differential control valve

installation, operating and maintenance instructions

model 110

GENERAL DESCRIPTION

The OCV Model 110 is designed to perform either of the following functions when used in conjuction with a meter:

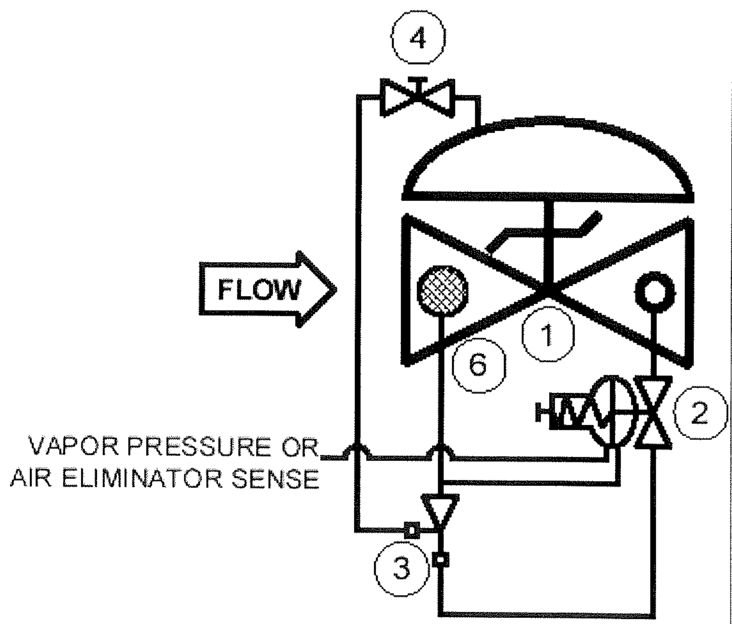
1. On LPG loading systems, to keep the valve inlet pressure a certain amount above product vapor pressure, thus preventing flashing through the meter.
2. When used with a bulk plant air eliminator, to close when air is present, thus preventing air from passing through the meter. In this application the 110 is often called an **air check valve**.

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, pilot controlled globe valve which closes with an elastomer-on-metal seal.
2. **Model 1356 Differential Control Pilot,** a two-way, normally closed control pilot that senses ta differential pressure and balances it against an adjustable spring load. An increase in differential above the set point tends to make the pilot open.
3. **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.
4. **Model 141-2 Needle Valve,** which controls the speed at which the valve opens and closes.
5. **Model 123 Inline Strainer,** which protects the pilot system from solid contaminants in the line fluid.

THEORY OF OPERATION

CONTROL ACTION: The action of the 110 is governed by the differential control pilot (2) and the ejector (3). The small orifice in the inlet of the ejector may be thought of as a **fixed** source of inlet pressure. Similarly, the differential 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



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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 differential pilot moves open or closed based on the differential pressure it is sensing. As the differential increases, the pilot moves further open. As the differential decreases, the pilot moves further closed. As explained above, the main valve follows, or "mirrors" the action of the pilot.

In an LPG system, the high pressure sense to the differential pilot is factory-connected to the inlet side of the main valve. The low pressure sense is field-connected to a source of vapor pressure, either the storage tank or a vapor pressure bulb. With the valve installed downstream of the meter, the pilot and valve will modulate as required to keep the valve inlet pressure, hence the pressure in the meter, a certain amount (typically 15-20 psi) higher than vapor pressure. This insures the product will remain liquid and flashing will not occur in the meter.

In an air eliminator system, the high pressure sense is again factory-connected to the inlet side of the main valve. The low pressure sense is field-connected to the air eliminator head. When air is not present, the low pressure sense line is vented to atmosphere through the air eleiminator's orificed bleed. The pilot thus sees a high differential and is full open, as is the main valve. However, when air is present, the low pressure sense line is pressurized, the pilot sees no differential, therefore it closes. The main valve follows, and remains closed until all air is exhausted. This insures that no air will pass through the meter.

INSTALLATION

The 110 is furnished fully factory-assembled, ready for installation at the meter. Please refer to the Model 65 Basic Valve section of this manual for full installation details.

Following main valve installation, a single sense line, typically 1/4" OD stainless steel tubing, must be installed from the low pressure sense port of the differential pilot to one of the following points:

(a) The storage tank or vapor pressure bulb on LPG systems.

(b) The air eliminator head on other systems.

STARTUP AND ADJUSTMENTS

Please follow these procedures, step-by-step, in performing an initial startup of the 110. Also, refer to the appropriate steps in the procedures should readjustment ever be required.

LPG SYSTEMS

1. Install pressure gauges as necessary to measure (a) the pressure upstream of the valve, and (b) the fluid vapor pressure.
2. Connect the loading arm to a truck or other receiving vessel.
3. Remove the protective cap from the differential pilot (2) and loosen the adjusting screw jam nut. Turn the adjusting screw **fully clockwise.**
4. Loosen the adjusting screw jam nut on the needle valve (4). Turn the adjusting screw **fully clockwise,** then **counter-clockwise** three full turns.
5. Start the pump. The valve should remain closed.
6. Carefully loosen a pipe plug in the bonnet of the main valve until fluid appears around the threads. When only clear fluid (no air) is discharging retighten the plug.
7. Slowly turn the adjusting screw of the differential pilot (2) **counter-clockwise** until the valve opens.
8. Observe the pressure gauges. Ideally, the gauge upstream of the valve should read 15-20 psi higher than the vapor pressure gauge. Adjust the differential pilot **clockwise** to **increase** the differential; **counter-clockwise** to **decrease** it.
9. Tighten the adjusting screw jam nut and replace the protective cap.

AIR ELIMINATOR SYSTEMS

1. Connect the loading arm to a truck or other receiving vessel.

2. Remove the protective cap from the differential pilot (2) and loosen the adjusting screw jam nut. Turn the adjusting screw **fully clockwise.**
3. Loosen the adjusting screw jam nut on the needle valve (4). Turn the adjusting screw **fully clockwise,** then **counter-clockwise** three full turns.
4. Start the pump. The valve should remain closed.
5. Carefully loosen a pipe plug in the bonnet of the main valve until fluid appears around the threads. When only clear fluid (no air) is discharging re-tighten the plug.
6. Allow the air eliminator to discharge all accumulated air.
7. Slowly turn the adjusting screw of the differential pilot (2) **counter-clockwise** until the valve opens and the proper flow rate is established.
8. Tighten the adjusting screw jam nut and replace the protective cap.

MAINTENANCE

The 110 requires little in the way of routine maintenance. Periodically

TROUBLESHOOTING

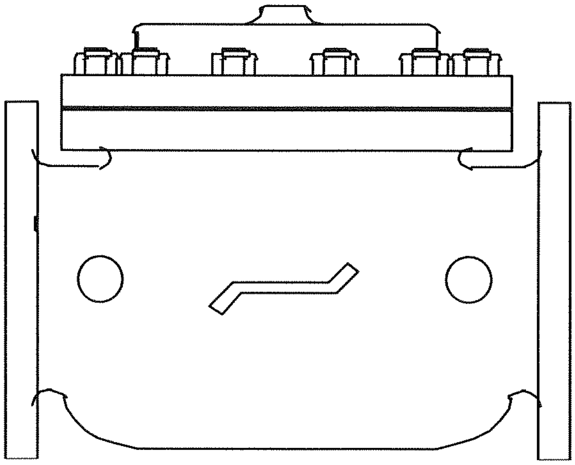
In the event of malfunction of the 110, the following guide should enable the technician to isolate the cause of the problem and take the appropriate corrective action.

MAIN VALVE FAILS TO OPEN

1. Isolation valve closed upstream or downstream of 110 — Open as required.
2. Needle valve (4) closed — Open as required. See Adjustment Instructions.
3. Differential pilot (2) adjusted too far clockwise — See Adjustment Instructions.
4. Stem of differential pilot (2) binding or diaphragm ruptured — Disassemble pilot and determine cause. See the 1356 Pilot section of this manual.
5. Stem of main valve binding or diaphragm ruptured — Disassemble main valve and determine cause. See the Model 65 Basic Valve section of this manual.

MAIN VALVE FAILS TO CLOSE

1. Isolation valve closed downstream of 110 — Open as required.
2. Needle valve (4) closed — Open as required. See Adjustment Instructions.
3. Differential pilot (2) adjusted topo far counter-clockwise — See Adjustment Instructions.
4. Stem of differential pilot (2) binding or seat damaged — Disassemble pilot and determine cause. See the 1356 Pilot section of this manual.
5. Main valve stem binding or seat deteriorated — 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 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

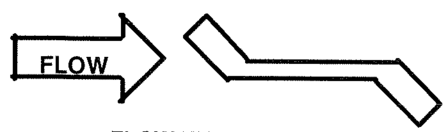
**A diaphragm failure can prevent the valve from either opening or closing, depending on the flow direction. Most water service valves flow "under the seat", in which case a diaphragm failure will keep the valve from closing. On the other hand, most fuel service valves flow "over the seat", in which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

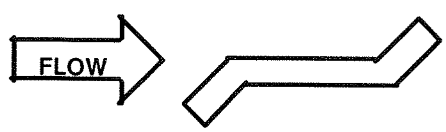
1. Isolate the valve from the system by closing upstream amd downstream block valves.
2. Loosen one of the tubing connections on the bonnet. Allow any residual pressure to bleed off.
3. Remove all tubing connected at the bonnet.
4. Remove the bonnet nuts.
5. Remove the bonnet. If the bonnet sticks in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

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.

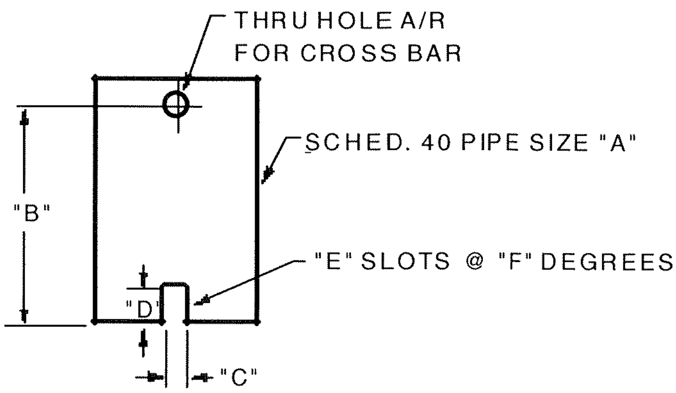
PROCEDURE C: SEAT DISC REPLACEMENT

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

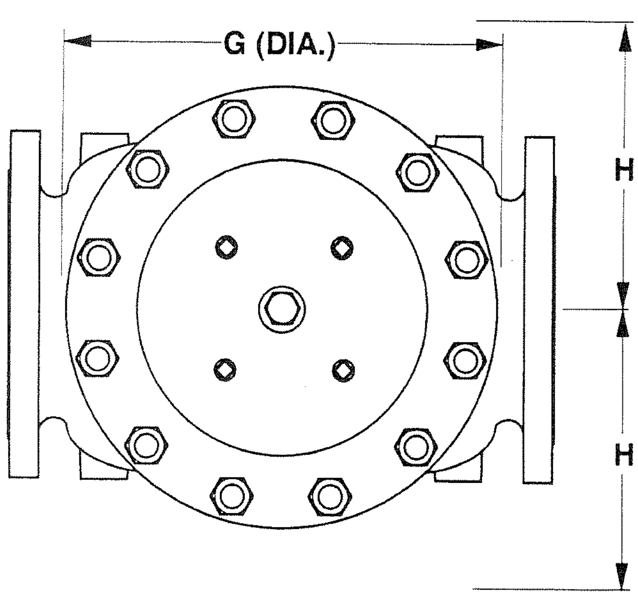
NOTE: It is rare for a seat ring to require replacement. Minor nicks and scratches in the seating surface can usually be smoothed out with emery cloth.

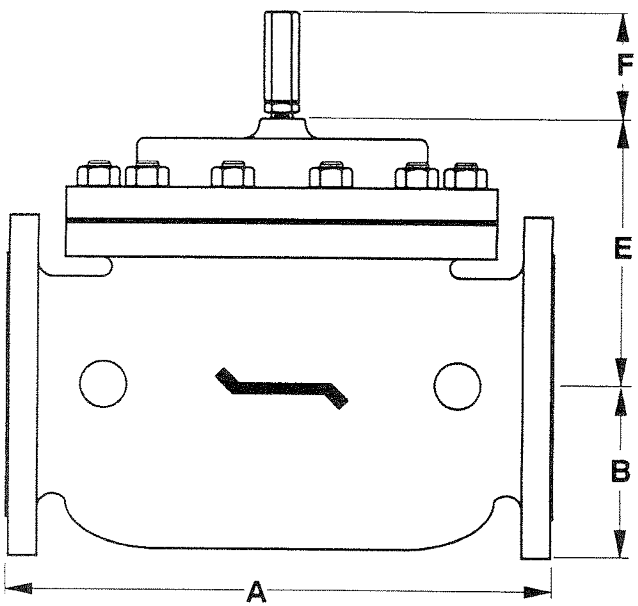
1. Perform Steps 1 and 2 of Procedure B, above.
2. If you are working on a 4" or smaller valve, follow Steps 3 thru 9, below.
3. If you are working on a 6" or larger valve, follow Steps 10 thru 16, below.
4. Seat rings in valves 4" and smaller are threaded into the valve body. To remove, you will need 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.



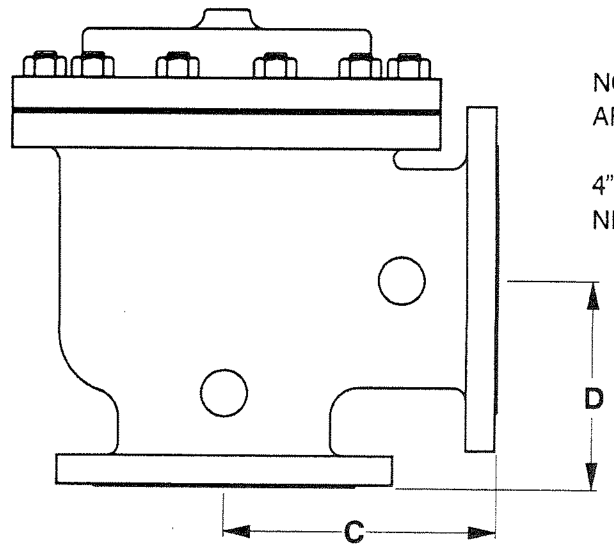
VALVE SIZE	"A" PIPE SIZE	"B" MIN. LENGTH	"C" SLOT WIDTH	"D" SLOT DEPTH	"E" NO. OF SLOTS	"F" SLOT SPACING
1-1/4"	3/4"	6"	3/8"	3/8"	2	180°
1-1/2"	3/4"	6"	3/8"	3/8"	2	180°
2"	1-1/2"	7"	3/8"	3/8"	2	180°
2-1/2"	2"	8"	1/2"	1/2"	3	120°
3"	2-1/2"	9"	5/8"	5/8"	2	180°
4"	3"	10"	5/8"	5/8"	2	180°

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

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

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.

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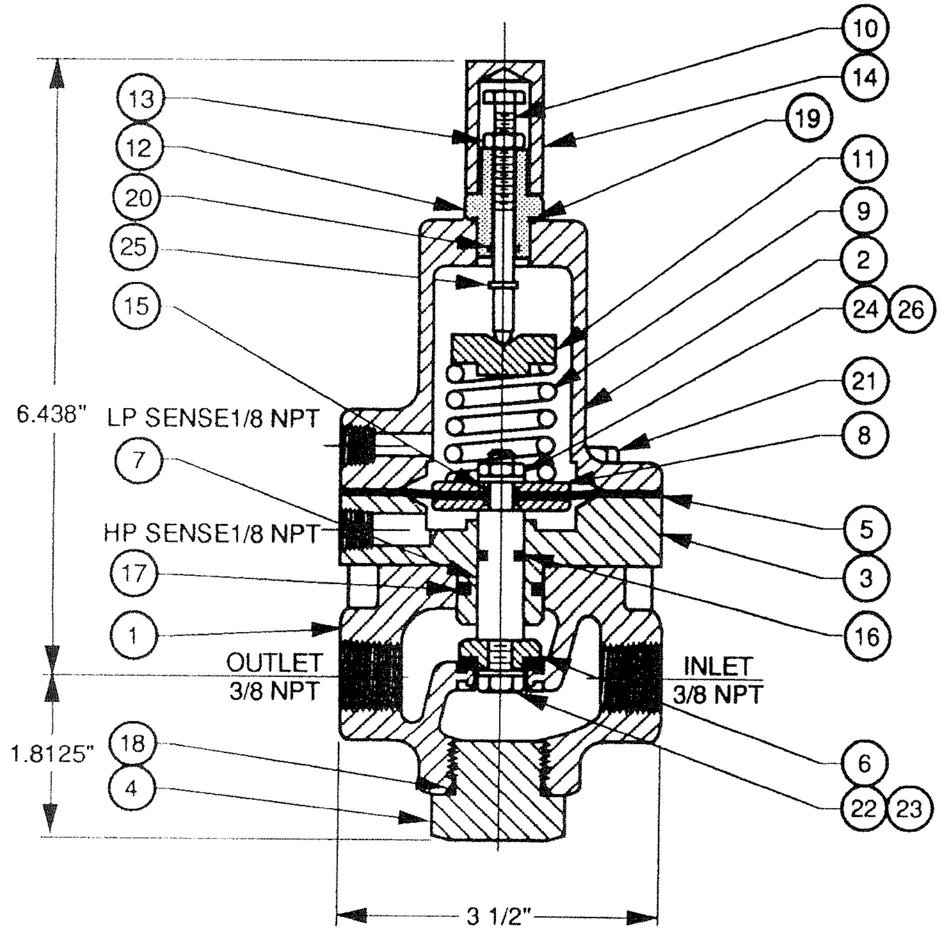
SPRING CHART		
651701	5-30 PSI	GREEN
651703	20-80 PSI	RED
651704	65-180 PSI	YELLOW
651702	100-300 PSI	BLUE



▲ = RECOMMENDED SPARE PARTS
VITON ELASTOMERS AVAILABLE
1/2" NPT AVAILABLE

	ITEM	PART NO.	QTY	DESCRIPTION	MATERIAL
	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

CHG	E.C. NO.	DATE	BY

REVISIONS

REF DWG NO'S

MATERIAL

STN STL / BUNA-N / MONEL STEM

TOLERANCES

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

NO. REQ'D

SCALE 1/2

DRAWN BY RON | DATE 4-11-95

CHKD. BY | DATE

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.

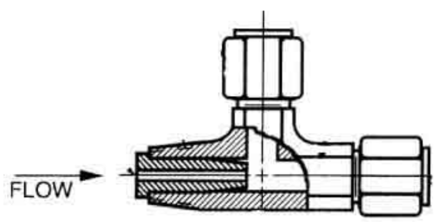
MODEL 126 EJECTOR DIAGRAM

Brass Construction / Stainless Steel Construction

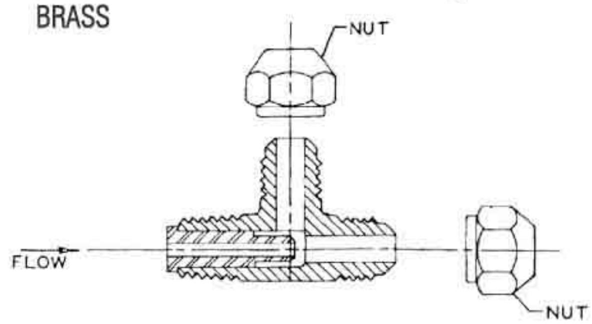
MATERIAL	PART NUMBER	P (NPT)	T-TUBE O.D.	STD. ORIFICE	USED ON VALVE SIZES
Brass	213100	3/8"	3/8"	.125"	1 ¼"-6"
Brass	214100	1/2"	1/2"	.188"	8"-10"
Brass	215100	3/4"	3/4"	.188"	12"-16"
316 Stn. Steel	213700	1/4"	3/8"	.090"	1 ¼"-6"
316 Stn. Steel	214700	3/8"	1/2"	.125"	8"-10"
316 Stn. Steel	215700	1/2"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

Orifice bushings are stainless steel.

STAINLESS

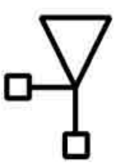


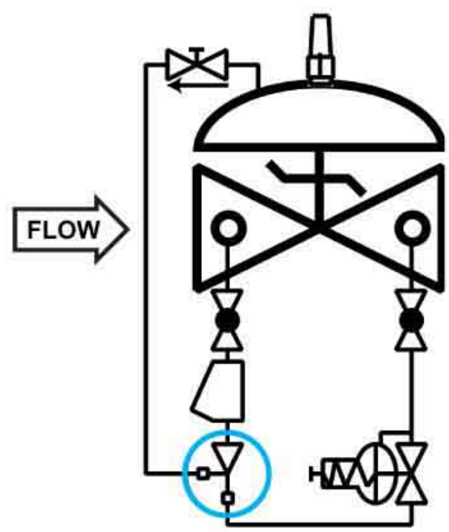
BRASS



SCHEMATIC SYMBOL

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





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

TOLL FREE 1.888.628.8258 • **phone:** (918)627.1942 • **fax:** (918)622.8916 • 7400 East 42nd Place, Tulsa, OK 74145
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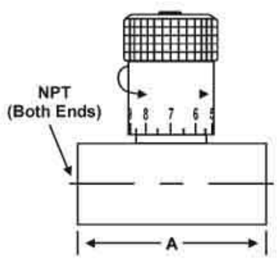
Needle Valves shown
Sizes: 3/4" & 1/4"

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.

MODEL 141-2 MATRIX

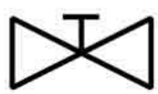


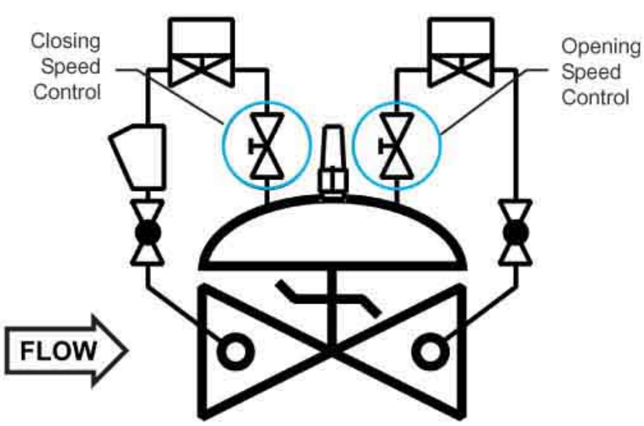
MATERIAL	PART NUMBER	INLET/OUTLET (NPT)	A	USED ON VALVE SIZE*
Brass	683100	1/4	2	1 ¼"-2"
Brass	683101	3/8	2 1/4	2 ½"-6"
Brass	683102	1/2	2 5/8	8"-10"
Brass	683103	3/4	3 1/4	12"-16"
Stn. Steel	683700	1/4	2	1 ¼"-2"
Stn. Steel	683702	3/8	2 1/4	2 ½"-6"
Stn. Steel	682704	1/2	2 5/8	8"-10"
Stn. Steel	683703	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.

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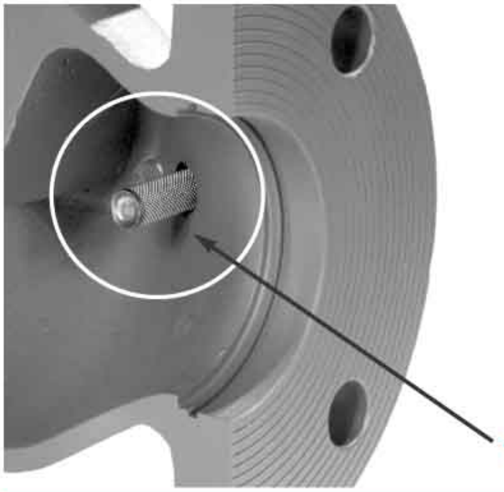
Needle Valve 141-2



Strainer Shown Installed

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

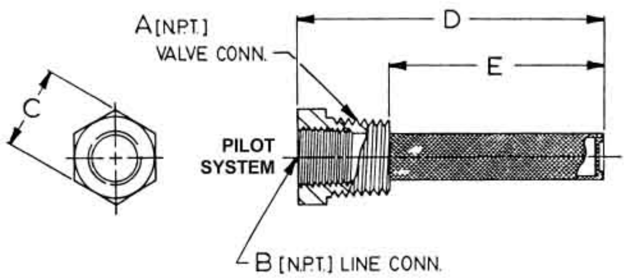
PART NUMBER	A	B	C	D	E	USED ON VALVE SIZE
660704	3/8	1/4	11/16	2 3/16	1 1/2	1 1/4"-6"
660705	1/2	3/8	7/8	2 1/4	1 1/2	8"-10"
660706	3/4	1/2	1 1/8	2 3/8	1 1/2	12"-16"

MATERIALS

Inline strainers are all-stainless steel construction.

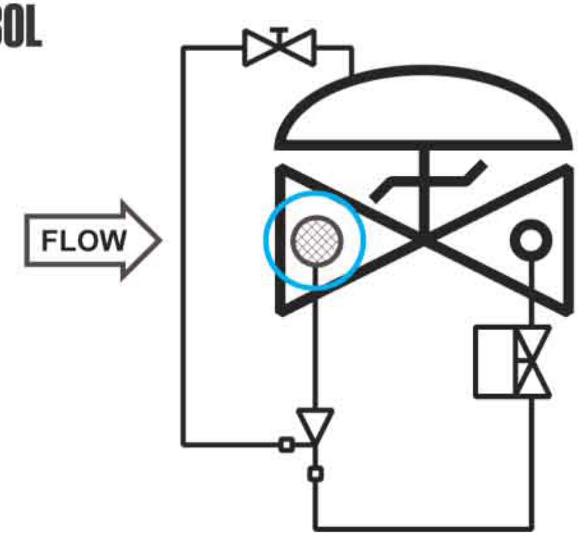
SCREEN SIZE

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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Inline Strainer 123