Zeparo Cyclone

Automatic air vents and separators
Dirt and magnetite separator with Cyclonic technology

Engineering GREAT Solutions
Zeparo Cyclone

Comprehensive range of products for sludge and magnetite separation in heating and cooling water systems. The number of potential applications as well as their modular construction is unique. Its new cyclonic technology takes dirt separation efficiency to the next level.

**Key features**

- **High separation efficiency with Cyclonic technology**
  Cleans your system in fewer cycles, each time reducing dirt particles that would normally deposit in the system with each additional cycle. The dirt collected can be easily and quickly flushed out with the help of the drain valve.

- **High efficiency independent of dimension**
  Dirt separator efficiency increases as flow velocity increases. The pressure drop remains stable during operation regardless of the amount of dirt collected. Even higher protection for higher flows, e.g. in cooling applications. Suitable for installations up to 300 kW of power.

- **Cleans and protects the installation**
  Protects critical investments from malfunction and even failure due to dirt, such as boilers, pumps, valves, chillers, and calorie meters. No clogging risk. Reduces maintenance of equipment needed over system lifetime and associated costs.

- **Magnet Accessory**
  Optimizes separation efficiency even further for sludge and magnetite (black iron oxide) deposits which consist of finer magnetic particles. Easy handling and cleaning. Combines magnetic separation and thermal insulation. Can be ordered separately as accessory.

**Technical description**

**Application:**
Heating and chilled water systems.

**Media:**
Non-aggressive and non-toxic system media. 
Addition of antifreeze agent up to 50%.

**Pressure:**
Max. admissible pressure, PS: 10 bar 
Min. admissible pressure, PSmin: 0 bar

**Material:**
Body: Brass 
Cyclone insert: PPS Ryton. 
Gaskets: EPDM

**Marking:**
Body: PN, DN, flow direction arrow. 
Label with TS and TSmin.

**Transportation and storing:**
In dry places.

**Magnet and Thermal insulation:**
Magnet: NdFeB with Ni-Cu-Ni cover/ protection against rust. 
Insulation: Expanded polypropylene (EPP), anthracite. Insulation value approx. 0.035 W/mk. 
Fire rating B2 to DIN 4102 and E in acc. to EN 13501-1. 
Max. temperature: 110 °C. 
Min. temperature: 6-8 °C (above dew point).
Separation principle

Cyclonic principle
The Zeparo Cyclone is based on a variety of principles that guarantee its high separation efficiency:
- Centrifugal forces - the cyclone creates a rotation within the Zeparo which results in additional forces on the dirt particles. The combination of gravitational and centrifugal forces result in high efficiency.
- Compared to the low gravity forces the centrifugal forces are significantly higher based on the speed inside the separator.
- The difference in density between the water and dirt particles (which have higher density) pushes the dirt particles to the outer wall of the Zeparo.
- Downwards stream: the downwards movement created within the Zeparo guides the dirt particles to the bottom and finally into the dirt collection chamber to be flushed out.
- In addition the ZCHM magnets will effectively increase the magnetite separation.

Separation efficiency

Typical curve
Zeparo Cyclone ZCD

Magnet and insulation
Uniquely integrates very strong magnets within the separator’s insulation which results in very high efficiency. Given all particles will move towards the outer diameter due to the cyclonic effect, this is where the magnets are located. This ensures the magnets are in the best possible position, whilst the insulation provides the perfect heat loss reduction.

The insulation is made of 4 pieces so that the upper section can stay on the Zeparo Cyclone whilst the lower section, which includes the magnets, is removed to flush out the dirt and magnetite. The unit can be easily mounted after the cleaning procedure.
Quick selection

Heating

Example:
Heating system with a pipe DN 25 and 1000 l/h flow. Draw a line from the point 1000 l/h to required dimension DN20/25 and read on the line for pressure drop 2,5 kPa.

For an exact calculation please use HySelect software.
Cooling

Example:
Cooling system with a pipe DN 32 and 3,5 m³/h flow. Draw a line from the point 3,5 m³/h to required dimension DN32 and read on the line for pressure drop 8 kPa.

For an exact calculation please use HySelect software.
Application examples

System with boiler

The Zeparo Cyclone dirt separator should be mounted either on the return in front of the unit to be protected or directly in front of the energy source. There is no minimum distance required to pipe bends etc. before or after the Zeparo Cyclone.

System with heat exchanger
Zeparo Cyclone Dirt ZCD – Separator, version Dirt for sludge particles

Zeparo Cyclone ZCD
Horizontal installation.
Female thread according to ISO 228. DN 20 thread length according to ISO 7/1.

<table>
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<tr>
<th>Type</th>
<th>H</th>
<th>h1</th>
<th>L</th>
<th>q_{min} [m^3/h]</th>
<th>q_{max} [m^3/h]</th>
<th>m  [kg]</th>
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*) Can be connected to smooth pipes by KOMBI compression coupling.

\[ q_{\text{max}} \] calculated on max speed in the pipe of 2 m/s.

Accessories

Magnet and Thermal insulation ZCHM
The insulation with magnet can mounted on the Zeparo Cyclone without draining the system.

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<th>Type</th>
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To select a Zeparo Cyclone with magnet you have to order a Zeparo Cyclone ZCD and an insulation with magnet ZCHM in the same dimension.

KOMBI compression coupling
Max.: 100°C
(See catalogue leaflet KOMBI.)
Support bush should be used TA 320 for copper pipes and TA 321 for steel pipes, see catalogue leaflet KOMBI.

<table>
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Additional information
Abbreviations and terminology: Datasheet Planning and calculation.