

General Technical specification for Electrical submersible pump unit

General requirements

All pumps and other accessories shall be of the size specified and as far as possible of the same type shall be of one manufacturer. All Electrical submersible pump (ESP) and accessories shall have the name of the manufacturer, working pressure, diameter, direction of flow, rate of flow; materials etc.

Supplier shall submit

- List of materials and accessories
- Details of specifications for pump, motor , cables and accessories
- Names of manufacturers; and the supplier shall submit a certificate from the manufacturer certifying that each (ESP) parts meets the requirements
- Impeller shaft and all internal nuts and bolts coming in contact with liquid are made of stainless steel to resist corrosion and pitting and extend the operational life of the pump.
- Another factor that must be considered to insure that (ESP) comply with manufacturers' performance curve characteristics is submergence. Adequate pressure at the pump intake is critical to guarantee pump performance and this intake pressure is directly related to head of water above the pump
- When ambient water temperatures exceed the limits recommended by the motor manufacturer, the drive motor for the pump may need to be rated higher. The winding insulation of a larger horsepower motor would withstand more heat, while the load, or amperage, on the motor would stay essentially the same. Therefore a cushion of safety would be built into the system. Manufacturers' heat multiplier factors should be consulted and horsepower raised as necessary. Flow inducer devices should be used accordingly.
- Proper pump/Motor selection and sizing is essential to insure efficient and reliable operation at specified head and flow rates

Submersible Pump Technical Specification

- Pump performance efficiency not less than **70 %**
- stainless steel impellers and diffusers for corrosion resistance SS304/316
- All bearings are water-lubricated
- The inlet strainer should prevent particles over a certain size from entering the pump.
- Heavy duty stainless steel structure to assure permanent alignment of all the components in order to increase run time and trouble-free operation
- PTFE floating neck ring, ceramic guide journal sleeve and Nitrile rubber fluted bearing to ensure durability against wear for long-lasting constant performances and product reliability
- Compact, reliable and suited to operate as heavy duty
- Built-in check valve to protect the pump against water hammer risk
- Pump must withstand water temperature up to **50 C** minimum
- External stainless steel sleeve to improve stiffness and assure permanent alignment of all the components
- The connection between pump and motor should be as per NEMA standard
- Date of manufacture , not older than 2023.

Submersible Motor Technical Specification

- Sand slinger and mechanical seal for high performance in sand
- Water lubricated thrust and radial bearings enable a maintenance-free operation
- Motor should be Rewindable type
- Min. temperature **+ 45 °C**
- Design for retrofitable PT100 sensor
- Approved and certified as per NEMA standard
- Non contaminating FES 93 filling
- Sand fighter SiC seal system is standard
- Standard Motors Complete **304SS/316SS**
- Rotor should run in carbon bearings / bushes
- Stator windings are made of solid copper conductor insulated with (PE2+PA)
- Operation Voltage (**380 - 415) V** / 50 HZ / 3 - Phase
- Protection: IP 68
- Start per hour: Min. **25**
- Efficiency shouldn't be less than **85%** at full load
- Rotor should be mounted on a stainless steel shaft which should run in water lubricated bearings and bushes
- Motor protection: thermal overloads according to EN 61947-4-1
- Rotation 2850-3000
- Motor must withstand water temperature from **50 C** as minimum
- Built-in cooling chambers submersible motors must have an efficient cooling to ensure cooling chambers at the top and at the bottom of the motor, and by an internal circulation of motor liquid
- Motor should be suitable for heavy continuous duty
- Date of manufacture , not older than 2023.

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- The embedded stator winding should be in the submersible motor should be hermetically enclosed in stainless steel for high mechanical stability and to eliminates the risk of short circuit of the windings caused by condensed water.
- The shaft seal is a ceramic/carbon mechanical shaft seal. The shaft seal should be replaceable.
- Quality guarantee of at least One year for pump and motor.

Submersible Cable Specification

- Cable must be submersible motor cable pure copper 3/4 core round or flat cable (HO7RN-F)
- Cable operation voltage 380 – 415 voltage
- Cable must be tested by manufacturer at 750 /1000 volt
- Cable insulation resistance must be in G-Ohms
- Maximum operation Temperature 70 C
- Maximum permissible voltage drop 2-5% at maximum load