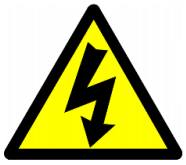
Surge – Sense
User Manual

Revision History

Issue:	Modification	Date:	Modified By:
1.0	First Issue	19/11/2018	N/A
2.0	Added Further Warnings due to Risk Assessment	08/07/2018	PG

Safety Precautions



The Surge - Sense is used to measure high voltage pulses, whilst the equipment is in use, all normal safety precautions associated with the HV generator being verified should be followed. The Surge Sense is for EN61000-4-5 Verification only.

The connections to the Surge – Sense should be made with shrouded test plugs and use a cable suitably rated for the surge being measured (2 kV Maximum Peak Voltage).

Battery replacement should be performed with the Surge – Sense disconnected from the HV test generator.

There are no serviceable parts inside the Surge-Sense, do not attempt to disassemble or repair. In the event of a failure or damage please contact the manufacturer for servicing.

Prior to use, the Surge-Sense should be inspected to ensure there is no damage to the case / connectors or battery compartment. If any damage is visible the Surge-Sense should not be used. Any connecting cables used should be inspected for correct insulation and integrity. Any damaged cables should be replaced before use.

If the Surge-Sense requires cleaning then this should be performed with a damp cloth only ensuring that the outer case is thoroughly dry prior to use

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Contact Details

In the event of an equipment failure, repair or any other general enquiry please use the following contact details, quoting the Generator type and serial number:

The Conformity Assessment Business

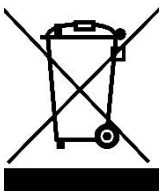
609 Delta Business Park, Welton Road, Swindon, United Kingdom, SN5 7XF

info@conformity-assessment.com

+ 44 (0) 1704 821376

+ 44 (0) 7943 405145

Waste Electrical Equipment (WEE)



The Conformity Assessment Business undertake to accept this equipment at it's end of life for recycling. Please contact us direct to arrange pickup at our cost should the equipment be no longer needed or serviceable.

EU Declaration of Conformity

THE CONFORMITY ASSESSMENT BUSINESS
COMPLIANCE DELIVERED

Declaration of Conformity

For

Surge - Sense

Applicable Directives:

- **Low Voltage Directive: 2014/35/EU**
- **EMC Directive: 2014/30/EU**
- **RHoS Directive: 2011/65/EU**
- **WEE Directive: 2012/19/EU**

Standards used to demonstrate compliance:

EN 61326-1: 2013 Electrical equipment for measurement, control and laboratory use — EMC requirements Part 1: General requirements

EN 61010-1: 2010 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements.

EN 61010-2010: 2014 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-2010: Particular requirements for laboratory equipment for the heating of materials.

We:

The Conformity Assessment Business Ltd.

Registered office address:

609 Delta Business Park, Welton Road, Swindon, United Kingdom, SN5 7XF

Declare that the Surge - Sense Generator meets all applicable Directives, This declaration of conformity is issued under the sole responsibility of the manufacturer:

Signed: 

Date: Monday, 08 July 2019

Peter Green, Director (The Conformity Assessment Business)

Introduction

The Surge-Sense provides a very quick verification of key unloaded waveform parameters for testing to EN61000-4-5. It has been designed to enable a quick but very accurate check of the surge output waveform prior to compliance testing.

The Surge -Sense works by measuring the energy content of the surge waveform. It can do this very accurately with a sensitivity of 10's of volts over several kV. Due to the unique way the waveform is measured, any change in either amplitude or duration will be identified.

Operation

Connection to the Surge Generator

The Surge-Sense has two external connections in-HI (Red connector) and in-LOW (Black connector), in-HI should be connected to the high voltage output of the surge generator and the in-LOW should be connected to the return path.

Example 1: If the surge generator is set to provide a L-E surge then Live should be connected to in-HI and Earth should be connected to in-LOW.

Example 2: If the surge generator is set to provide a N-E surge then Neutral should be connected to in-HI and Earth to in-LOW.

Example 3: If the surge generator is set to provide an EXT surge then Hi out is connected to in-HI and LOW/COM is connected to in-LOW.

The Surge-Sense supports input at mains potential so if the surge generator EUT supply is enabled it won't cause damage. However, this can affect the result by changing the CDN source impedance and also cause false triggering. The Surge-Sense should be used with the EUT mains supply disconnected.

The connections to the Surge – Sense should be made with shrouded test plugs and use a cable suitably rated for the surge being measured (2 kV Maximum Peak Voltage).

Negative going surges can be verified by reversing the connections detailed above.

Power-up

The Surge-Sense is equipped with an automatic power off to help maximise battery life. To power up, press and hold the front push button until the display comes on. The Surge-Sense will automatically power off after a single measurement run.

Measurement

The front display on the Surge-Sense will take the user through a measurement run.

1. Instructs the user to perform a surge
2. Waits for the application of the surge for two minutes
3. Measures the surge and displays the energy content measured
4. If no surge is detected after one minute, then “Fail” will be displayed

Note on Pulse Length:

Pulse length is an arbitrary figure used to determine that the surge amplitude / duration has not changed from the calibration point. This can not be used to set voltage as it is not linear across the full voltage range of measurement.

The energy content measured for a surge is dependant upon it’s amplitude and also it’s duration. It is recommended that when a surge generator is returned from calibration, a benchmark is obtained at various voltage outputs from the CDN and direct from the surge output port as required. Any change in either the amplitude or pulse duration over the calibration period will be picked up by the Surge-Sense.

As the **output duration from a surge generator CDN can vary significantly from generator to generator** and still meet the specification is it difficult to give exact pulse length figures for specific voltage outputs. Typical figures are as follows:

500V = 100-140

1000V = 250-300

2000V = 390-440

A change from the benchmark pulse length of more than approximately 30 from initial check point should be investigated further.

Battery

At power-up the battery voltage is checked and the power-up splash screen displays battery voltage “OK” or “LOW” depending on the measured voltage. When the battery voltage reaches 7V, measurements become inaccurate and at this point the Surge-Sense will display ”Battery Low, Shutting Off” power down and not allow a measurement to take place. The battery must be replaced at this time.

Battery replacement should be performed with the Surge – Sense disconnected from the HV test generator.

Technical Parameters

Surge Detection:

1 to 2 kV EN61000-4-5, 1.2 µs / 50 µs positive going open circuit surge

Measurement of surge applied between L-E or N-E or direct from the surge output. Mains OFF.

Maximum Input Voltage

250 V AC, 50 Hz

2.5 kV 1.2 µs / 50 µs Surge

Power Supply

9V Alkaline PP3

Battery Life, Approximately 200-250 full check cycles