

## **combination:**

- **rate of flow control**
- **slug control valve**

## **installation, operating and maintenance instructions**

# **model 119-5**

### **GENERAL DESCRIPTION**

The OCV Model 119-5 is special fuel system valve designed for use on the discharge of a filter separator. Working in conjunction with any of the OCV Series 800 interface float pilots, the 119-5 performs the following functions:

1. Opens to allow fuel flow when there is little or no water in the sump of the filter separator.
2. Prevents the flow through the filter separator from exceeding a predetermined rate.
3. Closes tightly to prevent flow when a high water level is reached.

The 119-5 consists of the following components, arranged as shown on the schematic diagram.

1. **Model 65 Basic Valve Assembly**, a hydraulically-operated, diaphragm-actuated globe-style valve which closes with an elastomer-on-metal seal.
2. An orifice plate, integrally mounted in the flange of the valve, which senses a differential pressure proportional to flow rate.
3. **Model A224 Accelerator Pilot**, which receives the hydraulic signals from the interface float pilot and solenoid pilot and shifts to either open or close the main valve.
4. **Model 2450 Rate of Flow Control Pilot**, a two-way, normally-open pilot valve which senses the differential across the orifice plate (item 2) and balances it against an adjustable spring load. If the differential, hence the flow rate, exceeds the set point, the pilot tends to close.

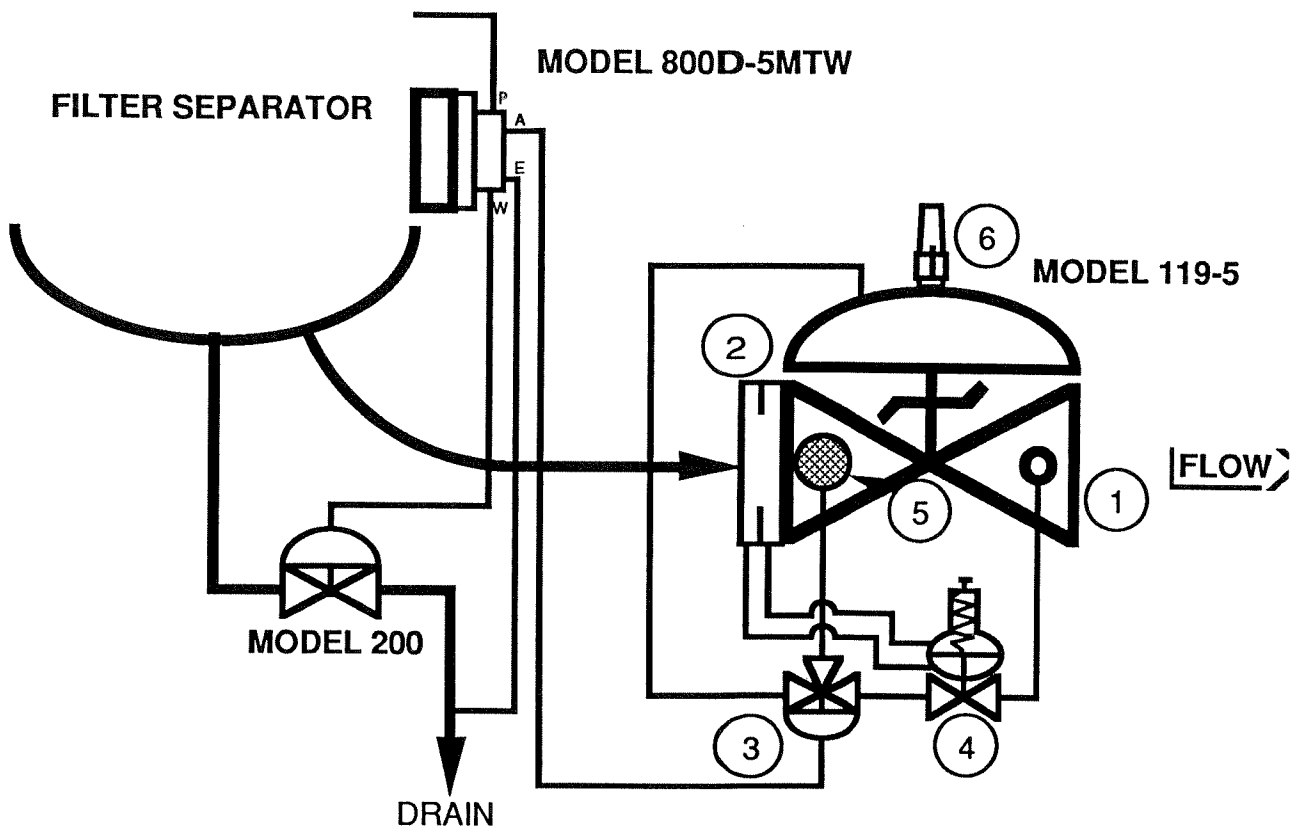
5. **Model 123 Inline Strainer**, which protects the pilot system from solid contaminants in the flow stream.
6. **Model 155L Visual Indicator Assembly**, which allows the user to determine the valve's operating position at a glance.

### **THEORY OF OPERATION**

**SLUG CONTROL:** The action of the valve as a slug control (high water level shutoff) is governed by the action of the accelerator pilot (item 3), which in turn is controlled by the interface float pilot. If there is little or no water in the sump of the filter separator, the float is down and the float pilot pressurizes the diaphragm of the accelerator pilot. This shifts the pilot to connect the main valve diaphragm chamber to downstream, allowing the main valve to open. In this position there is also an orificed bleed from upstream, the purpose of which is explained below.

If the water level in the sump rises enough to lift the float to its highest position, the float pilot vents the diaphragm of the accelerator pilot. The pilot shifts to connect the main valve diaphragm chamber directly to inlet pressure. This drives the main valve fully closed.

**RATE OF FLOW CONTROL:** The flow rate through the filter separator is controlled by the rate of flow control pilot (item 4), acting on the differential pressure signal received from the integral orifice plate (item 2). As long as the flow rate is below the set point of the pilot, the pilot is wide open, allowing the main valve to open fully. However, as the flow rate reaches the set point, the pilot begins to close. As it closes, the orificed bleed of the accelerator pilot increases pressure to the main valve diaphragm chamber, closing the



main valve as required to prevent the flow rate from increasing any further.

## INSTALLATION

The 119-5 is furnished fully factory-assembled, ready for installation on the discharge flange of the filter separator.

1. Install the valve following the instructions given in the Model 65 Basic Valve section of this manual.
2. Install the interface float pilot on the filter separator.
3. Make the hydraulic connections from the interface float pilot with 1/4" OD tubing as follows:
  - (a) "ACCEL VALVE" port on float pilot to the 1/8" NPT port in the bonnet of the accelerator pilot.
  - (b) "POWER" port on float pilot to a point which will sense main valve inlet pressure. A convenient location is the unused inlet side port of the main valve.

- (c) "WATER DRAIN" port on float pilot to the bonnet of the automatic water drain
- (d) "EXHAUST" port on float pilot to atmospheric drain. Port 3 of the solenoid pilot should also be connected to this drain line.

## STARTUP AND ADJUSTMENTS

The following steps should be followed in then order presented in order to effect an initial startup of the 119-5. NOTE: In order to properly set the rate of flow pilot, you will need some means of measuring flow, such as a flow meter or an orifice plate with differential pressure gauges.

1. Remove the protective cap from the rate of flow control pilot. Turn the adjusting screw fully counter-clockwise.
2. Start the pump or otherwise start the system flowing.
3. Carefully loosen a pipe plug in the valve bonnet until fluid appears around the threads. When only

clear fluid (no air) is discharging, retighten the plug.

4. Open downstream valves to increase system demand as much as possible.
5. Slowly turn the adjusting screw of the rate of flow pilot clockwise until flow rate increases to the desired set point. Replace the protective cap.

## **MAINTENANCE**

Required maintenance of the 119-5 is minimal. However, the following checks, periodically performed, will do much to keep the valve operating efficiently and safely.

1. Check for chipped or peeling paint. Touch up as required.
2. Check for leaks around flanges and fittings. Tighten as required.
3. If the interface float pilot is equipped with a manual tester, the slug control function of the 119-5 may be checked at any time. Simply activate the manual tester to close the valve. Release the manual tester to restore normal operation.

## **TROUBLESHOOTING**

In the event of malfunction, the following guide should enable the technician to isolate the specific cause of the problem and take appropriate remedial action.

### **MAIN VALVE FAILS TO OPEN**

1. High water level in filter separator sump — Drain water from sump.
2. Temporarily disconnect the sense line at the bonnet of the accelerator pilot. You should receive flow from the interface pilot, but no flow from the accelerator pilot.
  - (a) If conditions are as described above, proceed to Step 3.
  - (b) If you receive flow from the solenoid pilot, the accelerator pilot diaphragm is ruptured — Replace the diaphragm. See the A224 section of this manual.

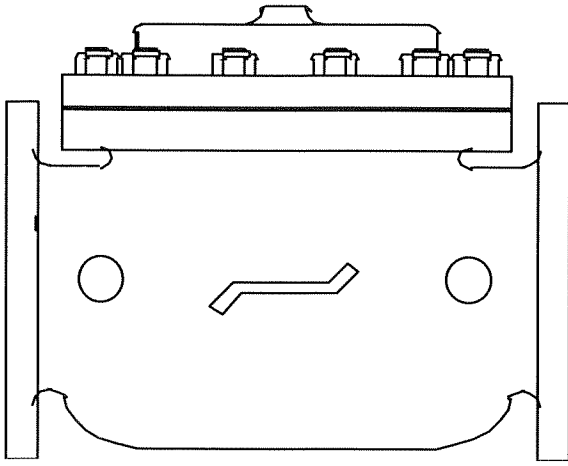
(c) If you receive no flow from the interface float pilot, there is a malfunction of that pilot — See the 800 pilot section of this manual.

3. Stem of accelerator pilot binding or lower seat deteriorated — Disassemble pilot and determine cause. See the A224 section of this manual.
4. Main valve diaphragm ruptured — Replace diaphragm. See the Model 65 Basic Valve section of this manual.
5. Main valve stem binding — Disassemble valve and determine cause. See the Model 65 Basic Valve section of this manual.

### **MAIN VALVE FAILS TO CLOSE**

1. If the interface float pilot is equipped with a manual tester, activate it.
  - (a) If the valve closes, the water level has not yet risen to the high level required to close the valve.
  - (b) If the valve still does not close, proceed to Step 2.
2. Temporarily disconnect the sense line at the bonnet of the accelerator pilot. There should be no flow from the interface float pilot.
  - (a) If there is flow from the interface float pilot, there is a malfunction of that pilot — See the 800 pilot section of this manual.
  - (b) If there is no flow from the interface float pilot, proceed to Step 3.
3. Stem of the accelerator pilot binding or upper seat deteriorated — Disassemble pilot and determine cause. See the A224 section of this manual. If you can find nothing wrong with the accelerator pilot, proceed to Step 4.
4. Main valve stem binding, seat deteriorated or object caught in valve — Disassemble valve and determine cause. See the Model 65 Basic Valve section of this manual.





# installation, operating, and maintenance instructions

## series 65 basic control valve

### GENERAL DESCRIPTION

The OCV Series 65 is a hydraulically-operated, diaphragm-actuated valve. It is available in either a globe (Model 65) or angle (Model 65A) configuration. The diaphragm is nylon-fabric bonded with synthetic rubber and forms a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. An elastomeric seat disc forms a tight seal with the valve seat when pressure is applied above the diaphragm.

### FUNCTIONAL DESCRIPTION

Because the Series 65 is a hydraulically operated valve, it requires a minimum line pressure of approximately 5 psig in order to function. The valve functions on a simple principle of pressure differential. The line pressure at the inlet of the valve is bypassed through the pilot control piping to the diaphragm chamber of the valve. This pressure, together with the valve spring, works against the pressure under the valve seat. Because the effective area of the diaphragm is greater than that of the seat, the valve is held tightly closed. As the controlling pilot(s) allow the pressure to bleed off the diaphragm chamber, the two opposing pressures begin to balance and the valve will begin to open. The valve can be used to perform a simple on-off function, or with the proper pilot system, a modulating, or regulating function.

In cases where the line fluid is unusually dirty, or is otherwise unsuitable for operating the valve, an independent operating pressure source may be employed. The pressure available from such a source must be equal to, or greater than, line pressure.

### INSTALLATION

In order to insure safe, accurate and efficient operation of the OCV control valve, the following list of checkpoints and procedures should be followed when installing the

valve.

1. Make a careful visual inspection of the valve to insure that there has been no damage to the external piping, fittings or controls. Check that all fittings are tight.
2. Thoroughly flush all interconnecting piping of chips, scale and foreign matter prior to mounting the valve.
3. Install the valve in the line according to the flow arrow on the inlet flange. The arrow should point downstream.
4. Allow sufficient room around the valve for ease of adjustment and maintenance service.

In addition, it is highly recommended that:

1. Isolation valves (eg., gate or butterfly) be installed on the inlet and discharge sides of the valve to facilitate isolating the valve for maintenance.
2. Pressure gauges be installed at the inlet and outlet sides of the valve to provide monitoring of the valve during initial start-up and during operation. The body side ports, if unused by the pilot system, provide a convenient connection for the gauges.
3. All valves larger than 6" be installed horizontally, i.e., with the bonnet pointed up, for ease of adjustment and maintenance servicing.

### MAINTENANCE

The OCV control valve requires no lubrication and a minimum of maintenance. However, a periodic inspection should be established to determine how the fluid being handled is affecting the efficiency of the valve. In a water system, for example, the fluid velocity as well as the substances occurring in natural waters, such as dissolved minerals and suspended particles, vary in every installation. The effect of these actions or substances must be determined by inspection. It is recommended that an annual inspection, which includes ex-

amination of the valve interior, be conducted. Particular attention should be paid to the elastomeric parts, i.e., the diaphragm and seat disc. Any obviously worn parts should be replaced.

### REPAIR PROCEDURES

In the event of malfunction of the OCV control valve, troubleshooting should be conducted according to the procedures outlined for the specific model of valve. Then, if those steps indicate a problem with the main valve, this section will outline the procedures necessary to correct the problem.

Problems with the main valve can be classed in three basic categories:

1. VALVE FAILS TO OPEN
  - a. Diaphragm damaged\* - See Procedure A
  - b. Stem binding - See Procedure B
2. VALVE FAILS TO CLOSE
  - a. Diaphragm damaged\* - See Procedure A
  - b. Stem binding - See Procedure B
  - c. Object lodged in valve - See Procedure B
3. VALVE OPENS AND CLOSES BUT LEAKS WHEN CLOSED
  - a. Seat disc damaged - See Procedure C
  - b. Seat ring damaged - See Procedure D

\*A diaphragm failure can prevent the valve from either opening or closing, depending on the flow direction. Most water service valves flow "under the seat", in which case a diaphragm failure will keep the valve from closing. On the other hand, most fuel service valves flow "over the seat", in which case a diaphragm failure will keep the valve from opening. To determine which you have, examine the bridge mark cast into the side of the valve body, then compare it with the figures below.

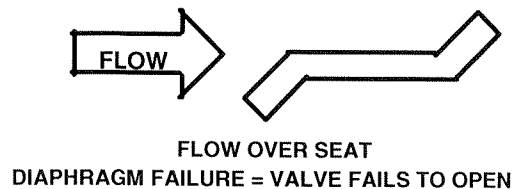
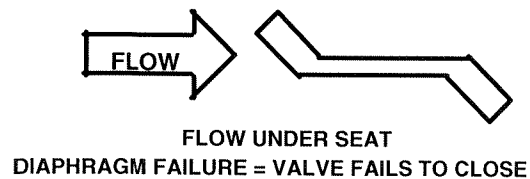
#### PROCEDURE A : DIAPHRAGM REPLACEMENT

1. Isolate the valve from the system by closing upstream and downstream block valves.
2. Loosen one of the tubing connections on the bonnet. Allow any residual pressure to bleed off.
3. Remove all tubing connected at the bonnet.
4. Remove the bonnet nuts.
5. Remove the bonnet. If the bonnet sticks in place, it may be loosened by rapping sharply around its edge with a rubber-headed mallet. *NOTE: 8" and larger valves are equipped with eye bolts through which a chain can be fastened to aid in*

- lifting the bonnet.*
6. Remove the spring.
7. Remove the diaphragm plate capscrews and the diaphragm plate.
8. Remove the old diaphragm.
9. Making sure the dowel pin holes are in the proper location, place the new diaphragm over the studs and press down until it is flat against the body and spool.
10. Replace the diaphragm plate and the diaphragm plate capscrews.
11. Tighten all diaphragm plate capscrews snugly.
12. Replace the spring.
13. Replace the bonnet and reinstall the bonnet nuts.
14. Tighten the bonnet nuts snugly using a criss-cross tightening pattern.
15. Reinstall the control tubing.
16. Reopen the upstream and downstream block valves.
17. Before placing the valve back in service, perform the air bleed procedure described in the first section of this manual.

#### PROCEDURE B: CORRECTION OF BINDING STEM

1. Perform Steps 1 thru 6 of Procedure A, above.
2. Remove the spool assembly from the valve. *NOTE:*



*On smaller valves, this can be accomplished simply by grasping the stem and pulling upward. Valves 6" and larger have the top of the stem threaded to accept an eyebolt to aid in lifting the spool out of the body. 6" thru 12" valves are threaded 3/8-16. 14" and 16" valves are threaded 5/8-11.*

3. Carefully examine both ends of the stem for deep scratches, scoring or buildup of mineral deposits.

- Polish the stem if necessary using a fine grade of emery cloth.
- 4. Similarly, examine and polish the upper bushing (in the bonnet) and the lower guide (in the seat ring).
- 5. Reinstall the spool assembly.
- 6. Reassemble the valve, following Steps 12 thru 17 in Procedure A.

**PROCEDURE C: SEAT DISC REPLACEMENT**

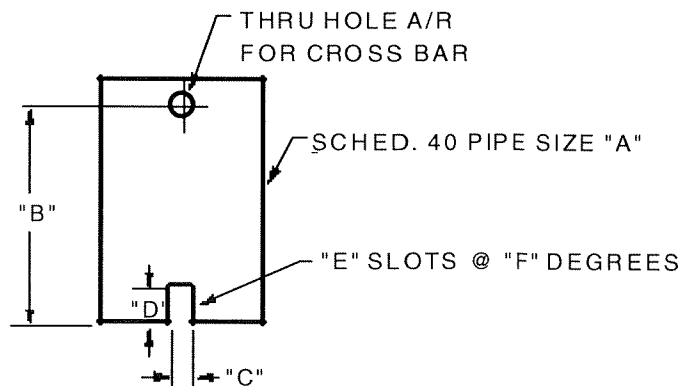
- 1. Perform Steps 1 and 2 of Procedure B, above.
- 2. With the spool assembly removed from the body, remove the seat retainer screws.
- 3. Slide the seat retainer off the lower end of the stem.
- 4. Remove the seat disc from its groove in the spool.  
*NOTE: The seat disc may fit quite tightly in the groove. If necessary, it may be pried out using a thin-bladed screwdriver or similar tool.*
- 5. Install the new seat disc in the groove.
- 6. Reinstall the seat retainer and tighten the seat retainer screws.
- 7. Reassemble the valve, following Steps 5 and 6 of Procedure B.

**PROCEDURE D: SEAT RING REPLACEMENT**

*NOTE: It is rare for a seat ring to require replacement. Minor nicks and scratches in the seating surface can usually be smoothed out with emery cloth.*

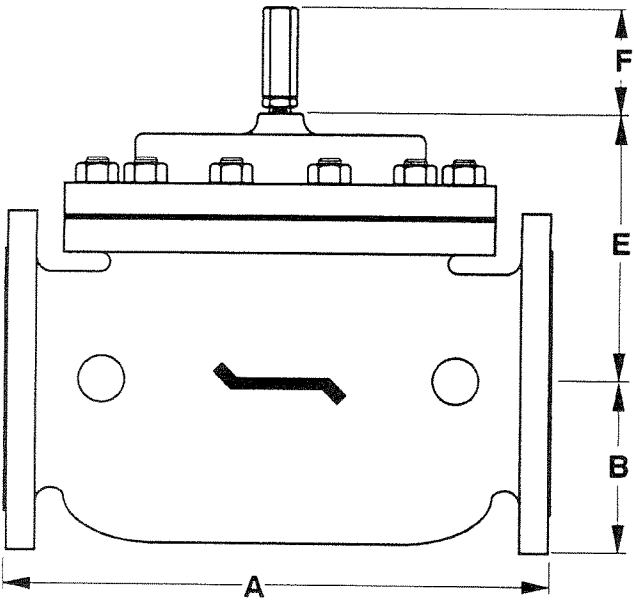
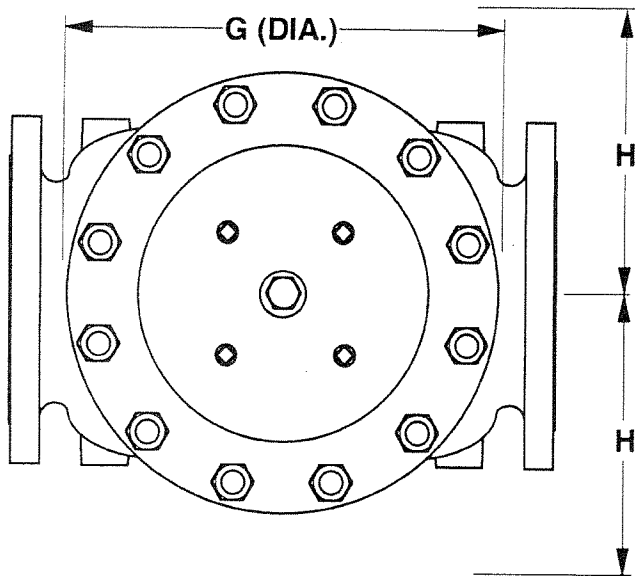
- 1. Perform Steps 1 and 2 of Procedure B, above.
- 2. If you are working on a 4" or smaller valve, follow Steps 3 thru 9, below.
- 3. If you are working on a 6" or larger valve, follow Steps 10 thru 16, below.

- 4. Seat rings in valves 4" and smaller are threaded into the valve body. To remove, you will need a special seat ring tool. You may fabricate one using standard pipe as shown in the sketch below, or one may be purchased from OCV.
- 5. Using the seat ring tool, unthread the seat ring from the body.
- 6. Remove the old o-ring from the counterbore in the body.
- 7. Install the new o-ring in the counterbore.
- 8. Using the seat ring tool, install the new seat ring.
- 9. Reassemble the valve, following Steps 5 & 6 of Procedure B.
- 10. Seat rings in valves 6" and larger are bolted into the body with socket head capscrews. In addition you will note that the seat ring is equipped with additional threaded holes that may be used for "jacking" the seat ring out of the body.
- 11. Remove the socket head capscrews.
- 12. Remove the old seat ring from the body by temporarily installing two or more of the capscrews in the "jacking" holes.
- 13. Install a new o-ring in the groove of the new seat ring. Lubricate the o-ring and outer seat ring wall with Vaseline® or similar lubricant.
- 14. Install the new seat ring in the body, making sure that the capscrew holes line up.
- 15. Replace and tighten all the capscrews.
- 16. Reassemble the valve, following Steps 5 and 6 of Procedure B.

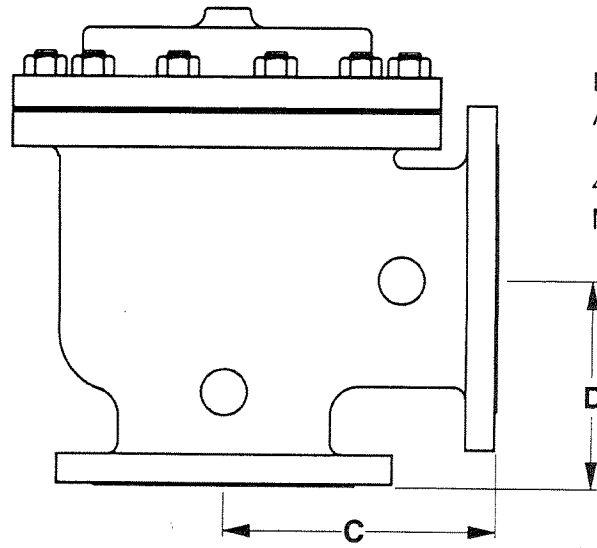


VALVE SIZE	"A" PIPE SIZE	"B" MIN. LENGTH	"C" SLOT WIDTH	"D" SLOT DEPTH	"E" NO. OF SLOTS	"F" SLOT SPACING
1-1/4"	3/4"	6"	3/8"	3/8"	2	180°
1-1/2"	3/4"	6"	3/8"	3/8"	2	180°
2"	1-1/2"	7"	3/8"	3/8"	2	180°
2-1/2"	2"	8"	1/2"	1/2"	3	120°
3"	2-1/2"	9"	5/8"	5/8"	2	180°
4"	3"	10"	5/8"	5/8"	2	180°

REVISED 3-17-97




DIM	ANSI CLASS	VALVE SIZE												
		1 1/4	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	24
A	SE	8.75	8.75	9.88	10.50	13.00	-	-	-	-	-	-	-	-
	150	8.50	8.50	9.38	10.50	12.00	15.00	17.75	25.38	29.75	34.00	39.00	40.38	62.00
	300	8.75	8.75	9.88	11.12	12.75	15.62	18.62	26.38	31.12	35.50	40.50	42.00	63.75
B	SE	1.44	1.44	1.69	1.88	2.25	-	-	-	-	-	-	-	-
	150	2.31	2.50	3.00	3.50	3.75	4.50	5.50	6.75	8.00	9.50	10.62	11.75	16.00
	300	2.62	3.06	3.25	3.75	4.12	5.00	6.25	7.50	8.75	10.25	11.50	12.75	18.00
C	SE	4.38	4.38	4.75	6.00	6.50	-	-	-	-	-	-	-	-
	150	4.25	4.25	4.75	6.00	6.00	7.50	10.00	12.69	14.88	17.00	-	20.81	-
	300	4 3/8	4.38	5.00	6.38	6.38	7.81	10.50	13.19	15.56	17.75	-	21.62	-
D	SE	3.12	3.12	3.88	4.00	4.50	-	-	-	-	-	-	-	-
	150	3.00	3.00	3.88	4.00	4.00	5.50	6.00	8.00	11.38	11.00	-	15.69	-
	300	3.25	3.25	4.12	4.38	4.38	5.81	6.50	8.50	12.06	11.75	-	16.50	-
E	ALL	6.00	6.00	6.00	7.00	6.50	7.92	10.00	11.88	15.38	17.00	18.00	19.00	27.00
F	ALL	3.88	3.88	3.88	3.88	3.88	3.88	3.88	6.38	6.38	6.38	6.38	6.38	8.00
G	ALL	6.00	6.00	6.75	7.69	8.75	11.75	14.00	21.00	24.50	28.00	31.25	34.50	52.00
H	ALL	10.00	10.00	11.00	11.00	11.00	12.00	13.00	14.00	17.00	18.00	20.00	20.00	28.50



NOTE: 3" VALVE DIMENSIONS ARE FOR NEW MODEL 3100  
4" VALVE DIMENSIONS ARE FOR NEW MODEL 4400

REV. A SDJ 6-6-02  
REV. B SDJ 2-3-03

<b>TOLERANCES</b>		 <b>OCV Control Valves</b> TULSA, OKLAHOMA U.S.A.	
UNLESS NOTED FRACTIONAL ±1/64 DECIMAL ±.005 MACH. FINISH 125/ ANGULAR ±1/2°			
<b>GENERAL VALVE DIMENSIONS</b>			
DRAWN BY SDJ	DATE 10-6-97	SIZE	DRAWING NUMBER
CHKD. BY	DATE	<b>A</b>	<b>65D</b>
			REV. <b>B</b>

# accelerator pilot

# installation, operating, and maintenance instructions

## model A224

### GENERAL DESCRIPTION

The OCV Model A224 Accelerator Pilot is a hydraulically-operated, diaphragm-type three-way valve. It has two operating positions, one which provides full flow between two of its ports. It is normally used on a main valve subject to the following conditions: (1) A modulating-type pilot, such as rate of flow, is also used on the valve; (2) Faster-than-normal closing speed is required; and (3) An independent means, such as a solenoid pilot or float valve, is used to place the valve in or out of operation.

### INSTALLATION

Referring to the attached assembly drawing for port identification, the A224 is installed on the main valve as follows: Port A is connected to the control pilot. Port B is connected to the bonnet of the main valve. Port D is connected to the energizing source (solenoid or float pilot).

### THEORY OF OPERATION

Pressurizing the bonnet of the A224 pilot through Port D moves the stem assembly to its downward position. Orificed flow is now available from Port C (main valve inlet) to both Port A (Control pilot) and Port B (Main valve bonnet). In this position, the A224 acts as an ejector. Flow through it is modulated by the control pilot, which in turn modulates the main valve to maintain a constant flow rate or pressure.

When pressure is removed from the bonnet of the A224, pressure at Port C forces the stem assembly to its upward position. Now Port A (Control pilot) is blocked, and full flow is available from Port C (main valve inlet) to Port B (main valve bonnet). The main valve thus goes quickly closed.

### MAINTENANCE

Because of the simplicity of design of the A224 pilot, required maintenance is minimal. Check fittings and bolts periodically for tightness, and inspect the body for damage or excessive buildup of foreign material.

### TROUBLESHOOTING

A major malfunction in the A224 pilot would generally be evident in a failure of the main valve to open or close. However, keep in mind that such symptoms can be also caused by a malfunction in the main valve itself or in the control pilot(s). If the A224 is suspected, proceed as follows:

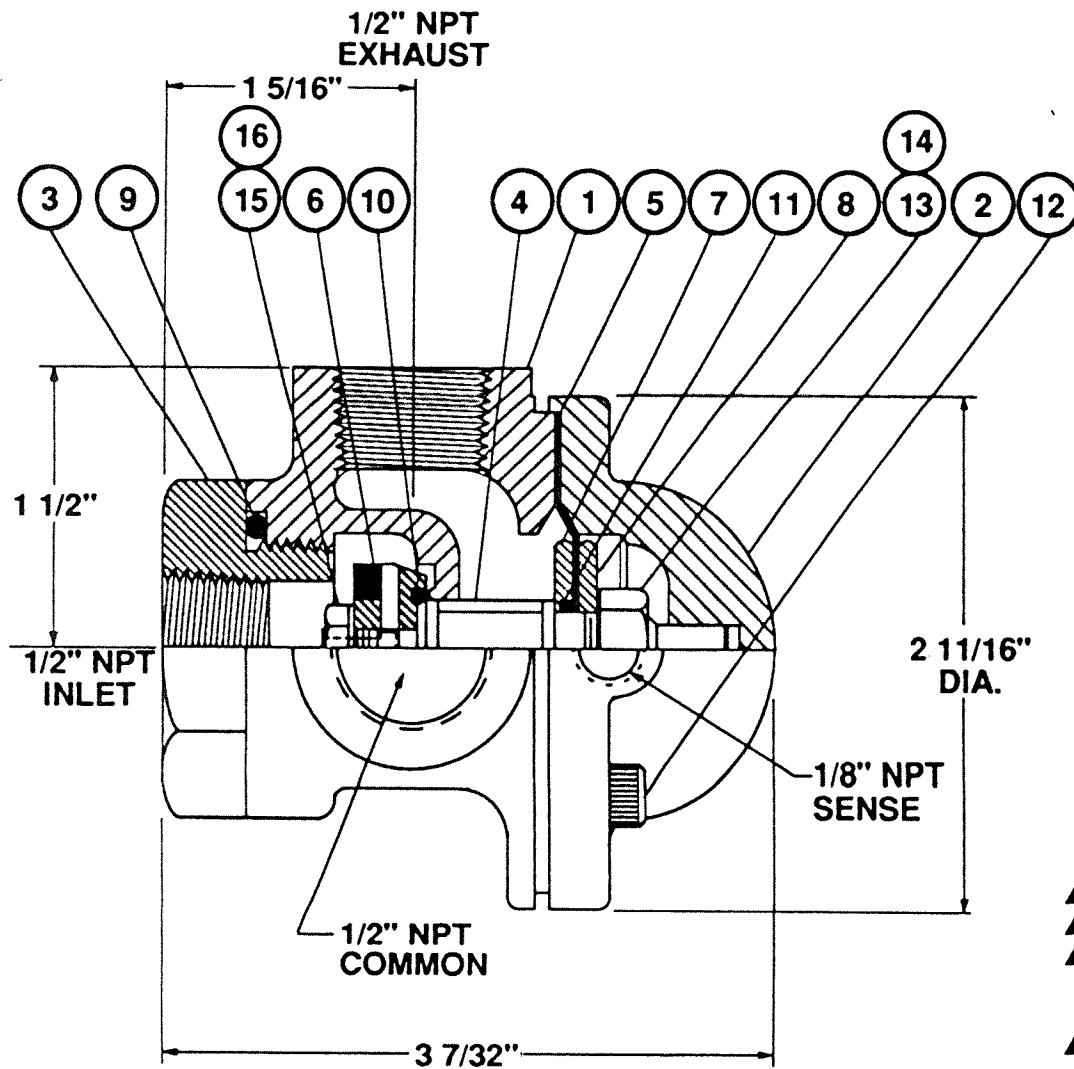
#### A. FAILURE OF PILOT TO OPEN MAIN VALVE

1. Ruptured diaphragm:
  - (a) Detach sense line from the bonnet of the pilot and remove the bonnet. Inspect the diaphragm carefully for holes or cracks.
  - (b) If damaged, replace with new diaphragm.
2. Pilot stem binding:
  - (a) With bonnet removed, inspect the stem journal in the bonnet for buildup of foreign material.
  - (b) Clean as necessary and reassemble pilot.
3. Obstruction in seat area: Disassemble pilot and remove obstruction.
4. Rubber seat damaged:
  - (a) Disassemble pilot and examine seats for excessive wear or damage.
  - (b) Replace if necessary and reassemble pilot.

#### B. FAILURE OF PILOT TO CLOSE MAIN VALVE

1. Pilot stem binding - Proceed as in A2, above.
2. Obstruction in seat area - Proceed as in A3, above.
3. Rubber seat damaged - Proceed as in A4, above.





▲ = RECOMMENDED SPARE PARTS

ITEM	PART NO	QTY	DESCRIPTION	MATERIAL
16	685720	1	LOCKWASHER	STN. STEEL
15	590718	1	HEX NUT	STN. STEEL
14	685702	1	LOCKWASHER	STN. STEEL
13	590717	1	HEX NUT	STN. STEEL
12	530708	4	SKT. HD. CAPSCREW	STN. STEEL
▲ 11	611012	1	O-RING	VITON
▲ 10	611111	1	O-RING	VITON
▲ 9	610216	1	O-RING	BUNA-N
8	308110	1	UPPER DIAPH. PLATE	BRASS
7	308109	1	LOWER DIAPH. PLATE	BRASS
▲ 6	310708	1	SEAT PLUG	SS/BUNA-N
▲ 5	694000	1	DIAPHRAGM	BUNA-N
4	314732	1	STEM	STN. STEEL
3	300782	1	ADAPTER	STN. STEEL
2	304100	1	BONNET	BRONZE
1	302100	1	BODY	BRONZE

REVISIONS				REF DWG NO'S		MATERIAL	TOLERANCES	OCV Control Valves TULSA, OKLAHOMA U.S.A.			
CHG	E.C. NO.	DATE	BY				UNLESS NOTED FRACTIONAL ±1/64 DECIMAL ±.006 MACH. FINISH 125 ANGULAR ±1/2°	ACCELERATOR PILOT			
						NO. RECD	DRAWN BY	DATE	SIZE	DRAWING NUMBER	REV.
						SCALE	SDJ	2-2-93	A	A224	
							CHKD. BY	DATE			

# rate of flow control pilot

## installation, operating, and maintenance instructions

# model 2450

### **GENERAL DESCRIPTION**

The OCV Model 2450 Rate of Flow Control Pilot is a direct-acting, spring-loaded, diaphragm-type control pilot. It is available in bronze or stainless steel (stainless steel internals) construction, with either Buna-N or Viton elastomers. It is designed to maintain a constant, preset rate of flow through the main valve. It is manually adjustable by means of an adjusting screw located on top of the pilot. The 2450 is a constant-throttling device, maintaining precise, positive control of the main valve.

### **FUNCTIONAL DESCRIPTION**

Basically, the 2450 controls the amount of pressure in the upper chamber of the main valve, hence the degree of opening or closing of the valve. The pilot senses the pressure differential across an orifice plate located on the inlet of the main valve. The upstream, or high pressure, side of the orifice plate is sensed under the pilot diaphragm and the downstream, or low pressure, is sensed above the diaphragm. The low pressure sense is assisted by the pilot spring. As the flow through the orifice plate increases, the differential pressure increases and begins to close the pilot. As the pilot closes, the pressure in the upper chamber of the main valve increases, causing the valve to close a proportionate amount in order to maintain the preset rate of flow. Conversely, as the rate of flow decreases, the pilot opens, allowing the main valve to open and compensate for the decrease in flow.

### **INSTALLATION AND ADJUSTMENT**

The 2450 should be installed in the main valve control piping between either the ejector or the accelerator pilot (depending on valve model) and the downstream body tap. Flow should be in the direction indicated on the pilot body. Sensing lines (1/4" O.D. tubing) are installed from the downstream orifice flange tap to the

upper sense tap of the pilot and from the upstream orifice flange tap to the lower sense tap of the pilot. Pilot adjustment is made with the adjusting screw located on top of the bonnet. Increase flow through the valve by turning the screw clockwise; decrease flow by turning the screw counterclockwise.

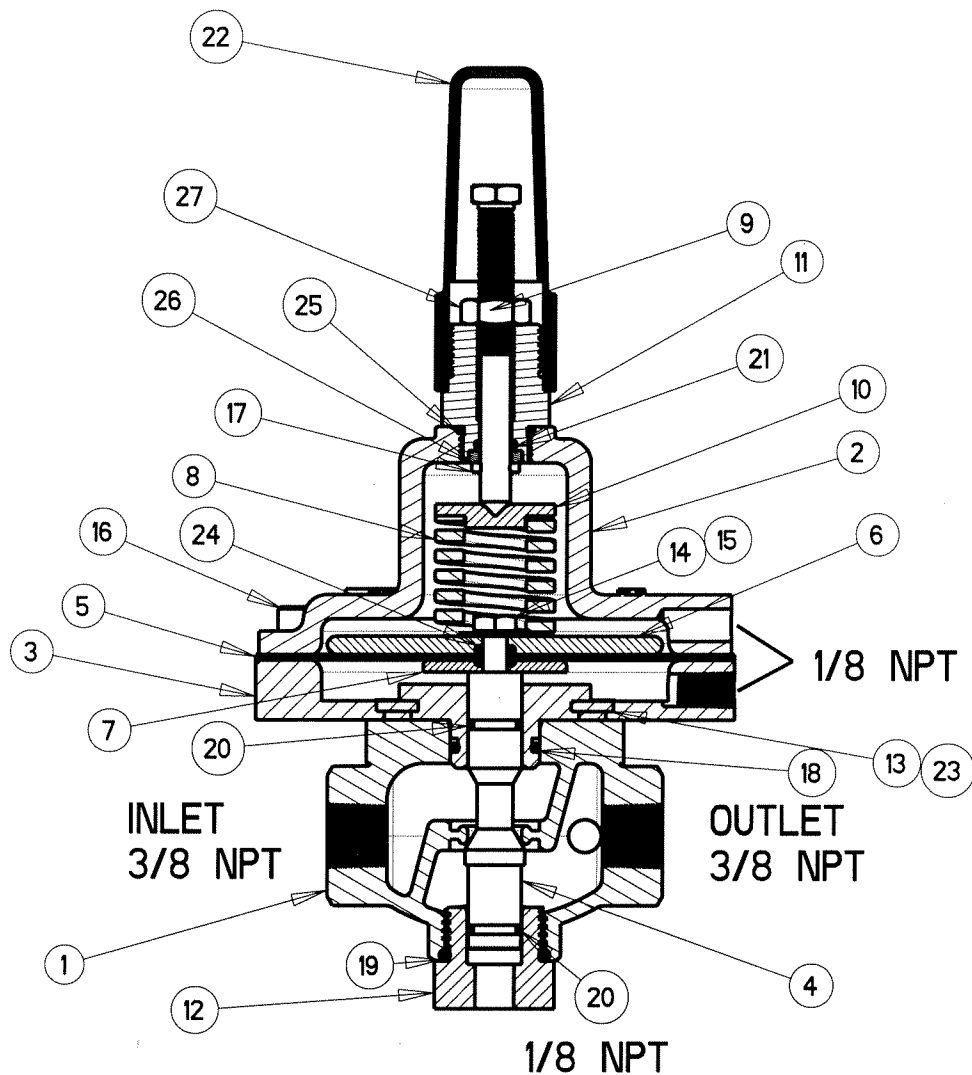
### **MAINTENANCE**

Because of the simplicity of design of the 2450 pilot, required maintenance is minimal. Fitting and bolts should be periodically checked for tightness and the body should be inspected for damage or excessive buildup of foreign material.

### **TROUBLESHOOTING**

Troubleshooting of the 2450 is equally simple. Major troubleshooting points are as follows:

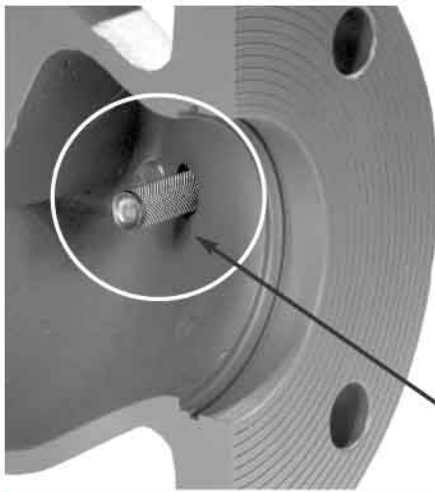
1. To check for ruptured diaphragm, disconnect the low pressure sense line from both the pilot and the valve flange. Plug the flange tap and pressurize the valve. A continuous discharge of fluid at the open sense port indicates a ruptured diaphragm.
2. An indication of the pilot stem binding may be checked by removing the pilot bonnet and moving the stem by hand. If excessive drag is evident, disassemble and pilot and determine the cause.
3. An erratic pilot action can result from a blockage in the port area of the valve stem or in the counterbalance area. Detach the sense line on the bottom plug and remove the plug. Clean out the counterbalance chamber as required. To remove the stem, hold the bottom of the stem with screwdriver in slot and remove the screw securing the diaphragm plates. The seat/stem assembly may now be removed through the bottom body port. Clean as necessary.



27	590717	1	HEX NUT	STN. STEEL
26	320718	1	BUSHING	STN. STEEL
25	610017	1	O-RING	BUNA-N
24	611010	1	O-RING	VITON
23	611011	4	O-RING	VITON
22	692002	1	CAP	BUTYRATE
21	611011	1	O-RING	VITON
20	611013	2	O-RING	VITON
19	610912	1	O-RING	BUNA-N
18	611116	1	O-RING	VITON
17	620712	1	CODDER PIN	STN. STEEL
16	530701	8	SKT HD CAPSCREW	STN. STEEL
15	685700	1	LOCK WASHER	STN. STEEL
14	531700	1	HEX HD CAPSCREW	STN. STEEL
13	532702	4	FLAT HD SCREW	STN. STEEL
12	310725	1	PLUG	STN. STEEL
11	320816	1	ADJUSTING SCREW ADAP.	STN. STEEL
10	300710	1	SPRING RETAINER	STN. STEEL
9	320724	1	ADJUSTING SCREW	STN. STEEL
8	651408	1	SPRING	CR-V STEEL
7	308702	1	LOWER DIAPH. PLATE	STN. STEEL
6	308720	1	UPPER DIAPH. PLATE	STN. STEEL
5	694004	1	DIAPHRAGM	BUNA-N/NYLON
4	314720	1	STEM	STN. STEEL
3	300706	1	ADAPTER	STN. STEEL
2	304730	1	BONNET	STN. STEEL
1	302702	1	BODY	STN. STEEL
ITEM	PART NO.	QTY	DESCRIPTION	MATERIAL

E				MATERIAL	TOLERANCES	OCV Control Valves							
D					UNLESS NOTED	TULSA OKLAHOMA USA							
C					.XX ±.015	RATE-OF-FLOW CONTROL PILOT							
B					.XXX ±.005								
A					ANGULAR ±0.5°								
CHG				ECN	DATE	BY	NO. REQ'D	DRAWN BY	DATE	SIZE	DRAWING NUMBER	REV	
REVISIONS				REF DWG NO'S			1/2				A	2450	

**DESCRIPTION**



The 123 Inline Strainer installs in the inlet side port of the main valve, and protects the pilot system from solid contaminants in the line fluid. The screen prevents the entrance of particles into the pilot system piping while flow through the main valve washes the screen clean. Recommended use on petroleum valve applications where flushing or removal of the screen for cleaning is not practical or may be considered hazardous.

← Strainer Shown Installed

**DIMENSIONS**

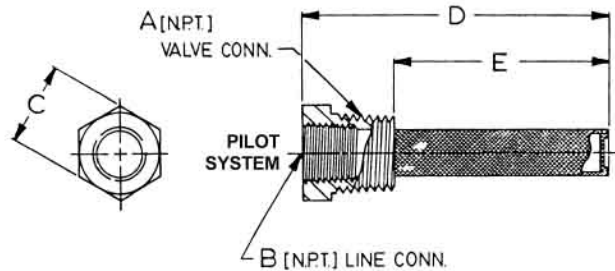
PART NUMBER	A	B	C	D	E	USED ON VALVE SIZE
660704	3/8	1/4	11/16	2 3/16	1 1/2	1 1/4"-6"
660705	1/2	3/8	7/8	2 1/4	1 1/2	8"-10"
660706	3/4	1/2	1 1/8	2 3/8	1 1/2	12"-16"

**MATERIALS**

Inline strainers are all-stainless steel construction.

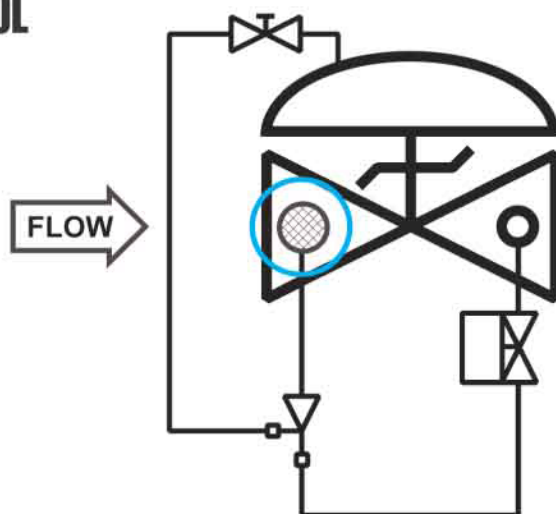
**SCREEN SIZE**

Standard screen is 40 mesh. Other mesh sizes are available.



**SCHEMATIC SYMBOL**

The Model 123 Inline Strainer is shown on OCV Valve Schematics as:



EXAMPLE: Shown here on a MODEL 115-2 Solenoid Valve.

**DESCRIPTION**

The Model 155L Visual Indicator is a device that enables the user to determine the extent of opening of a control valve. It consists of an adaptor threaded into the valve bonnet, a rod threaded into the main valve stem, a sealed Pyrex sight glass, and a protective aluminum housing. The indicator rod moves as the valve opens and closes. The 155L may be installed on virtually any OCV control valve, and can be done so without any disassembly of the valve itself. Since the assembly is not sealed from the diaphragm chamber of the main valve, it provides a convenient point for bleeding air via the 1/8" NPT port located at the top of the sight glass.

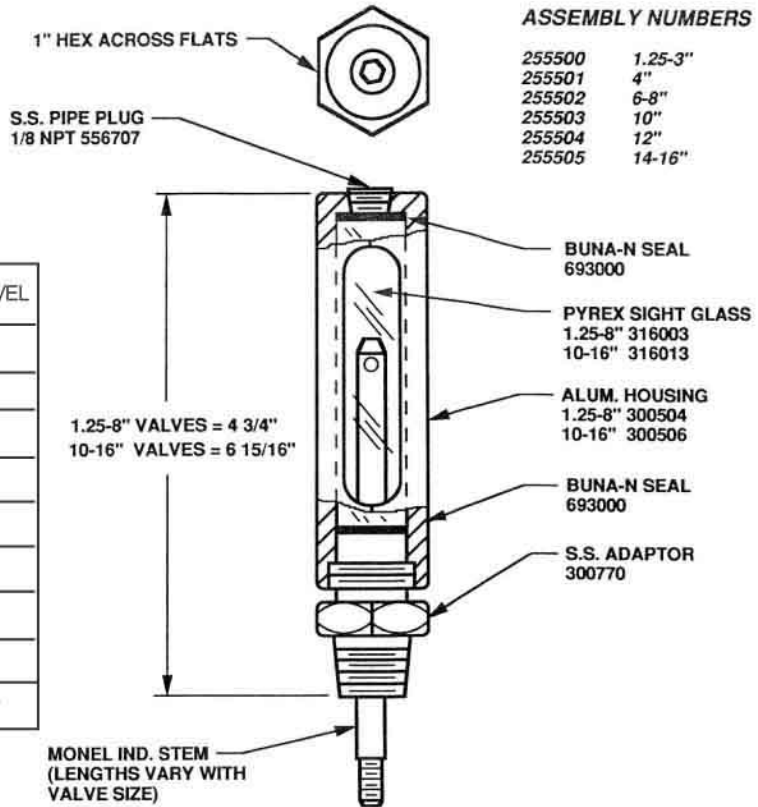
**WHERE USED** - The 155L is the standard visual indicator on fuel service valves. Optional on virtually any control valve not already employing a limit switch or position transmitter.



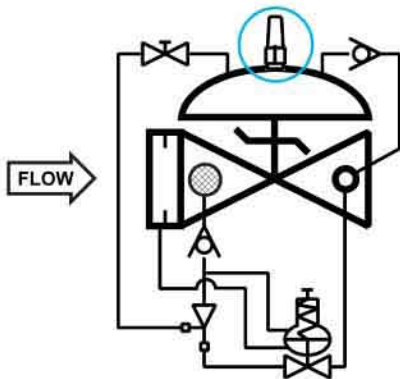
**MODEL 155L MATRIX**

MATERIAL	PART NO.	VALVE TRAVEL
1 1/4" - 1 1/2"	255500	3/8"
2"	255500	1/2"
2 1/2"	255500	3/4"
3"	255500	1"
4"	255501	1 3/8"
6" - 8"	255502	1 1/2" - 2"
10"	255503	2 1/2"
12"	255504	3"
14" - 16"	255505	3 1/2", 4"

MAX WORKING PRESSURE: 300 PSI



**SCHEMATIC SYMBOL**



The Model 155L is shown on OCV Valve schematics as:



EXAMPLE: Shown here on a Model 120-6 Rate of Flow / Check Valve.

**MATERIALS**

- |                    |                 |
|--------------------|-----------------|
| Indicator Rod:     | Monel           |
| Adapter:           | Stainless Steel |
| Housing:           | Aluminum        |
| Sight Glass:       | Pyrex           |
| Sight Glass Seals: | Buna-N          |

**Valve Position Indicator (Liquid Filled) 155L**