

# DK08 Direct Acting Solenoid Valve

# INSTRUCTION MANUAL

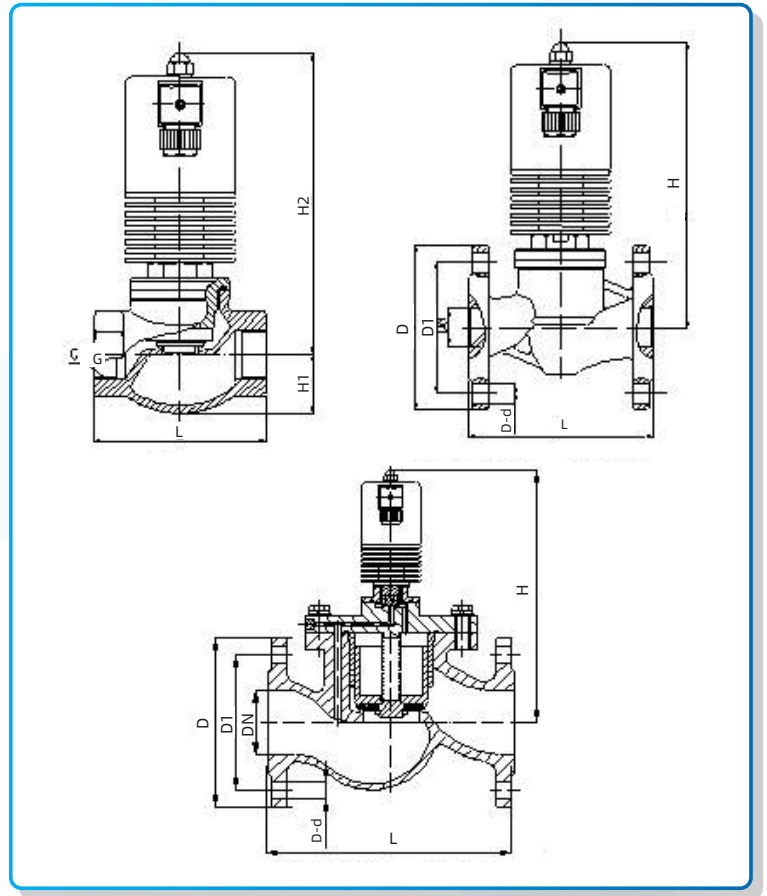


**dc DELCO**

Specialized Control Valve Manufacturer



<b>Characteristic</b>	1.Pilot operated diaphragm construction with less power consumption for longtime working. 2.Used for long-time working in pipeline system	
<b>Medium</b>	Steam , Hot water, oil, etc.	
<b>Temperature</b>	PEEK: -20°C~300°C P-PTFE: -20°C~180°C	
<b>Pressure</b>	0.05MPa~1.6MPa	
<b>Port Size</b>	Thread:3/8"-2" Flange:1/2"-4"	
<b>Port Thread</b>	BSPP/NPT/BSPP,NPT,FLANGE	
<b>Orifice(mm)</b>	10, 15, 20, 25, 32, 40, 50, 65, 80, 100	
<b>Voltage</b>	DC-12V,24V AC-24V,120V,240V/60Hz,110V,220V/50Hz	
<b>Tolerance</b>	±10%	
<b>Coils</b>	S21H,28VA(AC),18W(DC),IP65,100%ED S51H,70VA(AC),50W(DC),IP65,100%ED	
<b>Material</b>	Body	Stainless Steel
	Seal	PEEK,PTFE
	Armature Tube	Stainless Steel 304
	Plunger	Stainless Steel 430F
	Stop	SS 430F
	Springs	SS 304
	Shading Rings	Copper



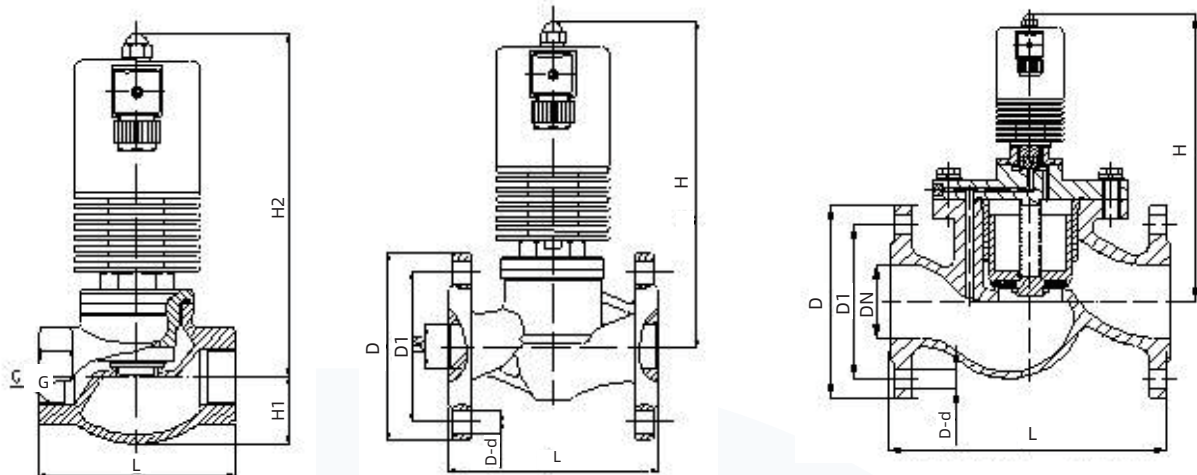
## Determine Valve Body Code

Type	Orifice mm	Port Thread	Body	Sealing	Coils	Voltage
DK08	12, 15, 20, 25, 40, 50, 65, 80, 100	G-G/BSP G/BSP N-NPT thread NPT F-Flange	S-Stainless steel	PTFE PEEK	Y21H Y51H	1, AC220V 2, DC24V 3, AC110V 4, DC12V 5, AC24V 6, AC12V

EXMAPLE: DK08 SERIES, 25MM ORIFICE, 1"G, STAINLESS BODY, PTFE SEAL, COIL Y32B, AC220V, DIN

## Size Drawing For DK08 Series Flange Solenoid Valve

Nominal Diameter	DN15	DN20	DN25	DN32	DN40	DN50
<b>L</b>	115	120	135	135	160	200
<b>B</b>	90	100	111	111	141	157
<b>C</b>	160	185	200	200	260	300
<b>D1</b>			85	85	110	125
<b>D</b>			66	66	86	100



## Characteristic

Step-by-step direct-acting solenoid valve: It is a combination of direct-acting and pilot-operated. Normally closed type- when there is no pressure difference between the inlet and the outlet, the electromagnetic force directly opens the pilot hole after power-on, the main valve piston is lifted up in turn, and the valve opens; when the inlet and outlet reach the starting pressure difference, after power-on, the electromagnetic force opens first in the pilot hole, the pressure in the upper cavity of the main valve piston drops, so that the pressure difference and electromagnetic force are used to pull the main piston, and the valve port is opened: when the power is off, the pilot hole is closed by the spring return, the upper cavity of the main piston is pressurized, and the main piston is pushed down the valve is closed. Normally open and normally closed.

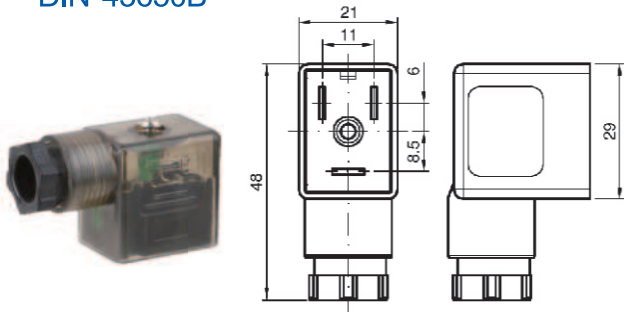
## Installation and Maintenance

01. Before installation, carefully check and read the product instruction manual, check whether the product fully meets the operating requirements, be familiar with the installation points, and make preparations.
02. Check whether the brand parameters are the selected parameters and whether they are consistent with the instruction manual.
03. Before installation, fully flush the pipeline with the highest operating pressure of the pipeline. The flushing time should be more than 5 minutes, and completely remove the metal powder, residual sealing material, and oxide scale after welding in the pipeline.
04. Pay attention to the cleanliness of the medium, if there are impurities in the circulating medium, a filter with a density of 0.5um must be installed before the inlet end of the solenoid valve.
05. The solenoid valve should be installed horizontally with the coil on top. The valve should not be installed in a low recess, such as installed in the discharge pipeline of the container, pay attention not to be drawn out from the bottom of the container, but should be installed at a position slightly above the bottom of the container.
06. If the medium will cause water hammer, pay attention to the selection of the solenoid valve or take corresponding preventive measures.
07. A water flow valve should be installed on the front side of the inlet of the solenoid valve for steam, The connecting pipe should be inclined and the water flow valve should be installed at a low position. It is best to install a multi-pass backwash filter.
08. The solenoid valve is generally directional and cannot be installed reversely. Usually, the "arrow" is used on the valve body to indicate the flow direction of the medium, and the installation should follow the direction indicated by the "arrow"
09. When taking over it should be noted that the sealing material should not be used excessively, For example, in the case of threaded connection. the thread of the connecting pipe should be kept within the effective length, and the half-thread pitch at the end should be chamfered with a file, and the sealing tape should be wound from the end of the two teeth. Otherwise, excessive sealing tape or adhesive will enter the solenoid valve, and an accident will occur that hinders the normal operation of the solenoid valve.
10. The on-site installation of explosion-proof solenoid valves must be carried out in accordance with the relevant regulations in the "Electrical Safety Regulations" for national explosion-hazardous places.
11. Non-electrical personnel are not allowed to disassemble the electrical components of the solenoid valve

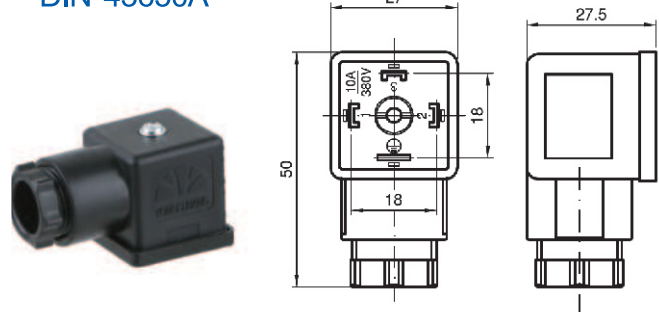
## Determine Valve Body Code

S	2	1	B	1
Model Number	NO	Wiring Form	Rank	Input Voltage
S-Plastic Coil Y-Waterproof Coil F-Waterproof Coil L-Self Retaining Coils Ex- Explosion-proof coils	1 2 3 4 5 6 7 8 9 A D0 C	1-Connection box 2-45cm lead 3-1/2" conduit 4-1m long lead	B-B grade (-20~130°C) F-F grade(-20~155°C) H-H grade(-20~180°C)	1-AC220V 2-DC24V 3-AC110V 4-DC12V 5-AC24V 6- DC6V 7-AC380V

### DIN 43650B



### DIN 43650A

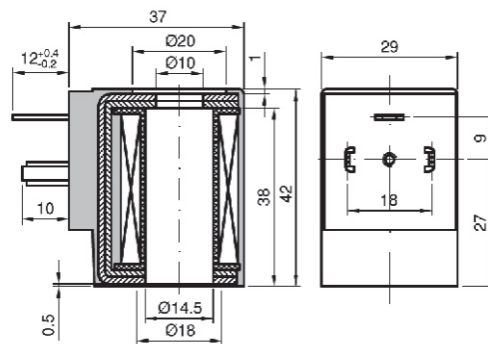


### S11B

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
22VA 13W

Protection level  
H

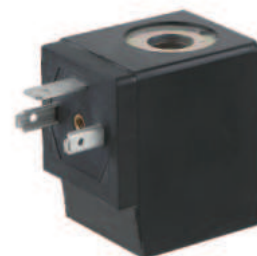
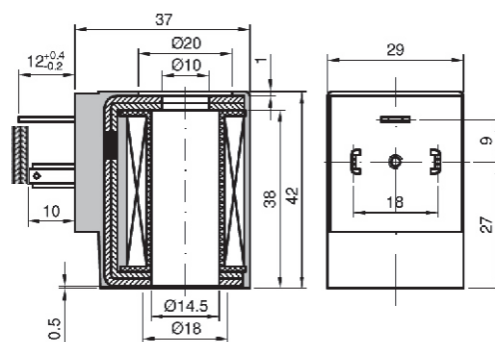


### L11B

Voltage  
DC4.5 - 24V

power  
14W

Protection level  
H

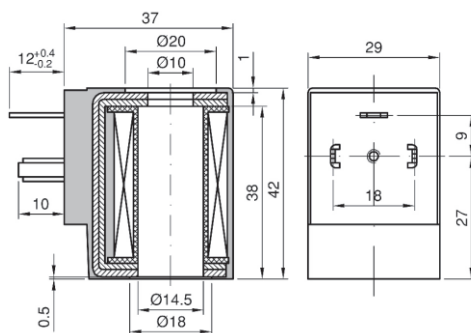


### 0543

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
22VA 13W

Protection level  
H

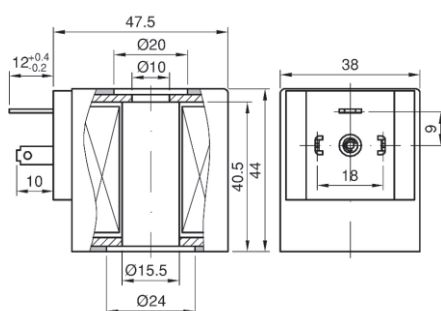


### S21B

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
24VA 18W

Protection level  
H

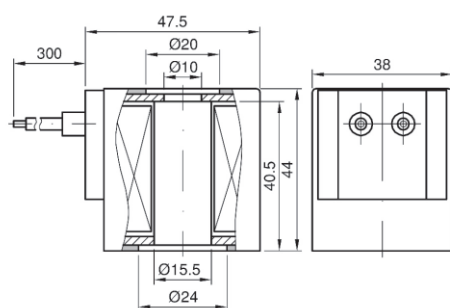


### S22B

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
30VA 18W

Protection level  
H

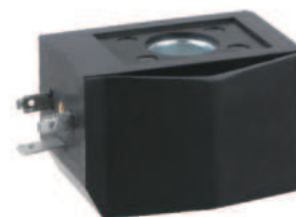
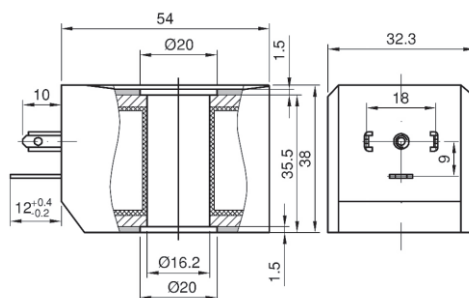


### S41B

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
18VA 11W

Protection level  
H

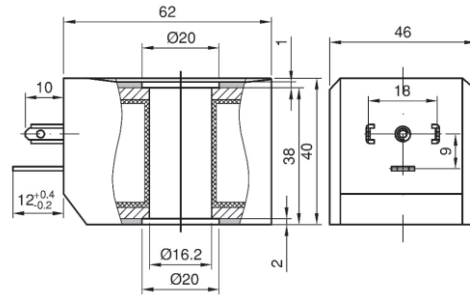


### S51B

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
30VA 24W

Protection level  
H

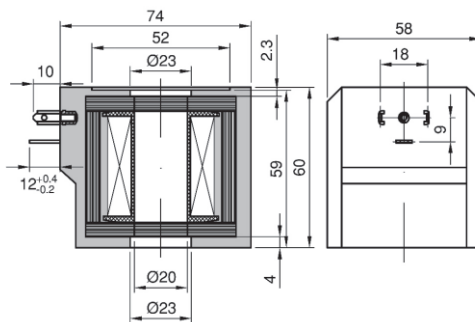


### S61B

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
28VA 36W

Protection level  
H

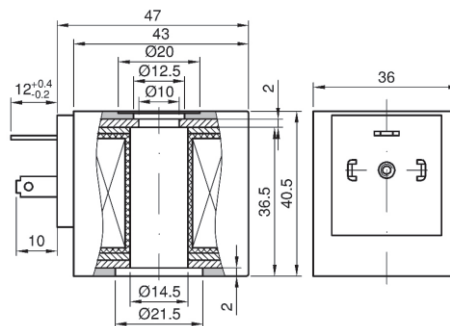


### S91B

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
22VA 17W

Protection level  
H

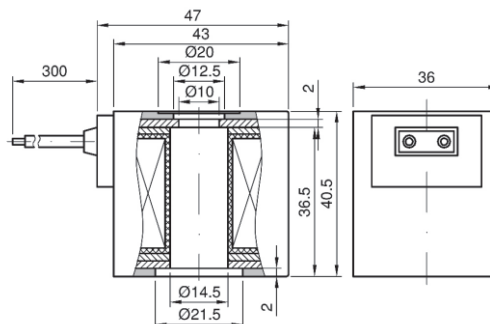


### S92B

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
22VA 17W

Protection level  
H

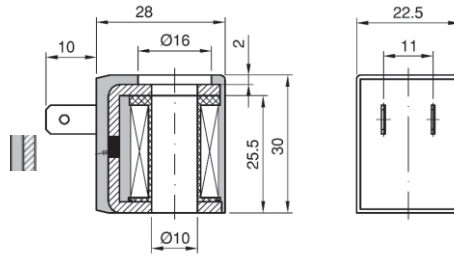


### L21B

Voltage  
DC4.5 - 24V

power  
10W

Protection level  
H

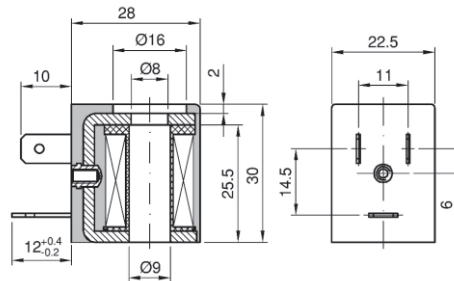


### S81B

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
5.5VA 4.8W

Protection level  
H

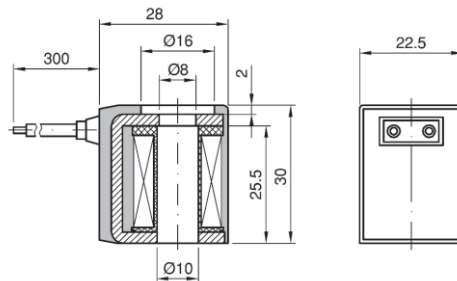


### SA12B

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
6.5W

Protection level  
H

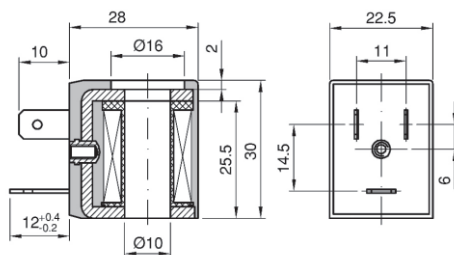


### SA11B

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
6.5W

Protection level  
H

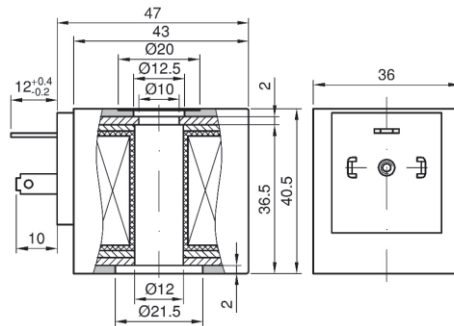


**SD01B**

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
16VA 13W

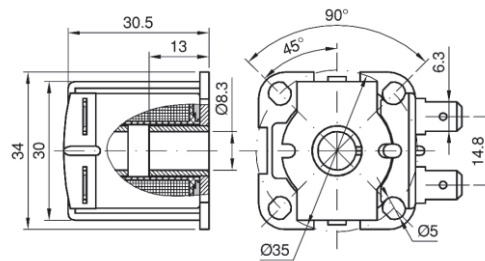
Protection level  
H


**SA41B**

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
5W

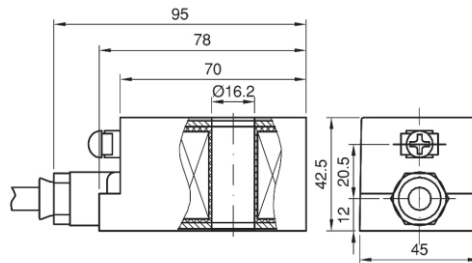
Protection level  
F


**EX1620**

Voltage  
AC220V 50Hz  
DC24V

power  
20VA 16W

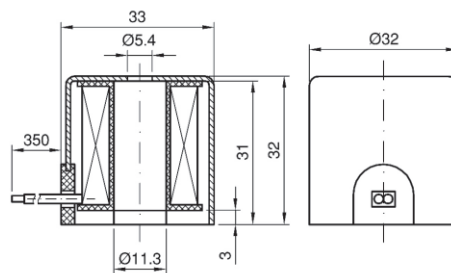
Protection level  
H


**AB12B**

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
5W

Protection level  
F

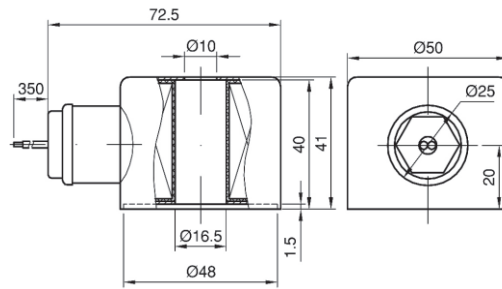


**Y32B**

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
40VA 18W

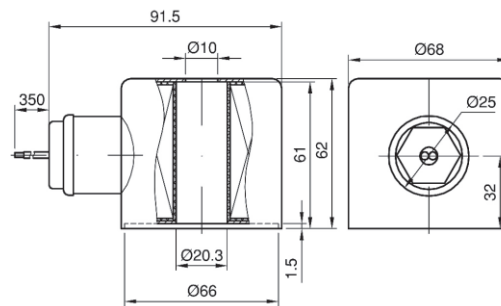
Protection level  
H


**Y42B**

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
50VA 20W

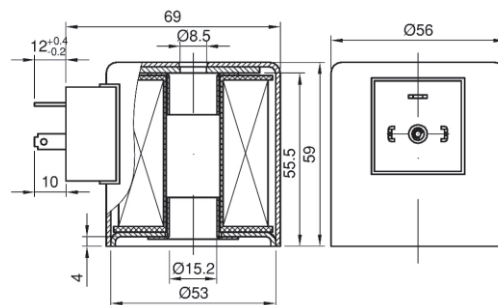
Protection level  
H


**Y21B**

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
18VA 16W

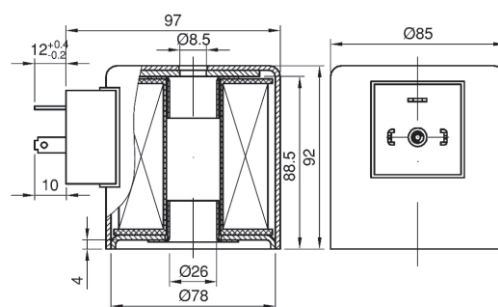
Protection level  
H


**Y51B**

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
70VA 50W

Protection level  
H

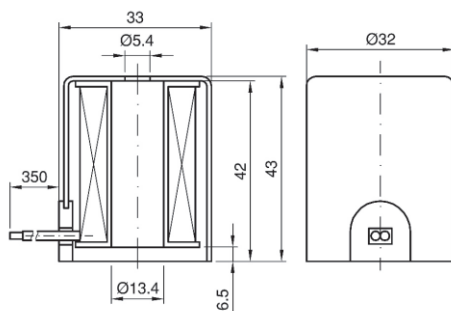


**Y82B**

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
6VA 5W

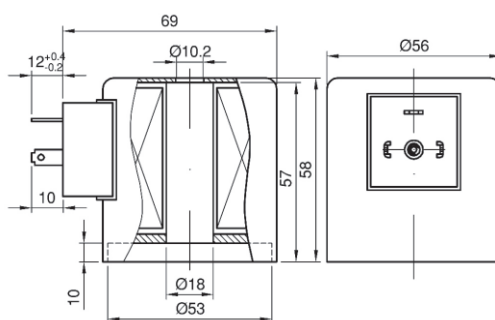
Protection level  
H


**Y91B**

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
20VA 28W

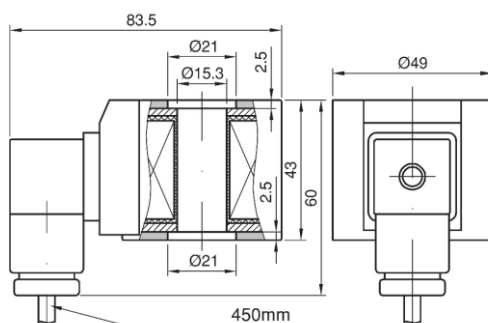
Protection level  
H


**F14**

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
26VA 13W

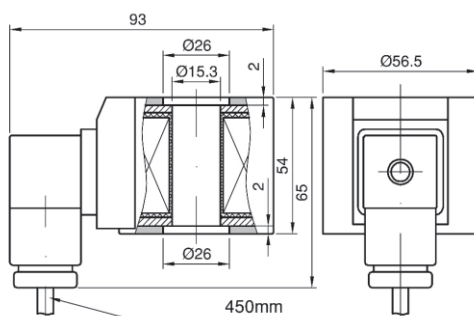
Protection level  
H


**F24**

Voltage  
AC24 - 240V 50Hz / 60Hz  
DC12 - 48V

power  
28VA 15W

Protection level  
H



**Valve body, seal material and medium modeling table**

Material Medium	Brass	Cast Iron	Stainless Steel	Plastic	NBR	EPDM	PTFE	Teflon
Air	√	√	√	√	√	√	√	√
Natural Gas	√	√	√		√	√	√	√
Oxygen	√	√	√	√	√	√	√	√
Hydrogen	√		√		√		√	√
City Gas	√		√				√	√
Industrial Gas	√		√		√			√
Nitrogen	√		√				√	√
Refined Oil	√	√	√				√	√
Water	√	√	√	√	√	√	√	√
Steam	√	√	√		x	√	√	√
Drinking Water	√	√	√	√		√		√
Seawater	√		√	√	√	√	√	√
Industrial Water			√				√	√
Gasoline	√	√	√			x	√	√
Kerosene	√	√	√	√	√	x	√	√
Diesel	√	√	√	√	√	x	√	√
Milk	√	√	√	√	√	√	√	√
Liqueur	√	√	√	√	√	√	√	√
Alcohol	√	√	√		√	x		√
Acetylene	√	√	√		√	x	√	√
Ethanol	√	√	√		√	x	√	√
Propanol	√	√	√		√	x	x	√
Ammonia					x			√
Toluene	√	√	√			x	√	√
Xylene	√	√	√			x	√	√
Propane	√	√	√			x	√	√
Methane	√	√	√		√	x	√	√
Sulfur Dioxide	√	√	√				√	√
< 20% Sodium Hydroxide		√	√		√	x		√
< 10% Nitric Acid			√				√	√
< 20% Sulfuric Acid							√	√
< 10% Hydrochloric Acid								√
Acetic Acid	√	√	√		√	x	√	√

## Flow Calculation

• **1.Liquid (volume)**

$$Q=14.28Cv \frac{\sqrt{P^1-P^2}}{\sqrt{G}}$$

Note: The influence of viscosity is not considered, when it is less than 20CST, that is, 200mm/s

• **3.Description**

- P1: Inlet pressure Kgf/cm<sup>2</sup>
- P2: Outlet pressure Kgf/cm<sup>2</sup>
- P: P1-P2
- G: Proportion (Water=1, Air=1)
- P4: Flow Coefficient (1Kv=14.28Cv)

• **2.Gas (volume)**

$$Q=198.3CvP_1 \frac{1}{\sqrt{G}} \left( P_2 \leq \frac{P_1}{1.89} \right)$$

$$Q=396.6Cv \sqrt{\Delta PP_2} \frac{1}{\sqrt{G}} \left( P_2 > \frac{P_1}{1.89} \right)$$

Note: Standard atmospheric state : 760mmHg,15.6C  
Q:cm/min

## Common Unit Of Pressure

1Kgf/cm<sup>2</sup> = 1bar = 0.1MPa = 100Ka = 14.5PSI

AC- Communicate With

DC- Direct Current

## Common Seals Material

Used in different places and conditions, some relevant data is for reference only:

**1.NBR**

Mainly used for diaphragms, O-rings and seals, suitable for most gases, water, gasoline, etc., and the medium temperature can be used at -10°C to 80°C

**2. EPDM**

Mainly used in places above the NBR temperature, (such as hot water, low pressure steam) is also suitable for most gases. The medium temperature can be used at -10°C to 100°C

**3. VITON**

Mainly used in places where NBR and EPDM cannot be used, and can be used with more gases, water, oil, gasoline, solvents, etc. The medium temperature can be used at -20°C to 120°C

**4.PTFE**

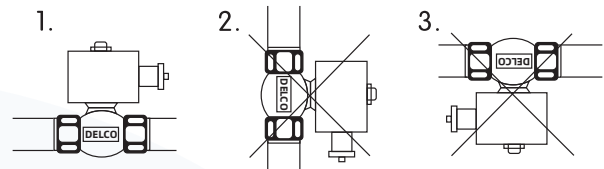
It can be applied to almost all fluids. But because of its "cold flow" characteristics. As a dynamic seal, it is prone to leakage especially under gas.

Coil Current Tile Number Statistics					Coil Current Tile Number Statistics				
Coil Model	Product Model	Voltage	Electric Current	Power	Coil Model	Product Model	Voltage	Electric Current	Power
S91B	2W31-15	DC12V	1.7A	20W	S51B	2W21-15	DC12V	2A	24W
S91B	2W31-15	DC24V	0.7A	17W	S51B	2W21-15	DC24V	0.96A	23W
S91B	2W31-15	AC110V	0.2A	12.5W	S51B	2W21-15	AC110V	0.27A	16.8W
S91B	2W31-15	AC220V	0.1A	12W	S51B	2W21-15	AC220V	0.14A	17.5W
S91B	2W31-15	AC380V			S51B	2W21-15	AC380V		
Y32B	2W-15	DC12V	1.1A	13W	SD01B	2W21-40	DC12V	2.8A	33.5W
Y32B	2W-15	DC24V	0.75A	18W	SD01B	2W21-40	DC24V	1.5A	36W
Y32B	2W-15	AV110V			SD01B	2W21-40	AV110V	0.32A	17.3W
Y32B	2W-15	AC220V	0.18A	20W	SD01B	2W21-40	AC220V	0.13A	14W
Y32B	2W-15	AC380			SD01B	2W21-40	AC380		
Y42B	2W-40	DC12V			Y92B	US-15	DC12V		
Y42B	2W-40	DC24V	2.7A	64W	Y92B	US-15	DC24V	2.8A	67W
Y42B	2W-40	AC110V	0.23A	14W	Y92B	US-15	AC110V	0.5A	16.4W
Y42B	2W-40	AC220V	0.14A	16.8W	Y92B	US-15	AC220V	0.23A	16W
Y42B	2W-40	AC380V			Y92B	US-15	AC380V		

## Safety instructions Before Starting

1. Check the compatibility of the medium used, temperature and other operating conditions with the materials and specifications of the product. It is the responsibility of the user to select the right product for the application.
2. Solenoid valves can only be used with clean liquids or gases. It is recommended to install a filter before the solenoid valve.
3. Never exceed the limits for pressure, temperature or voltage as indicated on the product and/or in the technical documentation.
4. The temperature of a solenoid valve coil can rise during operation; this is normal. Overheating will cause smoke and a burning smell. In this case, the power supply must immediately be disconnected.

**!** It is recommended to install the solenoid in vertical position with the coil facing upwards. This reduces the probability of the collection of debris in the solenoid valve.



Be aware of the direction of flow of the medium when installing the valve. Solenoid valves with an arrow on the housing must be connected in the indicated direction. The pipes on both sides of the valve must be securely fastened. Use a wrench for both valve and pipe while tightening to prevent unnecessary stresses in the system. The solenoid valve must be fixed via the provided connection points. Only exert force at the designated areas on the body such as the hexagon; never to the coil or armature. Avoid vibration in the pipes. Use a suitable sealant for threaded connections of the solenoid valve. Avoid the entry of thread sealing material in the valve, this can lead to malfunctioning of the valve.

## Common Faults and inspection , Troubleshooting

Problem	Solution
Valve fails to operate	1. Check electrical supply with voltmeter, Voltage must agree with nameplate rating.
	2. Check coil with ohmmeter for shorted or opened coil.
	3. Make sure that pressure complies with nameplate rating.
The valve is sluggish or inoperative-electrical supply and pressure check out	1. Disassemble valve; clean out extraneous matter, The plunger must be free to move without binding.
	2. If a diaphragm design, check the diaphragm for tears and/or clogged or obstructed bleed hole or pilot orifice. Torn diaphragm must be replaced.
	3. Check all springs. If broken, replace.
External leakage at sleeve flange or joint between body and cover	Check that the sleeve and/or cover screws are torqued to specifications. If leakage persists, replacement of diaphragm assembly or fange O-ring may be required and/or bodies or covers with damaged sealing surfaces may have to be replaced.
External leakage at speed control device	Check O-rings for damage and replace if necessary.
Internal leakage	1. Disassemble valve, remove extraneous matter, and clean parts in a mild soap and water solution.
	2. Examine diaphragm sealing surface for dirt. Remove all foreign particles. Examine orifice for nicks. Damaged parts must be repaired or replaced.
	3. Check plunger return spring. Replace if broken.
Chatter or buzz sound when energized	1. Remove power from the coil.
	2. Inspect the plunger and sleeve for excessive wear or contamination

# Seeking For Global Distributors



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