



GC Valves

A DEMA Company

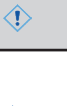
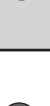
SPECIALISTS IN FLUID CONTROL

VALVE SELECTION INFORMATION & ENGINEERING GUIDE



GC VALVES PRODUCT LINE



Series	Media	Connection	Function	Orifice Range	Pressure Range	Max Fluid Temp	Cv Range	Approvals	Valve Body	Seal Materials
 S30		1/8"-3/8" NPT	NC, NO, 3-WAY	1/32"-3/8"	0-2400 PSI	366° F	.03-1.3		 (304)	Nitrile, FKM, GFLT, EPDM, PTFE, FFKM, Rulon
 S31		1/8"-3/8" NPT	NC, NO, 3-WAY	1/32"-3/8"	0-2000 PSI	366° F	.03-1.3		 (304)	Nitrile, FKM, GFLT, EPDM, PTFE, FFKM, Rulon
 S33		1/8"-1/4" NPT	3-WAY	1/16"-11/64"	0-200 PSI	295° F	.09-.38		 (304)	Nitrile, FKM, EPDM
 SC91		10-32"-1/4" NPT	NC, NO, 3-WAY	1.0mm-3.0mm	0-580 PSI	366° F	0.035-0.280		 (316)	Nitrile, FKM, EPDM, PTFE, FFKM
 SC31		1/8"-1/4" NPT	NC, NO	3.0mm	0-580 PSI	176° F	0.280			Nitrile, FKM, EPDM, PTFE, FFKM
 SC41		1/4" NPT	NC, NO, 3-WAY	0.5mm-4.0mm	0-2030 PSI	366° F	0.011-0.350		 (304)	Nitrile, FKM, EPDM, PTFE, FFKM
 S40		1/4"-1/2" NPT	NC, NO	3/8"	0-300 PSI	366° F	0.8-1.5		 (304)	Nitrile, FKM, EPDM, PTFE
 H40		1/4"-1/2" NPT	NC, NO	3/8"	0-2200 PSI	366° F	0.8-1.5		 (304)	FKM, PTFE
 SP31		3/4"-2" NPT	NC, NO	27mm-55mm	5-150 PSI	122° F	2.4-41			NR
 SP91		1/2"-1" NPT	NC, NO	12mm-27mm	8-200 PSI	266° F	4.5-12		 (304)	Nitrile, FKM, EPDM

KEY

MEDIA

-  Water
-  Air & neutral gases
-  Light Oil

-  Slightly Aggressive media
-  Aggressive media
-  Steam

FUNCTION

- NC – 2-way Normally Closed
- NO – 2-way Normally Open
- 3-way – Normally Closed, Normally Open, Diverting, Universal, or Free Exhaust

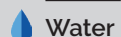
VALVE BODY

-  Brass
-  Nylon
-  (316) Stainless Steel
-  PVC
-  (304) Stainless Steel
-  Lead-Free Brass

Series	Media	Connection	Function	Orifice Range	Pressure Range	Max Fluid Temp	Cv Range	Approvals	Valve Body	Seal Materials
 S20		3/8"-1 1/2" NPT	NC, NO	5/8"-1 1/4"	0-140PSI	295° F	4.3-25			Nitrile, FKM, GFLT, EPDM
 S21		3/8"-2" NPT	NC, NO	5/8"-1 1/4"	4-200 PSI	295° F	4.3-28			Nitrile, FKM, GFLT, EPDM
 S21 HP		3/8"-2" NPT	NC, NO	5/8"-1-1/2"	4-250 PSI	366° F	4.3-29			Nitrile, PTFE
 H21		3/8"-3/4" NPT	NC, NO	5/8-3/4"	10-1400 PSI	230° F	3.3-5.1			FKM, PTFE
 S27		1"-2" NPT	NC, NO	1"-1 1/4"	0-125 PSI	295° F	13-27			Nitrile, FKM, GFLT, EPDM
 S71		3/8"-2" NPT	NC, NO	3/8"-2"	7-225 PSI	295° F	4.5-48			Nitrile, FKM, EPDM
 NS20		3/8"-1 1/2" NPT	NC, NO	5/8"-1 1/4"	0-100 PSI	295° F	4.3-25			EPDM
 NS21		3/8"-2" NPT	NC, NO	5/8"-1 1/4"	4-150 PSI	295° F	4.3-28			EPDM
 NS30		1/8"-3/8" NPT	NC, NO	1/32"-3/8"	0-2400 PSI	295° F	.03-1.3			EPDM
 NS31		1/8"-3/8" NPT	NC, NO	1/32"-3/8"	0-2000 PSI	295° F	.03-1.3			EPDM
 NS71		3/8"-2" NPT	NC, NO	3/8"-2"	7-225 PSI	295° F	4.5-48			EPDM

KEY

MEDIA



Water



Air & neutral gases



Light Oil



Slightly Aggressive media



Aggressive media



Steam

FUNCTION

NC – 2-way Normally Closed

NO – 2-way Normally Open

3-way – Normally Closed, Normally Open, Diverting, Universal, or Free Exhaust

VALVE BODY

 Brass

 Nylon

 316 Stainless Steel

 PVC

 304 Stainless Steel

 Lead-Free Brass

GC Valves offers solenoid valve manifolds and assemblies for dispensing and sampling industrial and scientific gases and liquids.

Industrial and High Performance Solenoid Valve Manifolds

- Standard body material: Brass, Stainless Steel
- Optional materials: Aluminum, PVC, other thermoplastics, plating available
- Uses proven operators and valve components
- Typical pipe sizes include 1/8" to 3/4" NPT
- Reverse manifolds, normally open operator, and metering options available



GC Valves provides a complete line of general purpose solenoid manifolds with customization options available to meet your specific requirements. Our manifolds are intended for a wide variety of applications at standard pressures and flow rates. Manifold valves can be rated up to 2400 PSI and can be made to withstand the harshest fluid media. Our world class designs are proven to cycle up to 5 million cycles.

Series	Media	Connection	Function	Orifice Range	Pressure Range	Max Fluid Temp	Cv Range	Approvals	Valve Body	Seal Materials
 SC9M		1/8" - 1/4" NPT	NC, NO, 3-WAY	1.0mm-3.0mm	0-580 PSI	366° F	0.035-0.280			Nitrile, FKM, EPDM, PTFE, FFKM
 SC4M		1/4" - 3/8" NPT	NC, NO, 3-WAY	0.5mm-4.0mm	0-2030 PSI	366° F	0.011-0.350			Nitrile, FKM, EPDM, PTFE, FFKM
 M30		1/8"-3/8" NPT	NC, NO, 3-WAY	1/32"-3/8"	0-2400 PSI	366° F	.03-1.3			Nitrile, FKM, GFLT, EPDM, PTFE, FFKM, Rulon
 M31		1/8"-3/8" NPT	NC, NO, 3-WAY	1/32"-3/8"	0-2000 PSI	366° F	.03-1.3			Nitrile, FKM, GFLT, EPDM, PTFE, FFKM, Rulon
 M40		1/4"-1/2" NPT	NC, NO	3/8"	0-300 PSI	366° F	0.8-1.5			Nitrile, FKM, EPDM, PTFE
 MH40		1/4"-1/2" NPT	NC, NO	3/8"	0-2200 PSI	366° F	0.8-1.5			FKM, PTFE
 M20		3/8"-3/4" NPT	3-WAY	3/4"	0-140 PSI	295° F	6.7			Nitrile, FKM, EPDM
 M21		3/8"-3/4" NPT	3-WAY	3/4"	4-200 PSI	295° F	6.7			Nitrile, FKM, EPDM

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 that 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.

Cv 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" sections for additional information.

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.

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).

Minimum Operating Pressure Differential

The minimum system pressure differential required to operate the valve and maintain it in the open position. MinOPD applies pilot-operated solenoid valves where system pressure is used assist operation when the solenoid is energized. Direct acting or zero differential valves do not require a minimum operating pressure.

Maximum Operating Pressure Differential

The 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.



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 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, 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.

NEMA 7 & 9 Refers to Indoor Hazardous Locations - Air-break Equipment

Class I Refers to locations in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

Group C - Acetaldehyde, Cyclopropane, Diethyl Ether, Ethylene, Isoprene, & Unsymmetrical Dimethyl

Group D - A wide range of gases and vapors including gasoline, propane, natural gas, methanol, acetone, butane, benzene, octanes, toluene, and xylenes

Class II Refers to locations which are hazardous because of the presence of combustible dust.

Group E - Atmospheres containing combustible metal dust

Group F - Atmospheres containing carbon black, coal or coke dust

Group G - Atmospheres containing flour, starch, or grain dust

Class I and **Class II** also have the following designations:
Division 1 refers to hazardous gases or dust that exist continuously

Division 2 refers to hazardous gases or dust that do not normally exist but may exist due to equipment failure etc.

Our explosion proof housings are not approved for:

"Group A" Acetylene

"Group B" Butadiene, Ethylene Oxide, Hydrogen, Gases containing more than 30% Hydrogen, and Propylene Oxide.

S3 A

NEMA 1, Metallic Housing, 24" Lead Wires, 1/2" NPT Conduit Hub

S4 A

NEMA 1, Metallic Housing, 24" Lead Wires, 1/2" NPT Conduit Hub

S5 A

NEMA 1, Metallic Housing, 24" Lead Wires, 1/2" NPT Conduit Hub

S3 G

NEMA 4/4X, IP65, Fully Encapsulated, 24" Lead Wires, 1/2" NPT Conduit Hub

S4 G

NEMA 4/4X, IP65, Fully Encapsulated, 24" Lead Wires, 1/2" NPT Conduit Hub

S5 G

NEMA 4/4X, IP65, Fully Encapsulated, 24" Lead Wires, 1/2" NPT Conduit Hub

C9 G

IP65, Fully Encapsulated, 18" Lead Wires

C4 G

IP65, Fully Encapsulated, 18" Lead Wires

S3/S4 B

Metallic Housing with Grommet, 24" Lead Wires

S3 Y

NEMA 4, IP65, Fully Encapsulated, Form A

S4 Y

NEMA 4, IP65, Fully Encapsulated, Form A

S5 Y

NEMA 4, IP65, Fully Encapsulated, Form A

C9 Y

IP65, Fully Encapsulated, Form B

C4 Y

IP65, Fully Encapsulated, Form B

S3/S4 S

One 1/2" Conduit Knockout, 24" Lead Wires

S3 X

NEMA 7, Explosion Proof, 24" Lead Wires, 1/2" NPT Conduit Hub, Class I & II, Groups C, D, E, F, & G, Division 1 & 2

S4 X

NEMA 7, Explosion Proof, 24" Lead Wires, 1/2" NPT Conduit Hub, Class I & II, Groups C, D, E, F, & G, Division 1 & 2

S3/S4 U

Two 1/2" Conduit Knockouts, 24" Lead Wires

GC VALVES NOMENCLATURE



VALVE SERIES	OPERATING MODE	COIL HOUSING	COIL CLASS	COIL VOLTAGE	SEAT I SHADING RING	BODY MATERIAL	PIPE SIZE	2-WAY ORIFICE*	SUFFIX
S20	1 - 2 WAY NC	A - Metal Conduit	F	01 - 24 VAC/60HZ	A - FFKM Silver	1 - 316 SS	A - 1/8"	C1 - 1/32"	A - Angle Body
S21	2 - 2 WAY NO	B - Grommet	H	02 - 110 VAC/50HZ	C - EPDM Copper	2 - 303 SS	B - 1/4"	C3 - 3/64"	B - SS Split Washer
S27	3 - 3 WAY NC	F - DIN w/ C-4010		120 VAC/60HZ	E - EPDM Silver	3 - 303 SS	C - 3/8"	C5 - 1/16"	C - CE Declaration
S30	4 - 3 WAY NO	G - 1/2" Conduit		03 - 208 VAC/60HZ	F - EPDM + Sant	4 - Brass	D - 1/2"	C7 - 5/64"	D - Mounting Bracket
S31	5 - Selector	NEMA 4X		04 - 240 VAC/60HZ	Copper	5 - Brass	E - 3/4"	C9 - 3/32"	E - CSA Certification
S33	6 - 3 WAY	P - Open Frame with		220 VAC/50HZ	G - GFLT Silver	6 - Aluminum	F - 1"	D3 - 7/64"	F - Metering
S40	Universal	Leads		14 - 6 VDC	J - Nitrile Silver	7 - 316 SS	G - 1-1/4"	D5 - 1/8"	G - Gold Plated Plunger
S71	7 - 3 WAY FREE	S - Long Junction BOX		15 - 12 VDC	K - FKM Copper (S21)	8 - Brass	H - 1-1/2"	D7 - 5/32"	and Tube Head
H21	Exhaust	U - Rain Tight Metal		16 - 24 VDC	K - PTFE Silver	9 - Brass	J - 2"	E1 - 3/16"	K - Mounting Bracket
H40		Conduit		18 - 120 VDC	(S30, S31,S40)	P - Nylon		E7 - 1/4"	L - Latching
M20		W - Rain Tight Metal		24 - 24 VAC/50-60HZ	L - FKM Silver			F1 - 9/32"	M - Manual Override
M21		Conduit		33 - 48 VDC	N - Nitrile Copper			F5 - 3/8"	N - Cleaned for Oxygen
NS20		X - Explosion Proof		45 - 12 VDC 14W	R - Rulon Silver			G1 - 1/2"	Service
NS21		NEMA 7/9		46 - 24 VDC 14W	S - PTFE Copper			G4 - 5/8"	NP - Gaseous CO2
NS30		Y - DIN		74 - 74 VDC	T - PTFE Copper			G5 - 3/4"	P - Nickel Plating
NS31					V - FKM Copper			G7 - 15/16"	S - UL Safety Rated
NS71					Z - PTFE + FKM Copper			G9 - 1"	T - TimeSaver Conn
NT20								J1 - 1-1/8"	W - Submersible
NT21								J2 - 1-1/4"	Z1 - 48" Coil Leads
T20								J5 - 1-1/2"	Z2 - 36" Coil Leads
T21								10 - 10mm	Z5 - Liquid CO2

Contact GC Valves to verify model numbers and feature compatibility

*3-way orifices refer to catalog or price list

CFA NOMENCLATURE

THREAD TYPE	OPERATING TYPE	# OF STATIONS	OPERATING MODE	COIL TYPE	COIL VOLTAGE	SEAL MATERIAL	BODY/OPERATOR MATERIAL	PIPE SIZE	ORIFICE	SUFFIX
S - NPT	C3 - ECI direct acting	1 station	1 - 2 WAY NC	YN - DIN	02 - 120 VAC	A - FFKM	A - Aluminum w/ SS	A - 1/8"	B0 - 0.5mm	A - Angle Body
T - True Union	P3 - ECI Piloted	2 station	2 - 2 WAY NO	GN - Lead Wires	03 - 208 VAC	C - EPDM	B - Brass w/ Brass	B - 1/4"	A0 - 0.8mm	B - Flow Control
U - BSPP	C4 - Bacosol direct acting	3 station	3 - 3 WAY NC		04 - 220 VAC	K - PEEK	C - SS w/ Brass	C - 3/8"	A1 - 1.0mm	C - MO + Flow
Y - BSPT	P4 - Bacosol piloted	4 station	4 - 3 WAY NO		05 - 240 VAC	M - Mixed	D - SS w/ SS	D - 1/2"	A2 - 1.2mm	F - Metering
	C9 - Minisol N direct acting	5 station	5 - 3 WAY Diverting		15 - 12 VDC	N - Nitrile	E - Brass SLM	E - 3/4"	A3 - 1.6mm	M - Manual Override
	P9 - Minisol N piloted	6 station	6 - 3 WAY Universal		16 - 24 VDC	O - Neoprene	F - SS SLM	F - 1"	A4 - 2.0mm	N - Sonic Cleaned
			7 - 3WAY NC		24 - 24 VAC	P - Polyurethane	G - Plastic Diaphragm	G - 1-1/4"	A5 - 2.4mm	P - Plated
			w/ Top Adapter		43 - 12 VDC 6W	R - Rulon	H - Plastic Diaphragm	H - 1-1/2"	A6 - 3.0mm	R - Reverse
			8 - Latching		44 - 24 VDC 6W	T - PTFE	I - Plastic, Nylon	J - 2"	A7 - 4.0mm	T - Top Adapter
					45 - 12 VDC 8W	V - FKM	J - Brass Diaphragm	K - 3/8" x 1/2"	A8 - 5.0mm	
					46 - 24 VDC 8W	X - Silicon	K - Brass w/ SS operator	L - 1/2" x 3/8"	A9 - 6.0mm	
					47 - 12 VDC 10W		L - SS Diaphragm	T - 3/8" x 1/4"	G1 - 1/2"	
					48 - 24 VDC 10W		P - PVC	Z - 1/4" x 1/8"	G5 - 3/4"	
					49 - 12 VDC 12W		R - Brass Round (C9 only)	U - 10/32	G9 - 1.0"	
					50 - 24 VDC 12W		S - SS Round (C9 & C4)		J2 - 1.25"	
									J5 - 1.5"	

Contact GC Valves to verify model numbers and feature compatibility



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