

Reply for Technical Pre-Bid Queries

Tender | TPCODL/ P&S/ 100000291/ 22-23

Package Open Tender for supply of Testing Instruments

Sr. No.	Detailed Reference to TPCODL Technical Document. Please specify Document No / Clause No / Page No	Description as per Bid Document	Remarks - Query / Clarification	TPCODL Response
1	2	3	4	5
1	DIGITAL INSULATION RESISTANCE TESTER 5KV, Clause 2	IEC 61557-5 Specification for electrical safety of Low voltage measurement – equipment for testing , measuring or monitoring of protective measures	Currently we don't have this standard certification instead of we are possessing with IEC 61010, IEC 61326	Acceptable
2	DIGITAL INSULATION RESISTANCE TESTER 5KV, Clause 4.6	Crank Generator:- 2-3 r.p.s. With moderate strength	Device is Digitally operated	Acceptable
3	EARTH TESTER DIGITAL, Clause no. 2, Application standard	IEC/EN 61557-5: Tester should perform a 3-pole fall-of potential test conforming to IEC/EN 61557-5	Instruments is capable for performing 3 pole & 4 pole method but not complying with IEC/EN 61557-5	Pls Specify in which standard it will be provided
4	TRANSFORMER WIND. RESTNCE KIT(0.1-200 μ i, Clause No. 3 GTR,	Accuracy: Value of 0.05% (+ /-) 1 digit	minimum accuracy +-0.1 % +- 5 Counts	Pls Comply
5	TRANSFORMER WIND. RESTNCE KIT(0.1-200 μ i, Clause No. 3 GTR,	Display: Color LCD viewable in bright daylight	Backlite LCD display	Acceptable
6	TRANSFORMER WIND. RESTNCE KIT(0.1-200 μ i, Clause No. 3 GTR,	Protection <input type="checkbox"/> Auto cut off after the test	Manual Cut off is available	No Deviation in TS
7	TRANSFORMER TURNS RATIO METER Clause No 4.11	Excitation Voltage: 1.8 V AC, 100Hz	Test Voltage offered:10V, 40V, 100V Frequency:50/60Hz	Acceptable
8	TRANSFORMER TURNS RATIO METER Clause No 4.19	Battery life operation Up to 12 hours of field operation	Mains Operated only	Not accepted
9	TRANSFORMER TURNS RATIO METER Clause No 4.15	Weight as furnished by bidder. Suitable to carry by hand less than 10 KG	Less than 15 kg	It should be as per spec
10	CB CRM, Clause No 3.9	Dimensions and Weight Lightweight not exceeding 10 kgs. And for portable use	Weight is 13 kg Approx	As per Spec
11	CB CRM, Clause No 3.11	Safety feature: <input type="checkbox"/> Auto trip provision with alarm signal in case of occurrence of body leakage for safety purpose	Dual Grounding is Externally provided & case is completely insulated. Internal grounding also provided for kit safety so there is no need of auto trip provision	As per TS

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12	AC HIPOTS 0-80KV	Doc. 1) Title Specification of Motorized High Voltage AC Test Set with 0-80 kV output at 100 mA Capacity. 2) Leakage current: 10 mA	Actually in document title 100mA capacity mentioned & in technical requirement 10mA please confirm your actual requirement.	100mA is accepted, there shall be provision that kit have form of switch or nob by which we can perform the testing whether leakage current is above 100mA.
1	AC leakage current Tester / specification / Point-3 / page-40	Large jaw with 30 mm diameter.	Suggest to keep low jaw side may be 18 mm for better measuring	NOT ACCEPTABLE
2	Tool Kit / clause-4 / STANDARD TECHNICAL PARTICULARS / sl no.15 / page-82	With Tools Trolley -1 No. with seven drawer	asked Trolley in List , however In technical data sheet photo of cantilever tool box has been shown. Kindly confirm.	Read as per technical data sheet of cantilever Tool box .
	PORTABLE POWER QUALITY ANALYSER (ITEM NO: 10)			
3	clause-2 - Applicable Standards	The equipment covered by this specification shall unless otherwise stated, be designed, constructed and tested in accordance with latest revisions of relevant Indian/IEC/other applicable standards shall confirm to the regulations of local statutory authorities.	You have asked for the PQM should be in accordance with latest revisions of relevant Indian/IEC/other applicable standards & asked IEC 61000-4-30:Class A reference unit: Testing and measurement techniques Power quality measurement methods, . While Latest standard is IEC 61000-4-30:Class A Edition 3. Should we read your reference standard as IEC 61000-4-30, Edition 3 which is latest revisions? Please clarify	ACCEPTABLE
4	General technical requirments-Point-4 - Voltage HF inputs (high frequency)	3 high frequency (2 MHz) voltage inputs (6 kV)	As most CTs used are either 3 KHz or 10 KHz band width, 2 MHz high speed sampling is of no application for Distribution utilities worldwide and the same applies to TPCODL. The same may be changed to 50 KHz./ Should be removed.	NOT ACCEPTABLE
5	point-7- General analogue inputs	2 - analog inputs (minimum)	This point may be deleted as most Distribution utilities do not require these analogue inputs/ Please specify application for these inputs / This can be deleted	ACCEPTABLE
6	point-9-Analog outputs	2- analog outputs (minimum)	This point may be deleted as most Distribution utilities do not require these analogue outputs / Please specify application for these outputs for providing correct output / This can be deleted	ACCEPTABLE

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7	Point-12- Memory	128 MB (Min)	You have requested only 128 MB continuous recording. Please note for high sample rate, the obvious corollary is that you need higher memory (even if you are storing all data in a server, as these memory provides redundancy which is invaluable) with ability to record at least 6 months to 1 year of data in the PQ meter. Typical memory should be around 1 GB (512 MB bare minimum) . However, when you sample at a 50 KHz sampling rate a higher memory is the need of the day. Typically reputed makes of PQ meters will provide about 1/1.2 GB of memory suitable to capture and store a minimum of 300 days of critical data. With large memory you need not worry about communication failure / software issue which may lose critical data.	MEMORY SHOULD BE 1GB
8	Point -15-Measuring frequency range	To be provided by the bidder	This should have Nominal 45 to 65 Hz to cover many distribution application.	ACCEPTABLE
9	Point-17-communication	CL port	Please Let us know what is this and what is the use of this in a Distribution utility? This may be changed to RS 485 ports--3 nos for better communication / Can be removed.	Its Serial Port and it should be RS485 and Ethernet is also required
		Ethernet port (RJ-45)	No of ports required is not mentioned. Many utilities are procuring dual ethernet ports. to get better redundancy in case a port fails or have various levels of access for senior and junior teams. Please check.	Redundancy Port may be given
10	Point-19-Transient registration	Peak detector function (1 MHz)	As most CTs used are either 3 KHz or 10 KHz, such high speed sampling is of no application for Distribution utilities worldwide and the same applies to TPCODL. The same may be changed to 50 KHz.	NOT ACCEPTABLE
11	Point-26- Basic features	The general analogue inputs should be used for specific measurements like temperature, pressure, speed etc.	Please advice why temperature, pressure, speed which are non electrical parameters are required. / Should be deleted	No Analog input & Outputs
		Fast transients (upto 1 MHz) should be captured by the measuring instrument	Fast transients 1MHz --are not possible to be captured as your existing CT bandwidth is 3KHz/10KHz.	comply as per TS
		Selectable storage intervals for all basic		NO query about storage interval

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		Detailed harmonics, THD and flicker measurements	In harmonics it is recommended by IEEE 519-2014 that harmonics should be monitored up to 50th order. Further, to analyze harmonics both Magnitude and Angle are preferred by engineers. Also new applications like Solar, Wind Turbine, Energy Storage , Vehicle charger require harmonics much higher than 50th, and so it is advisable to procure higher harmonics capability, say 100th order.	Harmonics monitored up to 50th order is acceptable ,if up to 100th order provided then preferable.
Following parameters which are missing in the specifications, may please be incorporated as nothing has been asked in tender				
1	protocols	IEC 61850 --Is this available in TPCODL	Is it Required for future communication to SCADA?	Not Required, It is Power Quality Analyzer not Meter.
2	Dual Ethernet Ports	This is becoming a requirement of many Distribution	If one Ethernet port malfunctions, the other continues to function correctly (provided it is on another IP address). A backup network with a unique IP address can be run on an additional Ethernet port. If the original network fails or is hacked, the backup network is unaffected and can be utilized while the other is being recovered. Different Ethernet ports can be used to separate networks, like private versus public or storage versus service. The PQ meter acts as a firewall to protect each network and keeps traffic separate.	redudancy Port may be given.


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3	Cyber Security	"It takes decades to build a reputation and only a few minutes of cyber-incident to ruin it." It is important in today's to secure your assets. Please peruse attached white Paper on Cyber Security in an Electrical utility	You can't promise that your organization will not be breached, not when intrusions are happening by the thousands or millions every hour. But you should be able to say that, one, you have secured the infrastructure your organization's sustainable growth depends on and that , two, when the inevitable breach happens, your stake holder can trust your organization to respond quickly and protect their interests. Important cyber security features like 128 bit AES Encryption (even Whatsapp provides this today) and Password fail timeouts --to safegaurd against Brute Attacks (many Banking apps provide this) should be the very basic security available in a professional equipment like the PQ Meter which has Ethernet access.	To be provided, It is mandatory
4	WebServer	An important capability for many utilities is the easy to access webserver from a PQ meter manufacturer – such a webserver provides unprecedented value for real time monitoring & viewing of such data "On the Go". Essentially you should be able to access the data anywhere from a PC or Smart Phone.	Built in Webserver to view and analyze real time data, stored historical logs, alarms, and waveform records	To be provided, It is mandatory
5	Flicker	Flicker meter should be F1 only as per IEC 61000-4-15 and complying to IEC 61000-4-30: 2015 Edition 3, Class A.	F3 flicker meter is expected to be DELETED in edition 4 of IEC 61000-4-30. Hence to future proof TPCODL investment it is advisable to procure F1 flicker meter only.	flicker should be F1 as per IEC 61000-4-15 and complying to both IEC 61000-4-15 and IEC 61000-4-30: 2015 Edition 3, Class A.

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6	Events	Voltage transients/SAG/SWELL with post and pre waveform record.	Number of cycles are NOT specified. PLEASE NOTE : As this is not specified in IEC 61000-4-30, some manufacturers provide low number of cycles for post and pre waveform records. This results in negligible to nil value to a distribution utility. We believe at least 100 cycles per window at specified sampling rate of 12.8 KHz (256 samples per cycle) and also 30 cycles at 51.2 KHz should be specified. This will cover typical distribution fault clearing times and the instantaneous reclosing time for breakers. Without adequate pre waveform record data, a user will be blind to any probable cause of an Power Quality event. Similarly without adequate post waveform record data, a user will be blind to any effect the said PQ event has on the system/network.	Data acquisition with resolution of 16-bit synchronous sampling and sampling frequency of 10.24 kHz at 50/60 Hz, synchronized to mains frequency. For Data storage internal flash memory (not user replaceable) with memory size suitable for Typical 10 logging sessions of 8 weeks with 1-minute intervals and 500 events.
7	Historical Logs	Nothing has been asked about no of logs	The meter should support eight configurable historical trending logs of 64 data channels per log. So that user can log maximum PQ parameters possible over a long period of time. We suggest minimum 6/8 logs ; Please clarify.	It should be 10 logs.
1	Digital Multimeter / point -7 / Frequency/ page-43	Maximum Frequency : 200 kHz Accuracy: $\pm(0.005\%+1)$ Maximum Resolution: 0.01 Hz	Frequency Range can be considered as 100 kHz instead of 200 KHz as 100 kHz is standard and the application within that frequency Range.	Acceptable

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2	Digital Multimeter / CALIBRATION CERTIFICATE/TEST REPORTS: / page-44	Vendor to provide Calibration certificate and Test reports at the time of shipment. All the tests shall be conducted by NABL accredited lab as per the relevant standards. Test should have been conducted in certified Test Laboratories for all Instruments to be supplied. In the event of any discrepancy in the test reports i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to TPCODL. Self calibrated meters is recommended.	Digital Multimeter: Calibration and Test Report are almost similar: Better to accept NABL Accredated Lab Calibration Report.	Acceptable
3	Digital Earth Tester / CALIBRATION CERTIFICATE/TEST REPORTS: / page-62	Vendor to provide Calibration certificate and Test reports at the time of shipment. All the tests shall be conducted by NABL accredited lab as per the relevant standards. Test should have been conducted in certified Test Laboratories for all Instruments to be supplied. In the event of any discrepancy in the test reports i.e. any test report not acceptable or any/all type tests (including additional type tests, if any) not carried out, same shall be carried out without any cost implication to TPCODL.	Digital Earth Tester: Better to accept NABL Calibration Certificate	Acceptable
4	Power Quality Meters /clause-4 / General technical requirments / page-65	<p>Point- 4 : Voltage HF inputs (high frequency) - 3 high frequency (2 MHz) voltage inputs (6 kV).</p> <p>Point-14: Resolution U/I - 16 bit</p> <p>Point-17. Communication:RS-232 port CL-port. Ethernet port (RJ-45) Modbus (TCP protocol)</p> <p>Point-19- Transient registration : Selectable pre-trigger Selectable post-trigger Selectable trigger value</p> <p>Point-24: Callback - function (optional): Send alarms directly via SMS</p>	<p>Power Quality Meters:</p> <p>a) Point No. 4 : Voltage HF inputs (high frequency) :3 high frequency (2 MHz) voltage inputs (6 kV)-Not Applicable (Please remove)</p> <p>b) Point No.14. Resolution U/I 16 bit-Not Clear - Pls. remove</p> <p>c) Point No.17. Communication RS-232 port CL-port Ethernet port (RJ- 45) Modbus (TCP protocol)-USB is sufficient or RS232/Ethernet/USB any one.Pls. correct.</p> <p>d) Selectable pre-trigger Selectable post-trigger Selectable trigger value- Not Applicable) Pls. remove.</p> <p>e) Callback-function (optional) Send alarms directly via SMS.-NA- Pls. remove</p>	As per TS


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5	Clamp on Meter / specification/ page-41	AC Clamp on Meter specification: Max/Mim Hold button	Max/Mim Hold Can be Read Hold on All Range	Acceptable
Contact Resistance Meter (CRM 100 B)				
1	4	Current:100 A DC	Not clear if current source will be continuous / Regulated DC/ Ripple free DC OUR QUERY: Please clarify whether this is pulse DC or Regulated Continuous DC current . Regulated Ripple free DC current kit will give consistent reading than other type of measurement	Acceptable
Transformer Ratio Meter				
2	4/1 - Turns ratio accuracy	$\pm 0.20\%$ (0.8 to 4,000) $\pm 0.25\%$ (4,001 to 10,000) For Excitation Current Values no greater than preset value.	Accuracy should be 0.8 - 999: $\pm 0.05\%$ as majority of values will remain within this range. Inaccuracy of 0.2% will give poor result. OR maximum value should be 1000 - 3999: $\pm 0.1\%$ Also, we could not understand ...For Excitation Current Values no greater than preset value. Kit only measures , there is no preset value. Accuracy should be better for fine measurement	Acceptable
3	4/4 - Protective Devices	High voltage side shorting relay, transient voltage suppressors and gas surge voltage protectors	What is gas surge protector??	Not Required.
4	4/6 - Phase Angle Measurement (three phase)	(- 179.9 ° to + 180 ° Max. error $\pm 0.1^\circ \pm 2$ digit)	This should be from 0 to 360 degree. $\pm 0,05$ Degrees with resolution of 0.01 degree. Asked measurement is not covering all quadrant & inaccuracy asked is very high. Accuracy should be better for fine measurement.	Acceptable
5	4/7 - Accuracy	Class 0.1	This seems to be of CT. Can be removed !!	It is current (RMS) accuracy $\pm 5\%$ rdg ± 0.5 mA.
	PC Connectivity	17)Connectivity:Able to connect laptop via Bluetooth, LAN & USB cable for data downloading. Leads for both HV and LV side of length 25 feet each in duplicate. Carry case both for leads and kits.	Please ask any one option: Bluetooth OR USB cable for data downloading / Simple kit with so many communication will increase cost !!	As Per TS
	4/8 - Excitation Voltage	1.8 V , 100Hz	Very low voltage for excitation. Maximum voltage should be 40 V for distribution transformer; Why excitation frequency should be 100 Hz, while transformer works at 50 Hz?	Acceptable
Ohm Meter Low Resistance Digital				

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1	OPEN Circuit Voltage ???	OPEN Circuit Voltage Not asked???	For Better & quick measurement OPEN Circuit voltage is required. Good quality equipment give Open circuit Voltage up to 50 V.	Given Open circuit voltage also preferable.
2	Number of Channels not mentioned??	Number of Channels not mentioned??	We suggest Three Channel (03) channels for quick measurement.	Acceptable
3	OPTC analysis	OLTC analysis	OLTC DCRM is must for Power Transformer. Kindly put this measurement as this does not increase cost, but supplier may not give software for analysis.	Not Required.
4	Weight : NOT Mentioned	Weight	Should not be more than 10 KG . Transformer Loaded kits wights more than 25 KG.	Should be less than 15kg
5	Demagnetisation Process: NOT Mentioned	Demagnetisation Process	This should be included as now a days this is very common.	Acceptable
6	Discharge Process : NOT Mentioned	Discharge Process (Demagnetisation & Discharge are different)	This should be included as now a days this is very common.: This is safety factor for operator while demagnetisation is to avoid tripping of Transformer while charging	Acceptable
7	PC Interface	USB & RS 232 C	Any one communication will be good enough. USB becomes standard. RS232C port should be deleted as majority laptop does not come with RS232C port as standard. Please confirm	Acceptable
2	Warranty period for AC leakage Clamp on Meter		please confirm warranty period	5years
3	Warranty period for AC Clamp on Meter		please confirm warranty period	5years

 TPCODL TP CENTRAL ODISHA DISTRIBUTION LIMITED	TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR TECHNICAL SPECIFICATION		
	Document Title Standard Technical Particular of Portable SF6 Gas Detector		
Document No.			Eff. Date: 26/10/2022
Revision No.			Page 1 of 6
Prepared by: Swarup Nayak	Reviewed By: Srastanth Mohanty	Approved By: Khajan C. Bhardwaj	Issued By: Pourush Garg

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		TP CENTRAL ODISHA DISTRIBUTION LIMITED, BHUBANESWAR	
		TECHNICAL SPECIFICATION	
Document Title		Standard Technical Particular of Portable SF6 Gas Detector	
Document No.		Eff. Date: 26/10/2022	
Revision No.		Page 2 of 6	
Prepared by: Swarup Nayak	Reviewed By: Srastanth Mohanty	Approved By: Khajan C. Bhardwaj	Issued By: Pourush Garg

1 SCOPE

This specification covers the technical requirements for '**Portable SF6 Gas Detector**' with respect to design, manufacturing & testing at manufacturer's works, packing, forwarding, registration, supply and unloading at TPCODL Stores/ site.

2 APPLICABLE STANDARDS

The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian/International standards and shall conform to the regulations of the local statutory authorities


S No.	IS/IEC/ASTM	Description
1	Regulation (EC) No. 842/2006	Regulation (EC) No. 842/2006 of European parliament and of council on certain fluorinated greenhouse gases.
2	IEC 61010	STANDARD FOR SAFETY REQUIREMENTS FOR ELECTRICAL EQUIPMENT
3	IEC 61326	EMC Testing of Lab Equipment

**In case of any conflict on any technical particular in the specification, the stricter requirement mentioned in the relevant standard shall be valid.*

3. CLIMATIC CONDITIONS OF THE INSTALLATION:

1	Maximum ambient temperature	50 deg C
2	Max. Daily average ambient temp	35 deg C
3	Min Ambient Temperature	0 deg C
4	Maximum Humidity	95%
5	Average Annual Rainfall	150cm
6	Average No. of rainy days per annum	120
7	Altitude above MSL not exceeding	1000m
8	Wind Pressure	300 Km/hr
9	Earthquakes of an intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
10	Earthquakes of an intensity in vertical direction	equivalent to seismic acceleration of 0.15g (g being acceleration due to gravity)

TPCODL service area has **heavy saline conditions along the coast and High cyclonic Intensity winds with speed upto 300 Kmph**. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

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4. GENERAL TECHNICAL REQUIREMENTS

The Portable SF6 Gas Detector shall be handheld SF6 Leak Detector that contains a robust infrared sensor to accurately detect even the smallest SF6 leaks with Rapid response rate, Low recovery time, Detection of leaks of up to 5g per year and Temperature compensated.

S. No.	Specification	Requirement
1	Ultimate Sensitivity	<3 grams of SF6/year
2	Measuring Range	0 - 2000 ppm
3	Accuracy	+/- 5% of reading
4	Power Supply	Rechargeable Alkaline Batteries
5	Battery Life	Not less than 40 Hours Normal Use
6	Duty Cycle	Continuous , No Limitation
7	Response	Instantaneous
8	Reset Time	1 Second
9	Alarm Mode	Multilevel Audible with LED Indication
		Visual-Display (Optional)
10	Operating Temperature	-10°C to 52°C (14°F to 125.6 °F)
11	Weight	500 grams approx.

The Portable SF6 Gas Detector shall be provided with all the required necessary accessories like Case, Power adapter, Spare Sensor Kit, Filter Papers for moisture removal etc.

5.0 GENERAL CONSTRUCTION:

The Portable SF6 Gas Detector shall be designed for pinpointing SF6 Gas leakage in the 66/33/11 kV Switchgears (11kV RMU). The Detector shall have all day battery life and bright LED/LCD screen ensure that a user can quickly find a leak in any conditions.

There shall be an optical filter in front of the detector to eliminate all wavelengths of IR except the one absorbed by the gas.


The Portable SF6 gas leakage detector shall be of compact probe design, with easy calibration and maintenance. There shall be provision for Multilevel Alarm for fault/warning, concentration alert. It shall have feature to set alarm range and digital display (digital display is optional) of gas concentration.

The Leakage data shall be clearly presented on the display screen. Also there shall be a multilevel audible alarm to alerts the user to the presence of SF6 leaks. The Leak Pointer shall clears itself quickly, even after detecting large SF6 leaks.

6.0 NAME PLATE AND MARKING:

The 'The Portable SF6 Gas Detector' shall be labelled with following details :

- Name of Manufacturer
- Model no.
- PO/RO Details
- Date of manufacturing (DD/MM/YYYY)

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7.0 TESTS:

Routine, Acceptance shall be carried out in accordance with the relevant standard.

**In case of any conflict on any technical particular in the specification, the stricter requirement mentioned in the relevant standard shall be valid.*

Routine & Acceptance Test:

SNo	Tests	Reference Standard
1	Visual examination	As per clause no. 5.0 of this technical specification
2	Technical particulars verification.	As per clause no. 4.0 of this technical specification
3	Functionality test	As per technical specification
4	Calibration Certificate	As per technical specification

8.0 TYPE TESTS CERTIFICATES:

Bidder has to submit the Calibration Certificate along with supply of materials.

9.0 PRE-DISPATCH INSPECTION:

Inspection shall be carried out by duly authorized representative of TPCODL. Bidder shall grant free access to the places of manufacture to TPCODL's representatives at all times when the work is in progress. Inspection may be made at any stage of manufacturing at the discretion of TPCODL and the equipment, if found unsatisfactory as to workmanship or material, the same is liable to rejection. Inspection by TPCODL or its authorized representatives shall not relieve the bidder of his obligation of furnishing equipment in accordance with the specifications.

Dispatch of material: Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL. Following documents shall be sent along with the supplied material:


- Test reports
- MDCC issued by TPCODL
- Invoice in duplicate
- Packing list
- Delivery Challan

10.0 INSPECTION AFTER RECEIPT AT STORE:

The material received at TPCODL's store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection or any other parameters observed after delivery. Bidders to attend and rectify the same at his own cost. The material shall be accepted in stores only after rectification of any observed flaw. Billing shall be processed only after acceptance of the material.

11.0 GUARANTEE:

Bidder shall confirm for guarantee towards design, material, workmanship & quality of process for integrated product delivered under the contract. In the event any defect is found by the Purchaser up to a period of 12 months from the date of commissioning or 18 months from the date of last supplies made under the contract, whichever is earlier. Bidder shall be liable to undertake to replace/rectify such defects at its own costs, within mutually agreed time frame, and to the entire satisfaction of TPCODL, failing which TPCODL will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the TPCODL's own charges (@ 20% of expenses incurred), from the Bidder or from 'Security cum Performance Deposit' as the case may be.

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12.0 PACKING:

Rail/ Road transportation: The bidder shall ensure that the equipment covered under this specification shall be prepared for rail/road transport in a manner so as to protect the equipment from damage in transit. Packing material shall be recyclable and environmental friendly.

13.0 TENDER SAMPLE:

Bidders shall conduct demo for verification of technical parameters as per specification during technical evaluation.

14.0 TRAINING:

Two training sessions shall be conducted at TPCODL sites

15.0 DRAWING AND DOCUMENTS:

Following documents to be submitted along with the bid for evaluation :

- Completely filled-in clause wise compliance of this specification.
- Type test reports
- Dimensional drawing


Following documents shall be submitted after award of RC/PO before manufacturing:

- Completely filled-in clause wise compliance of the specification.
- Dimensional drawing
- User manual with each equipment.

All the Documents shall be in English Language.

16.0 GUARANTEED TECHNICAL PARTICULARS:

S. No.	Specification	Requirement
1	Ultimate Sensitivity	
2	Measuring Range	
3	Accuracy	
4	Power Supply	
5	Battery Life	
6	Duty Cycle	
7	Response	
8	Reset Time	
9	Alarm Mode	

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Prepared by: Swarup Nayak	Reviewed By: Srastanth Mohanty	Approved By: Khajan C. Bhardwaj	Issued By: Pourush Garg

10	Operating Temperature	
11	Weight	

17.0

**SCHEDULE OF DEVIATIONS
(TO BE ENCLOSED WITH TECHNICAL BID)**

All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:

S. No	Clause No.	Details of deviation with justifications

We confirm that there are no deviations apart from those detailed above.

Seal of the Company:

Signature

Designation