

Compact Pilot Operated Solenoid Valve for Water FWD Series

New Product

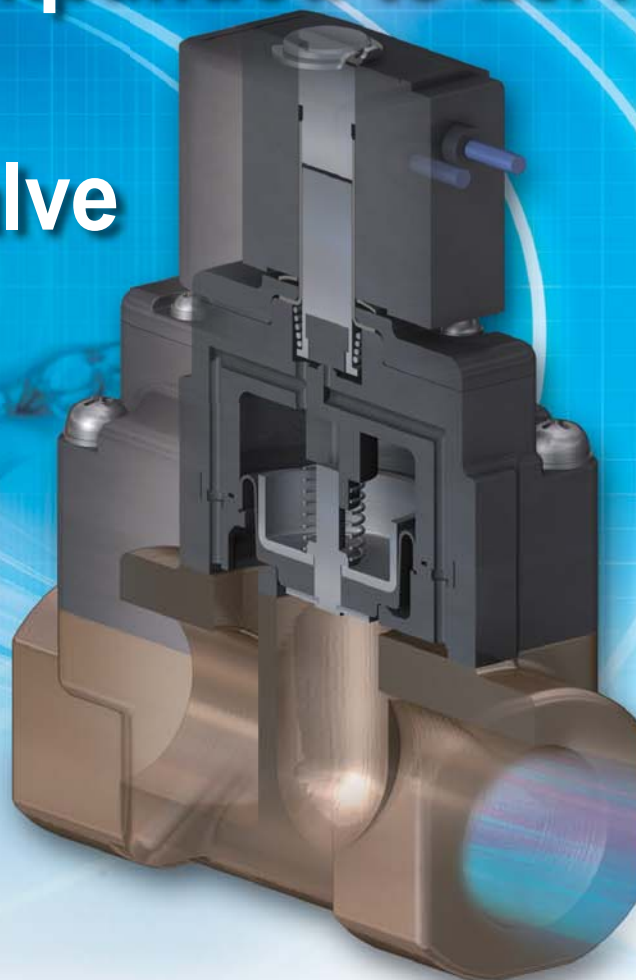
COMPACT PILOT OPERATED SOLENOID VALVE FOR WATER

Lightweight and large flow rate,
low power consumption
Improved corrosion resistance!

Reduced by
1/3
(CKD comparison)



Product lineup expanded to 25A! Eco-friendly CKD solenoid valve



Ecology

Low power consumption

Power consumption

Power consumption reduced to **4W!** (DC)

Reduced by
1/3
(CKD comparison)

Compact and lightweight

Product size

56x38x91mm (15A)

Reduced by
1/3
(CKD comparison)

Weight

390g (15A)

Reduced by
1/3
(CKD comparison)



Specially designed for water

Improved corrosion resistance

Uses specialized high corrosion proof magnetic material to improve corrosion resistance.

Body material

Brass (bronze) or stainless steel are available.

Large flow rate

Specially formed diaphragm provided

Specially formed diaphragm enables handling of large flow despite its compact size

Cv flow factor 6.0 (15A)



Compact Pilot Operated Solenoid Valve for Water

FWD Series

- NC (Normally closed)
- Port size: Rc1/4 to Rc1



Specifications

Descriptions	FWD11-8A	FWD11-10A	FWD11-15A	FWD11-20A	FWD11-25A	
Actuation	NC (normally closed)					
Working fluid	Water (other than sewage, agricultural water, liquid manure, antifreeze)					
Working pressure differential range	MPa	0.02 to 0.7				
Max. working pressure	MPa	0.7				
Pressure resistance (water)	MPa	1.05				
Fluid temperature	°C	5 to 60 (no freezing)				
Ambient temperature	°C	-10 to 60 (no freezing of fluid)				
Atmosphere	Area without corrosive or explosive gases					
Valve structure	Pilot operated poppet structure diaphragm structure					
Valve seat leakage	cm ³ /min	0 (water pressure) (Note 1)				
Installation attitude	Free					
Protection property	IPX5					
Port size	Rc1/4	Rc3/8	Rc1/2	Rc3/4	Rc1	
Orifice	mm	15 (Note 2)			22 (Note 2)	
Cv flow factor		2.8	4.2	6.0	11.0	12.0
Weight	g	340	320	390	730	950
Rated voltage	100VAC 50/60Hz, 200VAC 50/60Hz, 24VDC					
Allowable voltage fluctuation	Rated voltage ±10%					
Apparent power	VA	At holding (50/60Hz): 5/4, at starting (50/60Hz): 9/8			At holding (50/60Hz): 9.5/7, at starting (50/60Hz): 23/20	
Power consumption	W	AC(50/60Hz): 2.7/2, DC: 4			AC(50/60Hz): 4/3.2, DC: 4	
Coil heat resistance class	B					

Note 1: "Valve seat leakage 0 cm³/min" means that no water drip leaks for a minute.

Note 2: Orifice diameter refers to the diameter of the valve seat section.

How to order

FWD11 - 15 A - 0 2GS B - AC100V

Model no.

A Port size

B Thread type

C Body/sealant combination

D Coil option

E Mounting plate

F Rated voltage
Note 2



Note on model no. selection

Note 1: For port size 8, 10, 15; refer to Pg 9.

For port size 20, 25; refer to Pg11.

Note 2: The rated voltage includes 110VAC 50/60 Hz and 220VAC 50/60 Hz. Contact CKD for more information.

<Example of model number>

FWD11-15A-02GSB-AC100V

- A** Port size : 1/2
- B** Screw type : Rc screw
- C** Body/sealant combination : Brass / PPS, NBR
- D** Coil option : DIN terminal box with surge suppressor (pg 9)
- E** Mounting plate : Mounting plate
- F** Rated voltage : 100VAC 50/60 Hz, 110VAC 60 Hz

Symbol	Description
A Port size	
8	1/4
10	3/8
15	1/2
20	3/4
25	1

B Thread type	
A	Rc
G	G
N	NPT

C Body/sealant combination		
	Body	Seal
0	Brass / PPS (Port size: 8,10,15)	NBR
	Bronze / PPS (Port size: 20,25)	
D	Stainless steel/ PPS	NBR

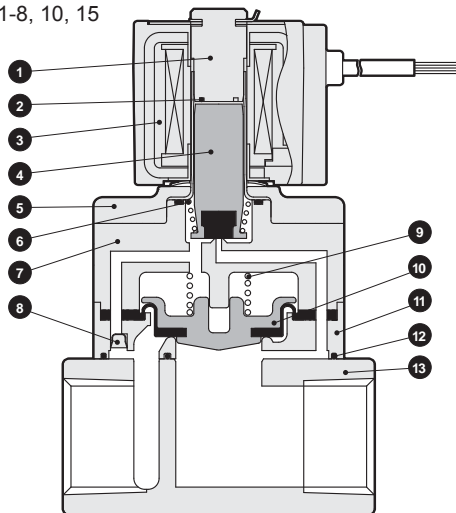
D Coil option	
2C	Grommet lead wire
2CS	Grommet lead wire with surge suppressor
2G	With DIN terminal box (Note 1)
2GS	DIN terminal box / with surge suppressor (Note 1)
2H	DIN terminal box with light (Note 1)
2HS	DIN terminal box and light, surge suppressor (Note 1)

E Mounting plate	
Blank	None
B	Mounting plate (Port size: only 8,10,15 are available)

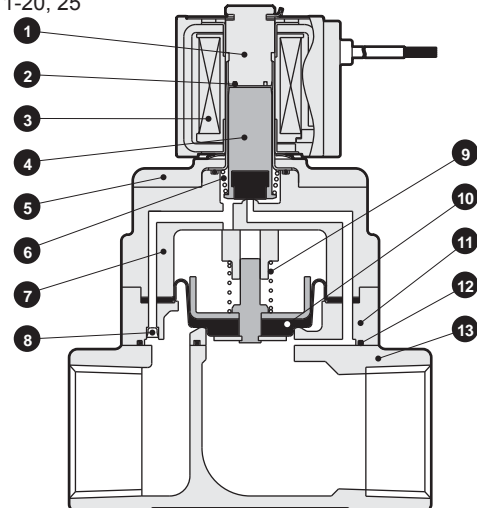
F Rated voltage	
AC100V	100VAC 50/60Hz, 110VAC 60Hz
AC200V	200VAC 50/60Hz, 220VAC 60Hz
DC24V	24VDC

Internal structure and parts list

● FWD11-8, 10, 15



● FWD11-20, 25



No.	Parts name	Material	No.	Parts name	Material
1	Core assembly	SUS Stainless steel	8	Filter	SUS Stainless steel
2	Shading coil *1	Cu (Ag for stainless steel body) Copper (Silver for stainless steel body)	9	Valve spring	SUS Stainless steel
3	Coil	-	10	Diaphragm assembly	Port size: 8,10,15; PPS/ NBR Polyphenylene sulfide/ nitrile rubber Port size: 20, 25; SUS/NBR Stainless steel/ nitrile rubber
4	Plunger	SUS · NBR Stainless, nitrile rubber	11	Valve body	PPS Polyphenylene sulfide
5	Holder plate	PPS Polyphenylene sulfide	12	Gasket	NBR Nitrile rubber
6	Plunger spring	SUS Stainless steel	13	Main body	Port size: 8, 10, 15; C3771 (SCS13) Brass (stainless steel) Port size: 20, 25; CAC408 (SCS13) Bronze (stainless steel)
7	Stuffing Assembly	PPS · SUS · NBR Polyphenylene sulfide/ stainless steel/ nitrile rubber			

Items inside parentheses are optional

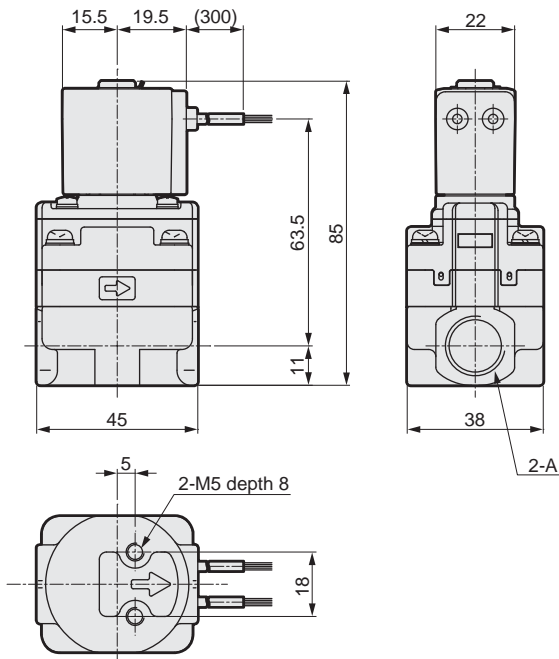
*1: Shading coil will not be used for DC coil.

Note: Material of thread is steel.

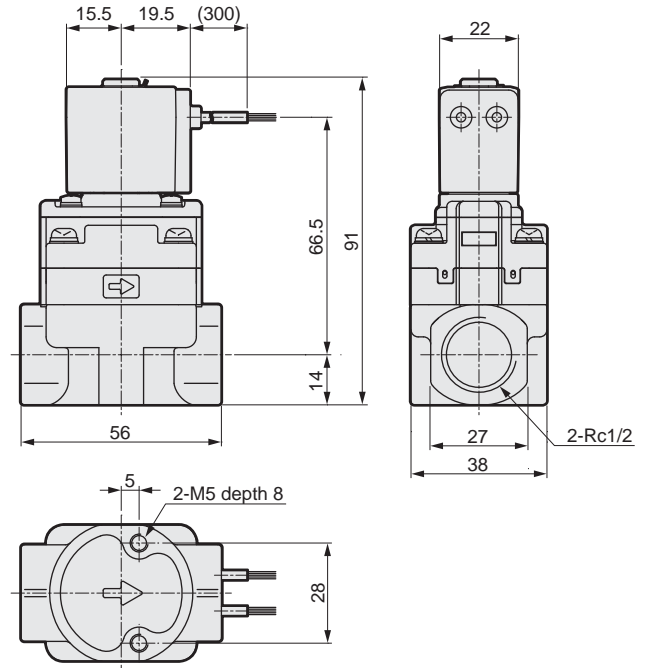
Dimensions (Port size 8A, 10A, 15A)

● Grommet lead wire type

FWD11-8A/10A-*2C



FWD11-15A-*2C

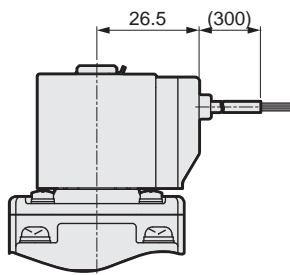


Model no.	A
FWD11-8A	Rc 1/4
FWD11-10A	Rc 3/8

Dimensions with options (Port size 8A, 10A, 15A)

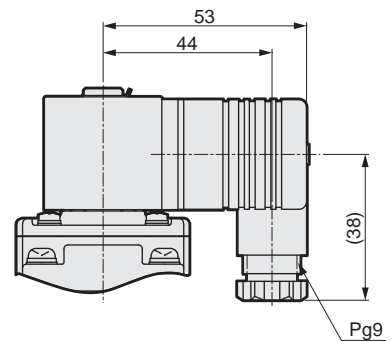
● Grommet lead wire with surge suppressor

FWD11-8A/10A/15A-*2CS



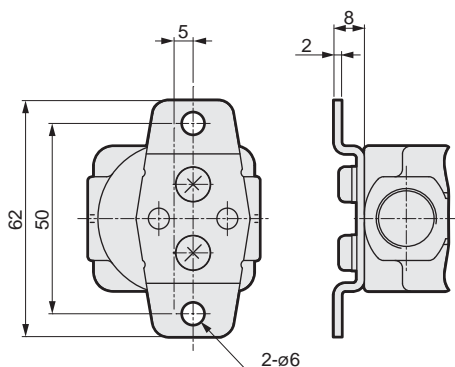
● With DIN terminal box

FWD11-8A/10A/15A-*2G/2GS/2H/2HS

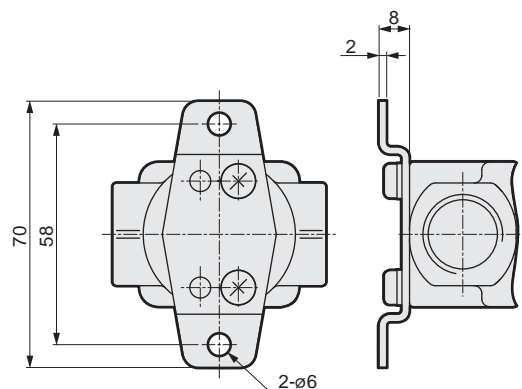


● Mounting plate

FWD11-8A/10A-**B



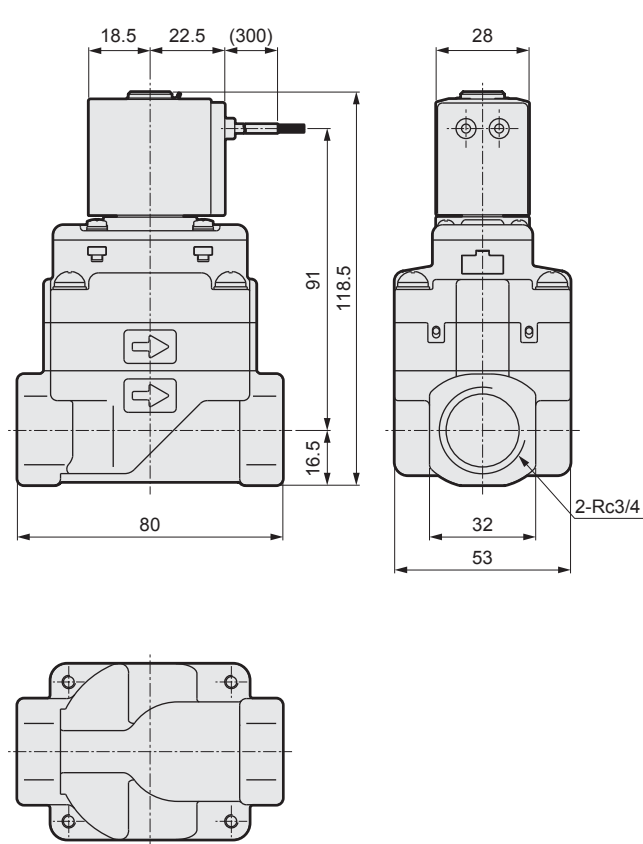
FWD11-15A-**B



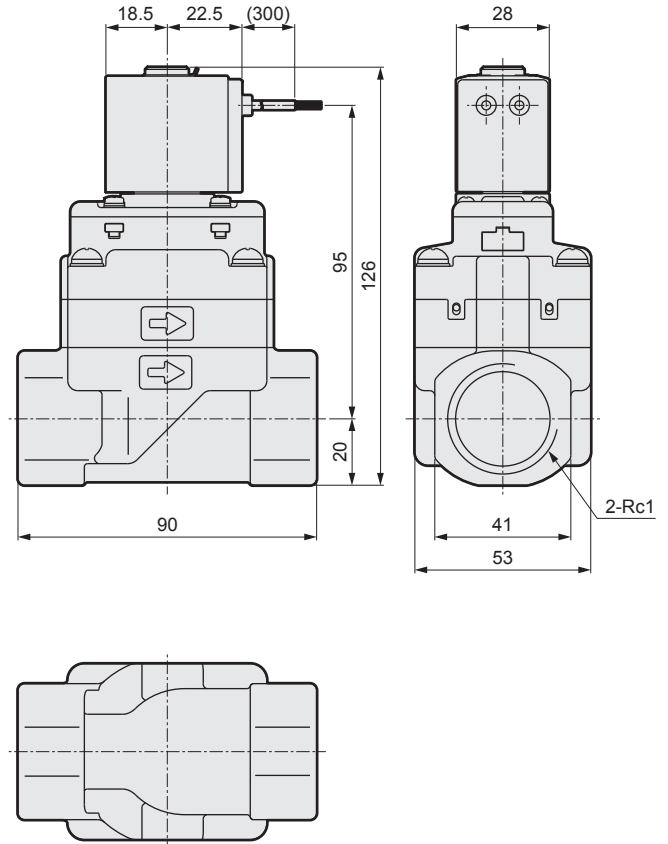
Dimensions (Port size 20A, 25A)

● Grommet lead wire type

FWD11-20A-*2C



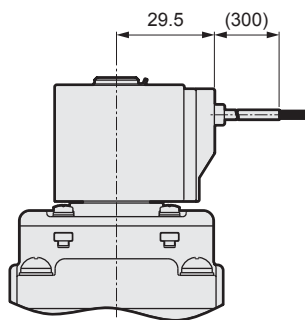
FWD11-25A-*2C



Dimensions with options (Port size 20A, 25A)

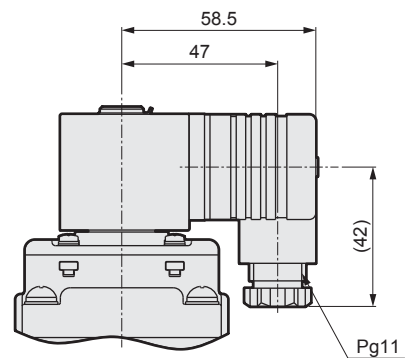
● Grommet lead wire with surge suppressor

FWD11-20A/25A-*2CS



● With DIN terminal box

FWD11-20A/25A-*2G/2GS/2H/2HS





Safety precautions

Always read this section before starting use.

When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices is secured.


It is important to select, use, handle, and maintain the product appropriately to ensure that the CKD product is used safely.


Observe warnings and precautions to ensure device safety.


Check that device safety is ensured, and manufacture a safe device.

WARNING

- 1** This product is designed and manufactured as a general industrial machine part. It must be handled by an operator having sufficient knowledge and experience in handling.
- 2** Use this product in accordance of specifications.
This product must be used within its stated specifications. It must not be modified or machined. This product is intended for use as a general-purpose industrial device or part. It is not intended for use outdoors or for use under the following conditions or environment.
(Note that this product can be used when CKD is consulted prior to use and the customer consents to CKD product specifications. The customer must provide safety measures to avoid risks in the event of problems.)
 - (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 cutoff circuits, press machines, brake circuits, or safety devices or applications.
 - (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.
ISO4414, 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 enough 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 precautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

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

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

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

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

Limited Warranty and Disclaimer

- 1** "Warranty Period" is one (1) year from the first delivery to the customer.
- 2** In case any defect attributable to CKD is found during Warranty Period, CKD shall, at its own discretion, repair the defect or replace the relevant product in whole or in part, according to its own judgment. In no event CKD shall never be liable for the costs in relation to and the damages resulting from the (de) installation of the product.
This Limited Warranty will not apply to:
 - (1) Product abuse/misuse contrary to conditions/environment recommended in its catalogs/specifications.
 - (2) Failure due to other causes.
 - (3) Use other than original design purposes.
 - (4) Third-party repair/modification.
 - (5) Failure due to causes not foreseeable with technology at the time of delivery.
 - (6) Failure attributable to force majeure.
- 3** IN NO EVENT SHALL CKD BE LIABLE FOR BUSINESS INTERRUPTIONS, LOSS OF PROFITS, PERSONAL INJURY, COSTS OF DELAY OR FOR ANY OTHER SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL LOSSES, COSTS OR DAMAGES.
- 4** 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.

Refer to the "General Purpose Valves (Catalog No. CB-03-1SA)" for details on precautions for general purpose valves.

Compact Pilot Operated Solenoid Valve for Water FWD Series

Design & selection

⚠ WARNING

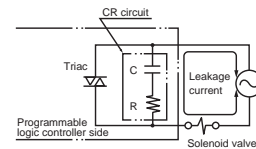
- Working fluid
 - Do not use with any other fluid than water.
- Working environment
 - Do not use the product where the product is exposed to direct-sunlight or may come in contact with water or oil. Can not be used outdoors.

⚠ CAUTION

■ Designed for Safety

- About leakage current from other control device
When using a programmable logic controller (PLC) to operate the solenoid valve, please ensure that the leakage current from the output of the PLC is within the range specified below.

Voltage Model no.	AC		DC
	100V	200V	24V
FWD	3mA or less	1.5mA or less	1mA or less



Installation & adjustment

⚠ CAUTION

■ Installation

- Install in a manner tension will not be applied to the coil section lead wire.
- Hold the product body when carrying the product. (Do not hold onto the lead wire.)

■ Piping

- Dirt or foreign matter in fluid may prevent the product from functioning correctly. Install a filter finer than 80 mesh.
- When the regulator and solenoid valve are directly connected, parts could mutually vibrate causing resonance and chattering.
- If the piping cross section on the fluid supply side is restricted, operation may become unstable because of a differential pressure fault when the valve function. Use a pipe that matches the port size on the supply side.

During use & maintenance

⚠ CAUTION

■ During use

- Instantaneous leakage phenomenon
When using the 2 port pilot operated solenoid valve, sudden application of pressure (e.g. starting up a pump) could momentarily open a closed valve and cause fluid to leak.
- Operation
Do not place a back pressure. There is a risk of malfunction.
- Water-hammer
If you experience a water-hammer problem, please consider using CKD "WHL" or "RSV" solenoid valve or a motor valve.

● Differential pressure

Keep the differential pressure 0.02 MPa or above between the primary and secondary sides with the valve open. Differential pressure will become difficult to generate between the primary and secondary in the following cases.

- If a restriction, such as a nozzle is attached to the secondary side.
- When valves are simultaneously opened in a state where multiple solenoid valves are piped in parallel.

■ Assembling & Disassembling

● Tightening torque

When disassembling or assembling, tighten using the values listed below.

Presser plate set thread	Body set thread
0.63 to 0.77N•m	0.81 to 0.99N•m (Port size: 8A, 10A, 15A) 1.5 to 1.8N•m (Port size: 20A, 25A)

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