

# 551 discal

automatic air separators



altecnic

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## Application

Automatic air separators or de-aerators are used to continuously remove the air contained in the hydraulic circuits of heating and cooling systems.

They are capable of automatically removing all the air present in the system down to micro-bubble level, with very low head losses.

Discal automatic air separators have large collection chambers able to accommodate a large volume of air before being released automatically.

The circulation of fully de-aerated water enables equipment to operate under optimum conditions, free from any noise, corrosion, localised overheating or mechanical damage, important for reducing energy demands and on going running costs.

## Design

The Discal automatic air separator is manufactured from brass with an internal element and automatic air vent.

Available for installation in horizontal or vertical pipes.

Supplied with female threaded connections, also available with 22mm compression ends, for horizontal and vertical pipes.

Supplied with compression ends complying with BS EN 1252-2 for use with R250 (half hard) copper tube or parallel threaded ends complying with BS EN ISO 228-1

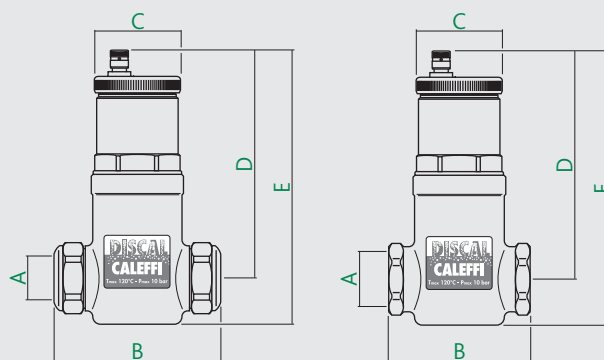
Drain connection threaded 1/2" female supplied with blanking plug.

## Construction Details

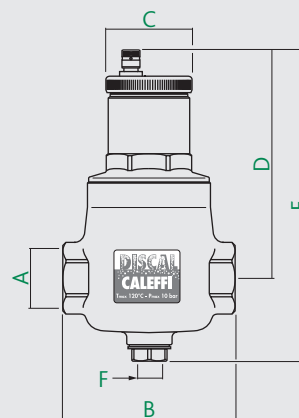
Component	Material	Grade
Body	Brass	BS EN 12165 CW617N
Internal Element	Polyamide 66	PA 66 GF 30
	Stainless steel	
Float	Poly propylene	
Float Guide	Brass	BS EN 12165 CW614N
Stem	Brass	BS EN 12165 CW614N
Float Lever	Stainless steel	
Spring	Stainless steel	
Seals	EPDM	

Product Code	Pipe Orientation	Size	Connections
551002	Horizontal	22 mm	comp. x comp.
551003	Horizontal	3/4"	screwed iron f x f
551005	Horizontal	3/4"	screwed iron f x f
551006	Horizontal	1"	screwed iron f x f
551007	Horizontal	1 1/4"	screwed iron f x f
551008	Horizontal	1 1/2"	screwed iron f x f
551009	Horizontal	2"	screwed iron f x f
551902	Vertical	22 mm	comp. x comp.
551905	Vertical	3/4"	screwed iron f x f
551906	Vertical	1"	screwed iron f x f

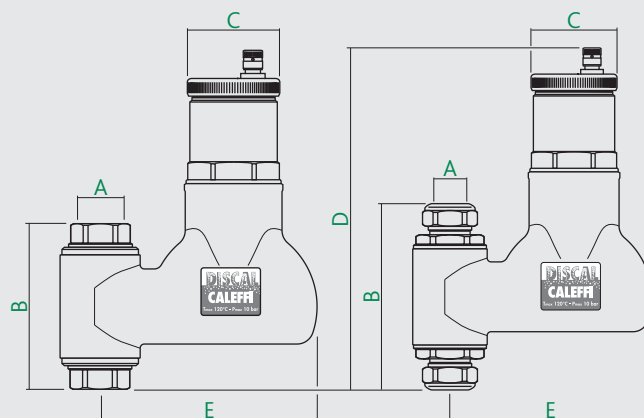
## Dimensions



Prod Code	A	B	C	D	E	kg
551002	Ø22	97	55	143	162	0.9
551003	G3/4	78	55	143	162	0.9



Prod Code	A	B	C	D	E	F	kg
551005	G3/4	110	55	146	205	G1/2	1.7
551006	G1	110	55	146	205	G1/2	1.7
551007	G1 1/4	124	55	166	225	G1/2	2.2
551008	G1 1/2	124	55	166	225	G1/2	2.2
551009	G2	130	55	166	225	G1/2	2.2



Prod Code	A	B	C	D	E	kg
551905	G3/4	102	55	211	130	2.05
551906	G1	107	55	214	130	2.05
551902	Ø22	121	55	221	130	2.05

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## Solubility of Air in Water

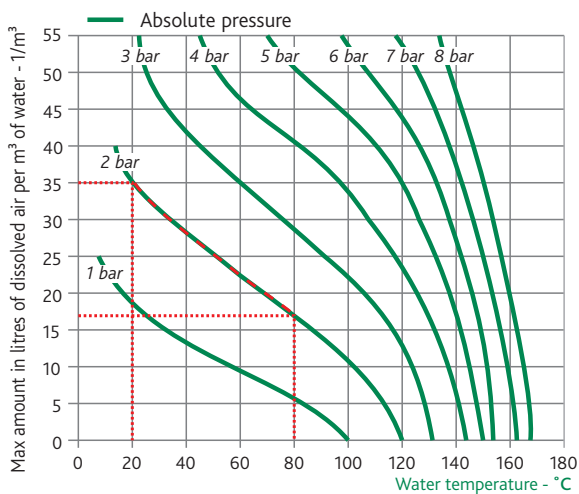
The amount of air which can remain dissolved in a water solution is a function of pressure and temperature.

This relationship is governed by Henry's Law and the graph shows the physical phenomenon of the volume of air content released by the fluid to be quantified.

As an 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 m<sup>3</sup> of water.

According to this law it can be seen that the amount of air released increases with temperature rise and pressure reduction.

The air comes in the form of micro-bubbles, a fraction of a millimetre in diameter.

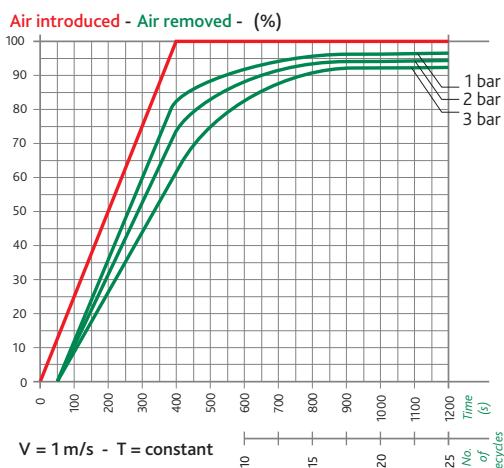


## Air Separation Efficiency

Under a controlled test the discal de-aerator was capable of continuously removing the air contained within a hydraulic circuit, with a high degree of separation efficiency.

The amount of air which may be removed from a circuit depends on various parameters: it increases as the circulation speed and pressure values fall.

As illustrated on the graph below, after be recycled just 25 times at the maximum recommended speed, almost all the air artificially introduced into the circuit is eliminated by the de-aerator, with variable percentages according to the pressure within the circuit.



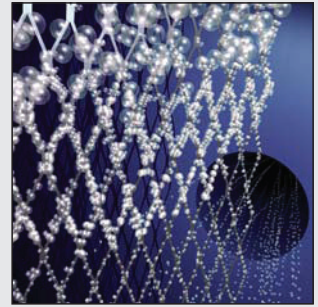
## Air Separation Efficiency

The small amount which remains is then gradually eliminated during normal system operation. In conditions where the speed is slower or the temperature of the medium is higher, the amount of air separated is even greater.

## Operating Principles

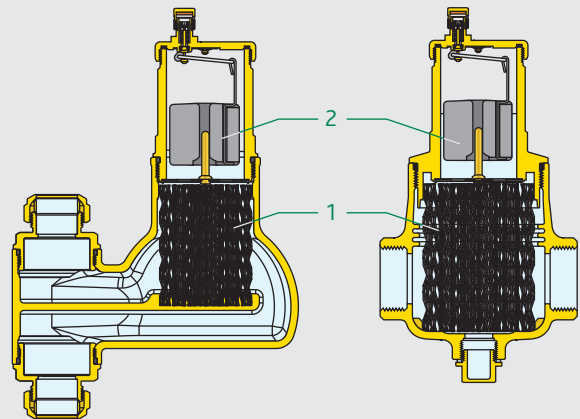
De-aerators use the combined action of several physical principles.

The active part consists of an assembly of concentric metal mesh surfaces (1). 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 (2) automatic air release valve. It is designed in such a way that the direction in which the medium is flowing inside it makes no difference.



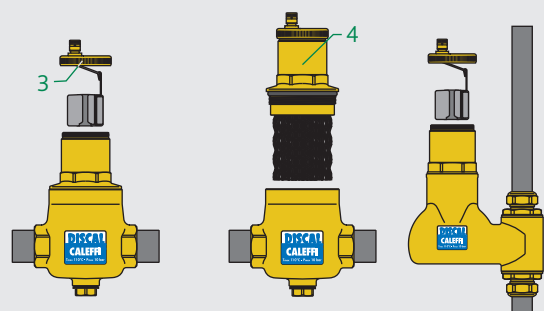
## Construction Details

The automatic air vent is located at the top of the de-aerator.

The construction of the discal allows it to be maintained and cleaned without removing it from the system.

The components that control the air venting are accessed by removing the cover (3).

When cleaning simply unscrew that part of the body containing the automatic air vent (4).



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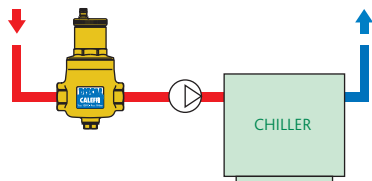
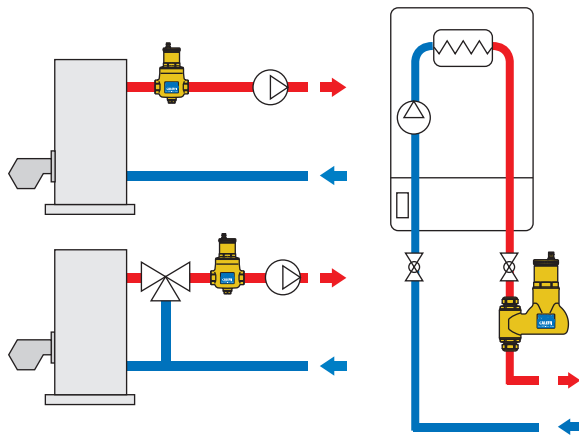
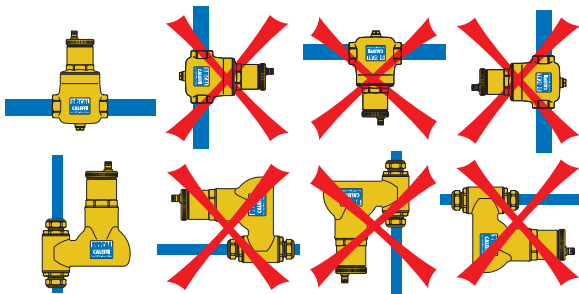
## Installation

Discal de-aerators may be used in both heating and cooling systems, to ensure the progressive removal of air which is continuously formed.

The units should preferably be installed after the boiler and on the pump suction side, as these are the points where the formation of micro-bubbles is greatest.

Discal de-aerators must be installed in a vertical position, and preferably upstream of the pump where, due to the high speed of the medium and the ensuing drop in pressure, in this position air micro-bubbles develop more easily.

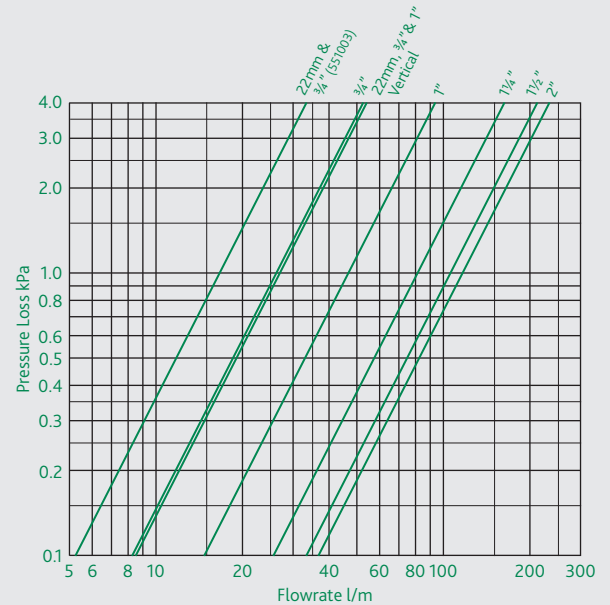
The flow direction of the medium is not important.



## Technical Data

Medium:	water glycol solution
Max. percentage of glycol:	50%
Max. working pressure:	10 bar
Max. discharge pressure:	10 bar
Temperature range:	0 to 110°C

## Pressure Loss Chart



Size	22 & 3/4"	3/4"	All Vertical	1"	1 1/4"	1 1/2"	2"
Kv - m <sup>3</sup> /h	10.0	16.2	17.0	28.1	48.8	63.2	70.0

The maximum recommended flow velocity inside the pipe is 1.2 m/s. The following shows the maximum flow rates to meet this requirement.

Size	Ø22	Ø28	3/4"	1"	1 1/4"	1 1/2"	2"
l/m	23.1	38.8	26.5	42.4	73.6	99.7	159.4

Based on BS EN 1057 copper tube and BS EN 10255 steel pipe.

E & O.E

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