



## HYDROCAL™ Combination Air, Dirt and Hydraulic Separator

### 549 and NA549 series

#### Function

The Caleffi HYDROCAL™ combination air, dirt and hydraulic separator is a device that combines high performance air and dirt removal with hydraulic separation. Primary and secondary circuits connected to it become hydraulically decoupled thus eliminating pump conflict.

A proven, time tested stainless steel internal coalescing element continuously and automatically eliminates all entrained air, including microbubbles, in the system. Air discharge capacity is very high. Over time, dirt particles as tiny as 5 microns are separated and drop to the bottom of the body where they collect.

The 3 in 1 high performance functionality of the HYDROCAL saves system installation and maintenance cost as there is no need to include a separate air and dirt separators. It can be used on either hot or chilled water systems.

#### Flow rate

Size	2"	2 1/2"	3"	4"	6"
gpm	37	62	94	148	376
l/s	2.3	3.9	5.9	9.3	23.7

#### Product range

**549 Series** Combination Air, Dirt and Hydraulic Separator with ANSI flanged connections and insulation. Size 2", 2-1/2", 3" and 4"

**NA549 Series** Combination Air, Dirt and Hydraulic Separator with ANSI flanged connections, ASME Registered. With insulation: Size 2", 2-1/2", 3" and 4"  
Without insulation: Size 6"

### 549 and NA549 series

Reference documentation: Tech. broch. 01178

#### Technical specification

<b>Materials:</b>	
Separator body:	Epoxy resin painted steel
Air vent body:	Brass
Shut-off and drain valve body:	Brass
Internal element:	Stainless steel
Air vent seal:	VITON
Air vent float:	Stainless steel
Suitable fluids:	Water and non-hazardous glycol solutions up to 50%
Max. operating pressure:	150 psi (10 bar)
Temperature range:	
With insulation:	32 - 220°F (0 - 105°C)
Without insulation:	32 - 250°F (0 - 120°C)
Particle separation capacity:	to 5 µm
<b>Connections:</b>	
Flanged:	2" – 6" ANSI B16.5 CLASS 150 RF

#### Technical specifications of insulation

##### Inner part

Material:	rigid closed cell expanded polyurethane foam
Thickness:	2 3/8" (60 mm)
Density:	3 lb/ft <sup>3</sup> (45 kg/m <sup>3</sup> )
Conductivity (ISO 2581):	0.16 BTU/in (0.023 W/(m·K))
Temperature range:	32–220°F (0–105°C)

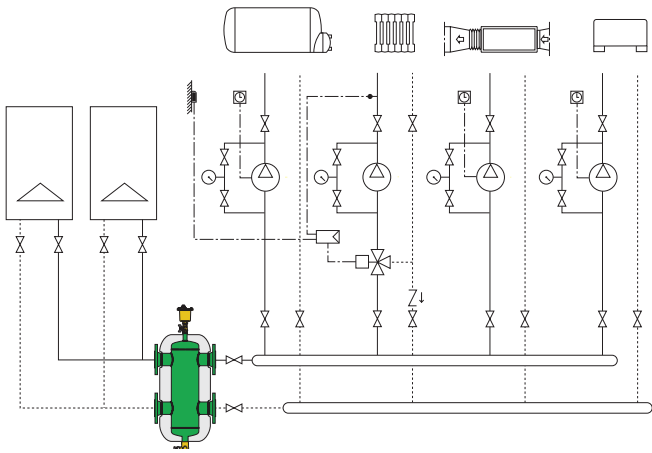
##### Outer part

Material:	Embossed aluminium
Thickness:	7-mil (0.70 mm)
Fire resistance (DIN 4102):	Class 1

##### Head covers

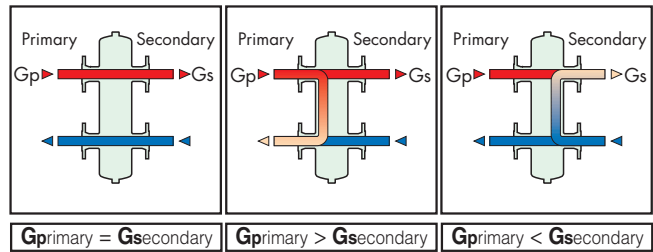
Heat formed material:	PS
-----------------------	----

## Application diagram



with a constant flow rate and a secondary distribution circuit with a variable flow rate. This is typical of modern heating and cooling systems.

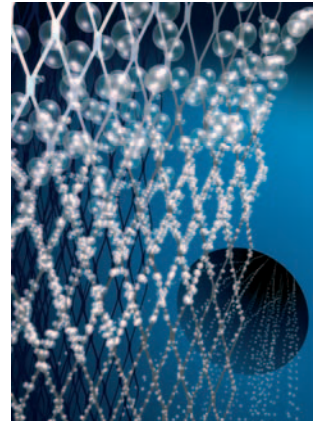
Three possible hydraulic balance situations are shown below.



## Microbubble air separation

The HYDROCAL's internal element (1) creates the whirling movement required to facilitate the release of microbubbles and their adhesion to the internal element surfaces.

The bubbles, fusing with each other, increase in size until the hydrostatic thrust overcomes the adhesion force to the mesh. They rise toward the top of the unit from which they are released through a float-operated automatic air vent.

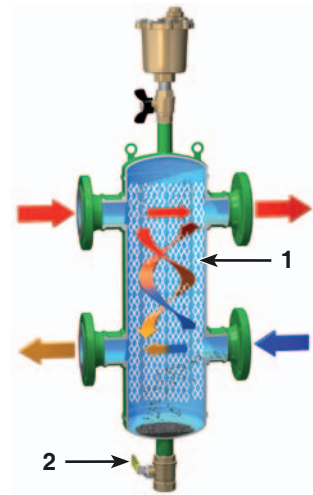


## Microparticle dirt separation

Impurities in the fluid upon striking the surfaces of the HYDROCAL's internal element (1), get separated and drop to the bottom of the body where they collect.

In addition, the large internal volume of HYDROCAL slows down the flow speed of the fluid thus helping, by gravity, to separate the particles it contains.

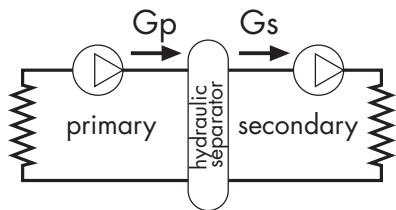
The collected impurities are discharged by opening the drain valve (2) with the handle, even with the system operating.



## Operating principal

### Hydraulic separation

Abnormal variations in circuit flow rates and pressures may occur when a single system consists of a primary and secondary circuit, each having separate pumps. The hydraulic separator creates a low pressure loss zone enabling the primary and secondary circuits to be hydraulically independent of each other. **The flow in one circuit does not affect flow in the other.**



The flow rate in each circuit depends solely on the flow rate characteristics of that circuit's pump, preventing pump conflict caused by other pumps within the system. Therefore, flow in the secondary circuit only occurs when that circuit's 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 entire flow rate produced by the primary pump is bypassed through the hydraulic separator. Therefore, it is possible to have a primary production circuit

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

Caleffi North America, Inc. • 3883 W Milwaukee Road • Milwaukee, WI 53208 • Tel: 414-238-2360 • Fax: 414-238-2366

[www.caleffi.us](http://www.caleffi.us) / [sales@caleffi.com](mailto:sales@caleffi.com)

© Copyright 2010 Caleffi North America, Inc.