HYDERABAD	**BHARAT HEAVY ELECTRICALS LIMITED** **RAMACHANDRPURAM :: HYDERABAD 502 032.**	**Enquiry No. :**	
		Due Date :	
	CONTACT DETAILS	**Supplier Qtn. No.:**	
	DGM/PUR(CG) email : bayyarapu@bhelhyd.co.in Phone No. 040-23182250	**Date :**	

SPECIFICATION CUM COMPLIANCE CERTIFICATION FOR 12 CHANNEL INTEGRATED AC/DC POWER ANALYZER

NOTE:-

1. Vendor (OEM) must submit complete information against clause no. 8. The offer meeting this clause 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, ambiguous, 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 THE INDIAN AGENTS :**
TELEPHONE NOS.:	**TELEPHONE NOS.:**
FAX NOS.:	**FAX NOS.:**
E-MAIL ADDRESS :	**E-MAIL ADDRESS :**

SCOPE: DESIGN, MANUFACTURE, TESTING , CALIBRATION, PACKING AND DISPATCH OF 12 CHANNEL INTEGRATED POWER ANALYZER

S.No.	**BHEL REQUIREMENT**	OFFERED	DEVIATIONS	REMARKS
1.0	**PURPOSE OF THE EQUIPMENT:**			
1.1	The AC/DC Power analyser is used for measurement and analysis of electrical parameters for Variable Frequency Drive power output (Motor option), Synchronous Generators, Brushless Exciters and Permanent Magnet Generators.			
2.0	**SCOPE :**			
2.1	Design, Manufacture, Testing , Calibration, Packing and Dispatch of 12 CHANNEL INTEGRATED POWER ANALYZER			
3.0	**TECHNICAL REQUIREMENT:**			
3.1	The equipment shall be compact in size , Six elements (6-voltages and 6-currents i.e, 3-phase power input from two systems or six phase inputs for AC or 6 independent power inputs for DC power measurements) Display in numerical, waveform, phase angles, Trends in various formats. Wide current and voltage ranges. Display and print out of harmonics and various factors in numerical and graphical formats, data storage, GPIB, Ethernet ports for connecting instruments to controllers, data transfer from the storage. Analog /digital inputs and outputs for output of signals and external input of signals, User friendly key board and function keys.			
3.2	**No. of channels:** Voltage : 6 AC or DC Current : 6 AC or DC			
3.3	**Voltage Measurement**: 0-1000 V DC to 1 MHz 6 Channels (1 kV rms, 1.5 kV peak continuous), Basic Accuracy : 0.05% of reading for DC and AC (Overall accuracy shall be better than 0.12 % at Full scale range including all the errors at 50/60 Hz)			

3.4	**Current Measurement**: Three channels of 0-5 A DC to 1 MHz (or above) (7 A rms, 10 A peak continuous), Three channels of 0-20 A DC to 1 MHz (or above) and external inputs from Shunt outputs [Selectable either direct current or through external inputs as voltage input] External inputs peak of 5 times of range continuous Basic Accuracy : 0.05% of rdg for DC and AC (Overall accuracy shall be better than 0.12 % at Full scale range including all the errors at 50/60 Hz) (Provision for both Direct inputs of current and external inputs from shunt shall be available.) Isolation for external shunt inputs shall be provided in the instrument.			
3.5	**Power measurement :** The analyser shall compute the power in all 6 power channels in AC and DC. The overall accuracy of the power shall be 0.3% or better considering all the errors at 50/60 Hz.			
3.6	**Frequency measurements** Up to 160 kHz. Accuracy 0.05% of reading			
3.7	**Sampling frequency :** 100 kHz (Minimum)			
3.8	**Display:** 5.7” Graphic display color or higher A variety of display formats for numerical values. (measured and derived quantities) Display of minimum 3 waveforms Harmonic measurements, Phase diagram, Bar graphs for harmonic measurement, Trend display of measured / calculated values, Settings of instrument, external inputs.			

3.9	**Storage:** The analyser shall be provided with Data storage memory for measured values.			
3.10	**Interfaces and input/outputs:** 1. IEEE 488 (GPIB) and Ethernet(100 Base T) 2. Input for external triggering, pulse input for rpm, Analog input for torque. 3. Complete command reference for the interface available in instrument shall provide for customized programming.			
3.11	**Printer :** Inbuilt printer shall be provided or External printer connection shall be provided for Printing of screens, list of measured values, harmonic graphs, settings etc.			
3.12	**Measurement/calculation functions :** Instrument shall be capable of measuring voltage and current and derive the following: ΣVoltage, ΣCurrent, Active power, Σ Active power, Reactive power, ΣReactive power, Apparent power, ΣApparent power, Power factor, ΣPower factor, Phase angle, ΣPhase angle, Current and voltage Peak measurements, Crest factor, Form factor, Impedance, resistance, Reactance, efficiency, Single phase 2 wire power (using one element) , Three phase three wire power(using two elements), Three phase four wire (using three elements), Harmonic measurement: Upto 99^{th} harmonic of Voltage, current, power. Voltage THF, Current THF, Voltage TIF, Current TIF, Harmonic voltage factor(HVF), Harmonic current factor(HIF), THD of Voltage, current, power. Positive only voltages, Positive only currents, Positive only powers, Negative only voltages, Negative only currents, Negative only powers, rms, mean. Averaging functions : Normal, exponential, moving averages.			

3.13	**CT, PT ratio inputs**: Provision shall be given for PT,CT ratio inputs.			
3.14	**Power Supply** : 180 V to 260 V AC 50 Hz.			
3.15	Operating temperature: 40 Deg.Cel. Storage temperature : 60 Deg.Cel			
3.16	**Connecting cables:** a) Set of Connecting cables of 1.5 meter length including connectors at both the ends for measurement of each 6 voltages, 6 currents with direct connection b) Set of cables for 6 shunt (current) connections including connectors at both the ends shall be provided. c) The voltage rating of the cables shall be 2000V d) The minimum current rating of 30 A rms for current cables. e) Power supply, interface cables shall be provided			
4.0	**INSPECTION, TESTING and CALIBRATION:**			
4.1	Supplier to submit Quality Plan for approval.			
4.2	Pre-dispatch inspection by BHEL/Customer at suppliers works.			
4.3	The complete supply shall be tested and calibrated at manufacturer works and reports shall be furnished.			
5.0	**PACKING and DISPATCH:**			
5.1	The equipment to be directly dispatched to project site from supplier's works after obtaining necessary clearance from BHEL. Consignee details will be intimated at the time of PO placement.			
5.2	Item shall be packed in all weatherproof packing with sufficient cushioning to avoid any possibilities of damage during transportation and storage at site. Specific storage requirements, if any, to be indicated by supplier.			

6.0	**GAURANTEE**: The guarantee of the equipment shall be as per BHEL standard terms and conditions.			
7.0	**DOCUMENTATION:**			
7.1	The following documents shall be submitted along with the offer. 1. Compliance statement as per the BHEL specifications 2. Vendor's technical catalogues, literature and write ups 3. Basic drawings for the equipment offered their interconnectivity drawings. etc. 4. Reference list of customers 5. Extended specifications			
7.2	The following documents shall be submitted along with the supply of equipment: 1. Test and calibration certificates for the equipment supplied. 2. Three sets of User manuals 3. Three sets of maintenance manuals.			
8.0	Only those vendors, who have supplied two numbers of 12 CHANNEL INTEGRATED AC/DC POWER ANALYZER of similar type (on the Date of opening of tender) and such supplies are presently working satisfactorily for more than one year after commissioning (On the Date of Opening of tender), should quote. However, if vendor had supplied 12 CHANNEL INTEGRATED AC/DC POWER ANALYZER to BHEL, then it should be presently working satisfactorily for more than six months after its commissioning and acceptance (On the Date of Opening of tender) in BHEL. Vendor shall furnish reference list of such customers with contact person/s' details and also order copies. This is required from all Vendors for qualification of their offer.			