

Eaton Gas/Liquid Separators

# Smart Technology for Cleaner, Drier Air, Gas, and Steam



Powering Business Worldwide

# Solutions for Every Application

## Contents



**Type T Gas/Liquid Separators** Cast iron, fabricated carbon, or stainless steel construction with flanged, threaded, or socket weld construction. Many available options for application versatility.

**Type TS Vertical Gas/Liquid Separators** Designed specifically for high liquid loading applications. Maintains high separation efficiency over a wide flow range.



**Type 30L In-line Gas/Liquid Separators** For downflow or horizontal installations. Ten different piping configurations available for application versatility.



**Types 60-I & 70-I Internal Type Gas/Liquid Separators** Internal separators designed to be installed inside of receivers, steam drums, or other vessels. Carbon or stainless steel construction for both upflow and downflow applications.



**Series CLC Coalescers/Separators** Two-stage separators remove particles down to 4 microns resulting in more than twice the efficiency of ordinary separators.



**Type 10-R Two-Stage Gas/Liquid Separators** For applications with "liquid slugs" and heavy liquid loading. Can be used as a flash or surge tank.



**Type 31L-ST Compact Gas/Liquid Separators** Compact, low profile design is easily installed and supported in-line. Cast iron construction in sizes up to 4" with threaded or flanged connections.



**Type DTL Dry Type Gas/Liquid Separators** For applications with higher than normal solids loading. A special cone shaped sump promotes solids collection at the drain port.



**Type 40 Exhaust Heads** Exhaust heads designed to remove water and oil from exhaust gases. Reduces maintenance on roofs and surrounding structures. Cast iron, fabricated carbon, or stainless steel construction in sizes to 48"



**Float Drain Traps** The perfect separator trap. Iron, carbon steel, or stainless steel construction with stainless steel internal parts for long life. Heater available for low temperature applications.



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## Steam

Eaton Gas/Liquid Separators are often installed ahead of steam turbines to protect the turbine blades from the erosive action of wet steam, pipe scale, and other damage-causing entrained solids. They are also installed in steam distribution lines to assure clean, dry steam enters heat exchangers, pressure reducing valves, temperature regulators, meters, and other process equipment.

## Compressed Air

Compressed air lines have Eaton Gas/Liquid Separators installed following intercoolers and aftercoolers to remove entrained moisture that would otherwise cause damage in successive stages of compression or to subsequent processes. They are used for entrainment removal in primary air lines leading to air-using equipment such as air chucks, air nozzles, and paint spray equipment. They are particularly suitable for long runs of pipe and where wide temperature differentials are found. The units are highly efficient for moisture separation of refrigerated air dryer packages.

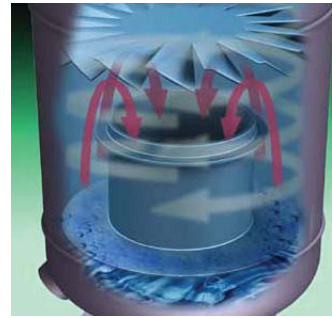
## Compressed Gas

Eaton Gas/Liquid Separators are used in conjunction with intercooler and aftercooler equipment installed on gas compressors. They are very effective in the removal of oil, tar, water, and other unwanted entrainment.

## The Exclusive Eaton Vortex Containment Plate (VCP)

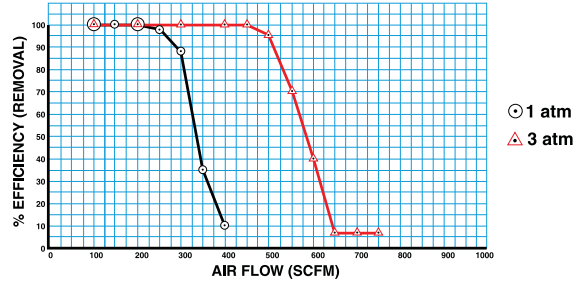
In the past, separators have often operated at less than peak efficiency due to the re-entrainment of separated liquid at normal or high flow rates. The Eaton VCP solves this problem. The VCP utilizes carefully placed rings that shield the separated liquid from the vortex action inside the separator and direct it to the separator drain. The turbulence of the swirling gas or air flow is sheltered from the liquid and cannot be re-entrained after separation. The VCP features extremely heavy duty construction, unlike the delicate baffles used by other systems. And the Eaton VCP is completely maintenance free.

The charts on the right graphically depict the high efficiency of Eaton's exclusive Vortex Containment Plate. They show the percentage efficiency versus air flow when the separator is operated at 1 and 3 atm with a water input rate of 150 pounds per hour. Two typical 3" gas/liquid separators that do not contain the Eaton Vortex Containment Plate are compared to a Type 31L Eaton Separator. The performance standard was the removal of all liquid and solid entrainment where particle sizes exceeded 10 microns.

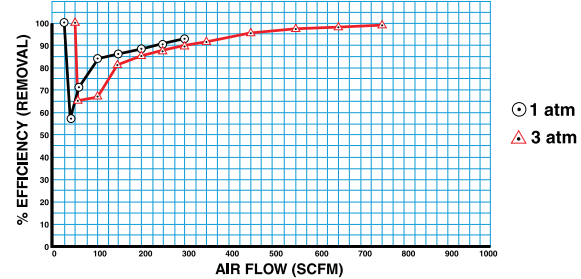


Vortex Containment Plate (VCP) prevents re-entrainment of separated liquid.

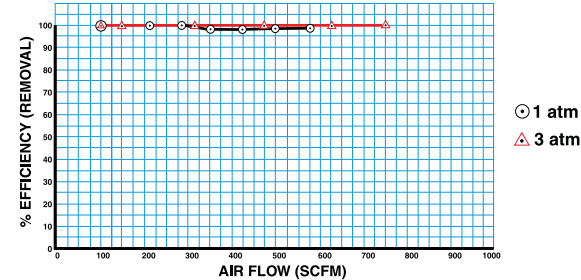
Separator A without the Vortex Containment Plate



Separator B without the Vortex Containment Plate



Type 31-L Separator with the Vortex Containment Plate



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# Type T Cast Construction



Type T Cast Iron Separator

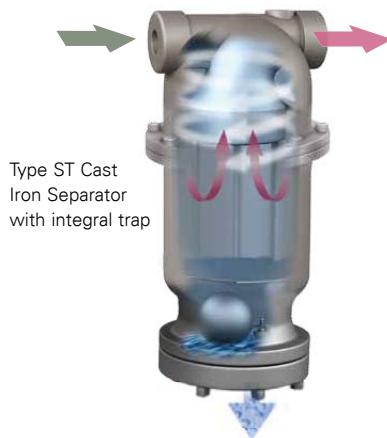
- Sizes 1" to 5"
- Threaded, Flanged, or Socket Weld
- Cast Iron, Cast Carbon Steel, or Cast Stainless Steel

## FEATURES

- Cast Construction
- High Efficiency Over Wide Flow Range
- No Required Maintenance
- Economical Choice for Most Applications
- Removes 99% of Liquid and Solid Entrainment Particles Larger Than 10 Microns
- Gas, Steam, or Air Applications

## OPTIONS

- Integral Trap
- Trap Heating Element
- ASME UM or U Code Stamp (CS and SS Models Only)
- Water Gauge Tap
- Thermometer Tap
- Larger Drain Size



Type ST Cast Iron Separator with integral trap

### High Efficiency – No Maintenance

The Eaton Type T Gas/Liquid Separator automatically removes 99% of all liquid and solid entrainment particles 10 microns in size or larger from air, gas, and steam processes. And it does so with no moving parts to wear out and no required maintenance. The Type T, with its cost-effective design, is the separator of choice for most applications that require clean, dry air, gas or steam.

### Exclusive Design

Moisture-laden gas enters the inlet of the separator where it is deflected in a centrifugal downward motion. The entrained solids and moisture droplets are separated out by a reduction in velocity. Separated liquid and solids fall into a reservoir where the exclusive Vortex Containment Plate (VCP) ensures that they cannot be re-entrained. The clean, dry flow is then directed to the outlet by the VCP. This eliminates the need for expensive, delicate baffles used in ordinary separators.

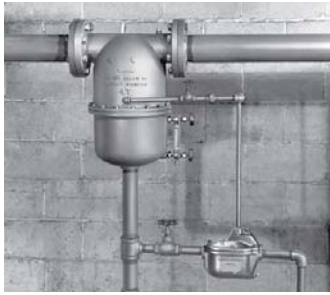
### Application Flexibility

The basic Type T Gas/Liquid Separator's straightforward, time-proven design fits most applications without options. For more specialized applications, the Type T is available as the Type ST with an integral trap as part of its design. The trap mechanism is a foolproof design which automatically ejects the condensate, without loss of line pressure, when it reaches a predetermined level. The Type ST is compact, easily installed, and can be supported by the line. Removal of the bottom flange releases the trap mechanism for inspection. The internal trap components are rust-proof stainless steel and include a nonmagnetic 18-8 stainless steel valve and seat. For applications below freezing, the Type ST Separator can be ordered as the Type STH that includes a heater for the trap. The heater is rated at 50W and runs with 110 volt service. The self-limiting heating element will keep fluid above freezing but does not add to the line temperature. The heater can be easily removed for inspection.



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# Type T Cast Gas/Liquid Separators

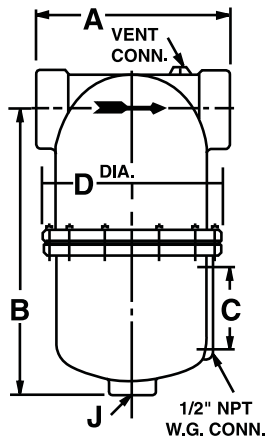


Typical Installation

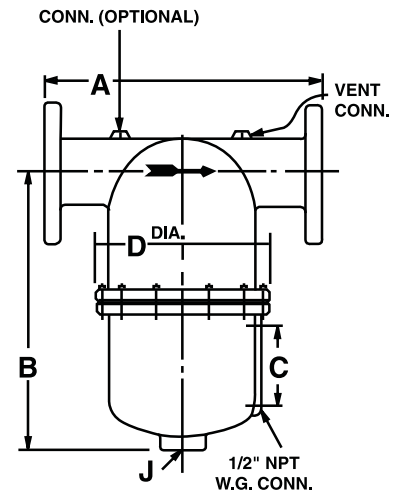
## Selection Table

Pipe Size (in)	Material	Connection	Rating
3/4 to 3	Cast Iron	Threaded	250 psi @ 450°F
2 to 4	Cast Iron	Flanged 125# FF	150 psi @ 353°F 125 psi @ 450°F
1 to 2	Cast Carbon Steel	Threaded or Socket Weld	1000 psi @ 650°F
1 to 2	Cast Stainless Steel	Threaded or Socket Weld	500 psi @ 300°F
1 to 24	Fabricated CS or SS	Flanged 150# RF Flanged 300# RF	150 psi @ 450°F 500 psi @ 650°F

### TYPE T Cast Iron Threaded



### TYPE T Cast Iron Flanged



### Dimensions - Type T Threaded (Cast Iron) - (in/mm)

Pipe Size	A	B	C	D	J - NPT Drains Regular	Optional	NPT Vent	Weight (lb/kg)
3/4	5.50 / 40	9.19 / 233	-	5.75 / 146	3/4	-	1/4	22 / 10
1	6.00 / 152	9.00 / 229	-	6.75 / 171	1	1-1/4	1/4	25 / 11.4
1-1/4	6.00 / 152	9.13 / 232	-	7.00 / 178	1	1-1/4	1/4	28 / 12.7
1-1/2	7.25 / 184	11.69 / 297	-	8.13 / 207	1	1-1/2	1/4	44 / 20
2	8.13 / 206	13.69 / 348	-	8.50 / 216	1	2	1/4	47 / 21.3
2-1/2	12.00 / 305	15.94 / 405	3.50 / 89	11.38 / 289	1-1/4	2	1/4	89 / 40
3	11.00 / 281	15.94 / 405	3.50 / 89	11.38 / 289	1-1/4	2-1/2	1/4	107 / 48

### Dimensions - Type T Flanged (Cast Iron) - (in/mm)

Pipe Size	A	B	C	D	J - NPT Drains Regular	Optional	NPT Vent	Weight (lb/kg)
2	10.50 / 267	13.75 / 349	-	8.50 / 216	1	2	1/4	59 / 27
3	14.00 / 356	16.00 / 406	3.50 / 89	11.38 / 289	1-1/4	2-1/2	1/4	130 / 59
4	15.88 / 403	19.38 / 492	5.00 / 127	14.06 / 357	1-1/4	2-1/2	1/4	195 / 88.6
5	18.38 / 467	24.63 / 626	7.88 / 200	17 / 432	1-1/2		1/4	370 / 168

Note: Threaded ends, NPT, Material ASTM A-278. Flanged ends, 125 lb ANSI flat face and drilling, Material ASTM A-278

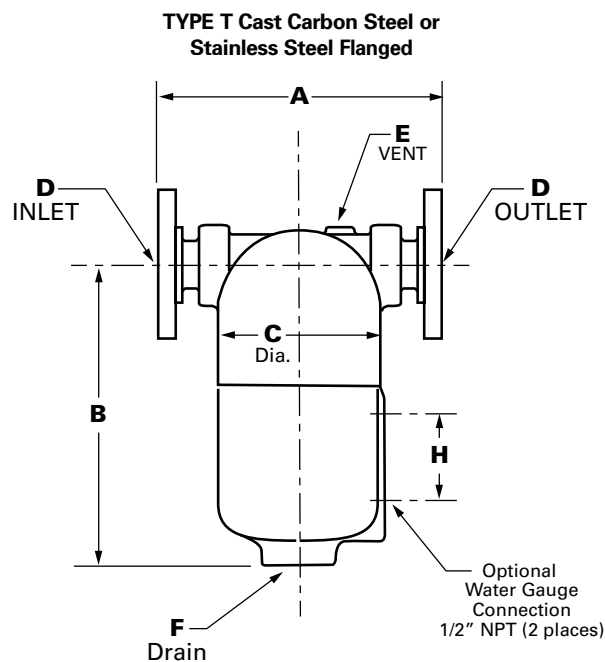
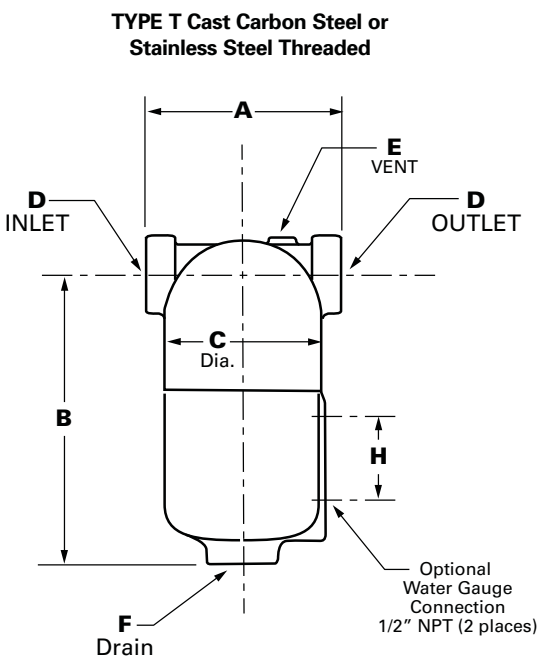
# Type T Cast Gas/Liquid Separators

## Cast Carbon Steel or Cast Stainless Steel Construction

Type T Gas/Liquid Separators are available in 1", 1-1/4", 1-1/2", and 2" sizes in cast carbon steel or cast stainless steel with standard configurations. Cast construction separators are readily available but not easy or cost effective to modify to conform to special application requirements. For these applications, see Fabricated Type T Separators which are made of carbon or stainless steel in sizes up to 24". Fabricated separators are not as heavy as cast ones, an important consideration in applications when weight is a concern.

## Capacities – Maximum Air Flow Rating in SCFM

Pipe Size	25 psig	50 psig	100 psig	150 psig	200 psig	250 psig
3/4	55	75	105	125	150	170
1	82	110	155	190	220	255
1-1/4	130	175	245	300	345	400
1-1/2	185	245	345	425	485	560
2	330	445	620	770	870	1000
2-1/2	500	680	945	1170	1350	1550
3	750	1000	1400	1750	1950	2300
4	1325	1775	2500	3075	3600	4000
5	2050	2750	3800	4750	5200	6000
Rated ΔP (psi)	0.88	0.99	1.19	1.40	1.60	1.85



### Dimensions: Type T Cast Threaded or Socket Weld - (in/mm)

Pipe Size	A	B	C	D	E	F	H	Weight (lb/kg)
1	6.38 / 161	10.50 / 267	5.56 / 141	1 / 25	1/4	1	4.75	25 / 11.4
1-1/4	6.38 / 161	10.50 / 267	5.56 / 141	1-1/4 / 32	1/4	1	4.75	28 / 12.7
1-1/2	7.63 / 194	12.50 / 317	6.63 / 168	1-1/2 / 40	1/4	1	4.75	44 / 20
2	7.63 / 194	12.50 / 317	6.63 / 168	2 / 50	1/4	1	4.75	47 / 21.3

Note: Threaded ends, NPT, Material ASTM A-278

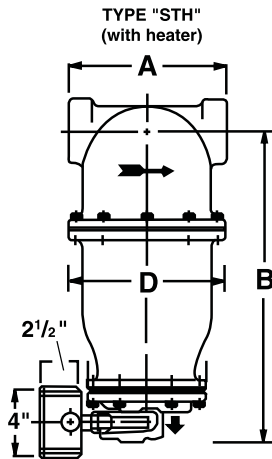
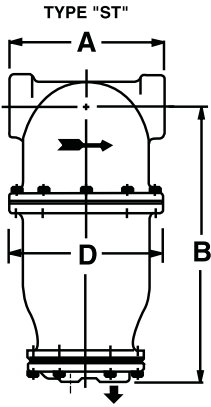
### Dimensions: Type T Cast Flanged - (in/mm)

Pipe Size	A	B	C	D	E	F	H	Weight (lb/kg)
1	10.50 / 267	10.50 / 267	5.56 / 141	1 / 25	1/4	1	4.75	29 / 13
1-1/4	10.50 / 267	10.50 / 267	5.56 / 141	1-1/4 / 32	1/4	1	4.75	30 / 13.6
1-1/2	11.50 / 292	12.50 / 317	6.63 / 168	1-1/2 / 40	1/4	1	4.75	53 / 24
2	11.50 / 292	12.50 / 317	6.63 / 168	2 / 50	1/4	1	4.75	57 / 25.8

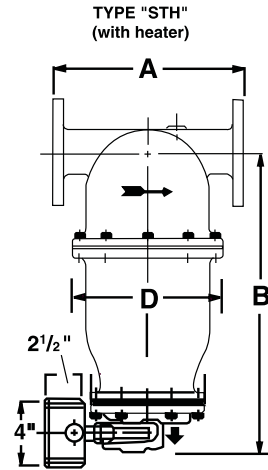
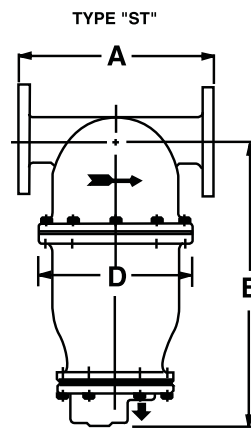
Note: Flanged ends, 125 lb ANSI flat face and drilling, Material ASTM A-278.

# Type T Cast Gas/Liquid Separators

**TYPE ST & STH Cast Iron Threaded**



**TYPE ST & STH Cast Iron Flanged**

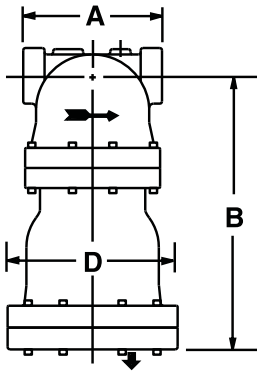


**Dimensions - Type ST & STH - Threaded Inlet & Outlet (in / mm)**

Pipe Size	A	B (ST)	D	Drain NPT	Vent NPT	Wt (lb/kg) ST	Wt (lb/kg) STH
3/4	5.5 / 40	11.69 / 297	6.75 / 171	3/4	1/4	31 / 14.1	31 / 14
1	6.0 / 152	10.25 / 260	6.75 / 171	3/4	1/4	39 / 17.7	41 / 18.7
1-1/4	6.0 / 152	12.25 / 311	7.00 / 178	3/4	1/4	47 / 21.3	50 / 22.3
1-1/2	7.25 / 184	14.06 / 357	8.13 / 207	3/4	1/4	53 / 24	53 / 24
2	8.13 / 206	14.94 / 380	8.50 / 216	3/4	1/4	58 / 26.3	58 / 26
2-1/2	12.00 / 305	20.44 / 520	11.38 / 289	3/4	1/4	109 / 29.5	109 / 50
3	11.00 / 280	22.44 / 570	11.38 / 289	3/4	1/4	105 / 47.7	108 / 48.7

Note: For steam service use hard valve seat only

**TYPE ST 3/4" Cast Iron Threaded**



**Dimensions - Type ST & STH - 125# Flanged Inlet & Outlet (in / mm)**

Pipe Size	A	B (ST)	D	Drain NPT	Vent NPT	Wt (lb/kg) ST	Wt (lb/kg) STH
2	10.50 / 267	15.31 / 389	8.50 / 216	3/4	1/4	51 / 23.2	54 / 24.2
3	14.00 / 356	20.44 / 519	11.38 / 289	3/4	1/4	100 / 45.5	103 / 46.5
4	15.88 / 403	23.50 / 597	14.06 / 357	3/4	1/4	225 / 102.3	228 / 103.3
5	18.38 / 467	31 / 787	17 / 432	3/4	1/4	390 / 177	393 / 178

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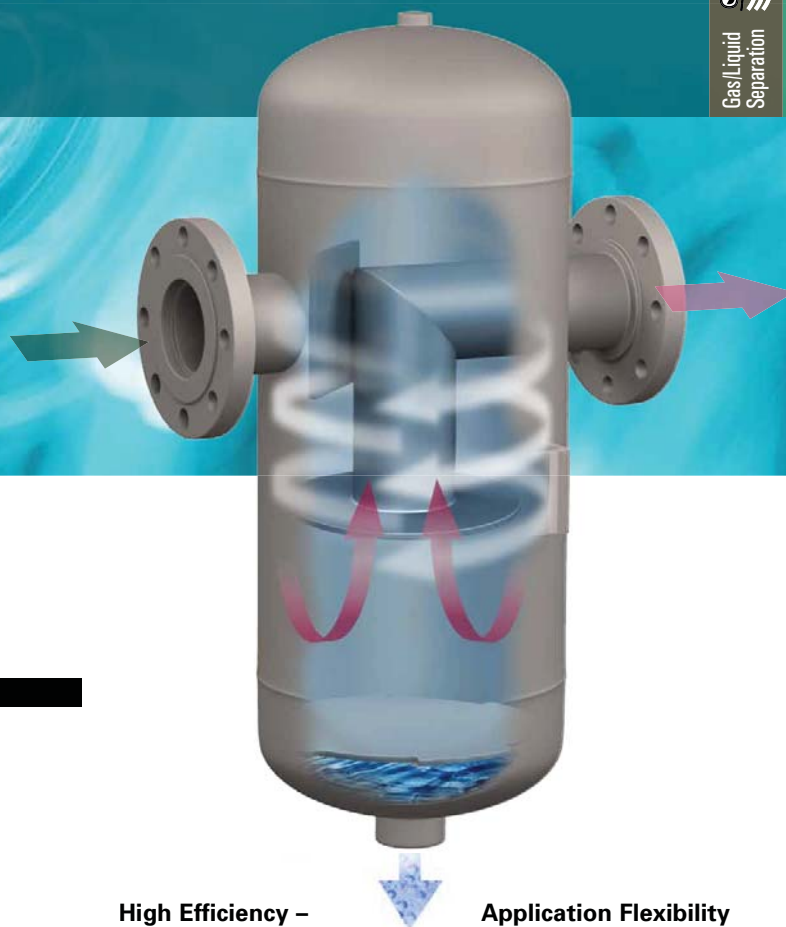


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# Type T Fabricated Construction



- Custom Sizes
- Carbon Steel or Stainless Steel

## FEATURES

- Fabricated Construction
- High Efficiency Over Wide Flow Range
- No Required Maintenance
- Economical Choice for Most Applications
- Removes 99% of Liquid and Solid Entrainment Particles Larger Than 10 Microns
- Gas, Steam, or Air Applications

## OPTIONS

- ASME UM or U Code Stamp
- Hundreds of Design Options to Conform to Application Requirements
- Support Legs



### High Efficiency – No Maintenance

The Eaton Type T Gas/Liquid Separator automatically removes 99% of all liquid and solid entrainment particles 10 microns in size or larger from air, gas, and steam processes. And it does so with no moving parts to wear out and with no required maintenance. The Type T, with its cost-effective design, is the separator of choice for most applications that require clean, dry air, gas or steam.

### Exclusive Design

Moisture-laden gas enters the inlet of the separator where it is deflected in a centrifugal downward motion. The entrained solids and moisture droplets are separated out by a reduction in velocity. Separated liquid and solids fall into a reservoir where the exclusive Eaton Vortex Containment Plate (VCP) ensures that they cannot be re-entrained. The clean, dry flow is then directed to the outlet by the VCP. This eliminates the need for expensive, delicate baffles used in ordinary separators.

### Application Flexibility

Fabricated separators are manufactured one at a time and are made to fit the exact requirements of unusual applications with unique size or piping connections. They are lighter in weight than a comparable size cast separator. There are no trade-offs with a fabricated separator. You get the perfect unit for your application. You never have to pay for more separator than you need, or settle for a separator that won't quite do the job you want it to.

### Fabricated Construction

Fabricated Type T Gas/Liquid Separators are available in sizes from 1" to 24" in carbon steel or stainless steel construction. Fabricated construction separators are built to order and can be easily manufactured to exactly meet the requirements of special applications or applications where weight is a concern.



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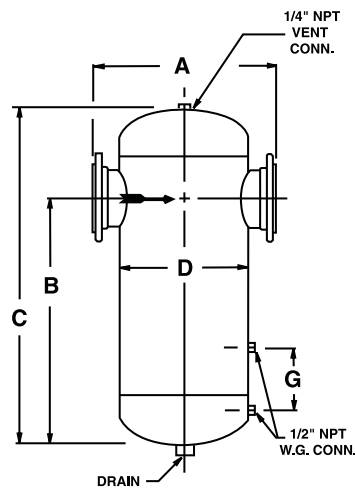
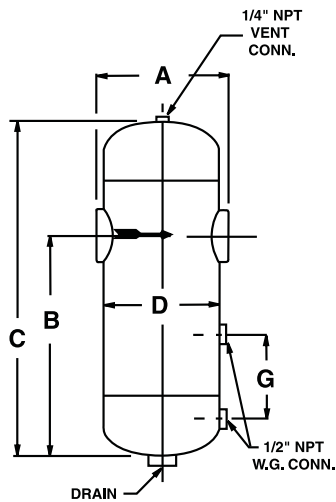


# Type T Fabricated Gas/Liquid Separators

Dimensions: Type T (Carbon Steel & Stainless Steel) - Threaded, Socket Weld & Flanged (in/mm)

Pipe Size	Threaded & Skt Weld A	Flanged 150 lb & 300 lb A	Flanged 600 lb A	B	Cast C	Fab C	D	G	NPT Drain Std	NPT Drain Opt'l	-----Weight (lb/kg)-----			
											Thd'd & Skt Weld 1000 psig @ 650 °F	Flanged 150 psig @ 450 °F	Flanged 500 psig @ 650 °F	Flanged 750 psig @ 650 °F
1	6.37 / 162	10.5 / 267	12 / 305	10.5 / 267	12 / 305	16 / 406	5.56 / 141	4.75 / 121	1	1-1/2	29 / 13	33 / 15	35 / 16	37 / 17
1-1/4	6.37 / 162	10.5 / 267	12 / 305	10.5 / 267	12 / 305	16 / 406	5.56 / 141	4.75 / 121	1	1-1/2	30 / 14	35 / 16	37 / 17	42 / 19
1-1/2	7.62 / 194	11.5 / 292	14 / 356	12.5 / 317	14 / 356	19 / 483	6.62 / 168	4.75 / 121	1	2	55 / 25	50 / 23	56 / 25	59 / 27
2	7.87 / 200	11.5 / 292	14 / 356	12.5 / 317	14 / 356	19 / 483	6.62 / 168	4.75 / 121	1	2	57 / 26	55 / 25	59 / 27	54 / 25
2-1/2	-	16 / 406	18 / 457	15 / 381	-	22 / 559	8.62 / 219	5.75 / 146	1	2	-	100 / 45	110 / 50	125 / 57
3	-	18 / 457	20 / 508	18 / 457	-	26 / 660	10.75 / 273	5.75 / 146	1-1/2	2-1/2	-	140 / 64	150 / 68	175 / 80
4	-	20 / 508	22 / 559	22 / 559	-	31 / 787	12.75 / 324	5.75 / 146	1-1/2	2-1/2	-	195 / 89	220 / 100	295 / 134
5	-	22 / 559	24 / 610	26 / 660	-	36 / 914	14 / 356	7.87 / 200	1-1/2	2-1/2	-	230 / 105	290 / 132	435 / 198
6	-	24 / 610	28 / 711	30 / 762	-	41 / 1041	16 / 406	7.87 / 200	1-1/2	2-1/2	-	350 / 159	380 / 173	715 / 325
8	-	28 / 711	32 / 813	37 / 940	-	50 / 1270	18 / 457	7.87 / 200	2	3	-	475 / 216	610 / 277	1070 / 486
10	-	34 / 864	38 / 965	55 / 1397	-	70 / 1778	24 / 610	7.87 / 200	2	3	-	780 / 355	1180 / 536	2065 / 939
12	-	38 / 965	42 / 1067	58 / 1473	-	75 / 1905	28 / 711	7.87 / 200	1-1/2	4*	-	940 / 427	1510 / 686	2750 / 1250
14	-	42 / 1067	46 / 1169	60 / 1524	-	79 / 2007	32 / 813	7.87 / 200	2-1/2	4*	-	1155 / 525	2205 / 1002	3400 / 1545
16	-	47 / 1194	51 / 1295	68 / 1727	-	89 / 2261	36 / 914	7.87 / 200	3	5*	-	1605 / 730	2785 / 1266	4750 / 2159
18	-	54 / 1372	58 / 1473	85 / 2159	-	109 / 2769	42 / 1067	9.12 / 232	3	5*	-	2260 / 1027	4370 / 1986	6295 / 2861
20	-	62 / 1575	66 / 1676	99 / 2515	-	126 / 3200	48 / 1219	9.12 / 232	3	5*	-	2845 / 1293	5635 / 2561	8600 / 3909
22	-	64 / 1626	68 / 1727	102 / 2591	-	130 / 3302	48 / 1219	10.25 / 260	3	5*	-	3000 / 1364	6085 / 2766	10900 / 4955
24	-	70 / 1778	74 / 1880	109 / 2769	-	140 / 3556	54 / 1372	10.25 / 260	4*	6*	-	4295 / 1952	7845 / 3566	14000 / 6364

\* Flanged drain



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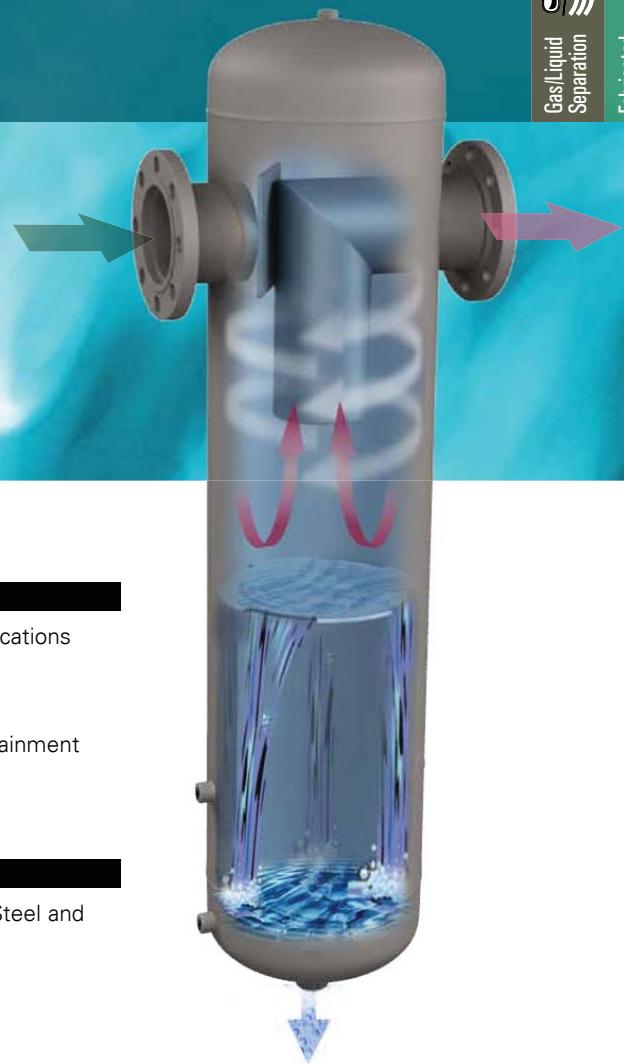
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# Type TS

## Vertical Fabricated Construction



- Custom Sizes
- Threaded, Flanged or Socket Weld
- Carbon Steel or Stainless Steel

### FEATURES

- Designed for High Liquid Loading Applications
- High Efficiency Over Wide Flow Range
- No Required Maintenance
- Removes 99% of Liquid and Solid Entrainment Particles Larger Than 10 Microns
- Gas, Steam, or Air Applications

### OPTIONS

- ASME UM or U Code Stamp (Carbon Steel and Stainless Steel Models)
- Support Legs

### High Efficiency – No Maintenance

The Eaton Type TS Gas/Liquid Separator automatically removes 99% of all liquid and solid entrainment particles 10 microns in size or larger from air, gas, and steam processes. And it does so with no moving parts to wear out and with no required maintenance.

### Applications

The Eaton Type TS Gas/Liquid Separator is designed for applications where heavier than normal liquid loading causes a “slugging” problem. These applications are widely found in refineries and

chemical plants. In many cases, there is a liquid holdup requirement where instrumentation is provided for controlling the level of the liquid in the reservoir of the vessel. Some common applications include upstream of gas turbines, absorption towers, steam generator outlets and gas scrubbers.

### Exclusive Design

Moisture-laden gas enters the inlet of the separator, where it is deflected in a centrifugal downward motion. The entrained solids and moisture droplets are separated out by a reduction in velocity. Separated liquid and

solids fall into a reservoir where the exclusive Eaton Vortex Containment Plate (VCP) ensures that they can't be re-entrained. The clean, dry flow is then directed to the outlet by the VCP. This eliminates the need for expensive, delicate baffles used in ordinary separators.

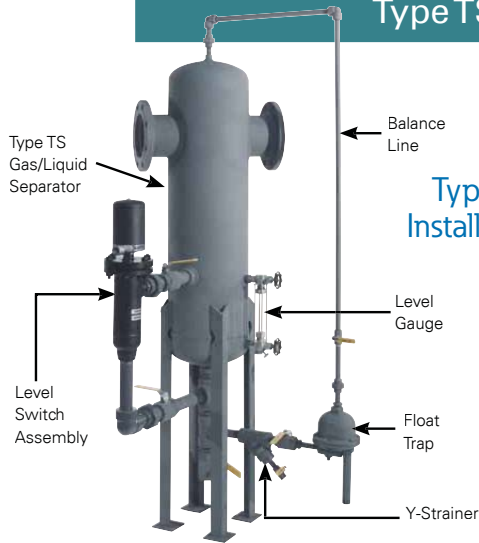
### Fabricated Construction

The Type TS Separator is available in fabricated carbon steel, stainless steel, or other alloy construction with socket weld, threaded or 150 lb., 300 lb., or 600 lb. flange connections. Depending on the separator size, liquid holdup capacities range from 0.19 cu. ft. to 32.64 cu. ft., or larger should the application require. The separators can be furnished with an ASME Code Stamp as an option. Optional integral support legs can also be specified.

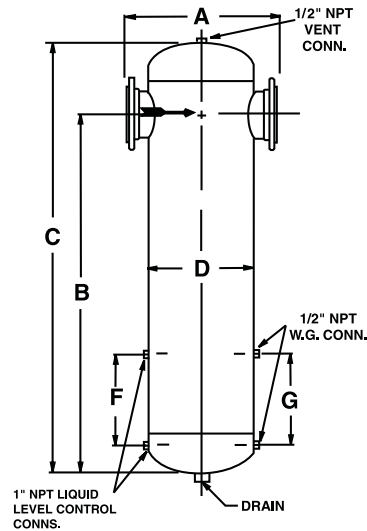


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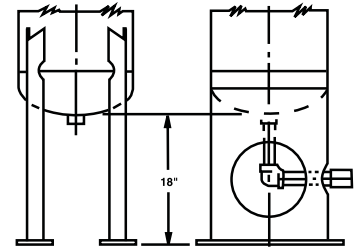
# Type TS Vertical Fabricated Gas/Liquid Separators



Typical Installation



Four angle legs with base plates or skirts are optional.



Dimensions: Type TS (Carbon Steel) with ANSI Flanges (in/mm)

Pipe Size	Threaded & Skt Weld A	Flanged A	B	C	D	F	G	NPT Drain		Weight (lb/kg)				Liquid Holdup Cap (cu ft/m)
								Std	Opt'l	Th'd & Socket Weld 1000 psig @ 650 °F	150 lb Flanged 150 psig @ 450 °F	300 lb Flanged 500 psig @ 650 °F		
1	6.87 / 174	10.5 / 267	22 / 559	28 / 711	5.56 / 141	—	7.87 / 200	1	1-1/2	44 / 20	47 / 21	49 / 22	0.19 / 0.0053	
1-1/4	6.87 / 174	10.5 / 267	22 / 559	28 / 711	5.56 / 141	—	7.87 / 200	1	1-1/2	45 / 20	50 / 23	52 / 24	0.19 / 0.0053	
1-1/2	7.87 / 200	11.5 / 292	24 / 610	30 / 762	6.62 / 168	9.12 / 232	9.12 / 232	1	2	83 / 38	69 / 31	75 / 34	0.20 / 0.0056	
2	7.87 / 200	11.5 / 292	24 / 610	30 / 762	6.62 / 168	9.12 / 232	9.12 / 232	1	2	85 / 39	74 / 34	78 / 36	0.20 / 0.0056	
2-1/2	—	16 / 406	27 / 686	35 / 889	8.62 / 219	9.12 / 232	9.12 / 232	1	2	—	122 / 55	132 / 60	0.39 / 0.011	
3	—	18 / 457	30 / 762	38 / 965	10.75 / 273	9.12 / 232	9.12 / 232	1-1/2	2-1/2	—	170 / 77	180 / 82	0.66 / 0.018	
4	—	20 / 508	36 / 914	45 / 1143	12.75 / 324	10.25 / 260	10.25 / 260	1-1/2	2-1/2	—	225 / 102	250 / 114	1.07 / 0.03	
5	—	22 / 559	40 / 1016	50 / 1270	14 / 356	10.25 / 260	10.25 / 260	1-1/2	2-1/2	—	265 / 120	335 / 152	1.35 / 0.04	
6	—	24 / 610	55 / 1397	66 / 1676	16 / 406	10.25 / 260	10.25 / 260	1-1/2	2-1/2	—	400 / 182	435 / 198	3.03 / 0.084	
8	—	28 / 711	62 / 1575	75 / 1905	18 / 457	11.87 / 301	11.87 / 301	2	3	—	545 / 248	700 / 318	3.83 / 0.107	
10	—	34 / 864	76 / 1930	91 / 2311	24 / 610	11.87 / 301	11.87 / 301	2	3	—	800 / 364	1355 / 616	6.94 / 0.194	
12	—	38 / 965	82 / 2083	99 / 2515	28 / 711	11.87 / 301	11.87 / 301	2-1/2	4*	—	1090 / 495	1735 / 789	11.74 / 0.33	
14	—	42 / 1067	89 / 2261	108 / 2743	32 / 813	12.62 / 321	12.62 / 321	2-1/2	4*	—	1335 / 607	2535 / 1152	16.81 / 0.47	
16	—	47 / 1194	98 / 2489	119 / 3023	36 / 914	12.62 / 321	12.62 / 321	3	5*	—	1850 / 841	3200 / 1455	20.22 / 0.57	
18	—	54 / 1372	108 / 2743	132 / 3353	42 / 1067	12.62 / 321	12.62 / 321	3	5*	—	2600 / 1182	5025 / 2284	22.99 / 0.64	
20	—	62 / 1575	118 / 2997	145 / 3683	48 / 1219	15 / 381	15 / 381	3	5*	—	3275 / 3275	6480 / 2945	26.47 / 0.74	
22	—	64 / 1626	121 / 3073	149 / 3785	48 / 1219	15 / 381	15 / 381	3	5*	—	3450 / 1568	7000 / 3182	26.47 / 0.74	
24	—	70 / 1778	127 / 3226	158 / 4013	54 / 1372	15 / 381	15 / 381	4*	6*	—	4940 / 2245	9020 / 4100	32.64 / 0.91	

\* Flanged drain

Note: Type TS Separators are of welded steel construction in accordance with ASME code for unfired pressure vessels. Available in stainless steel on request. Inlet and outlet connections can be rotated radially, if specified

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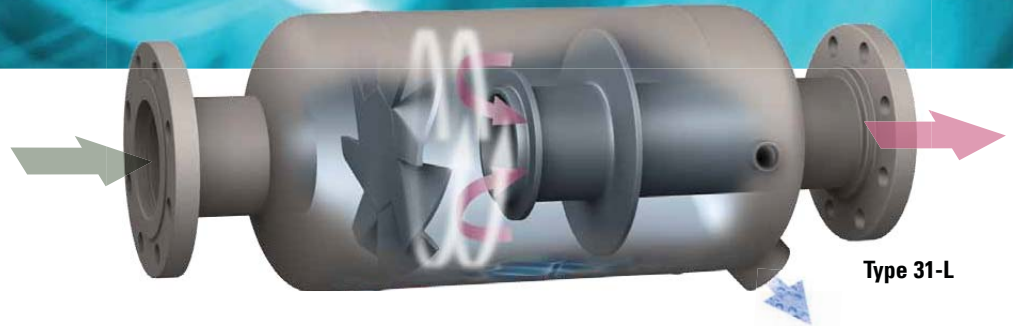


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# Type 30L Series

## Horizontal or Vertical Fabricated Construction

- 10 Models for Application Flexibility
- Low Profile
- Horizontal or Vertical Flow
- Flanged Connections
- Fabricated Carbon Steel or Stainless Steel Construction



### High Efficiency – No Maintenance

The Eaton Type 30L Gas/Liquid Separator automatically removes 99% of all liquid and solid entrainment particles 10 microns in size or larger. And it does so with no moving parts to break or wear out. Series 30L Gas/Liquid Separators perform to specification year in and year out with no required maintenance.

used in other separators, and helps direct the clean, dry flow to the outlet of the separator.

There are 10 different models available to match the needs of just about any application no matter what the flow direction or piping system orientation.

### Type 30L Series with In-line Piping Connections

The Type 31-L Separator is an in-line separator that can be installed horizontally or vertically for downflow applications. Models installed horizontally can be ordered with sump and water gauge mountings. Horizontally and vertically installed models can be furnished with reduced size inlet and outlet flanges to accommodate higher flow rates in smaller pipelines with an acceptable pressure drop. In all, five different configurations are offered to meet exact application requirements. The Type 32-L is an in-line vertical upflow separator.

### Operation

Moisture-laden gas enters the inlet of the separator where it is deflected through a unique Cenpellar™ into a centrifugal motion. The entrained solids and moisture droplets are separated out by a reduction in velocity of the flow. Separated liquids and solids fall out of the gas stream below the exclusive Eaton Vortex Containment Plate (VCP) where they cannot be re-entrained. The VCP eliminates the need for the expensive, delicate baffles

### FEATURES

- Compact Design
- No Required Maintenance
- Removes 99% of Liquid and Solid Entrainment Particles Larger Than 10 Microns
- Gas, Steam, or Air Applications

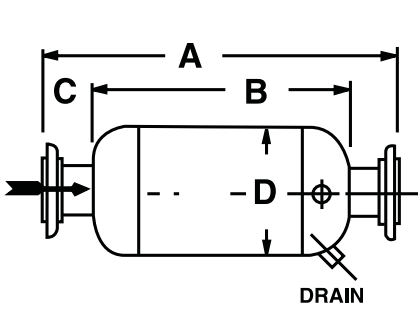
### OPTIONS

- Oversized Inlet Connections
- Reduced Size Inlet and Outlet Connections
- Different Flow Patterns
- Integral Sump
- ASME Code Stamp
- Support Legs

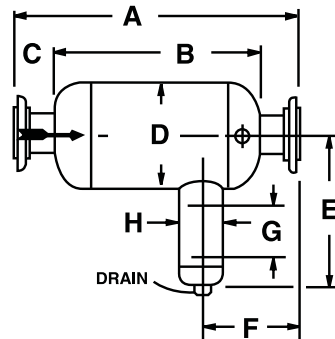


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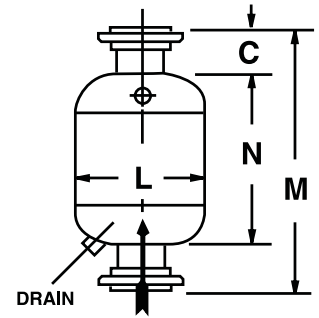
Standard Series 30L Separators for Horizontal or Vertical Upflow Applications



Type 31-L (Standard Model)

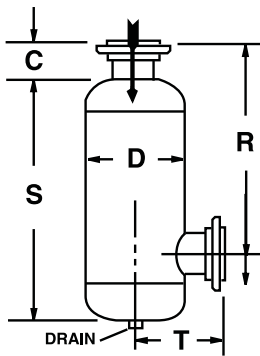


Type 31-LS with Optional Sump

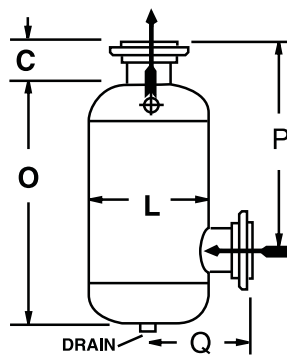


Type 32-L Vertical Upflow Separator

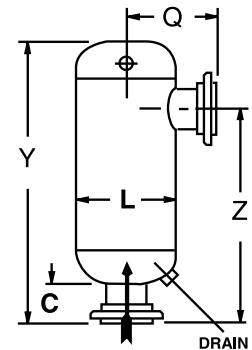
Series 30L Separators with Offset Piping Connections



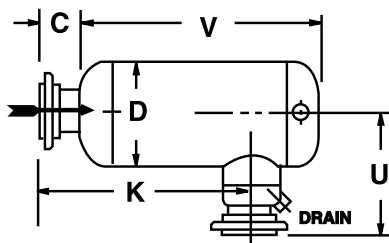
Type 33-L Vertical Downflow with Offset Outlet



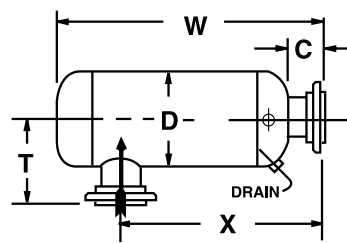
Type 35-L Vertical Upflow with Offset Inlet



Type 37-L Vertical Upflow with Offset Outlet



Type 34-L Horizontal Downflow with Offset Outlet



Type 36-L Vertical Upflow with Horizontal Outlet

# Type 30L Series Fabricated Gas/Liquid Separators

Dimensions: Type 30L Gas/Liquid Separators (in/mm)

Size	1-1/2	2	2-1/2	3	4	5	6	8	10	12	14	16	18	20	22	24	26	28	30	36	42
A	20.00 508	22.00 559	22.00 559	24.00 610	30.00 762	34.00 864	36.00 914	46.00 1168	52.00 1321	60.00 1524	66.00 1676	74.00 1880	80.00 2032	86.00 2184	96.00 2438	106.00 2692	120.00 3048	132.00 3353	142.00 3607	166.00 4216	190.00 4826
B	15.00 381	16.00 406	16.00 406	18.00 457	22.00 559	26.00 660	28.00 711	36.00 914	42.00 1067	50.00 1270	56.00 1422	64.00 1626	68.00 1727	74.00 1880	84.00 2134	94.00 2388	104.00 2642	114.00 2896	122.00 3099	144.00 3658	166.00 4216
C	3.00 76	3.00 76	3.00 76	3.00 76	4.00 102	4.00 102	4.00 102	5.00 127	5.00 127	5.00 127	5.00 127	5.00 127	6.00 152	6.00 152	6.00 152	6.00 152	8.00 203	9.00 229	10.00 254	11.00 279	12.00 305
D	5.56 141	6.63 168	6.63 168	8.63 219	10.75 273	12.75 324	14.00 356	16.00 406	20.00 508	24.00 610	28.00 711	30.00 762	36.00 914	36.00 914	42.00 1067	42.00 1067	48.00 1219	54.00 1372	54.00 1372	66.00 1676	78.00 1981
E	14.00 356	14.50 368	14.50 368	16.50 419	17.50 445	19.50 495	21.00 533	24.00 610	27.00 686	30.00 762	33.00 838	35.00 889	39.00 991	42.00 1067	46.00 1168	47.00 1194	50.00 1270	54.00 1372	55.00 1397	63.00 1600	70.00 1778
F	8.50 216	9.00 229	9.00 229	10.00 254	12.00 305	13.00 330	14.00 356	16.00 406	19.00 483	20.00 508	23.00 584	24.00 610	27.00 686	28.00 711	31.00 787	31.00 787	36.00 914	38.00 965	43.00 1092	48.00 1219	56.00 1422
G	6.75 171	6.75 171	6.75 171	6.75 171	6.75 171	6.75 171	6.75 171	7.88 200	7.88 200	7.88 200	7.78 198	7.78 198	9.13 232	9.13 232	10.25 260	10.25 260	10.25 260	10.25 260	10.25 260	11.88 302	11.88 302
H	2.38 60	2.88 73	2.88 73	3.50 89	4.50 114	5.56 141	6.63 168	8.63 219	10.75 273	10.75 273	12.75 324	14.00 356	16.00 406	18.00 457	20.00 508	20.00 508	22.00 559	22.00 559	24.00 610	30.00 762	36.00 914
J	21.00 533	23.00 584	23.00 584	25.00 635	32.00 813	36.00 914	40.00 1016	48.00 1219	58.00 1473	65.00 1651	71.00 1803	80.00 2032	86.00 2184	92.00 2337	103.00 2616	114.00 2896	128.00 3251	140.00 3556	152.00 3861	178.00 4521	202.00 5131
K	15.50 394	17.00 432	17.00 432	19.00 483	24.00 610	28.00 711	31.00 787	40.00 1016	47.00 1194	54.00 1372	60.00 1524	68.00 1727	77.00 1956	83.00 2108	90.00 2286	101.00 2565	112.00 2845	122.00 3099	136.00 3454	158.00 4013	184.00 4674
L	6.63 168	8.63 219	8.63 219	10.75 273	14.00 356	16.00 406	18.00 457	20.00 508	24.00 610	30.00 762	36.00 914	40.00 1016	42.00 1067	48.00 1219	48.00 1219	54.00 1372	60.00 1524	66.00 1676	72.00 1829	78.00 1981	96.00 2438
M	17.00 432	19.00 483	19.00 483	22.00 559	28.00 711	30.00 762	33.00 838	39.00 991	48.00 1219	54.00 1372	60.00 1524	66.00 1676	72.00 1829	78.00 1981	83.00 2108	88.00 2235	98.00 2489	106.00 2692	114.00 2896	134.00 3404	142.00 3607
N	12.00 305	13.00 330	13.00 330	16.00 406	20.00 508	22.00 559	25.00 635	29.00 737	38.00 965	44.00 1118	50.00 1270	56.00 1422	60.00 1524	66.00 1676	71.00 1803	76.00 1930	82.00 2083	88.00 2235	94.00 2388	112.00 2845	118.00 2997
O	19.00 483	20.00 508	20.00 508	26.00 660	28.00 711	33.00 838	37.00 940	45.00 1143	54.00 1372	66.00 1676	73.00 1854	85.00 2159	90.00 2286	97.00 2464	105.00 2667	113.00 2870	122.00 3099	130.00 3302	140.00 3556	166.00 4216	180.00 4572
P	15.00 381	16.00 406	16.00 406	21.00 533	23.00 584	27.00 686	30.00 762	37.00 940	44.00 1118	52.00 1321	58.00 1473	68.00 1727	72.00 1829	78.00 1981	84.00 2134	90.00 2286	98.00 2489	105.00 2667	114.00 2896	135.00 3429	144.00 3658
Q	6.00 152	8.00 203	8.00 203	9.00 229	11.00 279	12.00 305	13.00 330	15.00 381	17.00 432	20.00 508	23.00 584	25.00 635	27.00 686	30.00 762	30.00 762	33.00 838	38.00 965	42.00 1067	46.00 1168	50.00 1270	60.00 1524
R	12.50 318	14.00 356	14.00 356	16.00 406	20.00 508	24.00 610	27.00 686	33.00 838	40.00 1016	46.00 1168	52.00 1321	59.00 1499	68.00 1727	74.00 1880	81.00 2057	87.00 2210	96.00 2438	104.00 2642	112.00 2845	134.00 3404	160.00 4064
S	16.00 406	18.00 457	18.00 457	21.00 533	25.00 635	30.00 762	34.00 864	41.00 1041	50.00 1270	58.00 1473	65.00 1651	74.00 1880	85.00 2159	92.00 2337	101.00 2565	108.00 2743	118.00 2997	127.00 3226	136.00 3454	163.00 4140	194.00 4928
T	5.50 140	7.00 178	7.00 178	8.00 203	10.00 254	11.00 279	12.00 305	13.00 330	15.00 381	17.00 432	19.00 483	20.00 508	24.00 610	24.00 610	27.00 686	27.00 686	32.00 813	36.00 914	37.00 940	44.00 1118	51.00 1295
U	8.50 216	10.00 254	10.00 254	11.00 279	14.00 356	15.00 381	17.00 432	19.00 483	22.00 559	25.00 635	28.00 711	29.00 737	33.00 838	34.00 864	38.00 965	38.00 965	44.00 1118	48.00 1219	51.00 1295	59.00 1499	68.00 1727
V	20.00 508	22.00 559	22.00 559	25.00 635	30.00 762	36.00 914	40.00 1016	50.00 1270	59.00 1499	68.00 1727	76.00 1930	86.00 2184	96.00 2438	104.00 2642	114.00 2896	126.00 3200	137.00 3480	149.00 3785	165.00 4191	192.00 4877	223.00 5664
W	24.00 610	26.00 660	26.00 660	29.00 737	36.00 914	41.00 1041	45.00 1143	58.00 1473	68.00 1727	79.00 2007	89.00 2261	99.00 2515	109.00 2769	118.00 2997	131.00 3327	144.00 3658	163.00 4140	177.00 4496	189.00 4801	222.00 5639	255.00 6477
X	18.00 457	20.00 508	20.00 508	22.00 559	28.00 711	32.00 813	35.00 889	46.00 1168	54.00 1372	53.00 1346	71.00 1803	80.00 2032	87.00 2210	95.00 2413	108.00 2743	117.00 2972	131.00 3327	143.00 3632	153.00 3886	180.00 4572	207.00 5258
Y	25.00 635	27.00 686	27.00 686	31.00 787	38.00 965	43.00 1092	46.00 1168	59.00 1499	67.00 1702	78.00 1981	87.00 2210	96.00 2438	105.00 2667	113.00 2870	126.00 3200	138.00 3505	155.00 3937	167.00 4242	180.00 4572	210.00 5334	244.00 6198
Z	18.00 457	20.00 508	20.00 508	22.00 559	28.00 711	32.00 813	34.00 864	45.00 1143	51.00 1295	60.00 1524	67.00 1702	75.00 1905	81.00 2057	88.00 2235	99.00 2515	109.00 2769	122.00 3099	133.00 3378	144.00 3658	168.00 4267	194.00 4928
NPT Drain	1.00	1.00	1.00	1.50	1.50	1.50	1.50	2.00	2.00	2.50	2.50	3.00	3.00	4.00*	4.00*	4.00*	4.00*	4.00*	4.00*	4.00*	4.00*

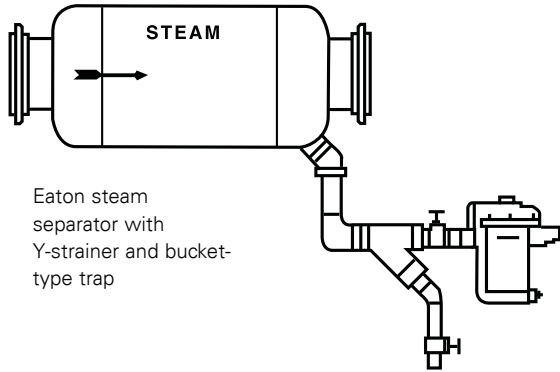
\* Flanged drain

Notes: 1. Dimensions shown for 1-1/2" through 6" are valid for 150 lb., 300 lb., and 600 lb. ANSI flanges  
Dimensions for 8" size and larger are valid for 150 lb. and 300 lb. flanges. Four inch drains and larger have flanged fittings

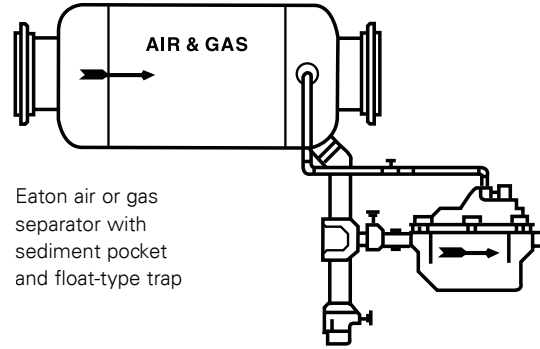
2. Designed and constructed for the latest ASME code for unfired vessels. Section VIII, division 1, with stamp

# Type 30L Series Fabricated Gas/Liquid Separators

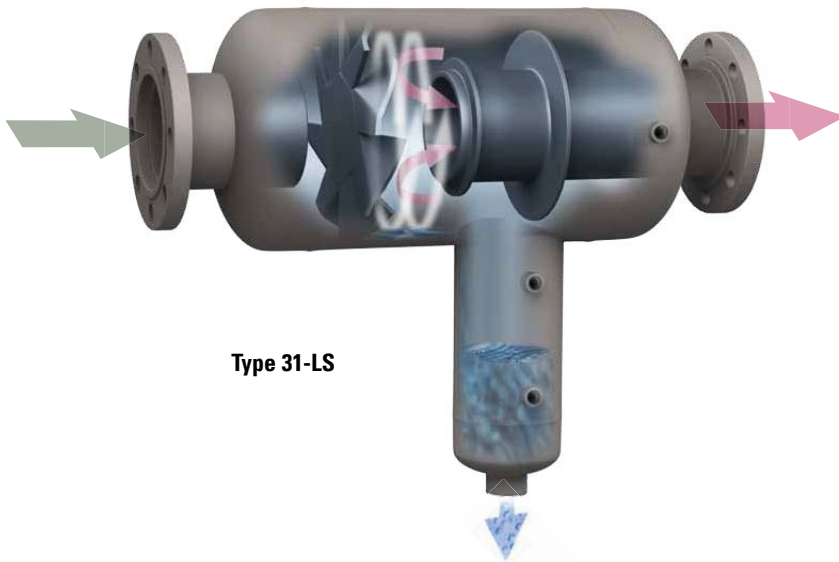
## Installation Suggestions



Eaton steam separator with Y-strainer and bucket-type trap



Eaton air or gas separator with sediment pocket and float-type trap



Type 31-LS



Type 32-L

### Notes:

1. In air or gas installations, keep piping between separator and trap as short as possible and add 1/4" balance line as indicated.
2. For positive drainage of separator, install trap a minimum of 6" below separator drain. For every inch of horizontal piping to trap, add 1" to the vertical piping. Never allow the top of the trap to extend above drain connection.

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EF-G/L-5  
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# Type 60-I & 70-I

## Internal Fabricated Construction

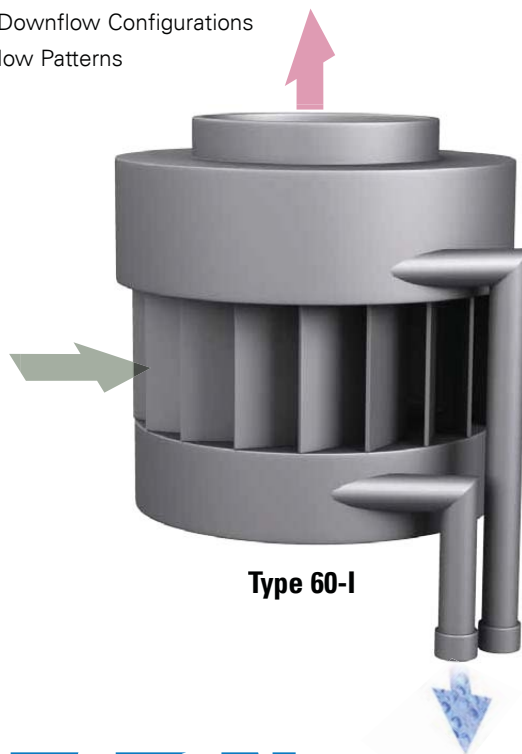
- Fabricated Carbon Steel or Stainless Steel
- Installs Inside Receivers, Drums, or Other Vessels

### FEATURES

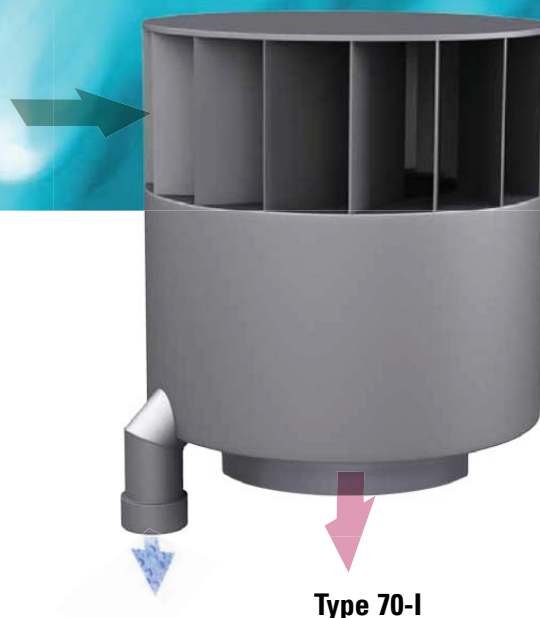
- Compact Design
- No Required Maintenance
- Removes 99% of Liquid and Solid Entrainment Particles Larger Than 10 Microns
- Gas, Steam, or Air Applications

### OPTIONS

- Upflow or Downflow Configurations
- Different Flow Patterns



Type 60-I



Type 70-I

Eaton Internal Gas/Liquid Separators are designed to be installed inside of receivers, steam drums, and other vessels where they will remove 99% of particles and liquid droplets of 10 microns or larger from air, gas, or steam.

These are centrifugal separators that cause the gas stream to enter a controlled centrifugal flow. This action forces the entrained liquids and solids to the outer wall of the internal separator where they fall to a bottom drain. The exit stream is drawn from the clean and dry center of the separator, which assures a clean, dry gas stream at the outlet.

The Type 60-I has an upflow configuration, while the 70-I has a downflow configuration. Both are fabricated from carbon steel and have 304/304L stainless steel blades.

### Sizing

See air and steam charts on the Technical Pages. Use 65% of the equivalent air or steam flow when sizing internal separators.

### Installation Considerations

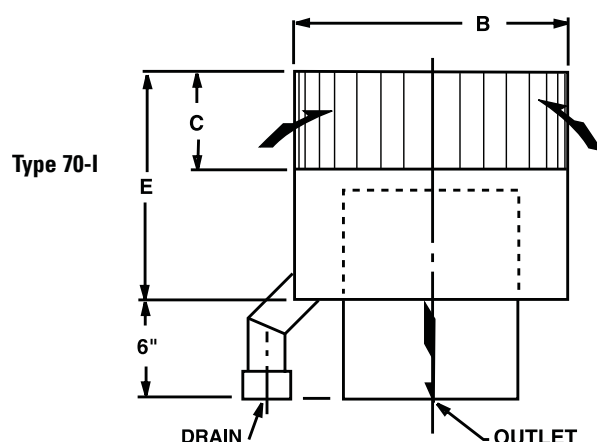
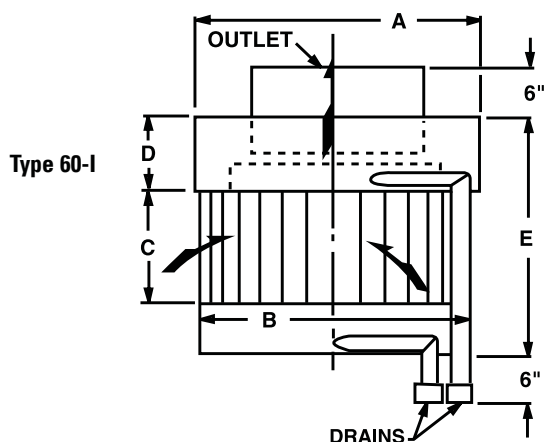
To operate effectively, the internal separator must be located a minimum of 12" above the surface of the liquid, plus the pressure drop across the element in inches of water.



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# Type 60-I & Type 70-I Internal Gas/Liquid Separators



Dimensions: Type 60-I & 70-I (in/mm)

Pipe Size	A	B	C	D	E	Drains NPT 60-I	Weight (lb/kg) 60-I	Drain NPT 70-I	Weight (lb/kg) 70-I
3	7 / 178	5.12 / 130	3 / 76	2.5 / 63	7 / 178	3/4	16 / 7.3	1-1/4	15 / 6.8
4	8 / 203	7 / 178	2.25 / 57	3 / 76	7 / 178	3/4	20 / 9.1	1-1/4	18 / 8.2
5	9.5 / 241	8.5 / 216	3.25 / 83	3 / 76	8.5 / 216	3/4	30 / 14	1-1/2	27 / 12
6	11.5 / 292	10.5 / 267	4 / 102	3.5 / 89	10 / 254	1	40 / 18	1-1/2	35 / 16
8	15 / 381	14 / 356	5 / 127	3.5 / 89	11.25 / 286	1-1/2	60 / 28	2	55 / 25
10	18 / 457	17 / 432	6 / 152	4.75 / 121	14 / 356	1-1/2	85 / 39	2	80 / 36
12	21 / 533	20 / 508	6.5 / 165	4.75 / 121	15 / 381	1-1/2	115 / 52	2-1/2	110 / 50
14	23.5 / 597	22.5 / 571	9 / 229	5 / 127	18 / 457	1-1/2	145 / 66	2-1/2	135 / 61
16	26.5 / 673	25.5 / 648	11 / 279	5 / 127	20 / 508	2	185 / 94	3	145 / 66
18	29 / 737	27.75 / 705	12 / 305	5 / 127	21 / 533	2	210 / 95	3	160 / 73
20	31 / 787	30 / 762	15.5 / 394	6 / 152	25 / 635	2-1/2	270 / 122	3	210 / 95
22	33.5 / 851	32.5 / 825	17 / 432	7 / 178	27.5 / 698	2-1/2	310 / 141	3	240 / 109
24	36 / 914	35 / 889	17.5 / 444	8 / 203	30 / 762	2-1/2	350 / 159	3	275 / 125
26	39 / 991	38 / 965	18 / 457	9 / 229	32.5 / 825	2-1/2	455 / 206	3	340 / 155
28	42 / 1067	40 / 1016	18.5 / 470	9.5 / 241	35 / 889	2-1/2	575 / 261	4	385 / 175

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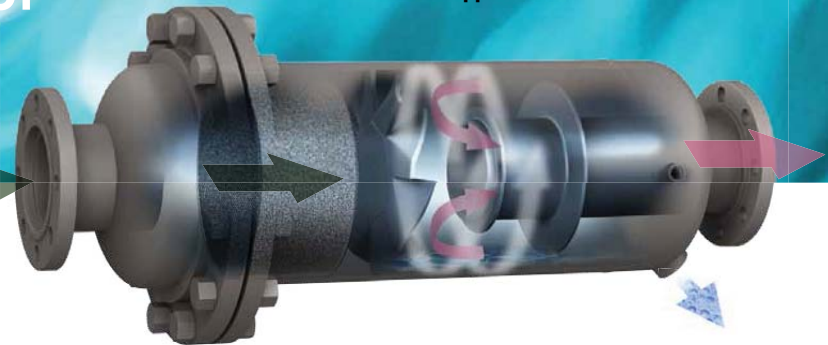
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# Series CLC Coalescer/Separator

Type 31L-CLC for Horizontal or Vertical Applications



- Centrifugal In-line Gas/Liquid Separators
- Two-Stage Design for Maximum Efficiency
- Flanged Connections
- Carbon Steel or Stainless Steel Construction
- Horizontal or Vertical Flow

## FEATURES

- Removes 99% of Liquid and Solid Entrainment Particles Larger Than 4 Microns
- Easy Maintenance
- Three Flow Configurations
- Gas, Steam, or Air Applications
- High Efficiency Over Wide Flow Range

## OPTIONS

- ASME Code Stamp

### High-Efficiency Separation Down to 4 Microns

The unique two-stage design of these Series CLC Coalescers/Separators allows them to remove 99% of all liquid and solid particles larger than 4 microns in size. Standard, one-stage separators are only capable of removing particles larger than 10 microns in size. The efficiency of Eaton's Coalescer/Separator far exceeds that of any other type of centrifugal, cyclone, turbine or vane type separator. And it works with no moving parts to fail or wear out.

### Two-Stage Separation

In the first stage, the coalescer stage, smaller liquid droplets enter a special wire mesh de-misting pad in the vessel. The pad's purpose is to increase the size of the droplets as they pass through it so they can be removed. The larger liquid droplets exit the de-misting pad and enter the second, separation stage. In the second stage, the droplets are centrifugally thrown to the outside wall of the vessel by a unique Censpellar™ and flow to the bottom for draining. Eaton's Vortex Containment Plate (VCP) prevents the droplets from being re-entrained after separation.

### Applications

The Eaton Coalescer/Separator provides two-stage separation of liquid that is in the form of a fine mist or fog from a gas or vapor. The Coalescer/Separator is primarily used in applications where a fine mist is encountered in processes involving cooling, condensation, flashing, or evaporation, such as:

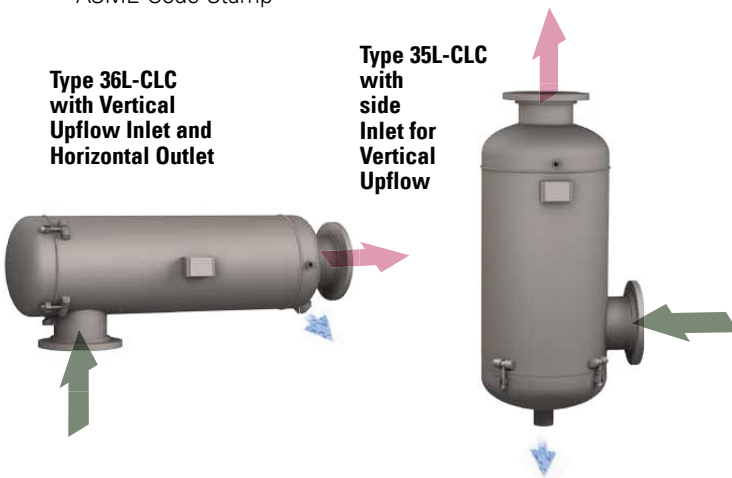
- Compressed refrigeration gases
- Evaporator overhead steam
- Compressed air prior to desiccant dryer beds
- High-pressure gas at injection wells
- Fuel gas lines to engines in power
- Industrial plants
- Natural gas and gas distribution lines
- Regulator stations

### Easy Maintenance

The only maintenance required is the inspection, cleaning, or replacement of the de-misting pad. This is easily accomplished through either a quick-opening body closure or body flanges.

### Engineering Specifications

All gas/liquid separators are fabricated carbon steel or stainless steel construction with two-stage coalescer/separator design and flanged connections. Separators have an ASME Code Stamp.



Type 36L-CLC with Vertical Upflow Inlet and Horizontal Outlet

Type 35L-CLC with side Inlet for Vertical Upflow



Powering Business Worldwide

# Series CLC Coalescers/Separators

## Dimensions: Type 31L-CLC (in/mm)

Pipe Size	A	B	C	D	Drain NPT	Wt (lb/kg)
2-1/2	34 / 864	28 / 711	3 / 76	6.62 / 168	1	125 / 57
3	36 / 914	30 / 762	3 / 76	8.62 / 219	1-1/2	180 / 82
4	42 / 1067	34 / 864	4 / 102	10.75 / 273	1-1/2	280 / 127
5	46 / 1168	38 / 965	4 / 102	12.75 / 324	1-1/2	390 / 177
6	48 / 1219	40 / 1016	4 / 102	14 / 356	1-1/2	510 / 232
8	58 / 1473	48 / 1219	5 / 127	16 / 406	2	665 / 302
10	64 / 1626	54 / 1372	5 / 127	20 / 508	2	1060 / 482
12	72 / 1829	62 / 1575	5 / 127	24 / 610	2-1/2	1415 / 643
14	78 / 1981	68 / 1727	5 / 127	28 / 711	2-1/2	1830 / 832
16	86 / 2184	76 / 1930	5 / 127	30 / 762	3	2130 / 968

See Steam and Air Charts on the Technical Information Page for sizing information.

## Dimensions: Type 36L-CLC (in/mm)

Pipe Size	C	D	T	W	X	Drain NPT	Wt (lb/kg)
2-1/2	3 / 76	6.62 / 168	7 / 178	37 / 940	30 / 762	1	130 / 59
3	3 / 76	8.62 / 219	8 / 203	41 / 1041	33 / 838	1-1/2	165 / 75
4	4 / 102	10.75 / 273	10 / 254	44 / 1118	36 / 914	1-1/2	295 / 134
5	4 / 102	12.75 / 324	11 / 279	51 / 1295	41 / 1041	1-1/2	420 / 191
6	4 / 102	14 / 356	12 / 305	54 / 1372	42 / 1067	1-1/2	475 / 216
8	5 / 127	16 / 406	13 / 330	66 / 1676	53 / 1346	2	525 / 239
10	5 / 127	20 / 508	15 / 381	77 / 1956	60 / 1524	2	590 / 268
12	5 / 127	24 / 610	17 / 432	88 / 2235	70 / 1778	2-1/2	1125 / 511
14	5 / 127	28 / 711	19 / 483	96 / 2438	77 / 1956	2-1/2	1475 / 670
16	5 / 127	30 / 762	20 / 508	101 / 2565	80 / 2032	3	1925 / 875

## Dimensions: Type 35L-CLC (in/mm)

Pipe Size	C	L	O	P	Q	Drain NPT	Weight (lb/kg)
2-1/2	3 / 76	8.62 / 219	30 / 762	24 / 610	8 / 203	1	145 / 66
3	3 / 76	10.75 / 273	34 / 864	28 / 711	9 / 229	1-1/2	195 / 89
4	4 / 102	14 / 356	39 / 991	31 / 787	11 / 279	1-1/2	305 / 139
5	4 / 102	16 / 406	45 / 1143	35 / 889	12 / 305	1-1/2	435 / 198
6	4 / 102	18 / 457	50 / 1270	39 / 991	13 / 330	1-1/2	530 / 241
8	5 / 127	20 / 508	56 / 1422	45 / 1143	15 / 381	2	665 / 302
10	5 / 127	24 / 610	67 / 1702	53 / 1346	17 / 432	2	975 / 443
12	5 / 127	30 / 762	76 / 1930	61 / 1549	19 / 483	2-1/2	1390 / 632
14	5 / 127	36 / 914	86 / 2184	67 / 1702	23 / 584	2-1/2	1920 / 873
16	5 / 127	40 / 1016	98 / 2489	77 / 1956	25 / 635	3	2645 / 1202

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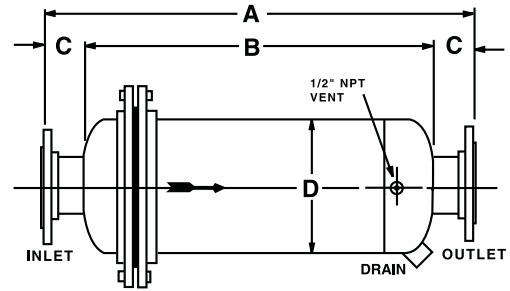
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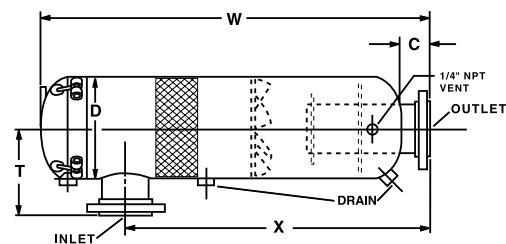
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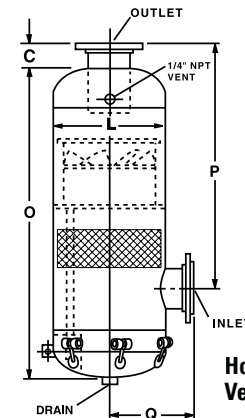
## Three Flow Patterns for Application Flexibility



Horizontal Inlet and Outlet



Vertical Upflow Inlet and Horizontal Outlet



Horizontal Inlet with Vertical Upflow Outlet

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# Type 10-R Series

## Two-Stage Design



### FEATURES

- Standard and Compact Models
- Capable of Handling Slugs of Liquids
- Removes 99% of Liquid and Solid Entrainment Particles Larger than 10 Microns
- ASME Code Stamp
- Two 1/2" NPT Water Gauge Connections
- One 1/2" NPT Vent Connection
- No Required Maintenance
- Gas, Steam, or Air Applications

### OPTIONS

- Support Stand
- Stainless Steel Construction
- Multiple Inlets and/or Outlets
- Sizes Larger than 16"

• For Heavier Than Normal Liquid Loads

• Flanged

• Fabricated Carbon Steel or Stainless Steel Construction

The Eaton standard size Type 10-R Series Separators are designed for liquid slugs or heavy liquid loads, and can be provided with a large reservoir to meet liquid holdup requirements. For applications where space is restricted, a compact model is available.

industries where large volumes of liquid must be separated from gases. They also may be used as a flash or surge tank, or as a scrubber or demister ahead of steam turbines.

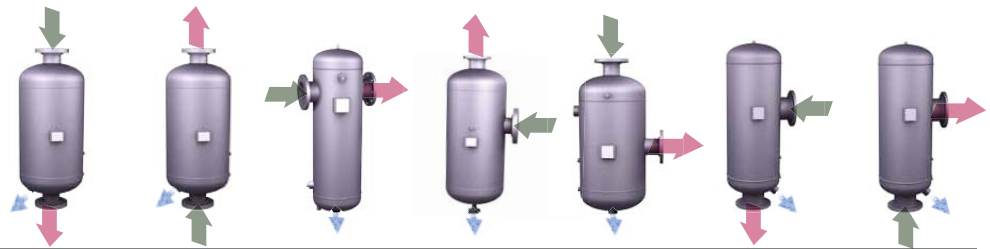
#### Operation

Eaton's Type 10-R Series Separators have two stages for separating large volumes of liquid from a smaller volume of a gas or vapor. In stage one, the flow enters the inlet and

is deflected downward by an impingement plate, causing it to lose velocity. This results in the majority of the liquid dropping into a reservoir. In the second stage, the moisture laden gas passes through a vane element where any remaining moisture is separated and flows down into the reservoir. The separator removes all liquid and solid entrainment where the particle size is 10 microns or greater.

#### Applications

Type 10-R Series Separators are widely used in the chemical and process



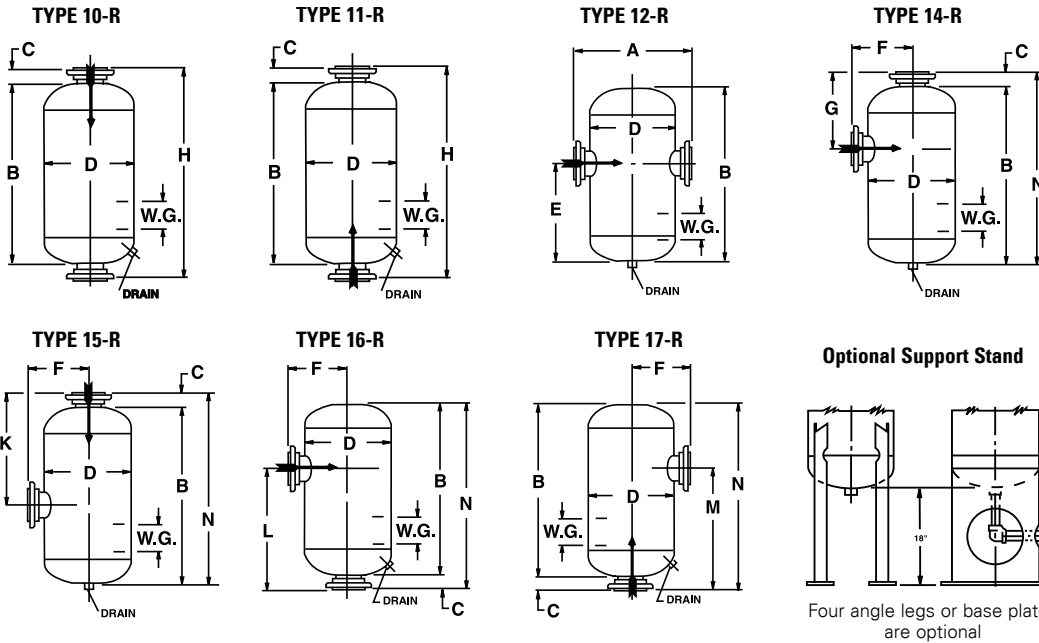
#### Liquid Holdup: Type 10-R Standard/Compact (cu ft)

Element Size	Total Volume in Cubic Ft	Cubic Ft. of Volume Per Inch of Shell	10-R	11-R	12-R	14-R	15-R	16-R	17-R
3	3.16 / 1.01	0.10 / 0.05	0.26 / 0.12	0.67 / 0.28	0.80 / 0.12	0.60 / 0.16	0.28 / 0.16	0.80 / 0.28	0.67 / 0.28
4	4.93 / 1.85	0.13 / 0.07	0.54 / 0.28	1.26 / 0.59	1.43 / 0.44	1.35 / 0.42	0.60 / 0.44	1.43 / 0.44	1.32 / 0.44
5	6.62 / 2.96	0.16 / 0.08	1.01 / 0.47	2.00 / 0.73	2.32 / 0.85	2.25 / 0.73	1.11 / 0.47	2.21 / 0.85	2.12 / 0.73
6	11.44 / 5.22	0.23 / 0.13	2.49 / 1.16	4.21 / 1.89	4.85 / 1.67	4.60 / 1.89	2.61 / 1.16	4.24 / 1.67	3.98 / 1.89
8	22.67 / 10.89	0.36 / 0.24	6.10 / 3.36	10.04 / 5.19	11.09 / 4.19	10.90 / 5.97	6.78 / 3.36	10.20 / 5.03	7.53 / 4.61
10	33.51 / 14.69	0.52 / 0.26	11.45 / 4.37	18.11 / 7.09	17.91 / 5.85	18.48 / 6.35	12.82 / 3.87	16.18 / 5.85	11.96 / 5.61
12	60.97 / 23.34	0.73 / 0.38	20.86 / 7.31	31.41 / 11.34	30.49 / 9.27	32.09 / 9.27	20.06 / 6.79	24.82 / 9.27	20.86 / 7.84
14	91.15 / 37.15	0.96 / 0.56	30.40 / 11.81	53.04 / 18.08	43.48 / 14.07	46.62 / 15.07	29.34 / 8.55	36.22 / 12.06	31.01 / 11.06
16	129.95 / 55.74	1.21 / 0.76	46.76 / 16.30	67.32 / 26.55	61.00 / 21.08	67.62 / 22.45	41.11 / 12.20	52.87 / 22.45	43.13 / 19.72



Powering Business Worldwide

# Type 10-R Series Gas/Liquid Separators



## Construction

Type R Separators are constructed in accordance with the ASME Code Section VIII, Division 1 and are code stamped. They are available with 150 lb. slip on raised face flanges rated at 200 psi at 300 °F or with 300 lb. slip on raised face flanges rated at 250 psi at 650 °F. They feature fabricated carbon steel construction, with internal vane blades made of 304L stainless steel.

See technical section for Air and Steam Capacity Charts

Four angle legs or base plates are optional

Dimensions: Type 10-R Gas/Liquid Separators (in/mm)

	Element	Inlet Size	Outlet	A	B	C	D	E	F	G	H	K	L	M	N	Gauge Connect Center to Center	Drain NPT
Type 10-R Standard	3	3		24 / 610	32 / 813	4 / 102	16 / 406	18 / 457	12 / 305	15 / 381	40 / 1016	22 / 559	22 / 559	22 / 559	36 / 914	6.75 / 171	1-1/2
	4	4		26 / 660	36 / 914	4 / 102	18 / 457	23 / 584	13 / 330	16 / 406	44 / 1118	23 / 584	27 / 686	27 / 686	40 / 1016	7.87 / 200	1-1/2
	5	5		30 / 762	40 / 1016	5 / 127	20 / 508	24 / 610	15 / 381	20 / 508	50 / 1270	28 / 711	29 / 737	29 / 737	45 / 1143	7.87 / 200	1-1/2
	6	6		34 / 864	48 / 1219	5 / 127	24 / 610	29 / 737	17 / 432	23 / 584	58 / 1473	33 / 838	34 / 864	34 / 864	53 / 1346	7.87 / 200	1-1/2
	8	8		40 / 1016	60 / 1524	5 / 127	30 / 762	38 / 965	20 / 508	26 / 660	70 / 1778	38 / 965	43 / 1092	43 / 1092	65 / 1651	9.12 / 232	2
	10	10		48 / 1219	72 / 1829	6 / 152	36 / 914	44 / 1118	24 / 610	33 / 838	84 / 2134	48 / 1219	50 / 1270	50 / 1270	78 / 1981	9.12 / 232	2
	12	12		54 / 1372	84 / 2134	6 / 152	42 / 1067	52 / 1321	27 / 686	36 / 914	96 / 2438	55 / 1397	58 / 1473	58 / 1473	90 / 2286	10.25 / 260	2-1/2
Type 10-R Compact	3	3		16 / 406	28 / 711	4 / 102	10-3/4 / 273	14 / 356	8 / 203	15 / 381	36 / 914	21 / 533	18 / 457	18 / 457	32 / 813	6.75 / 171	1-1/2
	4	4		20 / 508	35 / 889	4 / 102	12-3/4 / 324	19 / 483	10 / 254	20 / 508	43 / 1092	23 / 584	20 / 508	20 / 508	39 / 991	6.75 / 171	1-1/2
	5	5		22 / 559	40 / 1016	4 / 102	14 / 356	22 / 559	11 / 279	22 / 559	48 / 1219	26 / 660	26 / 660	26 / 660	44 / 1118	6.75 / 171	1-1/2
	6	6		24 / 610	48 / 1219	4 / 102	18 / 457	26 / 660	12 / 305	24 / 610	56 / 1422	30 / 762	32 / 813	32 / 813	52 / 1321	6.75 / 171	1-1/2
	8	8		30 / 762	56 / 1422	5 / 127	24 / 610	32 / 813	15 / 381	27 / 686	66 / 1676	37 / 940	37 / 940	37 / 940	61 / 1549	7.875 / 200	2
	10	10		34 / 864	64 / 1626	5 / 127	24 / 610	35 / 889	17 / 432	35 / 889	74 / 1880	45 / 1143	40 / 1016	40 / 1016	69 / 1753	7.875 / 200	2
	12	12		38 / 965	72 / 1829	5 / 127	30 / 762	39 / 991	19 / 483	38 / 965	82 / 2438	51 / 1295	44 / 1118	44 / 1118	77 / 1956	7.875 / 200	2-1/2
	14	14		42 / 1067	80 / 2032	5 / 127	36 / 914	41 / 1041	21 / 533	42 / 1067	90 / 2083	55 / 1397	46 / 1168	46 / 1168	85 / 2159	7.875 / 200	2-1/2
	16	16		46 / 1168	88 / 2235	5 / 127	40 / 1016	44 / 1118	23 / 584	45 / 1143	98 / 2489	60 / 1524	48 / 1219	48 / 1219	93 / 2362	7.875 / 200	3

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# Type 31L-ST

## Compact Series



### FEATURES

- Lightweight, Compact
- Removes 99% of Liquid and Solid Entrainment Particles Larger Than 10 Microns
- Integral Trap
- High Efficiency Over Wide Flow Range
- No Required Maintenance
- Economical Choice for Most Applications
- Gas, Steam, or Air Applications

### OPTIONS

- Trap Heater

- Sizes 1" to 4"
- Horizontal Low Profile Design
- Centrifugal In-line Installation
- Threaded or Flanged
- Iron Construction

Eaton Type 31L-ST Gas/Liquid Separators automatically remove 99% of all liquid and solid entrainment particles 10 microns in size or larger from air, gas, and steam processes.

#### Low Profile Design

The Type 31L-ST is a horizontal, in-line separator. It is very compact and can be supported by the line in which it is installed. No cumbersome, expensive support stands are required.

The compact design of these separators takes up little more than the space of the pipeline—an important consideration in space-restricted applications.

#### Vortex Containment Plate

Moisture-laden gas enters the inlet of the separator, where it is deflected by a unique Cenpellar™ into a centrifugal motion. The entrained solids and moisture droplets are then separated out by a reduction in velocity where they fall into the separator's integral drain trap. The exclusive Eaton Vortex Containment Plate (VCP) ensures they cannot be re-entrained. The VCP is constructed with a series of carefully placed rings and plates that shield the separated liquid from the vortex action within the separator to prevent re-entrainment. The VCP also helps direct the liquid to the

drain trap while at the same time moving the clean, dry gas to the separator outlet. With Eaton's exclusive VCP, the need for expensive, delicate baffles used in ordinary separators is eliminated.

#### Integral Drain Trap

Eaton Type 31L-ST Separators come with standard integral drain traps. This design saves space, reduces installation costs, and eliminates the need to size and source a properly designed drain trap to work with the separator. The integral trap automatically ejects condensate at predetermined levels without loss of line pressure. Internal trap parts are made of stainless steel

and include a non-magnetic 18-8 stainless steel valve and seat. Removal of a flange releases the trap mechanism for inspection. A heater option, Type STH, is also available for applications below freezing. A 50 watt, 120 volt, self-limiting heating element keeps the reservoir fluid from freezing. The heater does not increase the line temperature and can be easily removed for inspection.

#### Engineering Specifications

All gas/liquid separators are constructed of cast iron with threaded or flanged connections.



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# Type 31L-ST Compact Gas/Liquid Separators

## Dimensions: Type 31L-ST Flanged (in/mm)

Pipe Size	A	B (ST)	B (STH)	C	D	E	Drain NPT	Weight (lb/kg) ST	Weight (lb/kg) STH
3	25 / 635	9 / 229	10.12 / 257	6.75 / 171	7.63 / 194	0.81 / 21	1/2	115 / 52	118 / 54
4	27.25 / 692	9.88 / 251	11 / 279	6.75 / 171	9.63 / 244	0.81 / 21	1/2	160 / 73	175 / 79

NOTE: 1/8" orifice is standard. Other sizes are available, consult Eaton.

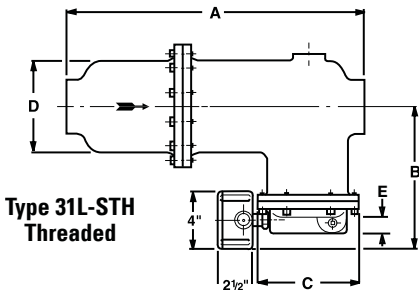
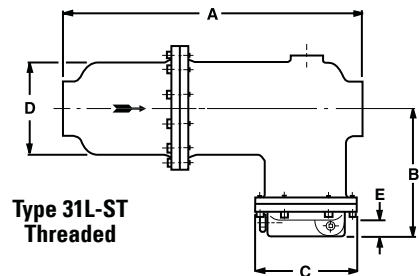
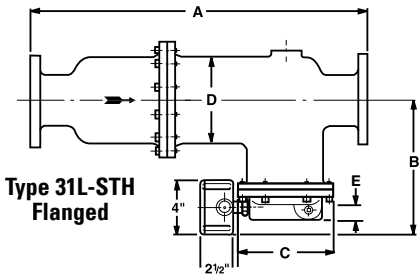
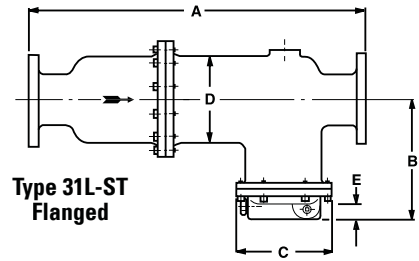
## Dimensions: Type 31L-ST Threaded (in/mm)

Pipe Size	A	B (ST)	B (STH)	C	D	E	Drain NPT	Weight (lb/kg) ST	Weight (lb/kg) STH
1	19 / 483	8 / 203	9.125 / 232	6.75 / 171	5.56 / 141	0.81 / 21	1/2	62 / 28.1	65 / 29.5
1-1/4	19 / 483	8 / 203	9.125 / 232	6.75 / 171	5.56 / 141	0.81 / 21	1/2	62 / 28.1	65 / 29.5
1-1/2	19 / 483	8 / 203	9.125 / 232	6.75 / 171	5.56 / 141	0.81 / 21	1/2	61 / 27.7	64 / 29
2	18 / 457	8 / 203	9.125 / 232	6.75 / 171	5.56 / 141	0.81 / 21	1/2	60 / 27.2	63 / 28.5
2-1/2	22.75 / 578	9 / 229	10.12 / 257	6.75 / 171	7.63 / 194	0.81 / 21	1/2	92 / 41.7	95 / 43
3	21 / 533	9 / 229	10.12 / 257	6.75 / 171	7.63 / 194	0.81 / 21	1/2	90 / 40.8	93 / 42.1

## Capacities: Maximum Air Flow Rating in SCFM

Pipe Size	25 psig	50 psig	100 psig	150 psig	200 psig	250 psig
1"	82	110	155	190	220	255
1-1/4"	130	175	245	300	345	400
1-1/2"	185	245	345	425	485	560
2"	330	445	620	770	870	1000
2-1/2"	500	680	945	1170	1350	1550
3"	750	1000	1400	1750	1950	2300
4"	1350	1750	2500	3050	-	-
Rated ΔP (psi)	0.88	0.99	1.19	1.40	1.60	1.85
Orifice* Dia.	1/8" 5/32"	1/8" 5/32"	1/8"	1/8"	1/8"	1/8"
Liquid Discharge (lb/hr)	265 790	427 1273	625	760	590	650

\* 5/64" orifice available for pressures up to 250 psig, but code stamp not available over 160 psig.



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EF-G/L-9  
6-2012

# DTL Dry Type

- For High Solid Loading Applications
- Sizes from 2" to 16"

## FEATURES

- Removes 99% of Liquid and Solid Entrainment Particles Larger Than 10 Microns
- No Required Maintenance
- Low Pressure Drop
- Flanged Drain
- Fabricated Carbon or Stainless Steel Construction

## OPTIONS

- Larger Sizes
- Code Stamp

Eaton's Dry Type Gas/Liquid Separators are designed for applications with higher than normal loads of entrained solids. In order to handle the large amount of solids, these separators feature a cone-shaped sump that does a better job of collecting removed solids at the drain port. The separated material must be removed before it fills the sump area. Since automatic drain traps are not suitable for handling solid materials, the use of a rotary valve is recommended for this purpose. This allows the solid material to be removed while releasing a minimum amount of air, gas, or steam from the system.

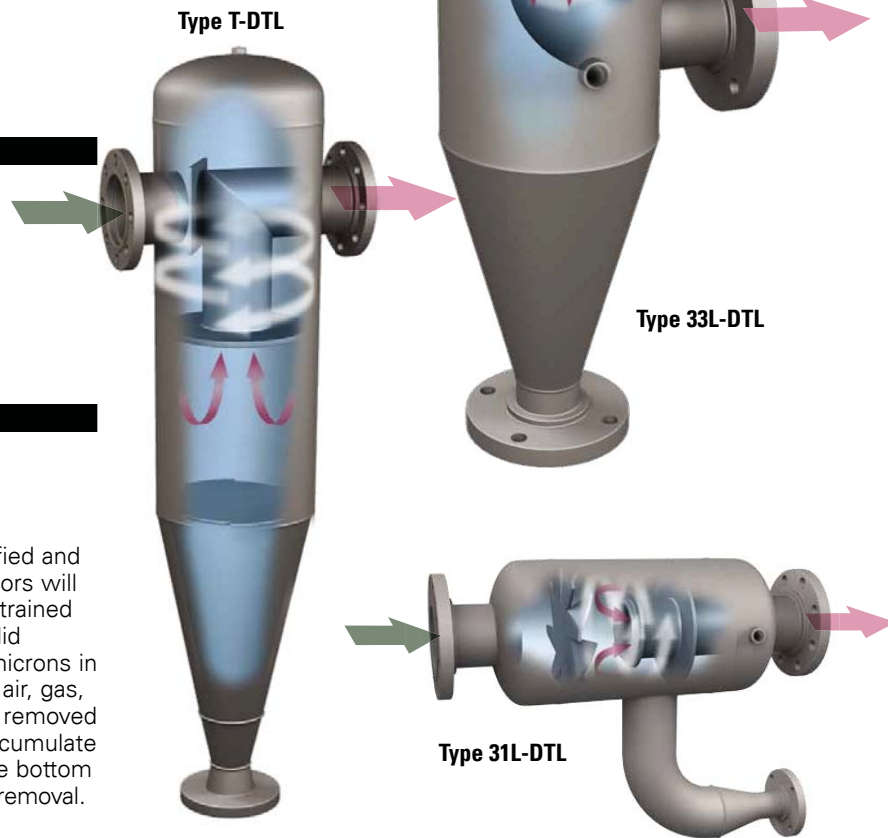
When correctly specified and installed, DTL separators will remove 99% of all entrained liquid droplets and solid particles that are 10 microns in size or larger from an air, gas, or steam stream. The removed particles and liquid accumulate at the drain port at the bottom of the drain sump for removal.

### Centrifugal Action

The Type DTL separators cause the gas stream to enter a controlled centrifugal flow, which forces any entrained liquids and solids to the outer wall. The exclusive Eaton Vortex Containment Plate (VCP) system shields these

separated particles and liquid droplets from the vortex action within the separator and directs them toward the drain sump. The exit stream is drawn from the clean, dry center of the separator. The VCP prevents re-entrainment of the removed liquids and solids and assures a clean, dry gas stream at the separator outlet.

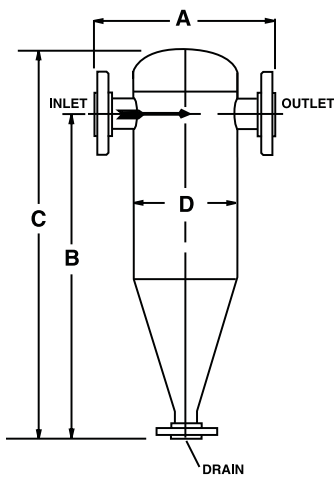
Type DTL Separators are available in three different configurations. The Type T-DTL has a straight-through flow connection, the 33L-DTL has a vertical downflow inlet and a horizontal outlet, and the 31L-DTL is a compact, straight-through flow design.



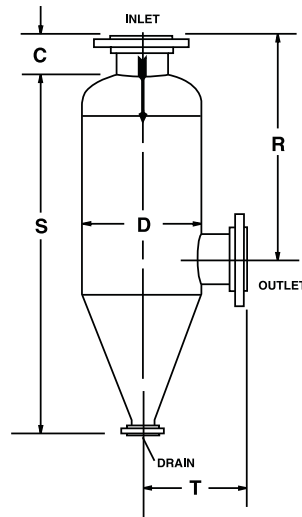
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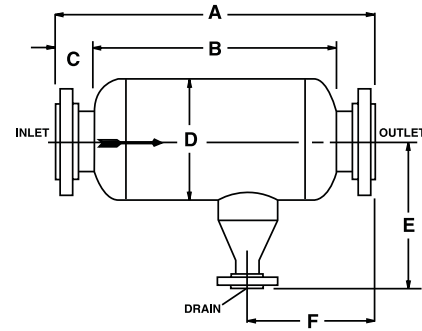
# DTL Dry Type Gas/Liquid Separators



Type T-DTL



Type 33L-DTL



Type 31L-DTL

## Dimensions: DTL Dry Type Gas/Liquid Separators (in/mm)

Pipe Size	A	B	C	D	Drain Flanged NPT
2	11.5 292	36 914	42 1067	6.62 168	2
2-1/2	16 406	37 940	43 1092	8.62 219	2
3	18 457	42 1067	50 1270	10.75 273	2-1/2
4	20 508	46 1168	55 1397	12.75 324	3
5	22 559	50 1270	60 1524	14 356	4
6	24 610	66 1676	77 1956	16 406	4
8	28 711	74 1880	87 2210	18 457	5
10	33 838	102 2591	117 2972	24 610	5
12	38 965	114 2896	131 3327	28 711	5
14	42 1067	118 2997	138 3505	32 813	8
16	47 1194	133 3378	154 3912	36 914	8

Pipe Size	C	D	R	S	T	Drain Flanged NPT
2	3 76	6.62 168	14 356	26 660	7 178	2
2-1/2	3 76	6.62 168	14 356	26.5 673	7 178	2
3	3 76	8.62 219	16 406	30 762	8 203	2-1/2
4	4 102	10.75 273	20 508	35 889	10 254	2-1/2
5	4 102	12.75 324	24 610	42 1067	11 279	3
6	4 102	14 356	27 686	52.5 1333	12 305	3
8	5 127	16 406	33 838	61 1549	13 330	4
10	5 127	20 508	40 1016	82 2083	15 381	4
12	5 127	24 610	46 1168	98 2489	17 432	5
14	5 127	28 711	52 1321	117 2972	19 483	8
16	5 127	30 762	59 1499	126 3200	20 508	8

Pipe Size	A	B	C	D	E	F	Drain Flanged NPT
2	22 559	16 406	3 76	6.62 168	16 406	11 279	2
2-1/2	22 559	16 406	3 76	6.62 168	16 406	11 279	2
3	24 610	18 457	3 76	8.62 219	17 432	11 279	2-1/2
4	30 762	22 559	4 102	10.75 273	19 483	13.5 343	2-1/2
5	34 864	26 660	4 102	12.75 324	21 533	14 356	3
6	36 914	28 711	4 102	14 356	22 559	14 356	3
8	46 1168	36 914	5 127	16 406	23 584	19 483	4
10	52 1321	42 1067	5 127	20 508	26 660	20.5 521	4
12	60 1524	50 1270	5 127	24 610	29 737	23.5 597	5
14	66 1676	56 1422	5 127	28 711	35 889	25 635	8
16	74 1880	64 1626	5 127	30 762	44 1118	28 711	8

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EF-G/L-10  
6-2012

# Type 40



**Type 40EHC (Cast)**

- Threaded or Flanged Connections
- Cast Iron, Carbon, or Stainless Steel Construction

## FEATURES

- Choice of Cast or Fabricated Construction
- Removes 99% of Liquid and Solid Entrainment Particles Larger Than 10 Microns
- No Required Maintenance
- Highly Efficient
- Virtually No Back Pressure

Eaton Type 40 Exhaust Heads are designed to separate entrained water and oil from exhaust air, gas, or steam prior to being discharged directly into the atmosphere. They remove more than 99% of liquids and solids over 10 microns in size from the discharged flow, reducing maintenance costs on roofs and surrounding objects.

connections. Size 4" models can be ordered with flanges or threads. The flange bolt holes are drilled to straddle the center line of the drain outlet. Flanges are cast integral with the body and have slotted holes, which are recessed to prevent the bolt heads from turning.

### Operation

Moisture-laden gas, air, or steam enters at the inlet of the exhaust head where it is directed into a centrifugal upward motion. The entrained solids and moisture droplets are separated out by a reduction in velocity and fall into a drain reservoir.

### Type 40EHMF Fabricated Carbon or Stainless Steel Construction

The Eaton Type 40EHMF Exhaust Head is welded at all joints to withstand heavy duty usage. These exhaust heads work at high temperatures and remain efficient even when steam or gas is discharged at high velocities. The Type 40EHMF has been designed to minimize the noise associated with high discharge velocities.

### Type 40EHC Rugged Cast Iron Construction

The Eaton Type 40EHC Exhaust Head is designed for long service life. Its body, cover and separating elements are made of high tensile strength cast iron. Sizes 3" and smaller have threaded NPT connections. 5" and larger have 125 lb. flanged

The units permit free flow of steam, gas or vapors with an absolute minimum of back pressure. They feature a separating element of 304/304L stainless steel, and the entire exhaust head can be ordered in 304/304L or 316/316L stainless steel if required.

**Type 40EHMF (Fabricated)**



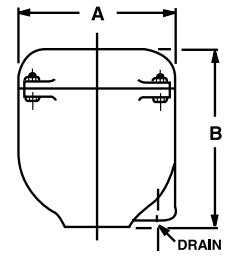
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# Type 40 Exhaust Heads

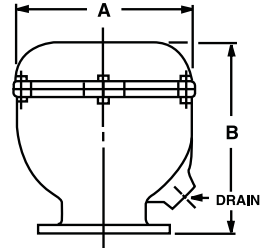
## Type 40EHC - Cast Iron

Dimensions: (in/mm)

	Pipe Size	Diameter A	Height B	Drain Connection (NPT)	Flange O.D.	Weight (lb/kg)	Capacity (lb) Exhaust Steam/Hr at Atmospheric Pressure (14.7 psia)	Capacity (SCFM) Exhaust Air at Atmospheric Pressure (14.7 psia)
Threaded Inlet	1	5.25 / 133	6.12 / 156	1/2	-	11 / 5	160	45
	1-1/2	5.25 / 133	6.12 / 156	1/2	-	11 / 5	370	100
	2, 2-1/2	7.5 / 190	8.87 / 225	3/4	-	25 / 12	1000	280
	3	8.75 / 222	11.25 / 286	3/4	-	40 / 18	2100	500
	4	10 / 254	11.87 / 302	1	-	50 / 23	2700	700
Flanged Inlet	4	10 / 254	15 / 381	1	9 / 229	68 / 31	2700	700
	5	13 / 330	14 / 356	1-1/2	10 / 254	90 / 41	4000	1100
	6	14.75 / 375	18.75 / 476	1-1/2	11 / 279	115 / 52	6000	1700
	8	18 / 457	20 / 508	2	13.5 / 343	190 / 86	10,500	2900
	10	23 / 584	24 / 610	2	16 / 406	335 / 152	16,000	4500



Threaded

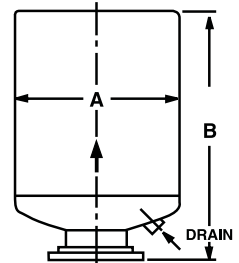


Flanged

## Type 40EHMF - Fabricated Carbon or Stainless Steel

Dimensions: (in/mm)

Pipe Size	Diameter of Outlet	A	B	Drain Size	Drain Type	Weight (lb/kg)	Capacity (lb) Exhaust Stream/Hr at Atmospheric Pressure (14.7 psia)	Capacity (SCFM) Exhaust Air at Atmospheric Pressure (14.7 psia)
2-1/2	2.5 / 63	8.62 / 219	16 / 406	1	NPT	55 / 25	1000	280
3	3 / 76	10.75 / 273	19 / 483	1-1/2	NPT	65 / 30	1600	410
4	4 / 102	14 / 356	24 / 610	1-1/2	NPT	100 / 45	2700	700
5	5 / 127	16 / 406	26 / 660	1-1/2	NPT	130 / 59	4000	1100
6	6 / 152	18 / 457	30 / 762	1-1/2	NPT	140 / 64	6000	1700
8	8 / 203	20 / 508	36 / 914	2	NPT	240 / 109	10,500	2900
10	10 / 254	24 / 610	42 / 1067	2	NPT	390 / 177	16,000	4500
12	12 / 305	30 / 762	48 / 1219	2-1/2	NPT	550 / 250	24,000	6500
14	14 / 356	36 / 914	54 / 1372	2-1/2	NPT	700 / 341	34,000	8800
16	16 / 406	40 / 1016	60 / 1524	3	NPT	850 / 386	44,000	11,500
18	18 / 457	42 / 1067	66 / 1676	3	NPT	1175 / 534	52,000	14,500
20	20 / 508	48 / 1219	72 / 1829	3	NPT	1500 / 682	66,000	17,000
24	24 / 610	54 / 1372	84 / 2134	4	Flanged	1850 / 841	94,000	26,000
30	30 / 762	72 / 1829	102 / 2591	4	Flanged	2100 / 955	145,000	40,000
36	36 / 914	78 / 1981	112 / 2845	4	Flanged	4500 / 2045	210,000	55,000
42	42 / 1067	96 / 2438	130 / 3302	4	Flanged	6100 / 2773	290,000	76,000
48	48 / 1219	102 / 2591	148 / 3760	4	Flanged	7800 / 3545	375,000	99,000



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EF-G/L-11  
6-2012

# Float Drain Traps

- Drain Condensate from Gas/Liquid Separators

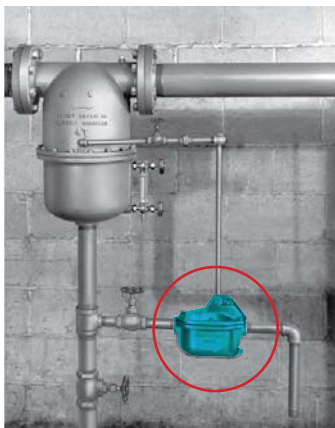
## FEATURES

- No Priming Required
- Stainless Steel Internal Parts
- Internal Parts Removed with Cover
- No Loss of Line Pressure
- Choice of Inlet/Outlet Configurations

## OPTIONS

- Heater for Low Temperature Applications

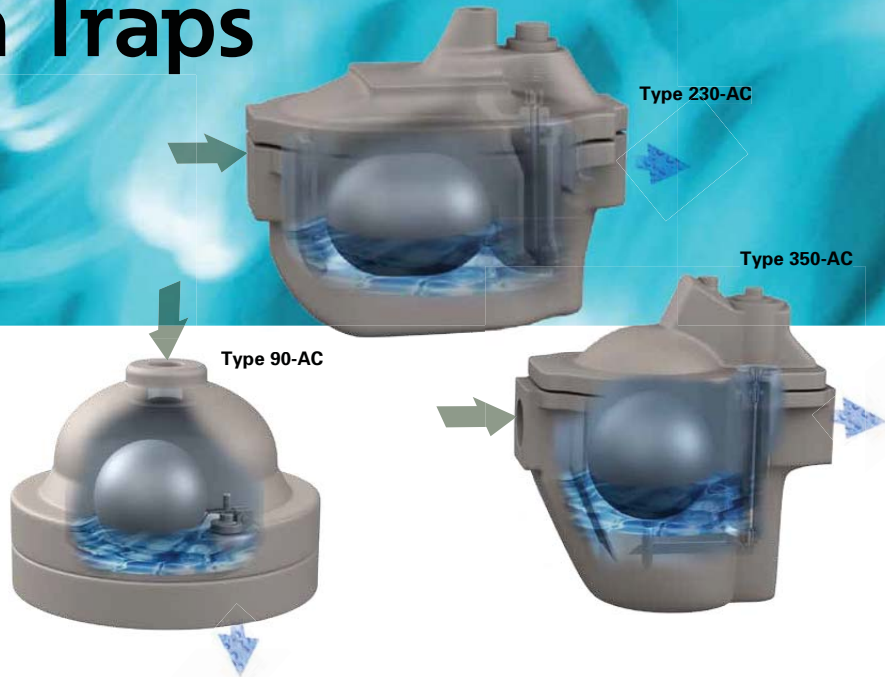
## Typical Float Drain Trap Installations



Type 230-AC Installation



Type 90-AC Installation



Eaton Float Drain Traps efficiently handle the liquids in the storage tanks and drip points of separators without pressure loss in the line. These traps are capable of removing up to 2800 pounds of condensate per hour and work with pressure differentials from 5 up to 250 psi.

### Type 90-AC and 95-AC Float Drain Traps

- Cast iron, cast carbon steel, or cast stainless steel for 0 to 500 psi service
- A positive water seal prevents loss of air or gas
- Straight-through design
- Internal parts, including the valve and seat, are corrosion-resistant, non-magnetic stainless steel
- Working parts are attached to the base for easy removal and inspection
- A side inlet/outlet configuration is available for iron, carbon steel, and stainless steel traps

### Type 230-AC Float Drain Traps

- Cast iron for 0 to 125 psi service, ideal where gummy emulsions or cylinder lubricants make other traps inoperative

- Vertical inlet, down-flow discharge design
- Ample float power and a large outward opening discharge valve prevent loss of pressure
- Internal parts are stainless steel, including a non-magnetic valve and seat
- Working parts are attached to the cover for easy removal without disconnecting the trap from the line.
- No priming is required
- For low temperature applications, a heater is available as an option

### Type 350-AC Float Drain Traps

These ball float traps feature a "Three-Traps-In-One" design. Three valves open and close progressively as condensate volume varies. When the float chamber water level rises, the ball float lies deep in the water until its buoyancy overcomes the opposing line pressure and snaps the valve wide open. When closing, as each valve approaches its seat, the line pressure snaps it tightly in place. These traps have cast iron bodies, and stainless steel, or copper internal parts.

# EATON

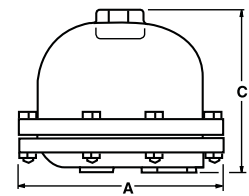
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# Float Drain Traps

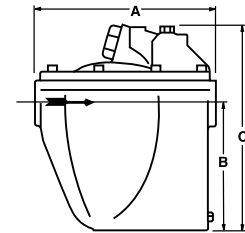
## Dimensions: Types 90, 95, 230 and 350 (in/mm)

Model No.	Pipe Size (NPT)	A	B	C	Width	---Weight (lb/kg)---		
						Cast Iron	Cast Steel	Stainless Steel
90-AC	3/4	6.12 / 155	—	4.87 / 124	5.12 / 130	19 / 8.6	—	—
90-AC-SI-SO	1/2	6.12 / 155	—	5.75 / 146	5.12 / 130	19 / 8.6	—	—
95-AC	1	7 / 178	—	6.12 / 155	6.12 / 155	19 / 8.6	19 / 8.6	19 / 8.6
230-ACN	1	9 / 229	3.63 / 92	7.5 / 190	5.63 / 143	25 / 11.3	—	—
350-ACN	1, 1-1/4, 1-1/2, 2*	14.38 / 365	8.5 / 216	15.38 / 391	9.25 / 235	81 / 36	—	—

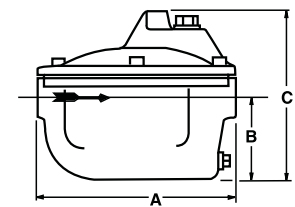
\* 1, 1-1/4, and 1-1/2 are bushed down from 2" size



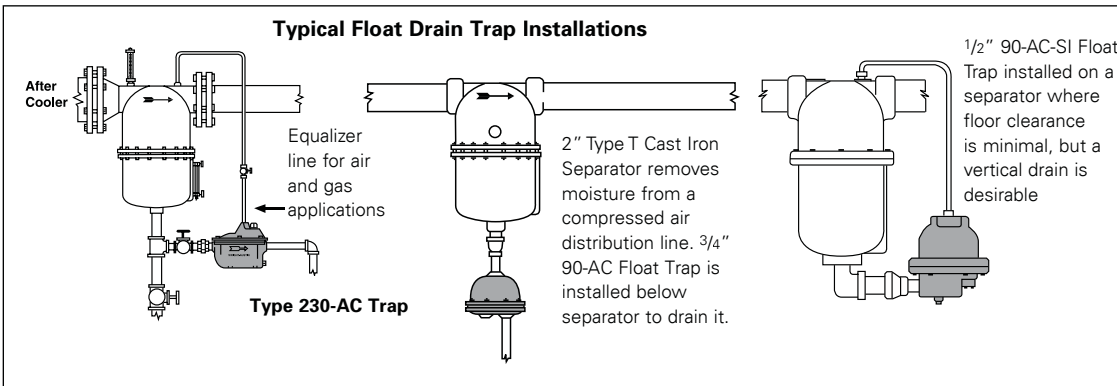
Type 90-AC



Type 350-ACN



Type 230-ACN



## Capacities: Condensate (lb/hr) at 70 °F - Types 90, 95, 230, and 350

Model No.	Orifice Diameter	Differential Pressure (psi). Specify on Order													
		5	10	25	50	75	100	125	150	175	200	250	300	500	
90-AC and 90-AC-SI-SO	5/32"	292	434	790	1273	1600	—	—	—	—	—	—	—	—	—
	1/8"	178	266	502	785	970	1130	1250	1370	1465	1550	1750	—	—	
	3/32"	97	147	265	427	545	625	697	760	815	870	965	—	—	
95-AC	5/32"	292	434	790	1273	1623	1850	2075	2250	2400	2575	2840	—	—	
	1/8"	178	266	502	785	970	1130	1280	1370	1465	1550	1750	1950	2500	
	3/32"	97	147	266	427	545	625	697	760	815	870	965	1060	1350	
230-AC	1/32"	396	595	1075	1733	2205	2525	2800	—	—	—	—	—	—	

Model No.	Orifice Diameter		Differential Pressure (psi). Specify on Order									
	Under 100 psi	Over 100 psi	5	10	25	50	75	100	125	150	175	200
350-AC	1/8"	3/32"	546	808	1464	2337	2985	3435	2085	2280	2445	2160
	9/64"	1/8"	702	1050	1804	2992	3787	4350	3825	4125	4410	4740
	5/32"	9/64"	877	1302	2370	3819	4867	5550	4860	5280	5400	6000
	3/16"	5/32"	1189	1785	3226	5201	6615	7575	6225	6750	7200	7400
	1/4"	7/32"	2145	3255	5771	9291	11,827	13,575	11,625	12,600	13,650	14,400

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EF-G/L-12  
6-2012

# TECHNICAL INFORMATION

## Gas/Liquid Separators

### Temperature Correction Factor

Temp °F	Factor
-20	0.904
-10	0.917
0	0.929
10	0.941
20	0.953
30	0.965
40	0.977
50	0.989
60	1.000
70	1.012
80	1.023
90	1.034
95	1.040
100	1.046
105	1.051
110	1.057
120	1.068
130	1.079
140	1.090
150	1.101
160	1.112
170	1.121
180	1.133
190	1.143
200	1.154
250	1.206
300	1.256
400	1.353
500	1.445
550	1.490
600	1.533
700	1.618
800	1.701
900	1.780
1000	1.858

### Specific Gravity Correction Factors

GAS	Symbol	M.W.	G	F <sub>g</sub>
Hydrogen	H <sub>2</sub>	2.0	0.069	0.344
Helium	He	4.0	0.138	0.452
Synthesis	75% H <sub>2</sub> 25% N <sub>2</sub>	8.5	0.295	0.611
Coke Oven	-	11.0	0.379	0.679
*Methane	CH <sub>4</sub>	16.0	0.551	0.788
Ammonia	NH <sub>3</sub>	17.0	0.586	0.808
Steam (Water Vapor)	H <sub>2</sub> O	18.0	0.621	0.826
*Natural Gas	75% CH <sub>4</sub> 25% N <sub>2</sub>	-	-	-
Acetylene	C <sub>2</sub> H <sub>2</sub>	26.0	0.897	0.957
Nitrogen	N <sub>2</sub>	28.0	0.950	0.986
Carbon Monoxide	CO	28.0	0.950	0.986
Air	-	29.0	1.00	1.00
Flue Gas	81%N <sub>2</sub> 19%CO <sub>2</sub>	31.0	1.08	1.027
Oxygen	O <sub>2</sub>	32.0	1.10	1.039
Argon	A	39.9	1.38	1.136
Propane	C <sub>3</sub> H <sub>8</sub>	44.1	1.52	1.182
*Carbon Dioxide	CO <sub>2</sub>	44.0	1.52	1.181
Nitrous Oxide	N <sub>2</sub> O	44.0	1.52	1.181
Butadiene	C <sub>4</sub> H <sub>6</sub>	54.1	1.86	1.284
Sulfur Dioxide	SO <sub>2</sub>	64.1	2.21	1.374
Chlorine	Cl <sub>2</sub>	70.9	2.45	1.431
Freon 12	CCl <sub>2</sub> F <sub>2</sub>	120.9	4.17	1.770

\* For applications involving gases (above 500 psi at 200 °F) so marked, contact Eaton to determine whether there is an additional correction factor for compressibility

$$1 \text{ psi} = 2.036'' \text{ Hg}$$

$$1'' \text{ Hg} = .4912 \text{ psi}$$

$$1 \text{ psi} = 27.71'' \text{ H}_2\text{O}$$

$$1'' \text{ H}_2\text{O} = .03613 \text{ psi}$$

### Symbol Key

- F<sub>g</sub> = Correction factor for specific gravity
- F<sub>t</sub> = Correction factor for temperature (See table on the inside page)
- G = Specific gravity
- MMSCFD= Million standard cubic feet per day
- MW = Molecular weight
- P<sub>a</sub> = Pressure (psia) at which volume is measured
- Q<sub>a</sub> = Rate of flow-standard cubic feet per minute (ACFM)
- Q<sub>c</sub> = Rate of flow-standard cubic feet per minute of equivalent air
- Q<sub>sg</sub> = Rate of flow-standard cubic feet per minute
- T = Operating temp. (°F)
- T<sub>a</sub> = Temperature (°F) at which volume is measured
- W = Rate of flow-pounds per hour

The Eaton Air Flow Chart on the next page is based on SCFM (cubic feet per minute of air measured at standard conditions of 14.7 psia and 60 °F). If any of the operating conditions are varied from the above, then correction factors must be applied.

To use the Air Flow Chart for applications involving other gases or

other than standard conditions, the following equation must be solved for Q<sub>c</sub>:

$$Q_c = Q_{sg} \times F_g \times F_t$$

In the event that Q<sub>sg</sub> is not provided in the proper form, any of the following equations may be used to arrive at the correct flow rate to insert in the above equation:

$$Q_{sg} = \frac{6.3 \times W}{MW}$$

$$Q_{sg} = \frac{35.7 \times Q_a \times P_a}{460 + T_a}$$

$$Q_{sg} \text{ (air only)} = .218 \times W$$

$$Q_{sg} = \frac{MMSCFD}{1440}$$

$$W = (\text{pounds mols/hour}) \times MW$$



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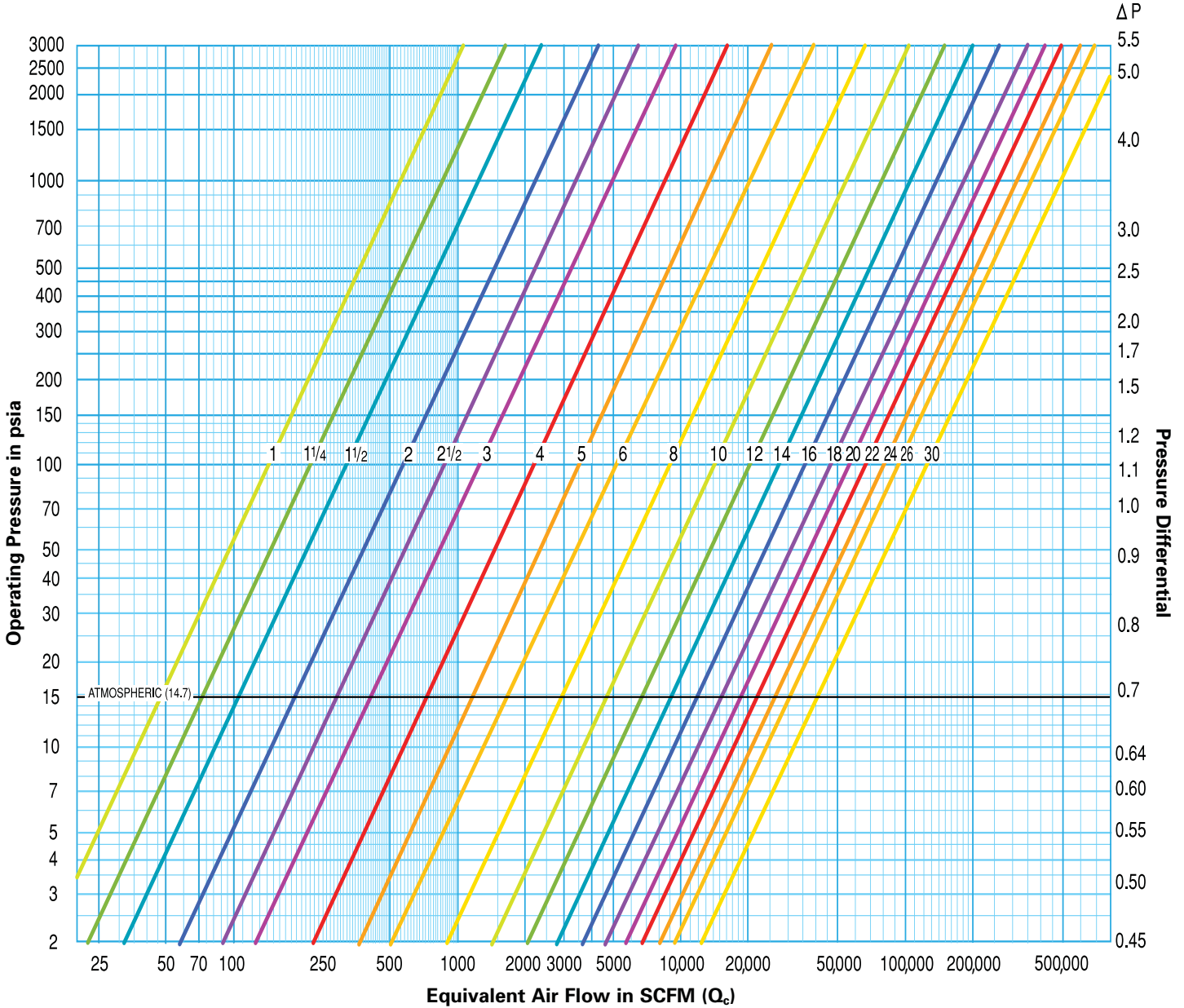
# TECHNICAL INFORMATION

## Gas/Liquid Separators

### Air Flow Capacity Chart

The values on the chart represent maximum recommended *Air Flow In Standard Cubic Feet Per Minute* through standard separators. The chart is based on SCFM (cubic feet per minute

of air measured at standard conditions of 14.7 psia and 60 °F). If any of the operating conditions are varied from these, consult Eaton.



$$\text{Actual Pressure Drop} = \left[ \frac{\text{Application's Equivalent Air Flow SCFM (Q}_c\text{)}}{\text{Separator's Maximum Rated Air Flow SCFM}} \right]^2 \times \text{Rated Pressure Drop (obtain from scale at the right side of this chart)}$$

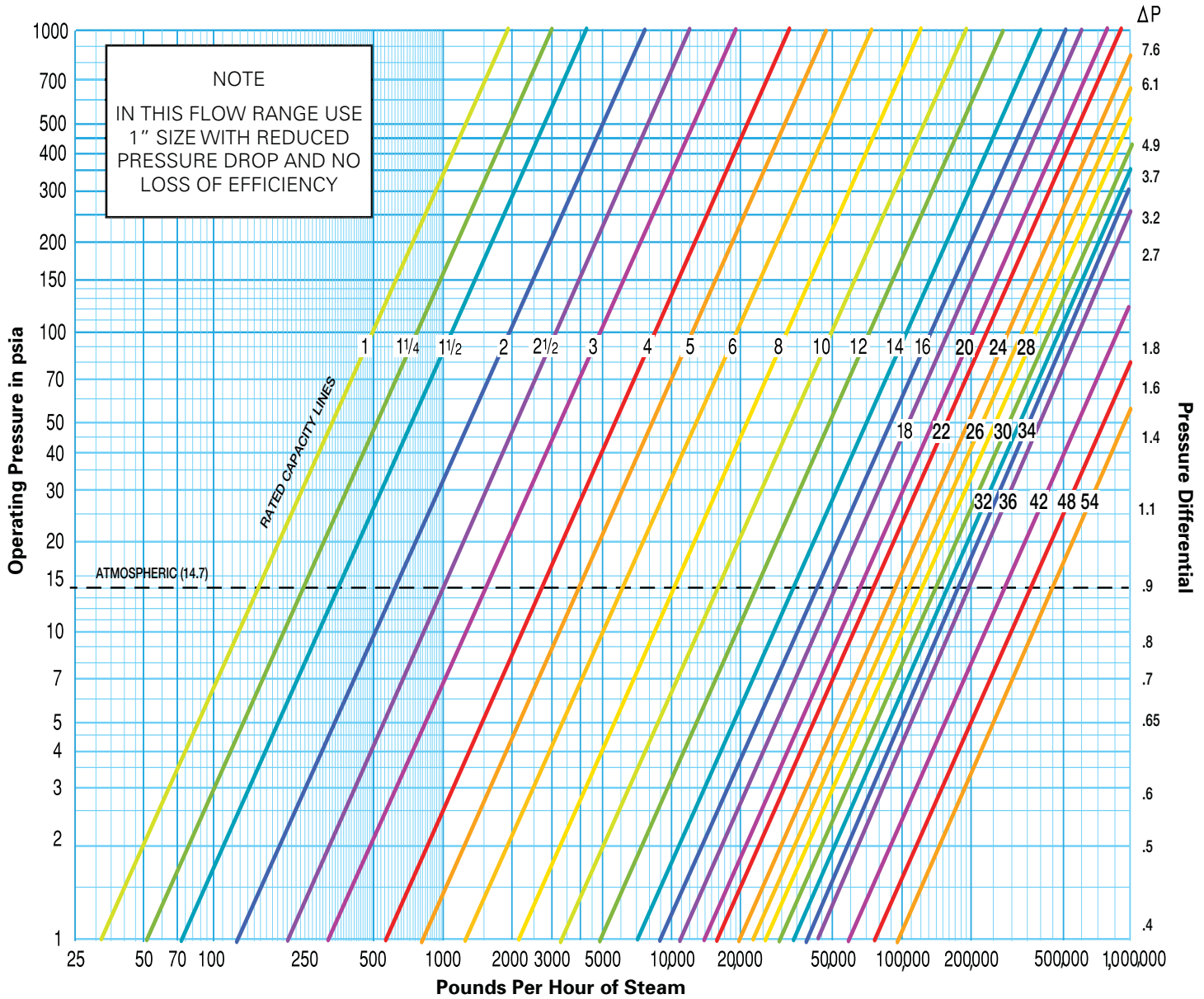
# TECHNICAL INFORMATION

## Gas/Liquid Separators

### Saturated Steam Flow Capacity Chart

The values on the chart represent maximum recommended saturated *Steam Flow in Pounds per Hour* through standard separators. The chart is based on SCFM (cubic feet per minute

of air measured at standard conditions of 14.7 psia and 60 °F). If any of the operating conditions are varied from these, consult Eaton.



$$\text{Actual Pressure Drop} = \left[ \frac{\text{Actual Steam Flow}}{\text{Rated Steam Flow}} \right]^2 \times \text{Rated Pressure Drop}$$

(obtain from scale at the right side of this chart)



# ENGINEERING SPECIFICATIONS

## Gas/Liquid Separators

### Type T, ST or STH Gas/Liquid Separators

All gas/liquid separators shall be constructed of (iron, carbon steel, stainless steel or other alloy) with threaded, flanged, or socket weld connections for pipe size \_\_\_\_\_. Construction shall be (cast, fabricated). Separators will remove 99% of entrained liquid or particulate matter 10 micron in size or larger when properly installed. Re-entrainment of separated material will be prevented by a Vortex Containment Plate. Options required are (integral trap, trap heating element, ASME UM or U Code Stamp, water gauge tap, thermometer tap, larger drain size). Separators shall be Eaton Type (T, ST, STH).



### Type 31L-ST Gas/Liquid Separators

All gas/liquid separators shall be cast iron construction with (threaded or flanged) piping connections for pipe size \_\_\_\_\_. Separators will remove 99% of all entrained liquid or particulate matter 10 micron in size or larger when properly installed. Separators to incorporate a Cempellar™ for efficient operation and a Vortex Containment Plate to prevent re-entrainment of separated material. All separators shall have an integral trap to save space and shall be capable of automatically ejecting the condensate at predetermined levels without loss of line pressure. Required options include (trap heater, ASME Code Stamp). Separators shall be Eaton Type 31L-ST.



### Type CLC Coalescer/Separators

All gas/liquid separators shall be of fabricated (carbon steel or other alloy) construction with flanged connections for pipe size \_\_\_\_\_. Separators will have a two-stage coalescer/separator design and remove 99% of all liquid and particulate matter 4 micron in size or larger when properly installed. Separators to incorporate a de-mister pad and a Cempellar™ for efficient operation as well as a Vortex Containment Plate to prevent re-entrainment of separated material. Required options are (ASME Code Stamp). All Coalescer/Separators shall be Eaton Type CLC, 31, 35 or 36.



### Exhaust Heads

All exhaust heads shall be (cast iron), (fabricated carbon steel, stainless steel or other alloy) construction with (threaded or flanged) piping connections for pipe size \_\_\_\_\_. Exhaust heads will remove 99% of all entrained liquid or particulate matter 10 micron in size or larger when properly installed. All exhaust heads will be designed so that there will be no required maintenance and have a Vortex Containment Plate to prevent the re-entrainment of separated material. Exhaust heads shall be Eaton Type 40EHC or Type 40EHMF.



### Type 30L Series Gas/Liquid Separators

All gas/liquid separators shall be of fabricated (carbon steel, stainless steel or other alloy) with flanged connections for pipe size \_\_\_\_\_. Separators will remove 99% of entrained liquid or particulate matter 10 micron in size or larger when properly installed. Separator design shall incorporate a Cempellar™ for efficient operation. Re-entrainment of separated material will be prevented by a Vortex Containment Plate. Options required are (oversize inlet connections, reduced size inlet and outlet connections, specified flow pattern, integral sump, ASME code stamp). Separators shall be Eaton Type 30L Series.



### Type 10-R Series Gas/Liquid Separators

All gas liquid separators shall be fabricated (carbon steel or other alloy) construction with flanged connections for pipe size \_\_\_\_\_. Separators will remove 99% of all entrained liquid or particulate matter 10 micron in size or larger when properly installed. Separators shall have a two-stage design for separating large volumes of liquid and be capable of handling liquid slugs. Re-entrainment of separated material will be prevented by a Vortex Containment Plate. All separators will have an ASME Code Stamp. Required options are (support stand, multiple inlets/outlets). Separators shall be Eaton Type 10-R Series standard or compact.

### Type DTL Gas/Liquid Separators

All gas/liquid separators shall be fabricated (carbon steel, stainless steel or other alloy) construction with flanged connections for pipe size \_\_\_\_\_. Separators will remove 99% of all liquid or entrained particulate matter 10 micron in size or larger when properly installed. Separators to be specially designed to handle larger than normal solid loads and have a conical shaped sump to better collect solids. Separators shall have a Vortex Containment Plate to prevent re-entrainment of separated material. All separators shall be Eaton Type T-DTL, 33L-DTL, or 31L-DTL.



### Float Drain Traps

All float drain traps shall be cast (iron or stainless steel) with stainless steel internal parts and threaded connections for pipe size \_\_\_\_\_. Traps to require no priming and all internal parts should be attached to and removable with the cover without disconnection the trap from the line. All traps shall have corrosion resistant stainless steel, nonmagnetic valves and seats. Traps to be Eaton Model 90AC, 95AC, 230AC or 350AC.



### Type 60-I and 70-I Internal Separators

All gas/liquid separators shall be of the internal design type and fabricated of (carbon steel, stainless steel or other alloy) with Type 304L stainless steel blades. Separators shall remove 99% of all entrained liquid or particulate matter 10 micron in size or larger when properly installed. Separators shall have an (upflow, down-flow) design configuration. Separators to be Eaton Type 60-I or 70-I.

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EF-G/L-13  
6-2012

# Application Data Sheet

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

E-Mail: \_\_\_\_\_

## Product(s) of Interest

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Cast ST and T Type Separators | <input type="checkbox"/> Fabricated L and T Type Separators  | <input type="checkbox"/> Exhaust Heads |
| <input type="checkbox"/> Cast LST Type Separators      | <input type="checkbox"/> Receiver & Coalesce Type Separators |  |
| <input type="checkbox"/> Air & Gas Drain Traps         | <input type="checkbox"/> Air Vents                           | <input type="checkbox"/> Accessories   |

## Application Parameters

Pipe Size: \_\_\_\_\_ in \_\_\_\_\_ mm

Flow Medium:  Air  Steam  Natural Gas  Other \_\_\_\_\_

Volumetric Flow: \_\_\_\_\_ SCFM \_\_\_\_\_ MMSCFD \_\_\_\_\_ NM<sup>3</sup>/hr

Weight Flow: \_\_\_\_\_ lb/hr \_\_\_\_\_ kg/hr

Average Molecular Weight: \_\_\_\_\_

Minimum Operating Pressure: \_\_\_\_\_ psig \_\_\_\_\_ kg/cm<sup>2</sup> \_\_\_\_\_ bar

Maximum Operating Temperature: \_\_\_\_\_ °F \_\_\_\_\_ °C

Flow Configuration Preference:  Vertical Flow  Horizontal Flow

Design Pressure of Vessel: \_\_\_\_\_ psig \_\_\_\_\_ kg/cm<sup>2</sup> \_\_\_\_\_ bar

Design Temperature of Vessel: \_\_\_\_\_ °F \_\_\_\_\_ °C

Maximum Entrained Liquid: \_\_\_\_\_ lb/hr \_\_\_\_\_ gpm \_\_\_\_\_ kg/hr

End Connections Req'd:  Threaded  Flanged  Socket Weld

125 lb  150 lb  300 lb  Other \_\_\_\_\_

Materials of Construction:  Cast Iron  Carbon Steel  304L SS  316L SS

Other \_\_\_\_\_

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