HAL Series Safety Testers

Case Studies

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Seaward tester meets safety and compliance standards at pressure washer equipment specialist

JMS Janitorial Supplies, who undertakes the refurbishment of thousands of Karcher electric pressure washers sent to its site in Surrey by retailers from across the UK, uses 6 HAL 103 electrical safety testers to ensure improved compliance with standards for Class I and Class II electrical products.

The JMS operation, which has been in place for the last 12 months, currently tests in excess of 150 washers a day with comprehensive earth bond, insulation resistance and flash testing at its 10,500 sq. ft. purpose-built facility in Betchworth.

The HAL 103 is a fast and efficient automatic industrial test solution, which records results and enables accurate testing to be carried out in line with relevant standards at all times.

Test information captured by the instruments is collected and stored on a PC database via Seaward's Safety-eBase software programme. A certificate, which includes a product barcode and serial number, is then issued for each washer to prove that it has been properly tested and safe to use.

Operations director, Simon Cuthbert, said the HAL 103 was an excellent and reliable tester, providing a high standard of performance in a demanding environment.

“With the high volume of units that are being refurbished on a daily basis we needed a highly effective and robust industrial testing solution.

“The HAL not only provides this but is also easy to use, enabling the operator to simply complete the required tests and accurately record the results all at once at the press of a button,” he said.

The HAL103 meets the requirements of demanding type testing or electronic design applications, performing a suite of standard electrical safety tests and allowing full traceability of test results and records via internal data memory storage.

It performs earth bond, AC/DC hi pot (flash) and insulation testing to ensure the compatibility of Class II electrical products with technical and performance standards.

Product serial numbers and test sequences can be selected by scanning in pre-defined bar codes making the equipment ideal for ISO traceable systems in QA, conformance and production line applications.

The HAL 103 has DC and selectable 50 or 60 Hz outputs for flash testing and incorporates a 0-40A constant current low voltage ground bond test. Other features include a large high contrast bar graph display of the test output and measured test parameters.

Specialist software and a large capacity internal database capable of storing up to 6,000 records gives the test instrument the ability to store test details and results against individual equipment serial numbers. Test reports can be downloaded directly to a PC for the generation of complete test data records.

HAL 103 forms part of a comprehensive range of microhmmeters and precision measurement instrumentation from Seaward.

To find out more about the HAL Series please visit www.seaward.co.uk/HALSeries

Clare rocks in testing at jukebox manufacturer

Clare's multi-function HAL 101 programmable tester is rocking to a different beat after being specified for hipot testing at the UK's only classic jukebox manufacturer.

Sound Leisure, one of only two companies in the world producing classic 1940s and 1950s style jukeboxes, is using the HAL 101 to test the transformers used in the products its supplies to customers and distributors throughout North America.

At its Leeds factory, dozens of new retro-styled jukeboxes are hand-made for American and Canadian customers each year before being tested to ensure they operate safely and perform as required.

Production line testing is undertaken as part of the company's stringent quality assurance programme to ensure the jukeboxes comply with US safety regulations UL 60065 and that they are safe for 110v operation before being shipped.

The HAL 101 enables Sound Leisure to undertake fast and accurate electrical safety testing without damaging the product under test, capturing important data and completing testing in line with the relevant compliance and product testing standards.

Pete Longley, Sound Leisure's safety manager, said the HAL 101 was a good instrument that worked well in an engineering environment to deliver fast and reliable testing.

He added: "The HAL 101 performs well as an important part of our safety testing programme. It is straightforward and easy-to-use, enabling us to complete testing quickly while recording the results simultaneously - all at the press of a button."

The HAL 101 is a programmable hipot tester with a user interface that enables manual use within a product compliance environment. It can be used with a barcode scanner to automate the production flow and enable the tester to be linked directly with most ISO quality systems.

Traceability is an important aspect of any safety programme and the tester can collect up to 6,000 test results internally before downloading these to a PC. It also incorporates various input and output ports, which allow the test to be mechanised when connected to a suitable safety enclosure or initiated from external controls.

To find out more about the HAL Series please visit www.seaward.co.uk/HALSeries

HAL LED shines in testing at JCC Lighting

A leading manufacturer of commercial and domestic lighting has improved electrical safety testing of its range of LED products using a low power multi-function HAL LED tester from Clare.

JCC Lighting Products Ltd, designs, sources and manufactures light fittings suitable for customers in domestic lighting, office lighting, industrial and retail lighting markets in the UK and growing international markets.

This includes a range of advanced LED downlights, LED panels, wall and ceiling lights, track and spotlight systems, and traditional wall lanterns.

The company's facility at Bognor Regis, Sussex has been using a HAL LED on its production line to batch test LED units manufactured or converted before they are distributed to UK electrical wholesalers and international customers

The HAL LED, which provides power measurement of less than 1000W with a resolution of 200mW, performs continuity and ground/earth bond tests alongside AC/DC Hipot (FLASH/Dielectric Strength) to ensure JCC's products guarantee product quality, performance and reliability and are safety compliant with EN 60598. This covers the safety of fixed lighting equipment such as recessed and surface luminaires.

Function testing is also undertaken as part of the programme to check that each unit switches on/off and lights correctly at the required power consumption levels and that any ancillary equipment works in accordance with technical specifications.
This ensures products are safe to use after leaving the factory gate and that a test record is produced for all manufactured units in the advent of any damage during distribution or to track and trace any product returns - in line with the company's quality assurance programme.

Michael Rickwood, technical manager at JCC, said: "The HAL LED is an impressive multi-function test platform, providing faster and more accurate testing at low power levels.

"It gives us the reassurance and peace-of-mind that every unit leaving the production line is 100% safe-to-use and functions as required."

He added that Clare's also a good supplier providing a responsive and professional service.

"The company is an excellent supplier whose high performance, added value solutions enable companies like ours to fully comply with demanding electrical safety testing. I've also been particularly impressed by the quality and efficiency of their aftersales support, which is very good."

The HAL LED delivers better resolution at low power to offer greater control of the output of products under test, ensuring improved accuracy and quality control standards during manufacturing.

Manufacturers such as JCC can complete end of line tests with the additional benefit of full functionality testing of the operation of the equipment, ensuring consistent quality control throughout the production process.

The HAL LED combines the performance of a multi-function production line safety tester with load and power factor measurement for product energy consumption and ratings assessments. The tester can be fully integrated into automated manufacturing systems with selectable sensors and enclosure interlocks, or by ultimate control using remote PCs and PLCs.

A large, clear full graphic display presents information either in a numerical or analogue format and a powerful internal memory allows the storage of up to 6,000 test results and up to 50 configurable test routines. The instrument can also be interfaced with a variety of accessories ranging from bar code scanners to pass/fail label printers.

To find out more about the HAL Series please visit www.seaward.co.uk/HALSeries

Seaward HAL104 shines in testing at lighting specialists

Martech UK Ltd, which designs and manufactures a wide range of energy efficient light fittings, has improved its electrical safety testing procedure by installing an automatic system provided by the advanced HAL 104 from Clare.

At its factory in West Yorkshire, Martech has been using ten HAL 104s on stock, assembly and sub-assembly production lines to test upwards of 600 units which it manufactures daily.

There, the HAL 104s perform a range of Class I, II and III tests to ensure compliance with EN 60598 and guarantee product quality, performance and reliability, including earth continuity, insulation resistance test and light-up/load test.

Function testing is also undertaken as part of a production line programme to check that units switch on/off and light correctly and that any ancillary equipment works in accordance with stringent performance criteria.

The digital HAL 104s, which replaced three different types of test equipment, are fast, high performance automatic instruments which record test results and ensure accurate testing is carried out in line with relevant product standards at all times.

This ensures that products leaving the factory gate are safe to use and that damage to delicate electronic and electrical components is avoided in line with the company's quality assurance programme.

Edmund Reed, Martech's quality manager, said the ability to set up the HAL 104 via a bar code input is advantageous, enabling tests to be fully controlled and operators to undertake testing in line within specific parameters.

He said: "The HAL 104 is an excellent instrument, which works extremely well providing fast, accurate and reliable testing in a demanding production environment.

"Using the all-in-one features of the HAL has led to greater automated testing and ultimately improvements in production line manufacturing and quality. Features like the barcode scanner, which improves data logging and traceability, are particularly beneficial."

The HAL 104 combines the performance of a multi-function production line safety tester with load and power factor measurement for product energy consumption and ratings assessments.

The instrument meets the end of line electrical safety compliance tests required by the majority of national and international product safety standards, including EN 60335, EN 60745 and EN 60598 and others.

As well as load and power functional tests, the new tester incorporates AC/DC Hipot (flash/dielectric strength), insulation, ground/earth bond testing to programmable up to 40A, load switching to 26A with measurement to 20 milliamps and leakage to 100 microAmps.

The new tester has widespread applications in production situations where high resolution performance measurements are important and can be used as a manual stand alone tester with simple push button test activation.

Alternatively, it can be fully integrated into automated manufacturing systems with selectable sensors and enclosure interlocks, or by ultimate control using remote PCs and PLCs.

A large, clear full graphic display presents information either in a numerical or analogue format and a powerful internal memory allows the storage of up to 6,000 test results and up to 50 configurable test routines. The instrument can also be interfaced with a variety of accessories ranging from bar code scanners to pass/fail label printers.

The HAL 104 meets all of the requirements of the various British and European standards in relation to high voltage testing and incorporates fully isolated high voltage outputs to ensure the highest levels of operator safety.

To find out more about the HAL Series please visit www.seaward.co.uk/HALSeries

Seaward HAL104 shines brightly at emergency lighting company

A leading manufacturer of commercial emergency lighting products has improved electrical safety test standards using the advanced HAL 104 multifunction tester from Clare.

Nu-Era Lighting Ltd, a member of the Industry Committee for Emergency Lighting (ICEL), designs and supplies a range of fluorescent and discharge lighting systems for public sector buildings, including vandal resistant, IP65 rated weatherproof, EXIT signs and emergency luminaires.

The company's facility at Witham, Essex, has been using four HAL 104s on its two production lines to test upwards of 1,500 units manufactured each week before distribution to electrical wholesalers around the UK.

The HAL 104 performs a range of important safety tests during production, including earth bonding at 10A, DC insulation resistance at 500VDC and checking for power leakage, to ensure compliance with EN 60598 and guarantee product quality, performance and reliability.

Function testing is also undertaken as part of the test programme to check that each unit switches on/off and lights correctly at the required power consumption levels and that any ancillary equipment works in accordance with technical specifications.

This ensures Nu-Era products are safe to use after leaving the factory gate and that an accurate test record is maintained for all the units produced in the advent of any later damage during distribution or to track and trace any product returns - in line with the company's quality assurance programme.

The digital HAL 104s, which replaced manually operated test equipment, are fast, high performance automatic instruments which record test results and ensure accurate testing is carried out in line with relevant product standards at all times.

Nu-Era Lighting is seeing strong demand for its products from customers so, in a move to further secure product quality and reliability, the company plans to introduce two HAL104s as it gears up for expansion into a new workshop unit at its Witham site.

Olly Mansell, technical manager, said: "The HAL 104 is a brilliant piece of kit, providing fast, accurate and extremely reliable testing.

"It provides us with the confidence and peace-of-mind knowing that every unit leaving the factory for the customer is 100% safe-to-use and works properly.

"And this is all supported and backed-up by a traceable test record and certificate to guarantee quality standard and reliability."

He added that features like the barcode scanner, which improves data logging and traceability, and the ability for the test results to be networked will be particularly beneficial in future.

The HAL 104 combines the performance of a multi-function production line safety tester with load and power factor measurement for product energy consumption and ratings assessments.

The instrument meets the end of line electrical safety compliance tests required by the majority of national and international product safety standards, including EN 60335, EN 60745 and EN 60598 and others.

As well as load and power functional tests, the new tester incorporates AC/DC Hipot (flash / dielectric strength), insulation, ground/earth bond testing to programmable up to 40A, load switching to 26A with measurement to 20 milliamps and leakage to 100 microAmps.

The new tester has widespread applications in production situations where high resolution performance measurements are important and can be used as a manual stand alone tester with simple push button test activation.

Alternatively, it can be fully integrated into automated manufacturing systems with selectable sensors and enclosure interlocks, or by ultimate control using remote PCs and PLCs.

A large, clear full graphic display presents information either in a numerical or analogue format and a powerful internal memory allows the storage of up to 6,000 test results and up to 50 configurable test routines. The instrument can also be interfaced with a variety of accessories ranging from bar code scanners to pass/fail label printers.

The HAL 104 meets all of the requirements of the various British and European standards in relation to high voltage testing and incorporates fully isolated high voltage outputs to ensure the highest levels of operator safety.

To find out more about the HAL Series please visit www.seaward.co.uk/HALSeries

Test and certification company benefits from Seaward tester's portability

One of the UK's leading test and product certification providers is using the versatile HAL 103 multi-function safety tester from Clare, benefiting from the tester's multi-function capability and portability.

TÜV SÜD undertakes safety testing of electrical items ranging from IT, telecommunications and white goods through to brown goods, laboratory products and medical devices, both in its own laboratories and at manufacturers' premises.

This often involves scheduling testing at short notice anywhere in the country to ensure products comply with relevant safety standards and are safe for use by customers once they leave the factory gate.

Previously, engineers had to use three separate testers to carry out earth bond, insulation resistance and HiPOT (flash) testing.

Now, in a move which has seen TÜV SÜD replace its older, much less portable, testers, the company is using two portable HAL 103 units, which enable its team of 18 engineers to move quickly from site-to-site undertaking three important electrical safety tests using a single portable instrument.

Safety Compliance manager Richard Poate, based at the company's Fareham headquarters, said the Clare HAL 103 is an excellent tester, delivering time-saving benefits.

"The great advantage for us is that the HAL 103 is portable, making it easy to transport to different locations. This enables our engineers to complete test programmes easily and efficiently, while ensuring quality of service is never compromised.

"It's also a very reliable and flexible tester, enabling the operator to simply complete the required tests and accurately record the results all at once, at the press of a button."

The HAL103 meets the requirements of demanding production line, type testing or electronic design applications - performing the complete suite of standard electrical safety tests and allowing full traceability of test results and records via internal data memory storage.

The tester performs earth bond, AC/DC hi pot (flash) and insulation testing to ensure the compatibility of Class II electrical products with technical and performance standards.

Tests can be applied individually or in set automatic sequences for repetitive multi-test routines. Test specifications can be quickly configured into the tester by scanning in pre-defined bar codes making the equipment ideal for ISO traceable systems in QA, conformance and production line applications. These

pre-defined bar codes can be generated directly from the tester on adhesive labels or from proprietary Microsoft PC applications.

The HAL 103 has selectable 50 or 60 Hz output frequencies for flash testing and incorporates a 40A constant current low voltage ground bond test. Other features include a large high contrast bar graph display of the mOhm value from 0 to 1,000 and of the programmed output current in Amps.

Specialist software and a large capacity internal database capable of storing up to 6000 records gives the test instrument the ability to store test details and results against individual equipment serial numbers. Test reports can be downloaded directly to a PC or printer for the generation of complete test data records.

The instrument is fully compatible with the requirements of the EN 50191 standard on test environments.

To find out more about the HAL Series please visit www.seaward.co.uk/HALSeries

Seaward HAL104 shines in testing at industrial lighting company

One of the UK's leading designers and manufacturers of weather and vandal resistant and security lighting has improved electrical safety test standards using the advanced ClareHAL 104 from Seaward.

Designplan, which designs, assembles and distributes a range of linear and bulkhead LED and fluorescent lighting fittings, has been using two HAL 104s on the production lines at its factory in Sutton, Surrey to test upwards of 5,000 lighting control gear tray assemblies each week.

The HAL104s perform a range of tests to ensure compliance with EN 60598 and guarantee product quality, performance and reliability. These include 10A earth continuity; a 500V DC insulation test, which uses a DC test voltage to protect sensitive electronic components during testing, and a 1500v AC flash test if required.

Function testing is also undertaken as part of the test programme to check that each unit switches on/off and lights correctly and that any ancillary equipment works in accordance with technical specifications.

This is enabling Designplan to ensure its products are safe to use after leaving the factory gate and that damage to delicate components is avoided in line with the company's quality assurance programme.

The digital HAL104s, which replaced manually operated test equipment, are fast, high performance automatic instruments which record test results and ensure accurate testing is carried out in line with relevant product standards at all times.

Designplan is seeing strong demand for its products from customers in the public housing, prison, and municipal transport sectors.

So, in a move to further secure product quality and reliability, the company will be introducing a third HAL104 as it gears up for expansion following new investment in the Sutton factory by Swedish parent company, Fagerhult. This will see the unit primarily used for testing tailor-made luminaires for special projects and bespoke systems.

Alan Dack, technical manager at Designplan, said: "The HAL 104 is an excellent instrument, which works extremely well providing fast, accurate and reliable testing.

"We considered a range of instruments but went with the HAL104 because, among many other benefits, it provided function testing – the only one we could find that would do this and meet our specific test requirements.

"Another advantage is that it´s technologically advanced; so its future proof, enabling us to meet unexpected test requirements as we introduce more production line improvements in the coming years.

“Features like the barcode scanner, which improves data logging and traceability, and the ability for the test results to be networked will be particularly beneficial.”

The HAL 104 combines the performance of a multi-function production line safety tester with load and power factor measurement for product energy consumption and ratings assessments.

The instrument meets the end of line electrical safety compliance tests required by the majority of national and international product safety standards, including EN 60335, EN 60745 and EN 60598 and others.

As well as load and power functional tests, the new tester incorporates AC/DC Hipot (flash / dielectric strength), insulation, ground/earth bond testing to programmable up to 40A, load switching to 26A with measurement to 20 milliamps and leakage to 100 microAmps.

The new tester has widespread applications in production situations where high resolution performance measurements are important and can be used as a manual stand alone tester with simple push button test activation.

Alternatively, it can be fully integrated into automated manufacturing systems with selectable sensors and enclosure interlocks, or by ultimate control using remote PCs and PLCs.

A large, clear full graphic display presents information either in a numerical or analogue format and a powerful internal memory allows the storage of up to 6,000 test results and up to 50 configurable test routines. The instrument can also be interfaced with a variety of accessories ranging from bar code scanners to pass/fail label printers.

The HAL 104 meets all of the requirements of the various British and European standards in relation to high voltage testing and incorporates fully isolated high voltage outputs to ensure the highest levels of operator safety.

To find out more about the HAL Series please visit www.seaward.co.uk/HALSeries

Seaward tester tastes success at UK coffee machine producer

The UK's only manufacturer of cappuccino and espresso coffee machines is using the advanced multi-function ClareHAL 104 from Seaward to improve product testing at its West Midlands engineering and manufacturing site.

Fracino is a brand leading manufacturer of stylish and innovative commercial coffee machines for coffee shops, boutique hotels, gastro bars and restaurants. It supplies products to markets around the world and was the first company of its type to achieve the ISO 9001 quality standard.

At its Birmingham facility, newly produced coffee machines are designed and tested for reliability to ensure they operate correctly and to the highest standards of performance and safety.

All products have to be electrically safety tested to ensure they are safe for use by customers once they leave the factory gate. This involves the accurate recording of test results and storing them for quality control and traceability purposes.

So, in a move to improve this process and provide greater flexibility Fracino is now using a ClareHAL 104 on one of its two main production lines.

This forms an integral part of the quality control processes at the factory, which produces over 3000 machines a year, and enables the company to undertake fast and accurate electrical safety and run testing without damaging product.

The ClareHAL 104 is a fast and efficient automatic manufacturing solution, which records test results and enables accurate testing to be carried out in line with relevant product standards at all times.

Fracino's managing director Adrian Maxwell said the ClareHAL 104 is an excellent tester which works well in the company's precision engineering environment.

He added: "The ClareHAL 104 is an important part of our safety testing processes. It is quick and very easy-to-use, enabling production line staff to complete all the required electrical safety tests and record the results at once, at the press of a button."

The ClareHAL 104 combines the performance of a multi-function production line safety tester with load and power factor measurement for product energy consumption and ratings assessments.

The instrument meets the end of line electrical safety compliance tests required by the majority of national and international product safety standards.

As well as load and power functional tests, the new tester incorporates AC/DC Hipot (flash/dielectric strength), Insulation, Ground/Earth bond testing to 40A, Load Switching to 16A with measurement to 20 milliamps and leakage to 100 microAmps.

The new tester has widespread applications in production situations where high resolution performance measurements are important and can be used as a manual stand alone tester with simple push button test activation.

Alternatively, it can be fully integrated into automated manufacturing systems with selectable sensors and enclosure interlocks, or by ultimate control using remote PCs and PLCs.

A large, clear full graphic display presents information either in a numerical or analogue format and a powerful internal memory allows the storage of up to 6,000 test results and up to 50 configurable test routines (expanded furthermore with Safety–eBase Pro). The instrument can also be interfaced with a variety of accessories ranging from bar code scanners to pass/fail label printers.

To find out more about the HAL Series please visit www.seaward.co.uk/HALSeries

Seaward cooks up safety test success at leading catering manufacturer

The standard of electrical safety testing at one of the world's leading producers of commercial catering equipment has been improved thanks to the advanced ClareHAL 104 from Seaward.

Lincat, which designs and produces equipment including ovens, grills and fryers, has introduced two HAL 104s on the production lines at its factory in Lincoln where the Silverlink 600 and Lynx 400 ranges of electric counter-top and free-standing catering units are manufactured.

Upwards of 200 of these units are produced and tested each week for supply to the professional catering sector in the UK and across the world.

The HAL 104s, which are designed for the fast and accurate electrical tests required by modern manufacturing environments, are undertaking pre-programmed single phase testing to ensure compliance with BS EN 60335 and guarantee product quality, performance and reliability.

The instruments have been introduced to provide more uniformed testing - every appliance is now tested for the same length of time and under identical conditions.

This ensures standardisation throughout the test life cycle and with bar-coding provided for improved traceability, any future quality issues can be quickly identified and rectified saving time and costs in the process.

Stephen Kendall, production engineer at Lincat, expects to introduce further HAL 104s in the near future for faster and more accurate safety testing across the entire production process.

He added: "The HAL 104 is an excellent instrument, which works very well providing fast, accurate and reliable testing.

"From a testing perspective, it offers peace-of-mind because it produces standard test results and traceability is an added benefit which contributes to improved after sales support and customer service."

The HAL 104 combines the performance of a multi-function production line safety tester with load and power factor measurement for product energy consumption and ratings assessments.

The instrument meets the end of line electrical safety compliance tests required by the majority of national and international product safety standards.

As well as load and power functional tests, the new tester incorporates AC/DC Hipot (flash / dielectric strength), insulation, ground/earth bond testing to 40A, load switching to 26A with measurement to 20 milliamps and leakage to 100 microAmps.

The new tester has widespread applications in production situations where high resolution performance measurements are important and can be used as a manual stand alone tester with simple push button test activation.

Alternatively, it can be fully integrated into automated manufacturing systems with selectable sensors and enclosure interlocks, or by ultimate control using remote PCs and PLCs.

A large, clear full graphic display presents information either in a numerical or analogue format and a powerful internal memory allows the storage of up to 6,000 test results and up to 50 configurable test routines. The instrument can also be interfaced with a variety of accessories ranging from bar code scanners to pass/fail label printers.

The HAL 104 meets all of the requirements of the various British and European standards in relation to high voltage testing and incorporates fully isolated high voltage outputs to ensure the highest levels of operator safety.

To find out more about the HAL Series please visit www.seaward.co.uk/HALSeries

New HAL range meets all compliance test needs

A new range of electrical safety testers have been developed to help manufacturers of electrical and electronic products comply with all required performance and safety standards.

The new Clare HAL series from Seaward provides a range of dedicated and all in one electrical safety testers that can be used in stand -alone applications or as part of integrated production line systems.

Based on the highly successful HAL Mark 1 range, the extended series now includes five testers to enable users to meet all common international safety standards quickly and effectively.

The new HAL series includes the HAL 101 AC/DC Hipot and DC insulation tester, the HAL 102 Hipot tester with a scanner switching matrix, the HAL 103 combined Hipot, ground bond and insulation tester and the flagship HAL 104 which is a comprehensive electrical safety tester that also provides load, leakage and power factor measurement.

By combining electrical safety and functional testing, the HAL104 is therefore particularly suitable for those production situations where high resolution performance measurements are important such as LED products in low energy lighting applications and PV solar panels.

All instruments in the new HAL range possess a simple user interface and fully isolated outputs to provide complete flexibility and safety of operation.

The testers can be operated manually with the simple push of a front fascia button and also offer an automatic test option with a series of pre-configured test specifications.

In addition, various input and output ports allow test activation to be initiated though selectable sensors and enclosure interlocks or via remote PCs or PLC systems for large automated production systems. The instruments can also be interfaced with a variety of accessories including bar code scanners and label printers.

Each new HAL includes a large clear full graphic display for the presentation of test information in a numerical or analogue format. Because traceability is such an important aspect of all production line procedures, an internal memory allows the storage and downloading of up to 6,000 test results.

By providing a flexible and versatile range of electrical safety testing instrumentation, the new HAL range has been designed to give all electrical and electronic goods manufacturers the levels of control and traceability needed to suit their own test requirements.

To find out more about the HAL Series please visit www.seaward.co.uk/HALSeries