K Type Series Solenoid Valve for Fountain

Underwater series
Diaphragm type/Piston type
Screwed

SSS&AAS Used※

※ Contact-free swinging mechanism (AAS※1) with special shape spring (SSS※1).
※1. Special Shape Spring ※2. Anti Abrasion System

K Type series solenoid valves for fountain or underwater applications or places where there is risk of submerging.
Of course, they can also be used for places where there is not such risk.
More durable than old models WS/PS-12K, 12CK Type.
Materials comply with RoHS directives.
Face-to-face dimensions are the same as those of WS/PS-12K, 12CK Type.

WS-22K, PS-22K Type

WS-22CK, PS-22CK Type

FEATURES

- Solenoid valves for underwater applications (depth up to 1.5m).
- A solution for fountain, pit, or waste water treatment tank.
- Working pressure up to 1.0MPa.
- Install in horizontal or vertical pipe。

SPECIFICATIONS

Operation	Energized open	Energized close	Energized open	Energized close
Model name	WS-22K	WS-22CK	PS-22K	PS-22CK
Code name	**WS22K-F□**	**WS22CK-F**	**PS22K-W□**	**PS22CK-W**
	※ 1 or 2 for rated voltage is required in □			
Applicable fluid	Water, air & inert gases		Water & air	
Fluid temperature	5~60℃		5~80℃	
Applicable pressure	0~1.0MPa			
Min. pressure differential across the disc	0MPa (0.03MPa for coil installed horizontally.)			
Leakage allowance	Nil (Confirm at pressure gauge. For gases, when 0.02~1.0MPa)		Water:Nil (Confirm at pressure gauge,) Air:50mL/min(standard state) or less (When 0.05~1.0MPa)	
Coil	Epoxy mold coil (Case:Cation painting)			
Ambient temperature	5~40℃			
Rated voltage	Refer to table of rated voltage			
Insulation	Class B			
Protection	Underwater application			
Lead wire	1.25mm^2 × 2m, 2-core 2PNCT			
Applicable water depth	Max. 1.5m			
End connection	Screwed JIS Rc			
Body Materials	Cast bronze			
Installation	Can be installed on both horizontal and vertical piping at any angle between the vertical (When the coil part is placed above) and horizontal.			
Valve body pressure test	Hydraulic 2.0MPa			

＊ Lead length of up to 20m is also available upon you request.

RATED VOLTAGE

Operation	Energized open		Energized close	
Model name	WS-22K	PS-22K	WS-22CK	PS-22CK
Rated voltage	**1:AC100V 50/60Hz 110V60Hz 2:AC200V 50/60Hz 220V60Hz**		AC100V 50/60Hz 110V60Hz or AC200V 50/60Hz 220V60Hz	

＊ Rated voltage of AC24V is also available.

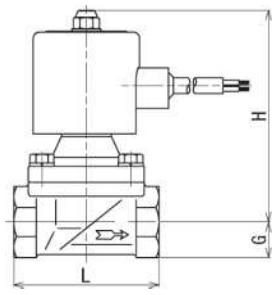
CURRENT VALUES

(A)

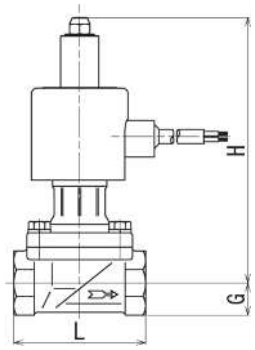
Voltage \ Model		WS-22K WS-22CK	PS-22K PS-22CK
AC100V	Rated(Starting)	0.35(1.30)	0.40(1.70)
AC200V	Rated(Starting)	0.18(0.65)	0.20(0.85)

FIGURATION DRAWING

WS-22K, PS-22K Type



WS-22CK, PS-22CK Type



DIMENSIONS

(mm)

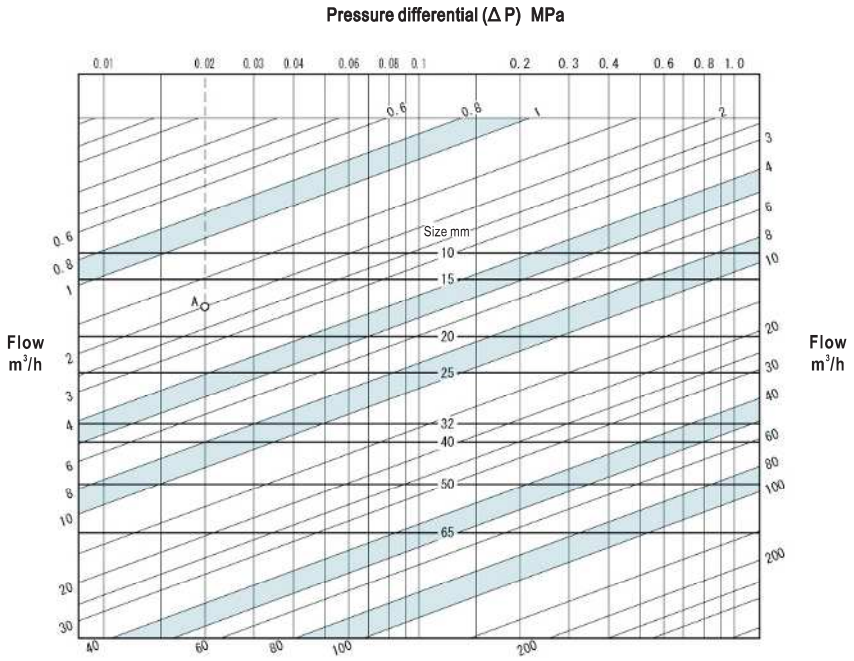
Size	d	L	G	H		Port size	Cv value		Mass(kg)	
				WS-22K Type	PS-22K Type		WS-22K Type	PS-22K Type	WS-22K Type	PS-22K Type
10(⅜″)	⅜″	63	15	112(170)	121(173)	18	3	3	1.7(2)	1.9(2.1)
15(½″)	½″	63	15	112(170)	121(173)	18	4	4.5	1.7(2)	1.9(2.1)
20(¾″)	¾″	80	18	114(171)	126(177)	23	7	7.5	1.9(2.1)	2.1(2.4)
25(1″)	1″	90	22	120(177)	131(182)	28	10	12	2.4(2.6)	2.6(2.9)
32(1¼″)	1¼″	106	27	149(203)	150(199)	32	17	18	3.1(3.6)	3.3(3.8)
40(1½″)	1½″	118	30	152(206)	153(202)	40	20	23	4 (4.5)	4.2(4.7)
50(2″)	2″	140	37	164(218)	165(214)	48	30	35	5.7(6.1)	5.7(6.1)

Figures in ( ) are for energized close type.

DATA/WS, WF Type Solenoid Valve (for Liquids or Gases)

SIZE SELECTION CHART (for Water)

Applicable models: WS-22, 22C, 22K, 22CK
WF-22, 22C, 22K, 22CK
WS-25, 25C
WF-25, 25C



HOW TO USE THE CHART

Example: Determine the size of valve meeting the following conditions:

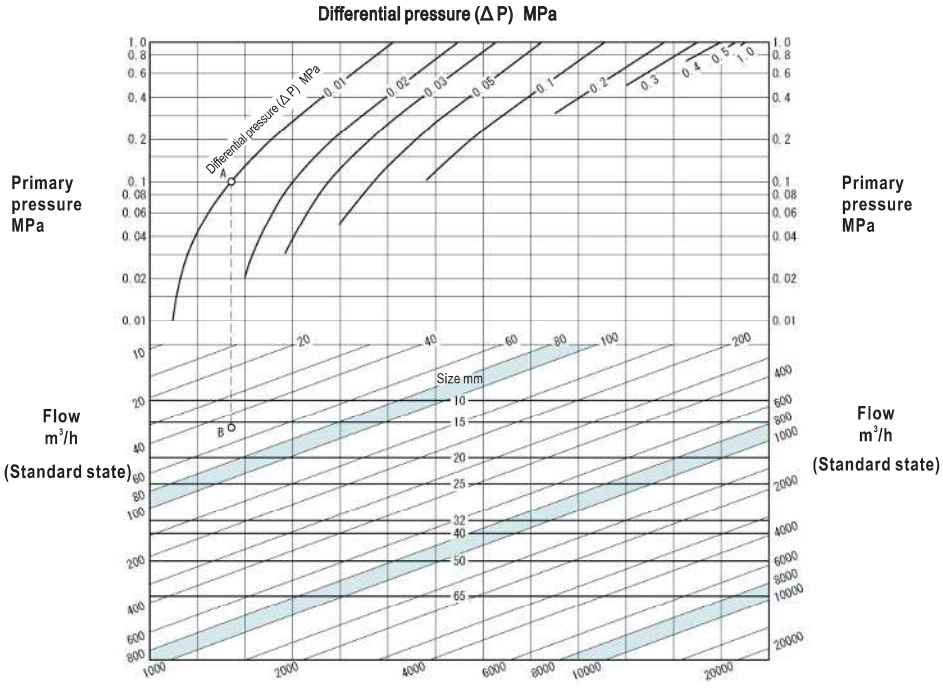
Primary pressure: 0.3MPa
Secondary pressure: 0.28MPa
Flow of water: 2m³/h

Differential pressure (Δ P) : 0.3−0.28=0.02MPa. Find out the intersection point A between the 0.02MPa differential pressure (ΔP) line and the 2m³/h flow line. Since point A is between the lines representing nominal diameter 15mm and 20mm, the nominal diameter should be the larger one, i.e. 20mm.

Note: Size 65mm is applicable to WS-12, 12C and WF-12, 12C types.

SIZE SELECTION CHART (for Air)

Applicable models: WS-22, 22C, 22K, 22CK
WF-22, 22C, 22K, 22CK
WS-25, 25C
WF-25, 25C



HOW TO USE THE CHART

Example: Determine the size of valve meeting the following conditions:

Primary pressure: 0.1MPa
Secondary pressure: 0.09MPa
Flow of air (at 20℃): 50m³/h (standard state)

Differential pressure (ΔP) is: 0.1−0.09=0.01MPa. Identify intersection point (A) of the 0.1MPa primary pressure line and the 0.01MPa Differential pressure curve. Draw a vertical line from point A until it intersects with the 50m³/h flow line. The intersection point is named B. Since point B is between the 15mm and 20mm size lines, the larger size, which is 20mm, is selected.

Note: Size 65mm is applicable to WS-12, 12C and WF-12, 12C types.

DATA/Solenoid Valve

METHOD FOR CONNECTION OF COIL

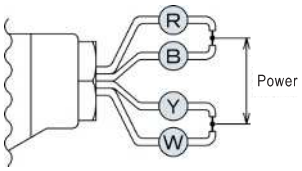
As shown in relevant specification table, different models of solenoid valves have different rated voltages.
When connecting to power, make sure the voltage does not exceed the rated voltage of solenoid valve.

<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.

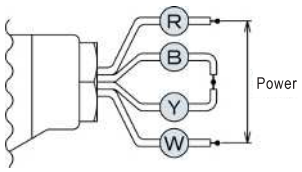
<Frequency selecting coil>
- There are 3 lead wires on coil. Read the connection method shown on product before connecting to power source.
  The lead wire left unused should be insulated by using insulating tape.

AC100/110V



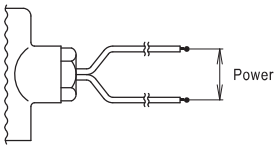
Connect R and B wires, then Y and W wires, before connecting them to power source.

AC200/220V



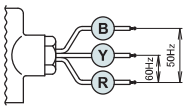
Connect and then insulate Y and B wires. Connect the R and W wires to power source.

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

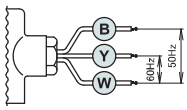


DS-10, 10H, 12, 13,13H Type

AC 100V

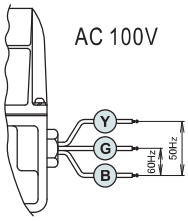


AC200V

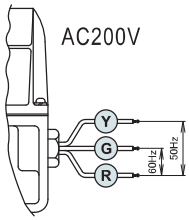


ED-S, F Type

AC 100V



AC200V



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

REFERENCE: ABOUT EXPLOSION PREVENTION

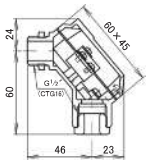
Terminal box specially designed for solenoid valve. Can be screwed in with lead wire of solenoid valve and protect power cable and lead wire from being exposed to rain or dust.
TB-03 series are for outdoor cables and conduit.

An example of TB-03 installation

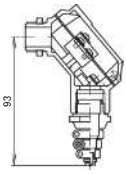
TB-03 TYPE SERIES (for indoor/outdoor, metal body, rainproof)

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

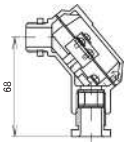
- TB-03 Type(standard model)
  With gland nut



- TB-03C Type
  With cap cone

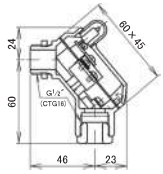


- TB-03F Type
  With ship-class gland

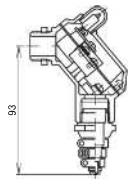


(With indication lamp) Rate power: AC100V or AC200V
Please specify voltage when ordering.

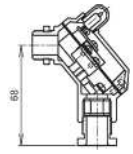
- TB-03L Type
  With indication lamp



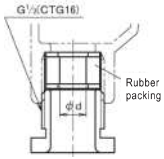
- TB-03LC Type
  Lamp + cap cone



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

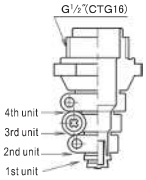


SPECIFICATIONS OF GLAND (TB-03F, 03LF Type)



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

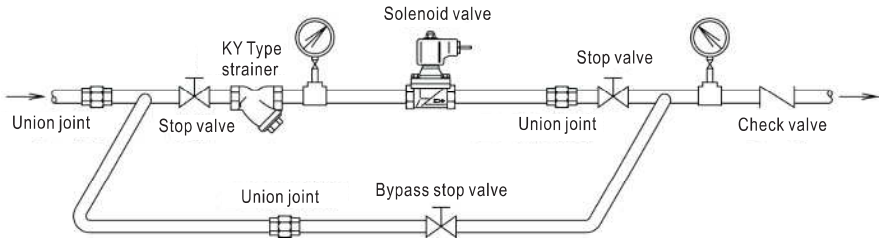
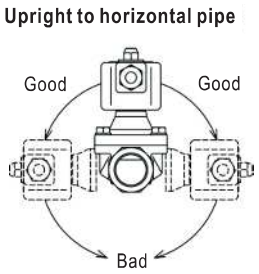


Fig.2 Installation position



■ 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^2 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℃. 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 dissembling 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.3: Elevated piping at secondary side

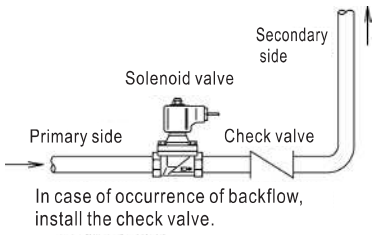


Fig.4 Steam line application

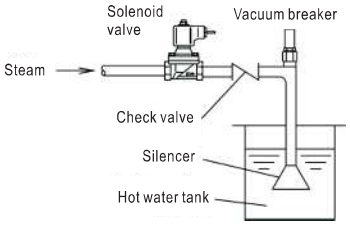
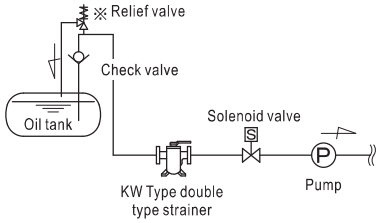


Fig.5 Relief valve installation



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