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Service and Installation

For Standard GC Valves

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H211-S211 SERIES PILOTED DIAPHRAGM 2-WAY SOLENOID VALVE

INSTALLATION SERVICE AND PARTS LIST

SDI/SDP HS211-1

DESCRIPTION

S211 Solenoid Valves are normally closed, 2-way, pilot operated diaphragm type, which are designed for on-off control of air, steam and liquids.

Available options include: Manual Opening Device, and UL Class F and H coils.

OPERATION

S211 Valves are normally closed, opening when energized and closing when de-energized.

SPECIFICATIONS

Use the valve within the specified operating ranges as indicated on the valve nameplate (min./max. psi, voltage, cycle, maximum media temperature at °F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

FLUID MEDIA	COIL CLASS	MAXIMUM TEMPERATURE °F		SEAT MATERIAL
		FLUID	AMBIENT	
GAS LIQUIDS OIL	F (155°C)	200	150	BUNA
	F (155°C)	230	150	VITON
	H (220°C)	185	176	
	H (220°C)	185	176	TEFLON
	H (220°C)	257	125	RULON
STEAM	H (220°C)	338	77	TEFLON
	H (220°C)	257	125	RULON
HOT WATER STEAM	F (155°C)	198	77	EPR
	H (220°C)	298	77	

For other applications, consult the factory.

INSTALLATION

WARNING

This valve is normally closed (N.C.) to flow when not powered. Do not use in place of a normally open (N.O.) valve.

Check valve specifications to be sure that the valve selected is the proper one for the application.

Installation must be performed only by a trained and experienced service person.

1. Clear lines of all foreign matter.
2. S211 Valves must be mounted on a horizontal pipeline with the solenoid in an upright position.
3. Thread seal should be applied sparingly and to the male threads only. To tighten, use a wrench on the body flats at the end being connected. Do not use the solenoid housing as a lever to turn the valve.
4. Provide a clearance for solenoid removal in case removal is subsequently necessary.

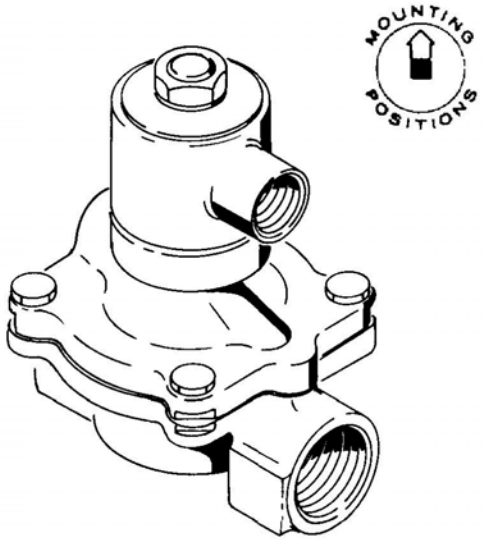

Fig. 1. Typical S211

5. Wire in accordance with applicable local and national electrical codes. Loosen the hex nut (Fig. 3, No. 1) to rotate the coil jacket (Fig. 3, No. 4). Using a torque wrench, tighten the hex nut to 20-25 inch pounds when installation is completed.

MAINTENANCE

It is recommended that S211 Series Valves be cleaned on a routine basis by qualified personnel. The customer or user should set up a sound maintenance schedule based on flow media, environment, and frequency of use, which should begin with checking for leakage. Correct voltage must be applied when the valve is tested. If excessive leakage (based on the application) occurs or if operation is sluggish, the unit must be cleaned. The cleaning fluid must be compatible with the valve's materials of construction.

SERVICE

Disassembly and Reassembly. (See Fig. 3.)

WARNING

During reassembly, be certain that the plunger is free of scratches or burrs. These imperfections could cause the valve to stick in an open or closed position, resulting in a potential hazard. If the valve has any tendency to stick during a test, return the whole Universal Kit for a new one. Dissassembly and reassembly should be performed only by properly trained and experienced personnel.

Turn off flow media and electrical power supply to the valve.

REPLACE ALL PARTS with the new parts contained in the Universal Kit only (see Universal Kit section). Use only the correct Universal Kit (use the chart to match Catalog Number with Kit Number), and never attempt to interchange parts from different numbered kits.

To disassemble:

1. Unscrew the hex nut (1). Remove the lockwasher (2).
2. Lift off the coil jacket (4) with nameplate (3) and coil (6) from the plunger tube assembly (10). Also remove the bottom washers (7).
3. Remove the coil and upper washer (5) from the coil jacket.
4. Use an ITTGC Spanner Nut (106198E) to remove the base nut (8).
5. Remove the tube base "O" ring (9) and remove the plunger tube assembly (10) from the bonnet (15). All parts numbered 9 through 13 on Fig. 3 will be replaced by the new parts in the Universal Kit.

   It may be necessary to tap the bonnet on your hand or flat surface to free the square seal (13).
6. Remove the bonnet cap screws (14), and lift the bonnet off of the body (19).
7. Remove the parts numbered 16, 17, and 18 on Fig. 3. These parts will all be replaced by the new parts from the Universal Kit. If necessary, tap the body against your hand or a flat surface to free the "O" ring gasket (18).

   Check to see that all bonnet and body holes, vents and seating surfaces are clean before reassembling the valve. Use a SOFT object for probing to prevent scratches or burrs.

Reassembly (Use the new parts contained in the Universal kit).

CAUTION

The body must be installed so that the vent passageway and the diaphragm passageway are lined up with the passageway in the bonnet.

Lubricate "O" rings prior to reassembly.

8. Place the new "O" ring gasket (18) into its hole in the body (19).
9. Replace the diaphragm assembly (17). The plate on the diaphragm assembly must face away from the body. Be sure that the diaphragm is lined up properly (see CAUTION above Step 8).
10. Replace the diaphragm spring (16) as shown in Fig. 3. Reassemble the bonnet (15) onto the body (see CAUTION above Step 8), and replace and tighten down the bonnet cap screws (14).
11. Place the new square seal into the recess in the bonnet operator cavity (REF.).
12. Install the plunger spring (11) small diameter down onto the plunger assembly (12). Insert the final assembly of (11) and (12) into the plunger tube assembly (10).
13. Place the plunger tube asembly, with the plunger spring and plunger in it, into the bonnet operator cavity (REF.). Place the new tube base "O" ring (9) onto the plunger tube assembly as shown in Fig. 3.
14. Replace the base nut (8) onto the plunger tube (10). USING A TORQUE WRENCH, TIGHTEN THE BASE NUT INTO THE THREADS ON THE BONNET TO 18 TO 24 LB. IN.
15. Replace the bottom washers (7) onto the plunger tube. The raised outer edge of the bottom washer which is closest to the bonnet (forms a complete circle) should face down (toward the bonnet). The "X" marked on the bottom washer closest to the coil must face the coil.
16. Replace the upper washer (5) into the coil jacket (4). The side of the upper washer with an "X" marked on it must face the coil upon reassembly.
17. Insert the lead wires from the coil through the hole in the jacket. Pull the wires all the way through, and place the coil into the jacket with the end with voltages printed on it facing away from the upper washer (5). Place the entire assembly back onto the plunger tube.
18. Replace the nameplate (3), lockwasher (2), and hex nut (1), in that order. Tighten the hex nut to 20-25 lb. in.

⚠ WARNING ⚠

The use of the manual opening device (MOD) prevents the valve from opening or closing and nullifies the effect of all electrical controls used with the valve. Equipment damage or safety hazard may result if shutoff is expected but does not occur.

To use the manual opening device (MOD), Turn the MOD stem counterclockwise to open.

After electrical power is restored, turn the MOD stem clockwise.

COIL REPLACEMENT

Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.

Incorrect coil reassembly can cause coil burnout. At all times, take care not to nick, dent, or damage the plunger tube.

Standard Model Fig. 3.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2, 3, 15, 16 and 17 in the DISASSEMBLY AND REASSEMBLY section. Take care to note the exact order of placement and quantity of parts.

Explosion-proof Model Fig. 4.

To replace the coil on an Explosion-proof Model

1. Remove the top cap assembly (1), lockwasher (2), and top cap "O" ring (3).

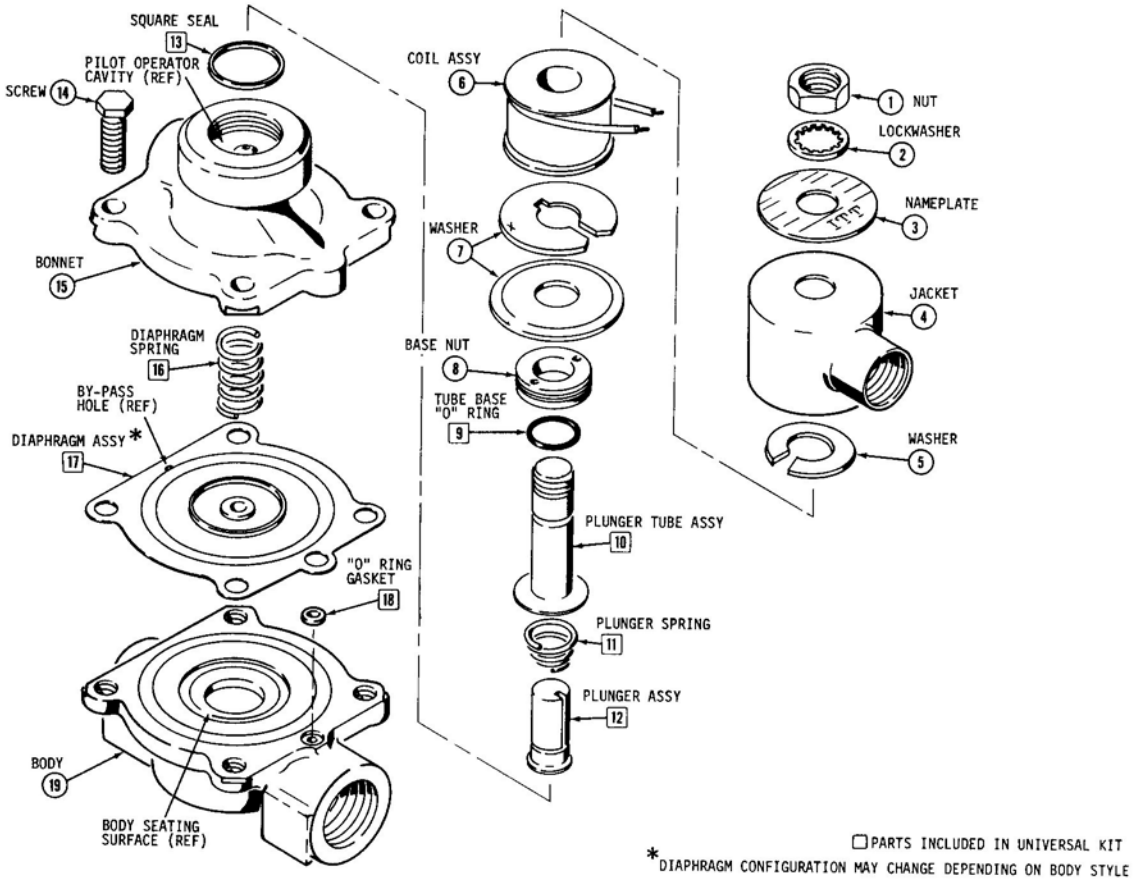

Fig. 3. Typical S211 Valve

2. Use a GC Valves Spanner Nut (Part Number 106198E) to remove the top plate (4).
3. Remove the washer (5). The coil (6) is now accessible for removal and replacement.

To reassemble the explosion-proof coil assembly:

1. Pull the wire through the hole in the jacket (7) and place the new coil in the jacket with the end with voltages printed on it facing into the jacket.
2. Position the washers (5) on top of the coil.
3. Screw the top plate (4) down until bottomed, or torque the top plate to 150 INCH POUNDS MINIMUM to retain registration of the new coil.
4. Place the lockwasher (2) on top of the top plate.
5. Replace the top cap "O" ring (3) in the top cap assembly (1), and screw the top cap back on.

PARTS

The charts which follow cover replaceable Coil Part Numbers and Universal Kits for most S211 Series Solenoid Valves.

Before ordering parts/kits, check the Serial Number on the valve which is to be repaired. This Serial Number includes the model designation which determines the appropriate Parts/Kit Number(s). The Serial Number can be found stamped on the nameplate or operator housing.

On older model valves, the third digit of the number, e.g. E5A or E5B, will designate Model "A" or "B". When the name serializing method is used, e.g. 8223A or 8223BA, the fifth and sixth digits will designate Model "A" or "BA", etc. In the instances where there is a double alpha digit designation, the first alpha digit refers to the valve model and the second alpha digit refers to the model of the operator.

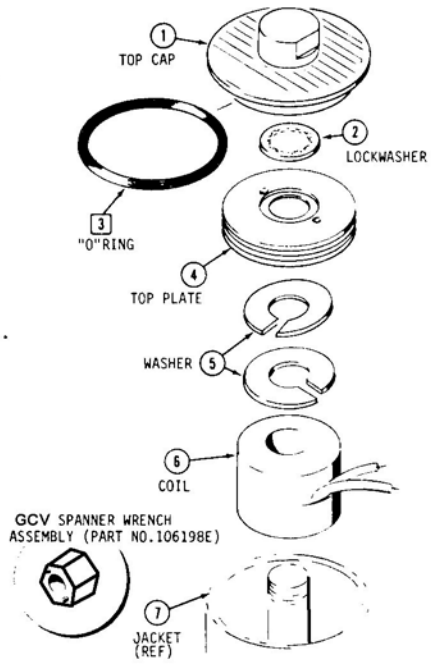

Fig. 4. Typical S211 Explosion-proof Operator

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

See Fig. 3 for an exploded view of a typical S211 Model "A", and Fig. 4 for an exploded view of a typical S211 Model "B" Explosion-proof operator assembly.

NOTE

A GROUNDING PROVISION IS SUPPLIED FOR CSA CERTIFIED VALVES.

COIL CHART

IDENTIFYING CATALOG DIGITS ①	COIL CLASS	WATTS	ELECTRICAL CONNECTION	COIL PART NUMBER②③
S21-GF	F	8	24" LEADS	HS3GF — A24
S21 — F	F			CS3AF — A24
S21 — H	H			CS3AN — A24
S21 - YF	F		DIN Connector	HS3YF —
H21 - GF	F	10	24" LEADS	HS4GF — A24
H21 — F	F			CS4AF — A24
H21 — H	H			CS4AN — A24
H21 - YF	F		DIN Connector	HS4YF —

① Sixth digit of Catalog Number represents coil class as shown.
② Seventh and eighth digits of Catalog Number represent voltages shown in coil class chart. These digits must be transferred into the coil part number.
③ Recommended spare part.

TROUBLE-SHOOTING

If valve fails to open —

1. Check voltage against rating on nameplate.
2. Check voltage at solenoid lead connections.
3. Check control circuit and solenoid coil for burnout.
4. Check operating pressures.
5. Clean all passageways and check condition of diaphragm.
6. Replace coil.

If valve fails to close —

1. Check for bent or nicked plunger tube.
2. Check for damaged springs.
3. Clean pilot valve and main valve seats.
4. Check condition of plunger seat disc and main valve diaphragm.
5. Clean passageways in pilot valve and main valve. Use a small probing object or blow through.

The valve must be free from dirt to ensure tight shutoff. Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage. Clean the plunger and the interior of the tube and base assembly.

UNIVERSAL KIT CHART

5TH DIGIT OF CAT. NO.	9TH & 10TH DIGIT OF CAT. NO.	13TH & 14TH DIGIT OF CAT. NO.	COIL & VOLTAGE TYPE	UNIVERSAL KIT
STANDARD A, B, S, T, U, V, or W	N1-N4	G9	AC	KS211AF02N4FG9
			DC	KS211AF16N4FG9
		J5	AC	KS211AF02N4GJ5
			DC	KS211AF16N4GJ5
	N5	G9	AC	KS211AF02N5FG9
			DC	KS211AF16N5FG9
		J2	AC	KS211AF02N5GJ2
			DC	KS211AF16N5GJ2
	K4	G1	AC	KS211AF02K4CG1
			DC	KS211AF16K4CG1
		G5	AC	KS211AF02K4EG5
			DC	KS211AF16K4EG5
	T4	G1	AC	KS211AF02T4CG1
			DC	KS211AF16T4CG1
		G5	AC	KS211AF02T4EG5
			DC	KS211AF16T4EG5
	T2	G1	AC	KS211AF02T2CG1
			DC	KS211AF16T2CG1
		G5	AC	KS211AF02T2EG5
			DC	KS211AF16T2EG5
		G9	AC	KS211AF02T2FG9
			DC	KS211AF16T2FG9
		J5	AC	KS211AF02T2GJ5
			DC	KS211AF16T2GJ5
	Z4	G1	AC	KH211AF02Z4CG1
			DC	KH211AF16Z4CG1
		G5	AC	KH211AF02Z4EG5
			DC	KH211AF16Z4EG5
EXPL. PROOF X	N1	G9	AC	KS211XF02N4FG9
			DC	KS211XF16N4FG9
		J5	AC	KS211XF02N4GJ5
			DC	KS211XF16N4GJ5
	N5	G9	AC	KS211XF02N5FG9
			DC	KS211XF16N5FG9
		J2	AC	KS211XF02N5GJ2
			DC	KS211XF16N5GJ2
	K4	G1	AC	KS211XF02K4CG1
			DC	KS211XF16K4CG1
		G5	AC	KS211XF02K4EG5
			DC	KS211XF16K4EG5
	T4	G1	AC	KS211XF02T4CG1
			DC	KS211XF16T4CG1
		G5	AC	KS211XF02T4EG5
			DC	KS211XF16T4EG5
	T2	G1	AC	KS211XF02T2CG1
			DC	KS211XF16T2CG1
		G5	AC	KS211XF02T2EG5
			DC	KS211XF16T2EG5
		G9	AC	KS211XF02T2FG9
			DC	KS211XF16T2FG9
		J5	AC	KS211XF02T2GJ5
			DC	KS211XF16T2GJ5
	Z4	G1	AC	KH211XF02Z4CG1
			DC	KH211XF16Z4CG1
		G5	AC	KH211XF02Z4EG5
			DC	KH211XF16Z4EG5

EXAMPLE CATALOG NUMBER

1	2	3	4	5	6	7	8	9	10	11	12	13
S	2	1	1	A	F	0	2	N	1	F	G	9
					COIL CLASS	VOLTAGE		SEAT, SQ. SEAL & "O" RING MATERIAL				

H401 -- Service and Installation --

4/24/18

DESCRIPTION
H401 Series are 2-way piloted piston operated solenoid valves with Standard stainless steel bodies. Positive shutoff is assured by using spring loaded plunger and synthetic seating materials such as Nitrile, FKM, or PTFE. Valves are designed for use with air, gas, liquids, steam and other flow media not corrosive to brass, stainless steel or the selected seating material.

OPERATION
H401 Valves are normally closed (N.C.) and open when electrically energized.

SPECIFICATIONS
Use H401 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (max. psi, voltage, hz, maximum media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	Elastomer	Fluid
32° - 125° F	EPR	32° - 295° F
32° - 125° F	Nitrile	32° - 180° F
32° - 125° F	FKM	32° - 230° F
32° - 125° F	PTFE	32° - 366° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter.
2. Valves are multi-poised and may be mounted in any position. Flow must be in direction indicated on the valve body. If small particulates are a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread sealant to the male threads only.
4. Provide a clearance for solenoid removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

Cleaning
Cleaning fluid must be compatible with all valve components.
It is recommended that H401 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most H401 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.
Incorrect coil reassembly can cause coil burnout. At all times, take care not to nick, dent, or damage the plunger tube.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **Disassembly and Assembly**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take care not to nick, dent or damage plunger tube (7).

REBUILD KIT
The Rebuild Kit contains the plunger, spring and spring pin assembly, plunger tube assembly, O-rings, piston assembly and adapter ring.

REPAIR KIT
The Repair Kit contains a plunger assembly, piston assembly and O-rings

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
H401AF__T1BF5Z5	KH401AF02T1BF5Z5	KH401T1BZ5
H401AF__T1CF5Z5	KH401AF02T1BF5Z5	KH401T1BZ5
H401AF__T1DF5Z5	KH401AF02T1BF5Z5	KH401T1BZ5
H401AF__X1BF5	KH401AF02X1BF5	KH401X1B
H401AF__X1CF5	KH401AF02X1BF5	KH401X1B
H401AF__X1DF5	KH401AF02X1BF5	KH401X1B
H401AF__Z1BF5	KH401AF02Z1BF5	KH401Z1B
H401AF__Z1CF5	KH401AF02Z1BF5	KH401Z1B
H401AF__Z1DF5	KH401AF02Z1BF5	KH401Z1B

COIL CHART

Valve	Voltage	DIN Coil	Conduit Coil
H401GF02_____	120V 50/60	HS4YN02	HS4GN02A24
H401GF24_____	24V 50/60	HS4YN24	HS4GN24A24
H401GF15_____	12 VDC	HS4YN15	HS4GN15A24
H401GF16_____	24 VDC	HS4YN16	HS4GN16A24

SERVICE
Disassembly and Assembly

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the Disassembly and Assembly instructions, complete valve must be replaced by a trained and experienced service-person.

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1. Unscrew the hex nut (1). Remove lockwasher (2).
2. Lift off the coil (3) from the plunger tube.
3. Do not damage the solenoid assembly.
4. Remove Split washer (4).
5. Use GC Valves spanner nut (106198E) or similar tool to remove solenoid base nut (5) and plunger tube (7). Do not nick dent or damage plunger tube (7) or valve seating surfaces.
6. Hold plunger tube (7) in position when removing from valve body (12) to prevent loss of internal parts.
7. Carefully remove the spring pin (8) spring (9) plunger assembly (10) and retaining clip (11),
8. Carefully remove the piston (12) and glide ring (13)
9. Check seating surfaces on the plunger (10) piston (12) and valve body (15) for damage or wear.
10. Replace plunger (10) piston assembly (12) body O-ring (14) and other parts as necessary.
11. Carefully install the piston (12) and glide ring (13). Take care not to pinch the glide ring (13) during installation. Replace retaining clip (11), plunger assembly (10) spring (9) and spring pin (8).
12. Align internal parts and carefully and slide plunger tube (7) over the assembled parts.
10. Tighten solenoid base nut (5) to 25 In/Lbs.
11. Re-connect electrical and test for proper operation.

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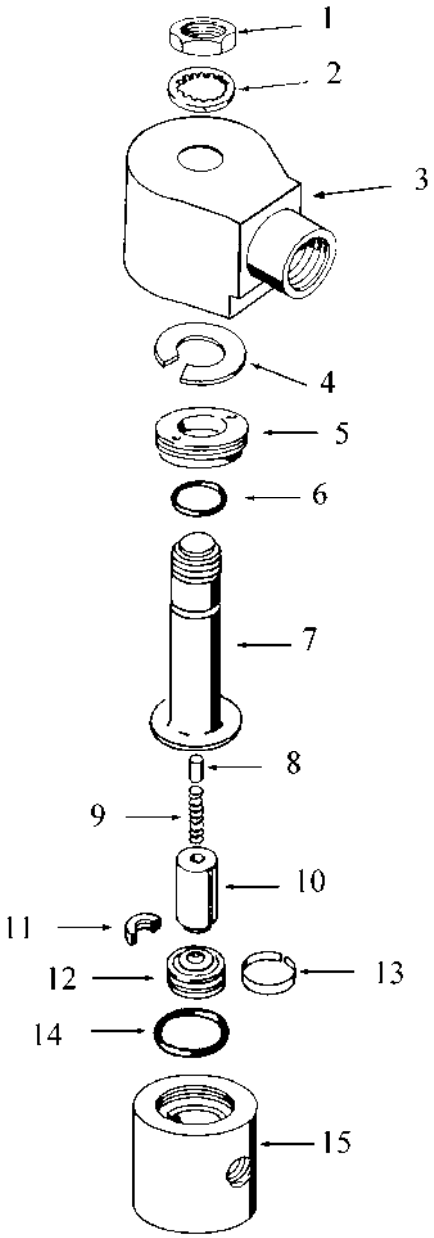

TROUBLE-SHOOTING

If valve fails to open check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.

GC Valves
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Simi Valley, CA 93063

K13
3-Way Universal
Lever Acting Solenoid Valve

INSTALLATION AND SERVICE

DESCRIPTION

K-13 Lever action operated three-way valves are two-wire, current failure, single magnetic packless valves. They are designed to direct the flow of oil, water, refrigerants and similar fluids.

Applications include control of fluid to piston and diaphragm operators, distribution of fluids from a common source pneumatic pumping and selection of fluid sources. Valve construction is universal in that any port (No. 1, No. 2 or Common) can be used for either inlet or outlet connections. High pressure connections may be made to either Common No. 1 or No. 2 ports as long as pressures are within valve ratings.

The valves have two operating positions (shown in Figures 2 and 3). Being of the single magnetic type, they cannot assume an intermediate position, but have No.1 port open to common and No 2 closed when current is on and No 2 open to common and No 1 closed when current is off. The valve functions is reversed for option A100-A104.

OPERATION

When the solenoid is de-energized, the weight of the solenoid plunger assembly (1, Figure 2) and operating link plus the force of spring (3) holds No. 2 port push rod (5) in against No. 2 port valve (6), opening No. 2 port to common. At the same time No. 1 port push rod (7) is released, allowing No. 1 port valve spring (9) to close No. 1 port valve (8) to common.

When the controlling electrical circuit closes, energizing the solenoid, the plunger assembly (1, Figure 3), is magnetically lifted, pivoting the rocker arm (2) about shaft (4). This action forces No.1 port push rod (7) to open No. 1 port to common and releases No. 2 port push rod (5) to allow No. 2 port valve spring o close No. 2 port valve (6).

When the controlling electrical circuit opens, de-energizing the solenoid, the solenoid plunger assembled drops and the rocker arm is returned to the position shown in Figure 6, with No. 2 port opened and No. 1 port closed.

Operating Temperatures

VALVE	FLUID MEDIA	COIL CLASS	MAX. TEMP. F	
			FLUID	AMBIENT
K13	Liquid Oil	F(155°C)	225	77
		H(220°C)	175	175
		H(220°C)	200	115

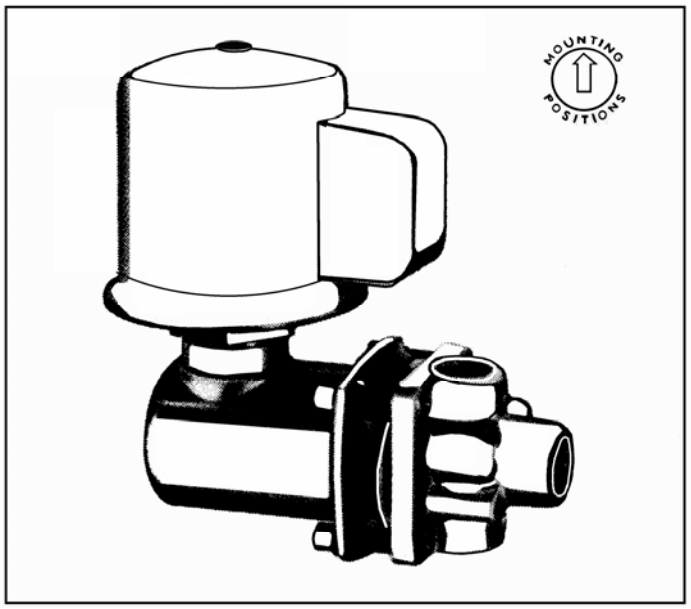

Fig. 1 Three-Way Valve, Lever Action Type K-13 C & D

APPLICATIONS

Flow to and from Common-- When switch is turned "On" (circuit closed), the solenoid is energized and flow from the supply line through No. 1 port and common actuates the piston.

When the switch is turned "Off" (circuit open), the valve solenoid is de-energized and flow is from common to the No. 2 port and vent or return line, allowing the piston spring to return piston rod. For reverse flow action, supply line is connected to No. 2 port and vent line is connected to the No. 1 port.

Flow distribution-- When the solenoid is energized (electrical circuit closed), flow is from Common to No. 1 port connection. When the solenoid is de-energized (electrical circuit opened), flow is from common to No. 2 port connection.

K-13 Three-Way Valves may be used for fluid selection by connecting inlet lines to No. 1 and No. 2 ports. When the solenoid is energized, flow will be from No. 1 port to common. When the solenoid is de-energized, flow will be from No. 2 port to common.

INSTALLATION

All valves including those having "W" designation (rainproof enclosure) in 5th digit position of valve catalog number must be mounted on a horizontal pipe line with solenoid in an upright position. When making the installation do not use the solenoid housing as a handle for carrying or turning the valve. Thread seal should be used sparingly and on male threads only.
If sediment is a problem, install fine mesh strainers having adequate capacity ahead of valve.
All piping must meet applicable local codes and ordinances.
Installations in Canada require the use of rigid metal conduit to ground the electrical enclosure of this valve when rated over 30 volts.
In making the electrical connections, make sure that the circuit hot wire passes through all switches, thermostats or limit controls before reaching valve.

OVERHAUL

Disassembly
1. Remove solenoid housing cover by taking out screw at top of early type valves or by removing retaining band on later type valves.
2. Lift solenoid coil from plunger housing.
3. Remove plunger housing assembly from valve by unscrewing at hex surface at base of assembly.
4. Remove flange, lever case and gasket from valve by unscrewing at hex surface at base of assembly.
4. Remove flange, lever case and gasket from valve body by taking out four screws and lock washers.
5. Unhook rocker tension spring (3, Figure 2) and remove.
6. Drive out shaft (4) and remove rocket arm (2), link and plunger (1) from mounting plate as an assembly, taking care not to spring valve port push rods (5 and 7).

CAUTION

DO NOT disassemble push rods from rocker arms as they are set accurately on a special jig and this setting cannot readily be duplicate din service.

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7. If necessary, solenoid plunger and link can be removed by driving out swedged pins Be careful not to lose coil spring or plunger pin.
8. Mark rocker support and valve body to assure correct reassembly, and remove rocker support from body by taking out two machine screws and lock washers.
9. If necessary to remove valve mechanism, keep valve seats, balls, springs and spring retainers matched and identified so that they can be reinstalled in the port from which they were removed. Otherwise, proper valve action cannot be secured.

Cleaning and Inspection
1. Wipe solenoid coil with lintless cloth dampened in solvent. Clean all mechanical parts in solvent. Dip valve body in solvent and blow out with compressed air.
2. Inspect all parts for wear or damage. Solenoid coil, plunger, link, cover, gaskets or rocker spring (3) may be replaced. If other parts are damaged, the complete valve assembly must be replaced.

Assembly
1. If valves have been disassembled from valve body, reinstall by inserting each spring, spring retainer, ball and valve seat in the correct port, tightening seat securely.
2. Position rocker support on valve body in accordance with marks made at disassembly and fastens securely with two machine screws and lock washers.
3. Reconnect solenoid plunger and link, if disassembled, making certain that small coil spring is installed on pin that holds plunger to link.
4. Carefully position rocker arm assembly on support, taking care not to damage valve port push rods, and fasten rocker arm in place by installing shaft (4).
5. Reinstall rocker spring (3). Position lever case on valve body and fasten with four screws and lock washers, making certain that solenoid plunger is positioned in opening for solenoid.
6. Attach solenoid plunger housing to cover by turning down into place and tightening at hexagonal flats at base of assembly.
7. Install solenoid coil on plunger housing.
8. Install housing cover and fasten with screw at top.

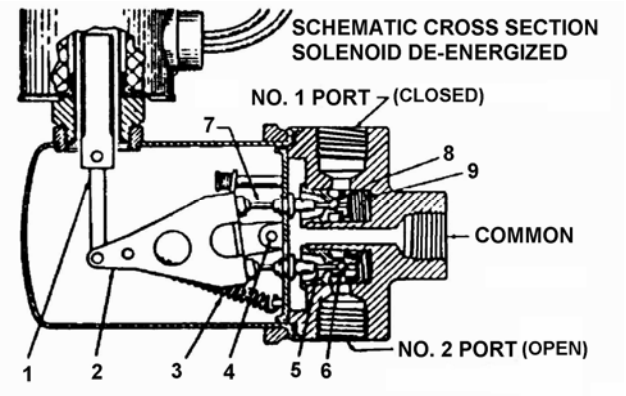


Fig. 2 Lever Action Type Valve De-Energized

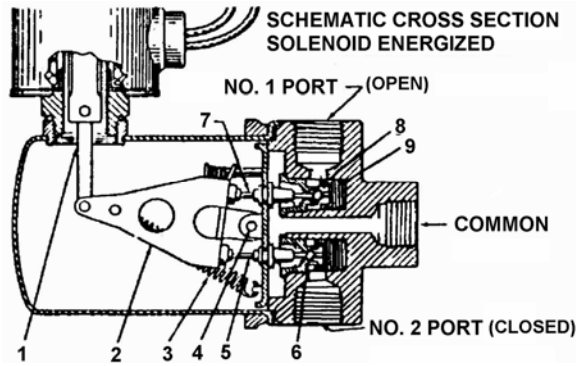


Fig. 3 Lever Action Type Valve Energized

NS201(AC) -- Service and Installation --

12/14/2016

DESCRIPTION
The NS201 Series Solenoid Valves are 2-way, normally closed, piloted, zero differential general purpose valves specifically designed for drinking water and other food products. All stainless steel or Noryl construction with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases.
Valves may be mounted in any positions. A spring loaded plunger assures positive shutoff. The S4 solenoid coil is rated at 10 watts.

OPERATION
NS201 Valves are normally closed (N.C.) and open when electrically energized.

SPECIFICATIONS
Use NS201 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (min./max. psi, voltage, hz, maximum media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	32° - 125° F	Fluid	32° - 295° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter .
2. Valves are multipoised and may be mounted in any position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.
Incorrect coil reassembly can cause coil burnout. At all times, take care not to nick, dent, or damage the plunger tube.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **VALVE DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take are not to nick, dent or damage plunger tube.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most NS201 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

REBUILD KIT
The Rebuild Kit contains a plunger/spring/seat disc assembly, plunger tube assembly, O-rings and adapter ring.

REPAIR KIT
The Repair Kit contains a seat disc, diaphragm assembly and O-rings.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
NS201YF02FPCG4	KS201AF02G4-NSF	K201G4-NSF
NS201YF02FPDG4	KS201AF02G4-NSF	K201G4-NSF
NS201YF02FPEG5	KS201AF02G5-NSF	K201G5-NSF
NS201YF24F7CG4	KS201AF02G4-NSF	K201G4-NSF
NS201YF24F7DG4	KS201AF02G4-NSF	K201G4-NSF
NS201YF24F7EG5	KS201AF02G5-NSF	K201G5-NSF

COIL CHART

Valve	Voltage	DIN Coil	Conduit Coil
NS201YF02FPCG4	120 VAC	HS4YN02	HS4GN02A24
NS201YF02FPDG4	120 VAC	HS4YN02	HS4GN02A24
NS201YF02FPEG5	120 VAC	HS4YN02	HS4GN02A24
NS201YF24F7CG4	24V AC	HS4YN24	HS4GN24A24
NS201YF24F7DG4	24V AC	HS4YN24	HS4GN24A24
NS201YF24F7EG5	24V AC	HS4YN24	HS4GN24A24

Cleaning
Cleaning fluid must be compatible with all valve components.
It is recommended that NS201 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

SERVICE
Disassembly

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

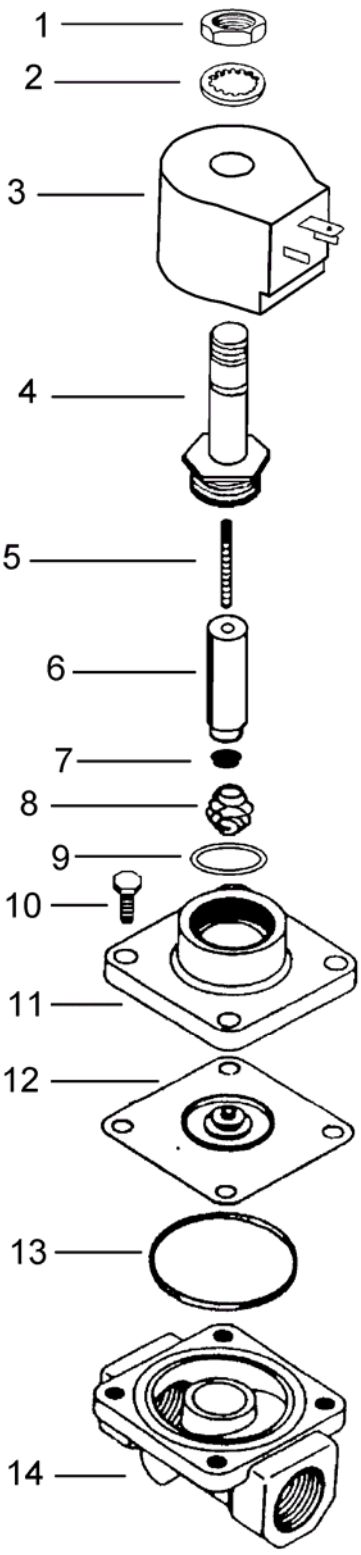
---

1. Unscrew the hex nut (1). Remove with lockwasher (2).
2. Lift off the coil (3) from the plunger tube.
3. Do not damage the solenoid assembly.
4. Use a 1" spanner to remove solenoid base nut and plunger tube (4). Do not nick, dent, or damage plunger tube (4) or valve seating surfaces.
5. Carefully hold plunger tube (4) in position when removing from valve bonnet (11) to prevent loss of internal parts.
6. Remove return spring (5) from plunger assembly (6),
7. Remove four bonnet bolts (10) and separate the valve bonnet (11) from the valve body (14).
8. Carefully remove connecting spring (8) from the diaphragm (12) and plunger (6) assemblies.
9. Check seat disc (7) and diaphragm assembly (12) for damage or wear.
10. Replace O-rings (9 & 13), diaphragm assembly (12), seat disc (7) and other parts as necessary.
11. Re-assemble in reverse order from above taking care to properly re-install the seat disc (7) and connecting spring (8).
12. Tighten Tube Base Nut (4) to 18 to 24 in/lbs. and bonnet bolts (10) to 40 to 45 in/lbs.
13. Re-connect electrical and test for proper operation.

TROUBLE-SHOOTING

If valve fails to open check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.



NS201(DC) -- Service and Installation --

12/14/2016

DESCRIPTION
The NS201 Series Solenoid Valves are 2-way, normally closed, piloted, zero differential general purpose valves specifically designed for drinking water and other food products. All stainless steel or Noryl construction with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases.
Valves may be mounted in any positions. A spring loaded plunger assures positive shutoff. The S4 solenoid coil is rated at 10 watts.

OPERATION
NS201 Valves are normally closed (N.C.) and open when electrically energized.

SPECIFICATIONS
Use NS201 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (min./max. psi, voltage, hz, maximum media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	32° - 125° F	Fluid	32° - 295° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter .
2. Valves are multipoised and may be mounted in any position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.
Incorrect coil reassembly can cause coil burnout. At all times, take care not to nick, dent, or damage the plunger tube.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **VALVE DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take are not to nick, dent or damage plunger tube.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most NS201 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

REBUILD KIT
The Rebuild Kit contains a plunger/spring/seat disc assembly, plunger tube assembly, O-rings and adapter ring.

REPAIR KIT
The Repair Kit contains a seat disc, diaphragm assembly and O-rings.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
NS201YF16FPCG4	KS201AF15G4-NSF	K201G4-NSF
NS201YF16FPDG4	KS201AF15G4-NSF	K201G4-NSF
NS201YF16FPEG5	KS201AF15G5-NSF	K201G5-NSF
NS201YF16F7CG4	KS201AF15G4-NSF	K201G4-NSF
NS201YF16F7DG4	KS201AF15G4-NSF	K201G4-NSF
NS201YF16F7EG5	KS201AF15G5-NSF	K201G5-NSF

COIL CHART

Valve	Voltage	DIN Coil	Conduit Coil
NS201YF16FPCG4	24V DC	HS4YN16	HS4GN16A24
NS201YF16FPDG4	24V DC	HS4YN16	HS4GN16A24
NS201YF16FPEG5	24V DC	HS4YN16	HS4GN16A24
NS201YF16F7CG4	24V DC	HS4YN16	HS4GN16A24
NS201YF16F7DG4	24V DC	HS4YN16	HS4GN16A24
NS201YF16F7EG5	24V DC	HS4YN16	HS4GN16A24

Cleaning
Cleaning fluid must be compatible with all valve components.
It is recommended that NS201 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

SERVICE
Disassembly

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

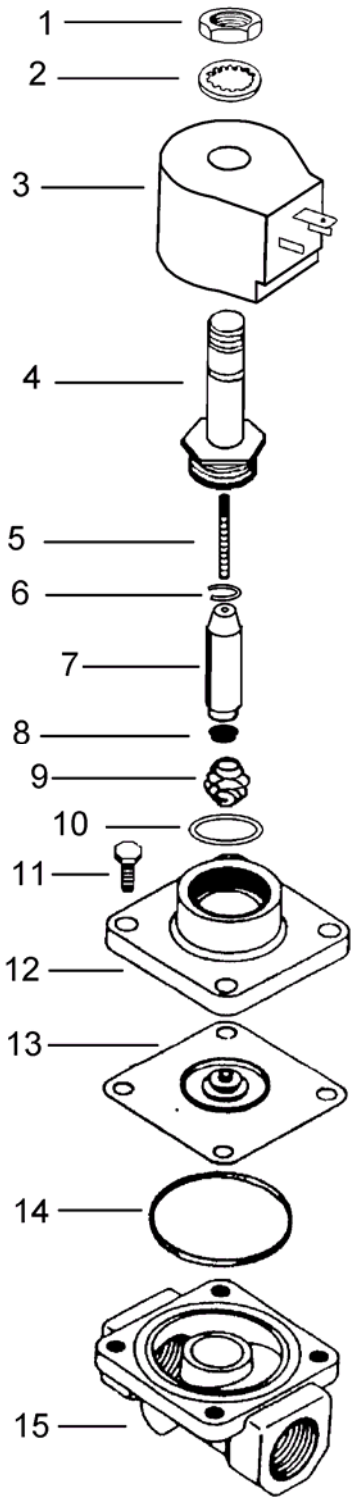
---

1. Unscrew the hex nut (1). Remove with lockwasher (2).
2. Lift off the coil (3) from the plunger tube.
3. Do not damage the solenoid assembly.
4. Use a 1" spanner to remove solenoid base nut and plunger tube (4). Do not nick, dent, or damage plunger tube (4) or valve seating surfaces.
5. Carefully hold plunger tube (4) in position when removing from valve bonnet (12) to prevent loss of internal parts.
6. Remove return spring (5) plunger assembly (7),
7. Remove four bonnet bolts (11) and separate the valve bonnet (12) from the valve body (15).
8. Carefully remove connecting spring (9) from the diaphragm (13) and plunger (7) assemblies.
9. Check seat disc (8) and diaphragm assembly (13) for damage or wear.
10. Replace O-rings (10 & 14), diaphragm assembly (13), seat disc (8) and other parts as necessary.
11. Re-assemble in reverse order from above taking care to properly re-install the seat disc (8) and connecting spring (9).
12. Tighten tube base nut (4) to 18 to 24 in/lbs and bonnet bolts 11) to 40 to 45 in/lbs.
13 . Re-connect electrical and test for proper operation.

TROUBLE-SHOOTING

If valve fails to open check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.



NS211(AC) -- Service and Installation --

12/14/2016

DESCRIPTION
The NS211 Series Solenoid Valves are 2-way, normally closed, piloted, general purpose valves specifically designed for drinking water and other food products. All stainless steel or Noryl construction with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases.
Valves may be mounted in any positions. A spring loaded plunger assures positive shutoff. The S4 solenoid coil is rated at 10 watts.

OPERATION
NS211 Valves are normally closed (N.C.) and open when electrically energized.

SPECIFICATIONS
Use NS211 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (min./max. psi, voltage, hz, maximum media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	32° - 125° F	Fluid	32° - 295° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter .
2. Valves are multipoised and may be mounted in any position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.
Incorrect coil reassembly can cause coil burnout. At all times, take care not to nick, dent, or damage the plunger tube.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **VALVE DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take are not to nick, dent or damage plunger tube.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most NS211 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

REBUILD KIT
The Rebuild Kit contains a plunger/spring/seat disc assembly, plunger tube assembly, O-rings and adapter ring.

REPAIR KIT
The Repair Kit contains a seat disc, diaphragm assembly and O-rings.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
NS211YF02FPCG4	KS211AF02G4-NSF	K211G4-NSF
NS211YF02FPDG4	KS211AF02G4-NSF	K211G4-NSF
NS211YF02FPEG5	KS211AF02G5-NSF	K211G5-NSF
NS211YF24FPCG4	KS211AF02G4-NSF	K211G4-NSF
NS211YF24FPDG4	KS211AF02G4-NSF	K211G4-NSF
NS211YF24FPEG5	KS211AF02G5-NSF	K211G5-NSF
NS211YF02F7CG4	KS211AF02G4-NSF	K211G4-NSF
NS211YF02F7DG4	KS211AF02G4-NSF	K211G4-NSF
NS211YF02F7EG5	KS211AF02G5-NSF	K211G5-NSF
NS211YF24F7CG4	KS211AF02G4-NSF	K211G4-NSF
NS211YF24F7DG4	KS211AF02G4-NSF	K211G4-NSF
NS211YF24F7EG5	KS211AF02G5-NSF	K211G5-NSF

COIL CHART

Valve	Voltage	DIN Coil	Conduit Coil
NS211YF02FPCG4	120V 50/60	HS3YN02	HS3GN02A24
NS211YF02FPDG4	120V 50/60	HS3YN02	HS3GN02A24
NS211YF02FPEG5	120V 50/60	HS3YN02	HS3GN02A24
NS211YF24FPCG4	24V 50/60	HS3YN24	HS3GN24A24
NS211YF24FPDG4	24V 50/60	HS3YN24	HS3GN24A24
NS211YF24FPEG5	24V 50/60	HS3YN24	HS3GN24A24
NS211YF02F7CG4	120V 50/60	HS3YN02	HS3GN02A24
NS211YF02F7DG4	120V 50/60	HS3YN02	HS3GN02A24
NS211YF02F7EG5	120V 50/60	HS3YN02	HS3GN02A24
NS211YF24F7CG4	24V 50/60	HS3YN24	HS3GN24A24
NS211YF24F7DG4	24V 50/60	HS3YN24	HS3GN24A24
NS211YF24F7EG5	24V 50/60	HS3YN24	HS3GN24A24

Cleaning
Cleaning fluid must be compatible with all valve components.
It is recommended that NS211 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

SERVICE
Disassembly

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

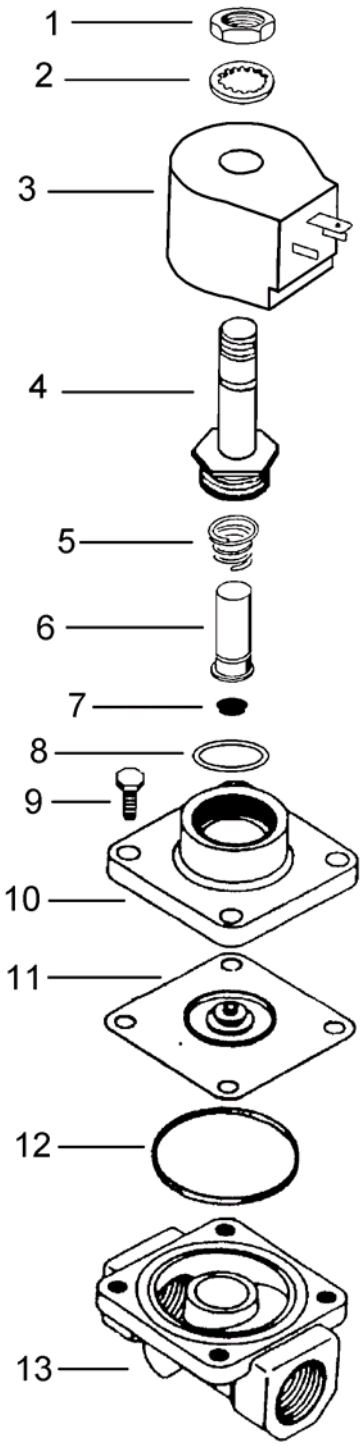
---

1. Unscrew the hex nut (1). Remove with lockwasher (2).
2. Lift off the coil (3) from the plunger tube.
3. Do not damage the solenoid assembly.
4. Use a 1" spanner to remove solenoid base nut and plunger tube (4). Do not nick, dent, or damage plunger tube (4) or valve seating surfaces.
5. Carefully hold plunger tube (4) in position when removing from valve bonnet (10) to prevent loss of internal parts.
6. Remove plunger/spring assembly (5, 6, & 7),
7. Remove four bonnet bolts (10) and separate the valve bonnet (10) from the valve body (13).
8. Check seat disc (7) and diaphragm assembly (11) for damage or wear.
9. Replace O-rings (8 & 12), diaphragm assembly (11), seat disc (7) and other parts as necessary.
10. Re-assemble in reverse order from above taking care to properly re-install the seat disc (7).
11. Tighten tube base nut (4) to 18 to 24 in/lbs and bonnet bolts (9) to 40 to 45 in/lbs.
12. Re-connect electrical and test for proper operation.

TROUBLE-SHOOTING

If valve fails to open check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.



NS211(DC) -- Service and Installation --

12/14/2016

DESCRIPTION
The NS211 Series Solenoid Valves are 2-way, normally closed, piloted, general purpose valves specifically designed for drinking water and other food products. All stainless steel or Noryl construction with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases.
Valves may be mounted in any positions. A spring loaded plunger assures positive shutoff. The S4 solenoid coil is rated at 10 watts.

OPERATION
NS211 Valves are normally closed (N.C.) and open when electrically energized.

SPECIFICATIONS
Use NS211 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (min./max. psi, voltage, hz, maximum media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	32° - 125° F	Fluid	32° - 295° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter .
2. Valves are multipoised and may be mounted in any position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.
Incorrect coil reassembly can cause coil burnout. At all times, take care not to nick, dent, or damage the plunger tube.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **VALVE DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take are not to nick, dent or damage plunger tube.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most NS211 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

REBUILD KIT
The Rebuild Kit contains a plunger/spring/seat disc assembly, plunger tube assembly, O-rings and adapter ring.

REPAIR KIT
The Repair Kit contains a seat disc, diaphragm assembly and O-rings.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
NS211YF16FPCG4	KS211AF15G4-NSF	K211G415-NSF
NS211YF16FPDG4	KS211AF15G4-NSF	K211G415-NSF
NS211YF16FPEG5	KS211AF15G5-NSF	K211G515-NSF
NS211YF16F7CG4	KS211AF15G4-NSF	K211G415-NSF
NS211YF16F7DG4	KS211AF15G4-NSF	K211G415-NSF
NS211YF16F7EG5	KS211AF15G5-NSF	K211G515-NSF

COIL CHART

Valve	Voltage	DIN Coil	Conduit Coil
NS211YF16FPCG4	24V DC	HS4YN16	HS4GN16A24
NS211YF16FPDG4	24V DC	HS4YN16	HS4GN16A24
NS211YF16FPEG5	24V DC	HS4YN16	HS4GN16A24
NS211YF16F7CG4	24V DC	HS4YN16	HS4GN16A24
NS211YF16F7DG4	24V DC	HS4YN16	HS4GN16A24
NS211YF16F7EG5	24V DC	HS4YN16	HS4GN16A24

Cleaning
Cleaning fluid must be compatible with all valve components.
It is recommended that NS211 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

SERVICE
Disassembly

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

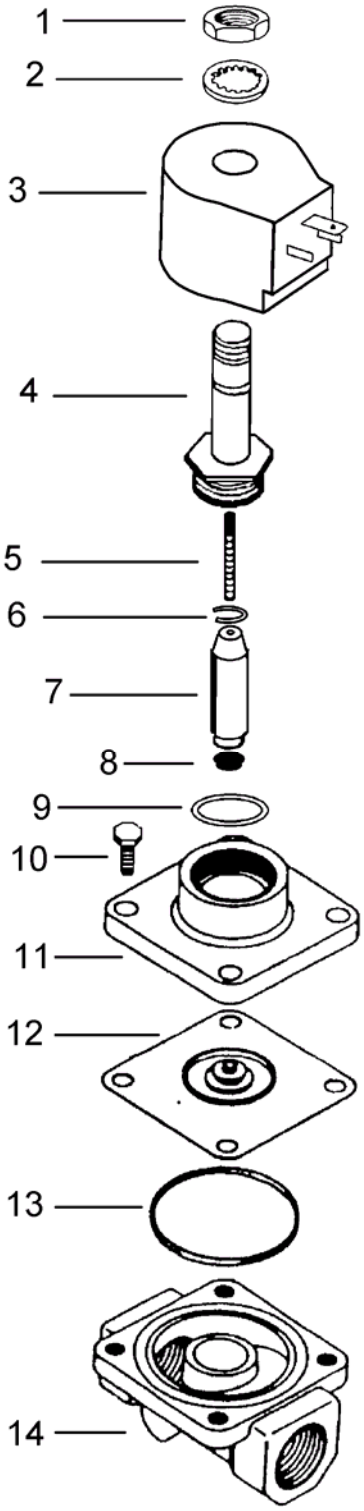
---

1. Unscrew the hex nut (1). Remove with lockwasher (2).
2. Lift off the coil (3) from the plunger tube.
3. Do not damage the solenoid assembly.
4. Use a 1" spanner to remove solenoid base nut and plunger tube (4). Do not nick, dent, or damage plunger tube (4) or valve seating surfaces.
5. Carefully hold plunger tube (4) in position when removing from valve bonnet (11) to prevent loss of internal parts.
6. Remove return spring (5) plunger assembly (7),
7. Remove four bonnet bolts (10) and separate the valve bonnet (11) from the valve body (14).
8. Check seat disc (8) snap ring (6) and diaphragm assembly (12) for damage or wear.
9. Replace O-rings (9 & 13), diaphragm assembly (12), seat disc (8) and other parts as necessary.
10. Re-assemble in reverse order from above taking care to properly re-install the seat disc (8).
11. Tighten tube base nut (4) to 18 to 24 in/lbs and bonnet bolts (10) to 40 to 45 in/lbs.
12. Re-connect electrical and test for proper operation.

TROUBLE-SHOOTING

If valve fails to open check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.



NS301 - Service and Installation -

12/14/2016

DESCRIPTION
The NS301 Series Solenoid Valves are 2-way, normally closed, direct acting, general purpose valves specifically designed for drinking water and other food products. All stainless steel construction with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases.
Valves may be mounted in any positions. A spring loaded plunger assures positive shutoff. The S4 solenoid coil is rated at 10 watts.

OPERATION
NS301 Valves are normally closed (N.C.) and open when electrically energized.

SPECIFICATIONS
Use NS301 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (min./max. psi, voltage, cycle, maximum media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	32^{o} - 125^{o} F	Fluid	32^{o} - 295^{o} F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter .
2. Valves are multipoised and may be mounted in any position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

Cleaning
Cleaning fluid must be compatible with all valve components.
It is recommended that NS301 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most NS301 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.
Incorrect coil reassembly can cause coil burnout. At all times, take care not to nick, dent, or damage the plunger tube.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **VALVE DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take are not to nick, dent or damage plunger tube.

REBUILD KIT
The Rebuild Kit contains a plunger/spring/seat disc assembly, plunger tube assembly, O-rings and adapter ring.

REPAIR KIT
The Repair Kit contains a seat disc, and O-rings.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
NS301YF02C3BE7	KS301AF02E7-NSF	K301E7-NSF
NS301YF02C3BD5	KS301AF02C3-NSF	K301C3-NSF
NS301YF02C3BC9	KS301AF02C3-NSF	K301C3-NSF
NS301YF24C3BE7	KS301AF02E7-NSF	K301E7-NSF
NS301YF24C3BD5	KS301AF02C3-NSF	K301C3-NSF
NS301YF24C3BC9	KS301AF02C3-NSF	K301C3-NSF
NS301YF16C3BE7	KS301AF02E7-NSF	K301E7-NSF
NS301YF16C3BD5	KS301AF02C3-NSF	K301C3-NSF
NS301YF16C3BC9	KS301AF02C3-NSF	K301C3-NSF

COIL CHART

Valve	Voltage	DIN Coil	Conduit Coil
NS301YF02C3BE7	120V 50/60	HS4YN02	HS4GN02A24
NS301YF02C3BD5	120V 50/60	HS4YN02	HS4GN02A24
NS301YF02C3BC9	120V 50/60	HS4YN02	HS4GN02A24
NS301YF24C3BE7	24V 50/60	HS4YN24	HS4GN24A24
NS301YF24C3BD5	24V 50/60	HS4YN24	HS4GN24A24
NS301YF24C3BC9	24V 50/60	HS4YN24	HS4GN24A24
NS301YF16C3BE7	24 VDC	HS4YN16	HS4GN16A24
NS301YF16C3BD5	24 VDC	HS4YN16	HS4GN16A24
NS301YF16C3BC9	24 VDC	HS4YN16	HS4GN16A24

GC Valves, LLC. 456 Crompton St., Charlotte, NC 28241
Ph: 704-588-3300, Fx: 704-973-9526, Service@gcvalves.com

SERVICE

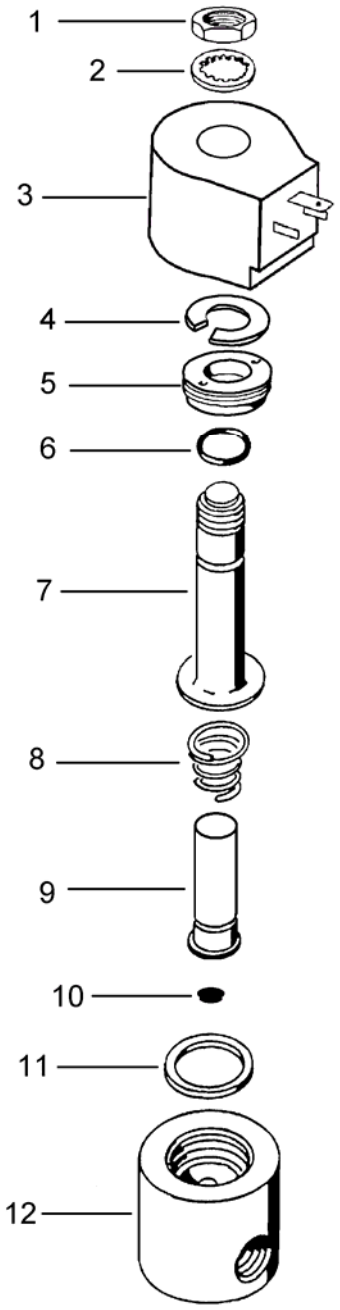
DISASSEMBLY AND REPAIR KIT INSTALLATION

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

---

1. Unscrew the hex nut (1). Remove with lockwasher (2).
2. Lift off the coil (3) from the plunger tube.
3. Do not damage the solenoid assembly.
4. Use GC Valves spanner nut (106198E) or similar tool to remove solenoid base nut (5) and plunger tube (7). Do not nick dent or damage plunger tube (7) or valve seating surfaces.
5. Hold plunger tube (7) in position when removing from valve body (12) to prevent loss of internal parts.
6. Carefully remove the plunger/spring/seat disc assembly (8, 9 & 10),
7. Check seating surfaces on the seat disc (10) and valve body (12) for damage or wear.
8. Replace seat disc (10) body O-ring (11) and other parts as necessary.
9. Re-assemble in reverse order from above taking care to properly install the seat disc (10), plunger (9) and plunger tube (7).
10. Tighten solenoid base nut (5) to 25 In/Lbs.
11. Re-connect electrical and test for proper operation.



REBUILD KIT INSTALLATION AND ASSEMBLY

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

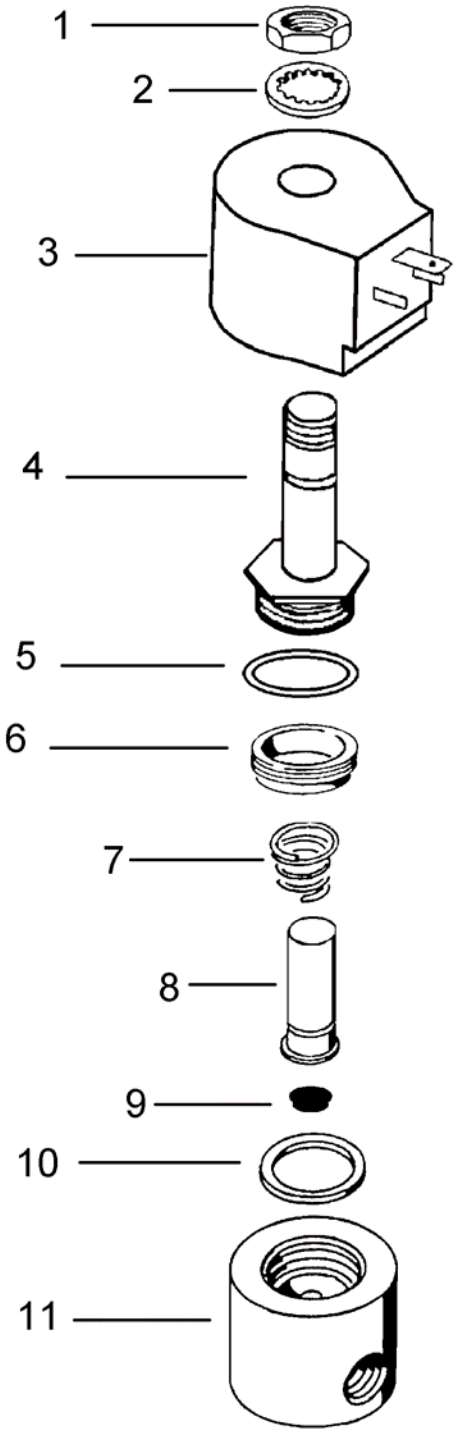
---

1. Carefully install seat disc (9) and spring (7) on the plunger (8).
2. Place body O-ring (10) in valve body (11) operator cavity..
3. Place tube O-ring (5) on plunger tube (4) base.
4. Thread adapter ring (6) on plunger tube (4) base.
5. Place plunger assembly (7, 8 & 9) in valve body (11) cavity.
6. Carefully thread plunger tube assembly (4, 5 & 6) into valve body (11).
7. Use a 1" spanner to tighten solenoid base nut and plunger tube (4). Do not nick, dent, or damage plunger tube (4) or valve seating surfaces.
8. Tighten plunger tube base nut (4) to 24 In/Lbs.
9. Replace coil (3), lockwasher (2) and top nut (1). Tighten to approximately 25 In/Lbs.
11. Re-connect electrical and test for proper operation.

TROUBLE-SHOOTING

If valve fails to open check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.



S201(AC) -- Service and Installation --

11/1/2016

DESCRIPTION
The S201 Series Solenoid Valves are 2-way, normally closed, piloted, zero differential general purpose valves. All stainless steel, brass or Noryl construction with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases.
Valves may be mounted in any position. A spring loaded plunger assures positive shutoff. The S4 solenoid coil is rated at 10 watts.

OPERATION
S201 Valves are normally closed (N.C.) and open when electrically energized.

SPECIFICATIONS
Use S201 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (min./max. psi, voltage, hz, maximum media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	32° - 125° F	Fluid	32° - 295° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter .
2. Valves are multipoised and may be mounted in any position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.
Incorrect coil reassembly can cause coil burnout. At all times, take care not to nick, dent, or damage the plunger tube.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **VALVE DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take are not to nick, dent or damage plunger tube.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most S201 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

REBUILD KIT
The Rebuild Kit contains a plunger/spring/seat disc assembly, plunger tube assembly, O-rings and adapter ring.

REPAIR KIT
The Repair Kit contains a seat disc, diaphragm assembly and O-rings.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
S201GF__C5CG4	KS201AF02C5CG4	K201C5C
S201GF__C5DG4	KS201AF02C5CG4	K201C5C
S201GF__C5EG5	KS201AF02C5EG5	K201C5E
S201GF__N5CG4	KS201AF02N5CG4	K201N5C
S201GF__N5DG4	KS201AF02N5CG4	K201N5C
S201GF__N5EG5	KS201AF02N5EG5	K201N5E
S201GF__V5CG4	KS201AF02V5CG4	K201V5C
S201GF__V5DG4	KS201AF02V5CG4	K201V5C
S201GF__V5EG5	KS201AF02V5EG5	K201V5E
S201GF__E7CG4	KS201AF02E7CG4	K201E7C
S201GF__E7DG4	KS201AF02E7CG4	K201E7C
S201GF__E7EG5	KS201AF02E7EG5	K201E7E
S201GF__J7CG4	KS201AF02J7CG4	K201J7C
S201GF__J7DG4	KS201AF02J7CG4	K201J7C
S201GF__J7EG5	KS201AF02J7EG5	K201J7E
S201GF__L7CG4	KS201AF02L7CG4	K201L7C
S201GF__L7DG4	KS201AF02L7CG4	K201L7C
S201GF__L7EG5	KS201AF02L7EG5	K201L7E

COIL CHART

Valve	Voltage	DIN Coil	Conduit Coil
S201GF02__G4	120V 50/60	HS4YN02	HS4GN02A24
S201GF02__G5	120V 50/60	HS4YN02	HS4GN02A24
S201GF15__G4	12 VDC	HS4YN15	HS4GN15A24
S201GF15__G5	12 VDC	HS4YN15	HS4GN15A24
S201GF16__G4	24 VDC	HS4YN16	HS4GN16A24
S201GF16__G5	24 VDC	HS4YN16	HS4GN16A24
S201GF24__G4	24V 50/60	HS4YN24	HS4GN24A24
S201GF24__G5	24V 50/60	HS4YN24	HS4GN24A24

Cleaning

Cleaning fluid must be compatible with all valve components.
It is recommended that S201 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

SERVICE
Disassembly

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

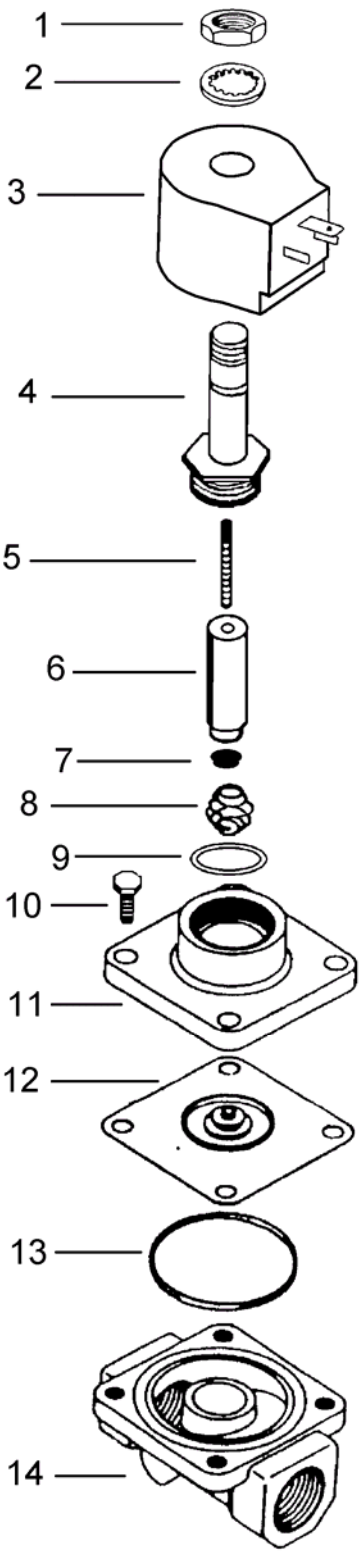
---

1. Unscrew the hex nut (1). Remove with lockwasher (2).
2. Lift off the coil (3) from the plunger tube.
3. Do not damage the solenoid assembly.
4. Use a 1" spanner to remove solenoid base nut and plunger tube (4). Do not nick, dent, or damage plunger tube (4) or valve seating surfaces.
5. Carefully hold plunger tube (4) in position when removing from valve bonnet (11) to prevent loss of internal parts.
6. Remove return spring (5) from plunger assembly (6),
7. Remove four bonnet bolts (10) and separate the valve bonnet (11) from the valve body (14).
8. Carefully remove connecting spring (8) from the diaphragm (12) and plunger (6) assemblies.
9. Check seat disc (7) and diaphragm assembly (12) for damage or wear.
10. Replace O-rings (9 & 13), diaphragm assembly (12), seat disc (7) and other parts as necessary.
11. Re-assemble in reverse order from above taking care to properly re-install the seat disc (7) and connecting spring (8).
12. Tighten Tube Base Nut (4) to 18 to 24 in/lbs. and bonnet bolts (10) to 40 to 45 in/lbs.
13. Re-connect electrical and test for proper operation.

TROUBLE-SHOOTING

If valve fails to open check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.



S201(DC) -- Service and Installation --

11/1/2016

DESCRIPTION
The S201 Series Solenoid Valves are 2-way, normally closed, piloted, zero differential general purpose valves. All stainless steel, brass or Noryl construction with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases.
Valves may be mounted in any position. A spring loaded plunger assures positive shutoff. The S4 solenoid coil is rated at 10 watts.

OPERATION
S201 Valves are normally closed (N.C.) and open when electrically energized.

SPECIFICATIONS
Use S201 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (min./max. psi, voltage, hz, maximum media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	32° - 125° F	Fluid	32° - 295° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter .
2. Valves are multipoised and may be mounted in any position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.
Incorrect coil reassembly can cause coil burnout. At all times, take care not to nick, dent, or damage the plunger tube.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **VALVE DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take are not to nick, dent or damage plunger tube.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most S201 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

REBUILD KIT
The Rebuild Kit contains a plunger/spring/seat disc assembly, plunger tube assembly, O-rings and adapter ring.

REPAIR KIT
The Repair Kit contains a seat disc, diaphragm assembly and O-rings.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
S201GF__C5CG4	KS201AF15C5CG4	K201C5C
S201GF__C5DG4	KS201AF15C5CG4	K201C5C
S201GF__C5EG5	KS201AF15C5EG5	K201C5E
S201GF__N5CG4	KS201AF15N5CG4	K201N5C
S201GF__N5DG4	KS201AF15N5CG4	K201N5C
S201GF__N5EG5	KS201AF15N5EG5	K201N5E
S201GF__V5CG4	KS201AF15V5CG4	K201V5C
S201GF__V5DG4	KS201AF15V5CG4	K201V5C
S201GF__V5EG5	KS201AF15V5EG5	K201V5E
S201GF__E7CG4	KS201AF15E7CG4	K201E7C
S201GF__E7DG4	KS201AF15E7CG4	K201E7C
S201GF__E7EG5	KS201AF15E7EG5	K201E7E
S201GF__J7CG4	KS201AF15J7CG4	K201J7C
S201GF__J7DG4	KS201AF15J7CG4	K201J7C
S201GF__J7EG5	KS201AF15J7EG5	K201J7E
S201GF__L7CG4	KS201AF15L7CG4	K201L7C
S201GF__L7DG4	KS201AF15L7CG4	K201L7C
S201GF__L7EG5	KS201AF15L7EG5	K201L7E

COIL CHART

Valve	Voltage	DIN Coil	Conduit Coil
S201GF02__G4	120V 50/60	HS4YN02	HS4GN02A24
S201GF02__G5	120V 50/60	HS4YN02	HS4GN02A24
S201GF15__G4	12 VDC	HS4YN15	HS4GN15A24
S201GF15__G5	12 VDC	HS4YN15	HS4GN15A24
S201GF16__G4	24 VDC	HS4YN16	HS4GN16A24
S201GF16__G5	24 VDC	HS4YN16	HS4GN16A24
S201GF24__G4	24V 50/60	HS4YN24	HS4GN24A24
S201GF24__G5	24V 50/60	HS4YN24	HS4GN24A24

Cleaning

Cleaning fluid must be compatible with all valve components.
It is recommended that S201 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

SERVICE
Disassembly

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

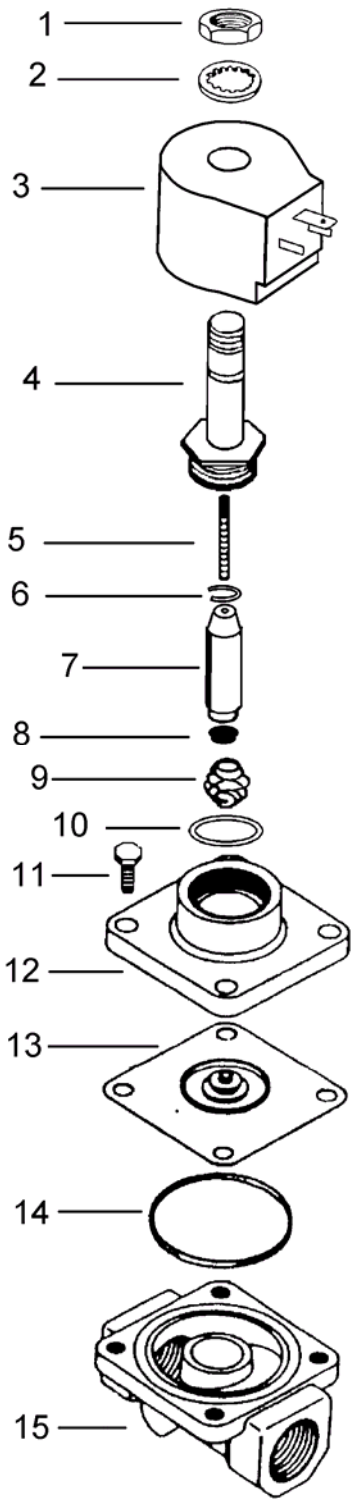
---

1. Unscrew the hex nut (1). Remove with lockwasher (2).
2. Lift off the coil (3) from the plunger tube.
3. Do not damage the solenoid assembly.
4. Use a 1" spanner to remove solenoid base nut and plunger tube (4). Do not nick, dent, or damage plunger tube (4) or valve seating surfaces.
5. Carefully hold plunger tube (4) in position when removing from valve bonnet (12) to prevent loss of internal parts.
6. Remove return spring (5) plunger assembly (7),
7. Remove four bonnet bolts (11) and separate the valve bonnet (12) from the valve body (15).
8. Carefully remove connecting spring (9) from the diaphragm (13) and plunger (7) assemblies.
9. Check seat disc (8) and diaphragm assembly (13) for damage or wear.
10. Replace O-rings (10 & 14), diaphragm assembly (13), seat disc (8) and other parts as necessary.
11. Re-assemble in reverse order from above taking care to properly re-install the seat disc (8) and connecting spring (9).
12. Tighten tube base nut (4) to 18 to 24 in/lbs and bonnet bolts 11) to 40 to 45 in/lbs.
13 . Re-connect electrical and test for proper operation.

TROUBLE-SHOOTING

If valve fails to open check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.



S202(DC) -- Service and Installation --

11/1/2016

DESCRIPTION
The S202 Series Solenoid Valves are 2-way, normally open, piloted, zero differential general purpose valves. All stainless steel, brass or Noryl construction with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases.
Valves may be mounted in any position. A spring loaded plunger assures positive shutoff. The S4 solenoid coil is rated at 10 watts.

OPERATION
S202 Valves are normally open (N.O.) and close when electrically energized.

SPECIFICATIONS
Use S202 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (min./max. psi, voltage, hz, maximum media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	32° - 125° F	Fluid	32° - 295° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter .
2. Valves are multipoised and may be mounted in any position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.
Incorrect coil reassembly can cause coil burnout. At all times, take care not to nick, dent, or damage the plunger tube.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **VALVE DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take are not to nick, dent or damage plunger tube.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most S202 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

REBUILD KIT
The Rebuild Kit contains a plunger/spring/seat disc assembly, plunger tube assembly, O-rings and adapter ring.

REPAIR KIT
The Repair Kit contains a seat disc, diaphragm assembly and O-rings.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
S202GF__C5CG4	KS202AF15C5CG4	K202C5C
S202GF__C5DG4	KS202AF15C5CG4	K202C5C
S202GF__C5EG5	KS202AF15C5EG5	K202C5E
S202GF__N5CG4	KS202AF15N5CG4	K202N5C
S202GF__N5DG4	KS202AF15N5CG4	K202N5C
S202GF__N5EG5	KS202AF15N5EG5	K202N5E
S202GF__V5CG4	KS202AF15V5CG4	K202V5C
S202GF__V5DG4	KS202AF15V5CG4	K202V5C
S202GF__V5EG5	KS202AF15V5EG5	K202V5E
S202GF__E7CG4	KS202AF15E7CG4	K202E7C
S202GF__E7DG4	KS202AF15E7CG4	K202E7C
S202GF__E7EG5	KS202AF15E7EG5	K202E7E
S202GF__J7CG4	KS202AF15J7CG4	K202J7C
S202GF__J7DG4	KS202AF15J7CG4	K202J7C
S202GF__J7EG5	KS202AF15J7EG5	K202J7E
S202GF__L7CG4	KS202AF15L7CG4	K202L7C
S202GF__L7DG4	KS202AF15L7CG4	K202L7C
S202GF__L7EG5	KS202AF15L7EG5	K202L7E

COIL CHART

Valve	Voltage	DIN Coil	Conduit Coil
S202GF02__G4	120V 50/60	HS4YN02	HS4GN02A24
S202GF02__G5	120V 50/60	HS4YN02	HS4GN02A24
S202GF15__G4	12 VDC	HS4YN15	HS4GN15A24
S202GF15__G5	12 VDC	HS4YN15	HS4GN15A24
S202GF16__G4	24 VDC	HS4YN16	HS4GN16A24
S202GF16__G5	24 VDC	HS4YN16	HS4GN16A24
S202GF24__G4	24V 50/60	HS4YN24	HS4GN24A24
S202GF24__G5	24V 50/60	HS4YN24	HS4GN24A24

Cleaning

Cleaning fluid must be compatible with all valve components.
It is recommended that S202 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

SERVICE
Disassembly

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

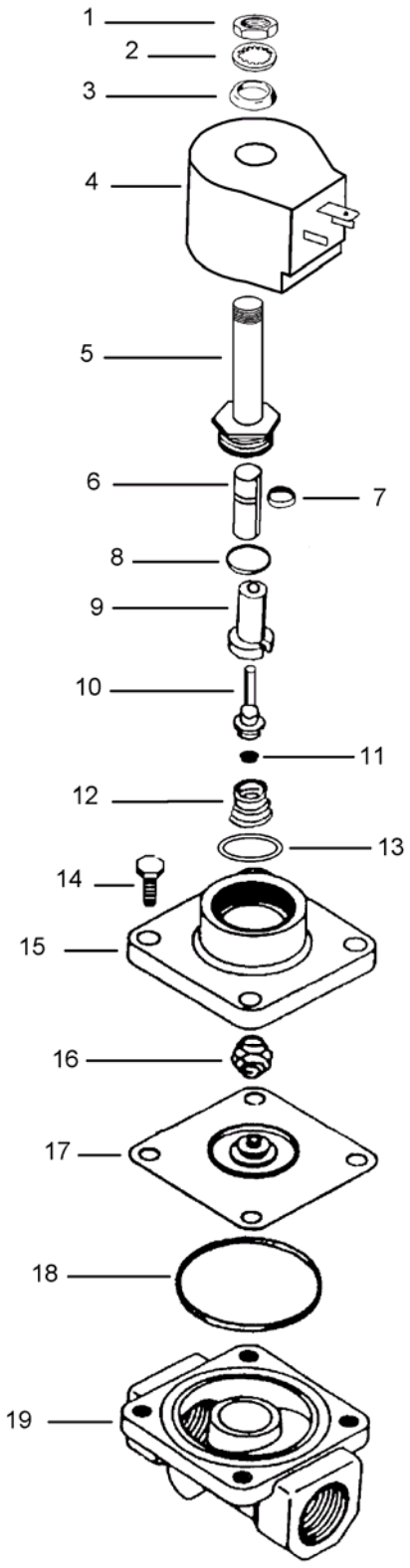
---

1. Unscrew the hex nut (1). Remove with lockwasher (2) and spacer (3).
2. Lift off the coil (4) from the plunger tube.
3. Do not damage the solenoid assembly.
4. Use a 1" spanner to remove solenoid base nut and plunger tube (5). Do not nick, dent, or damage plunger tube (5) or valve seating surfaces.
5. Carefully hold plunger tube (5) in position when removing from valve bonnet (15) to prevent loss of internal parts.
6. Carefully remove connecting spring (16) from the seat retainer (10).
7. Remove return spring (12) from bonnet (15),
8. Remove four bonnet bolts (14) and separate the valve bonnet (15) from the valve body (19).
9. Carefully remove the connecting spring (16) from the diaphragm assembly (17).
10. Check seat disc (11) and diaphragm assembly (17) for damage or wear.
11. Replace O-rings (8, 13 & 18), diaphragm assembly (17), seat disc (11) and other parts as necessary.
12. Re-assemble in reverse order from above taking care to properly re-install the seat disc (11) connecting spring (16) and PTFE strip (7).
13. Tighten Tube Base Nut (5) to 18 to 24 in/lbs. and bonnet bolts (14) to 40 to 45 in/lbs.
14. Re-connect electrical and test for proper operation.

TROUBLE-SHOOTING

If valve fails to close check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to open, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.



S202(AC) -- Service and Installation --

11/1/2016

DESCRIPTION
The S202 Series Solenoid Valves are 2-way, normally open, piloted, zero differential general purpose valves. All stainless steel, brass or Noryl construction with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases.
Valves may be mounted in any position. A spring loaded plunger assures positive shutoff. The S4 solenoid coil is rated at 10 watts.

OPERATION
S202 Valves are normally open (N.O.) and close when electrically energized.

SPECIFICATIONS
Use S202 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (min./max. psi, voltage, hz, maximum media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	32° - 125° F	Fluid	32° - 295° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter .
2. Valves are multipoised and may be mounted in any position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.
Incorrect coil reassembly can cause coil burnout. At all times, take care not to nick, dent, or damage the plunger tube.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **VALVE DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take are not to nick, dent or damage plunger tube.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most S202 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

REBUILD KIT
The Rebuild Kit contains a plunger/spring/seat disc assembly, plunger tube assembly, O-rings and adapter ring.

REPAIR KIT
The Repair Kit contains a seat disc, diaphragm assembly and O-rings.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
S202GF__C5CG4	KS202AF02C5CG4	K202C5C
S202GF__C5DG4	KS202AF02C5CG4	K202C5C
S202GF__C5EG5	KS202AF02C5EG5	K202C5E
S202GF__N5CG4	KS202AF02N5CG4	K202N5C
S202GF__N5DG4	KS202AF02N5CG4	K202N5C
S202GF__N5EG5	KS202AF02N5EG5	K202N5E
S202GF__V5CG4	KS202AF02V5CG4	K202V5C
S202GF__V5DG4	KS202AF02V5CG4	K202V5C
S202GF__V5EG5	KS202AF02V5EG5	K202V5E
S202GF__E7CG4	KS202AF02E7CG4	K202E7C
S202GF__E7DG4	KS202AF02E7CG4	K202E7C
S202GF__E7EG5	KS202AF02E7EG5	K202E7E
S202GF__J7CG4	KS202AF02J7CG4	K202J7C
S202GF__J7DG4	KS202AF02J7CG4	K202J7C
S202GF__J7EG5	KS202AF02J7EG5	K202J7E
S202GF__L7CG4	KS202AF02L7CG4	K202L7C
S202GF__L7DG4	KS202AF02L7CG4	K202L7C
S202GF__L7EG5	KS202AF02L7EG5	K202L7E

COIL CHART

Valve	Voltage	DIN Coil	Conduit Coil
S202GF02__G4	120V 50/60	HS4YN02	HS4GN02A24
S202GF02__G5	120V 50/60	HS4YN02	HS4GN02A24
S202GF15__G4	12 VDC	HS4YN15	HS4GN15A24
S202GF15__G5	12 VDC	HS4YN15	HS4GN15A24
S202GF16__G4	24 VDC	HS4YN16	HS4GN16A24
S202GF16__G5	24 VDC	HS4YN16	HS4GN16A24
S202GF24__G4	24V 50/60	HS4YN24	HS4GN24A24
S202GF24__G5	24V 50/60	HS4YN24	HS4GN24A24

Cleaning

Cleaning fluid must be compatible with all valve components.
It is recommended that S202 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

SERVICE
Disassembly

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

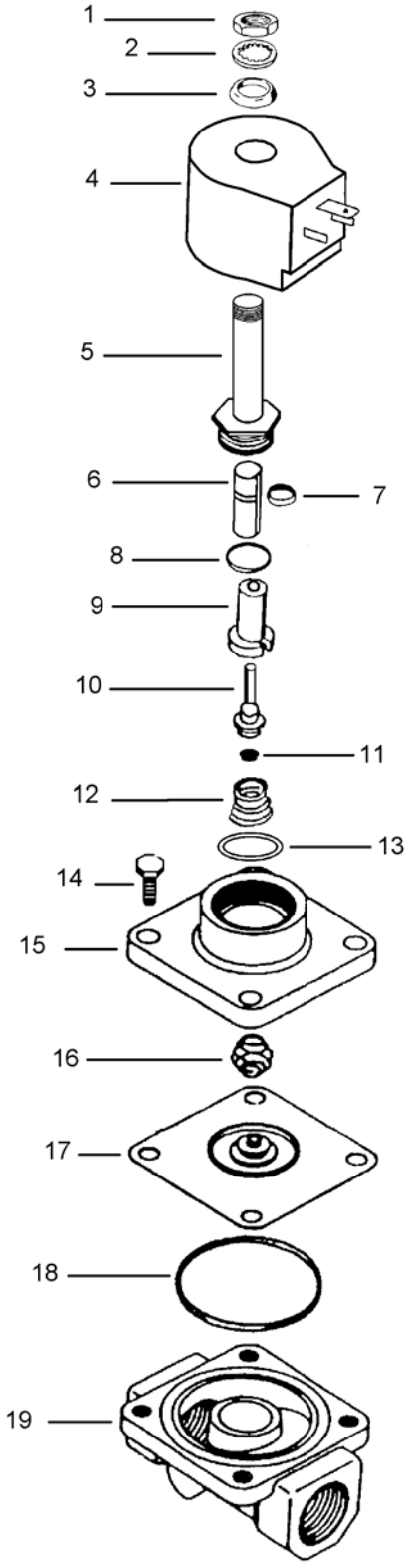
---

1. Unscrew the hex nut (1). Remove with lockwasher (2) and spacer (3).
2. Lift off the coil (4) from the plunger tube.
3. Do not damage the solenoid assembly.
4. Use a 1" spanner to remove solenoid base nut and plunger tube (5). Do not nick, dent, or damage plunger tube (5) or valve seating surfaces.
5. Carefully hold plunger tube (5) in position when removing from valve bonnet (15) to prevent loss of internal parts.
6. Carefully remove connecting spring (16) from the seat retainer (10).
7. Remove return spring (12) from bonnet (15),
8. Remove four bonnet bolts (14) and separate the valve bonnet (15) from the valve body (19).
9. Carefully remove the connecting spring (16) from the diaphragm assembly (17).
10. Check seat disc (11) and diaphragm assembly (17) for damage or wear.
11. Replace O-rings (8, 13 & 18), diaphragm assembly (17), seat disc (11) and other parts as necessary.
12. Re-assemble in reverse order from above taking care to properly re-install the seat disc (11) connecting spring (16) and PTFE strip (7).
13. Tighten Tube Base Nut (4) to 18 to 24 in/lbs. and bonnet bolts (10) to 40 to 45 in/lbs.
14. Re-connect electrical and test for proper operation.

TROUBLE-SHOOTING

If valve fails to close check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to open, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.



GC Valves
4525 E. Industrial St., 4C
Simi Valley, CA 93063

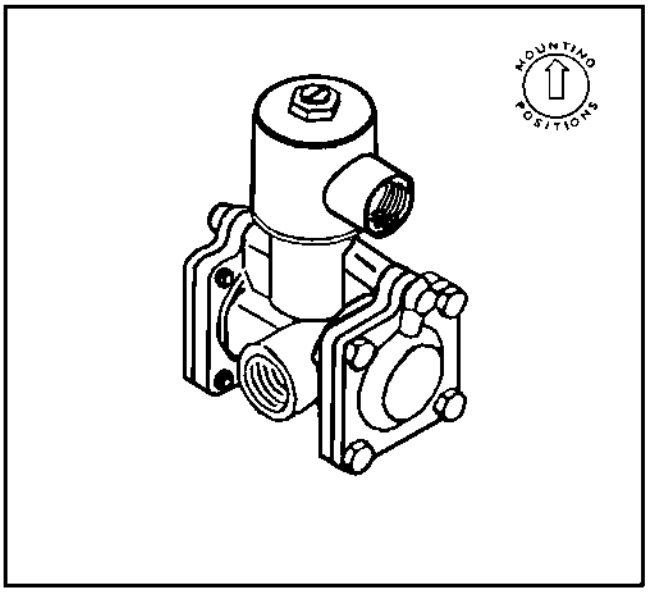
INSTALLATION AND SERVICE

S203
3-Way Normally Closed Pilot Operated Diaphragm Solenoid Valve
3/8", 1/2" NPT

DESCRIPTION

S203 Series three-way normally closed pilot operated diaphragm solenoid valves are designed for use with gas, air and liquid flow media compatible with cast brass body and Buna N seat. The valves are general purpose industrial valves used for domestic and other heating appliances. They are also used to alternately apply and exhaust pressure in a system controlling single acting cylinders and diaphragms.

S203 valves are standard with CS4 Class "A" moisture resistant coil rated at 10 watts. Manual operating device, explosion proof solenoid assembly and body mounted mounting bracket are optionally available.



SPECIFICATIONS

Use valve within specified operating ranges as indicated on valve nameplate and in complete catalog number — (Min./Max., PSI, Volts/Cycles, Max. Media Temperature at °F. ambient, Cv Factor, Coil Class, Max. Cycle Rate, etc.)

INSTALLATION

Check valve specifications to make sure of proper application.

1. Back pressure in cylinder port must be equal to the minimum operating differential or valve will not function properly.
2. Clear all lines of foreign matter. Recommend installing strainer ahead inlet of valve.
3. Valve must be mounted on a horizontal pipe line with solenoid in an upright position. Media flow must be in direction indicated on valve body. See Fig. 2 for flow pattern.
4. Do not use solenoid housing as handle. Apply thread seal to male threads only.
5. Provide clearance for solenoid removal.
6. Wire in accordance with applicable national and local electric wiring codes.

SERVICE AND REPAIR

If valve fails to close, check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of seat insert. Check for damaged spring. Valve must be free from dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation.

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage — clean plunger and interior of tube and base assembly.

DISASSEMBLY

Disassemble valve as follows:

1. Unscrew hex nut (1) and remove with lockwasher (2), spacer (3), nameplate (4). See Fig. 1.
2. Lift off coil jacket assembly (5), bottom washer (6) from plunger tube and base assembly (7), and remove coil (8), washer (9) and spring washer (10). Take care not to disarrange solenoid assembly.
3. Use GCV solenoid wrench #63591A to remove plunger tube and base assembly (7) from valve body (11). Do not nick, dent or damage plunger tube.
4. Lift out plastic seat disc retainer (12). Check seat disc for damage.

S212(DC) -- Service and Installation --

11/1/2016

DESCRIPTION
The S212 Series Solenoid Valves are 2-way, normally open, piloted, general purpose valves. All stainless steel, brass or Noryl construction with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases.
Valves may be mounted in any position. A spring loaded plunger assures positive shutoff. The S4 solenoid coil is rated at 10 watts.

OPERATION
S212 Valves are normally open (N.O.) and close when electrically energized.

SPECIFICATIONS
Use S212 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (min./max. psi, voltage, hz, maximum media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	32° - 125° F	Fluid	32° - 295° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter .
2. Valves are multipoised and may be mounted in any position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.
Incorrect coil reassembly can cause coil burnout. At all times, take care not to nick, dent, or damage the plunger tube.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **VALVE DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take are not to nick, dent or damage plunger tube.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most S212 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

REBUILD KIT
The Rebuild Kit contains a plunger/spring/seat disc assembly, plunger tube assembly, O-rings and adapter ring.

REPAIR KIT
The Repair Kit contains a seat disc, diaphragm assembly and O-rings.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
S212GF__C5CG4	KS212AF15C5CG4	K212C5C
S212GF__C5DG4	KS212AF15C5CG4	K212C5C
S212GF__C5EG5	KS212AF15C5EG5	K212C5E
S212GF__N5CG4	KS212AF15N5CG4	K212N5C
S212GF__N5DG4	KS212AF15N5CG4	K212N5C
S212GF__N5EG5	KS212AF15N5EG5	K212N5E
S212GF__V5CG4	KS212AF15V5CG4	K212V5C
S212GF__V5DG4	KS212AF15V5CG4	K212V5C
S212GF__V5EG5	KS212AF15V5EG5	K212V5E
S212GF__E7CG4	KS212AF15E7CG4	K212E7C
S212GF__E7DG4	KS212AF15E7CG4	K212E7C
S212GF__E7EG5	KS212AF15E7EG5	K212E7E
S212GF__J7CG4	KS212AF15J7CG4	K212J7C
S212GF__J7DG4	KS212AF15J7CG4	K212J7C
S212GF__J7EG5	KS212AF15J7EG5	K212J7E
S212GF__L7CG4	KS212AF15L7CG4	K212L7C
S212GF__L7DG4	KS212AF15L7CG4	K212L7C
S212GF__L7EG5	KS212AF15L7EG5	K212L7E

COIL CHART

Valve	Voltage	DIN Coil	Conduit Coil
S212GF02__G4	120V 50/60	HS4YN02	HS4GN02A24
S212GF02__G5	120V 50/60	HS4YN02	HS4GN02A24
S212GF15__G4	12 VDC	HS4YN15	HS4GN15A24
S212GF15__G5	12 VDC	HS4YN15	HS4GN15A24
S212GF16__G4	24 VDC	HS4YN16	HS4GN16A24
S212GF16__G5	24 VDC	HS4YN16	HS4GN16A24
S212GF24__G4	24V 50/60	HS4YN24	HS4GN24A24
S212GF24__G5	24V 50/60	HS4YN24	HS4GN24A24

Cleaning

Cleaning fluid must be compatible with all valve components.
It is recommended that S212 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

SERVICE
Disassembly

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

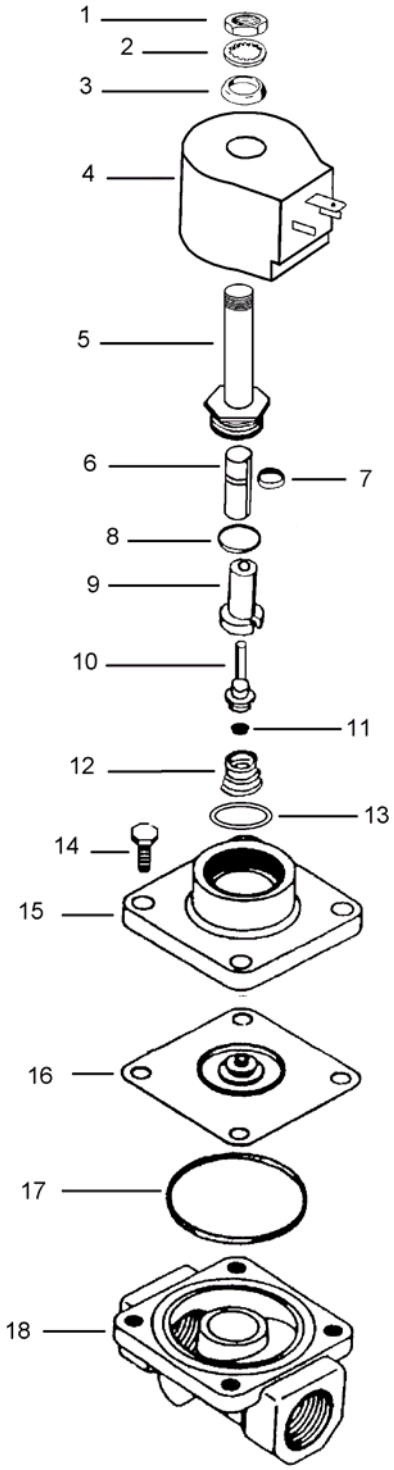
---

1. Unscrew the hex nut (1). Remove with lockwasher (2) and spacer (3).
2. Lift off the coil (4) from the plunger tube.
3. Do not damage the solenoid assembly.
4. Use a 1" spanner to remove solenoid base nut and plunger tube (5). Do not nick, dent, or damage plunger tube (5) or valve seating surfaces.
5. Carefully hold plunger tube (5) in position when removing from valve bonnet (15) to prevent loss of internal parts.
6. Remove return spring (12) from bonnet (15),
7. Remove four bonnet bolts (14) and separate the valve bonnet (15) from the valve body (18).
8. Check seat disc (11) and diaphragm assembly (16) for damage or wear.
9. Replace O-rings (8, 13 & 17), diaphragm assembly (16), seat disc (11) and other parts as necessary.
10. Re-assemble in reverse order from above taking care to properly re-install the seat disc (11) and PTFE strip (7).
11. Tighten Tube Base Nut (4) to 18 to 24 in/lbs. and bonnet bolts (10) to 40 to 45 in/lbs.
12. Re-connect electrical and test for proper operation.

TROUBLE-SHOOTING

If valve fails to close check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to open, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.



S212(AC) -- Service and Installation --

11/1/2016

DESCRIPTION
The S212 Series Solenoid Valves are 2-way, normally open, piloted, general purpose valves. All stainless steel, brass or Noryl construction with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases.
Valves may be mounted in any position. A spring loaded plunger assures positive shutoff. The S4 solenoid coil is rated at 10 watts.

OPERATION
S212 Valves are normally open (N.O.) and close when electrically energized.

SPECIFICATIONS
Use S212 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (min./max. psi, voltage, hz, maximum media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	32° - 125° F	Fluid	32° - 295° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter .
2. Valves are multipoised and may be mounted in any position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.
Incorrect coil reassembly can cause coil burnout. At all times, take care not to nick, dent, or damage the plunger tube.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **VALVE DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take are not to nick, dent or damage plunger tube.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most S212 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

REBUILD KIT
The Rebuild Kit contains a plunger/spring/seat disc assembly, plunger tube assembly, O-rings and adapter ring.

REPAIR KIT
The Repair Kit contains a seat disc, diaphragm assembly and O-rings.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
S212GF__C5CG4	KS212AF02C5CG4	K212C5C
S212GF__C5DG4	KS212AF02C5CG4	K212C5C
S212GF__C5EG5	KS212AF02C5EG5	K212C5E
S212GF__N5CG4	KS212AF02N5CG4	K212N5C
S212GF__N5DG4	KS212AF02N5CG4	K212N5C
S212GF__N5EG5	KS212AF02N5EG5	K212N5E
S212GF__V5CG4	KS212AF02V5CG4	K212V5C
S212GF__V5DG4	KS212AF02V5CG4	K212V5C
S212GF__V5EG5	KS212AF02V5EG5	K212V5E
S212GF__E7CG4	KS212AF02E7CG4	K212E7C
S212GF__E7DG4	KS212AF02E7CG4	K212E7C
S212GF__E7EG5	KS212AF02E7EG5	K212E7E
S212GF__J7CG4	KS212AF02J7CG4	K212J7C
S212GF__J7DG4	KS212AF02J7CG4	K212J7C
S212GF__J7EG5	KS212AF02J7EG5	K212J7E
S212GF__L7CG4	KS212AF02L7CG4	K212L7C
S212GF__L7DG4	KS212AF02L7CG4	K212L7C
S212GF__L7EG5	KS212AF02L7EG5	K212L7E

COIL CHART

Valve	Voltage	DIN Coil	Conduit Coil
S212GF02__G4	120V 50/60	HS4YN02	HS4GN02A24
S212GF02__G5	120V 50/60	HS4YN02	HS4GN02A24
S212GF15__G4	12 VDC	HS4YN15	HS4GN15A24
S212GF15__G5	12 VDC	HS4YN15	HS4GN15A24
S212GF16__G4	24 VDC	HS4YN16	HS4GN16A24
S212GF16__G5	24 VDC	HS4YN16	HS4GN16A24
S212GF24__G4	24V 50/60	HS4YN24	HS4GN24A24
S212GF24__G5	24V 50/60	HS4YN24	HS4GN24A24

Cleaning

Cleaning fluid must be compatible with all valve components.
It is recommended that S212 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

SERVICE
Disassembly

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

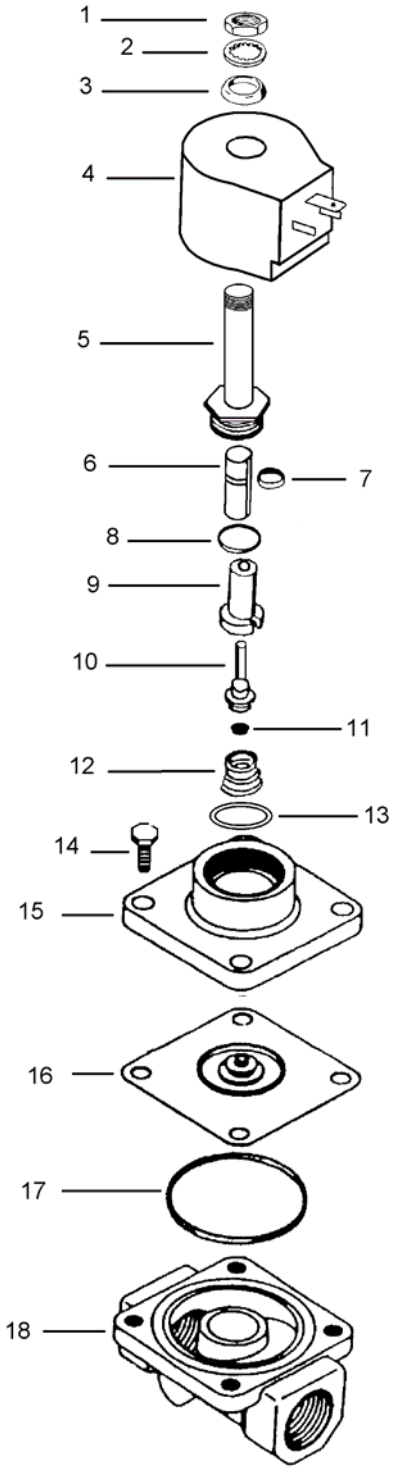
---

1. Unscrew the hex nut (1). Remove with lockwasher (2) and spacer (3).
2. Lift off the coil (4) from the plunger tube.
3. Do not damage the solenoid assembly.
4. Use a 1" spanner to remove solenoid base nut and plunger tube (5). Do not nick, dent, or damage plunger tube (5) or valve seating surfaces.
5. Carefully hold plunger tube (5) in position when removing from valve bonnet (15) to prevent loss of internal parts.
6. Remove return spring (12) from bonnet (15),
7. Remove four bonnet bolts (14) and separate the valve bonnet (15) from the valve body (18).
8. Check seat disc (11) and diaphragm assembly (16) for damage or wear.
9. Replace O-rings (8, 13 & 17), diaphragm assembly (16), seat disc (11) and other parts as necessary.
10. Re-assemble in reverse order from above taking care to properly re-install the seat disc (11) and PTFE strip (7).
11. Tighten Tube Base Nut (4) to 18 to 24 in/lbs. and bonnet bolts (10) to 40 to 45 in/lbs.
12. Re-connect electrical and test for proper operation.

TROUBLE-SHOOTING

If valve fails to close check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to open, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.



S211(DC) -- Service and Installation --

11/1/2016

DESCRIPTION
The S211 Series Solenoid Valves are 2-way, normally closed, piloted, general purpose valves. All stainless steel, brass or Noryl construction with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases.
Valves may be mounted in any position. A spring loaded plunger assures positive shutoff. The S4 solenoid coil is rated at 10 watts.

OPERATION
S211 Valves are normally closed (N.C.) and open when electrically energized.

SPECIFICATIONS
Use S211 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (min./max. psi, voltage, hz, maximum media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	32° - 125° F	Fluid	32° - 295° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter .
2. Valves are multipoised and may be mounted in any position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.
Incorrect coil reassembly can cause coil burnout. At all times, take care not to nick, dent, or damage the plunger tube.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **VALVE DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take are not to nick, dent or damage plunger tube.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most S211 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

REBUILD KIT
The Rebuild Kit contains a plunger/spring/seat disc assembly, plunger tube assembly, O-rings and adapter ring.

REPAIR KIT
The Repair Kit contains a seat disc, diaphragm assembly and O-rings.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
S211GF__C5CG4	KS211AF15C5CG4	K211C5C
S211GF__C5DG4	KS211AF15C5CG4	K211C5C
S211GF__C5EG5	KS211AF15C5EG5	K211C5E
S211GF__N5CG4	KS211AF15N5CG4	K211N5C
S211GF__N5DG4	KS211AF15N5CG4	K211N5C
S211GF__N5EG5	KS211AF15N5EG5	K211N5E
S211GF__V5CG4	KS211AF15V5CG4	K211V5C
S211GF__V5DG4	KS211AF15V5CG4	K211V5C
S211GF__V5EG5	KS211AF15V5EG5	K211V5E
S211GF__E7CG4	KS211AF15E7CG4	K211E7C
S211GF__E7DG4	KS211AF15E7CG4	K211E7C
S211GF__E7EG5	KS211AF15E7EG5	K211E7E
S211GF__J7CG4	KS211AF15J7CG4	K211J7C
S211GF__J7DG4	KS211AF15J7CG4	K211J7C
S211GF__J7EG5	KS211AF15J7EG5	K211J7E
S211GF__L7CG4	KS211AF15L7CG4	K211L7C
S211GF__L7DG4	KS211AF15L7CG4	K211L7C
S211GF__L7EG5	KS211AF15L7EG5	K211L7E

COIL CHART

Valve	Voltage	DIN Coil	Conduit Coil
S211GF02__G4	120V 50/60	HS3YN02	HS3GN02A24
S211GF02__G5	120V 50/60	HS3YN02	HS3GN02A24
S211GF15__G4	12 VDC	HS4YN15	HS4GN15A24
S211GF15__G5	12 VDC	HS4YN15	HS4GN15A24
S211GF16__G4	24 VDC	HS4YN16	HS4GN16A24
S211GF16__G5	24 VDC	HS4YN16	HS4GN16A24
S211GF24__G4	24V 50/60	HS3YN24	HS3GN24A24
S211GF24__G5	24V 50/60	HS3YN24	HS3GN24A24

Cleaning

Cleaning fluid must be compatible with all valve components.
It is recommended that S211 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

SERVICE
Disassembly

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

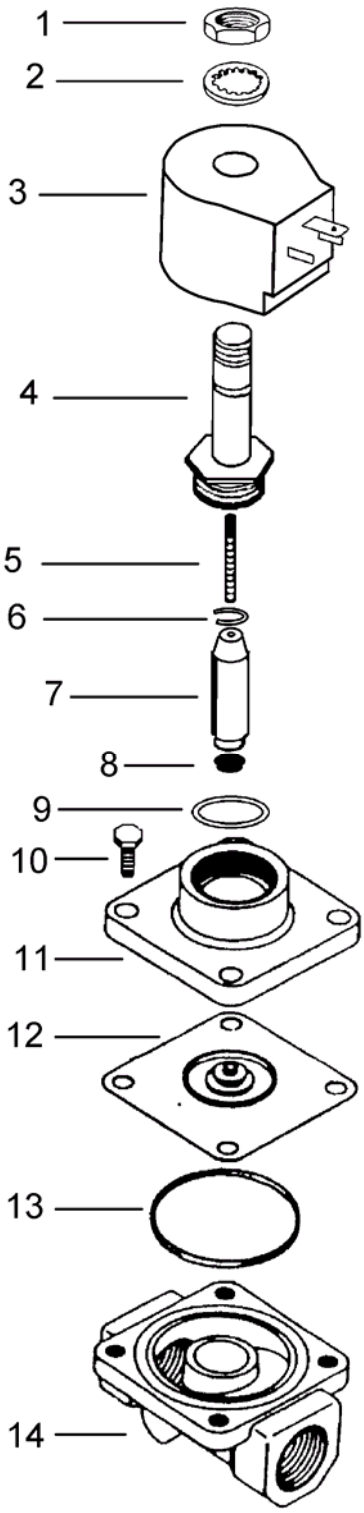
---

1. Unscrew the hex nut (1). Remove with lockwasher (2).
2. Lift off the coil (3) from the plunger tube.
3. Do not damage the solenoid assembly.
4. Use a 1" spanner to remove solenoid base nut and plunger tube (4). Do not nick, dent, or damage plunger tube (4) or valve seating surfaces.
5. Carefully hold plunger tube (4) in position when removing from valve bonnet (11) to prevent loss of internal parts.
6. Remove return spring (5) plunger assembly (7),
7. Remove four bonnet bolts (10) and separate the valve bonnet (11) from the valve body (14).
8. Check seat disc (8) snap ring (6) and diaphragm assembly (12) for damage or wear.
9. Replace O-rings (9 & 13), diaphragm assembly (12), seat disc (8) and other parts as necessary.
10. Re-assemble in reverse order from above taking care to properly re-install the seat disc (8).
11. Tighten tube base nut (4) to 18 to 24 in/lbs and bonnet bolts (10) to 40 to 45 in/lbs.
12. Re-connect electrical and test for proper operation.

TROUBLE-SHOOTING

If valve fails to open check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.



S211(AC) -- Service and Installation --

11/1/2016

DESCRIPTION
The S211 Series Solenoid Valves are 2-way, normally closed, piloted, general purpose valves. All stainless steel, brass or Noryl construction with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases.
Valves may be mounted in any position. A spring loaded plunger assures positive shutoff. The S4 solenoid coil is rated at 10 watts.

OPERATION
S211 Valves are normally closed (N.C.) and open when electrically energized.

SPECIFICATIONS
Use S211 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (min./max. psi, voltage, hz, maximum media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	32° - 125° F	Fluid	32° - 295° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter .
2. Valves are multipoised and may be mounted in any position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.
Incorrect coil reassembly can cause coil burnout. At all times, take care not to nick, dent, or damage the plunger tube.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **VALVE DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take are not to nick, dent or damage plunger tube.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most S211 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

REBUILD KIT
The Rebuild Kit contains a plunger/spring/seat disc assembly, plunger tube assembly, O-rings and adapter ring.

REPAIR KIT
The Repair Kit contains a seat disc, diaphragm assembly and O-rings.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
S211GF__C5CG4	KS211AF02C5CG4	K211C5C
S211GF__C5DG4	KS211AF02C5CG4	K211C5C
S211GF__C5EG5	KS211AF02C5EG5	K211C5E
S211GF__N5CG4	KS211AF02N5CG4	K211N5C
S211GF__N5DG4	KS211AF02N5CG4	K211N5C
S211GF__N5EG5	KS211AF02N5EG5	K211N5E
S211GF__V5CG4	KS211AF02V5CG4	K211V5C
S211GF__V5DG4	KS211AF02V5CG4	K211V5C
S211GF__V5EG5	KS211AF02V5EG5	K211V5E
S211GF__E7CG4	KS211AF02E7CG4	K211E7C
S211GF__E7DG4	KS211AF02E7CG4	K211E7C
S211GF__E7EG5	KS211AF02E7EG5	K211E7E
S211GF__J7CG4	KS211AF02J7CG4	K211J7C
S211GF__J7DG4	KS211AF02J7CG4	K211J7C
S211GF__J7EG5	KS211AF02J7EG5	K211J7E
S211GF__L7CG4	KS211AF02L7CG4	K211L7C
S211GF__L7DG4	KS211AF02L7CG4	K211L7C
S211GF__L7EG5	KS211AF02L7EG5	K211L7E

COIL CHART

Valve	Voltage	DIN Coil	Conduit Coil
S211GF02__G4	120V 50/60	HS3YN02	HS3GN02A24
S211GF02__G5	120V 50/60	HS3YN02	HS3GN02A24
S211GF15__G4	12 VDC	HS4YN15	HS4GN15A24
S211GF15__G5	12 VDC	HS4YN15	HS4GN15A24
S211GF16__G4	24 VDC	HS4YN16	HS4GN16A24
S211GF16__G5	24 VDC	HS4YN16	HS4GN16A24
S211GF24__G4	24V 50/60	HS3YN24	HS3GN24A24
S211GF24__G5	24V 50/60	HS3YN24	HS3GN24A24

Cleaning

Cleaning fluid must be compatible with all valve components.
It is recommended that S211 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

SERVICE
Disassembly

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

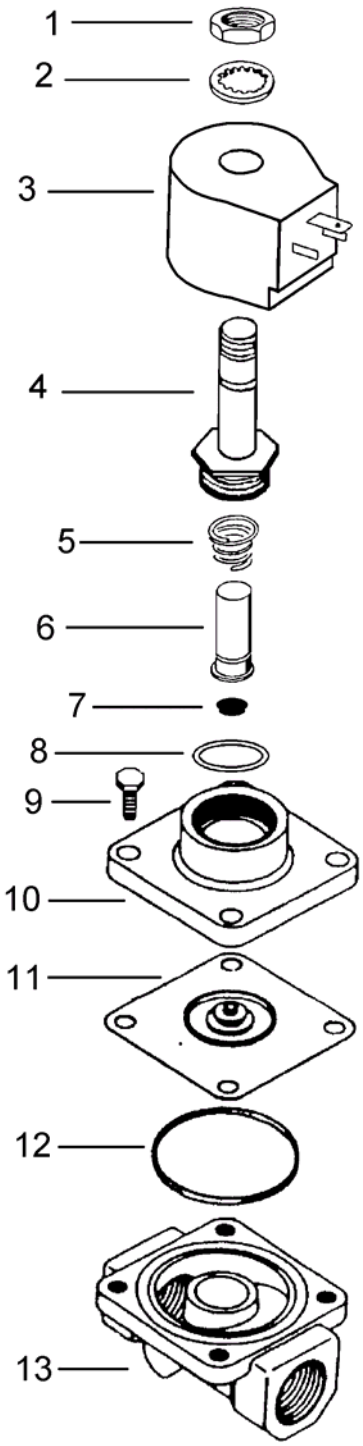
---

1. Unscrew the hex nut (1). Remove with lockwasher (2).
2. Lift off the coil (3) from the plunger tube.
3. Do not damage the solenoid assembly.
4. Use a 1" spanner to remove solenoid base nut and plunger tube (4). Do not nick, dent, or damage plunger tube (4) or valve seating surfaces.
5. Carefully hold plunger tube (4) in position when removing from valve bonnet (10) to prevent loss of internal parts.
6. Remove plunger/spring assembly (5, 6, & 7),
7. Remove four bonnet bolts (10) and separate the valve bonnet (10) from the valve body (13).
8. Check seat disc (7) and diaphragm assembly (11) for damage or wear.
9. Replace O-rings (8 & 12), diaphragm assembly (11), seat disc (7) and other parts as necessary.
10. Re-assemble in reverse order from above taking care to properly re-install the seat disc (7).
11. Tighten tube base nut (4) to 18 to 24 in/lbs and bonnet bolts (9) to 40 to 45 in/lbs.
12. Re-connect electrical and test for proper operation.

TROUBLE-SHOOTING

If valve fails to open check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.



5. Remove square seal (14), manifold assembly (13). Check seating surfaces on both sides of manifold assembly (13) for nicks or damage.
6. Lift out seat disc retainer (15), spring (16) and gasket (17). Check for damage. If removal of gasket is necessary, be sure the raised surface is replaced face up.
7. Facing "inlet", remove five end plate screws (18) on right hand side, end plate (19). Check square seal (25) for damage.
8. Remove hex nut (21) and lockwasher (22), seat disc retainer (23) and seat disc (24). Clean seat disc (24), if dirty, or replace if damaged.
9. Facing "inlet", remove five end plate screws (25) on left hand side.

NOTE

NOW BE SURE TO WATCH DISASSEMBLY SEQUENCE OF PARTS AND THE POSITION OF EACH ITEM REMOVED.

10. Remove end plate (26), gasket (27), hex nut (28) and lockwasher (29), backer plate (30), backup diaphragm (31) and diaphragm (32).
11. Grasp seat disc retainer (33) and carefully twist off retainer (33) and seat disc (34) from valve stem (35). Be careful not to damage seating surface.
12. Pull out valve stem (35), check for wear.
13. Check condition of all seating surfaces, seat discs, diaphragm sealing surfaces, square seal. Also check tube (36) for clogging or dirt.

REASSEMBLY

1. Reassemble in reverse order. Avoid damage to sealing and seating surfaces. Apply thin film of lubrication to gaskets, square seal before reassembling valve.
2. Tighten plunger tube and base nut assembly (7) to 25 inch-pounds minimum.

Field replacement parts are available for S203 valves. All necessary parts and instructions are included in the indicated kits. Order these parts kits from Form No. SDP S20-1.

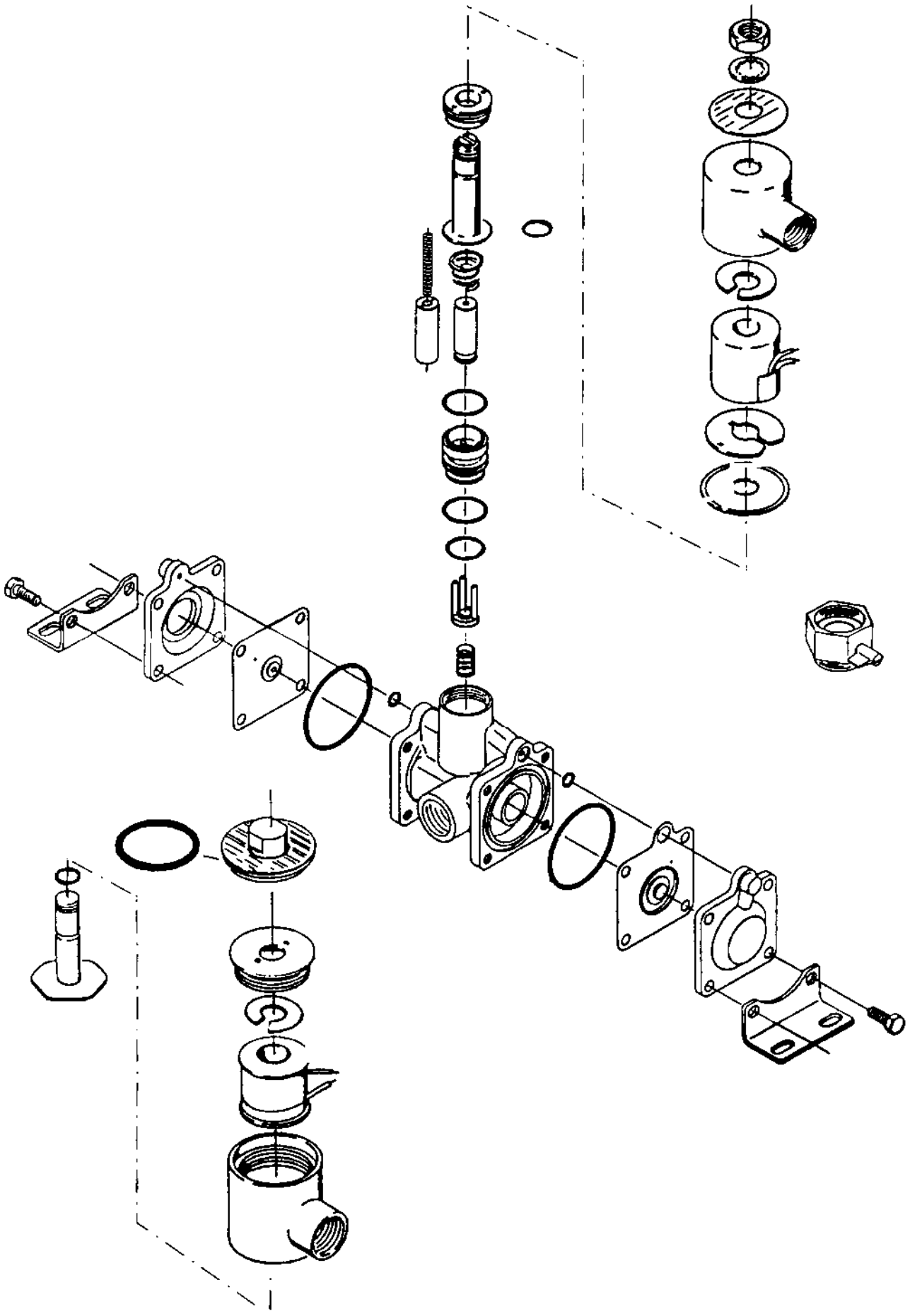
COIL REPLACEMENT

Turn off electric power to solenoid. Disconnect solenoid leads. It is not necessary to remove valve from pipeline. Follow steps 1 and 2 under VALVE DISASSEMBLY.

Disassemble solenoid, taking care to note exact order of replacement and quantity of parts. Incorrect reassembly can cause coil burnout. At all times take care not to nick, dent or damage plunger tube.

	Solenoid De-Energized	Solenoid Energized
Normally Closed Pressure at P		

Fig. 2. S203 Flow Patterns



GC VALVES
4525 E. INDUSTRIAL ST
UNIT 4C
SIMI VALLEY, CA 93063
(805) 582-0065

G C VALVES

S211 SERIES PILOTED DIAPHRAGM 2-WAY SOLENOID VALVE

INSTALLATION SERVICE AND PARTS LIST

SDI/SDP S211-1

DESCRIPTION

S211 Solenoid Valves are normally closed, 2-way, pilot operated diaphragm type, which are designed for on-off control of air, steam and liquids.

Available options include: Manual Opening Device, and UL Class F and H coils.

OPERATION

S211 Valves are normally closed, opening when energized and closing when de-energized.

SPECIFICATIONS

Use the valve within the specified operating ranges as indicated on the valve nameplate (min./max. psi, voltage, cycle, maximum media temperature at °F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

FLUID MEDIA	COIL CLASS	MAXIMUM TEMPERATURE °F		SEAT MATERIAL
		FLUID	AMBIENT	
	F (155°C)	200	150	BUNA
GAS	F (155°C)	230	150	VITON
LIQUIDS	H (220°C)	185	176	
OIL	H (220°C)	185	176	TEFLON
	H (220°C)	257	125	RULON
STEAM	H (220°C)	338	77	TEFLON
	H (220°C)	257	125	RULON
HOT WATER	F (155°C)	198	77	EPR
STEAM	H (220°C)	298	77	

For other applications, consult the factory.

INSTALLATION

⚠ WARNING ⚠

This valve is normally closed (N.C.) to flow when not powered. Do not use in place of a normally open (N.O.) valve.

Check valve specifications to be sure that the valve selected is the proper one for the application.

Installation must be performed only by a trained and experienced service person.

1. Clear lines of all foreign matter.
2. S211 Valves must be mounted on a horizontal pipeline with the solenoid in an upright position.
3. Thread seal should be applied sparingly and to the male threads only. To tighten, use a wrench on the body flats at the end being connected. Do not use the solenoid housing as a lever to turn the valve.
4. Provide a clearance for solenoid removal in case removal is subsequently necessary.

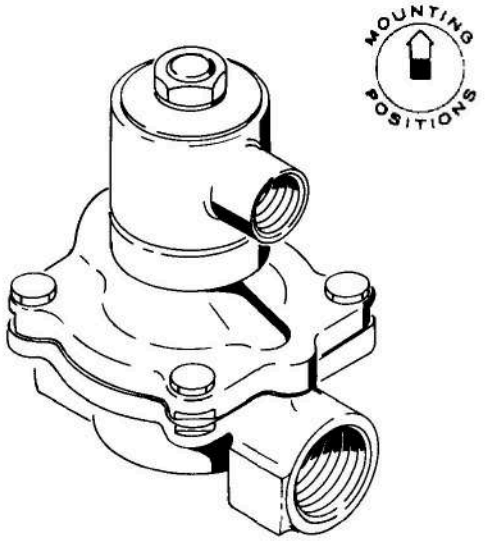


Fig. 1. Typical S211

5. Wire in accordance with applicable local and national electrical codes. Loosen the hex nut (Fig. 3, No. 1) to rotate the coil jacket (Fig. 3, No. 4). Using a torque wrench, tighten the hex nut to 20-25 inch pounds when installation is completed.

MAINTENANCE

It is recommended that S211 Series Valves be cleaned on a routine basis by qualified personnel. The customer or user should set up a sound maintenance schedule based on flow media, environment, and frequency of use, which should begin with checking for leakage. Correct voltage must be applied when the valve is tested. If excessive leakage (based on the application) occurs or if operation is sluggish, the unit must be cleaned. The cleaning fluid must be compatible with the valve's materials of construction.

SERVICE

Disassembly and Reassembly. (See Fig. 3.)

⚠ WARNING ⚠

During reassembly, be certain that the plunger is free of scratches or burrs. These imperfections could cause the valve to stick in an open or closed position, resulting in a potential hazard. If the valve has any tendency to stick during a test, return the whole Universal Kit for a new one. Dissassembly and reassembly should be performed only by properly trained and experienced personnel.

Turn off flow media and electrical power supply to the valve.

REPLACE ALL PARTS with the new parts contained in the Universal Kit only (see Universal Kit section). Use only the correct Universal Kit (use the chart to match Catalog Number with Kit Number), and never attempt to interchange parts from different numbered kits.

To disassemble:

1. Unscrew the hex nut (1). Remove the lockwasher (2).
2. Lift off the coil jacket (4) with nameplate (3) and coil (6) from the plunger tube assembly (10). Also remove the bottom washers (7).
3. Remove the coil and upper washer (5) from the coil jacket.
4. Use an ITTGC Spanner Nut (106198E) to remove the base nut (8).
5. Remove the tube base "O" ring (9) and remove the plunger tube assembly (10) from the bonnet (15). All parts numbered 9 through 13 on Fig. 3 will be replaced by the new parts in the Universal Kit.

   It may be necessary to tap the bonnet on your hand or flat surface to free the square seal (13).
6. Remove the bonnet cap screws (14), and lift the bonnet off of the body (19).
7. Remove the parts numbered 16, 17, and 18 on Fig. 3. These parts will all be replaced by the new parts from the Universal Kit. If necessary, tap the body against your hand or a flat surface to free the "O" ring gasket (18).

   Check to see that all bonnet and body holes, vents and seating surfaces are clean before reassembling the valve. Use a SOFT object for probing to prevent scratches or burrs.

Reassembly (Use the new parts contained in the Universal kit).

CAUTION

The body must be installed so that the vent passageway and the diaphragm passageway are lined up with the passageway in the bonnet.

Lubricate "O" rings prior to reassembly.

8. Place the new "O" ring gasket (18) into its hole in the body (19).
9. Replace the diaphragm assembly (17). The plate on the diaphragm assembly must face away from the body. Be sure that the diaphragm is lined up properly (see CAUTION above Step 8).
10. Replace the diaphragm spring (16) as shown in Fig. 3. Reassemble the bonnet (15) onto the body (see CAUTION above Step 8), and replace and tighten down the bonnet cap screws (14).
11. Place the new square seal into the recess in the bonnet operator cavity (REF.).
12. Install the plunger spring (11) small diameter down onto the plunger assembly (12). Insert the final assembly of (11) and (12) into the plunger tube assembly (10).
13. Place the plunger tube asembly, with the plunger spring and plunger in it, into the bonnet operator cavity (REF.). Place the new tube base "O" ring (9) onto the plunger tube assembly as shown in Fig. 3.
14. Replace the base nut (8) onto the plunger tube (10). USING A TORQUE WRENCH, TIGHTEN THE BASE NUT INTO THE THREADS ON THE BONNET TO 18 TO 24 LB. IN.
15. Replace the bottom washers (7) onto the plunger tube. The raised outer edge of the bottom washer which is closest to the bonnet (forms a complete circle) should face down (toward the bonnet). The "X" marked on the bottom washer closest to the coil must face the coil.
16. Replace the upper washer (5) into the coil jacket (4). The side of the upper washer with an "X" marked on it must face the coil upon reassembly.
17. Insert the lead wires from the coil through the hole in the jacket. Pull the wires all the way through, and place the coil into the jacket with the end with voltages printed on it facing away from the upper washer (5). Place the entire assembly back onto the plunger tube.
18. Replace the nameplate (3), lockwasher (2), and hex nut (1), in that order. Tighten the hex nut to 20-25 lb. in.

⚠ WARNING ⚠

The use of the manual opening device (MOD) prevents the valve from opening or closing and nullifies the effect of all electrical controls used with the valve. Equipment damage or safety hazard may result if shutoff is expected but does not occur.

To use the manual opening device (MOD), Turn the MOD stem counterclockwise to open.

After electrical power is restored, turn the MOD stem clockwise.

COIL REPLACEMENT

Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.

Incorrect coil reassembly can cause coil burnout. At all times, take care not to nick, dent, or damage the plunger tube.

Standard Model Fig. 3.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2, 3, 15, 16 and 17 in the DISASSEMBLY AND REASSEMBLY section. Take care to note the exact order of placement and quantity of parts.

Explosion-proof Model Fig. 4.

To replace the coil on an Explosion-proof Model

1. Remove the top cap assembly (1), lockwasher (2), and top cap "O" ring (3).

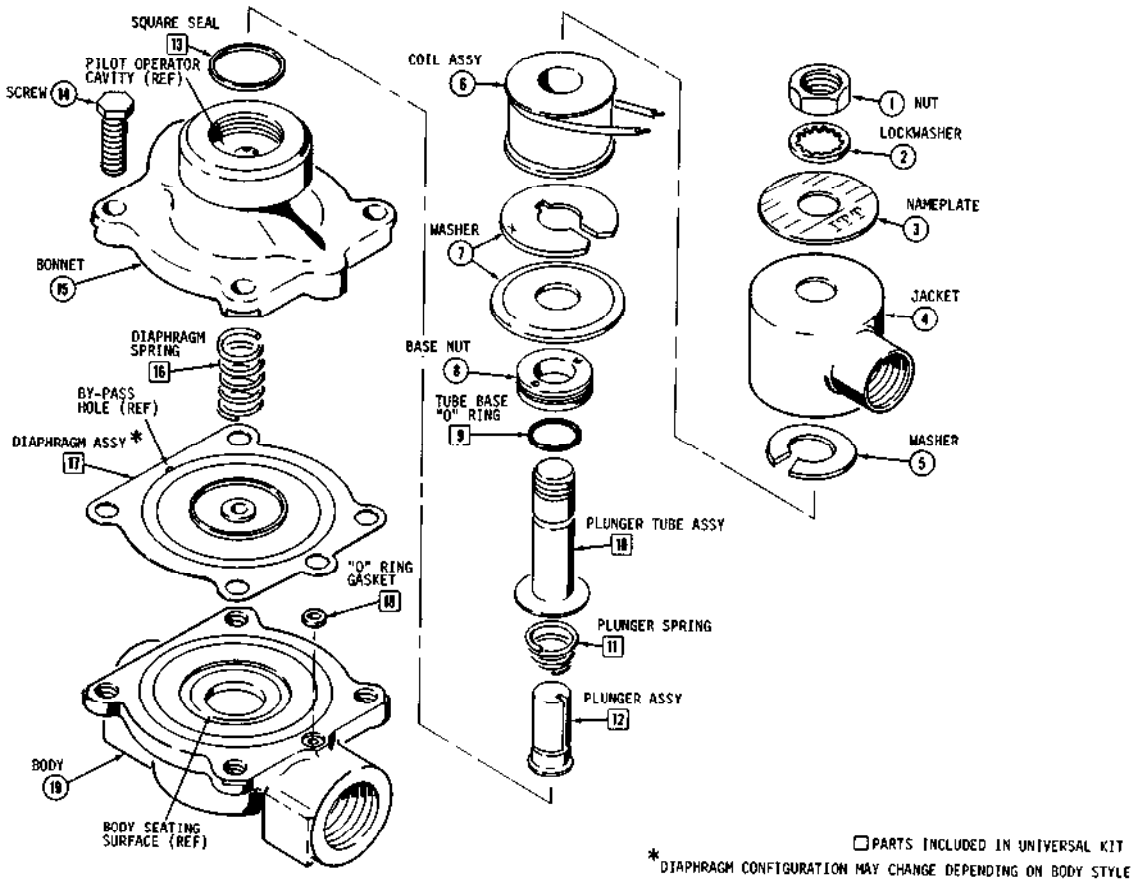


Fig. 3. Typical S211 Valve

2. Use a GC Valves Spanner Nut (Part Number 106198E) to remove the top plate (4).
3. Remove the washer (5). The coil (6) is now accessible for removal and replacement.

To reassemble the explosion-proof coil assembly:

1. Pull the wire through the hole in the jacket (7) and place the new coil in the jacket with the end with voltages printed on it facing into the jacket.
2. Position the washers (5) on top of the coil.
3. Screw the top plate (4) down until bottomed, or torque the top plate to 150 INCH POUNDS MINIMUM to retain registration of the new coil.
4. Place the lockwasher (2) on top of the top plate.
5. Replace the top cap "O" ring (3) in the top cap assembly (1), and screw the top cap back on.

PARTS

The charts which follow cover replaceable Coil Part Numbers and Universal Kits for most S211 Series Solenoid Valves.

Before ordering parts/kits, check the Serial Number on the valve which is to be repaired. This Serial Number includes the model designation which determines the appropriate Parts/Kit Number(s). The Serial Number can be found stamped on the nameplate or operator housing.

On older model valves, the third digit of the number, e.g. E5A or E5B, will designate Model "A" or "B". When the name serializing method is used, e.g. 8223A or 8223BA, the fifth and sixth digits will designate Model "A" or "BA", etc. In the instances where there is a double alpha digit designation, the first alpha digit refers to the valve model and the second alpha digit refers to the model of the operator.

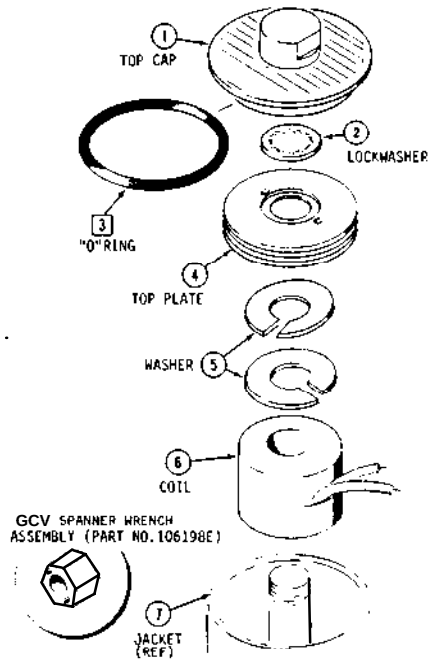


Fig. 4. Typical S211 Explosion-proof Operator

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

See Fig. 3 for an exploded view of a typical S211 Model "A", and Fig. 4 for an exploded view of a typical S211 Model "B" Explosion-proof operator assembly.

NOTE

A GROUNDING PROVISION IS SUPPLIED FOR CSA CERTIFIED VALVES.

COIL CHART

IDENTIFYING CATALOG DIGITS①	COIL CLASS	WATTS	ELECTRICAL CONNECTION	COIL PART NUMBER②③
S21-GF	F	8	24" LEADS	HS3GF — A24
S21 — F	F			CS3AF — A24
S21 — H	H			CS3AN — A24
S21 - YF	F		DIN Connector	HS3YF —

① Sixth digit of Catalog Number represents coil class as shown.
② Seventh and eighth digits of Catalog Number represent voltages shown in coil class chart. These digits must be transferred into the coil part number.
③ Recommended spare part.

TROUBLE-SHOOTING

If valve fails to open —

1. Check voltage against rating on nameplate.
2. Check voltage at solenoid lead connections.
3. Check control circuit and solenoid coil for burnout.
4. Check operating pressures.
5. Clean all passageways and check condition of diaphragm.
6. Replace coil.

If valve fails to close —

1. Check for bent or nicked plunger tube.
2. Check for damaged springs.
3. Clean pilot valve and main valve seats.
4. Check condition of plunger seat disc and main valve diaphragm.
5. Clean passageways in pilot valve and main valve. Use a small probing object or blow through.

The valve must be free from dirt to ensure tight shutoff. Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage. Clean the plunger and the interior of the tube and base assembly.

UNIVERSAL KIT CHART

5TH DIGIT OF CAT. NO.	9TH & 10TH DIGIT OF CAT. NO.	13TH & 14TH DIGIT OF CAT. NO.	COIL & VOLTAGE TYPE	UNIVERSAL KIT
STANDARD A, B, S, T, U, V, or W	N1–N4	G9	AC	KS211AF02N4FG9
			DC	KS211AF16N4FG9
		J5	AC	KS211AF02N4GJ5
			DC	KS211AF16N4GJ5
	N5	G9	AC	KS211AF02N5FG9
			DC	KS211AF16N5FG9
		J2	AC	KS211AF02N5GJ2
			DC	KS211AF16N5GJ2
	K4	G1	AC	KS211AF02K4CG1
			DC	KS211AF16K4CG1
		G5	AC	KS211AF02K4EG5
			DC	KS211AF16K4EG5
	T4	G1	AC	KS211AF02T4CG1
			DC	KS211AF16T4CG1
		G5	AC	KS211AF02T4EG5
			DC	KS211AF16T4EG5
	T2	G1	AC	KS211AF02T2CG1
			DC	KS211AF16T2CG1
		G5	AC	KS211AF02T2EG5
			DC	KS211AF16T2EG5
		G9	AC	KS211AF02T2FG9
			DC	KS211AF16T2FG9
		J5	AC	KS211AF02T2GJ5
			DC	KS211AF16T2GJ5
EXPL. PROOF X	N1	G9	AC	KS211XF02N4FG9
			DC	KS211XF16N4FG9
		J5	AC	KS211XF02N4GJ5
			DC	KS211XF16N4GJ5
	N5	G9	AC	KS211XF02N5FG9
			DC	KS211XF16N5FG9
		J2	AC	KS211XF02N5GJ2
			DC	KS211XF16N5GJ2
	K4	G1	AC	KS211XF02K4CG1
			DC	KS211XF16K4CG1
		G5	AC	KS211XF02K4EG5
			DC	KS211XF16K4EG5
	T4	G1	AC	KS211XF02T4CG1
			DC	KS211XF16T4CG1
		G5	AC	KS211XF02T4EG5
			DC	KS211XF16T4EG5
	T2	G1	AC	KS211XF02T2CG1
			DC	KS211XF16T2CG1
		G5	AC	KS211XF02T2EG5
			DC	KS211XF16T2EG5
		G9	AC	KS211XF02T2FG9
			DC	KS211XF16T2FG9
		J5	AC	KS211XF02T2GJ5
			DC	KS211XF16T2GJ5

EXAMPLE CATALOG NUMBER

1	2	3	4	5	6	7	8	9	10	11	12	13
S	2	1	1	A	F	0	2	N	1	F	G	9
					COIL CLASS	VOLTAGE		SEAT, SQ. SEAL & "O" RING MATERIAL				

4525 E. Industrial Street
Unit 4C
Simi Valley, CA 93063
Phone 805-582-0065
Fax 805-582-0210

G C VALVES

S212 SERIES PILOTED DIAPHRAGM 2-WAY — NORMALLY OPEN SOLENOID VALVE

INSTALLATION, SERVICE AND PARTS LIST

SDI/SDP S212-2

DESCRIPTION

S212 Series Solenoid Valves, which are designed for on-off control of air and liquids, are normally open, 2-way, pilot operated diaphragm type valves. S212 Valves should be mounted in the vertical position only.

OPERATION

S212 Series Valves are normally open type, closing when energized and opening when de-energized.

SPECIFICATIONS

Use S212 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. Data includes maximum psi, volts, cycles, and published flow data.

OPERATING TEMPERATURES

FLUID MEDIA	COIL CLASS	MAXIMUM FLUID °F	AMBIENT TEMP °F	SEAT MATERIAL
GAS	M (105°C)	185	77	
LIQUIDS	F (155°C)	200	150	BUNA
OIL	M (105°C)	185	77	
	F (155°C)	230	150	VITON
	H (220°C)	185	176	
	M (105°C)	185	77	
	F (155°C)	230	150	TEFLON
	H (220°C)	185	176	RULON
	H (220°C)	257	125	
	F (155°C)	298	77	TEFLON
STEAM	H (220°C)	338	77	RULON
	H (220°C)	257	125	

For other applications, consult the factory.

INSTALLATION

⚠ WARNING ⚠

This valve is normally open (N.O.) to flow when not powered. DO NOT USE IN PLACE OF A NORMALLY CLOSED (N.C.) VALVE.

Check valve specifications to be sure that the valve selected is the proper one for the application.

Installation must be performed only by a trained and experienced service person.

1. Clear all lines of foreign matter.
2. S212 Valves must be mounted on a horizontal pipeline with the solenoid in an upright position. Media flow must be in the same direction indicated on the valve body. If particulate matter is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Thread seal should be applied sparingly and to the male threads only. To tighten, use a wrench on the body flats at the end being connected. Do not use the solenoid housing as a lever to turn the valve.

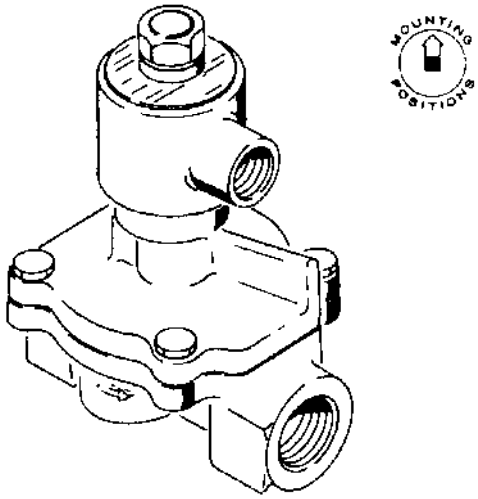


Fig. 1. Typical S212, N.O.

4. Provide a clearance for solenoid removal in case removal is subsequently necessary.
5. Wire in accordance with applicable local and national electrical codes. Loosen the hex nut (Fig. 2, No. 1) to rotate the coil jacket (Fig. 2, No. 5). Using a torque wrench, tighten the hex nut to 20-25 inch pounds when installation is completed.

MAINTENANCE

Cleaning

It is recommended that S212 Series Valves be cleaned on a routine basis by qualified personnel. The customer or user should set up a sound maintenance schedule, based on flow media, environment, and frequency of use, which should begin with checking for leakage. Correct voltage must be applied when the valve is tested. If excessive leakage (based on the application) occurs or if operation is sluggish, the unit must be cleaned. The cleaning fluid must be compatible with the valve's materials of construction.

SERVICE

Disassembly and Reassembly. (See Fig. 2.)

⚠ WARNING ⚠

During reassembly, be certain that the plunger is free of scratches or burrs. These imperfections could cause the valve to stick in an open or closed position, resulting in a potential hazard including explosion or fire, which could cause personal injury. If the valve has any tendency to stick during a test, return the entire Universal Kit for a new one. Disassembly and reassembly should be performed only by properly trained and experienced service personnel.

Turn off flow media and electrical power supply to the valve.

NOTE

PERFORM DISASSEMBLY AND REASSEMBLY WORK ON AN UNCLUTTERED FLAT SURFACE TO PREVENT PARTS FROM BEING LOST OR MISPLACED.

REPLACE ALL PARTS with the new parts contained in the Universal Kit (see Universal Kit section). Use only the correct Universal Kit (use Chart to match Catalog Number with Kit Number), and never attempt to interchange parts from different numbered kits.

To disassemble:

1. Unscrew the hex nut (1). Remove the lockwasher (2) and spacer (3).
2. Lift off the coil jacket (5) with nameplate (4) and coil (7) from the plunger tube and base assembly (9). Also remove the bottom washer (8).
3. Remove the coil and upper washers (6), from the coil jacket.
4. Unscrew the plunger tube and base assembly (9) to expose the parts numbered 9 through 17 on Fig. 2. All of these parts will be replaced by the new parts in the Universal Kit. It may be necessary to tap the bonnet (19) on your hand or flat surface to free the square seal (17).
5. Remove the bonnet cap screws (18), and lift the bonnet (19) off of the body (24).
6. Remove parts numbered 20 through 23 on Fig. 2. These parts will all be replaced by new parts from the Universal Kit. If necessary, tap the body against your hand or a flat surface to free the "O" ring gasket (23). Check to see that all bonnet and body holes, vents, and seating surfaces are clean before reassembling the valve.

Reassembly (Use the new parts contained in the Universal Kit.)

CAUTION

The body must be installed so that the vent passageway is lined up with the passageway in the bonnet. (The teflon diaphragm has no passageway.)

Lubricate "O" rings prior to reassembly.

7. Place the new "O" ring gasket (23) into its hole in the body (24).
8. Replace the diaphragm assembly (22). The plate on the diaphragm assembly must face away from the body.
9. Replace the diaphragm spring (21) and large "O" ring gasket (20) as shown in Fig. 2. Reassemble the bonnet (19) onto the body (24) (see CAUTION above), and replace and tighten down the bonnet cap screws (18).
10. Place the new square seal (17), spring (16), and seat retainer (15) into the bonnet pilot port (19, REF.), in that order.
11. Place the teflon guide strip (11) into the groove on the plunger (10). Insert the plunger, with the guide strip in the groove, into the plunger tube (9). The beveled (chamfered) end of the plunger goes into the tube last. This is a fairly delicate operation which may require a few attempts before success is achieved. If necessary, preform the teflon guide strip into a tight circle before inserting it into the groove on the plunger.
12. Insert the "O" ring (12), plunger tube head assembly (13), and push pin (14), in that order, into the plunger tube.
13. Taking care that the seat retainer and push pin remain in position, screw the plunger tube and base assembly back into the bonnet pilot port. USING A TORQUE WRENCH, TIGHTEN THE PLUNGER TUBE AND BASE ASSEMBLY NUT TO A MINIMUM OF 25 INCH POUNDS.
14. Replace the bottom washer (8) with the raised outer edge of the washer down (facing the bonnet).
15. Replace the upper washers (6) into the coil jacket (5) [with nameplate (4)]. The smaller upper washer is reinserted first. The "X" marked on the large upper washer should face the coil. Be sure that the large upper washer is all the way in before continuing.
16. Insert the lead wires from the coil through the hole in the jacket, pull the wires all the way through, and place the coil in the jacket with the end with voltages printed on it facing up (away from the washers). Place the entire assembly back onto the plunger tube.
17. Replace the spacer (3) [with the beveled end away from the nameplate), lockwasher (2), and hex nut (1), in that order. Tighten the hex nut to 20-25 inch pounds.

Coil Replacement

Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.

Incorrect reassembly can cause coil burnout. At all times, take care not to nick, damage, or dent the plunger tube.

Standard Model "B" (last digit of Serial Number). See Fig. 2.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2, 3, 15, 16 and 17 in the DISASSEMBLY AND REASSEMBLY section. Take care to note the exact position and quantity of parts.

NOTE

THE SIDE MARKED WITH AN "X" ON THE LARGE UPPER WASHER (6) MUST BE PLACED NEXT TO THE COIL UPON REASSEMBLY.

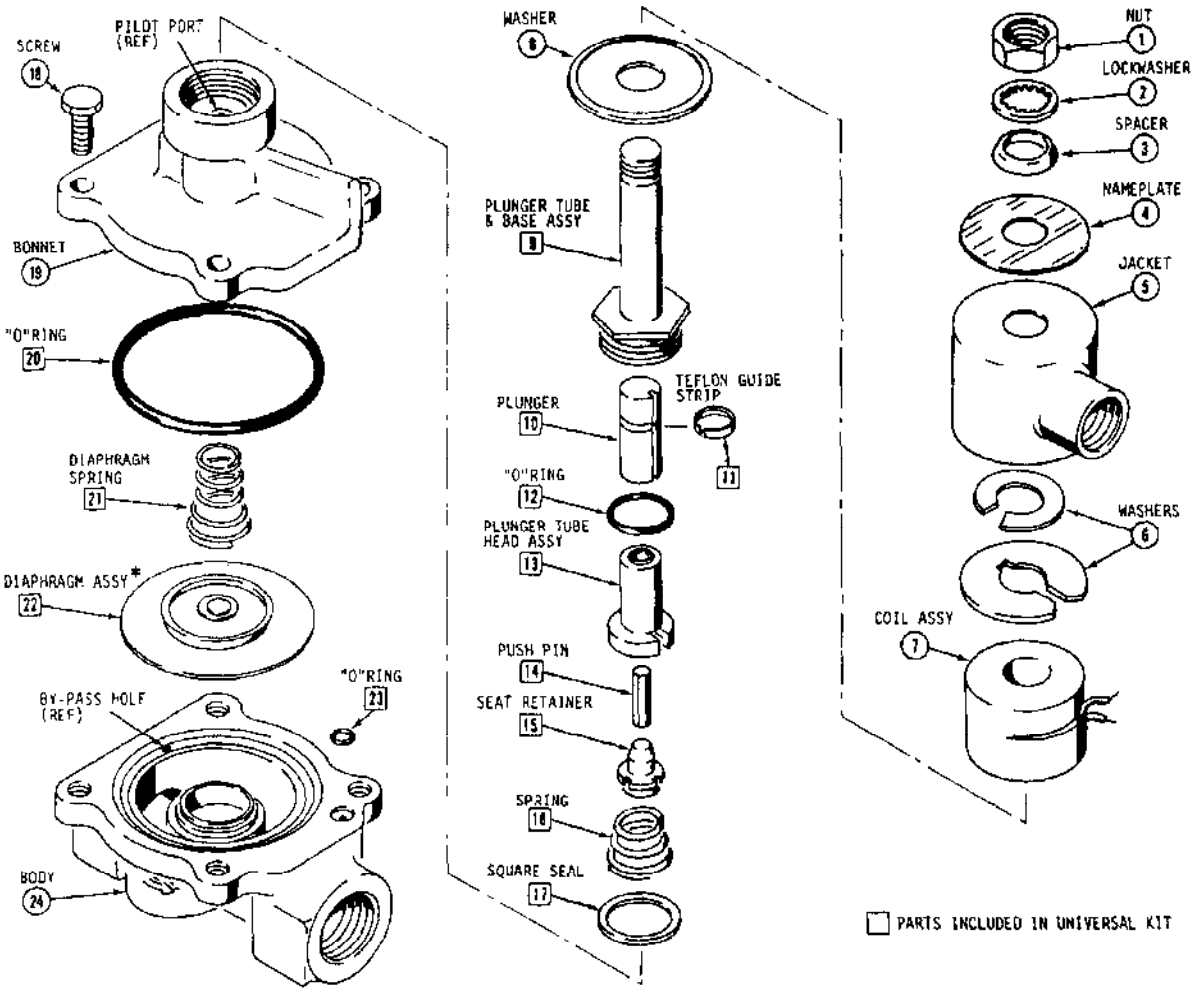
Explosion-proof Model "C" (last digit of Serial Number). See Fig. 3.

To replace the coil on an Explosion-proof Model:

1. Remove the top cap assembly (1), lockwasher (2), and top cap "O" ring (3).
2. Use an ITT/GC Spanner Wrench Assembly (Part Number 106198E) to remove the top plate (4).
3. Remove the washer (5). The coil (6) is now accessible for removal and replacement.

To reassemble the explosion-proof coil assembly:

1. Pull the wires through the hole in the jacket (7), and place the new coil in the jacket with the end with voltages printed on it facing up.
2. Position the washers (5) on top of the coil.
3. Screw the top plate (4) down until bottomed, or torque the top plate to 150 INCH POUNDS MINIMUM to retain registration of the new coil.
4. Place the lockwasher (2) on top of the top plate.
5. Replace the top cap "O" ring (3) in the top cap assembly (1), and screw the top cap back on.



*DIAPHRAGM CONFIGURATION MAY CHANGE DEPENDING UPON BODY STYLE

Fig. 2. Exploded View of Typical S212 Model "B" Valve, N.O. (#4 Body Style shown).

PARTS

The charts which follow cover replaceable Coil Part Numbers and Universal Kits for most current S212 Series Solenoid Valves.

Before ordering parts/kits, check the Serial Number on the valve which is to be repaired. This Serial Number includes the model designation, which is used to determine the appropriate part or kit number. The Serial Number is stamped on the nameplate or operator housing. On older valves, the third digit of the number, e.g. E5A or E5B, will designate Model "A" or "B".

When the new serializing system is used, the fifth and sixth digits, e.g. 8223A or 8223BA, will designate Model "A", "BA", etc. In the instances where there is a double alpha digit designation, e.g. 8223BA, the first alpha digit refers to the valve model, and the second digit refers to the model of the operator.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

See Fig. 2 for an exploded view of a typical S212 Model "B", and Fig. 3 for a typical S212 Model "C" Explosionproof operator assembly.

UNIVERSAL KIT

The Universal Kit contains a seat retainer assembly, plunger, teflon guide strip, push pin, spring, plunger tube, plunger tube head assembly, diaphragm assembly, square seal, diaphragm spring, and "O" rings.

COIL CHART

IDENTIFYING CATALOG DIGITS①	COIL CLASS	WATTS	ELECTRICAL CONNECTION	COIL PART NUMBER②③
S21 — F	F	9	24" LEADS	CS3AF — A24
S21 — H	H			CS3AH — A24
S21 - GF	F			HS3GF — A24
S21 - GN	H			HS3GN — A24
S21 - YF	F		DIN COIL	HS3YF —
S21 - YN	H			HS3YN —

① Sixth digit of Catalog Number represents coil class as shown.
② Seventh and eighth digits of Catalog Number represent voltages shown in coil class chart. These digits must be transferred into the coil part number.
③ Recommended spare part.

NOTE
* Type "A" coil is replaced by Type "M" coil. For coil part number CS3AA — A24 use CS3AM — A24
** Type "BW" coil is replaced by Type "F" coil. For coil part number CS3BW — A24 use CS3AF — A24

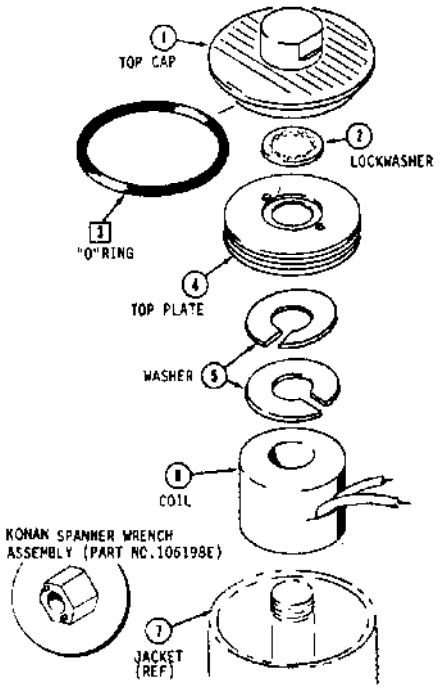


Fig. 3. Typical S212 Model "C" Explosion-proof Operator

NOTE: A grounding provision is supplied for CSA certified valves.

Component parts are no longer available for Model "A" or "B" Explosion-proof operators. However, the Model "C" Explosion-proof operator is interchangeable with a Model "A" or "B" Explosion-proof operator on the same valve body. If any part of your Model "A" or "B" Explosion-proof operator is damaged, a complete Model "C" operator may be purchased as a replacement.

COIL CLASS CHART

CATALOG DIGITS	VOLTAGE	AVAILABLE WITH COIL CLASS				
		F	H	M	A	BW
01	24V-60Hz	X		REPLACED BY "F"	REPLACED BY "F"	REPLACED BY "F"
02	120V-60Hz & 110V-50Hz	X	X			
03	208V-60Hz	X	X			
04	240V-60Hz & 220V-50Hz	X	X			
07	480V-60Hz	X	X			
14	6V DC	X	X			
15	12V DC	X	X			
16	24V DC	X	X			
24	24V-50Hz	X	X			
54	240V-50Hz	X	X			

TROUBLE-SHOOTING

TROUBLE-SHOOTING GUIDE TO ENSURE PROPER OPERATION

If valve fails to open —

1. Check voltage against rating on nameplate.
2. Check voltage at solenoid lead connections.
3. Check control circuit and solenoid coil for burnout.
4. Check operating pressures.
5. Clean all passageways and check condition of diaphragm.
6. Replace coil.

If valve fails to close —

1. Check for bent or nicked plunger tube.
2. Check for damaged springs.
3. Clean pilot valve and main valve seats.
4. Check condition of plunger seat disc and main valve diaphragm.
5. Clean passageways in pilot valve and main valve. Use small wire or blow through.

UNIVERSAL KIT CHART
S212 SERIES

5TH DIGIT OF CATALOG NO.	9TH & 10TH DIGIT OF CATALOG NO.	13TH & 14TH DIGIT OF CATALOG NO.	COIL & VOLTAGE TYPE	UNIVERSAL KIT
STANDARD A, B, S, T, U, V, or W	N1	G9	AC	KS212AF02N1FG9
			DC	KS212AF16N1FG9
		J5	AC	KS212AF02N1GJ5
			DC	KS212AF16N1GJ5
	K4	G1	AC	KS212AF02K4CG1
			DC	KS212AF16K4CG1
		G5	AC	KS212AF02K4EG5
			DC	KS212AF16K4EG5
	T4	G1	AC	KS212AF02T4CG1
			DC	KS212AF16T4CG1
		G5	AC	KS212AF02T4EG5
			DC	KS212AF16T4EG5
	T2	G1	AC	KS212AF02T2CG1
			DC	KS212AF16T2CG1
		G5	AC	KS212AF02T2EG5
			DC	KS212AF16T2EG5
		G9	AC	KS212AF02T2FG9
			DC	KS212AF16T2FG9
		J5	AC	KS212AF02T2GJ5
			DC	KS212AF16T2GJ5
EXP. PROOF X	N1	G9	AC	KS212XF02N1FG9
			DC	KS212XF16N1FG9
		J5	AC	KS212XF02N1GJ5
			DC	KS212XF16N1GJ5
	K4	G1	AC	KS212XF02K4CG1
			DC	KS212XF16K4CG1
		G5	AC	KS212XF02K4EG5
			DC	KS212XF16K4EG5
	T4	G1	AC	KS212XF02T4CG1
			DC	KS212XF16T4CG1
		G5	AC	KS212XF02T4EG5
			DC	KS212XF16T4EG5
	T2	G1	AC	KS212XF02T2CG1
			DC	KS212XF16T2CG1
		G5	AC	KS212XF02T2EG5
			DC	KS212XF16T2EG5
		G9	AC	KS212XF02T2FG9
			DC	KS212XF16T2FG9
		J5	AC	KS212XF02T2GJ5
			DC	KS212XF16T2GJ5

EXAMPLE CATALOG NUMBER

1	2	3	4	5	6	7	8	9	10	11	12	13
S	2	1	2	A	F	0	2	N	1	F	G	9

6 — COIL CLASS
7, 8 — VOLTAGE
9 — SEAT SEAL SQ. SEAL & "O" RING MATERIAL

S271(DC) -- Service and Installation --

11/1/2016

DESCRIPTION
The S271 Series Solenoid Valves are 2-way, normally closed, piloted, zero differential general purpose valves. Stainless steel or Brassl construction with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases.
Valves should be mounted with the operator in a vertical position. A spring loaded plunger assures positive shutoff. The S5 solenoid coil is rated at 17.5 watts AC and 22.5 watts DC.

OPERATION
S271 Valves are normally closed (N.C.) and open when electrically energized.

SPECIFICATIONS
Use S271 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (min./max. psi, voltage, hz, maximum media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	Elastomer	Fluid (EPR)
32° - 125° F	EPR	32° - 295° F
32° - 125° F	Niitrile	32° - 180° F
32° - 125° F	FKM	32° - 230° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter .
2. Valves should be mounted with the operator in a vertical/upright position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid coil removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **VALVE DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take are not to nick, dent or damage plunger tube.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most S271 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, consult the factory.

REBUILD KIT
The Rebuild Kit contains a plunger/seat disc assembly, spring, diaphragm assembly, plunger tube assembly and O-rings.

REPAIR KIT
The Repair Kit contains a seat disc, O-rings and diaphragm assembly

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits (DC)	Repair Kits
S271AF__C5FG9	KS271AF15C5FG9	K271C5F
S271AF__C5GJ2	KS271AF15C5GJ2	K271C5G
S271AF__C5HJ2	KS271AF15C5GJ2	K271C5G
S271AF__C5JJ2	KS271AF15C5GJ2	K271C5G
S271AF__N5FG9	KS271AF15N5FG9	K271N5F
S271AF__N5GJ2	KS271AF15N5GJ2	K271N5G
S271AF__N5HJ2	KS271AF15N5GJ2	K271N5G
S271AF__N5JJ2	KS271AF15N5GJ2	K271N5G
S271AF__V5FG9	KS271AF15V5FG9	K271V5F
S271AF__V5GJ2	KS271AF15V5GJ2	K271V5G
S271AF__V5HJ2	KS271AF15V5GJ2	K271V5G
S271AF__V5JJ2	KS271AF15V5GJ2	K271V5G
S271AF__E7FG9	KS271AF15E7FG9	K271E7F
S271AF__E7GJ2	KS271AF15E7GJ2	K271E7G
S271AF__E7HJ2	KS271AF15E7GJ2	K271E7G
S271AF__E7JJ2	KS271AF15E7GJ2	K271E7G
S271AF__J7FG9	KS271AF15J7FG9	K271J7F
S271AF__J7GJ2	KS271AF15J7GJ2	K271J7G
S271AF__J7HJ2	KS271AF15J7GJ2	K271J7G
S271AF__J7JJ2	KS271AF15J7GJ2	K271J7G
S271AF__L7FG9	KS271AF15L7FG9	K271L7F
S271AF__L7GJ2	KS271AF15L7GJ2	K271L7G
S271AF__L7HJ2	KS271AF15L7GJ2	K271L7G
S271AF__L7JJ2	KS271AF15L7GJ2	K271L7G

COIL CHART

S271AF15_____	12 VDC	CS5BF15A24
S271AF16_____	24 VDC	CS5BF16A24

Cleaning
Cleaning fluid must be compatible with all valve components.
It is recommended that S271 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

GC Valves, LLC. 456 Crompton St., Charlotte, NC 28241
Ph: 704-588-3300, Fx: 704-973-9526, Service@gcvalves.com

SERVICE
Disassembly

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

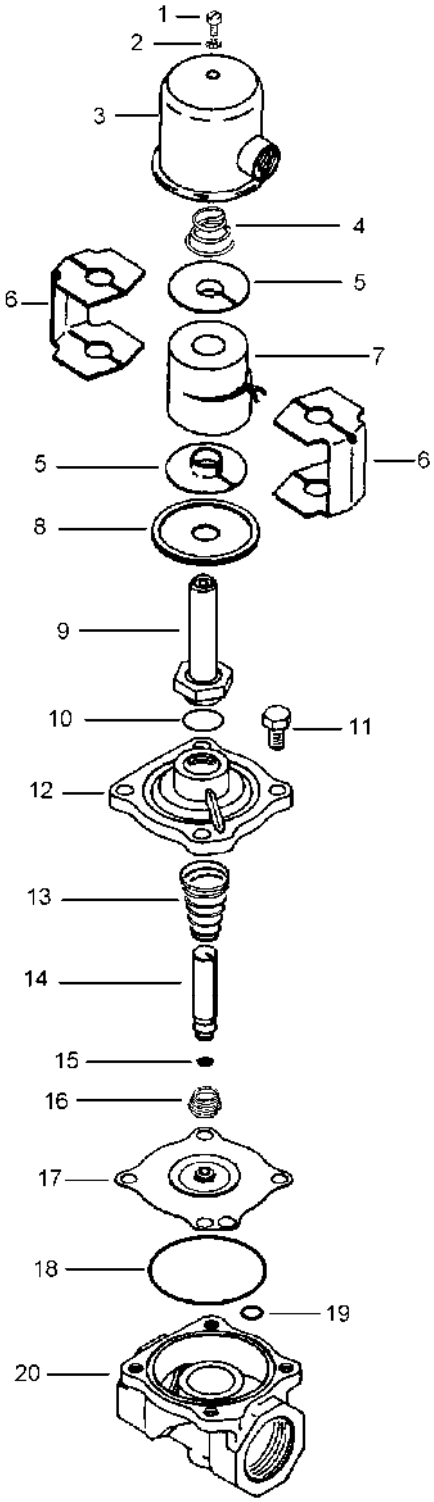
---

1. Disconnect electrical connections and remove retaining screw (1). Remove with lockwasher (2).
2. Lift off the coil housing (3) and coil magnetic assembly (4, 5, 6, 7, & 8) from the plunger tube (9)
3. Do not damage the solenoid assembly.
4. Use a 1 3/8" spanner to remove solenoid base nut and plunger tube (9). Do not nick, dent, or damage plunger tube (9) or valve seating surfaces.
5. Carefully hold plunger tube (9) in position when removing from valve bonnet (12) to prevent loss of internal parts.
6. Remove return spring (13) plunger assembly (14),
7. Remove four bonnet bolts (11) and separate the valve bonnet (12) from the valve body (20).
8. Carefully remove connecting spring (16) from the diaphragm (17) and plunger (14) assemblies.
9. Check seat disc (15) and diaphragm assembly (17) for damage or wear.
10. Replace O-rings (10, 18 & 19), diaphragm assembly (17), seat disc (15) and other parts as necessary.
11. Re-assemble in reverse order from above taking care to properly re-install the seat disc (15) and connecting spring (16).
12. Tighten Tube Base Nut (9)) 18 to 24 in/lbs, and bonnet bolts (11) to 40 to 45 in/lbs.
13. Re-connect electrical and test for proper operation.

TROUBLE-SHOOTING

If valve fails to open check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.



S271(AC) -- Service and Installation --

11/1/2016

DESCRIPTION
The S271 Series Solenoid Valves are 2-way, normally closed, piloted, zero differential general purpose valves. Stainless steel or Brass construction with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases.
Valves should be mounted with the operator in a vertical position.. A spring loaded plunger assures positive shutoff. The S5 solenoid coil is rated at 17.5 watts AC and 22.5 watts DC.

OPERATION
S271 Valves are normally closed (N.C.) and open when electrically energized.

SPECIFICATIONS
Use S271 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (min./max. psi, voltage, hz, maximum media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	Elastomer	Fluid (EPR)
32° - 125° F	EPR	32° - 295° F
32° - 125° F	Niitrile	32° - 180° F
32° - 125° F	FKM	32° - 230° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter .
2. Valves should be mounted with the operator in a vertical/upright position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid coil removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.
Incorrect coil reassembly can cause coil burnout.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take are not to nick, dent or damage plunger tube.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most S271 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, consult the factory.

REBUILD KIT
The Rebuild Kit contains a plunger/seat disc assembly, spring, diaphragm assembly, plunger tube assembly and O-rings.

REPAIR KIT
The Repair Kit contains a seat disc, O-rings and diaphragm assembly.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
S271AF__C5FG9	KS271AF02C5FG9	K271C5F
S271AF__C5GJ2	KS271AF02C5GJ2	K271C5G
S271AF__C5HJ2	KS271AF02C5GJ2	K271C5G
S271AF__C5JJ2	KS271AF02C5GJ2	K271C5G
S271AF__N5FG9	KS271AF02N5FG9	K271N5F
S271AF__N5GJ2	KS271AF02N5GJ2	K271N5G
S271AF__N5HJ2	KS271AF02N5GJ2	K271N5G
S271AF__N5JJ2	KS271AF02N5GJ2	K271N5G
S271AF__V5FG9	KS271AF02V5FG9	K271V5F
S271AF__V5GJ2	KS271AF02V5GJ2	K271V5G
S271AF__V5HJ2	KS271AF02V5GJ2	K271V5G
S271AF__V5JJ2	KS271AF02V5GJ2	K271V5G
S271AF__E7FG9	KS271AF02E7FG9	K271E7F
S271AF__E7GJ2	KS271AF02E7GJ2	K271E7G
S271AF__E7HJ2	KS271AF02E7GJ2	K271E7G
S271AF__E7JJ2	KS271AF02E7GJ2	K271E7G
S271AF__J7FG9	KS271AF02J7FG9	K271J7F
S271AF__J7GJ2	KS271AF02J7GJ2	K271J7G
S271AF__J7HJ2	KS271AF02J7GJ2	K271J7G
S271AF__J7JJ2	KS271AF02J7GJ2	K271J7G
S271AF__L7FG9	KS271AF02L7FG9	K271L7F
S271AF__L7GJ2	KS271AF02L7GJ2	K271L7G
S271AF__L7HJ2	KS271AF02L7GJ2	K271L7G
S271AF__L7JJ2	KS271AF02L7GJ2	K271L7G

COIL CHART

S271AF01_____	24V 60HZ	CS5AF01A24
S271AF02_____	120V 60Hz 110V 50Hz	CS5AF02A24
S271AF03____	208V 60Hz	CS5AF03A24
S271AF04_____	240V 60Hz 220V 50Hz	CS5AF04A24
S271AF15_____	12 VDC	CS5BF15A24
S271AF16_____	24 VDC	CS5BF16A24

Cleaning
Cleaning fluid must be compatible with all valve components.
It is recommended that S271 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

SERVICE
Disassembly

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

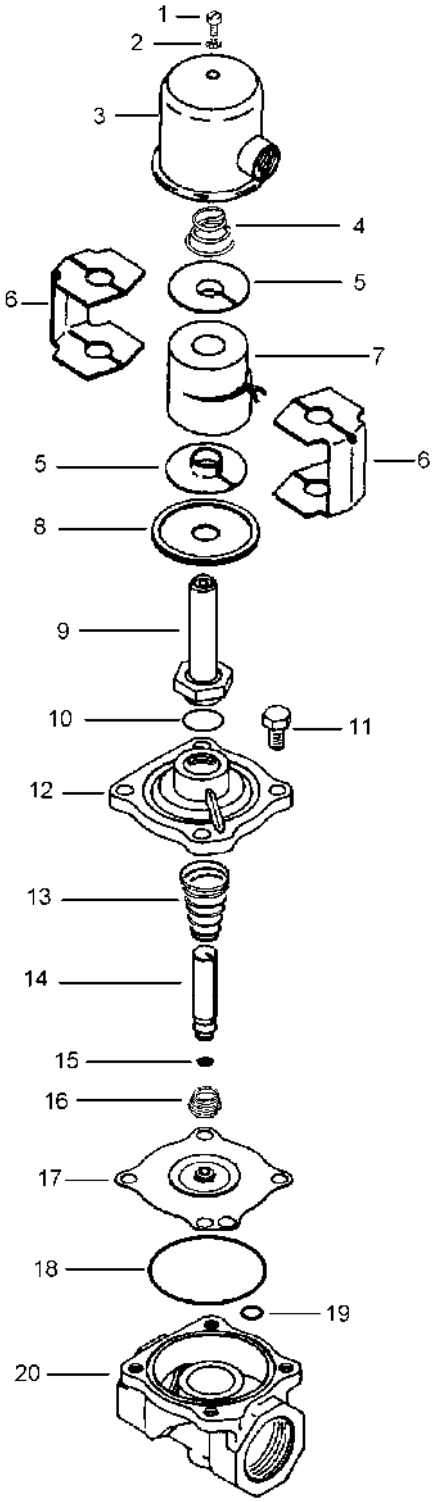
---

1. Disconnect electrical connections and remove retaining screw (1). Remove with lockwasher (2).
2. Lift off the coil housing (3) and coil magnetic assembly (4, 5, 6, 7, & 8) from the plunger tube (9)
3. Do not damage the solenoid assembly.
4. Use a 1 3/8" spanner to remove solenoid base nut and plunger tube (9). Do not nick, dent, or damage plunger tube (9) or valve seating surfaces.
5. Carefully hold plunger tube (9) in position when removing from valve bonnet (12) to prevent loss of internal parts.
6. Remove return spring (13) plunger assembly (14),
7. Remove four bonnet bolts (11) and separate the valve bonnet (12) from the valve body (20).
8. Carefully remove connecting spring (16) from the diaphragm (17) and plunger (14) assemblies.
9. Check seat disc (15) and diaphragm assembly (17) for damage or wear.
10. Replace O-rings (10, 18 & 19), diaphragm assembly (17), seat disc (15) and other parts as necessary.
11. Re-assemble in reverse order from above taking care to properly re-install the seat disc (15) and connecting spring (16).
12. Tighten Tube Base Nut (9)) 18 to 24 in/lbs, and bonnet bolts (11) to 40 to 45 in/lbs.
13. Re-connect electrical and test for proper operation.

TROUBLE-SHOOTING

If valve fails to open check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.



S272 (AC) -- Service and Installation --

12/14/18

DESCRIPTION
The S272 Series Solenoid Valves are 2-way, normally open, piloted, zero differential general purpose valves. Stainless steel or Brass construction with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases.
Valves should be mounted with the operator in a vertical position.. A spring loaded plunger assures positive shutoff. The S5 solenoid coil is rated at 17.5 watts AC and 22.5 watts DC.

OPERATION
S272 Valves are normally open (N.O.) and close when electrically energized.

SPECIFICATIONS
Use S272 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (min./max. psi, voltage, hz, maximum media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	Elastomer	Fluid
32° - 125° F	EPR	32° - 295° F
32° - 125° F	Nitrile	32° - 180° F
32° - 125° F	FKM	32° - 230° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter.
2. Valves should be mounted with the operator in a vertical/upright position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid coil removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.
Incorrect coil reassembly can cause coil burnout.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take care not to nick, dent or damage plunger tube.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most S272 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, consult the factory.

REBUILD KIT
The Rebuild Kit contains a plunger/seat disc assembly, spring, diaphragm assembly, plunger tube assembly and O-rings.

REPAIR KIT
The Repair Kit contains a seat disc, O-rings and diaphragm assembly.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
S272AF__C5FG9	KS272AF02C5FG9	K272C5F
S272AF__C5GJ2	KS272AF02C5GJ2	K272C5G
S272AF__C5HJ2	KS272AF02C5GJ2	K272C5G
S272AF__C5JJ2	KS272AF02C5GJ2	K272C5G
S272AF__N5FG9	KS272AF02N5FG9	K272N5F
S272AF__N5GJ2	KS272AF02N5GJ2	K272N5G
S272AF__N5HJ2	KS272AF02N5GJ2	K272N5G
S272AF__N5JJ2	KS272AF02N5GJ2	K272N5G
S272AF__V5FG9	KS272AF02V5FG9	K272V5F
S272AF__V5GJ2	KS272AF02V5GJ2	K272V5G
S272AF__V5HJ2	KS272AF02V5GJ2	K272V5G
S272AF__V5JJ2	KS272AF02V5GJ2	K272V5G
S272AF__E7FG9	KS272AF02E7FG9	K272E7F
S272AF__E7GJ2	KS272AF02E7GJ2	K272E7G
S272AF__E7HJ2	KS272AF02E7GJ2	K272E7G
S272AF__E7JJ2	KS272AF02E7GJ2	K272E7G
S272AF__J7FG9	KS272AF02J7FG9	K272J7F
S272AF__J7GJ2	KS272AF02J7GJ2	K272J7G
S272AF__J7HJ2	KS272AF02J7GJ2	K272J7G
S272AF__J7JJ2	KS272AF02J7GJ2	K272J7G
S272AF__L7FG9	KS272AF02L7FG9	K272L7F
S272AF__L7GJ2	KS272AF02L7GJ2	K272L7G
S272AF__L7HJ2	KS272AF02L7GJ2	K272L7G
S272AF__L7JJ2	KS272AF02L7GJ2	K272L7G

COIL CHART

S272AF01_____	24V 60HZ	CS5AF01A24
S272AF02_____	120V 60Hz 110V 50Hz	CS5AF02A24
S272AF03____	208V 60Hz	CS5AF03A24
S272AF04_____	240V 60Hz 220V 50Hz	CS5AF04A24
S272AF15_____	12 VDC	CS5BF15A24
S272AF16_____	24 VDC	CS5BF16A24

Cleaning
Cleaning fluid must be compatible with all valve components.
It is recommended that S272 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

SERVICE-Disassembly

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

---

1. Disconnect electrical connections and remove retaining screw (1) lockwasher (2) and spacer (3).

2. Lift off the coil housing (4) and coil magnetic assembly (5, 6, 7, 8, & 9) from the plunger tube (10)

3. Use a 1 3/8" spanner to remove solenoid base nut and plunger tube (10). Do not nick, dent, or damage plunger tube (10).

5. Carefully hold plunger tube (10) in position when removing from valve bonnet (20) to prevent loss of internal parts.

6. Remove and retain plunger (12), push pin (13) and tube head (15). O-rings (11) and (14) should be replaced.

7. Remove four bonnet bolts (19) and separate the valve bonnet (20) from the valve body (25).

8. Carefully remove connecting spring (21) from the diaphragm (22) and seat retainer (16) assemblies.

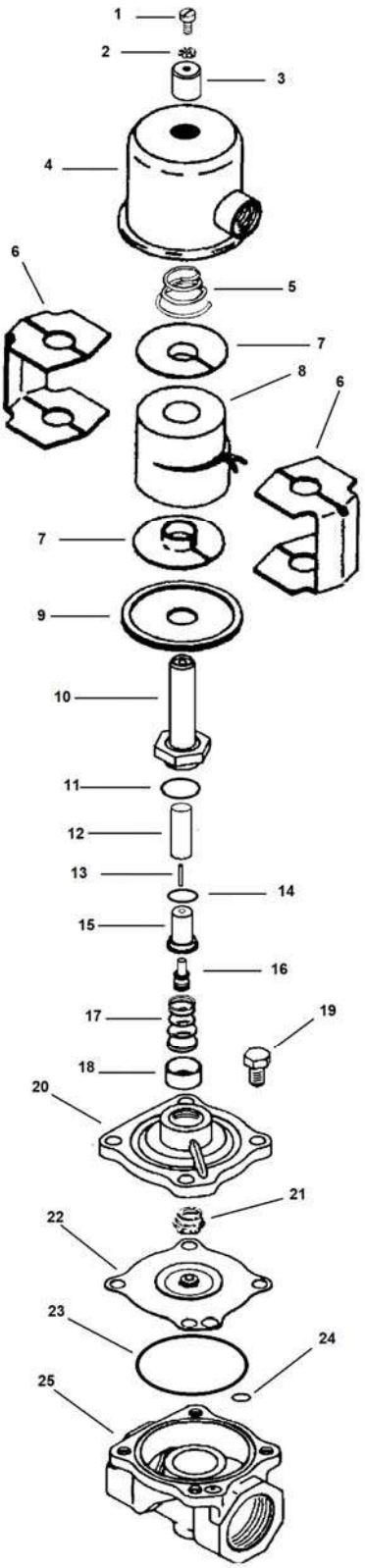
9. Check the disc in the seat retainer (16) and diaphragm assembly (17) for damage or wear.

10. Replace O-rings (23 & 24), diaphragm assembly (22), seat disc in the seat retainer (16) and other parts as necessary.

11. Re-assemble in reverse order from above taking care to properly re-install the seat retainer (16), connecting spring (21) and return spring (17) assembly.

12. Tighten Tube Base Nut (10)) 18 to 24 in/lbs, and bonnet bolts (19) to 40 to 45 in/lbs.

13. Re-connect electrical and test for proper operation.



TROUBLE-SHOOTING

If valve fails to close check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.

S272(DC) -- Service and Installation --

12/14/18

DESCRIPTION
The S272 Series Solenoid Valves are 2-way, normally open, piloted, zero differential general purpose valves. Stainless steel or Brass construction with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases.
Valves should be mounted with the operator in a vertical position.. A spring loaded plunger assures positive shutoff. The S5 solenoid coil is rated at 17.5 watts AC and 22.5 watts DC.

OPERATION
S272 Valves are normally open (N.O.) and close when electrically energized.

SPECIFICATIONS
Use S272 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (min./max. psi, voltage, hz, maximum media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	Elastomer	Fluid
32° - 125° F	EPR	32° - 295° F
32° - 125° F	Nitrile	32° - 180° F
32° - 125° F	FKM	32° - 230° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter.
2. Valves should be mounted with the operator in a vertical/upright position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid coil removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.
Incorrect coil reassembly can cause coil burnout.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take care not to nick, dent or damage plunger tube.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most S272 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, consult the factory.

REBUILD KIT
The Rebuild Kit contains a plunger/seat disc assembly, spring, diaphragm assembly, plunger tube assembly and O-rings.

REPAIR KIT
The Repair Kit contains a seat disc, O-rings and diaphragm assembly.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
S272AF__C5FG9	KS272AF15C5FG9	K272C5F
S272AF__C5GJ2	KS272AF15C5GJ2	K272C5G
S272AF__C5HJ2	KS272AF15C5GJ2	K272C5G
S272AF__C5JJ2	KS272AF15C5GJ2	K272C5G
S272AF__N5FG9	KS272AF15N5FG9	K272N5F
S272AF__N5GJ2	KS272AF15N5GJ2	K272N5G
S272AF__N5HJ2	KS272AF15N5GJ2	K272N5G
S272AF__N5JJ2	KS272AF15N5GJ2	K272N5G
S272AF__V5FG9	KS272AF15V5FG9	K272V5F
S272AF__V5GJ2	KS272AF15V5GJ2	K272V5G
S272AF__V5HJ2	KS272AF15V5GJ2	K272V5G
S272AF__V5JJ2	KS272AF15V5GJ2	K272V5G
S272AF__E7FG9	KS272AF15E7FG9	K272E7F
S272AF__E7GJ2	KS272AF15E7GJ2	K272E7G
S272AF__E7HJ2	KS272AF15E7GJ2	K272E7G
S272AF__E7JJ2	KS272AF15E7GJ2	K272E7G
S272AF__J7FG9	KS272AF15J7FG9	K272J7F
S272AF__J7GJ2	KS272AF15J7GJ2	K272J7G
S272AF__J7HJ2	KS272AF15J7GJ2	K272J7G
S272AF__J7JJ2	KS272AF15J7GJ2	K272J7G
S272AF__L7FG9	KS272AF15L7FG9	K272L7F
S272AF__L7GJ2	KS272AF15L7GJ2	K272L7G
S272AF__L7HJ2	KS272AF15L7GJ2	K272L7G
S272AF__L7JJ2	KS272AF15L7GJ2	K272L7G

COIL CHART

S271AF15_____	12 VDC	CS5BF15A24
S271AF16_____	24 VDC	CS5BF16A24

Cleaning
Cleaning fluid must be compatible with all valve components.
It is recommended that S272 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

GC Valves, LLC. 456 Crompton St., Charlotte, NC 28241
Ph: 704-588-3300, Fx: 704-973-9526, Service@gcvalves.com

SERVICE-Disassembly

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

---

1. Disconnect electrical connections and remove retaining screw (1) lockwasher (2) and spacer (3).

2. Lift off the coil housing (4) and coil magnetic assembly (5, 6, 7, 8, & 9) from the plunger tube (10)

3. Use a 1 3/8" spanner to remove solenoid base nut and plunger tube (10). Do not nick, dent, or damage plunger tube (10).

5. Carefully hold plunger tube (10) in position when removing from valve bonnet (20) to prevent loss of internal parts.

6. Remove and retain plunger (12), push pin (13) and tube head (15). O-rings (11) and (14) should be replaced.

7. Remove four bonnet bolts (19) and separate the valve bonnet (20) from the valve body (25).

8. Carefully remove connecting spring (21) from the diaphragm (22) and seat retainer (16) assemblies.

9. Check the disc in the seat retainer (16) and diaphragm assembly (17) for damage or wear.

10. Replace O-rings (23 & 24), diaphragm assembly (22), seat disc in the seat retainer (16) and other parts as necessary.

11. Re-assemble in reverse order from above taking care to properly re-install the seat retainer (16), connecting spring (21) and return spring (17) assembly.

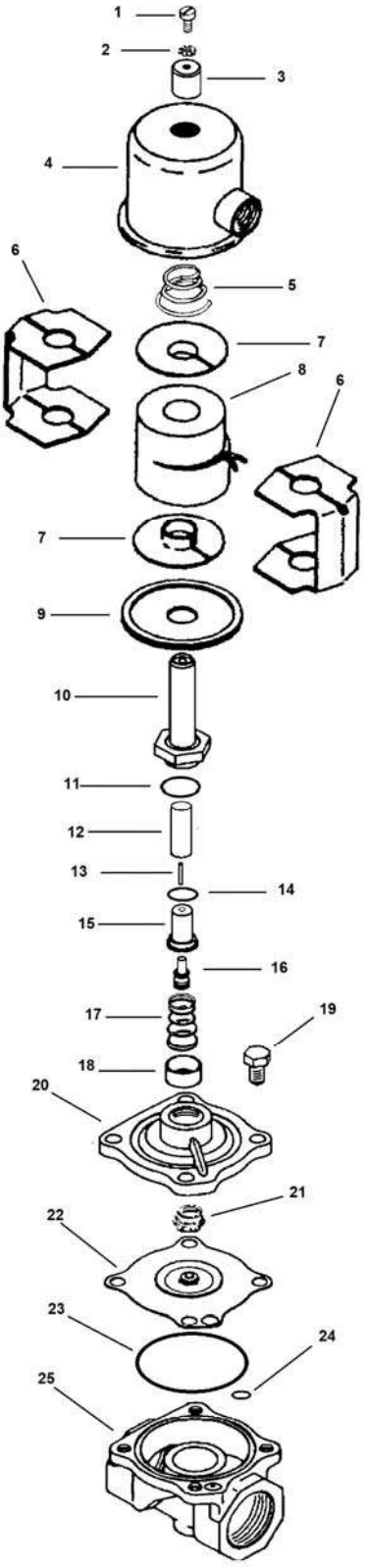
12. Tighten Tube Base Nut (10)) 18 to 24 in/lbs, and bonnet bolts (19) to 40 to 45 in/lbs.

13. Re-connect electrical and test for proper operation.

TROUBLE-SHOOTING

If valve fails to close check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.



S301 - Service and Installation -

4/24/18

DESCRIPTION
The S301 Series Solenoid Valves are 2-way, normally closed, direct acting, general purpose valves. All stainless steel or brass bodies with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases. Valves may be mounted in any positions. A spring loaded plunger assures positive shutoff. The S4 solenoid coil is rated at 10 watts.

OPERATION
S301 Valves are normally closed (N.C.) and open when electrically energized.

SPECIFICATIONS
Use S301 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (max. psi, voltage, cycle, max. media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	Elastomer	Fluid
32° - 125° F	EPR	32° - 295° F
32° - 125° F	Nitrile	32° - 180° F
32° - 125° F	FKM	32° - 230° F
32° - 125° F	PTFE	32° - 366° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter.
2. Valves are multi-poised and may be mounted in any position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

Cleaning
Cleaning fluid must be compatible with all valve components.
It is recommended that S301 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most S301 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **VALVE DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take care not to nick, dent or damage plunger tube.

REBUILD KIT
The Rebuild Kit contains a plunger/spring/seat disc assembly, plunger tube assembly, O-rings and adapter ring.

REPAIR KIT
The Repair Kit contains a seat disc, and O-rings.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
S301AF__C__C1-E1	KS301AF02C2AC3	K301CC3
S301AF__C__E7-F1	KS301AF02C2AE7	K301CE7
S301AF__C__F5-F7	KS301AF02C2AF5	K301CF5
S301AF__N__C1-E1	KS301AF02N2AC3	K301NC3
S301AF__N__E7-F1	KS301AF02N2AE7	K301NE7
S301AF__N__F5-F7	KS301AF02N2AF5	K301NF5
S301AF__T__C1-E1	KS301AF02T2AC3	K301TC3
S301AF__T__E7-F1	KS301AF02T2AE7	K301TE7
S301AF__T__F5-F7	KS301AF02T2AF5	K301TF5
S301AF__V__C1-E1	KS301AF02V2AC3	K301VC3
S301AF__V__E7-F1	KS301AF02V2AE7	K301VE7
S301AF__V__F5-F7	KS301AF02V2AF5	K301VF5

COIL CHART

Valve	Voltage	DIN Coil	Conduit Coil
S301GF02_____	120V 50/60	HS4YN02	HS4GN02A24
S301GF24_____	24V 50/60	HS4YN24	HS4GN24A24
S301GF15_____	12 VDC	HS4YN15	HS4GN15A24
S301GF16_____	24 VDC	HS4YN16	HS4GN16A24

GC Valves, LLC. 456 Crompton St., Charlotte, NC 28241
Ph: 704-588-3300, Fx: 704-973-9526, Service@gcvalves.com

SERVICE

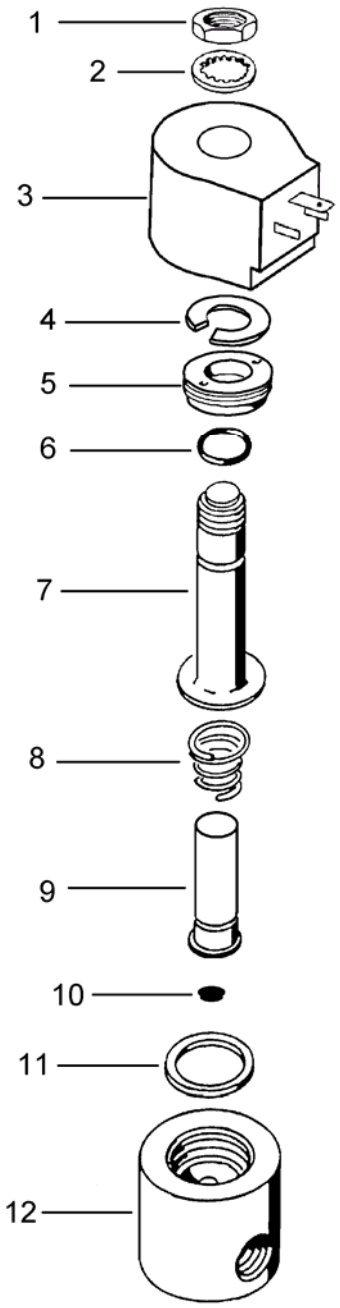
DISASSEMBLY AND REPAIR KIT INSTALLATION

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

---

1. Unscrew the hex nut (1). Remove with lockwasher (2).
2. Lift off the coil (3) from the plunger tube.
3. Do not damage the solenoid assembly.
4. Remove split washer (4).
5. Use GC Valves spanner nut (106198E) or similar tool to remove solenoid base nut (5) and plunger tube (7). Do not nick dent or damage plunger tube (7) or valve seating surfaces.
6. Hold plunger tube (7) in position when removing from valve body (12) to prevent loss of internal parts.
7. Carefully remove the plunger/spring/seat disc assembly (8, 9 & 10),
8. Check seating surfaces on the seat disc (10) and valve body (12) for damage or wear.
9. Replace seat disc (10) body O-ring (11) and other parts as necessary.
10. Re-assemble in reverse order from above taking care to properly install the seat disc (10), plunger (9) and plunger tube (7).
11. Tighten solenoid base nut (5) to 25 In/Lbs.
12. Re-connect electrical and test for proper operation.



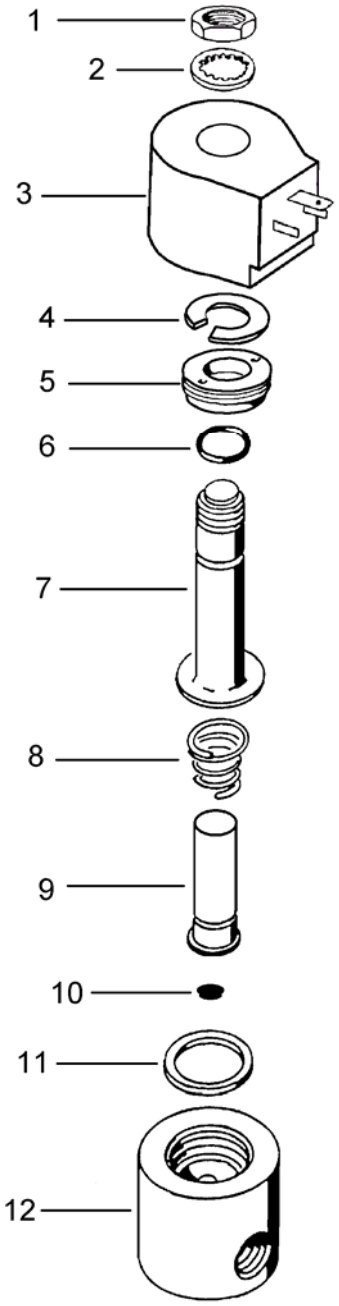
REBUILD KIT INSTALLATION AND ASSEMBLY

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

---

1. Carefully install seat disc (9) and spring (7) on the plunger (8).
2. Place body O-ring (10) in valve body (11) operator cavity..
3. Place tube O-ring (5) on plunger tube (4) base.
4. Thread adapter ring (6) on plunger tube (4) base.
5. Place plunger assembly (7, 8 & 9) in valve body (11) cavity.
6. Carefully thread plunger tube assembly (4, 5 & 6) into valve body (11).
7. Use a 1” spanner to tighten solenoid base nut and plunger tube (4). Do not nick, dent, or damage plunger tube (4) or valve seating surfaces.
8. Tighten plunger tube base nut (4) to 24 In/Lbs.
9. Replace coil (3), lockwasher (2) and top nut (1). Tighten to approximately 25 In/Lbs.
11. Re-connect electrical and test for proper operation.



TROUBLE-SHOOTING

If valve fails to open check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.

S302 - Service and Installation -

4/24/18

DESCRIPTION
The S302 Series Solenoid Valves are 2-way, normally open, direct acting, general purpose valves. Stainless steel or brass body with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases. Valves may be mounted in any positions. A spring loaded plunger assures positive shutoff. The S4 solenoid coil is rated at 10 watts.

OPERATION
S302 Valves are normally open (N.O.) and close when electrically energized.

SPECIFICATIONS
Use S302 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (max. psi, voltage, cycle, max. media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	Elastomer	Fluid
32° - 125° F	EPR	32° - 295° F
32° - 125° F	Nitrile	32° - 180° F
32° - 125° F	FKM	32° - 230° F
32° - 125° F	PTFE	32° - 366° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.

1. Clear all lines of foreign matter .
2. Valves are multi-poised and may be mounted in any position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

Cleaning
Cleaning fluid must be compatible with all valve components.

It is recommended that S302 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most S302 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **VALVE DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take care not to nick, dent or damage plunger tube.

REBUILD KIT
The Rebuild Kit contains a plunger, spring, seat retainer assembly, plunger tube assembly, PTFE glide strip, O-rings and adapter ring.

REPAIR KIT
The Repair Kit contains a seat disc, and O-rings only.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
S302AF__C__C1-E1	KS302AF02C2AC3	K302CC3
S302AF__C__E7-F1	KS302AF02C2AE7	K302CE7
S302AF__C__F5-F7	KS302AF02C2AF5	K302CF5
S302AF__N__C1-E1	KS302AF02N2AC3	K302NC3
S302AF__N__E7-F1	KS302AF02N2AE7	K302NE7
S302AF__N__F5-F7	KS302AF02N2AF5	K302NF5
S302AF__T__C1-E1	KS302AF02T2AC3	K302TC3
S302AF__T__E7-F1	KS302AF02T2AE7	K302TE7
S302AF__T__F5-F7	KS302AF02T2AF5	K302TF5
S302AF__V__C1-E1	KS302AF02V2AC3	K302VC3
S302AF__V__E7-F1	KS302AF02V2AE7	K302VE7
S302AF__V__F5-F7	KS302AF02V2AF5	K302VF5

COIL CHART

Valve	Voltage	DIN Coil	Conduit Coil
S302GF02_____	120V 50/60	HS4YN02	HS4GN02A24
S302GF24_____	24V 50/60	HS4YN24	HS4GN24A24
S302GF15_____	12 VDC	HS4YN15	HS4GN15A24
S302GF16_____	24 VDC	HS4YN16	HS4GN16A24

GC Valves, LLC. 456 Crompton St., Charlotte, NC 28241
Ph: 704-588-3300, Fx: 704-973-9526, Service@gcvalves.com

SERVICE

DISASSEMBLY AND REPAIR KIT INSTALLATION

WARNING

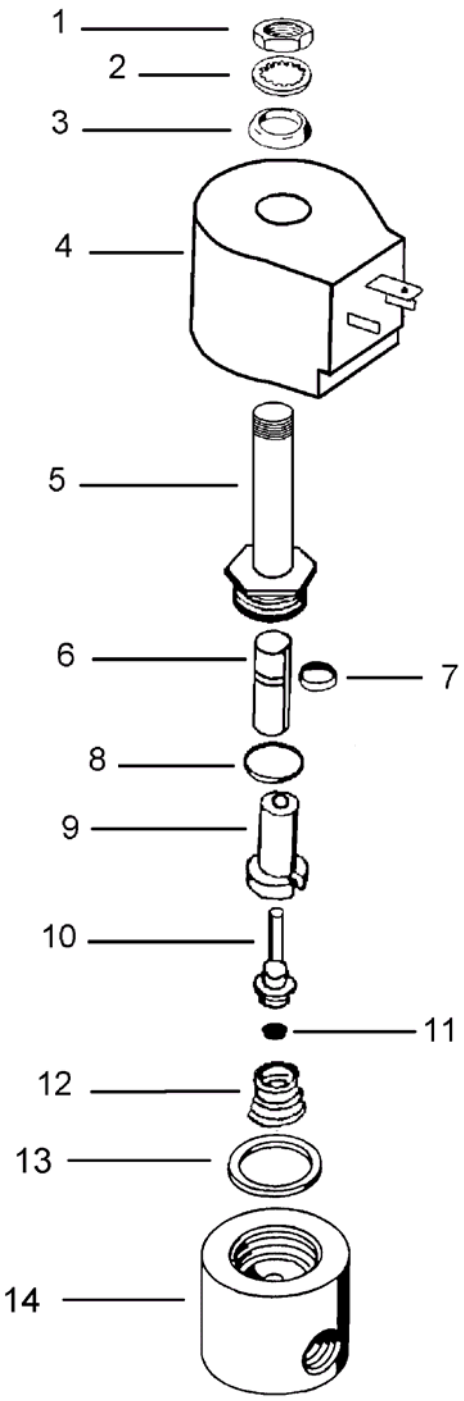
Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

---

1. Unscrew the hex nut (1). Remove with lockwasher (2) and spacer (3).
2. Lift off the coil (4) from the plunger tube.
3. Do not damage the solenoid assembly.
4. Use a 1" spanner to remove solenoid base nut and plunger tube (5). Do not nick, dent, or damage plunger tube (5) or valve seating surfaces.
5. Carefully hold plunger tube (5) in position when removing from valve bodyt (14) to prevent loss of internal parts.
6. Remove return spring (12) from body (14),
7. Replace O-rings (8 &13), seat disc (11) and other parts as necessary.
8. Re-assemble in reverse order from above taking care to properly re-install the seat disc (11) and PTFE strip (7).
9. Tighten Tube Base Nut (4) to 18 to 24 in/lbs. and bonnet bolts (10) to 40 to 45 in/lbs.
10. Re-connect electrical and test for proper operation.

TROUBLE-SHOOTING

If valve fails to open check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation. Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.



4525 E. Industrial Street
Unit 4C
Simi Valley, CA 93063
Phone 805-582-0065
Fax 805-582-0210

G C
VALVES

INSTALLATION AND SERVICE

S303 STANDARD 3-WAY — NORMALLY CLOSED DIRECT ACTING SOLENOID VALVE WITH CS4 COIL

DESCRIPTION

S303 Series Standard Solenoid Valves are a 3-way, N. C. . direct acting, general purpose type. All stainless steel construction and optional seating materials make them suitable for use with a variety of liquids, oils and gases.

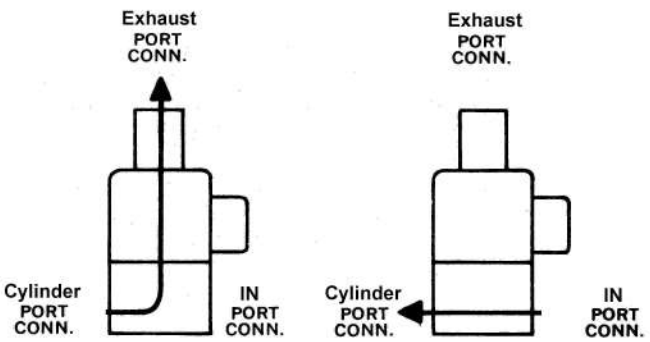
A spring loaded plunger assures positive shutoff. CS4 solenoid coil is rated at 10 watts.

SPECIFICATIONS

Use valve within specified operating ranges as indicated on nameplates and in complete catalog number. (Min/ max. p s i , volts, cycles, max. media temp @ °F ambient Cv factor, etc.)

FLOW DIRECTION

IMPORTANT: Flow direction for S303 valves is as shown below:



DE-ENERGIZED ENERGIZED

INSTALLATION

Check valve specifications to make sure of proper application.

CAUTION

This solenoid valve should be installed only by a qualified service person.

1. Difference between inlet and outlet pressure (MOPD) must not exceed nameplate rating.
2. Valves are multipoised* and may be mounted in any position. Flow must be in direction indicated on valve body. If sediment is a problem, install fine mesh strainer having adequate capacity ahead of valve.

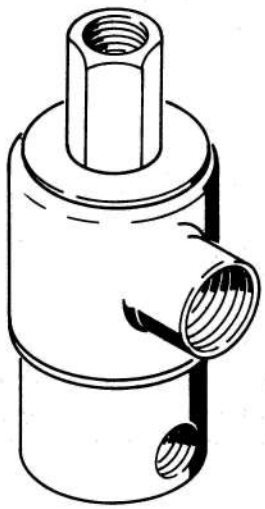


Fig. 1. Typical S303

CAUTION*

Valves with "W" (Rainproof Conduit) in 5th digit position of valve catalog number must be mounted on a horizontal pipe line with solenoid in an upright position.

3. Clear all lines of foreign matter.
4. Do not use wrench on valve body. Do not use solenoid to turn valve. Apply thread seal sparingly to male threads only.
5. Provide clearance for solenoid assembly removal.
6. Wire in accordance with applicable national and local electrical codes.

PREVENTIVE MAINTENANCE

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If control does not operate properly after following the INSTALLATION and PREVENTIVE MAINTENANCE instructions, complete control must be replaced by qualified person.

S303 Series Solenoid Valves provide dependable operation for many years. However, foreign matter between valve seat and disc can cause leakage.

NOTE

IT IS RECOMMENDED S303 SERIES VALVES BE CLEANED ON A ROUTINE BASIS BY QUALIFIED SERVICE PERSONNEL. VALVES SHOULD BE CLEANED WHERE FLOW MEDIA OR SERVICE CONDITIONS MAY DETERMINE LIFE OF VALVE. APPLY CORRECT VOLTAGE. IF EXCESSIVE LEAKAGE OCCURS OR OPERATION IS SLUGGISH, UNIT MUST BE CLEANED.

If valve fails to open, check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free from dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation.

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage — clean plunger and interior of tube and base assembly.

DISASSEMBLY AND REASSEMBLY — SEE FIG. 2

1. Unscrew top pipe connection (1), remove "O" Ring (2) and nameplate (3).
2. Lift off coil jacket (4) with bottom washers (5) from plunger tube (6).
3. Remove coil assembly (7) and washer (8) from coil jacket (4). Do not disarrange solenoid assembly.
4. Use GC solenoid wrench No. 63591A to remove base nut (9) from valve body (10). Do not nick, dent or damage plunger tube (6) or valve seating surfaces (Ref.) in plunger assembly (12) and in valve body (10).
5. Lift plunger tube (6) and base Nut (9) from valve body (10) and "O" ring (11).
6. Remove plunger assembly (12), spring (13), square seal (14).
7. Check square seal (14), "O" rings (2) and (11), seating surfaces (Ref.) in plunger assembly (12), and in valve body (10), plunger spring (13) for damage and wear.

Reassemble in reverse order.

NOTE

TIGHTEN BASE NUT (9), 18 to 24 INCH POUNDS.

COIL REPLACEMENT

CAUTION

Turn off electrical power supply to solenoid before disconnecting coil lead wires.

It is not necessary to remove valve from pipeline. Follow steps 1, 2 and 3 under VALVE DISASSEMBLY. Disassemble solenoid, taking care to note the exact order of placement and quantity of parts.

NOTE

ONE OF THE WASHERS (5) HAS "X" MARKING ON ONE SIDE. THE SIDE MARKED "X" MUST BE PLACED NEXT TO COIL.

Incorrect reassembly can cause coil burnouts. At all times take care not to nick, dent or damage plunger tube.

PARTS LIST

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If control does not operate properly after following the INSTALLATION and PREVENTIVE MAINTENANCE complete control must be replaced by qualified person.

This parts list covers replaceable coil part numbers and universal kits for most S303 Series Model "A" STANDARD, and Model "B" EXPLOSION PROOF valves.

When ordering parts — kits, specify catalog number, serial number and parts name. If your valve catalog number is not listed, obtain complete catalog number, serial number and consult factory.

See Figure 2 for exploded view of typical S303 Model "B" Explosion Proof actuator assembly.

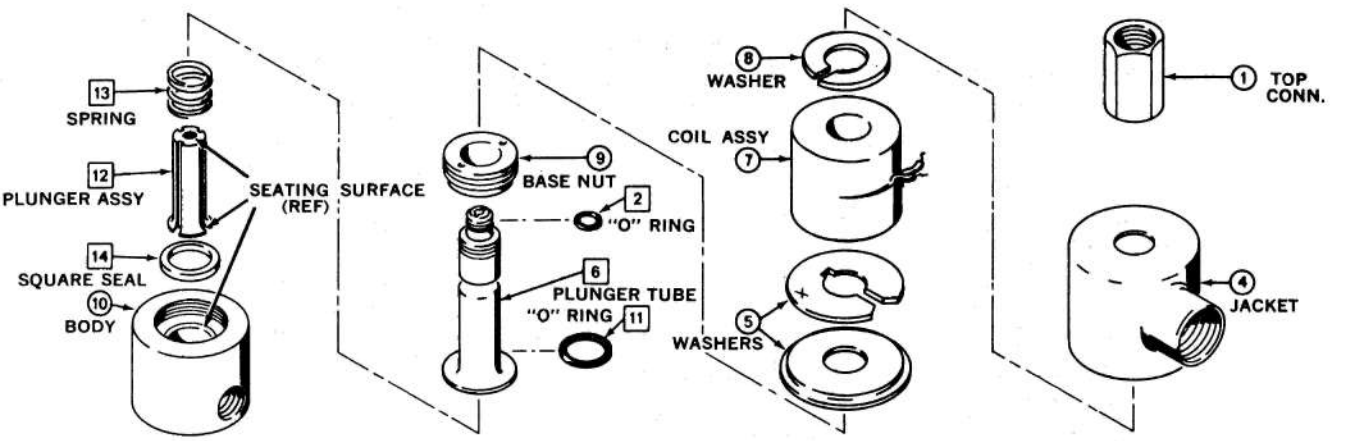


Fig. 2. Exploded View of Typical S303

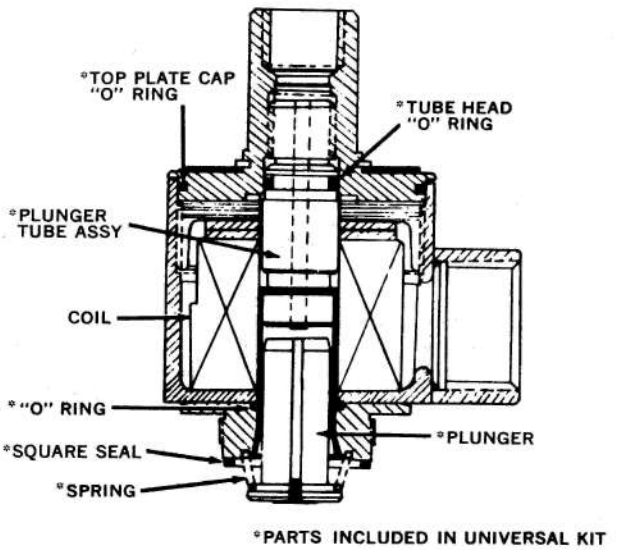


Fig. 3. Typical Three-Way Model "B" Expl. Proof Valve Actuator Cross-Section

COIL CHART

IDENTIFYING CATALOG DIGITS ①	COIL CLASS	WATTS	ELECTRICAL CONNECTION	COIL PART NUMBER ②③
S30 — — F	F	10	24" LEADS	CS4AF — — A24
S30 — — H	H			CS4AN — — A24
S30 — GF	F			HS4GF — — A24
S30 — GH	H			HS4GN — — A24
S30 — YF	F		DIN TERMINALS	HS4YF — —
S30 — YH	H			HS4YN — —

① Sixth digit of catalog number represents coil class as shown.
② Seventh and eighth digits of catalog number represent voltage shown in coil class chart. These digits must be transferred into the coil part number.
③ Recommended spare part.

EXAMPLE CATALOG NUMBER

1	2	3	4	5	6	7	8	9	10	11	12	13
S	3	0	3	A	F	0	2	N	3	B	C	5
				HOUSING	COIL CLASS	VOLTAGE		SEAT SQ. SEAL & "O" RING MATERIAL			ORIFICE SIZE	

G C
VALVES

S306 STANDARD 3-WAY — UNIVERSAL DIRECT ACTING SOLENOID VALVE WITH CS4 COIL

INSTALLATION SERVICE, AND PARTS LIST

DESCRIPTION

S306 Series Standard Solenoid Valves are a 3-way, Universal, direct acting, general purpose type. All stainless steel construction and optional seating materials make them suitable for use with a variety of liquids, oils and gases.

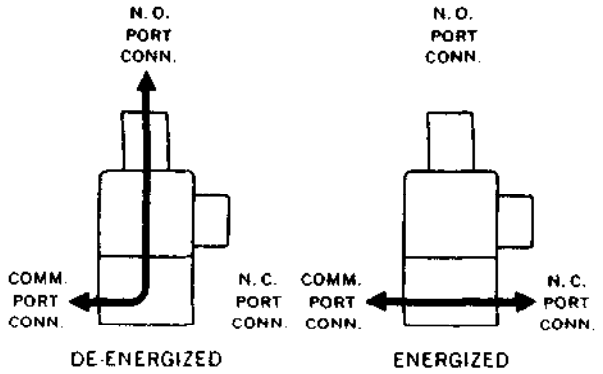
A spring loaded plunger assures positive shutoff. CS4 solenoid coil is rated at 10 watts.

SPECIFICATIONS

Use valve within specified operating ranges as indicated on nameplates and in complete catalog number. (Min/max. psi, volts, cycles, max. media temp @ °F ambient Cv factor, etc.)

FLOW DIRECTION

IMPORTANT: Flow direction for S306 valves is as shown below:



INSTALLATION

Check valve specifications to make sure of proper application.

CAUTION

This valve should be installed only by a trained and experienced service person.

1. Difference between inlet and outlet pressure (MOPD) must not exceed nameplate rating.
2. Valves are multipoised* and may be mounted in any position. Flow must be in direction indicated on valve body. If sediment is a problem, install fine mesh strainer having adequate capacity ahead of valve.

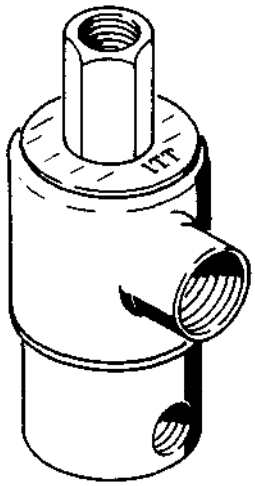


Fig. 1. Typical S306

1. Difference between inlet and outlet pressure (MOPD) must not exceed nameplate rating.
2. Valves are multipoised* and may be mounted in any position. See markings on valve body and top port connection for direction of flow. If sediment is a problem, install fine mesh strainer having adequate capacity ahead of valve.

CAUTION*

Valves with "W" (Rainproof Conduit) in 5th digit position of valve catalog number must be mounted on a horizontal pipe line with solenoid in an upright position.

3. Clear all lines of foreign matter.
4. Do not use wrench on valve body. Do not use solenoid to turn valve. Apply thread seal sparingly to male threads only.
5. Provide clearance for solenoid assembly removal.
6. Wire in accordance with applicable national and local electrical codes.

PREVENTIVE MAINTENANCE

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If control does not operate properly after following the INSTALLATION and PREVENTIVE MAINTENANCE instructions, complete control must be replaced by a trained and experienced service person.

Order this form by
SDI/SDP S306-1
Effective 6-80
Supersedes 6-79

PRINTED IN U.S.A.

S306 Series Solenoid Valves provide dependable operation for many years. However, foreign matter between valve seat and disc can cause leakage.

NOTE

IT IS RECOMMENDED S306 SERIES VALVES BE CLEANED ON A ROUTINE BASIS BY QUALIFIED SERVICE PERSONNEL. VALVES SHOULD BE CLEANED WHERE FLOW MEDIA OR SERVICE CONDITIONS MAY DETERMINE LIFE OF VALVE. APPLY CORRECT VOLTAGE. IF EXCESSIVE LEAKAGE OCCURS OR OPERATION IS SLUGGISH, UNIT MUST BE CLEANED.

If valve fails to open, check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free from dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation.

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage — clean plunger and interior of tube and base assembly.

DISASSEMBLY AND REASSEMBLY — SEE FIG. 2

1. Unscrew top pipe connection (1), remove "O" Ring (2) and nameplate (3).
2. Lift off coil jacket (4) with bottom washers (5) from plunger tube (6).
3. Remove coil assembly (7) and washer (8) from coil jacket (4). Do not disarrange solenoid assembly.
4. Use ITTGC solenoid wrench No. 63591A to remove base nut (9) from valve body (10). Do not nick, dent or damage plunger tube (6) or valve seating surfaces (Ref.) in plunger assembly (12) and in valve body (10).
5. Lift plunger tube (6) and base Nut (9) from valve body (10) and "O" ring (11).
6. *Remove plunger assembly (12), spring (13), square* seal (14).
7. Check square seal (14), "O" rings (2) and (11), seating surfaces (Ref.) in plunger assembly (12), and in valve body (10), plunger spring (13) for damage and wear.

Reassemble in reverse order.

NOTE

TIGHTEN BASE NUT (9), 18 to 24 INCH POUNDS.

COIL REPLACEMENT

CAUTION

Hazard of electrical shock.

Turn off electrical power supply to solenoid before disconnecting coil lead wires.

It is not necessary to remove valve from pipeline. Follow steps 1, 2 and 3 under VALVE DISASSEMBLY. Disassemble solenoid, taking care to note the exact order of placement and quantity of parts.

NOTE

STANDARD VALVE ONLY

ONE OF THE WASHERS (5) HAS "X" MARKED ON ONE SIDE. THE SIDE MARKED "X" MUST BE PLACED NEXT TO COIL. SEE FIG. 2.

TO REPLACE COIL ON EXPLOSION PROOF MODEL "B" VALVE ACTUATOR (FIG. 3) REMOVE TOP CAP (1) AND USE ITTGC SPANNER WRENCH ASSEMBLY 106198E TO REMOVE TOP PLATE (4). TO REASSEMBLE, POSITION WASHER (5) ON TOP OF COIL AND ASSEMBLE TOP PLATE (4) UNTIL BOTTOMED TO RETAIN COIL. REPLACE LOCKWASHER (3) AND TOP CAP (1) TAKING CARE TO NOT DAMAGE "O" RING (2).

Incorrect reassembly can cause coil burnouts. At all times take care not to nick, dent or damage plunger tube.

PARTS LIST

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If control does not operate properly after following the INSTALLATION and PREVENTIVE MAINTENANCE instructions, complete control must be replaced by a trained and experienced service person.

COIL CLASS CHART

CAT. DIGITS	VOLTAGE	AVAILABLE WITH COIL CLASS				
		A	BW	F	H	M
01	24v-60Hz	REPLACED BY "M"	REPLACED BY "F"	X	X	X
02	120v-60Hz					X
02	120v-60Hz & 110v-50Hz			X	X	
03	208v-60Hz			X	X	X
04	240v-60Hz					X
04	240v-60Hz & 220v-50Hz			X	X	
08	110v-50Hz					X
09	220v-50Hz					X
14	6v DC			X	X	X
15	12v DC			X	X	X
16	24v DC			X	X	X
24	24v-50Hz			X	X	X
54	240v-50Hz			X	X	X

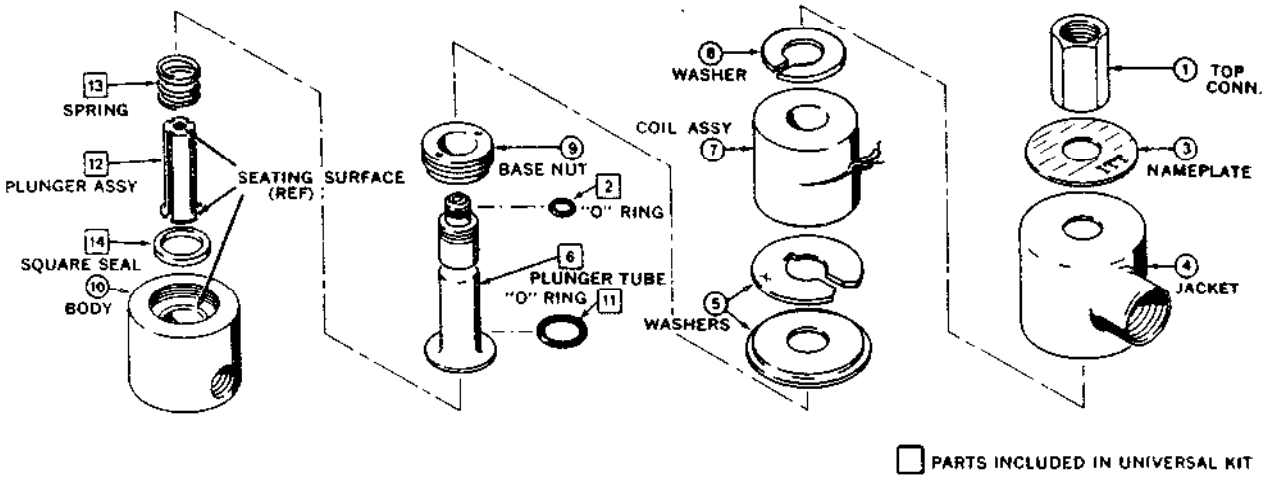


Fig. 2. Exploded View of Typical S306 Model "A" Valve

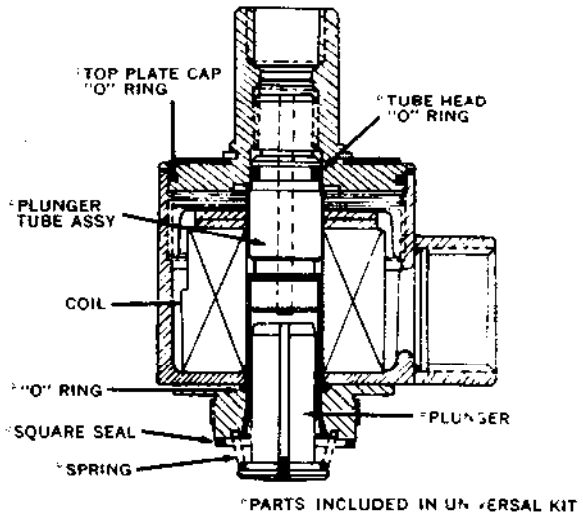


Fig. 3. Typical Three-Way Expl. Proof Valve Actuator Cross-Section

S311 - Service and Installation -

4/24/18

DESCRIPTION
The S311 Series Solenoid Valves are 2-way, normally closed, direct acting, general purpose valves. All stainless steel or brass bodies with synthetic seating and sealing materials make them suitable for use with a variety of liquids, oils and gases. Valves may be mounted in any positions. A spring loaded plunger assures positive shutoff. The S4 solenoid coil is rated at 10 watts.

OPERATION
S311 Valves are normally closed (N.C.) and open when electrically energized.

SPECIFICATIONS
Use S311 Valves within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (max. psi, voltage, cycle, max. media temperature at F ambient, Cv factor, etc.).

OPERATING TEMPERATURES

Ambient	Elastomer	Fluid
32° - 125° F	EPR	32° - 295° F
32° - 125° F	Nitrile	32° - 180° F
32° - 125° F	FKM	32° - 230° F
32° - 125° F	PTFE	32° - 366° F

For other applications, consult the factory.

INSTALLATION
Check valve specifications to make sure of proper application.
1. Clear all lines of foreign matter.
2. Valves are multi-poised and may be mounted in any position. Flow must be in direction indicated on the valve body. If sediment is a problem, install a fine mesh strainer having adequate capacity ahead of the valve.
3. Do not use the solenoid housing as a handle. Apply thread seal to the male threads only.
4. Provide a clearance for solenoid removal.
5. Wire in accordance with applicable local and national electrical codes.

MAINTENANCE

Cleaning
Cleaning fluid must be compatible with all valve components.
It is recommended that S311 Series Valves be cleaned on a routine basis by qualified personnel. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

PARTS
The charts which follow cover replaceable coil part numbers, Repair and Rebuild kits for most S311 valves.

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name. If your valve's Catalog Number is not listed, obtain the complete Serial Number and consult the factory.

COIL REPLACEMENT
Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.

It is not necessary to remove the valve from the pipeline. Follow Steps 1, 2 and 3 under **VALVE DISASSEMBLY**. Disassemble solenoid, taking care to note the exact order of placement and quantity parts.

Incorrect reassembly can cause coil burnout. At all times take care not to nick, dent or damage plunger tube.

REBUILD KIT
The Rebuild Kit contains a plunger/spring/seat disc assembly, plunger tube assembly, O-rings and adapter ring.

REPAIR KIT
The Repair Kit contains a seat disc, and O-rings.

REBUILD & REPAIR KIT CHART

Valve	Rebuild Kits	Repair Kits
S311AF__C__C1-E1	KS311AF02C2AC3	K311CC3
S311AF__C__E7-F1	KS311AF02C2AE7	K311CE7
S311AF__C__F5-F7	KS311AF02C2AF5	K311CF5
S311AF__N__C1-E1	KS311AF02N2AC3	K311NC3
S311AF__N__E7-F1	KS311AF02N2AE7	K311NE7
S311AF__N__F5-F7	KS311AF02N2AF5	K311NF5
S311AF__T__C1-E1	KS311AF02T2AC3	K311TC3
S311AF__T__E7-F1	KS311AF02T2AE7	K311TE7
S311AF__T__F5-F7	KS311AF02T2AF5	K311TF5
S311AF__V__C1-E1	KS311AF02V2AC3	K311VC3
S311AF__V__E7-F1	KS311AF02V2AE7	K311VE7
S311AF__V__F5-F7	KS311AF02V2AF5	K311VF5

COIL CHART

Valve	Voltage	DIN Coil	Conduit Coil
S311GF02_____	120V 50/60	HS3YN02	HS3GN02A24
S311GF24_____	24V 50/60	HS3YN24	HS3GN24A24
S311GF15_____	12 VDC	HS3YN15	HS3GN15A24
S311GF16_____	24 VDC	HS3YN16	HS3GN16A24

GC Valves, LLC. 456 Crompton St., Charlotte, NC 28241
Ph: 704-588-3300, Fx: 704-973-9526, Service@gcvalves.com

SERVICE

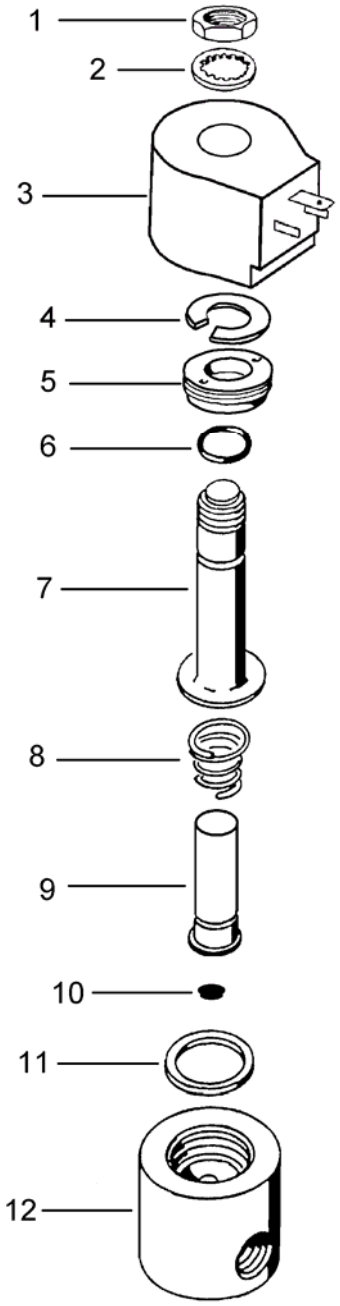
DISASSEMBLY AND REPAIR KIT INSTALLATION

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

---

1. Unscrew the hex nut (1). Remove with lockwasher (2).
2. Lift off the coil (3) from the plunger tube.
3. Do not damage the solenoid assembly.
4. Remove split washer (4).
5. Use GC Valves spanner nut (106198E) or similar tool to remove solenoid base nut (5) and plunger tube (7). Do not nick dent or damage plunger tube (7) or valve seating surfaces.
6. Hold plunger tube (7) in position when removing from valve body (12) to prevent loss of internal parts.
7. Carefully remove the plunger/spring/seat disc assembly (8, 9 & 10),
8. Check seating surfaces on the seat disc (10) and valve body (12) for damage or wear.
9. Replace seat disc (10) body O-ring (11) and other parts as necessary.
10. Re-assemble in reverse order from above taking care to properly install the seat disc (10), plunger (9) and plunger tube (7).
11. Tighten solenoid base nut (5) to 25 In/Lbs.
12. Re-connect electrical and test for proper operation.



REBUILD KIT INSTALLATION AND ASSEMBLY

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If valve does not operate properly after following the INSTALLATION and MAINTENANCE instructions, complete valve must be replaced by a trained and experienced service-person.

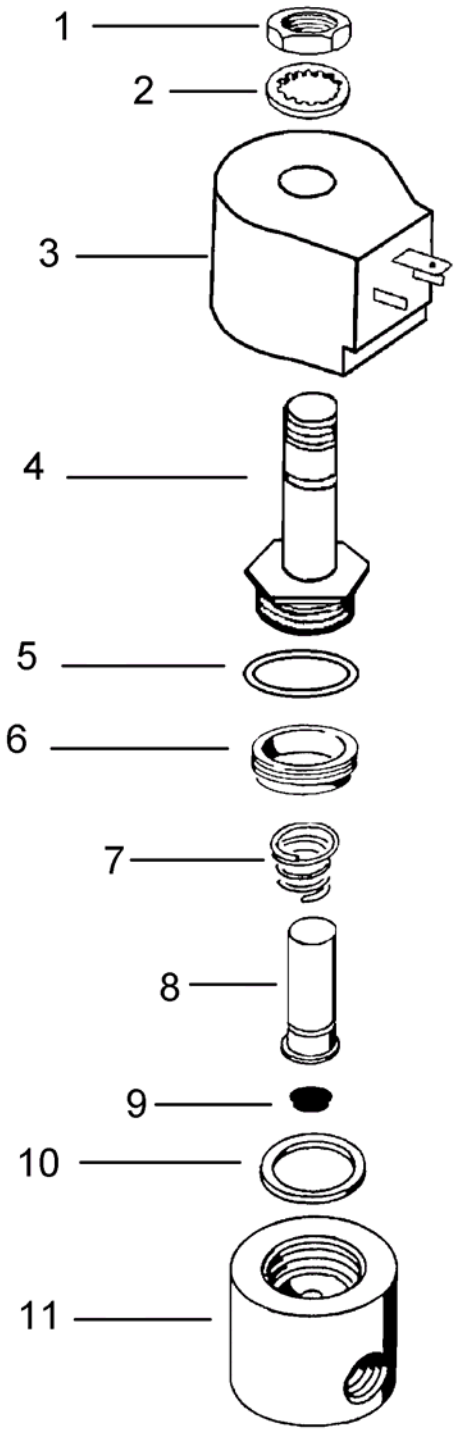
---

1. Carefully install seat disc (9) and spring (7) on the plunger (8).
2. Place body O-ring (10) in valve body (11) operator cavity..
3. Place tube O-ring (5) on plunger tube (4) base.
4. Thread adapter ring (6) on plunger tube (4) base.
5. Place plunger assembly (7, 8 & 9) in valve body (11) cavity.
6. Carefully thread plunger tube assembly (4, 5 & 6) into valve body (11).
7. Use a 1” spanner to tighten solenoid base nut and plunger tube (4). Do not nick, dent, or damage plunger tube (4) or valve seating surfaces.
8. Tighten plunger tube base nut (4) to 24 In/Lbs.
9. Replace coil (3), lockwasher (2) and top nut (1). Tighten to approximately 25 In/Lbs.
11. Re-connect electrical and test for proper operation.

TROUBLE-SHOOTING

If valve fails to open check voltage against rating on nameplate, check voltage at solenoid lead connections, check control circuit and solenoid coil for burnout. If valve fails to close, check condition of synthetic seat insert. Check for damaged spring. Valve must be free of dirt to insure tight shutoff. If dirt is a problem, install a fine mesh strainer to insure proper closing and trouble-free operation

Buzzing or chattering can be caused by low voltage or dirt or chips between top of plunger and tube head. Check voltage--clean plunger and interior of tube and base assembly.



4525 E. Industrial Street
Unit 4C
Simi Valley, CA 93063
Phone 805-582-0065
Fax 805-582-0210

G C
VALVES

S333 SERIES
DIRECT ACTING SOLENOID VALVE
3-WAY NORMALLY CLOSED (N.C.) TYPE

INSTALLATION, SERVICE AND PARTS LIST

SDI/SDP S333-1
Effective 3-82

DESCRIPTION

S333 Series are 3-way direct acting solenoid valves with all three pipe connections marked 1, 2 and 3 located in the forged brass or stainless steel body. Mounting bracket is standard on all stainless steel valve body sizes. Valves are designed for use with flow media, such as air, acetylene, hydraulic oil, water, and No. 2 oil; fluids not corrosive to forged brass or stainless steel or the selected seating material. Spring loaded plunger and poppet with synthetic seating materials such as Buna N or Viton insure positive shutoff.

S333 Series Solenoid valves are available as standard with General Purpose (NEMA Type 1) Enclosure. Rainproof (NEMA Type 3R) or a combination Explosion Proof and Watertight (NEMA 4, 7 and 9) Solenoid Enclosures are available as options, as well as other non-NEMA enclosures.

S333 Series Solenoid valves with optional "M" suffix in the catalog number are equipped with Manual Override. This allows the use of manual operation in the event of electrical power failure or automatic shutdown.

CAUTION

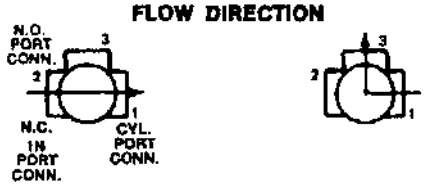
Solenoid cannot be operated electrically when manual override has been activated. Manual override must be returned to inoperative position before solenoid coil is re-energized.

OPERATION

When pressure is applied at port 2 which is normally closed, and solenoid electrically energized, port 2 opens and port 3 closes allowing full flow through port 1.

When solenoid is de-energized, port 2 closes and port 3 opens exhausting fluid from port 1 through port 3. See details of flow direction shown below.

FLOW DIRECTION



ENERGIZED DE-ENERGIZED

SPECIFICATIONS

Use valve within specified operating ranges as indicated on nameplate and in complete catalog number. (Max. psi, volts, cycles, published flow data.)

INSTALLATION

Check valve specifications to ensure proper application.

MOUNTING POSITIONS

Valves are multipoised and, therefore, may be mounted in any position except that:

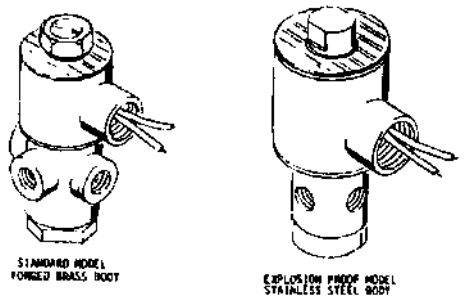


Fig. 1 Typical S333 Valve

OPERATING TEMPERATURES

FLUID MEDIA	COIL CLASS	TEMPERATURE °F		SEAT MATERIAL
		FLUID	AMBIENT	
AIR, ACETYLENE, HYDRAULIC OIL, WATER, NO. 2 OIL	F	200	150	BUNA
	M	185	77	
	M	185	77	VITON
	F	200	150	
	H	185	176	

Valves with "W" (Rainproof Enclosure) in 5th digit position of valve catalog number must be mounted on a horizontal pipe line with solenoid in an upright position.

PIPING

All piping must meet applicable local codes and ordinances.

Connect pipe to valve with flow in accordance with the port designation on valve body. Apply thread sealant to male pipe threads only. Applying sealant to valve threads may result in sealant entering and blocking the valve open, or causing other operational problems.

Do not use solenoid valve as a lever when tightening pipe.

NOTE

IF FOREIGN MATERIAL IS A POTENTIAL PROBLEM, INSTALL FINE MESH STRAINER HAVING ADEQUATE CAPACITY AHEAD OF VALVE.

WIRING

Wire in accordance with applicable Local and National Electrical Codes. On hazardous locations using explosion-proof, watertight solenoid enclosure, approved electrical fittings are required. ½" conduit connection is Standard on all valve sizes.

Installations in Canada require the use of rigid metal conduit to ground the electrical enclosure of this valve when rated over 30 volts.

By loosening the hex nut on the Standard valve or the top cap on the Explosion Proof valve, the housing can be turned to facilitate wiring.

TIGHTEN HEX NUT TO 25 INCH POUNDS MAX. TORQUE OR TOP CAP TO 150 INCH POUNDS MIN. TORQUE BEFORE OPERATING VALVE.

MAINTENANCE

⚠ WARNING ⚠

To prevent electrical shock, personal injury or damage to property, turn off electrical power and line pressure supply before maintenance. It is not necessary to remove valve from pipeline for maintenance.

CLEANING

Cleaning fluid must be compatible with all valve components.

It is recommended that S333 Series valves be cleaned on a routine basis. Valves should be cleaned where flow media or service conditions may influence life of valve. Apply correct voltage and if excessive leakage or noise occurs or operation is sluggish, valve should be cleaned.

PREVENTIVE MAINTENANCE

1. Clear all lines of foreign matter by keeping flow medium free of dirt, dust or lint, and this can be done by using fine mesh strainer having adequate capacity ahead of valve.
2. Check valve on a routine basis, preferably monthly or more often to assure that unit opens and closes as required.
3. Check internal parts of valve for damage and wear. Replace damaged or worn out parts.

SERVICE

COIL REPLACEMENT

Turn off electrical power supply to solenoid before disconnecting coil lead wires.

Standard and Open Frame Model (See Fig. 2)

To replace coil on STANDARD and OPEN FRAME MODEL, follow steps 1, 2 and 3 under VALVE DISASSEMBLY AND REASSEMBLY (Standard and Open Frame Model). Disassemble solenoid, taking care to note the exact order of replacement and quantity of parts.

Reassemble in reverse order.

NOTE

ONE OF THE WASHERS (6) HAS "X" MARKING ON ONE SIDE. THE SIDE MARKED "X" MUST BE PLACED NEXT TO COIL.

Explosion Proof Model (See Fig. 3)

To replace coil on EXPLOSION PROOF MODEL, follow steps 1, 2 and 3 under VALVE DISASSEMBLY AND REASSEMBLY (EXPLOSION PROOF MODEL).

To reassemble explosion-proof coil, position ~~washer~~ (6) on top of new coil (7) and assemble top plate (5) until bottomed to retain new coil, or torque top plate (5) to 150 INCH POUNDS MINIMUM. Replace lockwasher (3) and top cap assembly (1) taking care not to damage top cap "O" ring (2).

CAUTION

Incorrect reassembly of the Standard, Open Frame or Explosion-Proof solenoid parts will affect the magnetic circuit and valve function and may result in coil burnout.

NOTE

TO INSURE RELIABILITY AND SAFE PERFORMANCE, EXTRA CARE SHOULD BE TAKEN TO INSTALL AND MAINTAIN EXPLOSION PROOF EQUIPMENT. THE SOLENOID POLISHED SURFACES ARE MADE TO PROVIDE FLAME-PROOF SEAL. THEY MUST BE WIPED CLEAN BEFORE REPLACEMENT.

GREASE ALL JOINTS OF THE EXPLOSION PROOF/ WATERTIGHT SOLENOID WITH EITHER EXXON COMPANY U.S.A. NEBULA EP2 GREASE OR HIGH GRADE SILICONE GREASE SIMILAR TO DOW CORNING'S VALVE SEAL.

DISASSEMBLY AND REASSEMBLY

Turn off flow medium and electrical power supply to valve.

Standard and Open Frame Model

1. Unscrew top nut (1), remove with lockwasher (2), nameplate (3) and, in addition, spring washer (4) for Open Frame solenoid model from plunger tube (5).
2. Lift off solenoid assembly intact with washers (6) (Standard Model) or spring washer (7) (Open Frame Solenoid assembly) from plunger tube (5).
3. Remove coil jacket (8) or coil frame (9) (in the case of Open Frame solenoid model) from coil assembly (10) and washer (11) (used only in standard model).
4. Use GC solenoid wrench No. 63591A to remove plunger tube retaining nut (12) from valve body (13).
5. Carefully hold plunger tube (5) in position when removing plunger tube retaining nut (12) to prevent loss of internal parts. Do not nick, dent or damage plunger tube (5).
6. Lift off plunger tube (5) and remove "O" ring (14) plunger spring (15), plunger assembly (16) and square seal (17).
7. Unscrew valve cap (18) or manual override assembly (19) in the case of valve with manual override construction, and remove valve spring (20), "O" ring (21) and poppet assembly (22).
8. Check "O" rings (14) and (21), plunger and valve springs (15) and (20), square seal (17), and seating surfaces (Ref.) for damage and wear. Replace damaged or worn out parts.
9. Reassemble in reverse order of disassembly paying careful attention to exploded view provided in Fig. 2.

NOTE

1. TORQUE TOP NUT (1) TO 20 TO 25 INCH POUNDS.
2. TORQUE PLUNGER TUBE RETAINING NUT (12), 18 TO 24 INCH POUNDS.
3. TORQUE VALVE CAP (18) OR MANUAL OVERRIDE ASSEMBLY (19) TO 25 INCH POUNDS MINIMUM.

Explosion Proof Model

1. Remove top cap assembly (1), top cap "O" ring (2) and lockwasher (3) from plunger tube and base assembly (4).
2. Use ITTGC spanner wrench assembly No. 106198E to remove top plate (5).
3. Remove washer (6) and coil (7) is now accessible for removal and replacement.
4. Lift off coil jacket (8) and remove "O" ring (9) from plunger tube and base assembly (4).
5. Use 1⅜" hex wrench to remove plunger tube and base assembly (4) from valve body (10). Do not nick, dent or damage plunger tube and base assembly.
6. Carefully hold plunger tube and base assembly in position when removing from valve body (10) to prevent loss of internal parts.
7. Remove plunger spring (11), plunger assembly (12) and square seal (13).

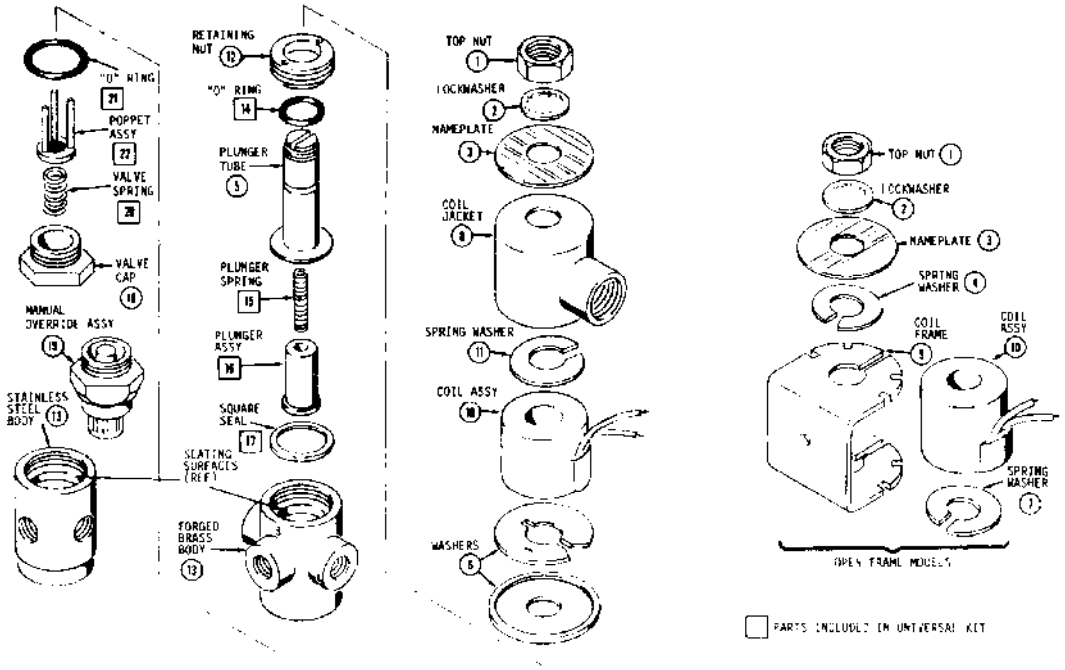


Fig. 2 Exploded View of Typical S333 Standard and Open Frame Models

8. Unscrew valve cap (14) or manual override assembly (15) (in the case of valve with manual override option) from valve body (10), and remove valve spring (16), "O" ring (17) and poppet assembly (18).
9. Check "O" rings (2), (9) and (17), plunger and valve springs (11) and (16), square seal (13) and seating surfaces (Ref.) for damage and wear. Replace damaged or worn out parts.
10. Reassemble in reverse order of disassembly paying careful attention to exploded view provided in Fig. 3.

NOTE

1. TORQUE PLUNGER TUBE AND BASE ASSEMBLY (4), TO 25 INCH POUNDS, MINIMUM.
2. TORQUE TOP PLATE (5) AND TOP CAP (1), TO 150 INCH POUNDS, MINIMUM.

PARTS LIST

This parts list covers replaceable coil part numbers and universal kits for most S333 Series, STANDARD, OPEN FRAME AND EXPLOSION PROOF valves. See tables for details. Before ordering parts or kits, check serial number, e.g., 8142A, on the nameplate. The fifth alpha digit indicates the Model type which in this case is "A".

When ordering parts or kits, specify catalog number of valve, serial number and part name.

COIL CLASS CHART

SEVENTH AND EIGHTH DIGITS OF CATALOG NUMBER	VOLTAGE	AVAILABLE WITH COIL CLASS		
		F	H	M
01	24V-60Hz	X	X	REPLACED BY "F"
02	120V-60Hz			
02	120V-60Hz & 110V-50Hz	X	X	
03	240V-60Hz & 220V-50Hz	X	X	
04	240V-60Hz			
04	240V-60Hz & 220V-50Hz	X	X	
14	6V DC	X	X	
15	12V DC	X	X	
16	24V DC	X	X	
18	120V DC	X	X	
19	240V DC	X	X	
66	12V-60Hz	X	X	

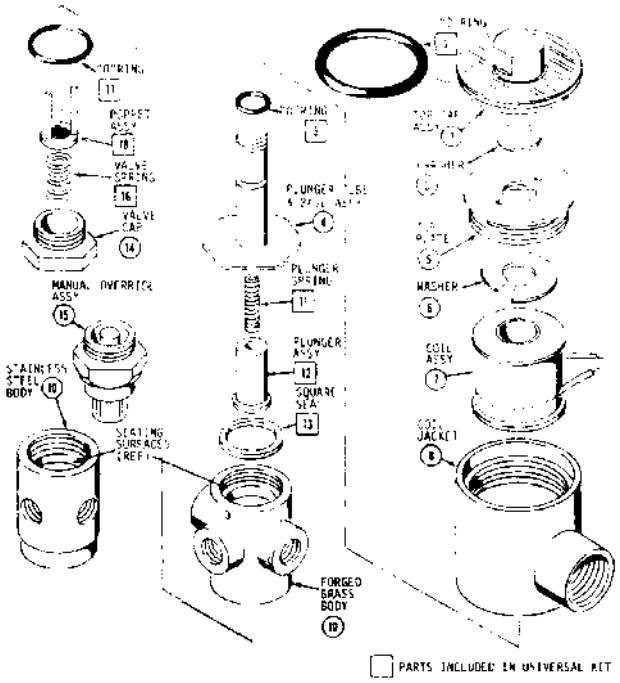


Fig. 3 Exploded View of Typical S333 Explosion Proof Model

UNIVERSAL KIT

The Universal Kit contains a plunger assembly, plunger spring, poppet, lower valve disc, valve spring, plunger tube "O" ring, square seal, top cap "O" ring, valve cap "O" ring, "O" ring. Manual opening device (M.O.D.) "O" ring when used.

Parts shown in boxed numbers are included in the universal kits.

COIL CHART

IDENTIFYING CATALOG DIGITS (1)	COIL CLASS	BODY	WATTS	ELECTRICAL CONNECTION	COIL PART NUMBER (2)
S33_ _F	F	3,7	8	24" Leads	CS3AF_ _A24
S33_ _H	H	3,7			CS3AH_ _A24
S33_ GF	F	3,7			HS3GF_ _A24
S33_ GN	H	3,7			HS3GN_ _A24
S33_ YF	F	3,7		DIN COIL	HS3YF_ _
S33_ _F	F	4,8	10	24" Leads	CS4AF_ _A24
S33_ _H	H	4,8			CS4AH_ _A24
S33_ GF	F	4,8			HS4GF_ _A24
S33_ GN	H	4,8			HS4GN_ _A24
S33_ YF	F	4 8		DIN COIL	HS4YF_ _

(1) Sixth digit of catalog number represents coil class as shown.

(2) Seventh and eighth digits of catalog number represent voltage shown in coil class chart. These digits must be transferred into the coil part number.

TROUBLE SHOOTING

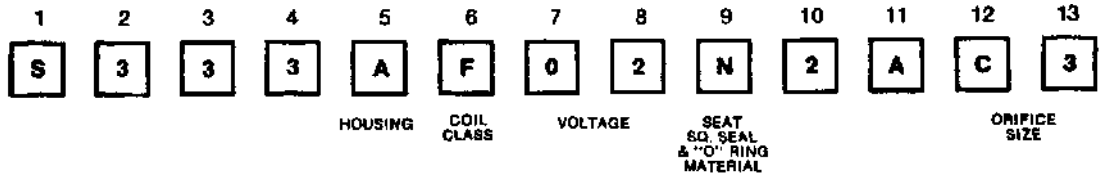
GUIDE TO INSURE PROPER OPERATION

1. Failure of Valve to Open. Check voltage at solenoid lead connections by electrically energizing solenold. A click sound indicates that solenoid is operating. If no click sound is heard, electric current probably is not reaching the solenoid coil. Check for loose leadwire connections, broken leadwire/open circuit, blown fuses, solenoid coil for coil burnout and other devices not energizing circuit . Tighten leadwire connections or replace coil if required. Buzzing or chattering can be caused by low voltage, or dirt between top of plunger and tube head. If low voltage is the problem, increase voltage. Valve will energize at 85% of rated voltage.

   Check condition of synthetic seat insert and seating surface. Check for damaged plunger tube or spring which may prevent plunger operation. Check poppet assembly for damage. Disassemble valve and clean internal parts with suitable cleaning fluid to insure positive shutoff or replace damaged or worn out parts.

2. Failure of Valve to Close. Check for damaged plunger tube or spring which may prevent plunger from operating. Check to see if there is any dirt, pipe sealant or other foreign matter between seat and seating surface restricting flow medium. Disassemble valve and clean internal parts with suitable cleaning fluid. Install strainer having adequate capacity ahead of the valve. Replace damaged or worn out parts.

EXAMPLE CATALOG NUMBER



GC Valves
4525 E. Industrial St., 4C
Simi Valley, CA 93063

S336
3-Way Universal
Direct Acting Solenoid Valve

INSTALLATION AND SERVICE

DESCRIPTION

S336 Series are 3-way direct acting solenoid valves, with all three pipe connections marked 1,2 and 3 located in the forged brass or stainless steel body. Mounting bracket is standard on all stainless steel valve body sizes. Valves are designed for use with flow media such as air, hydraulic oil, water, and No. 2 oil; fluids not corrosive to forged brass or stainless steel or the selected seating material. Spring loaded plunger and poppet with synthetic seating materials such as Buna N or Viton insure positive shutoff.

S336 Series Solenoid valves are available as standard with General Purpose (NEMA Type 1) Enclosure. Weatherproof (NEMA Type 4) or a combination Explosion Proof and Watertight (NEMA 4, 7 and 9) Solenoid Enclosures are available as options, as well as other non-NEMA enclosures.

S336 Series Solenoid valve with optional "M" suffix in the catalog number are equipped with Manual Override. This allows the use of manual operation in the event of electrical power failure or automatic shutdown.

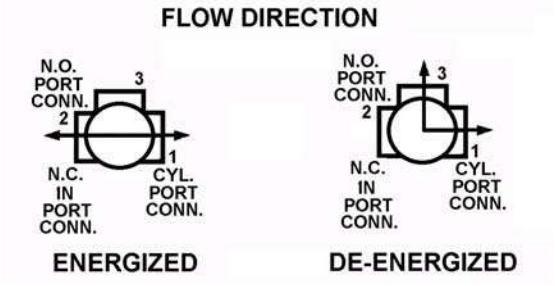
CAUTION

Solenoid cannot be operated electrically when manual override has been activated. Manual override must be returned to inoperative position before solenoid coil is re-energized.

OPERATION

When pressure is applied at port 2 which is normally closed, and solenoid electrically energized, port 2 opens and port 3 closes allowing full flow through port 1.

When solenoid is de-energized, port 2 closes and port 3 opens exhausting fluid from port 1 through port 3. See details of flow direction shown below.



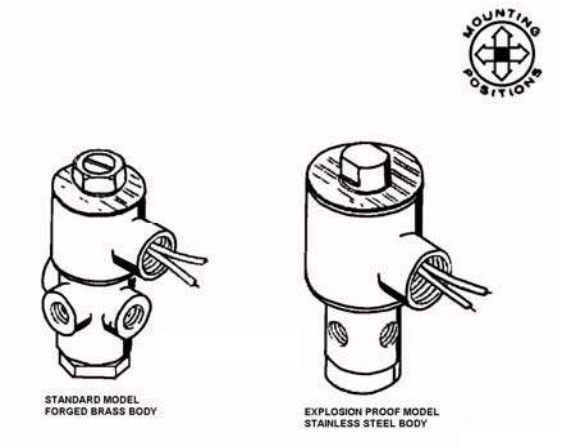


Fig. 1 Typical S336 Valve

SPECIFICATIONS

Use valve within the specified operating ranges as indicated on the nameplate and in the complete Catalog Number. (Min./Max. psi, volts, cycles, published flow data.)

OPERATING TEMPERATURES

FLUID MEDIA	COIL CLASS	TEMPERATURE °F		SEAT MATERIAL
		FLUID	AMBIENT	
AIR,	F	200	150	BUNA
HYDRAULIC	F	200	150	VITON
OIL, WATER	H	185	176	

For other applications, consult the factory.

INSTALLATION

Check valve specifications to ensure proper application.

Mounting Positions

Valves are multipoised and, therefore, may be mounted in any position except that:

Valves with "W" (Rainproof Conduit) in 5th digit position of valve catalog number must be mounted on a horizontal pipe line with solenoid in an upright position.

Piping

All piping must meet applicable local codes and ordinances.

Connect pipe to valve with flow in accordance with the port designation on valve body. Apply thread sealant to male pipe threads only. Applying sealant to valve threads may result in sealant entering and blocking the valve open, or causing other operational problems.

Do not use solenoid valve as a lever when tightening pipe.

NOTE

IF FOREIGN MATERIAL IS A POTENTIAL PROBLEM, INSTALL FINE MESH STRAINER HAVING ADEQUATE CAPACITY AHEAD OF VALVE.

Wiring

Wire in accordance with applicable Local and National Electrical Codes. On hazardous locations using an explosion-proof, watertight solenoid enclosure, approved electrical fittings are required. 1/2" conduit connection is Standard on valve sizes.

Installations in Canada require the use of rigid metal conduit to ground the electrical enclosure of this valve when rated over 30 volts.

By loosening the hex nut on the Standard valve or the top cap on the Explosion Proof valve, the housing can be turned to facilitate wiring.

TIGHTEN HEX NUT TO 25 INCH POUNDS MAX. TORQUE OR TOP CAP TO 150 INCH POUNDS MIN. TORQUE BEFORE OPERATING VALVE.

MAINTENANCE

WARNING

To prevent electrical shock, personal injury or damage to property, turn off electrical power and line pressure supply before maintenance. It is not necessary to remove valve from pipeline for maintenance.

Cleaning

Cleaning fluid must be compatible with all valve components.

It is recommended that S333 Series Valves be cleaned on a routine basis. Valves should be cleaned where flow media or service conditions may determine life of valve. Apply correct voltage. If excessive leakage occurs or if the operation is sluggish, the unit must be cleaned.

PREVENTIVE MAINTENANCE

1. Clear all lines of foreign matter by keeping flow medium free of dirt, dust or lint, and this can be done by using fine mesh strainer having adequate capacity ahead of valve
2. Check valve on a routine basis, preferably monthly or more often to assure that unit opens and closes as required.
3. Check internal parts of valve for damage and wear. Replace damaged or worn out parts.

SERVICE

Coil Replacement

Turn off the electrical power supply to the solenoid before disconnecting the coil lead wires.

Standard and Open Frame Models (See Fig. 2)

To replace coil on STANDARD and OPEN FRAME MODEL, follow Steps 1, 2 and 3 under **VALVE DISASSEMBLY AND REASSEMBLY** (Standard and Open Frame Model). Disassemble solenoid, taking care to note the exact order of replacement and quantity of parts.

Reassemble in reverse order.

NOTE

ONE OF THE WASHERS (7) HAS "X" MARKING ON ONE SIDE. THE SIDE MARKED "X" MUST BE PLACED NEXT TO THE COIL.

Explosion Proof Model (See Fig. 3)

To replace coil on EXPLOSION PROOF MODEL, follow steps 1,2 and 3 under **VALVE DISASSEMBLY AND REASSEMBLY** (EXPLOSION PROOF MODEL).

To reassemble explosion-proof coil, position washer on top of new coil and assemble top plate until bottomed to retain new coil, or torque top plate to 150 INCH POUNDS MINIMUM. Replace lockwasher and top cap assembly taking care not to damage top cap "O" ring.

CAUTION

Incorrect reassembly of the Standard, Open Frame or Explosion-Proof solenoid parts will affect the magnetic circuit and valve function and may result in coil burnout.

NOTE

TO INSURE RELIABILITY AND SAFE PERFORMANCE, EXTRA CARE SHOULD BE TAKEN TO INSTALL AND MAINTAIN EXPLOSION PROOF EQUIPMENT. THE SOLENOID POLISHED SURFACES ARE MADE TO PROVIDE FLAME-PROOF SEAL. THEY MUST BE WIPED CLEAN BEFORE REPLACEMENT.

DISASSEMBLY AND REASSEMBLY
Turn off flow medium and electrical power supply to valve.

Standard and Open Frame Models (See Fig. 2).

1. Unscrew the top nut, remove with lockwasher , and in addition, spring washer for Open Frame solenoid model from plunger tube.
2. Lift off solenoid assembly intact with washers (Standard Model) or “X” washer (Open Frame Solenoid assembly from plunger tube.
3. Remove the coil jacket or coil frame (in the case of Open Frame Solenoid model) from coil assembly and 1. washer (used only in standard model).
4. Use GC solenoid wrench No. 63591A to remove 2. plunger tube retaining nut from valve body.
5. Carefully hold plunger tube in position when removing plunger tube retaining nut to prevent loss of internal parts. Do not nick, dent, or damage plunger tube.
6. Lift off plunger tube and remove "O" ring, plunger spring, plunger assembly and square seal.
7. Unscrew valve cap or manual override assembly in the case of valve with manual override construction, and remove valve spring, "O" ring and poppet assembly.
8. Check "O" rings and, plunger and valve springs, and seating surfaces for damage and wear. Replace damaged or worn out parts.
9. Reassemble in reverse order of disassembly paying careful attention to exploded view provided in Fig. 2.

NOTE
1. TORQUE TOP NUT TO 20 TO 25 INCH POUNDS.
2. TORQUE PLUNGER TUBE RETAINING NUT, 18 TO 24 INCH POUNDS.
3. TORQUE VALVE CAP OR MANUAL OVERRIDE ASSEMBLY TO 25 INCH POUNDS MINIMUM.

Explosion Proof Model (See Fig. 3)

1. Remove top cap assembly, top cap "O" ring and lockwasher from plunger tube and base assembly.
2. Use ITT/GC spanner wrench No. 106198E to remove top plate.
3. Remove washer, and coil is now accessible for removal and replacement.
4. Lift off coil jacket and remove "O" ring, from plunger tube and base assembly.
5. Use 1 3/8" hex wrench to remove plunger tube and base assembly from valve body. Do not nick, dent or damage plunger tube and base assembly.
6. Carefully hold plunger tube and base assembly in position when removing from valve body to prevent loss of internal parts.
7. Remove plunger spring plunger assembly and “O” ring.
8. Unscrew valve cap or manual override assembly (in the case of valve with manual override option) from valve body, and remove valve spring , "O" ring and poppet assembly.
9. Check "O" rings, and, plunger and valve springs and, “O” ring and seating surfaces (Ref.) for damage and wear. Replace damaged or worn out parts.
10. Reassemble in reverse order of disassembly paying careful attention to exploded view provided in Fig. 3.

NOTE
TORQUE PLUNGER TUBE AND BASE ASSEMBLY, TO 25 INCH POUNDS, MINIMUM.
TORQUE TOP PLATE AND TOP CAP TO A MINIMUM OF 150 INCH POUNDS.

PARTS LIST
This parts list covers replaceable coil part numbers and assembly kits for most S333 Series STANDARD, OPEN FRAME AND EXPLOSION PROOF valves. See tables for details. Before ordering parts/kits, check the serial number e.g., 814A, on the nameplate. The fifth alpha digit indicates the model type which in this case is "A".

When ordering parts/kits, specify Catalog Number, Serial Number, and Part Name.

COIL CLASS CHART

IDENTIFYING CATALOG DIGITS	COIL CLASS	BODY	WATTS	ELECTRICAL CONNECTION	COIL PART NO.
S33__F	F	3, 7	8	24" LEADS	CS3AF--A24
S33__H	H	3, 7			CS3AN--A24
S33_GF	F	3, 7			HS3GF--A24
S33_GN	H	3, 7			HS3GN--A24
S33_YF	F	3, 7		DIN COIL	HS3YF--
S33__F	F	4, 8	10	24" LEADS	CS4AF--A24
S33__H	H	4, 8			CS4AN--A24
S33_GF	F	4, 8			HS4GF--A24
S33_GN	H	4, 8			HS4GN--A24
S33_YF	F	4, 8		DIN COIL	HS4YF--

(1) Sixth digit of catalog number represents coil class as shown.
(2) Seventh and eighth digits of catalog number represent voltage shown in coil class chart. These digits must be transferred into the coil part number.

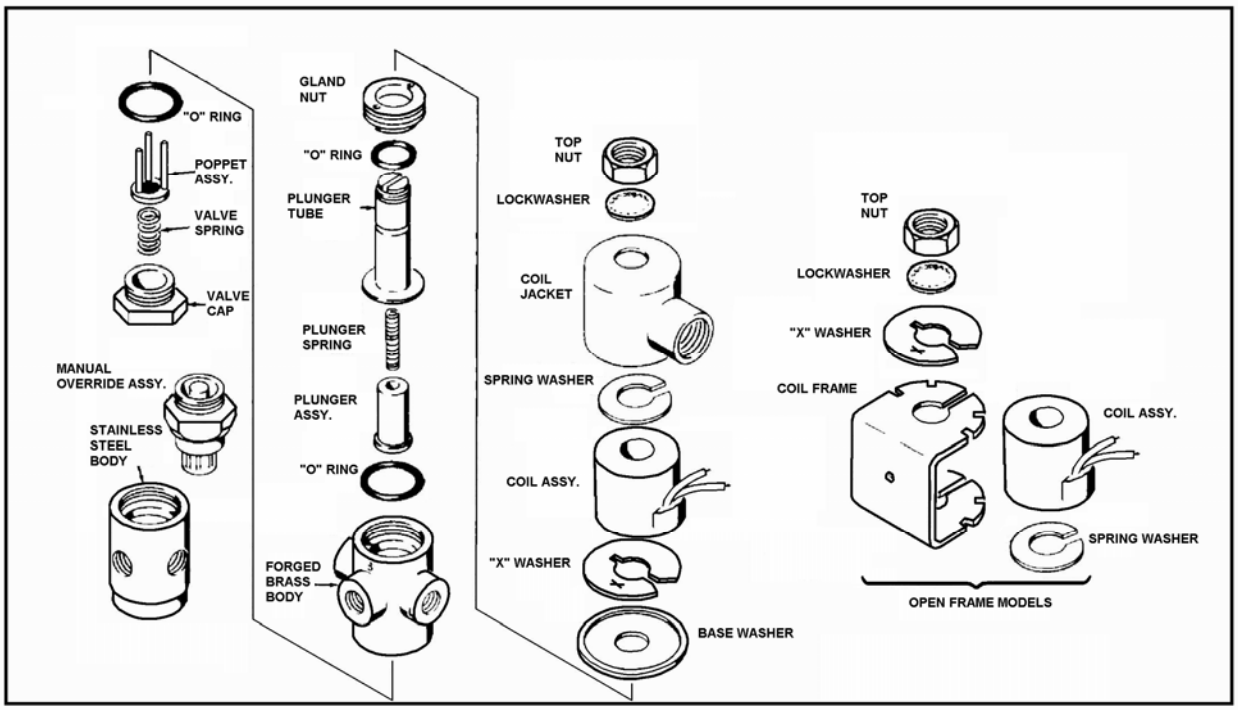


Fig. 2 Exploded View of Typical S33 Standard and Open Frame Models

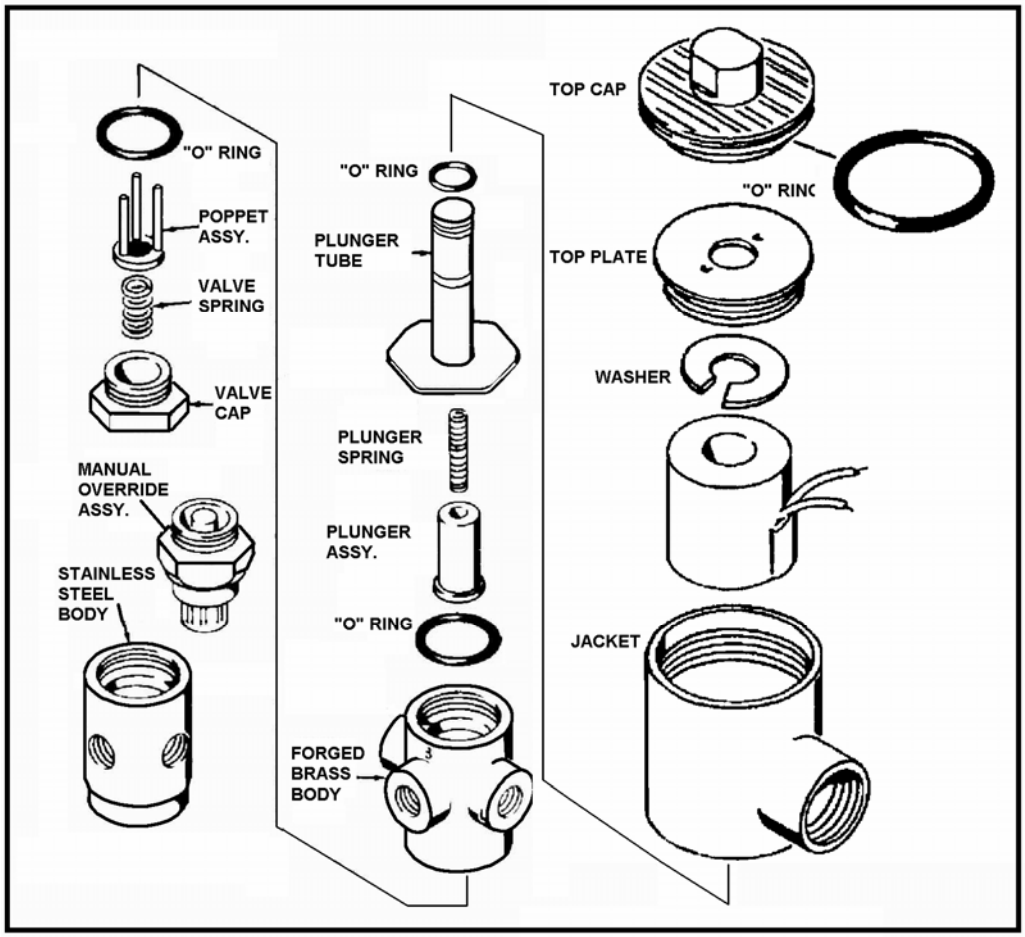


Fig. 3 Exploded View of Typical S33 Explosion Proof Model

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G C
VALVES

S401 SERIES PILOTED PISTON TYPE SOLENOID VALVES — 2-WAY N.C.

INSTALLATION, SERVICE AND PARTS LIST

SDI/SDP S401-1

DESCRIPTION

S401 Series are 2-way piloted piston operated solenoid valves, with Standard brass or Optional stainless steel body construction. Both feature stainless steel seats. Positive shutoff is assured by using spring loaded plunger and synthetic seating materials such as Buna N, Viton, Teflon or Rulon. Valves are designed for use with air, gas, liquids, steam and other flow media not corrosive to brass, stainless steel or the selected seating material. Valves' construction features make them suitable for automatic control of hydraulic lifts, machine tools, car washers, combustion equipment, laundry, dry cleaning and welding equipment.

S401 Series Solenoid valves are available as Standard with General Purpose (NEMA Type 1 Enclosure). Rainproof (NEMA Type 3R) or a combination Explosion Proof and Watertight (NEMA Types 4, 7 and 9) Solenoid Enclosures are available as OPTIONS, as well as other non-NEMA enclosures.

OPERATION

Valves are Normally Closed types, that is they open when electrically energized and close when de-energized.

When solenoid is electrically energized, the plunger rises lifting pilot valve off its seat. Fluid pressure above piston bleeds off through pilot port faster than it can be replaced by flow from around sides of piston, and piston rises due to greater pressure underneath. Simultaneously, the plunger lifts far enough to pick up the piston and hold it in the fully open position, allowing full flow through valve.

When solenoid is electrically de-energized, plunger drops and allows pilot valve to seat. Pressure now equalizes above and below piston and the plunger return spring pushes down plunger and piston, thereby closing valve. Fluid pressure and spring hold valve closed.

SPECIFICATIONS

Use valve within specified operating ranges as indicated on nameplate and in complete catalog number. (Min/Max. psi, volts, cycles, published flow data.)

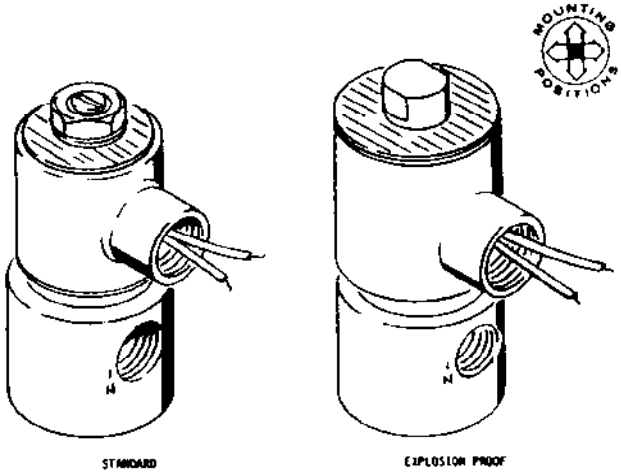

Fig. 1. Typical S401 Valve

OPERATING TEMPERATURES

FLUID MEDIA	COIL CLASS	MAXIMUM TEMP. °F		SEAT MATERIAL
		FLUID	AMBIENT	
GAS	M (105C)	185	77	
LIQUIDS	F (155C)	200	150	BUNA
OIL	M (105C)	185	77	
	F (155C)	230	150	VITON
	H (220C)	185	176	
	M (105C)	185	77	
	F (155C)	230	150	TEFLON
	H (220C)	185	176	RULON
	H (220C)	257	125	
	F (155C)	298	77	TEFLON
STEAM	H (220C)	338	77	RULON
	H (220C)	257	125	

For other applications, consult factory.

INSTALLATION

Check valve specifications to ensure proper application.

MOUNTING POSITIONS

Valves are multipoised and, therefore, may be mounted in any position except that:

Valves with "W" (Rainproof Enclosure) in 5th digit position of valve catalog number must be mounted on a horizontal pipe line with solenoid in an upright position.

PIPING

All piping must meet applicable local codes and ordinances or the National Fuel Gas Code (ANSI Z223.1/NFPA No. 54).

Connect pipe to valve with flow in accordance with the port designation on valve body. Apply thread sealant to male pipe threads only. Applying sealant to valve threads may result in sealant entering and blocking the valve open, or causing other operational problems.

Do not use solenoid valve as a lever when tightening pipe.

NOTE

IF FOREIGN MATERIAL IS A POTENTIAL PROBLEM, INSTALL FINE MESH STRAINER HAVING ADEQUATE CAPACITY AHEAD OF VALVE.

WIRING

Wire in accordance with applicable Local and National Electrical Codes. On hazardous locations using explosion-proof, watertight solenoid enclosure, approved electrical fittings are required. ½" conduit connection is Standard on valve sizes.

Installations in Canada require the use of rigid metal conduit to ground the electrical enclosure of this valve when rated over 30 volts.

By loosening the hex nut on the Standard valve or the top cap on the Explosion Proof valve, the housing can be turned to facilitate wiring.

TIGHTEN HEX NUT or TOP CAP BEFORE OPERATING VALVE.

MAINTENANCE

⚠ WARNING ⚠

To prevent electrical shock, personal injury or damage to property, turn off electrical power and line pressure supply before maintenance. It is not necessary to remove valve from pipeline for maintenance.

CLEANING

Cleaning fluid must be compatible with all valve components.

It is recommended that S401 Series valves be cleaned on a routine basis. Valves should be cleaned where flow media or service conditions may influence life of valve. Apply correct voltage and if excessive leakage or noise occurs or operation is sluggish, valve should be cleaned.

PREVENTIVE MAINTENANCE

1. **Clear all lines of foreign matter by keeping flow medium free of dirt, dust or lint, and this can be done by using fine mesh strainer having adequate capacity ahead of valve.**
2. **Check valve on a routine basis, preferably monthly or more often to assure that unit opens and closes as required.**
3. **Check internal parts of valve for damage and wear. Replace damaged or worn out parts.**

SERVICE

COIL REPLACEMENT

Turn off electrical power supply to solenoid before disconnecting coil lead wires.

Standard and Open Frame Models (See Fig. 2). To replace coil on STANDARD and OPEN FRAME MODELS, follow steps 1, 2 and 3 under VALVE DISASSEMBLY AND REASSEMBLY (Standard and Open Frame Models). Disassemble solenoid, taking care to note the exact order of replacement and quantity of parts. Reassemble in reverse order.

NOTE

ONE OF THE WASHERS (7) HAS "X" MARKING ON ONE SIDE. THE SIDE MARKED "X" MUST BE PLACED NEXT TO COIL.

Explosion Proof Model (See Fig. 3). To replace coil on EXPLOSION PROOF MODEL, follow steps 1, 2 and 3 under VALVE DISASSEMBLY AND REASSEMBLY (EXPLOSION PROOF MODEL).

To reassemble explosion-proof coil, position washer (5) on top of new coil (6) and assemble top plate (4) until bottomed to retain new coil, or torque top plate (4) to 150 INCH POUNDS MINIMUM. Replace lockwasher (2) and top cap assembly (1) taking care not to damage top cap "O" ring (3).

CAUTION

Incorrect reassembly of the Standard, Open Frame or Explosion-Proof solenoid parts will affect the magnetic circuit and valve function and may result in coil burnout.

NOTE

TO INSURE RELIABILITY AND SAFE PERFORMANCE, EXTRA CARE SHOULD BE TAKEN TO INSTALL AND MAINTAIN EXPLOSION PROOF EQUIPMENT. THE SOLENOID POLISHED SURFACES ARE MADE TO PROVIDE FLAME-PROOF SEAL. THEY MUST BE WIPED CLEAN BEFORE REPLACEMENT. GREASE ALL JOINTS OF THE EXPLOSION PROOF/WATERTIGHT SOLENOID WITH EITHER EXXON COMPANY U.S.A. NEBULA EP2 GREASE OR HIGH GRADE SILICONE GREASE SIMILAR TO DOW CORNING'S VALVE SEAL.

DISASSEMBLY AND REASSEMBLY

Turn off flow medium and electrical power supply to valve.

Standard and Open Frame Models (See Fig. 2).

1. Unscrew hex nut (1) and remove with lockwasher (2), nameplate (3) and, in addition, spring washer (4) for Open Frame solenoid model.
2. Lift off coil jacket assembly (5) or coil frame (6) (in the case of Open Frame solenoid model), bottom washers (7) or spring washer (8) (used only on Open Frame model) from plunger tube (9).

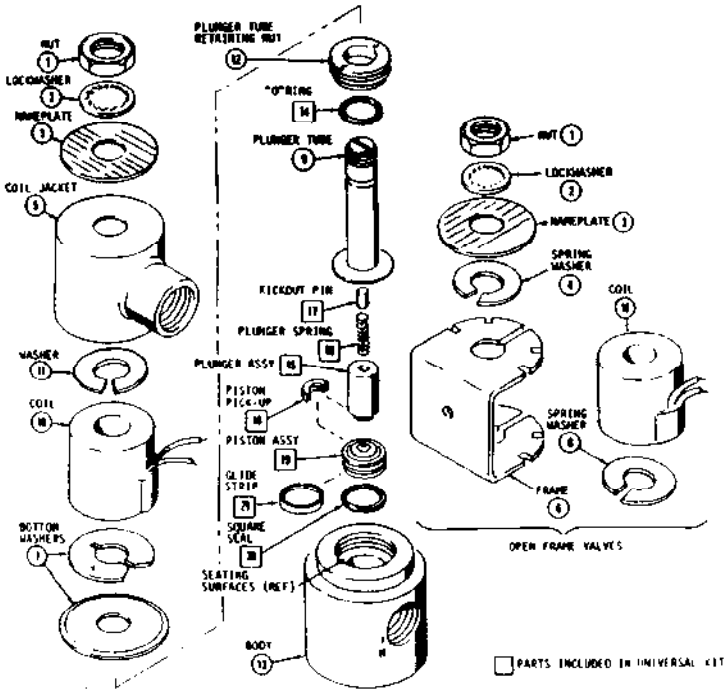

Fig. 2 Exploded View of Typical S401 Standard and Open Frame Models

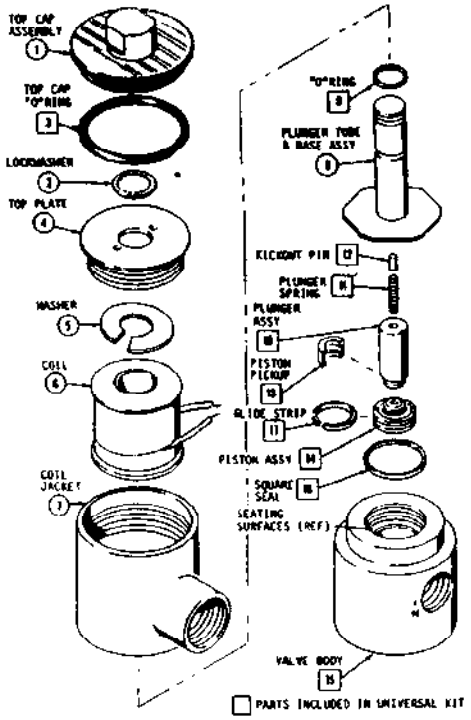

Fig. 3. Exploded View of Typical S401 Explosion Proof Model

3. Remove coil assembly (10) and washer (11). Do not disarrange solenoid assembly.
4. Use ITT/GC solenoid wrench No. 63591A to remove plunger tube retaining nut (12) and plunger tube (9). Do not nick, dent or damage plunger tube (9) or valve seating surfaces.
5. Carefully hold plunger tube (9) in position when removing plunger tube retaining nut (12) from valve body (13) to prevent loss of internal parts.
6. Lift off plunger tube (9) and remove plunger tube retaining nut (12), "O" ring (14).
7. Grasp plunger assembly (15) which includes plunger spring (16) and kickout pin (17). Lift out plunger with the piston pick-up (18). Do not damage seating surfaces.
8. Lift off piston assembly (19) from valve body (13) with fingertips.
9. Check square seal (20), "O" ring (14), plunger (15) seating surface, top and bottom of piston (19) seating surfaces, main port seating surface (Ref.) in valve body (13), and teflon glide strip (21)* for damage or wear.
10. Reassemble in reverse order of disassembly paying careful attention to exploded view provided in Fig. 2.

*Make sure the teflon glide strip (21) is properly contained in the piston groove on reassembly by moving it up and down a small distance inside the valve body before assembling plunger.

NOTE

TIGHTEN PLUNGER TUBE RETAINING NUT (12), TO 25 INCH POUNDS, MINIMUM.

Explosion Proof Model. (See Fig. 3).

1. Remove top cap assembly (1), lockwasher (2) and top cap "O" ring (3).
2. Use ITT/GC spanner wrench assembly No. 106198E to remove top plate (4).
3. Remove washer (5), and coil (6) is now accessible for removal or replacement.
4. Lift off coil jacket (7) and remove "O" ring (8).
5. Use 1⅜ hex wrench to remove plunger tube and base assembly (9). Do not nick, dent or damage plunger tube and base assembly.
6. Carefully grasp plunger assembly (10) which includes plunger spring (11) and kickout pin (12). Lift out plunger with the piston pickup (13). Do not damage seating surfaces.
7. Lift off piston assembly (14) from valve body (15) with fingertips.
8. Check square seal (16), "O" ring (8), plunger (10) seating surface, top and bottom of piston (14) seating surfaces, main port seating surface (Ref.) in valve body (15) and teflon glide strip (17) for damage or wear.
9. Reassemble in reverse order of disassembly paying careful attention to exploded view provided in Fig. 3.

NOTE

1. TORQUE PLUNGER TUBE AND BASE ASSEMBLY (9), TO 25 INCH POUNDS, MINIMUM.
2. TORQUE TOP CAP (1) AND TOP PLATE (4) TO A MINIMUM OF 150 INCH POUNDS.

PARTS LIST

This parts list covers replaceable coil part and interior assembly kit numbers for most S401 Series Model "C", STANDARD/OPEN FRAME AND EXPLOSION PROOF valves. See tables for details.

Before ordering parts or kits, check serial number on the nameplate for all STANDARD/OPEN FRAME valves, and for EXPLOSION PROOF valves, the serial number is stamped on the nameplate or operator (body) housing. The fifth alpha digit of this number, e.g., 8136C will be "C" on all Model "C" valves.

When ordering parts or kits, specify catalog number, serial number and part name. See Figure 2 for exploded view of typical S401 Standard and Open Frame Models; Figure 3 for exploded view of typical S401 Explosion Proof Model

KIT

THE INTERIOR ASSEMBLY KIT contains a top cap "O" ring (used only on Explosion Proof Model), "O" ring, plunger kickout pin, spring, plunger assembly, piston pickup, piston, glide strip, square seal.

Component parts are no longer available for Model "A" Explosion Proof valve. However, operator from Model "C" Explosion Proof valve is interchangeable with Model "A" Explosion Proof operator on the same valve body. If any part of your Model "A" Explosion Proof operator is worn out or damaged, complete Model "C" Explosion Proof operator may be purchased as a replacement.

INTERIOR ASSEMBLY KIT

S401 _ _ _ _ _ _ _ _ 0/2/8/9

NINTH AND TENTH DIGITS OF CATALOG NUMBER	INTERIOR ASSEMBLY KIT VOLTAGE TYPE	
	AC	DC
J2 or N9	S109327A	S109327B
K2 or T9	S109327C	S109327D
L2 or V9	S109327E	S109327F
R2 or R9	S109327G	S109327H
U2 or U9 W2 or W9 Y2 or Y9	S109327J	S109327K
S0 or S8	S109327L	S109327M

For plunger tube assembly replacement, consult factory.

COIL CLASS CHART

SEVENTH AND EIGHTH DIGITS OF CATALOG NUMBER	VOLTAGE	AVAILABLE WITH COIL CLASS				
		F	H	M	A	BW
01	24V-60Hz	X		X	REPLACED BY "M"	REPLACED BY "F"
02	120V-60Hz			X		
02	120V-60Hz & 110V-50Hz	X	X			
03	208V-60Hz	X	X	X		
04	240V-60Hz			X		
04	240V 60Hz & 220V-50Hz	X	X			
08	110V-50Hz			X		
09	220V-50Hz			X		
14	6V DC	X	X			
15	12V DC	X	X			
16	24V DC	X	X			
24	24V-50Hz	X	X	X		
54	240V-50Hz	X	X	X		

COIL CHART

IDENTIFYING CATALOG DIGITS ①	COIL CLASS	WATTS	ELECTRICAL CONNECTION	COIL PART NUMBER ② ③	
S40_ _ _A_ _ _	A*	10	24" LEADS	CS4AA	A24*
S40_ _ _B_ _ _	BW**			CS4AB	A24**
S40_ _ _F_ _ _	F			CS4AF	A24
S40_ _ _H_ _ _	H			CS4AH	A24
S40_ _ _M_ _ _	M			CS4AM	A24

① Sixth digit of catalog number represents coil class as shown

② Seventh and eighth digits of catalog number represent voltage shown in coil class chart. These digits must be transferred into the coil part number

③ Recommended spare part

NOTE

* Type "A" coil is replaced by Type "M" (molded) coil

CS4AA _ _ _ _ A24 USE CS4AM _ _ _ _ A24

For coil part number

** Type "BW" coil is replaced by Type "F" coil

CS4AB _ _ _ _ A24 USE CS4AF _ _ _ _ A24

For coil part number

TROUBLE SHOOTING

GUIDE TO INSURE PROPER OPERATION

TROUBLE	POSSIBLE CAUSE	REMEDY
Valve fails to open.	Clocks, limit controls or other devices not energizing circuit.	Check circuit for limit control operation, blown fuses, short circuits and loose wiring.
	Damaged plunger tube preventing plunger operation.	Replace plunger tube.
	Solenoid coil shorted, burned out or wrong voltage.	Replace with General Controls solenoid coil of correct voltage.
	Dirt, pipe compound or other foreign matter restricting operation of piston or pilot valve.	Disassemble and clean internal parts with suitable cleaning fluid. Install strainer ahead of the valve.
Valve fails to close.	Damaged plunger tube preventing plunger operation.	Replace plunger tube.
	Dirt, pipe compound or other foreign matter restricting operation of piston or pilot valve.	Disassemble and clean internal parts with suitable cleaning fluid. Install strainer ahead of the valve.
	Limit controls in grounded side of circuit.	Wire controls in hot side of circuit.

EXAMPLE CATALOG NUMBER

1	2	3	4	5	6	7	8	9	10	11	12	13
S	4	0	1	A	F	0	2	V	9	C	F	7
					COIL CLASS	VOLTAGE			SEAT SEAL SQ. SEAL & "O" RING MATERIAL			

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G C VALVES

S401 SERIES PILOTED PISTON TYPE SOLENOID VALVES — 2-WAY N.C.

INSTALLATION, SERVICE AND PARTS LIST

SDI/SDP S401-1

Order this form by SDI S401-2

DESCRIPTION

S401 Series normally closed solenoid valve features a piloted operated piston for positive on/off control of high flow of air, gas and liquids. Brass body, stainless steel interior and synthetic seating resist corrosion. Quiet closing action eliminates water hammer.

CS4 solenoid coil is rated at 10 watts, available in several voltages. Buna N, Viton seating materials and ½" conduit connection are standard. Explosion proof solenoid assembly is optional.

OPERATION

Energizing the solenoid lifts the plunger. This opens the pilot port through which flow media above the piston bleeds off, causing the greater pressure below the piston to force the piston up, holding the valve open.

When the solenoid is de-energized the plunger falls, closing the pilot port. Flow media pressure above and below the piston equalizes and the valve spring returns the piston to the closed position.

SPECIFICATIONS

OPERATING PRESSURE (PSI) MINIMUM	MAXIMUM	FLOW MEDIA	COIL CLASS	TEMPERATURE (°F) AMBIENT	FLUID	SEAT AND SEALS
5	100	AIR, GAS	M	77	185	BUNA N
			F	150	200	
5	150	WATER, OIL	M	77	185	
			F	150	200	
5	100	AIR	M	77	185	VITON
			F	150	230	
			H	176	185	
5	150	WATER, OIL	M	77	185	
			F	150	230	
			H	176	185	
5	150	GASOLINE	M	77	77	
			F	150	77	

MINIMUM FLOW REQUIREMENTS

NPT (INCH)	MIN. FLOW WATER	MIN. FLOW AIR
½	7.5 GPM	27 CFM
¾	16 GPM	50 CFM
1	26 GPM	90 CFM
1¼	42 GPM	140 CFM

INSTALLATION

Check valve specifications for proper application.

Fig. 1. Typical S401 Valve

CAUTION

This solenoid valve should be installed only by a qualified service person.

1. Check nameplate for correct voltage and operating pressure. Minimum pressure is 5 psi.
2. Mount valve in horizontal pipeline with solenoid above valve body. Flow must be in direction of arrows on valve body.
3. Clear all lines of dirt and foreign matter.
4. Use wrench on body flats at end of valve. Do not use solenoid for handling or turning valve on pipe.
5. Apply pipe thread seal sparingly to male threads only.
6. Recommend installation of strainer ahead of valve.
7. Provide clearance for removal of solenoid assembly.
8. Wire in accordance with applicable national and local electrical wiring codes.

SERVICE AND REPAIR

WARNING

Disassembly, reassembly or internal adjustment without factory test may result in hazardous condition. If control does not operate properly after following the INSTALLATION, SERVICE AND REPAIR instructions, service and repair of this solenoid valve should be performed by a qualified service person.

S401 Series valves will operate for years without trouble. However, foreign matter between seating surfaces can cause leakage. Excessive temperatures can cause coil burnout.

To clean the valve seat and seat disc, remove the complete solenoid assembly. Do not disarrange or disassemble the solenoid.

NOTE

Take care at all times. Do not nick, dent or damage plunger tube or seating surfaces.

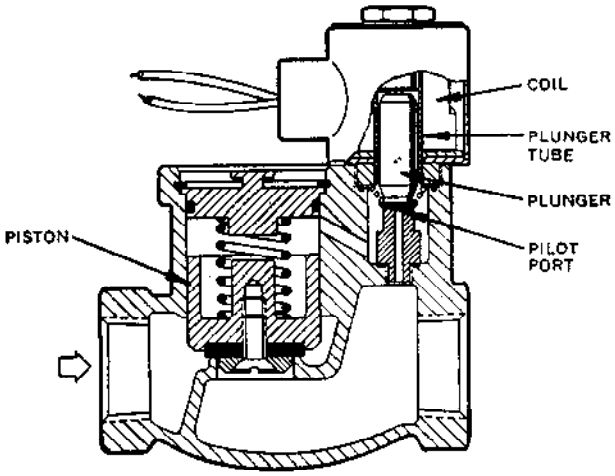

Fig. 2. Cross-section of Typical S401

COIL REPLACEMENT

Turn off electric power to solenoid and disconnect leads. It is not necessary to remove valve from pipeline. Disassemble only far enough to remove the coil. Do not nick, dent or damage plunger tube. Note exact order of placement and quantity of parts and replace in proper sequence. Incorrect assembly can cause coil burnout.

DISASSEMBLY

Valve may be disassembled without removal from pipeline. See Fig. 2 for disassembly.

SERVICE SUGGESTIONS

TROUBLE	POSSIBLE CAUSE	REMEDY
Valve fails to open.	Clocks, limit controls or other devices holding circuit open.	Check circuit for limit control operation, blown fuses, short circuits and loose wiring.
	Damaged plunger tube preventing plunger operation.	Replace plunger tube.
	Solenoid coil shorted, burned out or wrong voltage.	Replace with General Controls solenoid coil of correct voltage.
	Dirt, pipe compound or other foreign matter restricting operation of piston or pilot valve.	Disassemble and clean internal parts. Install strainer ahead of the valve.
Valve fails to close.	Damaged plunger tube preventing plunger operation.	Replace plunger tube.
	Dirt, pipe compound or other foreign matter restricting operation of piston or pilot valve.	Disassemble and clean internal parts. Install strainer ahead of the valve.
	Limit controls in grounded side of circuit.	Wire controls in hot side of circuit.

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G C
VALVES

S402 SERIES PILOTED PISTON TYPE SOLENOID VALVE — 2-WAY N.O.

INSTALLATION, SERVICE AND PARTS LIST

SDI/SDP S402-1

DESCRIPTION

S402 Series are 2-way piloted piston operated solenoid valves, with Standard brass or Optional stainless steel body construction. Both feature stainless steel seats. Positive shutoff is assured by using spring loaded plunger and synthetic seating materials such as Buna N, Viton, Teflon or Rulon. Valves are designed for use with air, gas, liquids, steam and other flow media not corrosive to brass, stainless steel or the selected seating material. Valves' construction features make them suitable for automatic control of hydraulic lifts, machine tools, car washers, combustion, laundry, dry cleaning and welding equipment.

S402 Series solenoid valves are available as Standard with General Purpose (NEMA Type 1 Enclosure). Rainproof (NEMA Type 3R) or a combination Explosion Proof and Watertight (NEMA Types 4, 7 and 9) solenoid enclosures are available as OPTIONS, as well as other non-NEMA enclosures.

OPERATION

Valves are Normally Open (N.O.) types, that is they close when electrically energized and open when de-energized.

When solenoid is electrically energized, the plunger pushes down pilot valve onto its seat, and closes off the orifice. Fluid pressure above piston builds up until it equalizes with pressure underneath. The plunger then pushes down the piston, through the push rod, thus closing the valve.

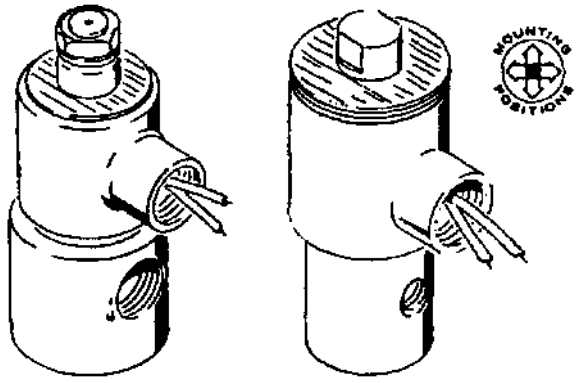
When solenoid is electrically de-energized, push rod kickoff spring lifts the push rod off the piston orifice. As the piston orifice is opened, pressure above piston bleeds off, and the piston return spring is now able to push up the piston and open the valve.

SPECIFICATIONS

OPERATING TEMPERATURES

FLUID MEDIA	COIL CLASS	MAXIMUM TEMPERATURE °F		SEAT MATERIAL
		FLUID	AMBIENT	
GAS	M (105C)	185	77	BUNA
LIQUIDS	F (155C)	200	150	
OIL	M (105C)	185	77	
	F (155C)	230	150	VITON
	H (220C)	185	176	
	M (105C)	185	77	
	F (155C)	230	150	TEFLON
	H (220C)	185	176	RULON
	H (220C)	257	125	
	F (155C)	298	77	TEFLON
STEAM	H (220C)	338	77	RULON
	H (220C)	257	125	

For other applications, consult factory.



Standard Model — Explosion Proof Model

Fig. 1. Typical S402 Valve

Use valve within specified operating ranges as indicated on nameplate and in complete catalog number. (Min/Max. psi, volts, cycles, published flow data.)

INSTALLATION

⚠ WARNING ⚠

This valve is normally open (N.O.) to flow when not powered. Do not use in place of normally closed (N.C.) valve.

Check valve specifications to ensure proper application.

MOUNTING POSITIONS

Valves are multipoised and, therefore, may be mounted in any position except that:

Valves with "W" (Rainproof Enclosure) in 5th digit position of valve catalog number must be mounted on a horizontal pipe line with solenoid in an upright position.

PIPING

All piping must meet applicable local codes and ordinances or the National Fuel Gas Code (ANSI 223:1/NFPA No. 54).

Connect pipe to valve with flow in accordance with the port designation on valve body. Apply thread sealant to male pipe threads only. Applying sealant to valve threads may result in sealant entering and blocking the valve open, or cause other operational problems.

Do not use solenoid valve as a lever when tightening pipe.

NOTE

IF FOREIGN MATERIAL IS A POTENTIAL PROBLEM, INSTALL FINE MESH STRAINER HAVING ADEQUATE CAPACITY AHEAD OF VALVE.

WIRING

Wire in accordance with applicable Local and National Electrical Codes. On hazardous locations using explosion-proof, watertight solenoid enclosure, approved electrical fittings are required. ½" conduit connection is Standard on all valve sizes.

Installations in Canada require the use of rigid metal conduit to ground the electrical enclosure of this valve when rated over 30 volts.

By loosening the hex nut on the Standard valve or the top cap on the Explosion Proof valve, the housing can be turned to facilitate wiring.

TIGHTEN HEX NUT or TOP CAP BEFORE OPERATING VALVE.

MAINTENANCE

⚠ WARNING ⚠

To prevent electrical shock, personal injury or damage to property, turn off electrical power and line pressure supply before maintenance. It is not necessary to remove valve from pipeline for maintenance.

CLEANING

Cleaning fluid must be compatible with all valve components.

It is recommended that S402 Series valves be cleaned on a routine basis. Valves should be cleaned where flow media or service conditions may influence life of valve. Apply correct voltage and if excessive leakage or noise occurs or operation is sluggish, valve should be cleaned.

PREVENTIVE MAINTENANCE

1. Clear all lines of foreign matter by keeping flow medium free of dirt, dust or lint, and this can be done by using fine mesh strainer having adequate capacity ahead of valve.
2. Check valve on a routine basis, preferably monthly or more often to assure that unit opens and closes as required.
3. Check internal parts of valve for damage and wear. Replace damaged or worn out parts.

SERVICE

COIL REPLACEMENT

Turn off electrical power supply to solenoid before disconnecting coil lead wires.

Standard Model (See Fig. 2). To replace coil on STANDARD MODEL, follow steps 1, 2 and 3 under VALVE DISASSEMBLY AND REASSEMBLY (Standard Model). Disassemble solenoid, taking care to note the exact order of replacement and quantity of parts.

Reassemble in reverse order.

NOTE

ONE OF THE WASHERS (9) HAS "X" MARKING ON ONE SIDE. THE SIDE MARKED "X" MUST BE PLACED NEXT TO COIL.

Explosion Proof Model (See Fig. 3). To replace coil on EXPLOSION PROOF MODEL, follow steps 1, 2 and 3 under VALVE DISASSEMBLY AND REASSEMBLY (EXPLOSION PROOF MODEL).

To reassemble explosion-proof coil, position washer (5) on top of new coil (6) and assemble top plate (4) until bottomed to retain new coil, or torque top plate (4) to 150 INCH POUNDS MINIMUM. Replace lockwasher (2) and top cap assembly (1) taking care not to damage top cap "O" ring (3).

CAUTION

Incorrect reassembly of the Standard or Explosion-Proof solenoid parts will affect the magnetic circuit and valve function and may result in coil burnout.

NOTE

TO INSURE RELIABILITY AND SAFE PERFORMANCE, EXTRA CARE SHOULD BE TAKEN TO INSTALL AND MAINTAIN EXPLOSION PROOF EQUIPMENT. THE SOLENOID POLISHED SURFACES ARE MADE TO PROVIDE FLAME-PROOF SEAL. THEY MUST BE WIPED CLEAN BEFORE REPLACEMENT. GREASE ALL JOINTS OF THE EXPLOSION PROOF/WATERTIGHT SOLENOID WITH EITHER EXXON COMPANY U.S.A. NEBULA EP2 GREASE OR HIGH GRADE SILICONE GREASE SIMILAR TO DOW CORNING'S VALVE SEAL.

DISASSEMBLY AND REASSEMBLY

Turn off flow medium and electrical power supply to valve.

Standard Model.

1. Unscrew hex nut (1), remove with lockwasher (2), spacer (3) and nameplate (4) from plunger tube and base assembly (5).
2. Lift off solenoid assembly intact with bottom washer (6) from plunger tube and base assembly (5).
3. Remove coil jacket (7) from coil assembly (8) and washers (9). Do not disarrange solenoid assembly.
4. Use ITT/GC solenoid wrench No. 63591A to remove plunger tube and base assembly (5) from valve body (10). Take care not to nick, dent or damage plunger tube and base assembly.
5. Carefully lift out plunger tube and base assembly and grasp hold of push rod and seat disc assembly.
6. Using ring pliers, remove retaining ring (11). Lift out push rod and seat disc assembly (12).
7. Remove push rod spring (13) and lift out piston assembly (14) and remove the teflon strip (15)* wrapped around piston assembly.
8. Remove piston retaining spring (16), and square seal (17).
9. Check springs (13) and (16), square seal (17), piston and push rod assemblies seating surfaces, main port seating surface (Ref.) in valve body (6) and teflon strip (15) for damage or wear.
10. Reassemble in reverse order of disassembly. Apply a thin film of lubricant to square seal before reassembly. Pay careful attention to exploded view provided in Fig. 2.

*Make sure the teflon strip is assembled properly to allow free movement of piston up or down on piston retaining spring.

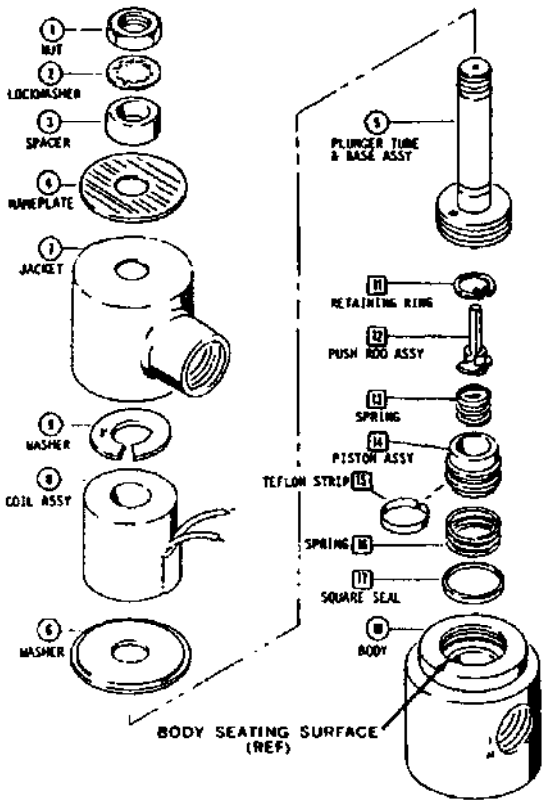


Fig. 2. Exploded View of Typical S402 Standard Model

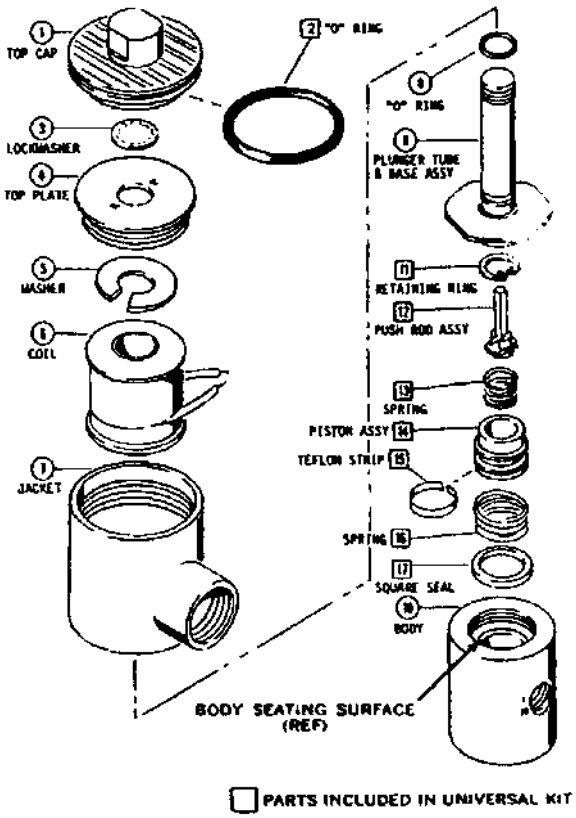


Fig. 3. Exploded View of Typical S402 Explosion Proof Model

NOTE

TIGHTEN PLUNGER TUBE BASE NUT (5), TO 25 INCH POUNDS MINIMUM.

Explosion Proof Model.

1. Remove top cap assembly (1), top cap "O" ring (2) and lockwasher (3).
2. Use ITT/GC spanner wrench assembly No. 106198E to remove top plate (4).
3. Remove washer (5) and coil (6) is now accessible for removal and replacement.
4. Lift off coil jacket (7), remove "O" ring (8), and use 1⅜" hex wrench to remove plunger tube and base assembly (9) from valve body (10). Do not nick, dent or damage plunger tube and base assembly.
5. Carefully lift out plunger tube and base assembly and grasp hold of push rod and seat assembly.
6. Using ring pliers, remove retaining ring (11). Lift out push rod and seat ring assembly (12).
7. Remove push rod spring (13) and lift out piston assembly (14). Remove the teflon strip (15)* wrapped around piston assembly.
8. Remove piston retaining spring (16) and square seal (17).
9. Check seating surfaces of piston and push rod assemblies, main port seating surface (Ref.) in valve body (10), and all other parts for damage or wear.
10. Reassemble in reverse order of disassembly. Apply a thin film of lubricant to square seal before reassembly. See exploded view provided in Fig. 3.

NOTE

1. TORQUE PLUNGER TUBE AND BASE ASSEMBLY (8), TO 25 INCH POUNDS, MINIMUM.
2. TORQUE TOP CAP (1) AND TOP PLATE (4) TO A MINIMUM OF 150 INCH POUNDS.

PARTS LIST

This parts list covers replaceable coil and interior assembly kit numbers for most S402 Series Model "C", STANDARD AND EXPLOSION PROOF Valves. See tables for details.

Before ordering parts or kits, check serial number on the nameplate for all STANDARD valves, and for EXPLOSION PROOF valves, the serial number is stamped on the nameplate or operator (body) housing. The fifth alpha digit of this number, e.g., 8140C will be "C" on all Model "C" valves.

When ordering parts or kits, specify catalog number, serial number and part name. See Figure 2 for exploded view of typical S402 Standard Model; Figure 3 for exploded view of typical S402 Explosion Proof Model.

KIT

THE INTERIOR ASSEMBLY KIT contains a top cap "O" ring (used only on Explosion Proof Model), push rod spring, piston spring, glide strip, retaining ring, piston, push rod assembly, square seal.

Component parts are no longer available for Model "A" Explosion Proof valve. However, operator from Model "C" Explosion Proof valve is interchangeable with Model "A" Explosion Proof operator on the same valve

body. If any part of your Model "A" Explosion Proof operator is worn out or damaged, complete Model "C" Explosion Proof operator may be purchased as a replacement.

COIL CLASS CHART

SEVENTH AND EIGHTH DIGITS OF CATALOG NUMBER	VOLTAGE	AVAILABLE WITH COIL CLASS				
		F	H	M	A	BW
01	24V-60Hz	X		REPLACED BY "F"	REPLACED BY "F"	REPLACED BY "F"
02	120V-60Hz					
02	120V-60Hz & 110V-50Hz	X	X			
03	208V-60Hz	X	X			
04	240V-60Hz					
04	240V-60Hz & 220V-50Hz	X	X			
08	110V-50Hz					
09	220V-50Hz					
14	6V DC	X	X			
15	12V DC	X	X			
16	24V DC	X	X			
24	24V-50Hz	X	X			
54	240V-50Hz	X	X			

TROUBLE SHOOTING

GUIDE TO INSURE PROPER OPERATION

TROUBLE	POSSIBLE CAUSE	REMEDY
Valve fails to close.	Clocks, limit controls or other devices not energizing circuit.	Check circuit for limit control operation, blown fuses, short circuits and loose wiring.
	Damaged plunger tube preventing plunger operation.	Replace plunger tube.
	Solenoid coil shorted, burned out or wrong voltage.	Replace with General Controls solenoid coil of correct voltage.
	Dirt, pipe compound or other foreign matter restricting operation of piston or pilot valve.	Disassemble and clean internal parts with suitable cleaning fluid. Install strainer ahead of the valve.
Valve fails to open.	Damaged plunger tube preventing plunger operation.	Replace plunger tube.
	Dirt, pipe compound or other foreign matter restricting operation of piston or pilot valve.	Disassemble and clean internal parts with suitable cleaning fluid. Install strainer ahead of the valve.
	Limit controls in grounded side of circuit.	Wire controls in hot side of circuit.

COIL CHART

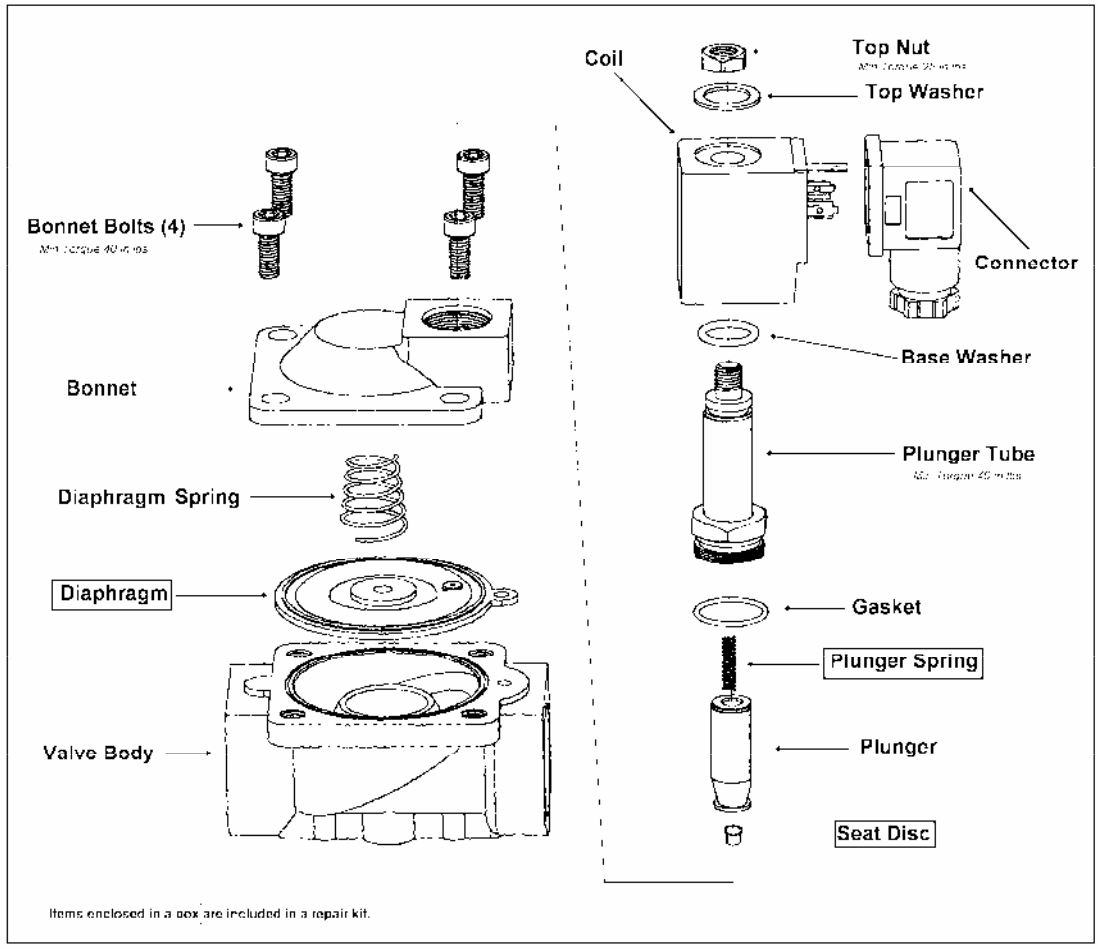
IDENTIFYING CATALOG DIGITS①	COIL CLASS	WATTS	ELECTRICAL CONNECTION	COIL PART NUMBER②③
S40 __ Y F	F	10	DIN COIL	HS4YF__ __
S40 __ G F	F		24" LEADS	HS4GF__ __ A24④
S40 __ __ F	F			CS4AF__ __ A24
S40 __ __ H	H			CS4AH__ __ A24
S40 __ G H	H			HS4GN__ __ A24

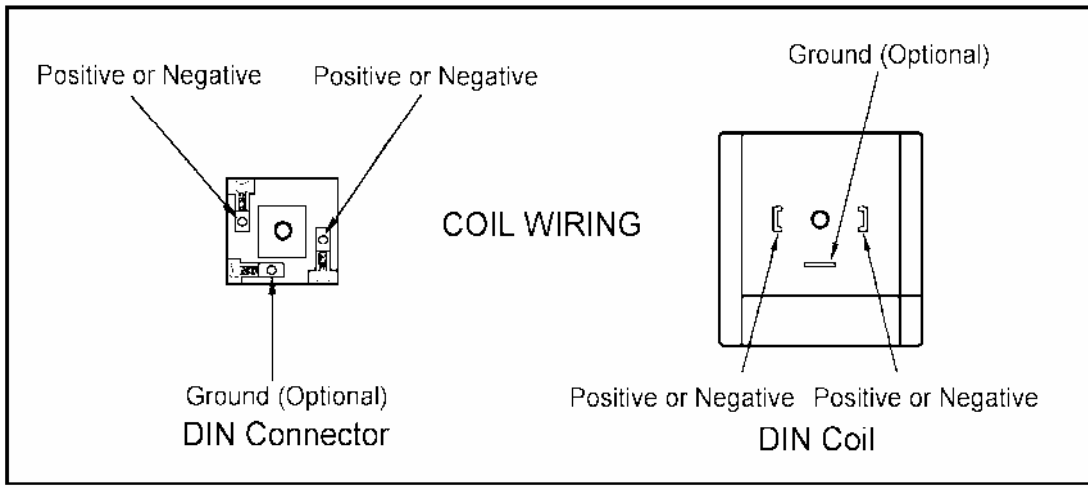
① Sixth digit of catalog number represents coil class as shown.
② Seventh and eighth digits of catalog number represent voltage shown in coil class chart. These digits must be transferred into the coil part number.
③ Recommended spare part.

EXAMPLE CATALOG NUMBER

1	2	3	4	5	6	7	8	9	10	11	12	13
S	4	0	2	A	H	0	2	S	0	B	E	7
					COIL CLASS		VOLTAGE		SEAT SEAL SQ. SEAL & "O" RING MATERIAL			

Installation, Parts List and Troubleshooting Guide





Installation:

1. Clear all lines of foreign matter.
2. Xtreme valves can be mounted in any position. However, installation with the coil in an upright position is preferred.
3. Thread sealant or Teflon tape should be used sparingly and applied only to the threads of the male fitting.

Caution: When installing the valve do not use the solenoid coil / housing as a handle!

4. Insure that the pressure source is installed into the valve body port marked "IN".
5. Wire the solenoid valve's coil in accordance with one of the above drawings.

Troubleshooting Guide:

Valve won't open:

- Insure adequate power is supplied to the coil's leads when energized.
- Insure that the applied pressure does not exceed the pressure rating of the valve.
- Insure that the valve's internal parts and passageways are clear of any foreign matter.

Valve won't close or leaks:

- Insure power has been removed from the coil (valve is de-energized).
- Insure that the pressure source is installed into the valve body port marked "IN".
- Insure that the valve's internal parts and passageways are clear of any foreign matter.

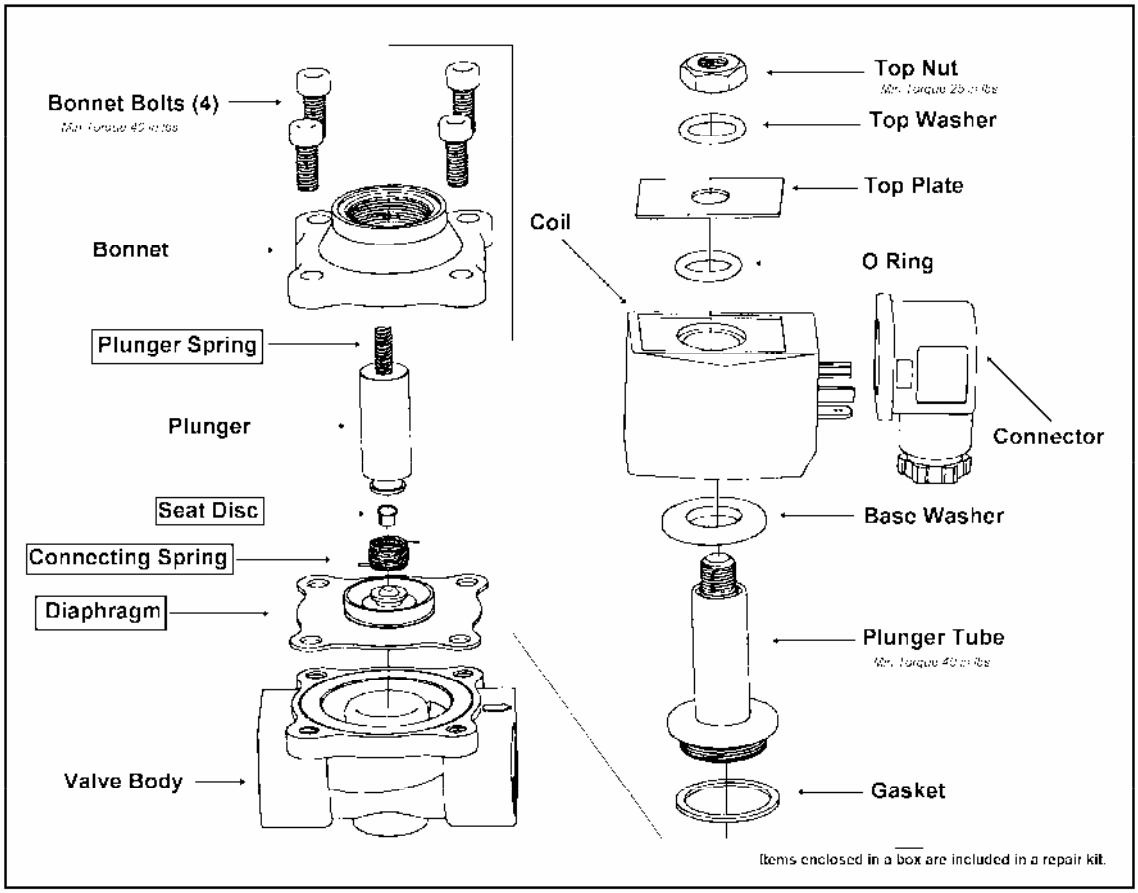
If problem persists contact GC Valves Customer Service at (800) 828-0484.

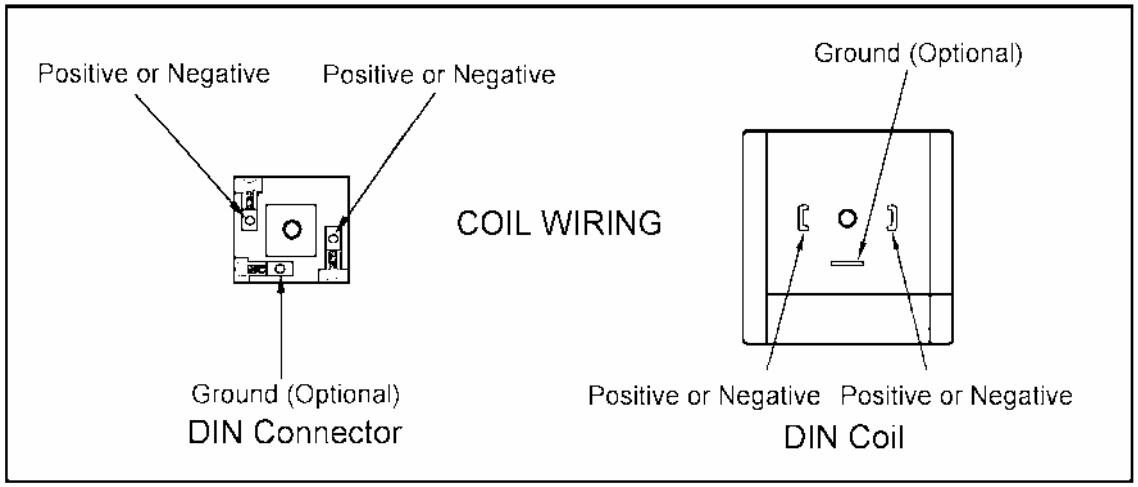
456 Crompton St.
Charlotte, NC 28273
(704) 588-3300

G C
VALVES

4525 E. Industrial St., 4C
Simi Valley, CA 93063
(805) 582-0065

Installation, Parts List and Troubleshooting Guide





Installation:

1. Clear all lines of foreign matter.
2. Xtreme valves can be mounted in any position. However, installation with the coil in an upright position is preferred.
3. Thread sealant or Teflon tape should be used sparingly and applied only to the threads of the male fitting.

Caution: When installing the valve do not use the solenoid coil / housing as a handle!

4. Insure that the pressure source is installed into the valve body port marked "IN".
5. Wire the solenoid valve's coil in accordance with one of the above drawings.

Troubleshooting Guide:

Valve won't open:

- Insure adequate power is supplied to the coil's leads when energized.
- Insure that the applied pressure does not exceed the pressure rating of the valve.
- Insure that the valve's internal parts and passageways are clear of any foreign matter.

Valve won't close or leaks:

- Insure power has been removed from the coil (valve is de-energized).
- Insure that the pressure source is installed into the valve body port marked "IN".
- Insure that the valve's internal parts and passageways are clear of any foreign matter.

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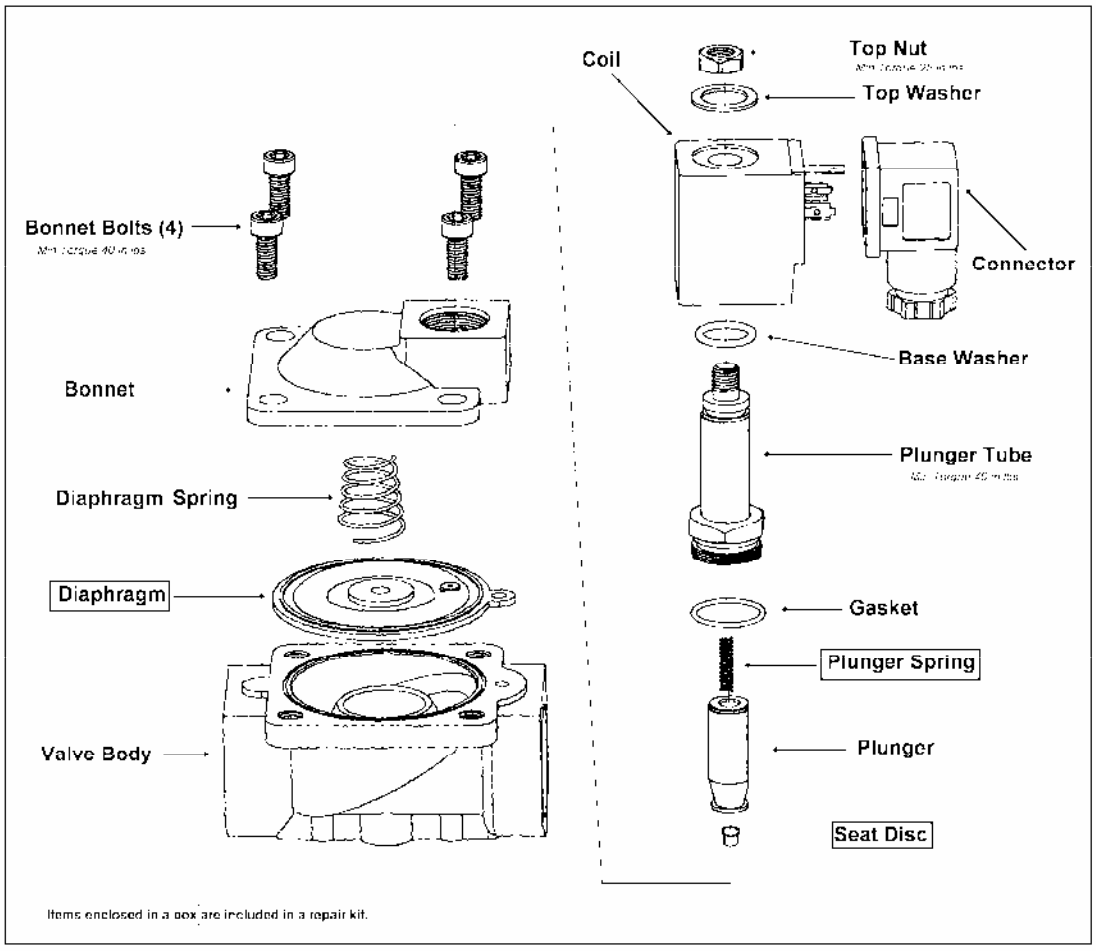
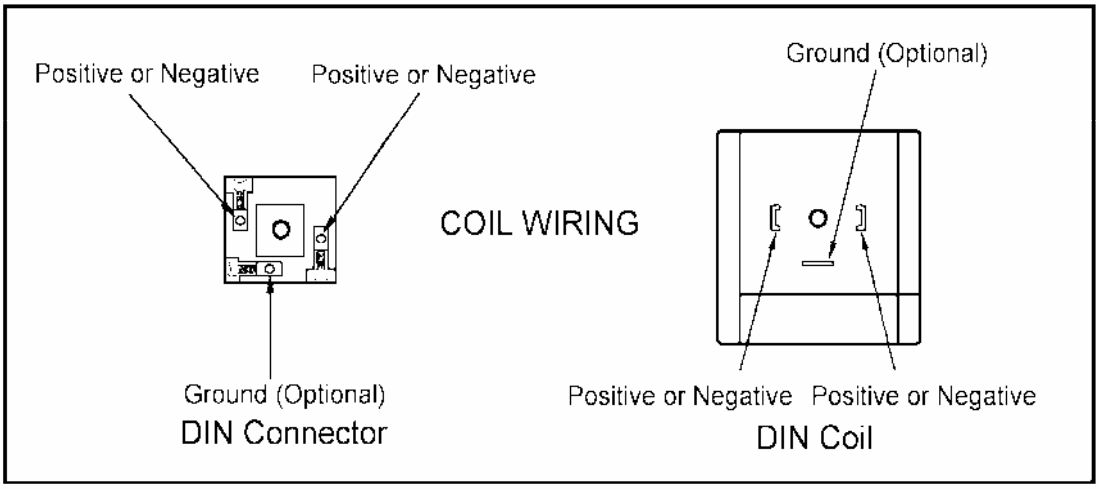
(805) 582-0065

350 XTREME VALVES

Installation, Parts List and Troubleshooting Guide





Installation:

1. Clear all lines of foreign matter.
2. Xtreme valves can be mounted in any position. However, installation with the coil in an upright position is preferred.
3. Thread sealant or Teflon tape should be used sparingly and applied only to the threads of the male fitting.

Caution: When installing the valve do not use the solenoid coil / housing as a handle!

4. Insure that the pressure source is installed into the valve body port marked "IN".
5. Wire the solenoid valve's coil in accordance with one of the above drawings.

Troubleshooting Guide:

Valve won't open:

- Insure adequate power is supplied to the coil's leads when energized.
- Insure that the applied pressure does not exceed the pressure rating of the valve.
- Insure that the valve's internal parts and passageways are clear of any foreign matter.

Valve won't close or leaks:

- Insure power has been removed from the coil (valve is de-energized).
- Insure that the pressure source is installed into the valve body port marked "IN".
- Insure that the valve's internal parts and passageways are clear of any foreign matter.

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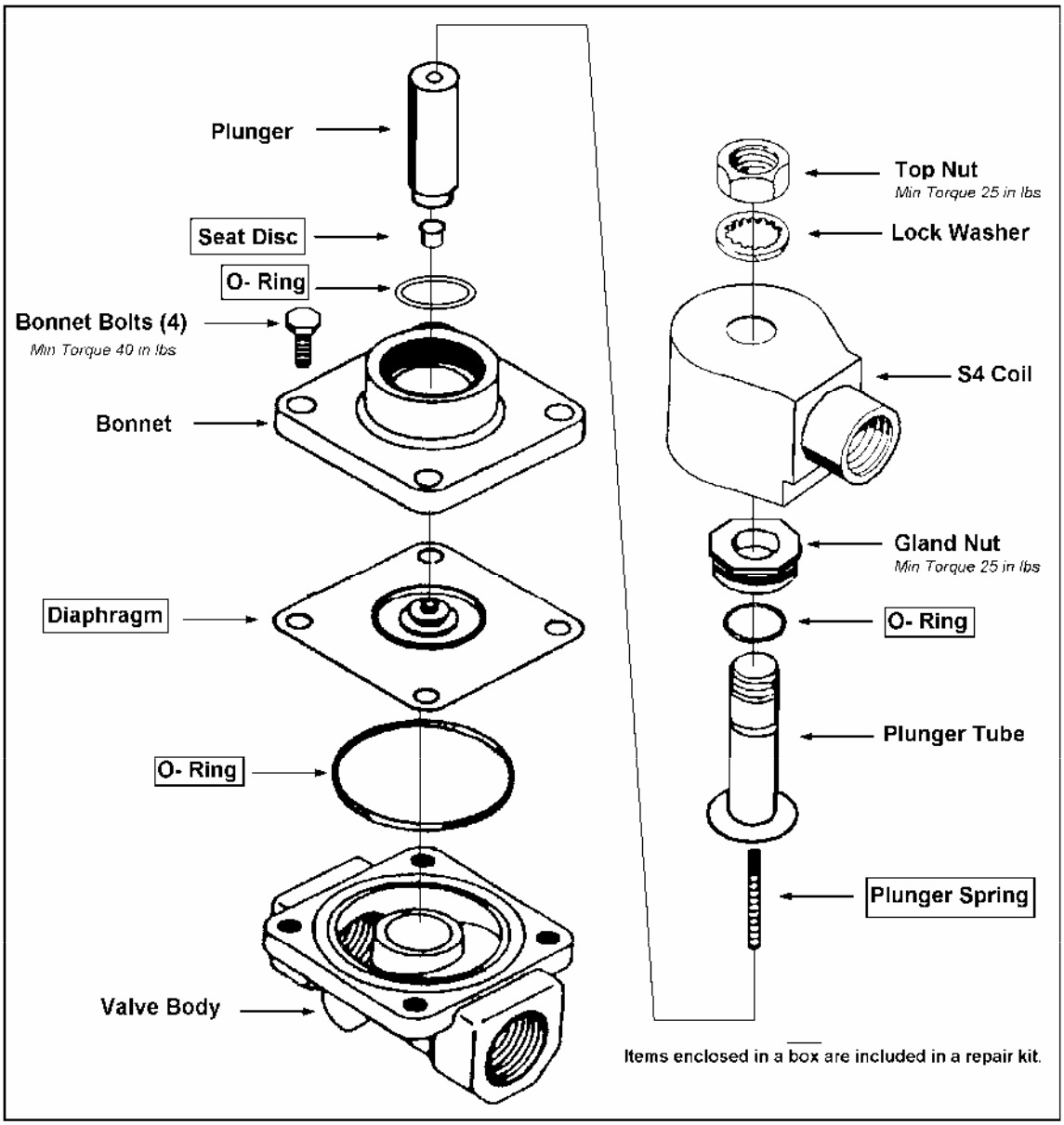

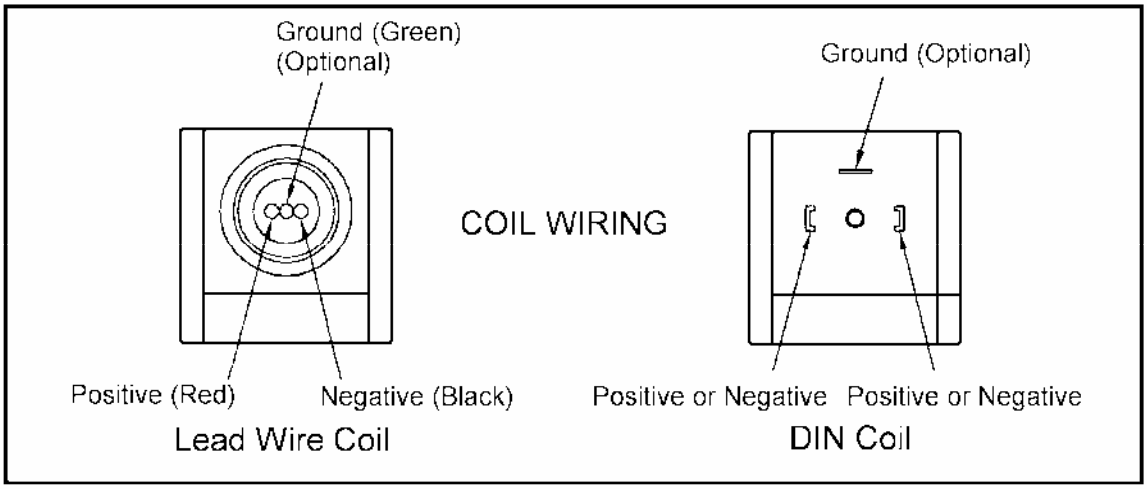

Installation:

1. Clear all lines of foreign matter.
2. Xtreme valves can be mounted in any position. However, installation with the coil in an upright position is preferred.
3. Thread sealant or Teflon tape should be used sparingly and applied only to the threads of the male fitting.

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GC VALVES
4525 E. INDUSTRIAL ST
UNIT 4C
SIMI VALLEY, CA 93063
(805) 582-0065

G C VALVES

"X" EXPLOSION PROOF
OPERATOR ASSEMBLY

INSTALLATION AND SERVICE DESCRIPTION

Installation

1. Unscrew Top Cap assembly (1) one full turn.
2. Rotate Coil Jacket (6) to properly align the conduit hub.
3. Re-tighten Top Cap (1) after completing the conduit connection.

Removal and Reassembly

1. Remove Top Cap assembly (1), and Top Cap "O" Ring (2).
2. Use GC Valves spanner wrench assembly no. 106198E to remove Top Plate (3).
3. Remove Washer (4) and Coil assembly (5) is now accessible for removal and/or replacement.
4. Lift off coil Jacket (6), remove "O" Ring (7) and use 1 3/8" hex wrench to remove plunger tube and base assembly (8) from valve body. Do not nick, dent, or damage plunger tube and base assembly.
5. Carefully remove valve interior assemblies.
6. Check seating surfaces, main port seating surface in valve body and all other parts for damage or wear.
7. Reassemble in reverse order of disassembly. Apply a thin film of lubricant to body square seal/ "O" Ring before reassembly

Note

1. Torque Plunger Tube and Base Assembly (7) to 25 inch pounds, minimum.
2. Torque Top Cap (1) and Top Plate (3) to a minimum of 150 inch pounds.