



BHARAT HEAVY ELECTRICALS LIMITED  
RAMACHANDRAPURAM: HYDERABAD – 502 032

5123

Ref: HY/M&S/ELS/KVS/BABB-SPECS/080  
Dt: 08.03.2014  
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**SPECIFICATIONS OF MOTOR-DRIVE SYSTEM FOR CENTRIFUGAL BABBITTING MACHINE IN 08 BLOCK (08-1215)**

**REPLACEMENT OF MOTOR-DRIVE SYSTEM, CONTROL PANEL WITH SWITCHGEAR FOR CENTRIFUGAL BABBITTING MACHINE IN 08 BLOCKS (ASSET NO. 08-1215).**

1 **OBJECTIVE:** The objective is to replace the existing DC motor/Drive with latest AC motor with Variable Frequency Drive (VFD) system with control panel.

**DETAILS OF EXISTING MOTOR : KIRLOSKAR Electric Co. Ltd. make DC Motor**

|                  |             |                  |          |
|------------------|-------------|------------------|----------|
| Type             | : DC 225/28 | Frame            | : BS2613 |
| Power            | : 11 KW     | RPM              | : 1500   |
| Armature voltage | : 380 V     | Armature current | : 33 A   |
| Field voltage    | : 200 V     | Field current    | : 2 A    |

**Qualifying conditions and references**

1. Only those vendors who have retrofitted and commissioned at least one Horizontal borer of spindle dia 100 mm or Vertical lathe with table dia 1200 mm with ABB/ Siemens /Control Technic/ Indramat make Motor Drive System for similar applications in the past five years (on the date of opening the tender) and such machine is working satisfactorily for more than one year should quote.
2. The vendor should have at least 5 years continuous experience in this field.
3. Performance certificate from the customers regarding satisfactory performance of retrofit to be enclosed along with technical offer.
4. The Bidder/Vendor to furnish reference list of customer, with full address, details of contract person, where similar system or higher version has been supplied in the past.
5. BHEL reserves the right to verify the information provided by Bidder/vendor. In case the information provided by Bidder/Vendor is found to be false / incorrect the offer shall be rejected.

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| Specifications   | Supplier's confirmation | Deviations if any /Remarks |
|--|-------------------------|----------------------------|
| <b>2 SCOPE OF MATERIAL SUPPLY</b>  |                         |                            |
| <b>2.1 THE MOTOR:</b> 3- Phase AC maintenance free Induction motor with external fan for cooling equivalent for above DC Motor<br><b>Type: Foot mounted</b><br>Protection: IP55 ,Insulation class F, Duty Cycle S1<br>* Technical data sheet which contain Type and other details to be provided with offer.<br><b>Application : Centrifugal Babbitting Machine</b><br><b>Make: MAKE: SIEMENS /ABB/ CONTROL TECHNIC / INDRAMAT</b>   |                         |                            |
| <b>2.2 THE DRIVE for above AC motor:</b> 3phase Variable AC Frequency (VFD), 4-Quadrant, regenerative braking system for dynamic control of above the motor.<br><b>Make: MAKE: SIEMENS /ABB/ CONTROL TECHNIC / INDRAMAT</b><br>The drive shall have following features<br><ul style="list-style-type: none"><li>• Facility to input analog reference voltage of (0 to <math>\pm 10</math> V) DC through external potentiometer as well as digital reference.</li><li>• Digital inputs for Direction, Inching and Continuous Start/Stop</li><li>• Potential free digital outputs for Zero speed, Drive trip, Drive status etc.</li><li>• Overvoltage / over current protection</li><li>• Local/Remote operation</li><li>• Digital RPM Meter for Chuck speed (Range 0-1500 RPM)</li></ul><br>The drive control panel shall have indication lamps for<br><ul style="list-style-type: none"><li>• Drive fault</li><li>• Drive in operation etc</li></ul> |                         |                            |

Central Bar



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|          |   |  |  |
|----------|---|--|--|
| 2.3      | <b>Control panel</b> (details): a standard control Panel with IP 54 Protection (Rodents and Foreign Objects should not enter into the panel) <ul style="list-style-type: none"><li>• THE VARIABLE FREQUENCY DRIVE (VFD)</li><li>• LINE FILTER</li><li>• CHOKE</li><li>• Complete SWITCHGEAR</li><li>• INDICATION METERS FOR MOTOR POWER AND CURRENT etc</li><li>• 24V DC POWER SUPPLY</li><li>• Energy meter with LAN connectivity.</li></ul> |  |  |
| 2.4      | Cables: Necessary Motor power/signal/interface cables of MAKE: Lapp/ equivalent. Length: 10 meters.   |  |  |
| 2.5      | Digital indication meters for <ul style="list-style-type: none"><li>a) Table RPM : 0-1500 RPM</li><li>b) Current / load meter</li></ul>   |  |  |
| <b>3</b> | <b>SCOPE OF WORK</b>  |  |  |
|          | <b>ELECTRICAL AND ELECTRONICS</b>   |  |  |
| 3.1      | Dismantling of existing motor, cables etc.  |  |  |
| 3.2      | Installation of new motor-drive system and electrical panel   |  |  |
|          | <b>SCOPE OF MECHANICAL WORK:</b>  |  |  |
| 3.3      | Mounting of motor on the machine  |  |  |
| 3.4      | Design, manufacture and mounting of brackets and fixtures to mount and align the motor.   |  |  |
|          | <b>INSTALLATION AND COMMISSIONING</b>   |  |  |
| 3.5      | Installation & Commissioning and testing of motor-drive system on the machine   |  |  |
| <b>4</b> | <b>DOCUMENTATION</b>  |  |  |

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MACHINE IN 08 BLOCK (08-1215)

|      |   |  |  |
|------|---|--|--|
| 4.1  | The supplier shall supply 3 sets of the following documents for MOTOR-DRIVE system  |  |  |
|      | i. Installation/commissioning and Maintenance manuals   |  |  |
|      | ii. Electrical drawings of the control panel and pendent panel.   |  |  |
| 4.2  | One set of the above documents and parameters shall be furnished in a DVD as well as 16 GB USB Memory   |  |  |
| 5    | GENERAL POINTS  |  |  |
| 5.1  | All equipment must be suitable to run with input voltage 3 wire, 3 phase, 415 V $\pm$ 10% 50 Hz $\pm$ 2 Hz  |  |  |
| 5.2  | All equipment shall be tropicalised and suitable for operation in shop floor conditions, where temperature variation is between 10 <sup>o</sup> to 45 <sup>o</sup> C  |  |  |
| 5.3  | Panels shall be free standing floor mounting type.  |  |  |
| 5.4  | Supplier should arrange for training on maintenance of Drive- free of cost for <b>two personnel</b> at Manufacturer's training facility                               |  |  |
| 5.5  | Supplier to quote separately for the material and for installation and commissioning charges.   |  |  |
| 5.6  | Supplier to send his offers for commercial and technical bids in a separate sealed cover and for price bid in a separate sealed cover.                                |  |  |
| 5.7  | Supplier has to prove out all the functions of drive and demonstrate working of the machine to the satisfaction of BHEL.  |  |  |
| 5.8  | Indication lamps wherever required to be provided.  |  |  |
| 5.9  | Earthing: All non-current carrying metallic parts shall be Earthed. All doors and movable parts shall be connected to the earth bus with flexible copper connections. |  |  |
| 5.10 | The machine will be available for modifications for duration of 2 weeks   |  |  |

CEM/B