

Operating Manual

Model: 108-2HP

Size: "

Serial #:

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pressure relief or pressure sustaining valve (high pressure type)

installation, operating,
and
maintenance instructions

model 108-2HP

GENERAL DESCRIPTION

The OCV Model 108-2HP may be genetically described as a **back pressure control valve**, i.e., it controls the pressure at its inlet. With this type of control, the 108-2HP may be employed in two different ways:

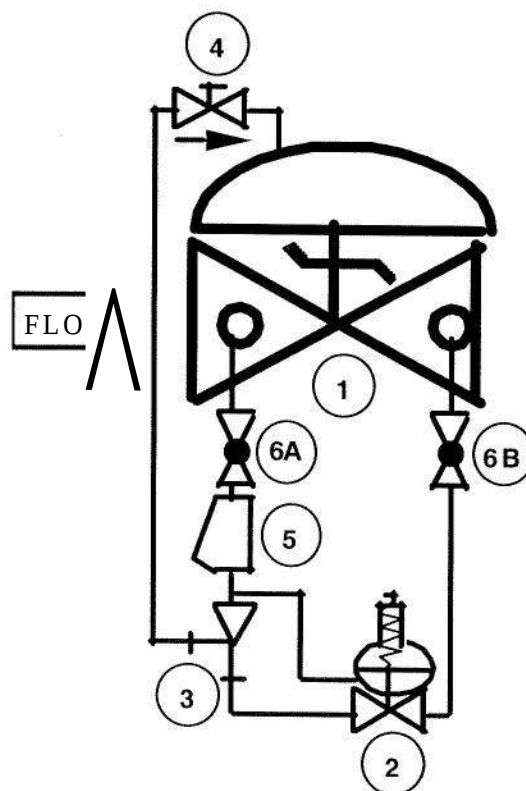
1. As a **Pressure Relief Valve**. Here the 108-2HP is installed on a bypass from a main line. It opens to relieve any pressure above its set point.
2. As a **Pressure Sustaining Valve**. Here the 108-2HP is installed in the main line itself. It functions to control the incoming pressure at the set point, or more commonly, to prevent the pressure from falling below a predetermined minimum. For example, it may be installed on the discharge of a pump to ensure that the pump remains "on its curve."

The Model 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. Adjustable from 200-750 psi.
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 141-3 Flow Control Valve**, a needle-type valve which provides adjustable, restricted flow

in one direction, and free flow in the opposite direction. On the 108-2HP, the flow control valve is connected as a **closing speed control**.

5. **Model 159 Y-Strainer** (standard on water service valves) or **Model 123 Inline Strainer** (standard on fuel 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.



nance or troubleshooting.

At user option, the 108-2HP 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 Speed Control.

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 **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**.

If the 108-2HP is installed as a **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. If the 108-2HP is installed as a **pressure sustaining valve**, the pressure upstream of the main valve is normally above the set point of the relief pilot. Therefore, the pilot is wide open as is the main valve. However, if system demand increases to the point that the upstream pressure tries to fall below the set point, the pilot will start to close and the main valve will follow, throttling as required to keep the pressure from

falling any further.

INSTALLATION

The 108-2HP is furnished fully factory-assembled and ready for installation at the appropriate point in the system.

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. Note that the procedure differs somewhat between a pressure relief valve and a pressure sustaining valve.

PROCEDURE A. PRESSURE RELIEF VALVE

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. Loosen the adjusting screw jam nut on the flow control valve (4) (closing speed control). Turn the adjusting screw **clockwise** to a full stop, then **counterclockwise** three full turns.
4. Make sure both pilot system isolation ball valves (6A and 6B) are **open**.
5. Start the pump or otherwise start the system flowing. The main valve at this time should be fully closed.
6. 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.
7. 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.
8. 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.

9. Increase flow in the system or otherwise increase demand until pressure returns to normal. Observe the closing speed of the valve. Ideally, the valve should close just slow enough to avoid inducing any secondary surges in the system. Turn the adjusting screw of the flow control valve (4) **clockwise** to **decrease** closing speed; **counterclockwise** to **increase** closing speed. **CAUTION:** *Do NOT adjust the flow control valve fully closed. To do so can keep the valve from closing at all.*
10. Shut down the pump.

PROCEDURE B. PRESSURE SUSTAINING VALVE

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. Loosen the adjusting screw jam nut on the flow control valve (4) (closing speed control). Turn the adjusting screw **clockwise** to a full stop, then **counterclockwise** three full turns.
4. Make sure both pilot system isolation ball valves (6A and 6B) are **open**.
5. Start the pump or otherwise start the system flowing. The main valve at this time should be fully closed.
6. 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.
7. Turn the adjusting screw of the pressure relief pilot (2) counterclockwise until it is loose enough to be turned with the fingers. The main valve should open fully.
8. Observing the inlet pressure gauge, open valves or otherwise increase flow until the pressure falls to a point approximately 5 psi below the desired set point.
9. Slowly turn the adjusting screw of the pressure relief pilot (2) clockwise until the pressure rises to the set point. Tighten the adjusting screw jam nut and replace the plastic cap.

10. 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. If the valve is equipped with a Y-strainer, check the screen 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 108-2. Open as required.
2. Downstream pilot system ball valve (6B) closed. Open as required.
3. Pressure relief pilot (2) adjusted too far clockwise. See Adjustment instructions.
4. 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.
5. Stem of pressure relief pilot (2) binding. Disassemble pilot and determine cause. See the 2400 Pilot section of this manual.
6. 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. Upstream pilot system ball valve (A) closed. Open as required.
2. Strainer (5) clogged. Clean as required.

3. Closing speed control adjusted fully closed. Open as required. See Adjustment instructions.
4. Pressure relief pilot (2) adjusted too far counter-clockwise. See Adjustment instructions.
5. Close the downstream pilot system ball valve (6B).
 - (a) If valve closes, proceed to Step 6.
 - (b) If valve remains open, proceed to Step 7.
6. Pressure relief pilot (2) stem binding or seat badly deteriorated. Disassemble pilot and determine cause. See the 2400 Pilot section of this manual.
7. Close both pilot system ball valves (6A and 6B) and loosen a pipe plug in the main valve bonnet. A continuous discharge of fluid from the loosened plug indicates that the main valve diaphragm is ruptured. Replace diaphragm. See the Model 65 Basic valve section of this manual.

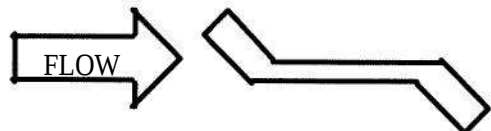
NOTE: Certain valves, predominantly those in fuel service, are assembled "fail closed." In this case, a ruptured diaphragm would keep the valve from opening, rather than keep it from closing. To determine which type you have, examine the "bridge mark" cast

into the side of the main valve body and compare it with the diagram below.

8. 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. Close downstream pilot system ball valve (6B).
 - (a) If the leak stops, the problem is in the pressure relief pilot (2), likely a damaged seat. Disassemble pilot and determine cause. See the 2400 pilot section of this manual.
 - (b) If the leak continues, the problem is in the main valve, likely a damaged seat. Disassemble valve and determine cause. See the Model 65 Basic Valve section of this manual.



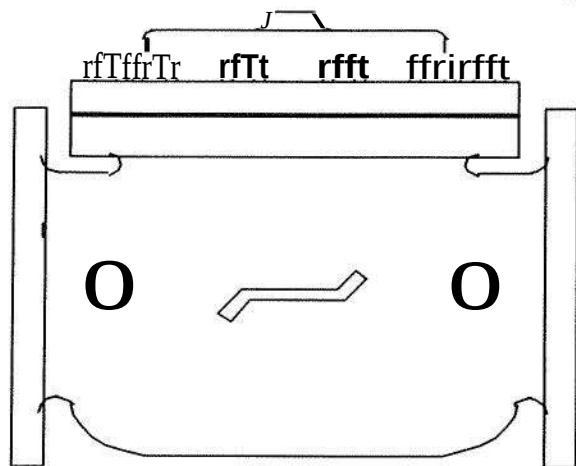
FLOW UNDER SEAT

DIAPHRAGM FAILURE = VALVE FAILS TO CLOSE



FLOW OVER SEAT

DIAPHRAGM FAILURE = VALVE FAILS TO OPEN



installation, operating⁵ 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 watersystem, 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 Aj. DIAPHRAGM REPLACEMENT

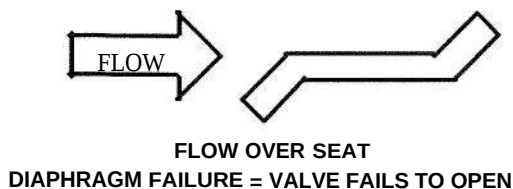
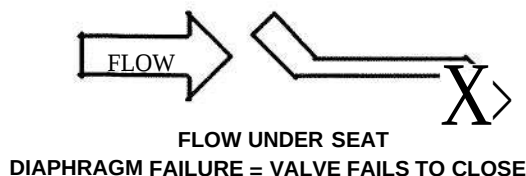
1. Isolate the valve from the system by closing upstream and downstream block valves.
2. Loosen one of the tubing connections on the bonnet. Allow any residual pressure to bleed off.
3. Remove all tubing connected at the bonnet.
4. Remove the bonnet nuts.
5. Remove the bonnet. If the bonnet sticks in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

6. 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 V. SEAT DISC REPLACEMENT

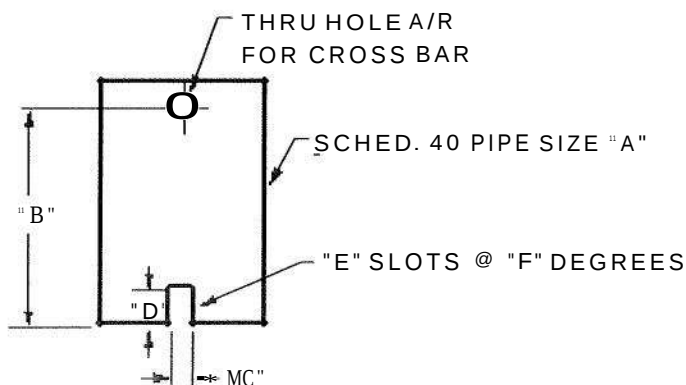
1. Perform Steps 1 and 2 of Procedure B, above.
2. With the spool assembly removed from the body, remove the seat retainer screws.
3. Slide the seat retainer off the lower end of the stem.
4. Remove the seat disc from its groove in the spool.
NOTE: The seat disc may fit quite tightly in the groove. If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

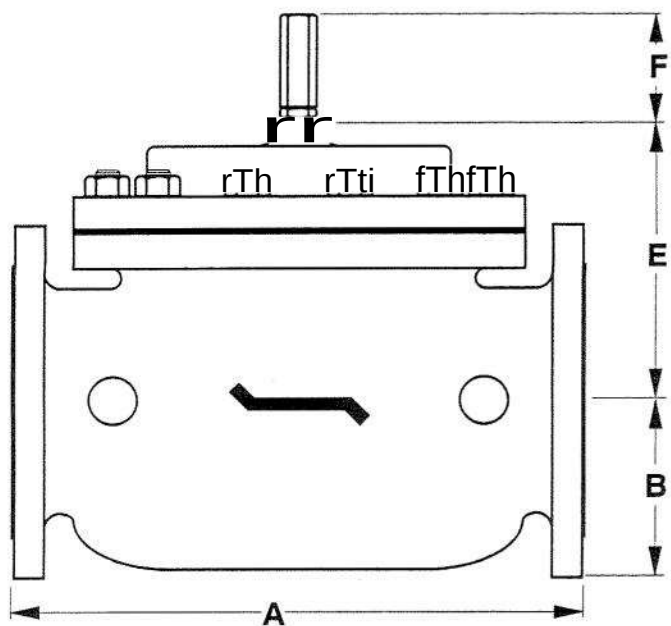
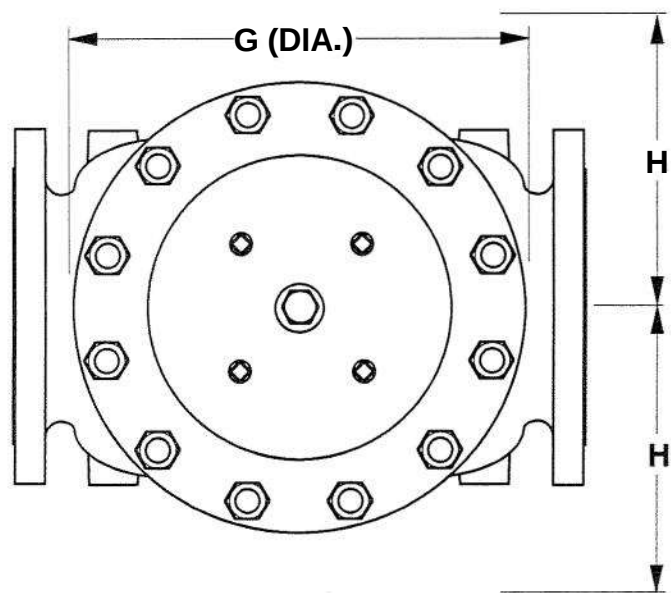
1. Perform Steps 1 and 2 of Procedure B, above.
2. If you are working on a 4" or smaller valve, follow Steps 3 thru 9, below.
3. If you are working on a 6" or larger valve, follow Steps 10 thru 16, below.

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.

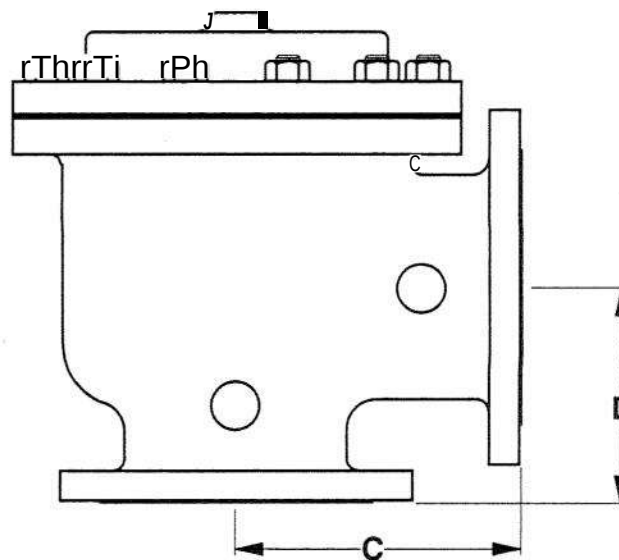


VALVE SIZE	"A" PIPE SIZE	"B" MIN. LENGTH	"C" SLOT WIDTH	"D" SLOT DEPTH	"E" NO. OF SLOTS	"F" SLOT SPACING
1-1/4"	3/4"	6"	3/8"	3/8"	2	180°
1-1/2"	3/4"	6"	3/8"	3/8"	2	180°
2"	1-1/2"	7"	3/8"	3/8"	2	180°
2-1/2"	2"	8"	1/2"	1/2"	3	120°
3"	2-1/2"	9"	5/8"	5/8"	2	180°
4"	3"	10"	5/8"	5/8"	2	180°

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	SE	11.25	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		 MOCV Control Valves TULSA, OKLAHOMA U.S.A. GENERAL VALVE DIMENSIONS					
UNLESS NOTED							
FRACTIONAL ±1/64							
DECIMAL ±.005							
MACH. FINISH 12½/							
ANGULAR ±1/2°							
DRAWN BY					SIZE	DRAWING NUMBER	REV.
SDJ					A	65D	B
DATE							
10-6-97							
CHKD. BY							
DATE							

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.

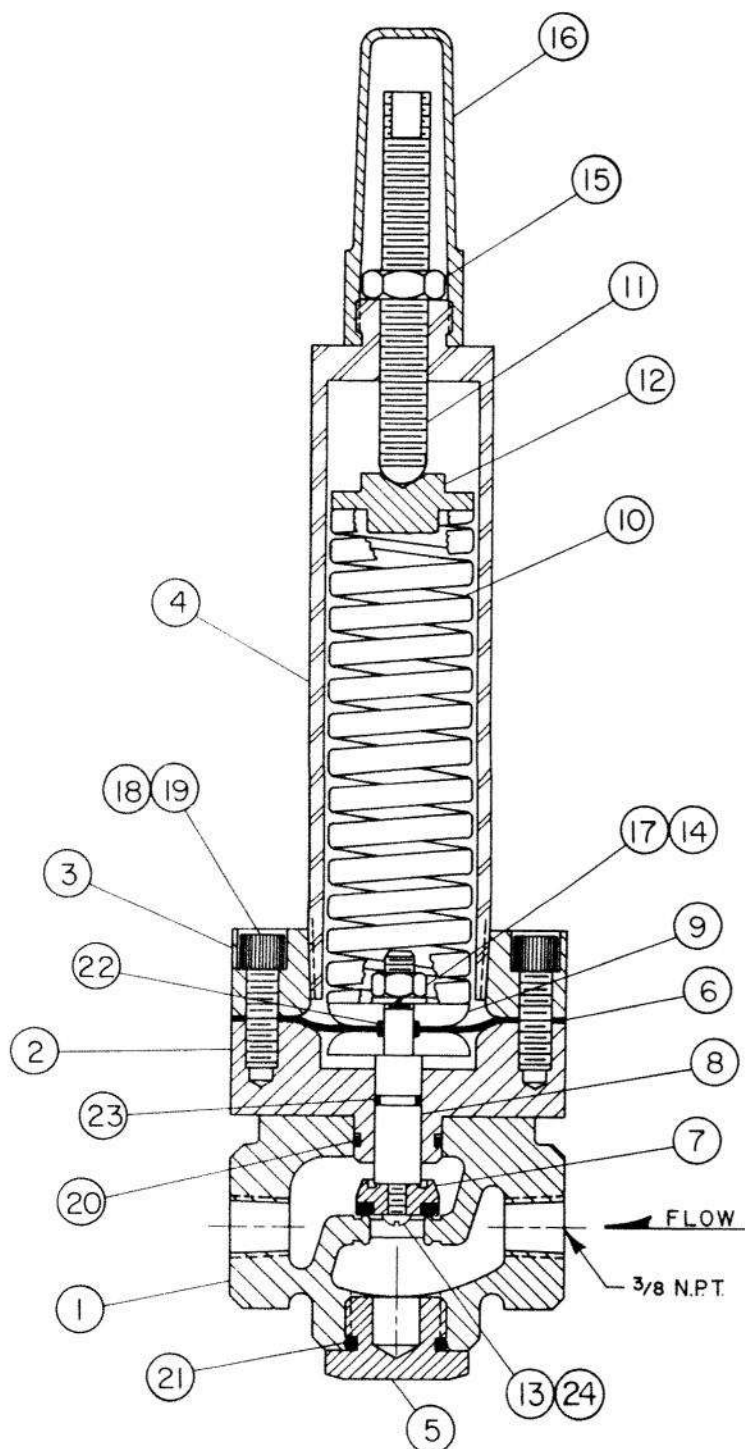
MAINTENANCE

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.



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

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
ITEM	PART NO.	QTY.	DESCRIPTION	MATERIAL

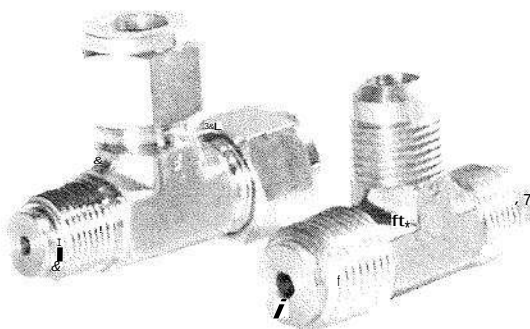
PARTS LIST

E					MATERIAL	TOLERANCES	OCV Control Valves TULSA, OKLAHOMA, U.S.A. HIGH PRESSURE RELIEF PILOT		
D						UNLESS NOTED			
C						FRACTIONAL $\pm 1/64$			
B						DECIMAL $\pm .005$			
A						MACH. FINISH 125			
CHG	E. C. NO.	DATE	BY		NO. REQ'D	DRAWN BY	DATE	REV	DRAWING NUMBER
						B.R.W.	12-82		2400
					SCALE	CHKD. BY	DATE		
REVISIONS					REF DWG NO'S				

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.



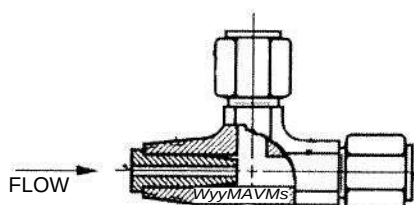
MODEL 126 EJECTOR DIAGRAM

Brass Construction / Stainless Steel Construction

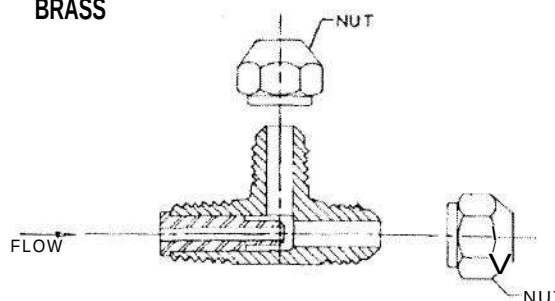
MATERIAL	PART NUMBER	P (NPT)	T-TUBE O.D.	STD. ORIFICE	USED ON VALVE SIZES
Brass	213100	3/8"	3/8"	.125"	1 1/4"-6"
Brass	214100	1/2"	1/2"	.188"	8"-10"
Brass	215100	3/4"	3/4"	.188"	12"-16"
316 Stn. Steel	213700	1/4"	3/8"	.090"	1 1/2"-6"
316 Stn. Steel	214700	3/8"	1/2"	.125"	8"-10"
316 Stn. Steel	215700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

Orifice bushings are stainless steel.

STAINLESS

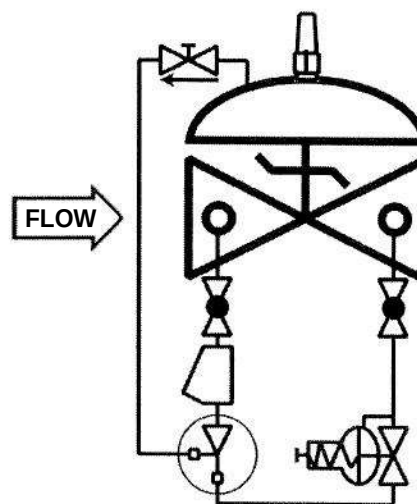
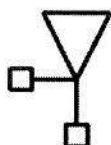


BRASS

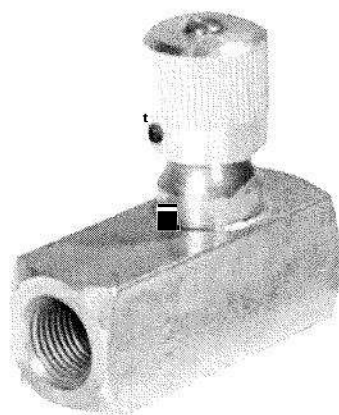


SCHEMATIC SYMBOL

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

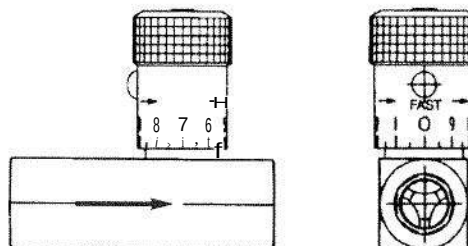


EXAMPLE: Shown here on a MODEL 127-3 Pressure Reducing Valve



DESCRIPTION

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

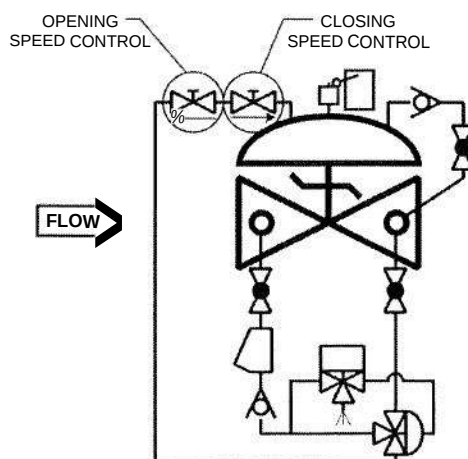


MODEL 141-3 MATRIX

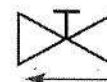
MATERIAL	PART NUMBER	INLET/OUTLET (NPT)	A	USED ON VALVE SIZE*
Brass	682100	1/4	2 3/8	1 1/8"-2"
Brass	682101	3/8	2 3/4	2 1/2"-6"
Brass	682102	1/2	3 1/4	8"-10"
Brass	682103	3/4	3 7/8	12"-16"
Stn. Steel	682700	1/4	2 3/8	1 1/4"-2" Stn.
Stn. Steel	682701	3/8	2 3/4	2 1/2"-6"
Stn. Steel	682702	1/2	3 1/4	8"-10"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

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

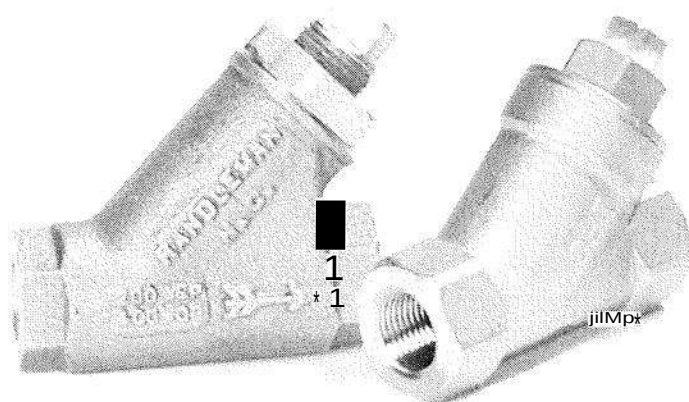
SCHEMATIC SYMDOL



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.

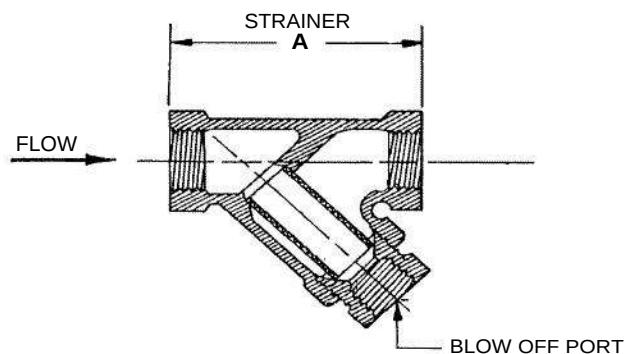


DESCRIPTION

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 VS-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

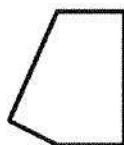
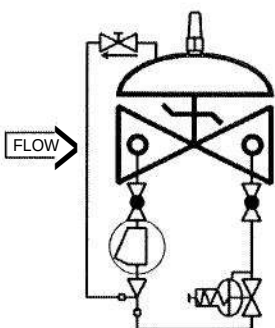
Bronze, ASTM B62
Optional mesh sizes: 50, 100

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

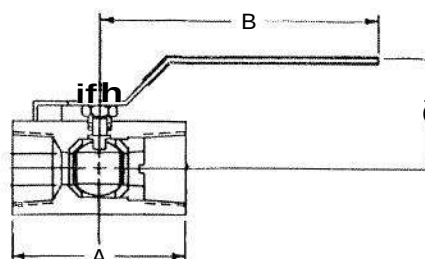
Routine cleaning and checking of the Y-Strainer will aid in keeping the control valve functioning properly. Pilot system isolation ball valves are supplied on valves equipped with the Model 159 Y-Strainer. These allow flushing of the screen through the blow off port, or removal of the screen itself for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

DESCRIPTION



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

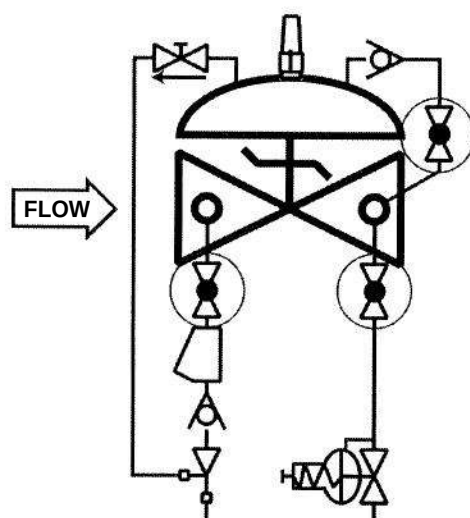
Ball valves are standard on water service valves; optional on fuel service valves.



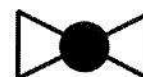
MODEL 141-4 MATRIX

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.

OCV[®] FLUID SOLUTIONS^{LLC}



matholding group