

STANDARD TECHNICAL SPECIFICATION COVER SHEET

Specification No. : ENG-GEN-4014

Specification Name : Technical Specification for Live Line Detector

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CONTENTS

1. SCOPE
2. APPLICABLE STANDARDS
3. CLIMATIC CONDITIONS OF THE INSTALLATION
4. GENERAL TECHNICAL REQUIREMENTS
5. GENERAL CONSTRUCTIONS
6. MARKING
7. TESTS
8. TYPE TEST CERTIFICATES
9. PRE-DISPATCH INSPECTION
10. INSPECTION AFTER RECEIPT AT STORES
11. GUARANTEE
12. PACKING
13. TENDER SAMPLE
14. QUALITY CONTROL
15. TESTING FACILITIES
16. MANUFACTURING ACTIVITIES
17. SPARES, ACCESSORIES AND TOOLS
18. DRAWINGS AND DOCUMENTS
19. SCHEDULE "A" GUARANTEED TECHNICAL PARTICULARS
20. SCHEDULE "B" DEVIATIONS

1. SCOPE

This specification covers technical requirements of supply, design, constructional features, inspection, testing & transportation of Live Line Detector (Neon Tester) for efficient and trouble free operations at TPCODL/TPNODL/TPSODL/TPWODL stores/site.

2. APPLICABLE STANDARDS

‘Live Line Detectors (Neon Tester)’ covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with latest revisions of relevant Indian Standards /IEC/ International Standards and shall conform to the regulations of local statutory authorities.

IEC 61243	Live working – Voltage detectors – Part 1: Capacitive type to be used for voltages exceeding 1 kV a.c.
IS 16622:2019	Live working-insulating hollow tubes for electrical purpose
IS: 11731(Part-II) - 1986	Methods of Test for Determination of Flammability of Solid Electrical Insulating Materials When Exposed to An Igniting Source - Part 2 : Vertical Specimen Method
IEC 61235	Live working - Insulating hollow tubes for electrical purposes

3. CLIMATIC CONDITIONS OF THE INSTALLATION:

SL. NO.	CONDITONS	VALUES
1	Max. altitude above sea level	1200m
2	Max. Ambient Temperature	50 °C
3	Max. Daily average ambient temp	35 °C
4	Min Ambient Temp	0 °C
5	Maximum temperature attainable by an object exposed to sun	60 °C
6	Maximum Humidity	95%
7	Minimum Humidity	10%
8	Average No. of thunderstorm days per annum	70
9	Average Annual Rainfall	150 cm
10	Average No. of rainy days per annum	120
11	Thermal Resistivity of soil	150 Deg. Ccm/W
12	Wind Pressure	126 kg/sq. m up to an elevation of 10 meter.
14	Earthquakes of intensity in horizontal direction	equivalent to seismic acceleration of 0.3g
15	Earthquakes of intensity in vertical direction	equivalent to seismic acceleration of 0.15g

16	Wind velocity	300 km/hr.
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TPCODL/TPNODL/TPSODL/TPCODL/TPWODL/TPWODL/TPSODL service area has heavy saline conditions along the coast and High cyclonic Intensity winds with speed up to 300 Km ph. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months.

4. GENERAL TECHNICAL REQUIREMENTS:

S.No.	Description	Requirement
1.	Application	The Electronic detector should be capable of detecting up to from 220 V to 36 kV and suitable for indoor and outdoor application
2.	Live Line Indication features in voltage detector	<ol style="list-style-type: none"> 1. Sound: should be easily audible from ground level for each voltage selection and presence of noise 2. Light: should be visible in day light (Blinking). Min. 40 lumens 3. Visual Indicator- high beam bright LEDs flashing (visibility from bottom while checking line). Min 30 mtr visible in day & Min 300 mtr visible in Night. Visible angle: 360 Deg. 4. Self-test mode – Shall have self-diagnostic test mode in voltage detector
3.	Insulating Rods	<ol style="list-style-type: none"> 1. Material- Fibre Glass (Sturdy and rugged) 2. Should have anti tracking coatings 3. Should have bright colour for visibility of scratches and should be free from scratches or mechanical damages. 4. One silicon petticoat should be there for better gripping on rod bottom section
4.	Total length of rod after extension	7 mtr. (in 6 folds) Height/ length of the collapsible section - 4 feet.
5.	Triangular Type Insulation rod	<ul style="list-style-type: none"> • Telescopic Triangle Type Fibre Glass Hot stick suitable to operate Neon Tester. • Fibre Glass Hot stick should have a Triangle design to have a unidirectional locking system for user-friendly operation. • Triangle design helps better grip and hold a position in field operation without having any tilt issues. • Telescopic Hot stick shall be following dimensions Top section - 25MM Bottom Section - 55MM Each piece should have 1.22 Mtr. No. of Sections – 6 nos.
6.	Attachment of extension handles	<ol style="list-style-type: none"> 1. The main rod and extension handles are provided with snap pins with spring to easily connect and remove extension handle. 2. The snap pins and its spring shall be made up of stainless steel to maintain its spring action for

		long time with two locking heads in 180° opposite.
7.	Fixing arrangement of Tester on Sticks	<ol style="list-style-type: none"> 1. The main stick shall have a sturdy Sunrise connector on top without any other protruding contact on top. 2. The sunrise connector top assembly shall be fixed with rivets so that it becomes non-removable type. Top assembly It shall cover the rods so that water shall not go inside rods. 3. Thickness of Sunrise connector on Neon tester housing with teeth & at base both should be provided by bidder and shall have min 2.5mm thickness.
8.	Dielectric strength of Insulation	8 to 12 kV/mm
9.	Insulation resistance	Should be >50 GΩ
10.	Leakage current at 80	Should be less than 40μA
11.	Weight of a. All combined discharge rods b. Neon tester only	To be provided by Bidder
12.	Neon Tester (Live line detector unit)	<ol style="list-style-type: none"> 1. The circuit should be design to detect the various voltages in proximity of 360 degrees from sensor. 2. The circuit shall have low power consumption. 3. The sensor shall have internal battery which can be replaceable at site. 4. The neon tester shall have mode selector switch as mentioned in this specification.
13.	Neon tester Connectivity on rods	<ol style="list-style-type: none"> 1. The sensor shall have sturdy sunrise connector for easy fixing on the rods. 1. 2. The placement of the connector shall be such that while testing the sensor load shall be easily handles by connector without stress on sunrise connector.
14.	Battery	The internal battery shall be easily available in market. Details of battery should be provided by bidder. Low battery indication should be provided.
15.	Battery type and capacity	Battery shall be Alkaline type or better. The size and quality shall be such that it shall last for one year with daily 10 minutes of usages with light and sound. Bidder to mention the Ah capacity, Voltage and number of cells.
16.	Battery Make	Reputed OEM (list of offered make to be provided by bidder.)
17.	Storage Temperature suitability	0° C to 55° C or better
18.	Carrying Case 2 nos.	Nylon Carrying case to be provided separately one for neon tester and one for sticks

19.	Sensitivity	Bidder to submit the proximity detection length of detector for following voltages, 1. 220 V – 5 inch 2. 6.6 kV – 0.5 m 3. 11 kV – 1m 3. 25 kV – 1.2 m 4. 33 kV – 1.5 m (Test reports from competent labs to be submitted)
20.	Calibration	Calibration OEM test certificated along with each detector in pouch to be provided.
21.	IP Rating	IP 6X
22.	Colour of the Universal Fibre Glass Rod	Red or Yellow
23	Operating Temperature	0°C to 50°C or Better

Mode of use of selector switch as given below table

Selector Switch Position	Function of Instrument	Indication of voltage from 80 V to 1000 V AC	Indication of voltage from 1000V to 33 kV	Remarks
OFF	Instrument is OFF			When not in use the detector is to be kept in OFF position.
Test	Test Position / Self-Test			Light and sound indication in this mode shows that the detector health is good. If there is no light and sound indication in this mode check battery status.
LV	Low voltage	Will indicate		This mode is used as non-contact MODE. Use this selector switch as per voltage requirement.
HV	High voltage	NO Indication	Will indicate	This mode is used as contact MODE. Use this selector switch as per voltage requirement.

5. GENERAL CONSTRUCTIONS:

- Main rod and extension rod should be very smooth and free from any cuts / defects.
- Extension handle should also be available separately.
- Carry case provided should be handy in view of the safety of detector and extension rod.
- Self-test button/ switch to test battery and proper functioning of Live Line detectors (Neon Tester):
- Battery should be easily replaceable on field.

- f) 02 nos. of rubber grip shall be provided in the Main Fibre Glass Rod bottom part for suitable handling and using of the same while using it in the line.

6. MARKING:

Following details shall be embossed/marked on Live Line detectors (Neon Tester)::

- Manufacturer's name
- month and Year of manufacturing (MM/YYYY)
- RO/PO No.
- Property of TPCODL/TPNODL/TPSODL/TPWODL
- Logo of TPCODL/TPNODL/TPSODL/TPWODL with high visibility

7. TESTS:

Routine, Acceptance & Type tests shall be carried out in accordance with the relevant IS/IEC/ International standard. Acceptance tests shall be witnessed by a) TPCODL/TPNODL/TPSODL/TPWODL's authorized representative. Following tests shall be necessarily conducted on the Live Line Detectors (Neon Tester) in additions to others specified in IS/IEC/ANSI standards. Type tests shall be conducted from CPRI/ERDA/Any Govt. Lab. only.

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

7.1 TYPE TESTS

Sl. No.	Tests	Clause no.	Reference Standard
1	Visual Inspection	Clause 8.1 of IS 16622	IS 16622 : 2019
2	Dimension Check	Clause 8.2 of IS 16622	IS 16622 : 2019
3	Calibration test report		As per specification
4	Dry Power Frequency Voltage Withstand Test at 100kV AC rms	Clause 9.1 of IS 16622	IS 16622 : 2019 IEC 61235 : 1993
5	Dielectric wet test	Clause 9.2 of IS 16622	IS 16622 : 2019 IEC 61235 : 1993
6	Mechanical test	Clause 10 of IS 16622	IS 16622 : 2019 IEC 61235 : 1993
6.a	Bending Test	Clause 10.1 of IS 16622	IS 16622 : 2019 IEC 61235 : 1993
6.b	Torsion Test	Clause 10.2 of IS 16622	IS 16622 : 2019 IEC 61235 : 1993
6.c	Crushing Test	Clause 10.3 of IS 16622	IS 16622 : 2019 IEC 61235 : 1993

7	Environmental Tests for Voltage Detector {Live Working – Voltage Detector (for voltages exceeding 1kV)}	Cl. No. 4..2.3 & Cl. 6.4.6.1 of IEC 61243	IEC 61243
8	Leakage Current Tests for Voltage Detector with Insulated Stick under Dry and Wet Condition	Cl. No. 7.1.1 & Cl. No. 7.1.2 IEC 61243	IEC 61243

7.2 ROUTINE AND ACCEPTANCE TESTS

All acceptance tests mentioned below shall be witnessed by TPCODL/TPNODL/TPSODL/TPWODL's representative during inspection stage.

- Visual inspection
- Functionality test and sensitivity Test
- Calibration test report
- Verification of Components
- Dry Power Frequency Voltage Withstand Test at 100kV AC rms
- Extension rod fitment test
- The detector fitment test on main rod

8. TYPE TEST CERTIFICATES:

Bidder shall furnish the type test report of Live Line Detector (Neon Tester) for the tests as mentioned in Clause no. 7 of this specification and as per reference standards.

Test Laboratories: Complete set of Type Tests shall be conducted at certified test laboratories, which are CPRI / ERDA/Any Govt. Lab.

Type test should have been conducted in certified test laboratories during the period not exceeding 5 years from the date of opening the bid. 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/TPNODL/TPSODL/TPWODL.

9. PRE DISPATCH INSPECTION:

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

Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPCODL/TPNODL/TPSODL/TPWODL.

Following documents shall be sent along with material.

- a) Test reports
- b) MDCC issued by TPCODL/TPNODL/TPSODL/TPWODL
- c) Invoice in duplicate
- d) Packing list
- e) Delivery Challan
- f) Other Documents (as applicable).

10. INSPECTION AFTER RECEIPT AT STORES:

The material received at TPCODL/TPNODL/TPSODL/TPWODL, Odisha store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering department.

11. GUARANTEE:

Bidder shall confirm for guarantee towards design, material, workmanship & quality of process/ manufacturing for integrated product delivered under the contract. In the event any defect is found by TPCODL/TPNODL/TPSODL/TPWODL, up to a period of at least 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/TPNODL/TPSODL/TPWODL, failing which TPCODL/TPNODL/TPSODL/TPWODL will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the TPCODL/TPNODL/TPSODL/TPWODL's own charges (@ 20% of expenses incurred), from the Bidder or from 'Security cum Performance Deposit' as the case may be.

12. 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. Packaging shall be as per climate change perspective. TPCODL/TPNODL/TPSODL/TPWODL encourages to use environment friendly packaging.

Note: Single use plastic not to be used for packing of the material.

13. TENDER SAMPLE:

NA.

However, the bidder shall arrange to submit one sample on returnable basis OR provide an onsite demonstration of the product at TPCODL/TPNODL/TPSODL/TPWODL premises before mass production.

14. QUALITY CONTROL:

The bidder shall submit with the offer Quality Assurance Plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections. The bidder shall ensure that the material supplied is as per the Guaranteed Technical Particulars as specified in the specifications.

15. TESTING FACILITIES:

Bidder shall have adequate in-house testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards.

16. MANUFACTURING ACTIVITIES:

CAT-B/CAT-A approval is mandatory to start manufacturing works.

17. SPARES, ACCESSORIES AND TOOLS

NA

18. DRAWINGS AND DOCUMENTS

A. Following documents shall be submitted along with the bid:

1. Completely filled-in clause wise compliance of the specification.
2. Type test Certificates for each specified test
3. Drawing of Live Line detectors (Neon Tester)

B. Following documents shall be submitted after the placement of RC/PO:

1. Completely filled-in clause wise compliance of the specification.
2. Type test Certificates for each specified test if not submit during technical evaluation
3. Drawing of Live Line detectors (Neon Tester)
4. Compliances of undertaking submitted during Technical Evaluation

All the Documents and Drawings shall be in English Language.

19. SCHEDULE- "A" GUARANTEED TECHNICAL PARTICULARS

Bidder to submit completely clause wise compliance of this specification.

20. SCHEDULE “B” 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:

SL. 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