Model series FEX 3000

EXTRACTION-FILTERSYSTEMS

Original instruction manual
for Technician



Read the instruction manual carefully before using the machine for the first time or before maintenance!



SW-Version 2.0
March 2018

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This mark is an attention-symbol.
Text passages which are marked with this symbol serve the safety and are to be regarded in each case.

Warning and safety references

Never use the equipment without filters inserted. Operation of this equipment without filters installed will cause potentially harmful fumes and particulates to be discharged into the workplace. There is also the risk that particles will accumulate in the fan and internal components and damage them.

Warning!
This machine is designed for dry application. Using it to pick up liquids will seriously damage the motors and the performance of the pre filter and/or main filter.

Only trained and authorised persons may use the equipment.



Full protective clothing must be worn when changing filters. Use the filter replacement kits provided with each filter.

Do not attempt to lift heavy equipment by yourself. Use lifting equipment or a two-man lift.



Repair works may only be carried out by technical personnel.
Repair work may only be carried out once the machine has been switched off and disconnected from the power supply.

Do not use the equipment if the power cable or connector is damaged. The power cable must be inspected for damage, such as cracks or ageing, at regular intervals. If there is any damage, the cable must be replaced before using the machine again.

An inspection of the area around the hose including all edges and welded seams of the extraction nozzle must be made as specified under “Controls/Checks”. Any debris (e.g. from lasing process) must be removed. An accumulation of debris can result in hot lumps breaking off and causing a fire.

Follow the recommended routine maintenance schedule given later in this manual. A good level of cleanliness will promote serviceability and reduce downtime.

We recommend a hazard risk assessment is completed and the necessary equipment is obtained to meet local and national regulatory requirements.
Consult local regulations concerning fume extraction systems, as these may be subject to periodic checks by authorised agencies and the re-issue of certificates of compliance or equivalent.

Introduction

The person using this machine is responsible for its operational safety.



Read the instruction manual carefully before using the machine for the first time.



The operating personnel must be instructed in the use of the machine.



Before using the device information, instruction and training must be obtained for use of the device as well as to the substances which have to be sucked.

This instruction manual must be kept in the vicinity of the equipment at all times, in a secure, dry place away from direct sunlight. It should always be accessible when needed.

Different processing procedures of specific materials cause fumes, vapours, gases or odours **(hereinafter referred to as particles)**
The FEX 3000 extraction system is designed for the extraction of those particles and leads filtered, clean air back to the working place.

The extraction system provides a visual alert if a filter is blocked. The different models have similar control, blower and hose systems, but different filtration systems.

The cleaned air and the cooling air are exhausted at the rear of the cabinet. System cabinets are protected against water and dust penetration according to IP55 standard and are made from corrosion-resistant.

The cabinets have door locks with protection caps, which can be opened with a triangular key. The cabinets are fully mobile on lockable, high-strength and corrosion resistant castors.

The filter housing is accessible via a door and consists of:

- A pre-filter cassette
- A divided main-filter cassette.

As an option, the extraction system can be equipped with a monitoring device which detects certain gases and fume particulates in the exhaust air. This device is not calibrated to meet regulatory requirements of a continuous monitoring device; it only provides a recommendation to the user.

Genuine accessory and spare parts

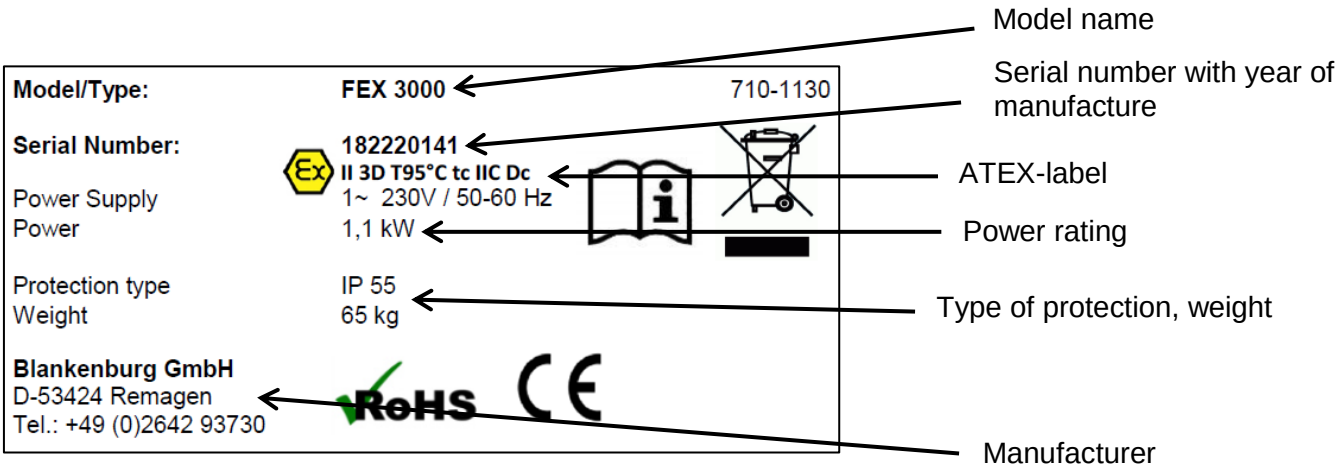
According to the intended use of the machine, only genuine spare parts or genuine accessories supplied by the manufacturer or specialist supplier must be utilised.

Spare parts and accessories can be purchased by

IVH Absaugtechnik e.K
Inh. Christiane Henning
Kreuzbergstr. 14
97828 Marktheidenfeld
info@ivh-absaugtechnik.de
Tel.: +49 (0)9391 810600

General information/Identifying data

For identification purposes, please refer to the important data relating to model, power consumption or serial number of the system which appear on the nameplate at the rear of the device:



You will need to provide all of the above information whenever you contact Customer Service. Identifying the equipment model and serial number uniquely excludes the risk of incorrect information being supplied.

Further technical specifications on your system (e.g. sound pressure level, flow rate, max. vacuum and max. surface temperature) can be found the table below.

Appropriate use:

Fumes, vapours, gases or odours **(hereinafter referred to as particles)** which occur during processing procedures cause health hazards. According the legal requirements for keeping clean the air at working places, they have to be removed from the breathing air.
The FEX 3000 extraction system extracts the polluted air and cleans it.

The exhaust air can be realized according to the requirements in recirculation or exhaust air operation.

Due to its robust construction, the device is perfectly suitable for the commercial use.

The FEX3000 extraction system is suitable for the extraction and filtration of dry, not combustible dusts, fumes, gases and odours in not highly explosive air mixtures.

When used appropriate, the devices are suitable for seperate fumes which occur in welding-related cutting-and joining processes in handling of unalloyed and alloy steel, including high-alloyed stainless steel (exhaust air mode).

Any other usage is not appropriate. Manufacturer and seller accept no liability for any dangers and damage resulting from this.

Without the manufacturer´s authorization, the extraction system must not be used for other purposes. Any unauthorized reconstruction and modification – which exceed beyond the opportunities described in this manual – are prohibited for safety reasons.

The following applies as well:



The dust class of the extraction system is defined by the highest dust class of the used filters. The appropriate usage is determined in the technical details.



The device must not be used for
- the suction of liquids.
- the extraction of explosive concentrations of gases, vapours or dusts.



No ignition sources must be vacuumed!

Definition of dust classes

Dust class M (included dust class L)
(medium risk as defined in standard EN 60335-2-69)
The machine can be used to absorb hazardous to health, dry, non-combustible dust with a WEL (Workplace Exposure Limit) value above 0.1 mg/m³.

Dust class H (included dust classes L and M)
(High risk according to the definition in standard EN 60335-2-69)
The machine can be used to absorb hazardous to health, dry, non-combustible dust of all WEL (Workplace Exposure Limit) values, as well as dry, non-combustible dust with substances likely to cause cancer. Clean air is recirculated in the surrounding air.



For dust class H
If the device is to be used in another place, all vents from which the substance or dusts can escape must be closed.
The outside of the machine must be vacuumed and wiped clean.
All machine parts (hoses, accessories etc.) must be regarded as contaminated and treated accordingly.

Use in areas rendered potentially explosive through dust (Type 22)

Extraction systems with the suffix "Type 22" are safety-engineered for picking up combustible, dry, and non-conductive dusts in Zone 22 areas.
Exceptions are dusts with extremely low minimum ignition energy (MIE < 1 mJ).
If the device is to be used for these dusts, individual safety assessments must be carried out on a case-by-case basis and additional measures taken if necessary.

Residual risk analysis:

If the instruction manual is complied with and work proceeds in accordance with the operating sequences it describes whilst applicable safety precautions are taken by operators, the system should pose no risk in normal operation.
However, if the system is used to pick up a variety of substances, there remains the risk of these substances combining to produce an unforeseeable chemical reaction.

Notes for Type 22 machines

Extraction systems with the suffix "Type 22" are safety-engineered for picking up combustible, dry, and non-conductive dusts in Zone 22 areas rendered potentially explosive through dust.
Exceptions are dusts with extremely low minimum ignition energy (MIE < 1 mJ). If the system is to be used for these dusts, individual safety assessments must be carried out on a case-by-case basis and additional measures taken if necessary.

Never use the cleaner to pick up hot material. Do not use the cleaner in open or sealed hearths, furnaces or other appliances containing hot ashes or glowing embers.

The device is not suited for vacuuming mixtures of combustible dusts with liquids.



Explosion-proof systems Type 22 are not safety-engineered for picking up explosive substances as defined in Section 1 of the German Explosives Act. Do not use the cleaner to pick up hot gases, ignition sources of any kind, mechanically-generated sparks or electrostatically-charged materials. No smoking!

Furthermore, the devices are not suitable for Zones 0, 1 and 2 as well as 20 and 21.



The device must only be operated with all filters inserted and in perfect order. If the filter is damaged, dust may be spread into the clean gas section and danger of explosion may arise.



No ignition sources must be vacuumed.

The device must only be used with anti-static suction hoses and accessories. Details of these appear in the appendix. Damaged accessories must be replaced.



Only use Type 22 compatible accessories approved by the manufacturer. Using other accessories may cause danger of explosion.

Check regularly if particles have settled inside the machine, e.g. on the fan. If so, they have to be removed.

Technical Details

Model		**FEX 3000** **FEX 3001 (SB*)**
Voltage	Volt	120 V 50/60 Hz or 230 V 50/60 Hz
Power output	Watt	1.100
Max. airflow. at free air	m³/h	460
Max. airflow in operation - measured at the end of 6m hose	m³/h	260
Maximal length of suction hose, Ø 50 mm	m	12
Max. negative pressure	mbar	100
1. level filter (consumable material)		Pre filter
2. level filter (consumable material)		Main filter and/or activated carbon
Sound pressure level **)	dB(A)	60
Measurement LxWxH	mm	395 x 430 x 995
Weight	kg	60
Type of protection		IP 55
Operation temperature	°C	5 – 40
Operating humidity	%	10 – 90 non condensing
Stainless steel	Quality	1.4301

***) SB** = Protective coating for the extraction of hydrochloric acid containing vapours (e.g. lasing PVC)

****)** Rating according to DIN EN ISO 3744 in 1 m distance to the device surface in free field at max. air flow rate (Tolerance +/- 2 dB(A)

Included in standard delivery:

- Extraction system inclusive Pre – and Main-Filter
- Exhaust air cover
- Key with triangular socket for opening the door
- Power supply cable
- Operating manual



Changings to the standard equipment (e.g. suction hose longer than 6 m, use of two suction hoses, variations of the diameter of the suction hose, suction arm) may have as a consequence that several notifications can displayed only limited.

Device overview model series FEX 3000

At the rear of the device cover:
Suction openings for two suction hoses Ø 50 mm (incl. one sealing plug)

Position of the suction openings can be structurally changed (additional at the right or left side)

Control panel with ON and OFF button, graphic screen and 6 operating keys



PRE-Filter

MAIN-Filter

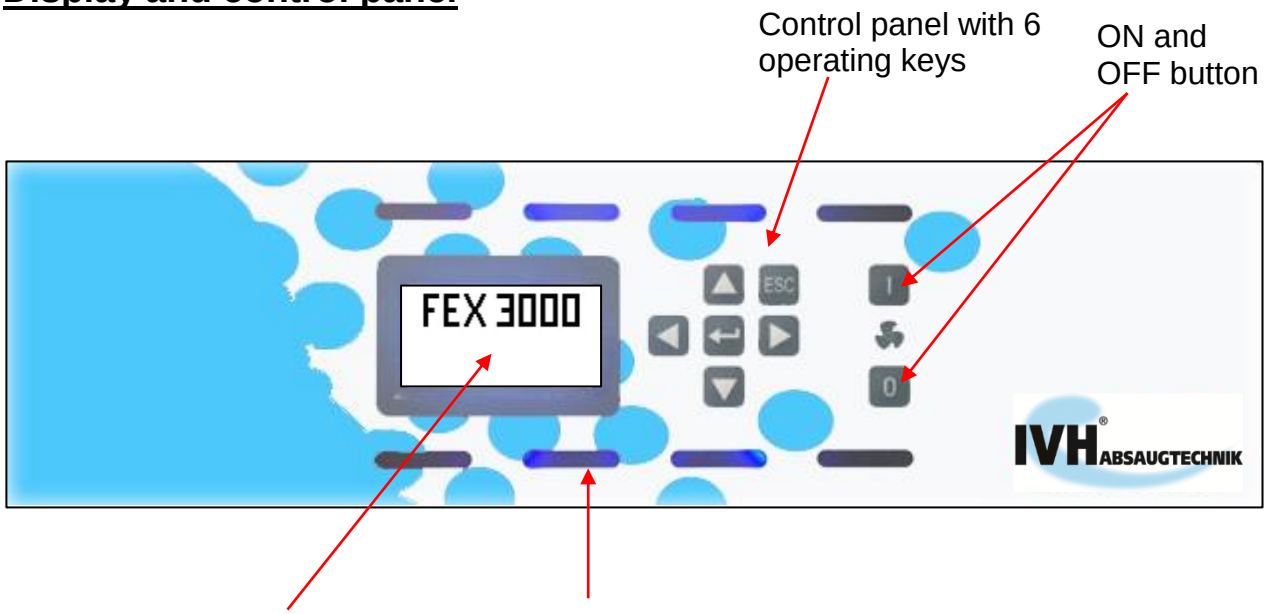
Filter operating lever with lifting function

Motor housing

Lockable castors

The mains power connection must always be easily accessible during operation in order to quickly remove the power from the system when required.

Display and control panel



Illuminating bars at the top and bottom to indicate status:

GREEN =	Device is in operation
YELLOW =	Information/Warning
YELLOW flashing =	Warning
RED =	Fault
BLUE =	Manual operation
LEDs off =	Remote-operation
BLUE flashing =	Awaiting input

Lower LED-row red dimmed = Stand-By

Buttons - Explanation:

I	Switch the machine **ON**
0	Switch the machine **OFF** (longer press: Stand-By)
↵	**CONFIRM** keypad inputs or **switch** to filter replacement mode
ESC	**EXIT** the menu
◀	**LEFT**-Button
▶	**RIGHT**-Button
▲	**UP**-Button **(+)** Increase flow rate
▼	**DOWN**-Button **(-)** Decrease flow rate

Installation

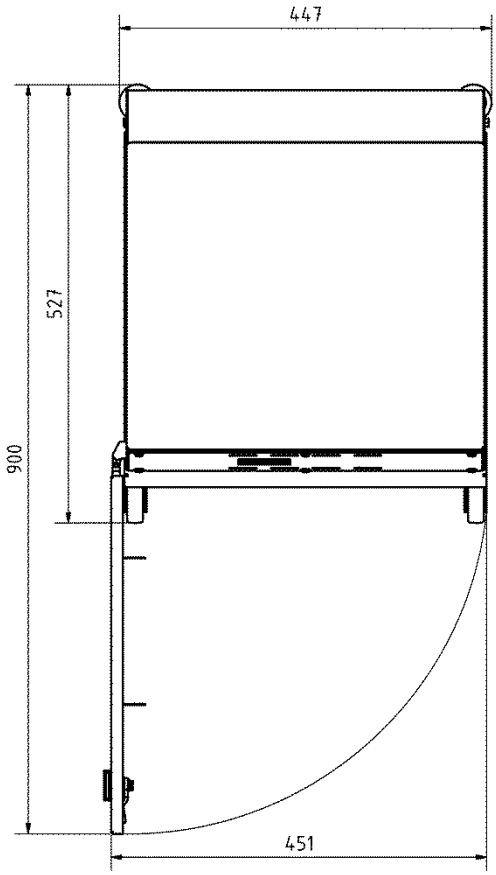
The extraction system should be installed as near to the point of origin as possible to keep the exhaust hose as short as possible. The following floor area and access is required to the cabinet:

Front:
Inspection and maintenance access for operating personnel

Rear:
Connection of the hose system and electrical connections under the exhaust air cover

After installing the system, both front castors must be locked.
For additional stability, supporting feet can be mounted (optional available)

Placing external devices on top of the unit is not recommended in order to ensure a permanent tightness.



A distance of 220mm from the wall is required for the hose connection. If necessary, the position of the hose connection can be moved structurally to the left or right side.

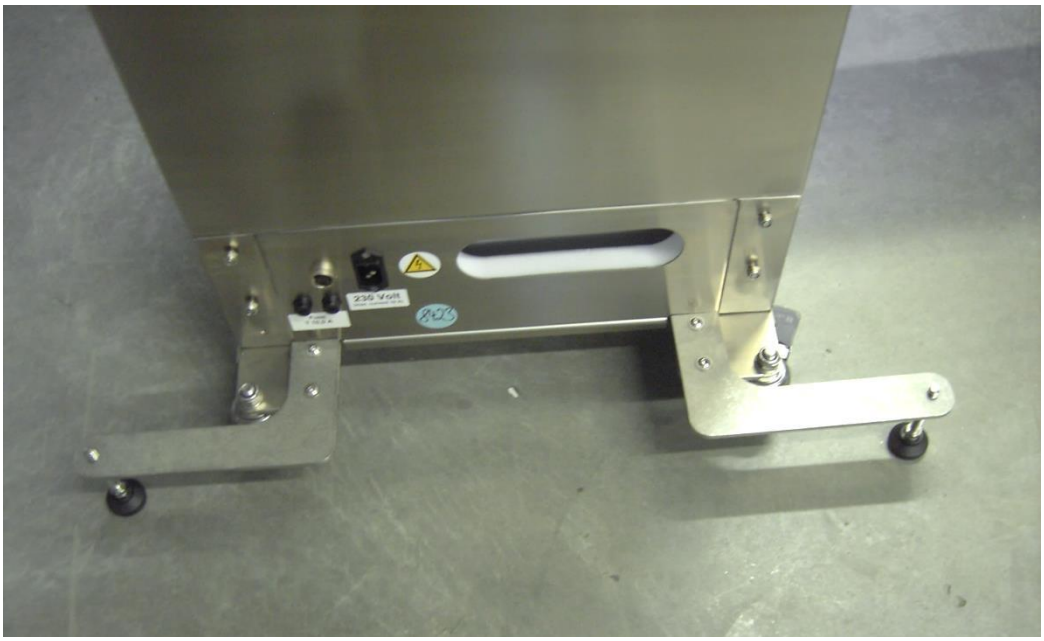
If exhaust air and eventually waste heat shall be led out of the room, an exhaust air hose may be installed (optional available.)

Electrical connections

The electrical connections are located at the rear side under the exhaust air cover.
The cover is equipped with a safety screw which prevents the cover from removing it accidentally.

Option additional supporting feet

For additional stability (e.g., when a suction arm is used), optional available supporting feet may be installed.
Those are mounted with two screws each at the bottom of the device near the castors.



Connections for the remote on/off control – Connection with external controllers or devices

An 8 pin socket type Lumberg No 0305-08 is located at the rear side (under the exhaust air cover), which provides the opportunity for a remote control.
In addition to the operating status, signals from fault messages can be forwarded potential free or with 24 V.
The matching plug for the interface is Lumberg No 0332-08.

Pin assignment see circuit diagram page 3 at the end of this manual.

Advice for the positioning of the hose opening respective capturing element

According to the instruction as specified in the recommended routine maintenance, an inspection of the area around the hose, including all edges and welded seams of the extraction nozzle must be made. Any debris from the lasing process must be removed. An accumulation of debris can result in hot lumps breaking off and causing a fire.

The FEX 3000 offers a double suction opening, of which one is sealed with a sealing plug.

The flexible suction hose (Ø 50 mm) is pushed into the suction opening at the rear side of the device.

Optionally, one or two suction hoses may be connected.

The following advices regarding the positioning of the hose opening respective capturing element should be considered:

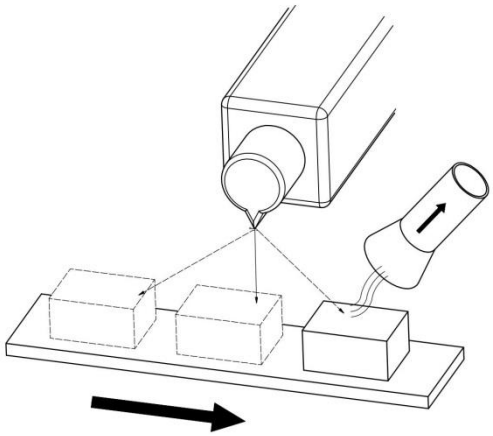
Generally, the intake socket of the suction hose or the capturing element is to be positioned as close as possible to the point of origin.

Recommended at production lines with a velocity in one direction:

Due to the air movement caused by the movement of the product, fumes can be carried away. Mount the opening of the suction hose ahead of the point of origin.

Characteristic at laser marking systems:
The opening of the suction hose should be placed in such a way that the gases are not drawn through the laser beam. This means, the extraction nozzle should be installed in the product movement direction after the marking process location. Particularly at high product speed, the gases are drawn along with the product and therefore transported in the direction of the extraction nozzle.
This is important to ensure that the laser marking is of a consistent quality.

Figure: Example positioning of the extraction hose:





As soon as the device and the suction hose are in their final positions, the hose should be laid with as few bends as possible and shortened to a practicable length.

Remove the nozzle with inner thread, cut the hose with a sharp knife and reattach the nozzle.

Information Flowrate (target /actual value-air flow performance %)

The airflow (also called the flow rate) can be set to the desired level. The machine automatically increases or reduces the motor speed to achieve an airflow that matches the target airflow.

As the filter becomes more clogged, the air flow resistance (Differential pressure Pa) increases. The machine constantly adjusts the motor speed to ensure that the actual airflow always matches the target airflow.

At a certain point, when the filter is full, the motor can no longer compensate the increasing resistance and a warning or fault message for a clogged filter is triggered.

Adjusting the air speed / air flow performance %



The lowest possible flow should be set. This ensures that it is only the fumes that are extracted and not the end product.

However, the flow must be high enough that the fumes generated in the process are conveyed into the capture nozzle.
This is the only way to prevent that debris can settle in the surroundings.

The airflow can be adjusted at any time.
Press the button

 until sufficient extraction is achieved

or

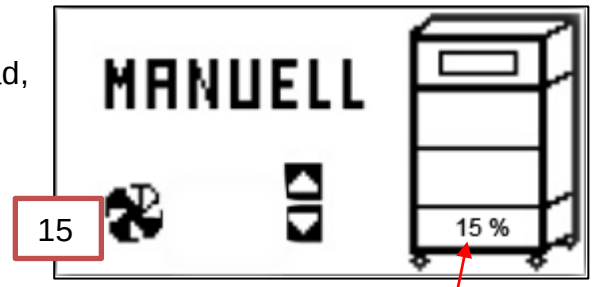
 until the lowest acceptable extraction is achieved.

 confirm with „Enter“, the setting will be saved.

Display view on the main screen

View in manual operation:

Depending on the level of filter load, the corresponding area of the filter is filled.

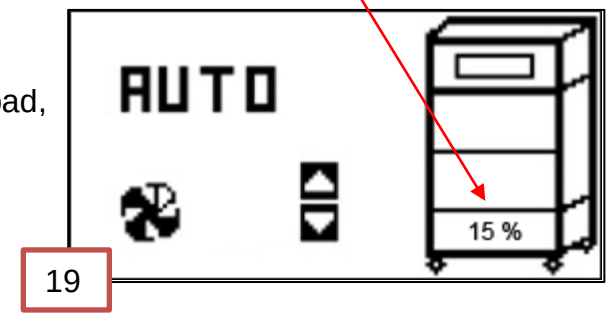


15 = Image group no. displayed in the lower left of the screen

Display **current** running airflow

View in remote operation:

Depending on the level of filter load, the corresponding area of the filter is filled.



If the device is properly operated (GREEN) a rotating propeller and the current airflow are displayed, as well as the adjusted set point.

IN this state the following buttons can be pressed:

Or change the airflow % air volume flow (Flowrate)

and at the same time = **USER/Technician menu**

Switching the machine **OFF**
(longer press: Stand-By)

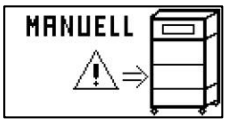
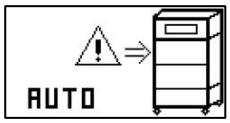
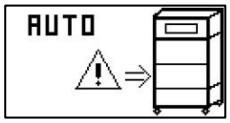
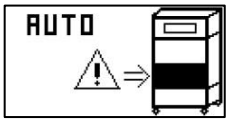
AFTER switching the machine off the following buttons can be pressed:

Filter replacement query
(replacement of the filters is possible at any time, regardless of a fault)

Filter replacement display

The level of the filter load is continuously displayed when the device is switched on.

Depending on the filter load the device displays a warning or an error:

FILTER-notifications	**Picture group-number**		
Warning 80 % full - LEDs YELLOW flashing	17		plus accruing filter boxes
Warning/Fault - LEDs RED PRE filter 95/98 % full	18		
Warning/Fault - LEDs RED MAIN filter 95/98 % full	49		
FILTER-notifications	**Picture group-number**		
Warning 80 % full - LEDs YELLOW flashing	21		plus accruing filter boxes
Warning/Fault - LEDs RED PRE filter 95/98 % full	22		
Warning/Fault - LEDs RED MAIN filter 95/98 % full	50		

YELLOW flashing = Warning
= ca. 80 % filter load
Pre-filter or main-filter must be replaced shortly.
Press „ESC“ to get back to the main screen, switch off the motor and press “Enter” to access the filter replacement menu.

RED = fault = Motor stops
= ca. 95/98 % filter load

➔ Pre-filter or main-filter must be replaced.

➔ Press „Enter“ to automatically go to the corresponding filter replacement menu

There are two ways to access the filter replacement menu:

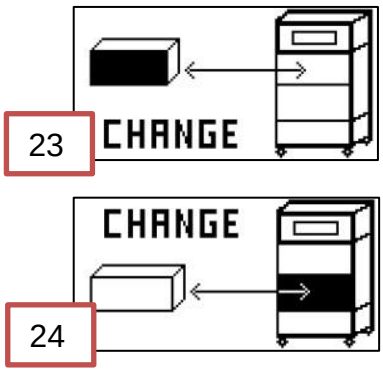
- If a filter is so full that the FEX 3000 displays a fault
- Or at an earlier time (condition: motor off)

When the motor is switched off, press the Enter-button



Filter replacement query
(replacement of the filters is possible at any time, regardless of a fault)

to access this menu:

	Prompt as to which filter you wish to replace ➔ Select using the “Up” or “Down” button ➔ Confirm with “Enter” (this takes you to the filter replacement menu) ➔ Press “ESC” to return to the main screen

Filter replacement procedure

After switching off the motor and after selecting the filter to be replaced, press “Enter” to go to the filter replacement menu.

Replacing the filter is an important process and maintains the performance of the extraction system.



During this procedure, full protective clothing / goggles must be worn. Use the filter replacement kits provided with each filter.

The filters are heavy! Do not just hold it by the front handle! When replacing them, only pull them carefully by the handle forwards, and then pull them out of the filter housing with both hands.

With the replacement pre-filter an insertion cardboard plate is provided. Place this into the lead above the pre-filter up to the stop before you replace the filters.

This avoids that eventual adhering residues from the upper housing come loose during the filter replacement procedure and fall down into the interior of the device.

Replacing the PRE-filter







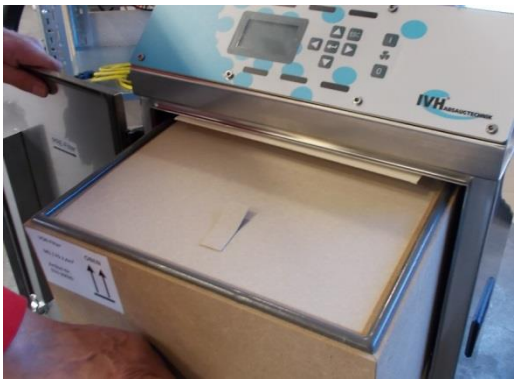
The insertion cardboard plate must be removed before re-starting the device!

Ensure that during the filter replacement procedure one filter stays in the device. This means, if both filters need to be replaced, at first replace only one filter, and when the new filter is inserted, then replace the other filter.
This is a further precaution to avoid that eventual adhering residues from the upper housing come loose during the filter replacement procedure and fall down into the interior of the device.

Unlock filter:

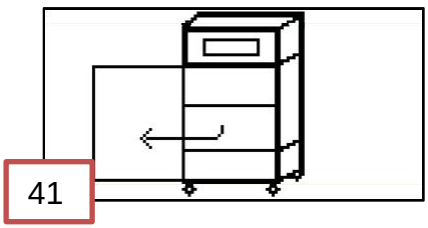
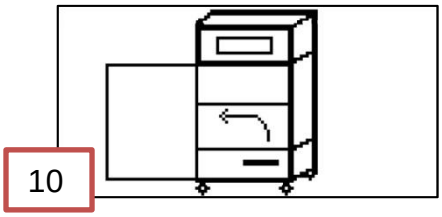


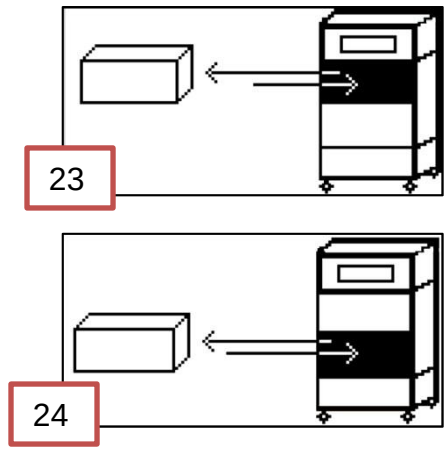
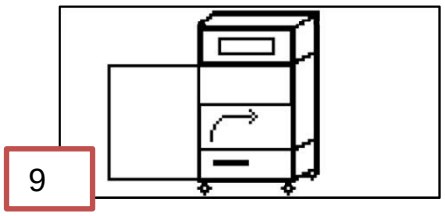
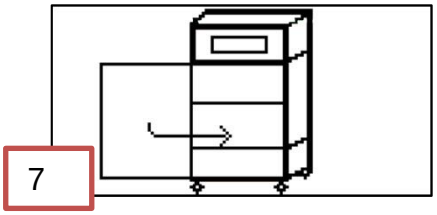
For a filter replacement with low contamination, insert the cover cardboard plate into the old filter in order to prevent a swirling of particles while removing the filter.



After the filter replacement, the interior of the device is to be cleaned. For vacuuming, a vacuum cleaner dust class H is to be used.

Filter replacement procedure – display view on the screen:

	Open door ➔ Confirm with “Enter”
	Unlock the filter by turning the lever „Possible crushing hazard!” ➔ Confirm with “Enter”

	Carefully replace the pre-filter or main-filter. Slide in the insertion cardboard plate up to the stop before removing pre-filter. For low contamination, insert the provided cover cardboard plate into the old filter. **<u>The filters are heavy!</u>** When replacing them, only pull them carefully by the handle forwards, and then pull them out of the filter housing with both hands. Do not just hold it by the front handle! ➔ Confirm with “Enter”
	Check the filter is positioned properly and then lock the filter by turning the lever ➔ Confirm with “Enter”
	Close door ➔ Confirm with “Enter” The display returns to the main screen.

Only use of original filters guarantees optimal operation of the extraction system!

The filter must be disposed of according to locally applicable legal regulations for the disposal and/or disposal of hazardous waste.

In order to sustain the IP protection, the protection caps of the door locking are always to close.

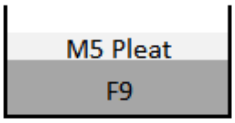
Possible replacement filters PRE-filter:

Pre filter - FEX 2000 und FEX 3000

Art-No. regard suffix (-01 = handles lateral / -02 = handles front and rear)

Optimum use and possible combinations

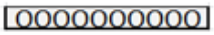
1



074-20019-01 (FEX 2000)
-02 (FEX 3000)

Free internal height = 50 mm

Outer height = 240 mm



Coarse dust filter mat

074-20060

Outer height = 50 mm

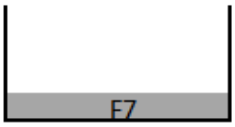
Spark protection grid

074-20058

Outer height = 15 mm

Caution !
For FEX 3000 , at the upper side must be 20 mm free internal space left for the lead of the insertion cartbord plate.

2



074-20040-01 (FEX 2000)
-02 (FEX 3000)

Free internal height = 165 mm

Outer height = 240 mm



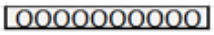
074-20067

Outer height = 100 mm



074-20059

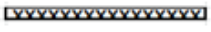
Outer height = 100 mm



Coarse dust filter mat

074-20060

Outer height = 50 mm

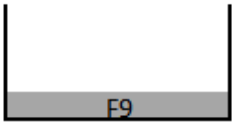


Spark protection grid

074-20058

Outer height = 15 mm

3



074-20041-01 (FEX 2000)
-02 (FEX 3000)

Free internal height = 165 mm

Outer height = 240 mm



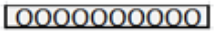
074-20067

Outer height = 100 mm



074-20059

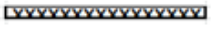
Outer height = 100 mm



Coarse dust filter mat

074-20060

Outer height = 50 mm



Spark protection grid

074-20058

Outer height = 15 mm

Replacement MAIN-Filter

Remove main filters:

The filters are heavy! Do not just hold it by the front handle! When replacing them, only pull them carefully by the handle forwards, and then pull them out of the filter housing with both hands.

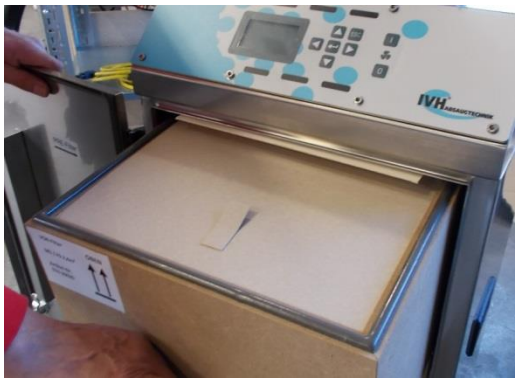






Ensure that during the filter replacement procedure one filter stays in the device. This means, if both filters need to be replaced, at first replace only one filter, and when the new filter is inserted, replace the other filter.
This is a further precaution to avoid that eventual adhering residues from the upper housing come loose during the filter replacement procedure and fall down into the interior of the device.

For a filter replacement with low contamination, insert the cover cardboard plate into the old filter in order to prevent a swirling of particles while removing the filter.



After the filter replacement, the interior of the device is to be cleaned. For vacuuming, a vacuum cleaner dust class H is to be used.

Insert new main filters:





When combining H13 and activated carbon, the H13 filter is to put on the activated carbon filter.

When inserting the filters into the device, pay attention to the accurate positioning and the sealing of the main filters.

Possible replacement filter

Main filter combinations - FEX 1000-2000 und FEX 3000

Art-No. regard suffix (-01 = handles lateral / -02 = handles front and rear)

Optimum use and possible combinations

1 | H 13

074-20064-01 (FEX 1000)
-01 (FEX 2000)
-02 (FEX 3000)

Outer height = 145 mm

2 | Active carbon

074-20063-01 (FEX 1000)
-01 (FEX 2000)
-02 (FEX 3000)

Outer height = 145 mm

Advices for FEX 3001 with protection coating (SB)

The extraction system FEX 3001 comes with a special protection coating in the upper part of the housing.

This corrosion-resistant coating protects the interior of the device when vacuuming acidic fumes, such as they occur e.g. when processing plastics. This enhances the longevity.

In order to further increase the tightness, SB devices are equipped with IP66 stainless steel door locks (without protection caps).



When cleaning the machine, a great care must be taken that absolutely no liquids get into the inside of the device!

If acidic fumes are vacuumed with the extraction system, the following is to be considered when cleaning the machine:

- the door must be closed through the entire cleaning process
- the exhaust air cover must be installed
- the outer surfaces are to be cleaned only with a clean cloth, in order to avoid corrosion or contamination at the outer surface.

Overview menu and passwords FEX 3000

Version 2.0 – 22.03.2018		Passwords:	
		User	Technician
Menu structure	**without Password**	**0010**	**9221**
USER-Menu			
Adjust flow rate	x	X	X
Routine pre filter replacement	x	X	X
Routine main filter replacement	x	X	X
Display contrast, preference 22		X	X
Run-Time (Overview)		X	X
Unit run time			
Pre filter run time			
Main filter run time			
Info-Display (Overview)		X	X
U = ……. mV			
FlowR = ... **%**			
PWM = …. I = ….mA			
Dp = ….. Pa			
Fill = ….. % (Filter load - slow) + ("real"-filter load %)			
Dust = not connected			
VOC = not connected			
Show statistics (Overview)		X	X
Alarms [1] h before ..			
Warnings [1] h before ..			
Messages [1] h before..			
Technician menü			
Delay switch off (001 s)			X
External control (yes/no)			X
After fault and confirmation “Enter” the device starts again instantly			
The device may be switched by remote on-off			
VOC-Option			X
YES - NO - Settings			
VOC-Settings:			
Waiting time: 1 - 9 min adjustable (Default = 5 min)			
Measurement time: 1 - 9 min adjustable (Default = 3 min)			
Limit value: 1 - 99 % adjustable (Default = 50 %)			

		0010	9221
PD-Option			**X**
YES - NO - Settings			
PD-Settings:			
Waiting time: 1 - 9 min adjustable (Default = 5 min)			
Measurement time: 1 - 9 min adjustable (Default = 3 min)			
Limit value: 1 - 99 % adjustable (Default = 20 %)			
Test Routine			**X**
Buttons			
LEDs			
Fan			
Sensor			
Filter limit START (fresh filter)			**X**
Filter limit 1 % = Default 300 Pa (adjustment range = 100 - 1000 Pa) -> adapt to delivery state			
Filter limit 100 % = Default 1000 Pa (adjustment range = 600 - 3.000 Pa)			
Confirm changes and default-value with ESC			
Filter limit STOP (voller Filter)			**X**
Filter limit 1 % = Default 1000 Pa (adjustment range = 600 - 3.000 Pa) -> adapt to delivery state			
Filter limit 100 % = Default 4.000 Pa (adjustment range = 2.500 – 9.000 Pa)			
Confirm changes and default-value with ESC			
Alarm Configuration (Tic-Box) = x = no signal at control box			**X**
Door open **X** (e.g. no signal now)			
Hose blocked **X** (e.g. no signal now)			
Motor off			
Filter warning (80 % full)			
Filter full (95 % full)			
Particle sensor signal			
VOC Gas sensor signal			
All Alarms off			
Low pressure configuration **e.g. for the use in cabins with insufficient air supply (open-close-open-close)**			

RESET (to factory settings)

Password: 1969

Reset of password User/Technician, Filter Limit Start/Stop, Values VOC/PD-Sensor, Alarm configuration, Delay switch off, Return to operation mode “Manuell”

Information VOC- and particle sensor (optional)

As an option, the extraction system can be equipped with a monitoring device which detects certain gases and fume particulates in the exhaust air. For this purpose, a circuit board equipped with gas- (VOC) and particle sensor is installed in the motor housing

If gases or particles are detected in the exhaust air, this will be visually displayed as a fault message on the screen (see warning- and fault messages) This device is not calibrated to meet regulatory requirements of a continuous monitoring device; it only provides a recommendation to the user.

The sensitivity of the sensors can be adjusted according to the pollution of the surrounding air.
By entering the password **9221** you will get into the technician menü.

Under the menu item VOC-option (Gas Sensor) or PD-Option (Particle Sensor) the function can be en- or disabled. Besides this, you can get into the settings:

Waiting-time (adjustment range from 1 – 9 minutes)
is the time from the launch of the device until the sensor is switched into active mode. This avoids premature fault messages due to accumulations after transport or longer standstill.

Measurement time (adjustment range from 1 – 9 minutes)
is the measurement periode, in which a preset limit has to be exceeded permanent to result in a fault message. The shorter the periode is set, the sooner the fault message is displayed (more sensitive)

Limit value (adjustment range 1 – 99 %)
The percentage value is calculated from the resistance of the sensors and can be defined as limit value. The lower the limit value is set, the sooner the sensor responds (more sensitive)

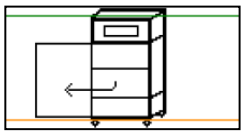
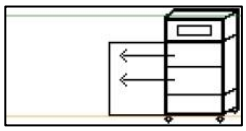
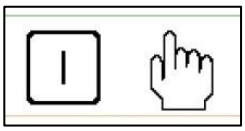
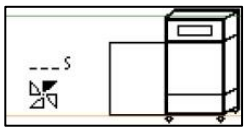
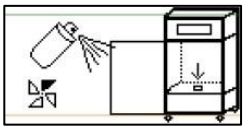
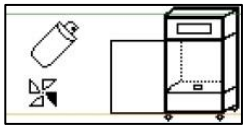
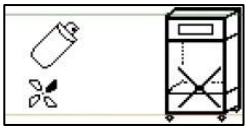
Factory default limit values of the sensors:

	VOC (Gas)	**PD (Particle)**
Waiting time	5 min	5 min
Measurement time	3 min	3 min
Limit value	50 %	20 %

The life time of the VOC-Sensor is ca. one year runtime.

To test the functionality of the sensors, a sensor test (Technician Menu/Test Routine/Sensor) can be carried out.

For carrying out the sensor test you will need a special **smoke detector-test aerosol (to order with article No 072-0625)**

Sensor-Test	**Image group number** (lower left)	
Open the door	41	
Remove pre-and main filter	42	
Start sensor test	43	
60 sec delay time run out. - VOC- und Dust-values are displayed for information.	44	
Spray in test spray for 4 seconds.	45	
Device runs further for ca 20 sec.(analysis)	46	
Device stopps and displays if sensors passed or failed.	47	
Sensor test failed	48	
The sensor test only can be carried out when sensors are mounted. During the sensor test, the motor runs with a performance of 20%. When exceeding the sensor values by 10% each, the test is passed (OK).		

Explanation Info-Display

The Info-Display can be opened from the User – as well as from the Technician Menu. The displayed values show the current operating states of the device and can supply helpful information in case of maintenance.

Hereinafter a short explanation of the main elements with example values:

Dp = 350 Pa
Differential pressure of the filters

Fill = 24 % (24 %)
Filter load pre-filter in %.
The left value is slow and corresponds to the load bar in the filter in the main screen (7 % = 1 bar).
The right value corresponds to the actual, real filter load.
In case of a sudden change of the differential pressure (e.g. aspiration of a large amount or blocked hose), these two values may be different.

Dust = not connected (Particle-Sensor not installed/activated)
If the particle sensor is installed and activated, the resistance value in Ohm and the converted percentage value are shown.

VOC = not connected (Gas-Sensor not plugged/activated)
If the VOC sensor is installed and activated, the resistance value in Ohm and the converted percentage value are shown.

Information to menu item “Filter Limit START” and “Filter Limit STOP”

The display of the filter load results from the interpretation of the differential pressure. The actual differential pressure can be viewed any time at the info display.

The filter load is calculated depending on the preset performance and the actual differential pressure.

Any changings at the device like:

- retrofitting a suction arm
- decrease or increase the diameter of the suction opening respective suction hose
- use of further suction hoses
- drastic shortening or extention of the suction hose

have effects to the differential pressure.

If you require a preferably exact display of the filter load in the display, this can be realised by a manual adaption of the basis values.

By entering the password 9221, you get to the technician menu.

In the menu items “Filter Limit START” or “Filter Limit STOP” you can have influence on the basis values on which the calculations are based.



Note that unreflected changes can have undesirable effects to the display of the filter load. The functionality of the device is however not effected.

Filter Limit Start =
Refers to the differential pressure value of a fresh, unloaded filter
1 % = 300 Pa (Differential pressure at lowest performance)
100 % = 1.000 Pa (Differential pressure at highest performance)

Filter Limit Stop =
Refers to the differential pressure values of a full filter.
1 % = 1.000 Pa (Differential pressure at lowest performance)
100 % = 4.000 Pa (Differential pressure at highest performance)

The mentioned values are default values. The analysis of the mean values is made on a straight line basis.



Caution:

- When increasing Filter Limit START, then Filter Limit STOP has to be increased minimum to the same extend.
- Carry out the adjustments in steps of full 100.
- If Filter Limit STOP is set too high, the filter may overflow.
  The optimal point can only be determined by individual observation.

Example procedure:

Reading the differential pressure values – Caution: fresh filters – in the info display give at
1 % performance = 400 Pa → = 100 Pa difference to default value
100 % performance = 1.400 Pa → = 400 Pa difference to default value

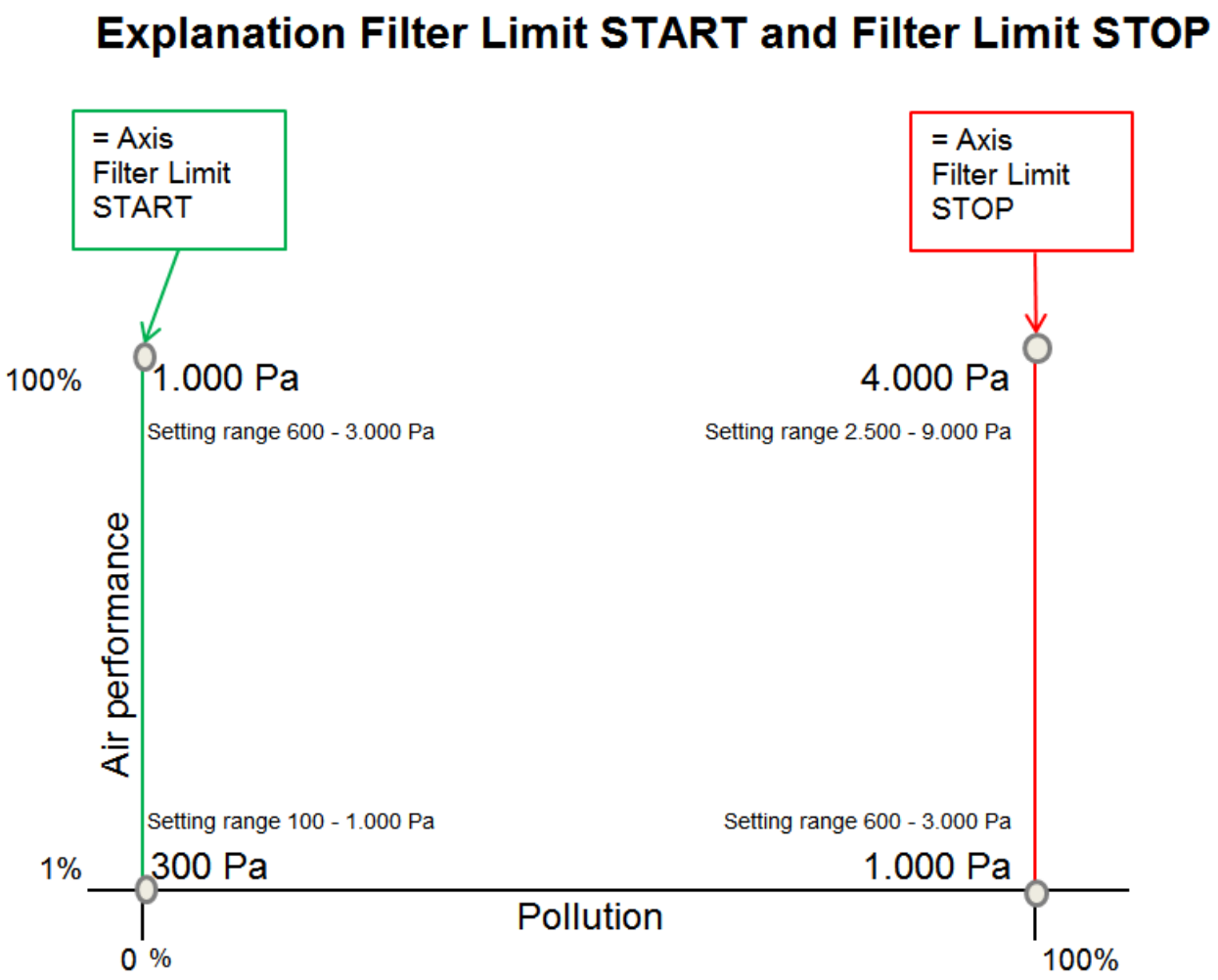
The read out differences are to be added in full 100 to the default value in the menu item Filter Limit START. Example:

1 % = 400 Pa (Default 300 Pa + 100 Pa difference)
100 % = 1.400 Pa (Default 1.000 Pa + 400 Pa difference)

In the menu item Filter Limit STOP, those difference values are minimum to be added also. Example:
1 % = 1.100 Pa (Default 1.000 Pa + 100 Pa difference)
100 % = 4.400 Pa (Default 4.000 Pa + 400 Pa difference)

→ see also the following diagram.

Diagram to Filter Limit START and Filter Limit STOP



By changing the actual values, the axes are shifted. Therefore the display of the filter load can be adapted to changed circumstances, e.g. after mounting a further suction hose.

When increasing the START values e.g. by 20 %, the STOP values have to be increased appropriate, as otherwise the filters are displayed as full too early.

Please contact the manufacturer for further explanation.

Information to menu item “Alarm configuration”

The menu alarm configuration offers the possibility to adapt warning and fault messages to the actual requirements.

Actually, the alarm configuration is constituted as follows:

Fault message	**Default operating condition Motor keeps running or goes out**	**Selection in tick box: no x = signal output to interface**
Hose blocked	out	Example:
Door open	out	X (= no signal)
Filter 80 % full (LEDs yellow flashing)	running	
Filter 95 % full (LEDs red)	out	
VOC-Sensor (Gas)	running	
PD-Sensor (particle)	running	
Low pressure configuration		

In remote operation (AUTO) the signal is forwarded to the interface in case of a warning or fault message.
If this is explicitly not desired, this can be suppressed by a choice in the tick box.

Low pressure configuration:

Difficult application conditions, e.g. extraction in a closed cabin without sufficient supplied air, can have effects to the fault messages.
Also, permanent opening and closing of cabin doors during running extraction can lead to problems with undesired fault messages.

In these cases this point can be confirmed with an “x” in the line “low pressure configuration” in the tick box, then the fault messages
"hose blocked"
"door open"
are suppressed completely, the motor continues to run.

This should only be applied with individual consideration of difficult application conditions.



ByPass-air supply is to be preferred to the suppression of fault messages

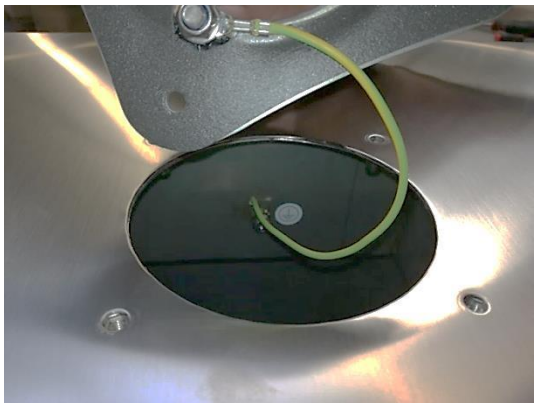
Mounting suction connection on top

Mounting of the suction connection on the top of the device lid:

Remove cover or suction arm.

Connect the grounding cable of the suction connection to the grounding bolt at the inner side of the device.

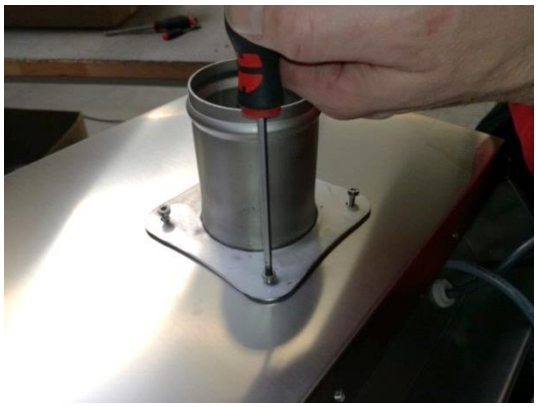
(notched washer M6, ground lug, self-locking hexagonal nut M6)



Fix the hose connection with four screws.

(hexagon socket screw 4mm)

Now the suction hose can be connected.



Maintenance



An inspection of the area around the hose including all edges and welded seams of the extraction nozzle must be made as specified under “Controls/Checks”. Any debris (e.g. from lasing process) must be removed. An accumulation of debris can result in hot lumps breaking off and causing a fire.



Original parts of the manufacturer must be used. Other parts eventually do not fulfil the construction or working requirements and can pose a risk for the personnel. The use of replacement parts supplied by third parties other than the manufacturer will invalidate the warranty.



When replacing the filters, full protective clothing must be worn. Use the filter replacement kits provided with each filter



Wrap the used filter into the disposal bag provided with the filter replacement kit. The filter must be disposed of according to locally applicable legal regulations for the disposal and/or disposal of hazardous waste

Controls / Checks

Depending on the processing procedure (production rate, performance) and amount/concentration of the particles to be vacuumed, the maintenance intervals listed below are to be adapted individually.

At least daily:
Check
→ extraction nozzle
→ hose
→ air inlet
if everything is mounted correctly and free from blockages.

Daily:
Check
→ whether debris has collected in the extraction hose or in the fume collection shroud (if installed)
→ that fumes are being drawn into the extractor.

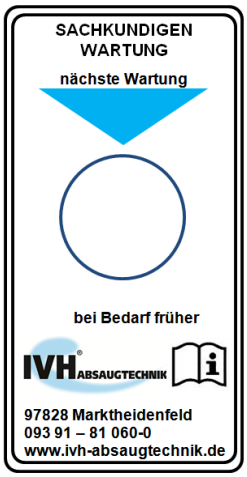
The laser marking application may require checks more frequently, depending upon the marking rate and laser power applied, this could be hourly.

Weekly
Check
→ the display status on the control panel
→ the condition of the extraction hose (or if applicable connected pipelines) for any build-ups that could block the hose/pipeline.

Monthly
Check
→ if the protection caps of the door locks close proper
→ power- and connection cables for damage.

Annual
shall the device be completely inspected and maintained by a competent person.

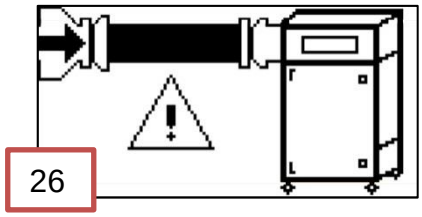
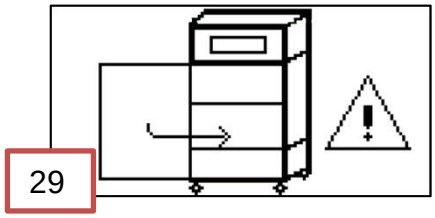
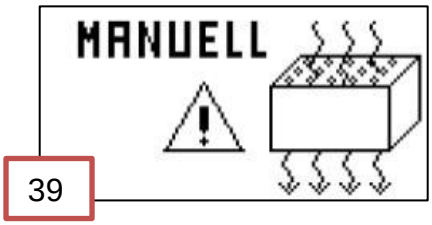
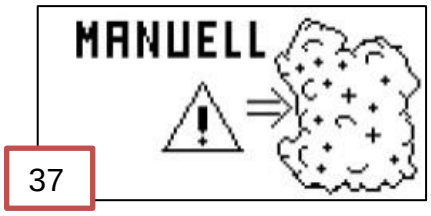
This can be implemented by a trained, competent person
Or: contact the manufacturer for further information and advice.



The annual maintenance shall include at least:
→ State of seals and connection leads
→ functionality of the lifting mechanism
→ protections (exhaust air cover, door locks etc.)
→ review state and performance of the extraction system
→ Air tightness of the device
→ earthing measurement of the discharging device parts (EX-protection)
→ insulation testing
→ interface testing
→ if applicable function of VOC and particle sensor
→ on demand: Software-Update

Warnings and fault messages

Various situations or faults result in a warning or fault message. In some circumstances, the system may not be able to clearly identify the fault and will then show the possible faults one after the other.

	**RED = fault = Motor stops** The extraction hose is completely blocked. Check the extraction hose and replace if necessary.
	**RED = fault = Motor stops** The door is open and must be closed.
	**RED = fault = Motor continues to run** The **VOC-Gas-Sensor** (optional available) has detected gas, which permeated pre- and main filter. The activated carbon filter has to be replaced.
	**RED = fault = Motor continues to run** The **Particle sensor** (optional available) has detected particle, which permeated pre- and main filter. The concerned filters are to be replaced.
	**RED = fault = Motor stops** Technical fault Please call the manufacturer service

Trouble shooting:

Motor is not running

- Switch, supply cable, connector or fuses are faulty.
  Solution: have the faulty component checked by a qualified electrician and replaced if necessary.
- The device switches off immediately after switching on and shows "door open" even though the door is closed
  Solution: check if the extraction arm is open or if the suction hose is free
- In remote operation: remote on/off-signal is not present
  Solution: check plug and connection

Insufficient or no suction power

- Suction hose or hose line is blocked or too soiled.
  Solution: clean or replace hose
- Filter too heavy loaded with dust, so the motor control cannot compensate sufficient
  Solution: Increase flowrate extraction performance or replace filter
- Suction hose is not connected
  Solution: Plug the suction hose into the device
- Extraction arm is not open
  Solution: Open the flap of the extraction arm
- Blocked or covered filter (e.g. insertion or cover cardboard plate not removed after filter replacement)
  Solution: remove blockade/covering

Dust is blown out

- **Switch off the device immediately!**
- Filter faulty
  Solution: check and replace the filter
- Filter not suitable
  Solution: check the filter and replace it with one with suitable properties.
- Filter replacement was not performed properly.
  Solution: clean the filter chamber dry.

Electrostatic voltage on cleaner

- Incorrect earthing
  Solution: check and restore earthing

Warning signs and information plates

The following information plates are mounted on the device and compliance with them is mandatory. All lost or illegible plates must be replaced with new ones. These can be requested from the manufacturer.

Explanation of information plates:



Attention!

“Do not vacuum ignition sources!”
“Type 22 – Suitable for vacuuming combustible dust in Zone 22"

Dust class M

This machine contains dust which may pose a health hazard. The machine must only be emptied and maintained (including emptying dust containers) by specialist personnel wearing appropriate safety gear. Only use the machine with the filtration system intact. Before use read the instruction manual carefully!



Dust class H

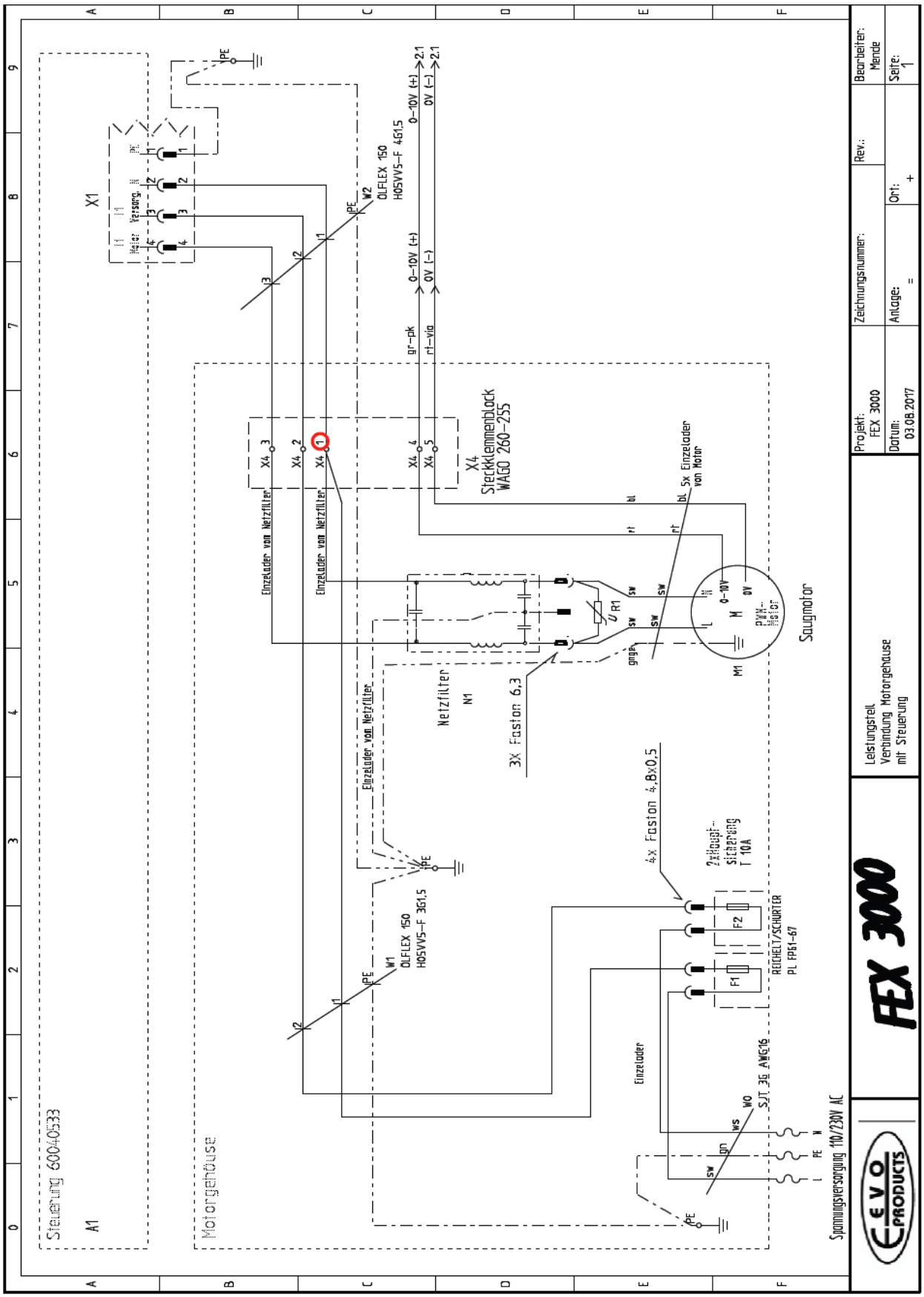
This device contains health hazardous dust.
Emptying and maintenance procedures, including the disposal of the dust collection container, may only be carried out by experts, who wear appropriate protective clothing.
Do not use the device without fully installed filtration system.
Read the manual before using the device.

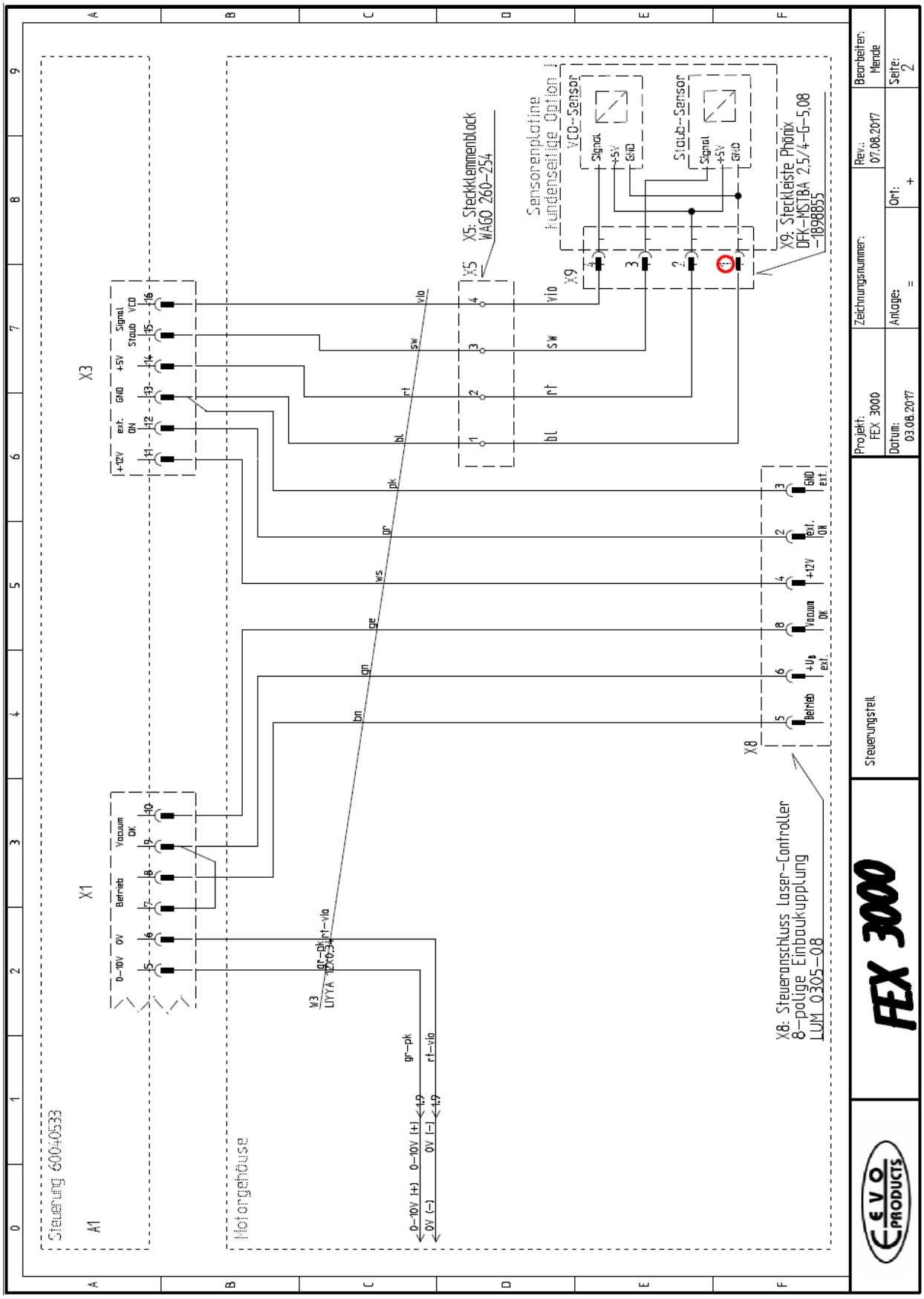


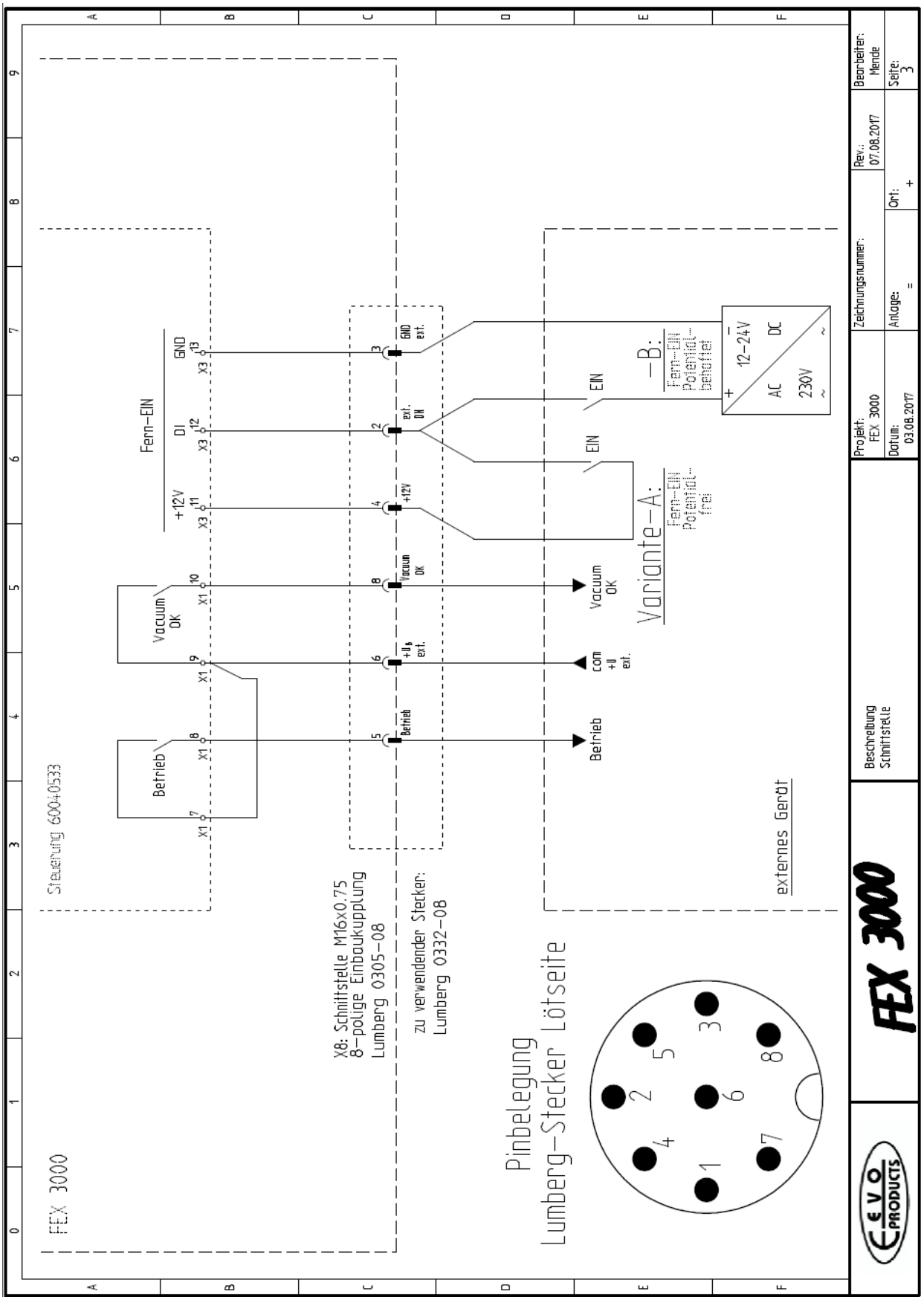
All machines carry the CE-sign (European conformity). The declaration of conformity is part of this instruction manual.



Circuit diagram FEX 3000




Steuerung 60040533
A1
X1
X3
X5: Steckklemmenblock
WAGO 260-254
X5
Sensorerweiterung
kundenseitige Option
VCO-Sensor
Staub-Sensor
X9
X9: Steckleiste Phönix
DFK-MSTBA 2,5/4-G-5,08
-1898855
X8
X8: Steueranschluss Laser-Controller
8-polige Einbaukupplung
LUM 0305-08
Motorgehäuse
W3
LiYY A 4x0,34
0-10V (+)
0V (-)
Projekt:
FEX 3000
Datum:
03.08.2017
Zeichnungsnummer:
Anlage:
Rev.:
07.08.2017
Ort:
Bearbeiter:
Mende
Seite:
2
Steuerungsstell
FEX 3000
EVO PRODUCTS


FEX 3000
Steuerung 6004-0533
Fern-EIN
+12V
DI
GND
Vacuum OK
Betrieb
X8: Schnittstelle M16x0.75
8-polige Einbaukupplung
Lumberg 0305-08
zu verwendender Stecker:
Lumberg 0332-08
Pinbelegung
Lumberg-Stecker Lötseite
Variante-A:
Fern-EIN Potential-frei
-B:
Fern-EIN Potential-behaftet
EIN
12-24V
AC
DC
230V
externes Gerät
Vacuum OK
com +U ext.
Betrieb
GND ext.
ext. DI
+12V
Vacuum OK
+Us ext.
Betrieb
Beschreibung Schnittstelle
Projekt: FEX 3000
Zeichnungsnummer:
Rev.: 07.08.2017
Bearbeiter: Mende
Datum: 03.08.2017
Anlage: =
Ort: +
Seite: 3
EVO PRODUCTS
FEX 3000

EU-Declaration of Conformity

As defined by the EC Machinery Directive 2006/42/EC

We hereby declare that the machine described below meets the provisions of the aforementioned Directive in its conception and construction as well as in the design put onto the market by us.

Designation	Extraction system
Series or type	FEX 3000
Manufacturer and address	EVO-PRODUCTS Blankenburg GmbH Dieselstraße 3 D – 53424 Remagen
Documentation officer	Iris Blankenburg

Further, we declare the conformity of the named machine with the protection goals of the following

Guidelines:
2014/30/EU (EMV)
2014/34/EU (ATEX Zone 22).
2006/95/EG (Low voltage)
2011/65/EU (RoHS)

Applied harmonized standards:
EN 61000-6-2:2005, EN 61000-6-3:2007/A1:2011
EN 61000-3-2:2014, EN 61000-3-3:2013
EN 60529:2014-09
EN 60950-1:2007/R:2014-10

The CE marking and the EU declaration of conformity become invalid when the machine is modified.

Remagen, 01.02.2018

CEO
Volker Blankenburg