AFS Airfilter Systeme GmbH

Original Instruction Manual for AFS Air Purification Devices for Removing Oil and Emulsion Mist
This instruction manual applies to the following AFS air purification devices:

AFS 600, AFS 1100, AFS 1600, AFS 3000, AFS 4000, AFS 6000, AFS 8000, AFS 12000, AFS 16000. Each classification corresponds to the AFS device's exhaust air output in m$^3$/h.

Inhalt

1 General Information .................................................................................................................. 2
   1.1 Importance of the Instruction Manual .............................................................................. 3
   1.2 Target Audience for the Instruction Manual ................................................................. 3
   1.3 Disclaimer .......................................................................................................................... 3
   1.4 Appropriate Use ............................................................................................................... 3
   1.5 Product Safety .................................................................................................................. 4

2 Safety instructions .................................................................................................................. 5
   2.1 Danger Due to Unloading and/or Transportation ........................................................... 5
   2.2 Danger from Doors and Inspection Doors ..................................................................... 5
   2.3 Danger Due to Electrical Power ..................................................................................... 5
   2.4 Danger Due to Ventilators .............................................................................................. 5
   2.5 Danger from Flaps, Cutoff Devices, or Shutters ............................................................. 6

3 Transportation and Loading .................................................................................................... 6
   3.1 Transport Damage and Missing Parts ............................................................................. 6

4 Design and function of the AFS air purification device .......................................................... 7
   4.1 Operating principle ......................................................................................................... 7
   4.2 Design ............................................................................................................................. 7

5 Installation and Startup .......................................................................................................... 9
   5.1 Device Assembly .............................................................................................................. 9
   5.2 Pipe or Hose Connections .............................................................................................. 9
   5.3 Siphon Connections ....................................................................................................... 9
   5.4 Electrical Connections ................................................................................................... 11
      5.4.1 Electrical Connection of AFS Air Purification Device .............................................. 11
      5.4.2 Motor protection ....................................................................................................... 12
      5.4.3 Electrical Connection of AFS Air Purification Devices with Frequency Converters (Optional) .................................................................................................................. 12
   5.5 Protective Conductor System .......................................................................................... 13
   5.6 Startup Operations ......................................................................................................... 13

6 Operation ............................................................................................................................... 14
   6.1 AFS air purification devices without frequency converters ........................................... 14
      6.1.1 Turn on ...................................................................................................................... 14
      6.1.2 Turn off .................................................................................................................... 14
   6.2 AFS Air Purification Devices with Frequency Converter (Optional) ................................ 14
6.2.1 Turning the System On: ................................................................. 14
6.2.2 Switch off the system ................................................................. 14
6.3 Follow-up time .............................................................................. 15
6.4 Motor protection: Acknowledge faults ............................................ 15
7 Maintenance ...................................................................................... 16
7.1 Maintenance Work and Cycles for Oil and Emulsion Mist Separation ................................................................. 16
7.1.1 Metal mesh preliminary separator (pos. ①) .................................. 17
7.1.2 Preliminary filter fleece (pos. ②) .................................................... 17
7.1.3 Longlife separator (pos. ③) ........................................................... 18
7.1.4 Post filter H13 (Pos. ④) ................................................................. 19
7.1.5 Metal mesh follow-up separator (pos. ⑤) ...................................... 20
7.1.6 Ventilator (pos. ⑥) ..................................................................... 20
7.1.7 Siphon (pos. ⑦) .......................................................................... 21
7.2 Overview of maintenance intervals ................................................. 21
7.3 Volumetric flow rate monitoring (optional) ..................................... 23
7.3.1 MPR Functionality ....................................................................... 23
7.3.2 MPR Connections ....................................................................... 24
7.3.3 MPR Error Diagnostics ................................................................. 24
8 EG-Konformitäts-Erklärung .............................................................. 25
9 Wear parts ......................................................................................... 26

Explanation of Symbols

⚠️ Safety precautions, danger point, or important or absolutely mandatory instructions


ℹ️ Important additional information or advice for use

1 General Information

AFS Airfilter Systeme GmbH (AFS) manufactures highly efficient mechanical air purification devices and systems that remove oil, emulsion, and minimal lubricant mist from the air, protecting the workplace environment in metalworking shops.

Moreover, as a special construction, AFS also manufactures air purification devices for cleaning air contaminated with solvents in areas that are not at risk of explosion as well as for exhaust air that accrues in dry processing.

⚠️ AFS devices are not ATEX-certified!
Our AFS air filter systems are today’s air purification devices both with respect to their safety levels and operating safety. By labeling devices with the CE label, we are confirming that the risk and hazard assessment meets the standards of the valid EC Machinery Directive 2006/42/EC and valid EMC Directive 2014/30/EU; see the EC declaration of conformity appendix.

The type plate, which lists the device type, serial number, and CE mark, is attached to the device’s door or at the rear of the device.

The relevant norms as well as local, national, and international regulations apply. They are to be observed and obeyed.

1.1 Importance of the Instruction Manual

Read this instruction manual carefully before installation and startup to ensure proper use! Please note that this instruction manual only applies to the particular device and not to the entire system!

The present instruction manual facilitates safe work on and with the device named. It contains safety information that must be observed as well as information that is necessary for undisturbed operation of the device.
The instruction manual is to be kept with the device. The instruction manual must be kept available to any person who is to interact with the device at all times. The instruction manual is to be kept for further use and must be passed on to each successive owner, user, or end customer.

1.2 Target Audience for the Instruction Manual

The instruction manual is directed at those who are entrusted with planning, installing, operating, maintaining, or repairing the device and who have the qualifications and knowledge necessary to execute their activities.

1.3 Disclaimer

This instruction manual has been examined to ensure that its contents coincide with the hardware and software of the device described. Nonetheless, there may be discrepancies; no guarantee of complete agreement is implied. We reserve the right to make changes in the construction and technical data in the interest of further development. Therefore, no claims may be derived from the information, illustrations or drawings, or descriptions. Errors are excepted.
AFS will not be liable for damages due to incorrect use or inappropriate use or that are incurred as a consequence of unauthorized repairs or alterations.

1.4 Appropriate Use

AFS air purification devices are intended exclusively for separating and cleaning exhaust air that contains coolant lubricant from machining tools and centers used in metalworking shops or for the tasks named in the order confirmation. Any other or additional use that is not contractually agreed upon will be considered inappropriate. The manufacturer will not be liable for any resulting damages. The company that uses the device will bear all risk.
Intended use also includes reading this instruction manual and adhering to all of the information contained therein particularly the safety information (color code). Instruction manuals for any attached components

Neither transfer or reproduction of these documents nor application or disclosure of their content are permitted without the explicit approval of AFS. Violations will require compensation for damages.
are also to be observed. The device operator, not the manufacturer, will be responsible for all damages to persons or property that result from inappropriate use.

1.5 Product Safety

The device was the best available technology at the time of its sale and is regarded as fundamentally reliable. The device and its accessories may only be installed and operated in sound condition and with due regard for the installation and operating instructions. Operation outside of the confines of the device's technical specifications (identification plate and addendum/technical data) may damage the device and could cause additional damages!
2 Safety instructions

2.1 Danger Due to Unloading and/or Transportation
Severe personal injury due to falling:
- Secure the AFS device against tipping and falling.
- Avoid standing under floating loads.
- Secure the assembly area.

2.2 Danger from Doors and Inspection Doors
Low pressure prevails when AFS devices are in operation.
- Danger of hand crushing due to pressure from doors and inspection doors on the low-pressure side:
  - Open doors only after the ventilator has stopped.
- If AFS air purification devices are operated in conjunction with multiple devices, then all of the devices must be turned off before a door or maintenance door is opened.

2.3 Danger Due to Electrical Power
- Danger of electric shock – potentially fatal – from contact with live components:
  - Always ensure that there is no electrical power before working.
- Danger of electric shock – potentially fatal. Some electric circuits such as the electronics in the ventilator may be charged for a few minutes after the electrical supply has been interrupted:
  - After turning off the electricity, wait at least three minutes before beginning to work on or near electrical components.
- Danger of electric shock due to static charge in the housing:
  - Ground the device (see Chapter 5.5).
- Danger of electric shock due to short circuit upon contact between electrical components:
  - All cables must be examined for assembly damage or insulation damage before operation.
- Danger of electric shock due to wet cleaning the device:
  - Always clean without electrical currents.

2.4 Danger Due to Ventilators
- After electrical tension has been interrupted, the ventilator can be started up again automatically.
- Fatal or severe injury from ventilator rotor:
  - Keep persons and objects away from the ventilator rotor.
  - For all work on the AFS device, switch off power to the system and wait for the ventilator to stop running.
Fatal or severe injury from the ventilator’s suction effect on clothing and hair:
- Never wear loose clothing and tie up long hair.
- For all work on the AFS device, switch off power to the system and wait for the ventilator to stop running.

Fatal or severe injury from rotor bursting if the maximum permissible operating speed is exceeded:
- Always operate the ventilator within permissible operating speed range.
- For all work on the AFS device, switch off power to the system and wait for the ventilator to stop running.

2.5 Danger from Flaps, Cutoff Devices, or Shutters
Flaps, cutoff devices, or shutters may be built into the pipes or ducts leading to or from the AFS air purification device.

Danger of finger crushing due to the motion of a shut-off flap:
- Keep hands away from the flap area.

Danger of hand injuries due to closing shutter flaps:
- Keep hands away from the flap area.

3 Transportation and Loading
The devices are delivered on non-returnable pallets and may be recycled by the recipient.

All other components are delivered in recyclable non-returnable packaging to be recycled by the recipient.

The devices can be transported and moved using a forklift (by lifting the entire transport pallet with the device) or, if they are fitted with lifting eyes, lifted off the pallet using transport chains.

AFS devices may only be transported, loaded, or handled by qualified personnel with appropriate professional qualifications.

3.1 Transport Damage and Missing Parts
Please check the delivery for completeness using the delivery documents / part lists as a reference and check the device for transport damage in the presence of the forwarder immediately on receipt. If there are any damaged or missing parts, please take a written note of this, let the forwarder countersign this note, and immediately notify the respective transport company and AFS, in the case of

Visible damage: Immediately, i.e. without undue delay.
Hidden damage: Within one week.
4 Design and function of the AFS air purification device

The operating principles and basic structure of all AFS air purification devices are the same; they differ only in scale, ventilation system performance, airflow direction, number of filters used per cross-sectional area (regardless of device type), color and layout of attachments.

4.1 Operating principle

Aerosols and particles from the coolant lubricant in the machine exhaust air are separated from/filtered out of the air current in the AFS air purification device. The separated coolant lubricant accumulates in the bottom area of the air purification device and drains through the two siphon lines. The suction output is generated by a motor fan wheel. The motor fan wheel is located in the airflow direction after the post filter and thus on the clean gas side.

4.2 Design

Figure 1: Exemplary design and component description using an AFS 100 with suction left as an example.

1 Suction on all sides of the device possible
2 Housing
3 Exhaust vent
4 Installation space for motor fan wheel
5 H13 filter or metal mesh follow-up separator
6 Maintenance opening (doors)
7 Hose or pipe connection
Figure 2: Exemplary description of material flows as well as separator and filter stages using the AFS 1600 as an example

A  polluted machine exhaust air  
B  purified exhaust air  
C  separated coolant lubricant/condensate

1  5-stage preliminary separation  
2  Follow-up separator

Figure 3: Elements of the preliminary separation in AFS air purification devices

1  Metal mesh preliminary separator  
2  Filter fleece (depicted without alternate frames)  
3  Longlife separator
5 Installation and Startup

5.1 Device Assembly

The device must always be set up horizontally on a rigid and, if possible, vibration isolated base.

The minimum distances between the device and ceilings, walls etc. required to ensure proper operation are:

- Top of the device (exhaust air outlet): > 800 mm
- Motor side: > 500 mm
- Door side: > 800 mm
- Bottom of the device (siphon connection): > 500 mm

These minimum distances must be observed to ensure that the device can operate properly.

5.2 Pipe or Hose Connections

Devices for connecting suction pipes or hoses must be arranged as follows:

- Kink-free
- Large bending radius (radius ≥ diameter)
- About 3° slope toward the air purification device or suction point
- No water pockets or sagging pipes
- If low points are unavoidable, for instance in passages that run below girders, the lowest point is to be equipped with a condensate drain with a siphon outflow.

The extraction opening on your processing machines should be fitted with a baffle plate to prevent droplets of coolant lubricant from entering the pipe:

- There should be a ca. 100 mm gap between this opening and the wall
- The cover over the extraction opening should be at least 100 mm on all sides
- The surface of the annular passage should be at least as large as the cross-sectional area of the suction pipe.

5.3 Siphon Connections

Two ½” outlets (three outlets for AFS 12000 and AFS 16000) are located on the bottom of the device for draining the coolant lubricant.

A siphon connection must be installed at each opening and filled with coolant lubricant.

The siphon lines must lead to a collection container or a collecting pipe.

The following points must always be observed. Otherwise the device will no longer function properly.

- Siphon design as a U pipe or loop based on Figure 4.
- The distance between the bottom of the device and the top siphon loop must be:
  - At AFS devices 600-1600 at least 200 mm
  - At AFS devices 3000-16000 at least 250 mm
- The height of the loop or U pipe must be:
  - At AFS devices 600-1600 at least 200 mm
  - At AFS devices 3000-16000 at least 250 mm
- The pipe must point downward in the direction of the collection container or collecting pipe.
- No low points or water pockets.
- Each siphon opening must be connected separately.
After the device has been installed or after longer periods of disuse, the siphons must be manually filled with coolant lubricant. To make sure: When filling the siphon, there must be fluid coming out of the bottom hose line or pipe!

![Diagram of siphon installation for AFS air purification devices](image)

**Figure 4:** Siphon installation for AFS air purification devices

Once past the siphons, the drain pipes can be joined into one pipe. See Figure 5 and Figure 6.

![Properly connected siphons](image)

**Figure 5:** Properly connected siphons

![Improperly connected siphons](image)

**Figure 6:** Improperly connected siphons
5.4 Electrical Connections

**Safety Instructions:**

- Electric motors contain dangerous components that are live and rotate during operation. If operated incorrectly, used improperly, or inadequately serviced, these components can cause damage to health and property.

- The devices are only to be accessed for work if the system has been disconnected from the power supply. The devices must also be protected from being accidentally reconnected.

- The devices' electrical components, such as electric motors, servomotors, control and monitoring systems, must be connected as specified in the manufacturer's instructions and the regulations of the relevant electricity board.

- The German Electrotechnology Federation's (VDE) regulations must be adhered to. Work on electrical components must be carried out only by qualified electricians.

- The drive motors for the ventilator wheels are always fitted with thermostat relays or PTC thermistors for motor protectors and must be connected accordingly.

5.4.1 Electrical Connection of AFS Air Purification Device

The accompanying instruction manual for the engine or engine fan wheel must be observed.

- The German Electrotechnology Federation's (VDE) regulations must be adhered to. Work on electrical components must be carried out only by qualified electricians.

- Once the ventilator motor has been connected, it is vital to make sure that the radial wheel rotates in the direction indicated by the direction arrow on the front of the device before starting up the air purification device.

![Figure 7: Backward cranked radial wheel with direction arrow](image)

If the rotor rotates in the wrong direction, the motor’s direction of rotation must be reversed by changing the electric poles (reversing the phases).
5.4.2 Motor protection

Various motor concepts are built in depending on the device type. Please inform yourself regarding the built-in motor and its protection devices using the supplied motor instruction manual or with AFS directly.

The protection devices and installation guidelines described in the motor instruction manual must be heeded. Make sure the motor does not restart by itself after a possible fault.

5.4.3 Electrical Connection of AFS Air Purification Devices with Frequency Converters (Optional)

The instruction manual for the frequency converter that is provided and the installation instructions contained within them must be observed for air purification devices with frequency converters for regulating the flow rate by controlling the rotation speed of the engine fan wheel.

When AFS air purification devices with frequency converters are operating, a lockable repair switch must be placed inside the feed line before the frequency converter (DON EN 13053-6.3.1).

The AFS device and the frequency converter must not be serviced unless the frequency converter and the AFS device have been shut off using the repair switch. While work is ongoing, the repair switch must be secured with an individualized, lockable closure against unauthorized or accidental restarting.

The repair switch and the frequency converter as well as the frequency converter and the AFS device are to be connected by a qualified and competent specialist and in accordance with all current guidelines and VDE regulations.

AFS partly parameterizes and presets the frequency converters. Adjustments that deviate from the standard are documented in the instruction manual for the frequency converter, see Figure 8.

The currents in the frequency converter are not shut off when the frequency converter's motor is turned off.

If the frequency converter's operating mode is set to "Motor ON" and the frequency converter is cut off from the grid, the motor will start immediately once the frequency converter is back on the grid.

![Figure 8: Example of basic setting on the frequency converter as altered by AFS](image-url)
5.5 Protective Conductor System

AFS devices must be grounded at the ground plate or ground bolt indicated in accordance with EN60204-1.

Before the AFS device is turned on, the protective conductor system of the entire system must be inspected and safe operation ensured.

A ground bolt is mounted ex factory. Depending on the device type, multiple locations have been provided for ground bolts at the base of the device or the carrier.

If necessary, the ground bolts can be mounted elsewhere. The ground bolt is to be connected to the metal housing structure by a professional.

5.6 Startup Operations

Before the device is turned on, all electrical wires, pipes, ducts, and the AFS device must be examined for proper installation and mechanical damage and leaks.

Before the device is turned on, all electrical wires, pipes, ducts, and the AFS device must be examined for proper installation and for mechanical damage and leaks.

The following must be ensured:

- All filter elements must be arranged properly; see Figure 10
- All filter elements must be as delivered
- The motor must be turning in the correct direction
- The AFS device must be securely placed and bolted down at its location
- There must be no debris (shavings, screws, installation materials, etc.) inside the device, the pipes, or the ducts.

The suction output for AFS devices with frequency converters can be adjusted and readjusted manually.

The operating principles of all AFS air purification devices are the same; they differ only in scale, ventilation system performance, and number of filters used regardless of device type.
6 Operation

AFS devices can remain in continuous operation.

Operating modes are to be separately described and observed by the operator depending on the on-site electrical installation.

⚠ Sequence and interval operations which involve turning off the air purification device after every process step cause damage to the AFS air purification device.

6.1 AFS air purification devices without frequency converters

6.1.1 Turn on

1) Turn on the air purification device based on the model series.
2) Pay attention to unnatural noises or vibrations and immediately turn off the air purification device if they occur in order to avoid damage. Examine the connection and installation and follow the Fehler! Verweisquelle konnte nicht gefunden werden. section in this instruction manual.

6.1.2 Turn off

Turn off the air purification device based on the model series.

6.2 AFS Air Purification Devices with Frequency Converter (Optional)

An AFS air purification device that has a frequency converter is operated and controlled by means of that frequency converter. Operation is menu-guided via the arrow keys and the P button. The frequency converter instruction manual must be observed.

6.2.1 Turning the System On:

We recommend installing a main switch using it to turn the AFS air purification device on and off. The operating modes and the suction output are to be adjusted accordingly with the frequency converter.

Figure 9: Example of a frequency converter FControl FXDM...AM and main switch

6.2.2 Switch off the system

Switch on the system according to the model installation on the frequency converter or main switch.
Additional Information:

If the frequency converter is parameterized ex factory, then the corresponding parameters will be noted in the instruction manual that is delivered with the frequency converter, see Chapter 5.4.

The operating modes and on/off procedures can be found in the frequency converter's instruction manual.

The currents in the frequency converter are not shut off when the frequency converter's motor is turned off.

If the frequency converter's operating mode is set to "Motor ON" and the frequency converter is cut off from the grid, the frequency converter will start again at the last selected setting immediately upon coming back on the grid. Where applicable, the motor may start.

To ensure safe suction output, the frequency converter is not to be operated below its minimum frequency of 70% of the maximum frequency.

6.3 Follow-up time

The AFS air purification device should continue to run for approximately 10-15 minutes once the process has ended.

6.4 Motor protection: Acknowledge faults

Various motor concepts are built in depending on the device type.

Please inform yourself regarding the built-in motor and its protection devices using the supplied motor instruction manual or with AFS directly.

The motor protection is already integrated in EC motors from the manufacturer ebm-papst. In case of fault, the motor automatically turns off. Before the motor can start again, the fault must be acknowledged and the motor reset by momentarily disconnecting the power supply.
7 Maintenance

Failure to maintain the device as specified in the AFS operating instructions will void the warranty or guarantee!

7.1 Maintenance Work and Cycles for Oil and Emulsion Mist Separation

All maintenance work on a device must be performed exclusively after the device has been turned off and by trained personnel familiar with the device.

If multiple AFS air purification devices are operating in conjunction with one another, ALL the devices must be disabled for maintenance to be performed. Low pressure will persist throughout the entire extraction pipe system for as long as networked devices are turned on. Where applicable, device doors must not be opened. There is an increased risk of injury.

Maintenance cycles are to be set in accordance with the type of process and degree of contamination in the air that is to be cleaned. The degree of pollution in the device as well as the separator elements must be examined and then cleaned or replaced as needed.

Figure 10: Filter arrangement within AFS air purification devices

Never change the order, number or installation position of the separation and filter elements as this will render the device inoperable.

The device must only be operated with AFS-approved separation/filter elements.

The separation and filter elements may be laterally removed from the device for cleaning or replacement.
7.1.1 Metal mesh preliminary separator (pos. ①)

Figure 11: Metal mesh preliminary separator

The preliminary separator is made of a corrosion-resistant metal mesh, is non-wearing, and can be cleaned/rinsed:

Cleaning interval: Clean when obviously clogged and dirty, i.e. if full of shavings, hardened oil, abraded material, grease residues.

And at least every 4 weeks.

Directions: Use hot water and a grease-removing cleaning agent with a high-pressure cleaner or in a component washing system.

⚠ Parts will have oil and coolant lubricant residue. Wastewater must be disposed of properly and in an ecologically responsible manner.

7.1.2 Preliminary filter fleece (pos. ②)

Figure 12: Fleece preliminary filter. Depicted without alternate frames

The preliminary filter comprises filter grade G3 filter fleeces, which must be replaced when they become clogged and dirty.

Replacement interval: Clean when obviously clogged and dirty, i.e. if full of shavings, hardened oil, abraded material, grease residues.

And at least every 4 weeks.

The preliminary filter fleeces can be replaced with conventional filter grade G3 filter fleeces with a fleece thickness of 20 mm.

⚠ Parts will have oil and coolant lubricant residue. Proper and ecologically responsible disposal is absolutely necessary.
7.1.3  Longlife separator (pos. ③)

![Longlife separator diagram](image)

Figure 13: Longlife separator: Arrow must point in the direction of flow

The Longlife separator distinguishes itself through its high-performance self-cleaning action and must therefore only be cleaned when visibly and seriously clogged or dirty.

Cleaning: self-cleaning.

If, despite its self-cleaning action, the Longlife separator should nonetheless become extremely dirty or clogged, i.e. full of oil and emulsion residues, hardened oil, the entire separator can be cleaned using warm water and a grease-removing cleaning agent.

The Longlife separator must not be opened or disassembled.

It is vital that the separator be installed in accordance with the air flow direction arrows on the separator's frame. Otherwise the device will no longer function properly.

If necessary, the writing on the Longlife separator can be arranged upside down relative to the airflow direction and the installation position.

Damaged Longlife separators must be replaced immediately.

Improperly installed or damaged Longlife separators will cause diminished or unsatisfactory separation performance. Under those conditions, the device will no longer function properly.

Parts will have oil and coolant lubricant residue. Wastewater must be disposed of properly and in an ecologically responsible manner.
7.1.4 Post filter H13 (Pos. ③)

The following are installed as subsequent separators or post filters:
- HEPA filter H13 (Pos. ④)
- Metal mesh follow-up separator (pos. ⑤)

The separation performance of the H13 follow-up separator is higher than that of the metal mesh follow-up separator (see Chapter 7.1.5). The metal mesh follow-up separator is not recommended for processing installations which produce smoke and vapor.

The H13 post filter will become clogged in the course of its operation, diminishing the AFS air purification device's suction output.

If the H13 post filter is clogged or if the air current is significantly reduced due to a saturated filter, then the H13 post filter must be replaced. To do so, undo the M6 screws on the terminal strips so that the post filter can be pulled out.

The H13 post filter cannot be cleaned.

Replacement interval: Replace when there is a noticeable reduction in the device's extraction performance due to oil and emulsion residue deposits, or hardened oil.

To replace, undo the M6 screws on the terminal strips so as to allow the suspended particle filter to be pulled out. When fitting a new post filter, the filter's rubber sealing strips must be on the suction side (in the terminal area).

The filter bags must be vertical.

If the H13 is not promptly replaced, it may tear. There will therefore be no filtration effect and the AFS air purification device will be inoperative. The AFS air purification device must be turned off immediately and a new H13 post filter must be installed.

Parts will have oil and coolant lubricant residue. Proper and ecologically responsible disposal is absolutely necessary.
7.1.5 Metal mesh follow-up separator (pos. ⑤)

The following are installed as subsequent separators or post filters:
- HEPA filter H13 (Pos. ④)
- Metal mesh follow-up separator (pos. ⑤)

The separation performance of the H13 follow-up separator (see Chapter 7.1.4) is higher than that of the metal mesh follow-up separator. The metal mesh follow-up separator is not recommended for processing installations which produce smoke and vapor.

The alternative to an H13 post filter, an adjustable, non-wearing, corrosion-resistant metal mesh follow-up separator, can be cleaned or washed like the metal mesh preliminary separator.

Cleaning interval: Clean when obviously clogged and dirty, i.e. if full of shavings, hardened oil, abraded material, or grease residues.

And at least every 4 weeks.

Directions: Use hot water and a grease-removing cleaning agent with a high-pressure cleaner or in a component washing system.

To replace a dirty post filter, undo the M6 screws on the terminal strips so as to allow the follow-up separator to be pulled out.

Parts will have oil and coolant lubricant residue. Wastewater must be disposed of properly and in an ecologically responsible manner.

7.1.6 Ventilator (pos. ⑤)

The ventilator motor and wheel are largely maintenance-free. If the separation and filter elements are not maintained or not properly maintained, there is a risk that the ventilator motor will overheat.

In the event of a malfunction, please contact AFS.

The ventilator wheel in any AFS air purification device must not be disassembled under any circumstances.
7.1.7 Siphon (pos. ②)

Siphons and drain pipes must be inspected and cleaned regularly. When separating sludge-forming products, the siphons and drain pipes might become blocked.

Inspection interval: Inspect when there is an obvious blockage caused by oil and emulsion residue deposits, hardened oil, fine dusts, etc.

And at least every 4 weeks.

Directions: Clean with hot water and a grease-removing cleaning agent.

⚠️ After cleaning the siphons, they must be filled again with coolant lubricant. If this is not done, then the AFS device will not be operational. It is therefore absolutely vital to ensure that the siphons are always full of fluid. See chapter 5.3.

⚠️ Parts will have oil and coolant lubricant residue. Wastewater must be disposed of properly and in an ecologically responsible manner.

7.2 Overview of maintenance intervals

⚠️ The filter elements must be inspected every week or inspected immediately if the device’s air extraction performance diminishes.

The AFS device must be serviced when all or some of the filter elements are clogged and dirty as detailed in the following.

⚠️ The separation and filter elements can be pulled out of the side of the device for cleaning.

⚠️ The AFS device must always be disconnected from its power supply before servicing!
<table>
<thead>
<tr>
<th>Type of clogging/dirt</th>
<th>Inspection interval</th>
<th>Cleaning interval</th>
<th>Directions for cleaning/replacements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> Preliminary separator metal mesh</td>
<td>Weekly</td>
<td>At least every 4 weeks</td>
<td>Clean with hot water and a grease-removing cleaning agent with a pressure washer or in a component washer system.</td>
</tr>
<tr>
<td><strong>2</strong> Preliminary filter fleece</td>
<td>Weekly</td>
<td>At least every 4 weeks</td>
<td>Replace with a conventional grade G3 filter fleece with a fleece thickness of 20 mm.</td>
</tr>
<tr>
<td><strong>3</strong> Longlife separator</td>
<td>Weekly</td>
<td>As needed</td>
<td>Please refer to section 7.1.3 for information on cleaning.</td>
</tr>
<tr>
<td><strong>4</strong> H13 post filter</td>
<td>Weekly</td>
<td>Cannot be cleaned</td>
<td>Replace filter. Undo M6 screws on terminal strips. Please refer to section 7.1.3 for information on cleaning.</td>
</tr>
<tr>
<td><strong>5</strong> Follow-up separator metal mesh (alternative to <strong>4</strong>)</td>
<td>Weekly</td>
<td>At least every 4 weeks</td>
<td>Clean the filter. To do so, undo M6 screws on terminal strips. Clean with hot water and a grease-removing cleaning agent with a pressure washer or in a component washer system.</td>
</tr>
<tr>
<td><strong>6</strong> Ventilator</td>
<td>Maintenance-free.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>7</strong> Siphon</td>
<td>Weekly</td>
<td>At least every 4 weeks</td>
<td>Clean with hot water and grease-removing cleaning agent. Once clean, the siphons have to be filled with coolant lubricant again; see section 7.1.7.</td>
</tr>
</tbody>
</table>

We recommend that a set of replacement filters be kept on hand so that old ones may be replaced quickly when necessary and so that the system can be put back into operation immediately.

Parts will have oil or coolant lubricant residue. Wastewater or components must be disposed of properly and in an ecologically responsible manner.
7.3 Volumetric flow rate monitoring (optional)

On AFS devices that are equipped with differential pressure indicators (MPR), a potential-free contact is activated as soon as the volumetric flow rate falls below a preset value of the nominal volume flow (adjustment ex factory). The design of the switching contacts and their connections can vary depending on the design.

The MPR is only installed in the original equipment for the H13 post filter (see Chapter 7.1.4). As soon as the MPR signal activates, the H13 post filter is most likely saturated and needs to be replaced.

The electrical connections are to be set by an electrician.

When that happens, maintenance according to Chapter 7 must be performed promptly. Continued system operation is not permitted.

The maintenance work and cycles described in Chapter 7 are absolutely mandatory. Extending the maintenance intervals until the MPR is activated is not permitted.

The MPR is to be set to 100 Pa (preset ex factory).

The MPR's technical details as well as information on connecting it and processing its signals can be found in the accompanying instruction manual.

![Figure 16: MPR ex factory adjustment and installation point]

7.3.1 MPR Functionality

There is a defined drop in pressure in the Longlife separator (see Chapter 7.1.3) when air flows through. The Longlife separator does not get dirty in normal operation. Consequently, the loss of pressure via the Longlife separator remains constant in all the AFS air purification device's areas of operation. The flow speed and therefore the volumetric flow rate within the device are directly indicated by the differential pressure determined by the differential pressure measurements before and after the Longlife separator.

The MPR will only operate error-free if the Longlife separator is not dirty or damaged. If the Longlife separator is removed, the MPR will not work.
7.3.2 MPR Connections

The MPR is to be connected as in Figure 17. The hoses must not be buckled.

Figure 17: Connection of MPR P1+ and P2.

7.3.3 MPR Error Diagnostics

If the MPR still indicates that the volumetric flow rate through the AFS device is below the minimum despite new filters or maintenance work, then the following steps should be carried out:

- Check motor rotation direction (see chapter 5.4.1)
- Check MPR switch position: Must be set to 100 Pa.

If the signal is still on, then:

- Remove all filters other than the Longlife separator
- Close the device again and turn the system back on
- Wait a little while until the differential pressure has adjusted
- If the signal is no longer on, install new or cleaned filters and separators as indicated in Chapter 5.6.

However, if the signal remains, then the unwanted volumetric flow rate is not being caused by the filters or separators. Other possible error sources might be:

- Blocked intake port or induction pipe
- Clogged pressure transducer
- Bent pressure transducer pipes (run in a path to the inner top edge of the device)
- Blocked exhaust vent or exhaust air pipe
- Overall pressure loss through the entire system (from intake to exhaust) too great
- Ventilator does not work in the desired area of operation
- Frequency converter (where available) adjusted incorrectly
- Ventilator speed too low
- MPR connected incorrectly
8 EG-Konformitäts-Erklärung

im Sinne der Maschinenrichtlinie 2006/42/EG, Anh. II 1.A
EC Declaration of Conformity
according to the Machinery Directive 2006/42 / EC, Annex II 1.A

Hersteller: AFS Airfilter Systeme GmbH
Manufacturer: Am Richtbach 14
D-74547 Untermünkheim-Übrigshausen

Die Bauart der Maschine: Luftreinigungsgerät für den betrieblichen Umweltschutz.
The type of machinery: Air purifying unit for environmental protection in factories.

Typenbezeichnung: AFS 600, -1100, -1600, -3000, -4000, -6000, -8000, -12000, -16000
Type number:

Fabrikationsnummer: 9300 und folgende
Fabrication number: 9300 and following

ist entwickelt, konstruiert und gefertigt in Übereinstimmung mit der EG-Richtlinie:
is developed, designed and manufactured in accordance with the EC Directive:


Die bevollmächtigte Person für die Zusammenstellung der technischen Unterlagen im Sinne der Maschinenrichtlinie ist Herr Uwe Burkhardt.

EN 60204-1 Sicherheit von Maschinen - Elektrische Ausrüstung von Maschinen ï Teil 1 Allgemeine Anforderungen
Safety of machinery - electrical equipment of machines ï part 1 general requirements

EN 13857:2008 Sicherheit von Maschinen - Sicherheitsabstände gegen das Erreichen von Gefährdungsbereichen mit den oberen und unteren Gliedmaßen
Safety of machinery - Safety distances to prevent danger zones being reached by the upper and lower limbs

EN 12100:2010 Sicherheit von Maschinen ï Allgemeine Gestaltungsleitsätze
Safety of machinery ï general principles for design

Eine technische Dokumentation ist vollständig vorhanden. Eine Betriebsanleitung wird jedem Gerät beigefügt.
The complete technical documentation is available. An operator’s manual is component of each machinery supply.

Übrigshausen, den 12. Mai 2015

- Dipl.-Ing. Kai Kuppinger -
(Geschäftsführer / Manager)
## 9 Wear parts

<table>
<thead>
<tr>
<th>Wear Parts</th>
<th>Description</th>
<th>Art.-Nr.</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Pre-Separator Metal Mesh</td>
<td>080009</td>
<td>(1)</td>
</tr>
<tr>
<td>2</td>
<td>Fine-Filter G3-Fleece</td>
<td>080010</td>
<td>(1)</td>
</tr>
<tr>
<td>1</td>
<td>G3-Filter with rotating metal frame</td>
<td>080008</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>Longlife-Separator</td>
<td>080007</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>Post Filter H13</td>
<td>080041</td>
<td>(1)</td>
</tr>
<tr>
<td></td>
<td>Post Separator Metal Mesh</td>
<td>080042</td>
<td>(1)</td>
</tr>
<tr>
<td>1</td>
<td>Fan with motor</td>
<td>080043</td>
<td>(1)</td>
</tr>
</tbody>
</table>

Only original AFS parts may be used. Only then can the function of the AFS device be ensured!