USER GUIDE

1. NAME OF THE TECHNICAL EQUIPMENT

Capacity-type voltage detector DETECT type, for indoor and outdoor electrical installations, used in dry and rain conditions.

2. MARKING AND DESCRIPTION OF EQUIPMENT

2.1. Marking

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

1. Manufacturer's name : **ROMIND T&G**
2. Detector's name: **Voltage detector**
3. Detector's code:

-Voltage detectors for nominal voltage of 3÷10 kV **DETECT 3-10 kV**
-Voltage detectors for nominal voltage of 6÷20 kV **DETECT 6-20 kV**
-Voltage detectors for nominal voltage of 10÷36 kV **DETECT 10-36 kV**
-Voltage detectors for nominal voltage of 36÷110 kV **DETECT 36-110 kV**

4. Nominal frequency: **50 Hz**
5. Indication group: **III**
6. Indication of category: **L**
7. Rated voltage: **3-10 kV; 6-20 kV; 10-36 kV; 36-110** kV
8. Climate category: **N**
9. Text: Use indoor/outdoor and in rain conditions
10. Graphic symbol in compliance with the use in indoor/outdoor and in rain conditions:

11. Text: Power supply: **alkaline battery 1x9V - 6LR61 type**

12. Certification mark: 

13. IEC Symbol– **double triangle for electrical tools and equipment:** 

14. Recycling symbol: 

15. Standard reference: **IEC 61243-1:2003/A1:2009**

16. Text: **Read the instructions before use**

17. Graphic symbol on the obligation to read the instructions before use: 

18. Detector's self-test method before and after use (**graphic symbols**)

19. Date of the next periodic check (**month/year**)

20. Serial number and year of manufacture

2.2. Device's description

The general aspect of voltage detectors is presented in the Annexes 1 and 2 from this user guide.

Voltage detectors DETECT type are identical from the point of view of dimension and shape, the only differences being just about the shape and dimensions of the contact electrode.

The contact electrode is removable, and in the case of **DETECT 36-110 kV type** it is orientable hook type, and for the **DETECT 3-10 kV**, **DETECT 6-20 kV** and **DETECT 10-36 kV type** it is "Y" type.

Inside the casing are installed the electronic assembly and the battery for power supply.

At the lower part, the voltage detector housing is provided with an "**universal**" coupling system so that it can be rotated at an angle of **30°, 60°** or **90°** towards the insulating stick axis. The grip is lateral in order to provide the widest point of view to the user.

The voltage detector is delivered along with a ***hexagonal adapter*** for coupling it with a telescopic insulating stick provided with a coupling system "***hexagon 12***" type.

The contact electrode is made of aluminium alloy, and the casing made of red transparent polycarbonate, a material with excellent mechanical and dielectric properties.

The indicating elements (4 red LEDs, 1 green LED, 3 orange LEDs and the acoustic signalling) and the test button of the self-testing device are installed on the front panel of the detector, on the signalling and control panel. Also, the voltage detector is provided with other signalling elements (8 red LEDs) installed laterally.

3. DOMAIN OF USE

The DETECT voltage detectors are designed to verify the presence/absence of the alternative voltage with 50Hz nominal frequency for indoor and outdoor electrical installations. Also, the DETECT voltage detectors can be used in rain conditions.

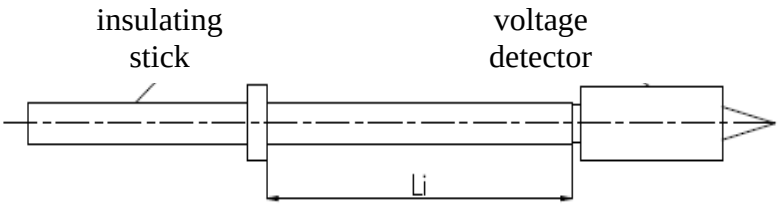
Depending on the rated voltages of the electrical installations, the voltage detectors are made as follows:

Detector type	**Voltage range of the checked electrical installation (kV)**
DETECT 3-10 kV	3 ÷ 10 ± 10%
DETECT 6-20 kV	6 ÷ 20 ± 10%
DETECT 10-36 kV	10 ÷ 36 ± 10%
DETECT 36-110 kV	36 ÷ 110 ± 10%

Voltage detectors ***do not indicate the presence of d.c. voltage in the checked installation*** and must be used only with a proper insulating stick corresponding to the nominal voltage of the checked electrical installation and the insulating distance.

According to EN 61243-1:2006+A1:2010, depending on the rated voltage of the electrical installation, insulating stick used must meet the following **minimum insulating distances** (**Li**):

Voltage (**kV**)		**Insulating 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



In case of using the detector in rain conditions, it must be used with an insulating stick certified for this way of use and wipe the detector with a silicone cloth or with a soaked cloth with NC 123 -manufactured by Chemsearch Company.

The environment conditions in which **can be used** the voltage detectors are the following:

- temperature: -25°C ...+55°C
- relative humidity: max. 96%
- wet weather conditions (rain, snow, drizzle, mist).

It is forbidden to use **DETECT** voltage detectors on heavy rain, heavy snow or in the presence of atmospheric discharges.

4. INSTRUCTIONS OF USE

The voltage detectors shall be used in accordance with the rules and warnings mentioned in this User Guide as well as the occupational safety rules according to the legislation on health and safety at work in force, as well as the user's internal safety and health instructions. Personal protective equipment should be used by trained and equipped personnel for live working (electrical insulating gloves and boots, helmet and protective visor, heat-resistant cloth suit).

If the use of voltage detectors and insulating sticks are made at temperatures below 0°C, the following should be considered:
- after removal of voltage detectors and insulating sticks from the storage space, it is recommended that before use, they should be removed from their own packaging and be maintained for at least 15 minutes for adaptation to ambient temperature;
- if appropriate, before use any traces of condensation will be removed, using a soft dry cloth, after which the outer surfaces will be wiped with a silicone cloth or with a cloth soaked with NC 123 -manufactured by Chemsearch Company.

If non-compliances with the requirements in Annex 3 are found, then the voltage detectors will ***be taken out of use***.

WARNING!

It is allowed to use the detector in rain conditions only if prior to use the detector has been wiped with a silicone cloth or with a cloth soaked with NC 123 - manufactured by Chemsearch Company.

In order to check the presence/absence of voltage in electrical installations with the DETECT type voltage detector, the following operations must be respected:

4.1. ***Before use***, it must be checked that the nominal frequency and voltage range mentioned on the voltage detector and the voltage range mentioned on the insulating stick to match with nominal frequency and voltage range of electrical installation that must be checked.

4.2. ***Before use***, it must be checked that the external surfaces of the voltage detector and the insulating stick used to be clean and dry, without cracks and scratches.

4.3. In case of voltage detector **DETECT 36-110 kV type**, hook type contact electrode must be mounted by screw driving method, after which it is ensured by manually clamping the existing nut on it.

4.4. The voltage detector it is mounted on the top of the insulating stick assembled to the corresponding length to the rated voltage range of the electrical installation to be checked.

4.5. ***Before and after*** checking the presence/absence of voltage from the electrical installation, the self-test of the voltage detector should be done: checking the electronic part and battery power status. This is done by ''short'' pushing the **self-test button**. So, after releasing the **self-test button**, for about 6 seconds, all indicating elements of the voltage detector (12 red LEDs, 1 green LED, 3 orange LEDs and the acoustic signalling) will alternately and intermittently signal, after which, if:

a) ***Green LED*** remains ***ON***, then the detector function correctly (electronic part is complete and the power battery is in good condition) and it is switched to ***Active Mode***. This ***green LED*** will remain ***ON*** for about **1,5 minutes**, period during which the

electronic circuit is permanently verified and the detector can be used, after which there are emitted **3 acoustic short beeps**, followed by the **green LED switch OFF**, moment when the voltage detector is switched to ***Stand-By Mode***;

b) ***Green LED*** remains ***OFF***, and the two orange LEDs (from the end of the orange LED group) remain ***ON***, then the battery must be replaced with a new one. Even if after replacing the battery, the ***Green LED*** remains ***OFF*** (after the self-test of the voltage detector), then the detector must be ***taken out of use*** and sent to the manufacturer;

c) ***Green LED*** remains ***OFF***, and the **three orange LEDs** remain ***ON***, then the voltage detector must be ***taken out of use*** and sent to the manufacturer.

WARNING!

When you activate the self-test function of the voltage detector, it is recommended do not look directly at the LEDs, because they emit signals with a very high brightness!

4.6. After performing the self-test of the voltage detector, within a maximum of one minute, the electrical installation shall be checked.

WARNING!

It is forbidden to check the presence/absence of voltage from the electrical installation that have the paint-covered surfaces. Checking the presence/absence of voltage will be made only at the transformer terminals or in the points where is going to be installed the mobile earthing and short-circuiting equipment.

4.7. For checking the presence/absence of voltage, the contact electrode of detector slowly approaches the ***checked element*** from electrical installation. If there is an acoustic and optical intermittent flashing at the proximity of the contact electrode to the ***checked element*** from electrical installation, then the electrical installation is ***live voltage***, and to confirm the presence of voltage ***it is mandatory*** touching it with the contact electrode of the detector. After which it withdraws from the electrical installation, performed again the self-test of the voltage detector by pressing the ***self-test button***.

WARNING!

If the voltage detector is used in rain or snow, then it should not be kept in contact for more than one minute with the live parts of electrical installation!

4.8. If the acoustic and optical intermittent flashing ***does not occur*** when the voltage detector contact electrode approaches the ***checked element***, then to confirm the ***absence of voltage***, ***it is mandatory*** to be touch it for ***at least 3 seconds*** with the contact electrode.

If not, in this situation, the voltage detector ***does not signal*** the presence of voltage, before deciding that the checked electrical installation is ***not live***, the self-test must be done again by **pressing** the ***self-test button***. If after this check, the detector response is correct (**see 4.5.**), it can be decided that the ***checked element*** from electrical installation is ***not live*** and mounting of the portable equipment for earthing or earthing and short-circuiting ***are allowed***.

5. REPLACING THE BATTERY

The replacement of the discharged battery must be made in clean and dry environment, in order to avoid contamination of the voltage detector inside. For this, the next succession of operations must be:

5.1. Unscrew the contact electrode, or the threaded bush (for **DETECT 36-110 kV** type) from the top of the voltage detector.

5.2. Unscrew the nut from the lower part of the voltage detector in order to remove the coupling piece (AF C-U adaptor – equipped with universal coupling system).

5.3. Remove the electronic part from the inside of the voltage detector casing, by slowly pushing the (without shocks) threaded pin at the top of the voltage detector.

5.4. Remove the discharged battery from its place and replaced with a new 9V alkaline battery, 6LR61 type.

WARNING!

Care must be taken when mounting the new battery to be sure the polarity is correct, matching the signs (+) and (-) with signals from the black plastic holder!

5.5. Must be verified the existence, to correct the positioning and integrity of the O-ring from the signalling and control panel and the one from the threaded pin at the top of the electronic assembly.

5.6. Must grease the two O-rings, only with silicone grease.

5.7. Position the electronic circuit, so that the **white alveola** from the electronic mounting case to be in front of the white sign on the voltage detector label.

5.8. Insert the electronic part into the casing, so that the electronic assembly to slide through the two existing side rails inside the voltage detector housing.

5.9. Push it (without shocks) electronic part of the voltage detector, until the threaded pin on the upper part of it comes out of the voltage detector casing.

5.10. Screw the contact electrode, respectively the threaded nut (for **DETECT 36-110 kV** type).

5.11. The voltage detector self-test is done by “short” pressing the ***self-test button***.

6. PERIODICAL TESTS

User is obliged to check the voltage detectors according the tests presented in ***Annex 3***.

Annual periodical tests are performed only in ROMIND T&G laboratory or in laboratories who could make these periodical tests.

The tests must be made under the following environmental conditions:

- environmental temperature: +15.....+35^{o}C
- relative humidity 25%.....75%
- atmospheric pressure 86.....106 kPa

The voltage 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.

7. PACKING, TRANSPORT AND STORAGE

7.1. The voltage detectors **DETECT** type are delivered in special protecting bags.

7.2. When delivered, each detector is accompanied by:

- User Guide;
- Declaration of conformity;
- Warranty Certificate;
- Test report.

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

7.4. Storage conditions:

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

WARNING! During storage of voltage detector 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.

8. MAINTENANCE AND REPAIRING

Voltage detectors do not need special maintenance measures. They must be cleaned and wiped (in case of use in rain conditions) with a silicone cloth or with a cloth soaked with NC 123 - manufactured by Chemsearch Company.

In case the contact electrode is deteriorated, it must be replaced with a similar one. It is not allowed any improvisation.
Repairing of detectors rejected to the periodical tests and of those faulty in exploitation must be performed only by the manufacturer's qualified personnel.

9. INFORMATION REGARDING THE ENVIRONMENT SAFETY

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 become the object of a separate collection, indicated by the symbol: 

According to OUG 5/02.04.2015 - art.34, the user has the obligation of to collect selectively the waste of electrical and electronic equipment and not to remove them together with unsorted municipal waste.

The components and materials of this product do not contain hazardous substances.

10. WARRANTY

10.1. When buying voltage detector **DETECT** type, the detector's warranty is guaranteed by the manufacturer for a period of 24 months from the delivery date.
In the warranty period, ROMIND T&G 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.

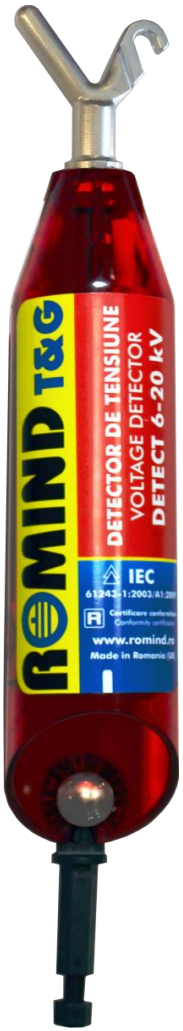
Warning: The deterioration of the seal determines the loss of the warranty!

10.2. Damage due to non-compliance with the instructions for use, storage or transport in this Users Guide are not covered by the warranty program.

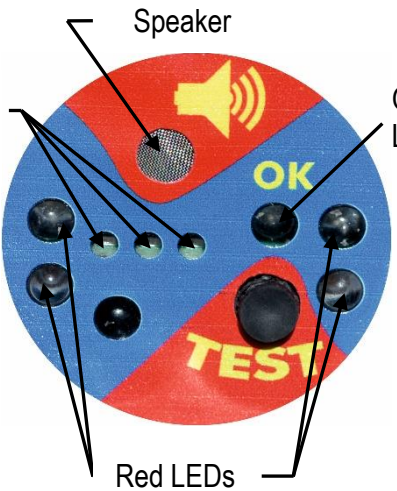
10.3. Romind T&G Company offers paid services including testing, post-warranty repairs, works that can be done at the company's headquarters.

ANNEX 1

VOLTAGE DETECTORS
DETECT 3-10 kV, DETECT 6-20 kV and DETECT 10-36 kV



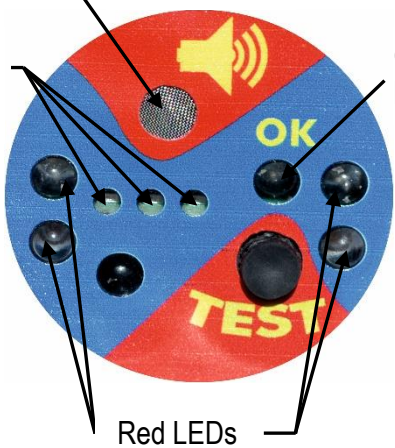
Signalling and control panel



ANNEX 2

Voltage detector
DETECT 36-110 kV

Signalling and control panel



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, 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 to cap. 6.4.1. din EN 61243-1:2005		-	X
3	Checking the battery and the function of the self-test device	Press the test button on the detector and check instructions given under chapter 4.5 of this User guide		X	X
4	Checking the protection against bridging	According to. 6.3.1. din EN 61243-1:2005		-	X
5	Checking spark resistance	According to. 6.3.3. din EN 61243-1:2005		-	X

6	Checking threshold voltage	According to. 6.2.1.2.1. din EN 61243-1/A1:2010 (only on dry conditions)		-	X
7	Checking influence of in phase interference field	According to. 6.2.1.3. din EN 61243-1/A1:2010 (only on dry conditions)		-	X
8	Checking perceptibility of visual indication	According to. 6.2.2.1. din EN 61243-1/A1:2010 (using alternative verification method)		-	X
9	Checking perceptibility of audible indication	According to. 6.2.3.1. din EN 61243-1/A1:2010 (using alternative verification method)		-	X
10	Checking of marking	Check compliance detector with installation and environmental conditions to be used	Visual	X	X

NOTE:

1. *Any mismatch leads to be taken out of use of the detector to remedy.*
2. *Annual periodical tests will be made only in ROMIND T&G laboratory or in laboratories who could make these periodical tests.*
3. *Annual periodical tests will be carried out in chronological order set out in the table above.*