

**SPECIFICATION CUM COMPLIANCE OF AC & DC KV METER (0-200 KV)**

Spec. No.: QC-1/2014-15/KVM200/Rev 00

Indent No. C/6510/2014/5904T

1. Vendor must submit complete information against clause 16 (Pre- Qualifying Requirement) of this specification. The offer meeting this clause would only be processed.
2. The "offered" column and wherever applicable the "deviation" and "remark" column of this format shall be filled in by the vendor and submitted along the offer. Whenever range or accuracy is mentioned, offered value shall be mentioned by vendor. Inadequate, incomplete, ambiguous, unsustainable information against any of the clause of the specification or requirement shall be treated as non-compliance. In case of any noncompliance M/s BHEL has the right to cancel the offer.

Clause No.	Description for BHEL Requirement	Confirmation by Vendor	Offered	Deviation	Remark
<b>1</b>	<b>Purpose:</b>				
1.1	AC/DC KV Meter is required for measurement & Calibration of different rated AC/DC High Voltage Sets having maximum voltage range up to 200 kV AC @ 50 Hz and DC.	Vendor to confirm			
<b>2</b>	<b>Scope: The High Voltage measurement system shall include following units:</b>				
2.1	Digital read out Unit with built in chargeable battery for on site calibration	Vendor to confirm			
2.2	High Voltage divider assembly	Vendor to confirm			
2.3	Interconnection cable ( 2 sets)	Vendor to specify			
2.4	Movable Carrying case with wheels( 1 no.)	Vendor to confirm			
2.5	Spare chargeable battery( 1 set)	Vendor to confirm			
2.6	All additional accessories required for the system( vendor to specify)	Vendor to specify			
2.7	Calibration certificate : Calibration certificate for overall System Accuracy & Measurement Accuracy of all the instruments traceable to National /International standards shall be supplied along with the installation.	Vendor to confirm			
<b>3</b>	<b>Technical Specification:</b>				
3.1	Specification for DC High Voltage Parameter				
3.1.1	Range: There shall be following two preferred ranges in readout unit: (Vendor to specify the ranges)	Vendor to specify			
	a) 0 to 20.0 kV or wider	Vendor to confirm			
	b) 20 kV to 200.0 kV or wider	Vendor to confirm			
3.1.2	Accuracy: 0.5% of full scale value or better (vendor to indicate the value)	Vendor to confirm			
3.2	Specification for AC High Voltage Parameter				
3.2.1	Range: There shall be following two preferred ranges in readout unit: (Vendor to specify the ranges)				
	a) 0 to 20.0 kV RMS or wider	Vendor to confirm			
	b) 20 to 200.0 kV RMS Peak or wider	Vendor to confirm			
3.2.2	Frequency: 40 Hz to 60 Hz or wider (Vendor to specify the range)	Vendor to confirm			
3.2.3	Accuracy of AC Voltage (RMS): 1.0% of full scale value or better (Vendor to indicate the value)	Vendor to confirm			
3.3	Specification for digital readout unit				
3.3.1	Least count: 0.01 KV or better for 20 KV range & 0.1 KV or better for 200KV range(vendor to indicate the value)	Vendor to confirm			
3.3.2	Voltage ratio of digital readout unit (Voltage input/display voltage): 1/2000 or suitable	Vendor to confirm			
3.3.3	The input impedance of readout unit shall be compatible with supplied divider and connecting leads.	Vendor to confirm			
3.3.4	Display of digital readout unit: 3 ½ digit, auto polarity, LED (Vendor to specify)	Vendor to confirm			
3.4	Specification of high Voltage divider				
3.4.1	High voltage divider shall be resistive-capacitive divider	Vendor to confirm			

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3.4.2	Ratio of HV:LV shall be 2000:1 or suitable (vendor to specify)	Vendor to confirm			
3.4.2	Frequency response: DC to 1 KHz	Vendor to confirm			
3.4.3	Resistance arm of the divider shall be atleast 700 Mohm (vendor to indicate the value)	Vendor to confirm			
3.4.4	Capacitance of divider shall not be more than 200 pico farad ( vendor to indicate the value)	Vendor to confirm			
3.4.5	The HV terminal of divider should be toroidal to minimize the corona effect	Vendor to confirm			
3.4.6	The LV terminal shall be BNC terminal to connect Divider to readout Unit vis BNC Cable	Vendor to confirm			
3.4.7	Stability Coefficient of divider:				
3.4.7.1	Stability Coefficient due to temp variation : 0.025%/°C or better (Vendor to indicate the value)	Vendor to confirm			
3.4.7.2	Stability coefficient due to voltage: 0.1% or better (vendor to indicate the value)	Vendor to confirm			
3.4.8	The physical specification of the divider shall be as follows:				
3.4.8.1	The vendor shall furnish the schematic & circuit diagram also dimensions of divider	Vendor to confirm			
3.4.8.2	Height of Divider shall not be more than 100 cm	Vendor to confirm			
3.4.8.3	The weight of Divider shall not be more than 25kg	Vendor to confirm			
<b>4</b>	<b>Measurement Features:</b>				
4.1	The readout unit shall have features to display following readings:	Vendor to confirm			
4.2	DC voltage	Vendor to confirm			
4.3	AC True RMS voltage	Vendor to confirm			
4.4	AC Average Voltage	Vendor to confirm			
4.5	Peak Voltage				
4.6	AC/DC Coupling feature				
4.7	Range indication low & high				
4.8	The readout display shall be at least 0.5" LED Display.	Vendor to confirm			
<b>5</b>	<b>Power Requirements:</b>				
5.1	The instrument shall operate on Internal Battery (Ni Cd or Ni MH) for minimum 8 hrs. continuously and shall have charging facility for charging through AC supply of 230 Volt. 50Hz	Vendor to confirm			
5.2	The instrument shall also operate on AC Voltage 230V ±10%, 50 Hz±3%	Vendor to confirm			
<b>6</b>	<b>Accessories:</b>				
6.1	Connecting Leads				
6.1.1	2 Nos of Minimum 7 meter lengthy Connecting Coaxial Lead suitable for connecting Divider Output to readout Unit Input with proper matching of impedance	Vendor to confirm			
6.1.2	2 Nos of Minimum 7 meter lengthy braided cable for grounding the Divider and Readout	Vendor to confirm			
6.2	Detachable Power supply cord for charging the readout Unit	Vendor to confirm			
6.3	Carrying case: The trolley carrying case should be handy, easy to use and should be capable of handling the weight of divider & read out unit and accommodate high voltage divider, meter and interconnect cables.	Vendor to confirm			
6.4	Battery Sets: 1 set compatible battery set (additional) shall be provided with readout unit.	Vendor to confirm			
<b>7</b>	<b>Measurement Capability of AC/DC KVM</b>				
7.1	The Instrument should be able to calibrate high voltage test system of up to 200 KV in AC/DC range without load and during high voltage testing of stator also .	Vendor to confirm			
7.2	Instrument should, work in environment as mentioned below: Operating temperature : 0-50 ° C, Humidity: up to 95%, non-condensing, Max. altitude : 1000M, Application : Indoor & at site both, Noise level : < 80 dBA	Vendor to confirm			

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<b>8</b>	<b>General requirement</b>				
8.1	The bidder's technical representative shall visit BHEL HEEP, Haridwar for technical discussions and on the spot finalization of technical issues, if needed, after technical bid opening and within four weeks from the date of first call by BHEL. Exact date will be confirmed to vendor by BHEL.	Vendor to confirm			
8.2	The system offered shall be complete in all respects. It shall contain all hardware / accessories / software required for satisfactory operation of the system. Any additional hardware, software or accessories if required during commissioning, for satisfactory operation of machine shall be supplied by vendor without any price implication.	Vendor to confirm			
8.3	Supplier shall enclose the leaflets /Datasheet having detail specification, Model No & Manufacturers Name of Items to be quoted.	Vendor to confirm			
8.4	Instrument should meet all points of our above specification and bidders must furnish point to point replies against the points of our above specification failing which their offer may not be considered.	Vendor to confirm			
<b>9</b>	<b>Pre dispatch Inspection:</b>				
9.1	Pre dispatch Inspection of the complete system shall be done by BHEL at vendor's end	Vendor to confirm			
9.2	Pre-dispatch inspection will be carried out as mentioned at clause 15.1	Vendor to confirm			
9.3	The vendor shall provide Inspection Certificate to BHEL Personnel deputed for inspection and two copies shall be supplied along with equipment.	Vendor to confirm			
9.4	Travel, boarding & lodging expenditure of BHEL personnel deputed for PDI will be borne by BHEL.	Vendor to confirm			
9.5	PDI call must reach BHEL at least four weeks in advance.	Vendor to confirm			
<b>10</b>	<b>Erection and Commissioning</b>				
10.1	Supplier to take full responsibility for carrying out the commissioning, start up, testing of Instrument, it's control & all types of other supplied equipment, calibration of HV Sets etc.	Vendor to confirm			
10.2	All tests, as mentioned at clause 15.2 (Instrument Acceptance) shall form part of the commissioning activity.	Vendor to confirm			
10.3	Demonstration of all functions of the complete system shall be done by the vendor to the satisfaction of BHEL Engineers at BHEL-HEEP, Haridwar.	Vendor to confirm			
<b>11</b>	<b>Guarantee / Warranty :</b>				
11.1	The instrument should be guaranteed / warranted with respect of design, material construction, operation and any manufacturing defects for a period of 24 months from the date of receipt of complete equipment at BHEL Haridwar or 18 months from the date of commissioning, whichever is later.	Vendor to confirm			
11.2	Free after sales service including spares is to be provided during the guarantee / warranty period at BHEL HEEP, Haridwar.	Vendor to confirm			
<b>12</b>	<b>Documents (to be supplied with equipment):</b>				
12.1	Two sets of Operation and Service Manual shall comprise of operating procedure, calibration procedure, troubleshooting charts, circuit diagram and parts list etc.	Vendor to confirm			
<b>13</b>	<b>Packing</b>				
13.1	Sea worthy & rigid packing for all items of complete machine, Measurement System, all Accessories and other supplied items to avoid any damage/loss in transit. When machine is dispatched in containers, all small loose items shall be suitably packed in boxes. Any damage, loss, theft during transit shall be the sole responsibility of the vendor.	Vendor to confirm			

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<b>14</b>	<b>Training</b>				
14.1	Training on operation of machine, other supplied accessories, troubleshooting & maintenance of complete system shall be imparted to the satisfaction of engineers of BHEL-HEEP, Haridwar without any price implication.	Vendor to confirm			
<b>15</b>	<b>Machine Acceptance: (Tests/Activities should be Performed by Vendor)</b>				
<b>15.1</b>	<b>Following Tests/Activities should be carried out at supplier's works on the machine before dispatch : (Pre-dispatch Inspection)</b>				
15.1.1	Physical Inspection (Scope of supply)				
15.1.2	Verification of machine as per clause 3,4 &5				
15.1.3	Demonstration of all features of the machine, control system & accessories				
<b>15.2</b>	<b>Tests/Activities should be carried out at BHEL works while commissioning the machine :</b>				
15.2.1	Physical Inspection (Scope of supply)				
15.2.2	Verification of machine accuracy as per clause 3				
15.2.3	Demonstration of all features of the machine, control system & accessories to the satisfaction of BHEL for efficient and effective use of the machine				
15.2.4	Calibration of high voltage test system without load as well as during testing of stator as provided by BHEL				
<b>16</b>	<b>Pre- Qualifying Requirement for Vendor:</b>				
16.1	Only those vendors should quote, who or their principal have supplied and commissioned at least one number of the quoted instrument having equal or better range & accuracy mentioned in clause 3 within last five years (on the date of opening of Tender) and worked satisfactorily for one year or more from tender floating date.	Vendor to confirm			
16.2	Vendor should be original equipment manufacturer (OEM) or authorized dealer/distributor of OEM having after sale service center in India. In case the party is dealer/distributor, they should furnish the details of OEM and valid authorization certificate from OEM.	Vendor to specify			
16.3	The vendor shall furnish following information of customers (to whom they have supplied the system as mentioned in clause 16.1	Vendor to confirm			
16.3.1	Name and address of customer	Vendor to furnish			
16.3.2	Name of Contact Person	Vendor to furnish			
16.3.3	Phone Number and mail ID of contact person.	Vendor to furnish			
16.4	The following documents shall be enclosed with offer by vendor.	Vendor to confirm			
16.5	Un priced copy of Purchase order of equipments supplied mentioned in clause 16.1.	Vendor to furnish			
16.6	Copy of Commissioning Reports of Equipment mentioned in clause 16.1	Vendor to furnish			
16.7	Performance certificate (Including Make and Model No) from at least one customer regarding satisfactory performance of machine supplied to them.	Vendor to furnish			
16.8	Supplier shall enclose the leaflets /Datasheet having detail specification, Model No & Manufacturers Name of Items to be quoted.	Vendor to furnish			
16.9	BHEL reserves the right to verify the information provided by vendor. If the information provided by vendor is found to be false/incorrect at any point of time, the offer shall be rejected.	Vendor to confirm			

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