0.55		0.6					
Electric specifications									
Voltage			12 VDC, 24 VDC, 100 VAC (50/60 Hz)						
Voltage fluctuation range			-10 to + 10% of rated voltage						
Power consumption	AC			11					
	DC			11.5					
Leakage current	mA	2 or less (12 VDC) / 1 or less (24 VDC) / 2 or less (100 VAC) (*6)							
Heat proof class			Class 130 (B)						

*1: Read the safety precautions for MYB3/MYG3 (page 49).

*2: Before starting use, check the compatibility between the materials of the product and working fluid.
Working fluids must not adhere to the product body.

*3: Foreign matter etc. inside the piping may cause malfunction and valve seat leakage. Always flush the piping before installing the valve.

*4: Do not use metal joints because they could damage the port. Use a PP or fluorine resin joint.

Wrap PTFE sealing tape two or three times around a joint which is compatible with the JIS B 0203 pipe taper screw.
Tighten the joint with the recommended tightening torque below.

Recommended tightening torque: Rc1/8: 0.5 to 0.8 N·m, Rc1/4 and Rc3/8: 1.0 to 1.5 N·m

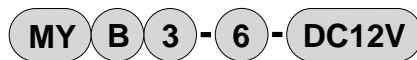
*5: Do not use for hydrochloric acid, hydrofluoric acid, nitric acid or sodium hypochlorite (soda).

*6: Keep leakage current from the control circuit within the range.

*7: When standing the secondary piping, do not make it higher than 2 m. Use tubing or piping with the same or larger bore size as the orifice to fix the pipe.

*8: Do not disassemble the product.

How to order



A No. of port

B Orifice

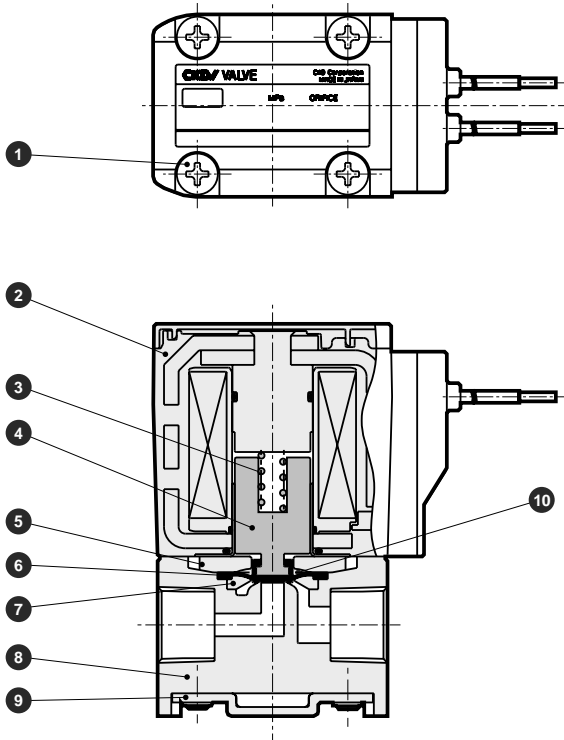
C Port size

D Rated voltage

Symbol	Descriptions
A	B 2 port G 3 port
B	3 φ 5
C	6 Rc1/8 8 Rc1/4 10 Rc3/8
D	DC12V 12 VDC DC24V 24 VDC AC100V 100 VAC (50/60 Hz)

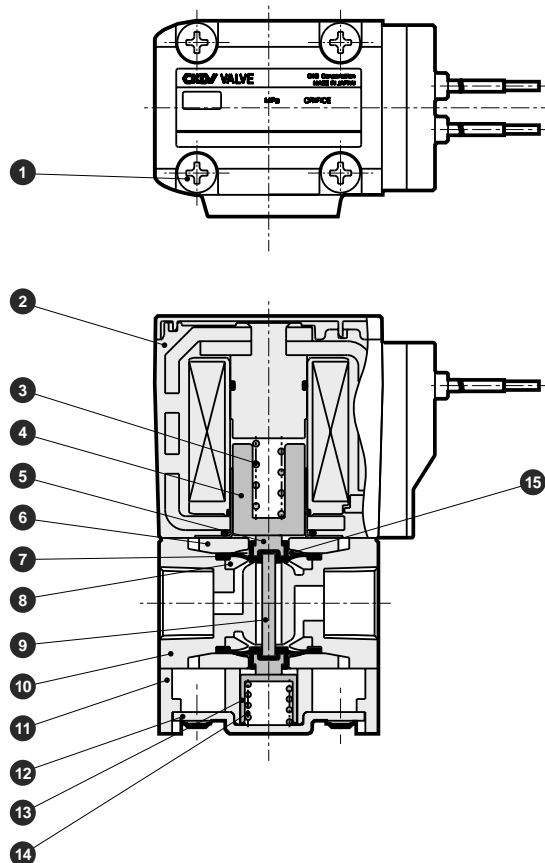
Internal structure and parts list

● MYB3



No.	Parts name	Material
1	Cross headed pan head machine screw	SUSXM7 Stainless steel
2	Coil assembly	Class B molded coil
3	Spring	SUS304 Stainless steel
4	Plunger	SUS405 Stainless steel
5	Diaphragm receiving	PPS Polyphenylene sulfide
6	Diaphragm	FKM Fluoro rubber
7	Diaphragm receiving	PPS Polyphenylene sulfide
8	Body	PPS Polyphenylene sulfide
9	Mounting plate	SUS304 Stainless steel
10	Protection seat	PTFE Tetrafluoroethylene resin

● MYG3



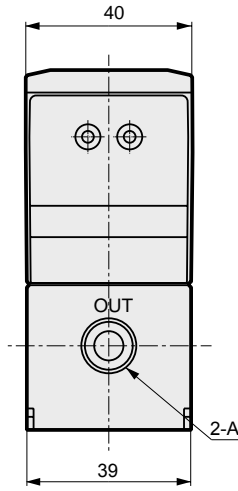
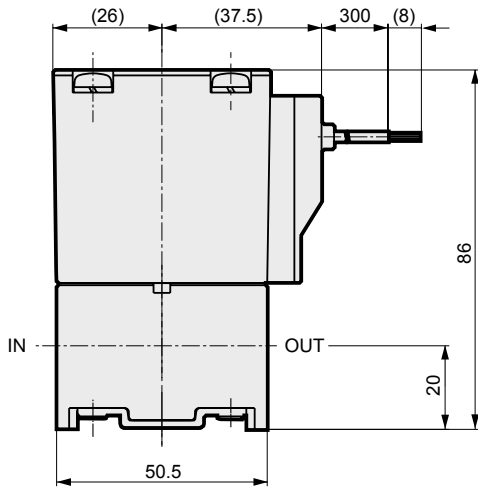
No.	Parts name	Material
1	Cross headed pan head machine screw	SUSXM7 Stainless steel
2	Coil assembly	Class B molded coil
3	Spring	SUS304 Stainless steel
4	Plunger	SUS405 Stainless steel
5	Spacer	PPS Polyphenylene sulfide
6	Diaphragm receiving	PPS Polyphenylene sulfide
7	Diaphragm	FKM Fluoro rubber
8	Diaphragm receiving	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	Protection seat	PTFE Tetrafluoroethylene resin

MYB3/MYG3 Series

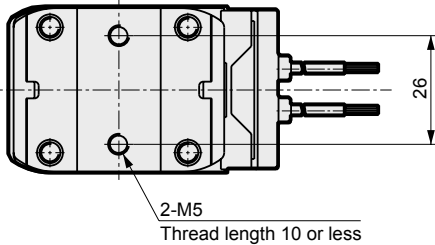
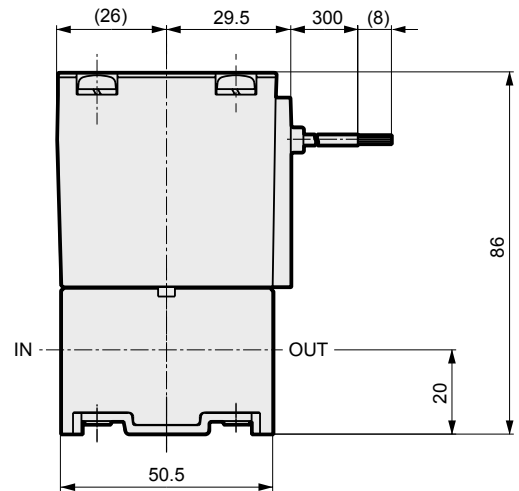
Dimensions



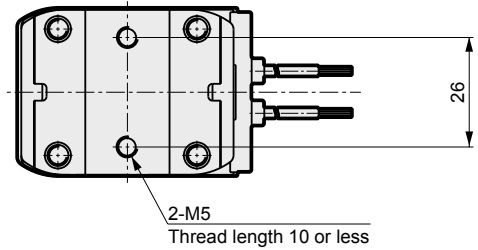
● MYB3 <For AC>



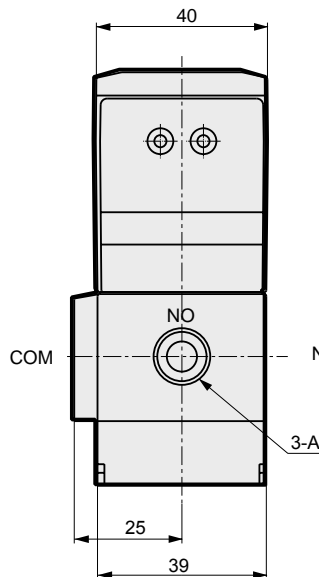
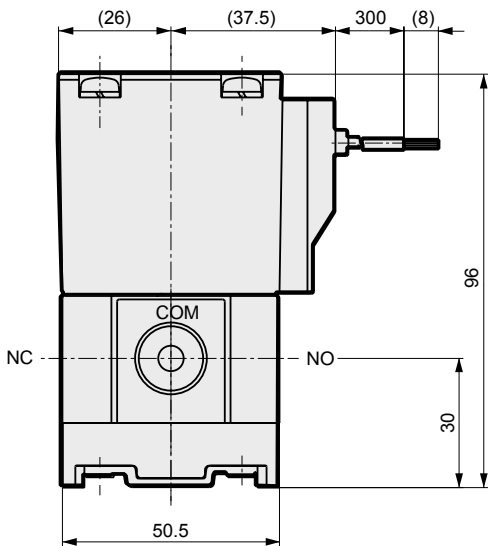
<For DC>



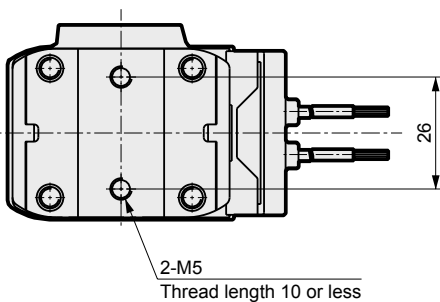
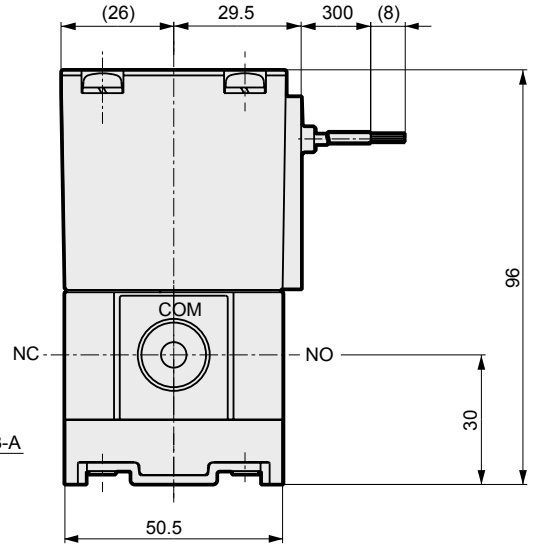
Model no.	A
MYB3-6	Rc1/8
MYB3-8	Rc1/4
MYB3-10	Rc3/8



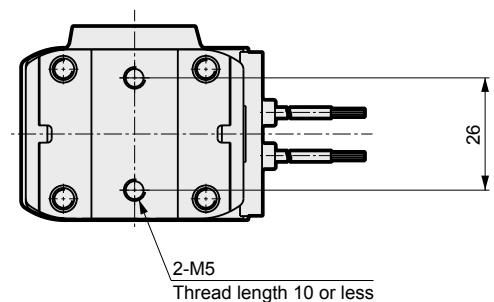
● MYG3 <For AC>



<For DC>



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





Metal free 2, 3 port solenoid valve for chemical liquid

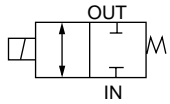
MEB2/MEG2 Series

- NC (normally closed) type, universal type
- Working fluid: water, pure water, chemical liquids
- Port size: Rc1/8

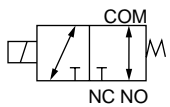


JIS symbol

- MEB2 (2 port)
: NC (normally closed) type



- MEG2 (3 port)
: universal type



Specifications

Item	MEB2-6				MEG2-6				
Working fluid	Water, pure water, chemical liquids (fluids that do not corrode materials at wetted parts)								
Working pressure MPa	Conditions	Fluid flow direction	Working pressure of each port		Conditions	Fluid flow direction	Conditions working pressure of each port		
			IN	OUT			COM	NC	NO
	IN positive	IN → OUT	0 to 0.2	0 to 0.1	COM positive	COM → NO or NC	0 to 0.2	0 to 0.1	0 to 0.1
	OUT positive	OUT → IN	0 to 0.1	0 to 0.1	NC positive	NC → COM	0 to 0.1	0 to 0.1	0 to 0.1
	IN negative	OUT → IN	-0.05 to 0	-0.05 to 0	NO positive	NO → COM	0 to 0.1	0 to 0.1	0 to 0.1
					COM negative	NO or NC → COM	-0.05 to 0	-0.05 to 0	-0.05 to 0
Proof pressure	MPa		0.3 (water pressure)						
Fluid temperature	°C		0 to 60 (no freezing)						
Ambient temperature	°C		0 to 50 (no freezing)						
Atmosphere	Not in explosive or corrosive environment								
Valve seat leakage	cm ³ /min.		0 (water pressure)						
Port size	Rc1/8 (*4)								
Orifice	mm		Equivalent to 3.0						
Cv flow factor	0.18								
Mounting attitude	Free								
Weight	kg		0.22			0.24			
Electric specifications									
Voltage	V		24 VDC, 100 VAC (50/60 Hz)						
Voltage fluctuation range	-10 to + 10% of rated voltage								
Power consumption	W		5.5						
Rush current	A		1 or less						
Leakage current	mA		24 VDC: 1 or less, 100 VAC: 6 or less (*6)						
Heat proof class	Class 130 (B)								

*1: Read the safety precautions for MEB2/MEG2 (page 49).

*2: Before starting use, check the compatibility between the materials of the product and working fluid.
Working fluids must not adhere to the product body.

*3: Foreign matter etc. inside the piping may cause malfunction and valve seat leakage. Always flush the piping before installing the valve.

*4: Do not use metal joints because they could damage the port. Use a PP or fluorine resin joint.
Wrap PTFE sealing tape two or three times around a joint which is compatible with the JIS B 0203 pipe taper screw.
Tighten the joint with the recommended tightening torque below.
Recommended tightening torque: 0.5 to 0.8 N·m

*5: Do not use for hydrochloric acid, hydrofluoric acid, nitric acid or sodium hypochlorite (soda).

*6: Keep leakage current from the control circuit within the range.

*7: When standing the secondary piping, do not make it higher than 2 m. Use tubing or piping with the same or larger bore size as the orifice to fix the pipe.

*8: Do not disassemble the product.

*9: As this product, incorporating electronic oscillator circuits, generates noise, noise prevention should be taken on the same power supply wire.

How to order

ME B 2 - 6 - DC24V

A No. of port

B Orifice

C Port size

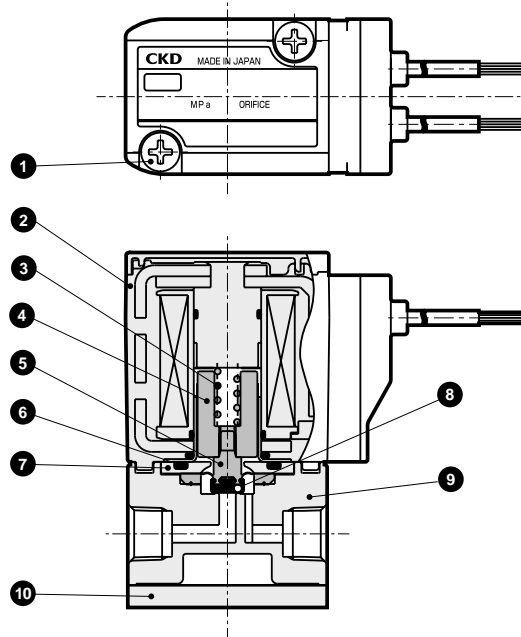
D Rated voltage

Symbol	Descriptions
A	No. of port
B	2 port
G	3 port
B	Orifice
2	φ 3
C	Port size
6	Rc1/8
D	Rated voltage
DC24V	24 VDC
AC100V	100 VAC (50/60 Hz)

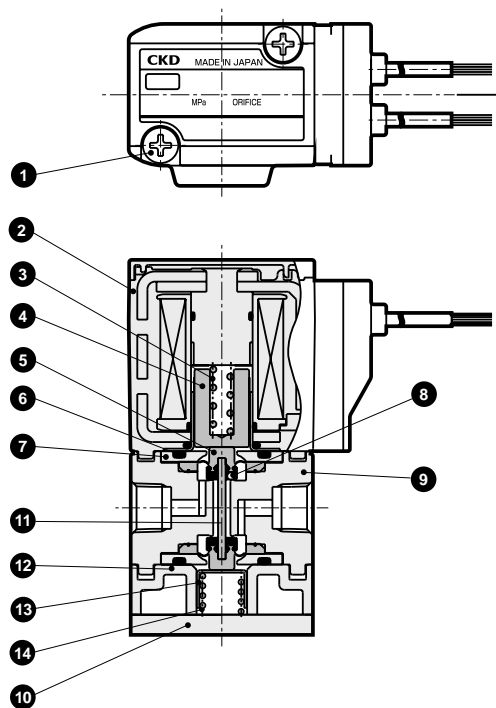
MEB2/MEG2 Series

Internal structure and parts list

● MEB2 (2 port valve)



● MEG2 (3 port valve)

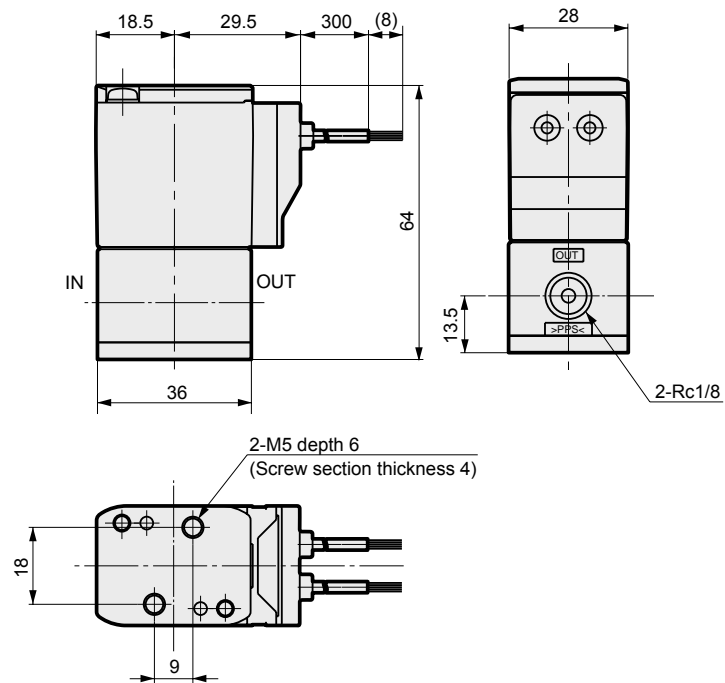


No.	Parts name	Material	No.	Parts name	Material
1	Cross headed pan head machine screw	SUSXM7 Stainless steel	8	Valve seat	Perfluoroelastomer
2	Coil assembly	Class B molded coil	9	Body	PPS Polyphenylene sulfide
3	Spring	SUS304 Stainless steel	10	Mounting plate	SUS304 Stainless steel
4	Plunger	SUS405 Stainless 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 receiving	PPS Polyphenylene sulfide	14	Spring	SUS304 Stainless steel

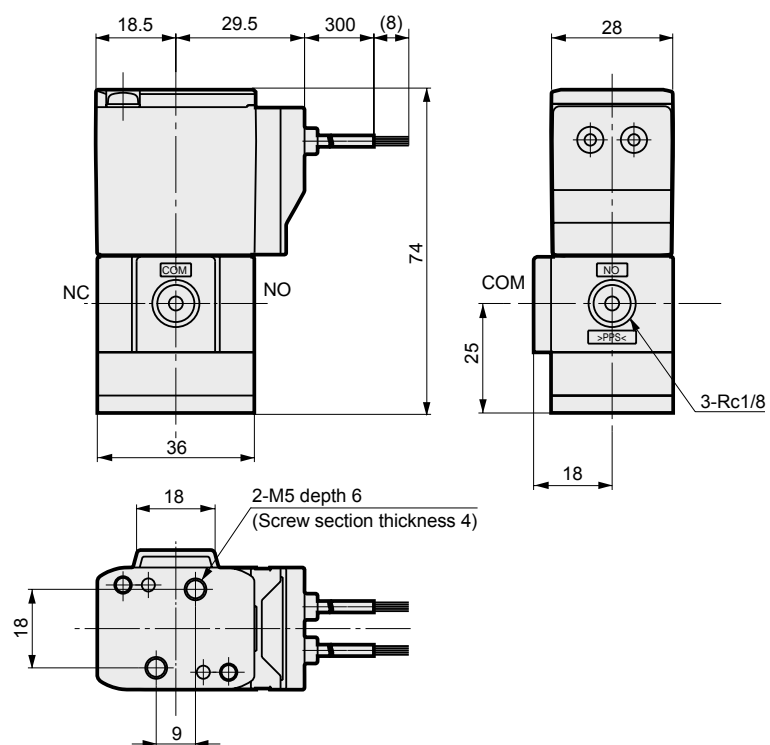
Dimensions



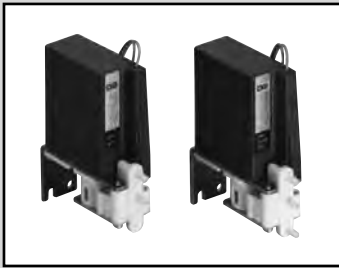
● MEB2 (2 port valve)



● MEG2 (3 port valve)



* When a set screw end in fixing holes 2-M5 is more than 6 mm from the bottom of the mounting plate, the screw cuts into the body or base, leading to cracking. The screw end must be 6 mm or less from the bottom of the mounting plate.



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

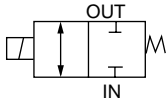
HMTB1/HMTG1 Series

- NC (normally closed) type, universal type
- Working fluid: water, pure water, chemical liquids
- Port size: φ 2 barbed joint

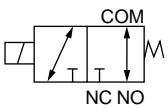


JIS symbol

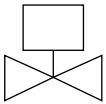
- HMTB1 (2 port)
: NC (normally closed) type



- HMTG1 (3 port)
: universal type



Mounting attitude



Specifications

Item	HMTB1	HMTG1
Working fluid	Water, pure water, chemical liquids (fluids that do not corrode materials at wetted parts)	
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
Proof pressure MPa	0.6 (water pressure)	
Fluid temperature °C	5 to 40	
Ambient temperature °C	0 to 55	
Port size	φ 2 barbed joint	
Orifice mm	1.6	
Cv flow factor	0.05	
Mounting attitude	Vertical position with coil facing upward	
Weight kg	0.21	
Frequency cycle/min.	60 or less (ON time, or OFF time is more than 0.5 seconds)	
Operation sound dB	50	
Electric specifications		
Voltage	12 VDC/24 VDC	
Voltage fluctuation range	-10 to +10% of rated voltage	
Temperature rise K	30	
Power consumption	Suction (0.2 sec)	9.6
	Holding	2.4
Leakage current mA	5 or less	
Heat proof class	Class 120 (E)	

*1: Read the safety precautions for HMTB/HMTG (page 50).

*2: Before starting use, check the compatibility between the materials of the product and working fluid.
Working fluids must not adhere to the product body.

*3: Foreign matter etc. inside the piping may cause malfunction and valve seat leakage. Always flush the piping before installing the valve.

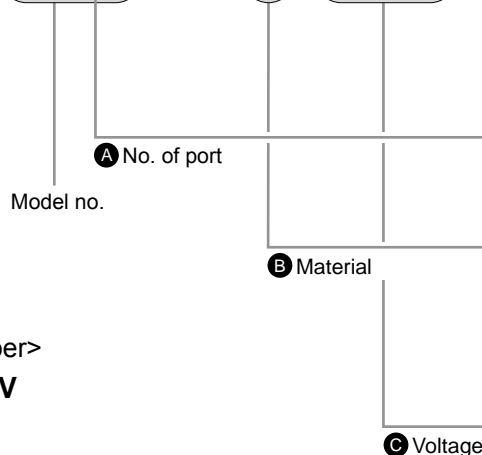
*4: Do not use for hydrochloric acid, hydrofluoric acid, nitric acid or sodium hypochlorite (soda).

*5: Do not apply excessive force on the joint when connecting or disconnecting the tube.

*6: Do not disassemble the product.

How to order

HMT(B)1 - 2TN - (PN) - DC12V



Symbol	Descriptions	
A No. of port		
B	2 port valve	
G	3 port valve	
B Material		
	Body	Sealant
PN	PPS	NBR
PF	PPS	FKM
PE	PPS	EPDM
C Voltage		
DC12V	12 VDC	
DC24V	24 VDC	

<Example of model number>

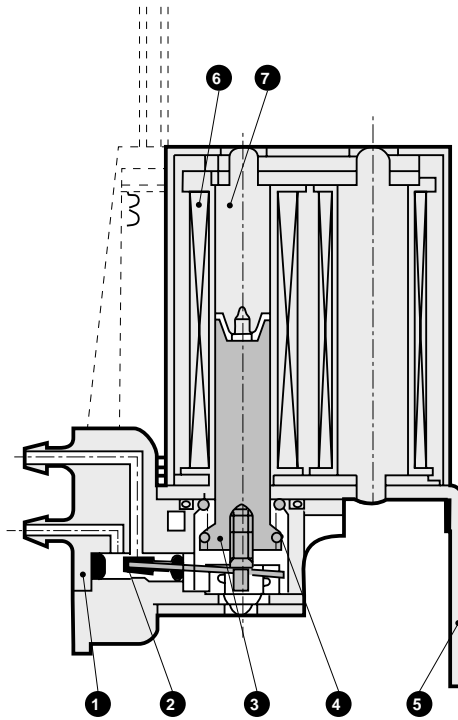
HMTB1-2TN-PF-DC24V

Model no.: HMTB1

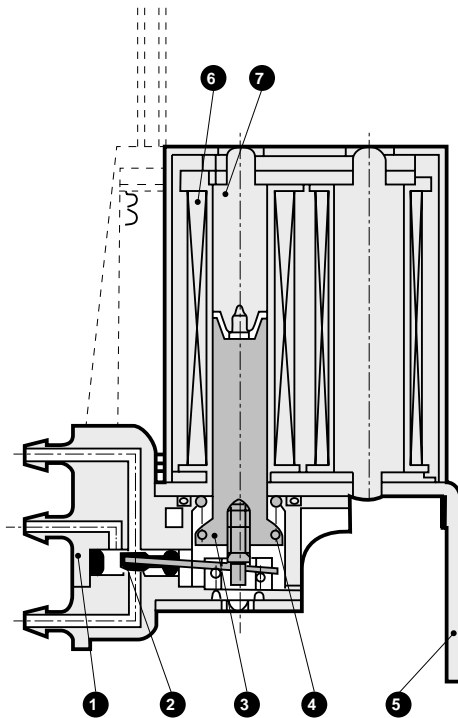
- A No. of port : 2 port valve
- B Material : Body - PPS, sealant - FKM
- C Voltage : 24 VDC

Internal structure and parts list

● HMTB1 (2 port)



● HMTG1 (3 port)



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

MEMO



Compact direct acting 2, 3 port solenoid valve

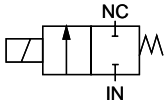
US (resin body type) series

- NC (normally closed) type, universal type
- Port size: M6, barbed joint (applicable bore size $\phi 6 \times \phi 4$)

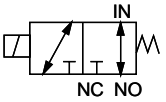


JIS symbol

- USB (2 port valve)
: NC (normally closed) type



- USG (3 port valve)
: universal type



Common specifications

Item	USB/USG
Working fluid	Refer to the use of fluid on individual specifications.
Working pressure diff. MPa	0 to 0.7 (It is different depending on the type, refer to the maximum working pressure differential of individual specifications.)
Withstanding pressure (water) MPa	1.5 (US*2), 2 (US*3)
Fluid temperature °C	0 to 60 (no freezing)
Ambient temperature °C	0 to 50
Heat proof class	Class 130 (B)
Atmosphere	Place free of corrosive gas and explosive gas
Valve seat leakage cm ³ /min.	0.2 or less
Port size	M6/barbed joint (applicable bore size $\phi 6 \times \phi 4$)
Mounting attitude	Free
Rated voltage	24 VDC
Treatment	Oil free

Individual specifications

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

Note 1: Check the compatibility between the wetted part material and working fluid before using chemicals for washing.

Note 2: When using a 3 port valve in a continuously energized state, use a fluoro rubber seal.

Note 3: Effective sectional area S and sonic conductance C are converted as $S \cong 5.0 \times C$.

Note 4: When using the 2 port valve with a low vacuum, vacuum the NC port side.

US (resin body type) Series

How to order

USB2 - M6 - 1 - S 2 - DC24V (Note 2)

A Model no.

B Port size

C Orifice

D Body/sealant materials

E Wetted metal material

A Model no.

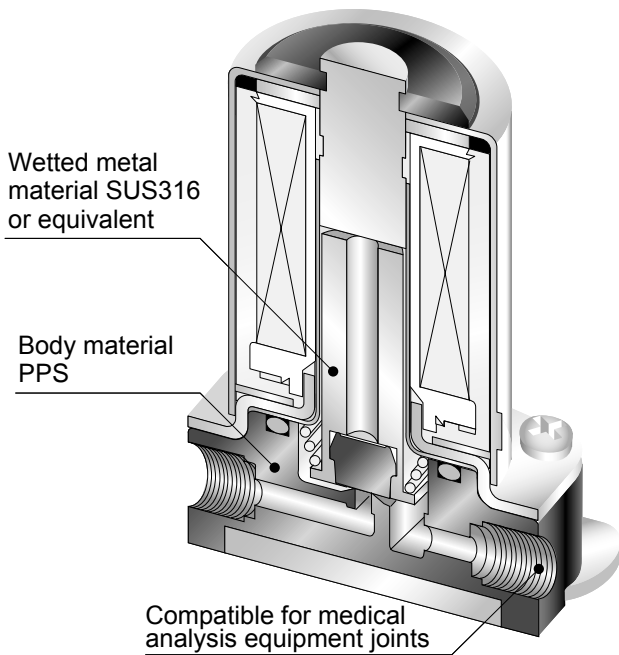
2 port valve 3 port valve

Symbol	Descriptions	USB2	USB3	USG2	USG3
B Port size					
M6	M6	●	●	●(Note1)	●
T6	Barbed joint	●	●	●	●
C Orifice					
1	Refer to the right.	φ 1	φ 1.6	φ 1	φ 1.6
2	Refer to the right.	φ 1.5	φ 2.3	φ 1.5	
D Body/sealant materials					
	Body	Sealant			
G	PPS	NBR	●	●	●
S	PPS	FKM	●	●	●
E Wetted metal material					
1	SUS405 or equivalent	●	●	●	●
2	SUS316 or equivalent	●	●	●	●

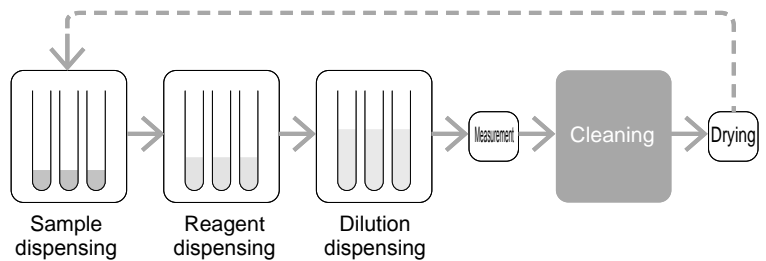
⚠ Note on model no. selection

Note 1: The NO port of USG2 is M5.

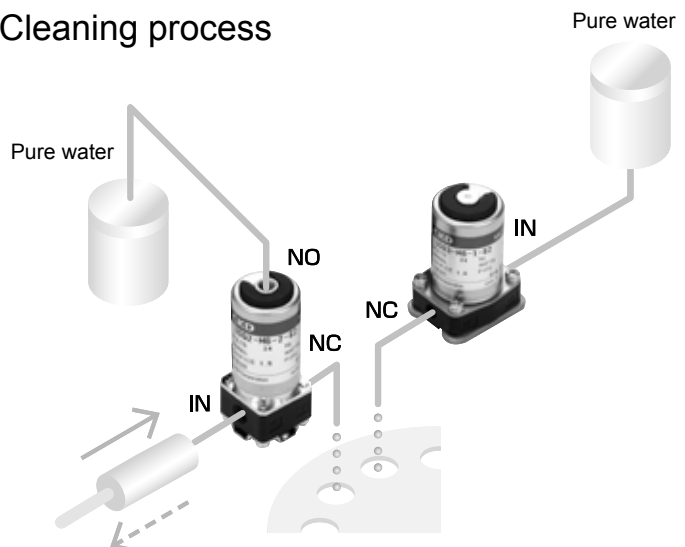
Note 2: Contact CKD for other voltage of 24 VDC.



Applications



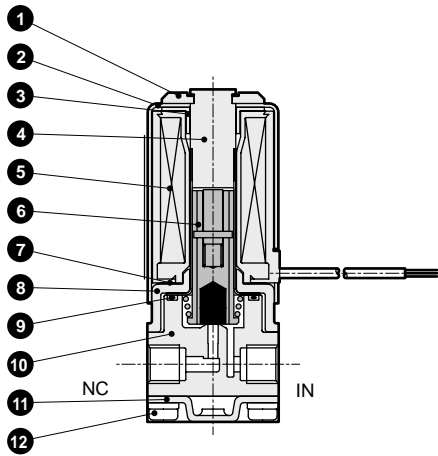
Cleaning process



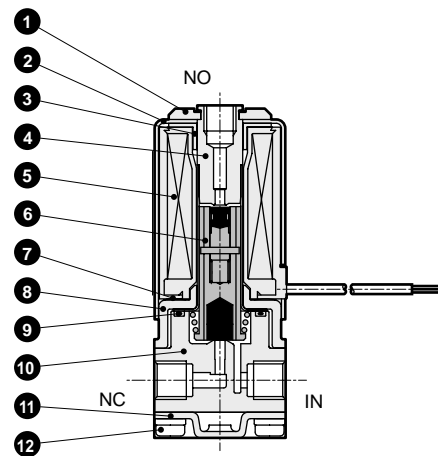
US^B_G2 (resin body type) Series

Internal structure and parts list

● USB2



● USG2

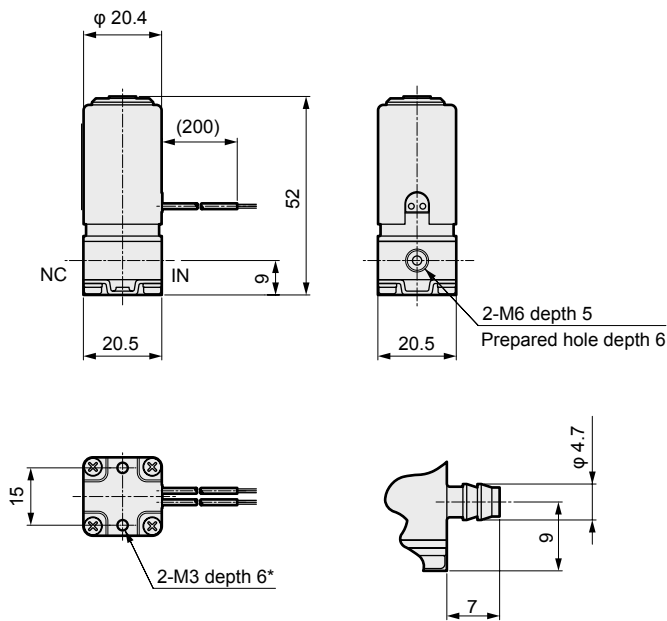


No.	Parts name	Material	No.	Parts name	Material
1	Clip	PBT	7	Waving washer	S65C
2	Bonnet	SPC	8	Core B	SPC
3	Sub core	SPC	9	O ring	NBR (FKM)
4	Core assembly	SUS316 (SUS405 or equivalent), SUS316L	10	Body	PPS
5	Coil assembly	-	11	Holding plate	SPC
6	Plunger assembly	SUS316 (SUS405 or equivalent), NBR (FKM)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

Materials in () are selectable based on options.

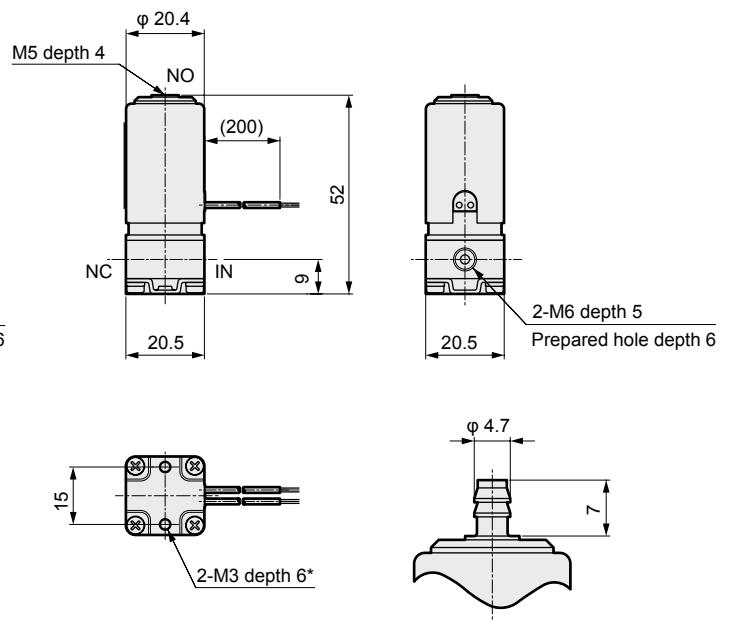
Dimensions

● USB2



<For option symbol "T6">
Barbed joint dimensions

● USG2



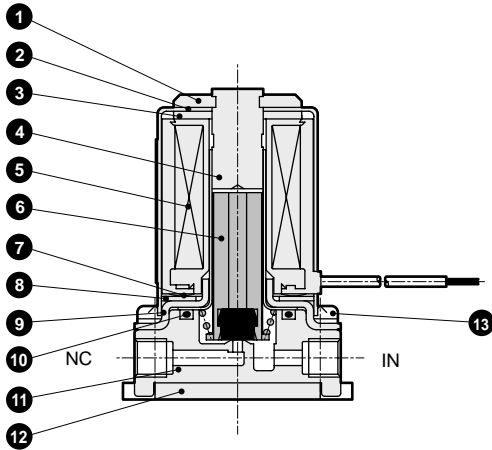
<For option symbol "T6">
NO port barbed joint dimensions
(IN and NC ports are the same as those of the 2 port valve)

* Do not screw in more than 6 mm when installing the product.

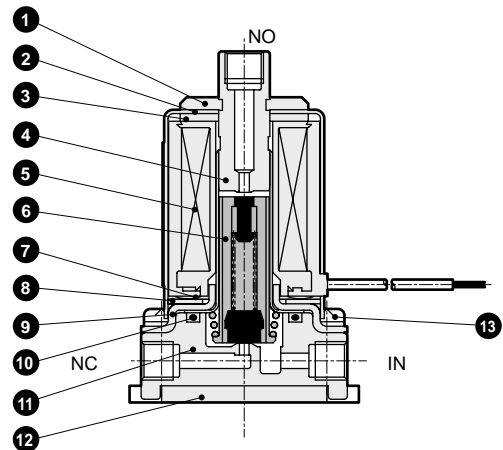
US^B_G3 (resin body type) Series

Internal structure and parts list

● USB3



● USG3

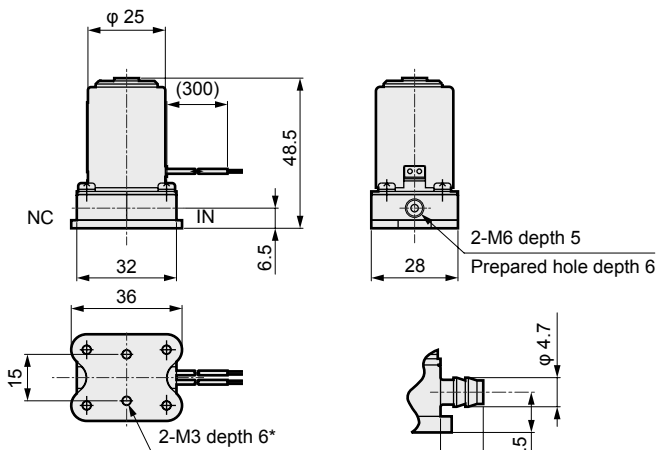


No.	Parts name	Material	No.	Parts name	Material
1	Clip	PBT	8	Sub core	SPC
2	Bonnet	SPC	9	Core B	SPC
3	Bonnet piece	SPC	10	O ring	NBR (FKM)
4	Core assembly	SUS316 (SUS405 or equivalent), SUS316L	11	Body	PPS
5	Coil assembly	-	12	Holding plate	SPC
6	Plunger assembly	SUS316 (SUS405 or equivalent), NBR (FKM)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

Materials in () are selectable based on options.

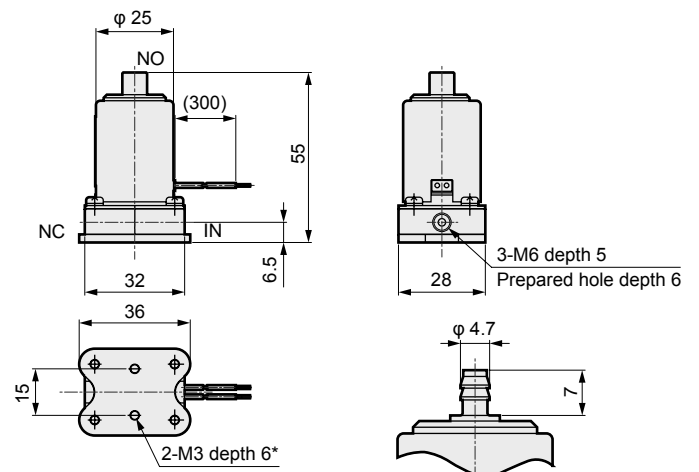
Dimensions

● USB3



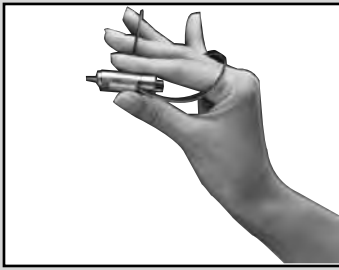
<For option symbol "T6">
Barbed joint dimensions

● USG3



<For option symbol "T6">
NO port barbed joint dimensions
(IN and NC ports are the same as those of the 2 port valve)

* Do not screw in more than 6 mm when installing the product.



High corrosion resistant miniature direct acting 2, 3 port solenoid valve for medical equipment

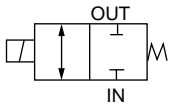
UMB1/UMG1 Series

- NC (normally closed) type, universal type
- Working fluid: water, pure water
- Port size: Stainless steel pipe of outer diameter ϕ 1.26 × inner diameter ϕ 0.9

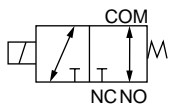


JIS symbol

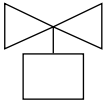
- USB (2 port)
: NC (normally closed) type



- USG (3 port)
: universal type



Mounting attitude



Specifications

Item	UMB1	UMG1
Working fluid	Water, pure water	
Working pressure MPa	0 to 0.2	
Proof pressure MPa	0.6 (water pressure)	
Fluid temperature °C	5 to 55	
Ambient temperature °C	0 to 55	
Valve seat leakage cm ³ /min.	0 (water pressure)	
Port size	Outer diameter ϕ 1.26 × inner diameter ϕ 0.9 stainless steel pipe	
Orifice mm	0.9	
Cv flow factor	0.01	
Mounting attitude	Vertical position with coil facing upward	
Weight kg	0.03	
Volumetric capacity cm ³	0.08	
Response time ms	8 or less	
Electric specifications		
Voltage	12 VDC/24 VDC	
Voltage fluctuation range	-10 to +10% of rated voltage	
Power consumption W	1.5	
Leakage current mA	0.7 or less (12 VDC) / 0.4 or less (24 VDC)	
Heat proof class	Class 130 (B)	

*1: Read the safety precautions for UMB/UMG (page 50).

*2: Foreign matter etc. inside the piping may cause malfunction and valve seat leakage. Always flush the piping before installing the valve.

*3: Protect the product against contact with water.

*4: Do not disassemble the product.

How to order

UMB1 - T1 - **DC12V**

Model no.

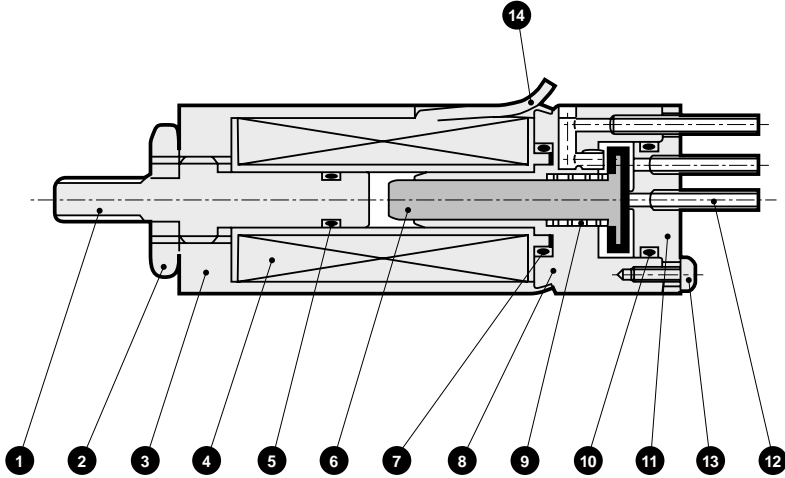
A No. of port

B Voltage

Symbol	Descriptions
A No. of port	
B	2 port valve
G	3 port valve
B Voltage	
DC12V	12 VDC
DC24V	24 VDC

Internal structure and parts list

● UMG1-T1

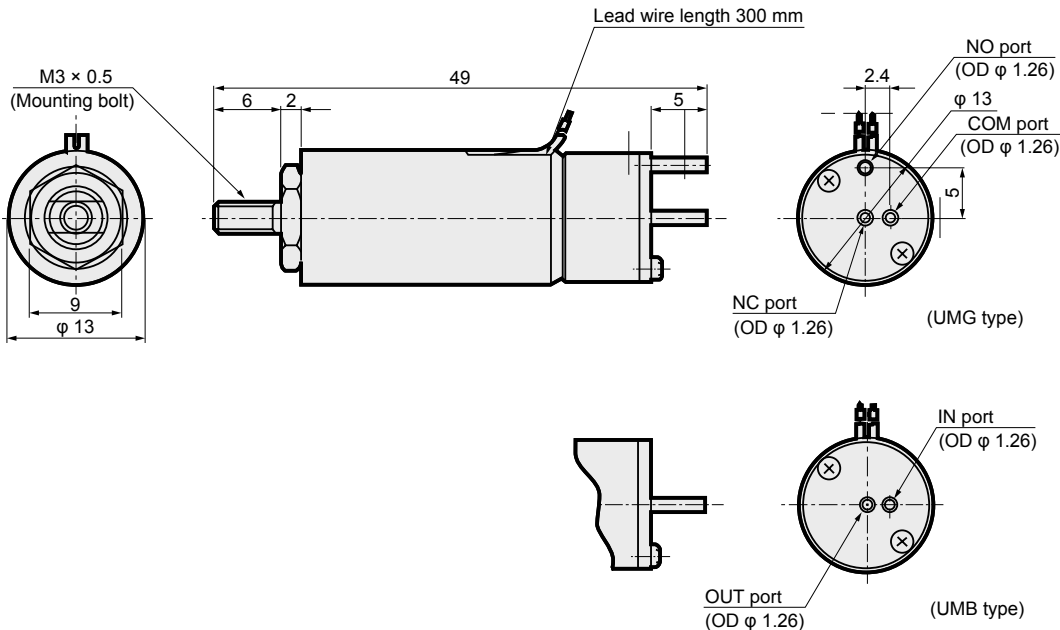


No.	Parts name	Material	No.	Parts name	Material
1	Core A	SUS304 or equivalent Stainless steel	8	Body	SUS304 or equivalent Stainless steel
2	Hexagon nut	SWRM3 Steel	9	Spring	SUS304 Stainless steel
3	Bonnet	SUYB Iron	10	O ring	FKM Fluoro rubber
4	Coil	— (wetted parts: PBT) (PBT)	11	Cap	SUS304 or equivalent Stainless steel
5	O ring	FKM Fluoro rubber	12	Pipe for connection	SUS304 Stainless steel
6	Plunger	SUS304 or equivalent, FKM Stainless steel, fluoro rubber	13	Cross headed pan head machine screw	SUS304 Stainless steel
7	O ring	FKM Fluoro rubber	14	Lead wire	—

Dimensions



● UMB1-T1
● UMG1-T1





High corrosion resistant direct acting 2 port solenoid valve

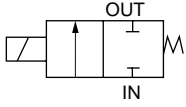
HB Series

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



JIS symbol

- NC (normally closed type)



Common specifications

Item	HB11/21/31/41
Working fluid	Water, pure water, chemical liquids (fluids that do not corrode materials at wetted parts)
Working pressure MPa	0 to 0.7 (refer to working pressure in individual specifications.)
Proof pressure (water pressure) MPa	1.5 (HB11), 2 (HB21/31/41)
Fluid temperature °C	-10 to 60 (no freezing)
Valve seat leakage cm ³ /min.	0 (water pressure) (*4) (When using PTFE sealant, 300 cm ³ /min or less at air pressure)
Mounting attitude	Free
Treatment	Oil free
Electric specifications	
Voltage	100 VAC (50/60 Hz), 200 VAC (50/60 Hz), 12 DVC, 24 DVC

*1: Read the safety precautions for HB (page 50).

*2: When using an AC rated voltage, the voltage is converted to DC with the diode in the coil.

*3: Before starting use, check the compatibility between the materials of the product and working fluid.

Working fluids must not adhere to the product body.

*4: When using NBR or FKM sealant, valve seat leakage is 0 cm³/min. at water pressure.

*5: Foreign matter etc. inside the piping may cause malfunction and valve seat leakage. Always flush the piping before installing the valve.

*6: Do not disassemble the product.

*7: Do not use for hydrochloric acid, hydrofluoric acid, nitric acid or sodium hypochlorite (soda).

Individual specifications

Item	Port size	Orifice (mm)	Cv flow factor	Working pressure (MPa)	Ambient temperature (°C)	Power consumption (w)	Weight (kg)
Model no.							
HB11-M5-1	M5	1.0	0.03	0 to 0.7	-20 to 50	AC: 4	0.10
HB11-M5-2		1.5	0.06	0 to 0.3		DC: 3	
HB21-6-1	Rc1/8	1.6	0.09	0 to 0.7	-20 to 60	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		4.0	0.48				0.69
HB41-8-5	Rc3/8	7.0	0.82	0 to 0.08	-20 to 60	11	0.69
HB41-10-5	Rc1/4						
HB41-8-7	Rc3/8						
HB41-10-7							

How to order

HB 3 1 - 6 - 3 - L - 5A - AC100V

Model no.

A Capacity

B Port size

C Orifice

D Sealant

E Coil variation

F Voltage
*2

<Example of model number>

HB41-8-5-L-3A-DC24V

Model no.: HB41

- A** Capacity : Control volume large
- B** Port size : Rc1/4
- C** Orifice : ϕ 4
- D** Sealant : NBR
- E** Coil variation : Open frame lead wire
- F** Voltage : 24 VDC

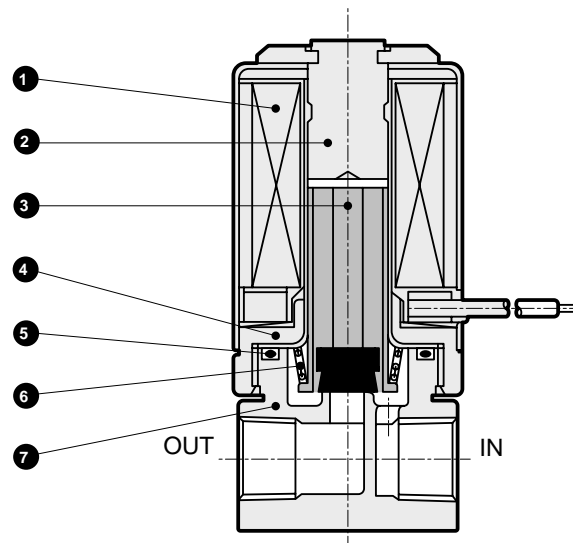
		Model no.			
		HB11	HB21	HB31	HB41
Symbol	Descriptions				
A Capacity					
1	Control volume small	●			
2	Control volume medium-small		●		
3	Control volume medium			●	
4	Control volume large				●
B Port size					
M5	M5	●			
6	Rc1/8		●	●	
8	Rc1/4			●	●
10	Rc3/8				●
C Orifice					
		HB11	HB21	HB31	HB41
1	ϕ 1	ϕ 1.6	-	-	●
2	ϕ 1.5	ϕ 2.3	-	-	●
3	-	ϕ 3.2	ϕ 3	-	●
5	-	-	-	ϕ 4	●
7	-	-	-	ϕ 7	●
D Sealant					
L	NBR	●	●	●	●
M	FKM	●	●	●	●
N	PTFE		●	●	●
E Coil variation					
Blank	Small size	●	●		
5A	Open frame lead wire (diode integrated) for AC voltage			●	●
3A	Open frame lead wire DC voltage			●	●
F Voltage					
AC100V	100 VAC (50/60 Hz)	●	●	●	●
AC200V	200 VAC (50/60 Hz)	●	●	●	●
DC12V	12 VDC	●	●	●	●
DC24V	24 VDC	●	●	●	●

*1: The combinations indicated with ● in the above table are available.

*2: 100 VAC or 200 VAC when **E** is 5A, and 12 VDC or 24 VDC when **E** is 3A.

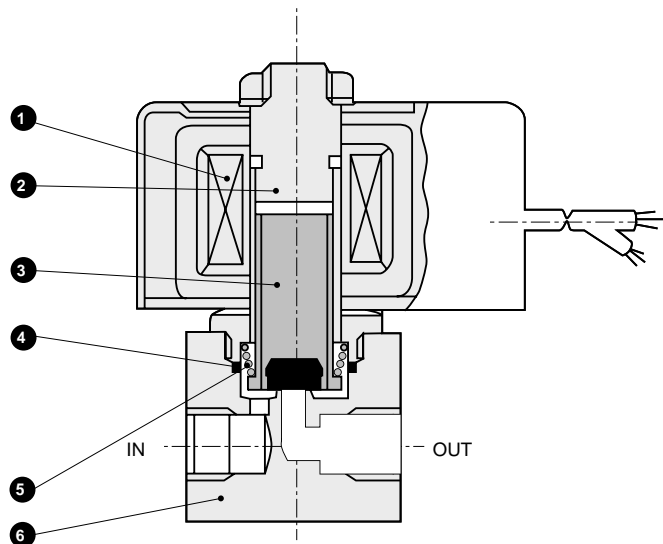
Internal structure and parts list

- HB11
- HB21



No.	Parts name	Material
1	Coil assembly	-
2	Core assembly	SUS316 or equivalent 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

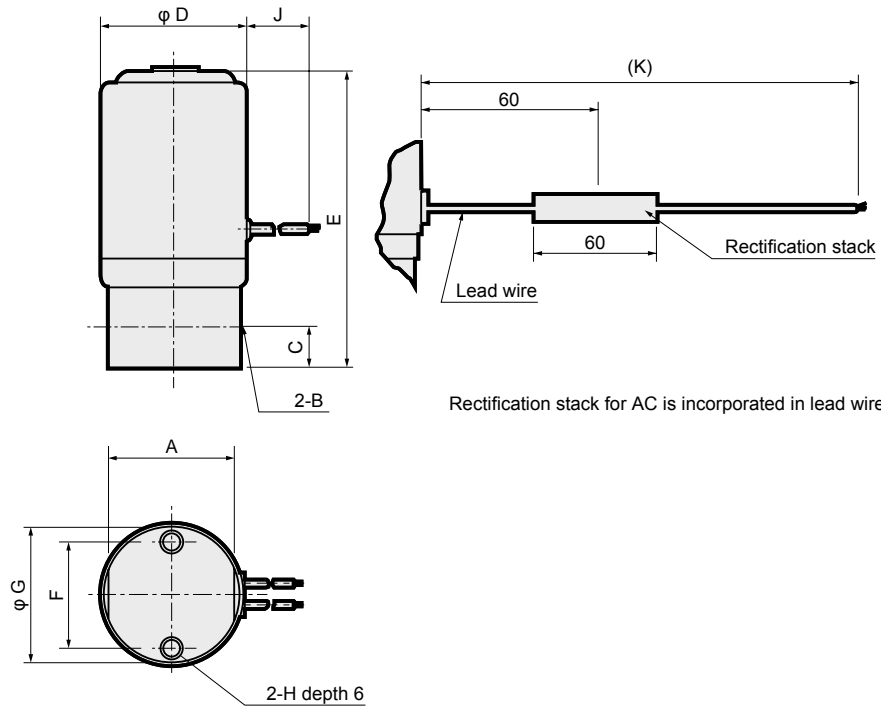


No.	Parts name	Material
1	Coil assembly	-
2	Core assembly	SUS316 or equivalent Stainless steel
3	Plunger assembly	SUS316 or equivalent/NBR (FKM/PTFE) Stainless steel, nitrile rubber (fluoro rubber, tetrafluoroethylene resin)
4	O ring	NBR (FKM/PTFE) Nitrile rubber (fluoro rubber, tetrafluoroethylene resin)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

Dimensions

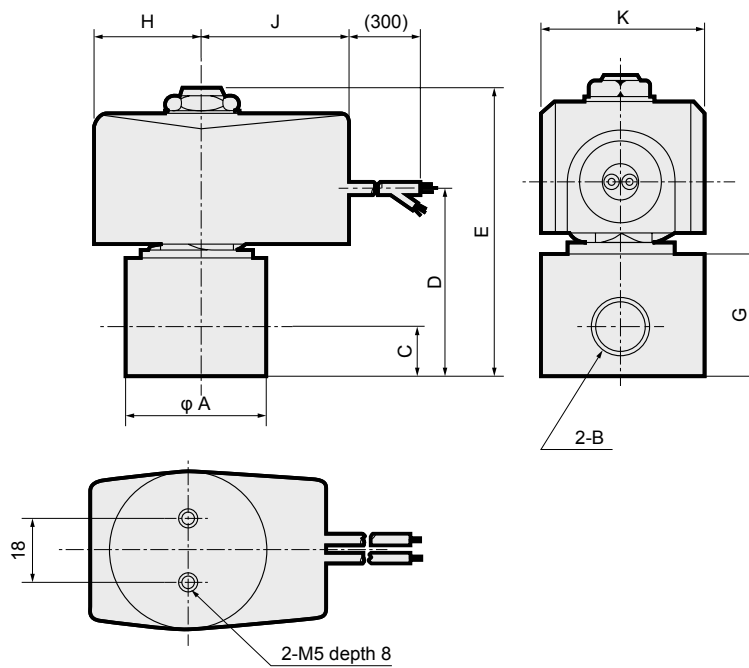


- HB11
- HB21



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

- HB31
- HB41



Model no.	A	B	C	D	E	G	H	J	K
HB31- $\frac{6}{8}$	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- $\frac{8-7}{-10-5/7}$	45	RC1/4 RC3/8	12	55	83.5	34	28	42	46



Compact direct acting 2 port solenoid valve

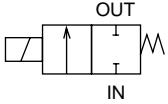
USB2 Series

- NC (normally closed) type
- Port size: M5



JIS symbol

- NC (normally closed) type



Specifications

Item	USB2-M5-1	USB2-M5-2
Working fluid	Air, water, dry air, low vacuum (1.33×10^2 Pa (abs))	
Working pressure differential range MPa	0 to 0.7	0 to 0.3
Withstanding pressure (water) 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 (pneumatic pressure)	
Mounting attitude	Free	
Weight kg	0.07	
Port size	M5	M5
Orifice mm	1	1.5
Cv flow factor	0.03	0.06
C [dm ³ /(s·bar)]	0.13	0.28
b	0.57	0.46

Electric specifications

Rated voltage	12 VDC, 24 VDC (option: 100 VAC 50/60 Hz, 200 VAC 50/60 Hz)	
Allowable voltage fluctuation	± 10%	
Power consumption W	DC	3
	AC	4
Heat proof class	B	

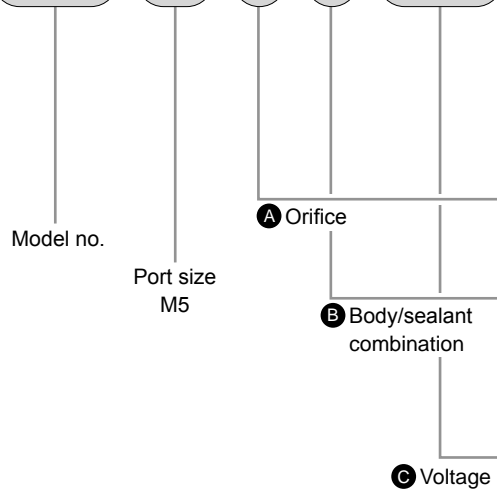
*1: For use with water when the solenoid valve is not used for a long time, the high corrosion resistant solenoid valve HB Series (page 33) is recommended.

*2: Effective sectional area S and sonic conductance C are converted as $S \approx 5.0 \times C$.

*3: When using with a low vacuum, vacuum the OUT port side.

How to order

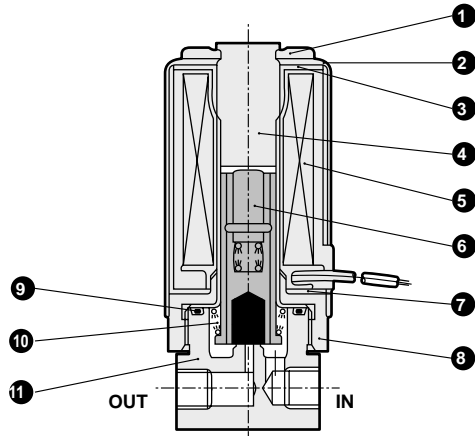
USB2 - M5 - 1 - 0 - DC24V



Symbol	Descriptions		
A Orifice			
1	φ 1.0		
2	φ 1.5		
B Body/sealant combination			
	Body	Sealant	Treatment
Blank	Stainless steel	Nitrile rubber	-
L			Oil free
0	Brass		-
C Voltage			
DC12V	Std.	12 VDC	
DC24V		24 VDC	
AC100V	Option	100 VAC 50/60 Hz	
AC200V		200 VAC 50/60 Hz	

Internal structure and parts list

● USB2-M5



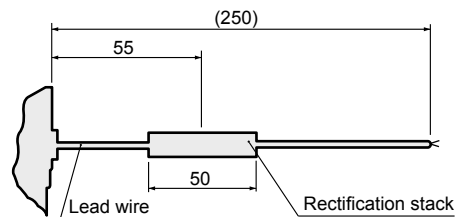
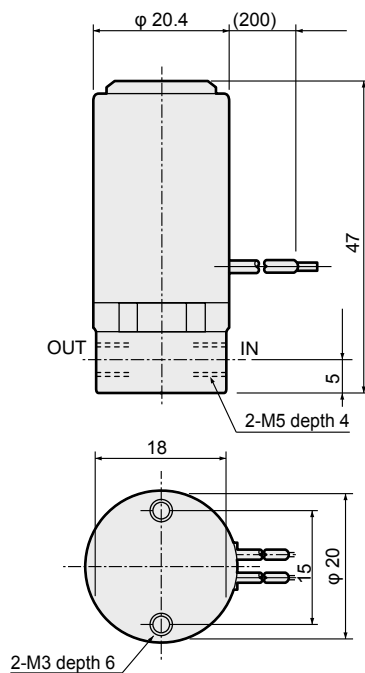
No.	Parts name	Material	
1	Clip	PBT	PBT
2	Bonnet	SPC	Steel
3	Sub core	SPC	Steel
4	Core assembly	SUS405 or equivalent, SUS316L	Stainless steel
5	Coil assembly	-	-
6	Plunger assembly	SUS405 or equivalent, SUS303, NBR	Stainless steel, nitrile rubber
7	Waving washer	S65CM	Steel
8	Core B	SUM22	Free cutting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

() shows option.

Dimensions



● USB2-M5



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



Compact direct acting 2 port solenoid valve

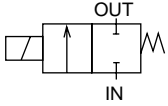
USB3 Series

- NC (normally closed) type
- Port size: Rc1/8



JIS symbol

- NC (normally closed) type



Specifications

Item	USB3-6-1	USB3-6-2	USB3-6-3
Working fluid	Air, water, dry air, low vacuum (1.33×10^2 Pa (abs))		
Working pressure differential range MPa	0 to 0.9	0 to 0.4	0 to 0.1
Withstanding pressure (water) 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 (pneumatic pressure)		
Mounting attitude	Free		
Weight kg	0.13		
Port size	Rc1/8	Rc1/8	Rc1/8
Orifice mm	1.6	2.3	3.2
Cv flow factor	0.09	0.18	0.3
C [dm ³ /(s·bar)]	0.34	0.64	1.2
b	0.56	0.51	0.48

Electric specifications

Rated voltage	12 VDC, 24 VDC (option: 100 VAC 50/60 Hz, 200 VAC 50/60 Hz)	
Allowable voltage fluctuation	± 10%	
Power consumption W	DC	4
	AC	4
Heat proof class	B	

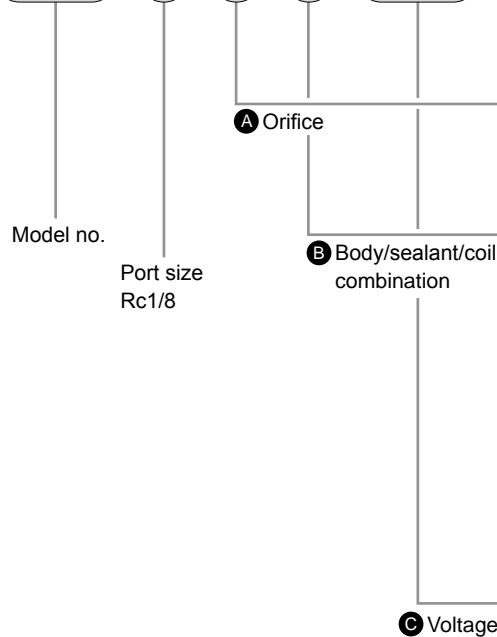
*1: For use with water when the solenoid valve is not used for a long time, the high corrosion resistant solenoid valve HB Series (page 33) is recommended.

*2: Effective sectional area S and sonic conductance C are converted as $S \approx 5.0 \times C$.

*3: When using with a low vacuum, vacuum the OUT port side.

How to order

USB3 - 6 - 1 - B - DC24V

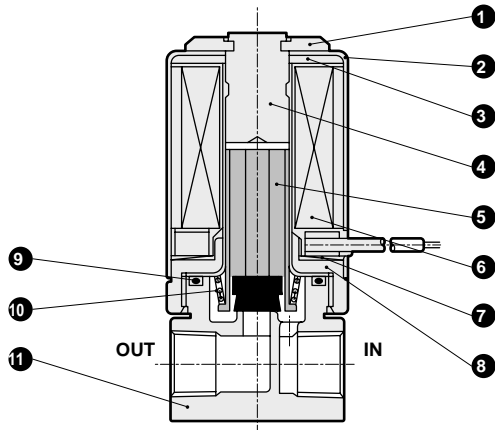


Symbol	Descriptions				
A Orifice					
1	φ 1.6				
2	φ 2.3				
3	φ 3.2				
B Body/sealant/coil combination					
		Body	Sealant	Coil	Treatment
Blank	Std.	Brass	Nitrile rubber	Taped	-
B	Option		Fluoro rubber		
V			Stainless steel	Nitrile rubber	
D		Fluoro rubber			
E		Fluoro rubber			
W		Fluoro rubber	Brass	Taped	Oil free
H	Nitrile rubber				
J	Fluoro rubber				
L	Stainless steel	Nitrile rubber	Molded coil	Oil free	
M		Fluoro rubber			
C Voltage					
DC12V	Std.	12 VDC			
DC24V		24 VDC			
AC100V	Option	100 VAC 50/60 Hz			
AC200V		200 VAC 50/60 Hz			

*: For option symbols V and W, vacuum is inspected at "leakage amount: 1.33×10^{-6} Pa·m³/s or less".

Internal structure and parts list

● USB3-6



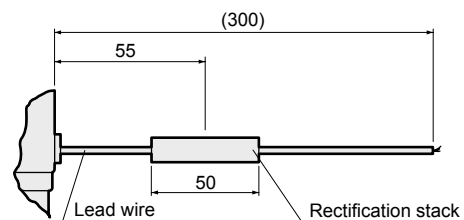
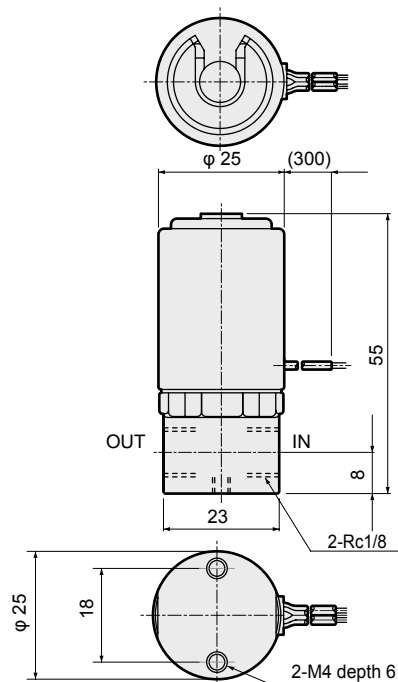
No.	Parts name	Material	
1	Clip	PBT	PBT
2	Bonnet	SPC	Steel
3	Bonnet piece	SPC	Steel
4	Core assembly	SUS316, SUS405 or equivalent	Stainless steel
5	Plunger assembly	SUS405 or equivalent, NBR (FKM)	Stainless steel, nitrile rubber (fluoro rubber)
6	Coil assembly	-	-
7	Waving washer	S65CM	Steel
8	Core B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

() shows option.

Dimensions



● USB3-6



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



Compact direct acting 3 port solenoid valve

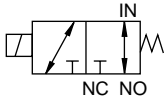
USG2 Series

- Universal type
- Port size: M5



JIS symbol

- Universal type



Specifications

Item	USG2-M5-1	USG2-M5-2
Working fluid	Air, water, dry air, low vacuum (1.33 × 10 ² Pa (abs))	
Working pressure differential range MPa	0 to 0.7 (0 to 0.3 when NO pressurized)	0 to 0.3 (0 to 0.1 when NO pressurized)
Withstanding pressure (water) 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 (pneumatic pressure)	
Mounting attitude	Free	
Weight kg	0.07	
Port size	M5	M5
Orifice mm	1	1.5
Cv flow factor	0.03	0.06
C [dm ³ /(s·bar)]	0.13	0.28
b	0.57	0.46

Electric specifications

Rated voltage	12 VDC, 24 VDC (option: 100 VAC 50/60 Hz, 200 VAC 50/60 Hz)	
Allowable voltage fluctuation	± 10%	
Power consumption W	DC	3
	AC	4
Heat proof class	B	

*1: Contact CKD when using water and the solenoid valve is not used for a long time.

*2: When using in a continuous energized state, use a fluoro rubber seal. Contact CKD for details.

*3: Effective sectional area S and sonic conductance C are converted as $S \approx 5.0 \times C$.

How to order

USG2 - M5 - 1 - 0 - DC24V

Model no.

Port size
M5

A Orifice

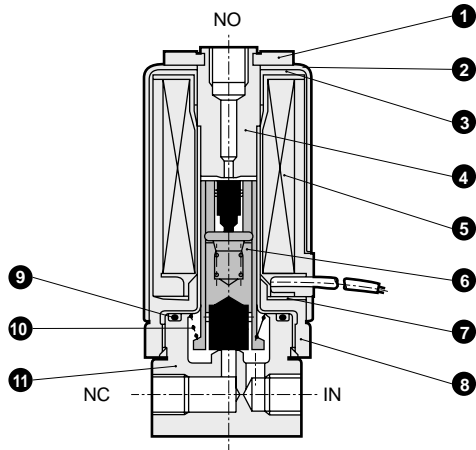
B Body/sealant combination

C Voltage

Symbol	Descriptions	
A Orifice		
1		φ 1.0
2		φ 1.5
B Body/sealant combination		
	Body	Sealant
Blank	Stainless steel	Nitrile rubber
0	Brass	Nitrile rubber
C Voltage		
DC12V	Std.	12 VDC
DC24V		24 VDC
AC100V	Option	100 VAC 50/60 Hz
AC200V		200 VAC 50/60 Hz

Internal structure and parts list

● USG2-M5



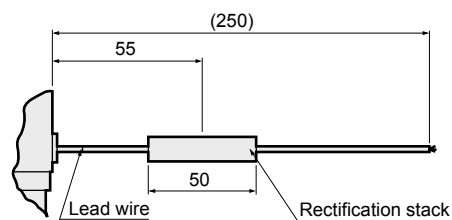
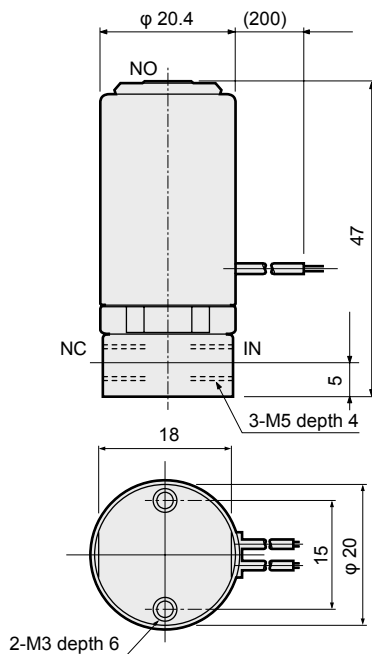
No.	Parts name	Material	
1	Clip	PBT	PBT
2	Bonnet	SPC	Steel
3	Sub core	SPC	Steel
4	Core assembly	SUS316, SUS405 or equivalent	Stainless steel
5	Coil assembly	-	-
6	Plunger assembly	SUS405 or equivalent, NBR	Stainless steel, nitrile rubber
7	Waving washer	S65CM	Steel
8	Core B	SUM22	Free cutting steel
9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

() shows option.

Dimensions



● USG2-M5



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



Compact direct acting 3 port solenoid valve

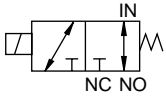
USG3 Series

- Universal type
- Port size: Rc1/8



JIS symbol

- Universal type



Specifications

Item	USG3-6-1	USG3-6-2
Working fluid	Air, water, dry air, low vacuum (1.33×10^2 Pa (abs))	
Working pressure differential range MPa	0 to 0.7 (0 to 0.3 when NO pressurized)	0 to 0.3 (0 to 0.1 when NO pressurized)
Withstanding pressure (water) 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 (pneumatic pressure)	
Mounting attitude	Free	
Weight kg	0.14	
Port size	Rc1/8	Rc1/8
Orifice mm	1.2	1.8
Cv flow factor	0.05	0.1
C [dm ³ /(s·bar)]	0.19	0.42
b	0.57	0.5

Electric specifications

Rated voltage	12 VDC, 24 VDC (option: 100 VAC 50/60 Hz, 200 VAC 50/60 Hz)	
Allowable voltage fluctuation	± 10%	
Power consumption W	DC	4
	AC	4
Heat proof class	B	

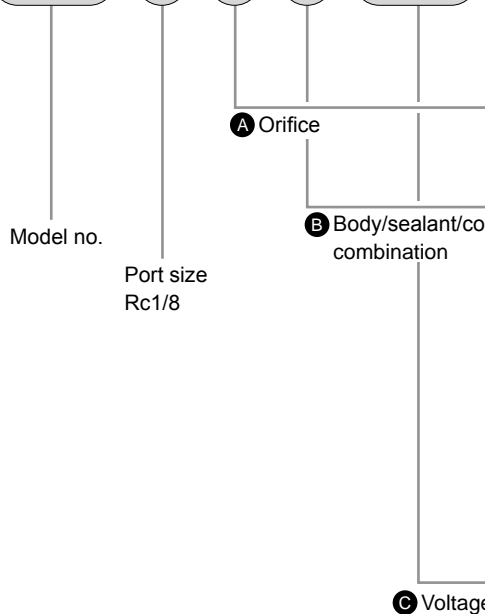
*1: Contact CKD when using water and the solenoid valve is not used for a long time.

*2: When using in a continuous energized state, use a fluoro rubber seal.

*3: Effective sectional area S and sonic conductance C are converted as $S \approx 5.0 \times C$.

How to order

USG3 - 6 - 1 - B - DC24V

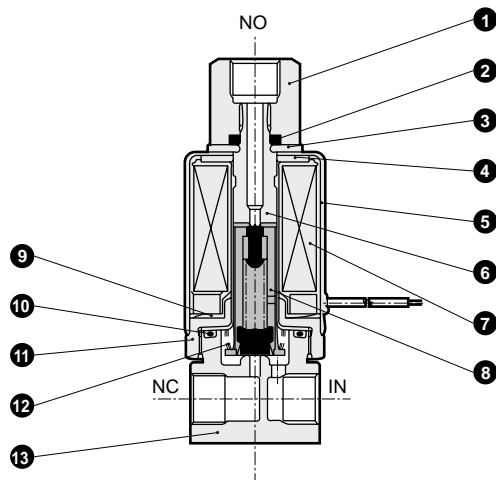


Symbol	Descriptions				
A Orifice					
1	φ	1.2			
2	φ	1.8			
B Body/sealant/coil combination					
		Body	Sealant	Coil	Treatment
Blank	Std.	Brass	Nitrile rubber	Taped	-
B	Option		Fluoro rubber	Molded coil	
V			Stainless steel		Nitrile rubber
D		Fluoro rubber			Vacuum inspection*
E		Brass	Nitrile rubber	Taped	Oil free
W			Fluoro rubber	Molded coil	
H	Stainless steel		Nitrile rubber		
J		Fluoro rubber			
L	Stainless steel	Nitrile rubber			
M		Fluoro rubber			
C Voltage					
DC12V	Std.	12 VDC			
DC24V		24 VDC			
AC100V	Option	100 VAC 50/60 Hz			
AC200V		200 VAC 50/60 Hz			

*: For option symbols V and W, vacuum is inspected at "leakage amount: 1.33×10^{-6} Pa·m³/s or less".

Internal structure and parts list

● USG3-6



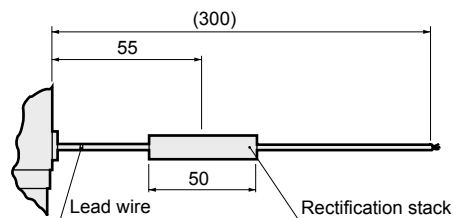
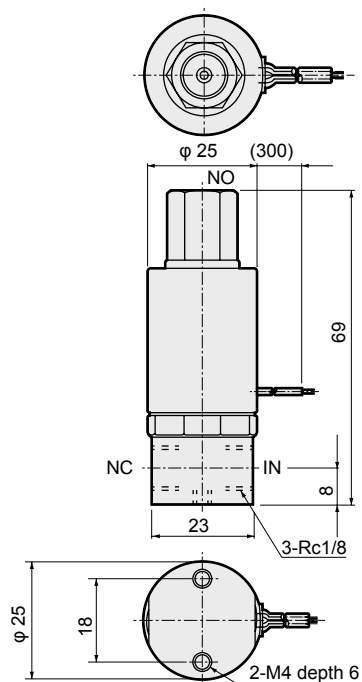
No.	Parts name	Material	
1	Socket	C3604 (SUS303)	Brass (stainless steel)
2	O ring	NBR (FKM)	Nitrile rubber (fluoro rubber)
3	Washer	SPC	Steel
4	Bonnet piece	SPC	Steel
5	Bonnet	SPC	Steel
6	Core assembly	SUS316, SUS405 or equivalent	Stainless steel
7	Coil assembly	-	-
8	Plunger assembly	SUS405 or equivalent, NBR (FKM)	Stainless steel, nitrile rubber (fluoro rubber)
9	Waving 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)	Brass (stainless steel)

() shows option.

Dimensions



● USG3-6



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



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

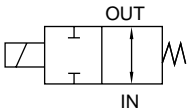
HYN Series

- NO (normally closed) type, NC (normally closed) type, universal type
- Working fluid: water, pure water, chemical liquids
- Tube mounting and removal method and applicable tube: $\phi 2 \times \phi 0.5$, $\phi 3 \times \phi 1$, $\phi 5 \times \phi 3$, $\phi 8 \times \phi 6$

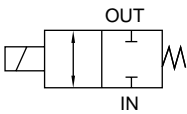


JIS symbol

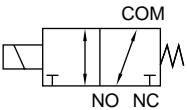
- 2 port valve
: NO (normally open) type



- 2 port valve
: NC (normally closed) type



- 3 port valve
: universal type



Common specifications

Item	HYN-2		HYN-3		HYN-5		HYN-8	
	AC	DC	AC	DC	AC	DC	AC	DC
Working fluid	Water, pure water, chemical liquids (fluids that do not corrode materials at wetted parts)							
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 cycle/min.	60 or less (*2)							
Mounting attitude	Free (*4)							
Electric specifications								
Rating	Continuous	Continuous	Continuous	Continuous	Intermittent (*3)	Continuous	Intermittent (*3)	Continuous
Voltage	100 V (50/60 Hz)	12 V 24 V	100 V (50/60 Hz)	12 V 24 V	100 V (50/60 Hz)	12 V 24 V	100 V (50/60 Hz)	12 V 24 V
Voltage fluctuation range	-10 to +10% of rated voltage							
Leakage current mA	2 or less							

*1: Read the safety precautions for HYN (page 50).

*2: Use at a cycle of ON for 0.5 seconds or more and OFF for 0.5 seconds or more.

*3: Keep the intermittent rating at 10 minutes or less for maximum continuous energizing, and one half or less of the DUTY ratio.

*4: Avoid vertical installation with the coil facing down.

*5: Tighten the set screw with the recommended tightening torque below. Recommended tightening torque: HYN-2/3: 0.2 to 0.4 N·m, HYN-5/8: 0.5 to 0.7 N·m

*6: The performance may not be satisfied if a tube other than the recommended ones is used.

*7: Do not disassemble the product.

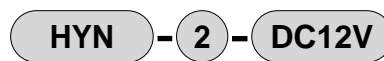
Individual specifications

Item	Applicable tube (*) (silicon tube)	Working pressure (MPa)	Power consumption 12/24 VDC (W)		Max. ampere 100 VAC (A)		Insulation class	Weight (kg)
			Suction (0.2 s)	Holding	Suction (0.2 s)	Holding		
HYN-2	$\phi 2 \times \phi 0.5$	0 to 0.05	3.6	3.6	0.06	0.06	Class 130 (B)	0.12
HYN-3	$\phi 3 \times \phi 1$		15	4	0.26		Class 120 (E)	0.18
HYN-5	$\phi 5 \times \phi 3$	0 to 0.02	30	8	0.55	0.14	Class 130 (B)	0.36
HYN-8	$\phi 8 \times \phi 6$		30	8				0.37

*: Use the following recommended applicable tubes.

Model of tube	Tube size (OD) × (ID) × (length)
HYN-2-0.5-1000	$\phi 2 \times \phi 0.5 \times 1$ m
HYN-2-0.5-5000	$\phi 2 \times \phi 0.5 \times 5$ m
HYN-3-1-1000	$\phi 3 \times \phi 1 \times 1$ m
HYN-3-1-5000	$\phi 3 \times \phi 1 \times 5$ m
HYN-5-3-1000	$\phi 5 \times \phi 3 \times 1$ m
HYN-5-3-5000	$\phi 5 \times \phi 3 \times 5$ m
HYN-8-6-1000	$\phi 8 \times \phi 6 \times 1$ m
HYN-8-6-5000	$\phi 8 \times \phi 6 \times 5$ m

How to order



Model no.

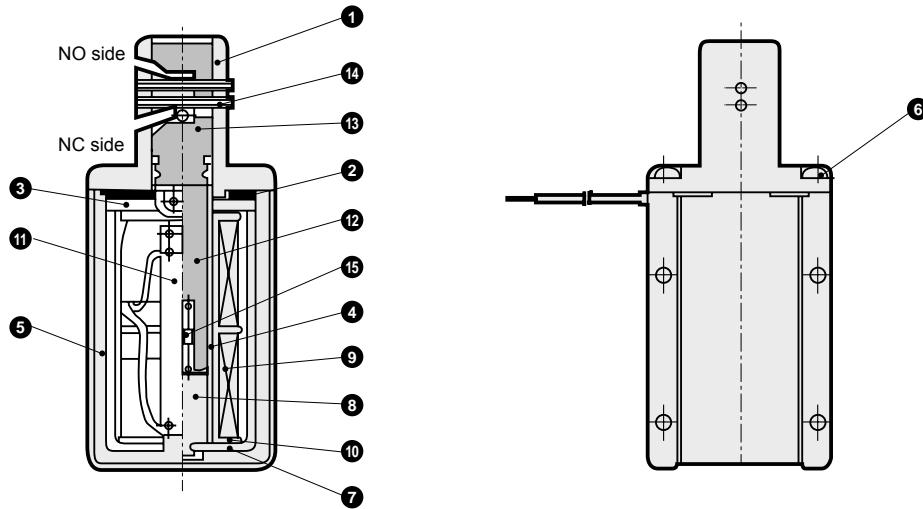
A Applicable tube

B Voltage

Symbol	Descriptions
A Applicable tube	
2	$\phi 2 \times \phi 0.5$
3	$\phi 3 \times \phi 1$
5	$\phi 5 \times \phi 3$
8	$\phi 8 \times \phi 6$
B Voltage	
AC100V	100 VAC (50/60 Hz)
DC12V	12 VDC
DC24V	24 VDC

Internal structure and parts list

● HYN

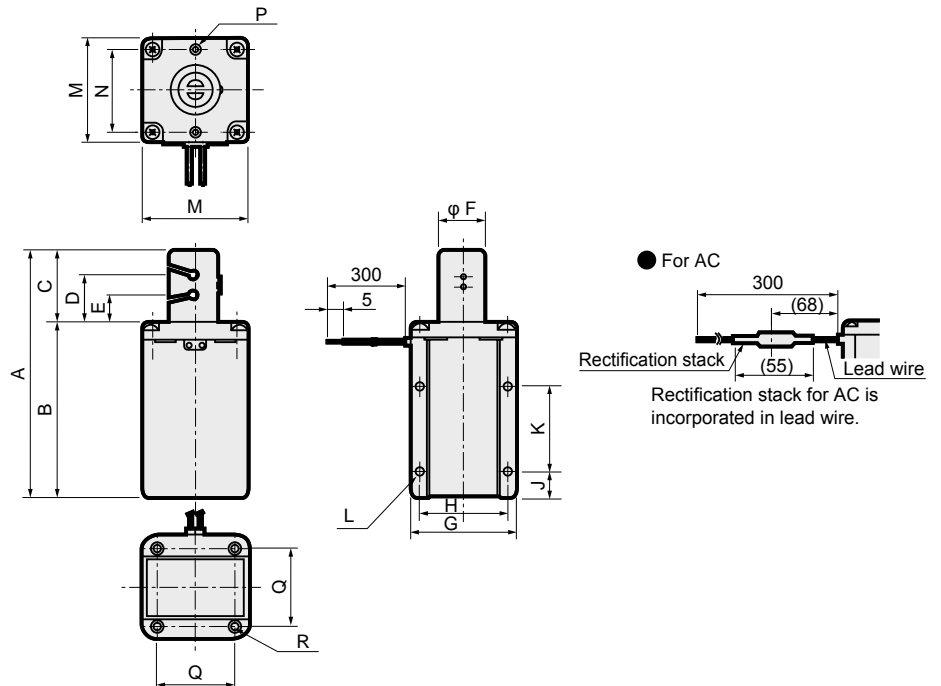


No.	Parts name	Material	No.	Parts name	Material
1	Valve A	POM Acetal resin	9	Coil	-
2	Packing seal	NBR Nitrile rubber	10	Bobbin	PET Polyethylene
3	Frame B	SPC Steel	11	Electric components assembly	-
4	Plunger guide	C2700 Copper	12	Plunger	SUS405 Stainless steel
5	Cover	PA Polyamide	13	Valve B	POM Polyacetal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

Dimensions



● HYN



Model no.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
HYN-2	72.9	52.9	20	14.1	8.5	14	30	24	8	24	4-M3 depth 7	30	24	2-M3 depth 5	-	-
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

MEMO



Safety precautions

Always read this section before starting use.

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




WARNING

- 1** This product is designed and manufactured as a general industrial machine part. It must be handled by an operator having sufficient knowledge and experience in handling.
 - 2** Use this product in accordance with specifications.

This product must be used within its stated specifications. It must not be modified or machined. This product is intended for use as a general-purpose device for industrial machine or parts. It is not intended for use outdoors (not applied for outdoor specification products) or for use under the following conditions or environment. (If you consult CKD upon adoption and consent to CKD product specifications, it will be applicable; however, safeguards should be adopted that will circumvent dangers in the event of failure.)

 - 1** Use for special applications including nuclear energy, railway, aircraft, marine vessel, vehicle, medicinal devices, devices or applications coming into contact with beverages or foodstuffs, amusement devices, emergency shutoff circuits, press machine, brake circuits, or for safeguard.
 - 2** Use for applications where life or assets could be adversely affected, and special safety measures are required.
 - 3** Observe corporate standards and regulations, etc., related to the safety of device design and control, etc.

ISO 4414, JIS B 8370 (pneumatic system rules)
JFPS2008 (Principles for pneumatic cylinder selection and use)
Including High Pressure Gas Maintenance Law, Occupational Safety and Sanitation Laws, other safety rules, body standards and regulations, etc.
 - 4** Do not handle, pipe, or remove devices before confirming safety.
 - 1** Inspect and service the machine and devices after confirming safety of the entire system related to this product.
 - 2** Note that there may be hot or charged sections even after operation is stopped.
 - 3** When inspecting or servicing the device, turn off the energy source (air supply or water supply), and turn off power to the facility. Discharge any compressed air from the system, and pay attention to possible water leakage and leakage of electricity.
 - 4** When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.
 - 5** Observe warnings and cautions on the pages below to prevent accidents.
- The safety cautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

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

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

Limited warranty and disclaimer

- 1** Warranty period
"Warranty Period" is one (1) year from the first delivery to the customer.
- 2** Scope of warranty
In case any defect attributable to CKD is found during the term of warranty.
Note that the following faults are excluded from the warranty term:
 - (1) Product abuse/misuse contrary to conditions/environment recommended in its catalogs/specification
 - (2) Failure caused by other than the delivered product
 - (3) Use other than original design purposes.
 - (4) Third-party repair/modification.
 - (5) Faults caused by reason that is unforeseeable with technology put into practical use at the time of delivery.
 - (6) Failure attributable to force majeure.The warranty mentioned here covers the discrete delivered product. Only the scope of warranty shall not cover losses induced by the failure of the delivered product.
- 3** Compatibility confirmation
In no event shall CKD be liable for merchantability or fitness for a particular purpose, notwithstanding any disclosure to CKD of the use to which the product is to be put.



Safety precautions

Fluid control components: Warnings, cautions

Always read this section before starting use.

Design & Selection

⚠ WARNING

1 Working environment

Provide appropriate guarding measures when using in an environment where the product could be subject to water drip.

⚠ CAUTION

- (1) Make sure that fluids do not adhere to the product body.
- (2) Carefully select the solenoid valve taking the chemical characteristics into consideration (presence of crystal deposits when chemicals dry, effect to solenoid valve component materials if chemicals evaporate, etc.).
- (3) When using these components for chemicals having a low boiling point, such as hexane, the chemicals in the solenoid valve could evaporate due to heating of the coils, and cause bubbles, etc., in the solenoid valve and pipe. Use the air operated valve AMD for chemicals if formation of bubbles, etc., poses a problem.
- (4) When using the solenoid valve with a negative pressure, such as for dispensing control, air may be sucked into the solenoid valve depending on the type of chemical, type of connection fitting, and type of tube, etc. Check the state carefully before starting use.

■ Working pressure and proof pressure

Working pressure and proof pressure are listed in below. Carefully select the model taking these pressure value into consideration.

Working pressure: pressure to allow valve open and close operation successfully.

Proof pressure: pressure that valve can endure without any functional or performance debasement.

Even the pressure higher than the working pressure temporarily, the specifications listed in catalog is fulfilled when used after coming back to the working pressure.

Installation, piping & wiring

⚠ CAUTION

1 Tighten the piping with the following torques.

In case the body of solenoid is made from resin, use resin fittings. The port could be damaged if a metal joint is used.

<For stainless steel solenoid valve bodies>

Nominal diameter of piping	Recommended value of tightening torque (N·m)
M5	2.1 to 3
Rc1/8	18 to 20
Rc1/4	23 to 25
Rc3/8	31 to 33

<For vinyl chloride solenoid valve bodies>

Nominal diameter of piping	Recommended value of tightening torque (N·m)
R3/8	1.5 to 2.0
R1/2	2.0 to 2.5
R3/4	2.5 to 3.0

<For fluorine resin solenoid valve bodies>

Nominal diameter of piping	Recommended value of 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
R3/4	2.0 to 2.5

<For PPS, PEEK solenoid valve bodies>

Nominal diameter of piping	Recommended value of tightening torque (N·m)
M5, M6	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

<Precautions per individual model>

Safety precautions for MR10

⚠ CAUTION

- (1) Check compatibility between the material of each components and working fluid.
- (2) Do not use for hydrochloric acid, hydrofluoric acid, nitric acid, sodium hypochlorite (soda), solvents.
- (3) Foreign matter etc. inside pipe may cause malfunction and valve seat leakage. Please securely implement air flushing.
- (4) When standing secondary piping, do not make it higher than 2 m. Use tubing or pipes with a bore the same size or larger than the orifice diameter, and fix the pipe in place.
- (5) Do not disassemble the product.
The required performance may not be satisfied even if a disassembled product is reassembled.

Safety precautions for MAB1, MAG1

⚠ 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 the AMD type air operated valve for chemicals. Vaporized corrosive gas could permeate a seat of diaphragm and result actuator part corrosion.
- (3) Consult with CKD if the secondary piping is laid at a high level or extremely restricted.
- (4) Do not disassemble the product.
The required performance may not be satisfied even if a disassembled product is reassembled.

Safety precautions for MYB¹_{2/3}, MYG¹_{2/3}, MEB2, MEG2

⚠ CAUTION

- (1) Check compatibility between the material of each components and working fluid.
Working fluid must not adhere to main 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) Do not use metal fittings. They could damage the port. Use a PP or fluorine resin joint.
Tighten the joint connection using the recommended torque.
- (4) When using strong acids such as hydrochloric acid, hydrofluoric acid or nitric acid, or sodium hypochlorite (soda), use the AMD type air operated valve for chemicals.
- (5) Leakage current from the control circuit must be less than that specified for each voltage.
- (6) Consult CKD if the secondary piping is laid at a high level (2 m and over) or extremely restricted.
- (7) Do not disassemble the product.
The required performance may not be satisfied even if a disassembled product is reassembled.

Safety precautions for HMTB, HMTG

CAUTION

- (1) Use a direct current power supply excluding rectified direct current.
- (2) Do not apply excessive force on the joint when connecting or disconnecting the tube.
- (3) Do not disassemble the product.
The required performance may not be satisfied even if a disassembled product is reassembled.
- (4) When using strong acids such as hydrochloric acid, hydrofluoric acid or nitric acid, or sodium hypochlorite (soda), use the AMD type air operated valve for chemicals.

Safety precautions for UMB, UMG

CAUTION

- (1) Do not disassemble the product.
The required performance may not be satisfied even if a disassembled product is reassembled.
- (2) Do not apply torque more than 0.3 N·m to 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), use the AMD type air operated valve for chemicals.

Safety precautions for HB

CAUTION

- (1) Foreign matter etc. inside pipe may cause malfunction and valve seat leakage. Always flush the piping before installing the valve.
- (2) Do not disassemble the product.
The required performance may not be satisfied even if a disassembled product is reassembled.
- (3) When using strong acids such as hydrochloric acid, hydrofluoric acid or nitric acid, or sodium hypochlorite (soda), use the AMD type air operated valve for chemicals.

Safety precautions for HYN

CAUTION

- (1) Use the power supply voltage within the average 24 VDC value and 4.8 VP-P ripple (when using an average 12 VDC value, the ripple must be within 2.4 VP-P).
- (2) When using a DC-specification product with a full wave rectified AC power supply, the power must be smoothed to attain the forementioned ripple voltage range. Consult with CKD for more information.
- (3) Tighten the HYN-2, 3 screw with a torque of 0.2 to 0.4 N·m, and the HYN-5, 8 screw with a torque of 0.5 to 0.7 N·m. (when screws mesh for 5 mm length)
- (4) Insert the tube securely to the specified position.
- (5) The performance may not be satisfied if a non-recommended tube is used.
- (6) Depending on the working fluid, the silicon tube may not be resistant to the chemicals, or the chemicals may adhere. Confirm this state before starting use.
- (7) The DC-specification product has a polarity. (red = ⊕)
- (8) Do not disassemble the product.
The required performance may not be satisfied even if a disassembled product is reassembled.
- (9) Do not apply water on the coils.
- (10) The noise-resistance crest values are shown below.

(excluding HYN-2)

Rated voltage	Noise-resistance crest value (with 1 μsec pulse width)
12 VDC	120 V
24 VDC	200 V
100 VAC	1000 V

When using this product with an electrical circuit that generates noise (instantaneous overvoltage) exceeding this crest value, the transistor circuit board could be damaged causing an overvoltage to flow and burn the coils.

- (11) If the product is left for a long time with silicon tube fixed, the silicon tube will adhere and cannot be opened. In case the tube is adhered, replace the tube or remedy to remove adhering by applying pressure or manually.
- (12) Do not apply higher pressure than the working pressure. Otherwise, tube may come off.

Related products

Solenoid valve for sterilizer

Pilot solenoid valve for steam SPK Series

Pilot solenoid valve customized for controlling steam

- 1 million cycle-life
Improved durability drastically by optimizing solenoid mechanism
- Improved external seal functionality
Adoption of high temperature and steam resistant PTFE square rings
- Low power consumption
Delivered lower wattage by improved efficiency of pilot valve dedicated for steam

Catalog no. CC-1068A



Silent solenoid valve for low pressure steam FSB Series **Custom order**

Silent type direct acting solenoid valve for low pressure steam and hot water

- Prevent beating sound
Prevent beating sound by coil with full wave rectifier
- Silent specifications
Reduce absorbing noise by impact attenuating structure
- Heatproof specifications
Adopted coil worth to thermal class
- High sealant
Delivered high sealant by adopting rubber sealing for high temperature

Catalog no. CC-1157A



For oxygen concentrator

Pilot operated solenoid valve for compressed air EXA Series **Custom order**

Supporting oxygen concentrator compactly with compact large-flow rate and dedicated manifold

- Compact and light weight
Light weight resin manifold by integrating 4 solenoid valves compactly
- Reducing piping man-hours
Integrated fitting reducing piping man-hours.
- Low power consumption
0.6 W/solenoid valve power consumption

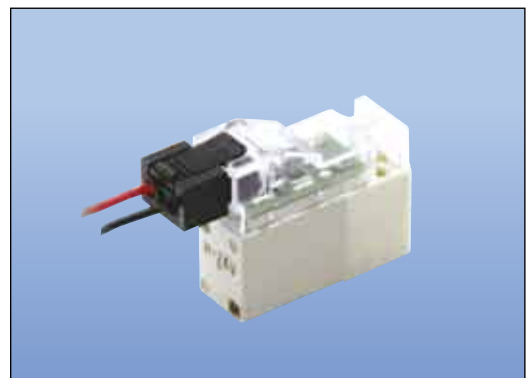


Compact pneumatic 3 port valve for oxygen 3QB Series **Custom order**

Usable safely for oxygen by oil-prohibited

- Compact, light weight
Valve width 10 mm, discrete weight 12.5 g
- Long service life
Nominal service life of 20 million + cycles (in environment of using oxygen)
- Customized
Customizable by each request

Catalog no. CC-842A



Related products

Equipment for analysis/investigation

Metal free solenoid valve for chemical liquids MJB3 Series

Metal free 2 port direct acting solenoid valve for chemical liquids

- Metal free structure
Adopted silicone rubber, PSU as a material for wetted parts
- Easy connection
Fittings (inner diameter × outer diameter = φ 4 × φ 8) attached
Recommended tube: silicone tube
(inner diameter × outer diameter = φ 5 × φ 11)

Catalog no. CB-03-1SA



Compact high corrosion resistance 2 port direct acting solenoid valve TRV Series

- Ideal for water controlling in medical/analytic equipments
- Ensure the corrosion resistance
Adopted SUS, FKM, PPS for wetted parts
- High durability
3.5 million-cycle life (durability conditions: room temperature, water pressure 0.3 MPa, ON/OFF frequency = 0.5 sec./0.5 sec.)

Catalog no. CC-1130A



Compact DD motor ABSODEX AX6000M Series

Desktop type compact DD actuator to meet many requests for "handy" and "compact" in parts assembling and shipping processes of facilities and equipments

- The most compact size in the industry
One size smaller than business card (87 mm diameter, 40 mm height)
- High reliability
No need to worry about attrition by gear-less structure
- Reducing assembling man-hours
Positioning pin hole and spigot are equipped as a standard
- Rich I/O signals
Ability to control with pulse controller

Catalog no. CC-1148A



Solenoid valves for various gas

Proportional control valve A2-6500 Series

Custom order

- Ability to control various gas
Working fluid: compressed air/inert gas
- Proportional control
Ability of no-stage flow control proportional to the current
- Variety of applications
Multi-stage flow rate control and adequate flow rate control contributes energy-saving and cutting waste of equipments

Catalog no. CC-1052A





CKD Corporation

Website <http://www.ckd.co.jp/>

- ☐ OVERSEAS SALES ADMINISTRATION DPT.
SALES AND MARKETING DIV. 2-250 Uji Komaki, Aichi 485-8551, Japan
- ☐ PHONE +81-(0)568-74-1338 FAX +81-(0)568-77-3461

U.S.A.
CKD USA CORPORATION
 ● CHICAGO HEADQUARTERS
 4080 Winnetka Avenue, Rolling Meadows, IL 60008, USA
 PHONE +1-847-368-0539 FAX +1-847-788-0575

EUROPE
CKD CORPORATION EUROPE BRANCH
 De Fruittuinen 28 Hoofddorp, the Netherlands
 PHONE +31-(0)23-5541490 FAX +31-(0)23-5541491

Malaysia
M-CKD PRECISION SDN.BHD.
 ● HEAD OFFICE
 Lot No.6, Jalan Modal 23/2, Seksyen 23, Kawasan MIEL,
 Fasa 8, 40300 Shah Alam, Selangor Darul Ehsan, Malaysia
 PHONE +60-(0)3-5541-1468 FAX +60-(0)3-5541-1533

Thailand
CKD THAI CORPORATION LTD.
 ● SALES HEADQUARTERS
 Suwan Tower, 14/1 Soi Saladaeng 1, North Sathorn Road, Kwaeng
 Silom, Khet Bangrak, Bangkok 10500, Thailand
 PHONE +66-(0)2-267-6300 FAX +66-(0)2-267-6305

Singapore
CKD SINGAPORE PTE. LTD.
 No.33 Tannery Lane #04-01 Hoesteel Industrial Building, Singapore 347789,
 Singapore
 PHONE +65-67442623 FAX +65-67442486
CKD CORPORATION BRANCH OFFICE
 No.33 Tannery Lane #04-01 Hoesteel Industrial Building, Singapore 347789,
 Singapore
 PHONE +65-67447260 FAX +65-68421022

Taiwan
TAIWAN CKD CORPORATION
 16F-3, No. 7, Sec. 3, New Taipei Blvd., Xinzhuang Dist., New Taipei City 242,
 Taiwan
 PHONE +886-(0)2-8522-8198 FAX +886-(0)2-8522-8128

China
CKD (SHANGHAI) CORPORATION
 ● SALES HEADQUARTERS / SHANGHAI OFFICE
 Room 601, Yuanzhongkeyan Building, No. 1905 Hongmei Road, Xinhui District,
 Shanghai 200233, China
 PHONE +86-(0)21-61911888 FAX +86-(0)21-60905356

Korea
CKD KOREA CORPORATION
 ● HEADQUARTERS
 (3rd Floor), 44, Sinsu-ro, Mapo-gu, Seoul 121-856, Korea
 PHONE +82-(0)2-783-5201~5203 FAX +82-(0)2-783-5204

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