

**BHARAT HEAVY ELECTRICAL LIMITED  
HEAVY ELECTRICAL EQUIPMENT PLANT  
UTTARAKHAND,INDIA**

**Enquiry No. &  
Date:**  
**Due Date:**  
**Supplier's Ref.:**  
**Date :**

**Specification for Ball Bar Calibration System**

**Note:-**

1. The 'Offered' Column and where applicable, the 'Deviations' & 'Remarks' Column of this format shall be filled in by the Vendor and submitted along with the offer. The offer containing Inadequate/incomplete, ambiguous or unsustainable information against any of the clause may be rejected.

2. The offer and all documents enclosed with offer should be in English language only.

**Name & Address of the supplier:**

**Name & Address of the Indian Agent:**

**Telephone No.:**

**Telephone No.:**

**Fax No.:**

**Fax No.:**

**e-mail :**

**e-mail :**

**Scope: Supply & Commissioning of Ball Bar Calibration System(1 set) complying with the following specifications.**

**Annexure to Indent No.:20140950 , Dated:15.05.2014**

**MATERIAL CODE NO.: ZWG061101010**

S. No.	Description - BHEL's Requirement	Qty.	Specified	Offered	Deviations	Remarks
1.0.0	<b>APPLICATION:</b>					
1.1.0	The subject telescoping Ballbar will be quickly and easily used to check contouring accuracy by testing how machine axes move in a circular path. Ballbar measures the deviation made by the machine tool and displays the data in a polar plot format. Error Parameters Measured are Backlash, Squareness, Stick-slip, Servo lag, Straightness, Scale mismatch and Machine and servo vibration.	-	Vendor to note and confirm			
2.0.0	<b>SCOPE OF SUPPLY:</b>					
2.1.0	Ball Bar Calibration System should consist of a telescopic bar with precision sphere and a kinematic magnetic cup joint located at either end, enabling the ball bar to be repeatedly loaded onto the machine. Deviation from the nominal interpolation should be measured by a high-accuracy linear sensor within the ball bar. The collected data is to be used to calculate overall measurements of positioning accuracy in accordance with national/international standards.	1 set	Vendor to Comply and confirm			
3.0.0	<b>Range</b>					
3.1.0	Ballbar measuring Range	-	± 1mm			

*Handwritten signature and date: 01-11-14*

*Handwritten initials and signature*

3.2.0	Ballbar measurement accuracy (maximum)	-	± 1 µm			
3.3.0	Data transmission range ( Bluetooth )	-	10			
4.0.0	<b>TECHNICAL SPECIFICATIONS:</b>					
4.1.0	Sensor resolution		0.25 µm			
4.2.0	The kit should contain a latest version wireless ball bar , battery, Centre pivot, Tool cup, 50, 150 and 300 mm extension bars, calibrator, System software, Setting ball and Machine validation cards.	1 set	Vendor to Comply and confirm			
4.3.0	The system should have 360° lathe adaptor kit to perform 360°, 100 mm radius ball bar tests on a lathe. The kit should consist of an arm assembly for attachment to the lathe turret and a spindle bar for attachment in the lathe spindle. Both arm and spindle should include magnetic cups to locate the ball bar.	1 set	Vendor to Comply and confirm			
4.4.0	It should contain VTL Adaptor for 2-axis CNC applications.	1set	Vendor to Comply and confirm			
4.5.0	It should contain Small Circle Accessory Kit to carry out tests with the radius of 50MM with suitable calibrator & adaptor to fit with the ball bar system.	1set	Vendor to Comply and confirm			
4.6.0	Appropriate system software (including system manuals) for interfacing with PC & data presentation.	1set	Vendor to Comply and confirm			
4.7.0	It shall also comprise of an excellent quality, durable, portable storage case to accommodate the complete ball bar system including all accessories.	1 no.	Vendor to Comply and confirm			
4.8.0	Calibration certificate for complete system traceable to Indian/International standards.	-	Vendor to Comply and confirm			
5.0.0	<b>Ambient Operating Temperature:</b> 2 Degree Centigrade to 45 Degree Centigrade without derating.	-	Vendor to note and confirm			
6.0.0	<b>COMMISSIONING:</b> Commissioning work should be completed by the vendor within 8 weeks from date of first intimation by BHEL, Haridwar .	-	Vendor to Comply and confirm			
7.0.0	It includes demonstrating the application/function and user training of equipment on following types of machine tool provided at BHEL,Haridwar works:-a)1 No. CNC Vertical Borer-2 days b) 1 no. CNC Horizontal borer-2 days c)1no. CNC Lathe-2 days.	-	Vendor to Comply and confirm			
8.0.0	<b>O &amp; M MANUALS:</b> Operation & Maintenance Manual with 1 set of CDs. All copies shall be hard-bound in high quality folders.	3 set	Vendor to Comply and confirm			
9.0.0	<b>PERFORMANCE GUARANTEE:</b>					

*Handwritten signature*  
01.11.14

*Handwritten mark*

*Handwritten mark*

9.1.0	The Performance of the complete set of equipment shall have guarantee/warranty for a minimum period of 24 months from the date of commissioning.	-	Vendor to Comply and confirm			
10.0.0	<b>SPECIAL INSTRUCTIONS:</b>					
10.1.0	Supplier must submit point wise reply to specifications, Deviations if any must be separately submitted with reasons for each.	-	Vendor to Comply and confirm			
11.1.1	<b>FINAL ACCEPTANCE</b>					
11.1.2	The equipment shall be finally accepted by BHEL, Haridwar subject to fulfillment of all the above points.	-	Vendor to Comply and confirm			



(SHIV PRAKASH)  
(Sr. Engr-WEX-ERS/ERN)



( R K VERMA )  
(Sr. Mgr.-WEX-Mech. Maint.)



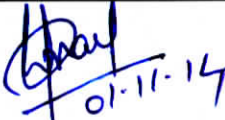
( B S GARG )  
(Sr. Mgr.- WEX-CNC)


**Scope: Supply & Commissioning of Ball Bar Calibration System(1 set) complying with the following specifications.**


**Annexure to Indent No.: 20140950 , Date: 15.05.2014**

**MATERIAL CODE NO.: ZWG061101010**

S. No.	Description - BHEL's Requirement		Specified	Offered	Deviations	Remarks
12.0.0	<b>PRE-QUALIFYING CONDITION:</b>					
12.1.1	Equipment must be of internationally reputed make.	-	Vendor to Comply and confirm			
12.1.2	Offers can be submitted by any of the following i) OEM of the Equipment. ii) Authorized supplier/ distributor/retailer/ stockiest/ channel partner of the OEM.		Vendor to Comply and confirm			
12.2.0	Vender/supplier must submit the document that OEM of the equipment will provide the services during warranty period.		Vendor to Comply and confirm			
12.3.0	Vendor/Supplier must furnish atleast one satisfactory performance certificate of the equipment(not older than 3 years from date of floating of tender ) having similar specification along with offer from a Govt./PSU/ organisation of repute in India.	-	Vendor to Comply and confirm			
12.4.0	The OEM must have service and technical support in India.	-	Vendor to Comply and confirm			

  
(SHIV PRAKASH)  
(Sr. Engr-WEX-ERS/ERN)

  
( R.K. VERMA )  
(Sr. Mgr.-WEX-Mech. Maint.)

  
( B S GARG )  
(Sr. Mgr.- WEX-CNC)