551 discal

automatic air separators

altecnic

551 discal automatic air separators

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 epoxy coated steel with a stainless steel internal element.

Suitable for installation in horizontal pipework.

Supplied with PN16 flanges to BS EN 1092 -1 or weld ends.

Low pressure loss.

Supplied with a 1" hose union ball blow down valve.

Top connection threaded ¾" male supplied with blanking plug

Supplied with hot preformed shell for thermal insulation.

Construction Details

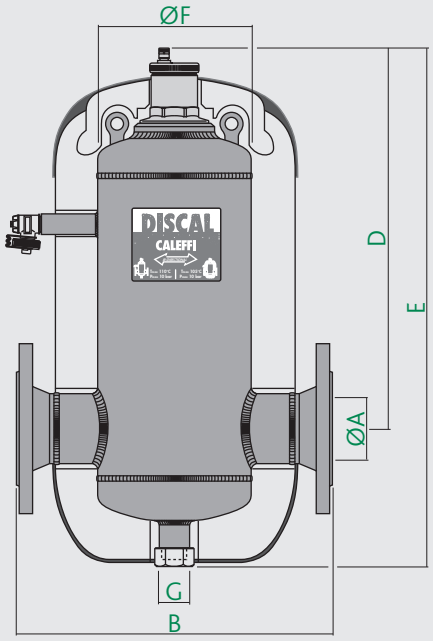
Component	Material	Grade
Body	Steel - epoxy coated	
Internal Element	Stainless Steel	
Blowdown Valve	Brass	BS EN 12165 CW617N
Float	Poly propylene	
Float Guide	Brass	BS EN 12165 CW614N
Stem	Brass	BS EN 12165 CW614N
Float Lever	Stainless steel	
Spring	Stainless steel	
Seals	EPDM	

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

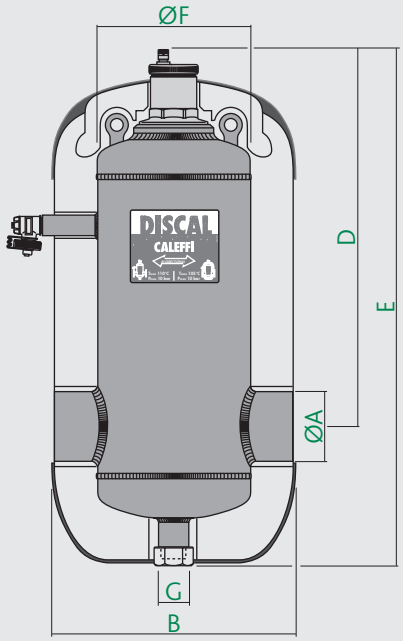
Dimensions

Flanged Ends



Prod Code	A	B	D	E	F	G	kg
551052	50	350	374	506	169	G1	15
551062	65	350	374	506	169	G1	16
551082	80	466	435	595	219	G1	28
551102	100	470	435	595	219	G1	30
551122	125	635	545	775	324	G1	48
551152	150	635	545	775	324	G1	53

Weld Ends



Prod Code	A	B	C	D	E	F	kg
551053	50	260	374	506	169	G1	9.3
551063	65	260	374	506	169	G1	9.4
551083	80	366	435	595	219	G1	20
551103	100	366	435	595	219	G1	21
551123	125	525	545	775	324	G1	35
551153	150	525	545	775	324	G1	38

Solubility of Air in Water

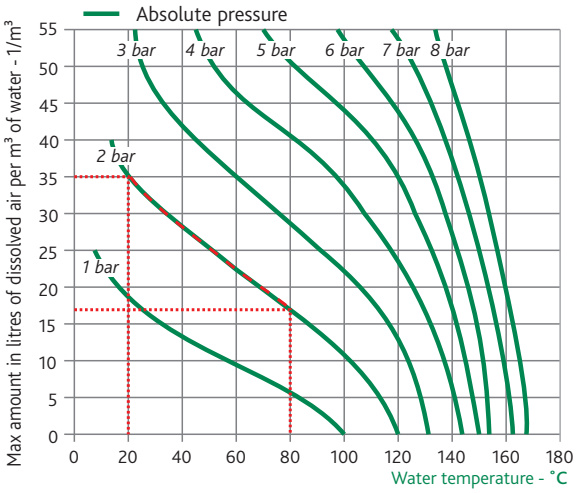
The amount of air which can remain dissolved in a water solution is a function of pressure and temperature.

This relationship is governed by Henry's Law and the graph shows the physical phenomenon of the volume of air 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 litres per m^3 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.

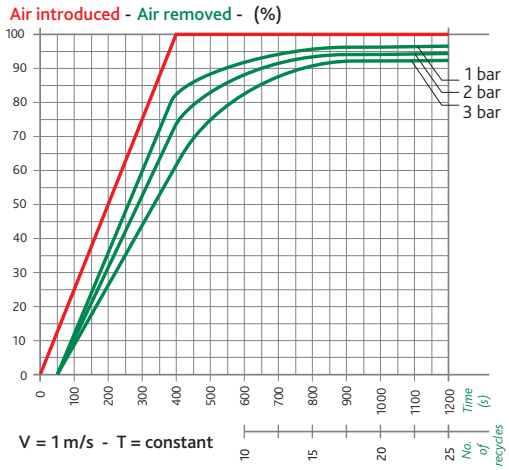


Air Separation Efficiency

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.

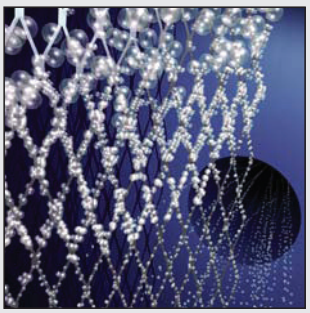
As illustrated on the graph below, after be recycled just 25 times at the maximum recommended speed, almost all the air artificially introduced into the circuit is eliminated by the de-aerator, with variable percentages according to the pressure within the circuit.



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

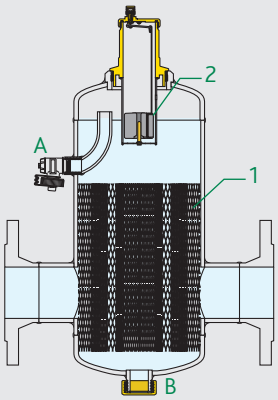


De-aerator use the combined action of several physical principles.

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.

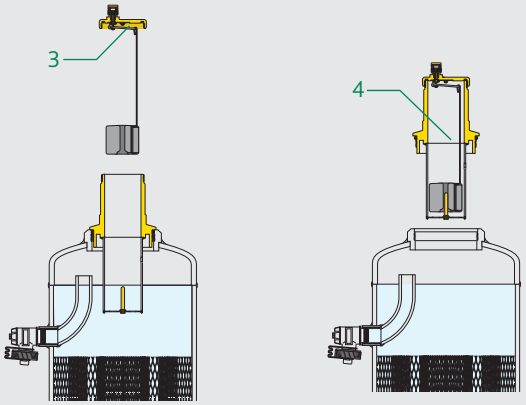
They rise towards the top of the unit from which they are released through a float-operated (2) automatic air release valve.It is designed in such a way that the direction in which the medium is flowing makes no difference.



Maintenance and Cleaning

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 for 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).

Flanged and weld-end de-aerations are equipped with a cock (A) that has the dual function of releasing large quantities of air when the system is being filled and for removing the impurities that float on the surface of the water.

A drain valve (B) can be connected at the bottom of the unit to drain the impurities that have collected at the bottom of the de-aeration.

551 discal automatic air separators

Installation

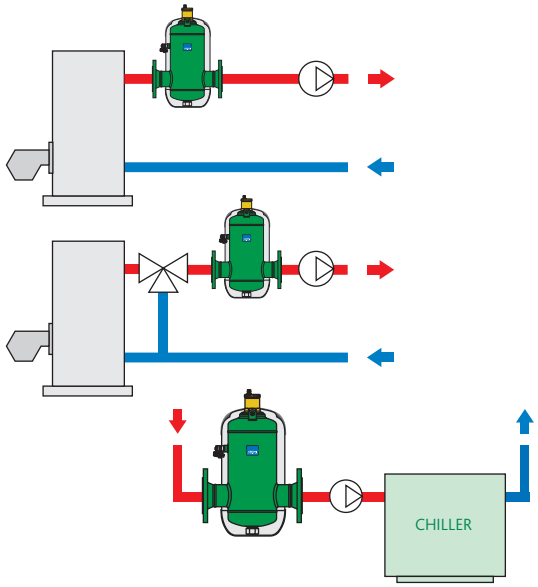
Discal de-aerators may be used in both heating and cooling systems, to ensure the progressive removal of air which is continuously formed.

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.

Discal de-aerators must be installed in horizontal pipework with the automatic air vent upper most.

The flow direction of the medium is not important.



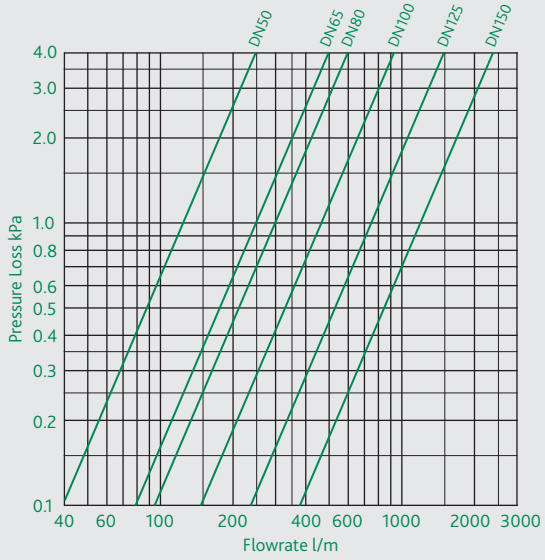
Insulation

Flanged and weld-end discal de-aerators are supplied complete with hot pre-formed shell insulation.

This system ensures not only perfect thermal insulation, but also the tightness required to prevent atmospheric water vapour from entering the unit.

For this reason, this type of insulation may also be used in cooling water circuits as it prevents condensation from forming on the surface of the valve body.

Pressure Loss Chart



Size - DN	50	65	80	100	125	150
Kv - m^3/h	75	150	180	280	450	720

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 - DN	50	65	80	100	125	150
l/m	159	267	369	624	951	1362

Based on BS EN 10255 steel pipe.

Technical Specification of Insulation Shell

DN50 to DN100 - Insulation

Material:		Rigid closed cell expanded polyurethane form
Thickness:		60mm
Density:		45 kg/m^3
Thermal conductivity (ISO 2581):		0.023 W/(m.K)
Working temperature range:		0 to 105˚C

DN50 to DN100 - Head Covers

Heat moulded material:	PS

DN125 to DN150 - Insulation

Material:			Closed cell expanded PE-X
Thickness:			60mm
Density:	- inner part		30 kg/m^3
	- outer part		80 kg/m^3
Thermal conductivity (ISO 2581):		at 0˚C	0.038W/(m.K)
		at 40˚C	0.045W/(m.K)
Coefficient of resistance to water vapour (DIN 52615):			> 1.300
Working temperature range:			0 to 100˚C
Resistance to fire (DIN 4102):			class B2

External Layer - all sizes

Material:	embossed unfinished aluminium
Thickness:	0.7mm
Resistance to fire (DIN 4102)	class 1

E & O.E

Altecnic Ltd Mustang Drive, Stafford, Staffordshire ST16 1GW
T: +44 (0)1785 218200 E: sales@altecnic.co.
Registered in England No: 2095101

altecnic.co.uk

AL 090 09-06-12