heating and plumbing products
that won't cost the **earth**

Discal Solar deaerator for solar systems

inta ECO

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Deaerators continuously discharge air from the hydraulic circuits of air conditioning or solar heating systems. The air vent capacity of these devices is extremely high and they are able to automatically remove the air from the circuits down to the level of microbubbles.

This allows the system to work under optimal conditions, free from noise, corrosion, local overheating or mechanical damage.

This particular deaerator is specifically designed to work at high temperatures with the Glycol medium that is typical of solar heating systems.

Air formation

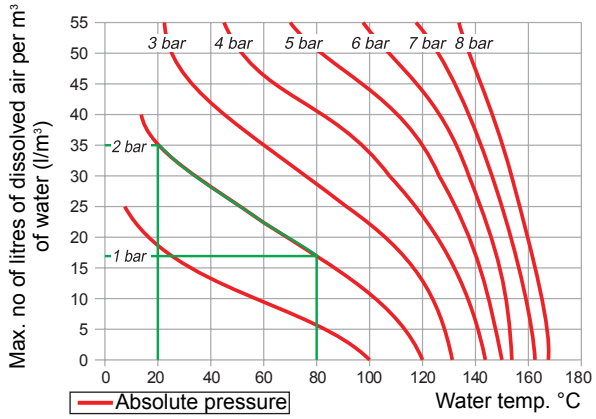
The quantity of air that can remain dissolved in solution in the water depends on pressure and temperature. This relationship is known as “Henry’s Law”. The graph below illustrates the physical phenomenon of releasing the air contained in the medium.

As an example, at a constant absolute pressure of 2 bar, heating the water from 20°C to 80°C, the quantity of air released by the solution is equal to 18 litres per minute.

As the temperature increases and the pressure decreases, there is a greater release of air from the solution. This takes the form of “microbubbles” with diameters in the order of tenths of a millimetre.

The microbubbles form continuously in the water of the solar heating system on the top of the panels, i.e. where the highest temperatures are achieved. The air is partly reabsorbed as the medium reaches the parts of the circuit at a lower temperature but some remain in the medium. Therefore, they must be extracted.

graph of solubility of air in water



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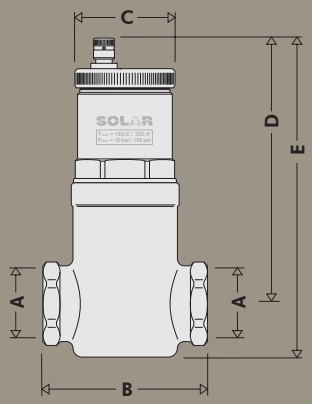
cert. no. 0003 ISO 9001



code	A	B	C	D	E	weight (Kg)
251003	¾"	78	Ø 55	143	162	0.91

Technical specifications

body:	Brass EN 12165 CW617N, chrome plated
cover:	Brass EN 12165 CW617N, chrome plated
float:	High resistance polymer
internal element:	Stainless steel
float guide:	Brass EN 12164 CW614N
obturator stem:	Dezincification resistant alloy CR EN 12164 CW602N
float lever:	Stainless Steel
spring:	Stainless Steel
hydraulic seals:	High resistance elastomer

medium	Water, Glycol solutions
maximum percentage of Glycol	50%
temperature range	-30°C - 160°C
max working pressure:	10 bar
max. discharge pressure:	10 bar
connections	¾" F

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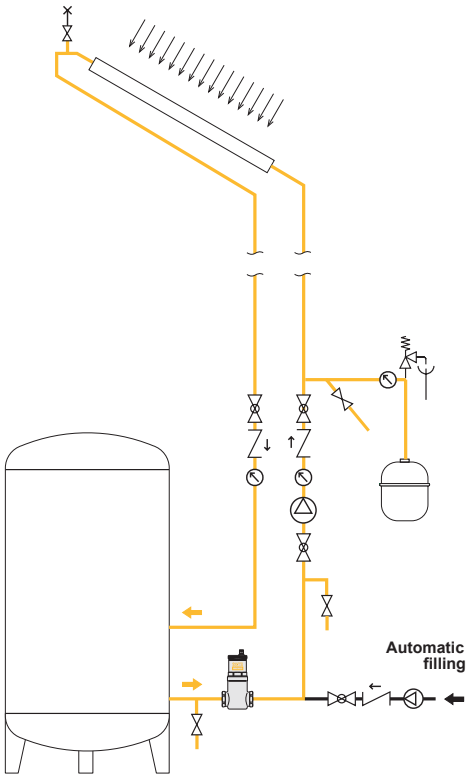
System operation

In solar panel heating systems with forced circulation it's necessary to expel all the air in the medium during the phase of starting up and operating the system. The deaerator separates and expels this air from the medium continuously and safely.

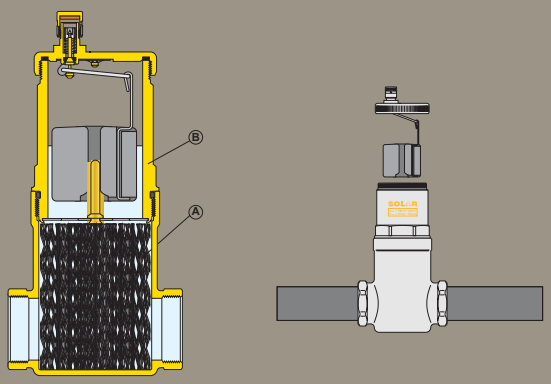
The circuit therefore stays completely deaerated automatically. Any decrease in pressure due to the release of air is compensated for by a suitable filling unit.



Construction details

The high performance of these deaerators is ensured by the use of materials which are particularly heat resistant. Thus, the product operates pefectly even with Glycol water temperatures of up to 160°C. The internal geometry of the valve also copes with air discharge up to a pressure of 10 bar.

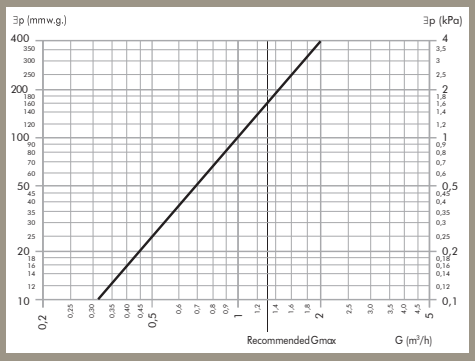
The valve has also been designed to allow maintenance and cleaning without removing it from the system. Even access to the moving parts of the valve is achieved simply, by removing the top cover.



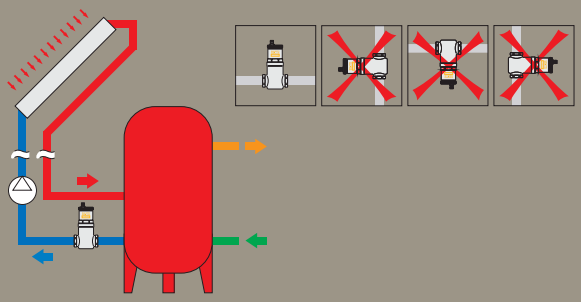
Operating principle

The deaerator uses several physical principles in its operation.The active component is the set of metal screen surfaces arranged like spokes (A). These elements create a swirling motion in the fluid causing the bubbles to join together, increasing in volume until the hydrostatic thrust overcomes the force of adhesion to the structure.

The bubbles then rise towards the top of the device and are released by a float-operated air vent (B).



The maximum recommended speed of the medium in the piping is 1.2m/s, which is equivalent to a flow rate of 22.7 m/l or 1.36m³/h.
Kv (m³/h) = 10



The deaerator must always be installed vertically and preferably;

upstream of the pump where due to the high speed of the medium and the ensuing drop in pressure, microbubbles of air develop more easily;

on the return and in the bottom portion of the solar circuit with no formation of stream.

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