

# ED-S, F Type Solenoid Valve (for Liquids or Gases)

ED-S Type screw connection and ED-F Type flange connection valves use powerful 2-way electromagnet to open or close valve. They are semi-direct acting valves suitable for fluid with high viscosity or low pressure.



ED-S Type



ED-F Type

## CURRENT VALUES

(A)

| Voltage |          | 50Hz | 60Hz |
|---------|----------|------|------|
| AC100V  | Rated    | 0.68 | 0.78 |
|         | Starting | 8.00 | 9.20 |
| AC200V  | Rated    | 0.34 | 0.39 |
|         | Starting | 4.00 | 4.60 |

## SPECIFICATIONS

| Operation                                  |      | Energized open                                                                                                                      |                  |                              |                  |                                     |                     |
|--------------------------------------------|------|-------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------------|------------------|-------------------------------------|---------------------|
| Model name                                 |      | ED-S                                                                                                                                |                  | ED-F                         |                  |                                     |                     |
| Type                                       |      | Metal disc                                                                                                                          | With Teflon-disc | Metal disc                   | With Teflon-disc | Metal disc                          | With Teflon-disc    |
| Code name                                  |      | EDS-J                                                                                                                               | EDS-W            | EDF-J                        | EDF-W            | EDF-B                               | EDF-R <sup>*4</sup> |
| Size                                       |      | 10~50(3⁄8"~2")                                                                                                                      |                  | 15~50(1⁄2"~2")               |                  | 65~80(2½"・3")                       |                     |
| Applicable fluid                           |      | Metal touch:Water & oils <sup>*3</sup> , With Teflon-disc:Diesel oil <sup>*4</sup> , kerosene, gasoline <sup>*4</sup> & inert gases |                  |                              |                  |                                     |                     |
| Fluid temperature                          |      | 5~100℃                                                                                                                              |                  |                              |                  |                                     |                     |
| Fluid viscosity                            |      | 100cSt or less <sup>*5</sup>                                                                                                        |                  |                              |                  |                                     |                     |
| Applicable pressure                        |      | 0~0.7MPa                                                                                                                            |                  |                              |                  |                                     |                     |
| Min. pressure differential across the disc |      | 0MPa                                                                                                                                |                  |                              |                  |                                     |                     |
| Leakage allowance                          |      | Water & oils:3g/min or less, Air(With Teflon-disc):50mL/min(standard state) or less                                                 |                  |                              |                  |                                     |                     |
| Rated voltage                              |      | AC100V 50/60Hz or AC200V 50/60Hz <sup>*6</sup>                                                                                      |                  |                              |                  |                                     |                     |
| Insulation                                 |      | Class B                                                                                                                             |                  |                              |                  |                                     |                     |
| Ambient temperature                        |      | 5~40℃                                                                                                                               |                  |                              |                  |                                     |                     |
| Protection                                 |      | Dust & drip proof (When using the solenoid valve outdoors, protect it with a cover, etc.)                                           |                  |                              |                  |                                     |                     |
| End connection                             |      | Screwed JIS Rc                                                                                                                      |                  | Flanged JIS 10KFF            |                  |                                     |                     |
| Materials                                  | Body | Cast bronze <sup>*2,*7</sup>                                                                                                        |                  | Cast bronze <sup>*2,*8</sup> |                  | Cast iron <sup>*2,*8</sup>          |                     |
|                                            | Trim | Disc:Stainless steel or with Teflon tip                                                                                             |                  |                              |                  | Disc:Cast bronze or with Teflon tip |                     |
| 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. Products for steam are also available.

\* 4. Code name: EDF-R is applicable to kerosene and gas.

\* 5. Fluid viscosity Max. 300cSt is also available upon your request.

\* 6. For products suitable for special voltage, please contact our agent in your area.

\* 7. For products with stainless steel body, please contact our agent in your area.

\* 8. For products with cast steel/stainless steel body, please contact our agent in your area.

## DIMENSIONS(ED-S Type)

(mm)

| Size       | d      | L   | G   | H   | Port size | Cv value | Mass(kg) |
|------------|--------|-----|-----|-----|-----------|----------|----------|
| 10(3/8")   | 3/8"   | 63  | 63  | 193 | 13        | 1.5      | 2.4      |
| 15(1/2")   | 1/2"   | 63  | 63  | 193 | 13        | 3        | 2.4      |
| 20(3/4")   | 3/4"   | 80  | 60  | 198 | 18        | 5        | 2.6      |
| 25(1")     | 1"     | 90  | 65  | 202 | 23        | 8.5      | 2.9      |
| 32(1 1/4") | 1 1/4" | 106 | 85  | 209 | 27        | 12.5     | 3.6      |
| 40(1 1/2") | 1 1/2" | 118 | 97  | 215 | 34        | 20       | 4.7      |
| 50(2")     | 2"     | 140 | 109 | 225 | 44        | 30       | 6.9      |

## DIMENSIONS (ED-F Type)

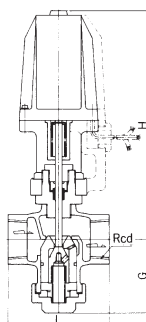
(mm)

| Size       | L   | G   | H   | Port size | Cv value | Mass(kg) |
|------------|-----|-----|-----|-----------|----------|----------|
| 15(1/2")   | 100 | 63  | 193 | 13        | 3        | 4.2      |
| 20(3/4")   | 106 | 60  | 198 | 18        | 5        | 4.9      |
| 25(1")     | 112 | 65  | 202 | 23        | 8.5      | 6.3      |
| 32(1 1/4") | 150 | 85  | 209 | 27        | 12.5     | 7.9      |
| 40(1 1/2") | 160 | 97  | 215 | 34        | 20       | 9.3      |
| 50(2")     | 170 | 109 | 225 | 44        | 30       | 12.5     |
| 65(2 1/2") | 270 | 120 | 289 | 65        | 36       | 35       |
| 80(3")     | 290 | 140 | 308 | 80        | 43       | 48       |

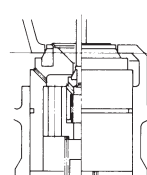
Flange code JIS 10KFF

## CONSTRUCTION (AC power)

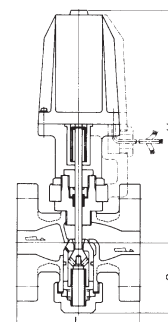
ED-S Type



Teflon disc structure

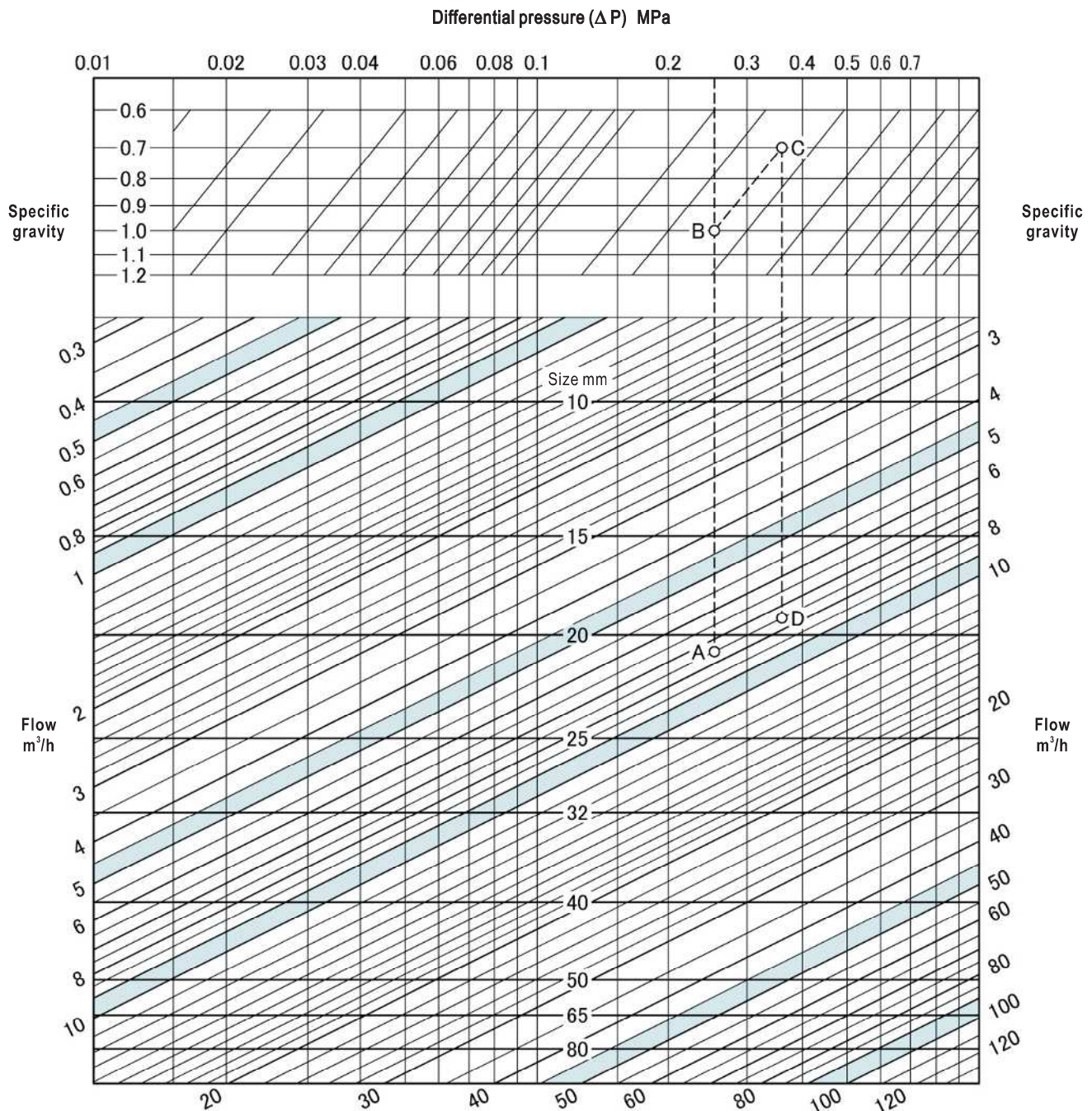


ED-F Type



Depending on size, the structure may vary.

## SIZE SELECTION CHART (for Liquids)



### ● HOW TO USE THE CHART

Example: Find out the nominal diameter meeting the following conditions: Primary pressure: 0.5MPa, Secondary pressure: 0.25MPa, Specific gravity: 1 (water), Flow: 7.5 $m^3/h$ .

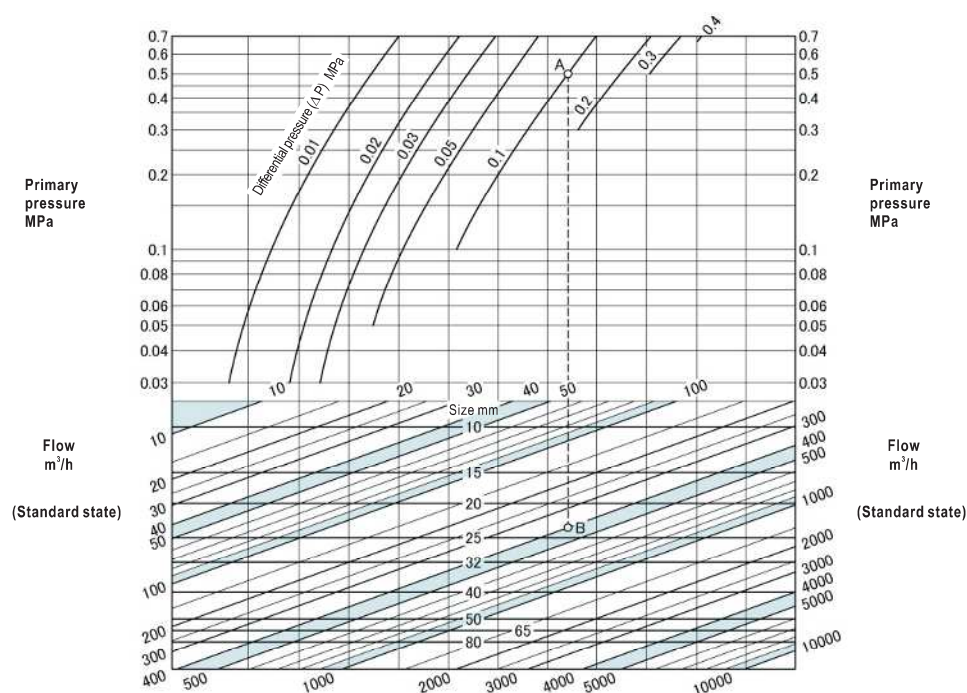
Differential pressure ( $\Delta P$ ) MPa:  $0.5 - 0.25 = 0.25$ MPa. Find out the intersection point A between the 0.25MPa differential pressure ( $\Delta P$ ) line and the 7.5 $m^3/h$  flow line.

Since point A is between the lines representing nominal diameter 20mm and 25mm, the nominal diameter should be the larger one, i.e., 25mm. In the case other conditions remain the same but the specific gravity is 0.7, find out the intersection point B between the 0.25MPa differential pressure ( $\Delta P$ ) line and the 1.0 specific gravity line. Move from point B on the 0.7 specific gravity line parallelly

to reach point C. Now draw a vertical line from point C until it intersects with the 7.5 $m^3/h$  flow line. The intersection point is named D. Since point D is located between the lines representing nominal diameter 15mm and 20mm, the nominal diameter should be the larger one, i.e., 20mm.

# DATA/ED-S, F Type Solenoid Valve (for Air)

## 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 ( $\Delta P$ ): 0.1MPa

Flow of air (20°C): 400m³/h (standard state)

Identify the 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 400m³/h flow line. The intersection point is named B. Since point B is between the 20mm and 25mm size lines, the larger size, which is 25mm, is selected.



# 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>

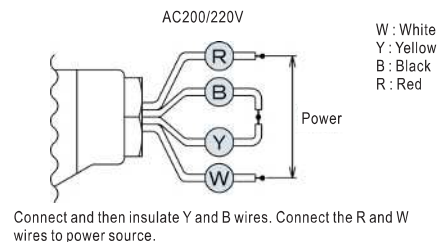
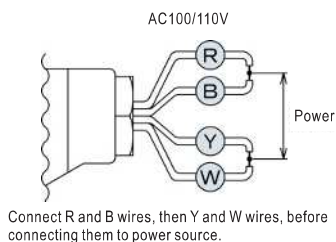
- Connect the 4 lead wires (in different colors) to power source.

### <Exclusive/Special voltage coil>

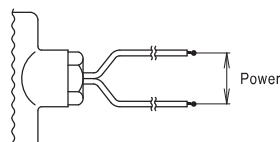
- Connect 2 lead wires to power source.

### <Frequency selecting coil>

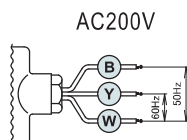
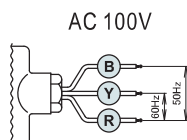
- There are 3 lead wires on coil. Read the connection method shown on product before connecting to power source. The lead wire left unused should be insulated by using insulating tape.



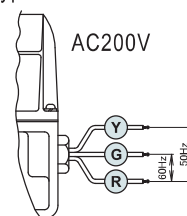
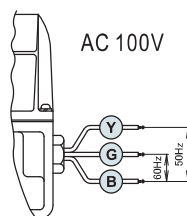
W : White  
Y : Yellow  
B : Black  
R : Red



DS-10, 10H, 12, 13, 13H Type



ED-S, F Type



W : White  
Y : Yellow  
B : Black or blue  
R : Red  
G : Grey

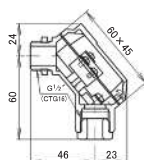
## REFERENCE: ABOUT EXPLOSION PREVENTION

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.

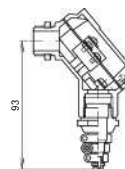
### TB-03 TYPE SERIES (for indoor/outdoor, metal body, rainproof)

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

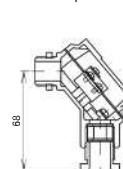
- TB-03 Type (standard model) With gland nut



- TB-03C Type With cap cone

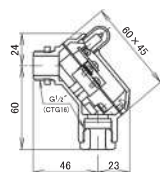


- TB-03F Type With ship-class gland

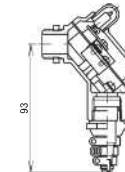


(With indication lamp) Rate power: AC100V or AC200V  
Please specify voltage when ordering.

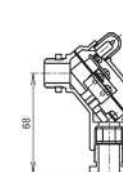
- TB-03L Type With indication lamp



- TB-03LC Type Lamp + cap cone

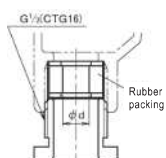


- TB-03LF Type Lamp + ship-class gland



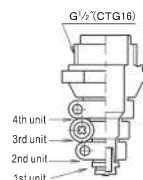
An example of TB-03 installation

### 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

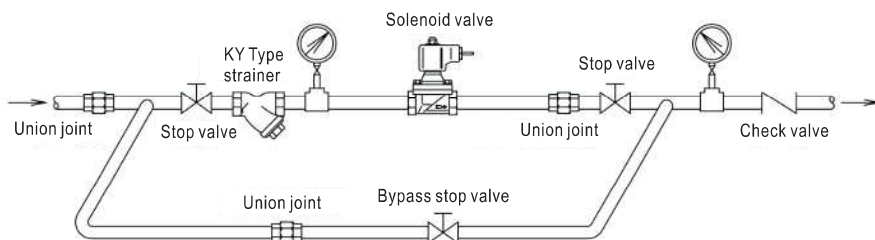


Fig.2 Installation position

Upright to horizontal pipe

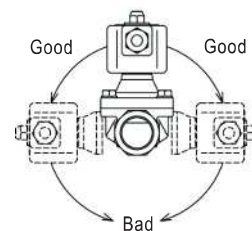


Fig.3: Elevated piping at secondary side

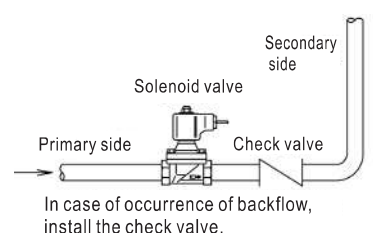


Fig.4 Steam line application

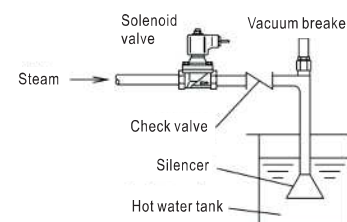
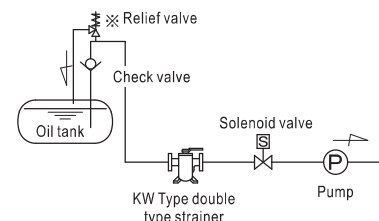


Fig.5 Relief valve installation



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

## ■ 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 0.75mm<sup>2</sup> 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.