Proportionating Electromagnetic Valves

For added safety valves are normally closed (NC) when deenergized. They can also serve as "ON-OFF" valves. For control functions see the Driver Module.

TABLE 55 PROPORTIONATING ELECTROMAGNETIC VALVE MAXIMUM FLOW RATES AND CV VALUES

MODEL	MATERIAL	*MAXIMUM FLOW RATE (mL/min)		ORIFICE SIZE		CV
		AIR	WATER	[in]	[mm]	
6APSV0101	Stainless Steel	3500	125	0.02	0.51	0.009
6APSV0102		13000	400	0.04	1.02	0.033
6APSV0103		21500	700	0.055	1.4	0.055
6APSV0104		25000	850	0.063	1.6	0.068
6APSV0105		100000	2850	0.125	3.18	0.24
6APSD0101	Proportionating Solenoid Valve Driver					

TABLE 55-1 PROPORTIONATING SOLENOID DRIVER ACCESSORIES

MODEL	DESCRIPTION
6APSSDNA-24	Power Supply, 110 vac/24 Vdc (North America)
6APSSDEU-24	Power Supply, 230 vac/24 Vdc (Europe)
6APSSDAU-24	Power Supply, 240 vac/24 Vdc (Australia)
6APSSDUK-24	Power Supply, 240 vac/24 Vdc (United Kingdom)
6ACBLDP9-6	Female 9 Pin D Connector 6 foot cable

SPECIFICATIONS FOR PROPORTIONATING ELECTROMAGNETIC VALVES

POWER INPUT: 0-30 Vdc.
MAXIMUM POWER REQUIRED: 400 mA.
TYPE OF OPERATION: Normally closed (NC) when de-energized.
CONNECTIONS: 1/4" Compression fittings optional 3/8" (1/8" with 6ASV0101, 6ASV0102 or 6ASV0103). (including compression fittings) x 1.00" (25.4mm) deep.
MATERIALS IN FLUID CONTACT: Types 316 and 416 stainless steel, FKM O-rings. Optional O-rings: Buna®, EPR and Kalrez®.
MAXIMUM PRESSURE: 1000 psig (6897 kPa).
MAX. DIFFERENTIAL PRESSURE: 50 psid (345 kPa).
LEAK INTEGRITY: 1 X 10^{-9} smL/sec Helium individually tested.
FLUID TEMPERATURE: 14 °F to 122 °F (-10 °C to 50 °C).
MAXIMUM TEMPERATURE (typical): 174 °F (79 °C) inside, 130 °F (54 °C) outside surface at 24Vdc.

The selection of materials of construction, is the responsibility of the customer. The company accepts no liability.

SPECIFICATIONS FOR 6APSD0101 PSV DRIVER MODULE

CONNECTION: 9-pin male "D" subconnector for input/output signals.
POWER INPUT REQUIRED: +12 to 30 Vdc 1A @ 12 Vdc, 0.5A (not supplied) @ 24 Vdc via 9-pin "D"-connector or DC power jack (center positive).
INPUT SIGNAL: Auto-Select feature allows circuit to recognize which analog input reference (0 to 5 Vdc or 4-20 mA) signal is provided.
TTL ON/OFF: Jumper selectable LOW (0 Vdc) OFF-HIGH (5 Vdc) on, or reverse, to select valve ON/OFF status.
VALVE OUTPUT POWER: Jumper selectable to +15, +22, and +29 Vdc with adjacent potentiometer to obtain ±2 Vdc.
FUSE RATING: An internal resettable 1.6A fuse protects the electronics on the power input.
POLARITY PROTECTION: Internal rectifier circuit protects from reversed polarity on the power input.
OPERATING TEMPERATURE: 32 °F (0 °C) to 122 °F (50 °C).
DIMENSIONS: 3" (7.62mm) wide x 3" (7.62mm) deep x 1" (25.4mm) high.
CE COMPLIANCE: EMC Directive 89/336/EEC EN55011:1991 Group 1, Class A EN50082-2:1995.

The selection of materials of construction, is the responsibility of the customer. The company accepts no liability.

6APSV Proportionating Electromagnetic Valves are designed to respond to variable power inputs to regulate the flow of liquids and gases proportionately.

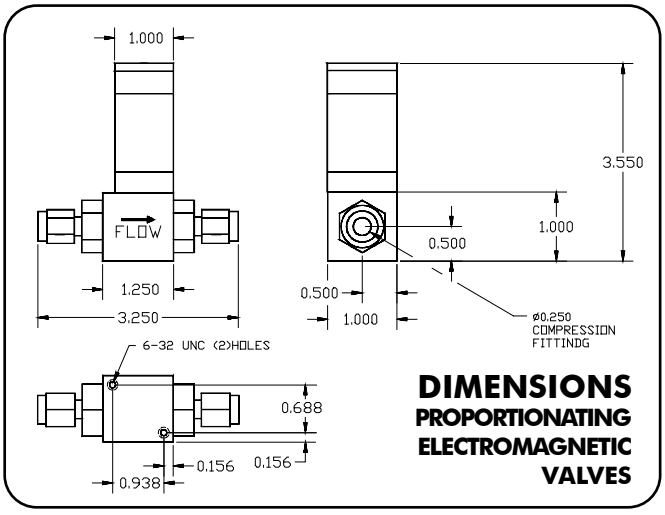
- ✓ **Leak Integrity 1 x 10^{-9} sec.**
- ✓ **Rigid metallic construction.**
- ✓ **Gas and liquids.**
- ✓ **Max pressure of 500 psig (34.8 bars).**

Flow is controlled by increasing or decreasing the voltage applied to the coil. This causes a magnetic force which raises the core and allows gas to flow.

Valves, constructed of stainless steel are available in five different sizes covering flow ranges from 3.5 sL/min - 100 sL/min air and 125 mL/min - 2.85 L/min H_2O.

PRINCIPLE OF OPERATION

A variable stroke electromagnetic valve featuring a valve seat design which permits increasing or decreasing flow rates of liquids or gases through it in proportion to variable input power.



DIMENSIONS
PROPORTIONATING ELECTROMAGNETIC VALVES

REGULATOR SYSTEMS

Complete flow regulating systems includes an electromagnetic valve connected to a pulse width modulated Driver Module.

For details see Driver Module description. Optional external RS-232 or RS-485 modules are available.

6APSD0101 Pulse Width Modulated Driver Module

Pulse width modulated 6APSD0101 Driver Modules regulate the power supplied to PSV Regulating valves based on a reference signal.

Set-point signals, 0-5 Vdc or 4-20 mA, input are employed to control the output pulse width modulated voltage at a fixed frequency (»30KHz) and amplitude. Incoming power to the valve coil is applied and discontinued for predetermined periods of time by a low loss solid state switching element.

The wide range of power input features conveniently accommodates 12 to 32 Vdc sources.

The Auto-Select feature of the Driver Module recognizes the type of reference signal received and defaults to 0 - 5 Vdc if both signals are provided.

SMV Stepping Motor Valves

DESIGN FEATURES

- ✓ High precision two-way metering valves in aluminum or 316 SS for air/water.
- ✓ Unparalleled precision and resolution in controlling flow rates (0.00025" per step resolution standard, 0.000125" optional).
- ✓ Operate continuously without overheating.
- ✓ Eliminates coil heating problems associated with solenoid designs.

GENERAL DESCRIPTION

A line of electronic two-way metering needle valves is presented. High precision linear stepping motors drive the valve spindle.

The resolution of the stepping motor driven needles is 0.0025"/steps standard. Optional 0.000125"/step resolution available. Low differential pressure valves, may be operated continuously (100% duty cycle). Valves stay in position as when de-energized.

Advantages over solenoid operated valves include cool operations, i.e. there are no control operating problems due to coils heating up, extremely fine resolution, very low differential pressures and high operating pressures. Valves are controllable by CMOS 12VDC compatible logic level and analog 0 to 5 Vdc signals.

OPERATION

When the "DIRECTION" is set LOW (GND) the valve spindle travels downward (closes), when it is set HIGH, the valve spindle moves upward (opens). The "SPEED" voltage on pin 4 determines how quickly the valve opens or closes. The signal amplitude for the "SPEED" control signal must remain within the limits of 0 to +2.5 Vdc. It may be necessary to override "DIRECTION" and "SPEED" signals with the preset (2.75 Vdc) speed control signal.

This can be accomplished with valve CLOSE and PURGE control signals (open collector NPN compatible). In order to CLOSE the valve, pin 3 on the 9-pin "D" -connector has to be connected to GND (pin 2). A GREEN light on the top of the valve will indicate a CLOSED valve condition. In order to PURGE the valve, pin 7 on the 9-pin "D"-connector has to be connected to GND (pin 2). A RED light on the top of the valve will indicate a fully OPEN valve condition.

During normal operation the valve remains in the last position as it is de-energized. After powering up, the valve will be automatically closed within the first 10 seconds and after that resumes control operation. Operating power and valve control signals are supplied via the "D"-connector.

TABLE 56 STEPPING MOTOR VALVES

MODEL	MATERIAL	CONNECTIONS	MAXIMUM FLOW RATE (mL/min)				CV	POWER INPUT
			Air		Water			
			[sL/min]	[scfh]	[L/min]	[GPM]		
6ASMV0101-2	Aluminum	3/8" compression	200	424	5.6	1.48	0.336	12VDC
6ASMV0102-2	Stainless Steel	3/8" compression	200	424	5.6	1.48	0.336	12VDC
6ASMV0103-2	Aluminum	1/2" compression	500	1060	14.2	3.75	0.855	12VDC
6ASMV0104-2	Stainless Steel	1/2" compression	500	1060	14.2	3.75	0.855	12VDC
6ASMV0105-2	Aluminum	3/4" FNPT	1000	2119	28	7.4	1.735	12VDC
6ASMV0106-2	Stainless Steel	3/4" FNPT	1000	2119	28	7.4	1.735	12VDC
6ASMV0101-4	Aluminum	3/8" compression	200	424	5.6	1.48	0.336	24VDC
6ASMV0102-4	Stainless Steel	3/8" compression	200	424	5.6	1.48	0.336	24VDC
6ASMV0103-4	Aluminum	1/2" compression	500	1060	14.2	3.75	0.855	24VDC
6ASMV0104-4	Stainless Steel	1/2" compression	500	1060	14.2	3.75	0.855	24VDC
6ASMV0105-4	Aluminum	3/4" FNPT	1000	2119	28	7.4	1.735	24VDC
6ASMV0106-4	Stainless Steel	3/4" FNPT	1000	2119	28	7.4	1.735	24VDC

TABLE 56-1 STEPPING MOTOR VALVES ACCESSORIES

MODEL	DESCRIPTION
6ACBLSMV	Connection Cable, D-Connector, 3 ft length, unterminated end

SPECIFICATIONS FOR STEPPING MOTOR VALVE

ALUMINUM MODELS: Aluminum housings and valve blocks, Fkm O-Rings, PFA closing pins.
STAINLESS / PTFE MODELS: 316 stainless steel valve blocks, PTFE-lined aluminum housing blocks, Fkm O-Rings, and PFA closing pins.
MAXIMUM FLOW RATES: 1000 L/min (air), 28 L/min ($H_2 0$).
CONNECTIONS: 3/8", 1/2", compression and 3/4" FNPT.
ELECTRICAL CONNECTIONS: 9-pin "D"-connector, located at the side of the valve.
POWER INPUT: 12 Vdc @ 800 mA, or +24 Vdc @ 600 mA, protected by a 600mA resettable fuse.
DIRECTIONAL CONTROL SIGNAL: 12 Vdc CMOS compatible logic level signal (10K input impedance). (Logic High >= 7.5 Vdc, Low <2.3 Vdc).
SPEED CONTROL SIGNAL: Analog 0 to 2.5 Vdc (100K input impedance). ON/OFF override: 12 Vdc CMOS low active level to pins 7 and 3 (10K input impendence).
RESPONSE TIME: 100ms time constant.
PRESSURE DROP AT MAX. FLOW: (700 to 1000) mbars 10 to 15 psid.
MAX. OPERATING PRESSURE: 500 psig (35 bars).
MAX. DIFFERENTIAL PRESSURE: 40 psig (2.7 bars).
GAS & AMBIENT TEMPERATURE: 32 °F to 122 °F (0 °C to 50 °C).

⚠ *The selection of materials of construction, is the responsibility of the customer. The company accepts no liability.*

Dimensions SMV Stepping Motor Valves