rate-of-flow control valve

installation, operating, and maintenance instructions

model 120

GENERAL DESCRIPTION

The OCV Model 120 rate-of-flow control valve is designed to control flow at a constant, predetermined rate regardless of fluctuations in upstream or downstream pressure. It consists of the following components:

1. **Model 65 Basic Valve**, a hydraulically-operated, diaphragm-actuated, globe or angle valve with an elastomer-on-metal seal.

2. An **Orifice Plate**, installed integral to the main valve’s inlet flange. The orifice plate is the flow-sensing device for the rate-of-flow pilot.

3. **Model 2450 Rate-of-Flow Control Pilot**, a two-way, normally-open pilot valve which senses the differential pressure created across an orifice plate integrally mounted in the upstream or downstream flange of the main valve and balances it against an adjustable spring load. This differential is proportional to the flow rate through the valve. An increase in differential tends to make the pilot close.

4. **Model 126 Ejector**, a simple "tee" fitting with a fixed orifice in its upstream port. It provides the proper pressure to the diaphragm chamber of the main valve depending on the position of the pressure reducing pilot.

5. **Model 141-2 Needle Valve** which controls the opening and closing speed of the main valve.

6. **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.

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

At user option, the 120 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 Flow Control Valve, set up as a closing speed control or as an opening speed control. Or two 141-3's can be provided to give separate, independent control of both closing and opening speeds.

THEORY OF OPERATION (refer to schematic diagram):

To understand how the 120 operates, it is best to begin with the EJECTOR. 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 RATE-OF-FLOW CONTROL PILOT. 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 main valve diaphragm chamber is connected at the branch port of the ejector, which is downstream of the orifice. In this manner, the pressure in the diaphragm chamber of the main valve is in fact controlled by the rate-of-flow control pilot. As the diaphragm pressure decreases, the main valve opens; as the diaphragm pressure increases, the main valve closes.

The rate-of-flow control pilot is sensing the differential pressure, proportional to flow rate, across the integrally-mounted orifice plate. As this differential tends to increase above the set point of the rate-of-flow control pilot, the pilot moves further closed. This results in an increase in pressure in the diaphragm chamber of the main valve. The main valve then closes slightly to restore the flow rate to the set point. Conversely, as the differential tends to decrease below the set point, the pilot moves further open. This results in a decrease in pressure in the diaphragm chamber of the main valve. The main valve then opens wider to bring the flow rate back up to the set point. The net result of all this is a constant modulating action by the pilot and main valve and a flow rate which remains constant despite fluctuations in inlet or outlet pressure.

INSTALLATION

The 120 is furnished fully factory-assembled and ready for installation at the appropriate point in the system. The user is referred to the Basic Valve section of this manual for full installation details.

Before installing the valve, check to see which flange contains the orifice plate. If the plate is in the inlet flange, it is recommended that at least five diameters of straight pipe be allowed upstream of the valve.

STARTUP AND ADJUSTMENT

The following procedures should be followed in the order presented in order to effect an initial startup of the 120.

1. Install some means of measuring flow in series with the 120.

2. Remove the plastic cap from the rate-of-flow control pilot. Turn the adjusting screw counterclockwise until it is loose enough to be turned by hand.

3. Turn the adjusting screw of the needle valve fully clockwise, then back it off three full turns.

4. Start the pump, or otherwise start the system flowing. The main valve will at this time be fully closed or else open only a very small amount.

5. Carefully loosen one of the pipe plugs in the main valve bonnet until fluid appears around the threads. When only clear fluid (no air) is discharging, retighten the plug.

6. Slowly turn the adjusting screw of the rate-of-flow control pilot clockwise until flow rate increases to the desired set point. Replace the plastic cap.

7. If there are small-scale oscillations in the flow, slowly turn the adjusting screw of the needle valve clockwise until the oscillations disappear. CAUTION: Never close this valve fully. To do so will prevent the main valve from operating.
8. If flow rate readjustment should ever be required, the rate-of-flow pilot is adjusted clockwise to **increase** flow rate; counterclockwise to **decrease** flow rate.

**MAINTENANCE**

Because of the simplicity of design of the 120, 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 for frayed or loose electrical connections.
4. 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 operating properly. 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 120, 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 - CANNOT SET FLOW RATE HIGH ENOUGH:**

1. Valve closed downstream of the 120. Open as required.
2. Downstream pilot system ball valve closed. Open as required.
3. Needle valve fully closed. See Adjustment instructions.
4. Rate-of-flow control pilot adjusted too far counterclockwise. See adjustment instructions.

**B. MAIN VALVE FAILS TO CLOSE - CANNOT SET FLOW RATE LOW ENOUGH:**

1. Upstream pilot system ball valve closed. Open as required.
2. Needle valve fully closed. See Adjustment instructions.
3. Strainer clogged. Clean as required.
4. Rate-of-flow pilot adjusted too far clockwise. See Adjustment instructions.
5. Close downstream pilot system ball valve.
   a. If main valve closes, proceed to Step 6.
   b. If main valve remains open, proceed to Step 7.
6. Rate-of-flow pilot diaphragm ruptured or stem binding. Disassemble pilot and determine cause. See 2450 section of this manual.

---

**OCV Control Valves**

7400 East 42nd Place / Tulsa, Oklahoma 74145 / 4744 USA / (918) 627-1942 / 888-OCV-VALV / FAX 918-622-8916
e-mail: sales@controlvalves.com / website: www/controlvalves.com
7. Close both pilot system ball valves 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 in the Basic 65 Section of this manual. If the bridge mark slants downward on the upstream end, the valve is "fail closed." If the bridge mark slants upward on the upstream end, the valve is "fail open."

8. Main valve stem binding or object in valve. Disassemble valve and determine cause. See Basic Valve section of this manual.
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 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 nuts.
16. Reopen the upstream and downstream block valves.
17. Before placing the valve back in service, perform the air bleed procedure described in the first section of this manual.

**PROCEDURE B: CORRECTION OF BINDING STEM**

1. Perform Steps 1 thru 6 of Procedure A, above.
2. Remove the spool assembly from the valve. **NOTE:**

On smaller valves, this can be accomplished simply by grasping the stem and pulling upward. Valves 6” and larger have the top of the stem threaded to accept an eyebolt to aid in lifting the spool out of the body. 6” thru 12” valves are threaded 3/8-16. 14” and 16” valves are threaded 5/8-11.

3. Carefully examine both ends of the stem for deep scratches, scoring or buildup of mineral deposits.

![Diagram](image)
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.

---

**THRU HOLE A/R FOR CROSS BAR**

**SCHED. 40 PIPE SIZE *A*”**

**“E” SLOTS @ “F” DEGREES**

<table>
<thead>
<tr>
<th>VALVE SIZE</th>
<th>“A” PIPE SIZE</th>
<th>“B” MIN LENGTH</th>
<th>“C” SLOT WIDTH</th>
<th>“D” SLOT DEPTH</th>
<th>“E” NO. OF SLOTS</th>
<th>“F” SLOT SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/4”</td>
<td>3/4”</td>
<td>6”</td>
<td>3/8”</td>
<td>3/8”</td>
<td>2</td>
<td>180”</td>
</tr>
<tr>
<td>1-1/2”</td>
<td>3/4”</td>
<td>6”</td>
<td>3/8”</td>
<td>3/8”</td>
<td>2</td>
<td>180”</td>
</tr>
<tr>
<td>2”</td>
<td>1-1/2”</td>
<td>7”</td>
<td>3/8”</td>
<td>3/8”</td>
<td>2</td>
<td>180”</td>
</tr>
<tr>
<td>2-1/2”</td>
<td>2”</td>
<td>8”</td>
<td>1/2”</td>
<td>1/2”</td>
<td>3</td>
<td>120”</td>
</tr>
<tr>
<td>3”</td>
<td>2-1/2”</td>
<td>9”</td>
<td>5/8”</td>
<td>5/8”</td>
<td>2</td>
<td>180”</td>
</tr>
<tr>
<td>4”</td>
<td>3”</td>
<td>10”</td>
<td>5/8”</td>
<td>5/8”</td>
<td>2</td>
<td>180”</td>
</tr>
</tbody>
</table>

**REVISED 3-17-97**
rate of flow control pilot

**GENERAL DESCRIPTION**
The OCV Model 2450 Rate of Flow Control Pilot is a direct-acting, spring-loaded, diaphragm-type control pilot. It is available in bronze or stainless steel (stainless steel internals) construction, with either Buna-N or Viton elastomers. It is designed to maintain a constant, preset rate of flow through the main valve. It is manually adjustable by means of an adjusting screw located on top of the pilot. The 2450 is a constant-throttling device, maintaining precise, positive control of the main valve.

**FUNCTIONAL DESCRIPTION**
Basically, the 2450 controls the amount of pressure in the upper chamber of the main valve, hence the degree of opening or closing of the valve. The pilot senses the pressure differential across an orifice plate located on the inlet of the main valve. The upstream, or high pressure, side of the orifice plate is sensed under the pilot diaphragm and the downstream, or low pressure, is sensed above the diaphragm. The low pressure sense is assisted by the pilot spring. As the flow through the orifice plate increases, the differential pressure increases and begins to close the pilot. As the pilot closes, the pressure in the upper chamber of the main valve increases, causing the valve to close a proportionate amount in order to maintain the preset rate of flow. Conversely, as the rate of flow decreases, the pilot opens, allowing the main valve to open and compensate for the decrease in flow.

**INSTALLATION AND ADJUSTMENT**
The 2450 should be installed in the main valve control piping between either the ejector or the accelerator pilot (depending on valve model) and the downstream body tap. Flow should be in the direction indicated on the pilot body. Sensing lines (1/4" O.D. tubing) are installed from the downstream orifice flange tap to the upper sense tap of the pilot and from the upstream orifice flange tap to the lower sense tap of the pilot. Pilot adjustment is made with the adjusting screw located on top of the bonnet. Increase flow through the valve by turning the screw clockwise; decrease flow by turning the screw counterclockwise.

**MAINTENANCE**
Because of the simplicity of design of the 2450 pilot, required maintenance is minimal. Fitting and bolts should be periodically checked for tightness and the body should be inspected for damage or excessive buildup of foreign material.

**TROUBLESHOOTING**
Troubleshooting of the 2450 is equally simple. Major troubleshooting points are as follows:

1. To check for ruptured diaphragm, disconnect the low pressure sense line from both the pilot and the valve flange. Plug the flange tap and pressurize the valve. A continuous discharge of fluid at the open sense port indicates a ruptured diaphragm.

2. An indication of the pilot stem binding may be checked by removing the pilot bonnet and moving the stem by hand. If excessive drag is evident, disassemble and pilot and determine the cause.

3. An erratic pilot action can result from a blockage in the port area of the valve stem or in the counterbalance area. Detach the sense line on the bottom plug and remove the plug. Clean out the counterbalance chamber as required. To remove the stem, hold the bottom of the stem with screwdriver in slot and remove the screw securing the diaphragm plates. The seat/stem assembly may now be removed through the bottom body port. Clean as necessary.
**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

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>PART NUMBER</th>
<th>P (NPT)</th>
<th>T-TUBE O.D.</th>
<th>STD. ORIFICE</th>
<th>USED ON VALVE SIZES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brass</td>
<td>213100</td>
<td>3/8&quot;</td>
<td>3/8&quot;</td>
<td>.125&quot;</td>
<td>1 1/2&quot;-6&quot;</td>
</tr>
<tr>
<td>Brass</td>
<td>214100</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
<td>.188&quot;</td>
<td>8&quot;-10&quot;</td>
</tr>
<tr>
<td>Brass</td>
<td>215100</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
<td>.188&quot;</td>
<td>12&quot;-16&quot;</td>
</tr>
<tr>
<td>316 Stn. Steel</td>
<td>213700</td>
<td>1/4&quot;</td>
<td>3/8&quot;</td>
<td>.090&quot;</td>
<td>1 1/4&quot;-6&quot;</td>
</tr>
<tr>
<td>316 Stn. Steel</td>
<td>214700</td>
<td>3/8&quot;</td>
<td>1/2&quot;</td>
<td>.125&quot;</td>
<td>8&quot;-10&quot;</td>
</tr>
<tr>
<td>316 Stn. Steel</td>
<td>215700</td>
<td>1/2&quot;</td>
<td>3/4&quot;</td>
<td>.188&quot;</td>
<td>12&quot;-16&quot;</td>
</tr>
</tbody>
</table>

**SCHEMATIC SYMBOL**

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

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

The Model 141-2 Needle Valve is an adjustable restriction device installed in the control circuit tubing. The setting of the needle valve meters the flow into and out of the main valve diaphragm chamber, thus controlling the response speed of the main valve. Depending on the application, the needle valve may be used as a closing speed control, opening speed control, or both simultaneously.

Needle Valves shown
Sizes: 3/4" & 1/4"

MODEL 141-2 MATRIX

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>PART NUMBER</th>
<th>INLET/OUTLET (NPT)</th>
<th>A</th>
<th>USED ON VALVE SIZE*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brass</td>
<td>683100</td>
<td>1/4</td>
<td>2</td>
<td>1 3/4&quot;-2&quot;</td>
</tr>
<tr>
<td>Brass</td>
<td>683101</td>
<td>3/8</td>
<td>2 1/4</td>
<td>2 1/2&quot;-6&quot;</td>
</tr>
<tr>
<td>Brass</td>
<td>683102</td>
<td>1/2</td>
<td>2 5/8</td>
<td>8&quot;-10&quot;</td>
</tr>
<tr>
<td>Brass</td>
<td>683103</td>
<td>3/4</td>
<td>3 1/4</td>
<td>12&quot;-16&quot;</td>
</tr>
<tr>
<td>Ss. Steel</td>
<td>683700</td>
<td>1/4</td>
<td>2</td>
<td>1 1/4&quot;-2&quot;</td>
</tr>
<tr>
<td>Ss. Steel</td>
<td>683702</td>
<td>3/8</td>
<td>2 1/4</td>
<td>2 1/2&quot;-6&quot;</td>
</tr>
<tr>
<td>Ss. Steel</td>
<td>682704</td>
<td>1/2</td>
<td>2 5/8</td>
<td>8&quot;-10&quot;</td>
</tr>
<tr>
<td>Ss. Steel</td>
<td>683703</td>
<td>3/4</td>
<td>3 5/8</td>
<td>12&quot;-16&quot;</td>
</tr>
</tbody>
</table>

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.

TOLL FREE 1.888.628.8258 - phone: (918)627.1942 - fax: (918)622.8916 - 7400 East 42nd Place, Tulsa, OK 74145
email: sales@controlvalves.com - website: www.controlvalves.com

Global performance. Personal touch.
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

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>PART NUMBER</th>
<th>INLET/OUTLET (NPT)</th>
<th>BLOW OFF PORT (NP)</th>
<th>A</th>
<th>STD. MESH</th>
<th>USED ON VALVE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronze</td>
<td>660100</td>
<td>3/8</td>
<td>3/8</td>
<td>2 11/16</td>
<td>24</td>
<td>1 ¼&quot;-6&quot;</td>
</tr>
<tr>
<td>Bronze</td>
<td>660101</td>
<td>1/2</td>
<td>3/8</td>
<td>2 5/8</td>
<td>24</td>
<td>8&quot;-10&quot;</td>
</tr>
<tr>
<td>Bronze</td>
<td>660102</td>
<td>3/4</td>
<td>3/8</td>
<td>3 5/16</td>
<td>24</td>
<td>12&quot;-16&quot;</td>
</tr>
<tr>
<td>Stn. Steel</td>
<td>660700</td>
<td>3/8</td>
<td>1/4</td>
<td>2 1/2</td>
<td>20</td>
<td>1 ¼&quot;-6&quot;</td>
</tr>
<tr>
<td>Stn. Steel</td>
<td>660701</td>
<td>1/2</td>
<td>1/4</td>
<td>2 1/2</td>
<td>20</td>
<td>8&quot;-10&quot;</td>
</tr>
<tr>
<td>Stn. Steel</td>
<td>660702</td>
<td>3/4</td>
<td>1/4</td>
<td>3 1/8</td>
<td>20</td>
<td>12&quot;-16&quot;</td>
</tr>
</tbody>
</table>

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

MATERIALS
Bronze, ASTM B62
Optional mesh sizes: 50, 100

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

Screens are stainless steel

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

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

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

**MODEL 141-4 MATRIX**

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>PART NUMBER</th>
<th>INLET/OUTLET (NPT)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>USED ON VALVE SIZE*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronze</td>
<td>680100</td>
<td>3/8</td>
<td>1 3/4</td>
<td>3 1/2</td>
<td>1 7/8</td>
<td>1 1/4&quot;-6&quot;</td>
</tr>
<tr>
<td>Bronze</td>
<td>680101</td>
<td>1/2</td>
<td>2</td>
<td>3 1/2</td>
<td>2 1/4</td>
<td>8&quot;-10&quot;</td>
</tr>
<tr>
<td>Bronze</td>
<td>680102</td>
<td>3/4</td>
<td>3</td>
<td>4 3/4</td>
<td>2 1/4</td>
<td>12&quot;-16&quot;</td>
</tr>
<tr>
<td>Stn. Steel</td>
<td>680700</td>
<td>3/8</td>
<td>2</td>
<td>3 3/4</td>
<td>2 1/8</td>
<td>1 1/4&quot;-6&quot;</td>
</tr>
<tr>
<td>Stn. Steel</td>
<td>680701</td>
<td>1/2</td>
<td>2 1/4</td>
<td>3 3/4</td>
<td>2 1/2</td>
<td>8&quot;-10&quot;</td>
</tr>
<tr>
<td>Stn. Steel</td>
<td>680702</td>
<td>3/4</td>
<td>3</td>
<td>4 3/4</td>
<td>2 1/4</td>
<td>12&quot;-16&quot;</td>
</tr>
</tbody>
</table>

**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.