



## OPERATING INSTRUCTIONS MANUAL

Directions on safety measures and particular instructions for single phase and three phase asynchronous electric motors and special executions..

Carefully read the below-mentioned instructions before executing any operation of movement, transport, installation, putting into service, maintenance or repair of electric motors.

The following symbology indicates reference to the safety measures and additional instructions mentioned in this user guide.

Safety and guarantee instructions:



Danger :instructions and signals



Adhere scrupulously to safety measures and instructions included in this manual, for prevention of accidents and damages to people and/or things and for environmental preservation.



Electric machinery, single phase and three phase asynchronous motors, supplied on low voltage, contain rotating parts in movement and can reach high temperature on external surface (housing). The improper use of electric motors can cause damages to people and/ or things and produce damage to the environment.



All operations of movement, transport, installation putting into service, maintenance or repair must be carried out by qualified staff and supervised by superintendents (see IEC 364 and VDE 0105) The improper use of electric motors (partly-completed-machinery) can cause damages to people and/or things and produce damage to the environment.

Electric machinery must be installed and used by qualified personnel.

### 1) GENERAL INSTRUCTIONS

Three phase and single phase asynchronous electric motors comply with construction harmonized Directive EN60034-1. They therefore correspond to what is prescribed by Low Voltage Directive 73/23/EEC (amended by 93/68/EEC). The electric motor, considered as a component, **partly-completed-machinery**, is compliant concerning:

- Machinery Directive 2006/42/EC provided that the installation has been correctly realized by the machinery manufacturer (for example: compliant with our installation instructions and to EN 60 204 “Electrical Equipment of Industrial Machines”.
- EMC Directive 89/336/EEC (amended by 92/31/EEC and 93/68/EEC) regarding intrinsic characteristics concerning emission and immunity levels.

All motors on standard execution working on continuous duty and supplied from the mains comply with the general rules EN50081 (emission limits for civil environments) and EN50082 (immunity for industrial environments).

All electric motors, as components, are considered **partly-completed-machinery** (Directive 2006/42/EC). They are set for being incorporated into appliances or completed systems and they must not be put into service until the machines they have been incorporated to comply with the Machinery Directive (Declaration of Incorporation – Directive 2006/42/EC).

The machinery manufacturer is responsible for the conformity of a complete installation with the Machinery Directive and EMC Directive.



We suggest you to carefully read the following instructions before putting into service.; every operation of installation, putting into service, maintenance and protection of the motor must be carried out by qualified personnel in full observance of all existing legal requirements and technical standards, as well as safety prescriptions for electrical equipment of machinery according to what European Directive EN60201-1 has declared. This documentation integrates and does not substitute any legal requirements, technical standards or safety prescriptions concerning electric motors. The manufacturer accepts no liability for accident or damage resulting from improper use or failure to adhere to safety rules or anyway EEC existing directives regarding electric motors.

Pay particular attention to the nameplate's indications. The conditions of use must correspond to the date indicated on the nameplate besides this manual's general instructions.

## 2) TRANSPORT AND HANDLING

Any kind of damages found at delivery time must be immediately contested to the transport company. Do not proceed with the putting into service of electric motors found damaged.



Handle motors with caution and with reference to their weight according to the rule in force (Art 167 and ff. Gov. Decrees 03/08/2009 nr 106 turned into Gov. Decree 09/04/2008 nr 81). Use eyebolts only if they are connected to the machine and specially measured for lifting. Possibly use adequate tools

## 3) MECHANICAL INSTALLATION



Before installation verify that: the electric motor is not visually damaged (damages due to transport or storage); the data on the nameplate correspond to the conditions of use and the intended application of the electric motor; supply voltage is the same as the network voltage; the allowed tolerance is 230/400V  $\pm 10\%$  with 50Hz as well as 60Hz ( $\pm 5\%$  for different voltages and/or single phase); ambient temperature is between  $-20^{\circ}\text{C}$  and  $+40^{\circ}\text{C}$ ; altitude is  $<1000$  meters above sea level.; different conditions of ambient temperature and/or higher altitudes imply the application of a corrective factor of the power; relative humidity is  $<90\%$  for motors with tropicalization degree TROP1; tropicalization degree is TROP2 for environments with relative humidity  $>90\%$  and/or high thermal excursion with possibility of condensation; the IP protection degree mentioned on the electric motors is suitable to the ambient conditions according to IEC34-5. By lifting the motor, please use the intended points; eyebolts present on motors are suitable only for the lifting of the motor and not other machines coupled to it; verify that the components to connect to the electric motor are in conformity with the electric motor data.



### **Preliminary operations.:**

Remove all fasteners or protections used for the transport (ex. protection of motor end shaft exit) and verify that the motor shaft rotates freely; verify that the motor has not absorbed humidity, in particular after a long storage, by measuring that insulation resistance is  $>10\text{M}\Omega$  at  $20^{\circ}\text{C}$ ; This measure must be carried out by applying a 500V continuous voltage between the phases to earth; the windings must be discharged immediately after the measure. If the insulation resistance is not sufficient, the motor must be dried with warm air or through an insulation transformer by connecting in series the windings of each phase and applying an auxiliary alternate voltage equal to 10-20% of the nominal voltage, in order to obtain a sufficient resistance.



### **Mechanical installation of the motor:**

We recommend to fix the electric motor adequately according to earth, type of assembly and mounting position; assemble the motor on a flat, rigid and vibration-free base, resistant to deformations; carefully align the motor and the machine to avoid stress not admitted on the motor shaft, observing the max radial and axial charges admitted; a misalignment or a forced keying can cause, during running, anomalous overheatings that could endanger safety; in case of vertical installations, be careful that nothing falls inside the ventilation openings. During the assembly avoid damages on bearings, by using the motor shaft as a





support, having previously dismantled the fan cover; do not strain or bump the motor shaft end. The motor must be installed in a suitable position to allow: the reading of the data on nameplate, inspection of the terminal box, cleaning of the motor, absence of parts in movement outside protections, an adequate ventilation; avoiding any obstruction to the air intakes and the entrance of swarf, dust or liquids and all situations that can cause overheating; in case of humid environments, the terminal box should be set in order for the entrance of the cables to be placed downwards; verify there is no condensation; if there are condensate drainage holes, remove any possible condensate and then replace plastic plugs to restore IP protection degree; carry out this operation only after having disconnected the power supply. If the motor is equipped with anti-condensation heaters, verify the motor is not supplied or running yet before putting the anti-condensation heaters into service; verify also that the supply voltage of the anti-condensation heaters is equal to the specified voltage.

#### 4) ELECTRICAL INSTALLATION AND USE



Connect the motor to the supply mains following the wiring diagram indicated on the motor plate. Do not connect or start the motor in absence of the wiring diagram; do not start the motor with free shaft key. Before connection, check that the motor conductors are correctly tightened on the terminal box; for the cable connection, use the connection tools supplied; the cable terminals used for the wiring of the cable must be of insulated type in order to grant the respect of the minimum distances between live parts and non active metallic parts; the choice of the cable gland must be congruent to the external diameter of the cable used; all cable entrances not used must be sealed in order to restore IP protection degree. The supply cables and the grounding cables must comply strictly to the applicable regulations selecting cables and conductors suitable for the required capacity and insulation; the wiring of connections and cables' section must comply with EN60204-1. All motors are suitable for the grounding inside the terminal box and outside on the motor

housing.; the points of application of the earth terminals are marked with the symbol  $\perp$ . The fixing of the earth cable must be done avoiding any loosening. Before the putting into service, verify the sense of rotation of the motor; if the motor has to run in the opposite direction instead of the established one, for three phase motors it is enough to commutate 2 phases, for single phase motors, follow the wiring diagram. The sense of rotation is clockwise viewing the motor from the drive side opposite to the fan. In case of backstop device, do not start the motor in the block direction. For checking reasons, the backstop device can be activated only once in the block direction at a voltage lower than half the supply voltage. After wiring operations, meticulously re-assemble the terminal box and its gasket. Do not touch the motor casing when the motor is running, as the operating temperatures may reach values  $> 50^{\circ}\text{C}$ .

#### 5) PROTECTIONS FOR ELECTRIC MOTORS



All electric circuits must be protected against damages resulting from faults or anomalous workings, due to: short-circuit overloads, overload current, interruption/reduction of the supply voltage, excessive speed of the machines parts, overheating because of frequent startings. For the safety of people and/or objects, protections must be provided against direct or indirect contacts due to insulation failures. In case the shaft stops rotating because of current inversion, precautions must be taken for the stop of rotation on the opposite sense: when the safety of the machine depends on the sense of rotation, it is necessary to take measures in order to avoid an inversion of phases; moreover, the sense of rotation must be indicated with a label in a visible position.

#### 6) ESSENTIAL SAFETY REQUIREMENTS (ESR)



##### Acoustic emissions.

Single phase and three phase electric motors comply with Gov. Decree 195 dd.10/04/2006 n. 195 for the regulation of sound emissions as they come under sound emissions degree inferior to the pressure of 80 dB(A)



### Vibrations



Electric motors are considered partly-completed-machinery, therefore the evaluation of vibrations must be done by the manufacturer of the end machine coming under the reference directive, considering what follows: vibrations emitted by the single electric motor comply with the parameters considered by the rule of the Gov. Dec. nr. 187 dd. 19/08/2005.

## 7) MAINTENANCE



Before any intervention on electric motors or in the nearby areas select the supply mains of power and wait for the stop of the masses in movement, wait until the surface temperature is lower than 50°C in order to avoid any possible burn. Periodically verify: absence of possible deposit of dust, oil, dirt on the fan or fan cover; the conditions of the seal ring; the tightening of the connections; the absence of vibrations and noise. Any disassembly of components not authorized by the builder will invalidate the warranty and release the builder from all liability. .

## 8) STORAGE



Motors must be stored in mild, dry and clean ambients, under shelter against bad weather, without vibrations and/or bumps. Shaft ends must be protected with anticorrosive paint or grease (in case of seal ring, avoid any contact with protections).

## 9) ASSISTANCE



Warranty right is valid for 12 months from the date of purchase; this right is not recognized in case of evident damages and deteriorations, disassembly of components not authorized and/or use of not original spares. It is Customers' responsibility to ensure that these instructions are known by users and/or fitters. If necessary, please contact the manufacturer CIMA Spa. – Via Pasubio, 49 -36051 Creazzo (VI) Italia.

To see technical data visit our website <http://www.cimamotori.com> , further news and particular information can be given by our technicians..