

OPERATING INSTRUCTIONS



NA-K

Stationary Dust Extractors

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

**DEDUSTING
EXTRACTION
CLEANING**

The logo for ESTA, consisting of the word "ESTA" in red, bold, uppercase letters, centered within a gray square background.

Operating manual



Wet separator NA-K

Item No. 45.183 (NA-K 1800)
Item No. 45.363 (NA-K 3600)
Item No. 45.603 (NA-K 6000)



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

Translation of the original instructions
45603-08-01

Edition notice

Original operating manual

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Warnings and safety instructions



Reference to legal regulations



Note

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1. General safety notes

The device must be used only by persons who have been instructed in its handling and are explicitly authorized to use it. No aggressive gases may be exhausted. 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. When replacing electrical parts and cables, only original ESTA replacement parts must be used. Work on electrical parts, including replacement of electrical cables, must be performed only by electrical experts or people trained for the purpose. When operating a device, use only original ESTA accessories. Connecting extension cords, coupling devices, etc., is not permitted.



Exhausting or dust removal from machines and/or workplaces that produce aluminium or magnesium dust is not permitted.



According to work equipment user directive 2009/104/EEC, safety devices for prevention or removal of hazards must be regularly maintained and inspected by an expert for safe, flawless operation.

2. Preventing mechanical hazards

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



If a covering that can only be unfastened with tools 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 60 204.



Residual risk:

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

The power cable (H07RN – F5G2.5... metres long with CEE 32 A plug) must be replaced only by an authorized electrical specialist.

The power separator (plug) must be activated only when it is shut off.

4. Intended use

NA-K series devices are suitable for exhausting dust-producing machines that give off moist dust or flying sparks. Avoid vacuuming up ignition sources.

In this regard, follow the general safety notes in point 1.



Exhausting or dust removal from machines and/or workplaces that produce aluminium or magnesium dust and/or combustible or explosive dusts or combustible gases is not permitted.

Connecting extension cords, coupling devices, etc., is not permitted.

5. Technical data and description

5.1 Technical data (all models)

		NA-K 1800	NA-K 3600	NA-K 6000
Mode of operation:		S1 (continuous operation)	S1 (continuous operation)	S1 (continuous operation)
Type of current:		3N ~	3N ~	3N ~
Drive power:	kW	3.0	5.5	7.5
Supply voltage:	V	400	400	400
Power frequency:	Hz	50	50	50
Current consumption:	A	6.3	11	14.7
Dimensions:	mm	800 x 800 x 2.94	950 x 950 x 3.460	950 x 950 x 3.460
Empty weight approx.:	kg	420	500	500
Water capacity approx.:	l	290	390	390
Max. volume flow:	m ³ /h	2,100	3,200	5,150
Max. vacuum:	Pa	4,200	3,500	3,500
Environmental conditions:	°C	5 ≤ θ ≤ 45 °C		
Measuring surfaces - sound pressure level:	db (A)	75	79	81
Production year:	See model plate			

5.2 Functional description

This device produces the volume flow and vacuum necessary for suction using a radial fan that is on top of the housing or next to it.

The dusty air exhausted from the processing machine is guided through a pipeline or a suitable hose connection to the device's intake port. The wet separator's intake port goes directly into a specially shaped swirl chamber.

The lower portion of the swirl chamber is in water. The exhausted air flows at a high speed through this chamber and swirls intensely with the water. In this way, the dust carried in the air is moistened with water and thickens in the water to become sludge.

A capacitive sensor automatically controls the state of the water and makes sure that there is always enough water in the device.

There is a droplet separator between the fan and the swirl chamber. The droplet separator separates the agitated droplets that are still in the air. The water-bound dust sinks as sludge into the flange-mounted pail.

For easier disposal and maintenance, there are two drain spigots on the sludge pail.

6. Delivery and assembly

The **NA-K** wet separator is delivered lying on a pallet. After the protective covering is removed, it can be set up using a crane. The upper part of the **NA-K** has two loops for this purpose.



Never use the fan to lift the NA-K!

The wet separator must be set up in such a way that in the front and on the right side (control module) the device has at least 2 m of free space. The distance from the ceiling must be at least 50 cm. Further details are in point 8.2 (environmental conditions) of this operating manual.

After connecting the energy supply, secure the water supply.

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



The dust extractor must be set up in such a way that the system's intake and discharge openings are secure against foreign objects falling in or being sucked in. The device must be placed on a level surface with a load capacity of at least 1,000 kg. To improve stability, bolt the device to the floor.

Dust extractors and collection containers must never be set in direct sunlight.



There should be an open distance of 2 metres around the device to provide enough room for maintenance.

The maintenance doors must be freely accessible. The dust extractor must be set up to allow easy inspection and cleaning (such as removing dust build-up on the fan wheel).



When operating the device, the legal requirements of the clean air act and the immission control act.

Disposal of packaging: The wet separator is delivered on a EURO wooden pallet and is protected from dirt by a PE film.

Both materials must be disposed of or recycled according to local regulations.

6.1 Connecting processing machines

To correctly exhaust a dust-producing machine, the pipe or hose connection and the electrical connection must be created between the processing machine to be exhausted and the **NA-K**.



The diameters of the hoses and pipes must be chosen so as to ensure a minimum interior air speed of 20 m/s.

If several processing machines are connected to the **NA-K**, the total volume flow is divided among the individual devices. Find out the volume flow necessary for exhaust from the machine's manufacturer.

The data shown in the chart can be taken as reference values:

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

7. Start-up

Check the fan's direction of rotation as it operates.

Before starting a device with three-phase drive, please make sure that the drive motor's direction of rotation is correct.

Proceed as described below:

1. The device must be ready to operate (enough water, main switch at the "I" position).
2. Turn on the fan.
3. Wait 5 seconds.
4. Turn off the fan.
5. Check to see that the motor fan wheel is moving in the direction of the arrow.



When the direction of rotation is wrong, the device gets impermissibly hot, and performance suffers.

For devices that are delivered ready to connect with CEE plugs, the rotating field can be changed using the rotating pole pins in the phase inverter. Use an appropriate screwdriver to press lightly while turning the pole pins and change their sequence.



For devices that are connected to the electrical grid without plug connections, the phase swap must be performed by a trained electrical specialist.



Before start-up, all of the dust extractor's maintenance openings must be closed. Sudden closing of the suction port during operation must always be avoided.

To start up the NA-K, the red-yellow main switch on must first be turned to position "I". For devices with a control cabinet: The red and green button for turning the fan wheel on and off is on the front of the switch box. The green signal light goes on when the fan motor is running.



If the level control's signal light goes on, the device's water level is too low and no suction can occur.

The water level control is active as soon as the main switch is activated. 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. Therefore the device's controls must be adapted to the water supply network at the place where it is set up. For this purpose, the time between the response of the capacitative sensor and the attainment of target water level is stopped. The target water level is about 2 cm above the minimum mark. The sensor's response can be seen on the level control (the red light goes out). The stop time is set at the K2T time relay.



The operator of the NA-K must see to it that, if the device is defective, the escaping water causes no damage to persons, machines, fixtures, buildings or the environment!



One possible way of preventing damage from escaping water is setting the device up in a water-tight catch basin with an automatic simultaneous alarm sent to an appropriate person (maintenance person, gatekeeper, etc.).

8. Repair and maintenance

8.1 Routine tasks

Check daily:

- Is there damage to the device or its parts?
- Is there mechanical damage to the power cable?
- Is the fill level sensor's measurement impaired by dirt on the inspection window?

Check monthly:

- Is the seal between the sludge pail and the device housing perfect?
- Does the water fill level control work properly? Drain the water while the fan is running. If the water goes below the minimum mark on the inspection glass, open the water intake valve.
- Is the swirl chamber or gas deflector damaged (by corrosion) or is its diameter changed by build-up?
- Is the droplet separator contaminated?
- Is there corrosion anywhere inside the device?
- If heavily soiled, the device interior must be cleaned.

A log is to be kept of the monthly inspection. It must document the date of inspection, deficiencies determined and the name of the inspector.



When necessary, of course, the device must be repaired.

8.2 Environmental conditions

Ambient temperature:

$$5 \leq \vartheta \leq 45 \text{ } ^\circ\text{C}$$

Air humidity:

Max. 80%

Before a long downtime, make sure that the wet separator is cleaned.

8.3 Troubleshooting

In an emergency (fire, etc.), the device must be turned off at the emergency shut-off switch.



During repairs to the device, make absolutely sure that the red-yellow main switch is turned to the “0” position and is secured with a padlock against unintentional reactivation.

The following chart describes possible malfunctions that may arise during operation of **NA-K** models, their cause and possible solutions.

Problem	Cause	Solution
The level control's main signal light stays on.	The water is too low.	See if the water intake is correct, and if necessary turn the spigot further.

9. Cleaning

9.1 Cleaning the wet separator

The device must be cleaned at regular intervals — at least once a month.

Water is the recommended cleaning agent.

For correct operation of the device, clean surroundings are necessary. Therefore make sure that dust build-up is removed from the surface of the dust extractor.

9.2 Cleaning the droplet separator

The **NA-K** is equipped with a droplet separator. Its purpose is to separate the droplets still remaining in the cleaned air, before they leave the device. After extended use, dirt settles in the droplet separator's channels. This causes higher internal air resistance in the device, reducing suction performance.

If this occurs, the droplet separator must be thoroughly cleaned.

The droplet separator must be cleaned or maintained as follows:

1. Open the upper doors on the wet separator by turning the star grip clockwise.
2. Pull the droplet separator out using the front grips.
3. Now the droplet separator can be properly cleaned (with a steam jet).
4. Slide the cleaned droplet separator back into the device.
5. Close the doors and lock them by turning the star grip. The **NA-K** is ready to work.

10. Disposal

10.1 Disposing of and replacing the contaminated water

With time, the water in the **NA-K** gets used up and must be completely changed. For this, two drain spigots are mounted on the device. Drain the lightly contaminated water in the upper part of the **NA-K** through the upper spigot, and the rest of the water with the lower spigot mounted on the sludge pail. For better cleaning, use the four quick-tension locks to disconnect the sludge pail from the device. It is best to clean the device thoroughly before filling it with fresh water. This increases the useful life of the water. Before refilling with water, the sludge pail must be reconnected to the device, and the drain spigots must be closed.



Dispose of the contaminated water and the sludge build-up in an environmentally sound manner, according to local regulations.



With some dusts, the water tends to foam. In that case, an anti-foaming agent (such as soda) should be added to the water.

10.2 Dismantling or disposing of the device

Instructions on dismantling, packaging and loading

Before any necessary dismantling, the electricity and water must be disconnected and the water and sludge should be drained. Do this as in the cleaning procedures described in 8.4 and 8.5.

To transport the device, use the loops at the top of the **NA-K** to set it on a pallet, and cover it with film against dirt.



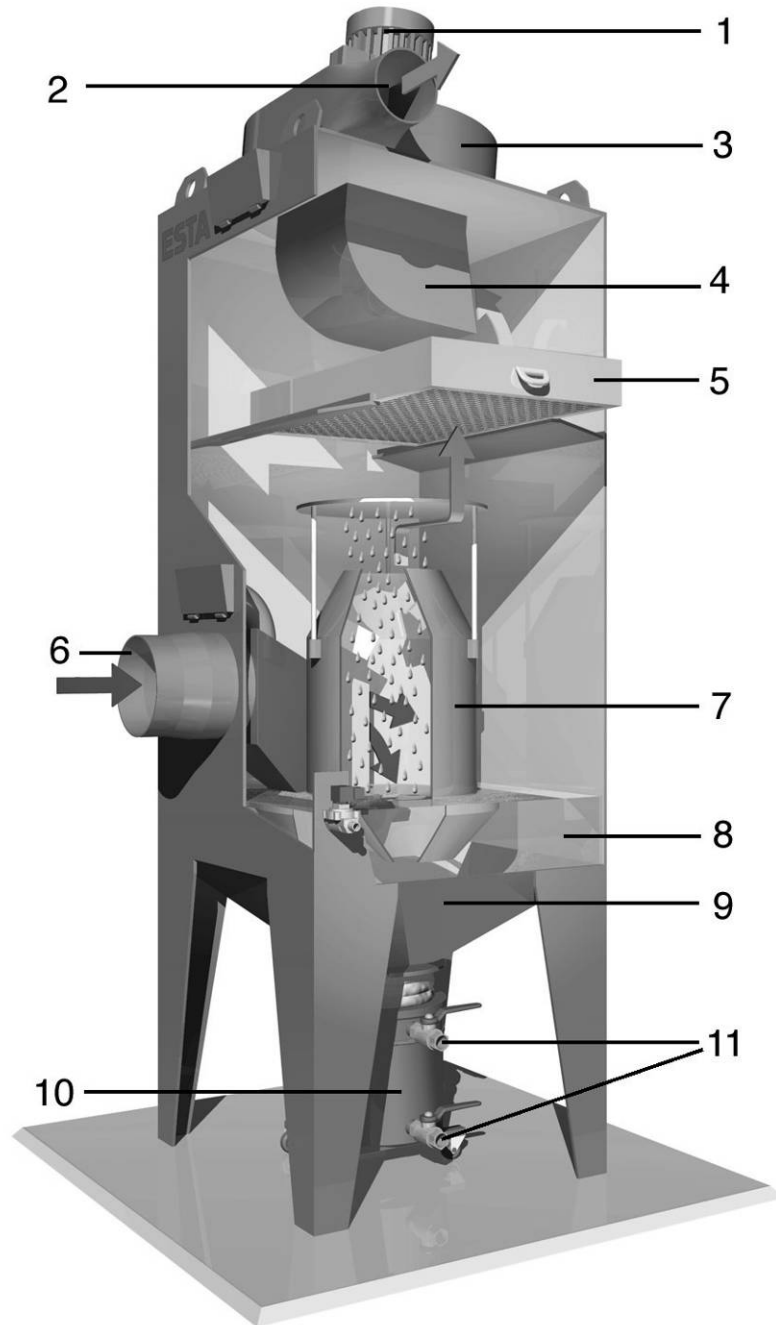
Never use the fan to lift the NA-K!

Disposing of or returning the device

After removal of the water and sludge, and after all connections have been removed, the device can undergo the standard disposal process. Explicitly comply with regulations.

The device cannot be returned to ESTA.

11. Device diagram from declaration of conformity



- | | |
|------------------------|-------------------|
| 1. Motor | 7. Swirl chamber |
| 2. Exhaust release | 8. Water |
| 3. Fan | 9. Device cone |
| 4. Gas deflector | 10. Sludge pail |
| 5. Droplet separator | 11. Drain spigots |
| 6. Raw gas intake port | |

12. Declaration of conformity

EC Conformity declaration for machines

Name of manufacturer: ESTA APPARATEBAU GmbH & Co. KG
Address of manufacturer: Gotenstraße 2 – 6,
89250 Senden

Person in charge of
documentation: Ramona Pflum
Gotenstr. 2 - 6
89250 Senden

We hereby declare that the design of the machine

Machine: Dust extractor for exhausting dust
Series: NA-K
Model: NA-K 1800, NA-K 3600, NA-K 6000

conforms to the applicable directives:

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

Reconciled norms used:

EN 12100	Safety of machinery - basic concepts, general propositions (part 1 and part 2)
EN 13857	Safety of machinery, devices and systems; safety distances for avoiding hazard zones
EN 349	Safety of machinery; minimum distances for preventing body parts from being crushed
EN 60 204-1	Machine safety - Electrical machinery equipment,
EN 61 000-6-3	Electromagnetic compatibility Emitted interference in domestic applications.

Senden, 03.05.2012


Dr. Peter Kulitz
CEO

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