

# Operating Instructions

DUSTEX-P, -S, -F

CE

**ESTA**

Version 09.04

Order No. 661.040 (DUSTEX-P40)  
Order No. 661.060 (DUSTEX-P60)  
Order No. 661.090 (DUSTEX-P90)  
Order No. 662.010 (DUSTEX-S10)  
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Order No. 662.025 (DUSTEX-S25)  
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Order No. 663.144 (DUSTEX-F144)



**Warning and safety instructions**



Reference to statutory regulations

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# 1. Introduction

Using the DUSTEX modular dust extractor you can effortlessly extract dry dust and welding fumes in your works at several extraction points simultaneously.

The installation separates the large particles from the drawn-in air in the preliminary separating chamber. The vertically mounted filter cartridges and filter hoses are only used for filtering the finer dust particles. The filtration efficiency of the dust extractor is greater than 99%.

The filter cartridges and hoses are dedusted by means of a compressed-air impact from the automatic jet-deduster during and after operation, in order to guarantee the dust extractor's cleaning power.

The separated dust is captured in the dust-collecting container, which can be uncoupled with a couple of hand movements.

# 2. General Safety Instructions



Before carrying out any maintenance work or repairs, the main switch on the switchbox and the repair switch in question are to be turned to the "OFF" position and secured with a padlock against unauthorised switching on.



Maintenance work and repairs to the installation may only be carried out by a person instructed in the job or a skilled person trained in this field.

The device is only to be used by persons who have been instructed in its handling and are expressly authorised to use it.

The device is only to be used for dry cleaning.

No liquids, aggressive gases, easily inflammable media or red-hot particles (smoulder spots or the like) are to be drawn in. The extraction of welding fumes when welding oil-wetted parts is not permitted.



## **ATTENTION: Danger of fire!**

Only oil and water free compressed air (approx. 6 bar) is to be used for filter cleaning. It is recommended that a service unit be connected line-side.

Only original ESTA replacement parts are to be used.

Only original ESTA accessories for operating a device.

The complete extraction plant is to be given a daily visual inspection for damaged parts before start-up.

The device must of course be overhauled when necessary.

## **3. Defence against mechanical danger**

All moving machine parts driven by electric motors and all other dangerous machine parts are to be shrouded with fixed safety guards, firmly fastened and only removable with tools.



### ***Acceptable Risk:***

If a cover that can only be undone with tools is removed, a risk of injury from a machine in operation or switched on equipment cannot be excluded.

## **4. Defence against electrical danger**

All electrical parts are to be shrouded with fixed safety guards, firmly fastened and only removable with tools.



### ***Acceptable Risk:***

If a cover that can only be undone with tools is removed, a risk of electric shock cannot be excluded.

**Comment:**

To guarantee fault-free operation of the equipment, the factory-set operating parameters may only be changed after consultation with the ESTA Company.

## **5. The Filter Unit**

### **5.1. Working with the extraction plant**

A check that the compressed air is connected, the pressure (approx. 6 bar) is available and that the equipment is in a safe and serviceable condition must be carried out each time before starting the dust extractor

To start the equipment, the red-yellow main switch is turned to the "ON" position. The equipment is now ready for operation. The desired operating mode is selected with the knob-operated switch. The red-yellow main switch is used as the Emergency Stop.

### **5.2. Dedusting the cartridges and hoses**

The extractor plant automatically dedusts the contaminated filter during operation. In addition, the filters are dedusted one after the other in two passes after switch-off. As soon as the filters have reached a specified level of contamination during extraction operation (i.e. the differential pressure, measured before and after the filter, exceeds the limiting value set at the differential pressure monitor) the filter dedusting is activated. After activation individual cartridges and hoses are dedusted by a compressed-air impact. If the extraction power then diminishes, the filter cartridges or hoses are probably heavily contaminated. This is shown by a red indicator lamp. In this case please attempt to dedust the filter once more. For this purpose the extractor unit is switched on for approx. 5 minutes. After the extractor unit is switched off the automatic deduster cleans all cartridges and hoses twice in succession. If the suction power does not improve after such dedusting, the filters are worn out and must be replaced (see section 10 Faults).

## 6. Fan

### 6.1. General industrial safety instructions

Any person in the operator's company who is concerned with the transport, assembly, disassembly, commissioning, operation and maintenance of the fan must have read and understood the complete operating instructions.



In addition to the operating instructions and the regulations for accident prevention currently valid at the site, the recognised technical safety regulations for safe and professional work are to be observed.

The fan is manufactured in accordance with the state of the art and the recognised technical safety regulations. Nonetheless, danger to life and limb for staff, or damage and impairment to the installation and other property can occur during operation.

The fan may only be operated in a technically perfect condition as well as for the intended purpose, in a manner aware of safety and danger while observing the operating instructions. In particular, faults which impair safety are to be remedied without delay.

Assembly, disassembly, operation, maintenance and servicing of the fan are only to be carried out by authorised and expert staff.

The operating instructions must always be available at the fan location. The manufacturer accepts no liability for damage of any sort arising from misuse of the Ventilators or non-observance of the technical documentation.

## 6.2. Special industrial safety instructions



Any work on the fan may only be carried out when the fan is at a standstill. Care must be taken to ensure that the motor cannot be switched on inadvertently. This can be done, for example, by using a lockable repair switch (not supplied).

Connect the motor in compliance with your national safety regulations.

Freely accessible air intakes and pressure joints must be secured with an appropriate safety device (e.g. wire grating).

Before switching on, check that all safety devices and cleaning valves are properly fitted.

After appropriate electrical assembly, check the direction of rotation and the safety measures in use.

## 6.3. Construction and method of operation

The radial fan has an impeller in which the axially inflowing air is diverted in the radial direction. In the impeller the applied energy is converted to mass flow and increased conveying medium pressure.

In the standard construction, the fan consists of a motor console with screwed-on drive motor with the flywheel fastened to its shaft journal over the hub. The hub housing exit is sealed by a shaft seal.

## 6.4. Assembly



Observe the accident prevention regulations.  
The fan must not be operated a disassembled state.



In no circumstances must the transport cable be fastened to the impeller on the drive shaft. The impeller must always be free to move and must never knock against anything.

In the case of flange connections, the screws must be tightened reciprocally and in several steps.



Inlet nozzles supplied loose must be aligned exactly. Rotate the impeller by hand and check that it turns without grinding noises.

## 6.5. Electrical connection

- Observe the following points when connecting the electric motor:
- The currently valid national electrical regulations
- The connection work must basically be carried out by an authorised skilled person and in accordance with the directions of the motor manufacturer
- The available mains voltage and frequency must agree with the data given on the motor rating plate
- Note the circuit diagrams in the motor terminal box
- The power supply cable must be protected from damage and of appropriate dimensions for the power consumption
- The protective equipment (motor protecting relay, earthing resistance etc.) must be checked and set
- The cooling air inlet for the motor must not be obstructed



Power current! Only connect when disconnected from the supply!

To check the fan's correct direction of rotation, switch on briefly and compare with the direction of rotation arrow on the fan housing. The drive motor can be overloaded if the direction of rotation is incorrect.

## 6.6. Commissioning

When the fan is first switched on a throttle organ built into the plant system should be closed, since the motor could be overloaded if the theoretically-established plant resistances are too low compared with those actually available.

After the fan runs up the throttling is to be opened slowly until the desired operating point is reached. In doing so it is essential to note the current input. In the case of the operating speed, the measured value must not exceed the rated current.

The operating speed must not be exceeded.

Note also the fan's vibrational behaviour. The permissible effective vibration speed must not exceed a value of 7.1 mm/s. Higher values can develop an impeller imbalance.

## 6.7. Remediating faults on commissioning

<b>Fault</b>	<b>Possible Cause</b>	<b>Possible Remedy</b>
The motor switches off before reaching operating speed	The existing switching devices are incorrectly set or not suitable	Set switching devices appropriately, provide for possible heavy starting
The motor power consumption is too high	The direction of rotation of the motor is incorrect	Change direction of rotation by swapping the 2 phases
	The resistances in the installation are too low	Close existing throttle organ until desired air flow rate is obtained
The desired air flow rate has not been reached	The direction of rotation of the motor is incorrect	Change direction of rotation by swapping the 2 phases
	Throttle organ is closed	Open throttle organ appropriately
The vibration speed is too high	Fan is built in distorted	Check threaded joints Check impeller, poss.
	Impeller is unbalanced	re-balance by expert

## 6.8. Maintenance

Operational reliability and service life fundamentally depend on proper maintenance. Faults produced by insufficient or inexperienced maintenance can cause high repair costs and long down times. Regular maintenance is therefore essential.

Ensure that the impeller is at a standstill during maintenance! Observe the accident prevention regulations (UVV)!

### 6.8.1. General maintenance instructions

The fan is to be regularly inspected visually and acoustically in the operational condition. The causes for changes in the normal condition must immediately be established and remedied accordingly.

The protective and safety equipment provided is to be checked regularly and repaired, if necessary, with the fan switched off.

Screwed connections accessible from outside must be checked regularly and tightened if necessary.

### 6.8.2. Maintenance and servicing list

Maintenance and servicing deadlines	Maintenance and servicing jobs
24 h after commissioning	Check housing tightness Check quiet running Check bearing temperature Tighten screws
Annually	Check housing tightness; Check housing for stress cracks Check quiet running Check bearing temperature Tighten screws Check impeller for deformations, stress cracks and wear

## 6.9. Fault handling and corrective maintenance of the fan

When a fault occurs you should go through the following checklist. If a fault has occurred that is not allowed for in the list, then contact ESTA directly.

<b>Fault</b>	<b>Possible Cause</b>	<b>Possible Remedy</b>
Fan runs unevenly	Impeller unbalanced due to caking	Remove caking carefully and cautiously, re-balance by a specialist if necessary, check bearing
	Unbalance due to material decomposition on the impeller, e.g. due to aggressive conveying media	Consultation with ESTA, renew impeller if necessary. Check bearing
	Unbalance due to deformation of the impeller through overheating	Consultation with ESTA, renew impeller if necessary. Check bearing
	Unbalance due to wear in the impeller	Consultation with ESTA, renew impeller if necessary. Check bearing
Temperature rise at the bearings	Increased churning work in the bearing through fresh re-lubrication, or new bearing	Continue to run fan, temperature becomes normal after a certain time
	Lubrication intervals not adhered to	Renew bearing and re-lubricate in accordance with lubrication intervals
	Bearing installed twisted	Renew bearing
	Excessive heat transfer for fans with hot conveying medium	Reduce conveying medium temperature; in the case of already existing bearing damage renew the bearing
Leakage at shaft opening	Sealing element worn	Replace sealing element

## 7. Emptying the dust-collecting container

The dust-collecting container is flange-mounted on the filter via four quick-action fastenings. To empty the dust-collecting container the four quick-action fastenings are loosened diagonally by turning the container locking lever in the upward direction. The quick-action fastener hooks are folded down. The container can now be emptied. Proceed in the reverse order to re-fit the container.

## 8. Control unit functions

Control of the installation is assumed by a programmable control relay. It incorporates a time switch with 3 adjustable on/off times (weekday block diagrams are supported) as well as a servicing meter. In addition, this module monitors the filter accumulation and controls the dedusting. To set the time and the cleaning period see the enclosed documentation "Control relay operating instructions".

### **Note:**

The cleaning period preset on the control relay should only be altered after consultation with ESTA.

The control unit is equipped with the following control elements and indicator lamps:

### **Main switch (red-yellow knob-operated switch)**

Used to switch off the complete installation and as Emergency Stop. The main switch can be secured with a padlock against unauthorised switching on during maintenance or repair work.

### **Operating mode selector switch (black knob-operated switch)**

Position "Auto": Start-up via potential-free contact e.g. start by processing machine or auxiliary panel.

Position "Manual": Suction unit runs immediately

Position "0": Suction unit is switched off

### **Green indicator lamp "Run":**

Indicates if the suction unit is running

### **Red indicator lamp "Motor protection":**

Indicates if the motor protecting relay has picked up

### **Red indicator lamp "Filter heavily contaminated":**

Lights up when filter is used up or a faulty dedusting device function occurs.

### **Yellow lamp "Service":**

signals that the installation needs checking and servicing.

## **9. Servicing**

The installation should be serviced for the first time after 500 operating hours, and then every 1.500. The following points must be covered during servicing:

- Check suction unit for unusual running noises
- Check filter visually for damage or wear (no significant dust on clean air side)
- Check all dedusting valves for reliability performance.

Damaged or contaminated parts must of course be exchanged or cleaned. Faulty setting values must be corrected.

ESTA will be pleased to carry out this maintenance work for you.

## 10. Faults

<b>Fault</b>	<b>Possible Cause</b>	<b>Measures</b>
Installation does not start up, red "Fault" lamp lights up	Installation overload has operated	Inform ESTA After-Sales Service
Installation has inadequate extraction power. Red "Filter contaminated" lamp lights up	It is possible that the filters are so clogged with dust that the jet dedusting can no longer regenerate them	The used-up filter must be replaced by the ESTA After-Sales Service for a new one
No compressed air impact could be heard during dedusting	Compressed air line disconnected	Check that the compressed air line is connected to the filter
Filter dedusting insufficient suction power, "Filter contaminated" lamp lights up	Insufficient pressure available in compressed air system. Faulty dedusting equipment operation	Check if the compressed air system has sufficient pressure (min. 6 bar) Inform ESTA
Yellow service lamp lights up	The service interval has been reached	Have the installation serviced by the ESTA After-Sales Service



**phone ESTA hotline:  
+49 7307 - 80 4 831**

## 11. Technical Data

Model	DUSTEX P-40	DUSTEX P-60	DUSTEX P-90
Filter area m <sup>2</sup> /Number of cartridges	40 / 4	60/6	90/9
Max. vacuum Pa	3.200	3.800	3.800
Max. air flow m <sup>3</sup> /h	approx. 4.500	approx. 6.000	approx. 7.100
Drive power kW	4	5,5	7,5
Dust collecting container l	100	100	100
Inlet/outlet diameter mm	224 / 250	280 / 300	315 / 355
Dimensions (W/D/H) mm	1.400 x 1.350 x 3.050	1.820 x 1.350 x 3.550	1.880 x 1.900 x 3.700
	<b>661.040</b>	<b>661.060</b>	<b>661.090</b>

Model	DUSTEX S-10	DUSTEX S-17	DUSTEX S-25	DUSTEX S-33
Filter area m <sup>2</sup> /Number of cartridges	10,5 / 20	17/32	25/48	33/48
Max. vacuum Pa	2.600	3.200	3.200	3.800
Max. air flow m <sup>3</sup> /h	approx. 3.500	approx. 4.300	approx. 5.400	approx. 7.000
Drive power kW	3	4	5,5	7,5
Dust collecting container l	50	50	50	50
Inlet/outlet diameter mm	200 / 250	250 / 300	300 / 355	355 / 400
Dimensions (W/D/H) mm	1.400 x 1.350 x 3.400	1.820 x 1.350 x 3.850	1.880 x 1.780 x 4.000	1.800 x 1.780 x 4.400
<b>Order No.</b>	<b>662.010</b>	<b>662.017</b>	<b>662.025</b>	<b>662.033</b>



<b>Model</b>	<b>DUSTEX F-60</b>	<b>DUSTEX F-64</b>	<b>DUSTEX F-96</b>	<b>DUSTEX F-144</b>
Filter area m <sup>2</sup> /Number of cartridges	60 / 4	64 / 4	96 / 6	144 / 9
Max. vacuum Pa	3.800	3.800	4.400	4.800
Max. air flow m <sup>3</sup> /h	approx. 6.100	approx. 7.300	approx. 10.300	approx. 13.200
Drive power kW	5,5	7,5	11	15
Dust collecting container l	50	50	50	50
Inlet/outlet diameter mm	280 / 315	315 / 355	355 / 400	450 / 500
Dimensions (W/D/H) mm	1.400 x 1.350 x 3.150	1.400 x 1.350 x 3.160	1.820 x 1.450 x 3.660	1.880 x 1.990 x 3.700
<b>Order No.</b>	<b>663.060</b>	<b>663. 064</b>	<b>663.096</b>	<b>663.144</b>



**DUSTEX** with filter cartridges



**DUSTEX** with hose filters

## 12. EC Declaration of Conformity for Machines

**Name of the Manufacturer:** ESTA APPARATEBAU GmbH & Co. KG  
**Address of the Manufacturer:** Gotenstrasse 2 – 6, 89250 Senden

**We hereby declare that the design of the machine**

**Machine:** Dedusting plant for dust extraction  
**Series:** DUSTEX  
**Type:** DUSTEX ...

**is in conformity with the following valid stipulations:**

EC Machine Directive 98/37/EC  
EC Low-Voltage Directive 73/23/EEC  
Amended by Directive 93/88/EEC  
EC Directive on Electromagnetic Compatibility 89/336/EEC  
Amended by Directive 92/31/EEC and 93/88/EEC

**Applied harmonized standards:**

EN 292	Safety of machinery; Basic concepts and general principles for design
Part 1	Basic terminology and methodology
Part 2	Technical principles and specifications
EN 294	Safety of machinery, plant and equipment; Safety distances to prevent danger zones being reached by the upper limbs
EN 349	Safety of machinery; Minimum gaps to avoid crushing of parts of the human body
EN 60 204-1	Safety of machinery; Electrical equipment of machines
Part 1	General requirements
EN 50 081-2	Electromagnetic compatibility Emitted interference in industrial applications
EN 50 082-2	Electromagnetic compatibility Interference immunity in industrial applications

**Applied national standards and technical specifications:**

Adherence to the principles for the inspection and certification of dust-removing machinery and appliances (SBM).

For other standards, refer to the technical documentation relating to the EC declaration of conformity in accordance with the Machine Directive Annex V.

Senden, May 07, 2001

  
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Dr. Peter Kulitz (Managing Director)