# POWER VENT™

## In-line and adjustable deaerator

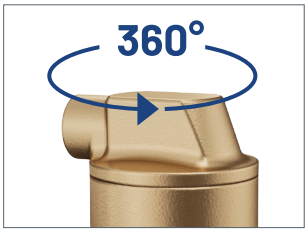
CARING FOR WATER

STEC0011HCE.EN.08



MAXIMUM DISCHARGE PRESSURE
10 bar

PATENT PENDING




## Function

The deaerator is used to continuously eliminate air from the hydraulic circuits of HVAC systems. This device has an exceptionally high discharge capacity. It can completely remove any air in the circuit up to the size of micro-bubbles, thanks to the innovative AirTrap Cartridge.
The air is eliminated automatically with a minimal pressure drop. Air-free water in the circuits allows the systems to operate under the best possible conditions and eliminates problems of noise, corrosion, localized overheating and mechanical damage.

## Plus

- Prevents noise, corrosion and overheating
- Ensures the system remains efficient and extends its service life
- Self-cleaning
- Adjustable air vent valve
- Sediment drain plug

Greater efficiency compared to traditional separators

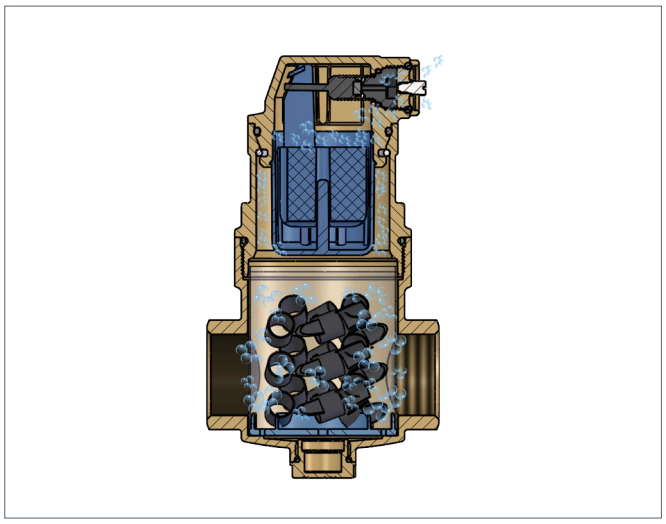
Bi-directional

Innovative Air Trap Cartridge

## Product range

| CODE | DESCRIPTION | SIZE | COLOUR |
|---|---|---|---|
| DA00100034 | In-line model | 3/4" F x 3/4" F | Brass |
| DA00100100 | In-line model | 1" F x 1" F | Brass |
| DA00100114 | In-line model | 1" 1/4 F x 1" 1/4 F | Brass |
| DA00100022 | In-line model | ø22 x ø22 mm | Brass |
| DA00100028 | In-line model | ø28 x ø28 mm | Brass |
| DA00200034 | Adjustable model | 3/4" F x 3/4" F | Brass |
| DA00200100 | Adjustable model | 1" F x 1" F | Brass |
| DA00200022 | Adjustable model | ø22 x ø22 mm | Brass |
| DA00200028 | Adjustable model | ø28 x ø28 mm | Brass |

MADE IN ITALY



## Materials

**Body**: Brass EN 12165 CW617

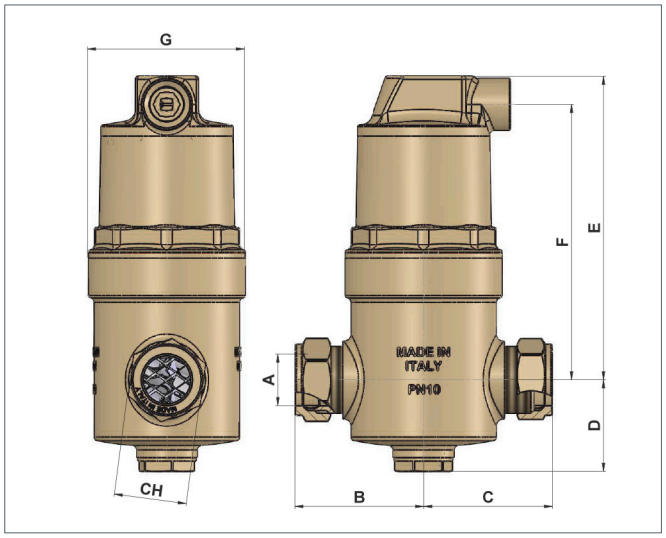
**Float**: lever type, polypropylene resin

**Spring**: AISI 302 Stainless Steel

**AIR TRAP Cartridge**:

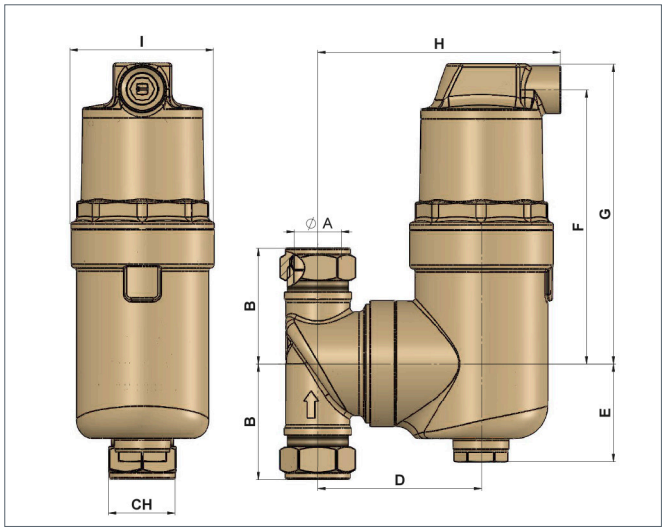
- Support: PA66 + FV 30%
- Mesh: AISI 302 Stainless Steel
- Cylinders: AISI 302 Stainless Steel

**Seals**: Peroxide cured EPDM




## Sizes (In-line model)

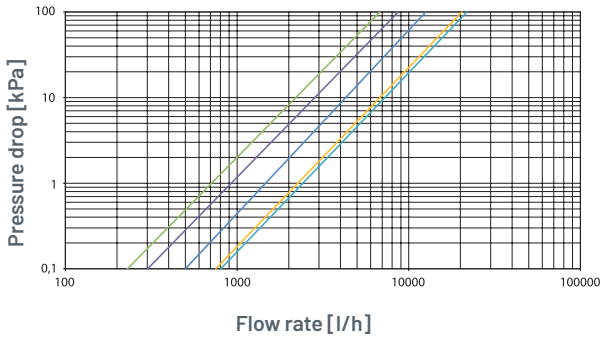
| A ø | 3/4" | 1" | 1" 1/4" | ø 22 mm | ø 28 mm |
|---|---|---|---|---|---|
| B | 47 | 50 | 50 | 55 | 56,8 |
| C | 47 | 50 | 50 | 55 | 59,8 |
| D | 39 | 39 | 39 | 39 | 39 |
| E | 129,5 | 129,5 | 131,5 | 129,5 | 129,5 |
| F | 117,5 | 117,5 | 117,5 | 117,5 | 117,5 |
| G | 67 | 67 | 67 | 67 | 67 |
| CH | 33 | 38 | 47 | 31 | 38 |




## Sizes (Adjustable model)

| A ø | 3/4" | 1" | ø 22 mm | ø 28 mm |
|---|---|---|---|---|
| B | 46 | 49 | 54 | 57,8 |
| C | 46 | 49 | 54 | 57,8 |
| D | 76,5 | 76,5 | 76,5 | 76,5 |
| E | 45,5 | 45,5 | 45,5 | 45,5 |
| F | 128 | 128 | 128 | 128 |
| G | 140 | 140 | 140 | 140 |
| H | 113 | 113 | 113 | 113 |
| I | 67 | 67 | 67 | 67 |
| CH | 32 | 38 | 31 | 38 |

FLUID DYNAMIC FEATURES
Flow diagram - pressure drop




## Technical data

**Filter mesh (cylindrical elements):** 1000 µm

**Max fluid temperature:** 110 °C

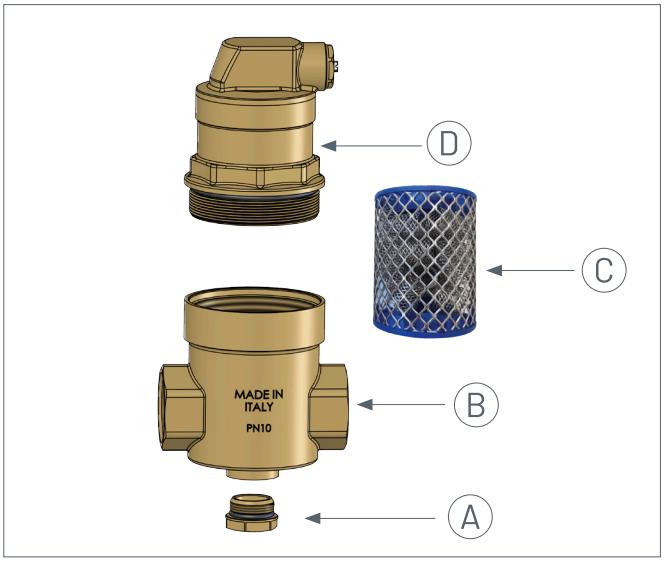
**Maximum working pressure:** 10 bar (1000 kPa)

**Maximum discharge pressure:** 10 bar (1000 kPa)

| SIZE | Kv |
|---|---|
| 3/4" - ø 22 (In-line) | 12,66 m³/h |
| 1" - ø 28 (In-line) | 20,44 m³/h |
| 1" 1/4 (In-line) | 21,83 m³/h |
| 3/4" - ø 22 (Adjustable) | 9,50 m³/h |
| 1" - ø 28 (Adjustable) | 10,30 m³/h |

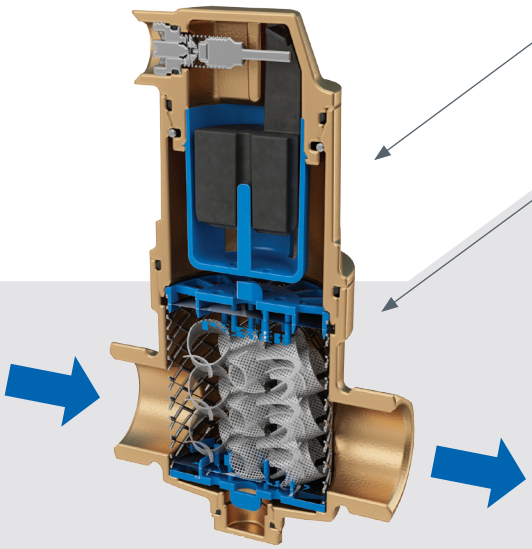
**The maximum recommended fluid speed at the device connections is ~ 1.2 m/s.** The table below shows the maximum flow rates to meet this condition.

| SIZE | l/h optimal flow rate |
|---|---|
| 3/4" (In-line) | 1400 |
| 1" (In-line) | 2300 |
| 1" 1/4 (In-line) | 3600 |
| 3/4" (Adjustable) | 1400 |
| 1" - ø 28 (Adjustable) | 2300 |




## Description

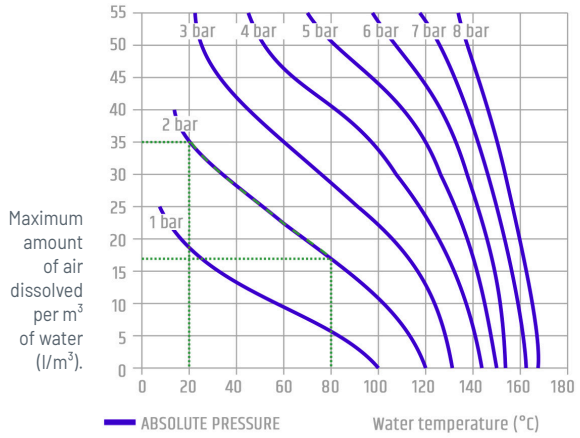
A. Drain plug
B. Body
C. AIR TRAP Cartridge
D. Automatic vent valve



PASSIVE PART:
High performance air vent valve
(discharge guaranteed up to 10 bar).

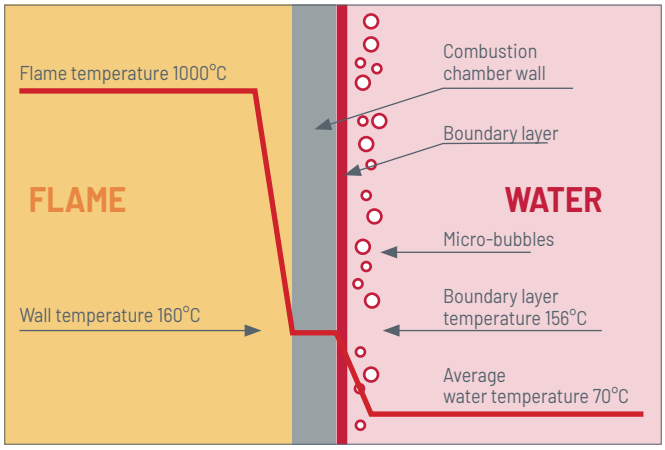
ACTIVE PART:
Innovative Air Trap Cartridge made up of a stainless steel chamber that guarantees exceptional service life and maximum reliability in variable pressure and temperature conditions. Air Trap Cartridge provides greater resistance to corrosion and wear due to impurities (the nature of which is always unpredictable) compared to any other system available on the market. The flow passes directly through the cartridge and the filtering cylinder system causes continuous changes in section to produce swirling movements that promote the release of micro-bubbles. In addition, the cartridge offers little resistance to flow (low pressure drop). The micro-bubbles settle inside the Air Trap Cartridge and after having reached a suitable size, move upwards and are expelled through the passive part of the device.

SOLUBILITY OF AIR IN WATER



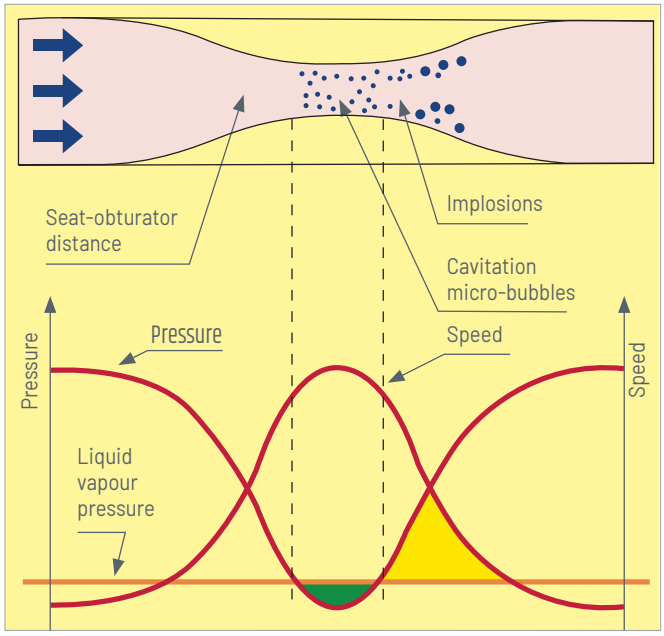

## The air formation process

The amount of air that can remain dissolved in a water solution depends on the pressure and temperature. This relationship is known as Henry's law; the graph at the side allows us to quantify the amount of air released from the fluid. 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 $m^3$ of water.
According to this law, it can be seen that the amount of air released from the solution increases as the temperature increases and as the pressure decreases. This air is in the form of micro-bubbles with diameters in the order of a few tenths of a millimetre.
There are specific points in HVAC system circuits at which micro-bubbles form continuously: inside boilers and devices which operate under cavitation conditions.



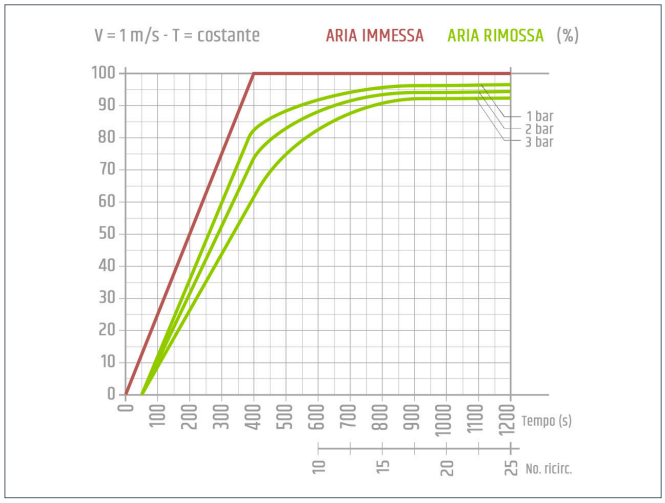

## Boiler micro-bubbles

Micro-bubbles form continuously on the surfaces that separate the water from the combustion chamber due to the high temperature of the fluid.
This air, carried by the water, collects at critical points in the circuit, from where it should be removed. Some of it is reabsorbed when it comes into contact with colder surfaces.



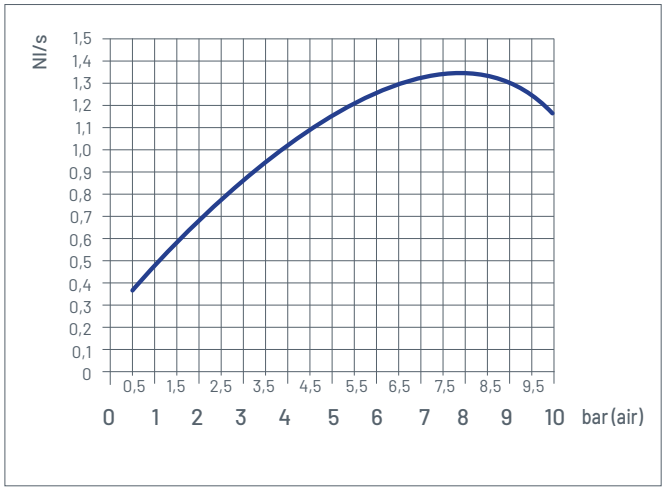

## Cavitation micro-bubbles

Micro-bubbles develop where the speed of the fluid is particularly high with a corresponding reduction in pressure. These points usually include the pump impellers and the orifices of the regulating valves. These air and steam micro-bubbles, the formation of which is accentuated in water, cannot subsequently implode.




## Air separation efficiency

The high efficiency POWER VENT™ separators are able to continuously eliminate air from hydraulic circuits. The amount of air that can be removed from a circuit depends on several parameters: it increases as the circulation speed and pressure decreases.
As shown in the graph at the side, after only 25 recirculation cycles, at the maximum recommended speed, nearly all of the artificially introduced air (blue curve on the graph) is removed by the deaerator. The percentage varies according to the pressure in the circuit.
The small amount of residue that remains is progressively eliminated during the normal operation of the system. Under slower speed or increased temperature conditions, the amount of air separated is even higher.

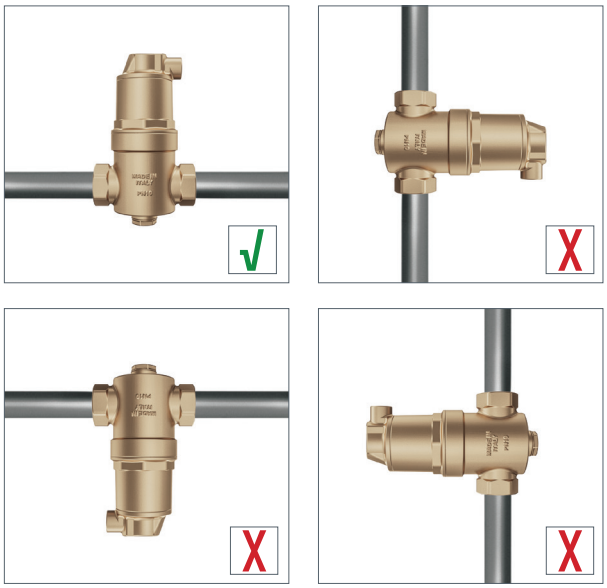



## Hydraulic characteristics

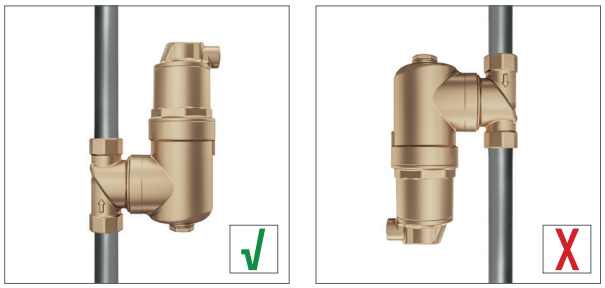
Discharge capacity during system loading phase.

## Installation instructions

### In-line model




### Adjustable model




- Install on the warmest part of the system as this is the area in which micro-bubbles will form more readily. In the case of heating systems, install at the boiler outlet. In the case of cooling systems, they should be installed on the return piping, at the cooling unit (Chiller) inlet.
- Install shut-off valves upstream and downstream of the filter in order to allow scheduled filter cleaning and maintenance to be carried out.
- In order to operate correctly, the POWER VENT™ deaerator should be installed vertically (on horizontal pipes), with the air discharge device facing upwards.

THE DEVICE MUST BE INSTALLED ACCORDING TO CURRENT REGULATIONS AND INSTALLED BY A QUALIFIED TECHNICIAN.

## Application diagrams

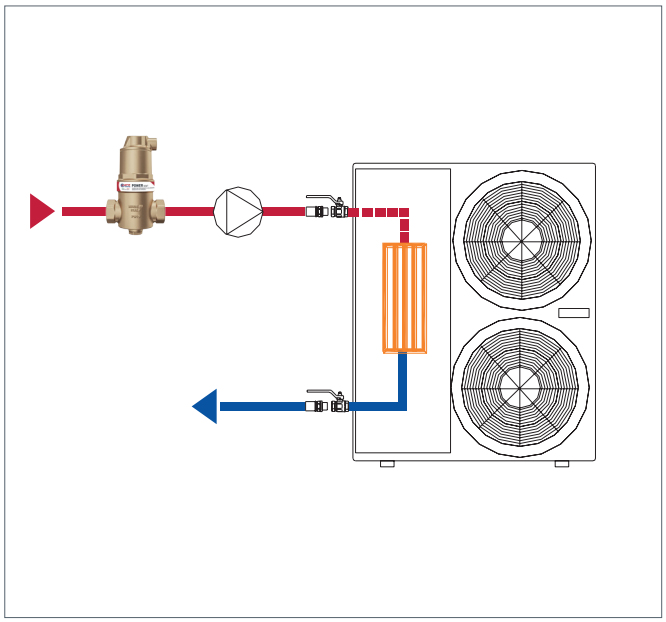


Diagram 1: POWER VENT™ installed on the system return pipe at the inlet of the cooling unit.

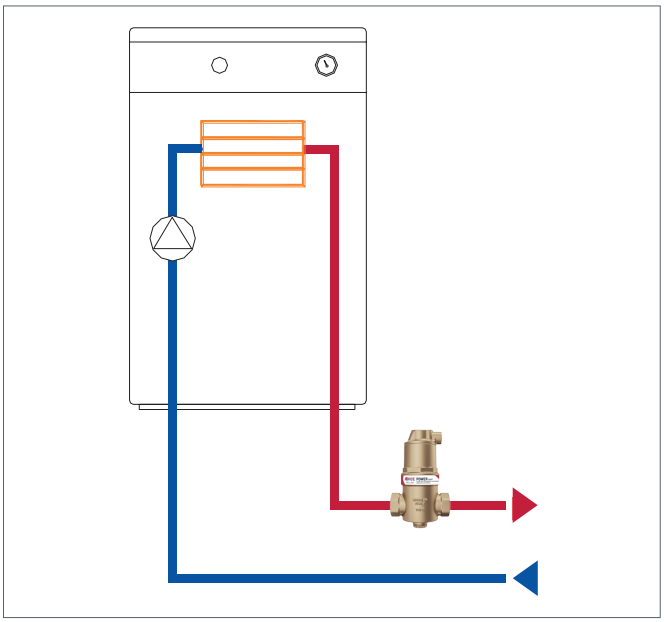
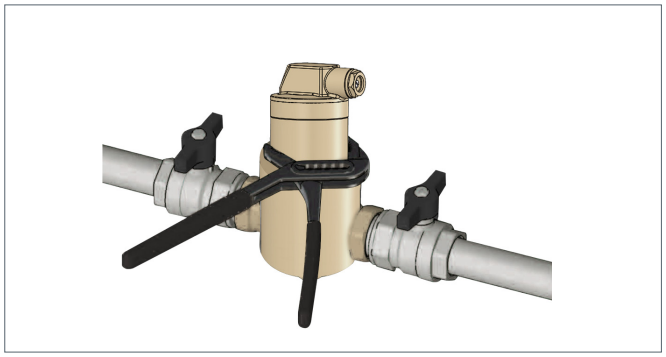
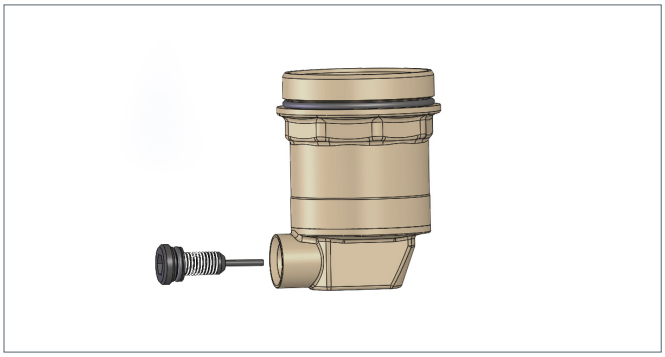


Diagram 2: POWER VENT™ installed on the system delivery pipe.

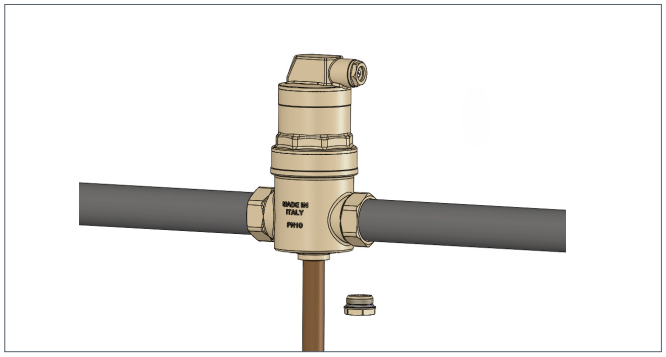
## Maintenance



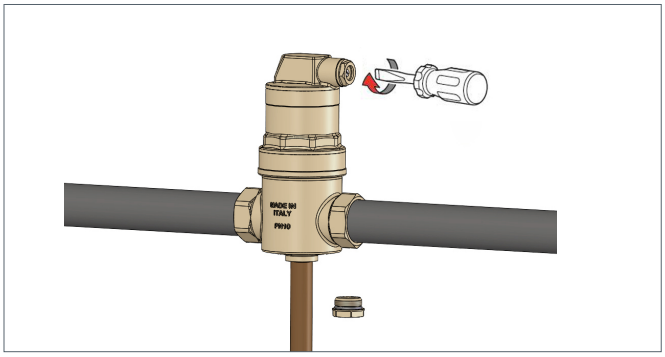
1. Before carrying out maintenance, close the shut-off valves upstream and downstream of the deaerator and then use a pipe wrench to unscrew the upper part of the body.



2. If the air vent valve leaks, it should be removed or replaced. To do this proceed as follows: remove the cap and use a wrench to unscrew the vent valve and then clean it.



3. To insert the rod onto the float, turn the upper part of the deaerator upside-down and screw the air vent valve back on. A 1/2" threaded fitting with a plug is located at the bottomof the deaerator so that a drain valve can be installed.



4. It is important to make sure that the screw is always unscrewed to vent the air automatically. The screw can be tightened to block the automatic operation of the air vent valve.

## Thermal insulation for POWER VENT™

## Package contents

- POWER VENT™ deaerator.

## Tender specifications

In-line and adjustable deaerator: model POWER VENT™. Brass body. PP float. Brass float guide and rod. Stainless steel float lever and spring. AISI 304 steel AIR TRAP filter cartridge. EPDM hydraulic seals. Threaded fittings FF-UNI-EN-ISO 228 (or compression type for copper pipe). Maximum working pressure 10 bar. Maximum discharge pressure 10 bar. Maximum operating temperature 110 °C. Available size IN-LINE MODEL: 3/4" - 1" - 1" 1/4 (or compression for copper pipe ø22 and ø28). Available size ADJUSTABLE MODEL: 3/4" - 1" (or compression for copper pipe ø22 and ø28).