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Seaward, Clare, Rigel Medical,
Cropico, Seaward Group USA
are all part of the Seaward Group



Tried. Tested. Trusted.

ELECTRICAL SAFETY TEST INSTRUMENTATION



CLARE

Testing millions of products every day.

CLARE
Tried. Tested. Trusted.

Over the last half-century or so, we've developed and supplied the highest quality electrical testing equipment for hundreds of thousands of companies.

Clare testing equipment is used all over the world. It's built to satisfy exacting industry standards, reduces product returns and facilitates vital data collection. In other words, it's designed to improve your bottom line.

Our consistently innovative approach, breakthrough products and flexible range mean we're market leader and proud to be regarded as the industry standard.

And it's not just about the products. Clare service staff have an international reputation for their expertise. They make it their business to know your processes inside out as they work alongside your team.

Read on and find how Clare can help your organization.



CUSTOMISATION

How our bespoke service works.

Although we can design and build your test equipment requirements from scratch, it's probably worth looking into a bespoke solution first.

Our range of testers is generally flexible enough to accommodate most clients' specifications.

MONEY-SAVING

Clearly there's an economic advantage in your taking the bespoke route. This entails four steps.

THE PROCESS

First, our design team meet you to establish what you need.

Then we analyse your situation and suggest variations or modifications of our existing instruments.

Thirdly, we present you with our proposals. We call this the consultancy stage. It enables us to discuss further improvements, provides clarity and results in increased efficiency.

The fourth stage of the process is when we move into design and build.

THE EQUIPMENT WE CAN ADAPT AND MODIFY

We call these 'smart' modules. They're the basic ingredients we select and, if need be, adapt to build your dedicated test system.

ELECTRICAL SAFETY TEST ENGINE

This is based on the Clare Elite multi function test unit (pages 18-21). This flexible instrument lies at the essence of a bespoke solution.

SWITCHSMART SWITCHING MATRIX

A switching module which allows you to test at multiple points. When it's combined with the Electrical Safety Testing Engine, you can carry out high voltage and/or high current tests which can be routed to multiple locations.

POWERSMART

This extends the load-switching capability of the Electrical Safety Test Engine. It can power equipment with a rating of up to 50Amp.

QUAD TESTING SERIES

Clare Quad Testers enable products with isolated internal circuits to be fully electrically tested when they're powered from an isolated supply.

ELECTRICAL SAFETY ENCLOSURES

We can supply a wide range of electrical safety enclosures which can accommodate almost any item of electrical equipment, providing full protection to the operator throughout the testing process.



TRACEABILITY

An integrated system designed for test traceability. So much more than a test instrument range.

Electrical safety depends on a rigorous regime of design and safety testing. However, for protection against legal or commercial challenges, it's also vitally important that the process is supported by evidence of every stage.

Clare was the first company in the world to create an integrated system of instruments capable of storing test results. The system interfaces with comprehensive software database products and a collection of printers for labels or tags.

THE RIGHT TESTS. AT THE RIGHT TIME.

It gives you the option of selecting automatic instruments like HAL. When you programme these instruments with suitable test sequences, they'll automatically perform tests, store results in the internal memory and print labels for attachment to the product.

BACKED BY THE EVIDENCE

They'll also communicate with PATGuard software to create a database for report generation or information for future reference.

OUR REVOLUTIONARY TEST N TAG PRINTER

The Test n Tag printer is designed for Service and Rental depots which require fast, simple-to-use equipment and the security of record-keeping.

Used with a wide range of our testers, the Test n Tag Printer is a fully integrated, automatic record-keeping system.

It can be configured so it instantly prints durable labels you can customize with your logo and addresses. These show test results, equipment ID, date of test and barcode ID. And it can print duplicate tags for attaching to contracts and other documents.

But that's not all.

It can also be configured for manual operation where you can select a PASS or FAIL label which incorporates the information mentioned above.

Whatever you need, our instruments have the right level of sophistication.



**TESTERS WITH THIS SYMBOL ARE
DESK TEST N TAG COMPATIBLE**



PRODUCT MATRIX

A handy reference for your perfect testing solutions.



Instrument Type and Model Reference	Flash/Hipot, Ground and Insulation Testers							Multi Functional Electrical Safety Testers												System Customisation
	HAL - 101	HAL -102 (Scan)	Hal Combi - 103	A203ES	A203H/TL	A203K	Sentinel	Elite E9024	Elite E9024V	Safetest Manufacturing	SafeMedic	Safetest Luminaire	G2000	SafeCheck 8	B255	A252	B433R	A320	Horizon II	Quad Tester
Page Number	12	12	12	14	14	14	15	18	18	22	24	26	28	30	32	34	36	37	38	44
Analogue	No	No	No	Yes	Yes	Yes	No	No	No	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No
Digital	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No	No	Yes	Yes
Measurement Functions																				
AC Flash/Hipot (V or kV)	0-5kV	0-5kV	0-5kV	0-5kV	0-10kV	0-15kV	0-5kV	0-5kV	0-5kV	1500, 3000	100V - 5kV	1500, 3000	1500, 4000	1250, 2500	500, 1250, 3000, 3750	500, 1250, 2500, 3000, 3750	No	0-5kV	0 - 1000 V	0-5kV
DC Flash/Hipot (V or kV)	0-6kV	0-6kV	0-6kV	No	No	No	0-6kV	0-6kV	0-6kV	No	100V - 6kV	No	No	No	No	No	No	No	0 - 1500 V	No
Ramping	Yes	Yes	Yes	Man	Man	Man	Yes	Yes	Yes	No	Yes	No	No	No	No	No	No	Yes	Yes	Yes
Trip Current	0-20mA (AC) 0-10mA (DC)	0-20mA (AC) 0-10mA (DC)	0-20mA (AC) 0-10mA (DC)	5, 25, 125mA	5mA	5mA	0-40mA (AC) 0-10mA (DC)	0-20mA (AC) 0-10mA (DC)	0-20mA (AC) 0-10mA (DC)	0-10mA	100mA	5mA	5mA	0-10mA	5, 10mA	5, 10mA	No	5mA, 10mA	0 - 10mA	0-20mA
Arc Detection	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes
Insulation Resistance	10V-1000V	10V-1000V	10V-1000V	No	No	No	No	200V-1050V	200V-1050V	250V, 500V	350V, 500V	500V	No	Yes	No	500V	No	Yes Simultaneous with flash	0 - 1000 V	No
Earth/Ground Bond	No	No	0-40A	No	No	No	No	0-26A	0-26A	100mA, 4A, 10A, 25A	0-40A	10A	10A	100mA, 4A, 10A, 25A	25A	100mA, 8A, 25A	25A	30A	100mA	0-40A
P-N Test	No	No	No	No	No	No	No	Yes	Yes	No	No	Yes	Yes	No	No	No	No	Yes	No	No
Polarity Test	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No
Load/Run Test	No	No	No	No	No	No	No	10-280V	10V-supply input	240/110V	0-4kVA	240/110V	240V	240/110V	240/110V	No	No	No	No	Yes
Test Sequences																				
Manual	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No	Yes	No	Yes
Automatic	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No	Yes	Self-learning	Yes
Features																				
PC Interface	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes	Yes
Printer Interface	Yes	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes	Yes
Store Test results	Yes	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes	Yes
Ext. Control Ports	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	No	No	No	No	No	No	Yes	No
Software	Opt	Opt	Opt	No	No	No	No	Yes	Yes	Opt	Yes	Opt	No	Opt	No	No	No	No	Yes	Opt
Isolated Output	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes
Guard Switch	Prog	Prog	Prog	No	No	No	No	Prog	Prog	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	Prog
Beacon Port	Yes	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Remote Control	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	No	No	Yes & Net-Listing	Yes
Mains Input	110/240 Manual (50Hz & 60Hz)	110/240 Manual (50Hz & 60Hz)	110/240 Manual (50Hz & 60Hz)	110 - 240 V	110 - 240 V	110 - 240 V	110/240 Auto (50Hz & 60Hz)	110/240V Auto (50Hz & 60Hz)	110/240V Auto (50Hz & 60Hz)	110/240V Auto (50Hz & 60Hz)	110/240V Auto (50Hz & 60Hz)	110/240 Auto (50Hz & 60Hz)	240V	110/240V Auto (50Hz & 60Hz)	240V (+110V for 110 Load test)	240V	240V	110 - 240 V	110 - 240 V	110/240 Manual (50Hz & 60Hz)
Test N Tag	Yes	Yes	Yes					Yes	Yes	Yes	Yes	Yes		Yes						

Industry Sector Key

- Multi Industry Use
- Medical
- Lighting
- Hire / Rental / Service
- Wiring & Cable

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FLASH / HIPOT, GROUND BOND AND INSULATION TESTERS

Dielectric Withstand testing is also known as Flash testing or Hipot testing. It is one of the most effective ways of proving the safety and compliance to standards of an electrical product or component's design and construction.

By applying a high voltage from a Hipot / Flash tester, the quality and suitability of insulation and electrical separation can be determined.

The exact nature of the tests will depend upon the product and the relevant national or international standard.

For over seventy-five years, Clare has supplied many of the world's leading manufacturers' instruments with features that satisfy every type of requirement.

Clare's extensive product range offers supply voltages from 50 volts up to 15kV. It can incorporate Insulation testing and Ground Bond testing at currents of up to 40 Amps.

Flash/Hipot testers are commonly used in manufacturing conformance tests.



HAL SERIES

Electrical Safety, AC/DC Hipot, Insulation and Ground Bond Tester with Results Memory

■ Multi Industry Use

The HAL family is designed to offer advanced automation techniques which can make dramatic improvements in productivity and efficiency of the production line test process.

The isolated floating test outputs make it one, if not the, safest flash/hipot tester on the market. The user interface can be operated manually or in automatic mode, with a barcode scanner to automate the production flow. The HAL family can be linked directly into most ISO quality systems which cover production, laboratory and audit usage.

The HAL family will collect up to 6000 test results internally. These can be downloaded to a PC if required (software is an optional accessory). It will even scan the equipment's barcode under test and produce result labels, making the whole test process accurate, efficient and fast. Test sequences can be automatically configured using a barcode scanner and the tester includes remote start and stop ports. In addition, the HAL family all have RS232 ports, both of which makes the HAL ideal for system intergration.



KEY FEATURES:	HAL	HAL Scan	HAL Combi
Earth Bond Test			■
AC / DC Flash / Hipot Test	■	■	■
Insulation Resistance	■	■	■
Scanner		■	
Arc Detection	■	■	■
Visual Alarm	■	■	■
Audible Alarm	■	■	■
Storage of test results	6000	6000	6000
Predefined and custom test sequences	■	■	■
PLC interface	■	■	■

SPECIFICATION

AC Flash / Hipot Test

Voltage Range	0.100-5.000kV (programmable)
Voltage Resolution	10V / step (settable)
Voltage Accuracy	1% of reading +/-2 digits
Maximum Output Current	20mA @5kV 50 / 60hz selectable
Display Current Range	0.0-20.00mA
Current Accuracy	1% of reading +/-2 digits
Display Current Resolution	0.01mA

DC Flash / Hipot Test

Voltage Range	0.100 – 6.000kV (programmable)
Voltage Resolution	10V / step (settable)
Voltage Accuracy	1% of reading +/-2 digits
Maximum Output Current	10mA @ 6kV
Display Current Range	0.01 – 10.00mA
Current Accuracy	1% of reading +/-2 digits
Display Current Resolution	0.01mA
Output Ripple	<5% @ 6kV

Earth / Ground Bond (HAL Combi Only)

Test Voltage	Nominal 6V AC
Output Current Range	0.1 – 40.0A settable in 0.1A steps
Compliance Ranges	0-200m Ω up to 25.0A, 0-500m Ω up to 10A
Measurement Range	0-1000m Ω +/- 1% +/-5 digits
Test Duration	0.5 – 10.0s
Trip Level Upper / Lower	1 - 1000 Ω

DC Insulation Resistance

DC Output Voltage	250, 500 or 1000V selectable or fully adjustable from 10-1000V
Resistance Ranges Measurement	0.1 – 99.99MΩ and 100.0MΩ – 999.9MΩ
Resistance Ranges (Accuracy)	0.50MΩ – 99.99MΩ 5% of reading +/- 5 digits, 100.0MΩ -699.0MΩ 5% of reading +/- 5 digits, 700.0 – 999.9MΩ 10% of reading +/- 5 digits

Arc Detection

Detect Current	10 levels
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External Connections

Printer	RS232
PC	RS232
Beacon	Yes
Guard Switch	Yes via 3 pin rear connection
Scanner Boards (HAL Scan Only)	5 (1 pair on front panel, 4 pairs on the rear)

ADDITIONAL INFORMATION

Mechanical

Dimensions	370W x 300H x 204D mm
Weight	Approx 12kg

Electrical

Supply Voltage	Selectable 115V / 230V 50 or 60Hz
Operating Temperature	0°C to +40°C
Storage Temperature	-10°C to +60°C
EN50191	Compliant when used with appropriate accessories

Supplied With

Class I Grounded Output Box (HAL Combi only)
Guard Plug
Earth Probe (HAL Combi only)
HT Probe
HT Clip Lead, 5 supplied (excluding HAL Combi)
Mains Lead
Instruction Manual

OPTIONAL EXTRAS

Hardware

312A912	Desk Test 'n' Tag Printer
194A922	Barcode Scanner
H-5014	Data Cable
G2/5001	H103 Class I Output Socket Box
H-5009	H101 Class I Output Socket Box
H-5022	H101 Class II Output Socket Box
H-5008	Foot Guard Switch
DCS317	Guard Switch
01521/1	Earth Clip
01520/1	Earth Probe
03919/2	HT Probe - Yellow
03918/2	HT Probe - Red
H-5017	Status Beacon
H-5003	HT - Clip
H-5030	Printer Lead (Desk Test 'n' Tag)

Software

352A910	PATGuard Elite 2 – Premier
352A920	PATGuard Pro 2 – Professional
352A930	PATGuard Lite 2 – Entry level

Service

Onsite or return to base
Service
Calibration

Order Numbers

H101	HAL
H102	HAL Scan
H103	HAL Combi

A203ES, A203H, A203K

Analogue Hipot / Flash / Dielectric Withstand Testers Covering Voltages from 0 to 15kV AC

■ Multi Industry Use

The A203 range of hipot testers is robust and simple to use. Each instrument is ideally suited to manufacturing or laboratory environments and offers high accuracy control, allowing continuous selection of voltage from 0 to 15kV AC from a 500VA transformer source. Output voltage is clearly displayed on moving analogue meters. Also available is a selection of features which includes current monitoring from a variable trip settings for over-current and audio-visual indication.

All A203 instruments are supplied with probes and are ideal for testing to a variety of international safety standards.

KEY FEATURES	A203ES	A203H	A203K
Simple clear logical user interface	■	■	■
Voltage fully adjustable with large clear analogue display	■	■	■
Voltage source for 500VA transformer	■	■	■
Rugged design suitable for industrial and laboratory use	■	■	■
Over current flash/dielectric breakdown indicated by attaching panel lamps and audible alarm	■	■	■
Volt indication reset by safety button	■	■	■

SPECIFICATION

	A203ES	A203H/TL	A203K
AC Flash/Hipot Test Trip Range	0-5kV AC 5.25 and 125mA	0-10kV AC 5mA fixed	0-15kV AC 5mA fixed
Weight	25 kg	25 kg	30kg
Supply Voltage	230v AC	230v AC	230v AC
Operating Temperature	0-40°C	0-40°C	0-40°C

Services

Service & Calibration

Order numbers

A203ES
A203H/TL
A203K



SENTINEL

Programmable Hipot / Flash / Dielectric Tester

CLARE
Tried. Tested. Trusted.

■ Multi Industry Use

The Sentinel provides simple, affordable AC or DC Hipot/flash/dielectric withstand testing. It is ideal for the manufacturing or conformance lab test environment. Manual or automatic test sequences can be created with multiple test steps. This is a highly versatile tester.

KEY FEATURES	Sentinel
AC / DC Flash / Hipot Test	■
ARC Detect	■
Programmable memory	■
RS232C interface	■
Integrated into automated processes	■
Predefined and custom test sequences	■
Used stand alone	■

SPECIFICATION

AC Flash/Hipot Test

Output Voltage Range	0.100 ~ 5.000kV
Max. Current	40mA, (above 500V)
Current Limit	0.10 ~ 40mA, 0.02mA (resolution)

DC Flash/Hipot Test

Output Voltage Range	0.100 ~ 6.000kV
Max. Current	10mA, (above 500V)
Current Limit	0.10~10mA, 0.01mA (resolution)

ARC Detect

Detect Current	40 levels (1-40mA)
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Memory

Test Sequences	10 having upto 16 steps
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Interface

RS232C	Yes
Remote I/O	Yes
16 Channel HV Scanner	Optional
GPIB	Optional

ADDITIONAL INFORMATION

Mechanical

Dimensions	330W x 149H x 446D mm
Weight	Approx 15kg

Electrical

Supply Voltage	Selectable 120V / 230V 50 or 60Hz
Operating Temperature	0-40°C
EN50191	Compliant when used with appropriate accessories

Supplied With

HT Probe
HT Clip
Mains lead
Instruction Manual

Order Number

SEN001



MULTI FUNCTIONAL ELECTRICAL SAFETY TESTERS

These Multi-function safety testers perform up to six different electrical safety tests. Their applications range from conformance laboratory standard instruments through to individual application-specific testers. With Clare's seventy-five years' experience, we can offer you instruments with the tests and features suited to any particular situation you require. For example, the SafeCheck 8 for Tool Rental and Service Companies.



ELITE

A Comprehensive Electrical Safety Analyser Offering Fully Selectable Tests for Complete Flexibility.



■ Multi Industry Use

The Elite test system features powerful tests in one instrument. These tests are: AC/DC flash/hipot, DC insulation resistance, Earth/Ground bond and leakage.

This system is designed for automatic dual voltage operation and is capable of testing product safety in accordance with most international safety standards and approvals agency recommendations. These include IEC, UL, CSA, VDE, EN, BEAB, BSI and BABT.

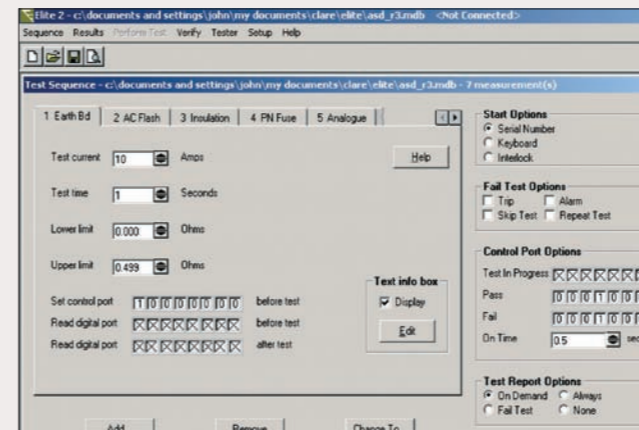
The Elite has a simple, user-friendly interface which uses a single button operation. It has an option which allows engineers and supervisors to create their own pre-programmed test sequence for each product. Powerful Windows software is bundled with this product to give the tester network connection.

The 9024 and the 9024V variants of the Elite incorporate a test capability with a function output test voltage that can be varied from 10 to 280V.

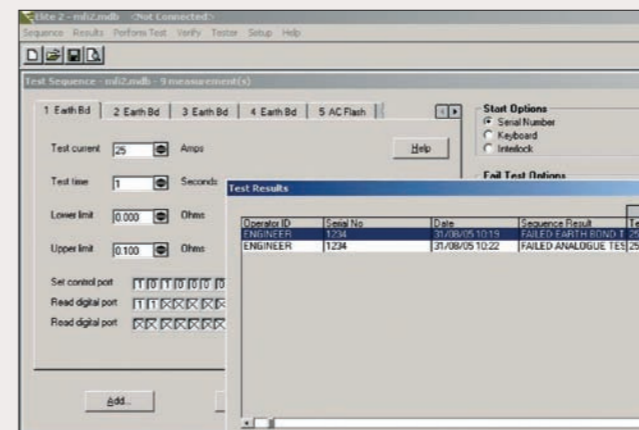
The 9024 variant can also raise the function test output higher than the supply (up to 280V). This makes it ideal for product lab audit and conformance type testing. The Elite not only carries out electrical safety tests but can also act as the core within an automated test system.



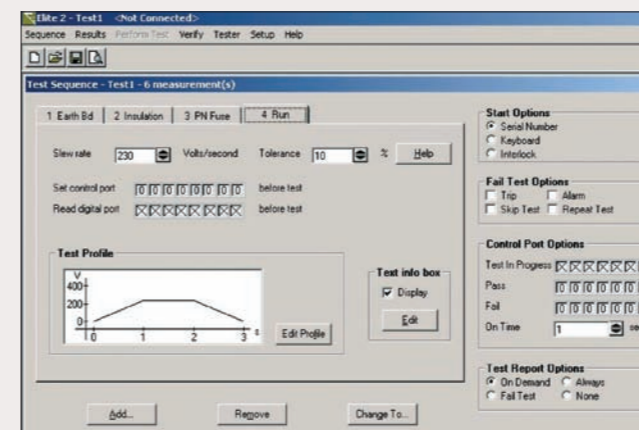
KEY FEATURES	Elite
Meets most international standards including; EN 50178, EN 60335, UL 1026, EN 60950, UL 1270 and EN 61010	■
All-in-one Electrical Safety Tester including Load test capability	■
Powerful PC software for complete automatic control	■
Statistical analysis (SPC) and result traceability	■
Simple straightforward user interface with single button operation	■
Powerful I/O allowing control of external devices	■
Able to act as PLC controller	■
Ability to be network connected	■
Test results can be loaded directly into MS Access/Excel	■
Can be remote controlled via RS232	■
Industrial 19-inch rack mounting option	■



▲ Earth Ground Bond Test



▲ Test Results Window: Failed



▲ Power / Run / Load Test

SPECIFICATIONS

AC Flash/Hipot Test

Test Voltage	100V to 5kV AC in steps of 25V
Test Voltage Accuracy	±2% ±20V
Test Current	20mA AC maximum
Measurement Range	0 to 19.99mA with a resolution of 0.01mA
Measurement Accuracy	±2% of reading ±2 digits ±20mA/kV
Ramp Time	0.5 to 25 seconds in steps of 0.1 second
Dwell Time	0 to 255 seconds in steps of 1 second
Failure Modes	Breakdown (dv/dt > 10V/ms)
Software trip	(user selectable 0 - 19.99mA)
Hardware trip	(22mA nominal)
Discharge Time	1 second maximum
Shut Down Time	<20ms maximum

DC Flash/Hipot Test

Test Voltage	200V to 6kV DC in steps of 25V
Test Voltage Accuracy	±2% ±20V
Test Current	10mA DC maximum
Capacitance Drive	1mF
Measurement Range	0 to 9.99mA with a resolution of 0.01mA
Measurement Accuracy	±2% of reading ±2 digits
Ramp Time	0.1 to 25 seconds in steps of 0.1 second
Dwell Time	0 to 255 seconds in steps of 1 second
Failure Modes	Breakdown (dv/dt > 10V/ms)
Software trip	(user Selectable 0 - 9.99mA)
Hardware trip	(11mA nominal)
Discharge Time	2 seconds maximum
Shut Down Time	<20ms maximum

DC Insulation Test

Test Voltage	200 to 1050V DC in steps of 5V
Test Voltage Accuracy	±2%
Break Point Current	1mA DC minimum
Short Circuit Current	1.5 mA DC nominal
Capacitance Drive	1mF at 10M Ω
Measurement Range	0 to 20M Ω in steps of 10k Ω 19M Ω to 199.99M Ω in steps of 0.1M Ω
Measurement Accuracy	±2% of reading ±2 digits
Test Time	0 to 255 seconds in steps of 1 second

Earth/Ground Bond Test

Test Voltage	12V AC nominal into an open circuit
Test Current	0 to 26A in steps of 1A
Test Current Accuracy	±3%
Measurement Range	0 to 1.999 Ω with a resolution of 0.001 Ω
Measurement Accuracy	±2% of reading ±2 digits ±5m Ω
Test Time	0 to 255 seconds in steps of 1 second
Measurement System	4 wire

Earth Leakage Test

Test Voltage	100V to 300V in 1V increments
Test Voltage Accuracy	±2%
Test Current	10mA maximum
Measurement Range	0 to 9.99mA with a resolution of 0.01mA
Measurement Accuracy	±2% of reading ±2 digits
Test Time	0 to 255 seconds in steps of 1 second

Screen (100 mA Earth Continuity)

Test Voltage	250mV DC maximum into an open circuit
Test Current	100mA DC constant current
Test Current Accuracy	±2%
Measurement Range	0 to 1.999 Ω with a resolution of 0.001 Ω
Accuracy	±2% of reading ±2 digits
Test Time	0 to 255 seconds in steps of 1 second
Protection	protection against connection to mains
Measurement System	4 wire

Power / Run / Load Test

Test Voltage	10V to 280V (9024) in 1V increments
Test Voltage Accuracy	±2% ±2V
Test Current	12.99A AC maximum, peak factor <1.5
Current Measurement Range	0 to 12.99A AC with a resolution of 0.01A
Current Accuracy	±2% of reading ±2 digits ±50mA
Power Measurement Range	0 to 2999W with a resolution of 1W
Power Accuracy	±2% of reading ±2 digits ±5W
Slew Rate	0 to 240 V/second in steps of 1V/second
Test Time	0 to 255 seconds in steps of 1 second
Protection	thermal overload, over current trip

Phase Neutral Continuity Test

Test Voltage	9 V DC nominal into an open circuit
Test Voltage Accuracy	±2%
Test Current	8mA DC short circuit
Measurement Range	0 to 1999 Ω with a resolution of 1 Ω
Measurement Accuracy	±2% of reading ±2 digits
Test Time	0 to 255 seconds in steps of 1 second
Protection	protection against connection to mains

Analogue Test

Voltage Input Range	0 to 12V
Measurement Range	0 to 11.99V with a resolution of 0.01V
Measurement Accuracy	±2% of reading ±2 digits
Test Time	1 to 255 seconds in steps of 1 second

ADDITIONAL INFORMATION

Mechanical

Case Dimensions	520W x 210H x 400D mm approx
Weight	45kg approx

Electrical

Supply Voltage	230V ±15% at 50 - 60Hz
Power Consumption	50VA maximum (standby) 4.25kVA maximum during functional test
Operation Temperature	0-40°C
EN50191	Compliant when used with appropriate accessories

Supplied With

- Elite Software
- Earth bond Clip
- Output Box
- Guard Switch
- Data Cable
- Keyboard
- Mains Lead
- Instruction Manual.

OPTIONAL EXTRAS

Hardware

E9-5009	Barcode Scanner
E9-5001	Data Cable
E9-5006	Foot Guard Switch
E9-5007	Earth Probe
E9-5008	Status Beacon
E9-5010	Printer Cable
03918/2	HT – Probe
312A950	Desk Test n Tag Printer
312A954	Desk Test n Tag Printer Labels
312A952	Desk Test n Tag Printer Ribbon

Service

- Onsite or return to base
- Service
- Calibration

Order Numbers

- E9024 – including Voltage swing up to 280V for type testing
- E9024V

SAFETEST MANUFACTURING

Bench Mounted Comprehensive Tester

■ Multi Industry Use

SafeTest Manufacturing can be used as a simple manual tester or with varying degrees of automatic test sequencing.

It performs earth bond, insulation resistance, flash/hipot, leakage, short-to-line and run/load tests. It is easy to operate with a full QWERTY keypad and/or barcode scanner, and includes full-on screen user instructions.

The SafeTest Manufacturing meets the needs of manufacturers who require a range of fundamental safety tests to be carried out on a variety of electrical and electronic products to CE and international standards.

All tests are individually selectable and Safe Testing Manufacturing's internal memory has the capacity to store the results of 6,000 tests.

An optional safety label printer enables the automatic production of test tags, labels and test reports. Clever use of the optional barcode scanner (for product identification and tester configuration) means this product can be integrated easily into a typical ISO quality control system.



KEY FEATURES	SafeTest Manufacturing
Earth / Ground Bond Test	■
AC / Flash / Hipot Test	■
DC Insulation Resistance	■
Leakage Test	■
Load Test	■
Power / Run Test	■
Storage of test results	Up to 6000
Manual and semi-automatic test sequencing	■
Link to a printer and scanner for fast and traceable testing	■

SPECIFICATION

Flash/Hipot Test (Class I)

Test Voltage Class I	1.5 kV AC
Display Range	0.1 – 10.00 mA
Resolution	0.01 mA
Accuracy	+/- 5% +/- 2 digits
Pass Levels	Selectable up to 10 mA

Flash/Hipot Test (Class II)

Test Voltage Class II	3.0 kV AC
Range	0.1 – 10.00 mA
Resolution	0.01 mA
Accuracy	+/- 5% +/- 2 digits
Pass Levels	Selectable up to 10 mA

Earth / Ground Bond Test

Test Voltage	6V AC (open circuit)
Test Currents	25A, 10A, 4A, 100mA AC into short circuit
Range	0.04Ω - 20Ω
Resolution	1 mΩ
Accuracy	+/- 5% +/- 2 digits
Pass Levels	User Selectable

DC Insulation Test

Test Voltages	250V, 500V DC
Range	100kΩ - 50MΩ
Accuracy	+/- 5% +/- 2 digits

Earth Leakage (Load Leakage)

Voltage	Mains Supply
Range	0.1 – 20mA
Resolution	0.01 mA
Accuracy	+/- 10% +/- 2 digits (1.00 – 20 mA)
Pass Levels	Selectable up to 10 mA

Substitute Leakage (Short to case test)

Voltage	40V AC nominal at 230V/110V supply
Range	0.1 – 20mA
Resolution	0.01 mA
Accuracy	+/- 10% +/- 2 digits (1.00 – 20 mA)
Pass Levels	Selectable up to 15 mA

Power / Run / Load Test

Measured Load	0 – 4.2kVA
Resolution	0.01 kVA
Accuracy	+/- 10% of reading, +/- 2 digits

Polarity

Test performed	Live & Neutral continuity & polarity
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External Connections

Serial Port	
Parallel Port	
Guard Switch	
Beacon	

ADDITIONAL INFORMATION

Mechanical

Dimensions	450W x 410H x 155D mm
Weight	9kg

Electrical

Operating Voltage Range	103V – 126V, 207V – 253V, 45Hz – 65Hz
Operating Temperature	0 – 40°C
EN 50191	Compliant when used with appropriate accessories

Supplied with

HT Probe	
Earth Bond Lead	
Guard with Plug	
Instruction Manual	

Optional Accessories

194A922	Barcode Scanner
283A955	Serial Printer Lead
194A919	Serial-PC Lead (9-9 way)
194A920	Serial-PC Lead (9-25 way)
312A950	Desk Test n Tag Printer
312A954	Desk Test n Tag Printer Labels
312A952	Desk Test n Tag Printer Ribbon
DCS317	Guard Switch
H-5027	Beacon
H-5028	Beacon connector lead

Software

352A910	PATGuard Elite 2 – Premier
352A920	PATGuard Pro 2 – Professional
352A930	PATGuard Lite 2 - Entry level

Service

Onsite or return to base	
Service	
Calibration	

Order Number

STM

SAFEMEDIC

Comprehensive IEC/EN 60601 Medical Electrical Safety Analyser



Medical

The SafeMedic provides a comprehensive suite of test functions designed to enable the user to perform full compliance testing in accordance with a wide range of test requirements (EN 60601/ IEC 60601).

It can be operated manually, where the user selects individual tests. Or it can be configured to run automatic tests of a predetermined selection.

Tests are applied and results are recorded within the instrument's internal memory. This high-precision instrument can simulate a wide range of fault conditions, measure the full range of leakage current requirements and apply both high current testing and high voltage hi pot / flash tests.

An optional extra is a high energy defibrillator module, which enables users to confirm the high voltage defibrillator proof testing.

SafeMedic is ideal for a wide range of applications including type test and conformance laboratories, design and development laboratories and environments where medical electrical equipment is manufactured. A clear, intuitive graphics interface helps the user to select and record test information the additional facility of controlling an instrument by remote PC.

The unit can be used either as a stand alone system or part of an applications specific test station.



KEY FEATURES	SafeMedic
Earth / Ground Bond Current up to 40A	■
Hipot / Flash Test for patient connection cables	■
Defibrillation proof test	■
Powered Leakage Tests	■
110 / 240V operation	■
Optional PC control	■
Automatic scan through up to 12 applied parts connections	■
All Tests fully compliant with the requirements of EN 60601	■
Internal memory stores up to 4,000 sets of results	■

SPECIFICATIONS

AC Flash / Hipot Test

Method	Isolated switched mode Voltage
Programmable	100 – 5000V rms.
Ramp Up Time Programmable	0.0 – 255.0s
Hold Time Programmable	0.0 – 255.0s
Ramp Down Time Programmable	0.0 – 255.0s
Voltage Accuracy	+/- 2% +/- 2 digits of set value
Maximum Current	100mA rms.
Current Accuracy	+/- 2% +/- 2 digits of displayed value
Resolution	0.01mA
Phase Angle	-90 to + 90 degrees or -1.0 to 1.0 or resistive component only
Arc Detection	Selectable 0 – 9

DC Flash / Hipot Test

Method	Isolated switched mode
Voltage Programmable	100 – 6000Vdc
Ramp Up Time Programmable	0.0 – 255.0s
Hold Time Programmable	0.0 – 255.0s
Ramp Down Time Programmable	0.0 – 255.0s

Voltage Accuracy	+/- 2% +/- 2 digits of set value
Maximum Current	10mA DC
Current Accuracy	+/- 2% +/- 2 digits of displayed value
Resolution	0.01mA
Arc Detection Selectable	0 – 9

DC Insulation Resistance

Voltage	Selectable 350V/500 V DC @2mA.
Maximum O/C Voltage	600V
Range	100K - 20 M Ω +/- 5% +/-2 digits 20M – 100M Ω +/-10% +/-2 digits
Resolution	0.01m Ω

Earth / Ground Bond Test

Current Programmable	1 to 30A AC Constant Current into 0.2 Ω . Up to 40A into 0.1 Ω
Max No Load Voltage	6V rms. o/c
Range	0.000 – 1.000 Ω
Pass/Fail	Programmable, factory default set to 0.1 Ω
Accuracy	+/- 5% of value, +/- 2 digits
Resolution	1m Ω

Earth Leakage

Selectable	between EN 60601, AAMI True rms, able to measure AC & DC separately for IEC601/AAMI standards.
Input Impedance	>1M Ω
Frequency Response	DC to 1 MHz (5%) (IEC601/AAMI only)
Range	0 – 20mA
Accuracy	+/- 5%, +/- 2 digits

Enclosure Leakage

Method	As described in IEC601.1 clause 19, fig 18
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Applied Parts Leakage

Selectable Between	EN 60601-1 and AAMI/NFPA
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Testing	Class I and Class II equipment, Mains on applied part, patient auxiliary AC and DC Testing type B, BF, and CF
---------	---

Patient Auxiliary Current

Selectable	between EN 60601-1 and NFPA
------------	-----------------------------

Power / Run / Load Test

Frequency	50 & 60 Hz
Power	0.1kVA – 4kVA
Current	0.0A – 16A
Accuracy	+/- 5% of value, +/- 2 digits

Defibrillator Options

Method	As described in IEC 60601.1 Clause 8.5.5 Figures 9 & 10
Voltage	min 5kV DC

Supplied With

Earth Bond Probe	
Applied Parts / Patient Connection Probe	
Comprehensive User Manual	

OPTIONAL EXTRAS

Hardware

194A922	Barcode Scanner
312A950	Desk Test n Tag Printer

Service

Onsite or return to base	
Service	
Calibration	

Order Number

460A910	Comprehensive Electrical Safety Tester
460A912	Comprehensive Electrical Safety Tester including Defibrillator module

SAFETEST LUMINAIRE

Electrical Safety Tester for Luminaire on Lighting Products

■ Lighting

The SafeTest Luminaire is a complete solution for lighting (luminaire) manufacturers who need to meet electrical safety standards. It provides all the required tests in a clear and simple interface, which can be operated manually or automatically. It adheres to standards IEC598 (incorporating BS EN 60598) UL1598, C22.2 no. 250.0.

This innovative tester can store up to one thousand test results and will interface to a PC for further analysis of measured data.

In a production environment, serial numbers can be scanned and stored against test results. Test results can also be output to a printer during testing. The SafeTest Luminaire can also be used with the Desk Test 'n' Tag label printer for clear and concise product labelling.

KEY FEATURES	SafeTest Luminaire
Earth Continuity / Ground bond test	■
Hipot / Flash Test	■
Insulation Resistance Test	■
Power / Load / Run Test	■
Internal memory	Yes upto 1000 test results
Link to scanner and PC for traceability	■
Used stand alone	■
Test Sequences	■



SPECIFICATION

AC Flash / Hipot Tests

Test Voltage Class I	1.5kV AC
Test Voltage Class II	3kV AC

DC Insulation Resistance

Test Voltage	500V DC, 2MΩ trip
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Earth / Ground Bond Test

Test Current	10A AC, 0.5Ω trip
--------------	-------------------

Power / Run / Load Test

Measured Load	120V/240V AC, 15A
---------------	-------------------

Polarity

Test Performed	Live & Neutral continuity & polarity
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External Connections

RS232	For Connection to Printer, PC or Barcode Scanner
Beacon	Yes
Guard Switch	Yes

ADDITIONAL INFORMATION

Mechanical

Dimensions	450W x 410H x 155D mm approx.
Weight	5kg

Electrical

Supply Voltage	220/240V 50Hz
Operating Temperature	0-40°C
EN50191	Compliant when used with appropriate accessories

Supplied With

- HT Probe
- EC Clip
- Guard with plug
- Instruction Manual
- Mains Lead

OPTIONAL EXTRAS

Hardware

312A912	Desk Test 'n' Tag Printer
STL 5010	Earth Clip Lead & Plug
STL-5011	EC Probe
DCS317	Guard Switch
H-5017	Status Beacon
03918/2	HT - Probe
Y300	Simulator
68555 BC	Continuity Probe
68556 SBC	Continuity Probe
68557 EC	Continuity Probe
68558 SES	Continuity Probe

Software

352A910	PATGuard Elite 2
352A920	PATGuard Pro 2
352A930	PATGuard Lite 2

Services

- Onsite return to base Service
- Calibration

Order Number

STL

G2000

Manual Safety Tester for Lighting Products and Luminaire

■ Lighting

The G2000 has been designed specifically for manufacturers of lighting (luminaire) products to allow complete electrical safety testing in a production environment to the relevant national and international standards. This product meets the requirements of the UK lighting association code of practice and IEC598 including EN60598.

By design, the unit is flexible, testing both Class I and Class II standard lighting products and in addition, it will test Chokes, Low Energy Fittings and High Frequency Controllers. The output test box can be supplied to meet a specific home or export market.

A light up test (Load / Run Test) will allow a 500W fitting to be fully tested.

The rugged metal case has been designed so that the unit can be used in the harshest of environments.

Straightforward operation and standard test sockets complete this excellent value-for-money package.

KEY FEATURES	G2000
Meets "The Lighting Association Code of Practice" and IEC 598 (inc BSEN60598)	■
Continuity Test	■
Polarity Test	■
Light up Test	■
Earth Bond Test	■
Flash Test for Class I / Class II	■
Simple straight-forward operation	■
Output box can incorporate any country specific socket	■
Suitable for testing low energy fittings	■

SPECIFICATION

AC Flash / Hipot Test

Test Voltage Class I	1.5kV AC
Test Voltage Class II	4kV AC

Earth / Ground Bond Test

Test Current	10A AC, 0.5Ω trip
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Polarity

Test Performed	Live & Neutral, Continuity & Polarity
----------------	---------------------------------------

External Connections

Beacon	Yes
Guard Switch	Yes

ADDITIONAL INFORMATION

Mechanical

Dimensions	460W x 460H x 190D mm approx
Weight	16kg

Electrical

Supply Voltage	220/240V 50Hz
Operating Temperature	0-40°C
EN50191	Compliant when used with appropriate accessories

Supplied With

- EC Probe
- HT Probe
- Guard Switch
- Simulator
- Continuity Probe
- Output Box
- Operating Key
- Mains Lead
- Instruction Manual

OPTIONAL EXTRAS

Hardware

G2000-5006	EC Probe
03918/2	HT - Probe
DCS317	Guard Switch
DCS276	BEACON S/ASSY RED/GREEN
Y266	SIMULATOR
68555	BC Continuity Probe
68556	SBC Continuity Probe
68557	EC Continuity Probe
68558	SES Continuity Probe
G2000-5005	Output Box

Service

- Onsite or return to base
- Service
- Calibration

Order Number

G2000



SAFECHECK 8

Bench Mounted Comprehensive Tester for the Service and Rental Industry

■ Hire / Rental / Service

This tester is ideal for use in the hire and service industry.

SafeCheck 8 is a bench-mounted instrument for those who need a comprehensive tester with memory which can provide result traceability.

Operators can select one of the following tests from its clear user interface: Class I, Class II, IEC Extension Power Cord.

Equipment and tools are automatically sequenced through the test routine. The results are recorded, and information is displayed on a large clear LCD screen.

In order to eliminate potential data entry errors and to speed up the test process, the tester can also be used with a barcode reader which scans in the equipment's ID number.

SafeCheck 8 is outstanding value for money and helps you meet your safety obligations while you improving productivity.



KEY FEATURES	SafeCheck 8
Earth / Ground Bond Test	■
DC Insulation Resistance	■
Leakage Test	■
IEC Cord Test	■
Power / Run Test	■
Storage of test results	Up to 5000
Predefined and custom test sequences	■
Link to a printer and scanner for fast and traceable testing	■

SPECIFICATION

Flash/Hipot Test (Class I)

Test Voltage Class I	1.25kV AC
Display Range	0.1 - 10 mA AC
Resolution	0.01mA
Accuracy	+/- 5% +/- 2 digits
Pass Levels	selectable up to 10mA

Flash/Hipot Test (Class II)

Test Voltage Class II	2.5 kV AC
Display Range	0.1 - 10 mA AC.
Resolution	0.01mA
Accuracy	+/- 5% +/- 2 digits
Pass Levels	selectable up to 10mA

DC Insulation Test

Test Voltage	500V
Display Range	0.1 - 99.99MΩ
Accuracy	+/- 5% +/- 2 digits (up to 19.99MΩ)

Earth/Ground Bond Test

Test Voltage	6V AC (open circuit)
Test Current	25A, 10A, 4A, 100mA AC into short circuit
Range	0.04Ω - 20Ω
Resolution	1mΩ
Accuracy	+/- 5% +/- 2 digits
Pass Levels	user selectable

Substitute Leakage (Short to Case Test)

Test Voltage	40V AC o/c
Display Range	0.1 - 20.0mA AC
Resolution	0.01mA
Accuracy	+/- 10% +/- 2 digits (1.00 - 20mA)
Pass Levels	selectable up to 15mA

Earth Leakage

Test Voltage	Mains Supply
Display Range	0.1 - 20.0mA AC
Resolution	0.01mA
Accuracy	+/- 10% +/- 2 digits (1.00 - 20mA)
Pass Levels	selectable up to 10mA

Power / Run / Load Tests

Resolution	0.01kVA
Measured Load	0 - 4kVA
Accuracy	+/- 10 of reading, +/- 2 digits

IEC Power Cord Test

Test Voltage	40V AC
Detects	Good, Open, Short, Reversed

ADDITIONAL INFORMATION

Mechanical

Dimensions	450W x 410H x 155D mm
Weight	Approx 8.8kg

Electrical

Supply Voltage	Selectable 115V / 230V 50 or 60Hz
Operating Temperature	0°C to +40°C

Storage Temperature	-10°C to +50°C
EN50191	Compliant when used with appropriate accessories

Supplied With

HT Probe
3 pin guard link connector
Earth bond clip
Mains lead
Instruction Manual

SafeCheck 8 Solutions package for automation and traceability, includes:

SafeCheck 8
Desk Test n Tag printer
Barcode Scanner
1000 white labels
PATGuard Lite 2

OPTIONAL EXTRAS

Hardware

194A922	Barcode scanner
312A912	Desk Test n Tag printer
3PHA	Three phase adaptor

Software

352A910	PATGuard Elite 2 - Premier
352A920	PATGuard Pro 2 - Professional
352A930	PATGuard Lite 2 - Entry level

Services

Service and Calibration

Order Number

SC08 UK	
SC08 USA	
SC08 UK Package	Includes Test n Tag Printer and labels
SC08 USA Package	Includes Test n Tag Printer and labels

B255

Comprehensive Power Tool & Appliance Safety Tester

■ Hire / Rental / Service

Recognised as the industry standard and product of choice for the hire/rental and service/repair industries. The B255's simple and straightforward operation, compact design and comprehensive range of measuring functions make it the leader of its class.

The B255 is recognised as the work horse of the testing industry. It has a strength of construction that makes it ideal for the most arduous environments.

With the ability to perform five different tests, the B255 helps ensure compliance with International standards for Class I and Class II products, including EN60335, EN61029, EN60065, EN50144 and EN 60745.

KEY FEATURES	B255
The robust workhorse for the rental sector and equipment service departments.	■
Simple clear controls.	■
Used by thousands of Technicians throughout the world.	■
Unsurpassed reliability and value.	■
Provides a full suite of electrical safety tests including Earth/ground bond, hipot/flash testing load/run and leakage testing.	■



SPECIFICATION

AC Flash / Hipot Test

Test Voltage	500V, 1250V AC 3000V, 3750V AC
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Earth / Ground Bond Test

Test Current	25A, into 0.1Ω, from 8V AC, 0 – 1 Ω meter display
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Earth Leakage Test

Trip Current	0 – 10mA
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Power / Run / Load Test

Test Voltage	230V 0 – 15A, 110V, 0 – 25A
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Features

Visual Alarm	Yes
Audible Alarm	Yes

External Connections

Beacon (EN50191)	Yes
Guard Switch	Yes

ADDITIONAL INFORMATION

Mechanical

Size	400W x 180H x 250D mm
Weight	10 kg

Electrical

Power	230V 16A 50Hz
Operating Temperature	0-40°C
EN50191	Compliant when used with appropriate accessories

Supplied With

- HT Probe
- EC Clip Lead
- Output Box
- Fault Simulator
- Test Log
- Guard plug
- Mains Lead
- Instruction Manual

OPTIONAL EXTRAS

Hardware

03918/2	HT Probe
41510	EC Clip
48319	Mains Lead
B255-2005	Outlet Box
Y250	Simulator
CON965/LINK	Guard Plug

Services

- Onsite or return to base
- Service
- Calibration

Order Number

B255

A252

Compact Portable Electrical Safety Tester

■ Hire / Rental / Service

This versatile portable test set is easy to operate and carries out effective electrical safety testing of office equipment, power tools and appliances.

The A252 is a rugged instrument. It is ideal for use in service and maintenance departments and rental stores. It connects to both 110 and 240 volt appliances and provides clear, simple results on a large moving scale display.

With a minimum of controls, it provides both audible and visual indications of the condition of any appliance. It comes with a full set of test leads and probes.

Its unique construction means it is ideal for transporting between test locations.

This tester offers earth/ground bond testing at three separate currents and a selection of five high voltage tests with two selectable trip levels.

KEY FEATURES	A252
Simple and straight forward to use	■
Ideal for the safety testing of office equipment, power tools and appliances.	■
Test both 110 and 240 volts appliances.	■
Ideal for applications where run test is unnecessary.	■
Audio visual indication of results.	■
Supplied with High quality Test Probes.	■



SPECIFICATION

AC Flash / Hipot Tests

Test Voltage Class I	1250V or 500V
Test Voltage Class II	3750V, 3000V or 2500V

Earth Leakage

Trip Current	5mA and 10mA
--------------	--------------

Earth / Ground Bond Test

Test Voltage	25A, 8A and 100mA with meter indication.
--------------	--

DC Insulation Resistance

Measurement Range	0 – 100 Megohms at 500V DC meter indication
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Test Status

Indication by Pass/Fail lamps

ADDITIONAL INFORMATION

Mechanical

Size	210W x 140H x 250D mm
------	-----------------------

Electrical

Operating Temperature	0-40°C
EN50191	Compliant when used with appropriate accessories

Supplied With

- 240V and 110V Test Sockets
- Earth Return clip lead
- Safety Clip
- Fault Simulator
- Instruction Manual

Optional Extras

Hardware:	
LOG 001	Log Book
LOG 002	Record Sheets
LOG 003	Refill Pack
LOG 004	Pass Labels
LOG 005	Fail Labels

Service

Service and Calibration

Order Number

A252

B433R

Stand Alone Earth / Ground Bond Tester

■ Multi Industry Use

The B433R Earth bond tester is cost effective, simple to use, rugged and suited to manufacturing or laboratory environments.

It can deliver a test current of 25A through a resistance/impedance of 0.1Ω from a low voltage AC source.

Its built-in test pass/fail threshold is indicated by a green LED. This is integral to the No-Burn test probe. The LED illuminates during test application and facilitates remote working when the operator is unable to see the test instrument. Behind a large product under test, for example.

This product meets the general requirements of the majority of international test standards that relate to system earth continuity or ground bonding measurement.

KEY FEATURES:	B433R
Earth Continuity / Ground Bond Test	■
Analogue	■
Test current of 25A AC. into a 0.1Ω impedance	■
Clear and simple interface	■
No-burn earth bond probes supplied	■
Built in Pass/Fail indication by LEDs	■
Used stand alone	■



SPECIFICATION

Test Output Current	25A AC through 0.1Ω or 10A AC through 0.5Ω
Test Voltage	Less than 7.5V AC open circuit
Measurement Range	0.1Ω
Output Connection	2 wire

ADDITIONAL INFORMATION

Mechanical

Dimensions	335W x 230H x 255D (mm)
Weight	8 kg

Electrical

Supply Voltage	120, 220 or 230V 50 or 60 Hz, specified at time of order
Operating Temperature	0-40°C
EN50191	Compliant when used with appropriate accessories

Supplied With

Clip Lead
"No Burn" probe with integral pass lamp
Instruction Manual

Services

Onsite or return to base
Service
Calibration

Order Number

B433R	240 Volts
B433R	110 Volts

A320

The World's Fastest Power Cord Tester

CLARE
Tried. Tested. Trusted.

■ Wiring & Cable

ASTA, BSI and other regulatory body requirements mean it has become standard practice to test mains powered electrical products with pre-wired cord sets which are fitted with either moulded-on or re-wireable connectors.

Clare developed the Mains Cord Test Set in response to cord set manufacturer's requirement for a production line tester that ensured 100% build integrity and the electrical safety of their product.

This instrument, when coupled with a dedicated test enclosure, provides complete test cycles in three seconds and will check Earth continuity, Line and Neutral continuity / polarity, insulation between all cores and between cores, the outer surfaces of plug tops and other fitted connectors.

The A320 Power Cord Tester can also be set for 2-core lead sets, with the Earth test being replaced by a sensing circuit to detect the presence of a 3-core lead if incorrectly loaded.



KEY FEATURES

KEY FEATURES	A320
Earth / Ground bond test	■
Line and Neutral Continuity test	■
Polarity test	■
Tests automatically run	■
Lamps indicate test complete and PASS status	■
FAIL lamps	■
Manual mode for calibration	■

SPECIFICATION

AC Flash / Hipot Test	0-2.5kV AC. between Line and Neutral conductors 0-2.5kV AC. from Line and Neutral conductors to the Earth conductor 0-5kV AC. from Line and Neutral conductors to outer surface of plug top
Earth Leakage	Monitored at Flash Test voltage nominal trip equivalent to 5 MΩ
Earth Bond Resistance	High current injection (variable 0-30A) through the Earth conductor
Continuity	Low voltage DC. through Line and Neutral conductor
Polarity	Applied simultaneously with the Continuity test

ADDITIONAL INFORMATION

Supplied With

Operating Manual

Services

Annual Service and Calibration

Order Number

A320

HORIZON II

Bench Top Wiring Analyser

Wiring & Cable

The Horizon II is the next-generation Horizon wiring analyser.

Clare have completely repackaged it to make the user experience even better and improve its overall test performance.

All H2 models enable 128-point testing with modular expansion capability up to 1024 points capable of switching 1A and hipot testing up to 1500 VDC and/or 1067 VAC. Standard test capability includes fault location, automatic product learning, component detection and real-time intermittent open/short detection.

Its key features include: a fully updated Windows-based user environment, colour touch-screen, real-time temperature and humidity monitoring, expanded I/O, flash disk data storage and improved ergonomics.

Operators will appreciate its oversized, colour touch-screen, built-in 'START' and 'STOP' buttons, and onscreen user advice which makes it easy to program and test. H2 software accepts and runs any Horizon test program, so you don't need to recreate test programs when you move to it.

Networked, integrated or used as a standalone tester, Horizon II provides virtually unlimited data storage and reporting capabilities with built-in flash disk and label printer support.

The all-in-one Horizon II offers an unrivalled diversity of test scenarios in a portable wiring analyser.

KEY FEATURES	Horizon II
Built in PC and flash drive for independent or networked operation	■
Fault location test	■
Component detection	■
Onscreen help	■
Supplied with 128 high voltage test points	■
AC Flash / Hipot test	■
DC Flash / Hipot test	■



SPECIFICATION

Functions	
AC Flash/Hipot	1067V
DC Flash/Hipot	1500V
Measurement Speed	500 point net in less than a second
Continuity Threshold	300Ω
Isolation Threshold	80 Ω
Load/Run Test	120V/240V AC, 15A

Low Voltage Resistance Measurements

	Range	Accuracy	Resolution
2W ⁽²⁾	0.1Ω to <2MΩ	±2.5%, ±20mΩ (HC/FHC)	1mΩ or 3 digits
	0.1Ω to <2MΩ	±5.0%, ±50mΩ (MSR)	1mΩ or 3 digits
	2MΩ to <10MΩ	±7.0%, ±1KΩ	3 digits
	10MΩ to <25MΩ	±15.0%, ±10KΩ	3 digits
	25MΩ to <50MΩ	±30.0%, ±10KΩ	3 digits
4W ⁽²⁾	10mΩ to <400Ω	±2.5%, ±20mΩ	1mΩ or 3 digits
	MSR 10mΩ to <400MΩ	±3.5%, ±30mΩ (>128 points)	1mΩ or 3 digits
4W HCS	1mΩ to <400Ω	±2.5%, ±1mΩ	1mΩ or 3 digits
4W FCS	1mΩ to <400Ω	±2.5%, ±1mΩ	1mΩ or 3 digits
Comp- liance	50pF to 1μF	±4.0%, ±2pF	1mΩ or 3 digits
	1μF to 10,000μF	±10.0%, ±1pF	3 digits

ADDITIONAL INFORMATION

Dimensions	532W x 175H x 278D mm
Weight	15Kg (33 lbs) - main unit 5Kg (11 lbs) - expansion box
Supply Voltage	110/220VAC, 50/60 Hz, 1A

Supplied With

- Ground probe
- Instruction manual
- AC power pack
- Calibration certificate
- One-year warranty

OPTIONAL EXTRAS

Hardware

- Full range of product adapters
- Custom adapter kits
- Expansion boxes in 128-point increments with cable lengths of 3', 6', 9' and 15'
- Tools for periodic verification of system calibration
- 1A/28VDC programmable high-current source
- Handheld digital probe for remote probing of product under test
- TCL scripting language
- Simplex and Kelvin test adapters
- NB: Customers should request above accessories, if required

Services

- Onsite return to base
- Service
- Calibration

Order Number

Model	VAC	VDC	HC
HV1-H2	-	1000	1A fixed
HV2-H2	-	1500	1A Fixed
HV3-H2	1067	-	1A Fixed
HV4-H2	1067	1500	1A Fixed
HV5-H2	1067	1000	1A Fixed
HV6-H2	-	-	1A Fixed

SYSTEMS CUSTOMISATION

“SMART” modules have a unique method which allows customers to select individual modules and build a dedicated test system around one electrical safety test engine, thus creating the ideal test solution.

ELECTRICAL SAFETY TEST ENGINE

Based on the Clare Elite multifunction test unit (pages 18-21), this flexible instrument provides the heart of a customised solution.

SWITCHSMART SWITCHING MATRIX

The switching module allows the customer to carry out testing at multiple points. Combined with the Electrical testing engine, high voltage and/or high current tests can be routed to multiple locations. Individual tests can be carried out and the results recorded in the instrument.

POWERSMART

The PowerSmart extends the load switching capability of the Electrical Test Engine. With the capability to power equipment with a rating of up to a 50Amp, it incorporates a number of safety functions to help customers carry out load and leakage testing in a safe, controlled environment.

QUAD TESTING SERIES

Our Quad testers enable products with isolated internal circuits to be fully electrically tested when they're powered from an isolated supply. This means that users can be sure that a product's electrical safety has been fully tested throughout its operating cycle. Available in both single and three phase options.

ELECTRICAL SAFETY ENCLOSURES

Clare can supply a wide range of electrical safety enclosures to accommodate almost any item of electrical equipment and provide full protection to the operator during the testing process.



SWITCHSMART

Automates Electrical Safety Testing Between Multiple Test Points or Multiple Products Simultaneously

■ Multi Industry Use

Clare has developed a versatile modular switch scanning matrix which can be used to connect high voltage or high current electrical safety tests to multiple test points or products.

Applications include multiple point or multiple product testing with products such as transformers, motors or electrical system devices which require testing for earth/ground bonding or high voltage hipot/flash dielectric withstand test

Each switch port is capable of handling high voltage or high currents, which makes the module extremely flexible.

It has been designed to interface directly to the Elite family of products or for independent use within larger system integration/automation projects.

Because it is a modular design, the effective number of points it can be connected to is virtually unlimited, as the module can be controlled either by RS-232 serial interface or by a digital control port.

Housed in a stylish 4U 19-inch case, this module features a high contrast LCD display which indicates the real-time status of each switch port.



SPECIFICATION

Fuse	250V/1A Fast blow
PC/Host/Elite Control Mechanism	RS-232 or digital I/O port via 25 way D type connection
Maximum Switch Port Rating – High Voltage	3 kV AC. and DC
Maximum Switch Port Rating – High Current	32A*
Number of Ports	16 single pole normally open (SPST) type
Switch Port Connections	Via two Harting style industrial rear panel connections
Display	2 X 20 character high contrast backlit LCD

KEY FEATURES	SwitchSmart
16 Switching Ports type SPST (NO)	■
Maximum switching voltage 3 kV AC	■
Maximum switching current 32 Amps AC	■
RS-232 serial communication control port	■
Digital I/O control port	■
LCD display showing switching port status	■
Standard 19-inch 4U case	■
Rear mounted industrial connections	■
Universal power supply from 100 to 250 V 50/60 Hz	■
Virtually unlimited number of points can be connected by cascading multiple modules	■
Interfaces directly with Elite	■
Simple interface for integration into third party systems	■
Test points can be switched hot	■

ADDITIONAL INFORMATION

Mechanical	
Case Dimensions	19-inch 4U, 510W x 133H x 400D mm
Weight	9 kg
Electrical	
Operating Temperature	0 - 40° C
Supply Voltage	100 – 250V AC. 50/60 Hz
Order Number	
462A910	

POWERSMART

Automation and Leakage Test Module



■ Multi Industry Use

PowerSmart simplifies the test process, giving immediate productivity benefits. It improves operator safety from electric shock, and enables low-skilled operators to perform electrical and functional tests on the production line.

The module has been designed to work with the Elite electrical safety tester. A safety test enclosure can be added if required.

The automation module also offers full leakage testing to EN 60990 and will display run test voltage and current during the functional tests. The power for the functional run test can be selected from either the internal supply or from the external connected electrical safety tester.

To maximise this test automation module's flexibility, a simple 8 input 4 output PLC module is incorporated. This has accessible terminals and programming connections at the rear of the module, which makes the module a truly versatile device adaptable to most automation applications.

ADDITIONAL INFORMATION

Mechanical

Case Dimensions	19-inch 4U, 510W x 133H x 400D mm
Weight	9 kg

Electrical

Operating Temperature	0 - 40° C
Supply Voltage	100 – 250V AC. 50/60 Hz

Order Number

461A910	50A Functional / Run Test
461A915	16A Functional / Run Test



KEY FEATURES / SPECIFICATION	PowerSmart
Enables automation of the test process to increase productivity and safety	■
Increases safety in line EN 50191	■
Enables high voltage testing to be performed safely on the production line	■
Automatic controlled discharge function for products where DC testing is required	■
Unique 24V D.C. protected supply for test enclosure internal automation devices	■
Includes an internal user configurable 8 + 4 I/O PLC controller for flexible automation of test enclosure	■
Handles all safety inputs and outputs between test enclosure and test equipment	■
All connections are accessible via rear mounted industrial sockets	■
Interfaces directly with Elite 2	■
Leakage measurement in accordance with EN 60990	■
Functional test voltage and current measurement	■
Can be integrated into third party systems	■
Can be configured to provide signal for locking of the test enclosure door	■
Compatible with EN 50191 high visibility status beacon	■
Available with either 16 Amp or 50 Amp functional/run test	■

QUAD TEST SERIES

Enables Products with Isolated Internal Circuits to be Fully Electrically Tested Whilst Powered

■ Multi Industry Use

Clare is the first manufacturer to develop a testing solution that can fully test any product that has in-built internal circuitry requiring a powered supply connection for the circuitry accessible to high voltage hipot/flash/dielectric test.

Typical products incorporating this type of circuitry are microprocessor-based domestic/industrial washing machines, cooking appliances, consumer audio/TV/IT products and construction machinery built to international standards such as IEC355, IEC950, IEC601, IEC598, and IEC204.

The Quad module is designed to work with the Clare Hal Combi unit's isolated test outputs ideal for this application. The system can also be adapted for use with any test instrument incorporating a fully isolated test output which enables the user to incorporate the Quad module into testing systems when more convenient or appropriate.

KEY FEATURES	Quad 1	Quad 3
Test products which have internal circuits that require power for access	■	■
Meets requirement of IEC 60335-1 and similar product safety standards	■	■
Can test products up to 16 Amps	■	■
Can test products up to 32 Amps	Option	Option
Isolated test output to maximise safety to test operatives	■	■
EN 50191 compliant	■	■
Can test single phase products	■	■
Can test three phase products		■



ADDITIONAL INFORMATION

Mechanical

QUAD1 Dimensions	16 and 32A model, 430H x 520W x 480D mm
QUAD3 Dimensions	16 and 32A model, 810H x 590W x 480D mm
QUAD1 Weight	16A model 36 kg, 32A model 42 kg
QUAD3 Weight	16A model 62 kg, 32A model 76 kg

Electrical

QUAD1 230V 16A	230 V, 50 or 60 Hz 1 phase supply – 16A
QUAD3 400V 16A	400 V, 50 or 60 Hz 3 phase supply – 16A
QUAD1 120V 20A	120 V, 50 or 60 Hz – 20A
QUAD3 240V 20A	240 V, 50 or 60 Hz 3 phase supply – 20A
QUAD3 380V 16A	380 V, 50 or 60 Hz 3 phase supply – 16A
QUAD3 440V 16A	440 V, 50 or 60 Hz 3 phase marine supply – 16A
QUAD1 230V 32A	230 V, 50 or 60 Hz 1 phase supply – 32A
QUAD3 400V 32A	400 V, 50 or 60 Hz 3 phase supply – 32A
QUAD1 120V 32A	120 V, 50 or 60 Hz – 32A
QUAD3 240V 32A	240 V, 50 or 60 Hz 3 phase supply – 32A
QUAD3 380V 32A	380 V, 50 or 60 Hz 3 phase supply – 32A
QUAD3 440V 32A	440 V, 50 or 60 Hz 3 phase marine supply – 32A
Operating range	0 - 40° C; Humidity: <75%

Services

Onsite or return to base
Service
Calibration

Order Numbers

463A917	QUAD1 230V 16A
464A917	QUAD3 400V 16A
463A918	QUAD1 120V 20A
463A919	QUAD3 240V 20A
464A918	QUAD3 380V 16A
464A919	QUAD3 440V 16A
463A920	QUAD1 230V 32A
464A920	QUAD3 400V 32A
463A921	QUAD1 120V 32A
463A922	QUAD3 240V 32A
464A921	QUAD3 380V 32A
464A922	QUAD3 440V 32A

CUSTOM SOLUTIONS AND ACCESSORIES

In industry, we're recognised as experts in Electrical Safety Test Equipment supply. Our products are built to meet your current test requirements and have an unrivalled record for longevity. That's how we know that our products can test all day, every day.

Quality accessories make for quality testing. We're experts at testing and, not surprisingly, we make accessories in high quality, robust materials. Our cabling for probes, for instance, not only meets electrical requirements for test. They're also designed to give you maximum flexibility with regular use.

Because of our experience in the field, we've been able to develop a range of Tester accessories which help you save time and reduces the need for repetition.

Now, for example, you can print labels while testing (via our Test n Tag printers), label the appliance and store and retrieve information.

And that's just a small sample of what you can do.



ENCLOSURES

The function of the test enclosure is to provide a safe environment for the product to be tested and to maximise the productivity of the test process.

By doing this the test process can be effectively de-skilled. Clare enclosures are designed using high quality aluminium extruded parts; impact resistant clear plastic panels, dual door safety interlock switches, and discharge facilities for DC hipot/flash/dielectric withstand testing.

Automation of the test connections, PASS/FAIL stamping, and destructive test fail can be included within the enclosure.

Clare test enclosures are designed to work directly with any tester in our product range.

When used with the Power Smart automation module, a host of advanced automation techniques are available direct to the end user.

Electrical safety testing is considered to be a hazardous process. When it is deployed into a production or laboratory environment, it needs to comply with the EN 50191 standard: Erection & Operation of Electrical Test Equipment. In addition the HSE have published a guidance document INDG354: Safety in Electrical Testing at Work which closely follows the EN50191 standard.



KEY FEATURES	Enclosures
Eliminates all risk of electric shock to operator	■
Enables test process to be 'de-skilled'	■
Enables full compliance with EN 50191 standard	■
automates test connections to product under test	■
Suitable for Class I and Class II products	■
Multiple products can be tested at once	■
Minimizes physical space requirement	■

SPECIFICATION

Material	Glass panels with Aluminium frame
Size	ENC1 Effective volume 400H x 400D x 400W mm
ENC2	Effective volume 500H x 500D x 500W mm
ENC3	Effective volume 600H x 600D x 600W mm
ENC4	Effective volume 400H x 400D x 1000W mm
ENC5	Effective volume 2000H x 1000D x 1000W mm

Note: Please specify at time of order if you require the lid to lift up fully or up and over as indicated in the photographs

DESK TEST N TAG PRINTER

The revolutionary Desk Test 'n' Tag system provides a complete automatic record keeping system.

Duplicate tags can also be printed for attachment to contracts etc.

The printer is suitable for use with a wide range of Clare Testers.

The printer can be configured so that it automatically produces test tags displaying test results, equipment identification, date of test, barcode ID. It can be easily customised to add your own company logo, address and website.

The printer can also be configured for manual operation where the user can select a 'pass' or 'fail' label which incorporates all the above information. Desk Test 'n' Tag system produces synthetic, durable tags which are printed immediately after the test, giving you complete flexibility.



KEY FEATURES

- Tags are waterproof, don't tear and don't fade.
- Tamperproof. Security and accuracy of information is assured as test details are printed direct from the tester's memory.
- Professional, printed label as opposed to handwritten label
- Tag size is 100mm x 50mm.
- Printer supplied with roll of tags (approx. 1000 labels per roll), printer ribbon and PC software disk.

ADDITIONAL INFORMATION

Supplied With

- Parallel lead
- Roll of tag labels
- Roll of printer ribbon
- Software configuration disk
- Mains cable
- Power supply unit
- Instruction leaflet

Recommended Extras

- | | |
|---------|-----------------------------|
| 312A951 | Roll of tag labels (orange) |
| 312A954 | Roll of tag labels (white) |
| 312A952 | Roll of printer ribbon |

Order Number

312A912



TESTERS WITH THIS SYMBOL ARE COMPATIBLE WITH THIS PRODUCT

PATGUARD 2 SOFTWARE

A top of the line premier software package, the PATGuard 2 provides you with quick and easy, complete management of the PAT testing process. One program provides the total solution from the first test, through downloading test results, certificates, planning re-tests and uploading. Its simple to use extensive features include: clear re-test identification and optional email alerts for re-testing, which will improve analysis and transparency and help you increase the speed of your business. It connects directly to your tester and uploads and download fast. PATGuard 2 uses Windows-based information management, so it's easy to learn how to use it.



KEY FEATURES	Pro	Elite	Lite
Automatic record generation	■	■	■
Drag & Drop for easy re-location	■	■	
Produce Acrobat Certificates	■	■	■
Network enabled	■	■	
Full range of printed reports		■	
Full test history	■	■	
PATGuard Viewer program generator		■	

SYSTEM REQUIREMENTS

IBM Compatible PC
 Processor Speed 500Mhz or higher
 Microsoft Windows XP/VISTA
 512Mb RAM
 50Mb available hard disk space
 Colour monitor with 32 bit colour or greater video card
 CD ROM drive

Order Numbers

352A910	PATGuard 2 Elite
352A920	PATGuard 2 Pro
352A930	PATGuard 2 Lite

ACCESSORIES



Calibration Check Unit (V242)

The Calibration Unit is intended for on-site verification of the standard range of Clare test stations and stand-alone core testers. We recommend that this unit is returned to us for annual calibration.

Order Number:
V242



Fault Simulators.

Our range of Fault Simulators should be used on a daily basis to check that test equipment is operating correctly. They should not be used as calibration standards.

Y160
Fault Simulator, for Flash, IR, Comprehensive testers.

Y250
Fault Simulator, for Portable Appliance testers.

YSC8
Fault Simulator, for SafeCheck 8 testers.

Order Number
Y160
Y250
YSC8



Flash Probes

This instrument gives you the options of RED probes for HIGH or HOT potential or YELLOW probes for COLD or EARTHY potential.

Constructed in a high quality and robust nylon. The probe's high voltage cable is rated for use on voltage up to 12kV AC or DC and is 2 metres in length.

Its spring load steel contact tip has a 2mm diameter and is exposed by depressing the probe-mounted plunger which exposes the contact tip by 8mm. On release, the tip retracts into the moulding by 12mm. For additional safety, the cable entry is mounted below the operator guard to direct the cable away from the operator's hand.

Order Numbers
03918/2 (Hot)
03919/2 (Cold)



High Visibility Beacons

A set of lights, external to the test instrument, which indicate (via the GREEN lamp) that the instrument is energised and ready to apply the required electrical tests. The RED light illuminates when any tests is applied.

Order Number
DCS276

SERVICES

CALIBRATION & SERVICE

Regular calibration to verify test results is vital. ISO quality and other recognized standards require equipment to be calibrated on a regular basis.

Clare is part of the Seaward Group which operates from the UKAS Accredited Calibration Laboratory at our Peterlee site. It's staffed by a highly qualified team of Engineers who provide back-up calibration and service for Clare's entire range of products.



We'd recommend that you have two on-site calibrations a year to ensure that you always have calibrated units in operation. This frequency also meets the standards of approval agencies such as BSI, BEAB, UL and TUV.

We're almost unique among instrument manufacturers in that we provide nationwide on-site calibration and service. Our Customer Support staff will manage your individual customer account and will schedule periodic calibration recalls or service visits to your premises.

On an international level, our calibration service is supported through our US facility or our worldwide network of distributors.

MEETING THE STANDARDS

Clare Instruments products are routinely used to meet the requirements of the following standards;

- EN60204** Safety of machinery
- EN60950** Information technology
- EN41003** Data Processing Equipment Apparatus for Connection to Telecommunications Networks
- EN60065** Safety of household electronic tools
- EN60601** Medical Electrical Equipment
- EN60335** Household and similar electrical appliances
- EN50106** Safety of household appliances
- EN60730** Controls
- EN60745** Hand Held Motor Operated Power Tools
- EN50144** Safety of hand held electrical tools
- EN60598** Luminaires
- EN60669** Electronic Switches
- EN60968** Self Balasting Lamps
- EN61347** Lamp Control Gear
- EN61242** Cable Reels
- EN61010** Electrical Equipment for Measurement Control and Laboratory Use
- EN50191** Erection and Operation of Electrical Test Installations

National and International approvals testing, Clare Instruments meets the standard:

- BSI / BEAB / ASTA / BAPT / VDE / UL / CSA / THE LIGHTING ASSOCIATION / THE HIRE ASSOCIATION OF EUROPE AND MANY MORE**


 All Clare Instruments products are CE marked.

Guidance information:

GUIDE TO EN50191

Clare Instruments have produced a guide to the EN50191 standard of for the erection and operation of electrical test installations. For you free guide, contact sales@clareinstruments.com





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