

# non-surge check valve

## installation, operating and maintenance instructions

### model 120G-6

#### GENERAL DESCRIPTION

The OCV Model 120G-6 is a fuel service control valve designed to perform the following functions:

1. Modulate as required to prevent flow rate from exceeding a predetermined maximum.
2. Close tightly to prevent backflow in the event of pressure reversal.

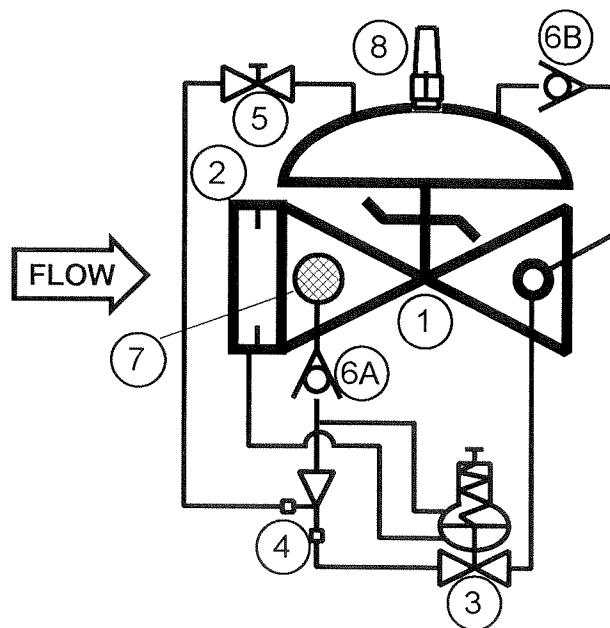
The 120G-6 consists of the following components, arranged as shown on the schematic diagram.

1. **Model 65 Basic Control Valve**, a hydraulically operated, diaphragm actuated, pilot controlled globe valve which closes with an elastomer-on-metal seal.
2. An **orifice plate**, integrally mounted in the upstream valve flange, which provides a differential pressure proportional to the flow rate.
3. **Model 2450 Rate of Flow Control Pilot**, a two-way, normally open control pilot that senses the differential pressure created by the orifice plate and balances it against an adjustable spring load. An increase in differential above the set point tends to make the pilot close.
4. **Model 126 Ejector**, a simple “tee” fitting with a small orifice pressed into its inlet port. The ejector, acting in conjunction with the rate of flow pilot (item 3), allows the valve to open and control the flow rate.
5. **Model 141-2 Needle Valve**, which controls the speed at which the valve opens.

6. Two **Model 141-1 Check Valves**, which give the 120G-6 its check valve feature.
7. **Model 123 Inline Strainer**, which protects the pilot system from solid contaminants in the line fluid.
8. **Model 155L Visual Indicator**, which enables the operator to determine the valve's operating position at a glance.

#### THEORY OF OPERATION

**RATE OF FLOW CONTROL ACTION:** The action of the 120G-6 in its primary mode of rate of flow control is governed by the rate of flow pilot (3) and the ejector (4). The small orifice in the inlet of the ejector may be thought of as a **fixed** source of



inlet pressure. Similarly, the rate of flow pilot may be thought of as a **variable** exhaust to the downstream side of the valve. Now, the main valve diaphragm chamber is connected to the ejector **downstream** of the orifice, therefore the pressure applied to the diaphragm is a **resultant** of the fixed supply provided by the orifice and the variable exhaust provided by the rate of flow pilot. As the pilot moves further open, exhaust becomes greater than supply, pressure on the diaphragm is decreased, and the main valve opens further. Conversely, as the pilot moves further closed, exhaust becomes less than supply, the pressure on the diaphragm is increased, and the main valve closes further.

The rate of flow control pilot moves open or closed based on the differential pressure created across the orifice plate. As the differential, hence the flow rate, increases, the pilot moves further closed. As the differential decreases, the pilot moves further open. As explained above, the main valve follows, or “mirrors” the action of the pilot. The net result is a constant modulation of the pilot and the main valve to hold the flow rate constant.

**CHECK VALVE ACTION:** In the event downstream pressure becomes higher than inlet pressure, check valve (6B) will open, routing downstream pressure straight to the diaphragm chamber. This will force the main valve fully and tightly closed. At the same time, check valve (6A) will close, preventing any backflow through the pilot system.

## INSTALLATION

The 120G-6 is furnished fully factory-assembled, ready for installation at the appropriate point in the system, typically on the discharge of a pump. Please refer to the Model 65 Basic Valve section of this manual for full installation details.

## STARTUP AND ADJUSTMENTS

Please follow these procedures, step-by-step, in performing an initial startup of the 120G-6. Also, refer to the appropriate steps in the procedures should re-adjustment ever be required.

1. Remove the protective cap from the rate of flow pilot (3). Turn the adjusting screw **fully counter-clockwise**.

2. Loosen the adjusting screw jam nut on the needle valve (5). Turn the adjusting screw **fully clockwise**, then **counter-clockwise** three full turns.
3. Carefully loosen the small pipe plug in the top of the indicator (8) housing until fluid appears around the threads. When only clear fluid (no air) is discharging re-tighten the plug.
4. Start the pump. The valve should open to a relatively low flow position.
5. Slowly turn the adjusting screw of the rate of flow pilot (3) **clockwise** until flow rate increases to the designated set point. Replace the protective cap.
6. Shut down the pump and observe that the valve closes.

## MAINTENANCE

The 120G-6 requires little in the way of routine maintenance. However, the following checks, periodically performed, will do much to keep the valve operating properly and efficiently.

1. Check for leaks at fittings and around flanges and connections. Tighten as required.
2. Check to make sure the valve is maintaining the proper flow rate. Readjust as required.

## TROUBLESHOOTING

In the event of malfunction of the 120G-6, the following guide should enable the technician to isolate the cause of the problem and take the appropriate corrective action.

### MAIN VALVE FAILS TO OPEN OR FLOW RATE TOO LOW (PUMP ON)

1. Isolation valve closed upstream or downstream of 120G-6 — Open as required.
2. Needle valve (5) closed — Open as required. See Adjustment Instructions.
3. Rate of flow pilot (3) adjusted too far counter-clockwise — See Adjustment Instructions.
4. Stem of rate of flow pilot (3) binding — Disassemble pilot and determine cause. See the 2450 Pilot section of this manual.
9. Stem of main valve binding or diaphragm rup-

tured — Disassemble main valve and determine cause. See the Model 65 Basic Valve section of this manual.

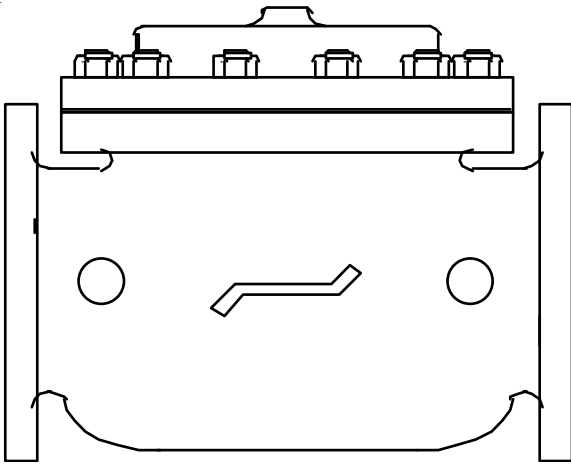
#### MAIN VALVE FAILS TO CLOSE (PUMP OFF)

1. Isolation valve closed downstream of 120G-6 — Open as required.
2. Check valve (6B) stuck closed — Repair or replace as necessary.
3. Check valve (6A) leaking — Repair or replace as necessary.
4. Main valve stem binding, seat deteriorated, or its diaphragm ruptured — Disassemble main valve and determine cause. See the Model 65 Basic Valve section of this manual.

#### FLOW RATE TOO HIGH (PUMP ON)

1. Needle valve (5) fully closed — Open as required. See Adjustment Instructions.
2. Rate of flow pilot (3) adjusted too far clockwise — See Adjustment Instructions.
3. Stem of rate of flow pilot (3) binding or its diaphragm ruptured — Disassemble pilot and determine cause. See the 2450 Pilot section of this manual.
4. Check valve (6B) leaking — Repair or replace as necessary.
5. Check valve (6A) stuck closed — Repair or replace as necessary.
6. Main valve stem binding — Disassemble main 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

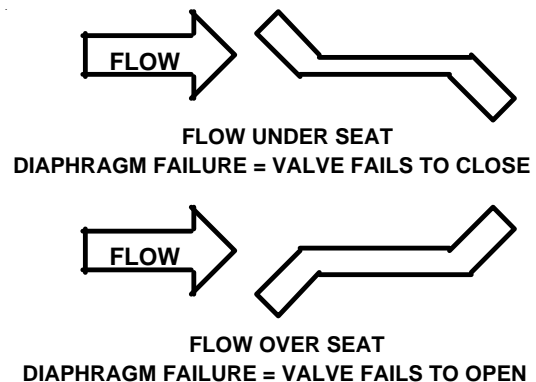
1. Isolate the valve from the system by closing upstream and downstream block valves.
2. Loosen one of the tubing connections on the bonnet. Allow any residual pressure to bleed off.
3. Remove all tubing connected at the bonnet.
4. Remove the bonnet nuts.
5. Remove the bonnet. If the bonnet sticks in 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**

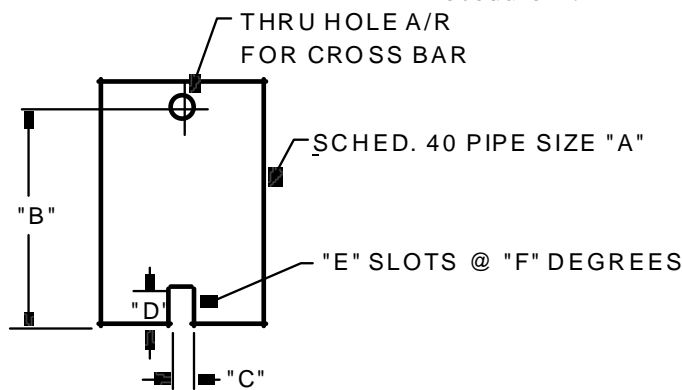
1. Perform Steps 1 and 2 of Procedure B, above.
2. With the spool assembly removed from the body, remove the seat retainer screws.
3. Slide the seat retainer off the lower end of the stem.
4. Remove the seat disc from its groove in the spool.  
*NOTE: The seat disc may fit quite tightly in the groove. 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.*

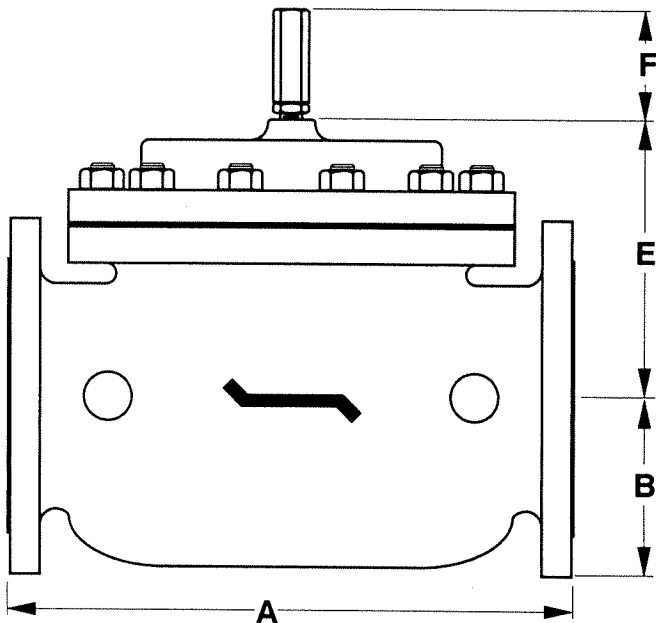
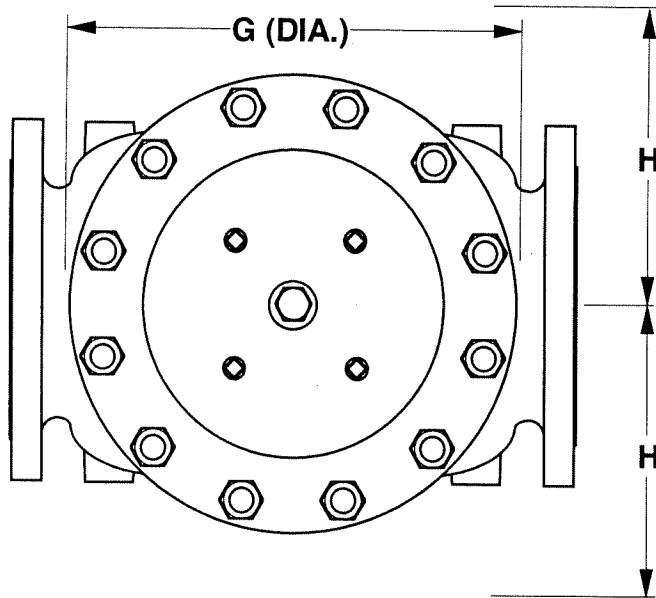
1. Perform Steps 1 and 2 of Procedure B, above.
2. If you are working on a 4" or smaller valve, follow Steps 3 thru 9, below.
3. If you are working on a 6" or larger valve, follow Steps 10 thru 16, below.

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.

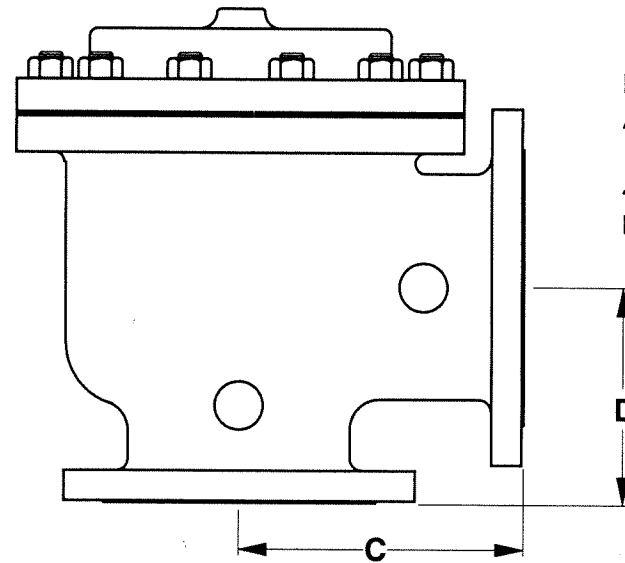


VALVE SIZE	"A" PIPE SIZE	"B" MIN. LENGTH	"C" SLOT WIDTH	"D" SLOT DEPTH	"E" NO. OF SLOTS	"F" SLOT SPACING
1-1/4"	3/4"	6"	3/8"	3/8"	2	180°
1-1/2"	3/4"	6"	3/8"	3/8"	2	180°
2"	1-1/2"	7"	3/8"	3/8"	2	180°
2-1/2"	2"	8"	1/2"	1/2"	3	120°
3"	2-1/2"	9"	5/8"	5/8"	2	180°
4"	3"	10"	5/8"	5/8"	2	180°

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	S.E	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 <b>A</b>	DRAWING NUMBER <b>65D</b>
CHKD. BY	DATE		REV. <b>B</b>

# 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**

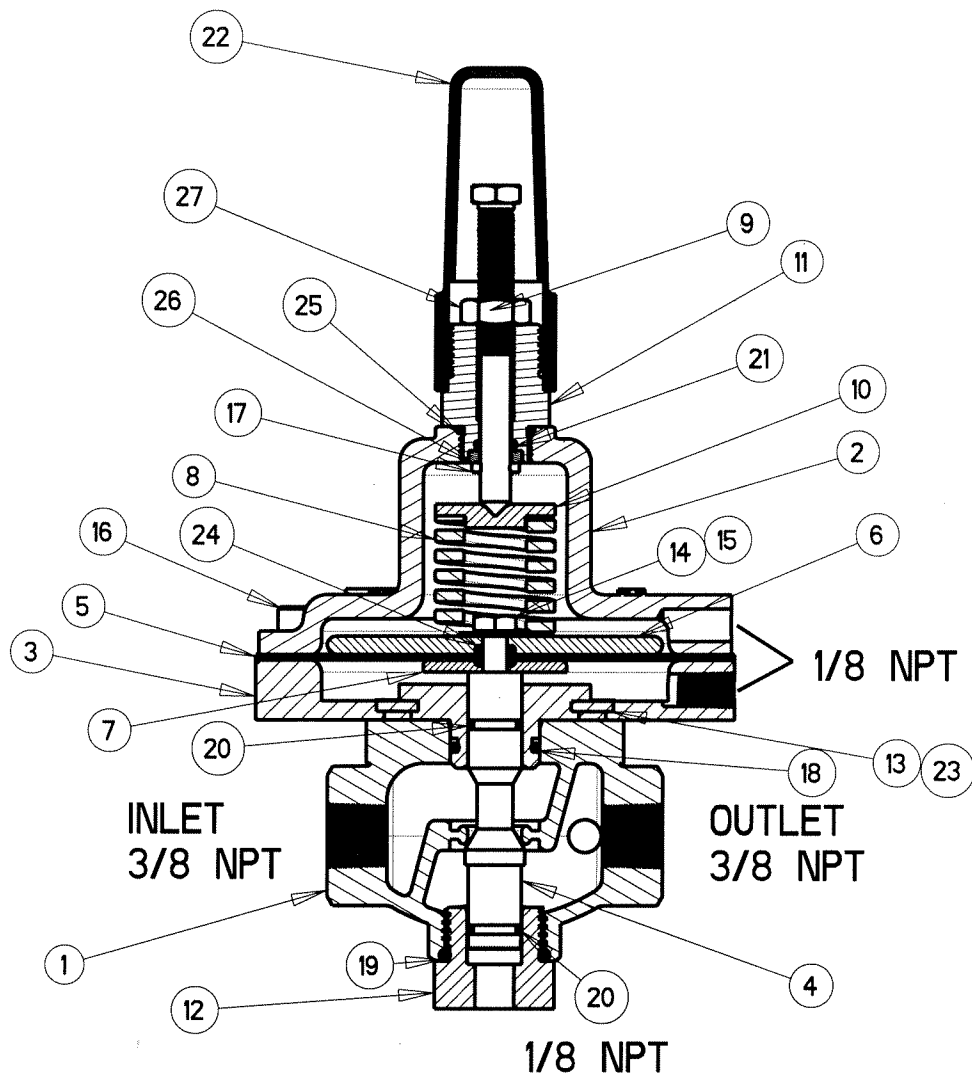
Because of the simplicity of design of the 2450 pilot, required maintenance is minimal. Fitting and bolts should be periodically checked for tightness and the body should be inspected for damage or excessive buildup of foreign material.

### **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				B.K.	11-9-07	A	2450	
							SCALE	CHKD BY	DATE			
							1/2					

**DESCRIPTION**



**MODEL 126 EJECTOR**  
 The Model 126 ejector is a simple tee fitting with a fixed orifice in its inlet port. It provides the proper supply pressure to the main valve diaphragm chamber, allowing various two-way control pilots to control the valve position.

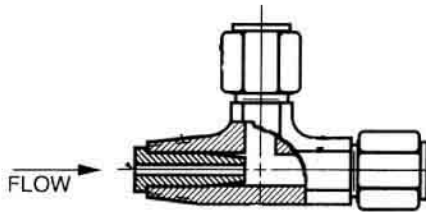
**MODEL 126 EJECTOR DIAGRAM**

Brass Construction / Stainless Steel Construction

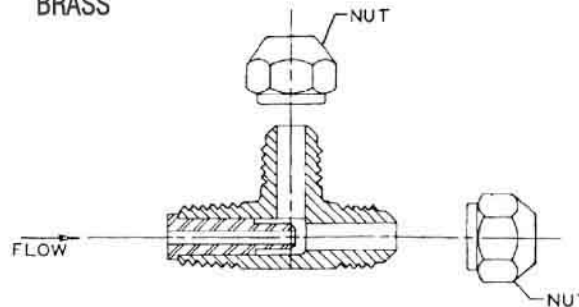
MATERIAL	PART NUMBER	P (NPT)	T-TUBE O.D.	STD. ORIFICE	USED ON VALVE SIZES
Brass	213100	3/8"	3/8"	.125"	1 1/4"-6"
Brass	214100	1/2"	1/2"	.188"	8"-10"
Brass	215100	3/4"	3/4"	.188"	12"-16"
316 Stn. Steel	213700	1/4"	3/8"	.090"	1 1/4"-6"
316 Stn. Steel	214700	3/8"	1/2"	.125"	8"-10"
316 Stn. Steel	215700	1/2"	3/4"	.188"	12"-16"

Orifice bushings are stainless steel.

STAINLESS

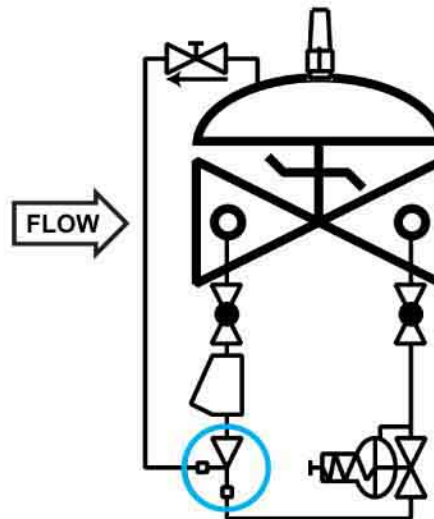
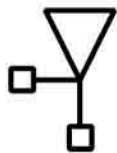


BRASS



**SCHEMATIC SYMBOL**

The Model 126 Ejector is shown on OCV Valve Schematics as:



EXAMPLE: Shown here on a MODEL 127-3 Pressure Reducing Valve

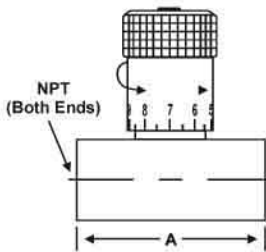
## DESCRIPTION

The Model 141-2 Needle Valve is an adjustable restriction device installed in the control circuit tubing. The setting of the needle valve meters the flow into and out of the main valve diaphragm chamber, thus controlling the response speed of the main valve. Depending on the application, the needle valve may be used as a closing speed control, opening speed control, or both simultaneously.



◀ Needle Valves shown  
Sizes: 3/4" & 1/4"

## MODEL 141-2 MATRIX

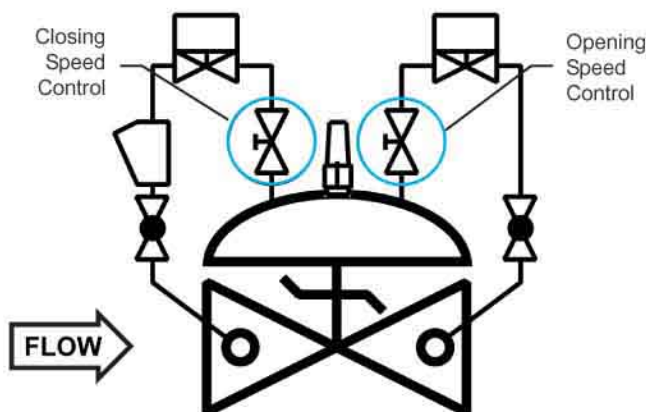
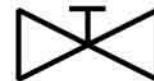


MATERIAL	PART NUMBER	INLET/OUTLET (NPT)	A	USED ON VALVE SIZE*
Brass	683100	1/4	2	1 1/4"-2"
Brass	683101	3/8	2 1/4	2 1/2"-6"
Brass	683102	1/2	2 5/8	8"-10"
Brass	683103	3/4	3 1/4	12"-16"
Stn. Steel	683700	1/4	2	1 1/4"-2"
Stn. Steel	683702	3/8	2 1/4	2 1/2"-6"
Stn. Steel	682704	1/2	2 5/8	8"-10"
Stn. Steel	683703	3/4	3 5/8	12"-16"

Note: Needle valve size may vary on valve application. Consult factory.

## SCHEMATIC SYMBOL

The Model 141-2 Needle Valve is shown on OCV Valve Schematics as:



EXAMPLE: Shown here on a MODEL 115-3 DIGITAL VALVE as separate opening and closing speed controls.

**DESCRIPTION**

The Model 141-1 Check Valve uses a spring-loaded poppet that will allow flow in one direction only. It is the primary component used on valves with a reverse flow check function. Flow is in the direction of the arrow on the check valve body.



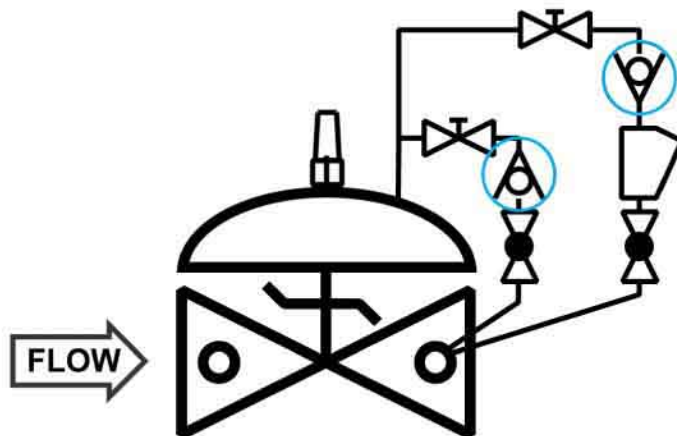
◀ Check Valves shown  
Stainless Steel & Brass

**MODEL  
141-1  
MATRIX**

MATERIAL	PART NUMBER	INLET/OUTLET (NPT)	LENGTH	USED ON VALVE SIZE
Bronze	681100	3/8	2	1 1/4"-6"
Bronze	681101	1/2	2 1/8	8"-10"
Bronze	681102	3/4	2 1/4	12"-16"
Stn. Steel	681700	3/8	2 5/16	1 1/4"-6"
Stn. Steel	681701	1/2	2 5/16	8"-10"
Stn. Steel	681702	3/4	2 7/8	12"-16"

**SCHEMATIC  
SYMBOL**

The Model 141-1 Check Valve is shown on OCV Valve Schematics as:



EXAMPLE: Shown here on a  
MODEL 94-3 Check Valve.

**Check Valve 141-1**

## DESCRIPTION

The Model 141-1 Check Valve uses a spring-loaded poppet that will allow flow in one direction only. It is the primary component used on valves with a reverse flow check function. Flow is in the direction of the arrow on the check valve body.



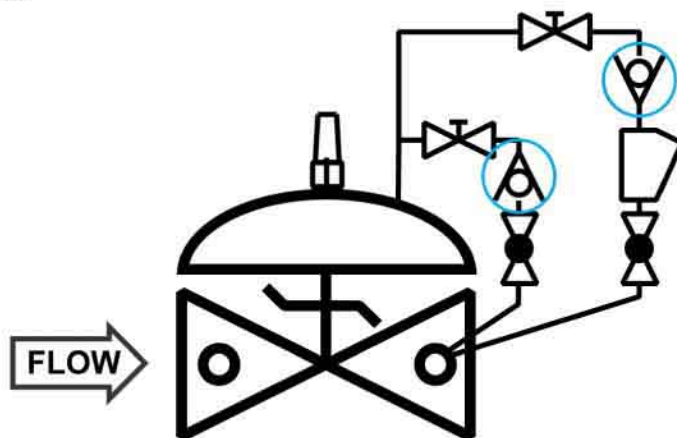
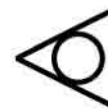
◀ Check Valves shown  
Stainless Steel & Brass

## MODEL 141-1 MATRIX

MATERIAL	PART NUMBER	INLET/OUTLET (NPT)	LENGTH	USED ON VALVE SIZE
Bronze	681100	3/8	2	1 1/4"-6"
Bronze	681101	1/2	2 1/8	8"-10"
Bronze	681102	3/4	2 1/4	12"-16"
Stn. Steel	681700	3/8	2 5/16	1 1/4"-6"
Stn. Steel	681701	1/2	2 5/16	8"-10"
Stn. Steel	681702	3/4	2 7/8	12"-16"

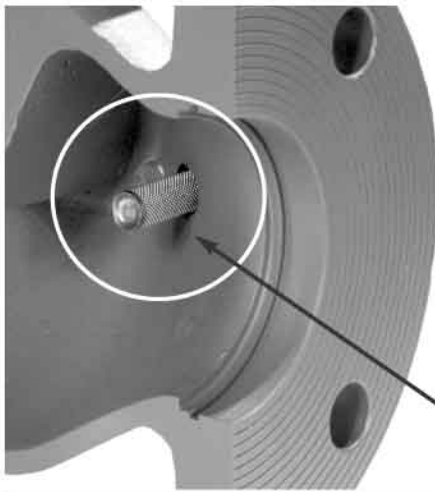
## SCHEMATIC SYMBOL

The Model 141-1 Check Valve is shown on OCV Valve Schematics as:



EXAMPLE: Shown here on a MODEL 94-3 Check Valve.

**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**

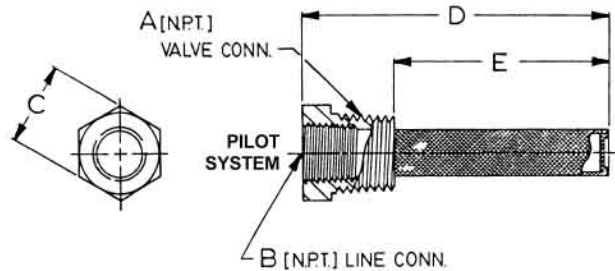
PART NUMBER	A	B	C	D	E	USED ON VALVE SIZE
660704	3/8	1/4	11/16	2 3/16	1 1/2	1 1/4"-6"
660705	1/2	3/8	7/8	2 1/4	1 1/2	8"-10"
660706	3/4	1/2	1 1/8	2 3/8	1 1/2	12"-16"

**MATERIALS**

Inline strainers are all-stainless steel construction.

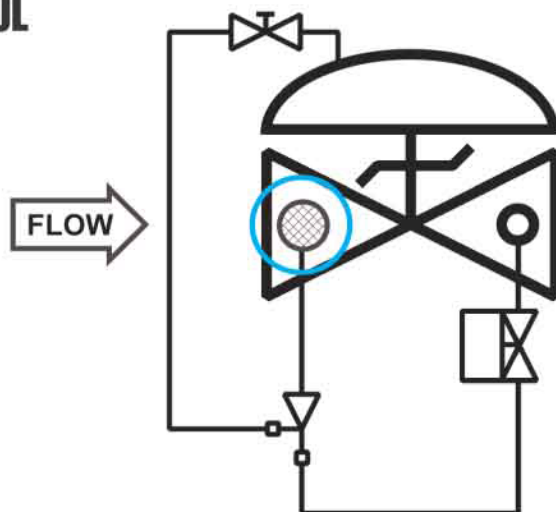
**SCREEN SIZE**

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.

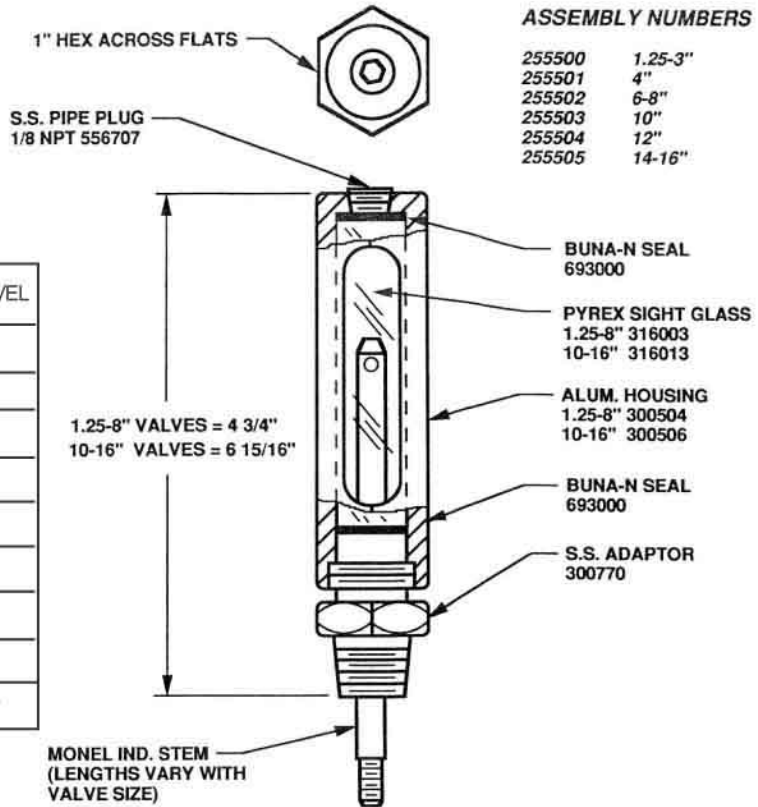
**WHERE USED** - The 155L is the standard visual indicator on fuel service valves. Optional on virtually any control valve not already employing a limit switch or position transmitter.



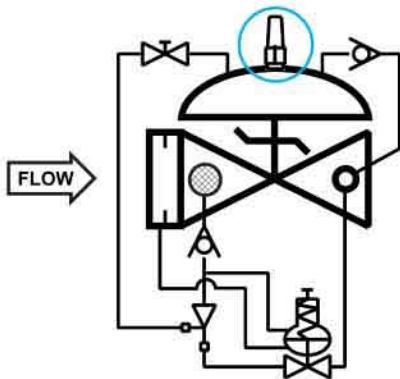
**MODEL 155L MATRIX**

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**