

	<u>BHARAT HEAVY ELECTRICAL LIMITED</u>					Enquiry No. :
	<u>UNIT'S ADDRESS:</u>					Due Date :
	<u>UNIT'S PHONE NO.:</u>					Supplier Qtn. No.:
	<u>CONTACT PERSON'S NAME/DESGN./PHONE NO./E-MAIL (FROM PURCHASE DEPT.)</u>					Date :
<u>SPECIFICATION CUM COMPLIANCE CERTIFICATION FOR TORQUE MEASUREMENT SYSTEM</u>						
<u>NOTE:-</u>						
1. Vendor must submit complete information against all Clauses. The offer meeting clause no. 4 would only be processed.						
2. 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. Inadequate / incomplete, or unsustainable information against any of the clauses of the specifications/requirements shall be treated as non-compliance.						
3. The offer and all documents enclosed with offer should be in English language only.						
ADDRESS OF THE SUPPLIER :		ADDRESS OF LOCAL (BHOPAL/MP) AGENTS :				
TELEPHONE NOS.:		TELEPHONE NOS.:				
FAX NOS.:		FAX NOS.:				
E-MAIL ADDRESS :		E-MAIL ADDRESS :				
SCOPE: SUPPLY OF TORQUE MEASUREMENT SYSTEM AS SPECIFIED BELOW						

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
1.0 PURPOSE :					
1.1	Purpose : For measurement of Torque during Turbine Model Testing. The output of the load cell will be fed to the carrier frequency amplifier. The whole system of Torque Measurement System is to be supplied by the same party.				
2.0 SCOPE OF SUPPLY					
2.1 Load Cell					
2.1.1	Type 200 Kg Load cell with 3m cable	04 No			
2.1.2	TEDS for above load cell ready fitted in transducer cable, non- crush enclosure	04 No			
2.2 Connection Box/Junction Box					
		01 No			
2.3 Carrier Frequency Amplifier System: Suitable for above mentioned load cell					
2.3.1	Type 19" RACK FRAME	01 set			
2.3.2	Display & Control Panel along with cable	01 No			
2.3.3	Single Channel Amplifier module equivalent to HBM Germany make ML30B CF amplifier	02 No			
2.3.4	Connection Board for each amplifier	02 Nos.			
2.3.5	Cable Socket with capnut socket alongwith 10 m cable	02 Nos.			
2.3.6	25 Pole D Connector	02 Nos.			
3.0 SPECIFICATION :					
3.1 Load Cell					
3.1.1	Type (As per sketch enclosed at clause no. 3.1.19)	Vendor to confirm			
	Round Beam Cantilever type Metal Bellow Stainless Steel Load Cell optimized for parallel connection				
3.1.2	Measuring Range	Vendor to confirm			
	200 kg				

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3.1.3	Accuracy Class	C3 as per OIML R60.Maximum numbers of load cell verification intervals =3000.	Vendor to confirm			
3.1.4	Signal Output at capacity	2 ± 1% mV/V	Vendor to confirm			
3.1.5	Temperature Effect on Output	<0.002 % per degree Centigrade	Vendor to confirm			
3.1.6	Temperature Effect on Zero	<0.002 % per degree Centigrade	Vendor to confirm			
3.1.7	Repeatability	< ± 0.01 % FSO	Vendor to confirm			
3.1.8	Linearity	< ± 0.02% on FSO	Vendor to confirm			
3.1.9	Hysteresis	< ± 0.02% on FSO	Vendor to confirm			
3.1.10	Load					
3.1.10.1	Type of Load	Bidirectional Tensile	Vendor to confirm			
3.1.10.2	Safe Load Limit	300 kg	Vendor to confirm			
3.1.10.3	Breaking Load	> 600 kg	Vendor to confirm			
3.1.11	Protection class	IP 68	Vendor to confirm			
3.1.12	Excitation Voltage	5 V to 12 V	Vendor to confirm			
3.1.13	Cable	3m PVC cable with 6 wire connectivity	Vendor to confirm			
3.1.14	TEDS for above Load cell	Load cell must be 6 wire TEDS ready	Vendor to confirm			
3.1.15	Working Environment	Temperature: 0 - 40°C, Humidity - 95 %	Vendor to confirm			
3.1.16	Material	Stainless Steel	Vendor to confirm			
3.1.17	Dimensions	approx. Dia - 42 mm, Length 123 mm	Vendor to confirm & specify			

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3.1.18	Load cell should be suitable for mounting in Horizontal and Vertical arrangement	Vendor to confirm								
3.1.19	<div>Overall Dimensions :Typical Dimensions given below.Marginal changes in dimensions are acceptable: Dimensions in mm Capacity: 200 Kg</div> <div><p>Cable: 3 m, Ø 5.4 mm, 6 cores screened, screen connected to housing</p><p>Metal bellow</p><table><tr><td></td><td>A</td><td>B</td></tr><tr><td>5...200 kg</td><td>8.2</td><td>8.2</td></tr></table></div>		A	B	5...200 kg	8.2	8.2			
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5...200 kg	8.2	8.2								

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3.2	Connection Box/Junction Box	EMC rated Junction Box compatible for parallel connection of two load cells	Vendor to confirm			
3.3	Carrier Frequency Amplifier System:		Vendor to confirm			
3.3.1	Stand alone system		Vendor to confirm			
3.3.2	Rack Frame	19"	Vendor to confirm			
3.3.3	Maximum no. of Channels	16	Vendor to confirm			
3.3.4	Supply Voltage	230V AC 50 Hz	Vendor to confirm			
3.3.5	Display & Control Panel		Vendor to confirm			
3.3.5.1	Display	Backlit Display,menu with password facility, touch sensitive	Vendor to confirm			
3.3.5.2	Display	80 mmx 30 mm (typical)	Vendor to specify			
3.3.5.3	Menu Language	English	Vendor to confirm			
3.3.5.4	Key panel	Key pad (alphanumeric) All keys to be touch	Vendor to confirm			
3.3.6	Single Channel Amplifier					
3.3.6.1	Accuracy Class	0.03	Vendor to confirm	s		
3.3.6.2	Signal Conditioning	Digital Signal Conditioning for full bridge strain gauge transducers	Vendor to confirm			
3.3.6.3	A/D converter	Each channel should have 24 bit A/D converter (No,Track & Hold,Sample & Hold or multiplexing)	Vendor to confirm			
3.3.6.4	Sampling rate per channel	Simultaneous and parallel sampling of 19,200 samples/sec/channel	Vendor to confirm			

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3.3.6.5	Load Cell connection	1/4 bridge via 4 wire regulated Extended Via Kreuzer 6 wire circuit (6 wires including TEDS identification lines)	Vendor to confirm			
3.3.6.6	Linearity Deviation (%)	<0.02 %	Vendor to confirm			
3.3.6.7	Measuring Range (mV / V)	±0.50 to 15.0 mV / V	Vendor to confirm			
3.3.6.8	Transducer Resistance Range	30 - 5000 Ohm	Vendor to confirm			
3.3.6.9	Carrier frequency	600 Hz	Vendor to confirm			
3.3.6.10	TEDS	Fully TEDS compliant with IEE 1451.4 standard	Vendor to confirm			
3.3.6.11	Auto recognition	The amplifier should automatically recognize the load cell and set up the required parameters automatically when switched "ON"	Vendor to confirm			
3.3.6.12	Bridge Excitation Voltage	1, 2.5 and 5 V and more	Vendor to confirm & specify			
3.3.6.13	Filter Frequency (Hz)	Both Bessel & Butterworth required with a range of 0.05 Hz to 200 Hz	Vendor to confirm			
3.3.6.14	Effect of Temperature: i. On signal output ii. On Zero;	< 0.001 % / °C < 0.0005 % / °C	Vendor to confirm			

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3.3.6.15	Calibration		Auto (must be done parallel in all channels)	Vendor to confirm		
3.3.6.16	Analog output of amplified signal		±10 V for each channel	Vendor to confirm		
3.3.6.17	Connection Board for amplifier			Vendor to confirm		
3.3.6.17.1	Transducer connection		7 pin MS-Female (for transducer connection)	Vendor to confirm		
3.3.6.17.2	Output signal connection		D-25 Female receptacle	Vendor to confirm		
3.3.6.17.3	Cable Socket with cap nut socket alongwith 10 m cable		suitable to item at 3.3.6.17.1	Vendor to confirm		
3.3.6.17.4	25 Pole D-connector		suitable to item at 3.3.6.17.2	Vendor to confirm		
4.0	QUALIFICATION					
4.1	The supplier should be a regular supplier and should have supplied earlier atleast 3 numbers of similar Load Cell of the Range between 100-300 kg and carrier frequency amplifier to atleast three customers . A list of customers is to be given by supplier with offer.		Vendor to Confirm			
4.2	Copy of purchase order (P.O.) of Torque Measurement System from atleast one Customer listed in clause 4.1, with date of purchase order within last three years is to be submitted.		Vendor to Specify			
5.0	CALIBRATION:					
	Calibration certificate of load Cell and the carrier Frequency Amplifier by NABL/ NKO or any other Laboratory approved by APLAC/ILAC shall be provided by vendor. Certificate should be traceable Internationally.		Vendor to Confirm			

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6.0	DOCUMENTATION					
6.1	Technical Documents and operating manual - 4 Sets.		Vendor to Confirm and Submit			
6.2	One copy of relevant technical documents along with the drawings must be submitted along with the offer.					
7.0	GUARANTEE :		Vendor to confirm			
7.1	Supplier should give guarantee of smooth and trouble free operation for at least 18 months from the date of receipt.					
8.0	STANDARDS		Vendor to confirm			
8.1	National/International standards or any other equivalent standards must be applied for Any material, method and quality for items.					
9.0	METRIC UNITS		Vendor to confirm			
9.1	Dimensions, Drawings and Documents shall be in metric units.					