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- **WATERTIGHT INTEGRITY**

The watertight integrity of the single-body pump-motor assembly shall be assured.

The Cable Entry shall contain an elastomer grommet, flanked by two washers, closely fitted to the cable O.D. A watertight seal shall be maintained by screwing a threaded gland down to a positive stop (metal-to-metal, to prevent permanent deformation by overtightening), thereby tightly compressing the grommet around the cable. The gland will provide a strain-relieving, anti-kink feature, functioning independently from the separate sealing action. For pumps above 30 horsepower an isolated Junction Box containing the Terminal Board, and sealed from the Motor Compartment by a watertight isolation plate, will provide a secondary barrier against water or moisture penetration. Each pump shall be supplied with 30 feet of SO Type power cable.

- **SEALS**

Motor Compartment shall be isolated from the Liquid End by Single Mechanical Shaft Seals in tandem arrangement (dual-independent, both oriented to resist pressure from the impeller). The upper motor side seal shall run in an Oil Chamber, which separates the Motor Compartment from the Liquid End and provides permanent lubrication and cooling. The lower impeller side seal will also get lubrication from the Oil Chamber. Each seal will have a stationary portion and a positively driven rotary portion. Springs must be protected from the pumped liquid; and under no circumstances can solid particles accumulate on the external spring and hamper its effectiveness. Seals must not require repeated checking or re-adjustment, except periodic inspection of the oil chamber. At the interfaces of major castings, sealing shall be accomplished by resilient Buna-N O-Rings, confined within closely fitted, high surface quality rabbet joints, compressed only to the prescribed dimension by metal-to-metal contact, allowing radial movement and preventing permanent set. Flat gaskets and seal rings, which may be squeezed unevenly or beyond the permanent deformation limit, are not allowed.

- **SEAL PROBE**

A single wire, conductive seal probe shall be provided with pump. Probe shall be mounted into mechanical seal chamber and shall be accessible without disassembly of pump. When interlocked with control panel, probe shall indicate the presence of contaminants within mechanical seal chamber..

- **ELECTRIC MOTOR**

Each pump shall be driven by a Submersible Squirrel Cage Induction Motor, rated at \_\_\_ HP \_\_\_RPM\_\_\_Volts\_\_\_ Phase. Motor shall be NEMA Design B for continuous duty, capable of sustaining a minimum of 10 starts per hour. The pump and motor shall be produced by one manufacturer and shall be of the air-filled, watertight design.

All stator windings and leads shall be insulated with moisture-resistant Class F Insulation, capable of withstanding 155°C Max. temperature, dipped and baked three times. Upon assembly the stator shall be heat-shrink-fitted into the stator housing; the use of bolts, pins or other fastening devices, which would require penetration of the stator housing, shall not be acceptable.

In each phase winding there shall be embedded a bi-metallic temperature sensor, wired in series and interlocked with the motor overload protection in the Control Panel. Any of these thermal sensors shall cut out electric power if the temperature in its winding exceeds 140°C, but shall automatically reset when the winding temperature returns to normal. The motor shall be non-overloading through the selected performance curve and have a Service Factor of 1.15.

When the application requires, the motor shall be approved for use in Hazardous (Classified) areas. Pumps shall be suitable for operation in Class 1, Division 1, Groups C & D Areas only and shall be approved by Factory Mutual (FM) for use in the area classification indicated. Seal leak probe, if required, shall be dual wire. All FM Approved pumps supplied for use in Hazardous areas shall be supplied with an isolated junction box as described above.

- **COOLING JACKET**

Motors shall be equipped with a Cooling Jacket around the Stator Housing, filled during operation with the pumped liquid, to provide adequate cooling of the motor under any operating point on the selected performance curve. Impeller back vanes shall be employed to keep liquid in forced circulation throughout the cooling jacket and a properly sized and positioned air vent pipe shall assure air is not trapped within jacket.

- **SPARE PARTS**

The following spare parts shall be furnished for each unit:

- One (1) Spare Impeller of appropriate size for application.
- One (1) Complete Mechanical Seal Kit including both upper and lower seals.
- One (1) Complete O-Ring Kit to permit routine service of pump.
- One (1) Volute Wear Ring

One (1) Complete Cable Entry Grommet Assembly

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