DISCAL® deaerator

551 series

551810CST

replaces dp 000/14 GB

Code		
551810CST 3/4" F	-	9

Function

Deaerators are able to release large quantities of air that has formed in the hydraulic circuits of heating and air conditioning systems, even against substantial pressure values. This prevents the appearance of negative phenomena that might prejudice the working life and performance of the heating system, such as:

- Corrosive processes caused by oxygen;
- Air pockets in the heating elements;
- Cavitation in the circulating pumps

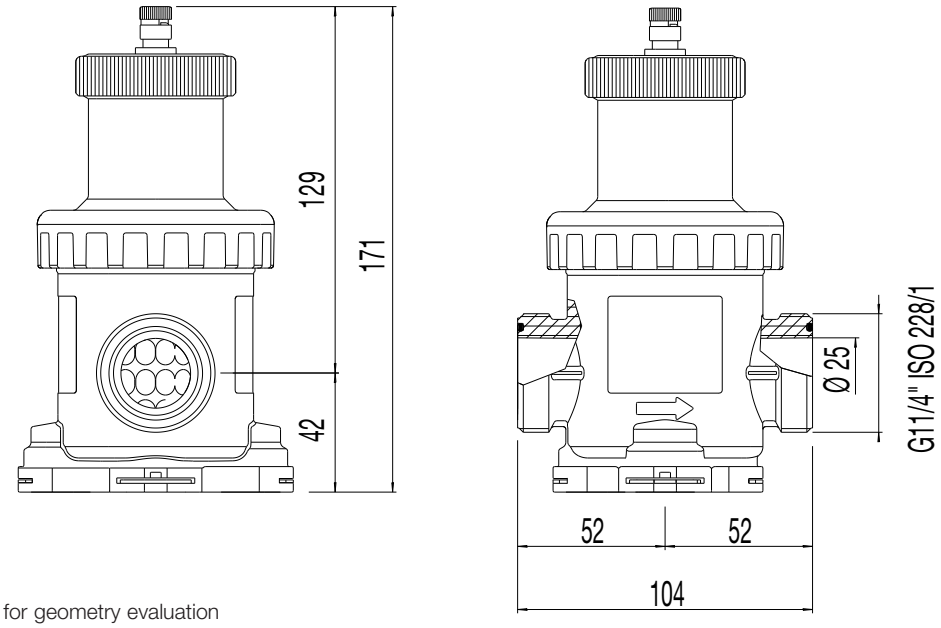
Product range

551**810CST** DISCAL® deaerator for horizon — sizes DN 32 (1 1/4")

Technical specifications

series	551810CST
Materials	
Body:	PA66G30
Float:	PP
Air vent cap:	brass EN 12164 CW614N
Spring:	stainless steel EN 10270-3 (AISI 302)
Hydraulic seals:	EPDM
Performance	
Media.	water, non-hazardous glycol solutions
Max. percentage of glycol:	50%
Max. working pressure:	3 bar
Working temperature range:	90°C
Fluid dynamic characteristics – Kv @ 1bar:	15 m^3/h
Discharge flow rate:	@ 1 bar: 1650 nl/h; @ 2 bar: 2390 nl/h
Tolerance:	± 30 %
Connections	
Main:	1 1/4"M
Max.tightening torque:	30 ± 2 Nm

Dimensions

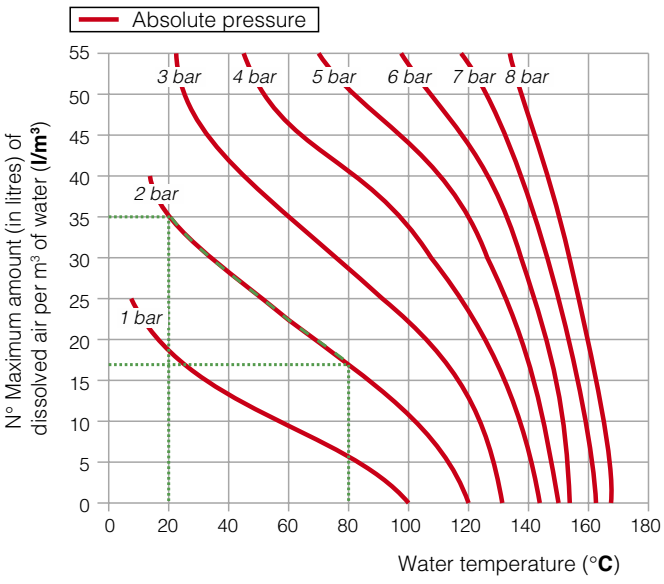


Dimensions valid only for geometry evaluation

The air formation process

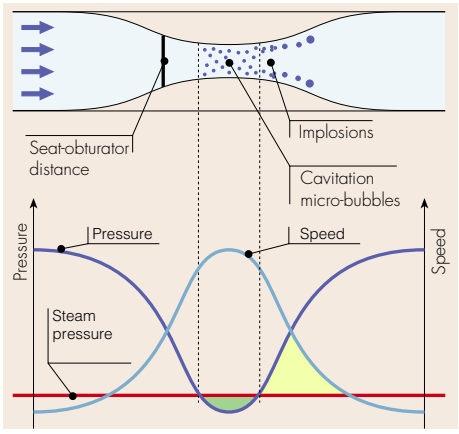
The amount of air which can remain dissolved in a water solution depends on the pressure and temperature.
This relationship is known as Henry's law; the graph below allows us to quantify the physical phenomenon of releasing the air contained in the medium.
For example: at a constant absolute pressure of 2 bar, if the water is heated from 20°C to 80°C, the amount of air released by the solution is equal to 18 l per m³ of water.
According to this law, it may be noted how the amount of air released by the solution increases as the temperature rises and the pressure decreases. This air is in the form of micro-bubbles with diameters in the order of tenths of a millimetre.
In circuits of air-conditioning systems there are specific points where this micro-bubble formation process takes place continuously: inside boilers and devices which operate under conditions of cavitation.

Graph of solubility of air in water

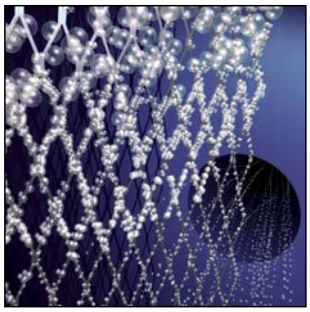


Cavitation micro-bubbles

Micro-bubbles develop where the speed of the medium is particularly high, with a corresponding reduction in pressure.
These points are usually the pump impellers and the water orifices of the regulating valves.
These micro-bubbles of air and steam, the formation of which is accentuated in non-deaerated water, may subsequently implode as a result of the cavitation effect.



Operating principle

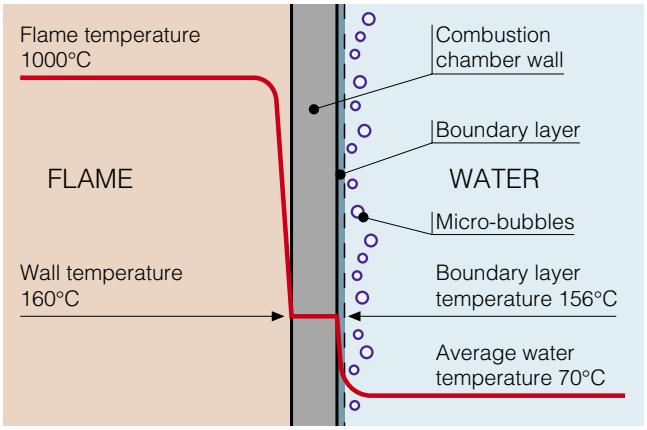


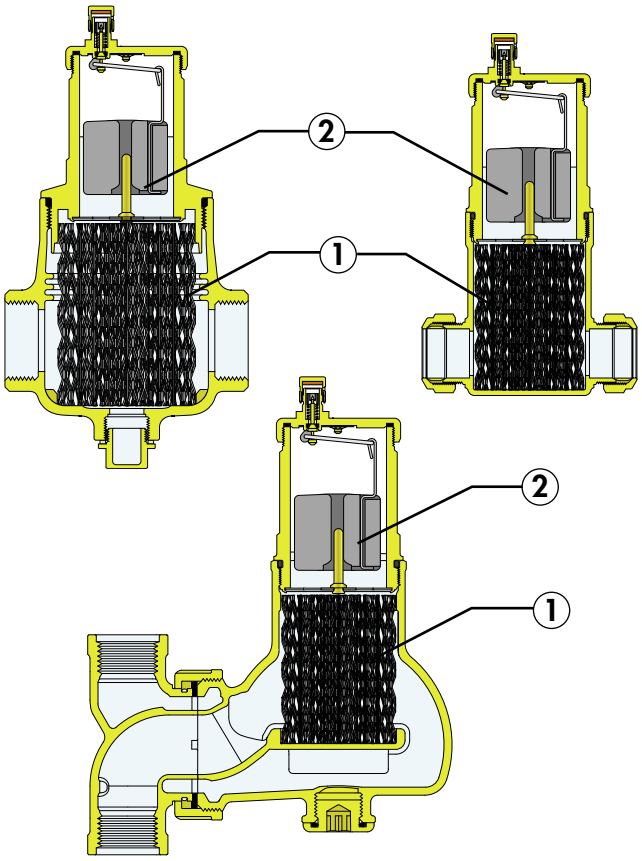
The deaerator utilises the combined action of several physics principles. The active part consists of a set of concentric metal mesh surfaces (1). These elements create the swirling motion required to facilitate the release of micro-bubbles and their adhesion to the surfaces.
The bubbles, fusing with each other, increase in volume until the hydrostatic thrust is sufficient to overcome the force of adhesion to the structure. They then rise towards the top of the device and are expelled through a float-operated automatic air vent valve (2). It is designed in such a way that the direction in which the medium is flowing inside it makes no difference.

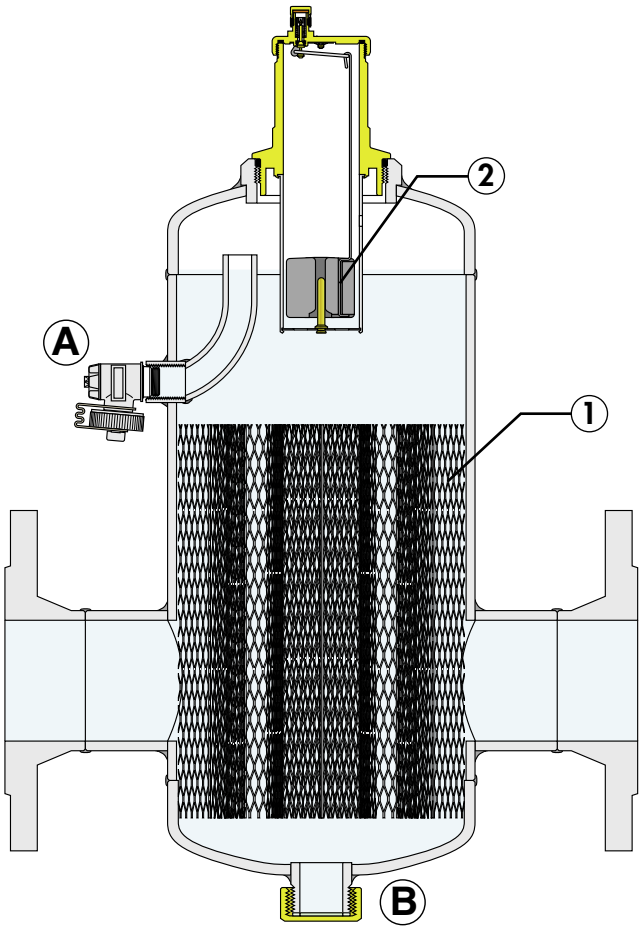
Boiler micro-bubbles

Micro-bubbles form continuously on the surfaces separating the water from the combustion chamber due to the high temperature of the medium.

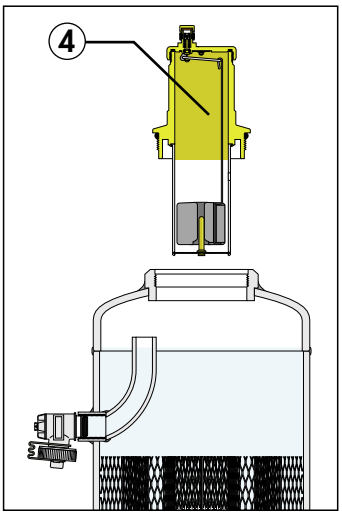
This air, carried by the water, collects at critical points of the circuit, from which it must be removed. Some of it is reabsorbed where it meets colder surfaces.

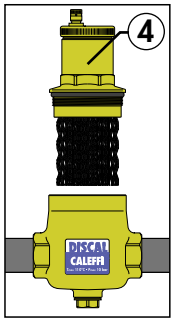


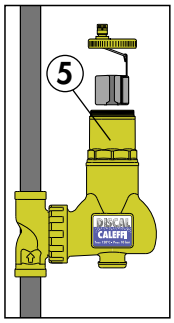




- When cleaning, simply unscrew the portion of the body containing the automatic air vent valve (4). On threaded models without drain and in the 5517 series with adjustable T-fitting, this part is not removable (5).







Flanged and weld-end deaerators are equipped with a cock (A) which performs the dual function of releasing large amounts of air while the system is being filled and eliminating any impurities floating on top of the water.

The lower part is fitted with a plug (B) which can be connected to a drain valve, for the elimination of any impurities which have collected at the bottom of the deaerator.

SPECIFICATION SUMMARY

DISCAL® 551810CST
Deaerator for horizontal pipes. Size DN 32 connections (1 1/4"M). PA66G30 body. PP float. Stainless steel float lever and spring. EPDM hydraulic seals. Medium water and non-hazardous glycol solutions excluded from the guidelines of EC directive 67/548; maximum percentage of glycol 50%. Maximum working pressure 3 bar. Working temperature range Max 90°C.

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