

Installation & Maintenance Instructions

3-WAY, 2-POSITION DIRECT-ACTING SOLENOID VALVES
 NORMALLY CLOSED, NORMALLY OPEN OR UNIVERSAL OPERATION
 1/4" NPT, RC 1/4", G 1/4" - 9.5MM ORIFICE - STAINLESS STEEL CONSTRUCTION

SERIES
 327C

⚠ WARNING To reduce the risk of death, serious injury, or property damage:

- Personnel installing, maintaining, or operating this equipment must be qualified and follow these instructions. See also separate solenoid installation & maintenance instructions. Keep this document.
- Before installing or maintaining the valve, turn off electrical power, depressurize valve, extinguish all open flames and avoid any type of sparking or ignition. Vent hazardous or combustible fluid to a safe area.

DESCRIPTION

Series 327C valves are 3-way, 2-position (3/2) solenoid valves designed for general service. Valves are made of stainless steel. Series 327C valves are provided with an explosionproof/watertight solenoid.

North American Hazardous Location Approvals (UL, ULC-Division) (If marked on nameplate)

- Explosionproof Class I, Division 1, Groups B, C, D, T* T_{amb} *
- Explosionproof Class II, Division 1, Groups E, F, G, T* T_{amb} *
- Enclosure meets Type 4X – Watertight, Types 6 and 6P Submersible

Canadian Zone Approvals (If marked on nameplate)

- Class I, Zone 1, Group IIB+H2
- Class II, Zone 21, Group IIIC

European Approvals (ATEX, IECEx) (If marked on nameplate)

- Ingress Protection IP66, 68
- II2 G Ex db IIC Gb, T* T_{amb} *
- II2 D Ex tb IIIC Db, T* T_{amb} *

*See T code table

IECEx	ATEX
IEC 60079-0:2017	EN IEC 60079-0:2018 / AC: 2020
IEC 60079-1:2014	EN 60079-1:2014
IEC 60079-31:2013	EN 60079-31:2014

Area Classification: ATEX, IECEx, Canadian Zone

IMPORTANT: Ex db and tb solenoids can be installed in hazardous areas zone 1 and zone 2.

Zone 0: Explosive gas-air mixture continuously present or present for longer periods.

Zone 1: Explosive gas-air mixture likely to occur in normal operation.

Zone 2: Explosive gas-air mixture not likely to occur and if it occurs, it will exist only for a short time.

OPERATION

⚠ CAUTION To reduce the risk of ignition of hazardous atmospheres, disconnect the equipment from the supply circuit before opening. Keep assembly tightly closed when in operation.

Normally Closed: Applies pressure when solenoid is energized.

Solenoid De-energized: Flow is from Port 2 to Port 1. Port 3 is closed.

Solenoid Energized: Flow is from Port 3 to Port 2. Port 1 is closed.

Normally Open: Applies pressure when solenoid is de-energized.

Solenoid De-energized: Flow is from Port 1 to Port 2. Port 3 is closed.

Solenoid Energized: Flow is from Port 2 to Port 3. Port 1 is closed.

Universal

For normally closed, normally open, selection or diversion flow. Pressure can be applied at any port.

OPERATION OF MANUAL OPERATORS (OPTIONAL)


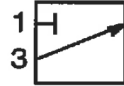
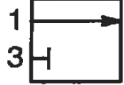
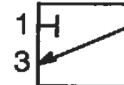
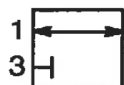
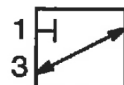
Manual Operator – Push Type

This is a momentary manual operator. When the button is fully depressed, the manual operator will lift the lower seat seal off the seat. This action will enable media to flow from port 3 to port 2 and close media flow from port 2 to port 1, without electrically energizing the valve. When the button is released, the core spring will automatically return the valve to its de-energized position.

Manual Operator – Screw Type

This is a manually sustained operator. The button must be pushed and then turned clockwise to operate. This action will lift the lower seat seal off the seat. Enabling media to flow from port 3 to port 2 and close media flow from port 2 to port 1, without electrically energizing the valve. When the button is released, the valve will stay in position. To disengage the operator, turn the button anti-clockwise until the operator disengages, and the core spring is able to fully return the valve to its de-energized position.

Flow Diagrams

OPERATION	DE-ENERGIZED	ENERGIZED
NORMALLY CLOSED PRESSURE AT 3		
NORMALLY OPEN PRESSURE AT 1		
UNIVERSAL PRESSURE AT ANY PORT		

INSTALLATION

Check nameplate for correct catalog number, pressure, voltage, frequency, and service. Never apply incompatible fluids or exceed pressure rating of the valve. Installation and valve maintenance to be performed by qualified personnel. Never apply incompatible fluids or exceed pressure rating of the valve. Contact ASCO or your supplier for more information about this valve or other valve options if this valve is not suitable for your application.

NOTE: Process-wetted single seal materials per UL122701 are chemically compatible with the process mediums: air/inert gas, water, and "light oil"/hydraulic oil.

Future Service Considerations

Provision should be made for performing seat leakage, external leakage, and operational tests on the valve with a nonhazardous, noncombustible fluid after disassembly and reassembly.

Temperature Limitations

For maximum valve ambient and fluid temperatures, refer to chart below. Check nameplate for maximum pressure rating.

Temperature Ranges			
		Standard 7th Cat No.: 0 or J	Low Temperature 7th Cat No. 1 or L
ATEX, IECEx	Ambient & Fluid	-20°C (-4°F) TO +90°C (194°F)	-60°C (-76°F) TO +60°C (140°F)
UL, ULc	Ambient & Fluid	-20°C (-4°F) TO +84°C (183°F)*	-60°C (-76°F) TO +60°C (140°F)

*1.9W version only. All other wattages, 80°C (176°F).

IMPORTANT: When relying on single seal certification for UL 122701: Requirements for Process Sealing Between Electrical Systems and Flammable or Combustible Process Fluids, the ambient/fluid temperature is limited to -54°C (-65°F) for Low Temperature versions.

*T Codes for Surface & Cable Temperature for Standard Temperature Valve									
Service	Watts	Insulation Class	UL/ULc, Division, Canadian Zone			ATEX/IECEx			
			Temperature (°C)			Temperature (°C)			
			Surface Temperature		Ambient/Fluid	Surface Temperature		Ambient/Fluid	Cable
			Dust	Gas		Dust	Gas		
≤24vDC	1.9	H	T85°C	T6	75	T85°C	T6	75	80
	1.9	H	T100°C	T5	84				
	1.9	H				T100°C	T5	90	95
All Other Voltages	≤3.6	H	T85°C	T6	70	T85°C	T6	70	80
	≤3.6	H	T100°C	T5	80	T100°C	T5	80	90
	≤3.6	H				T135°C	T4	90	100

*T Codes for Surface & Cable Temperature for Low Temperature Valve									
Service	Watts	Insulation Class	UL/ULc, Division, Canadian Zone			ATEX/IECEx			
			Temperature (°C)			Temperature (°C)			
			Surface Temperature		Ambient/Fluid	Surface Temperature		Ambient/Fluid	Cable
			Dust	Gas		Dust	Gas		
≤ 24vDC	1.9	H	T85°C	T6	60	T85°C	T6	60	65
All Other Voltages	≤3.6	H	T85°C	T6	60	T85°C	T6	60	70

Positioning

This valve is designed to perform properly when mounted in any position. However, for optimum life and performance, the solenoid should be mounted vertically and upright to reduce the possibility of foreign matter accumulating in the solenoid base sub-assembly area.

Mounting

For mounting dimensions, refer to Figure 1.

Piping

Connect piping to valve according to markings on valve body. Apply pipe compound sparingly to male pipe threads only. If applied to valve threads, the compound may enter the valve and cause operational difficulty. Avoid pipe strain and valve damage by properly supporting and aligning piping. When tightening the pipe, do not use valve or solenoid as a lever. Locate wrenches applied to valve body or piping as close as possible to connection point. To avoid damage to the valve body, DO NOT OVERTIGHTEN PIPE CONNECTIONS. If PTFE tape, paste, spray, or similar lubricant is used, use extra care when tightening due to reduced friction.

Temporary Connector

The Temporary Connector, if equipped, is an optional part designed to reduce the time to test multiple valves. The connector has a standard C6 female connection (IEC 60320-3 standard) and is prewired to the coil so there is no need to remove the enclosure cover to test valve function. The valve can be tested by connecting a male C5 connector to the Temporary Connector. Then, apply the required voltage listed on the Nameplate to actuate the valve for test.

⚠ WARNING To prevent the possibility of death, serious injury or property damage, the optional Temporary Connector, if applicable (see Figure 1), must be removed before final installation. The Temporary Connector is for testing purposes only and not intended for final use.

NOTICE These solenoid valves are intended for use on clean dry air or inert gas as well as, water or light oil (<65Cst). The media should be filtered to 50 micrometer or better. The dew point of the media should be at least 10°C (18°F) below the minimum temperature to which the media could be exposed, to prevent freezing. If lubricated air is used, the lubricant must be compatible with the used elastomers. Instrument air in compliance with ANSI/ISA Standard S7.3 (1975) exceeds the above requirements and is therefore, an acceptable media for these valves. The exhaust port can also be optionally protected either by means of a filter or with the help of a pipe connection to a central filter system.

MAINTENANCE

⚠ WARNING To prevent the possibility of death, serious injury, or property damage, turn off electrical power, depressurize valve, and vent fluid to a safe area. Delay opening enclosure for 35 minutes before servicing the valve. Solenoid components may be hotter than enclosure surface.

Cleaning

All solenoid valves should be cleaned periodically. The time between cleaning will vary depending on the medium and service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive noise or leakage will indicate that cleaning is required. In the extreme case, faulty valve operation will occur and the valve may fail to shift. Clean strainer or filter when cleaning the valve.

Preventive Maintenance

- Keep the media flowing through the valve as free from dirt and foreign material as possible.
- While in service, the valve should be operated at least once a month to insure proper shifting.
- Depending on the media and service conditions, periodic inspection of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. If parts are worn or damaged, install a complete ASCO Rebuild Kit.

Causes of Improper Operation

- **Incorrect Pressure:** Check valve pressure. Pressure to valve must be within range specified on nameplate.
- **Excessive Leakage:** Disassemble valve and clean all parts. If parts are worn or damaged, install a complete ASCO Rebuild Kit.
- **Incorrect Voltage:** Check supply voltage. Voltage must be at least 85% of rated voltage.
- **Burned-Out Solenoid:** Check for open-circuited solenoid. Replace if necessary. Check supply voltage. It must be the same as specified on nameplate.

⚠ WARNING When disassembling or re-assembling the valve, the utmost care should be taken to avoid any damage to the enclosure-body connection bore, body-enclosure mounting shaft, enclosure cover threads or SBSA threads. These joints constitute the critical flame paths of the flameproof solenoid. The flameproof joints are not intended to be repaired. Do not paint these surfaces.

Valve Disassembly

1. Turn off power.
2. See "Solenoid Disassembly" section.
3. Remove solenoid base sub-assembly (36mm extra deep socket required with at least 72mm bolt clearance).
4. Remove Enclosure Housing.
5. Remove Core sub-assembly.
6. All Parts are now accessible for cleaning or replacement. If parts are worn or damaged, install a complete ASCO Rebuild Kit.

Valve Reassembly

1. Lubricate all gaskets with MOLYKOTE® 55.
2. Install Core sub-assembly.
3. Install Solenoid base gasket.
4. Install Core Spring.
5. Install Enclosure Housing.
6. Screw in Solenoid base sub-assembly, see Torque chart (36mm extra deep socket required).
7. See "Solenoid Reassembly" section.

Solenoid Disassembly

1. Turn off power.
2. Remove Enclosure Cover.

3. Disconnect wires to solenoid.
4. Disassemble solenoid using exploded view in Figure 1 for identification and placement of parts.
5. Remove Terminal Block, Retaining Ring and Retaining Plate.
6. Remove Solenoid / Coil Assembly.

Solenoid Reassembly

1. Slide Solenoid assembly over Solenoid base sub-assembly.
2. Install Retaining Plate.
3. Install Retaining Ring.
4. Install Terminal Block.
5. Connect field wiring to Terminal Block.
6. Install Enclosure Cover.

WIRING

⚠ WARNING To reduce the risk of electrocution, fire, or property damage, wiring must comply with local codes and the National Electrical Codes (as applicable).

Solenoids are provided standard with either a 1/2" NPT conduit hub or M20 x 1.5 cable gland connection. The coil is not polarity sensitive. To facilitate wiring, the solenoid may be rotated 360°. To rotate solenoid, loosen bottom housing set screw. To lock rotation, tighten bottom housing set screw. An internal ground connection is provided on the retaining plate and an external ground connection is provided on the exterior of the housing below the conduit opening.

Internal ground connector accepts 18 -22AWG or equivalent wire size and must be crimped. Terminal Block may be removed from assembly to facilitate wiring.

⚠ CAUTION When installing Terminal Block, supply wires must face center of valve assembly, not enclosure wall. See detailed view in Figure 1 for correct positioning of Terminal Block.

⚠ WARNING For North American wiring applications: must use supply wires suitable for at least 90°C.

⚠ WARNING The solenoid must be grounded with grounding wire or rigid metallic conduit - do not rely on pipe as ground.

⚠ WARNING To reduce the risk of ignition of hazardous atmospheres, conduit runs must have a sealing fitting connected within 18 inches of the enclosure.

SPECIAL CONDITIONS FOR SAFE USE

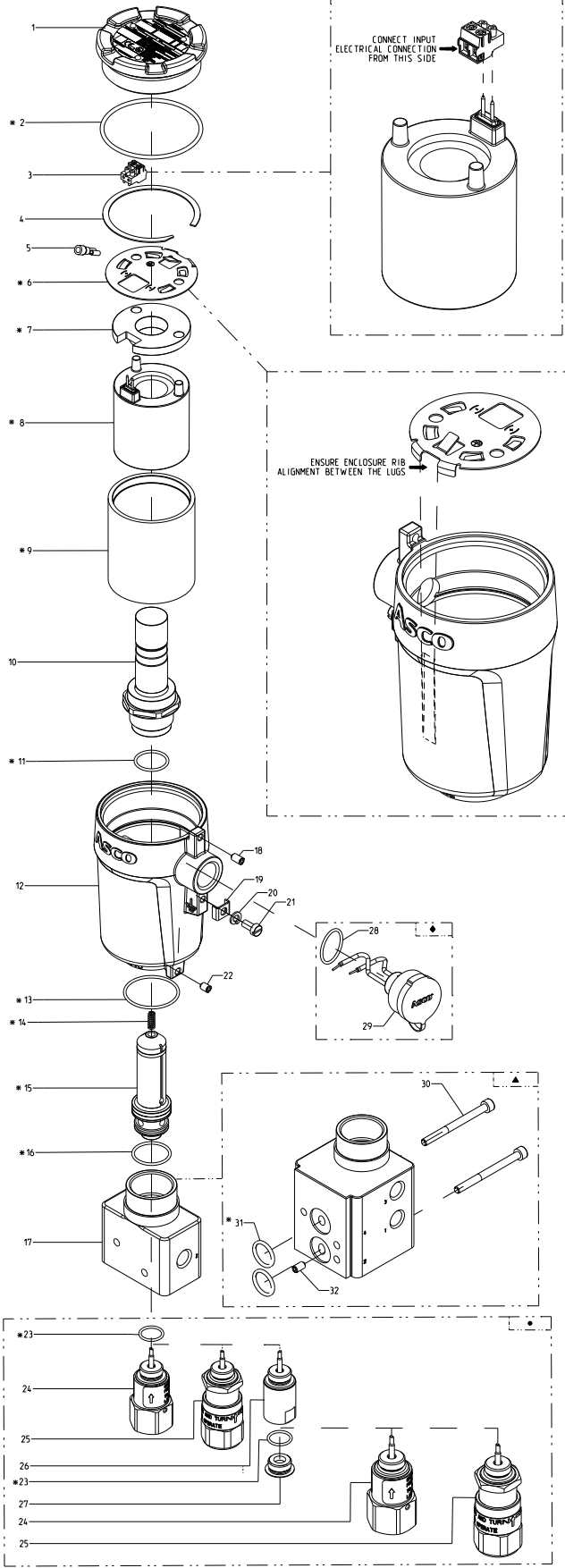
- For Painted Aluminum Models: The device is a potential electrostatic charging hazard. Clean with a damp cloth before servicing to avoid electrostatic discharge.
- Do not repair flameproof joints.

ORDERING INFORMATION FOR ASCO REBUILD KITS

Parts marked with an asterisk (*) in the exploded view are supplied in Rebuild Kits. When Ordering Rebuild Kits for ASCO valves, order the Rebuild Kit number stamped on the valve nameplate. If the number of the kit is not visible, order by indicating the number of kits required, and the Catalog Number and Serial Number of the valve(s) for which they are intended.

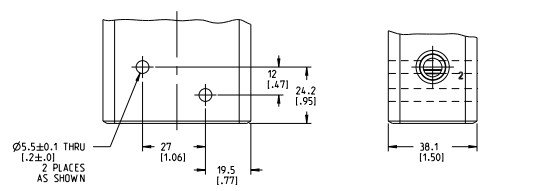
Torque Chart

Part Name	Torque Value Inch-Pounds	Torque Value Newton-Meters
Solenoid Base Sub-Assembly	260 ± 25	30 ± 3
Core / Insert Sub-Assembly	20 ± 5	2.25 ± 0.5

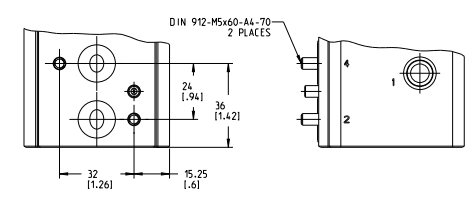


GB	DESCRIPTION
1.	Cover
2.	O-Ring
3.	Terminal, Block
4.	Ring, Retaining
5.	Terminal, Quick Disconnect
6.	Retainer, Plate
7.	Washer, Flux
8.	Coil Assy, M20
9.	Yoke Assembly
10.	Solenoid Base Sub-Assembly
11.	O-Ring
12.	Enclosure
13.	O-Ring
14.	Spring, Compression
15.	Core / Insert Sub-Assembly
16.	O-Ring
17.	Valve Body
18.	Screw, Set-Hex, Socket
19.	Saddle, Clamping
20.	Washer, Lock
21.	Screw, Slotted (Cheese Head)
22.	Screw, Set-Hex, Socket
23.	O-Ring
24.	Manual operator, MO push type
25.	Manual operator, MS screw type
26.	Manual operator, adapter type
27.	Plug
28.	O-Ring
29.	Temporary Connector
30.	Screw, DIN 912-M5x60-A4-70 (2X)
31.	O-Ring (2X)
32.	Screw, Set-Hex, Socket

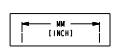
- GB Manual operator optional
- GB NAMUR body optional
- GB Temporary connector optional (Note 1)



Valve Body Mounting Dimensions



NAMUR Valve Body Mounting Dimensions



* Indicates Parts Supplied in ASCO Rebuild Kits

Note:
1. Temporary Connector for testing purposes only. Not to be used in final installation or application.

Figure 1. Series 327C Valve With Solenoid