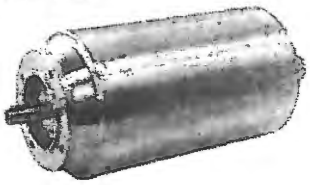
INSTALLATION AND MAINTENANCE INSTRUCTIONS FOR THREE-PHASE STAINLESS STEEL INDUCTION MOTORS



1. General safety instructions

Danger: electric rotating machines present dangerous parts since, when operating, they have live and rotating components, with temperatures that could exceed 50°C. than 50 °C. The electric motor must not be put into service until the machinery, into which it has been incorporated, has been declared in conformity with the Machinery Directive (Certificate of Incorporation, Directive 2006/42/EC Art 4.2 and Annex II, Sub.B).

ENGLISH

An incorrect installation, an improper use, the removing or disconnection of protection devices, the lack of inspections and maintenance, the inadequate connections may cause several personal injury or property damage. Therefore the motor must be moved, installed, put into service, handled, controlled, serviced and repaired **exclusively by responsible qualified personnel** (definition to IEC 364).
It is recommended to pay attention to the following instructions, to the instructions relevant to the system, to all existing safety laws and standards concerning correct installation.
May be necessary additional information in case of motors in non-standard design, please consult the manufacturer.
Motors of these instructions are suitable for installations in industrial areas; **additional protection measures**, if necessary for other applications, must be adopted and assured by the person responsible for the installation. When working on electric machine, machine must be stopped and disconnected from the power line (including auxiliary equipment, if present). If there are electric protections, avoid any possibility of unexpected restarting, paying attention to the specific recommendations on equipment application. In single-phase motors, running capacitor can remain temporarily charged keeping live relevant terminals even after motor stop.

Compliance with «Low Voltage» European Directive 2006/95/EC and with Directive «RoHS» 2011/65/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipments: motors are in conformity with the previsions of the Directives and therefore are provided with the CE mark on the nameplate.

2. Operating Conditions

Motors are designed for use in ambient temperatures from -15 to 40 ° C, maximum altitude 1000m in accordance with IEC 60034-1.
In case of different conditions of temperature and altitude, depending on the type of application, consult the manufacturer.

It is forbidden the use in aggressive environments with explosion hazard (e.g. ATEX), etc.

3. Installation, general information

On receipt, verify that the motor corresponds to order and that it has not been damaged during the transport; in case, immediately notify it to the forwarder. Do not put into service any damaged motors. Eyebolts on motors, if present, are suitable only for lifting the motor and not other machines fitted to it.

In case of **storing** the environment must be clean, dry, free from vibrations (veff≤0,2mm/s) and corrosive agents. Always protect motor from humidity.
Insulation resistance check. Before putting into service and after long still standing or storing periods, it is necessary to measure insulation resistance between the windings and to ground by adequate d.c. instrument (500 V). **Don't touch the terminals during and just after the measurement because of live terminals.**
The insulation resistance, measured with the winding temperature at 25°C, must not be lower than 10 MΩ for new winding, than 1 MΩ for winding run for a long time. Lower values usually denote the presence of humidity in the windings; in this case let them dry.

During the **installation**, position the motor so as to allow a free passage of air for cooling. Avoid: any obstruction to the airflow; heat sources near the motor that might affect the temperatures both of cooling air and of motor (for radiation); insufficient air recycle or any other factor hindering the steady heat exchange.
For outdoor installations, protect the motor with suitable measures against solar radiation and weather; weather protection becomes essential when the motor is self-ventilated (IC411), installed with vertical shaft and fan upwards.
The surface to which motor is fitted must be correctly dimensioned and flattened in order to allow fastening security and motor alignment with driven machine and to avoid vibrations on the motor.
For full load and long lasting running or for jamming conditions, cutouts, electronic torque limiters or other similar devices should be fitted.
Where duty cycles involve a high number of on-load starts, it is advisable to utilize **thermal probes** for motor protection (fitted inherent on the wiring); magnetothermic breaker is unsuitable since its threshold must be set higher than the motor nominal current of rating.
For no-load starts (or with very reduced load) and whenever it is necessary to have smooth starts, low starting currents and reduced stresses, adopt a reduced voltage starting (e.g.: Y-Δ starting, with starting autotransformer, with inverter, etc.).

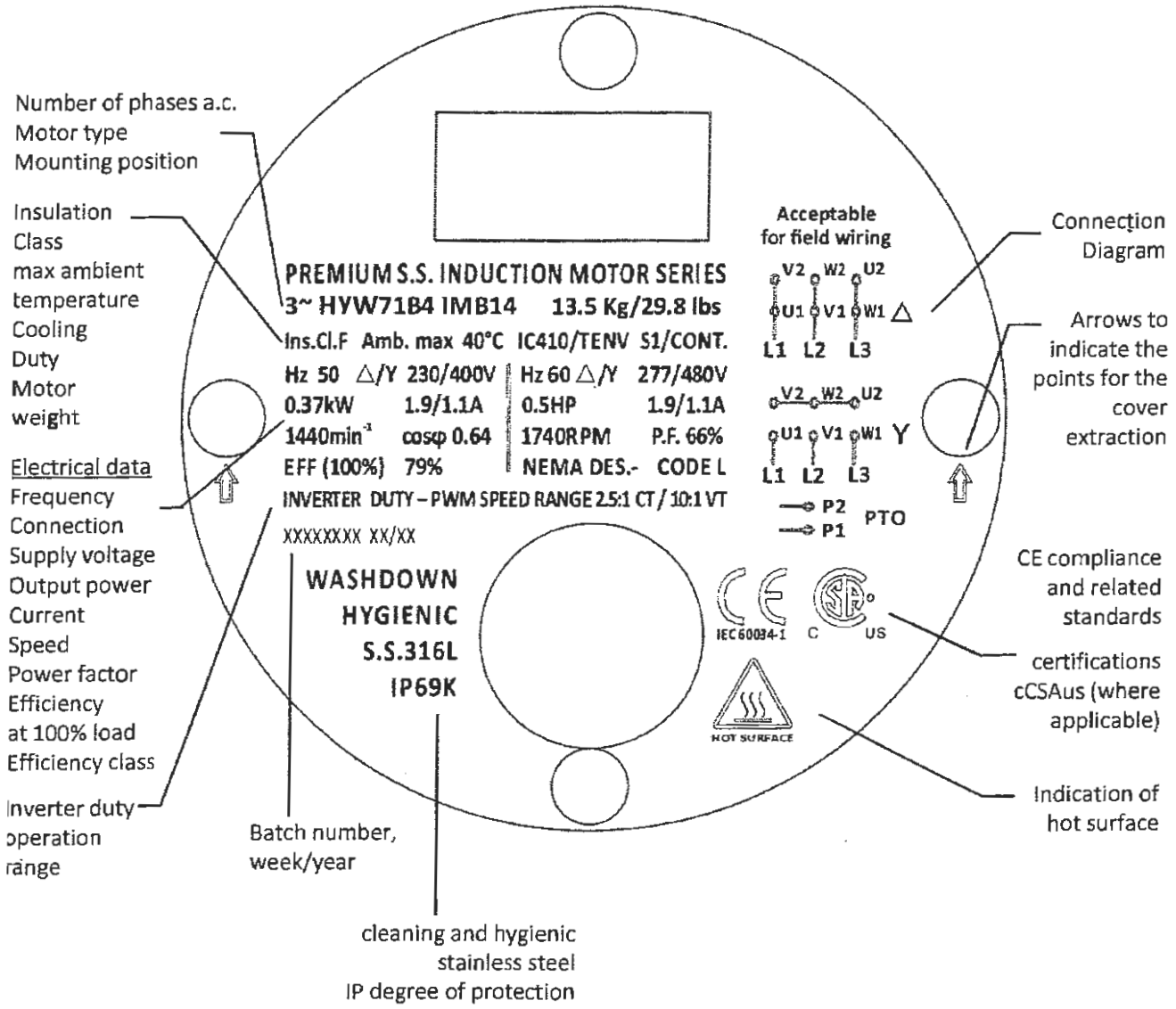
Before wiring up to the electrical power supply make sure that the voltage corresponds to nameplate data for: motor, independent cooling fan, if any, etc.
Only after making sure that the connection is according to scheme printed on the nameplate and other information as per these instructions, to make the wiring of the motor, brake and any other auxiliary equipment. Select cables of suitable section in order to avoid over heating and/or excessive voltage drops at motor terminals and suitable with the cable gland for the proper tightening and ensuring the compliance with the IP rating (that is IP69K, as standard).

Metallic parts of motors which usually are not under voltage, must be firmly **connected to ground** through a cable of adequate section and by using the proper terminal inside the terminal box marked for the purpose.
In order not to alter the IP degree of protection, close the terminal box by correctly positioning the gaskets taking care not to pinch them and tightening all fastening screws.

For three-phase motors the direction of rotation is clockwise (view from Drive-End side) if connections are according to the diagram on the nameplate. If direction of rotation is not as desired, invert two phases at the terminals.
In case of connection or disconnection of motor windings with high polarity (≥6 poles), there can be dangerous voltage peaks; **pre-arrange the proper protection (e.g. varistors or filters) on the supply-line.**
Three-phase stainless steel motors are suitable for **use with inverter**, as standard. The use of inverters in any case requires some precautions relevant to voltage peaks (Umax) and voltage gradients (dV/dt) that are generated with this type of power supply; values have gradually become higher by increasing the mains voltage UN, the motor size, the length of power cables between the inverter and motor and by worsening the inverter quality. For mains voltages UN> 400V, voltage spikes UMAX> 1000V, voltage gradients dV/dt>1kV, power cables between the inverter and motor> 30m, it is recommended the insertion of appropriate filters between the inverter and the motor.

4. Marking

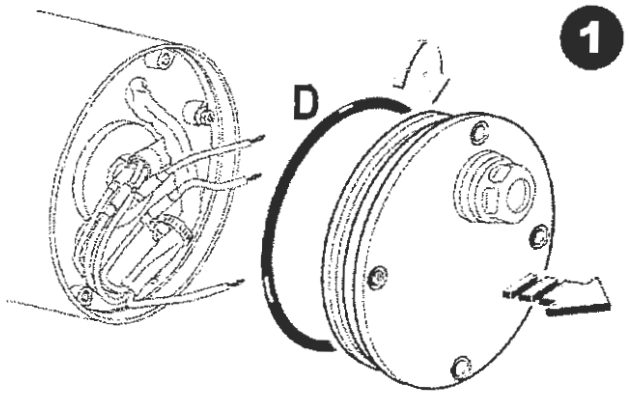
The nameplate data of the motor and the connection diagram are permanently marked on the back cover or the housing.

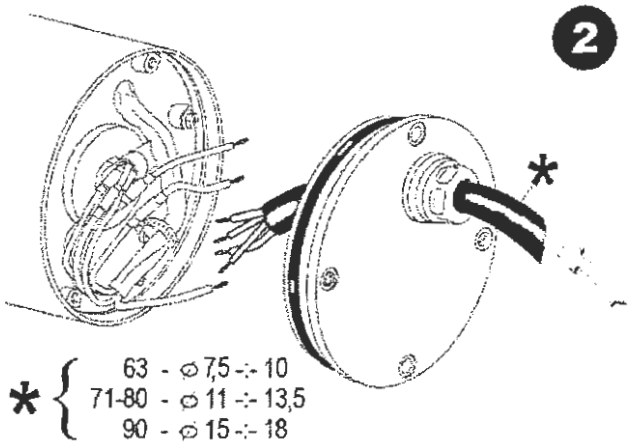


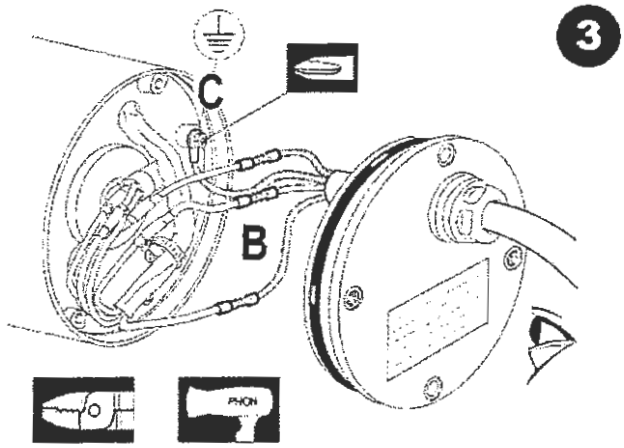
5. Terminal box opening, connections and cable gland tightening

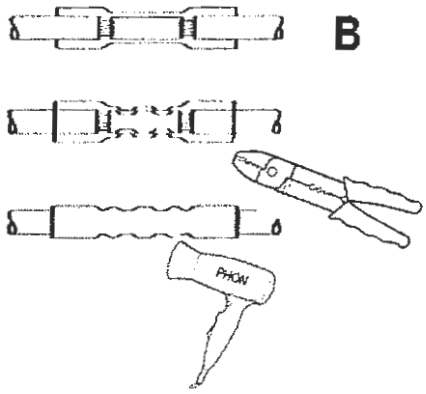
The motor is supplied with the rear cover only partially screwed so as to allow an easy opening of the same during the wiring operations. After removing the cover, inside the inner instructions for wiring, heat-shrinkable wire-to-wire splicings for the cable connection, the extraction screw for properly removing the cover in case of maintenance.

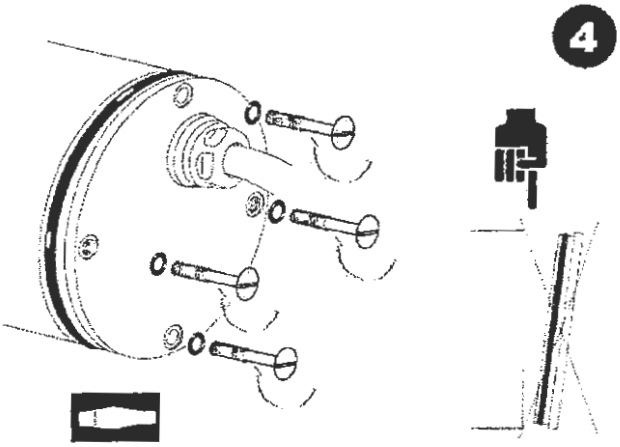
Carefully follow the instructions supplied, taking care when closing the cover that all seals are present and undamaged and of the proper tightening of the cable of suitable size, in order to guarantee the IP rating indicated on the nameplate (see illustrations from 1 to 5 and recommendations in the next page).

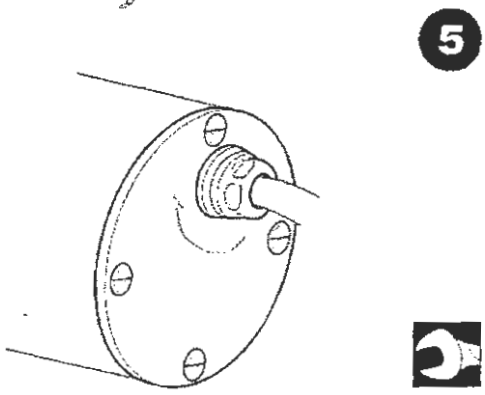


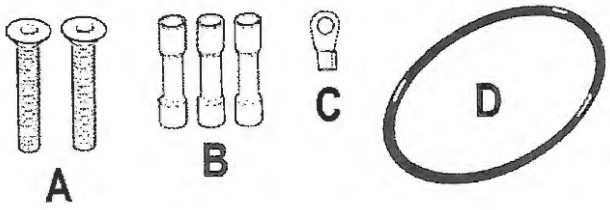


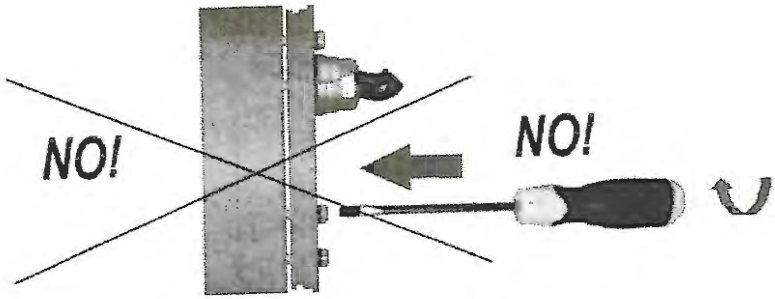






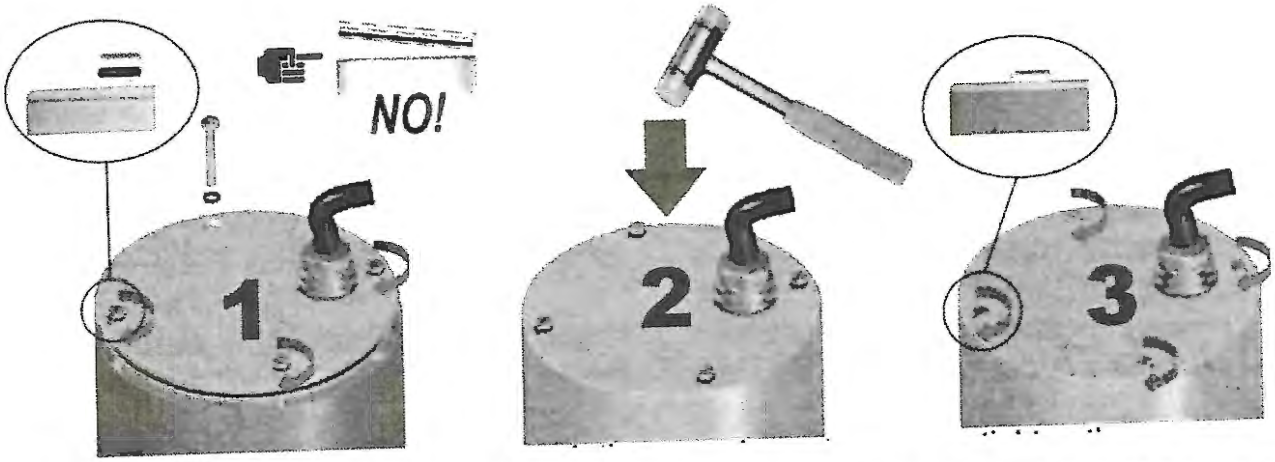






DO NOT USE THE TIGHTENING BOLTS TO BRING THE COVER IN ITS SEAT

IN ORDER NOT TO COMPROMISE THE INTEGRITY OF THE O-RING SEALS UNDER THE SCREW AND SO THE WARRANTIES OF THE PROPER IP DEGREE OF PROTECTION, DURING THE ASSEMBLING OF THE COVER, TO STRICTLY RESPECT THE FOLLOWING STEPS:



1. To take and partially tighten the screws (same as from condition of supply) so as to properly orient the cover in position, prior to assembly it
2. Avoiding to incline the cover, to close it in its seat with the aid of a rubber hammer
3. Fully tighten the screws

6. Coupling

It is recommended to machine the hole of parts keyed onto shaft ends to H7 tolerance. Before mounting, clean mating surfaces thoroughly and lubricate against seizure. Assemble and disassemble with the aid of jacking screws and pullers taking care to avoid impacts and shocks which may irremediably damage bearings. In case of direct fitting or coupling be sure that the motor has been carefully aligned with the driven machine. If necessary, interpose a flexible or elastic coupling.
In the case of vertical installation (V1 ... V19), it is recommended to seal the area of the coupling flange with sealant to prevent possible infiltration and stagnation of water in the compartment flange, which could threaten the proper degree of IP protection if, as a result of rotation of the shaft, the water to flow inside the motor through the oil seal. In case of direct coupling without speed reducer and installation with motor shaft on the top, an "open" flange version is also available that allows water to flow out; if necessary, consult us.
In case of V-belt drives make sure that overhung is minimum and that driven shaft is always parallel to machine shaft. V-belts should not be excessively tensioned in order to avoid excessive loads on bearings and motor shaft (for maximum loads on the shaft and relative bearing life, see catalogue of the product).
Motor is dynamically balanced with half key inserted into the shaft end and exclusively for the nominal rotation speed; in order to avoid vibrations and unbalances it is necessary that also power transmissions are pre-balanced with half key. Before executing a possible trial run without output elements, secure the key. Before putting into service verify the correct tightening of terminals, fastening and fitting systems. Check that eventual condensate drain holes are facing down.
For operation at ambient temperature greater than 40°C or lower than -15°C consult us.
When ordering spare parts always point out all data (ref. to next section 9).

7. Installation provisions for the purpose of the «Electromagnetic Compatibility Directive (EMC)» 2004/108/EC.

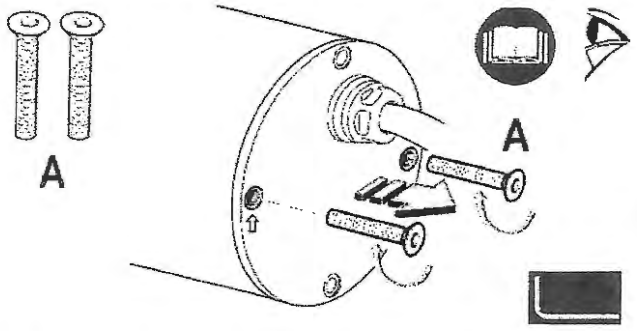
In conformity with IEC60034-1, the provisions of the EMC Directive must not be directly applied, as the electric motors are intended for incorporation as components and not as machines that are supplied directly to the end-user. Asynchronous three-phase and single-phase motors supplied from the line and running in continuous duty comply with standards EN 50081 and EN 50082 and no particular shieldings are necessary.
In case of jogging operation, any disturbance generated by insertion devices must be limited through adequate wirings (as indicated by the manufacturer of device).
Where motors are supplied by inverters it is necessary to follow the wiring instructions of the manufacturer of the inverter.
In case of design with encoder pay attention to following instructions: install the electronic control board as close as possible to the encoder (and as far away as possible from inverter; if not possible, carefully shield the inverter); always use shielded and twisted cables with ground connection at both ends; signal cables of the encoder must be separate from the power cables (see specific instructions of the manufacturer, attached to the motor).
All above mentioned components are designed to be incorporated into equipment or complete systems and should not be put into service before equipment or system has been made in conformity with the EMC Directive 2004/108/EC.

8. Periodic maintenance

If necessary, and periodically (depending on the environment and service) check and restore if necessary: periodically verify (according to environment and duty) and reset, if necessary; motor cleaning (absence of oil, dirt and machining residuals) and free passage of cooling air; correct tightening of electrical connections, of the tightening screws and of motor mechanical pairing; static

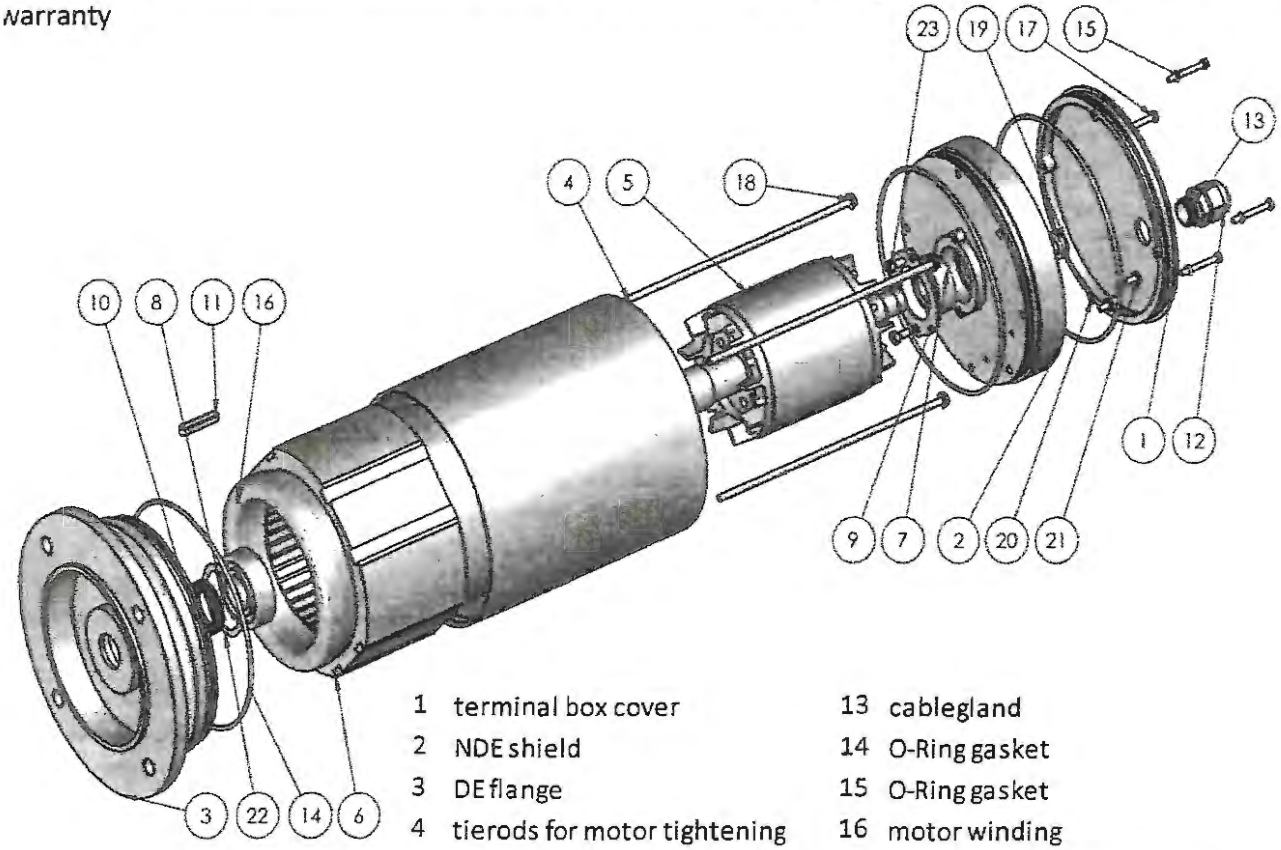
and dynamic seals conditions; that motor run is free from vibrations (veff < 3,5 mm/s) and anomalous noises; in that case, verify the motor tightening, the balancing of the paired machine or the need to replace the bearings; the lack of water inside the motor due to condensation, unscrewing the drain plugs (if present) and resealing them to ensure proper degree IP once downloaded any water.

In case of maintenance, to use the appropriate screws for the extraction of the cover, to be applied at the threaded holes marked with the arrows (see below). Do not lift the cover with screwdriver or other means, in order not to damage the cover and the related O-Ring gasket.



9. Extraordinary maintenance, exploded drawing of the motor , spare parts

If necessary, please contact our after-sales office, indicating the model and the parts to be replaced. The opening of the motor without specific authorization and appropriate instructions, will void any warranty



1 terminal box cover
2 NDE shield
3 DE flange
4 tierods for motor tightening
5 rotor with shaft
6 wound stator in the housing
7 NDE bearing
8 DE bearing
9 bearing locking ring
10 oil seal
11 key
12 cablegland cover
13 cablegland
14 O-Ring gasket
15 O-Ring gasket
16 motor winding
17 terminal box cover screws
18 grower washer
19 conduit bushing
20 ground symbol
21 ground screw and cable tie
22 wave ring
23 bearing locking screws