

SUB: Budgetary Offer for Horizontal Monoshaft Submerged Mine De-watering Pumpset 2500GPM, 250 meter head with Dry Motor (air filled) & complete electrical

It has been proposed to procure Horizontal Monoshaft Submerged Mine De-watering Pumpset 2500GPM, 250 meter head with Dry Motor (air filled) & complete electrical at WCL **under trial tender, with guarantee / warranty period of 3 years from date of commissioning & CAMC of 2 years (after completion of guarantee / warranty period).**

Detailed technical specification has been enclosed herewith. PBG terms & conditions for trail tender, during guarantee / warranty period of 3 years & CAMC period of 2 years may kindly be noted as per enclosure details.

Budgetary offer for Horizontal Monoshaft Submerged Mine De-watering Pumpset 2500GPM, 250 meter head with Dry Motor (air filled) & complete electrical is required in following format:

DESCRIPTION	AMOUNT (Rs.) Excluding GST
Equipment cost	
Horizontal Monoshaft Submerged Mine De-watering Pumpset 2500GPM, 250 meter head with Dry Motor (air filled) & complete electrical, including guarantee / warranty period of 3 years	
CAMC cost for 4 th year	
CAMC cost for 5 th year	
TOTAL	

You are requested to submit budgetary offer within 7 days i.e. latest by 11.05.23.

In case of any query, please contact Kriti Garg Manager (E&M) – 8275970068.

Technical Specifications

Item Description : 3.3KV Horizontal Monoshaft submerged, mine dewatering pump set with head 250 mtr, 2500 GPM with electrical, Qty - 2 sets

Technical Specifications of Horizontal, Mono Shaft Submerged Mine Dewatering Pump Sets (*Dry Motor{Air filled}, Multistage Pump (Volute or Diffuser)*)

1. The pump set shall be of Horizontal, Unitary Monoshaft construction with Impeller/s (& Casing/s) mounted directly onto the Extended Solid Motor Shaft (*without any couplings*).
2. Pump shall be multi- stage type.
3. Installation: shall be decided as per Site Conditions. It is Recommended to install the Pumpset in Floating Pontoon in Horizontal Mode for most applications, however in case of Clear Water with Minimum debris; pump may be installed Horizontal Bottom Rested on ground
4. Speed: Speed is required to not exceed 1500rpm.
5. The Head - Capacity (H-Q) curve shall be continuously rising towards shut off with the highest at shut off. The shut off head shall be atleast 120% of the specified duty point head
6. Suction Strainer: The pump should be fitted directly with a Heavy Duty Stainless Steel Strainer
7. **INDUCTION DRY MOTOR (*SUBMERGED*) END DESIGN**
 - 7.1. The motor shall be of Squirrel Cage, Induction type, Air Filled but Surface water cooled (IC4A1W0) capable of Water Immersion (IP68 upto 40 mWC) suitable for S₁ duty
 - 7.2. Motors with Oil or Water filled windings shall not be allowed.
 - 7.3. It is rated for 3300 V \pm 10 %, 50 Hz \pm 5%, (10% \pm Combined Voltage & frequency), 3 phase, A.C. Power Supply.
 - 7.4. Its winding should be atleast Class "F" insulation (*withstanding winding hot spot temperature of up to 155°C respectively*) while the nominal temp of winding should not exceed that of Class "A" (105°C)

7.5. Motor's Insulation is to be based on Resin Poor, Mica Based, Dual Vacum Pressure Impregnation (VPI) & Oven Baked with Fungus & Moisture Repellent Top Coatings for Extremely High Di-Electric Strength.

7.6. The Motor's Rotor shall be of Copper Bar type only to assure :

1. Long Corrosion free Service life (in presence of high moisture inevitable in submerged motors, Aluminum corrodes much faster than Copper),
2. Beneficial Fly Wheel type Inertial effect (as compared to aluminum rotor, copper rotor is heavy) which reduces detrimental effects of water hammer
3. Better Motor Efficiency & Cooler Operating Temperature
4. Aluminum Die Cast Rotors for HT motors will not be allowed (*however for LT motors Aluminum Die Cast Rotor may be allowed*).

8. CABLES

1. Watertight IP 68 Cable Glands shall be provided to seal motor Stator & Power and Control cables.
2. It should have Power as well as Control Cables of Dual Sheathed EPRS/ PVC for HT type with Copper Core
3. Material of Conductor – Copper
4. Suitable power cable of 50 meters shall be provided

9. SHAFT & BEARINGS

9.1. The Single Piece Solid Shaft shall be supported by heavy duty Ball or Roller bearings with a minimum L_{10} life of 1,00,000 hours

9.2. The bearings should be lubricated with Premium Quality, High Temperature, Long Life Grease thereby eliminating the need of re-lubrication for upto 75,000 hours for all LT motors & upto 45,000 hours for all HT motors

10. STUFFING BOX / OIL CHAMBER

10.1. The entry of water into the motor should be prevented by Two independent high Quality, Bi-Directional mechanical seals mounted in a Tandem mode within an oil chamber.

10.2. For Material Of construction of Mechanical Seal – Refer Table 1

11. TESTING

11.1. The pump sets maybe tested at the pump manufacturer's works in accordance of IS 5120 (*Tolerance Class 2*), HIS 11.6, IEC 60034, IS 10981, ISO 9906; with or without VFD

11.2. Measurements of Head, Discharge, Motor Input at least for 3 different points to plot the Actual Performance Curves

11.3. The Flow shall be measured by full Bore Electro-Magnetic Flow Meters or Ultrasonic Flow Meter of maximum 0.5 % accuracy class.

12. DUTY PARAMETERS

1. Altitude of working site 300 M
2. Ambient temperature 50 deg.C.maximum
3. Sp. Gravity of liquid 1.03
4. Working Hrs./day 24 Hrs.

13. STARTER SPECIFICATION:

1. Minimum degree of protection - IP55
2. Utilization category of Starter: AC-3
3. CONSTRUCTION :
 - a-Shall be in two compartments.
 - b-One shall house through going bus bars and off load isolator.
 - c-2nd compartment shall house contactors and protective devices.
 - d-In case of auto transformer starter, the auto transformer shall also be accommodated in 2nd compartment and shall be accessible from rear side of the enclosure for maintenance.
 - e-Door of 2nd compartment shall be interlocked with isolator in such a way that the door can be opened only when the isolator is in 'OFF' position.
 - f-Cable terminal boxes with sealing boxes shall be provided for both incoming and out going terminals suitable for PVCDWA mining cables of required size.
 - g-Through going terminals of bus bar shall be provided with bus trunking box with blanking cover.
 - h-Mounting - Skid mounted
4. BUS BAR & ISOLATOR :
 - a-BUS BAR REQUIREMENT: Made of Electrolytic copper of cross section not less than 240 Sq.mm covered with heat shrunk PVC sleeves.
 - b-ISOLATOR REQUIREMENT: Off load, triple pole reversing type
 - c-Rating of Isolator: Not less than 300 A
5. CONTACTORS (ONLY Govt./Govt. test house tested make contactors shall be used) :
 - a-Operation:Electromagnetic

b-OPERATING LIMITS OF CONTACTOR: As per IS:13947 (Part 4/Sec.I)/IS:9046. However the drop out voltage shall not be more than 50% of rated control supply voltage

"NOMINAL CURRENT RATING OF CONTACTORS (FOR AC-3 DUTY): Not less than 2.0 times the full load current.

Note : In case of star/delta starters, all the three contactors shall be of same rating."

c-Type of contactor (whether air break or vacuum break)

6. **PROTECTIONS :**

"a-OVER LOAD PROTECTION: Thermal Over Load relay with.

Range of current adjustment : 75% to 100%"

"b-E L protection Type of E.L. Relay. The relay shall be as per the relevant Indian Standard or IEC.:CBCT operated E.L. Relay
"

c-Minimum value of leakage current (on primary) to operate:0.5 A – 2 A (Max.) in steps of 0.5 A

d-Time delay setting range for Earth leakage protection 0 – 1 Sec in steps or 0.1 Sec

e-Testing and resetting of the relay: By means of push buttons on front cover of the panel.

f-Indication of E.L. trip:By means of indicating lamps on front cover.

g-P.T. and coils of the relay: Epoxy resin sealed

h-Short circuit: Through back up HRC fuses

i-Instruments:Amp. Meter of suitable range

j-Printed circuit diagram:On a brass plate shall be affixed on inside the cover.

14. SCOPE OF SUPPLY: Each pump set will consists of

1. Pump with accessories-1
2. Motor - 1
3. Starter -1
4. Base plate fabricated from structural steel
5. Sluice valve suitable for delivery size of the pump.-1 No
6. Non Return Valve, suitable for delivery size of the pump.-1 No
7. Power Cable – 50 meter
8. Other required accessories

15. PRE-DESPATCH INSPECTION & TESTS :

15.1 WCL reserves its right to get the pump sets inspected and tested by CMPDI at manufacturer's works before dispatch of the Pumps to ascertain the conformity of the pump set to order specifications, relevant ISS. The pump will be tested as per CI 11as stated above.

15.2 -The manufacturer shall make available to the inspector, the required test facilities with necessary support for conducting the tests as per the ISs and supply order.

15.3 -The manufacturer shall make available to the inspector the following during the inspection.

- (a) Copies of relevant ISs.
- (b) Material test certificate of the pump.
- (c) All records of quality checks under QAP
- (d) Manufacturers test certificates for bought-out items.

16. FINAL INSPECTION: Inspection of the consignment shall be carried out at the destination stores, which will be arranged by the Consignee on receipt of stores.

17. INSTALLATION & COMMISSIONING: Installation & commissioning shall be done by WCL under supervision of manufacturer / supplier. Manufacturer / supplier have to provide technical supervision for carrying out installation & commissioning work.

18. DELIVERY SCHEDULE: Supply should be completed within three (3) months from the date of placement of order.

19. GUARANTY / WARRANTY: Guarantee / warranty of 36 months from date of commissioning.

20. CAMC: CMC of 2 years (after completion of Guarantee/ warranty period)

21. PERFORMANCE BANK GUARANTEE:

- **PBG during Guarantee / warranty period:** The guarantee for equipment availability shall be backed by a Performance Bank Guarantee of 100% of the total contract value (equipment cost & CMC cost). Payment of 100% equipment cost shall be made after six months of satisfactory performance against submission of Bank Guarantee of 100% of the total contract value (equipment cost & CMC cost), valid for a period of 33 months (beyond six months).
- **PBG during CMC:** The guarantee for CMC shall be backed by a Performance Bank Guarantee of 5% of the total value of equipment, valid for a period of 27 months (beyond guarantee / warranty period). PBG against CMC shall be submitted before release of 100% PBG submitted against guarantee / warranty period.
- **Release of PBG against Guarantee / warranty period:** The equipment found to perform satisfactorily and fulfilling the contractual obligations as per the supply order for a period of three year from the date of commissioning and submission of Bank Guarantee of 5% of the total value of equipment against CMC, 100% Bank Guarantee shall be released.
- **Release of PBG against CMC:** The equipment found to perform satisfactorily and fulfilling the contractual obligations for CMC as per the supply order for a period of two year, 5% Bank Guarantee shall be released.

22.

Table 1 : Material of Construction	
Motor Casing, Oil Chamber & other parts	Cast Iron (<i>FG 260 as per IS 210 or GG25 or EN-JL1040</i>)
Motor `s (Squirrel Cage) Rotor	Copper bar only for HT motors & Copper bar / Aluminum bar for LT motors
Mechanical Seals	Double mechanical seal should be fitted. <ul style="list-style-type: none"> • Primary (Inboard) : Silicon Carbide v/s Silicon Carbide or Tungsten Carbide v/s Tungsten Carbide • Secondary (Outboard): <ul style="list-style-type: none"> ◦ Carbon v/s Silicon Carbide or Tungsten Carbide.
Fastener (exposed to Liquid)	Stainless Steel (A2)
Pump (Bowl/Volute) Casing	Cast Steel – ASTM A 216, GR WCB or Spheroidal Cast Iron (<i>SG 400/18</i>) <i>Cast Iron is not allowed.</i>
Impeller	Cast Austenitic Stainless Steel (<i>SS 304 or CF 8</i>)
Wearing Rings (<i>Suction Head Casing & Impeller</i>)	Cast Austenitic Stainless Steel (<i>SS 316 or CF 8M</i>)
Pump-Motor Shaft	Stainless Steel (<i>SS 410 or SS 430 or 1.4021</i>)*
Suction Strainer	Stainless Steel 202 or SS 304
Portable Stand	MS (C15) Fabricated with Epoxy 2 layer Coating