



- 56 FRAME SIZE 3 PHASE ASYNCHRONOUS MOTORS
- 63 FRAME SIZE 3 PHASE ASYNCHRONOUS MOTORS
- 71 FRAME SIZE 3 PHASE ASYNCHRONOUS MOTORS
- 80 FRAME SIZE 3 PHASE ASYNCHRONOUS MOTORS
- 90 FRAME SIZE 3 PHASE ASYNCHRONOUS MOTORS
- 100 FRAME SIZE 3 PHASE ASYNCHRONOUS MOTORS
- 112 FRAME SIZE 3 PHASE ASYNCHRONOUS MOTORS
- 132 FRAME SIZE 3 PHASE ASYNCHRONOUS MOTORS
- 160 FRAME SIZE 3 PHASE ASYNCHRONOUS MOTORS
- 180 FRAME SIZE 3 PHASE ASYNCHRONOUS MOTORS
- 200 FRAME SIZE 3 PHASE ASYNCHRONOUS MOTORS
- 225 FRAME SIZE 3 PHASE ASYNCHRONOUS MOTORS
- 250 FRAME SIZE 3 PHASE ASYNCHRONOUS MOTORS
- 280 FRAME SIZE 3 PHASE ASYNCHRONOUS MOTORS
- 315 FRAME SIZE 3 PHASE ASYNCHRONOUS MOTORS
- 355 FRAME SIZE 3 PHASE ASYNCHRONOUS MOTORS
- 400 FRAME SIZE 3 PHASE ASYNCHRONOUS MOTORS
- 450 FRAME SIZE 3 PHASE ASYNCHRONOUS MOTORS

PRODUCER

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SERVICE AND SPARE PARTS

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**GENERAL INFORMATION**

This instruction includes Cage Three-Phase Asynchronous Motors which is produced according to "IEC" advice with totally-enclosed low voltage for general use purposes. The motors are generally designed for continuous running duty (S1) at cooling-air temperatures in the range of -30°C to +40°C and at site altitudes not exceeding 1000m above sea-level.

To prevent injury and/or damage during the installation of Electric Motors in heavy shafts, the basic planning work for installation, transport, assembly, commissioning, etc. must be done and checked by authorized and competent personnel only. The national, local and plant general erection and safety regulations must also be considered.

Low voltage motors are defined as components for installation in machinery in terms of the Machinery Directive 2006/42/EEC. Our motors, provided they are correctly installed as our Operating Instructions and Safety Regulations, comply with this directive. Additionally it must be ensured that the end product also conforms to this directive prior to commissioning. (EN 60204-1)

LIFTING

Use the eye-bolt provided only, DO NOT lift a machine set with a base-plate with the motor eye-bolt. Ensure the lifting gear has the carry capacity.

STORAGE

Motors must be kept in a dry and vibration free, clean, well-ventilated room if they have to be stored for a long period. Rotate shaft every other week. The insulation resistance must be checked and the windings must be dried if necessary before the motors are taken into operation. (Please refer to the "INSULATION RESISTANCE" paragraph).

VENTILATION/COOLING

Motors are surface cooled by means of an external radial flow fan which ventilates the motor irrespective of rotation. The flow of cooling-air over the motor should NOT be obstructed. Special protective measures have to be taken against extremely severe outdoor climatic conditions in case of motors installed vertically, or, if motors are exposed to direct sun-rays.

INSTALLATION AND OPERATION

Isolate the motor from the power-supply before working on it.

MOUNTING

The motors should always be mounted on a flat, vibration-free base. All motor feet must rest positively on their entire surface.

ALIGNMENT

Motors must always be accurately aligned and this applies especially where they are directly coupled. Incorrect alignment can lead to vibration, bearing failure, and even shaft fracture. It is also recommended to re-check the alignment at the thermal equilibrium temperature of the motors.

TRANSMISSION COUPLINGS AND PULLEYS (SHAFT FITMENTS)

The permissible mechanical forces given in the catalogue should not be exceeded when using Shaft Fitments which exert radial or axial shaft loads during operation. Flexible couplings only should be used as the rigid couplings will necessitate a special bearing design.

Shaft fitments should be fitted and removed only by means of suitable devices. The bearings must by no means be subjected to any pressure or shock. If a belt drive is used, install the motor on slide-rails to permit the correct adjustment of belt tension. With a belt drive, the shafts must be parallel, the pulleys must be in line and the lower part of the belt must be pulling. Excessive belt tension may cause damage to shaft and bearings. Please refer to catalogue for selection of SLIDE-RAILS and BELT-PULLEYS.

shaft key must be well secured against flying out, when the motor is operated prior to a shaft fitment bearing fitted to the shaft extension.

BALANCING

Shaft and rotor assemblies are dynamically balanced with half shaft key. Shaft fitments such as couplings, pulleys and fans should be balanced likewise to prevent undue vibration and adverse effects on bearing life.

The shaft key must be well secured against flying out, when the motor is operated prior to a shaft fitment bearing fitted to the shaft extension.

INSULATION RESISTANCE

Before an electric motor is commissioned for the first time or after a long period of storage/standstill period, the insulation resistance of each phase earth should be measured with 500 Volt DC for 1 minute maximum until the final resistance value is indicated.

During and immediately after measuring, the terminals must not be touched as they may carry residual dangerous voltages. Furthermore, if power cables are connected, make sure that the main supply is clearly disconnected. This applies both the main and auxiliary circuits and particularly to the anti-condensation heater circuits.

Dry windings as new have insulation resistance values much higher than the minimum limit of 10MΩ. The insulation resistance of the motor windings may decrease after long periods of operation due to damp and dirty operating conditions. Then the minimum insulation resistance value, at room temperature of 25°C, should always be above the specific critical resistance value of 0.5 MΩ/kV.

I.e. Rated voltage in kV X specific critical resistance value of 0.5 MΩ = minimum insulation resistance of motor windings. The motor must not be allowed to be operated until appropriate precautions are taken if the measured resistance is below the minimum value. Lower values normally indicate the presence of moisture/dirt in the windings which should be dried/cleaned. (Please see Insulation Resistance Section of the Operating Instructions & Safety Regulations).

ELECTRICAL CONNECTIONS

All the terminal boxes comply with the degree of protection to IP 65, and they are placed to the front and on top of the motor frames, allowing an easy cable entry from sides. In the basic design, the motors have six fixed terminals, and they are fitted with an earthing-screw inside the terminal-box. A connection diagram is provided in the cover of each terminal box. The supply cable must be connected in accordance with the connection diagram. Always ensure that the power supply matches with the name-plate data. The cross-section of a supply cable should be selected as required on the basis of rated current and plant specific conditions. Connection of the supply cable must be secured with special care to ensure a permanent and reliable contact. Locknuts are provided on terminal pins in order that connections remain permanently tight (Loose connections will cause excessive heat and lead to motor failures). All cable supports have to be mounted properly to prevent sagging or twisting of the supply cable. Unused entry openings should be closed off firmly by plugs. Check all sealings and surfaces are fitted correctly and are in perfect condition. Replace if damaged.

DIRECTION OF ROTATION

All motors are suitable for operation in both directions of rotation.

When viewed from the Drive-End, the motor will rotate clockwise if the power supply phase conductors: L1, L2, L3 are connected to terminals U1, V1, W1. If the connections of terminals are reversed, the motor will rotate anticlockwise.

Check the direction of rotation, by switching quickly ON/OFF prior to coupling the motor.

COMMISSIONING

The following checks/tests should be performed after installation:

- Insulation and operating conditions comply with the name-plate data.
- Machine correctly installed and aligned.
- Shaft Fitments properly fitted.
- Insulation resistance to be satisfactory.
- Direction of rotation.
- Cooling air-flow not obstructed.
- Ensure rotor rotates freely.
- Ensure all fastening elements and electrical connections are tight.
- Earthing connections properly made.
- Proper lubrication of bearings.
- Additional attachments are fitted, properly connected and serviceable.
- All protective precautions against contact with moving or live parts are taken.
- Any built-on brake properly fitted connected and serviceable.
- Start up the motor at no-load until full speed is reached.

- Noises and vibrations at the bearings / endshields
- Disconnect the motor if it does NOT run smoothly or if any unusual noises are experienced.
- Determine the cause of the defects as it decelerates, during which if the defect is eliminated the cause will be of a magnetic of electrical nature. Otherwise, the cause is mechanical.
- Motor is loaded at its rated output if it performs satisfactory. Observe the running smoothness, and record the supply voltage as well as performance data of motor.
- The temperature of winding, bearing etc. Until the thermal equilibrium is reached.
- To shut down the motor, switch-off the circuit breaker and let it come to rest without braking and switch-on the anti-condensation heater, if equipped.

To avoid any damage or injury, when the thermal protection system responds during the cooling down the drive unit, temperature sensors should be connected and controlled in such a way that any unexpected automatic restarting of the motor is prevented.

The above check list cannot over every possible eventuality when commissioning. Therefore, further measures may have to be taken by the installation/commissioning engineer that recognizes the particular plant/size conditions and associated supplementary instructions.

BEARINGS

Motors of frame size 56...280 have double shielded ball-bearings (ZZ) which are factory greased and sealed for life. They have to be replaced as they cannot be re-greased.

Motors of frame size 315...450 have open type bearings with nipples for re-lubrication during operation. Initially, grease type of SHELL ALVANIA RT3 is used for lubrication during assembly of motors. The type/size of bearings for motor sizes and the permissible mechanical forces are specified in the catalogue.

LUBRICATION

The type of grease, its quantity and re-lubrication interval of motors equipped with greasing nipples are indicated on the nameplate. However, irrespective of the operating hours, the grease should be changed after 3 years of operation at the latest due to ageing. In general, different brands/types of grease must not be mixed. Mixing grease with different type of thickeners may destroy its composition and physical properties. Even if the thickeners are of the same type, possible differences in the additive may cause detrimental effects. To allow the new grease to be evenly distributed inside the bearing, the bearings need to be greased whilst the motor is running. Initially the bearing temperature will rise significantly and then drop to its normal value after the excess grease has been displaced from the bearing.

REPLACEMENT

Remove ball-bearings by means of an extraction device after slightly heating the inner ring. Never use a hammer. The inner ring of cylindrical roller bearings should be heated quickly by means of a torch and then levered-off by a screw driver. If after taking this action, it still does not come off, grind a V-shaped groove into the inner ring and break it. Before installing the bearings, make sure that the shaft mounted parts inside the bearings are in place before installation. Use extreme care and ensure clean conditions during installation and assembly. Heat the ball bearings or the inner ring of the roller bearings in oil or air to a temperature of approx. 80 °C and slip them. Heavy blows will damage the bearings and must definitely be avoided.

SEALINGS

V-ring dust seals and radial shaft seals (Oil-seals) are pushed into place by means of an appropriate assembly tool. Contact faces of both sealings should be greased. The correct axial position of V-ring dust sealings has to be attained to prevent damage due to excessive friction.

SPARES

Always replace the damaged components with the genuine spare parts.

The spare-parts are fully interchangeable as they are designed and manufactured to fine limits on their dimensional tolerances.

Please state motor type, serial number, type of construction / mounting arrangement and, part number with full description when ordering spare parts.

FOR DETAILED IMPLANTING, OPERATION, COMMISSIONING, MAINTENANCE INSTRUCTIONS, PLEASE CONTACT TO **GAMAK** FOR MOTOR CATALOGUE AND OPERATING MAINTENANCE INSTRUCTION MANUAL.

**WARRANTY CERTIFICATE****FOR YOUR INFORMATION:**

- In accordance with Article 56 of Consumer Protection Law No. 6502, which was promulgated in the Official Gazette numbered 28835 dated November 28, 2013, and entered into force on May 28, 2014, the Ministry's approval of warranty certificates is no longer required.
- Manufacturers and importers can issue their own warranty certificates, provided that they comply with Law No. 6502 and the Warranty Certificate Regulation.
- The provisions in the warranty certificate are only valid for sales where one of the parties is a consumer.

MANUFACTURER AND IMPORTER'S:

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PRODUCT

TYPE : ELECTRIC MOTOR
BRAND : GAMAK
MODEL : -
SERIAL NUMBER : -
DATE AND PLACE OF DELIVERY : -
WARRANTY PERIOD : 2 YEARS
REPAIR PERIOD WITH WARRANTY : 20 BUSINESS DAYS

SELLER'S:

COMPANY NAME :

ADDRESS :

PHONE :

TELEFAX :

INVOICE DATE AND NUMBER :

WARRANTY TERMS

GAMAK MAKİNA SAN. A.Ş., ("Gamak") warrants this product ("Product") against production failures for two (2) years ("Warranty Period") from its delivery to the first end user on purchase from Gamak or one of its authorized dealers, on the terms and conditions below:

- 1- This warranty covers all the components of the Product, as delivered by Gamak.
- 2- The repairs to be carried out under this guarantee shall be completed within a maximum of 20 working days (for Türkiye) from the date of notification of the defect to Gamak. The time required for repair shall be added to the Warranty Period.
- 3- Any defects identified during the Warranty Period shall be remedied by Gamak, at its sole discretion, by repair or replacement and without any expenses incurred by Gamak. During the Warranty Period, (i) the occurrence of the same defect for two (2) or four (4) times, the repair is impossible and the determination of this in a report to be prepared by Gamak or its authorized service center; (ii) if the repair is not completed within 20 days, the Product shall be replaced.
- 4- This warranty shall not apply to the damages or failures caused by or related to (i) handling, loading, unloading or carriage of the Product; (ii) normal wear and tear; (iii) installation or use of the Product contrary to the conditions set out in its manual; (iv) faulty wiring and/or electrical installation; (v) the electric supply; (vi) any accident, lightning, ingress of water, fire or force majeure events or improper ventilation, dropping or excessive shock or any external cause beyond Gamak's control and/or tampering of the Product by an unauthorized agent, (vii) improper maintenance, dismantling the Product or intervening the motor shaft.
- 5- Gamak's liability is limited to the repair or replacement of the Product as provided herein. Gamak shall not be liable for any loss or damages, including consequential, indirect or incidental damages or third party claims arising out of the use of, or inability to use, the Product or for breach of any express or implied warranty or condition. Under no circumstances shall Gamak be liable for an amount greater than the actual purchase price of the Product.
- 6- This warranty has been given in favor of the first user who purchased the Product from Gamak or its authorized dealer, and the transfer of the rights of warranty it contains is not possible.