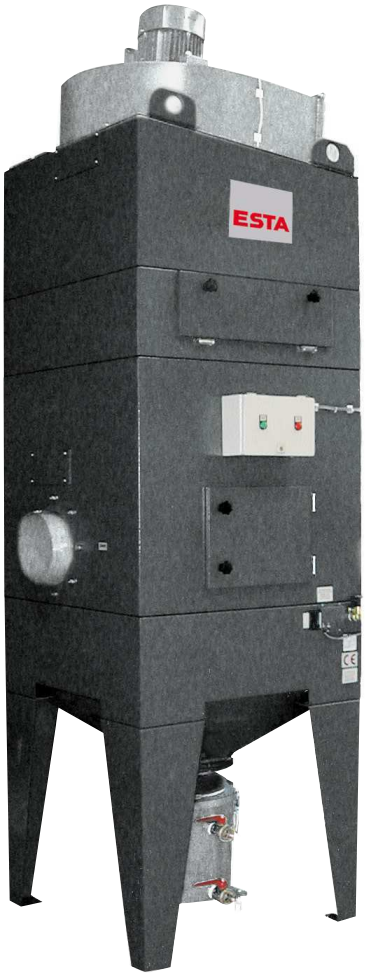
The World of Extraction

ESTA

OPERATING INSTRUCTIONS



NA-K B/VA

Stationary Dust Extractors

The World of Extraction ESTA

Welcome to the sphere of suction technology

Your purchase of an **ESTA** machine has been a good decision. The design of our quality products complies with the latest state of the art. **ESTA** products have been devised to provide for clean air at the workplaces at which they are applied. This results in an even more enhanced level of quality and longer machine times and, particularly, healthier working conditions. Should you have any questions pertaining to suction technology issues, please feel free to contact us at any time. Our experts will be gladly at your disposal.

Your **ESTA Absaugtechnik** Team

www.esta.com

Operating Instructions

CE

Water-Spray Separator
NA-K

Order No. 45.180 (NA-K 1800 VA)
Order No. 45.182 (NA-K 1800 B)
Order No. 45.184 (NA-K 1800 B)
Order No. 45.360 (NA-K 3600 VA)
Order No. 45.362 (NA-K 3600 B)
Order No. 45.364 (NA-K 3600 B)
Order No. 45.600 (NA-K 6000 VA)
Order No. 45.601 (NA-K 6000 B)
Order No. 45.604 (NA-K 6000 B)

Do not use this device prior to having read these operating instructions and never without having understood their content.

Translation of the original instructions
45601-08-03

Edition notice

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Warnings and safety information pertaining to ATEX compliant machines, devices and protective systems

Warning and safety information

Dangers due to electric current

Note(s) or advice(s)

Reference to the services offered by the ESTA customer service department

Reference to legal provisions

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1. General safety information

All users or personnel charged with the execution of maintenance or servicing works on the extraction system described herein should, prior to using the device, be informed on and instructed in its handling and use and have been trained for and made familiar with its operation and utilisation. The same also applies in regard to the substances for separation of which the device has been designed for. Users should also have undergone a briefing on how to proceed in order to dispose the collected materials of in a safe manner.

Concerning the personnel in charge, the individual responsibilities with regard to the following task assignments ought to be defined clearly:

- **Mounting and assembly**
- **Commissioning / taking into operation**
- **Operation**
- **Servicing, maintenance and repair**

The device must not be used by anybody other than persons who have been instructed in its correct handling and who have explicitly been charged to use it.

Always make sure to keep these operating instructions permanently at the place of operation of the wet separator in such a manner that experts and members of the technical staff are able to consult them at any time.

Concerning the separation of aluminium dusts, the requirements specified in BGR 109 (= guidance and recommendations for the avoidance of hazards due to dust explosions issued by the Central Office of the Professional German Trade Associations) need to be followed and complied with. According to BGR 109, aluminium dust is not conductive.

When using the NA-K for the separation of aluminium dusts, always make sure to perform all cleaning and/or maintenance works in compliance with the requirements specified in BGR 109 (4.9.1) and to keep corresponding records.
The formation of potentially explosive hydrogen gas areas can thus be avoided!

Dangerous gas explosion zones can be called into being when using the NA-K for any purposes other than those specified in these instructions. The same applies with regard to the execution of any unauthorised servicing and/or cleaning works. The design of the machines of the NA-K series allows no such unauthorised use. ESTA refuses to assume any liabilities for any such unauthorized use whatsoever!

Prior to starting up for the first time, the device must be checked by an expert and a corresponding report on the results taken down in writing.

The extraction of magnesium dusts produced by machines and/or at work-places is prohibited!

The device is not to be used if damage to the power cable or water supply has been determined.

An expert electrician or a person specially instructed in the execution of any such works only may perform the replacement of the mains cable and the mains plug.

No other than original spare parts specified by ESTA must be used for the replacement or repair of the mains cable or lead. This ensures that the parts are splash-proof in accordance with the currently operative standards and norms and dispose of the necessary mechanical stability and strength.

The use of extension cables, coupling devices, etc., is prohibited!

No other than original ESTA accessories must be used for the operation of the device.

Always take care to ensure that the mains cable can neither be damaged by vehicles that run over them, nor by breaking, pinching or pulling them or anything the like. Check the mains cable regularly for damage symptoms or ageing. The device must not be used if the mains cable is not in perfect condition.

Safety devices that serve for the prevention or elimination of dangers must, in compliance with the directive 2009/104/EEC and in compliance with TRGS 560 (technical directions for dangerous substances), be serviced on a regular base and checked by an expert for correct functioning with respect to the relevant safety requirements to be met.

No personal protective precautions need to be taken.

Always make sure to comply with the requirements specified in VDE 0185 (= Protection against lightning) when installing the device.

In all emergencies, the device must be disconnected from the power supply immediately. Turn the device off at the main switch (serves as emergency shut-off). If there is a fire, the fire department is to be alerted immediately, and the fire must be contained by appropriate means. A suitable extinguishing agent must be kept near the device before start-up and during operation.

2. Defence against mechanical dangers

All machine parts driven by electric motors and all movable parts of the machine are covered by stationary and securely fastened protective coverings that can be removed only by means of the appropriate tools.

Beware of remaining risks!
In the event a protective covering that can only be taken off by the appropriate tools has been removed, the danger of injury cannot be excluded if the machine or system is running!

3. Defence against electrical dangers

Stationary and securely fastened protective coverings that can only be removed by the appropriate tools cover all electrical parts. The device complies with the safety class I according to EN 60 204.

Beware of remaining risks!
In the event a protective covering that can only be taken off by the appropriate tools has been removed, risks or dangers due to electric shocks cannot be excluded!

4. Preventing hazards, liquids

Make sure that the connection to the on-site water mains is secure. Before disconnecting the water, bleed the pressure from the water pipe.

Residual risk:
Beware of slipping hazard! If fluid leaks onto the floor, there may be a slipping hazard.

5. Intended Use

The design of the NA-K enables to extract humid kinds of dust or flying sparks that are being produced by processing machines. The devices of the NA-K series are, beyond that, also suited for the extraction of aluminium dusts.

During operation, all inspection doors must be kept closed.

The device's installation room must have spatial ventilation or the exhaust flaps must be vented out the roof through an appropriate, steadily rising pipeline.

The device must be operated only with the droplet separator installed and the sludge pail connected.

For high filtration efficiency, a minimum dust load of 5 g/m³ with an average grain size of ≥25 µ is necessary in the raw gas.

To prevent a potentially explosive dust atmosphere in the suction line, the maximum dust load must not exceed 30 g/m³ (UEG).

In terms of safety, dust-explosion-protected wet separators are suitable for extracting combustible, dry dusts in Zone 22 explosive areas. This does not include dusts known to have extremely low minimum ignition energy (MZE ≤ 1 mJ). Use with these dusts requires case-by-case safety considerations in connection with other measures, if necessary. Conductive suction equipment (e.g., extraction hoods on machines) and conductive parts of processing machines (e.g., devices in protection class II) that are not earthed (grounded) through the wet separator must be earthed in some other way to prevent electrostatic charge.

5.1 Improper use

If sources of ignition are not eliminated, the maximum dust load of the NA-K, including the suction pipe system, must never exceed 30 g/m³ (UEG).

Different types of dust are never to be extracted through the same pipeline; the pipeline exterior is to be thoroughly cleaned of residual dusts.

If the NA-K, including the suction-side pipeline, is not used, maintained or cleaned as intended, dangerous gas-explosive zones can form. Devices of the NA-K product line are not designed for this, and the manufacturer shall assume no liability.

In regard to safety, dust-explosion-protected wet separators are not suitable for aspiration of explosive or equivalent materials in the sense of Section 1 of the explosives act, of liquids or of mixtures of flammable dusts with liquids.

Installation and operation in dust-explosive zones 20 and 21 or gas-explosive areas is forbidden!

6. Technical characteristics & functional description

6.1 Technical characteristics (all models)

	NA-K 1800	NA-K 3600	NA-K 6000
Operating mode	S1 (continuous operation)	S1 (continuous operation)	S1 (continuous operation)
Type of current	3N ~	3N ~	3N ~
Power	4.0 kW	5.5 kW	7.5 kW
Supply voltage	400 V	400 V	400 V
Mains frequency	50 Hz	50 Hz	50 Hz
Rated current	7.8 A	10.4 A	13.8 A
Dimensions (fan)	800 x 800 x 2960 (+500) mm	950 x 950 x 3385 (+500) mm	950 x 950 x 3440 (+500) mm
Dead weight approx.	400 kg	550 kg	620 kg
Water capacity approx.	290 ltr	390 ltr	390 ltr
Max. volume flow	2,160 m³/h	3,125 m³/h	5,150 m³/h
Max. negative pressure	4,300 Pa	3,500 Pa	3,600 Pa

Power rating of the potential-free contact:

	NA-K
Ohmic load (230V)	8 A
Inductive load (230V)	2 A
Ambient temperature	5 ≤ ϑ ≤ 40 °C
Air moisture	max. 80 %
max. admissible ambient pressure	1,1 bar

Technical changes reserved

6.2 Functional description

With all devices of the NA-K series, a radial fan is employed that generates the volume flow and the negative pressure needed for extraction.

The dusty air exhausted from the processing machine is guided through a pipeline or a suitable conductive or dissipative hose connection to the device's intake port. This intake port leads directly into a specially shaped whirl chamber.

The lower part of the whirl chamber is covered with water. The extracted air flows through this chamber at high speed and is swirled up intensively with the water. The dust carried with the air stream is wetted and transformed to a watery slurry. The water-bound dust sinks as sludge into the flange-mounted sludge pail. For easier disposal and maintenance, there are two drain spigots on the sludge pail. If the water level is too high, these can be used to drain some of the water. The drained water must be captured with a suitable container and disposed of according to local regulations.

Two capacitive sensors automatically control the water level and make sure that there is always enough water in the device. For this, the sensors detect the minimum and maximum water level. The device is automatically filled with water through an inlet valve to be attached to the on-site water connection, until the maximum water level has been reached.

A demister is located between the fan and the whirl chamber. It separates swirled up water drops that still exist in it, from the through-flowing air. The mud contained in the dust slurry sinks down and settles in the mud bucket that has been flanged to the bottom of the device.

7 Delivery and mounting

Failure to comply with the safety instructions can lead to a fatal explosion (of dust and/or gas).

The wet spray separators of the NA-K series are delivered on a wooden pallet (in lying condition). The machines are covered with a protective PE film. After removal of the protective covering, a crane can be used to lift it off using the lifting eyes that exist at its upper part and to move it to the provided place of operation.

The NA-K may only be lifted off using the four lifting eyes at its roof!

The device must be installed on a plane floor the load carrying ability of which must come to at least 1000 kg/m². To enhance its stability, the device must be bolted into place / bolted down on the respective floor. To facilitate the execution of control and/or cleaning works, a free space of at least 2 meters must be reserved at the front side (service openings) and also at the right side of the device (control module). If installing the fan on the roof of the NA-K, care must be taken to ensure that the distance between fan and roof comes to at least 0.5 m.

The device must not be exposed to direct solar radiation.

The system's suction and discharge openings must be secured by a wire mesh to prevent foreign objects from falling in or being sucked in.

Always make sure to comply with the legal requirements specified in the Technical Instructions on Air Quality Control (TA Luft) and in the Federal Imission Control Ordinance (BImSchV) when operating the device.

After set-up, the device's water and electrical supplies must be connected.

7.1 Connection of processing machines

Extraction hoods, extraction conduits and/or extraction hoses need to be connected to the NA-K in an electrically conducting manner to avoid electrostatic charging.

To correctly extract from a dust-producing machine, a conductive pipe or hose connection and the electrical connection must be created between the processing machine to be exhausted and the **NA-K**. If the airflow volume goes below the minimum limit, the machines that are connected and are to be extracted from must be turned off. For this, the controls have a potential-free contact, to which the processing machine is to be connected. The connection must be made according to the circuit documentation included (see the circuit diagram in the switch box). If the operating parameters for the entire suction are correct, this contact is closed.

The diameters of all hoses, pipes and conduits must be of such size that a minimum air speed of 20m/sec. in their inside is guaranteed.

With several processing machines connected to the NA-K, the overall volume flow apportions between the individual devices, For the volume flow needed in order to extract the dust produced by your processing machine, please contact the producer of this machine.
The values indicated in this table can be considered as standard values:

Pipe or hose diameter	Volume flow at 20 m/sec.
50 mm	141 m³/h
70 mm	277 m³/h
80 mm	362 m³/h
100 mm	566 m³/h
125 mm	884 m³/h
140 mm	1,108 m³/h
160 mm	1,448 m³/h
180 mm	1,832 m³/h
200 mm	2,262 m³/h
225 mm	2,863 m³/h
250 mm	3,534 m³/h
280 mm	4,434 m³/h
300 mm	5,090 m³/h

The electrical coupling between the dust-processing machines and the NA-K dust extractor must, in compliance with the enclosed documents relating thereto, imperatively be realised in a professional and skilled manner. Prior to taking it into operation, the system needs to be checked for correct functioning!

8. Commissioning

Only the persons described in section 1., "General safety information" in these instructions are authorised to commission the dust extractor and to bring it on stream.
Prior to establishing the electrical connection between the device and the existing mains supply, a check must be made in order to verify if the operating voltage indicated on the rating plate complies with the actual supply voltage.

A functional test must be made prior to using the device for the first time. Always make sure to close all service openings prior to starting it up for the first time and take all necessary precautions to prevent the suction intakes from getting closed suddenly while the machine is on duty. The ventilation flaps close by themselves due to the vacuum occurring when the fan is turned on.

The first steps:

- Check that all quick-tension locks to the sludge pail are secured and that the drain spigots are closed (if necessary, secure them against leaks using 3/4” stoppers).
- Connect the inlet valve (G 3/4”) to the on-site water mains, and turn on the spigot until there is water pressure on the inlet valve.
- Turn the red/yellow main switch to the position "I". The water level control is now active.
- Let water run in until the water level in the device is adequate. The target water level is about 2 cm above the “min” mark.
- For safety reasons, the inlet valve turns off after a minute if the capacitive sensors continuously respond. Therefore, upon first filling and after every time the water is changed, the main switch must be switched off and back on at intervals of about a minute, or filling should be done through a separate hose.

For control purposes, the water level can be read from the device's inspection window and absolutely must be between the "min" and "max" levels.

Because the water pressure at the **NA-K**'s inlet valve can vary from place to place, the time necessary for water filling also varies. The target water level is about 2 cm above the "min" mark. The sensor's response can be seen from the control unit LOGO! built into the control cabinet and causes the suction operation to be turned off.

If the red "motor fault" signal light flashes at 0.5 sec. intervals, the water level inside the device is too low and the reason must be detected. At the same time, a plain text message is displayed on the LOGO! controls. No suction is to occur, and the connected processing machines must be turned off!

Check if the fan turns in the correct direction!

Prior to the commissioning the device, always make sure that the drive motor turns in the correct direction. Performing the following steps, will allow to verify this:

- Push the green button "Suction on" at the switch cabinet to activate the fan (indicator lamp lights green if the fan motor is running);
- Wait for 5 seconds;
- Turn the fan off with the red "Suction off" button on the control cabinet.
- Check if the motor fanwheel turns in the direction of the arrow.

Once the fanwheel turns in the direction of the arrow, the NA-K has been connected correctly. Once it turns in the opposite direction, two phase-carrying conductors will have to be exchanged between each other.

If the sense of rotation of the fanwheel is incorrect, the device overheats in an inadmissible manner without attaining the required extraction performance.

With all devices where the connection to the power grid has been established without using a connector, no persons, other than trained expert electricians only, may perform the exchange of phases!

Once the fanwheel has been checked for its correct sense of rotation, the device needs to be activated again in order to perform further functional controls.

Once the processing machines provided for dust extraction via the NA-K have been connected to the wet separator, both the electrical coupling and the function required for the maintaining of the minimum volume flow need to be checked and controlled. If a lower deviation of the minimum volume flow occurs, the machines connected to the NA-K for dedusting need to be deactivated.
This contact will remain closed as long as the operating parameters of the overall extraction systems are OK.

Once the functional check has been performed without findings, the NA-K is ready for being used within the limits of dust extraction applications it has been specified for.

Please contact the ESTA maintenance service whenever uncertainties or unsolvable problems occur.

ESTA maintenance service: +49 (0) 7307 804 - 0
ESTA customer service: + 49 (0) 7307 804 - 0

The operator of the NA-K must take care to ensure that the water leaking out of the device in the event of a possible defect, can cause no harm to people, machines, fixtures, facilities, buildings or the environment!

8.1 Alternative water level control

There are alternative designs for controlling the water level. Depending on the application, other capacitive fill level sensors can be used. It is also possible to control the water level using a bypass pipe (magnetic floats and external reed contacts).

9. Maintenance and repairing of faults

9.1 Maintenance advice

When using the NA-K for the separation of aluminium dusts, always make sure to perform all cleaning and/or maintenance works in compliance with the requirements specified in BGR 109 (4.9.1) and to keep corresponding records. The formation of potentially explosive hydrogen gas areas can thus be avoided!

Prior to the execution of any servicing works on the device through qualified personnel, it must, as far as practicable, be opened at the appropriate places and be cleaned and serviced without putting the physical safety of the maintenance personnel and of any third persons into jeopardy. The qualified precautions to be taken prior to the cleaning of the device and the removal and replacement of wear parts include the provision of forced filtered ventilation in the room in which the servicing of the device takes place and also comprise the control of all persons involved for their complying with the constraint to wear appropriate personal protective equipment.

All polluted objects that cannot be cleaned sufficiently during the execution of maintenance and/or repair works, need to be disposed of. Any such objects must be put in tight and impermeable bags and be disposed of in compliance with the relevant regulations currently operative and in force.

For objects and materials with which hydrogen may develop, never use airtight tanks, because these can lead to a potentially explosive environment.

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°C or above 40°C. Before storage, the water in the device must be drained, the interior and the droplet separator must be cleaned, the device's exterior must be cleaned with a damp cloth, and the sludge pail must be completely emptied and cleaned.

In no case must a water jet be applied for the cleaning of the device!

The operator of the machine is obliged to let it have serviced once annually. An instructed expert must check the complete system for perfect functioning during these works. Each time an annual general inspection is made, a corresponding entry is to be made in the related log. The entry must indicate the date of the inspection, the name of the person that performed the inspection and must also indicate all possibly detected defects. The date of the next servicing routine to be performed is to be indicated on the inspection sticker that has to be affixed to the machine.

9.2 Inspection and servicing intervals

According to TRGS 560 (5.9) the separation equipment must be maintained regularly.

The regular maintenance comprises following procedures:

1. The daily inspection:
(To be performed by the user of the dust extractor.)

Visual inspection

- of the water level in the **NA-K** through the inspection window.
- for leaks between the sludge pail and the device's housing.
- for damage to the device or its parts.
- for mechanical damage to the power cable
- for damage or leaks in the incoming water line.
- for the sludge pail's fill level (regulations require that the container be emptied if it is more than 1/2 full)
- whether the fill level sensor's measurement is impaired by dirt on the inspection window. If necessary, clean the inspection window!
- to see if the ventilation flaps open independently after shut-off and close independently after switch-on.
- After every operating phase, the separated aluminium dust must be removed from inside the device. This prevents development of potentially explosive air/hydrogen mixtures.

2. The monthly inspection:
(To be performed by competent maintenance personnel.)

Visual and functional inspection

- to see if the water level control works properly (let the water out with the fan running. If the water goes below the minimum mark on the inspection glass, open the water intake valve. If the level goes below the minimum mark, the device must be shut off for about 15 seconds.)

Here, make sure that there is no processing machine connected and that no dust or sparks are being extracted.

- to see if the swirl chamber or gas deflector has been damaged (by corrosion) or if its diameter has changed due to build-up.
- to see if the droplet separator, the fan housing or the fan wheel is soiled. If so, clean the components.
- of the fan wheel for free oscillation, and of all other movable parts for correct operation and freedom from friction.
- of the minimum airflow volume control. (See "Technical data".)
- for corrosion anywhere inside the device.

If the interior of the device is heavily soiled, it must be cleaned.

3. The annual inspection:

A sticker on the machine indicates the date at which the machine has last been inspected by ESTA!
(To be performed in cooperation with the ESTA maintenance service.)

- Measuring of the volume flow
- Measuring of the negative pressure
- Measuring of the current consumption
- Check for tightness
- Functional check of the control system

After completion of the above inspection works, a new inspection sticker is to be affixed to the machine in proof of the performed servicing and maintenance works.

This inspection is to be made once annually.

The inspection works actually performed are to be recorded in writing in the related maintenance booklet. The entry must indicate the inspected equipment and, if necessary, all possibly detected defects. The entry must also indicate the date of the inspection and the name of the person that performed it. If malfunctions occur, the dust extractor is to be deactivated immediately and the responsible maintenance service to be informed thereof directly!

Safety devices that serve for the prevention or elimination of dangers must, in compliance with the directive 2009/104/EEC and in compliance with TRGS 560 (technical directions for dangerous substances), be serviced on a regular base and checked by an expert for correct functioning with respect to the relevant safety requirements to be met.

All maintenance and/or servicing works or routines are to be performed in compliance with the currently applicable rules for the prevention of accidents. Prior to performing any such works, the device has to be disconnected from the power grid! During maintenance, be sure that the zone around the device is clear!

When using the NA-K for the separation of aluminium dusts, always make sure to perform all cleaning and/or maintenance works in compliance with the requirements specified in BGR 109 (4.9.1) and to keep corresponding records. The formation of potentially explosive hydrogen gas areas can thus be avoided!

Get the most from ESTA's maintenance service!

A maintenance contract ensures a long life and top-notch operation for your welding fume filter system.
We'll make you a great offer — just call us up:
ESTA maintenance service: +49 (0) 7307 804 – 0
ESTA replacement part service: +49 (0) 7307 804 – 0

9.3 General troubleshooting instructions

Use the main switch to turn the device off in case of an emergency (fire etc.).

In all emergencies, the device must be disconnected from the power supply immediately. Turn the device off at the main switch (serves as emergency shut-off). If there is a fire, the fire department is to be alerted immediately, and the fire must be contained by appropriate means. A suitable extinguishing agent must be kept near the device before start-up and during operation.

Prior to performing any works on the device in order to repair any possibly occurred faults, always make sure to turn the red/yellow main switch to the position "0" and apply a padlock to prevent an unintentional restarting of the machine.

All work on the control cabinet must be done when the system is not running. It must be ensured that the fan cannot be turned on unintentionally. For this, turn the main switch to the "0/Off" position and secure it with a padlock against unintentional activation.

If a failure or trouble has occurred, please go through the check list hereafter in order to find the corresponding reason and remedy. Once a failure or trouble occurred that is not mentioned in this list, immediately please address yourself to ESTA directly. Never perform any servicing and/or repair works on the machine by yourself that have not explicitly been specified.

9.3.1 Allgemeine Hinweise zur Steuerung

Troubleshooting and work on the controls must be done only by an electrical specialist or by a person trained for the purpose.

The LOGO! - controls are on the switch box delivered with the system. Before the switch box is opened, the main switch must be set to "0/Off" and secured against reactivation.
If a malfunction occurs (the "Motor malfunction" signal light goes on), the reason for the malfunction can be read on the LOGO! control's (A1) display. The two vertical arrow keys can be used to switch between the text and status displays.

9.4 Control elements on the switch box

The exterior of the switch box has the following control elements:

Control element	Function
Main switch	For turning the whole system on and off. During maintenance or repair work, the main switch can be secured with a padlock against unintentional activation.
Green switch **“Suction on”**	For turning the fan on. Suction mode starts.
Red button **“Suction off”**	For turning the fan off. Suction mode stops. It is also used to release the system after an error message or malfunction (press for at least 3 minutes).
Green warning light **“Motor operation”**	Glows continuously to show that the system is operating trouble-free. Goes off when an error message or malfunction occurs.
Red warning light **“Motor malfunction”**	Flashes (fast or slow) or glows continuously to show an error message or malfunction.

9.5 Troubleshooting error messages and malfunctions

Error messages = Display of a specific error message in plain text on the control unit

Malfunctions = Malfunctions occurring on the device itself, which can also cause error messages on the controls.

Error message	Motor OFF	Processing machine OFF	Solenoid valve closed	Green warning light OFF	Red warning light Continuous	Red warning light Slow flashing	Red warning light Quick flashing	Cause	Solution
Volume flow too low	after time t			after time t		after time t		The pressure controller has responded because the volume flow is too low.	Check the suction pipes and droplet separators for clogs and clean them, if necessary.
	after time t			after time t		after time t		Motor rotating in the wrong direction	Change in direction of rotation because two phases in the feed line were switched.
	after time t			after time t		after time t		Throttling device in suction pipe is closed	Open the throttling device in the suction pipe as appropriate.
Volume flow too low EMERGENCY SHUT-OFF!								The pressure controller has responded because the volume flow is cut off. Suction line clogged	Check the suction pipes and droplet separators for clogs and clean them, if necessary.
Control voltage 24V AC								The motor protection switch or thermistor protection relay has triggered due to overload. A phase may be missing in the power grid.	Press the black reset button for the motor safety switch or on the thermistor protection relay to reset this. If this continues to occur: Notify ESTA customer service.

Error message	Motor OFF	Processing machine OFF	Solenoid valve closed	Green warning light OFF	Red warning light Continuous	Red warning light Slow flashing	Red warning light Quick flashing	Cause	Solution
Motor protection active								The motor protection switch or thermistor protection relay has triggered due to overload. A phase may be missing in the power grid.	Press the black reset button for the motor safety switch to reset this. If this continues to occur: Notify ESTA customer service.
								Wrong or poorly installed switching devices.	Install the switching devices correctly or allow for heavy starting.
								Time for star/triangle start-up incorrectly set.	Check the time relay and reset, if necessary.
								Motor rotating in the wrong direction.	Change in direction of rotation because two phases in the feed line were switched.
								The resistance in the system's suction pipe is too low.	Close the throttling device in the suction pipe until the desired air mass is reached.
Check the direction of rotation								The motor's direction of rotation control has triggered.	Disconnect the system from the power supply! Change in direction of rotation because two phases in the feed line were switched.
								Motor rotating in the wrong direction.	Disconnect the system from the power supply! Change in direction of rotation because two phases in the feed line were switched.

Error message	Motor OFF	Processing machine OFF	Solenoid valve closed	Green warning light OFF	Red warning light Continuous	Red warning light Slow flashing	Red warning light Quick flashing	Cause	Solution
Water level too low								The water level is too low.	See if the water intake and minimum pressure are correct, and if necessary turn the spigot further. Check the drain spigots on the sludge pail and close them, if necessary.
								System dirty.	Turn the system off and clean it.
								Valve doesn't open. Water feed defective Dirt in water pipe	Clean the valve and, if necessary, replace it. Check the feed line and, if necessary, clean it.
Gate query neg.								Gate has not drawn in or is hanging.	Check or change the gate.

Malfunction	Cause	Solution
System doesn't start or displays malfunction	The direction of rotation control has triggered.	Disconnect the system from the power supply! Change in direction of rotation because two phases in the feed line were switched.
Error resolved, but device does not start after it has been switched on at the main switch and by pressing the green "Suction on" button.	Error must be dismissed after repair.	Press the red "Suction off" button. Then turn the device back on by pressing the "Suction on" button.
Leaky shaft passage.	Sealing element worn.	Replace the sealing element.
Fan runs rough.	Rotor is off balance due to build-up. Imbalance due to material degradation on the rotor, e.g., from handling materials. Imbalance from rotor deformation due to overheating. Imbalance due to rotor wear.	Cautiously and carefully remove the build-up. If necessary, have an expert rebalance. Check the bearing. Consult with ESTA; replace rotor if necessary; check the bearings. Consult with ESTA; replace rotor if necessary; check the bearings. Consult with ESTA; replace rotor if necessary; check the bearings.
Temperature rise in bearings.	Increased flexing in the bearing due to fresh bearing lubrication (new bearings) Bearing defective Bearings installed tense	Continue operating the fan. The temperature normalizes by itself after a certain time. Replace the bearings. Replace the bearings.

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10. Monitoring of the minimum air flow rate

The wet separator described in these instructions enables to clean processing machines with differently sized suction nozzles. If cleaning different machines by way of extraction, the system monitors the aspired air flow rate permanently to ensure it will not fall below a certain minimum level. This level depends on the size of the suction nozzle of the connected dust-producing machine. The monitoring device of the deduster has been adjusted to this minimum air flow rate (two pressure switches).
This device measures the vacuum between the droplet separator and fan and compares it to the current ambient pressure around the machine. If the difference exceeds a pre-set value, the controls report this in plain text as the error message “Volume flow too low”. At the same time, the red “Motor malfunction” warning light flashes on the switch box. This means that the processing machines connected must be shut off, because the set minimum volume flow is no longer assured.

If the pressure controller’s pre-set value (see “Technical data”) is too weak for the operational use conditions (long suction distances and small tube diameters), this can be adjusted upon consultation with ESTA maintenance services.

Changes to the pressure switch’s settings are to be made only in consultation with ESTA.

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11. Cleaning

When using the NA-K for the separation of aluminium dusts, always make sure to perform all cleaning and/or maintenance works in compliance with the requirements specified in BGR 109 (4.9.1) and to keep corresponding records. The formation of potentially explosive hydrogen gas areas can thus be avoided!

The persons charged with the execution of cleaning works must have been trained in the handling of the extracted health-hazardous substances and been instructed in how to deal with them. All such works are to be performed without affecting non-involved third persons! During cleaning and maintenance work that brings one into contact with toxic substances or objects, suitable protective gloves absolutely must be worn.

All polluted objects that cannot be cleaned sufficiently during the execution of cleaning works, need to be disposed of. Any such objects must be put in tight and impermeable containers and be disposed of in compliance with the currently applicable regulations concerning the disposal of such industrial waste.

Prior to performing any cleaning works on the NA-K, always make sure to turn the main switch off and to apply a padlock to the switch to prevent an unintended restarting of the machine.

11.1 Cleaning of the interior of the NA-K

The machine needs to be cleaned at regular intervals; at least, however, once every month and always after longer rest periods. Here the interior with the swirl chamber must be freed of deposited residue. We recommend using water for cleaning. Here the interior can be cleaned with a water jet.
Only a clean environment will ensure the proper operation of the NA-K. The same applies also in regard to dust deposits that may have settled on the machine. Therefore, always make sure to remove such deposits too.

11.2 Cleaning the NA-K's outer surface

The machine needs to be cleaned at regular intervals; at least, however, once every month and always after longer rest periods.
Only a clean environment will ensure the proper operation of the NA-K. The same applies also in regard to dust deposits that may have settled on the machine. Therefore, always make sure to remove such deposits too. It is recommended that this be removed with a damp cloth.

11.3 Cleaning of the demister

The NA-K is equipped with a so-called demister. The demister separates the water drops that still remained in the cleaned air prior to leaving the device. Dirt may accumulate inside the flow ducts of the device after longer operation periods. The accumulated dirt leads to an increased air resistance in the device and thus to a reduced extraction performance.

Once this is the case, the demister needs to be cleaned thoroughly. For the servicing and/or cleaning of the demister, proceed as follows:

- Open the upper door at the wet spray separator by turning the star knob clock-wise;
- Remove the demister by pulling at the handles fitted on the front side;
- The demister can now be cleaned using the appropriate means (high-pressure washer, water jet);
- After cleaning, slide the cleaned demister back into the device again;
- Close the door again and lock it by turning the star knob.

After restart, the NA-K is ready for operation again.

11.4Cleaning of the fan

Open the maintenance cover and remove all possibly existing dirt deposits and/or cakings. Always make sure to mind the protection class of the fan (IP 65) when doing so. The use of pressure washers **can destroy the motor of the fan!**
Never forget to close the maintenance again cover after cleaning!

12. Disposal

The persons charged with the execution of cleaning works must have been trained in the handling of the extracted health-hazardous substances and been instructed in how to deal with them. All such works are to be performed without affecting non-involved third persons!

Before disposal work begins, the NA-K must be turned off at the main switch and be secured against reactivation. The device must be disconnected from the water mains.

12.1 Disposal and exchange of the polluted water

The dust extracted from the individual processing machines is, inside the NA-K, mixed up with water and settles in the mud bucket. Two draining cocks have been fitted at the mud bucket. They allow to remove the mud without any need to exchange the complete volume of water that has been filled into the machine. As described here below, one of the draining cocks in each case must be opened as needed in order to wash the deposited mud out along with the draining off water.

The escaping water including the mud deposits need to be collected in an appropriate tank or container and need, in compliance with the applicable local rules, to be disposed of in an environmentally compatible manner.

After a certain time, the water inside the NA-K gets used up and needs to be exchanged completely. Two drain cocks have been fitted at the device to enable this. The slightly polluted water existing in the upper part of the NA-K can be discharged using the upper cock, while the discharging of the residual water can be realised by the lower cock fitted at the mud bucket. To enable better cleaning, the mud bucket can be decoupled from the device by the four quick release fasteners provided for this purpose. The device must be thoroughly cleaned before it is filled with fresh water. This will increase the serviceable life of the water. Before refilling it with water, the mud bucket must be connected again and all drain cocks be closed. All quick-tension locks must be secured again, and the drain spigots closed. To prevent slurry and water from leaking out, the drain spigots can be secured with stoppers (3/4”).

The polluted water including the mud deposits need, in compliance with applicable local rules, to be disposed of in an environmentally compatible manner.

With certain types of dust, the water may show a tendency to form foam. In this case, an anti-foaming agent (e.g. sodium carbonate) should be added to the water.

12.2 Information concerning the dismantling, wrapping and loading of the machine

Prior to any possibly required dismantling of the deduster, always make sure to disconnect all electrical and water supplies and to drain off the water and mud that possibly still exist inside the device. Make sure the pressure has been bled from the water pipe before connecting it to the device. The water and slurry in the device must be drained through the drain spigots attached to the sludge pail. When doing so, always make sure to proceed as described herein with regard to the cleaning of the device.
Lifting is enabled by the lifting eyes at the upper part of the NA-K. This way, the device can be lifted up and put it down again on the pallet determined for its transport, shipment or transfer. Applying an appropriate film helps protecting it against the accumulation of dirt.

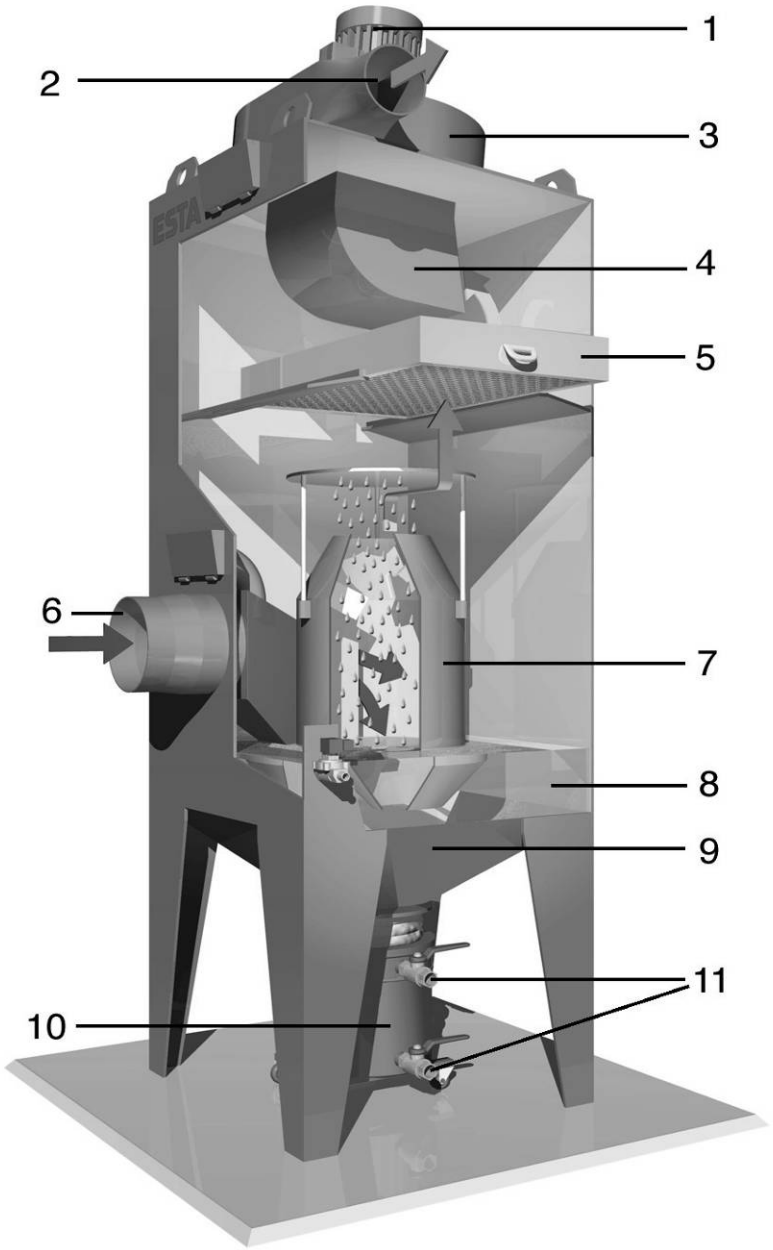
The NA-K may be lifted off only using the four lifting eyes at its roof!

12.3 Information concerning the disposal of the machine

After the discharge of both mud and water and after the disconnection of all existing supplies, the device can be disposed of in the usual way and manner applying to such equipment. All applicable disposal regulations need to be followed and adhered when disposing the device of!

The taking back of the device by ESTA is excluded.

13. Representation of the device



1. Motor
2. Used air outlet
3. Fan
4. Gas deflector
5. Demister
6. Air intake
7. Whirl chamber
8. Water
9. Device cone
10. Mud bucket
11. Draining cocks

Spare parts can be ordered from the responsible ESTA spare parts service at +49 (0) 7307 804 – 0 by indicating the required type(s).

14. EC Declaration of Conformity

EC - Declaration of Conformity within the meaning of the EC machinery directive (2006/42/EC).

Name of the producer:	ESTA Apparatebau GmbH & Co KG
Address:	Gotenstraße 2 - 6 D-89250 Senden
Mrs. Pflum is authorised to compile the technical file according to Annex VII A.:	Ramona Pflum Gotenstraße 2 - 6 89250 Senden

We hereby declare that the design of the machine(s) specified hereafter

Machine:	Wet separator for the extraction of different types of dust
Series:	NA-K
Type:	NA-K 1800, NA-K 3600, NA-K 6000

comply / complies with the following pertinent directives, standards and rules:

ATEX 94/9/EC	Equipment and protective systems intended for use in potentially explosive zones
2006/42/EC	EC machinery directive
2004/108/EC	EC directive concerning electromagnetic compatibility

The marking applied to the device must contain the following indications:

CE Ex **II 3D c tD A22 T135°c X**

(concerning non-conductible types of dust)

The product has been manufactured in compliance with the following harmonized standards:

DIN EN ISO 12100:2011-03	Safety of machinery - General principles for design - Risk assessment and risk reduction
DIN EN ISO 13857:2008-06	Safety of machinery, devices and systems; safety distances to prevent hazard zones from being reached
DIN EN 349:2008-09	Safety of machinery; minimum distances for preventing body parts from being crushed
DIN EN 13463-1:2009-07	Non-electrical equipment for use in potentially explosive atmospheres - Basic method and requirements (sections 7.4 and 11)
DIN EN 13463-5:2011-06	Non-electrical equipment for use in potentially explosive atmospheres - Protection by constructional safety 'c' (sections 5 and 6)
DIN EN 61241-0:2007-07	Electrical apparatus for use in the presence of combustible dust - General requirements
DIN EN 61241-1:2005-06	Electrical apparatus for use in the presence of combustible dust - Protection by enclosures "tD"
DIN EN 61241-14:2005-06	Electrical apparatus for use in the presence of combustible dust - Selection and installation
DIN EN 60335-1:2012-10	Household and similar electrical appliances - Safety - General requirements
DIN EN 60335-2-69:2012-08	Household and similar electrical appliances - Safety - Particular requirements for wet and dry vacuum cleaners, including power brush, for commercial use
DIN EN 61000-6-1:2007-10	EMC - Generic standards - Immunity for residential, commercial and light-industrial environments
DIN EN 61000-6-2:2006-03	EMC - Generic standards - Immunity for industrial environments
DIN EN 61000-6-3:2011-09	EMC - Generic standards - Emission standard for residential, commercial and light-industrial environments
DIN EN 61000-6-4:2011-09	EMC - Generic standards - Emission standard for industrial environments
DIN EN 61000-3-11:2001-04	EMC - Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems; Equipment with rated current ≤ 75 A and subject to conditional connection

Applied national standards and technical specifications:

BGR 109:2008-02	Trade Association Rules for Occupational Safety and Health - Avoidance of dangers due to dust fires and explosions during grinding, finishing and polishing of aluminium and its alloys
TRBS 2153	Trade Association Rules for Occupational Safety and Health: Avoidance of ignition risks due to electrostatic charges (section 6.2.4)

Senden, 5th January 2012

Dr. Peter Kulitz
(CEO)

Notices

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