

# USER INSTRUCTIONS

## 1. TECHNICAL DESCRIPTION

Motors of series MS, MY, MYT, 56, 63, 71, 80, 90, 112, 132 are asynchronous motors with squirrel cage rotor. Standard motors have protection class IP55 or IP56 (special requirements). They are designed for continuous duty S1. Motor housing components are made of aluminum alloy EN AC-44300 (AK11), except the fan cover, which is made of steel sheet. The motor connection is located in the terminal box.

Connect the motor to the power supply and protective contact. A protective conductor "PE" or "PEN" is required when using automatic disconnection in TN, TT, IT systems.

The terminal box is equipped with an insulating gland through which the power cable passes and is sealed. For single-phase motors, in series with an auxiliary winding, a working capacitor made of metallized paper is included and connected to the terminals of the connection plate. Motors are designed for horizontal operation. They can also be used in vertical position with the shaft end pointing up or down, provided that the axial load on the bearing is low, resulting from the weight of the rotor, pulley, coupling or fan mounted on the motor shaft. If motors have condensation holes, condensate is removed through rubber plugs in horizontal position. Motors are self-cooled. The maximum ambient temperature in which the motors operate depends on climatic classification and must not exceed:

313K (+40°C) for temperate climate N / 2, N / 3 and humid tropical TH / 2, TH / 3,  
318K (+45°C) for marine climate MU / 2, MU / 3.

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## 2. OPERATING CONDITIONS

Motors of series MS, MY, MYT, 56, 63, 71, 80, 90, 112, 132 are squirrel cage motors. These are general-purpose motors intended for use in various machines or equipment. The motor housing, designed for protection class IP55 (IP56), protects the motor against ingress of solid particles or water according to PN-EN 60034-5 standard. Condensate should be drained every 12 months or every 3 months under harsher operating conditions.

Motors are started by direct connection to the power supply. Motors can operate with voltage fluctuations not exceeding 5% of the rated voltage. All rated data refer to nominal voltage. If voltage fluctuations exceed 10% of nominal voltage, the motor must not be started. Deviation from this rule is allowed only if the motor has sufficient thermal reserve.



Each motor must be protected against overload and short circuit using protective measures applied by the user in accordance with PN-89/E-05012 or manufacturer recommendations. The use of protection depends on the device and must comply with PN-HD 60364-4-41.

Drive components directly connected to the motor shaft must be dynamically balanced with an accuracy of at least 5  $\mu\text{m}$ .

## 2.1. PREPARATION OF THE MOTOR FOR CONNECTION

Before installing the motor on the device, check:

- a) whether the motor rotor rotates freely,
- b) whether the drive components are directly connected to the motor shaft and are dynamically balanced.
- c) mount driven elements on the motor shaft by sliding or with light pressure; otherwise bearings may be damaged. During this process, the motor shaft should be firmly supported from the fan side to prevent damage to the spring washer and misalignment of the rotor axis.
- d) check whether the motor is blocked during operation and whether there is sufficient minimum clearance (at least 20 mm) between the fan axis and other components.

**Warning: Airflow must not be blocked.**

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## 2.2. CONNECTION OF THE MOTOR TO THE POWER SUPPLY

### 2.2.1. THREE-PHASE MOTORS:

a) for rated voltage 230 / 400V, connection is possible:  
to a 3x 400V  $\pm 5\%$ , 50Hz  $\pm 2\%$  network with motor windings connected in star (Y).  
For 3x 230V  $\pm 5\%$ , 50Hz  $\pm 2\%$  networks, windings are connected in delta ( $\Delta$ ).

b) motors designed for other voltages (voltage variations) may be connected to a network with line voltage U corresponding to the value stated on the motor nameplate.

$$U = U_n \pm 5\%, f = f_n \pm 2\%$$

Three-phase motors 132, 112, 100, 90, 80, 71, 63 are manufactured as:

- a) single-speed motors with number of poles:  $2p = 2, 4, 6, 8$ ,
- b) two-speed motors with pole combinations:  
 $2p = 4/2$  single winding,  
 $2p = 8/4$  single winding,  
 $2p = 8/6$  double winding,



2p = 6/4 double winding,  
others – special versions.

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### **2.2.2. SINGLE-PHASE MOTORS DESIGNED FOR 230V 50HZ CAN BE CONNECTED TO A SINGLE-PHASE SUPPLY 230V $\pm$ 5%, 50HZ $\pm$ 2%.**

Single-phase motors with a working capacitor are designed as single-speed motors. Wiring methods for windings and capacitor are shown on the terminal block; connection to the network and direction of rotation are indicated in the connection diagrams in the manual. Connection diagrams are also found on the terminal box.

Three-phase (asynchronous) induction motors for general use can operate with a frequency inverter. Selection of drive and motor depends on load type, speed range, ventilation conditions, etc.

Speed of standard induction (asynchronous) motors can be adjusted from 25 to 90 Hz.

### **2.2.3. BEFORE CONNECTING THE MOTOR, CHECK THE FOLLOWING:**

- a) whether the rated voltage corresponds to the supply voltage,
- b) whether the winding connections at the terminal are in accordance with the wiring diagram,
- c) correctness of tightening (N) and protective grounding (PE),
- d) whether the motor is properly protected against load (heat dissipation),
- e) whether the motor is protected against short circuit (fuses or circuit breaker),
- f) insulation resistance of the motor, which in cold condition must not be lower than 20 M $\Omega$ ,
- g) whether the direction of rotation matches the direction of the driven machine (for standard motors, rotation is clockwise when viewed from shaft end),
- h) whether the capacitor (in single-phase motor) is not damaged (housing or dents).

### **Comments**

1. If the motor is wet (if insulation resistance is below 20 M $\Omega$ ), it must be dried at a temperature not exceeding +80°C.
  2. Motor disconnection must be carried out by connecting the neutral conductor (N) and protective earth (PE) to the motor terminals.
  3. During operation, monitor the motor and immediately disconnect it if excessive vibrations, significant speed reduction, overheating of the motor or bearings occur.
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### 3. MOTOR MAINTENANCE

Asynchronous motors described in points 1, 2 and 3 of CE declaration of conformity No. A must be inspected after 24 months of operation or 20,000 operating hours. Special asynchronous motors described in points 4 and 5 must be inspected after 12 months or 20,000 operating hours.

During inspection, the following should be performed:

- a) visual inspection (seals, screw connections, surface),
- b) cleaning of motor and protective equipment without disassembly, unless necessary,
- c) measurement of efficiency or grounding resistance,
- d) measurement of insulation resistance of supply,
- e) evaluation of noise and operation,
- f) drain condensate by removing rubber plug from drainage hole
  - In IP55 version – on drive side cover,
  - In IP56 version – on both covers: drive side and fan side.

Inspection must be carried out by qualified personnel and in accordance with installation instructions and wiring diagram. Testing must comply with required electrical qualification standards.

### 4. ACCEPTANCE TEST AFTER INSPECTION OR REPAIR

After inspection and reassembly of the motor, the following tests must be performed:

- a) measurement of winding resistance
- b) verification of correct wiring
- c) measurement of insulation resistance in cold condition
- d) if necessary, perform a no-load test for 2 hours at rated load and monitor temperature to ensure it remains within normal limits. The test must be carried out in accordance with PN-EN 60034-1.

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### 5. MOTOR WEIGHTS

The weight of motors varies depending on the type, output power, mounting system, and additional special components.

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### 6. STORAGE

Motors should be stored in dry and ventilated areas, away from gases, liquids or vapors that may damage insulation, components, and windings. Avoid areas where fertilizers, chlorine, lime, acids, or chemicals are stored. Storage areas should be



above 5°C with relative humidity below 70%.

Motors stored beyond the warranty period should be refurbished, including:

- a) external cleaning of the motor,
- b) checking proper operation of bearings; if faulty, replace with new ones,
- c) measurement of winding insulation resistance; if below 20 MΩ (cold state), the motor must be dried at temperatures up to 80°C,
- d) shaft end should be protected against corrosion using anti-corrosion grease or removable coating.

## 7. WARRANTY CONDITIONS

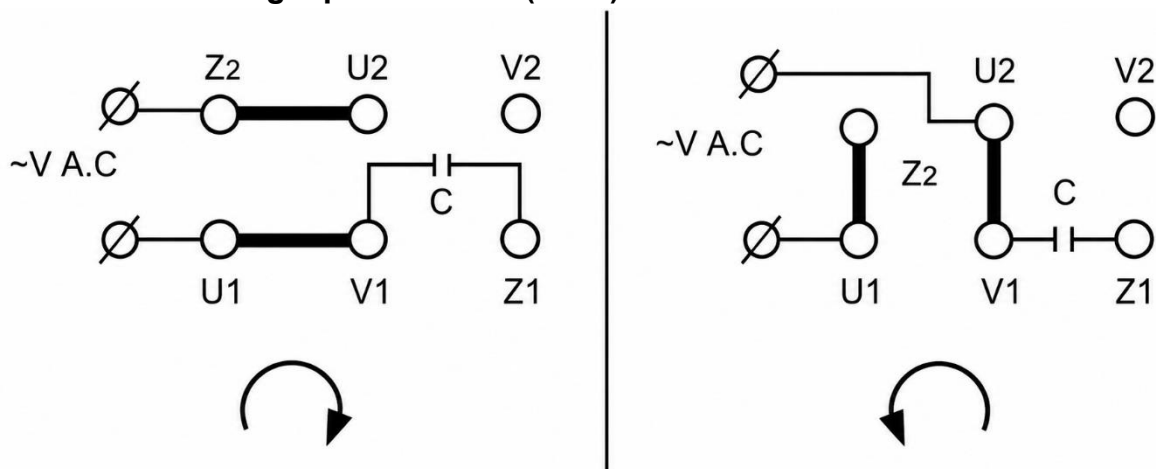
The following warranty period applies unless otherwise agreed:

- a) for standard asynchronous motors: 6 months from the date of purchase.

### Information for users on disposal of electrical and electronic equipment:

This product is marked in accordance with the WEEE Directive (2002/96/EC) and subsequent amendments regarding waste electrical and electronic equipment. The symbol shown on the product or accompanying documentation indicates that defective electrical or electronic equipment must not be disposed of with household waste. Proper disposal requires delivering the product to a designated collection point. Correct handling helps preserve valuable environmental resources and reduce negative impacts on the environment and human health. Detailed information about the nearest collection point can be obtained from local authorities. Improper disposal may be penalized according to applicable local regulations.

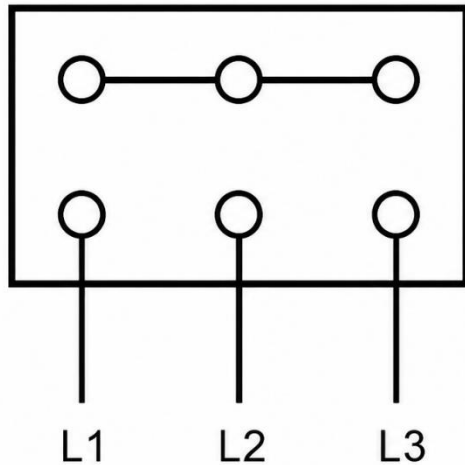
### Connection of single-phase motor (230V)



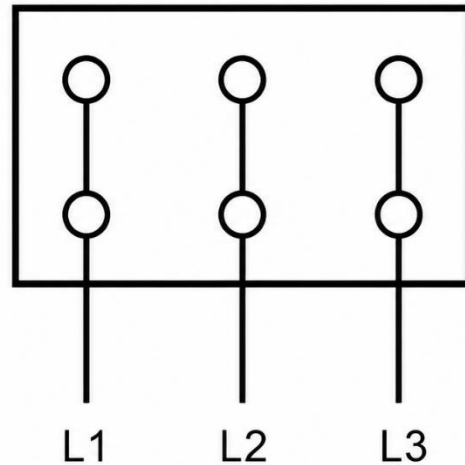
**NOTE:** An additional terminal in the terminal box is a bimetal thermal sensor used for motor overheating protection (connected through the phase conductor).

Connection of three-phase motor (400V)

Zvezda Y = višja  
napetost



Trikot D = nižja  
napetost



**NOTE:** An additional terminal in the terminal box is a bimetal thermal sensor used for motor overheating protection (connected through the phase conductor).

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**The connection of the electric motor must be carried out only**