

M20 SERIES

catalog No.94-176a

TWO-WAY SOLENOID VALVES (SMALL-SIZE)

General-purpose/Explosion-proof

M20 SERIES TWO WAY SOLENOID VALVE



KANEKO SANGYO CO., LTD



Kaneko's new M20 Series Two-way Solenoid Valves have been developed as a popular type for use in the widest range of application.

The primary feature of this series is superiority in flow rate capacity. Usually popular type valves are apt to sacrifice flow rate, while the new valves allow a high flow rate because they are of the full-bore type. In addition, as the valve body is a sturdy, struck brass forging, there is no such material defect as is seen in the case of the cast body.

The fluid can be used in the low and medium working pressure ranges, up to 16 kgf/cm² for water, kerosene and lubricating oils and up to 9 kgf/cm² for air and gases. The valve is a piston valve of highly airtight packless type, suitable for use with varying kinds, pressures and temperatures of fluids.

Solenoids are available in general-purpose and explosion-proof types. Especially the explosion-proof type includes shop-explosion-proof, coal-mine-explosion-proof, hydrogen-explosion-proof and dust-explosion-proof. Kaneko offers a variety of solenoids for use with different protective constructions as it is called "Kaneko of explosion-proof solenoid valves". Solenoids are available for AC and DC applications, as a matter of course, and so the present solenoid valve can be used at any and every place by selecting either the explosion-proof type or the general-purpose type.

With the terminal box of the explosion-proof type solenoid valve in particular, the conduit can be rotated within the limits of approximately 340°, making conduit connection and wiring work very easy. Moreover, the casing is highly resistant to corrosion as it is both internally and externally hard alumite treated. At the same time, the casing has sufficient resistance to wind and rain, and so the solenoid valve can be safely installed outdoors.

Features

1. Small-size, but a large flow rate capacity can be obtained.
2. Highly airtight packless type.
3. Provided with a manual button for ease of inspection and confirmation of operation at no voltage.
4. Even the general purpose type uses a costly mold coil and maintains high watertightness.
5. Free installing position.
6. Small power consumption.
7. Easy maintenance due to simple construction.

Modified Version

Conventional solenoid valves have been designed for operation in the continuously energized condition. In this case, however, the valve changes from open to closed position on power failure, resulting in an unexpected accident in some instances. To prevent such accidents, Kaneko offers a double-latch solenoid valve of instantaneous energization type. The double-latch solenoid valve also is available in general-purpose and explosion-proof types (manual button is optional).



● General-purpose type



● General-purpose type with terminal box



● Explosion proof type D₂G₄

Standard Specifications

Size: 15(1/2"), 20(3/4"), 25(1")

Body material: C3771 (brass forging)

Operation: Pilot-operated, normally closed

Solenoid Enclosure: General-purpose type, explosion-proof type (d₂G₄, d₃aG₄, SDP)

Fluid temperature: -20 to +60°C

Ambient temperature: -20 to +60°C

Max. working pressure (kgf/cm²):

Solenoid valve operating pressure range

Type	Air , Gas	Water , Lubricating Oil
M20 C	0.05 ~ 0.09 MPa	0.05 ~ 1.6 MPa
M20 D	0.05 ~ 0.6 MPa	

Note: Oily fluids are less than 50 Cst in viscosity.

Differential pressure: Normally over 0.5 kgf/cm² (0.09 MPa)

Electrical specifications:

AC Power Source			DC Power Source	
V/Hz	Inrush Current (A)	Holding Current (A)	V	A
100/50	0.27	0.16	24	0.330
100/60	0.25	0.13	100	0.072
110/60	0.25	0.15	110	0.080
200/50	0.14	0.08	125	0.060
200/60	0.13	0.07		
220/60	0.13	0.08		

•Coil insulation class: H

•Rating: Continuous

•Permissible voltage regulation: + 10%, - 15%

Individual specifications:

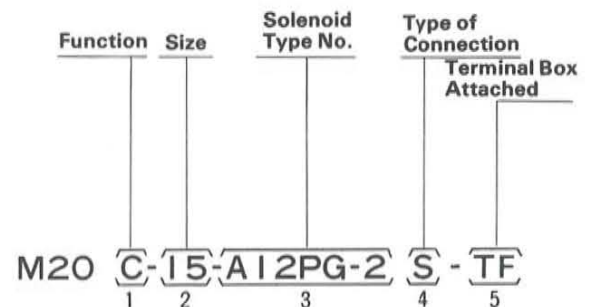
Designation	Nominal Diameter	Connection Pipe Size	Orifice Diameter	CV Flow Factor	Effective Cross Sectional Area
M20□-15	15	1/2"	13	4.5	85
M20□-20	20	3/4"	20	8.6	165
M20□-25	25	1"	25	12.6	225

Weight:

Designation	kgs
M20□-15-A12PG D12PG	1.9
M20□-20-A12PG D12PG	2.4
M20□-25-A12PG D12PG	3.2
M20□-15-AE12PU DE12PU	2.3
M20□-20-AE12PU DE12PU	2.8
M20□-25-AE12PU DE12PU	3.5

Note: For valves with terminal box, add 230 g.

Type Number (Designation)



1. **Function C:** Normally closed (Energized open)

D: Normally open (Energized closed)

3. **Solenoid type No.**

Normally closed (Energized open)

A12PG-2: General-purpose type for AC single coil

D12PG-2: General-purpose type for DC single coil

AE12PU-2: Explosion-proof type for AC single coil

DE12PU-2: Explosion-proof type for DC single coil

Normally open (Energized closed)

A12PG-01: General-purpose double-latch type for AC Double coil

D12PG-01: General-purpose double-latch type for DC Double coil

AE12PU-01: Explosion-proof double-latch type for AC Double coil

DE12PU-01: Explosion-proof double-latch type for DC Double coil

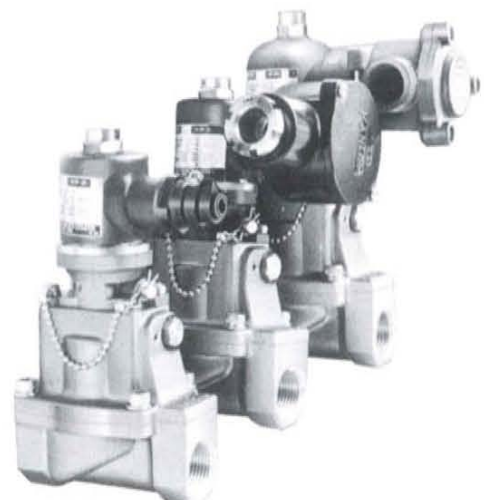
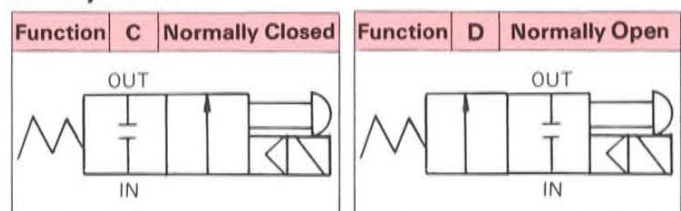
4. **Type of connection**

S: Screwed connection F: Flanged

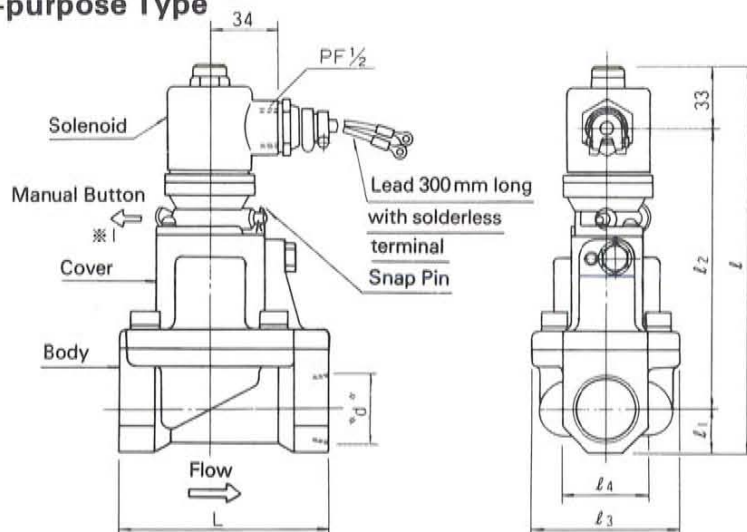
5. **Terminal box attached:**

TF: TF-60 outdoor terminal box (for general-purpose type only)
Nothing: no making

JIS Symbol



General-purpose Type



*1 Manual Operation

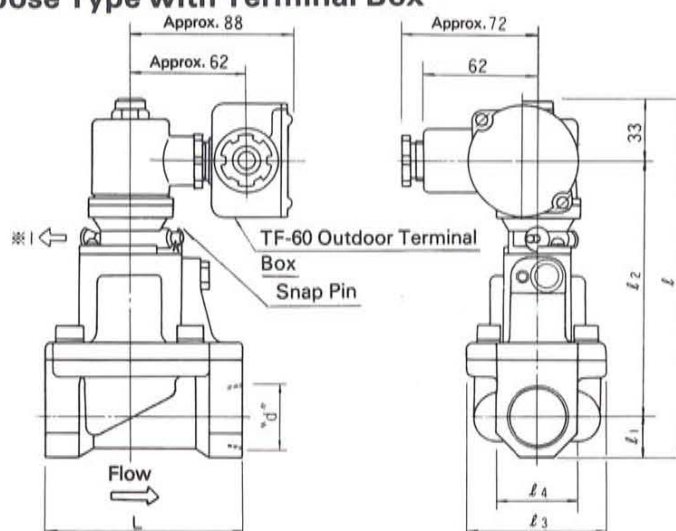
Pull manual button after removing snap pin, and valve position will be same as when energized.

M20C-15-A(D)12P-2S						
"d"	L	ℓ	ℓ ₁	ℓ ₂	ℓ ₃	ℓ ₄
1/2"	85	161	14.5	115.5	55	29

M20C-20-A(D)12P-2S						
"d"	L	ℓ	ℓ ₁	ℓ ₂	ℓ ₃	ℓ ₄
3/4"	95	177	17	129	65	34

M20C-25-A(D)12P-2S						
"d"	L	ℓ	ℓ ₁	ℓ ₂	ℓ ₃	ℓ ₄
1"	105	193	22	140	75	44

General-purpose Type with Terminal Box

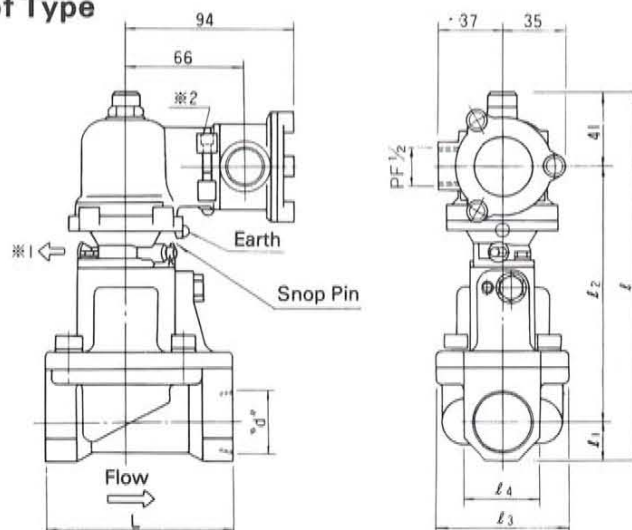


M20C-15-A(D)12P-2S-T						
"d"	L	ℓ	ℓ ₁	ℓ ₂	ℓ ₃	ℓ ₄
1/2"	85	161	14.5	115.5	55	29

M20C-20-A(D)12P-2S-T						
"d"	L	ℓ	ℓ ₁	ℓ ₂	ℓ ₃	ℓ ₄
3/4"	95	177	17	129	65	34

M20C-25-A(D)12P-2S-T						
"d"	L	ℓ	ℓ ₁	ℓ ₂	ℓ ₃	ℓ ₄
1"	105	193	22	140	75	44

Explosion-proof Type



*2. Direction of Terminal Box

Direction of terminal box can be changed (turned within limits of 340°) by loosening cap screw. After setting terminal box in required direction, tighten cap screw without fail.

M20C-15-AE(DE)12PU-2S						
"d"	L	ℓ	ℓ ₁	ℓ ₂	ℓ ₃	ℓ ₄
1/2"	85	175	14.5	116.5	55	29

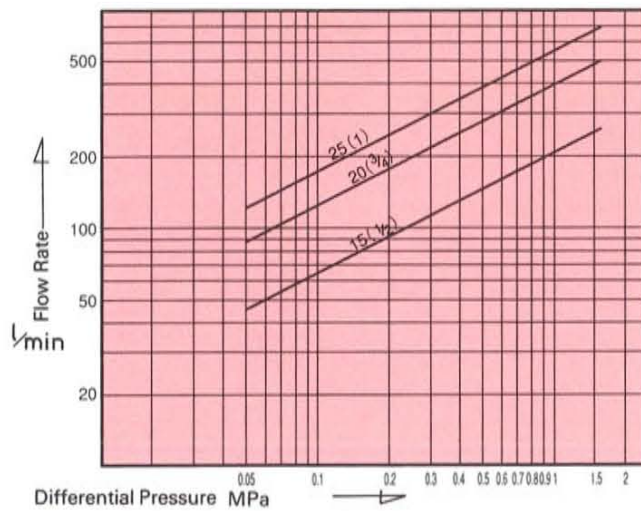
M20C-20-AE(DE)12PU-2S						
"d"	L	ℓ	ℓ ₁	ℓ ₂	ℓ ₃	ℓ ₄
3/4"	95	190	17	132	65	34

M20C-25-AE(DE)12PU-2S						
"d"	L	ℓ	ℓ ₁	ℓ ₂	ℓ ₃	ℓ ₄
1"	105	210	22	147	75	44

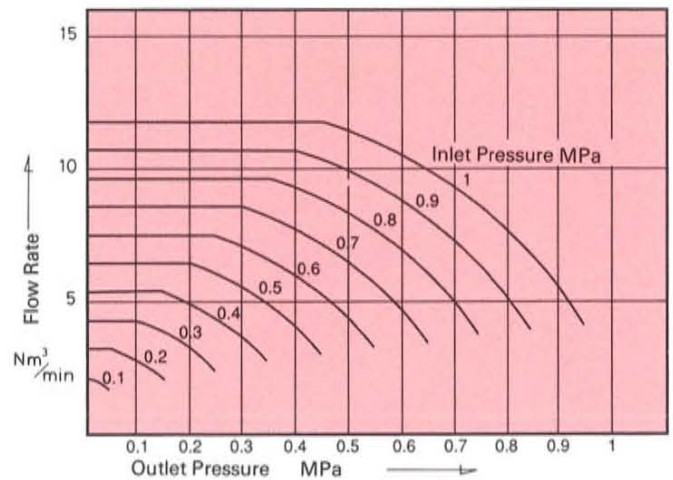
*Specifications, dimensions and shape may be subject to alterations without prior notice.

M20 SERIES FLOW RATE DIAGRAMS (WATER, AIR)

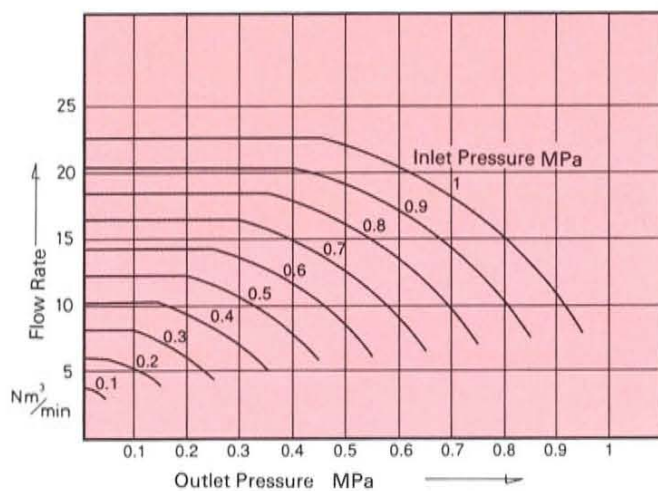
Water Flow Rate 15 (1/2"), 20 (3/4"), 25 (1")



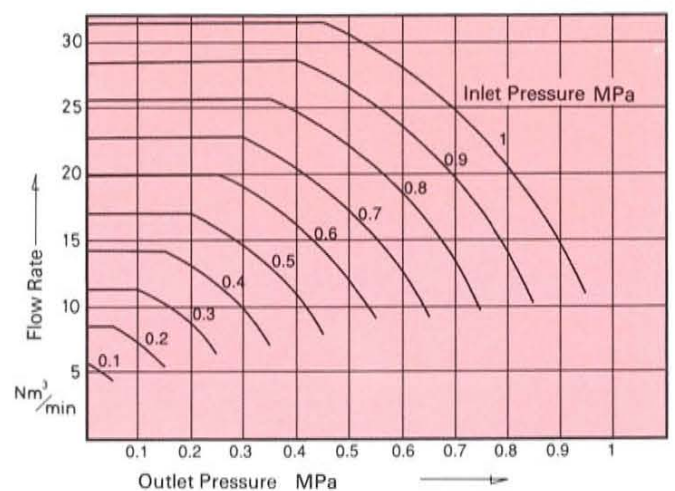
Air Flow Rate 15 (1/2")



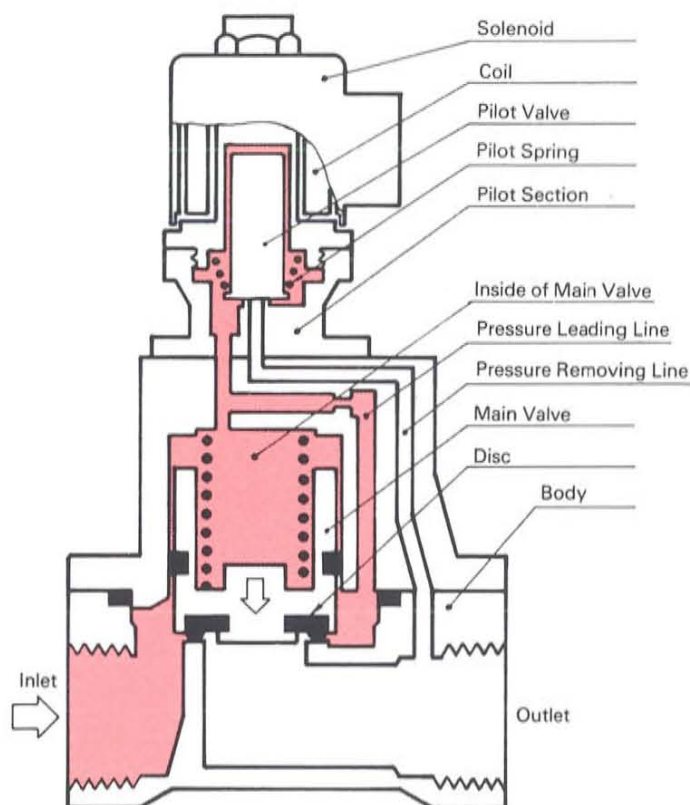
Air Flow Rate 20 (3/4")



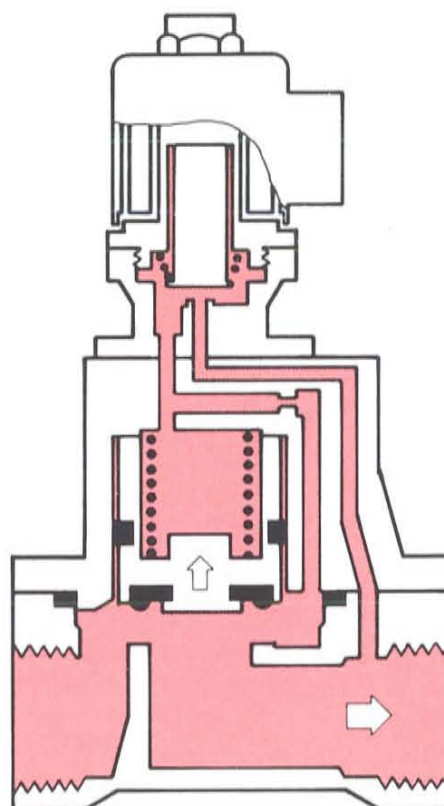
Air Flow Rate 25 (1")



On Power Failure



On Energization



Explanation of Operation

On Power Failure

The fluid pressure at inlet of the valve passes through the pressure leading line and enters the inside of the main valve and the pilot section. The pilot valve is pressed against the pilot seat by the action of the pilot spring to prevent the fluid within the main valve from flowing to the outlet of the valve. The main valve is closed by spring force and fluid pressure to stop flowing of the fluid.

On Energization

When the coil is energized, the pilot valve is raised so that the fluid flows to the outlet of the valve through the pressure removing line. Then the pressure within the main valve becomes lower than the valve inlet pressure with the result that the main valve is raised by thus formed differential pressure to allow the fluid to flow from the inlet to the outlet of the valve.

Precautions on Handling

1. Flush piping sufficiently.
2. Install a strainer or the like at the primary side of the solenoid valve to prevent foreign matter.
3. Confirm the kind and voltage of the power source prior to installing the solenoid valve.
4. At places of low temperature, use particular care to prevent freezing of the solenoid valve.
5. In an explosive atmosphere, select a solenoid valve of the explosion-proof construction suitable for use in that atmosphere.
6. As this valve is pilot-operated, be sure to ensure a minimum differential pressure of over 0.05Mpa at all times. The valve will fail under such conditions in which the secondary pressure becomes higher.
7. At fluid temperatures from 60 to 200°C, use Kaneko's M30 series two-way solenoid valves.

SOLENOID ENCLOSURE

GENERAL PURPOSE : Molded Class B Coil with leads. Specify when considerable moisture or humidity may be present, But when valve is used to out-door there is prepared with O-ring sealed construction enclosure for water-proof.

EXPLOSION PROOF : Explosion proof construction are following the table, Please select one suitable for an ambient atmosphere.

In place	Explosion proof for Factory			Explosion proof for Coal mine
Explosion proof model of JIS	d2G4	d3aG4	SDP13	(Token)
solenoid type	AE12PU	AE22P	E12PU-T	———
Ambient atmosphere for gas or ignition group of gas	Acetone, Ammonia, Carbon monoxide, Propane, Benzene, Methanol, Methan, Ethanol, Ethylene, Gasoline and Ethylether etc.	Before listed gas for d2G4 and Water gas or Hydrogen (General said to Hydrogen explosion proof)	Inflammability dust of over 120°C under 200°C, Magnesium, Carbon black, Wheat, Sugar, Rubber and Sulphur etc.	Methan and Inflammability gas of Explosive coal dust.
Explosion proof construction	Flame proof type of Explosion protection		Flame proof type of Explosion protection for Dust	Flame proof type of Explosion protection construction