

**MANN+HUMMEL**  
**ENTARON HD**  
Installation and  
Maintenance Manual

Original operating instructions

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# 1 INTRODUCTION

This Installation and Maintenance Manual is a component part of the scope of delivery. It is to be kept close at hand throughout the product life time.

We reserve the right to make technical improvements to the products described in this Installation and Maintenance Manual without notification. This Installation and Maintenance Manual is not subject to an updating service. Information on the current status is available from the manufacturer.

Copyright remains with the publisher. Reprinting, translation and copying of this document, or extracts of it, requires the explicit written consent of the publisher.

## 1.1 Vendor and publisher

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## 1.2 Guarantee and warranty

Information about the warranty periods and general terms and conditions are available from the manufacturer or at [www.mann-hummel.com](http://www.mann-hummel.com).

Guarantee and warranty are invalid if you

- alter the product without the consent of the manufacturer,
- do not comply with the Installation and Maintenance Manual,
- install or remove replacement parts and/or accessory devices other than those supplied or approved by the manufacturer,
- do not handle or use the product properly.

## 1.3 Disclaimer

These instructions serve as a guide only. They have been compiled to the best of the manufacturer's knowledge. You cannot make the manufacturer responsible for the functioning of this product in its ultimate application, as this is beyond the manufacturer's control.

You should conduct your own tests to approve the product for its application. Therefore, the manufacturer shall not be held liable for downtime, damage or personal injury resulting from a failure of the product in the application.

## 1.4 Means of representation

### 1.4.1 Lists

Lists are marked with indents:

- Item 1
- Item 2
- Item 3

### 1.4.2 Instructions

Instructions that are to be performed in a certain order are numbered:

1. Check the filter system for damage.
2. Screw on the filter system.

### 1.4.3 Safety notices



**WARNING!**

*A safety notice with the signal word **WARNING!** indicates a personal risk, which could potentially result in minor or moderate injury.*



**CAUTION!**

*A safety notice with the signal word **CAUTION!** indicates a risk of damage to property.*

### 1.4.4 Information



**NOTE**

**This symbol in all the sections of the manual in which the information provided must be carefully observed to ensure trouble-free and economic operation.**



Additional information is marked with this symbol.

## 2 SAFETY

Please observe the following guidelines when dealing with the filter system:

- The section "Basic safety instructions" outlines the basic code of conduct for working with the filter system.
- The sections under "Special safety instructions" list the precautions that are specific to the work explained in these installation instructions.

The individual work steps are accompanied by safety instructions that relate to the specific instructions.

### 2.1 Basic safety instructions

- The operator is responsible for the provision of the necessary working equipment which comply with the basic health and safety requirements. This also includes deploying this work equipment only within the scope of its intended use.
- Please read this Installation and Maintenance Manual in full before you start installing the filter system.
- Keep this Installation and Maintenance Manual to hand throughout the installation.
- Ensure that all labels and identifications on the filter system are in a legible condition.
- The operator must ensure that the person who carries out the installation and maintenance of the filter system is properly informed about the installation and maintenance by means of this Installation and Maintenance Manual.
- In case of visible damage to the filter system and its components, these may not be installed or operated. Damage to the housing can impair the function of the filter system.
- Install the filter system in such a way that no damage to the vehicle or the components of the filter system arises from vibration, temperature and moisture (such as splashed water or rain).
- There is a risk of electrostatic discharge due to the plastic housing of the filter system. During installation, make sure there is a conductive connection to the installation location.
- Ensure that no impurities enter the air intake on the clean air side when installing or exchanging the filter or filter elements.
- Eliminate any faults immediately which can impair safety during operation.
- After installation, secure the cables and hoses to prevent unintentional movement.
- When installing the filter system, ensure that all screws and bolts are securely fixed in position (length and torque setting).
- Any cable and hose fixings removed when dismantling the filter system should be fixed again in their original position during installation.

## 2.2 Intended use

- Use the filter system for its intended purpose only and if it is in technically perfect condition, taking aspects of safety and risk into account and observing the Installation and Maintenance Manual.
- Operate it only in compliance with the Installation and Maintenance Manual and in compliance with the intervals and requirements for inspections and maintenance work.
- The filter system is only intended for the mechanical filtration of intake air for internal combustion engines and compressors. If the filter system is to be deployed for another use, please contact the manufacturer beforehand.
- Only authorized personnel are permitted to maintain the filter system.
- The filter system is designed for permanent operation.

## 2.3 Non-intended use

- The standard filter system is not suitable for use as a passenger compartment filter.
- Do not use the filter system in a manner other than that described in this Installation and Maintenance Manual.
- Any use other than or in addition to the filtration of air—such as the filtration of aggressive, flammable or explosive media—is not considered to be the intended use.
- Do not use it if you are unable to comply with the operating conditions.
- You may not modify it or convert it without the consent of MANN+HUMMEL.
- Do not operate the filter system if you have not completed the necessary maintenance and repair work.

## 2.4 Labels on the filter system



### NOTE

Ensure that all labels on the filter system are legible and that they are not concealed by other installations.

### 2.4.1 Type label (example)

10-digit part number of the filter system:

XX XXX XX XXX

6-digit part number of the filter element:

C XX XXX

6-digit part number of the secondary element:

CF XXXX



## 3 RELATED DOCUMENTS

In addition to this Installation and Maintenance Manual, please observe and apply the following documents:

- Technical data of the filter system according to the proposal drawing and/or product catalogue,
- Operating and maintenance instructions of the engine manufacturer or the application,
- Operating and maintenance instructions of the extraction system manufacturer (optional),
- National laws governing the operation of the filter system and the disposal of used filters in the country of application.

## 4 TECHNICAL DATA

The technical data for ENTARON HD can be found in the product catalogue and/or the proposal drawing for the respective deployment in the machine or application. If necessary, please contact the manufacturer (see chapter “1.1 Vendor and publisher” on page 4).



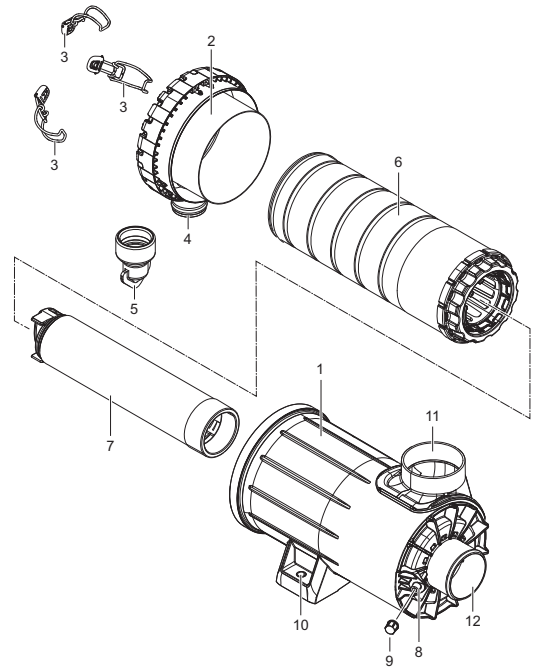
# 5 SCOPE OF DELIVERY

The filter system is delivered fully assembled. Check the scope of delivery for completeness and damage before installation. In case of discrepancy, please contact the manufacturer.



Scope of delivery and equipment may vary depending on the version and application.

- (1) Housing
- (2) End cap
- (3) Quick fastener (3x)
- (4) Discharge nozzle
- (5) Dust discharge valve (optional)
- (6) Main filter element
- (7) Secondary filter element (optional)
- (8) Maintenance indicator connector
- (9) Cover cap
- (10) Mounting bracket
- (11) Raw air nozzle
- (12) Clean air nozzle

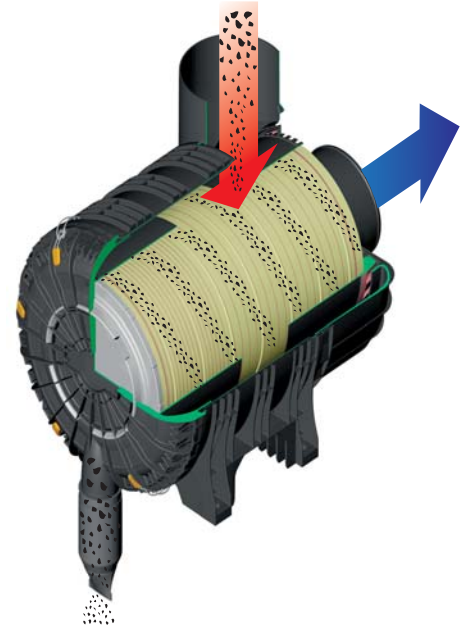


# 6 FUNCTION DESCRIPTION

## 6.1 Description

The ENTARON HD filter system is a two-stage dry air filter for cleaning the intake air of air-aspirated internal combustion engines and compressors. The tangentially arranged raw-air nozzle causes the intake air to rotate. Centrifugal forces eject the heavy particulate matter outwards against the housing wall, where it falls into the end cap and is discharged via the dust discharge valve.

The dust discharge valve is not required if an extraction system is used. The initial filtering process (1st filter stage) means that the ENTARON HD is particularly suited for applications involving higher concentrations of dust. The cleaned air then flows through the main filter element (2nd filter stage) and the downstream secondary or safety element (for optional retrofitting, if not included in the scope of delivery) to the clean air nozzle.



The illustration shows a comparable flow pattern using the example of an ENTARON XD.

The shape of the filter elements forms a radial seal to the clean air nozzle. This seal has the following advantages:

- Minimal forces of assembly and disassembly
- Minimal pressure exertion on the paper bellows
- Necessity to assemble the secondary element through the main element
- Necessity to assemble the main element through the end cap

The secondary or safety element prevents particulate matter from entering the engine or compressor during maintenance or when operating with a main element damaged by improper handling. A damaged main element must always be replaced together with the secondary element!

Secondary or safety elements can be retrofitted as optional accessories at any time if they are not included in the scope of delivery.

The maintenance indicator/switch/sensor (option) attached to the maintenance indicator connector indicates or signals when the vacuum produced by the suction exceeds a specified value (e.g. 65 mbar). This means that the specified maximum filter flow resistance has been exceeded and the main filter element must be exchanged.

Quick fasteners (wire clamps with locking levers) secure the end cap to the filter housing.

# 7 INSTALLATION

## 7.1 Special safety instructions



### CAUTION!

- *There is a risk of electrostatic discharge due to the plastic housing of the filter system. During installation, make sure there is a conductive connection to the installation location (grounding).*
- *The clean air nozzle should be horizontal or pointing upwards to stop any particulate matter from entering the clean air line during maintenance. For installation in a different configuration, please consult the manufacturer.*
- *Particulate matter must not get into the clean air nozzle during installation.*
- *Avoid deforming the raw air and clean air nozzles when connecting to the air ducting system (e.g. by using unsuitable or over-tightened hose clamps).*
- *The dust discharge valve should point downwards ( $\pm 15^\circ$  deviation from the vertical) for the easy discharge of pre-separated particulate matter. When combined with an extraction system, the discharge nozzle can be aligned in any direction.*
- *The dust discharge valve must be firmly seated on the discharge nozzle.*
- *The connector of the maintenance indicator must be higher than the central axis of the housing to avoid moisture collecting there.*
- *Make sure not to damage any existing installations when mounting the filter system.*



### NOTE

Check that the scope of delivery is complete and that there are no signs of damage. If the delivery comes with damaged parts, please inform your sales partner.



Where tightening torque requirements are particularly high, special filter housing variants with an integrated reinforcement ring are available on request.

## 7.2 Requirements of the installation location of the ENTARON HD filter system

- The mounting point provided by the customer on the application must be sufficiently stable to absorb the forces that occur and to prevent movements relative to the fastening points.
- Install the filter system in an easily accessible location to ensure trouble-free servicing (inspection and maintenance).
- The filter system in its installation location must not be damaged by contact with other components.
- For installation in a different configuration, please consult the manufacturer.
- The raw air and clean air hoses must be connected without kinking or chafing.
- Provide protection from temperatures exceeding the service temperature, e.g. from adjacent components such as the engine, turbochargers, etc.

## 7.3 Installing the ENTARON HD filter system



### WARNING!

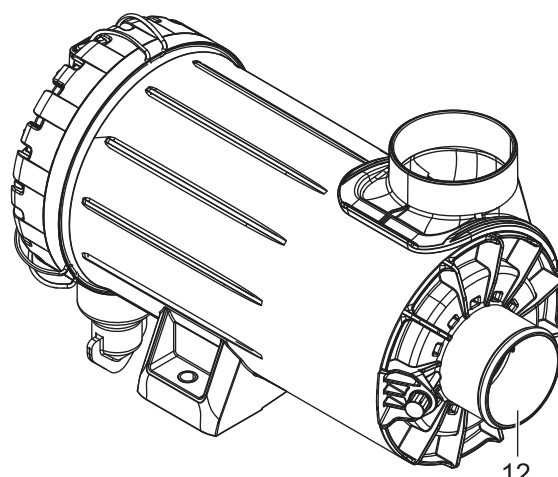
*Do not use the filter system as a step or climbing aid when working on the engine/vehicle.*



### NOTE

Have the product catalogue and/or the proposal drawing ready during the installation to look up information on the spacing and diameter of the mounting holes, the dimensions for screws, nuts and threaded bolts as well as the maximum tightening torques.

1. Decide on a suitable vibration-free location for the installation. Make sure that the clean air nozzle (12) is horizontal or pointing upwards.



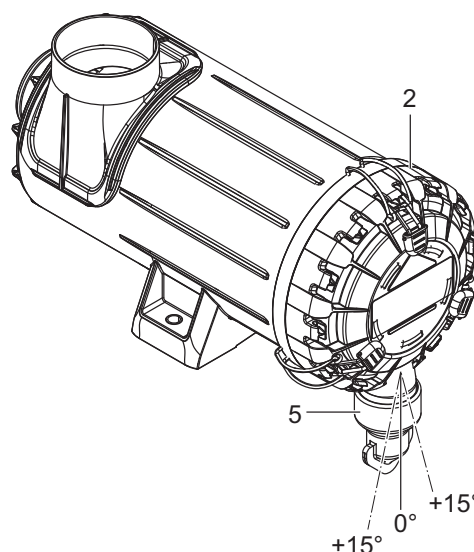
### CAUTION!

*For versions featuring a dust discharge valve (5), this must be installed pointing downwards (a deviation of  $\pm 15^\circ$  from the vertical is permissible). If necessary, loosen the end cap (2) and refasten it after rotating it accordingly. Avoid making contact between the dust discharge valve and any adjacent components to avoid impairing its function.*



Dust discharge (and service life) can be improved by replacing the dust discharge valve (5) and connecting to an extraction system. In this case the position of the dust discharge valve is irrelevant.

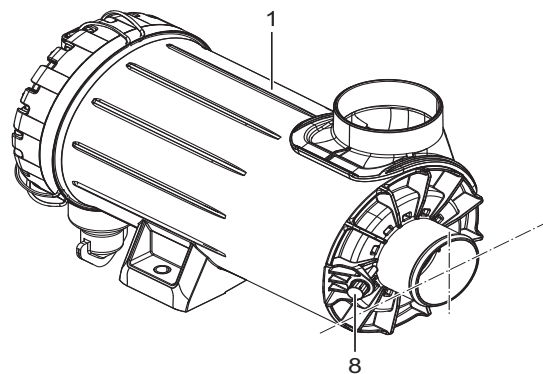
Installation, operation, maintenance and cleaning of this extraction system are performed according to the operating instructions of the system manufacturer.





**CAUTION!**

The connector of the maintenance indicator must be higher than the central axis of the housing (1) to avoid moisture collecting there.



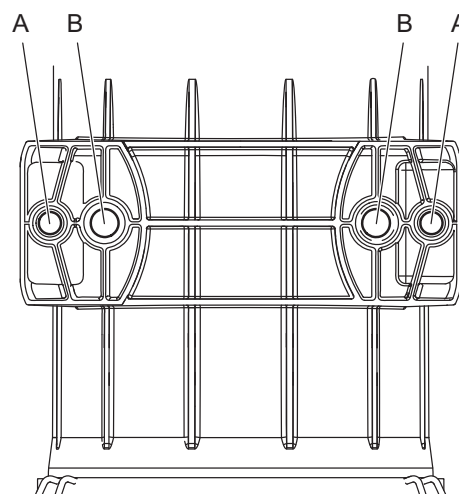
2. If necessary, drill holes for mounting the EN-TARON HD filter system. Ensure that the drill holes are protected from corrosion.



**NOTE**

The dimensions of the hole spacing of the EN-TARON HD filter system can be found in the proposal drawing and/or the product catalogue. Depending on the version, use the through holes (A) or the insert nuts (B) in the integrated bracket (1).

3. Clean the contact surface of the filter system.



4. Fasten the filter system with 2 screws or threaded bolts, washers and self-locking nuts. Depending on the version, use the through holes (A) or the insert nuts (B) in the integrated bracket (1).



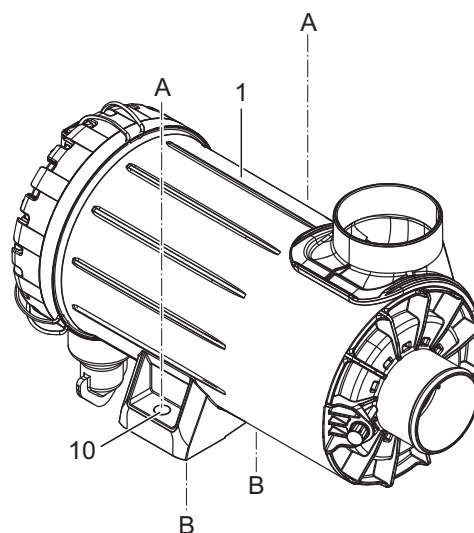
**NOTE**

The dimensions for screws, threaded bolts, washers and nuts as well as the tightening torque can be found in the proposal drawing and/or the product catalogue.



**NOTE**

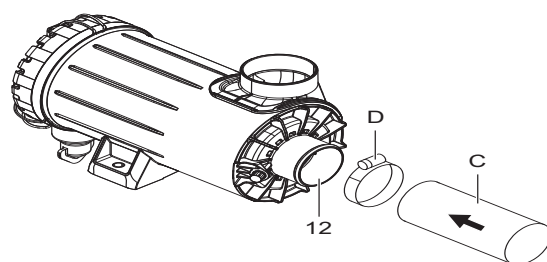
Note the screw-in depth of the threaded inserts of max. 18 mm.



How the ENTARON HD filter system is connected to the air ducting system depends on the application. The following instructions describe the assembly using raw- and clean-air hoses. For information on installing the filter system in non-standard application environments, please refer to the proposal drawing and/or the product catalogue.

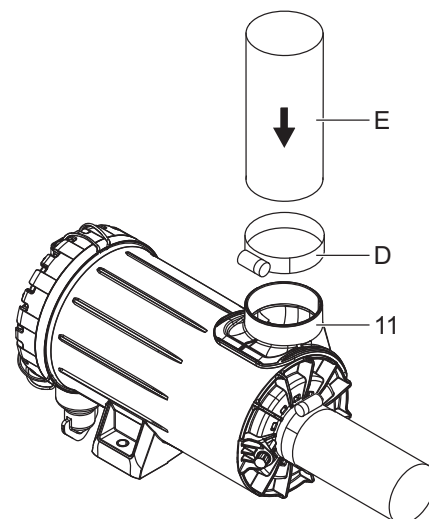
- Fasten the clean air hose (C) to the clean air nozzle (12) using suitable hose clamps (D).

Carefully tighten the hose clamps without deforming the clean air nozzle (12).



- Fasten the intake hose (E) to the raw air nozzle (11) using suitable hose clamps (D).

Tighten the hose clamps without deforming the raw air nozzle (11).



- Optional: Remove the cover cap (9) and screw the maintenance indicator (F) onto the connection thread (8) by hand (until tight).



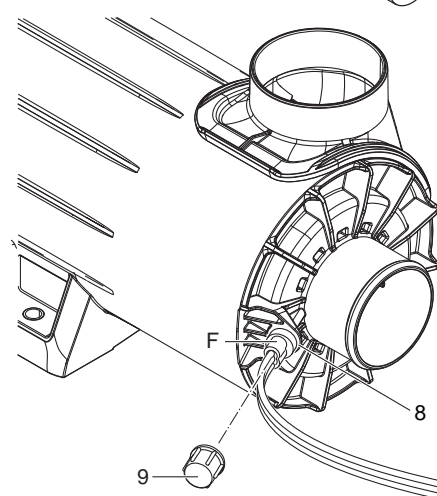
**CAUTION!**

*The fleece in the hole protects the clean air side from contamination when the cover cap is unscrewed and must not be removed.*



**NOTE**

For detailed information on the required tightening torques, please refer to the proposal drawing and/or the product catalogue.



# 8 EXCHANGE/DISASSEMBLY

## 8.1 Special safety instructions



### CAUTION!

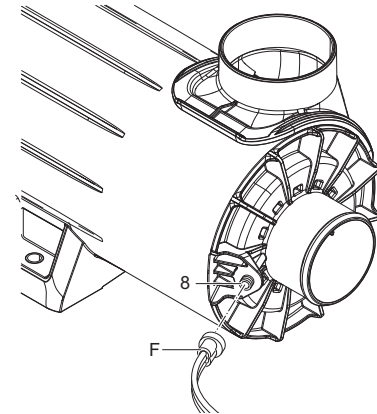
- *In normal operation, never run the engine without the main filter element! In emergencies, short-term operation is possible with the secondary filter element only. Following this, the secondary filter element must be replaced!*
- *Make sure that no contaminants enter the air ducting system when the clean air hose is removed.*
- *Be sure not to damage any existing installations when disassembling the filter system (1).*
- *Secure any loose connection cables and hoses against unintentional movement.*

## 8.2 Disassembling the ENTARON HD filter system

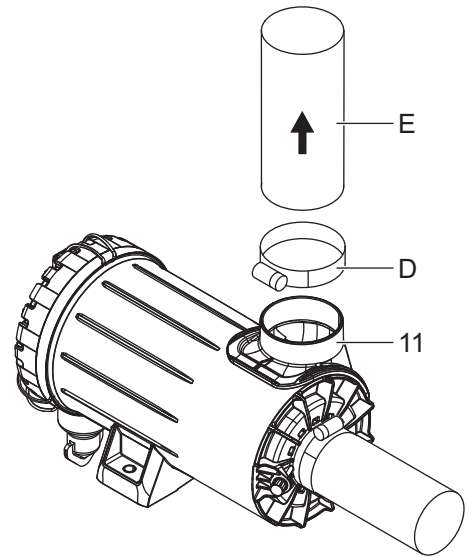


How the ENTARON HD filter system is connected to the air ducting system depends on the application. The following instructions describe the disassembly where raw- and clean-air hoses are used. When disassembling the filter system in other application environments, note the information from the respective application manufacturer.

1. Optional: Unscrew the maintenance indicator (F) from the connector thread (8).



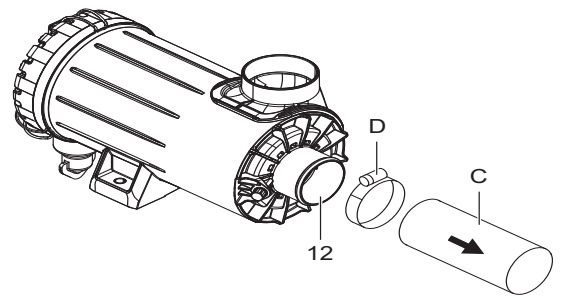
- Loosen the hose clamp (D) on the intake hose (E) and pull the intake hose (E) off the raw air nozzle (11).



- Loosen the hose clamp (D) on the clean air hose (C) and pull the clean air hose (C) off the clean air nozzle (12).



**CAUTION!**  
 Fix the clean air hose (C) with the opening facing down so that no contaminants can enter the clean air side of the air ducting system.



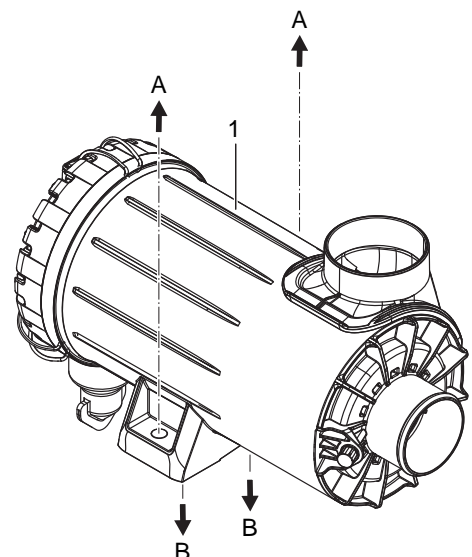
- Loosen the screws (A) or threaded bolts (B) that secure the filter system to the application and remove the filter system (1).



The mounting described here may differ from the actual application environment.



In you are exchanging the system, install the new EN-TARON HD filter system in accordance with chapter 7 on page 11.





# 9 CHECKS

## 9.1 Special safety instructions



### **CAUTION!**

- ***In normal operation, never run the engine without the main filter element! In emergencies, short-term operation is possible with the secondary filter element only. Following this, the secondary filter element must be replaced!***
- ***The operator is recommended to check the filter system for externally visible damage and defects at regular intervals (i.e. once a week).***
- ***If any changes occur (e.g. to the operating behaviour) that impair functionality, report this to the manufacturer or the vendor immediately.***

## 9.2 General check

1. Check that the filter system is bolted to the vehicle tightly (no vibration).
2. Check the entire filter system for damage.
3. Check that the connection cable for the maintenance indicator/switch/sensor (optional) and the hose on the clean air outlet nozzle are tightly connected to the filter system. Check for any damage (kinks, chafing) and for a secure fit to the vehicle.
4. Check whether the maintenance indicator (optional) is properly connected to the on-board electronics (only applies to the electronic maintenance indicators).
5. Check the maintenance indicator for external signs of damage or defects.
6. Check the dust discharge nozzle and dust discharge valve for damage.
7. Check the filter elements for damage.
8. Check the end cap and/or multicyclone block and the wire clamp for correct and secure fit.
9. Start the engine.
10. Check the entire filter system and all hoses for leaks.
11. Check that the maintenance indicator (optional) is working, if applicable.

## 9.3 Function check of the maintenance indicator/switch/sensor system (optional)



### NOTE

The function check of the (optional) maintenance indicator/switch/sensor should be conducted at regular intervals (e.g. annually).

1. Detach the raw air nozzle of the ENTARON HD filter system from the air ducting system of the machine or application.
2. Start the engine.
3. Slowly cover up the intake opening on the multicyclone block with a suitable, stable plate (e.g. sheet metal or plastic plate) until the maintenance indicator responds.



### CAUTION!

*The air intake opening must not be further reduced in size after the maintenance indicator/switch responds, to prevent any damage to the application or machine (e.g. engine, compressor and maintenance indicator).*

4. Reset the maintenance indicator by pressing the Reset button, if applicable.
5. Reconnect the raw air nozzle to the air ducting system of the machine or application (see chapter 7.3 "Installing the ENTARON HD filter system" on page 12).



### NOTE

Further function checks will be outlined in the separate maintenance instructions for the respective maintenance indicators.



### NOTE

A defective maintenance indicator should be replaced. For information about the exchange, see chapter 8 "Exchange/Disassembly" on page 15 and chapter 7 "Installation" on page 11.

# 10 MAINTENANCE

## 10.1 Special safety instructions



### CAUTION!

*In normal operation, never run the engine without the main filter element!*

## 10.2 Storing filter elements



### CAUTION!

- *Protect stored filter elements against UV radiation, dust, moisture and damage.*
- *Store the filter elements out of the reach of insects and rodents.*
- *If possible, keep at least one spare element in stock for each filter element used.*
- *MANN+HUMMEL guarantees the function of properly stored filter elements for up to 4 years after purchase.*

## 10.3 Maintenance plan

Activity	Interval	Comment
General check	– Weekly	See chapter 9.2 on page 17.
Replace the main filter element	<ul style="list-style-type: none"> <li>– According to the operating instructions of the engine or device manufacturer.</li> <li>– If the maintenance indicator was triggered.</li> <li>– With a hard or brittle seal.</li> <li>– At the latest after 2 years.</li> </ul>	See chapter 10.3.1 on page 19 The main filter element should only be cleaned in emergencies (see the chapter 10.3.2 on page 23)
Replace the secondary filter element (optional)	<ul style="list-style-type: none"> <li>– After servicing the main filter element 3 - 5 times.</li> <li>– If the main filter element is damaged.</li> <li>– After an emergency short-term operation with the secondary filter element only.</li> <li>– After 2 years at the latest.</li> </ul>	See chapter 10.3.3 on page 23
Check and clean or exchange the dust discharge valve	<ul style="list-style-type: none"> <li>– Depends on the dust concentration in the environment (e.g. daily in very dusty conditions).</li> <li>– Annually for valve-rubber brittleness.</li> </ul>	See chapter 10.3.4 on page 24 The valve will not close properly if the rubber is brittle.
Check the plastic housing	<ul style="list-style-type: none"> <li>– When servicing the filter.</li> <li>– Depends on the operating conditions and type of particulate matter</li> </ul>	See chapter 9.2 on page 17 Clean the inner and the seal seat
Check maintenance indicator (optional)	– Annually	See chapter 9.3 on page 18



### NOTE

**Operators can define their own maintenance plans and intervals in addition to those stipulated in this Installation and Maintenance Manual.**

### 10.3.1 Changing the main filter element



**CAUTION!**

*During disassembly of the filter element, make sure that no contaminants enter the clean side of the air ducting system.*



**CAUTION!**

- *Use only an original MANN-FILTER.*
- *To avoid the risk of engine damage, never install replica elements from other manufacturers!*



**NOTE**

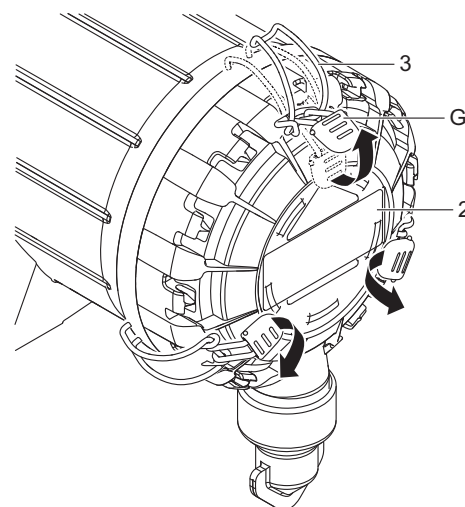
The main filter element is replaced according to the operating instructions of the engine or device manufacturer after the (optional) maintenance indicator is triggered, or after 2 years at the latest.

1. Remove the wire clamp (3) from the end cap (2).

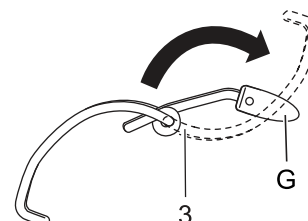


**CAUTION!**

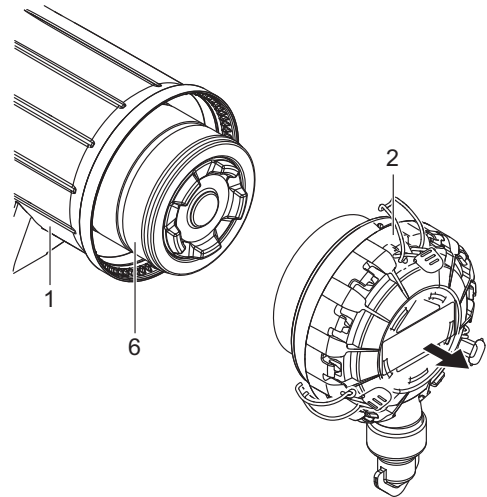
*The wire clamps (3) may be under high mechanical tension and snap free accordingly. For this reason, hold the wire clamp (3) by the clamp levers (G) when opening.*



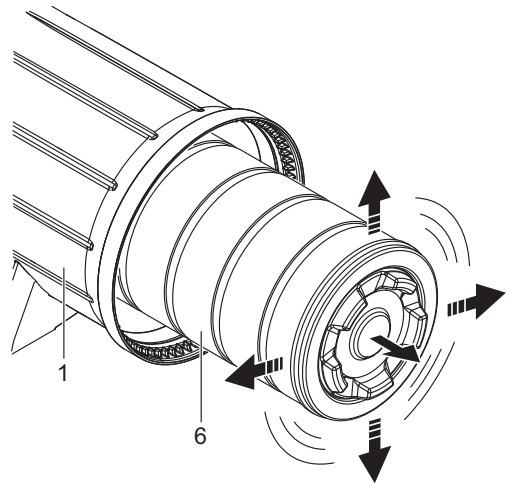
You can jam the wire clamps (3) open by applying light pressure to the coloured clamp levers (G) to ensure that the wire clamps do not become trapped between the filter housing (1) and the end cap (2) during assembly.



- Remove the end cap (2) from the filter housing (1).



- Pull the main filter element (6) out of the filter housing (1) by gently rocking and rotating it at the same time.

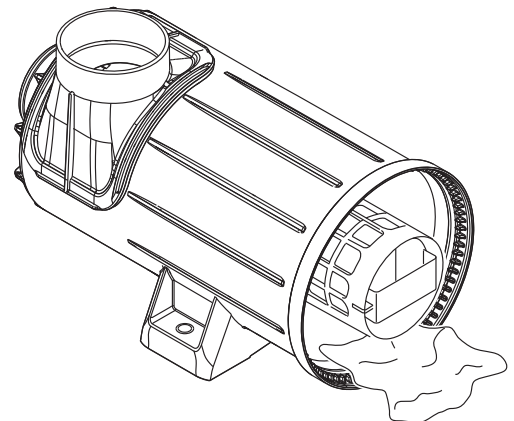


- Use a damp cloth to thoroughly clean the inside of the housing and the seal seating.

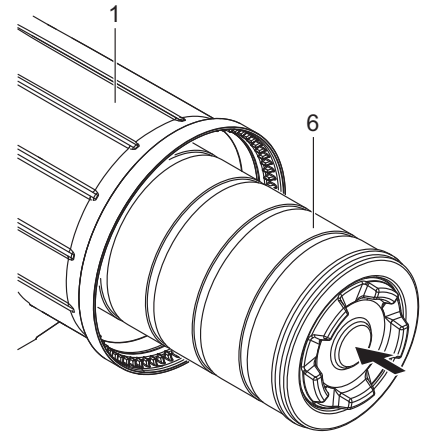


**CAUTION!**  
***Make sure that no dust or dirt gets into the clean air side of the housing.***

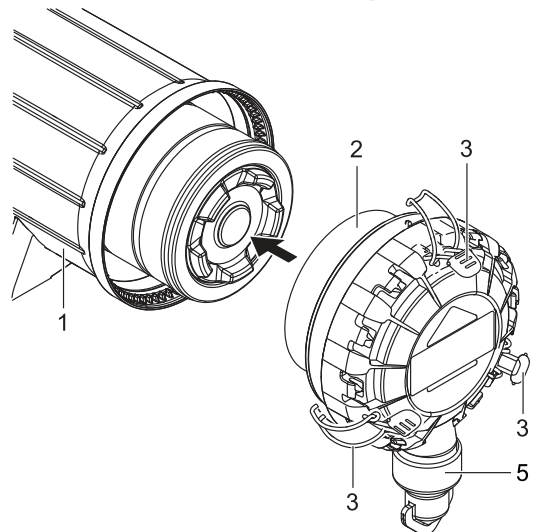
- Replace the secondary filter element, if applicable (see chapter 10.3.3 on page 23).



6. Mount the security element first, if applicable.
7. Insert the open end of the new main filter element (6) into the filter housing (1) and press it in firmly.



8. Fit the end cap (2) to the housing (1). Close the wire clamps (3) by placing them one after the other in the groove on the housing (1) and pressing the clamp levers onto the end cap (2).



**CAUTION!**  
 When installing the end cap (2), be careful of the position of the dust discharge valve (5) (see chapter 7.3 on page 12).

### 10.3.2 Cleaning the main filter element



#### CAUTION!

- *Since small defects are difficult or even impossible to detect, we recommend that you always install new elements in order to protect the machines or devices!*
- *Under no circumstances should damaged main filter elements be reused. If in doubt, always use a new MANN-FILTER main filter element.*
- *Regardless of the number of operating hours, main filter elements must be replaced after 2 years at the latest.*
- *If cleaning is unavoidable, make sure that you clean the main filter element using compressed air only.*
- *Never wash, brush or beat the main filter element clean.*
- *When blow cleaning, use dry compressed air with max. 5 bar.*
- *Make sure that no dust gets inside the main filter element when blow cleaning.*
- *MANN+HUMMEL assumes no liability if cleaned elements are reused.*
- *Before reinstalling, the cleaned main element must be checked thoroughly for signs of damage to the paper bellows and seals.*
- *After servicing the filter element, use a damp cloth to thoroughly clean the inside of the housing and the seal seating (see chapter 10.3.1 on page 20).*

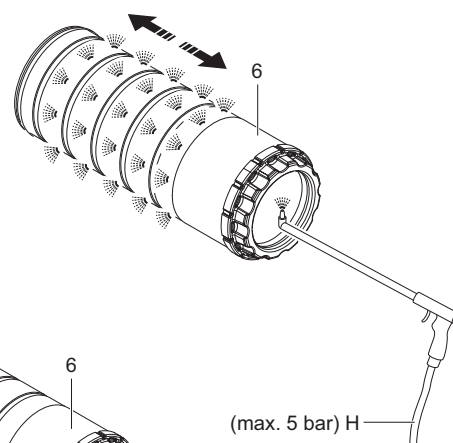
1. Attach a compressed air gun with a tube (H) to the end of a compressed air hose.



#### NOTE

The tube on the compressed air gun (H) must be at least as long as the main filter element (6). Use a tube with its end bent by approx. 90° so that you can reach the whole of the main filter element's interior.

2. Use the tube (H) to blow dry compressed air (max. 5 bar) into the main element (6) from the inside to the outside. Do this while moving the tube (H) up and down until no more dust escapes.



#### CAUTION!

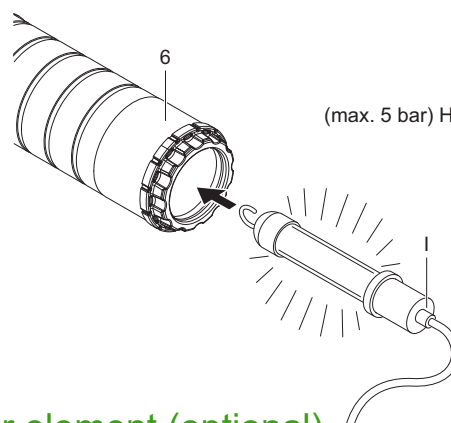
*Avoid damage by ensuring that the tip of the tube (H) does not come into contact with the filter paper.*

3. Check the folds of the paper bellows for cracks and holes using a suitable inspection lamp (I).



#### NOTE

You can best detect even the slightest damage by carrying out the test in a darkened environment.



### 10.3.3 Replacing the secondary filter element (optional)



#### CAUTION!

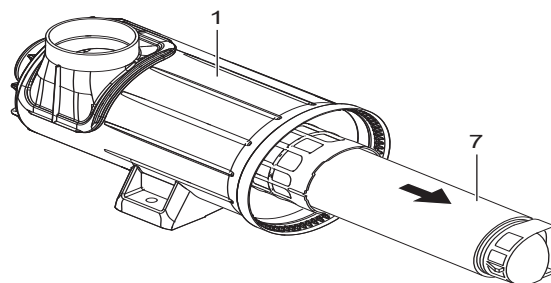
- *The secondary filter element must not be cleaned.*
- *It must not be reused after being disassembled.*

- *During disassembly of the filter element, make sure that no contaminants enter the clean side of the air ducting system.*
- *Hold the secondary filter element firmly by its stable basket when inserting it and match up the positioning lug on the filter element with the notch on the housing centre tube.*
- *Be careful not to damage the fleece when inserting it.*
- *In emergencies, short-term operation is possible with the secondary filter element only. You must then replace the secondary filter element.*
- *Use only original MANN-FILTER elements.*

**NOTE**

The secondary filter element is changed after every 3rd to 5th servicing of the main filter element or at the latest after 2 years.

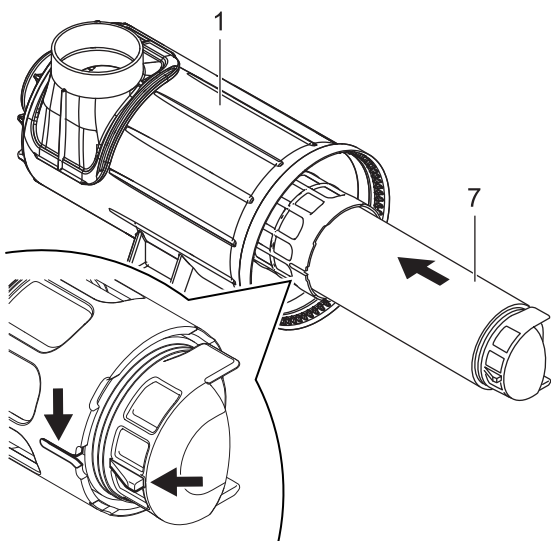
1. Remove the main filter element (6) (see chapter 10.3.1 on page 20).
2. Pull the secondary filter element (7) out of the filter housing centre tube (1)



3. Carefully insert a new secondary filter element (7) into the housing (1).

**CAUTION!**

*When inserting the secondary filter element, make sure that the positioning lug on the filter element matches the notch on the housing centre tube.*



4. Insert the main filter element (6) (see chapter 10.3.1 on page 20).

### 10.3.4 Changing the end cap

The end cap for the ENTARON HD filter system is available as a spare part. The wire clamps must be attached before installation.



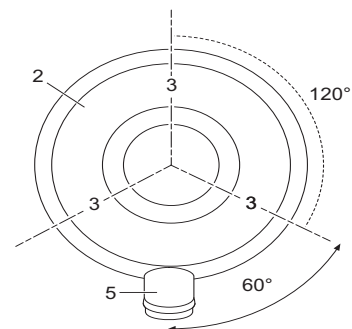
1. Determine the positions of the wire clamps (3) on the end cap (2) (see schematic illustration on the right).



Use the locking positions of the original cap as a guide. If in doubt, spread the clamps evenly around the circumference of the cap.



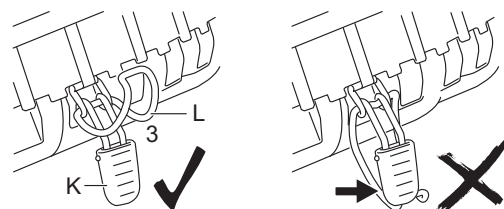
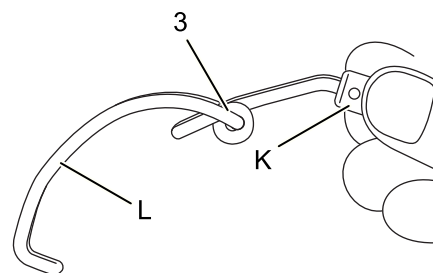
**CAUTION!**  
Mind the position of the dust discharge valve (5) – see chapter 7.3 on page 12.



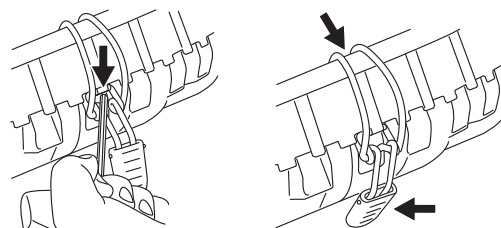
2. Bring the wire clamps (3) into position.



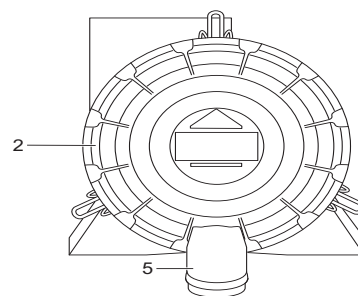
When positioning the cap, the lever (K) of the wire clamp (3) must be above the locking hook (L).



3. Open the wire clamp (3) with a pair of spreader pliers and insert the splayed end into the groove on the housing cover (2).
4. Check that the wire clamp (3) is firmly seated and mount the end cap (2) onto the filter housing.



**CAUTION!**  
When installing the end cap (2), mind the position of the dust discharge valve (5) (see chapter 7.3 on page 12) and ensure that the cap seal is in place and correctly seated.



### 10.3.5 Cleaning the dust discharge (nozzle and valve)



#### CAUTION!

- *The suction of the filter system keeps the dust discharge valve closed during operation. Only remove the dust discharge valve if it is essential to do so.*
- *Locate the dust discharge valve in free space. Do not let to touch or be deformed by other structures of the application or machine.*
- *Do not deform the dust discharge valve when fitting it to the discharge nozzle. A damaged dust discharge valve must be replaced.*
- *A brittle/hardened dust discharge valve should be replaced to ensure the initial filtering function.*
- *Use only original MANN-FILTER elements.*



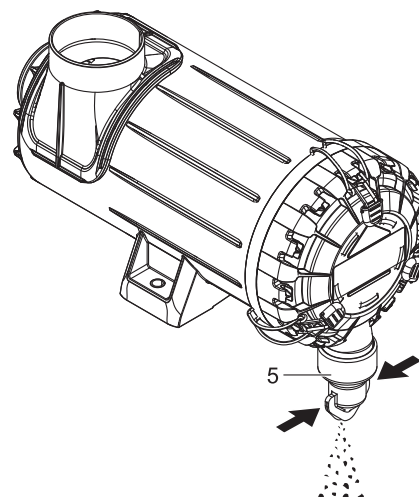
#### NOTE

How often you check the dust discharge valve depends on how dusty the environment is. In very dusty conditions, clean the dust discharge valve daily.



Depending on the environment of the application, the dust discharge nozzle can be connected to an extraction system. Maintenance and cleaning of this extraction system is performed according to the operating instructions of the system manufacturer.

1. Open the lips of the valve to remove any dust deposits by squeezing the wider section of the dust discharge valve (5).



# 11 TROUBLESHOOTING



**CAUTION!**  
Use only original MANN-FILTER elements.

Fault / error	Cause	Solution
Dust accumulation in the housing	Dust discharge nozzle clogged, brittle, hard or defective	Service the valve (see chapter 10.3.5 on page 26). Possibly replace dust discharge valve.
Significant dust accumulation on the clean air side downstream of the filter	Lines/connections on the clean air side leaking downstream of the filter	Remove dust thoroughly, seal lines/connections.
Significant dust accumulation on the clean air side in or downstream of the filter	Main filter element defective	Remove dust thoroughly, replace the main filter element (see chapter 10.3.1 on page 20). Replace the secondary filter element (see chapter 10.3.3 on page 23).
	Incorrect maintenance	Remove dust thoroughly, perform maintenance correctly (see chapter 9.3 on page 18).
	Housing not closed correctly	Remove dust thoroughly, check for damage to the main filter element, housing, and latches on the end cap, replace if necessary, and close the housing correctly (see the chapter 10.3.1 on page 20)
	Wrong main and/or secondary filter element inserted	Remove dust thoroughly, insert correct filter elements.
Maintenance indicator/switch/sensor system (optional) does not respond despite strong contamination of the filter element	Maintenance indicator defective	Check the maintenance indicator (see chapter 9.3 on page 18), replace it if necessary and check again.
	Lines, housing and/or main filter element leaking or damaged	Thoroughly clean the clean-air side, eliminate leaks, replace damaged parts.
Maintenance indicator (optional) constantly triggering	Blockage of raw-air tubing and/or intake	Check whether raw-air tubing and/or intake are free.
	Main filter element worn out	Replace the main filter element (see chapter 10.3.1, page 20)
	Secondary filter element worn out	Replace the secondary filter element (see chapter 10.3.3, page 23)
	Maintenance indicator defective	Replace maintenance indicator

# 12 DISPOSAL

Component	Material	Disposal
Main filter element	Bellows filter: Filter paper/cellulose Sheath: Coloured film PP Foaming: PUR	According to local regulations
Secondary filter element	Bellows filter: Fleece Centre tube PP-T20 Foaming: PUR	According to local regulations
End cap	PP-T20	Plastic recycling
Housing	PP-T20 Centre tube PP-T20 Through hole: Steel Insert nut: Brass	Plastic recycling Metal recycling
Wire clamps	Spring-steel wire, Cr6-free Clamp levers (PA6-GF30)	Metal recycling Plastic recycling
Dust discharge nozzle	NBR	Rubber recycling

