

# VHS110 Z22

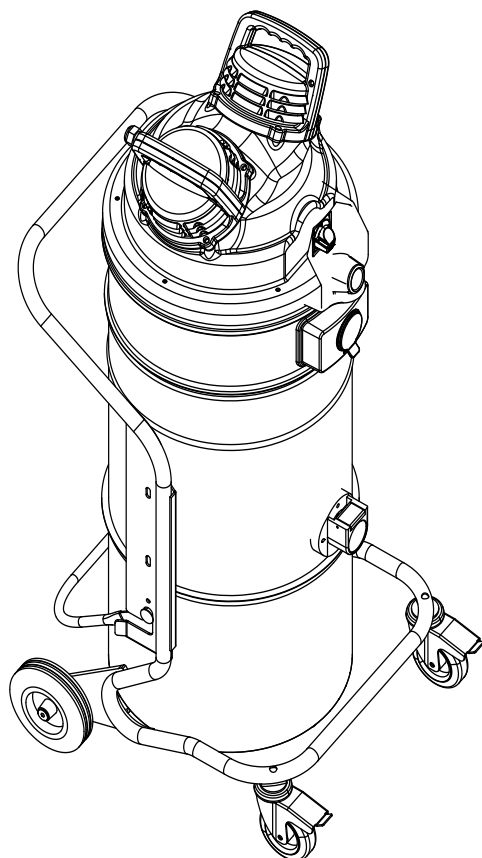
## Instructions for use

MANUALE DI ISTRUZIONI  
INSTRUCTIONS MANUAL  
MANUEL D'INSTRUCTIONS  
BETRIEBSANLEITUNG  
MANUAL DE INSTRUCCIONES

C421-I-GB-F-D-E  
EDITION 11/2016



I Italian  
GB English  
F French  
D Deutsch  
E Spanish



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# Instructions for use

Read the operating instructions and comply with the important safety recommendations identified by the word **WARNING!**

## Operator's safety

**WARNING!**

**Before starting the device, it is absolutely essential to read these operating instructions and to keep them ready at hand for consultation.**

**The vacuum cleaner can only be used by people who are familiar with the way it works and who have been explicitly authorized and trained for the purpose. Before using the device, the operators must be informed, instructed and trained on how to work with it and for which substances its usage is permitted including the safe method for removing and disposing of the vacuumed material.**

**WARNING!**

**The use of vacuum cleaner by people (including children) with limited physical and mental capacities or lacking in experience and knowledge is strictly forbidden, unless they are supervised by a person who is experienced in the use and safe handling of the machine.**

**Children must be supervised to make sure they will not play with the vacuum cleaner.**

## General information for using the vacuum cleaner

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Use of the vacuum cleaner is governed by the laws in force in the country where it is used.

Besides the operating instructions and the laws in force in the country where the vacuum cleaner is used, the technical regulations for ensuring safe and correct operation must also be observed (Legislation concerning environmental and labour safety, i.e. European Union Directive 89/391/EC and successive Directives).

Do not carry out any operation that could jeopardize the safety of people, property and the environment.

Comply with the safety indications and prescriptions in this instruction manual.

## Important safety instructions

To reduce the risk of fire, electric shock, or injury:

- Do not leave the appliance unattended when plugged in. Unplug from outlet when not in use and before servicing.
- To reduce the risk of electrical shock, do not use the vacuum cleaner outdoors. Do not use outdoors or on wet surfaces.
- Do not allow this appliance to be used as a toy. This machine is for adult-use only. Close attention is necessary when used by or near children.
- Use only as described in this manual. Use only the manufacturer's recommended attachments.
- Do not use with damaged cord or plug. If appliance is not working as it should, has been dropped, damaged, left outdoors or dropped into water, return it to a service center.
- Do not pull or carry by the cord, use cord as a handle, close a door on cord, or pull cord around sharp edges or corners. Do not run the appliance over the cord. Keep cord away from heated surfaces.
- Do not unplug by pulling on cord. To unplug, grasp the plug, not the cord.
- Do not handle plug, cord or appliance with wet hands.
- Do not put any object into the openings. Do not use with any opening blocked; keep free from dust, lint, hair, and anything that may reduce airflow.
- Keep hair, loose clothing, fingers, and all parts of the body away from openings and moving parts.
- Turn off all controls before unplugging.
- Use extra care when cleaning stairs.
- Do not pick up anything that is burning or smoking, such as cigarettes, matches, or hot ashes.
- Do not use without dust bag/or filters in place.
- Connect to a properly grounded outlet only. See grounding instructions.

## Grounding instructions

This equipment must be grounded. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This appliance is equipped with a cord that has an equipment-grounding conductor. The plug (provided by other) must be inserted into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

**WARNING!**

**Improper connection of the equipment-grounding conductor can result in a risk of electric shock. Check with a qualified electrician or service person if you are in doubt as to whether the outlet is properly grounded.**

**WARNING!**

**The vacuum cleaner is supplied without an electrical plug.**

**It is the user's responsibility to install a suitable plug certified for the classified zone (Class II - 3D).**

**The plug shall be installed by a qualified electrician only.**

This appliance is for use on a nominal 120-V circuit and a suitable grounding attachment plug has to be installed that looks like the plug illustrated in sketch A Fig. 16. Make sure that the appliance is connected to an outlet having the same configuration as the plug. No adaptor should be used with this appliance.

Check that the electric panel and cable glands are efficient to prevent dust infiltrations.

Check that the hose clamps are correctly tightened.

In case of breakage, only use original Nilfisk spare parts. Any parts that need replacing must be replaced by trained personnel. Never perform any kind of disassembly, tampering and/or maintenance on the safety systems.

**The motor and turbine ball bearings must be serviced by a Nilfisk Service Center every 10,000 working hours or every 2 years. Contact the sales network or the machine manufacturer. The operator must not dismantle, tamper with and/or service the turbines.**

**WARNING!**

**In the case of abnormal noise, faulty bearings or faulty rotating parts, stop the machine immediately, as there is the risk of explosion!**

**Do not start the vacuum cleaner again, as this could cause an explosion.**

**Repairs must be done by Nilfisk Service Centers only.**

Periodically check the inlet/outlet filters of the cooling air located on the motorhead (2, Fig. 5)

The above prescriptions, precautions and service operations must be observed, or the Nilfisk Warranty for proper operation of ATEX machine Cat II 3D is void, the Nilfisk ATEX Declaration of Conformity is no longer valid and the User is entirely responsible for the use of the vacuum cleaner.

**WARNING!**

**All maintenance and cleaning operations must be carried out when the vacuum cleaner is off and disconnected from the electrical mains.**

## Proper uses

This vacuum cleaners consists of a vacuum unit, with a filter upstream and a container for collecting the sucked material.

- This vacuum cleaner is suitable for commercial use in factories, workshops, for example, for hire and in any case for purposes other than normal domestic use.
- This vacuum cleaner is suitable for cleaning and vacuuming dry materials in indoor environments only.
- Always leave enough room around the vacuum cleaner to reach the controls easily.
- The vacuum cleaner has been designed to be used by one operator only.
- Take care not to generate dust clouds while cleaning the area, mostly around the vacuum cleaner itself.
- This vacuum cleaner is designed to collect a combustible dust and/or dry particles in atmosphere classified as Zone 22, with the following limitations:
  - Minimum ignition energy (MIE) of the dust > 1mJ
  - Kst value of the dust <300 bas m/s (St1, St2)

## Improper Use

**WARNING!**

**The following use of the vacuum cleaner is strictly forbidden:**

- **Outdoors always.**
- **When not placed on horizontal level ground.**
- **When the filter unit is not installed.**
- **When the vacuum inlet and/or hose are turned to parts of the human body.**
- **When the protective covers and safety systems are not installed by the manufacturer.**
- **When the cooling vents are partially or totally clogged.**
- **When the vacuum cleaner is covered with plastic or fabric sheets.**
- **When the air outlet is partially or totally closed.**
- **When used in narrow areas where there is no fresh air.**
- **Vacuuming the following materials:**
  1. **Burning materials (embers, hot ashes, lit cigarettes, etc.).**
  2. **Naked flames.**
  3. **Combustible gas.**
  4. **Flammable liquids, aggressive and corrosive substances (gasoline, solvents, acids, alkaline solutions, etc.).**
- **Use the vacuum cleaners in Zones 20, 21 and/or Zone 0, 1 and 2.**
- **Collection of explosives or chemically unstable substances.**
- **Vacuuming fluids with a low flash point or incendiary substances (T<200°C)**

**IMPORTANT: Fraudulent use is not permitted.**

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## Identification plate marking



II3D Ex tc IIIC T 125°C Dc IP64  
0° C ≤ Ta ≤ 40°C

## EC Declaration of conformity

Every vacuum cleaner comes with a EC Declaration of conformity. See fac-simile in Fig. 18.

### [ NOTE ]

*The Declaration of conformity is an important document and should be kept in a safe place to be presented to the Authorities on request.*

## HEPA Filter

This vacuum cleaner can be equipped with an absolute (HEPA) filter for vacuuming hazardous dust to one's health. The procedures for servicing and emptying the vacuum cleaner including removing the dust container, must only be performed by authorized personnel wearing protective clothing. Do not use without the complete filter system in place.

### [ NOTE ]

- *In the case of dust harmful to health, contact the local health and safety authorities, and observe national regulations in force both during use and disposal.*
- *Radioactive substances are not included in the definition of the type of dust harmful to health described above.*

## General recommendations



### WARNING!



*If an emergency situation occurs:*

- *Filter breakage*
- *Fire outbreak*
- *Short-circuit*
- *Motor blockage*
- *Electric shock*
- *Other emergency situations.*

*Turn the vacuum cleaner off, unplug it and request assistance from qualified personnel.*

# Vacuum cleaner description

## Vacuum Cleaner Parts and Labels

Figure 1

1. Data plate which includes:
  - Manufacturer's name and address
  - Technical specifications
  - Serial number
  - Year of manufacture
  - Weight (kg)
2. Panel power plate  
Indicates that the panel must only be powered by the voltage indicated on the data plate.
3. Inlet
4. Air Outlet
5. Manual motor starter
6. Motorhead
7. Band latches
8. Container release handle

This vacuum cleaner creates a strong air flow which is drawn in through the inlet (4) and blows out from the motor head cover (5).

Before turning the vacuum cleaner on, fit the vacuum hose into the inlet and then fit the required tool on the end of the hose. After the hose and tools have been fitted, make sure that the motor turns correctly.

The vacuum cleaner is equipped with a main filter which enables it to be used for the majority of applications.

Besides the main filter which retains the more common types of dust, the vacuum cleaner can be fitted with an upstream absolute (HEPA) filter with a higher filtering capacity for fine dust and substances harmful to health.

## Optional kits

Please contact the manufacturer's sales network for information on options.

Instructions for installing the options are included in the conversion kit.



## Accessories

Various accessories are available; refer to the manufacturer's accessory catalogue.



## Packing and unpacking

Dispose of the packing materials in compliance with the laws in force.

Figure 2

MODEL	A in. (mm)	B in. (mm)	C in. (mm)	lbs.* (kg)
VHS110 Z22 V230	700	790	1440	57
VHS110 Z22 V110				59

\* Weight with packaging

## Unpacking, moving, use and storage

Operate on flat, horizontal surfaces.

The load-bearing capacity of the surface the vacuum cleaner is placed on must be suitable for bearing its weight.

## Setting to work - connection to the power supply

**WARNING!**

- *Make sure there is no evident sign of damage to the vacuum cleaner before starting work.*
- *Before plugging the vacuum cleaner into the electrical mains, make sure the voltage rating indicated on the data plate corresponds to that of the electrical mains.*
- *Plug the vacuum cleaner into a socket with a correctly installed ground contact/connection. Make sure that the vacuum cleaner is turned off.*
- *The plugs and connectors of the connection cables must be protected against splashed water.*
- *Make sure that connections to the electrical mains and plug are correct.*
- *Use the vacuum cleaner only when the cord that connect to the electrical mains are in perfect condition (damaged cords could lead to electric shocks!).*
- *Regularly check that the electric cable does not show signs of damage, excessive wear, cracks or ageing.*

**WARNING!**

*When the device is operating, do not:*

- *Crush, pull, damage or tread on the cord that connects to the electrical mains.*
- *Only disconnect the cable from the electrical mains by removing the plug (do not pull the cable).*
- *Only replace the electric power cable with one of the same type as the original: H07 RN - F.*
- *The cable must be replaced by the manufacturer's Service Center staff or by equivalent qualified personnel.*

## Warning labels

Figure 3

Labels:

1. Warning: Using an appropriate tester, check the grounding continuity between the plug ground pin and the final suction accessory
2. Caution: Don't open while the voltage is applied

## Extensions

Extension cords are not allowed within a classified zone unless marked accordingly.

**WARNING!**

*The vacuum cleaner's power socket must be protected by a differential circuit-breaker with surge current limitation that shuts off the power supply when the current discharged to the ground exceeds 30 mA for 30 ms or an equivalent protection circuit. In case the socket that the vacuum cleaner is connected to could exceed 1000 V in case of a surge generated by a lightning, the user shall provide the appropriate protection*

**WARNING!**

*Never spray water on the vacuum cleaner: this could be dangerous for persons and could short circuit the power supply.*

## Dry applications

[ NOTE ]

*The supplied filters must be installed correctly as explained in section "Primary star filter replacement"*

**WARNING!**

*Comply with the safety regulations governing the materials for which the vacuum cleaner is used.*

## Maintenance and repairs

**WARNING!**

*Disconnect the vacuum cleaner from its power source before cleaning, servicing or replacing parts; the plug must be removed from the socket.*

- *Carry out only the maintenance operations described in this manual.*
- *Use only original spare parts.*
- *Do not modify the vacuum cleaner in any way.*

*Failure to comply with these instructions could jeopardize your safety. Moreover, such action would immediately make the EC Declaration of conformity issued with the vacuum cleaner void.*

**WARNING!**

*Contact the manufacturer's technical service or sales network for maintenance operations not described in this manual.*

## Technical data

Parameter	Units	VHS110 Z22	
		V230	V110
Frequency	Hz	50	
Voltage	V	230	110
Power rating (EN 60335-2-69)	kW	1.1	
Noise level ( $L_{pA}$ ) (**)	dB(A)	76	
Protection	IP	6X	
Insulation	Class	I	
Container capacity	L	37	
Inlet diameter	mm	50	
Vibration, $a_n$ (**)	m/s <sup>2</sup>	≤2.5	
Max vacuum	hPa - mbar	220-220	205-205
Maximum air flow rate (without hose and reductions)	m <sup>3</sup> /h - L/min'	216-3600	208-3407
Maximum air flow rate (with hose, length: 3 m, diameter: 50 mm)	m <sup>3</sup> /h - L/min'	204-3417	176-2933
Main filter surface area	m <sup>2</sup>	1	
Absolute filter surface - HEPA 14 according to MPPS	m <sup>2</sup>	1.1	

(\*) Total value of vibration output to the operator arm and hand

(\*\*) Measurement uncertainty KpA <1.5 dB(A). Noise emission values obtained according to EN-60335-2-69

**WARNING!**

*Use only hoses with diameters that comply with the indications in the Technical data table .  
This is done in order to prevent the air speed from dropping below 20 ms in the vacuum hose.*

## Dimensions

Figure 4

Model	VHS110 Z22	
	V230	V110
A (mm)	570	
B (mm)	560	
C (mm)	1240	
Weight (kg)	42	44

- **Storage conditions:**  
Temperature : 0°C ÷ +40°C  
Humidity: ≤ 85%
- **Operating conditions:**  
Maximum altitude: 800 m  
[Up to,000 m with reduced performances]  
Temperature : 0°C ÷ +40°C  
Humidity: ≤ 85%

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## Safety devices

Figure 5

1. Cover
2. Cooling air HEPA filter
3. Brushless motor

## Controls, indicators and connections

Figure 6

1. Container release handle
2. Swivel caster with brake
3. PullClean filter cleaning system
4. Vacuum gauge
5. Manual motor starter
6. Band latches
7. Power supply cord
8. Push bar handle

## Inspections prior to starting

Figure 7

1. Inlet

Prior to starting, check that:

- The filter is installed and in good conditions;
- All latches are tightly locked;
- The vacuum hose and tools have been correctly fitted into the inlet (1).
- The polyliner is installed, if applicable.
- The filter is intact before using the machine as follows: vacuum fine inert dust (e.g.: talc, chalk, scagliola...) and make sure it isn't blown out of the outlet.
- The motor cooling air filters (2, Fig. 5) are cleaned.
- The filter chamber gasket is properly sealing (see "Filter chamber seal check" section on page 11).

**WARNING!**  
*Do not use the device if the filter is faulty.*

## Starting and stopping

Figure 9

**WARNING!**  
*Lock the caster brakes (1) before starting the vacuum cleaner.*

### Standard version

- Turn the manual motor starter (2) to the "I" position to start the vacuum cleaner. Turn the manual motor starter (2) to the "O" position to turn the vacuum cleaner off.

### Vacuum cleaner operation

Check that the data on the machine's identification plate correspond to the Zone classification and to the maximum allowable temperature to avoid dust ignition in the work area.

Check that the vacuum cleaner specifications have not been modified, otherwise the Declaration of Conformity is no longer valid.

Static electricity can cause sparks, with the consequent risk of explosion! Therefore, make sure the electrical socket and plug are connected to earth.

Use an insulation tester to check the resistance of the earth connection from the inlet to the end of the vacuum pipe (and the antistatic hose connecting to the electrical mains on air compressed models): the resistance must be lower than 1 MΩ (106 Ohm).

Check the continuity of the ground view (green-yellow protective conductors) and make sure that they are in perfect conditions.

Check for loose electrical or mechanical connections.

Be sure that the machine is turned off before connecting it to an energy source. Connect the machine to an energy source outside the ATEX Zone (unclassified zone). If the machine has an ATEX electrical plug certified for the area it is used in, it can be connected to an ATEX certified socket in the same type of zone with the same rating.

The operator shall take care not to generate dust clouds while cleaning the area, mostly around the vacuum cleaner itself.

Do not remove hoses during operation, always wait until the machine has stopped.

If a preseparator must be used, check that it is well grounded. Only use antistatic hoses, both for suction and connecting the preseparator. Do not use the machine to suck up large objects or particles because they can knock against each other, causing sparks.

Do not rub or hit the floor with steel tools, as they can produce sparks under friction. Only use collectors and suction caps that can be replaced with original Nilfisk antistatic spare parts to clean the floor.

## Checking the flow rate

Figure 10

Vacuum gauge (2): green zone (3), red zone (1)

- when the vacuum cleaner is operating, the pointer of the vacuum gauge must remain in the green zone (3) to ensure that the speed of the intake air does not drop below the safety value of 20 m/s;
- if the pointer is in the red zone (1) it means that the speed of the air in the vacuum hose is less than 20 m/s and that the vacuum cleaner is not operating in safety conditions.. The filters must be cleaned or replaced.
- during normal operation conditions, close the vacuum hose. The pointer of the vacuum gauge must switch from the green zone (3) to the red zone (1).

**WARNING!**  
*When the vacuum cleaner is operating, always check that the vacuum gauge pointer remains in the green zone (3).  
 Consult the "Troubleshooting" chapter if faults occur.*

**WARNING!**  
*Allow the vacuum cleaner to work with the pointer in the red area only for limited period of time (max 10 minutes), as this shall not be considered a normal operating condition, but an abnormal one. If this prescription is not respected by the user, motor and turbine overheating can occur, potentially creating a danger situation.*

**WARNING!**  
*In case that the vacuum cleaner is kept working with the pointer in the red area for long, a thermal switch present in the suction motor could intervene and cut-off the power supply, to avoid winding and control overheating. If this happens, rotate the main switch to the OFF position and wait for a few minutes, in order to let the motor cool down, before than trying to turn the power on back. If the motor does not restart, please wait longer*

## Main filter cleaning

Figure 10-11

Depending on the vacuumed dust quantity and when the pointer of the vacuum gauge switches from the green zone (3, Fig. 10) to the red zone (2, Fig. 10), clean the main filters by closing the inlet and opening the PullClean flap 3 or 4 times for 1 or 2 seconds each time (1 Fig. 11).

## Emergency stopping

Turn the manual motor starter to the "0" position.

## Emptying the container

**WARNING!**  
*Before proceeding with these operations, turn off the vacuum cleaner and remove the plug from the power socket.*

Before emptying the container it is advisable to clean the filter (see "Main filter cleaning" paragraph).

## At the end of a cleaning session

- Turn off the vacuum cleaner and remove the plug from the socket.
- Coil the power supply cord and store it on the hanger at the center of the handle (Fig. 8).
- Bring always the vacuum cleaner out of the ATEX classified area, then release the container and empty it, especially after vacuuming wet vegetable particles or fluids, to prevent the accumulation of fermentation gases.
- To avoid changing the classification of the work area, the dust bag must be emptied outside the zone (zone without ATEX classification).
- Clean the vacuum cleaner as described in the "Maintenance, cleaning and decontamination" paragraph.
- Wash the container with clean water if aggressive substances have been vacuumed.
- Store the vacuum cleaner in a dry place, out of reach of unauthorized people.

**[ NOTE ]**  
*At the end of a cleaning session let the vacuum cleaner run for at least 60 seconds before turning it off.  
 Avoid too frequent starts/stops.*

## Safe Dust Bag

The vacuum can be supplied with a dust bag (\*) (Fig. 12).

If these bags are installed incorrectly, this could create health risks for persons exposed.

(\*) For the codes, see the Recommended Spare Parts table

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## How to change the bag



- *These operations can only be carried out by trained and qualified personnel who must wear adequate clothing, in compliance with the laws in force.*
- *Take care not to raise dust during these operations. Wear a P3 protective mask.*
- *In case of dangerous and/or toxic dust, you must use the supplied safety bag for these certified vacuum cleaners.*
- *The bag must only be disposed of by qualified personnel and in compliance with the laws in force.*



*Installing the wrong paper bag for the class of dust to be vacuumed or incorrect installation, can create a health risk for the persons exposed.*

## How to replace the Safe Bag

Figure 12

- Remove and put the vacuum hose in a safe and dust-free place.
- Close the inlet by using the relevant cap (1).
- Release the dust container.
- Close the connection part between the two plastic inlets with a plastic clamp (2)
- Remove the relevant connection (3) of the bag from the inlet.
- Fix together the two plastic inlets (4).
- Close the plastic bag using the relevant band (5)
- Insert a new safe bag, making sure the bag inlet is sealed.
- Wrap the plastic bag around the dust container external wall.
- Replace the dust container in the vacuum cleaner.



*Only use suitable bags for the vacuum cleaner class you are using.*

## Maintenance, cleaning and decontamination

Bring the vacuum cleaner out of the ATEX classified area before then performing any maintenance operation.



*This vacuum cleaner can vacuum dust hazardous for the health. The procedures for servicing and emptying the vacuum cleaner including removing the dust container, must only be performed by specialised personnel wearing protective clothing. Do not use without the complete filter system in place.*



*The precautions described below must be taken during all maintenance operations, including cleaning and replacing the primary and HEPA filters.*



*The maintenance, cleaning and decontamination operations must only be performed with the vacuum cleaner turned off and the plug disconnected from the power socket. It is absolutely forbidden to perform maintenance with the plug connected to the socket. Danger of electric shock!*

- If the user is performing the maintenance operations, all the suitable precautions should be taken. The suitable precautions include decontamination, adequate filtered ventilation of the exhaust air from the room in which maintenance is performed, cleaning the maintenance area and suitable personal protection.
- All parts of the vacuum cleaner must be considered contaminated when they are removed from the hazardous zone and appropriate actions must be taken to prevent the dispersion of dust. When maintenance or repair procedures are carried out, all the contaminated elements that cannot be properly cleaned must be eliminated. These elements must be disposed of in sealed bags, conform to applicable regulations and in accordance with the local laws governing the disposal of such material. This procedure must also be followed when the filters are eliminated (primary and HEPA filters). Compartments that are not dust-tight must be opened with suitable tools (screwdrivers, wrenches, etc.) and thoroughly cleaned.



*The procedures for servicing and emptying the vacuum cleaner, including removing the dust container, must only be performed by authorized personnel wearing protective clothing.*

## Primary and absolute filter disassembly and replacement



### WARNING!

When the vacuum cleaner is used to vacuum hazardous substances, the filters become contaminated, therefore:

- Work with care and avoid spilling the vacuumed dust and/or material;
- Place the disassembled and/or replaced filter in a sealed plastic bag;
- Close the bag hermetically;
- Dispose of the filter in accordance with the laws in force.



### WARNING!

Filter replacement is a serious matter. The filter must be replaced with one of identical characteristics, filtering surface and category. Otherwise the vacuum cleaner will not operate correctly.

## Primary star filter replacement

Figure 13

1. Band latch
2. Lid

Take care not to raise dust when this operation is carried out. Wear a P3 mask and other protective clothing including protective gloves (DPI) suited to the hazardous nature of the dust collected, refer to the laws in force.

Before proceeding with these operations, turn off the vacuum cleaner and remove the plug from the power socket.

- Use the band latches (1) to remove the lid (2) together with the primary star filter.
- Remove the old star filter from the cage.
- Fit the new star filter.
- Install the lid and the primary star filter in the reverse order of removal.
- Dispose of the old star filter according to the laws in force.

If necessary contact the manufacturer's Service Center.

## Upstream absolute filter replacement

### Version for dust harmful for the health



### WARNING!

Take care not to raise dust when this operation is carried out. Wear a P3 mask and other protective clothing including protective gloves (DPI) suited to the hazardous nature of the dust collected; refer to the laws in force.



### WARNING!

Do not use the HEPA filter again after having removed it from the vacuum cleaner.

Figure 14

1. Band Latch
  2. Lid
  3. Absolute filter /HEPA)
  4. Stop nut (absolute filter)
- Stop the vacuum cleaner.
  - Remove the absolute filter (3) unscrewed the nut (4)
  - Cover the absolute filter (3) with a plastic bag, close the plastic bag hermetically and dispose of the filter in accordance with the laws in force.
  - Insert a new absolute filter (3) with the same filtering characteristics as the removed one.
  - Lock the absolute filter with the nut (4).
  - Close the cover hermetically by means of the band latch (1).

## Motor cooling fan inspection and cleaning



### WARNING!

These operations can only be carried out by trained and qualified personnel.

Periodically clean the motor cooling filters to prevent the motor from overheating, especially if the vacuum cleaner is used in a dusty place (2, Fig. 5).

## Inspection

### Filter chamber seal check

Figure 15

If the gasket (1, Fig. 14) between the container and the filter chamber (3) fails to guarantee tightness:

- Loosen the four screws (2) that lock the filtering chamber (3) against the vacuum cleaner structure.
- Allow the filtering chamber (3) to lower down and tighten the screws (2) once it has reached the tightness position.

If an optimal seal cannot be obtained and the gasket (1) is torn or cracked, etc. it must be replaced.

**Wiring diagrams****Fig. 16**

<b>VHS110 Z22 V230</b>			
<b>Item</b>	<b>Type</b>	<b>Description</b>	<b>Qty.</b>
Q1	4083901742	Switch 2 pole 16A	1
J1	4083901743	Rectifier filter	1

**Fig. 17**

<b>VHS110 Z22 V110</b>			
<b>Item</b>	<b>Type</b>	<b>Description</b>	<b>Qty.</b>
Q1	4083901742	Switch 2 pole 16A	1
J1	4083901743	Rectifier filter	1
L1	4083901740	Reactor 16A	1

## Recommended spare parts

The following is a list of spare parts that should be kept ready at hand in order to speed up maintenance operations.

Refer to the manufacturer's spare parts catalogue when ordering spare parts. Please contact the manufacturer's sales network when seeking spare parts for special machine variants or options.

	Description	Model VHS110 Z22	
		V230	V110
	Star filter	4081701208	
	Filter ring gasket ss	Z8 17025	
	Filter chamber gasket	4081100183	
	Filter clamp	4084001291	
	Replacement upstream absolute (HEPA) filter	Z8 17262	
	Brushless Motor	4085300390	4085300392
	Safe Bag	Z8 40874	

# Troubleshooting

Problem	Cause	Remedy
The vacuum cleaner suddenly stops	Clogged primary filter	Shake the filter. Replace it if necessary
	Clogged vacuum hose	Check the vacuum hose and clean it.
	Circuit breaker activation	Check the setting. Check the motor electrical input. Contact an authorized after-sales service center if necessary.
	Thermal protector switch opening	Rotate the main switch to the OFF position and wait for a few minutes, in order to let the motor cool down, before than trying to turn the power on back. If the motor does not restart, please wait longer. If the issue persists, contact the manufacturer
Dust leaks from the vacuum cleaner	The filter is torn	Replace it with another of identical type.
	Inadequate filter	Replace it with another of a suitable category and check.
Electrostatic current on the vacuum cleaner	Non existent or inefficient grounding	Check all ground connections. Especially check the connection at the inlet. See test for ground continuity on page 2

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