



The Singareni Collieries Company Limited

(A Government Company)
CENTRAL WORK SHOP
KOTHAGUDEM-507101

Vendor meet for supply, erection & commissioning of 3T capacity induction melting furnace on Trunkey basis for central workshop SCCL is scheduled to be held on 23.03.2018 at 11.00 AM at video conference hall, Head Office, Kothagudem

Vendors are requested to participate. Vendors may visit the foundry at central workshop between 08.00 AM to 10.30 AM before the meet.

Contact Persons: Shri P.Ravikumar, GM(E&M) CWS.

Cell: 9491144904

P.J.Fitzgerald, DGM(E&M) CWS.

Cell: 9491144896

SUPPLY, ERECTION AND COMMISSIONING OF 3T CAPACITY INDUCTION MELTING FURNACE

Sl.No.	Item Code	Description	Unit	Qty.
1	6643000038	Supply, Erection and Commissioning of 3T capacity Induction Melting Furnace , On Turn Key basis for Central workshop, corporate.	Nos	01

TECHNICAL SPECIFICATION:

Sl.No.	Description	Specifications
1	Alloy to be melted	Steel
2	Nominal capacity	3000 Kgs
3	Melting Temperature	1480°C to 1800°C
4	Rated Kilo Watts	1250 to 1500KW
5	Nominal Furnace Frequency	Medium Frequency (To be furnished by firm)
6	Line power Factor	0.95 and above
7	Harmonic Levels	Voltage -- <5% Current -- <8%
8	Pouring Mechanism	Hydraulic tilting
9	Melting rate	1500 to 2000Kgs/hr

A. FURNACE TRANSFORMER:

- i) Suitable rated furnace duty transformer for 3T capacity Induction Melting Furnace, conforming to IS: 2026.
 - a) In put voltage 33000 volts
 - b) Type of cooling ONAN
 - c) Winding Material- Copper
 - d) Line power factor of 0.95 and above to be maintained.
 - e) Make: Madhya Pradesh Transformer (MPT)/ Volt- Amp/ Kirloskar/PETE/ETE/ Andrew Yule. The firm has to submit test reports (Short circuit & Impulse test certificates of offered transformer including routine test certificate along with Transformer)

- ii) The Transformer shall be supplied with first filling of oil and to be provided with below mentioned standard fittings (As per relevant IS standards)
 - a) Cable box for HT AND Bus Duct for LT
 - b) Off Ckt tap changer switch with handle and tap position indicator

- c) Conservator Tank with Oil Drain valve cum sampling valve with plug and with oil filling hole and cap.
 - 2 Nos earthing terminal

- Air release plug
- Rating plate including Line Diagram
- Detachable Radiators
- Inspection Cover
- Lifting lugs for Cover
- Lifting lugs for Transformer
- Silica Gel Breather
- Thermometer pocket
- Pressure Relief valve with trip contacts
- Buchholz relay with alarm and trip mercury contacts
- Oil temp. Indicator with alarm & trip mercury contacts
- Winding temp indicator with alarm and trip mercury contacts
- Marshalling box.
- Magnetic oil level gauge with low level alarm with mercury contacts
- Top filter valve with plug
- Jacking Pad
- Plain oil level gauge

B. CONTROL PANEL (POWER SUPPLY UNIT):

- 1) CABINET: Metal cabinet, with panel Doors, which are gasketed and equipped with locks as per IP 65 Enclosure. In addition, Micro switches are to be provided with illumination lamp on the monitor board with Door Inter-Locking provision.
- 2) PROTECTION CIRCUIT:
 - a) High power silicon controlled rectifiers (SCR) with snubbers for rectifications.
 - b) Fast acting semi conductor filter.
 - c) Suitable semi conductor fuses to be provided.
 - d) Earth leakage, over current and instantaneous over current protection to be provided as per Industrial norms.
- 3) RECTIFIER UNIT WITH FILTER:
 - a) High power SCR's with snubbers are to be provided for rectifications. This rectifier should be able to minimize line harmonics.
 - b) Instantaneous trip circuit facility to be provided for the protection of the rectifier.
 - c) Current limiting reactor to be provided.
 - d) Suitable DC Capacitor to be provided in capacitor section.
 - e) Suitable semi conductor fuses are to be provided.
- 4) INVERTER UNIT: (Voltage fed series inverter)
To be provided with high power inverter SCR's, anti- parallel diode and DI/DT reactors (to protect Thyristers) to ensure full power throughout the melt cycle.
- 5) CAPACITOR UNIT:
To be provided with DC Filters, medium frequency AC capacitors, pressure switch for each capacitor and indicating lamp on the board.

6) GROUND/ METAL LEAK DETECTOR:

Ground / Metal leak detector circuit should consist of indicating lamp, Meters, probe disconnect switch etc, to disconnect power supply in case of grounding / metal leak.

7) CONTROL AND MONITORING SYSTEM:

- a) Frequency meter, KW meter and furnace voltmeter etc are to be provided
- b) Main control board for controlling of the equipment to be provided.
- c) ON /OFF Push buttons, one power control knob to set the desired power levels are to be provided,
- d) Monitoring facility of Circuit indicating functional parameters such as water pressure, temperature, and other electrical faults are to be provided.

8) INTERNAL CLOSED WATER CIRCUIT SYSTEM:

- a) Suitable water heat exchanger, expansion / air separator tank, pump with Motor Control Centre and one de-ionizer cartridge for continuous purification of internal water to be provided.
- b) One feed manifold with temperature gauge, pressure switches and one drain manifold with temperature sensors for different paths of cooling system to be provided inside the cabinet.
- c) Firm should submit line diagram of cooling system working arrangements.
- d) The model and make of the heat exchanger, pump with MCC to be submitted.
- e) Spare parts list of items used in the control panel to be submitted along with supplies.

9) COOLING WATER SYSTEM FOR FURNACE COIL: To be provided with suitable Cooling towers, pumps, Motors, pipeline ,fittings, plate type heat exchanger, RO(Reverse Osmosis)/ DM plant for coil cooling including electrical (MCC panels with required wiring for cable terminations including internal and external pumps are to be provided.

C. CAPACITOR RACK: To be provided with suitable rated Capacitor Rack fitted with capacitors for power supply unit with connecting bus bar and capacitor switch to maintain the power factor of the furnace 0.95 and above.

D. FURNACE:

- (i) 2 Nos coreless steel frame induction melting furnaces, 3 Ton capacity, complete with refracting top and bottom mounted on rigid support to copper Induction coils powered by common power pack of Voltage fed series inverter.
- a) A set of shrouded hydraulic cylinders with check valve for the hydraulic tilting
- b) Manually operated hydraulic direction control valve for tilting.
- c) Leak detector assembly with stainless steel probe wires and Hardware
- d) Set of flexible water-cooled power leads for connection between Induction coil and power supply unit, water cooled leads with sleeves for protection against metal splash.

E. HYDRAULIC POWER UNIT: One suitable Hydraulic pumping unit consisting of 3 phase induction motor, Hydraulic pump, Motor control unit, oil storage tank

pressure gauges, pressure relief valve, return line filter and filter air breather cap all mounted on a common base with seamless pipes and fittings.

- F. **DIESEL PUMP** : Suitable capacity Diesel Pump with all accessories to be provided for cooling Circuit as emergency in case of Power failure. Make & Model to be furnished.
- G. **DM WATER / SOFT WATER TREATMENT PLANT** : De-Mineraliser or Soft Water Treatment plant with all accessories, pipeline, fittings etc including electricals for internal/ external cooling system of the Furnaces.

SCOPE OF SUPPLY OF FIRM

Supply, installation, commissioning and on load test run of the Supplied Equipment with all accessories and to handover the same in ready to use condition as per mutually agreed time schedule. The scope is also to include all works like electricals / materials / consumables / tools and tackles / man power required to carry out the job totally and successfully. Space, electrical power and water at single point are in SCCL scope. All material supplied will be in suppliers custody till successful handing over to SCCL. The job will be on turn-key basis.

1. Furnace transformer of suitable rated capacity. Firm should furnish make of the furnace transformer.
2. Input bus bar with bus duct from furnace transformer to furnace power supply unit (control panel).
3. Suitable rated Capacitor Rack fitted with capacitors for above power supply unit complete with connecting bus bar and capacitor switch to maintain the power factor of the furnace 0.95 and above.
4. Internal water system for furnace and power supply unit.
5. 2 Nos of Coreless Induction Furnace of 3 Ton capacity.
6. 1250KW – 1500KW Power Supply Unit (Control Panel) to 3T furnace with interconnecting arrangement.
7. Arrangement of hydraulic system (motor, hydraulic pump, motor control centre) for pouring of molten metal from 3T furnace.
8. Cooling water system which includes suitable
 - a) Cooling Tower

- b) Water Pumps
 - c) Motors
 - d) Motor Control Centers including suitable SWA Cables.
 - e) Heat Exchangers
 - f) Piping & Fittings including emergency Lines
 - g) Other material , if any.
9. Suitable Diesel pump for emergency line.
 10. Suitable MCC panels for controlling of 415V 3phase 50hz internal and external electrical pumps and other required Auxiliary loads for 3t induction furnace with 2 spare pump sets.
 11. Cable supply and wiring from MCC panel to all internal and external pumps and other required Auxiliary loads.
 12. Suitable capacity DM plant or Soft Water Treatment plant.
 13. 1st fill of hydraulic oil, distilled water, ramming mass for 1st patching, silica and Magnesite lining material, melt out former - 1 no.
 14. Suitable capacity pouring laddles -2 nos.
 15. Pyrometer.
 16. Scrap charging devices of suitable capacity. Firm has to furnish details of the same.
 17. Suitable capacity ramming tools, automatic lining vibrator suitable for 3MTN Induction Furnace.
 18. Suitable diesel generator set for Furnace Auxiliary Load with accessories.
 19. Firm has to fulfill statutory requirements of Electricity Board, Factory Inspectorate, Pollution Control and any other statutory requirements.
 20. To provide necessary foundation layout drawing / load data. All necessary Drawings are to be submitted to GM (E&M) central workshop.
 21. To provide Equipment layout drawings, wiring and water diagrams, equipment Outline, furnace cross section drawing and an operating & maintenance and spare parts manual (1 soft copy + 3 hard copies).
 22. Previous purchase orders and performance certificates of 3Ton/ Higher capacity of voltage fed induction melting furnace to be submitted
 23. All inter – connections like cables, bus-bars, termination with copper lugs should be provided.
 24. Hydraulic system for 3Ton melting furnace with accessories including electrical (MCC panel).
 25. All insulation of electrical equipment should comply with central electricity authority regulation 2010.
 26. Installation and commissioning of the complete equipment & Systems.
 27. On-site training to be imparted to SCCL Staff and Engineers regarding operation and maintenance of Induction furnace

SCCL's SCOPE OF WORK:

1. Power line up to furnace transformer & erection of
 - a. 33KV AB Switch -1no,
 - b. 33KV Current Transformers -3nos
 - c. 33KV VCB with remote control panel-1 set,
 - d. Earthing arrangements for above
2. Foundation for furnace transformer, complete Civil works for Furnace Platform, Furnace Foundation, External Water System Tanks, Raw Water / DM Water Tanks, Diesel Pumps and Electricals
3. 415 V 3-ph supply Source to all Auxiliary Load MCC panels.
4. Pressurized air supply if required (100 PSI)
5. 33KV Cable

Annual Maintenance Contract :

1. The firm has to carryout Annual Maintenance Contract of the complete system i.e; for all the items supplied for a period of THREE YEARS.
2. The Annual Maintenance Contract will commence after the Warranty period.
3. The firm has to make atleast Six Scheduled Visits to the site for AMC in each Year as per the schedule given by GM(E&M)/AGM(E&M). CWS. Each Visist may last for a day or two.
4. Further , the Firm has to attend any Number of Breakdown calls during the complete AMC period and should be available till repairs are completed.
5. The Firm has to draw out a plan for procurement of spares well in advance based on joint inspection and arrange for immediate supply upon placement of Purchase Order by SCCL.
6. During the Scheduled Visits & Breakdown calls, accommodation will be provided to the firm's representative on Free of Cost in the Company's Guest House, subject to availability.