

## OPERATING INSTRUCTIONS

### FANS WITH EXTERNAL-ROTOR MOTOR



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**Be sure to familiarize yourself with these instructions before working on this unit. Not paying attention to these warnings and instructions may lead to malfunctions and failures or may seriously endanger human life.**

R09..., R11..., R13... axial fans with integrated external rotor asynchronous motor are not ready-to-use products, but designed as components for air-conditioning, air supply and air extraction. The fans may only be operated when they are installed as intended & instructed, and when safety is ensured by safety equipment according to EN 13857 or by other protection measures.

**Safety information:**

- a. This appliance should only be installed or opened by qualified personnel.
- b. This appliance can be used by children aged from 8 years and above and persons with reduced physical sensory and 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.
- c. This appliance is solely intended as a built-in component and should not be operated otherwise. Sufficient protection against accidental contact according to machinery directive 2006/42/CE has to be safeguarded, especially for the rotating parts. Should there be a malfunction, it still has to be safeguarded that the parts breaking off or flying away cannot cause serious damage or bodily harm.
- d. Do not operate this appliance in an explosive atmosphere!
- e. The fans are only intended for the transfer of air or air-like mixtures. They cannot be used in hazardous areas for the transfer of gas, mix vapours or mixtures. Also cannot be used for transfer of solid components in transfer medium.
- f. Whether the fan is intended for mounting in outside windows or walls that precautions must be taken to avoid the back-flow of gases into the room from the open flue of gas or other fuel-burning appliances.
- g. The fans are only to be operated within the ranges specified on the motor name-plate.
- h. The temperature monitors built in to the motor winding serve as motor cut-out switches and must be connected to the outside control unit!
- i. If the motor is ordered without temperature monitors, it is imperative that an outside motor cut-out switch should be employed!
- j. If the fans are supplied via an external control unit, the manufacturer or user of control unit is responsible for keeping to the Electromagnetic compatibility (EMC) guideline 2014/30/EU.

**Installation**

- a. The system manufacturer or the machine builder is responsible that the inherent installation and security information are harmonized with the valid standards and guidelines (ex. EN 13857).
- b. When unpacking the unit, grip the blades close to the centre (maximum stability) and lift it out very gently and carefully. Shocks have to be avoided by all means!
- c. Do not install the fan on an unstable surface. Ensure that the air-gap between the fan impeller and the stationary housing is constant. Distortion due to an uneven surface of basis may lead to fan failure.
- d. Inspect the motor bearings for proper operation prior to installation.
- e. Main electrical installation and motor must be protected against short circuit and installation must be constructed properly according to valid national directives.
- f. Electrical connection must correspond to connection diagram which is enclosed:
  - For fans with connection box on inside of connection box cover.
  - For fans with connection cable is attached in packaging.
- g. Rotational speed of three-phase dual speed motor can be reduced with STAR connection. When using speed-change over switch, bridges on connection terminals must be removed!
- h. Do not use metal compression-gland cable fittings with plastic connection boxes. There is a danger of an electric shock if the connection is not made correctly!
- i. Secure connection cable to the fan guard grill or to the motor holder with cable fasteners.
- j. Most of single phase motors have internally connected thermal protector which switches off the motor if a fault occurs and switch on again automatically after it has cooled down. All three-phase motors have leaded-out thermal contacts (if not otherwise agreed).
- k. If the motor has leaded-out contacts of built-in thermal protectors (terminals TK), thermal contacts must be connected to the outside control unit in such a way that, if a fault occurs, the motor cannot switch on again automatically after it has cooled down. The protection of several motors using one protection device is possible by connecting the temperature monitors of the individual motors in series. It must be remembered that, if a temperature fault occur at one motor, all motors will then be switched off. In practice, motor are therefore assembled in groups so that emergency operation with reduced performance is still possible if a motor fails.
- l. Means for disconnection from power mains having a contact separation in all poles must be incorporated in the fixed wiring in accordance with the wiring rules if the fan is not fitted with such a device.

### Installation - fan with speed controller

- a. Under agreed conditions, fans are suitable for operating with speed controllers by voltage reduction (autotransformer, triac) or by voltage/frequency reduction (frequency converter).
- b. If the speed control is applied, increased temperature-rise and noise may be expected and has to be reviewed in the final application. Also EMC requirements must be achieved in the final application and the manufacturer or user of control unit is responsible for it.
- c. In order to assure the best performance of our fans controlled with Pulse-With Modulation (PWM) Frequency Converter, it is highly recommended to use the "SINE WAVE FILTER" on converter output with right settings of PWM Frequency Converter.
- d. Ensure the right settings of controller parameters, i.e., "Torque characteristics" or "Voltage / Frequency characteristics" will be met. Optimal settings of controller parameters leads into reduced electrical currents at low RPM's, reduced heating of the motor at low RPM's and also contribute to saving of the energy.
- e. If the shielded cable is to be used, both ends of cable shield must be grounded.
- f. Using of ferrite ring at the ends of connection cable additionally reduce the current in ground conductor which reduce radio frequency interference (RFI) disturbances.

### Operating conditions

- a. The fans are rated for S1 (IEC 60034-1) continuous operation.
- b. Extreme ON-OFF switching operating must be avoided, because it has negative influence on life expectancy and power consumption.
- c. Permissible ambient temperature is stated to the specified operating point. If actual load deviates from specified operating point, motor temperature-rise should be checked.
- d. Figures on the motor name plate refer to nominal values according to IEC60335.
- e. Continuous sound pressure level may exceed 70dBA (depends of fan model).
- f. If a fan is switched OFF for a long period in a humid atmosphere, it should be switched ON for minimum of two hours every month to remove any moisture that may have condensed inside the motor.

### Putting into operation

Before first start you should check:

- a. Appropriate installation and electrical connection.
- b. If safety equipment is in place and motor protection device is in function.
- c. If the impeller can rotate freely once the unit is mounted and the right direction of rotation is assured.



Only if all dangerous situations are excluded, the fan may be put into operation!

Switch on the power supply and check the direction of the rotation and the smoothness of running. The direction of the rotation of three-phase motors-fans can be changed by interchanging of 2 phases (on motor terminals or in main supply).

### Maintenance, service and cleaning

This unit should only be opened and maintained by qualified personnel.



**Before any maintaining or repairing operation is carried out, the unit must be securely disconnected from any power supply source!**

### Cleaning

- a. Regular inspection, if required, and cleaning when necessary to prevent imbalance due to the build-up of dirt. Clean the fan's flow area.
- b. Blades must be cleaned carefully to avoid damage to them.

- c. Never use a high-pressure cleaner or water spray for cleaning.
- d. Wet cleaning under voltage may lead to an electric shock.
- e. Do not use any aggressive paint solvent cleaning agents.
- f. For cleaning, use just a moist cloth. You can clean the entire fan with a moist cloth.
- g. If water penetrates into the motor, the motor windings must dry before restarting.

### Transport and storage

- a. Unit must be transported only in its original package.
- b. When the fan's transported with wood spacer on pallet, take care with the cables (in the situation that fan has connection cables). When unpacking fans, transported in such a way, grip the fan to protection grill. Do not apply any force for the cable(s).
- c. When transporting fans mounted on final units (apparatus), take care that they are properly secured and don't touch other devices which are transported near or on to.
- d. Store the fans in the original packaging in a dry area protected from the weather. Do not store fans in extreme heat and cold.
- e. We recommend a maximum of one year of storage. After a long period of storage we recommend that you inspect the bearings for proper operation before installation.

### Additional data and recommendation

- a. Fan must be mounted in appropriate way to achieve optimal efficiency and life expectancy. We suggest assembling fan in long inlet cone, with fan blade trailing edge aligned with outlet edge of inlet cone.
- b. Only environment friendly, recyclable materials according to RoHS2 (2011/65/EU) and REACH (EC1907/2006) directive are used in the product.
- c. Disposal must be carried out professionally and environmentally friendly in compliance with regulations applicable in your country.
- d. Design of the product enables simple decomposition of all components. Main components are appropriate marked for easy further handling at product end-of-life.

For all further information please contact our technical advice service.

### Contact:

- Hidria d.o.o.
- Business unit PE Hidria Movent
- Spodnja Kanomlja 23  
5281 Spodnja Idrija  
Slovenia
- T: +386 5 375 6000
- F: +386 5 375 6517
- E: [sales.fans@hidria.com](mailto:sales.fans@hidria.com)

### Service address:

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