Operating Manual

Model #: 114-2
Size:
Serial #:
Sales Order:

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OCV Control Valves™ LLC

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installation, operating and maintenance instructions

truck loading valve (TLV)

model 114-2

GENERAL DESCRIPTION

The OCV Model 114-2 is a control valve specifically designed for aircraft refueling service. Referred to as either a refueling control valve or hydrant control valve, it performs the following functions:

1. Opens and closes hydraulically from a deadman control handle.
2. While open, modulates to control downstream pressure at a predetermined set point.
3. Prevents flow rate from exceeding a predetermined maximum.
4. Closes rapidly to prevent undue pressure buildup due to a rapid reduction in demand.

The 114-2 consists of the following components, arranged as shown on the schematic diagram.

1. **Model 65 Basic Valve Assembly,** a hydraulically operated, diaphragm actuated globe valve which closes with an elastomer-on-metal seal.
2. An **Orifice Plate,** integrally installed in the valve inlet flange. The orifice plate provides a differential pressure, proportional to flow rate, for sensing the rate of flow control pilot (item 4).
3. **Model 1340 Pressure Reducing Pilot,** a two-way, normally-open control pilot which senses downstream pressure under its diaphragm and balances it against an adjustable spring load. An increase in pressure above the set point tends to make the pilot close.
4. **Model 2450 Rate of Flow Control Pilot,** a two-way, normally-open control pilot which senses orifice plate differnetial pressure across its diaphragm and balances it against an adjustable spring load. An increase in differential, hence flow rate, above the set point tends to make the pilot close.
5. **Model 2430 Deadman Control Pilot,** a two-way, normally-closed pilot valve which acts as a relay between the deadman handle and the valve.
6. **Model 1330 Surge Control Pilot,** a two-way, normally-closed control pilot which senses downstream pressure under its diaphragm and balances it against an adjustable spring load. An increase in pressure above the set point tends to make the pilot open.
7. **Model 126 Ejector,** a simple "tee" fitting with a fixed orifice in its inlet port. It provides the proper pressure to the diaphragm chamber of the main valve depending on the positions of the reducing and solenoid pilots.
8. **Model 141-3 Flow Control Valve,** a needle-type valve which provides adjustable, restricted flow in one direction, and free flow in the opposite direction. On the 114-2 the flow control valve is connected as an **opening speed control**.
9. **Two Model 141-1 Check Valves,** that allow the vlave to open for retrun flow and thermal relief.
10. **Model 123 Inline Strainer,** which protects the pilot system from solid contaminants in the line fluid.
11. **Model 155L Visual Indicator** that allows the user to determine the valve's oiperating position at a glance.

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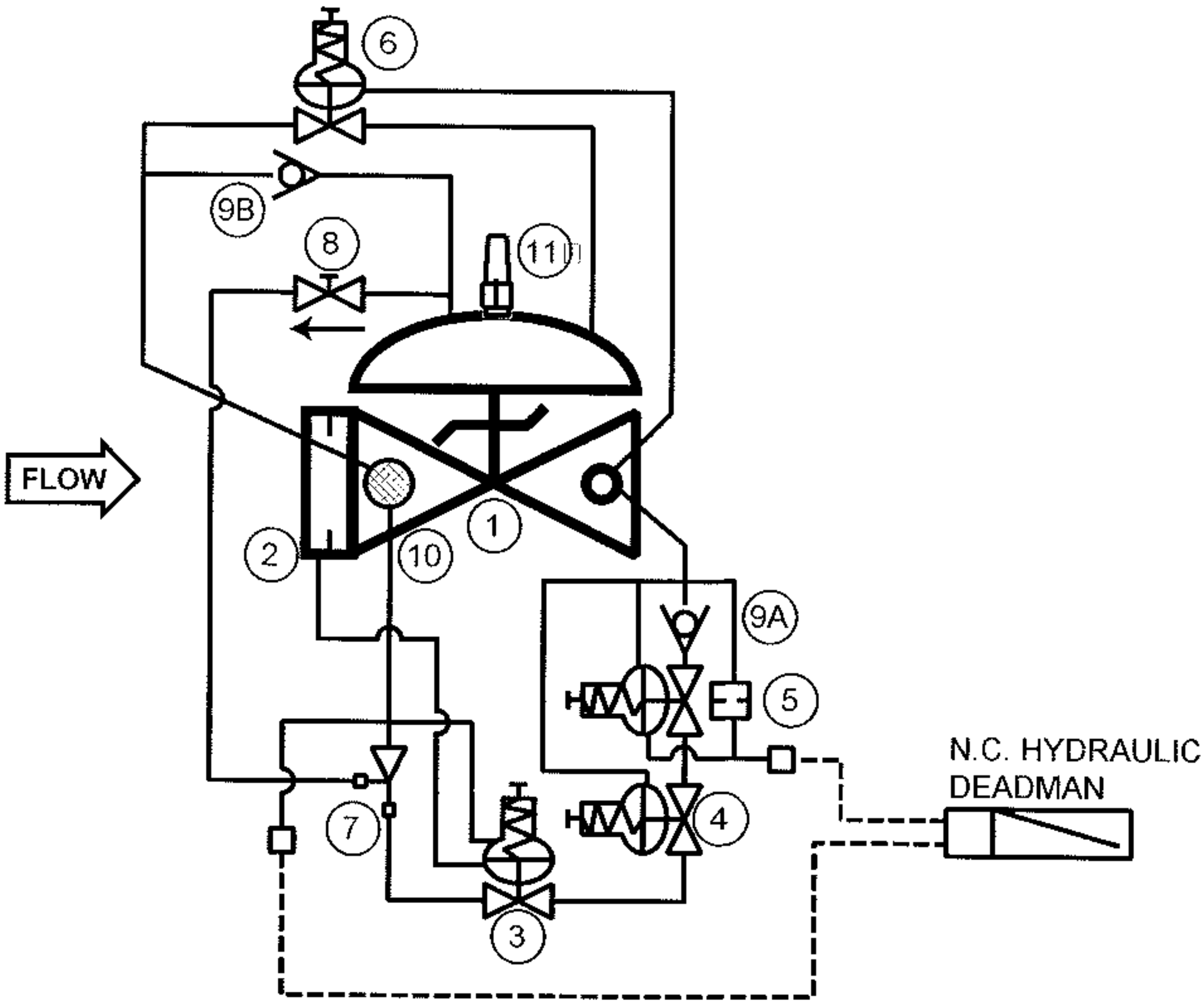

12. A **Hydraulic Deadman Handle** to place the valve in or out of operation.

THEORY OF OPERATION

PRESSURE REDUCING ACTION: To understand how the 114-2 operates, it is best to start with the **ejector (7).** Due to the orifice in its upstream port, the ejector creates a pressure drop proportional to the flow through it. The flow through the ejector is in turn controlled by the degree of opening of the **pressure reducing pilot (3).** The wider the pilot opens, the **greater the flow** through the ejector and the **lower the pressure** downstream of the orifice. Conversely, the **more** the pilot **closes**, the **lower the flow** through the ejector and the **greater the pressure** downstream of the orifice.

Now not that the diaphragm chamber of the **main valve (1)** is connected to the branch port of the ejector and is thus downstream of the orifice. In this manner, the pressure in the diaphragm chamber of the main valve is in fact controlled by the pressure reducing pilot. As the diaphragm pressure **decreases**, the main valve **opens**; as the diaphragm pressure **increases**, the main valve **closes**.

The pressure reducing pilot senses the pressure at the discharge of the valve. As the pressure tends to increase above the set point, the pilot moves further closed. This results in an increase in pressure in the diaphragm chamber of the main valve. The valve then closes slightly to restore the downstream pressure to the set point. Conversely, as the pressure tends to decrease below the set point, the pilot moves further open. This results in a decrease in pressure in the diaphragm chamber of the main valve. The main valve then opens wider to bring the downstream pressure back up to the set point. The net result of all this is a constant modulating action by the pilot and main valve and a downstream pressure which remains constant despite fluctuations in inlet pressure or demand.

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RATE OF FLOW CONTROL ACTION: The **rate of flow control pilot (4)** is also connected downstream of the ejector, and modulates the main valve in much the same way as the pressure reducing pilot. However, rather than sensing downstream pressure, this pilot senses the differential pressure across the **orifice plate (2)** installed in the main valve inlet flange. The differential produced by the orifice plate is proportional to the flow rate through the valve. An increase in the differential above the set point, will tend to make the pilot and the main valve close to prevent the flow rate from exceeding the predetermined maximum.

SURGE CONTROL ACTION: As explained above, the main valve tends to close as downstream pressure rises above the set point. However, the speed of this closure is limited by the size of the orifice in the ejector. In the event of a rapid reduction in demand, such as might be caused by the closure of an aircraft tank valve, the valve may not be able to close fast enough to prevent the pressure from rising beyond established limits. For this reason, the 114-2 is equipped with a **surge control pilot (6).** This normally-closed pilot valve is connected directly between the inlet of the valve and the diaphragm chamber, and, like the pressure reducing pilot, senses downstream pressure. It is normally set 5-10 psi higher than the reducing pilot, therefore under normal conditions it is closed and has no effect on valve operation. However, if pressure does rise to its set point, the surge control pilot opens and sends a large volume of fluid to the main valve diaphragm chamber, causing the valve to close at a rate much greater than that which can be obtained through the ejector. Therefore downstream pressure build up is held to a minimum.

DEADMAN CONTROL ACTION: Squeezing the trigger of the deadman handle opens the **deadman control pilot (5),** allowing the valve to open and come under control of the pressure reducing pilot, as described above. Releasing the trigger closes the pilot. This completely blocks the discharge side of the pilot system and allows full inlet pressure to build up in the diaphragm chamber of the main valve. Thus the main valve moves to the full closed position.

INSTALLATION

1. The 114-2 is furnished fully factory-assembled and ready for installation at the appropriate point in the system. The user is referred to the Model 65 Basic Valve section of this manual for full installation details.
2. The normally-closed hydraulic deadman handle is then connected to the pilot system as shown in the schematic diagram.

STARTUP AND ADJUSTMENTS

The following procedures should be followed in the order presented in order to effect an initial startup of the 114-2.

1. Remove the plastic cap from the deadman control pilot (5). Turn the adjusting screw fully **clockwise**. *CAUTION: Do not attempt to force the adjusting screw too far.*
2. Remove the plastic cap from the pressure reducing pilot (3) and loosen the adjusting screw jam nut. Turn the adjusting screw **clockwise** to a full stop.
3. Remove the plastic cap from the rate of flow control pilot (4). Turn the adjusting screw **clockwise** to a full stop.
4. Remove the plastic cap from the surge control pilot (6) and loosen the adjusting screw jam nut. Turn the adjusting screw **clockwise** to a full stop.
5. Loosen the adjusting screw jam nut on the opening speed control valve (8). Turn the adjusting screw **fully clockwise**, then **counterclockwise** three full turns.
6. Connect the refueling nozzle at the receiving vessel.
7. Start the pump or otherwise pressurize the system. The valve should remain closed.
8. Carefully loosen one of the pipe plugs in the main valve bonnet until fluid appears around the threads. When only clear fluid (no air) is discharging, retighten the plug.
9. Squeeze and hold the trigger of the deadman handle. The valve should open. If it does not, slowly turn the adjusting screw of the deadman pilot (5) **counterclockwise** until the valve does open.

10. Slowly turn the adjusting screw of the pressure reducing pilot (3) **counterclockwise** until the downstream pressure decreases to the desired set point **plus 10 psi**.
11. Slowly turn the adjusting screw of the surge control pilot (6) **counterclockwise** until the pressure falls to the set point **plus 5 psi.** Tighten the adjusting screw jam nut and replace the plastic cap.
12. Slowly turn the adjusting screw of the pressure reducing pilot (3) **counterclockwise** until the pressure falls to the set point. Tighten the adjusting screw jam nut and replace the plastic cap.
13. Open downstream valves to increase demand as necessary to increase the flow rate slightly above desired maximum.
14. Slowly turn the adjusting screw of the rate of flow pilot (4) **counterclockwise** until flow rate decreases to the desired maximum. Replace the plastic cap.
15. Release the trigger of the deadman handle and observe that the valve closes.
16. Shut down the system.
17. Replace the plastic cap on the deadman pilot (3).
18. In case readjustment of the 114-2 should be required, the following summarizes the adjustment of the five adjustable controls on the 114-2.
    (a) Pressure Reducing Pilot (3): **Clockwise** to **increase** downstream pressure.
    (b) Surge Control Pilot (6): **Clockwise** to **increase** downstream pressure.
    (c) Rate of Flow Control Pilot (4): **Clockwise** to **increase** flow rate.
    (d) Deadman control pilot (5): **Clockwise** to **increase** tendency of valve to close when trigger of deadman handle is released.
    (e) Flow Control Valve (8): **Clockwise** to **decrease** valve opening speed. *CAUTION: Never close this valve fully. To do so will prevent the valve from opening at all.*

MAINTENANCE

Because of the simplicity of design of the 114-2, required maintenance is minimal. However, the following checks, periodically performed, can do much to keep the valve operating properly and efficiently.

1. Check for chipped or peeling paint. Touch up as required.
2. Check for leaks at fittings and around flanges and connections. Tighten as required.
3. Check the deadman hoses for leaks, abrasion, or signs of undue wear. Replace hoses as necessary.

TROUBLESHOOTING

In the event of malfunction of the 114-2, 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 PRESSURE TOO LOW

1. Valve closed upstream or downstream of 114-2 — Open as required.
2. Trigger of deadman handle not depressed — Depress as required.
3. Flow control valve (8) fully closed — Open as required. See Adjustment Instructions.
4. Pressure reducing pilot (3) adjusted too far counterclockwise — See Adjustment Instructions.
5. Surge control pilot (6) adjusted too far counterclockwise — See Adjustment Instructions.
6. Rate of flow control pilot (4) adjusted too far counterclockwise — See Adjustment Instructions.
7. Deadman control pilot (5) adjusted too far clockwise — See Adjustment Instructions.
8. Deadman control stem binding or diaphragm ruptured — See the 2430 Pilot section of this manual.
9. Stem of pressure reducing pilot (3) binding — Disassemble pilot and determine cause. See the 1340 Pilot section of this manual.
10. Stem of surge control pilot (6) binding or seat deteriorated — Disassemble pilot and determine cause. See the 2470 Pilot section of this manual.
11. Stem of main valve (1) binding or diaphragm rup-

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

MAIN VALVE FAILS TO CLOSE OR PRESSURE TOO HIGH

1. Defective deadman handle — Repair or replace as necessary.
2. Deadman control pilot (5) adjusted too far counterclockwise — See Adjustment Instructions.
3. Pressure reducing pilot (3) adjusted too far clockwise — See Adjustment Instructions.
4. Deadman control pilot (5) stem binding or seat deteriorated — See the 2430 Pilot section of this manual.
5. Stem of pressure reducing pilot (3) binding or seat deteriorated — Disassemble pilot and determine cause. See the 1340 Pilot section of this manual.
6. Strainer (10) or ejector (7) clogged — Clean as required.
7. Stem of main valve (1) binding or object caught in valve — Disassemble valve and determine cause. See the Model 65 Basic Valve section of this manual.

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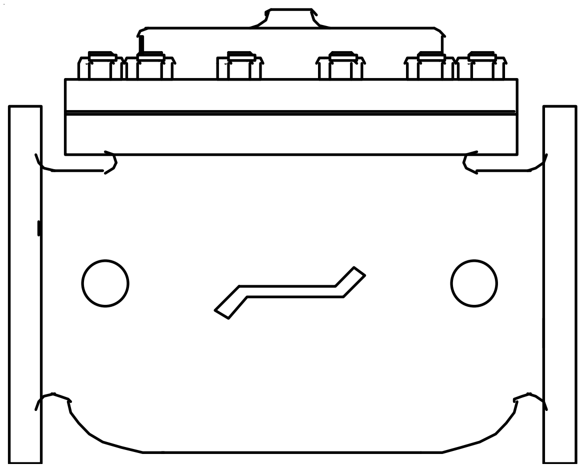


installation, operating, and maintenance instructions

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 examination 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

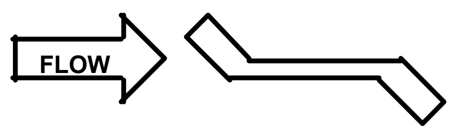
   **A diaphragm failure can prevent the valve from either opening or closing, depending on the flow direction. Most water service valves flow "under the seat", in which case a diaphragm failure will keep the valve from closing. On the other hand, most fuel service valves flow "over the seat", in which 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

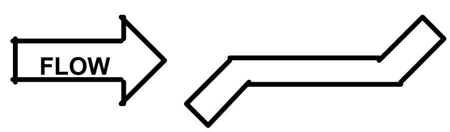
1. Isolate the valve from the system by closing upstream amd downstream block valves.
2. Loosen one of the tubing connections on the bonnet. Allow any residual pressure to bleed off.
3. Remove all tubing connected at the bonnet.
4. Remove the bonnet nuts.
5. Remove the bonnet. If the bonnet sticks in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



FLOW UNDER SEAT
DIAPHRAGM FAILURE = VALVE FAILS TO CLOSE



FLOW OVER SEAT
DIAPHRAGM FAILURE = VALVE FAILS TO OPEN

   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.

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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.

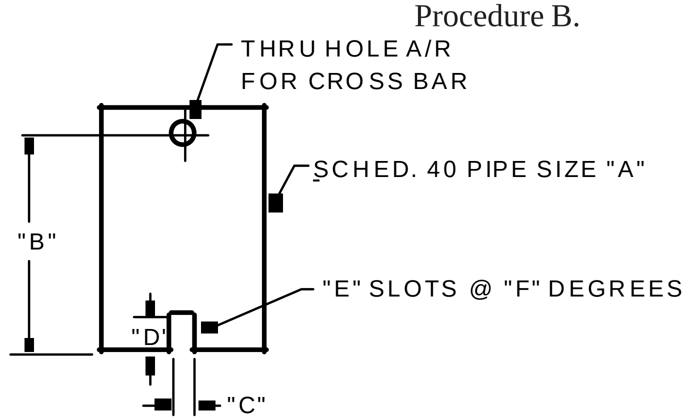
PROCEDURE C: SEAT DISC REPLACEMENT

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°

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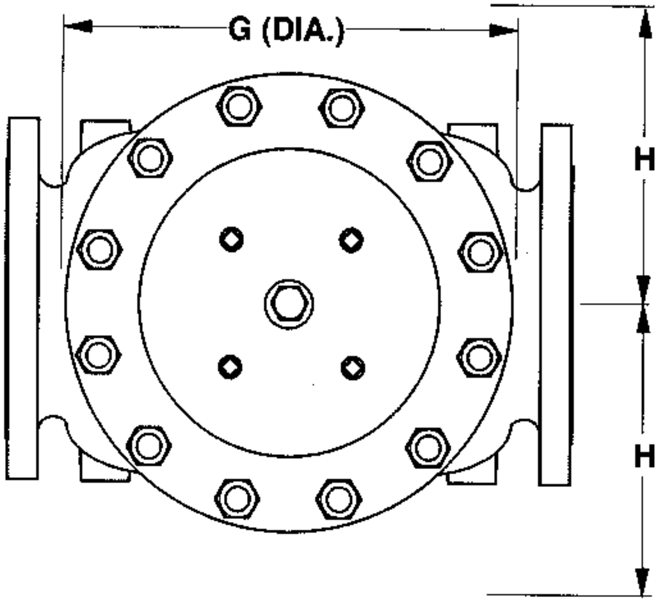
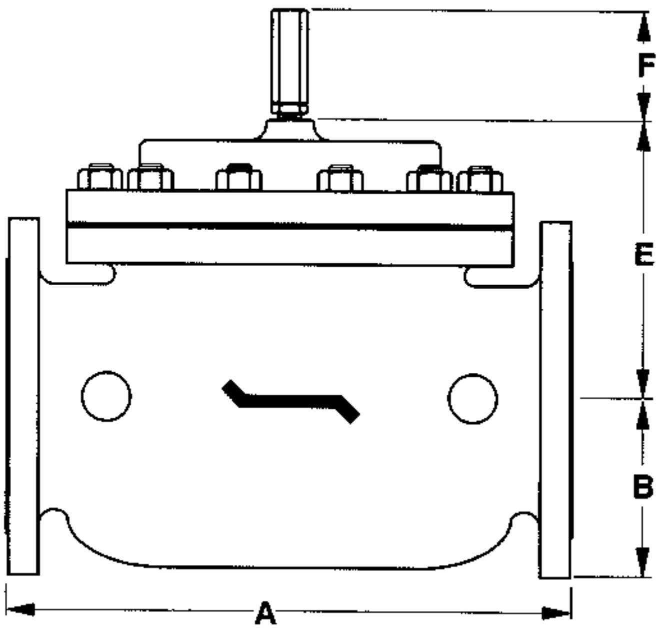
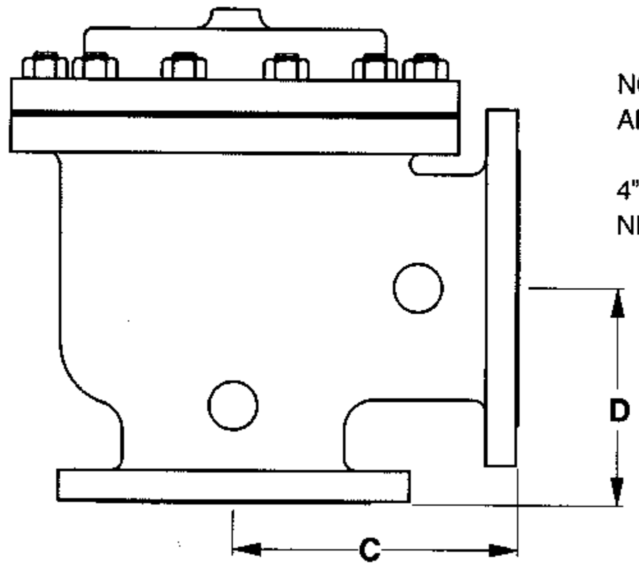


DIM	ANSI CLASS	VALVE SIZE												
		1 1/4	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	24
A	S.E	8.75	8.75	9.88	10.50	13.00	–	–	–	–	–	–	–	–
	150	8.50	8.50	9.38	10.50	12.00	15.00	17.75	25.38	29.75	34.00	39.00	40.38	62.00
	300	8.75	8.75	9.88	11.12	12.75	15.62	18.62	26.38	31.12	35.50	40.50	42.00	63.75
B	SE	1.44	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

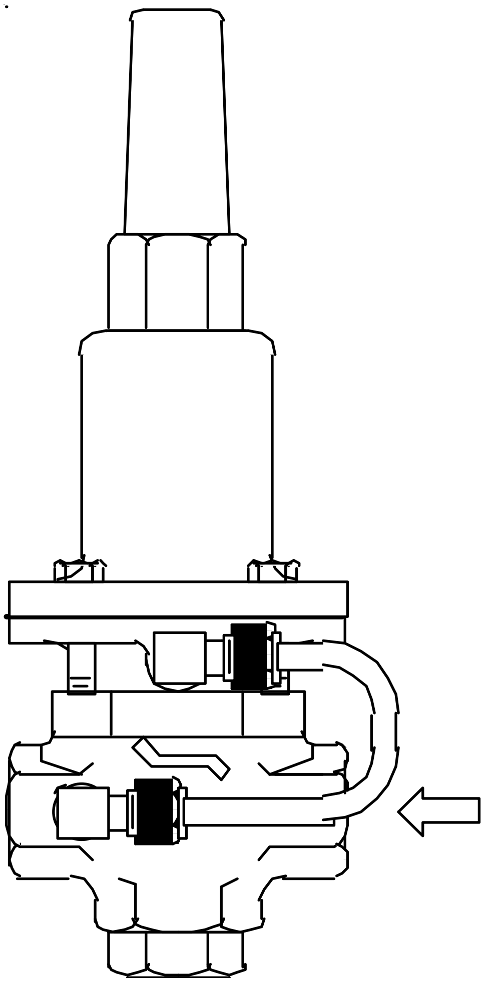
TOLERANCES
UNLESS NOTED
FRACTIONAL ±1/64
DECIMAL ±.005
MACH. FINISH 125√
ANGULAR ±1/2°

DRAWN BY	DATE
SDJ	10-6-97
CHKD. BY	DATE

OCV Control Valves
TULSA, OKLAHOMA U.S.A.

GENERAL VALVE DIMENSIONS

SIZE	DRAWING NUMBER	REV.
A	65D	B



installation, operating,
and
maintenance instructions

pressure reducing pilot

model 1340

GENERAL DESCRIPTION

The Model 1340 Pressure Reducing Pilot is a normally-open, direct-acting, spring-loaded, diaphragm-type control pilot. As the primary control pilot for the OCV Series 127 control valves, it is designed to maintain a constant preset discharge pressure from the main valve. It is a constant throttling device, maintaining precise, positive control of the main valve.

The 1340 may also be used by itself as a downstream pressure regulator.

The 1340 is available in bronze or stainless steel construction and with 3/8 NPT or 1/2 NPT end connections.

The 1340 is available with four different adjustment ranges:

5-30 psi	65-180 psi
20-80 psi	100-300 psi

FUNCTIONAL DESCRIPTION

The 1340 controls the pressure in the diaphragm chamber of the main valve, hence the degree of opening or closing of the valve. The downstream pressure is sensed under the diaphragm of the pilot and is balanced against an adjustable spring load. As the downstream pressure decreases below the set point, the pilot opens wider, decreasing the pressure in the diaphragm chamber of the main valve, opening the valve a proportionate amount. Conversely, as downstream pressure increases above the set point, the pilot closes further, increasing the pressure in the diaphragm chamber of the main valve, closing the valve a proportionate amount. The net result is a constant modulating action of the pilot and main valve, keeping the downstream pressure at the set point within very close limits.

INSTALLATION AND ADJUSTMENT

The 1340 is normally installed in the main valve control piping between the ejector and the downstream body tap. Flow must be in the direction indicated. In most cases, a sense line is factory installed between the diaphragm sense port and the downstream pilot body side port, as shown in the drawing. The pilot can also be remote sensed by running a line (typically 1/4" O.D. tubing) from the 1/8 NPT connection under the pilot diaphragm to the desired downstream point where the pressure control is desired.

Pressure adjustment is made by means of the single adjusting screw:

Clockwise adjustment **increases** downstream pressure.

Counterclockwise adjustment **decreases** downstream pressure.

MAINTENANCE

Required maintenance of the 1340 is minimal. Fittings and bolts should be periodically checked, and the body should be inspected for damage or excessive buildup of foreign material.

TROUBLESHOOTING

Other than improper adjustment, there are basically only three malfunctions which can occur with the 1340 pilot. These, and the symptoms they can cause, are as follows:

1. PILOT DIAPHRAGM RUPTURED: Results in failure of the main valve to close and/or downstream pressure that is too high. A ruptured pilot diaphragm will be evidenced by leakage through the vent hole in the pilot bonnet.
2. PILOT SEAT DISC DETERIORATED: Results in a downstream pressure that drifts too high under dead-end (zero flow) conditions.
3. PILOT STEM BINDING: Typically results in poor pressure control, though in extreme cases, it can result in failure of the main valve to open or close.

REPAIR PROCEDURES

Refer to the 1340 assembly drawing for parts identification.

A. DIAPHRAGM REPLACEMENT

1. Prior to disassembling the pilot, turn the adjusting screw (10) fully counterclockwise until it is loose enough to be turned with the fingers.
2. Remove the four bonnet capscrews (17).
3. Remove the bonnet (2). Set the spring (9) and spring retainers (11) aside in a safe place.
4. Remove the plug (4) from the bottom of the pilot.
5. Using a 7/16" socket as a backup on capscrew (12), remove hex nut (16), lockwasher (22), upper diaphragm plate (8) and o'ring (20).
6. Remove old diaphragm (5).
7. Inspect both diaphragm plate o'rings (20). Replace if necessary.
8. Place new diaphragm on stem (7).
9. Replace upper diaphragm plate (8), o'ring (20), lockwasher (22) and hex nut (16). Tighten securely.
10. Reinstall plug (4).
11. Hold spring (9) and spring retainers (11) together in the proper orientation, and insert them into the bonnet (2).
12. Place the bonnet over the adapter, and insert the bonnet capscrews (17). Tighten securely.
13. Place valve back in service, following the startup and adjustment procedures given in the main portion of this manual.

B. SEAT DISC REPLACEMENT

1. Follow Steps 1 through 4 under DIAPHRAGM REPLACEMENT, above.
2. Using a 7/16" socket as a backup on capscrew (12), remove hex nut (16), lockwasher (22), diaphragm plates (8) and o'rings (20).
3. Remove stem (7) and seat disc (12) through bottom of pilot.
4. Remove capscrew (12), seal washer (13) and old seat disc (6).
5. Place new seat disc, new seal washer and capscrew (12) on stem. Tighten securely.
6. Reinsert stem through bottom of pilot.
7. Reinstall diaphragm plates (8), o'rings (20), diaphragm (5), lockwasher (22) and hex nut (16). Tighten securely.
8. Reassemble pilot following Steps 10 through 13 under DIAPHRAGM REPLACEMENT, above.

C. STEM REPAIR

1. Follow Steps 1 through 3 under SEAT DISC REPLACEMENT, above.
2. Inspect stem and o'ring (21) carefully.
3. Remove any foreign material or light scratches from the stem with a fine grade of emery cloth. A badly scored stem should be replaced.
4. Replace o'ring (21).
5. Lubricate the o'ring and stem liberally with Vaseline® or similar lubricant.
6. Reassemble pilot following Steps 6 through 8 under SEAT DISC REPLACEMENT, above.

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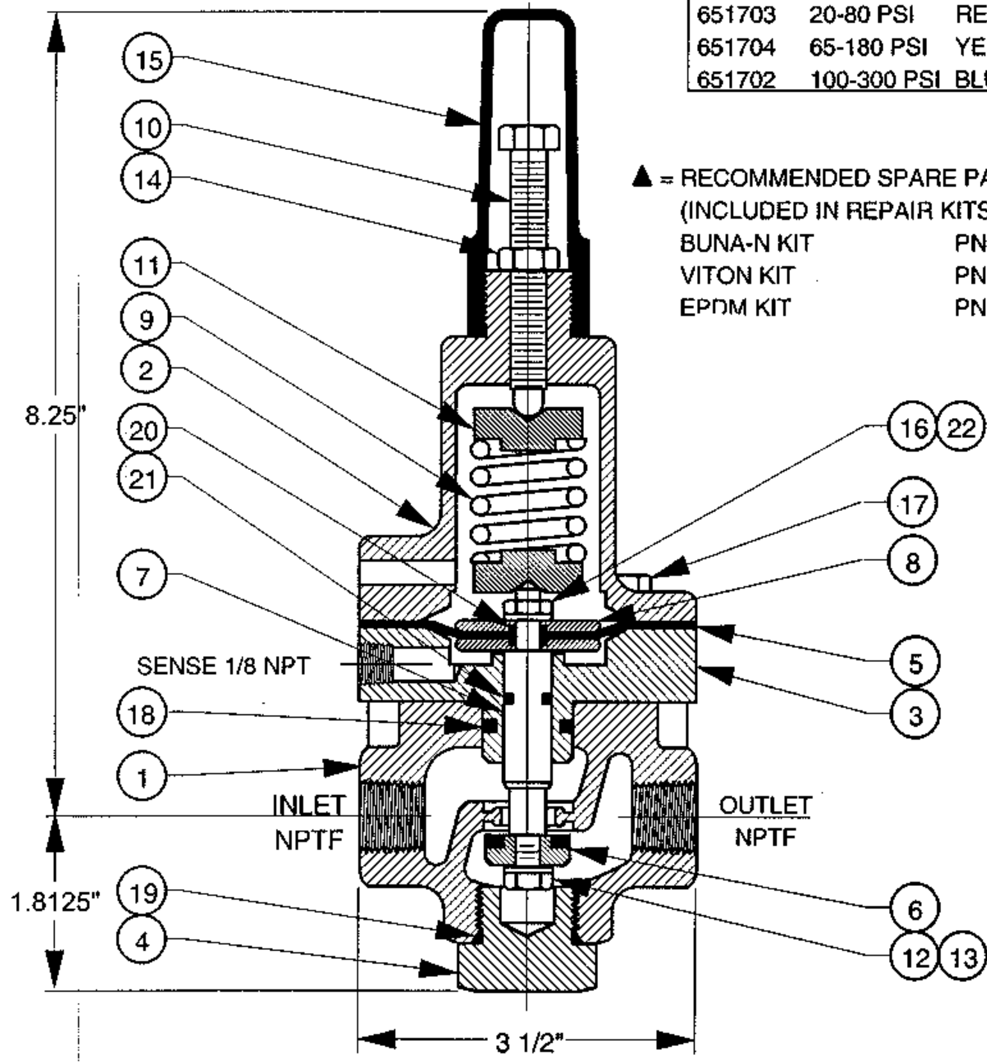
e-mail: sales@controlvalves.com / website: www/controlvalves.com



SPRING CHART		
651701	5-30 PSI	GREEN
651703	20-80 PSI	RED
651704	65-180 PSI	YELLOW
651702	100-300 PSI	BLUE

▲ = RECOMMENDED SPARE PARTS
(INCLUDED IN REPAIR KITS)

BUNA-N KIT	PN 930000
VITON KIT	PN 930100
EPDM KIT	PN 930400

	ITEM	PART NO	QTY	DESCRIPTION	MATERIAL
	1	302102	1	BODY 3/8" NPTF	BRONZE
		302104		1/2" NPTF	
		302702		3/8" NPTF	STN STEEL
		302704		1/2" NPTF	
	2	304102	1	BONNET	BRONZE
		304702			STN STEEL
	3	300129	1	ADAPTOR	BRONZE
		300719			STN STEEL
	4	692502	1	PLUG	ZINC PLTD STL
		310730			STN STEEL
▲	5	694002	1	DIAPHRAGM	BUNA-N / NYLON
		694102			VITON / NYLON
		694016			EPDM / NYLON
▲	6	310703	1	SEAT DISC	BUNA-N / SS
		310709			VITON / SS
		310707			EPDM / SS
	7	314704	1	STEM	STN STEEL
		314004			MONEL
	8	308102	2	DIAPHRAGM PLATE	BRASS
		308702			STN STEEL
	9	CHART	1	SPRING	STN STEEL
	10	300700	1	ADJUSTING SCREW	STN STEEL
	11	300134	2	SPRING RETAINER	BRASS
		300729			STN STEEL
	12	531700	1	HEX HEAD CAPSCREW	STN STEEL
▲	13	685760	1	LOCKWASHER	STN STEEL
	14	590717	1	HEX NUT	STN STEEL
	15	692002	1	CAP	PVC
	16	590712	1	HEX NUT	STN STEEL
	17	531701	4	HEX HEAD CAPSCREW	STN STEEL
▲	18	611116	1	O-RING	VITON
		614116			EPDM
▲	19	610912	1	O-RING	BUNA-N
		611912			VITON
		914912			EPDM
▲	20	611010	2	O-RING	VITON
		614010			EPDM
▲	21	611012	1	O-RING	VITON
		614012			EPDM
	22	685700	1	LOCKWASHER	STN STEEL

CHG	E.C. NO.	DATE	BY

REVISIONS

REF DWG NO'S

MATERIAL: NOTED

TOLERANCES
UNLESS NOTED
FRACTIONAL ±1/64
DECIMAL ±.005
MACH. FINISH 125 √
ANGULAR ±1/2°

NO. REQ'D

DRAWN BY: RON — DATE: 2-15-96

SCALE: 1/2

CHKD. BY — DATE

OCV Control Valves TULSA, OKLAHOMA U.S.A.

MODEL 1340 PILOT 3/8"-1/2" NPTF PRESSURE REDUCING

SIZE	DRAWING NUMBER	REV.
A	1340	

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 uper 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.

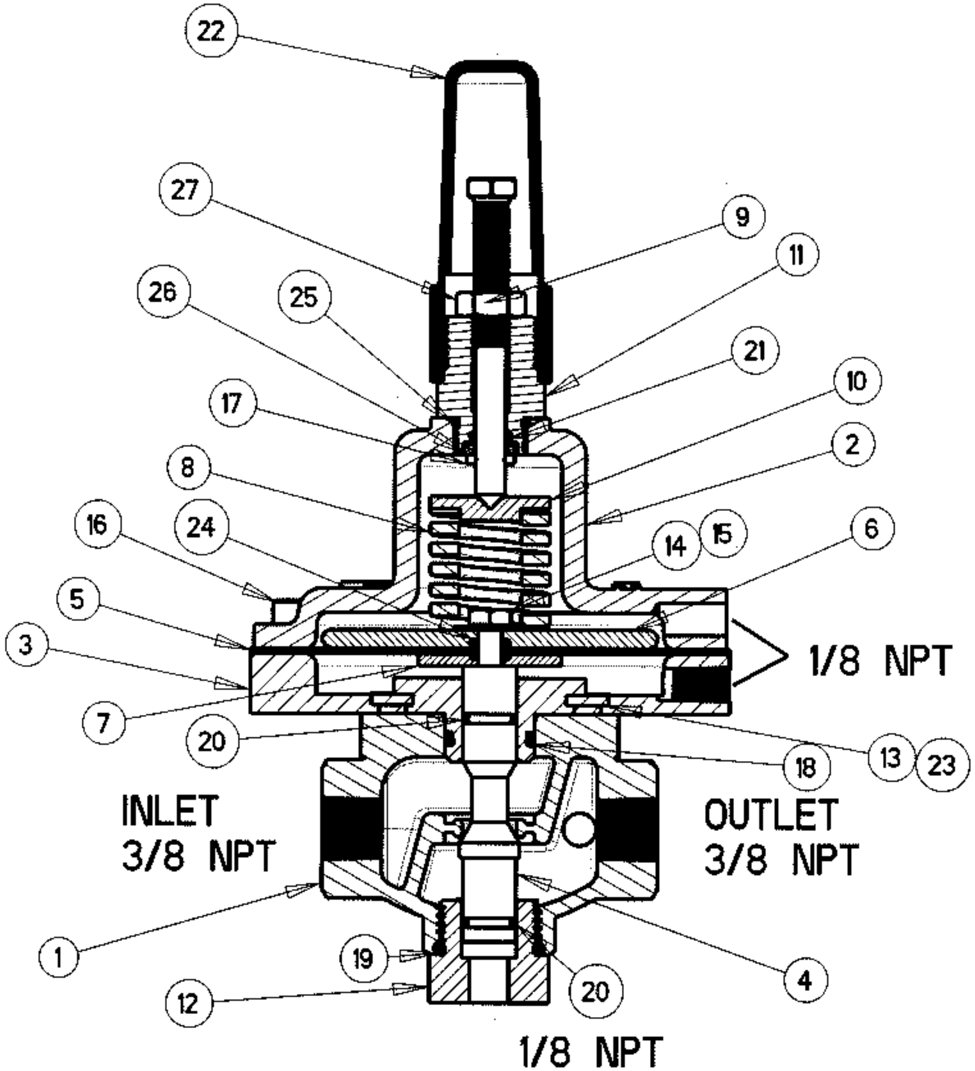
MAINTENANCE

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.



ITEM	PART NO.	QTY	DESCRIPTION	MATERIAL
27	590717	1	HEX NUT	STN. STEEL
26	320718	1	BUSHING	STN. STEEL
25	610908 611908	1	O-RING	BUNA-N VITON
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. STELL
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

CHG	ECN	DATE	BY
E			
D			
C			
B			
A			

REVISIONS

REF DWG NO'S

MATERIAL

NO. REQ'D

SCALE 1/2

TOLERANCES

UNLESS NOTED
.XX ±.015
.XXX ±.005
ANGULAR ±0.5°
MACH. FINISH 125

DRAWN BY: B.K. | DATE: 11-9-07

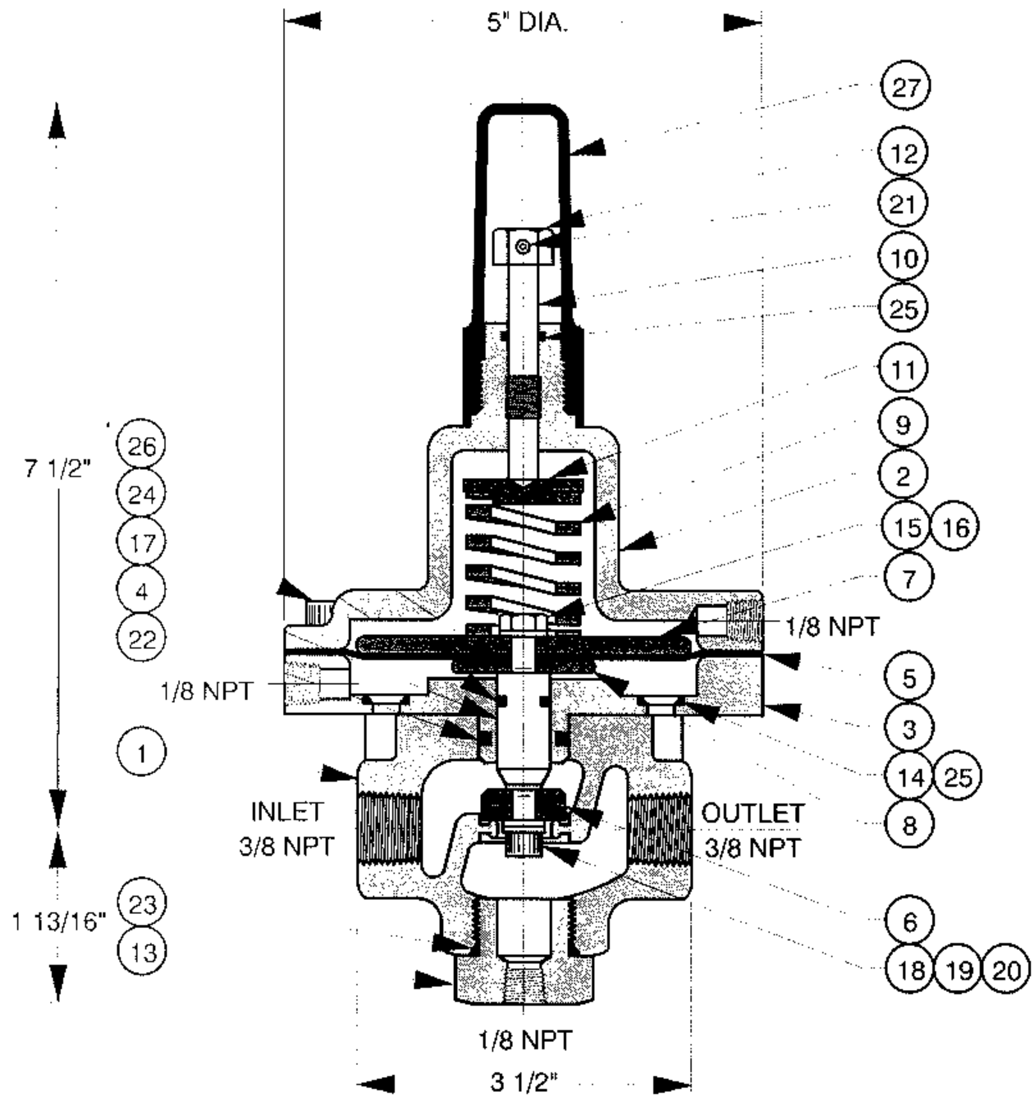
CHKD BY: | DATE:

OCV Control Valves

TULSA OKLAHOMA USA

RATE-OF-FLOW CONTROL PILOT

SIZE: A | DRAWING NUMBER: 2450 | REV:



ITEM	PART NO.	QTY	DESCRIPTION	MATERIAL
27	692002	1	CAP	BUTYRATE
26	611010	1	O-RING	VITON
25	611011	5	O-RING	VITON
24	611013	1	O-RING	VITON
23	610912	1	O-RING	BUNA-N
22	611116	1	O-RING	VITON
21	530416	1	SET SCREW	STEEL
20	685760	1	SEAL WASHER	SS/BUNA-N
19	685706	1	FLAT WASHER	STN. STEEL
18	530710	1	SKT HD CAPSCREW	STN. STEEL
17	530701	8	SKT HD CAPSCREW	STN. STEEL
16	685700	1	LOCK WASHER	STN. STEEL
15	531700	1	HEX HD CAPSCREW	STN. STEEL
14	532702	4	FLAT HD SCREW	STN. STEEL
13	310725	1	PLUG	STN. STEEL
12	300131	1	DRIVE ADAPTER	BRASS
11	300710	1	SPRING RETAINER	STN. STEEL
10	300707	1	ADJUSTING SCREW	STN. STEEL
9	651408	1	SPRING	CR-V STEEL
8	308702	1	LOWER DIAPH. PLATE	STN. STEEL
7	308720	1	UPPER DIAPH. PLATE	STN. STEEL
6	310703	1	SEAT DISC	SS/BUNA-N
5	694004	1	DIAPHRAGM	NYLON/BUNA-N
4	314741	1	STEM	STN. STEEL
3	300706	1	ADAPTER	STN. STEEL
2	304720	1	BONNET	STN. STEEL
1	302702	1	BODY	STN. STEEL

CHG	E.C. NO.	DATE	BY

REVISIONS

REF DWG NO'S

MATERIAL

TOLERANCES

UNLESS NOTED
FRACTIONAL ±1/64
DECIMAL ±.005
MACH. FINISH 125 √
ANGULAR ±1/2°

NO. REQ'D

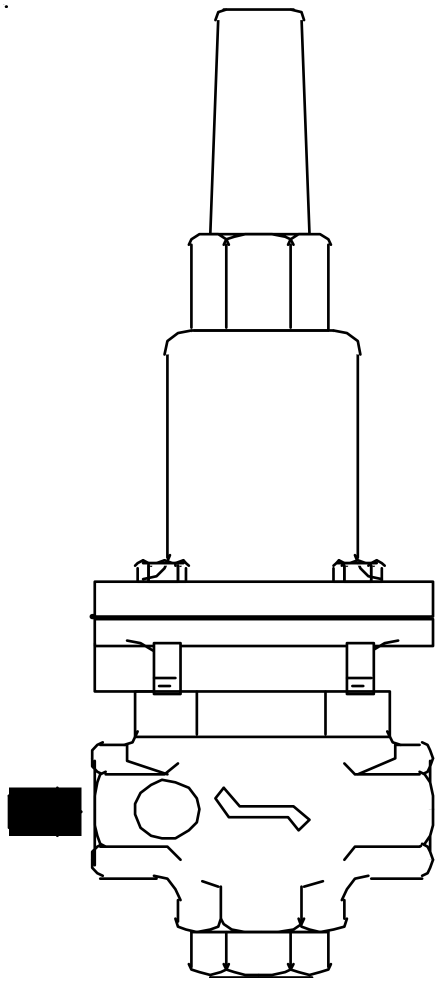
DRAWN BY	DATE
SDJ	4-12-94
CHKD. BY	DATE

SCALE 1/2

OCV Control Valves
TULSA, OKLAHOMA U.S.A.

DEADMAN CONTROL PILOT
3/8" NPT

SIZE	DRAWING NUMBER	REV.
A	2430	



installation, operating,
and
maintenance instructions

pressure sustaining/ pressure relief pilot

model 1330

GENERAL DESCRIPTION

The Model 1330 Pressure Sustaining/Pressure Relief Pilot is a normally-closed, direct-acting, spring-loaded, diaphragm-type control pilot. As the primary control pilot for the OCV Series 108 control valves, it is designed to maintain a constant preset inlet pressure on the main valve. It is a constant throttling device, maintaining precise, positive control of the main valve.

The 1330 may also be used by itself as a back pressure regulator.

The 1330 is available in bronze or stainless steel construction and with 3/8 NPT or 1/2 NPT end connections.

The 1330 is available with four different adjustment ranges:

5-30 psi	65-180 psi
20-80 psi	100-300 psi

FUNCTIONAL DESCRIPTION

The 1330 controls the pressure in the diaphragm chamber of the main valve, hence the degree of opening or closing of the valve. The upstream pressure is sensed under the diaphragm of the pilot and is balanced against an adjustable spring load. As the upstream pressure increases above the set point, the pilot opens wider, decreasing the pressure in the diaphragm chamber of the main valve, opening the valve a proportionate amount. Conversely, as upstream pressure decreases below the set point, the pilot closes further, increasing the pressure in the diaphragm chamber of the main valve, closing the valve a proportionate amount. The net result is a constant modulating action of the pilot and main valve, keeping the upstream pressure at the set point within very close limits.

INSTALLATION AND ADJUSTMENT

The 1330 is normally installed in the main valve control piping between the ejector and the downstream body tap. Flow must be in the direction indicated. A sensing line, typically 1/4" O.D. tubing, must be installed between the pilot sense port and the upstream control piping ahead of the ejector.

Pressure adjustment is made by means of the single adjusting screw:

Clockwise adjustment **increases** upstream pressure.

Counterclockwise adjustment **decreases** upstream pressure.

MAINTENANCE

Required maintenance of the 1330 is minimal. Fittings and bolts should be periodically checked, and the body should be inspected for damage or excessive buildup of foreign material.

TROUBLESHOOTING

Other than improper adjustment, there are basically only three malfunctions which can occur with the 1330 pilot. These, and the symptoms they can cause, are as follows:

1. PILOT DIAPHRAGM RUPTURED: Results in failure of the main valve to open. A ruptured pilot diaphragm will be evidenced by leakage through the vent hole in the pilot bonnet.
2. PILOT SEAT DISC DETERIORATED: Results in failure of the valve to seal off completely (pressure relief service). Can also cause poor pressure control.
3. PILOT STEM BINDING: Typically results in poor pressure control, though in extreme cases, it can result in failure of the main valve to open or close.

REPAIR PROCEDURES

Refer to the 1330 assembly drawing for parts identification.

A. DIAPHRAGM REPLACEMENT

1. Prior to disassembling the pilot, turn the adjusting screw (10) fully counterclockwise until it is loose enough to be turned with the fingers.
2. Remove the four bonnet capscrews (17).
3. Remove the bonnet (2). Set the spring (9) and spring retainers (11) aside in a safe place.
4. Pull the adapter (3) out of the pilot body (1).
5. Remove hex nut (16), lockwasher (22), upper diaphragm plate (8) and o’ring (20).
6. Remove old diaphragm (5).
7. Inspect both diaphragm plate o’rings (20). Replace if necessary.
8. Place new diaphragm on stem (7).
9. Replace upper diaphragm plate (8), o’ring (20), lockwasher (22) and hex nut (16). Tighten securely.
10. Insert adapter (2) back into pilot body (1).
11. Hold spring (9) and spring retainers (11) together in the proper orientation and insert them into the bonnet (2).
12. Place the bonnet over the adapter and insert the bonnet capscrews (17). Tighten securely.
13. Place valve back in service, following the startup and adjustment procedures given in the main portion of this manual.

B. SEAT DISC REPLACEMENT

1. Follow Steps 1 through 4 under DIAPHRAGM REPLACEMENT, above.
2. Remove capscrew (12), seal washer (13) and old seat disc (6).
3. Place new seat disc, new seal washer and capscrew (12) on stem. Tighten securely.
4. Reassemble pilot following Steps 10 through 13 under DIAPHRAGM REPLACEMENT, above.

C. STEM REPAIR

1. Follow Steps 1 and 2 under SEAT DISC REPLACEMENT, above.
2. Remove stem (7) from adapter (3).
3. Inspect stem and o’ring (21) carefully.
4. Remove any foreign material or light scratches from the stem with a fine grade of emery cloth. A badly scored stem should be replaced.
5. Replace o’ring (21).
6. Lubricate the o’ring and stem liberally with Vaseline® or similar lubricant.
7. Place stem in adapter (3). Make sure it moves freely.
8. Reassemble pilot following Steps 3 and 4 under SEAT DISC REPLACEMENT, above.

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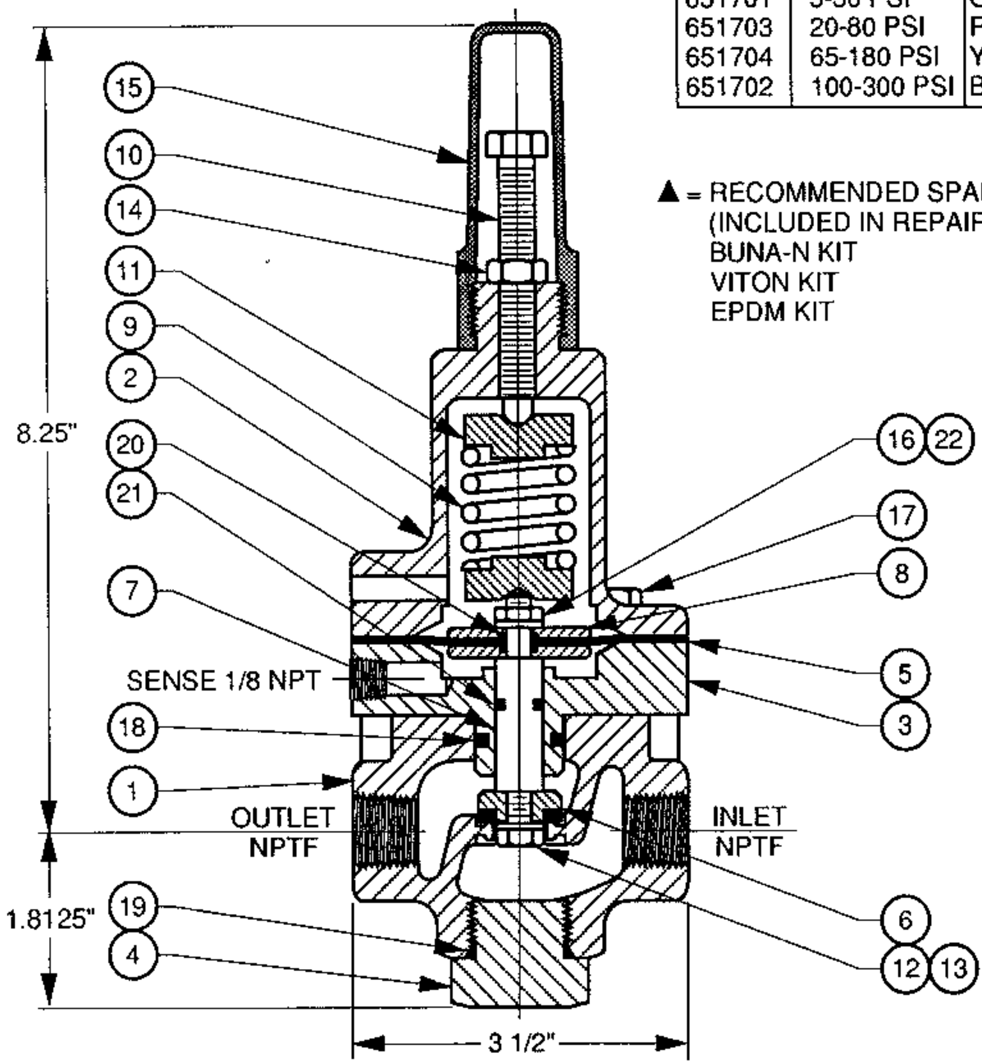


SPRING CHART		
651701	5-30 PSI	GREEN
651703	20-80 PSI	RED
651704	65-180 PSI	YELLOW
651702	100-300 PSI	BLUE

▲ = RECOMMENDED SPARE PARTS
(INCLUDED IN REPAIR KITS)

BUNA-N KIT	PN 930000
VITON KIT	PN 930100
EPDM KIT	PN 930400

	ITEM	PART NO	QTY	DESCRIPTION		MATERIAL
	1	302102	1	BODY	3/8" NPTF	BRONZE
		302104			1/2" NPTF	
		302702			3/8" NPTF	STN STEEL
		302704			1/2" NPTF	
	2	304102	1	BONNET		BRONZE
		304702				STN STEEL
	3	300129	1	ADAPTOR		BRONZE
		300719				STN STEEL
	4	692502	1	PLUG		ZINC PLTD STL
		310730				STN STEEL
▲	5	694002	1	DIAPHRAGM		BUNA-N / NYLON
		694102				VITON / NYLON
		694016				EPDM / NYLON
▲	6	310703	1	SEAT DISC		BUNA-N / SS
		310709				VITON / SS
		310707				EPDM / SS
	7	314702	1	STEM		STN STEEL
		314002				MONEL
	8	308102	2	DIAPHRAGM PLATE		BRASS
		308702				STN STEEL
	9	CHART	1	SPRING		STN STEEL
	10	300700	1	ADJUSTING SCREW		STN STEEL
	11	300134	2	SPRING RETAINER		BRASS
		300729				STN STEEL
	12	531700	1	HEX HEAD CAPSCREW		STN STEEL
▲	13	685760	1	LOCKWASHER		STN STEEL
	14	590717	1	HEX NUT		STN STEEL
	15	692002	1	CAP		PVC
	16	590712	1	HEX NUT		STN STEEL
	17	531701	4	HEX HEAD CAPSCREW		STN STEEL
▲	18	611116	1	O-RING		VITON
		614116				EPDM
▲	19	610912	1	O-RING		BUNA-N
		611912				VITON
		914912				EPDM
▲	20	611010	2	O-RING		VITON
		614010				EPDM
▲	21	611012	1	O-RING		VITON
		614012				EPDM
	22	685700	1	LOCKWASHER		STN STEEL

CHG	E.C. NO.	DATE	BY

REVISIONS

REF DWG NO'S

MATERIAL: NOTED

TOLERANCES
UNLESS NOTED
FRACTIONAL ±1/64
DECIMAL ±.005
MACH. FINISH 125√
ANGULAR ±1/2°

NO. REQ'D

DRAWN BY	DATE
RON	2-14-96
CHKD. BY	DATE

SCALE 1/2

OCV Control Valves TULSA, OKLAHOMA U.S.A.

MODEL 1330 PILOT 3/8"-1/2" NPTF
PRESSURE RELIEF / SUSTAINING / SURGE

SIZE	DRAWING NUMBER	REV.
A	1330	

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.

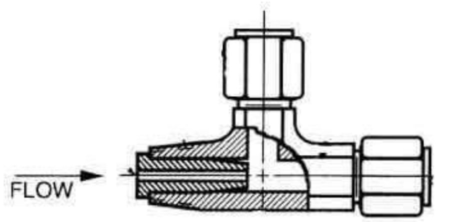
MODEL 126 EJECTOR DIAGRAM

Brass Construction / Stainless Steel Construction

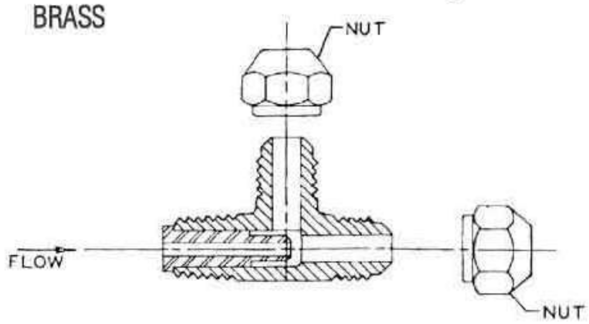
MATERIAL	PART NUMBER	P (NPT)	T-TUBE O.D.	STD. ORIFICE	USED ON VALVE SIZES
Brass	213100	3/8"	3/8"	.125"	1 ¼"-6"
Brass	214100	1/2"	1/2"	.188"	8"-10"
Brass	215100	3/4"	3/4"	.188"	12"-16"
316 Stn. Steel	213700	1/4"	3/8"	.090"	1 ¼"-6"
316 Stn. Steel	214700	3/8"	1/2"	.125"	8"-10"
316 Stn. Steel	215700	1/2"	3/4"	.188"	12"-16"

Orifice bushings are stainless steel.

STAINLESS

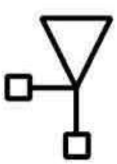


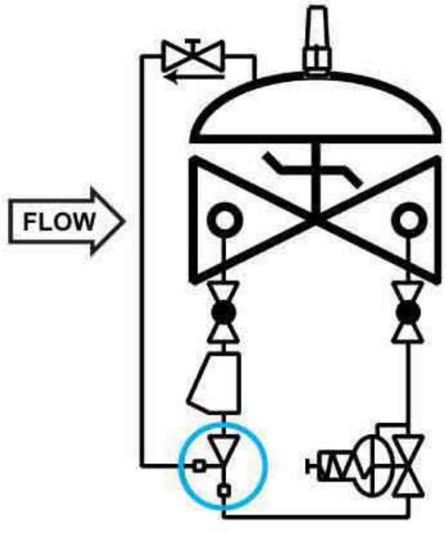
BRASS



SCHEMATIC SYMBOL

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

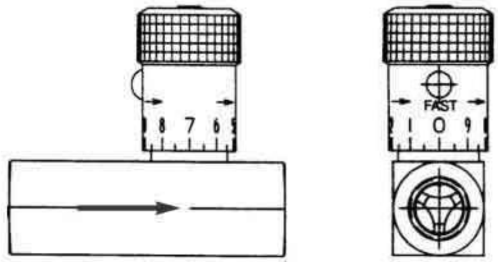




EXAMPLE: Shown here on a MODEL 127-3 Pressure Reducing Valve

DESCRIPTION

The Model 141-3 Flow Control Valve is an adjustable restriction device, installed in the control circuit tubing. The flow control valve differs from a standard needle valve in that it includes an internal check valve. Thus it allows free flow in one direction (through the check) and restricted flow in the other direction (through the needle). The setting of the flow control valve meters the flow into or out of the main valve diaphragm chamber, thus controlling either the opening or closing speed of the main valve. These can be installed in series for separate opening and closing speed control. Restricted flow is in the direction of the flow arrow on the body.

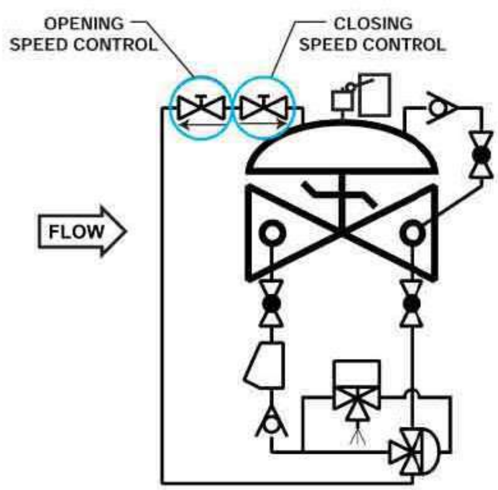


MODEL 141-3 MATRIX

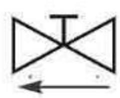
MATERIAL	PART NUMBER	INLET/OUTLET (NPT)	A	USED ON VALVE SIZE*
Brass	682100	1/4	2 3/8	1 ¼"-2"
Brass	682101	3/8	2 3/4	2 ½"-6"
Brass	682102	1/2	3 1/4	8"-10"
Brass	682103	3/4	3 7/8	12"-16"
Stn. Steel	682700	1/4	2 3/8	1 ¼"-2" Stn.
Stn. Steel	682701	3/8	2 3/4	2 ½"-6"
Stn. Steel	682702	1/2	3 1/4	8"-10"
Stn. Steel	682703	3/4	3 5/8	12"-16"

Note: Flow control valve use and size may vary on valve application. Consult factory.

SCHEMATIC SYMBOL



The Model 141-3 Flow Control Valve is shown on OCV Valve Schematics as:



EXAMPLE: Shown here on a MODEL 125 Pump Control Valve as separate opening and closing speeds.

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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.

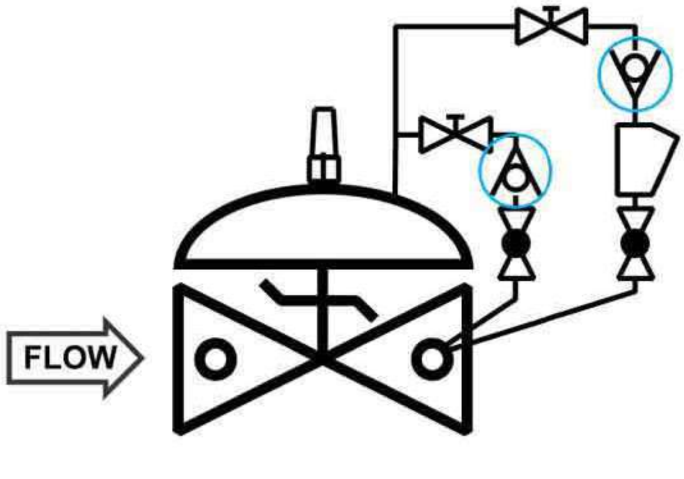
Check Valves shown Stainless Steel & Brass

MODEL 141-1 MATRIX

MATERIAL	PART NUMBER	INLET/OUTLET (NPT)	LENGTH	USED ON VALVE SIZE
Bronze	681100	3/8	2	1 ¼"-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 ¼"-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.

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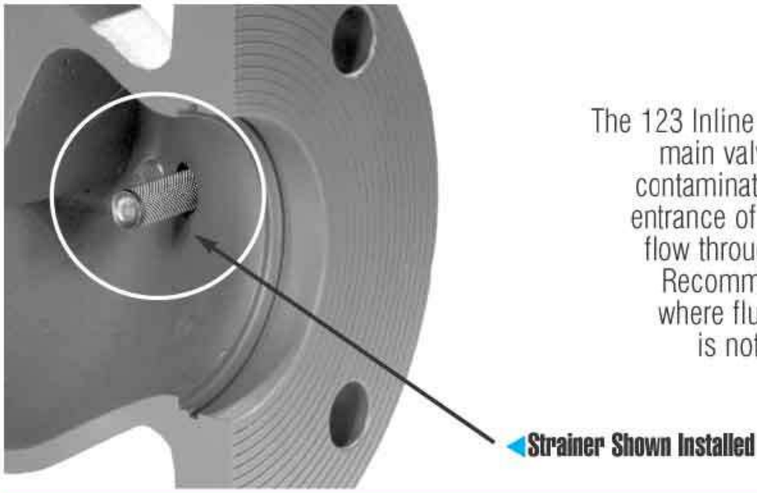


DESCRIPTION

The 123 Inline Strainer installs in the inlet side port of the main valve, and protects the pilot system from solid contaminates 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.

DIMENSIONS

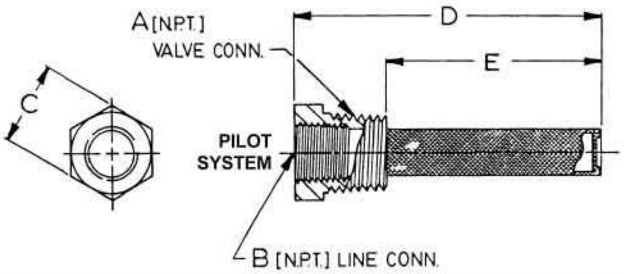
PART NUMBER	A	B	C	D	E	USED ON VALVE SIZE
660704	3/8	1/4	11/16	2 3/16	1 1/2	1 1/4"-6"
660705	1/2	3/8	7/8	2 1/4	1 1/2	8"-10"
660706	3/4	1/2	1 1/8	2 3/8	1 1/2	12"-16"

MATERIALS

Inline strainers are all-stainless steel construction.

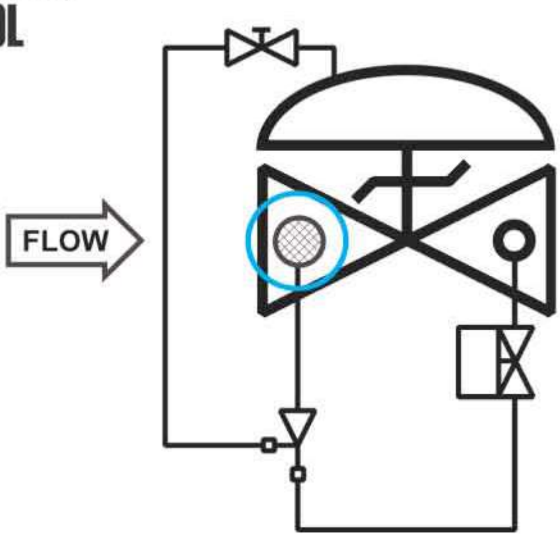
SCREEN SIZE

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.

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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.

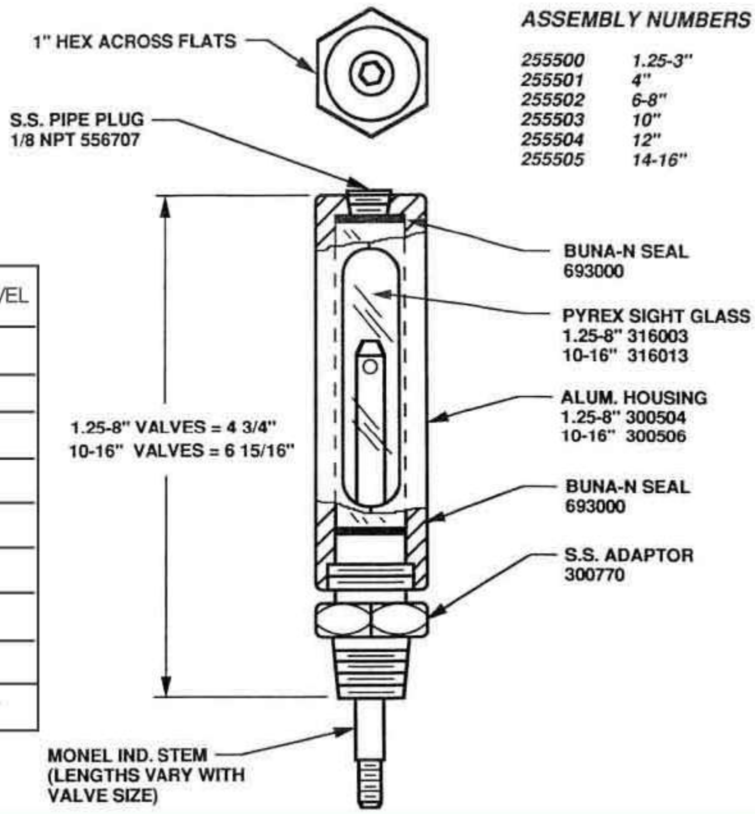
MODEL 155L MATRIX

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"

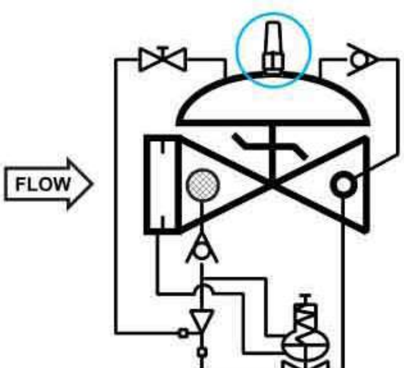
MAX WORKING PRESSURE: 300 PSI

ASSEMBLY NUMBERS

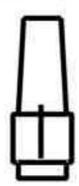
255500	*1.25-3"*
255501	*4"*
255502	*6-8"*
255503	*10"*
255504	*12"*
255505	*14-16"*



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

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