Full power
Cyclone precleaner technology – when the going gets dusty
High quality
Harsh operating conditions require the best quality – and that does not start with the ventilation systems, engine parts or fine filters of your machine. In fact, when conditions are extremely dusty, it is exactly these parts which need to have special protection in order to prevent failures.
This is where the high performance air cleaner systems with MANN+HUMMEL cyclone technology are used. Their separation efficiency of up to 99.5 % means they offer the best protection and therefore keep downtime and running costs to a minimum.

Individual customisation
Whether as a precleaner or stand-alone solution – the modular and compact design and individual fine tuning to different volume flow rates enables the realisation of almost all customer requirements.

Everything from a single source
Original equipment, retrofitting and replacement parts – our wide product range also covers the most difficult requirements and offers high quality solutions for each application.
MANN+HUMMEL has extensive experience as a development partner to well-known producers of engines and vehicles. One of our specialities is the production of customised high performance air cleaner systems with precleaners. MANN+HUMMEL offers a variety of concepts for dealing with the precleaning of intake air for diesel engines. Using single or two-stage solutions a separation efficiency of up to 99.5% can be achieved. Customised versions are flexible and easy to implement.

**Single stage cyclone cell**

Ø 16, 18, 25, 40, 65

- Low pressure drop
- High pre-separation
- Different sizes ideal for adaptation to different applications
- Suitable for engines and dedusting applications
- Mainly suction operation, pressure operation possible

Separation 90 - 98% \(^1\)

**2-stage cyclone cell**

Ø 16, 18

- Highest pre-separation
- Optimised for use with engines
- Maximum service life improvement
- Suction operation

Separation 99.1 \(^1\) – 99.5% \(^2\)

**Reverse flow cyclone cell**

Ø 32

- Good pre-separation without scavenging
- Suction and pressure operation possible

Separation 95 - 97% \(^1\)

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\(^1\) Pre-separation efficiency achievable with scavenging.
\(^2\) Tested acc. to ISO 5011 with PTI coarse test dust.
Cyclone cells

Function
The inlet air flows through the cyclone precleaner. Vanes rotate the air and generate centrifugal forces. This causes dust particles in the air to be thrown outwards and collected in a dust collector. The continuous emptying of the dust collector is made using a blower, exhaust ejector or with compressed air ejectors.

Depending on the design and the configuration of the cyclone precleaner, the separation efficiency is between 90 and 99.5%. The pressure drop for various applications is typically between 3 and 25 mbar and remains more or less constant over the whole operating time.

Application areas
- As pre-separation for applications with extremely dusty conditions
- As a stand-alone solution for the separation of coarse dust where the air purity requirements are low such as with cooling or ventilation

Installation possibilities
- As a precleaner upstream of fine filters, e.g. paper filters
- As a precleaner upstream of the turbocharger
- As a stand-alone solution

MANN+HUMMEL precleaner concepts offer the following advantages:
- Long service life of the fine filter located downstream
- Almost wear-free operation
- Low running costs
- Easy integration in any installation space through modular and compact design
- Individual and easy adjustment to all volume flow rates
- Easy to retrofit

High tech for high tech
Security for each application
Application examples

Operating data per cell
An extensive range of cyclone cell types enables flexible configuration to meet almost any customer requirement.

Regardless of the technical and installation space specifications from the customer, MANN+HUMMEL always has the right customised solution.

Flow through cell blocks
- High separation efficiency
- Maintenance-free with scavenging
- Compact, low design
- Partly self-discharging
- Lifetime part as there are no service components

Return flow cell blocks
- Self-discharging without scavenging
- No clogging also with coarse particles
- Operation possible with suction operation with scavenging or maintenance cover
- Lifetime part as there are no service components

Technical data

<table>
<thead>
<tr>
<th>Cyclone diameter</th>
<th>Specifications</th>
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<tbody>
<tr>
<td>16, 18, 25, 40, 65 mm</td>
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<table>
<thead>
<tr>
<th>Flow rate per cell</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_{nom} = 0.1 ) to 1.6 ( m^3/)min</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Temperature range</th>
<th>Specifications</th>
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<tr>
<td>-40 to 80°C</td>
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<table>
<thead>
<tr>
<th>Dirt load</th>
<th>Specifications</th>
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<tbody>
<tr>
<td>from 0.2 mg/m³</td>
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</table>

<table>
<thead>
<tr>
<th>Flow resistance</th>
<th>Specifications</th>
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<tbody>
<tr>
<td>3 to 25 mbar</td>
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<table>
<thead>
<tr>
<th>Separation efficiency</th>
<th>Specifications</th>
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<tbody>
<tr>
<td>90 to 99.5%</td>
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</table>

Service life of the fine filter

Pre-separation efficiency: 95 %

- 100 kg dust
- Separated dust: 95 kg
- Service life: 100%
- Pass through of dust to filter element: 5 kg dust

Separation efficiency: 99.5 %

- 100 kg dust
- Separated dust: 99.5 kg
- Service life ≥ 300%
- Pass through of dust to filter element: 0.5 kg dust

This example illustrates the exponential effect of high performance pre-separation on the service life of the fine filter located downstream: the increase of the separation efficiency from 95 % to 99.5 % reduces the dust passed through to the filter element by 90 %. This leads to a longer service life of ≥ 300 %. 
The MANN+HUMMEL Group is a company with international operations and employs around 15,200 people worldwide at 60 international locations.

The company develops, produces and sells technically complex components and systems for the automotive industry and many other fields. A key area is high quality filtration products for vehicles, engines and industrial applications. The OEM business with global market leaders and producers of vehicles, machines and installations defines the quality and performance of the products. Filters for the international aftermarket are sold under numerous international brands as well as under the group’s own MANN-FILTER brand.

MANN+HUMMEL Industrial Filtration
The Industrial Filtration Business Unit with its headquarters in Speyer (Germany) is specialised in meeting the requirements of off-highway vehicle and engine applications, compressed air and vacuum technology, mechanical engineering and plant construction.

For these and other industrial fields MANN+HUMMEL Industrial Filtration offers high performance products for the filtration and separation of air, gases and liquids.

Thanks to an efficient and well-organised partner network and global sales network the products are readily available at almost all locations.