

# **SPECIFICATION**

## **Immersible Motors**

**RELIANCE**

**5-200 HP TEBC  
210-449 Frames  
600 Volt and Below**

### **1.0 SCOPE**

This specification details the electrical and mechanical requirements for totally enclosed blower cooled immersible squirrel cage induction motors.

### **2.0 GENERAL**

**2.1** All motors defined under this specification shall conform to the latest applicable requirements of NEMA, ANSI, IEEE and NEC.

**2.2** Motors are to be designed for continuous duty for three phase, 50 or 60 Hz, (**single voltage only**). The motors shall be capable of running on inverter, 10:1 speed range, variable torque with a constant speed blower motor.

**2.3** Ratings to be based on a 40 degree C ambient, 1000 meters (3300 ft) or lower operation with a maximum winding temperature rise of 80 degree C (Class B) by resistance at 1.0 service factor. Ambients above 40 degree C require marketing approval.

**2.4** Motors to be furnished with Class F insulation. All motors covered under this specification shall be capable of operating at 1.15 service factor on sine wave power but shall be selected for operation within their full load rating without applying the service factor.

**2.5** Motors shall be Reliance XE Premium Efficiency design.

**2.6** Motors shall be equipped with space heaters appropriate for the frame size.

**2.7** Motors shall be equipped with thermal protection by normally closed thermostats in series.

### **3.0 MECHANICAL**

#### **3.1 BEARINGS AND LUBRICATION**

**3.1.1** Bearings shall be single shielded construction, deep groove Conrad type, and have a Class 3 internal fit conforming to AFBMA std 20.

**3.1.2** Bearings shall be selected to provide L10 life of 100,000 hrs minimum for flexible direct coupled applications.

**3.1.3** Motor lubrication system is to be re-greasable. Grease inlet and outlet will be plugged. Grease fittings will not be provided.

**3.1.4** Motor to be greased by manufacturer with a premium moisture resistant polyurea thickened grease containing rust inhibitors and suitable for operation over temperatures from -25 degrees C to 120 degrees C.

## **3.2 ENCLOSURE**

**3.2.1** Motor enclosure, including frame, end brackets, fan shroud and conduit box shall be cast iron. Motor shall be designed to meet or exceed IP67. Motors shall be designed to prevent leakage for periods of submergence up to 2 weeks.

**3.2.2** Motor main conduit box shall be cast iron Reliance Immersible design construction, rotatable in 90 degree increments with a bolted and sealed cover. Motor leads will be potted into the motor frame to prevent any moisture leakage into the motor frame. 25 feet of power cable shall be provided as standard and the power leads shall enter into the conduit box through either a sealable water tight gland or a potted hub that will be bolted and sealed to the conduit box while still allowing the power cable to be removable. The power cable shall be non-shielded type SOOW or type W. Vertical lifting lugs will be supplied.

**3.2.3** The motor shall be equipped with a humidity/moisture detector internal to the motor.

**3.2.4** Motor frame sizes 250 to 440 shall be blower cooled such that when the motor is submerged, the blower shall disable without overloading the main motor. The blower fan shall be "washdown duty". A float switch to be supplied by others shall disengage the blower motor when submerged. The main motor shaft will not protrude through the opposite drive end bracket and there will be no running fit to allow entrance of water into the motor. Once the motor is submerged, the blower motor must be replaced. Motor with frame size 210 shall be TENV enclosure.

**3.2.5** Motor rotor construction shall be of cast aluminum. Rotors shall be dynamically balanced to NEMA standards. Balance weights if required shall be secured to the rotor resistance ring or fan blades.

**3.2.6** The motor shall be designed to prevent infiltration of water along the shaft by utilizing a Reliance immersible seal arrangement.

**3.2.7** All mounting hardware shall be high strength, SAE Grade 5, and plated for protection. Exterior hardware shall be stainless steel.

**3.2.8** Corrosion resistant stainless steel nameplate shall be affixed to the motor frame with stainless steel or brass drive pins. Nameplate information shall include all required NEMA data and AFBMA numbers.

**3.2.9** All mating fits shall have rabbet joints with O-rings to ensure a watertight design.

**3.2.10** All motor parts, including frame, bracket, fan cover and terminal box are to receive a coat of severe duty, high grade epoxy paint. All motor parts in frame size 449 and smaller shall be primed with an epoxy primer. These parts include the stator/frame assembly, rotor assembly, end brackets, fan cover, conduit box, and conduit box cover. Completed motor assembly must successfully withstand salt spray tests for corrosion per ASTM B-117 for 96 hours.

## **4.0 ELECTRICAL**

**4.1** All motors shall successfully operate under power supply variations per NEMA MG1-1993-14.30.

**4.2** All motors shall be NEMA Design A or B.

**4.3** Motors shall have random wound, copper windings.

**4.4** Insulation systems shall be evaluated in accordance with IEEE 117 classification tests.

**4.5** Internal motor leads shall be non-wicking type, Class F temperature rating or better and numbered for identification.

**4.6** Each completed and assembled motor shall receive a routine factory test per NEMA standards.

## **5.0 STANDARD SOFTWARE**

**5.1** Standard software will be Dimension Sheet, Performance Data, and instruction manual.