

HIGH VOLTAGE INSTRUMENTS LTD

T&R Test (Holdings) Ltd. Company

OPERATING AND MAINTENANCE MANUAL

Product: ***High Voltage Detector***

Type: ***Switchgear Kit***



MANUFACTURED BY:

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1 SAFETY RULES



- 1.1 Only personnel who are fully trained in the use of High Voltage Detectors should use this equipment. The systems that it will be used on are powered from high voltages which can be lethal.
- 1.2 Before use ensure that the HVD and the accessories that are required for use are clean, free from cracks or deep scores, and are properly secured together.
- 1.3 Make certain that the HVD is properly rated for the voltage of the system under test.
- 1.4 Test the operation of the assembled HVD complete with accessories before and after each test (refer to Section 3).
- 1.5 Do not allow a live high voltage conductor to come in contact with the HVD at a point below the limit mark.
- 1.6 The HVD must never be used without a handle or without insulating rods incorporating a handle.

- 1.7 Safe working distances must always be observed.

- 1.8 The comparators viewing face must always be considered to be at the same voltage as the conductor under test. The safe working distance must always be from that viewing face.

- 1.9 Never attempt to touch the viewing face or press the test button should the LED's go out when the contact electrode is touching, or is in the vicinity of, A LIVE CONDUCTOR.

REMEMBER

SAFETY IS NO ACCIDENT!

THIS TESTER SHOULD ONLY BE USED BY A COMPETENT,
SUITABLY TRAINED PERSON.

2 HVD SWITCHGEAR KIT

The HVD Switchgear Kit consists of Special Capacitive Bent End Adapter Probes and Custom Handles contained in a Carry Bag.

The Kit is designed for use the HVD Types Rated for use on System Voltages up to 33kV only when checking for **DEAD on Switchgear**.

Capacitive Bent End Adaptor	DFH5067
HVD Switchgear Handle	DDC0245
Carry Bag	CMP5023



Figure 1 Capacitive Bent End Adapter Probes and Custom Handle

3 DESCRIPTIONS

3.1 GENERAL

The Capacitive Bent End Adaptor and Handle Kit is designed for use with HVD Types for use up to 33kV System Voltage Operation only.

To allow the suitable HVD Types to be used on Metal Clad Switchgear. They have been designed to meet the requirements of IEC standard 61481. They may be used indoors and outdoors in all weathers.

The Capacitive Bent End Adaptor is designed to limit the current available from the source to <1.5mA

The function of the suitable HVD Types (Rated for use on System Voltages up to 33kV only) is to determine whether a conductor is energised or de-energised

3.2 PRINCIPAL OF OPERATION

Cone shaped plastic mouldings house the HVD Detector. The inner wall of the cone has a metallic screen coating to which the earthy parts of the circuit are connected. This screen coating is capacitively coupled to the earth of the electric field and acts as a voltage divider with an internal sensing capacitor. In this manner, a high voltage appearing at the electrode is divided down and the voltage across the sensing capacitor is proportional to the voltage at the electrode with respect to earth.

This proportional signal voltage is fed to the electronic circuitry whose output drives a system of indicating lamps and audible signals.

The HVD unit must be used in conjunction with the approved Handle of the correct length required to provide the clearance distance relative to the system voltage.

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4 ASSEMBLING THE EQUIPMENT

For use on Switchgear and Busbars on System Voltages up to 33kV only.

Screw the Capacitive BEA onto the suitable HVD

Ensure the handle is screwed onto the Stud at the bottom of the HVD

Carry out the self-test prior to using the HVD to prove it is operational

(See Proving Section in Instruction Manual for further information on proving the complete assembly)



Figure 2 Assembling the Equipment



*Figure 3 BENT END ADAPTER
from HVD Switchgear Kit*

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5 SPECIFICATIONS

5.1 *BENT END ADAPTER*

BEA DFH5067	Length: 250mm Diameter: 15mm Material: ABS/Steel/Aluminium Rating: <1.5mA at 40kV
Handle DDC0245	Length: 750mm (Fixed 350mm insulating element length from hand guard) Material: PVC/ABS

6 RECALIBRATION AND PROOF TESTING

Every twelve months the HVD and accessories should be inspected. This should include checking the threshold voltage calibration points.

Voltage proof testing of all the accessories is also recommended, this testing should be carried out by the manufacturer.

7 PROVING

The High Voltage Detector Proving Unit—HVP03, is used to prove that the HVD and accessories are operating correctly. In order to do so, the HVD should be completely assembled with all its relevant accessories.

The Proving Unit should be removed from its carry case and assembled as follows. The test lead with crocodile clip should be plugged into one of the 4 mm sockets on the Proving Unit, and the Croc Clip connected to the BEA Connector End, the Capacitive Coupler should be wrapped tightly round the body of the HVD and the connecting lead with the 4mm plug should be connected into the other socket on the Proving Unit.

The HVD should be Armed by operating the Test Button. The Red LED will Flash, and the Buzzer will sound while the button is pressed. Release the Test Button and the Green LED on the HVD should flash, and the audible alarm should stop. The HVD is now ready for proving. This is accomplished by pressing the test button on the Proving Unit. The RED LED should flash on the HVD, and the Buzzer should sound. This indicates that the HVD is operating correctly.

NB: Where an HVD has a high threshold setting, the Proving Test may only give a few Bursts, this still indicates the HVD, and BEA are operating correctly



Figure 4 High Voltage Detector Proving Unit—HVP03

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8 CARE AND MAINTENANCE

8.1 STORAGE

The HVD and their accessories should be stored in the proprietary carrying case/bag when not in use. If the equipment is not going to be used for an appreciable length of time (one month or more) then it is a wise precaution to remove the battery. Remember to replace the battery when the equipment is used again.

8.2 TRANSPORTING

When the equipment is in transit it should be stored in its carrying case/bag. Whilst the equipment has been designed for field use it should not be subjected to excessive bumps and shocks.

8.3 CLEANLINESS

Dirt can cause surface tracking and it is therefore necessary to keep the comparators and their accessories clean by using a detergent solution. The comparators and other plastic accessories should then be polished with the liquid polymer polish provided.

8.4 MECHANICAL DAMAGE

If surface scratches or dents can be easily seen by the naked eye, then the equipment should be returned to the manufacturer for repair since these blemishes act as traps for dirt and moisture. Mechanical damage to stud or bush screw threads would also necessitate the return of the equipment to the manufacturer.

8.5 PERIODIC MAINTENANCE

The Capacitive Bent End Adaptors and the Handles should be checked on an annual basis to ensure their operational integrity.

9 LIMITED WARRANTY

High Voltage Instruments Ltd warrant instruments and test equipment manufactured by them to be free from defective material or factory workmanship and agree to repair or replace such products which, under normal use and service, disclose the defect to be the fault of our manufacturing, with no charge for parts and service. If we are unable to repair or replace the product, we will make a refund of the purchase price. Consult the Instruction Manual for instructions regarding the proper use and servicing of instruments and test equipment. Our obligation under this warranty is limited to repairing, replacing or making refund of any instrument or test equipment which proves to be defective within twelve months from the date of original purchase.

This warranty does not apply to any of our products which have been repaired or altered by unauthorised persons in any way so as, in our sole judgement, to injure their stability or reliability, or which have been subject to misuse, abuse, misapplication, negligence or accident or which have had the serial numbers altered, defaced or removed. Accessories, not of our manufacture used with this product, are not covered by this warranty. To register a claim under the provisions of this warranty, return the instrument or test equipment to

**High Voltage Instruments Ltd,
15-16 Woodbridge Meadows
Guildford, GU1 1BJ, U.K.**

Upon our receipt and inspection of the product we will advise you as to the disposition of your claim.

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ALL WARRANTIES IMPLIED BY LAW ARE HEREBY LIMITED TO A PERIOD OF TWELVE MONTHS, AND THE PROVISIONS OF THE WARRANTY ARE EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES EXPRESSED OR IMPLIED.

The purchaser agrees to assume all liability for any damages and bodily injury which may result from the use or misuse of the product by the purchaser, his employees, or others, and the remedies provided for in this warranty are expressly in lieu of any other liability High Voltage Instruments Ltd may have including incidental or consequential damages.

High Voltage Instruments Ltd reserve the right to discontinue models at any time, or change specification, price or design, without notice and without incurring any obligation.

9. REVISION

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