

VF-13, 13C, 14, 14C Type Solenoid Valve (for Liquids or Gases)

Large diameter, flanged solenoid valve with simple structure and compact body for liquids or gases, automatically adjusts valve opening time, prevents water hammer that may occur when the flow of liquid is extremely large.

VF-13, 13C Type has cast iron body,
VF-14, 14C Type has bronze body.

FEATURES

- With diaphragm in driving unit, bronze cap (including pilot-operating valve), and strainer embedded in flow channel, the valve is highly dirt proof and rust proof.
- Water hammer relaxation mechanism.
- Light-weight, compact, low power consumption, energy saving.
- VF-14, 14C Type is made of bronze and rust-proof material.

SPECIFICATIONS

Operation	Energized open		Energized close	
Model name	VF-13	VF-14	VF-13C	VF-14C
Code name	VF13-B	VF14-F	VF13C-B	VF14C-F
Applicable fluid	Water, air & oils ^{*2}			
Fluid temperature	5~60°C			
Fluid viscosity	50cSt or less			
Applicable pressure	0.03~1.0MPa			
Min. pressure differential across the disc	0.03MPa			
Leakage allowance	Nil (Confirm at pressure gauge.)			
Rated voltage	Common use: AC100/200V 50/60Hz or AC110/220V 60Hz ^{*3}			
Rated current	AC100V 50/60Hz: 0.20/0.16A, AC200V 50/60Hz: 0.10/0.08A			
Starting current	AC100V 50/60Hz: 0.5/0.42A, AC200V 50/60Hz: 0.25/0.21A			
Insulation	Class B			
Ambient temperature	5~60°C			
Protection	Dustproof, splash proof, for indoor use (When used outdoors, also use TB-03 Type terminal box, as rain proof type ^{*4})			
End connection	Flanged JIS 10KFF			
Materials	Body(Cast iron)	Body(Cast bronze)	Body(Cast iron)	Body(Cast bronze)
	Trim(Brass and Synthetic rubber), Upper cover(Cast bronze)			
Interior painting for body	Epoxy resin	—	Epoxy resin	—
Installation	Install the valve vertically in horizontal piping placing coil part above.			
Valve body pressure test	Hydraulic 2.0MPa			

- * 1. Refer to Page 244 for method of wiring.
 * 2. If there is any regulation for fuel oils or diesel oil, confirm body material according to the regulation.
 * 3. For products suitable for special voltage, please contact our agent in your area.
 * 4. Products with TB-03 Type terminal box are rain-proof type. Products with TB-03C Type terminal box are splash-proof type.
 * 5. K Type series for foundation or underwater, with size 65~100mm, are also available.
 * 6. VF-13, 14 Type with manual mechanism are also available.

DIMENSIONS (VF-13,13C Type)

(mm)

Size	L	G	H	Port size	Cv value	Mass(kg)
80(3")	270	79	163(183)	70	70	21
100(4")	290	92	175(195)	90	100	30

* Figures in () are for VF-13C Type. Other dimensions are common.

Flange code JIS 10KFF

DIMENSIONS (VF-14,14C Type)

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Size	L	G	H	Port size	Cv value	Mass(kg)
80(3")	270	79	163(183)	70	70	21
100(4")	290	92	175(195)	90	100	30

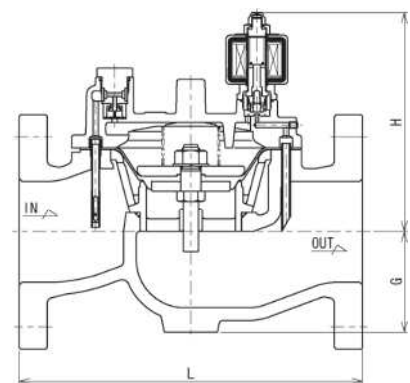
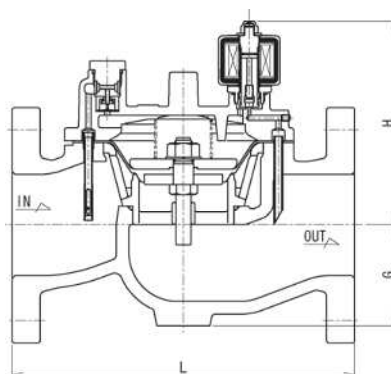
* Figures in () are for VF-14C Type. Other dimensions are common.

Flange code JIS 10KFF

CONSTRUCTION

VF-13, 14 Type

VF-13C, 14C Type



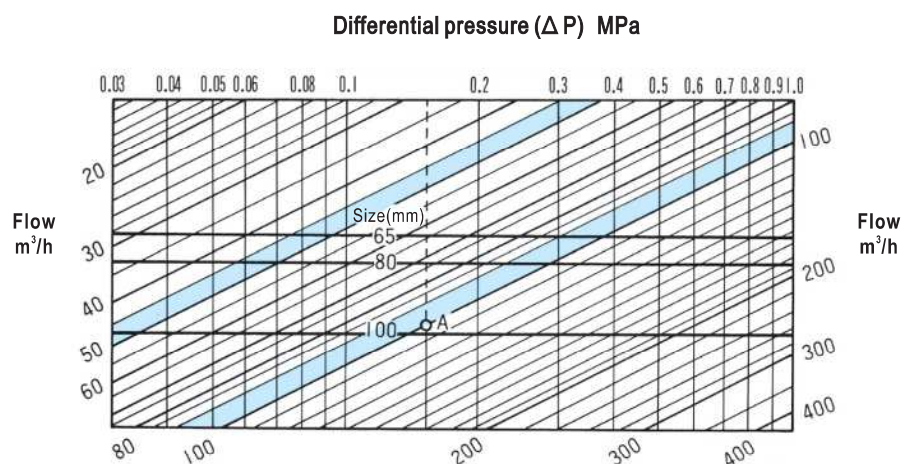
VF-13, 14 type



VF-13C, 14C Type

DATA/VF-13, 13C, 14, 14C Type Solenoid Valve (for Liquids or Gases)

SIZE SELECTION CHART (for Water)

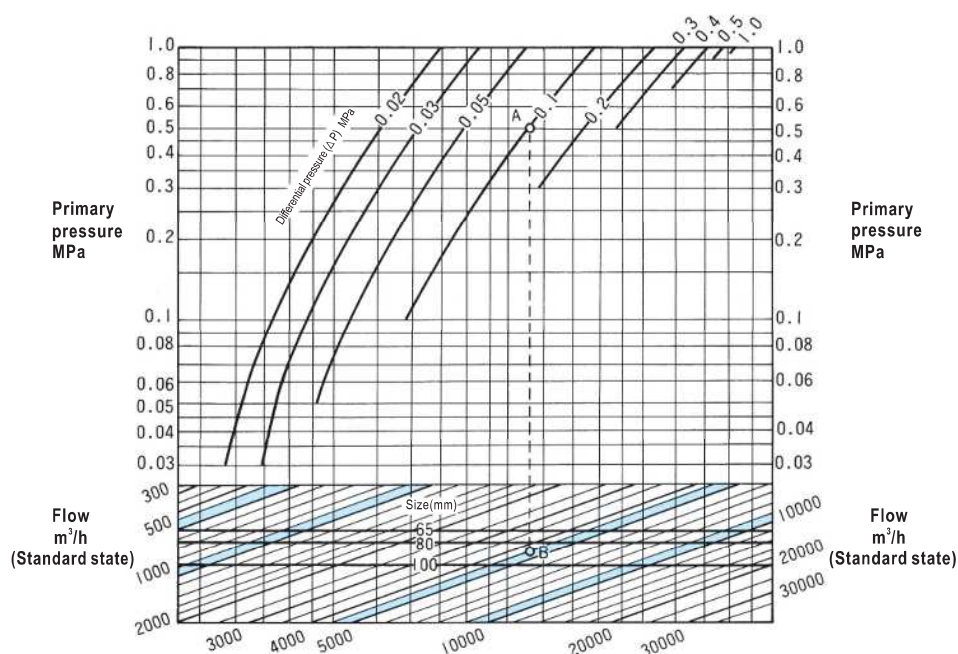


HOW TO USE THE CHART

Example: Determine the size of valve meeting the following conditions:
 Primary pressure: 0.4MPa
 Secondary pressure: 0.25MPa
 Flow of water: 100m³/h
 Differential pressure (ΔP): 0.4–0.25=0.15MPa.
 Find out the intersection point A between the 0.15MPa differential pressure (ΔP) line and the 100m³/h flow line. Since point A is between the lines representing nominal diameter 80mm and 100mm, the nominal diameter should be the larger one, i.e., 100mm.

Note: Size 65mm valve is applicable to K Type series for fountain.

SIZE SELECTION CHART (for Air)



HOW TO USE THE CHART

Example: Determine the size of valve meeting the following conditions:
 Primary pressure: 0.5MPa
 Differential pressure (ΔP): 0.1MPa
 Air: 20°C
 Flow of water (standard state): 4,500m³/h
 Identify intersection point (A) of the 0.5MPa primary pressure line and the 0.1MPa differential pressure curve. Draw a vertical line from point A until it intersects with the 4,500m³/h flow line. The intersection point is named B. Since point B is between the 80mm and 100mm size lines, the larger size, which is 100mm, is selected.

Note: Size 65mm valve is applicable to K Type series for fountain.

DATA/Solenoid Valve

METHOD FOR CONNECTION OF COIL

As shown in relevant specification table, different models of solenoid valves have different rated voltages. When connecting to power, make sure the voltage does not exceed the rated voltage of solenoid valve.

<Common voltage coil>

- Connect the 4 lead wires (in different colors) to power source.

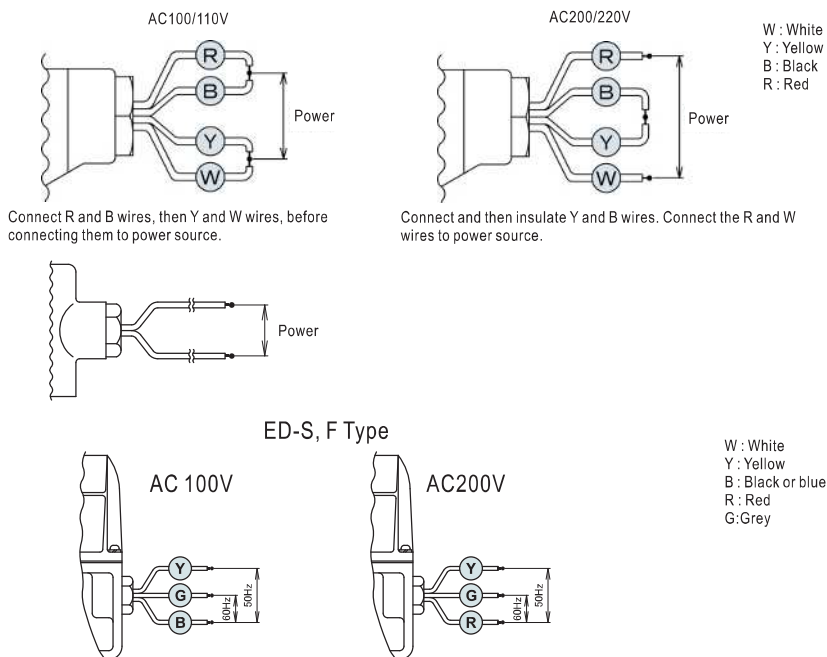
<Exclusive/Special voltage coil>

- Connect 2 lead wires to power source.

<Frequency selecting coil>

- There are 3 lead wires on coil. Read the connection method shown on product before connecting to power source.

The lead wire left unused should be insulated by using insulating tape.



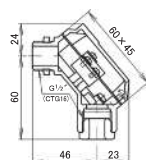
REFERENCE: ABOUT EXPLOSION PREVENTION

Terminal box specially designed for solenoid valve. Can be screwed in with lead wire of solenoid valve and protect power cable and lead wire from being exposed to rain or dust. TB-03 series are for outdoor cables and conduit.

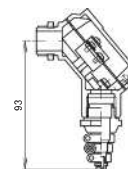
TB-03 TYPE SERIES (for indoor/outdoor, metal body, rainproof)

(Without indication lamp) Rated power: 250V 15A

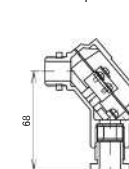
- TB-03 Type (standard model) With gland nut



- TB-03C Type With cap cone

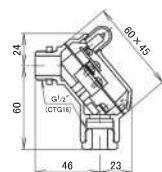


- TB-03F Type With ship-class gland

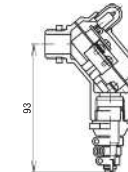


(With indication lamp) Rate power: AC100V or AC200V
Please specify voltage when ordering.

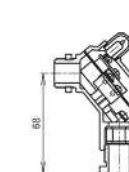
- TB-03L Type With indication lamp



- TB-03LC Type Lamp + cap cone

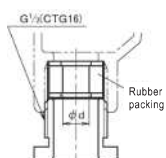


- TB-03LF Type Lamp + ship-class gland



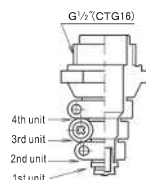
An example of TB-03 installation

SPECIFICATIONS OF GLAND (TB-03F, 03LF Type)



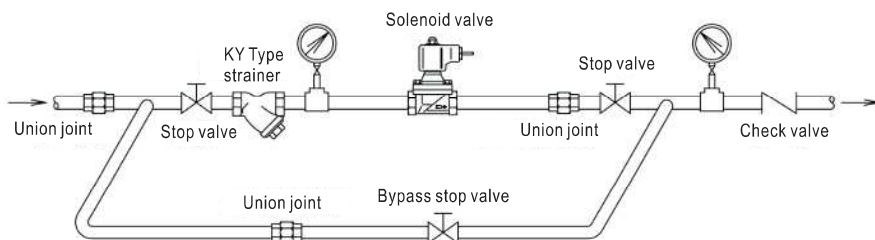
Gland size	d (mm)
15a	9
15b	10
15c	11

SPECIFICATIONS OF CAPCONE PLUG (TB-03C, 03LC Type)



Cut position	Applicable cable diameter(mm)
4th unit	10~12
3rd unit	8~10
2nd unit	6~8
1st unit	4~6

■ Fig.1 Piping example



■ SELECTION AND INSTALLATION

1. Install strainer on the primary side of solenoid valve (see Fig.1).
2. Install a bypass pipe (with stop valve) between the primary and secondary sides of solenoid valve if the operation of equipment cannot be stopped (see Fig.1).
If you do not intend to install bypass pipe, install blowing stop valve, which is branched from the main pipe, right before the stop valve on the primary side of solenoid valve, to allow flushing.
3. The coil should stand upright above horizontal pipe (see Fig.1, 2).
For size 50mm (and below) valve of WS, PS series, the coil can be upright above or at the same level of (and perpendicular to) horizontal pipe. In this case, make sure the pressure differential before and after the valve is larger than 0.03MPa (see Fig.2).
4. Back flow may occur when the secondary pressure is larger than the primary pressure. To prevent back flow, install check valve on the secondary side (see Fig. 3).
5. If the valve is used for steam and the secondary pressure is negative pressure when the valve is closed, install vacuum regulating valve (vacuum breaker) on the secondary side of solenoid valve (see Fig.4).
6. Install steam trap on piping if the valve is used for steam.
7. When used for liquid, the pressure inside the piping may increase due to water hammer which occurs when valve is closed or due to the expansion caused by ambient temperature increase. In this case, it is recommended to install relief valve to protect machine (see Fig.5).
8. Connect coil properly using 0.75mm² above wire. Install fuse to protect electric circuit.
9. Repeated power-on and power-off for a long period may make the surface temperature rise up to about 70°C. Attentions should be paid to avoid burning. (Depending on conditions and models, the temperature rise varies.)
10. Make sure the arrow mark on solenoid valve match with the direction of flow of fluid.
11. Leave some space for disassembling and maintenance.
12. Fix and support piping properly to prevent solenoid valve from being damaged due to weight of piping, excessively large stress, bending force or vibration.
13. Discharge drain or apply thermal insulation if there is risk of freezing.
However, the coil should not be applied with any thermal insulation.

Fig.2 Installation position

Upright to horizontal pipe

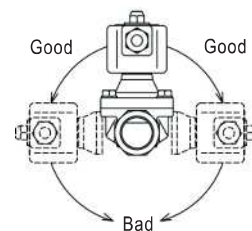


Fig.3: Elevated piping at secondary side

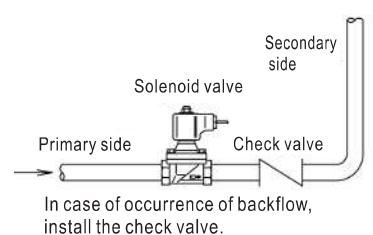


Fig.4 Steam line application

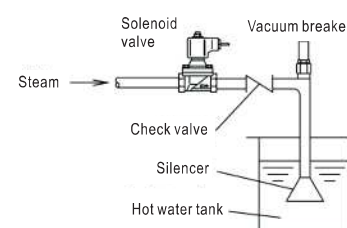
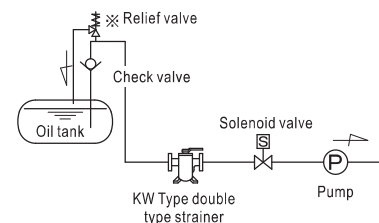


Fig.5 Relief valve installation



※ Install relief valve if pressure rise due to thermal expansion or other factors is anticipated.