Ball Type Duplex Basket Strainer

Pipeline Strainer | Cast Construction | Permanent Media

Model 53BTX

- Sizes 3/4" to 4"
- Iron, bronze, carbon steel or stainless steel
- Threaded or flanged

Unique diverter cartridge assures leak-tight isolation of basket chamber during cleaning.

A double sealing system on the upper and lower stems guards against any possible leakage. If service becomes necessary, just remove four bolts and the cartridge slides right out the top of the strainer body.

Features

- Dynamic sealing design for long life
- Easy-to-operate lever handle—no gear box required
- Unique seat and seal design requires no adjustments
- Teflon® seats for longer service life
- Foot pads for rock solid installation
- Double-stem O-rings for positive sealing
- Easy to access body vent valve
- Drain plugs in each basket cover
- Piston seal strainer basket cover
- Easy access for diverter cartridge removal
- 316 stainless steel ball design
- American Bureau of Shipping (ABS) Type Approved for ship designers, builders and owners

EATON
Powering Business Worldwide

Continuous operation

The Eaton Model 53BTX duplex basket strainer can operate continuously, eliminating the need to shut down processes for cleaning of strainers. When the first basket is full, a unique flow diverter cartridge shifts flow to a second basket to permit removal and cleaning with no interruption to operations.

Draining this chamber is easy; the cover lifts and swings clear of the chamber opening with no special tools required.

The unique flow diverter cartridge prevents fluid bypass into the out-of-service chamber. It features a dynamic sealing system that ensures exceptionally long seat life and positive sealing. Manual internal or external ball support adjustments are not necessary.

Size and material

The compact, low-profile Model 53BTX fits into spaces ordinary strainers may not, yet it still uses full-size strainer baskets with a low-pressure drop performance. Eaton offers basket openings from 3/4" down to 45 microns. Type 316 stainless steel is standard and MONEL® or HASTELLOY® C materials are optional.

Easy basket servicing

One drain plug is on each side of the housing. Additionally, an easy to access vent valve is in the cover. Standard foot mounting pads ensure a rock solid installation no matter where the strainer operates.

Available options include:

- Differential pressure gauges, with or without switches
- Magnetic separators installed in the strainer basket for removing fine ferrous particulate matter from the process media

Model 53BTX Ball Type Duplex Basket Strainer

Selection table

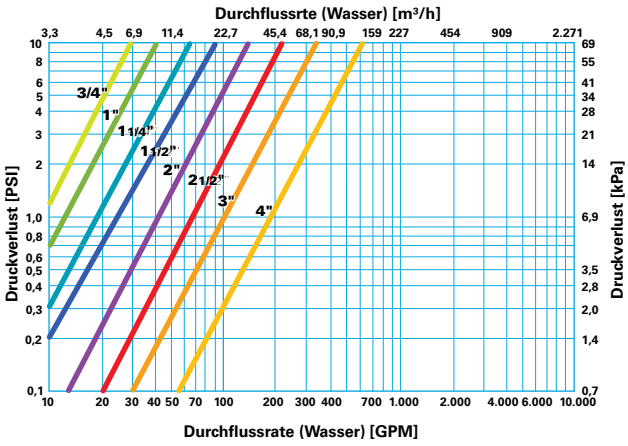
Size	Body & cartridge material	End connection	Seat/Seal	Diverter balls	Pressure rating @ 150 °F (65 °C)
3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2"	Iron	Threaded	TFE/Buna-N®*	Stainless steel	200 psi (13.8 bar)
3/4", 1", 1-1/4", 1-1/2", 2", 2-1/2"	Bronze	Threaded	TFE/Buna-N*	Stainless steel	200 psi (13.8 bar)
3/4", 1", 1-1/4", 1-1/2", 2"	Carbon steel	Threaded	TFE/Buna-N*	Stainless steel	200 psi (13.8 bar)
3/4", 1", 1-1/4", 1-1/2", 2"	Stainless steel	Threaded	TFE/Viton®	Stainless steel	200 psi (13.8 bar)
1", 1-1/2", 2", 2-1/2", 3", 4"	Iron	Flanged 125#	TFE/Buna-N*	Stainless steel	200 psi (13.8 bar)
1", 1-1/2", 2", 2-1/2", 3", 4"	Bronze	Flanged 150#	TFE/Buna-N*	Stainless steel	200 psi (13.8 bar)
1", 1-1/2", 2", 2-1/2", 3", 4"	Carbon steel	Flanged 150#	TFE/Buna-N*	Stainless steel	200 psi (13.8 bar)
1", 1-1/2", 2", 2-1/2", 3", 4"	Stainless steel	Flanged 150#	TFE/ Viton	Stainless steel	200 psi (13.8 bar)

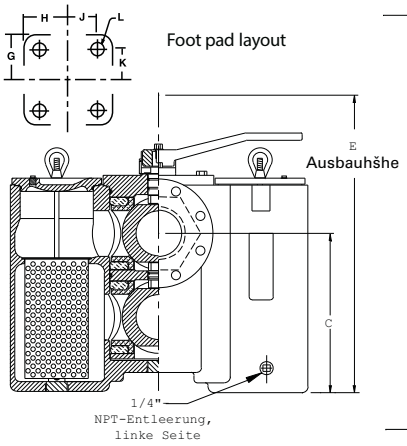
*Viton standard for SSTL, optional for iron, bronze and carbon steel.

C_V factors*

Size	Value	Size	Value
3/4"	13	2"	42
1"	13	2-1/2"	65
1-1/4"	18	3"	110
1-1/2"	25	4"	175

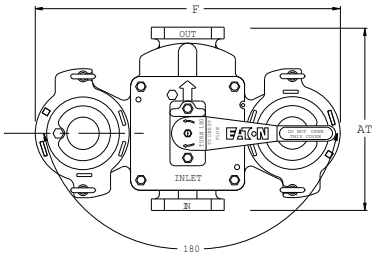
* For water with clean, perforated basket



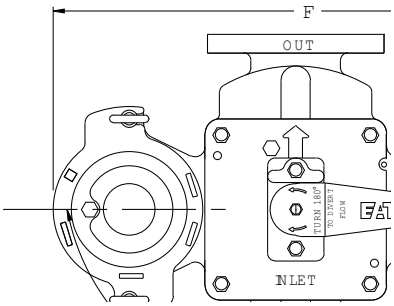


Front view flanged and threaded models

Top view threaded model



Top view flanged model



Dimensions (in/mm)

Pipe size	AF	AT	C	E	F	G	H	J	K	L	Weight – Iron flanged (lb / kg)	Weight – Iron threaded (lb / kg)	Weight – Bronze flanged (lb / kg)	Weight – Bronze threaded (lb / kg)	Weight – Carbon & SS flanged (lb / kg)	Weight – Carbon & SS threaded (lb / kg)
3/4	—	5.50 / 140	5.00 / 127	13.38 / 340	10.50 / 268	3.25 / 83	2.13 / 54	1.63/ 41	2.75/ 70	3/8	–	37 / 17	–	46 / 21	–	41 / 19
1	6.88 / 175	5.50 / 140	5.00 / 127	13.38 / 340	10.50 / 268	3.25 / 83	2.13 / 54	1.63/ 41	2.75/ 70	3/8	42 / 19	37 / 17	52 / 24	46 / 21	47 / 21	41 / 19
1-1/4	6.88 / 175	7.50 / 190	6.81 / 173	17.00 / 432	13.25 / 330	3.25 / 83	2.13 / 54	1.63/ 41	2.75/ 70	3/8	–	80 / 36	–	100 / 45	–	89 / 40
1-1/2	9.38 / 238	7.50 / 190	6.81 / 173	17.00 / 432	13.25 / 330	3.25 / 83	2.13 / 54	1.63/ 41	2.75/ 70	3/8	90 / 41	80 / 36	113 / 51	100 / 45	100 / 45	89 / 40
2	10.63 / 270	10.00 / 254	8.38 / 213	21.75 / 552	17.38 / 441	4.69 / 119	2.50/ 64	1.81/ 46	4.00/ 102	5/8	167 / 76	157 / 71	209 / 95	197 / 90	185 / 84	174 / 79
2-1/2	10.75 / 273	10.00 / 254	8.38 / 213	21.75 / 552	17.37 / 441	4.69 / 119	2.50/ 64	1.81/ 46	4.00/ 102	5/8	183 / 83	157 / 71	229 / 104	197 / 90	203 / 92	–
3	13.50 / 343	—	8.88 / 226	26.50 / 673	22.75 / 578	4.69 / 119	2.50/ 64	1.81/ 46	4.00/ 102	5/8	285 / 129	–	357 / 162	–	432 / 196	–
4	16.00 / 406	—	13.25 / 337	33.00 / 838	24.75 / 629	5.19 / 132	3.94/ 100	3.25/ 83	4.50/ 114	5/8	389 / 177	–	487 / 221	–	432 / 196	–

Dimensions and weights are for reference only. Contact Eaton for certified drawings.
Pressure equalizing valve and piping standard on 4" Model 53BTX duplex strainers.

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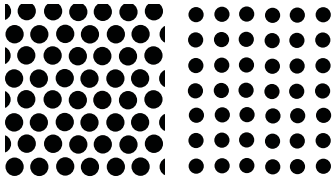
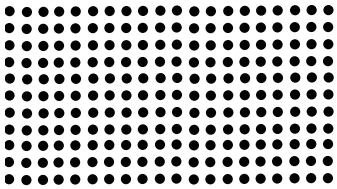
Basket and screen data

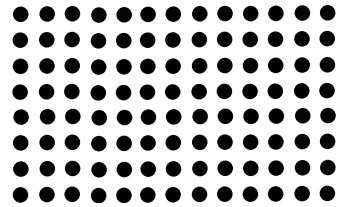
Pattern examples



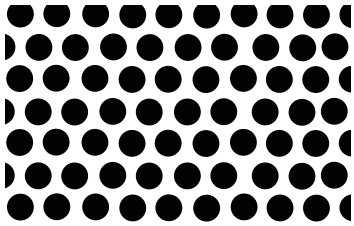
Staggered holes Straight holes



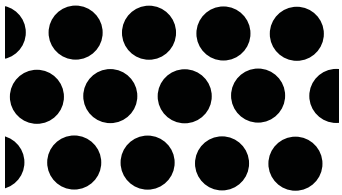
1/32" – Actual size



1/16" – Actual size



1/8" – Actual size



1/4" – Actual size

Basket and screen design

Designed to be both effective and durable, the basket or screen is the heart of an Eaton strainer. Eaton supplies baskets for simplex and duplex strainers and screens for Y strainers, in standard and heavy-duty designs. Standard design baskets meet the needs of most applications. Eaton recommends the heavy-duty design in cases when straining an extremely high viscosity material or experiencing a high solids load.

Eaton baskets and screens are available in two standard materials: 316 stainless steel or MONEL®. These materials cover nearly all corrosion resistance levels needed in strainer services. A wide range of perforations and mesh provides removal of solids from 1/2" down to as low as 40 microns. For special, unique applications, Eaton custom fabricates baskets from just about any material to exact specifications.

Basket construction

Each style basket includes a perforated sheet induction welded to a rigid top ring and solid bottom cap. Special attention to the welds along the perforated sheet seam, prevent the possible bypass of solids and maintain the basket's strength. A handle, welded to the I.D. of the top ring, facilitates easy removal. Heavy-duty baskets have reinforcing strips induction welded along the perforation's seam and circumferentially on the outside of the mid-section of the basket. The perforated sheet is inside the top ring and bottom cap.

Screen construction

Y strainer screens, rolled to form a cylinder, are induction welded along the seam. A neat weld, applied along the perforated sheet seam, prevents the possible bypass of solids and provides a seam of acceptable strength. Eaton machines Y strainer screen seats to specific dimensions and, accordingly, both the O.D. and length of these screens are closely toleranced.

Perforated sheet – specification

Eaton baskets utilize perforated sheets because of their greater inherent strength and resistance to stress cracking. The percentage of open area of a screen generally dictates the internal pressure drop experienced across it. The objective is to select a perforation with the best balance of open area, hole arrangement and sheet thickness.

Open area

Perforated sheets can have an open area from 15% to 75%. In general, the larger the open area of perforated sheet, the thinner the sheet thickness must be. Holes punched closer together increase the perforated open area; the solid portion between holes distorts and becomes weak. Another factor in controlling the sheet thickness is the hole diameter. The smaller the hole diameter, the thinner the sheet. Eaton baskets and screens have between 28% to 63% open area with gauge thickness from 18 (0.048 mm) to 25 (0.021 mm), depending upon the size of the perforations and the size and model of the strainer.

Hole arrangement

Holes can be punched either in a straight line or in a staggered pattern. Eaton baskets and screens have a staggered pattern that increases the open area, provides extra strength and creates less pressure drop.

Perforations

Eaton baskets and screens are available in 1/32", 3/64", 1/16", 1/8", 5/32", 1/4", 3/8" and 1/2" perforations and in mesh sizes 20, 40, 60, 80, 100, 200, 325 and 400. However, for general service there is one perforation for each size and type of strainer. Unless specified, this standard perforation is the size furnished with the strainer.

Basket and screen data

Wire mesh specifications

Eaton strainers are available with woven wire mesh screens. Wire mesh provides smaller openings for very fine straining applications down to 40 microns. Eaton baskets and screens use monofilament mesh possessing equal wire size and wire count in both directions to produce square openings. Other types of mesh such as Dutch (or Hollander) are also available. Dutch weave has a greater quantity of wires in one direction and fewer wires of a larger diameter in the other direction. This creates a rectangular opening. As with perforated sheet, the best wire mesh selection is a balance of open area, wire diameter and type of weave.

Openings

Standard wire mesh liners for Eaton baskets and screens are available from 20 to 400 mesh. For any size mesh, there are different open area selections based on the diameter of the wires used. Twenty mesh means 20 wires per inch in both a vertical and horizontal direction. Therefore, as the wire size increases, the hole size decreases. Eaton baskets offer wire mesh with openings from 0.034" to 0.0015" (20 mesh to 400 mesh).

Open area

The open area of wire mesh is a function of both the weave and the wire diameter. Eaton uses a plain square weave in most cases because its straight-through flow path creates the least pressure drop. The mesh is reinforced with a perforated metal backing possessing greater than a 60% open area. This combination affords the greatest degree of strength, yet offers a lower pressure drop than other types of wire mesh. In certain instances, such as Y strainer in steam applications, the increased pressure drop resulting from the use of a Dutch weave is not as critical as the retention of small particles. Therefore, in applications that involve steam, Eaton suggests the use of weave such as the 30 x 160 size that can withstand a much higher differential pressure without bursting. Eaton can supply baskets and screens with open areas from 14% to 46%

Plain square weave

Woven in an over and under pattern of wire having the same diameter, this weave produces a square opening with excellent flow characteristics.

Plain dutch weave

Woven in an over and under pattern in one direction in which the horizontal wires are larger in diameter than the vertical wires, which are driven close and crimped at each pass. This weave produces greater strength, but lower flow rates, than a square weave. Most often used in steam applications.

Mesh liners available

The number of openings per linear inch determines the size of mesh liners. The standard sizes Eaton can furnish are 20, 40, 60, 80, 100, 200, 325 and 400.

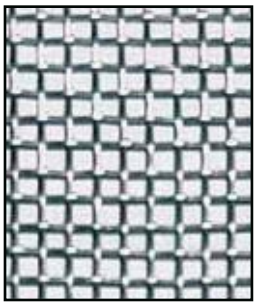
Perforated basket sheet specifications

Perforation size inches	Sheet thickness uss gauge #	Hole pattern	% Open area
0.020	26 (0.018 mm)	Straight	16.0
1/32	26 (0.018 mm)	Straight	28.0
3/64	26 (0.018 mm)	Straight	30.2
0.045	26 (0.018 mm)	Straight	37.0
1/16	26 (0.018 mm)	Straight	31.0
1/8	26 (0.018 mm)	Staggered	40.0
5/32	26 (0.018 mm)	Staggered	63.0
1/4	26 (0.018 mm)	Staggered	42.0
3/8	26 (0.018 mm)	Staggered	52.0
1/2	26 (0.018 mm)	Staggered	47.9

Mesh basket sheet specifications

Mesh size	Wire diameter inches	Mesh opening inches	Mesh opening microns	% Open area
20	0.016	0.0340	864	46.2
40	0.010	0.0150	381	36.0
60	0.0075	0.0092	234	30.5
80	0.0060	0.0065	165	27.0
100	0.0045	0.0055	140	30.3
200	0.0021	0.0029	74	33.6
325	0.0014	0.0017	43	30.0
400	0.0010	0.0015	38	36.0

Wire mesh weaves



Plain square weave

Plain dutch weave

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Basket effective area

Strainer model	Pipe size (in)	Perforation size (in)	Nominal area of pipe (sq in)	Gross screen area (sq in)	Free area (sq in)	Ratio free area to pipe area
85	1/4	.045	.10	5.0	1.8	18.0
85	3/8	.045	.19	5.0	1.8	9.5
85	1/2	.045	.30	5.0	1.8	6.0
85	3/4	.045	.53	7.1	2.6	4.9
85	1	.045	.86	10.4	3.7	4.3
85	1-1/4	.045	1.49	15.1	5.5	3.7
85	1-1/2	.045	2.03	21.7	7.8	3.8
85	2	.045	3.35	30.4	10.9	3.3
85	2-1/2	.045	4.78	43.2	15.5	3.2
85	3	.045	7.39	70.7	25.5	3.4
85	4	.045	12.73	106.8	38.4	3.0
85	6	.045	28.70	241.7	87.0	3.0
85	8	.045	50.02	414.6	149.2	3.0
85	10	.045	71.80	652.2	234.8	3.3
30R	1-1/2	5/32	2.03	35.4	22.3	11.0
30R	2	5/32	3.35	50.9	32.1	9.6
30R	2-1/2	5/32	4.78	84.7	53.4	11.2
30R	3	5/32	7.39	84.7	53.4	7.2
30R	4	5/32	12.73	114.5	72.1	5.6
30R	5	5/32	20.0	158.1	99.6	5.0
30R	6	5/32	28.9	180.9	113.9	4.0
30R	8	5/32	50.03	275.6	171.8	3.4
50	5	3/16	20.0	216.1	106.0	5.4
50	6	3/16	28.9	265.4	132.7	4.6
50	8	3/16	50.02	506.7	253.4	5.1
52	10	3/16	78.8	800	400	5.1
52	12	3/16	113,1	1200	600	5.3
52	14	3/16	137.9	2000	1000	7.3
52	16	3/16	182.6	2000	1000	5.5
52	18	3/16	182.6	2000	1000	5.5
53BTX	3/4	1/32	0.53	19.8	5.5	10.4
53BTX	1	1/32	0.86	19.8	5.5	6.4
53BTX	1-1/4	1/8	1.49	45.0	22.0	14.4
53BTX	1-1/2	1/8	2.03	45.0	22.0	10.6
53BTX	2	1/8	3.35	65.0	31.0	9.3
53BTX	2 -1/2	1/8	4.78	65.0	31.0	6.5
53BTX	3	3/16	7.39	110.3	55.1	7.4
53BTX	4	3/16	12.73	152.0	76.0	5.9

Strainer model	Pipe size (in)	Perforation size (in)	Nominal area of pipe (sq in)	Gross screen area (sq in)	Free area (sq in)	Ratio free area to pipe area
72	3/8	1/32	0.19	12.7	3.4	18.0
72	1/2	1/32	0.30	12.7	3.4	11.3
72	3/4	1/32	0.53	19.5	5.2	9.9
72	1	1/32	0.86	19.5	5.2	6.1
72	1-1/4	1/8	1.49	30.1	14.4	9.7
72	1-1/2	1/8	2.03	49.7	19.0	9.4
72	2	1/8	3.35	50.9	24.4	7.3
72	2-1/2	1/8	4.78	80.2	38.4	8.0
72	3	3/16	7.39	114.5	57.2	7.8
72	4	3/16	12.73	168.3	84.1	6.6
72	5	3/16	20.0	265.4	132.7	6.6
72	6	3/16	28.9	324.2	162.1	5.6
72	8	3/16	50.02	555.3	277.7	5.6
73	10	3/16	78.8	800	400	5.1
73	12	3/16	113.1	1200	600	5.3
73	14	3/16	137.9	2000	1000	7.3
73	16	3/16	182.6	2000	1000	5.5
73	18	3/16	182.6	2000	1000	5.5

Alloy data

Metal alloys used in Eaton strainers

Carbon steel – ASTM A-216 grade WCB

Tensile strength: . . . . . 70,000 lb/sq (480 N/mm²)
Yield: . . . . 36,000 lb/sq in (245 N/mm²)
Elongation: 22%
Chemical composition:
C (Carbon) 0.30%
Si (Silicon) 0.60%
P (Phosphorus) 0.04%
S (Sulfur) 0.045%
Mn (Manganese) 1.00%
Residual Elements . . . . 1.00% max

Aluminum bronze – ASTM B-148 grade C95400

Tensile strength: . . . . . 75,000 lb/sq in (517 N/mm²)
Yield:. . . . 30,000 lb/sq in (206 N/mm²)
Elongation: 12%
Chemical composition:
Cu (Copper) 85%
Fe (Iron) 4%
Al (Aluminum) 11%

Stainless steel – ASTM A-351 grade CF8M

Tensile strength: . . . . . 70,000 lb/sq in (480 N/mm²)
Yield:. . . . 30,000 lb/sq in (206 N/mm²)
Elongation: 30%
Chemical composition:
C (Carbon) . . . . . 0.08% max
Si (Silicon) 1.5%
P (Phosphorus) 0.040%
Cr (Chromium) . . . . . 18.0 - 21.0%
Ni (Nickel) . . . . . 9.0 - 12.0%
Mn (Manganese) 1.50%
S (Sulfur) 0.04%
Mo (Molybdenum) . . . . 2.0 - 3.0%

Cast iron – ASTM A-126 class B

Tensile strength: 31,000 lb/sq in (214 N/mm²)
Compressive strength: 109,000 lb/sq in (750 N/mm²)
Tensile modulus: . . . . 15×10^6 lb/sq in
Chemical composition:
C (Carbon) . . . . . 3.20 - 3.40 %
Si (Silicon) . . . . . 2.10 - 2.30%
P (Phosphorus) . . . . . 0.15 - 0.30%
S (Sulfur) . . . . . 0.08 - 0.12%
Mn (Manganese) . . . 0.50 - 0.80%

Ductile iron – ASTM A-395 grade 60-40-18

Tensile strength: . . . . . 60,000 lb/sq in (413 N/mm²)
Yield:. . . . . 40,000 lb/sq in (275 N/mm²)
Elongation: 18%
Chemical composition:
C (Carbon) . . . . . 3.20 - 4.0%
Si (Silicon) . . . . . 1.80 - 2.80%
P (Phosphorus) . . . . . 0.08% max.
S (Sulfur) . . . . . 0.03% max.
Mn (Manganese) . . . 0.03% max.

Pressure drop calculations

Pressure drops for Eaton strainers are shown on each product page. The curves are based on the flow of water through clean, perforated baskets or screens. For mesh-lined baskets or screens and/or for fluids other than water, use the correction factors listed on this page. To accurately calculate the pressure loss for filters and strainers in a pipeline, proceed as follows:

1. First calculate pressure loss using C_V factor formula at right.
2. Take the pressure loss figure obtained in (1) and recalculate it using the appropriate correction factor from the following table.

Correction factors for mesh-lined baskets

First – Multiply the pressure drop for water shown in charts by the specific gravity of the liquid.

Second – Multiply the corrected pressure drop figure by the following correction factors for more viscous liquids. (Water has a viscosity of 30 SSU.)

Viscosity (SSU)	Unlined perforated basket	40 Mesh lined basket	60 Mesh lined basket	80 Mesh lined basket	100 Mesh lined basket	200 Mesh lined basket	325 Mesh lined basket
30 (water)	1	1.2	1.4	1.6	1.7	2.0	2.5
500	1.6	1.9	2.1	2.4	2.6	3.1	3.6
1000	1.7	2.2	2.4	2.6	2.8	3.3	3.8
2000	1.9	2.4	2.7	2.9	3.2	3.8	4.0
3000	2.0	2.6	2.9	3.2	3.5	4.1	4.3
5000	2.2	3.0	3.5	4.0	4.5	5.3	6.3
10000	2.5	3.5	4.2	5.0	6.0	7.1	8.5

Strainer basket opening equivalents

Mesh	Inches	Millimeters	Microns
400	0.0015	0.0381	38
300	0.0018	0.0457	45
250	0.0024	0.0609	60
200	0.0027	0.0686	68
150	0.0041	0.1041	104
100	0.0065	0.1651	165
80	0.007	0.1778	177
60	0.009	0.2286	228
40	0.015	0.8636	380
20	0.034	0.8636	862

Perf	Inches	Millimeters	Microns
1/32	0.033	0.838	838
3/64	0.045	1.143	1143
1/16	0.070	1.778	1776
3/32	0.094	2.387	2387
1/8	0.125	3.175	3175
5/32	0.150	3.810	3810
3/16	0.1875	4.762	4762
1/4	0.250	6.350	6350
3/8	0.375	9.525	9525
1/2	0.500	12.700	12700

Pressure loss calculation using C_V factor

Metric units

$$\Delta p = \left[\frac{Q}{C_V}\right]^2 (133.6)$$

Δp = Pressure drop in kPa
Q = Flow in m³/h
C_V = Flow coefficient

Standard units

$$\Delta p = \left[\frac{Q}{C_V}\right]^2$$

Δp = Pressure drop in psi
Q = Flow in gpm
C_V = Flow coefficient

The pressure loss across a strainer can be calculated using the system's flow rate and the C_V factor for that strainer.

For example, a 1" Model 72 simplex strainer with a perforated basket has a C_V factor of 22.5. In water service with a 30 gpm (6.8 m³/h) flow rate, it will have a 1.7 psi (117 mbar) pressure drop $(30 \div 22.5)^2 = 1.7$. For mesh-lined baskets and/or fluids with a viscosity greater than water, multiply the pressure drop by the correction factors in the chart "Correction factors for mesh-lined baskets."

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Pressure Drop Calculations

Pressure drops for Eaton strainers are shown on each product page. The curves are based on the flow of water through clean, perforated baskets or screens. For mesh-lined baskets or screens and/or for fluids other than water, use the correction factors listed on this page. To accurately calculate the pressure loss for filters and strainers in a pipeline, proceed as follows:

1. First calculate pressure loss using C_V factor formula at right.
2. Take the pressure loss figure obtained in (1) and recalculate it using the appropriate correction factor from the following table.

Correction Factors for Mesh-lined Baskets

First – Multiply the pressure drop for water shown in charts by the specific gravity of the liquid.

Second – Multiply the corrected pressure drop figure by the following correction factors for more viscous liquids. (Water has a viscosity of 30 SSU.)

Viscosity (SSU)	Unlined Perforated Basket	40 Mesh Lined Basket	60 Mesh Lined Basket	80 Mesh Lined Basket	100 Mesh Lined Basket	200 Mesh Lined Basket	325 Mesh Lined Basket
30 (water)	1	1.2	1.4	1.6	1.7	2.0	2.5
500	1.6	1.9	2.1	2.4	2.6	3.1	3.6
1000	1.7	2.2	2.4	2.6	2.8	3.3	3.8
2000	1.9	2.4	2.7	2.9	3.2	3.8	4.0
3000	2.0	2.6	2.9	3.2	3.5	4.1	4.3
5000	2.2	3.0	3.5	4.0	4.5	5.3	6.3
10000	2.5	3.5	4.2	5.0	6.0	7.1	8.5

Strainer Basket Opening Equivalents

Mesh	Inches	Millimeters	Microns
400	0.0015	0.0381	38
300	0.0018	0.0457	45
250	0.0024	0.0609	60
200	0.0027	0.0686	68
150	0.0041	0.1041	104
100	0.0065	0.1651	165
80	0.007	0.1778	177
60	0.009	0.2286	228
40	0.015	0.8636	380
20	0.034	0.8636	862

Perf	Inches	Millimeters	Microns
1/32	0.033	0.838	838
3/64	0.045	1.143	1143
1/16	0.070	1.778	1776
3/32	0.094	2.387	2387
1/8	0.125	3.175	3175
5/32	0.150	3.810	3810
3/16	0.1875	4.762	4762
1/4	0.250	6.350	6350
3/8	0.375	9.525	9525
1/2	0.500	12.700	12700

Pressure Loss Calculation Using C_V Factor

Metric Units

$$\Delta P = \left[\frac{Q}{C_V}\right]^2 (133.6)$$

ΔP = Pressure Drop in kPa
Q = Flow in M^3/hr
C_V = Flow Coefficient

Standard Units

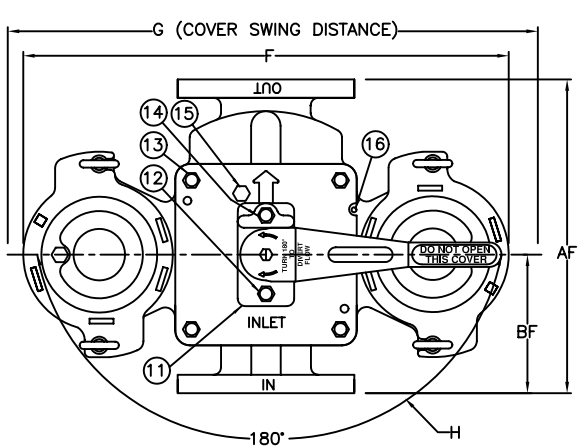
$$\Delta P = \left[\frac{Q}{C_V}\right]^2$$

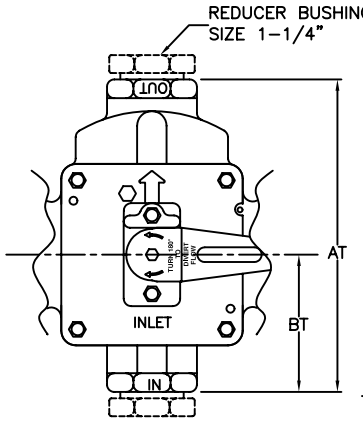
ΔP = Pressure Drop in psi
Q = Flow in gpm
C_V = Flow Coefficient

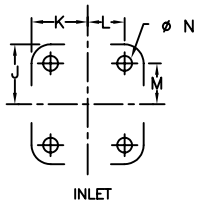
The pressure loss across a strainer can be calculated using the system's flow rate and the C_V factor for that strainer.

For example, a 1" Model 72 simplex strainer with a perforated basket has a C_V factor of 22.5. In water service with a 30 gpm flow rate, it will have a 1.7 psi pressure drop $(30 \div 22.5)^2 = 1.7$. For mesh-lined baskets and/or fluids with a viscosity greater than water, multiply the pressure drop by the correction factors in the chart "Correction Factors for Mesh-lined Baskets."

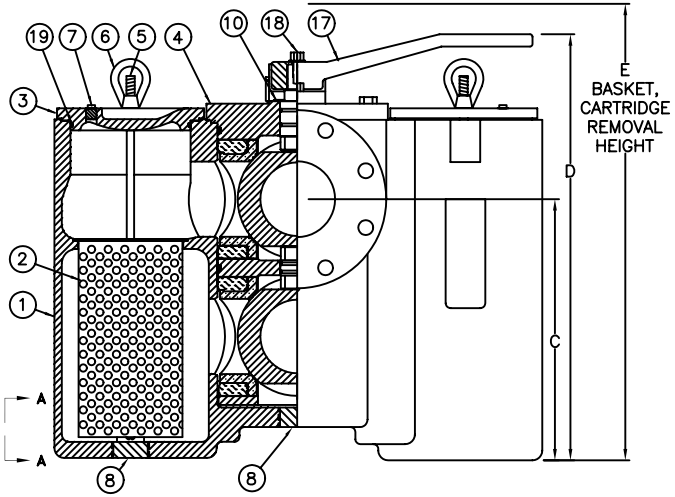
PIPE SIZE (NOMINAL)		DIMENSIONS																				STRAINER WEIGHT	STRAINER PART NO.
		AF±0.13		BF		AT±0.13		BT		C		D		E		F		G		H		J		K		L		M		N			
IN.	MM.	IN.	MM.	IN.	MM.	IN.	MM.	IN.	MM.	IN.	MM.	IN.	MM.	IN.	MM.	IN.	MM.	IN.	MM.	IN.	MM.	IN.	MM.	IN.	MM.	IN.	MM.	IN.	MM.	LBS.	KGS.	
3/4	(20)					5.50	140	2.53	64	5.00	127	10.50	267	13.38	340	10.50	268	16.50	419	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	37	17	ST053007AT46TS
1	(25)					5.50	140	2.53	64	5.00	127	10.50	267	13.38	340	10.50	268	16.50	419	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	37	17	ST053010AT46TS
1	(25)	6.88	175	3.19	81					5.00	127	10.50	267	13.38	340	10.50	268	16.50	419	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	42	19	ST053010AF46TS
1-1/4	(32)					8.75	222	3.88	99	6.81	173	12.75	324	17.00	432	13.25	330	19.88	5.05	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	80	36	ST053012AT46TS
1-1/2	(40)					7.50	190	3.25	83	6.81	173	12.75	324	17.00	432	13.25	330	19.88	5.05	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	83	38	ST053015AT46TS
1-1/2	(40)	9.38	238	4.31	109					6.81	173	12.75	324	17.00	432	13.25	330	19.88	5.05	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	90	41	ST053015AF46TS
2	(50)					10.00	254	4.50	114	8.38	213	15.50	394	21.75	552	17.38	441	26.25	667	10.63	270	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	157	71	ST053020AT46TS
2	(50)	10.63	270	4.63	117					8.38	213	15.50	394	21.75	552	17.38	441	26.25	667	10.63	270	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	167	76	ST053020AF46TS
2-1/2	(65)					10.00	254	4.50	114	8.38	213	15.50	394	21.75	552	17.38	441	26.25	667	10.63	270	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	157	71	ST053025AT46TS
2-1/2	(65)	10.75	273	4.69	119					8.38	213	15.50	394	21.75	552	17.38	441	26.25	667	10.63	270	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	183	83	ST053025AF46TS
3	(80)	13.50	343	5.93	151					8.88	226	18.00	457	26.50	673	22.75	578	35.00	889	12.00	305	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	285	129	ST053030AF46TS
4	(100)	16.00	406	7.06	179					13.25	337	21.63	549	33.00	838	24.75	629	36.75	933	12.00	305	5.19	132	3.94	100	3.25	83	4.50	114	5/8	(16)	391	177	ST053040AF46TS

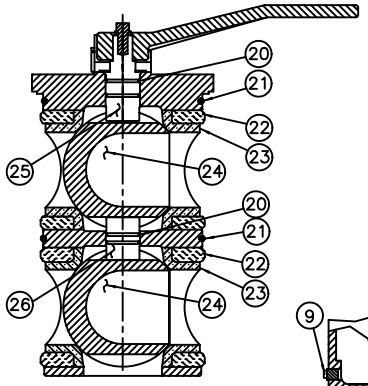




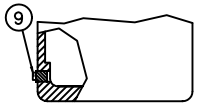


FOOT PAD LAYOUT





CARTRIDGE



VIEW A-A

ITEM	PART NAME	MATERIAL	QTY.
1	BODY	CAST IRON, A126 CL. B	1
2▲	BASKET	STAINLESS STEEL, 316	2▲
	PERF. DIA.		
	MESH SIZE		
3	COVER	DUCTILE IRON, A395	2
4	CARTRIDGE	DUCTILE IRON, A395	1
5	STUD	CARBON STEEL	4
6	EYENUT	CARBON STEEL	4
7 8 9	PIPE PLUG	CAST IRON	2, 3, 2
10▲	WASHER	STAINLESS STEEL	1▲
11	STEM RETAINER	STAINLESS STEEL	1
12 13 14	CAP SCREW	CARBON STEEL	1, 4, 1
15	VENT VALVE	BRASS	1
16	PIN	CARBON STEEL	1
17	HANDLE	DUCTILE IRON/CARBON STEEL	1
18	CAP SCREW	CARBON STEEL	1
19▲ 20▲ 21▲	O-RING	BUNA-N	2▲, 4▲, 2▲
22▲	SEAL	BUNA-N	4▲
23▲	SEAT	TEFLON	4▲
24	BALL	STAINLESS STEEL	2
25, 26	STEM	STAINLESS STEEL	1, 1

(▲ – SPARES)

NOTES: 1. INLET/OUTLET CONNECTIONS PER ANSI STANDARDS.
2. MAX. WORKING PRESSURE: 200 PSI @ 150° F (13.8 BAR @ 65.5° C)

CERTIFIED FOR: --

P.O. NO.: __ QUOTE NO.: __

REG. NO.: __ TAG NO.: __

EATON FILTRATION, LLC

900 FAIRMOUNT AVENUE, ELIZABETH, NEW JERSEY 07207

NAME MODEL 53 "BTX" – DUPLEX STRAINER
ANSI CLASS 125 FF FLANGE & NPT
SIZES 3/4" THROUGH 4" CAST IRON

DRAWN	VA	DATE	08/16/99	CERT.	WB	DATE	08/16/99

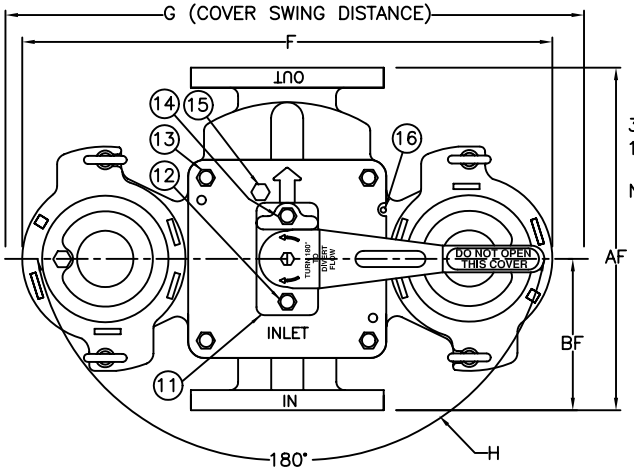
SIZE	DWG NO	REV
A	SD053081	F

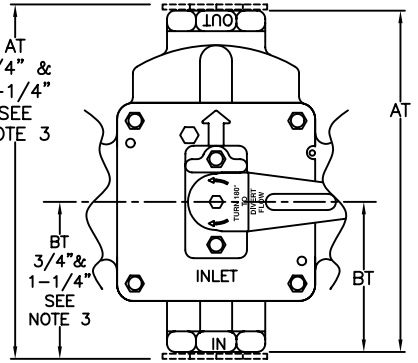
ELECTRONIC FILE NAME: SD053081.DWG

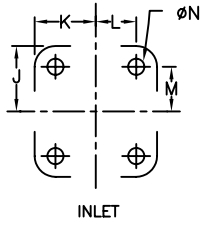
REF. ECR	D627	DATE	12/15/05

REV 8/00

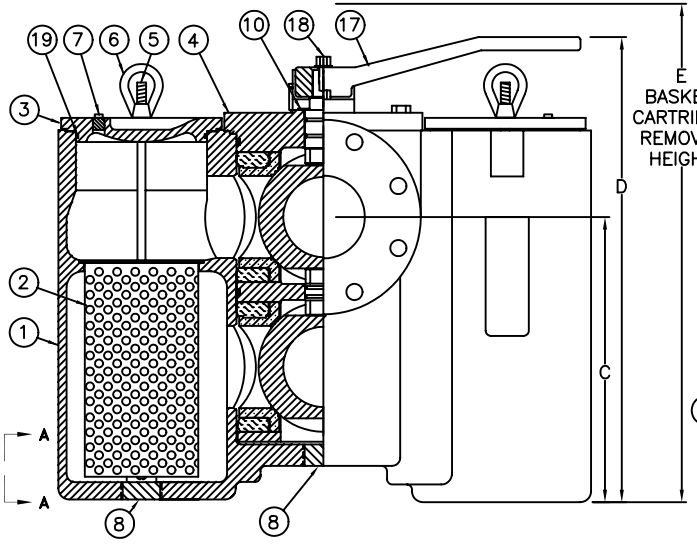
PIPE SIZE (NOMINAL) IN.	MM.	DIMENSIONS AF±0.13 IN.	MM.	BF IN.	MM.	AT±0.13 IN.	MM.	BT IN.	MM.	C IN.	MM.	D IN.	MM.	E IN.	MM.	F IN.	MM.	G IN.	MM.	H IN.	MM.	J IN.	MM.	K IN.	MM.	L IN.	MM.	M IN.	MM.	N IN.	MM.	STRAINER WEIGHT LBS.	KGS.	STRAINER PART NO.
3/4	(20)					6.13	156	2.84	72	5.00	127	10.50	267	13.38	340	10.50	268	16.50	419	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	45	21	ST053007BT11TS
1	(25)					5.50	140	2.53	64	5.00	127	10.50	267	13.38	340	10.50	268	16.50	419	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	43	20	ST053010BT11TS
1	(25)	6.88	175	3.19	81					5.00	127	10.50	267	13.38	340	10.50	268	16.50	419	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	49	22	ST053010BF11TS
1-1/4	(32)					8.75	222	3.75	95	6.81	173	12.75	324	17.00	432	13.25	330	19.88	505	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	97	44	ST053012BT11TS
1-1/2	(40)					7.50	190	3.25	83	6.81	173	12.75	324	17.00	432	13.25	330	19.88	505	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	94	43	ST053015BT11TS
1-1/2	(40)	9.38	238	4.31	109					6.81	173	12.75	324	17.00	432	13.25	330	19.88	505	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	106	48	ST053015BF11TS
2	(50)					10.00	254	4.50	114	8.38	213	15.50	394	21.75	552	17.38	441	26.25	667	10.63	270	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	185	84	ST053020BT11TS
2	(50)	10.63	270	4.63	117					8.38	213	15.50	394	21.75	552	17.38	441	26.25	667	10.63	270	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	197	89	ST053020BF11TS
2-1/2	(65)					10.00	254	4.50	114	8.38	213	15.50	394	21.75	552	17.38	441	26.25	667	10.63	270	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	185	84	ST053025BT11TS
2-1/2	(65)	10.75	273	4.69	119					8.38	213	15.50	394	21.75	552	17.38	441	26.25	667	10.63	270	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	216	98	ST053025BF11TS
3	(80)	13.50	343	5.93	151					8.88	226	18.00	457	26.50	673	22.75	578	35.00	889	12.00	305	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	336	153	ST053030BF11TS
4	(100)	16.00	406	7.06	179					13.25	337	21.63	549	33.00	838	24.75	629	36.75	933	12.00	305	5.19	132	3.94	100	3.25	83	4.50	114	5/8	(16)	461	209	ST053040BF11TS

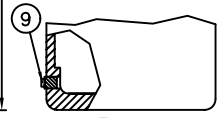




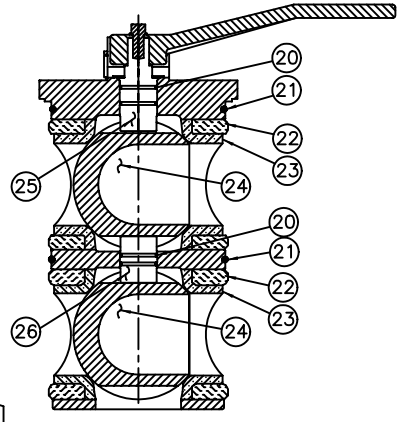


FOOT PAD LAYOUT





VIEW A–A



CARTRIDGE

ITEM	PART NAME	MATERIAL	QTY.
1	BODY	ALUMINUM BRONZE, B148	1
2▲	BASKET	STAINLESS STEEL, 316	2▲
	PERF. DIA.		
	MESH SIZE		
3	COVER	ALUMINUM BRONZE, B148	2
4	CARTRIDGE	ALUMINUM BRONZE, B148	1
5	STUD	CARBON STEEL	4
6	EYENUT	CARBON STEEL	4
7 8 9	PIPE PLUG	BRASS	2, 3, 2
10▲	WASHER	STAINLESS STEEL	1▲
11	STEM RETAINER	STAINLESS STEEL	1
12 13 14	CAP SCREW	CARBON STEEL	1, 4, 1
15	VENT VALVE	BRASS	1
16	PIN	CARBON STEEL	1
17	HANDLE	DUCTILE IRON/CARBON STEEL	1
18	CAP SCREW	CARBON STEEL	1
19▲ 20▲ 21▲	O-RING	BUNA-N	2▲, 4▲, 2▲
22▲	SEAL	BUNA-N	4▲
23▲	SEAT	TEFLON	4▲
24	BALL	STAINLESS STEEL	2
25 26	STEM	STAINLESS STEEL	1, 1

(▲ – SPARES)

NOTES:
1. INLET/OUTLET CONNECTIONS PER ANSI STANDARDS.
2. MAX. WORKING PRESSURE: 200 PSI @ 150° F (13.8 BAR @ 65.5° C)
3. BUSHINGS USED FOR 3/4" & 1-1/4" CONNECTIONS.

CERTIFIED FOR: --

P.O. NO.: --
REG. NO.: --
QUOTE NO.: --
TAG NO.: --

EATON FILTRATION, LLC
900 FAIRMOUNT AVENUE, ELIZABETH, NEW JERSEY 07207

NAME MODEL 53 "BTX" – DUPLEX STRAINER
ANSI CLASS 150 FF FLANGE & NPT
SIZES 3/4" THROUGH 4" BRONZE

DRAWN	VA	DATE	12/16/99	CERT.	WB	DATE	12/16/99

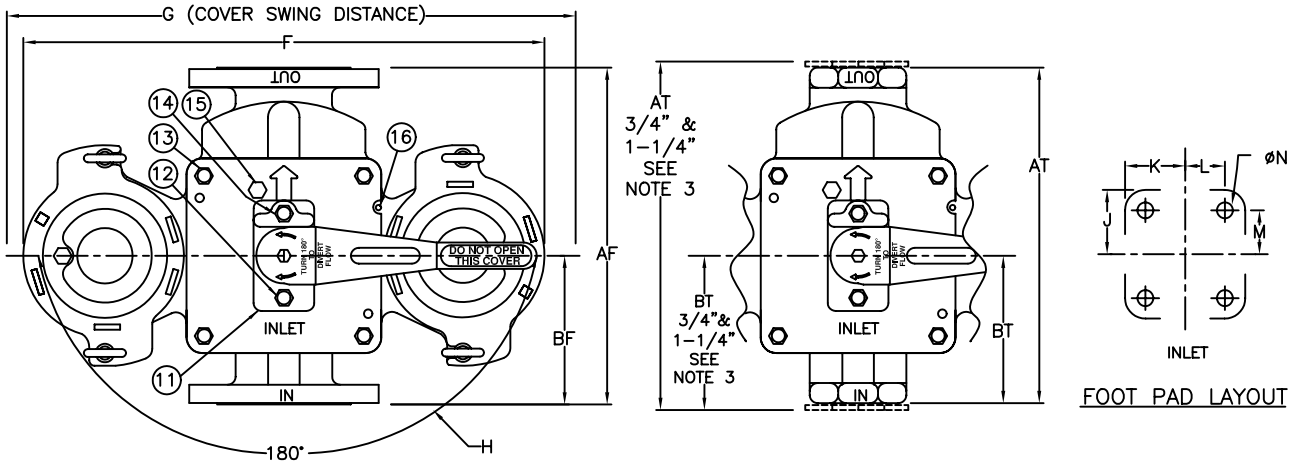
SIZE	DWG NO	REV
A	SD053082	K

ELECTRONIC FILE NAME: SD053082.DWG

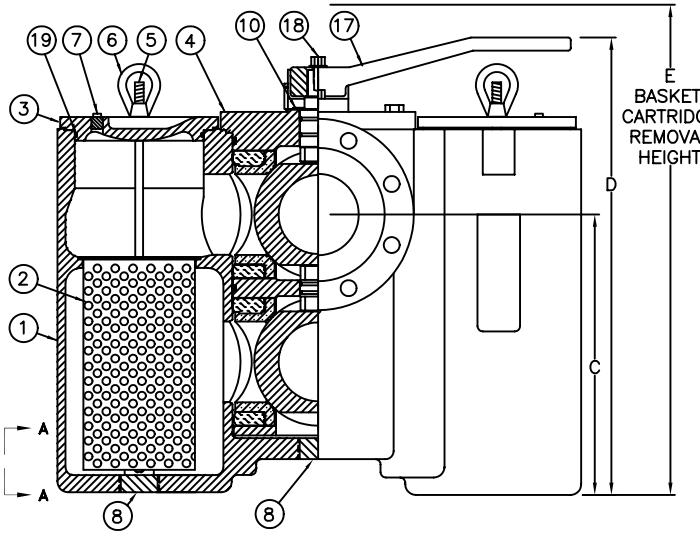
REF. ECR	D507	DATE	11/1/05

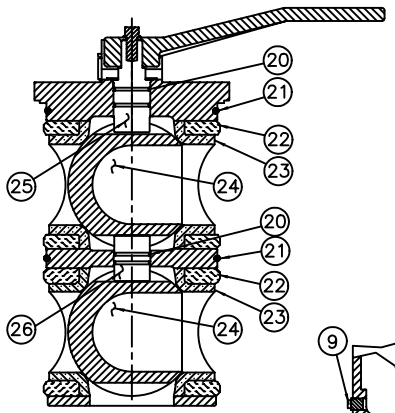
REV 8/00

PIPE SIZE (NOMINAL) IN.	MM.	DIMENSIONS AF±0.13 IN.	MM.	BF IN.	MM.	AT±0.13 IN.	MM.	BT IN.	MM.	C IN.	MM.	D IN.	MM.	E IN.	MM.	F IN.	MM.	G IN.	MM.	H IN.	MM.	J IN.	MM.	K IN.	MM.	L IN.	MM.	M IN.	MM.	N IN.	MM.	STRAINER WEIGHT LBS.	KGS.	STRAINER PART NO.
3/4	(20)					6.13	156	2.84	72	5.00	127	10.50	267	13.38	340	10.50	268	16.50	419	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	41	19	ST053007BT33TS
1	(25)					5.50	140	2.53	64	5.00	127	10.50	267	13.38	340	10.50	268	16.50	419	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	39	18	ST053010BT33TS
1	(25)	6.88	175	3.19	81					5.00	127	10.50	267	13.38	340	10.50	268	16.50	419	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	45	20	ST053010BR33TS
1-1/4	(32)					8.75	222	3.75	95	6.81	173	12.75	324	17.00	432	13.25	330	19.88	505	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	89	40	ST053012BT33TS
1-1/2	(40)					7.50	190	3.25	83	6.81	173	12.75	324	17.00	432	13.25	330	19.88	505	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	86	39	ST053015BT33TS
1-1/2	(40)	9.38	238	4.31	109					6.81	173	12.75	324	17.00	432	13.25	330	19.88	505	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	97	44	ST053015BR33TS
2	(50)					10.00	254	4.50	114	8.38	213	15.50	394	21.75	552	17.38	441	26.25	667	10.63	270	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	168	77	ST053020BT33TS
2	(50)	10.63	270	4.63	117					8.38	213	15.50	394	21.75	552	17.38	441	26.25	667	10.63	270	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	179	81	ST053020BR33TS
2-1/2	(65)					10.00	254	4.50	114	8.38	213	15.50	394	21.75	552	17.38	441	26.25	667	10.63	270	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	168	77	ST053025BT33TS
2-1/2	(65)	10.75	273	4.69	119					8.38	213	15.50	394	21.75	552	17.38	441	26.25	667	10.63	270	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	197	89	ST053025BR33TS
3	(80)	13.50	343	5.93	151					8.88	226	18.00	457	26.50	673	22.75	578	35.00	889	12.00	305	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	306	139	ST053030BR33TS
4	(100)	16.00	406	7.06	179					13.25	337	21.63	549	33.00	838	24.75	629	36.75	933	12.00	305	5.19	132	3.94	100	3.25	83	4.50	114	5/8	(16)	420	191	ST053040BR33TS

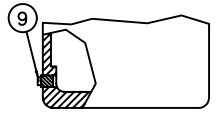


FOOT PAD LAYOUT





CARTRIDGE



VIEW A–A

ITEM	PART NAME	MATERIAL	QTY.
1	BODY	CARBON STEEL, A216 WCB	1
2▲	BASKET	STAINLESS STEEL, 316	2▲
	PERF. DIA.		
	MESH SIZE		
3	COVER	CARBON STEEL, A216 WCB	2
4	CARTRIDGE	CARBON STEEL, A216 WCB	1
5	STUD	CARBON STEEL	4
6	EYENUT	CARBON STEEL	4
7 8 9	PIPE PLUG	CARBON STEEL	2, 3, 2
10▲	WASHER	STAINLESS STEEL	1▲
11	STEM RETAINER	STAINLESS STEEL	1
12 13 14	CAP SCREW	CARBON STEEL	1, 4, 1
15	VENT VALVE	BRASS	1
16	PIN	CARBON STEEL	1
17	HANDLE	DUCTILE IRON/CARBON STEEL	1
18	CAP SCREW	CARBON STEEL	1
19▲ 20▲ 21▲	O-RING	BUNA-N	2▲, 4▲, 2▲
22▲	SEAL	BUNA-N	4▲
23▲	SEAT	TEFLON	4▲
24	BALL	STAINLESS STEEL	2
25 26	STEM	STAINLESS STEEL	1, 1

(▲ – SPARES)

NOTES:
1. INLET/OUTLET CONNECTIONS PER ANSI STANDARDS.
2. MAX. WORKING PRESSURE: 200 PSI @ 150° F (13.8 BAR @ 65.5°C)
3. BUSHINGS USED FOR 3/4" & 1-1/4" CONNECTIONS.

CERTIFIED FOR: --

P.O. NO.: --
REG. NO.: --
QUOTE NO.: --
TAG NO.: --

EATON FILTRATION, LLC
900 FAIRMOUNT AVENUE, ELIZABETH, NEW JERSEY 07207

NAME MODEL 53 "BTX" – DUPLEX STRAINER
ANSI CLASS 150 RF FLANGE & NPT
SIZES 3/4" THROUGH 4" CARBON STEEL

DRAWN	VA	DATE	08/16/99	CERT.	WB	DATE	08/16/99

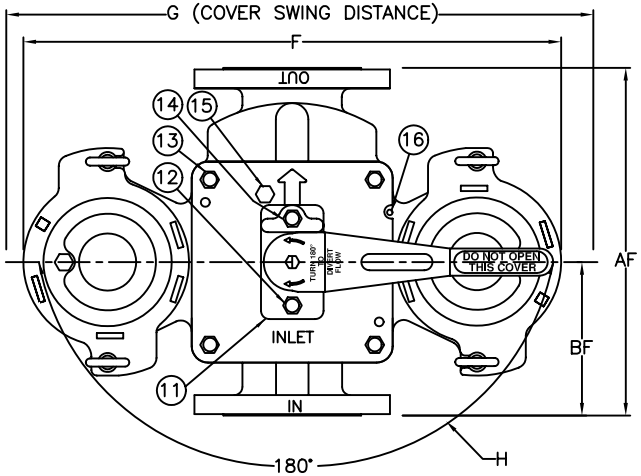
SIZE	DWG NO	REV
A	SD053083	J

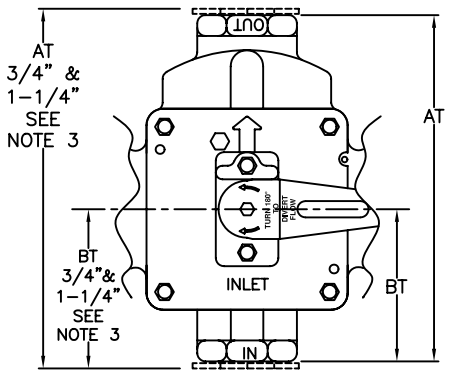
ELECTRONIC FILE NAME: SD053083.DWG

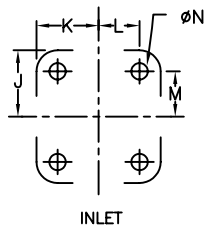
REF. ECR	D507	DATE	11/1/05

REV 8/00

PIPE SIZE (NOMINAL) IN.	MM.	DIMENSIONS AF±0.13 IN.	MM.	BF IN.	MM.	AT±0.13 IN.	MM.	BT IN.	MM.	C IN.	MM.	D IN.	MM.	E IN.	MM.	F IN.	MM.	G IN.	MM.	H IN.	MM.	J IN.	MM.	K IN.	MM.	L IN.	MM.	M IN.	MM.	N IN.	MM.	STRAINER WEIGHT LBS.	KGS.	STRAINER PART NO.
3/4	(20)					6.13	156	2.84	72	5.00	127	10.50	267	13.38	340	10.50	268	16.50	419	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	41	19	ST053007BT22A
1	(25)					5.50	140	2.53	64	5.00	127	10.50	267	13.38	340	10.50	268	16.50	419	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	39	18	ST053010BT22A
1	(25)	6.88	175	3.19	81					5.00	127	10.50	267	13.38	340	10.50	268	16.50	419	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	45	20	ST053010BR22A
1-1/4	(32)					8.75	222	3.75	95	6.81	173	12.75	324	17.00	432	13.25	330	19.88	505	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	89	40	ST053012BT22A
1-1/2	(40)					7.50	190	3.25	83	6.81	173	12.75	324	17.00	432	13.25	330	19.88	505	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	86	39	ST053015BT22A
1-1/2	(40)	9.38	238	4.31	109					6.81	173	12.75	324	17.00	432	13.25	330	19.88	505	7.88	200	3.25	83	2.13	54	1.63	41	2.75	70	3/8	(10)	97	44	ST053015BR22A
2	(50)					10.00	254	4.50	114	8.38	213	15.50	394	21.75	552	17.38	441	26.25	667	10.63	270	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	168	77	ST053020BT22A
2	(50)	10.63	270	4.63	117					8.38	213	15.50	394	21.75	552	17.38	441	26.25	667	10.63	270	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	179	81	ST053020BR22A
2-1/2	(65)					10.00	254	4.50	114	8.38	213	15.50	394	21.75	552	17.38	441	26.25	667	10.63	270	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	168	77	ST053025BT22A
2-1/2	(65)	10.75	273	4.69	119					8.38	213	15.50	394	21.75	552	17.38	441	26.25	667	10.63	270	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	197	89	ST053025BR22A
3	(80)	13.50	343	5.93	151					8.88	226	18.00	457	26.50	673	22.75	578	35.00	889	12.00	305	4.69	119	2.50	64	1.81	46	4.00	102	5/8	(16)	306	139	ST053030BR22A
4	(100)	16.00	406	7.06	179					13.25	337	21.63	549	33.00	838	24.75	629	36.75	933	12.00	305	5.19	132	3.94	100	3.25	83	4.50	114	5/8	(16)	420	191	ST053040BR22A



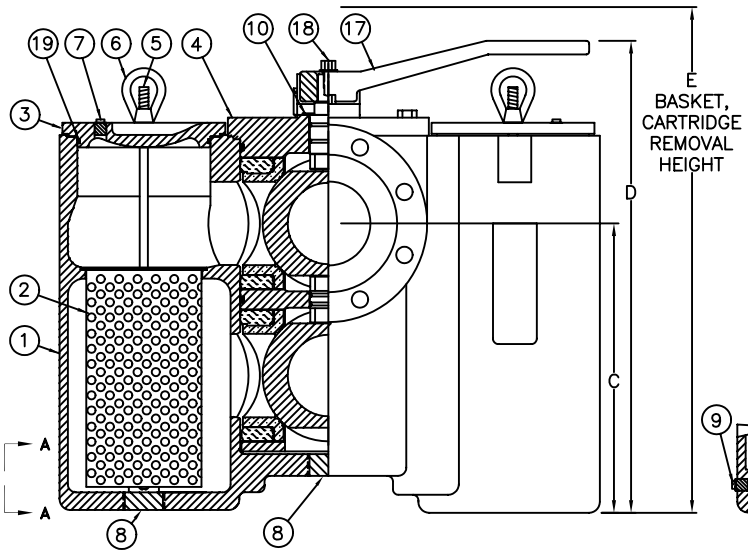


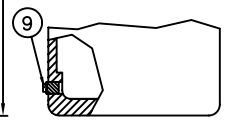


FOOT PAD LAYOUT

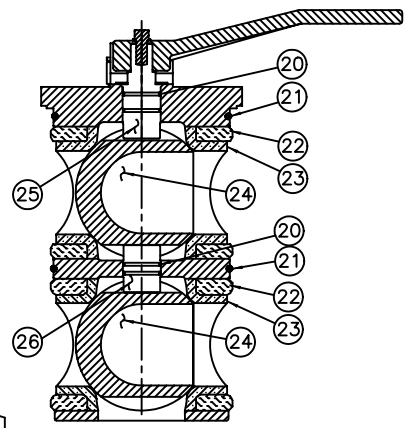
ITEM	PART NAME	MATERIAL	QTY.
1	BODY	STAINLESS ST, A351 CF8M	1
2▲	BASKET	STAINLESS STEEL, 316	2▲
	PERF. DIA.		
	MESH SIZE		
3	COVER	STAINLESS ST, A351 CF8M	2
4	CARTRIDGE	STAINLESS ST, A351 CF8M	1
5	STUD	CARBON STEEL	4
6	EYENUT	CARBON STEEL	4
7 8 9	PIPE PLUG	STAINLESS STEEL	2, 3, 2
10▲	WASHER	STAINLESS STEEL	1▲
11	STEM RETAINER	STAINLESS STEEL	1
12 13 14	CAP SCREW	CARBON STEEL	1, 4, 1
15	VENT VALVE	STAINLESS STEEL	1
16	PIN	CARBON STEEL	1
17	HANDLE	DUCTILE IRON/CARBON STEEL	1
18	CAP SCREW	CARBON STEEL	1
19▲ 20▲ 21▲	O-RING	VITON	2▲, 4▲, 2▲
22▲	SEAL	VITON	4▲
23▲	SEAT	TEFLON	4▲
24	BALL	STAINLESS STEEL	2
25 26	STEM	STAINLESS STEEL	1, 1

(▲ – SPARES)





VIEW A–A



CARTRIDGE

NOTES:
1. INLET/OUTLET CONNECTIONS PER ANSI STANDARDS.
2. MAX. WORKING PRESSURE: 200 PSI @ 150° F (13.8 BAR @ 65.5°C)
3. BUSHINGS USED FOR 3/4" & 1-1/4" CONNECTIONS.

CERTIFIED FOR: --

P.O. NO.: --

REG. NO.: --

QUOTE NO.: --

TAG NO.: --

EATON FILTRATION, LLC

900 FAIRMOUNT AVENUE, ELIZABETH, NEW JERSEY 07207

NAME MODEL 53 "BTX" – DUPLEX STRAINER
ANSI CLASS 150 RF FLANGE & NPT
SIZES 3/4" THROUGH 4" STAINLESS STEEL

DRAWN	VA	DATE	12/16/99	CERT.	WB	DATE	12/16/99

SIZE	DWG NO	REV
A	SD053084	H

ELECTRONIC FILE NAME: SD053084.DWG

REF. ECR	D507	DATE	11/1/05

Read all the following information and instructions prior to installing and operating the equipment. Failure to comply with these instructions could result in bodily injury or property damage.

TABLE OF CONTENTS

INTRODUCTION

The Eaton Model 53BTX duplex strainer easily installs in pipelines to remove sediment and debris from fluids. Fluid flows uninterrupted while the basket is removed for cleaning. These strainers are designed for pressure or suction applications.

Straining on the Model 53BTX is accomplished by directing the fluid through sized openings in the basket. Once sediment and debris is collected in the basket, the fluid flow is directed by manually turning the handle over to the other basket for continuous operation. At this time the debris filled basket can be removed for cleaning.

For additional information regarding Model 53BTX Duplex Strainers visit our website at **www.eaton.com/filtration**

RECEIVING, HANDLING, AND INSPECTION

1. Unpack the strainer and inspect for damage occurring during transit. Report damage to the carrier. If the strainer is not installed immediately, see "**Storage"** instructions.

2. Remove any preservatives with solvent-dampened cloths. Exercise care when using solvent and follow solvent manufacturer's instructions.

3. Verify that the rating of the strainer is greater than or equal to the maximum pressure and temperature of the installation.

4. Open each basket well cover by turning the eye nut 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.

5. Remove all flange or nozzle protectors. Check the inside of the body for any foreign or loose material that could be carried downstream 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.

6. The cover to basket handle contact holds the baskets in place. If the basket handle is not in contact with the cover, bend the handle to a higher position to insure greater compressions when cover is seated.

STORAGE

Replace protective wrap, flange protectors etc. that may have been removed during receiving, handling and inspection. Store the strainer in a clean, dry environment.

INSTALLATION

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

INSTALLATION (CONTINUED)

1. Remove protective wraps, caps, plugs etc. before installing the strainer. Be sure to inspect cover gasket or O-ring for possible damage and replace as required. Position the strainer in the pipeline 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.

2. Be sure sufficient clearance is provided for easy opening of the cover and removal of the basket. Refer to the Sales Drawing for removal clearances. Support the strainer to a firm foundation by using the footpads. Refer to sales drawing for footpad layout.

3. Connect the strainer to the pipeline. 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.

4. On threaded strainers with other line connections, use standard piping practice when installing the strainer.

CAUTION: Duplex strainers are not designed to be anchor supports in the piping line. Be sure to properly support 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.

INSTALLATION (CONTINUED)

Eaton recommends that basket well drain plugs be removed and pressure equalizer valves with a drain valve be installed (standard on 4" size) see Figure 1.

Figure 1

Eaton also recommends replacing each cover plug with a vent valve and piping to a safe area. See Figure 2.

Figure 2

Pressure gauges near the strainer inlet and 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: To protect the operator during draining and venting, the fluid must be piped to a safe area. This requirement is for all fluids and water with temperatures above 120° F. The operator should wear appropriate protective equipment (goggles, gloves, vests, clothing etc.) consistent with the process fluid for strainer operation and servicing.

START UP

1. Open cover vent valves and cartridge vent. Close pressure equalizer valves and drain valve. Rotate the handle 90º clockwise, so that the handle is over the strainer inlet.

2. **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.

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

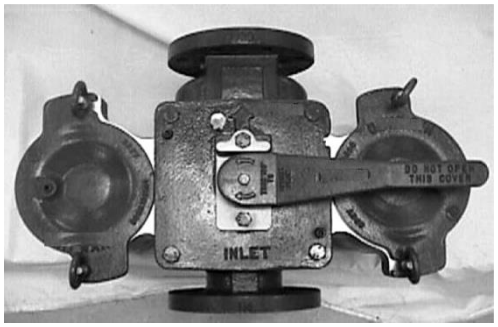


Figure 3

OPERATION

The strainer handle's position indicates which basket well is in operation. 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.

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

2. To service the basket well, 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.

3. 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.

4. 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

1. Place the cleaned or 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**.

2. 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

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

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

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

RECOMMENDED SPARE PARTS

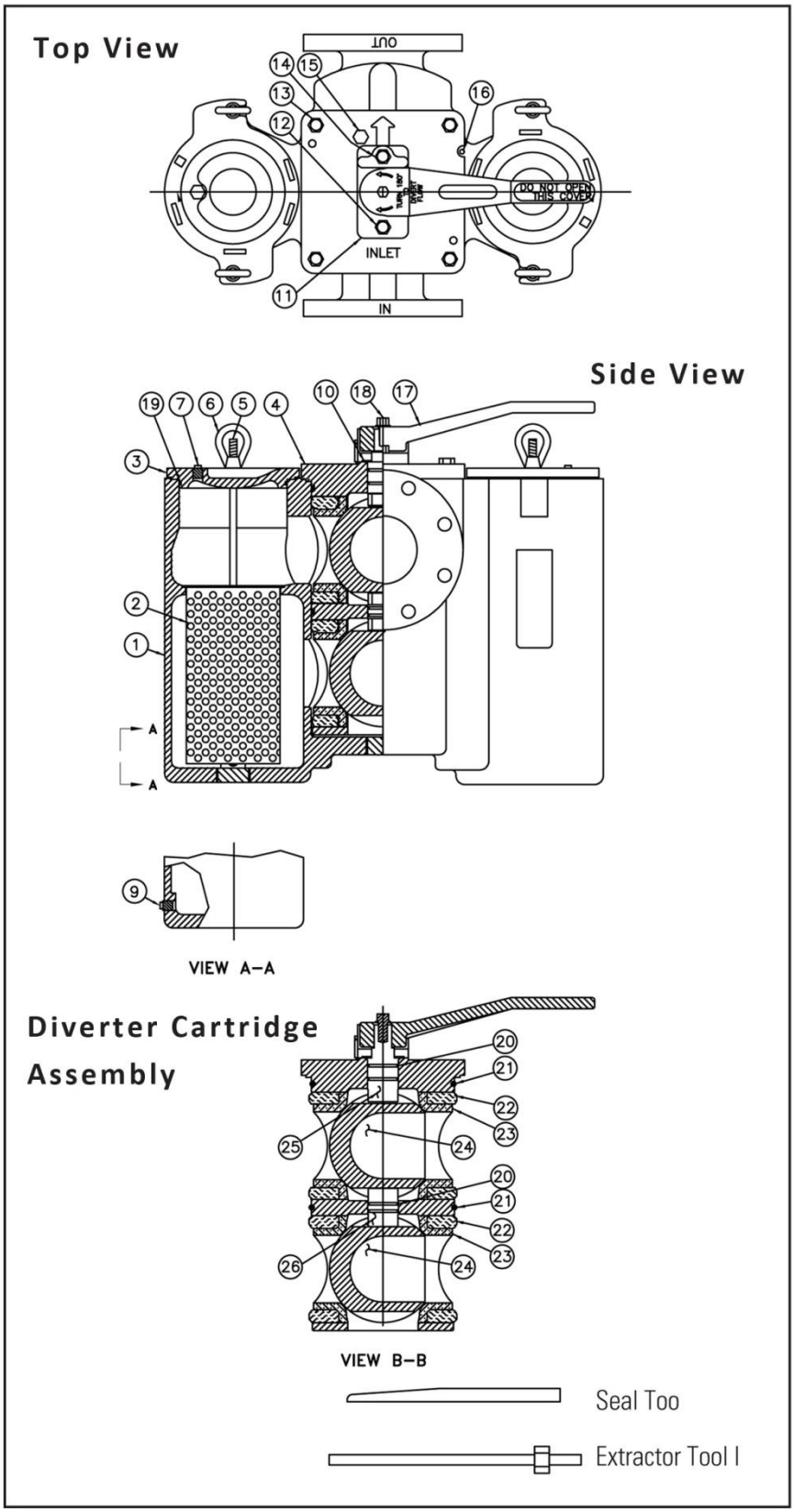
2	Strainer Baskets
2	Cover O-rings
4	Stem O-rings **
2	Cartridge O-rings**
4	Seals**
4	Seats **

** Only supplied in a "#53 sealing kit"

When ordering spare parts, be sure to specify all nameplate data as well as description and quantity of parts.

Always use genuine Eaton replacement parts for guaranteed fit and performance.

Visit our web site, filtration.eaton.com for information about the different types of Eaton Duplex Basket Strainers.



PARTS LIST FOR EATON MODEL 53BTX

Item Description

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

* Recommended Spare Parts List

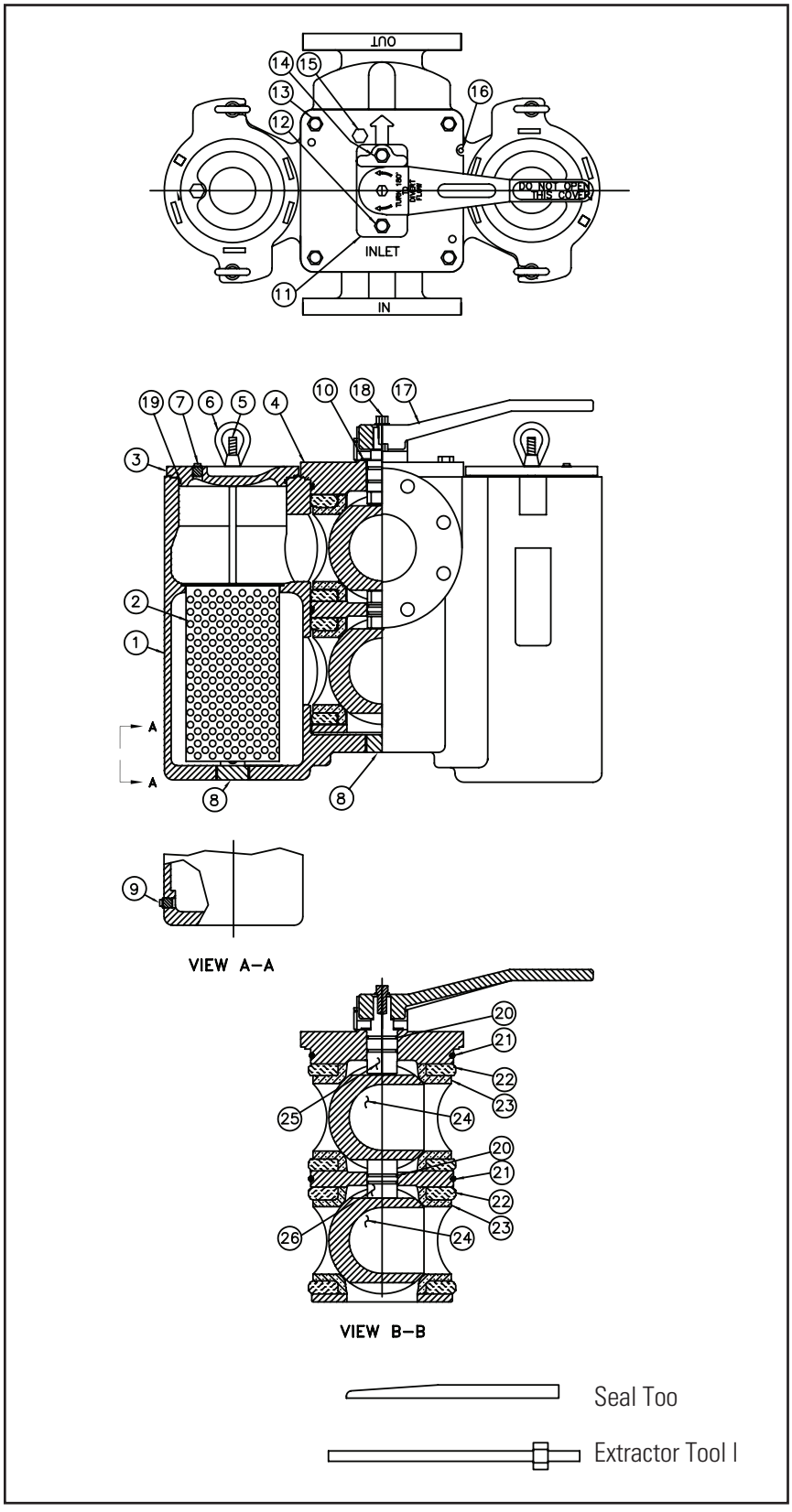
Item	Description
2	Strainer Basket (2)
19	O-Ring, Cover (2)
20**	O-Ring, Stem (4)
21**	O-Ring, Cartridge (2)
22**	Seal (4)
23**	Seat (4)

** Only supplied in a "#53 sealing kit"

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."

Read all the following information and instructions prior to installing & operating the Strainer. Failure to comply with these instructions could result in bodily injury or property damage.



Parts List for Eaton Model 53 BTX

Item	Description
1.	Duplex Strainer Body
2.	Strainer Basket (2) *
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.	O-Ring, Cover (2) *
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.	O-Ring, Stem (4) *
21.	O-Ring, Cartridge (2) *
22.	Seal (4) *
23.	Seat (4) *
24.	Ball (2)
25.	Stem, Top
26.	Stem, Middle

* Recommended Spare Parts List

Item	Description
2	Strainer Basket (2)
10	O-Ring, Cover (2)
20**	O-Ring, Cover (4)
21**	O-Ring, Cartridge (2)
22**	Seal (4)
23**	Seat (4)

** Only supplied in a "#53 Sealing Kit"

CARTRIDGE MAINTENANCE

IMPORTANT

For 2", 2½", 3" & 4" Strainers, it is advisable to support the cartridge assembly by external means (hoist, slings, etc.) during cartridge maintenance.

For ¾", 1", 1-¼" & 1-½" Strainers, use your own discretion to support the cartridge assembly during cartridge maintenance.

For Tools and Items, refer to Diagram & Parts List, pg. 1

CARTRIDGE REMOVAL AND INSPECTION

CAUTION

To remove cartridge assembly, first isolate the strainer (shut down your pumps, close valves, etc.). Slowly open vents, releasing strainer internal pressure and open **plugs, Item 9** at bottom of basket wells (or the drain valves if installed) to drain the fluid from the strainer.

1. Rotate the **handle, Item 17**, 90 degrees to **"Inlet"** on **cartridge, Item 4.**
2. Remove the four (4) **cap screws, Item 13** that secure the cartridge assembly to the strainer body.
3. Remove plastic caps from threaded holes "A" on top of cartridge. Thread the **Extractor Tool** (provided), into a threaded hole in the top of the cartridge. Use a socket or box wrench for turning. As the **Extractor Tool** turns, the cartridge rises from the strainer body.
4. As the **upper seals Item 22 and upper seats Item 23** clear the top of body, remove the upper seals and seats.

Top ball, Item 24 cannot be removed with the handle positioned over the inlet.
Do not remove the **Top Ball** at this time.

5. Continue turning **Extractor Tool** until the **lower seals, Item 22 and lower seats, Item 23** become visible as the cartridge assembly continues to rise.

Lower seals, seats and ball remain in place with the handle positioned over the inlet. Do not remove any of these components at this time.

6. Continue to raise the cartridge assembly until it has cleared the cartridge bore of the body.
7. Place the cartridge assembly on a clean surface. With cartridge upright & inlet towards assembler, remove **lower seats & lower seals** at this time.
8. Slowly rotate the **handle, Item 17**, 90 degrees counter clockwise until the handle makes contact with **stem retainer, Item 11. Pay special attention to both balls as they may shift and dislodge from the cartridge at this time.**
9. Remove the **lower and upper balls, Item 24.**
10. Remove the **handle screw, Item 18** (and washer if provided) and then remove **handle, Item 17**. Remove the two (2) **screws, Items 12 & 14** that hold down the **stem retainer, Item 11.** Remove the **stem retainer, Item 11 and stem retainer washer, Item 19.**
11. Reattach **handle, Item 17** to **top stem, Item 25** with **handle screw, Item 18** and washer if provided. Pull **top stem, Item 25** out from top of cartridge. Next remove **middle stem, Item 26** by pushing downward through cartridge central hole.
12. Inspect the two (2) **cartridge O-rings, Item 21,** the four (4) **top and middle stem O-rings, Item 20** and replace. Inspect **top and bottom balls, Item 24** for scoring. Replace as necessary.

IMPORTANT
Keep used seats separate from new seats to prevent reinstalling used seats by mistake

CARTRIDGE REASSEMBLY

Note: Make sure that all parts are free from dirt.

IMPORTANT
All O-rings and mating surfaces require lubrication. Use a light film of Process Compatible lubricant.

13. Lubricate **middle stem O-rings, Item 20** and inside of the cartridge middle stem bore.
14. Insert **middle stem, Item 26** from bottom of cartridge into the cartridge middle stem bore (chamfer provided).

Ensure that the **middle stem, Item 26** is equally spaced between upper and lower ball bores of the cartridge.

Ensure that both **middle stem O-rings, Item 20** are compressed into the cartridge middle stem bore.

Align flat tabs of the **middle stem, Item 26** to be inline to the large ports of the cartridge. This allows the flats of the **middle stem, Item 26** to be aligned with the slots of the **balls, Item 24**.

15. Lubricate the **top stem O-rings, Item 20** and inside of the cartridge top stem bore. Insert **top stem, Item 25** into top of cartridge. Push down until shoulder on tab end of **top stem, Item 25** is flush with inside of the large ports of the cartridge (cartridge ball bore).

16. Align flat tab on **top stem, Item 25** to be in-line to the large ports of the cartridge. **Top stem** tabs and **middle stem** tabs are to be in the same direction. Remove handle from **top stem**.

17. Place **stem retainer washer, Item 19**, then **stem retainer, Item 11** over **top stem, Item 25**. Centralize the hole of the **stem retainer, Item 11** around the **top stem, Item 25**. The two (2) small locating posts under **stem retainer** point towards the inlet on the cartridge. Insert and tighten the two (2) **screws, Items 12 & 14**.

18. Attach **handle, Item 17** to **top stem, Item 25** using **screw, Item 18** (and washer if provided). Move handle counter-clockwise until contact is made with the stem retainer.

19. Lay cartridge down on table with top of cartridge away from assembler and inlet facing up and the **handle, Item 17** pointing to your right.

20. Insert **upper ball, Item 24** keeping closed side of ball opposite the **handle, Item 17** (see View "B-B"). Assemble two (2) sets of **seals Item 22** and **seats, Item 23**. Match the recess groove in the **seat** to raised channel in the **seal.** Slide the **seat and seal** assemblies into the cartridge around the **upper ball, Item 24** keeping the recess groove in the **seat** and the raised channel in the **seal** to top of cartridge. **Wrap securely about the center with wire tie provided.**

21. Insert **lower ball, Item 24** keeping closed side of ball opposite the **handle, Item 17** (see View B-B). Assemble two (2) sets of **seals Item 22 and seats Item 23.** Match the recess groove in the **seat** to raised rib on the **seal**. Slide the **seat and seal** assemblies into the cartridge around the **lower ball, Item 24** keeping the recess groove in the **seat** and the raised channel in the **seal** to top of cartridge. **Wrap securely about the center with wire tie provided.**

22. Stand the cartridge up with top up and inlet facing assembler. Check for alignment.

IMPORTANT
Inside diameters of balls are to be aligned with inside diameter of seats.

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23. Lubricate the outer face of each of the **seals**, cartridge **O-rings** and inside of cartridge bore in the body with a light film of Process Compatible lubricant.

INSERTING CARTRIDGE

When inserting the cartridge into the strainer body:

Sizes ¾" through 1": Make sure that the flow arrow on the cartridge is pointing 45 degrees to either side of the outlet on the body.

Sizes 1-¼" through 4": Make sure that the word "INLET" on the top of the cartridge is directly above the inlet of the body.

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24. Lift cartridge and place inside the cartridge bore of the body. **Carefully start (or lead) the lower seals, Item 22 into the cartridge bore of the body.** Remove wire tie around the lower seals when **lower seals, Item 22** have been lowered halfway into cartridge bore of the body.

Sizes 1-¼" through 4": Make sure that the lower **seals, Item 22** smoothly pass through all of the internal openings (or ports). If the lower **seals** start to extrude into ports, gently tap bottom of the **seals** with the **Seal Tool** (provided). Thus greatly assisting the leading edges of the **lower seals** into cartridge bore of the body

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25. Push cartridge down until half of the **top seals, Item 22** are in the cartridge bore of the body. Use the **Seal Tool** (provided) as required. Follow same instructions for the **upper seals** as described in #24 above for the **lower seals**.

26. **Remove wire tie around the top seals at this time**.

27. **Sizes ¾" through 1"**: Push cartridge down until just above roll pin in body. Turn cartridge 45 degrees, so that the flow arrow (cast on the top of the cartridge) is aligned with the outlet of the strainer. Insert the four (4) **cap screws, Item 13** and turn until cartridge is all the way into body.

IMPORTANT
Verify that the top & lower seals have not extruded into the ports. If seals have extruded, gently tap bottom of the seals with the Seal Tool until seals are past the ports. If not, repeat "Inserting Cartridge " instructions.

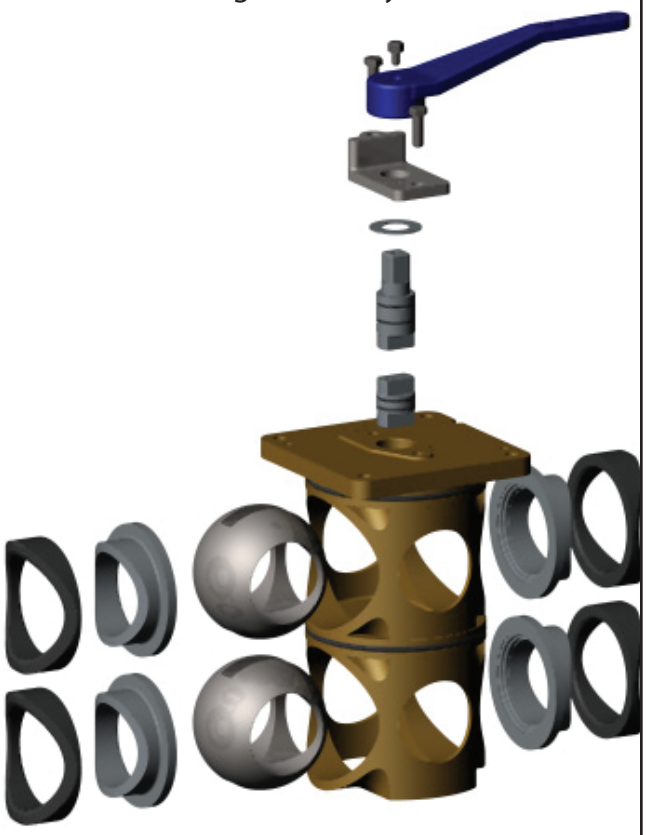
28. Sizes 1-¼" through 4" If cartridge does not lower sufficiently to tighten the four (4) cap screws, Item 13, you will need to run a washer and nut up the Extractor Tool. Insert the Extractor Tool through the bolt hole in cartridge and into screw threads in strainer body. With washer between nut and cartridge, tighten the nut that lowers the cartridge into the body a sufficient distance for the four (4) cap screws, Item 13 to be tightened.

IMPORTANT
Verify that the top & lower seals have not extruded into the ports. If seals have extruded, gently tap bottom of the seals with the Seal Tool until seals are past the ports. If not, repeat "Inserting Cartridge " instructions.

29. Tighten the four (4) cap screws, Item 13, until the cartridge is completely in the strainer body.

For any questions or further assistance,
please call Eaton Technical Support

Cartridge Assembly



CERTIFICATE NUMBER
15-HS1385403-PDA

DATE
23 Jul 2015

ABS TECHNICAL OFFICE
Houston SED Machinery - Piping
& Electrical Sys.

CERTIFICATE OF DESIGN ASSESSMENT

This is to certify that a representative of this Bureau did, at the request of

EATON

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product: **Strainer**

Model: **Model 53**

This Product Design Assessment (PDA) Certificate 15-HS1385403-PDA, dated 23/Jul/2015 remains valid until 22/Jul/2020 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA.

Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

AMERICAN BUREAU OF SHIPPING

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Tier: 2 - PDA Issued

Product: **Strainer**

Model: **Model 53**

Intended Service:
Marine and Offshore Applications - Fuel oil, lube oil, fresh water and sea water systems for marine vessels and offshore installations

Description:
Duplex basket strainers with flanged or threaded connections. The strainers covered by this certificate are available in the following materials: Carbon Steel (ASTM WCB), Stainless Steel (ASTM A351 CF8M) and Bronze (ASTM B148 C95400).

Rating:
Design Pressure: 200 psi (13.8 bar)
Design Temperature: 150degF (65.5degC)

Carbon Steel (ASTM A216 WCB); 150 # Flanged (ASME B16.5); Sizes: 1", 1.5", 2", 2.5", 3", 4";
Carbon Steel (ASTM A216 WCB); NPT (ASME B1.20.1); Sizes: 3/4", 1", 1.25", 1.5", 2", 2.5";

Stainless Steel (ASTM A351 CF8M); 150 # Flanged (ASME B16.5); Sizes: 1", 1.5", 2", 2.5", 3", 4";
Stainless Steel (ASTM A351 CF8M); NPT (ASME B1.20.1); Sizes: 3/4", 1", 1.25", 1.5", 2";

Bronze (ASTM B148 C95400); 150 # Flanged (ASME B16.24); Sizes: 1", 1.5", 2", 2.5", 3", 4";
Bronze (ASTM B148 C95400); NPT (ASME B1.20.1); Sizes: 3/4", 1", 1.25", 1.5", 2", 2.5";

Service Restriction:
1) Unit Certification is not required for this product. If the manufacturer or purchaser's request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

2) Strainers for piping systems containing flammable fluids are to be constructed of steel or other materials approved by ABS as per 4-6-2/3.5 of the SVR.

Comments:
1) The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

2) The strainers' body is to bear permanent identification, such as manufacturer's name or trademark, standard of compliance, material identity, pressure rating, etc., as required by the standard of compliance (ASTM F1199-88 or ASTM F1200-88, as applicable), as per 4-6-1/7.1.4 & Table 2 of the SVR.

3) The installation of the strainers is to comply with the applicable requirements in 4-6-5/3.3.4, 4-6-5/3.5.4, 4-6-5/5.3.6, 4-6-5/5.5.2 and 4-6-5/7.7.2 of the SVR, as applicable.

Notes/Drawing/Documentation:
Drawing No. 69213-2009-AQ-USA-ANAB, ISO 9001:2008, Revision: A, Pages: 1
Drawing No. ASTME F1199 10.16.2014, ASTM letter of conformance, Revision: A, Pages: 1
Drawing No. CALC4032, ST053010BF11 Calculation, Revision: B, Pages: 1
Drawing No. CALC4033, ST053015BF11 Calculation, Revision: A, Pages: 1
Drawing No. CALC4034, ST053020BF11 Calculation, Revision: A, Pages: 1

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Tier: 2 - PDA Issued

Drawing No. CALC4035, ST053025BF11 Calculation, Revision: A, Pages: 1
Drawing No. CALC4036, ST053030BF11 Calculation, Revision: B, Pages: 1
Drawing No. CALC4037, ST053040BF11 Calculation, Revision: B, Pages: 1
Drawing No. SD053082, model 53 "BTX"- duplex strainer ANSI Class 150 FF Flange & NPT sizes 3/4" thru 4" bronze, Revision: L, Pages: 1
Drawing No. SD053083, model 53 "BTX"- duplex strainer ANSI Class 150 RF Flange & NPT sizes 3/4" thru 4" Carbon Steel, Revision: K, Pages: 1
Drawing No. SD053084, model 53 "BTX"- duplex strainer ANSI Class 150 RF Flange & NPT sizes 3/4" thru 4" Stainless Steel, Revision: J, Pages: 1
Drawing No. ST053007BT11, 3/4" #53 BTX NPT BRZ, Revision: A, Pages: 1
Drawing No. ST053007BT22, 3/4" #53 BTX NPT SS, Revision: A, Pages: 1
Drawing No. ST053007BT33, 3/4" #53 BTX NPT CS, Revision: A, Pages: 1
Drawing No. ST053010BF11, 1"#53 BTX 150#FF FLG'D BRZ, Revision: A, Pages: 1
Drawing No. ST053010BR22, 1"#53 BTX 150#FF FLG'D SS, Revision: A, Pages: 1
Drawing No. ST053010BR33, 1"#53 BTX 150#FF FLG'D CS, Revision: A, Pages: 1
Drawing No. ST053010BT11, 1"#53 BTX NPT BRZ, Revision: A, Pages: 1
Drawing No. ST053010BT22, 1"#53 BTX NPT SS, Revision: A, Pages: 1
Drawing No. ST053010BT33, 1"#53 BTX NPT CS, Revision: A, Pages: 1
Drawing No. ST053012BT11, 1.25"#53 BTX NPT BRZ, Revision: A, Pages: 1
Drawing No. ST053012BT22, 1.25"#53 BTX NPT SS, Revision: A, Pages: 1
Drawing No. ST053012BT33, 1.25"#53 BTX NPT CS, Revision: A, Pages: 1
Drawing No. ST053015BF11, 1.5" #53 BTX 150#FF BRZ, Revision: A, Pages: 1
Drawing No. ST053015BR22, 1.5" #53 BTX 150#FF CS, Revision: A, Pages: 1
Drawing No. ST053015BR33, 1.5" #53 BTX 150#FF CS, Revision: A, Pages: 1
Drawing No. ST053015BT11, 1.5" #53 BTX NPT BRZ, Revision: A, Pages: 1
Drawing No. ST053015BT22, 1.5" #53 BTX NPT SS, Revision: A, Pages: 1
Drawing No. ST053015BT33, 1.5" #53 BTX NPT CS, Revision: A, Pages: 1
Drawing No. ST053020BF11, 2"#53 BTX 150#FF FLG'D BRZ, Revision: A, Pages: 1
Drawing No. ST053020BR22, 2"#53 BTX 150#FF FLG'D SS, Revision: A, Pages: 1
Drawing No. ST053020BR33, 2"#53 BTX 150#FF FLG'D CS, Revision: A, Pages: 1
Drawing No. ST053020BT11, 2"#53 BTX NPT BRZ, Revision: A, Pages: 1
Drawing No. ST053020BT22, 2"#53 BTX NPT SS, Revision: A, Pages: 1
Drawing No. ST053020BT33, 2"#53 BTX NPT CS, Revision: A, Pages: 1
Drawing No. ST053025BF11, 2.5" #53 BTX 150#FF FLG'D BRZ, Revision: A, Pages: 1
Drawing No. ST053025BR22, 2.5" #53 BTX 150#FF FLG'D SS, Revision: A, Pages: 1
Drawing No. ST053025BR33, 2.5" #53 BTX 150#FF FLG'D CS, Revision: A, Pages: 1
Drawing No. ST053025BT11, 2.5"#53 BTX THR'D NPT BRZ, Revision: A, Pages: 1
Drawing No. ST053025BT33, 2.5"#53 BTX THR'D NPT CS, Revision: A, Pages: 1
Drawing No. ST053030BF11, 3"#53 BTX 150#FF FLG'D BRZ, Revision: A, Pages: 1
Drawing No. ST053030BR22, 3"#53 BTX 150#FF FLG'D SS, Revision: A, Pages: 1
Drawing No. ST053030BR33, 3"#53 BTX 150#FF FLG'D CS, Revision: A, Pages: 1
Drawing No. ST053040BF11, 4"#53 BTX 150#FF FLG'D BRZ, Revision: A, Pages: 1
Drawing No. ST053040BR22, 4"#53 BTX 150#FF FLG'D SS, Revision: A, Pages: 1
Drawing No. ST053040BR33, 4"#53 BTX 150#FF FLG'D CS, Revision: A, Pages: 1
Drawing No. materials, material designations, Revision: A, Pages: 1

Terms of Validity:
This Product Design Assessment (PDA) Certificate 15-HS1385403-PDA, dated 23/Jul/2015 remains valid until 22/Jul/2020 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

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or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

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STANDARDS

ABS Rules:
Rules for Conditions of Classification, Part 1 – 2015 Steel Vessels Rules 1-1-4/7.7, 1-1-A3, 1-1-A4, which covers the following:
Steel Vessel Rules (2015) 4-1-1/Table 6, 4-6-1/7 and 4-6-2/3.
ABS Rules for Conditions of Classification, Part 1 – 2015 Offshore Units and Structures 1-1-4/9.7, 1-1-A2, 1-1-A3, which covers the following:
Mobile Offshore Drilling Units (2015) 4-2-2/1.3, 4-2-2/3, 6-1-6/5 and 6-1-6/Table 1.

National:
ASTM F1199 - 80 (Reapproved 2010);
2013 ASME BPVC, Section VIII, Division 1;
ASME B16.5-2013;
ASME B16.24-2011;
ASME B1.20.1-2013;

International:
NA

Government:
NA

EUMED:
NA

OTHERS:
NA