RAGNAR STÅLSKOG AB

INSTRUCTION MANUAL

HVDC-H
HVDC-L

VOLTAGE DETECTOR HVDC-H, HVDC-L

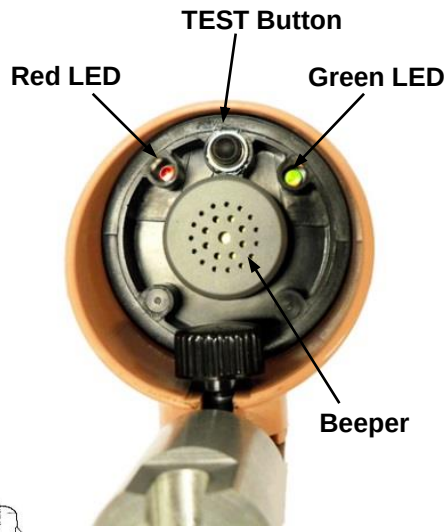
Attention: Read this instruction manual carefully before using the detector.

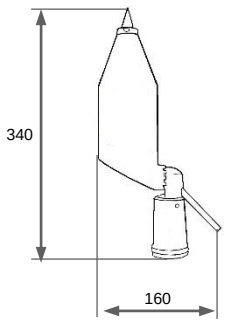
1. FUNCTION / USE

This device is designed to check absence or presence of nominal voltage by direct contact to the line.

2. SPECIFICATIONS

- Type: Direct contact DC voltage detector, 20 - 800 kV (refer to the label indication).
- Group*: III (indication of voltage present and permanent stand-by).
- Field of use: Outdoor all weather use (and indoor).
- Climatic category*: N (-25˚C to +55˚C, Humidity 20 to 96 %).
- Category*: L (without probe extension).
- Permanent stand-by mode.
- Built in ”All-check” test feature provides checking of all electronic and battery level. Green light indicate that the unit is ready.
- Polycarbonate shell. Active and passive electrode of aluminium.
- Sound indication by beeper.
- Light indication by 1 red and 1 green LED.
- Dimensions: Ø 90 mm (housing).
- Universal (sunrise) adapter or RS adapter.
- Power supply: 4 pcs 1,5 V alkaline battery type LR6.
- Weight: 0,9 kg.





*) Refers to EN-61243-1 (Live working - Voltage detectors - Part 1: Capacitive types to be used for voltages exceeding 1 kV a.c.)

3. OPERATION

The HVDC-detector is to be checked, treated and served as a sophisticated measuring instrument and NOT as a tool must be kept clean and dry and avoid shocks and drops.

- Before use, clean the detector including the electrodes with a soft cloth and check that scratches and holes are not occurring on the surfaces.
- Clean all the part of the device if there is frost or condensation.

3-1 Insulating stick

Each unit must be equipped with an insulating stick with the insulating length in accordance with applicable regulations.
Can be fitted directly to insulating stick equipped with universal (sunrise) end fitting or RS end fitting (depends of the design of the passive electrode).

3-2 Preparation for field measurements

Operator requirements

The HVDC-detector operator is to have the knowledge and basic information of:

A. The geographical area of the construction lines, and it's specific topography and surroundings.
B. The date and time of any currency changes or breaks regarding the appropriate lines.
C. Currency and voltage levels of subjects to be tested and the currency and voltage levels in the surrounding area.
D. Any special arrangements regarding to the lines to be measured.

Equipment requirements to be aware of before testing with HVDC-detector.

A. The HVDC-detector has been inspected, clean and dry, with extension rods according to EN 61235/EN 60855.
B. The HVDC-detector has been checked and approved by operator according to behaviour described in paragraph 3-3 (Self Test).

Topographic requirement under and around lines subject to be measured.

A. The area under the lines to be measured MUST be a flat, open space.
B. The ground to stand on MUST be free from metal bars and rails.

Electrical construction requirements close to the lines subject to be measured.

A. The lines to be measured MUST be hanging free for several meters, there MUST NOT be any crossings, junctions or layers of other strange lines, bars or building objects around the spot chosen for the testing positions on the line.
B. The lines to be measured MUST hanging separately and suspended from pole to pole.
C. The detector MUST be located to the outside of parallel wire pairs when used.

3-3 All-check function (Self Test)

This checking has to be done <u>before and after</u> any detection operation

- By pushing the test button the red LED flashes and an intermittent signal sounds as long it is depressed. The green light indicates that the unit is ready.

- When the test button is released the LED stops flashing and the signal stops. The green light will be lit during approximately 1.5 minutes and serves the purpose to confirm sufficient battery capacity. If 1.5 minutes are not achieved with the green diode (or the red diode constantly continues to flash and the signal sounds), replace the batteries.

- If the replacement of the battery has no effect, please contact the company Ragnar Stålskog AB, rs@stalskog.se

3-3 Voltage detection operation

After performing the test for correct functioning the device is ready for operation.

A. The passive electrode of the detector must be laid over the wire or bar to be tested, while it is connected to the appropriate extension rod. (see picture).

   The active electrode must have sufficient air clearance.

   If the line is alive, the red LED flashes and an intermittent signal sounds. If the conductor is dead, only the green LED remains lit.

B. After each test described above the detector must be carefully lowered to ground and the self test be repeated.

C. The Voltage detection operation above has to be repeated three (3) times for each line, and the test position on the line must be changed about one (1) meter from both sides of the first test position of the line.

   After a period of approximately 1.5 minutes, the device is switched automatically to stand-by mode. For further tests, the test button has to be pushed again and the test for correct functioning has also to be repeated. The detector is ready for operation.

3-4 Product limitation of usability

- **The detector may NOT operate properly if surface is wet and/or dirty.**
  The HVDC-detector surface MUST be kept dry and free from dirt and pollution's

- **The detector may NOT operate properly if methods and environments not fulfil the requirements from paragraph 3-2.**

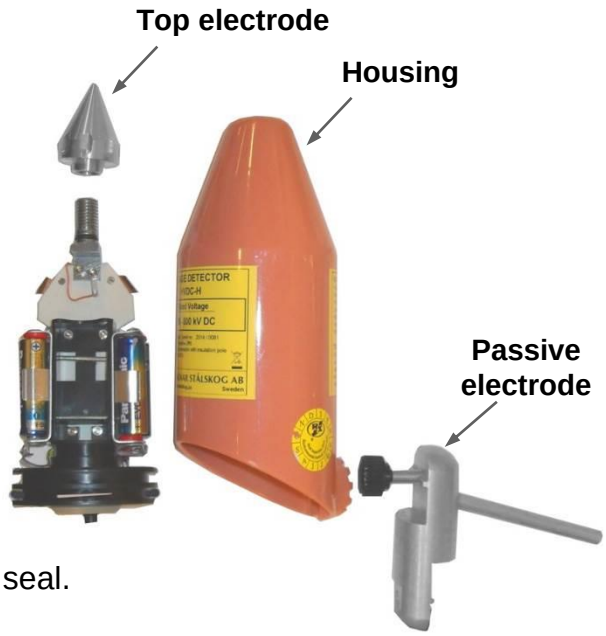
- **The detector may NOT operate properly due to mechanical shocks and/or electrode scratches and/or housing defects.**
  The detector and peripherals MUST be controlled both electrically and mechanically every 6 years by Ragnar Stålskog AB.

- **The detector may NOT operate properly due to low battery charges.**
  The detector batteries MUST be replaced with new batteries according to paragraph 4.1

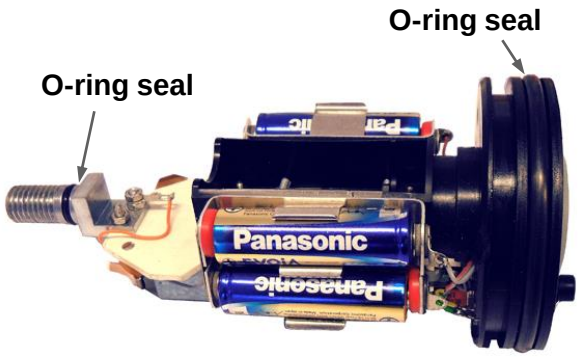
- **The detector may NOT operate properly under a voltage range different from the voltage range described for each detector.**
  The HVDC-detector MUST not be used under other voltage ranges other than those described for each HVDC-detector in it's technical data sheet.

4-1 Battery replacement

This operation must be carried out in a clean area.



- Remove the passive electrode/rod connector.
- Unscrew the active top electrode.
- Push the electronic unit backwards out of the housing.
- Replace batteries 4 x LR6 á 1,5 V Alkaline (twice a year is recommended).
  Important! Checking the polarity indicated by the sign ”+” engraved on the battery holder.
- Take care of the quality and position of the O-ring seal. Lubricate the seal with silicone grease.
- Screw the top electrode holding firmly inside piece in position.
  Important! Never change the top electrode between different HVDC-tester (each top electrode is individual adapted to each tester).



- Do not over tighten the top electrode.
- Attach the passive electrode.
- Check the device with the ”all check” function.

4-2 Cleaning

Cleaning of the polycarbonate shell with silicone impregnated cloth, excluding any solvent.

4-3 Special care

- **HVDC-H and HVDC-L are safety devices,** they must be keep clean stored in a clean and dry area. Avoid shocks and drops.
- When opening the unit (only for battery replacement) take special care of the cleanness of the inside: no dust, dirt or moisture, and check the quality of the seals.

Any attempt to disassemble the unit or to have access to the circuit board is prohibited and shall release manufacturer from his guarantee duty.

5. MAINTENANCE

5-1 Storage

Before each storage the HVDC-detector MUST be visually inspected for any damages and cleaned dry.

Storage location: inside a building or truck, and NOT exposed for sunshine or high frequency radiation.

Storage air conditions: a temperature between + 5°C to + 40°C and NOT exposed to water, moistness, pollution or dust.

Do NOT store HVDC-detector for a longer time with batteries kept inside the HVDC-indicator. The batteries of the HVDC-indicator must be replaced EVERY six (6) months regardless of use or storage.
The battery holder MUST be visually inspected for leakage from the batteries and/or incoming moistness

5-1 Routine maintenance

At least every 6 years detector must be checked by the manufacturer*, a check which includes control of the Threshold voltage*.

**) Threshold voltage is a voltage level, set by the manufacturer of the device, where the Voltage Detector shall start to indicate “voltage present”. The threshold value is fixed at a voltage level of approx. 0,10 x U_{nmax} with regard to the rated voltage range of the detector.

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