

OPERATOR MANUAL

Instrument
Model No.
Serial No.
Customer

Heavy-Duty Flash Tester
A203ES

It is strongly recommended that all sections of this Manual are read and fully understood by ALL those intending to operate, or supervise the operation of any activity involving, this test instrument.

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NOTE

The information contained within this manual is given in good faith and is provided for guidance only. Although all reasonable care has been taken to ensure accuracy of the information, Clare Instruments Ltd, their agents and distributors, accept no responsibility for any omissions or errors within this document, nor for any misinterpretations by the user. For clarification on any part of this document please contact Clare Instruments or your local agent before operating the instrument.

GENERAL GUIDANCE NOTES

GENERAL INFORMATION

Limited Warranty & Limitation of Liability

CLARE Instruments Limited guarantees this product for a period of 1 year. The period of warranty will come into effect on the day of delivery.

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E&OE

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Due to a policy of continuous development CLARE Instruments Limited reserve the right to alter or amend equipment specifications and descriptions outlined in this publication without prior notice. No part of this publication shall be deemed to form, or be part of, any contract for the equipment unless specifically referred to as an inclusion within such contract.

Design Principles

The design of CLARE Test & Measurement instruments meets the European Commission Directive No. 73/23/EEC, relating to the "Low Voltage Directive". This is in accordance with BS EN 61010-1: 1993 – Safety requirements for electrical equipment for measurement control, and laboratory use. This unit is also compliant with EN 50191 Draft.

The design of the equipment is safe when used under the following conditions:

- ◆ Indoor use.
- ◆ Altitude up to 2000 m.
- ◆ Temperature 5°C to 40°C.
- ◆ Maximum relative humidity 80% for temperatures up to 31°C to 50% at 40°C.
- ◆ Mains supply voltage fluctuations of $\pm 10\%$ of the nominal voltage.

The user **MUST** follow the remainder of this section on safety, installation, guidance and maintenance to guarantee safe operation and to maintain the equipment in a safe condition.

WARNING!

Any interruption of the protective earth conductor (mains input earth) inside or outside the equipment is likely to make the equipment dangerous. The user must not intentionally interrupt the protective earth conductor.

GENERAL GUIDANCE NOTES

Electromagnetic Compatibility

Electrical safety tests, required to comply with legislative documents on product testing, may, by their very nature, encroach on Electromagnetic Compatibility (EMC) requirements, in particular Flash Testing.

Clare test instruments are designed to minimise the effects of EMC disturbance but some interference may result from particular applications and may well be dependent on the type of product being tested.

The user is therefore responsible for ensuring that the equipment is operated in accordance with the manufacturer's recommendations and that any disturbances are investigated and resolved, with, where necessary, technical assistance from the manufacturer of the test instrument and/or item under test.

Before installing test equipment, the user should assess the potential for any EMC disturbance to cause interference within the surrounding area. Particular care should be taken with the proximity of some of the following –

- Supply cables, other than those supplying the instrument, and control, signal and telephony cables – these may not always be apparent and they could be above, below or adjacent to the test equipment.
- Radio and television transmitters, and receivers, within a distance of 30 metres.
- Computers and other IT equipment within 10 metres.
- Safety critical equipment i.e. machinery guard circuits and the like.
- People using medical implants or appliances such as hearing aids, heart pacemakers etc. within 3 metres.
- Delicate electronic equipment used for calibration or measurement.

The size of the surrounding area to be considered will depend on the overall structure of the building and any other activities likely to take place. It is also important to remember that the effects of EMC disturbance are not confined to the boundaries of the premises.

In extreme cases it may be necessary to site the test instrument, and item under test, within the confines of a screened and filtered enclosure, such as a Faraday Cage. The user should attempt to reduce any disturbance to the point where it is no longer effecting other equipment or systems.

GENERAL GUIDANCE NOTES

The Test Area

As well as assessing potential EMC problems, it is important to consider the 'safety' of the test area, both for the operator and anyone else within the vicinity.

Electrical safety testing, by its very nature, can be hazardous and various common sense precautions must be observed –

- ◆ Test equipment must be positioned in a clearly defined area with access limited to the operator only.
- ◆ Test benches should be insulated and preferably of wooden construction – steel benches, even if covered with rubber or other insulating materials, are not recommended.
- ◆ Free standing benches, if not sited against a wall or in a corner must be fitted with high back and side fences to limit access to the operator only.
- ◆ It is recommended that mains supply outlets in workshops and in particular those used to supply equipment in any 'test areas' are protected by an Earth Leakage Circuit Breaker.
- ◆ Arrange the test bench so that test equipment controls can be readily operated without the need to stretch or reach across the item under test. This is particularly important when testing motorised items.
- ◆ The item under test must be placed on an insulated surface, and must not come into contact with the instrument case or any other 'earthed' metalwork (conduit, trunking and the like).
- ◆ The operator must also be on an insulated surface such as rubber matting or nail-free duckboard.

WARNING - THE ITEM UNDER TEST MUST NOT BE TOUCHED WHILST TESTS ARE APPLIED

Provision should be made for securing the item under test to prevent movement when applying test probes and to avoid accidental handling during testing.

Operator Competence

Electrical safety test equipment must not be operated by persons under 18 years of age.

Anyone who operates electrical safety test equipment must have undergone thorough training in the correct use and application of the particular equipment that they are required to operate.

The degree of additional supervision should be appropriate for the competence and experience of the operator.

It is the duty of the operator to ensure that the test equipment is operating correctly and is appropriate for the intended purpose – see also 'Periodic Inspection' under Calibration & Servicing.

GENERAL GUIDANCE NOTES

Maintenance, Calibration & Servicing

Clare Instruments Ltd. supplies a guarantee against defective material and faulty manufacture for a twelve-month period from the date of delivery.

Prior to despatch the equipment undergoes careful inspection and comprehensive testing. Report any defect discovered with the equipment in respect of materials or workmanship within the guarantee period. We undertake to put right the defect at our expense subject to our standard conditions of sale.

Our responsibility is in all cases limited to the cost of making good the defect in the equipment. This does not apply to defects caused by abnormal conditions of working, accident, misuse, neglect or wear and tear.

Periodic Calibration Checks

All electrical safety test equipment must be re-calibrated at least once a year by a suitably qualified Calibration / Service engineer. Heavily used equipment may require more frequent inspection.

In the high throughput area of Production Line testing, it is recommended that regular, even daily, checks are carried out to ensure the continued integrity of the internal test / measurement circuits and correct operation of the instrument.

Clare manufacture a range of standard and custom Appliance Fault Simulators and Calibration Check Units to provide a ready means to establishing a regular check routine.

Periodic Visual Inspection

In use, test equipment is subject to normal wear and tear and it is the user's responsibility to monitor those parts that are subject to constant use – particular attention should be paid to: -

- Test leads and probes – check for fraying around cable entries and for any undue wear, such as knicks and abrasions, along the entire lead length. Check probe operation.
- Test sockets and Safebloc connectors – check for excessive wear and/or loose terminals, both of which could give rise to false measurements.
- Controls, switches and push buttons – check rotary controls for smooth operation, ensure switches operate as intended.

In the interests of continued safety, repairs and servicing should only be carried out by suitably qualified personnel and only Clare Approved parts should be used.

Clare Instruments are able to offer a full Maintenance & Calibration Service either in our fully equipped Service Centre or, by appointment, 'on site' at your location – please contact us on 01903 502551 for further details.

Returns

We recommend that the complete instrument be returned to us for repair or re-calibration:

The Service Department.
Clare Instruments Ltd. Woods Way, Goring-by-Sea, WORTHING, West Sussex
BN12 4QY

Please take adequate care with packing and arrange insurance cover against transit damage or loss when returning the instrument – if possible use the original packing box and supports.

OPERATING PROCEDURES

Product Description

Model A203ES Heavy-Duty Flash tester, variable 0-5kV with Total Leakage monitored and displayed on a meter scaled 0-2.5mA.

Setting Up

Site the instrument in accordance with the General Guidelines, earlier in this manual, so as to promote ease of use and operator safety.

Ensure the H.T. VOLTS control is set to zero (fully anti-clockwise) and the H.T. Probes are housed in the rear panel mounted scabbards.

Connect the instrument supply lead to a **220/230 Volt 50Hz EARTHED supply**.

Switch the SUPPLY switch on and note the amber ON lamp illuminates.

Depress the FLASH FAULT RESET button to reset the Flash trip and cancel the warning signals.

Set the key operated H.T. TRIP mA switch to the required position.

In the 5mA position the key is removable.

In the 5mA position the Total Leakage milliammeter is a direct reading 0-2.5mA

In the 25mA position the Total Leakage milliammeter is multiplied by 10 (0-25mA)

In the 125mA position the Total Leakage milliammeter is multiplied by 100 (0-250mA)

Increase the H.T. VOLTS control (clockwise) until the required test output voltage is indicated on the 0-5kV meter.

NOTE – when the H.T. TRIP mA key switch is set to the 125mA position the Flash test output is potentially lethal.

ONLY SKILLED TECHNICIANS SHOULD USE THE TEST EQUIPMENT.

Suitable interlocks and safety guards surrounding the test piece should be installed.

OPERATING PROCEDURES

Test Application

Class 1, 3 Wire, Earthed (i.e. Household Appliance)

The Flash test is generally set between 1250 and 1500 volts.

Remove the HT probes from the scabbards.

The Yellow (low potential / earthy) probe is applied to the earth wire and the Red (high potential) probe is applied to the Live and Neutral conductors of the item under test.

Note the preset voltage is indicated on the 0-5kV meter.

Observe the Total Leakage meter is indicating below the Q.C. standard.

A Flash over or insulation breakdown will operate the Flash Fault lamp, operate the audible warning device and isolate the high voltage.

Remove the Flash test probes from the item under test and return them to the scabbards.

Depress the Flash Fault Reset pushbutton in order to cancel the warning devices, reset the Flash trip and restore the Flash test voltage.

Flash Trip By-Pass (Burn Out)

When the H.T. TRIP switch is in the 125mA position the Flash Trip By-Pass (Burn Out) button may be pressed to by-pass the Flash trip in order to observe arcing in the item under test.

The By-Pass button should not be held on any longer than is necessary to locate the breakdown point.

IMPORTANT – WHEN THE BY-PASS BUTTON IS DEPRESSED THE TEST OUTPUT IS POTENTIALLY LETHAL AND MUST BE USED BY SKILLED PERSONNEL ONLY.

OPERATING PROCEDURES

Test Application

Class 2, 2 Wire, Double Insulated (i.e. Power Tools)

The Flash test is generally set to 3750 volts.

Remove the HT probes from the scabbards.

The Red (high potential) probe is applied to the Live and Neutral conductors and the Yellow (low potential / earthy) probe is applied to any exposed metal parts (chucks, screw heads, around the handle, switch and cable entry)

Note the preset voltage is indicated on the 0-5kV meter.

Observe the Total Leakage meter is indicating below the Q.C. standard.

A Flash over or insulation breakdown will operate the Flash Fault lamp, operate the audible warning device and isolate the high voltage.

Remove the Flash test probes from the item under test and return them to the scabbards.

Depress the Flash Fault Reset pushbutton in order to cancel the warning devices, reset the Flash trip and restore the Flash test voltage.

NOTE – a small spark may be observed when the tip of the probe is applied to the exposed metal parts. This is quite normal and should not be confused with a Flash over or breakdown.

Flash Trip By-Pass (Burn Out)

When the H.T. TRIP switch is in the 125mA position the Flash Trip By-Pass (Burn Out) button may pressed to by-pass the Flash trip in order to observe arcing in the item under test.

The By-Pass button should not be held on any longer than is necessary to locate the breakdown point.

IMPORTANT – WHEN THE BY-PASS BUTTON IS DEPRESSED THE TEST OUTPUT IS POTENTIALLY LETHAL AND MUST BE USED BY SKILLED PERSONNEL ONLY.

END.



**SOLUTIONS FOR
ELECTRICAL SAFETY**

CLARE INSTRUMENTS LTD

WOODS WAY GORING-BY-SEA WORTHING

WEST SUSSEX ENGLAND BN12 4QY

TELEPHONE +44 (0)1903 502551 FACSIMILE +44 (0)1903 244258

E-MAIL info@clare.co.uk INTERNET <http://www.clare.co.uk>