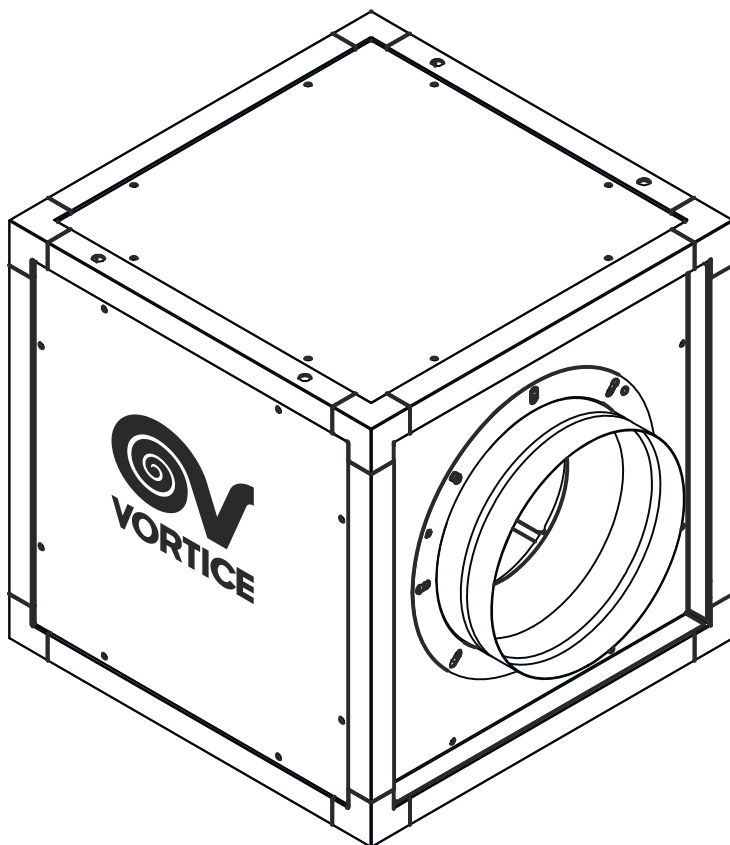


Libretto d'istruzioni
Instruction booklet
Notice d'emploi et d'entretien
Betriebsanleitung
Manual de instrucciones
Instrukcja obsługi



QBK HE SAL / COMFORT



Description and use

The product you have purchased is a high tech industrial centrifugal extraction fan.

Safety



Warning:
this symbol indicates that care must be taken to avoid injury to the user

- Do not use this appliance for functions other than those described in this booklet.
- **This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.**
- **These appliances are designed for use in residential and commercial properties.**
- After removing the appliance from its packaging, ensure that it is complete and undamaged. Check that:
 - the fan blades can rotate freely;
 - the flexible supports are undamaged;
 - the external panel shows no signs of damage;
 - there are no foreign bodies inside the product;
 - internal parts with direct access are clean.
- If in doubt contact an authorised Vortice service centre. Do not leave packaging within the reach of children or differently able persons.
- Certain fundamental rules must be observed when using any electrical appliance:
 - never touch appliances with wet or damp hands;
 - never touch appliances while barefoot;
 - do not allow the unit to be operated by unsupervised children or disabled persons.
- Store the appliance out of the reach of children and disabled persons if you decide to disconnect it from the power supply and use it no more.
- Do not use the appliance where there are inflammable substances and vapours (alcohol, insecticides, petrol, etc.).
- Do not use in potentially explosive environments.
- The interior of the appliance must only be cleaned by trained personnel.
- If this appliance is to be installed in a location where can be constantly subjected to noise, appropriate

sound-proofing measures must be taken or personal protection equipment issued.



Caution:
this symbol indicates that care must be taken to avoid damaging the appliance

- Do not make modifications of any kind to this appliance.
- Regularly inspect the appliance for visible defects. If the appliance does not function correctly, do not use it and contact an authorised Vortice service centre immediately
- If the appliance malfunctions and/or develops a fault, contact Vortice immediately. Ensure that only genuine original Vortice spares are used for any repairs.
- Should the appliance be dropped or suffer a heavy blow, have it checked immediately by Vortice. The appliance must be connected to an efficient earthing system.
- The electrical power supply/socket to which the appliance is to be connected must be able to provide the maximum electrical power required by the appliance. If it cannot do so, arrange for a qualified electrician to make the necessary modifications.
- The temperature of the air being treated on intake must not be outside the range specified for the appliance.
- Keep the appliance intake and outlet grilles free to ensure the best possible flow of air.
- Always protect the appliance with a safety grille to prevent contact with the fan blades and stop foreign bodies from entering the appliance
- The appliance must be mounted on suitably sized supports and is not suitable for bearing the weight of ducting connected to it.
- If the appliance has to be stored outside before installation, make sure that it is well protected from the elements to prevent damage from rain, foreign bodies or dirt.
- The electrical specifications correspond to the ones on the rating label.
- **The electrical system to which the product is connected must be in compliance with applicable regulations.**
- **The appliance must be installed by a professionally qualified electrician.**
- **An omnipolar switch with a contact opening distance of 3 mm or higher should be provided for installation, enabling complete disconnection under overvoltage category III conditions.**
- **Products equipped with three-phase wiring (T) engines ALWAYS require connection to**

380-415V (or only 400V where required) three-phase lines, or also 220-240V (or only 230V where required). Any kind of modification shall be considered as product tampering and shall nullify the relative warranty. Products equipped with single-phase wiring (M) engines ALWAYS require connection to 220-240V (or only 230V where required) single-phase lines. Any kind of modification shall be considered as product tampering and shall nullify the relative warranty.

Duct and window - wall fan units

Precautions must be taken to prevent gas coming from the gas flue pipe or from other fuel combustion units from entering into the room.

Disposal

This product complies with Directive 2012/19/EU on the management of waste electrical and electronic equipment (WEEE).

The crossed-out wheeled bin symbol on the appliance indicates that, at the end of its useful life, the product must be taken to a specialised company for transport and treatment. This company will take care of the disposal of the various materials making up the product and their subsequent proper recycling.



Alternatively, the manufacturer of the appliance is obliged to take back the product to be disposed of in exchange for the purchase of an equivalent appliance.

European compliance

All fans manufactured and supplied by Vortice comply with the EC regulation 2006/95/EC (Low Voltage), 2006/42/EC (Machinery), 2014/30/UE (Electromagnetic compatibility), 2009/125/EC* (Ecodesign).

It is also extended for each particular range in compliance with the required specific standards.

Regulations:

- UNE-EN ISO 12100-1: Safety
- UNE-EN ISO 12100-2: Safety
- EN ISO 13857: Safety
- ISO 13852: Safety
- UNE 100250 (ISO 12499): Industrial fans.
- ISO 3744: Acoustics.
- ISO 1940-1: Mechanical vibrations.
- ISO 10816-1: Mechanical vibrations.

Important: Rating label shows all the technical features of the fan, including environment requirements and the max temperature. According with rating label: don't use this product with other gas mix-compositions or different temperatures. Anyway, this product cannot work in different environmental conditions (different from rating label).

Identifying the machine

A specific rating label is fixed on the external body (external panel), for every product.

The rating label shows the product ID and main technical features. Fig. 1 shows a sample ID plate and index.

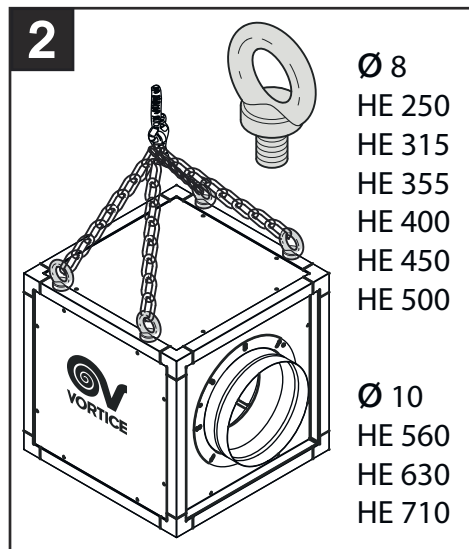
1

VORTICE ELETTROSOCIALI SPA				
STR.CERCA.2 - FR.DI ZOATE-20067 - TRIBIANO (MI) ITALY				
MOD./TYPE [1]				
V ~ Hz	[2]	Mot. IP55 [6]	Cl. Is. F [9]	
	[3] kW	Serv. S1 [10]		
RPM	[4]	T 50 [7]	Made in EU [11]	
COD.	[5]	[8]		

- 1 Type and model
- 2 Electric power supply
- 3 Power consumption
- 4 Number of revolutions per minute
- 5 Product code
- 6 IP motor protection
- 7 Max environment Temperature
- 8 Logos: EAC, CE, Bin for WEEE
- 9 Insulation class of the motor
- 10 Continuous operation
- 11 Made in EU (Europe)

Handling

Before moving the appliance, make sure that the equipment being used has an adequate lifting capacity. Use a fork lift truck and pallet to lift the appliance. Alternatively, it's possible to lift the appliance with eyebolts, as shown in fig. 2.



The appliance can be lifted manually in accordance with the applicable legislation. When lifting the appliance, take great care not to damage the side panels. During transport and handling, the appliance should remain in the vertical position and must never be turned upside down or leaned over.

The weight of each model is shown in the table shown in following tables:

Code	Description	Net Weight [Kg]	Gross Weight [Kg]
45765	HE SAL 250 EC	23,10	26,10
45766	HE SAL 315 4M	31,60	34,60
45767	HE SAL 355 4M	38,30	42,30
45768	HE SAL 400 4M	49,40	53,40
45769	HE SAL 450 4M	63,60	68,60
45770	HE SAL 500 4M	103,90	108,90
45771	HE SAL 315 EC	31,60	34,60
45772	HE SAL 315 4T	31,50	34,50
45773	HE SAL 355 4T	38,20	42,20
45774	HE SAL 400 4T	49,30	53,30
45775	HE SAL 450 4T	73,60	78,60
45776	HE SAL 500 4T	109,90	114,9
45777	HE SAL 560 4T	140,90	146,90
45778	HE SAL 630 4T	174,40	180,40
45779	HE SAL 710 6T	231,50	237,50

Code	Description	Net Weight [Kg]	Gross Weight [Kg]
45780	HE COMFORT 250 EC	24,90	27,90
45781	HE COMFORT 315 4M	33,90	36,90
45782	HE COMFORT 355 4M	41,10	45,10
45783	HE COMFORT 400 4M	52,60	56,60
45784	HE COMFORT 450 4M	67,20	72,20
45785	HE COMFORT 500 4M	108,00	113,00
45786	HE COMFORT 315 EC	33,90	36,90
45787	HE COMFORT 315 4T	33,80	36,80
45788	HE COMFORT 355 4T	41,00	45,00
45789	HE COMFORT 400 4T	52,50	56,50
45790	HE COMFORT 450 4T	77,20	82,20
45791	HE COMFORT 500 4T	114,00	119,00
45792	HE COMFORT 560 4T	145,60	151,60
45793	HE COMFORT 630 4T	179,90	185,90
45794	HE COMFORT 710 6T	238,10	244,10

Installation and start up

Don't install this machine before having read these instructions. Keep them for further technical operations and/or maintenance operations.

Preliminary checks

Installation area:

The area where the appliance is to be positioned offers enough room for installation and later maintenance work. There must be enough room on the inspection panel side of the appliance for the panels to be fully opened and for components to be removed should the need arise.

Supports:

All the supports have to be: enough strength to hold the weight of the fan and with the right stiffness for vibrations (especially when starting up).

Ordinary vibrations caused while functioning depend mainly on the rigidity degree of the structural element where the fan is placed.

In this sense, it is highly recommended that in those models that there is this possibility, elastic shock absorbers should be installed (either made with rubber or springs) to avoid transmission of vibrations and noises, keeping the fan in a floating position.

To complete correctly this insulation with the rest of the conducting installation, elastic joints should be placed in the suctioning inlet and outlet of the fan.

Also, installing the product on a rigid plan is possible, as well on concrete bases or walls, but the rigid plan have to be perfectly planar and correctly aligned.

Anyway: never force the fan structure by tightening the screws.

Base:

The platform (floor or roof) where the appliance is to be positioned is both flat and smooth and capable of safely bearing its weight. The bottom horizontal base have to be perfectly planar and aligned. Beforehand small strips of aluminium sheets, washers, or fast cement should be placed in the gaps to fill the space

ensuring the correct support of the fan.

Point of the power supply:

A special attention should be placed on reinforcing the charging point of the fan and make sure that the waterproof property is not affected by the vibrations.

Correct mounting

Fans installed on the roof or wall, or those which use a supporting system or any additional structure, should be levelled correctly horizontally and vertically. In horizontal bases such base should be flat and levelled, and in cases where there is a concrete base it should be perfectly flat.

Note: The appliance must be installed in such a way that the shaft of the motor runs parallel to the ground.

Electrical connections

Each model fan has a connection drawing inside the terminal box. **IMPORTANT:** The feeding cable connection should be done inside such terminal box of the motor or fan. Pass the power supply cable into the casing through an appropriately sized grommet.

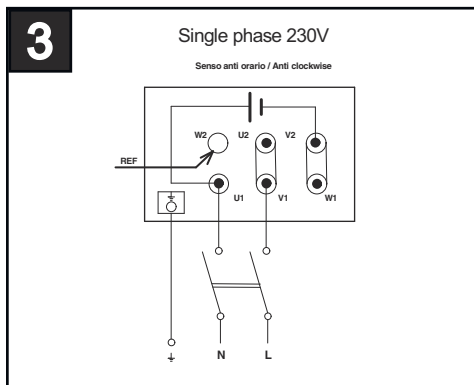
It is important that the feeding lines and other components used in the installation meet the requirements of the valid regulations of industrial installations and that the protection system are in accordance to the power of the fan (Motor protection system, differential protection, wiring limit and ground system).

For motors over 7.5 HP (5.5Kw) is also suggested to perform a timed limit relay start up or control it electronically so nor excess consumption peaks occur and ensure a smooth start up.

NOTE: Avoid connecting single phase appliances to 3-phase line shunt connections.

Single phase motors

Fig. 3 shows the electrical connections for each versions of single phase motors:



Three phases motors

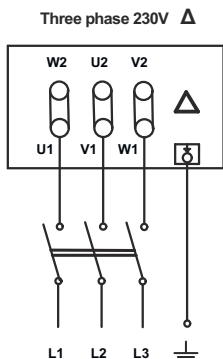
Every three phases motors have 2 available electric connections; the installer can choose the designed connection:

- Δ connection
- Y connection

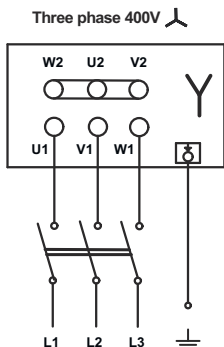
Fig. 4a;

Fig. 4b.

4a



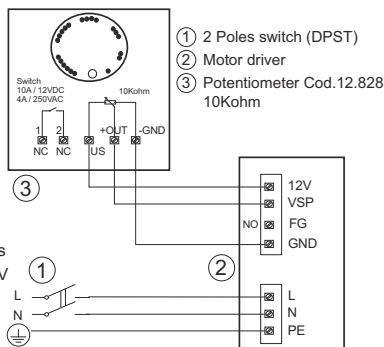
4b



EC motors

Fig. 5 shows the electrical connections for each versions of single phase motors. Vortice suggest the use of the optional potentiometer (not supplied):
Cod.12.828 - POT

5



NOTE:

- The installer is responsible for connecting optional safety devices that automatically turn the appliance

OFF when the inspection panel is opened. The installation of micro-switches, like any other electrical safety device fitted, must completely stop the appliance from operating. Should this happen, the power supply to appliance can only be restored by manually turning the appliance switch back ON and by returning power to it from the mains board.

- The installer is responsible for activating any safety devices on the appliance in accordance with the EC Machinery Directive.
- All the wiring and electrical components used in the installation must comply with current European and local legal requirements.
- All the QBK motors have, internally, a thermal protection (see "Maintenance and cleaning").

Voltage and frequency

The motor feeding connection must be done according to the tension and frequency indicated in the fan's plate. Some differences ($\pm 5\%$) can be allowed in the power circuit. If the connection cannot keep this level there is a high risk of burning the motor. Therefore, ensure the selected disposition of Y-1 corresponds to the tension of the power circuit and use a tester to check besides the tension the frequency as well.

Consumption

Control that the consumption (A) once installed in the fan does not exceed the conditions specified in the fan's plate. The capacity of the fan and the installation charge should be correctly adjusted (see "Start up"). In case of non compliance please consult the manufacturer.

Ground system

According to the current legislations the fan is a Class I and it is mandatory that the ground system is connected, it can be found inside the connection box of the motor or the fan.

The earth connection must be made using the special terminals inside the appliance and in complete accordance with current legal requirements.

Once connected, it is advised to check the electric insulation with device (tester).

Environment conditions

The following environment conditions need to be respected:

- Temperature = 50°C Max; (single phase motors); 60°C Max (three phases motors);

In case of doubts, checking the rating label of the product is always advised: it contains all the technical informations to be respected.

Note: Motorfans insulation class is F. for other applications, who needs particular features, checking technical data is always advised. In case of doubts of more informations: contact the supplier directly.

Direction of the rotation

The direction of the rotation is shown into the housing (see: "Electrical connections").

Noise level

Depending on the model of the fan, its power, size and revolutions the noise level can be different. You can find the noise level information, for every models, on technical catalogues or website.

Connecting to Air system ducts

Connecting to the ducts is possible thanks:

- Air inlet: connecting the duct to the circular flange (on the inlet side);
- Air outlet: using optional joints (not supplied)

The product is provided with side panels with pre-cutting lines (one with circular shape and one with rectangular shape), depending on the discharge duct to which the machine will be connected to (see table 1 for pre-cutting dimensions).

In any cases of connection, It is always advised to use elastic joints.

It is not recommended that you use ducting with bends in the immediate vicinity of the appliance, as the flow of air generated requires a straight section at least 3 or 4 times the equivalent diameter of the duct to reduce the vertical air flow to normal.

Tab. 1 Pre-cutting dimensions

Product size	Circular pre-cutting diameter [mm]	Rectangular pre-cutting dimensions [mm]
VORT QBK HE 250	250	250x200
VORT QBK HE 315	315	300x250
VORT QBK HE 355	355	300x300
VORT QBK HE 400	400	400x300
VORT QBK HE 450	450	400x400
VORT QBK HE 500	500	500x400
VORT QBK HE 560	560	500x500
VORT QBK HE 630	630	600x500
VORT QBK HE 710	710	700x600

Motorfan balancing

The appliance is statically and dynamically balanced to level 6.3 according to ISO 1940 standards, however the use of vibration dampers on the base is recommended.

Protection against unvoluntary accident

Preventing accidents with rotating bodies is necessary. In the following cases, you must install protection grids:

- Air inlet: without any inlet duct connected;
- Air outlet: without any outlet duct

connected.

Note: in any cases of connection (inlet side or outlet side), preventing accidents is always necessary (checking the minimal lenght of the duct).

Start up

Once completing the installation, checking the missing friction on rotating bodies is always advised. Also double check no external element or left over material from the installation is inside the fan or its ducts. Check also that the air inlet and outlets are clear. Note: in case of adjustable air grids, need to verify the correct opening and functioning (in order to avoid over consumptions).

First start up

for a short time (5-10 minutes) check only:

- the correct direction of the rotation;
- the correct missing of abnormal noises;
- the correct missing of abnormal frictions.

Note: in case of wrong direction of the rotation, it could be solved checking the right electrical connection.

Second start up

for a longer time (120-180 minutes) check nominal values:

- the maximum speed;
- the maximum absorbed current and power consumption;
- the correct functioning of protections/safety devices: testing them many times and verifying that they always lock the machine (with all rotating bodies) and lock the power supply to the product. You need to repeat the test 3 times at least (with a positive feedback).

NOTE Some models, equipped with an heavy impeller, need a long time for the start up. In these cases, you need to check it at the starting.

IMPORTANT: You need to verify, with tool, the real consumption, and you need to compare nominal values with rating label. In case of more consumptions: need to turn of the fan, immediately.

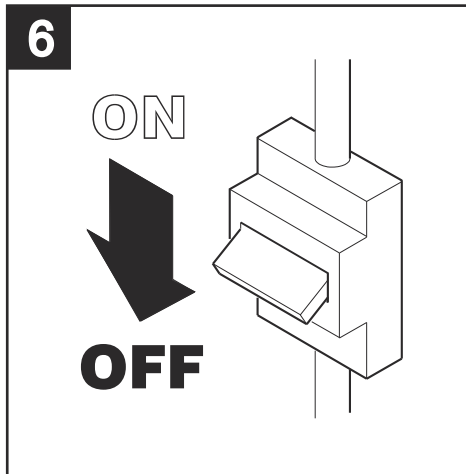
An excessive consumption could be caused by a possible defect of the fan, motor, friction, or an electrical connection error, but the main cause usually is a wrong adaptation of the installation due to excess or faulty charge.

On the contrary, the air flow should be obstructed with the regulating door if existing or by placing any element that can obstruct partly the suctioning inlet. In this latest case, amongst anything check that no elements are loose that can be suctioned inside the fan. Once readjusted the installation check again that the consumption is within the range. After this readjustment is achieved, the fan should be started up and work correctly without any problems.

Maintenance and cleaning

Fig. 6

It is recommended a complete check up of the fan and its installation after the first 24 hours after start up, by electronically disconnecting it from the network in order to avoid accidents. Vortice suggest usage of security switches specially made for this purpose. General notes for the maintenance
During maintenance operations, please take note of the following points:



1. The functioning of the fan must be smooth and free of vibrations.
2. The absorbed current (A), measured tools, cannot exceed the nominal consumption specified in the motor's plate.
3. All screwed elements must be checked that they have not been loosened.
4. In applications where the fan works in a high dust or greasy air environment, the blades of the impeller or propeller can be unbalanced due to the accumulation of particles and consequently damage the bearings. Therefore, cleaning of the rotating element must be done periodically using the maintenance stops or whenever the fan vibrates or does not work correctly. To ensure a correct functioning, never leave dust inside the fan.
5. In case of applications in chemically abrasive environments impeller blades could worn out. In case of unbalancing, it need to replace damaged parts.
6. In case of stored fans or not functioning for periods of two or more years, it is recommended a full inspection of rotating bodies, along with a check of any rusts and residual greases. In general, a good mantaining of metal surfaces is required.

Safety devices

The safety systems required to comply with the EC Machinery Directive relating to this appliance must be tested at least once every 90 days.
In particular, to ensure an easy and safety

maintenance, Vortice strongly suggest the use of ON/OFF safety switches, manually resettable.

The inspection on safety devices, must ensure a properly and reliable working.

To perform a valid test is necessary:

1. to match all technical documents (supplied with the machine and safety devices) with adopted mounting details;
2. to take all the necessary precautions and, when the appliance is operating normally, cause the safety systems to cut in one at a time. Make sure that the power supply to the appliance cuts out and that all moving parts come to a stop (by opening the inspection panel); repeat this operation twice but not consecutively with all the safety devices fitted to the appliance.
3. check that the static and passive safety systems are properly positioned and fastened in place; check especially that shields protecting moving parts are properly fastened in place and can only be removed using special tools.

Records must be kept of these 90-day checks and must show the outcome of the tests carried out.

Cleaning

Fig. 7

Periodically, need to ensure a correct maintenance and cleaning of all installed elements.

This is required to avoid accumulations of dirt, dust, grease, etc.: the main cause of fires and their expansion.



Motorfan assembly

Periodically, check all the elements of the motorfan assembly: motor support, motor, motor shaft, impeller, etc.. Also need to check inlet cone and circular flange. In case of noises or problems: contact the supplier.

Bearings

During cleaning maintenance, please keep on mind the following instructions:

1. The bearings of the electrical motors should not need any maintenance, nonetheless it is advised not to exceed the limit of 15.000 - 20.000 hours of ensured working.
2. Other bearings, involved in transmission groups, need to be replaced every 10.000 - 15.000 hours depending on the temperature conditions and humidity of the circulating air.
3. Special bearings, self-covered with external greasers, are involved in special conditions and, in general, they don't need either maintenance. Their life, in designed extreme conditions, usually don't exceed 500 - 1000 hours of working time. It is very important never mix grease with different chemical compositions and viscosities.

Adjustable air grids

In case of connecting adjustable air grids (manual or electronic controlling), a check is required every 180 days:

- surfaces cleaning and checking;
- functioning verify (a correct opening and/or control).

Type of check	90 days	180 days	12 days
Safety systems - checks and tests	**		
Motors, fans, drive system: - cleaning motor/fan assembly; - bearings, eventual replace		**	**
adjustable air grids - check		**	

Precautions in case of keeping machine off for a long time

If the appliance is to be out of operation for a lengthy period, need to manage the following inspections:

- periodically, every 30 days or so, rotate the motor and fan for a few seconds to prevent any damage to the bearings. After that, a complete running test is required (1 hour is advised);
- check all components: they need to maintain the initial status, without signs of strains or noises;
- Disconnect the power supply from the electric system, creating/putting an alert of "machine off" status.

Important: all QBK models have a thermal protector that can temporarily make the motor stop.

Therefore do not access to the fan without previously disconnecting it from the network.

In three-phase models such protection activates the contactor circuit of the electrical installation.

Type of problem	Probable cause	Action
1. Safety system not working	<ul style="list-style-type: none"> • Faulty power supply • Faulty electrical component 	<ul style="list-style-type: none"> • Electrician needed • Replace component • Help needed
2. Low air flow	<ul style="list-style-type: none"> • Fan blades rotating in wrong direction • Excessive appliance load loss • Vents closed 	<ul style="list-style-type: none"> • Connect motor correctly • Check the design and/or appliance • Modification to fan section needed • Open the vents and check operating function
3. High air flow	<ul style="list-style-type: none"> • Appliance load loss less than nominal • Inspection panel open 	<ul style="list-style-type: none"> • Adjust vents and check operating function • Check the design and/or appliance • Close inspection panel
4. Excessive noise and/or vibration	<ul style="list-style-type: none"> • Fan or motor bearings worn • Fan vibration damper too compressed • Unsuitable vibration damper supports • Low balancing tolerance in rotating components • Rotating components not properly fixed on shaft (blades and/or pulley) • Foreign bodies interfering with rotating components • Panel screws loose • Power supply missing one phase • Incorrect mains voltage 	<ul style="list-style-type: none"> • Replace bearings • Reposition fan • Help needed • Help needed • Balance or replace rotating components • Help needed • Fully tighten the screws on fan blades and pulley • Clean inside the appliance • Fully tighten fixing screws • Check terminal connections and tighten if required • Compare voltage with that shown on ID plate

Accessories

It is possible to also order these optional accessories indicated below :

On/off security switch (max 16A):

Code	Description
25059	SWT 16

Rain cover:

Code	Description
21450	QBK-HE RRC 250
21451	QBK-HE RRC 315
21452	QBK-HE RRC 355
21453	QBK-HE RRC 400
21454	QBK-HE RRC 450
21455	QBK-HE RRC 500
21456	QBK-HE RRC 560
21457	QBK-HE RRC 630
21458	QBK-HE RRC 710

Protection grill (exhaust nozzle):

Code	Description
21567	QBK-HE GP 250
21568	QBK-HE GP 315
21569	QBK-HE GP 355
21570	QBK-HE GP 400
21571	QBK-HE GP 450
21572	QBK-HE GP 500
21573	QBK-HE GP 560
21574	QBK-HE GP 630
21575	QBK-HE GP 710

Panel with circular flange (exhaust nozzle):

Codice	Descrizione
26862	QBK-HE MFL 250
26863	QBK-HE MFL 315
26864	QBK-HE MFL 355
26865	QBK-HE MFL 400
26866	QBK-HE MFL 450
26867	QBK-HE MFL 500
26868	QBK-HE MFL 560
26869	QBK-HE MFL 630
26870	QBK-HE MFL 710

Flexible junction circle-circle:

Code	Description
21585	QBK-HE RF 250
25063	QBK-HE RF 315
25064	QBK-HE RF 355
25065	QBK-HE RF 400
21589	QBK-HE RF 450
25066	QBK-HE RF 500
25067	QBK-HE RF 560
21592	QBK-HE RF 630
21593	QBK-HE RF 710

Steel support feet:

Code	Description
21413	QBK F

Antivibration supports:

Frequency variation speed controller

Code	Description
21412	QBK SAVIB 40
21414	QBK SAVIB 75
21586	QBK SAVIB 110
21415	QBK SAVIB 235
21416	QBK SAVIB 300

INVERTER):

Code	Description
12815	IREM INVERTER 4 M
12818	IREM INVERTER 6 M
12820	IREM INVERTER 10 M
12816	IRET INVERTER 2,5 M
12817	IRET INVERTER 5 M
12821	IRET INVERTER 8 M
12822	IRET INVERTER 10 M
12828	POT

Note: The model are different for : Single-phase (IREM), 3-phase (IRET) and for the maximum charge supported (2,5-4-5-6-8-10) A.

The POT model is a wall and recessed potentiometer with standard electric box DIN. (Resistance 10 kΩ . Switch rating: 4A/250 Vac - 10A/12 Vac , Protection grade IP44(Recessed), IP54 (wall).