

Two-Stage Preset Valve ▲

The 110-9S is specifically designed for fuel loading systems and performs the following functions:

- ▶ Electrical opening and two stage shutdown via preset register
- ▶ Air Eliminator Functions - Main valve goes closed when air is detected at the air eliminator head and will re-open when all air has been exhausted from the air eliminator. This prevents air from passing through a meter and causing inaccurate readings.
- ▶ LPG/LNG Functions - upstream pressure is held at a fixed value above vapor pressure to prevent flashing at the flowmeter

SERIES FEATURES

- ▶ Adjustable flow setting for 2nd stage dwell
- ▶ Can be controlled by mechanical or electronic presets
- ▶ 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 110-9s is an air block valve which opens to fill a reservoir and will limit passage of any compressible medium such as air or flashing liquefied gas that may cause inaccurate flowmeter readings. The air block functions are designed to override electronic preset functions.

1. For liquefied gas systems, the 1356 pilot senses differential pressure between upstream and a system vapor pressure source, thereby, keeping upstream pressure a set value above vapor pressure. This prevents the upstream fluid from flashing, which would cause erroneous flowmeter readings.

2. For air eliminator systems under normal operation, the 1356 top sense has little or no pressure and the 110-9S is wide open. When air is introduced into the system, the air eliminator will simultaneously evacuate air from the system and pressurize the 1356 top sense port. When the 1356 top port is pressurized, the 110-9S will close. The 110-9S will open to continue the filling process when enough air has been removed.

The 110-9S is electronically opened and closed via a preset controller:

Opening, Full Flow - The Main valve (1) opens when the preset controller energizes solenoid (3) and the differential pilot (4) is opened. Needle valve (5) is adjusted for optimum opening and closing speed.

- HI output applies power and opens the N.C. solenoid, activating pressure air check functions.

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 110-9S into a low flow position.

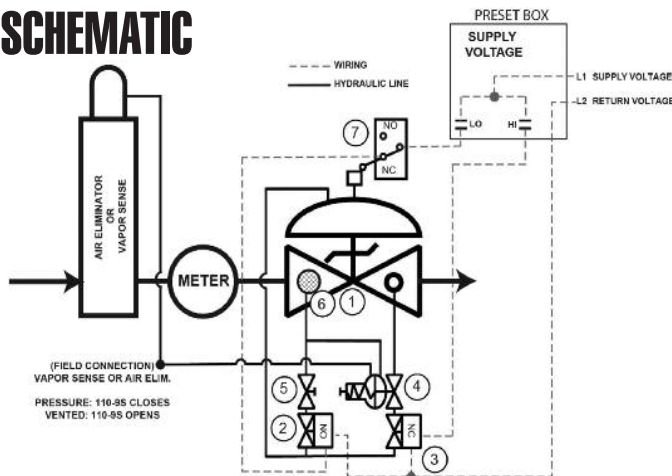
Final Closure - Main valve will close fully when the load is complete.

- 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.) 1356 Differential Pressure 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 100°F.

END CONNECTIONS	DUCTILE IRON	STEEL/STN STL	ALUMINUM
Threaded	640 psi	640 psi	285 psi
Grooved	300 psi	300 psi	200 psi
150# Flanged	250 psi	285 psi	285 psi
300# Flanged	640 psi	740 psi	--

Note: Working pressures of solenoids vary greatly, consult factory on application of the OCV Model 110 valves.

SIZING

The 110-9S valve is normally sized to match the meter size; however, in no case should the maximum velocity exceed 20 ft/sec, as shown below.

SIZE	1 1/4", 1 1/2"	2"	2 1/2"	3"	4"	6"	8"	10"
MAX. FLOW, GPM	120	200	280	460	800	1800	3000	4200

TOLL FREE 1.888.628.8258 • phone: (918)627.1942 • fax: (918)622.8916 • 7400 East 42nd Place, Tulsa, OK 74145
email: sales@controlvalves.com • website: www.controlvalves.com

Model 110-9S (Terminal Services)



SIZES Globe or Angle

Screwed Ends -	1 1/4" - 3"
Grooved Ends -	1 1/2" - 6" (globe) 1-1/2" - 6" (angle)
Flanged Ends -	1 1/4" - 10" (globe) 1 1/4" - 6" (angle)

MAX. WORKING PRESSURE (at 100°F)

250 psi for 150# ANSI flanged Ductile Iron.
285 psi for Steel and Stainless Steel. 285 psi for Aluminum. 300# ANSI flanges are available.

FLUID OPERATING TEMPERATURE RANGE

Buna-N -40°F to 180°F

Viton 20°F to 230°F

Fluorosilicone -40°F to 150°F

EPDM 0°F to 230°F

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.

OCV valves can be mounted in the horizontal or vertical position, however 8" and larger valves are best suited to be mounted horizontally. 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 @ **1-888-628-8258** for parts and service.

When ordering your 110-9S 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

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> psi at flow rates up to <X> gpm.

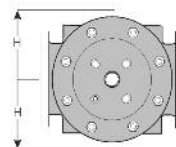
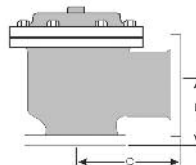
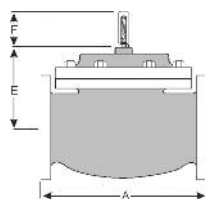
ACCEPTABLE PRODUCTS

The two-stage preset valve shall be a <size> Model 110-9S, <globe pattern, angle pattern>, with <threaded, grooved, 150# flanged, 300# flanged> end connections, as manufactured by OCV Control Valves, Tulsa, Oklahoma, USA.

U.S. DIMENSIONS - INCHES

DIM	END CONN.	1 1/4-1 1/2	2	2 1/2	3	4	6	8	10
A	SCREWED	8 3/4	9 7/8	10 1/2	13	--	--	--	--
	GROOVED	8 3/4	9 7/8	10 1/2	13	15 1/4	20	--	--
	150# FLGD	8 1/2	9 3/8	10 1/2	12	15	17 3/4	25 3/8	29 3/4
	300# FLGD	8 3/4	9 7/8	11 1/8	12 3/4	15 5/8	18 5/8	26 3/8	31 1/8
C	SCREWED	4 3/8	4 3/4	6	6 1/2	--	--	--	--
	GROOVED	4 3/8*	4 3/4	6	6 1/2	7 5/8	--	--	--
	150# FLGD	4 1/4	4 3/4	6	6	7 1/2	10	12 11/16	14 7/8
	300# FLGD	4 3/8	5	6 3/8	6 3/8	7 13/16	10 1/2	13 3/16	15 9/16
D	SCREWED	3 1/8	3 7/8	4	4 1/2	--	--	--	--
	GROOVED	3 1/8*	3 7/8	4	4 1/2	5 5/8	--	--	--
	150# FLGD	3	3 7/8	4	4	5 1/2	6	8	11 3/8
	300# FLGD	3 1/8	4 1/8	4 3/8	4 3/8	5 13/16	6 1/2	8 1/2	12 1/16
E	ALL	6	6	7	6 1/2	8	10	11 7/8	15 3/8
F (OPT)	ALL	3 7/8	3 7/8	3 7/8	3 7/8	3 7/8	3 7/8	6 3/8	6 3/8
H	ALL	10	11	11	11	12	13	14	17

*GROOVED END NOT AVAILABLE IN 1 1/4"



QUALITY SYSTEM
REGISTERED TO
ISO 9001

Represented by:

TOLL FREE 1.888.628.8258 • phone: (918)627.1942 • fax: (918)622.8916 • 7400 East 42nd Place, Tulsa, Oklahoma 74145
email: sales@controlvalves.com • website: www.controlvalves.com