

HITEC

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Installation & Maintenance Guide

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GENERAL INFORMATION

The safety prescriptions of this manual must be observed in connection with electrical, mechanical and chemical-physical risks (electrical shock, injury by moving parts, etc.) to which machine users and operators are exposed.

HITEC accepts no liability for damage and injury caused by the non-observance of the prescriptions and instructions contained in the manual. The following are, in general, necessary:

- Check all rating plate data, especially voltage and winding connection (star or delta). Turn shaft by hand to check free rotation, remove transport locking if employed. Advise the manufacturer of any damage noted following transport, and do not put the motors into service.
- Install and use the motors only by using specialize personnel trained to perform mechanical and electrical installation and maintenance on the machines and equipment.
- Store this manual in place where it can not be damaged and is easy to find.

PURPOSE OF USE

The appliances described in this manual are induction electric motors, asynchronous type, with squirrel cage rotor, intended for use on industrially produced machinery operating on alternate current, low voltage, externally ventilated, and designed to operate at an altitude of maximum 1000m above sea level with a Normal ambient temperature limits -25°C to +40°C conforming to standards EN 60034. Low voltage motors are considered by directives 89/393/EEC (Machines Directive) as parts of the machine itself. It is absolutely forbidden to put the machine into operation if the final product does not conform to EN 60204-1 directive.

OPERATIONAL LIMITS AND CONDITIONS

Feed voltage: Single-phase or 3-phase alternate mains voltage as indicated in the nominal values on the data-plate. Voltage variations of $\pm 2\%$ are permitted under continuous duty.

Ambient temperature: In the range from -25°C to +40°C. For higher temperatures, a drop in permitted voltage of about 7% for every 10°C should be considered.

Height: The assigned nominal values apply up to 1,000m above sea level. At higher altitudes, the power produced falls by about 10% for every extra 1,000m.

Corrosive and tropical ambient: The data-plate states, if the motor was designed to operate in places with particularly severe conditions in terms to temperature and relative humidity.

Inflammable atmospheres and atmospheres with explosion risk: The motors are not designed to function in such places.

IP Class: See information on the data-plate. HITEC motors are usually in protection class IP 55.

Condensation: The motors are usually supplied without any anti-condensation holes.

Electrical and mechanical safety: The safety measures to be implemented specifically in connection with the machine or with the appliance used by the motor are not described in this manual. It is the responsibility of the person assembling the appliance on which the motor is installed, to make the machinery safe according to his/her risk analysis. The risk analysis must be conducted on the entire construction, taking into account the applicable provisions and the prescriptions in this manual.

Transport and Storage

Motors fitted with cylindrical-roller and/or angular contact bearings shall be fitted with locking devices during transport

Storage Conditions

Ambient temperature: In the range from -25°C to $+55^{\circ}\text{C}$. To avoid internal condensation and/or damage, when putting the motor into service, wait until motor temperature is the same as that of the use environment.

Relative humidity: Not exceeding 80% at 25°C .

Dust and physical/chemical stresses: The motor must be stored protected against the weather and in a vibration-free place, protected against impact abnormal settling of dusty and corrosive substances. It must not be exposed to direct sunlight. Also take care that the rust proofing protection (described further below) does not deteriorate.

Packing: Do not put the packed items one on top of the other on pallets. Unpacked and individually packed motors must be stored side-by-side and not one on top of the other. In any event, make sure that stability is good.

Shaft protection: Unprotected machined surfaces (shaft-ends and flanges) should be given anti-corrosion coatings. When it's exposed to a salty atmosphere or dust, apply rust proofing protection to the shaft, according to the following procedure: remove the protective cap from the shaft, clean the residue of the old coating, using appropriate solvents (petrol or benzene), dry, and apply a film of silicone-based oil.

When you are about to use the shaft, or if more than 6 months of storage life have elapsed, or if the shaft was damaged, proceed as follows:

-Run a visual check to see if the shaft is in good mechanical condition and is generally clean, making sure that the shaft can turn smoothly (with the exception of brake motors, where the shaft must be locked/braked).

-Measure isolation resistance, according to the provisions of standard EN60204-1 the minimum value must not be lower than $0,5\text{M}\Omega$, at a test voltage of 500Vcc .

If the conditions are unsatisfactory, please contact HITEC's technical service department.

Manual handling: The risks linked to lifting and manual handling of the motor must be prevented by the user, by specifically evaluating the risk of mechanically-induced injuries and risk prevention in the workplace. If the motor weighs more than 30kg, an adequate lifting appliance must, in general, always be used. The weight of the motor is indicated on the data-plate for every type of model.

Machine weights

Total weights for machines vary within the same frame size (center height) depending on different outputs, different mounting arrangements and different added-on special details.

The following table shows estimated maximum weights for machines in their basic versions as a function of frame material.

More accurate weight for a specific motor can be found on the rating plate.

Frame size	Aluminum Weight kg	Add for brake kg	Cast iron Weight kg	Steel Weight kg
63	6	5		
71	8	8	13	
80	12	10	20	
90	17	16	30	
100	25	20	40	
112	36	30	50	
132	63	55	90	
160	110	65	170	
180	160		250	
200	220		300	
225	295		400	
250	370		550	
280			800	600
315			1300	1000
355			2300	1600
400			3500	

Installation and Electrical Connection

Check the general condition of the motor before putting it into operation, with special reference to:

- Good state of preservation on the mechanical parts, including smooth rotation of shaft and fan.
- Good condition of anchoring points (flanges or feet)
- Good condition of the fan-cover
- Good condition of the surface coating

The characteristics of the application you intend to use must be compatible with the technical data on the data-plate and in the catalogue, and with the prescriptions and indications in this manual. Necessary checks during installation and commissioning:

- Check if all the electrical terminals connected to the terminal board are correctly connected (see item “Electrical connection”).
- Make sure that the data on the data-plate match the characteristics of the feed circuit to which the motor is connected.
- Observe the criteria of good construction and preventive technique, local regulations, and the specifications of the system.
- In case of incompatibility or uncertainty, do not put the motor into operation or service.

Installation

The indicated prescriptions on installation and mechanical connection must be observed.

- Position the motor in its assigned place and secure it with adequate fastening means, respecting its construction shape. The motor can, in general, be installed in any position. However protection against penetration of bodies in the fan compartment must be guaranteed. According to type of application, penetration can, for example occur through the grill of the fan-cover if the fan is at the top and through the interspaces between fan-cover and carcass if the fan is facing downward. Such penetration must be countered by an appropriate guard or by suitably location the fan in the installation structure.
- Before connecting mechanical parts to the shaft remove the protective layer from the shaft (as mentioned in “Storage conditions”).
- Key the mechanical elements onto the shaft, using adequate tools only.
- In the event of forced coupling and to avoid damaging the bearings, we advise you to use the cold-state procedure.
- For fitting and removing respectively. The coupling tolerances must be inline with ISO286-2 (UNI4399 can be used as a further application guide), taking into account the construction geometry of the shaft as indicated.
- For motors with a double output shaft, a rigid coupling on both sides must not be used

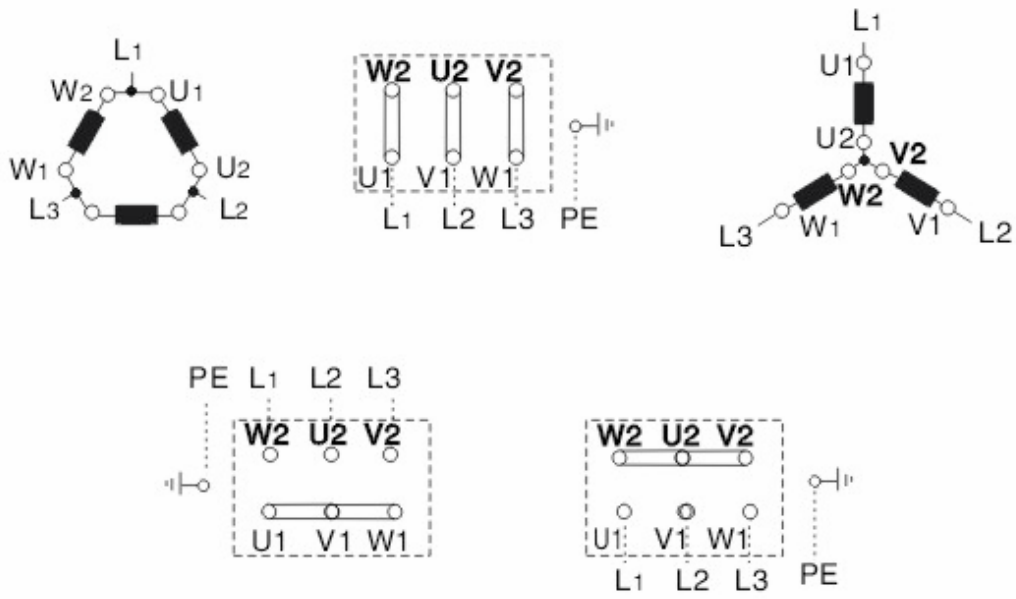


Figure 1: Connection diagram

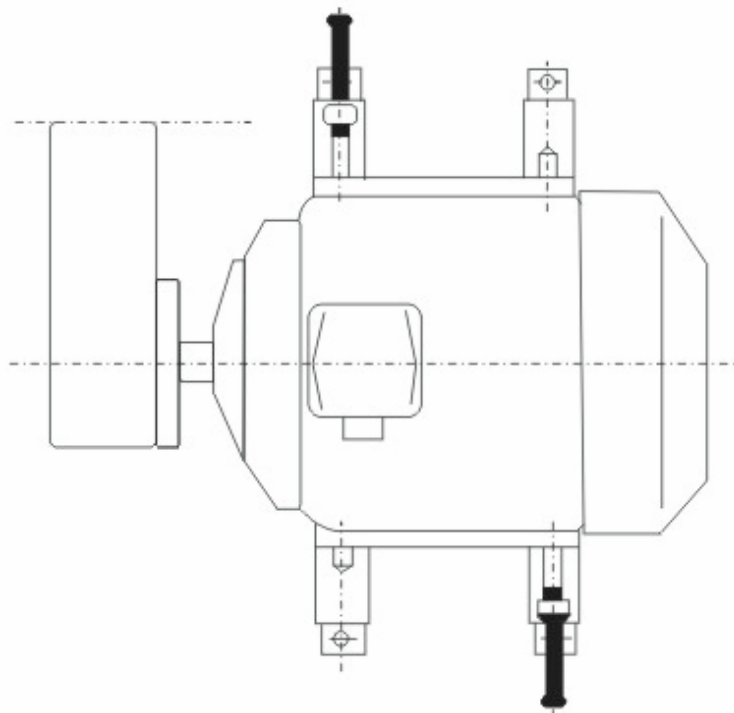


Figure 2: Belt drive

- Check correct alignment between motor shaft and the keyed-on rotating parts. In any event, make sure that these parts are statically and dynamically balanced (according to ISO1940-1); to avoid any unwanted moments and vibrations.
- When the shaft is connected to a joint, make sure that the misalignment does not cause static and/or dynamic imbalance.
- Make sure that the applied radial and axial loads are within the limits.
- After the electrical connection or on a provisional connection, check rotation direction with the shaft not mechanically engaged. The rotation direction of the motors can be modified for the single-phase version, by positioning the jumpers according to the indications of the connection shown in fig 1.
- In all non-special motors, rotation direction is in relation to the electrical connection according to EN6003-8, where the production standard is clock-wise motion. In any case, it should be empirically verified according to the specific application and the installation configuration.
- In the final operating situation, there must be sufficient free space around the fan to allow good air intake.

If the motor is supplied with a lifting eyebolt, remember that the safety requirements of the destination machine may include removal of the eyebolt (to prevent it from being used to lift the entire motor-appliance combination). The shaft of the electric motor, in common with guards, flanges, carcasses and mechanical parts conform to IEC72-1 in terms of dimensions and construction structure.

Electrical Connection

The type of power supply to the motor (three-phase/single-phase) is indicated on the data-plate. Connection should be made to the terminal box strictly with a cable (not with single conductors) equipped as follows:

- Copper diameter adequate for the maximum specified current. For thermal sizing and the drop in voltage of the power cables to the electric motor, please refer to standards EN60204-1 and EN60031-1, in addition to the criteria of good technique.
- Diameter of the cable suitable for the box cable-sleeve, to ensure that the IP class is maintained.

Insulation resistance check

Measure insulation resistance before commissioning and when winding dampness is suspected.

Resistance, measured at 25°C, shall exceed the reference value, i.e.

$R1 \geq \frac{20XU}{1000+2p}$ M ohm (measured with 500V dc meger)

Where U=voltage, volts; P=output power, KW

WARNING

Windings should be discharged immediately after measurement to avoid risk for Electric shock.

Insulation resistance reference value is halved for each 20°C rise in ambient temperature.

If the reference resistance value is not attained, the winding is too damp and must be oven dried.

Oven temperature should be 90°C for 12-16 hours followed by 105°C for 6-8 hours.

Drain hole plugs, if fitted, must be removed during heating.

Windings drenched in sea water normally need to be rewound.

Direct-on-line or star/delta starting

The terminal box on standard single speed machines normally contains 6 winding terminals and at least one earth terminal.

Earthing shall be carried out according to local regulations before the machine is connected to the supply voltage.

The voltage and connection are stamped on the rating plate.

Direct-on-line starting (DOL):

Y or Δ winding connections may be used. e.g. 660VY, 380V Δ indicates Y-connection for 660V and Δ -connection for 380V.

Star/Delta starting(Y/ Δ):

The supply voltage must be equal to the rated voltage of the machine in Δ -connection. Removed all connection links from the terminal block.

For two-speed and special machines, supply connection must follow the instructions inside the terminal box.

Terminals and direction of rotation

Direction of rotation is clockwise when viewing the shaft face at the machine drive end, when the line phase sequence L1, L2, L3 is connected to the terminals as shown in the figure 1.

To alter the direction of rotation, interchange the connection of any two line cables.

If the machine has an un-directional fan check that the direction of rotation is according to the arrow marked on the machine.

The electrical connection prescriptions must be observed.

- Do not temper with the contact box or in any way alter its tightness and penetration resistance characteristics.
- Make the connections with an eyelet type terminal, strictly using the supplied. Observe the following minimum air distances for phase-phase and phase carcass according to the specifications of IEC60664-1.
- When closing the contacts box after every job, make sure that it is clean and check the following: no foreign bodies inside the box; no dust, humidity or contamination in general; seal correctly positioned, screws well tightened. Power up the motor only after the contacts box has been closed.
- Protection against overloading must be effected in relation to the specific use, load conditions and to the legal regulations applicable to the motor appliance combination. Said protection must be set according to the motor's rated current, taking into account any start-up transients or overloading with special characteristics. The protection can be obtained by using a thermal relay.
- You are recommended to protect the windings with a thermistor or bimetal device, when the motor is located in a poorly ventilated place, or in connection to the legal regulations applicable to the motor-appliance combination.
- The external protective devices must, in any event, be supplied by the motor user according to the analysis of the risk of the motor-appliance combination. The protective devices must be adapted to the overloading conditions, and described under item "Operation".
- The earth connection (PE) must be made before the phase connections, by securing the earth conductor with terminal to the blind hole marked on the terminal board and using the supplied screw. The nominal connection pint is inside the contact box. However, another PE connection point is provided on carcass.
- Use conductors of adequate diameter, according to the diameter of the phase conductors, e.g. according to EN60204-1.
- At the first start-up, with the motor mechanically disconnected, check if the rotation direction is correct. This is in addition to the check indicated during the mechanical installation.

HITEC motors electrically conform to EN60034-1. Applications with power feed at variable voltage or frequency must be expressly agreed when ordering.

The normal machine design is with terminal box on top and with cable entry possibilities from both sides.

Some machines are available as special solutions, with top mounted terminal boxes rotatable

4×90, and some with side mounted terminal boxes.

Availability of these solutions is described in the product catalogues.

Unused cable entries must be closed.

Besides the main winding and earthen terminals the terminal box can also contain connections for thermistors, standstill heating elements, bimetallic switches, or PT100 resistance elements.

WARNING

Voltage may be connected at standstill inside the terminal box for heating elements or direct winding heating.

Connection diagrams for auxiliary elements are found inside the terminal box cover.

WARNING

The capacitor in single-phase motors can retain a charge which appears across the motor terminals, even when the motor has reached standstill.

Commissioning

In his/her capacity of assembler of complex appliances or machinery, the user has the responsibility to ensure the safety of his/her construction according to the provisions of the applicable EU directives to the instructions for the product and to national legal regulations. The safety prescriptions supplied with this manual can be used and should be borne in mind for that purpose, but strictly concern the motor in its expected, generic use.

The indicated test prescriptions must be observed.

- During the load less tests, restrain the motor shaft tab, to prevent it from being expelled by centrifugal force, and causing serious damage. To this end, you may leave on the protection cap with which the motor is supplied.
- Check if the bearings are moving smoothly.
- During operation, the motor-appliance combination must not be subjected to excessive vibrations (as mentioned in item "Installation"). An adequate check is necessary to this end. If necessary, stop the motor and check the balance of the coupled assemblies, the stability and rigidity of the base or structure on which the motor is secured, and/or the fastening elements.
- Motors equipped with a brake are adjusted and inspected without any load applied and, therefore, the air gap must be re-checked during commissioning, in order to compensate for any settling due to the coupling of motor to machine. For the procedure for this operation, consult the catalogue and/or the lay-out annexed to the motor.

Foundation

The purchaser bears full responsibility for preparation of the foundation.

Metal foundations should be painted to avoid corrosion.

Foundations shall be even and sufficiently rigid to withstand possible short circuit forces. They shall be dimensioned as to avoid the occurrence of vibration due to resonance.

Foundation studs

Bolt the foundation studs to the feet of the motor and place a 1-to-2mm shim between the stud and the feet.

Align the motor directly using appropriate means.

Grout the studs with concrete, check alignment and drill holes for locating pins.

Drain holes

Check that open drain holes face downwards when the mounting designation differs from standard.

Machines with closable plastic drain plugs are delivered with these in the open position. In extremely dusty environments all drain holes should be closed.

Alignment

Correct alignment is essential to avoid bearing failures, vibrations and possible fractured shaft extensions.

Slide rails and belt drives

Fasten the machine to the slide rails as shown in figure 2 on **page**

Place the slide rails horizontally on the same level.

Check that the machine shaft is parallel with driven or driving shaft

Belt to be tensioned according to suppliers instructions.

WARNING

Excessive belt tension will damage bearings and can cause shaft breakage.

Do not exceed the maximum belt forces (i.e. radial bearing loadings) stated in the relevant product catalogues.

Operation

For the operating conditions, see item “Intended use”.

The motor is started by supplying voltage at nominal value to the phase terminals. The motor is stopped by cutting power to all the phase circuits connected to the terminals.

The overloading conditions possible on the motor conform to standard EN60034-1 according to type of duty (this information can be obtained from the data-plate and catalogue).

For radial and axial loads, consult the catalogue. The surface of the motor's external housing can reach high temperatures. They are high enough to put in place protective measures against burns by contact in relation to the construction and operational characteristics of the motor-appliance combination, according to the specific risk analysis conducted by the assembler and, possibly, according to standard EN563. The temperature of the housing of the ventilated models does not usually exceed 75°C (85°C in versions without a fan).

Run a periodic check to see if there are any deposits and if dust has settled on the carcass or motor housing, to avoid a worsening of thermal exchange and overheating.

Remember that the capacitor supplied with the single-phase models entails unforeseeable explosion risks, however minimal they may be. Although the consequences, in addition to the destruction of the component, are very slight, the user of the motor must bear this possibility in mind when analyzing the risk referred, for example, to the location and lay-out of the motor.

Maintenance Methods

Before attempting any maintenance jobs on the electric motor or on parts of the motor-appliance combination nearby, make sure you obtain positive answers to the following checks:

- The electrical feed circuit must be clearly and visibly switched OFF and under the control of the maintenance person.
- All mechanical masses kinematically connected to the motor shaft must be idle, and no possibility of unexpected starting due to the shaft being rotated by external mechanical parts.
- If the motor is excessively noisy while operating, check if the bearings are worn and replace them if necessary.

Periodic Inspections

The following inspection and maintenance operation must be carried out every 2,000 hours, or following any faults.

- Check if the motor is connected to its mechanical load.
- Visually check if the electrical phase and PE Connections are sound.
- Check if the free ventilation space mentioned in item “Installation” is always available.
- Cleaning the motor. Vacuum clean. Never expose the motor to water jets or immerse it.
- Grease the bearings of models which, according tot the catalogue, require it – such models are supplied with a greasing device. Use products with the characteristics indicated on the following table.

Lubrication

Machines with permanently greased bearings

Machines up to frame size 180 are normally fitted with permanently greased bearings of either Z or 2Z types.

Bearing types are specified in the respective product catalogues.

Machines fitted with Z- bearings can be re-greased by dismantling the machine, cleaning the bearings and bearing housings, and filling these with new grease to 50-70%.

Guidelines for re-greasing intervals are
 20 000 - 40 000 duty hours for ≥ 4 pole machines
 10 000 – 20 000 duty hours for 2 and 2/4 pole machines.
 The shorter times are valid for larger frame sizes.

Machines fitted with grease nipples
 Lubricate the machines while running.

If grease outlet plug fitted, remove temporarily when lubricating, or permanently with automatic lubrication.

If the machine is fitted with a lubrication information plate, follow the values given, otherwise use values as follows:

Ball bearings Lubrication intervals in duty hours

Frame size	Amount of grease in gms	3600 r/min	3000 r/min	1800 r/min	1500 r/min	1000 r/min	500-900 r/min
112,132	15	4200	4800	7000	7800	10000	10500
160,180	20	3200	4200	6000	7000	9000	10000
200,225	25	1800	3100	5500	6500	8500	9000
250,280	35	800	2000	5000	6000	8000	8500
315	50	800	2000	4600	5500	7000	8000
355	60		1000	4000	5000	7000	8000

Roller bearings Lubrication intervals in duty hours

Frame size	Amount of grease in gms	3600 r/min	3000 r/min	1800 r/min	1500 r/min	1000 r/min	500-900 r/min
200,225	25	900	1500	4300	5000	6500	7000
250,280	35	400	1000	3300	4500	6300	6800
315	50	400	1000	2700	3800	6000	6500
355,400	60			2200	3200	5500	6000

The table is prepared for horizontally mounted machines.

Lubrication intervals for vertical machines are half of the above values.

The grease amount in the table is used if small quantities of fresh grease are replaced at regular intervals as above.

As an alternative when the machines are fitted with grease escape valves, fresh grease may be pressed into the bearings until the old grease is totally replaced.

The table values are based on 80°C bearing temperature.

The values should be halved for every 15k increase in bearing temperature.

If the maximum bearing temperature is 70°C, the table values may be doubled.

WARNING

The maximum operating temperature of the grease and bearings must not be exceeded.

Higher speed operation, example frequency converter applications, or slower speed with heavy loading will require shortened lubrication intervals. Consult Y2 Machines in such cases.

Typically a doubling of speed will require a reduction of lubrication intervals to approx. 40% of values tabulated above.

Suitability of bearings for high speed operation must also be checked.

Lubricants

When re-greasing, use only special ball bearing grease with the following properties:

- good quality lithium base or lithium complex grease
- base oil viscosity 100 – 140 Cst at 40°C
- consistency NLGI grade 2 or 3
- temperature range –30°C - +120°C, continuously

Greases with the correct properties are available from all the major lubricant manufacturers.

If the make of grease is changed and compatibility is uncertain, lubricate several times at short intervals in order to displace the old grease.

Highly loaded and/or slowly rotating bearings require EP-grease.

If lubrication intervals are short due to bearing temperatures of 80°C or above, use high temperature greases which normally permit approximately 15 K higher bearing temperature.

If the ambient temperature is below -25°C consult Y2 Motors regarding the possible use of low temperature grease.

NOTE:

For high speed machines (e.g. larger 2-pole machines), check that the f_n factor of the grease is sufficiently high.

$$f_n = D_m \times n$$

D_m =average bearing diameter (mm)

n =rotational speed(r/min)

Many types of grease can cause skin irritation and eye inflammation.

Follow all safety precautions specified by the manufacturer.

Recommended Lubricants

Ambient temperature	VISCOL	SHELL	MOBIL
- 45° + 100°C	Stintplex It	Aero Shell oppure Grease 22	Mobiltemp oppure Shc 22

- In the case of brake motors, wear of the friction seal makes it essential for the air gap to be periodically checked and, if necessary, adjusted, according to the methods described in the catalogue and/or in the lay-out annexed to the motor (FPC type).

If penetration by liquids or humidity occurs, the extraneous liquids must be eliminated and the motor must be dried by heating with an external heat source.

If the period elapsing between supply and commissioning is over 4 years under favorable storage conditions (a dry place without any dust and vibrations), or over 2 years under unfavorable conditions, the bearings must, in any case, be replaced. In any event, storage conditions must be compatible with the specifications of item "Storage conditions".

Assembly and dismantling

General

Dismantling and assembly of machines must be carried out by qualified personnel using only suitable tools and working methods.

Bearings

Special care shall be taken with the bearings. Bearings shall be removed using pullers and fitted by heating or the use of specialized tools for the purpose. Change of bearings is described in detail in a separate instruction leaflet available from Y2 Motors.

Fitting coupling halves and pulleys

Coupling halves and pulleys shall be fitted using suitable equipment and tools that do not damage the bearings.

Never fit a coupling half or pulley by hammering into place or remove it using a lever pressed against the body of the machine.

Mounting accuracy of coupling half:

Check that the clearance **b** is less than 0.05mm and that the difference **a1** to **a2** is less than 0.05mm also.

See figure 3

Balancing

The rotor of the machine is dynamically balanced.

As standard, balancing has been carried out using a full key and the shaft face is marked with "F".

Usually the balancing is half-key balance.

To avoid vibration the coupling-half or pulley must be balanced without a key after the key way has been machined.

To repair the motors, we recommend the use of original spare parts.

Any repair jobs carried out during the guarantee period must be approved by the manufacturer.

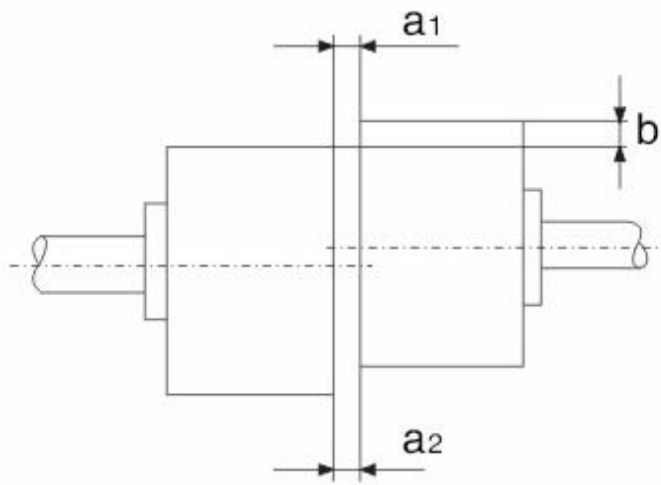


Figure 3: Mounting of half-coupling or pulley

Spare Parts

When ordering spare parts, the full type designation and product code as stated on the rating plate must be specified.

If the machine is stamped with a serial manufacturing number, this should also be given.

Environmental requirements

Noise levels

Smaller machines have a sound pressure level which does not exceed 70 dB (A).

The following table indicates those frame sizes where sound pressure levels at 1 m from the machine surface can exceed 70 dB(A).

Values for specific machines can be found in the relevant product catalogues. The table values refer to 50HZ sinusoidal supply conditions.

Frame Size	Guideline sound pressure level (DBA)			
	2 POLE	4 POLE	6 POLE	8 POLE
132	72	-	-	-
160	72	-	-	-
180	72	-	-	-
200	72	-	-	-
225	74	-	-	-
250	75	-	-	-
280	77	-	-	-
315	80	71	-	-
355	83	80	75	75
400	83	80	75	75

For 60HZ sinusoidal supply, add 4 dB (A) to the above values.

For sound pressure levels with non-sinusoidal supplies, contact Y2 Motors.

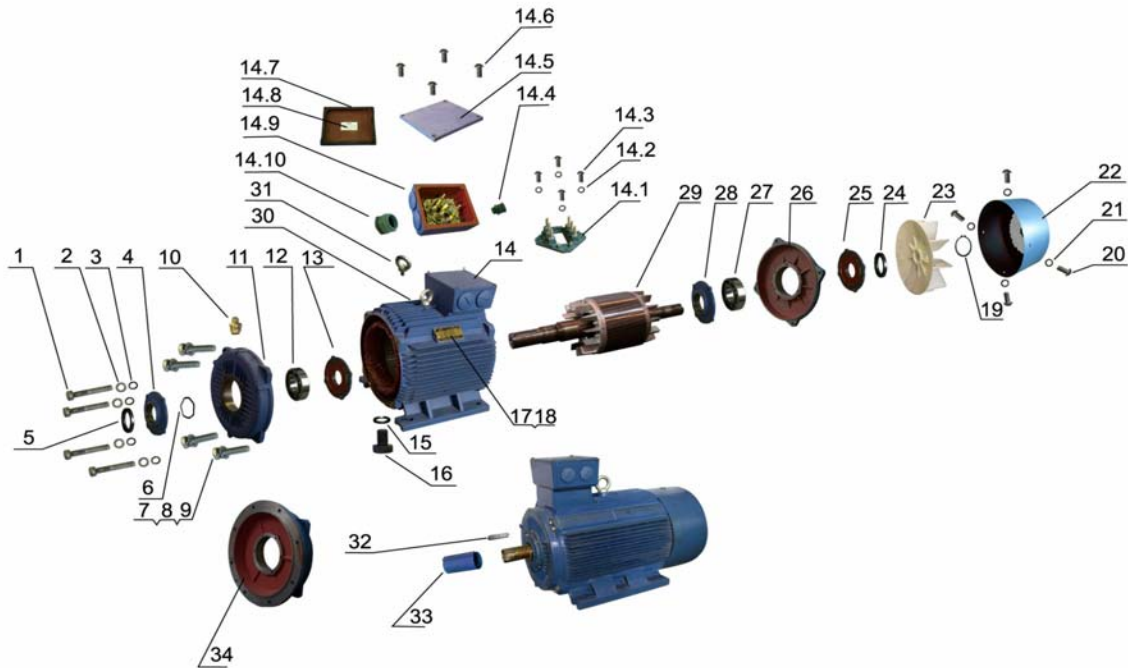
Disposal

When put out of service, the motor is (in the EU) considered as non-dangerous special waste according to Law Decree 22/97, code CER 160205. It can be conveniently disposed of by entrusting it to a specialized company authorized to collect waste and recover and recycle goods and materials under the provisions of law.

Plastics materials and packing cartons can be assimilated with ordinary city waste (code CER 200101 or 200103) and, in general, can be put in public waste bins for differentiated collection. However, it is good practice to first consult the local public service.

HITEC

COMPONENTS



- | | |
|-----------------------------|--------------------------|
| 1, Bolt | 14.9 Terminal box holder |
| 2, Washer | 14.10 Cable inlet |
| 3, Washer | 15, Seal ring |
| 4, Bearing cap | 16, Plug screw |
| 5, Seal ring | 17, Nameplate |
| 6, Wave form elastic washer | 18, Rivet |
| 7, Bolt | 19, Retainer ring |
| 8, Washer | 20, Bolt |
| 9, Washer | 21, Washer |
| 10, Oil cup | 22, Fan cover |
| 11, End cover | 23, Cooling fan |
| 12, Bearing | 24, Seal ring |
| 13, Bearing cap | 25, Bearing cap |
| 14, Terminal box | 26, End cover |
| 14.1 Connecting board | 27, Bearing |
| 14.2 Washer | 28, Bearing cap |
| 14.3 Screw | 29, Rotor |
| 14.4 Cable inlet | 30, Stator |
| 14.5 Terminal box cover | 31, Eyebolt |
| 14.6 Screw | 32, Key |
| 14.7 Terminal box seal | 33, Shaft sleeve |
| 14.8 Connecting diagram | 34, Flange |

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