

## DISCALDIRT® air and dirt separator

### 546 Series

### Installation, commissioning and servicing instructions



#### Function

Air and dirt separators are used to continuously remove the air and debris contained in the hydronic circuits of heating and cooling systems. The air discharge of these devices is very high. They are capable of automatically removing all of the air present in the system down to the micro-bubble level. The DISCALDIRT® air and dirt separator also separates any solid impurities in the system. The impurities collect at the bottom of the device and can be removed through the drain pipe for the steel versions, to which a separately sourced drain valve can be mounted, or drain shut-off valve for the brass version. The circulation of fully de-aerated and cleaned water enables the equipment to operate under optimum conditions, free from noise, corrosion, localized or mechanical damage.

#### Product range

- Series 546 DISCALDIRT air and dirt separator in brass \_\_\_\_\_ Sizes 3/4" and 1" sweat union
- Series 546 DISCALDIRT air and dirt separator in brass \_\_\_\_\_ Size 1" NPT male union
- Series 546 DISCALDIRT air and dirt separator in steel with flanged connections \_\_\_\_\_ Sizes 2"-6" ANSI
- Series 546 DISCALDIRT air and dirt separator in brass \_\_\_\_\_ Size 1-1/4" sweat
- Series NA546 DISCALDIRT air and dirt separator in steel with flanged connections 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; CRN registered \_\_\_\_\_ Sizes 2"-12" ANSI
- Series NA546 DISCALDIRT air and dirt separator in steel with threaded connections 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; CRN registered \_\_\_\_\_ Sizes 2"-4"

## Technical specification

### Brass DiscalDirt

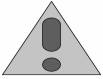
Materials:	- Body, Dirt separation chamber and Automatic air vent body:	brass
	- Internal element:	glass reinforced nylon, PA66GF30
	- Float:	PP
	- Float guide and Stem:	brass
	- Float lever and Spring:	stainless steel
	- Seals:	EPDM
	- Drain shut-off valve:	brass

Suitable fluids:	water, glycol solution
Max percentage of glycol:	50%
Max working pressure:	150 psi (10 bar)
Temperature range:	32–230°F (0–110°C)
Particle separation capacity:	to 5 µm (0.2 mil)
Connections:	- Main: 3/4" and 1" sweat union; 1" NPT male union; 1 1/4" sweat
	- Drain shut-off valve: hose connection

### Steel DiscalDirt

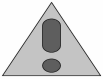
Materials:	- Body:	epoxy resin painted steel
	- Automatic air vent body:	brass
	- Internal element:	stainless steel
	- Float:	PP
	- Float guide and Stem:	brass
	- Float lever and Spring:	stainless steel
	- Seals:	EPDM
	- Side drain shutoff valve:	brass

Suitable fluids:	water, glycol solution
Max percentage of glycol:	50%
Max working pressure:	150 psi (10 bar)
Temperature range:	32–250°F (0–120°C)
Particle separation capacity:	to 5 µm (0.2 mil)
Connections:	- Flanged (ASME & CRN Registered): 2"–12" ANSI B16.5 150 CLASS RF
	- Flanged: 2"–6" ANSI B16.5 150 CLASS RF
	- Threaded (ASME and CRN Registered): 2"–4"
	- Drain pipe: 2"–6" : 1" NPT male
	8"–12" : 2" NPT male



## **SAFETY INSTRUCTION**

This safety alert symbol will be used in this manual to draw attention to safety related instructions. When used, the safety alert symbol means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED! FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN A SAFETY HAZARD.**



**CAUTION:** All work must be performed by qualified personnel trained in the proper application, installation, and maintenance of systems in accordance with all applicable codes and ordinances.



**CAUTION:** If the DISCALDIRT air and dirt separator is not installed, commissioned and maintained properly, according to the instructions contained in this manual, it may not operate correctly and may endanger the user.



**CAUTION:** Make sure that all the connecting pipework is water tight.



**CAUTION:** When making the water connections, make sure that the pipework connecting the DISCALDIRT air and dirt separator mechanically overstressed. Over time this could cause breakages, with consequent water losses which, in turn, could cause harm to property and/or people.



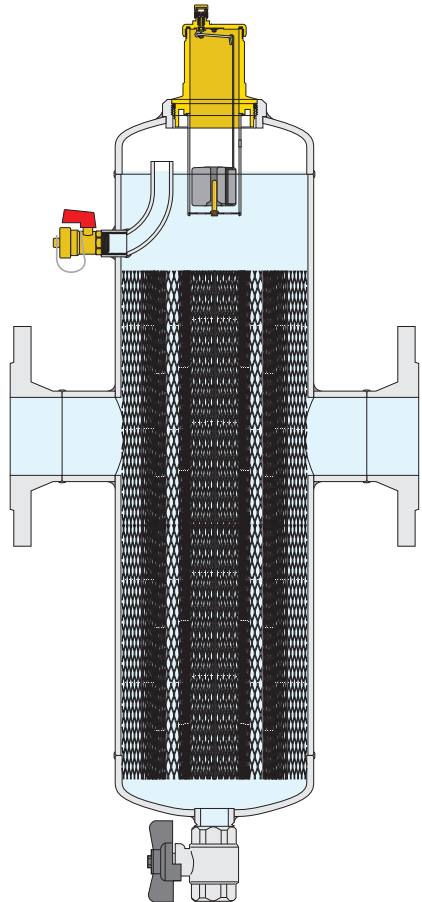
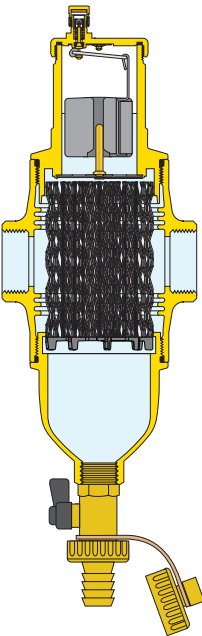
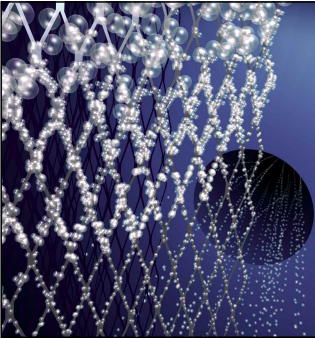
**CAUTION:** Water temperatures higher than 100°F (38°C) can be dangerous. During the installation, commissioning and maintenance of the DISCALDIRT air and dirt separator, take the necessary precautions to ensure that such Temperatures do not endanger people.

**Leave this manual for the user.**

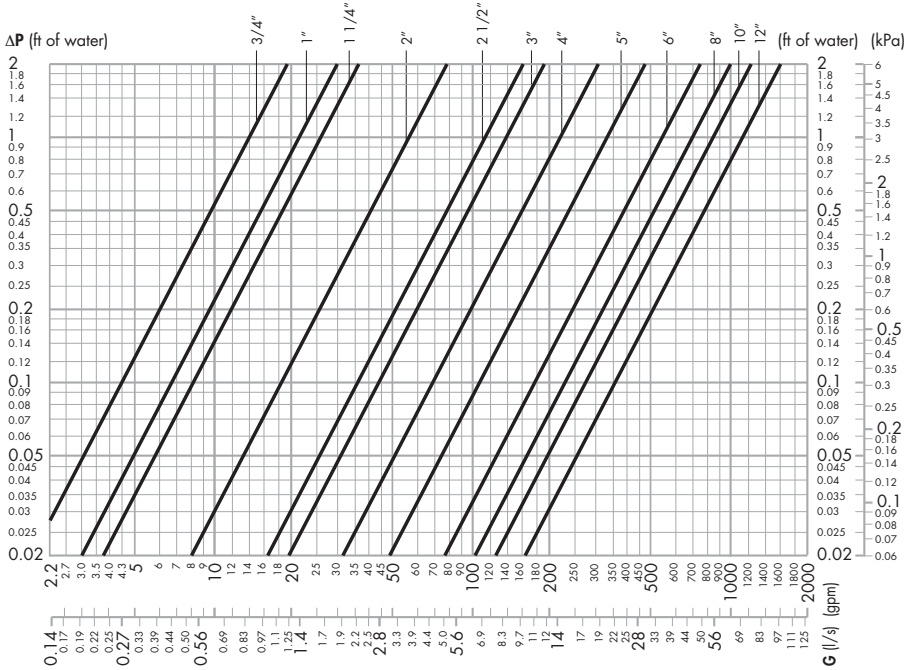
## Operating principle

The air and dirt separator uses the combined action of several physical principles. The active part consists of an assembly of concentric metal mesh surfaces. These elements create the whirling movement required to facilitate the release of micro-bubbles and their adhesion to these surfaces.

The bubbles, fusing with each other, increase in volume until the hydrostatic thrust is such as to overcome the adhesion force to the structure. They rise towards the top of the unit from which they are released through a float-operated automatic air vent valve. When the impurities present in the water collide with the metal surfaces of the internal element they become separated and precipitate to the bottom of the separator body.



## Hydraulic characteristics



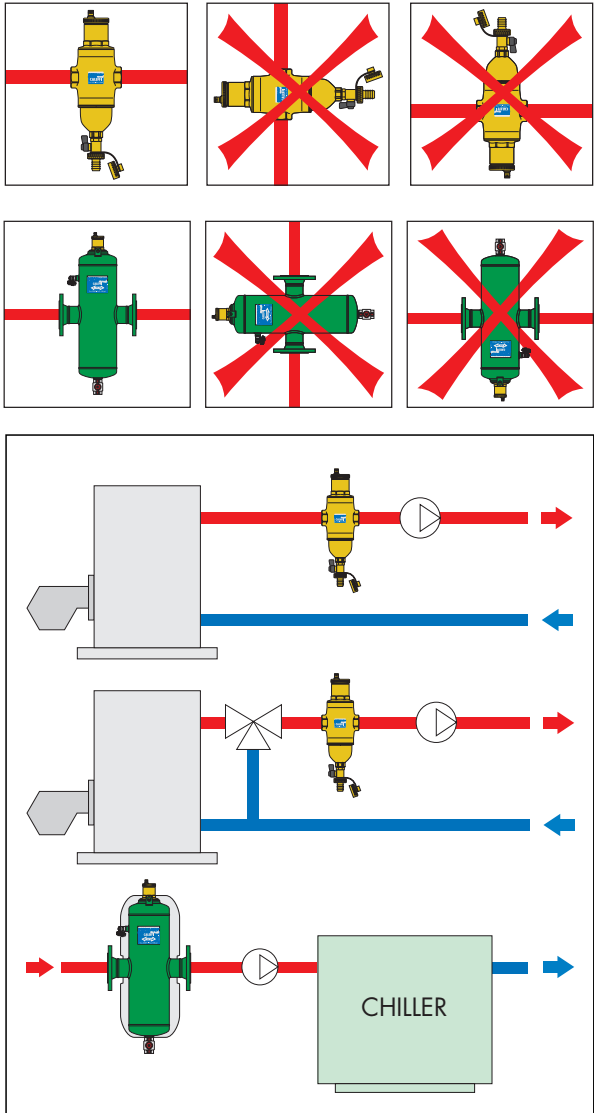
## Flow Capacity

The fluid velocity at connections for DISCALDIRT 546 and NA546 series air and dirt separators is recommended to not exceed 10.0 f/s. Above this speed, heavy internal turbulence and noise can occur and air and dirt elimination efficiency begins to fall measurably. Optimal air and dirt separation performance occurs at fluid velocities of 4.0 f/s or less. See the flow capacity chart.

		FLOW CAPACITY											
		BRASS			STEEL								
Optimal (≤4.0 f/s)	Size	3/4"	1"	1 1/4"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"
	GPM		8.0	9.3	10.0	37.3	63.0	95	149	259	380	625	980
l/s		0.5	0.6	0.63	2.4	4.0	6.0	9.4	16.3	24.0	40.0	62.0	89.0
Max. (10.0 f/s)	GPM	19.0	22.1	25.0	88.8	150.1	227.4	355.3	616.4	903.6	1,570	2,450	3,530
	l/s	1.2	1.4	1.6	5.6	9.5	14.3	22.4	38.9	57.0	100.0	155.0	222.0
	Cv	19.1	32.5	40.0	87	174	208	324	520	832	1,109	1,387	1,664

## Installation

DISCALDIRT units may be used in both heating and cooling systems, to ensure continuous air and dirt elimination. The units should be installed after the boiler and on the pump suction side, as these are the points where the formation of micro-bubbles is greatest. DISCALDIRT air and dirt separators must be installed vertically. In installation conditions where inspection is not possible, it is recommended that the venting valve cap is replaced by a Caleffi part number R59681 hygroscopic safety vent. The standard replacement cap code number is 59199.



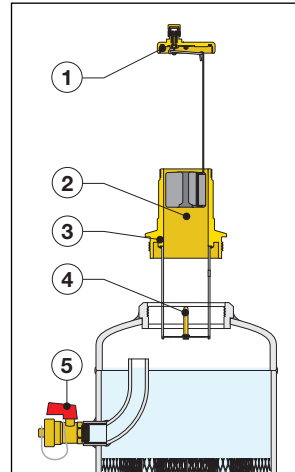
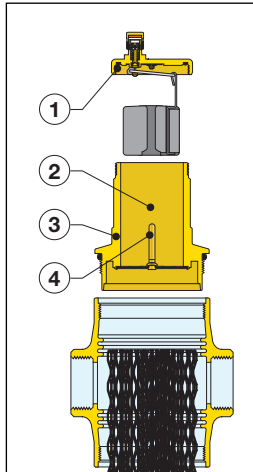
## Maintenance

The DISCALDIRT air and dirt separator is designed to be maintained and cleaned without removing it from system piping.

The automatic air vent, located at the top of the device, has a long chamber for float movement (2). This prevents any impurities in the water from reaching the seal seat. The non-corroding stainless steel pinned linkage and PP float can be accessed by removing the upper cover (1). The float guide pin (4) prevents the float from jamming against the inside housing in non-vertical installations or from boiler residue buildup. Unscrew the top part of the casing (3) to clean the entire air venting system.

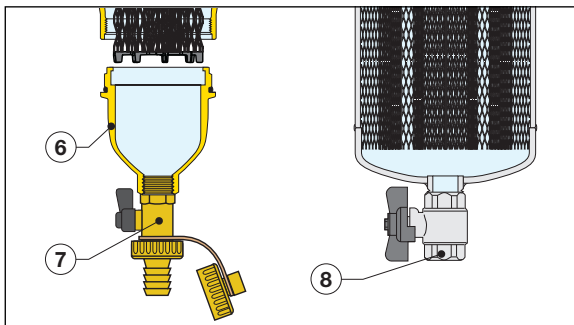
The air venting system in both brass and steel DISCALDIRT air and dirt separators features a pinned float. Steel DISCALDIRT air and dirt separators with flanged and threaded connections have an integral side drain port (5), which has two functions:

1. Air removed while filling the system during system commissioning.
2. Remove debris that float within the air separator.



A separately-sourced drain valve installed to the drain pipe at the base of the steel DISCALDIRT air and dirt separator (8) can be used to remove any debris that has settled at the bottom of the separator, even with the system is in operation.

To inspect the internal element of brass DISCALDIRT air and dirt separators, unscrew the large dirt separation chamber (6) with a 26 mm hexagon wrench. The internal element can be removed for cleaning. Additionally, the brass air and dirt separator has a lever-operated shut-off drain valve and hose attachment with plug (7), to drain accumulated debris as needed.





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