

▲ Two-Stage Preset Valve

The 120-7S is specifically designed for fuel loading systems and performs the following functions:

- ▶ Electrical opening – full flow delivery
- ▶ Rate of Flow Control – valve will limit flow from exceeding a maximum flowrate during high flow filling process
- ▶ Two-Stage shutdown

## SERIES FEATURES

- ▶ Opens on signal from preset register
- ▶ Limits flow rate to meter capacity (adjustable)
- ▶ Extra sensitive differential pilot
- ▶ Can be controlled by mechanical or electronic presets
- ▶ Adjustable flow setting for 2nd stage dwell
- ▶ Factory tested
- ▶ Junction box options are available, with explosion proof ratings
- ▶ Two-stage electronic opening options are available
- ▶ Standard Class 1 Div 1 (Optional Class I Div 2, ATEX, IECEX)

## OPERATION

The model 120-7S control valve opens to fill the system at a constant flow rate. Near the end of the load, the 120-7S rapidly closes down in 2 stages to top off the reservoir:

**Opening, Full Flow:** The Main valve (1) opens to supply a constant flow rate when the preset controller energizes solenoid (3). The rate of flow pilot (4), sensing differential across the integral orifice plate, will modulate the main valve to prevent the flow rate from exceeding the predetermined maximum. Needle valve (5) is adjusted for optimum performance of pilot (4).

- HI output applies power and opens the N.C. solenoid, activating flow control function.

**1st Stage Shutdown:** Main valve begins closing a predetermined number of gallons before the end of the load.

- HI output removes power and closes the N.C. solenoid. HI output remains off through load.
- LO output sends power to the limit switch. The N.O. solenoid remains open (de-energized) because limit switch contact is open.

**Low (Dwell) Flow:** Main valve closes far enough to trip the limit switch contact and holds this position for low flow filling.

- LO output sends power through limit switch contact and closes the N.O. solenoid. This hydraulically locks the 120-7S into a low flow mode.

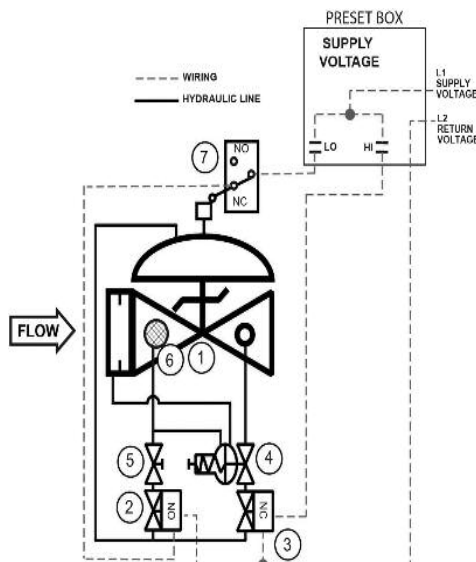
**Final Closure:** Main valve will close fully when the load is complete.

- LO output removes power from limit switch and N.O. solenoid. The N.O. solenoid opens and allows the main valve to close fully.

## COMPONENTS

- 1.) Model 65 Basic Control Valve (fail closed)
- 2.) Two-Way Solenoid Pilot, (N.O.)
- 3.) Two-Way Solenoid Pilot, (N.C.)
- 4.) 2450 Rate of Flow Control Pilot
- 5.) Needle Valve, (Closing Speed)
- 6.) Inline Strainer
- 7.) Limit Switch, (Low Flow setting)

## SCHEMATIC



## RECOMMENDED INSTALLATION

- ▶ Install the valve at the appropriate location, typically downstream of the preset meter.
- ▶ Install the valve with adequate space above and around the valve to facilitate servicing. Refer to the Dimension Table.
- ▶ Valve should be installed with the bonnet (cover) at the top, particularly 8" and larger valves.
- ▶ Shut-off valves should be installed upstream and downstream of the control valve. These are used to isolate the valve during start-up and maintenance.
- ▶ Following main valve installation, the solenoids and limit switch must be wired into the preset register, as shown in the wiring diagram.

## MAX. PRESSURE

(Based on ANSI flange ratings.)

(The pressures listed here are maximum working pressures at 37.78°C.)

END CONNECTIONS	DUCTILE IRON	STEEL WCB	STEEL LCB	Stn. Stl. CF8M	ALUMINUM
Threaded	44.1 bar	44.1 bar	44.1 bar	44.1 bar	19.7 bar
Grooved	20.7 bar	20.7 bar	20.7 bar	20.7 bar	13.8 bar
150# Flanged	17.2 bar	19.7 bar	18.4 bar	19.0 bar	19.7 bar

Note: Working pressures of solenoids vary greatly, consult factory on application of the OCV Model 120-7S valves.

## SIZING

The 120-7S valve is normally sized to match the meter size; however, in no case should the maximum velocity exceed 6 meters/second. As shown.

SIZE, DN	32-40	50	65	80	100	150	200	250
MAX FLOW, M <sup>3</sup> /HR	27	45	64	105	182	409	681	954

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# Model 120-7S (Terminal Services) METRIC



## SIZES Globe or Angle

Screwed Ends

1 1/4"-3" (DN32-DN80)

Grooved Ends

1 1/2"-6" (globe) (DN40-DN150)

1 1/2"-6" (angle) (DN40-DN150)

Flanged Ends

1 1/4"-10" (globe) (DN32-DN250)

1 1/4"-6" (angle) (DN32-DN150)

## FLUID OPERATING TEMPERATURE

### RANGE

Buna-N -40°C to 82.22°C

Viton -6.67°C to 110°C

Fluorosilicone -40°C to 65.56°C

EPDM -17.78°C to 110°C

## SOLENOID VALVE VOLTAGE

Enclosure: Explosion Proof NEMA 4, 4X, 6P, 7, 9

Class I, Div I (standard)

Class I, Div 2-ATEX, IECEx (opt)

Body: Brass, Stainless Steel

Voltages: 24, 120, 240, 480 VAC; 12, 24 VDC

**MATERIALS** (Consult factory for others)

**Body/Bonnet:** Ductile Iron (epoxy coated), Carbon Steel (epoxy coated), Stainless Steel, Aluminum

**Seat Ring:** Stainless Steel, Bronze

**Stem:** Stainless Steel, Monel

**Spring:** Stainless Steel

**Diaphragm:** Buna-N, Viton (Nylon reinforced)

**Seat Disc:** Buna-N, Viton

**Pilot:** Stainless Steel, Bronze

**Other pilot system components:**

Stainless Steel, Bronze/Brass

**Tubing & Fittings:** Stainless Steel, Copper/Brass

## OPTIONAL FEATURES

Two Stage Opening

Pre-wired junction box

For other sizes, please contact factory.

## SPECIFICATIONS (Typical Terminal Services Application)

The two-stage preset valve shall open in one stage and close in two stages based on signals from the preset register.

### DESIGN

The two-stage preset valve shall be a single-seated, line pressure operated, diaphragm actuated, pilot controlled globe valve. The valve shall seal by means of a corrosion-resistant seat and a resilient, rectangular seat disc. These, and other parts, shall be replaceable without removing the valve from the line. The stem of the main valve shall be guided top and bottom by integral bushings. Alignment of the body, bonnet and diaphragm assembly shall be by precision dowel pins. The diaphragm shall not be used as a seating surface, nor shall the pistons be used as an operating means. The orifice plate shall be integrally-installed in the valve inlet flange. The pilot system shall be furnished complete, installed on the main valve and include two solenoid pilots, a needle valve and an inline strainer. The two-stage preset valve shall be operationally and hydrostatically tested prior to shipment.

### MATERIALS OF CONSTRUCTION

The main valve body and bonnet shall be Ductile Iron. All ferrous surfaces shall be coated with 4 mils of epoxy. The main valve seat ring shall be stainless steel. Elastomers (diaphragms, resilient seats and O-rings) shall be Buna-N. Solenoid pilots shall be Stainless Steel, as shall the needle valve and control line tubing. The solenoid and limit switch enclosures shall be explosion-proof and suitable for operation on <voltage>.

### OPERATING CONDITIONS

The two-stage preset valve shall be suitable for operation at <X> bar at flow rates up to <X> m<sup>3</sup>/hr.

### ACCEPTABLE PRODUCTS

The two-stage preset valve shall be a <size> Model 120-7S, <globe pattern, angle pattern>, with <threaded, grooved, 150# flanged, 300# flanged> end connections, as manufactured by OCV Control Valves, Tulsa, Oklahoma, USA.

METRIC DIMENSIONS - M.M.

DIM	END CONN.	DN32-DN40	DN50	DN65	DN80	DN100	DN150	DN200	DN250
A	SCREWED	222	251	267	330	---	---	---	---
	GROOVED	222	251	267	330	387	508	---	---
	150# FLGD	216	238	267	305	381	451	645	756
	300# FLGD	222	251	283	324	397	473	670	791
C ANGLE	SCREWED	111	121	152	165	---	---	---	---
	GROOVED	111*	121	152	165	194	---	---	---
	150# FLGD	108	121	152	152	191	254	322	378
	300# FLGD	111	127	162	162	198	267	335	395
D ANGLE	SCREWED	79	98	102	114	---	---	---	---
	GROOVED	79*	98	102	114	143	---	---	---
	150# FLGD	76	98	102	102	140	152	203	289
	300# FLGD	79	105	111	111	148	165	216	306
E	ALL	152	152	178	165	203	254	302	391
F	ALL	98	98	98	98	98	98	162	162
H	ALL	254	279	279	279	305	330	356	432

\*GROOVED END NOT AVAILABLE IN DN32

### CE Markings

Applies to fuel valves installed in the European Union in accordance with the Pressure Equipment Directive, 2014/68/EU

CE-marked valves are available in LCB steel and CF8M stainless steel only

OCV is registered to the PED through Det Norske Veritas

The following valves will be CE-marked:

- 6" (DN150) and larger valves, 150# and 300# class, liquid fuel only
- 2" (DN50) thru 4" (DN100) valves, 300# class, liquid fuel
- 1 1/4" (DN32) thru 4" (DN100) valves, 300# class, LPG or Butane service
- 4" (DN100) and smaller valves in Class 150# (liquids) are furnished under SEP with no CE-mark

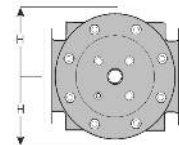
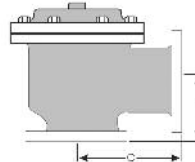
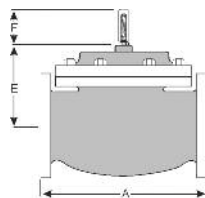
For maximum efficiency, the OCV control valve should be mounted in a piping system so that the valve bonnet (cover) is in the top position. Other positions are acceptable but may not allow the valve to function to its fullest and safest potential. In particular, please consult the factory before installing 8" (DN200) and larger valves, or any valves with a limit switch, in positions other than described. Space should be taken into consideration when mounting valves and their pilot systems.

A routine inspection & maintenance program should be established and conducted yearly by a qualified technician. Consult our factory @ 1-918-627-1942 for parts and service.

### When ordering your 120-7S valve,

please provide:

Fluid to be controlled - Model Number - Size - Globe or Angle End Connection - Body Material Trim Material - Solenoid Voltage Special Requirements / Installation Requirements



QUALITY SYSTEM  
REGISTERED TO  
ISO 9001

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