

Technical Specification
Of
Non-Contact type High Voltage Detector
With
Highly insulated Telescopic FRP rod

Signature of Tenderer:		Company's Round Seal:
Date:	Place:	

PASCHIM GUJARAT VIJ COMPANY LIMITED

1. Scope:-

This Specification covers the design, engineering, manufacture, testing at factory, testing in presence of Department Engineers at Suppliers' premises before dispatch, packing, supply and delivery at site of PGVCL, of Non-Contact type High voltage detector with telescopic stick and provides warning of exposed high voltage AC, un known sources of unshielded and potentially hazardous AC voltage from a safe distance for PGVCL 11KV Distribution lines as per specification.

2. Our System Details:-

The Non-contact type high voltage detector is intended for use in 11 KV and 22 KV distribution system; 3-phase, 3-wire at high voltage and 4-wire at low voltage with solidly earthed neutral(at the source neutral terminal) and shall have following system conditions:-

Sr. no.	Description	Details
1	System voltage for 3-phase, 3 wire	11 KV and 22 KV
2	During LST/SDT operation condition on 11 KV Ag. dom feeders	11 KV / 6.3 KV / 3.8 KV
3	LT system voltage (415 V 3-phase 4wire, 5 wire, 230 V 1-phase 2 wire/3-wire)	up to 230 V AC with -- 30% to +20% of ref. voltage
4	Frequency	50 Hz +5.0% to -5.0 %.

3. Climatic condition:-

The equipment/material to be supplied against this specification shall be suitable for satisfactory operation under the following climatic conditions

Sr. no.	Description	Details
1	Maximum ambient air temperature in shade.	50°Cent.
2	Minimum ambient temperature	(-) 5°Cent.
3	Maximum altitude above mean sea level	Up to 1000 meters.
4	Minimum relative Humidity(%)	10%
5	Maximum relative Humidity(%)	95%
6	Average annual rainfall	10 cms. to 150 cms.
7	Maximum wind pressure	150 kg/sqmt

The equipment shall be for use in moderately hot and humid tropical climate condition which is conducive to rust and fungus growth.

4. Application:-

- 4.1 The instrument is intended to use for safety purpose for Electrical line staff of PGVCL to ensure the safe guard of their lives, therefor, reliability of the instrument highly essential. In any case the equipment should not be failed while operating or gives misleading indication or misleading behavior or become dangerous to life while operating.

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- 4.2 The Non-contact type high voltage detector will use to detect the presence of voltage in the electrical Overhead line, cable box end terminations or any parts of the Electrical line network to ensure no presence of Power in the line which can be hazardous to the human life by detecting it through the application of this device.
- 4.3 The Non-contact type voltage detector should have the unique capability to warn the user of the presence of high voltage from a safe distance and must be exceptionally sensitive.
- 4.4 The unit meant for professional use only. It is an aid in detecting live wire/parts and dangerous AC potentials.
- 4.5 **The device should be normally in OFF condition and when it turns for ON condition it should be first come to test condition to ensure proper functioning of all parts viz, its battery, alarm, indication lamp and internal circuit, thereafter it should turn in to ON condition of different range.**

5. Non-contact type Voltage Detector:-

- 5.1 The instrument should be designed to detect the presence of voltage without physical contact (non-contact proximity).
- 5.2 **Rotary Switch:-** The instrument should be with rotary switches to select the detection range from OFF, TEST, 240 Volt, 2KV, 6 KV, 11 KV and 22 KV.
- 5.3 **Warning Indicators:-** The instrument should have warning light of Bright Red color LED/neon lamp light indication triggers on voltage detection and warning buzzer of high noise level audible buzzer triggers on voltage detection when the instrument comes in the proximity of the live conductor carrying voltage.
- 5.4 As the sensor is moved closer to the voltage carrying conductor or part, its sensor head picks up the radiated electric field. Once the range threshold is reached, the buzzer sounds and a bright red warning light warns the operator of live conductors or parts.
- 5.5 **Detection:** - selected range is detected at approximately 4" (10 Cm) distance from the voltage carrying live wire/parts. Greater detection should be obtained at lower distance position.
- 5.6 The Voltage detector should be powered by three standard alkaline C cell batteries / with 1.5Vx3=4.5Volt batteries.
- 5.7 **Self-diagnosis feature:-** The model should have a self-test position that ensures that all circuitry and annunciators are working properly by energizing the complete system. The High Voltage Detector shall be

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capable of performing complete self-diagnostic check to ensure the working of the voltage detector before taking on site. On selecting the test button, it shall give both visual bright red light and audible high noise buzzer to confirm that the voltage detector is working.

- 5.8 The instrument can be used for both in-and out-of-doors.
- 5.9 A universal spline on the back end facilitates attachment to any standard hot stick.
- 5.10 The instrument should be supplied with individual hard carrying case, user manual and batteries.

6. Telescopic rod- FRP stick:-

- 6.1 The Fiber Glass Telescopic Stick should be manufactured form fully automatic pultrusion machine made out of Fiber Reinforced Polyester (FRP) Resin bonded, with boron free glass rowing.
- 6.2 The stick should be free from all the foreign bodies and without any pin holes.
- 6.3 The inner and outer surface of the FRP pipe should be smooth and glossy & minimum glass content will be 60 %.
- 6.4 The length of FRP Stick should be at least 15 feet in 03 equal sections. The diameter of Top section will be 32 mm & diameter of Bottom section will be 45 mm. The minimum wall thickness will be 2.5 mm.
- 6.5 The arrangement of locking system between two section of FRP Stick will be of spring loaded push button system. The joints will be provided with complete vibration free fitting.
- 6.6 **Type test:-**
Telescopic FRP Stick should be type tested 110 KV in Dry & Wet Condition as per IEC 60060 & Lightning Impulse Voltage withstand test should be 250 KVP as per IEC 60060. Dielectric strength should be 9 KV/mm minimum. Also telescopic FRP Telescopic Stick should be type tested as per IS 6746 with low flammability test & glass content should be minimum 60% as per BS : 2782-Pt10-1977.
- 6.7 Top section of FRP Telescopic Stick should be provided with facility to attach with universal spline on the back end of the Non-contact type voltage detector.
- 6.8 FRP Telescopic Stick provided with suitcase type bag to include all the attachment in the bag.
- 6.9 Manufacturer must have in-house testing facility for minimum 200KV

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high voltage test to ensure the quality during inspection

- 6.10 The bottom end of the Telescopic Stick will be dressed with rubber shoe for adequate grip & to prevent the penetration of the moisture from underneath, thus making the device completely moisture proof & to hold FRP Stick conveniently.
- 6.11 The arrangement of locking system between two section of FRP Stick will be of good quality of spring loaded aluminum push button and the design of such equipment will be Telescopic type design.
- 6.12 The joints will be provided vibration free and provided with Complete fittings.
- 6.13 The FRP Stick will have very good mechanical Strength , excellent dielectric strength and free from the water absorption.
- 6.14 The weight of FRP Stick will be very less & suitable for easy handling & Operation by single person.

6.15 Technical Specification of FRP type telescopic rod

1	Material	: FRP Pultruded.
2	Process	: Automatic Pultrusion Plant.
3	Surface	: Smooth and Glossy.
4	Design	: Telescopic Type.
5	Locking	: Push Button type Locking System.
6	Assembled Length	: 15 Feet
7	H.V.Test	: 110 KV (Dry & Wet Condition - IEC 60060)
8	Lightning Impulse	: 250 KVP (IEC 60060)
9	Dielectric Strength	: 9 KV Min. (IEC 60243-Pt-1-1998)
10	Low flammability	: IS 6746 - 1994
11	Glass Content	: 60 %. (Bs : 2782-Pt10-1977)
12	Top Section Dia	: 32 mm.
13	Bottom Section Dia	: 45 mm.

- 6.16 The FRP telescopic rod should be supplied with suitable carrying bag. The carry bag shall be marked with manufacturer name/logo and PGVCL

7. General Safety and Constructional requirement:-

High Voltage Detector with telescopic rod shall be designed and constructed in such a way so as to avoid danger during using under normal / abnormal conditions.

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However, the following should be ensured.

- a) Personal safety against electric shock
- b) Personal safety against effect of excessive temperature
- c) Protection against spread of fire
- d) Protection against penetration of solid objects, dust & water.

8. **Marking:-**

The basic marking on the High Voltage Detector Name plate shall be as follows:

1. Manufacturers name & Trade mark
2. Rated Voltage
3. Serial No.
4. Year of Manufacturing

“PGVC” should be marked in the Non-contact type high voltage detector and telescopic rod sticks.

9. **Test at site:-**

9.1 Test on Non-contact type voltage detector

- Test of performance under all Rotary switch position with and without live wire at site
- Visual examination
- Fitting of spline on the back end facilitates attachment to the FRP telescopic rod
- Insulation resistance test

9.2 Test on telescopic FRP stick

- Dimension check
- Insulation resistance check
- High voltage test
- Visual examination
- Locking arrangement & fittings

9.3 Inspections and testing:-

The material shall be checked and inspected by an authorised engineer of PGVCL before dispatch. The purchaser reserves right to get the material tested in any testing laboratory before despatch.

10. **Sub mission of Type test report:-**

The supplier should submit a set of type test report as per the standards carried out at CPRI/ERDA/ NABL accredited laboratory with the tender. The test certificates should be not more than 5 year old. The test report other than NABL accredited and more than 5 years older will be rejected.

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11. Catalogue and operating manual:-

A complete set of catalogue and operating manual is required to submit with the tender as well as with the supply of the order quantity with individual items.

12. Guarantee:-

The supplier shall give guarantee for a period of at least 3(three) years from the date of supply of trouble free performance of Non-contact type high voltage detector and telescopic FRP stick.

If the goods, stores and equipment found defective due to bad design or workmanship, the same should be repaired or replaced by the supplier free of cost if required within the guarantee period. The supplier shall be responsible for the proper performance of equipment/ material for the guarantee period.

13. Proof of proper working:-

The tenderer may be asked to demonstrate the model item offered by him in the tender before the Committee of the PGVCL to know and evaluate its performance for its operation. The supplier will have to undertake all the test of demonstration in the proximity of the live 11 KV/22 KV/LT wire at his own risk and cost. If the committee will not satisfy and not approve the model offered, the offer will be technically rejected and will not be eligible for further evaluation process.

14. Deviation from the specification:-

If the tendered wish to depart from specification in any respect, he should clearly state such departure indicating the reason thereof. PGVCL reserves the right to accept or to reject the deviation in the specification while evaluation of the technical bid.

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