



# Eaton Filtration, LLC

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**Installation, Operation &  
Service Manual**

**Model 53BTX Duplex  
Basket Strainer  
3/4" to 4" Sizes**

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



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### Introduction

The Eaton Model 53 BTX duplex strainer is installed in a pipeline to remove sediment and debris from fluids. Fluid flow is not interrupted while the basket is removed for cleaning. These strainers are designed for pressure or suction applications.

Straining is accomplished by directing the fluid through sized openings in the basket. Once sediment and debris is collected in the basket, fluid flow is directed to the other basket for continuous operation prior to removing the debris filled basket for cleaning.

For additional information regarding Duplex Basket Strainers visit our website at:  
**www.filtration.eaton.com**

### Receiving, Handling and Inspection

Unpack strainer. Inspect for damage occurring during transit. Report any damage to carrier. For strainers not installed immediately, see “Storage” instructions

Remove preservatives with solvent dampened cloths. Exercise care when using solvent and follow solvent manufacturer’s instructions . Verify that the rated pressure and temperature of the strainer is greater than or equal to the maximum pressure and temperature of the installation.



### Receiving, Handling and Inspection, Cont.

Open each basket well cover by turning the eye nuts counterclockwise to end of studs. Lift cover up by the tabs until cover is free of basket well and rotate cover counterclockwise, clearing the basket well.

Remove flange/thread protectors. Check for and remove any foreign or loose material that could be carried down stream when fluid is introduced into the strainer. Install the strainer baskets. Reset the covers by reversing procedure above. To tighten, turn eye nuts clockwise until the cover is seated and secured at the top of the basket well.

Baskets are held in place by the cover to basket handle contact. If the basket handle is not in contact with the cover, bend the handle to a higher position to insure greater compression when cover is seated.

### Storage

Replace protective wrap, flange protectors etc. which may have been removed during inspection and store the strainer indoors in a clean, dry environment.

### Installation

**CAUTION: Before installation review the application and chemical compatibility of the process fluid to the materials of construction of the strainer.**

Remove protective wraps, caps, plugs etc. before installing the strainer into operation after storage. Be sure to inspect cover O-rings for possible damage and replace as required.

Position the strainer in the line so that the fluid enters the connection marked "IN" or "INLET".

**CAUTION: To lift flanged duplex strainers, put slings under the inlet and outlet connections and secure above strainer. To lift duplex strainers with threaded connections, put slings under the center body section and secure above strainer.**

Be sure sufficient clearance is provided for easy removal of the cartridge assembly and baskets. Refer to sales drawing for removal clearances.

### Installation, Continued

Support the strainer to a firm foundation by using the foot pads. Refer to sales drawing for foot pad layout.

Connect the strainer to the piping line. On flanged strainers be sure to use the same type of flange faces. Do not bolt a raised face flange to a flat face flange. Be sure flange gaskets are in place and fasteners are tight. On threaded strainers use standard piping practice when making connections.

**CAUTION: Duplex strainers are not designed to be anchor supports in the piping line. Be sure to properly support the process piping on both sides of the strainer. Use care to prevent piping forces and movements from acting on the strainer connections. Damage may occur to the strainer if improperly connected.**

It is recommended that basket well drain plugs be removed and pressure equalizer valves with a drain valve be installed (standard on 4" size) see Figure 1. It is also recommended to replace each cover plug with a vent valve and piping to a safe area.



Figure 1

It is also recommended to replace each cover plug with a vent valve and piping to a safe area, see Figure 2.



Figure 2



### Installation, Continued

Pressure gauges near the strainer inlet & outlet are required to determine differential pressure across the strainer and cleaning frequency. Pressure gauges are essential for the safe operation of the strainer.

**CAUTION: Drain & vent valve piping to a safe area is required for all fluids & when water temperature is above 120°F. Drain & vent valve piping to a safe area protects the operator. The operator should wear appropriate protective equipment (goggles, gloves, vests, clothing, etc.) consistent with the process fluid for strainer operation & servicing.**

### Start-Up

Open cover vent valves & cartridge vent. Close pressure equalizer valves & drain valve. Rotate the handle 90° clockwise. So that the handle is over the strainer inlet.

**Slowly** allow fluid to enter the strainer. First **slowly** open the downstream valve nearest to strainer outlet. Then **slowly** open the upstream valve nearest to the strainer inlet.

Close cover vent valves and cartridge vent when air is expelled. Rotate the handle 90° counterclockwise over the right side basket well. See Figure 3.

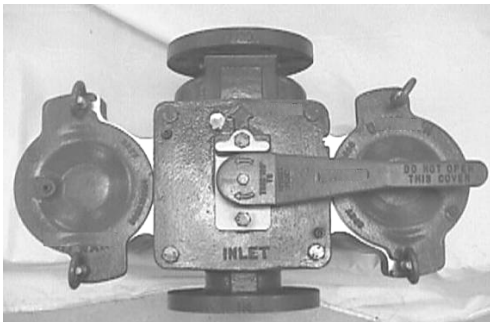


Figure 3

### Operation

The basket well in operation is indicated by the position of the strainer handle. The handle in the 3 o'clock position over the cover indicates the right basket operation. This **prevents** access to the basket underneath the handle. See Figure 3. The handle in the 9 o'clock position indicates the left basket operation **Note:** Above references are with the strainer inlet in the 6 o'clock position.

### Switching Flow

Open both pressure equalizer valve to insure that both basket wells are pressurized and rotate the strainer handle 180° (traveling over the strainer inlet) until the handle is over the opposite basket cover from where the handle started. Close both pressure equalizer valves.

### Basket Removal and Cleaning

A differential pressure increase of **5 psi** across the strainer indicates that the basket in operation is full of debris and needs to be removed and cleaned.

**CAUTION: To prevent damage to the baskets, DO NOT permit the differential pressure across the strainer to exceed 20 psi.**

Transfer flow from the basket well in operation to the opposite basket well. Refer to **Switching Flow**. Open the drain valve.

For the basket well to be serviced slowly open the cover vent and drain or pressure equalizer valve (if installed). This relieves the pressure and drains the fluid in that basket well

When pressure is relieved and fluid drained, open the basket well cover by turning the eye nuts counterclockwise to end of studs. Lift cover up by the tabs until cover is free of basket well and rotate cover counterclockwise, clearing the basket well.

Remove the debris-laden basket. Invert the basket and wash out the debris. Direct a stream of air or water from the exterior of the basket to the interior. **Note:** Do not permit the basket debris to dry, as it would be difficult to remove and clean the basket. Inspect basket at each cleaning for holes or tears. Replace as needed with genuine Eaton strainer baskets.

### Basket Replacement

Place the cleaned / new basket into the basket well. Be sure basket handle is sufficiently high to be compressed by the cover. Refer to **Receiving, Handling and Inspection**. Inspect cover O-ring and sealing surface. Clean sealing surface and replace O-ring as necessary. Reseat the cover. Refer to **Receiving, Handling and Inspection**.



**Basket Replacement, Continued**

Close drain valve and open pressure equalizer and cover vent valves of basket well just serviced. Open the pressure equalizing valve of the basket well in operation filling the serviced basket well with fluid. Then close cover vent valve when air is expelled. Next close both pressure equalizing valves.

**Shut Down**

Slowly close the pipeline valves upstream and downstream from the duplex strainer. Make sure these valves are tightly closed.

To relieve fluid pressure in the strainer, first open the drain valve. Then slowly open the pressure equalizer and cover vent valves.

Proceed to clean and inspect each basket. Inspect the strainer to insure there is no standing fluid.

**Recommended Spare Parts**

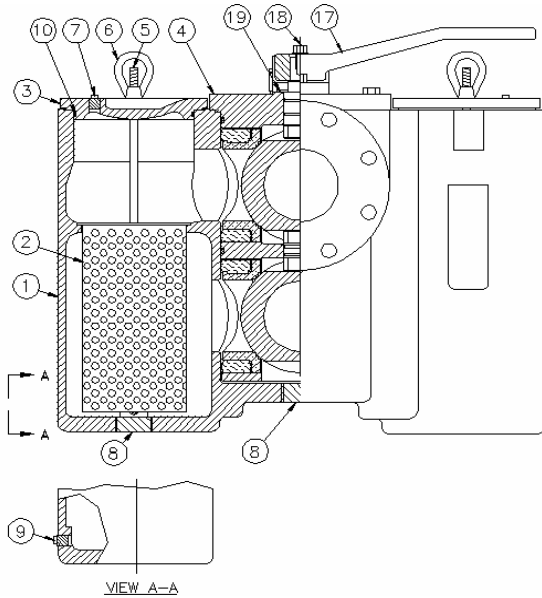
<b>Item</b>	<b>Quantity</b>
Strainer Baskets	2
Cover O-Rings	2
Stem O-Rings	4
Cartridge O-Rings	2
Seals	4
Seats part of Sealing Kit (Only)	4

**Use only genuine Eaton parts.**

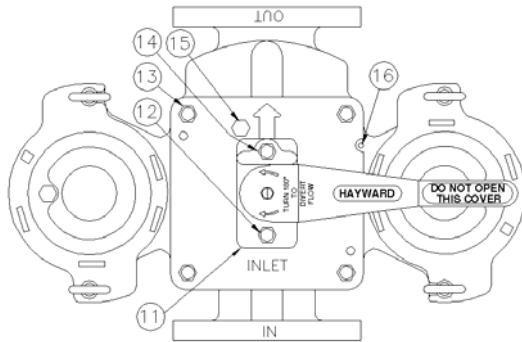


## PARTS LIST

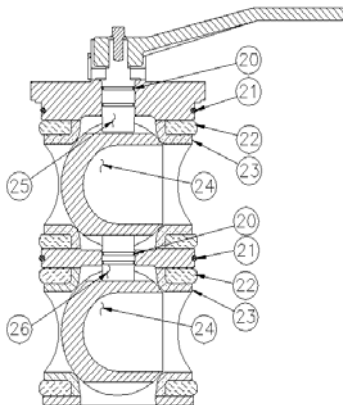
Side View



Top View



Diverter Cartridge Assembly



Item	Description
1	Duplex Strainer Body
2	<b>Strainer Basket (2) *</b>
3	Basket Cover (2)
4	Cartridge
5	Stud (4)
6	Eye Nut (4)
7	Pipe Plug (2)
8	Pipe Plug (3)
9	Pipe Plug (2)
10	<b>O-Ring, Cover (2) *</b>
11	Stem Retainer
12	Cap Screw
13	Cap Screw (4)
14	Cap Screw
15	Vent Valve
16	Pin
17	Handle
18	Cap Screw
19	Washer
20	<b>O-Ring, Stem (4) *</b>
21	<b>O-Ring, Cartridge (2) *</b>
22	<b>Seal (4) *</b>
23	<b>Seat (4) *</b>
24	Ball (2)
25	Stem, Top
26	Stem, Middle

### Diverter Cartridge Maintenance

The Diverter Cartridge assembly is maintenance free. No initial or operational servicing is required. In the event that the cartridge O-rings, stem O-rings, seats or seals need replacement, Sealing Kits are available for strainer sizes: ¾" – 1", 1¼" – 1½", 2" – 2½", 3" and 4".

# 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:  
[www.Filtration.Eaton.com](http://www.Filtration.Eaton.com)

## Gas/Liquid Separators

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:  
[www.Filtration.Eaton.com](http://www.Filtration.Eaton.com)

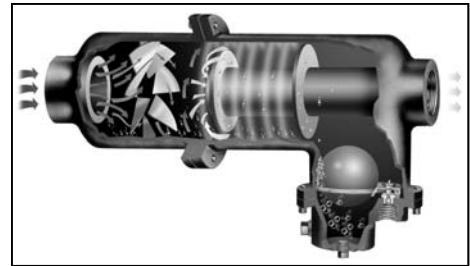
the consistent, reliable performance that you demand. Eaton Filter Bags fit all Eaton Filter Housings and the housings of most other manufacturers as well.

Find out more on the web at:  
[www.Filtration.Eaton.com](http://www.Filtration.Eaton.com)

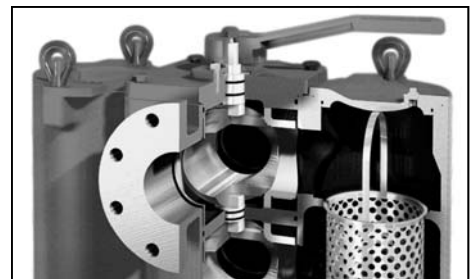


## Filtration Systems

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



Eaton Filtration warranties its products against defective material and workmanship only. Eaton assumes no responsibility for damage or injury resulting from improper installation, abuse, or misapplication of any product. Eaton assumes no responsibility for damage or injury resulting from chemical incompatibility between its products and the process fluids to which they are subjected. The end user should always test to determine application suitability. Contact your Eaton Representative for complete warranty information.

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