

# **TROJAN ELECTRIC MOTORS**

## **INSTALLATION AND MAINTENANCE MANUAL**

### **1. RECEIPT**

Before any motor is accepted on site it should be inspected carefully for damage or loss incurred during transit.

Packing materials may be damaged including sheeting and crate timbers.

Handling operations may have damaged fan cowls, terminal boxes or auxiliaries.

Where an instance of the item being dropped or loss is evident or suspected, it may be necessary to unpack the goods to establish the full extent of the problem.

Wherever possible damage should be recorded, photographed and witnessed.

Report any damage to the carriers and Trojan Electric Motors as soon as possible, quoting on the motor number and consignment note reference. The insurance company's agent as shown on the insurance certificate should also be advised.

**Note:** Bolts are always included with the slide rails but foundation bolts are not.

**Warning: The handling and lifting of electric motors must only be undertaken by skilled personnel using the correct equipment.**

### **2. LIFTING**

Where two eyebolts/lifting lugs are used with inclined loading, the maximum safe working loads of BS 4278: 1984 should not be exceeded.

Where an eyebolt is provided with the motor, this should be screwed down until its shoulder is against the face of the stator frame to be lifted. The motor eye bolt should be used for **lifting the motor only**, unless otherwise agreed. Eyebolts are normally designed for a vertical lift.

### **3. VERTICAL MOUNTING**

Vertical shaft down motors should have rain hats/impact cover fitted to prevent small falling objects hitting the fan.

### **4. INSPECTION**

Eyebolts and lifting lugs should be inspected. Attention should be paid to the following areas:

- Legibility of markings
- Threads free from wear and corrosion
- No debris on the underside of the collar
- No distortion in the eyebolt
- No nicks, cracks, corrosion

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### **5. STORAGE**

If motors have to be stored before installation, precautions should be taken to prevent deterioration.

All motors are to be stored off the floor and if stored near an area where vibration is imminent motors are to be stored on rubber mats to reduce the risk of bearing damage.

### **6. DRAIN HOLES**

Motors provided with drain holes will be provided at the lowest point which will be advised by the customer upon the enquiry.

### **7. ENVIRONMENT**

Trojan electric motors should be stored in a dry, vibration free and clean area at normal ambient (-20 degree C - 40 degree C), unless other arrangements have been made with Trojan Electric Motors.

Motors must be stored away from corrosive or chemically damaging fumes.

Before placing motors into storage, machined components should be carefully inspected. Bearings and shafts are normally covered with an anti corrosive barrier. If this coating is damaged it should be repaired immediately, if rust is present clean then re apply coating.

### **8. ANTI CONDENSATION HEATERS**

If the electric motor is to be installed in an area where humidity is high, anti condensation heaters are recommended.

Supplies are normally 220-240 volt single phase or 110 volt single phase.

### **9. INSULATION RESISTANCE**

During extended storage a 6 monthly insulation test is recommended to avoid possible lengthy drying out periods when installing. Use a 500 volt D.C. Meager.

The insulation resistance between the windings and the frame should be checked.

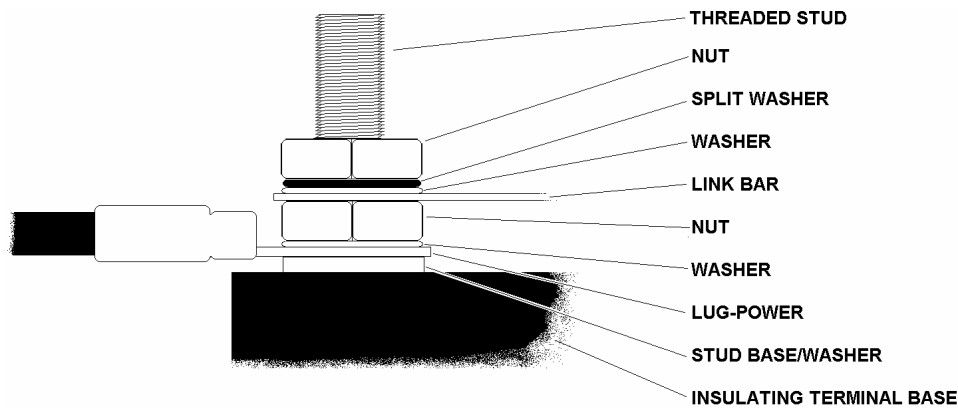
Insulation resistance should be maintained above 10 million ohm, if lower send to a Trojan authorized repairer to be dried out and tested.

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### **10. CABLE TERMINATION/ TERMINAL BOX SEALING**

All cable termination must be screwed down tightly. The diagram below shows the terminal stud arrangement recommended for Trojan Electric Motors.



### **11. EARTH CONNECTIONS**

All Trojan Electric Motors are fitted with an Earth terminal, in adjacent to the terminal box, with good accessibility and effective connection.

The cable must have the capacity at least that of the main connections up to 16mm<sup>2</sup> phase conductors. Between 16 and 35 mm<sup>2</sup> phase conductors, the earth should be a minimum of 16mm<sup>2</sup>. Above 35mm<sup>2</sup> phase conductors should be a minimum of half the phase conductor.

### **12. SUPPLY**

Trojan Electric Motors operate within the limits of its design voltage and frequency. Standard Voltage is 415 volt 50 Hz, with a tolerance of +/-10%. Voltages beyond these limits will cause a high winding temperature rise.

All motors have 6 terminals for Star and/or Delta connections. Motors up to and including 2.2kw are connected in star and 3kw and above are connected in delta unless otherwise specified by Trojan.

The supply cables must be able to capable of carrying the full load current specified on the motor name plate without over heating or excessive voltage drop under starting conditions.

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### **13. CHECKLIST**

#### **General**

- Location
- Nameplate details

#### **Mechanical**

- Drain holes
- A free shaft rotation
- Bearings and grease
- Cable termination
- Motor bolts
- Slide rails
- Pulley fitment

#### **Electrical**

- Insulation resistance
- Drying out procedures
- Supply
- Earthing
- Heater continuity
- Thermistor continuity
- Auxiliaries
- Connection diagrams
- Rotation
- Rotation must be free and even, if uneven and bumpy when rotating the bearing, inspect to establish if they were damaged during transportation or storage.

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### **14. PULLEY FITMENT**

When fitting a coupling or pulley ensure there are no burrs or bruising on the shaft and the coupling bore is of the correct tolerance. It is recommended by Trojan that anti seize or other specified anti corrosion substance be used when fitting a pulley.

**Beware some hazardous areas don't allow certain greases or anti corrosion substances.**

Shaft keys should be a good fit but with adequate top clearance.

The pulley must always be positioned up to the shoulder to minimize the over hung load.

Excessive force whilst fitting the pulley can permanently damage the bearings.

Ensure belts are not over tightened. Trojan recommends that you refer to the manufacturers specifications.

### **15. SLIDE RAILS**

If a Trojan motor is fitted to slide rails we must ensure the slide rails are fixed to the mounting base properly. The rail at the driving end of the motor should have the adjusting screw between the motor and the motor pulley.

The other rail is positioned the opposite way around. The drive should be through the lower part of the belt or chain.

NOTE: Belts which may become charged with static electricity should not be used in hazardous atmospheres.

### **16. AUXILIARIES**

Where auxiliaries are fitted, the characteristics should be checked. Example: RTD's (resistance temperature detectors) should have their resistances checked against manufacturer's figures.

CONNECTION DIAGRAMS: Refer to the connection diagram supplied with the motor for supply details and the required winding connection.

### **17. MAINTENANCE**

An induction motor requires very little maintenance. It is recommended that regular even intervals to check items listed on the check list in this booklet. Bearings to be checked as per catalogue chart recommendations.