

Solenoid Valves | Angle Valves



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Introduction

Sude is a leading Indian based company specialized in the line of Automated valves Pneumatically & Electrically actuated control. Sude real strength is to develop customized products to solve any requirement of utilization and keep creating new innovation to offer the best solutions for your fluid control requirements.

PRODUCT – Sude offers innovative products designed to optimize the performance of your machinery.

PROCESS – Sude technology and quality system guarantees constant performance of the products.

SERVICING – Our technical office is at your disposal for any further information request about product choice, characteristics and applications.

SUDE ENGINEERING WINS THE TRUST OF CUSTOMERS WITH ITS HIGH QUALITY PRODUCTS AND BEST SERVICES.



Construction & Operational Details of Solenoid Valves

Solenoid valves are control units which, when electrically energized or de-energized, either shut off or allow fluid flow. The actuator takes the form of an electromagnet. When energized, a magnetic field builds up which pulls a plunger or pivoted armature against the action of a spring. When de-energized, the plunger or pivoted armature is returned to its original position by the spring action.

Valve operation

According to the mode of actuation, a distinction is made between direct-acting valves, internally piloted valves, and externally piloted valves. A further distinguishing feature is the number of port connections or the number of flow paths ("ways").

How does a solenoid valve work?

The media controlled by the solenoid valve enters the valve through the inlet port. The media must flow through the orifice before continuing into the outlet port. The orifice is closed and opened by the plunger. The valve pictured shown is a normally-closed solenoid valve.

Normally-closed valves use a spring which presses the plunger tip against the opening of the orifice. The sealing material at the tip of the plunger keeps the media from entering the orifice, until the plunger is lifted up by an electromagnetic field created by the coil.

This Engineering Information section provides a complete description of valve operation, the types of valves that are available, a glossary of terms, coils and complete flow rating data.

Principal of Operation

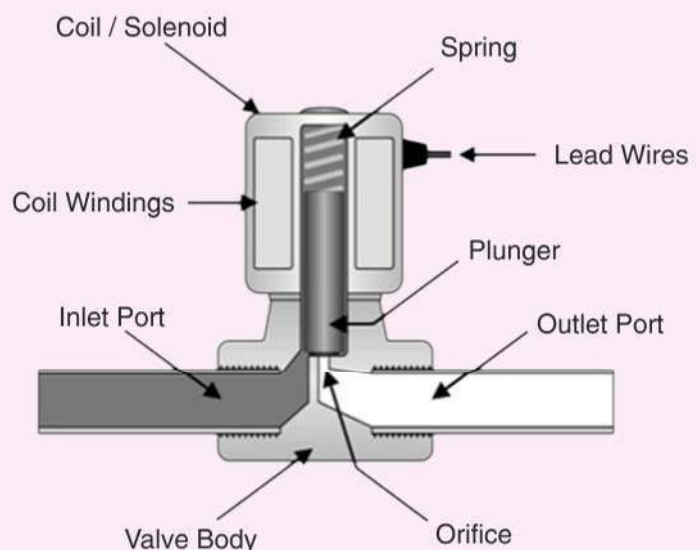
A solenoid valve is a combination of two basic functional units – (1) a solenoid (electro-magnet) with its plunger (or core); and (2) a valve containing an orifice in which a disc or plug is positioned to stop or allow flow.

The valve is opened or closed by movement of the magnetic plunger (or core) which is drawn in to the solenoid when the coil is energized.

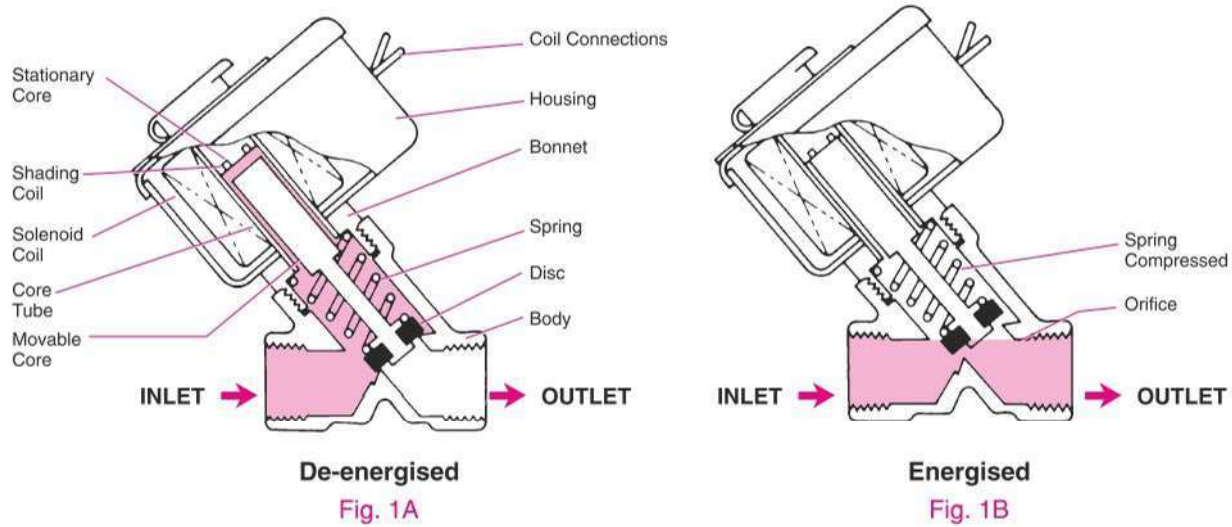
Solenoid valves have a solenoid mounted directly on the valve body with the solenoid core attached to the valve stem. The core is enclosed and free to move in a permanently sealed tube inside the solenoid coil. This construction provides a compact, leak tight assembly.

Different parts of a solenoid valve?

The illustration depicts the basic components of a solenoid valve. The valve shown in the picture is a normally-closed, direct-acting valve. This type of solenoid valve has the most simple and easy to understand principle of operation.

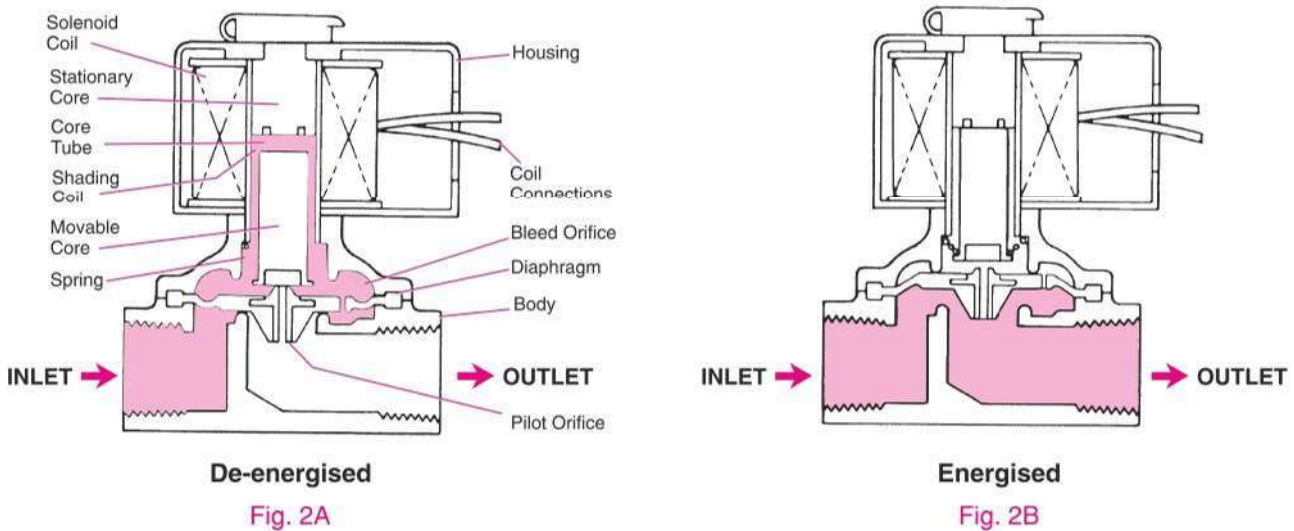


Direct Acting Valve



In direct acting, fully automatic valves, the solenoid core is mechanically connected to the valve disc and directly opens or closes the orifice, depending upon whether the solenoid is energized or de-energized. Operation is not dependent upon line pressure or rate of flow, and valve will operate from zero p.s.i. to its maximum rated pressure.

Internal Pilot Operated Valve



This valve has a pilot and bleed orifice, and utilizes the line pressure for operation. When the solenoid is energized, it opens the pilot orifice and releases pressure from the top of the valve piston or diaphragm to the outlet side of the valve. This results in an unbalanced pressure which causes the line pressure to lift the piston or diaphragm off the main orifice, thereby opening the valve. When solenoid is de-energized, the pilot orifice is closed and full line pressure is applied to the top of the piston or diaphragm through the bleed orifice, thereby providing a seating force for tight closure.

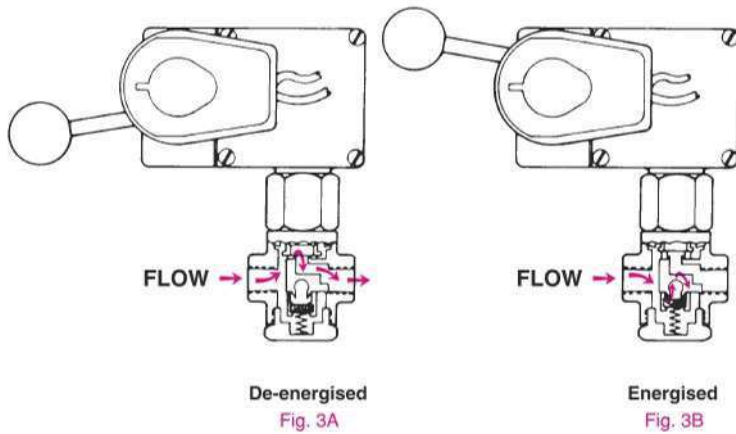
Two types of construction are available:

- A] Floating diaphragm or piston which requires a minimum pressure drop to hold it in the open position.
- B] Hung type diaphragm or piston which is mechanically held open by the solenoid core and operates from zero

External Pilot Operated Valve

(Not illustrated)

This is a diaphragm or piston operated valve equipped with a 3 way solenoid pilot which alternately applies or removes a separate operating pressure to or from the



The manual reset valve must be manually operated. It will return to its original position when the solenoid is energized or de-energized, depending upon construction.

Types of Solenoid Valves

2-Way Valves (Fig. 4A and 4B)

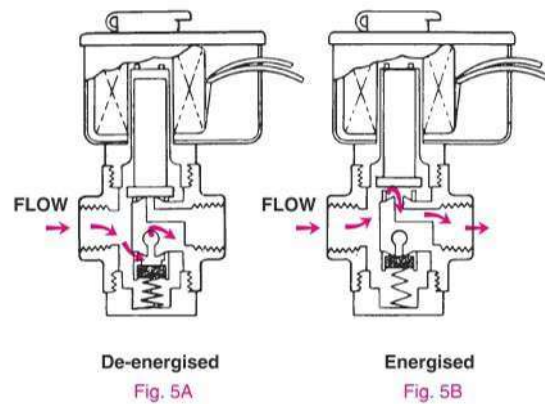
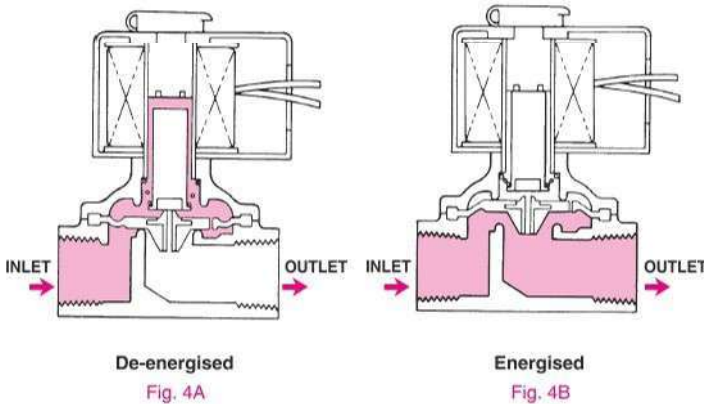
Two way (shut-off) valves have one inlet and one outlet pipe connection. Valves are available in either:

Normally Closed Construction – Valve is closed when de-energized and open when energized.

Normally Open Construction – Valve is closed when energized and open when de-energized.

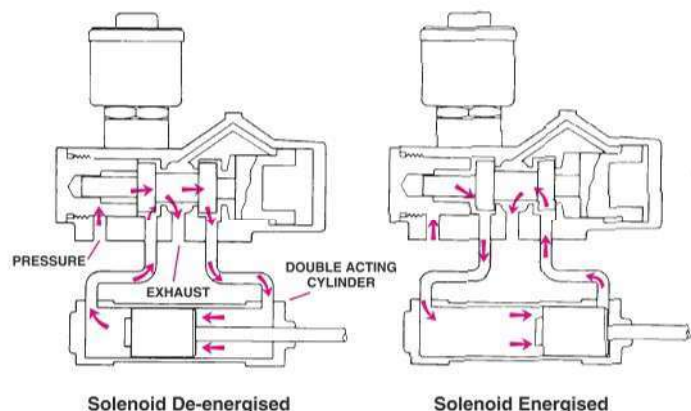
3-Way Valves (Fig.5A and 5B)

Three way solenoid valves have three pipe connections and two orifices (one orifice is always open and one is always closed). These valves are commonly used to alternately apply pressure to and exhaust pressure from a diaphragm valve or single acting cylinder. They also may be used to select or divert flow.



4-Way Valves (Fig.6A and 6B)

Four way solenoid valves are generally used to operate double acting cylinders. These valves have four pipe connections – one pressure, two cylinder and one exhaust. In one valve position, pressure is applied to one cylinder; the other is connected to exhaust. In the other valve position, pressure and exhaust are reversed in cylinder connections.



Solenoid Enclosures:

Most valves are supplied standard with a general purpose or explosion proof – watertight solenoid enclosure as listed in the respective bulletins. Rainproof, submersible and junction box solenoid enclosures as well as open frame and panel mount constructions are also available. The solenoid enclosures actually form a path for the magnetic circuit on most enclosures; therefore, do not remove as this will affect valve operation.

General Purpose Solenoid Enclosure:

A pressed steel housing is suitable for general purpose applications that are located indoors and where atmospheric conditions are normal. It serves as a protection for the coil but it is not dust tight. It meets NEMA Type1, General Purpose – Indoor Enclosure Classification.

OPERATING TEMPERATURE RANGE INDICATING CODE NUMBERS		
Maximum Temperature		Code Number
Deg. C	Deg. F	
450	842	T1
300	572	T2
280	536	T2A
260	500	T2B
230	446	T2C
215	419	T2D
200	392	T3
180	356	T3A
165	329	T3B
160	320	T3C
135	275	T4
120	248	T4A
100	212	T5
85	185	T6

*When used on valves having fluid temperature ratings exceeding 120°C (248°F).

Solenoid Construction:

Internal parts in contact with the fluid are made of non-magnetic 300 and magnetic 400 series stainless steel and, in some few solenoids, silicon steel. In AC constructions only, the shading coil is normally copper except silver is used in stainless steel body valves. Other materials are available when required. No shading coil is used in DC valves.

The core tube is of 300 stainless steel and formed by deep drawing, eliminating silver brazed or welded joints otherwise necessary.

Maximum Operating Pressure

Differential (M.O.P.D):

The maximum operating pressure differential is the maximum differential pressure between the inlet and the outlet sides of the valve against which the solenoid can safely operate the valve. This also is referred to as M.O.P.D. This pressure may be much less than the maximum safe working pressure.

Minimum Operating Pressure

Differential:

The minimum operating pressure differential is the lowest operating pressure differential required for dependable operation. For 2 way shut-off valves with floating piston or diaphragm, the valve will start to close below the minimum differential pressure. For 3 and 4 way pilot valves, the minimum operating pressure must be maintained throughout the operating cycle to insure complete transfer from one position to the other.

Note: Direct acting, hung diaphragm or piston valves do not require a minimum pressure.

Safe Working Pressure:

Line or system working pressure to which the valve may be safely subjected. The proof pressure for any valve is five times the safe working pressure.

Ambient Temperature Limitations:

Minimum Ambient Temperature:

The nominal limitation of 32°F is advisable for any valve that might contain moisture (water vapor). The actual minimum ambient temperature permissible can be greatly affected by both application and valve construction. For many of our valve constructions, when used for applications where freezing water is not a factor, minimum ambients as low as 0°F can be tolerated. In addition, special constructions are available for ambient temperatures down to -40°C

Maximum Ambient Temperature:

The nominal maximum ambient temperatures listed are

based primarily on test conditions. in determining safe limits for coil insulation. They are determined under continuously energized conditions and with maximum fluid temperatures existing in the valve. In many applications, the specific conditions existing will permit use at considerably higher ambient temperatures. In addition, modifications to standard constructions are also available which can extend the maximum ambient temperature limitation to 180F or more.

Response Time:

The response time from fully closed to fully open position, or vice versa, is dependent upon the valve size and operating mode, electrical service, fluid media and temperature, inlet pressure, and pressure drop. The response time for AC valves on air service under average conditions can be generalized as follows:

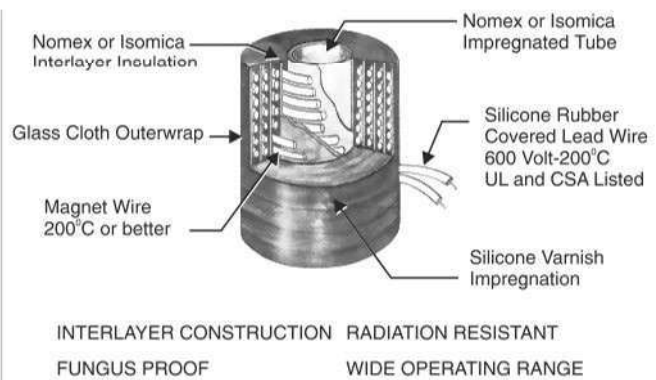
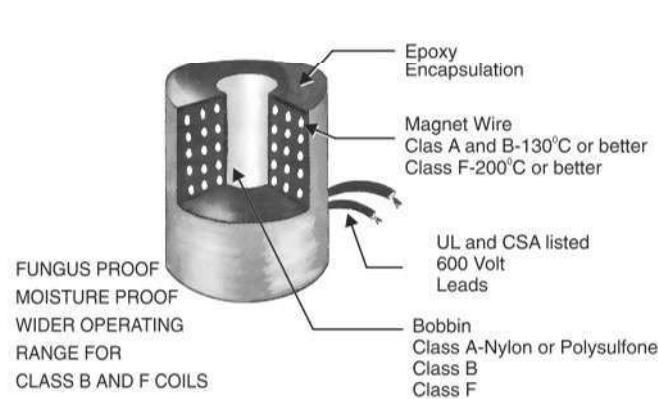
- a. **Small direct acting valve – 5 to 10 milliseconds.**
- b. **Large direct acting valve – 20 to 40 milliseconds.**
- c. **Internal pilot operated valves:**
 1. Small diaphragm type – 15 to 50 milliseconds.
 2. Large diaphragm type – 50 to 75 milliseconds.
 3. Small piston type – 75 to 100 milliseconds.
 4. Large piston type – 100 to 150 milliseconds.

Generally speaking, operation on liquid media has relatively little effect on the small direct acting valves; however, large direct acting valves and internally piloted valves will show an increase in response time between 50 and 100%.

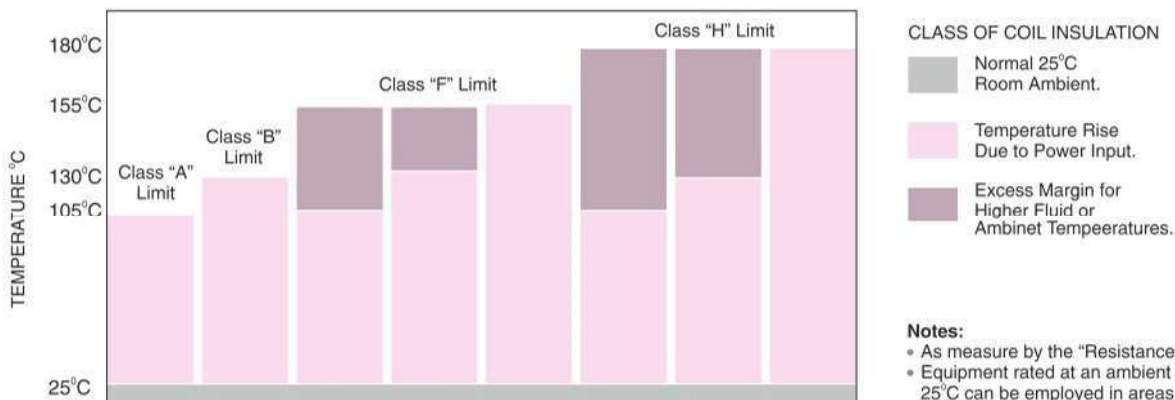
DC operation will yield approximately a 50% increase in response time over that listed for AC service.

Industrial Temperature Limitations and Therm Charateristis of Solenoids and Coils

Class A (105°C), Class B (130°C) & Class F



The following table illustrates the temperature parameters of standar Coils:



Coil Operating Voltage Range

All coils are designed for industrial operating voltages and can be used on the following voltage ranges :

AC		DC	
Nominal Voltage Rating	Normal Operating Range	Nominal Voltage Rating	Normal Operating Range
24	20-24	6	5.1-6.3
120	102-120	12	10.2-12.6
240	204-240	24	20-25
480	408-480	120	102-126
		240	204-252

Note: 125 volts DC and 250 volts DC are battery voltages and require special construction.

All valves are tested to operate at 15% under the nominal voltage and at maximum operating pressure differential, and are capable of operating for short periods at 10% over the nominal voltage. For wider voltage ranges than shown at left, a different coil or insulation system must be used.

Power Consumption:

Power consumption of solenoid valves may be determined from the rating in bulletins. For valves on AC service, the watt rating, the volt-ampere “inrush” and the volt-ampere “holding” are given.

The volt-amp (VA) “inrush” is the high momentary surge of current which occurs at the moment an AC solenoid is energized.

The Volt-amp (VA) “holding” is the continuous rating after the initial “inrush.”

The current rating for the “inrush” and “holding” may be determined by dividing the voltage into the volt-amp rating.

$$\text{AMPS (Inrush)} = \frac{\text{Volt-amp "inrush"}}{\text{Voltage}}$$

$$\text{AMPS (Holding)} = \frac{\text{Volt-amp "holding"}}{\text{Voltage}}$$

Valves supplied for DC service have no “inrush” current, as in the case of AC service. The amp rating can be determined by dividing the voltage into the DC watt rating.

$$\text{AMPS} = \frac{\text{Watts (DC)}}{\text{Voltage}}$$

Note: (1) When a valve has been energized for a long period the solenoid enclosure becomes hot and cannot be touched by hand except for an instant. This is a perfectly safe operating temperature. Any excessive heating will be indicated by the smoking and burning odor of the coil insulation.

(2) Valves for AC service can be converted for use on other AC voltages simply by changing the coil; similarly, DC valves can be converted for other DC voltages. When converting from AC to DC or vice versa.

Flow Data

Valve Sizing is Important –Over sizing or under sizing the solenoid valve introduces needlessly greater initial investment or below standard performance in controlling any process.

The basic factors in valve sizing include – maximum and minimum flows to be controlled, maximum and minimum pressure differentials across the valve, specific gravity, temperature and viscosity.

The Cv method of valve sizing has proven to be practical in that it reduces all variables to a common denominator. Existing conditions are variables (pressure differential, specific gravity, temperature, etc.) of the media flowing through the valve are converted into a reference condition.

conditions

have been converted into this coefficient, the valve size is found by referring to the catalog pages.

The catalog Engineering Information Section presents the complete procedure and reference data for the accurate sizing of solenoid valves in liquid, steam, and gas services. The graphs provide the simplest means of finding the required Cv factor and are based on the formula

$$\text{Cv} = \text{Flow Required} / \text{Graph Factor}$$

The graph factor can be easily picked out by aligning known pressure conditions on the graphs.

Estimating Cv or Orifice Size:

The following tables can be used to estimate a Cv if the orifice size is known or relate the approximate orifice size if the Cv is known. The chart is based on the designs of inline globe type valves. The flow charts must be used for precise sizing and converting Cv factors to actual flow terms and the catalog must be consulted for the actual Cv of a particular valve.

Note: ΔP means Pressure Drop.

Sample Problems:

Liquids: To find Cv: What Cv is required to pass 20 GPM of oil with a specific gravity of 0.9 and a pressure drop of 25 p.s.i.? The viscosity is less than 300 SSU's.

Solution: Formula is
$$Cv = \frac{GPM}{Fg \times Fsg}$$

To find Fg, use Liquid Flow Graph. The Fg factor is that corresponding to 25 p.s.i. pressure drop and equals 5. The Fsg factor can be obtained from Fsg Chart and is that corresponding to 0.9 specific gravity and equals 1.05.

$$Cv = \frac{20}{5 \times 1.05} = 3.81$$

Air And Gases:

To find Cv: A valve is required to pass 500 SCFH at an inlet pressure of 60 p.s.i.g. and a Δ P of 10 p.s.i. Find Cv if the medium is carbon dioxide at room temperature.

Solution: Refer to 10-100 p.s.i.g.graph

The formula to be used is

$$Cv = \frac{SCFH}{Fg \times Fsg \times Ft}$$

Locate Fg at the intersection of 60 p.s.i.g. inlet pressure and 10 p.s.i. Δ P (curved lines).Read down to Fg. Fg =1560.

Locate Fsg corresponding to specific gravity of carbon dioxide (S.G. =1.5). Fsg = 0.81. Since the gas is at room temperature the Ft factor can be ignored.

Insert values into formula,

$$Cv = \frac{SCFH}{Fg \times Fsg \times Ft} = \frac{500}{1560 \times 0.81} = 0.395$$

STEAM:

To find Cv: A valve is required to pass 25 lb/hr of saturated steam at an inlet pressure of 7 p.s.i.g. and a ΔP of 3 p.s.i. What is the Cv?

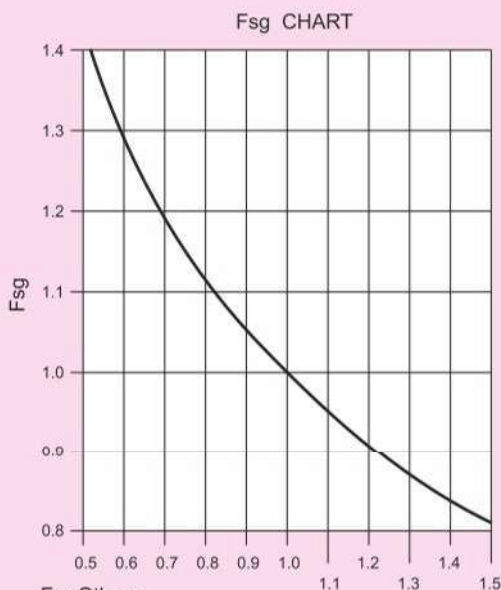
Solution : Refer to the steam Graph. Use formula

$$Cv = \frac{lb/hr}{Fg}$$

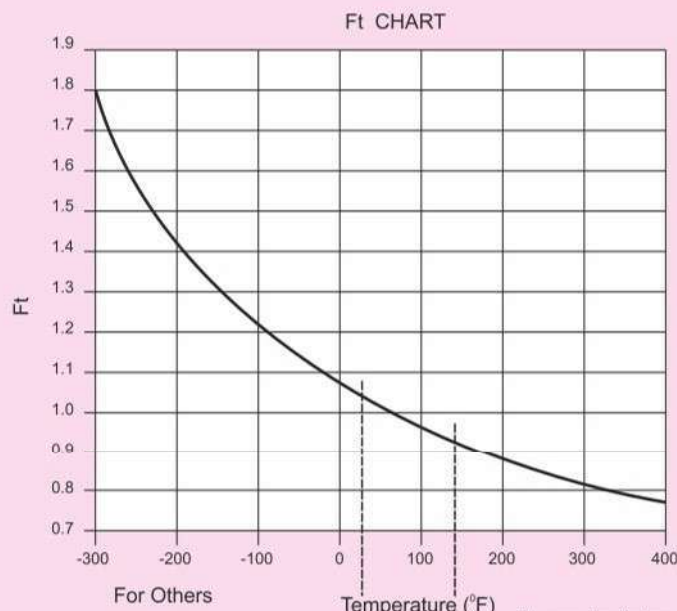
Locate Fg on graph corresponding to 7 p.s.i.g. inlet pressure and 3 p.s.i. ΔP (curved lines). Fg = 23.5.

Insert values into formula,

$$Cv = \frac{lb/hr}{Fg} = \frac{25}{23.5} = 1.06$$



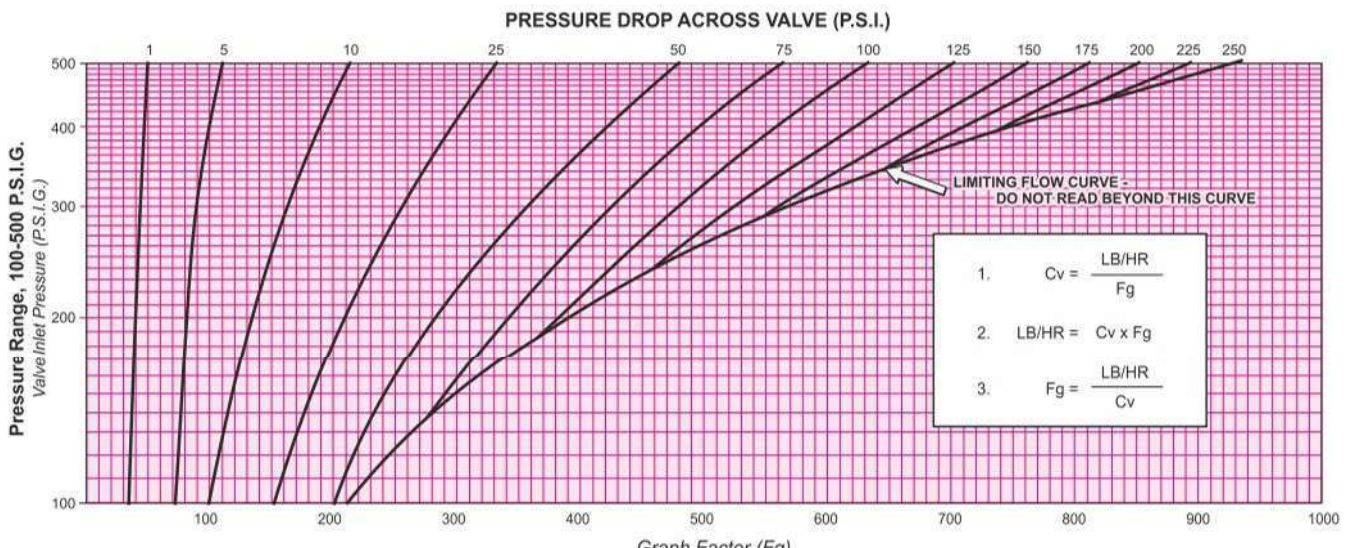
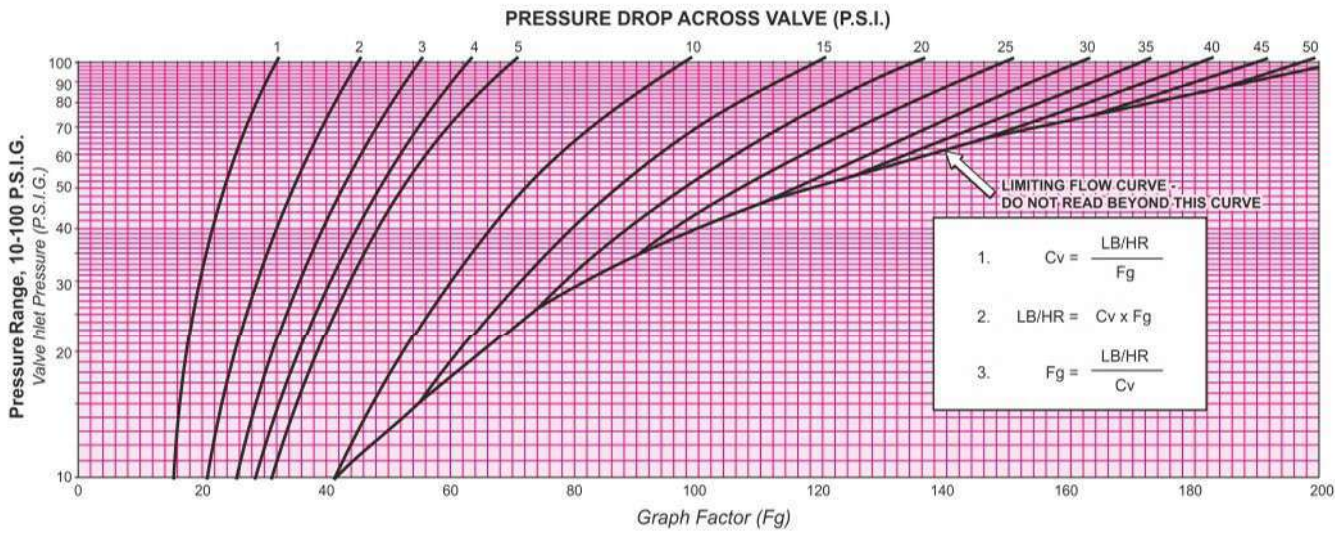
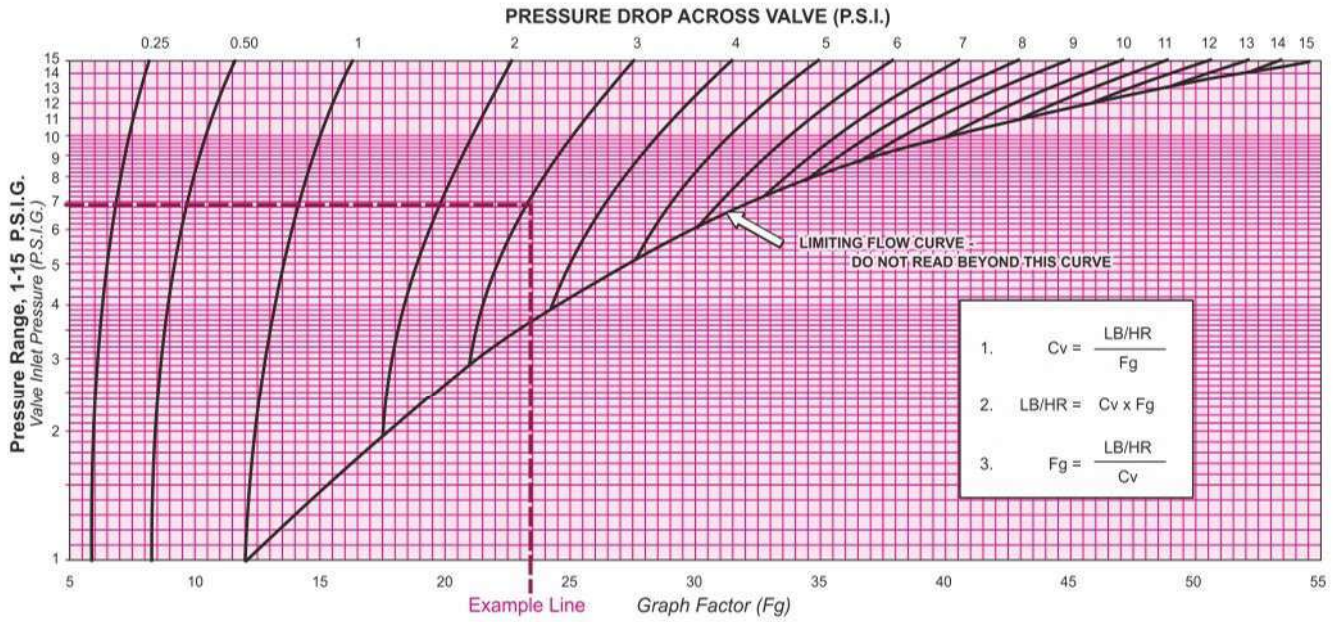
$$Fsg = \frac{1}{\text{Specific Gravity @ 14.7 PSIA and 60°F}}$$



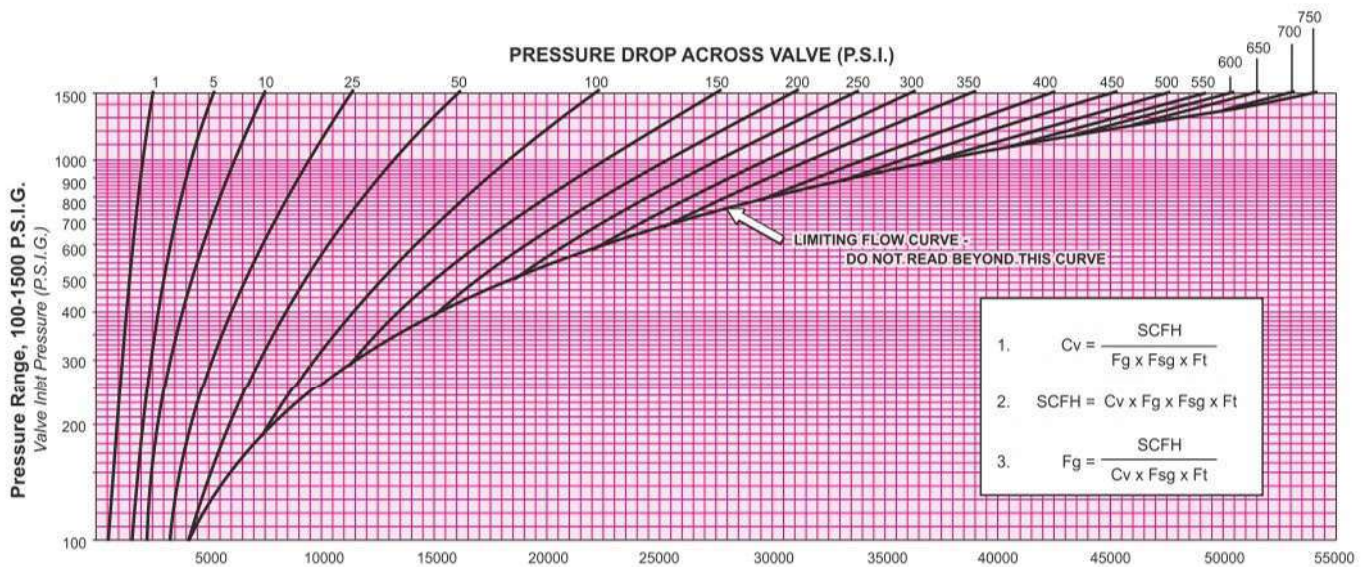
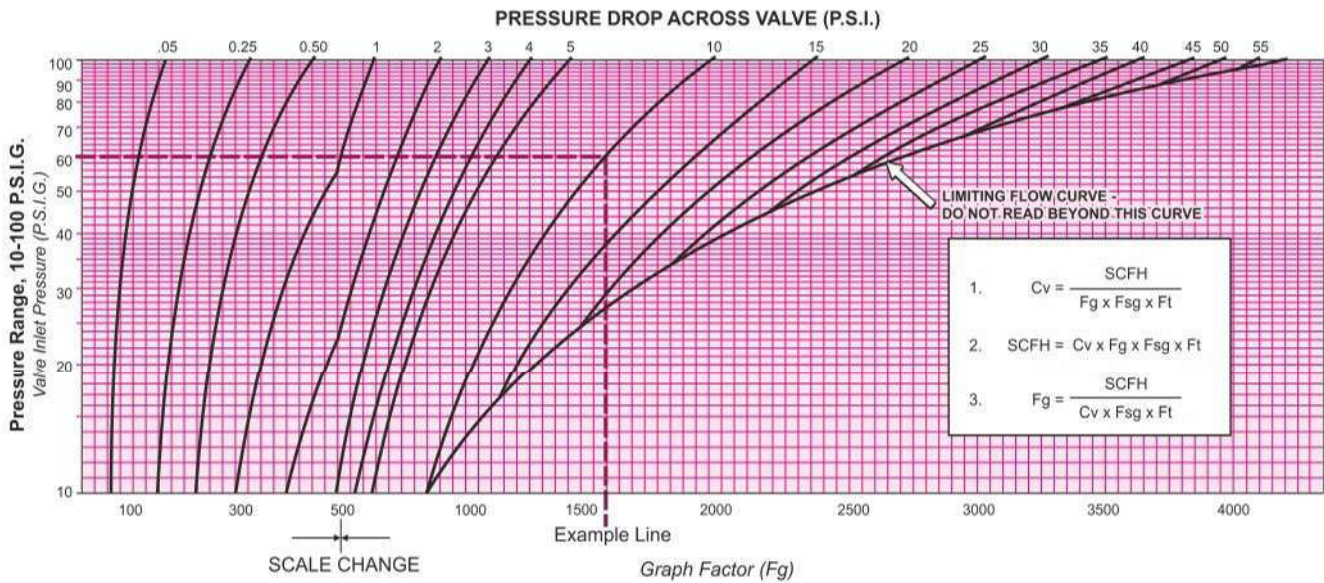
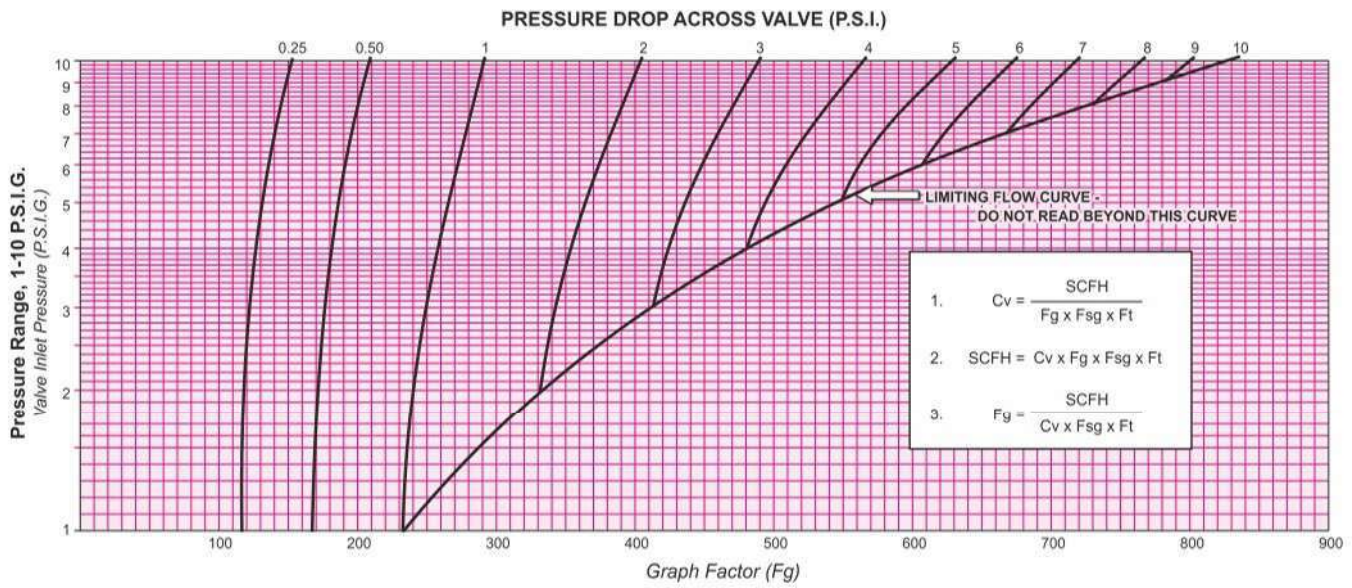
$$Ft = \frac{530}{\text{Temperature (°F)}}$$

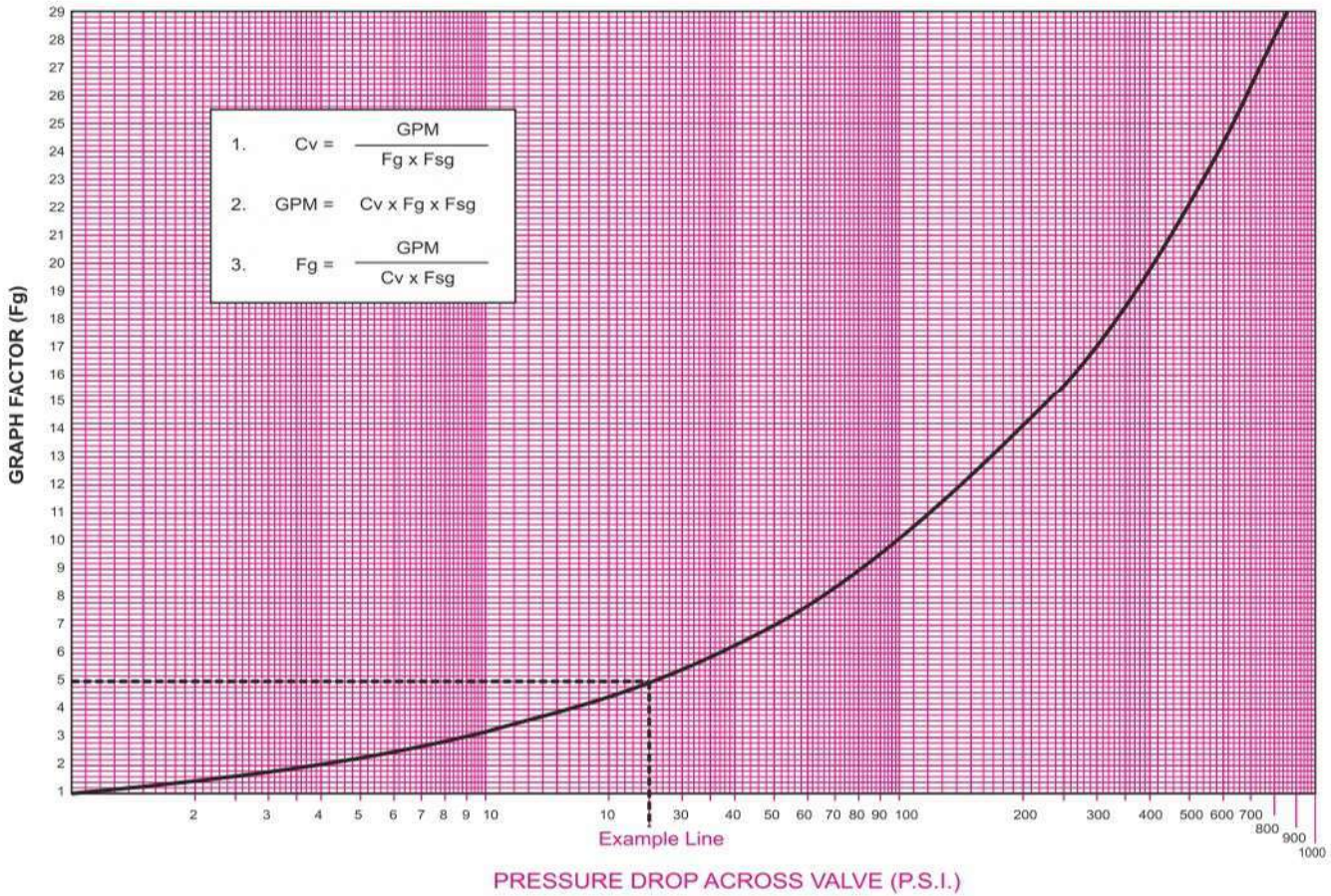
The correction for temperature in the range of 200°F to 150°F

Steam Flow Graph



Air and Gas Flow Graph





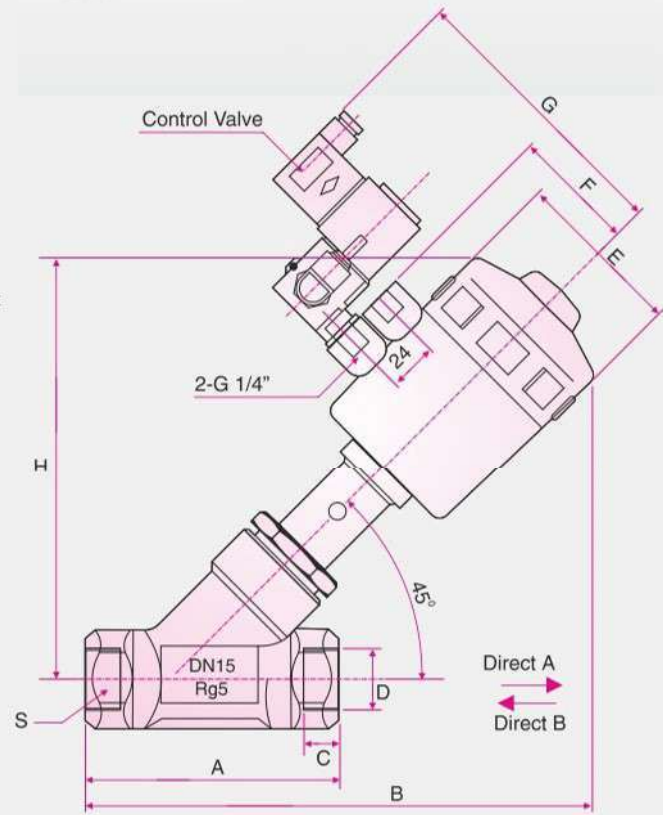
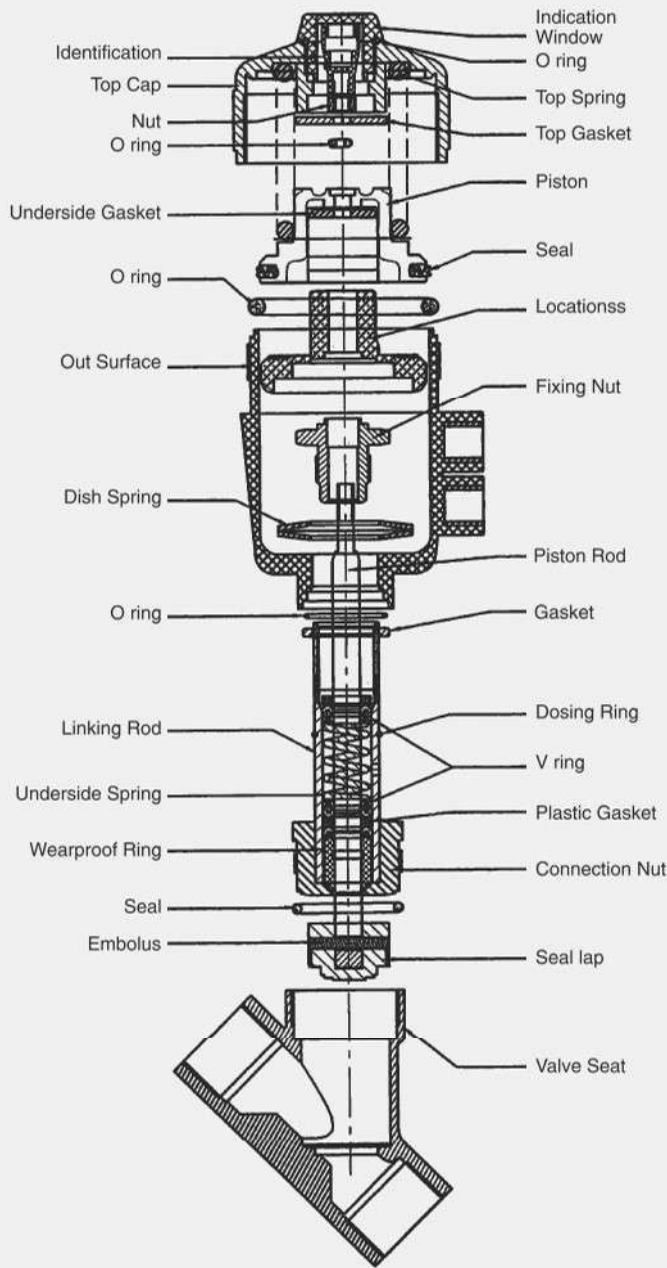
2/2 Way Piston Operated **Angle Seat Valves**

Series 1162

General Description: These are Cylinder operated valves with auxiliary pressure to open/close and spring return. Available with either integral 3 way pilot or suitable for remote piloting.

Specifications:

- PIPE SIZE : 1/2" to 2" BSP/ NPT screwed end, flanged and socket as option.
- VALVE BODY : Brass / Gun Metal / SS304 / SS316.
- VALVE SEAT : Teflon/ Buna N or Viton
- PLUG : SS316
- FLOWING MEDIUM : Steam/Hot water/can be made available for any liquid, consult Sude
- WORKING PRESSURE : 16Bar
- TEMPERATURE : 180°C
- ASSEMBLED WITH : Pneumatic cylinder
- AIR PRESSURE : 3.5 bar to 5.5 bar
- SOLENOID VALVE/LIMIT SWITCH : As an accessory.
- INSTALLATION : Valves may be mounted in any position without affecting operation, except as noted.
- APPLICATION : Grinding machine, Steaming equipments, Textile equipments, Laundry equipments and Other process areas where automation is needed. For any critical application like proportional operation of the valves is possible with little change in plug design and by adding Electro pneumatic positioner, consult Sude



Dimension Sheet :

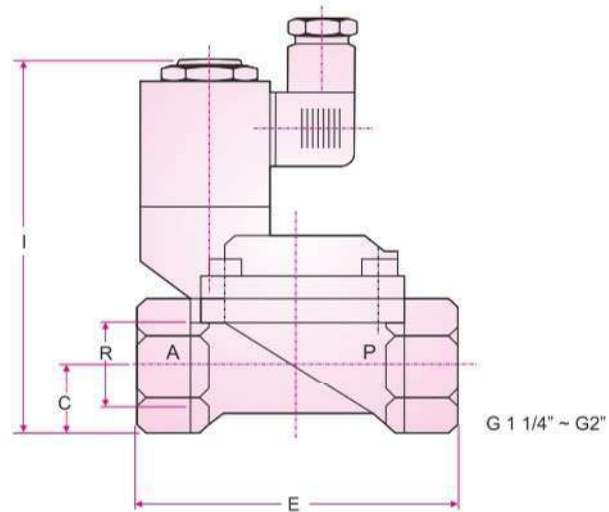
Model No.	Orifice Size (mm)	Port Connection D	Actuator size (Ømm)		B			ØE		F		G		H		S	
			Polyamide	Alu. Alloy	A	Polyamide	Alu. Alloy	C	Polyamide	Alu. Alloy	Polyamide	Alu. Alloy	Polyamide	Alu. Alloy			
1162/2WNC/15/15/ S4/S4/T/ONF/BSP	15	G 1/2"	50	-	85	173	-	12	64	-	44	-	112	-	137	-	27
1162/2WNC/20/20/ S4/S4/T/ONF/BSP	20	G 3/4"	50	-	95	176	-	12	64	-	44	-	112	-	145	-	32
1162/2WNC/25/25/ S4/S4/T/ONF/BSP	25	G 1"	63	-	105	212	-	14	80	-	52	-	120	-	173	-	41
1162/2WNC/32/32/ S4/S4/T/ONF/BSP	32	G 1 1/4"	63	100	118	236	276	16	80	140	52	70	120	138	189	250	55
1162/2WNC/40/40/ S4/S4/T/ONF/BSP	40	G 1 1/2"	63	100	130	230	270	18	80	140	52	70	120	138	189	250	55

2/2 Way Pilot Operated Normally Closed / Normally Opened

Diaphragm Type Solenoid Valves

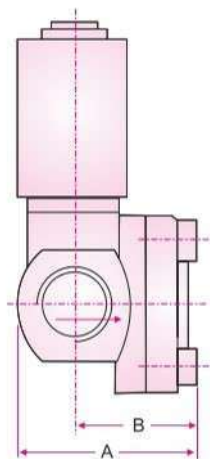
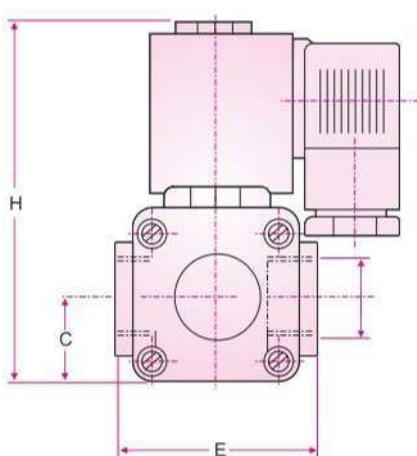
1181F Series

SUDE



Specifications:

- PIPE SIZE : 1/8" to 2" BSP / N.P.T.
- VALVE BODY : Brass / SS304 / SS316
- VALVE SEAT : Buna "N" / Viton / Neoprene / EPDM [We also offer the different seats to suit the process media]
- SOLENOID ENCLOSURE : General Purpose Flame Proof / Explosion Proof & Water tight consult SUDE for protection class.
- PRESSURE : 0.6 to 10 bar
- TEMPERATURE : 80°C, 150°C [with special seating]
- ELECTRICAL : Standard Voltages: 24, 120, 240, volts, AC, 60 Hz (or 50 Hz in 110 volt multiples), unless otherwise noted. Other voltages and DC available.
- COIL : Continuous Duty H and Molded Class A, Class B and Class F, as listed.
- INSTALLATION : Valves may be mounted in any position without affecting operation, except as noted.
- NOTE : Special Solenoid Valves Can be Developed for the Specific Application Consult SUDE

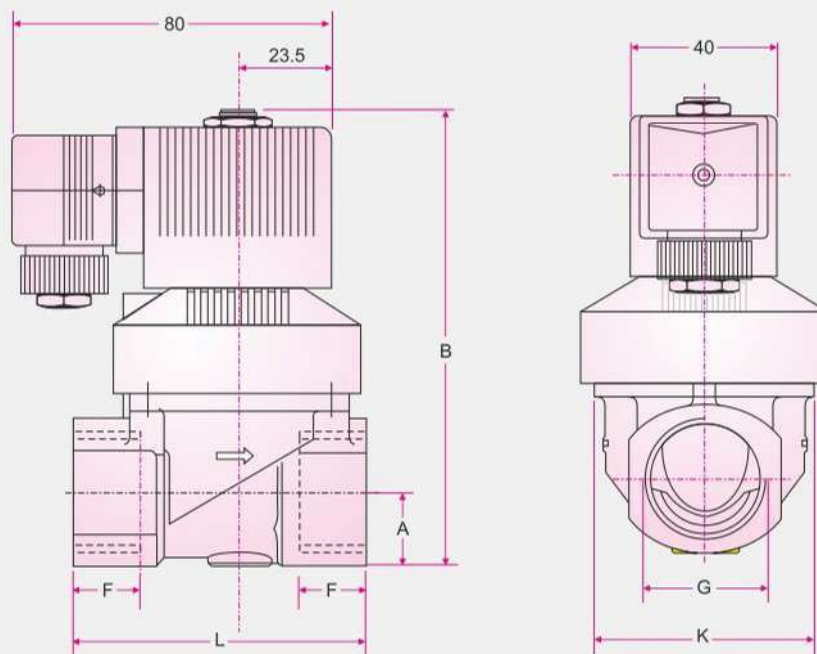


Dimension Sheet :

Model No.	R	A	B	C	E	H	I
1181F/2WNCPOD/06/06/BSP/BR/S4/BN	G 1/4"	47	33.5	22	55	113	101
1181F/2WNCPOD/10/10/BSP/BR/S4/BN	G 3/8"	47	33.5	22	55	113	101
1181F/2WNCPOD/15/15/BSP/BR/S4/BN	G 1/2"	47	33.5	22	55	113	101
1181F/2WNCPOD/20/20/BSP/BR/S4/BN	G 3/4"	66	45.5	30	81	130	118
1181F/2WNCPOD/25/25/BSP/BR/S4/BN	G 1"	66	45.5	30	91	130	118
1181F/2WNCPOD/32/32/BSP/BR/S4/BN	G 1 1/4"	92.5	47	33.5	132	157	145
1181F/2WNCPOD/40/40/BSP/BR/S4/BN	G 1 1/2"	92.5	47	33.5	132	157	145

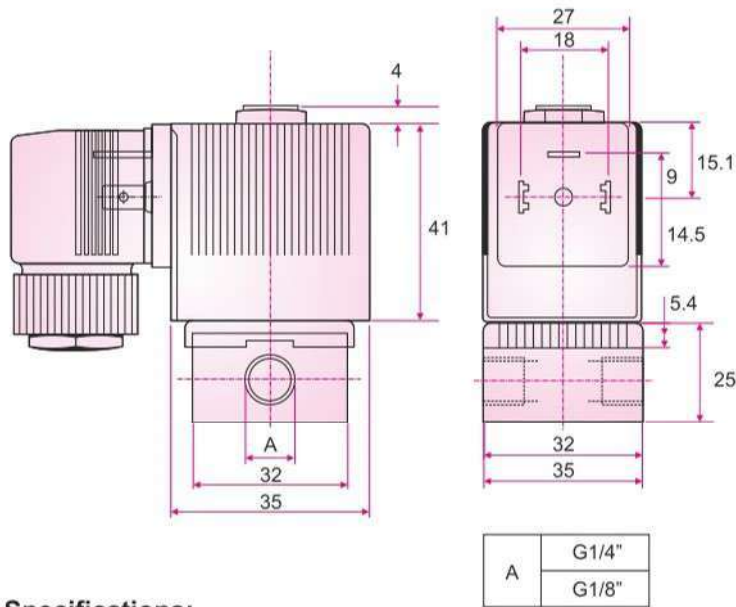
Specifications:

- PIPE SIZE : 3/8" to 2" N.P.T./B.S.P.
- VALVE BODY : Brass / SS304 / SS316
- VALVE SEAT : TEFLON [We also offer the different seats to suit the process media]
- SOLENOID : General Purpose Flame Proof / Explosion Proof & Water
- ENCLOSURE : tight consult SUDE for protection class.
- PRESSURE : 0 TO 10 BAR also available in 0 to 20 bar concept
- TEMPERATURE : 180°C
- ELECTRICAL : Standard Voltages: 24, 120, 240, volts, AC, 60 Hz (or 50 Hz in 110 volt multiples), unless otherwise noted. Other voltages and DC available.
- COIL : Continuous Duty H and Molded Class A, Class B and Class F, as listed.
- INSTALLATION : Valves may be mounted in any position without affecting operation, Except as noted.
- NOTE : Special Solenoid Valves Can be Developed for the Specific Application Consult SUDE



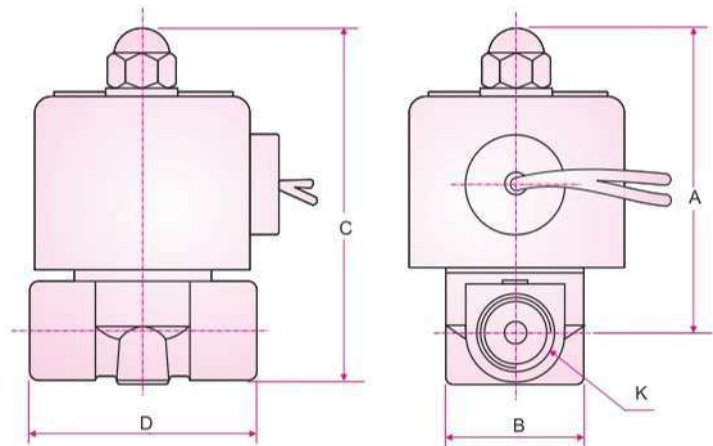
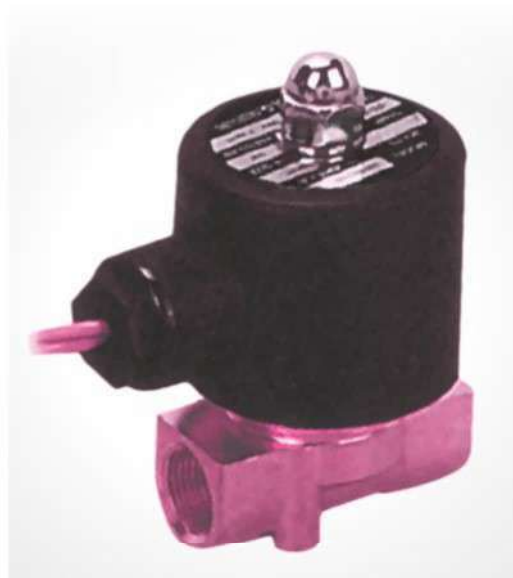
Dimension Sheet

Model No.	G	A	B	F	K	L
1181H/2WNCPOPP/06/06/BSP/BR/S4/T	ZG1/4"	16	97	12	34	65
1181H/2WNCPOPP/10/10/BSP/BR/S4/T	ZG3/8"					
1181H/2WNCPOPP/15/15/BSP/BR/S4/T	ZG1/2"					
1181H/2WNCPOPP/20/20/BSP/BR/S4/T	ZG3/4"	20	124	16	60	92



Specifications:

- PIPE SIZE : 1/8" to 1/2" N.P.T./B.S.P.
- VALVE BODY : Brass / SS304 / SS316
- VALVE SEAT : Buna "N" / Viton / Neoprene / EPDM
[We also offer the different seats to suit the process media]
- SOLENOID ENCLOSURE : General Purpose Flame Proof / Explosion Proof & Water tight
- PRESSURE : 0 to 30 bar
- TEMPERATURE : 80°C, 150°C [with special seating] consult SUDE for protection class.
- PHOTO ELECTRICAL : Standard Voltages 24, 120, 240, volts, AC, 60 Hz (or 50 Hz in 110 volt multiples), unless otherwise noted. Other voltages and DC available.
- COIL : Continuous Duty H and Molded Class A, Class B and Class F, as listed.
- INSTALLATION : Valves may be mounted in any position without affecting operation, except as noted.
- NOTE : Special Solenoid Valves Can be Developed for the Specific Application Consult SUDE

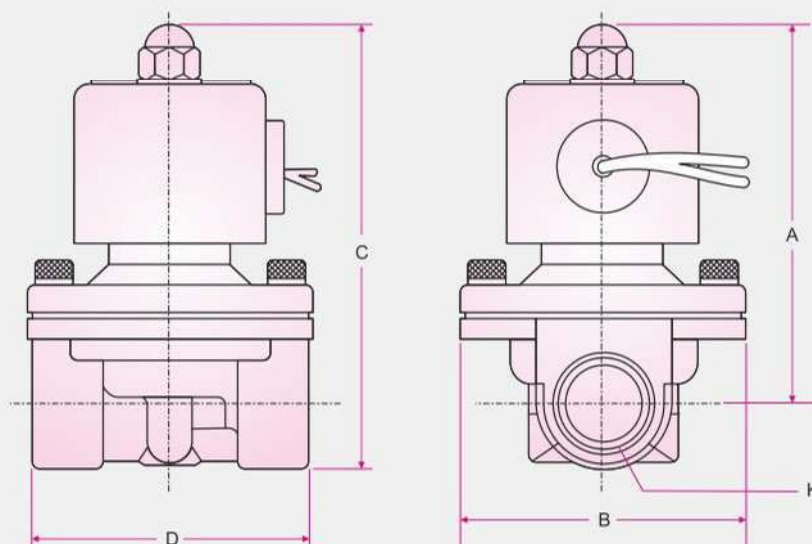


Dimension Sheet

Model No.	K	A	B	C	D
1182B/2WNCMID/06/06/BSP/BR/S4/BN	ZG1/4"	66	30	75	40.5
1182B/2WNCMID/08/08/BSP/BR/S4/BN	ZG1/8"	66	30	75	40.5
1182B/2WNCMID/10/10/BSP/BR/S4/BN	ZG3/8"	72.5	32	83.5	55

Specifications:

- PIPE SIZE : 3/8" to 2" N.P.T./B.S.P.
- VALVE BODY : Brass / SS304 / SS316
- VALVE SEAT : Buna "N" / Viton / Neoprene / EPDM
[We also offer the different seats to suit the process media]
- SOLENOID : General Purpose Flame Proof / Explosion Proof &
- ENCLOSURE : Water tight consult SUDE for protection class.
- PRESSURE : 0 to 6 bar, also available in 0 to 16 bar concept
- TEMPERATURE : 80°C, 150°C [with special seating]
- ELECTRICAL : Standard Voltages: 24, 120, 240, volts, AC, 60 Hz (or 50 Hz in 110 volt multiples), unless otherwise noted. Other voltages and DC available.
- COIL : Continuous Duty H and Molded Class A, Class B and Class F, as listed.
- INSTALLATION : Valves may be mounted in any position without affecting operation, except as noted.
- NOTE : Special Solenoid Valves Can be Developed for the Specific Application Consult SUDE

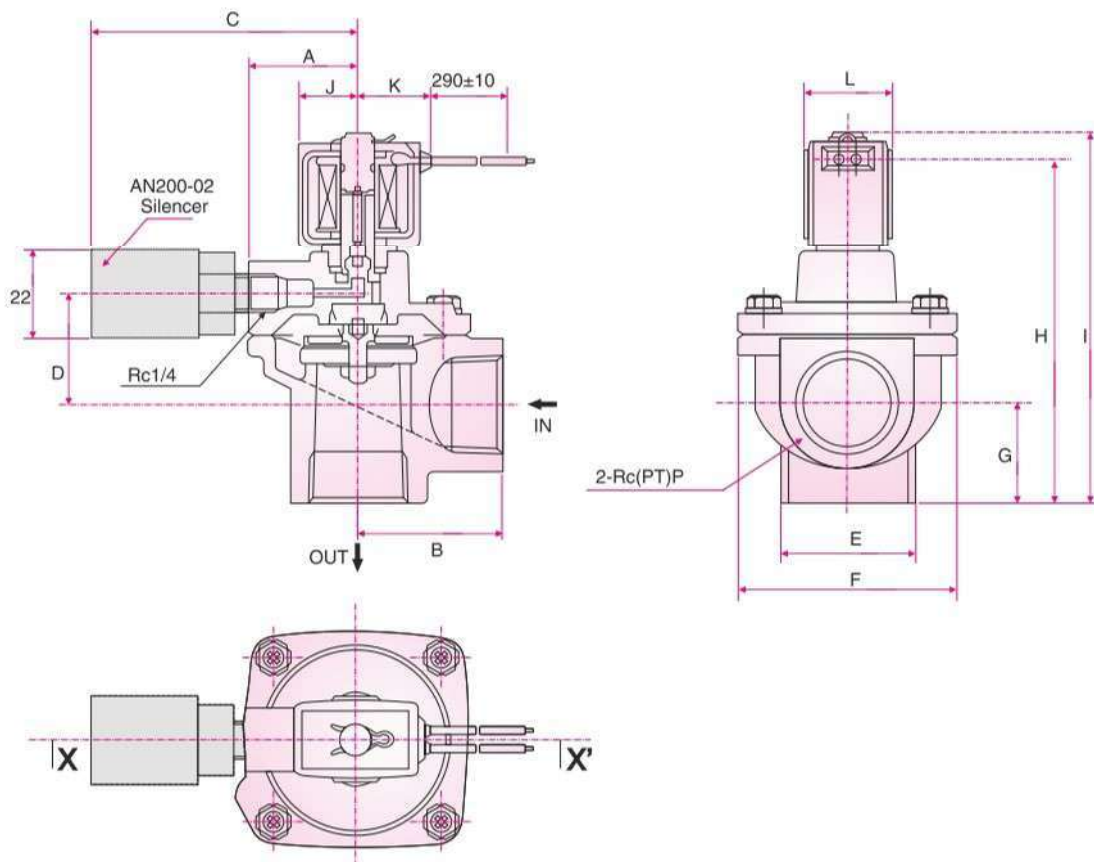


Dimension Sheet

Model No.	K	A	B	C	D
1182D/2WNCSLD/10/10/BSP/BR/S4/BN	ZG 3/8"	93	56	106	69
1182D/2WNCSLD/15/15/BSP/BR/S4/BN	ZG 1/2"	93	56	106	69
1182D/2WNCSLD/20/20/BSP/BR/S4/BN	ZG 3/4"	100	55	117	73
1182D/2WNCSLD/25/25/BSP/BR/S4/BN	ZG 1"	104	78	125	99
1182D/2WNCSLD/35/35/BSP/BR/S4/BN	ZG 1 1/4"	141	93	172	124
1182D/2WNCSLD/40/40/BSP/BR/S4/BN	ZG 1 1/2"	141	93	172	124

Specifications:

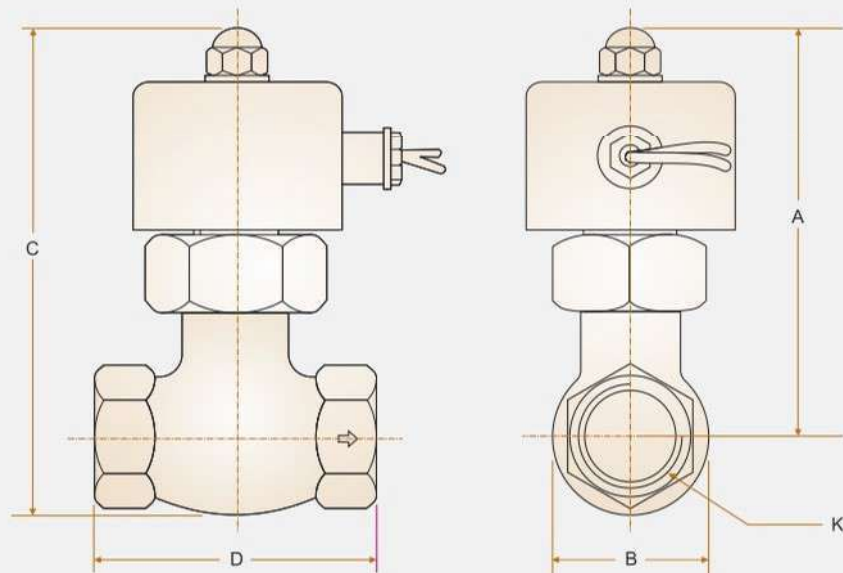
- PIPE SIZE : 3/4" to 1 1/2" N.P.T./B.S.P.
- VALVE BODY : Aluminium
- VALVE SEAT : Buna Nitrile
- SOLENOID : General Purpose
- ENCLOSURE : Flame Proof / Explosion Proof & Water tight consult SUDE for protection class.
- PRESSURE : 0.6 to 8.5 bar
- TEMPERATURE : Ambient
- FLOWING MEDIUM : AIR
- ELECTRICAL : Standard Voltages: 24, 120, 240, volts, AC, 60Hz (or 50 Hz in 110 volt multiples), unless otherwise noted. Other voltages and DC available.
- COIL : Continuous Duty H and Molded Class A, Class B and Class F, as listed.
- INSTALLATION : Valves may be mounted in any position without affecting operation, except as noted.
- NOTE : Special Solenoid Valves Can be Developed for the Specific Application Consult SUDE



Model No.	P	A	B	C	D	E	F	G	H	I	J	K	L
1181B/2WNC/BAG/20/20/BSP/AL/S4/BN/RJF	3/4"	33	40	85	32.5	36	66	25	103	113	20	23	30
1181B/2WNC/BAG/20/20/BSP/AL/S4/BN/RJF	1"	37	48	89	38	45	74	33.5	118	127	20	23	30
1181B/2WNC/BAG/20/20/BSP/AL/S4/BN/RJF	1/2"	28	68	81	58	73	110	62.5	174	184	23	25	35

Specifications:

- PIPE SIZE : 3/8" to 2" N.P.T./B.S.P.
- VALVE BODY : Brass / SS304 / SS316
- VALVE SEAT : EPDM [We also offer the different seats to suit the process media]
- SOLENOID ENCLOSURE : General Purpose Flame Proof / Explosion Proof & Water tight consult SUDE for protection class.
- PRESSURE : 0 TO 5 BAR
- TEMPERATURE : 150°C
- ELECTRICAL : Standard Voltages: 24, 120, 240, volts, AC, 60 Hz (or 50 Hz in 110 volt multiples), unless otherwise noted. Other voltages and DC available.
- COIL : Continuous Duty H and Molded Class A, Class B and Class F, as listed.
- INSTALLATION : Valves may be mounted in any position without affecting operation, except as noted.
- NOTE : Special Solenoid Valves Can be Developed for the Specific Application Consult SUDE

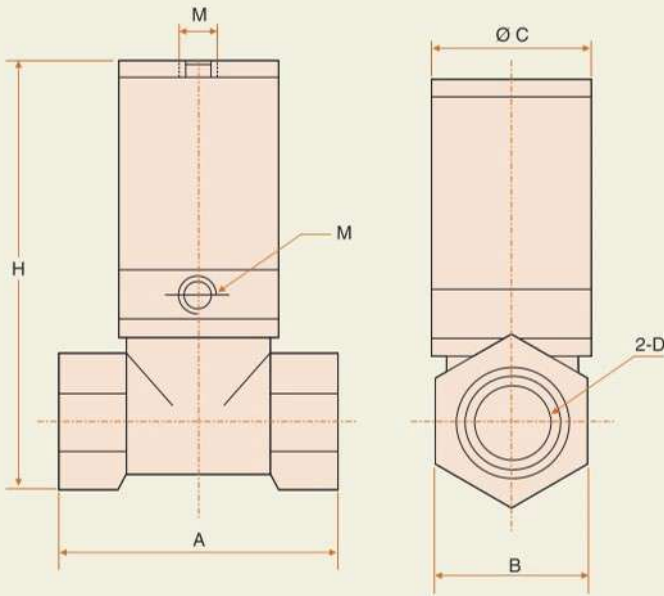


Dimension Sheet

Model No.	K	A	B	C	D
1182D/2WNCPOD/10/10/BSP/BR/S4/E	ZG 3/8"	125	42	146	84
1182D/2WNCPOD/15/15/BSP/BR/S4/E	ZG 1/2"	125	42	146	84
1182D/2WNCPOD/20/20/BSP/BR/S4/E	ZG 3/4"	125	42	146	84
1182D/2WNCPOD/25/25/BSP/BR/S4/E	ZG 1"	136	52	162	94
1182D/2WNCPOD/35/35/BSP/BR/S4/E	ZG 1 1/4"	148	74	183	111
1182D/2WNCPOD/40/40/BSP/BR/S4/E	ZG 1 1/2"	147	74	183	111

Economy Series 2 Way **Pneumatic Piston Valves** - Series 1162 MINI

SUDE



Specifications:

- PIPE SIZE : 1/2" to 2" BSP/N.P.T.
- VALVE BODY : Brass / Gun metals listed.
- VALVE SEAT : Teflon/EPDM
- PLUG : SS316
- FLOWING MEDIUM : Steam / Hot water / can be made available for any liquid/gas, consult Sude
- WORKING PRESSURE : 2.0 to 6.0 bar
- TEMPERATURE : 150°C
- ASSEMBLED WITH : Pneumatic cylinder
- AIR PRESSURE : 3.5 bar TO 5.5 bar
- SOLENOID VALVE : As an accessory.
- INSTALLATION : Valves may be mounted in any position without affecting operation, except as noted.

Dimension Sheet :

Model No.	D	A	B	C	H	M
1162MINI/2W/15/15/BSP/BR/S6/T/ONF	G1/2"	46	26	Ø30	96	G1/8"
1162MINI/2W/20/20/BSP/BR/S6/T/ONF	G3/4"	54	32	Ø37	107	G1/8"
1162MINI/2W/25/25/BSP/BR/S6/T/ONF	G1"	66	34	Ø37	118	G1/8"
1162MINI/2W/35/35/BSP/BR/S6/T/ONF	G1 1/4"	80	53	Ø65	162	G1/8"
1162MINI/2W/40/40BSP/BR/S6/T/ONF	G1 1/2"	80	53.6	Ø65	162	G1/8"
1162MINI/2W/50/50/BSP/BR/S6/T/ONF	G2"	105	66	Ø78	180	G1/4"

NOTE : TECHNICAL SPECIFICATIONS, DETAILS & DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE. DIMENSIONS IN THE TABLE ARE APPROXIMATE SUBJECT TO FINAL CONFIRMATION BY SUDE.

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SUDE / 14-15



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