Operating manual

MOBEX F- BIA W3

MOBEX F-28 BIA W3 (Order No.: 09820) Raw gas inlet left
MOBEX F-56 BIA W3 (Order No.: 09821) Raw gas inlet left
MOBEX F-28 BIA W3 (Order No.: 09822) Raw gas inlet right
MOBEX F-56 BIA W3 (Order No.: 09823) Raw gas inlet right

Do not use this device unless you have
read the user manual and understand it.

Translation of the original operating manual
09820-08-00

Warnings and safety instructions

Electrical current hazard

Note

Reference to ESTA customer service

Reference to legal regulations

Contents

1. General safety notes

Before operation, all persons who are to use the welding fume exhaust device or perform maintenance on it must be provided with information, instructions and training in using the device and on the substances for which it is to be used, including the procedure for safe disposal of the collected material. Responsibilities must be clearly established for the following:

- **Installation**
- **Start-up**
- **Operation**
- **Maintenance and repair**

The device must be used only by persons who have been instructed in its handling and are explicitly authorized to use it.

Always keep the operating manual at the place where the welding fume exhaust device is being used, so that it can be seen by personnel at all times.

The welding fume exhaust device is intended only for dry cleaning and must not be used or stored outdoors or under wet conditions.

Only original ESTA replacement parts must be used; use of other products will void the warranty.

During exhaust, the volume flow returned from the welding fume exhaust device into the room must be no more than 50% of incoming air. With free room ventilation, the incoming airflow must equal the room volume every hour. This means that the rate of air replacement must be once per hour.

$$\text{Incoming air flow } [m^3/h] = \text{room volume } [m^3] * \text{air replacement rate } [1/h]$$

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

No liquids, aggressive gases, easily flammable materials or glowing particles (such as hot embers) may be aspirated. For example, it is prohibited to use the welding fume exhaust device in painting operations. It is forbidden to exhaust processing machines with active ignition sparks or hot embers.

Installation and operation in dust-explosive or gas-explosive areas is forbidden.

Make sure that the power cable does not become damaged by being run over, compressed, pulled, etc.

The power cable must be examined regularly for signs of damage or ageing.

The device must not be used if damage to the power cable is determined.

The power cable and plug must be replaced only by an appropriately trained electrical specialist.

For the power supply and the device's power cords, only original replacement parts must be used. This guarantees that they are spray-proof according to applicable standards and have the necessary mechanical strength.

The power cord must be plugged in only after the welding fume exhaust device has been successfully set up at its place of use. For this a 16-amp CEE wall socket (MOBEX F-28) with a 16-amp support fuse, or a 32-amp CEE wall socket (MOBEX F-56) with a 20-amp support fuse, must be in place.

After use, before moving the devices to another site and before cleaning, maintenance, or replacement or removal of movable parts, the device must be unplugged and the compressed air disconnected.

From its first use, the device contains toxic dust. Emptying and maintenance processes, including removal or emptying of the dust collection container, must be performed by expert personnel who are wearing appropriate protective gear. The welding fume exhaust device must not be operated without the complete filtration system!

According to work equipment user directives 89/655/EWG and TRGS 560, safety devices for prevention or removal of hazards must be regularly maintained and regularly inspected by an expert for safe, flawless operation.

In all emergencies, the device must be disconnected from the power supply immediately, the device turned off at the emergency switch, and the plug pulled immediately. If there is a fire, the fire department is to be alerted immediately, and the fire must be contained by appropriate means.

2. Preventing mechanical hazards

All movable machine parts driven by electric motors must be covered by fixed, securely fastened protective covers that can be removed only with tools.

Residual risk:
If a covering that can only be unfastened with a tool is removed, there is risk of injury if the machine is running.

3. Preventing electrical hazards

All electrical parts must be covered by fixed, securely fastened protective covers that can be removed only with tools. The device complies with Protection Class I according to EN 60 335.

Residual risk:
If a covering that can only be unfastened with a tool is removed, a hazard is posed by electric current.

4. Preventing dust hazards

When removing the dust collection container, it is possible to inhale dust. Following the instructions in the “Disposal” section will minimize this hazard.
When transporting the device, close the intake port securely to prevent dust from escaping.

5. Intended use

The welding fume exhaust device has been manufactured according to the state of the art and in compliance with safety regulations. It is suitable for commercial use, such as in industrial firms and workshops, for separation of dry, non-flammable welding fumes.
The welding fume exhaust device corresponds to welding fume exhaust class W3 and is therefore suitable for separation of smoke from steels with an alloy content such as >30% of nickel and chrome.

Aspiration of welding fumes is not permissible with welding of oil-moistened parts.

The welding fume exhaust device must not be used or stored outdoors or under wet conditions.

Other applications are considered unintended use. ESTA is not liable for damages due to unintended use!

The manufacturer sets up the welding fume exhaust device according to the operator’s information.

For optimal welding fume detection, the capture element must be tracked by using thermally induced welding fume movement.

Make sure that the welding current return line between the work piece and the welding machine has a low resistance and that connections between the work piece and the welding fume separator are avoided, so that the welding current cannot flow back through the protective ground wire of the welding fume separator to the welding machine.

6. Technical data and description

6.1 Technical data

MOBEX BIA W3 model		**F-28**	**F-56**
Filter type		Filter cartridge	
Number of filter elements	[unit]	2	4
Filter area	[m²]	28	56
Drive output kW	[kW]	2.2	3.0
Max. vacuum Pa	[Pa]	2,150	3,000
Max. volume flow	[m³/h]	2,400	4,400
Min. volume flow	[m³/h]	1,700	2,650
Dust collection container (per 50 litres)	[unit]	1	2
Intake port (dia.)	[mm]	200	250
Dimensions	[L x W x H]	1,592 x 850 x 1,941	2,232 x 850 x 1,941
Environmental conditions	[℃]	5≤ϑ≤40	
Rel. humidity	[%]	30 - 70	
Noise (according to casing body procedure DIN EN ISO 3744)	[dBA]	65	66
Connection voltage	[V]	400	
Rated current	[A]	7	8.5
Circuit breaker	[A]	16	16
Nominal frequency	[Hz]	50	50
Max. air humidity	[%]	60	60
Weight	[kg]	approx. 420	approx. 570
Production year		See model plate.	

6.2 Functional description

Depending on the model, the device is driven by a 2.2 kW or 3 kW three-phase motor that drives a radial fan. The main switch supplies or cuts off the necessary power to the device, and the device is turned on and off with the red-green double push button.
The vacuum created by the fan draws air through the suction hose connected to the intake port. A permanent filter set up within the filter housing separates the dust that is in the exhausted air or welding fumes. The purified air is guided back into the room through the exhaust air port.

With the filter cartridges used, the device is equipped with a vacuum monitor as a control device for overseeing minimum airflow volume. This monitoring device measures the vacuum behind the filter. With increased dust soiling of the filters, the flow resistance increases along with the vacuum behind the filter.

If the value set on the vacuum monitor is reached, the filter cartridges are automatically cleaned with compressed air. If this does not decrease the vacuum, a siren sounds. This means that the minimum airflow volume has fallen to the limit and that the filter must be cleaned immediately. See the “Maintenance” section.

The cleaning frees the filter elements of dust and reconditions them. The dust collection container underneath the filter catches the dust that is cleared.

For easier removal of the collected material, the dust collection container and its contents can be detached from the device and removed. The plastic bag inserted into the container (item No. 06000358) with the magnetic strips (item No. 06002080) is for low-emission removal and disposal of the collected hazardous material. Disposal must be done in compliance with local regulations.

7. Delivery and commissioning

7.1 Delivery and transport

Beware of crushing hazard!
Wear safety shoes when transporting the machine!

At delivery, the device is fastened to a pallet. After the protective cover and the bottom fasteners have been removed, the device can be picked up with a forklift or crane. The roof sheet has eye hooks at the corners for crane transport. Transport slots are provided for transport with a forklift. Pay attention to the weight of the welding fume exhaust device and its centre of gravity during all transport operations.

Upon delivery, please inspect the welding fume exhaust device for transportation damage. Damage determined must be reported and documented immediately.

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When moving the welding fume exhaust device, make sure the ground can support it and be driven over.

7.2 Commissioning

Only persons authorized under “General safety instructions” must turn the device on.

Before setting up the cable connection between the device and the power grid, check to make sure the operating voltage shown on the model plate is the same as that of the grid.

When the device is turned off, the neutral line is not disengaged. The device is therefore intended only for use in TN networks.

The welding fume exhaust device must be placed on a level surface as near as possible to the source of welding fumes. Lock the device's wheels. The welding fume exhaust device's intake port has an interior diameter of 200 mm, 250 mm or 160 mm, depending on the model. Onto it is slid and fastened a suitable suction hose or spiral seam duct (original ESTA accessories) that has the necessary safety characteristics.

Connection is made to a suction element (exhaust arm, cutting table, etc.) with a smaller port diameter by using a suitable adaptor that fits the exhaust hose and is chosen to fit the port diameter of the capture element.

Jet cleaning
The cleaning equipment for the filter elements requires oil- and water-free compressed air (max. 4 bar at the compressed air nozzle) at the attached coupling. The ¼-inch plug nipple can be connected with a DN 7.2 ¼-inch coupling to the compressed air network. For safety, the connection to the compressed air network should not be made until the device is at its set-up area.

Welding fume class W3 is achieved with pre-coated filters and the pressure limit for the compressed air for filter cleaning at 4 bar.

Make sure that when the suction equipment is connected the welding fume exhaust device is turned on first, and then the welding machine. When switching off, follow the same procedure in reverse. This is guaranteed by using the optional equipment (see section 12).

Before the device is used, its operation must be tested.

To start up the welding fume exhaust device, the red-yellow main switch is turned to the "I" position. This switch also serves as an emergency shut-off and can be secured with a lock against unintentional activation. Then the device can be started up by pressing the green button on the double push button. The red button is for shut-off.
Optionally, the device can be equipped with an additional rotary switch (see section 12).

Pay attention to the direction of rotation.

After turning on the device for the first time, check to see that the fan rotor's direction of rotation is correct. Meanwhile, also look at the red light on the double push button. If this lights up after the device is turned on, the direction of rotation is wrong, and the power supply's polarity must be reversed. For this purpose, the CEE plug is equipped with a phase inverter. Using a screwdriver to turn the pole pin built into the insulated part of the plug changes the fan rotor's direction of rotation.

When the direction of rotation is wrong, the device gets impermissibly hot, the airflow volume gets weaker, and the device's performance suffers. This can also damage the device.

After connection of the suction hose to the source of welding fumes, first the welding fume exhaust device is started, and then the welding process. When switching off, follow the same procedure in reverse.

During operation, the welding fume exhaust device's location should not be changed.

8. Maintenance and troubleshooting

8.1 Maintenance instructions

If the device is not needed in its location of use for a long time, it must be stored in a dry room. The temperature should not be below 5℃ or above 40℃.
Before storing the MOBEX, it must be emptied and cleaned.

If necessary, the device can be cleaned with a damp cloth.
It must never be cleaned with flowing water.

For maintenance by qualified personnel, the device must be opened, cleaned and inspected at the given locations, as well as possible, without any hazard being posed to maintenance personnel or to other persons. Proper precautions must be taken before cleaning and removal of wearing parts. This includes locally filtered forced-air ventilation in the area in which the device is being maintained, and proper personal protective gear.

During maintenance or repair work, all soiled objects that can no longer be adequately cleaned must be disposed of. Such objects must be disposed of in a dustproof bag in compliance with applicable regulations for disposal of such refuse.

It is recommended that the operator have maintenance performed once per year. Depending on the mode of operation, the time intervals could be even shorter. During maintenance, the entire system is to be tested by a trained expert for correct operation. A written log is to be kept of the main annual inspection in the included maintenance book. It must document the date of inspection, deficiencies determined and the name of the inspector. The date of the next inspection can be read from the test plate installed on the device.

8.2 Inspection and maintenance intervals

Regular maintenance consists of 3 intervals:

1. Daily inspection includes:

➢ ***By the welding fume exhaust device's user***

Visual inspection

- for damage to the device or its parts
- for mechanical damage to the power cable
- for a full dust collection container (regulations require that the container be emptied if it is more than 2/3 full)
- whether the demisting mat is dirty. If dirty, it must be cleaned.

2. Monthly inspection includes:

➢ ***By expert maintenance personnel***

Functional and visual inspection

- for filter leaks (dust trails or deposits on the air outlets)
- to guarantee operation of the minimum airflow volume monitor (siren). During inspection, the device's air intake must be closed. If the siren sounds, the equipment is in order.

3. The main annual inspection includes:

The last test by ESTA is documented on the device.

➢ ***In collaboration with the ESTA maintenance service***

- Flow volume measurement
- Vacuum measurement
- Current consumption measurement
- Visual check of filters
- Seal inspection

After the main annual inspection, the device receives a new test plate to document that maintenance has been performed.

This inspection must be done at least once per year.

The 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.
If there is a malfunction, the welding fume exhaust device must be switched off immediately and the responsible maintenance service notified!

Maintenance must be performed according to accident prevention regulations. The device must be disconnected from the electrical power and from the compressed air network. Even when the compressed air supply is turned off, the compressed air tank is still under pressure!
To empty the compressed air tank, with the compressed air supply shut off, confirm the manual cleaning and wait until it is completed.

Get the most from ESTA's maintenance service!

A maintenance contract ensures a long life and top-notch operation for your welding fume exhaust device.
We'll make you a great offer — just call us up:

ESTA maintenance service: **+49 (0) 7307 804 - 832**
ESTA replacement part service: **+49 (0) 7307 804 - 831**

8.3 Troubleshooting

If dust escapes or clouds up from the air outlets, if smoke develops or the fan runs loud, the device must immediately be turned off from the red-yellow main switch!

Problem	Possible cause	Possible solution
The housing is too hot	Suction medium too hot	Make sure there is a balanced fresh air supply
Suction too weak	Main filter dirty Suction hose clogged	Clean filter In a vacuumed area, hold the hose vertically and bang it out with a rubber mallet.
Warning signal for low suction volume persists despite filter cleaning.	Filter pores clogged in main filter	Replace filter
Motor protection triggers	Fan frequently turned on and off	On devices with potential-free contact, motor protection must be reset manually.

Before opening the switch box, make sure to turn the main switch to the “0” position and pull the electrical plug! Work in the switch box must be performed only by an electrical expert or an appropriately trained person.

9. Monitoring the minimum airflow volume

Capture elements with various exhaust port diameters can be used with this welding fume exhaust device. In so doing, make sure that the exhausted airflow volume does not drop below the lower limit. This minimum airflow volume depends on the capture element's port diameter. Any Y-sections, reducers, hoses and tubes necessary for connecting are available from ESTA.
The welding fume exhaust device's monitoring equipment (pressure controller) must be adjusted to this minimum airflow volume.

The pressure controller must be adjusted only by an appropriately trained person in consultation with ESTA. The adjustment is made with a size 6 Allen wrench. After the pressure controller has been set, the device is ready for operation again.

During operation, if the minimum airflow volume drops below that set on the pressure controller, even after cleaning, a warning signal sounds. The welding fume exhaust device must be switched off, and the suction side must be checked for clogging or for a full dust collection container.

10. Cleaning

If necessary, the device can be cleaned with a damp cloth.
It must never be cleaned with flowing water.

10.1 Jet filter cleaning

Pneumatically operated filter cleaning, so-called jet cleaning, is built into the **MOBEX F-28** and **F-56**. If the vacuum set at the differential pressure switch is reached during operation, filter cleaning takes place.

Additionally, the filters can be cleaned manually with the blowers turned off (the main switch must remain on) by pressing the push button marked "Start cleaning". Each filter will now be cleaned twice by a compressed air blast. The manual cleaning process can be repeated as often as needed. However, cleaning must be done any time the warning signal sounds.

If fine dust is being exhausted, the filters need to be cleaned more often.

If the warning signal still immediately sounds again after the device has been cleaned and started, check the amount of material in the dust collection equipment. If necessary, empty the container. If the warning signal still sounds, replace the filter elements.

10.2 Replacing the filter

After an extended operation period, the filter pores can be clogged by extremely fine dust. Even the cleaning equipment cannot remove this dust. The affected filter must be replaced with a new one. This work should be done only by a professional.
The new filter bears item No. 30004315.

If possible, filter replacement must be done when there is no work going on. Used filters must be discarded in compliance with local regulations.

When removing a used filter, the person performing the work must wear a particle filter class P3 respirator mask, protective clothing and gloves.

First disconnect the compressed air supply and manually clean the vessel to empty it. The door cover is separated by pushing it up from the housing. Remove the screws from the inspection doors that now become visible. Remove the door to allow access to the filter unit.

To prevent contact with the filter cartridges, pack them from underneath in plastic bags. Make sure that the closure at the upper end is as dustproof as possible. If necessary, close the plastic bag with tape at the upper edge so that it doesn't slip downward. Then loosen the nuts on the filter cartridges and remove the earthing (ground) cable from the screw. By rotating each cartridge clockwise, it can be removed and enclosed completely in the bag.

Install the new filter by performing the same process in reverse. During installation, make sure to place a new rubber gasket at the top of each cartridge.

10.3 Cleaning the demisting mat

A demisting mat is installed in the intake port. This mat is for catching sparks so that they cannot damage the filter. Because it is possible for the demisting mat to collect flammable particles, it must be inspected and cleaned regularly by the user.
Therefore, loosen the fastening screws, including the retaining plate to remove the demisting mat, and clean it with soapy water. If the demisting mat gets too dirty, it must be replaced. Running the welding fume exhaust device without the demisting mat is not permitted.
The new demisting mat bears item No. 01000107.

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ESTA replacement part service: **+49 (0) 7307 804 - 831**

11. Disposal

11.1 Disposing of collected dust materials

The dust collection bag (item No. 06000358) with the magnetic strips (item No. 06002080) in the dust collection container must always be closed (with a cable tie) carefully when it reaches the maximum container fill level (about 2/3) after the welding fume exhaust device is used. It must be removed and disposed of according to applicable local regulations. Since the ESTA company does not know what types of dust are being exhausted, it can be necessary to empty the dust collection bag before it has reached its maximum fill level (a large bulk density means heavy weight).

When emptying the dust collection container or dust collection bag, the person performing the work must wear a particle filter class P3 respirator mask, protective clothing and gloves.

To remove the filled dust collection container, remove the cover plate and detach the dust collection container from the device. Dispose of the dust contained in the dust collection bag in keeping with local regulations.

11.2 Disposing of the welding fume exhaust device

Before disposing of the welding fume exhaust device, empty the dust collection container, remove the filter cartridges, and dispose of both of them in compliance with local regulations.

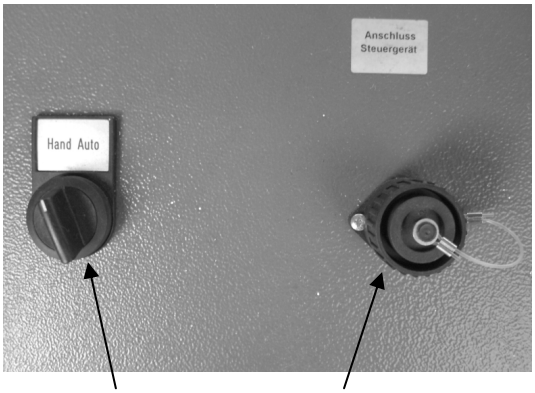
Pack the device in a suitable manner and dispose of it in compliance with local regulations.

Due to contamination of the device with toxic dust, ESTA cannot take the device back.

12. Optional equipment

Start-up with potential-free contact

Optionally, the device can be equipped with start-up through an external potential-free contact. This means there can be a coupling between the welding fume exhaust device and a welding machine connected to it. In this case, the welding machine starts and stops the welding fume exhaust device. The grey rotary switch on the switch box must be set to “AUTO” for this operating mode. In the “HAND” setting, the welding fume exhaust device is operated as previously described.
PIN 1 and 2 of the external potential-free contact are connected to the plug (packaged with the device). PIN 3 is reserved for the neutral wire. This is needed only when using special ESTA accessories. Connect the potential equalization to the PIN with the earthing (ground) indicator.
(Please follow the enclosed switching documentation!)



Rotary switch

Plug connections for external start-up

All electrical installations necessary to starting up the welding fume exhaust device, as well as electrical modifications and installation work to the welding machines, must be done only by an electrical specialist or a person trained for the job.
As soon as the main switch is set to “ON”, the contacts to the welding fume exhaust device’s black socket carry live voltage!

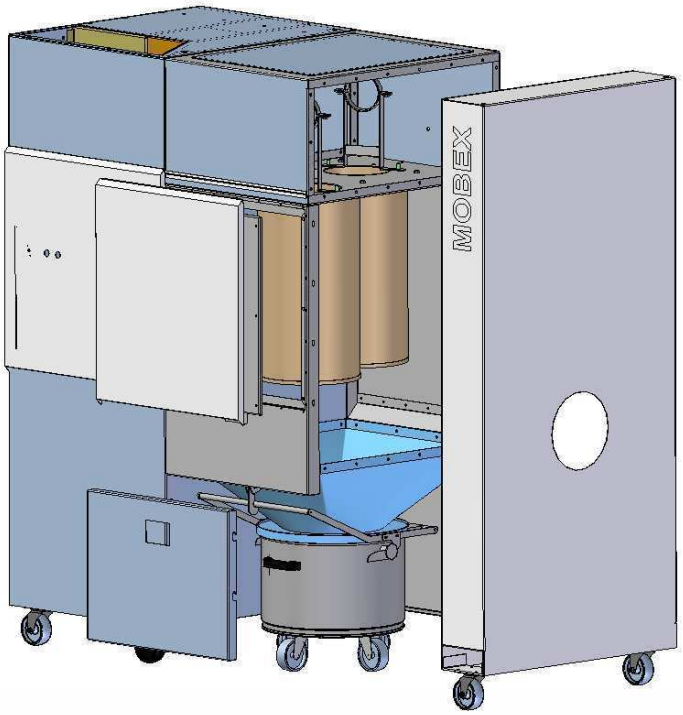
When the welding machine is connected, the welding fume exhaust device’s fan can start running by itself at any time!

When maintenance work is being done to the welding fume exhaust device, therefore, the control cable to the control box must be disconnected, and the main switch must be set to “0” and secured with a padlock against unintentional start-up! The electrical plug must be pulled.

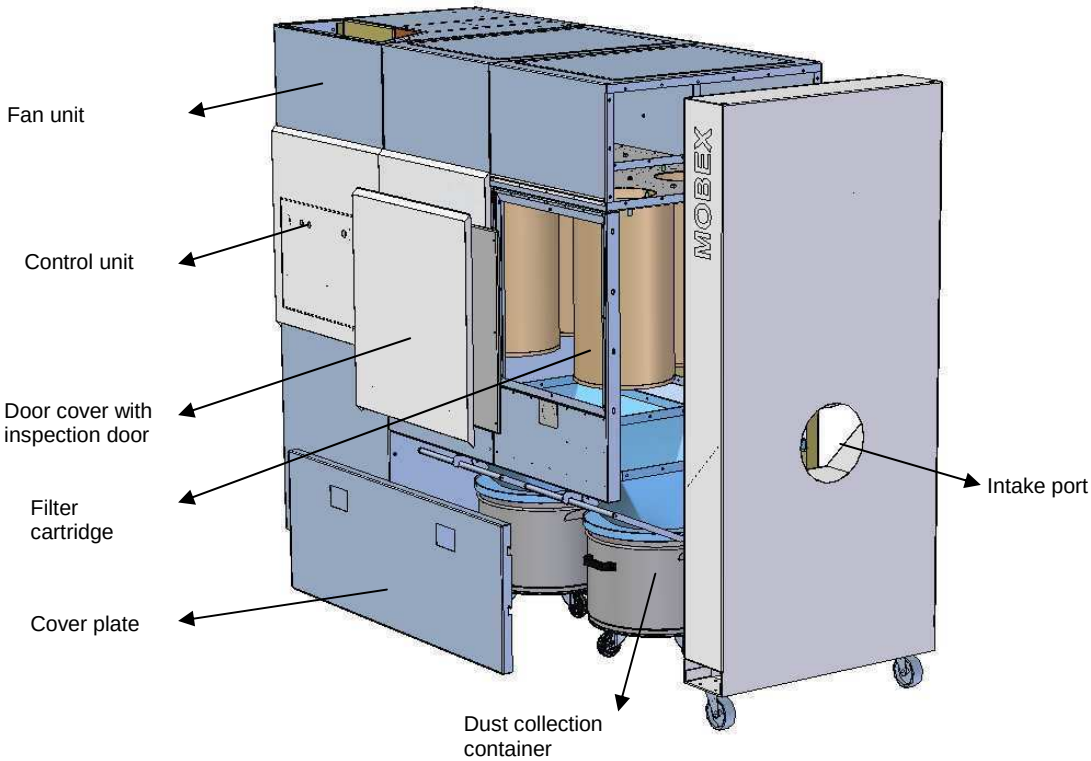
When maintenance work is being done to the connected welding machine and devices or control units, the control cable to the welding fume exhaust device must be disconnected, and all main switches must be set to “0” and secured, if possible, with a padlock against unintentional start-up! Additionally, the electrical plug must be pulled. If this is not possible, take appropriate measures to ensure that all machines are free of current. This applies to all welding machines connected to the system.

13. Device diagram

MOBEX F-28 BIA W3



MOBEX F-56 BIA W3



With the model information, request the replacement parts you need from the ESTA maintenance service: +49 (0) 7307 804 - 831

14. Declaration of conformity

Name of manufacturer:	ESTA Apparatebau GmbH & Co. KG
Address of manufacturer:	Gotenstraße 2 - 6 89250 Senden
Authorized person for documentation:	Michael Mertins Gotenstr. 2 - 6 89250 Senden

Here we explain that the design of the machine

Machine:	Dust extractor for collection, transport and elimination of dry dusts and welding fumes.
Series:	MOBEX
Model:	**MOBEX F-28, ...F-56**

conforms to the following regulations:

2006/42/EG	EC Machine Directive,
2004/108/EG	EC Directive on Electromagnetic Compatibility

Reconciled norms used:

EN 12100	Safety of machinery - basic concepts, general propositions (part 1 and part 2)
EN ISO 13857	Safety of machinery, devices and systems; safety distances to prevent hazard zones from being reached
EN 349	Safety of machinery; minimum distances for preventing body parts from being crushed
EN 60335	Safety of electrical appliances for household and similar use (part 1 and part 2-69)
EN 61000-6-3	Electromagnetic compatibility - Emitted interference in residential areas, commercial and business operations, as well as small enterprises
EN 61000-6-4	Electromagnetic compatibility - Emitted interference for the industrial sector
EN 61000-3 Part 11	Electromagnetic compatibility Limit values - Limiting voltage changes

National norms and technical specifications used:

VDI 3677	Filtering separators.

Senden, 30 December 2009

Dr. Peter Kulitz
CEO

Notes

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