

ORIGINAL OPERATION MANUAL

Stationary deduster

ESTMAC 1500



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 at
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 ESTA product, it must be ensured that all persons about to use the extraction system 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 Editorial information

Document structure

- Product description** The product description provides all of the required details applying to your product.
- Safety** Important information on the safe handling of your product is provided here.
- Operation** The manual contains all information required to ensure trouble-free operation of your product.
- Maintenance/servicing** The information on services and maintenance provide you with the knowledge about how and when to service the product or product components.

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.

Carefully read this document before any use of the product in any way (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 and that you must perform and fulfil your tasks lawfully and in accordance with these instructions.

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.

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

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

indicates the possibility of a harmful situation. If this is not averted, the assembly or something in its vicinity may be damaged.

This warning is displayed when there is a thread 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.

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.



Name plate of the product (sample name plate)

CE



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



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

2.2 Intended use

The product was designed for use at the following work stations:

The product's application is documented in the data sheet and on the name plate. 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 free-flowing dust
- 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 air with humidity >70%
- Extraction of process air outside the specified temperature range
- Use in dust or gas EXPLOSION areas
- Extraction of liquids
- Extraction of combustible gases
- Extraction of moist or fluid substances
- Installation in paint shops
- Using or keeping in the open air or under wet conditions
- Change in the location during operation

2.4 Foreseeable misuse

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

This includes:

- 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 appropriately as described in this document. 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

2.7 Principles of the procedure

Room air is aspired through vacuum in a collection system (e.g. extraction arm, extraction hood) and then freed from dust in a filter unit. The suction unit attached to the product generates an air current, and the cleaned air is returned to the atmosphere via the outlet opening.

The room air is aspired through vacuum in the collection system and then freed from dust in a filter unit. The suction unit attached to the product generates an air current, and the cleaned air is returned to the workspace via the outlet openings.

3 Safety

3.1 Hazard prevention



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 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.
- ▶ Do not switch on the product if it or the power supply exhibits visible damage and secure it against reactivation (e.g. padlock).
- ▶ Have any damaged cable replaced by specialised staff.
- ▶ Check the protective devices (motor protection relay, earthing resistor, etc.) and set them to the operating conditions of the product.



DANGER

Danger of fire due to sparks and glowing particles

- ▶ If there is a fire, alert the fire department immediately, and contain the fire by appropriate means.
- ▶ Keep a suitable extinguishing agent near the product before start-up and during operation.
 - ⇒ A cyclone can separate sparks and glowing particles but the manufacturer does not guarantee any protection from fire as a result. Spark detection and quenching systems adapted to the application can be provided for this.

**⚠ WARNING****Crushing hazard 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 caused by dust in the breathing air, depending on the type of dust (material, particle size, etc.)**

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.
- ▶ Set up locally filtered forced-air ventilation where the product is being maintained, inspected, cleaned or emptied.
- ▶ Seal the intake port with a sealing plug so it is dust-tight during transportation.
- ▶ Only operate the product with the complete filtration system.
- ▶ Check regularly to determine whether the filters have clogged.
- ▶ Ensure that the collection container is attached to the discharge opening.
- ▶ Ensure that inspection doors are firmly closed.
- ▶ Change the filter elements 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 your application and the resulting minimum flow volume.

NOTICE**Danger of fire on air guide plate**

Deposits of dust trails and particles can cause a fire on the air guide plate

- ▶ Remove adhesions and deposits from the guide plate and the inspection cover regularly.
- ▶ Prevent spark ingress into the air guide plate.

3.2 Workstation ventilation



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

During extraction, the volume flow returned from the product into the room should be no more than 50% of the supply air. With open room ventilation, supply air flow should be assumed as equal to 1x the room volume every hour. This means that the rate of air replacement must be 1/h.

Calculation Supply air flow [m³/h] = room volume [m³] x air replacement rate [1/h]

Example:

When the product is operating at the nominal airflow volume of 1,060 m³/h, the same volume of fresh air must be fed in. This occurs with natural ventilation if the volume of the work room is 1,060m³ (e.g., 353m² surface x 3m ceiling height).

3.3 Product safety

The following points have to be considered in order to avoid injuries and other risk 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). 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, the product must be disconnected immediately from the power supply, turned off at the main switch and the plug pulled immediately.

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.

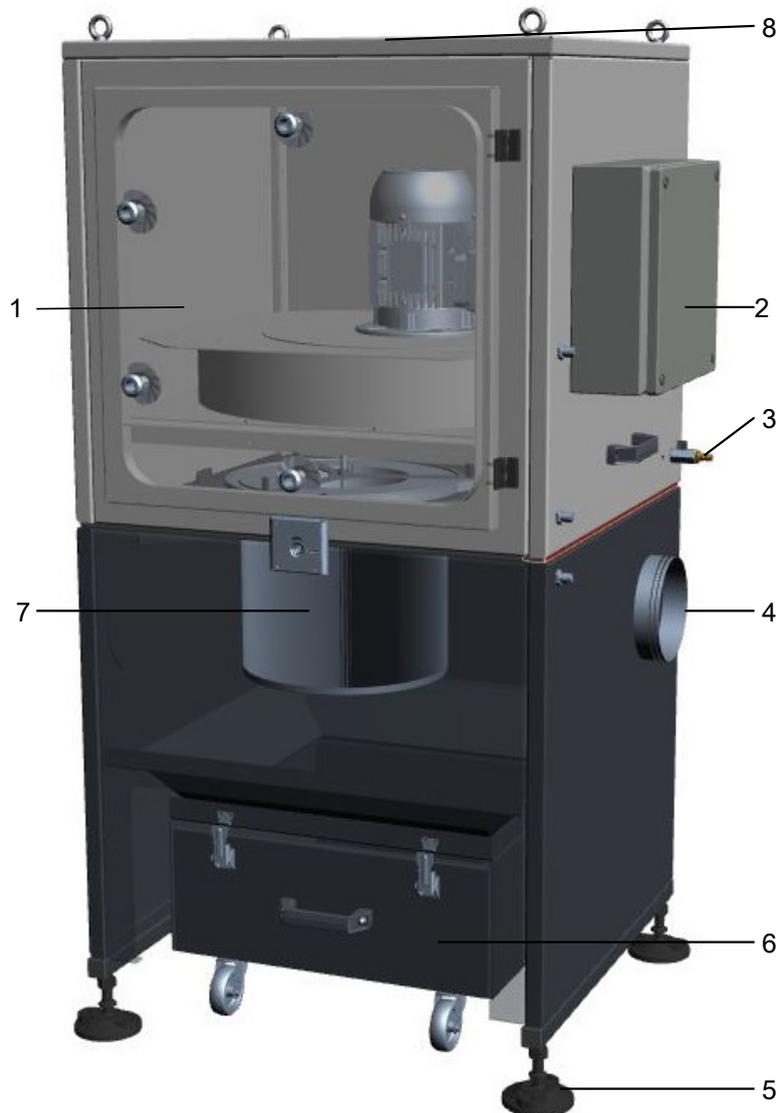
Qualified semi-skilled technicians An employee with appropriate technical training, knowledge and experience who is able to identify and avoid hazards. Knowledge of this manual is mandatory.

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 Cleaning	Trained personnel	

4 Structure and function

4.1 Illustration of ESTMAC 1500



1	Fan unit	2	Control unit
3	Compressed air connection	4	Connection for air inlet raw gas
5	System feet adjustable in height	6	Disposal unit with collection drawer
7	Filter unit	8	Outlet opening clean air

4.2 Functional description

The product is equipped with a three-phase motor which drives a radial fan. The product is supplied with or disconnected from the requisite power via a main switch. The fan is turned on and off at the control panel.

Due to the negative pressure 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.

The filter cartridges are manually cleaned with compressed air. The compressed air is fed into the rotating cleaning device in the product's filter unit. The filters are freed from dust and regenerated as a result of this cleaning process.

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 disposed of together with the collected material.

4.3 Safety and monitoring devices

- Phase sequence control** The phase sequence control lamp illuminates during commissioning if the rotational direction of the fan is incorrect.
- Main switch** Main switch for turning the product on and off. EMERGENCY-OFF switch, which can be secured with a lock against unintentional activation.

5 Transport and installation

5.1 Transport



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.
- ▶ When loading by crane: the weight, centre of gravity and permissible suspension angle (60°) of the lifting load must be taken into account.
- ▶ Only transport the product with suitable, approved means of lifting and transport.
- ▶ Make sure that the surface can be driven on, is level and sufficiently load bearing.

The product is delivered fully pre-assembled on a pallet. After the protective covers and the floor fixing have been removed, the device can be lifted and transported using suitable lifting equipment.

After the packaging has been removed, the product must be inspected for any damage. Any foreign objects inside the product must be removed before start-up. The product must not be put into operation if there is any damage. Contact ESTA in such cases.

5.2 Set-up

Space requirement	Operating side (mm)	1000
	Inlet side (mm)	1000
	Outlet side (mm)	1000
	Rear (mm)	500
	Top (mm)	1000

Tab. 1: Space requirement

1. Check that the delivery is complete.
 2. Release the transport locks and remove the protective cover.
 3. Attach suitable lifting gear to the crane eyelets on the top of the product.
 4. Lift with a crane or a fork lift attached to the crane eyelets on top of the product and place it in its final position at the place of installation.
- ⇒ The product is installed and ready to connect to the electrical, pneumatic and any possible hydraulic supply system.

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 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.
- ▶ Do not switch on the product if it or the power supply exhibits visible damage and secure it against reactivation (e.g. padlock).
- ▶ Have any damaged cable replaced by specialised staff.
- ▶ Check the protective devices (motor protection relay, earthing resistor, etc.) and set them to the operating conditions of the product.



WARNING

Crushing hazard 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.

You require the following technical documentation 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

Environmental/storage temperature	[°C]	+5 ≤ ≥ +40
Humidity	[%]	30 - 70

6.2 Air inlet and outlet

Air inlet (raw gas) and collecting system

1. Connect the collection system (e.g. extraction hood, extraction arm) on the processing machine where extraction is to take place with a pipe or hose pipe to the intake port of the Stationary deduster .

⇒ The collection system is operational

Please use the following as intake line:

- an appropriate suction hose that meets the national requirements for this application.
- an appropriate pipe (wrap fold) that meets the national requirements for this application.
- Approved adapters (with small diameters at the port).

6.3 Electrical connection

Connection to the building's power supply is made at the installation location.

6.4 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.

Pneumatics 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.

6.5 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 with electrical products.

When the direction of rotation is incorrect, the product becomes impermissibly hot, the volume increases, the airflow volume falls, and the suction performance suffers. Damage to the product cannot be ruled out. After first switching on the product, the fan rotor's direction of rotation must be checked:

Check the rotation direction

1. Switch on the product at the main switch.

Change rotation direction

1. Switch off the product at the main switch and secure it from re-operation (e.g. with a padlock).
 2. Pull the power plug.
 3. Exchange the phases in the CEE connector plug.
 4. Insert the power plug.
 5. Switch on the product at the main switch.
 6. Switch off the product at the main switch and secure it from re-operation (e.g. with a padlock).
- ⇒ The product is ready for operation.

6.6 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:

Motor output kW	Power-ups / h
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



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 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.
- ▶ Do not switch on the product if it or the power supply exhibits visible damage and secure it against reactivation (e.g. padlock).
- ▶ Have any damaged cable replaced by specialised staff.
- ▶ Check the protective devices (motor protection relay, earthing resistor, etc.) and set them to the operating conditions of the product.

CAUTION

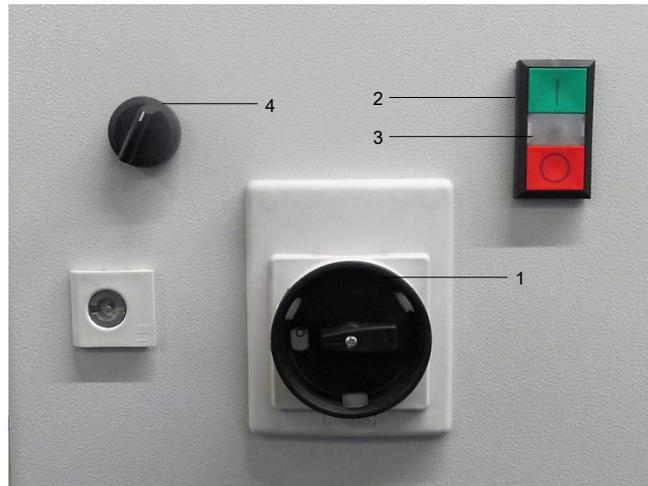
Dust in the breathing air

Short-term impairment of the respiratory organs during inhalation

Display elements with their operation and function are described in the following chapters.

7.1 Auto Manual operating mode

The control unit is equipped with the following elements:



- 1 Main switch** Switching the product on and off. EMERGENCY-OFF switch, which can be secured with a lock against activation.
- 2 Control panel** Start (green) or stop (red) extraction and phase sequence control.
- 3 Phase sequence control** If the fan impeller of the motor is rotating in the wrong direction, the white control field illuminates
- 4 Toggle switch** For switching from automatic to manual mode. Disconnects or connects the product's power supply to the activated system.
 - Manual mode = control possible via the control box.
 - Automatic mode = product is controlled via the activated system.

7.2 Operating the product

- Switching on**
1. Switch on the product at the main switch.
 2. Switch on the processing machine and the collection element as required.
- ⇒ The extraction system is operational and the processing step can be started.

- Switch the extraction off**
1. End the operating process.
 2. Switch off the processing machine and the collection element as required.
 - ⇒ The automatic post-cleaning starts. The device's main switch must re-main switched on for around 5 minutes!

- Switch product off**
1. Switch off the product at the main switch and secure it from re-operation (e.g. with a padlock).
 - ⇒ The product is not in operation.

7.3 Manual rotary cleaning

If the fan stops during the rotary cleaning procedure, dust may emerge from the extraction points as a result of the compressed air introduced during the cleaning process. Optimum cleaning results are only obtained if the product is completely switched off.

- Clean off filter**
- ✓ The compressed air supply is connected
 - ✓ Product is switched off.
 - 1. Connect the compressed-air supply to the product.
 - 2. Switch on compressed air supply.
 - ⇒ The compressed air feed causes the rotation of the nozzle bar and the filter elements are thoroughly cleaned by the compressed air streaming out of the nozzles.
 - 3. Perform the cleaning process for at least 5 minutes.
 - 4. Switch off the compressed air supply after the cleaning time has elapsed.
 - 5. Wait 5 minutes until the nozzle bar is no longer rotating, then disconnect the compressed air supply.
 - ⇒ The filters are cleaned and product is ready for use again.

8 Servicing and maintenance



TARGET GROUP: Maintenance and cleaning staff



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 for all metal parts:

- Mild detergent
- Damp disposable cloths

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

- Industrial vacuum cleaner
- Broom

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

		Daily	Monthly	Annually	further information
8.4	Functional check		1		
8.5	Check the filter elements		1		
8.11	Cleaning the product		1		
8.4	Functional check			1	

1 - Maintenance personnel; 2 - Service 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 [▶ 35]
 - Leakage of media (e.g. trails of dust) at the interfaces
 - Trails of dust or deposits at the outlet openings
 - Whistling during active extraction
 - Check for electrical cables for damage such as open cable insulation, crushing, visible wiring or heavy soiling.
 - 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 [▶ 33].
 - 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 initiates its removal by a specialist, e.g. have the drive motor and / or fan impeller replaced by a specialist.

- Annually**
- Check the sealing of the complete product
 - Check the fan:
 - Proper fitting of the fixing screws and connections to the product
 - Cracks of the housing / sealing

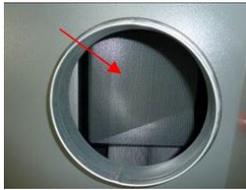
8.4 Functional check

- 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
 - Check the mains connection line for damage and replace damaged parts as necessary
 - Check the safety devices (motor protection relay, earthing resistor, etc.) and initiate adjustments by service personnel
 - Check all pipe fittings and bearings for firm seating
 - Check the pipeline system for damage, deposits and leaks
- Annually**
- Check all electrical devices in accordance with VDE 0701 - 0702, VDE 0600
 - 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 discharge

8.6 Clean the air guide plate



The air guide plate is a filter pre-separator. This prevents the ingress of coarse particles into the filter space. It has an air-channelling function, with which the service life of the filter cartridges is improved. Depending on the type of application, a weekly check of the external and internal sides of the air guide plate is necessary. If adhesions are detected, these must be removed. 1 person wearing personal protective equipment is needed for this operation.

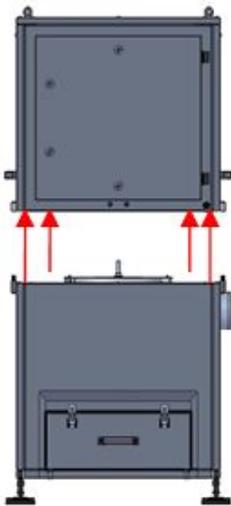
1. Dismount the pipe or hose line on the intake port
2. Use a damp disposable cloth or a suitable industrial vacuum cleaner to remove the adhesions on the accessible part of the air guide plate.
3. Wait 5 minutes.
 - ⇒ Dust in the disposal carton settles.
4. Mount the pipe or hose line on the intake port.
5. Connect compressed air supply.
6. Insert the power plug.
 - ⇒ The air guide plate has been cleaned

8.7 Changing the filter cartridge

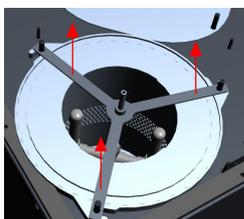
After an extended period of operation, the filter elements gradually clog up due to the ingress of extremely fine dust into the pores. The cleaning device can no longer remove this penetrated dust. The filter elements must be replaced with new ones.



1. Open both toggle-type fasteners on the fan unit



2. Two persons from the assembly personnel or a suitable lifting tool should be used to lift the fan unit and place it next to the product.



3. Remove the cleaning unit from the filter cartridges.
4. Turn the filter cartridge $\frac{1}{4}$ rotation clockwise at the bayonet connection.



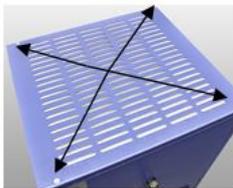
5. Fold the disposal bag over the edge of the filter cartridge.



6. While the first operator carefully takes out the filter cartridge, the second operator carefully folds the disposal bag over the complete filter cartridge.
7. Wrap a disposal bag around the filter cartridges and seal these tightly (e.g. with cable ties).
 - ⇒ Used filter cartridges are removed and ready for disposal.
8. Clean the housing, including the rear side of the air guide plate, with an industrial vacuum cleaner.
 - ⇒ The dust must not be dispersed while this is being done.
9. Unpack new, original ESTA filter cartridges.
10. Check the fit of the seal (below) on the filter cartridge and adjust as needed.
11. Insert new filter cartridges in the housing.
12. Turn the filter cartridge approx. $\frac{1}{4}$ rotation anticlockwise.
 - ⇒ The bayonet closure locks the filter cartridge in place.
13. Insert cleaning unit.
 - ⇒ The cleaning unit must not grind on the support basket of the cartridge.
14. Two persons from the assembly personnel or a suitable lifting tool should be used to set down the fan unit.
15. Lock the fan unit toggle-type fasteners.
 - ⇒ The filter cartridges are replaced.

8.8 Changing filter mats

A filter mat is installed on the fan unit outlet element. This must be checked regularly and replaced.



1. Remove the outlet element fastening screws.

2. Remove the outlet element cover.

3. Carefully withdraw the filter mat from the holder.

4. Place the filter mat in the disposal bag provided.

⇒ Used filter mats have been removed and are ready for disposal.

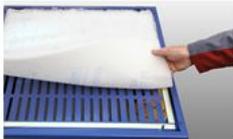


5. Unpack and insert the new, genuine ESTA filter mat in the holder.

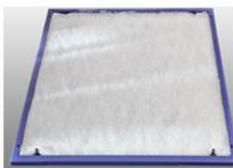
6. Place the outlet element back on the fan unit

7. Insert the cover fastening screws and tighten them by hand.

8. Switch on the product.



⇒ The filter mat has been replaced

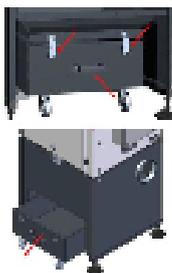


8.9 Emptying the collection container

1. Open the toggle-type fasteners on the collection drawer.

⇒ Collection drawer lowers.

2. Carefully withdraw the collection drawer.



3. Empty the collection draw and dispose according to local regulations.

4. Clean the interior of the collection drawer using suitable means (industrial vacuum cleaner, damp cloth).

5. Push the collection drawer back into the device.

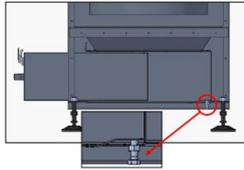
6. Close the collection drawer by the toggle fasteners.

⇒ Collection drawer is tightly sealed.

⇒ Collection drawer is emptied and tightly sealed.

Locking the collection drawer

The rails of the connection drawer can block from time to time with mechanical effect (retraction and extension of the drawer). This can be eliminated by way of precaution or as necessary by aligning the sheet of the rail by locking the adjusting screw.



1. Open the toggle-type fasteners on the collection drawer.
2. Carefully withdraw the collection drawer.
3. Locate the plate upwards on the runner in the housing by turning the adjusting screw.

8.10 Fan replacement

Rough operation, unusual oscillations, vibrations, noises and temperatures indicate that the drive motor is defective or damaged or that it is installed the wrong way around.

Removal

1. Switch off extraction on the control panel, refer to the chapter Operating the product [▶ 25].
 2. Separate the compressed air hose from the supply connector.
 3. Switch off the product at the main switch and secure it from re-operation (e.g. with a padlock).
 4. 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.
 5. Disconnect drive motor from the power network.
 6. Ensure that the fan is deactivated.
 7. Loosen fastening screws on motor plate to housing. Observe the weight of the fan!
 8. Take impeller wheel with motor plate out of housing. Ensure that the blades of the impeller wheel are not damaged during removal.
 9. Store the impeller wheel with motor plate safely and dry during repair work.
- ⇒ The impeller wheel with drive motor is dismantled.

Installation

1. Place impeller wheel with motor plate into the housing.
⇒ Motor plate in the recess of the housing.
 2. Fasten motor plate to the housing with fastening screws.
 3. Connect drive motor to power network.
- ⇒ The impeller wheel with drive motor is installed.

Functional test

1. Switch on the product again, refer to the chapter Operating the product [▶ 25].
2. Check smooth running and rotation direction of the drive motor, change rotation direction if necessary.

8.11 Cleaning the product

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 the cooling air intake area of the motor with a brush.
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 before working on them and secure them against reactivation (e.g. padlock).

9.1 Product

Fault	possible cause	fault clearance
The product has insufficient extraction power	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
The system does not start up.	The overload protection of the product has responded.	Notify ESTA customer service.
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

Fault	possible cause	fault clearance
Motor protection trips.	Motor was switched on and off too often within a short time.	Adhere to the "Switchon 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.

9.3 Fan and drive motor

Fault	possible cause	fault clearance
Leak at the shaft passage.	Sealing element worn.	Have the sealing element exchanged by an expert.
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. Check the fan for tension and transport damage.
	Impeller grinds on the housing.	Check the fastening screws. Check the screw connection. Check drive motor for bearing damage; replace bearings as required
	Noises from the motor.	Have the fan checked by the ESTA customer service.
Vibration speed too high.	Fan has been installed under tension.	Check the screw connection.
	The impeller is unbalanced.	Have the impeller checked by a specialist and rebalanced as required.
The power uptake is too high.	Direction of rotation is wrong.	Change turning direction.
	The resistances in the entire system are too low.	Close the existing throttle element until the desired air volume has been reached.
Increase in bearing temperature.	Increased flexing work in the bearing due to relubrication or new bearings.	Continue operating the fan, the temperature will stabilise on its own after some time.
	Lubrication intervals were not adhered to.	Have the bearing replaced by a specialist and relubricated according to the lubrication plan.
	Bearing has been installed under tension.	Have the bearings replaced by a specialist.

Fault	possible cause	fault clearance
	Excessive heat transfer in hot conveying medium.	Reduce the temperature of the conveying medium; replace bearings if damage has already occurred.
The fan does not run smoothly	The impeller wheel is imbalanced due to deposits.	Immediately switch off. Carefully and thoroughly remove the deposits. Check the cause for deposits, deformation or wear.
	Imbalance due to material corrosion at the impeller, e.g. caused by the transport of aggressive media.	Rebalance as required and have the bearings checked by a specialist.
	Imbalance due to deformation of the impeller wheel due to overheating.	Replace impeller wheel if necessary and check bearings.
	Fan has been installed in a strained condition.	Check the screw connection.
	Imbalance due to wear of the impeller wheel.	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"

10 Decommissioning



TARGET GROUP: Commissioning personnel



CAUTION

Hazardous 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.
- ▶ Set up locally filtered forced-air ventilation where the product is being maintained, inspected, cleaned or emptied.
- ▶ Change the filter elements 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.

1. Clean the filter element.
 2. Disconnect the product from the mains supply and secure it against reactivation (e.g. with a padlock).
 3. Empty the collection container.
 4. Clean the product inside and out.
 5. Disconnect the cleaning-controller cable from the switch cabinet.
 6. Disconnect the fan's drive-motor cable from the switch cabinet.
 7. Remove the intake and outlet pipes from the product's ports.
 8. Securely fasten all loose hoses, pipes and cables on the product.
 9. 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



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.
- ▶ When loading by crane: the weight, centre of gravity and permissible suspension angle (60°) of the lifting load must be taken into account.
- ▶ Only transport the product with suitable, approved means of lifting and transport.
- ▶ Make sure that the surface can be driven on, is level and sufficiently load bearing.

1. Decommission the product, refer to the chapter Decommissioning [▶ 39].
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

Before the product is put in storage,

1. Clean the filter elements, refer to the chapter Jet impulse cleaning.
2. Empty the collection container and dispose according to local regulations.
3. Clean the product inside and out, refer to Cleaning the product [▶ 35].

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

Hazardous 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.
- ▶ Set up locally filtered forced-air ventilation where the product is being maintained, inspected, cleaned or emptied.
- ▶ Change the filter elements 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.



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, e.g. motor, fan, cover, etc., 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

We reserve the right to make technical changes.

FC = filter cartridge

ESTMAC 1500	
Type	ESTMAC 1500
Power (kW)	1,1
Voltage (V)	400
Frequency (Hz)	50
max. air flow (m ³ /h)	1.500
max. neg. pressure (Pa)	2.040
Intake (mm)	160
Dimensions (mm)	650x710x1.454
Collection bin (l)	40
Weight (kg)	170
Sound pressure level (LpA)	71,3
Required compressed air (l/h)	4-6
No. of filter elements (Pc)	1
Filter type	Filter cartridge
Filter area (m ²)	7,5
Filter material	M

13 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:	ESTMAC 1500

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
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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.

Reconciled norms used:

- DIN EN ISO 12100:2011-03
- DIN EN ISO 13857:2008-06
- DIN EN 349:2008-09
- DIN EN 60335-1:2012-10
- DIN EN 60204-1:2014-10
- DIN EN 61000-6-1:2007-10
- DIN EN 61000-6-2:2006-03
- DIN EN 61000-6-3:2011-09
- DIN EN 61000-6-4:2011-09
- DIN EN 61000-3-2:2015-03
- DIN EN 61000-3-3:2014-03

Applied national standards and technical specifications:

- VDI 3677

Place and date Senden, 18/07/2018

Signature Philipp Raunischke
Managing Director

ESTA maintenance service - *Think about tomorrow today!*

ESTA MAINTENANCE SERVICE OFFERS THESE ADVANTAGES!

- » Check of your extraction system by an experienced and well trained team of ESTA service technicians
- » Ensuring optimum functionality and efficiency of your extraction equipment and system, even many years after the initial operation
- » Minimising the risk of a product failure
- » Short response times
- » Reduction of risk of costly repair expenses
- » Preserving the value retention of your system
- » Compliance with statutory provisions
- » Detailed maintenance documentation as verification of compliance with statutory regulations
- » Relieving the workload for internal service employees
- » Permanent cleanliness in the work stations

Service phone +49 (0) 7307 804-0

Online support www.esta.com/en

Office hours

Monday to Thursday 08:00 to 17:00

Friday 08:00 to 16:00



ESTA maintenance contract - *Your Plus in terms of service!*

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