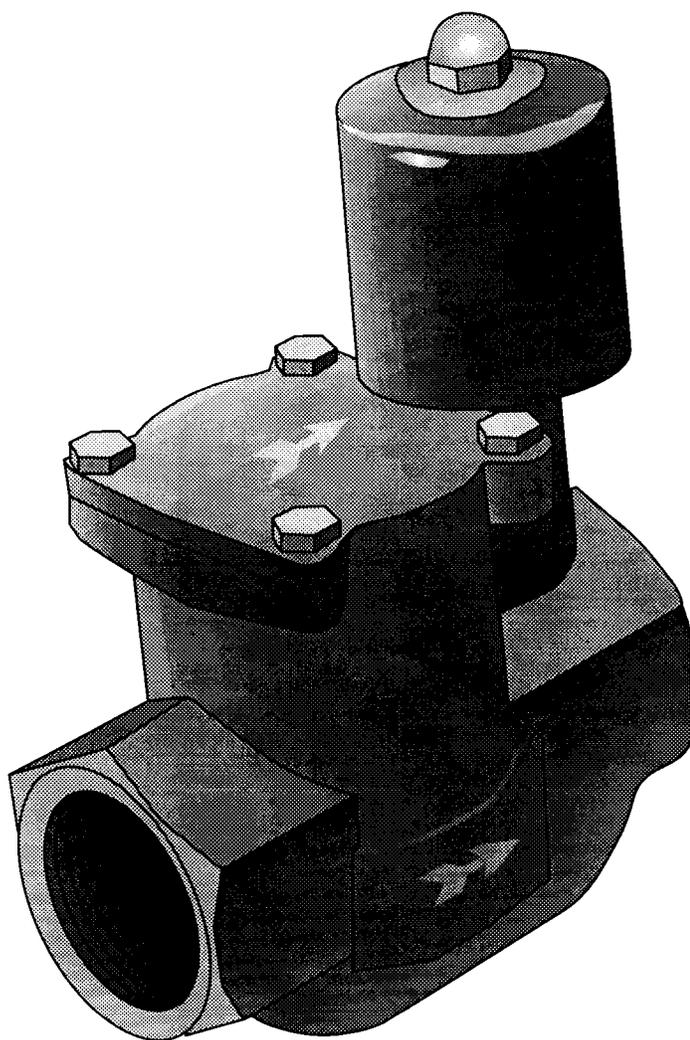


# ® FSV300 Series

## ® General Purpose Solenoid Valves



**Operator's Manual**



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**General Purpose Steam Solenoid Valve**

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## Notes

# Chapter 1 Introduction

## 1.1 Unpacking

Remove the Packing List and verify that you have received all equipment, including the following (quantities in parentheses):

General Purpose Steam Solenoid Valve (1)  
Operator's Manual (1)

If you have any questions about the shipment, please call the OMEGA Customer Service Department. When you receive the shipment, inspect the container and equipment for signs of damage. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

### NOTE

The carrier will not honor any claims unless all shipping material is saved for inspection. After examining and removing contents, save packing material and carton in the event reshipment is necessary.

## 1.2 Description

The OMEGA® FSV300 Series Steam Valve is a two-way normally closed pilot operated piston-type solenoid valve used for industrial steam applications. A two-way valve controls the flow of fluid through a single passage. It has two ports, an inlet and an outlet. A normally closed valve does not pass fluid unless it is energized. Line pressure assures positive valve closing and maintains shutoff.

There is a minimum pressure drop. Internal design of this valve assures exceptional flow performance. Lead wires and coil have high temperature insulation. Internal components are of materials which provide low friction and minimum wear. The FSV300 series valve has only two moving parts which means consistent performance and low maintenance. The removal of the bonnet and/or cap provides easy access to the internal components making maintenance, when necessary, easy and convenient.

### 1.3 Features

The FSV300 Solenoid Valves have the following features:

- 2-way Normally Closed
- Pilot-Operated
- Piston-Type
- Bronze Construction
- One coil satisfies both Class H & F requirements

### 1.4 Available Models

OMEGA Engineering, Inc. has the following models with the following characteristics:

#### FSV300 Series for Steam

Part Number *	Description
FSV301	Solenoid Valve with EPDM/AFLAS Seal and 3/8" NPT Connector
FSV302	Solenoid Valve with EPDM/AFLAS Seal and 1/2" NPT Connector
FSV303	Solenoid Valve with EPDM/AFLAS Seal and 3/4" NPT Connector
FSV304	Solenoid Valve with EPDM/AFLAS Seal and 1.00" NPT Connector
FSV305	Solenoid Valve with EPDM/AFLAS Seal and 1.25" NPT Connector
FSV306	Solenoid Valve with EPDM/AFLAS Seal and 1.50" NPT Connector
FSV307	Solenoid Valve with EPDM/AFLAS Seal and 2.00" NPT Connector

\* For DIN coil option, add suffix "-DIN" to the part number.

## 1.5 Typical Applications

- Automatic and Remote Control of Steam
- Commercial Laundry Equipment & Facilities
- Commercial Dishwashers
- Bottlewashers
- Pot & Pan Washers
- Industrial Maintenance Repair and Operation
- Boiler Blow Down

## Chapter 2 Parts of the Solenoid Valve

### FSV300 Series

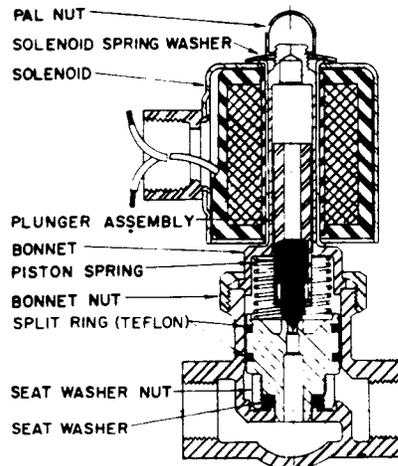


Figure 2-1. 3/8", 1/2", 3/4" NPT

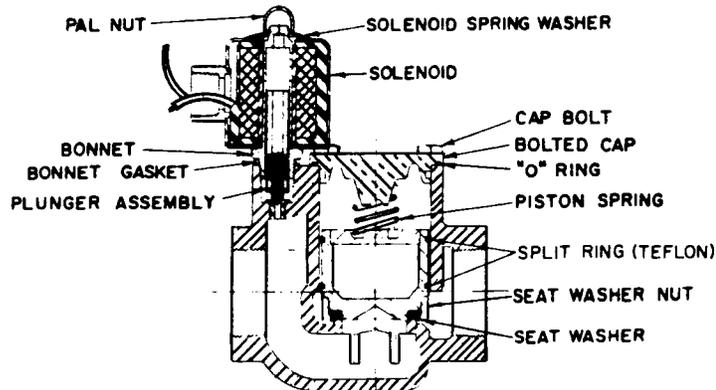


Figure 2-2. 1", 1-1/4" NPT

## Parts of the Solenoid Valve Valve (cont'd)

### FSV300 Series

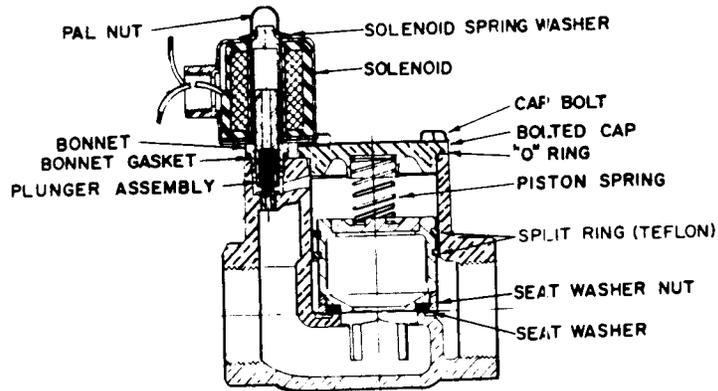


Figure 2-3. 1-1/2", 2" NPT

## Chapter 3 Installation

Be sure to adhere to the following when installing your solenoid valve:

- Arrow on valve body indicates direction of flow.
- Apply wrench only on end of valve being connected; (leverage on other valve parts can cause damage)
- Install in horizontal position with solenoid vertical.
- Make electrical connections in compliance with electrical code.

### CAUTION

Be certain electric power is of the same voltage and cycles as marked on solenoid.

## Chapter 4 Troubleshooting Guide

Problem	Possible Cause	Corrective Action
Failure to open when solenoid energized	1. Low voltage at solenoid (below 85% of rated voltage)	Insure proper voltage at solenoid
	2. Solenoid failure	Check for excessive voltage at solenoid
	3. Pressure drop less than 5 PSI	Increase pressure differential to 5 PSI
Failure to close when solenoid de-energized	1. Piston Ring binding between body bore and piston	Remove piston and place ring in groove, then insert piston in body
	2. Foreign matter lodged on body seat	Remove piston and clean out matter
	3. Foreign matter preventing plunger from seating	Clean out foreign matter at plunger seat hole
	4. Plunger tip is broken or badly worn	Replace plunger assembly
Leakage	1. Plunger seat hole eroded	3/8", 1/2", & 3/4" replace piston
		1", 1-1/4", 1-1/2" & 2" replace valve
	2. Piston seat washer takes a deep set	Replace seat washer
	3. "O" ring in cap takes a set	Replace "O" ring

Caution: Do not apply voltage to solenoid coil that has been removed from valve.

## Chapter 5 Spare Parts List

### FSV300 Valve Max P - 150 PSI Max. Temp - 365°

Solenoid Electrical Data	Volts	Spare Part Number	Max. Watts Holding	Max. Volt Amps		Duty
				In Rush	Holding	
Coil with 1/2" NPT Conduit outlet and 30" lead wires. Fits all valve sizes.	24 Vac	76056	19	70	39	Continuous
	120 Vac	76052	11	40	23	Continuous
	208 Vac	76053	8	33	12	Continuous
	240 Vac	76054	8	50	19	Continuous
	480 Vac	76055	12	48	19	Continuous

Consult Factory for other voltages and coils with ground wire.

### 3/8"•1/2"•3/4"•1"•1¼"•1½"•2" NPT Connector Styles

FSV300					
	3/8" & 1/2"	3/4"	1" & 1¼"	1½"	2"
Plunger Assembly	7319503	7319503	7319503	7319503	7319503
Bonnet	83021	73026	83192	83192	83192
Bonnet Gasket	N/A	86913	86913	86913	86913
Bonnet Nut	76303	76028	N/A	N/A	N/A
Bolted Cap	N/A	N/A	76744	7674701	7668801
"O" Ring	N/A	N/A	88545	88546	88547
Cap Bolt	N/A	N/A	84552	88234	85459
Pal Nut	83069	83069	83069	83069	83069
Solenoid Spring Washer	83600	83600	83600	83600	83600
Piston Spring	82486	82488	82486	82486	82486
Piston Assembly	76332	77798	7643104	7646904	7647004
Teflon Split Piston Ring (2 Req'd)	86334	86331	86548	86549	86550
Piston Seat Washer	85553	85567	86155	86473	86474
Piston Seat Washer Nut	82222	86030	76745	76750	7673801

# Chapter 6 Specifications

## Flow Capacity Charts

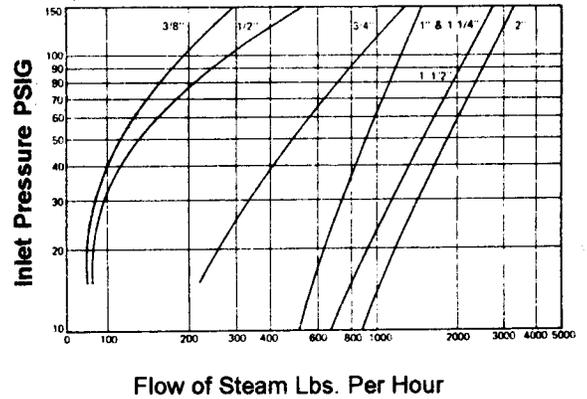
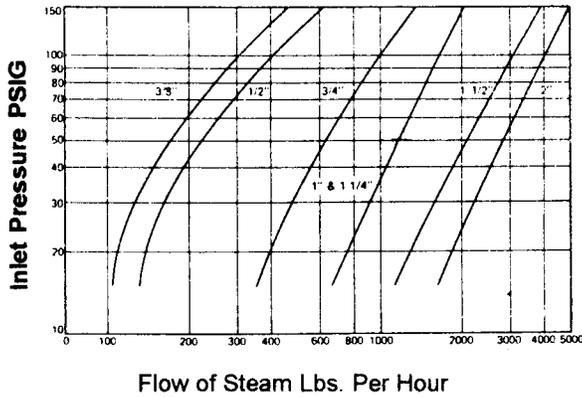


Figure 6-1. Pressure Drop Across Valve = 10 PSID

Figure 6-2. Pressure Drop Across Valve = 5 PSID

- \* Electrosteam requires minimum 5 PSI pressure differential for reliable operation.
- \* Must be installed in horizontal piping with solenoid in vertical position.
- \* Valve should be sized to flow requirement, not pipe size.
- \* Average closing time: 3/8"-3/4" 1-3 sec., 1"-2" 2-5 sec.

### Dimensions

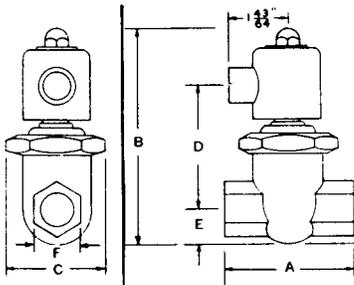


Figure 6-3. 3/8" - 3/4"

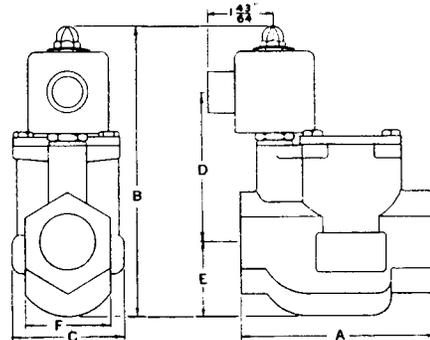


Figure 6-4. 1" - 2"

Pipe Size (Valve Size)							
Dimension	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
A	2-17/32"	2-21/32"	3-3/4"	4-13/16"	4-13/16"	5-7/16"	6-1/32"
B	5-1/16"	5-1/16"	6-1/32"	6-31/32"	6-31/32"	7-11/32"	8-3/16"
C	1-31/32"	1-31/32"	2-13/16"	2-3/4"	2-3/4"	3-1/8"	3-3/4"
D	2-27/32"	2-27/32"	3-1/2"	3-5/8"	3-5/8"	4-5/16"	4-21/32"
E	11/16"	11/16"	1"	1-3/4"	1-3/4"	1-1/2"	1-15/16"
F	15/16"	1-3/32"	1-3/8"	2-1/16"	2-1/16"	2-3/8"	2-7/8"

Pipe Size	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
Cv Factor	2.3	3.3	7.5	9.8	15	28	39

Note: (Cv Factor) The amount of water that will flow through the valve with a 1 PSI pressure drop at 60°F. This should be used for a comparison flow.

Weight	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
Lbs.	2.00	2.12	3.50	7.20	7.25	10.00	13.75
Kgs.	0.91	0.96	1.59	3.27	3.29	4.55	6.25

## Specifications (con't)

Minimum Pressure:	5 PSI
Maximum Pressure:	150 PSI
Temperature Range:	32°F to 365° (0°C to 185°C)
Medium:	Steam
Power:	17 Watts, 120 Vac coils
Wetted Parts:	Bronze, EPDM/AFLAS
Cv Values:	Refer to Flow Capacity Charts
Dimensions:	Refer to figures
Weight:	Refer to table

Part Number	NPT	Orifice	Seal	Response Time (Sec)		Tolerance
				Open	Close	
FSV301	3/8	0.439	EPDM/AFLAS	0.85	0.015	±0.001
FSV302	1/2	0.439	EPDM/AFLAS	0.85	0.015	±0.001
FSV303	3/4	0.849	EPDM/AFLAS	0.6-4.5	0.1-0.25	±0.005
FSV304	1.00	1.250	EPDM/AFLAS	0.6-4.5	0.1-0.25	±0.002
FSV305	1.25	1.250	EPDM/AFLAS	0.8-5.8	0.2-0.5	±0.002
FSV306	1.50	1.500	EPDM/AFLAS	1.5-9	0.2-0.4	±0.002
FSV307	2.00	2.000	EPDM/AFLAS	1.5-9.5	0.25-0.45	±0.002

## Notes

## Notes



## WARRANTY

OMEGA warrants this unit to be free of defects in materials and workmanship and to give satisfactory service for a period of **13 months** from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product. If the unit should malfunction, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. However, this WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear or which are damaged by misuse are not warranted. These include contact points, fuses, and triacs.

**OMEGA is glad to offer suggestions on the use of its various products. Nevertheless, OMEGA only warrants that the parts manufactured by it will be as specified and free of defects.**

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FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS OR **CALIBRATION**, consult OMEGA for current repair/calibration charges. Have the following information available BEFORE contacting OMEGA:

1. P.O. number to cover the COST of the repair/calibration,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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