

# ASCO Solenoid Valves

## Solenoid Valves

Solenoid valves are used to operate pneumatic actuators, acting upon electrical signals to admit and exhaust supply pressure to the actuator. Three-way solenoid valves are generally used with spring return actuators, and four-way solenoids on double acting actuators.

Solenoid valves manufactured by ASCO (Automatic Switch Co.) are regularly furnished with pneumatic actuators when ordered with solenoid valves.

When solenoid valves are ordered with actuators, they are assembled to the actuator and tested before shipment from the factory.

### **Solenoid Valves on Double Acting Actuators.**

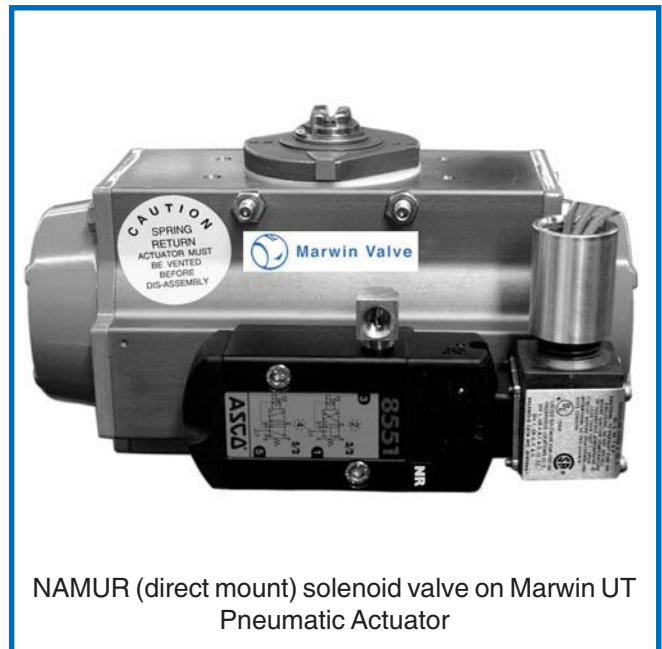
Solenoid valves are normally mounted on double acting actuators to provide for ball valve closure on loss of electrical power. If valve opening is required, the solenoid valve will be mounted with the connections reversed. Valves with double acting actuators will remain in place on loss of supply air pressure.

### **Solenoid Valves on Spring Return Actuators.**

Solenoid valves are normally mounted on spring return actuators to provide for ball valve closure on loss of electrical power or supply air. If valve opening is required, the solenoid valve will be mounted with the connections the same, but the actuator will be mounted on the valve with the valve in the open position. This means that the valve will rotate clockwise to open, counterclockwise to close, opposite the normal convention. The pistons in the actuator must be reversed at extra cost to convert the actuator to reverse rotation for the valve to rotate counterclockwise to fail open. Reverse rotating actuators are required for control valves and certain multi-port valve configurations to function properly.

More specific mounting information is given on page 2 for NAMUR mount and page 3 for NAMUR mount and page 4 for nipple mount solenoid valves.

**Actuator Information.** Specific actuator information can be found in the UT bulletin.



NAMUR (direct mount) solenoid valve on Marwin UT Pneumatic Actuator



3-Way nipple (line) mount solenoid valve on Marwin UT Spring Return Pneumatic Actuator

**Recommended Solenoid Valves.** The tables on pages 2 list the recommended solenoid valve for each Marwin UT actuator. NAMUR direct mount solenoids (Table 1) are standard for small and mid-size actuators (UT-0A through UT-5), but a nipple mount option is given (Table 2) for those cases where a NAMUR mount is not suitable or not desired. Nipple mount solenoids (Table 2) are standard for large size actuators (UT-6 and UT-7) because of solenoid valve flow capacity (Cv) requirements for the larger actuators. The solenoid valves are sized to provide the typical valve operating speeds cited in the UT bulletin. These generally range from 1 second on the smallest actuators, up to 15 seconds on the larger ones.

**Solenoid Valve Electrical Enclosures.** Standard solenoid valve electrical enclosures are as follows:  
 NEMA 4 – General purpose and watertight, meeting the requirements of Type 1, 2, 3, 3S, 4 and 4X  
 NEMA 7 – Combination Explosion Proof and Watertight, meeting the requirements of 3, 3S, 4, 4X, 6, 6P, 7 and 9, Class 1, Div. 1 (Groups A-D) and Class 1, Div. 2 Type 9 (Groups E-G).

**Accessories.** Accessories / options such as quick exhaust valves, speed control valves, mufflers / bug vents, special coil connections, manual operating, filter-regulator (FR), and filter-lubricator-regulator (FLR) are also available.

**Ordering.** To order a solenoid valve, simply choose the appropriate model and specify the required voltage and option code (if given) from the tables on pages 2 and 3. For example, a standard NAMUR mount solenoid valve with a NEMA 4 enclosure and 110 VAC coil for a UT-2-SR would be specified as WT8551A001MS (110 VAC) (code 3A).

## Installation, Operating, and Maintenance Instructions

I & M's (Installation & Maintenance) instructions, including solenoid operated valve flow schematics, are shipped with the products. They are also available on the Marwin website at [www.marwinvalve.com](http://www.marwinvalve.com).

Table 1. Solenoid Valve Installation & Maintenance Instructions				
Solenoid Valve		ASCO Form Number		
Series	Description	Body	Coil	General
8551	NAMUR (Direct) Mount 3 & 4 way	V7418	V6796R2	V6950R5
8317	Nipple Mount 3-way	V5084R3-T84	V6584R8	
8321	Nipple Mount 3-way	V5417R2	V6583R7	
8316	Nipple Mount 3-way	V6592	V6583R7	
8342	Nipple Mount 4-way	V6319R3	V7221R3	
8344	Nipple Mount 4-way	V5770	V6584R8	

Note: Table lists revisions on ASCO web site as of November, 2005. Consult ASCO website at [www.ascovalvenet.com](http://www.ascovalvenet.com) to ensure use of latest version.

**NAMUR (Direct Mount) Solenoid Operated Valves (SOV)**

Table 2. NAMUR Mount Solenoid Valve								
UT Actuator Type and Size	NEMA 4			NEMA 7			CV Inlet / Exhaust	NPT Inlet / Exhaust
	Description	Volt	Opt. Code	Description	Volt	Opt. Code		
<b>For UT-SR Spring Return Rack &amp; Pinion Pneumatic Actuators</b>								
UT-0-SR	WT8551A001MS (Use 3/2 Plate)	120 VAC	<b>3A</b>	EF8551A001MS (Use 3/2 Plate)	120 VAC	<b>3C</b>	0.7	0.25 / .012
UT-1-SR								
UT-2-SR								
UT-2.5-SR		24 VDC	<b>3E</b>		24 VDC	<b>3G</b>		
UT-3-SR		240 VAC	<b>3K</b>		240 VAC	<b>3N</b>		
UT-3.5-SR								
UT-4-SR								
UT-5-SR								
<b>For UT-DA Double Acting Rack &amp; Pinion Pneumatic Actuators</b>								
UT-0A-DA	WT8551A001MS (Use 5/2 Plate)	120 VAC	<b>4A</b>	EF8551A001MS (Use 5/2 Plate)	120 VAC	<b>4D</b>	0.7	0.25 / 0.12
		24 VDC	<b>4G</b>		24 VDC	<b>4K</b>		
		240 VAC	<b>4N</b>		240 VAC	<b>4R</b>		
UT-0-DA								
UT-1-DA								
UT-2-DA		120 VAC	<b>4B</b>		120 VAC	<b>4E</b>		
UT-2.5-DA		24 VDC	<b>4H</b>		24 VDC	<b>4L</b>		
UT-3-DA		240 VAC	<b>4P</b>		240 VAC	<b>4S</b>		
UT-3.5-DA								
UT-4-DA								
UT-5-DA								

**Speed Control Valves (SCV).** Speed control valves are not recommended for ASCO 8551 solenoid operated valves (SOV) in the 3-way configuration; use nipple mount 3-way SOV's when SCV's are required (see Table 3). In the 4-way configuration, the SCV on the top (#3) SOV port controls CW actuator speed, and the SCV on the bottom (#5) port controls CCW speed.

**Mounting.** Use the M5 mounting bolts, which are the bolts in the package with the locating set screw and O-rings to bolt the 8551 to the UT actuator. UT-0A requires adaptor block 26-00002 between actuator and solenoid 5/2 plate. Mounted 8551 SOV's are furnished with a street elbow in the top exhaust port so it opens in a vertical plane to reduce entry of contaminants.

**Mounting Orientation.** ASCO 8551 SOV's are normally mounted to UT direct rotating actuators with the air supply port down. **Caution! Mounting the SOV with the port up affects the functioning of the actuator.** Functioning for *direct* rotating actuators is as follows:

- DA UT Actuators – fail clockwise on loss of electricity and fail in place on loss of air (4-way SOV function using 5/3 plate).
- SR UT Actuators – fail clockwise on loss of air or electricity (3-way SOV function using 3/2 plate).

The function is reversed for *reverse* rotating actuators. Closing action of the ball valve depends on whether it is open or closed when the *deenergized* actuator is mounted on it. The closing action of normal 2-way ball valves can be changed by the way the actuator is mounted on the valve, but control and 3-way ball valves require a specific closing rotation direction for proper operating, and a reverse rotating actuator may be required for the valve to function properly.

**Port Seals.** Port seals are standard size 016 NBR 70 O-rings and may be procured locally if those supplied with the solenoid valve are lost.

**Nipple (Line) Mount Solenoid Operated Valves (SOV)**

**Table 3. Nipple (Pipe) Mount Solenoid Valve**

UT Actuator Type and Size	NEMA 4			NEMA 7			CV Inlet / Exhaust	NPT Inlet / Exhaust
	Description	Volt	Opt. Code	Description	Volt	Opt. Code		
<b>For UT-SR Spring Return Rack &amp; Pinion Pneumatic Actuators</b>								
UT-0-SR	8317G35	120 VAC	<b>3J</b>	EF8317G35	120 VAC	<b>3Q</b>	0.2 / 0.73	0.25
UT-1-SR		24 VDC	<b>3S</b>		24 VDC	<b>3U</b>		
UT-2-SR		240 VAC	<b>3W</b>		240 VAC	<b>3Y</b>		
UT-2.5-SR								
UT-3-SR	8321G2	120 VAC	<b>3M</b>	EF8321G2	120 VAC	<b>3R</b>	0.8 / 1.2	0.38
UT-3.5-SR		24 VDC	<b>3T</b>		24 VDC	<b>3V</b>		
UT-4-SR		240 VAC	<b>3X</b>		240 VAC	<b>3Z</b>		
UT-5-SR								
UT-6-SR	8316G54	120 VAC	<b>3B</b>	EF8316G54	120 VAC	<b>3D</b>	3	0.38
UT-7-SR		24 VDC	<b>3F</b>		24 VDC	<b>3H</b>		
		240 VAC	<b>3L</b>		240 VAC	<b>3P</b>		
<b>For UT-DA Double Acting Rack &amp; Pinion Pneumatic Actuators</b>								
UT-0-DA	8342G1			EF8342G1			0.7	0.25
UT-1-DA								
UT-2-DA		120 VAC	<b>4U</b>		120 VAC	<b>4V</b>		
UT-2.5-DA		24 VDC	<b>4W</b>		24 VDC	<b>4X</b>		
UT-3-DA		240 VAC	<b>4Y</b>		240 VAC	<b>4Z</b>		
UT-3.5-DA								
UT-4-DA								
UT-5-DA								
UT-6-DA	8344G72	120 VAC	<b>4C</b>	EF8344G72	120 VAC	<b>4F</b>	1.4 / 2.2	0.375 / 0.50
UT-7-DA		24 VDC	<b>4J</b>		24 VDC	<b>4M</b>		
		240 VAC	<b>4Q</b>		240 VAC	<b>4T</b>		

Note: For nipple mount solenoids without option code, specify the appropriate model from the "Description" column, and the required voltage.

**Mounting.** Nipple mount solenoid valves are piped to the top or right port of spring return UT actuators. They are piped to both ports of double acting UT actuators, with the connections depending upon the desired actuator functioning. See the solenoid valve instructions and the UT Actuator bulletin and Installation and Maintenance (I & M) manual. Pressurizing the top or right port of direct rotating UT actuators produces CCW rotation, and pressurizing the opposite port produces CW rotation.



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