



PF 3500 LUFTREINIGER

BEDIENUNGSANLEITUNG USER MANUAL



DE

Luftreiniger



EN

Air Filter

EC Declaration of Conformity, IIA
In conformity with EC Machine Directive 2006 / 42 / EC,
Amendment of the Directive 95 / 16 / EC (new version)

For unit series: Air filters / filter units
Type: PowerFilter PF 3500 (patented)

HEYLO GmbH of Im Finigen 9, D-28832 Achim, Germany, declares that, if they are fitted, maintained and used in conformity with the operating instructions and the generally accepted engineering standards, the machines mentioned are in keeping with the fundamental safety and health requirements of the "Machine Ordinance" as well as with the regulations and standards mentioned hereinafter.

Zutreffende EG-Richtlinien:

Safety of machines	2006/42/EG
Low-Voltage Directive	2014/35/EU
Electro-Magnetic Compatibility (EMC)	2014/30/EU

The declaration loses its validity in case of unauthorized changes to the machines.

in conformity with the Directive

DIN VDE 0700 Part 1 und Part 30
DIN EN 55014-1:2012-05
DIN EN 60 335-1
DIN EN 60 335-2-69



Achim, 18.05.2017

.....
Dr. Thomas Wittleder
- Geschäftsführer -
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Table of contents

(1) General aspects	17
(2) Scope of delivery	17
(3) Installation (in case of initial operation)	17
(4) Safety guidelines	18
(5) Putting into operation / operation	19
(6) Application / fields of operation	20
(7) Filter / change of filter	22
(8) Installation guidelines	26
(9) Technical data	26
(10) Maintenance / fault finding	27
(11) Optional accessories	27
(12) List of spare parts	28
(13) Wiring diagram	29

(1) General aspects

CAUTION: Read carefully before starting up !

Please observe the notes in the operating instructions carefully. In case of non-observation, the warranty claims will become void. The manufacturer shall not be liable for any damage and/or consequential damage resulting.

PF 3500 is a mobile air filtration unit. The air drawn from the environment and is passed through a two-stage filtration system. In the process the filter collect particles from the air, such as coarse and fine dusts, mould spores, pollen, pet hair and smoke. Apart from circulating air operation, low pressure for refurbishment areas can be produced by connecting air hoses. In addition, the filtered air can be removed and/or added on the suction side and exhaust side by connection of hoses.

In order to produce "clean air", the air flow and filtration are perfectly harmonised to each other by PF 3500. The motor directs the air through two different filter stages: a pre-filter and a main filter. The first filter stage (pre-filter) separates coarse dusts of up to 3 µm. The second filter stage (main filter) separates micro-dusts and suspended matter up to 1 µm.

On account of the filter class used HEPA-H14 in conformity with German standard DIN EN 1822 or of dust class H in conformity with German standard DIN EN 60335, the filtration unit is suitable for the filtration of certain biological agents, such as mould spore and other contaminants. The number of required air exchanges depends on the type of noxious substance.

Corresponding official and/or professional association regulations have to be observed. The operator of the unit shall be obligated to obtain information on handling hazardous materials. Potentially, the operator has to prepare a risk assessment prior to refurbishment work.

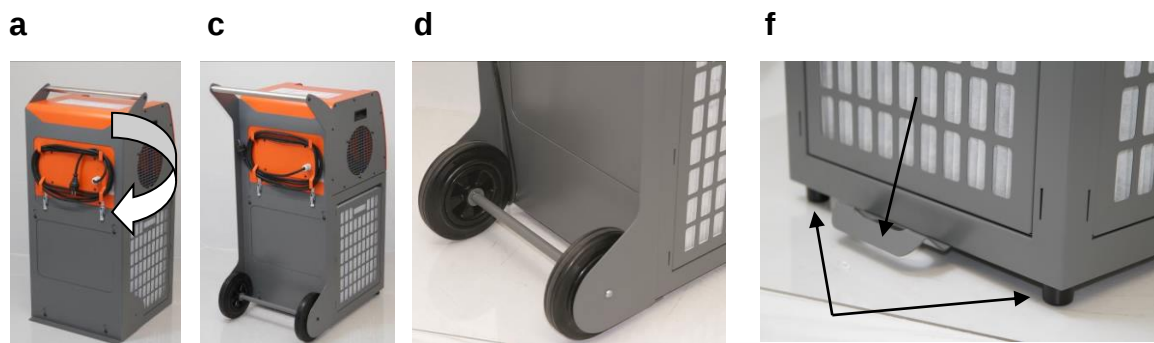
(2) Scope of delivery

- | | |
|--|--|
| <ul style="list-style-type: none">▪ 1 x filter unit PF 3500▪ 3 x filter holder for pre-filter▪ 3 x coarse dust pre-filter G4▪ 1 x transport rollers | Main filter as well as hose connection socket - see optional accessory |
|--|--|

(3) Installation (in case of initial operation)

PF 3500 is supplied pre-mounted in a box. In order to use the unit, the following installation steps have to be carried out:

- a) Unscrew the handle bracket (on the rear side).
- b) Tip the unit to the front a little.
- c) Re-fit the rear handle in reverse order.
- d) Mount the axle with the transport wheels.
- e) Tip the unit to the rear a little.
- f) Fit the front carrier handle and the supporting feet.



(4) Safety guidelines

Target group: This manual is intended for technicians who install the unit, carry out maintenance work and replace faulty parts.

Copyright The duplication of the this manual in whole or in part shall be permitted only upon written approval of HEYLO GmbH.

Reservation: HEYLO GmbH reserves the right carry out modifications and improvements on the product and in the manual at any time without previous announcement.

Disposal: The unit has been designed for many years of operation. If it has to be disposed of, the competent legal regulations have to be observed in environmentally-gentle manner.

Keep away from children: Do not allow children to play with or in the vicinity of the unit.

Electric connection: Air filter, such as PF 3500, have been designed for operation on 230 V / 50 Hz. The connection has to be fused with 16 A.
Use shock-proof plugs only. The sockets have to be earthed or protected by residual current circuit-breakers with at least 30 mA.

Protect the power cable against damage: Never use the unit with damaged power cable. If the power cable has been damaged, it has to be replaced by a cable of the same type and dimension.

Extension cable: Use approved extension cables only !

Handle with care: Do not drop or throw the unit as this may cause damage to the unit or wiring.

Operate on solid surface: Always set up the unit on a solid and plane surface.

Secure during transport: When transporting devices in vehicles, secure against slipping.

Keep dry: The unit must not be operated in puddles or in standing water. Do not store or operate outdoors. If the electric wires or parts of the unit get wet, the unit has to be thoroughly dried before re-using.

Keep the air openings free: Do not cover or block the air inlets and outlets.

Disposal: If the unit has been used in polluted air, pack the used filter in air-tight sacks and dispose of them professionally. The change of filter has to be carried out wearing breathing protection.

Environment: Do not use in explosive areas.

(5) Putting into operation / operation



1. **Attention:** The device can only be switched on when the main filter is inserted and the fan is set up correctly.
A safety switch ensures that the device is switched off while changing the filter
2. **Turn on:** To turn on the device, turn on the main switch **(A)**. (Switch lights up orange)
3. **Power control:** With the power controller **(C)** the air flow rate can be set between 0% and 100%. It is recommended to operate the device with 100% power.
ATTENTION: after switching on, it takes about 10sec for the fan motor to start. This is not an error!
4. **Filter change indicator:** If the main filter is saturated, this will be indicated by the display **(B)** and a signal tone. When this signal is triggering, the main filter as well as the pre-filters should be replaced. Please remember to have enough replacement filters on hand.
The service life of the filters depends on the amount of dust sucked in. The device uses an integrated differential pressure switch to determine the air flow through the filter.
5. **Energy meter:** On the energy meter **(D)** you can read the recorded electrical power and, if necessary, use it for documentation.
6. **Operating hour counter:** On the operating hour counter **(E)** you can read the operating hours and, if necessary, use them for documentation.

(6) Application / fields of operation

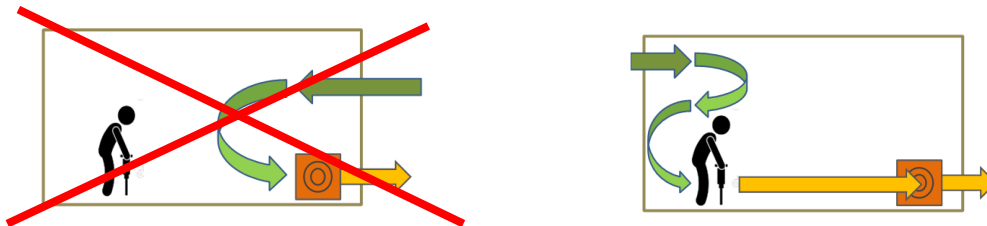
The main purpose of PF 3500 is the use in case of dust-intensive work at varying work locations. Here the unit is used for industrial safety and health protection, ensures the refurbishment targets and increases the efficiency of work. By air filtration, harmless ambient air is ensured. This is used for the protection of the employee, and at the same time increases the work performance. Unaffected areas and residents are protected against detrimental particles from spreading. By sealing off and by generating low pressure in the refurbishment area, the success of micro-cleaning in the removal of contaminants is considerably increased.

ATTENTION: Like all low pressure units, PF 3500 must be operated only with the corresponding expertise when dealing with contaminants. The local trade association will inform you about the required proof of expertise.

ATTENTION: PF 3500 must not be used in explosive areas.

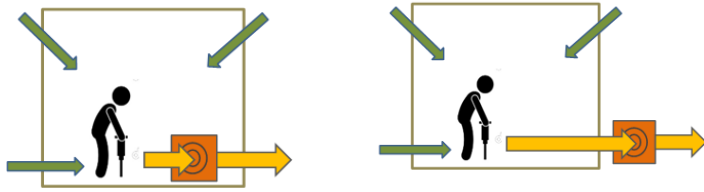
Design: If PF 3500 is used in areas, in which people are employed, the professional association of the building industry (BG-Bau in Germany) requires a 15-fold air exchange. In order to ensure maximum performance of PF 3500 and to achieve a correct display of the filters used, the air filter has to be operated at maximum fan stage. If suction or exhaust hoses are used, all hose connections have to be fitted with hoses (exhaust air two hoses of 205 mm each, and on the suction side three hoses of 205 mm - accessories see chapter (11)).

Circulating air operation: The PF 3500 must be set up in the middle of the area concerned. The suspended matter stirred up during work and/or use of the room is collected by the continuous air exchange of the unit and is found in the filter. In this case an air hose should be placed on the air outlet side or on the suction side in such a way that a ventilation is ensured by the entire area.



Collection at the source Particles should be collected as close as possible to the point of origin. Basically, quick-running tools should be fitted with dust extraction by means of safety vacuum cleaner. In order to collect additional free dust, the PF 3500 can be provided with air hoses. These should be placed as close as possible to the source. This minimises the spread of dust in the room air (*optionally a holder is offered as an accessory*).

Low pressure maintenance: The refurbishment area has to be sealed off from the non-affected areas. This is done by dust control wall or film doors. The working area should be kept as small as possible. Hoses are used to pass the filtered exhaust air from the refurbishment area into the open. PF 3500 can be set up in the refurbishment area as well as in front of the refurbishment area. Let PF 3500 run with low pressure for the duration of the work without interruption.



WARNING - breathing risk: When operating PF 3500 in a closed area, all power sources to open fires, such as chimneys, boilers, oven, water heaters and air conditioning units, have to be switched off in order to reduce the risk of the return of deadly carbon monoxide.

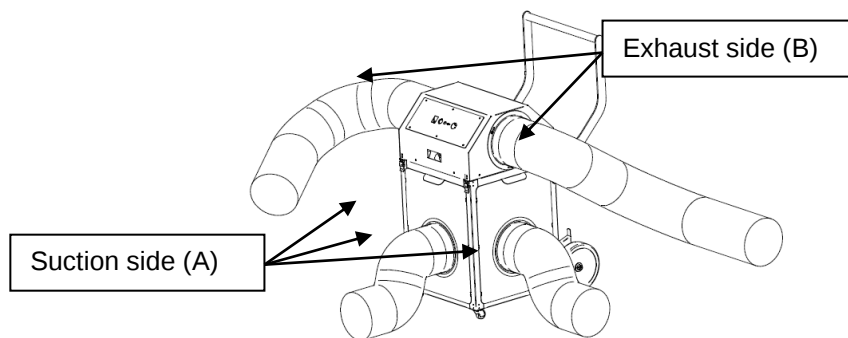
When the change of filter indicator lights up during operation, the pre-filter or the HEPA filter (main filter) has to be replaced immediately. More information is rendered in the chapters titled "Filter exchange" and "Maintenance".

Special functions for refurbishing professionals:

PF 3500 has two special functions to assist refurbishment.

1. Adapter sheets for hose connections (diam. 200 mm) can be fitted to the three suction sides **(A)** of the unit. Thus, PF 3500 can be set up outside of the enclosed area as well in order to draw off by means of suction hoses and/or local removal in the black area.
2. By means of bayonet catches, adapter sockets for hose connections (diam. 200 mm) can be fitted to the two outlet openings **(B)** in order to pass the purified air from the black area through hoses.

If the area is sealed well, this help building up an effective low pressure. Monitor the air pressure using a pressure gauge. Pressure gauges are available from most unit suppliers.



Laying of hoses: The connecting hose of PF 3500 or rather of the entire unit itself has to be laid as close as possible to the source of the air contamination. With increasing distance of the suction hose from the origin of the air contamination, the share of air contamination decreases disproportionately.

For improved acquisition at the point of origin HEYLO provides a base stand to hose connection socket on the suction side. In order to place the hose ends at a higher position, the hoses can be attached to telescope rods using lashing straps.

Ensure move of the suction hoses in the work area as close to time as possible. Hoses should be laid without kinks, if possible, and in a straight line to the air filter. If and when necessary, auxiliary constructions have to be set up for overcoming differences in height, for example (by chamfering of supporting wood nailers, for example). In the area of the suction hoses, the constriction of the cross-section by kinks increases the suction air flow. In the exhaust air hose, the exhaust air flow counter the cross-sectional constriction by kinks.

The suction hose has to be arranged in such a way that contaminated air is removed from the breathing area of the employees, and fresh air and/or purified air is supplied to the employees.

The purified exhaust air of the air filter has to be passed to well ventilated areas and/or to the outside. A return of purified air into the working area is permitted only, if sufficient base ventilations with fresh air is ensured at the same time. A second air filter may be set up for air ventilation, if and when necessary. Please observe the national health and safety regulations.

Required air exchange: The required air exchange depends on the type and volume of air pollutants. Correspondingly, air exchange rates of between triple and 20-fold of the room volume may be required.

The professional associations recommend a 15-fold air exchange. The occupational exposure limit value is 1,25 mg/cum in case of A dusts and 10 mg/cum for E dusts (TRGS 900).

Example: A 15-fold air exchange is required for a room volume of 100 cum.
The required air volume is 15 x 100 cum, thus at least 1,500 cum/h. When the filter display has been activated, HEYLO PF 3500 continues to have an output of approx. 1,700 cum/h.
A sufficient air exchange is thus ensured.

The precise requirements are listed in the installation guidelines mentioned in chapter (8).

(7) Filter / change of filter

Filter system: The air filter PF 3500 uses a two-stage filter system which uses the latest HEPA filter technique. The first filter stage consists of three pre-filters and the main filter stage of one robust HEYLO drum filter in various filter classes.

Change of filter: Independent of the change of filter indicator, both filters have to be replaced after every use involving contaminants. If the composition of the particles drawn in is not known, the filter should be replaced completely after use on the respective building site. Both filters have to be replaced so that the soiling (contamination) is not passed into clean areas.

Service life of filter: The service life of the filter depends on the quantity of dust drawn in. Very fine dust may drastically reduce the service life. Saturated pre-filters have to be replaced; saturated main filters can be cleaned up to a maximum of five times.

The calculated service life of the G4 filter and dust class H (HEPA H14) is rendered in the following table:

Degree of soiling in mg/cum	10	20	30	40	50
Separated dust g/h	22.3	44.6	66.9	89.1	111.4
Service life of pre-filter in h	9.6	4.8	3.2	2.4	1.9
Service life of main filter in h	144.9	72.5	48.3	36.2	29
Max. change of pre-filter	12-15	12-15	12-15	12-15	12-15

Change of filter indicator: When the signal is sounded, the pre-filter has to be replaced and the main filter has to be vacuumed (if the type of dust is not known, use safety vacuum cleaner of dust class H) wearing personal protection equipment. Please remember to have sufficient filter material available in order to prevent interruption of the work.

ATTENTION: Before changing the filter, put the unit out of service !

Please refer to the following table to determine which filter class is required for which material:

Material	Regel	Klasse	Material	Regel	Klasse
Hausstaub	-	M	Porenbeton	TRGS 559	M
Erde	TRGS 559	M	Betonstaub	TRGS 559	M
Sand	TRGS 559	M	Zementstrich	TRGS 559	M
Styropor	TRGS 504	M	Fliesenkleber	TRGS 559	M
Buchenholz	TRGS 553	M	Latex-/Ölfarben	-	M
Eichenholz	TRGS 553	M	Bleihaltige Lacke	TRGS 505	M
Eschenholz	TRGS 553	M	Kalkputz	TRGS 559	M
Kiefernholz	TRGS 553	M	Kalkzementputz	TRGS 559	M
Tannenholz	TRGS 553	M	Zementputz	TRGS 559	M
Birkenholz	TRGS 553	M	Lehmputz	TRGS 559	M
Trockenbau	TRGS 559	M	Trockenbau/Putzarbeiten	TRGS 559	M
Zement	TRGS 559	M	Schimmelpilzsporen	TRGS 524	H
Ziegel	TRGS 559	M	Asbest	TRGS 519	H
Bimstein	TRGS 559	M	Mineralfasern	TRGS 521	H
Kalksandstein	TRGS 559	M	Krebserregende Stoffe	TRGS 560	H

Pre-filter: The first filter stage consists of three Z line pre-filters. The pre-filters are pushed into the filter cassette. To change the pre-filter, the filter cassette has to be pushed up by abt. 1 cm. Now the filter cassette can be removed from the front and the new pre-filter can be pushed in. Subsequently place the filter cassette in the unit again.



Main filter: Undo the quick-action fastener between the unit head (fan) and the filter part. Subsequently lift off the fan section and place it next to the unit. Now the main filter can be placed in the filter housing. The drum filter has to be centred at the bottom in the filter foot. Subsequently place the fan.



Cleaning of the main filter: Use a safety vacuum cleaner of dust class H fitted with a soft brush nozzle to clean the main filter. Watch for potential damage. Wear personal safety equipment for cleaning and do not endanger third parties. After several (maximum 5) cleaning processes a distinctly higher filter resistance has to be reckoned with and the filter has to be replaced.



Disposal: If the unit has been used in polluted air, pack the used filter in air-tight sacks and dispose of them professionally. Wear personal safety equipment, especially suitable breathing protection, to change the filter.

After use

After every use PF 3500 has to be cleaned thoroughly before taking it out of the refurbishment area. This is done by using a safety vacuum cleaner and by moist wiping. Compressed air is not permitted here. The area around the air intake has to be cleaned especially thoroughly. For transport from a contaminated area, the unit can be closed with a sealing cover so that the contamination cannot be passed only (see optional equipment).

CAUTION: Let the unit dry before fitting a new filter !

Protective measures during change of location: If the location of the unit is changed, the pre-filters should be exchanged prior to transport. The main filter can be cleaned as described. If necessary, separate transport in an air-tight transport container may be sensible.

Types of filter

Pre-filter:



Z line pre-filter (coarse dust filter) class G4 in conformity with EN 779

- Pre-filter for the main filter
- Filter for especially coarse dust of up to 3 µm
- Separation efficiency 85 to 98 per cent at 10 µm and 30 to 55 per cent at 1 µm
- Absorption of coarse dust

Coarse dust filter for pre-filter cassette, class G4

- Pre-filter for the main filter
- Filter for especially coarse dust of up to 3 µm
- Separation efficiency 85 to 98 per cent at 10 µm and 30 to 55 per cent at 1 µm
- Absorption of coarse dust

Main filter:



Fine particle air filter of class F9 in conformity with EN 779

Dust class M in conformity with German standard EN 60335

- Main filter cartridge for suspended matter and particles up to 1 µm
- Separation efficiency 99.9 per cent
- Suitable for refurbishment areas with heavy formation of dust

Suspended matter filter HEPA H14 in conformity with German standard EN 1822

Dust class M in conformity with German standard EN 60335

- Main filter cartridge for suspended matter and particles up to 1 µm
- Separation efficiency 99.995 per cent
- Suitable for room with highest demands, in laboratories, in industry as well as in medicine.

Activated carbon filter

- Main filter cartridge for cleaning air of organic matter.
- Binds odour molecules, such as scent of mould, tobacco smoke, oil odour, solvent vapours or ozone.

(8) Installation guidelines

The legal regulations of the respective country have to be observed for the installation and use of PF 3500. In Germany, the following regulations have to be observed among others:

1. German Workplace Ordinance, Sections (5) and (14)
2. German Workplace Regulations ASR (5)
3. Accident Prevention Regulations VBG 43
4. Ordinance on Hazardous Substances dated 1st January 2005
5. BGR 128 (Trade Association)

(to be obtained from: Deutsches Informationszentrum für technische Regeln (DITR) in DIN, Burggrafenstrasse 6, D-10787 Berlin, Germany.

HEYLO does not accept any liability for damage which is caused by incorrect and irregular installation and use of the air filter PF 3500.

Decommissioning and disposal of the unit

HEYLO units have been designed for many years of operation. If it has to be disposed of, the competent legal regulations have to be observed in environmentally-gentle manner.

(9) Technical data

Type of unit	PF 3500
Air flow rate max. (cum/h)	3200
Electric connection (V/Hz)	230/50 230/60
Performance (kW)	0.48
Power consumption (A)	2.5
Electrical protection (A)	16
Int. electrical protection - socket (A)	6.3 A
Compression (Pa)	720
Loudness max. (dB(A)) 3 m	70
Cable length (m) <i>H07RN-F 3G 1.5 cumm</i>	5
Protection class (IP)	41
Height / Width / Depth (mm)	1,010 / 460 / 710
Weight (kg)	48
Hose diameter - inlet / outlet side (mm)	205
Air flow rate with saturated filter (cum/h)	1700
Max. room volume at an air exchange of 15 times (cum)	115
Max. room size at a ceiling height of 3 m (cum)	38

CAUTION: Within the scope of further development, technical data may be changed without prior announcement. Some values are approximate values.

(10) Maintenance / fault finding

WARNING: Danger of electric shock !

The unit has to be disconnected from the mains before maintenance work is carried out. Electrical components must not be cleaned with a water hose or pressure washer because water may enter the electric unit and may cause an electric shock.

When disassembling component parts, please tighten the screws by hand in order to prevent damage to the thread !

WARNING: Contamination hazard

Always wear the recommended protective equipment and the breathing apparatus when removing or replacing the filter as well as when cleaning the HEPA filter. Prior to transport, the unit has to be cleaned completely or as an alternative has to be packed air-tight.

Fault detection and elimination

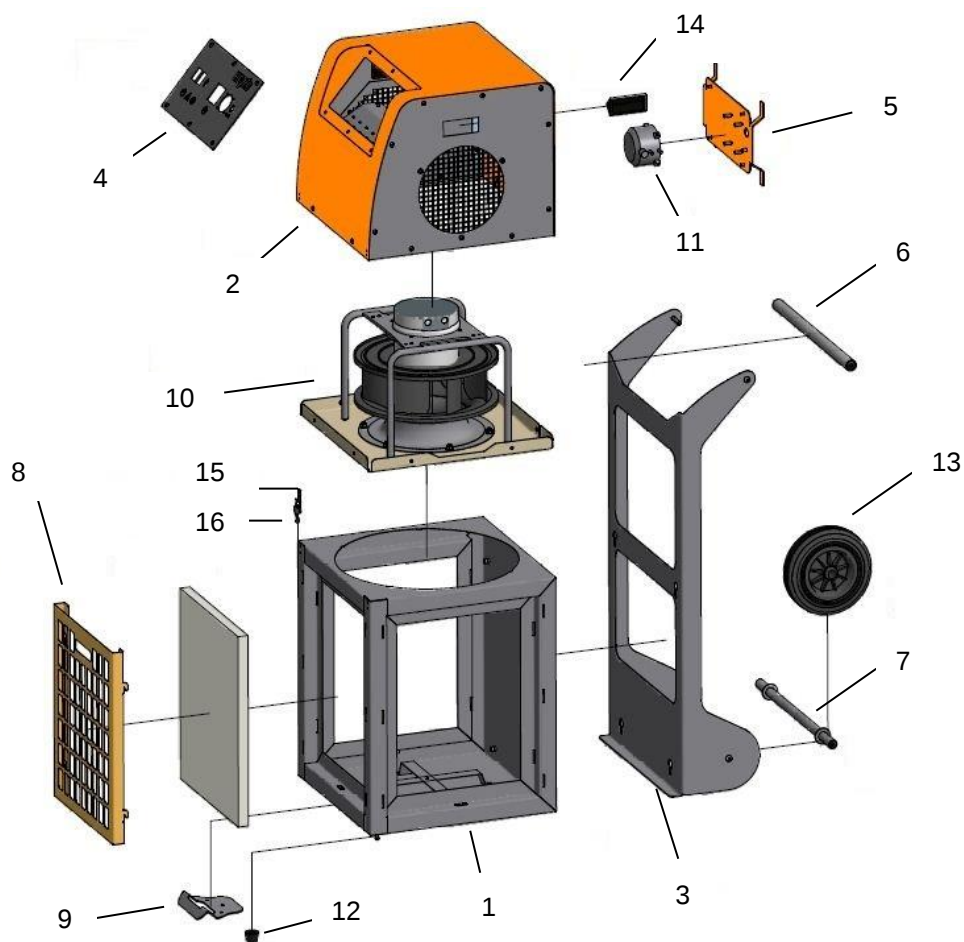
Problem	Potential cause	Solution
The unit is not operational.	The unit has no power. The unit has not been switched on.	Connect the unit to another socket; check whether the socket is live. Switch the switch on.
Change filter display is lit and signal is sounded.	Main filter is soiled. Air inlet is blocked.	Change filter; cf. chapter on filter. Remove kinks in the hose or remove the hose.
Impeller is not operational.	Fan is blocked.	Remove blockage.
Socket of the unit is not functional.	Micro fuse is defective.	Replace micro fuse (6.3 A) (cf. chapter on operation).

(11) Optional accessories

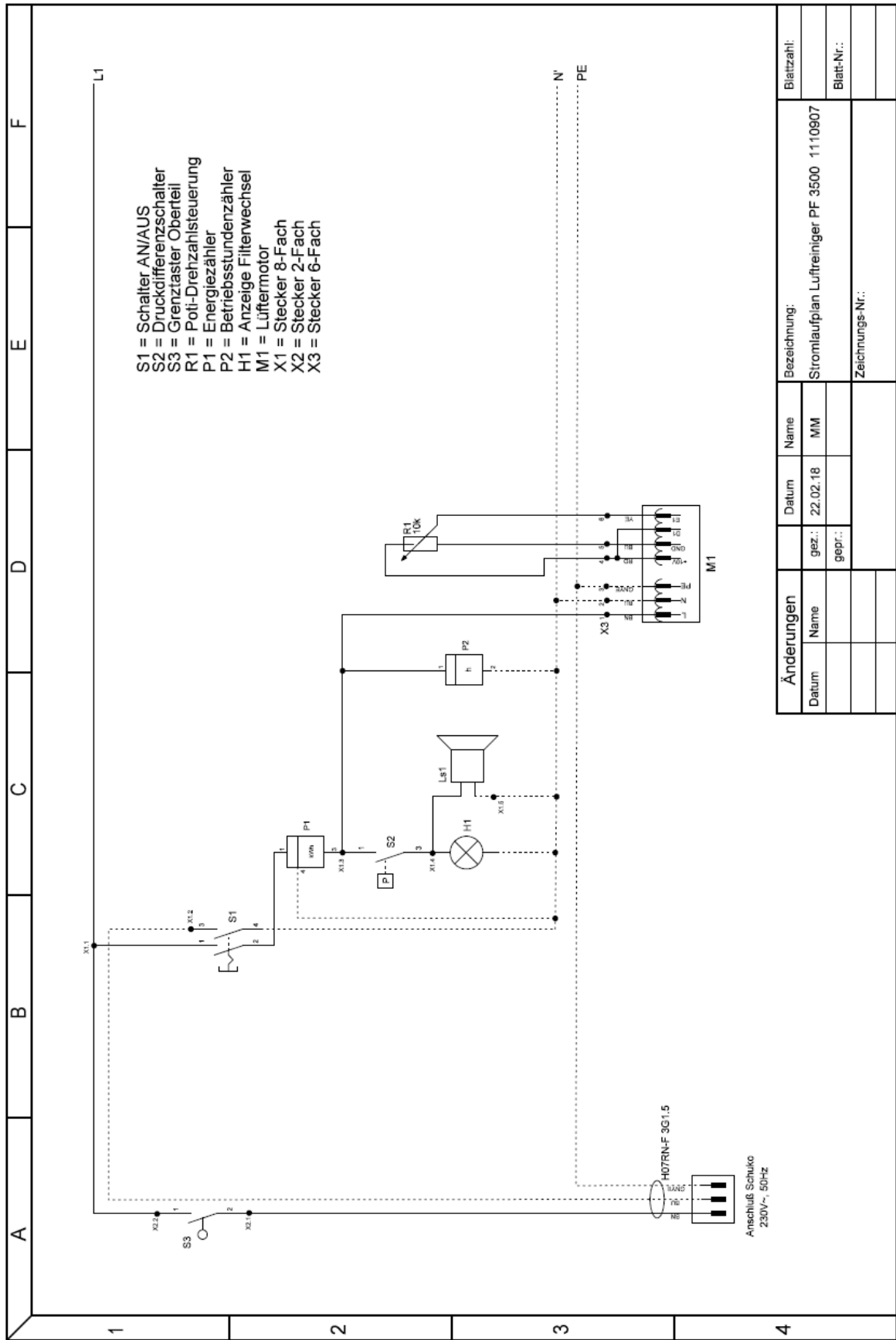
Description	HEYLO Art. No.
Pre-filter - coarse dust G4 (pack of 3)	1 110 926
Pre-filter - coarse dust G4 for pre-filter cassette	1 110 834
Main filter - suspended matter (HEPA) H14	1 110 920
Main filter fine dust F9, dust class M	1 110 922
Main filter - activated carbon filter	1 110 924
Air circulation filter F7 (can be used for both main filters as additional filter)	1 110 927
Dust control sheet (cover sheet for closing)	1 200 071
Dust control sheet (cover plate with hose connection socket, diam. 205 mm)	1 200 072
Cover plate for exhaust opening	1 200 073
Hose connection socket for exhaust opening	1 200 074
Pre-filter cassette (with hose connection socket, diam. 305 mm)	1 200 075
Stable foot for hose connection socket - suction side	1 200 044
Sealing cap for duct connection Ø 205 mm	1 200 086
Air hose diam. 205 mm, length 7.6 m	1 250 007
Air hose diam. 305 mm, length 7.6 m	1 250 005
Dust control wall (HEYWALL-base-package)	1 920 101

(12) List of spare parts

Item	HEYLO Art. No.	Description
1	1631701	Base box
2	1631703	Cover
3	1631704	Wheel receiver
4	1631796	Switch panel
5	1631707	Pressure monitor unit
6	1631708	Handle
7	1631709	Axle
8	1631730	Filter frame
9	1631731	Bottom grip
10	1631780	Radial fan with holder
11	1631781	Pressure monitor
12	1631782	Rubber foot
13	1631783	Wheel
14	1631784	Grip plate
15	1631785	Counter-hook
16	1631786	Tension lock



(13) Wiring diagram



SIE HABEN FRAGEN? WIR HELFEN IHNEN GERN!
Do you have any questions? We are happy to help you!

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