

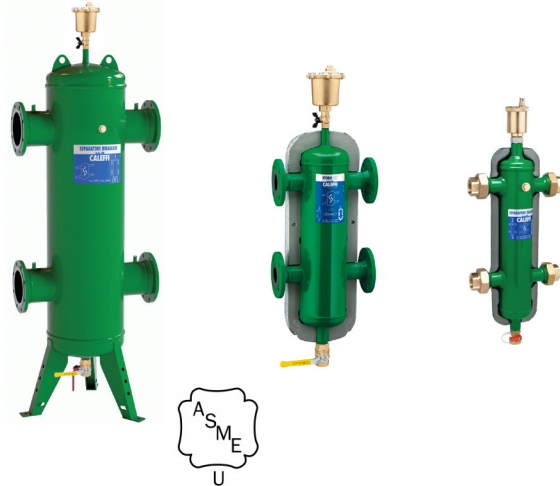
Hydro separator

548 and NA548 series



01076/14 NA

Replaces 01076/08 NA



Function

The Caleffi 548 and NA548 series hydraulic separator creates a zone with a low pressure loss, which enables primary and secondary circuits connected to it to be hydraulically independent of each other; **the flow in one circuit does not create a flow into the other**. This device consists of several different functional components, each of which meets specific requirements, typical of the circuits used in heating and air-conditioning systems.

- **Hydraulic separator** - To keep connected hydronic circuits totally independent from each other.
- **Dirt remover** - To permit the separation and collection of any impurities present in the circuits. Provided with a valved connection with discharge piping.
- **Automatic air vent valve** - For automatic venting of any air contained in the circuits. Provided with a valved connection for maintenance purposes.

Product range

548 series	Hydraulic separator in steel with union connections, drain and insulation.....connections 1" to 2" union sweat
	1 to 2" NPT female
548 series	Hydraulic separator in steel with flanged connections, drain and insulation.....connections 2" to 4" ANSI
NA548 series	Hydraulic separator in steel with flanged connections, drain and insulation ASME and CRN.....connections 2" to 4" ANSI
NA548 series	Hydraulic separator in steel with flanged connections and drain, ASME and CRN.....connections 5" to 12" ANSI*

*Larger sizes available, consult factory

Technical specifications

Threaded and sweat connections

Connections - main:	1", 1¼", 1½", 2" NPT female union
	1", 1¼", 1½", 2" sweat union
- drain valve:	¾" garden hose thread
- thermo well tap:	½" straight thread female
Materials	
- separator body:	epoxy resin painted steel
- internal baffle	300 series stainless steel
- air vent body:	brass
- shut off and drain valve body:	brass

Performance

Suitable fluids:	water and non-hazardous glycol solution up to 50%
Max. operating pressure:	150 psi (10 bar)
Working temperature range with insulation:	32–210°F (0–100°C)
Working temperature range without insulation:	32–250°F (0–120°C)

Agency approval

Series NA548 is designed and built in accordance with Section VIII, Division 1 of the ASME Boiler and Pressure Vessel Code and tagged and registered with the National Board of Boiler and Pressure Vessel Inspector, and CRN registered, and stamped for 150 psi (10 bar) working pressure, with ASME U stamp.

Technical specifications of insulation

Materials:	double density closed cell expanded PEX
Thickness:	3/4" (20 mm)
Density:	- internal part: 2 lb/ft³ (30 kg/m³)
	- external part: 3.1 lb/ft³ (50 kg/m³)
Thermal conductivity:	32°F (0°C): 9 BTU-in/hr-ft²·°F (0.038 W/(m·K))
	-40°F (-40°C): 11 BTU-in/hr-ft²·°F (0.045 W/(m·K))
Coefficient of resistance to the diffusion of vapor:	>1,300
Temperature range:	32–210°F (0–100°C)
Reaction to fire (DIN4102):	class B 2

Flanged connections

Connections - main:	2"-12"ANSI B16.5 150 CLASS RF
- drain valve:	2 — 6": 1¼" NPT female
	8 — 12": 2" NPT female
- thermo well tap (8 — 12" only):	
- front center:	¾" NPT female
- inlet/outlet flanges:	½" NPT female
Materials	
- separator body:	epoxy resin painted steel
- air vent body:	brass
- shut off and drain valve body:	brass
- internal baffle:	300 series stainless steel

Performance

Suitable fluids:	water and non-hazardous glycol solution up to 50%
Max. operating pressure:	150 psi (10 bar)
Working temperature range with insulation:	32–220°F (0–105°C)
Working temperature range without insulation (vessel):	32–270°F (0–132°C)

Technical specifications of insulation, flanged versions to 4"

Internal part

Materials:	rigid closed cell expanded polyurethane foam
Thickness:	2 3/8" (60 mm)
Density:	2.8 lb/ft³ (45 kg/m³)
Thermal conductivity:	6 BTU-in/hr-ft²·°F (0.023 W/(m·K))
Temperature range:	32–220°F (0–105°C)

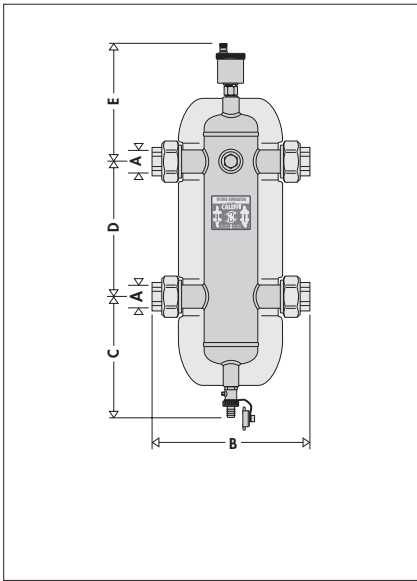
Outer part

Materials:	embossed aluminum
Thickness:	7.0-mil (0.7 mm)
Reaction to fire (DIN 4102):	class 1

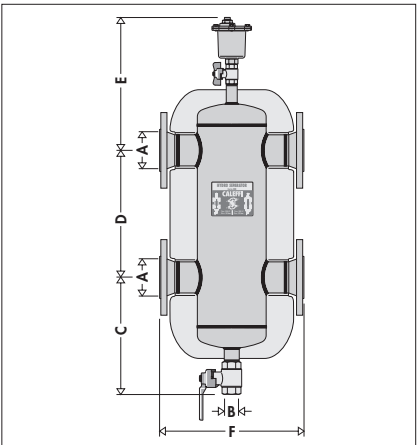
Head covers

Heat formed materials:	PS
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Dimensions

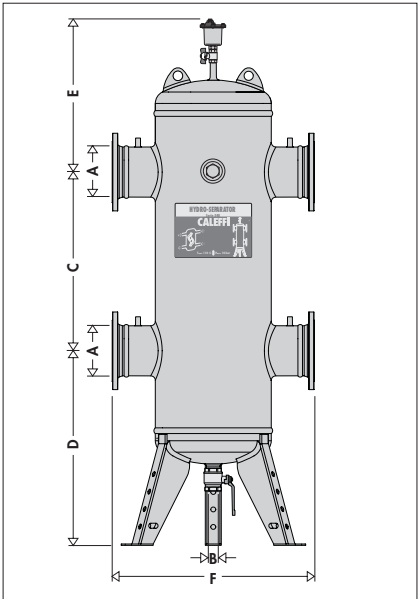


Code	A	B	C	D	E	Weight (lb)	Flow (gpm)	Vol. (gal)
548006A/96A	1"	8 3/4"	6 1/4"	8 5/8"	8"	13	11	0.5
548007A/97A	1 1/4"	9 3/8"	7 3/8"	9 1/2"	8 3/8"	17	18	0.7
548008A/98A	1 1/2"	10 7/8"	7 3/4"	10 1/4"	8 3/4"	25	26	1.3
548009A/99A	2"	12"	10 1/8"	11 7/8"	9 1/2"	27	37	3.5



Code	A	B	C	D	E	F	Weight (lb)	Flow (gpm)	Vol. (gal)
548052A	2"	1 1/4"	13"	13"	15"	14"	75	60	4.0
548062A	2 1/2"	1 1/4"	13"	13"	15"	14"	82	80	4.0
548082A	3"	1 1/4"	15"	18"	17"	18"	112	124	8.0
548102A	4"	1 1/4"	15"	18"	17"	18"	117	247	8.0
NA548120A*	5"	1 1/4"	15"	22"	19"	25"	220	300	22.5
NA548150A*	6"	1 1/4"	15"	22"	19"	25"	231	484	23.2

*Without insulation
NA prefix indicates ASME tagged and registered with the National Board of Boiler and Pressure Vessel Inspectors and CRN registered, with ASME U stamp.
Add NA prefix to 2" to 4" flanged connection for ASME approved, CRN registered.



Code	A	B	C	D	E	F	Weight (lb)	Flow (gpm)	Vol. (gal)
NA548200A	8"	2"	39 3/8"	33 7/8"	27 1/2"	35 1/2"	520	792	95
NA548250A	10"	2"	43 5/16"	35 7/8"	30"	41 3/4"	725	1330	175
NA548300A	12"	2"	47 1/4"	37 7/8"	31 1/2"	47 3/4"	1,100	1,850	255

For larger sizes, consult with factory.

Operating principle

When a single system contains a primary production circuit, with its own pump, and a secondary user circuit, with one or more distributions pumps, operating conditions may arise in the system whereby the pumps interact, creating abnormal variations in circuit flow rates and pressures.

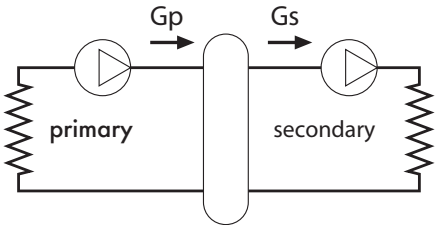
The hydraulic separator creates a zone with a low pressure loss, which enables the primary and secondary circuits connected to it to be hydraulically independent of each other; **the flow in one circuit does not create a flow in the other if the pressure loss in the common section is negligible.**

In this case, the flow rate in the respective circuits depends exclusively on the flow rate characteristics of the pumps, preventing reciprocal influence caused by connection in series.

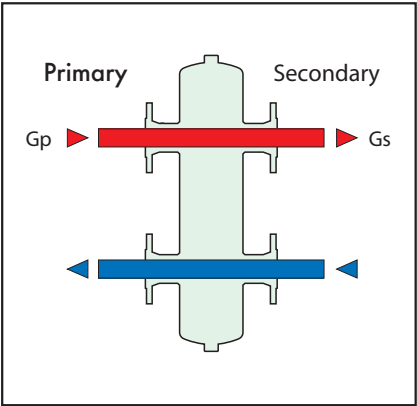
Therefore, using a device with these characteristics means that the flow in the secondary circuit only circulates when the relevant pump is on, permitting the system to meet the specific load requirements at that time.

When the secondary pump is off, there is no circulation in the secondary circuit; the whole flow rate produced by the primary pump is by-passed through the separator.

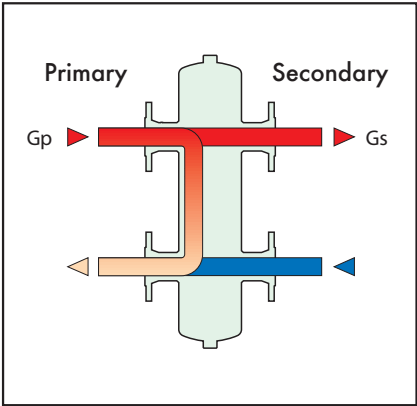
With the hydraulic separator, it is therefore possible to have a primary production circuit with a constant flow rate and a secondary distribution circuit with a variable flow rate; these operating conditions are typical of modern heating and cooling systems.



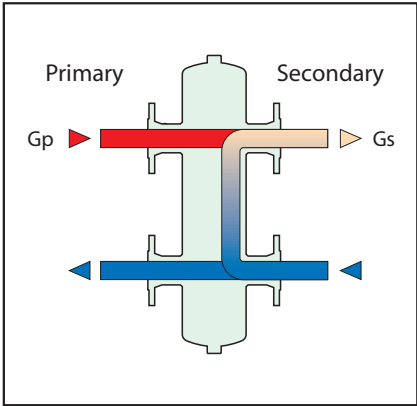
Three possible hydraulic balance situations are shown below.



$G_{\text{primary}} = G_{\text{secondary}}$

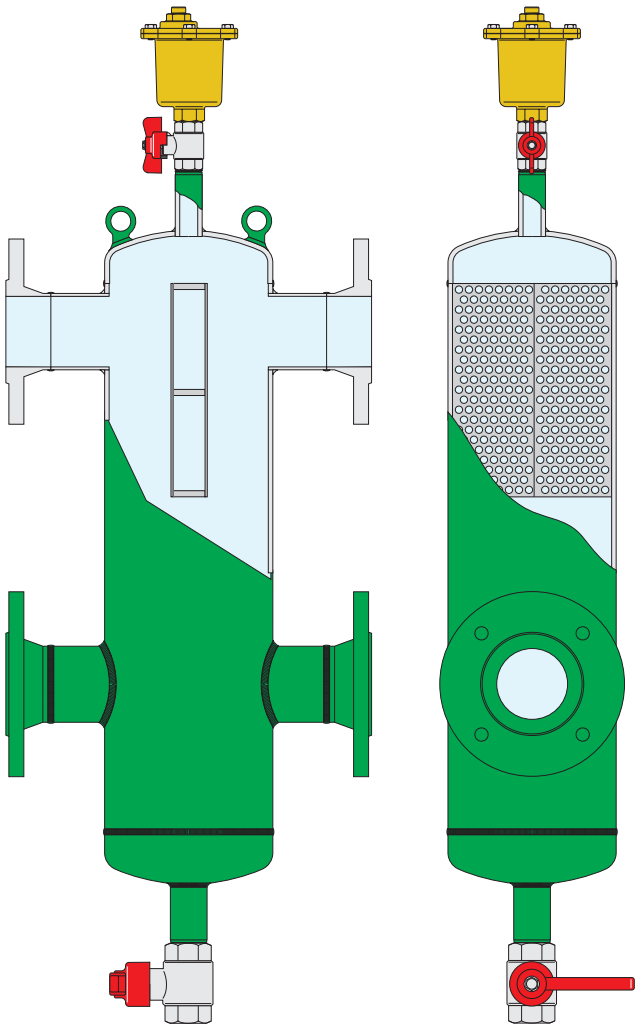


$G_{\text{primary}} > G_{\text{secondary}}$



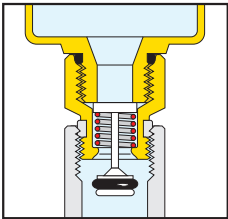
$G_{\text{primary}} < G_{\text{secondary}}$

Construction details



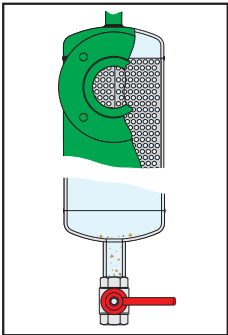
Isolating the air vent valve

In flanged separators, the air vent is isolated manually, using a shut-off ball valve. In union separators, however, the air vent body is automatically isolated by the check valve, which closes when the air vent body is removed.



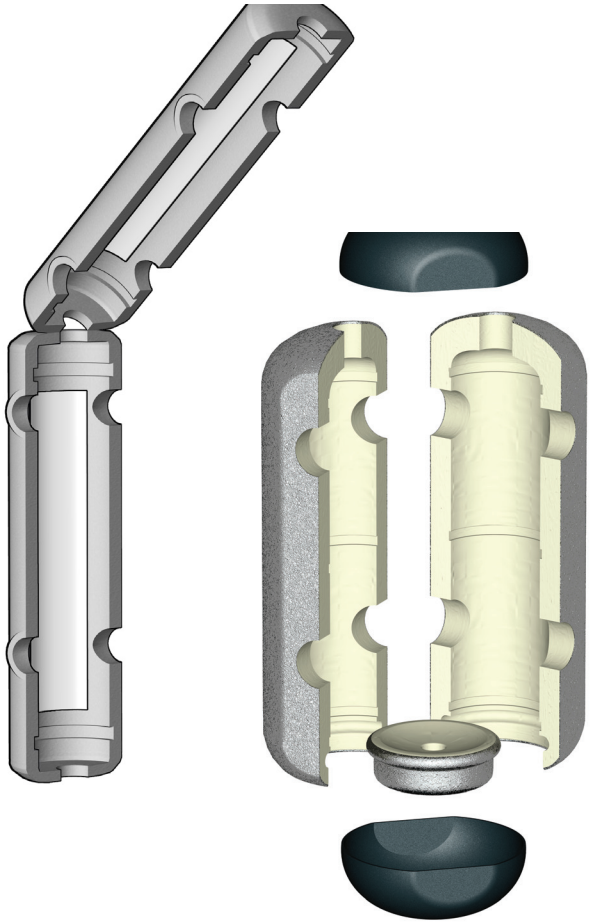
Dirt removing element

A vital function of the hydraulic separator is performed by the dirt removing element inside the device. This makes it possible to separate and collect any impurities which may be present in the system. These impurities are removed by means of the drain valve, which can be connected to a discharge pipe, placed at the bottom of the separator.



Insulation

Hydraulic separators are available complete with a hot preformed insulation shell. In the flanged series, up to 4", the insulation is made of a shell in expanded polyurethane foam covered with an aluminium layer. In the union sweat or thread version the insulation is made of a pre-formed shell in double density closed cell expanded PEX. This insulation ensures not only perfect heat insulation but also the tightness required to prevent atmospheric water vapors from entering the unit. For these reasons, this type of insulation can also be used in cooling water circuits, as it prevents the formation of condensate on the surface of the separator body.



Hydraulic characteristics

The hydraulic separator should be sized according to the maximum flow rate value at the inlet. The selected design value must be the greatest required flow rate of either the primary circuit or the secondary circuit.

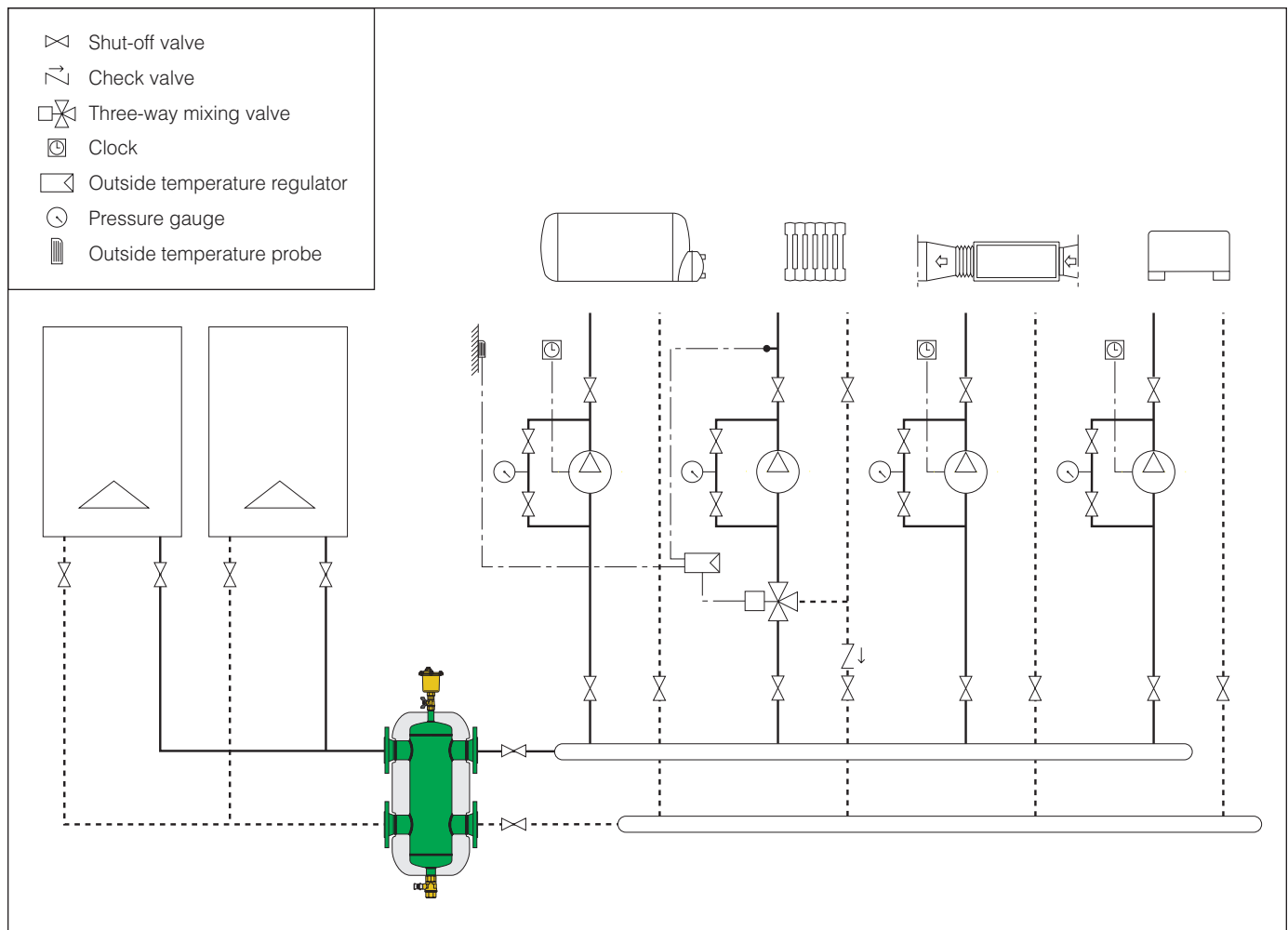
Union connections

Size	1"	1 1/4"	1 1/2"	2"
gpm	11	18	26	37
m³/h	2.5	4	6	8.5
l/s	0.7	1.1	1.6	2.3

Flanged connections

Size	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"
gpm	60	80	124	247	300	484	792	1330	1850
m³/h	14	18	28	56	68	110	180	302	420
l/s	3.8	5.0	7.8	16	19	30	50	84	117

Application diagram



SPECIFICATION SUMMARIES

Hydro Separator 548 series

Hydraulic separator. NPT and sweat union connections 1", 1-1/4", 1-1/2" and 2". Epoxy resin painted steel body. 300 series stainless steel internal baffle. Working temperature range of 32–210°F (0–100°C) with insulation, 32–250°F (0–120°C) without insulation. Glycol maximum 50%. Max. working pressure 150 psi (10 bar). Supplied with: automatic air vent with automatic service check valve 1/2" NPT female outlet connection and brass body. Drain ball valve brass body with hose connection. Pre-formed double density closed cell expanded PE-X foam shell insulation with external embossed aluminium cover. 1/2 inch female straight thread thermometer pocket well front center.

Hydro Separator 548 series

Hydraulic separator. ANSI B16.5 CLASS 150 RF flanged connections 2", 2-1/2", 3", and 4". Epoxy resin painted steel body. 300 series stainless internal baffle. Vessel working temperature range of 32–220°F (0–105°C) with insulation, 32–270°F (0–132°C) without insulation. Glycol maximum 50%. Max. working pressure 150 psi (10 bar). Supplied with: automatic air vent with 3/4" NPT female outlet connection and brass body. Brass body 3/4" NPT female shut-off ball valve with T-handle for air vent. Drain ball valve brass body with 1-1/4" NPT female connection. Rigid closed cell expanded polyurethane foam shell insulation with external embossed aluminium cover.

Hydro Separator NA548 series

Hydraulic separator. ANSI B16.5 CLASS 150 RF flanged connections 2", 2-1/2", 3", 4", 6", 8", 10" and 12". Epoxy resin painted steel body. 300 series stainless steel internal baffle. Vessel working temperature range of 32–220°F (0–105°C) with insulation, 32–270°F (0–132°C) without insulation. Glycol maximum 50%. Max. working pressure 150 psi (10 bar). Supplied with: automatic air vent with 3/4" NPT female outlet connection and brass body. Brass body 3/4" NPT female shut-off ball valve for air vent. Drain ball valve brass body with 1-1/4" NPT female connection for separator sizes 2–6"; 2" NPT female connections for separator size 8–12". For separator size 8–12" only thermometer pocket well on front center 3/4" NPT female; and on inlet/outlet flanges 1/2" NPT female. Rigid closed cell expanded polyurethane foam shell insulation with external embossed aluminium cover for 2, 2-1/2, 3 and 4 inch sizes. The separator is designed and built in accordance Section VIII, Division 1 of the ASME Boiler and Pressure Vessel Code and tagged and registered with the National Board of Boiler and Pressure Vessel Inspector, and CRN registered, and stamped for 150 psi (10 bar) working pressure, with ASME U stamp.

We reserve the right to change our products and their relevant technical data, contained in this publication, at any time and without prior notice.