

 IIT PALAKKAD	भारतीय प्रौद्योगिकी संस्थान पालक्काड <b>Indian Institute of Technology Palakkad</b> अहलिआ एकीकृत कैम्पस, कोज़िहपारा Ahalia Integrated Campus, Kozhipara पालक्काड- 678557 Palakkad – 678 557	दूरभाषसंख्या/ Phone no:04923 226300/586  ईमेल/Email: purchase@iitpkd.ac.in
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**TENDER FOR INVITING QUOTATIONS**

**TENDER NO: IITPKD/ELE/AR/112/2017**

**DATE: 30.01.2018**

**DUE DATE OF THE TENDER: 14.02.2018 AT 3.00 PM**

Sir,

On Behalf of Indian Institute of Technology Palakkad quotations are invited for the following items

1. Part A – Insulation Tester,
2. Part B - Earth resistance tester
3. Part C – Power quality analyzer

Confirming to the specification in the Annexure

1. **Preparation of Bids:** - The tenders should be submitted **under two-bid system** (i.e.) Technical bid and Financial bid. The technical bid should consist of all technical details along with commercial terms and conditions. **No prices should be included in technical bid.** Financial Bid should indicate item – wise prices for the items mentioned in the technical bid. The technical bid and the Financial should be put **in separate cover** and sealed. Both sealed covers should be put into a bigger cover.
2. The Quotations duly sealed and superscribed on the envelope **with the reference No. and due date, should be addressed to the undersigned so as to reach him on or before the due date stipulated above. Fax and Email quotation are not acceptable.**
3. The price should be quoted per unit and packing and delivery charges should be indicated separately. The offer/bids should be exclusive of Taxes and Duties, which will be paid by the purchaser as applicable. However the percentage and of taxes and duties as on date should be clearly indicated.
4. The Quotations should be valid for **sixty days** from the due date and the period of delivery required should also be clearly indicated.
5. **Local Firms:** Quotations should be for free delivery to this Institute. If Quotations for Ex-Godown delivery charges should be indicated separately.

6. Firms outside Palakkad: Quotations should be for **F.O.R. at IIT Palakkad**. If F.O.R. consignor station, freight charges by passenger train / lorry transport must be indicated. If Ex-Godown, packing, forwarding and freight charges must be indicated.
7. Goods should be supplied carriage paid and insured. Goods shall not be supplied without an official supply order.
8. **Custom Duty:** Custom Duty which will be paid at a concessional rate against duty exemption certificate.
9. **GST :** Concessional **GST@5%** will be paid extra as per **GOI Notification No.47/2017 Dated : 14.11.2017**
10. **Payment:** Every attempt will be made to make payment within 30 days from the date of receipt of bill / acceptance of goods, whichever is later. **Please indicate actual product cost + Taxes separately.** No advance payment will be made. The Tenderer have to furnish the bank details along with tender like Account No, Account Name, IFSC Code etc.,
11. **Submission of Bids:** Quotation should be sent to the following address "**The Registrar, Indian Institute of Technology Palakkad, Ahalia Integrated Campus, Kozhipara, Palakkad -678 557, Kerala**", Phone No: **04923 226 300/ 590/586** , Email : **[purchase@iitpkd.ac.in](mailto:purchase@iitpkd.ac.in)**
12. **Delivery Period:** **The Item to be supplied within 3-4 weeks from the date of purchase order.** In case there is any deviation in the delivery schedule, liquidated damages may be enforced or penalty for the delayed supply period may be levied.
13. **Late offer:** The quotation received after due date will not be considered. Please ensure that your offer is sent well in advance to reach the Institute by the due date.
14. **Warranty:** Warranty clause should be indicated clearly.
15. **Acceptance and Rejection:** I.I.T Palakkad has the right to accept the whole or any parts of the Tender or portion of the quantity offered or reject it in full without assigning any reason

Yours faithfully,



**REGISTRAR, IIT PALAKKAD**



# Technical Specifications for Insulation Tester, Earth resistance tester, Power Quality analyzer

Part A	Insulation Tester	5 numbers
Part B	Earth resistance tester	2 numbers
Part C	Power Quality analyzer	1 numbers

The bidder may quote for one or more parts (Part A, Part B, Part C). Technical and Financial bid for each part must be enclosed in separate envelopes. EMD for each part should be enclosed in the respective financial bid. All the financial and technical bids must be put in one big envelope and delivered to the purchase section. The evaluation will be done for each part separately and purchase order will be given to the technically qualified bidder, who quotes the lowest price for the respective part. For each of the parts the technical evaluation will be done based on the mandatory requirements for that part mentioned in the specifications.

**IMPORTANT :** Enclosing EMD or mentioning value of EMD in technical bid will lead to immediate disqualification.

IIT Palakkad reserves the right to request for a demonstration, if required, of compliance w.r.t to technical specifications. Such a demonstration will be conducted in the Temporary Campus of IIT Palakkad, Ahalia Integrated Campus, Palakkad. The expenses for this demonstration will have to borne by the bidder.

## Part A

### Insulation Tester Specification

1	Insulation test range	0.01 MΩ to 10 GΩ
2	Insulation test voltages	50 V, 100 V, 250 V, 500 V, 1000 V
3	AC/DC voltage	0.1 V to 600 V
4	Continuity	200 mA
5	Resistance	0.01 Ω to 20.00 KΩ
6	Save battery power with auto power off option	Should be provided
7	Back-lit display	Should be provided
8	Over-voltage category rating for added user protection	CAT IV 600 V
9	Remote probe, test leads, probes and alligator clips	Should be provided
10	Other features	1. Live circuit detection prevents insulation test if voltage > 30 V is detected for added user protection

				2. Auto-discharge of capacitive voltage for added user protection
11	warranty			One-year
12	Range			600.0 V
13	Resolution			0.1 V
14	Frequency range			50 Hz to 400 Hz
15	Input impedance			3 M $\Omega$ (nominal), < 100 pF
16	Common mode rejection ratio			> 60 dB at dc, 50 or 60 Hz
17	Overload protection			600 V rms or dc
18	<b>Earth bond resistance measurement</b>			
	Range		Resolution	Accuracy + (% of Rdg + Digits)
a	20.00 $\Omega$		0.01 $\Omega$	$\pm (1.5 \% + 3)$
b	200.0 $\Omega$		0.1 $\Omega$	$\pm (1.5 \% + 3)$
c	2000 $\Omega$		1 $\Omega$	$\pm (1.5 \% + 3)$
d	20.00 k $\Omega$		0.01 k $\Omega$	$\pm (1.5 \% + 3)$
19	<b>Other specifications</b>			
20	Overload protection			2 V rms or dc
21	Open circuit test voltage			> 4.0 V, < 8 V
22	Short circuit current			> 200.0 mA
23	Measurement range			0.01 M $\Omega$ to 10 G $\Omega$
24	Test voltages			50 V, 100 V, 250 V, 500 V, 1000 V
25	Test voltage accuracy			+ 20 %, - 0 %
26	Short-circuit test current			1 mA nominal
27	Auto discharge			Should be provided, Discharge time < 0.5 second for C = 1 $\mu$ F or less
28	Live circuit detection			Inhibit test if terminal voltage > 30 V prior to initialization of test
29	Maximum capacitive load			Operable with up to 1 $\mu$ F load
30	<b>Accuracy</b>			
	Output Voltage		Display Range	Resolution
				Accuracy $\pm$ (% of Rdg + Digits)
a	50 V and 100V (0 % to + 20 %)	0.01 M $\Omega$ to 20.00 M $\Omega$	0.01M $\Omega$	$\pm (3 \% + 5)$
		20.0 M $\Omega$ to 50.0 M $\Omega$	0.1 M $\Omega$	
b	250 V (0 % to + 20 %)	0.01 M $\Omega$ to 20.00 M $\Omega$	0.01M $\Omega$	$\pm (1.5 \% + 5)$
		20.0 M $\Omega$ to 200.0 M $\Omega$	0.1 M $\Omega$	
c	500 V (0 % to + 20 %)	0.01 M $\Omega$ to 20.00 M $\Omega$	0.01M $\Omega$	$\pm (1.5 \% + 5)$
		20.0 M $\Omega$ to 200.0 M $\Omega$	0.1 M $\Omega$	
		200 M $\Omega$ to 500 M $\Omega$	1 M $\Omega$	
d	1000 V (0 % to + 20 %)	0.1 M $\Omega$ to 200.0 M $\Omega$	0.1 M $\Omega$	$\pm (1.5 \% + 5)$
		200 M $\Omega$ to 2000 M $\Omega$	1 M $\Omega$	

		2.0 GΩ to 10.0 GΩ	0.1 GΩ	± (1.5 % + 5) ± (10 % + 3)
31	Maximum voltage applied to any terminal	600 V ac rms or dc		
32	Storage temperature	-40 °C to 60 °C (-40 °F to 140 °F)		
33	Operating temperature	-20 °C to 55 °C (-4 °F to 131 °F)		
34	Relative humidity non-condensing	0 % to 95 % @ 10 °C to 30 °C (50 °F to 86 °F)		
		0 % to 75 % @ 30 °C to 40 °C (86 °F to 104 °F)		
		0 % to 40 % @ 40 °C to 55 °C (104 °F to 131 °F)		
35	Shock	1 meter drop per IEC 61010-1 2nd Edition (1 meter drop test, six sides, oak floor)		
36	Certifications	CSA per standard CSA/CAN C22.2 No. 61010.1-04; TUV per standard IEC/EN 61010-1 2nd Edition		
37	Batteries	Four AA batteries (NEDA 15A or IEC LR6)		
38	Battery life	Should perform at least 1000 insulation tests with fresh alkaline batteries at room temperature. Resistance measurements		
39	IP rating	Atleast IP40		
40	Over-range capability	110 % of range		
41	Included accessories	Test Leads, Test Probes, necessary clips (red) and (black), holster and remote probe		
42	warranty	2 year		

All the supporting software and drivers with necessary connecting probes must be supplied along with the unit

### **About Price bid**

**Price bid must be in a separate envelope and if found otherwise, the bidder will be disqualified**

The Price bid must contain,

- Item a) Price for 5 sets of base equipment inclusive of all standard accessories
- Item b) Price for the Optional accessories



## Who can participate?

Only those bidders fulfilling the following criteria should respond to the tender.

1. Bidder should be either an Original Equipment Manufacturer (OEM) or designer of insulation testers/allied fields
2. Bidder must be in existence in the business of insulation testers/allied fields for a minimum period of two year (before or since 01-April-2015). Documentary evidence of experience must be provided. Appropriate Registration/ incorporation certificate to be submitted. Bidder must have a registered office/ service centers in Karnataka/Tamil Nadu/ Telangana/Andhra Pradesh/Maharashtra, or Kerala. Certificate of registration for the offices to be provided.
3. The bidder should have implemented orders insulation testers or allied fields worth exceeding INR 2 lakhs during previous financial years. Purchase orders and certificates of successful implementation must be included.
4. The bidder should have documentary evidence of having supplied insulation testers or related instruments at a Centrally Funded Technical Institution (like IIT, NIT, IISc, IIST). Bidder must provide a certificate of satisfactory performance of the installed setup. Contact details of faculty-in-charge of installed setup must also be provided.
5. Compliance sheet for the specification & OEM Brochure has to be attached along with Technical bid. Vendor has to fill the compliance sheet and mention page number or reference number in OEM brochure. Unfilled / partial filled compliance sheets lead to disqualification.
6. The bidder must provide detailed specifcaton of each equipment/item. Model numbers, datasheets and brochures must be included for each quoted equipment /accessories /item. Specifcatons corresponding to quoted model number must be available publicly via OEM's website for scrutiny. Ifnot, bid can be disqualified on technical grounds.
7. The bidder should ensure that the insulation testers should be covered by warranty of at least two year.
8. If required, IIT Palakkad has the right to judge the technical compliance of the equipment based on the demonstration of the equipment as per the published tender specification.
9. Either the bidder can bid on behalf of the Principal/OEM or Principal/OEM itself can bid, but both cannot simultaneously bid for the same item. Also, if the bidder submits a bid on behalf of a particular Principal/OEM, the same bidder cannot submit another bid on behalf of another Principal/OEM in the same tender for the same item. However, the bidder can submit bids for multiple items from the same Principal/OEM.

## Part- B

### Earth Resistance Testers Technical Specification

#### Earth Resistance Tester Required Quantity - 2 numbers

1	<b>Specification overview</b>		
2	Must provide 3- and 4-pole Fall of Potential, earth resistance loop testing feature		
3	Must provide 4-pole Soil Resistivity testing feature		
4	Must provide Selective earth ground rod testing using 1 clamp		
5	Must provide Stake-less earth ground rod testing using 2 clamps		
6	Earth resistance testers must be atleast IP56 rated for outdoor use		
7	Must provide a rugged carrying case		
8	Should provide the following items, a. Stake Set for 3-Pole Measurement b. Stake Set for 4-Pole Measurement c. Ground/Earth Stake d. Ground/Earth Cable Reel 50 m e. Stakeless Clamp Set f . 2 year warranty		
8	<b>General Specifications</b>		
a	Display	4 digit (2999 Digit) - 7 segment liquid crystal display, digit size 18 mm (0.71 in) with supplementary signs and active illumination	
b	Temperature Specifications		
c	Working temperature range	-10 °C to 50 °C (14° F to 122° F)	
d	Storage temperature range	-30 °C to 60 °C (-22° F to 140° F)	
e	Climate class	C1 (IEC 654-1), -5 °C to 45 °C, 5 % to 95 % RH	
f	Type of protection	IP56 for case	
g	EMC (Emission Immunity)	IEC 61326-1:1997 Class A	
h	Quality standard	ISO 9001	
i	Auxiliary power	6 x 1.5 V alkali-manganese-batteries (IEC LR6 or type AA )	
j	Battery life span	typ. 3,000 measurements (R E +R H ≤ 1 kΩ) typ. 6,000 measurements (R E + R H > 10 kΩ)	
k	Case material	Shock -and scratch proof thermoplast	
l	Measuring Range	1 V to 50 V	
m	Display Range	0.0 V to 50 V	
n	Resolution	0.1 V	
o	Frequency Range	dc/ac 45 Hz to 400 Hz sine	
p	Limits of Error	± (5 % of rdg + 5 digit)	
q	Measuring sequence	approx. 4 measurements/s	
r	Internal resistance	approx. 1.5 MΩ	
s	Max. Overload	U rms = 250 V	
9	<b>Measurement of interference frequency (F )</b>		
a	Measuring Range	Resolution	Limits of Error



	6.0 Hz to 400 Hz	0.1 Hz to 1 Hz	± (1 % of rdg + 2 digit)		
<b>10</b>	<b>Earthing resistance (RE)</b>				
a	Measuring method		Current and voltage measurement with probe as IEC61557-5		
b	Open circuit voltage		20/48 V, ac		
c	Short circuit current		250 mA ac		
d	Measuring frequency		94, 105, 111, 128 Hz selected manually or automatic. (AFC) 55 Hz in function R*		
e	Noise rejection		120 dB (16⅔, 50, 60, 400 Hz)		
f	Max. overload		Urms = 250 V		
<b>11</b>	<b>Electrical measurement specifications</b>				
a	Measuring Range	Display Range	Resolution		
	0.020 Ω to 300 kΩ	0.001 Ω to 2.999 Ω	0.001 Ω		
		3.00 Ω to 29.99 Ω	0.01 Ω		
		30.0 Ω to 299.9 Ω	0.1 Ω		
		0.300 kΩ to 2.999 kΩ	1 Ω		
		3.00 kΩ to 29.99 kΩ	10 Ω		
		30.0 kΩ to 299.9 kΩ	100 Ω		
b	Max. probe resistance		≤ 1 MΩ		
c	Max. auxiliary earth electrode resistance		≤ 1 MΩ		
<b>12</b>	<b>Standard earth ground test methods</b>				
a	Soil resistivity	Fall of Potential		Selective	Stakeless
	4-pole Soil Resistivity testing-must be provided	3-pole and 4-pole method must be possible	4-pole	1 clamp-must be provided	2 clamps-must be provided

- All the supporting software and drivers with necessary connecting probes must be supplied along with the unit

### **About Price bid**

**Price bid must be in a separate sealed envelope and if found otherwise, the bidder will be disqualified**

The Price bid must contain,

- Item a) Price for 2 sets of base equipment inclusive of all standard accessories
- Item b) Price for the Optional accessories



## Who can participate?

Only those bidders fulfilling the following criteria should respond to the tender.

- 1) Bidder should be either an Original Equipment Manufacturer (OEM) or designer of **Earth resistance testers**/allied fields
- 2) Bidder must be in existence in the business of **Earth resistance testers**/allied fields for a minimum period of two year (before or since 01-April-2015). Documentary evidence of experience must be provided. Appropriate Registration/ incorporation certificate to be submitted. Bidder must have a registered office/ service centers in Karnataka/Tamil Nadu/ Telangana/Andhra Pradesh/Maharashtra, or Kerala. Certificate of registration for the offices to be provided.
- 3) The bidder should have implemented orders **Earth resistance testers** or allied fields worth exceeding INR 2 lakhs during previous financial years. Purchase orders and certificates of successful implementation must be included.
- 4) The bidder should have documentary evidence of having supplied **Earth resistance testers** or related instruments at a Centrally Funded Technical Institution (like IIT, NIT, IISc, IIST). Bidder must provide a certificate of satisfactory performance of the installed setup. Contact details of faculty-in-charge of installed setup must also be provided.
- 5) Compliance sheet for the specification & OEM Brochure has to be attached along with Technical bid. Vendor has to fill the compliance sheet and mention page number or reference number in OEM brochure. Unfilled / partial filled compliance sheets lead to disqualification.
- 6) The bidder must provide detailed specification of each equipment/item. Model numbers, datasheets and brochures must be included for each quoted equipment/accessories/item. Specification corresponding to quoted model number must be available publicly via OEM's website for scrutiny. If not, bid can be disqualified on technical grounds.
- 7) The bidder should ensure that the **Earth resistance testers** should be covered by warranty of at least two year.
- 8) If required, IIT Palakkad has the right to judge the technical compliance of the equipment based on the demonstration of the equipment as per the published tender specification.
- 9) Either the bidder can bid on behalf of the Principal/OEM or Principal/OEM itself can bid, but both cannot simultaneously bid for the same item. Also, if the bidder submits a bid on behalf of a particular Principal/OEM, the same bidder cannot submit another bid on behalf of another Principal/OEM in the same tender for the same item. However, the bidder can submit bids for multiple items from the same Principal/OEM.

## Part-C

### Three-Phase Power Quality Analyzers Technical Specification

Three-Phase Power Quality Analyzer Required quantity- 1 number

	Specification	Requirement
1	Measurement method class	IEC 61000-4-30 Class-A standard
2	Measurement accuracy class	According IEC 61000-4-7
3	<b>Voltage</b>	
a	Number of inputs	4 (3phases + neutral)
b	Maximum input voltage	600V RMS or higher
c	Bandwidth	> 10 kHz
d	Resolution	0.01 Vrms or better
e	Accuracy	± 0.1 % of nominal voltage or better
4	<b>Current</b>	
a	Number of inputs	4 (3phases + neutral)
b	Type	Clamp on current transformer
c	Current range	30A to 3000A or higher
d	Bandwidth	> 10 kHz (or better)
e	frequency	Up to 70 Hz (or better)
5	<b>Sampling</b>	
a	Resolution	16 bit or better
b	Maximum sampling speed	200 kS/s on each channel (or better)
6	<b>Display modes</b>	
a	Waveform display	Cursors: single vertical line showing min, max, avg reading at cursor position
b	Phasor	Shows real time phasor diagram
c	Meter readings	Volts/Amps/Hertz, Harmonics, Power and Energy, Flicker and Unbalance
d	Bargraph	Harmonics and Monitor mode
7	<b>Measurement modes</b>	
a	Scope	Vrms, Arms, Vcursor, Acursor, Vfund, Afund, Hz, V phase angles, A phase angles
b	Harmonics dc, 1 to 50	Harmonic Volts, THD Volt, Harmonic Amps, THD Amps, K Amps, Harmonic Watts, THD Watts, K Watts
c	Power and energy	Watts, VA, VAR, Power factor, Cos $\phi$ /DPF, Arms, Vrms, kWh, kVAh, kVARh
d	Unbalance	Vneg, Vzero, Aneg, Azero, Vfund, Afund, Hz, V phase angles, A phase angles



e	Transients	Vrms, Arms, Vcursor, Acursor
8	Harmonic order (n)	DC, 1 to 50 grouping for both voltage and current and harmonic groups according to IEC 61000-4-7
9	THD Resolution	0.1 % or better
10	Frequency measurement range	0 Hz to 3500 Hz
11	Frequency Resolution	1 Hz or better
12	Frequency accuracy	± 1 Hz or better
13	Phase angle Resolution	1 ° or better
14	Power Range (active and reactive power)	Upto maximum feasible based on input voltage and current range
15	Power factor Range	0 to 1
16	Power factor resolution	0.01 or better
17	Cos φ/DPF resolution	0.01 or better
18	Flicker resolution	0.01 or better (IEC61000-4-15)
19	Unbalance	0.0 % to 10.0 % or better
20	Transient Voltage	± 6000 Vpk
21	Sag/swell	0.0 % to 200 % of nominal voltage
22	Memory Requirement	Should have expandable storage
23	Record trending	should be able to store trends of each phase voltages currents with record period of at least 1 year
24	Communication to PC	USB, ethernet
25	Display	320*240(RGB) Pixel, 3.5 inch color LCD/TFT
26	All the supporting software and drivers with necessary connecting probes must be supplied along with the unit	
27	<p><b><u>About Price bid</u></b></p> <ul style="list-style-type: none"> <li>• <b>Price bid must be in a separate sealed envelope and if found otherwise, the bidder will be disqualified</b></li> </ul> <p>The Price bid must contain,</p> <p>Item a) price for 1 set of base equipment inclusive of all standard accessories  Item b) Price for current probes for various ranges (30 A to 3000A)  Item c) Optional accessories</p>	
28	Warranty	3 years

## Who can participate?

Only those bidders fulfilling the following criteria should respond to the tender.

- 1) Bidder should be either an Original Equipment Manufacturer (OEM) or designer of **power quality analyzer**/allied fields
- 2) Bidder must be in existence in the business of **power quality analyzer**/allied fields for a minimum period of two year (before or since 01-April-2015). Documentary evidence of experience must be provided. Appropriate Registration/ incorporation certificate to be submitted.  
Bidder must have a registered office/ service centers in Karnataka/Tamil Nadu/ Telangana/Andhra Pradesh/Maharashtra, or Kerala. Certificate of registration for the offices to be provided.
- 3) The bidder should have implemented orders **power quality analyzer** or allied fields worth exceeding INR 2 lakhs during previous financial years. Purchase orders and certificates of successful implementation must be included.
- 4) The bidder should have documentary evidence of having supplied **power quality analyzer** or related instruments at a Centrally Funded Technical Institution (like IIT, NIT, IISc, IIST). Bidder must provide a certificate of satisfactory performance of the installed setup. Contact details of faculty-in-charge of installed setup must also be provided.
- 5) Compliance sheet for the specification & OEM Brochure has to be attached along with Technical bid. Vendor has to fill the compliance sheet and mention page number or reference number in OEM brochure. Unfilled / partial filled compliance sheets lead to disqualification.
- 6) The bidder must provide detailed specification of each equipment/item. Model numbers, datasheets and brochures must be included for each quoted equipment/accessories/item. Specification corresponding to quoted model number must be available publicly via OEM's website for scrutiny. If not, bid can be disqualified on technical grounds.
- 7) The bidder should ensure that the **power quality analyzer** should be covered by warranty of at least three year.
- 8) If required, IIT Palakkad has the right to judge the technical compliance of the equipment based on the demonstration of the equipment as per the published tender specification.
- 9) Either the bidder can bid on behalf of the Principal/OEM or Principal/OEM itself can bid, but both cannot simultaneously bid for the same item. Also, if the bidder submits a bid on behalf of a particular Principal/OEM, the same bidder cannot submit another bid on behalf of another Principal/OEM in the same tender for the same item. However, the bidder can submit bids for multiple items from the same Principal/OEM.