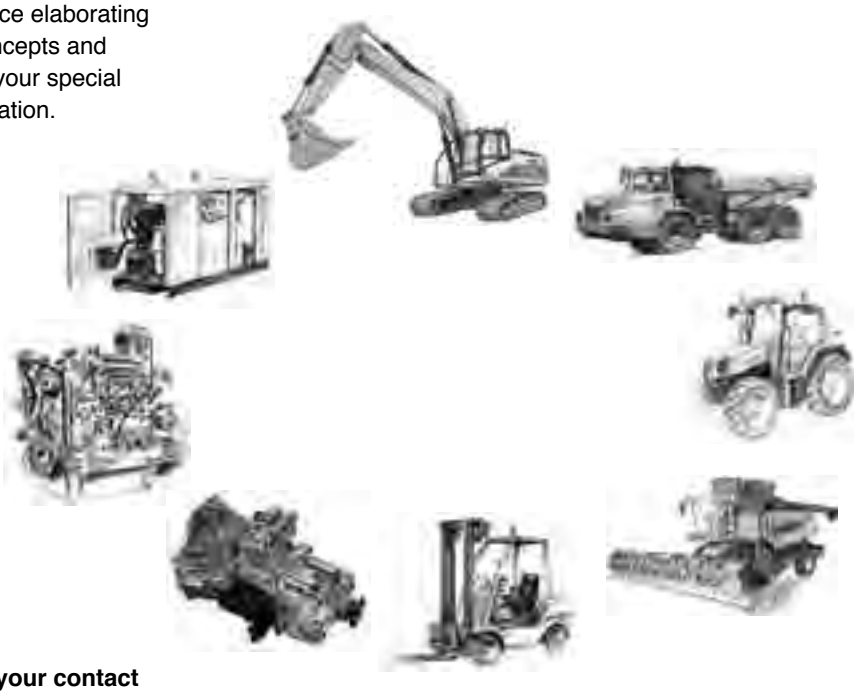
MANN+HUMMEL Air Cleaners

Air cleaners for many fields of application

Modern, high performance vehicles, machines, devices and engines require filters and components with a correspondingly high performance. This catalogue provides an overview of our air cleaners and the matching accessories – all having the renowned MANN+HUMMEL OEM quality. Since our customers operate in many varied fields, such as

- construction machines
- agricultural machines
- compressors
- mechanical engineering
- engines and gear units
- commercial and customised vehicles, etc.

MANN+HUMMEL has extensive experience elaborating individual concepts and solutions for your special field of application.



Close to you

Production facilities and sales offices at various locations in Europe, America, South America and in Asia enable the clarification of technical questions locally. A subsidiary company or representative located near you means we are always available to offer you assistance.

How to find your contact partner:

If you are not yet in contact with MANN+HUMMEL or one of our representatives, please call

Tel.: +49 (62 32) 53-80
Fax: +49 (62 32) 53-88 99

and name your field of application. We will then pass you on to the appropriate sales team.

Information is also available in the internet at:
www.mann-hummel.com
E-Mail:
if.info@mann-hummel.com

Important information for our customers

We are continually developing our range of filters to further improve our high performance, economic filtration products. For this reason we expressly reserve the right to make changes to our products and product range after this catalogue has been printed. This includes technical changes and the discontinuation of products, especially in the case of old products. Information about changes and general availability is available from your MANN+HUMMEL contact person.

Contents

Product overview

IQORON

Two-stage plastic air cleaner

Page 9

Volumetric flow range	4 m³/min to 12 m³/min
Operating temperature	Continuous: -30 °C to +100 °C For short periods: +100 °C
Pre-separation	Multicyclone block
Main element	CompacPleat element with dual bellows technology, axial seal, metal-free
Secondary element	Pleated paper element, metal-free
Selection criteria	High power density, compact design and long service life, scavenging required
Typical applications	Construction and agricultural machines, dismantling operations, etc.

IQORON-V

Two-stage plastic air cleaner

Page 20

Volumetric flow range	4 m³/min to 9 m³/min
Operating temperature	Continuous: -30 °C to +90 °C (-V 7), -40 °C to +100 °C (-V 9) For short periods: +110 °C (-V 7), +120 °C (-V 9)
Pre-separation	Multicyclone block
Main element	CompacPleat element with dual bellows technology, axial seal, metal-free
Secondary element	Pleated paper element, metal-free
Selection criteria	High power density, compact design, flexibility and long service life, dust discharge via valve does not require scavenging
Typical applications	Construction and agricultural machines, dismantling operations, etc.

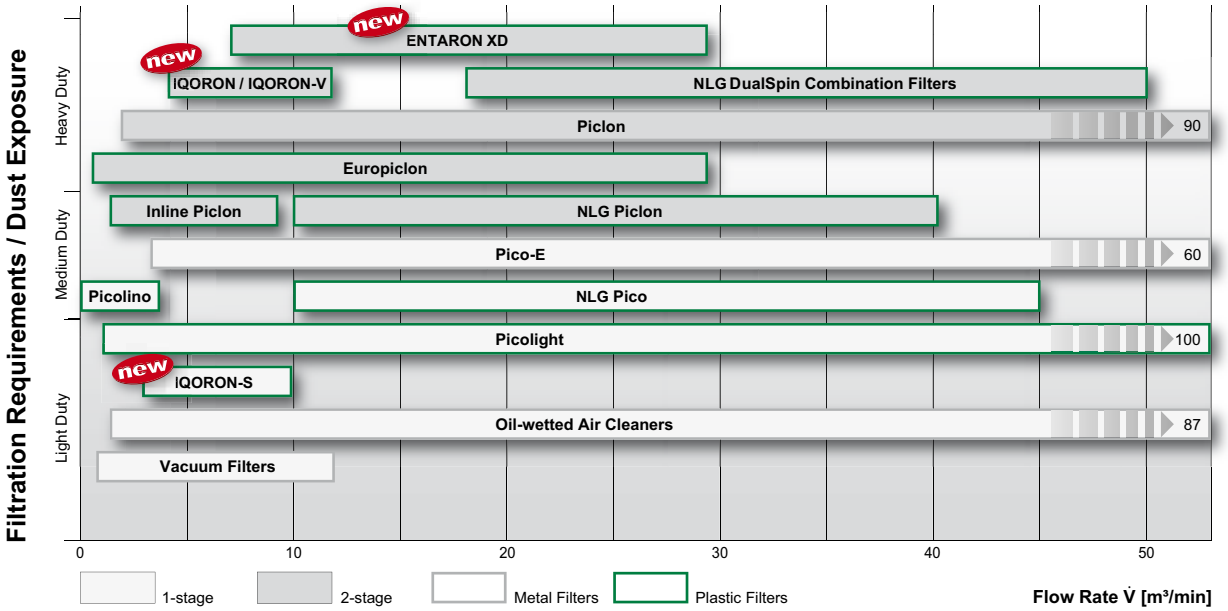
IQORON-S

Single-stage plastic air cleaner

Page 20

Volumetric flow range	4 m³/min to 10 m³/min
Operating temperature	Continuous: -30 °C to +90 °C For short periods: +110 °C
Main element	CompacPleat element with dual bellows technology, axial seal, metal-free
Secondary element	Pleated paper element, metal-free
Selection criteria	High power density, compact design, flexibility, very low pressure loss
Typical applications	Stationary environments with low dust concentrations, e.g. stationary compressors and generators, etc.

Product overview



Volumetric flow range	7 m³/min to 28 m³/min
Operating temperature	Continuous: -30 °C to +90 °C For short periods: +110 °C
Pre-separation	Tangential inlet
Main element	Star-pleated element with plastic centre tube and high performance filter medium with glue string technology, radial seal, metal-free
Secondary element	Synthetic fabric element with centre tube, radial seal, metal-free
Selection criteria	High power density, extreme mechanical requirements, excellent flexibility through variable modular system, long service interval, economy
Typical applications	Construction and agricultural machines, harvesters, mobile compressors, construction site trucks, mobile cranes, gensets, etc

ENTARON XD

Two-stage plastic air cleaner

Page 27

Volumetric flow range	0.8 m³/min to 28 m³/min
Operating temperature	Continuous: -40 °C to +80 °C For short periods: +100 °C
Pre-separation	Tangential inlet
Main element	Star-pleated element, centre tube in the housing, radial seal, metal-free
Secondary element	Synthetic fabric element with centre tube, radial seal, metal-free
Selection criteria	Flexibility and economy with longer service life
Typical applications	Construction and agricultural machines, mobile compressors

EUROPICLON

Two-stage plastic air cleaner

Page 35

Product overview

NLG Pico

Single-stage plastic air cleaner

Page 56

Volumetric flow range	10 m³/min to 45 m³/min
Operating temperature	Continuous: -40 °C to +80 °C For short periods: +100 °C
Main element	Star-pleated element with centre tube, radial seal, metal-free
Secondary element	Synthetic fabric element with centre tube, radial seal, metal-free
Selection criteria	Low pressure drop and highly economical with low dust loads
Typical applications	Trucks, mobile cranes, buses, stationary compressors, generators

NLG PicIon

Two-stage plastic air cleaner

Page 60

Volumetric flow range	10 m³/min to 40 m³/min
Operating temperature	Continuous: -40 °C to +80 °C For short periods: +100 °C
Pre-separation	Vane to generate air spin
Main element	Star-pleated element with centre tube, radial seal, metal-free
Secondary element	Synthetic fabric element with centre tube, radial seal, metal-free
Selection criteria	Highly economical with medium dust loads
Typical applications	Mobile compressors, mobile cranes, construction site trucks, construction and agricultural machines

NLG DualSpin

Combination air cleaner

Two-stage plastic air cleaner

Page 64

Volumetric flow range	18 m³/min to 50 m³/min
Operating temperature	Continuous: -40 °C to +80 °C For short periods: +100 °C
Pre-separation	External monocyclone with integrated pressure regeneration (DualSpin)
Main element	Star-pleated element with centre tube, radial seal, metal-free
Secondary element	Synthetic fabric element with centre tube, radial seal, metal-free
Selection criteria	Long service life with heavy dust conditions
Typical applications	Combine harvesters, field choppers, harvesting machines, construction and agricultural machines in very dusty conditions

Product overview

Piclon

Two-stage metal air cleaner

Page 69

Volumetric flow range	2 m^3/min to 90 m^3/min
Operating temperature	Continuous: -40 °C to +100 °C For short periods: +120 °C
Pre-separation	Vane to generate air spin
Main element	Star-pleated element with centre tube, axial seal, reinforced with metal
Secondary element	Synthetic fabric element with centre tube, axial seal, rein-forced with metal
Selection criteria	Long service life with very high mechanical stress on the housing
Typical applications	Construction and agricultural machines, engine construction

Picolino

Single-stage plastic air cleaner

Page 79

Volumetric flow range	0.25 m^3/min to 3.5 m^3/min
Operating temperature	Continuous: -30 °C to +100 °C For short periods: +120 °C
Filter element	Star-pleated element, radial seal, metal-free
Typical applications	Filters for two-way ventilation, small engines, small piston compressors, general mechanical engineering

Picolight

Single-stage air cleaner without housing

Page 87

Volumetric flow range	1 m^3/min to 100 m^3/min
Operating temperature	Continuous: -30 °C to +80 °C For short periods: +100 °C
Filter element	Star-pleated element, radial seal, metal-free
Typical applications	Stationary compressors, generators, marine applications

Vacuum filters

ngle-stage metal air cleaner

Page 91

Volumetric flow range	0.7 m^3/min to 12 m^3/min
Operating temperature	Continuous: -30 °C to +80 °C For short periods: +100 °C
Filter element	Star-pleated element with centre tube, axial seal, reinforced with metal
Typical applications	Air and gas pipes with negative pressure (vacuum pumps)

Other air cleaners*

Pico-E

Single-stage
metal air cleaner

Volumetric flow range	3 m^3/min to 60 m^3/min
Operating temperature	Continuous: -40 °C to +100 °C For short periods: +120 °C
Main element	Star-pleated element with centre tube, axial seal, reinforced with metal
Secondary element	Synthetic fabric element with centre tube, axial seal, reinforced with metal
Selection criteria	Low pressure drop with very high mechanical stress on the housing
Typical applications	Compressors, generators

Inline Piclon

Two-stage plastic air
cleaner

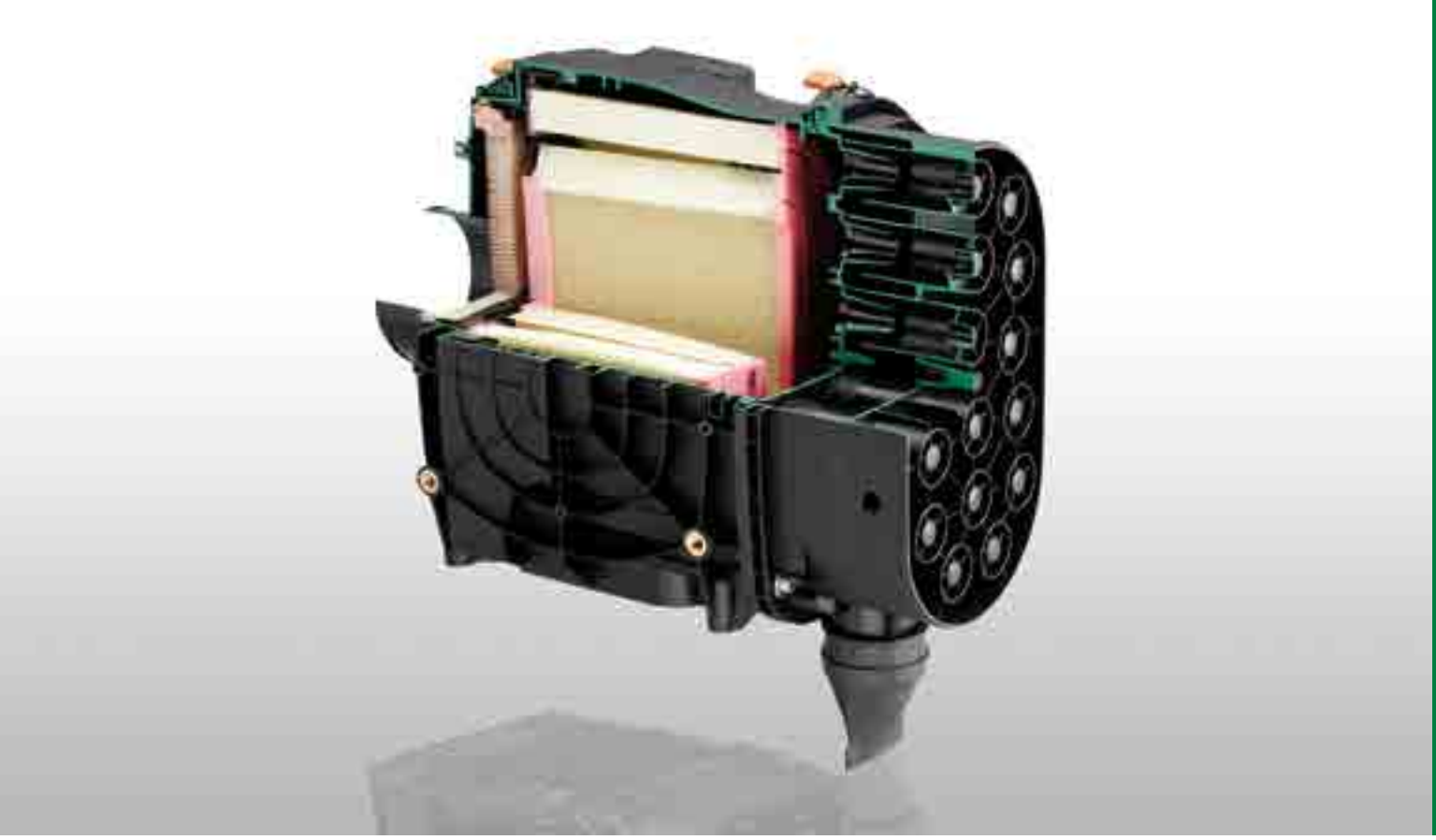
Volumetric flow range	3 m^3/min to 8 m^3/min
Operating temperature	Continuous: -40 °C to +80 °C For short periods: +100 °C
Pre-separation	Vane to generate air spin
Main element	Star-pleated element with centre tube, axial seal, reinforced with metal
Secondary element	Synthetic fabric element with centre tube, axial seal, reinforced with metal
Selection criteria	Linear air flow when fitting to engine and medium dust loads
Typical applications	General mechanical engineering and vehicle construction

Oil-wetted air cleaners

Single-stage air cleaner
without housing

Volumetric flow range	1.4 m^3/min to 87 m^3/min
Operating temperature	Continuous: -30 °C to +100 °C For short periods: +130 °C
Filter element	Steel mesh wetted with oil, radial seal
Typical applications	Stationary compressors, generators, marine applications

* These air cleaners remain available. Please contact your MANN+HUMMEL contact person for technical details.



MANN+HUMMEL IQORON
The new compact air cleaners for high requirements

IQORON

An intelligent solution

IQORON

IQORON-V

IQORON-S

The newly developed IQORON air cleaner series from MANN+HUMMEL meets current and future requirements for greater air throughput and reduced installation space and is therefore the ideal solution for demanding applications.

Advantages at a glance:

- low space requirement through compact design
- long filter service life through highly efficient multi-cyclone block pre-cleaner and the CompacPleat double-bellows element
- highest reliability through filter element with axial seal and additional secondary element with radial seal
- inline air flow enables numerous installation possibilities
- easy monitoring of the dirt accumulation level through integrated connection for service switch
- cleaning of multi-cyclone block made easy through central fixing screw
- eco-friendly disposal of metal-free filter element (fully incinerable)
- problem-free fitting to different units through variable installation positions
- quick first-fit through various fixing possibilities

Variations of the IQORON series

IQORON

Target applications

The power pack: with a high power density and long service life – scavenging required

Dimensions and part numbers on page 16.

IQORON-V

High performance cyclone technology – without scavenging

Dimensions and part numbers on page 22.

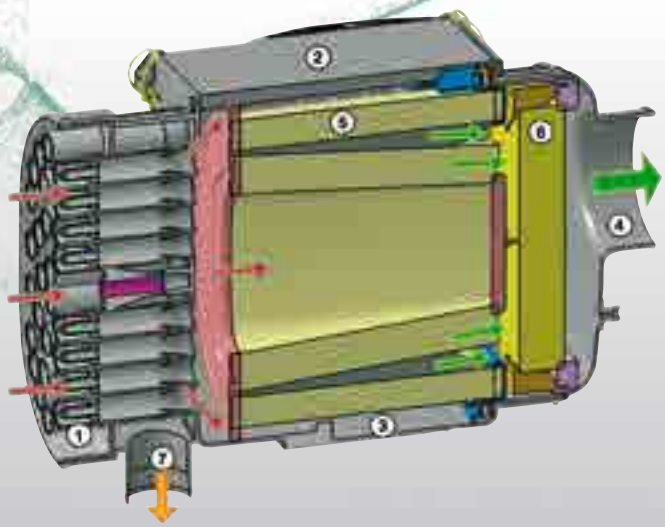
IQORON-S

The single-stage filter for low pressure drop

Dimensions and part numbers on page 21.

IQORON

Pre-separation through high performance cyclone technology



Basic principle of the new IQORON

1) Cyclone block
2) Service cover
3) Housing
4) Clean air port
5) CompacPleat double bellows element
6) Secondary element
7) Dust discharge port

A more efficient precleaner leads to a longer filter service life and as a result it is not necessary to change the filter element as often – an advantage which has an immediate effect on the economy of the machine.

The best and most technically advanced solution is achieved by the connection in parallel of many small, separate precleaner cells in a multi-cell separator, the so-called multi-cyclone block.
The multi-cyclone block of the IQORON from MANN+HUMMEL with its precleaner cells is a real filtration highlight with an efficiency of more than 95%. Compared to a conventional standard two-stage filter with a pre-separation efficiency of 85%, the IQORON multi-cyclone block offers dust pre-separation which is 3 times as effective.

IQORON
multi-cyclone block

New CompacPleat filter element

The core of the IQORON is the newly developed MANN+HUMMEL CompacPleat double-bellows element. In comparison to a conventional filter element in the same installation space the CompacPleat has a considerably larger surface area. In addition, the air cleaner with its linear air flow allows numerous installation possibilities. The metal-free filter element is easily disposed of by incineration and therefore eco-friendly. The element carrier frame (if available) is re-used which makes it only necessary to change the filter insert with the integrated seal. In this way the IQORON is able to make a contribution towards conservation of resources.

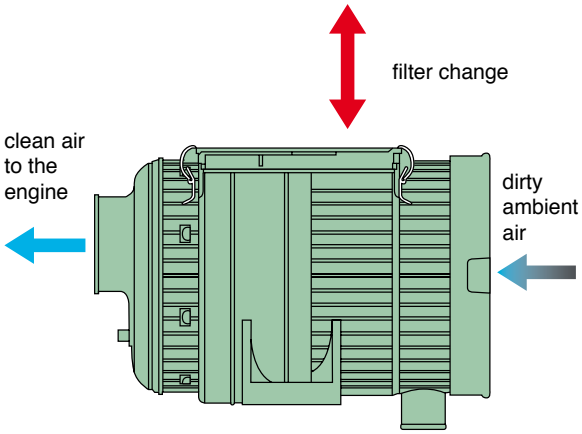
New CompacPleat filter element

IQORON

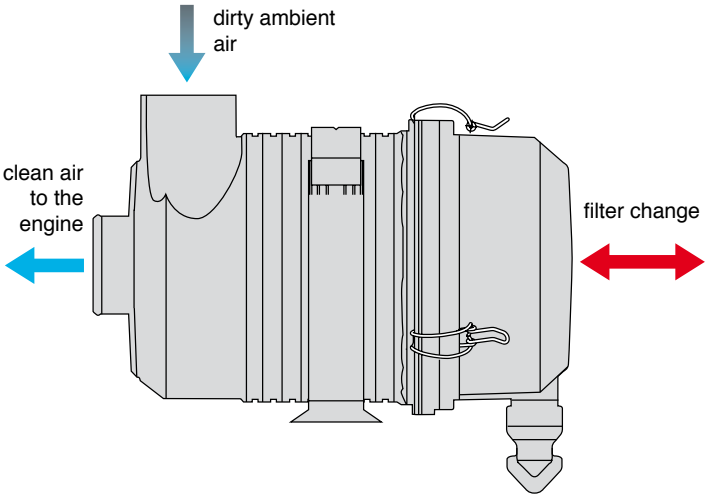
The IQORON is a two-stage air cleaner with a highly efficient cyclone block. The cleaner is scavenged continuously to fully exploit its efficiency of more than 95% (see page 15).

The inline concept of the IQORON

Air flow in the new IQORON air cleaner

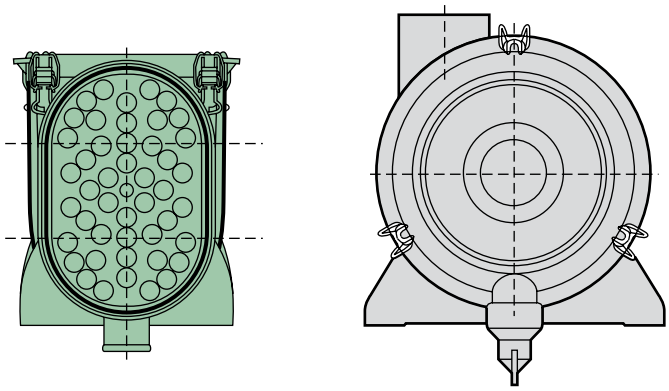


Air flow in a conventional air cleaner



A filter for tight installation conditions

A size comparison with a conventional filter and same service life shows: IQORON saves valuable installation space!



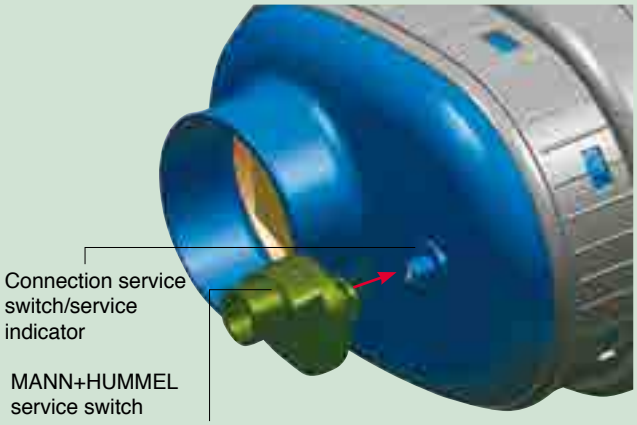
IQORON

Details

Connection service switch / service indicator

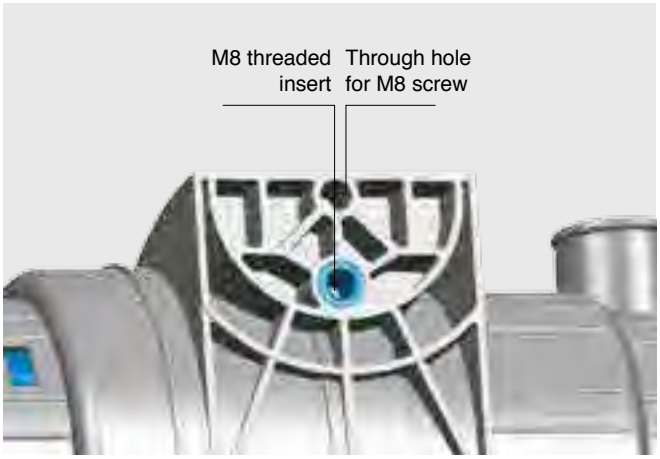
The IQORON filter housing has an integrated M10x1 threaded connection for a service switch or indicator. Further parts are not required. We recommend the use of a MANN+HUMMEL service switch or indicator to monitor the dirt level.

If a service switch is not used, the connection is sealed to be dust-tight using the supplied protection cover.



Fixing

For mounting to the bracket, in addition to the option of the "through-hole" there is also the possibility to use a number of threaded inserts (standard: M8, option: M10 or UNC 3/8“-16). This removes the need for washers and nuts and considerably shortens the time required for the first-fit of the filter to the vehicle.



Secondary element

The IQORON is equipped with a separate secondary element so that the cleaner can also perfectly protect the engine while servicing the main element.
This secondary element is perfectly positioned for the flow behind the filter element and has its own radial seal for the housing. This prevents the ingress of dirt in the intake system even when the main element is removed or damaged through inappropriate handling.
The IQORON secondary element is also metal-free and therefore eco-friendly and fully incinerable.

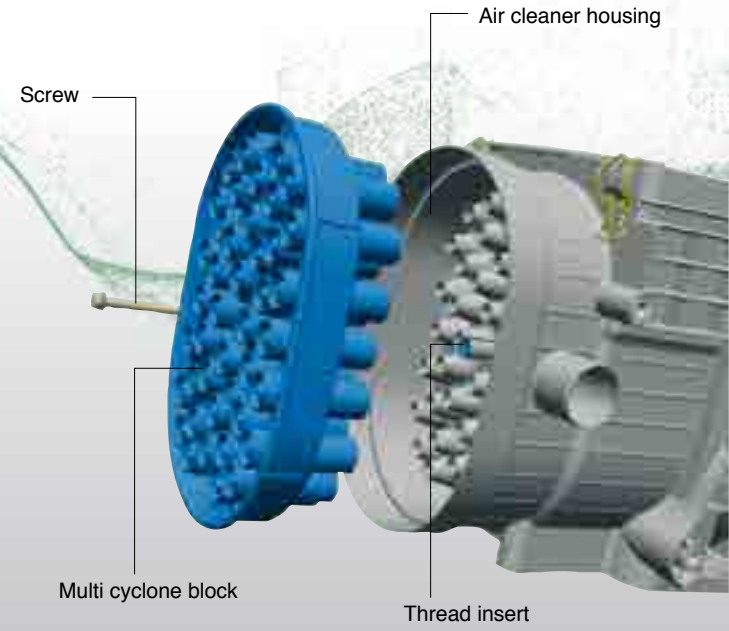
IQORON

Installation and maintenance

Servicing the preseparator

If particularly unfavourable application conditions occur (e.g. simultaneous ingress of large amounts of dust particles and water) and the preseparator does block, then it can be easily and quickly serviced:

After unscrewing the central holding screw the cyclone block is removed from the housing and cleaned either with compressed air or by washing out.



Changing the filter elements

IQORON 7

Step 1
Remove the cover.

Step 2
Now remove the main element.

Step 3
Dispose the used element.

Step 4
Now there is access to the secondary element, which must also be changed regularly.

IQORON 10 and 12

Step 1
Remove the cover

Step 2
Undo the lever by pulling towards the clean air side (see arrow).

Step 3
Now remove the main element together with the frame

Step 4
Dispose the used element and re-use the frame.

Step 5
Now there is access to the secondary element, which must also be changed regularly.

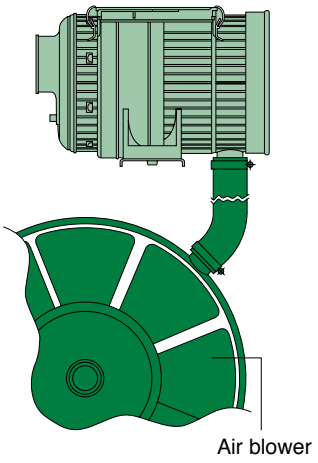
IQORON

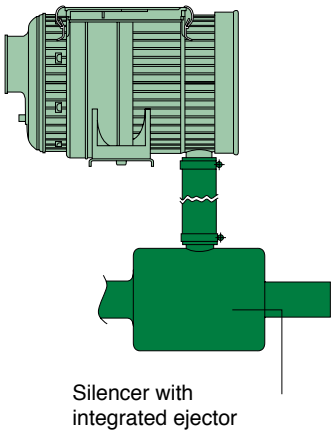
Continuous scavenging

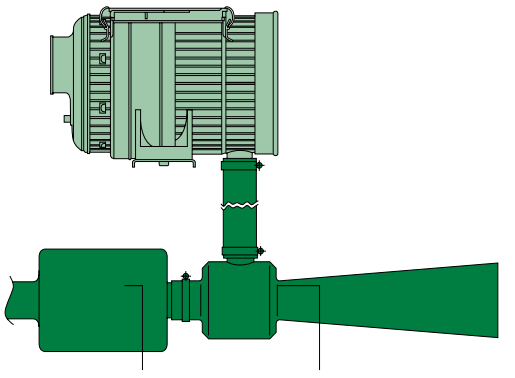
To guarantee reliable, problem-free running of the IQORON it is necessary to continuously scavenge the preseparator of the air cleaner. This removes the pre cleaned dust from the preseparator and avoids deposits building up which otherwise lead to a considerable reduction in efficiency and service life.

The condition for reliable dust scavenging is a negative pressure of at least 8 mbar via the preseparator with a nominal volume flow of the filter. To determine the required total negative pressure, it is necessary to include the pipe resistance values of the raw air pipe and scavenging pipe. If there is any uncertainty we recommend measurement of the actual negative pressure present.

The following pictures show the different possibilities of how to realise dust removal through scavenging







Scavenging using a blower

The engine cooling fan can be used for the scavenging provided the negative pressure generated is at least 8 mbar. This is usually the case with modern engine fans which at the present time generate a negative pressure of up to 20 mbar. Alternatively, the use of a special suction fan is possible, for example mechanically driven with a V-belt or electrically driven.

Scavenging with an integrated ejector

A frequently used space saving alternative is to use an exhaust ejector in the silencer of the exhaust pipe to eject the pre cleaned dust back into the environment together with the engine exhaust fumes.

Scavenging with MANN+HUMMEL ejector fitted downstream

The scavenging can be easily realised using the proven MANN+HUMMEL ejectors which are installed downstream of the silencer. The integrated venturi tube generates the required negative pressure. A pipe connects the IQORON to the ejector and the separated dust is blown out of the exhaust pipe. When using exhaust ejectors care should be taken that the permissible exhaust back pressure is not exceeded.

IQORON

Installation positions

In order to ensure ideal dust discharge in varying positions, the IQORON is available with three different orientation directions for the dust scavenging connection. The best separation efficiency is achieved when the dust discharge port is pointed downwards. If the direction deviation of the dust discharge port to the vertical is more than 45°, the next port position should be used.

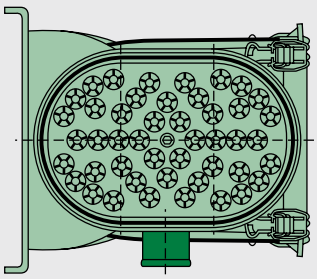


Fig. 1

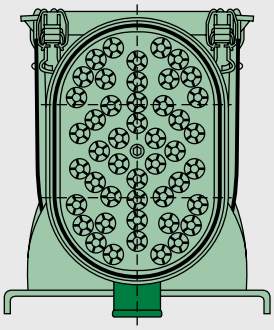


Fig. 2

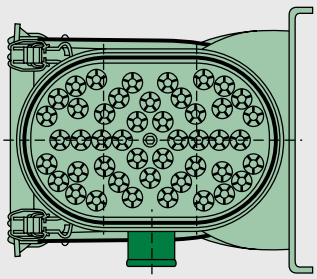


Fig. 3

Dimensions and part numbers

Filter size	Nominal flow rate [m³/min]	Fig.	Part no. without secondary element	Part no. with secondary element	Replacement filter element MANN-FILTER main element	Replacement filter element MANN-FILTER secondary element	Weight [kg]
IQORON 7	4 - 7	1	**45 215 95 913**	**45 215 95 910**	**C 23 220**	**CF 2125**	3.5
		2	**45 215 95 914**	**45 215 95 911**			
		3	**45 215 95 915**	**45 215 95 912**			
IQORON 10	5 - 10	1	**45 395 95 913**	**45 395 95 910**	**C 27 380**	**CF 2530**	5.0
		2	**45 395 95 914**	**45 395 95 911**			
		3	**45 395 95 915**	**45 395 95 912**			
IQORON 12	6 - 12	1	**45 395 95 993**	**45 395 95 990**	**C 27 380**	**CF 2530**	5.3
		2	**45 395 95 994**	**45 395 95 991**			
		3	**45 395 95 995**	**45 395 95 992**			

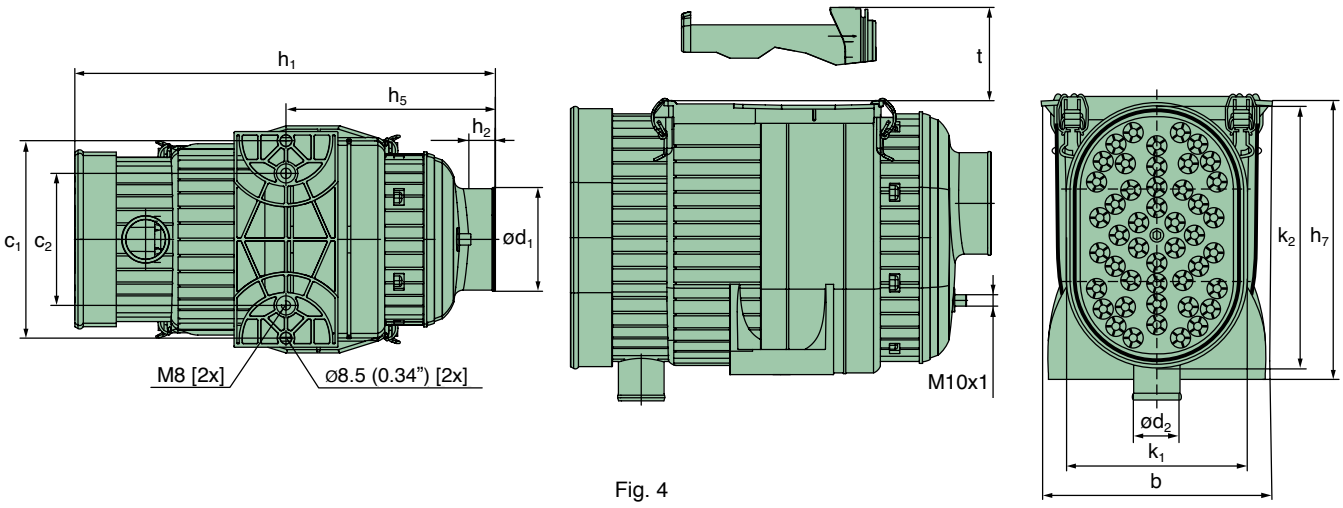
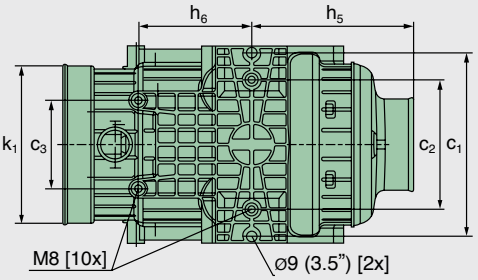


Fig. 4

IQORON

Dimensions and part numbers



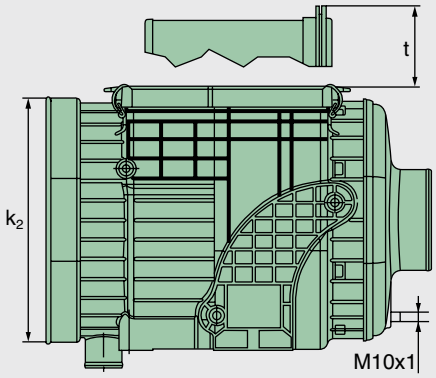
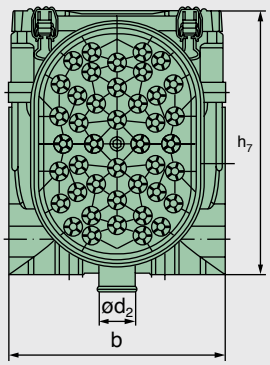
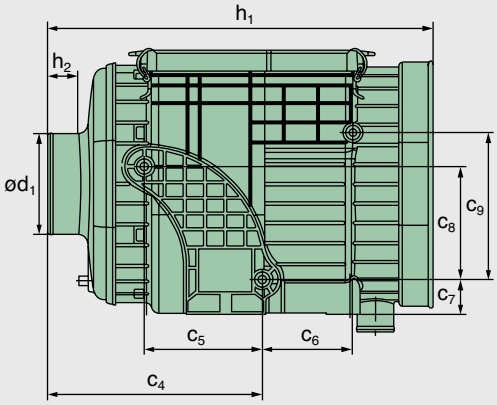


Fig. 5





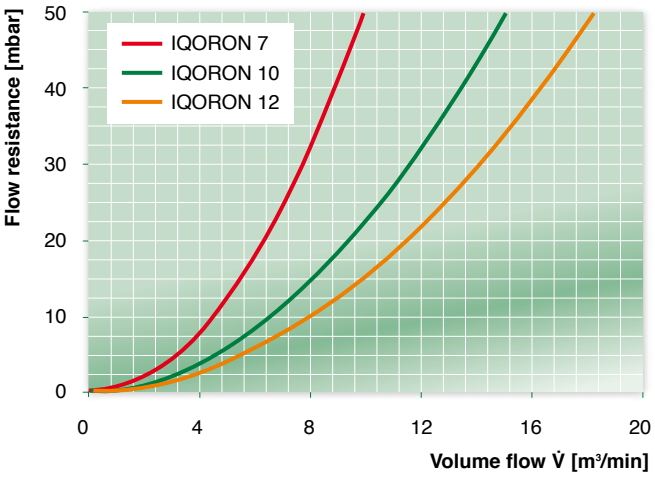
Filter size	Fig.	Dimensions in mm *(Dimensions in inches)*									
		b	c_1	c_2	c_3	c_4	c_5	c_6	c_7	c_8	c_9
IQORON 7	4	207.5 *(8.17)*	173 *(6.81)*	115.7 *(4.56)*	–	–	–	–	–	–	–
IQORON 10	5	236 *(9.29)*	218 *(8.58)*	155 *(6.10)*	105.4 *(4.15)*	233.4 *(9.19)*	128.4 *(5.06)*	98.4 *(3.87)*	37.7 *(1.48)*	123 *(4.84)*	159.9 *(6.30)*
IQORON 12	5	236 *(9.29)*	218 *(8.58)*	155 *(6.10)*	105.4 *(4.15)*	233.4 *(9.19)*	128.4 *(5.06)*	98.4 *(3.87)*	37.7 *(1.48)*	123 *(4.84)*	159.9 *(6.30)*

Filter size	Fig.	Dimensions in mm *(Dimensions in inches)*									
		d_1	d_2	h_1	h_2	h_5	h_6	h_7	k_1	k_2	t
IQORON 7	4	89 *(3.50)*	40 *(1.57)*	368 *(14.49)*	30 *(1.18)*	183.5 *(7.22)*	–	240 *(9.45)*	153 *(6.02)*	226 *(8.90)*	225.3 *(8.87)*
IQORON 10	5	110 *(4.33)*	40 *(1.57)*	420 *(16.54)*	30 *(1.18)*	193.5 *(7.62)*	135.2 *(5.32)*	287 *(11.30)*	189 *(7.44)*	266 *(10.47)*	263.9 *(10.39)*
IQORON 12	5	110 *(4.33)*	40 *(1.57)*	425 *(16.73)*	30 *(1.18)*	193.5 *(7.62)*	135.2 *(5.32)*	287 *(11.30)*	216 *(8.50)*	293 *(11.54)*	263.9 *(10.39)*

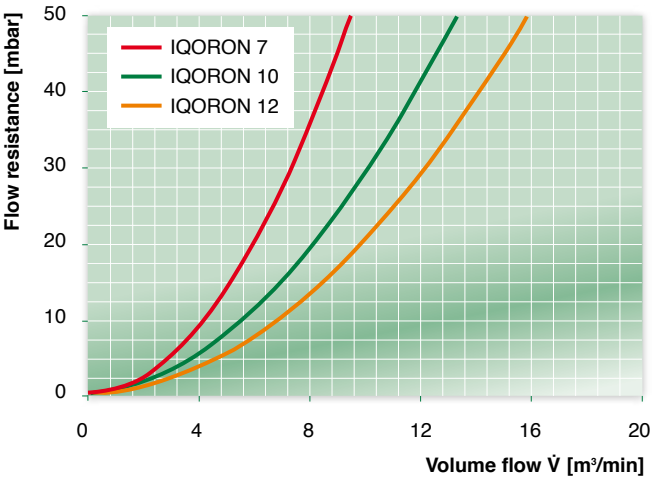
IQORON

Flow characteristics

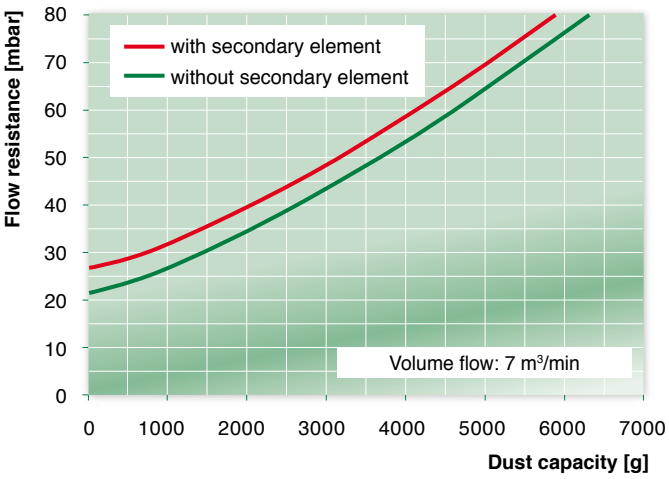
... for flow rates as per ISO 5011
without secondary element



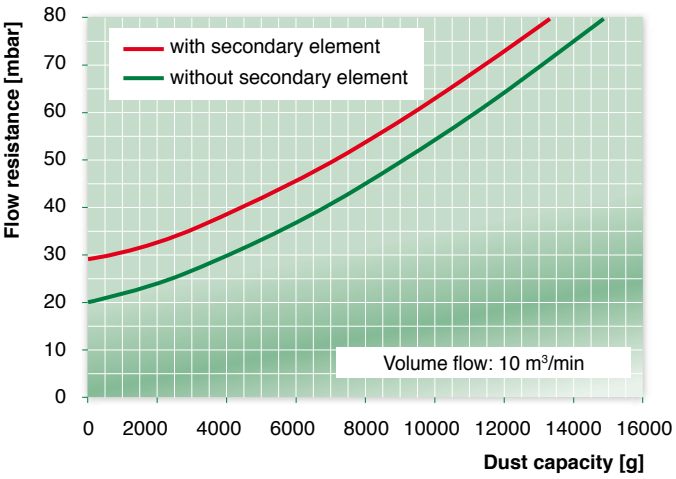
... for flow rates as per ISO 5011
without secondary element



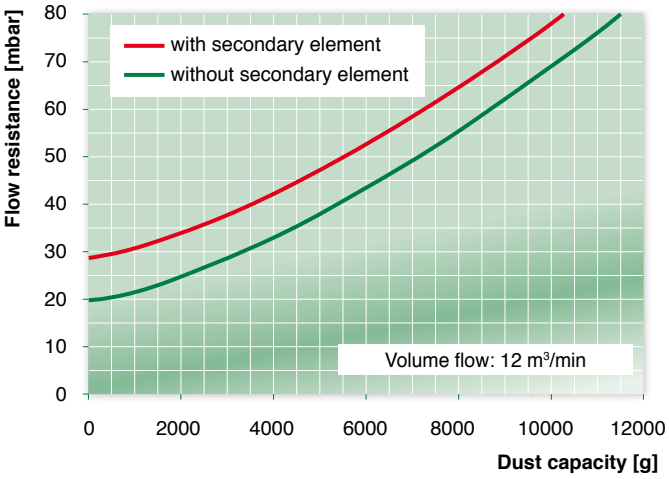
... for dust capacity as per ISO 5011
IQORON 7



... for dust capacity as per ISO 5011
IQORON 10



... for dust capacity as per ISO 5011
IQORON 12

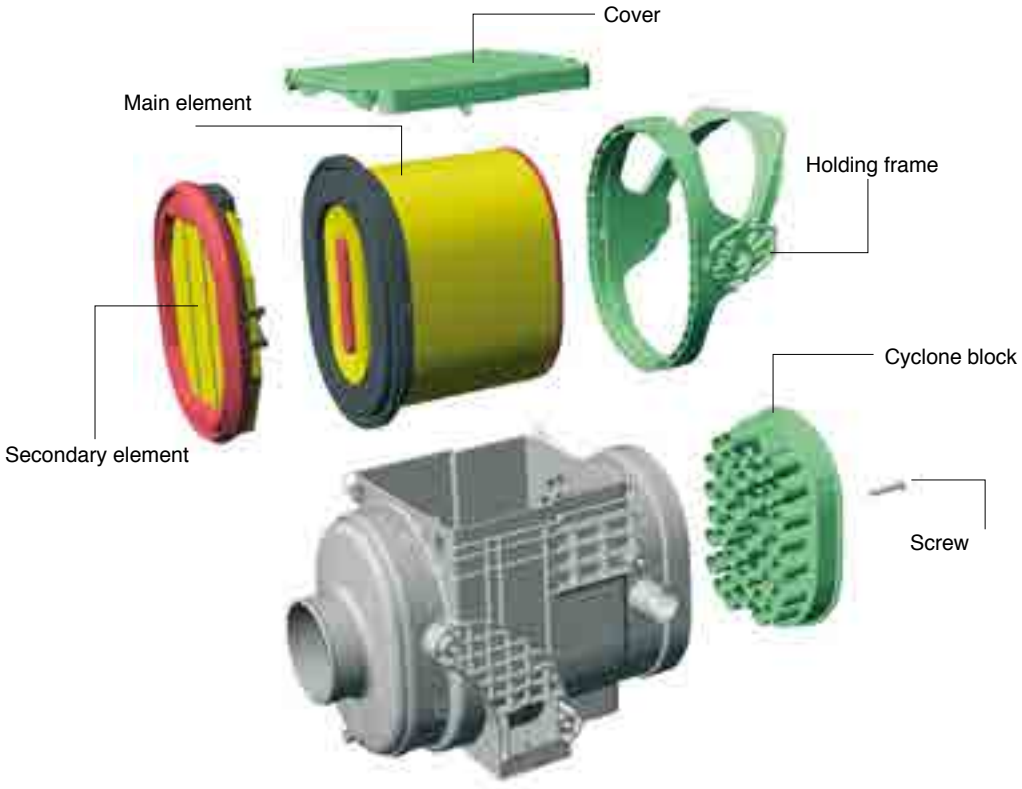


IQORON

Replacement parts

Here are the replacement parts
for the IQORON

Filter size	Part no.				Replacement filter element	
	Cover	Cyclone block	Holding frame complete	Screw	MANN-FILTER main element	MANN-FILTER secondary element
IQORON 7	**45 215 17 999**	**45 210 12 998**	**–**	**01 105 06 050**	**C 23 220**	**CF 2125**
IQORON 10	**45 395 17 999**	**45 420 12 998**	**45 395 12 999**	**01 105 06 050**	**C 27 380**	**CF 2530**
IQORON 12	**45 395 17 999**	**45 550 12 999**	**45 395 12 999**	**01 105 06 050**	**C 27 380**	**CF 2530**



Further specifications

Operating temperatures for continuous operation	-30 °C to +100 °C +120 °C for a short time	Tightening torque for hose clamp (on the clean side)	max. 5 Nm
Tightening torque for mounting screws	15 Nm threaded insert 23 Nm through-hole	Housing material	PA6 GF 30

IQORON-V / IQORON-S

The IQORON-V is a two-stage filter. "V" stands for dust discharge via a valve.

The IQORON-S is a single-stage filter. "S" stands for "single stage". It is suitable for applications which require a low pressure drop in the filter system – e.g. in compressors.

The clever design means it is possible to convert an IQORON-S into an IQORON-V at any time. This is achieved just by replacing the raw air grid of the single-stage filter with the cyclone precleaner. All the mounting points and clean air hoses remain intact. The reverse changeover works in exactly the same way. And of course the IQORON-V and IQORON-S are both equipped with CompacPleat elements from MANN+HUMMEL.

This allows a compact design with low pressure drop and a high simultaneous dust holding capacity.

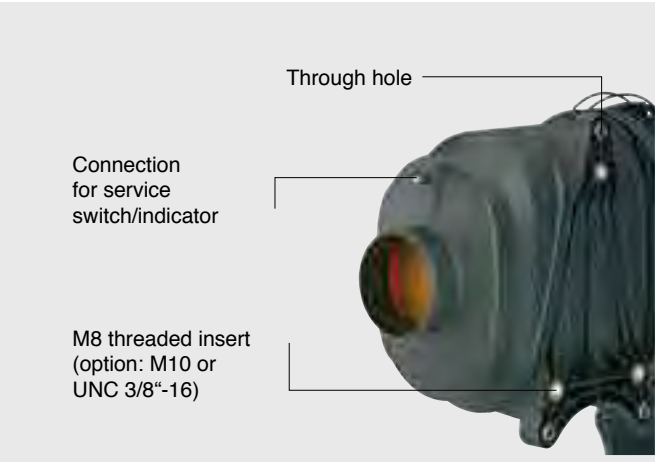
The new IQORON-V/S filters are suitable for all applications where high filter performance is required in a small installation space, for example with construction machines such as compact loaders and back-hoe loaders, for tractors, forklifts, mobile and stationary compressors and for numerous other applications.

Advantages at a glance:

- oval design allows use in extremely tight installation spaces
- inline air flow enables space-saving fitting concepts
- high filtration performance
- easy element change without obstructive hinge mechanics
- version as two-stage filter with long service life or as single-stage filter with low initial pressure drop

Filter housing

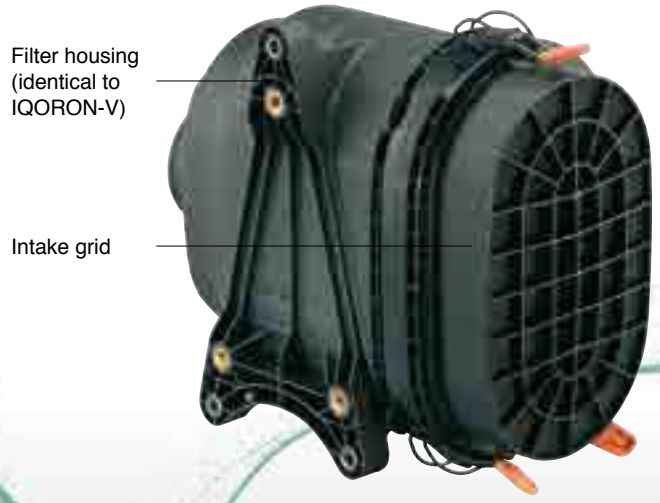
The housing is made from especially robust, fibre-glass reinforced plastic. This choice of material offers advantages with regard to the possible mechanical stress load and operating temperatures. As a result the IQORON-V/S can be used continuously with temperatures up to +90 °C and for a short time with temperature peaks up to +110 °C. The service switch or indicator can be mounted directly to the housing. In addition, the mounting possibilities are available in the standard version. Different threaded inserts or through-holes for M8 screws are available.



IQORON-S

Single-stage filter

The IQORON-S is suitable for use with all applications where very low pressure drop is a requirement. This is naturally especially true for compressors, but also includes stationary engines used for energy generation and machines which operate in low dust conditions. This is where the IQORON-S shows its strength – with a very low pressure drop.



The IQORON-S can be converted to an IQORON-V at any time if the dust conditions make this necessary: simply remove the raw air grid and replace it with the precleaner.

Dimensions and part numbers

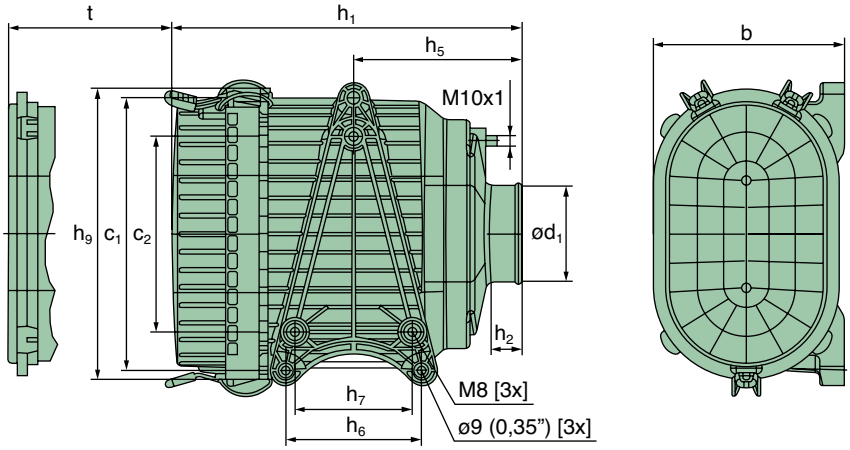


Fig. 1

Filter size	Nominal flow rate [m³/min]	Fig.	Part no.		Replacement filter element		Weight [kg]
			without secondary element	with secondary element	MANN-FILTER main element	MANN-FILTER secondary element	
IQORON-S 7	4 - 10	1	**45 270 75 912**	**45 270 75 910**	**C 26 270**	**CF 2125/1**	2.7

Filter size	Dimensions in mm *(Dimensions in inches)*										
	b	c_1	c_2	d_1	h_1	h_2	h_5	h_6	h_7	h_9	t
IQORON-S 7	176.4 *(6.95)*	250 *(9.84)*	180 *(7.09)*	89.1 *(3.51)*	324 *(12.76)*	30 *(1.18)*	155 *(6.10)*	125 *(4.92)*	108 *(4.25)*	267.9 *(10.55)*	105 *(4.13)*

IQORON-V

Two-stage filter

IQORON-V 9

Housing made from fibre-glass reinforced plastic with integrated fixing points (M8 threaded inserts – option: M10 or UNC 3/8“-16 – and through-holes for M8 screws)

Cyclone precleaner

Fasteners for axial element removal without hinge

Dust discharge valve

IQORON-V 7

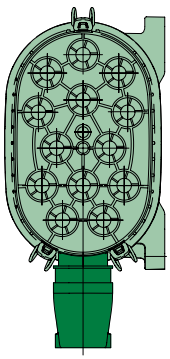
The IQORON-V is the ideal filter for all machines which require high reliability under heavy dust conditions. These are, for example, construction and agricultural machines and mobile compressors.

Other applications also include machines and vehicles in horticulture and landscaping, as well as forklifts.
The cyclone preseparator offers excellent pre-separation. The IQORON-V achieves a pre-separation efficiency of 95% with scavenging and 90% without scavenging (with SAE coarse).
Two different positions for the dust discharge port enable the filter to be fitted in a vertical or horizontal position.
The precleaner can easily be cleaned should it become clogged during operation.

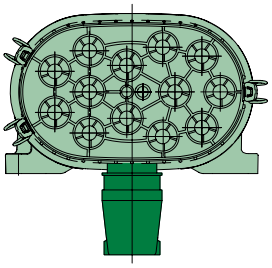
IQORON-V installation positions

The IQORON-V is available in two versions: for a horizontal or vertical fitting position. During installation make sure that the angle deviation of the dust valve to the vertical is not more than 15°.

If the filter is operated with scavenging, a deviation of max. 45° to the vertical is permissible.



Vertical fitting
Fig. 1



Horizontal fitting
Fig. 2

Filter size	Nominal flow rate [m³/min]	Fig.	Part no.		Replacement filter element		Weight [kg]
			without secondary element	with secondary element	MANN-FILTER main element	MANN-FILTER secondary element	
IQORON-V 7	4 - 7	1 2	**45 270 95 912** **45 270 95 913**	**45 270 95 910** **45 270 95 911**	**C 26 270**	**CF 2125/1**	3.1
IQORON-V 9	5 - 9	3 4 3 4	**45 402 95 914** **45 402 95 915** **45 402 95 916** **45 402 95 917**	**45 402 95 910*** **45 402 95 911** **45 402 95 912** **45 402 95 913****	**C 30 400/1**	**CF 2631**	4.8

* Cover and dust discharge valve on the same side
** Cover on the left side

IQORON-V

Dimensions and part numbers

Fig. 4

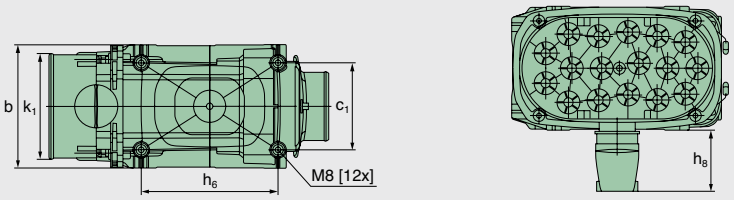
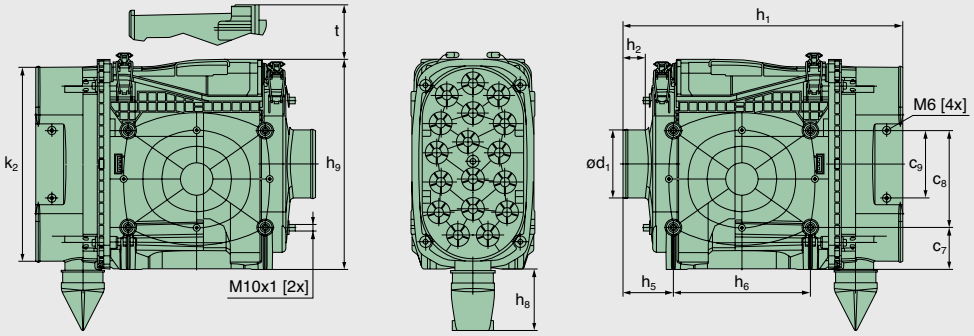


Fig. 3



Filter size	Dimensions in mm *(Dimensions in inches)*								
	b	c_1	c_2	c_7	c_8	c_9	d_1	h_1	h_2
IQORON-V 7*	176.4 *(6.95)*	250 *(9.84)*	180 *(7.09)*	–	–	–	89.1 *(3.51)*	378 *(14.88)*	30 *(1.18)*
IQORON-V 9	185 *(7.28)*	130 *(5.12)*	–	63 *(2.84)*	145 *(5.71)*	100 *(3.94)*	102 *(4.02)*	418.8 *(16.49)*	34 *(1.34)*

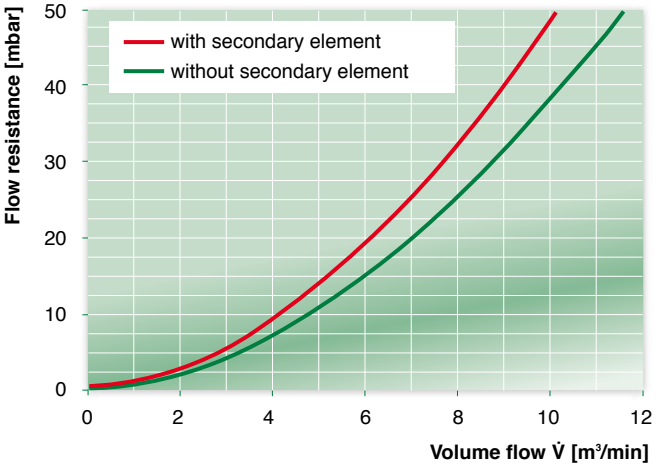
Filter size	Dimensions in mm *(Dimensions in inches)*								
	h_5	h_6	h_7	h_8		h_9	k_1	k_2	t
				Fig. 3	Fig. 4				
IQORON-V 7*	155 *(6.10)*	125 *(4.92)*	108 *(4.25)*	86.1 *(3.39)*	88.5 *(3.48)*	268.8 *(10.58)*	153 *(6.02)*	245.4 *(9.66)*	50 *(1.97)*
IQORON-V 9	75.3 *(2.97)*	205 *(8.07)*	–	91.1 *(3.59)*	91.5 *(3.60)*	314.9 *(12.40)*	157.2 *(6.19)*	289.7 *(11.41)*	210.1 *(8.27)*

* see Fig. 1, page 21

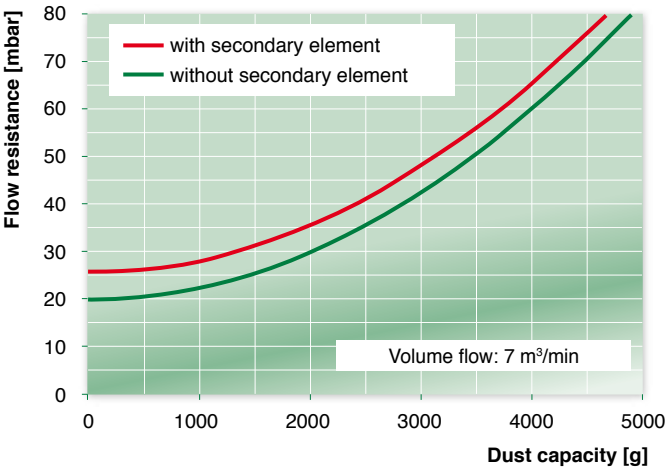
IQORON-V / IQORON-S

Flow characteristics

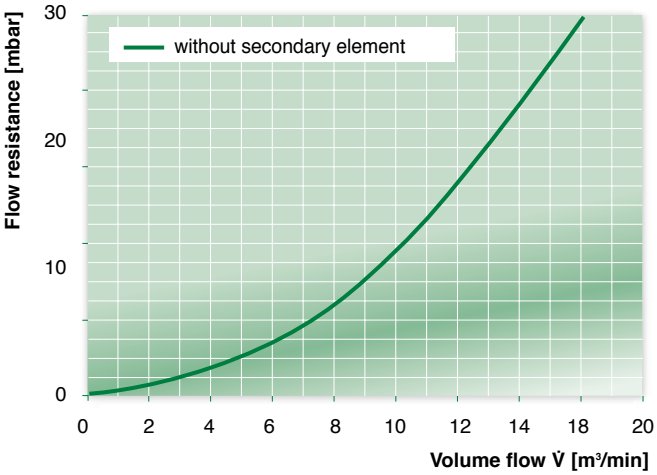
... for flow rates as per ISO 5011
IQORON-V 7



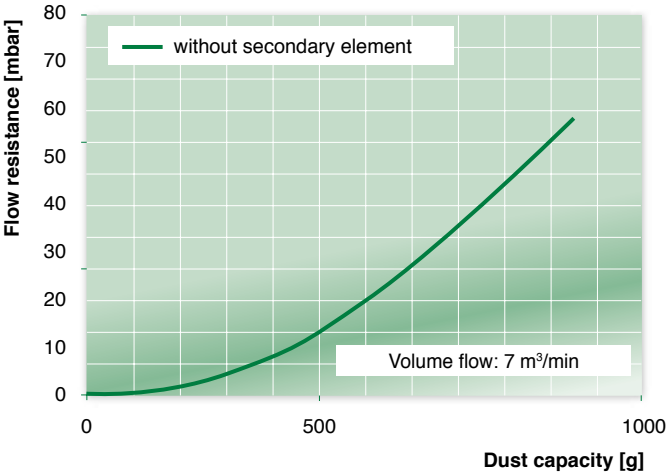
... for dust capacity as per ISO 5011
IQORON-V 7



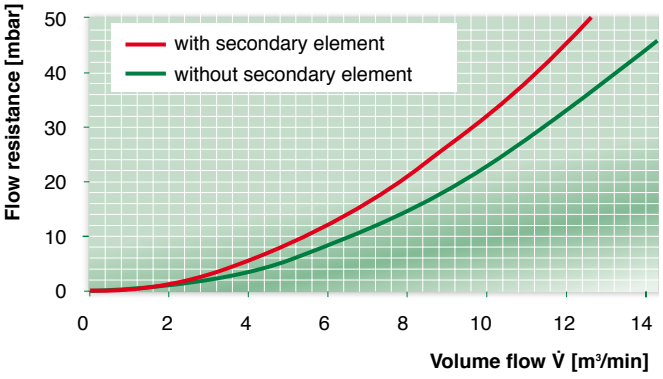
... for flow rates as per ISO 5011
IQORON-S 7



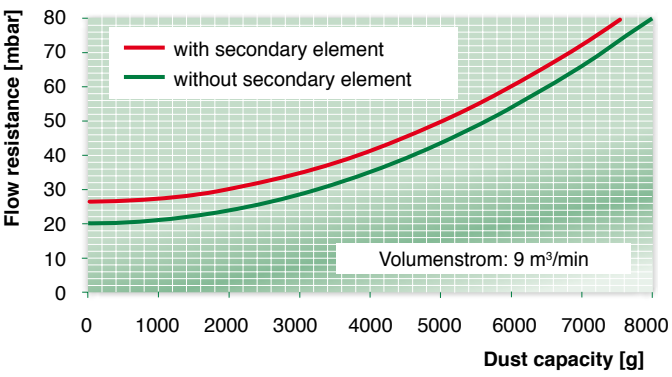
... for dust capacity as per ISO 5011
IQORON-S 7



... for flow rates as per ISO 5011
IQORON-V 9

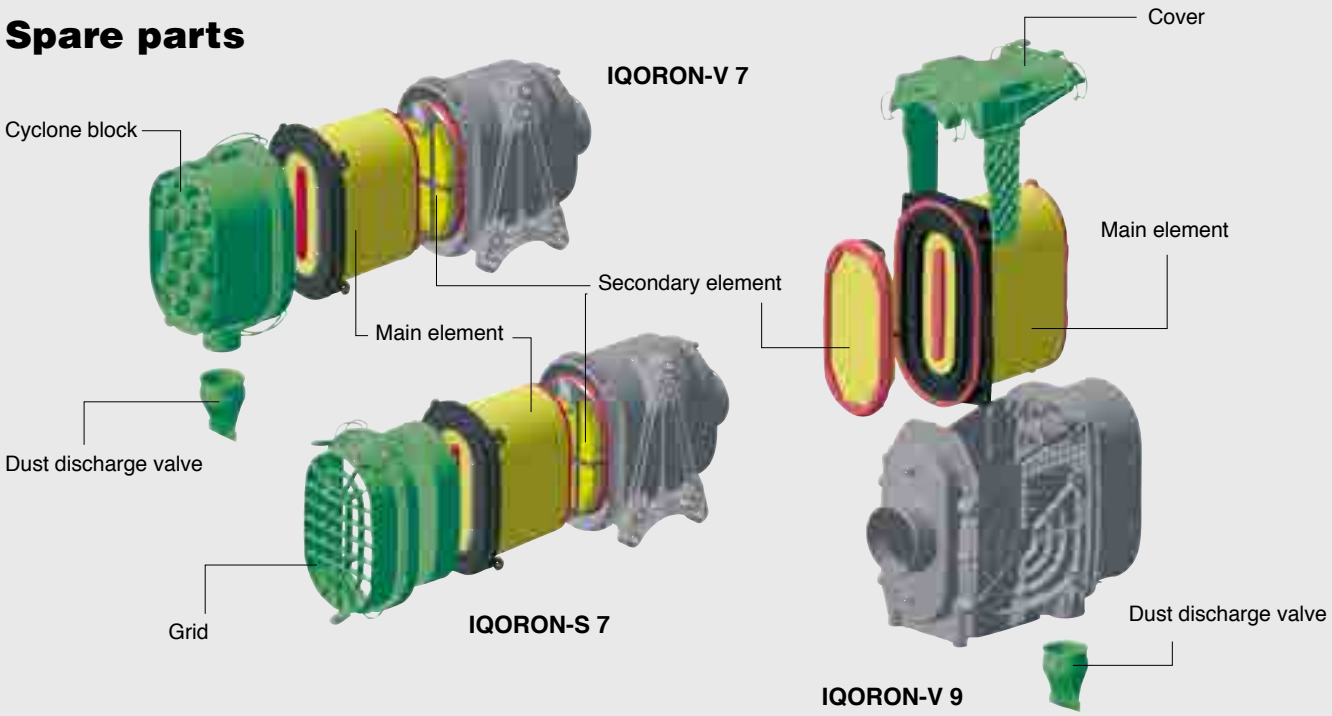


... for dust capacity as per ISO 5011
IQORON-V 9



IQORON-V / IQORON-S

Spare parts

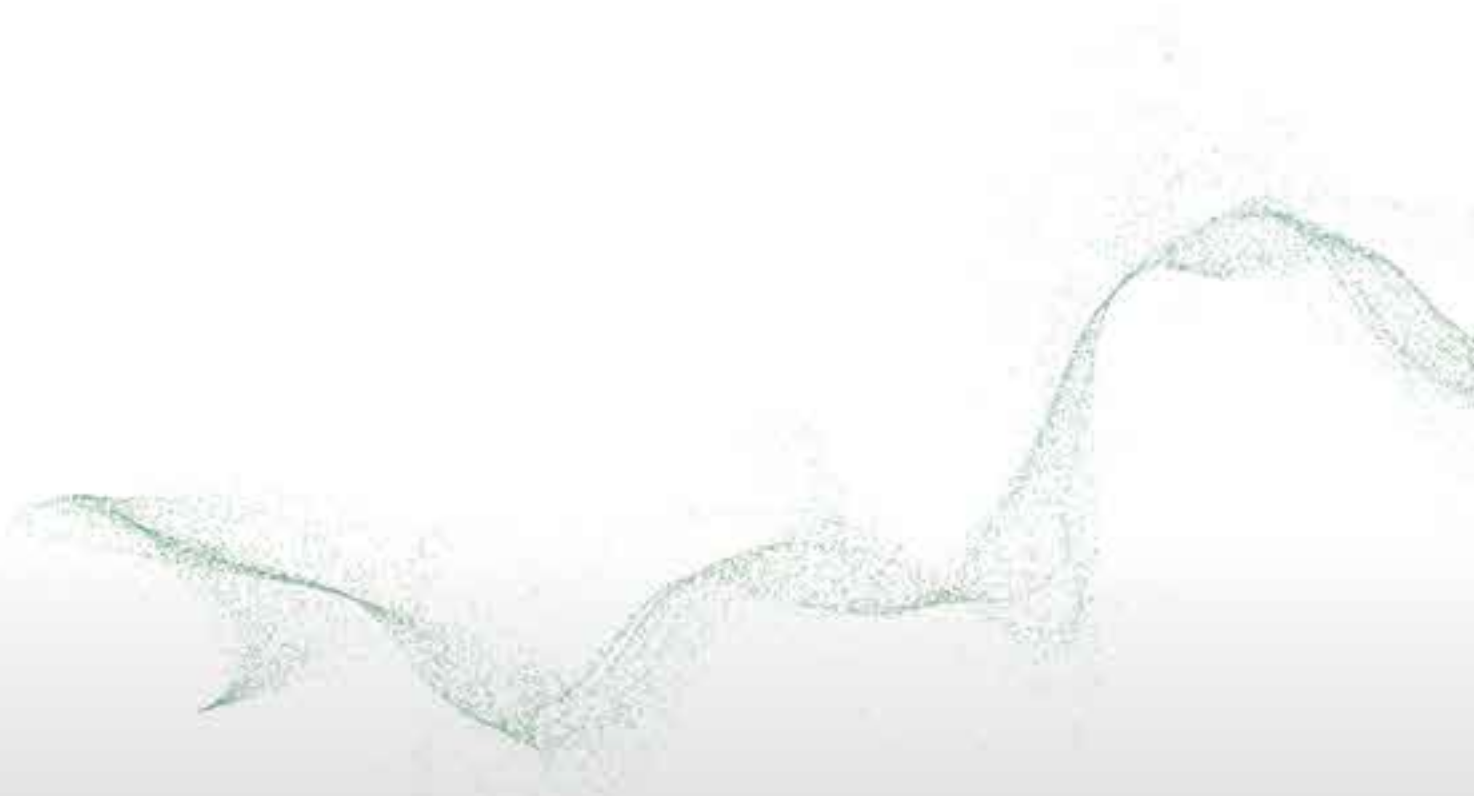


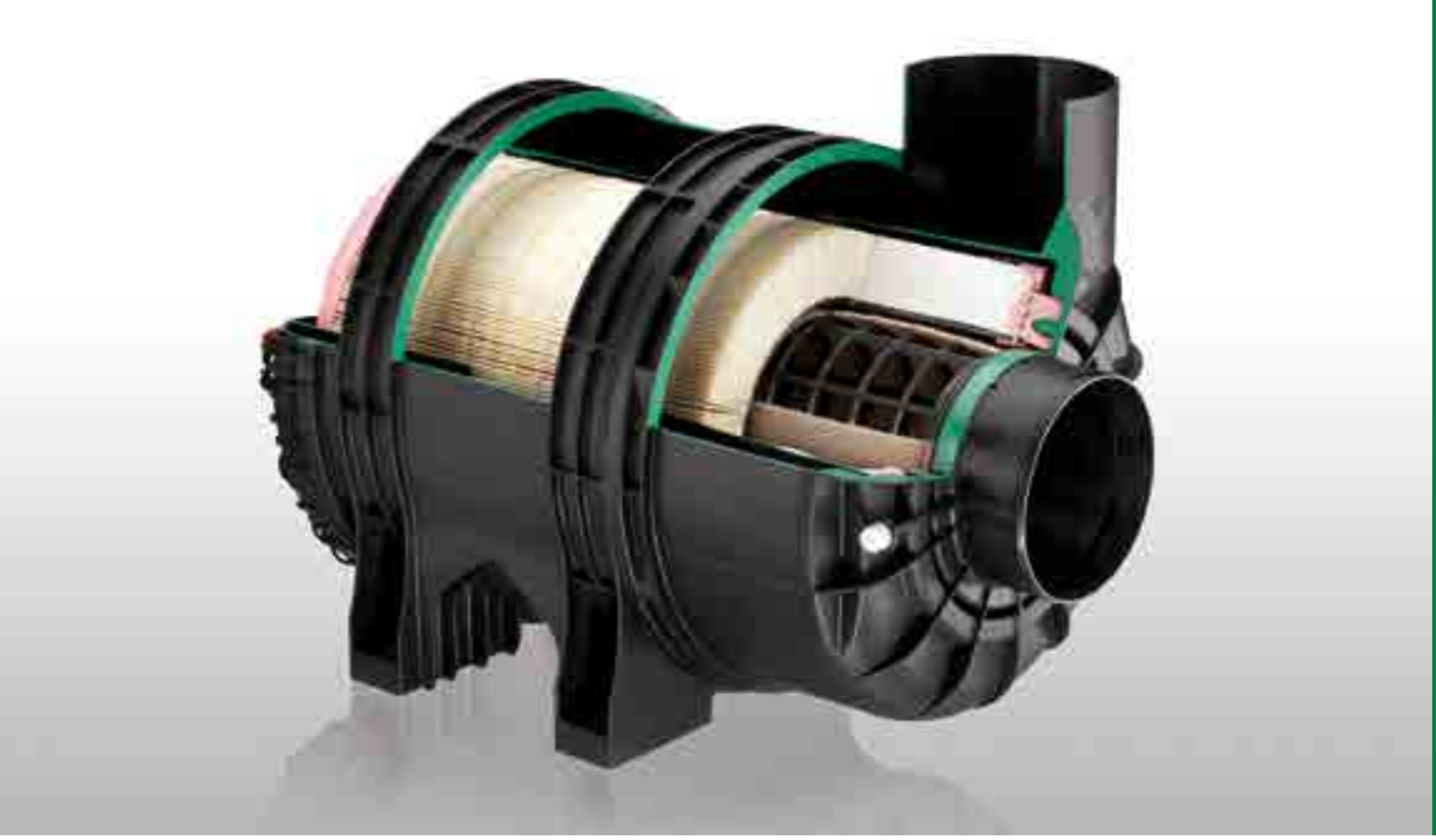
Filter size	Part no.					Replacement filter element	
	Fig. (see page 22)	Cyclone block	Dust discharge valve	Grid	Foam	MANN-FILTER main element	MANN-FILTER secondary element
IQORON-S 7	1	**–**	**–**	**45 280 12 972**	**45 270 04 100**	**C 26 270**	**CF 2125/1**
IQORON-V 7	1	**45 280 47 982**	**39 000 40 731**	**–**	**–**		
	2	**45 280 47 962**					

Filter size	Part no.		Replacement filter element	
	Cover	Dust discharge valve	MANN-FILTER main element	MANN-FILTER secondary element
IQORON-V 9	**45 402 17 929**	**39 000 40 731**	**C 30 400/1**	**CF 2631**

Further specifications

Operating temperatures for continuous operation	-V 7 / -S 7: -30 °C to +90 °C -V 9: -40 °C to +100 °C	Tightening torque for hose clamp (on the clean side)	max. 5 Nm
	-V 7 / -S 7: +110 °C for a short time -V 9: +120 °C for a short time	Housing material	PA6 GF 30 Cr(VI)-free
Tightening torque for mounting screws	15 Nm threaded insert 23 Nm through-hole		





MANN+HUMMEL ENTARON XD
The flexible all-rounder for your high flow requirements

ENTARON XD

Developed for high requirements

The new ENTARON XD series from MANN+HUMMEL sets new standards for two-stage air cleaners. This series combines the best characteristics of the successful and proven Europiclon and NLG air cleaners with a number of innovative new ideas.
This makes the ENTARON XD the new benchmark for two-stage tangential air cleaners.

The advantages at a glance:

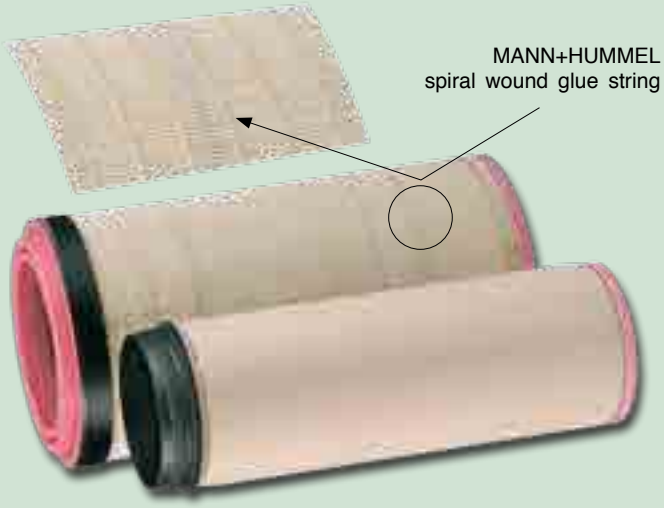
- Excellent flexibility via variable modular design
- Economic filter system through combination of standard parts
- Corrosion-free and robust housing through use of fibre-glass reinforced plastic
- Easy handling with tool-free filter element replacement
- Total reliability through robust elements and a new sealing system
- Eco-friendly disposal through metal-free filter element (fully incinerable)
- Easy adaptation to different machines through different connection positions
- Quick first installation on vehicle through screw threads integrated in housing (option, on request)
- Suitable for use in extreme conditions due to especially robust construction and materials

ENTARON XD

High performance filter elements

The filter elements of the new ENTARON XD are thoughtfully designed to handle demanding applications:

- A new sealing system en-sures reliable sealing between the elements and housing.
- A robust middle tube made from plastic einforces the filter element and therefore protects the machine and the engine.
- The ENTARON XD uses a filter medium which simultaneously offers dramatically improved separation efficiency and a long service life.
- The MANN+HUMMEL glue string (GST) stabilizes the pleat ends and thus ensures that the element can achieve its full performance under all operating conditions. An advantage only available as standard from MANN+HUMMEL.
- The safety element in the ENTARON XD is screwed to the housing to prevent the possibility of unintentional removal and to ensure reliable function of the filter.



Robust housing

The housing of the new ENTARON XD is reinforced with FEM-designed strengthening ribs and made from plastic reinforced with fibre-glass. This means the filter is able to handle extreme physical conditions and at the same time is resistant to corrosion.

The filter construction consists of three elements with the main housing attached to the connections using a special welding process. This welding ensures a ro-bust and reliable joint and at the same time enables unlimited possible orienta-tions of the connection to the integrated bracket. This achieves an extremely high flexibility and enables adaptation of the filter to almost all installation situations.
The clean air outlet is also reinforced as standard with a metal ring which allows a tightening torque on the hose clamps of up to 5 Nm.

Naturally the standard ver-sion also has an integrated connection port for a service switch or indicator.

The high pre-separation efficiency of over 85 % makes the new ENTARON XD ideal for applications with heavy dust loads. This value of 85% sets the standard for its size filter class with comparable competitor products only able to achieve a much lower value. This high pre-separation efficiency also eliminates the need for an additional external preseparator.

Clever details

Color-coded fasteners simplify handling and are easy to understand even when visibility conditions are unfavorable.

The fasteners can also be locked using special snap-in noses so they are no longer in the way when removing or attaching the cover. Another user-friendly and clever de-tail from MANN+HUMMEL.

ENTARON XD

Dimensions and part numbers

* Mirror image version of dirty air connection

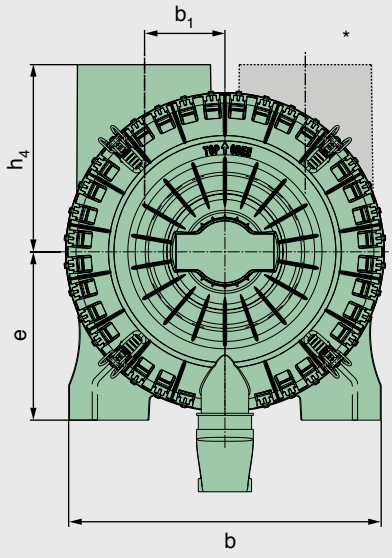


Fig. 1/4

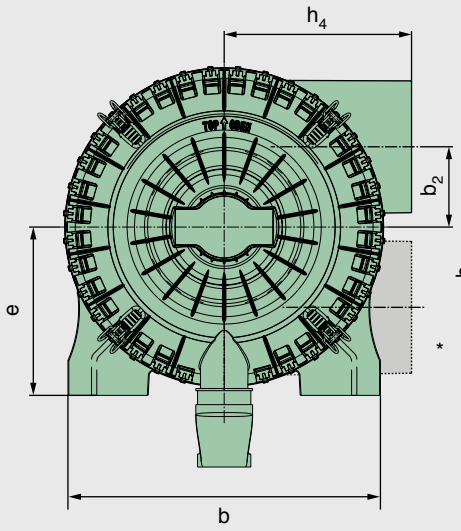


Fig. 2/5

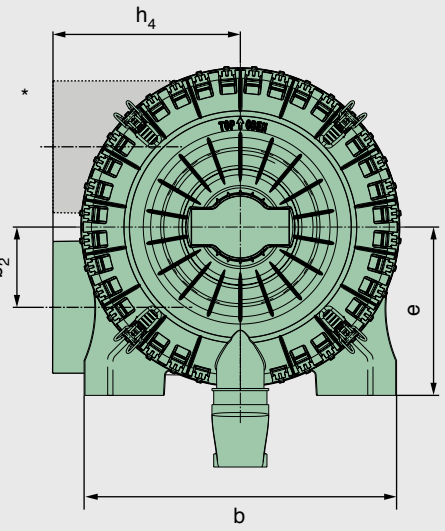


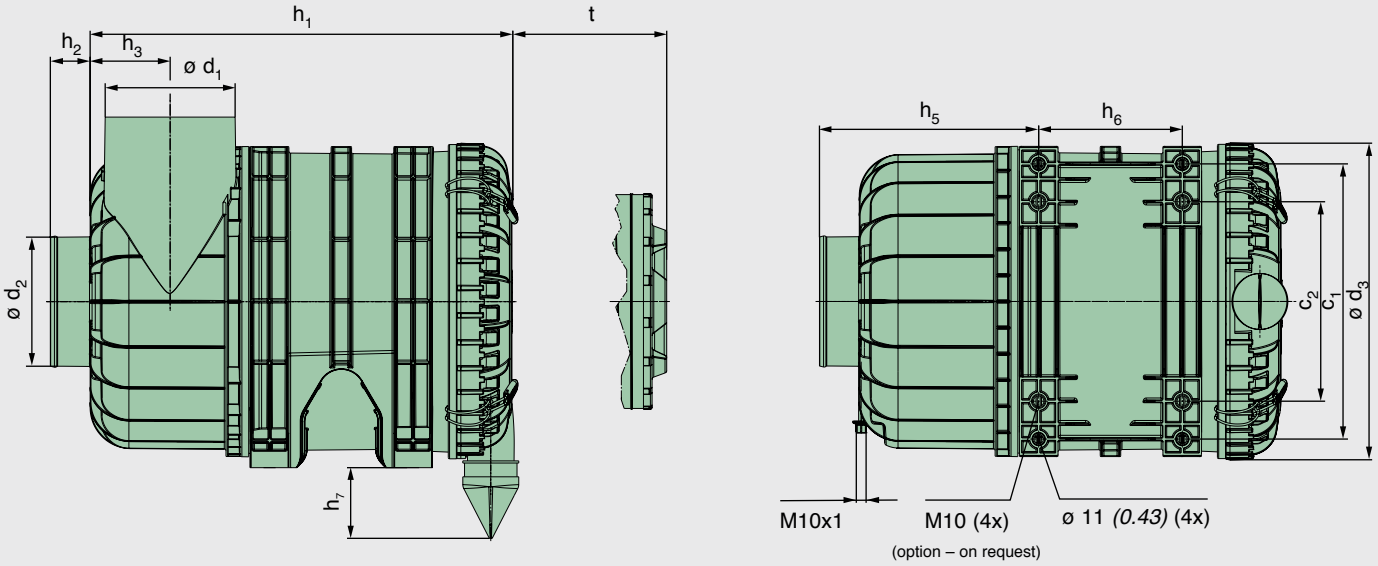
Fig. 3/6

Filter size	Flow rate [m³/min	Position of connecting piece	Fig.	Part No. without secondary element	Part No. with secondary element	Replacement filter element MANN-FILTER main element	Replacement filter element MANN-FILTER secondary element	Weight [kg]
ENTARON XD 14	7 - 14	left	1	**45 526 92 950**	**45 526 92 910**	**C 21 600**	**CF 1280**	5.0
			2	**45 526 92 951**	**45 526 92 911**			
			3	**45 526 92 952**	**45 526 92 912**			
		right	4	**45 527 92 950**	**45 527 92 910**			
			5	**45 527 92 951**	**45 527 92 911**			
			6	**45 527 92 952**	**45 527 92 912**			
ENTARON XD 17	9 - 17	left	1	**45 625 92 950**	**45 625 92 910**	**C 23 800**	**CF 1350**	6.3
			2	**45 625 92 951**	**45 625 92 911**			
			3	**45 625 92 952**	**45 625 92 912**			
		right	4	**45 626 92 950**	**45 626 92 910**			
			5	**45 626 92 951**	**45 626 92 911**			
			6	**45 626 92 952**	**45 626 92 912**			
ENTARON XD 21*	11 - 21	left	1	**45 722 92 950**	**45 722 92 910**	**C 25 900**	**CF 1470**	7.3
			2	**45 722 92 951**	**45 722 92 911**			
			3	**45 722 92 952**	**45 722 92 912**			
		right	4	**45 723 92 950**	**45 723 92 910**			
			5	**45 723 92 951**	**45 723 92 911**			
			6	**45 723 92 952**	**45 723 92 912**			
ENTARON XD 21-24*	11 - 21	left	1	**45 722 92 980**	**45 722 92 960**	**C 25 1020**	**CF 1480**	7.9
			2	**45 722 92 981**	**45 722 92 961**			
			3	**45 722 92 982**	**45 722 92 962**			
		right	4	**45 723 92 980**	**45 723 92 960**			
			5	**45 723 92 981**	**45 723 92 961**			
			6	**45 723 92 982**	**45 723 92 962**			
ENTARON XD 28*	14 - 28	left	1	**45 920 92 950**	**45 920 92 910**	**C 28 1300**	**CF 1750**	9.6
			2	**45 920 92 951**	**45 920 92 911**			
			3	**45 920 92 952**	**45 920 92 912**			
		right	4	**45 921 92 950**	**45 921 92 910**			
			5	**45 921 92 951**	**45 921 92 911**			
			6	**45 921 92 952**	**45 921 92 912**			
ENTARON XD 28-32*	14 - 28	left	1	**45 920 92 980**	**45 920 92 960**	**C 28 1460**	**CF 1760**	10.1
			2	**45 920 92 981**	**45 920 92 961**			
			3	**45 920 92 982**	**45 920 92 962**			
		right	4	**45 921 92 980**	**45 921 92 960**			
			5	**45 921 92 981**	**45 921 92 961**			
			6	**45 921 92 982**	**45 921 92 962**			

* Successor generation to Europiclon 700 and Europiclon 800

ENTARON XD

Dimensions and part numbers

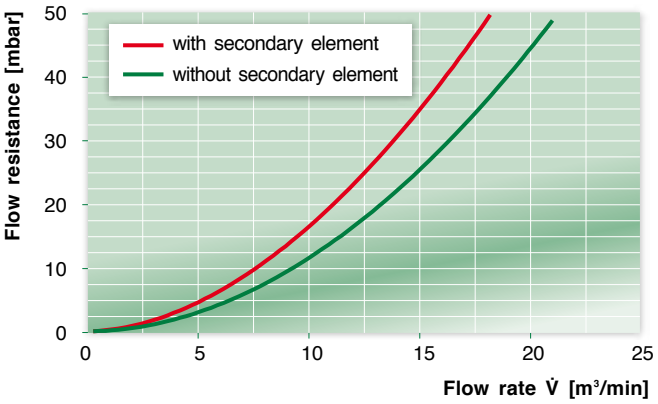


Filter size	Dimensions in mm *(Dimensions in inches)*															
	b	b_1	c_1	c_2	d_1	d_2	d_3	e	h_1	h_2	h_3	h_4	h_5	h_6	h_7	t
ENTARON XD 14	300 *(11.82)*	79 *(3.11)*	263.3 *(10.37)*	175.3 *(6.90)*	130 *(5.20)*	110 *(4.33)*	305.7 *(12.04)*	159.7 *(6.29)*	422.9 *(16.65)*	45 *(1.77)*	72.8 *(2.87)*	186.5 *(7.34)*	218.4 *(8.60)*	136.8 *(5.39)*	85.8 *(3.38)*	362 *(14.25)*
ENTARON XD 17	328.2 *(12.92)*	90.1 *(3.55)*	291.8 *(11.92)*	203.8 *(8.03)*	130 *(5.20)*	130 *(5.20)*	335.1 *(13.19)*	173.7 *(6.84)*	474.8 *(18.70)*	45 *(1.77)*	80.3 *(3.16)*	198 *(7.80)*	235.8 *(9.29)*	169.9 *(6.69)*	90.4 *(3.56)*	408 *(16.06)*
ENTARON XD 21	357.8 *(14.09)*	92 *(3.62)*	320 *(12.60)*	232 *(9.13)*	150 *(5.91)*	150 *(5.91)*	368.9 *(14.52)*	193 *(7.60)*	491 *(19.33)*	45 *(1.77)*	90 *(3.54)*	215 *(8.46)*	254 *(10)*	167 *(6.58)*	82.1 *(3.23)*	426 *(16.77)*
ENTARON XD 21-24	357.8 *(14.09)*	92 *(3.62)*	320 *(12.60)*	232 *(9.13)*	150 *(5.91)*	150 *(5.91)*	368.9 *(14.52)*	193 *(7.60)*	546 *(21.50)*	45 *(1.77)*	90 *(3.54)*	215 *(8.46)*	254 *(10)*	221.8 *(8.73)*	82.1 *(3.23)*	480 *(18.90)*
ENTARON XD 28	388 *(12.28)*	96 *(3.78)*	354 *(13.94)*	266 *(10.47)*	180 *(7.09)*	180 *(7.09)*	398 *(15.63)*	208 *(8.19)*	572 *(22.48)*	45 *(1.77)*	105 *(4.13)*	245 *(9.65)*	283 *(11.14)*	220 *(8.66)*	80.7 *(3.18)*	505 *(19.88)*
ENTARON XD 28-32	388 *(12.28)*	96 *(3.78)*	354 *(13.54)*	266 *(10.47)*	180 *(7.09)*	180 *(7.09)*	398 *(15.63)*	208 *(8.19)*	638 *(25.12)*	45 *(1.77)*	105 *(4.13)*	245 *(9.65)*	283 *(11.14)*	285 *(11.22)*	80.7 *(3.18)*	573 *(22.56)*

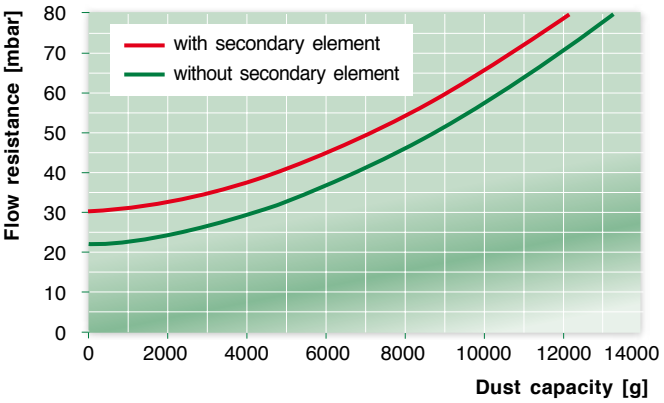
ENTARON XD

Flow characteristics

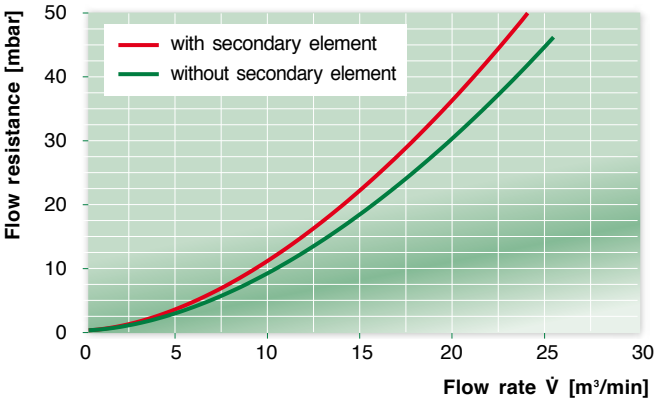
... for flow rates according ISO 5011
ENTARON XD 14



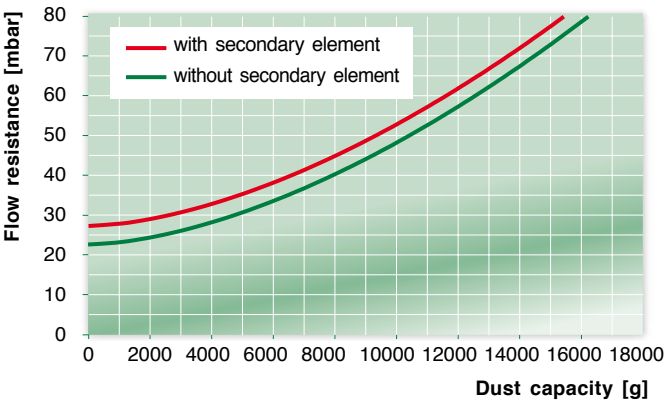
... for dust capacity according ISO 5011
ENTARON XD 14



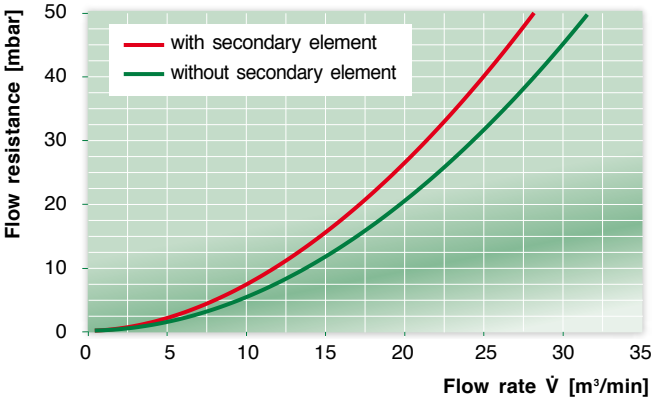
... for flow rates according ISO 5011
ENTARON XD 17



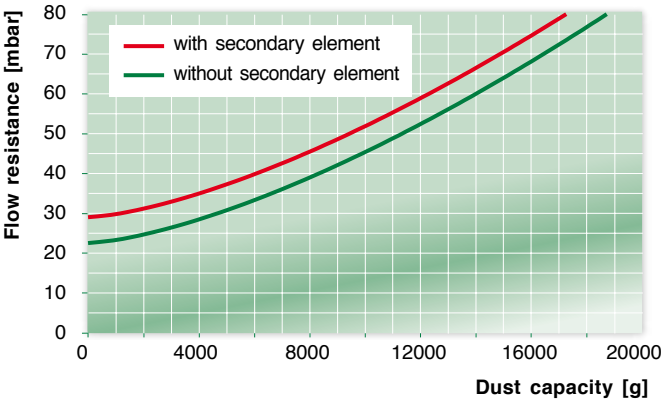
... for dust capacity according ISO 5011
ENTARON XD 17



... for flow rates according ISO 5011
ENTARON XD 21



... for dust capacity according ISO 5011
ENTARON XD 21



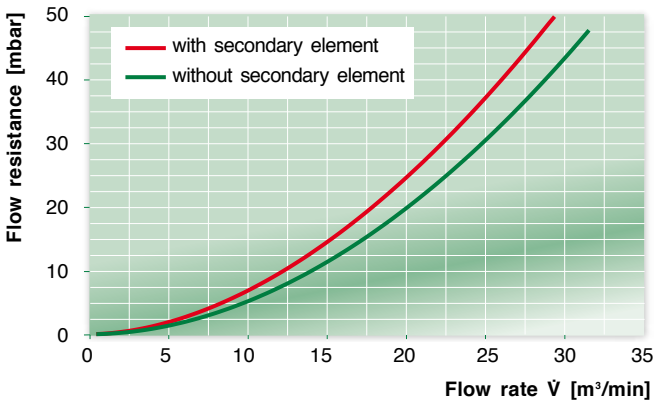
Further specifications

Operating temperatures	-30 °C to +90 °C	Tightening torque	15 Nm threaded insert
Continuous operation	+110 °C short-term	Mounting screws	23 Nm through-hole

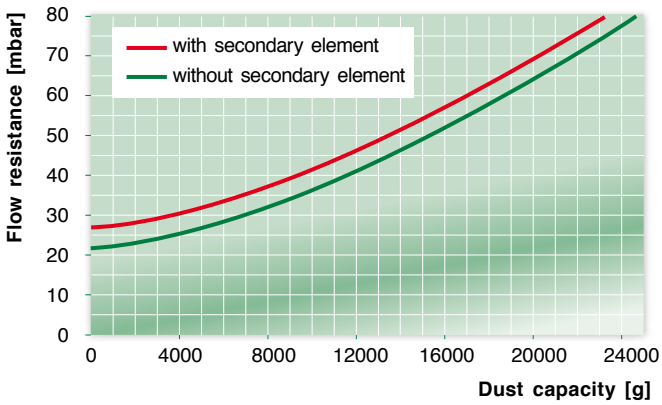
ENTARON XD

Flow characteristics

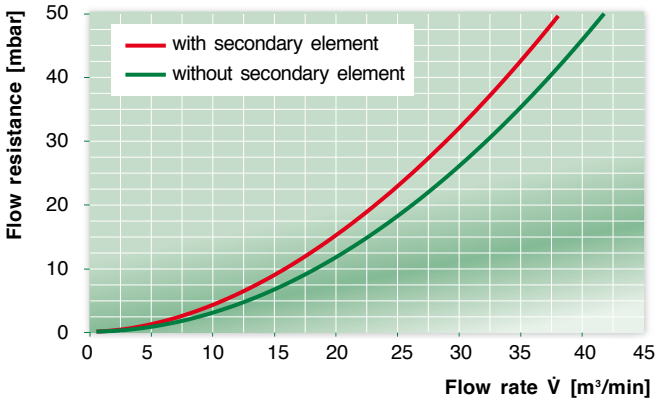
... for flow rates according ISO 5011
ENTARON XD 21-24



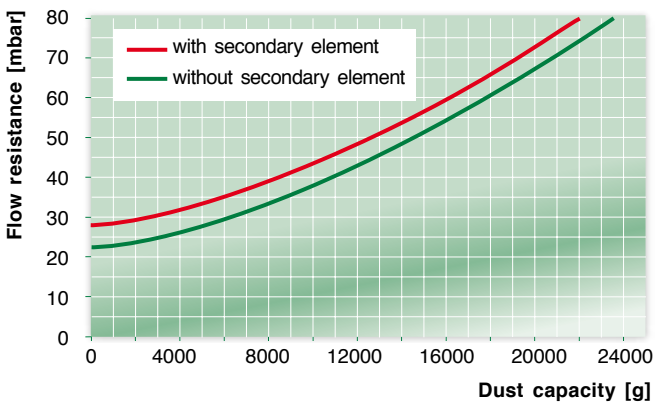
... for dust capacity according ISO 5011
ENTARON XD 21-24



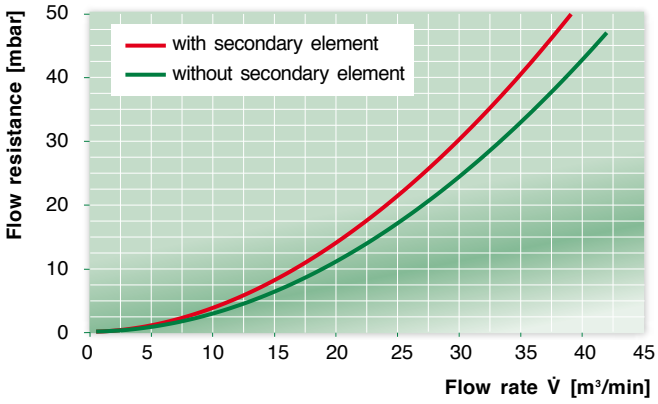
... for flow rates according ISO 5011
ENTARON XD 28



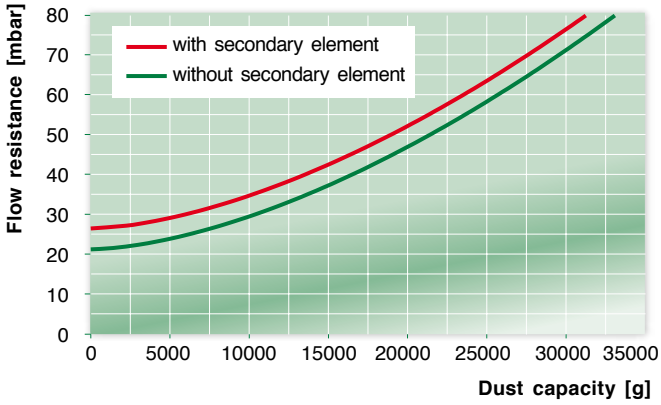
... for dust capacity according ISO 5011
ENTARON XD 28



... for flow rates according ISO 5011
ENTARON XD 28-32



... for dust capacity according ISO 5011
ENTARON XD 28-32



Further specifications

Tightening torque for hose clamp (on clean side)	max. 5 Nm	Housing material Connection dimension of dust discharge	PP GF 30 / Cr(VI)-free Diameter 54 mm

ENTARON XD

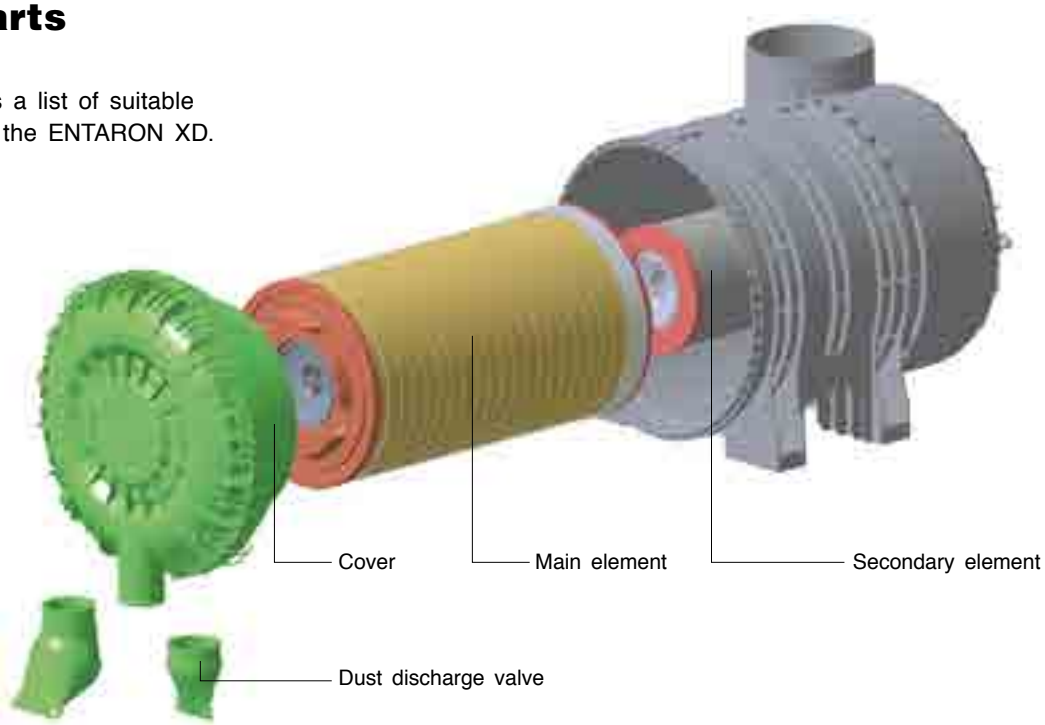
Accessories

The following accessories are suitable for use with the ENTARON XD.

Filter size	Rain cap (page 100/101)		Straight connectors (page 104)		90° elbow (page 103)	
	Form A	Form B	Fig. 1	Fig. 2	Fig. 1	Fig. 2
ENTARON XD 14	**39 160 67 910**	**39 160 67 020**	**39 600 27 999**	**39 600 27 979**	**39 600 25 999**	**39 600 25 979**
ENTARON XD 17	**39 160 67 910**	**39 160 67 020**	**39 700 27 999**	**39 700 27 979**	**39 700 25 999**	**39 700 25 979**
ENTARON XD 21	**39 190 67 910**	**45 880 67 100**	**39 800 27 999**	**39 800 27 979**	**39 800 25 999**	**39 800 25 979**
ENTARON XD 21-24	**39 190 67 910**	**45 880 67 100**	**39 800 27 999**	**39 800 27 979**	**39 800 25 999**	**39 800 25 979**
ENTARON XD 28	**39 220 67 910**	**39 220 67 100**	**39 930 27 999**	**39 930 27 979**	**39 930 25 999**	**39 930 25 979**
ENTARON XD 28-32	**39 220 67 910**	**39 220 67 100**	**39 930 27 999**	**39 930 27 979**	**39 930 25 999**	**39 930 25 979**

Spare parts

The following is a list of suitable spare parts for the ENTARON XD.



Filter size	Part No.		Replacement filter element	
	Cover	Dust discharge valve	MANN-FILTER main element	MANN-FILTER secondary element
ENTARON XD 14	**45 526 17 909**	**39 000 40 731**	**C 21 600**	**CF 1280**
ENTARON XD 17	**45 625 17 909**	**39 000 40 731**	**C 23 800**	**CF 1350**
ENTARON XD 21	**45 722 17 909**	**39 000 40 731**	**C 25 900**	**CF 1470**
ENTARON XD 21-24	**45 722 17 919**	**39 000 40 731**	**C 25 1020**	**CF 1480**
ENTARON XD 28	**45 920 17 909**	**39 000 40 731**	**C 28 1300**	**CF 1750**
ENTARON XD 28-32	**45 920 17 919**	**39 000 40 731**	**C 28 1460**	**CF 1760**

MANN+HUMMEL EUROPICLON
Two-stage air cleaner – Modular system

EUROPICLON

The flexible allrounder

The Europiclon from MANN+HUMMEL is characterised by its high dust capacity and low pressure drop.

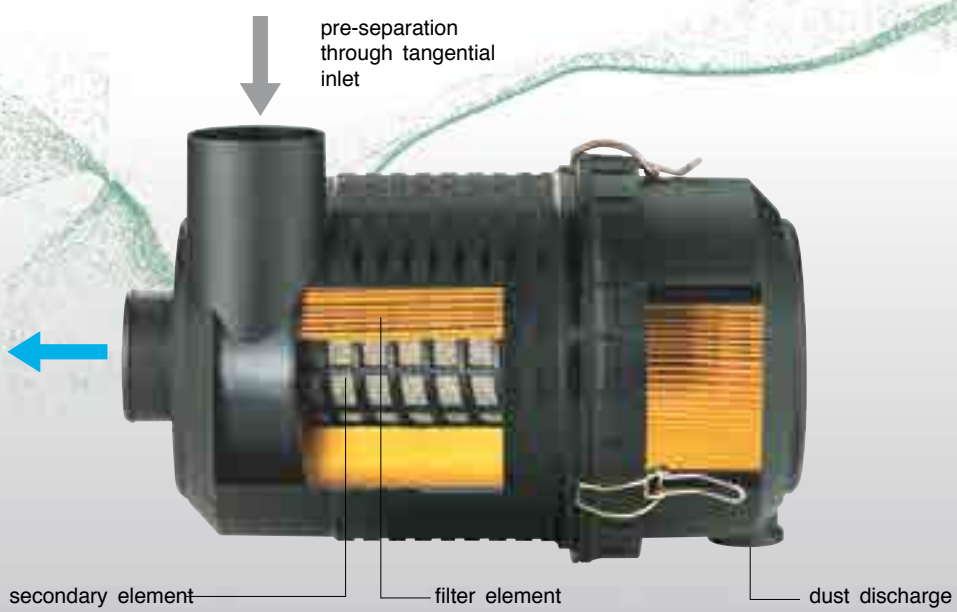
These characteristics have made the Europiclon the tried and tested air cleaner for all machines and equipment used in conditions with medium to heavy dust loads. These include construction and agricultural machines, mobile compressors and harvesting machines.

Advantages at a glance:

- long service life through integrated pre-separation
- highly economical through modular system
- extensive range of accessories
- corrosion free housing in impact resistant plastic
- easy element change without tools
- highest operational reliability through elements with proven radial seal
- metal-free filter elements are easily disposed of by incineration and therefore are environmentally friendly with inexpensive disposal
- easy adaptation to other equipment with a flexible bracket system
- patented filter elements

EUROPICLON

Sectional view



Housing

The housing of the Europiclon is made of impact resistant polypropylene and is suitable for continuous use in the emperature range - 40 °C to +80 °C or for short periods up to +100 °C.
The external polygon design of the housing is recognisable in the picture. The Europiclon bracket, designed especially for this structure, can be turned in increments of 5° opposite to the housing.

Depending on the air cleaner size, the housing can be turned in the axial direction to six different locking positions. This offers the designer up to 432 different fitting possibilities for the air cleaner. In addition, the wire clamps which lock the air cleaner housing can be placed in special pockets on the cap to adapt to special installation conditions.

Filter elements

The Europiclon elements are free of metal and therefore easily disposed of by incineration. This enables inexpensive and environmentally friendly disposal of the used elements.

Main element

- high dust capacity through special MANN+HUMMEL filter medium
- high reliability through radial seal on housing
- reliable pleat stability prevents pleats sticking together under demanding conditions

Secondary element

- MANN+HUMMEL synthetic fabric allows a high safety margin with low pressure drop
- secure fit in housing prevents unintentional removal of the secondary element

EUROPICLON 100 to 600

Dimensions and part numbers

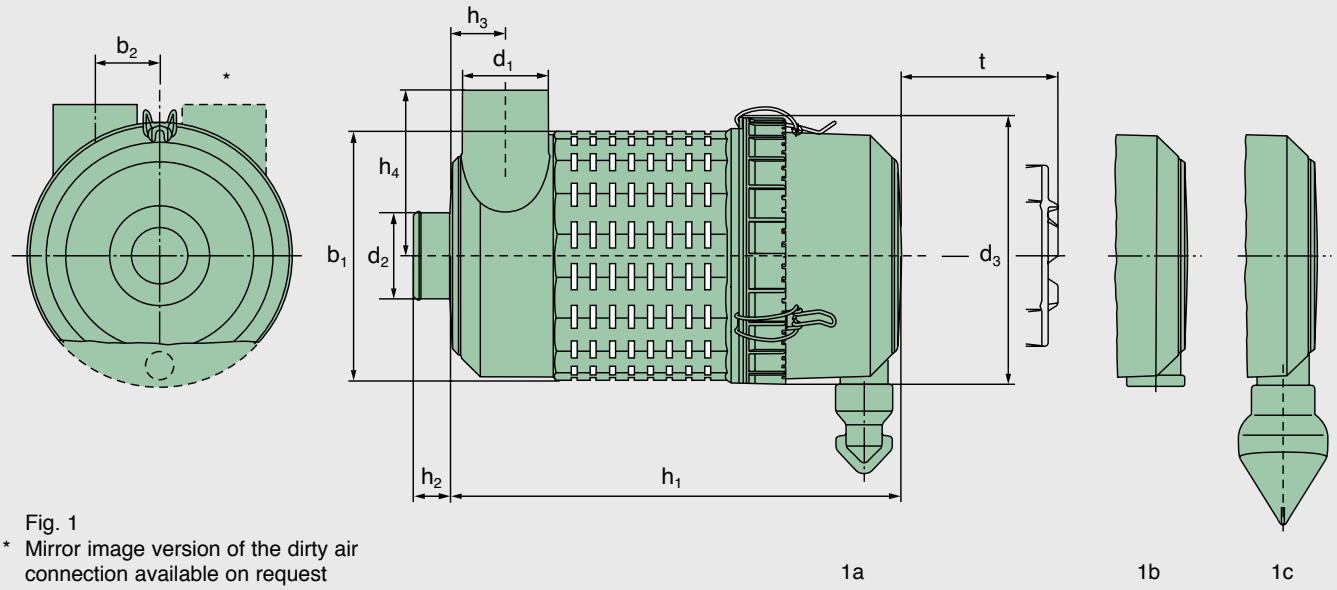
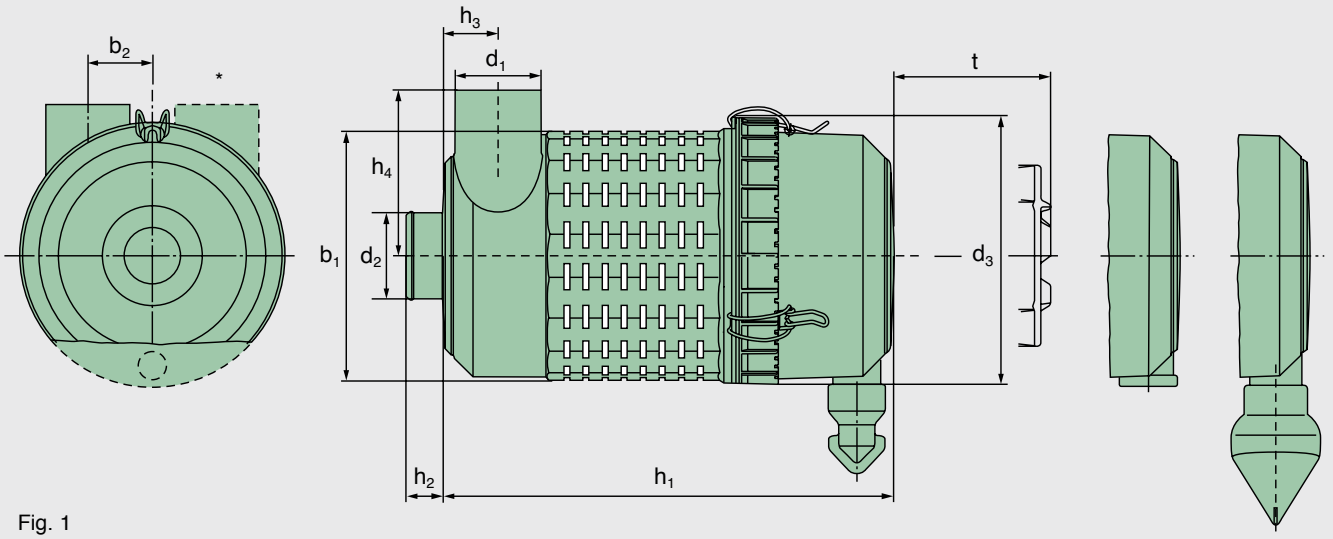


Fig. 1
* Mirror image version of the dirty air connection available on request

Size Europiclon	Part No. without secondary element	Part No. with secondary element	Fig.	Nominal flow rate [m³/min]	Replace filter element MANN-FILTER main element	Replace filter element MANN-FILTER secondary element	Weight [kg]
100	**45 100 92 910**	**45 100 92 911**	1a	1 – 3	**C 11 100**	**CF 100**	0.9
	45 100 92 940	**45 100 92 941**	1c				
200	**45 200 92 910**	**45 200 92 911**	1a	2 – 4.5	**C 14 200**	**CF 200**	1.7
	45 200 92 920	**45 200 92 921**	1b				
	45 200 92 940	**45 200 92 941**	1c				
300	**45 300 92 910**	**45 300 92 911**	1a	3 – 6	**C 15 300**	**CF 300**	2.1
	45 300 92 920	**45 300 92 921**	1b				
	45 300 92 940	**45 300 92 941**	1c				
400	**45 400 92 910**	**45 400 92 911**	1a	4 – 8	**C 16 400**	**CF 400**	3.0
	45 400 92 920	**45 400 92 921**	1b				
	45 400 92 940	**45 400 92 941**	1c				
500	**45 500 92 910**	**45 500 92 911**	1a	6 – 12	**C 20 500**	**CF 500**	3.8
	45 500 92 920	**45 500 92 921**	1b				
	45 500 92 940	**45 500 92 941**	1c				
600	**45 600 92 910**	**45 600 92 911**	1a	7.5 – 15	**C 23 610**	**CF 610**	5.0
	45 600 92 920	**45 600 92 921**	1b				
	45 600 92 940	**45 600 92 941**	1c				

EUROPICLON 100 to 600

Dimensions and part numbers



1a 1b 1c

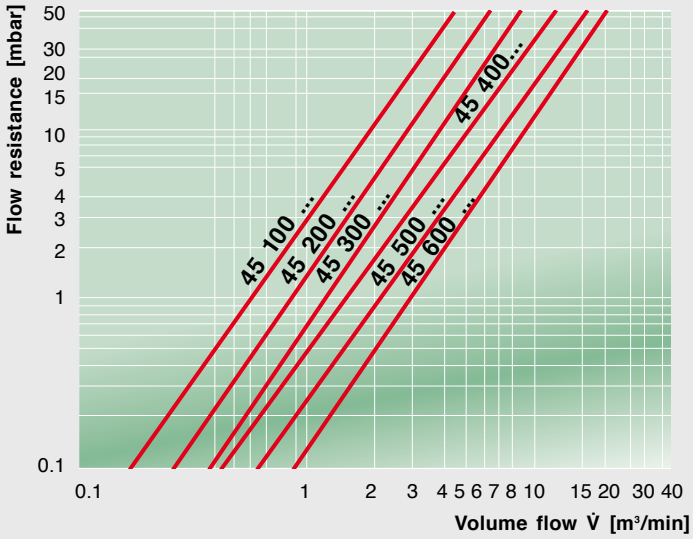
Fig. 1
* Mirror image version of the dirty air connection available on request

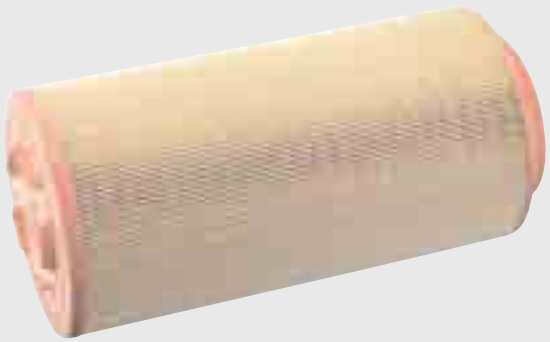
Part No.		Fig.	Dimensions in mm *(Dimensions in inches)*									
without secondary element	with secondary element		b_1	b_2	d_1	d_2	d_3	h_1	h_2	h_3	h_4	t
45 100 92 910	**45 100 92 911**	1a	158	45	54	50	188	260	27	38	104	237
45 100 92 940	**45 100 92 941**	1c	*(6.22)*	*(1.77)*	*(2.12)*	*(1.97)*	*(7.40)*	*(10.24)*	*(1.06)*	*(1.50)*	*(4.09)*	*(9.39)*
45 200 92 910	**45 200 92 911**	1a										
45 200 92 920	**45 200 92 921**	1b	173	48	62	60	198	327	27	42	112	304
45 200 92 940	**45 200 92 941**	1c	*(6.81)*	*(1.89)*	*(2.44)*	*(2.36)*	*(7.80)*	*(12.87)*	*(1.06)*	*(1.65)*	*(4.41)*	*(11.97)*
45 300 92 910	**45 300 92 911**	1a										
45 300 92 920	**45 300 92 921**	1b	203	59	70	70	228	367	30	45	135	344
45 300 92 940	**45 300 92 941**	1c	*(7.99)*	*(2.32)*	*(2.76)*	*(2.76)*	*(8.98)*	*(14.45)*	*(1.18)*	*(1.77)*	*(5.32)*	*(13.54)*
45 400 92 910	**45 400 92 911**	1a										
45 400 92 920	**45 400 92 921**	1b	223	63	82	80	248	383	32	52	144	359
45 400 92 940	**45 400 92 941**	1c	*(8.78)*	*(2.48)*	*(3.23)*	*(3.15)*	*(9.76)*	*(15.08)*	*(1.26)*	*(2.05)*	*(5.67)*	*(14.13)*
45 500 92 910	**45 500 92 911**	1a										
45 500 92 920	**45 500 92 921**	1b	264	73	102	100	288	408	37	62	174	384
45 500 92 940	**45 500 92 941**	1c	*(10.39)*	*(2.87)*	*(4.02)*	*(3.94)*	*(11.34)*	*(16.06)*	*(1.46)*	*(2.44)*	*(6.85)*	*(15.12)*
45 600 92 910	**45 600 92 911**	1a										
45 600 92 920	**45 600 92 921**	1b	295	87	110	110	323	414	27	65	190	384
45 600 92 940	**45 600 92 941**	1c	*(11.61)*	*(3.43)*	*(4.33)*	*(4.33)*	*(12.72)*	*(16.30)*	*(1.06)*	*(2.56)*	*(7.48)*	*(15.12)*

EUROPICLON 100 to 600

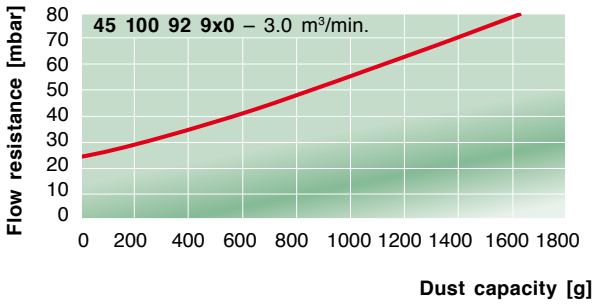
Flow characteristics without secondary element

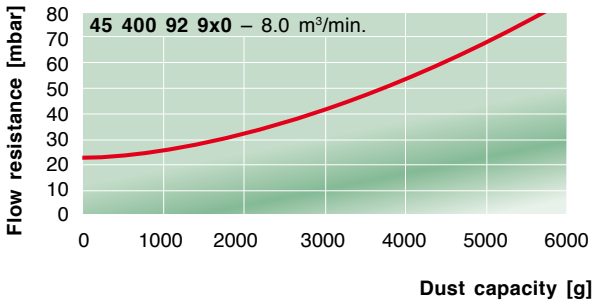
... for flow rates as per ISO 5011

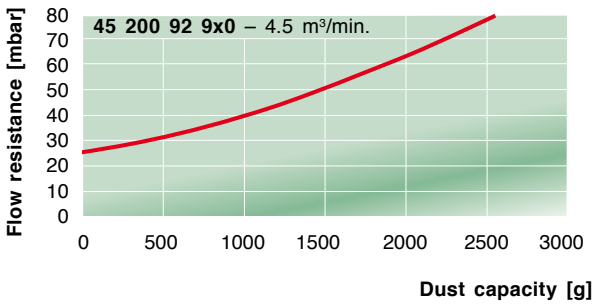


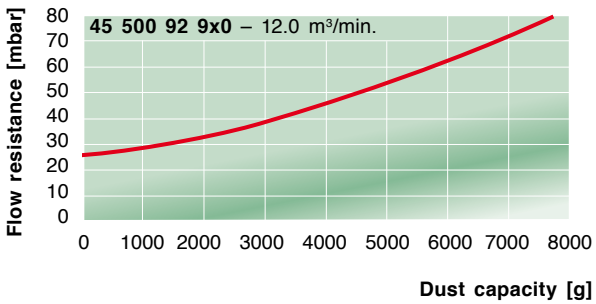


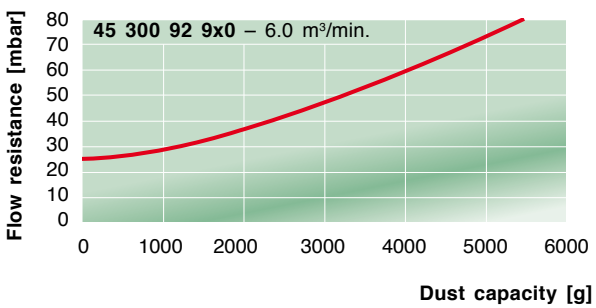
... for dust capacity
as per ISO 5011 with SAE coarse test dust

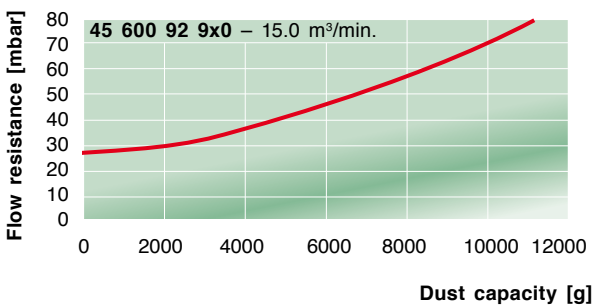








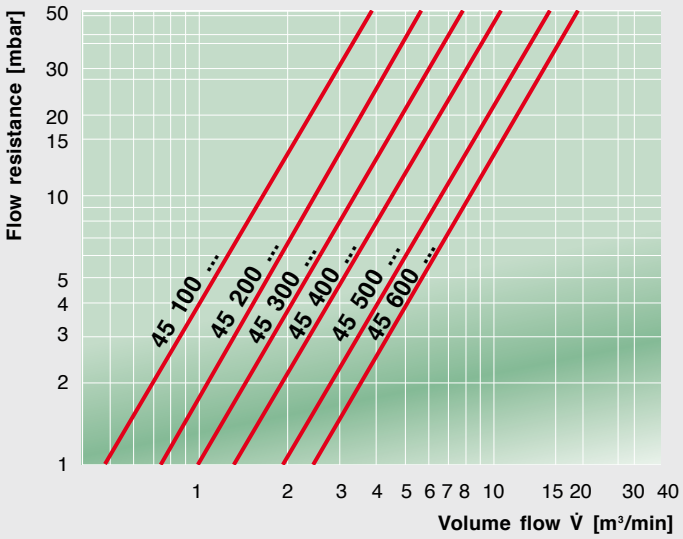




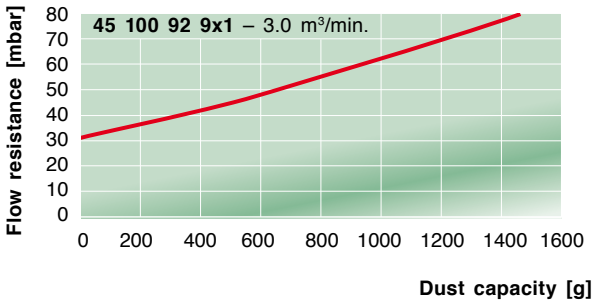
EUROPICLON 100 to 600

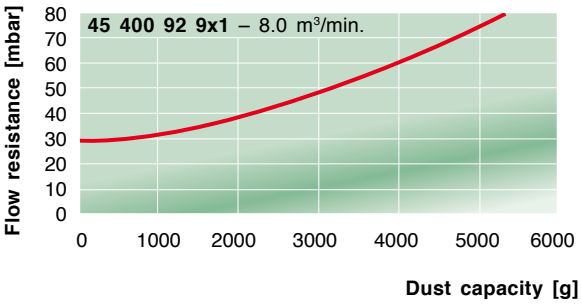
Flow characteristics with secondary element

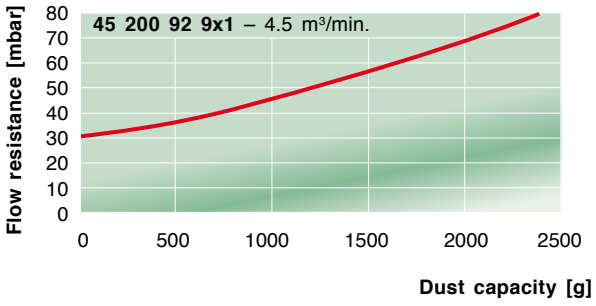
... for flow rates as per ISO 5011

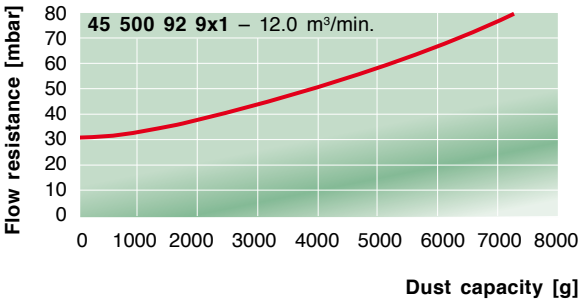


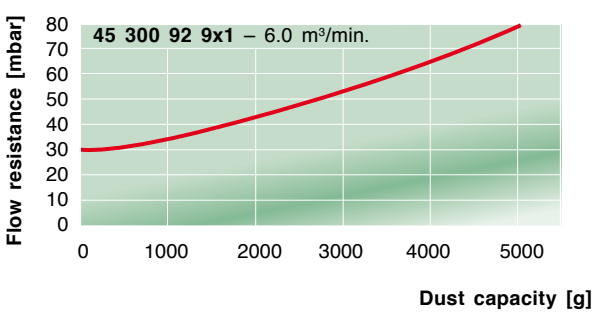
... for dust capacity
as per ISO 5011 with SAE coarse test dust

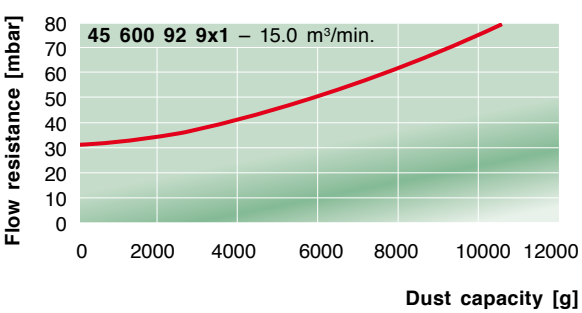












EUROPICLON 50

The new Europiclon 50 from MANN+HUMMEL extends the range of the successful Europiclon line to engines and equipment with a power rating up to 20 kW. Along with the known advantages of the Europiclon line which include reliability, long service life and its robust, corrosion-free housing, the new Europiclon 50 has a number of additional features which offer important advantages for the designer and user.

Advantages at a glance:

- twelve-position clean air outlet with integrated connection for service indicator or switch
- clean air outlet available with straight pipe connection or with a 90° elbow
- space-saving wire clamp fasteners and easy filter element change without tools
- especially low pressure drop also in operation with fitted secondary element
- cost-effective

Bracket

The Europiclon 50 bracket offers flexibility during installation with 16 different available positions around its circumference and two possible locking positions in the axial direction. The special polygon design is matched to the air cleaner housing and ensures that the air cleaner fits securely in the bracket.

EUROPICLON 50

Filter elements

The new filter elements for the Europiclon 50 offer high performance and are cost-effective. The radial seal used for the main element in connection with the special pleat stabilisation enables a high separation efficiency of more than 99.95% and a high dust capacity. A further advantage is the patented MANN+HUMMEL production technology where the seal and the element end plates are manufactured in one process step using special elastomers.

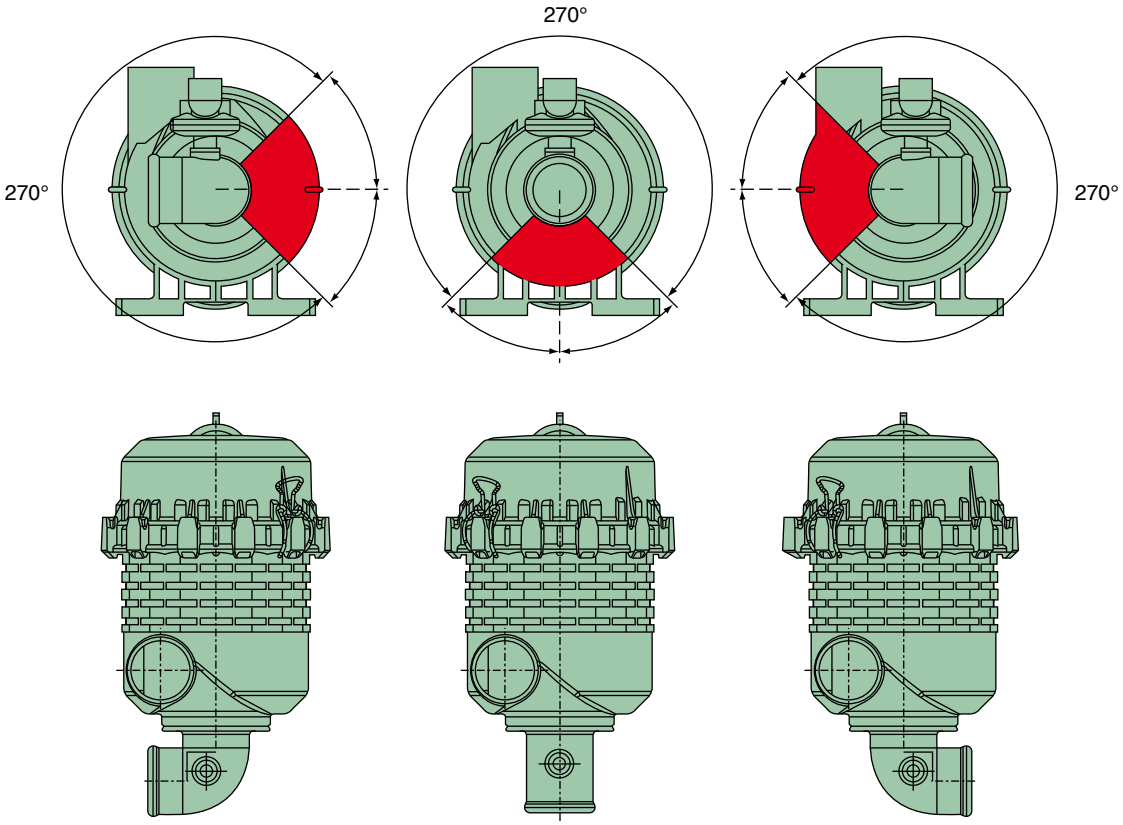
A plastic centre tube in the housing provides good support for the element without negatively influencing the withdrawal distance.

A secondary element protects the engine during a filter service or if the main element is damaged. It is an important component for comprehensive engine protection, which ensures the maximum service life of your machine. The secondary element of the new Europiclon 50 consists of a special synthetic fabric, a plastic centre tube and a radial seal in PUR foam. The filter surface area is approx. 45% larger than comparable prod-ucts from the competition. This leads to minimal pressure drop with an increase in the service life of the filter.

Clean air outlet

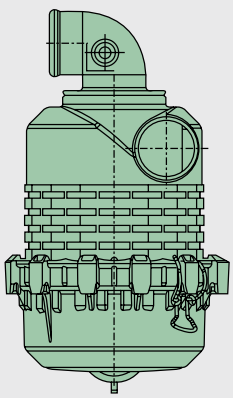
On the clean air side the new Europiclon 50 is equipped with a twelve-position clean air outlet. This port is available in a straight pipe version or with a 90° elbow. As the hanging installation position is not recommended for the service switch, MANN+HUMMEL offers the 90° elbow in two versions.

Note:
The red areas are not recommended for fitting.

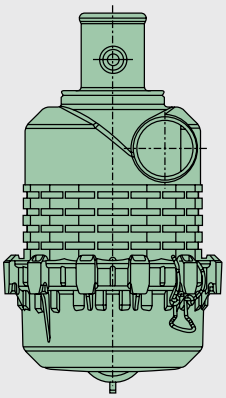


EUROPICLON 50

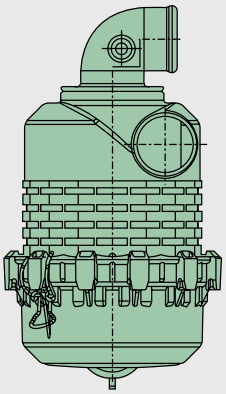
Dimensions and part numbers



90° elbow
Fig. 1



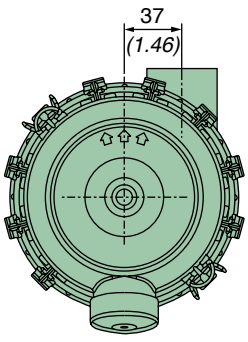
Straight pipe
Fig. 2



90° elbow
Fig. 3

Part No.*		Version Clean air outlet	Version Dust discharge	Nominal flow rate	Replacement filter element		Weight [kg]
without secondary element	with secondary element	Fig.	Fig.	[m³/min]	MANN-FILTER main element	MANN-FILTER secondary element	
45 058 92 910	**45 058 92 911**	1	5	0.8 – 2	**C 10 050**	**CF 50**	0.7
45 058 92 920	**45 058 92 921**	1	4				
45 050 92 910	**45 050 92 911**	2	5	0.8 – 2	**C 10 050**	**CF 50**	0.7
45 050 92 920	**45 050 92 921**	2	4				
45 059 92 910	**45 059 92 911**	3	5	0.8 – 2	**C 10 050**	**CF 50**	0.7
45 059 92 920	**45 059 92 921**	3	4				

* These part numbers are currently not available in Canada, the U.S. and Mexico.
If you are interested in these products, please contact your local MANN+HUMMEL partner for suitable alternatives.



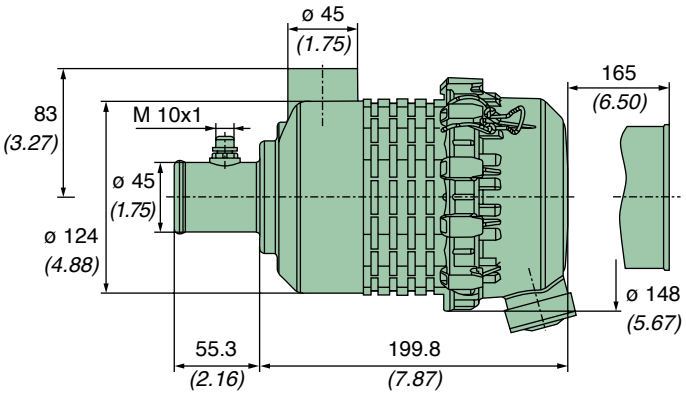


Fig. 4

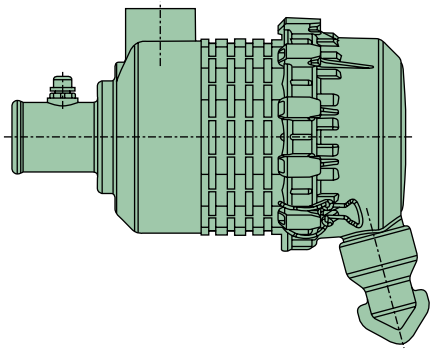
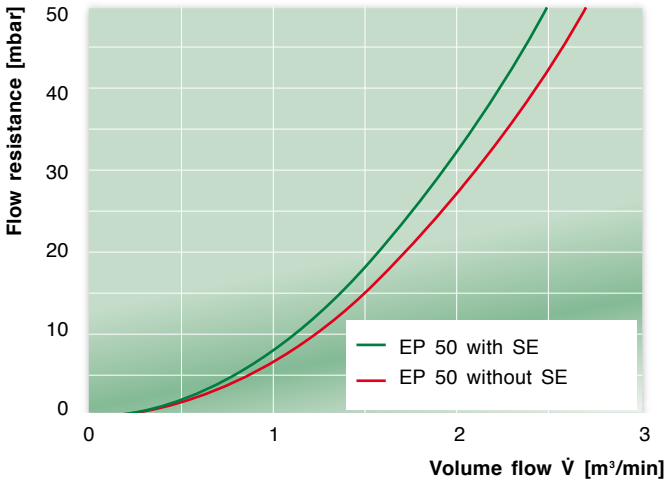


Fig. 5

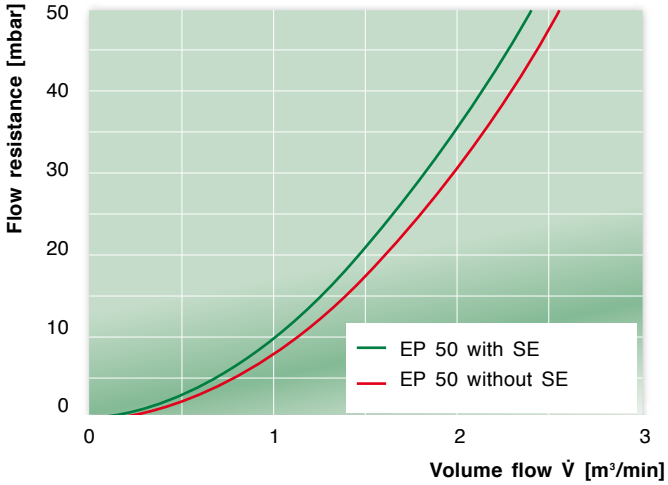
EUROPICLON 50

Flow characteristics

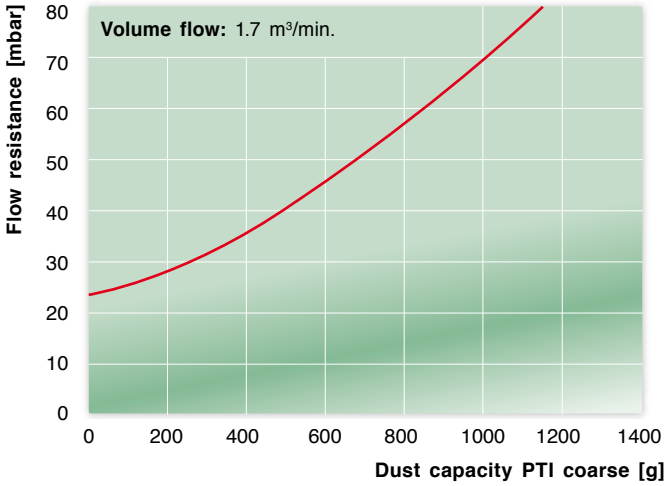
... for flow rates as per ISO 5011
with straight pipe



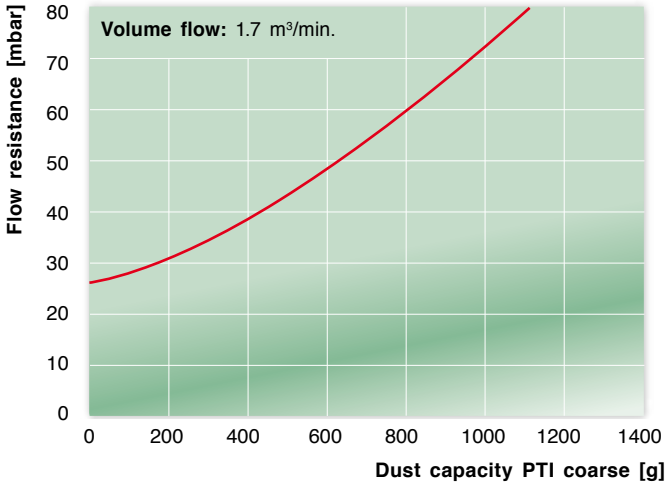
... for flow rates as per ISO 5011
with 90° elbow



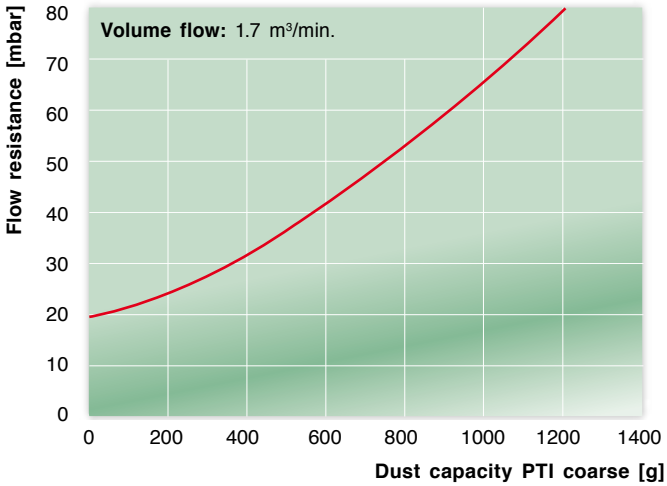
... for dust capacity as per ISO 5011 with straight pipe **with secondary element ...**



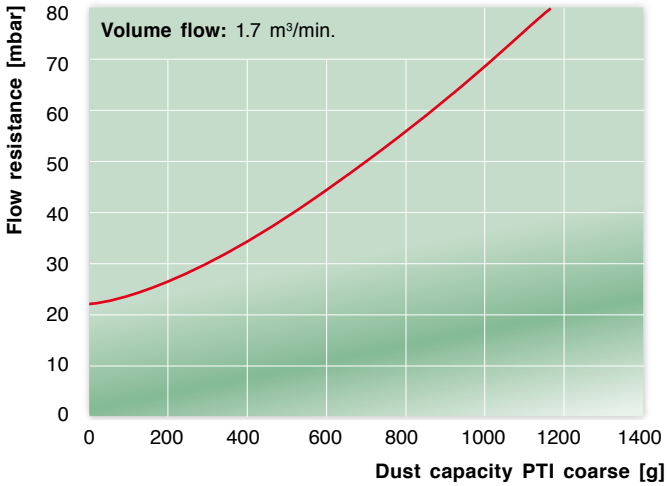
... for dust capacity as per ISO 5011 with 90° elbow **with secondary element ...**



... for dust capacity as per ISO 5011 with straight pipe **without secondary element ...**



... for dust capacity as per ISO 5011 with 90° elbow **without secondary element ...**

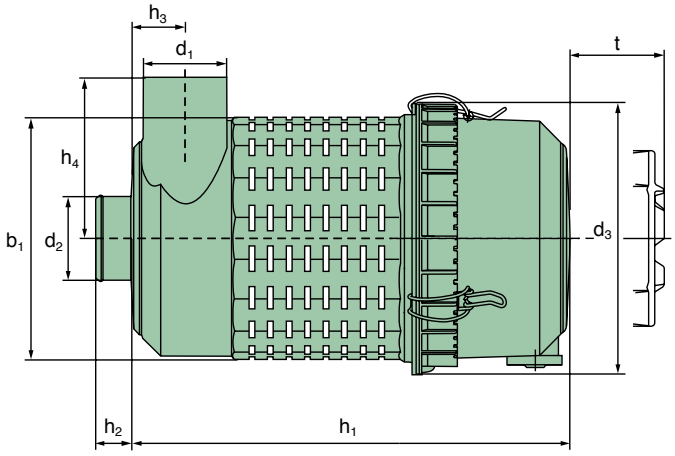


Special versions

Europiclon with dust collector (sizes 300 to 800)

The Europiclon with a dust collector is especially suitable for applications where the dust discharge process should not dirty the immediate surroundings, e.g. as a requirement for production equipment. At the same time the service life advantages of a two-stage air cleaner are still valid. In these conditions the cover of the Europiclon is fitted with a dust collector and sealed to the surroundings. The functionality of the pre-separation remains exactly the same. The dust is separated reliably into the dust collector and is emptied manually from time to time. The timing of the service intervals depends on the application conditions.

Your MANN+HUMMEL partner will be happy to answer any questions on this version.



Dimensions and air cleaner specifications for size 300 – 600 identical to types ... 920/921, see page 39

Size Europiclon	Part No.		Nominal flow rate [m³/min]	Replacement filter element	
	without secondary element	with secondary element		MANN-FILTER main element	MANN-FILTER secondary element
300	**45 300 92 950**	**45 300 92 951**	3 – 6	**C 15 300**	**CF 300**
400	**45 400 92 950**	**45 400 92 951**	4 – 8	**C 16 400**	**CF 400**
500	**45 500 92 950**	**45 500 92 951**	6 – 12	**C 20 500**	**CF 500**
600	**45 600 92 950**	**45 600 92 951**	7.5 – 15	**C 23 610**	**CF 610**
700*	**45 700 92 950**	**45 700 92 951**	15 – 21	**C 25 710/3**	**CF 710**
800*	**45 800 92 950**	**45 800 92 951**	18 – 28	**C 30 810/3**	**CF 810**

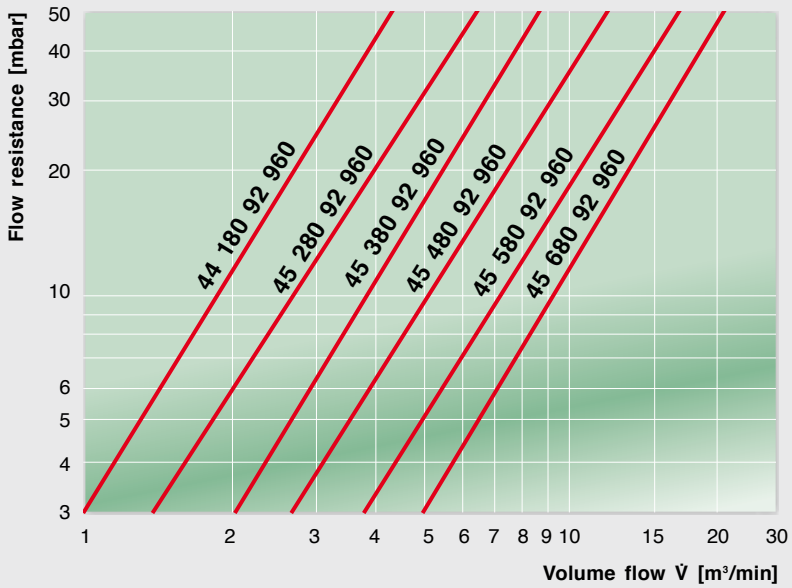
* Dimensions for sizes 700 + 800 on request.

Special versions

Europiclon for vacuum applications (sizes 100 to 600)

Specially modified filter types are available for use with vacuum applications. An additional moulded gasket seals the filter.

Typical applications are vacuum lifting devices and other negative pressure systems. The pressure tightness is approx. 950 mbar.



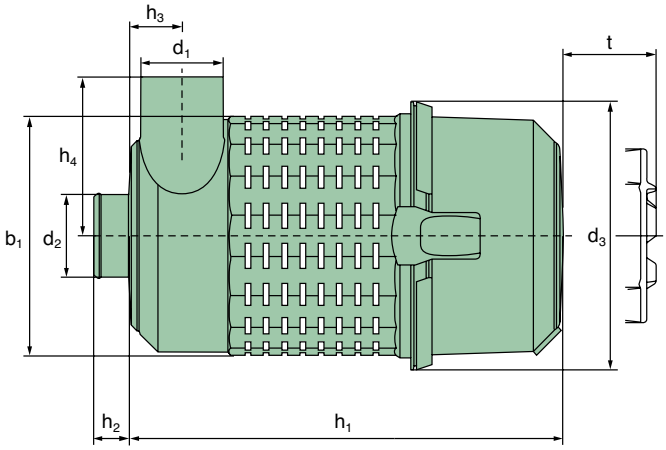


Fig. 1 Cover with snap fastener (only 44 180 ...)

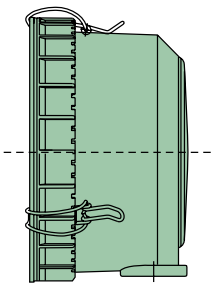


Fig. 2 Cover with wire clamps (45 280 ... to 45 680 ...)

Dimensions identical to types ... 920/921, see page 39

Size Europiclon	Part No. without secondary element	Fig.	Nominal flow rate [m³/min]	Replacement filter element MANN-FILTER main element
100	**44 180 92 960**	1	1 – 3	**C 11 100**
200	**45 280 92 960**	2	2 – 4.5	**C 14 200**
300	**45 380 92 960**	2	3 – 6	**C 15 300**
400	**45 480 92 960**	2	4 – 8	**C 16 400**
500	**45 580 92 960**	2	6 – 12	**C 20 500**
600	**45 680 92 960**	2	7.5 – 15	**C 23 610**

EUROPICLON

Accessories

Filter size	Rain cap	Straight pipe		90° elbow	
	design A * (p. 100)	without connection (p. 104)	with connection (p. 104)	without connection (p. 103)	with connection (p. 103)
Europiclon 50	**39 014 67 910**	**–**	**–**	**–**	**–**
Europiclon 100	**39 020 67 910**	**39 100 27 999**	**39 100 27 979**	**39 100 25 999**	**39 100 25 979**
Europiclon 200	**39 028 67 910**	**39 200 27 999**	**39 200 27 979**	**39 200 25 999**	**39 200 25 979**
Europiclon 300	**39 040 67 910**	**39 300 27 999**	**39 300 27 979**	**39 300 25 999**	**39 300 25 979**
Europiclon 400	**39 056 67 910**	**39 400 27 999**	**39 400 27 979**	**39 400 25 999**	**39 400 25 979**
Europiclon 500	**39 080 67 910**	**39 500 27 999**	**39 500 27 979**	**39 500 25 999**	**39 500 25 979**
Europiclon 600	**39 100 67 910**	**39 600 27 999**	**39 600 27 979**	**39 600 25 999**	**39 600 25 979**
Europiclon 700**	**39 160 67 910**	**39 700 27 999**	**39 700 27 979**	**39 700 25 999**	**39 700 25 979**
Europiclon 800**	**39 190 67 910**	**39 800 27 999**	**39 800 27 979**	**39 800 25 999**	**39 800 25 979**

Dust discharge valves

Part No.	Name	Suitable for
23 040 30 111	Diaphragm valve	**45 x00 92 920/921**
39 000 40 391	Small dust discharge valve	**45 x00 92 910/911**
39 000 40 661	Large dust discharge valve	**44 x00 92 940/941**
39 000 40 102	Large dust discharge valve	**45 x00 92 940/941**

x = 1 bis 8

* Alternative design B possible (see page 101)

You will find the complete range of accessories for our air cleaners on page 99.

** Accessories only for special designs.

EUROPICLON

Brackets

The brackets are especially designed for the external surface of the Europiclon housing and allow vibration-free mounting of the air cleaner.

From size 700 it is necessary to use two brackets.

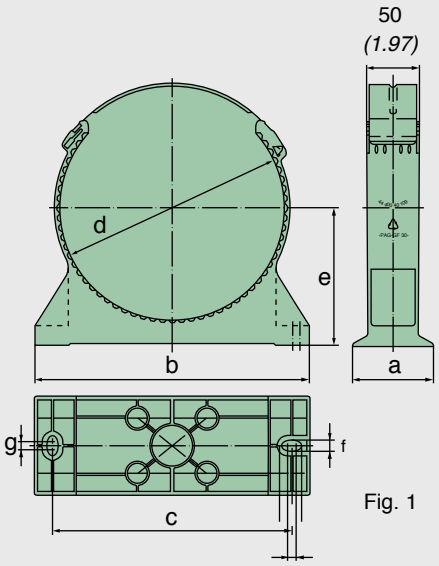


Fig. 1

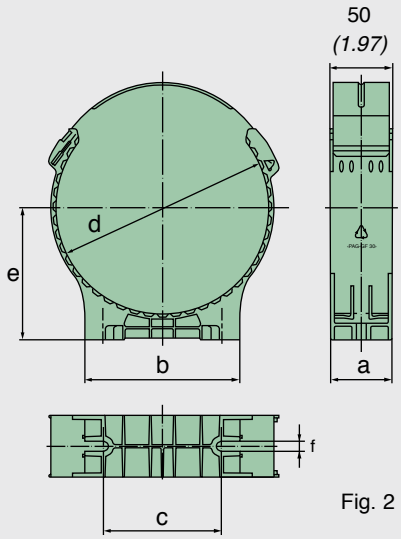


Fig. 2

Part No.	Suitable for Europiclon	Fig.	Dimensions in mm *(Dimensions in inches)*						
			a	b	c	d	e	f	g
39 050 40 959	**45 05x 92 ...**	1	40 *(1.57)*	137 *(5.39)*	116 *(4.57)*	122 *(4.80)*	85.7 *(3.37)*	9 *(0.35)*	–
39 100 40 999	**45 100 92 ...**	1	60 *(2.36)*	205 *(8.07)*	175 *(6.89)*	156 *(6.14)*	105 *(4.13)*	8.5 *(0.33)*	15.5 *(0.61)*
39 200 40 999	**45 200 92 ...**	1	80 *(3.15)*	220 *(8.66)*	190 *(7.48)*	171 *(6.73)*	110 *(4.33)*	8.5 *(0.33)*	15.5 *(0.61)*
39 300 40 999	**45 300 92 ...**	1	80 *(3.15)*	250 *(9.84)*	220 *(8.66)*	201 *(7.91)*	125 *(4.92)*	8.5 *(0.33)*	15.5 *(0.61)*
39 400 40 999	**45 400 92 ...**	1	80 *(3.15)*	270 *(10.63)*	240 *(9.45)*	221 *(8.70)*	135 *(5.32)*	8.5 *(0.33)*	15.5 *(0.61)*
39 500 40 999	**45 500 92 ...**	1	80 *(3.15)*	310 *(12.20)*	280 *(11.02)*	262 *(10.32)*	155 *(6.10)*	8.5 *(0.33)*	15.5 *(0.61)*
39 600 40 999	**45 600 92 ...**	1	80 *(3.15)*	345 *(13.58)*	315 *(12.40)*	296 *(11.65)*	173 *(6.81)*	8.5 *(0.33)*	15.5 *(0.61)*
39 700 40 999	**45 700 92 ...**	1	80 *(3.15)*	385 *(15.16)*	355 *(13.98)*	326 *(12.83)*	206 *(8.11)*	8.5 *(0.33)*	7.0 *(0.28)*
39 800 40 999	**45 800 92 ...**	1	80 *(3.15)*	452 *(17.80)*	422 *(16.61)*	391 *(15.39)*	220 *(8.66)*	8.5 *(0.33)*	7.0 *(0.28)*
39 100 40 989	**45 100 92 ...**	2	50 *(1.97)*	110 *(4.33)*	80 *(3.15)*	156 *(6.14)*	100 *(3.94)*	8.5 *(0.33)*	–
39 200 40 989	**45 200 92 ...**	2	50 *(1.97)*	125 *(4.92)*	95 *(3.74)*	171 *(6.73)*	106 *(4.17)*	8.5 *(0.33)*	–
39 300 40 989	**45 300 92 ...**	2	50 *(1.97)*	140 *(5.51)*	110 *(4.33)*	201 *(7.91)*	121 *(4.76)*	8.5 *(0.33)*	–
39 400 40 989	**45 400 92 ...**	2	50 *(1.97)*	157 *(6.18)*	127 *(5.00)*	221 *(8.70)*	132 *(5.20)*	8.5 *(0.33)*	–
39 500 40 989	**45 500 92 ...**	2	50 *(1.97)*	182 *(7.17)*	152 *(5.98)*	262 *(10.32)*	153 *(6.02)*	8.5 *(0.33)*	–
39 600 40 989	**45 600 92 ...**	2	50 *(1.97)*	182 *(7.17)*	152 *(5.98)*	296 *(11.65)*	173 *(6.81)*	8.5 *(0.33)*	–
39 700 40 989	**45 700 92 ...**	2	50 *(1.97)*	233 *(9.17)*	203 *(7.99)*	326 *(12.83)*	206 *(8.11)*	8.5 *(0.33)*	–
39 800 40 989	**45 800 92 ...**	2	50 *(1.97)*	233 *(9.17)*	203 *(7.99)*	391 *(15.39)*	221 *(8.70)*	8.5 *(0.33)*	–

EUROPICLON

Additional spare parts

The new spare part kits for the MANN+HUMMEL Europiclon series consist of a lower part, fasteners, rating plate, operation manual and as the case may be with or without valve or plugs.

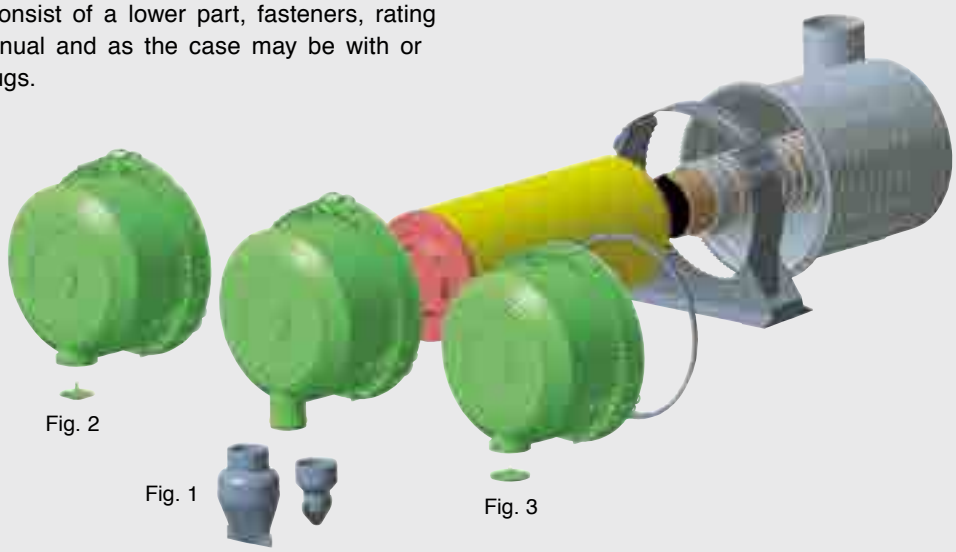


Fig. 2

Fig. 1

Fig. 3

Filter size	Small / large valve not fitted (see p. 48) Fig. 1	Umbrella valve fitted Fig. 2	Plug fitted Fig. 3
Europiclon 100	**45 100 17 997**	**–**	**–**
Europiclon 200	**45 200 17 997**	**45 200 17 977**	**45 200 17 937**
Europiclon 300	**45 300 17 997**	**45 300 17 977**	**45 300 17 937**
Europiclon 400	**45 400 17 997**	**45 400 17 977**	**45 400 17 937**
Europiclon 500	**45 500 17 997**	**45 500 17 977**	**45 500 17 937**
Europiclon 600	**45 600 17 997**	**45 600 17 977**	**45 600 17 937**

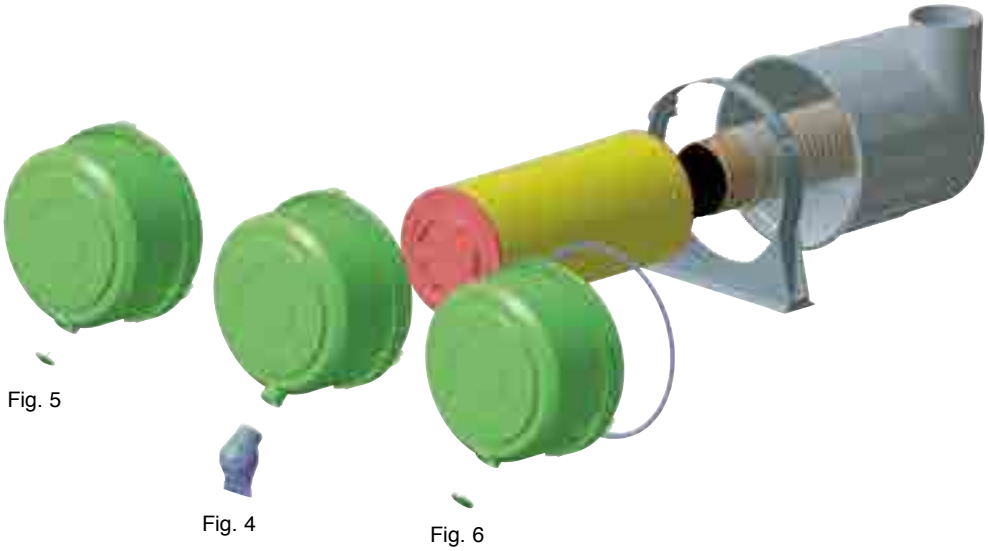


Fig. 5

Fig. 4

Fig. 6

Filter size	Inclined valve not fitted (see p. 48) Fig. 4	Umbrella valve fitted Fig. 5	Plug fitted Fig. 6
Europiclon 700	**45 700 17 997**	**45 700 17 977**	**45 700 17 937**
Europiclon 800	**45 800 17 997**	**45 800 17 977**	**45 800 17 937**

MANN+HUMMEL NLG
Modular air cleaner system for a wide range of applications

NLG

Flexible – Robust – Economical

The new NLG line from MANN+HUMMEL offers a flexible and economic solution for many varied applications in the field of intake air filtration.

Advantages at a glance:

- high flexibility through variable modular system
- economic air cleaner system through modular design
- easy element change without tools
- corrosion-free and robust housing through use of plastic reinforced with fibreglass
- the Piclon version with integrated dust pre-separation can also be used with medium to heavy dust loads
- as a combination air cleaner with DualSpin precleaner also suitable for very difficult dust conditions due to its long service life
- metal-free filter elements are easily disposed of by incineration and therefore are environmentally friendly with inexpensive disposal
- problem-free adaptation to other equipment through variable connection positions
- quick first-fit on the vehicle through threaded inserts
- patented filter elements

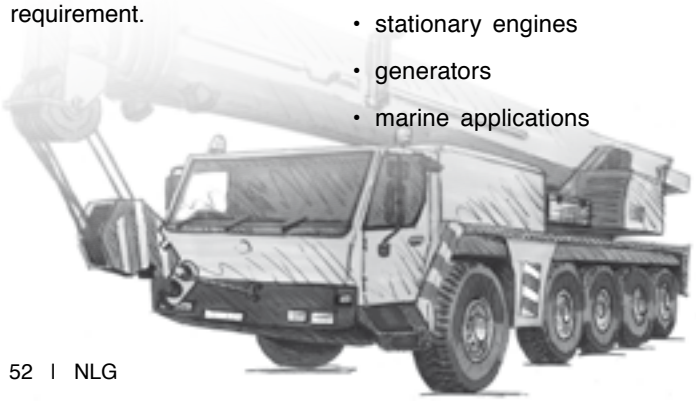
NLG Pico

Single-stage air cleaners

The Pico is the single-stage version of the NLG, i.e. without integrated dust pre-separation. It is particularly suitable for applications with low dust loads where minimal pressure drop in the air cleaner is a special requirement.

These are, for example:

- commercial vehicles (trucks)
- buses
- mobile cranes
- compressors
- stationary engines
- generators
- marine applications



NLG Piclon

Two-stage air cleaners with integrated pre-separation

The Piclon version is the two-stage version of the NLG with integrated dust pre-separation and an efficiency of more than 75%. It is particularly suitable for applications with medium to heavy dust loads.

These are, for example:

- construction and agricultural machines
- all typical Pico applications with a requirement for longer service life

The Pico and Piclon versions both have identical housing and connection dimensions. Therefore the Piclon can replace the Pico if the use of a machine in a certain region requires a special version. In this situation changing the air cleaner does not require making any changes to the pipe connections or to the fixing of the air cleaner bracket.

NLG DualSpin Combination air cleaners

Two-stage air cleaners with external pre-separation

The combination air cleaners consist of Pico versions of the NLG air cleaner in size 37 and the new DualSpin precleaners specially developed for these air cleaners which have an efficiency of more than 90% with a low pressure drop. Due to its long service and special version of the precleaner, where clogging is almost unheard of, the combination air cleaners are suitable for use with most applications in very dusty conditions.

These include, for example:

- combine harvesters
- field choppers
- special harvesting machines, e.g. for cotton, sugar cane or peat
- construction and agricultural machines in very dusty conditions

You can configure the combination air cleaner exactly according to the service life you require and the air requirement of the machine.

There are three housing lengths available for the air cleaner and two versions of the precleaner for volume flows between 20 m^3/min and 40 m^3/min.

NLG

Modular system

The combination of housings and elements allows selection of a suitable solution from 12 different basic variations. Thus it is possible to adapt the NLG to meet individual machine requirements of different regions.
Whereas, for example, a NLG with short housing and short elements may be sufficient for the standard version of a certain machine, versions for machines with higher dust loads can be equipped with a longer housing and longer elements. With the same pipe connections and bracket fixing you can match the service life ideally to the respective conditions to achieve the most economical solution.

The largest and the smallest: NLG 37-42 and NLG 15-12

NLG Modular system

4 different air cleaner diameters ...

... with 3 different housing lengths ...

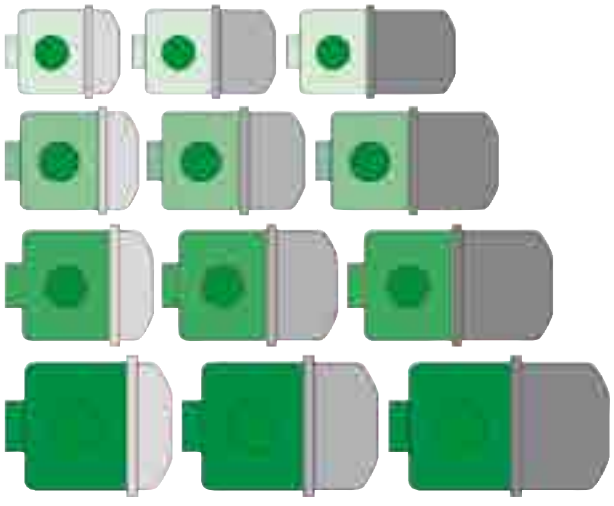
... result in 12 basic variations

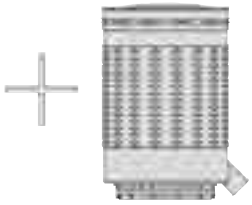
NLG Group 15

NLG Group 21

NLG Group 28

NLG Group 37





DualSpin

NLG

Filter elements

NLG Filter element

- high dust capacity through MANN+HUMMEL graded medium
- robust design with plastic centre tube
- patented design
- element protection due to integrated handle prevents damage during filter change

NLG Secondary element

- MANN+HUMMEL synthetic fabric for high separation drop
- secure fit in housing with screw fitting which further protects the engine as this prevents unintentional removal of the secondary element
- robust design with plastic centre tube

DualSpin Precleaner

MANN+HUMMEL has developed a precleaner especially designed for the NLG air cleaner. The DualSpin is suitable for use in very difficult operating conditions, such as harvesting applications.

Advantages of the DualSpin precleaner:

- high pre-separation efficiency with low pressure drop
- the housing is made from special antistatic plastic which is very suitable for organic particles
- various distributor inserts can be used to adapt the pre-cyclone perfectly to the air requirement of the machine

DualSpin

NLG Pico (1-stage)

Dimensions and part numbers

NLG Pico version with connection dimension d_1 = 250 mm *(9.84 inch)*

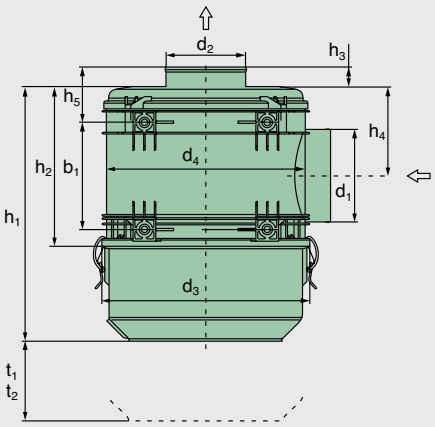
Filter size	Part No.		Fig.	Nominal flow rate [m³/min]	Replacement filter element		Weight [kg]
	without secondary element	with secondary element			MANN-FILTER main elementt	MANN-FILTER secondary element	
NLG 37-37	**–**	**44 930 85 953***	1	25 – 45	**C 30 1530**	**CF 1830**	8.3
NLG 37-42	**–**	**44 930 85 960***	1	25 – 45	**C 30 1730**	**CF 1840**	8.7
NLG 37-42	**–**	**44 930 85 974****	2	25 – 45	**C 33 2200**	**CF 1840**	9.4
NLG 37-42	**–**	**44 930 85 975****	1	25 – 45	**C 33 2200**	**CF 1840**	9.4

* Pleat height 48 mm *(1.89 inch)*
** Pleat height 60 mm *(2.36 inch)*

Filter size	Part No.		Fig.	Nominal flow rate [m³/min]	Replacement filter element		Weight [kg]
	without secondary element	with secondary element			MANN-FILTER main element	MANN-FILTER secondary elemen	
	44 513 85 901	**44 513 85 950**	1				
NLG 15-12	**44 513 85 902**	**44 513 85 951**	2	10 – 18	**C 23 513**	**CF 1240**	3.3
	44 513 85 900	**44 513 85 952**	3				
	44 632 85 905	**44 632 85 951**	1				
NLG 15-15	**44 632 85 906**	**44 632 85 952**	2	10 – 18	**C 23 632/1**	**CF 1250**	3.6
	44 632 85 900	**44 632 85 950**	3				
	44 750 85 903	**44 750 85 951**	1				
NLG 15-18	**44 750 85 904**	**44 750 85 950**	2	10 – 18	**C 23 750**	**CF 1260**	4.3
	44 750 85 901	**44 750 85 952**	3				
	44 742 85 905	**44 742 85 950**	1				
NLG 21-18	**44 742 85 906**	**44 742 85 952**	2	12 – 24	**C 25 740**	**CF 1420**	4.3
	44 742 85 904	**44 742 85 953**	3				
	44 860 85 908	**44 860 85 952**	1				
NLG 21-21	**44 860 85 909**	**44 860 85 953**	2	12 – 24	**C 25 860/5**	**CF 1430**	4.6
	44 860 85 900	**44 860 85 951**	3				
	44 860 85 911	**44 860 85 954**	1				
NLG 21-24	**44 860 85 912**	**44 860 85 950**	2	12 – 24	**C 25 990**	**CF 1440**	5.1
	44 860 85 904	**44 860 85 955**	3				
	44 920 85 926	**44 920 85 950**	1				
NLG 28-24	**44 920 85 927**	**44 920 85 955**	2	18 – 30	**C 27 1020**	**CF 1631**	5.2
	44 920 85 916	**44 920 85 956**	3				
	44 920 85 915	**44 920 85 954**	1				
NLG 28-28	**44 920 85 914**	**44 920 85 957**	2	18 – 30	**C 27 1170**	**CF 1640**	5.6
	44 920 85 904	**44 920 85 952**	3				
	44 920 85 928	**44 920 85 958**	1				
NLG 28-32	**44 920 85 924**	**44 920 85 951**	2	18 – 30	**C 27 1320/2**	**CF 1650**	6.3
	44 920 85 918	**44 920 85 959**	3				
	44 930 85 912	**44 930 85 950**	1				
NLG 37-32	**44 930 85 913**	**44 930 85 956**	2	25 – 45	**C 30 1330**	**CF 1820**	6.4
	44 930 85 902	**44 930 85 957**	3				
	44 930 85 908	**44 930 85 958**	1				
NLG 37-37	**44 930 85 909**	**44 930 85 959**	2	25 – 45	**C 30 1530**	**CF 1830**	7.4
	44 930 85 900	**44 930 85 951**	3				
	44 930 85 914	**44 930 85 955**	1				
NLG 37-42	**44 930 85 915**	**44 930 85 952**	2	25 – 45	**C 30 1730**	**CF 1840**	7.9
	44 930 85 901	**44 930 85 954**	3				

NLG Pico (1-stage)

Dimensions and part numbers



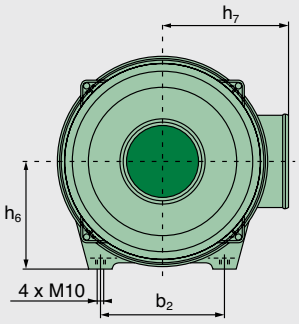


Fig. 1

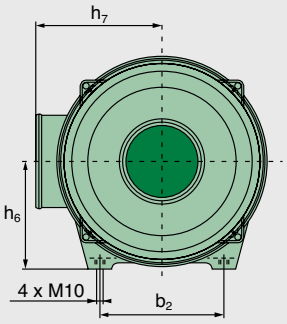


Fig. 2

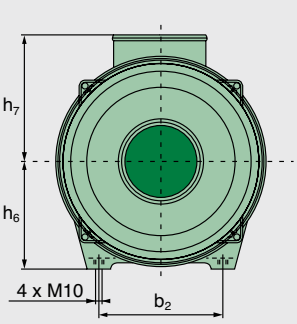


Fig. 3

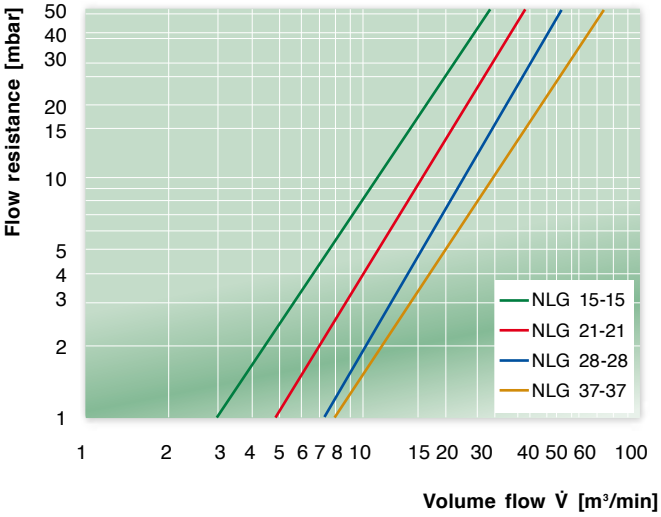
Group	Filter size	Dimensions in mm *(Dimensions in inches)*														
		d_1	d_2	d_3	d_4	b_1	b_2	h_1	h_2	h_3	h_4	h_5	h_6	h_7	t_1 [1)]	t_2 [2)]
15	**NLG 15-12** **NLG 15-15** **NLG 15-18**	130 *(5.12)*	110 *(4.33)*	299 *(11.77)*	285 *(11.22)*	140 *(5.51)*	200 *(7.87)*	305 *(12.01)* 360 *(14.17)* 415 *(16.34)*	228 *(8.98)*	33 *(1.30)*	120 *(4.72)*	91 *(3.59)*	153 *(6.02)*	182 *(7.17)*	230 *(9.06)*	273 *(10.75)* 328 *(12.91)* 383 *(15.08)*
21	**NLG 21-18** **NLG 21-21** **NLG 21-24**	150 *(5.91)*	130 *(5.12)*	339 *(13.35)*	323 *(12.72)*	175 *(6.89)*	200 *(7.87)*	365 *(14.37)* 415 *(16.34)* 465 *(18.31)*	260 *(10.24)*	33 *(1.30)*	145.*5* *(5.73)*	91 *(3.59)*	173 *(6.81)*	203 *(7.99)*	260 *(10.24)*	332 *(13.07)* 382 *(15.04)* 432 *(17.01)*
28	**NLG 28-24** **NLG 28-28** **NLG 28-32**	180 *(7.09)*	150 (5.91)	365 *(14.37)*	349 *(13.74)*	210 *(8.27)*	200 *(7.87)*	427 *(16.81)* 480 *(18.90)* 533 *(20.98)*	*295* *(11.61)*	33 *(1.30)*	*163* *(6.42)*	91 *(3.59)*	185 *(7.28)*	215 *(8.46)*	296 *(11.65)*	395 *(15.55)* 448 *(17.64)* 501 *(19.72)*
37	**NLG 37-32** **NLG 37-37** **NLG 37-42**	210 *(8.27)*	180 (7.09)	407 *(16.02)*	393 *(15.47)*	245 *(9.65)*	240 *(9.45)*	498 *(19.61)* 563 *(22.17)* 628 *(24.72)*	*363* *(14.29)*	33 *(1.30)*	*188* *(7.40)*	91 *(3.59)*	207 *(8.15)*	237 *(9.33)*	364 *(14.33)*	465 *(18.31)* 530 *(20.87)* 595 *(23.43)*

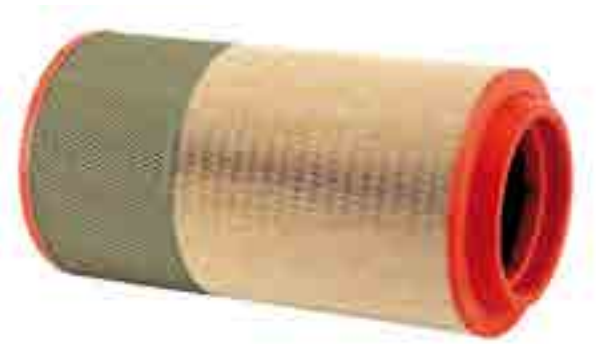
[1)] Removal height without secondary element
[2)] Removal height with secondary element

NLG Pico (1-stage)

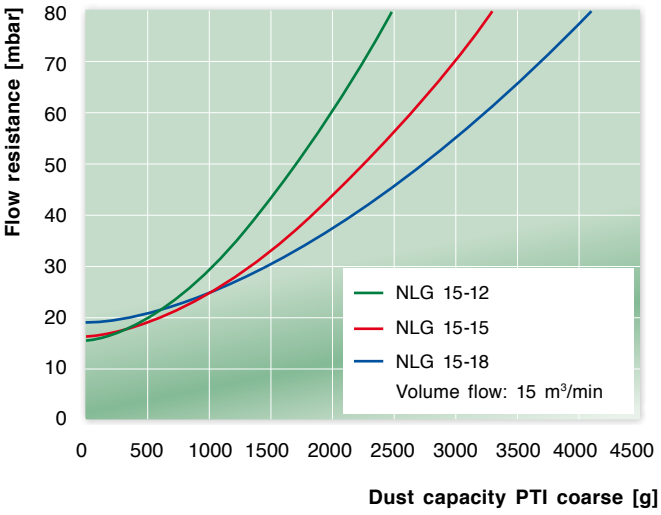
Flow characteristics without secondary element

... for flow rates as per ISO 5011





... for dust capacity as per ISO 5011



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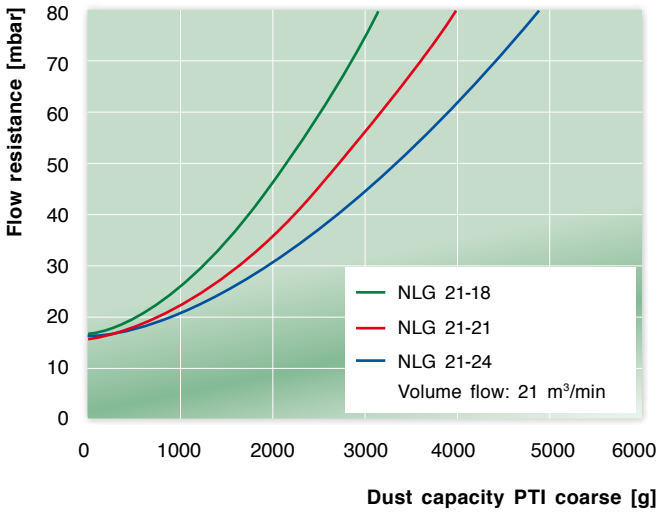

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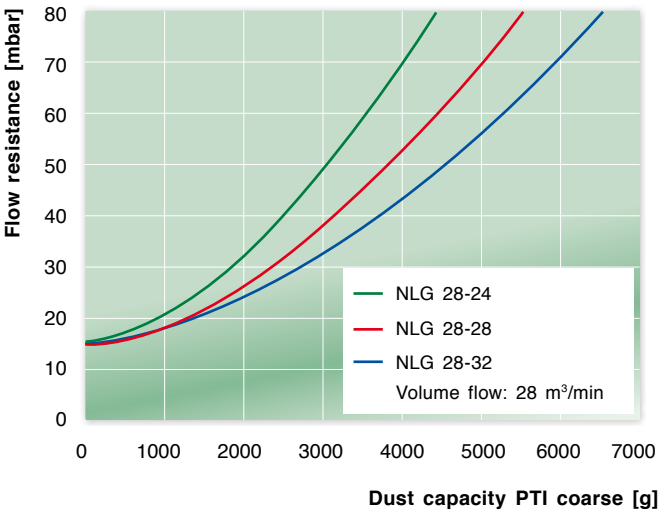
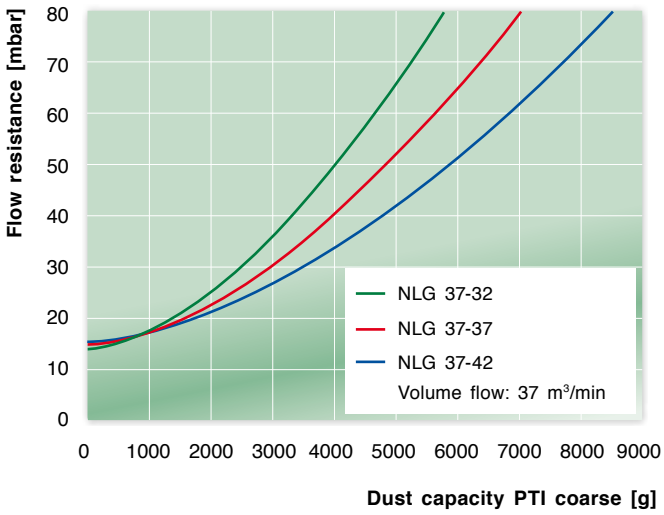


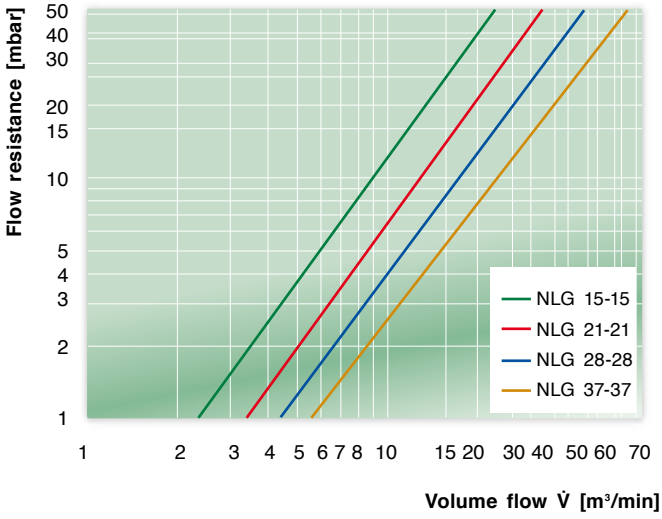
... for dust capacity as per ISO 5011



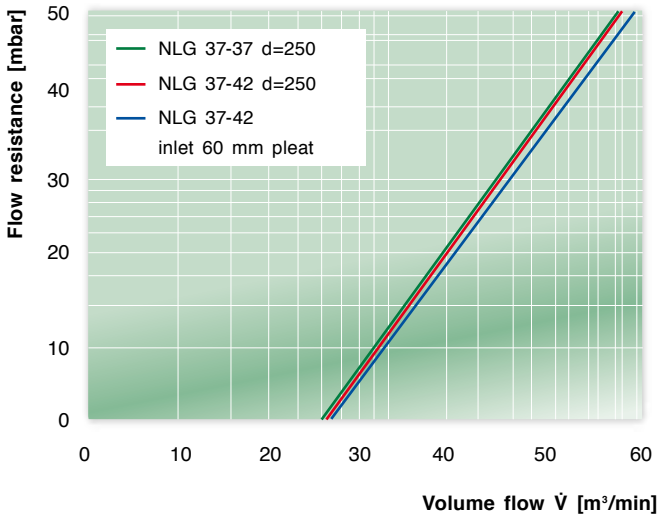
NLG Pico (1-stage)

Flow characteristics with secondary element

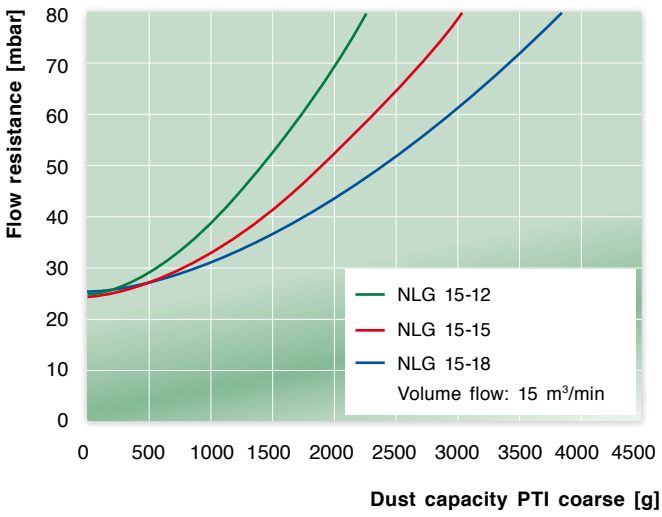
... for flow rates as per ISO 5011



... for flow rates as per ISO 5011



... for dust capacity as per ISO 5011



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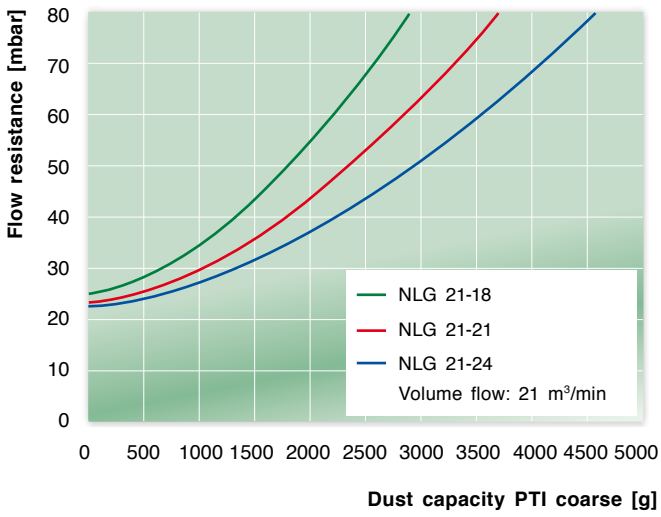

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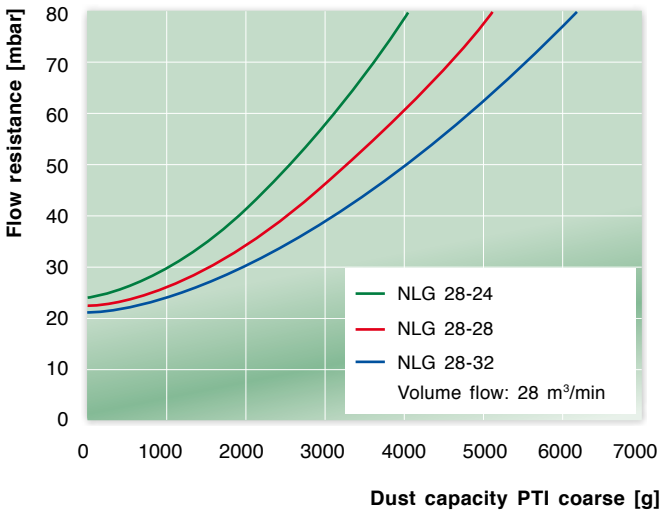

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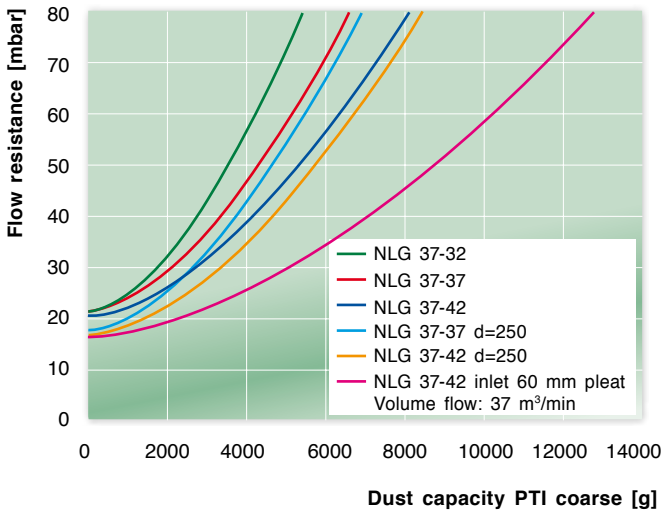


NLG Piclon (2-stage)

Dimensions and part numbers

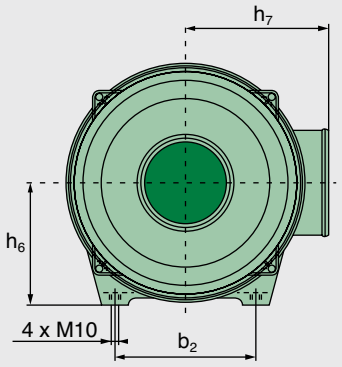


Fig. 1

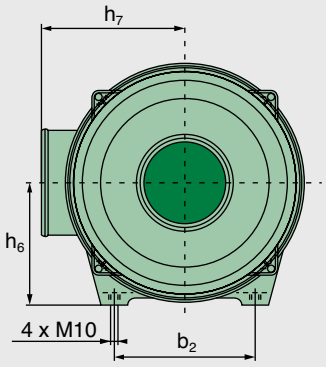


Fig. 2

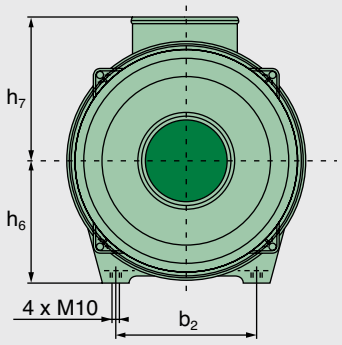
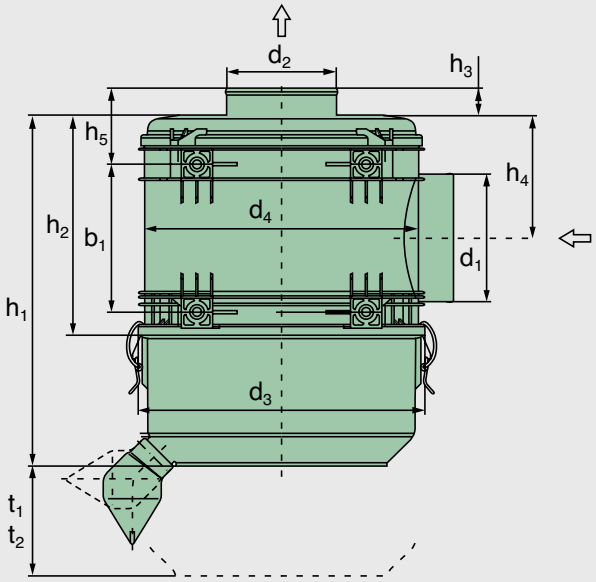


Fig. 3

Filter size	Part No.		Fig.	Nominal flow rate [m³/min]	Replacement filter element		Weight [kg]
	without secondary element	with secondary element			MANN-FILTER main element	MANN-FILTER secondary element	
	44 526 92 900	**44 526 92 951**	1				
NLG 15-15	**44 526 92 901**	**44 526 92 952**	2	10 – 15	**C 22 526/1**	**CF 1250**	3.6
	44 526 92 902	**44 526 92 950**	3				
	44 625 92 901	**44 625 92 951**	1				
NLG 15-18	**44 625 92 902**	**44 625 92 952**	2	10 – 15	**C 22 625**	**CF 1260**	4.3
	44 625 92 900	**44 625 92 950**	3				
	44 722 92 905	**44 722 92 954**	1				
NLG 21-21	**44 722 92 906**	**44 722 92 953**	2	15 – 21	**C 24 745/1**	**CF 1430**	4.6
	44 722 92 904	**44 722 92 950**	3				
	44 722 92 907	**44 722 92 956**	1				
NLG 21-24	**44 722 92 908**	**44 722 92 957**	2	15 – 21	**C 24 820**	**CF 1440**	5.1
	44 722 92 903	**44 722 92 951**	3				
	44 920 92 906	**44 920 92 956**	1				
NLG 28-28	**44 920 92 907**	**44 920 92 954**	2	20 – 28	**C 26 980**	**CF 1640**	5.6
	44 920 92 902	**44 920 92 950**	3				
	44 920 92 908	**44 920 92 957**	1				
NLG 28-32	**44 920 92 909**	**44 920 92 958**	2	20 – 28	**C 26 1100**	**CF 1650**	6.3
	44 920 92 903	**44 920 92 951**	3				
	44 930 92 902	**44 930 92 950**	1				
NLG 37-37	**44 930 92 903**	**44 930 92 953**	2	25 – 40	**C 28 1275**	**CF 1830**	7.4
	44 930 92 900	**44 930 92 951**	3				
	44 930 92 904	**44 930 92 954**	1				
NLG 37-42	**44 930 92 905**	**44 930 92 955**	2	25 – 40	**C 28 1440**	**CF 1840**	7.9
	44 930 92 901	**44 930 92 952**	3				

NLG Piclon (2-stage)

Dimensions and part numbers



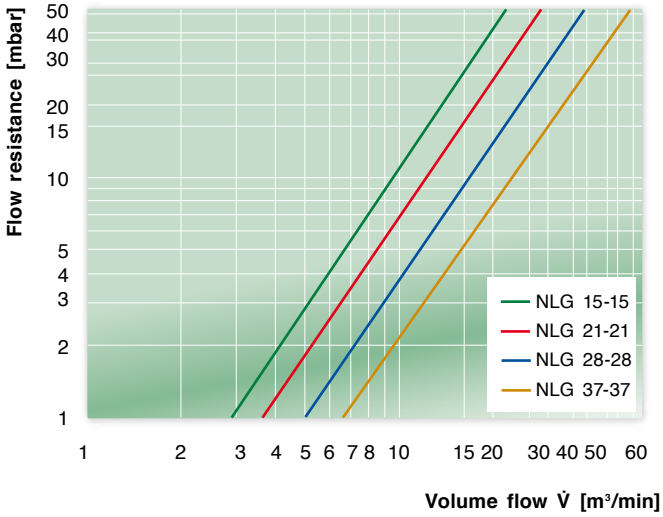
Group	Filter size	Dimensions in mm *(Dimensions in inches)*														
		d_1	d_2	d_3	d_4	b_1	b_2	h_1	h_2	h_3	h_4	h_5	h_6	h_7	t_1 [1)]	t_2 [2)]
15	**NLG 15-15** **NLG 15-18**	130 *(5.12)*	110 *(4.33)*	299 *(11.77)*	285 *(11.22)*	140 *(5.51)*	200 *(7.87)*	360 *(14.17)* 415 *(16.34)*	228 *(8.98)*	33 *(1.30)*	120 *(4.72)*	91 *(3.59)*	153 *(6.02)*	182 *(7.17)*	230 *(9.06)*	328 *(12.91)* 383 *(15.08)*
21	**NLG 21-21** **NLG 21-24**	150 *(5.91)*	130 *(5.12)*	339 *(13.35)*	323 *(12.72)*	175 *(6.89)*	200 *(7.87)*	415 *(16.34)* 465 *(18.31)*	260 (10.24)	33 *(1.30)*	145.5 *(5.73)*	91 *(3.59)*	173 *(6.81)*	203 *(7.99)*	260 *(10.24)*	382 *(15.04)* 432 *(17.01)*
28	**NLG 28-28** **NLG 28-32**	180 *(7.09)*	150 (5.91)	365 *(14.37)*	349 *(13.74)*	210 *(8.27)*	200 *(7.87)*	480 *(18.90)* 533 *(20.98)*	295 *(11.61)*	33 *(1.30)*	163 *(6.42)*	91 *(3.59)*	185 *(7.28)*	215 *(8.46)*	296 *(11.65)*	448 *(17.64)* 501 *(19.72)*
37	**NLG 37-37** **NLG 37-42**	210 *(8.27)*	180 (7.09)	407 *(16.02)*	393 *(15.47)*	*245* (9.65)	240 *(9.45)*	563 *(22.17)* 628 *(24.72)*	363 *(14.29)*	33 *(1.30)*	188 *(7.40)*	91 *(3.59)*	207 *(8.15)*	237 *(9.33)*	364 *(14.33)*	530 *(20.87)* 595 *(23.43)*

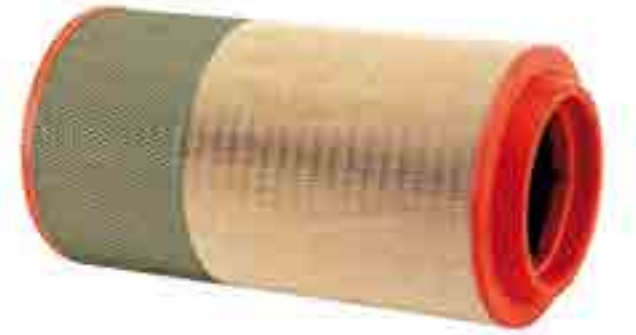
[1)] Removal height without secondary element
[2)] Removal height with secondary element

NLG Piclon (2-stage)

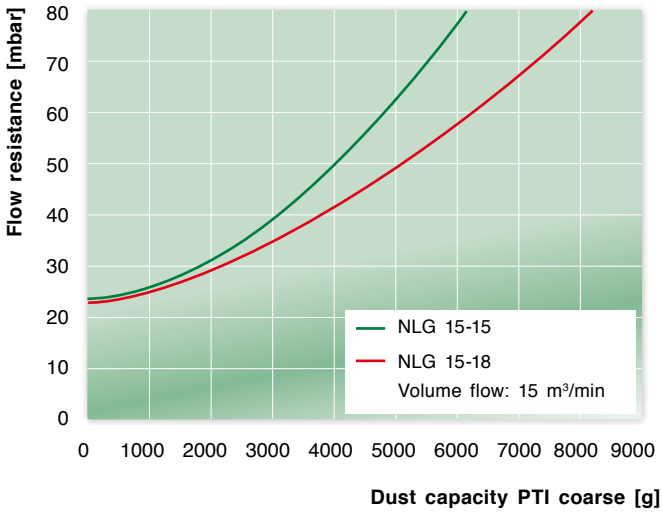
Flow characteristics without secondary element

... for flow rates as per ISO 5011

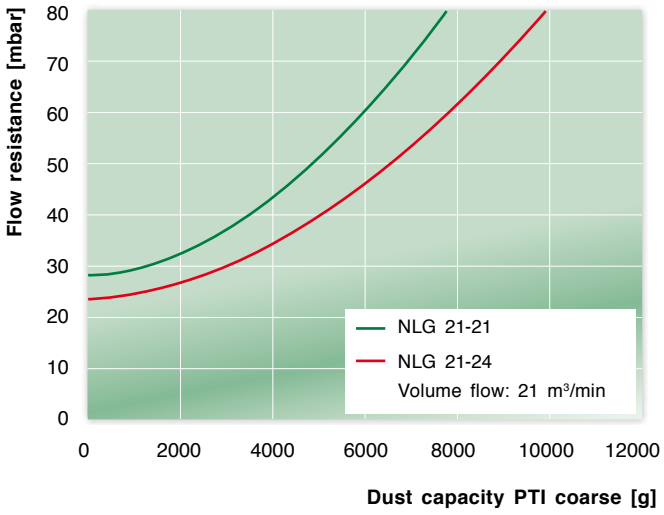




... for dust capacity as per ISO 5011



... for dust capacity as per ISO 5011



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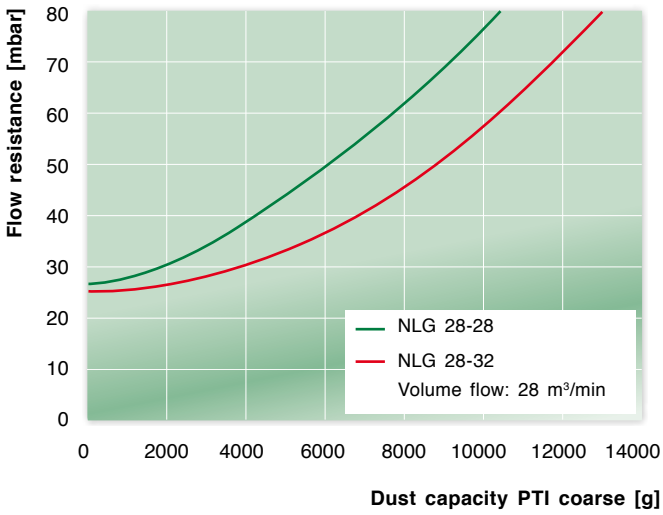
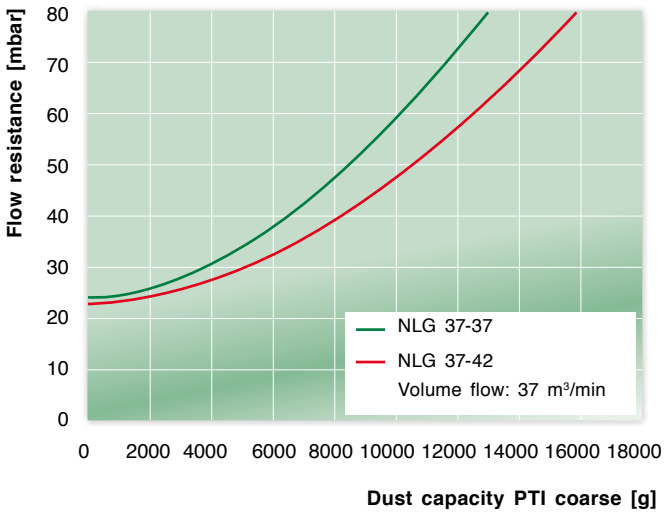


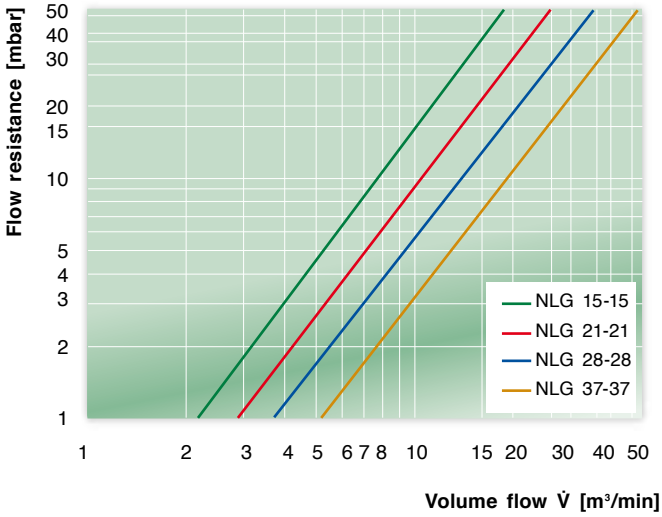
... for dust capacity as per ISO 5011



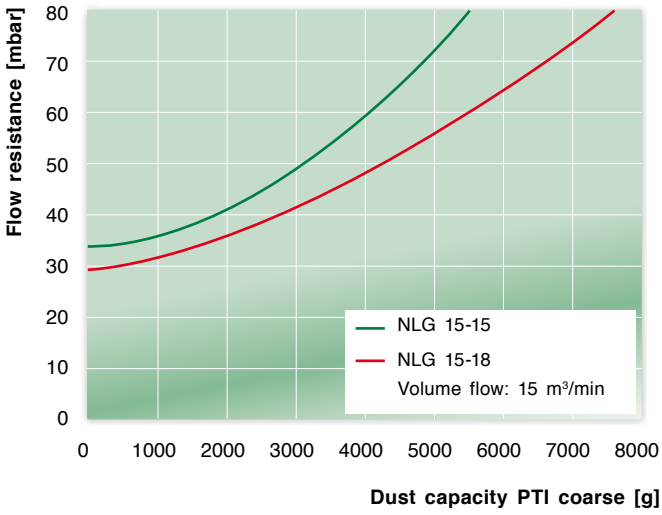
NLG Piclon (2-stage)

Flow characteristics with secondary element

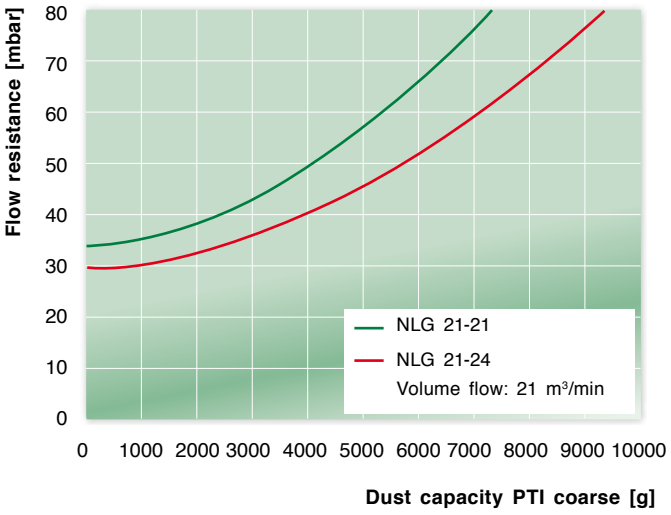
... for flow rates as per ISO 5011



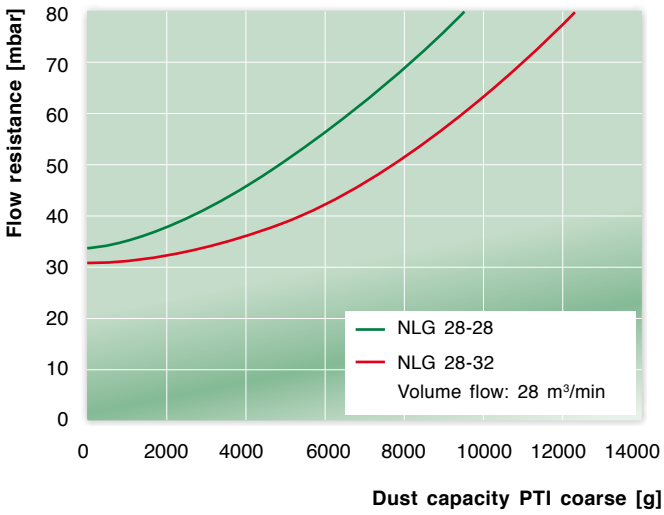
... for dust capacity as per ISO 5011



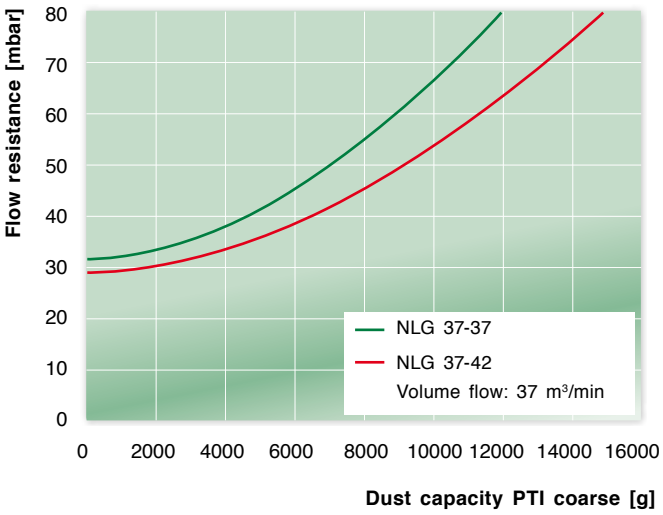
... for dust capacity as per ISO 5011



... for dust capacity as per ISO 5011



... for dust capacity as per ISO 5011



DualSpin — Precleaners

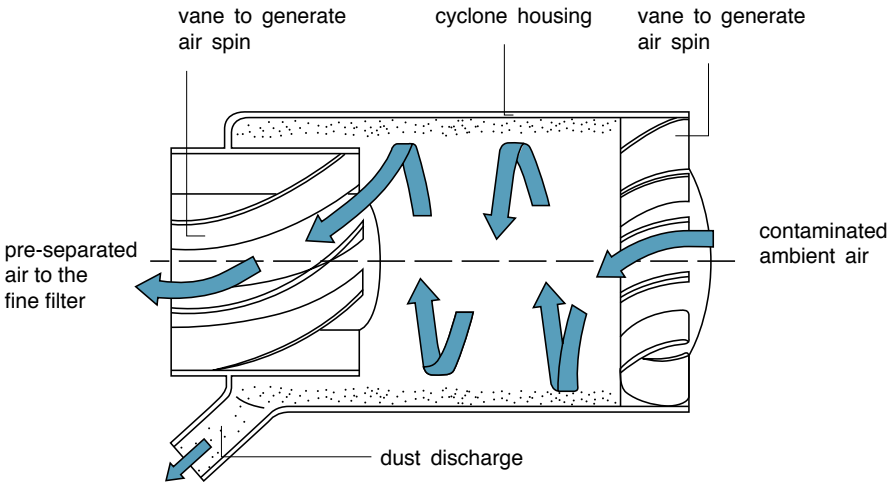
DualSpin

The DualSpin precleaner newly developed by MANN+HUMMEL offers excellent separation efficiency with a simultaneous minimal drop in pressure. The special arrangement of both distributors reduces the pressure drop of the precleaners by up to 50%. Generously dimensioned cross-sectional flow areas almost completely prevent clogging – even under unfavourable conditions, such as with harvesting machines. The DualSpin is the ideal complement to the air cleaners of the NLG line (see page 51), but it can also be combined with other air cleaners (e.g. metal air cleaners).

Advantages of the DualSpin precleaner:

- The highest separation performance (η > 90%, SAE-C) with scavenging is achieved by connecting an exhaust ejector (see page 111), radiator fan or an external blower.
- operation with dust discharge valve possible as a more economic alternative (η > 85%, SAE-C)
- Different distributor inserts are used to adjust the precyclone within a range of 18 m³/min to 50 m³/min ideally to the air requirement of the machine.

Working principle of the DualSpin precleaner

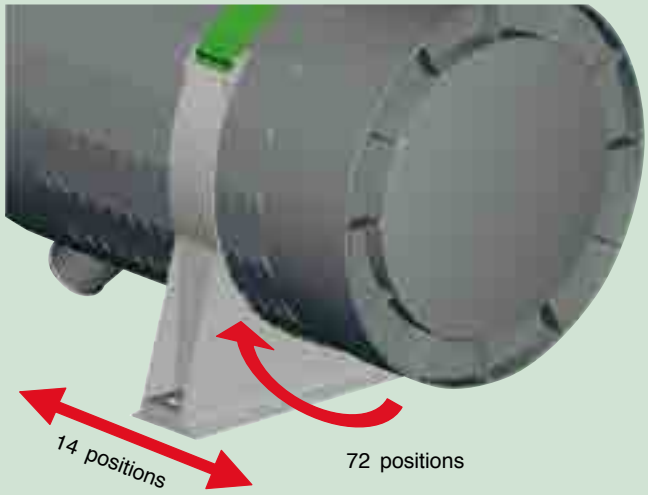


DualSpin — Precleaners

Installation possibilities

A polygon structure is integrated in the exterior wall of the DualSpin precleaner and enables use of the proven bracket of the Europiclon 700.

The polygon structure has 14 locking positions in the axial direction and 72 different orientations on the circumference.



The DualSpin precleaner can be directly fitted onto the air cleaner housing (horizontal or vertical). If there is no scavenging, the valve on the discharge connection must always be downwards (direction of gravity). In the case of active scavenging with DualSpin an overhead fitting position is also possible.

DualSpin fitted directly onto the air cleaner housing

There is also the possibility, however, to fit the precleaner in a different position and connect it to the air cleaner using an air duct. This is referred to as a remote design.

Remote design

DualSpin Combination air cleaners (2-stage)

Dimensions and part numbers

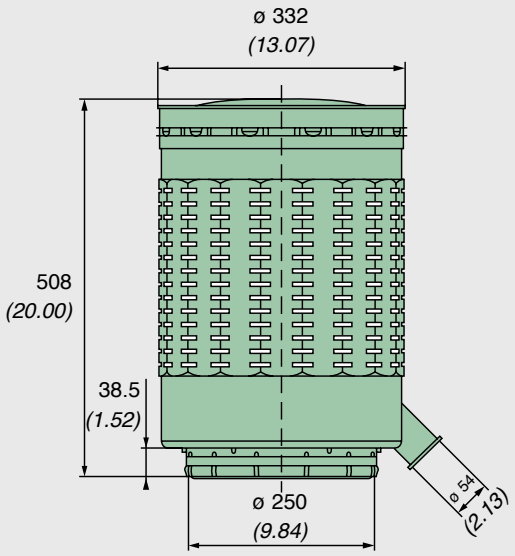


Fig. 1 (scavenging)

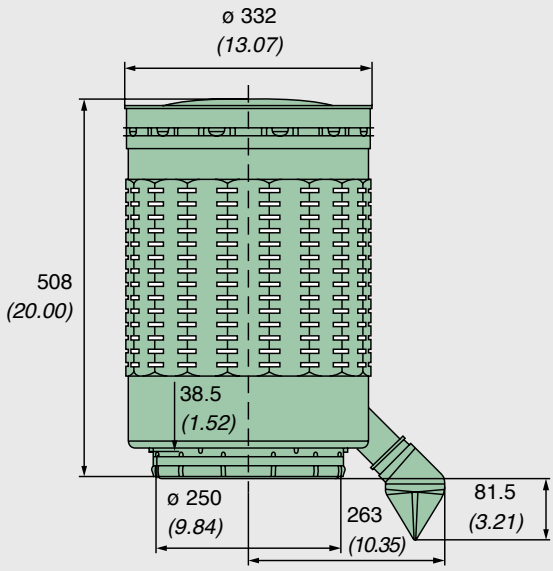


Fig. 2 (with dust discharge valve 39 000 40 671)

NLG Pico to be used with DualSpin

Filter size	Part No. with secondary element	Connection dimension in mm *(inch)* (see page 57)	Replacement filter element	
			MANN-FILTER main element	MANN-FILTER secondary element
NLG 37-37	**44 930 85 953***	250 *(9.84)*	**C 30 1530**	**CF 1830**
NLG 37-42	**44 930 85 960***	250 *(9.84)*	**C 30 1730**	**CF 1840**
NLG 37-42	**44 930 85 974****	250 *(9.84)*	**C 33 2200**	**CF 1840**
NLG 37-42	**44 930 85 975****	250 *(9.84)*	**C 33 2200**	**CF 1840**

* Pleat height 48 mm *(1.89 inch)*

** Pleat height 60 mm *(2.36 inch)*

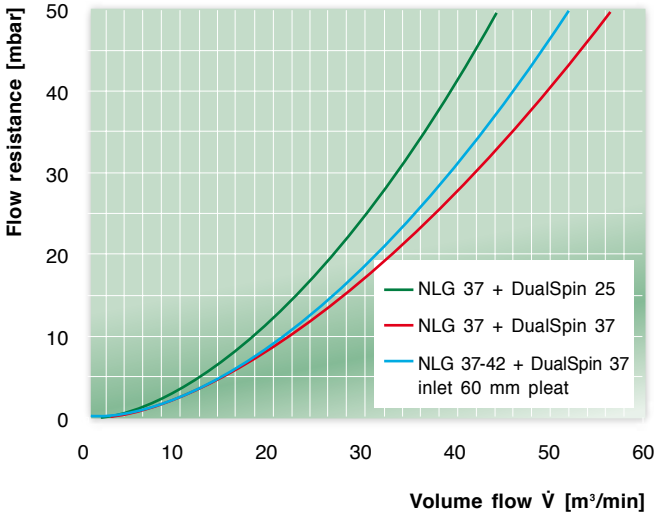
DualSpin precleaners

Installation size	Bracket suitable for preseparator (option)	Part No. without dust discharge valve (Fig. 1)	Part No. with dust discharge valve (Fig. 2)	Nominal flow rate [m³/min]	Weight [kg]
DualSpin 25	**39 700 40 999**	**48 025 75 900**	**48 025 75 910**	18 – 25	2.4
DualSpin 37	**39 700 40 999**	**48 037 75 910**	**48 037 75 920**	25 – 50	2.4

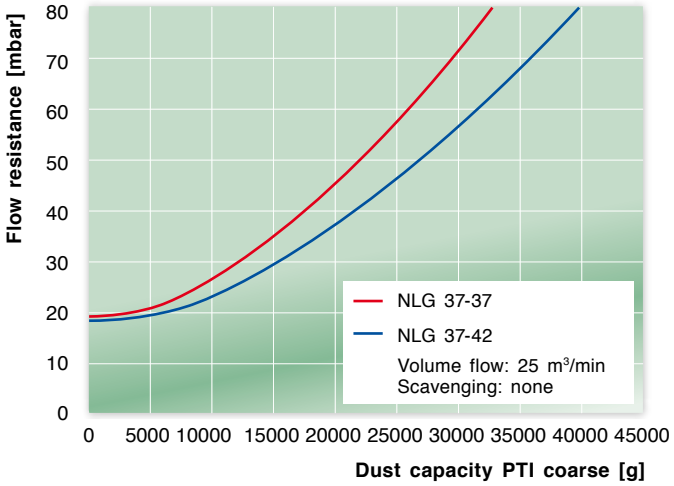
DualSpin Combination air cleaners (2-stage)

Flow characteristics with secondary element

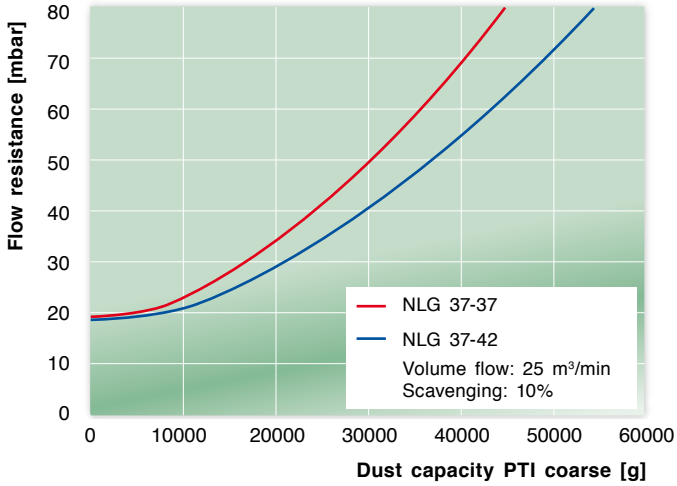
... for flow rates as per ISO 5011



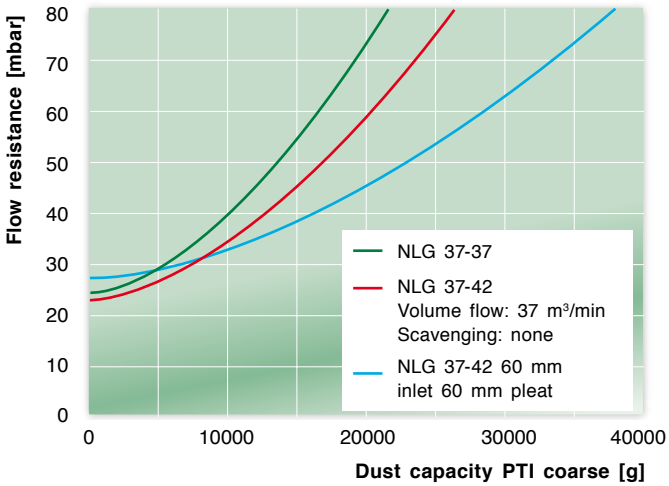
... for dust capacity as per ISO 5011
Precleaner: DualSpin 25 with valve



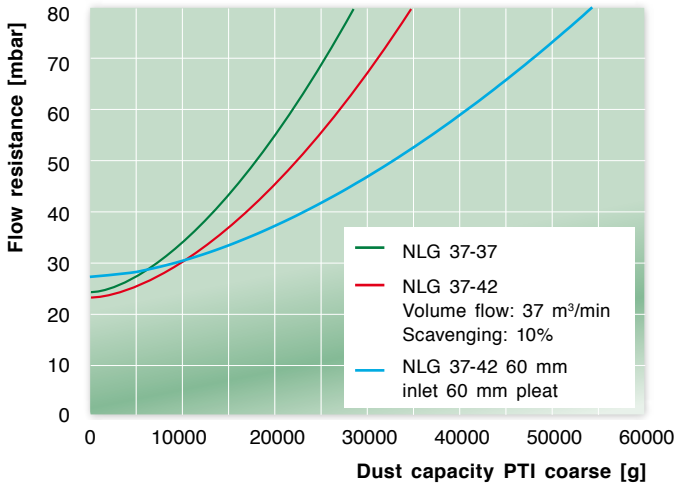
... for dust capacity as per ISO 5011
Precleaner: DualSpin 25 with scavenging



... for dust capacity as per ISO 5011
Precleaner: DualSpin 37 with valve



... for dust capacity as per ISO 5011
Precleaner: DualSpin 37 with scavenging



NLG

Accessories

Filter size	Rain cap [1]	Straight pipe connection		90° elbow	
	design A * (p. 100)	without connection (p. 104)	with connection (p. 104)	without connection (p. 103)	with connection (p. 103)
NLG Group 15	**39 160 67 910**	**39 600 27 999**	**39 600 27 979**	**39 600 25 999**	**39 600 25 979**
NLG Group 21	**39 190 67 910**	**39 700 27 999**	**39 700 27 979**	**39 700 25 999**	**39 700 25 979**
NLG Group 28	**39 220 67 910**	**39 800 27 999**	**39 800 27 979**	**39 800 25 999**	**39 800 25 979**
NLG Group 37	**39 370 67 910**	**39 930 27 999**	**39 930 27 979**	**39 930 25 999**	**39 930 25 979**

You will find the complete range of accessories for our air cleaners on page 99.

* Alternative design B possible (see page 101)

[1] Cr(VI)-free

Dust discharge valves

Part No.	Name	Suitable for
39 000 40 661	Large dust discharge valve	**NLG Piclon**
23 040 30 121	Water discharge valve	**NLG Pico**
39 000 40 671	Large dust discharge valve	**DualSpin**

MANN+HUMMEL Piclon
High performance two-stage air cleaners with robust metal housing

Piclon

Two-stage air cleaners with metal housing

The Piclon line from MANN+HUMMEL, with its proven two-stage air cleaners, has long been established in our range of air cleaners.

The air cleaners are particularly robust, have very good filtration characteristics and are excellently suited for use in very dusty conditions with high mechanical loads, e.g. in construction and agricultural machines. But you will also find these filters at work in quarries, cement plants and mines. They are also used in applications which specify a flame-resistant housing.

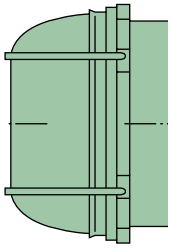
Advantages at a glance:

- especially robust metal design
- long filter service life with low pressure drop
- particularly robust filter elements with centre tubes in metal
- different versions available for the dust discharge
- secondary element available as optional extra

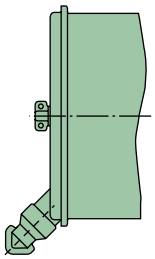
Versions

The Piclon is available in the following versions:

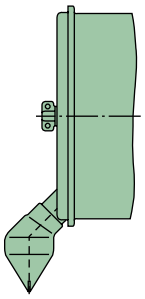
- with dust collector, last digit of the part no. is ...04



- with a small dust discharge valve for strongly pulsating intake air, last digit of the part no. is ...14

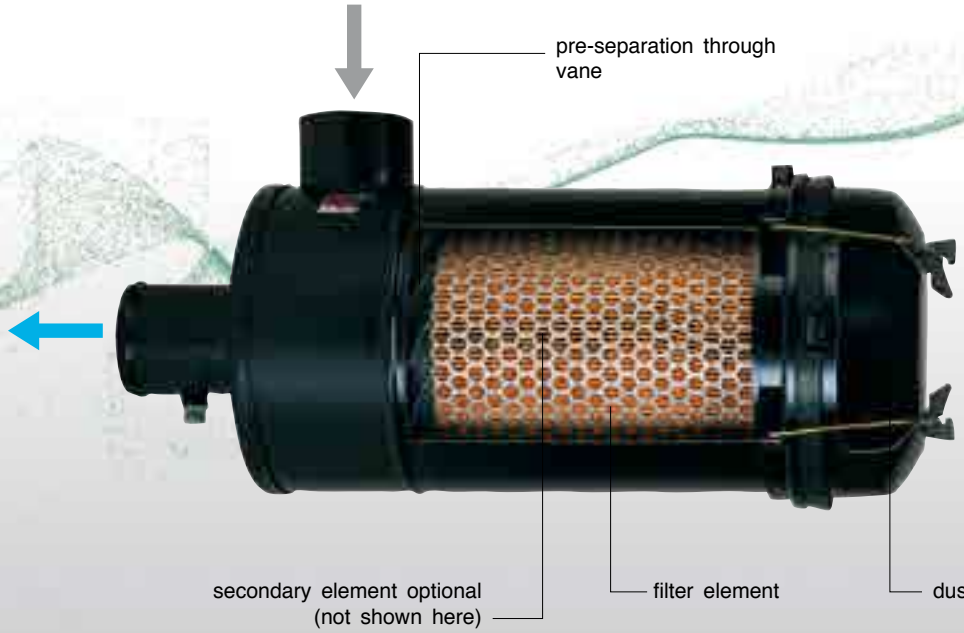


- with large dust discharge valve for non-pulsating or weak-pulsating intake air, last digit of the part no. is ...44



Piclon

Sectional view



Filter elements

Filter element

- high dust capacity through special MANN+HUMMEL filter medium
- reliable pleat stabilisation prevents pleats sticking together under unfavourable conditions
- an axial tie-rod firmly welded into the housing and a fastening nut hold the element securely in the sealed position

Secondary element

- MANN+HUMMEL synthetic fabric for a high safety margin with low pressure drop
- secure fit in housing through tie-rod and fastening nut prevent unintentional removal of the secondary element
- secondary element available as an optional extra

Piclon

Dimensions and part numbers

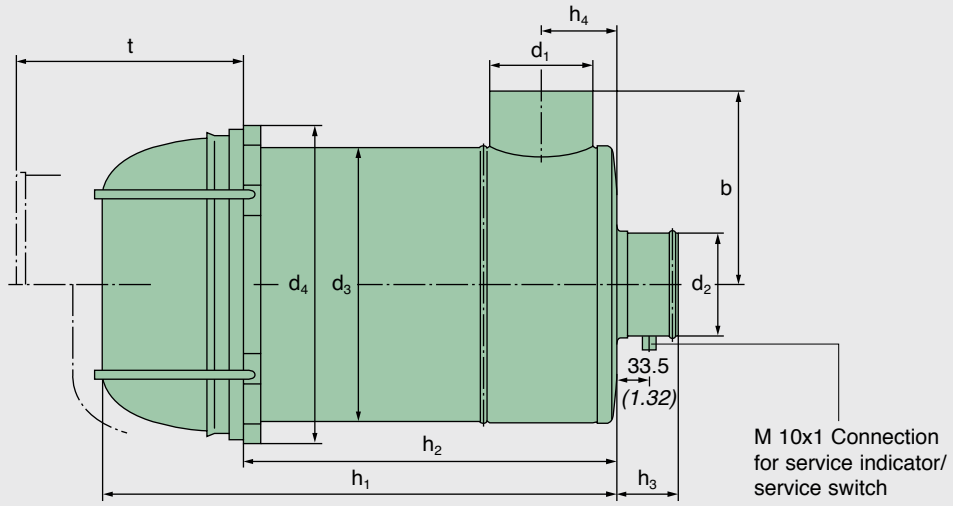


Fig. 1

Piclon with dust collector

Dust collector with toggle clip on request

Part No.		Nominal flow rate [1] [m³/min]	Replacement filter element		Weight [2] [kg]
without secondary element	with secondary element		MANN-FILTER main element	MANN-FILTER secondary element	
45 043 92 304	**–**	2	**C 1043/1**	**–**	1.4
45 043 92 314	**–**				
45 076 92 304	**–**	3	**C 1176/3**	**–**	2.0
45 076 92 314	**–**				
45 114 92 304	**45 114 92 404**	4.5	**C 13 114/4**	**CF 600**	3.1
45 114 92 314	**45 114 92 414**				
45 165 92 304	**45 165 92 404**	6	**C 15 165/3**	**CF 700**	4.5
45 165 92 314	**45 165 92 414**				
45 225 92 304	**45 225 92 404**	8	**C 17 225/3**	**CF 800**	5.4
45 225 92 314	**45 225 92 414**				
45 325 92 304	**45 325 92 404**	12	**C 20 325/2**	**CF 1000**	7.2
45 325 92 344	**45 325 92 444**				
45 440 92 304	**45 440 92 404**	15	**C 23 440/1**	**CF 1200**	9.4
45 440 92 344	**45 440 92 444**				
45 650 92 304	**45 650 92 404**	21	**C 24 650/1**	**CF 1300**	13.2
45 650 92 344	**45 650 92 444**				
45 880 92 304	**45 880 92 404**	28	**C 30 850/2**	**CF 1600**	17.5
45 880 92 344	**45 880 92 444**				
45 920 92 304	**45 920 92 404**	40	**C 33 920/3**	**CF 2100**	26.0
45 920 92 344	**45 920 92 444**				
44 940 92 104	**–**	60	**C 45 3265**	**–**	46.0
45 940 92 144	**–**	90	**C 45 3265**	**–**	57.0

[1] The nominal flow rate relates to a flow resistance [Δp] of approx. 20 mbar (2 kPa) and for air cleaners with a secondary element to approx. 30 mbar (3 kPa)..

[2] Weight valid for the versions with last digit... 304, ... 314, ... 344.

Piclon

Dimensions and part numbers

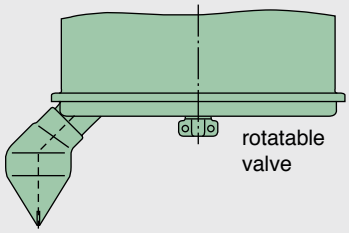
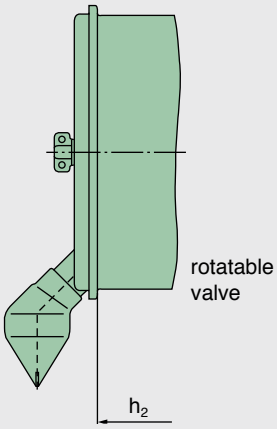


Fig. 2

Piclon with large dust discharge valve



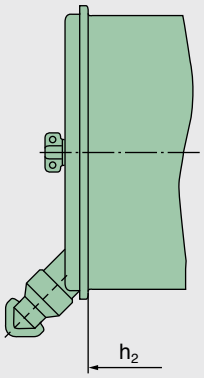


Fig. 3

Piclon with small dust discharge valve

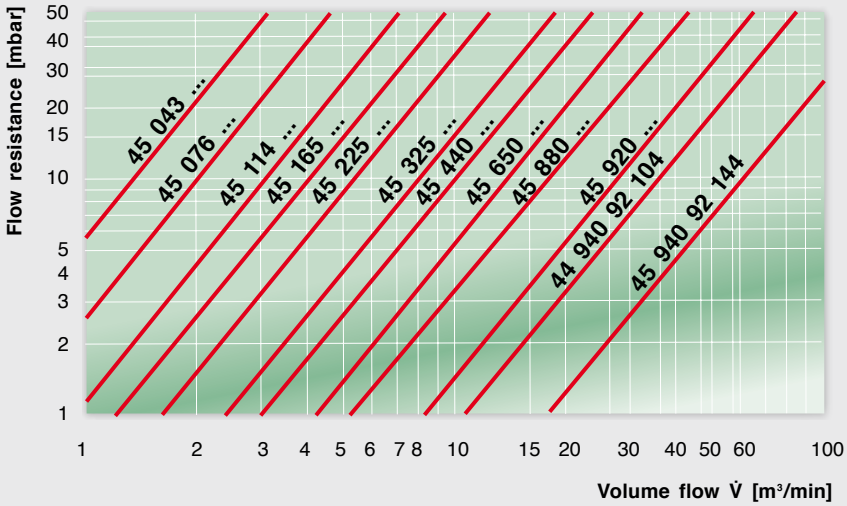
Part No.		Fig.	Dimensions in mm *(Dimensions in inches)*									
without secondary element	with secondary element		b	d_1	d_2	d_3	d_4	h_1	h_2	h_3	h_4	t [1]
45 043 92 304	–	1	90	42	40	120	137	233	172	70	35	190
45 043 92 314 [3]	–	3	*(3.54)*	*(1.65)*	*(1.57)*	*(4.72)*	*(5.39)*	*(9.17)*	*(6.77)*	*(2.76)*	*(1.38)*	*(7.48)*
45 076 92 304	–	1	105	54	50	140	157	300	224	70	45	250
45 076 92 314 [3]	–	3	*(4.13)*	*(2.13)*	*(1.97)*	*(5.51)*	*(6.18)*	*(11.81)*	*(8.82)*	*(2.76)*	*(1.77)*	*(9.84)*
45 114 92 304	**45 114 92 404**	1	120	62	60	165	182	360	291	70	50	305
45 114 92 314 [3]	**45 114 92 414** [3]	3	*(4.72)*	*(2.44)*	*(2.36)*	*(6.50)*	*(7.17)*	*(14.17)*	*(11.46)*	*(2.76)*	*(1.97)*	*(12.01)*
45 165 92 304	**45 165 92 404**	1	140	68	70	195	212	416	335	80	55	350
45 165 92 314 [3]	**45 165 92 414** [3]	3	*(5.51)*	*(2.68)*	*(2.76)*	*(7.68)*	*(8.35)*	*(16.38)*	*(13.19)*	*(3.15)*	*(2.17)*	*(13.78)*
45 225 92 304	**45 225 92 404**	1	155	82	80	215	232	442	350	80	65	365
45 225 92 314 [3]	**45 225 92 414** [3]	3	*(6.10)*	*(3.23)*	*(3.15)*	*(8.47)*	*(9.13)*	*(17.40)*	*(13.78)*	*(3.15)*	*(2.56)*	*(14.37)*
45 325 92 304	**45 325 92 404**	1	180	102	100	255	272	476	375	90	75	390
45 325 92 344 [4]	**45 325 92 444** [4]	2	*(7.09)*	*(4.02)*	*(3.94)*	*(10.04)*	*(10.71)*	*(18.74)*	*(14.76)*	*(3.54)*	*(2.95)*	*(15.35)*
45 440 92 304	**45 440 92 404**	1	205	110	110	290	312	495	380	100	80	405
45 440 92 344 [4]	**45 440 92 444** [4]	2	*(8.07)*	*(4.33)*	*(4.33)*	*(11.42)*	*(12.28)*	*(19.49)*	*(14.96)*	*(3.94)*	*(3.15)*	*(15.94)*
45 650 92 304	**45 650 92 404**	1	230	132	130	320	342	610	496	105	95	515
45 650 92 344 [4]	**45 650 92 444** [4]	2	*(9.06)*	*(5.20)*	*(5.12)*	*(12.60)*	*(13.46)*	*(24.02)*	*(19.53)*	*(4.13)*	*(3.74)*	*(20.28)*
45 880 92 304	**45 880 92 404**	1	280	150	150	385	407	597	474	105	102	495
45 880 92 344 [4]	**45 880 92 444** [4]	2	*(11.02)*	*(5.91)*	*(5.91)*	*(15.16)*	*(16.02)*	*(23.50)*	*(18.66)*	*(4.13)*	*(4.02)*	*(19.49)*
45 920 92 304 [2]	**45 920 92 404** [2]	1	305	210	200	420	442	760	615	105	132	635
45 920 92 344 [4]	**45 920 92 444** [4]	2	*(12.01)*	*(8.27)*	*(7.87)*	*(16.54)*	*(17.40)*	*(29.92)*	*(24.21)*	*(4.13)*	*(5.20)*	*(25.00)*
44 940 92 104	–	1	380	240	250	540	572	760	615	105	150	630
			(14.96)	*(9.45)*	*(9.84)*	*(21.26)*	*(22.52)*	*(29.92)*	*(24.21)*	*(4.13)*	*(5.91)*	*(24.80)*
45 940 92 144	–	1	445	315	300	610	642	792	637	120	185	630
			(17.52)	*(12.40)*	*(11.81)*	*(24.02)*	*(25.28)*	*(31.18)*	*(25.08)*	*(4.72)*	*(7.28)*	*(24.80)*

[1] Removal depth of the filter elements
[2] Dust collector only with toggle clip
[3] Large dust discharge valve available: part no. 39 000 40 661
[4] Small dust discharge valve available: part no. 39 000 40 391

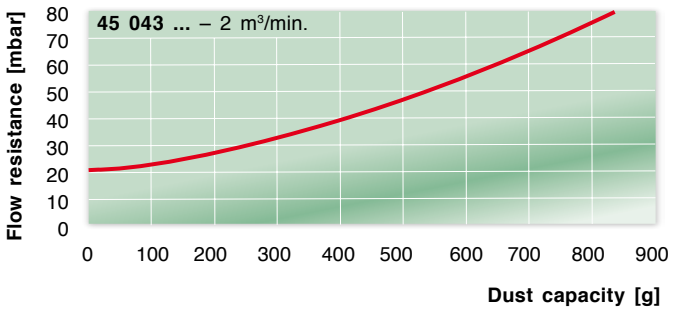
Piclon

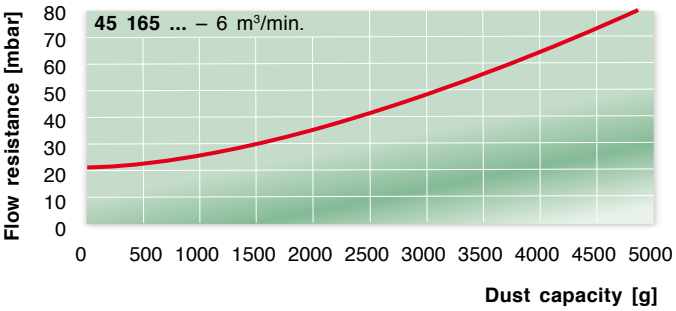
Flow characteristics without secondary element

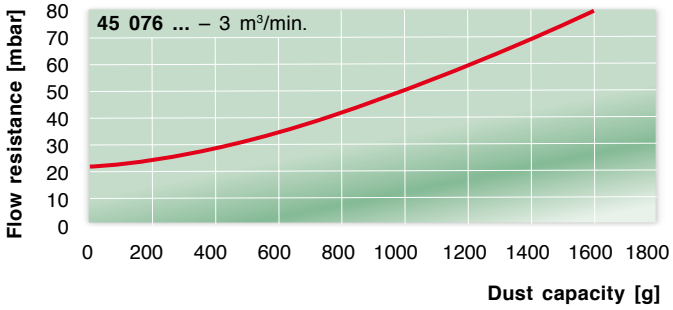
... for flow rates as per ISO 5011

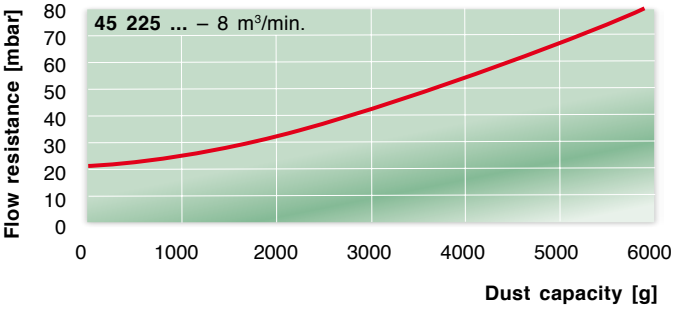


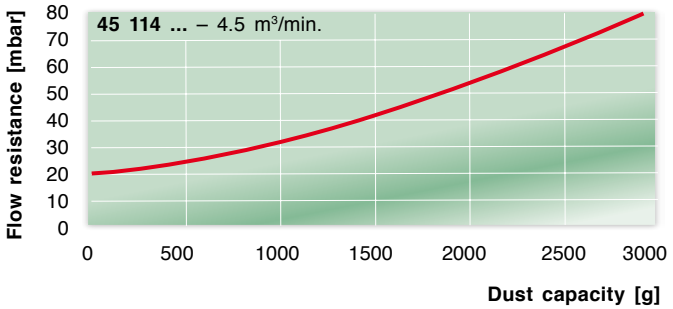
... for dust capacity as per ISO 5011 with SAE coarse test dust

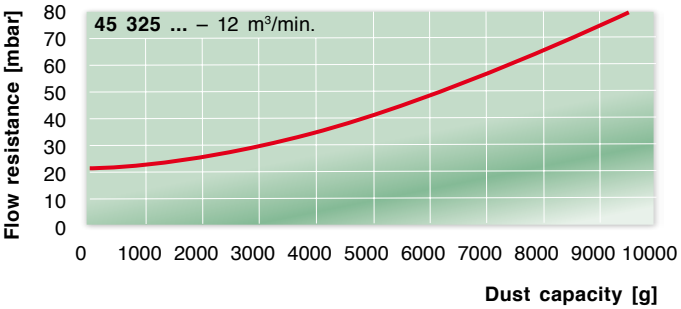








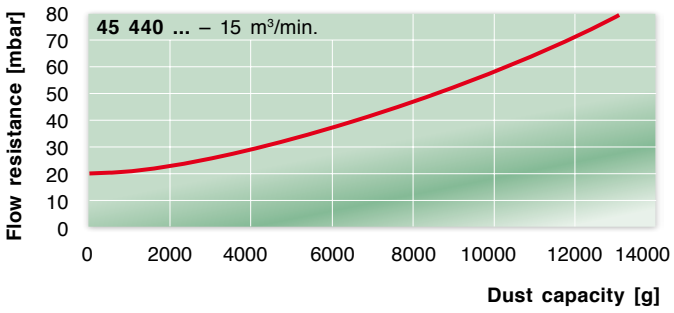


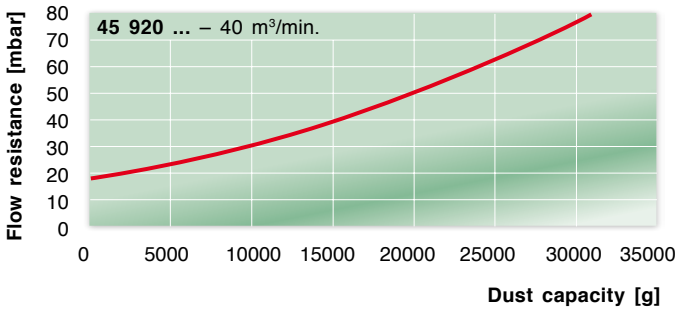


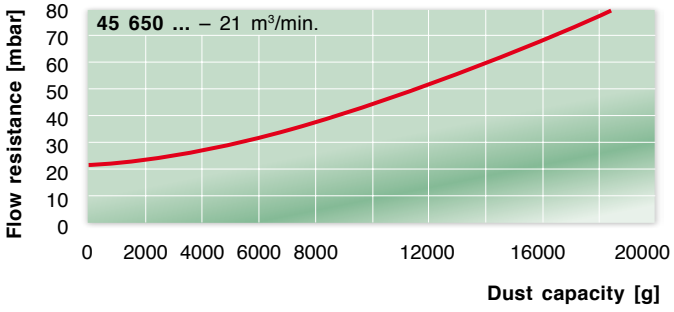
Piclon

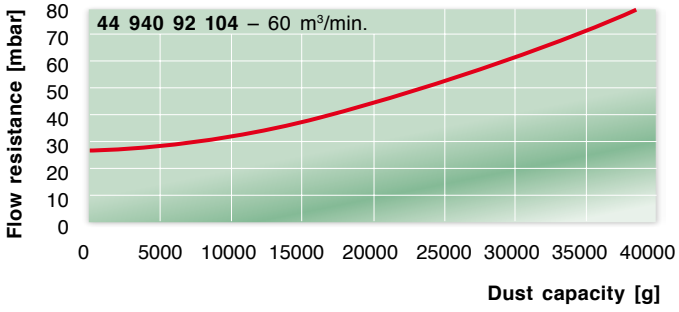
Flow characteristics without secondary element

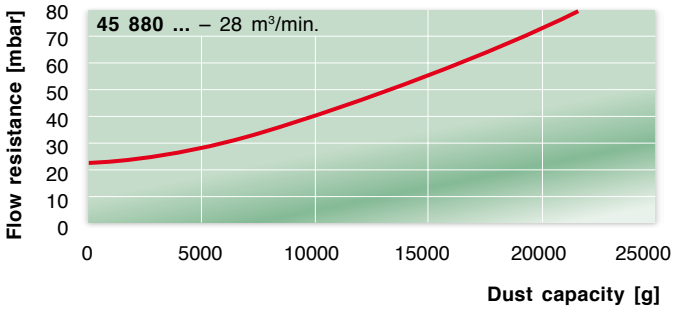
... for dust capacity as per ISO 5011 with SAE coarse test dust

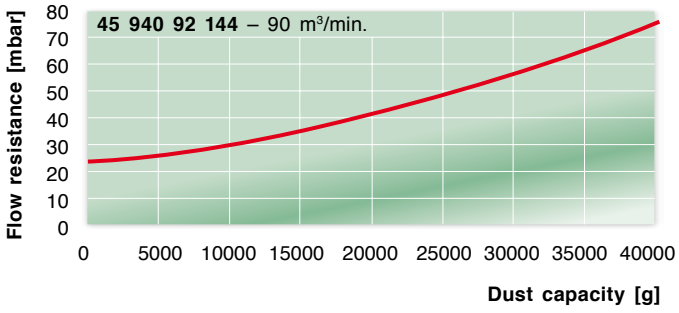








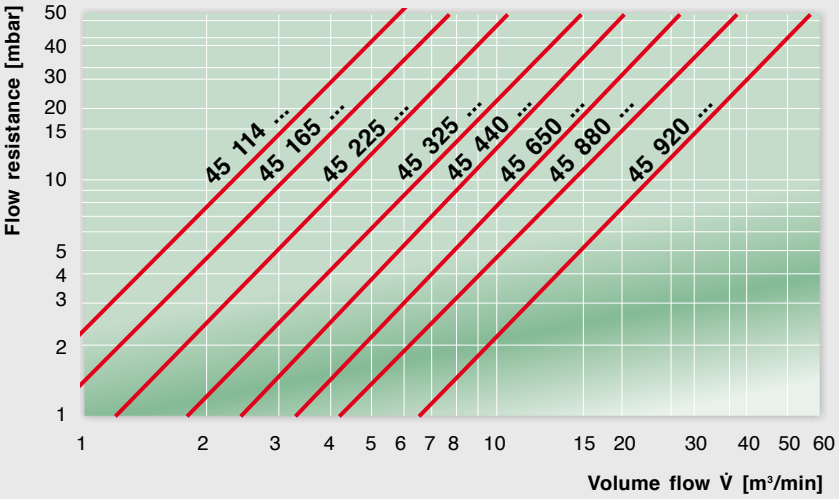




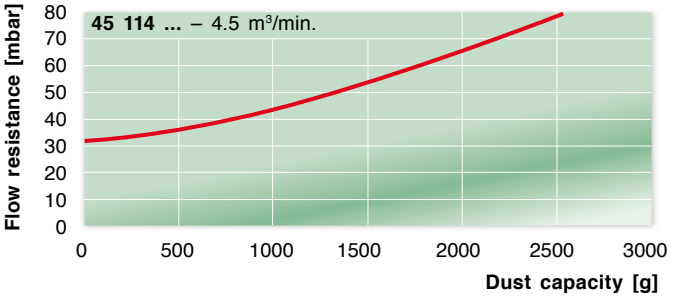
Piclon

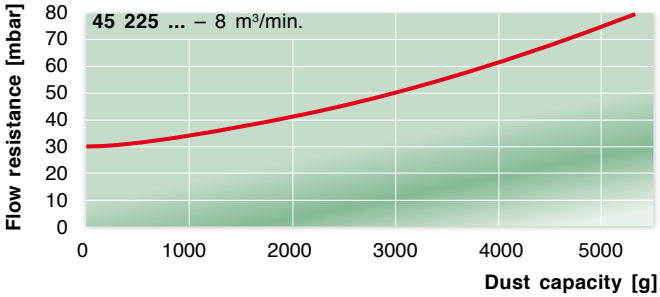
Flow characteristics with secondary element

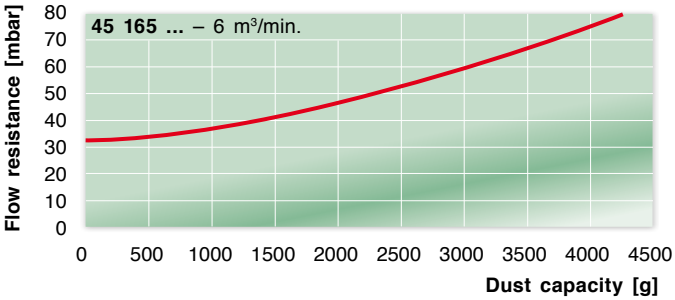
... for flow rates as per ISO 5011

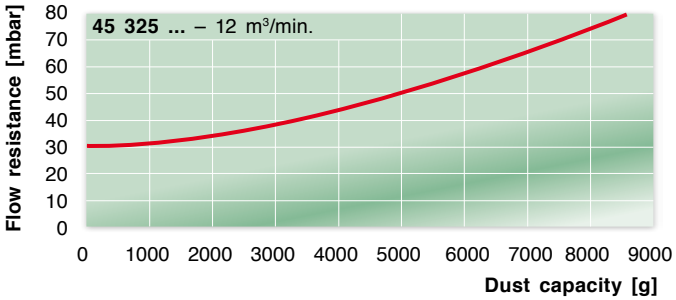


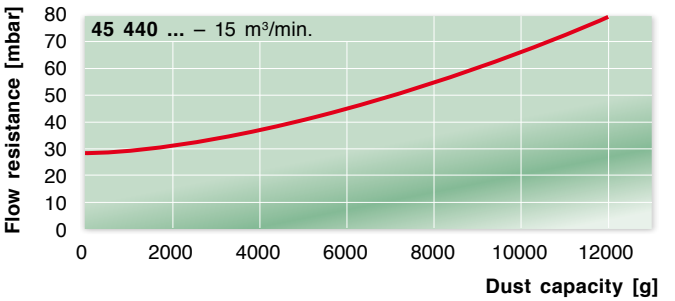
... for dust capacity as per ISO 5011 with SAE coarse test dust

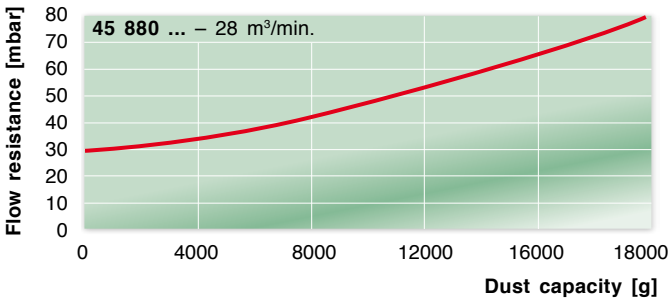


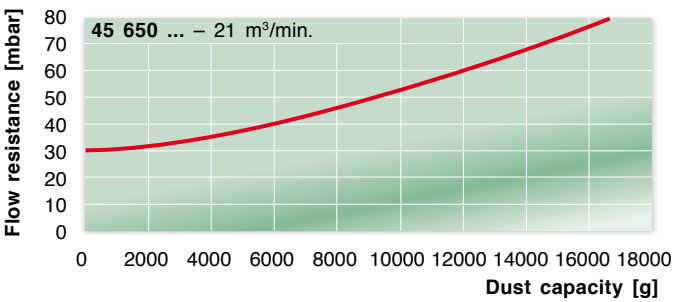


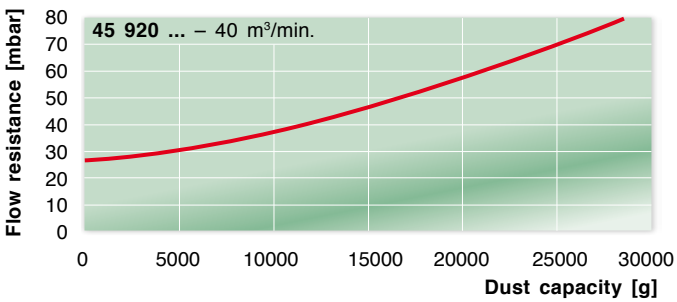












Piclon

Brackets

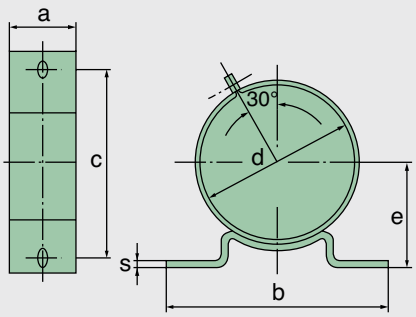


Fig. 1

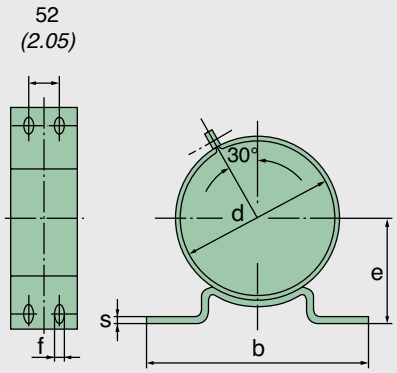


Fig. 2

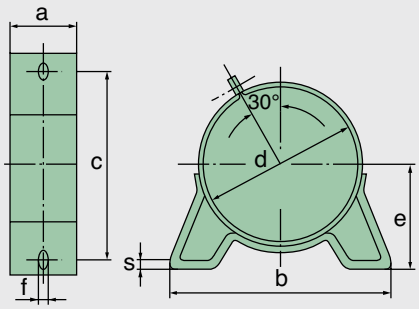


Fig. 3

Part No.	Suitable for Piclon	Fig.	Dimensions in mm *(Dimensions in inches)*							Weight [kg]
			a	b	c	d	e	f	s	
39 014 38 990	**45 043 92...**	1	40 *(1.57)*	170 *(6.69)*	130 *(5.12)*	120 *(4.72)*	70 *(2.76)*	10 *(0.39)*	2.5 (0.10)	0.6
39 076 38 970	**45 076 92...**	1	20 *(0.79)*	190 *(7.48)*	150 *(5.91)*	140 *(5.51)*	80 *(3.15)*	10 *(0.39)*	3 *(0.12)*	0.3
39 114 38 970	**45 114 92...**	1	20 *(0.79)*	220 *(8.66)*	180 *(7.09)*	165 *(6.50)*	100 *(3.94)*	10 *(0.39)*	3 *(0.12)*	0.3
39 165 38 970	**45 165 92...**	1	40 *(1.57)*	240 *(9.45)*	200 *(7.87)*	195 *(7.68)*	125 *(4.92)*	10 *(0.39)*	3 *(0.12)*	0.6
39 225 38 970	**45 225 92...**	1	40 *(1.57)*	240 *(9.45)*	200 *(7.87)*	*215* *(8.46)*	130 *(5.12)*	10 *(0.39)*	3 *(0.12)*	0.6
39 325 38 970	**45 325 92...**	1	40 *(1.57)*	280 *(11.02)*	240 *(9.45)*	255 *(10.04)*	145 *(5.71)*	12 *(0.47)*	3 *(0.12)*	0.8
39 440 38 970	**45 440 92...**	1	40 *(1.57)*	310 *(12.20)*	270 *(10.63)*	290 *(11.42)*	165 *(6.50)*	12 *(0.47)*	3 *(0.12)*	0.9
39 440 38 941	**45 440 92...**	3	40 *(1.57)*	322 *(12.68)*	270 *(10.63)*	290 *(11.42)*	165 *(6.50)*	12 *(0.47)*	3 *(0.12)*	1.0
39 120 38 980	**45 650 92...**	1	40 *(1.57)*	310 *(12.20)*	270 *(10.63)*	320 *(12.60)*	185 *(7.28)*	12 *(0.47)*	3 *(0.12)*	1.0
45 650 38 761	**45 650 92...**	3	40 *(1.57)*	322 *(12.68)*	270 *(10.63)*	320 *(12.60)*	185 *(7.28)*	12 *(0.47)*	3 *(0.12)*	1.1
39 880 38 990	**45 880 92...**	3	40 *(1.57)*	340 *(13.39)*	270 *(10.63)*	385 *(15.16)*	220 *(8.66)*	12 *(0.47)*	3 *(0.12)*	1.0
45 920 38 990	**45 920 92...**	2	80 *(3.15)*	420 *(16.54)*	*380* (14.96)	420 *(16.54)*	235 *(9.25)*	12 *(0.47)*	3 *(0.12)*	2.3
44 940 38 991	**44 940 92...**	3	40 *(1.57)*	480 *(18.90)*	420 *(16.54)*	540 *(21.26)*	284 *(11.18)*	14 *(0.55)*	3 *(0.12)*	2.0
45 940 38 841	**45 940 92...**	3	45 *(1.77)*	580 *(22.83)*	520 *(20.47)*	610 *(24.02)*	325 *(12.80)*	14 *(0.55)*	3 *(0.12)*	3.5

Piclon

Accessories

Filter size	Rain cap design B * (p. 101)	Straight connection pipe connection for service indicator/service switch integrated in housing (p. 104)	90° elbow connection for service indicator/service switch integrated in housing (p. 103)
Piclon 45 043 ...	**39 014 67 900**	**39 000 27 203**	**–**
Piclon 45 076 ...	**39 020 67 900**	**39 100 27 999**	**39 100 25 999**
Piclon 45 114 ...	**39 028 67 900**	**39 200 27 999**	**39 200 25 999**
Piclon 45 165 ...	**39 040 67 900**	**39 300 27 999**	**39 300 25 999**
Piclon 45 225 ...	**39 056 67 900**	**39 400 27 999**	**39 400 25 999**
Piclon 45 325 ...	**39 080 67 900**	**39 500 27 999**	**39 500 25 999**
Piclon 45 440 ...	**39 100 67 020**	**39 600 27 999**	**39 600 25 999**
Piclon 45 650 ...	**39 160 67 020**	**39 700 27 999**	**39 700 25 999**
Piclon 45 880 ...	**45 880 67 100**	**39 800 27 999**	**39 800 25 999**
Piclon 45 920 ...	**39 320 67 100**	**39 000 27 345**	**39 000 25 270**
Piclon 45 940 ...	**39 640 67 100**	**–**	**–**

Dust discharge valves

Part No.	Name	Suitable for
39 000 40 391	Small dust discharge valve	**... 314 + ... 414**
39 000 40 661	Large dust discharge valve	**... 344 + ... 444**

You will find the complete range of accessories for our air cleaners on page 99.

* Alternative design A possible (see page 100)

MANN+HUMMEL Picolino
Compact air cleaner system for high requirements

Picolino

Compact air cleaner for high requirements

The Picolino line from MANN+HUMMEL offers exceptional filtration in a compact installation space with excellent flexibility. The Picolino line is available with a number of different connections to enable it to adapt to different applications.

Advantages at a glance:

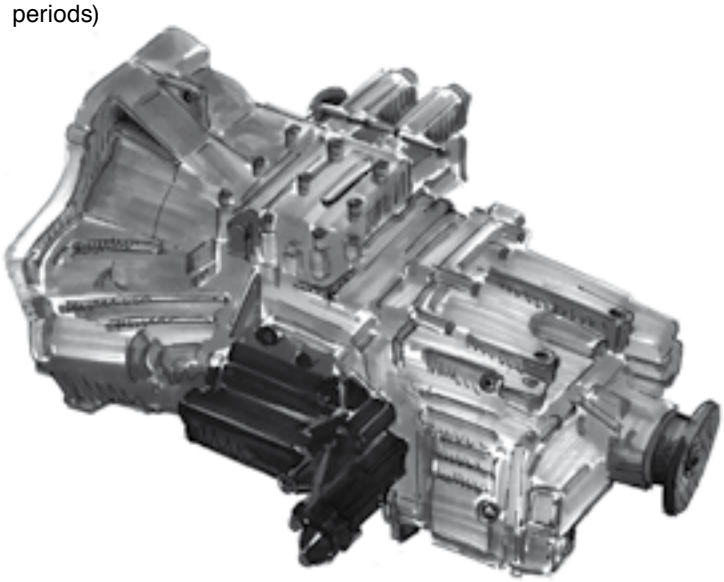
- excellent flexibility through variable modular system
- economical air cleaner system through combination of standard parts
- easy element change without tools
- corrosion-free and robust housing through use of plastic reinforced with fibre-glass
- Cr(VI)-free
- temperature resistant to +120 °C (for short periods)
- material with high temperature stability available for adapters on request
- quick response to customised filtration solutions
- metal-free filter elements are easily disposed of by incineration and therefore are environmentally friendly with inexpensive disposal
- patented filter elements with radial seal

Applications

The right configuration for every application

The air cleaners of the Picolino line are available with a number of connection fittings and are, for example, suitable for:

- silencer air cleaners for low-noise air intake, e.g. in small piston compressors
- intake air cleaners for small engines (lawn mowers, power generators, etc.)
- two-way ventilation air cleaners for gear units and tanks for liquids



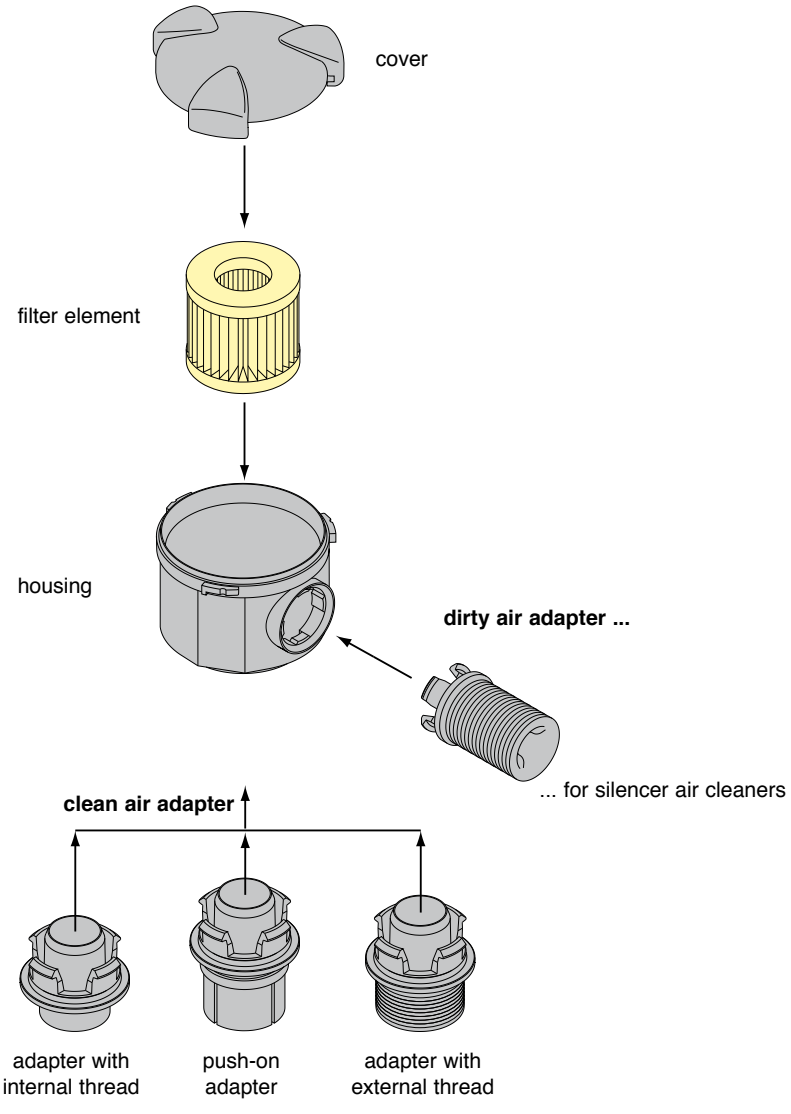
Picolino

Filter elements

- high dust capacity through special MANN+HUMMEL filter medium
- radial seal through elastomer end plates (protected by patents)
- reliable pleat stabilisation prevents pleats sticking together under unfavourable conditions

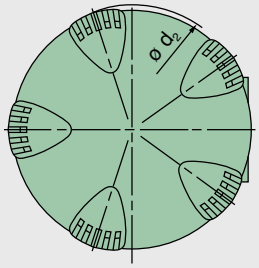
Picolino modular system

The product line consists of five master housings with various adapter pieces which can be used to adapt the cleaner to the individual requirements of customised applications. The housing, adapters and filter elements are free of metal. Depending on the design, the system covers nominal flow rates from 0.15 m^3/min to 3.2 m^3/min.



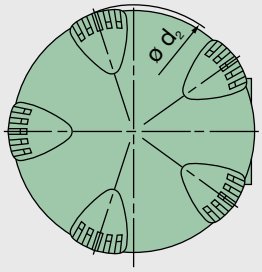
Picolino Intake air cleaners (two-way ventilation air cleaners)

Dimensions and part numbers



Cover

Fig. 1



Cover

Fig. 2

Part No.	Fig	Nominal flow rate [m³/min] [1]	Dimensions in mm *(Dimensions in inches)*							MANN-FILTER main element
			d_1	d_2	e_1	h_1	h_2	l	t	
44 010 72 996	2	0.25	G ½ [3]	58 *(2.28)*	14 *(0.55)*	61 *(2.40)*	34 *(1.34)*	27 *(1.06)*	30 *(1.18)*	**C 410**
44 010 72 997	2	0.2	G ⅜ [3]	58 *(2.28)*	11 *(0.43)*	61 *(2.40)*	34 *(1.34)*	27 *(1.06)*	30 *(1.18)*	**C 410**
44 010 72 999	2	0.2	M 18x1.5 [2]	58 *(2.28)*	10 *(0.39)*	61 *(2.40)*	34 *(1.34)*	27 *(1.06)*	30 *(1.18)*	**C 410**
44 010 77 999	1	0.25	35 *(1.38)*	58 *(2.28)*	23 *(0.91)*	73 *(2.87)*	64 *(2.52)*	27 *(1.06)*	30 *(1.18)*	**C 410**
44 020 72 996	2	0.25	G ½ [3]	68 *(2.68)*	14 *(0.55)*	62 *(2.44)*	34 *(1.34)*	31 *(1.22)*	30 *(1.18)*	**C 420**
44 020 72 997	2	0.25	G ⅜ [3]	68 *(2.68)*	11 *(0.43)*	62 *(2.44)*	34 *(1.34)*	31 *(1.22)*	30 *(1.18)*	**C 420**
44 020 72 999	2	0.2	M 18x1.5 [2]	68 *(2.68)*	11 *(0.43)*	62 *(2.44)*	34 *(1.34)*	31 *(1.22)*	30 *(1.18)*	**C 420**
44 020 77 999	1	0.25	35 *(1.38)*	68 *(2.68)*	23 *(0.91)*	74 *(2.91)*	46 *(1.81)*	31 *(1.22)*	30 *(1.18)*	**C 420**
44 030 72 999	2	0.8	G ¾ [3]	102 *(4.02)*	15 *(0.59)*	94 *(3.70)*	45 *(1.77)*	48 *(1.89)*	68 *(2.68)*	**C 630**
44 030 77 997	1	1.2	40 *(1.57)*	102 *(4.02)*	25 *(0.98)*	116 *(4.57)*	67 *(2.64)*	48 *(1.89)*	68 *(2.68)*	**C 630**
44 030 77 998	1	1.2	30 *(1.18)*	102 *(4.02)*	23 *(0.91)*	116 *(4.57)*	67 *(2.64)*	48 *(1.89)*	68 *(2.68)*	**C 630**

[1] The nominal flow rate relates to flow resistance of 15 mbar. The flow rate depends on the cross-section of the clean air outlet.
[2] External thread
[3] Internal thread

Picolino Intake air cleaners (two-way ventilation air cleaners)

Dimensions and part numbers

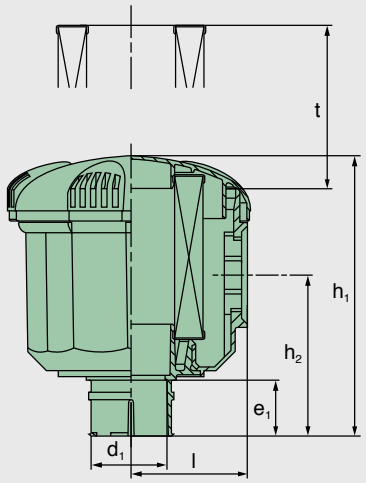


Fig. 1

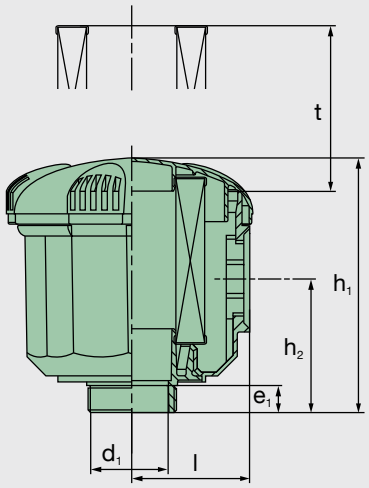


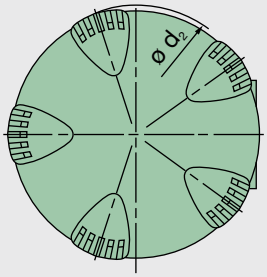
Fig. 2

Part No.	Fig.	Nominal flow rate [m³/min] [1]	Dimensions in mm *(Dimensions in inches)*							MANN-FILTER main element
			d_1	d_2	e_1	h_1	h_2	l	t	
44 030 77 999	1	0.7	20 *(0.79)*	102 *(4.02)*	23 *(0.91)*	116 *(4.57)*	67 *(2.64)*	48 *(1.89)*	68 *(2.68)*	**C 630**
44 040 72 999	2	2.1	G 1¼ [3]	145 *(5.71)*	19 *(0.75)*	131 *(5.16)*	71 *(2.80)*	69 *(2.72)*	79 *(3.11)*	**C 1140**
44 040 77 996	1	3.0	71 *(2.8)*	145 *(5.71)*	25 *(0.98)*	136 *(5.35)*	76 *(2.99)*	69 *(2.72)*	79 *(3.11)*	**C 1140**
44 040 77 997	1	2.8	60 *(2.36)*	145 *(5.71)*	25 *(0.98)*	136 *(5.35)*	76 *(2.99)*	69 *(2.72)*	79 *(3.11)*	**C 1140**
44 040 77 998	1	2.6	52 *(2.05)*	145 *(5.71)*	25 *(0.98)*	136 *(5.35)*	76 *(2.99)*	69 *(2.72)*	79 *(3.11)*	**C 1140**
44 040 77 999	1	2.1	40 *(1.57)*	145 *(5.71)*	25 *(0.98)*	136 *(5.35)*	76 *(2.99)*	69 *(2.72)*	79 *(3.11)*	**C 1140**
44 050 72 999	2	2.3	G 1¼ [3]	181 *(7.13)*	19 *(0.75)*	188 *(7.40)*	112 *(4.41)*	86 *(3.39)*	135 *(5.32)*	**C 1250**
44 050 77 996	1	3.5	71 *(2.8)*	181 *(7.13)*	25 *(0.98)*	193 *(7.60)*	117 *(4.61)*	86 *(3.39)*	135 *(5.32)*	**C 1250**
44 050 77 997	1	3.4	60 *(2.36)*	181 *(7.13)*	25 *(0.98)*	193 *(7.60)*	117 *(4.61)*	86 *(3.39)*	135 *(5.32)*	**C 1250**
44 050 77 998	1	3.1	52 *(2.05)*	181 *(7.13)*	25 *(0.98)*	193 *(7.60)*	117 *(4.61)*	86 *(3.39)*	135 *(5.32)*	**C 1250**
44 050 77 999	1	2.3	40 *(1.57)*	181 *(7.13)*	25 *(0.98)*	193 *(7.60)*	117 *(4.61)*	86 *(3.39)*	135 *(5.32)*	**C 1250**

[1] The nominal flow rate relates to flow resistance of 15 mbar. The flow rate depends on the cross-section of the clean air outlet.
[2] External thread
[3] Internal thread

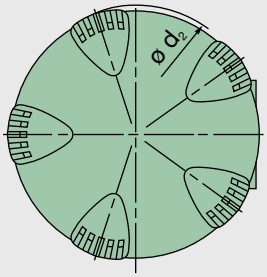
Picolino Silencer air cleaners

Dimensions and part numbers



Cover

Fig. 1



Cover

Fig. 2

Part No.	Fig.	Nominal flow rate [m³/min] [1]	Dimensions in mm *(Dimensions in inches)*								MANN-FILTER main element
			d_1	d_2	e_1	e_2	h_1	h_2	l	t	
44 010 82 996	2	0.15	G ½ [3]	58 *(2.28)*	14 *(0.55)*	29 *(1.14)*	61 *(2.40)*	34 *(1.34)*	56 *(2.20)*	30 *(1.18)*	**C 410**
44 010 82 997	2	0.15	G ⅜ [3]	58 *(2.28)*	11 *(0.43)*	29 *(1.14)*	61 *(2.40)*	34 *(1.34)*	56 *(2.20)*	30 *(1.18)*	**C 410**
44 010 82 999	2	0.15	M 18x1.5 [2]	58 *(2.28)*	10 *(0.39)*	29 *(1.14)*	61 *(2.40)*	34 *(1.34)*	56 *(2.20)*	30 *(1.18)*	**C 410**
44 010 87 999	1	0.15	35 *(1.38)*	58 *(2.28)*	23 *(0.91)*	29 *(1.14)*	73 *(2.87)*	46 *(1.81)*	56 *(2.20)*	30 *(1.18)*	**C 410**
44 020 82 996	2	0.15	G ½ [3]	68 *(2.68)*	14 *(0.55)*	29 *(1.14)*	62 *(2.44)*	34 *(1.34)*	60 *(2.36)*	30 *(1.18)*	**C 420**
44 020 82 997	2	0.15	G ⅜ [3]	68 *(2.68)*	11 *(0.43)*	29 *(1.14)*	62 *(2.44)*	34 *(1.34)*	60 *(2.36)*	30 *(1.18)*	**C 420**
44 020 82 999	2	0.15	M 18x1.5 [2]	68 *(2.68)*	10 *(0.39)*	29 *(1.14)*	62 *(2.44)*	34 *(1.34)*	60 *(2.36)*	30 *(1.18)*	**C 420**
44 020 87 999	1	0.15	35 *(1.38)*	68 *(2.68)*	23 *(0.91)*	29 *(1.14)*	74 *(2.91)*	46 *(1.81)*	60 *(2.36)*	30 *(1.18)*	**C 420**
44 030 82 999	2	0.6	G ¾ [3]	102 *(4.02)*	15 *(0.59)*	47 *(1.85)*	94 *(3.70)*	45 *(1.77)*	95 *(3.74)*	68 *(2.68)*	**C 630**
44 030 87 997	1	0.8	40 *(1.57)*	102 *(4.02)*	25 *(0.98)*	47 *(1.85)*	116 *(4.57)*	67 *(2.64)*	95 *(3.74)*	68 *(2.68)*	**C 630**
44 030 87 998	1	0.8	30 *(1.18)*	102 *(4.02)*	23 *(0.91)*	47 *(1.85)*	116 *(4.57)*	67 *(2.64)*	95 *(3.74)*	68 *(2.68)*	**C 630**

[1] The nominal flow rate relates to flow resistance of 15 mbar. The flow rate depends on the cross-section of the clean air outlet.
[2] External thread
[3] Internal thread

Picolino Silencer air cleaners

Dimensions and part numbers

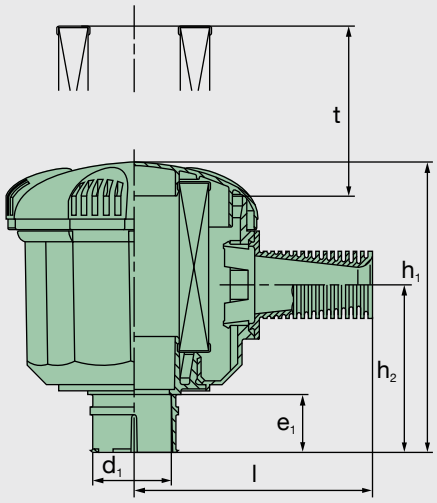


Fig. 1

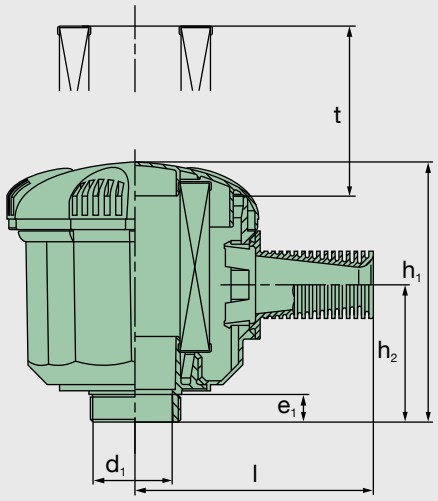
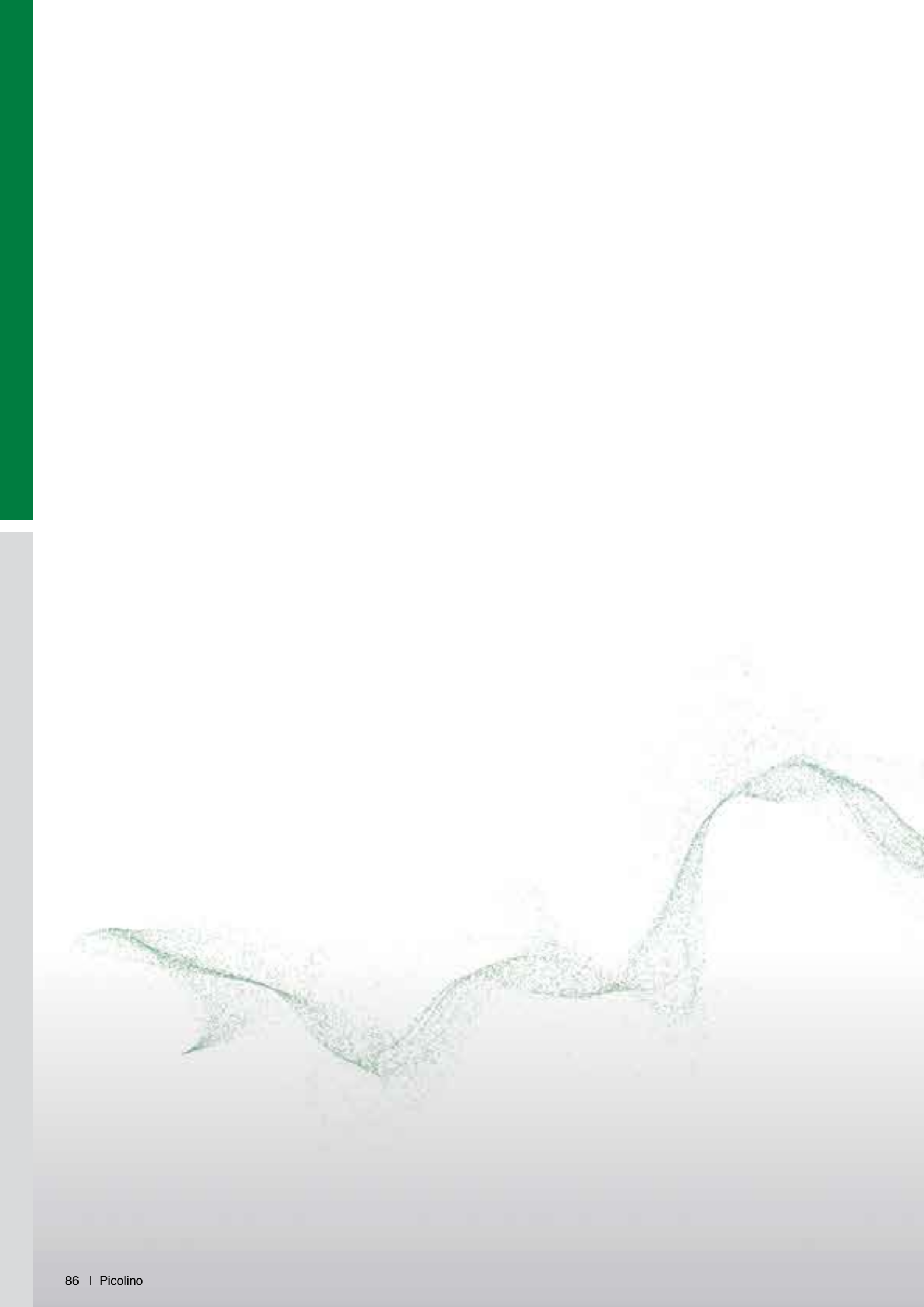


Fig. 2

Part No.	Fig.	Nominal flow rate [m³/min] [1]	Dimensions in mm *(Dimensions in inches)*								MANN-FILTER main element
			d_1	d_2	e_1	e_2	h_1	h_2	l	t	
44 030 87 999	1	0.5	20 *(0.79)*	102 *(4.02)*	23 *(0.91)*	47 *(1.85)*	116 *(4.57)*	67 *(2.64)*	95 *(3.74)*	68 *(2.68)*	**C 630**
44 040 82 999	2	1.7	G 1¼ [3]	145 *(5.71)*	19 *(0.75)*	55 *(2.17)*	131 *(5.16)*	71 *(2.80)*	79 *(3.11)*	79 *(3.11)*	**C 1140**
44 040 87 996	1	2.0	71 *(2.8)*	145 *(5.71)*	25 *(0.98)*	55 *(2.17)*	136 *(5.35)*	76 *(2.99)*	79 *(3.11)*	79 *(3.11)*	**C 1140**
44 040 87 997	1	2.0	60 *(2.36)*	145 *(5.71)*	25 *(0.98)*	53 *(2.09)*	136 *(5.35)*	76 *(2.99)*	116 *(4.57)*	79 *(3.11)*	**C 1140**
44 040 87 998	1	1.9	52 *(2.05)*	145 *(5.71)*	25 *(0.98)*	53 *(2.09)*	136 *(5.35)*	76 *(2.99)*	116 *(4.57)*	79 *(3.11)*	**C 1140**
44 040 87 999	1	1.6	40 *(1.57)*	145 *(5.71)*	25 *(0.98)*	53 *(2.09)*	136 *(5.35)*	76 *(2.99)*	116 *(4.57)*	79 *(3.11)*	**C 1140**
44 050 82 999	2	2.0	G 1¼ [3]	181 *(7.13)*	19 *(0.75)*	55 *(2.17)*	188 *(7.40)*	112 *(4.41)*	133 *(5.24)*	135 *(5.32)*	**C 1250**
44 050 87 996	1	2.8	71 *(2.8)*	181 *(7.13)*	25 *(0.98)*	55 *(2.17)*	193 *(7.60)*	117 *(4.61)*	133 *(5.24)*	135 *(5.32)*	**C 1250**
44 050 87 997	1	2.8	60 *(2.36)*	181 *(7.13)*	25 *(0.98)*	59 *(2.32)*	193 *(7.60)*	117 *(4.61)*	133 *(5.24)*	135 *(5.32)*	**C 1250**
44 050 87 998	1	2.5	52 *(2.05)*	181 *(7.13)*	25 *(0.98)*	59 *(2.32)*	193 *(7.60)*	117 *(4.61)*	133 *(5.24)*	135 *(5.32)*	**C 1250**
44 050 87 999	1	2.0	40 *(1.57)*	181 *(7.13)*	25 *(0.98)*	59 *(2.32)*	193 *(7.60)*	117 *(4.61)*	133 *(5.24)*	135 *(5.32)*	**C 1250**

[1] The nominal flow rate relates to flow resistance of 15 mbar. The flow rate depends on the cross-section of the clean air outlet.
[2] External thread
[3] Internal thread



MANN+HUMMEL Picolight
Single-stage air cleaners without housing

Picolight

Single stage air cleaners without housing

The metal-free air cleaners of the Picolight line from MANN+HUMMEL are characterised by an especialy low-weight and compact design. We particularly recommend these air cleaners for use in stationary applications with low dust loads such as generators, compressors, marine engines, etc.

Advantages at a glance:

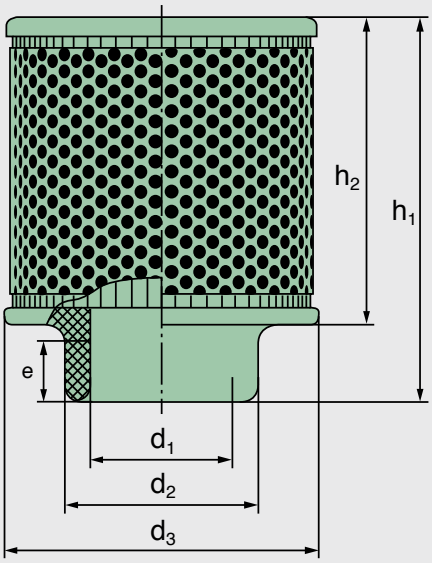
- low pressure drop
- very economical
- compact design
- metal-free design
- excellent filtration performance
- Cr(VI)-free

Technical information

Use of MANN+HUMMEL standard high quality filter media achieves high separation efficiency and filtration performance in the Picolight. The Picolight is recommended for use in installation areas which are enclosed or protected against humidity. The types shown here cover volumetric flows from 1 m^3/min to 100 m^3/min. A tensioning strap is required to mount the air cleaner.

Picolight

Dimensions and part numbers



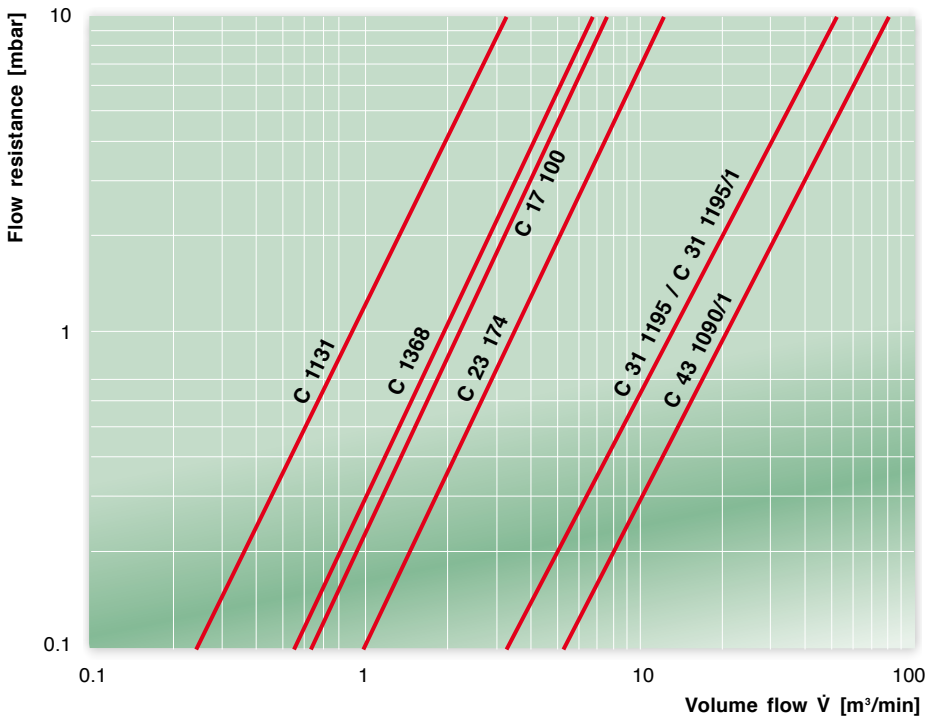
MANN-FILTER	Nominal flow rate[1] [m³/min]	Dimensions in mm *(Dimensions in inches)*						Weight [kg]	Tightening strap
		d_1	d_2	d_3	h_1	h_2	e		
C 1131	3.3	50 (1.97)	65 *(2.56)*	110 *(4.33)*	120 *(4.72)*	95 *(3.74)*	20 *(0.79)*	0.16	**02 018 01 709**
C 1368	6.8	76 *(2.99)*	90 *(3.54)*	130 *(5.12)*	150 *(5.91)*	125 *(4.92)*	20 *(0.79)*	0.24	**02 018 01 712**
C 17 100	7.7	76 *(2.99)*	90 *(3.54)*	160 *(6.30)*	165 *(6.50)*	140 *(5.51)*	25 *(0.98)*	0.38	**02 018 01 712**
C 23 174	12.5	100 *(3.94)*	120 *(4.72)*	230 *(9.06)*	156 *(6.14)*	120 *(4.72)*	30 *(1.18)*	0.68	**02 018 01 715**
C 31 1195	40	198 *(7.8)*	198 *(7.8)*	318 *(12.52)*	444 *(17.48)*	400 *(15.75)*	40 *(1.57)*	3.3	**02 018 01 724**
C 31 1195/1	40	198 *(7.8)*	198 *(7.8)*	318 *(12.52)*	444 *(17.48)*	400 *(15.75)*	40 *(1.57)*	3.2	**02 018 01 724**
C 43 1090/1	80	250 *(9.84)*	260 *(10.24)*	425 *(16.73)*	404 *(15.91)*	335 *(13.19)*	80 *(3.15)*	5.6	**02 018 01 728**

[1] The nominal flow rate relates to flow resistance of 10 mbar.

Picolight

Flow characteristics

... for flow rates as per ISO 5011



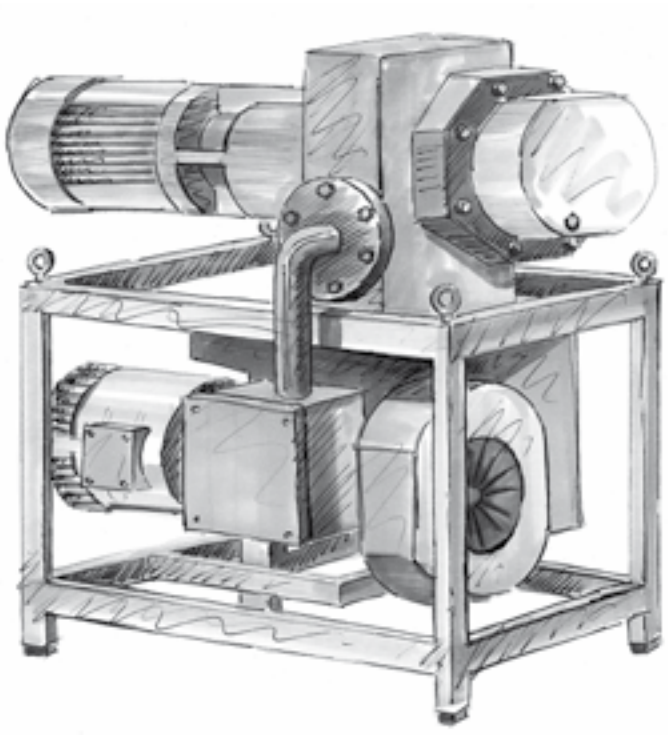
MANN+HUMMEL Vacuum air cleaners

Vacuum air cleaners

The airtight vacuum air cleaners from MANN+HUMMEL are designed for installation in air and gas pipes. They are airtight up to 1000 mbar negative pressure and equipped with a filter element. They are also used as intake filters in vacuum pumps.

Advantages at a glance:

- reliable sealing
- compact design
- robust metal design
- different connections are available
- excellent filtration performance



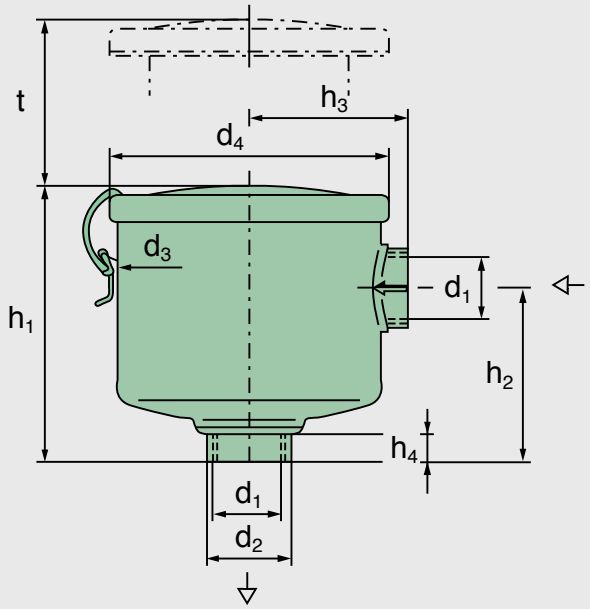
Technical information

The air cleaner size depends on its nominal flow rate. The air cleaner size is to be selected so that the nominal flow rate of the air cleaner is equal or greater than the air requirement.

The air cleaner can be installed vertically or horizontally, however it should not be mounted with the clean air outlet at the bottom, as otherwise dirt can enter the clean air pipe during a service.

Vacuum air cleaners

Dimensions and part numbers

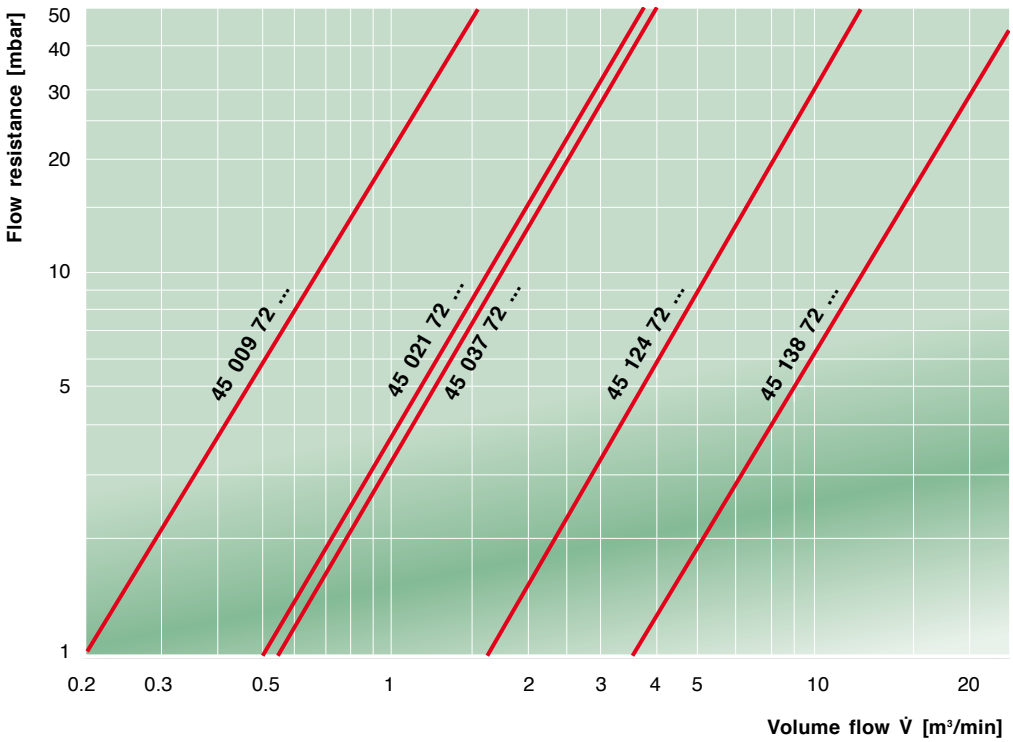


Part No.	Nominal flow rate [m³/min]	Dimensions in mm *(Dimensions in inches)*									MANN-FILTER main element	Weight [kg]
		d_1	d_2	d_3	d_4	h_1	h_2	h_3	h_4	t		
45 009 72 105	0.7	G ¾	35 *(1.38)*	90 *(3.54)*	97 *(3.82)*	89 *(3.50)*	45 *(1.77)*	59 *(2.32)*	6 *(0.24)*	70 *(2.76)*	**C 75**	0.6
45 021 72 105	1.6	G 1 ¼	50 *(1.97)*	125 *(4.92)*	136 *(5.35)*	116 *(4.57)*	68 *(2.68)*	81 *(3.19)*	17 *(0.67)*	75 *(2.95)*	**C 1112**	1.0
45 037 72 105	1.8	G 1 ¼	50 *(1.97)*	162 *(6.38)*	172 *(6.77)*	170 *(6.69)*	108 *(4.25)*	98 *(3.86)*	17 *(0.67)*	130 *(5.12)*	**C 1337**	1.5
45 124 72 104	6.0	G 2 ½	86 *(3.39)*	194 *(7.64)*	200 *(7.87)*	250 *(9.84)*	129 *(5.08)*	123 *(4.84)*	10 *(0.39)*	240 *(9.45)*	**C 15 124/1**	4.3
45 124 72 114	6.0	2 ½ NPT	86 *(3.39)*	194 *(7.64)*	200 *(7.87)*	250 *(9.84)*	129 *(5.08)*	123 *(4.84)*	10 *(0.39)*	240 *(9.45)*	**C 15 124/1**	4.3
45 138 72 105	12.0	G 4	123 *(4.84)*	268 *(10.55)*	272 *(10.71)*	263 *(10.35)*	147 *(5.79)*	197 *(7.76)*	74 *(2.91)*	165 *(6.50)*	**C 21 138/1**	14.5

Vacuum air cleaners

Flow characteristics

... for flow rates as per ISO 5011



MANN+HUMMEL Two-way ventilation air cleaners for crankcases, gear unit housings and hydraulic tanks

MANN+HUMMEL Silencer air cleaners

Air cleaners for two-way ventilation

The two-way ventilation air cleaners from MANN+HUMMEL are single-stage air cleaners which are mainly used for the two-way ventilation of liquids in tanks and gear units.

Dry air cleaners offer a very high filtration performance of over 99.5%, but must be replaced when they are full of dirt.

There are models available with an integrated pressure regulating valve. There is also the option of using the metal-free filters of the Picolino line (see page 79).

Silencer air cleaners

Dimensions and part numbers

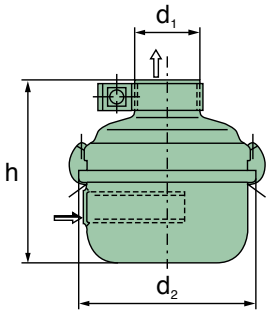


Fig. 1
Clamp connection

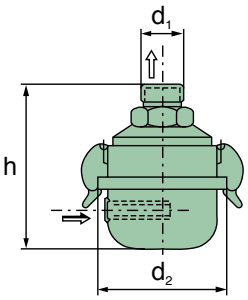
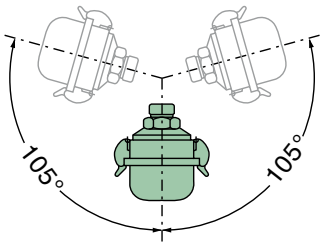


Fig. 2
Threaded connection



Range of possible installation angles

Part No.	Fig.	Nominal flow rate [1] [m³/min]	Dimensions in mm *(Dimensions in inches)*				Weight [kg]
			Silencer pipe	d_1	d_2	h	
41 007 87 113	1	0.8	with	30 *(1.18)*	82 *(3.23)*	85 *(3.35)*	0.2
41 015 87 113	1	2.0	with	40 *(1.57)*	118 *(4.65)*	120 *(4.72)*	0.5
41 021 87 013	1	2.2	with	52 *(2.05)*	138 *(5.43)*	130 *(5.12)*	0.5
41 004 82 123	2	0.33	without	M 22x1.5	66 *(2.60)*	74 *(2.91)*	0.2
41 004 82 183	2	0.33	with	G ½	66 *(2.60)*	84 *(3.31)*	0.2

[1] With 100 mbar flow resistance.

Two-way ventilation air cleaners (dry air cleaners)

Dimensions and part numbers

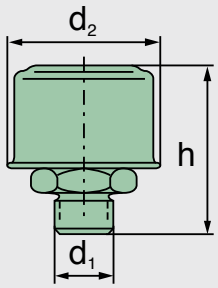


Fig. 1

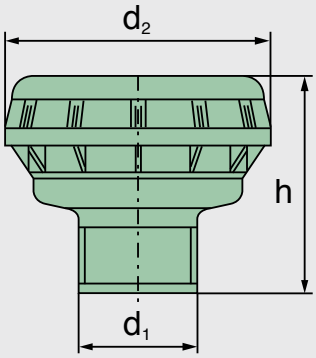


Fig. 2

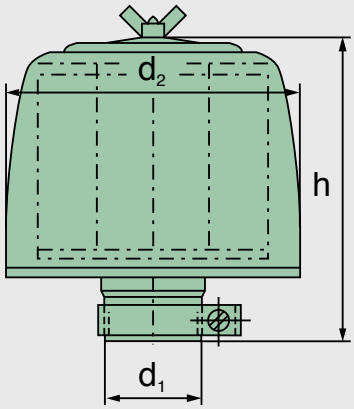


Fig. 3

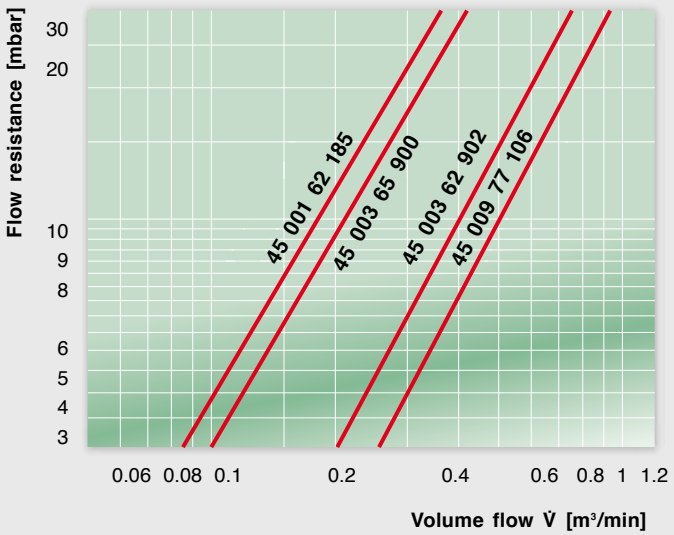
Part No.	Fig.	Nominal flow rate [m³/min]	Opening pressure		Dimensions in mm *(Dimensions in inches)*			MANN-FILTER main element	Weight [kg]
			[bar]	[kPa]	d_1	d_2	h		
45 001 62 185	1	–	–	–	M 18x1.5	45 *(1.77)*	47 *(1.85)*	–[1)]	0.08
45 003 65 900	2	–	–	–	35 *(1.38)*	80 *(3.15)*	65 *(2.56)*	–[1)]	0.06
45 003 62 902	2	–	–	–	G ¾	80 *(3.15)*	73.5 *(2.89)*	–[1)]	0.08
45 003 62 900 [2)]	2	0.2	0.85	85	G ¾	80 *(3.15)*	73.5 *(2.89)*	–[1)]	0.1
45 003 62 901 [2)]	2	0.2	0.35	35	G ¾	80 *(3.15)*	73.5 *(2.89)*	–[1)]	0.1
45 009 77 106	3	0.5	–	–	20 *(0.79)*	98 *(3.86)*	110 *(4.33)*	**C 75/4**	0.3
45 021 77 125	3	2.0	–	–	40 *(1.57)*	132 *(5.20)*	120 *(4.72)*	**C 1112**	0.5
45 032 77 105	3	3.5	–	–	52 *(2.05)*	132 *(5.20)*	152 *(5.98)*	**C 1132**	0.65
45 037 77 015	3	4.5	–	–	60 *(2.36)*	170 *(6.69)*	175 *(6.89)*	**C 1337**	1.1
45 074 77 115	3	8.0	–	–	80 *(3.15)*	208 (8.19)	185 (7.28)	**C 1574**	1.3
45 138 77 126	3	15.0	–	–	100 *(3.94)*	283 *(11.14)*	200 *(7.87)*	**C 21 138/1**	7.0
45 240 77 104	3	23.0	–	–	140 *(5.51)*	318 *(12.52)*	302 *(11.89)*	**C 26 240**	9.0
45 375 77 104	3	32.0	–	–	180 *(7.09)*	396 *(15.59)*	285 *(11.22)*	**C 30 375**	11.0

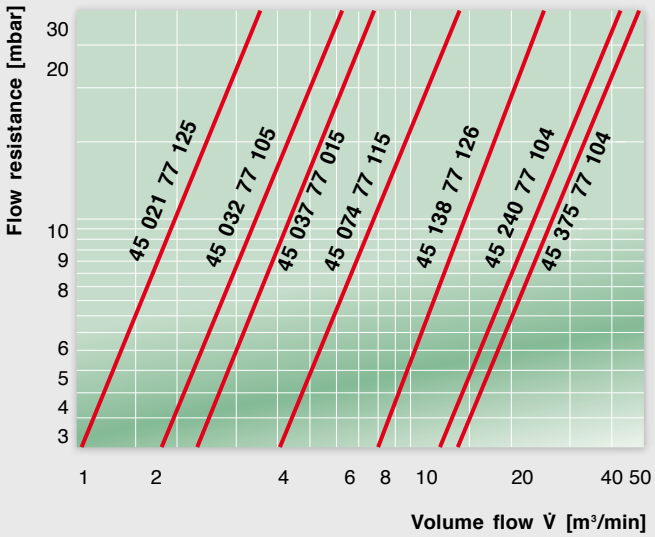
[1)] The entire air cleaner is exchanged during a service.
[2)] With integrated pressure regulating valve.

Air cleaners for two-way ventilation

Flow characteristics

... for flow rates as per ISO 5011

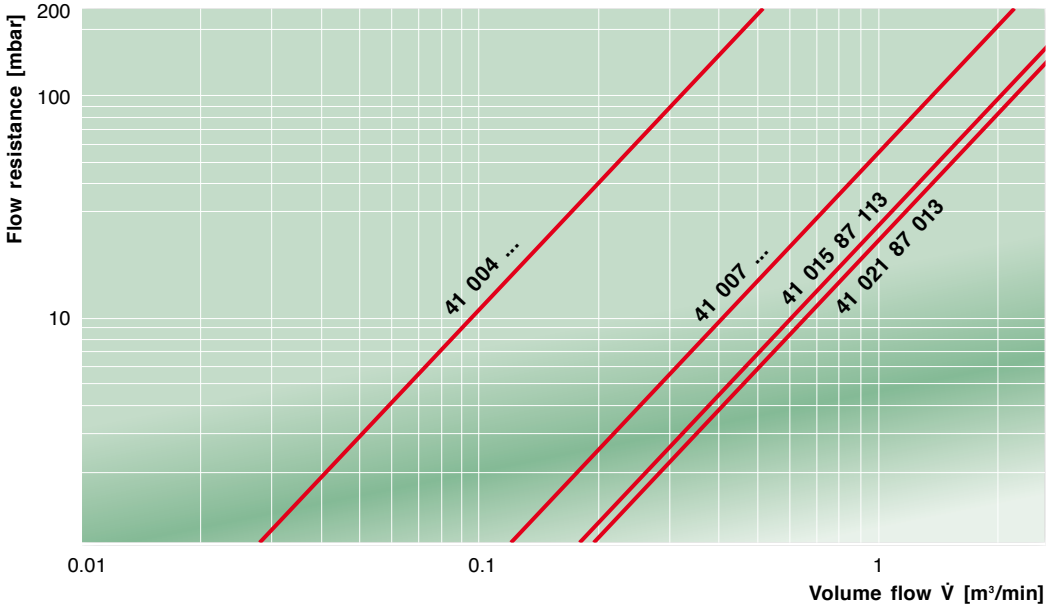




Silencer air cleaners

Flow characteristics

... for flow rates as per ISO 5011



MANN+HUMMEL
Accessories for air cleaners

The reliable operation of intake air cleaners for internal combustion engines and compressors must also be ensured under the most difficult operating conditions. This is only possible if the air cleaner and the accessories are perfectly matched to each other.

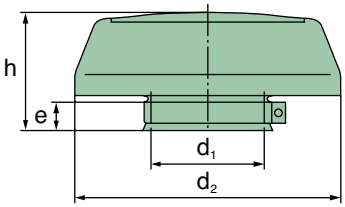
MANN+HUMMEL offers a comprehensive range of accessories for all air cleaners especially designed for the respective type of air cleaner. These are proven products which offer reliability and long life in numerous applications – also under the hardest oper-ating conditions.

Rain caps – Design A

In order to effectively prevent ingress of rain, snow, spray water etc. MANN+HUMMEL recommends equipping the air cleaner with a rain cap. Since this also protects the air cleaner against coarse contaminant particles, the main element is less exposed to damage and this extends the service interval.

Part No.	Suitable for				Dimensions in mm *(Dimensions in inches)*				Weigh [kg]
	Europiclon	NLG	Piclon	ENTARON XD	d_1	d_2	e	h	
39 014 67 910 [1]	**45 050 ...**	**–**	**45 043 ...**	**–**	45 *(1.77)*	150 *(5.91)*	22 *(0.87)*	63 *(2.48)*	0.11
39 020 67 910 [1]	**45 100 ...**	**–**	**45 076 ...**	**–**	54 *(2.13)*	150 *(5.91)*	22 *(0.87)*	63 *(2.48)*	0.11
39 028 67 910 [1]	**45 200 ...**	**–**	**45 114 ...**	**–**	62 *(2.44)*	150 *(5.91)*	22 *(0.87)*	63 *(2.48)*	0.11
39 040 67 910 [1]	**45 300 ...**	**–**	**45 165 ...**	**–**	68 *(2.68)*	200 *(7.87)*	30 *(1.18)*	85 *(3.35)*	0.23
39 056 67 910 [1]	**45 400 ...**	**–**	**45 225 ...**	**–**	82 *(3.23)*	200 *(7.87)*	30 *(1.18)*	85 *(3.35)*	0.23
39 080 67 910 [1]	**45 500 ...**	**–**	**45 325 ...**	**–**	102 *(4.02)*	270 *(10.63)*	40 *(1.57)*	115 *(4.53)*	0.44
39 100 67 910 [1]	**45 600 ...**	**–**	**45 440 ...**	**–**	110 *(4.33)*	270 *(10.63)*	40 *(1.57)*	115 *(4.53)*	0.44
39 160 67 910 [1]	**45 700 ...**	**NLG 15 - ...**	**45 650 ...**	**XD 14/17**	132 *(5.20)*	360 *(14.17)*	50 *(1.97)*	150 *(5.91)*	0.90
39 190 67 910 [1]	**45 800 ...**	**NLG 21 - ...**	**45 880 ...**	**XD 21**	150 *(5.91)*	360 *(14.17)*	50 *(1.97)*	150 *(5.91)*	0.90
39 220 67 910 [1]	**–**	**NLG 28 - ...**	**–**	**XD 28**	180 *(7.09)*	405 *(15.94)*	33 *(1.30)*	128 *(5.04)*	0.95
39 370 67 910 [1]	**–**	**NLG 37 - ...**	**45 920 ...**	**–**	210 *(8.27)*	535 *(21.06)*	42 *(1.56)*	126 *(4.96)*	1.80

[1] Plastic model, Cr(VI)-free



e = insertion depth

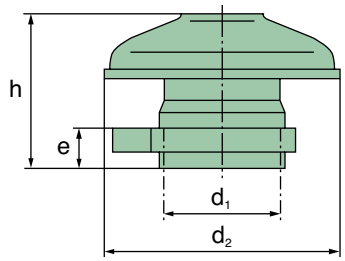
Rain caps – Design B

The rain caps are simply pushed on to the dirty air connection of the air cleaner or onto the air intake of the dirty air pipe and then fastened using the tightening strap supplied. In order to cater for different installation requirements and styling, the rain caps are available in two different versions.

Part No.	Suitable for				Dimensions in mm *(Dimensions in inches)*				Weigh [kg]
	Europiclon	NLG	Piclon	ENTARON XD	d_1	d_2	e	h	
39 014 67 900 [1]	**45 050 ...**	**–**	**45 043 ...**	**–**	45 *(1.77)*	92 *(3.62)*	22 *(0.87)*	53 *(2.09)*	0.07
39 020 67 900 [1]	**45 100 ...**	**–**	**45 076 ...**	**–**	54 *(2.13)*	110 *(4.33)*	22 *(0.87)*	53 *(2.09)*	0.08
39 028 67 900 [1]	**45 200 ...**	**–**	**45 114 ...**	**–**	62 *(2.44)*	124 *(4.88)*	22 *(0.87)*	56 *(2.20)*	0.11
39 040 67 900 [1]	**45 300 ...**	**–**	**45 165 ...**	**–**	68 *(2.68)*	145 *(5.71)*	22 *(0.87)*	63 *(2.48)*	0.12
39 056 67 900 [1]	**45 400 ...**	**–**	**45 225 ...**	**–**	82 *(3.23)*	172 *(6.77)*	22 *(0.87)*	64 *(2.52)*	0.15
39 080 67 900 [1]	**45 500 ...**	**–**	**45 325 ...**	**–**	102 *(4.02)*	203 *(7.99)*	35 *(1.38)*	90 *(3.54)*	0.18
39 100 67 020 [2]	**45 600 ...**	**–**	**45 440 ...**	**–**	110 *(4.33)*	236 *(9.29)*	40 *(1.57)*	125 *(4.92)*	0.82
39 160 67 020 [2]	**45 700 ...**	**NLG 15 - ...**	**45 650 ...**	**XD 14/17**	132 *(5.20)*	292 *(11.50)*	40 *(1.57)*	138 *(5.43)*	1.50
45 880 67 100 [2]	**45 800 ...**	**NLG 21 - ...**	**45 880 ...**	**XD 21**	150 *(5.91)*	342 *(13.46)*	40 *(1.57)*	166 *(6.54)*	2.00
39 220 67 100 [2]	**–**	**NLG 28 - ...**	**–**	**XD 28**	180 *(7.09)*	342 *(13.46)*	45 *(1.77)*	163 *(6.42)*	2.20
39 320 67 100	**–**	**–**	**45 920 ...**	**–**	210 *(8.27)*	455 *(17.91)*	80 *(3.15)*	223 *(8.78)*	2.50
39 640 67 100 [2]	**–**	**–**	**45 940 ...**	**–**	315 *(12.40)*	645 *(25.39)*	86 *(3.39)*	272 *(10.71)*	5.80

[1] Plastic model, Cr(VI)-free

[2] Metal model



e = insertion depth

Precleaners

Dust bowls

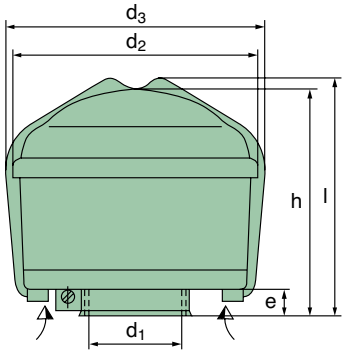
The proven precleaners from MANN+HUMMEL are suitable for extending the service life of single-stage air cleaners such as the NLG Pico.
Due to its transparent insert. it is possible to read the filling level of the precleaner at any time and accordingly select the right time for the service.

The easy and problem-free emptying of the dust bowl is made possible by the closing clamp. Precleaners offer protection against ingress of spray water and rain.

Part No.	Application		Dimensions in mm *(Dimensions in inches)*						Weight [kg]
	Nominal flow rate [m^3/min]	at Δp [1] [mbar]	d_1	d_2	d_3	e [2]	h	l	
48 017 67 900	1.4 – 1.7	7 – 10.5	42.2 *(1.66)*	164 *(6.46)*	175 *(6.89)*	52 *(2.05)*	140 *(5.51)*	150 *(5.91)*	0.4
48 024 67 900	2 – 2.4	8.5 – 12	54.2 *(2.13)*	164 *(6.46)*	175 *(6.89)*	52 *(2.05)*	140 *(5.51)*	150 *(5.91)*	0.4
48 030 67 900	2.8 – 3.4	9 – 13	62.2 *(2.45)*	164 *(6.46)*	175 *(6.89)*	52 *(2.05)*	140 *(5.51)*	150 *(5.91)*	0.4
48 034 67 900	2.8 – 3.4	6 – 9	62.2 *(2.45)*	219 *(8.62)*	236 *(9.29)*	62 *(2.44)*	167 *(6.57)*	180 *(7.09)*	1.0
48 048 67 900	4 – 4.5	10 – 12.5	68.2 *(2.69)*	219 *(8.62)*	236 *(9.29)*	62 *(2.44)*	167 *(6.57)*	180 *(7.09)*	1.0
48 056 67 900	5.6 – 6.8	12 – 17.5	82.2 *(3.24)*	219 *(8.62)*	236 *(9.29)*	62 *(2.44)*	167 *(6.57)*	180 *(7.09)*	1.0
48 068 67 900	5.6 – 6.8	7 – 10.5	82.2 *(3.24)*	303 *(11.93)*	315 *(12.40)*	84 *(3.31)*	208 *(8.19)*	217 *(8.54)*	1.3
48 096 67 900	8 – 9.6	8.5 – 12	102.2 *(4.02)*	303 *(11.93)*	315 *(12.40)*	84 *(3.31)*	208 *(8.19)*	217 *(8.54)*	1.3
48 120 67 900	10 – 12	11 – 16	110.2 *(4.34)*	303 *(11.93)*	315 *(12.40)*	84 *(3.31)*	208 *(8.19)*	217 *(8.54)*	1.3

[1] Δp = Flow resistance. When using as precleaner. add 70% of the stated flow resistance to the resistance of the air cleaner fitted downstream.

[2] e = insertion depth



vertical mounting

Air connecting parts

Elbow pipes

90° elbows
Operating temperature:
-40 °C to +100 °C

Fig. 1

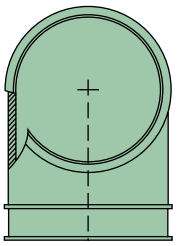
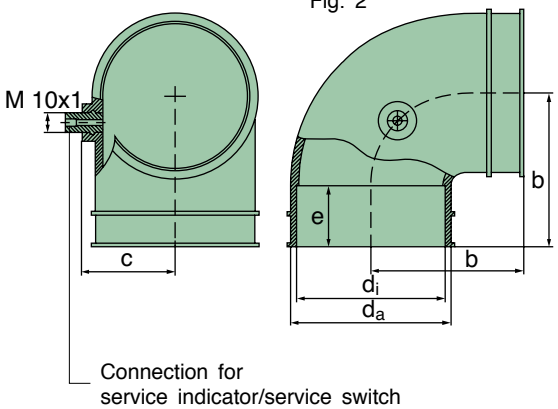


Fig. 2

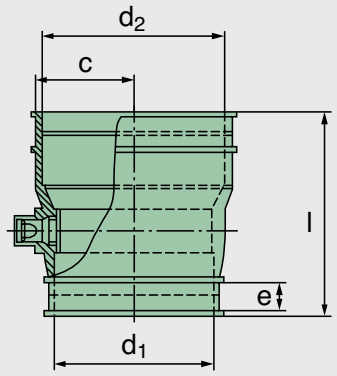


Part No.	Fig.	Dimensions in mm *(Dimensions in inches)*					Connection for
		b	c	d_i	d_a	e	
39 100 25 999	1	57 *(2.24)*	– 33 *(1.30)*	50 *(1.97)*	55 *(2.17)*	25 *(0.98)*	– M 10x1
39 100 25 979	2						
39 200 25 999	1	62 *(2.44)*	– 38 *(1.50)*	60 *(2.36)*	65 *(2.56)*	25 *(0.98)*	– M 10x1
39 200 25 979	2						
39 300 25 999	1	72 *(2.83)*	– 43 *(1.69)*	70 *(2.76)*	75 *(2.95)*	28 *(1.10)*	– M 10x1
39 300 25 979	2						
39 400 25 999	1	77 *(3.03)*	– 48 *(1.89)*	80 *(3.15)*	85 *(3.35)*	30 *(1.18)*	– M 10x1
39 400 25 979	2						
39 215 25 999	1	77 *(3.03)*	–	89 *(3.5)*	94 *(3.7)*	25 *(0.99)*	–
39 500 25 999	1	92 *(3.62)*	– 58 *(2.28)*	100 *(3.94)*	105 *(4.13)*	35 *(1.38)*	– M 10x1
39 500 25 979	2						
39 600 25 999	1	89 *(3.50)*	– 63 *(2.48)*	110 *(4.33)*	119 *(4.69)*	27 *(1.06)*	– M 10x1
39 600 25 979	2						
39 700 25 999	1	98.5 *(3.88)*	– 75 *(2.95)*	130 *(5.12)*	135 *(5.32)*	27 *(1.06)*	– M 10x1
39 700 25 979	2						
39 800 25 999	1	108.5 *(4.27)*	– 83 *(3.27)*	150 *(5.91)*	155 *(6.10)*	27 *(1.06)*	– M 10x1
39 800 25 979	2						
39 930 25 999	1	170 *(6.69)*	– 98.5 *(3.88)*	180 *(7.08)*	196 *(7.71)*	30 *(1.18)*	– M 10x1
39 930 25 979	2						

Air connecting parts

Connections

Reducer connections
Operating temperature:
-40 °C to +100 °C



Part No.	Dimensions in mm *(Dimensions in inches)*				
	c	d_1	d_2	e	l
39 300 27 949	43 *(1.69)*	70 *(2.76)*	80 *(3.15)*	13.5 *(0.53)*	89.5 *(3.52)*
39 300 27 959	43 *(1.69)*	60 *(2.36)*	70 *(2.76)*	13.5 *(0.53)*	85.5 *(3.37)*
39 300 27 969	43 *(1.69)*	50 *(1.97)*	70 *(2.76)*	13.5 *(0.53)*	85.5 *(3.37)*

Straight connections
Operating temperature:
-40 °C to +100 °C

Fig. 1

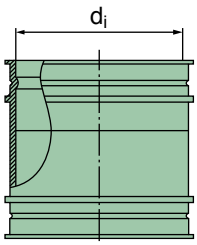
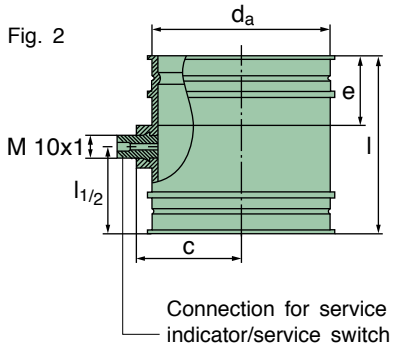


Fig. 2



Part No.	Fig.	Dimensions in mm *(Dimensions in inches)*					Con-nection for
		c	d_i	d_a	e	l	
39 100 27 999	1	–	50 *(1.97)*	55 *(2.17)*	25 *(0.98)*	68 *(2.68)*	–
39 100 27 979	2	33 *(1.30)*					M 10x1
39 200 27 999	1	–	60 *(2.36)*	65 *(2.56)*	25 *(0.98)*	68 *(2.68)*	–
39 200 27 979	2	38 *(1.50)*					M 10x1
39 300 27 999	1	–	70 *(2.76)*	75 *(2.95)*	28 *(1.10)*	75 *(2.95)*	–
39 300 27 979	2	43 *(1.69)*					M 10x1
39 400 27 999	1	–	80 *(3.15)*	85 *(3.35)*	30 *(1.18)*	78 *(3.07)*	–
39 400 27 979	2	48 *(1.89)*					M 10x1
39 215 27 999	1	–	89 *(3.5)*	94 *(3.7)*	25 *(0.98)*	70 *(2.76)*	–
39 500 27 999	1	–	100 *(3.94)*	105 *(4.13)*	35 *(1.38)*	88 *(3.46)*	–
39 500 27 979	2	58 *(2.28)*					M 10x1
39 600 27 999	1	–	110 *(4.33)*	119 *(4.69)*	27 *(1.06)*	72 *(2.83)*	–
39 600 27 979	2	63 *(2.48)*					M 10x1
39 700 27 999	1	–	130 *(5.12)*	135 *(5.32)*	27 *(1.06)*	72 *(2.83)*	–
39 700 27 979	2	75 *(2.95)*					M 10x1
39 800 27 999	1	–	150 *(5.91)*	155 *(6.10)*	27 *(1.06)*	72 *(2.83)*	–
39 800 27 979	2	83 *(3.28)*					M 10x1
39 930 27 999	1	–	180 *(7.09)*	195 *(7.68)*	45 *(1.77)*	140 *(5.51)*	–
39 930 27 979	2	109.5 *(4.31)*					M 10x1

Air connecting parts

Accordion hoses

Accordion hoses with moulded-on end sleeves (standard model)
Material: TPO

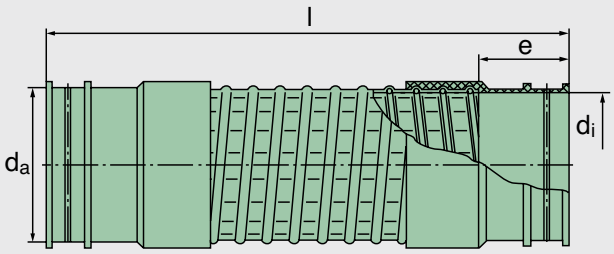


Fig. 1

Accordion hoses (reinforced model)
Material: rubber with fabric insert

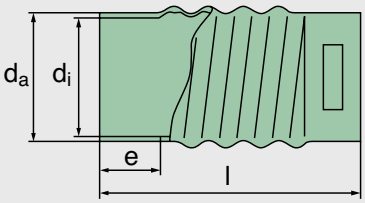


Fig. 2

Fig. 1

Part No.	Dimensions in mm *(Dimensions in inches)*				
	d_i	d_a	e	l_{min}	l_{max}
39 000 27 164	40 *(1.57)*	51 *(2.01)*	30+5 *(1.18+0.20)*	180 *(7.09)*	250 *(9.84)*
39 000 27 161	50 *(1.97)*	62 *(2.44)*	30+5 *(1.18+0.20)*	190 *(7.48)*	285 *(11.22)*
39 000 27 140	60 *(2.36)*	70 *(2.76)*	30+5 *(1.18+0.20)*	190 *(7.48)*	285 *(11.22)*
39 000 27 139	70 *(2.76)*	80 *(3.15)*	30+5 *(1.18+0.20)*	195 *(7.68)*	310 *(12.20)*
39 000 27 138	80 *(3.15)*	90 *(3.54)*	30+5 *(1.18+0.20)*	205 *(8.07)*	340 *(13.39)*
39 000 27 158	100 *(3.94)*	106 *(4.17)*	40+5 *(1.57+0.20)*	230 *(9.06)*	395 *(15.55)*
39 000 27 152	110 *(4.33)*	118 *(4.65)*	35+5 *(1.38+0.20)*	240 *(9.45)*	425 *(16.73)*
39 000 27 151	130 *(5.12)*	138 *(5.43)*	45+5 *(1.77+0.20)*	280 *(11.02)*	500 *(19.69)*
39 000 27 150	150 *(5.91)*	156 *(6.14)*	45+5 *(1.77+0.20)*	300 *(11.81)*	545 *(21.46)*

Operating temperature:
-30 °C to +100 °C
Maximum curvature:
90° (depending on the vibration load)

Fig. 2

Part No.	Dimensions in mm *(Dimensions in inches)*			
	d_i	d_a	e	l
39 000 27 205	50 *(1.97)*	58 *(2.28)*	25 *(0.98)*	110±5 *(4.33±0.20)*
39 000 27 206	60 *(2.36)*	68 *(2.68)*	50 *(1.97)*	215±5 *(8.46±0.20)*
39 000 27 207	70 *(2.76)*	78 *(3.07)*	50 *(1.97)*	215±5 *(8.46±0.20)*
39 000 27 208	80 *(3.15)*	88 *(3.46)*	50 *(1.97)*	215±5 *(8.46±0.20)*
39 000 27 213	100 *(3.94)*	108 *(4.25)*	50 *(1.97)*	215±5 *(8.46±0.20)*
39 000 27 214	110 *(4.33)*	118 *(4.65)*	50 *(1.97)*	215±5 *(8.46±0.20)*
39 000 27 215	130 *(5.12)*	138 *(5.43)*	50 *(1.97)*	215±5 *(8.46±0.20)*
39 000 27 184	150 *(5.91)*	158 *(6.22)*	50 *(1.97)*	215±5 *(8.46±0.20)*
39 000 27 346	200 *(7.87)*	208 *(8.19)*	50 *(1.97)*	215±5 *(8.46±0.20)*

Operating temperature:
-30 °C to +100 °C
Maximum curvature:
45° (depending on the vibration load)

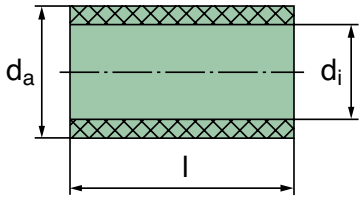
Air connecting parts

Straight couplings in rubber

Straight couplings
Material:
rubber (NBR. 60±5 Shore)
with fabric insert
Operating temperature:
-30 °C to +100 °C

Part No.	Dimensions in mm *(Dimensions in inches)*		
	d_i	d_a	l
39 000 27 203	40 *(1.57)*	52 *(2.05)*	100 *(3.94)*
39 000 27 202	50 *(1.97)*	63 *(2.48)*	100 *(3.94)*
39 000 27 198	60 *(2.36)*	74 *(2.91)*	150 *(5.91)*
39 000 27 197	70 *(2.76)*	84 *(3.31)*	150 *(5.91)*
39 000 27 252	70 *(2.76)*	84 *(3.31)*	80 *(3.15)*
39 000 27 196	80 *(3.15)*	96 *(3.78)*	150 *(5.91)*
39 000 27 950	80 *(3.15)*	96 *(3.78)*	75 *(2.95)*
39 000 27 195	90 *(3.54)*	106 *(4.17)*	150 *(5.91)*
39 000 27 104	100 *(3.94)*	116 *(4.57)*	100 *(3.94)*
39 000 27 194	100 *(3.94)*	118 *(4.65)*	150 *(5.91)*

Part No.	Dimensions in mm *(Dimensions in inches)*		
	d_i	d_a	l
39 000 27 193	110 *(4.33)*	126 *(4.96)*	150 *(5.91)*
39 000 27 359	110 *(4.33)*	128 *(5.04)*	75 *(2.95)*
39 000 27 188	130 *(5.12)*	148 *(5.83)*	100 *(3.94)*
39 000 27 192	130 *(5.12)*	148 *(5.83)*	150 *(5.91)*
39 000 27 297	130 *(5.12)*	148 *(5.83)*	65 *(2.56)*
39 000 27 183	150 *(5.91)*	166 *(6.54)*	150 *(5.91)*
39 223 27 111	150 *(5.91)*	168 *(6.61)*	100 *(3.94)*
39 000 27 182	180 *(7.09)*	198 *(7.80)*	150 *(5.91)*
39 000 27 345	200 *(7.87)*	218 *(8.58)*	200 *(7.87)*
39 000 27 306	210 *(8.27)*	228 *(8.98)*	200 *(7.87)*



Air connecting parts

Elbow pipes in rubber / Couplings in metal

90° elbows
Material:
rubber (NBR. 60±5 Shore)
with fabric insert

Operating temperature:
-25 °C to +100 °C

Couplings
(black painted metal)

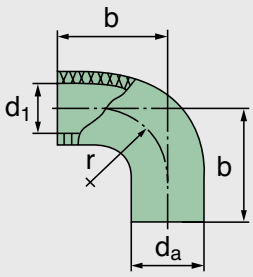


Fig. 1

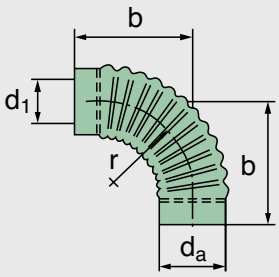


Fig. 2

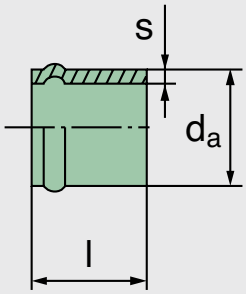


Fig. 3

Part No.	Fig.	Dimensions in mm *(Dimensions in inches)*			
		b	d_1	d_a	r
39 000 25 280	1	115 *(4.53)*	52 *(2.05)*	60 *(2.36)*	75 *(2.95)*
39 000 25 264	1	115 *(4.53)*	60 *(2.36)*	68 *(2.68)*	75 *(2.95)*
39 000 25 263	1	140 *(5.51)*	70 *(2.76)*	79 *(3.11)*	90 *(3.54)*
39 000 25 262	1	140 *(5.51)*	80 *(3.15)*	90 *(3.54)*	95 *(3.74)*
39 000 25 258	2	205 *(8.07)*	100 *(3.94)*	110 *(4.33)*	155 *(6.10)*
39 000 25 265	2	215 *(8.46)*	110 *(4.33)*	120 *(4.72)*	165 *(6.50)*
39 000 25 266	2	265 *(10.43)*	130 *(5.12)*	140 *(5.51)*	210 *(8.27)*
39 000 25 267	2	300 *(11.81)*	150 *(5.91)*	160 *(6.30)*	245 *(9.65)*
39 000 25 270	2	355 *(13.98)*	200 *(7.87)*	210 *(8.27)*	300 *(11.81)*

Part No.	Fig.	Dimensions in mm *(Dimensions in inches)*		
		d_a	l	s
39 000 25 177	3	52 *(2.05)*	50 *(1.97)*	0.75 *(0.03)*
39 000 25 167	3	62 *(2.44)*	65 *(2.56)*	1.0 *(0.04)*
39 000 25 164	3	70 *(2.76)*	50 *(1.97)*	1.0 *(0.04)*
39 000 25 168	3	82 *(3.23)*	50 *(1.97)*	1.0 *(0.04)*
39 000 25 165	3	92 *(3.62)*	50 *(1.97)*	1.0 *(0.04)*
39 000 25 175	3	102 *(4.02)*	50 *(1.97)*	1.0 *(0.04)*
39 000 25 176	3	110 *(4.33)*	50 *(1.97)*	1.0 *(0.04)*
39 000 25 174	3	132 *(5.20)*	50 *(1.97)*	1.0 *(0.04)*
39 000 25 184	3	150 *(5.91)*	90 *(3.54)*	1.0 *(0.04)*
39 000 25 185	3	180 *(7.09)*	90 *(3.54)*	1.0 *(0.04)*

Air connecting parts

Connection pipes and couplings in metal

Intermediate pipe
(black painted metal)
only for dirty air intake

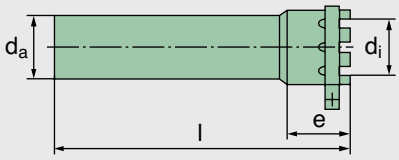


Fig. 4

Pipes
(black painted metal)

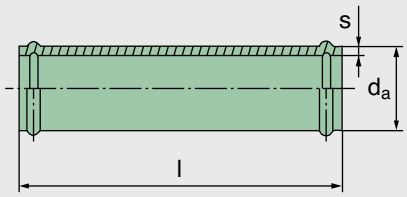


Fig. 5

Part No.	Fig.	Dimensions in mm *(Dimensions in inches)*			
		d_i	d_a	e	l
31 056 25 821	4	82.2 *(3.24)*	82 *(3.23)*	80 *(3.15)*	245 *(9.65)*
31 080 25 731	4	102.2 *(4.02)*	102 *(4.02)*	80 *(3.15)*	250 *(9.84)*
39 100 25 991	4	110.2 *(4.34)*	110 *(4.33)*	110 *(4.33)*	200 *(7.87)*
31 160 25 771	4	132.2 *(5.20)*	132 *(5.20)*	110 *(4.33)*	400 *(15.75)*

Part No.	Fig.	Dimensions in mm *(Dimensions in inches)*		
		d_a	l	s
39 000 25 172	5	42 *(1.65)*	500 *(19.69)*	0.75 *(0.03)*
39 000 25 173	5	82 *(3.23)*	500 *(19.69)*	0.75 *(0.03)*
39 000 25 158	5	92 *(3.62)*	500 *(19.69)*	0.75 *(0.03)*
39 000 25 183	5	102 *(4.02)*	500 *(19.69)*	0.75 *(0.03)*
39 000 25 166	5	110 *(4.33)*	500 *(19.69)*	0.75 *(0.03)*
39 000 25 157	5	132 *(5.20)*	500 *(19.69)*	0.75 *(0.03)*
39 000 25 155	5	150 *(5.91)*	500 *(19.69)*	0.75 *(0.03)*

Air connecting parts

Elbow pipes in metal

Part No.	Fig.	Dimensions in mm *(Dimensions in inches)*				
		a	b	d_a	r	s
39 000 25 188	1	60 *(2.36)*	60 *(2.36)*	52 *(2.05)*	40 *(1.57)*	0.75 *(0.03)*
31 034 25 442	1	95 *(3.74)*	95 *(3.74)*	62 *(2.44)*	60 *(2.36)*	0.75 *(0.03)*
39 000 25 152	1	70 *(2.76)*	70 *(2.76)*	70 *(2.76)*	60 *(2.36)*	1.0 *(0.04)*
39 000 25 207	2	100 *(3.94)*	100 *(3.94)*	70 *(2.76)*	60 *(2.36)*	1.0 *(0.04)*
39 000 25 956	2	110 *(4.33)*	110 *(4.33)*	80 *(3.15)*	55 *(2.17)*	1.0 *(0.04)*
39 000 25 148	1	61 *(2.40)*	61 *(2.40)*	82 *(3.23)*	55 *(2.17)*	1.0 *(0.04)*
39 000 25 153	1	80 *(3.15)*	67 *(2.64)*	90 *(3.54)*	60 *(2.36)*	1.0 *(0.04)*
39 000 25 273	1	80 *(3.15)*	80 *(3.15)*	100 *(3.94)*	65 *(2.56)*	1.0 *(0.04)*

Part No.	Fig.	Dimensions in mm *(Dimensions in inches)*				
		a	b	d_a	r	s
39 000 25 124	2	110 *(4.33)*	110 *(4.33)*	100 *(3.94)*	65 *(2.56)*	1.0 *(0.04)*
39 000 25 146	1	90 *(3.54)*	90 *(3.54)*	110 *(4.33)*	85 *(3.35)*	1.0 *(0.04)*
39 000 25 192	2	110 *(4.33)*	110 *(4.33)*	110 *(4.33)*	85 *(3.35)*	1.0 *(0.04)*
39 000 25 198	2	125 *(4.92)*	125 *(4.92)*	110 *(4.33)*	85 *(3.35)*	1.0 *(0.04)*
39 000 25 147	1	120 *(4.72)*	120 *(4.72)*	130 *(5.12)*	95 *(3.74)*	1.0 *(0.04)*
39 000 25 224	2	140 *(5.51)*	140 *(5.51)*	130 *(5.12)*	95 *(3.74)*	1.0 *(0.04)*
39 000 25 142	1	180 *(7.09)*	180 *(7.09)*	150 *(5.91)*	110 *(4.33)*	1.0 *(0.04)*
39 000 25 333	2	180 *(7.09)*	180 *(7.09)*	150 *(5.91)*	110 *(4.33)*	1.0 *(0.04)*

Metal elbow pipes (black painted metal)

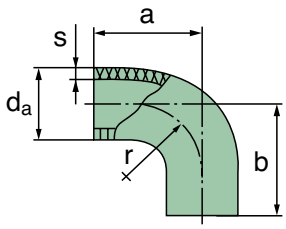


Fig. 1

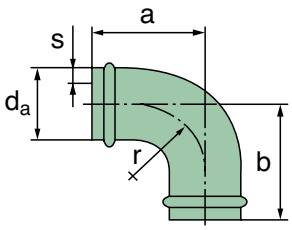


Fig. 2

Air connecting parts

Adapter pieces in metal / Hose clips

Adapter pieces
(black painted metal)

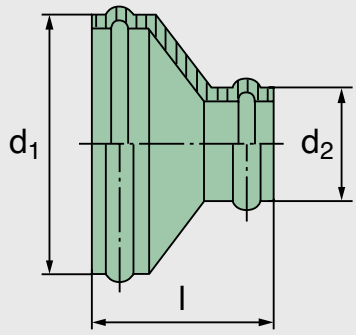


Fig. 1

Hose clips

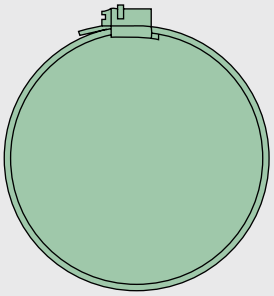


Fig. 2

Fig. 1

Part No.	Dimensions in mm *(Dimensions in inches)*		
	d_1	d_2	l
39 000 25 621	70 *(2.76)*	40 *(1.57)*	65 *(2.56)*
39 000 25 622	70 *(2.76)*	60 *(2.36)*	56 *(2.20)*
39 000 25 631	80 *(3.15)*	50 *(1.97)*	65 *(2.56)*
39 000 25 431	82 *(3.23)*	70 *(2.76)*	56 *(2.20)*
39 000 25 461	100 *(3.94)*	70 *(2.76)*	75 *(2.95)*
31 080 25 511	102 *(4.02)*	80 *(3.15)*	76 *(2.99)*
39 000 25 295	110 *(4.33)*	80 *(3.15)*	75 *(2.95)*
39 000 25 193	110 *(4.33)*	100 *(3.94)*	70 *(2.76)*
39 000 25 105	132 *(5.20)*	102 *(4.02)*	71 *(2.80)*
39 000 25 253	132 *(5.20)*	110 *(4.33)*	76 *(2.99)*
39 000 25 325	150 *(5.91)*	130 *(5.12)*	86 *(3.39)*
39 000 25 145	180 *(7.09)*	150 *(5.91)*	95 *(3.74)*
39 000 25 327	200 *(7.87)*	150 *(5.91)*	105 *(4.13)*

Fig. 2

Part No.	Clamping range (diameter) (mm and *inches)*	Part No.	Clamping range (diameter) (mm and *inches)*
02 018 01 707	32 – 50 *(1.26 – 1.97)*	**02 018 01 717**	130 – 150 *(5.12 – 5.91)*
02 018 01 708	40 – 60 *(1.57 – 2.36)*	**02 018 01 718**	140 – 160 *(5.51 – 6.30)*
02 018 01 709	50 – 70 *(1.97 – 2.76)*	**02 018 01 719**	150 – 170 *(5.91 – 6.69)*
02 018 01 710	60 – 80 *(2.36 – 3.15)*	**02 018 01 720**	160 – 180 *(6.30 – 7.09)*
02 018 01 711	70 – 90 *(2.76 – 3.54)*	**02 018 01 721**	170 – 190 *(6.69 – 7.48)*
02 018 01 712	80 – 100 *(3.15 – 3.94)*	**02 018 01 722**	180 – 200 *(7.09 – 7.87)*
02 018 01 713	90 – 110 *(3.54 – 4.33)*	**02 018 01 723**	190 – 210 *(7.48 – 8.27)*
02 018 01 714	100 – 120 *(3.94 – 4.72)*	**02 018 01 724**	200 – 220 *(7.87 – 8.66)*
02 018 01 715	110 – 130 *(4.33 – 5.12)*	**02 018 01 725**	210 – 230 *(8.27 – 9.06)*
02 018 01 716	120 – 140 *(4.72 – 5.51)*	**02 018 01 728**	240 – 260 *(9.45 – 10.24)*

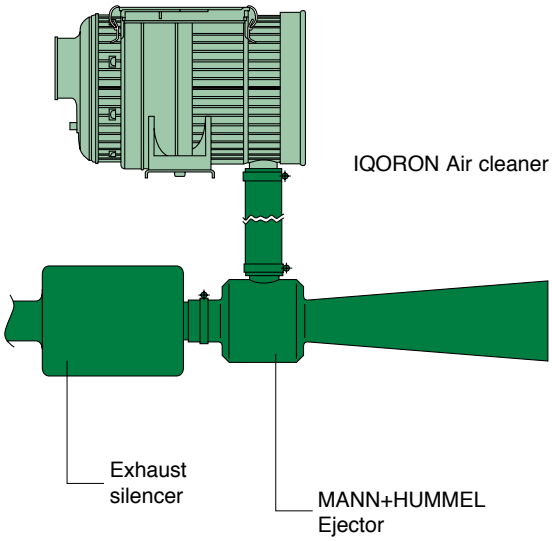
Exhaust ejectors

Maintenance-free dust scavenging with two-stage air cleaners

MANN+HUMMEL ejectors are designed to provide maintenance-free scavenging of the pre-separated dust in two-stage air cleaners.
In addition to being maintenance-free, the ejectors achieve a significantly improved pre-separation efficiency of the two-stage air cleaner. This enables a considerably longer filter service life (up to 60%).

The ejector is fitted behind the exhaust silencer on the tailpipe. The flow energy of the exhaust gases generates a negative pressure in the ejector. This enables the pre-separated dust to be scavenged to the ejector and the dust is then blown out together with the exhaust gases.

Installation example



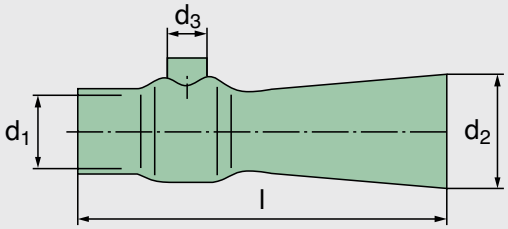
Installation instructions

The connection pipe between the air cleaner and ejector should be as short as possible and not have any tight elbows which would increase flow resistance. Coarse contaminant particles in the intake air (e.g. awns. fibres. stems or leaves) can lead to clogging in the air cleaner.
In order to avoid this, the scavenging should either be made in a closed area (cool-ing air shaft, scavenging under engine bonnet) or in-stalled upstream with a basket sieve. When using an ejector, care should also be taken that the maximum permissible exhaust back pressure specified by the engine producer is not exceeded.

In addition, in all operational conditions there must be a pressure drop to the ejector in order to prevent exhaust gas being sucked in. In case of doubt we recommend use of a non-return adapter.

Exhaust ejectors

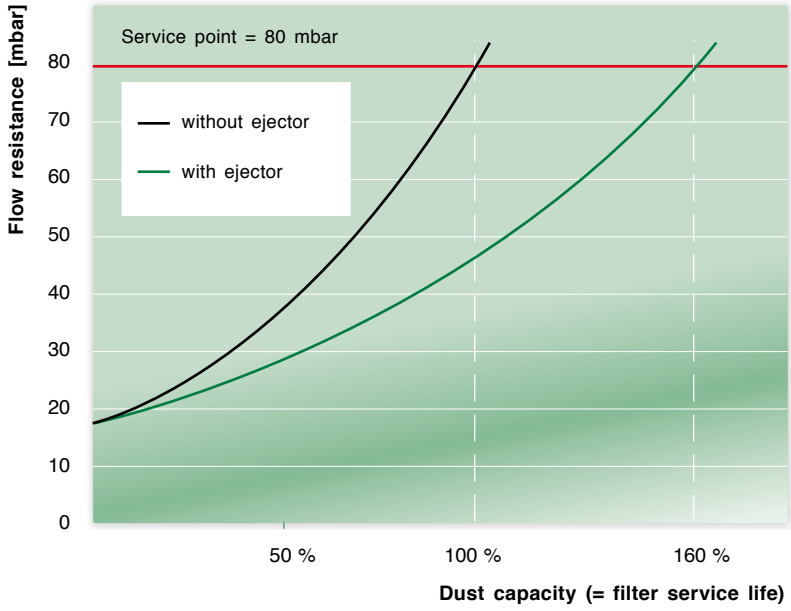
Dimensions and part numbers



Part No.	Application [kW]	Suitable for				Dimensions in mm *(Dimensions in inches)*			
		IQORON	Europiclon	NLG-Piclon	Piclon (Metal)	d_1	d_2	d_3	l
39 330 70 111	50 – 75	**-7, -V 7**	**45 400 ...**	**–**	**45 225 ...**	55.5 *(2.19)*	75 *(2.95)*	32 *(1.26)*	352 *(13.86)*
39 330 70 100	75 – 100	**-V 9, -10**	**45 500 ...**	**–**	**45 325 ...**	72.5 *(2.85)*	80 *(3.15)*	32 *(1.26)*	312 *(12.28)*
39 105 67 110	100 – 130	**-12, -V 14**	**45 600 ...**	**NLG 15**	**45 440 ...**	80.2 *(3.16)*	88 *(3.46)*	32 *(1.26)*	345 *(13.58)*
39 150 65 100	130 – 195	**–**	**45 700 ...**	**NLG 21**	**45 650 ...**	90.0 *(3.54)*	109 *(4.29)*	40 *(1.57)*	416 *(16.38)*
39 170 67 100	180 – 300	**–**	**45 800 ...**	**NLG 28**	**45 880 ...**	110.0 *(4.33)*	143 *(5.63)*	40 *(1.57)*	547 *(21.54)*

Significant extension of the air cleaner service life

The use of exhaust ejectors enables the service life of a two-stage air cleaner to be increased by 60%. This is demonstrated by the graphic pictured here which shows the typical flow characteristics for the dust capacity in relation to the increase in pressure drop.



Accessories for ejectors

Part No.	Fig.
39 000 25 919	1
39 000 25 751	2

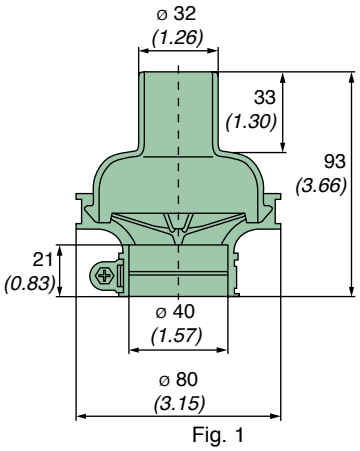


Fig. 1
Non-return adapter

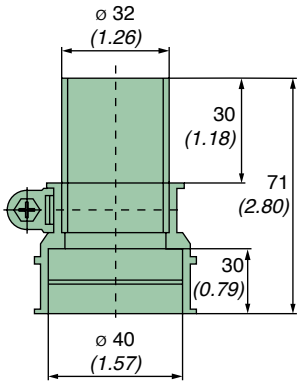


Fig. 2
Ejector adapter

New Electronic Service Indicator

The new electronic service indicator from MANN+HUMMEL indicates the optimal point for servicing of your air filter system and hence reduces operational cost, risk and down time.

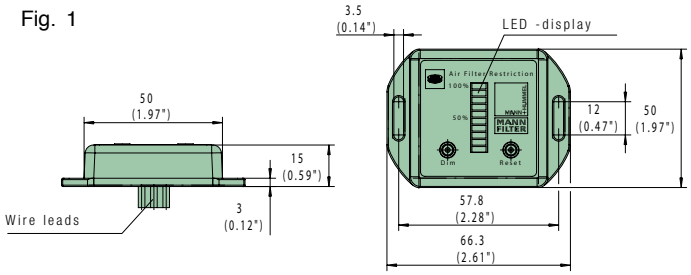
During operation the indicator exactly displays the continuous increase in differential pressure in air cleaners in combustion engines and compressors. The electronic service indicator offers advantages for machine operators. It is easier to schedule the servicing – leading to lower running costs.

The service indicator is suitable for differential pressures from 0 to 100 mbar and can be combined with the following air cleaner series:
IQORON, IQORON-V, IQORON-S, ENTARON XD, EUROPICLON, NLG.

An adapter makes the indicator compatible to all air cleaners for combustion engines available on the market.

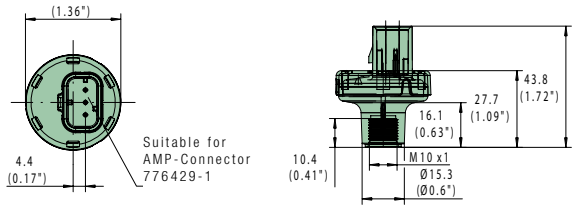
Part No.	Fig.	
39 000 70 920	1	Service indicator assy, packed (Kit including display, pressure sensor, cable harness, manual), programmable for 50/65/80 mbar
39 000 70 910	2	Pressure sensor assy, packed, with connection jack AMPSEAL 16 (Output voltage has to be evaluated with additional interface, e.g. using the on-board electronic system)
26 013 98 100	3	Cable harness assy, packed, suitable for connection jack AMPSEAL 16, with wire leads

Fig. 1



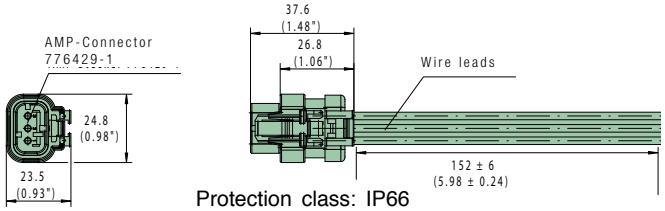
Protection class: IP50

Fig. 2



Protection class: IP66

Fig. 3



Protection class: IP66

Technical Specification

Measurement Type:	Vacuum or Pressure (Reference to atmosphere)
Operational Pressure Range:	0 - 100 mbar [0 - 10 kPa]
Media:	Air
Supply Voltage:	Normal 5 - 30 V DC; Sensor can be powered direct from vehicle up to 30 V DC.
Accuracy:	± 2.5 %
Output Voltage:	0.5 - 4.5 V DC
Over-Voltage Protection:	45 V, Forward Voltage
Reverse Polarity Protection:	36 V, Misconnect 16 V
Operating Temperature:	-40 °C to 125 °C
Storage Temperature:	-40 °C to 125 °C
Vibration Envelope:	10 - 2000 Hz at 10 g
Mounting Connection:	M10x1 female thread fits all MANN+HUMMEL air cleaners (adapter for any other air cleaners on request)

Service switches

Electrical monitoring of the level of accumulated dirt

The electrical service switch monitors the level of accumulated dirt in the air cleaner and sends an electrical signal when maintenance is required.
This enables constant supervision of the state of the air cleaner and maintenance only takes place when it is really necessary.
This removes potential damage to equipment which may occur through frequent and careless maintenance actions.

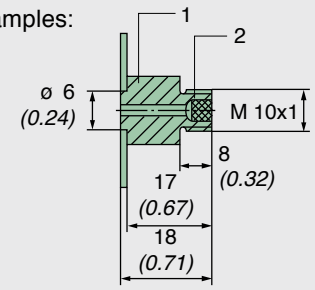
Models

MANN+HUMMEL service switches are available with a number of different connection threads and plug connectors versions (Adapter from M10x1 to 1/8“-27 NPT).

Accessories for external mounting

Installation examples:

Connection on air cleaner (generally existing)

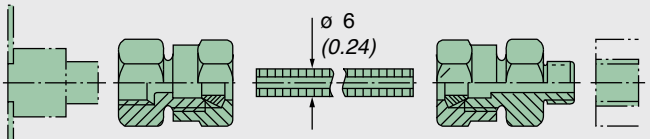


For retro-fitting in the clean air pipe

1 Connection nipple Part No.:
21 010 15 121
2 Felt disc Part No.:
23 005 31 171

Ensure that the felt disc is fitted to the nipple before installing.

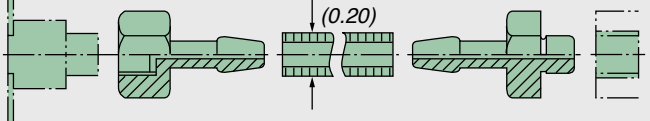
Parts for pipe connection



Pipe connector
Part No.: 02 011 11 001

Pipe connector
Part No.: 02 011 04 005

Parts for hose connection



Hose connector
Part No.: 39 000 47 211

Hose connector
Part No.: 39 000 47 221

Specifications

- Material:
  polyamide 6 GF 30
- Permissible operating temperature:
  -30 °C to + 120 °C
- Switching pressure (negative pressure):
  35 mbar to 80 mbar
  (3.5 kPa to 8.0 kPa)
- Max. switching capacity:
  6W/24V DC (ohmnique load, U_{max} = 24V, I_{max} = 0.25 A)

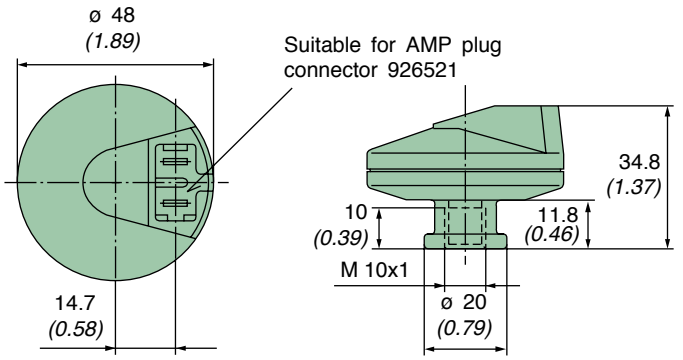
Technical instructions

Thanks to the completely insulated and fully enclosed contact insert, the switch is insensitive to dust or humidity. The system is not mechanical but pressure-dependent so that possible tolerances of the components do not affect the accuracy of the switch. The heart of the system is a kick-over spring that makes readjustment of the switching point unnecessary. The spring contacts are not affected by contact erosion. As a result of the hysteresis between the points for switching and switching back, contact fluttering is reduced to a minimum. The service switch should not be fitted in a hanging position so as to prevent ingress of any condensed water into the air pipe.

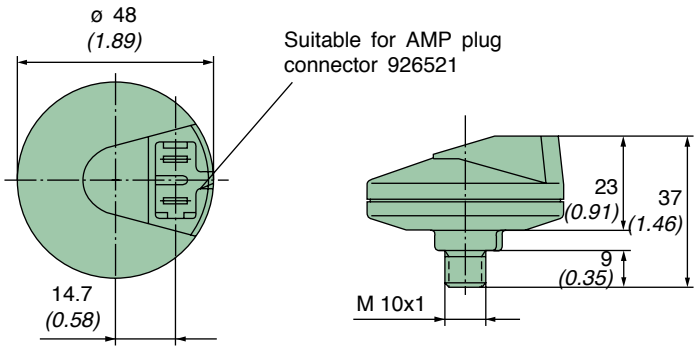
Service switches

with connection for flat plug (Protection class: IP21)

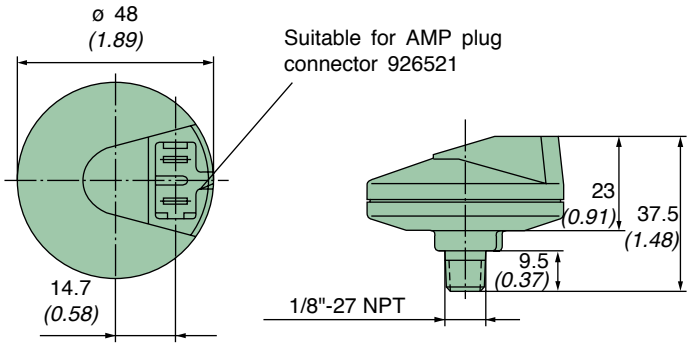
Service switch internal thread M 10x1		
Part No.	switches at gauge pressure [mbar]	[kPa]
39 035 70 902	35±3	3.5±0.3
39 050 70 902	50±3	5.0±0.3
39 055 70 902	55±3	5.5±0.3
39 060 70 902	60±3	6.0±0.3
39 065 70 902	65±3	6.5±0.3
39 070 70 902	70±4	7.0±0.4
39 080 70 902	80±4	8.0±0.4



Service switch external thread M 10x1		
Part No.	switches at gauge pressure [mbar]	[kPa]
39 035 70 952	35±3	3.5±0.3
39 050 70 952	50±3	5.0±0.3
39 055 70 952	55±3	5.5±0.3
39 060 70 952	60±3	6.0±0.3
39 065 70 952	65±3	6.5±0.3
39 070 70 952	70±4	7.0±0.4
39 080 70 952	80±4	8.0±0.4

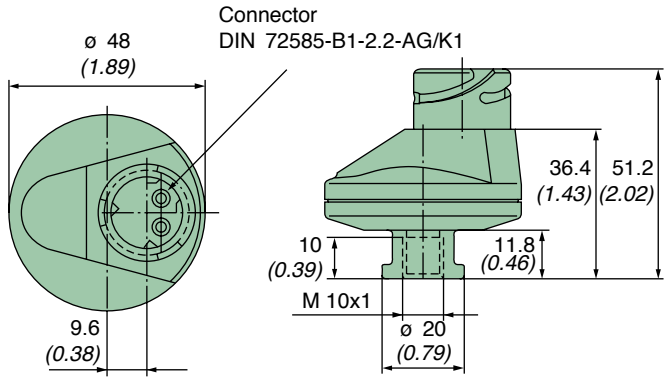


Service switch external thread 1/8“-27 NPT		
Part No.	switches at gauge pressure [mbar]	[kPa]
39 035 70 962	35±3	3.5±0.3
39 050 70 962	50±3	5.0±0.3
39 055 70 962	55±3	5.5±0.3
39 060 70 962	60±3	6.0±0.3
39 065 70 962	65±3	6.5±0.3
39 080 70 962	80±4	8.0±0.4

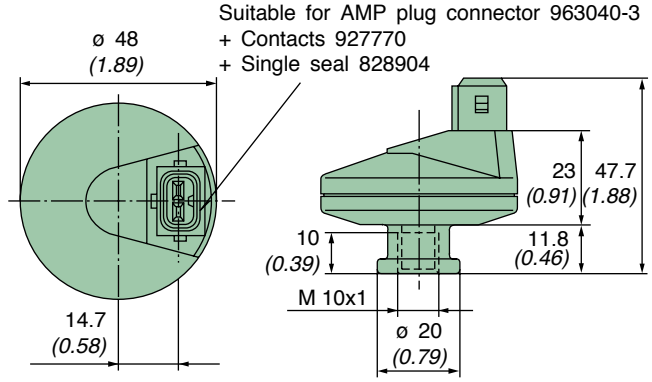


Service switches

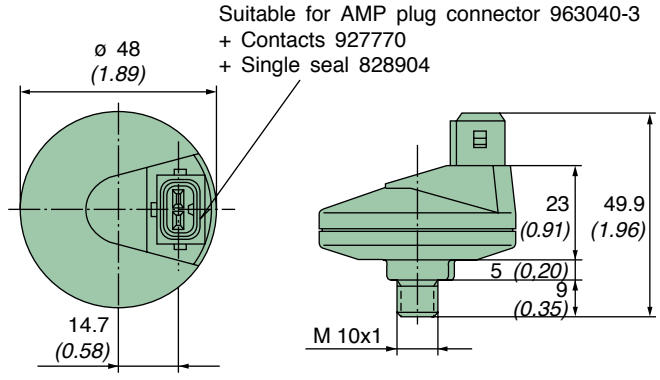
for water-tight electrical connections (Protection class: IP65)



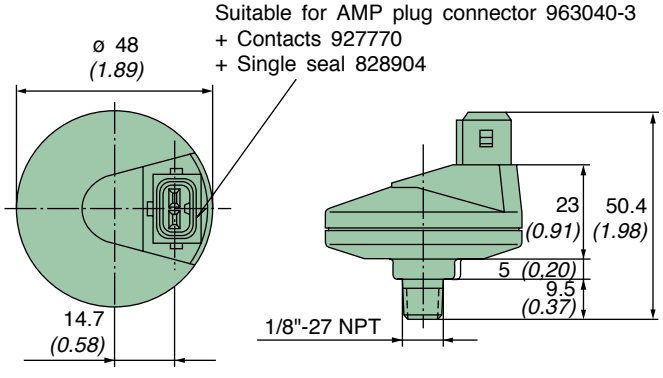
Service switch internal thread M 10x1		
Part No.	switches at gauge pressure [mbar]	[kPa]
39 035 70 702	35±3	3.5±0.3
39 050 70 702	50±3	5.0±0.3
39 055 70 702	55±3	5.5±0.3
39 060 70 702	60±3	6.0±0.3
39 065 70 702	65±3	6.5±0.3
39 070 70 702	70±4	7.0±0.4
39 080 70 702	80±4	8.0±0.4



Service switch internal thread M 10x1		
Part No.	switches at gauge pressure [mbar]	[kPa]
39 035 70 802	35±3	3.5±0.3
39 050 70 802	50±3	5.0±0.3
39 055 70 802	55±3	5.5±0.3
39 060 70 802	60±3	6.0±0.3
39 065 70 802	65±3	6.5±0.3
39 070 70 802	70±4	7.0±0.4
39 080 70 802	80±4	8.0±0.4



Service switch external thread M 10x1		
Part No.	switches at gauge pressure [mbar]	[kPa]
39 035 70 852	35±3	3.5±0.3
39 050 70 852	50±3	5.0±0.3
39 055 70 852	55±3	5.5±0.3
39 060 70 852	60±3	6.0±0.3
39 065 70 852	65±3	6.5±0.3
39 080 70 852	80±4	8.0±0.4



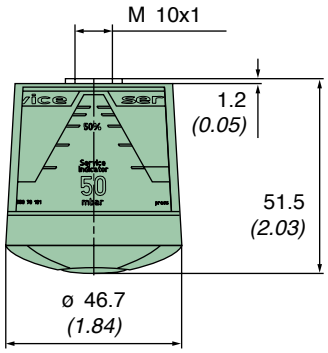
Service switch external thread 1/8“-27 NPT		
Part No.	switches at gauge pressure [mbar]	[kPa]
39 035 70 862	35±3	3.5±0.3
39 050 70 862	50±3	5.0±0.3
39 055 70 862	55±3	5.5±0.3
39 060 70 862	60±3	6.0±0.3
39 065 70 862	65±3	6.5±0.3
39 080 70 862	80±4	8.0±0.4

Service indicators

Level of dirt accumulation readable at any tim

The MANN+HUMMEL service indicator allows you to read the current level of dirt accumulation in the air cleaner, even when the engine is not in operation. The yellow indicating piston catches on a scale of 12 snap-in positions. In the triangular display, the remaining service life of the filter is displayed, in relation to the increased clogging of the filter element.

The service indicator is insensitive to the intake air pulsations of the engine, excluding the possibility of a false indication. Maintenance is necessary when the yellow piston reaches the red zone. After maintenance has been carried out, the indicator level is readjusted to “zero“ by pressing the reset button.



Part No.	snaps into place at gauge pressure	
	[mbar]	[kPa]
39 035 70 911	35±3	3.5±0.3
39 050 70 911	50±4	5.0±0.4
39 050 70 931*	50±4	5.0±0.4
39 060 70 911	60±4	6.0±0.4
39 065 70 911	65±5	6.5±0.5
39 080 70 911	80±5	8.0±0.5
39 080 70 931*	80±5	8.0±0.5

Specifications

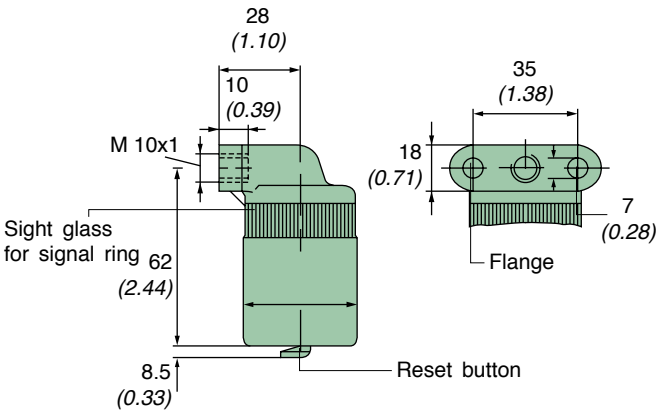
- Material: PC
- Permissible operating temperature: -30 °C to +100 °C
- Switching pressure (negative pressure): 35 mbar to 80 mbar (3.5 kPa to 8 kPa)

* readable in vertical position

Service indicators with 90° flange

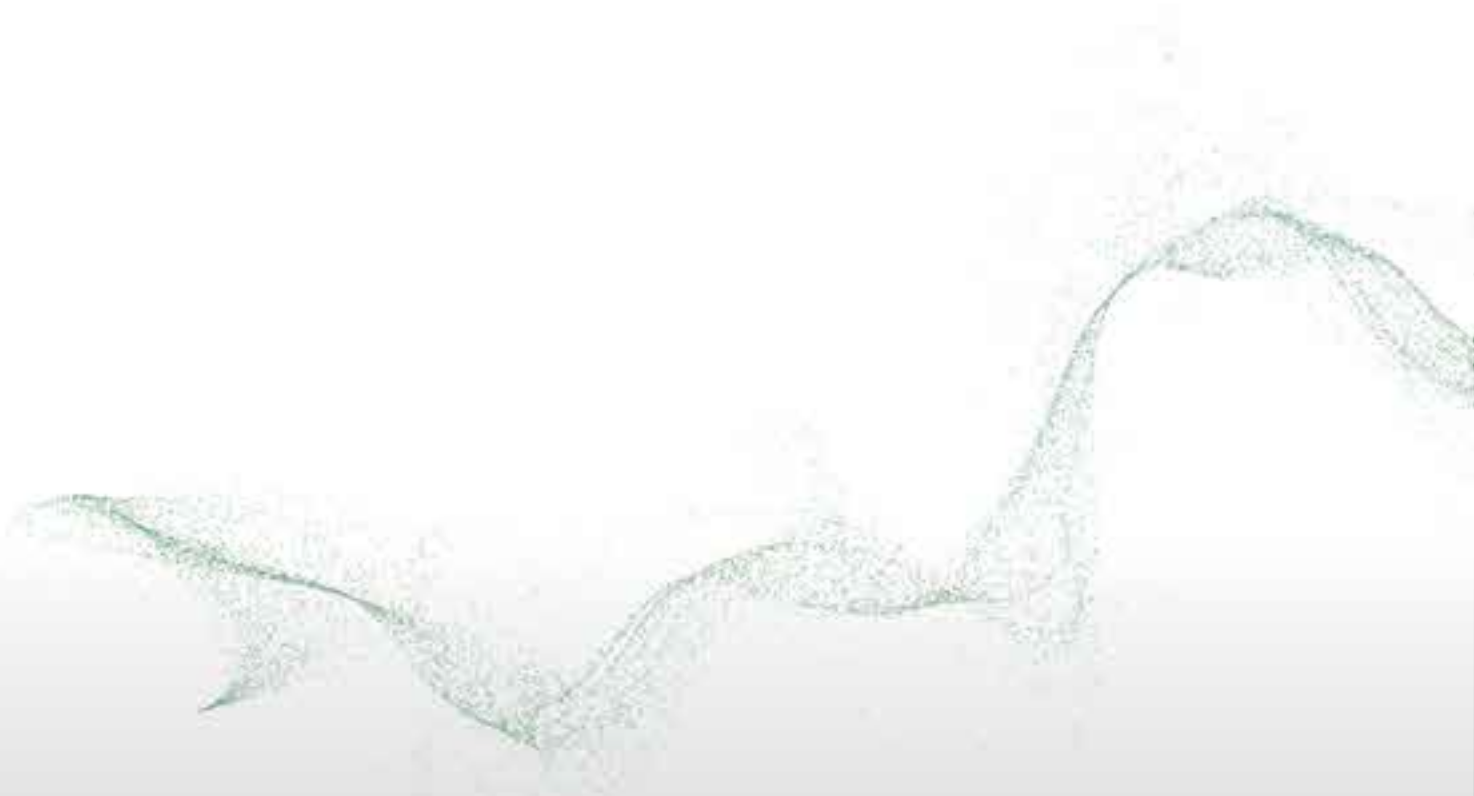
The 90° connecting flange allows nearly any fitting position. The red indicating piston snaps into position upon reaching the maximum value possible, signalling that maintenance is needed. After maintenance has been carried out, the indicating piston is readjusted to the start position by pressing the reset button.

Part No.	snaps into place at gauge pressure	
	[mbar]	[kPa]
39 000 62 924	35±3	3.5±0.3
39 000 62 925	50±6	5.0±0.6
39 000 62 926	65±7	6.5±0.7
39 000 62 927	80±8	8.0±0.8



Specifications

- Material: PA
- Permissible operating temperature: -40 °C to +100 °C
- Switching pressure (negative pressure): 35 mbar to 80 mbar (3.5 kPa to 8 kPa)



Technical Appendix

Glossary of filtration terms

Clean air pipe
Pipe after air cleaner through which cleaned air is fed to the engine/compressor etc.

Dirty air intake
Dirty air pipe before the air cleaner through which ambient air (unfiltered) is sucked in.

DualSpin
MANN+HUMMEL brand name for a precleaner line for use under heavy dust conditions.

Dust discharge valve
Valve on the housing of two-stage air cleaners which discharges the separated dust from the air cleaner housing.

Ejector
A component in the exhaust tract of the engine where a cross-section constriction (using the Venturi principle) generates a negative pressure for the continuous scavenging of the air cleaner.

ENTARON XD
MANN+HUMMEL brand name for an air cleaner line in plastic. This line is available as a single-stage or two-stage air cleaner.

EuropiclOn
MANN+HUMMEL brand name for a two-stage air cleaner line in plastic.

Flow resistance Δp
[mbar] or [kPa]. Measured variable for the pressure drop of a filter.

Glue String Technology GST
Standard technology for the new air cleaner series ENTARON XD. The glue string stabilizes the pleat ends so that the filter element can achieve its full performance under all operating conditions.

IQORON / IQORON-V
MANN+HUMMEL brand name for an air cleaner line in plastic. This line is available as a single-stage or two-stage air cleaner.

IQORON-S
MANN+HUMMEL brand name for an air cleaner line in plastic. This line is available as a single-stage air cleaner.

Laboratory dust capacity
[g]. The measured quantity of a defined test dust which is added to a filter under laboratory conditions until the service point is reached.

Laboratory service life
[h]. The time measured under laboratory conditions that an air cleaner with air flowing through it and loaded with dust will reach a defined flow resistance. The test dust, dust concentration and volume flow must be defined.

Main element
Also called the filter element or primary element. An air cleaner insert consisting of a filter medium and seal which effect the fine filtration in a dry air cleaner.

NLG
MANN+HUMMEL brand name for an air cleaner line in plastic. This line is avail-able as a single-stage or two-stage air cleaner.

Nominal flow rate $\dot{V}$
Describes a design consi-deration for an air cleaner. Depending on the design or line the nominal flow rate describes the respective volume flow where the filter will show a pressure drop of 25 mbar to 30 mbar.

Piclon
MANN+HUMMEL brand name for a two-stage air cleaner line in metal or in general for a two-stage version of a dry air cleaner (e.g. NLG Piclon).

Glossary of filtration terms

Pico
MANN+HUMMEL brand name for a single-stage air cleaner line in metal or in general for a single-stage version of a dry air cleaner (e.g. NLG Pico).

Picolight
MANN+HUMMEL brand name for a single-stage air cleaner line without housing.

Picolino
MANN+HUMMEL brand name for a single-stage air cleaner line in plastic.

Precleaner
Centrifugal force separator to filter out particles from the intake air.

Pre-separation efficiency
[%]. Amount of dust separated in the first stage of a two-stage air cleaner.

Pulsation
Pressure oscillations in the intake channel of an engine or a compressor.

Secondary element
An additional air cleaner insert which is fitted downstream from the main element and which prevents ingress of dust into the clean air pipe during maintenance work or when the main element is defective.

Service indicator
Mounted device which indicates the time when to service.

Service life
[h]. Life of filter determined in the field before the filter needs servicing.

Service switch
Mounted device which triggers an electric signal when the time for a service is reached which in turn sets off an audio or visual warning signal.

Single-stage air cleaner
Air cleaner without pre-separation. Available with or without a secondary element.

Two-stage air cleaner
An air cleaner with an integrated filtration stage for pre-separation of dust from the intake air before subsequent fine filtration.

Volume flow $\dot{V}$
[m^3/min]. Quantity which flows through filter per unit of time, also called the volumetric flow.

Design criteria

Separation efficiency

The most important task of an air cleaner is to provide adequate protection for the application in use (e.g. engine, compressor, etc.) under all conceivable operating conditions. The separation efficiency of the filter therefore has to be sufficiently high to meet this requirement. The measurement of the separation efficiency is defined by ISO 5011.

A dosing device is used to add dust to the filter with a defined particle size spectrum and concentration. The filter separates by far the largest part of this dust. The separation efficiency of the filter is given by the ratio of the separated dust mass to the dosed dust mass. The separation efficiency of dry air cleaners is usually above 99.95%.

For two-stage cleaners where a filter acts as a pre-separator an additional pre-separation efficiency is given which is determined in exactly the same way. A higher pre-separation efficiency correspondingly reduces the dust concentration which enters the main filter element and serves to lengthen the service life of the filter. The total separation efficiency of the filter, on the other hand, is determined by the filter element.
The often considerable differences in the passage of dust with different filters are only evident after a comparison of the different separation efficiencies has been made.

Example:

Filter 1: 99.93% separation efficiency

Filter 2: 99.97% separation efficiency

(1-0.9993) / (1-0.9997) = 2.3

The filter with a separation efficiency of 99.93% allows more dust through the filter by a factor of 2.3 than the filter with a separation efficiency of 99.97%.

Service life

In order to determine the service life of a filter, a defined amount of dust is added to the filter in the test laboratory until an agreed differential pressure or a differential pressure defined according to ISO is achieved over the complete filter. During the test the differential pressure increases constantly. The time from the start to the end of the test is described as the laboratory service life of the air filter and is given in hours.
The filter separation efficiency and the filter service life are characteristics of an air filter which can be verified at any time. In practice, the service life is usually longer due to the fact that the laboratory conditions are generally much more extreme than conditions in the field.

Specification of filter size

Step 1: Determine the pulsation factors

With a small number of cylinders, flow pulsations occur in the intake system. The corresponding varying velocities must be taken into account when determining the size of the filter. The use of so-called pulsation factors (Fig. 1) can be used to overcome this problem.

Step 2: Determine the design flow rate

With 1-4 cylinders, the air requirement obtained above must be multiplied with the corresponding pulsation factor to determine the filter size. This results in the following equation (1):

Design flow rate = air requirement · pulsation factor

with air requirement in [m^3/min]

For naturally aspirated engines with 5 or more cylinders, and for all turbocharged engines, the air requirement corresponds to the design flow rate of the filter, i.e., the filter size is specified directly with the determined design flow rate (m^3/min).

The **nominal flow rate of the filter** (m^3/min) is a deciding factor for the air cleaner size.

Example 1:

3 cylinder 4 stroke Diesel engine with volume flow rate of 1.6 m^3/min.

1. Pulsation factor from the table

Dry air cleaner
3 cylinder, 4 stroke engine
Pulsation factor = 1.3

2. Design flow rate after equation (1)

$\dot{V}$ = 1.6 m^3/min · 1.3
$\dot{V}$ = 2.1 m^3/min

Result:
The design flow rate of the engine is 2.1 m^3/min.

Fig. 1: Pulsation factors

	Air intake			
	Naturally aspirated engines			
No. of cylinders	4 stroke engines	2 stroke engines	Turbocharged[1)]	Piston compressors[2)]
1	2	1.5	1	1.5
2	1.4	1.2	1	1.2
3	1.3	1.1	1	1.1
4	1.1	1	1	1
5 and more	1	1	1	1

[1)] Turbocharged engines do not require a pulsation factor.
[2)] For compressors with gripper control a pulsation factor of 2 is valid.

Example 2:

Turbocharged Diesel engine with 107 kW power

$\dot{V}$ = 107 · 0.09
$\dot{V}$ = 9.63 m^3/min

Estimation of the design flow rate based on engine breake power

If necessary data is not available for the previous calculation, the air requirement can be estimated using the following approximations:

Diesel engines
1 kW approx. 0.09 m^3/min
(1 HP approx. 0.065 m^3/min)

Screw compressors
1 kW approx. 0.15 m^3/min

Petrol engines
1 kW approx. 0.07 m^3/min
(1 HP approx. 0.05 m^3/min)

Defining the dust capacity

All MANN+HUMMEL air cleaners are tested on special test benches. The resulting data allows a uniform basis for comparison for the dust capacity of the various filter types and sizes. This offers true comparison possibilities for filters from different sources and enables a service life estimation for use in practice. On the following pages the mean value curves of the effective dust-holding capacity for the described filters are illustrated based on the nominal volume flow ($\dot{V}$).

These values relate to a standard ISO coarse test dust with an exactly defined particle size distribution and were determined with a dust concentration of 1 g/m³. Here one can speak of a so-called laboratory service life.
In order to calculate the working service life in hours or driving kilometres from the laboratory dust-capacity data for a given dry air cleaner, the dust concentration prevailing in practice must be known. Extensive tests have led to the overview on this page (Fig. 2):

Mean dust concentration in	[mg/m³]
Truck in normal European road traffic	0.6
Truck in road traffic outside Europe	3
Off-highway truck (construction site use)	8
Construction machines (front-end loaders, track vehicles, mobile compressors)	35
Agricultural machines in central Europe (agriculture without periods of drought)	5
Agricultural machines in areas outside Europe in single operation	15
Agricultural machines used in fleets	50
Quick-moving track vehicles	100

Fig. 2: Typical dust concentrations

Estimation of conditions in practice

Equation (2) is used in order to estimate the hours of operation in practice from the laboratory dust capacities.

Equation (2) indicates that the so-called service life of a filter directly depends on the laboratory dust capacity.

In addition to the influencing factors described in equation (2) such as laboratory dust capacity, dust concentration and air requirement, in practice there are further parameters which cannot be taken into account here. This includes, for example, the distribution of particle sizes and different air humidity levels. In practice, these influencing factors deviate from the standardised test conditions.

Example 3:

A construction machine with an air requirement of 12 m³/min is equipped with a filter with a laboratory dust capacity of 5800 g. The expected hours of operation are to be calculated.

According to equation (2):

$$\textbf{Hours of operation} = \frac{5800 \cdot 1000}{35 \cdot 12 \cdot 60}$$

Hours of operation = 230 hours

$$\textbf{Hours in practice} = \frac{\textbf{laboratory dust capacity} \cdot 1000}{\textbf{dust concentration} \cdot \textbf{air requirement} \cdot 60}$$

with dust capacity in [g]
dust concentration in [mg/m³]
air requirement in [m³/min]

Equation (2): Estimated service life

Defining the dust capacity

Application example

Vehicle data
Vehicle type: Tractor
Location: Central Europe, but designed for use in harvesting fleet

Engine data
Fuel: Diesel
Type: Aspirating engine
Engine capacity: 5.3 dm³
Nominal rot. speed: 2300 rpm
No. cylinders: 4
Air requirement: 5.49 m³/min

Requirements
Initial resistance:
30 mbar max.
End resistance:
65 mbar max
Required service life:
min. 200 operating hours

Step 1:
Determining the pulsation factors

From Fig. 1 we can see:

No. of cylinders	Pulsation factors for dry air cleaners (aspirating engines) 4 stroke engines	5 stroke engines	Piston compressors[1)]
1	2	1.5	1.5
2	1.4	1.2	1.2
3	1.3	1.1	1.1
4	(1.1)	1	1
5 and more	1	1	1

Step 2:
Defining the design flow rate

Acc. to equation (1):

$$\dot{V} = 5.49\ m^3/min \cdot 1.1$$
$$\dot{V} = 6.0\ m^3/min$$

Step 3:
Filter recommendation

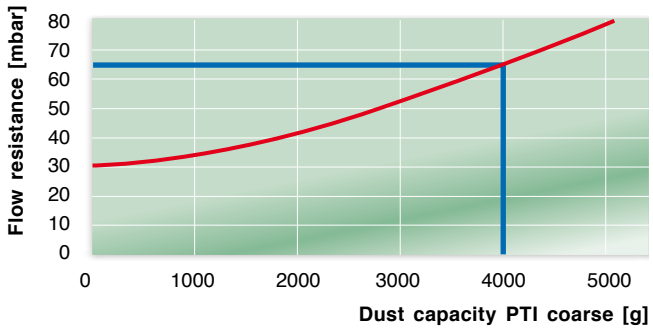
Due to the operating conditions a **Europiclon 300** is recommended with a secondary element and a small dust discharge valve.

Part No:
45 300 92 911

In the resistance diagram on page 41 the initial pressure drop of the filter can be read to be 30 mbar.

Step 4:
Laboratory dust capacity from the diagram

From the diagram on page 41 a dust capacity of 4000 g can be read.



Step 5:
Dust concentration in practice

Acc. to Fig. 2
"Dust concentrations"

there is a concentration of 50 mg/m³ for fleet operations.

Step 6:
Calculation of hours of operation

According to equation (2):

$$\text{Hours of operation} = \frac{4000 \cdot 1000}{50 \cdot 6.0 \cdot 60}$$

Hours of operation = 222 hours

General instructions for installation and maintenance

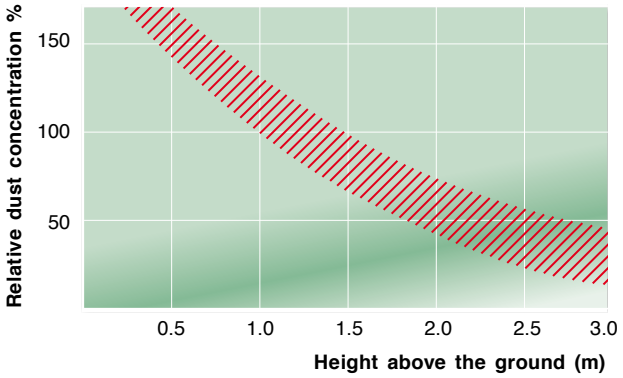
Filter installation

There are a number of important points to be observed when installing dry air cleaners:

- The temperature stability of MANN+HUMMEL filter elements covers -40 °C to +80 °C in continuous operation with short peaks of up to +100 °C (e.g. due to heating up from the switched-off engine).
- The filters should be fitted as close to the engine as possible and should be easily accessible for servicing.
- Enough room must be left for filter element removal.
- Service indicators should be clearly visible, and in some cases service switches are recommended with external service displays.
- The air cleaner should be installed in such a way that the clean air pipes (the connection between air cleaner and engine) do not need to be removed under any circumstances during air cleaner or engine servicing.
- Avoid positioning the air cleaner in an area where water is splashed or a lot of dust is raised (e.g. in areas where the wheels spray).
- The air cleaner should be mounted on the vehicle frame or some sturdy body component. The matching brackets are recommended for this purpose. If the air cleaner is subjected to heavy impacts, it should be installed on an elastic mounting.
- The air cleaner should be installed where it is protected against collision damage (observe the gradient of slope). This is especially valid for off-road vehicles.

Air intake

Fig. 3: Dust concentration depending on the position of the air intake



- The air intake should be located in a low-dust area. This generally means as high as possible and, for on-road vehicles, as far forward as possible (see Fig. 3).
- The air intake should not be where the wheels spray or under the floor.
- Screening against the entrance of water (e.g. while the vehicle is being washed) and rainfall is required. Rain caps are recommended.
- The intake of hot air (e.g. radiator cooling air) and exhaust gases should be avoided. Intake of exhaust soot drastically shortens the air cleaner service intervals.
- The intake openings should be as large as possible. Intake-flow velocities should not exceed 3 m/sec.

Air pipes

- Only use suitable material for these pipes. This applies in particular to the clean air pipe. MANN+HUMMEL accessories fulfil these requirements.
- The line cross sections should not be selected smaller than the connection cross sections on the air cleaner.
- Due to their being attached to different parts of the vehicle (engine, chassis, driver's cab), the connection pieces in the air intake system are subject to relative movement. This should be compensated by fitting flexible intermediate links between the air intake pipes. Spiral and rubber accordion hoses are recommended for this purpose. The pipes are not tobe welded to the inlet and outlet connections on the air cleaner. Rubber hoses are also recommended for these connections.
- Pipes should be fitted to avoid damage from scuffing, melting of rubber hoses on hot exhaust components or damage through other causes, such as stones thrown up from vehicle wheels. When fitting these dirty air pipes, care should be taken to ensure that water pockets cannot form. Drain points must be provided if necessary.

General instructions for installation and maintenance

Clean air pipes

The clean air pipes must be airtight. Leaky clean air pipes allow dirt to bypass the filter and enter the engine, causing premature wear. Therefore, particular attention should be paid to the clean air pipes.
The following points should be observed:

- The clean air pipes should be as short as possible and use the least number of joints.
- The material used for the pipes must retain its shape and remain airtight during operation (it is a vacuum system). This applies in particular to all flexible connections. Fabric-ply rubber hoses retain their shape well and are also sufficiently resistant to oil, fuel, ozone and weather and are adequately temperature-resistant.
- Hose clamps for securing the connecting elements must be sufficiently wide and strong, and must not cut into the hoses. In the closing area they should be designed so that no folding of the hose is possible.
- Pipes and couplings must not have any rough welding or casting seams, or overlapping metal. Connecting sleeves for mounting rubber hoses or elbows should be provided with a sealing bead. The length of overlapmust be sufficient (at least 30 mm).
- Self-made clean air pipes should be descaled and varnished on the inside before being fitted.
- Clean air pipes must be checked for leaks at regula intervals. Faulty connection components must be replaced.

Servicing

An air cleaner service be-comes necessary when the MANN+HUMMEL filter element is exhausted.
The following basic prin-ciples should be observed:

- Always select the service point according to the service indicator or service switch. A regular inspection or cleaning of the element, as is some-times practised in the field, is more likely to be damaging than useful as there is a risk that the element will be damaged and that dust will gain access to the engine.
- **MANN+HUMMEL always recommends exchanging rather than cleaning the filter element in order to avoid damage and ensure maximum engine protection.**
- If, however, cleaning cannot be avoided, care should be taken that the filter element is not washed out.
- In order to clean, position a pipe with an end bent by approx. 90° on the end of compressed-air pistol. The pipe must be long enough to reach to the bottom of the filter element. Carefully blow out the filter element with dry compressed air (max. 5 bar) from the inside to the outside, or from the clean air side to the dirty air side until there is no more development of dust. The end of the pipe must not touch the element (see Fig. 4).
- Next, carefully examine the filter for possible damage.
- Never beat or knock the filter element as this will damage it and there will be a danger of damage to the engine.
- Please note that the secondary element is never cleaned, but must be always replaced.

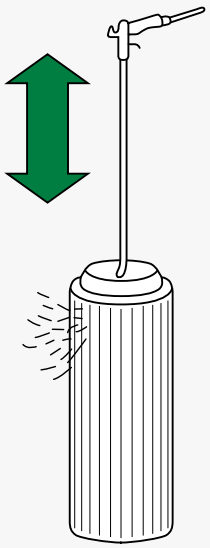


Fig. 4: Cleaning the main element

- Please note that a cleaned element will never match the service life and performance of a new element.
- After servicing the filter element carefully wipe out the inside of the housing and the seal contact surface with a moist cloth. Take care that no dust or dirt gains access to the clean air side of the air cleaner.
- When fitting the filter element take care that it is correctly positioned in the housing so that the function of the seals is not impaired.
- Please note that engine damage can cause considerable costs and stoppage times which can make the cost of a new filter element appear insignificant.
- There are detailed maintenance instructions available for the various filter lines from MANN+HUMMEL which offer detailed instructions on the correct main-tenance of your filter. Please ask us – and we will behappy to answer your questions.

Conversion table

Pressure

5 mbar	=	0.5 kPa	=	2 " H_2O
10 mbar	=	1.0 kPa	=	4 " H_2O
15 mbar	=	1.5 kPa	=	6 " H_2O
20 mbar	=	2.0 kPa	=	8 " H_2O
25 mbar	=	2.5 kPa	=	10 " H_2O
30 mbar	=	3.0 kPa	=	12 " H_2O
35 mbar	=	3.5 kPa	=	14 " H_2O
40 mbar	=	4.0 kPa	=	16 " H_2O
45 mbar	=	4.5 kPa	=	18 " H_2O
50 mbar	=	5.0 kPa	=	20 " H_2O
55 mbar	=	5.5 kPa	=	22 " H_2O
60 mbar	=	6.0 kPa	=	24 " H_2O
62.5 mbar	=	6.3 kPa	=	25 " H_2O
65 mbar	=	6.5 kPa	=	26 " H_2O
70 mbar	=	7.0 kPa	=	28 " H_2O
75 mbar	=	7.5 kPa	=	30 " H_2O
80 mbar	=	8.0 kPa	=	32 " H_2O

Weight

10 g	=		=	0.35 ounces	=	
25 g	=		=	0.88 ounces	=	
50 g	=		=	1.75 ounces	=	
100 g	=		=	3.5 ounces	=	
250 g	=		=	8.8 ounces	=	
500 g	=		=	17.6 ounces	=	
1000 g	=	1 kg	=	35.3 ounces	=	2.2 lb
2000 g	=	2 kg	=	70.5 ounces	=	4.4 lb
3000 g	=	3 kg	=	105.8 ounces	=	6.6 lb
4000 g	=	4 kg	=	141.1 ounces	=	8.8 lb
5000 g	=	5 kg	=	176.4 ounces	=	11.03 lb
10000 g	=	10 kg	=		=	22.05 lb
20000 g	=	20 kg	=		=	44.1 lb
50000 g	=	50 kg	=		=	110.23 lb

Temperature

-30 °C	=	-22.0 °F
-10 °C	=	14.0 °F
0 °C	=	32.0 °F
10 °C	=	50.0 °F
30 °C	=	86.0 °F
50 °C	=	122.0 °F
80 °C	=	176.0 °F
100 °C	=	212.0 °F
120 °C	=	248.0 °F

Power

10 kW	=	13.4 HP
20 kW	=	26.8 HP
50 kW	=	67.1 HP
100 kW	=	134.1 HP
150 kW	=	201.2 HP
200 kW	=	268.2 HP
250 kW	=	335.3 HP
500 kW	=	670.5 HP
1000 kW	=	1341.0 HP

Volume flow m^3/min → cfm

1 m^3/min	=	35.3 cfm
1.7 m^3/min	=	60.0 cfm
2 m^3/min	=	70.6 cfm
3 m^3/min	=	105.9 cfm
4 m^3/min	=	141.3 cfm
4.5 m^3/min	=	158.9 cfm
6 m^3/min	=	211.9 cfm
8 m^3/min	=	282.5 cfm
10 m^3/min	=	353.1 cfm
12 m^3/min	=	423.8 cfm
15 m^3/min	=	529.7 cfm
18 m^3/min	=	635.7 cfm
20 m^3/min	=	706.3 cfm
21 m^3/min	=	741.6 cfm
24 m^3/min	=	847.6 cfm
25 m^3/min	=	882.9 cfm
28 m^3/min	=	988.8 cfm
32 m^3/min	=	1130.1 cfm
37 m^3/min	=	1306.6 cfm
40 m^3/min	=	1412.6 cfm
42 m^3/min	=	1483.2 cfm
50 m^3/min	=	1765.7 cfm
60 m^3/min	=	2118.9 cfm
80 m^3/min	=	2825.2 cfm
100 m^3/min	=	3531.5 cfm

Volume flow cfm → m^3/min

25 cfm	=	0.7 m^3/min
50 cfm	=	1.4 m^3/min
75 cfm	=	2.1 m^3/min
100 cfm	=	2.8 m^3/min
150 cfm	=	4.2 m^3/min
200 cfm	=	5.7 m^3/min
250 cfm	=	7.1 m^3/min
300 cfm	=	8.5 m^3/min
350 cfm	=	9.9 m^3/min
400 cfm	=	11.3 m^3/min
450 cfm	=	12.7 m^3/min
500 cfm	=	14.2 m^3/min
550 cfm	=	15.6 m^3/min
600 cfm	=	17.0 m^3/min
650 cfm	=	18.4 m^3/min
700 cfm	=	19.8 m^3/min
750 cfm	=	21.2 m^3/min
800 cfm	=	22.7 m^3/min
850 cfm	=	24.1 m^3/min
900 cfm	=	25.5 m^3/min
950 cfm	=	26.9 m^3/min
1000 cfm	=	28.3 m^3/min
1500 cfm	=	42.5 m^3/min
2000 cfm	=	56.6 m^3/min
3000 cfm	=	85.0 m^3/min

A selection of catalogues for MANN+HUMMEL Industrial Filters

ProVent

The product line for crankcase ventilation

Catalogue part no.
19 944 10 100 (german)
19 944 10 101 (english)
Further languages on request.

PreLine

Pre-filter for diesel fuel

Catalogue part no.
W9 942 21 100 (german)
W9 942 21 101 (english)
Further languages on request.

Filters for liquids

Spin-on filters
Fuel filters
In-line filters

Catalogue part no.
19 942 10 100 (german)
19 942 10 101 (english)
Further languages on request.

Air/oil separators for compressors and vacuum pumps

Air/oil separator elements
Air/oil separator boxes

Catalogue part no.
19 943 00 100 (german)
19 943 00 101 (english)
Further languages on request.

MANN-FILTER

Filter elements in OEM quality for construction and agricultural machines:
- Air cleaners
- Oil filters
- Fuel filters
- Hydraulic filters
- Cabin filters

Catalogue part no.
19 939 24 600
(multi-lingual)

Notes

Notes

MANN+HUMMEL Group

The MANN+HUMMEL Group is an international company and employs over 14,750 people at 50 locations worldwide. The group develops, produces and distributes innovative technical components and systems for the automotive industry and many other industrial fields.

For more than 70 years the company has been a specialist for high quality filtration products for vehicles, engines and industrial applications and is a reliable partner in the OEM business to leading producers of vehicles, machines and installations. Filters for the international aftermarket are sold under numerous international brands as well as under the company's own MANN-FILTER brand.

MANN+HUMMEL Industrial Filtration

The Industrial Filtration Business Unit with its headquarters in Speyer, Germany, specialises 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.

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