

# INSTALLATION AND MAINTENANCE MANUAL

## **SAFETY FIRST**

High voltage and rotating parts can cause serious or fatal injury. Qualified personnel must perform safe operation, and maintenance. Familiarization with and adherence to NEMA MG2, the National Electrical Code (NEC) and local codes is required. It is important to observe safety precautions to protect personnel from possible injury. Personnel should be instructed to:

1. Be familiar with the equipment and read all instructions thoroughly before installing or working on equipment.
2. Avoid contact with energized circuits or rotating parts.
3. Disconnect all power sources before initiating any maintenance or repair.
4. Act with care in accordance with prescribed procedures in handling and lifting this equipment.
5. Be sure unit is electrically grounded in accordance with code requirements.
6. Be sure equipment is properly enclosed or protected to prevent access by children or other unauthorized personnel in order to prevent possible accidents.
7. Be sure shaft key is fully captive before unit is energized.
8. Avoid contact with capacitors until safe discharge procedures have been completed.
9. Provide proper guarding for personnel against rotating parts and applications involving high inertia loads, which can cause overspeed.
10. Avoid extended exposure to equipment with high noise levels.

## **INSPECTION AND HANDLING**

Inspect unit to make sure no damage has occurred during shipment. Check nameplate for correct speed, horsepower, voltage, Hertz, and phase for conformance with power supply and equipment. **WARNING:** Units should be lifted using all eyebolts or lugs if provided. These eyebolts or lugs are provided for lifting this unit only and must not be used to lift any additional weight. Lifting angle, from shank of eyebolt, must not exceed 30° for machines with single and 45° for machines with multiple lifting means. Replacement eyebolts must be per ASTM A489 or equivalent. All eyebolts must be securely tightened. Be careful not to touch overhead power lines with lifting equipment. Failure to observe this warning may result in serious personal injury.

## **STORAGE**

Units should be stored indoors, in a clean, dry location and winding should be protected from excessive moisture absorption. **NOTE:** If motors are to be stored for more than one year, refer to US Motors.

## **MAINTENANCE**

Inspect units at regular intervals. Keep units clean and ventilation openings clear of dust, dirt or other. **WARNING:** Disconnect all power sources to the unit and discharge all parts, which may retain an electrical charge before attempting any maintenance or repair. Screen and covers must be maintained in place when unit is in operation. Failure to observe this warning may result in personal injury. All actions connected with installations of the motor shall be made by a qualified person.

## **GREASE LUBRICATION INSTRUCTIONS**

Units are pre-lubricated at the factory and do not require any additional lubrication.

## **BEARING LIST**

<b>E line Frame size</b>	<b>Bearing Type DE &amp; ODE</b>
140T	6205 2Z C3
180T	6306 2Z C3
210T	6308 2Z C3
250T	6309 2Z C3
280T	6311 2Z C3

## **LOCATION**

**WARNING:** Use only UL Listed Hazardous Location Motors for service in Hazardous Locations as defined in Article 500 of the NEC. Units should be located in a clean, well-ventilated area. **WARNING:** Units should be located in a suitable enclosure to prevent access by children or other unauthorized personnel to prevent possible accidents.

## **INSTALLATION / MOUNTING**

Motors may be mounted horizontally or vertically, provided that there is free movement for cooling air. The motors are designed for mounting position, W-2, W-3, W-6, W-8, and F-1 or F-2 assembly positions. The F-1 assembly is standard.

When mounting the motor, make sure drain holes are positioned to allow condensed moisture to drain off.

Mount units on a firm, flat surface sufficiently rigid to prevent vibration. Drive belts and chains should be tensioned in accordance with supplier recommendations.

Couplings should be properly aligned and balanced. For belt, chain and gear drive selection refer to the drive or equipment manufacturer. For application of drive equipment refer to applicable information in NEMA MG1.

Motors have been dynamically balanced using a half key the same length as the full key shipped with the motor.

If pulley keyway length is less than this length, rework long key by removing one-half of excess length between pulley and end of key to maintain balance.

Do not restrict motor ventilation. Unless otherwise specified on nameplate, motor is designed for operation in accordance with NEMA MG1 "Usual Service Conditions" which states an ambient temperature range of -15°C to 40°C (5°F to 104°F).

Standard grease lubricated units are suitable for operation within this temperature range, special lubricants may be required for ambient temperatures outside of the range.

**NOTE:** Motors operating under rated load and allowable ambient conditions may feel hot when touched; this is normal and should not be cause for concern. When in doubt, measure frame surface temperature and confer with nearest office. Enclosed motors normally have condensation drain openings. Insure that drain openings are properly located and open (plugs removed) for the motor mounting position. Drain openings should be at the lowest point of end brackets, frame housing and terminal housing when the motor is installed. This may require modification of motor to accomplish. If unit appears wet, and/or has been stored in a damp location, dry out thoroughly and check for adequate insulation resistance to ground before operating

- ✓ 20 MOhms - for 140 through 180 motor frames
- ✓ 2 MOhms - for 210 through 280 motors frame  
as measured with a 500V magneto .

Resistance control device between each phase and frame indicates excess moisture requiring that the windings be dried before installation.

**WARNING:** Guards should be provided for all exposed rotating parts to prevent possible personal injury. Keep fingers and foreign objects away from ventilation and other openings. Applications involving *high inertia loads* may damage equipment due to motor overspeed during coast shutdown. Such applications should be refereed to US Motors.

**CAUTION:** Do not force drive coupling or other equipment onto shaft, as bearing damage may result.

## **POWER SUPPLY AND CONNECTIONS**

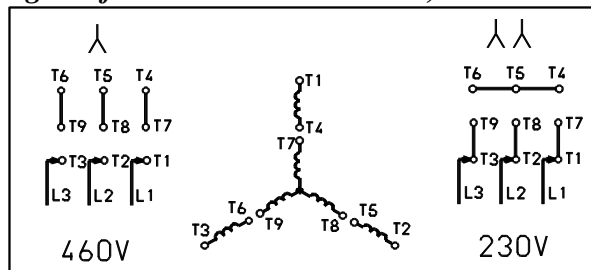
The power supply must agree with values on nameplate. Terminal voltage should not vary more than  $\pm 10\%$  of nameplate voltage at rated frequency. Unbalanced line voltage, greater than one percent, can cause overheating. Do not exceed the continuous rated load amperes on the nameplate.

Starting controls and overload protection should be properly sized in accordance with the NEC and the control manufacturer's recommendations.

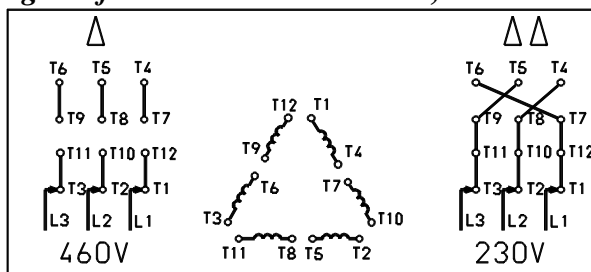
## Connecting Data and Starting Methods

*\*All the motors must be connected according to the following diagrams\**

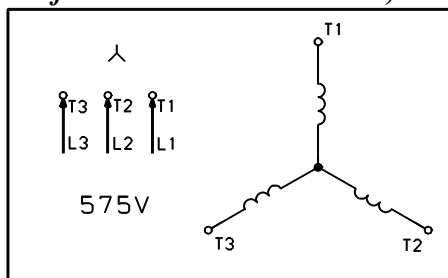
**Connection Diagram for Frames 143T to 184T, nominal voltage 230/460V**



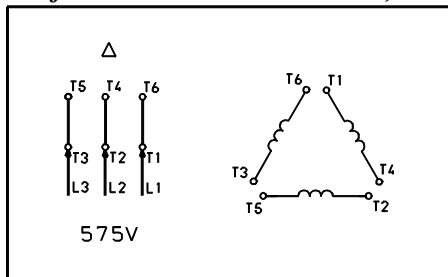
**Connection Diagram for Frames 213T to 286T, nominal voltage 230/460V**



**Connection Diagram for Frames 143T to 184T, nominal voltage 575V**

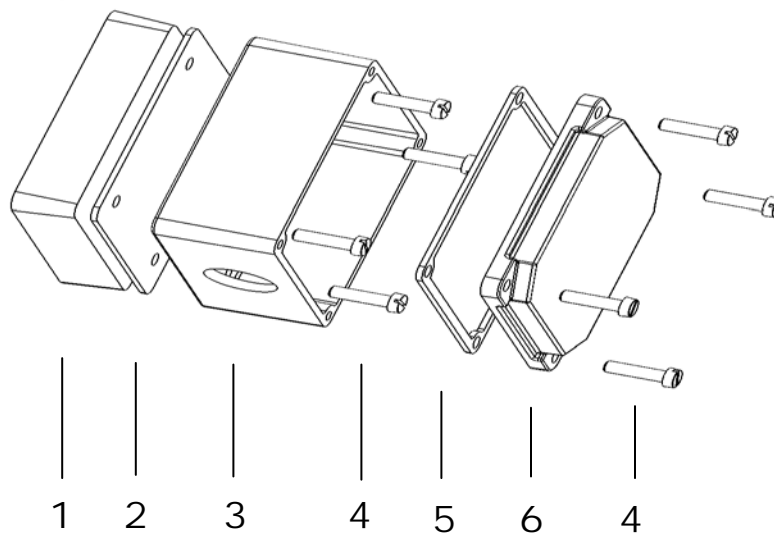


**Connection Diagram for Frames 213T to 286T, nominal voltage 575V**



### **140 frames with unscrewed conduit box**

After taking out the motor from the carton, the conduit box should be assembled accordingly to the drawing below.



- 1- Motor frame (140)
- 2- T.B body seal
- 3- Terminal box body
- 4- Screws
- 5- Cover gasket
- 6- Terminal box cover



## **SERVICE**

For after sales service and warranty questions refer to you local US Motors representative or visit our website at: [www.usmotors.com](http://www.usmotors.com)