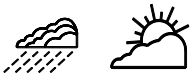
ROMIND T&G
Modern Solutions & Technologies

USER GUIDE

HIGH VOLTAGE DETECTORS

- INDOOR & OUTDOOR USE -

Model:

DTCIER/P 6-35Kv ☐ **- DRY/RAIN WEATHER** 

DTCIER/P 110kV ☐ **- DRY/RAIN WEATHER** 

DTCIER/P 220-400kV ☐ **- DRY/RAIN WEATHER** 

DTCIER 6-20kV ☐ **- ONLY DRY WEATHER** 

DTCIER 110kV ☐ **- ONLY DRY WEATHER** 

USER GUIDE
Edition 0 / Revision 6 - 2019

1. NAME OF THE TECHNICAL EQUIPMENT

Capacity-type voltage detectors, for indoor and outdoor electrical installations.
Code: DTCIER; DTCIER/P respectively

Detector code	Nominal voltage (kV)	Operating conditions
DTCIER/P 6-35kV	6 – 35	In dry and rain conditions
DTCIER/P 110kV	110	
DTCIER/P 220-400kV	220 – 400	
DTCIER 6-20kV	6 - 20	In dry conditions, without precipitations
DTCIER 110kV	110	

2. REFERENCE DOCUMENTS AND NORMS

- SR[1] EN 61243-1/A1:2010: Live works. Voltage detectors. Part 1: Capacitive type voltage detectors in electrical networks with voltages higher than 1 kV, with alternative current (Amendments)
- SR[1] EN 61318:2008: Live works. Conformity assessment applicable to tools, devices and equipment;
- SR[1] EN 61243-1:2006: Live works. Voltage detectors. Part 1: Capacitive type voltage detectors in electrical networks with voltages higher than 1 kV, with alternative current
- SR[1] HD 588.1 S1:2003: High Voltage testing techniques. Part 1: General definitions and testing regulations;
- SR[1] HD 478.2.1 S1:2002: Environment conditions classification. Part 2: Effective environment conditions. Temperature and humidity.
- SR EN 60721-2-1:2014 ver. eng. Environment conditions classification. Partea 2-1: Environment conditions appering in nature. Temperature and humidity;
- SR[1] EN 60068:2-6:2003: Environment testing Part 2: Testing Fc. vibrations (sinusoidal).
- PE 101/85: Normative for connecting and transforming electrical installations construction with voltages higher than 1 kV (republished in 1993)
- HG 1037/2010 regarding waste electrical and electronic equipment;
- OUG 5/2015 regarding waste electrical and electronic equipment;
- HG 322/2013 - regarding the restriction of use of certain hazardous substances in electrical and electronic equipment;
- SC Electrica SA[2] – Own instructions regarding the work safety for operating electrical installations, Edition 2007
- SF[3] 35/1999, ed.2/rev.3-2015 – Capacitive type, portable voltage detectors for indoor and outdoor voltage installations

Note

1 – the SR abbreviation that precede the EN or HD means that the standard was adopted in Romania, being identical with the European one;

2 - SC Electrica SA = the main Romanian energy distribution company (more than 40% of the market);

3 – SF = Romind internal product standard.

3. MARKING AND DESCRIPTION OF EQUIPMENT

3.1. MARKING

On the case of each device is marked the following information:

1. Manufacturer's name / mark: ROMIND T&G

2. Detector's name: Voltage detector
3. Detector's code:

Voltage detectors for nominal voltage range of 6-20 kV	DTCIER 6-20 kV
Voltage detectors for nominal voltage of 110 kV	DTCIER 110 kV
Voltage detectors for nominal voltage range of 6-35 kV	DTCIER/P 6-35 kV
Voltage detectors for nominal voltage of 110 kV	DTCIER/P 110 kV
Voltage detectors for nominal voltage range of 220-400 kV	DTCIER/P 220-400 kV

The signification of the encoding symbols is as follows:

D – detector (device type)
T – voltage (electrical feature detected)
C – capacitive (type)
` IE – usable in indoor and outdoor areas
R – ROMIND T&G (producer's name)
P – usable in rain conditions
6 – 20 kV or 110 kV or 6 – 35 kV or 220 – 400 kV – nominal voltage range

4. Frequency: $f_{nom.}$ =50Hz
5. Group of designation, in compliance with SR EN 61243-1: gr. III
6. Category designation, in compliance with SR EN 61243-1: cat. L
7. Rated voltage
8. Text "Tim" for use in systems with small induced voltages (for detectors DTCIER/P 6-35kV, DTCIER/P 220-400kV)
9. Climate category N climate category
10. Text: Use in rain conditions or Use in dry conditions
11. Graphic symbol in compliance with the use in rain conditions: rain clouds
Graphic symbol in compliance with the use in dry conditions: sun partially covered by a cloud
12. Text: Power supply: alkaline battery 1x9V 6LR61 type
13. Mark certification (third party - only for DTCIER/P 6-35kV şi DTCIER/P 110 kV*)*

14. Threshold voltage
15. CEI Symbol– double triangle for electrical tools and equipments

16. Recycling symbol

17. Romanian Standard reference: SR EN 61243-1 / A1: 2010 (only for DTCIER/P 6-35kV şi DTCIER/P 110 kV*)*
18. Text: ATTENTION Read the instructions before use
19. Icon on the obligation to read the instructions before use

NOTE: Detector's number: manufacturing year / serial number composed of **"*manufacturing year / detector no.*"** appears on a separate label affixed and stuck to the detector case.

3.2. DEVICE'S DESCRIPTION

The overall appearance and general dimensions of the detectors are presented in the Annexes 1 and 2 from this user guide. The detectors are composed of:

- insulated plastic case that includes inside:
  - metal case for shielding;
  - electronic assembly;
  - battery for power supply;
  - signaling elements (LEDs, acoustic signaling device);
  - test button;

- contact electrode made of aluminum alloy:
- "Y" type for: DTCIER 6-20 kV and DTCIER/P 6-35 kV;
- "hook" type for: DTCIER 110 kV, DTCIER/P 110 kV and DTCIER/P 220-400 kV.
- piece clamping for isulating stick made of plastic

The detectors is internally shielded in order both to protect detector against electric fields and for a more accurate control of the measurement capacity.

The detectors are equipped with incorporated test generator to verify the good functioning of the electronic arrangement and the state of the battery. It is activated by pushing the self-control test button. The detector responds in the same way as in the situations where it is put into contact with a conductor whose voltage compared to earth is higher than the threshold voltage: emitting intermittent signals (both acoustic and optical, red color) while pushing the button, and after releasing the button it stops the intermittent signaling and lights the green LED for minimum 2 minutes.

Any other response or lack thereof when it is pushed the test button represents a signaling of a fault: whether the detector is faulty, whether its battery discharged under the level which insures a correct functioning.

The signaling elements (four red color LEDs, one green color LED and acoustic signaling device) and the self-control operating button (test button) of the integrated device are mounted in the bottom of the device.

The user may replace the battery without dismantling the detector's case, smply by manual unscrewing of the battery's lid.

4. DOMAIN OF USE

The DTCIER and DTCIER/P voltage detectors are destined to verify the presence/absence of the alternative voltage with nominal frequency of 50Hz in indoor and outdoor electrical installations having the nominal voltages in the interval of:

Detector code	Nominal voltage or voltage range of the verified electrical installation (kV)
DTCIER 6-20 kV	6 – 20 kV ± 10%
DTCIER/P 6-35 kV	6 – 35 kV ± 10%
DTCIER/P 110 kV and DTCIER 110 kV	110 kV ± 10%
DTCIER/P 220-400 kV	220 – 400 kV ± 10%

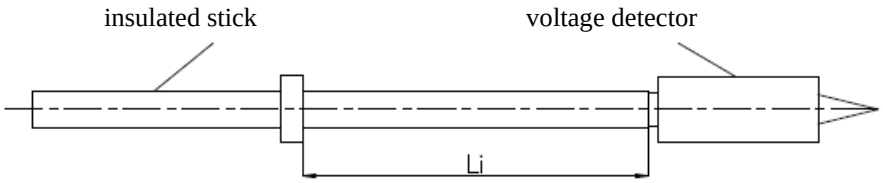
The detectors do not signalize the presence of the d.c. voltage in the verified electrical installation.

The detectors must be used only with an appropriate insulating stick corresponding to the nominal voltage of the verified installation and provided, if applicable with AF E-C, AR E-C or AR C-C adapters (made by Romind). The environment conditions in which may be used the devices are the following:

- temperature: -25 °C ...+55 °C according to climateand category type N from SR EN 61243-1: 2006, respectively WT from SR HD 478.2.1 S1: 2002
- relative humidity: max. 96%

In case of using the detectors in rain conditions, it must be used with an insulating stick certified for this way of use and the case of the detector must be covered with the rain-resistant aerosol-oil (bottled in aerosol NC 123 spray – provided on request by Chemsearch Company). **Only the DTCIER/P type detectors can be used like that, in rain conditions.**

Also insulating stick used must meet the following isolation distances (Li) minimum:



Voltage (kV)		Isolation distance for the insulated stick Li (mm)
min	max	
1	7.2	320
7.2	12	360
12	17.5	370
17.5	24	470
24	36	520
36	72.5	830
72.5	123	1300
123	170	1700
170	245	2300
245	420	3600

The detectors must not be used in environment with electricity conducting powders , active chemical substances or corrosive ones.

5. OPERATING INSTRUCTIONS

5.1. Before use it, the external device's surface estate must be visually examined. If it is found any contamination of the external surface with powders or it is noticed the appearance of a condensation film, the detector must be cleaned with a soft, dry cloth. Also check absence of any defect (see Chapter 7 Tests).

WARNING!

1. It is forbidden to use or to keep the detectors DTCIER/P with the electrode upside-down in rain conditions, because the water can infiltrate the detector through the hole of the speaker.

2. It is allowed to use the detector in rain conditions only if prior to use the detector has been covered with aerosol-oil spray, NC 123 type (bottled by Chemsearch company) delivered by Romind.

5.2. The detector is permanently in stand-by; before each use it must be verified its good functioning by pushing the self-test button. If the battery is in a good condition and the electronic circuits are functional, the pushing of the test button generates both acoustic and optical (red color light), intermittent signals; when pressing the button is stoped, the intermittent signals must stop and the green light is on for an interval of minimum 2 minutes. In case the test button is pressed and the detector does not respond by the above described signalizing, the battery must be removed (according to the procedure described at point 5.9. in this User Guide), then it must be pressed again the self-control button. If the detector does not respond even in these conditions by the signaling above described, the detector must be declared faulty and taken out of use until its repairing or replacing.

5.3. After verifying the good functioning, the detector is fixed on the head of the insulating stick extended at the appropriate length for the nominal (range) voltages of the detector.

5.4. In order to check the presence of the voltage in the electrical installation, the detector's contact electrode is slowly approached near the element which is needed to be verified. When the contact electrode is approached near to the verified installation, if appears the acoustic and optical signaling (red color light), that means the verified installation is under voltage and there is not necessary to touch with the contact electrode the part of verified installation, in order to confirm the presence of the voltage.

When approaching the contact electrode near the element of the verified installation and no acoustic and optical signaling occurs, then, in order to confirm the voltage absence on electrical installation, it is mandatory to have a direct contact of the electrode with the electrical installation's element.

If also in this case (after the contact is made) the detector does not signal acoustically and optically the voltage presence, before being concluded that the electrical installation is not energized, the voltage detector must be checked again by pressing the self-control button. Once again, if the

battery provides sufficient power supply and all the circuits are integer, the detector will emit intermittent both acoustic and visual signals (red color light). After releasing the test button, the intermittent signals must stop and the green LED must be on and remain lighted for minimum 2 minutes.

After this test, if the detector's answer is correct, it may be decided that the tested element from the verified instalation is de-energized and it can be allowed the application of the short-circuiting device.

5.5. The voltage detectors can be used in order to check the presence / absence of voltage in electrical installations only in respect of the particular electrical safety at work rules.

5.6. In dry conditions, the DTCIER/P detector can be used in any position. In rain conditions it must be used so the water does not infiltrate inside through the speaker's hole. (at least, the detector must be held oblique, with the contact electrode up).

WARNING

When using the detectors DTCIER/P in rain conditions, they must be protected against water by spraying it with a film of aerosol-oil NC 123 – Chemsearch Company. The whole external surface of the detector's case, including the bottom area where are situated the acoustic signaling speaker, the LEDs and the test button must be protected in this way. However, in order to prevent the accumulation of the product NC 123 on the membrane of acoustic signaling, the speaker's hole must be covered before spraying. After applying the protective film, the speaker's hole must be uncovered in order to allow the transmission of a sound signal of intensity in compliance with the requirements.

5.7. The dismantling of the detector's case and the adjusting of the elements responsible with the threshold voltage or the self-test voltage settings, **are strictly forbidden**. Te replacement of the discharged batteries must be made in compliance with the procedure described at point 5.9 of the present User Guide, without dismantling the detector's case.

5.8. The mounting and adjustment of the position of the contact electrode must be made manually, without using any other helpful tools. The contact electrode and the fixing nuts must be manually but firmly tightened in order to obtain a good electrical contact with the electrode gripping piece, but without damaging its thread. Please do not use any other tools that may damage the thread.

5.9. In order to remove a discharged battery, it must be unscrewed its cover from the detector's base. The discharged battery should be carefully removed in order not to break the connecting wires between the battery coupling and detector, then it will be connected and introduced a new 9V alkaline battery. It is pushed the self-control button and is observed the proper functioning by the appearance of both acoustic and optical intermittent signals (red color lights);when the button is released, the green color light must be on; then the little cover should be screwed and tightened so that the detector's sealing not to be affected

WARNING!

There shall be used only good quality alkaline batteries of 9V, 6LR61 type or similar.

6. WORK SAFETY INSTRUCTIONS FOR VOLTAGE DETECTORS

6.1. WARNING!

In order to preserve the integrity and the functionality of the device and in order to safely use it, the users must respect the mentioned rules and warnings in this user guide along with the safety at work provisions, according the safety legislation in force for the current work area and also the internal safety and health at work instructions of the user. The operating of the device without respecting these above provisions can determine major accidents.

6.2. The voltage detectors will be used only by the trained and properly equipped personnel (insulating gloves and shoes, helmet and protective visor are mandatory).

6.3. It is forbidden the use of the voltage detectors with insulating sticks that present cracks, flashover traces, and major scratches. Also, it is forbidden the use of the voltage detectors with uncertified insulating sticks in terms of safety for the particular working conditions meaning also the respective nominal voltage range and the proper environment conditions.

6.4. WARNING!

It is not admitted the use of the voltage detectors at other voltages or in other environmental conditions than the ones for which they have been manufactured.

It is forbidden the use of the detectors in electrical installations to check the absence of voltage in points or on element's surfaces covered with paint.

The checking of the presence / absence of the voltage will be done only at the transformers terminals or in the points where it must be mounted the short-circuiting device.

7. PERIODICAL TESTS

User is obliged to test the detectors as contained in Annex 5.

The tests must be made under the following environmental conditions:

- environmental temperature: +15.....+35ºC
- relative humidity 45%.....75%
- atmospheric pressure 86.....106 kPa

The detectors submitted to tests will be stored for at least four hours, under the mentioned conditions, before being submitted for tests.

Except the periodical tests, the voltage detectors must be submitted to these tests every time when there are any doubts relating to their functioning or when visible signs of deterioration appear.

The detectors rejected at the periodical tests must be taken out of use until to remediation.

8. PACKING, TRANSPORT AND STORAGE

8.1. The voltage detectors are delivered in special protecting bags or boxes.

8.2. Each detector is accompanied by:

- User Guide
- Declaration of conformity;
- Warranty Certificate;
- Test report for threshold and test report for report case dielectric strength;

The NC 123 product (spray) is delivered by ROMIND T&G only on request - in case the detectors DTCIER/P will be used in rain conditions.

8.3. The detectors must be protected against any vibrations and excessive shocks during transportation.

8.4. The 9V alkaline battery 6LR61 is delivered along the voltage detector.

8.5. Storage conditions:

- temperature: -10.....+45ºC (long term);
  -25.....+55ºC (short term);
- humidity: 45%.....75%;
- keep away from the sunlight.

WARNING! During storage of appliances for a long period, the battery must be taken out of its place, in order to avoid the damaging of the electronic part, in the event of any electrolyte leak.

9. MAINTENANCE AND REPAIRING

Voltage detectors do not need special maintenance measures. They must be cleaned, wiped and protected (in case of use in rain conditions for DTCIER/P) by covering them with a film of aerosol-oil NC 123 (spray), in compliance with the above mentioned instructions for use.

In case the contact electrode is deteriorated, it must be replaced with a similar one. It is not allowed any improvisation.

Any spare parts can be provided, on request, by the manufacturer.

Repairing of detectors rejected to the periodical tests and of those faulty in exploitation must be performed only by the manufacturer's qualified personnel.

10. INFORMATION REGARDING THE ENVIRONMENT SAFETY

The product is designed and manufactured in order to assure a high protection degree of the operators health, of the environment and does not contain substances dangerous, forbidden or restricted by the Regulation (CE) nr. 1907/2006 of the European Parliament and of the Council from 18 December 2006 (REACH).

Due to the fact that the components and the materials contained in the product have a natural decomposing characteristic that can last for decades, phenomenon that can influence negatively the environment factors, after being taken out of use, this device will became the object of a separate collection, indicated by the symbol: 

In conformity with the Directive 2002/96/CE regarding the electrical and electronic equipment waste, the user has the obligation of assuring the managing of the product became waste.

The collection, the transport and exploitation/ elimination of the waste is done by appropriate authorized agents.

The materials and the components of the DEEE that require selective treatment and its localization, according to Directive 2002/96/CE:

No.	Materials and components	Quantity Pieces	Description
1	Alkaline batteries	1 piece	9V
2	Printed circuit plates	1 piece	< 10 cm^2
3	Components:	3 pieces	Transistors
		1 piece	integrated circuits
		13 pieces	Resistors
		6 pieces	Diodes
		1 piece	Speaker
		5 pieces	LEDs
		4 pieces	Ceramic capacitors and thermistors
4	Plastic case	1 piece	Product body

11. WARRANTY. LIABILITY

11.1. The detector's warranty is guaranted by the manufacturer for a period of 24 months from the delivery date. In the warranty period, the manufacturer will repair or replace, without any charge, any damaged detector, if the product is returned without being opened by the client (with the seal intact) and if it is accompanied by the warranty certificate and invoice. This present warranty commitment covers only the detector's value and not any other loses due to the malfunction or lack of function of the detector.

Warning: The deterioration of the seal determines the loss of the warranty!

11.2. Intended use

The device is intended strictly for use in applications described in the operating instructions. Any other usage is considered improper and forbidden, and can result in accidents or the destruction of the instrument. Any such application will result in the immediate expiry of all guarantee and warranty claims on the part of the operator against the manufacturer.

11.3. We assume no liability for damages to property or personal injury caused by improper handling or failure to observe the safety instructions. Any warranty claim expires in such cases. An exclamation mark in a triangle indicates safety notices in the operating instructions. Read the instructions completely before beginning the initial commissioning.

11.4. Disclaimer

The warranty claim expires in cases of damages caused by failure to observe the instructions! We

assume no liability for any resulting damage!

Romind is not responsible for damage resulting from failure to observe the Instructions, changes to the product that have not been approved by Romind or the use of spare parts that have not been manufactured or approved by Romind, the use of alcohol, drugs or medication.

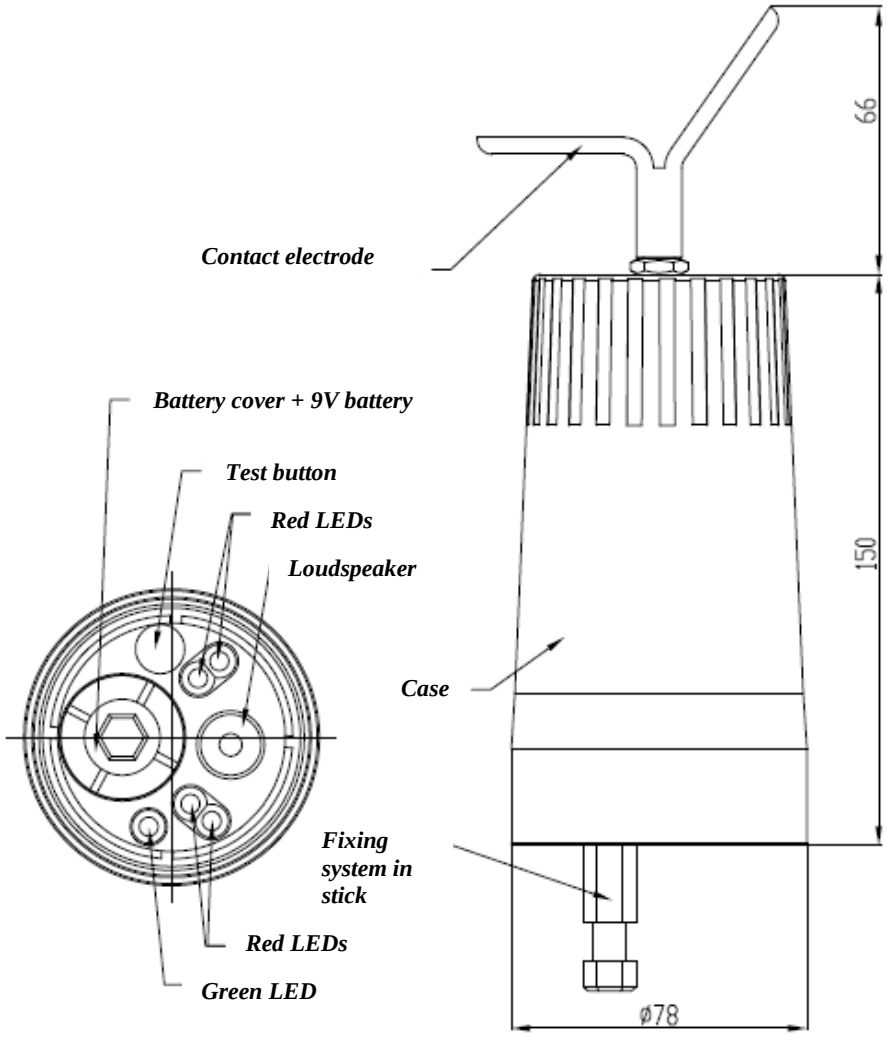
Accuracy of the operating instructions

These operating instructions have been compiled with due care and attention. No guarantee is given that the data, illustrations and drawings are complete or correct. All rights reserved with regard to changes, printing mistakes and errors.

11.4 Romind T&G Company offers paid services including testing, post-warranty repairs, works that can be done at the company’s headquarters.

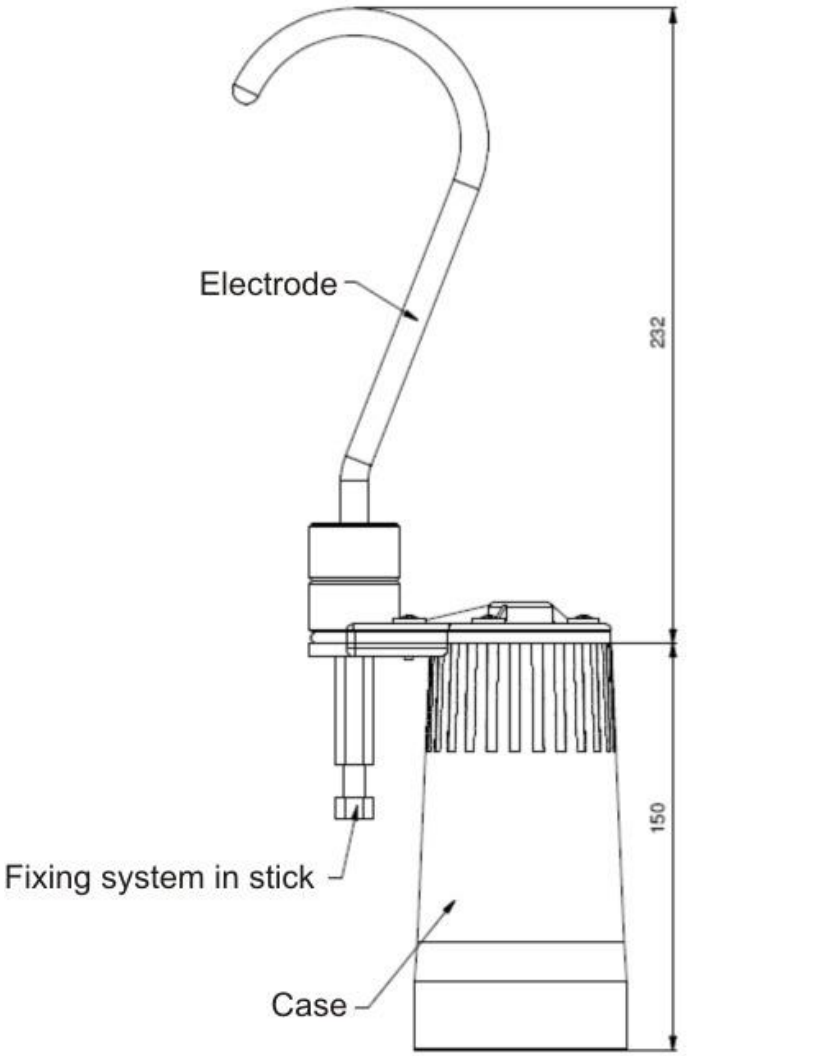
Annex 1

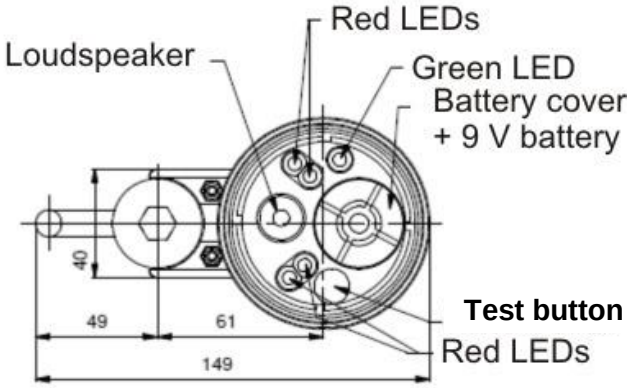
The general appearance of DTCIER 6-20 kV and DTCIER/P 6-35kV detectors



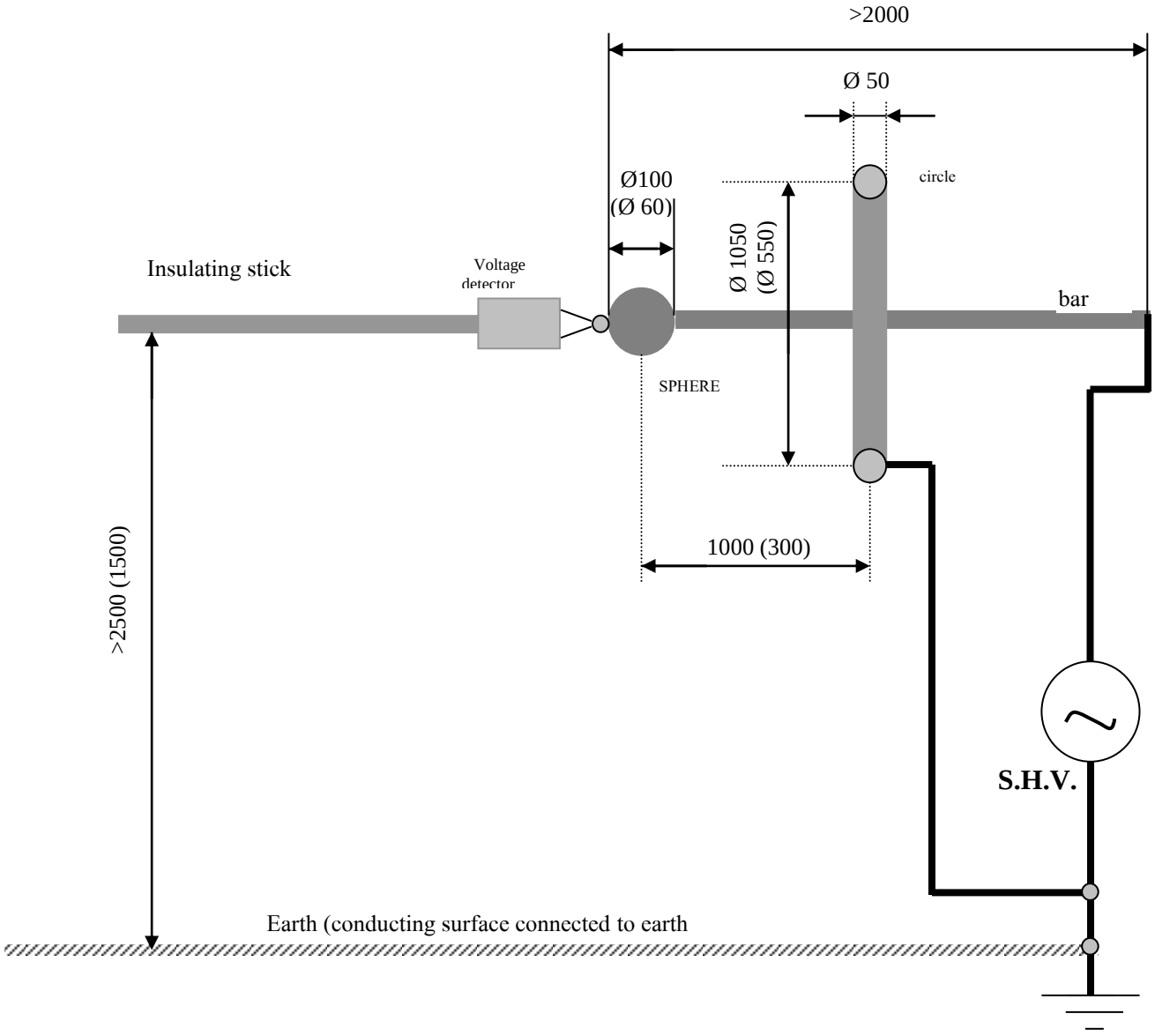
Annex 2

The general appearance of DTCIER 110 kV, DTCIER/P 110 kV and DTCIER/P 220-400 kV detectors





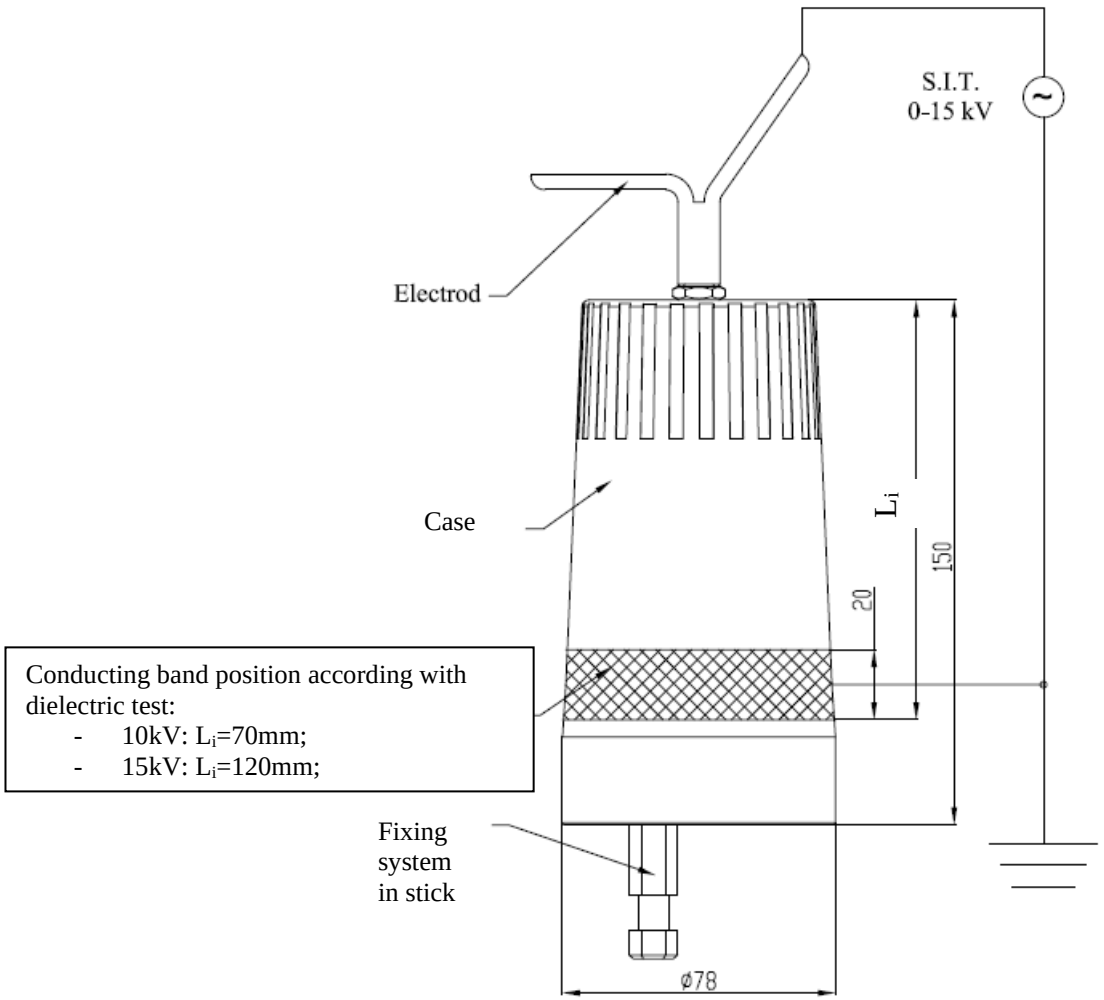
Annex 3



S.H.V. = Source of high voltage

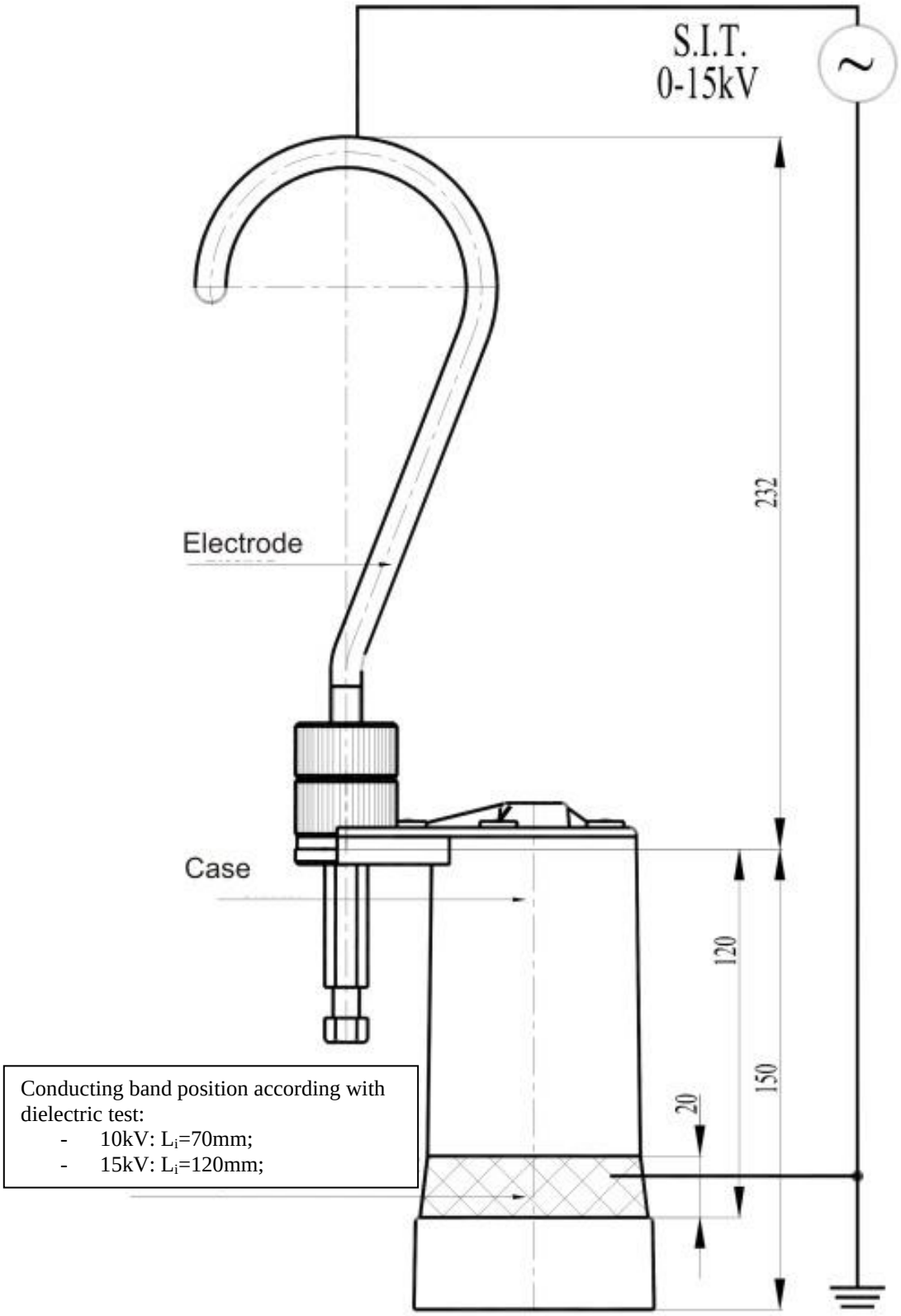
The mounting for the threshold voltage test - for DTCIER 6-20 kV, DTCIER/P 6-35 kV, DTCIER 110 kV, DTCIER/P 110 kV and DTCIER/P 220-400 kV voltage detector,
(the figures in the brackets are valid only for the DTCIER 6-20 kV and DTCIER/P 6-35 kV detectors)

Annex 4a



The mounting for the dielectric rigidity test of the case - for voltage detectors DTCIER 6-20 kV and DTCIER/P 6-35kV

Annex 4 b



The mounting for the dielectric rigidity test of the case - for voltage detectors DTCIER 110 kV, DTCIER/P 110 kV and DTCIER/P 220-400 kV

Annex 5

TESTS

No.	Test name	Test description	Test method	Test interval	
				Before each use	Annual
1	Checking the appearance and integrity	Check the appearance and integrity of the casing and all the external elements of the detector (electrode, buttons, trimmings, LED adapter for stick)	Visual Inspected items must not show fractures, cracks or other defects that may affect the functioning	X	X
2	Checking dimensional	According ch.2.1.1 & 4.1.1 of SF 35/1999		-	X
3	Checking control device	According ch.2.2.8 & 4.2.9 of SF 35/1999		-	X
4	Checking resistance flashover detector case	According ch.2.2.12 & 2.3.2 & 4.2.5 of SF 35/1999 (only on dry weather)		-	X
5	Checking resistance priming electric arc	According ch.2.2.11 & 4.2.6 of SF 35/1999 (only 5 seconds)		-	X
6	Checking threshold voltage	According ch.2.2.1 & 2.2.2 & 4.1.3 of SF 35/1999 (only on dry weather)		-	X
7	Checking of in phase interferance	According ch.2.3.4 & 4.2.2 of SF 35/1999		-	X
8	Checking of visual indication	According ch.2.3.3 & 4.2.11 of SF 35/1999 (using alternative verification methode)		-	X
9	Checking of audible indication	According ch.2.3.4 & 4.2.12 of SF 35/1999 (using alternative verification methode)		-	X
10	Checking of marking	Check compliance detector installation and environmental conditions to be used	Visual	X	X
11.	Checking the battery and the control of the check device	Press the test button on the detector and check instructions given under chapter. 5.2 of this User guide		X	X

NOTE:

1. Any mismatch leads to scrapping of the detector to remedy.
2. Annual periodic tests will be made only in laboratories manufacturer or its authorized partners.
3. Annual periodic tests will be carried out in chronological order set out in the table above.

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