

OPERATING AND MAINTENANCE MANUAL

Product: ***High Voltage Indicator***

Type: ***HVI***



MANUFACTURED BY:

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1 SAFETY RULES



- 1.1 Only personnel who are fully trained in the use of High Voltage Indicators (HVI) 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 HVI and the accessories that are required for use are clean, free from cracks or deep scores, and that the earth lead insulation and connections are sound.
- 1.3 Make certain that the HVI is properly rated for the voltage of the system under test.
- 1.4 Check the operation of the of the HVI before and after each test using the Proving Unit. (Refer to Section 4.2)
- 1.5 Do not allow a live high voltage conductor to come in contact with the detector at a point below the limit mark.
- 1.6 Safe working distances must always be observed.

REMEMBER
SAFETY IS NO ACCIDENT!
THIS TESTER SHOULD ONLY BE USED BY A COMPETENT AND
SUITABLY TRAINED PERSON.

2 DESCRIPTIONS

2.1 GENERAL

The HVIL High Voltage Indicator (HVI) has been designed to be used on bus-bars and switchgear spouts using a bent end adaptor in indoor and dry outdoor situations.

The function of the HVI is to determine whether a system or conductor is energised or de-energised before commencing work.

2.2 PRINCIPAL OF OPERATION

An HVI is a device that draws current from the source under test. This current flows through two parallel resistor chains to earth via an earth lead. In each resistor chain a bridge/discharge circuit fires a pair of neon lamps. The effect is that as the system voltage increases the neon lamps flash at an increasing rate until they become continuously illuminated at 6.35kV (the phase to earth voltage of 11kV phase to phase). Using this feature some measure of the magnitude of the system voltage may be assessed.

2.3 LIMIT MARK

At the contact electrode end of the HVI there is a red band which indicates the limit mark. By definition the limit mark indicates the physical limit to which the HVI may be inserted between live components or may touch them.

However, when a bent end adaptor is attached it covers the limit mark, hence a further limit mark is carried on the bent end adaptor.



Figure 1: High Voltage Indicator

3 INSTRUCTIONS FOR USE

3.1 ASSEMBLING THE EQUIPMENT

3.1.1 FOR USE ON CONDUCTORS AND BUS-BARS

Attach the earth lead by screwing it into the sockets at the rear of the hand grip.

3.1.2 FOR USE ON SWITCHGEAR

Attach the earth lead as in 3.1.1. Select either the 90° bent end adaptor DFH5050 or the 60° bent end adaptor DFH5051 and push it firmly onto the HVI. Line up the bent end adaptor as required and tighten the locking ring to secure the alignment.

3.2 USING THE EQUIPMENT

3.2.1 Assemble the equipment as required. Refer to section 3.1

3.2.2 PROVING

The complete assembled equipment should now be checked using a HV PROVING UNIT or a known HV source.

The proving unit consists of an HV Generator, housed in a handheld tube, which is placed over the end of the HVI/bent end adaptor. At the closed end of the tube, there is an earth bollard to which the earth lead is clipped. When the proving unit is pressed home a micro-switch is activated which energises the HV Generator.

A lamp in the prover will illuminate as will the lamps in the HVI which will flash on and off at a slow rate. If the lamp in the proving unit does not illuminate do not proceed with the test but check and replace the batteries and then repeat the proving test.

The HVI should also be proved again after use to ensure that the indication given during the test is valid.

3.2.3 TESTING

Attach the earth lead clip to a good convenient earth and touch the conductor under test with the contact electrode, keeping the hands and body behind the hand guard.

A live conductor will be indicated by the lamps illuminating either by flashing or a steady state dependant on the magnitude of the voltage on the conductor. A window in the guard allows the lamps to be viewed in awkward situations.

4 SPECIFICATIONS

4.1 ELECTRICAL

4.1.1 HIGH VOLTAGE INDICATOR

Operating Voltage	0.2 to 15kV a.c. (50 to 400Hz) and d.c.
Measuring Current	400 μ A nominal at 15kV 293 μ A nominal at 11kV
Bridging Protection	The detector and its accessories will not cause flashover or breakdown between live parts of the installation or between live parts of the installation and earth.

4.1.2 SAFETY

EMC	Meets: BS EN50081-1 BS EN50082-2
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4.1.3 PROVING UNIT

Operating Voltage	300V d.c. nominal
Battery Low	2V d.c. nominal
Battery	2 off 1.5V IEV R14A zinc carbon

4.2 MECHANICAL

4.2.1 HIGH VOLTAGE INDICATOR

Length	485mm
Diameter	32mm
Material	Black Rigid PVC
Handguard	100x100mm
Handguard Material	Clear Polycarbonate

4.2.2 PROVING UNIT

Length	248mm
Diameter	38mm
Material	Black Rigid PVC

4.2.3 BENT END ADAPTOR (90° AND 60° ANGLE)

Length	360mm
Penetration	250mm
Diameter	21mm minimum section 38mm maximum section
Material	Black Rigid PVC

4.2.4 OTHER

Vibration Resistance	To BS EN 61010
Drop Resistance	To BS EN 61010
Shock Resistance	To BS EN 61010

4.3 **ENVIRONMENTAL**

Operating Temperature	-5 to + 50°C
Cold	To IEC 68-2-1 Part 2Ab
Dry Heat	To IEC 68-2-2 Part 2Bd
Damp Heat	To IEC 68-2-3 Part 2Ca

5 CARE AND MAINTENANCE

5.1 STORAGE

The HVI and its accessories should be stored in the proprietary carrying bag when not in use.

5.2 TRANSPORTING

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

5.3 CLEANLINESS

Dirt can cause surface tracking; therefore, it is necessary to keep the equipment clean by wiping with a cloth soaked in weak detergent solution. The equipment should then be dried and polished with the polymer polish provided.

5.4 MECHANICAL DAMAGE

If surface scratches or dents can be easily seen with the naked eye, then the equipment should be returned to the manufacturer for repair. Blemishes act as traps for dirt and moisture.

5.5 PERIODIC MAINTENANCE

5.5.1 BATTERY REPLACEMENT

The proving unit batteries should be replaced if the lamp does not illuminate during proving. Unscrew the end cap and slide out the spent batteries. Replace with 2 off 1.5V IEC R14S zinc carbon batteries and replace the end cap.

5.5.2 RECALIBRATION AND PROOF TESTING

Every twelve months the equipment should be rechecked.

This should include inception voltage, radial voltage proof testing and mechanical inspection. It is recommended that this be carried out by the manufacturer or a certified test home.

6 SPARES

Description	Part Number
Earth Lead	DFH5044
Cleaning Kit	DDM5003
Battery (Type IEC R14S)	2x 1.5V CEJ0000
Carry Bag	CMP0120
Bent End Adaptor (90° Angle)	DFH5050
Bent End Adaptor (60° Angle)	DFH5051
Instruction Manual	CMR0062

7 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,
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Upon our receipt and inspection of the product we will advise you as to the disposition of your claim.

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.

8 REVISIONS

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