Operating Manual

Model #: 108-2HP
Size:
Serial #:
Sales Order:

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OCV® FLUID SOLUTIONS LLC

OCV® Dorot

matholding group

high pressure fire pump relief valve (non UL/FM version)

installation, operating and maintenance instructions

model 108-2HP

Ron 9-18-08

GENERAL DESCRIPTION

The OCV Model 108-2HP (non UL/FM) is specifically designed for use on the discharge of a high pressure fire pump. It will relieve any pressure higher than its set point and thereby can ensure a constant pressure in the system as demand changes.

The 108-2HP is utilized for both horizontal split case centrifugal and vertical turbine fire pumps.

The 108-2HP 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 2400 High Pressure Relief Pilot**, a two-way, normally-closed pilot valve which senses upstream pressure under its diaphragm and balances it against an adjustable spring load. An increase in upstream pressure tends to make the pilot open.
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 pressure relief pilot.
4. **Model 141-1 Check Valve**, which prevents the 108-2HP from inadvertently opening when used on vertical turbine pumps.
5. **Model 159 Y-Strainer**, which protects the pilot system from solid contaminants in the line fluid.
6. A bonnet-mounted **Pressure Gauge**, useful for monitoring valve operation.

At user option, the 108-2HP may also be equipped with the following:

1. Model 155 Visual Indicator (Item 7).
2. Model 141-3 Closing Speed Control.
3. Model 141-1 Isolation Ball Valves.

THEORY OF OPERATION

To understand how the 108-2HP operates, it is best to start with the **Ejector (3)**. 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 **High Pressure Relief Pilot (2)**. 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 note 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. Therefore, the pressure in the diaphragm chamber of the main valve is effectively controlled by the pressure relief pilot, in the manner described above. As the pilot **opens**, the diaphragm pressure **decreases** and the main valve **opens**; as the pilot **closes**, the diaphragm pressure **increases** and the main valve **closes**.

Since the 108-2HP is used as a **high pressure relief valve**, the pressure upstream of the main valve is normally below the set point of the relief pilot. Therefore, the pilot is fully closed and so is the main valve. However, if for any reason, the pressure rises above the set point, the pilot will open and the main valve will follow in turn. The net effect is that the main valve will open and

control the pressure at the set point, not allowing it to rise any further. Once pressure returns to normal, the pilot and main valve will return to the closed position.

INSTALLATION

For full installation details, the user is referred to the Model 65 Basic Valve section of this manual.

START-UP AND ADJUSTMENTS

The following procedures should be followed in the order presented in order to affect an initial startup of the 108-2HP.

1. Install a pressure gauge of the proper range upstream of the 108-2HP. The unused **inlet** side port in the main valve body may be used for this purpose if there is no convenient location in the upstream piping.
2. Remove the plastic cap from the pressure relief pilot (2) and loosen the adjusting screw jam nut. Turn the adjusting screw **clockwise** to a full stop.
3. Start the pump or otherwise start the system flowing. The main valve at this time should be fully closed.
4. Carefully loosen a pipe plug in the main valve bonnet until fluid begins to discharge around the threads. When only clear fluid (no air) is discharging, retighten the plug.
5. While observing the inlet pressure gauge, retard flow in the system by closing valves or otherwise reducing demand until the pressure increases to approximately 5 psi **above** the desired set point.
6. Slowly turn the adjusting screw of the pressure relief pilot (2) **counterclockwise** until the valve opens and the pressure falls **to the set point**. Tighten the adjusting screw jam nut and replace the plastic cap.
7. Increase flow in the system or otherwise increase demand until pressure returns to normal. The valve should close.
8. Repeat step 5 for set point verification. The valve should reopen. Repeat step 7.
9. Shut down the pump.

MAINTENANCE

Because of the simplicity of design of the 108-2HP, 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 screen of the Y-strainer for buildup of solid material. Clean as required. This point is most important, as a clogged strainer can keep the valve from closing. On new installations, it is recommended that the strainer be checked every day or two until experience dictates a greater or lesser interval. Strainer maintenance is covered in detail on a special page later in this manual.

TROUBLESHOOTING

In the event of malfunction of the 108-2HP, the following guide should enable the technician to isolate the specific cause of the problem and take the appropriate corrective action.

A. MAIN VALVE FAILS TO OPEN:

1. Valve closed upstream or downstream of the 108-2HP. Open as required.
2. Pressure relief pilot (2) adjusted too far clockwise. See Adjustment instructions.
3. Diaphragm of pressure relief pilot (2) ruptured. This will be evidenced by a discharge of fluid from the vent hole in the pilot bonnet. Replace diaphragm. See the 2400 Pilot section of this manual.
4. Stem of pressure relief pilot (2) binding. Disassemble pilot and determine cause. See the 2400 Pilot section of this manual.
5. Stem of main valve binding. Disassemble valve and determine cause. See the Model 65 Basic Valve section of this manual.

B. MAIN VALVE FAILS TO CLOSE:

1. Strainer (5) clogged. Clean as required.
2. Pressure relief pilot (2) adjusted too far counterclockwise. See Adjustment instructions.
3. Pressure relief pilot (2) stem binding or seat badly deteriorated. Disassemble pilot and determine cause. See the 2400 Pilot section of this manual.
4. Main valve diaphragm ruptured. Replace diaphragm. See the Model 65 Basic Valve section of this manual.
5. Main valve stem binding or object caught in

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

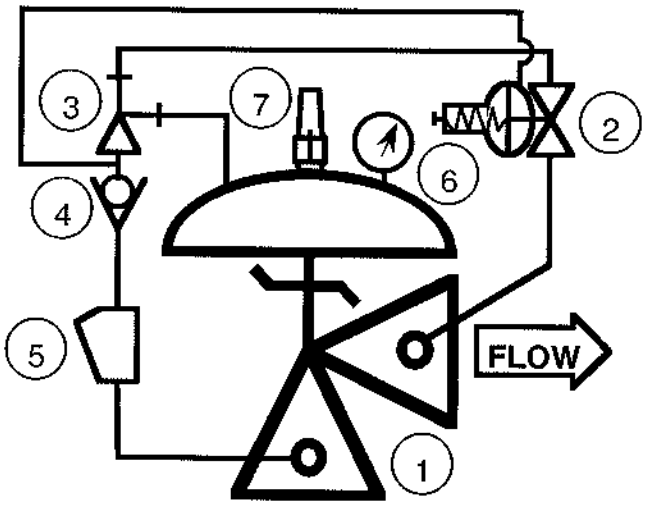
C. MAIN VALVE OPENS AND CLOSES, BUT LEAKS WHEN CLOSED.

1. Pressure relief pilot (2) adjusted slightly too low. See Adjustment instructions.
2. Damaged seat in the pressure relief pilot (2). Replace seat. See the 2400 pilot section of this manual.
3. Damaged seat in the main valve. Replace seat. See the Model 65 Basic Valve section of this manual.

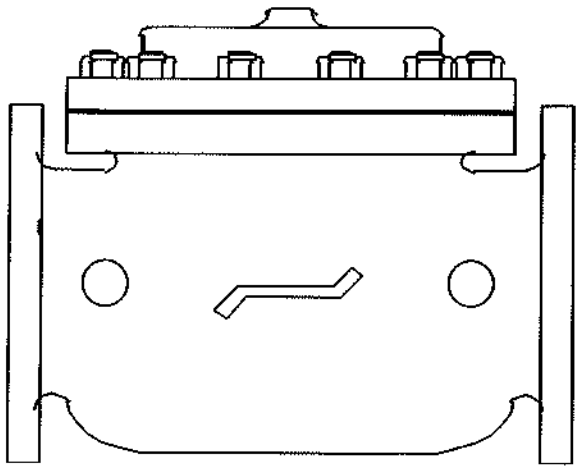
MODEL 108-2HPA

RON
2-2-06

PRESSURE RELIEF VALVE
(HIGH PRESSURE TYPE)



ITEM	PART NO.	QTY	DESCRIPTION
1	65A	1	BASIC ANGLE VALVE ASSEMBLY
2	2400	1	PRESSURE RELIEF PILOT (200-740 PSI ADJ.)
3	126	1	EJECTOR
4	141-1	1	CHECK VALVE
5	159	1	Y-STRAINER
6	--	1	PRESSURE GAUGE
7	155	1	VISUAL INDICATOR (Optional)



installation, operating, and maintenance instructions

series 65

basic control valve

GENERAL DESCRIPTION

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

FUNCTIONAL DESCRIPTION

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

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

INSTALLATION

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

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

In addition, it is highly recommended that:

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

MAINTENANCE

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

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

REPAIR PROCEDURES

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

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

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

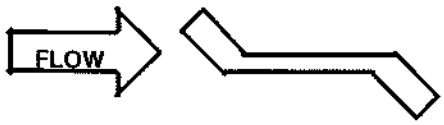
**A diaphragm failure can prevent the valve from either opening or closing, depending on the flow direction. Most water service valves flow "under the seat", in which case a diaphragm failure will keep the valve from closing. On the other hand, most fuel service valves flow "over the seat", in which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

PROCEDURE A : DIAPHRAGM REPLACEMENT

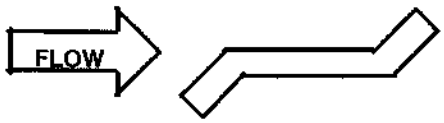
1. Isolate the valve from the system by closing upstream amd downstream block valves.
2. Loosen one of the tubing connections on the bonnet. Allow any residual pressure to bleed off.
3. Remove all tubing connected at the bonnet.
4. Remove the bonnet nuts.
5. Remove the bonnet. If the bonnet sticks in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

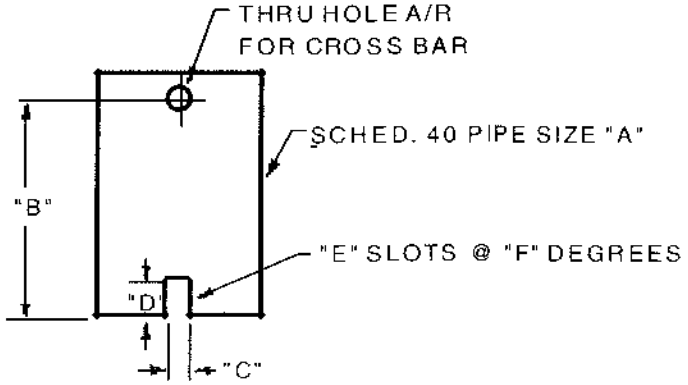
PROCEDURE C: SEAT DISC REPLACEMENT

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°

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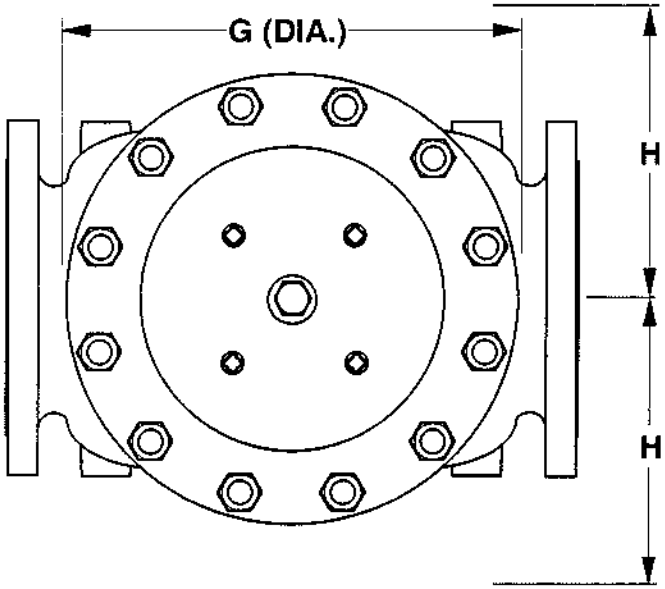
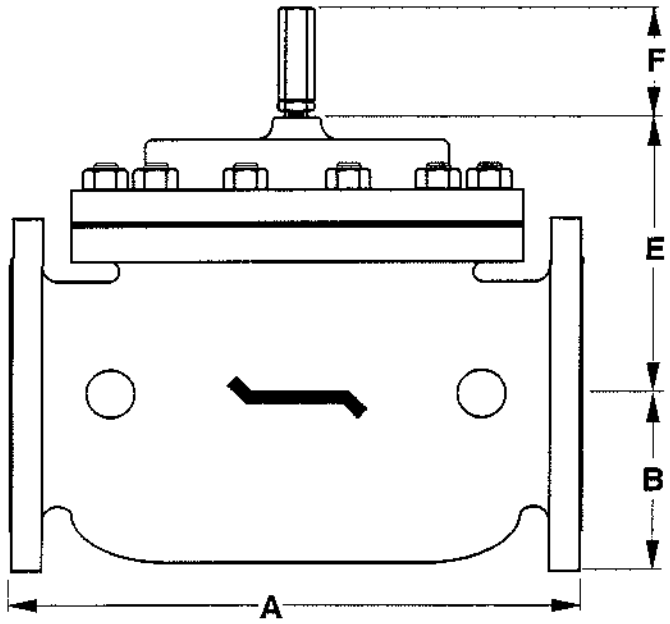
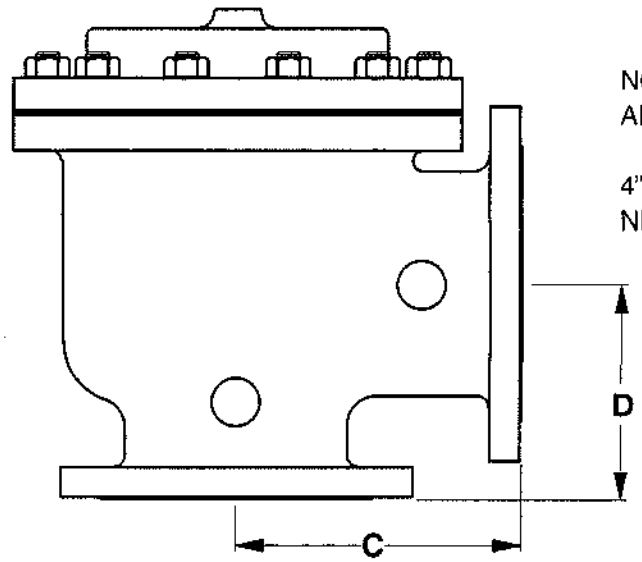




DIM	ANSI CLASS	VALVE SIZE 1 1/4	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	24
A	S.E	8.75	8.75	9.88	10.50	13.00	–	–	–	–	–	–	–	–
	150	8.50	8.50	9.38	10.50	12.00	15.00	17.75	25.38	29.75	34.00	39.00	40.38	62.00
	300	8.75	8.75	9.88	11.12	12.75	15.62	18.62	26.38	31.12	35.50	40.50	42.00	63.75
B	SE	1.44	1.44	1.69	1.88	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

pressure sustaining/ relief pilot 200-750 psi

installation, operating, and maintenance instructions

model 2400

GENERAL DESCRIPTION

The Model 2400 Pressure Sustaining Pilot is a normally closed, direct-acting, spring-loaded, diaphragm-type control pilot. It is designed to maintain a constant pre-set means of an adjustment screw located under the cap on top of the positive control of the Main Valve. It may also be used for open and close pressure relief service. The 2400 is specially designed for high pressure service and is adjustable over a range of 200-750 psi.

FUNCTIONAL DESCRIPTION

Basically, the Model 2400 Pressure Sustaining Pilot 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 upstream system pressure is sensed under the pilot diaphragm. As the upstream pressure increases, the pilot begins to open, decreasing the amount of pressure in the upper chamber of the Main Valve allowing it to open a proportionate amount, in order to maintain a constant inlet pressure. As the upstream pressure decreases, the pilot begins to close, allowing the pressure in the upper chamber of the Main Valve to increase, causing it to close. This is a constant modulating action compensating for any change in upstream pressure.

INSTALLATION & ADJUSTMENT

The Model 2400 Pressure Sustaining Pilot should be installed in the Main Valve Control Piping between the ejector and the downstream body tap. Flow should be in the direction indicated on the pilot body. A sensing line (1/4" O.D. Tubing) should be installed from the pilot sensing port to a point upstream of the valve. Pilot adjustment is achieved with the adjustment screw located on top of the bonnet. Increase upstream pressure by turning the screw clockwise; decrease upstream pressure by turning the screw counter-clockwise.

MAINTENANCE

Because of the simplicity of design of the 2400 Pilot, required maintenance is minimal. Fittings and bolts should be periodically checked and the body should be inspected for damage or excessive buildup of foreign material.

TROUBLESHOOTING

Troubleshooting the 2400 Pilot is equally simple. Major troubleshooting points are as follows:

1. A ruptured pilot diaphragm is readily evident by the discharge of fluid at the vent hole in the pilot bonnet.

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.

3. A suspected leak in the pilot seat area can be checked by disassembling the pilot and inspecting the seat disc and the seat in the pilot's body.

OCV Control Valves
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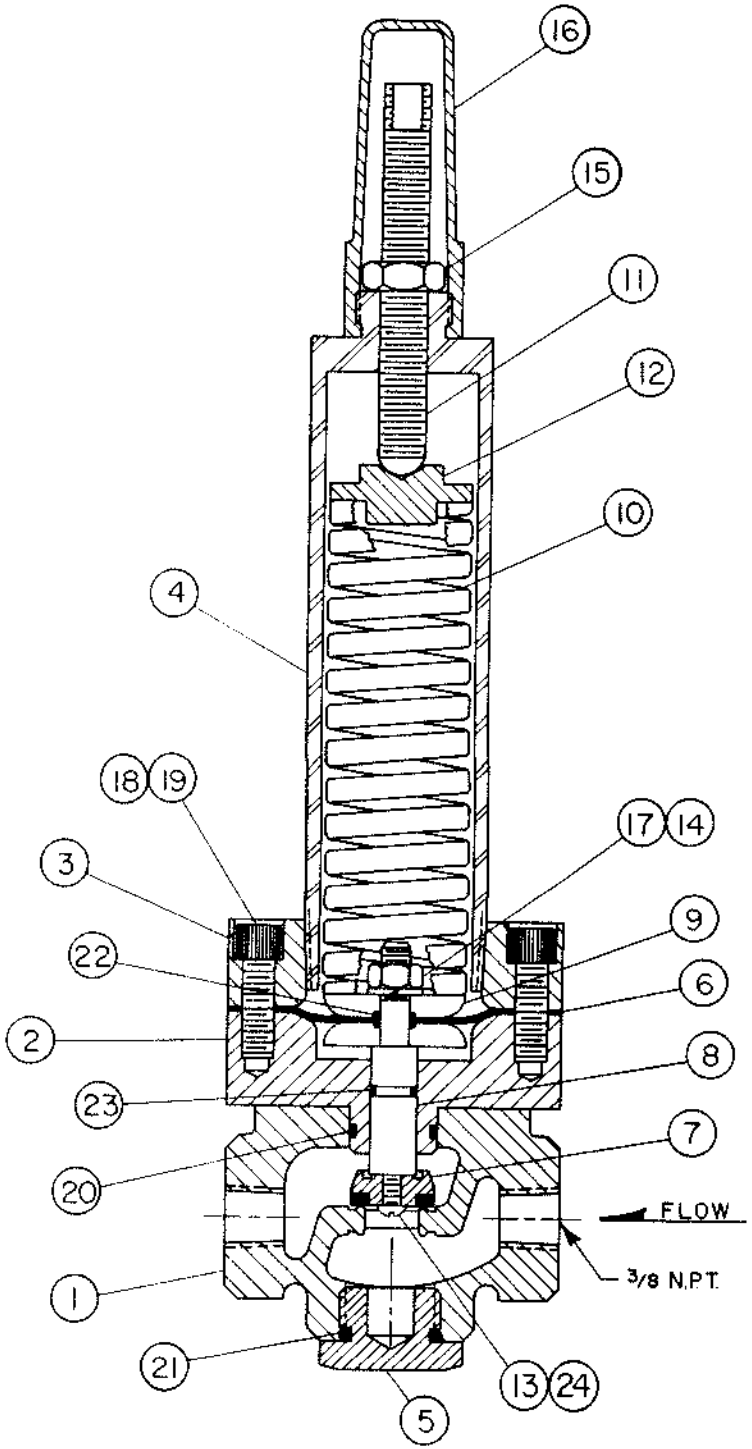


NOTE:

1. WHEN ORDERING PARTS, PLEASE SPECIFY; ITEM NO., PART NO. AND MATERIAL.
2. ▲ RECOMMENDED SPARE PARTS.
3. SPRING RANGE 200 PSI TO 750 PSI

	ITEM	PART NO.	QTY.	DESCRIPTION	MATERIAL
	24	685760	1	SEAL WASHER	STN. STL. / BUNA
▲	23	611012	1	O-RING	VITON
▲	22	611011	2	O-RING	VITON
▲	21	610119	1	O-RING	BUNA-N
▲	20	611116	1	O-RING	VITON
	19	530406	4	SOC. HD. CAPSCREW	STEEL
	18	530413	4	SOC. HD. CAPSCREW	STEEL
	17	590725	1	HEX NUT	STAINLESS STEEL
	16	692002	1	CAP	BUTYRATE
	15	590004	1	HEX NUT	CAD. PLATED STEEL
	14	685715	1	LOCKWASHER	STAINLESS STEEL
	13	532714	1	RD. HD. MACH. SCREW	STAINLESS STEEL
	12	300401	1	SPRING RETAINER	STEEL
	11	300400	1	ADJUSTING SCREW	STEEL
	10	651001	1	SPRING	Cr-V STEEL
	9	308703	2	DIAPHRAGM PLATE	STAINLESS STEEL
	8	314703	1	STEM	STAINLESS STEEL
▲	7	310703	1	PLUG	STN'L STL. / BUNA-N
▲	6	694009	1	DIAPHRAGM	BUNA-N
	5	692502	1	PLUG	STEEL
	4	300058	1	SPRING BARREL	STEEL
	3	304403	1	BONNET FLANGE	STEEL
	2	300711	1	ADAPTER	STAINLESS STEEL
	1	302703	1	BODY	STAINLESS STEEL

PARTS LIST

REVISIONS					REF DWG NO'S
CHG	E. C. NO	DATE	BY		
E					
D					
C					
B					
A					

MATERIAL | TOLERANCES: UNLESS NOTED FRACTIONAL ± 1/64, DECIMAL ± .005, MACH. FINISH 125, ANGULAR ± 1/2°

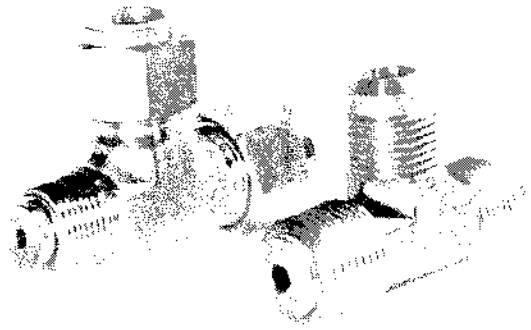
NO REQ'D | DRAWN BY: G.R.W. | DATE: 12-82

SCALE | CHKD. BY | DATE

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

HIGH PRESSURE RELIEF PILOT

SIZE: C | DRAWING NUMBER: 2400 | REV.



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.

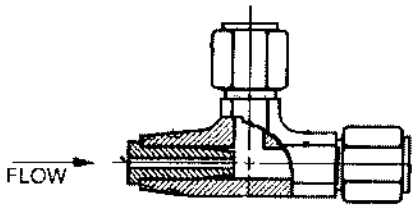
MODEL 126 EJECTOR DIAGRAM

Brass Construction / Stainless Steel Construction

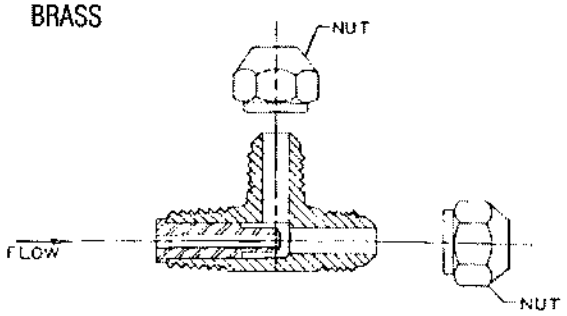
MATERIAL	PART NUMBER	P (NPT)	T-TUBE O.D.	STD. ORIFICE	USED ON VALVE SIZES
Brass	213100	3/8"	3/8"	.125"	1 ¼"-6"
Brass	214100	1/2"	1/2"	.188"	8"-10"
Brass	215100	3/4"	3/4"	.188"	12"-16"
316 Stn. Steel	213700	1/4"	3/8"	.090"	1 ¼"-6"
316 Stn. Steel	214700	3/8"	1/2"	.125"	8"-10"
316 Stn. Steel	215700	1/2"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

Orifice bushings are stainless steel.

STAINLESS

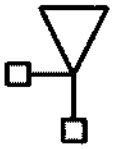


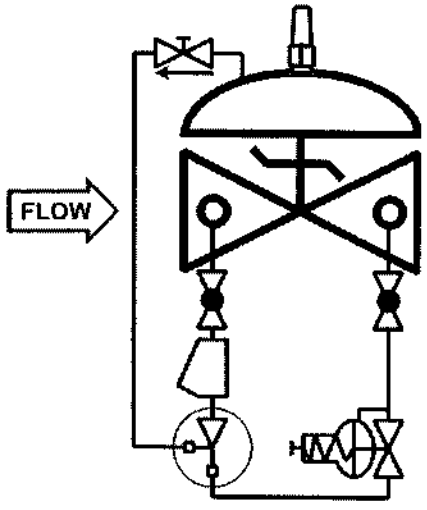
BRASS



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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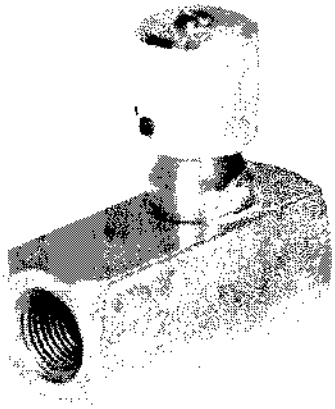
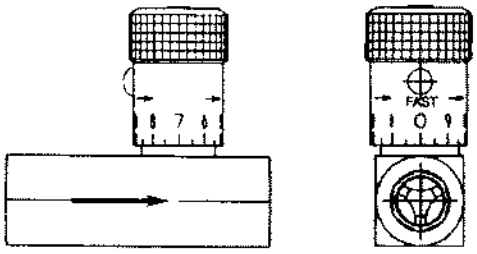
FLOW CONTROL VALVE 141-3



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.

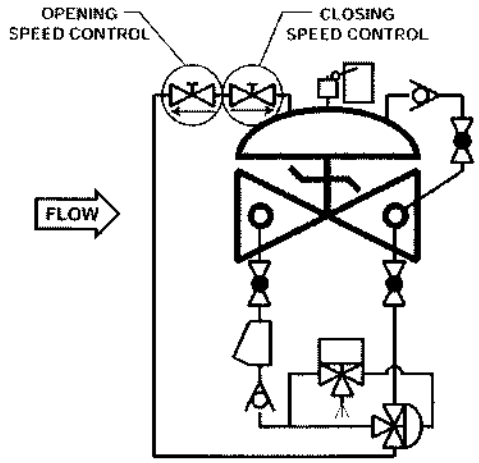


MODEL 141-3 MATRIX

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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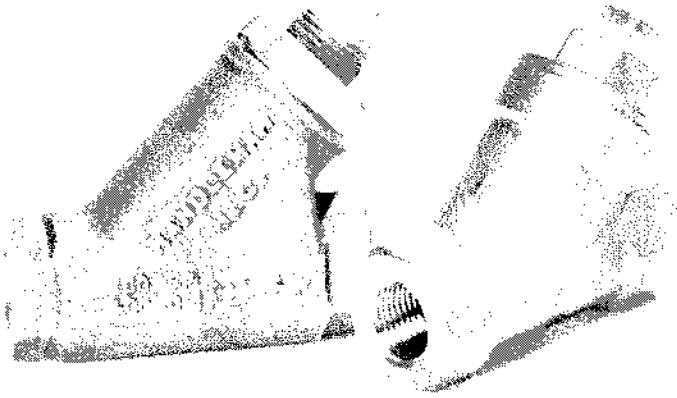
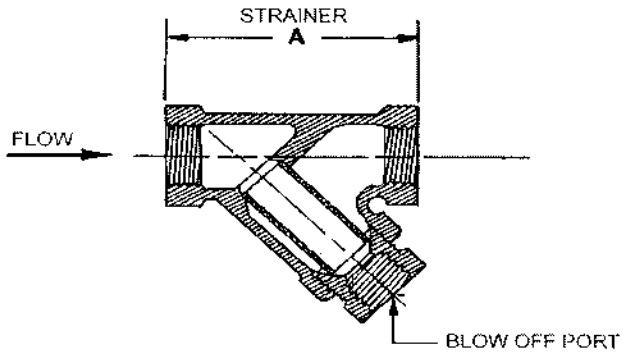


DESCRIPTION

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 ¼"-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 ¼"-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"



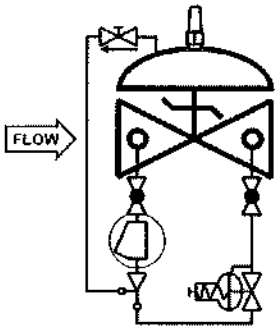
MATERIALS

Bronze, ASTM B62
Optional mesh sizes: 50,100

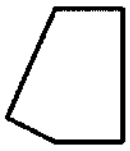
Stainless Steel, CF8-M (316)
Optional mesh sizes: 60, 80, 100

Screens are stainless steel

SCHEMATIC SYMBOL



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

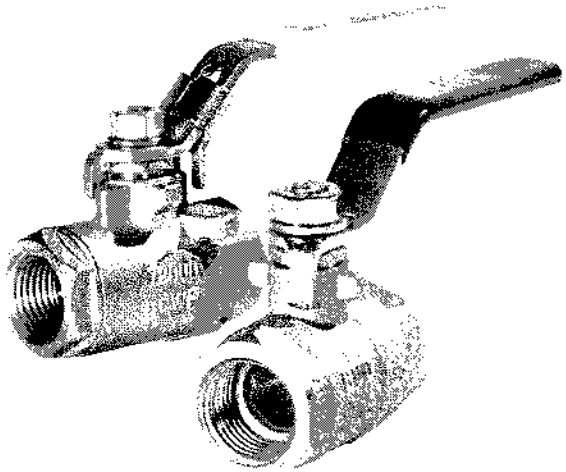


EXAMPLE: Shown here on a MODEL 127-3 Pressure Reducing Valve

MAINTENANCE

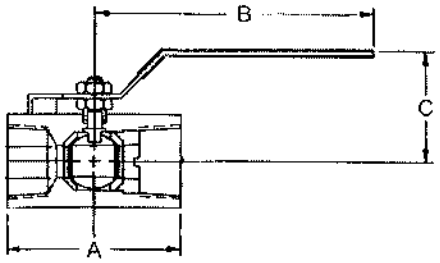
Routine cleaning and checking of the Y-Strainer will aid in keeping the control valve functioning properly. Pilot system isolation ball valves are supplied on valves equipped with the Model 159 Y-Strainer. These allow flushing of the screen through the blow off port, or removal of the screen itself for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

DESCRIPTION



The Model 141-4 Ball Valve is a ¼-turn shutoff device used for isolating the pilot system from the main valve. They are extremely useful for performing routine maintenance and troubleshooting.

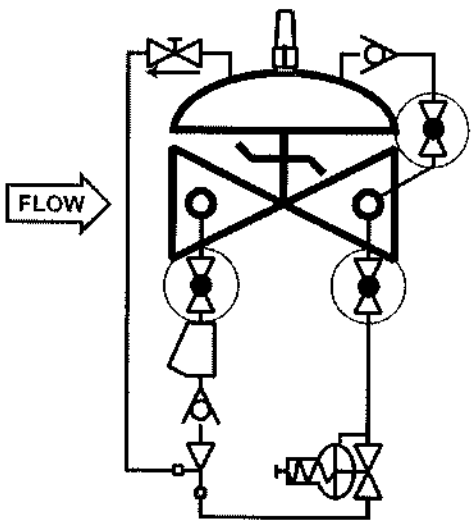
Ball valves are standard on water service valves; optional on fuel service valves.



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 ¼"-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 ¼"-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.

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