CKD

New Products

Compact pilot operated solenoid valve for water

FWD Series

COMPACT PILOT OPERATED SOLENOID VALVE FOR WATER

- Light weight, large flow rate and low power consumption -

The standard in solenoid valves for water

New

Introducing the fluoro rubber diaphragm

Make sure to read the safety precautions on the back before use.

CKD Corporation

CC-1057A 4

Use in more applications with the addition of the fluoro rubber diaphragm! CKD solenoid valve for water

Supports port sizes

8 A to 25 A

Ecological

Low power consumption

Only consumes

4 W! (DC)

1/3 When compared to general-purpose solenoid valves

(in-house comparison)

Compact and lightweight

Product size

56 × 38 × 91 mm

(15 A)

Weight

390 g (15 A)

Dedicated design for water

Improved corrosion resistance

Improved corrosion resistance with the adoption of special anti-corrosive magnetic substance

Body material

Select from brass (bronze) and stainless steel

Sealant

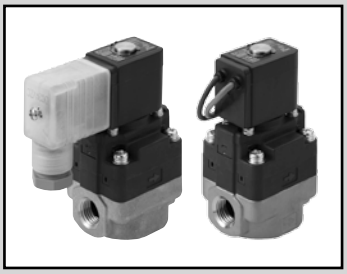
Select from nitrile rubber (NBR) and fluoro rubber (FKM)

Large flow rate

Adopting the special-profile diaphragm

Realized large flow rate in a compact body with the adoption of a special-profile diaphragm

Cv 6.0 (15 A)



Compact pilot operated solenoid valve for water

FWD Series

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

Specifications

Description		FWD11-8A	FWD11-10A	FWD11-15A	FWD11-20A	FWD11-25A
Actuation		NC (normally closed)				
Working fluid		Water (excluding sewage, agricultural water, liquid manure and antifreeze liquid)				
Operating pressure differential	MPa	0.02 to 0.7				
Max. working pressure	MPa	0.7				
Proof pressure (water pressure)	MPa	1.05				
Fluid temperature	°C	5 to 60 (no freezing)				
Ambient temperature	°C	-10 to 60 (no freezing)				
Atmosphere		Place free of corrosive gas and explosive gas				
Valve structure		Pilot operated poppet, diaphragm drive				
Valve seat leakage	cm^3/min	0 (water pressure) (* 1)				
Mounting orientation		Free				
Degree of protection		IPX5				
Port size		Rc1/4	Rc3/8	Rc1/2	Rc3/4	Rc1
Orifice size	mm	15 (Note 2)			22 (* 2)	
Cv		2.8	4.2	6.0	11.0	12.0
Weight	g	340	320	390	730	950
Rated voltage		100 VAC 50/60 Hz, 200 VAC 50/60 Hz, 24 VDC				
Voltage fluctuation range		Rated voltage ± 10%				
Apparent power	VA	When holding (50/60 Hz): 5/4, when starting (50/60 Hz): 9/8			When holding (50/60 Hz): 9.5/7, when starting (50/60 Hz): 23/20	
Power consumption	W	AC (50/60 Hz): 2.7/2, DC: 4			AC (50/60 Hz): 4/3.2, DC: 4	
Coil thermal class		Class 130 (B)				

* 1: Valve seat leakage of 0 cm^3/min means that no water drop leak is observed for one minute.
* 2: Orifice size means the size of valve seat.

How to order

FWD11 - 15 A - 0 2GS B - AC100V

- Model No. FWD11
- Ⓐ Port size 15
- Ⓑ Thread A
- Ⓒ Body/sealant combination 0
- Ⓓ Coil option 2GS
- Ⓔ Mounting plate B
- Ⓕ Rated voltage *2 AC100V

Code	Content
Ⓐ Port size	
8	1/4
10	3/8
15	1/2
20	3/4
25	1
Ⓑ Thread	
A	Rc thread
G	G thread
N	NPT thread
Ⓒ Body/sealant combination	
0	Brass (port size: 8, 10, 15) / Bronze (port size: 20, 25) / PPS, NBR
B	Brass (port size: 8, 10, 15) / Bronze (port size: 20, 25) / PPS, FKM
D	Stainless steel/PPS, NBR
E	Stainless steel/PPS, FKM
Ⓓ Coil option	
2C	Grommet lead wire
2CS	Grommet lead wire with surge suppressor
2G	DIN terminal box (* 1)
2GS	DIN terminal box with surge suppressor (* 1)
2H	DIN terminal box with lamp (* 1)
2HS	DIN terminal box with lamp/surge suppressor (* 1)
Ⓔ Mounting plate	
Blank	None
B	Mounting plate (port size: 8, 10 and 15 only)
Ⓕ Rated voltage	
AC100V	100 VAC 50/60 Hz, 110 VAC 60 Hz
AC200V	200 VAC 50/60 Hz, 220 VAC 60 Hz
DC24V	24 VDC

Precautions for model No. selection

* 1: Pg9 for port sizes 8, 10 and 15, and Pg11 for 20 and 25.
* 2: Rated voltages of 110 VAC, 50/60 Hz and 220 VAC, 50/60 Hz are also available. Contact CKD for details.

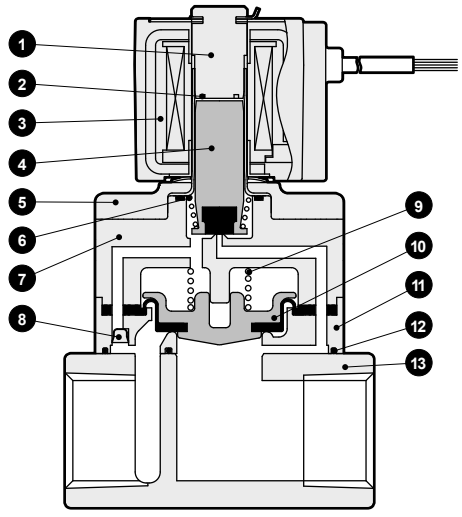
[Example of model No.]

FWD11-15A-02GSB-AC100V

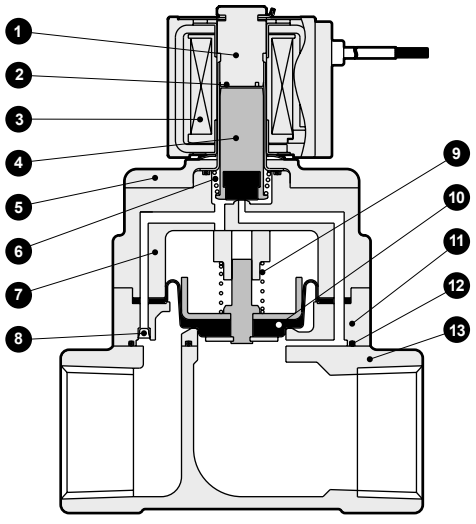
- Ⓐ Port size : 1/2
- Ⓑ Thread : Rc thread
- Ⓒ Body/sealant combination : Brass/PPS, NBR
- Ⓓ Coil option : DIN terminal box with surge suppressor (Pg9)
- Ⓔ Mounting plate : Mounting plate
- Ⓕ Rated voltage : 100 VAC 50/60 Hz, 110 VAC 60Hz

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 (FKM)	Polyphenylene sulfide/nitrile rubber (fluoro rubber)
4	Plunger	SUS/NBR (FKM)	Stainless steel, nitrile rubber (fluoro rubber)			Port size: 20, 25; SUS/NBR (FKM)	Stainless steel, nitrile rubber (fluoro rubber)
5	Holder plate	PPS	Polyphenylene sulfide	11	Valve body	PPS	Polyphenylene sulfide
6	Plunger spring	SUS	Stainless steel	12	Gasket	NBR (FKM)	Nitrile rubber (fluoro rubber)
7	Stuffing assembly	PPS/SUS/NBR (FKM)	Polyphenylene sulfide/ Stainless steel, nitrile rubber (fluoro rubber)	13	Main body	Port size: 8, 10, 15; C3771 (SCS13)	Brass (stainless steel)
						Port size: 20, 25; CAC408 (SCS13)	Bronze (stainless steel)

( ) shows options.

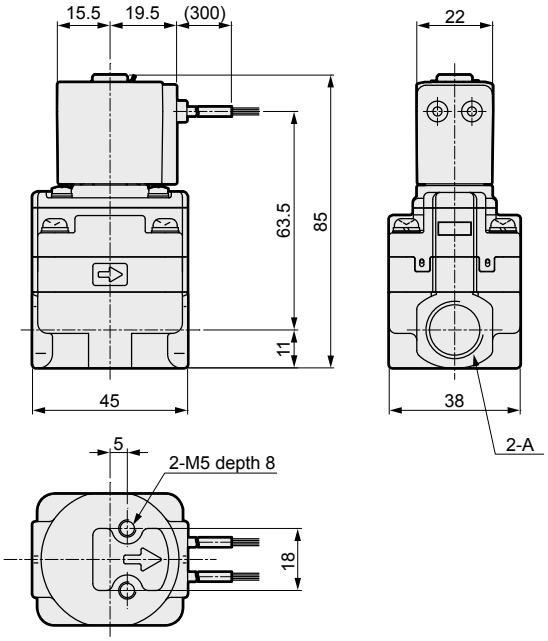
Note: Screws are steel.

*1: No shading coil is used for DC coil.

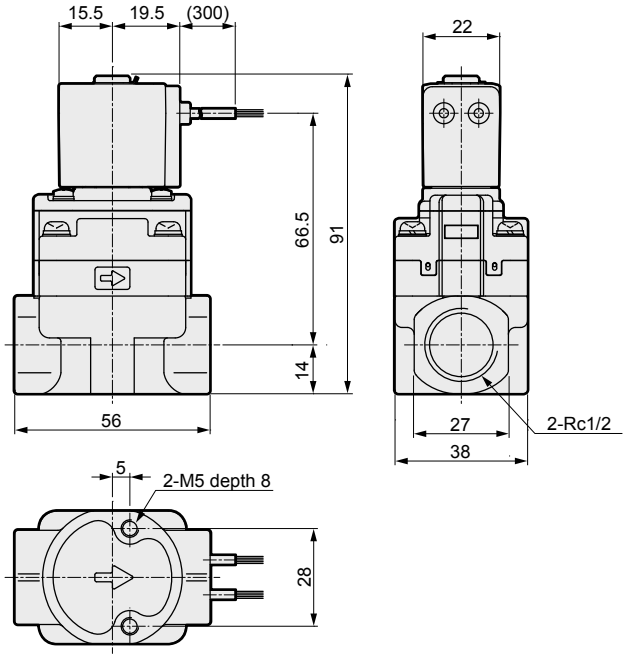
Dimensions (port size: 8 A, 10 A, 15 A)

● Grommet lead wire

FWD11-8A/10A-*2C



FWD11-15A-*2C

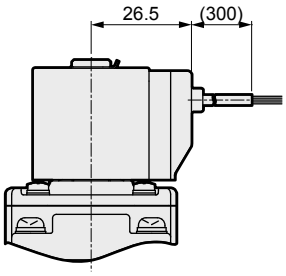


Model No.	A
FWD11-8A	Rc 1/4
FWD11-10A	Rc 3/8

Optional dimensions (port size: 8 A, 10 A, 15 A)

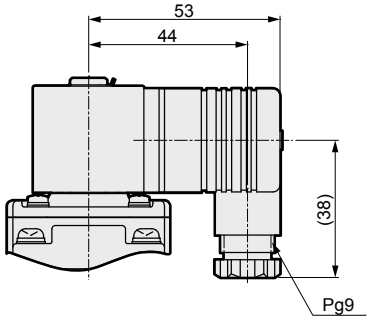
● Grommet lead wire with surge suppressor

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



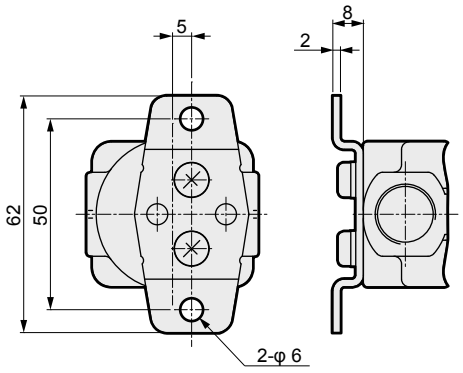
● DIN terminal box

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

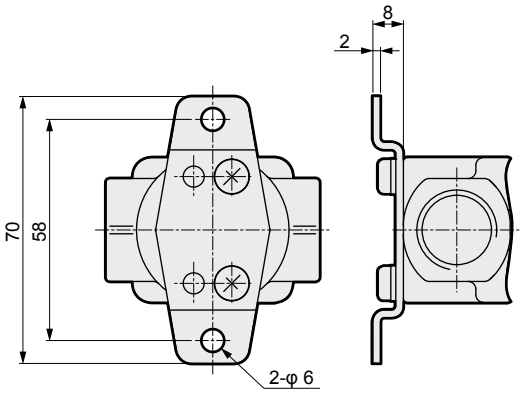


● Mounting plate

FWD11-8A/10A-**B



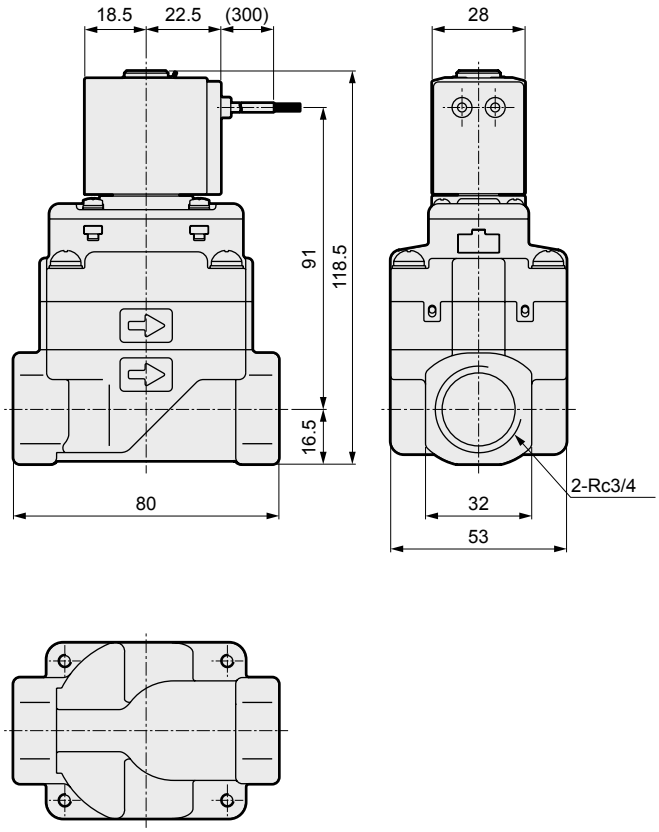
FWD11-15A-**B



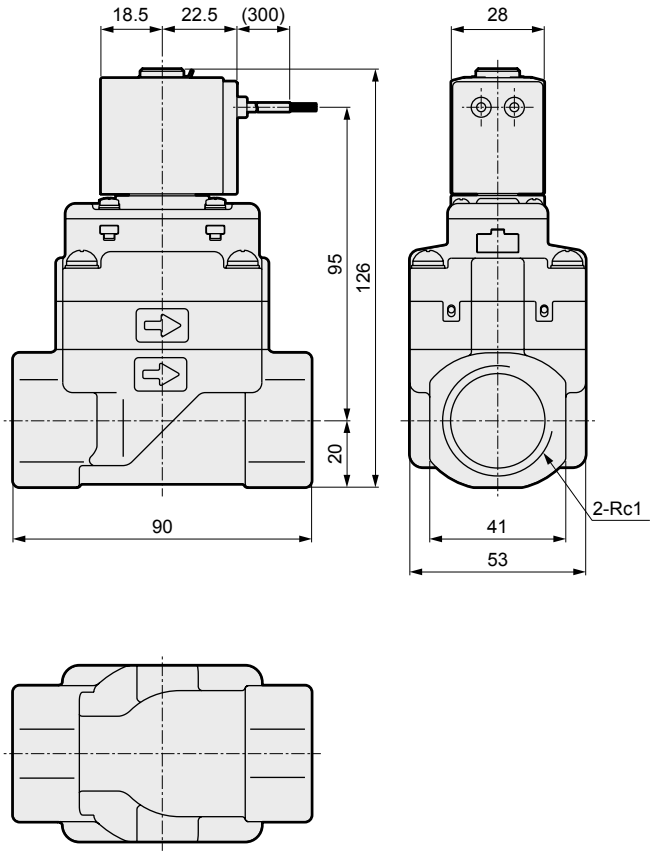
Dimensions (port size 20 A, 25 A)

● Grommet lead wire

FWD11-20A-*2C



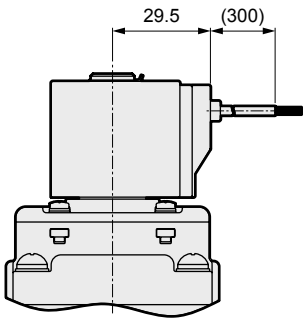
FWD11-25A-*2C



Optional dimensions (port size: 20 A, 25 A)

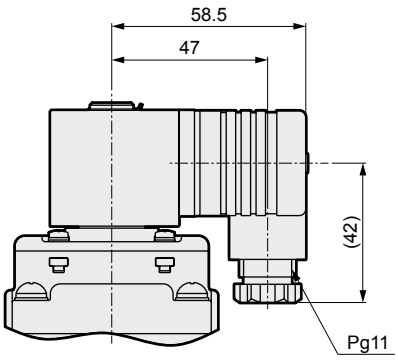
● Grommet lead wire with surge suppressor

FWD11-20A/25A-*2CS



● DIN terminal box

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



Safety Precautions

Always read this section before use.

When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that the safety of the device 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. In addition, never modify or additionally machine this product.
   This product is intended for use as a device or part for general-purpose industrial machinery. It is not intended for use outdoors or for use under the following conditions or environment.
   (Note that this product can be used under such conditions only when CKD is consulted prior to its usage and the customer consents to CKD product specifications. The customer should provide safety measures to avoid danger in the event of problems.)
   ❶ Use for applications requiring safety, including nuclear energy, railways, aircraft, marine vessels, vehicles, medical devices, devices or applications in contact with beverages or foodstuffs, amusement devices, emergency cutoff circuits, press machines, brake circuits, or safety devices or applications.
   ❷ Use for applications where life or assets could be significantly affected, and special safety measures are required.
3. Observe organization standards and regulations, etc. related to the safety of device design and control, etc.
   ISO4414, JIS B 8370 (General rules for pneumatic systems)
   JFPS2008 (Principles for pneumatic cylinder selection and use)
   Including High Pressure Gas Safety Act, Industrial Safety and Health Act, other safety rules, organization standards and regulations, etc.
4. Do not handle, pipe, or remove devices before confirming safety.
   ❶ Inspect and service the machine and devices after confirming safety of all systems related to this product.
   ❷ Note that there may be hot or charged sections even after operation is stopped.
   ❸ When inspecting or servicing the device, turn OFF the energy source (air supply or water supply), and turn OFF power to the facility. Discharge any compressed air from the system, and pay attention to possible water leakage and leakage of electricity.
   ❹ When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.
5. Observe warnings and cautions in the following pages to prevent accidents.

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

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

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

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

Note that some items described as "CAUTION" may lead to serious results depending on the situation.
Every item provides important information and must be observed.

Limited warranty and disclaimer

1. Term of warranty
   This warranty shall be valid for one year after delivery to the customer's designated site.
2. Scope of warranty
   If any faults, found to be the responsibility of CKD, occur during the above warranty term, a replacement product or required replacement parts shall be provided free of charge, or the product shall be repaired at the CKD factory free of charge.
   This Limited Warranty will not apply to:
   (1) Failures due to use outside the conditions and environments set forth in the catalog or these specifications.
   (2) Failures resulting from factors other than this product.
   (3) Failures caused by improper use of the product.
   (4) Failures resulting from modifications or repairs made without CKD consent.
   (5) Failures caused by matters that could not be predicted with the technologies in practice when the product was delivered.
   (6) Failures resulting from natural disasters or accidents for which CKD is not liable.
   The warranty covers the actually delivered product, and does not cover any damage resulting from faults in the delivered product.
3. Compatibility confirmation
   The customer is responsible for confirming the compatibility of CKD products with the customer's systems, machines and equipment.

Safety precautions

Fluid Control Components: Warnings and Cautions

Always read this section before use.
Read safety precautions in "General Purpose Valves (catalog No. CB-03-1SA)" as well.

Product-specific cautions: Compact pilot operated solenoid valve for water FWD Series

Design & selection

⚠WARNING

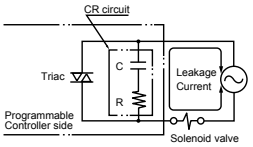
■Working fluid
- No liquid other than water can be used.

■Working environment
- Install in a place where the product is not exposed to rain, water, or direct sunlight. This valve cannot be used outdoors.

⚠CAUTION

■Safety design
- Leakage current from other fluid control components
  When operating the solenoid valve with a programmable controller, etc., check that the output leakage current from the programmable controller is within the following specifications.

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



Installation & adjustment

⚠CAUTION

■Installation
- When installing the valve, make sure that no tension is applied to the coil lead wire.
- When carrying the product, hold the body. (Do not dangle the product from the lead wire when carrying it.)

■Piping
- Dirt or foreign matter in fluid could prevent the product from functioning correctly. Install an 80-mesh or finer air filter.
- When the regulator and solenoid valve are directly coupled, the parts could mutually vibrate causing resonance and chattering.
- If the piping cross-section area on the fluid inlet is reduced, the operation may become unstable due to a differential pressure fault during valve operation. The piping on the fluid inlet must have a size that matches the valve port size.

During use & maintenance

⚠CAUTION

■When using
- Sudden leakage
  With the pilot operated 2 port valve, if sudden pressure is applied when the pump starts while the valve is closed, the valve may open for an instant causing fluid to leak. Caution is required during use.
- Operation
  Do not apply back pressure. This could lead to malfunction.
- Water hammer
  If the water hammer poses problems, consider using the CKD "RSV type" solenoid valve or a motor valve.

Revision details
·Added sealant material

- Pressure differential
  Be sure to set the pressure so that the pressure differential between the primary side and the secondary side while the valve is open does not drop below 0.02 MPa.
  In the following cases, the pressure differential between the primary side and the secondary side diminishes:
  · When a needle valve is mounted on the secondary side
  · When multiple solenoid valves connected in parallel piping are opened simultaneously

■Assembling & disassembling
- Tightening torque
  When disassembling or assembling, use the values below as tightening torques to tighten the screws.

Holder mounting screw	Body mounting screw
0.63 to 0.77 N·m	0.81 to 0.99 N·m (port size: 8 A, 10 A, 15 A) 1.5 to 1.8 N·m (port size: 20 A, 25 A)

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