

BHARAT HEAVY ELECTRICALS LIMITED, JHANSI **TRANSFORMER TESTING LABORATORY**

SPECIFICATION FOR KV PEAK METER WITH POTENTIAL DIVIDER FOR POWER TRANSFORMER

Amexure -A

REF. NO. : DEBOTTLENECKING-CAPITAL/SPECS/2018-19/10 REV. 00 DATE: 16.01.19

Note : 1) Vendor must submit complete following information. The offer meeting the following requirements would only be processed.
 2) The offered column and Deviation & Remarks column (where ever applicable) of this format shall be filled by the vendor and to be submitted along with the offer. Inadequate, incomplete, ambiguous or unsustainable information against any of the clause of specification/requirement shall be treated as non-compliance.

Sl. No.	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / CONFIRMED	VENDOR TO SPECIFY/CONFIRM	DEVIATION & REMARK
1.1	Purpose : Potential Divider along with Peak Kilo Voltmeter test system is required for measuring the high voltages during following testing on Power Transformers (Upto 315 MVA, 400 KV, 3 phase), Shunt Reactors, Instrument Transformers and Bushings etc. :- A) Power Frequency applied voltage test B) Induced Over Potential Test with PD Measurement	Vendor to Confirm.		
1.2	Quantity : 01 No. each	Vendor to Note		
1.3	Applicable Standard : Accredited Calibration as per relevant standard.	Vendor to furnish applicable standard.		
2	GENERAL SPECIFICATION :			
2.1	Potential Divider along with Peak Kilo Voltmeter shall be a integrated system and it shall be used to measure High Voltages during testing on Power Transformers.	Vendor to specify Type, Make and Model No. of Potential Divider and Peak KV Meter.		
2.2	System should be able to measure direct reading of the voltages with suitable units without any conversion factor.	Vendor to confirm		
2.3	Range : 0 - 1200 KV AC	Vendor to confirm		
2.4	Accuracy : ± 3.0 % of reading	Vendor to confirm		
2.5	Frequency : 40 - 200 Hz	Vendor to confirm		
2.6	Duty : Continuous Without Cooling	Vendor to confirm		
2.7	Step Response Time : 100 μ sec. (Approx.)	Vendor to Specify		
2.8	Input Resistance	Vendor to Specify		
2.9	Divider Ratio	Vendor to Specify		
2.10	Output Cable Connector : BNC Type	Vendor to Specify		
2.11	Mounting : Base Mounted Potential Divider	Vendor to confirm		
2.12	System should consist of following Modules :-	Vendor to confirm		
2.12.1	HV Coupling Capacitor for High Voltage Measurement & Input for peak kilo voltmeter	Vendor to confirm		
2.12.2	Peak Kilo Voltmeter for displaying measured values	Vendor to confirm		
2.12.3	One set of inter connecting cables with suitable termination for both end shall be provided along with system for following connection:- A) For connection between Coupling capacitor & Peak Kilo Volt Meter - 20 Meters (Min.) B) For connection between Coupling capacitor & System Ground - 20 Meter (Min.)	Vendor to confirm Vendor to confirm Vendor to confirm		

(Saitish Sahni)

(D.N. Yadav)

(Pawan Kumar)

(Vinoth Jaseja)

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2.13	HV Coupling Capacitor			
2.13.1	Coupling Capacitor to be used as direct connection of the measuring system to high voltage point & AAC input to peak kilovolt meter	Vendor to confirm		
2.13.2	Type of Use : Indoor	Vendor to confirm		
	Max. Voltage : 0 - 1200 kV	Vendor to confirm		
	Frequency : 40 - 200 Hz	Vendor to confirm		
	Capacity : 1 nF $\pm$ 10 %	Vendor to confirm		
	PD Level : $\leq$ 10 pC upto 765 kV	Vendor to confirm		
2.13.3	High Voltage end / Top electrode of Coupling Capacitor should be of suitable toroidal electrode.	Vendor to confirm		
2.13.4	Base of Coupling Capacitor should be fitted with alloy wheel for easy & frequent movement on the shop floor in all direction. Wheel and structure should be rugged and suitable for oily surface.	Vendor to confirm		
2.13.5	High Voltage Capacitor arm should be housed into glass fiber reinforced epoxy tube.	Vendor to confirm		
2.14	Peak Kilo Voltmeter			
2.14.1	Peak Kilo Voltmeter should be able to take the measurement automatically and system should have provision for display the following reading with suitable unit without any conversion factor.			
	A) Display of RMS value of Voltage	Vendor to confirm		
	B) Display of Peak value of Voltage	Vendor to confirm		
	C) Display of peak $\sqrt{2}$ value of Voltage	Vendor to confirm		
2.14.2	Peak Kilo Voltmeter shall be housed in a suitable enclosure for its handling/shifting in shop floor. The enclosure should have proper slots for leads connection.	Vendor to confirm		
2.14.3	AC Mode input voltage from Coupling Capacitor			
	Voltage Value : 0 to 150 Vrms			
	Frequency : 40 - 200 Hz	Vendor to confirm		
2.14.4	Accuracy : $\pm$ 0.5 %	Vendor to confirm		
2.14.5	Display : Display shall be 4 DIGITS Large, Back Light LED or LCD Display. Display on PC/Laptop as a primary display is not acceptable.	Vendor to confirm		
2.14.6	Range Setting : Automatic			
2.14.7	Peak Kilo Voltmeter shall have suitable user interface for setting through front panel menu/setting key.	Vendor to confirm		
2.14.8	Peak Kilo Voltmeter shall be provided with following connection at the rear end of the meter :-			
	A) AC Input	Vendor to confirm		
	B) Grounding Terminal	Vendor to confirm		
	C) Power Supply Terminal	Vendor to confirm		
2.14.9	Main supply cable: Suitable for 230V $\pm$ 10%, 50Hz, 1-ph supply of suitable length	Vendor to confirm		

(Sathish Sonli)

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2.15	The offer will be technically accepted after complying following for price bid opening :			
	A) Meeting all requirements mentioned in this technical specification	Vendor to confirm		
	B) Technical Discussions of offered equipment at BHEL Jhansi	Vendor to confirm		
2.16	SAFETY ARRANGEMENTS:			
	1) System should have adequate and reliable safety interlocks / devices.	Vendor to confirm		
	2) All electronics parts shall be housed in shielded enclosures.	Vendor to confirm		
	3) Instrument meets the requirement of relevant IEC.	Vendor to confirm & specify IEC		
3	ACCESSORIES: Vendor to furnish list and details of accessories to be supplied along with offered instrument	Vendor to specify list of all accessories.		
4	SPARES:			
4.1	All necessary spares for two years trouble-free operation are to be included in offer separately. Cost of all spare items are to be indicated separately in offer.	Vendor to furnish the spare list.		
4.2	Vendor to ensure availability of all spares item with OEM for at least 5 years of operation.	Vendor to confirm.		
4.3	Vendor to include following spare cable in main offer :- a) 100 meter cable for connection between Coupling capacitor & Peak Kilo Volt Meter b) 100 meter cable for connection between Coupling capacitor & System ground. c) 10 Nos. Termination arrangement for both ends of cables.	Vendor to confirm. Vendor to confirm. Vendor to confirm.		
5	DOCUMENTATION:			
5.1	Vendor to submit the reference list of customers (where offered systems had been supplied within last 3 years) mentioning the customer, Machine Model, major specifications of the supplied system, Year of Supply etc. along with offer.	Vendor to submit along with offer		
5.2	Vendor to submit Detailed GA Drawing, catalogues, photographs of instrument & its accessories along with the offer.	Vendor to submit along with offer		
5.3	Vendor to submit soft copy of Operation and Instruction manual along with offer and subsequently two hard copies of manual along with the supply.	Vendor to confirm and submit as per requirement		
5.4	Vendor to submit soft copy of Maintenance manual along with circuit diagrams and schematics for trouble shooting along with offer and subsequently two hard copies of manual along with the supply.	Vendor to confirm and submit as per requirement		
5.5	Vendor to submit soft copy and two hard copies of Test Certificate & Guarantee Certificate along with the supply.	Vendor to confirm and submit along with supply.		
5.6	Calibration certificate to be submitted from laboratory having traceability with NABL : Vendor to submit Valid Calibration certificate from NABL accredited lab (having at least 8 to 9 months validity left at the time of supply) of offered instrument along with the supply.	Vendor to confirm and submit along with supply.		

(Satish Sahu)
19.01.19

(D. K. Yadav)
19.01.19

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**BHEL AT HEAVY ELECTRICALS LIMITED, JH, SRI
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6 SYSTEM INSPECTION:			
6.1	Inspection by BHEL at Supplier works before dispatch.	Vendor to confirm	
6.2	All routine & operational tests to verify this specification and demonstration of all features of system (including accessories) as per PO specification shall be carried out at supplier's works/any other test lab/calibration agency in presence of BHEL representative before their dispatch and submit the test report along with supply.	Vendor to confirm & specify list of tests to be carried out on system.	
6.3	Demonstration of all controls, operation & measurement performance at supplier's works/any other test lab/calibration agency in presence of BHEL representative.	Vendor to confirm	
6.4	Transportation, boarding & loading upto supplier's works for inspection activities shall be in vendor scope.	Vendor to confirm	
7	TRAINING AT BHEL WORKS : Training to BHEL testing engineer & maintenance person shall be provided at BHEL Jhansi for following : (a) Use of all system Features, programming of Measuring Systems & supplied accessories etc. (b) Electrical, Electronic & maintenance for system & other supplied equipments	Vendor to confirm	
8	INSTALLATION & COMMISSIONING AT BHEL WORKS :	Vendor to confirm	
8.1	Supplier to take full responsibility for carrying out the start up and commissioning. Commissioning to be done in presence of technical expert from OEM.	Vendor to confirm	
8.2	Successful proving by demonstration on BHEL Transformer by the supplier shall be considered as part of commissioning. All operational tests deemed necessary for system acceptance and demonstration of all features shall form part the commissioning activity.	Vendor to confirm	
8.3	Demonstration by actual use of all supplied components and accessories to their full capacity.	Vendor to confirm	
8.4	Commissioning tools, required for commissioning of the system within stipulated time, shall be brought by the supplier on returnable basis.	Vendor to confirm	
8.5	Schedule of delivery, installation & commissioning shall be submitted with the offer.	Vendor to submit along	
9	AMBIENT CONDITIONS & THERMAL STABILITY :	Vendor to confirm	
9.1	System and all supplied items should work trouble free and efficiently under following operating conditions and should give specified accuracies. Power Supply: 230 V $\pm$ 10%, Voltage: Frequency : 50 Hz $\pm$ 1.5 Hz Relative Humidity : 10% to 80% Operating Temperature : 10 Deg. C to 50 Deg. C	Vendor to confirm Vendor to confirm Vendor to confirm Vendor to confirm	
	Vendor to confirm that system is suitable for above and details of additional Provisions if any required on the system for the same are to be furnished by vendor.	Vendor to confirm	

(Satish Soni) 17/1/19

(D. N. Yadav) 16.01.19

(Pawan Kumar) 21/01/19

(Vinod Jaseja) 16.01.19

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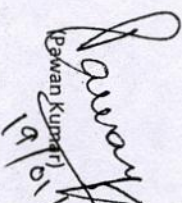
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10	PACKING: Air worthy/Sea worthy & rigid packing for all items of complete system, all accessories and other supplied items to avoid any damage/loss in transit. When system is despatched in containers, all small loose items shall be suitably packed in boxes.	Vendor to confirm		
11	GUARANTEE/WARRANTY : 24 Months after commissioning at our works from the date of acceptance by BHEL irrespective of date of supply.	Vendor to confirm		
12	QUALIFYING REQUIREMENTS:			
12.1	Only those vendors who have supplied at least 5 Nos. of the offered 1200 kV or above rating potential divider within last 10 years from the date of tender opening shall be eligible for participating in the tender.	Vendor to confirm		
12.2	Following documents are required to be submitted along with the offer :-			
12.2.1	Reference list of customers mentioning the customer name, contact details and year of supply.	Vendor to submit		
12.2.2	Copy of Purchase Order of 5 nos. of offered 1200 kV or above rating potential divider as referred in clause 12.1.	Vendor to submit		
12.2.3	Performance certificates along with Purchase Order copy of atleast 2 nos of the offered 1200 kV or above rating potential divider and certifying one year or more of satisfactory performance. Performance certificate and purchase order issued by the user in the name of OEM or Authorised dealer of OEM are acceptable.	Vendor to submit		
13	BHEL reserves the right to verify information submitted by vendor. In case, information is found false / incorrect, the offer shall be rejected	Vendor to confirm		

Note: Supplier shall submit the technical compliance/comments against each point in above format. Technical bid without complete technical compliance sheet will not be considered for technical evaluation.


18/01/19
(Satish Soni)


19.01.19
(D. N. Yadav)


19/01/19
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19.01.19
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