

TRANSLATION OF THE ORIGINAL OPERATION  
MANUAL

## Stationary deduster

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### MOBEX P-50 ECO+



## **Welcome to the wide world of extraction technology**

With the purchase of an ESTA product you have chosen a quality product which has been designed to the current state of the art.

ESTA products provide clean air to the work place and consequently guarantee better quality, longer machine running times and above all, provide healthier working conditions.

We will be pleased to answer at any time your questions on any aspect of extraction technology.

Your team from

ESTA Apparatebau GmbH & Co. KG

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The information in the document must be followed during operation in order to avoid faults or damage. The operator must therefore make it available to all relevant maintenance and operating staff. Subject to alteration.

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The warranty can only be accepted if the following conditions are met:

- Professional transport
- Professional assembly, commissioning and operation using these operating instructions.
- Verifiable compliance with the prescribed maintenance intervals.
- Operation of the product with conveyed media having the specified chemical and physical properties.
- Immediate reporting of damage to the manufacturer.
- Exclusive use of genuine replacement parts.
- Structural modifications to the original condition only to be carried out with the agreement and written approval of the manufacturer.

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# 1 General instructions

## 1.1 General notes prior to use

Before using the product, it must be ensured that all persons about to use the product or perform maintenance work on it,

- Have received all relevant information, instructions and training courses for using the product and have understood them.
- Are able to perform or fulfil their tasks according to the law and the current operating manual.

## 1.2 Legal information

To reduce potential risks posed by the product, the design and construction of the product conform to the directives and standards listed in the EU/EC declaration of conformity. Potential risks can only be minimised when the user or its authorised representative adheres to the additional, relevant standards for a product ready to install.

## 1.3 Target group of the document

This document is intended for

- Operators trained on the product who are familiar with the extraction process.
- Trained assembly and maintenance personnel.
- Trained electrical specialists

## 1.4 How to read this document

This document is a component of the product it describes. Keep the instructions easily accessible at the place where the device is being used, so that they can be seen by the staff at all times.

All persons must carefully read this document before any work on the product takes place (commissioning, assembly, maintenance, etc.). Prerequisite for safe work and trouble-free handling is that all relevant information, instructions and training for the use of the product and substances it is used for have been obtained and understood. The tasks must be performed or fulfilled according to the law and in accordance with this document.

Please follow the safety and warning instructions in the document and on the product. All plant, operating, and work instructions of the owner-operator apply in addition to this document.

The document also contains graphical examples along with the descriptions. For this reason, the equipment may differ somewhat from the descriptions and representations.

### Highlighting in the text

In order to simplify the legibility and overview, various paragraphs and information are highlighted by distinguishing elements.

The symbols have the following meaning:

- 1st level list
  - 2nd level list
- ✓ Handling requirement
- 1. Handling step
  - ⇒ Intermediate result
- ⇒ Result of the entire handling sequence



Information on the target group for whom the following instructions are intended.

## 1.5 Form and significance of warning information

### **DANGER**



#### **High risk**

indicates an imminent hazard. If this is not averted, death or very serious injury will result.

### **WARNING**



#### **Medium risk**

indicates the possibility of an imminent hazard. If this is not averted, death or very serious injury may result.

### **CAUTION**



#### **Low risk**

indicates the possibility of an imminent hazard. If this is not averted, slight or minimal injury may result.

### **NOTICE**

























#### **Material damage**

Foreseeable material damage for the product and environment with a failure to comply with the specified measures.

This warning is displayed when there is a threat of danger or damage. This represents actions which can cause a risk of damage.

Warnings are indicated by a symbol or signal word. The warning includes information on the type and source of the hazard, the consequences if it occurs, and actions for averting it.

### 1.6 Explanation of symbols

<b>Warning notices</b>		General warning signs		Electric voltage
		Hearing damage		Toxic dusts
		Danger of crushing		Falling/tipping hazard
		Hand injuries		Automatic start-up
		Suspended load		Automatic start-up
<b>Prohibition symbols</b>		General prohibition		Read the manual
		Wear ear defenders		Wear safety goggles
		Wear safety footwear		Wear a hard hat
		Wear gloves		Use breathing equipment
		Wear protective clothing		Enable before maintenance or repair work
		Further information		Reference to target group

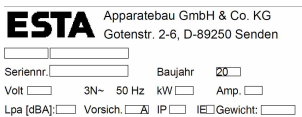


## 2 Product identification

### 2.1 Symbols and labels used



The ESTA service label indicates when and by whom the last service was carried out by the ESTA maintenance service. It also lists when the next service by the ESTA maintenance service is scheduled.



Product name plate (sample name plate)



- 1 Switch the product off.
- 2 Wait 5 minutes.
- 3 Pull out the collection drawer or open the product.



Hand injury warning.



Do not take in glowing dust or other sources of ignition. Do not use in conjunction with spark-generating machinery.



The surface may be loaded briefly with max. 175 kg.

### 2.2 Intended use



A pre-separator may be required for chip-generating extraction processes or very fine dusts (grain size  $\leq 10\mu\text{m}$ ).

The product was designed for use at the following workplaces:

- Individual work station
- Group work station
- A central extraction system on dust-generating machinery
- A central extraction system on chip-generating machinery

Coordinate any deviating applications with the manufacturer to ensure that the functioning of the product is not compromised.

The product has been manufactured based on state-of-the-art technology and according to recognised safety regulations and must be used appropriately and as follows:

- For commercial use, such as in industrial enterprises and workshops.
- For the extraction of dry dust
- for the extraction of chips
- For the extraction of free-flowing dust
- For the extraction of non-flammable dust
- Only for dry cleaning
- For the extraction of non-explosive dust

### 2.3 Improper use

The product may only be used within the scope of the technical data specified by ESTA. Uses that exceed the specifications in “Intended Use” are deemed to be inappropriate. The manufacturer is in this case not liable for resulting damage.

Examples of inappropriate use are:

- Extraction of combustible gases, dust, vapours or mist
- Using or storing the product outdoors
- Change in the location during operation
- Use in dust or gas EXPLOSION areas
- Extraction of highly flammable or glowing particles
- Connecting to processing machines that may produce active ignition sparks or hot embers
- Extraction of process air outside the specified temperature range, see Process air conditions [▶ 23]
- Extraction of dust from sources where the suction connection is larger than that of the product
- Extraction of liquids
- Extraction of corrosive gases
- Extraction of moist or fluid substances
- Extraction of oily parts
- Extraction of smouldering or burning substances
- Installation in paint shops
- Installation in food operations

## 2.4 Foreseeable misuse

The use of the product in an unintended way, but which can arise from easily foreseeable human behaviour.

This includes for example:

- Installing outdoors
- Installation or operation in explosive dust and gas environments
- Unauthorised modifications to the product
- Intake of glowing embers such as, e.g., cigarettes
- Start-up of the product despite defects detected on the product or attached parts (e.g., pipeline)
- Intake of items not suitable for suction (e.g., mobile phone, tool, glove, screws, etc.)
- Closing of intake opening

## 2.5 Warranty terms

ESTA accepts no liability for direct damage and consequential damage to products or for personal injuries when the product is not used for its intended purpose. The operating company must prove that the fault was not caused by inappropriate installation, assembly, maintenance or use of the product.

For your own safety, use only genuine replacement parts and accessories. ESTA accepts no liability for any resulting damage if other products are used.

## 2.6 Important information on the product

Responsibility must be clearly stipulated for the following tasks:

- Transport
- Assembly
- Commissioning
- Operation
- Maintenance and repair
- Cleaning
- Decommissioning
- Disposal

## 3 Safety

### 3.1 Hazard prevention

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#### **DANGER**



##### **Electric shock from high voltage**

Severe injury including death possible

- ▶ Any work on the electrical grid and on live components may only be performed by an electrician.
- ▶ Follow the safety rules for working with electrical products.
- ▶ Shut down the product or any live components at the main switch before working on them and secure them against reactivation (e.g. padlock).
- ▶ Establish electrical connections of the components according to the manufacturer's specifications.
- ▶ Protect the power supply cables against damage and dimension them according to the power uptake of the drive motor.
- ▶ Perform the electrical installation and connection of the drive motor according to the regionally applicable regulations (e.g. VDE), the legal standards of the country and the rules of the regional power company.
- ▶ Regularly check the power cable for damage and wear.
- ▶ If damage is found to the product or power cable, it must not be put into operation and the product must be secured against being switched on again. (e.g. padlock on the main switch or pull the power plug)
- ▶ Have any damaged cable replaced by specialised staff.
- ▶ Do not clean electrical components with a water jet.
- ▶ Check existing protective devices and adjust them to the working process of the product.

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#### **DANGER**



##### **Danger of fire due to sparks and glowing particles**

Severe injury including death possible

- ▶ Keep combustible, flammable materials away from the work area.
  - ▶ Never run away if clothing catches fire. Extinguish flames by rolling on the ground or by smothering them with blankets.
  - ▶ If there is a fire, alert the fire department immediately, and contain the fire by appropriate means.
  - ▶ Keep a suitable extinguishing agent (not included in scope of delivery) near the product before start-up and during operation.
-



## **DANGER**

### **Risk of falling and tripping**

Danger to life from falling objects or loads

- ▶ Do not stand under suspended loads.
- ▶ Secure the assembly area and mark it out (e.g., with barrier tape).
- ▶ Always lift the product vertically during loading and assembly work.
- ▶ Only transport the product with suitable, approved means of lifting and transport.
- ▶ Keep a sufficient distance from the product while it is being installed. Distance at least 1.5 times the height of the product.
- ▶ Wear personal protective equipment.
- ▶ Seal the intake port with a sealing plug so it is dust-tight during transportation.

## **DANGER**

### **Risk of fire due to deposits**

Deposits of dust trails and particles can cause a fire.

- ▶ Prevent spark ingress.



## **WARNING**

### **Danger of crushing due to loose or open covers**

Injuries to the limbs

- ▶ Keep covers tightly closed during operation.
- ▶ Ensure that inspection doors are firmly closed.
- ▶ Check regularly that fastening screws and component connections are secure.
- ▶ Only start up the product after the assembly is complete and correct.





## ⚠ CAUTION

### Toxic dusts

Short-term impairment of the respiratory organs during inhalation

- ▶ Maintenance, cleaning, repair, and emptying work may only be completed by expert personnel.
- ▶ Wear personal protective equipment.
- ▶ Seal the intake port with a sealing plug so it is dust-tight during transportation.
- ▶ Only operate the product with the filter elements installed.
- ▶ Regularly check the filter elements for clogging.
- ▶ Ensure that the collection container is attached to the discharge opening.
- ▶ Ensure that inspection doors are firmly closed.
- ▶ Always complete all maintenance and upkeep work in a well-ventilated room.
- ▶ Do not blow out or beat out the filter elements when they are disassembled.
- ▶ Dispose of used filter elements in air-tight-sealed disposal bags in accordance with regional regulations.

## ⚠ CAUTION



### Dust deposits in the pipe system

Short-term impairment of the respiratory organs during inhalation

- ▶ Check the connected piping system regularly for dust deposits.
- ▶ Observe the minimum air speed required for use and the resulting minimum airflow volume.

## ⚠ CAUTION



### Release of compressed air pulses when filter elements are being cleaned

Risk of hearing damage

- ▶ Wear personal protective equipment.
- ▶ Do not open the product during cleaning.
- ▶ Ensure that inspection doors are firmly closed.
- ▶ Only open the inspection doors when the compressed air tank is pressure-free.
- ▶ Wait for the automatic post-cleaning to end.
- ▶ Disconnect the compressed-air supply from the product.
- ▶ Empty the compressed air tank.

## 3.2 Workstation ventilation



The provisions of DGUV rule 109-002 must be complied with.

The operator must take air conditioning measures to ensure that the workplace ventilation requirements are met.

## 3.3 Product safety

The following points must be considered to avoid injuries and other risks due to inappropriate use and operation of the product:
















- Assembly, electrical connection, maintenance, initial operation, cleaning, repair and other work in connection with the product may only be performed by trained specialists.
- The product must be checked for faulty or damaged supply lines (cables, pipe systems, etc.), connections and open system parts (inspection door, discharge opening) every time before starting up. Do not use the product in such cases and immediately notify the maintenance personnel responsible.
- The product may only be operated when it is ready for operation, when the inspection doors are shut and when the toggle-type fasteners of the collection container are firmly closed.
- Ensure before any work is performed on the product or before inspection doors are opened that the product is disconnected from the power supply and secured against unauthorised reactivation.
- Connect the product to the electrical power supply properly and in precise compliance with the safety instructions and use it exclusively in accordance with the specifications.
- In all emergencies, disconnect the product from the power supply immediately.
  - Switch off the product at the main switch and secure it against re-operation.

### 3.4 Qualified personnel

**Trained personnel** Trained personnel are those who have been instructed in the correct handling of the product and who are aware of the risks presented by improper use. Personnel must receive instruction on safety equipment. Knowledge of this manual is mandatory.

**Qualified semi-skilled technicians** An employee with appropriate technical training, knowledge and experience who is able to identify and avoid hazards. Knowledge of this manual is mandatory.

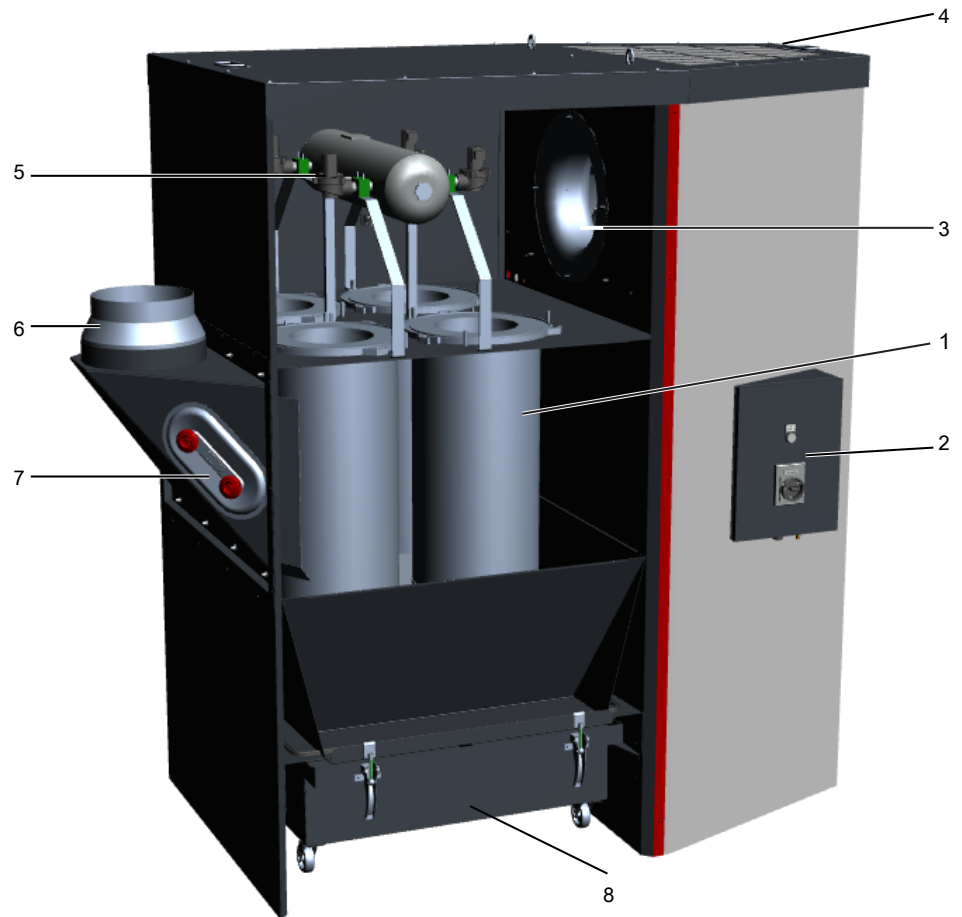
**Trained skilled worker** Qualified technician in a qualified profession. Knowledge of this manual is mandatory.

Target group	Task	Qualification	Protective equipment
Transport personnel	Transport Set-up	Qualified semi-skilled technicians	 
Installation personnel	Installation	Trained skilled worker	
Commissioning personnel	Commissioning	Trained skilled worker	 
Operating personnel	Operation	Qualified semi-skilled technicians	   
Maintenance personnel	Inspection Maintenance Repair work	Trained skilled worker	   
Maintenance, cleaning personnel	Maintenance Clean	Trained personnel	 



## 4 Structure and function

### 4.1 Illustration



1 Filter unit	2 Operating unit
3 Clean gas exhaust air, fan unit	4 Outlet opening clean gas
5 Jet-pulse cleaning compressed air tank	6 Raw gas intake
7 Raw gas collection container	8 Disposal unit

## 4.2 Functional description

**Procedure principle** Collected air is extracted using a vacuum and volume flow in a collection system (e.g. extraction arm, extraction hood) and then dust/smoke is removed in a filter unit. The suction unit attached to the product generates an air current and returns the purified air to the atmosphere via the outlet opening.

**Fan** The product is equipped with a motor which drives a radial fan. The fan is turned on and off at the control panel.

**Filter unit** Due to the negative pressure and volume flow produced by the fan, air is sucked in through the corresponding filter unit. The permanent filter in the filter unit separates the dust from the extracted air.

The purified air is fed back into the room through the outlets on the top of the fan unit.

**Air guide plate** The air guide plate acts as a filter pre-separator and is installed in the intake duct. The air sucked in is guided in a targeted manner and coarse particles are separated through the plate, which prevents the filter elements from being damaged. The air guide plate improves the service life of the filter cartridges.

**Cleaning** The cleaning is automatically activated via the control. The control determines the filter differential pressure. If the "Filter differential pressure" alarm threshold is reached during operation, the message appears on the display and is output via the external contact. The set lower threshold is exceeded and the cleaning of the filters is activated. The cleaning takes place via the pneumatic cleaning system in the filter unit. After switching off the suction, the filter cartridges are automatically cleaned.

**Disposal unit** Dust that is generated during the cleaning process is collected in the disposal unit below the filter unit. The collection drawer is lowered and pulled out for easier disposal of the collected material. Depending on the type of material collected, a collecting container can also be used, which is sealed tight together with the collected material for low-dust disposal in accordance with the local regulations.

## 4.3 Safety and monitoring devices

**Main switch** Main switch for turning the product on and off. EMERGENCY-OFF switch, which can be secured with a lock against unintentional activation.

**Differential pressure measurement** The minimum volume flow is monitored via the differential pressure of the control system.

**Motor protection switch** If the motor protection switch has tripped, the extraction operation stops and reactivation of the extraction is not possible.

**Safety valve** The safety valve monitors the pre-set activation pressure. As soon as the air reaches or exceeds the set pressure, the valve opens and allows the compressed air to escape. Once the pressure has regulated to normal, the valve closes again.

## 5 Transport and installation



TARGET GROUP: Transport personnel

### 5.1 Transport



#### **! DANGER**

##### **Risk of falling and tripping**

Danger to life from falling objects or loads

- ▶ Do not stand under suspended loads.
- ▶ Secure the assembly area and mark it out (e.g., with barrier tape).
- ▶ Always lift the product vertically during loading and assembly work.
- ▶ Only transport the product with suitable, approved means of lifting and transport.
- ▶ Keep a sufficient distance from the product while it is being installed. Distance at least 1.5 times the height of the product.
- ▶ Wear personal protective equipment.
- ▶ Seal the intake port with a sealing plug so it is dust-tight during transportation.

#### **! WARNING**



##### **Crushing hazard when setting the product down**

Injuries to the hands and feet

- ▶ Secure the product against tipping and falling during transport.
- ▶ Set the product down carefully and cautiously during set-up.
- ▶ Wear work gloves and safety shoes.

#### **NOTICE**



##### **Material damage due to improper transport**

Damage to the housing, lines and product components

- ▶ Do not push or pull the product across the floor if it does not have any rollers.
- ▶ Seal the intake port with a sealing plug so it is dust-tight during transportation.
- ▶ Pay attention to any protruding components when setting down the product.
- ▶ Note the centre of gravity (which is not in the centre) when setting down the product.

The product is delivered fastened to a pallet. After the protective covers and the floor fixing have been removed, the device can be lifted and transported using suitable lifting equipment.

- Remove the packaging and check the product for damage and completeness
- The product must not be put into operation if there is damage, or if the delivery is incomplete. Contact ESTA in such cases
- Any foreign objects inside the product must be removed before start-up

## 5.2 Set-up

### NOTICE



#### Avoid material damage due to electrostatic charge

The operator must ensure that conductive extraction systems and conductive processing machines that are not earthed via the product are earthed on site and integrated in the building's equipotential bonding.

### NOTICE



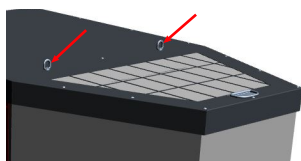
#### Damage to property and the environment

Observe minimum load-bearing capacity of the substrate

- ▶ Only install the product on a level, firm substrate with sufficient load-bearing capacity.
- ▶ Products that are stationary during use must be fastened to the floor with anchors or another appropriate means of fastening.
- ▶ Products that are mobile during use must be secured with the parking brake.

During set-up, always consider the required minimum distances from the product to ceilings and walls.

<b>Space requirement</b>	Operating side (mm)	1500
	Inlet side (mm)	1000
	Outlet side (mm)	1000
	Rear (mm)	500
	Top (mm)	1000



1. Check that the delivery is complete.
  2. Release the transport locks and remove the protective cover.
  3. Use the transport lugs provided to attach the product to approved hoisting equipment (e.g. lifting belt, round sling).
  4. Lift the product from the pallet and set it down on the floor adjacent to the pallet.
- ⇒ The product is ready for further connection.

## 6 Commissioning



TARGET GROUP: Commissioning personnel



### **DANGER**

#### **Electric shock from high voltage**

Severe injury including death possible

- ▶ Any work on the electrical grid and on live components may only be performed by an electrician.
- ▶ Follow the safety rules for working with electrical products.
- ▶ Shut down the product or any live components at the main switch before working on them and secure them against reactivation (e.g. padlock).
- ▶ Establish electrical connections of the components according to the manufacturer's specifications.
- ▶ Protect the power supply cables against damage and dimension them according to the power uptake of the drive motor.
- ▶ Perform the electrical installation and connection of the drive motor according to the regionally applicable regulations (e.g. VDE), the legal standards of the country and the rules of the regional power company.
- ▶ Regularly check the power cable for damage and wear.
- ▶ If damage is found to the product or power cable, it must not be put into operation and the product must be secured against being switched on again. (e.g. padlock on the main switch or pull the power plug)
- ▶ Have any damaged cable replaced by specialised staff.
- ▶ Do not clean electrical components with a water jet.
- ▶ Check existing protective devices and adjust them to the working process of the product.



### **WARNING**

#### **Danger of crushing due to loose or open covers**

Injuries to the limbs

- ▶ Keep covers tightly closed during operation.
- ▶ Ensure that inspection doors are firmly closed.
- ▶ Check regularly that fastening screws and component connections are secure.
- ▶ Only start up the product after the assembly is complete and correct.



### **⚠ CAUTION**

#### **Risk of injury when the fan impeller starts up**

Risk of crushing limbs

- ▶ Only work on the drive motor / fan impeller when the system is switched off.
- ▶ Ensure a freely accessible discharge opening with a protective grid.



### **⚠ CAUTION**

#### **Injury due to tripping**

Risk of tripping due to collection drawer and lifting device

- ▶ Always drive the collection drawer back into the housing and seal it.
- ▶ Wear personal protective equipment.



### **⚠ CAUTION**

#### **Release of compressed air pulses when filter elements are being cleaned**

Risk of hearing damage

- ▶ Wear personal protective equipment.
- ▶ Do not open the product during cleaning.
- ▶ Ensure that inspection doors are firmly closed.
- ▶ Only open the inspection doors when the compressed air tank is pressure-free.
- ▶ Wait for the automatic post-cleaning to end.
- ▶ Disconnect the compressed-air supply from the product.
- ▶ Empty the compressed air tank.



### **NOTICE**

#### **Avoid material damage due to electrostatic charge**

The operator must ensure that conductive extraction systems and conductive processing machines that are not earthed via the product are earthed on site and integrated in the building's equipotential bonding.

**NOTICE**



**Material damage**

- ▶ Inspect the product before each use for faulty, damaged or missing components.
- ▶ If there is damage, do not use the product and immediately notify the maintenance personnel responsible.



The switch cabinet must have an assured supply of cooling air.

The following technical documentation is required for commissioning:

- Product operating instructions
- Any supplier documentation
- Any circuit diagrams
- Any pipe-system installation diagrams (suction, discharge, intermediate piping)
- Site plan of the product's place of installation

**6.1 Ambient conditions for the product**

Ambient temperature	[°C]	+5 ≤ ≥ +40
Humidity	[%]	30 - 70

**6.2 Process air conditions**

Process air temperature	[°C]	+5 ≤ ≥ +40
Air humidity, non-condensing	[%]	up to 60

## 6.3 Pipeline connection

### CAUTION



#### Dust deposits in the pipe system

Short-term impairment of the respiratory organs during inhalation

- ▶ Check the connected piping system regularly for dust deposits.
- ▶ Observe the minimum air speed required for use and the resulting minimum airflow volume.

### NOTICE



#### Dust accumulations impede the airflow volume

If there is a change of the pipeline or the pipeline  $\varnothing$ , there is no guaranteed that dust deposits in the pipeline are avoided. The necessary minimum air speed must be taken into consideration and observed for the application.



ESTA recommends placing a spark pre-separator and a fire-extinguishing system upstream of the product.

#### Air inlet (raw gas)

1. Connect a pipeline or hose pipe to the intake port of the product.

⇒ Product is connected to the suction line.

Use as a suction line:

- an appropriate pipe (e.g. spiral duct) that corresponds with national requirements for this application.
- approved adapters in case of small diameters at the port.



## 6.4 Electrical connection

### CAUTION



**Starting up the drive motor / fan impeller when the extraction and outlet pipe are not correctly connected**

Risk of crushing limbs

- ▶ Check correct connection of the intake and outlet pipe.

### NOTICE



#### **Fault caused by residual current**

In accordance with DIN VDE 0100-530, a residual current circuit breaker or residual current circuit breaker RCD AC/DC sensitive Type B must be used with a three-phase current frequency converter.

### NOTICE



#### **Observe type plate**

Before establishing cable connections between the product and the mains, check whether the operating voltage specified on the rating plate matches that of the mains.

The product is connected according to the information on its type plate.

To supply the product with electricity, a CEE coupling provided by the customer must be available with the following connector plug:

- CEE 16

The connection to the building's power supply is established at the installation location by the customer.

## 6.5 Pneumatic connection



### NOTICE

#### Risk of corrosion of the compressed air tank or damage to the filter elements when using unfiltered compressed air

Use a compressed air maintenance unit to make sure that only oil-free and water-free compressed air is fed into the product.

- ▶ Wear personal protective equipment.

Compressed air is required for pneumatic cleaning of the filter elements. Only connect oil- and water-free compressed air with a hose approved for this purpose to ensure operating safety and machine availability.

Compressed air, free of oil and water (bar)	4-6
Compressed air quality, according to ISO 8573-1	3.2.2
Compressed air connection (")	1/4 (ø 9 mm)
Compressed air consumption*	19 (l/pulse)

at 4 bar with a valve opening time of 0.12 sec.

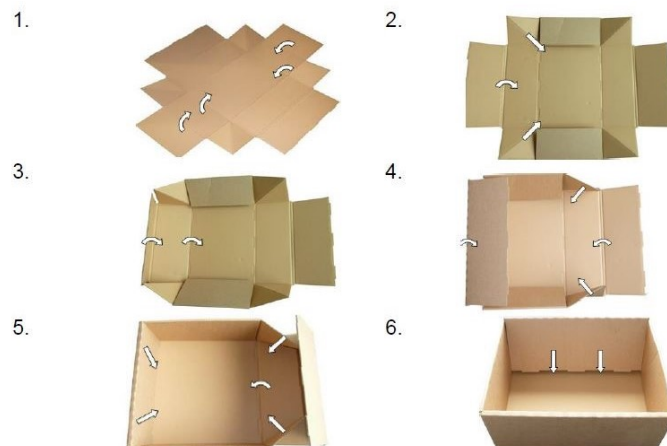
Tab. 1: Compressed air quality

## 6.6 Preparing disposal unit

The disposal carton must be inserted prior to commissioning.

### Prepare carton

Folding process sequence:





1. Open the toggle-type fasteners on the collection drawer.
  2. Open the clamp on the rail.
  3. Visual inspection for any consolidated product residues of other substances or objects, if necessary empty and clean the collection drawer.
  4. Insert disposal carton.
  5. Move the collection drawer back into the device.
  6. Close the clamp on the rail.
  7. Close the collection drawer by the toggle fasteners.
- ⇒ The collection drawer is ready for operation.

## 6.7 Collection equipment



Hazardous substances must be fully recorded at their point of discharge or source. Almost complete collection can be achieved if the hazardous substances are drawn off by suction using collection elements of an enclosed, semi-open or an open design. Collection elements must be adapted to the local conditions and dimensioned to take account of air pollution. Mobile collection elements must be adjusted in such a way that air pollutants are reliably collected and not guided through the breathing zone.

Extraction elements with various intake port diameters can be operated with the product. In this case, ensure that:

- The minimum airflow volume sucked away is not undershot
  - The minimum airflow volume depends on the diameter of the intake port of the extraction element and the requisite conveying velocity.

## 6.8 Operating and display elements



For further information, see the Control manual.



**Main switch** Main switch for turning the product on and off. EMERGENCY-OFF switch, which can be secured with a lock against unintentional activation.

**Panel** Touch display for displaying and selecting functions.



### Switching the extraction function on

The button illuminates green when extraction is active.



### Switching the extraction function off

The button illuminates red when there is a fault pending. Observe the instructions and messages on the display.

Within the menu: BACK function to the previous menu



### Activating cleaning manually

Cleaning is activated with the current pulse and pause time and takes place according to the pre-adjusted parameters. The button lights when cleaning is active.

The button flashes when the preset minimum volumetric flow is reached.



### INTERNAL

Selects internal control system (manual mode).

Within the menu: Navigation in the sub-menu / value adjustment



### EXTERNAL or TIMER

Selection of external control unit (optional; automatic operation via potential-free contact).

Selects the timer function (optional).

Within the menu: Navigation in the sub-menu / value adjustment



### SERVICE

Access the main service menu

Within the menu: ENTER function

## 6.9 Monitoring rotation direction

### DANGER



#### Electric shock from high voltage

Severe injury including death possible

- ▶ Any work on the electrical grid and on live components may only be performed by an electrician.
- ▶ Follow the safety rules for working on electrical products.

### NOTICE

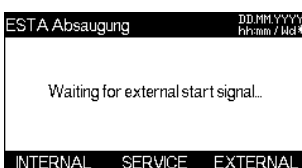
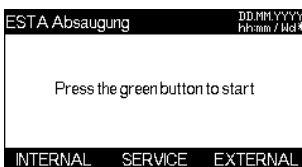


#### Possible material damage caused by incorrect fan rotation direction

- ✓ If the rotation direction is incorrect, the product heats up unacceptably.
- ✓ The volume increases, the airflow volume falls, and the product's suction performance deteriorates.
- ✓ Damage to the product cannot be ruled out.
- ▶ After first switching on the product, the fan rotor's direction of rotation must be checked.

#### Change rotation direction

1. Turn the product off at the main switch.
  2. Remove the power plug.
  3. Have the phases of the phase reversing connector transposed by an electrical technician.
  4. Insert the power plug.
  5. Switch on the product at the main switch.
  6. Compare the rotation speed of the fan impeller with the rotation direction arrow on the housing.
  7. The signal light of the phase sequence control no longer lights up; i.e. the fan runs in the wrong direction.
  8. If this display is shown on the control unit, the fan's running direction is correct.
- ⇒ The product is ready for operation.



## 6.10 Activation operations for motors

Motors with high output without frequency converters should be not be switched on and off within a short period of time too frequently. Otherwise, electrical components could be overloaded. Please observe the table for activation operations:

<b>Motor output kW</b>	<b>Power-ups / h</b>
1 - 4	< 8 starts
4 - 7.5	< 6 starts
7.5 - 15	< 4 starts
15 - 30	< 3 starts
From 30	Electronically controlled overrun time

## 7 Operation



TARGET GROUP: Operating personnel

### 7.1 Operating modes

#### Internal mode (manual operation)

**INTERN**

Selects manual mode.

"Internal" mode is a manual mode.

The extraction is started and stopped manually.

#### Timer mode (optional)

**TIMER**

Selects automatic mode via the timer function

If the device is in timer mode, the extraction will be started and stopped via adjustable switching times when the main switch is switched on.

If the product is already in this mode when switched on, a countdown of approx. 10 seconds takes place before start-up to allow the operating mode to be changed.

#### Pre-coat mode (optional)

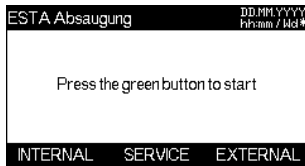
If the product is in pre-coat mode at the time of delivery, the system will stay in that mode until the filter saturation has reached the adjusted value. For further information, see the software manual.

No cleaning can take place before or after extraction if pre-coat mode is active. The product cannot be manually cleaned either.

## 7.2 Operating the product

### Switch on the product

1. Switch on the product at the main switch.  
⇒ The product is ready for operation after activation via the main switch. Now, the extraction can be activated.
2. Select manual operation.



**INTERN**



3. Switch on the extraction function with the control unit.  
⇒ The product is in operation.

### Switching the extraction function off



1. Switch off extraction on the control panel.  
⇒ The automatic post-cleaning starts. The product must remain switched on for around 5 minutes.

### Switch product off

1. Turn the product off at the main switch.  
⇒ The product is not in operation.



### 7.3 Symbol description



**ESTA Absaugung**

Product name



Warning message present.



System runs via external operation.



System runs in manual operation.



System runs via timer clock.



SD card inserted (optional).



No SD card inserted (optional).



Recording on the SD card (optional).



Booster function activated (optional).



Max. fill level in the disposal carton / collection container has been reached (optional).

**DD.MM.YYYY  
Hh:mm / Wd\***

Date (day, month, year) and time (hour:minute / day of week)



Summer time: Summer / winter time changeover (automatic).

**INTERN**

Manual operation. If the extraction is started externally or via timer clock, the control unit can be switched to internal.

**EXTERN**

Selects automatic operation (optional potential-free contact).

**SERVICE**

Accessing the service menu.

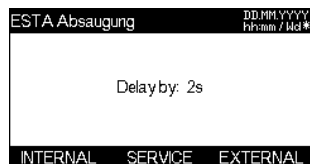
**TIMER**

Selects automatic operation via timer function (optional timer clock).

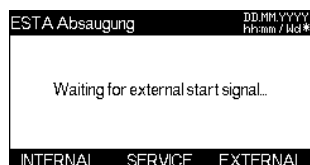
### 7.3.1 Potential-free contact (optional)

**EXTERN**

The product is connected to a potential-free contact.

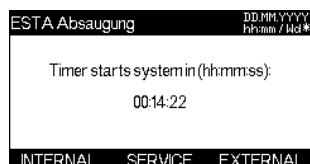


The countdown is displayed in order to change the operating mode, if necessary.



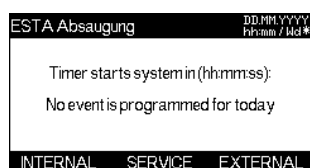
The extraction starts after the countdown has elapsed.

### 7.3.2 Timer function (optional)



Indicator of when the timer function in the product is released and switching times are programmed.

After the countdown has elapsed, the extraction starts according to the programmed switching times.

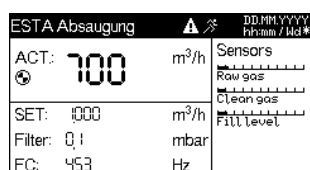


Indicator of when the timer function in the product is released and **no** switching time is programmed.

### 7.3.3 During operation

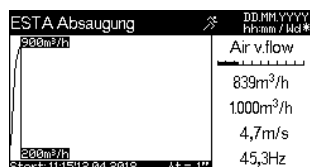


The display switches to show "sensors".



The displayed data relates to various optional sensors.

On start-up of the system, additional operating parameters, such as actual and setpoint volume flow, frequency and differential filter pressure are displayed in run mode.



Currently measured values during operation.



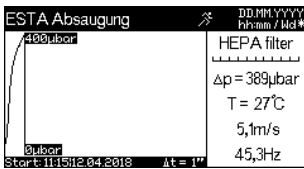
Adapt specified volume flow (m³/h) to be achieved with the cursor.



< 5,000 m³/h	Increments of 50
> 5,000 m³/h	Increments of 100
> 10,000 m³/h	Increments of 150



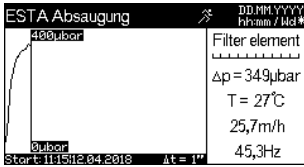
The display switches to show "inlet nozzle".



The displayed data relates to the inlet nozzle.



The display switches to show "filter element".



The displayed data relates to integrated filter elements.

### 7.3.4 Service menu



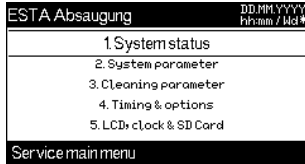
Various settings of the product can be viewed or changed in the main service menu. Certain areas are password-protected and identified with a lock symbol. After successful CODE entry, these areas can be opened and corresponding parameters can be changed.

- If no activity takes place in the main service menu for 1 minute, the control unit ends the process and the main menu is exited automatically.
- If no activity takes place in the submenus for 1 minute, the control unit ends the process and the main menu is exited automatically.
- Changes are saved without confirmation when the submenus are exited.

## Main service menu access

**SERVICE**

Briefly press the button.



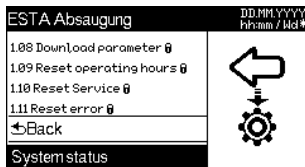
The main service menu appears.



Navigate in the main service menu with the cursor.



Select the menu item.



Press 'Previous' to return to main screen.

## CODE entry



In order to be able to change parameter settings, access to some sub-menu items in the main service menu is only possible after CODE entry. These areas are identified with a lock symbol.

CODE entry applies for the following levels:

**USER mode** Parameters can be viewed, but no changes can be made.

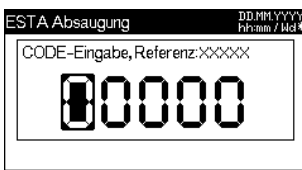
**ADMIN mode** Released parameters can be viewed and changed. Only for trained, specialist personnel.

**SERVICE mode** ESTA service area.

Proceed as follows:



1. Press and hold the button for approx. 3 seconds.



2. Release the button when the display blinks.

3. CODE entry is activated.

4. Notify ESTA customer service of the displayed reference (XXXXXX). You receive a 5-digit access code.

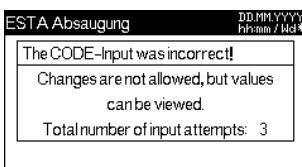
5. The access code is valid in ADMIN mode for approx. 1 operating hour. If the system is switched off with the main switch, the CODE entry must take place again.



6. Enter the 4-digit access code with the cursor buttons.



Within the menu function: Selection / ENTER function.



The following messages appears when an incorrect entry is made.

You remain in USER status.

## 7.4 Jet impulse cleaning



### ⚠ CAUTION

#### Release of compressed air pulses when filter elements are being cleaned

Risk of hearing damage

- ▶ Wear personal protective equipment.
- ▶ Do not open the product during cleaning.
- ▶ Ensure that inspection doors are firmly closed.
- ▶ Only open the inspection doors when the compressed air tank is pressure-free.
- ▶ Wait for the automatic post-cleaning to end.
- ▶ Disconnect the compressed-air supply from the product.
- ▶ Empty the compressed air tank.




Due to the fact that the fan is shut down when the jet pulse is active, it is possible for dust to escape at the suction points due to the use of compressed air.

The filter unit of the product has an integrated, pneumatic jet-pulse cleaning system. This unit has the following functions:

- Automatic cleaning during suction operation
- Automatic post-cleaning
- Manual cleaning

### 7.4.1 Automatic cleaning

- Start of cleaning**
- ✓ Suction power weakens.
  - ✓ The product reaches the pre-set differential pressure.
  - ✓ The yellow button  flashes.
  - 1. The cleaning cycle starts automatically during suction mode
    - ⇒ After completion, wait at least 5 minutes until the cleaning cycle is complete.
  - ⇒ Filter elements are cleaned of coarse dirt.

## 7.4.2 Manual cleaning



### NOTICE


#### Dust leaks at the extraction points

In the event of manual cleaning, dust may leak from the extraction points during cleaning due to the pulse-like introduction of compressed air if the suction assemblies are not running.

Manual cleaning is performed to release the pressure in the compressed air tank, for example, before the product is opened. Dust may leak from the suction points during this process due to the pulse-like introduction of compressed air.

#### Start of cleaning

- ✓ At any time during operation
- ✓ The product is switched off and the automatic post-cleaning cycle is completed

1. Press the  button on the cleaning controller for at least 2 seconds.
  - ⇒ Filter elements are cleaned of coarse dirt.

## 7.4.3 Automatic post-cleaning

- Start of post-cleaning**
- ✓ The yellow "Post-cleaning threshold" LED on the differential pressure column lights up.
  - ✓ Extraction on the control panel switched off
1. The cleaning cycle starts automatically while the extraction assembly is still running.

⇒ Filter elements are cleaned of coarse dirt.

Wait at least 5 minutes before opening the inspection door. This allows the cleaning cycle to be completed and the contaminants to settle in the collection container.

## 8 Servicing and maintenance



TARGET GROUP: Maintenance and cleaning staff

### ⚠ CAUTION



#### Toxic dusts

Short-term impairment of the respiratory organs during inhalation.

- ▶ Maintenance, cleaning, repair, and emptying work may only be completed by expert personnel.
- ▶ Wear personal protective equipment.
- ▶ Regularly check the filter elements for clogging.
- ▶ Always complete all maintenance and upkeep work in a well-ventilated room.
- ▶ Do not blow out or beat out the filter elements when they are disassembled.
- ▶ Dispose of used filter elements in air-tight-sealed disposal bags in accordance with regional regulations.
- ▶ Seal the intake port with a sealing plug so it is dust-tight during transportation.



All maintenance work must be recorded in writing in the maintenance book provided. This must make clear the equipment inspected and, if necessary, the deficiencies found, along with the name of the inspector and the date of the inspection.

All maintenance tasks should be carefully performed within the given time-scales. Preventative maintenance of the components prolongs the life of the product. So does regular cleaning and preventative exchange of wearing parts.

Safety devices for prevention or removal of hazards (e.g. according to the 2009/104/EC work equipment user devices and TRGS 560) must be regularly maintained and inspected by an expert for safe and appropriate operation.

Shut down the product immediately if malfunctions and defects are discovered and notify the responsible maintenance and repair staff.



## 8.1 Operating and auxiliary materials



### NOTICE

#### **Material damage caused by aggressive cleaning agents and incorrect cleaning methods**

Damage to seals, surfaces or plastics on the product

- ▶ Do not use any aggressive cleaning agents which might attack seals, surfaces or plastics.
- ▶ Use damp disposable cloths for cleaning.
- ▶ Use industrial vacuum cleaners approved for the application.
- ▶ Do not use any sharp objects or cleaning material with a rough surface.

**Cleaning agents** The following are suitable as cleaning agents:

- Mild detergent
- Damp disposable cloths

The following are suitable as cleaning agents for deposited dusts and coarse soiling on surfaces:

- Industrial vacuum cleaner

**Compressed air** Compressed air is required for pneumatic cleaning of the filter elements. Always connect oil and water-free compressed air to ensure operational safety and optimum function of the product.

## 8.2 Maintenance table

### NOTICE



#### Adjusting the maintenance interval to the operating time

The inspection and maintenance intervals specified here refer to normal application conditions.

In difficult conditions, e.g. increased separation volume and extended daily operating hours, the specified intervals must be shortened.

#### Maintenance table

	daily	monthly	quarterly	half-yearly	annually	as required
8.3 Visual inspection	1					
8.4 Functional check		2				
8.5 Check the filter elements		2				
8.8 Checking the pipeline		2				
8.9 Checking the filter mat		2				
8.13 Clean the air guide plate			2			
8.7 Check safety valve				2		
8.3 Visual inspection					2	
8.6 Emptying the compressed air tank						2
8.10 Changing the filter cartridge						2
8.11 Replacing filter mats						2
8.12 Emptying the collection container						2
8.14 Cleaning the product						2

1 - Operating personnel; 2 - Maintenance personnel

## 8.3 Visual inspection

Parts and components on the product exhibiting damage must be replaced immediately with new original ESTA parts.

- Daily**
- Check the complete product and its parts for damage
  - Check the product and its parts for dirt and clean as necessary, see Cleaning the product [▶ 55]
  - Check discharge and deposits of media (e.g. dust trails) on interfaces and outlet openings and check filter if necessary.
  - Check electrical cables for damage such as open cable insulation, crushing, visible wiring or heavy soiling
  - Check sensors for contamination and deposits, remove severe dirt deposits if necessary
  - Check the fill level of the collection container (regulations require that the container be emptied if it is more than 2/3 full), see Emptying the collection container [▶ 52].
  - Fan impeller noise / check drive motor start-up
    - non-circular running
    - flapping
    - grinding
    - pounding
1. Switch the product off immediately if the noise indicates an unusual fault of the fan impeller.
  2. Determine and eliminate the cause of the fault or initiate its removal by a specialist, e.g. have the drive motor and / or fan impeller replaced by a specialist.
- Weekly**
- Check the air baffle for accumulations, clean as required.
  - Check pipelines to specify operational inspection and cleaning intervals
- Annually**
- Check the sealing of the complete product
  - Have the fan checked by the manufacturer for:
    - Proper fitting of the fixing screws and connections to the product
    - Cracks of the housing / sealing
  - Check the compressed air tank
    - Leaking of air or condensate, Emptying the compressed air tank [▶ 45] if necessary or Compressed air tank condensate
    - Compressed air connections on the product

## 8.4 Functional check

- Monthly**
- Check all moving parts for firm seating
  - Check hoses and connections for sealing
  - Check operating and display elements (buttons, switches) for function
  - Check the volume flow control for function
    - Closing the product air inlet: If the automatic cleaning starts or an acoustic signal sounds, the volume flow control reacts correctly.
  - Check the mains connection line for damage and replace damaged parts as necessary
  - Check the safety devices (motor protection relay etc.) and arrange for adjustments by service personnel, if necessary
  - Check that all pipe fittings and bearings are tight
  - Check the pipeline system for damage, deposits and leaks
  - Tighten externally accessible screw connections
  - Check optionally available equipment according to the manufacturer's instructions
- Half-yearly**
- To ensure that the timer works properly, the system time must be checked every six months and adjusted if necessary.
- Annually**
- Check all electrical devices in accordance with VDE 0701 - 0702
  - Contact ESTA maintenance service to check the volume flow, vacuum and current consumption

## 8.5 Check the filter elements

- Condition of the filter elements
- Damage and level of soiling
- Soiling in the interior between the filter elements and the outlet

## 8.6 Emptying the compressed air tank



### CAUTION

#### Risk of hearing damage

Release of compressed air pulses when filter elements are being cleaned.

- ▶ Wear hearing protection.

After a longer period of operation, condensate collects in the compressed air tank. If this is not drained regularly, it can lead to corrosion in the compressed air tank and insufficient cleaning of the filter cartridges.

For most cleaning, maintenance and repair work, the compressed air tank must be emptied by manually cleaning the control unit if necessary; see chapter Manual cleaning [▶ 39].

1. Switch off extraction on the control panel.
2. Disconnect the compressed air supply.
3. Switch off the product and secure it against reactivation.
4. Place a suitable container under the drain valve to collect the condensate.
5. Open the draining valve of the compressed air container.
  - ⇒ Condensate drains.
6. When pressure gauge is displayed: "0", close the drain valve.
  - ⇒ The compressed air tank contains no compressed air or condensate.
7. Re-connect the compressed air supply.
8. Switch the product on again.

## 8.7 Check safety valve

The function of the safety valve must be checked every six months. The valve is lifted by means of a knurled screw. In the event of leakage or contamination, lift the safety valve several times.

## 8.8 Checking the pipeline



### NOTICE

#### Avoiding electrostatic charges

- ▶ Have an electrician inspect and log the equipotential bonding of the system and the pipeline system.
- ▶ Check the conductivity.

When increasing the pipeline diameter or extending the pipeline, dust deposits can accumulate in the pipeline.

1. Check the connected piping system regularly for dust deposits.
2. Observe the minimum air speed required for use and the resulting minimum airflow volume.

## 8.9 Checking the filter mat



### ⚠ CAUTION

#### Damage due to dust release

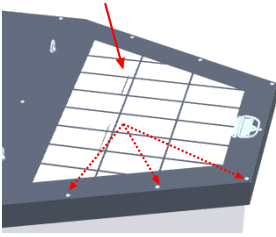
- ▶ Only operate the product with the complete filtration system.
- ▶ Regularly check the filter mats for soiling.
- ▶ Wear personal protective equipment.

Filter mats are installed on the side outlet elements. These must be checked regularly and replaced when necessary.

- Degree of contamination and filter mat deposits
- Proper fitting of the filter mats on the outlet elements

Proceed as follows:

1. Switch off extraction on the control panel.
2. Disconnect the compressed air supply.
3. Empty the compressed air tank; use manual cleaning on the operating unit if necessary; see Manual cleaning [▶ 39] chapter.
4. Switch off the product and secure it against reactivation.
5. Wait at least 5 minutes until the contaminants have settled in the collection container.
6. Remove the power plug.



7. Loosen and remove the fastening screws.
8. Disconnect potential compensation from the cover (optional).
9. Remove the outlet element cover.
10. Perform a visual inspection. If the filter mat is saturated and exhibits clear signs of sedimentation, it must be replaced, see chapter Replacing filter mats [► 50].
11. Reinstall cover.
12. Connect potential compensation to the cover (optional).
13. Insert the cover fastening screws and tighten them by hand.
14. Re-connect the compressed air supply.
15. Insert the power plug.
16. Switch the product on again.

## 8.10 Changing the filter cartridge

### CAUTION

#### Toxic dusts

Short-term impairment of the respiratory organs during inhalation.



- ▶ Maintenance, cleaning, repair, and emptying work may only be completed by expert personnel.
- ▶ Wear personal protective equipment.
- ▶ Regularly check the filter elements for clogging.
- ▶ Always complete all maintenance and upkeep work in a well-ventilated room.
- ▶ Do not blow out or beat out the filter elements when they are disassembled.
- ▶ Dispose of used filter elements in air-tight-sealed disposal bags in accordance with regional regulations.
- ▶ Seal the intake port with a sealing plug so it is dust-tight during transportation.

After an extended time in operation, the fabric of the filter elements slowly clogs up due to the penetration of dust. Depending on the degree of soiling, it may no longer be possible to clear the fabric of deposits using the cleaning device alone. It is no longer possible to reach the minimum volume flow. At this stage, the filter elements must be completely replaced.

1. Switch off extraction on the control panel.
2. Wait at least 5 minutes until the contaminants have settled in the collection container.
3. Empty the compressed air tank; use manual cleaning on the operating unit if necessary; see Manual cleaning [▶ 39] chapter.
4. Disconnect the compressed air supply.
5. Unscrew and remove the fastening screws from the product's cover.
6. Release the compressed air tank fastening nuts.
7. Remove the compressed air tank.
8. Loosen fastening screws on cleaning device and remove from the holder.
9. Loosen and completely remove the filter cartridge fastening nuts.
10. Fold the disposal bag over the edge of the filter cartridge.



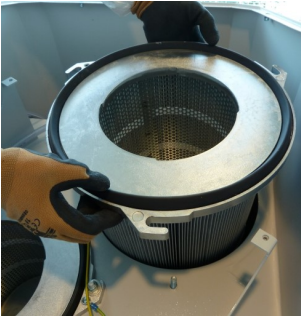
11. User 1: Carefully remove the filter cartridge  
User 2: Carefully fold the disposal bag over the complete filter cartridge.
12. Wrap a disposal bag around the filter cartridges and seal these tightly.  
⇒ Filter cartridges are removed and ready for disposal.



13. Clean the housing, including the rear side of the air baffle, with an industrial vacuum cleaner.  
⇒ Dust must not be agitated.
14. Unpack the new, original ESTA filter cartridges, check the fit of the seal on the filter cartridge, and adjust as needed.
15. Insert the filter cartridge and turn it approx. one  $\frac{1}{4}$  rotation anti-clockwise.  
⇒ The bayonet closure locks the filter cartridge in place.







16. Insert cleaning unit.
  - ⇒ The cleaning unit must not grind on the support basket of the cartridge.
17. Lock the fan unit toggle-type fasteners.
  - ⇒ The filter cartridges are replaced.
18. Remove the additional filter cartridges as described.
19. Insert the compressed air tank with bracket carefully.
  - ⇒ The compressed air tank outlets must be positioned centrally in the filter cartridge.
20. Insert the fastening nuts for the filter cartridge and fasten them.
21. Mount the pressure hose to the compressed air tank and fasten it with a pipe clamp.
  - ⇒ The filter cartridges are replaced
22. Re-connect the compressed air supply.
23. Switch the product on again.

## 8.11 Replacing filter mats

### **WARNING**



#### **Risk of crushing when removing and fitting covers**

Hand injuries

- ▶ Do not reach between the housing and the cover.
- ▶ Wear gloves.

### **CAUTION**

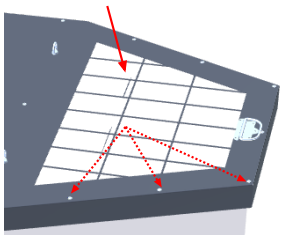
#### **Toxic dusts**

Short-term impairment of the respiratory organs during inhalation.



- ▶ Maintenance, cleaning, repair, and emptying work may only be completed by expert personnel.
- ▶ Wear personal protective equipment.
- ▶ Regularly check the filter elements for clogging.
- ▶ Always complete all maintenance and upkeep work in a well-ventilated room.
- ▶ Do not blow out or beat out the filter elements when they are disassembled.
- ▶ Dispose of used filter elements in air-tight-sealed disposal bags in accordance with regional regulations.
- ▶ Seal the intake port with a sealing plug so it is dust-tight during transportation.

1. Switch off the product and secure it against reactivation.
2. Wait at least 5 minutes until the contaminants have settled in the collection container.
3. Disconnect the compressed air supply.
4. Empty the compressed air tank; use manual cleaning on the operating unit if necessary; see Manual cleaning [▶ 39] chapter.
5. Remove the power plug.
6. Loosen and remove the fastening screws.
7. Disconnect potential compensation from the cover (optional).
8. Remove the outlet element cover.
9. Carefully withdraw the filter mat from the interior.
10. Place the filter mat in the disposal bag provided.
  - ⇒ Used filter mat have been removed and are ready for disposal.



11. Unpack and insert the new, genuine ESTA filter mat.  
⇒ The filter mat has been replaced.
12. Reinstall cover.
13. Connect potential compensation to the cover (optional).
14. Insert the cover fastening screws and tighten them by hand.
15. Re-connect the compressed air supply.
16. Insert the power plug.
17. Switch the product on again.

## 8.12 Emptying the collection container

### ⚠ CAUTION



#### Toxic dusts

Short-term impairment of the respiratory organs during inhalation.

- ▶ Maintenance, cleaning, repair, and emptying work may only be completed by expert personnel.
- ▶ Wear personal protective equipment.
- ▶ Regularly check the filter elements for clogging.
- ▶ Always complete all maintenance and upkeep work in a well-ventilated room.
- ▶ Do not blow out or beat out the filter elements when they are disassembled.
- ▶ Dispose of used filter elements in air-tight-sealed disposal bags in accordance with regional regulations.
- ▶ Seal the intake port with a sealing plug so it is dust-tight during transportation.

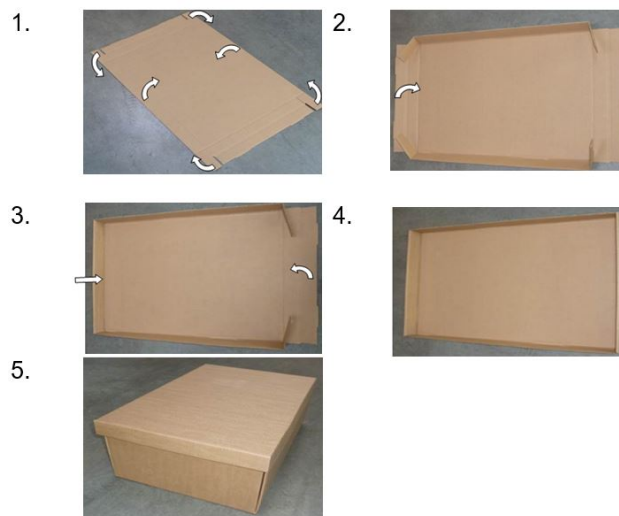
### NOTICE

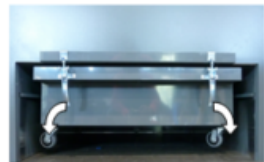
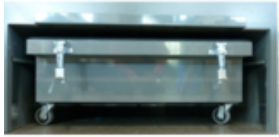
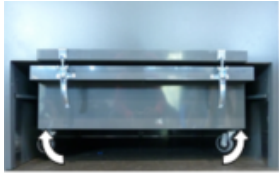


#### Filling level varies

Depending on the bulk density, it may be necessary to empty the disposal carton before it has reached its maximum fill level. (High bulk density → High weight).

When removing the disposal carton, a cover is used to ensure the dust-tight sealing of the collected material and to restrict any contamination. Prepare this before emptying the disposal unit as follows:





1. Switch off the product and secure it against reactivation.
2. Wait at least 5 minutes until the contaminants have settled in the collection container.
3. Disconnect the compressed air supply.
4. Empty the compressed air tank; use manual cleaning on the operating unit if necessary; see Manual cleaning [▶ 39] chapter.
5. Open the toggle-type fasteners on the collection drawer.
  
6. Open the clamp on the rail.
7. Close the disposal carton with lid and pack it into a disposal bag, dispose of collected material in accordance with local regulations.
8. Clean collection drawer interior (industrial vacuum cleaner, damp cloth).
9. Insert disposal carton.
10. Move the collection drawer back into the device.
11. Close the clamp on the rail.
12. Close the collection drawer by the toggle fasteners.  
⇒ The collection drawer is emptied.
13. Re-connect the compressed air supply.
14. Switch the product on again.

## 8.13 Clean the air guide plate



### **DANGER**

#### **Risk of fire due to deposits**

Deposits of dust trails and particles can cause a fire.

- ▶ Prevent spark ingress.

Depending on the type of application, a weekly check of the external and internal sides of the air baffle plate is necessary. If adhesions are detected, these must be removed. This process requires 2 people with personal protective equipment.

1. Switch off extraction on the control panel.
2. Wait at least 5 minutes until the contaminants have settled in the collection container.
3. Disconnect the compressed air supply.
4. Empty the compressed air tank; use manual cleaning on the operating unit if necessary; see Manual cleaning [▶ 39] chapter.
5. Switch off the product and secure it against reactivation.
6. Remove the power plug.
7. Loosen the inspection cover up to the end stop.
8. Remove the inspection cover.  
⇒ The air baffle is visible.
9. Remove the clamping profile fastening screws with nuts.
10. **User 1:** One user holds the inlet element and tilts this carefully from above.
11. Carefully withdraw the air baffle plate. If present → Detach the potential equalisation from the inlet element.
12. **User 2:** Use a damp disposable cloth or a suitable industrial vacuum cleaner to remove the adhesions.
13. Visual inspection of filter cartridges and inner housing for damage and wear.
14. Reinsert the inlet element. Observe the correct arrangement of the air baffle.
15. Mount the air baffle plate again using the fastening screws. If present, clamp the potential equalisation to the inlet element.
16. Re-connect the compressed air supply.
17. Insert the power plug.
18. Switch the product on again.

## 8.14 Cleaning the product



### **DANGER**

#### **Risk of fire due to deposits**

Deposits of dust trails and particles can cause a fire.

- ▶ Prevent spark ingress.

Clean the product regularly inside and out:

1. Remove severe soiling and large amounts of deposits with an industrial vacuum cleaner.
2. Thoroughly remove deposits of fine dusts with a damp disposable cloth.
3. Clean any dust from the cooling air intake area of the motor with a damp, disposable cloth.
4. Do **NOT** spray down with a water jet.

## 9 Faults and Rectification



TARGET GROUP: Maintenance staff



### **DANGER**

#### **Electric shock from high voltage**

Severe injury including death possible

- ▶ Any work on the electrical grid and on live components may only be performed by an electrician.
- ▶ Follow the safety rules for working with electrical products.
- ▶ Shut down the product or any live components at the main switch before working on them and secure them against reactivation (e.g. padlock).
- ▶ Do not clean electrical components with a water jet.

### **CAUTION**

#### **Toxic dusts**


Short-term impairment of the respiratory organs during inhalation.



- ▶ Maintenance, cleaning, repair, and emptying work may only be completed by expert personnel.
- ▶ Wear personal protective equipment.
- ▶ Regularly check the filter elements for clogging.
- ▶ Always complete all maintenance and upkeep work in a well-ventilated room.
- ▶ Do not blow out or beat out the filter elements when they are disassembled.
- ▶ Dispose of used filter elements in air-tight-sealed disposal bags in accordance with regional regulations.
- ▶ Seal the intake port with a sealing plug so it is dust-tight during transportation.



## 9.1 Product

Fault	possible cause	fault clearance
Suction too weak	Filter fouled	Clean off filter
	Throttle is closed too tightly	Open throttle accordingly
	Clog due to deposited residue in the suction pipe system	Check the suction pipe system for deposited residue and clogs, and clean it if necessary
	Cleaning point too low, therefore no filter cleaning	Contact ESTA customer service to adjust the cleaning point
The product has insufficient extraction power Pressure switch responds.	The holes in the filter elements are so severely clogged with dust so that the cleaning device can no longer regenerate them.	Replace used filter elements with new ones.
Suction too weak	Filter wearing out.	Replace filter.
Suction too weak,  flashing	Filter wearing out.	Replace filter.
The product does not start	The overload protection of the product has been triggered.	Check the connection to the power supply. Check whether power plug is plugged in. Notify ESTA customer service.
No compressed air surges can be heard during cleaning.	Compressed air pipe interrupted.	Compressed air pipe is connected to the product.
Cleaning of the filter elements insufficient.	The pressure in the compressed air supply network is insufficient.	Check whether the compressed air supply network provides sufficient pressure (min. 4-6 bar).
	Faulty function of the cleaning device.	Notify ESTA customer service.

## 9.2 Complete cleaning system

<b>Fault</b>	<b>possible cause</b>	<b>fault clearance</b>
Cleaning starts constantly whenever the entire system is switched on.	Filter elements worn.	Clean the filter elements.
	Collection container full.	Empty the collection container.
Minimum flow volume undercut.	Cleaning point set too high.	Contact ESTA customer service to adjust the cleaning point.
Motor protection trips.	Motor was switched on and off too often within a short time.	Adhere to the "Switchon and off procedures for motors"
Dust leaks and dust trails at air outlet openings.	Filter elements worn out.	Replace filter elements.
	Filter elements inadequately attached.	Check the assembly of the filter elements.
Flow at the intake point too weak.	Filter soiled.	Clean filter.
	Clogging due to deposited residue in the pipe system.	Check the pipe system for deposited residue and clogs and clean as required.
	Cleaning point too low, therefore no cleaning of the filters.	Contact ESTA – customer service to adjust the cleaning point.

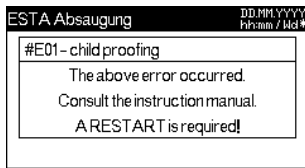
## 9.3 Fan and drive motor

<b>Fault</b>	<b>possible cause</b>	<b>fault clearance</b>
Rotating field control lights up	Rotation direction not correct.	Change rotation direction.
Leakage at the shaft passage	Sealing element worn.	Notify ESTA customer service.
The desired air quantity is not reached	Rotation direction not correct.	Change rotation direction.
	Throttle is closed in the system.	Open throttle element accordingly.
The motor shuts down before reaching the operating speed.	The switching devices present are incorrectly set up or unsuitable.	Adjust the switching device accordingly; possibly provide for heavy start-ups.
Smoke development or loud running noises of the fan	Imbalance in the fan.	Immediately switch off.
	Impeller scrapes against the housing.	Have fan checked by ESTA customer service.
	Noises from the motor.	

Fault	possible cause	fault clearance
Vibrational speed too high	Fan has been installed in a strained condition. The impeller is unbalanced.	Have fan checked by ESTA customer service.
The power uptake is too high.	Direction of rotation is wrong. The resistances in the entire system are too low.	Change turning direction. Close the existing throttle element until the desired air volume has been reached.
The fan does not run smoothly	The impeller wheel is imbalanced due to deposits. Imbalance due to material corrosion at the impeller, e.g. caused by the transport of aggressive media. Imbalance due to deformation of the impeller wheel due to overheating. Fan has been installed in a strained condition. Imbalance due to wear of the impeller wheel.	Immediately switch off. Carefully and thoroughly remove the deposits. Notify ESTA customer service.
The supply cable's preliminary fuse has tripped.	Motor was switched on/off too often within a short period of time.	Observe table "Switch-on procedures for motors"

## 9.4 Display error messages

### E01 – Cycle protection



The control unit recognises when the extraction has been activated and de-activate repeatedly in rapid succession over a short time. This is not permissible operation.

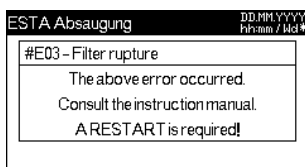
1. Switch off the system at the main switch.
2. Switch on the system at the main switch.

### E02 - Rotary field

The control unit checks the rotary field of the feed each time the main switch is switched on. If the rotary field is incorrect, this message appears and operation of the system is not possible. The rotary field must be changed.

1. Switch off the system at the main switch.
2. Change the rotary field on the supply line.
3. Switch on the system at the main switch.

### E03 – Filter rupture (optional / clean gas dust sensor)

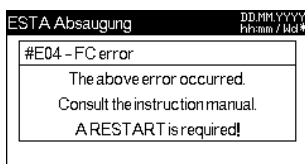


The control unit recognises when an increased concentration of dust particles arises. This indicates a filter rupture! During extraction mode, the control unit interrupts the extraction, which cannot be restarted, and this message appears.

The threshold for recognition of the unfiltered particles in the clean gas area for recognition of a filter rupture.

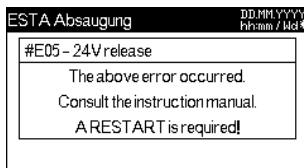
1. Switch off the system at the main switch.
2. Check the system for a filter rupture, clean the overall system as necessary and replace all filter elements.
3. Switch on the system at the main switch.

### E04 – FC error (optional / frequency converter)



There is a fault in the frequency converter.

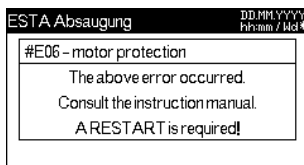
1. Switch off the system at the main switch.
2. Correct the error with the FC manual.
3. Switch on the system at the main switch.



### E05 – 24 V release

The control unit recognises if the system door(s) are not completely closed. During extraction mode, the control unit interrupts the extraction, which cannot be restarted, and this message appears.

1. Switch off the system at the main switch.
2. Close all doors.
3. Switch on the system at the main switch.



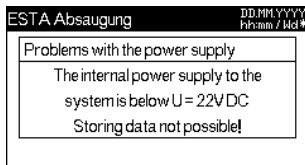
### E06 – Motor protection

The motor fault input on the power unit is activated. During extraction mode, the control unit interrupts the extraction, which cannot be restarted, and this message appears. Extraction mode cannot be switched on again until the motor fault has been eliminated.

1. Switch off the system at the main switch.
2. Troubleshoot and eliminate the cause of the motor fault.
3. Switch on the system at the main switch.

## 9.5 Display fault messages

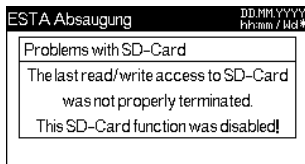
### Power supply



The control unit recognises when the internal voltage supply is below 22V DC. Parts of the control unit will be damaged or rendered unusable. The extraction cannot be started.

Inform the ESTA maintenance service.

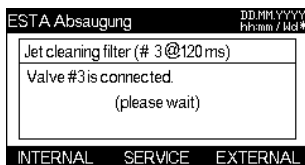
### SD card (option)



The error has occurred due to impermissible operation. No data can be stored on the SD card.

Inform the ESTA maintenance service.

### Jet cleaning filter

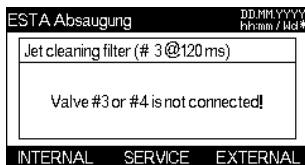


While the cleaning is active, the control unit checks whether the actuated valves function faultlessly. In the process, a shock for overcurrent and short-circuit takes place.

If a valve error has occurred, the cleaning continues despite the error.

Eliminate the cause of the fault immediately.

The cause for this fault may be a severed cable or defective valve, or a short-circuit in the cable or valve.



## 9.6 Messages

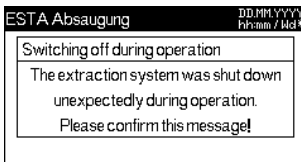
### Service / maintenance



The permissible operating hours until the next maintenance have been reached.

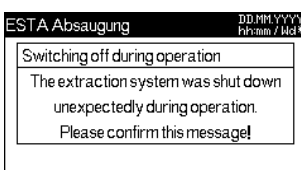
Inform the ESTA maintenance service.

### System clock



Inform the ESTA maintenance service to replace the support battery.

### Switching off during operation

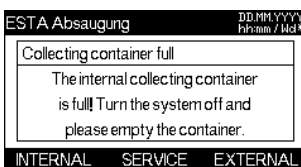


When switching on, the control unit recognises when the dust system has been switched off directly at the main switch during operation. This is not permissible operation. Always observed the prescribed shut-down procedure!



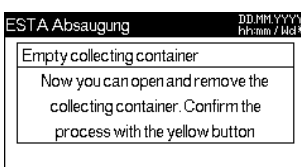
Acknowledge message.

### Collection container (optional fill level sensor)



If the system is equipped with a fill level sensor, this message is shown in the display as soon as the collecting container / disposal carton has reached the max. permissible fill level.

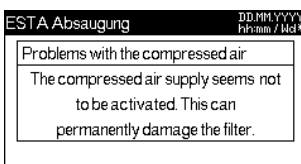
Follow the instructions on the display.



1. Switch off the extraction function.
2. Switch off the system at the main switch.
3. Emptying the collection container, see chapter Emptying the collection container [▶ 52].
4. Switch on the system at the main switch.
5. Acknowledge the message after emptying the collecting container.



### Compressed air problem



The control unit recognises when there is no compressed air connected for the cleaning. Permanent damage to the filters can occur if they are not cleaned.

Connect the compressed air to the system immediately.

## 9.7 Error codes

<b>Error code</b>	<b>Possible cause</b>	<b>Possible solution</b>
E00 – N. D.	Another error was present briefly and could not be identified.	If this occur frequently, contact ESTA Customer Service.
E01 – Cycle protection	Motor was switched on/off too often within a short period of time.	Observe permissible Switch-on procedures for motors.
E02 - Rotary field	Incorrect rotating direction.	Have the rotating direction checked by an electrician and reverse the phases, if necessary.
E03 – Filter rupture	Filter element broken.	Replace the filter.
	Sensor defect.	Have an electrician test the sensor.
E04 – FC error	FC causes an error.	Refer to the manual for the FC to eliminate the error.
E05 – 24 V release	System doors not closed correctly.	Close all system doors correctly.
E06 – Motor protection+	Motor protection adjusted incorrectly.	Have an electrician adjust the motor circuit breaker, incorporate a gentle start-up, if necessary.
	Incorrect rotating direction.	Have the rotating direction checked by an electrician and reverse the phases, if necessary.
	Overload due to inadequate air resistance in the system.	Check the extraction line, if applicable. <ul style="list-style-type: none"> <li>● Use an extraction line with a larger diameter.</li> <li>● Reduce the line length.</li> <li>● Incorporate throttling devices.</li> </ul>
	Short-circuit.	Have an electrician check the cable connections of the motor.
	Motor blocked.	Inspect the motor.
	Motor was switched on/off too often within a short period of time.	Observe permissible Switch-on procedures for motors.
	FC consumes too much current.	Contact ESTA customer service.



## 10 Decommissioning



TARGET GROUP: Commissioning personnel

### CAUTION

#### Toxic dusts

Short-term impairment of the respiratory organs during inhalation.

- ▶ Maintenance, cleaning, repair, and emptying work may only be completed by expert personnel.
- ▶ Wear personal protective equipment.
- ▶ Regularly check the filter elements for clogging.
- ▶ Always complete all maintenance and upkeep work in a well-ventilated room.
- ▶ Do not blow out or beat out the filter elements when they are disassembled.
- ▶ Dispose of used filter elements in air-tight-sealed disposal bags in accordance with regional regulations.
- ▶ Seal the intake port with a sealing plug so it is dust-tight during transportation.



Proceed as follows:

1. Clean filter elements.
  2. Wait at least 5 minutes until the contaminants have settled in the collection container.
  3. Disconnect the product from the mains supply and secure it against reactivation (e.g. with a padlock).
  4. Take out the filter and package according to local regulations.
  5. Empty the collection container.
  6. Clean the product inside and out, refer to Cleaning the product [▶ 55].
  7. Disconnect the compressed air supply on the cleaning controller and remove the hose.
  8. Disconnect the cleaning-controller cable from the switch cabinet.
  9. Disconnect the fan's drive-motor cable from the switch cabinet.
  10. Remove the intake and outlet pipes from the product's ports.
  11. Securely fasten all loose hoses, pipes and cables on the product.
  12. Use approved lifting gear to place the product onto a pallet and secure it with transport locks.
- ⇒ Product prepared for relocation, storage or transport.

## 11 Packing and storage



TARGET GROUP: Transport personnel

### 11.1 Packaging



#### **! DANGER**

##### **Risk of falling and tripping**

Danger to life from falling objects or loads

- ▶ Do not stand under suspended loads.
- ▶ Secure the assembly area and mark it out (e.g., with barrier tape).
- ▶ Always lift the product vertically during loading and assembly work.
- ▶ Only transport the product with suitable, approved means of lifting and transport.
- ▶ Keep a sufficient distance from the product while it is being installed. Distance at least 1.5 times the height of the product.
- ▶ Wear personal protective equipment.
- ▶ Seal the intake port with a sealing plug so it is dust-tight during transportation.

#### **NOTICE**



##### **Material damage due to improper transport**

Damage to the housing, lines and product components

- ▶ Do not push or pull the product across the floor if it does not have any rollers.
- ▶ Seal the intake port with a sealing plug so it is dust-tight during transportation.
- ▶ Pay attention to any protruding components when setting down the product.
- ▶ Note the centre of gravity (which is not in the centre) when setting down the product.

1. Decommission the product, refer to the chapter Decommissioning [▶ 65].
2. Fasten the product to an adequately dimensioned pallet.
3. Wrap the product in tear-proof packaging foil and pack it to prevent slipping and damage.
4. Clearly mark the packaged product.

**Transport** The product is transported in accordance with general logistics guidelines.

## 11.2 Storage

Store the product in a dry room if it is not required for a longer period of time.

Storage temperature	[°C]	+5 ≤ ≥ +25
Humidity	[%]	30 - 70

- Fan** To prevent "sticking" of the bearings in the drive motor of the fan, the impeller wheel of the fan must be manually turned during storage at intervals of approx. two weeks.

## 11.3 Disposal

### CAUTION

#### Toxic dusts

Short-term impairment of the respiratory organs during inhalation.

- ▶ Maintenance, cleaning, repair, and emptying work may only be completed by expert personnel.
- ▶ Wear personal protective equipment.
- ▶ Regularly check the filter elements for clogging.
- ▶ Always complete all maintenance and upkeep work in a well-ventilated room.
- ▶ Do not blow out or beat out the filter elements when they are disassembled.
- ▶ Dispose of used filter elements in air-tight-sealed disposal bags in accordance with regional regulations.
- ▶ Seal the intake port with a sealing plug so it is dust-tight during transportation.



### NOTICE

#### Contamination

Due to contamination of the extraction system with dust hazardous to health, the system or its parts cannot be returned to ESTA. Dispose of collected material and filter elements according to the country-specific and regional laws and regulations.



Proceed as follows:

1. Take the disposal carton out of the product and seal it tightly.
2. Remove the filter elements and package them air-tight.
3. Take the removable parts out of the product.
4. Package the product and the detachable parts as specified by local regulations.
5. Dispose of everything according to local regulations.

## 12 Technical data



### NOTICE

#### Differing technical data for special versions

- ▶ The potentially differing technical data for special versions of the standard product can be found on the type plate
- ▶ We reserve the right to make technical changes.

	<b>09852</b>
Type	MOBEX P-50 eco+
Power (kW)	4,0
Voltage (V)	400
Frequency (Hz)	50
Power input (A)	8,0
Fuse (A)	C16
Protection class	IP 54
max. air flow (m <sup>3</sup> /h)	5.600
max. neg. pressure (Pa)	3.300
Intake (mm)	280
Dimensions (mm)	2.030 x 1.040 x 2.030
Collection bin (l)	2x38*
Weight (kg)	415
Sound pressure level (dB[A])	77
No. of filter elements (Pc)	4
Filter type	FP
Filter area (m <sup>2</sup> )	48
Filter material	M

FP = filter cartridge

\* with cartons

Capacity of collection drawer: 100-150 l

## 12.1 Replacement parts list



### NOTICE

#### Improper storage

Material damage

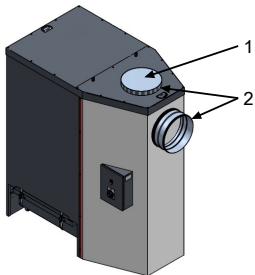
- ▶ Store spare parts in the original packaging until use.
- ▶ Observe storage temperature.

Electrically conductive filter cartridge (pre-filter)	01000518
Filter mat PSB 870 x 570 x 430 mm outlet	01000520
Fan filter mat	01000523
Disposal box with cover	06001074 (1 units) 30008311 (1 set)
Foil bag for disposal box and filter cartridge	30000575 (1 set)
Disposal bag for collected material	06000358 30000567 (1 set)
PTFE filter cartridge (pre-filter)	01001019

## 13 Optional equipment

Optional equipment can be installed or retrofitted on the product depending on the application and requirements.

### Discharge air port



1 Discharge air port blank cover

2 Discharge air port openings

The product can be fitted with an optional discharge air port ( $\varnothing$  400) on the cover or laterally on the fan unit. As a result, a discharge air line (hose or pipe) can be connected to channel the cleaned air out into the open, for example. The opening that is not used as a pipe connection must be fitted with a blank cover.

A suitable sound absorber can be attached to exhaust air port to reduce the noise. In order to maintain a constant delivery rate, ensure that the cleaned air is able to be freely discharged into the atmosphere.

### Frequency converter operation

The product can be fitted with a frequency converter start-up to control suction extraction operation.

Fault messages indicated on the frequency converter's display are described in greater detail in the frequency converter's operating instructions.

### Potential-free contact

An option for connection is start-up via an external potential-free contact between the product and the processing machine. The product is started or stopped by the processing machine. The external potential-free contact is connected to a plug connector at 1 and 2. The potential equalisation is connected to "protective earth". Additional details are listed in the accompanying circuit diagrams.

The toggle switch must be set to "AUTO" for this operating mode.

As soon as the main switch is set to "ON", the contacts of the product's black socket carry live voltage.

During maintenance work on the connected processing machines and products or control units, the control line to the dust extractor must be disconnected. Set all main switches to the "0" position and secure with a padlock against unintentional start-up. Disconnect all mains connectors.

### Continuous electrical conductivity

A continuous electrical connection of all easily touchable metal parts which are not a component of the electrical operating circuit (thus inactive) is established to earth. Prevents a high contact voltage on electrically conductive device parts (e.g. housings) in the event of a fault.

## 14 EC/EU Declaration of Conformity

pursuant to EC guideline Machinery 2006/42/EC Appendix II, Part 1 A

Name of manufacturer:	ESTA Apparatebau GmbH & Co. KG
Address:	Gotenstr. 2 – 6 89250 Senden / GERMANY

Name of the authorised documentation manager:	ESTA Apparatebau GmbH & Co. KG
Address:	Gotenstr. 2 – 6 89250 Senden / GERMANY

We hereby declare that the

Machine:	Stationary deduster
Type:	MOBEX P-50 eco+

was developed, designed and manufactured in compliance with the EC directives specified in this declaration.

It also fulfils the protection goals of the following EC/EU directives:

2014/30/EU EU – Electromagnetic Compatibility Directive

The protective goals of the 2014/35/EU Low Voltage Directive have been accomplished in accordance with Appendix I, No. 1.5.1 of the 2006/42/EC Machinery Directive.

Applied harmonised standards:

- DIN EN ISO 12100
- DIN EN ISO 13857
- DIN EN 349
- DIN EN 60335-1
- DIN EN 60335-2-69
- DIN EN 61000-6-1
- DIN EN 61000-6-2
- DIN EN 61000-6-3
- DIN EN 61000-6-4
- DIN EN 61000-3-2
- DIN EN 61000-3-3
- DIN EN 60079-0

Applied national standards and technical specifications:

- VDI 3677

**Place and date** Senden, 13/03/2020

**Signature**

Philipp Raunitschke  
Managing Director









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## ESTA Apparatebau GmbH & Co. KG

Gotenstrasse 2 – 6

89250 Senden / GERMANY

Telephone +49 (0) 7307 804-0

Fax +49 (0) 7307 804-500

E-Mail [info@esta.com](mailto:info@esta.com)