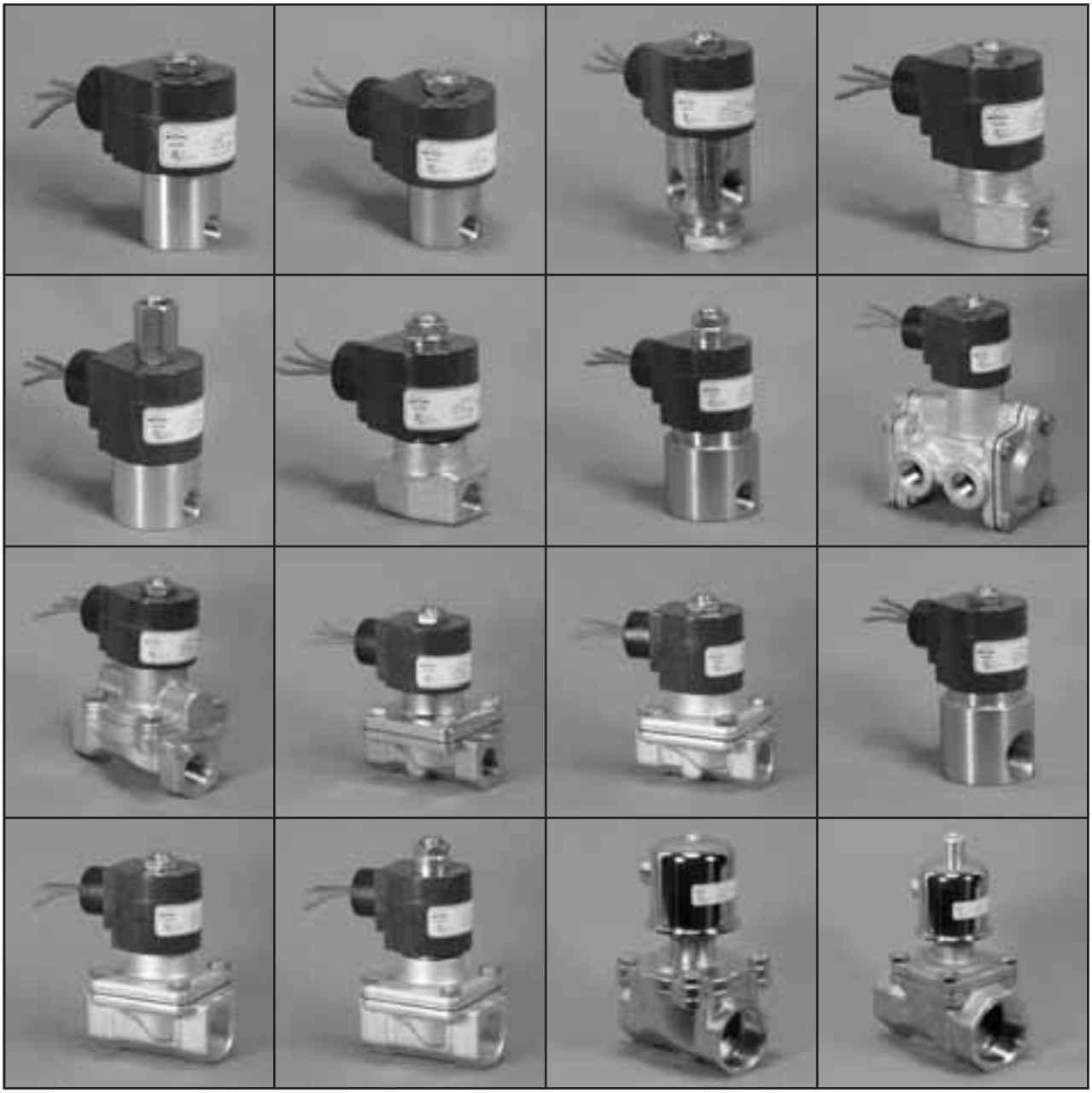


Engineering Guide and Valve Selection Information

G C
VALVES

GC Valves Delivers Quality from the Inside Out

We use only stainless steel hardware on our diaphragms. This includes the pilot orifice … a wear point for many competitive designs.

Our plungers are manufactured exclusively from 430FR stainless steel. Made only by a limited number of steel mills, 430FR is simply the best material available for solenoid operators. It combines excellent magnetic properties with a high degree of corrosion resistance.

Our plunger tubes are all TIG welded for superior quality, instead of deep drawn. The result is a quieter valve due to better tube head alignment, and a stronger, longer lasting valve. Our tubes are designed to exceed a 6000 psi burst pressure.

We believe in quality right down to our bolts and nuts. Most manufacturers save money on inexpensive hardware. We use stainless steel, because we believe our valves should resist corrosion outside as well as in.

We are especially proud of our coil designs. Years ago we decided to end coil problems by standardizing on high temperature coil windings for all our coils. In addition, our standard coil is a NEMA 4/4X construction.

GC Valves incorporates only proven time tested designs. The basic operators were designed by ITT General Controls and have been in continuous production for over 30 years. When combined with our commitment to the highest quality materials, these designs will yield years of trouble free operation. In fact, each operator is designed to operate –trouble free– for over 5,000,000 cycles.

Index

How To Select A Solenoid Valve

We offer a wide variety of General Purpose Solenoid Valves from which to choose. To select the valve that best suits your application, determine the following:

Valve Type and Operating Mode

Available configurations include:

2-Way Normally Closed—Two pipe connections (inlet and outlet) and one orifice to provide On-Off control. Valve is open when energized, closed when de-energized.

2-Way Normally Open—Two pipe connections (inlet and outlet) and one orifice to provide On-Off control. Valve is closed when energized, open when de-energized.

3-Way Normally Closed—Three pipe connections (one always open to one of the other two) and two orifices (one always open and one always closed) to regulate the direction of media flow. When energized, the flow is from the inlet port through the cylinder port; When de-energized, the flow is from the cylinder port through the exhaust port.

3-Way Normally Open—Three pipe connections (one always open to one of the other two) and two orifices (one always open and one always closed) to regulate the direction of media flow. When de-energized, the flow is from the inlet port through the cylinder port. When energized, the flow is from the cylinder port through the exhaust port.

3-Way Universal, Diverting & Selecting—Three pipe connections (one always open to one of the other two) and two orifices (one always open and one always closed) to regulate the direction of media flow. Valves can be installed to provide either normally closed (open when energized, closed when de-energized) or normally open (closed when energized, open when de-energized) operation. The valve can also be connected to select one of two flow media or to divert media flow from one port to another.

Pipe Connections

Pipe connections (ports) are openings which conduct the flow of the controlled media in and out of the valve. Factors influencing the selection of pipe sizes are the system's existing or designed pipe connection sizes and the flow requirements (Cv) of the application.

C_V Factor

Cv is the amount of water at standard conditions (60°F, specific gravity = 1) in GPM (gallons per minute) which will pass through the valve with a one psi (pound per square inch) pressure drop across the valve in the full open position. The appropriate Cv will determine which combination of pipe and orifice sizes will be required for the application. Refer to the "VALVE SIZING" and "Cv Factor" pages for additional information.

Maximum Operating Pressure Differential

Maximum operating pressure differential is the maximum difference in pressure (measured in psi or bar) between the inlet and the outlet valve ports. Factors influencing the maximum operating pressure rating include the pipe connection sizes, orifice size(s), and design of construction.

Operating Temperature

Sealing materials, coil class, body materials, and duty cycle all influence the valve's temperature capabilities. Operating temperature is determined by a combination of media and ambient temperatures.

Flow Media

Flow media is the substance being controlled by the valve. The media's temperature, pressure, and concentration will determine the type of body and sealing materials required for the application. Consult the ENGINEERING INFORMATION section for data on flow media and valve materials compatibility.

Power Requirements

Voltage and Cycles (Hertz) will usually be determined by the system's existing power specifications. VA is a measure of the solenoid's power consumption. The "inrush" VA rating is the maximum initial surge of current required to energize the coil, while "holding" VA is a lesser current required to hold the valve in its energized position. In either case, the solenoid's amperage is determined by dividing the VA rating by the applied voltage. Inrush and holding currents are identical for DC solenoids, and the rating is given in watts (watts DC = volts x amperes).

General Purpose Solenoid Valves

Direct Acting

S30

- 2- & 3-way
- Vacuum to 2400 psi
- C_v to 1.7
- Orifices to 3/8"
- Brass, SS bodies with Nitrile, Viton, EPR, Teflon, Rulon seals
- 1/8" to 3/8" NPT ports

S31

- 2- & 3-way
- Vacuum to 2400 psi
- C_v to 1.7
- Orifices to 3/8"
- Brass, SS bodies with Nitrile, Viton, EPR, Teflon, Rulon seals
- 1/8" to 3/8" NPT ports

S33

- 3-way, all ports in body
- 0 to 200 psi
- C_v to .38
- Orifices to 11/64"
- Brass, SS bodies with Nitrile, Viton, seals
- 1/8" & 1/4" NPT ports

Piloted Diaphragm

S20

- 2-way Zero Differential; 3-way
- Vacuum to 200 psi
- C_v to 23
- Orifices to 1-1/4"
- Brass, SS bodies with Nitrile, Viton, EPR seals
- 3/8" to 1-1/2" NPT ports

S21

- 2-way
- 1 to 250 psi
- C_v to 29
- Orifices to 1-1/2"
- Brass, SS bodies with Nitrile, Viton, EPR, Teflon seals
- 3/8" to 2" NPT ports

S27

- 2-way Zero Differential
- Vacuum to 125 psi
- C_v to 28
- Orifices to 1-1/4"
- Brass, SS bodies with Nitrile, Viton, EPR seals
- 1" to 2" NPT ports

Piloted Piston

S40

- 2-way
- Vacuum to 1200 psi
- C_v to 18.75
- Orifices to 1-1/8"
- SS, Brass bodies with Nitrile, Viton, Teflon seals
- 1/4" to 1-1/4" ports

Lever Acting

K13

- 3-way Fuel Oil Recirculating Valve
- 0 to 275 psi
- C_v to 1.27
- Orifices to 13/32"
- Brass body with metal seat
- 3/8" to 3/4" NPT ports

Automotive

PV1C

- 2-way Fuel Valve
- 0 to 300 psi
- C_v to 1.0
- Orifices to 1/4"
- Die Cast Aluminum body with Nitrile seal
- 1/8", 1/4" NPT ports

Interface Assembies

DIRECT OR MANIFOLD MOUNT

- 6.3 C_v piloted diaphragm assembly for direct mount on OEM equipment
- 1" (inlet) x 3/4" NPT (outlets) manifold
- 3-way configurations available
- Brass or Stainless Steel

Options

- Metering
- Manual Override
- DIN molded connector/cable
- DC Rectified coils
- Corrosion resistant coatings/seals
- Timers
- Stainless Steel trim
- DC Magnetic Latching operators
- Nickel Plating

Industrial Solenoid Valve Applications

Air & Water

GENERAL PURPOSE

- 2- & 3-way
- Vacuum to 2400 psi
- C_v to 2.9
- Orifices to 1 1/2"
- Brass, SS bodies with Nitrile, Viton, EPR, Teflon, Rulon seals
- 1/8" to 2" NPT ports

Hot Water & Steam

HIGH TEMPERATURE

- 366º F Max. Fluid Temp.
- 2- & 3-way
- 0 to 2400 psi
- C_v to 29
- Orifices to 1-1/2"
- Brass, SS bodies with EPR, Teflon, Rulon seals
- 1/8" to 2" NPT ports

Zero Differential

TO 2" NPT

- 2- & 3-way
- Vacuum to 2400 psi
- C_v to 28
- Orifices to 1-1/4"
- Brass, SS bodies with Nitrile, Viton, EPR, Teflon, Rulon seals
- 1/8" to 2" NPT ports

Vacuum

TO 10^{-6} TORR

- 2-way
- Brass & SS bodies
- Normally Closed & Normally Open
- 1/8" to 2" NPT ports
- for Ultra-High Vacuum, contact GC Valves

Cryogenic

S30, S31 & S40

- Specially coated plungers and tubes
- Exclusive reinforced seals
- Ultrasonically Cleaned
- Intended for liquid oxygen, liquid argon, liquid nitrogen

Chemicals

INERT

- 2- & 3-way
- SS bodies with Nitrile, Viton, EPR, Teflon, Rulon seals
- 1/8" to 2"ports
- corrosion resistant coatings and seal materials available

High Pressure

TO 2400 PSI

- 2-way Normally Closed to 2400 psi
- 2-way Normally Open to 1200 psi
- 3/8" Orifice
- Stainless steel body and seats
- 1/4", 3/8", 1/2" NPT ports

Safety Shutoff

UL/FM/CSA

- 2-way, Normally Closed
- 0 to 300 psi
- 1/8" to 1/2"NPT
- Fuel Oil
- Natural Gas
- LP Gas

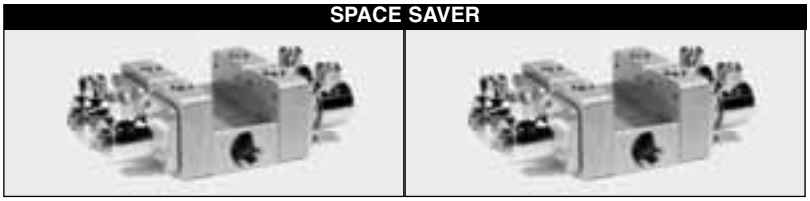
Explosion Proof

NEMA 7

- 1/8"to 2" NPT available on most
- 2-way Normally Closed & Normally Open Designs
- 3-way Normally Closed, Normally Open & Universal Designs
- 0 - 300 psi

Manifolds/Assemblies

SPACE SAVER



- Direct Acting & Piloted designs
- 2- & 3-way; custom engineered
- Brass, SS, AL, Acetal bodies

Electrical Equipment Enclosure Description

The following information is transcribed from the requirements of NEMA and the American Institute of Electrical Engineers covering various classifications of the Underwriters' Laboratories. These requirements are listed for reference purposes only. They are taken from the requirements of the approval associations or engineering groups. They are not necessarily an indication of what should be sold in the way of control apparatus. GC Valves does not supply all types of enclosures on all valves designs. (Contact GC Valves Customer Service for specific combinations.)

NEMA Enclosure Types

In non-hazardous locations, the specific enclosure types, their applications, and the environmental conditions they are designed to protect against, when completely and properly installed, are as follows:

Type 1 - Enclosures constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment and to provide a degree of protection against falling dirt.

Type 4 - Enclosures constructed for either indoor or outsoor use to provide a degree of protection against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water; and that will be undamaged by the external formation of ice on the enclosure.

Type 4X - Enclosures constructed for either indoor or outdoor use to provide a degree of protection against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, hose-directed water, and corrosion; and that will be undamaged by the external formation of ice on the enclosure.

Type 7 — (C or D) Hazardous Locations Class I — Air-Break (Specific to our rating)

These enclosures are designed to meet the application requirements of the National Electrical Code for Class I, Hazardous Locations, which may be in effect from time to time. In this type of equipment, the circuit interruption occurs in air.
Group C — Atmospheres containing ethyl-ether vapors, ethylene, or cyclo-propane.
Group D — Atmospheres containing gasoline, hexane, naptha, benzine, butane, propane, alcohol, acetone, benzol, lacquer solvent vapors, or natural gas.
GROUP E — Atmospheres containing metal dust, including aluminum, magnesium and their commercial alloys, and other metals of similar hazardous characteristics.
GROUP F — Atmospheres containing carbon black, coal, or coke dust.
GROUP G — Atmospheres containing flour, starch, or grain dust.

Voltage Changeover

S201, S202, S271, S272, S333, S334, S336 – AC to AC; DC to DC

Please note that unlike many of the older ITT designs, the valves listed above cannot be retrofitted from AC to DC or DC to AC by changing the coil. DC valves feature a chamfered interface between the plunger and plunger tube, while AC versions do not. AC and DC valves also have different spring configurations.

S21

Standard designs can be converted from AC to AC and DC to DC voltages. They may not be changed from AC to DC or DC to AC voltages. High performance versions can be converted from AC to DC but not from DC to AC.

S30, S31, and S40 – AC to AC; AC to DC; DC to DC

These ITT-designed valves can be converted from AC to AC, AC to DC, and DC to DC voltages. They may not be changed from DC to AC.

K13 – AC to AC; DC to DC

K13 can be converted from AC to AC or DC to DC voltages only. They may not be changed from AC to DC or DC to AC.

Notes:

- Changing voltages may change the maximum operating pressure may be reduced. Check catalog for applicable new operating pressure information or contact GC Valves Customer Service.
- Always insure that the correct temperature rated coil (Class F to Class F or Class H to Class H) is used when changing voltages.
- Changeovers should be restricted to those areas where you are aware of all the operating and electrical characteristics of the valve after the voltage change. If in doubt, contact GCV Customer Service.
- It should be noted that changing voltage by coil change in the field may make the valve pressure rating different from that printed on the nameplate.
- To assist in customer identification of voltage changes, contact GC Valves Customer Service for voltage stickers or new nameplates to indicate the new voltage and new operating parameters.

Seal Material & Shading Ring Codes – Position 9

Code	Seal	Shading Ring	Code	Seal	Shading Ring	Code	Seal	Shading Ring
C	EPR	Copper	L	Viton	Silver	T (S21)	Teflon/EPR	Copper
E	EPR	Silver	N	Nitrile	Copper	T (H40)	Teflon/Viton	Copper
J	Nitrile	Silver	R	Rulon	Silver	V	Viton	Copper
K	Teflon	Silver	S	Teflon	Copper			
K (S21)	Viton	Copper	T	Teflon	Copper			

Voltage Codes - Position 7 & 8

Code	Voltage	Code	Voltage	Code	Voltage
01	24 vac/60hz	14	6 vdc	24	24 vac/50hz
02	120 vac/60hz	15	12 vdc	33	48 vdc
03	208 vac/60hz	16	24 vdc	54	240 vac/50hz
04	240 vac/60hz 220 vac/50hz	17	32 vdc	55	380 vac/50hz
07	480 vac/60hz 440 vac/50hz	18	120 vdc	74	74 vdc

**** For Additional Variations Contact GC Valves Customer Service.***

Valve Sizing & Cv Flow Factor

Valve Sizing Procedures

The successful operation of a controlled system depends on proper sizing of the valve. A practical method — utilizing a graphical presentation of valve sizing based on the Cv ("C" sub "v") ratings of valves — is presented for the GC Valves general purpose designs.

The Cv rating of any valve is the flow rate of water at standard conditions (60˚F, specific gravity = 1) in GPM (gallons per minute), which will pass through the valve with a one psi (pound per square inch) pressure drop across the valve when in the full open position. This rating is determined by the manufacturer's tests and is published in catalogs and specification sheets.

A valve so restricted or ported which passes 1 GPM of liquid with a specific gravity of 1 and an accompanying pressure drop of 1 psi is assigned a rating of Cv = 1. By comparison, a valve having a Cv = 2 would have twice the flow capacity with the same pressure drop.

Please contact GC Valves Customer Service for assistance in determining the required flow factor for your application.

Flow Charts

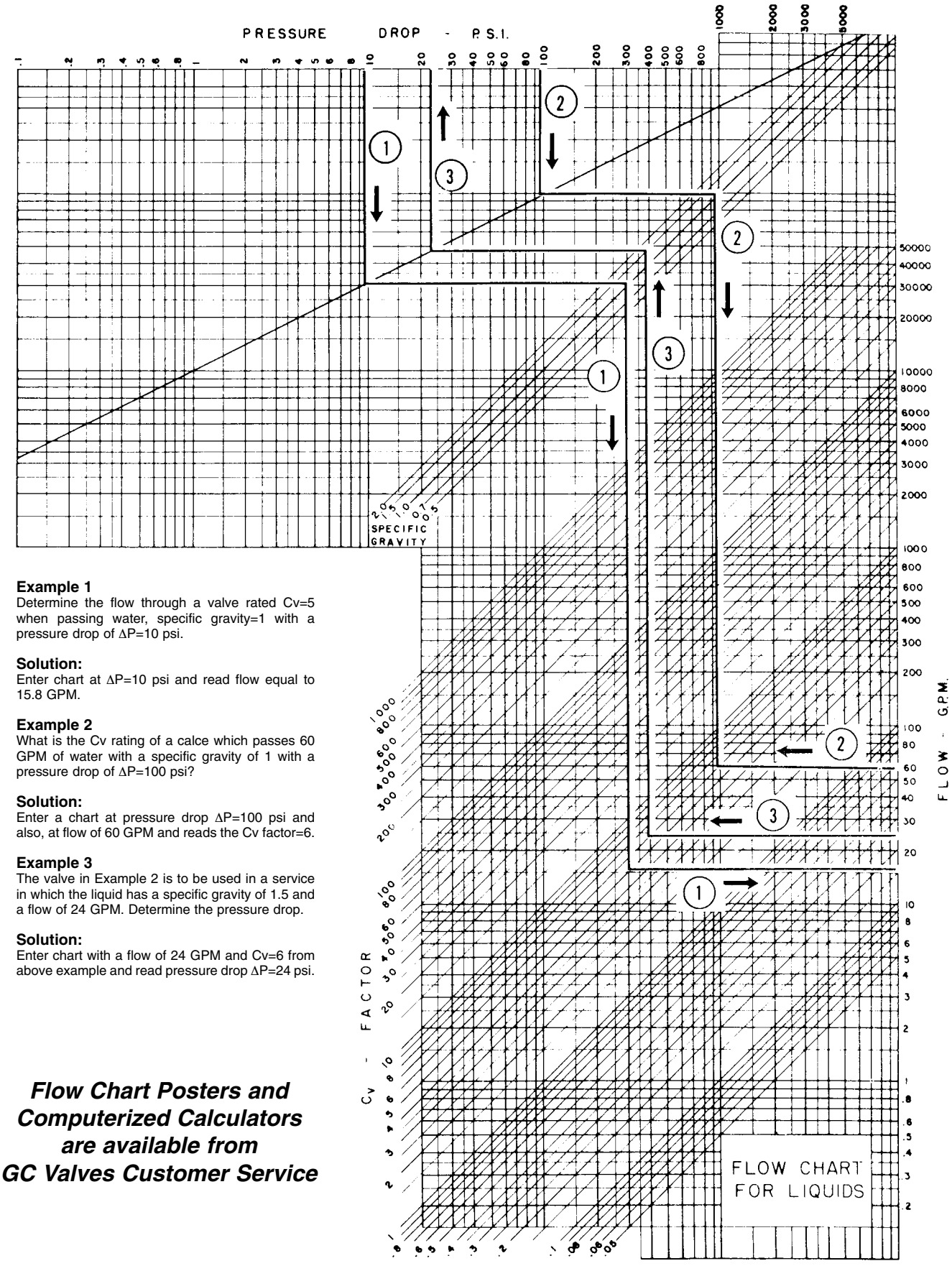
The two charts, shown on the following pages, are presented to assist in the proper selection of valves. These charts provide a convenient and rapid means of solving fluid flow equations and are similar in nature, having a common basis. The two flow charts, one for liquids, the other for compressible fluids, are useful for valve sizing for normal applications.

The use of the liquid flow chart is recommended for water and other liquids having relatively low viscosities. Liquids having high viscosities such as glycerine, Bunker "C", and other heavy grade oils are not directly applicable to this chart. Valve selection for use with high viscosity fluids should be referred to GC Valves for recommendations.

The flow chart for compressible fluids such as air and gases is also relatively accurate for the flow of saturated steam. Although the assumption for saturated steam flow is not strictly valid, the valves taken from this chart will be sufficiently accurate for most flow problems.

Examples of typical problems of valve sizing are presented on the charts. Quite often in practice it is necessary to assume one or more properties of the fluid or the flow conditions. When arbitrarily assuming a factor affecting flow, it is advisable to determine and evaluate the effects of an error in the estimated value. In many cases an error in the data will not noticeably affect the proper valve sizing.

Liquid Flow Chart



Example 1
Determine the flow through a valve rated Cv=5 when passing water, specific gravity=1 with a pressure drop of ΔP=10 psi.

Solution:
Enter chart at ΔP=10 psi and read flow equal to 15.8 GPM.

Example 2
What is the Cv rating of a calce which passes 60 GPM of water with a specific gravity of 1 with a pressure drop of ΔP=100 psi?

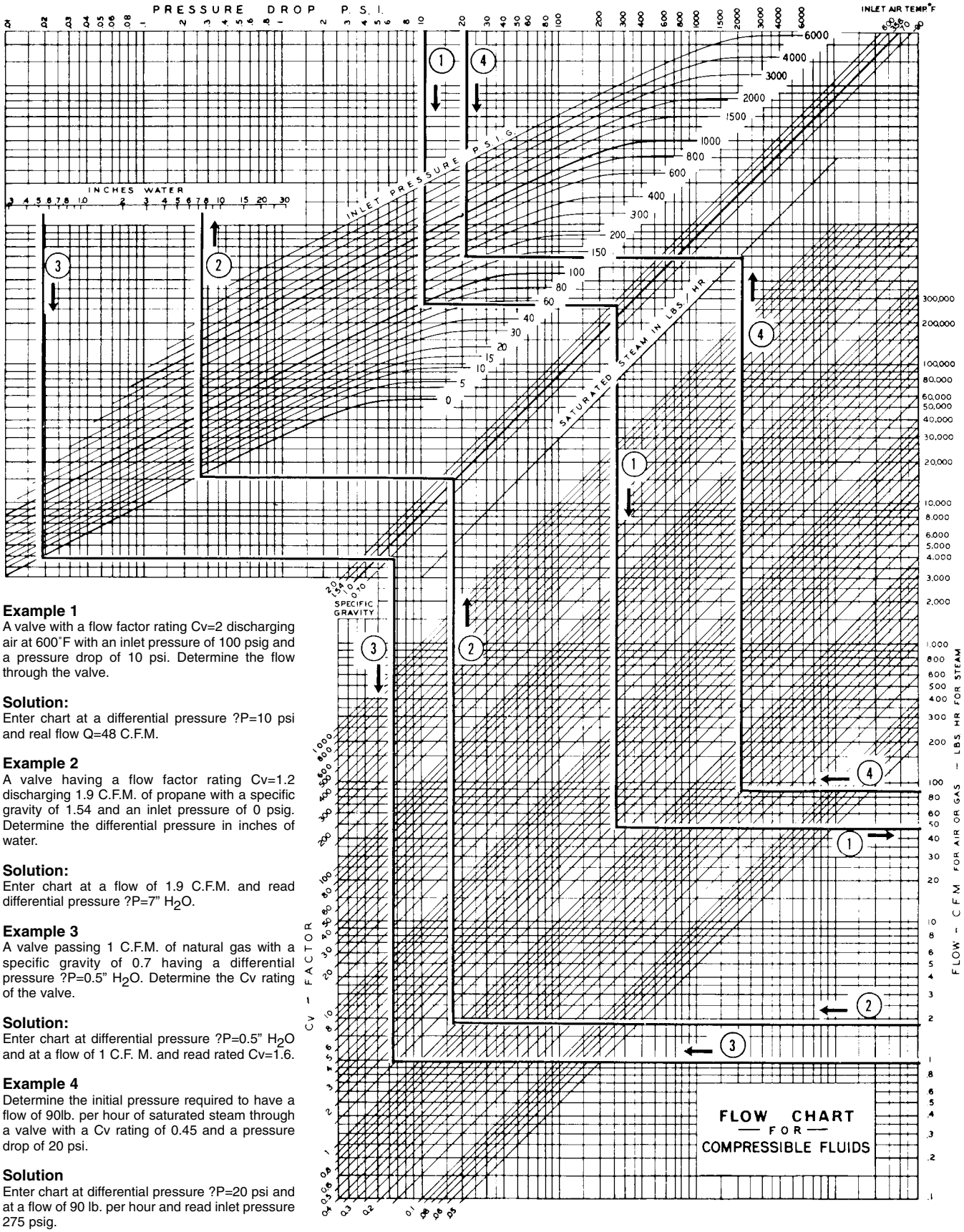
Solution:
Enter a chart at pressure drop ΔP=100 psi and also, at flow of 60 GPM and reads the Cv factor=6.

Example 3
The valve in Example 2 is to be used in a service in which the liquid has a specific gravity of 1.5 and a flow of 24 GPM. Determine the pressure drop.

Solution:
Enter chart with a flow of 24 GPM and Cv=6 from above example and read pressure drop ΔP=24 psi.

Flow Chart Posters and Computerized Calculators are available from GC Valves Customer Service

Compressible Fluid Flow Chart



Example 1
A valve with a flow factor rating Cv=2 discharging air at 600˚F with an inlet pressure of 100 psig and a pressure drop of 10 psi. Determine the flow through the valve.

Solution:
Enter chart at a differential pressure ?P=10 psi and real flow Q=48 C.F.M.

Example 2
A valve having a flow factor rating Cv=1.2 discharging 1.9 C.F.M. of propane with a specific gravity of 1.54 and an inlet pressure of 0 psig. Determine the differential pressure in inches of water.

Solution:
Enter chart at a flow of 1.9 C.F.M. and read differential pressure ?P=7" H_2O.

Example 3
A valve passing 1 C.F.M. of natural gas with a specific gravity of 0.7 having a differential pressure ?P=0.5" H_2O. Determine the Cv rating of the valve.

Solution:
Enter chart at differential pressure ?P=0.5" H_2O and at a flow of 1 C.F. M. and read rated Cv=1.6.

Example 4
Determine the initial pressure required to have a flow of 90lb. per hour of saturated steam through a valve with a Cv rating of 0.45 and a pressure drop of 20 psi.

Solution
Enter chart at differential pressure ?P=20 psi and at a flow of 90 lb. per hour and read inlet pressure 275 psig.

Valve Characteristics

Viscosity • Specific Gravity

Viscosity is the internal friction of a fluid tending to reduce flow. It varies greatly with temperature as well as from one fluid to another. The viscosity for liquids decreases with a rising temperature. The flow of a liquid such as water or gasoline having a low viscosity is not greatly affected by this internal friction. With liquids having high viscosities of 3000 SSU and above, such as glycerine, tar, and asphalt base crude oils, the effect of viscosity on flow is significant and should not be neglected. For applications of extremely viscous fluids, please contact GC Valves Customer Service.

Specific Gravities of Common Gases and Liquids

The specific gravity of fluid decreases with an increase in temperature. The effect of this change with respect to flow is negligible. For practical applications of Valve sizing, the average value of specific gravity for a fluid is sufficiently. Specific gravity varies greatly from one fluid to another, as indicated by the average values of specific gravities for the more common fluids listed below.

Vacuum Applications

Industrial vacuum also known as, low vacuum (760 Torr to 25 Torr) can be handled by many of the standard GC Valve designs. No special order codes are necessary, however—so that appropriate records may be kept—please contact GC Valves when a valve is intended for vacuum service. Standard valves suitable for use in industrial vacuum applications are:

- S201
- S271
- S30 (2 way)
- S401
- S202
- S272
- S31 (2 way)

Cryogenic Applications

Certain GC Valve designs can be modified for use in Cryogenic Applications. Typical applications include Liquid CO2 and Liquid Nitrogen. Please contact GC Valves Customer Service for additional information.

Gases (Referenced to Air*)

Gases	Specific Gravity	Gases	Specific Gravity	Gases	Specific Gravity
Acetylene	.897	Helium	0.138	Nitric Oxide	1.039
Air	1.000	Hydrogen	0.069	Nitrous Oxide	1.527
Butane	2.050	Hydrogen Sulfide	1.190	Oxygen	1.103
Carbon Dioxide	1.516	Illuminatating Gas	0.400	Propane	1.550
Carbon Monoxide	0.967	Methane	0.554	Sulphur Dioxide	2.208
Chlorine	2.423	Methylamine	1.080		
Dimethylamine	1.521	Methyl Chloride	1.785		
Ethane	1.049	Methyl Flouride	1.195		
Ethylene	0.967	Natural Gas	0.570		
Flourine	1.312	Nitrogen	.966		

*Average weight 0.0763 pounds per cubic foot at standard air temperatures, 60º F and 14.7 psia pressure. (29.92 in Hg)

Liquids (Referenced to Water**)

Liquids	Specific Gravity	Liquids	Specific Gravity	Liquids	Specific Gravity
Acetic Acid	1.05	Ether	0.73	Oelic Acid	0.90
Acetone	0.79	Ethyl Acetate	0.90	Ethyl Acetate	0.82
Alcohol, commercial	0.83	Fuel Oil	0.82	Phosphoric Acid	1.75
Alcohol, ethyl	0.79	Gasoline	0.72	Sulfuric Acid	1.83
Alcohol, methyl	0.81	Glycerine	1.26	Tar	1.00
Chlorine	0.66	Hydrochloric Acid		Turpentine Oil	0.87
Dimethylamine	1.27	Concentrated	1.19	Vinegar	1.07
Brine		Hydroflouric Acid		Water	1.00
Ethylene	1.23	Concentrated	0.99	Water, Sea	1.02
Flourine	1.19	Kerosene	0.81		
Bromine	2.97	Linseed Oil	0.94		
Carbolic Acid	0.96	Milk	1.03		
Carbonic Acid	0.92	Mineral Oil	0.92		
Carbon Disulfide	1.26	Muriatic Acid	1.20		
Carbon Tetrachloride	1.59	Naphtha	0.77		
Chlorine	1.56	Nitric Acid	1.50		

**Average weight 62.4 pounds per cubic foot at ordinary air temperatures, 60º F.

Material Selection Guide for Corrosive Media

GC VALVES

	SEALS					SHADING RINGS	METALLIC COMPONENTS					
	Nitrile	EPR	Viton	Teflon	Copper	Silver	S.S. 302, 303, 304	S.S. 316	S.S. 430	Bronze	Brass	Aluminum
Acetone	U	S	U	S	S	S	F	F	F	S	S	F
Acetylene	S	S	S	S	U	U	S	S	S	U	U	S
Acetic Acid, 10%					U	F	S	S	F	U	U	F
Acetic Acid, Pure	T	U	U	S	U	S	F	S	F	U	U	S
Alcohol, Ethyl (Ethanol)	S	S	S	S	F	S	F	F	F	F	F	F
Alcohol, Methyl (Methanol)	S	S	U	S	S	S	S	S	S	S	S	F
Alcohol, Isopropyl	S	S		S		S	S	F		S		
Ammonia	F		U	S	U	U	S	S	S	U	U	F
Argon	F						S	S	S	U	U	U
Benzene	U	U	F	S	S	S	S	S	S	S	S	S
Butane	T	U	S	S	S		S	S	S	S	S	S
Carbon Dioxide, Dry	T	T	T	S	S	S	S	S	S	S	S	S
Carbon Tetrachloride	U	U	S	S	T	F	F	F	F	F	T	U
Chlorine, Anhydrous Liquid	U		S	S	T		U	U	F	T	U	
Chlorine, Gas	U	U	F	F	T	F	U	F	U	T	U	T
Coffee	S		S	S	S		S	S	S	S	S	
Coke Oven Gas	T	U	F	S	S	S	S	S	S	T	U	S
Freon 11	F	U	U	S	S	S	S	S	S	S	S	S
Freon 12	S	U	U	S	S	S	S	S	S	S	S	S
Freon 13	S	T	U	S	S	S	S	S	S	S	S	S
Freon 21	U	U		S	S	S	S	S	S	S	S	S
Freon 22	U	T	U	S	S	S	S	S	S	S	S	S
Freon 502	U		U	S	S	S	S	S	S	S	S	S
Freon 1301 (Fire Ext.)	S		F		S		S	S	S	S		
Gasoline	T	U	S	S	T	S	S	S	S	S	S	T
Hydrocarbons (Chlorinated)	T	U	F	S	S	F	F	F	F	S	S	S
Hydrogen	S	S	S	S	S	S	S	S	S	S	S	S
Hydrogen Peroxide	T	T	S	S	U	U	T	F	T	U	U	F
Ink (Non Alkaline)	F		S	S		T	U	S	S			T
Kerosene	S	U	S	S	S	S	S	S	S	S	S	S
LPG	F	U	S		S	S	S	S	S	S	S	S
Methyl Ethyl Ketone (MEK)	U	F	U	S	S	F	F	F	F	S	S	S
Milk	S	S	S	S	S		S	S	S	S	S	S
Naptha	S	U	F	S	F	S	S	S	S	F	F	S
Natural Gas	S	U	S	S	F	S	S	S	S	T	S	S
Oil, Cooking		U	S		S		S	S			S	
Oil, Fuel	S	U	S	S	T	S	S	S	S	S	S	S
Oil, Hydraulic, MIL-H-5606	S	U	S	S	S	S	S		S		S	S
Oxygen	T		S	T	S	F	S	S	S	S	S	S
Perchlorethelyne	U	U	S	S	F	S	F	F	F	F	F	T
Phosphoric Acid (Aerated)	T	F	S	S	U	F	T	F	U	U	U	T
Phosphoric Acid (Air Free)	T	F	S	S	T	F	T	F	U	T	T	U
Sewage	S	S	S	S	F			U				U
Stoddards Solvent	S	U	S				S	S	S	S	S	
Sulfric Acid	U	T	S	S	U	U	T	T	T	U	U	F
Toluene	F	U	S	S	S	S	S	S	S	S	S	S
Trisodium Phosphate (TSP)	S			S	T	F	T	S	F			U
Turpentine	S	U	F	S	F	S	F	F	F	F	F	F
Vinyl Chloride				S	U		T	F		U	U	
Water, Boiler Feed	S		T	S	F	S	S	S	S	F	T	F
Water, Carbonated	S		S	S	F			S	S	F	F	F
Water, Condensate	S	S	T	S	F	S	S	S	S	F	T	F
Water, Distilled	F	S	S	S	S	S	S	S	S			
Water, Demineralized	F	S	S	S	S	S	S	S	S			
Water, Deionized	F	S	S	S	S	S	S	S	S			
Water, Sea	S	S	S	S	F	S	F	F	U	S	U	U

S — Satisfactory

F — Fair

T — Test (May or may not be used)

U — Unsatisfactory

CAUTION:
This material selection guide must be treated as a guide only. There are a number of factors such as temperatures, pressure, and concentration of solution that can change a Satisfactory (S) rating into a Fair (F) or Unsatisfactory (U) rating.

For specific materials recommendation on your application, contact GC Valves Customer Service.

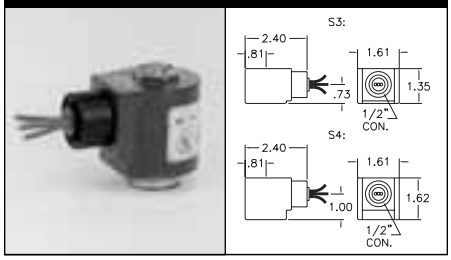
Be prepared to provide a complete description including media, temperature, pressures, and flow rates required.

Standard Enclosures

Housing Codes - Position 5

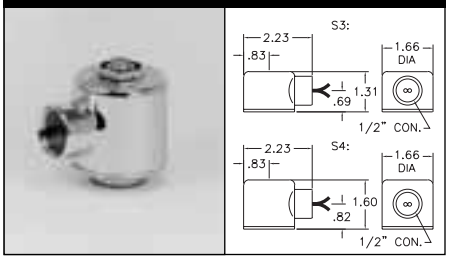
Conduit – Coil Family S3 & S4

G



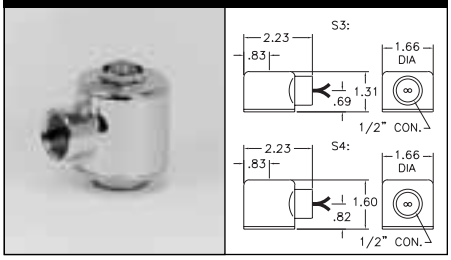
NEMA 4/4X; Fully encapsulated, 24 inch lead wires, 1/2" conduit hub

A



NEMA 1; Metallic housing, 24 inch lead wires, 1/2" conduit hub

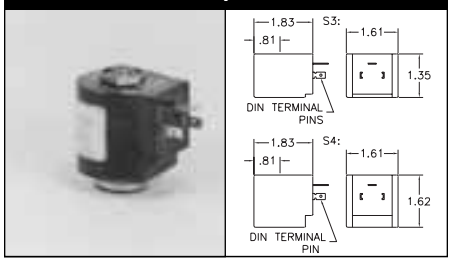
W



NEMA 4; Metallic housing, 24 inch lead wires, 1/2" conduit hub

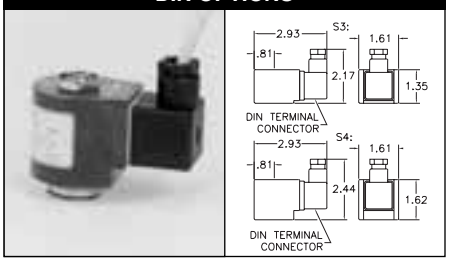
DIN – Coil Family S3 & S4

Y



ISO; Fully encapsulated, spade terminal, European configuration, NEMA 4

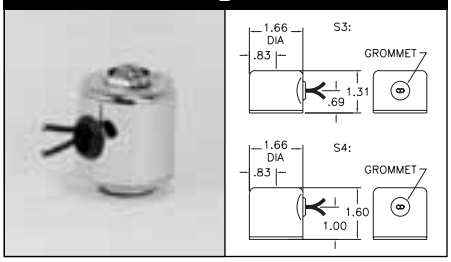
DIN OPTIONS



ISO; Molded connectors, cables, timers etc. designed for DIN coil/housing

Grommet – Coil Family S3 & S4

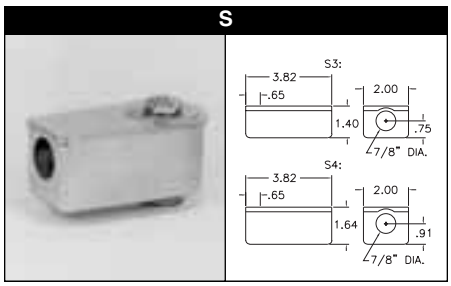
B



Metallic housing, 24 inch lead wires

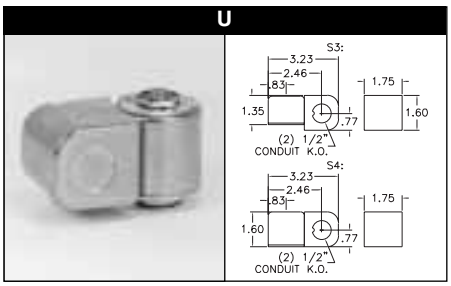
Junction Box – Coil Family S3 & S4

S



Standard – with 1/2" conduit knockout, lead wires

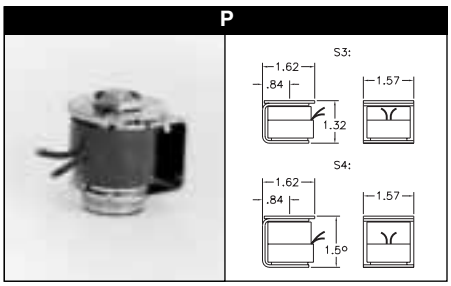
U



Compact with two 1/2" conduit knockouts, lead wires

Open Frame – Coil Family S3 & S4

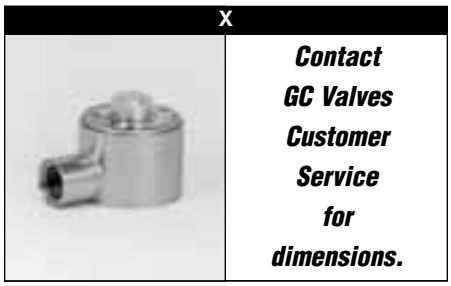
P



24 inch Lead Wires

NEMA 7 – Coil Family S3 & S4

X

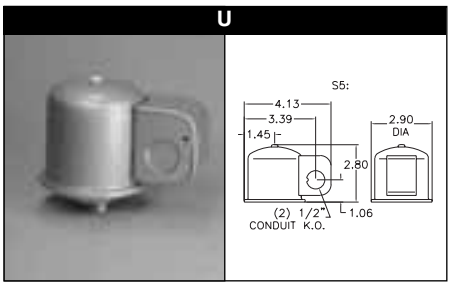


Contact GC Valves Customer Service for dimensions.

Explosion Proof; 24 inch lead wires, 1/2" conduit hub Class I & II Groups C, D, E, F & G, Division 1 & 2

Junction Box – Coil Family S5

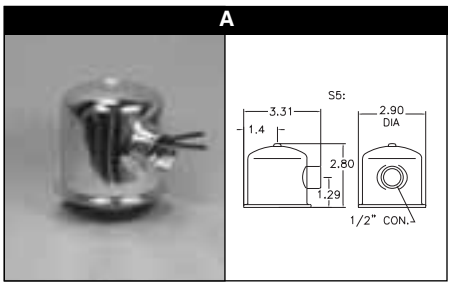
U



Compact with two 1/2" conduit knockouts, lead wires

Conduit – Coil Family S5

A



NEMA 1; Metallic housing, 24 inch lead wires, 1/2" conduit hub