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**Installation, Operation &
Service Manual**

**Model 50 10" to 18"
Duplex Strainers**

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Read all instructions before installation or operation of equipment. Failure to comply with these instructions could result in bodily injury or property damage

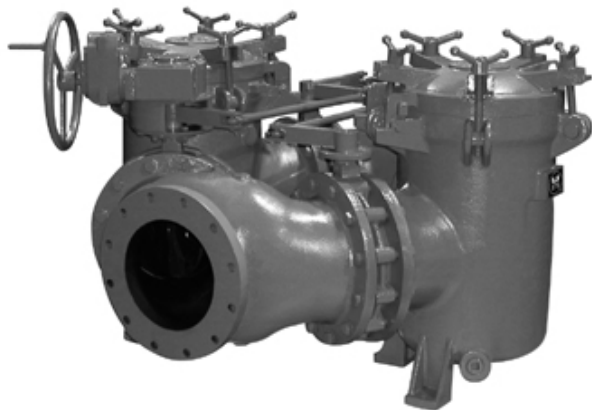
Introduction

A duplex strainer is a device installed in a pipeline to remove dirt and other unwanted debris from fluids. Straining is accomplished by directing the fluid through sized opening in baskets. Duplex strainers are installed where fluid flow cannot be interrupted while the baskets are removed for cleaning. Duplex strainers are designed for pressure or suction applications.

Model 50 Duplex Strainers employ synchronized butterfly valves to divert flow from one strainer basket chamber to the other. By using balanced butterfly valves, a minimum of effort is required to change over for basket cleaning. The location of the hand wheel, relative to flow direction can be altered at the factory to satisfy application requirements.

Model 50 Duplex Strainers require only one basket for each well, and has been designed to provide increased screening area which extends the intervals between cleaning and lowers initial pressure loss. The design also reduces the length of the basket, making it much easier to remove from the housing.

The strainer basket consists of pleated convoluted perforated sheet metal welded to end caps at the top and bottom of the basket. A sturdy handle is welded to the top plate. A metal to metal seal between the basket and the inlet port is provided on three sides of the opening. The basket fits into a groove cast into the body and as the flow rate increases a better seal is realized. The strainer cover applies downward pressure on the basket handle maintaining a tight seal at the top of the basket.





Receiving, Handling and Inspection

1. Inspect strainer after unpacking for damage incurred during transit. Report any damage to carrier immediately. If strainer is not to be installed immediately, store indoors in a clean, dry environment.
2. Remove preservative with solvent dampened cloths. Exercise care when using solvent.
3. Check to be sure that the installation pressures do not exceed the maximum pressure for the pressure cast on the body of the strainer.
4. Rotate the hand wheel to an extreme travel position.
5. Release the cover swing bolts by loosening the clamping handles until they clear the cover and swing away from the body. Release the swing bolts from both basket chambers.
6. Examine the body to which the arrow on the Warning/Instruction plate is pointing. Visually check that the butterfly discs on either side of the basket chamber are centered in their seats.
7. Remove the basket and check for damage.
8. Examine the O-ring for damage. Replace if necessary. Always keep a spare O-ring on hand.
9. Rotate the hand wheel in the opposite direction of an extreme travel position.
10. Repeat steps 5, 6, 7, and 8.
11. Close both covers carefully. Rough handling could damage cover seals. Lock covers in place by tightening the ball clamping handles firmly.

Installation

1. Ideally, the strainer should be installed in a horizontal pipeline with the basket well covers accessible from the top. Sufficient clearance should be allowed above the strainer for easy removal of the strainer basket.

A crane hoist or other lifting aid should be used to lift and restrain the cover during the basket cleaning operation. Required clearances are 10" (250mm) line 49" (1245mm), 12" (300mm) line 66" (1676mm), 14" (350mm) and 16" & 18" (400mm & 460mm) lines 77" (1956mm).

2. Install the strainer in the pipeline in accordance with the system flow.
3. The strainer should not be used to support connecting piping. Expansion joints should be used where long, straight runs of piping are present, as even small changes in temperature can cause large thermal expansion forces which the strainer is not designed to withstand. Excessive piping loads may also cause deflection into the strainer, which may result in a linkage misalignment, thereby causing valve leakage. Use the mounting provisions integral with the strainer body for mounting the strainer to a concrete foundation or steel pad.
4. The strainer should be lifted by a fork lift truck or by a suitable hoist with slings placed around the inlet and outlet connections only.
5. It is recommended that a differential pressure gauge be installed between the inlet and outlet ends of the strainer in order to alert maintenance personnel as to when flow diversion and strainer basket cleaning is necessary. When there is a 5 psi (0.35kg/cm²) increase in pressure loss across the strainer, it is recommended to clean the basket. Gauge tap holes (1/2" NPT) are provided at the inlet and outlet connections for gauge installation.
CAUTION: to prevent damage to the baskets DO NOT permit strainer pressure differential between inlet and outlet connection to exceed 20 psi (1.4 kg/cm²)
6. Suitable drain piping with a shut off valve is recommended between the bottom of the strainer chamber and an open sump.
7. Install a vent valve on top of each cover to release trapped air in the vessel.



Installation (Continued)

8. With both covers secured in the closed position and the vent and drain valves closed, open the main inlet valve to start the flow. With a cloth over the vent valve of the well in service, to prevent injury, gradually open the vent valve to release trapped air in the vessel. When the escaping liquid is free of air, close the vent valve.
9. The strainer is now ready for service.

NOTE: To prevent accidental closure, especially aboard ship, the cover should be held open with a steel wire cable.

CAUTION: When fluids other than water and with temperatures in excess of 120°F are to be handled by the strainer, the vent cock must be removed and the vent piped to a safe discharge point to protect the operator. Wear protective clothing which includes gloves, vests and goggles when handling dangerous fluids.

Operation

The not in service, ready for cleaning basket can be determined by the direction of the arrow on the Warning/Instruction plate. Always be sure that the hand wheel is turned to an extreme travel position before opening the basket chamber cover.

Start Up

1. Open both basket chamber vent cocks to expel air from the strainer (if so equipped).
2. Slowly open valves upstream and downstream of the strainer to start flow into the strainer.
3. Turn the hand wheel to a mid position so that the fluid enter both basket chambers.

CAUTION: Start flow gradually. This eliminates sudden shock to the strainer and other equipment in the line.

4. Close vent cocks when air is expelled and fluid starts to flow. Use a cloth and gloves to prevent injury.
5. Rotate handwheel to extreme travel position to divert flow into a clean basket. DO NOT leave the handwheel in the center position or both baskets will become dirty. This would require interrupting the flow to clean them.

WARNING: DO NOT open the cover over the basket well that is in service while the strainer is in operation. The Warning/Instruction plate arrow indicates which basket is not in service and ready for cleaning. To switch the flow from one basket well to the other the handwheel must be turned fully clockwise or counter-clockwise.

Basket Removal

In order to avoid high differential pressures across the strainer (difference between inlet and outlet pressure), it is advisable to keep the strainer baskets clean. The pressure drop (differential) should not exceed 10 psi at maximum flow. If the pressure drop exceeds 10 psi (0.7 kg/cm²) with a clean basket the flow through the strainer is too high, or the strainer is undersized for the intended service.

To clean and inspect the strainer basket not in service, the following steps should be taken:

1. Turn the handwheel so that the arrow on the Warning/Instruction plate points to the basket ready for cleaning.
2. Open the vent cock (if so equipped) to release liquid pressure in the dirty chamber.
3. Slowly release the cover swing bolts loosening the clamping handle until it clear the cover and swing away from the body.



Basket Removal (Continued)

4. Open the drain valve (if so equipped) or remove the drain plug from the side of the body at the bottom to drain liquid from the basket chamber. Failure to do this may cause floating debris to contaminate the strained liquid.
5. Remove the dirty basket by pulling straight up on the basket handle.

Basket Replacement

1. Replace the cleaned basket making sure that the inlet side is inserted into the groove cast into the strainer body.
2. Inspect the cover O-ring seal and sealing surface, clean seat and replace seal if necessary.
3. If the cover has a vent cock, be sure it is open. Close the drain valve (if so equipped) or replace the drain plug.
4. Divert flow to the clean basket and when air is expelled from the chamber with the clean basket, close the vent cock.

Basket Cleaning

CAUTION: To prevent damage to the baskets, DO NOT permit strainer pressure differential to exceed 20 psi (1.4 kg/cm²).

1. Clean the basket when there is a 5 psi (0.35 kg/cm²) increase in pressure loss across the strainer.
2. During shut downs for a temporary period, drain fluid and clean the baskets.

How to Clean

WARNING: Wear eye protection to avoid injury when cleaning baskets with compressed air.

1. Invert the basket and shake out all the debris and foreign particles from the basket.

Baskets severely plugged with grease and other contaminants should be soaked in a suitable cleaning solution and cleaned with a stream jet water or compressed air. Kerosene and aqueous detergents are representative solvents. If the strained fluid is fuel or a chemical, use an appropriate solvent to clean the baskets..

2. Inspect basket at each cleaning for holes or tears. Always keep spare baskets on hand.

Service

Butterfly Valve Assembly

Clean all reusable parts. If possible use silicone base oil or lubricant to facilitate assembly. Place O-rings at the outside stem holes in the seat. Assemble the seat with O-rings in the body bore, taking care to align the stem holes. Install the packing bushing and stem. Use a rotary downward pressure on the stem to facilitate assembly while paying particular attention that the seat is not damaged due to any misalignment of the stem holes. Align the counter drilled portion of the stem screw holes with the disc screw holes. Place O-rings on the disc screws. Install the disc screws and tighten securely. With the valve disc replaced in the semi-closed position, rubber interference and initial torque build up is reduced during installation.

Butterfly Valve Installation Instructions

Observe that the disc sealing edge is in line with the parallel flats on the stem. Rotate the stem clockwise to position the disc within the body at least 3/8" (9.5mm) away from the body face. Spread the adjacent flanges and insert the valve. Center the valve body to the flanges and tighten the bolting hand tight. Slowly open the valve counter-clockwise to check for adequate disc clearance. Return the disc to the nearby closed position and cross-tighten all bolting until the flange/valve interface is metal to metal.



Butterfly Valve Installation Instructions (Continued)

Note: The valve is non-directional and will control flow equally well in either direction.

Replace the linkage and restore proper valve disc alignment and synchronism. Re-install gear operator.

Butterfly Valve Gear Operator

If flow diversion becomes difficult, check to be sure that the gear operator is packed with grease.

Rods and Bearings

Periodic lubrication is required for proper functioning of the rod and bearings. Disconnect the tie rod from the linkage arm and rotate the ball so that the surface adjacent to the race is exposed. Grease the surface with multi-purpose lubricant or equivalent. Reconnect the tie rod to the link arm with the clevis pin and cotter pin.

Recommended Spare Parts

Two Eaton Strainer Baskets
Six Eaton Cover O-ring seals

When ordering spare parts, be sure to specify the assemble part number of the strainer (as appears on the invoice) as well as the quantity and description of the parts.

When operating conditions such as pressure, temperature and type of fluid are known, they should be specified.

More From Eaton Filtration

Pipeline Strainers

Eaton provides the most complete range of standard cast pipeline strainers for coarse filtration available from any manufacturer. These include Simplex, Duplex and Y Type Strainers, in Iron, Bronze, Carbon and Stainless Steel. For ultra-pure applications, strainers of all plastic construction are available. Cast Pipeline Strainers range in size from 1/2" to 36" and larger.

When a cast strainer won't meet the applications requirements because of size, weight or design Eaton offers standard fabricated strainers to meet exact customer requirements. without any trade-offs. When a standard design fabricated strainer will not meet an application's requirements Eaton's design team can work with customers to create a unique one that will.

Eaton also offers Automatic Self-Cleaning strainers. These are motorized strainers designed for the continuous removal of entrained solids from liquids in pipeline systems. The strainer operates un-attended and the system flow never has to be shut down for strainer element cleaning. These strainers are available in both cast and fabricated types.

Find out more on the web at:
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Eaton's Gas/Liquid Separators have been the "Industry Standard" for over 100 years. Nobody knows more about gas/liquid separation than us.

Eaton Gas/Liquid Separators are used to remove 99% of damage causing moisture and particulate matter from air, gas and steam pipelines. They protect valuable system components like air compressors and turbines from damage.

Eaton has a wide selection with hundreds of different Gas/Liquid Separators. When a standard model isn't right for an application, Eaton Engineers can work with customers to create a custom fabricated model that fits the application requirements exactly.

Find out more on the web at:
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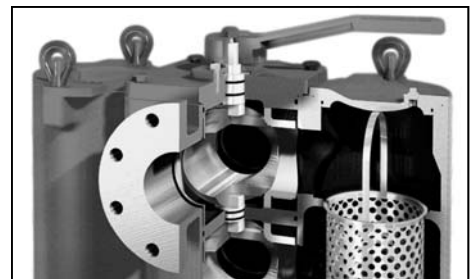
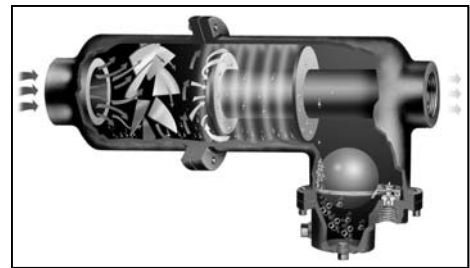
Filtration Systems

With Eaton Filter Housings you have your choice of high grade investment cast construction or engineered fabricated construction in stainless steel or carbon steel. Or, for extremely corrosive or ultra-pure services, you can choose all-plastic construction. You can be sure Eaton Filter Housings will meet specifications because they are all made to ISO 9001:2000 Standards. Eaton has representatives in over 40 countries, experienced professionals to provide the filtration help you need, when and where you need it.

Choosing the correct filter bag is critical to the success of you application. Don't trust anything less than a filter bag from Eaton. They're made under ISO 9001:2000 Standards to ensure

the consistent, reliable performance that you demand. Eaton Filter Bags fit all Eaton Filter Housings and the housings of most other manufacturers as well.

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