

installation, operating and maintenance instructions

Differential Control Valve

model 110

GENERAL DESCRIPTION

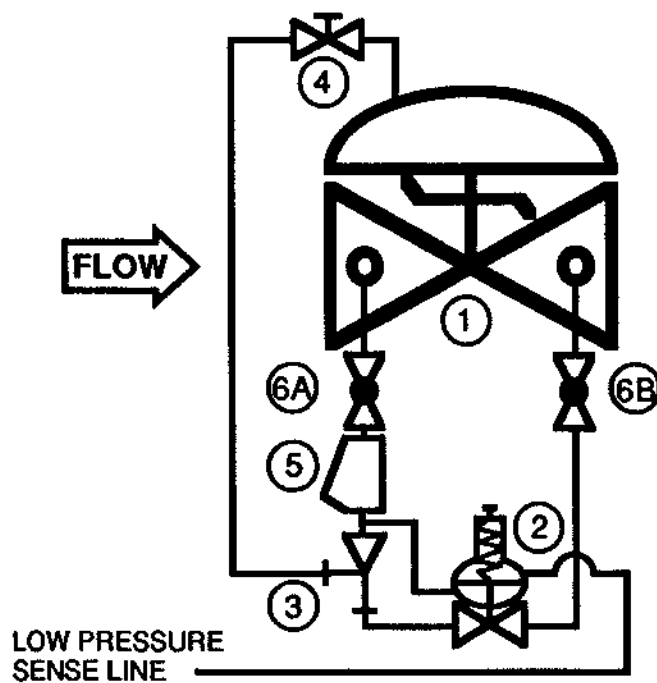
The OCV Model 110 Differential Control Valve is a diaphragm-actuated valve designed to maintain a constant pressure differential between any two points in a system where the closing of the valve directly causes the differential pressure to increase. The main valve tends to close on a decrease in differential pressure, and open on an increase in differential pressure.

The 110 consists of the following components, arranged as shown on the schematic diagram.

1. **Model 65 Basic Control Valve**, a hydraulically-operated, diaphragm-actuated globe or angle valve which closes with an elastomer-on-metal seal.
2. **Model 1356 Differential Control Pilot**, a two-way, normally-closed pilot valve which senses (high) valve inlet pressure under its diaphragm, and balances low pressure over its diaphragm coupled with an adjustable spring load.
3. **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 position of the differential control pilot.
4. **Model 141-2 Needle Valve**, controls the response speed (opening and closing), of the main valve.

5. **Model 159 Y-Strainer**, (standard on water service valves) or **Model 123 Inline Strainer**, standard on petroleum service valves. The strainer protects the pilot system from solid contaminants in the line fluid.

6. Two **Model 141-4 Ball Valves**, (standard on water service valves, optional on fuel service valves). Useful for isolating the pilot system for maintenance or troubleshooting.



At user option, the 110 may also be equipped with the following:

1. Model 155 Visual Indicator.
2. Model 150 Limit Switch Assembly (includes visual indicator).
3. Model 141-3 Opening and/or Closing Speed Control.

THEORY OF OPERATION

Operation of the Model 110 can be seen clearly by referring to the schematic diagram. The differential control pilot (2) balances high pressure under its diaphragm versus low pressure and an adjustable spring force over its diaphragm. An increase in differential above the spring set point causes the pilot to open wider, and a decrease in differential below the spring set point causes the pilot to go further closed.

If the pilot opens wider (due to increased differential), the flow through it increases. The increased flow causes an increase in pressure drop across the orifice of the ejector (3). Thus, the pressure applied to the bonnet of the main valve (1) is decreased, and the main valve opens wider, causing the differential to decrease. Conversely, if the pilot goes further closed (due to decreased differential), the pilot flow decreases, the pressure drop across the ejector orifice decreases, and an increased pressure is applied to the main valve bonnet. The main valve closes further, causing the differential to increase. The net result is modulation of both the pilot (2) and main valve (1) to maintain a constant differential pressure.

The needle valve (4) as well as controlling the main valves response speed, can also be used to dampen out small-scale oscillations in the main valve.

INSTALLATION

The Model 110 is furnished fully factory-assembled and ready for installation at the appropriate point in the system except for connecting the low pressure sense line.

Refer to the OCV SERIES 65 BASIC CONTROL VALVE section of this manual for general installation details.

After the valve has been installed, connect the low pressure sense line of the differential control pilot (2) to the appropriate point in the system.

STARTUP AND ADJUSTMENT

1. Install two pressure gauges at the desired points in the system so that the required pressure differential can be determined and adjusted during startup.
2. Remove the adjusting screw cover from the differential control pilot (4).
3. Loosen the adjusting screw jam nuts on the speed control(s) (4) and the differential control pilot (2).
4. Turn the speed control(s) adjusting screw fully clockwise, then counterclockwise 1-3 turns.
5. Turn the differential control pilot adjusting screw fully clockwise to a full stop.
6. Start the pump. The valve should remain closed and the differential will be maximum. Carefully loosen a pipe plug or fitting ferrule on the bonnet of the main valve until water begins to discharge around the threads. When only clear water (no air) is discharging, retighten the plug.
7. Turn the adjusting screw of the differential control pilot (2) counterclockwise slowly. The valve will begin to open and flow will begin. Continue turning the adjusting screw slowly counterclockwise until the desired differential is established.
8. After the initial setting, the valve may be "fine tuned", if necessary, by turning the adjusting screw in small increments. Clockwise to increase differential. Counterclockwise to decrease differential. Tighten the jam nut.
9. If the speed control (4) initial adjustment is adequate for smooth system operation and there are no pressure oscillations, tighten the jam nut. If the valves response speed is too slow, turn the speed control adjustment counterclockwise. If the valves response speed is too fast or there are small-scale pressure oscillations, turn the speed control adjusting screw clockwise. **CAUTION; Never close the speed control fully. This will render the valve inoperable.** After the speed control has been satisfactorily set, tighten the jam nut.

MAINTENANCE

Because of the simplicity of design of the 110, 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, around flanges, and connections. Tighten as required.

TROUBLESHOOTING

In the event of malfunction of the 110, 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

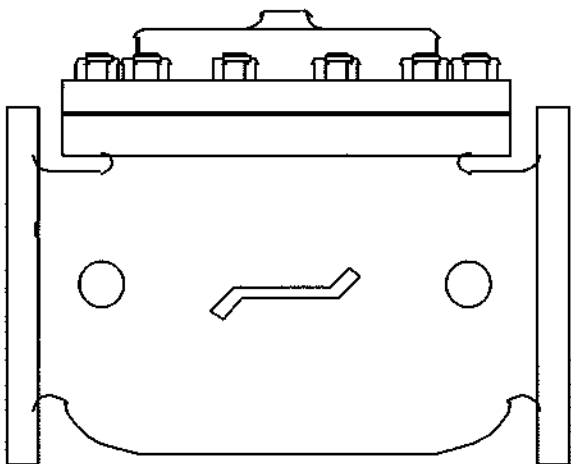
1. Valve closed downstream of 110. Open as required.
2. Downstream pilot system ball valve (6B) closed. Open as required.
3. Differential control pilot (1) adjusted too far clockwise. See Adjustment Instructions.
4. Needle valve (4) fully closed. See Adjustment Instructions.
5. Diaphragm of differential control pilot (1) ruptured. Replace diaphragm. See the 1356 Pilot section of this manual.
6. Stem of differential control pilot (1) binding. Disassemble pilot and determine cause. See the 1356 Pilot section of this manual.
7. Main valve (1) stem binding. Disassemble valve and determine cause. See the Model 65 Basic Valve section of this manual.

MAIN VALVE FAILS TO CLOSE

1. Upstream pilot system ball valve (6A) closed. Open as required.
2. Strainer (5) clogged. Clean as required.
3. Ejector (3) clogged. Clean as required.
4. Needle valve (4) fully closed. See Adjustment Instructions.
5. Differential control pilot (2) adjusted too far counterclockwise. See Adjustment Instructions.
6. Close the downstream pilot system ball valve (6B).
 - (a) If valve closes, proceed to Step 7.
 - (b) If valve remains open, proceed to Step 8.
7. Differential control pilot (2) stem binding or seat badly deteriorated. Disassemble pilot and determine cause. See the 1356 Pilot section of this manual.
8. Close both pilot system ball valves (6A and 6B) and loosen a pipe plug on the main valve bonnet, or a flare nut on the needle valve. A continuous discharge of fluid from the loosened plug or flare nut, indicates the main valve diaphragm is ruptured. Replace diaphragm. See the Model 65 Basic Valve section of this manual.

NOTE: Certain valves, predominantly those in fuel service, are assembled "fail closed". In this case a ruptured diaphragm would keep the valve from opening, rather than keep it from closing. To determine which type you have, examine the "bridge mark" cast into the side of the main valve body and compare it with the diagram shown in the Model 65 Basic valve section of this manual.
9. Main valve stem binding 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 CLOSSES 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

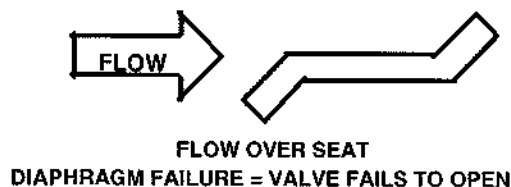
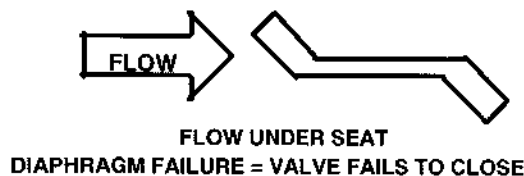
1. Isolate the valve from the system by closing upstream and downstream block valves.
2. Loosen one of the tubing connections on the bonnet. Allow any residual pressure to bleed off.
3. Remove all tubing connected at the bonnet.
4. Remove the bonnet nuts.
5. Remove the bonnet. If the bonnet sticks in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

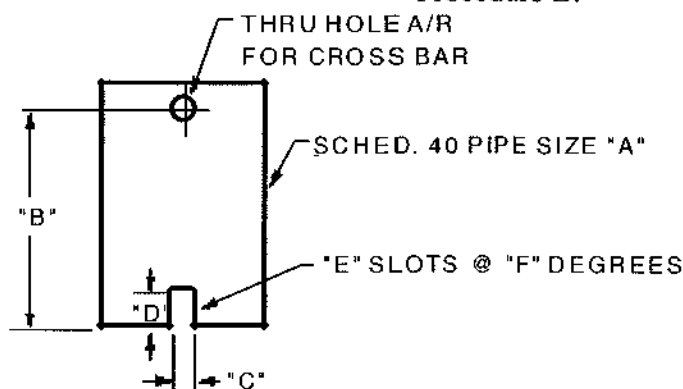
1. Perform Steps 1 and 2 of Procedure B, above.
2. With the spool assembly removed from the body, remove the seat retainer screws.
3. Slide the seat retainer off the lower end of the stem.
4. Remove the seat disc from its groove in the spool.
NOTE: The seat disc may fit quite tightly in the groove. If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

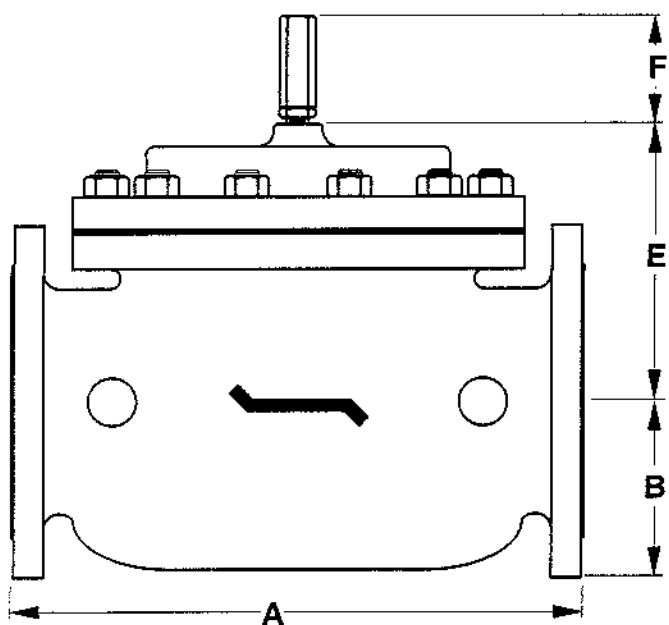
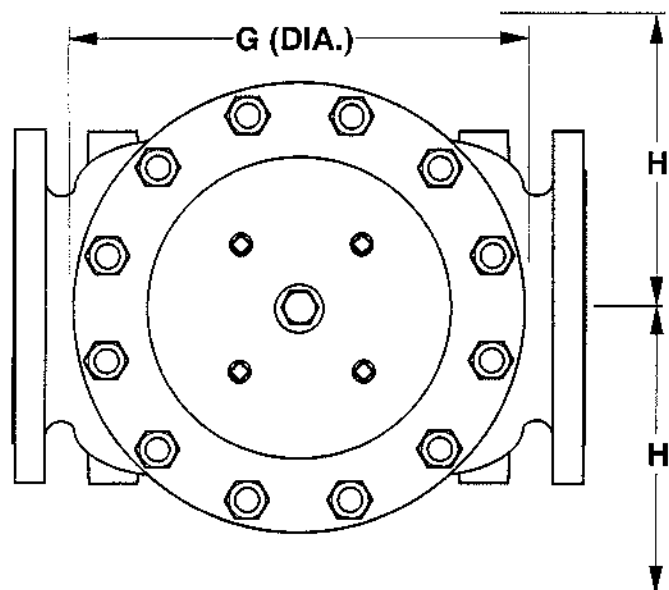
1. Perform Steps 1 and 2 of Procedure B, above.
2. If you are working on a 4" or smaller valve, follow Steps 3 thru 9, below.
3. If you are working on a 6" or larger valve, follow Steps 10 thru 16, below.

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.

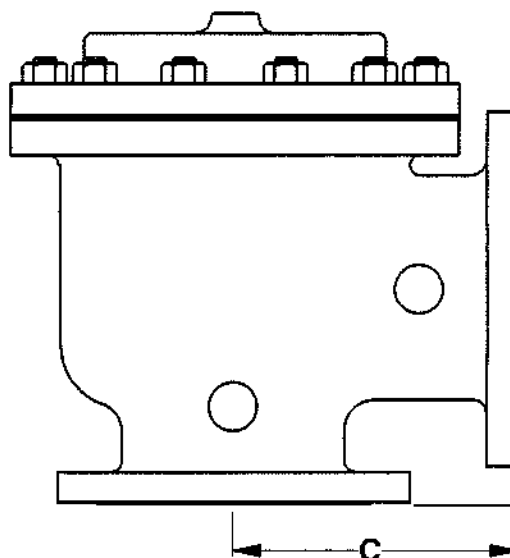


VALVE SIZE	"A" PIPE SIZE	"B" MIN. LENGTH	"C" SLOT WIDTH	"D" SLOT DEPTH	"E" NO. OF SLOTS	"F" SLOT SPACING
1-1/4"	3/4"	6"	3/8"	3/8"	2	180°
1-1/2"	3/4"	6"	3/8"	3/8"	2	180°
2"	1-1/2"	7"	3/8"	3/8"	2	180°
2-1/2"	2"	8"	1/2"	1/2"	3	120°
3"	2-1/2"	9"	5/8"	5/8"	2	180°
4"	3"	10"	5/8"	5/8"	2	180°

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

TOLERANCES
UNLESS NOTED
FRACTIONAL $\pm 1/64$
DECIMAL $\pm .005$
MACH. FINISH 125/
ANGULAR $\pm 1/2^\circ$

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

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

GENERAL VALVE DIMENSIONS

SIZE	DRAWING NUMBER	REV.
A	65D	B

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

differential control pilot

installation, operating,
and
maintenance instructions

model 1356

GENERAL DESCRIPTION

The Model 1356 Differential Control Pilot is a normally-closed, direct-acting, spring-loaded, diaphragm-type control pilot. It is designed primarily for use in systems using LPG or other high vapor pressure liquids to maintain valve inlet pressure a constant, preset amount higher than storage tank vapor pressure in order to prevent flashing in the system. It is manually adjustable by means of an adjustment screw located under the cap on top of the pilot. It is a constant throttling device, maintaining precise positive control of the Main Valve.

FUNCTIONAL DESCRIPTION

Basically, the Model 1356 controls the amount of pressure in the upper chamber of the main valve, hence, the degree of opening or closing of the main valve. The main valve inlet pressure is sensed under the pilot diaphragm and balances against both tank vapor pressure and spring loading above the diaphragm. As valve inlet pressure increases (or vapor pressure decreases), the pilot opens wider, decreasing the pressure in the upper chamber of the main valve and allowing it to open a proportionate amount in order to maintain a constant differential. As valve inlet pressure decreases (or vapor pressure increases), the pilot begins to close, increasing the pressure in upper chamber of the main valve and allowing it to close. This is a constant modulating action compensating for any changes in either inlet pressure or vapor pressure.

INSTALLATION & ADJUSTMENT

The Model 1356 should be installed in the Main Valve Control Piping between the ejector and the downstream body tap. Flow should be in the direction indicated by the arrow on the pilot body. A sensing line (1/4" O.D. tubing) should be installed from the pilot high pressure sensing port (see drawing) to a point upstream of the main valve. A

second sensing line should be installed from the pilot low pressure sensing port to a point on the storage tank located to sense vapor pressure. To aid in accurate setting of the pilot, two pressure gauges—one measuring inlet pressure and one measuring vapor pressure—should be installed. Prior to start up, set the pilot to its fully closed position by turning the adjustment screw all the way clockwise. Start the pump. At this point the main valve will be fully closed or else open slightly, flowing at an inlet pressure higher than desired. Turn the adjustment screw slowly counterclockwise until inlet pressure falls to the desired point in excess of vapor pressure.

Tighten the lock nut on the adjustment screw and reinstall the cap. If adjustments are needed later, turning the adjustment clockwise increases the differential; turning it counterclockwise decreases the differential.

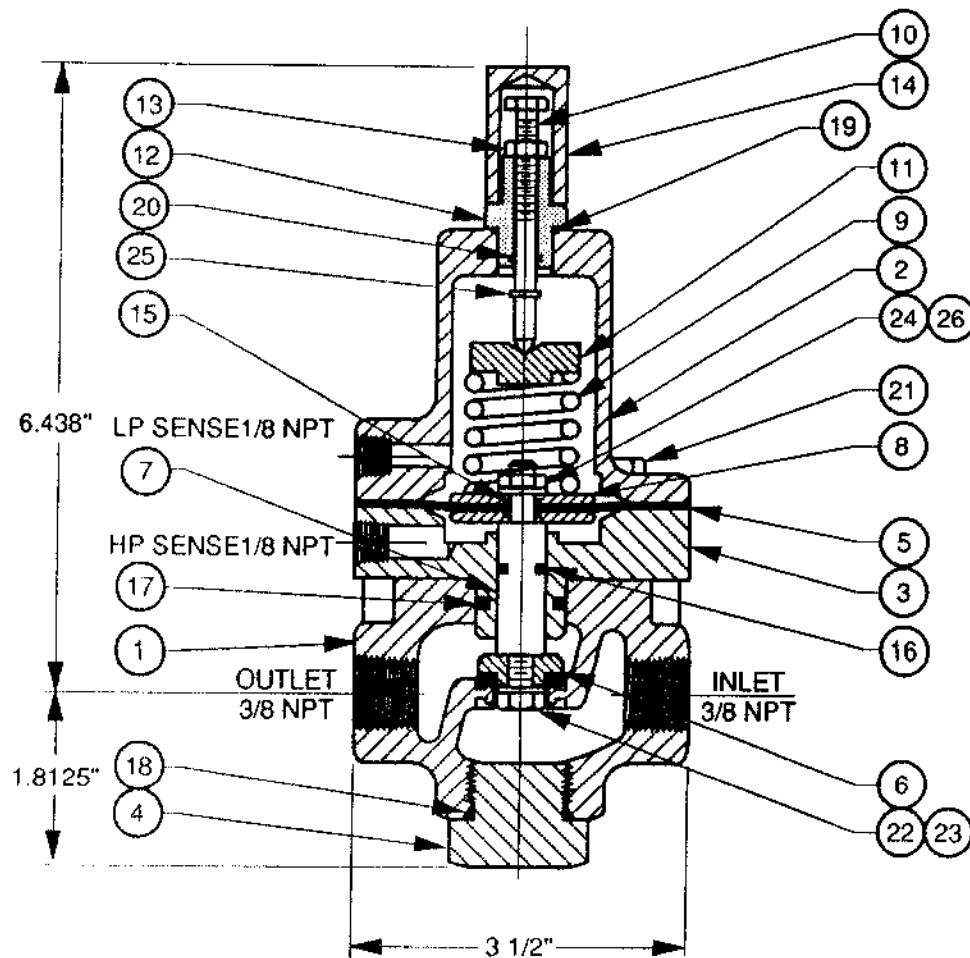
MAINTENANCE

Because of the simplicity of design of the 1356 Pilot, required maintenance is minimal. Fittings and bolts should be periodically checked and the body should be inspected for damage or excessive build-up of foreign material.

TROUBLESHOOTING

Troubleshooting the 1356 is equally simple. Major troubleshooting points are as follows:

1. To check for a ruptured diaphragm, disconnect the low pressure sense line from the pilot. Plug this line to prevent loss of vapor from tank. Pressurize the valve. A continuous discharge of fluid at the open sense port on the pilot 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 the pilot and determine the cause.



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
 VITON ELASTOMERS AVAILABLE
 1/2" NPT AVAILABLE

26	685700	1	LOCKWASHER	STN. STEEL
25	630715	1	E-RING	STN. STEEL
24	590712	1	HEX NUT	STN. STEEL
▲ 23	685760	1	LOCKWASHER	STN. STEEL
22	531700	1	HEX HD CAPSCREW	STN. STEEL
21	531701	4	HEX HD CAPSCREW	STN. STEEL
▲ 20	611008	2	O-RING	VITON
▲ 19	611906	1	O-RING	VITON
▲ 18	610119	1	O-RING	BUNA-N
▲ 17	611116	1	O-RING	VITON
▲ 16	611012	1	O-RING	VITON
▲ 15	611010	2	O-RING	VITON
14	300137	1	CAP	BRASS
13	300709	1	NUT	STN. STEEL
12	300716	1	ADJ SCREW GUIDE	STN. STEEL
11	300729	1	SPRING RETAINER	STN. STEEL
10	300724	1	ADJUSTING SCREW	STN. STEEL
9	CHART	1	SPRING	STN. STEEL
8	308702	2	DIAPHRAGM PLATE	STN. STEEL
7	314002	1	STEM	MONEL
▲ 6	310703	1	SEAT DISC	BUNA-N/SS
▲ 5	694002	1	DIAPHRAGM	BUNA-N/NYLON
4	310730	1	PLUG	STN. STEEL
3	300719	1	ADAPTER	STN. STEEL
2	304705	1	BONNET	STN. STEEL
1	302702	1	BODY	STN. STEEL
ITEM	PART NO.	QTY	DESCRIPTION	MATERIAL

				MATERIAL	TOLERANCES
				STN STL / BUNA-N / MONEL STEM	UNLESS NOTED FRACTIONAL $\pm 1/64$ DECIMAL $\pm .005$ MACH. FINISH 125/ ANGULAR $\pm 1/2^\circ$ ✓
				NO. REQ'D	DRAWN BY RON
				SCALE 1/2	DATE 4-11-95
CHG	E.C. NO.	DATE	BY		CHKD. BY DATE
REVISIONS				REF DWG NO'S	

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

DIFFERENTIAL CONTROL PILOT

SIZE	DRAWING NUMBER	REV.
A	1356	

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.

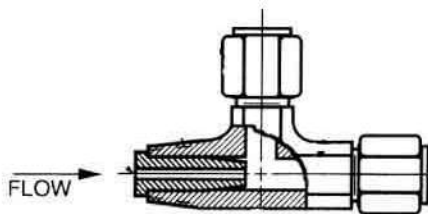
MODEL 126 EJECTOR DIAGRAM

Brass Construction / Stainless Steel Construction

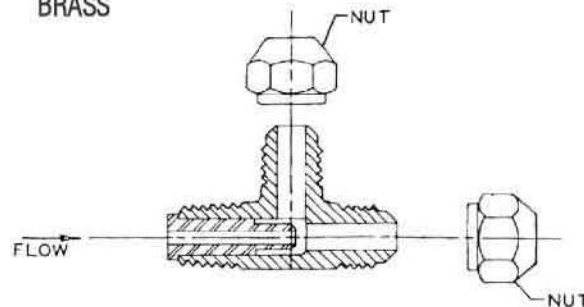
MATERIAL	PART NUMBER	P (NPT)	T-TUBE O.D.	STD. ORIFICE	USED ON VALVE SIZES
Brass	213100	3/8"	3/8"	.125"	1 1/4"-6"
Brass	214100	1/2"	1/2"	.188"	8"-10"
Brass	215100	3/4"	3/4"	.188"	12"-16"
316 Stn. Steel	213700	1/4"	3/8"	.090"	1 1/4"-6"
316 Stn. Steel	214700	3/8"	1/2"	.125"	8"-10"
316 Stn. Steel	215700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

Orifice bushings are stainless steel.

STAINLESS

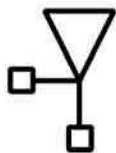


BRASS

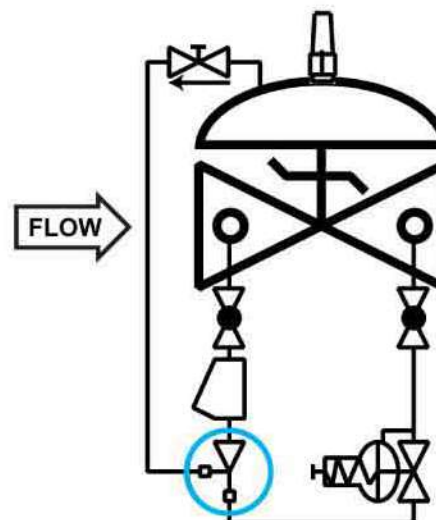


SCHEMATIC SYMBOL

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



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



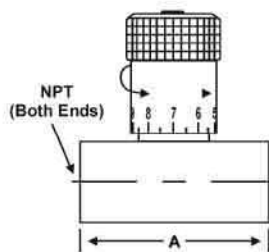
DESCRIPTION

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

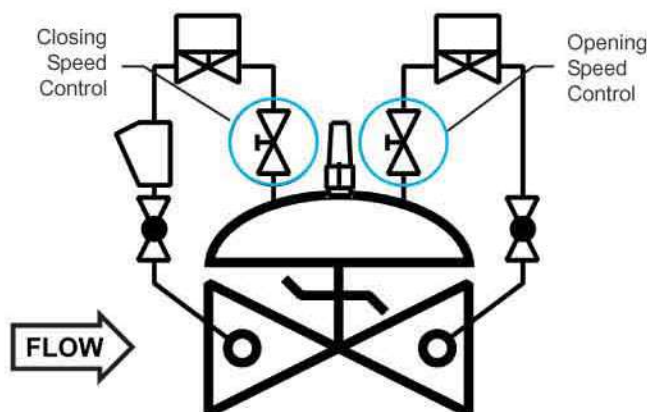
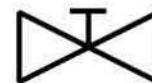


MATERIAL	PART NUMBER	INLET/OUTLET (NPT)	A	USED ON VALVE SIZE*
Brass	683100	1/4	2	1 1/4"-2"
Brass	683101	3/8	2 1/4	2 1/2"-6"
Brass	683102	1/2	2 5/8	8"-10"
Brass	683103	3/4	3 1/4	12"-16"
Stn. Steel	683700	1/4	2	1 1/4"-2"
Stn. Steel	683702	3/8	2 1/4	2 1/2"-6"
Stn. Steel	682704	1/2	2 5/8	8"-10"
Stn. Steel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



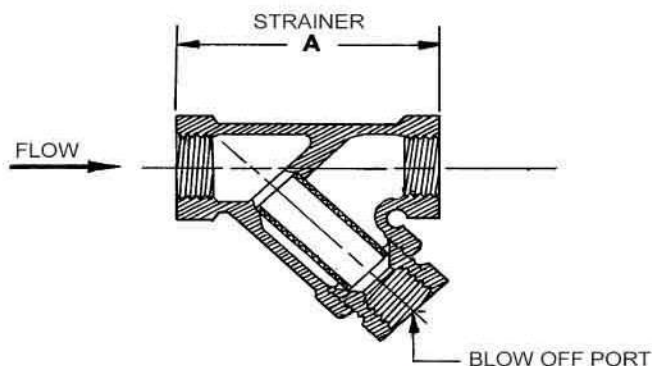
DESCRIPTION

MODEL 159 Y-STRAINER

The 159 Y-Strainer installs in the inlet piping of the pilot system and protects the pilot system from solid contaminants in the line fluid. It is the standard strainer for water service valves.

MODEL 159 Y-STRAINER MATRIX

MATERIAL	PART NUMBER	INLET/OUTLET (NPT)	BLOW OFF PORT (NP)	A	STD. MESH	USED ON VALVE SIZE
Bronze	660100	3/8	3/8	2 11/16	24	1 1/4"-6"
Bronze	660101	1/2	3/8	2 5/8	24	8"-10"
Bronze	660102	3/4	3/8	3 5/16	24	12"-16"
Stn. Steel	660700	3/8	1/4	2 1/2	20	1 1/4"-6"
Stn. Steel	660701	1/2	1/4	2 1/2	20	8"-10"
Stn. Steel	660702	3/4	1/4	3 1/8	20	12"-16"



MATERIALS

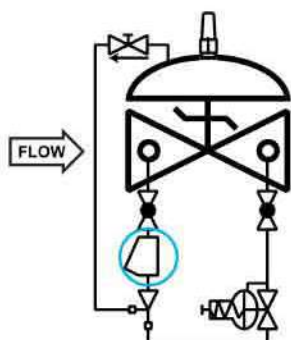
Bronze, ASTM B62
Optional mesh sizes: 50, 100

Stainless Steel, CF8-M (316)
Optional mesh sizes: 60, 80, 100

Screens are stainless steel

SCHEMATIC SYMBOL

The Model 159 Y-Strainer is shown on OCV Valve Schematics as:



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

MAINTENANCE

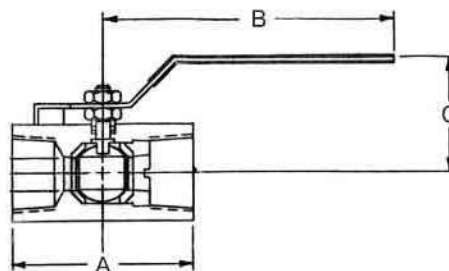
Routine cleaning and checking of the Y-Strainer will aid in keeping the control valve functioning properly. Pilot system isolation ball valves are supplied on valves equipped with the Model 159 Y-Strainer. These allow flushing of the screen through the blow off port, or removal of the screen itself for manual cleaning.

DESCRIPTION



The Model 141-4 Ball Valve is a 1/4-turn shutoff device used for isolating the pilot system from the main valve. They are extremely useful for performing routine maintenance and troubleshooting.

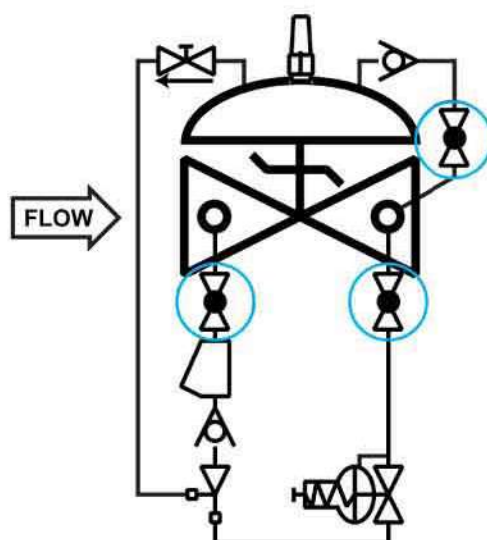
Ball valves are standard on water service valves; optional on fuel service valves.



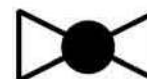
MODEL 141-4 MATRIX

MATERIAL	PART NUMBER	INLET/OUTLET (NPT)	A	B	C	USED ON VALVE SIZE*
Bronze	680100	3/8	1 3/4	3 1/2	1 7/8	1 1/4"-6"
Bronze	680101	1/2	2	3 1/2	2 1/4	8"-10"
Bronze	680102	3/4	3	4 3/4	2 1/4	12"-16"
Stn. Steel	680700	3/8	2	3 3/4	2 1/8	1 1/4"-6"
Stn. Steel	680701	1/2	2 1/4	3 3/4	2 1/2	8"-10"
Stn. Steel	680702	3/4	3	4 3/4	2 1/4	12"-16"

SCHEMATIC SYMBOL



The Model 141-4 Ball Valve is shown on OCV Valve Schematics as:



EXAMPLE: Shown here on a MODEL 127-4 Pressure Reducing / Check Valve.