

# HAL:400 Series

Comprehensive multi-function production line Hipot tester



**The HAL:400 Series builds on our class leading HAL series to bring the ultimate production line test solution.**

#### Advanced Production Features

Our history of working closely with our customers has allowed us to ensure we include features that improve your production processes.

The HAL:400 offers part number to test sequence mapping, ensuring the correct test sequence is performed on your products without fail, by simply entering the part number of the

product tested.

Custom test names can be used to clearly identify test points, making sure operators are testing to your exact standards.

Test results can be instantly transferred to a secure cloud based software option, giving instant access to results from anywhere in the world along with key production line metrics, such as Yield (Pass vs. Fail) and test failure indication by reason. An easy transfer to a USB stick also gives quick access to the test results.

#### Key Features:

- > Perfect for any production line testing of electrical equipment
- > Full suite of electrical tests in accordance with worldwide standards including IEC / EN and UL
- > Automatic, manual and remote command modes offer full flexibility for labs, production lines and automated test cells
- > Full test results recording and large on-board memory

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### Touch Screen Interface

We spent many hours with our customers to ensure that we captured the very best way of working, with maximum flexibility.

Our first touch screen interface on a Seaward product has been designed with speed and simplicity in mind. Easily accessible and familiar menus allow you to get straight to the options required.

### Upgradeable

The HAL:400 has been designed to ensure not only can it meet your test requirements but also your budget. Our base unit can be upgraded to add Earth Bond testing, potentially saving thousands of pounds in replacing test equipment that doesn't have the functionality your future needs require.

In addition any HAL:400 can be combined with our Load Leakage Module to add functional test capabilities, such as Power tests.

### Modern Connectivity

The HAL:400 has all the connectivity you could ever need!

Wi-Fi (via optional USB dongle) and Ethernet connections allow test result data to be instantly transferred to cloud software.

USB allows for the quick result transfer to a USB stick as well as for connection of modern peripherals such as Barcode scanners and printers.

Over the air upgrade capabilities mean that we can ensure your unit is running the most up to date firmware, and add features in the future.

Display output even allows for a larger display if required by simply plugging in a compatible monitor.

### Features and Functions

(Subject to change)

- 3 level of instrument user (Operator, Supervisor, Engineer)
- Test Sequencing
- Manual Testing
- PC Remote Command
- External Screen Output
- Template system to aid global changes to test sequences
- Create messages to operators
- Link Part numbers to test sequence for auto test selection
- Transfer results to a secure cloud based software option<sup>1</sup>
- Transfer results to USB stick
- Barcode Scan Functionality<sup>3</sup>
- Print Test Labels<sup>3</sup>
- Remote firmware upgrade

### Future Updates to include

(Subject to change)

- Auto Log out after defined period
- Add a visual failure via matrix
- Simple and Advanced Test Screens
- Display key production line metrics – Throughput<sup>2</sup>
- Clone Instruments
- Performance Dashboard View – Remote<sup>2</sup>
- Display Operational tests in Watts, V/A, Amperes and more<sup>4</sup>

<sup>1</sup> Requires registered account and key

<sup>2</sup> Via cloud software (requires registered account and key)

<sup>3</sup> Requires optional accessories

<sup>4</sup> When used in conjunction with the Load Leakage Module

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### Electrical Test Functions:

- > Continuity
- > Insulation Resistance
- > 50 Hz Hipot
- > 60 Hz Hipot
- > DC Hipot
- > 50 Hz Earth bond<sup>1</sup>
- > 60 Hz Earth bond<sup>1</sup>
- > Power<sup>2</sup>
- > Protective Conductor Current<sup>2</sup>
- > Touch Current<sup>2</sup>

### Technical Specification

#### Continuity Test

Display Range	0.00 Ω ... 9.99 Ω, 10.0 Ω ... 99.9 Ω, 100 Ω ... 999Ω, 1.00 kΩ ... 10 kΩ
Measurement Range	0.00 Ω ... 9.99Ω, 10.0 Ω ... 99.9 Ω, 100 Ω ... 999Ω, 1.00 kΩ ... 9.99 kΩ
Display Resolution	0.01 Ω between 0.00 Ω ... 9.99 Ω 0.1 Ω between 10.0 Ω ... 99.9 Ω 1 Ω between 100 Ω ... 999 Ω 0.01 kΩ between 1.00 kΩ ... 10 kΩ
Measurement Accuracy	±2.5% ±0.05 Ω between 0.00 Ω ... 9.99 Ω ±2.5% ±0.1 Ω between 10.0 Ω ... 99.9 Ω ±2.5% ±1 Ω between 100 Ω ... 999 Ω ±5% ±0.01 kΩ between 1.00 kΩ ... 10 kΩ
Open Circuit Voltage	12 V <sub>DC</sub>
Short Circuit Current	50 mA <sub>DC</sub>

#### Earth Bond Test\*

Display Range	0.000 Ω ... 1.999 Ω
Measurement Range	0.000 Ω ... 1.999 Ω
Display Resolution	0.001 Ω
Measurement Accuracy	±2.5% ±3 mΩ for currents <2 A ±2.5% ±2 mΩ for currents 2 A ... 5 A ±2.5% ±1 mΩ for currents >5 A
Open Circuit Voltage	6 V <sub>AC</sub>
Test Current	1 A ... 40 A User definable (240 W maximum output)

#### Insulation Resistance Test

Display Range	0.10 MΩ ... 9.99 MΩ for voltages 100 V ... 1000 V 0.50 MΩ ... 9.99 MΩ for voltages 1001 V ... 5000 V 10 MΩ ... 999 MΩ for voltages 100 V ... 5000 V 1.00 GΩ ... 50.00 GΩ for voltages 500 V ... 5000 V
Measurement Range	0.50 MΩ ... 9.99 MΩ for voltages 1001 V ... 5000 V 10 MΩ ... 999 MΩ for voltages 100 V ... 5000 V 1.00G Ω ... 50.00 GΩ for voltages 500 V ... 5000 V
Display Resolution	0.01 MΩ for range 0.10 MΩ ... 9.99 MΩ 1 MΩ for range 10 MΩ ... 999 MΩ 10 MΩ for range 1.00 GΩ ... 50.00 GΩ

<sup>1</sup> Earth Bond functionality optional unlock

<sup>2</sup> When used in conjunction with the Load Leakage Module

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### Additional Solutions:

#### Accessories

Our optional optional accessories offer a wide range of valuable additions to your HAL:400.

#### Load Leakage Module (Coming soon)

The Load Leakage Module used in conjunction adds additional functionality such as Touch Current, Protective Conductor Current, and Power tests, perfect for ensuring your product is working as expected prior to shipping.

> HAL:PL1 Load Leakage Module

### Technical Specification (Continued):

Measurement Accuracy	±5% ±0.05 MΩ for range 0.10 MΩ ... 9.99 MΩ ±10% ±5 MΩ for range 10 MΩ ... 999 MΩ ±20% ±50MΩ for range 1.00 GΩ ... 50.00 GΩ
Output Voltage Range	100 V ... 5000 V <sub>DC</sub>
Output Voltage Steps	10 V
Output Voltage Accuracy	±1% ±5 digits
Maximum Output Ripple	5% AC <sub>rms</sub>
Maximum Capacitive Load	2 uF
Maximum Rated Load	50 VA (5 kV @ 10 mA)
Maximum Rated Current	10 mA

#### AC Hipot Test

Display Range	0.001 mA ... 20.000 mA
Measurement Range	0.001 mA ... 20.000 mA
Display Resolution	0.001 mA
Measurement Accuracy	±1% ±10 uA
Output Voltage Range	100 V ... 5000 V <sub>rms</sub>
Output Voltage Steps	10 V
Output Voltage Accuracy	±1% ±5 digits
Output Frequency	50 Hz or 60 Hz
Maximum Rated Load	100 VA (5 kV @ 20 mA)
Maximum Rated Current	20 mA
Arc Detection Sensitivity Level	1...40 / OFF

#### DC Hipot Test

Display Range	0.001 mA ... 10.000 mA
Measurement Range	0.001 mA ... 10.000 mA
Display Resolution	0.001 mA
Measurement Accuracy	±1% ±10 uA
Output Voltage Range	100V ... 6000 V <sub>DC</sub>
Output Voltage Steps	10 V
Output Voltage Accuracy	±1% ±5 digits
Maximum Output Ripple	5% AC <sub>rms</sub>
Maximum Rated Load	60 VA (6 kV @ 10 mA)
Maximum Rated Current	10 mA
Arc Detection Sensitivity Levels	1...40 / OFF

#### Mains Power Supply

Input Voltage Range	90 V <sub>AC</sub> ... 264 V <sub>AC</sub>
Input Frequency Range	50 / 60 Hz
Power Rating (Nominal)	500 W

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### General Specification:

#### Dimensions

Height (h)	160 mm
Width (w)	300 mm
Depth (d)	500 mm
Weight	18 kg

#### Environmental Conditions

Environment	indoors, dry
Overvoltage	Category II 300 V
Pollution degree	2 according to IEC 61010-1
Protective system	IP40 according to IEC 60529
Electromagnetic compatibility (EMC)	Interference immunity and emitted interference conforming to IEC 61326-1, Class B

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### What's in the box?:

- > 1 × HAL:400
- > 1 × Hipot Test Lead Croc Clip Set (2 m)
- > 1 × Earth Bond / Continuity Kelvin Test Lead Set (2 m)
- > Mains Power Leads
- > 1 × Guard Plug
- > 1 × Start / Stop Plug
- > 1 × Quick Start Guide
- > 1 × Calibration Certificate

### Part numbers:

#### Instrument:

HAL:400 without Earth Bond test option	490A910
HAL:400 with Earth Bond test option	490A913

#### Optional Test Modules:

HAL:PLI Load Leakage Module	coming soon
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#### Accessories for Hipot Testing:

Hipot Test Lead Pistol Probe (Red) (2 m)	490A1204
Hipot Test Lead Pistol Probe (Black) (2 m)	490A1205
Hipot Test Lead Pistol Probe (Red) (5 m)	490A1206
Hipot Test Lead Pistol Probe (Black) (5 m)	490A1207
Hipot Test Lead Croc Clip (Black) (5 m)	490A1201
Hipot Test Lead Croc Clip (Red) (5 m)	490A1203
Beacon (red/green)	490A1213
Emergency Stop Button (2 m lead)	490A1233
Palm Switch (2 m lead)	490A1229
Foot switch (2 m lead)	490A1243

#### Optional Test Accessories :

No-burn Earth Bond Probe (2 m)	490A1210
No-burn Earth Bond Probe (5 m)	490A1211
Earth Bond / Continuity Kelvin Test Lead Set (5 m)	490A1209
HAL:400 Output Box UK (1 m)	490A1221
HAL:400 Output Box UK (3 m)	490A1222
HAL:400 Output Box US (1 m)	490A1223
HAL:400 Output Box US (3 m)	490A1224
HAL:400 Output Box SCHUKO (1 m)	490A1239
HAL:400 Output Box SCHUKO (3 m)	490A1240

#### Replacement Accessories :

Hipot Test Lead Croc Clip (Black) (2 m)	490A1200
Hipot Test Lead Croc Clip (Red) (2 m)	490A1202
Earth Bond / Continuity Kelvin Test Lead Set (2 m)	490A1208
Guard Plug	490A1212
Start / Stop Plug	490A1048

#### Productivity Accessories:

Wi-Fi Dongle	490A1247
Barcode Scanner	490A1218
Label Printer	312A916

### Getting the most from your tester:

#### Service and Warranty:

2 year warranty  
(subject to terms and conditions, available at [seaward.com/warranty24](https://seaward.com/warranty24))

#### Service and Calibration:

Keep your HAL:400 in peak condition with one of our service and calibration packages, including on site calibration at a date to suit, saving you lost production time in shipping instruments.

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