

PNEUMATEX®

zeparo ZI | ZE

Principles | Range | Benefits

# Function

The lifetime and efficiency of heating, solar and chilled water systems are strongly affected by the quality of the system water. Although the type and age of an installation are often the deciding factors for the type and frequency of problems, corrosion due to "air" and sludge in the water circuit substantially increases the rate of wear on system components. The consequences are: constantly recurring problems and expensive repairs, which bring high costs and a steadily increasing level of dissatisfaction among users and installers.

The new Zeparo separators from Pneumatex are demonstrating that there is a better way of doing things.

The Zeparo Industrial (ZI) and Extended (ZE) have been specially developed by Pneumatex to meet the high demands of large installations, and they have one objective: to achieve an air-free, sludge-free installation without the use of filters, which become clogged or require regular maintenance.

## Separation

### Pneumatex Principle

The Pneumatex engineers have brought the best of the known separation principles together in one highly effective solution: Zeparo separators capture both large air bubbles and micro bubbles, as well as dirt. The core of the Zeparo is the unique *helistill* separator, with numerous blades tilted in a propeller-like arrangement, which works like a baffle to direct foreign matter upward (air and micro bubbles) or downward (dirt) towards the still zone of the vessel.

The optional magnet improves the dirt separation efficiency by attracting the magnetite in the water.

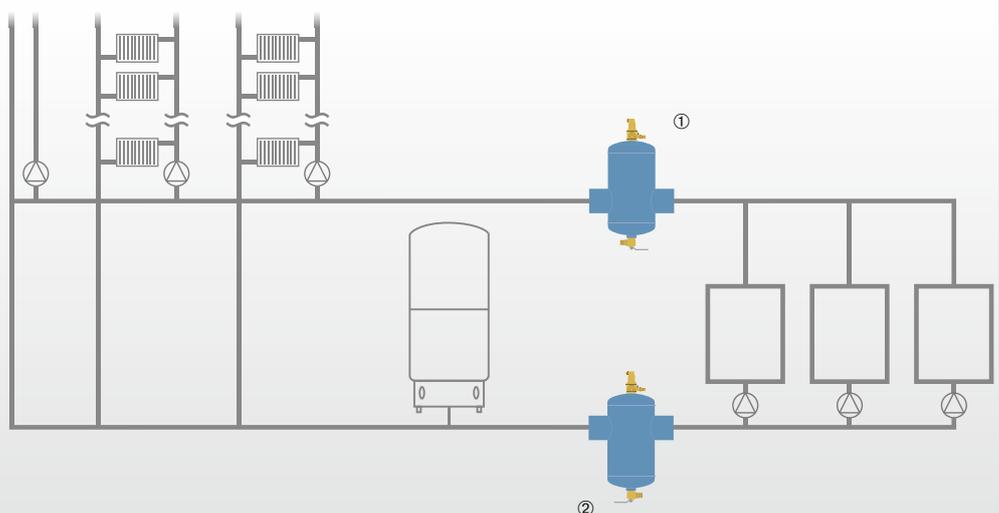
» Extract helistill

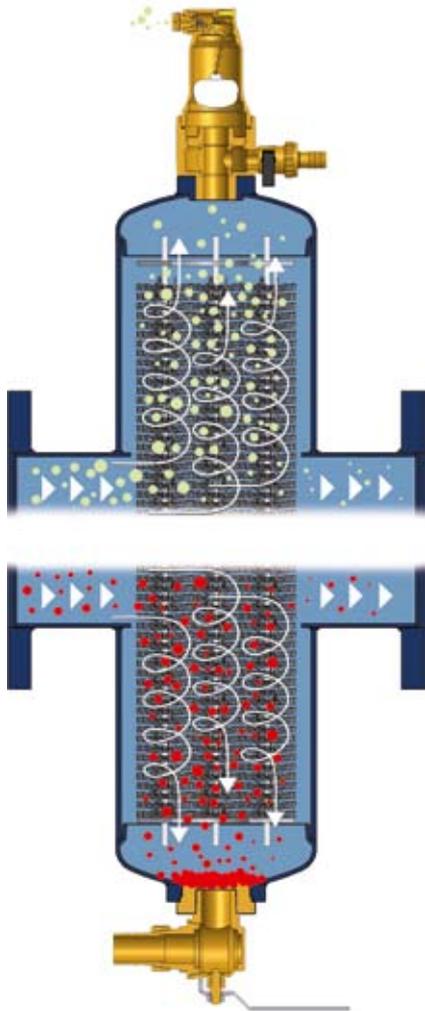
02

## Plan of a large installation

ZIO ①  
as micro bubble separator

ZIO ②  
as dirt separator





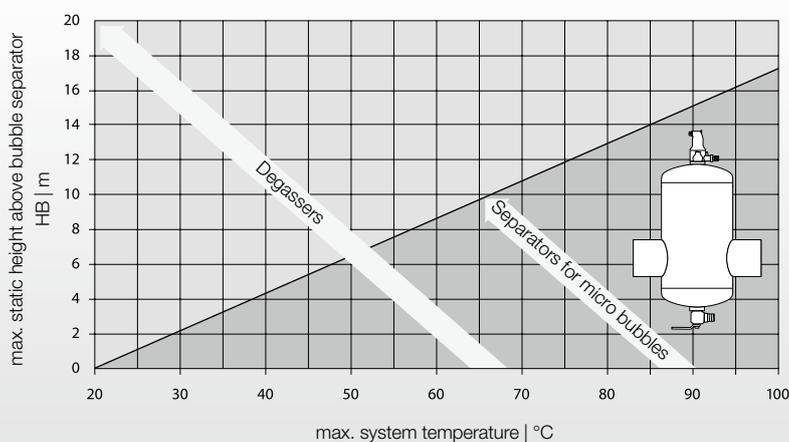
### Principle of helistill micro bubble or dirt separation

Micro bubble or dirt separation only (ZIO) or both simultaneously (ZIK, ZEK) with the helistill separator in Zeparo.

**Air** Various factors affect the absorption of 'air' (gases) into the system water, for example air could be absorbed directly after the installation is filled, or during water make-up, or by diffusion through non-airtight materials in the system. Gases can also be released as bubbles due to pressure and temperature changes in the installation. The bubbles are carried along with the water when it is circulating around the installation. This is when the *helistill* principle developed by Pneumatex goes to work: gas and micro bubbles are separated from the water in the helistill separator. The baffle plates in the *helistill* separator act as 'docking' surfaces. In the still zone, the bubbles are allowed to rise to the top, and can thus be expelled automatically from the system.

**Sludge** Sludge and corrosion particles cause damage to the pumps, valves and heat generators in hot water and chilled water systems. As sedimentation (settling) increases, heat transfer deteriorates until it becomes impossible. For example, heat exchangers with their narrow flow channels are particularly at risk. Once they are clogged up, non-demountable heat exchangers will bring system operation to a halt.

The Zeparo dirt separator catches these particles and separates them out of the water circuit using the *helistill* principle. Zeparo dirt separators can catch and separate even the tiniest particles (5 – 10µm), which often cause the most serious problems! The optional multiphase dry magnetic rod at the centre of the separator boosts the retention of magnetite.



### Use of separators and pressure step degassers ▶

Separators for micro bubbles are only fully functional in the lower area of the graph.

▶▶ Technical Guide Air

Zeparo separators for air are suitable for the separation of micro bubbles. Pneumatex pressure step degassers also separate the dissolved gases.

▶▶ Brochure Vento

# Range

The entire Zeparo family is multifaceted and ranges from the ZI (Zeparo Industrial) and ZE (Zeparo Extended) product groups, specially developed for large-scale applications, to separators for smaller pipe diameters ►► Brochure Zeparo ZU.

The smart, universal solution for the separation of micro bubbles and sludge.

- Nominal diameter: DN 50 – DN 300
- Max. adm. pressure PS: 10 bar
- Max. adm. temperature TS: 110°C
- With flange or welding end
- *leakfree* Zeparo ZUTX automatic air vent
- Optional:
  - ZIMA magnet attachment
  - ZHI thermal insulation for Zeparo ZI
- As defined in Pressure Equipment Directive PED/DEP 97/23/EC
- Customer specific solutions on request

## Zeparo Industrial (ZI)

Zeparo ZI separators provide the right solution for all requirements: used for the separation of air and/or sludge, depending on model and assembly position.

**ZIO:** The Zeparo Industrial Omni is unique in that the same separator can be used either for air separation or sludge separation as required, simply by installing it upside down.

**ZIK:** The Zeparo Industrial Kombi is a cleverly combined solution, which allows the simultaneous separation of air and dirt in one separator.



Zeparo Industrial ZIO ①  
as air separator  
(DN 50 – 300)

Zeparo Industrial ZIO ②  
as dirt separator  
with ZIMA magnet attachment  
(DN 50 – 300)

Zeparo Industrial ZIK ③  
combination air and  
dirt separator  
(DN 50 – 300)



Zeparo Extended ZEK ①  
with pipe coupling  
(DN 50 – 100)

Zeparo Extended ZEK ②  
with flange coupling  
(DN 100 – 300)

ZIMA magnet attachment ③  
for any Zeparo Industrial  
and the Zeparo Extended  
dirt separator

### Zeparo Extended (ZE)

**ZEK:** Zeparo Extended – the combination separator for air and dirt particles, designed for extreme and special applications. The practical coupling (pipe coupling up to DN 100, flange coupling from DN 125) allows easy access to the inside of the separator for inspection. The Zeparo Extended can be installed with the coupling opening facing either upward or downward.

### Accessories

#### ZIMA magnet attachment

Unique accessory for all Zeparo ZIs and ZEs. High-power dry magnets to ensure that any magnetite present is effectively extracted from the water.

The magnetite particles stick to the pocket, and when the magnets are pulled out they are drawn down into the sludge chamber. They are then removed manually by flushing out through the blow down valve.

#### ZHI thermal insulation

Made-to-measure insulation for all Zeparo ZIOs and ZIKs. Insulation available for ZEK on request.

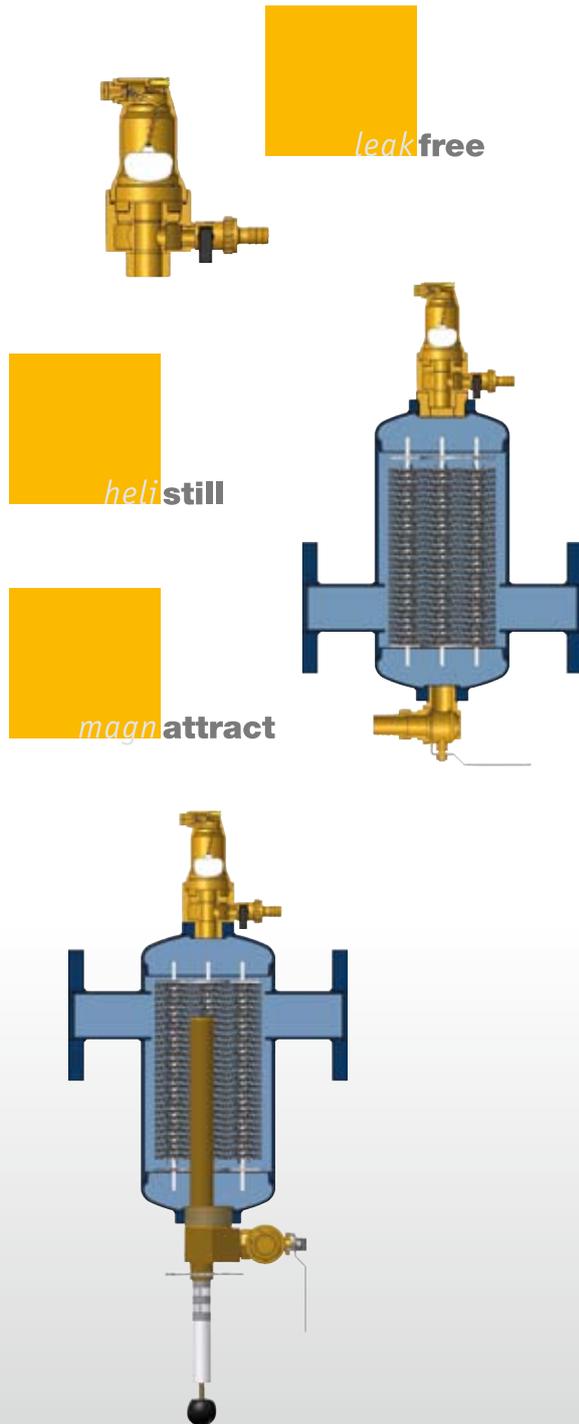


Tests have shown: when a ZIMA magnet attachment is installed, 94% of the small magnetite particles and 98% of the large particles are extracted out of the water circuit within a short time.



# Advantages in PNEUMATEX®

For applications of all sizes, the Zeparo range offers a complete, reliable solution for problems with air and sludge in hot and chilled water systems – from initial venting to the separation of the tiniest and finest magnetite particles. The Zeparo works continuously to prevent the high costs of repairs and system failures. Since: the less air and sludge in the water circuit, the more stable is the distribution of the heating or cooling medium, and the less susceptible is the system to corrosion and the failure of system components.



## Pneumatex quality features

### *Leakfree*

Zeparo automatic air vents are fitted with the *leakfree* safety pack. This ensures the safe, dry extraction of the separated gases without leaks or drips. All air vents and air separators are tested before delivery.

### *Helistill*

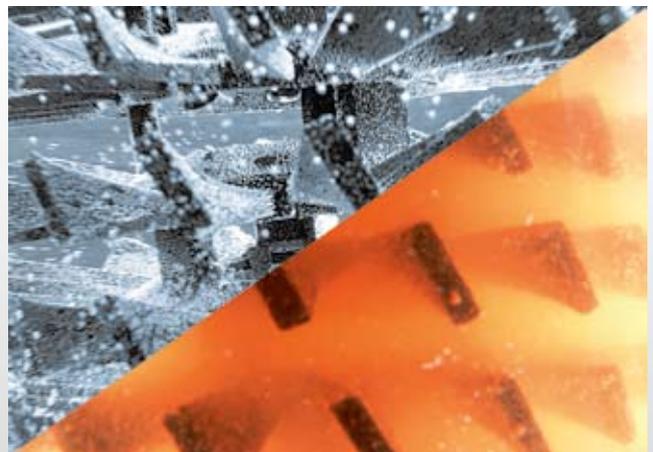
Zeparo separators are fitted with *helistill* separator. These provide the micro bubbles and dirt particles with a sufficiently large 'docking' surface, so they can be separated from the water in a still zone and then extracted. The unique *helistill* principle ensures highly effective separation.

The «heli» (as in «helical») stands for the tangential dynamics used for separation, and the «still» stands for the relatively still zone required for separation of the gaseous and solid components.

### *ZMA dry magnet*

There is a pocket at the centre of the helical separator containing a high-power, multiphase dry magnetic rod. This attracts the magnetite and holds it firmly. When the magnets are removed from the pocket, the magnetite drops down into the sludge chamber, where it can be flushed out manually along with other foreign matter.

## New



Helistill separator in Zeparo separators, made of high-quality glass fibre reinforced plastic (GRP) or stainless steel

» Extract helistill

### Projekt: Birmingham New Hospital

In June 2006 in Birmingham, the starting signal was given for the «Birmingham New Hospitals Project» – a building project for a hospital with various interconnected buildings of superlative design, covering a total surface area of more than 20 ha, and with more than 1200 beds.

Ensuring the reliable operation of a heating and cooling system in a structure of this kind is a tough challenge, and depends among other things on high quality of the water in the installation, which will in turn ensure long life and a smooth-running system.

For this project, Pneumatex AG had to produce a Zeparo dirt separator with a special DN500 pipe diameter. This provides optimal dirt separation and, with the additional dry magnet attachment, also effectively draws the magnetite out of the water circuit.

The gigantic Zeparo ZI was installed and put into operation at the start of 2008. It has been running ever since then, and has functioned perfectly.

#### Birmingham New Hospital

*Heart of the building design: three elliptical buildings linked by walkways and standing on a two-storey base structure.*



*Dry magnet insert and blow down valve to effectively trap magnetite and easily flush out sludge.*

#### Dirt separation in highly demanding conditions

*An impressive sight: the Zeparo Extended dirt separator in operation. Not your average installation.*



#### Quality and passion

With the «advantages of Pneumatex», the Zeparo sets new benchmarks for the separation of micro bubbles and dirt particles. Our developers have unparalleled know-how in fluid dynamics and separation technology, and these are combined in our Zeparo products with effective and reliable results.

The better is the enemy of the good. So Pneumatex makes a point of constantly improving even well-proven products, using advances in technology and the know-how of our employees to maintain a high level of quality in our products and customer services.

These demands for quality are matched by the dedication of our employees. This process is supported by face-to-face contact and interactions with our customers and partners.

Good reasons for making Pneumatex your partner too.

►► Charta – the principles of dynamic water management

| swiss made | **Pneumatex – Dynamic Watermanagement**

Pneumatex AG  
Mühlerainstrasse 26  
CH-4414 Füllinsdorf  
Tel. +41 61 906 26 26  
Fax +41 61 906 26 27  
info@pneumatex.com  
[www.pneumatex.com](http://www.pneumatex.com)

**PNEUMATEX®**

*Dynamic Watermanagement*