

Plastic Products

VALVES • PUMPS • SYSTEMS

PVC • Polypropylene • Teflon



PLAST-O-MATIC
VALVES, INC.

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PLAST--MATIC

**CORROSION RESISTANT PLASTIC CONTROLS RECOGNIZED AS
AMONG THE FINEST AND MOST COMPLETE IN THE WORLD**

THIS CATALOG IS A COMPOSITE OF OUR PRODUCTS, POLICIES, AND
CAPABILITIES IN AN EFFORT TO ASSIST

YOU!

IF YOU FEEL WE HAVE NOT ATTAINED
THIS OBJECTIVE PLEASE LET US KNOW

AND

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IF IT'S A BIG PROBLEM CALL

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ENGINEERING SECTION

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PRODUCT SECTION

*FAIL-DRY registered trademark of PLAST-O-MATIC VALVES, INC. (see center page insert)

ADVANTAGES OF PLASTICS

Industry's demand for plastic products is constantly and rapidly increasing due to the many superior advantages they offer over metal products. Below is a general listing of some of their superior advantages:

1. Exceptional corrosion resistance to acids and alkalies as well as many other hard to handle solutions.
2. Lightweight construction.
3. Absence of electrolytic or galvanic action.
4. Non-toxicity thus preventing product contamination.
5. Ease of installation.
6. Resistance to weathering.

INSTALLATION OF PLASTIC CONTROLS

Plastics, while having the superior advantages listed above, have the disadvantage of not being as hard or strong as metals. With this in mind it is very important to use care when installing plastic products. Pipe wrenches should never be used on plastic pipe or valves since they can deeply scratch the surface and cause stresses in the plastic which could lead to ruptures sometime in the future. Instead, strap wrenches should be used. Generally, teflon tape is recommended on threaded connections and only a little more than hand-tight is required to effect a sealed joint. Avoid forcing and overtightening and do not screw metal fittings into plastic components. If frequent dismantling is required, flanged connections are recommended. Be sure that the mating flanges line up perfectly; otherwise, the flange bolts will force misaligned pipe lines to line up thus causing undesirable stresses which can result in future ruptures. If a plastic system is constructed properly it will offer trouble-free service in addition to the advantages listed above.

PRODUCT DEVELOPMENT TESTING

All **PLAST-O-MATIC** products have been subjected to a series of thorough development tests to prove their suitability for industry's corrosion resistant control requirements. This includes pressure ratings, material selection, material distortion, sealing reliability, and cycle life. The data from these test programs is collected from lab testing as well as field testing.

PRODUCTION TESTING

Every **PLAST-O-MATIC** control, whether a small valve or a complete pumping system, is individually and completely tested before shipment. All controls are subjected to careful visual inspections, leak tests and tests to confirm overall operating characteristics. This is your constant assurance of always purchasing a **PLAST-O-MATIC** product of the highest quality available.

PVC (POLYVINYL CHLORIDE) AND CPVC (CHLORINATED POLYVINYL CHLORIDE)

INTRODUCTION

PVC is the most commonly used plastic for industrial systems as well as the most economical. It offers an exceptionally wide range of selection for fittings, piping, valves, and system components. One limiting factor is its maximum working temperature of 140° F. CPVC (Hi-temp PVC and at one time called PVDC) is very similar to PVC except that it has a maximum working temperature of 180° F. The following pertains to both PVC and CPVC.

RESISTANCE TO AND EFFECT ON FLUID MEDIA

PVC is resistant to most commonly used salts, acids, alkalies, and oils. It is especially suited for deionized water applications. It is not recommended for chlorinated hydrocarbons, ketones, esters, and certain aromatic compounds.

PVC is resistant to the damaging effect of sunlight and is unaffected by weathering, thus no painting is necessary. It does not sweat when transmitting cold fluids.

PVC is non-toxic and imparts no odors, flavors, or tastes into the fluid.

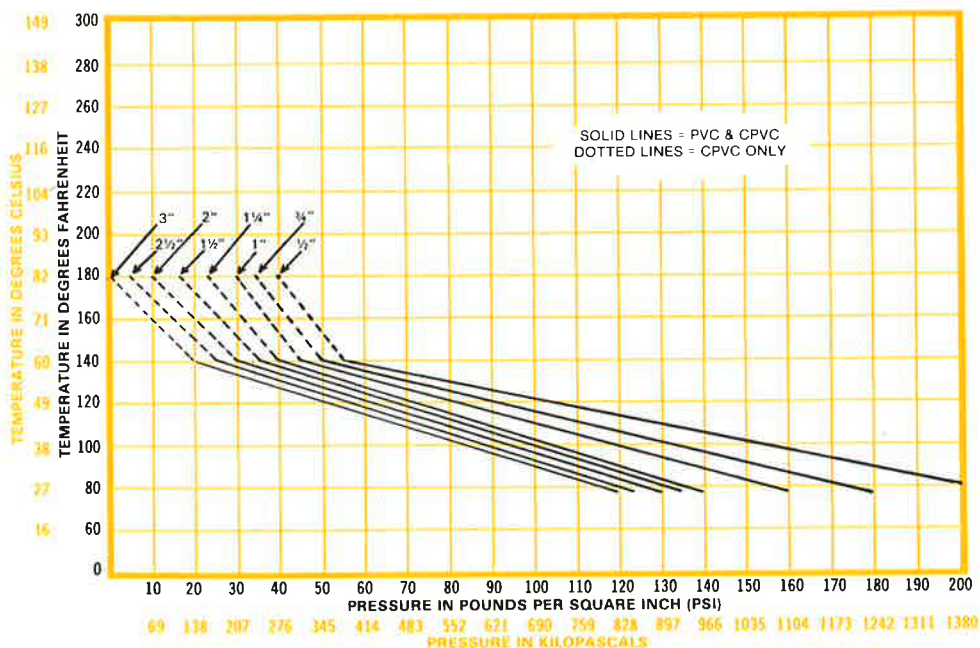
INSTALLATION

PVC can be installed with threaded connections utilizing teflon tape, flanged connections, or socket weld connections. For threaded and flanged connections precautions must be taken as described in the general data section. For socket weld connections care must be taken not to drip PVC or CPVC solvent cement onto working parts of valves or mechanical components. For both PVC and CPVC it is recommended to use solvent weld joints for all temperatures above 120° F.

TEMPERATURES AND PRESSURES

For all **PLAST-O-MATIC** PVC and CPVC controls, temperature limits their effective use. Both strength and chemical resistance decrease with heat. While the heat distortion temperature of PVC and CPVC is 165° F, and 200° F respectively, conservative engineering has resulted in the **PLAST-O-MATIC** maximum recommendations of 140° F and 180° F respectively.

Since the presence of line pressure directly affects temperature ratings the below chart takes both factors into consideration. In general, our maximum recommended temperature rating for PVC is 140° F @ 40 PSI and our maximum recommended line pressure for PVC is 140 PSI @ 75° F. Our maximum recommended temperature rating for CPVC is 180° F @ 20 PSI and our maximum recommended line pressure for CPVC is 140 PSI @ 75° F. Even with these general recommendations it must be remembered that each **PLAST-O-MATIC** product has its own specific ratings which also takes into consideration design characteristics.



POLYPROPYLENE

INTRODUCTION

Polypropylene is the lowest in cost of all the Polyolefins as well as being the lightest in weight and most heat resistant. It can be used with a wide range of chemicals and offers a maximum working temperature of 180° F as compared to PVC's 140° F. It is used extensively in the chemical waste handling market as well as in hospitals and laboratories. It has also found wide application in the petroleum industry.

RESISTANCE TO AND EFFECT ON FLUID MEDIA

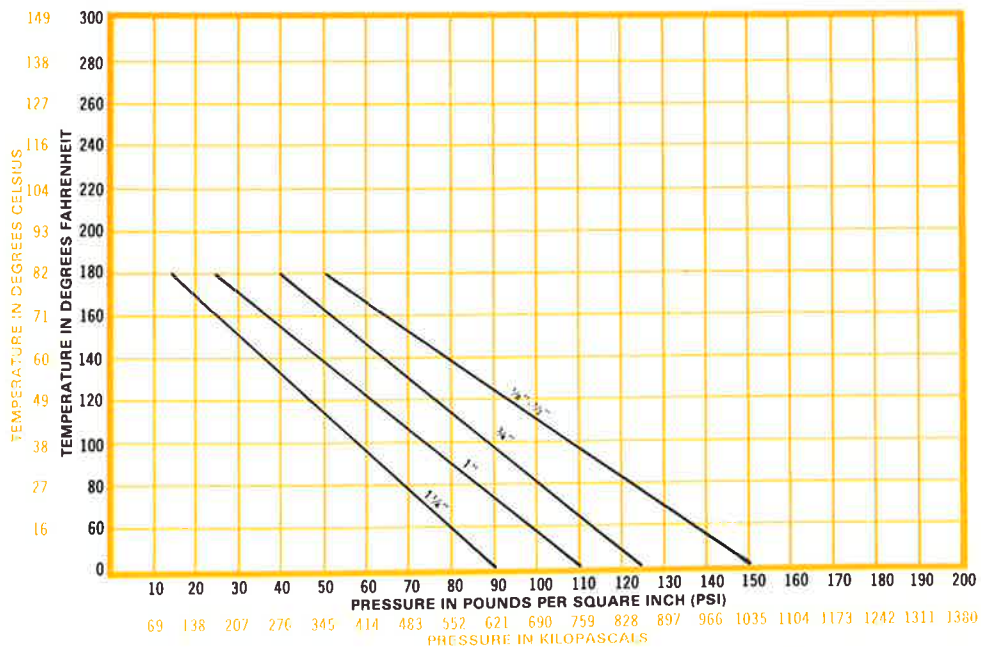
Polypropylene is non-aging, will not pick up scale or algae, and is unaffected by ground conditions. It will not support bacterial growth. It has an outstanding resistance to most alkalis, solvents, and acids; however, it is attacked by oxidizing acids. Polypropylene is not recommended for chlorinated hydrocarbons.

INSTALLATION

There are certain limitations when installing Polypropylene piping and controls. Threading Polypropylene pipe is difficult due to its out-of-round nature and leaks will sometimes result, especially at higher pressures. However, Polypropylene threaded controls can often be used in conjunction with CPVC threaded piping when both are compatible with the fluid media. Being a solvent-resistant thermoplastic, Polypropylene cannot be solvent welded as can PVC and CPVC. Fused connections which are thermal bonds are generally recommended on all Polypropylene systems to avoid leaking problems. Flanges can also be used effectively.

TEMPERATURES AND PRESSURES

As with other thermoplastics the chemical resistance and strength of PLAST-O-MATIC Polypropylene decreases as temperature rises. While the heat distortion temperature of Polypropylene is 215° F PLAST-O-MATIC'S maximum recommended working temperature is 180° F. Since the presence of line pressure affects temperature ratings the below chart takes both factors into consideration.



TEFLON

INTRODUCTION

The most remarkable thermoplastic used by industry today is Teflon, a DuPont trademark. It has practically universal chemical inertness; however, it is one of the most expensive of the industrially used plastics. It has a maximum temperature capability of 500° F although when used in product design we recommend a maximum temperature of 300° F.

RESISTANCE TO AND EFFECT ON MEDIA

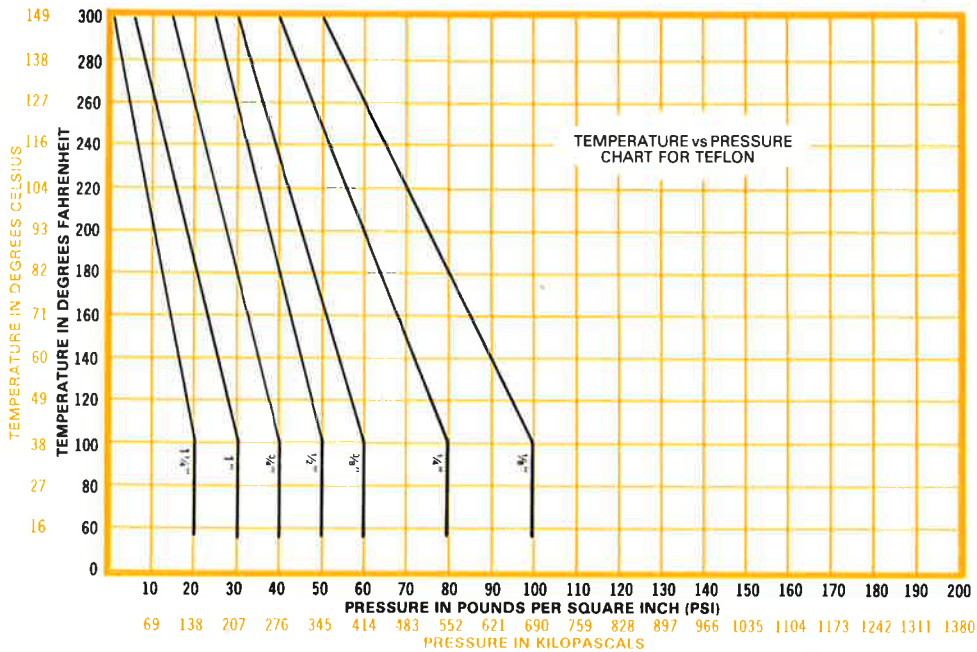
Teflon, as mentioned above, has practically universal chemical inertness. It is unaffected outdoors, absorbs no water, is non-flammable, and has an exceptionally low coefficient of friction which results in its non-sticking ability.

INSTALLATION

Due to the cold-flow property of Teflon care must be used during installation so as to avoid distortion. Do not overtighten threaded connections.

TEMPERATURE AND PRESSURE

While Teflon is capable of 500° F it is not recommended to go beyond 300° F with mechanical products due to the expansion and contraction of mating parts. The chart below compares the temperature and pressure ratings for 1/8" through 1 1/4" NPT PLAST-O-MATIC Teflon controls.



PLEXIGLAS

INTRODUCTION

In many applications PLAST-O-MATIC will design Plexiglas, a Rohm and Haas Co. trademark, into a product to take advantage of its excellent optical clarity so as to see whether a valve is open or closed. Plexiglas has a continuous service temperature of 180° F.

RESISTANCE TO AND EFFECT ON MEDIA

Plexiglas has excellent resistance to weathering as well as to many chemicals and oils. It is generally attacked by solvents.

TEMPERATURES AND PRESSURES

As mentioned above the maximum service temperature for Plexiglas is 180° F. The application of the Plexiglas is for air cylinders as well as sight glass and level tube cylinder walls, and they are designed to withstand 125 PSI at 100° F, 80 PSI at 140° F, 50 PSI at 160° F, and 10 PSI at 180° F.

ELASTOMER SPECIFICATIONS

INTRODUCTION

A sometimes difficult problem in valve or pump selection is the type of elastomer seals that are compatible with the fluid in the system. PLAST-O-MATIC's standard seal materials are Viton and Buna-N although in many cases other materials must be selected. If there are any doubts about the proper seal material please consult with our engineering department. Quite often, compatibility charts do not take all factors into consideration and cannot be relied upon except as a guide.

BUNA-N

This elastomer is generally used with waters, oils, and alkaline solutions. IN PLAST-O-MATIC's testing it has been found to be excellent for caustic (sodium hydroxide) applications.

VITON

Generally, Viton (a DuPont trademark) is used on all acid applications. Wherever necessary, PLAST-O-MATIC uses a specially cured Viton to reduce the swell problems encountered with standard Viton-A. This is especially needed in concentrated acids. Testing has found Viton to be a problem in caustic (sodium hydroxide).

ELASTOMER COMPATIBILITY CHARTS

Most O-ring manufacturers publish fairly extensive elastomer compatibility charts; however, it is recommended that these charts be used only as a guide. In critical applications tests should be run to substantiate the chart since many of them do not take the swelling problem into consideration.

BACK PRESSURE ON VALVES

Many of **PLAST-O-MATIC's** valve ratings include the term maximum back pressure. This pressure can develop either from a separate pressure source in the downstream piping or from the resistance of the fluid flow in the downstream piping. The general result if the back pressure rating is exceeded is that the valve will not close.

The most common causes of the resulting excessive back pressure due to fluid flow are as follows:

1. **THROTTLING VALVES IN THE DOWNSTREAM PIPING.** This will cause a restriction making it difficult for the fluid to flow. Instead, place the throttling valves upstream of the **PLAST-O-MATIC** control.
2. **SMALLER LINES DOWNSTREAM.** The piping should be the same size as upstream; otherwise, the fluid will have a difficult time getting through the line. It is usually best to have the piping size identical to the control's ports.
3. **EXCESSIVE PIPING AND FITTINGS DOWNSTREAM.** Naturally, the more pipe and fittings downstream the harder it is for the fluid to flow, and hence, the higher the back pressure.
4. **NOZZLES AND GOOSE-NECK SINK FITTINGS.** These generally are very restrictive and must be carefully designed around.

If it is not possible to compute the back pressure build-up in the downstream piping then it would be wise to run a simple test with a pressure gauge at the point where the **PLAST-O-MATIC** control is to be mounted.

FAIL-DRY CONCEPT

Most of the **PLAST-O-MATIC** line of products are designed to keep the fluid media away from metal parts which would quickly corrode or impart impurities into the fluid media. This is accomplished successfully through the use of plastics and various seal design; however, our **FAIL-DRY** concept carries this technique one step further.

The aim of the **FAIL-DRY** concept is to utilize a back-up sealing system so as to give a warning signal when a valve or pump seal is beginning to leak, and yet, allow the valve or pump to continue functioning properly so that maintenance people can service the problem on a non-emergency basis.

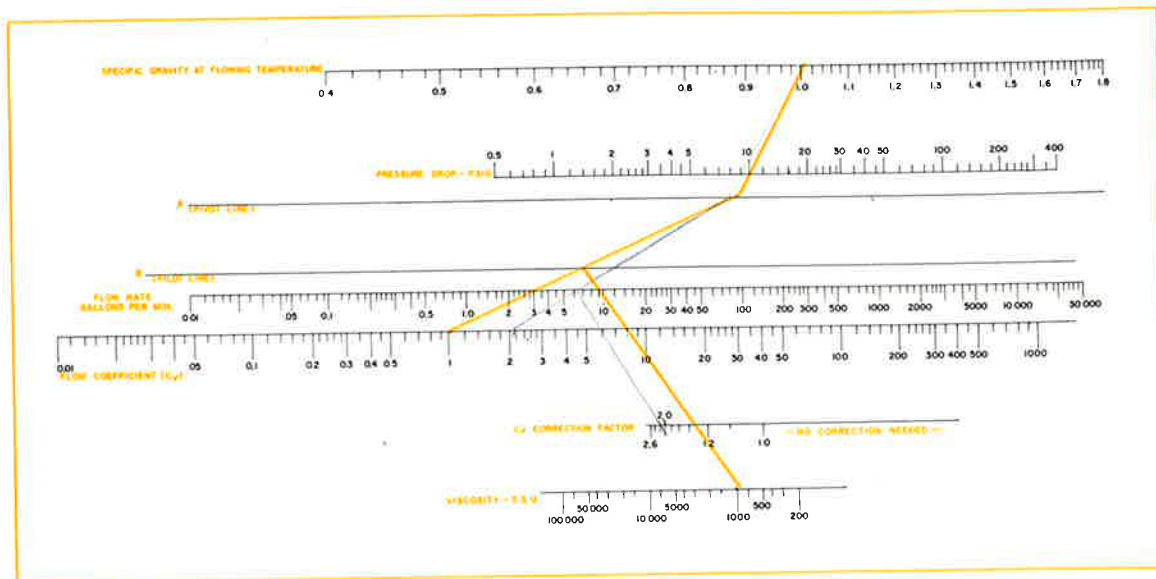
For more on the **FAIL-DRY** concept please refer to the center of the catalog.

FLOW DATA

The designer in the automatic control industry requires a positive method of valve sizing. Oversizing or undersizing valves introduces needlessly greater initial investment or below standard performance in controlling any process.

The basic factors in valve sizing include — maximum and minimum flow to be controlled, maximum and minimum pressure differential across the valve, specific gravity, and viscosity.

The Cv method of sizing has been proven practical in that it reduces all variables to a common denominator. Existing conditions or variables (flow rate, pressure differential, specific gravity, and viscosity) of the media flowing through the valve are converted into a reference condition. This is called the flow coefficient (Cv) which can be found with the nomograph below.



INSTRUCTIONS

With the exception of viscosity and correction factor lines, this Nomograph can be worked from top or bottom depending upon what information is being determined. Conditions known are to be connected in sequence indicated, e.g., flow coefficient and flow rate or specific gravity and pressure drop can be connected, but flow coefficient and pressure drop cannot. Whenever the line through two known conditions intersects pivot line (a), this intersection is to be used to continue on to the next known condition.

To use the viscosity correction scales, connect the pilot line (B) intersection with the known viscosity and read the Cv correction factor. Under 200 SSU, no viscosity correction is needed.

For accuracy, use a thin, beveled, transparent straight edge and a fine pointer.

EXAMPLES

The gold lines demonstrate how the following conditions would be traced through the Nomograph: Sp. Gr. = 1; Pressure Drop through Valve = 10 PSI; Gallons per minute = 3.2; Flow Coefficient = 1; Viscosity = 1000 SSU.

Using the dotted lines as a guide and considering the conditions stated above, the following are examples of problems that can be solved.

A. To Obtain Required Valve Size (Cv Factor unknown):

1. Connect Sp. Gr. (1) to Pressure Drop (10 PSI) and extend line to intersect with pivot line (A).

2. Connect intersection with pivot line (A) to required flow (3.2 GPM) and extend to Flow Coefficient (Cv = 1).

3. Connect intersection with pilot line (B) to Viscosity (1000 SSU) and read Cv Correction Factor (1.38).

4. Multiply Flow Coefficient (1) by Cv Correction Factor (1.38) to obtain Cv Factor corrected for Viscosity (1.38).

B. To Obtain Flow Through Valve (Cv Factor Known):

1. Repeat Step 1, in Example "A."

2. Connect Cv Factor (1) to intersection point on pivot line (A) and read flow where line crosses flow line (3.2 GPM).

3. Connect intersection on pilot line (B) with Viscosity (1000 SSU) and read Cv Correction Factor (1.38).

4. Divide uncorrected flow (3.2 GPM) by Cv Correction Factor (1.38) to obtain flow corrected for Viscosity (2.32 GPM).

C. To Obtain Drop Required for Specific Flow (Cv Factor Known):

1. Connect Cv Factor (1) and required flow (3.2 GPM) and extend line to intersect pilot line (B) and pivot line (A).

2. Connect intersection with pilot line (B) to Viscosity (1000 SSU) and read Cv Correction Coefficient (1.38).

3. Connect pivot line (A) intersection with Sp. Gr. (1) and read drop (10 PSI) where line crosses.

4. Multiply drop (10 PSI) by the square of the Cv Correction Factor (1.38)² to obtain required drop (19 PSI).

WATER HAMMER CALCULATION

Water hammer is defined as the change in pressure in closed piping systems, above or below the normal, resulting from changes in flow. Since there is danger to valves, fittings, and the pipeline from these induced pressures it is essential for engineers to be able to assess when to expect water hammer, to calculate the pressure rise, and, if necessary to provide a means of controlling it.

Water hammer can be produced when flow is stopped suddenly and the inertia is generated into a wave passing along the pipe causing all water particles to stop. Such a wave is called pressure surge or pressure wave. The pressure wave travels much faster than any flow velocity used in practice, so that the way in which water hammer is transmitted does not depend on the direction in which the liquid is moving, or on whether it moves at all.

Water hammer can also be produced by suddenly starting flow. In this case, the pressure is reduced as flow is increased. Thus, as flow is suddenly reduced the pressure rises; when it is increased the pressure falls. These changes must be pictured as a wave which travels along the pipe with a surge velocity. It is essential to remember that both flow and head change when a pressure wave passes a point in a system.

Maximum pressures caused by water hammer, or surge, can be calculated from the nomograph below. The nomograph is based on data for water and is applicable to other similar industrial liquids.

NOMOGRAPH DIRECTIONS

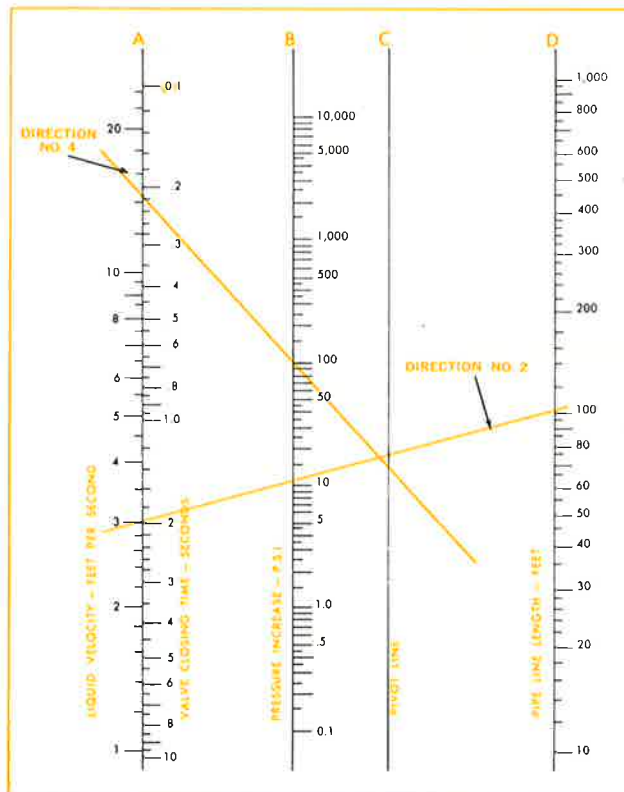
- 1) Liquid velocity, pipeline length, and valve closing time must be known.
- 2) Place a straight edge on the liquid velocity (line A) and pipe line length (line D).
- 3) Mark intersection with pivot line C.
- 4) Place straight edge at intersection on pivot line and on valve closing time for valve being used (line A).
- 5) The intersection of the straight edge with the pressure line (line B) is the liquid surge pressure (water hammer).

The liquid surge pressure should be added on to the previous line pressure to determine the maximum line pressure to be used to determine pipe wall thickness or valve closing time.

The nomogram is based on the formula

$$P = \frac{0.070VL}{T}$$

Where P is increase in pressure due to momentum surge in psi, L is pipeline length in feet, V is liquid velocity in feet per second, and T is the valve closing time in seconds.



ACCESSORY SECTION

The accessory products listed in this section are recommended for use in conjunction with various **PLAST-O-MATIC** products.

Naturally, there are other products available to perform the same functions; however, it has been our experience that these listed products will perform exceptionally well in all of their recommended applications.

ACCESSORY INDEX

PAGE NUMBER

XVI	3-WAY AIR SOLENOID VALVES
XVI	4-WAY AIR SOLENOID VALVES
XVII	PRESSURE GAUGES (Inches of Water)
XVII	PRESSURE GAUGES (PSI)
XVII	VACUUM GAUGES (Inches of Mercury)
XVII	GAUGE & GAUGE GUARD FILL LIQUID
XVIII	AIR FLOW CONTROL VALVES
XVIII	FOOT VALVES FOR SERIES "VP" PUMPS

3-WAY & 4-WAY ACCESSORY AIR SOLENOID VALVES

The metal air solenoid valves listed on this page are recommended for directing air pressure in and out of **PLAST-O-MATIC** operating cylinders and **SHOULD NOT** be used to handle corrosive or ultra-pure fluids. They are of the "packless" design, thus have their metallic operating components exposed to the fluids in the valves. In cases where air pressure is not available these accessory air solenoid valves can be used to direct city water pressure in and out of **PLAST-O-MATIC** operating cylinders.

Because of differences in orifice sizes and flow capacities it is suggested that the below recommended accessory air solenoid valves be used in conjunction with the listed **PLAST-O-MATIC** products. This will eliminate situations where **PLAST-O-MATIC** products do not function properly due to insufficient air flow.

All the below recommended air solenoid valves are supplied with either general purpose (NEMA 1) or explosion-proof and watertight (NEMA 4, 7, & 9) Underwriters' Laboratories approved solenoid enclosures. For specific information and NEMA solenoid enclosure specifications please consult page 22 of this catalog.

These valves are operated by continuous duty coils constructed in accordance with Underwriters' Laboratories, NEMA, AIEE, and other industry standards. They are available with standard A.C. voltages of 24, 120, 240 or 480.

The coils are equipped with two leads which can be connected to any electrical controlling device. For three-phase power systems, the two leads can be connected to any two of the three phases.

3-WAY AIR SOLENOID



SPECIFICATIONS

1/8" NPT CONNECTIONS
1/16" DIAMETER ORIFICE
125 PSI MAXIMUM PRESSURE DIFFERENTIAL
.090 C_v FLOW FACTOR
FORGED BRASS BODY
BUNA-N VALVE SEAL
6-WATT, CLASS "A" COIL

RECOMMENDED FOR

SERIES "EL" VALVES PAGE 9
SERIES "ES-NC" VALVES PAGE 11
SERIES "ES-NO" VALVES PAGE 12
SERIES "DS-NC" VALVES PAGE 14
SERIES "DS-NO" VALVES PAGE 15
SERIES "F" VALVES PAGE 16
SERIES "VP" PUMPS PAGE 23 & 25

PART NUMBERS

8320A13
(GENERAL PURPOSE)

8320A14
(EXPLOSION-PROOF)

4-WAY AIR SOLENOID



SPECIFICATIONS

1/4" NPT CONNECTIONS
1/16" DIAMETER ORIFICE
150 PSI MAXIMUM PRESSURE DIFFERENTIAL
.036 C_v FLOW FACTOR
FORGED BRASS BODY
BUNA-N VALVE SEAL
11 WATT, CLASS "A" COIL

RECOMMENDED FOR

SERIES "EA" VALVES PAGE 10
SERIES "DA" VALVES PAGE 13
SERIES "VPA7" PUMPS PAGE 24 & 25
SERIES "VPA10" PUMPS PAGE 24 & 25

PART NUMBERS

8345C1
(GENERAL PURPOSE)

8345C11
(EXPLOSION-PROOF)

4-WAY AIR SOLENOID



SPECIFICATIONS

1/4" NPT CONNECTIONS
3/16" DIAMETER ORIFICE
125 PSI MAXIMUM PRESSURE DIFFERENTIAL
.700 C_v FLOW FACTOR
FORGED BRASS BODY
BUNA-N VALVE SEAL
20 WATT, CLASS "F" COIL

RECOMMENDED FOR

SERIES "VPA32" PUMPS PAGE 24 & 25
SERIES "VPA128" PUMPS PAGE 24 & 25

PART NUMBERS

8342A1
(GENERAL PURPOSE)

8342A3
(EXPLOSION-PROOF)

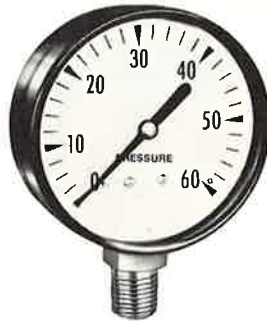
ACCESSORY PRESSURE & VACUUM GAUGES

The gauges listed on this page are for use with the **PLAST-O-MATIC** Series "GG" gauge guard illustrated on page 6 of this catalog. It should be noted that, although these standard gauges will effectively indicate pressure or vacuum readings in corrosive lines when connected to a Series "GG" gauge guard, they can be attacked by highly corrosive atmospheres. Other gauges suitable for highly corrosive atmospheric conditions are available upon request. Please consult our Sales Department for specifications and minimum ordering quantities.

The standard gauges listed below have drawn steel cases with black corrosion resistant paint. They have flat glass windows which are held in place by drawn steel rings. Pointers are aluminum with a black finish. Dials are steel with white background and black markings. Movements are precision geared brass. Connections, at bottom center of gauges, are 1/4" NPT. Accuracy is from ± 2 to $\pm 3\%$.



DIAMETER: 2-1/2"
DIAPHRAGM: Beryllium copper
MEASUREMENT: 0-35" H₂O
PART NUMBER: W35



DIAMETER: 2"
BOURDON TUBE: Phosphor bronze
MEASUREMENT: 0-60PSI & 0-160PSI
PART NUMBER: P60 & P160



DIAMETER: 2"
BOURDON TUBE: Phosphor bronze
MEASUREMENT: 0-30" Hg
PART NUMBER: V30



ACCESSORY GAUGE FILL LIQUID

Series "GG" fill liquid is a temperature stable liquid (stability range 40°F-300°F) available in 4 ounce bottles. It is recommended for filling **PLAST-O-MATIC** Series "GG" gauge guards and gauges.

There is almost no limit to the liquids that can be used for filling purposes; however, certain properties make the **PLAST-O-MATIC** Series "GG" fill liquid more suitable than others.

The Series "GG" fill liquid is temperature stable, thus temperature differentials will not cause gauge errors which otherwise could be considerable at low pressure ranges.

It does not contain any additives or inhibitors which could precipitate, break down, or polymerize at the intended process pressure or temperature. It will remain stable indefinitely and will not support anaerobic bacteriological growth or react with the materials of the gauge guard or gauge.

ACCESSORY AIR FLOW CONTROL VALVE

This air flow control valve is used to regulate the velocity of air that operates **PLAST-O-MATIC** air operated valves and pumps. The air velocity can be regulated over a wide range with the easy to read micrometer adjusting knob.



APPLICATION FOR AIR OPERATED VALVES

One of the dangers in a plastic piping system is "Water Hammer" caused by the sudden stopping of liquid flow in the system. If "Water Hammer" is evident in a system with an air operated valve simply install this air flow control valve, and set it so that the air operated valve closes slowly or until the "Water Hammer" disappears.

APPLICATION FOR AIR OPERATED PUMPS

Each stroke of a **PLAST-O-MATIC** air operated pump generally delivers the metered amount of liquid in approximately one second, depending on the size, length, and restrictions of the discharge line. By using the air flow control valve this delivery time can be stretched out to as long as 10 seconds if desired. It would also reduce the sudden force that the liquid has when discharging and would avoid splashing of dangerous liquids.

C_v FULLY OPEN — CONTROLLED DIRECTION:	.235
C_v UN-CONTROLLED DIRECTION:	.750
VALVE BODY MATERIAL:	HH SAE BRASS
ADJUSTING KNOB & LOCKNUT:	NYLON
O-RING MATERIAL:	BUNA-N
END TO END DIMENSION:	1-15/32"
OVERALL HEIGHT (FULLY OPEN):	1-3/32"
BODY DIMENSION (SQUARE):	5/8"
PIPE SIZE (NPT):	1/8"

ACCESSORY FOOT VALVES



The Series "FVS" foot valves are recommended for use with all **PLAST-O-MATIC** Series "VP" pumps to prevent loss of prime in the pump suction line.

This foot valve must be installed at the end of the suction line in the liquid as it depends on the liquid level above to keep it sealed. The liquid level should be at least two feet.

The Series "FVS" foot valves are constructed of TYPE 1, GRADE 1, PVC (Polyvinyl Chloride) and 304 stainless steel. They have either 1/2" or 3/4" female pipe threads for their installation. The check valve is a flapper design, and the flapper is either Viton or Buna-N. They are not available with a strainer.

PIPE SIZE (NPT)	OVERALL LENGTH	OUTSIDE DIAMETER	RECOMMENDED FOR USE WITH	SERIES "FVS" PART NUMBERS	
				BUNA-N-SEALS	VITON SEALS
1/2"	1-7/8"	1-1/16"	VP3	FVS050B	FVS050V
3/4"	2"	1-1/4"	VP7 & VP21	FVS075B	FVS075V

FAIL-DRY

FAIL-DRY IS A PLAST-O-MATIC REGISTERED TRADEMARK (PATENTS ISSUED AND PENDING). IT BASICALLY DESCRIBES THE UNIQUE CONCEPT OF HAVING A VENTED CHAMBER SEPARATING TWO SEALED SECTIONS OF A VALVE OR PUMP.

HOW DOES IT FAIL DRY?

As mentioned above, the concept is having a vented chamber separating two sealed sections of a valve or pump. One of these sections is the fluid media and the other is the operating media which could be either electric, pneumatic, or mechanical. The primary seal is in the fluid media and the secondary seal is in the operating media. The primary seal will fail first since it is in the corrosive fluid media and subject to the system pressure. When the primary seal fails the fluid media reaches the secondary seal which is still isolating the operating media. Consequently, the operating media remains dry after primary seal failure, and thus **FAIL-DRY**.

IS A PRIMARY SEAL FAILURE EVIDENT?

Yes, in pressure applications the vent between the primary and secondary seals will indicate the leakage visually. In vacuum applications, the vacuum will be lost in the system, and by placing a finger over the **FAIL-DRY** vent port it can be determined if the **FAIL-DRY** product is the problem.

WILL A FAIL-DRY PRODUCT STILL OPERATE AFTER PRIMARY SEAL FAILURE?

Yes, one specific advantage of the **FAIL-DRY** design is the fact that the product will continue to operate in the system until a scheduled repair can be made. This is especially important in systems that cannot be shut down during a process cycle.

WHAT ARE THE MECHANICAL AND ECONOMICAL ADVANTAGES OF USING FAIL-DRY PRODUCTS?

Since a **FAIL-DRY** product can continue to function after primary seal failure, a system can continue operating until a shut-down is practical. This is especially important in treatment systems and process cycles.

Emergency repairs are avoided with the **FAIL-DRY** concept, and consequently the repair can be done on a scheduled basis.

The **FAIL-DRY** design helps prevent the operating media from becoming wetted by the corrosive fluid media. This keeps any metallic parts in the operating media from being attacked, and therefore, keeps the cost of repair lower.

WHY CHOOSE A FAIL-DRY PRODUCT OVER A COMPETITIVE PRODUCT?

Although some manufacturers may boast a low initial price, one production shut down will create a cost situation far in excess of the cost of any **FAIL-DRY** valve or pump. REMEMBER — ALL VALVES AND PUMPS EVENTUALLY FAIL. ONLY **PLAST-O-MATIC'S** VALVES AND PUMPS WILL FAIL DRY.

TYPICAL FAIL-DRY OPERATION

The below operating sequence typifies the **FAIL-DRY** concept with an illustration of the **PLAST-O-MATIC** Series "EUS" direct operating solenoid valve. The other **PLAST-O-MATIC** valves and pumps utilizing the **FAIL-DRY** concept will operate similarly with the exception of plugging the vent ports.



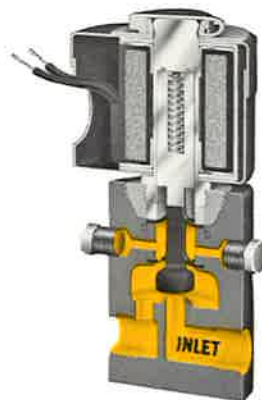
NORMAL OPERATION

The photo at left illustrates a Series "EUS" direct operating solenoid valve operating normally, before lower (primary) seal failure. At this moment both upper and lower (secondary and primary) seals are isolating the metallic operator components from the liquid in the valve.



SEAL FAILURE

This photo depicts lower seal failure which is usually attributed to flexing wear and exposure to the corrosive liquid. If operating under pressure and a failure of the lower seal occurs, the liquid will enter the vented chamber between the upper and lower seals creating a weepage through the vent giving a visual indication of lower seal failure. If operating under vacuum, lower seal failure will create a vacuum loss in the system. Such failure can be confirmed by placing finders over vents to see if vacuum returns.



OPERATION CONTINUED

This photo describes how **FAIL-DRY** products can remain in service without system shutdown. Since the upper seal is still isolating the metallic operating components from the liquid the only requirement is to plug the vent or vents. This will enable the valve to run satisfactorily, either under pressure or vacuum, until repairs can be made at a convenient time. Plugging the vents is only applicable to the Series "EUS" valves. Other **FAIL-DRY** products must remain vented; however, the vent can be piped to a sump area which could accept the leakage until repairs can be made.

PRODUCT SECTION

Designers and purchasers in the control industry know there is considerably more to the selection of a control than simply choosing one that meets their particular specification.

In the **PLAST-O-MATIC** product line there may be as many as 4 or 5 different controls which could meet a particular specification. Because of this, other factors should be considered. Cost, construction, design, and cycle life should also be an important part of the criteria in selecting the most appropriate **PLAST-O-MATIC** control for a specific application.

PRODUCT INDEX

PAGE NUMBER

- 1 "CK" CHECK VALVES, diaphragm design
- 2 "VB" VACUUM BREAKERS, diaphragm design
- 3 "FV" FOOT VALVES, diaphragm design
- 4 "G" SIGHT GLASS FLOW INDICATORS
- 5 "GL" LIQUID LEVEL INDICATOR TUBES
- 6 "GG" GAUGE GUARDS
- 7* "RVT" PRESSURE RELIEF VALVES
- 8 "PR" PRESSURE REGULATING VALVES
- 9 "EL" AUTOMATIC SHUTOFF VALVES, inline flow, liquid pressure to open/air pressure to close
- 10* "EA" AUTOMATIC SHUTOFF VALVES, inline flow, air pressure to open and close
- 11* "ES-NC" AUTOMATIC SHUTOFF VALVES, inline flow, air pressure to open/spring to close
- 12* "ES-NO" AUTOMATIC SHUTOFF VALVES, inline flow, spring to open/air pressure to close
- 13* "DA" AUTOMATIC SHUTOFF VALVES, angle flow, air pressure to open and close
- 14* "DS-NC" AUTOMATIC SHUTOFF VALVES, angle flow, air pressure to open/spring to close
- 15* "DS-NO" AUTOMATIC SHUTOFF VALVES, angle flow, spring to open/air pressure to close
- 16 "F" AUTOMATIC DIVERTER VALVES, air operated
- 17* "EUS" SOLENOID VALVES, normally closed, direct operating, inline flow
- 18* "EAS" SOLENOID VALVES, normally closed, direct operating, inline flow
- 19* "DAS" SOLENOID VALVES, normally closed, direct operating, angle flow
- 20 "EU" SOLENOID VALVES, normally closed, direct operating, inline flow
- 21 "SP" SOLENOID VALVES, normally closed, pilot operated, inline flow
- 22 SOLENOID ENCLOSURE & COIL SPECIFICATIONS
- 23 "VP" METERING PUMPS, air operated, moderately corrosive service
- 24* "VPA" METERING PUMPS, air operated, highly corrosive service
- 25 METERING PUMP SPECIFICATIONS
- 26 "A" CHEMICAL METERING SYSTEM
- 27 "FC" LIQUID FLOW CONTROLLERS
- 28 "AW" ACID WASTE PUMPING STATIONS

* FAIL-DRY PRODUCTS (see center page insert)

SERIES "CK" CHECK VALVES

(½", ¾", & 1" NPT)

NORMALLY CLOSED LEAK-PROOF CHECK VALVES TO PREVENT REVERSE FLOW OF EXTREMELY CORROSIVE AND ULTRA-PURE LIQUIDS. WILL CHECK IN ANY POSITION, VERTICAL OR HORIZONTAL, ELIMINATING SPECIAL POSITIONING REQUIREMENTS OF OTHER CHECK VALVES.

The Series "CK" check valves utilize a normally closed design which is entirely automatic in action. They are self closing — not dependent on liquid line back pressure. The unique Series "CK" molded diaphragm (Patents Pending) operates silently resulting in chatter-proof operation. It seals in the identical location every time allowing more reliable sealing and prolonged life, and the diaphragm and seat are kept clean by the constant flushing action of the inlet flow keeping the sealing area free of particles which might cause leakage. The Series "CK" check valves with their bolted flange design allow line dis-assembly without the necessity of an additional union or flanges when the piping has sufficient play.

CONSTRUCTION

Series "CK" check valves are constructed of either PVC (Polyvinyl Chloride), Polypropylene, or Teflon. Standard diaphragms are Buna-N or Viton. Fasteners are cadmium plated steel. Stainless steel fasteners are also available upon request. Screwed ends are standard; however, PVC check valves are also available with socket ends. Maximum working pressure for Series "CK" check valves is 100 PSI. For specific pressure ratings consult pressure and temperature tables in engineering section.

OPERATION

The Series "CK" check valve shown at left is normally closed as indicated in the top illustration. It will remain in the closed position in any mounting position and without assistance from back pressure. When back pressure is sensed it is equalized on both sides of the diaphragm with the exception of the heavy center sealing section of the diaphragm which covers the orifice.

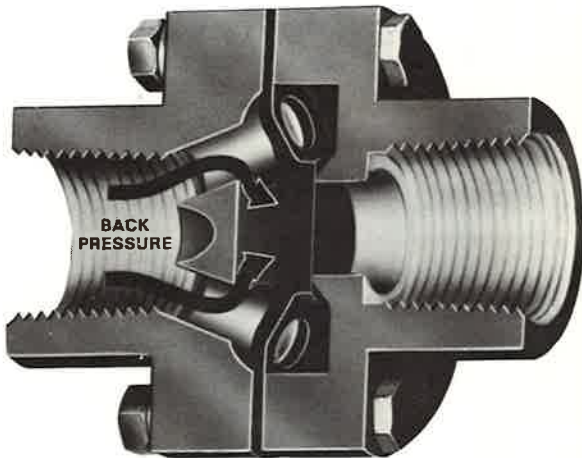
When inlet pressure is sensed as shown in the lower illustration the diaphragm is pushed off the valve seat opening the valve. In this position the diaphragm is supported by the internal valve body allowing the valve to operate under high flow conditions with relatively no force or stress on the diaphragm.

INSTALLATION

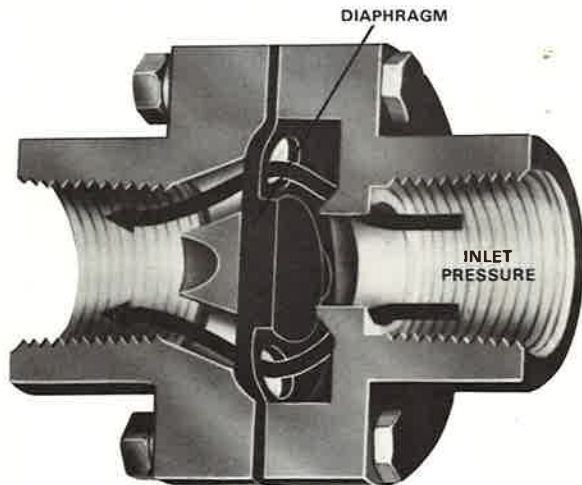
The Series "CK" check valve can be installed in any position unlike other check valve designs. Ball check valves, for example, depend on gravity for closing assistance. The sealing ball has the additional problem of floating or sinking in the liquid depending on the specific gravity.

ORDERING INFORMATION

When ordering Series "CK" check valves order by part number and specify exact chemicals, concentrations, temperatures, and pressures. Also specify materials of construction desired: PVC, Polypropylene, or Teflon.

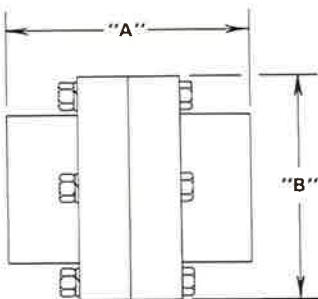


CLOSED POSITION



OPEN POSITION

SERIES "CK" DIMENSIONS



PIPE SIZE (NPT)	"A"		"B"
	THREADED INCHES	SOCKET INCHES	
½"	3 ¼"	3 ¾"	3"
¾"	3 ¾"	4 ¾"	3"
1"	4 ¾"	5 ½"	3"

SERIES "CK" CHECK VALVE SPECIFICATIONS AND PART NUMBERS

PIPE SIZE (NPT)	Cv FACTOR	MAX. WORKING PRESSURE @ 75° F. PSI	MAX. TEMPERATURE RATINGS		MATERIAL OF CONSTRUCTION	DIAPHRAGM MATERIAL	SERIES "CK" PART NUMBERS
			FAHRENHEIT	CELSIUS			
½"	8.0	100	140°	60°	PVC	BUNA-N	CK050B-PV
½"	8.0	100	140°	60°	PVC	VITON	CK050V-PV
½"	8.0	100	180°	82°	POLYPROPYLENE	BUNA-N	CK050B-PP
½"	8.0	100	180°	82°	POLYPROPYLENE	VITON	CK050V-PP
½"	8.0	50	275°	135°	TEFLON	BUNA-N	CK050B-TF
½"	8.0	50	275°	135°	TEFLON	VITON	CK050V-TF
¾"	13.0	100	140°	60°	PVC	BUNA-N	CK075B-PV
¾"	13.0	100	140°	60°	PVC	VITON	CK075V-PV
¾"	13.0	100	180°	82°	POLYPROPYLENE	BUNA-N	CK075B-PP
¾"	13.0	100	180°	82°	POLYPROPYLENE	VITON	CK075V-PP
¾"	13.0	40	275°	135°	TEFLON	BUNA-N	CK075B-TF
¾"	13.0	40	275°	135°	TEFLON	VITON	CK075V-TF
1"	16.0	100	140°	60°	PVC	BUNA-N	CK100B-PV
1"	16.0	100	140°	60°	PVC	VITON	CK100V-PV
1"	16.0	100	180°	82°	POLYPROPYLENE	BUNA-N	CK100B-PP
1"	16.0	100	180°	82°	POLYPROPYLENE	VITON	CK100V-PP
1"	16.0	30	275°	135°	TEFLON	BUNA-N	CK100B-TF
1"	16.0	30	275°	135°	TEFLON	VITON	CK100V-TF

*PLEASE CONSULT PRESSURE & TEMPERATURE TABLES IN ENGINEERING SECTION OF CATALOG FOR PRESSURE RATINGS AT SPECIFIC TEMPERATURES.

SERIES "VB" VACUUM BREAKERS

PROTECTIVE VACUUM BREAKERS FOR ELIMINATING VACUUM WHICH CAN PRODUCE UNWANTED SIPHONAGE OR COLLAPSING OF TANKS STORING CORROSIVE OR ULTRA-PURE LIQUIDS.

Series "VB" vacuum breakers feature the same sensitive diaphragm design as the Series "CK" check valves allowing them to respond to a minimum of vacuum, approximately 1" Hg (3.4 kilopascals). When operating in the full open position Series "VB" vacuum breakers will allow atmospheric pressure to enter a system at a rate of 80 cubic feet of air/minute (.38 cubic metres air/second). These vacuum breakers are available in three (3) pipe sizes with either threaded or socket connections.

CONSTRUCTION

Series "VB" vacuum breakers, including their dust caps are constructed of TYPE I, GRADE 1 PVC (Polyvinyl Chloride). Diaphragm seals are either Buna-N or Viton. The maximum working pressure for all Series "VB" vacuum breakers is 100 psi @ 75° F (690 kilopascals @ 24° C). Their maximum temperature rating is 130° F @ 50 psi (55° C @ 345 kilopascals).

OPERATION AND INSTALLATION

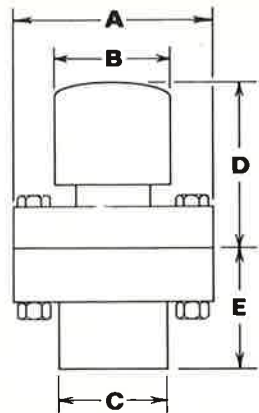
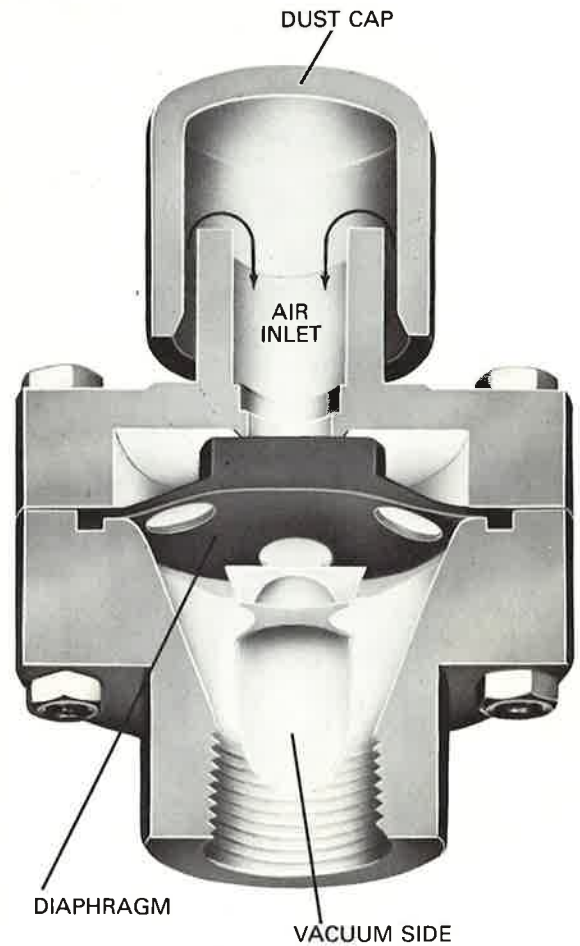
Since Series "VB" vacuum breakers feature a diaphragm design that does not rely on gravity for sealing they can be mounted in any position. However mounted it is recommended that for tank applications they be mounted at the highest point of the tanks. These vacuum breakers will operate whenever a vacuum of at least 1" Hg (3.4 kilopascals) is present in a system. The vacuum will lift the diaphragm off its seat allowing atmospheric pressure into the system to replace the vacuum. When the vacuum has been relieved the diaphragm will return to the closed position since there is no longer any force to lift it off its seat.

IMPORTANT: In applications where pipe hammer or pressure surges could possibly rupture the vacuum breakers' diaphragm it is recommended that Series "CK" check valves be used in place of Series "VB" vacuum breakers. The check valves can be piped to a sump or remote area thus eliminating the possibility of spraying dangerous and highly corrosive liquids in work areas if a diaphragm were to fail. Since Series "VB" vacuum breakers have dust caps they cannot be piped to a remote area.

ORDERING INFORMATION

When ordering Series "VB" vacuum breakers specify chemicals, concentrations, line pressures, and temperatures. Threaded ends will be furnished unless socket ends are specified.

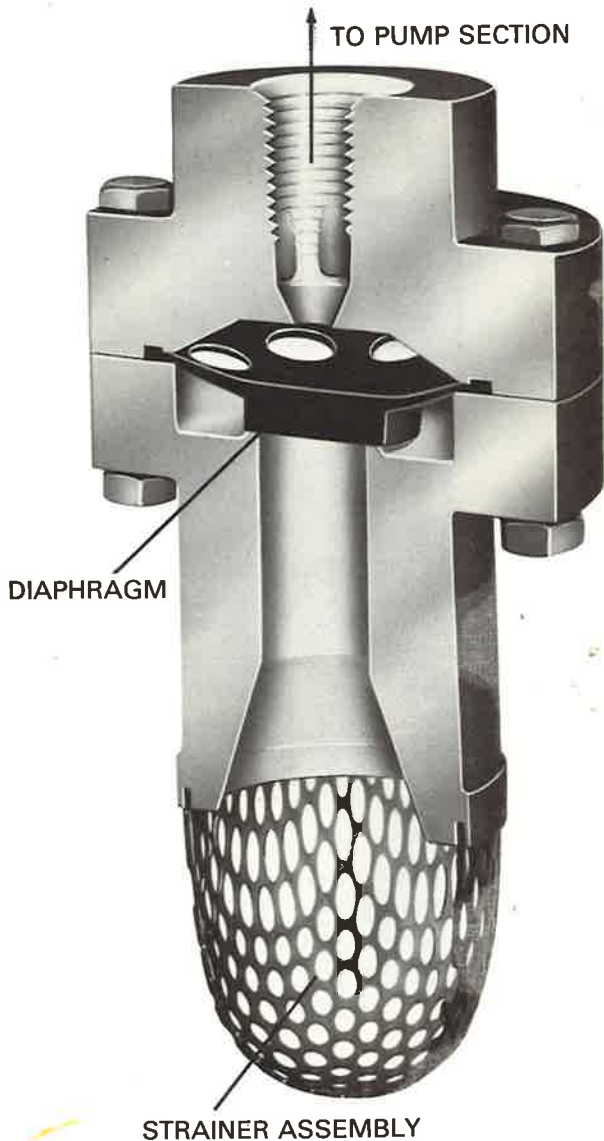
PIPE SIZE	SERIES "VB" PART NUMBERS	
	BUNA-N SEALS	VITON SEALS
½"	VB050B	VB050V
¾"	VB075B	VB075V
1"	VB100B	VB100V



SERIES "VB" VACUUM BREAKER DIMENSIONS

PIPE SIZE	"A" DIAMETER		"B" DIAMETER		"C" DIAMETER		"D" LENGTH		"E" LENGTH	
	INCHES	MILLIMETRES	INCHES	MILLIMETRES	INCHES	MILLIMETRES	INCHES	MILLIMETRES	INCHES	MILLIMETRES
½" Thread	3"	76.2	1½"	41.2	1½"	47.6	2½"	63.5	1½"	41.2
½" Socket	3"	76.2	1½"	41.2	1½"	47.6	2½"	63.5	2"	50.8
¾" Thread	3"	76.2	1½"	41.2	1½"	47.6	2½"	63.5	2"	50.8
¾" Socket	3"	76.2	1½"	41.2	1½"	47.6	2½"	63.5	2¼"	57.1
1" Thread	3"	76.2	1½"	41.2	1½"	47.6	2½"	63.5	2"	50.8
1" Socket	3"	76.2	1½"	41.2	1½"	47.6	2½"	63.5	2¾"	69.8

SERIES "FV" FOOT VALVE AND STRAINER ASSEMBLIES



FOOT VALVE AND STRAINER ASSEMBLIES TO PREVENT LOSS OF PRIME IN PUMP SUCTION LINES AND ELIMINATE LARGE HARMFUL PARTICLES FROM ENTERING PUMPS HANDLING HIGHLY CORROSIVE OR ULTRA-PURE LIQUIDS.

Series "FV" foot valves feature the same sensitive diaphragm design as the Series "CK" check valves allowing them to respond to a minimum of vacuum, approximately 1" Hg (3.4 kilopascals). Since these foot valves do not use the conventional ball check design, there is no danger of a PVC ball floating in higher specific gravity acids resulting in loss of prime.

CONSTRUCTION

Series "FV" foot valve bodies, strainer screens and fasteners, are constructed of TYPE I, GRADE 1 PVC (Polyvinyl Chloride) and can be fully submerged without fear of corrosion. Diaphragm seals are either Buna-N or Viton. The maximum working temperature for all Series "FV" foot valves is 140° F (60°C).

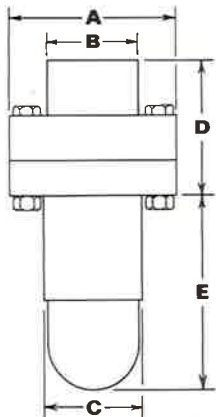
OPERATION AND INSTALLATION

Because the Series "FV" foot valve and strainer assemblies feature a diaphragm design that does not rely on gravity for sealing they can be mounted in any position; however, it is recommended that they be mounted in a vertical position. These foot valves will operate whenever vacuum is present due to a pump's suction. The vacuum will lift the diaphragm off its seat allowing liquid into the pump's suction line. Whenever the pump stops operating the diaphragm will return to the closed position holding the prime in the pump's suction line. Care should be taken in positioning foot valves deep enough in the corrosive or ultra-pure liquid to prevent the pump from pulling in air.

ORDERING INFORMATION

When ordering Series "FV" foot valve and strainer assemblies specify chemicals, concentrations, and temperatures. Threaded ends will be furnished unless socket ends are specified.

PIPE SIZE	C _v FACTOR	SERIES "FV" PART NUMBERS	
		BUNA-N SEALS	VITON SEALS
1/2"	8.0	FV050B	FV050V
3/4"	13.0	FV075B	FV075V
1"	15.0	FV100B	FV100V



SERIES "FV" FOOT VALVE DIMENSIONS

PIPE SIZE	"A" DIAMETER		"B" DIAMETER		"C" DIAMETER		"D" LENGTH		"E" LENGTH	
	INCHES	MILLIMETRES	INCHES	MILLIMETRES	INCHES	MILLIMETRES	INCHES	MILLIMETRES	INCHES	MILLIMETRES
1/2" Thread	3"	76.2	1 1/8"	47.6	1 1/8"	47.6	2 3/4"	69.3	3 1/2"	88.9
1/2" Socket	3"	76.2	1 1/8"	47.6	1 1/8"	47.6	2 3/4"	69.3	3 1/2"	88.9
3/4" Thread	3"	76.2	1 1/8"	47.6	1 1/8"	47.6	2 3/4"	69.3	3 1/2"	88.9
3/4" Socket	3"	76.2	1 1/8"	47.6	1 1/8"	47.6	3"	76.2	3 1/2"	88.9
1" Thread	3"	76.2	1 1/8"	47.6	1 1/8"	47.6	2 3/4"	69.3	3 1/2"	88.9
1" Socket	3"	76.2	1 1/8"	47.6	1 1/8"	47.6	3 1/2"	88.9	3 1/2"	88.9

SERIES "G" SIGHT GLASSES

SIGHT GLASSES TO SAFELY, ECONOMICALLY, AND POSITIVELY INDICATE THE FLOW AND CLARITY OF EXTREMELY CORROSIVE OR ULTRA-PURE LIQUIDS.

Series "G" sight glasses are available in two (2) models, "GY" and "GX". Model "GY", used to handle concentrated acids and caustics, employs a heavy duty Pyrex inner cylinder surrounded and protected by a heavy duty Plexiglas outer cylinder wall (AS ILLUSTRATED). Model "GX", used for mild or ultra-pure liquids such as demineralized water, employs a single heavy duty Plexiglas cylinder wall.

CONSTRUCTION

Series "G" sight glass ends are constructed of either TYPE I, GRADE 1 PVC (Polyvinyl Chloride), or Polypropylene. Cylinder wall construction is either Plexiglas or a combination of Pyrex and Plexiglas. Seals are Buna-N or Viton. Fasteners are cadmium plated steel; however, stainless steel fasteners are also available. Optional streamers are constructed of flexible PVC.

OPERATION AND INSTALLATION

Series "G" sight glasses may be installed without regard to flow direction and can be confidently used to handle line pressures up to a maximum of 150 psi (1035 kilopascals). Consult pressure table below for specific pressure ratings.

Series "G" PVC sight glasses are available with either threaded or socket ends, whereas, Polypropylene sight glasses are only available with threaded ends.

It is possible in high clarity applications that the Series "G" sight glass will not indicate the flow of the liquid. In such cases, it is recommended that optional PVC streamers be used. The streamer should be installed through the inlet side of the sight glass. This will allow them to flex and bounce visibly with the liquid flow.

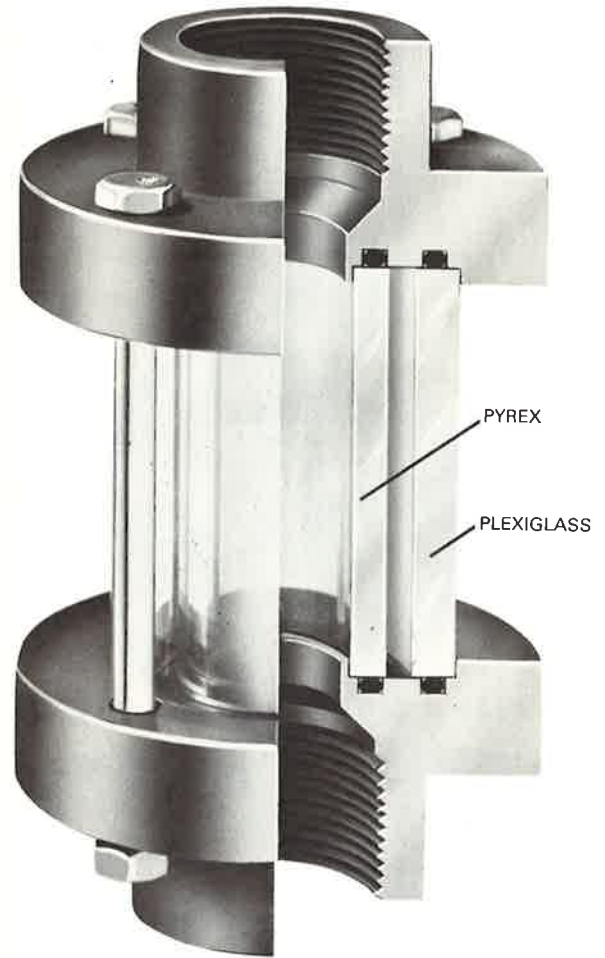
OPTIONAL ACCESSORIES

Corrosion resistant flexible vinyl streamers are available for all sizes of sight glasses as are stainless steel bolts, nuts, and lock washers.

ORDERING INFORMATION

When ordering Series "G" sight glasses specify exact chemical, concentration, and pressure. Also specify material of construction desired (PVC or Polypropylene) and whether threaded or socket ends are required. If stainless steel fasteners are desired specify "WITH STAINLESS FASTENERS". If streamers are required include the below part numbers with "-S". EXAMPLE: a 1/2" PVC sight glass with Pyrex and Plexiglas cylinders and vinyl streamers would be a number GY050V-S PVC SIGHT GLASS.

PIPE SIZE (NPT)	PLEXIGLAS CYLINDER BUNA-N SEALS	PLEXIGLAS CYLINDER VITON SEALS	PLEXIGLAS AND PYREX CYLINDERS VITON SEALS
1/2"	GX050B	GX050V	GY050V
3/4"	GX075B	GX075V	GY075V
1"	GX100B	GX100V	GY100V
1 1/4"	GX125B	GX125V	GY125V
1 1/2"	GX150B	GX150V	GY150V
2"	GX200B	GX200V	GY200V
3"	GX300B	GX300V	GY300V



SERIES "G" SIGHT GLASS PRESSURE RATINGS

PVC ENDS

125 psi @ 75° F

863 kilopascals @ 24° C

50 psi @ 140° F

345 kilopascals @ 60° C

POLYPROPYLENE ENDS

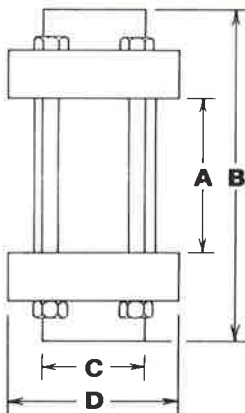
150 psi @ 125° F

1035 kilopascals @ 52° C

100 psi @ 180° F

690 kilopascals @ 82° C

SERIES "G" SIGHT GLASS DIMENSIONS



PIPE SIZE	"A" VISUAL LENGTH		"B" END/END LENGTH		"C" DIAMETER		"D" DIAMETER	
	INCHES	MILLIMETRES	INCHES	MILLIMETRES	INCHES	MILLIMETRES	INCHES	MILLIMETRES
1/2"	2 1/4	57.1	4 3/4	120.6	1 1/2	38.1	2 1/2	63.5
3/4"	2 1/4	57.1	4 3/4	120.6	1 1/2	38.1	2 1/2	63.5
1"	2 1/4	57.1	5 1/4	133.3	1 3/4	44.4	3	76.2
1 1/4"	2 1/2	63.5	5 7/8	149.2	2 3/8	60.3	3 1/2	88.9
1 1/2"	2 1/2	63.5	5 7/8	149.2	2 3/8	60.3	3 1/2	88.9
2"	3 1/8	79.3	7 3/8	187.3	2 7/8	73.0	4	101.6
3"	3 3/8	85.7	8 3/8	212.7	4 3/8	111.1	5 1/2	139.7



SERIES "GL" LEVEL INDICATOR TUBES

LEVEL INDICATOR TUBES TO SAFELY, ECONOMICALLY, AND POSITIVELY INDICATE EXACT LEVEL IN TANKS WITH EXTREMELY CORROSIVE OR ULTRA-PURE LIQUIDS.

Series "GL" level indicator tubes are available in two (2) pipe sizes and four (4) nominal lengths to fit most small and medium size acid and caustic tanks. Series "GL" tubes utilize a heavy duty Pyrex inner cylinder surrounded and protected by a heavy duty Plexiglas outer cylinder wall offering excellent visibility and maximum compatibility.

CONSTRUCTION

To offer maximum corrosion and temperature resistance Series "GL" level indicator tubes are available in three (3) materials of construction; TYPE I, GRADE 1 PVC (Polyvinyl Chloride), Polypropylene, and Teflon. Cylinder wall construction is Pyrex surrounded by Plexiglas.

Although these level tubes are not designed for pressure applications they can be safely used with internal pressures up to 50 psi (345 kilopascals). It must be noted that some corrosion resistant factors may change with increases in temperature.

OPERATION AND INSTALLATION

Series "GL" level indicator tubes must be installed vertically. They may be mounted to a tank by means of elbows, nipples, unions, and tank adapters or can be mounted remotely by connecting to tank pipe lines. It is advisable to pipe in shut-off valves in case servicing is necessary.

For high tank applications more than one level tube may be vertically attached with nipples to obtain desired height. Extreme care should be taken when making such installations.

ORDERING INFORMATION

When ordering Series "GL" level indicator tubes, specify exact chemical, concentration, temperature, and pressure. Also specify material of construction desired (PVC, Polypropylene, or Teflon). Threaded ends are standard on all level tubes but socket ends are available on PVC level tubes if so requested.

PIPE SIZE (NPT)	NOMINAL LENGTH FEET	NOMINAL LENGTH METRES	MATERIALS OF CONSTRUCTION		
			PVC	POLYPROPYLENE	TEFLON
1/2"	1	.31	GL050PV1	GL050PP1	GL050TF1
1/2"	2	.61	GL050PV2	GL050PP2	GL050TF2
1/2"	3	.91	GL050PV3	GL050PP3	GL050TF3
1/2"	4	1.22	GL050PV4	GL050PP4	GL050TF4
3/4"	1	.31	GL075PV1	GL075PP1	GL075TF1
3/4"	2	.61	GL075PV2	GL075PP2	GL075TF2
3/4"	3	.91	GL075PV3	GL075PP3	GL075TF3
3/4"	4	1.22	GL075PV4	GL075PP4	GL075TF4

"SERIES "GL" LEVEL INDICATOR TUBE TEMPERATURE RATINGS

PVC ENDS

150° F @ 5 psi 66° C @ 35 kilopascals
140° F @ 50 psi 60° C @ 345 kilopascals

POLYPROPYLENE ENDS

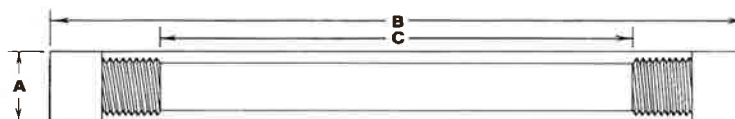
200° F @ 5 psi 93° C @ 35 kilopascals
180° F @ 50 psi 82° C @ 345 kilopascals

TEFLON ENDS

350° F @ 5 psi 177° C @ 35 kilopascals
275° F @ 50 psi 135° C @ 345 kilopascals

SERIES "GL" LEVEL INDICATOR TUBE DIMENSIONS

PIPE SIZES	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"	3/4"	3/4"	3/4"
NOMINAL LENGTH (FEET)	1	2	3	4	1	2	3	4	
NOMINAL LENGTH (METRES)	.31	.61	.91	1.22	.31	.61	.91	1.22	
"A" BODY DIAMETER	1 1/2" 38.1	1 1/2" 38.1	1 1/2" 38.1	1 1/2" 38.1	1 1/2" 38.1	1 1/2" 38.1	1 1/2" 38.1	1 1/2" 38.1	1 1/2" 38.1
"B" END/END LENGTH	15" 381.0	27" 685.8	39" 990.6	51" 1295.4	15" 381.0	27" 685.8	39" 990.6	51" 1295.4	
"C" VISUAL LENGTH	10" 254.0	22" 558.8	34" 863.6	46" 1168.4	10" 254.0	22" 558.8	34" 863.6	46" 1168.4	



SERIES "GG" GAUGE GUARDS

GAUGE GUARDS DESIGNED TO PROTECT PRESSURE AND VACUUM GAUGES USED ON HIGHLY CORROSIVE AND ULTRA-PURE LIQUID LINES. ALSO PROTECTS GAUGES FROM PROCESS LINES CONTAINING SUSPENDED SOLIDS WHICH COULD CAUSE CLOGGING. ELIMINATES GAUGE DEAD POCKETS WHERE FOOD AND CHEMICALS CAN DECOMPOSE.

The Series "GG" gauge guard, available with or without a gauge, features a thin flexible diaphragm which serves as a protective barrier between the process liquid and gauge. This molded diaphragm, with a volumetric capacity of 2.40 cubic inches, will actuate most low pressure (30" Hg-160 PSI) gauges.

CONSTRUCTION

Series "GG" gauge guards are constructed of TYPE 1, GRADE 1 PVC (Polyvinyl Chloride), Polypropylene or Teflon. Standard diaphragms are Viton and Buna-N; however, other diaphragm materials are available on special order. Fasteners are cadmium plated steel. Stainless steel fasteners are also available on special order.

OPERATION

The Series "GG" gauge guard illustrated at right with an attached gauge is completely automatic in operation when solidly filled with PLAST-O-MATIC Instrument Oil, a specifically selected temperature stable fill liquid (see accessory section of catalog for fill liquid specifications). The Series "GG" diaphragm, essentially a separation member, senses process pressure on its bottom side. This pressure is transmitted to the gauge through the solid liquid fill. The diaphragm and liquid fill are simply a means of transmitting process pressure to the gauge while acting as a physical barrier to prevent the process material from contacting the gauge.

INSTALLATION

To install a Series "GG" gauge guard which already has a gauge simply attach a 1/4" NPT nipple into the bottom center inlet of the gauge guard and install on process line. It is recommended that teflon tape or acceptable pipe sealant be used to prevent pressure leakage between the process line and gauge guard.

If a Series "GG" gauge guard is to be installed which does not already have a gauge the entire upper gauge guard and gauge must be solidly filled with a fill liquid (see Filling Information). Before installing gauge to gauge guard teflon tape or acceptable pipe sealant should be used on the 1/4" NPT gauge connection to effect a bubble-tight seal between the gauge and gauge guard.

FILLING INFORMATION

If a Series "GG" gauge guard is purchased without a gauge the gauge guard must be solidly filled with a temperature stable fill liquid. Likewise, the gauge must be filled before assembling it to the gauge guard. When a Series "GG" gauge guard and gauge are filled and connected it must remain a sealed system. Any loss or leakage of the fill liquid can only result in loss of gauge accuracy.

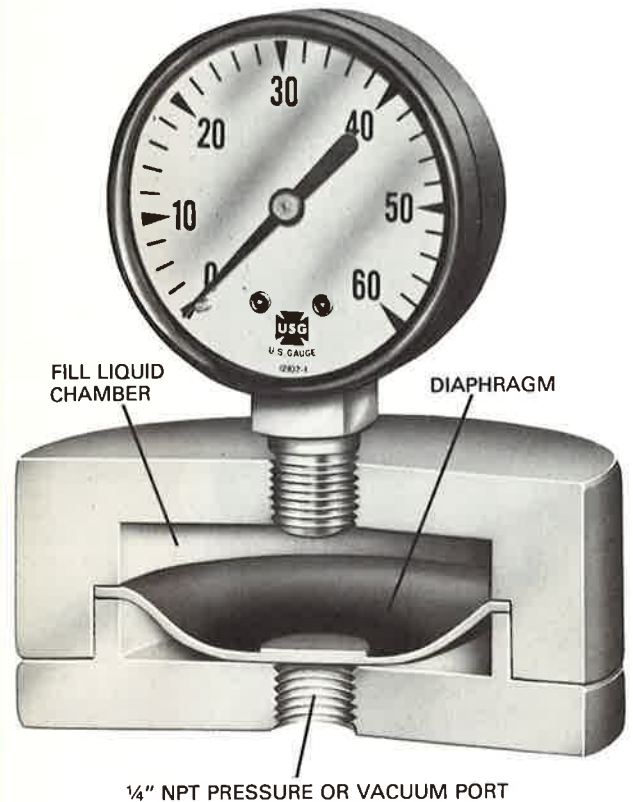
The principle object when filling is to remove all possible air bubbles from the gauge guard and gauge. Air bubbles can cause loss of gauge accuracy due to air expansion; however, the Series "GG" gauge guard with its high volume diaphragm seal contains sufficient volumetric capacity (2.40 cubic inches) to tolerate minimum filling errors without loss of pressure measurement accuracy. Actual filling instructions are shipped with each gauge guard.

GAUGE INFORMATION

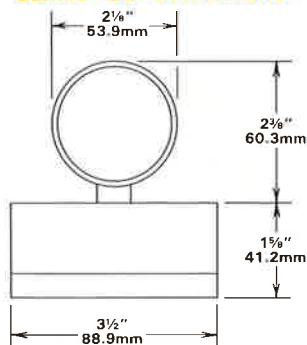
Series "GG" gauge guards are also available with mounted gauges as a sealed and solidly filled system. Of the (4) standard gauges offered three (3) are pressure gauges of 0-60 PSI, 0-160 PSI, and 0-35" H₂O. The other is a vacuum gauge of 0-30" Hg. Consult gauge accessory section of catalog for gauge specifications. For special applications contact factory for minimum ordering quantities.

ORDERING INFORMATION

Order by part number and specify exact chemicals, pressures, and temperatures. For materials of construction other than those listed, please consult our Sales Department.



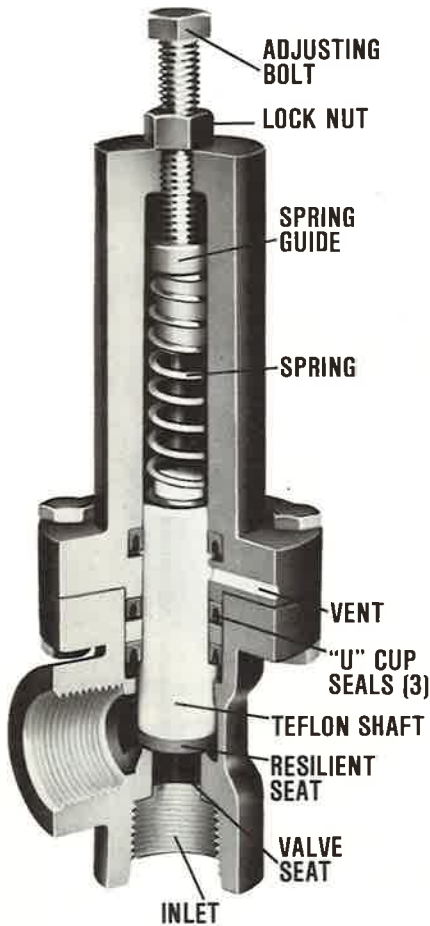
SERIES "GG" DIMENSIONS



SERIES "GG" GAUGE GUARD SPECIFICATIONS AND PART NUMBERS

AVAILABLE GAUGE RANGES PRESSURE-VACUUM	MAX. WORKING PRESSURE PSI	MAX. WORKING TEMPERATURE		MATERIAL OF CONSTRUCTION	DIAPHRAGM MATERIAL	SERIES "GG" PART NUMBERS
		FAHRENHEIT	CENTIGRADE			
GAUGE GUARD W/O GAUGE	160	1104	140°	PVC	BUNA-N	GGB-PV
GAUGE GUARD W/O GAUGE	160	1104	140°	PVC	VITON	GGV-PV
GAUGE GUARD W/O GAUGE	160	1104	200°	POLYPROPYLENE	BUNA-N	GGB-PP
GAUGE GUARD W/O GAUGE	160	1104	200°	POLYPROPYLENE	VITON	GGV-PP
GAUGE GUARD W/O GAUGE	160	1104	300°	TEFLON	VITON	GGV-TF
0-30" Hg	160	1104	140°	PVC	BUNA-N	GGB030PV
0-30" Hg	160	1104	140°	PVC	VITON	GGV030PV
0-30" Hg	160	1104	200°	POLYPROPYLENE	BUNA-N	GGB030PP
0-30" Hg	160	1104	200°	POLYPROPYLENE	VITON	GGV030PP
0-30" Hg	160	1104	300°	TEFLON	VITON	GGV030TF
0-35" H ₂ O	160	1104	140°	PVC	BUNA-N	GGB035PV
0-35" H ₂ O	160	1104	140°	PVC	VITON	GGV035PV
0-35" H ₂ O	160	1104	200°	POLYPROPYLENE	BUNA-N	GGB035PP
0-35" H ₂ O	160	1104	200°	POLYPROPYLENE	VITON	GGV035PP
0-35" H ₂ O	160	1104	300°	TEFLON	VITON	GGV035TF
0-60 PSI	160	1104	140°	PVC	BUNA-N	GGB060PV
0-60 PSI	160	1104	140°	PVC	VITON	GGV060PV
0-60 PSI	160	1104	200°	POLYPROPYLENE	BUNA-N	GGB060PP
0-60 PSI	160	1104	200°	POLYPROPYLENE	VITON	GGV060PP
0-60 PSI	160	1104	300°	TEFLON	VITON	GGV060TF
0-160 PSI	160	1104	140°	PVC	BUNA-N	GGB160PV
0-160 PSI	160	1104	140°	PVC	VITON	GGV160PV
0-160 PSI	160	1104	200°	POLYPROPYLENE	BUNA-N	GGB160PP
0-160 PSI	160	1104	200°	POLYPROPYLENE	VITON	GGV160PP
0-160 PSI	160	1104	300°	TEFLON	VITON	GGV160TF

SERIES "RVT" RELIEF VALVES



RELIEF VALVES TO PREVENT OVERPRESSURES IN VESSELS AND LINES AND TO HANDLE BY-PASS FLOW FROM PUMPS. FOR HIGHLY CORROSIVE OR PURE LIQUIDS.

"RVT" relief valves feature a non-sticking design utilizing a Teflon shaft passing through (3) U-cup seals. Venting between the upper and center U-cup seals results in our FAIL-DRY* design for added protection.

MATERIALS OF CONSTRUCTION

"RVT" relief valves are constructed of TYPE 1, GRADE 1 PVC (Polyvinyl Chloride) with a Teflon shaft. Seals are Buna-N or Viton. All hardware (not in contact with fluid) is cadmium plated steel.

OPERATION AND ADJUSTMENT

OPERATION: As line pressure increases to the valve's set pressure, the shaft begins to lift off the valve seat. Further increases opens the valve seat more, allowing a higher rate of relief. As line pressure decreases, the spring pushes the shaft downward decreasing the valve seat opening until completely closed.

ADJUSTMENT: To adjust relieving pressure simply turn adjusting bolt down to increase and up to reduce pressure setting. If such adjustments are not desirable in the field, a tamper-proof factory set wire seal is available. This seal must be broken in order to alter a valve's pressure setting.

INSTALLATION

"RVT" valves should be mounted upright and should be installed as near as possible to the vessel or line being protected. If it is desirable to pipe the valve's outlet to a remote location the length of outlet piping should be kept at a minimum.

PRESSURE & FLOW INFORMATION

"RVT" valves can be set for pressures ranging from 5 to 100 PSI. The relief valve begins to leak slightly at its set pressure and requires an overpressure to open further. The overpressure, as listed in the chart below, is the actual pressure required in excess of the set pressure to fully open the valve and reach maximum flow.

An example on how to use the Flow Rate Reference Chart is as follows: What line pressure would have to be reached to flow 15 GPM through a 1" relief valve set at 30 PSI? The correct valve size is being used since the chart shows that a 1" valve has a maximum flow rate of 15 GPM. The chart also shows that a 40% overpressure is required to reach the 15 GPM flow rate. This 40% overpressure (12 PSI) would correspond to a 42 PSI (30 + 12) line pressure requirement. If 42 PSI is too high for the application, either the initial set pressure of 30 PSI would have to be lowered or the next larger size valve used.

APPLICATIONS

"RVT" valves are used for two (2) typical applications, straight relief and by-pass relief. The straight relief application occurs when a pressurized tank is being protected from overpressure. In this application the valve would usually relieve to atmosphere. The by-pass relief application occurs when a pump is being protected from dead-heading. In this application the valve normally relieves the liquid flow back to the pump's suction tank. **CAUTION:** Series "RVT" relief valve are not "POP-SAFETY" valves and should not be used in applications requiring such valves.

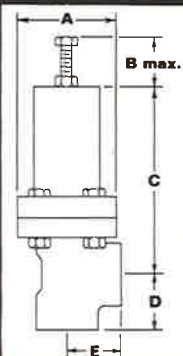
ORDERING INFORMATION

Order by part number and specify exact chemical, concentration, line pressure, pressure setting, and temperature. When ordering tamper-proof wire seal conclude below part numbers with "-W".

SERIES "RVT" FLOW RATE REFERENCE CHART

RELIEF VALVE PIPE SIZES	(NPT)	¾"	1"	1¼"	1½"	2"					
MAXIMUM RECOMMENDED FLOWS	G.P.M. cm ³ /sec	8.0 804	15.0 945	40.0 2520	60.0 3780	100.0 6300					
VALVE PRESSURE SETTINGS											
PSI	kilopascals	PSI	kilopascals	PSI	kilopascals	PSI	kilopascals				
5-25	35-173	12	83	10	69	8	55	8	55	6	41
26-59	180-407	40%		40%		40%		30%		30%	
60-100	414-690	40%		40%		30%		30%		30%	

SERIES "RVT" RELIEF VALVE DIMENSIONS



VALVE SIZE (NPT)	DIMENSION "A" INCHES		DIMENSION "B" INCHES		DIMENSION "C" INCHES		DIMENSION "D" INCHES		DIMENSION "E" INCHES	
¾"	2½"	63.5	1½"	38.1	5¼"	133.3	1½"	38.1	1½"	38.1
1"	3"	76.2	1¾"	44.4	5½"	139.7	1¾"	44.4	1¾"	44.4
1¼"	3½"	88.9	2½"	63.5	7⅞"	193.6	2"	50.8	2"	50.8
1½"	3¾"	95.2	2"	50.8	7"	177.8	2⅞"	63.9	2⅞"	63.9
2"	4¼"	109.7	3¼"	82.5	8½"	215.9	2¼"	57.1	2¼"	57.1

SERIES "RVT" PART NUMBER

PIPE SIZE	BUNA-N SEALS	VITON SEALS
¾"	RVT075B	RVT075V
1"	RVT100B	RVT100V
1¼"	RVT125B	RVT125V
1½"	RVT150B	RVT150V
2"	RVT200B	RVT200V

SERIES "PR" PRESSURE REGULATORS

PRESSURE REGULATORS TO ACCURATELY CONVERT VARYING OR CONSTANT EXCESSIVE UPSTREAM PRESSURES TO A PRE-DETERMINED MAXIMUM DOWNSTREAM PRESSURE IN SYSTEMS HANDLING HIGHLY CORROSIVE OR ULTRA-PURE LIQUIDS.

MATERIALS OF CONSTRUCTION

Series "PR" pressure regulators are constructed of TYPE 1, GRADE 1 PVC (Polyvinyl Chloride). Seals are either Buna-N or Viton. Valve spring and fasteners are cadmium plated steel and do not contact the liquid. Consult factory for other materials.

OPERATION

"PR" regulators prohibit downstream pressure from exceeding the set pressure. Downstream pressure is equal to the set pressure at zero flow. As downstream flow increases, downstream pressure drops below the set pressure, and the higher the flow the higher the downstream pressure drop. Therefore, when liquid flows downstream of the regulator the downstream pressure will be less than the set pressure. See chart below for amount of pressure drop. The "PR" regulator, illustrated at right, modulates according to downstream pressure changes. The downstream pressure is sensed on the bottom side of the piston as it enters the vertical pressure sensing orifice on top of the regulator's outlet port. When no downstream pressure is sensed the spring forces the piston and shaft down, fully opening the internal valve seat opening. As downstream pressure increases the spring is compressed and the piston and shaft move upwards gradually closing off the internal valve seat opening. When this pressure increases to equal the regulator's set pressure the seat is closed off completely, thus eliminating any further increase in downstream pressure.

INSTALLATION

Since a "PR" regulator is reacting to downstream pressure, it is important to eliminate downstream pressure surges that could damage the regulator. These surges are caused by abruptly stopping downstream flow; therefore, install all main shut-off valves upstream of the regulator. A manifold downstream of the regulator with a number of smaller valves would be satisfactory if all of these valves did not close at the same time. When installing two regulators in parallel, unions and manual valves should be placed both upstream and downstream of each regulator so repairs can be made easily and without complete line shut-down.

FLOW INFORMATION

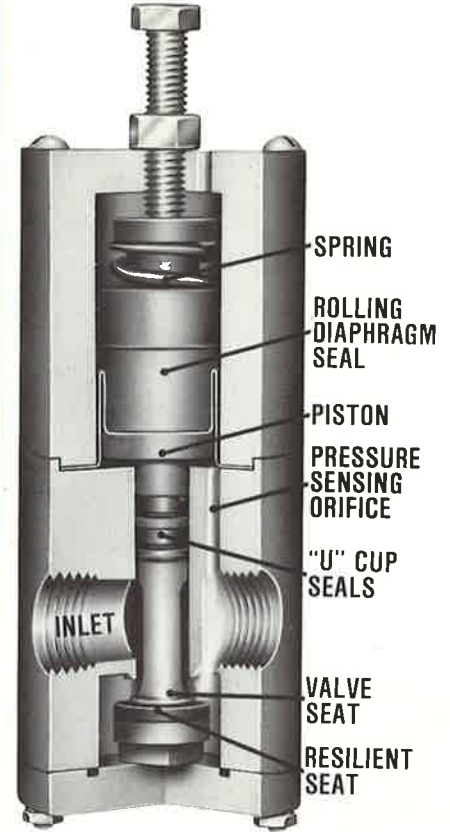
Use a multiple regulator installation piped in parallel when flows are in excess of one regulator's capacity. Example: A 3/4" system requires 30 GPM at a maximum pressure of 10 PSI. The inlet pressure is 70 PSI. From the chart below, one 3/4" regulator set at 10 PSI will give 18 GPM. Therefore, two 3/4" regulators piped in parallel are needed.

PRESSURE INFORMATION

Maximum inlet pressure rating is 125 PSI at 75°F. Adjustable downstream pressure range is 5 to 50 PSI.

ORDERING INFORMATION

Order by part number, as listed below, and specify exact chemicals, pressures (inlet and downstream) and temperatures. Consult factory for materials other than PVC.

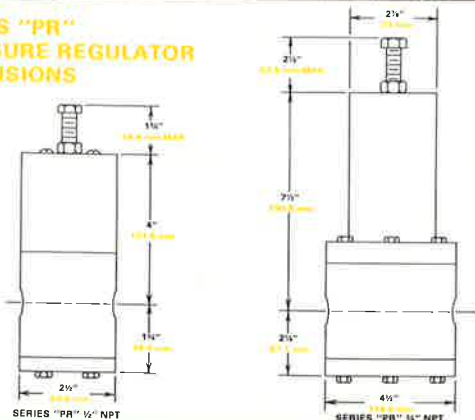


SERIES "PR" FLOW RATE REFERENCE CHART

INLET PRESSURE (psi) INLET PRESSURE	1/2" NPT SERIES "PR" PRESSURE REGULATOR					3/4" NPT SERIES "PR" PRESSURE REGULATOR				
	10	15	20	25	30 & ABOVE	6	10	15	20	25 & ABOVE
REGULATOR SETTINGS										
PSI	2	2	2 1/2	2 1/2	3	8	8	8	8	8
G.P.M.	24.5	126	158	198	189	504	504	504	504	504
10	8.9	5	6 1/2	7	7	12	14	18	18	18
15	103.5	5 1/2	34.7	44.2	44.2	13	820	1136	21	1830
20	138	6	379	442	442	13	820	1136	24	1830
25	172.5	6	379	442	442	13	820	1136	24	1830
30	207	6	379	442	442	13	820	1136	24	1830
40	276	6	379	442	442	13	820	1136	24	1830
50	345	6	379	442	442	13	820	1136	24	1830

NOTE: The above flow ratings are a result of laboratory testing and should be used only as a guide for actual field use. Tests were conducted without piping on the outlet of the regulators.

SERIES "PR" PRESSURE REGULATOR DIMENSIONS



FLOW CAPACITY VS PRESSURE DROP REFERENCE CHART

1/2" PRESSURE REGULATOR			3/4" PRESSURE REGULATOR		
FLOW G.P.M.	Pressure Drop PSI	Set Pressure	FLOW G.P.M.	Pressure Drop PSI	Set Pressure
2	126	1 1/2	8	504	4
4	252	4	15	945	6 1/2
6	379	6 1/2	20	1262	8 1/2
8	504	9	25	1577	10
10	631	13	30	1890	12
			35	2208	14

* Pressure drop is measured from set pressure of regulator.

SERIES "PR" PRESSURE REGULATOR PART NUMBERS

PIPE SIZE (NPT)	ADJUSTABLE OUTLET RANGE psi	VALVE SEALS	SERIES "PR" PART NUMBERS
1/2"	5-50	BUNA-N	PR050B
1/2"	5-50	VITON	PR050V
3/4"	5-50	BUNA-N	PR075B
3/4"	5-50	VITON	PR075V

SERIES "EL" SHUTOFF VALVES

LIQUID LINE PRESSURE TO OPEN & AIR PRESSURE TO CLOSE

ECONOMICAL BUBBLE-TIGHT SHUTOFF VALVES WITH VISUAL INDICATION OF VALVE POSITION. USED PRIMARILY FOR DEMINERALIZED WATER AND OTHER SIMILAR LIQUIDS. NOT RECOMMENDED FOR MOST ACIDS AND CORROSIVE CAUSTICS. REQUIRES A MINIMUM OF 10 PSI LIQUID LINE PRESSURE TO OPERATE AND HAS A MAXIMUM RATING OF 125 PSI AT ROOM TEMPERATURE.

The Series "EL" valves are the most economical of the automatic shutoff valves in the PLAST-O-MATIC product line. Further economies are realized by the fact that they are operated by a 3-way air solenoid valve instead of a 4-way. The Series "EL" valves offer long life — capable of more than 500,000 cycles. This is achieved through a design utilizing a poppet type seat and U-cups, both of which are low friction seals. The U-cup design allows a wetting action between the piston and cylinder wall helping to lubricate the seals; however, this wetting action can create vapor or droplets in the air line system. This is the reason the "EL" series is not recommended for most acids and corrosive caustics. A Series "EL" valve is opened by the liquid line pressure; therefore, if the air pressure necessary to hold the valve closed falls below the minimum pressure requirement the valve will open.

CONSTRUCTION

Series "EL" valves are constructed of TYPE 1, GRADE 1 PVC (Polyvinyl Chloride). Cylinder walls of clear Plexiglas offer visual indication of valve position. Seals are Buna-N or Viton.

OPERATION

The Series "EL" valve illustrated at left is closed by a single 3-way air solenoid valve which induces air pressure on top of the "EL" valve piston. To fully close the "EL" valve this pressure must be at least 10 PSI greater than the liquid line pressure. When the 3-way air solenoid valve changes to its exhaust position the air pressure on top of the piston is relieved and the liquid line pressure sensed under the opposite end of the piston will lift the piston and open the valve. To achieve this the liquid line pressure must be a minimum of 10 PSI; however, once the valve is opened it will stay open even if the liquid line pressure falls to zero and until air pressure is reapplied to the top of the piston. Maximum cylinder pressure is 100 PSI.

INSTALLATION

A Series "EL" valve must be installed so that the liquid line pressure is sensed under the "EL" valve piston. This is the opposite flow direction from that of the "EA" and "ES" shutoff valves. A single 1/8" NPT 3-way air solenoid valve (see air solenoid accessory section of catalog for specifications) should be piped to the valve head to apply air pressure on top of the piston. It is recommended that a filter and lubricator be installed on the air line to obtain maximum seal and cylinder life. A lubricator may not be permissible in some pure water applications because of the wetting action caused by the U-cup design.

LIMIT STOP ASSEMBLY

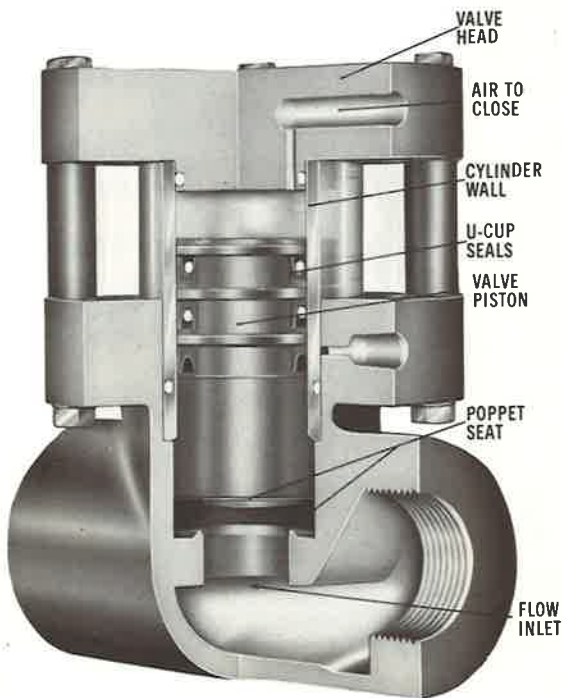
Series "EL" valves are available with limit stop and tapered shaft assemblies. These assemblies will adjust flow through the valves by regulating the open area of the valve orifice. Flow adjustment is achieved by simply turning the limit stop bolt located in the center of the valve head. This will restrict the travel of the piston anywhere between full open and full closed. The limit stop bolt is equipped with a locking nut and thread seal which, when locked in place, will make the thread assembly air tight.

OPTIONAL FEATURES

Series "EL" valves are also available with optional 150# flanged ends. If such connections are desired conclude below part numbers with "-F" when ordering valves. EXAMPLE: a 2" valve with flanged ends, Viton seals and limit stop assembly would be number EL200V-LS-F.

ORDERING INFORMATION

When ordering Series "EL" automatic shutoff valves order by part number and specify exact chemicals, concentrations, temperatures, and line pressures. To order 3-way air solenoid valves to operate Series "EL" valves consult air solenoid accessory section of catalog for specifications and part numbers.



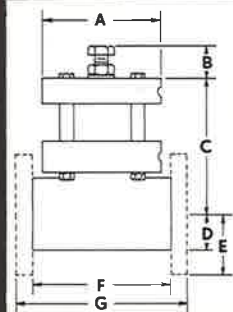
RECOMMENDED MINIMUM AIR PRESSURE REQUIRED TO CLOSE SERIES "EL" VALVES AGAINST GIVEN LINE PRESSURES

INLET PRESSURES	0		25		50		75		100		125	
	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
1/8"	10	0.7	35	2.4	60	4.1	85	5.9	110	7.6	135	9.3
1/4"	10	0.7	35	2.4	60	4.1	85	5.9	110	7.6	135	9.3
1/2"	10	0.7	35	2.4	60	4.1	85	5.9	110	7.6	135	9.3
3/4"	10	0.7	35	2.4	60	4.1	85	5.9	110	7.6	135	9.3
1"	10	0.7	35	2.4	60	4.1	85	5.9	110	7.6	135	9.3
1 1/2"	10	0.7	35	2.4	60	4.1	85	5.9	110	7.6	135	9.3
2"	10	0.7	35	2.4	60	4.1	85	5.9	110	7.6	135	9.3
2 1/2"	10	0.7	35	2.4	60	4.1	85	5.9	110	7.6	135	9.3
3"	10	0.7	35	2.4	60	4.1	85	5.9	110	7.6	135	9.3

SERIES "EL" PART NUMBERS

PIPE SIZE	C _v FACTOR	FULLY OPEN/FULLY CLOSED OPERATION WITHOUT MANUALLY SET THROTTLING LIMIT STOP		PARTIALLY OPEN/FULLY CLOSED OPERATION WITH MANUALLY SET THROTTLING LIMIT STOP	
		BUNA-N SEALS	VITON SEALS	BUNA-N SEALS	VITON SEALS
3/8"	8.5	EL075B	EL075V	EL075B-LS	EL075V-LS
1"	15.0	EL100B	EL100V	EL100B-LS	EL100V-LS
1 1/4"	24.0	EL125B	EL125V	EL125B-LS	EL125V-LS
1 1/2"	33.0	EL150B	EL150V	EL150B-LS	EL150V-LS
2"	60.0	EL200B	EL200V	EL200B-LS	EL200V-LS
2 1/2"	60.0	EL250B	EL250V	EL250B-LS	EL250V-LS
3"	110.0	EL300B	EL300V	EL300B-LS	EL300V-LS

SERIES "EL" AUTOMATIC SHUTOFF VALVE DIMENSIONS



VALVE DIMENSIONS	3/4" NPT		1" NPT		1 1/4" NPT		1 1/2" NPT		2" NPT		2 1/2" NPT		3" NPT	
	inches	millimetres	inches	millimetres	inches	millimetres	inches	millimetres	inches	millimetres	inches	millimetres	inches	millimetres
"A"	3 3/8"	88.9	3 3/8"	95.3	4 3/8"	110.8	3 3/8"	95.3	6"	152.4	6"	152.4	6 3/8"	168.3
"B"(max)	1 1/2"	44.5	1 1/2"	44.5	1 3/4"	41.3	1 3/4"	44.5	2 3/8"	60.3	2 3/8"	60.3	3 1/8"	84.4
"C"	4 1/4"	108.0	4 3/8"	117.8	5 1/4"	133.4	5 1/4"	133.4	6 3/8"	174.6	6 3/8"	174.6	9 3/8"	238.1
"D"	1"	25.4	1 1/8"	28.8	1 3/8"	34.8	1 3/8"	34.9	1 11/16"	42.9	1 11/16"	42.9	2 1/4"	60.9
"E"	1 15/16"	48.2	2 1/8"	54.0	2 3/8"	54.7	2 3/8"	63.5	3"	76.2	3"	76.2	3 3/8"	89.3
"F"	3 11/16"	83.7	4 1/2"	114.3	5 1/2"	139.7	5 1/2"	139.7	7 3/8"	181.0	7 3/8"	181.0	9 3/8"	238.1
"G"	4 11/16"	119.1	5 5/8"	142.9	6 3/4"	171.5	6 3/8"	174.6	8 3/8"	219.1	9"	228.6	11 1/4"	290.1

SERIES "EA" SHUTOFF VALVES

AIR PRESSURE TO OPEN & AIR PRESSURE TO CLOSE

FAIL-DRY* BUBBLE-TIGHT SHUTOFF VALVES WITH VISUAL INDICATION OF VALVE POSITION. RECOMMENDED FOR HIGHLY CORROSIVE AND ULTRA-PURE LIQUID SERVICES SUCH AS ACIDS, CAUSTICS, AND DEMINERALIZED WATER. DO NOT REQUIRE ANY LIQUID LINE PRESSURE TO OPERATE. MAXIMUM RATED LIQUID LINE PRESSURE IS 125 PSI AT ROOM TEMPERATURE.

The Series "EA" valves feature the FAIL-DRY* design with venting provided between O-ring seals. This enables a valve seal failure to result in leakage to the atmosphere rather than into the air operating chamber. The valves are operated by air pressure for both opening and closing, and maintain whichever position they are in in the event of air system failure. Positive bubble-tight sealing is achieved by the shaft O-ring completely closing off the valve orifice, resulting in cycle life in excess of 100,000 cycles. They can be used as drain valves as well as on high pressure applications.

CONSTRUCTION

Series "EA" valves are constructed of TYPE 1, GRADE 1 PVC (Polyvinyl Chloride). Cylinder walls of clear Plexiglas offer visual indication of valve position. Seals are Buna-N or Viton.

OPERATION

The Series "EA" valve illustrated at right is controlled by a single 4-way air solenoid valve. When closing an "EA" valve, the 4-way air solenoid valve directs air pressure to the top of the "EA" piston while exhausting air pressure from the bottom side of the piston. This pushes the piston and attached shaft downward, closing off the "EA" valve orifice. When the 4-way air solenoid valve changes position it opens the "EA" valve by exhausting the air pressure from the top of the piston and re-directing the incoming air pressure to the bottom side of the piston. This lifts the piston and shaft, opening the valve orifice. For recommended minimum air cylinder pressures consult below pressure chart. Maximum recommended air cylinder pressure is 100 PSI. If valve closes too quickly and causes a water hammer, a rate valve should be used in the air line to control the air supply velocity. See accessory section.

INSTALLATION

A Series "EA" valve must be installed so that the inlet line pressure is NOT sensed under the valve's shaft when closed. This is the opposite flow direction from that of the Series "EL" valve. A single 4-way air solenoid valve (see air solenoid accessory section of catalog for specifications) should be piped to the Series "EA" valve air connections. It is recommended that a filter and lubricator be installed on the air line to obtain maximum seal and cylinder life.

LIMIT STOP ASSEMBLY

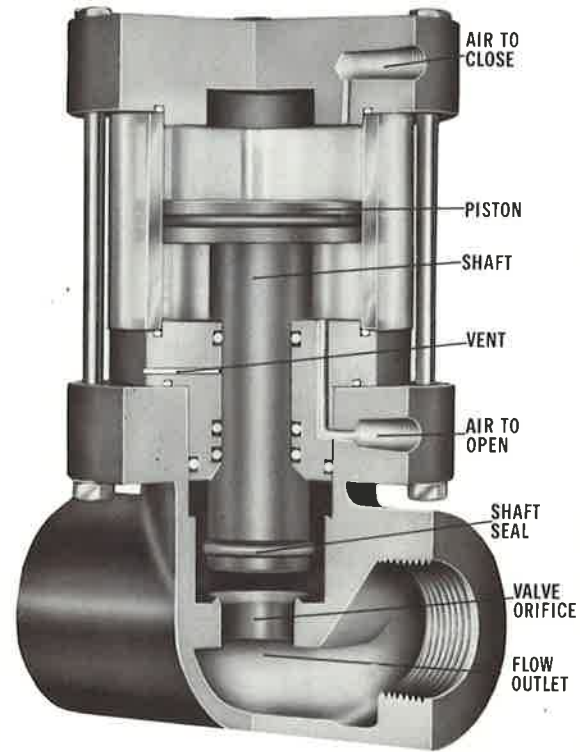
Series "EA" valves are available with limit stop and tapered shaft assemblies. These assemblies will adjust flow through the valves by regulating the open area of the valve orifice. Flow adjustment is achieved by simply turning the limit stop bolt located in the center of the valve head. This will restrict the travel of the shaft and piston anywhere between full open and full closed. The limit stop bolt is equipped with a locking nut and thread seal which, when locked in place, will make the thread assembly air tight.

OPTIONAL FEATURES

Series "EA" valves are also available with optional 150# flanged ends. If such connections are desired conclude below part number with "- F" when ordering valves. EXAMPLE: a 1½" valve with flanged ends, Viton seals and limit stop assembly would be number EA150V-LS-F.

ORDERING INFORMATION

When ordering Series "EA" automatic shutoff valves order by part number and specify exact chemicals, concentrations, temperatures, and line pressures. To order 4-way air solenoid valves to operate Series "EA" valves consult air solenoid accessory section of catalog for specifications and part numbers.



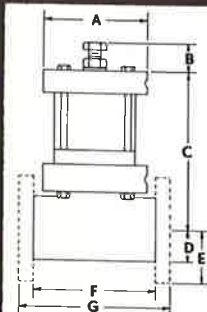
RECOMMENDED MINIMUM AIR PRESSURE REQUIRED TO OPEN AND CLOSE SERIES "EA" VALVES AGAINST GIVEN LINE BACK PRESSURES

GIVEN LINE BACK PRESSURES	0		25		50		75		100		125	
	psi	mmHg	psi	mmHg	psi	mmHg	psi	mmHg	psi	mmHg	psi	mmHg
PIPE SIZES												
¾"	20	138	20	138	25	173	25	173	30	211	30	211
1"	20	138	20	138	25	173	30	211	30	211	35	242
1½"	20	138	25	173	30	211	35	242	45	311	45	311
2"	20	138	25	173	30	211	40	286	50	350	60	418
2½"	20	138	25	173	30	211	40	286	50	350	60	418
3"	20	138	25	173	40	286	50	350	65	448	75	518

SERIES "EA" PART NUMBERS

PIPE SIZE	C _v FACTOR	FULLY OPEN/FULLY CLOSED OPERATION WITHOUT MANUALLY SET THROTTLING LIMIT STOP		PARTIALLY OPEN/FULLY CLOSED OPERATION WITH MANUALLY SET THROTTLING LIMIT STOP	
		BUNA-N SEALS	VITON SEALS	BUNA-N SEALS	VITON SEALS
¾"	8.5	EA075B	EA075V	EA075B-LS	EA075V-LS
1"	15.0	EA100B	EA100V	EA100B-LS	EA100V-LS
1½"	24.0	EA125B	EA125V	EA125B-LS	EA125V-LS
2"	33.0	EA150B	EA150V	EA150B-LS	EA150V-LS
2½"	60.0	EA200B	EA200V	EA200B-LS	EA200V-LS
3"	110.0	EA250B	EA250V	EA250B-LS	EA250V-LS
		EA300B	EA300V	EA300B-LS	EA300V-LS

SERIES "EA" AUTOMATIC SHUTOFF VALVE DIMENSIONS



VALVE DIMENSIONS	¾" NPT		1" NPT		1¼" NPT		1½" NPT		2" NPT		2½" NPT		3" NPT	
	inches	millimetres	inches	millimetres	inches	millimetres	inches	millimetres	inches	millimetres	inches	millimetres	inches	millimetres
"A"	3½"	88.9	3¾"	95.3	4¾"	115.9	5"	127.0	6"	152.4	6"	152.4	6¾"	168.3
"B"(max)	1½"	44.5	1¾"	44.5	1¾"	41.3	1¾"	44.5	2½"	60.3	2½"	60.3	3"	76.4
"C"	5½"	139.7	6½"	163.5	7½"	182.6	7¾"	193.7	8¾"	208.0	8¾"	208.0	10"	253.1
"D"	1"	25.4	1½"	38.6	1¾"	34.9	1¾"	34.9	1½"	42.9	1½"	42.9	2"	50.8
"E"	1½"	49.2	2"	50.8	2½"	58.7	2½"	63.5	3"	76.2	3"	76.2	3"	76.2
"F"	3½"	89.1	4½"	114.3	5½"	139.7	5½"	139.7	7"	177.8	7"	177.8	9"	228.6
"G"	4½"	114.3	5"	127.0	6"	152.4	6"	152.4	8"	203.2	8"	203.2	11"	279.4

* FAIL-DRY registered trademark of PLAST-O-MATIC VALVES, INC. (see center page insert)

SERIES "ES-NC" SHUTOFF VALVES

AIR PRESSURE TO OPEN & SPRING PRESSURE TO CLOSE

NORMALLY CLOSED FAIL-DRY* VALVES WITH BUBBLE-TIGHT SHUTOFF AND VISUAL INDICATION OF VALVE POSITION. RECOMMENDED FOR HIGHLY CORROSIVE AND ULTRA-PURE LIQUID APPLICATIONS REQUIRING POSITIVE VALVE CLOSURE IN THE EVENT OF AIR SYSTEM FAILURE. MAXIMUM RATED LIQUID LINE PRESSURE IS 125 PSI AT ROOM TEMPERATURE.

The Series "ES-NC" valves feature the FAIL-DRY* design with venting provided between O-ring seals. The valves are opened by air pressure and closed by spring pressure. They are designed to close in the event of an air system failure against 100 PSI liquid line pressure in all sizes except 3" NPT which is rated to close against 50 PSI liquid line pressure. Positive bubble-tight sealing is achieved by the shaft O-ring completely closing off the valve orifice, resulting in cycle life in excess of 100,000 cycles. They can be used on either drain or high pressure applications.

CONSTRUCTION

Series "ES-NC" valves are constructed of TYPE 1, GRADE 1 PVC (Polyvinyl Chloride). Cylinder walls of clear Plexiglas offer visual indication of valve position. Springs are cadmium plated steel. Standard seals are Buna-N or Viton.

OPERATION

The Series "ES-NC" valve illustrated at left is opened by a single 3-way air solenoid valve which directs air pressure to the bottom side of the "ES-NC" piston. This pushes the piston and attached shaft upward, opening the "ES-NC" valve orifice. When the 3-way air solenoid valve changes to its exhaust position the air pressure under the piston is relieved and the spring pushes the piston and shaft downward, closing off the "ES-NC" valve orifice. For recommended minimum air cylinder pressures consult below pressure chart. Maximum recommended air cylinder pressure is 100 PSI. If valve closes too quickly and causes a water hammer, a rate valve should be used in the air line to control the air supply velocity. See accessory section.

INSTALLATION

A Series "ES-NC" valve must be installed so that the inlet liquid line pressure is not sensed under the valve's shaft when closed. This is the opposite flow direction from that of the Series "EL" valve. A single 3-way air solenoid valve (see air solenoid accessory section of catalog for specifications) should be piped to the Series "ES-NC" valve air connection. It is recommended that a filter and lubricator be installed on the air line to obtain maximum seal and cylinder life.

LIMIT STOP ASSEMBLY

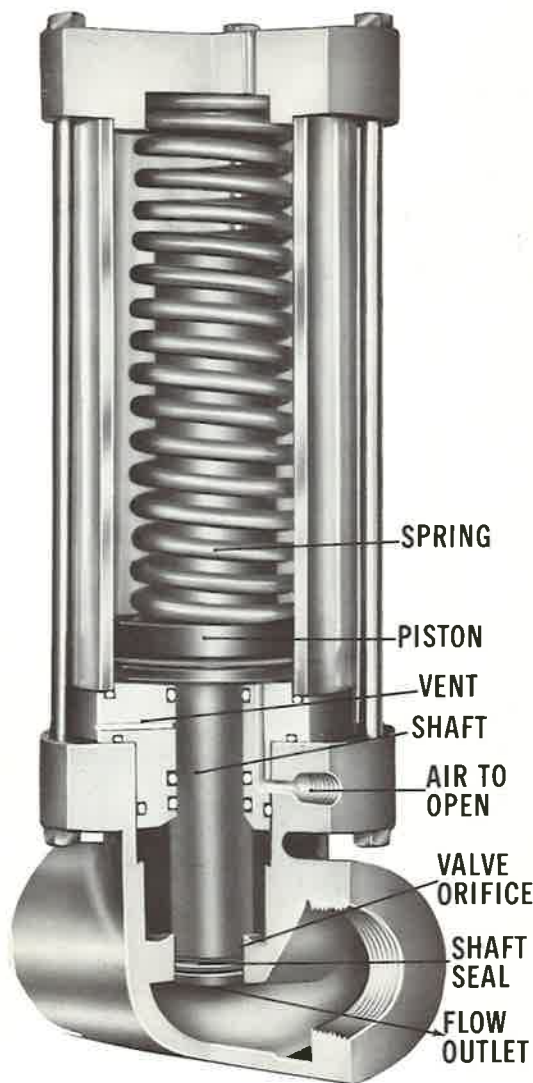
Series "ES-NC" valves are available with limit stop and tapered shaft assemblies. These assemblies will adjust flow through the valves by regulating the open area of the valve orifice. Flow adjustment is achieved by simply turning the limit stop bolt located in the center of the valve head. This will restrict the travel of the shaft and piston anywhere between full open and full closed. The limit stop bolt is equipped with a locking nut.

OPTIONAL FEATURES

Series "ES-NC" valves are also available with optional 150# flanged ends. If such end connections are desired simply conclude below part numbers with "-F" when ordering valves. EXAMPLE: a 1 1/4" valve with flanged ends, Viton seals and limit stop assembly would be number ES125V-NC-LS-F.

ORDERING INFORMATION

When ordering Series "ES-NC" automatic shutoff valves order by part number and specify exact chemicals, concentrations, temperatures, and line pressures. To order 3-way solenoid valves to operate Series "ES-NC" valves consult air solenoid accessory section of catalog for specifications and part numbers.



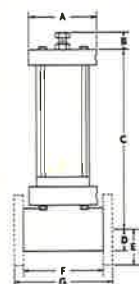
RECOMMENDED MINIMUM AIR PRESSURE REQUIRED TO OPEN SERIES "ES-NC" VALVES AND MAXIMUM LINE BACK PRESSURE RATINGS

VALVE PIPE SIZES	MINIMUM AIR PRESSURE REQUIRED TO OPEN VALVES		MAXIMUM LINE BACK PRESSURE VALVES WILL REMAIN CLOSED AGAINST	
	psi	Atmosphere	psi	Atmosphere
3/4"	45	3.11	100	6.90
1"	45	3.11	100	6.90
1 1/4"	45	3.11	100	6.90
1 1/2"	45	3.11	100	6.90
2"	55	3.97	100	6.90
2 1/2"	55	3.97	100	6.90
3"	55	3.97	50	3.45

SERIES "ES-NC" PART NUMBERS

PIPE SIZE	C _v FACTOR	FULLY OPEN / FULLY CLOSED OPERATION WITHOUT MANUALLY SET THROTTLING LIMIT STOP		PARTIALLY OPEN / FULLY CLOSED OPERATION WITH MANUALLY SET THROTTLING LIMIT STOP	
		BUNA-N SEALS	VITON SEALS	BUNA-N SEALS	VITON SEALS
3/4"	8.5	ES075B-NC	ES075V-NC	ES075B-NC-LS	ES075V-NC-LS
1"	15.0	ES100B-NC	ES100V-NC	ES100B-NC-LS	ES100V-NC-LS
1 1/4"	24.0	ES125B-NC	ES125V-NC	ES125B-NC-LS	ES125V-NC-LS
1 1/2"	33.0	ES150B-NC	ES150V-NC	ES150B-NC-LS	ES150V-NC-LS
2"	60.0	ES200B-NC	ES200V-NC	ES200B-NC-LS	ES200V-NC-LS
2 1/2"	60.0	ES250B-NC	ES250V-NC	ES250B-NC-LS	ES250V-NC-LS
3"	110.0	ES300B-NC	ES300V-NC	ES300B-NC-LS	ES300V-NC-LS

SERIES "ES-NC" AUTOMATIC SHUTOFF VALVE DIMENSIONS



VALVE DIMENSION	3/4" NPT		1" NPT		1 1/4" NPT		1 1/2" NPT		2" NPT		2 1/2" NPT		3" NPT	
	inches	millimetres	inches	millimetres	inches	millimetres	inches	millimetres	inches	millimetres	inches	millimetres	inches	millimetres
"A"	3 1/2"	88.9	3 3/4"	95.3	4 9/16"	115.9	5"	127.0	6"	152.4	6"	152.4	6 5/8"	168.3
"B"(max)	1 1/2"	44.5	1 3/4"	44.5	1 5/8"	41.3	1 3/4"	44.5	2 3/8"	60.3	2 3/8"	60.3	3 3/8"	88.4
"C"	8 3/16"	211.1	10 3/8"	263.5	11 3/8"	301.6	13 3/16"	348.1	13 3/16"	350.8	13 3/16"	350.8	17 1/2"	444.5
"D"	1"	25.4	1 1/8"	28.6	1 3/8"	34.9	1 3/8"	34.9	1 1/2"	42.9	1 1/2"	42.9	2 3/4"	69.9
"E"	1 15/16"	49.2	2 1/8"	54.0	2 5/8"	58.7	2 5/8"	63.5	3"	76.2	3 1/8"	88.9	3 3/4"	96.3
"F"	3 11/16"	93.7	4 1/2"	114.3	5 1/2"	139.7	5 1/2"	139.7	7 1/8"	181.0	7 1/8"	181.0	9 3/8"	238.1
"G"	4 11/16"	119.1	5 1/8"	142.9	6 3/4"	171.5	6 7/8"	174.8	8 5/8"	219.1	9"	228.6	11 1/2"	292.1

SERIES "ES-NO" SHUTOFF VALVES

SPRING PRESSURE TO OPEN & AIR PRESSURE TO CLOSE

NORMALLY OPEN FAIL-DRY* VALVES WITH BUBBLE-TIGHT SHUTOFF AND VISUAL INDICATION OF VALVE POSITION. RECOMMENDED FOR HIGHLY CORROSIVE AND ULTRA-PURE LIQUID APPLICATIONS WHERE POSITIVE VALVE OPENING IS REQUIRED IN THE EVENT OF AIR SYSTEM FAILURE. MAXIMUM RATED LIQUID LINE PRESSURE IS 125 PSI AT ROOM TEMPERATURE.

The Series "ES-NO" valves feature the FAIL-DRY* design with venting provided between O-ring seals. The valves are closed by air pressure and opened by spring pressure. They are designed to open in the event of an air system failure. Positive bubble-tight sealing is achieved by the shaft O-ring completely closing off the valve orifice, resulting in cycle life in excess of 100,000 cycles. They can be used on either drain or high pressure applications.

CONSTRUCTION

Series "ES-NO" valves are constructed of TYPE 1, GRADE 1 PVC (Polyvinyl Chloride). Cylinder walls of clear Plexiglas offer visual indication of valve position. Springs are cadmium plated steel.

OPERATION

The Series "ES-NO" valve illustrated at right is closed by a single 3-way air solenoid valve which directs air pressure to the top side of the "ES-NO" valve piston. When the 3-way air solenoid valve changes to its exhaust position the air pressure on top of the piston is relieved and the spring pushes the piston and shaft upward, opening the "ES-NO" valve orifice. For recommended minimum air cylinder pressures consult below pressure chart. Maximum recommended air cylinder pressure is 100 PSI. If valve closes too quickly and causes a water hammer, a rate valve should be used in the air line to control the air supply velocity. See accessory section.

INSTALLATION

A Series "ES-NO" valve must be installed so that the inlet liquid line pressure is not sensed under the valve's shaft when closed. This is the opposite flow direction from that of the Series "EL" valve. A single 3-way air solenoid valve (see air solenoid accessory section of catalog for specifications) should be piped to the Series "ES-NO" valve air connection. On this valve the lower air connection port is used only as an exhaust. It is recommended that a filter and lubricator be installed on the air line to obtain maximum seal and cylinder life.

LIMIT STOP ASSEMBLY

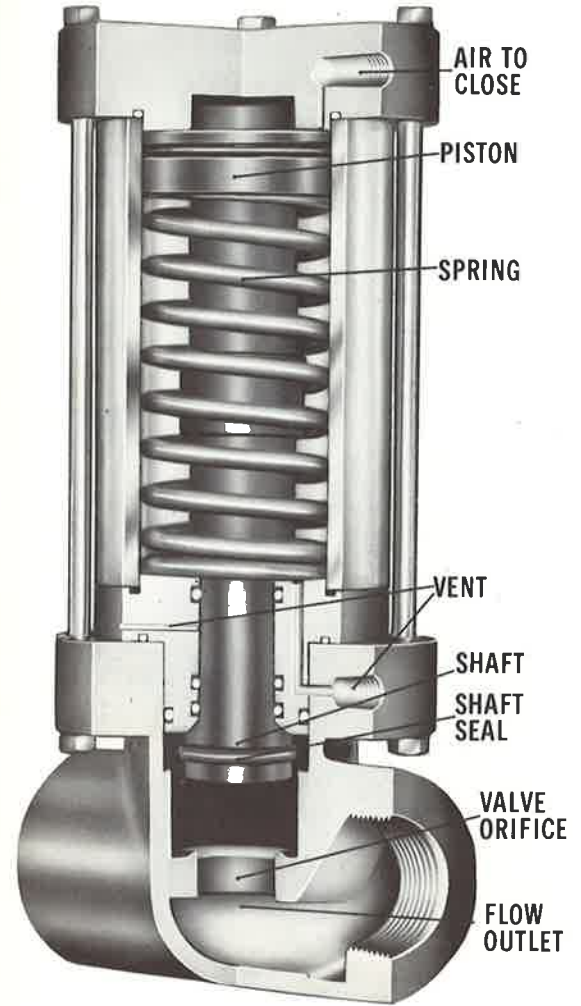
Series "ES-NO" valves are available with limit stop and tapered shaft assemblies. These assemblies will adjust flow through the valves by regulating the open area of the valve orifice. Flow adjustment is achieved by simply turning the limit stop bolt located in the center of the valve head. This will restrict the travel of the shaft and piston anywhere between full open and full closed. The limit stop bolt is equipped with a locking nut and thread seal which, when locked in place, will make the thread assembly air tight.

OPTIONAL FEATURES

Series "ES-NO" valves are also available with optional 150# flanged ends. If such end connections are desired simply conclude below part numbers with "F" when ordering valves. EXAMPLE: a 3/4" valve with flanged ends, Viton seals and limit stop assembly would be number ES075V-NO-LS-F.

ORDERING INFORMATION

When ordering Series "ES-NO" automatic shutoff valve order by part number and specify exact chemicals, concentrations, temperatures, and line pressures. To order 3-way solenoid valves to operate Series "ES-NO" valves consult air solenoid accessory section of catalog for specifications and part numbers.



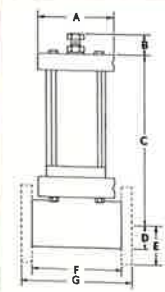
RECOMMENDED MINIMUM AIR PRESSURE REQUIRED TO CLOSE SERIES "ES-NO" VALVES AGAINST GIVEN LINE BACK PRESSURES

GIVEN LINE BACK PRESSURES	0		25		50		75		100		125	
	psi	atmospheres	psi	atmospheres	psi	atmospheres	psi	atmospheres	psi	atmospheres	psi	atmospheres
PIPE SIZES												
3/4"	45	3.11	45	3.11	50	3.45	55	3.89	55	3.89	55	3.89
1"	40	2.76	40	2.76	40	2.76	45	3.11	50	3.45	55	3.89
1 1/2"	40	2.76	40	2.76	40	2.76	45	3.11	50	3.45	55	3.89
2"	40	2.76	40	2.76	40	2.76	45	3.11	50	3.45	55	3.89
2 1/2"	40	2.76	40	2.76	40	2.76	45	3.11	50	3.45	55	3.89
3"	35	2.42	40	2.76	40	2.76	45	3.11	50	3.45	55	3.89

SERIES "ES-NO" PART NUMBERS

PIPE SIZE	C _v FACTOR	FULLY OPEN/FULLY CLOSED OPERATION WITHOUT MANUALLY SET THROTTLING LIMIT STOP		PARTIALLY OPEN/FULLY CLOSED OPERATION WITH MANUALLY SET THROTTLING LIMIT STOP	
		BUNA-N SEALS	VITON SEALS	BUNA-N SEALS	VITON SEALS
3/4"	8.5	ES075B-NO	ES075V-NO	ES075B-NO-LS	ES075V-NO-LS
1"	15.0	ES100B-NO	ES100V-NO	ES100B-NO-LS	ES100V-NO-LS
1 1/2"	24.0	ES125B-NO	ES125V-NO	ES125B-NO-LS	ES125V-NO-LS
2"	33.0	ES150B-NO	ES150V-NO	ES150B-NO-LS	ES150V-NO-LS
2 1/2"	60.0	ES200B-NO	ES200V-NO	ES200B-NO-LS	ES200V-NO-LS
3"	110.0	ES300B-NO	ES300V-NO	ES300B-NO-LS	ES300V-NO-LS

SERIES "ES-NO" AUTOMATIC SHUTOFF VALVE DIMENSIONS

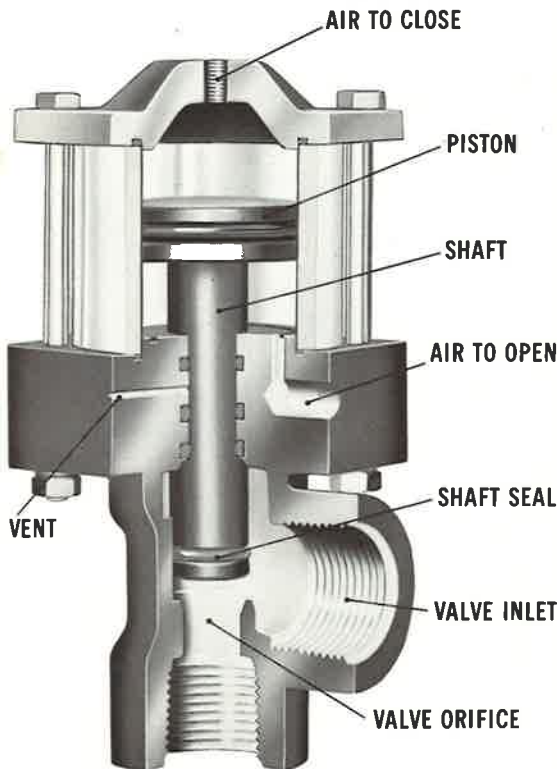


VALVE DIMENSION	3/4" NPT		1" NPT		1 1/4" NPT		1 1/2" NPT		2" NPT		2 1/2" NPT		3" NPT	
	inches	millimetres	inches	millimetres	inches	millimetres	inches	millimetres	inches	millimetres	inches	millimetres	inches	millimetres
"A"	3 1/2"	88.9	3 3/4"	95.3	4 9/16"	115.9	5"	127.0	6"	152.4	6"	152.4	6 3/8"	168.3
"B"(max)	1 1/4"	44.5	1 3/4"	44.5	1 3/8"	41.3	1 3/4"	44.5	2 3/8"	60.3	2 3/8"	60.3	3 3/8"	98.4
"C"	8"	203.2	9"	228.6	10 7/16"	255.6	12 3/4"	323.9	12 3/4"	323.9	12 3/4"	323.9	12 3/4"	317.5
"D"	1"	25.4	1 1/8"	28.6	1 3/8"	34.9	1 3/8"	34.9	1 11/16"	42.9	1 11/16"	42.9	2 1/4"	69.9
"E"	1 15/16"	49.2	2 1/8"	54.0	2 3/8"	58.7	2 3/8"	63.5	3"	76.2	3 3/8"	88.9	3 3/4"	95.3
"F"	3 11/16"	93.7	4 1/2"	114.3	5 1/2"	139.7	5 1/2"	139.7	7 1/8"	181.0	7 1/8"	181.0	9 3/8"	238.1
"G"	4 11/16"	119.1	5 5/8"	142.9	6 3/4"	171.5	6 3/8"	174.8	8 5/8"	219.1	9"	228.6	11 1/2"	292.1

*FAIL-DRY registered trademark of PLAST-O-MATIC VALVES, INC. (see center page insert)

SERIES "DA" SHUTOFF VALVES

AIR PRESSURE TO OPEN & AIR PRESSURE TO CLOSE



FAIL-DRY* ANGLE PATTERN BUBBLE-TIGHT SHUTOFF VALVES WITH VISUAL INDICATION OF VALVE POSITION. RECOMMENDED FOR HIGHLY CORROSIVE AND ULTRA-PURE LIQUID SERVICES SUCH AS ACIDS, CAUSTICS, AND DEMINERALIZED WATER.

The Series "DA" valves feature the FAIL-DRY* design with venting provided between O-ring seals. This enables a valve seal failure to result in leakage to the atmosphere rather than into the air operating chamber. The valves are operated by air pressure for both opening and closing, and maintain whichever position they are in in the event of air system failure. Positive bubble-tight sealing is achieved by the shaft O-ring completely closing off the valve orifice, resulting in cycle life in excess of 100,000 cycles. They can be used as drain valves as well as on high pressure applications.

CONSTRUCTION

Series "DA" valves are constructed of TYPE 1, GRADE 1, PVC (Polyvinyl Chloride). Cylinder walls of clear Plexiglas offer visual indication of valve position. Seals are Buna-N-Viton.

OPERATION

The Series "DA" valve illustrated at left is controlled by a single 4-way air solenoid valve. When closing a "DA" valve, the 4-way solenoid valve directs air pressure to the top of the "DA" piston while exhausting air pressure from the bottom side of the piston. This pushes the piston and attached shaft downward, closing off the "DA" valve orifice. When the 4-way air solenoid valve changes position it opens the "DA" valve by exhausting the air pressure from the top of the piston and re-directing the incoming air pressure to the bottom side of the piston. This lifts the piston and shaft, opening the valve orifice. For recommended minimum air cylinder pressures consult below pressure chart. Maximum recommended air cylinder pressure is 100 PSI. The maximum line pressure is 125 PSI at room temperature. If the valve closes too quickly and causes a water hammer, a rate valve should be used in the air line to control the air supply velocity. See accessory section.

INSTALLATION

A Series "DA" valve must be installed so that the inlet line pressure is NOT sensed under the valve's shaft when closed. A single 4-way air solenoid valve (see air solenoid accessory section of catalog for specifications) should be piped to the Series "DA" valve air connections. It is recommended that a filter and lubricator be installed on the air line to obtain maximum seal and cylinder life.

LIMIT STOP ASSEMBLY

Series "DA" valves are available with limit stop and tapered shaft assemblies. These assemblies will adjust flow through the valves by regulating the open area of the valve orifice. Flow adjustment is achieved by simply turning the limit stop bolt located in the center of the valve head. This will restrict the travel of the shaft and piston anywhere between full open and full closed. The limit stop bolt is equipped with a locking nut and thread seal which, when locked in place, will make the thread assembly air tight.

OPTIONAL FEATURES

Series "DA" valves are also available with optional 150# flanged ends. If such connections are desired conclude below part number with "-F" when ordering valves. EXAMPLE: a 1-1/2" valve with flanged ends, Viton seals and limit stop assembly would be number DA150V-LS-F.

ORDERING INFORMATION

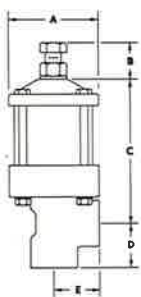
When ordering Series "DA" automatic shutoff valves order by part number and specify exact chemicals, concentrations, temperatures, and line pressures. To order 4-way air solenoid valve to operate Series "DA" valves consult air solenoid accessory section of catalog for specifications and part number.

RECOMMENDED MINIMUM AIR PRESSURE REQUIRED TO OPEN AND CLOSE SERIES "DA" VALVES AGAINST GIVEN LINE BACK PRESSURES

GIVEN LINE BACK PRESSURES (psi)	0		25		50		75		100		125	
	psi	mm Hg	psi	mm Hg	psi	mm Hg	psi	mm Hg	psi	mm Hg	psi	mm Hg
PIPE SIZES	psi	mm Hg	psi	mm Hg	psi	mm Hg	psi	mm Hg	psi	mm Hg	psi	mm Hg
3/4"	20	138	20	138	25	172	25	172	30	212	30	212
1"	20	138	20	138	25	172	30	212	35	247	35	247
1 1/4"	20	138	25	172	30	212	35	247	40	282	45	317
1 1/2"	20	138	25	172	30	212	35	247	45	317	50	352
2"	20	138	25	172	30	212	40	282	50	352	60	422
2 1/2"	20	138	25	172	35	247	45	317	60	422	70	492
3"	20	138	25	172	40	282	50	352	65	457	75	522

SERIES "DA" PART NUMBERS

PIPE SIZE	Cv FACTOR	FULLY OPEN / FULLY CLOSED OPERATION WITHOUT MANUALLY SET THROTTLING LIMIT STOP		PARTIALLY OPEN / FULLY CLOSED OPERATION WITH MANUALLY SET THROTTLING LIMIT STOP	
		BUNA-N SEALS	VITON SEALS	BUNA-N SEALS	VITON SEALS
3/4"	12.2	DA075B	DA075V	DA075B-LS	DA075V-LS
1"	19.2	DA100B	DA100V	DA100B-LS	DA100V-LS
1 1/4"	34.5	DA125B	DA125V	DA125B-LS	DA125V-LS
1 1/2"	47.5	DA150B	DA150V	DA150B-LS	DA150V-LS
2"	79.0	DA200B	DA200V	DA200B-LS	DA200V-LS
2 1/2"	99.0	DA250B	DA250V	DA250B-LS	DA250V-LS
3"	161.5	DA300B	DA300V	DA300B-LS	DA300V-LS



SERIES "DA" AUTOMATIC SHUTOFF VALVE DIMENSIONS

VALVE DIMENSIONS	3/4" NPT		1" NPT		1 1/4" NPT		1 1/2" NPT		2" NPT		2 1/2" NPT		3" NPT	
	INCHES	millimeters	INCHES	millimeters	INCHES	millimeters	INCHES	millimeters	INCHES	millimeters	INCHES	millimeters	INCHES	millimeters
"A" SQ.	2 3/4"	69.8	2 3/4"	69.8	2 3/4"	69.8	3 1/4"	82.5	3 3/4"	95.2	3 3/4"	95.2	4 3/4"	120.6
"B" MAX.	1 3/4"	44.5	1 3/4"	44.5	1 3/4"	44.5	1 3/4"	44.5	2 3/8"	60.3	2 3/8"	60.3	3 3/8"	88.4
"C"	4 5/8"	117.8	4 3/4"	120.6	5 1/2"	139.7	6"	152.4	6 3/4"	171.8	7 3/8"	188.9	9 1/8"	231.8
"D"	1 1/2"	38.1	1 3/4"	44.5	2"	50.8	2 1/8"	53.9	2 3/8"	60.3	2 3/4"	69.8	3 1/8"	79.3
"E"	1 1/2"	38.1	1 3/4"	44.5	2"	50.8	2 1/8"	53.9	2 3/8"	60.3	2 3/4"	69.8	3 1/8"	79.3

SERIES "DS-NC" SHUTOFF VALVES

AIR PRESSURE TO OPEN & SPRING PRESSURE TO CLOSE

NORMALLY CLOSED ANGLE PATTERN FAIL-DRY* VALVES WITH BUBBLE-TIGHT SHUTOFF AND VISUAL INDICATION OF VALVE POSITION. RECOMMENDED FOR HIGHLY CORROSIVE AND ULTRA-PURE LIQUID APPLICATIONS REQUIRING POSITIVE VALVE CLOSURE IN THE EVENT OF AIR SYSTEM FAILURE.

The Series "DS-NC" valves feature the FAIL-DRY* design with venting provided between O-ring seals. The valves are opened by air pressure and closed by spring pressure. They are designed to close in the event of an air system failure against 100 PSI liquid line pressure in all sizes except 3" NPT which is rated to close against 50 PSI liquid line pressure. Positive bubble-tight sealing is achieved by the shaft O-ring completely closing off the valve orifice, resulting in cycle life in excess of 100,000 cycles. They can be used on either drain or high pressure applications.

CONSTRUCTION

Series "DS-NC" valves are constructed of TYPE 1, GRADE 1 PVC (Polyvinyl Chloride). Cylinder walls of clear Plexiglas offer visual indication of valve position. Springs are cadmium plated steel. Standard seals are Buna-N or Viton.

OPERATION

The Series "DS-NC" valve illustrated at right is opened by a single 3-way air solenoid valve which directs air pressure to the bottom side of the "DS-NC" piston. This pushes the piston and attached shaft upward, opening the "DS-NC" valve orifice. When the 3-way air solenoid valve changes to its exhaust position the air pressure under the piston is relieved and the spring pushes the piston and shaft downward, closing off the "DS-NC" valve orifice. For recommended minimum air cylinder pressures consult below pressure chart. Maximum recommended air cylinder pressure is 100 PSI. Maximum line pressure is 125 PSI at room temperature. If the valve closes too quickly and causes a water hammer, a rate valve should be used in the air line to control the air supply velocity. See accessory section.

INSTALLATION

A Series "DS-NC" valve must be installed so that the inlet liquid line pressure is not sensed under the valve's shaft when closed. A single 3-way air solenoid valve (see air solenoid accessory section of catalog for specifications) should be piped to the Series "DS-NC" valve air connection. It is recommended that a filter and lubricator be installed on the air line to obtain maximum seal and cylinder life.

LIMIT STOP ASSEMBLY

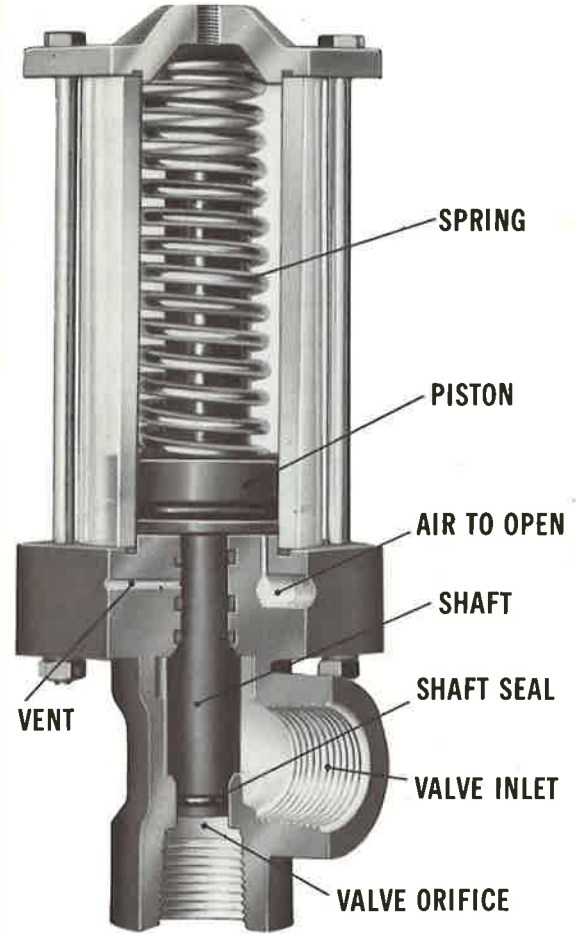
Series "DS-NC" valves are available with limit stop and tapered shaft assemblies. These assemblies will adjust flow through the valves by regulating the open area of the valve orifice. Flow adjustment is achieved by simply turning the limit stop bolt located in the center of the valve head. This will restrict the travel of the shaft and piston anywhere between full open and full closed. The limit stop bolt is equipped with a locking nut.

OPTIONAL FEATURES

Series "DS-NC" valves are also available with optional 150# flanged ends. If such end connections are desired simply conclude below part numbers with "-F" when ordering valves. EXAMPLE: a 1-1/4" valve with flanged ends, Viton seals and limit stop assembly would be number DS125V-NC-LS-F.

ORDERING INFORMATION

When ordering Series "DS-NC" automatic shutoff valves order by part number and specify exact chemicals, concentrations, temperatures, and line pressures. To order 3-way solenoid valves to operate Series "DS-NC" valves consult air solenoid accessory section of catalog for specifications and part numbers.



RECOMMENDED MINIMUM AIR PRESSURE REQUIRED TO OPEN SERIES "DS-NC" VALVES AND MAXIMUM LINE BACK PRESSURE RATINGS

VALVE PIPE SIZES	MINIMUM AIR PRESSURE REQUIRED TO OPEN VALVES		MAXIMUM LINE BACK PRESSURE VALVES WILL REMAIN CLOSED AGAINST	
	PSI	kilopascals	PSI	kilopascals
3/4"	45	311	100	690
1"	45	311	100	690
1 1/4"	45	311	100	690
1 1/2"	45	311	100	690
2"	55	380	100	690
2 1/2"	65	449	100	690
3"	55	380	50	345

SERIES "DS-NC" PART NUMBERS

PIPE SIZE	Cv FACTOR	FULLY OPEN/FULLY CLOSED OPERATION WITHOUT MANUALLY SET THROTTLING LIMIT STOP		PARTIALLY OPEN/FULLY CLOSED OPERATION WITH MANUALLY SET THROTTLING LIMIT STOP	
		BUNA-N SEALS	VITON SEALS	BUNA-N SEALS	VITON SEALS
3/4"	12.2	DS075B-NC	DS075V-NC	DS075B-NC-LS	DS075V-NC-LS
1"	19.2	DS100B-NC	DS100V-NC	DS100B-NC-LS	DS100V-NC-LS
1 1/4"	34.5	DS125B-NC	DS125V-NC	DS125B-NC-LS	DS125V-NC-LS
1 1/2"	47.5	DS150B-NC	DS150V-NC	DS150B-NC-LS	DS150V-NC-LS
2"	79.0	DS200B-NC	DS200V-NC	DS200B-NC-LS	DS200V-NC-LS
2 1/2"	99.0	DS250B-NC	DS250V-NC	DS250B-NC-LS	DS250V-NC-LS
3"	161.5	DS300B-NC	DS300V-NC	DS300B-NC-LS	DS300V-NC-LS



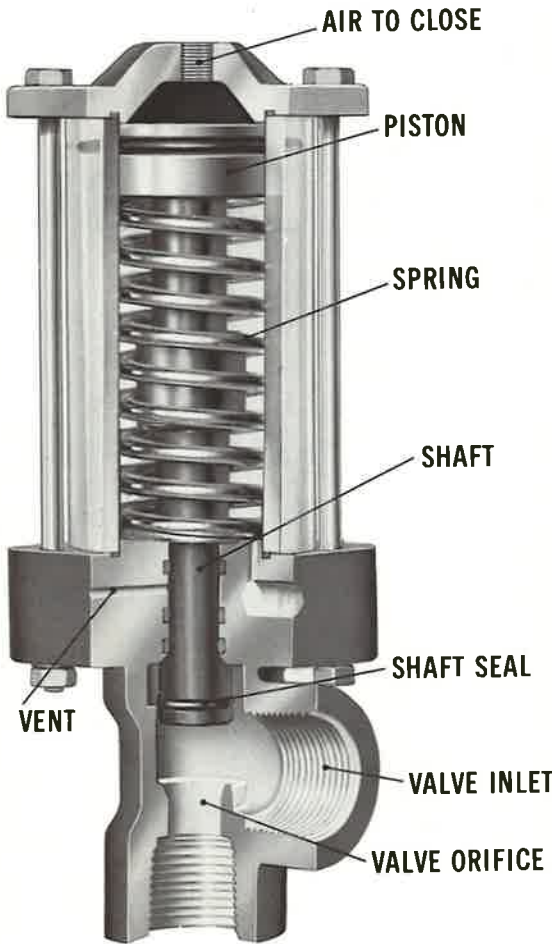
SERIES "DS-NC" AUTOMATIC SHUTOFF VALVE DIMENSIONS

VALVE DIMENSIONS	3/4" NPT		1" NPT		1 1/4" NPT		1 1/2" NPT		2" NPT		2 1/2" NPT		3" NPT	
	INCHES	millimetres	INCHES	millimetres	INCHES	millimetres	INCHES	millimetres	INCHES	millimetres	INCHES	millimetres	INCHES	millimetres
"A" SQ.	2 3/4"	69.8	2 3/4"	69.8	3 1/4"	82.5	3 3/4"	96.2	4 3/4"	120.6	5 1/2"	139.7	5 1/2"	139.7
"B" MAX.	1 3/4"	44.5	1 3/4"	44.5	1 5/8"	41.3	1 3/4"	44.5	2 3/8"	60.3	2 3/8"	60.3	3 3/8"	98.4
"C"	7 5/8"	193.7	7 5/8"	193.7	9 1/2"	241.3	10 3/4"	273.1	12 3/4"	323.9	13"	330.2	20 1/8"	511.3
"D"	1 1/2"	38.1	1 3/4"	44.5	2"	50.8	2 1/8"	53.9	2 3/8"	60.3	2 3/4"	69.8	3 1/8"	79.3
"E"	1 1/2"	38.1	1 3/4"	44.5	2"	50.8	2 1/8"	53.9	2 3/8"	60.3	2 3/4"	69.8	3 1/8"	79.3

*FAIL-DRY registered trademark of PLAST-O-MATIC VALVES, INC. (see center page insert)

SERIES "DS-NO" SHUTOFF VALVES

SPRING PRESSURE TO OPEN & AIR PRESSURE TO CLOSE



NORMALLY OPEN ANGLE PATTERN FAIL-DRY* VALVES WITH BUBBLE-TIGHT SHUTOFF AND VISUAL INDICATION OF VALVE POSITION. RECOMMENDED FOR HIGHLY CORROSIVE AND ULTRA-PURE LIQUID APPLICATIONS WHERE POSITIVE VALVE OPENING IS REQUIRED IN THE EVENT OF AIR SYSTEM FAILURE.

The Series "DS-NO" valves feature the FAIL-DRY* design with venting provided between O-ring seals. The valves are closed by air pressure and opened by spring pressure. They are designed to open in the event of an air system failure. Positive bubble-tight sealing is achieved by the shaft O-ring completely closing off the valve orifice, resulting in cycle life in excess of 100,000 cycles. They can be used on either drain or high pressure applications.

CONSTRUCTION

Series "DS-NO" valves are constructed of TYPE 1, GRADE 1 PVC (Polyvinyl Chloride). Cylinder walls of clear Plexiglas offer visual indication of valve position. Springs are cadmium plated steel.

OPERATION

The Series "DS-NO" valve illustrated at left is closed by a single 3-way air solenoid valve which directs air pressure to the top side of the "DS-NO" valve piston. When the 3-way air solenoid valve changes to its exhaust position the air pressure on top of the piston is relieved and the spring pushes the piston and shaft upward, opening the "DS-NO" valve orifice. For recommended minimum air cylinder pressures consult below pressure chart. Maximum recommended air cylinder pressure is 100 PSI. The maximum line pressure is 125 PSI at room temperature. If the valve closes too quickly and causes a water hammer, a rate valve should be used in the air line to control the air supply velocity. See accessory section.

INSTALLATION

A Series "DS-NO" valve must be installed so that the inlet liquid line pressure is not sensed under the valve's shaft when closed. A single 3-way air solenoid valve (see air solenoid accessory section of catalog for specifications) should be piped to the Series "DS-NO" valve air connection. On this valve the lower air connection port is used only as an exhaust. It is recommended that a filter and lubricator be installed on the air line to obtain maximum seal and cylinder life.

LIMIT STOP ASSEMBLY

Series "DS-NO" valves are available with limit stop and tapered shaft assemblies. These assemblies will adjust flow through the valves by regulating the open area of the valve orifice. Flow adjustment is achieved by simply turning the limit stop bolt located in the center of the valve head. This will restrict the travel of the shaft and piston anywhere between full open and full closed. The limit stop bolt is equipped with a locking nut and thread seal which, when locked in place, will make the thread assembly air tight.

OPTIONAL FEATURES

Series "DS-NO" valves are also available with optional 150# flanged ends. If such end connections are desired simply conclude below part numbers with "-F" when ordering valves. EXAMPLE: a 3/4" valve with flanged ends, Viton seals and limit stop assembly would be number DS075V-NO-LS-F.

ORDERING INFORMATION

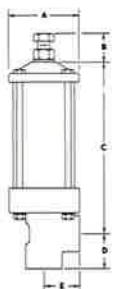
When ordering Series "DS-NO" automatic shutoff valve order by part number and specify exact chemicals, concentrations, temperatures, and line pressures. To order 3-way solenoid valves to operate Series "DS-NO" valves consult air solenoid accessory section of catalog for specifications and part numbers.

RECOMMENDED MINIMUM AIR PRESSURE REQUIRED TO CLOSE SERIES "DS-NO" VALVES AGAINST GIVEN LINE BACK PRESSURES

GIVEN LINE BACK PRESSURES (psig)	0		25		50		75		100		125	
	INCHES	MILLIMETERS	INCHES	MILLIMETERS	INCHES	MILLIMETERS	INCHES	MILLIMETERS	INCHES	MILLIMETERS	INCHES	MILLIMETERS
PIPE SIZES	DN	INCHES	DN	INCHES	DN	INCHES	DN	INCHES	DN	INCHES	DN	INCHES
1/2"	45	1143	45	1143	45	1143	45	1143	45	1143	45	1143
3/4"	45	1143	45	1143	45	1143	45	1143	45	1143	45	1143
1"	40	1016	40	1016	40	1016	40	1016	40	1016	40	1016
1 1/2"	40	1016	40	1016	40	1016	40	1016	40	1016	40	1016
2"	40	1016	40	1016	40	1016	40	1016	40	1016	40	1016
2 1/2"	40	1016	40	1016	40	1016	40	1016	40	1016	40	1016
3"	35	889	35	889	35	889	35	889	35	889	35	889

SERIES "DS-NO" PART NUMBERS

PIPE SIZE	Cv	FULLY OPEN / FULLY CLOSED OPERATION WITHOUT MANUALLY SET THROTTLING LIMIT STOP		PARTIALLY OPEN / FULLY CLOSED OPERATION WITH MANUALLY SET THROTTLING LIMIT STOP	
		BUNA-N SEALS	VITON SEALS	BUNA-N SEALS	VITON SEALS
1/2"	12.2	DS075B-NO	DS075V-NO	DS075B-NO-LS	DS075V-NO-LS
1"	19.7	DS100B-NO	DS100V-NO	DS100B-NO-LS	DS100V-NO-LS
1 1/2"	34.5	DS125B-NO	DS125V-NO	DS125B-NO-LS	DS125V-NO-LS
2"	47.5	DS150B-NO	DS150V-NO	DS150B-NO-LS	DS150V-NO-LS
2 1/2"	79.0	DS200B-NO	DS200V-NO	DS200B-NO-LS	DS200V-NO-LS
3"	99.0	DS250B-NO	DS250V-NO	DS250B-NO-LS	DS250V-NO-LS
3"	161.5	DS300B-NO	DS300V-NO	DS300B-NO-LS	DS300V-NO-LS



SERIES "DS-NO" AUTOMATIC SHUTOFF VALVE DIMENSIONS

VALVE DIMENSIONS	3/4" NPT		1" NPT		1 1/4" NPT		1 1/2" NPT		2" NPT		2 1/2" NPT		3" NPT	
	INCHES	MILLIMETERS	INCHES	MILLIMETERS	INCHES	MILLIMETERS	INCHES	MILLIMETERS	INCHES	MILLIMETERS	INCHES	MILLIMETERS	INCHES	MILLIMETERS
"A" SQ.	2 3/4"	69.9	2 3/4"	69.9	3 1/4"	82.5	3 3/4"	95.2	4 3/4"	120.6	5 1/2"	139.7	5 1/2"	139.7
"B" MAX.	1 3/4"	44.5	1 3/4"	44.5	1 5/8"	41.3	1 3/4"	44.5	2 3/8"	60.3	2 3/8"	60.3	3 3/8"	98.4
"C"	7 1/4"	184.2	7 1/4"	184.2	9 1/4"	235.0	9 1/4"	241.3	11 3/8"	298.9	11 3/8"	295.3	16 3/8"	419.9
"D"	1 1/2"	38.1	1 3/4"	44.5	2"	50.8	2 1/8"	53.9	2 3/8"	60.3	2 3/8"	60.3	3 1/8"	79.3
"E"	1 1/2"	38.1	1 3/4"	44.5	2"	50.8	2 1/8"	53.9	2 3/8"	60.3	2 3/8"	60.3	3 1/8"	79.3

SERIES "F" DIVERTER VALVES

PNEUMATICALLY OPERATED DIVERTER VALVES TO AUTOMATICALLY, SAFELY, AND INSTANTLY DIVERT FLOW DIRECTION OF HIGHLY CORROSIVE OR ULTRA-PURE LIQUIDS. ALLOWS CONSTANT FLOW FROM ONE INLET THROUGH EITHER OF TWO OUTLETS, OR FROM TWO SEPARATE INLETS WHEN PIPED IN REVERSE. ABSOLUTELY NO METAL CONTACT WITH LIQUID BEING CONTROLLED. AVAILABLE IN 1/2" NPT THRU 3" NPT.

CONSTRUCTION

Series "F" Diverter valves are constructed of Type 1, Grade 1 PVC (Polyvinyl Chloride). Cylinder walls of clear Plexiglas offer visual indication of valve position. Springs are cadmium plated steel. Standard seals are Buna-N or Viton. 1/2" NPT is also available in Polypropylene and Teflon.

OPERATION

The Series "F" diverter valve illustrated at right is operated by a single 3-way air solenoid valve which directs air pressure to the top side of the Series "F" piston. This pushes the piston and attached shaft downward closing off the normally open port while allowing flow through the normally closed port. When the 3-way air solenoid valve changes to its exhaust position the air pressure on top of the piston is relieved and the spring pushes the piston and attached shaft upward. This closes off the normally closed port and allows flow through the normally open port. The common port, normally closed port, and the normally open port can be operated as inlets or outlets as desired. For recommended minimum air cylinder pressure consult below pressure chart. Maximum recommended air cylinder pressure is 100 PSI. Maximum rated liquid line pressure is 125 PSI at room temperature.

INSTALLATION

The usual installation of a Series "F" valve is with the common port used as the inlet and the remaining two ports as outlets to simply divert one liquid input to two separate places. An example of this would be a pump delivering liquid to two locations in a plant. Another installation of a Series "F" valve is with the normally closed and normally open ports used as separate inlets and the common port used as a common outlet. An example of this would be a pump alternately pulling from two separate tanks and delivering to a common link.

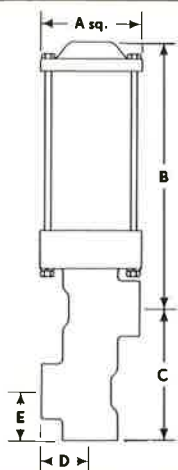
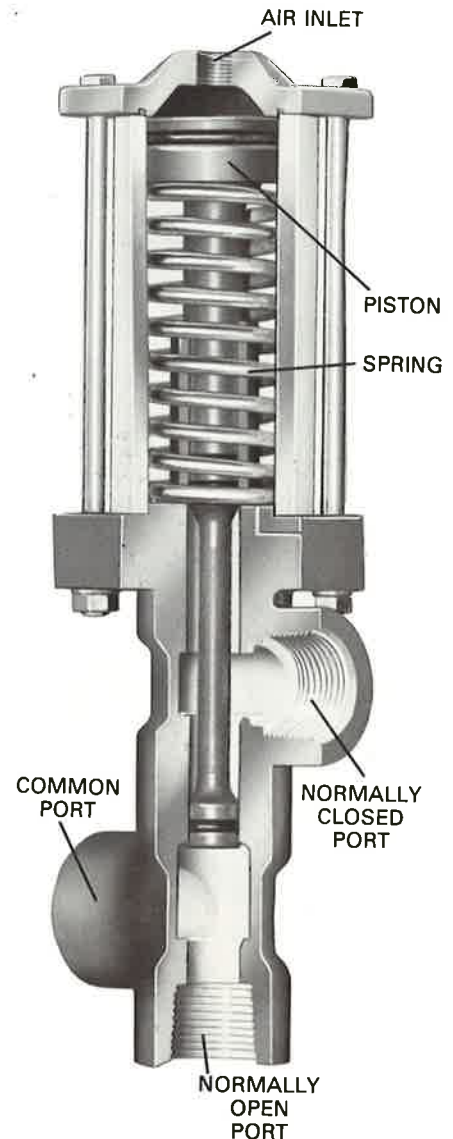
A single 3-way air solenoid valve (see air solenoid accessory section of catalog for specifications) should be piped to the air inlet connection located at the center of the Series "F" head. It is recommended that a filter and lubricator be installed on the air line to obtain maximum seal and cylinder life. If the valve changes position too quickly and causes a water hammer, a rate valve should be installed in the air line to control the air supply velocity. See accessory section.

OPTIONAL FEATURES

Standard connections on Series "F" valves are screwed ends. They are also available with optional 150# flanged ends. If flanged end connections are desired simply conclude below part numbers with "-F" when ordering valves. EXAMPLE: a 1" valve with flanged ends and Viton seals would be number F100V-F.

ORDERING INFORMATION

When ordering Series "F" automatic diverter valves order by part number and specify exact chemicals, concentrations, temperatures, and line pressures. To order 3-way solenoid valve to operate Series "F" valves consult air solenoid accessory section of catalog for specifications and part numbers.



RECOMMENDED MINIMUM AIR PRESSURE REQUIRED TO REPOSITION SERIES "F" VALVES AGAINST GIVEN LINE BACK PRESSURES

GIVEN LINE BACK PRESSURES	0 PSI		25 PSI		50 PSI		75 PSI		100 PSI		125 PSI	
	INCHES	MILLIMETRES	INCHES	MILLIMETRES	INCHES	MILLIMETRES	INCHES	MILLIMETRES	INCHES	MILLIMETRES	INCHES	MILLIMETRES
PIPE SIZE	3/8"	9.5	3/8"	9.5	1/2"	12.7	1/2"	12.7	3/4"	19.0	3/4"	19.0
	45	114	45	114	50	127	55	139	55	139	60	152
	1"	25.4	45	114	50	127	55	139	55	139	60	152
	1 1/4"	31.8	40	101.6	45	114.3	50	127	55	139.5	60	152.4
	1 1/2"	38.1	40	101.6	40	101.6	45	114.3	50	127	55	139.5
	2"	50.8	40	101.6	40	101.6	45	114.3	50	127	55	139.5
	3"	76.2	35	88.9	35	88.9	40	101.6	45	114.3	50	127

SERIES "F" PART NUMBERS

VALVE SIZE (NPT)	PORT Cv FACTORS		VALVE PART NUMBERS	
	N/O	N/C	BUNA-N SEALS	VITON SEALS
1/2"	3.8	3.6	F050B*	F050V*
3/4"	12.2	7.3	F075B	F075V
1"	19.2	11.5	F100B	F100V
1 1/4"	34.5	20.7	F125B	F125V
1 1/2"	47.5	28.5	F150B	F150V
2"	79.0	47.5	F200B	F200V
3"	161.5	67.0	F300B	F300V

* ALSO AVAILABLE IN POLYPROPYLENE AND TEFLON

SERIES "F" DIVERTER VALVE DIMENSIONS

VALVE DIMENSION	3/4" NPT		1" NPT		1 1/4" NPT		1 1/2" NPT		2" NPT		3" NPT	
	INCHES	MILLIMETRES	INCHES	MILLIMETRES	INCHES	MILLIMETRES	INCHES	MILLIMETRES	INCHES	MILLIMETRES	INCHES	MILLIMETRES
"A"	2 3/4"	69.9	2 3/4"	69.9	3 3/16"	81.0	3 11/16"	93.7	4 11/16"	118.9	5 1/2"	139.7
"B"	7 1/8"	181.0	7 7/8"	200.0	8"	203.2	9 1/8"	231.8	11 7/8"	301.6	14 1/8"	358.8
"C"	3 5/8"	92.1	4 1/4"	108.0	4 15/16"	125.2	5 1/2"	139.7	6 1/2"	165.1	9 1/2"	241.3
"D"	1 3/8"	34.9	1 3/4"	44.4	1 15/16"	49.2	2"	50.8	2 1/4"	67.1	3 1/2"	88.9
"E"	1 3/8"	34.9	1 3/4"	44.4	1 15/16"	49.2	2"	50.8	2 1/4"	67.1	3 1/2"	88.9

NOTE: 1/2" NPT SERIES "F" DIVERTER VALVES ARE MANUFACTURED FROM BAR STOCK AND ABOVE DIMENSIONS DO NOT APPLY.

SERIES "EUS" SOLENOID VALVES

NORMALLY CLOSED IN-LINE PATTERN SOLENOID VALVES FEATURING THE FAIL-DRY* DESIGN AND BUBBLE-TIGHT SHUTOFF. RECOMMENDED FOR HIGHLY CORROSIVE AND ULTRA-PURE LIQUID APPLICATIONS REQUIRING POSITIVE VALVE CLOSURE IN THE EVENT OF AN ELECTRICAL FAILURE.

"EUS" solenoid valves feature the FAIL-DRY* design with venting provided between a pair of diaphragms (primary and secondary seals) which isolate the metal operating components from all process liquids, even in the event of a primary seal failure. They are intended to operate under corrosive conditions which severely affect conventionally designed (packless) solenoid valves. Available from 1/8" to 1/2" NPT with pressure ranges from full vacuum to 200 PSI. Cycle life under normal conditions should be in excess of 1,000,000 cycles. Maximum orifice is 5/16 diameter.

CONSTRUCTION

"EUS" solenoid valves are constructed of TYPE 1, GRADE 1, PVC (Polyvinyl Chloride), Polypropylene, or Teflon. Standard seals are Buna-N or Viton; however, other materials are available upon request. Screwed ends are standard. "EUS" valves are available with either general purpose or explosion-proof coil housings (see coil information section — page 22).

OPERATION

The "EUS" valve illustrated at left is direct operating and normally closed by design. It will operate without assistance from line pressure or flow. Under the correct pressure conditions (see below chart) the coil, when energized (power on), creates an electro-magnetic field in the top section of the core tube. This force pulls the core and shaft upward opening the valve orifice. When the coil is de-energized (power off) the valve spring pushes the core and shaft downward closing the valve orifice.

If the inlet pressure is in excess of the inlet pressure ratings in the below chart the valve will open prematurely. Likewise, the valve will open prematurely or remain open when de-energized if the back pressure is in excess of the below back pressure ratings.

All Series "EUS" solenoid valves may be used for vacuum service; however, because they require a different internal spring "EUS" vacuum valves will not operate in pressure applications. Likewise, "EUS" pressure valves will not operate under vacuum conditions. **IMPORTANT:** see ordering information for correct ordering procedure.

INSTALLATION

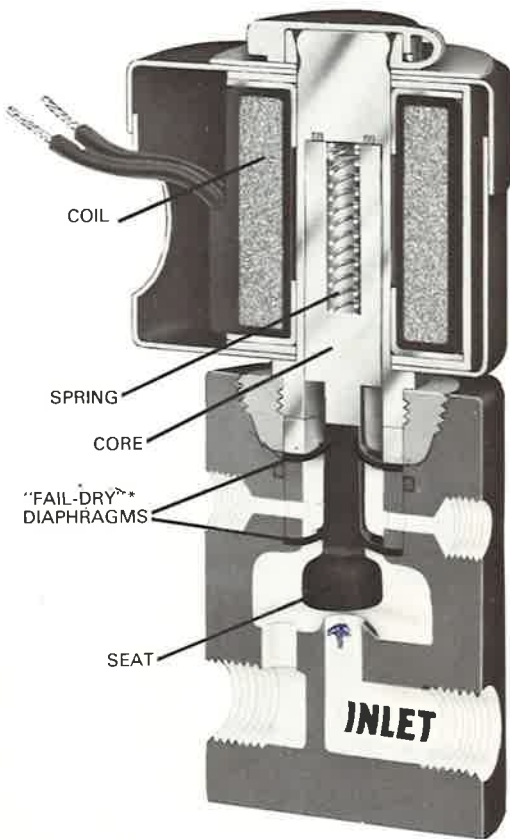
"EUS" valves may be mounted in any position. Do not install throttling valves, excessive fittings or restrictions downstream of the "EUS" valves. This can cause back pressure in excess of that listed in the below chart. Throttling valves should be mounted upstream of the "EUS" valves. Other back pressure problems are caused by spray nozzles and goose-neck fittings, in the downstream piping.

COIL INFORMATION

"EUS" valves are operated by 20 watt Class F coils. These coils, manufactured in accordance with Underwriters' Laboratories insulation standards, can be energized continuously without danger of overheating or failure; however, they will reach very high temperatures. They are available with either general purpose or explosion-proof housings with standard A.C. voltages of 24, 120, 240, 480. Please consult page 22 of catalog for detailed coil specifications.

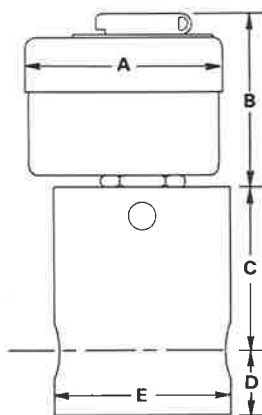
ORDERING INFORMATION

Order by part number and specify material of construction, exact chemicals, concentrations, temperatures, and pressures. Specify vacuum or pressure service.



SERIES "EUS" (SHOWN ENERGIZED)

SERIES "EUS" DIMENSIONS



	1/8" NPT		1/4" NPT		3/8" NPT		1/2" NPT	
	INCHES	MILLIMETERS	INCHES	MILLIMETERS	INCHES	MILLIMETERS	INCHES	MILLIMETERS
A	2 1/4"	60.3	2 1/4"	60.3	2 1/4"	60.3	2 1/4"	60.3
B	3 1/2"	88.9	3 1/2"	88.9	3 1/2"	88.9	3 1/2"	88.9
C	2 1/2"	63.5	2 1/2"	63.5	2 1/2"	63.5	2 1/2"	63.5
D	2"	50.8	2"	50.8	2"	50.8	2"	50.8
E	2"	50.8	2"	50.8	2 1/2"	63.5	2 1/2"	63.5

SERIES "EUS" SPECIFICATIONS AND PART NUMBERS

PIPE SIZE (NPT)	ORIFICE SIZE	MAXIMUM PRESSURE RATINGS**		Cv FACTOR	SEAL MATERIAL	SERIES "EUS" PART NUMBERS		
		INLET PRESSURE PSI	BACK PRESSURE PSI			GENERAL PURPOSE	EXPLOSION-PROOF	
1/8"	1/16"	200	1378	34	.234	BUNA-N	EUS1B2G20	EUS1B2E20
	1/8"	200	1378	34	.234	VITON	EUS1V2G20	EUS1V2E20
	3/32"	100	689	34	.234	BUNA-N	EUS1B4G20	EUS1B4E20
	1/4"	100	689	34	.234	VITON	EUS1V4G20	EUS1V4E20
	5/32"	200	1378	34	.234	BUNA-N	EUS2B2G20	EUS2B2E20
	3/16"	200	1378	34	.234	VITON	EUS2V2G20	EUS2V2E20
1/4"	1/8"	100	689	34	.234	BUNA-N	EUS2B4G20	EUS2B4E20
	3/16"	100	689	34	.234	VITON	EUS2V4G20	EUS2V4E20
	1/4"	43	298	25	.173	BUNA-N	EUS2B6G20	EUS2B6E20
	5/16"	43	298	25	.173	VITON	EUS2V6G20	EUS2V6E20
	3/8"	25	173	17	.117	BUNA-N	EUS2B8G20	EUS2B8E20
	1/2"	25	173	17	.117	VITON	EUS2V8G20	EUS2V8E20
3/8"	1/4"	17	117	17	.117	BUNA-N	EUS2B10G20	EUS2B10E20
	5/16"	17	117	17	.117	VITON	EUS2V10G20	EUS2V10E20
	3/16"	100	689	34	.234	BUNA-N	EUS3B4G20	EUS3B4E20
	1/4"	100	689	34	.234	VITON	EUS3V4G20	EUS3V4E20
	5/16"	43	298	25	.173	BUNA-N	EUS3B6G20	EUS3B6E20
	3/8"	43	298	25	.173	VITON	EUS3V6G20	EUS3V6E20
1/2"	1/2"	25	173	17	.117	BUNA-N	EUS3B8G20	EUS3B8E20
	5/8"	25	173	17	.117	VITON	EUS3V8G20	EUS3V8E20
	3/4"	17	117	17	.117	BUNA-N	EUS3B10G20	EUS3B10E20
	1"	17	117	17	.117	VITON	EUS3V10G20	EUS3V10E20
	1/8"	100	689	34	.234	BUNA-N	EUS4B4G20	EUS4B4E20
	3/16"	100	689	34	.234	VITON	EUS4V4G20	EUS4V4E20
1/2"	1/4"	43	298	25	.173	BUNA-N	EUS4B6G20	EUS4B6E20
	3/8"	43	298	25	.173	VITON	EUS4V6G20	EUS4V6E20
	1/2"	25	173	17	.117	BUNA-N	EUS4B8G20	EUS4B8E20
	3/4"	25	173	17	.117	VITON	EUS4V8G20	EUS4V8E20
	1"	17	117	17	.117	BUNA-N	EUS4B10G20	EUS4B10E20
	1 1/4"	17	117	17	.117	VITON	EUS4V10G20	EUS4V10E20

**ALL SERIES "EUS" VALVES ARE RATED FULL VACUUM.

SERIES "EAS" SOLENOID VALVES

NORMALLY CLOSED IN-LINE PATTERN SOLENOID VALVES FEATURING THE FAIL-DRY* DESIGN AND BUBBLE-TIGHT SHUTOFF. RECOMMENDED FOR HIGHLY CORROSIVE AND ULTRA-PURE LIQUID APPLICATIONS REQUIRING POSITIVE VALVE CLOSURE IN THE EVENT OF AN ELECTRICAL FAILURE.

The Series "EAS" solenoid valves feature the FAIL-DRY* design with venting provided between a set of three (3) U-cups (primary seals) and a diaphragm (secondary seal) thus isolating the metal operating components from all process liquids even in the event of a primary seal failure. They are intended to operate under corrosive conditions which severely affect conventionally designed (packless) solenoid valves. Valve sticking problems are virtually eliminated through the utilization of a Teflon shaft. Valves are available from 1/2" to 1-1/4" NPT with pressure ranges from full vacuum to 140 PSI. Cycle life under normal conditions should be in excess of 1,000,000 cycles.

CONSTRUCTION

"EAS" valves are constructed of TYPE 1, GRADE 1, PVC (Polyvinyl Chloride), Polypropylene, or Teflon. Valve shafts are constructed of glass filled Teflon. Standard seals are Buna-N or Viton; however, other materials are available upon request. Screwed ends are standard. Series "EAS" solenoid valves are available with general purpose or explosion-proof coil housings (see information section — page 22).

OPERATION

The "EAS" valve illustrated at right is direct operating and normally closed by design. It will operate without assistance from line pressure or flow. Under the correct pressure conditions (see below chart) the coil, when energized (power on), creates an electro-magnetic field in the top section of the core tube.

IMPORTANT — PRESSURE INFORMATION: This force pulls the core and shaft upward opening the valve orifice. When the coil is de-energized (power off) the valve spring pushes the core and shaft downward closing the valve orifice.

If the inlet pressure is in excess of the inlet pressure ratings in the below chart the valve will not open when energized. **CAUTION —** if the valve remains energized under this condition the coil will burn out. It is also important that line back pressure, generated by flow restrictions in the downstream piping, does not exceed the back pressure rating in the below chart or the valves will not close (see back pressure information in engineering section of catalog).

Series "EAS" solenoid valves may also be used for vacuum service; however, because they require different internal parts Series "EAS" vacuum valves will not operate in pressure applications. Likewise, Series "EAS" pressure valves will not operate under vacuum conditions. **IMPORTANT:** see ordering information for correct ordering procedure.

INSTALLATION

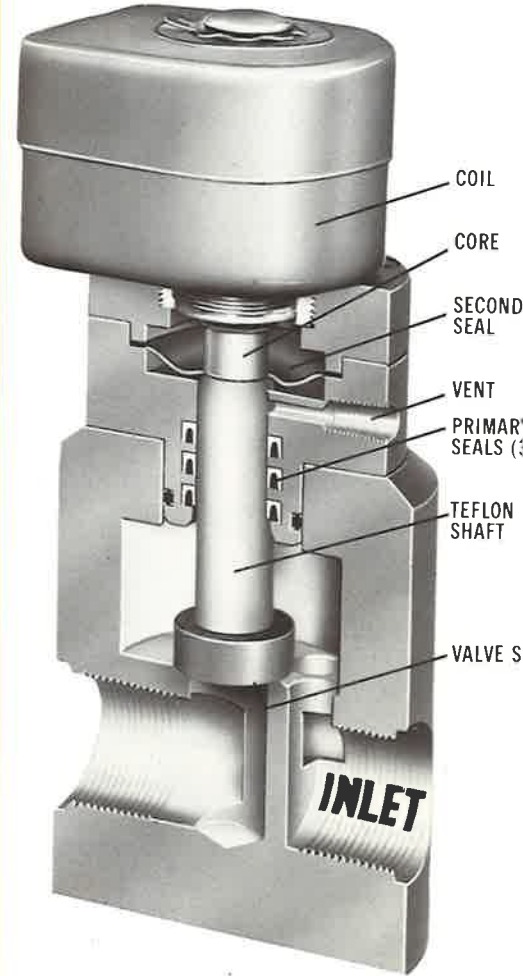
"EAS" valves may be mounted in any position but preferably upright (as illustrated at right). In the upright position particles will not settle against the U-cup seals. Do not install excessive fitting or restrictions downstream of the valves which cause back pressure in excess of that listed in the below chart. Throttling valves should be mounted upstream of the solenoid valves to eliminate back pressure problems. Other back pressure problems are caused by spray nozzles and goose-neck fittings.

COIL INFORMATION

"EAS" valves are operated by 20 watt Class F or 58 watt Class H high power duty coils. These coils, manufactured in accordance with Underwriters' Laboratories' insulation standards, can be energized continuously without danger of overheating or failure; however, they will reach very high temperatures. Available with either general purpose or explosion-proof housings with standard A.C. voltages of 24, 120, 240, 480. Please consult page 22 of catalog for detailed coil specifications.

ORDERING INFORMATION

Order by part number and specify material of construction, exact chemicals, concentrations, temperatures, and pressures. Specify vacuum or pressure service.

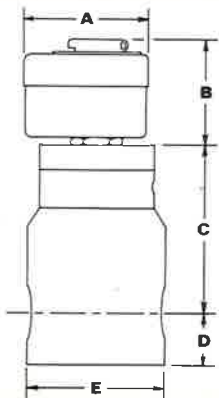


SERIES "EAS" SOLENOID VALVE RATINGS AND PART NUMBERS

PIPE SIZE (NPT)	ORIFICE DIAMETER INCHES	MAXIMUM PRESSURE RATINGS		MAXIMUM VACUUM RATINGS		Cv FACTOR	WATT RATING	SEAL MATERIAL	VALVE PART NUMBERS	
		INLET PRESSURE PSI	BACK PRESSURE PSI	VACUUM INCHES Hg	INLET PRESSURE PSI				GENERAL PURPOSE COIL ENCLOSURE	EXPLOSION-PROOF COIL ENCLOSURE
1/2"	3/8"	120	16	30"	101 VAC	2.1	20	BUNA-N	EAS4B12G20	EAS4B12E20
1/2"	3/8"	120	16	30"	101 VAC	2.1	20	VITON	EAS4V12G20	EAS4V12E20
1/2"	3/8"	140	55	30"	101 VAC	3.2	58	BUNA-N	EAS4B12G58	EAS4B12E58
1/2"	3/8"	140	55	30"	101 VAC	3.2	58	VITON	EAS4V12G58	EAS4V12E58
3/4"	1/2"	30	10	30"	101 VAC	3.6	20	BUNA-N	EAS5B16G20	EAS5B16E20
3/4"	1/2"	30	10	30"	101 VAC	3.6	20	VITON	EAS5V16G20	EAS5V16E20
3/4"	1/2"	100	20	30"	101 VAC	4.4	58	BUNA-N	EAS5B16G58	EAS5B16E58
3/4"	1/2"	100	20	30"	101 VAC	4.4	58	VITON	EAS5V16G58	EAS5V16E58
1"	3/4"	10	8	15"	81 VAC	6.2	20	BUNA-N	EAS6B22G20	EAS6B22E20
1"	3/4"	10	8	15"	81 VAC	6.2	20	VITON	EAS6V22G20	EAS6V22E20
1"	3/4"	60	12	30"	101 VAC	6.2	58	BUNA-N	EAS6B22G58	EAS6B22E58
1"	3/4"	60	12	30"	101 VAC	6.2	58	VITON	EAS6V22G58	EAS6V22E58
1 1/4"	1"	40	8	NOT RECOMMENDED	NOT RECOMMENDED	13.0	58	BUNA-N	EAS7B32G58	EAS7B32E58
1 1/4"	1"	40	8	NOT RECOMMENDED	NOT RECOMMENDED	13.0	58	VITON	EAS7V32G58	EAS7V32E58

*NOTE: VALVE WILL OPEN AGAINST FULL VACUUM DUE TO EXTRA POWER GENERATED BY VOLTAGE INRUSH; HOWEVER, IT CAN ONLY OPERATE CONTINUOUSLY AT A MAXIMUM OF 15" Hg

SERIES "EAS" SOLENOID VALVE DIMENSIONS



PIPE SIZE (NPT)	1/2" NPT		3/4" NPT		1" NPT		1 1/4" NPT	
	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES
"A" GENERAL PURPOSE	2 5/8"	88.8	2 5/8"	88.8	2 5/8"	88.8	2 5/8"	88.8
"A" EXPLOSION-PROOF	3 1/2"	88.9	3 1/2"	88.9	3 1/2"	88.9	3 1/2"	88.9
"A" GENERAL PURPOSE	3 3/4"	95.2	3 3/4"	95.2	3 3/4"	95.2	3 3/4"	95.2
"A" EXPLOSION-PROOF	4 3/4"	120.8	4 3/4"	120.8	4 3/4"	120.8	4 3/4"	120.8
"B" GENERAL PURPOSE	2 1/4"	57.1	2 1/4"	57.1	2 1/4"	57.1	2 1/4"	57.1
"B" EXPLOSION-PROOF	2 1/2"	63.5	2 1/2"	63.5	2 1/2"	63.5	2 1/2"	63.5
"B" GENERAL PURPOSE	2 5/8"	66.6	2 5/8"	66.6	2 5/8"	66.6	2 5/8"	66.6
"B" EXPLOSION-PROOF	3 1/4"	82.5	3 1/4"	82.5	3 1/4"	82.5	3 1/4"	82.5
"C"	3 3/4"	95.3	4"	101.6	4 1/2"	114.2	5 3/4"	148.0
"D"	7/8"	22.3	1 1/8"	28.9	1 1/2"	38.1	2"	60.8
"E"	2 1/2"	63.5	3"	76.2	3 1/2"	88.9	4 1/2"	114.2

SERIES "DAS" SOLENOID VALVES

DIRECT OPERATING NORMALLY CLOSED ANGLE PATTERN SOLENOID VALVES FEATURING THE FAIL-DRY® DESIGN AND BUBBLE-TIGHT SHUTOFF. RECOMMENDED FOR HIGHLY CORROSIVE AND ULTRA-PURE LIQUID APPLICATIONS REQUIRING POSITIVE VALVE CLOSURE IN THE EVENT OF AN ELECTRICAL FAILURE.

The Series "DAS" solenoid valves feature the FAIL-DRY® design with venting provided between a set of three (3) U-cups (primary seals) and a diaphragm (secondary seal) thus isolating the metal operating components from all process liquids even in the event of a primary seal failure. They are intended to operate under corrosive conditions which severely affect conventionally designed (packless) solenoid valves. Valve sticking problems are virtually eliminated through the utilization of a Teflon shaft. Valves are available from 1/2" to 2" NPT with pressure ranges from full vacuum to 140 PSI. Cycle life under normal conditions should be in excess of 1,000,000 cycles.

CONSTRUCTION

"DAS" valves are constructed of TYPE 1, GRADE 1, PVC (Polyvinyl Chloride). Valve shafts are constructed of glass filled Teflon. Standard seals are Buna-N or Viton; however, other materials are available upon request. Screwed ends are standard. Series "DAS" solenoid valves are available with general purpose or explosion-proof coil housings (see information section — page 22).

OPERATION

The "DAS" valve illustrated at left is direct operating and normally closed. It will operate without assistance from line pressure or flow. Under the correct pressure conditions (see below chart) the coil, when energized (power on), creates an electro-magnetic field in the top section of the core tube. This force pulls the core and shaft upward opening the valve orifice. When the coil is de-energized (power off) the valve spring pushes the core and shaft downward closing the valve orifice.

IMPORTANT — PRESSURE INFORMATION: If the inlet pressure is in excess of the inlet pressure ratings in the below chart the valve will not open when energized. **CAUTION —** if the valve remains energized under this condition the coil will burn out. It is also important that line back pressure, generated by flow restrictions in the downstream piping, does not exceed the back pressure rating in the below chart or the valves will not close (see back pressure information in engineering section of catalog).

Series "DAS" solenoid valves may also be used for vacuum service; however, because they require different internal parts Series "DAS" vacuum valves will not operate in pressure applications. Likewise, Series "DAS" pressure valves will not operate under vacuum conditions. **IMPORTANT:** see ordering information for correct ordering procedure.

INSTALLATION

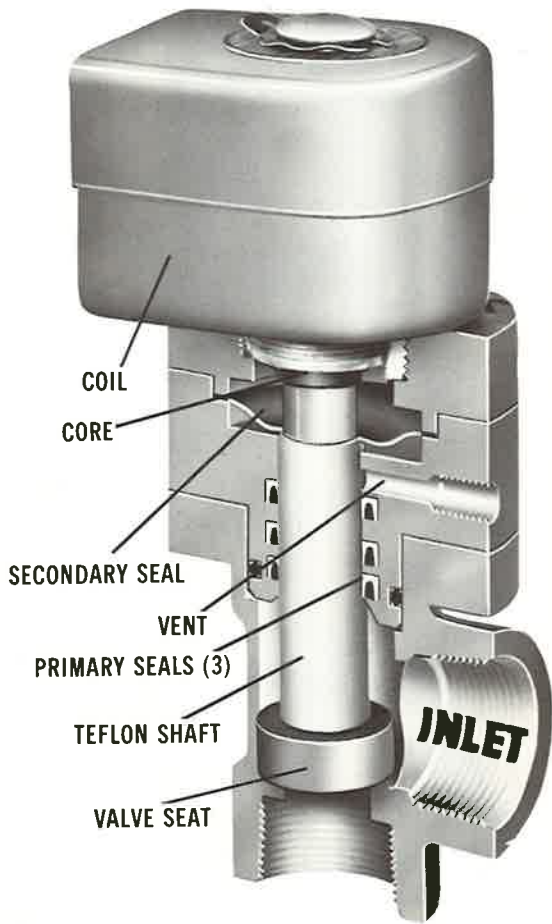
"DAS" valves may be mounted in any position but preferably upright (as illustrated at left). In the upright position particles will not settle against the U-cup seals. **DO NOT** install excessive fittings or restrictions downstream of the valves which cause back pressure in excess of that listed in the below chart. Throttling valves should be mounted upstream of the solenoid valves to eliminate back pressure problems. Other back pressure problems are caused by spray nozzles and goose-neck fittings.

COIL INFORMATION

"DAS" valves are operated by 20 watt Class-F or 58 watt Class-H high power coils. These coils, manufactured in accordance with Underwriters' Laboratories insulation standards, can be energized continuously without danger of failure; however, they will reach very high temperatures. Available with either general purpose or explosion-proof housings with standard A.C. voltages of 24, 120, 240, or 480. Please consult page 22 of catalog for detailed coil specifications.

ORDERING INFORMATION

Order by part number and specify exact chemicals, concentrations, temperatures, and pressures. Specify **VACUUM** or **PRESSURE SERVICE**.

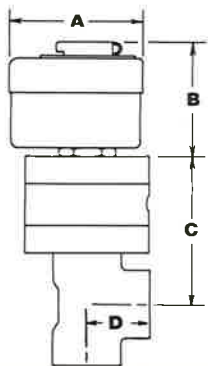


SERIES "DAS" SOLENOID VALVE RATINGS AND PART NUMBERS

PIPE SIZE (NPT)	ORIFICE DIAMETER INCHES	MAXIMUM PRESSURE RATINGS		MAXIMUM VACUUM RATINGS		Cv FACTOR	WATT RATING	SEAL MATERIAL	VALVE PART NUMBERS	
		INLET PRESSURE PSI	BACK PRESSURE PSI	INCHES Hg	INCHES Hg				GENERAL PURPOSE COIL ENCLOSURE	EXPLOSION-PROOF COIL ENCLOSURE
1/2"	3/8"	120	16	110	16	1.1	20	BUNA-N	DAS4B12G20	DAS4B12E20
1/2"	3/8"	140	16	110	16	2.1	20	VITON	DAS4V12G20	DAS4V12E20
1/2"	3/8"	140	55	30"	30"	3.2	58	BUNA-N	DAS4B12G58	DAS4B12E58
1/2"	3/8"	140	55	30"	30"	3.2	58	VITON	DAS4V12G58	DAS4V12E58
3/4"	1/2"	30	10	30"	30"	3.6	20	BUNA-N	DAS5B16G20	DAS5B16E20
3/4"	1/2"	30	10	30"	30"	3.6	20	VITON	DAS5V16G20	DAS5V16E20
3/4"	1/2"	100	20	30"	30"	4.4	58	BUNA-N	DAS5B16G58	DAS5B16E58
3/4"	1/2"	100	20	30"	30"	4.4	58	VITON	DAS5V16G58	DAS5V16E58
1"	1/2"	10	8	15"	15"	6.2	20	BUNA-N	DAS6B22G20	DAS6B22E20
1"	1/2"	10	8	15"	15"	6.2	20	VITON	DAS6V22G20	DAS6V22E20
1"	1/2"	60	12	30"	30"	6.2	58	BUNA-N	DAS6B22G58	DAS6B22E58
1"	1/2"	60	12	30"	30"	6.2	58	VITON	DAS6V22G58	DAS6V22E58
1 1/4"	1"	40	8	NOT RECOMMENDED	NOT RECOMMENDED	13.0	58	BUNA-N	DAS7B32G58	DAS7B32E58
1 1/4"	1"	40	8	NOT RECOMMENDED	NOT RECOMMENDED	13.0	58	VITON	DAS7V32G58	DAS7V32E58
1 1/2"	1 1/8"	20	4	NOT RECOMMENDED	NOT RECOMMENDED	15.0	58	BUNA-N	DAS8B36G58	DAS8B36E58
1 1/2"	1 1/8"	20	4	NOT RECOMMENDED	NOT RECOMMENDED	15.0	58	VITON	DAS8V36G58	DAS8V36E58
2"	1 3/8"	3	2	NOT RECOMMENDED	NOT RECOMMENDED	16.5	58	BUNA-N	DAS9B44G58	DAS9B44E58
2"	1 3/8"	3	2	NOT RECOMMENDED	NOT RECOMMENDED	16.5	58	VITON	DAS9V44G58	DAS9V44E58

*NOTE: VALVE WILL OPEN AGAINST FULL VACUUM DUE TO EXTRA POWER GENERATED BY VOLTAGE INRUSH, HOWEVER, IT CAN ONLY OPERATE CONTINUOUSLY AT A MAXIMUM OF 15" Hg

SERIES "DAS" SOLENOID VALVE DIMENSIONS



PIPE SIZE (NPT)	1/2" NPT		3/4" NPT		1" NPT		1 1/4" NPT		1 1/2" NPT		2" NPT	
	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES
"A" GENERAL PURPOSE	2 5/8"	88.6	2 5/8"	88.6	2 5/8"	88.6	2 5/8"	88.6	2 5/8"	88.6	2 5/8"	88.6
"A" EXPLOSION-PROOF	3 1/2"	88.9	3 1/2"	88.9	3 1/2"	88.9	3 1/2"	88.9	3 1/2"	88.9	3 1/2"	88.9
"A" GENERAL PURPOSE	3 3/4"	95.2	3 3/4"	95.2	3 3/4"	95.8	3 3/4"	95.2	3 3/4"	95.8	3 3/4"	95.8
"A" EXPLOSION-PROOF	4 3/4"	120.6	4 3/4"	120.6	4 3/4"	120.6	4 3/4"	120.6	4 3/4"	120.6	4 3/4"	120.6
"B" GENERAL PURPOSE	2 1/4"	57.1	2 1/4"	57.1	2 1/4"	57.1	2 1/4"	57.1	2 1/4"	57.1	2 1/4"	57.1
"B" EXPLOSION-PROOF	2 1/2"	63.5	2 1/2"	63.5	2 1/2"	63.5	2 1/2"	63.5	2 1/2"	63.5	2 1/2"	63.5
"B" GENERAL PURPOSE	2 5/8"	66.4	2 5/8"	66.9	2 5/8"	66.9	2 5/8"	66.8	2 5/8"	66.8	2 5/8"	66.8
"B" EXPLOSION-PROOF	3 1/4"	82.5	3 1/4"	82.5	3 1/4"	82.5	3 1/4"	82.5	3 1/4"	82.5	3 1/4"	82.5
"C"	2 5/8"	73.0	3"	75.2	3 3/8"	85.7	4"	101.6	4 1/8"	104.8	4 3/8"	111.1
"D"	1 1/4"	31.8	1 1/2"	38.1	1 3/4"	44.4	2"	50.8	2 1/8"	53.3	2 3/8"	60.3

SERIES "EU" SOLENOID VALVES

SINGLE DIAPHRAGM NORMALLY CLOSED IN-LINE PATTERN SOLENOID VALVES. RECOMMENDED FOR CORROSIVE AND ULTRA-PURE LIQUID APPLICATIONS REQUIRING POSITIVE VALVE CLOSURE IN THE EVENT OF AN ELECTRICAL FAILURE. THE SINGLE DIAPHRAGM ("EUS" HAS DUAL DIAPHRAGMS) PROHIBITS USE OF FAIL-DRY* CONCEPT.

Series "EU" solenoid valves feature a single diaphragm which isolates the metal operating components from all process liquids. They are intended to operate under corrosive conditions which severely affect conventionally designed (packless) solenoid valves. Available from 1/8" to 1/2" NPT with pressure ranges from full vacuum to 140 psi. Cycle life under normal conditions should be in excess of 1,000,000 cycles. Maximum orifice is 1/4" diameter.

The Series "EU" valves are less expensive than the "EUS" valves, and unlike Series "EUS", "EAS", and "DAS" FAIL-DRY* solenoid valves, the Series "EU" valves use only a single diaphragm to isolate the metal operating components from the process liquid. Consequently, in the event of a seal failure the Series "EU" valve does not offer secondary seal protection or an indication of the failure. Thus a complete valve failure and shutdown will occur. If seal failure must be indicated and if system shutdown cannot be tolerated consult pages 17, 18, and 19 of catalog.

CONSTRUCTION

Series "EU" solenoid valves are constructed of TYPE 1, GRADE 1 PVC (Polyvinyl Chloride), Polypropylene, or Teflon. Standard seals are Buna-N or Viton; however, other materials are available upon request. Screwed ends are standard. "EU" valves are available with either general purpose or explosion-proof coil housings (see coil information section — page 22).

OPERATION

The "EU" valve illustrated at right is direct operating and normally closed by design. It will operate without assistance from line pressure or flow. Under the correct pressure conditions (see below chart) the coil, when energized (power on), creates an electro-magnetic field in the top section of the core tube. This force pulls the core and shaft upward opening the valve orifice. When the coil is de-energized (power off) the valve spring pushes the core and shaft downward closing the valve orifice.

If the inlet pressure is in excess of the inlet pressure ratings in the below chart the valve will open prematurely. Likewise, the valve will open prematurely or remain open when de-energized if the back pressure is in excess of the below back pressure ratings.

Only "EU" solenoid valves with 20 watt coils may be used for vacuum service. Since they require a different internal spring they will not operate in pressure applications. Likewise, "EU" pressure valves will not operate under vacuum conditions. **IMPORTANT:** see ordering information for correct ordering procedure.

INSTALLATION

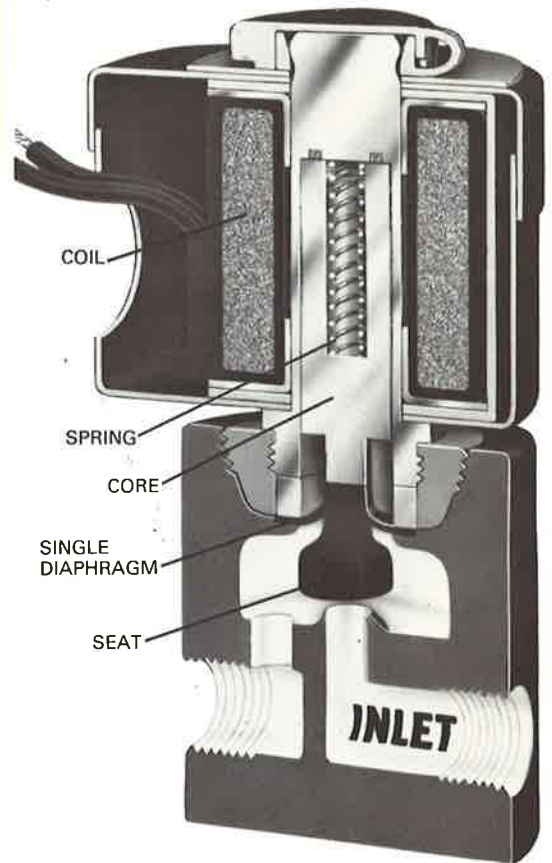
Series "EU" valves may be mounted in any position. Do not install throttling valves, excessive fittings or restrictions downstream of the "EU" valves. This can cause back pressure in excess of that listed in the below chart. Throttling valves should be mounted upstream of the "EU" valves. Other back pressure problems are caused by spray nozzles and goose-neck fittings, in the downstream piping.

COIL INFORMATION

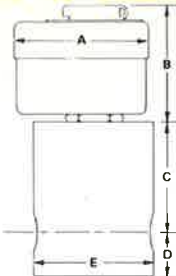
Series "EU" valves are operated by either 6 or 20 watt coils. These coils, manufactured in accordance with Underwriters' Laboratories insulation standards, can be energized continuously without danger of overheating or failure; however, they will reach very high temperatures. They are available with either general purpose or explosion-proof housings with standard A.C. voltages of 24, 120, 240, 480. Please consult page 22 of catalog for detailed coil specifications.

ORDERING INFORMATION

Order by part number and specify material of construction, exact chemicals, concentrations, temperatures, and pressures. Specify vacuum or pressure service.



SERIES "EU" DIMENSIONS



PIPE SIZES (NPT)	1/8" & 1/4"		1/4"		3/8" & 1/2"	
	ORIFICE SIZES (IDA)		ORIFICE SIZES (IDA)		ORIFICE SIZES (IDA)	
DIMENSIONS	INCHES		INCHES		INCHES	
6 WATT GENERAL PURPOSE						
"A"	2 1/2"	3 3/8"	2 1/2"	3 3/8"	2 1/2"	3 3/8"
"B"	1 1/2"	2 1/8"	1 3/8"	2 1/8"	1 1/2"	2 1/8"
6 WATT EXPLOSION-PROOF						
"A"	2 1/2"	3 3/8"	2 1/2"	3 3/8"	2 1/2"	3 3/8"
"B"	2 3/4"	3 5/8"	2 3/4"	3 5/8"	2 3/4"	3 5/8"
20 WATT GENERAL PURPOSE						
"A"	2 3/4"	3 7/8"	2 3/4"	3 7/8"	2 3/4"	3 7/8"
"B"	2 1/4"	3 1/4"	2 1/4"	3 1/4"	2 1/4"	3 1/4"
20 WATT EXPLOSION-PROOF						
"A"	3 1/2"	4 1/8"	3 1/2"	4 1/8"	3 1/2"	4 1/8"
"B"	2 1/2"	3 3/8"	2 1/2"	3 3/8"	2 1/2"	3 3/8"
"C"	1 1/2"	2 1/4"	1 1/2"	2 1/4"	1 1/2"	2 1/4"
"D"	3/4"	1 1/8"	3/4"	1 1/8"	3/4"	1 1/8"
"E"	1 3/4"	2 1/4"	2"	2 1/4"	2"	2 1/4"

SERIES "EU" SPECIFICATIONS AND PART NUMBERS

PIPE SIZE (NPT)	ORIFICE SIZE INCHES	MAXIMUM PRESSURE RATINGS**		C _v FACTOR	WATT RATING	SEAL MATERIAL	SERIES "EU" PART NUMBERS	
		INLET PRESSURE PSI	BACK PRESSURE PSI				GENERAL PURPOSE	EXPLOSION-PROOF
1/8"	1/8"	140	10	09	6	BUNA-N	EU1B2G6	EU1B2E6
	1/4"	40	10	35	6	BUNA-N	EU1B4G6	EU1B4E6
1/4"	1/8"	140	10	09	6	BUNA-N	EU2B2G6	EU2B2E6
	1/4"	40	10	35	6	BUNA-N	EU2B4G6	EU2B4E6
3/8"	1/8"	140	10	09	6	BUNA-N	EU3B2G6	EU3B2E6
	1/4"	40	10	35	6	BUNA-N	EU3B4G6	EU3B4E6
1/2"	1/8"	140	10	09	6	BUNA-N	EU4B2G6	EU4B2E6
	1/4"	40	10	35	6	BUNA-N	EU4B4G6	EU4B4E6

** ALL SERIES "EU" VALVES WITH 20 WATT COILS ARE RATED FOR FULL VACUUM SERVICE. SERIES "EU" VALVES WITH 6 WATT COILS ARE NOT RECOMMENDED FOR VACUUM SERVICE.

SERIES "SP" PILOT OPERATED SOLENOID VALVES

NORMALLY CLOSED IN-LINE SOLENOID VALVES FEATURING BUBBLE-TIGHT SHUT-OFF. RECOMMENDED FOR HANDLING CORROSIVE AND ULTRA-PURE LIQUIDS IN HIGH FLOW OR HIGH PRESSURE APPLICATIONS. OFFERS POSITIVE VALVE CLOSURE IN THE EVENT OF AN ELECTRICAL FAILURE.

Series "SP" pilot operated solenoid valves utilize a single diaphragm seal to isolate the metal operating components from all process liquids. They are intended to operate under corrosive conditions which severely affect conventionally designed (packless) pilot operated solenoid valves. They are available from 3/4" to 3" NPT with inlet pressure ranges from 10 PSI minimum (required to open the valve) to 120 PSI maximum. Cycle life under normal conditions should be in excess of 1,000,000 cycles.

CONSTRUCTION

Series "SP" valve bodies are constructed of TYPE 1, GRADE 1, PVC (Polyvinyl Chloride). Cylinder walls are transparent Plexiglas (PVC available also). Piston springs are PVC coated 302 stainless steel (316 available also). Standard seals are Buna-N or Viton; however, other materials are available upon request. Series "SP" valves are available with either general purpose or explosion-proof coil housings (see coil information sheet — page 22).

OPERATION

The Series "SP" valve illustrated at left is pilot operated and normally closed by design. It requires line pressure and flow for operating assistance. Under the correct pressure conditions (see below chart) the coil, when energized (power on), creates an electromagnetic field in the top section of the core tube. This force pulls the core and pilot seat upwards opening the pilot orifice. This allows the liquid on top of the piston, previously holding the valve closed, to escape through the pilot outlet and re-enter the piping system on the downstream side of the Series "SP" valve.

The upper chamber of the piston is now void of pressure since it escapes through the pilot orifice at a faster rate than it can enter through the smaller piston orifice. The main line pressure will now lift the piston upward opening the main valve orifice and permitting flow through the valve.

When the coil is de-energized (power-off) the solenoid spring pushes the core and pilot seat downward closing the pilot orifice. The main line pressure can no longer escape through the pilot outlet and so it builds up on the top side of the piston. This force, combined with the piston spring force, pushes the piston downward closing off the main valve orifice. **CAUTION** — Series "SP" solenoid valves will not operate unless a minimum line pressure of 10 PSI can be maintained.)

INSTALLATION

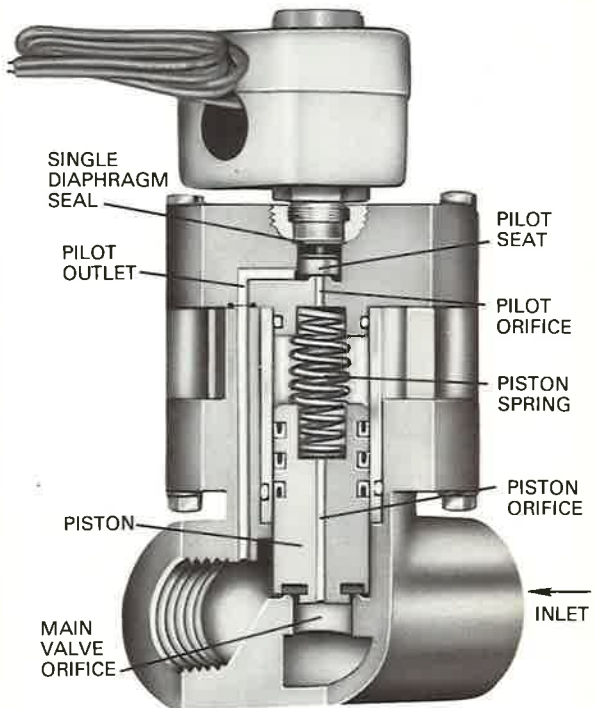
Series "SP" valves must be installed so that the liquid line pressure is sensed under the Series "SP" piston. Care should be taken not to install throttling valves or similar restrictions that would eliminate or reduce the pressure drop required to hold open the Series "SP" valve.

COIL INFORMATION

Series "SP" valves are operated by 20 watt Class B coils. These coils, manufactured in accordance with Underwriters' Laboratories insulation standards, can be energized continuously without danger of overheating or failure; however, they will reach very high temperatures. They are available with either general purpose or explosion-proof housings with standard A.C. voltages of 24, 120, 240, 480. Please consult page 22 of catalog for detailed coil specifications.

ORDERING INFORMATION

Order by part number and specify exact chemicals, concentrations, temperatures, flows, and pressures.



SERIES "SP" PILOT SOLENOID VALVE SPECIFICATIONS

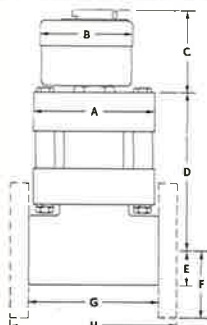
VALVE SIZE (NPT)	VALVE ORIFICE DIAMETER		Cv FLOW FACTOR	MAXIMUM INLET PRESSURE		MINIMUM INLET PRESSURE*		MAXIMUM BACK PRESSURE**		COIL WATT RATING
	INCHES	MILLIMETERS		PSI	BAR	PSI	BAR	PSI	BAR	
3/4"	3/4"	19.0	8.0	120	8.0	10	0.7	35	2.4	20
1"	1"	25.4	9.5	120	8.0	10	0.7	35	2.4	20
1 1/4"	1 1/4"	31.8	14.5	120	8.0	10	0.7	35	2.4	20
1 1/2"	1 1/2"	38.1	27.0	120	8.0	10	0.7	35	2.4	20
2"	2"	50.8	37.0	120	8.0	10	0.7	35	2.4	20
2 1/2"	2"	50.8	37.0	120	8.0	10	0.7	35	2.4	20
3"	3"	76.2	69.5	120	8.0	10	0.7	35	2.4	20

* A CONSTANT PRESSURE DROP OF 10 PSI IS ALWAYS REQUIRED TO OPERATE SERIES "SP" VALVES.
** IF THIS PRESSURE IS EXCEEDED THE SERIES "SP" VALVES WILL NOT CLOSE.

SERIES "SP" PART NUMBERS

VALVE SIZE (NPT)	VALVE SEALS	GENERAL PURPOSE ENCLOSURE	EXPLOSION-PROOF ENCLOSURE
3/4"	BUNA-N	SP075BG20	SP075BE20
3/4"	VITON	SP075VG20	SP075VE20
1"	BUNA-N	SP100BG20	SP100BE20
1"	VITON	SP100VG20	SP100VE20
1 1/4"	BUNA-N	SP125BG20	SP125BE20
1 1/4"	VITON	SP125VG20	SP125VE20
1 1/2"	BUNA-N	SP150BG20	SP150BE20
1 1/2"	VITON	SP150VG20	SP150VE20
2"	BUNA-N	SP200BG20	SP200BE20
2"	VITON	SP200VG20	SP200VE20
2 1/2"	BUNA-N	SP250BG20	SP250BE20
2 1/2"	VITON	SP250VG20	SP250VE20
3"	BUNA-N	SP300BG20	SP300BE20
3"	VITON	SP300VG20	SP300VE20

SERIES "SP" PILOT OPERATED SOLENOID VALVE DIMENSIONS



VALVE DIMENSIONS	3/4" NPT		1" NPT		1 1/4" NPT		1 1/2" NPT		2" NPT		2 1/2" NPT		3" NPT	
	INCHES	MILLIMETERS	INCHES	MILLIMETERS	INCHES	MILLIMETERS	INCHES	MILLIMETERS	INCHES	MILLIMETERS	INCHES	MILLIMETERS	INCHES	MILLIMETERS
"A" GENERAL PURPOSE	3 1/2"	88.9	2 3/4"	68.2	4 3/4"	119.9	3 3/4"	94.3	6"	152.0	6"	152.0	6 1/2"	165.1
"B" GENERAL PURPOSE	2 1/4"	60.3	2 1/4"	60.3	2 3/4"	68.8	2 3/4"	68.8	2 3/4"	68.8	2 3/4"	68.8	2 3/4"	68.8
"C" GENERAL PURPOSE	3 1/4"	86.1	3 1/4"	86.1	3 1/4"	86.1	3 1/4"	86.1	3 1/2"	88.9	3 1/2"	88.9	3 1/2"	88.9
"C" EXPLOSION-PROOF	2 1/4"	60.3	2 1/4"	60.3	2 1/4"	60.3	2 1/4"	60.3	2 1/2"	63.5	2 1/2"	63.5	2 1/2"	63.5
"D"	4 1/4"	111.8	5"	127.0	5 1/2"	140.0	5 1/2"	140.0	7 1/4"	184.2	7 1/4"	184.2	9 3/4"	247.7
"E"	1"	25.4	1 1/4"	34.9	1 3/4"	44.4	1 3/4"	44.4	1 3/4"	44.4	1 3/4"	44.4	2 3/4"	68.8
"F"	1 1/4"	34.9	1 1/4"	34.9	1 1/4"	34.9	1 1/4"	34.9	1 1/4"	34.9	1 1/4"	34.9	1 1/4"	34.9
"G"	3 1/4"	86.1	4 1/4"	111.8	4 1/4"	111.8	4 1/4"	111.8	5 1/2"	140.0	5 1/2"	140.0	5 1/2"	140.0
"H"	4 3/4"	119.1	5 1/4"	137.8	6 1/4"	162.7	6 1/4"	162.7	7 1/2"	190.5	7 1/2"	190.5	8 1/2"	215.9

SOLENOID ENCLOSURE & COIL SPECIFICATIONS

PLAST-O-MATIC SOLENOID ENCLOSURES

ALL PLAST-O-MATIC solenoid valves are supplied with either general purpose or explosion-proof and watertight Underwriters' Laboratories approved solenoid enclosures.

GENERAL PURPOSE ENCLOSURES (NEMA 1)

This enclosure consists of a pressed steel housing suitable for general purpose applications indoors and where atmospheric conditions are normal. It serves to protect the coil but is not dust-tight. It meets NEMA Type 1, General Purpose — indoor Solenoid Enclosure General Classification.

EXPLOSION PROOF & WATERTIGHT ENCLOSURES (NEMA 4, 7, & 9)

These enclosures are either die-cast aluminum or pressed steel equipped with a 1/2" threaded conduit hub and meet below NEMA solenoid enclosure requirements.

NEMA Type 4: Watertight and Dust-tight — Indoor and Outdoor: These enclosures are intended for use indoors or outdoors to protect coils against splashing water, water seepage, falling or hose directed water, and severe external condensation. They are Sleet-resistant but not Sleet-(Ice)-Proof.

NEMA Type 7: These enclosures are listed for Class I, Groups 7C and 7D hazardous locations. Class I locations are those in which flammable gases or vapors may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. They are described by the National Electric Code as:



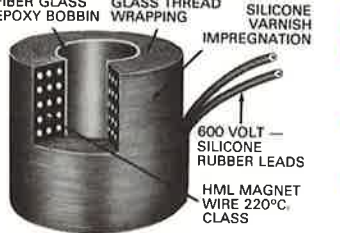
- GROUP C — Atmospheres containing ethyl-ether vapors, ethylene or cyclopropane.
- GROUP D — Atmospheres containing gasoline, hexane, naphtha, benzene, butane, propane, alcohol, acetone, benzol, lacquer, solvent vapors, or natural gas.

NEMA Type 9: These enclosures are listed for Class II, Groups E, F, and G hazardous locations. Class II locations are those which are hazardous because of the presence of combustible dust.

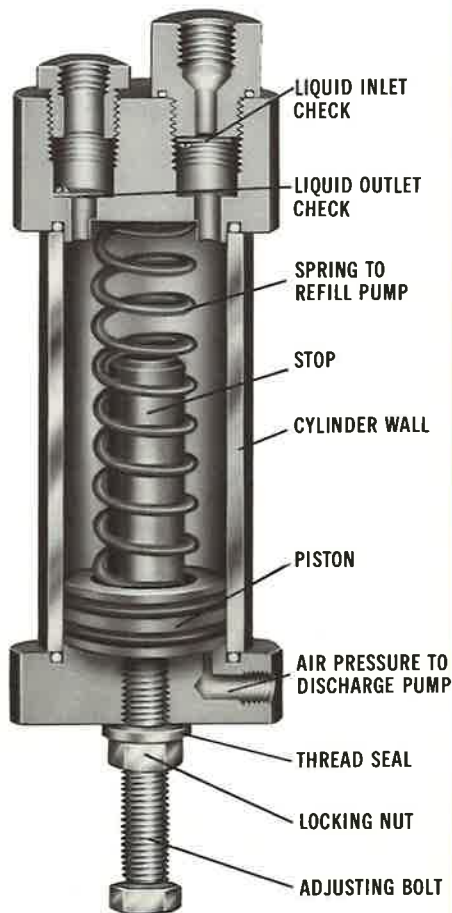
- GROUP E — Atmospheres containing metal dust, including aluminum, magnesium, and their commercial alloys and other metals of similarly hazardous characteristics.
- GROUP F — Atmospheres containing carbon black, coal or coke dust.
- GROUP G — Atmospheres containing flour, starch or grain dust.

PLAST-O-MATIC SOLENOID COILS

ALL PLAST-O-MATIC solenoid valves are equipped with continuous duty coils. They can be energized continuously without danger of overheating or failure; however, they will reach very high temperatures. The ambient temperature must also be taken into consideration, see below chart. Coils are provided with two (2) coil leads which can be connected to any controlling device. For three-phase power systems, the two leads can be connected to any two of the three phases. All coils are constructed in accordance with Underwriters' Laboratories, NEMA, AIEE, and other industry standards. They are available with standard A.C. voltages of 24, 120, 240 or 480. Types of coil insulations and temperature limitations are shown below.

<p>6 WATT CLASS "A" COILS</p>	 <p>EPOXY ENCAPSULATION MAGNET WIRE 130°C CLASS OR BETTER UL LISTED 600 VOLT LEADS NYLON BOBBIN</p>	<ul style="list-style-type: none"> ● FUNGUS PROOF ● MOISTURE PROOF 	<table border="1"> <tbody> <tr><td>COIL CLASS</td><td>"A"</td></tr> <tr><td>INSULATION</td><td>GRADE "A"</td></tr> <tr><td>COIL TEMP. *</td><td>221°F 105°C</td></tr> <tr><td>MAX. ALLOWABLE AMBIENT TEMP. *</td><td>77°F 25°C</td></tr> <tr><td>A.C. WATT RATING</td><td>6</td></tr> </tbody> </table> <p>*WITH POWER ON CONTINUOUSLY</p>	COIL CLASS	"A"	INSULATION	GRADE "A"	COIL TEMP. *	221°F 105°C	MAX. ALLOWABLE AMBIENT TEMP. *	77°F 25°C	A.C. WATT RATING	6
COIL CLASS	"A"												
INSULATION	GRADE "A"												
COIL TEMP. *	221°F 105°C												
MAX. ALLOWABLE AMBIENT TEMP. *	77°F 25°C												
A.C. WATT RATING	6												
<p>20 WATT CLASS "F" COILS</p>	 <p>EPOXY ENCAPSULATION MAGNET WIRE 200°C CLASS OR BETTER UL LISTED 600 VOLT LEADS EPOXY BOBBIN</p>	<ul style="list-style-type: none"> ● FUNGUS PROOF ● MOISTURE PROOF ● LOW TEMP. RISE/ WATT ● WIDER OPERATING RANGE 	<table border="1"> <tbody> <tr><td>COIL CLASS</td><td>"F"</td></tr> <tr><td>INSULATION</td><td>GRADE "FT"</td></tr> <tr><td>COIL TEMP. *</td><td>221°F 105°C</td></tr> <tr><td>MAX. ALLOWABLE AMBIENT TEMP. *</td><td>167°F 75°C</td></tr> <tr><td>A.C. WATT RATING</td><td>20</td></tr> </tbody> </table> <p>*WITH POWER ON CONTINUOUSLY</p>	COIL CLASS	"F"	INSULATION	GRADE "FT"	COIL TEMP. *	221°F 105°C	MAX. ALLOWABLE AMBIENT TEMP. *	167°F 75°C	A.C. WATT RATING	20
COIL CLASS	"F"												
INSULATION	GRADE "FT"												
COIL TEMP. *	221°F 105°C												
MAX. ALLOWABLE AMBIENT TEMP. *	167°F 75°C												
A.C. WATT RATING	20												
<p>58 WATT CLASS "H" COILS</p>	 <p>FIBER GLASS EPOXY BOBBIN GLASS THREAD WRAPPING SILICONE VARNISH IMPREGNATION 600 VOLT — SILICONE RUBBER LEADS HML MAGNET WIRE 220°C, CLASS</p>	<ul style="list-style-type: none"> ● FUNGUS PROOF ● RADIATION RESISTANT ● WIDER OPERATING RANGE ● GLASS INTERWOVEN CONSTRUCTION 	<table border="1"> <tbody> <tr><td>COIL CLASS</td><td>"H"</td></tr> <tr><td>INSULATION</td><td>GRADE "HP"</td></tr> <tr><td>COIL TEMP. *</td><td>356°F 180°C</td></tr> <tr><td>MAX. ALLOWABLE AMBIENT TEMP. *</td><td>77°F 25°C</td></tr> <tr><td>A.C. WATT RATING</td><td>58</td></tr> </tbody> </table> <p>*WITH POWER ON CONTINUOUSLY</p>	COIL CLASS	"H"	INSULATION	GRADE "HP"	COIL TEMP. *	356°F 180°C	MAX. ALLOWABLE AMBIENT TEMP. *	77°F 25°C	A.C. WATT RATING	58
COIL CLASS	"H"												
INSULATION	GRADE "HP"												
COIL TEMP. *	356°F 180°C												
MAX. ALLOWABLE AMBIENT TEMP. *	77°F 25°C												
A.C. WATT RATING	58												

SERIES "VP" SINGLE CYLINDER AIR OPERATED METERING PUMPS



PNEUMATICALLY OPERATED, EXPLOSION-PROOF, AND SELF-PRIMING PUMPS FOR DELIVERY OF EXACT QUANTITIES OF MODERATELY CORROSIVE LIQUIDS. NOT RECOMMENDED FOR MOST ACIDS AND CORROSIVE CAUSTICS — SEE SERIES VPA PUMPS INSTEAD.

- REDUCES OPERATING COSTS
- ELIMINATES WASTE AND ERRORS
- INCREASES EMPLOYEE SAFETY
- INSURES A BETTER END PRODUCT

CONSTRUCTION AND CYCLE LIFE

Series "VP" standard pump ends, piston, and stop are Type 1, Grade 1 PVC (Polyvinyl Chloride). Cylinder wall is either PVC, Epoxy, or Type 304 stainless. Spring is Type 302 stainless and seals are either Buna-N or Viton.

A Series "VP" pump should yield between 50,000 and 200,000 cycles with PVC or Epoxy cylinders depending on the cleanliness and lubricity of both the liquid being pumped and the air supply driving the pump. Over 1,000,000 cycles is normal with stainless cylinders.

CAPACITIES

Series "VP" pumping capacities range from zero to 21 ounces per cycle. A cycle is one up and down stroke of the pump piston. A pump can be cycled up to 8 times per minute with liquids similar to water. Each pump is adjustable from its maximum to approximately 20% of maximum.

OPERATION

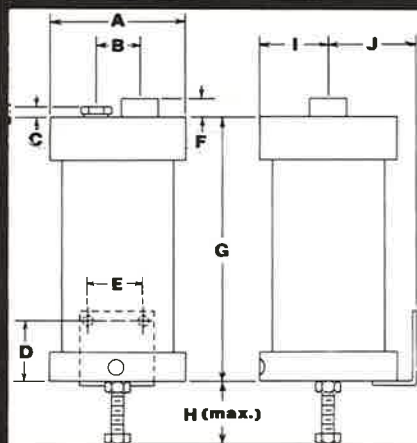
Series "VP" pumps have a single piston and cylinder design. The air supply to drive the piston is controlled by a 3-way air valve. As air pressure is induced on the bottom side of the piston, the piston moves upward and discharges the liquid from the pump. By venting this air pressure (done by the 3-way air valve) the pump spring pushes the piston downward creating a vacuum or suction — thus refilling the pump. The alternate discharging and refilling of the pump is achieved by a pair of opposing check valves mounted in the top of the pump. This cycling procedure can be repeated up to 8 times per minute with water or similar liquids. The air consumption and pressures required are listed in the chart below. The cycling can be created manually by using a hand operated 3-way air valve, or automatically using PLAST-O-MATIC'S pump metering panel and solenoid accessory section of catalog for selection of proper 3-way air solenoid valve.

IMPORTANT: FOR SUCTION LIFT INFORMATION, INSTALLATION INSTRUCTIONS, AND ORDERING INFORMATION, SEE SUPPLEMENTARY DATA SHEET — PAGE 25 OF CATALOG.

SERIES "VP" PUMP SPECIFICATIONS & PART NUMBERS

NOMINAL STROKE CAPACITY OUNCES	INLET & OUTLET (NPT)	RECOMMENDED TUBING SIZES (O.D.)	AIR LINE CONNECTIONS (NPT)	NOMINAL PUMPING CAPACITY*		CYLINDER BORE DIAMETER INCHES	MINIMUM CYLINDER OPERATING PRESSURE		MAXIMUM CYLINDER OPERATING PRESSURE		AIR CYLINDER CONSUMPTION* FEET ³ /MIN.	CYLINDER WALL MATERIAL	SERIES "VP" PUMP NUMBERS	
				GALLONS/MIN.	LITERS/MIN.		PSI	BAR	PSI	BAR			BUNA-N	VITON
3	3/8"	1/2"	1/8"	1.9	56.7	2"	40	2.0	120	0.24	EPOXY	VP3M-B	VP3M-V	
3	3/8"	1/2"	1/8"	1.9	56.7	2"	40	2.0	120	0.24	PVC	VP3P-B	VP3P-V	
3	3/8"	1/2"	1/8"	1.9	56.7	2"	40	2.0	120	0.24	STAINLESS	VP3S-B	VP3S-V	
7	1/2"	3/4"	1/4"	4.4	127.0	2 1/2"	40	2.1	120	0.56	EPOXY	VP7M-B	VP7M-V	
7	1/2"	3/4"	1/4"	4.4	127.0	2 1/2"	40	2.1	120	0.56	PVC	VP7P-B	VP7P-V	
7	1/2"	3/4"	1/4"	4.4	127.0	2 1/2"	40	2.1	120	0.56	STAINLESS	VP7S-B	VP7S-V	
21	3/4"	1"	1/2"	1.31	37.7	4"	40	2.7	120	1.68	EPOXY	VP21M-B	VP21M-V	
21	3/4"	1"	1/2"	1.31	37.7	4"	40	2.7	120	1.68	PVC	VP21P-B	VP21P-V	
21	3/4"	1"	1/2"	1.31	37.7	4"	40	2.7	120	1.68	STAINLESS	VP21S-B	VP21S-V	

*BASED ON EIGHT (8) CYCLES PER MINUTE PUMPING WATER



SERIES "VP" PUMP DIMENSIONS

PUMP DIMENSIONS	VP3		VP7		VP21	
	INCHES	MILLIMETERS	INCHES	MILLIMETERS	INCHES	MILLIMETERS
"A"	3"	76.2	3 1/2"	88.9	5 1/2"	139.7
"B"	1 1/2"	38.1	1 3/4"	44.4	1 3/4"	44.4
"C"	3/8"	9.5	1/2"	12.7	1/2"	12.7
"D"	3/4"	19.0	2 1/2"	63.5	2 1/2"	63.5
"E"	1 3/4"	44.4	2 3/8"	60.3	2 3/8"	60.3
"F"	7/8"	22.2	3/4"	19.0	3/4"	19.0
"G"	7 1/2"	190.5	9 1/4"	234.9	10 3/4"	273.0
"H"	2"	50.8	2 3/4"	69.8	3 3/4"	95.2
"I"	1 1/2"	38.1	1 3/4"	44.4	2 3/4"	69.8
"J"	1 3/4"	44.4	2 3/8"	60.3	2 1/2"	88.9

SERIES "VPA" DUAL CYLINDER AIR OPERATED METERING PUMPS

PNEUMATICALLY OPERATED, EXPLOSION-PROOF, AND SELF-PRIMING PUMPS FOR DELIVERY OF EXACT QUANTITIES OF HIGHLY CORROSIVE OR ULTRA-PURE LIQUIDS. EXAMPLES: CONCENTRATED SULPHURIC AND HYDROCHLORIC ACIDS, BLEACH, CAUSTICS, AND DEMINERALIZED WATER.

- INCREASES EMPLOYEE SAFETY
- ELIMINATES WASTE AND ERRORS
- INSURES A BETTER END PRODUCT
- REDUCES OPERATING COSTS

CONSTRUCTION AND CYCLE LIFE

Series "VPA" standard pumps are constructed of Type 1, Grade 1 PVC bodies, shafts, and pistons with a choice of either PVC or 304 stainless cylinder walls. Standard seals are Buna-N or Viton. The pumps will offer between 50,000 and 200,000 cycles with PVC cylinders depending on the cleanliness and lubricity of both the liquid being pumped and the air supply driving the pumps. Over 1,000,000 cycles is normal with stainless cylinders; however, stainless cannot be used in many corrosive applications.

FAIL-DRY* DESIGN PROTECTION

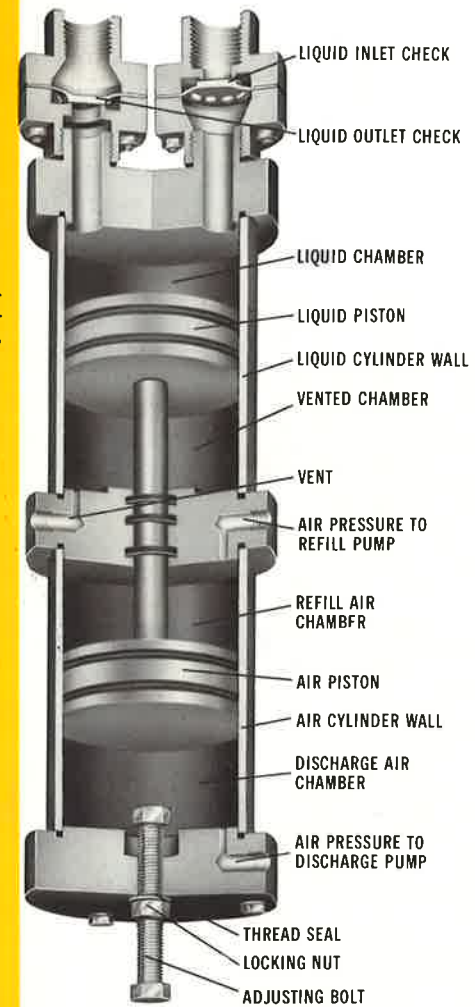
The Series "VPA" pumps are designed with a vented chamber separating the liquid chamber from the top air operating chamber. This prevents the latter two chambers from mixing in the event of seal failures.

CAPACITIES

Series "VPA" pumping capacities range from zero to 128 ounces per cycle. A cycle is one up and down stroke of the pump piston assembly. A pump can be cycled up to 8 times per minute with liquids similar to water. Each pump is adjustable from its maximum to approximately 20% of maximum.

OPERATION

Series "VPA" pumps have two separate pistons and cylinders; one piston and cylinder set is for the liquid chamber, and the other set is for the air operating chamber. The air pressure to the air operating chambers is controlled by a 4-way air valve. The pump fills itself as air pressure is induced on the upper side of the air piston. This forces the shaft and two-piston assembly downward to create a vacuum or suction in the liquid chamber. By venting this pressure and inducing pressure on the lower side of the air piston (done by the 4-way air valve), the shaft and two-piston assembly move upward causing the pump to discharge. The alternate filling and discharging of the pump is achieved by a pair of opposing check valves mounted at the top of the pump. This cycling procedure can be repeated up to 8 times per minute with water or similar liquids. The air consumption and pressures required are listed in the chart below. The cycling can be created manually by using a hand operated 4-way air valve, or automatically by using PLAST-O-MATIC'S pump metering panel in conjunction with a 4-way air solenoid valve. See page 26 of catalog for metering panel and solenoid accessory section of catalog for selection of proper 4-way air solenoid valve.



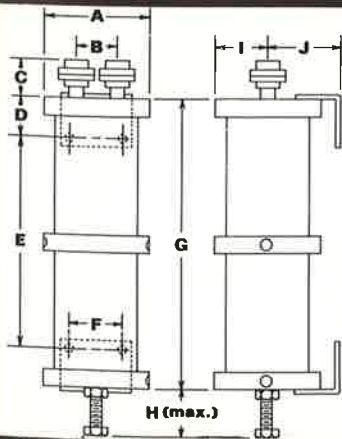
IMPORTANT: FOR SUCTION LIFT INFORMATION, INSTALLATION INSTRUCTIONS, AND ORDERING INFORMATION, SEE SUPPLEMENTARY DATA SHEET — PAGE 25 OF CATALOG.

SERIES "VPA" PUMP SPECIFICATIONS & PART NUMBERS

NOMINAL STROKE CAPACITY OUNCES	INLET & OUTLET PIPE SIZE (NPT)	AIR LINE CONNECTIONS (NPT)	VENT PIPE SIZE (NPT)	NOMINAL PUMPING CAPACITY**		CYLINDER BORE DIAMETER INCHES	MINIMUM CYLINDER OPERATING PRESSURE		MAXIMUM CYLINDER OPERATING PRESSURE		AIR CYLINDER CONSUMPTION**		CYLINDER WALL MATERIAL	SERIES "VPA" PART NUMBERS	
				GALLONS/MIN	LITERS/MIN		PSI	PSI (BAR)	PSI	PSI (BAR)	FEET ³ /MIN	LITERS/MIN		BUNA-N	VITON
7	3/8"	1/4"	1/4"	44	27.8	2 1/2"	20	136	100	990	.11	.05	PVC	VPA7P-B	VPA7P-V
7	3/8"	1/4"	1/4"	44	27.8	2 1/2"	20	136	100	997	.11	.05	STAINLESS	VPA7S-B	VPA7S-V
10	1/2"	1/4"	1/4"	63	39.8	2 1/2"	20	136	100	591	.16	.08	PVC	VPA10P-B	VPA10P-V
10	1/2"	1/4"	1/4"	63	39.8	2 1/2"	20	136	100	599	.16	.08	STAINLESS	VPA10S-B	VPA10S-V
32	3/4"	1/2"	1/2"	200	126.2	4"	20	136	100	633	.53	.25	PVC	VPA32P-B	VPA32P-V
32	3/4"	1/2"	1/2"	200	126.2	4"	20	136	100	631	.53	.25	STAINLESS	VPA32S-B	VPA32S-V
128	1"	1/2"	1/2"	800	504.7	8"	10	68	40	278	2.14	1.01	PVC	VPA128P-B	VPA128P-V
128	1"	1/2"	1/2"	800	504.7	8"	10	68	40	276	2.14	1.01	STAINLESS	VPA128S-B	VPA128S-V

**BASED ON EIGHT (8) CYCLES PER MINUTE PUMPING WATER

SERIES "VPA" PUMP DIMENSIONS



PUMP DIMENSIONS	VPA7		VPA10		VPA32		VPA128	
	INCHES	millimetres	INCHES	millimetres	INCHES	millimetres	INCHES	millimetres
"A"	3 1/2" DIA.	88.9 DIA.	3 1/2" DIA.	88.9 DIA.	5 1/2" DIA.	139.7 DIA.	8 3/4" SQ.	222.2 SQ.
"B"	1 3/4"	44.4	1 3/4"	44.4	3 3/8"	79.3	5 1/2"	139.7
"C"	1 3/4"	44.4	1 3/4"	44.4	4"	101.6	4 1/4"	108.7
"D"	2 1/2"	63.5	2 1/2"	63.5	2 1/2"	63.5	2 1/4"	57.1
"E"	7 7/8"	200.0	10"	254.0	11 7/8"	301.6	13 3/4"	349.2
"F"	2 3/8"	60.3	2 3/8"	60.3	2 3/8"	60.3	9 3/4"	247.6
"G"	12 7/8"	327.0	15"	381.0	16 7/8"	428.6	18 1/4"	463.5
"H"	3 3/4"	82.5	4 1/4"	107.9	4"	101.6	4"	101.6
"I"	1 3/4"	44.4	1 3/4"	44.4	2 3/4"	69.8	4 3/8"	111.1
"J"	2 1/4"	57.1	2 1/4"	57.1	3 1/2"	88.9	6"	152.4

*FAIL-DRY registered trademark of PLAST-O-MATIC VALVES, INC. (see center page insert)

SERIES "VP" & "VPA" SUPPLEMENTARY DATA

SUCTION LIFT INFORMATION

Series "VP" and "VPA" pumps can self-prime themselves from a maximum recommended lift of 10 feet with liquids similar to water. To insure against loss of prime in the suction line, a foot valve must be used. (see "Suction Line Foot Valves" below).

INSTALLATION INFORMATION

MOUNTING: Series "VP" and "VPA" pumps should always be mounted with the end of the liquid discharge line higher than the inlet liquid source to eliminate siphoning through the pumps. The pumps can be mounted in any position, but preferably upright. Mounting brackets are supplied with the pumps along with 1/4-20x3/4 long mounting bolts and nuts. The hole layouts of the brackets are given in the charts on pages 23 and 24.

AIR SUPPLY AND CONNECTIONS: A filter and lubricator should be installed in the air supply line to obtain maximum pump cycle life. The air pressures and consumptions are listed in the pump charts on pages 23 and 24.

The air connections to the pumps are either 1/8 NPT or 1/4 NPT female pipe threads and these are listed in the pump charts. The "VP" pumps have one air connection at the bottom end of the pump which must be piped to the 3-way air valve.

The Series "VPA" pumps have two air connections, one at the bottom end of the pump and one in the middle flange. Both of these must be piped to the 4-way air valve.

LIQUID SUPPLY: If the liquid to be pumped contains abrasive solids, the pump cycle life can be shortened considerably. Consequently, the liquid should be filtered before entering the pump. This is especially important in pumps with plastic cylinder walls.

3-WAY AND 4-WAY AIR VALVES: The manually operated air valves that are used to run the pumps (3-way for "VP" and 4-way for "VPA") can be supplied by PLAST-O-MATIC but are not standard. Consult PLAST-O-MATIC if information is needed.

The automatic 3-way (for "VP") and the 4-way (for "VPA") air solenoid valves that are needed for automatic operation of the pumps are supplied by PLAST-O-MATIC as standard parts. See solenoid accessory section of catalog for proper selection. If explosion-proof installation is needed, then either the solenoids have to be ordered with explosion-proof housings, or they have to be mounted outside the explosion-proof area. If mounted outside the area, then only the air lines run to the pump and not the electrical lines.

SUCTION LINES: The suction lines for the "VP" and "VPA" pumps should be at least the same pipe or tubing size as that listed in the charts under "Inlet and Outlet Size" and should be kept as short as possible. The suction lift should be 10 feet or less with water or similar liquids, and even less for heavier liquids.

SUCTION LINE FOOT VALVES: It is recommended to install a foot valve at the end of the suction line to keep the entire suction line full of liquid at all times.

See foot valve accessory section of catalog for selection of foot valves for "VP" pumps, and see page 3 of catalog for Series "FV" foot valves for "VPA" pumps.

DISCHARGE LINES: The discharge lines for the "VP" and "VPA" pumps should be at least the same pipe or tubing size as that listed in the charts under "Inlet and Outlet Size". If the discharge lines are to be longer than 50 feet, increase the pipe or tubing to the next larger size.

The discharge lines can be piped to atmosphere or to a pressure line up to 60 PSI. When connected to a pressure line, the amount of pressure in that line would have to be added to the minimum cylinder operating pressure listed in the charts in order to obtain the actual air supply pressure needed.

VENT DISCHARGE ON "VPA" PUMPS ONLY: The Series "VPA" pumps have a vent port separating the top air pressure chamber from the liquid chamber to prevent the two from mixing. This vent should be piped to a receiving area when pumping dangerous liquids. If excessive leakage develops through this vent, it indicates that the liquid piston seals or the liquid cylinder is wearing and should be replaced. The vent is located in the middle flange of the "VPA" pump assembly — opposite the air connection and is always larger than the air connection. The sizes of the female threads for this vent port are listed in the "VPA" chart.

"VP" AND "VPA" STROKE ADJUSTMENT FOR METERED AMOUNT

ACCURACY: Once the metered amount is set and checked, the repeatability and accuracy is approximately 1/2 of 1%.

CALIBRATION: The stroke adjustment setting to achieve the metered amount required is a simple one; however, the amount delivered by the pump must be physically measured in a container to be sure of the setting. The maximum rated output (approximate) of the pump is obtained when the stroke adjustment bolt is positioned at dimension "H" in the charts. To get lesser amounts the bolt is simply turned into the pump end.

For your reference in relation to the distance required to turn the bolt in, a 3 ounce pump changes delivery at the rate of 1.8 ounces per inch, a 7 and 10 ounce pump at the rate of 2.7 ounces per inch, a 21 and 32 ounce pump at the rate of 7.0 ounces per inch, and a 128 ounce pump at the rate of 28.0 ounces per inch. Before attempting to turn the adjusting bolt, loosen the locking nut, and after setting the adjusting bolt, retighten the locking nut. Do not overtighten or the thread seal just above the locking nut will be damaged.

ORDERING INFORMATION

Order by Part Number and specify exact chemicals, concentrations, pressures, and temperatures. For special pump designs or different materials of construction consult our engineering department.

SERIES "A" CHEMICAL METERING SYSTEM

ELECTRIC PANEL TO CYCLE PLAST-O-MATIC'S AIR DRIVEN METERING PUMPS AND TO DELIVER LIQUID FLOW RATES FROM 1-OUNCE PER MINUTE TO 8 GALLONS PER MINUTE.

The Series "A" chemical metering system will alternately fill and discharge Plast-O-Matic's air driven metering pumps. This cycling can be repeated 4 or 8 times per minute. The pump(s) will run continuously until the system is manually turned off; however, this can be done automatically with a supplementary timer.

SYSTEM INDICATOR LIGHTS

The Series "A" system has two neon lights. The red light (left side) is on when electrical power is feeding the panel. The amber light (right side) is on when the pump(s) is discharging.

SYSTEM TOGGLE SWITCHES

The ON-OFF switch (left side) is for starting and stopping the pumping. The panel is manual as to the time it runs; however, a supplementary timer can be used to automatically control the time.

The System Selection switch (center) is marked "System #1" in the up position and "System #2" in the down position. The operator can select delivery from two different pumps or two different groups of pumps. "System #1" can never run simultaneously with "System #2".

The Cycle Selection switch (right side) is marked "8 cycles/minute" in the up position and "4 cycles/minute" in the down position. The 8 cycles/minute setting is generally applicable to liquids similar to water. It is recommended to use the 4 cycle/minute setting to reduce wear on the pumps, and to increase the filling time for more viscous liquids.

INSTALLATION OF PANEL

MOUNTING: A rotating mounting bracket is attached to offer a number of mounting positions and 1/4-20 x 3/4" long bolts and nuts are included. The hole layout is shown below.

POWER SOURCE: A 25 foot extension cord is supplied for the power source to the panel (115 V.A.C./60 cycles, 1 amp), and it gets plugged into the rear of the panel with the other end plugged into a standard wall outlet. If automatic control of the "ON" time is needed, this other end would go to a supplementary timer.

"SYSTEM #1 & "SYSTEM #2" RECEPTACLES: On the rear of the panel are two receptacles for electrically connecting the 3-way or 4-way solenoid valve(s). These receptacles are labeled "System #1" and "System #2" corresponding with the System Selector switch in front. Two 12 foot extension cords are supplied.

METERING PUMP SELECTION

The pump model to be selected is determined by the liquid. Series VP pumps have a stainless spring which must be compatible with the liquid. Series VPA pumps have no metal parts in the liquid and are used for highly corrosive applications. See pages 23, 24, and 25.

The size of the pump is determined by the liquid volume to be metered and the cycle rate (4 or 8 cycles/minute). For example, a VP7 pump set at 6 ounces per cycle and running at 4 cycles/minute will deliver 24 liquid ounces/minute.

ELECTRICAL INSTALLATION OF SOLENOID VALVES

TYPE OF SOLENOID VALVE: The Series "VP" pumps require a 3-way air solenoid valve, and the Series "VPA" pumps require a 4-way. Consult air solenoid accessory section of catalog for specifications.

SINGLE PUMP ON "SYSTEM #1" OR "SYSTEM #2": Simply connect the two wires at the one end of the supplied 12 foot extension cord to the two wires on the solenoid valve (either 3-way or 4-way). Plug other end of extension cord into System #1 or System #2 receptacle at rear of panel.

MULTIPLE PUMPS ON "SYSTEM #1" OR "SYSTEM #2": With multiple pump installations one solenoid valve should be used for each pump. One (1) amp is required to feed the panel with single pump installations; however, with multiple pumps more amps may be required. **DO NOT** exceed 5 amps total.

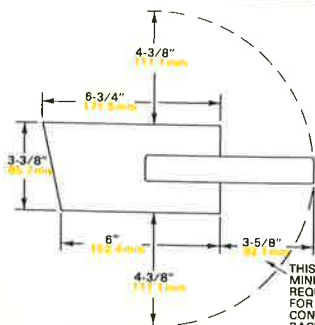
AIR LINE INSTALLATION OF SOLENOID VALVES

3-WAY FOR "VP" PUMPS: The 3-way air solenoid valves recommended by PLAST-O-MATIC are piped with the valve outlet port (marked #1) going to the bottom end of the "VP" pump, the valve inlet port (marked #2) going to the air supply, and the valve exhaust port (marked #3) going to atmosphere.

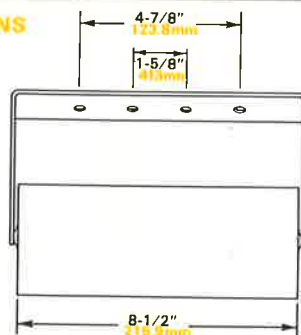
4-WAY FOR "VPA" PUMPS: The 4-way air solenoid valves recommended by PLAST-O-MATIC are piped with the valve inlet port (marked "pressure") going to the air supply, the outlet port (marked "cylinder A") going to the middle flange of the VPA pump, the outlet port (marked "cylinder B") going to the bottom end of the "VPA" pump, and the exhaust port (marked "exhaust") going to atmosphere.



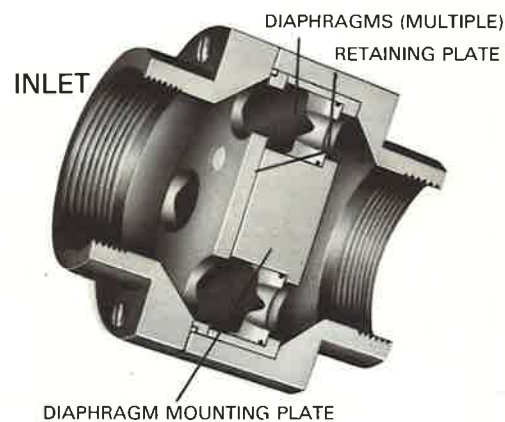
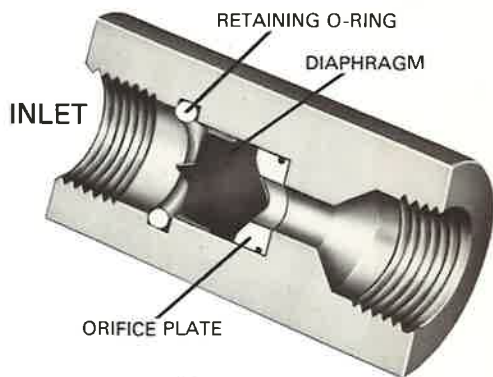
SERIES "A" DIMENSIONS



THIS DIMENSION IS THE MINIMUM CLEARANCE REQUIRED TO ALLOW FOR ELECTRICAL CONNECTIONS TO BACK OF PANEL



SERIES "FC" FLOW CONTROL VALVES



AUTOMATIC METERING FLOW CONTROL VALVES DESIGNED TO MAINTAIN A CONSTANT FLOW WITH CHANGES IN INLET PRESSURE FROM 10 PSI TO 150 PSI. NO METALS IN CONTACT WITH THE LIQUID.

IMPORTANT These flow controls are designed for liquids similar in viscosity to water. All applications should be tested for flow characteristics and chemical compatibility to insure desired results. Swelling of the diaphragms in certain liquids will result in loss of flow rate accuracy. An in-line strainer or filter should be installed before the flow control when suspended solids are present, and for all applications below 1.0 GPM.

ACCURACY The rated output of Series "FC" flow controls will vary $\pm 10\%$ with Buna-N assemblies and $\pm 15\%$ with Viton assemblies.

MATERIALS OF CONSTRUCTION

The standard Series "FC" flow controls are constructed of TYPE 1, GRADE 1 PVC (Polyvinyl Chloride) with diaphragms of either Buna-N or Viton. Stainless steel fasteners are standard.

OPERATION AND INSTALLATION

The Series "FC" flow controls are used to maintain a constant pre-determined flow in a system. They must be installed in the correct flow direction (indicated by label) to work properly. They utilize a diaphragm which changes shape with inlet pressure changes, thus maintaining a constant flow rate. Whenever possible, they are used to replace more costly metering pumps. Standard flow ranges are from 1/4 GPM to 96 GPM (see below chart). Special sizes are available upon request.

TEMPERATURE AND PRESSURE

The Series "FC" flow controls can operate from 32° - 140°F. with PVC bodies and either Buna-N or Viton diaphragms. With optional polypropylene bodies they can operate from 32° - 180°F. with Viton diaphragms, and 32° - 160°F. with Buna-N diaphragms. The Series "FC" flow controls must have at least 10 PSI (15 PSI for 9 GPM assembly only) inlet pressure in order to deliver the rated flow. Maximum pressure is 150 PSI.

ORDERING INFORMATION

Order by part number as follows: The basic number is given in the chart below; follow it with either "B" or "V" for Buna-N or Viton seals respectively. This is then to be followed by the required flow rate. **EXAMPLE:** a 3/8" NPT control with Viton seals having a 1/2 GPM flow rate is part number FC037V-1/2. Specify exact chemicals, pressures, and temperatures. For body materials other than PVC please contact our Sales Department.

SERIES "FC" PIPE SIZE (NPT)			1/4"		3/8"		1/2"		3/4"	
BASIC PART NUMBERS			FC025		FC037		FC050		FC075	
SERIES "FC" FLOW RATES GALLONS/MINUTE	NUMBER OF CONTROL ASS'Y IN HOUSING		OVERALL LENGTH INCHES	DIAMETER INCHES	OVERALL LENGTH INCHES	DIAMETER INCHES	OVERALL LENGTH INCHES	DIAMETER INCHES	OVERALL LENGTH INCHES	MAX. DIAMETER INCHES
1/4	00001	1	2 3/8	1 1/8	2 1/8	1 1/8	2 1/2	1 1/4		
1/2	00003	1	2 3/8	1 1/8	2 1/8	1 1/8	2 1/2	1 1/4		
3/4	00004	1	2 3/8	1 1/8	2 1/8	1 1/8	2 1/2	1 1/4		
1	00005	1	2 3/8	1 1/8	2 1/8	1 1/8	2 1/2	1 1/4		
1 1/2	00006	1	2 3/8	1 1/8	2 1/8	1 1/8	2 1/2	1 1/4		
2	00012	1	2 3/8	1 1/8	2 1/8	1 1/8	2 1/2	1 1/4		
3	00018	1							3 1/4	1 1/2
4	00025	1							3 1/4	1 1/2
5	00032	1							3 1/4	1 1/2
6	00038	1							3 1/4	1 1/2
7	00044	1							3 1/4	1 1/2
8	00050	1							3 1/4	1 1/2
9	00057	1							3 1/4	1 1/2
10-16	00063-00111	2							5	3 1/2
17-24	00107-00151	3							5	3 1/2

SERIES "FC" PIPE SIZE (NPT)			1"		1 1/4"		1 1/2"		2"	
BASIC PART NUMBERS			FC100		FC125		FC150		FC200	
SERIES "FC" FLOW RATES GALLONS/MINUTE	NUMBER OF CONTROL ASS'Y IN HOUSING		OVERALL LENGTH INCHES	MAX. DIAMETER INCHES	OVERALL LENGTH INCHES	MAX. DIAMETER INCHES	OVERALL LENGTH INCHES	MAX. DIAMETER INCHES	OVERALL LENGTH INCHES	MAX. DIAMETER INCHES
5	00072	1	3 1/2	2						
6	00078	1	3 1/2	2						
7	00084	1	3 1/2	2						
8	00090	1	3 1/2	2						
9	00097	1	3 1/2	2						
10-16	00103-00151	2	5	3 1/2	5	3 1/2				
17-24	00147-00195	3	5	3 1/2	5	3 1/2				
25-32	00191-00239	4			5 1/2	4	5 1/2	4		
33-40	00235-00283	5			5 1/2	4	5 1/2	4		
41-64	00279-00327	8					6 1/8	4 1/2	6 1/8	4 1/2
65-96	00321-00369	12						7 1/4	184.2	5 1/2

SERIES "AW" ACID WASTE PUMPING STATIONS

AUTOMATIC PUMPING STATIONS TO ECONOMICALLY COLLECT AND TRANSFER CORROSIVE WASTES FROM PRODUCTION MACHINES OR LABORATORY SINKS WHERE GRAVITY DRAINS CANNOT BE USED.

"AW" heavy duty all plastic acid waste pumping stations are available in four (4) models, AW-10, AW-15, AW-30, and AW-50. Compact in size, they easily fit under laboratory sinks or adjacent to production machinery. Designed for continuous operation at 180°F, intermittent to 210°F, they also offer optimum reliability for extended periods of time with a minimum amount of maintenance. "AW" stations are shipped in "ready to use" condition with pre-wired 120 volt A.C. line cord and 3 pole plug.

MATERIALS OF CONSTRUCTION

"AW" holding tanks are constructed of extra thick wall High Density Linear Polyethylene with Polypropylene tank inlets. Removable tank covers are Polypropylene with Nylon bolts and nuts. All wetted parts of "AW" pumps and level controls are CPVC with PVC mounting plates.

OPERATION

The "AW" station is completely automatic. As liquid waste enters the tank its level is sensed by the level control's float. The float will rise to a pre-determined level where it actuates the high level reed switch which engages a relay starting the pump. As the liquid level drops the level control's float also drops and actuates the low level reed switch shutting off the pump.

INSTALLATION

Attach liquid waste line to the inlet (FNPT) of the "AW" holding tank. It is recommended that the optional basket strainer be placed at this point in the system. Then attach piping to the pump discharge. To connect electrically, simply insert the unit's cord into a single phase, 120 volt, 60 hertz receptacle. For dangerous vapors pipe the tank vent to a safe area.

PUMPS

"AW" stations utilize "Series PL" vertical pumps which are virtually maintenance free having no bearings or seals and are all-plastic construction. These pumps, driven by heavy duty close connected TEFC motors, are designed to run dry without damage, handle slightly abrasive solutions, and perform superbly in the on/off type of operation which is typical of "AW" stations.

LEVEL CONTROLS

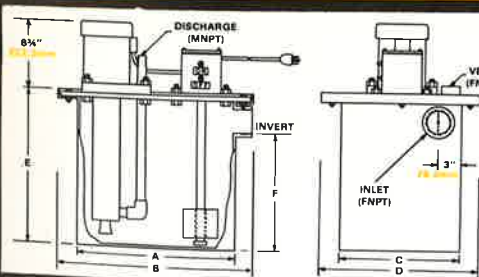
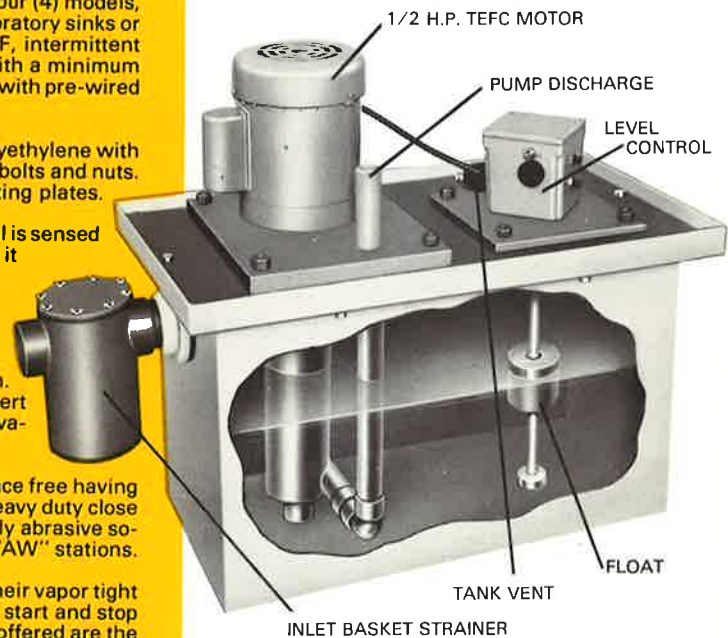
The level controls used in "AW" stations have 10 amp fuse protected relays in their vapor tight control heads. These relays are actuated by reed switches causing the pump to start and stop automatically at pre-determined tank levels. The two (2) types of level controls offered are the standard single float control and the optional double float control. The standard single float control, suitable for most applications, has a single large diameter float guided by a sealed float column. The float rises and falls with the liquid level to actuate switches in the sealed float column. A clearance of .260" between the float and the column minimizes malfunctions due to sediment build-up on the column. The optional double float control is recommended in applications where heavy sediment or crystalline deposits occur above the liquid/air interface.

OPTIONAL FEATURES

"AW" stations are also available with a DOUBLE FLOAT CONTROL which has two (2) large diameter floats permanently welded to their sealed float columns which rise and fall with the liquid level. A large capacity LINE STRAINER to protect the pump from damage by large objects is also available. This strainer, available in all PVC or all Polypropylene, fits directly into the holding tank inlet fitting. Also available is a HIGH LEVEL ALARM buzzer mounted in the face of the level control. It actuates an 80db signal at 2900 Hz if, for any reason, the liquid level rises above the normal "start pump" position.

ORDERING INFORMATION

When ordering "AW" acid waste pumping stations order by part number. Also specify optional features and their materials of construction. Shipping weights are specified below.



SERIES "AW" ACID WASTE PUMPING STATION DIMENSIONS

MODEL NO.	INCHES A	INCHES B	INCHES C	INCHES D	INCHES E	INCHES F	VENT SIZE (NPT)
AW-10	15 3/4"	19 1/8"	12 3/4"	16 1/4"	16 1/2"	12 1/2"	1"
AW-15	24 1/2"	27 3/4"	12 1/2"	15 3/4"	16 1/2"	11 1/2"	1 1/2"
AW-30	30 3/4"	34 1/2"	16 1/4"	20 1/2"	19 1/2"	14 1/2"	1 1/2"
AW-50	30 3/4"	34 1/2"	18 1/2"	22 1/2"	25 3/4"	20 1/2"	1 1/2"

SERIES "AW" CRATED SHIPPING WEIGHTS

POUNDS	AW-10	AW-15	AW-30	AW-50
	100	103	106	110
Kilograms	45.4	46.7	48.1	49.9

SERIES "AW" ACID WASTE PUMPING STATION SPECIFICATIONS

MODEL NO.	TANK INLET (NPT)	PUMP DISCHARGE (NPT)	MOTOR CHARACTERISTICS
AW-10	1 1/2"	1/2"	1/2 HP, 3450 RPM, 120/1/60 TEFC
AW-15	2"	1"	1/2 HP, 3450 RPM, 120/1/60 TEFC
AW-30	2"	1"	1/2 HP, 3450 RPM, 120/1/60 TEFC
AW-50	2"	1"	1/2 HP, 3450 RPM, 120/1/60 TEFC

PUMP PERFORMANCE CURVE

