

**TSGENCO
4 X 270 MW BHADRADRI TPS**

VOLUME II B

**TECHNICAL SPECIFICATION
FOR
ELECTRICAL LAB EQUIPMENT (METERING & TESTING)**

SPECIFICATION NO. : PE-TS-411-556-E003, REV. 04



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR PROJECT ENGINEERING MANAGEMENT
NOIDA, 201301**

365901/2021/PS-PEM-EL



**TECHNICAL SPECIFICATION
FOR ELECTRICAL LAB EQUIPMENT
(METERING & TESTING)**

Doc. No. PE-TS-411-556-E003 R04

Volume

Section

IIB

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Rev. : 04 DATE-13.07.2021


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TOTAL NO. OF SHEETS=
(INCLUDING COVER/ SEPARATOR SHEETS)

13

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	4X270 MW BHADRADRI TPS TECHNICAL SPECIFICATION FOR ELECTRICAL LABORATORY EQUIPMENTS (METERING & TESTING)		Doc. No. PE-TS-411-556-E003 R04	
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	COMPLIANCE CERTIFICATE		Rev. : 04 DATE-13.07.2021	

COMPLIANCE CERTIFICATE

The bidder shall confirm compliance to the following by signing/ stamping this compliance certificate and furnishing same with the offer.

1. The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusion/ deviation with regard to same.
2. There are no deviation with respect to specification other than those furnished in the 'schedule of deviations'
3. Only those technical submittals which are specifically asked for in NIT to be submitted at tender stage shall be considered as part of offer. Any other submission, even if made, shall not be considered as part of offer.
4. Any comments/ clarifications on technical/ inspection requirements furnished as part of bidder's covering letter shall not be considered by BHEL, and bidder's offer shall be construed to be in conformance with the specification.
5. Any changes made by the bidder in the price schedule with respect to the description/ quantities from those given in Annexure-A [BOQ-Cum-Price schedule] of the specification shall not be considered (i.e., technical description & quantities as per specification shall prevail).
6. All essential accessories for each electrical laboratory equipment required for testing various electrical equipment /devices during Commissioning, Operation and Maintenance of power plant to be ensured by bidder in their offer.

BIDDER'S STAMP & SIGNATURE

	4X270 MW BHADRADRI TPS TECHNICAL SPECIFICATION FOR ELECTRICAL LABORATORY EQUIPMENTS (METERING & TESTING)	Doc. No. PE-TS-411-556-E003 R04	
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		Section	I
	SPECIFIC TECHNICAL REQUIREMENTS	Rev. : 04 DATE-13.07.2021	

1.0 SCOPE

- 1.1 Design, manufacture, inspection and testing at manufacturer's work, proper packing and delivery to site of Electrical Laboratory Equipment as mentioned in different sections of this specification.
- 1.2 General technical requirements of the Electrical Laboratory Equipment are indicated in Section – II. Project specific technical requirements/changes are listed in section-I.
- 1.3 Electrical Laboratory Equipment shall be supplied along with all essential accessories required for the successful operation of the equipment.
- 1.4 Detailed technical parameters of Electrical laboratory equipment are listed in Annexure – I of Section-I.
- 1.5 The requirement of section-1 shall prevail and govern in case of conflict between the corresponding requirements of Section-I and section-II.

2.0 BILL OF QUANTITIES

Quantity requirement shall be as per 'BOQ cum price schedule' enclosed in NIT.

3.0 SPECIFIC TECHNICAL REQUIREMENT


S.No.	Reference Clause No. of Section-II (if any)	Specific Requirement/Change
1	Cl. no 4.1	Shall be read as "BHEL/BHEL's customer shall witness the testing of equipment. Vendor to furnish test report/calibration certificate to BHEL for review/ acceptance. "

4.0 DRAWING & DOCUMENTS TO BE SUBMITTED

- 4.1 Following documents/drawings for each Electrical Laboratory Equipment shall be submitted after placement of order for BHEL & customer's approval in addition to the documents/drawings listed in clause No. 8.2 of section-II:

Sl. No.	Drawings/Document description	Drawings/Document Number
1	Technical Data Sheet	PE-Vx-411-556-E0yy
2	Catalogue	PE-Vx-411-556-E1yy

Complete Document numbers shall be provided after order placement.

	4X270 MW BHADRADRI TPS TECHNICAL SPECIFICATION FOR ELECTRICAL LABORATORY EQUIPMENTS (METERING & TESTING)	Doc. No. PE-TS-411-556-E003 R04	
		Volume	IIB
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	Annexure-I of SECTION-I DETAILED TECHNICAL PARAMETERS	Rev. : 04 DATE-13.07.2021	

1. LV Insulation Tester (Megger) 500V : 10 No

Purpose:	For Checking the Insulation level, Polarization index of LV Electrical equipment
Test Voltages:	500 V DC variable in steps of 250/500V
Display:	LCD 3 ½ Digit and/or Analogue.
Mega Ohm Range:	500 MΩ
Accuracy :	± 3%.
Safety Standards:	As per IEC
EMC Standards:	IEC
Power Supply:	Battery operated or Hand Crank
Accessories:	Test Leads, Carrying case, Instruction manual, Test/Calibration certificates.

2. Battery operated Insulation Tester (Megger) : 4 Nos


Purpose:	For Checking the Insulation level, Polarization index of HV & LV Electrical equipment
Test Voltages:	1000 V DC variable in steps of 500/1000
Display:	LCD 3 ½ Digit and/or Analogue.
Mega Ohm Range:	500 MΩ or More
Accuracy :	± 3%.
Safety Standards:	IEC 61010-1
EMC Standards:	IEC
Power Supply:	240 V, 1 Phase, AC and Re-chargeable Battery.
Accessories:	Test Leads, Carrying case, Instruction manual, Test/Calibration certificates.

3. Clip on Ammeter (AC): 5 Nos

Purpose:	For carrying out AC/DC Current measurements
Range:	200A/600A (for AC) and DC (Available range)
Accuracy:	±2 % to ±3 %.
Resolution:	0.1A/1A
Voltage test range:	Up to 600V AC/DC.
Resistance Range:	200 Ω.
Power Supply:	Alkaline Battery.
Min. Safety Standards:	IEC 61010-1 and IEC 61010-2-31
Accessories:	Carrying case, Instruction Manual, Battery

4. Digital Time Counter: 2 No

Purpose:	intended to use in substation
Time Range:	0-999.99 Sec

	4X270 MW BHADRADRI TPS TECHNICAL SPECIFICATION FOR ELECTRICAL LABORATORY EQUIPMENTS (METERING & TESTING)		Doc. No. PE-TS-411-556-E003 R04
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Resolution:	1 milli second
Accuracy Class:	±0.05 %
LVD/EMC Standards:	CE Marking/Standard
Supply Voltage:	220 V ±10 % AC/DC
Trigger:	Potential free NO/NC contact or voltage application for start/Stop.
Accessories:	Rugged carrying case, Manual etc.,

5. Precision Portable Digital Frequency Meter: 1 No

Purpose:	for Measurement of Frequency and calibration of Frequency Meters
Range:	0-100 KHz/0-1000Hz.
Resolution:	1 KHz/0.1 Hz.
Maximum Load:	5mA
Accuracy:	±0.5% of reading.
Display:	LED Display
Auxiliary Power Input:	230V, 1Ph, 50Hz, AC.
Accessories:	The instrument shall be housed in a rugged and shall be supplied with carrying case, Test leads, Battery, Manuals, warranty certificate etc.



**TECHNICAL SPECIFICATION FOR
ELECTRICAL LABORATORY
EQUIPMENT (METERING & TESTING)
EQUIPMENT**

SPECIFICATION NO. PE-TS-411-556-E003 R04

VOLUME II

SECTION II

REVISION 04

DATE: 13.07.2021

SHEET -

SECTION-II

STANDARD TECHNICAL SPECIFICATION



TECHNICAL SPECIFICATION FOR ELECTRICAL LABORATORY (METERING & TESTING) EQUIPMENT

SPECIFICATION NO. PE-TS-411-556-E003 R04

VOLUME II

SECTION II

REVISION 04

DATE: 13.07.2021

SHEET 1 of 3

1.0 TECHNICAL REQUIREMENTS

- 1.1 Basic technical requirements for Electrical Lab Equipment shall be as indicated in this section, in addition to technical requirements specified in Section-I.
- 1.2 The intent of specification is not to specify herein all the details of design and manufacture. However, the equipment shall conform in all respect to high standards of design engineering and workmanship and shall be capable of performing in continuous commercial operation up to vendors guarantee.
- 1.3 The Bidder may note that the equipment range, rating, quantities as detailed herein, are the minimum requirement only. All accessories for the equipment not covered here, if necessary for satisfactory and trouble free operation of the equipment, shall be quoted by the Bidder.
- 1.4 The instrument shall be suitable for satisfactory operation at an ambient temperature from 0°C to 55°C.
- 1.5 The Analog instruments shall be provided with knife-edge pointer and anti – parallax mirror.
- 1.6 The Bidder to quote only 'one' make/model against each equipment best to suit specification requirement.
- 1.7 The instrument shall be suitable for hand held operation, rugged in construction and suitable for field use.
- 1.8 All the equipment components shall be procured from reputed manufacturers and make of equipment shall be subject to the approval of BHEL/ BHEL's Customer.
- 1.9 **Bidder to note that "In case any offered make / model becomes obsolete or is stopped manufacturing by manufacturer, next higher model of the same make may be considered for ordering / supply at contract stage, without any price implication. In such cases, bidder is required to furnish valid confirmation letter from OEM as proof of change of model (citing reason: obsolete technology or stopping of manufacturing with date of effect) and that the offered model is "technically equivalent or better".**

2.0 CODES AND STANDARDS

Some of the standards, which shall generally be followed, are listed below. Other applicable relevant standards for any component part, even if not covered in listed standards shall be followed.

- i) IS – 6103 Method of test for specific resistance (resistivity) of electrical insulating fluid.
- ii) IS – 6700 Requirements of general purpose Cathode Ray Oscilloscope.
- iii) IS – 722 Specification for AC electricity meters.
- iv) IS – 8143 Specification for plugs & keys for resistance boxes.
- v) IS – 6104 Method of test for interfacial tension of oil against water.
- vi) IEC-51 Direct acting indicating analogue electrical measuring instruments and their accessories.
- vii) Any other relevant National/ International standards as mentioned in Section-II with technical specification.

3.0 DESIGN CRITERIA:

- 3.1 Electrical Laboratory Equipment shall be used for metering & testing of various electrical equipment/ devices during Commissioning, Operation and Maintenance of power plant.
- 3.2 The Equipment will be kept in a clean but hot, humid and tropical atmosphere when not in use. Equipment will be placed in dust laden, hot, humid atmosphere during its use.



TECHNICAL SPECIFICATION FOR ELECTRICAL LABORATORY (METERING & TESTING) EQUIPMENT

SPECIFICATION NO. PE-TS-411-556-E003 R04

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- 3.3 For continuous operation at specified rating, temperature rise of various equipment/ components shall be limited to the permissible value stipulated in the relevant standards and this specification.

4.0 TEST REQUIREMENTS:

- 4.1 Vendor to furnish test report to BHEL for review/ acceptance. BHEL/BHEL's customer may witness the testing of equipment.

5.0 PACKING:

All equipment shall be properly packed in Galvanized sheet steel trunk/ box with proper lock & key arrangement except for equipment which are trolley mounted or are already available in rugged steel/wooden box packing. Further, any damage (reading error/calibration error/broken parts/missing parts etc) found on receipt at site, leading to replacement of parts/whole item, shall be to bidder's account.

6.0 DEMONSTRATION TO BHEL / BHEL'S CUSTOMER

- 6.1 The vendor shall be responsible for demonstration of the supplied equipment at site, conforming the satisfactory operation.
- 6.2 The equipment for which demonstration is required at site shall be intimated by BHEL.
- 6.3 The charges for visit to site for demonstration at site shall be in-line with Annexure- I of Section-II.

7.0 PERFORMANCE GUARANTEE

The bidder shall guarantee that the equipment offered shall meet the requirement as stipulated in this specification and as confirmed by them in Technical Data Sheet. In case the performance of equipment is not as per performance guarantee, the bidder will have to replace the equipment at site free of cost.

8.0 DRAWING DATA & MANUAL

- 8.1 To be submitted with the bid as technical offer:

- Compliance to Technical parameters of various equipment as specified in Annexure-I of Section-I in Data Sheet – B (as enclosed).
- Technical leaflets/ Catalogues/Product Manual of the Equipment

The Bidder may note that the drawing, data and manual listed herein are minimum requirement only. The Bidder shall ensure that the other necessary write-ups, curves and information required to fully describe the equipment are submitted with the bid.

- 8.2 Following documents/drawings shall be submitted after placement of order for BHEL & customer's approval:

- Technical Datasheet for each equipment
- Technical leaflets/ Catalogues/Product Manual of the Equipment
- Tests Reports and calibration certificate
- General arrangement drawing showing constructional features, accessories, connections, range and rating, mounting arrangement, space requirement etc.
- Detail instructions for application, assembly & testing of equipment.
- Wiring and schematic diagrams (if applicable).
- Instruction manual/ O&M manual of individual equipment



**TECHNICAL SPECIFICATION FOR
ELECTRICAL LABORATORY
(METERING & TESTING) EQUIPMENT**

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8.3 Instruction manual/O&M Manual of individual equipment

The manual shall clearly indicate in English the installation and connection method, check list of the tests to be carried out before commissioning of equipment. Maintenance and Calibration method shall also be provided in the manual.

8.4 Bidder to furnish all user instruction manuals, maintenance, handling, installation manuals & all test reports complete in all respect in bound volumes & soft copies to BHEL / BHEL's customer at the time of handing over the same to BHEL / BHEL's Customer.

8.5 Bidder to note that quoted item cost shall include cost of main item, cost of all accessories required for successful operation of equipment and testing cost of all equipment test as per relevant standard.

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			Volume IIB
			Section II
	<u>ANNEXURE-I OF SECTION – II</u> <u>DEMONSTRATION & HANDING OVER CHARGES</u>		Rev. : 04 DATE-13.07.2021

**SCHEDULE OF PRICES FOR DEMONSTRATION & HANDING OVER TO
BHEL / BHEL'S CUSTOMER**

SL. NO.	DETAILS	ACTIVITY	UNIT CHARGES
1	LUMP SUM ALL INCLUSIVE CHARGES PER VISIT FOR EXPERIENCED / CAPABLE ENGINEER (EXCEPT DAILY CHARGES)	1 VISIT	20000/-
2	LUMP SUM ALL INCLUSIVE CHARGES FOR EXPERIENCED / CAPABLE ENGINEER PER DAY	1 DAY	5000/-

Note:

- TOTAL CHARGES = (Charges as per S.No.1) + [No. of Days(*) x Unit Charges as per Sl. No. 2]
- Bidder to note that provision of maximum 1 visit amounting to total 3 man days is envisaged for respective bidders.

*: To be certified by BHEL site

4X270 MW BHADRADRI TPS							
TECHNICAL SPECIFICATION FOR ELECTRICAL LABORATORY EQUIPMENT							
PE-TS-411-556-E003							
DATA SHEET-B (Annexure-II of Section-II)							
Item description	Whether Quoted or not (Yes/No)	Make	Model no	Country of Manufacture	EQUIPMENT & ACCESSORIES CONFIRMS TO ALL TECHNICAL REQUIREMENTS IN TOTALITY - (YES/NO)	Catalogue (attached or not)	Remarks
NOTE :-							
1) EQUIPMENT TO BE SUPPLIED ALONG WITH ESSSNTIAL ACCESSORIES FOR SUCCESSFUL OPERATION OF EQUIPMENT AT SITE .i.e. CLAMPS, CLIPS,LEADS ,CARRYING CASE etc.							
2) ALL EQUIPMENTS SHALL BE SUPPLIED WITH VALID CALIBRATION CERTIFICATE, WHEREVER APLLICABLE.							
3) All equipment shall be properly packed in Galvanized sheet steel trunk/ box with proper lock & key arrangement except for equipment which are trolley mounted or are already available in rugged steel/wooden box packing. Further, any damage (reading error/calibration error/broken parts/missing parts etc) found on receipt at site, leading to replacement of parts/whole item, shall be to bidder's account							
1. LV Insulation Tester (Megger) 500V : 10 No							
Purpose: For Checking the Insulation level, Polarization index of LV Electrical equipment							
Test Voltages: 500 V DC variable in steps of 250/500V							
Display: LCD 3 ½ Digit and/or Analogue.							
Mega Ohm Range: 500 MΩ							
Accuracy : ± 3%.							
Safety Standards: As per IEC							
EMC Standards: IEC							
Power Supply: Battery operated or Hand Crank							
Accessories: Test Leads, Carrying case, Instruction manual, Test/Calibration certificates.							
2. Battery operated Insulation Tester (Megger) : 4 Nos							
Purpose: For Checking the Insulation level, Polarization index of HV & LV Electrical equipment							
Test Voltages: 1000 V DC variable in steps of 500/1000							
Display : LCD 3 ½ Digit and/or Analogue.							
Mega Ohm Range: 500 MΩ or More							
Accuracy : ± 3%.							
Safety Standards: IEC 61010-1							
EMC Standards: IEC							
Power Supply: 240 V,1 Phase ,AC and Re-chargeable Battery.							
Accessories: Test Leads, Carrying case, Instruction manual, Test/Calibration certificates.							

3. Clip on Ammeter (AC): 5 Nos							
Purpose: For carrying out AC/DC Current measurements							
Range: 200A/600A (for AC) and DC (Available range)							
Accuracy : ±2 % to ±3 %.							
Resolution: 0.1A/1A							
Voltage test range : Upto 600V AC/DC.							
Resistance Range: 200 Ω							
Power Supply: Alkaline Battery.							
Min.Safety Standards: IEC 61010-1 and IEC 61010-2-31							
Accessories: Carrying case, Instruction Manual, Battery							
4. Digital Time Counter: 2 No							
Purpose: intended to use in substation							
Time Range: 0-999.99 Sec							
Resolution: 1 milli second							
Accuracy Class : ±0.05 %							
LVD/EMC Standards: CE Marking/Standard							
Supply Voltage: 220 V ±10 % AC/DC							
Trigger: Potential free NO/NC contact or voltage application for start/Stop.							
Accessories: Rugged carrying case, Manual etc.,							
5. Precision Portable Digital Frequency Meter: 1 No							
Purpose: for Measurement of Frequency and calibration of Frequency Meters							
Range: 0-100 KHz/0-1000Hz.							
Resolution: 1KHz/0.1 Hz.							
Maximum Load: 5mA							
Accuracy: ±0.5% of reading.							
Display: LED Display							
Auxiliary Power Input: 230V,1Ph, 50Hz, AC.							
Accessories: The instrument shall be housed in a rugged and shall be supplied with carrying case, Test leads, Battery, Manuals, warranty certificate etc.							

**TSGENCO
4 X 270 MW BHADRADRI TPS**

VOLUME II B

**TECHNICAL SPECIFICATION
FOR
ELECTRICAL LAB EQUIPMENT (CALIBRATION & DIAGNOSTICS)**

SPECIFICATION NO. : PE-TS-411-556-E002, REV. 02



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR PROJECT ENGINEERING MANAGEMENT
NOIDA, 201301**

364818/2021/PS-PEM-EL



**TECHNICAL SPECIFICATION
FOR ELECTRICAL LAB EQUIPMENT
(CALIBRATION & DIAGNOSTIC)**

Doc. No. PE-TS-411-556-E002

Volume

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b)	SPECIFIC TECHNICAL REQUIREMENTS	01
c)	ANNEXURE-I OF SECTION-I (DETAILED TECHNICAL PARAMETERS)	01
02	SECTION – II	
a)	STANDARD TECHNICAL SPECIFICATION	03
b)	ANNEXURE- I TO SECTION-II (DEMONSTRATION & HANDING OVER CHARGES)	01
c)	ANNEXURE-II OF SECTION-II (DATA SHEET-B FORMAT)	01
TOTAL NO. OF SHEETS= (INCLUDING COVER/ SEPARATOR SHEETS)		11

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	4X270 MW BHADRADRI TPS TECHNICAL SPECIFICATION FOR ELECTRICAL LABORATORY EQUIPMENTS (CALIBRATION & DIAGNOSTIC)	Doc. No. PE-TS-411-556-E002	
		Volume	IIB
		Section	I
	COMPLIANCE CERTIFICATE	Rev. : 02 DATE-14.07.2021	

COMPLIANCE CERTIFICATE

The bidder shall confirm compliance to the following by signing/ stamping this compliance certificate and furnishing same with the offer.

1. The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusion/ deviation with regard to same.
2. There are no deviation with respect to specification other than those furnished in the 'schedule of deviations'
3. Only those technical submittals which are specifically asked for in NIT to be submitted at tender stage shall be considered as part of offer. Any other submission, even if made, shall not be considered as part of offer.
4. Any comments/ clarifications on technical/ inspection requirements furnished as part of bidder's covering letter shall not be considered by BHEL, and bidder's offer shall be construed to be in conformance with the specification.
5. Any changes made by the bidder in the price schedule with respect to the description/ quantities from those given in Annexure-A [BOQ-Cum-Price schedule] of the specification shall not be considered (i.e., technical description & quantities as per specification shall prevail).
6. All essential accessories for each electrical laboratory equipment required for testing various electrical equipment /devices during Commissioning, Operation and Maintenance of power plant to be ensured by bidder in their offer.

 BIDDER'S STAMP & SIGNATURE

	4X270 MW BHADRADRI TPS TECHNICAL SPECIFICATION FOR ELECTRICAL LABORATORY EQUIPMENTS (CALIBRATION & DIAGNOSTIC)		Doc. No. PE-TS-411-556-E002
			Volume IIB
			Section I
	SPECIFIC TECHNICAL REQUIREMENTS		Rev. : 00 DATE-04.07.2017

1.0 SCOPE

- 1.1 Design, manufacture, inspection and testing at manufacturer's work, proper packing and delivery to site of Electrical Laboratory Equipment as mentioned in different sections of this specification.
- 1.2 General technical requirements of the Electrical Laboratory Equipment are indicated in Section – II. Project specific technical requirements/changes are listed in section-I.
- 1.3 Electrical Laboratory Equipment shall be supplied along with all essential accessories required for the successful operation of the equipment.
- 1.4 Detailed technical parameters of Electrical laboratory equipment are listed in Annexure – I of Section-I.
- 1.5 The requirement of section-1 shall prevail and govern in case of conflict between the corresponding requirements of Section-I and section-II.

2.0 BILL OF QUANTITIES

Quantity requirement shall be as per 'BOQ cum price schedule' enclosed in NIT.


3.0 SPECIFIC TECHNICAL REQUIREMENT

S.No.	Reference Clause No. of Section-II (if any)	Specific Requirement/Change

4.0 DRAWING & DOCUMENTS TO BE SUBMITTED

- 4.1 Following documents/drawings for each Electrical Laboratory Equipment shall be submitted after placement of order for BHEL & customer's approval in addition to the documents/drawings listed in clause No. 8.2 of section-II:

Sl. No.	Drawings/Document description	Drawings/Document Number
1	Technical Data Sheet	PE-V0-411-556-E001
2	Catalogue	PE-V0-411-556-E002

	4X270 MW BHADRADRI TPS TECHNICAL SPECIFICATION FOR ELECTRICAL LABORATORY EQUIPMENTS (CALIBRATION & DIAGNOSTIC)	Doc. No. PE-TS-411-556-E002	
		Volume	IIB
		Section	I
	Annexure-I of SECTION-I DETAILED TECHNICAL PARAMETERS	Rev. : 00 DATE-14.07.2021	

1. Portable Circuit Breaker Motion Analyser: 1 No

Purpose: Measuring opening & closing time of circuit breaker

Brief Description: For analyzing performance of SF6/Vacuum/air Circuit breakers. Microprocessor-based capable of measuring, recording and printing opening/closing times and velocity, coil currents, dynamic contact resistance of main/aux. & arcing contacts, pole discrepancy etc. The instrument shall have user-friendly menu driven software for easy operation and reduced set up time. It shall have communication ports for down loading of data from memory on to a PC. It should have a built-in DC battery and printer.

Other specifications shall be as follows:

Input Supply	: 110-240V, 50Hz with built in DC battery backup with charger
Current injection	: up to 100A DC
Timing Range	: 0-9.99 S. with a resolution of 0.1 ms and accuracy of $\pm 0.01\%$
Number of channels	: 12 analog 24 digital
Display	: 16 character alphanumeric LCD

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**4X270 MW BHADRADRI TPS
TECHNICAL SPECIFICATION FOR ELECTRICAL
LABORATORY EQUIPMENTS (CALIBRATION &
DIAGNOSTIC)**

Doc. No. PE-TS-411-556-E002

Volume

IIB

Section

I

Rev. : 02 DATE-14.07.2021

SECTION-II

STANDARD TECHNICAL SPECIFICATION



TECHNICAL SPECIFICATION FOR ELECTRICAL LABORATORY (CALIBRATION & DIAGNOSTICS) EQUIPMENT

SPECIFICATION NO. PE-TS-411-556-E002

VOLUME II

SECTION II

REVISION 02

DATE: 14.07.2021

SHEET 1 of 3

1.0 TECHNICAL REQUIREMENTS

- 1.1 Basic technical requirements for Electrical Lab Equipment shall be as indicated in this section, in addition to technical requirements specified in Section-I.
- 1.2 The intent of specification is not to specify herein all the details of design and manufacture. However, the equipment shall confirm in all respect to high standards of design engineering and workmanship and shall be capable of performing in continuous commercial operation up to vendors guarantee.
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2.0 CODES AND STANDARDS

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- ii) IS – 6700 Requirements of general purpose Cathode Ray Oscilloscope.
- iii) IS – 722 Specification for AC electricity meters.
- iv) IS – 8143 Specification for plugs & keys for resistance boxes.
- v) IS – 6104 Method of test for interfacial tension of oil against water.
- vi) IEC-51 Direct acting indicating analogue electrical measuring instruments and their accessories.
- vii) Any other relevant National/ International standards as mentioned in Section-II with technical specification.



TECHNICAL SPECIFICATION FOR ELECTRICAL LABORATORY (CALIBRATION & DIAGNOSTICS) EQUIPMENT

SPECIFICATION NO. PE-TS-411-556-E002

VOLUME II

SECTION II

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3.0 DESIGN CRITERIA:

- 3.1 Electrical Laboratory Equipment shall be used for calibration & diagnostics of various electrical equipment/ devices during Commissioning, Operation and Maintenance of power plant.
- 3.2 The Equipment will be kept in a clean but hot, humid and tropical atmosphere when not in use. Equipment will be placed in dust laden, hot, humid atmosphere during its use.
- 3.3 For continuous operation at specified rating, temperature rise of various equipment/ components shall be limited to the permissible value stipulated in the relevant standards and this specification.

4.0 TEST REQUIREMENTS:

- 4.1 All equipment to be tested as per latest edition of relevant standards. Further, testing shall include verification of physical, functional & technical parameters of equipment & accessories, in line with approved datasheet.
- 4.2 The tests shall be carried out by the vendor at in-house lab/ OEM lab/ Third party govt. accredited lab. Charges for all these tests shall be deemed to be included in the bid price.
- 4.3 Vendor to furnish test report to BHEL for review/ acceptance. BHEL/BHEL's customer may witness the testing of equipment.

5.0 PACKING:

All equipment shall be properly packed in Galvanized sheet steel trunk/ box with proper lock & key arrangement except for equipment which are trolley mounted or are already available in rugged steel/wooden box packing. Further, any damage (reading error/calibration error/broken parts/missing parts etc) found on receipt at site, leading to replacement of parts/whole item, shall be to bidder's account.

6.0 DEMONSTRATION TO BHEL / BHEL'S CUSTOMER

- 6.1 The vendor shall be responsible for demonstration of the supplied equipment at site, conforming the satisfactory operation.
- 6.2 The equipment for which demonstration is required at site shall be intimated by BHEL.
- 6.3 The charges for visit to site for demonstration at site shall be in-line with Annexure- I of Section-II.

7.0 PERFORMANCE GUARANTEE

The bidder shall guarantee that the equipment offered shall meet the requirement as stipulated in this specification and as confirmed by them in Technical Data Sheet. In case the performance of equipment is not as per performance guarantee, the bidder will have to replace the equipment at site free of cost.

8.0 DRAWING DATA & MANUAL

- 8.1 To be submitted with the bid as technical offer:



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- a) Compliance to Technical parameters of various equipment as specified in Annexure-I of Section-I in Data Sheet – B (as enclosed).

- b) Technical leaflets/ Catalogues/Product Manual of the Equipment

The Bidder may note that the drawing, data and manual listed herein are minimum requirement only. The Bidder shall ensure that the other necessary write-ups, curves and information required to fully describe the equipment are submitted with the bid.

- 8.2 Following documents/drawings shall be submitted after placement of order for BHEL & customer's approval:


- a) Technical Datasheet for each equipment
- b) Technical leaflets/ Catalogues/Product Manual of the Equipment
- c) Tests Reports and calibration certificate
- d) General arrangement drawing showing constructional features, accessories, connections, range and rating, mounting arrangement, space requirement etc.
- e) Detail instructions for application, assembly & testing of equipment.
- f) Wiring and schematic diagrams (if applicable).
- g) Instruction manual/ O&M manual of individual equipment

- 8.3 Instruction manual/O&M Manual of individual equipment

The manual shall clearly indicate in English the installation and connection method, check list of the tests to be carried out before commissioning of equipment. Maintenance and Calibration method shall also be provided in the manual.

- 8.4 Bidder to furnish all user instruction manuals, maintenance, handling, installation manuals & all test reports complete in all respect in bound volumes & soft copies to BHEL / BHEL's customer at the time of handing over the same to BHEL / BHEL's Customer.

- 8.5 Bidder to note that quoted item cost shall include cost of main item, cost of all accessories required for successful operation of equipment and testing cost of all equipment test as per relevant standard.

	4X270 MW BHADRADRI TPS TECHNICAL SPECIFICATION FOR ELECTRICAL LABORATORY EQUIPMENTS (CALIBRATION & DIAGNOSTIC)	Doc. No. PE-TS-411-556-E002	
		Volume	IIB
		Section	II
	<u>ANNEXURE-I OF SECTION – II</u> <u>DEMONSTRATION & HANDING OVER CHARGES</u>	Rev. : 00 DATE-14.07.2021	

**ANNEXURE-I
SCHEDULE OF PRICES FOR DEMONSTRATION & HANDING OVER TO
BHEL / BHEL'S CUSTOMER**

SL. NO.	DETAILS	ACTIVITY	UNIT CHARGES
1	LUMP SUM ALL INCLUSIVE CHARGES PER VISIT FOR EXPERIENCED / CAPABLE ENGINEER (EXCEPT DAILY CHARGES)	1 VISIT	20000/-
2	LUMP SUM ALL INCLUSIVE CHARGES FOR EXPERIENCED / CAPABLE ENGINEER PER DAY	1 DAY	5000/-

Note:

- TOTAL CHARGES = (Charges as per S.No.1) + [No. of Days(*) x Unit Charges as per Sl. No. 2]
- *: To be certified by BHEL site
- Bidder to note that provision of maximum 1 visits amounting to total 3 man days is envisaged for respective bidders.

4X270 MW BHADRADRI TPS								
TECHNICAL SPECIFICATION FOR ELECTRICAL LABORATORY EQUIPMENTS								
PE-TS-411-556-E002								
DATA SHEET-B (Annexure-II of Section-II)								
NOTE :-								
1) EQUIPMENT TO BE SUPPLIED ALONG WITH ESSNTIAL ACCESSORIES FOR SUCCESSFUL OPERATION OF EQUIPMENT AT SITE .i.e. CLAMPS, CLIPS,LEADS ,CARRYING CASE etc.								
2) ALL EQUIPMENTS SHALL BE SUPPLIED WITH VALID CALIBRATION CERTIFICATE, WHEREVER APLLICABLE.								
3) All equipment shall be properly packed in Galvanized sheet steel trunk/ box with proper lock & key arrangement except for equipment which are trolley mounted or are already available in rugged steel/wooden box packing. Further, any damage (reading error/calibration error/broken parts/missing parts etc) found on receipt at site, leading to replacement of parts/whole item, shall be to bidder’s account								
Item description	Whether Quoted or not (Yes/No)	Make	Model no	Country of Manufacture	Authorizatio n letter (attached or not)	Bidder to indicate the parameters of offered model against each parameter mentioned in the tender specification so that it can be concluded that offered model is meeting all requiremnets as specified in technical specification	Catalogue (attached or not)	Remarks
8. Portable Circuit Breaker Motion Analyser: 1 No								
Purpose: Measuring opening & closing time of circuit breaker								
Brief Description: For analyzing performance of SF6/Vacuum/air Circuit breakers. Microprocessor-based capable of measuring, recording and printing opening/closing times and velocity, coil currents, dynamic contact resistance of main/aux. & arcing contacts, pole discrepancy etc. The instrument shall have user-friendly menu driven software for easy operation and reduced set up time. It shall have communication ports for down loading of data from memory on to a PC. It should have a built -in DC battery and printer.								
Other specifications shall be as follows:								
Input Supply : 110-240V, 50Hz with built in DC battery backup with charger								
Current injection : up to 100A DC								
Timing Range : 0-9.99 S. with a resolution of 0.1 ms and accuracy of ±0.01%								
Number of channels : 12 analog 24 digital								
Display : 16 character alphanumeric LCD								