SPS ELECTRONIC
SERIAL DEVICES + ACCESSORIES

THE WHOLE RANGE OF
SAFETY TEST TECHNOLOGY
Welcome to SPS electronic

We are the technology-loving experts for electric testing equipment from the heart of Germany. We develop our products from the conviction to only offer the best quality. In doing so, we have always been oriented towards typical German values, such as reliability, accuracy and perfection – in every area. From product development via customer advice to individual support. In short, with SPS electronic you are always on the safe side.

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Our work – safety testing 360°

At SPS electronic you will find an all in all offer of safety testing technology and everything that goes with it.

For almost 40 years, SPS electronic has designed and produced test technology in the field of electric safety, selling it worldwide. In doing so, our main focus is on providing safety and function testers as well as a wide selection of suitable accessories. Always at the latest state of the art and, of course, in best quality.

But apart from the continuous extension and further development of our product range, we are specialised in developing test and checking systems that are individually tailored to customer requirements. Thus, we also look after implementation apart from planning.

And it goes without saying that this takes place with highest claims. Because no matter what test problem you face – we will always find a solution.

We round off our product range with a reliable full service. This includes, for example, our comprehensive advice prior and after the purchase, the installation as well as the repair of appliances, if necessary. And this even applies when it is a third-party product. Furthermore, we offer worldwide training courses and seminars, covering all topics – from mere product use to safe handling of the test technology.

True German Quality – This is SPS electronic

New building of the headquarters in Schwäbisch Hall on 4,000 m², completion by the end of 2019

Good things can be so close at hand – Our distribution and service center:
SERIAL DEVICES
MULTIFUNCTION SAFETY TESTER

**LG 1805B**

Multifunction tester with safety current limitation. Fully-electronic generators, extended voltage range supply 90 up to 250 V, 50 Hz / 60 Hz.

**Description**

- **High voltage test AC**
  - Voltage range: 100 up to 5,500 V
  - Current range: 0 up to 3 mA
  - Short circuit current: < 3 mA
- **High voltage test DC**
  - Voltage range: 100 up to 6,000 V
  - Current range: 0 up to 10 mA
  - Short circuit current: < 12 mA
  - Residual ripple: < 3 %
- **Insulation measurement DC**
  - Voltage range: 100 up to 6,000 V
  - Measuring range (voltage dependent): 250 kΩ up to 1 GΩ
- **ARC detection**
  - Range: 0 up to 100%
- **Ground bond test**
  - Measuring range: 0 up to 10 Ω
  - Test current AC: 1 up to 30 A
- **Equivalent leakage current test**
  - Measuring range: 0 up to 10 mA
  - Test voltage AC: 50 up to 270 V
- **Continuity test**
  - Measuring range: 0 up to 600 mA
- **Resistance measurement**
  - Measuring range: 0 up to 1,000 Ω
- **Measured variables in function test**
  - Current AC / DC: 0 up to 16 A
  - Voltage AC / DC: 0 up to 300 V
  - Active power: 0 up to 4,000 W
  - Reactive power: 0 up to 4,000 VAR
  - Apparent power: 0 up to 4,000 VA
  - Cos φ: -1 up to +1
- **Subjective tests**
  - Picture step / text step: subjective or informative
- **General Data**
  - Dimensions (HxWxD) and weight:
    - 241 x 380 x 450 mm / approx. 15.0 kg
    - 9.5 x 15.0 x 17.7 in. / approx. 33.1 lbs.
- **Interfaces**
  - Computer interfaces: 2 x USB, RS 232, Ethernet / LAN, CAN
  - Digital interface 24 V DC: 8 input + 8 output
  - Analogue interface 10 V DC: 2 x input + 1 x output
- **Operation**
  - Touch: 10.1"-TFT-colour display

**KT 1886B / KT 1886J**

Multifunction safety tester series KT 1886, plug-in 19” / 5 HU in housing.

**Description**

- **High voltage test AC**
  - Voltage range: 100 up to 5,500 V
  - Current range: 0 up to 3 mA
  - Short circuit current: < 3 mA
  - > 200 mA
- **High voltage test DC**
  - Voltage range: 100 up to 6,000 V
  - Current range: 0 up to 10 mA
  - Short circuit current: < 12 mA
  - Residual ripple: < 3 %
- **Insulation measurement DC**
  - Voltage range: 100 up to 6,000 V
  - Measuring range (voltage dependent): 250 kΩ up to 1 GΩ
- **ARC detection**
  - Range: 0 up to 100%
- **Ground bond test**
  - Measuring range: 0 up to 10 Ω
  - Test current AC: 1 up to 30 A
- **Equivalent leakage current test**
  - Measuring range: 0 up to 10 mA
  - Test voltage AC: 50 up to 270 V
- **Continuity test**
  - Measuring range: 0 up to 600 mA
- **Resistance measurement**
  - Measuring range: 0 up to 1,000 Ω
- **Source function test**
  - Voltage: 50 up to 270 V
  - Frequency: 50 Hz and 60 Hz
  - Power / current: 250 VA / 1 A, 500 VA / 2 A
- **Measured variables in function test**
  - Current AC / DC: 0 up to 16 A
  - Voltage AC / DC: 0 up to 300 V
  - Active power: 0 up to 4,000 W
  - Reactive power: 0 up to 4,000 VAR
  - Apparent power: 0 up to 4,000 VA
  - Cos φ: -1 up to +1
- **Subjective tests**
  - Picture step / text step: subjective or informative
- **General Data**
  - Dimensions (HxWxD) and weight:
    - 222 x 483 x 491 mm / approx. 21.5 kg
    - 8.7 x 19.0 x 19.3 in. / approx. 47.5 lbs.
  - Weight:
    - approx. 27.5 kg / 60.5 lbs.
- **Interfaces**
  - Computer interfaces: 2 x USB, RS 232, Ethernet / LAN, CAN
  - Digital interface 24 V DC: 8 input + 8 output
  - Analogue interface 10 V DC: 2 x input + 1 x output
- **Operation**
  - Touch: 10.1"-TFT-colour display
# MULTIFUNCTION SAFETY TESTER

## KT 1885K

![Safety tester KT 1885K](image1.png)

### Description

Fully automatic safety tester with safety current limitation. Fully-electronic generators, extended voltage range supply 90 V up to 250 V, 50 Hz / 60 Hz.

### High voltage test AC
- **Voltage range**: 100 up to 5,500 V
- **Current range**: 0 up to 3 mA
- **Short circuit current**: < 3 mA

### High voltage test DC
- **Voltage range**: 100 up to 6,000 V
- **Current range**: 0 up to 10 mA
- **Short circuit current**: < 12 mA
- **Residual ripple**: < 3 %

### Insulation measurement DC
- **Voltage range**: 100 up to 6,000 V
- **Measuring range (voltage dependent)**: 250 kΩ up to 1 GΩ

### ARC detection
- **Range**: 0 up to 100 %

### Ground bond test
- **Measuring range**: 0 up to 10 Ω
- **Test current AC**: 1 up to 30 A

### Equivalent leakage current test
- **Measuring range**: 0 up to 10 mA
- **Test current AC**: 50 up to 270 V

### Continuity test
- **Measuring range**: 0 up to 600 mA

### Resistance measurement
- **Measuring range**: 0 up to 1,000 Ω

### Subjective tests
- **Picture step / text step subjective or informative

### General data
- **Dimensions (HxWxD) and weight**: 222 x 483 x 491 mm / approx. 19.0 kg / 8.7 x 19.0 x 19.3 in. / approx. 41.9 lbs.

### Interfaces
- **Computer interfaces**: 2 x USB, RS 232, Ethernet / LAN, CAN
- **Digital interface**: 24 V DC
- **8 input + 8 output
- **Analogue interface**: 10 V DC
- **2 x input + 1 x output

### Operation
- **Touch 10.1"-TFT-colour

## KT 1885L

![Safety tester KT 1885L](image2.png)

### Description

Fully automatic safety tester with 500 VA / 100 mA high voltage test. Potential-free, fully-electronic generators, extended voltage range supply 90 V up to 250 V, 50/60 Hz.

Please note: The KT 1885L generates life-threatening voltages and currents. It is the responsibility of the user (OEM) to ensure the safety requirements according to EN 50191. Without appropriate means of protection the device must not be operated.

### High voltage test AC
- **Voltage range**: 100 up to 5,500 V
- **Current range**: 0 up to 100 mA
- **Short circuit current**: > 200 mA

### High voltage test DC
- **Voltage range**: 100 up to 6,000 V
- **Current range**: 0 up to 100 mA
- **Residual ripple**: < 3 %

### Insulation measurement DC
- **Voltage range**: 100 up to 6,000 V
- **Measuring range (voltage dependent)**: 250 kΩ up to 1 GΩ

### ARC detection
- **Range**: 0 up to 100 %

### Ground bond test
- **Measuring range**: 0 up to 10 Ω
- **Test current AC**: 1 up to 30 A

### Equivalent leakage current test
- **Measuring range**: 0 up to 10 mA
- **Test current AC**: 50 up to 270 V

### Continuity test
- **Measuring range**: 0 up to 600 mA

### Resistance measurement
- **Measuring range**: 0 up to 1,000 Ω

### Subjective tests
- **Picture step / text step subjective or informative

### General data
- **Dimensions (HxWxD) and weight**: 222 x 483 x 491 mm / approx. 25.0 kg / 8.7 x 19.0 x 19.3 in. / approx. 55.1 lbs.

### Mains supply
- **90 up to 250 V, 50 Hz / 60 Hz

### Interfaces
- **Computer interfaces**: 2 x USB, RS 232, Ethernet / LAN, CAN
- **Digital interface**: 24 V DC
- **8 input + 8 output
- **Analogue interface**: 10 V DC
- **2 x input + 1 x output

### Operation
- **Touch 10.1"-TFT-colour
MULTIFUNCTION SAFETY TESTER
S 1800M

Description
Hipot test devices with integrated safety current limitation at DC and AC voltage. With a few exceptions applicable in all global standards. In these devices the protection of the employee is “on-board”, there is no additional safety protection required. The fully electronic safety test device with digital generator generates the programmed constant current according to all test system standards. With the rear connections an almost unlimited application is given in manual test stations and in automatic test systems.

High voltage test AC
Voltage range: 100 up to 5,500 V
Current range: 0 up to 3 mA
Short circuit current: < 3 mA

High voltage test DC
Voltage range: 100 up to 6,000 V
Current range: 0 up to 10 mA
Short circuit current: < 12 mA
Residual ripple: < 3 %

Insulation measurement DC
Voltage range: 100 up to 6,000 V
Measuring range (voltage dependent): 250 kΩ up to 1 GΩ
Residual ripple: < 3 %

Ground bond test
Measuring range: 0 up to 400 mΩ
Test current AC: 10 up to 30 A
Open circuit voltage (OCV): 6 V or 12 V

Subjective tests
Text step: subjective or informative

General data
Threshold values: all programmable
Error message: visual and audible
Ramp function: programmable (EC 601)
Generator: fully electronic, digital technology
Memory: 180 MByte
Additional function: programmable inputs and outputs
Dimensions (HxWxD): 19" / 5 HU:

MULTIFUNCTION SAFETY TESTER
KT 1880B / LG 1800B

Description
Multifunction tester with safety current limitation, high voltage test and insulation test. Potential-free, fully-electronic generators, extended voltage range supply 90 up to 250 V, 50 Hz / 60 Hz.

High voltage test AC
Voltage range: 100 up to 5,500 V
Current range: 0 up to 3 mA
Short circuit current: < 3 mA

High voltage test DC
Voltage range: 100 up to 6,000 V
Current range: 0 up to 10 mA
Short circuit current: < 12 mA
Residual ripple: < 3 %

Insulation measurement DC
Voltage range: 100 up to 6,000 V
Measuring range (voltage dependent): 250 kΩ up to 1 GΩ
Residual ripple: < 3 %

Ground bond test
Measuring range: 0 up to 0.4 Ω
Test current AC: 10 up to 30 A

Equivalent leakage current test
Measuring range: 0 up to 10 mA
Test voltage AC: 100 up to 270 V

Continuity test
Measuring range: 0 up to 600 mA
Function test
Power consumption AC: 4 A (option: 1 A, 10 A or 16 A)
Subjective tests
Text step: subjective or informative

General Data
Dimensions (HxWxD) and weight plug-in 19" / 5 HU:
KT 1880B: 222 x 483 x 491 mm / approx. 20.0 kg
8.7 x 19.0 x 19.3 in. / approx. 44.1 lbs.
LG 1800B: 233 x 380 x 450 mm / approx. 13.5 kg
9.2 x 15.0 x 17.7 in. / approx. 29.8 lbs.
Mains supply: 90 up to 250 V, 50 Hz / 60 Hz

Interfaces
Computer interfaces: 2 x USB, RS 232, Ethernet / LAN
Digital interfaces: 24 V DC
8 input + 8 output

Operation
Keypad for input
4.3”-TFT colour display
**Description**

Hipot test devices with integrated safety current limitation at DC and AC voltage. With a few exceptions applicable in all global standards. In these devices the protection of the employee is “on-board”, there is no additional safety protection required.

**High voltage test AC**

- Voltage range: 100 up to 5,500 V
- Current range: 0 up to 3 mA
- Short circuit current: < 3 mA

**High voltage test DC**

- Voltage range: 100 up to 6,000 V
- Current range: 0 up to 10 mA
- Short circuit current: < 12 mA
- Residual ripple: < 3 %

**Insulation measurement DC**

- Voltage range: 100 up to 6,000 V
- Measuring range (voltage dependent): 250 kΩ up to 1 GΩ
- Residual ripple: < 3 %

**ARC detection**

- Range: 0 up to 100%

**Subjective tests**

- Picture step / test step subjective or informative

**General data**

- Threshold values: all programmable
- Error message: visual and audible
- Clock / calendar: internal
- Ramp function: programmable (IEC 601)
- Generator: fully electronic, digital technology
- Memory: up to 64 Gbyte
- Additional function: programmable inputs and outputs
- Dimensions (HxWxD) and weight: 222 x 483 x 487 mm / approx. 24.0 kg
- Mains supply: 90 up to 250 V, 50 Hz / 60 Hz

**Interfaces**

- Computer interfaces: USB, RS 232, Ethernet / LAN, CAN
- Digital interface 24 V DC: 8 input + 8 output
- Analogue interfaces 10 V DC: 2 x input + 1 x output

**Operation**

- Touch: 10.1”-TFT colour display
### HIPOT TESTER
#### HA 1885J
![Hipot device HA 1885J](image)

**Description**
- Hipot tester with a fully electronic high voltage source up to 500 VA power. This performance and a short circuit current > 200 mA is required by global standards and is met by these devices. The in Europe required standards for work station safety at test stations of more than 1,000 V such as safety control panels and potential-free high voltage are also met. Thereby a global use in the test bay, in production and in the laboratory is possible.

#### High voltage test AC
- **Voltage range**: 100 up to 5,500 V
- **Current range**: 0 up to 100 mA
- **Short circuit current**: > 200 mA

#### High voltage test DC
- **Voltage range**: 100 up to 6,000 V
- **Current range**: 0 up to 50 mA
- **Residual ripple**: < 3 %

#### Insulation measurement DC
- **Voltage range**: 100 up to 6,000 V
- **Measuring range (voltage dependent)**: 250 kΩ up to 1 GΩ
- **Residual ripple**: < 3 %

#### ARC detection
- **Range**: 0 up to 100 %

#### Subjective tests
- **Picture step / test step**: subjective or informative

#### General data
- **Safety power panel**: built-in
- **Threshold values**: all programmable
- **Error message**: visual and audible
- **Clock / calendar**: internal
- **Ramp function**: programmable (IEC 601)
- **Generator**: fully electronic, digital technology
- **Memory**: up to 64 Gbyte
- **Additional function**: programmable inputs and outputs
- **Dimensions (HxWxD) and weight**: 222 x 483 x 487 mm / ca. 24.0 kg
- **Mains supply**: 90 up to 250 V, 50 Hz / 60 Hz

#### Interfaces
- **Computer interfaces**: USB, RS 232, Ethernet / LAN
- **Digital interface 24 V DC**: 8 input + 8 output
- **Analogue interfaces 10 V DC**: 2 x input + 1 x output

#### Operation
- **Touch**: 10.1"-TFT colour display

### HIPOT TESTER
#### HA 1800M
![Hipot device HA 1800M](image)

**Description**
- Hipot test devices with integrated safety current limitation at DC and AC voltage. With a few exceptions applicable in all global standards. In these devices the protection of the employee is “on-board”, there is no additional safety protection required.

#### High voltage test AC
- **Voltage range**: 100 up to 5,500 V
- **Current range**: 0 up to 3 mA
- **Short circuit current**: < 3 mA

#### High voltage test DC
- **Voltage range**: 100 up to 6,000 V
- **Current range**: 0 up to 10 mA
- **Short circuit current**: < 12 mA
- **Residual ripple**: < 3 %

#### Insulation measurement DC
- **Voltage range**: 100 up to 6,000 V
- **Measuring range (voltage dependent)**: 250 kΩ up to 1 GΩ
- **Residual ripple**: < 3 %

#### Subjective tests
- **Test step**: subjective or informative

#### General data
- **Threshold values**: all programmable
- **Error message**: visual and audible
- **Ramp function**: programmable (IEC 601)
- **Generator**: fully electronic, digital technology
- **Memory**: 180 MByte
- **Additional function**: programmable inputs and outputs
- **Dimensions (HxWxD) and weight**: 159 x 360 x 331 mm / approx. 10.0 kg
- **6.3 x 14.2 x 13.0 in. / approx. 22.0 lbs.
- **Mains supply**: 90 up to 250 V, 50 Hz / 60 Hz

#### Interfaces
- **Computer interfaces**: 2 x USB, RS 232, Ethernet / LAN
- **Digital interface 24 V DC**: 8 input + 8 output

#### Operation
- **Keypad for input**: 4.3"-TFT colour display
### HIPOT TESTER

#### HA 1800B / HA 1880B

**Description**

Hipot test devices with integrated safety current limitation at DC and AC voltage. With a few exceptions applicable in all global standards. In these devices the protection of the employee is „on-board“, there is no additional safety protection required.

**High voltage test AC**

- Voltage range: 100 up to 5,500 V
- Current range: 0 up to 3 mA
- Short circuit current: < 3 mA

**High voltage test DC**

- Voltage range: 100 up to 6,000 V
- Current range: 0 up to 10 mA
- Short circuit current: < 12 mA
- Residual ripple: < 3 %

**Insulation measurement DC**

- Voltage range: 100 up to 6,000 V
- Measuring range (voltage dependent): 250 kΩ up to 1 GΩ
- Residual ripple: < 3 %

**Subjective tests**

- Threshold values: all programmable
- Error message: visual and audible
- Ramp function: programmable (EC 601)
- Generator: fully electronic, digital technology
- Memory: 180 MByte
- Additional function: programmable inputs and outputs
- Dimensions (HxWxD) and weight plug-in 19” / 5 HU:
  - HA 1880B: 22 x 483 x 483 mm / approx. 17.0 kg
  - HA 1800B: 8.7 x 19.0 x 19.0 in. / approx. 37.5 lbs.

**Operating modes**

- Testing (t) testing with time base up to 60 s
- Testing static testing
- Burn fault finding with 150 mA

**General data**

- Safety power panel: built-in
- Threshold values: release current adjustable from 10 to 100%
- Voltage: manually selectable via control knob
- Error message: visual and audible
- Measurement voltage: on the primary side
- Measurement current: on the secondary side
- Dimensions (HxWxD) and weight: 159 x 360 x 335 mm / approx. 18.5 kg
  
  6.3 x 14.2 x 13.2 in. / approx. 40.8 lbs.
- Mains supply: 230 V / 50 Hz, Option: 115 V / 60 Hz
- Interfaces:
  - Waring lamp set external connection 230 V
  - Foot switch / remote control potential-free contact
- Measuring instruments:
  - Voltage: analogue, class 1.5
  - Current: analogue, class 1.5

**Interfaces**

- Computer interfaces: 2 x USB, RS 232, Ethernet / LAN, CAN
- Digital interface: 8 input + 8 output
- Operation: Keypad for input 4.3”-TFT colour display

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### HIPOT TESTER

#### HA 3600D

**Description**

Hipot tester with a fully electronic high voltage source up to 500 VA power. This performance and a short circuit current > 200 mA is required by global standards and is met by these devices. The in Europe required standards for work station safety at test stations of more than 1,000 V such as safety control panels and potential-free high voltage are also met. Thereby a global use in the test bay, in production and in the laboratory is possible.

**High voltage test AC**

- Voltage range: 2,500 V / 0 up to 2,500 V
- Voltage range: 5,000 V / 0 up to 5,000 V
- Current range: 0 up to 100 mA
- Short circuit current: > 200 mA

**Operating modes**

- Testing (t) testing with time base up to 60 s
- Testing static testing
- Burn fault finding with 150 mA

**General data**

- Safety power panel: built-in
- Threshold values: release current adjustable from 10 to 100%
- Voltage: manually selectable via control knob
- Error message: visual and audible
- Measurement voltage: on the primary side
- Measurement current: on the secondary side
- Dimensions (HxWxD) and weight: 159 x 360 x 335 mm / approx. 18.5 kg
  
  6.3 x 14.2 x 13.2 in. / approx. 40.8 lbs.
- Mains supply: 230 V / 50 Hz, Option: 115 V / 60 Hz
- Interfaces:
  - Waring lamp set external connection 230 V
  - Foot switch / remote control potential-free contact
- Measuring instruments:
  - Voltage: analogue, class 1.5
  - Current: analogue, class 1.5

**Interfaces**

- Computer interfaces: 2 x USB, RS 232, Ethernet / LAN, CAN
- Digital interface: 8 input + 8 output
- Operation: Keypad for input 4.3”-TFT colour display
**PARTIAL DISCHARGE TESTER**

**PD 4000B**

The two channel partial discharge tester is the best choice for production or use in the laboratory. Both in the surge test and in the high voltage test, the devices can be used with three different active sensors. Two sensors can be used at the same time. Therefore, even under difficult conditions, e.g. in an industrial environment, reproducible measurements are ensured.

**Input HF**
- **Channel / Sensor A**: TNC socket, 50 Ω impedance, ± 20 V peak max.
- **Channel / Sensor B**: TNC socket, 50 Ω impedance, ± 20 V peak max., or switchable to 1 MΩ, 15 pF for external voltage divider.

**Measurement HF**
- **Frequency range**: 1 up to 2 GHz broadband
- **Sensitivity**: approx. -90 up to -30 dBm
- **Damping in the stop band**: 120 dB
- **Time basis**: 1 ns (1 GS/s)
- **Rise time**: 3.5 ns
- **Memory**: 256 MS

**Input HV**
- **Voltage measurement**: 5,500 V AC / 6,000 V DC
- **Input impedance**: 2 x 90 MΩ against earth, potential free
- **Differential probe**: abs. max. 16 kV peak, < 100 Hz

**External trigger**
- ± 5 V peak max.

**Automatic evaluation**
- Limit value partial discharge
- Limit value partial discharge with phase
- PDIV inception voltage
- PDEV extinction voltage
- Norm pulse according to IEC TS 61934
- Double impulse

**General data**
- **Error message**: optical
- **PC-Software**: DAT
- **Dimensions (HxWxD) and weight**: 222 x 483 x 491 mm / approx. 12 kg, 8.7 x 19.0 x 19.3 in. / approx. 26 lbs
- **Mains supply**: 115 V / 230 V, 50 Hz / 60 Hz
- **Interfaces**: Computer interfaces, USB, Ethernet / LAN, RS 232
- **Operation**: Touch, 10.1" colour display

**SURGE TESTER**

**ST 4000B**

Winding goods like stators, coils or transformers can be examined precisely and comfortably with the surge tester ST 4000B. Thus, winding shorts and insulation faults inside a winding can be recognised even before the fault has an effect on the DUT. This avoids breakdowns of electric motors and any related call-backs.

**Surge test**
- **Voltage**: 100 up to 6,000 V
- **Surge capacity**: 100 / 200 μA

**High voltage test AC**
- **Voltage range**: 100 up to 6,000 V / 10 mA
- **Insulation measurement DC**: Measuring range 100 up to 6,000 V / 100 GΩ / kV
- **Resistance measurement**: Measuring range 20 mΩ – 200 kΩ up to 1 A

**Sense of rotation sensor**
- HS 85 / HS 75

**Internal matrix**
- 3 Phase + PE, 4 wire

**Partial discharge**
- Active, microwave antenna 1.57 GHz
- Active, inductive antenna 400 MHz

**Automatic evaluation**
- Limit value PD
- Limit value PD with phase
- PDIV inception voltage
- PDEV extinction voltage
- **Norm pulse according to IEC TS 61934**
- Double impulse

**General data**
- **Error message**: visual
- **PC-Software**: DAT
- **Dimensions (HxWxD) and weight**: 222 x 483 x 491 mm / approx. 12 kg, 8.7 x 19.0 x 19.3 in. / approx. 26 lbs
- **Mains supply**: 115 V / 230 V, 50 Hz / 60 Hz
- **Interfaces**: Computer interfaces, USB, Ethernet / LAN
- **Operation**: Touch, 10.1" colour display
## Description

Small but extremely powerful desktop device. Developed for quality assurance in production of winding goods. But also for application in laboratories, development and repair meets the surge tester ST 1800B the requirements. With the PC software available as an accessory all test data and test results can be comfortably stored. The surge test is the only option to recognize winding short circuits and insulation faults within a winding even before the fault affects the electrical specifications of the DUT. There is no other test method which detects if the DUT has previous damages and this results in a failure. By quickly applying a charged capacitor to the winding to be tested the stored energy of the capacitor is discharged in the inductance. This results in a sinusoidal, damped oscillation. The frequency and the amplitude are typical for the DUT. With the evaluation of partial discharges the insulation quality of the winding can be tested. This is particularly important if the winding good is controlled by electronic inverters.

### Surge test

- **Voltage range**: 200 up to 5,000 V
- **Surge energy**: max. 0.05 J
- **DUT inductance**: > 10 µH

### Evaluation process

- **Defective area**
- **Differential area**
- **Corona energy**
- **Corona number**

### Computer technology

- **Sampling rate**: 100 MHz
- **Resolution**: 8 Bit / 10 ns
- **Memory depth**: 6 kByte
- **Master curves**: 360 pieces
- **Time base**: 250 ns to 250 µs

### General Data

- **Error message**: visual and audible
- **PC software**: DAT
- **Dimensions (HxWxD) and weight**: 163 x 315 x 186 mm / approx. 5.5 kg
- **Mains supply**: 115 V / 230 V, 50 Hz / 60 Hz

### Interfaces

- **Computer interfaces**: USB, RS 232
- **Digital interface**: 5 V / TTL
  - 3 input + 3 output

### Operation

- **Keyboard**
- **5.6”-LCD colour display**

---

## Description

The surge test is the only option to recognize winding short circuits and insulation faults within a winding already before the fault affects the electrical specifications of the DUT. There is no other test method which detects if the DUT has previous damages and this results in a failure. By quickly applying a charged capacitor to the winding to be tested the stored energy of the capacitor is discharged in the inductance. This results in a sinusoidal, damped oscillation. The frequency and the amplitude are typical for the DUT. With the evaluation of partial discharges the insulation quality of the winding can be tested. This is particularly important if the winding good is controlled by electronic inverters.

### Surge test

- **Voltage**: 6,000 V
- **Surge capacity**: 40 nF
- **DUT inductance**: > 10 µH

### Evaluation process

- **Defective area**
- **Differential area**
- **Corona**

### Computer technology

- **Sampling rate**: 100 MHz
- **Resolution**: 8 Bit / 1 ns
- **Memory depth**: 256 MByte
- **Master curves**: unlimited
- **Time base**: 10 µs up to 100 ms

### General data

- **Error message**: visual and audible
- **PC software**: DAT
- **Software interface**: DLL

### Dimensions (HxWxD) and weight

- **Dimensions**: 133 x 483 x 489 mm
- **Weight**: approx. 17.5 kg

### Mains supply

- **Supply**: 115 up to 240 V, 50 Hz / 60 Hz

### Interfaces

- **Computer interfaces**: USB, RS 232, Ethernet / LAN

### Operation

- **Remote control via separate PC**
GROUND BOND TESTER
P 1800D

Ground bond test device P 1800D
desktop 14" / 3 HU

Description
The fully electronic ground bond test device with digital generator generates the programmed constant current according to all test system standards. With front and rear connections an almost unlimited application is given in manual test stations and in automatic test systems.

Ground bond test
- Measuring range: 0 up to 400 mΩ
- Test current AC: 10 up to 30 A
- Open circuit voltage (OCV): 6 V or 12 V

Continuity test
- Measuring range: 0 up to 600 mA

Technology
- Fully electronic, digital generator
- Due to dynamic memory management unlimited number of test programmes storable
- For the front panel sockets for all country standards are available
- All parameters are freely programmable
- Time base 0.1 to 999.9 s
- Auto start function
- Internal clock / calendar

Subjective tests
- Text style: subjective or informative

General data
- Dimensions (HxWxD) and weight: 159 x 360 x 328 mm / approx. 7.0 kg
  6.3 x 14.2 x 12.9 in. / approx. 15.4 lbs.
- Mains supply: 90 up to 250 V, 50 Hz / 60 Hz

Interfaces
- Computer interfaces: 2 x USB, RS 232, Ethernet / LAN
- Digital interface 24 V DC: 8 input + 8 output

Operation
- Membrane keyboard
- 4.3"-TFT colour display
RELAYS
**RELAYS**

**RL 42-I / RL 42 / RL 21**

- High voltage relay RL 42-l, up to 5,000 V, low current
- High voltage relay RL 42, up to 5,000 V
- High voltage relay RL 21, up to 5,000 V

<table>
<thead>
<tr>
<th>Contacts</th>
<th>RL 42-I</th>
<th>RL 42</th>
<th>RL 21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field coil</td>
<td>double pole double throw</td>
<td>single pole double throw</td>
<td></td>
</tr>
<tr>
<td>Coil voltage</td>
<td>24 V DC (10 – 40 °C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Holding current</td>
<td>0.07 A (20 °C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial current (1st 100 ms)</td>
<td>0.25 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Status indication</td>
<td>LED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connections</td>
<td>Switching circuits flat plug 6.3 mm (0.25 in.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Field coil flat plug 4.8 mm (0.19 in.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switching voltage / capacity</td>
<td>For applications up to 5,000 V AC / max. 5,000 VA (ohmic load)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test voltage</td>
<td>20,000 V DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact / contact</td>
<td>8,000 V DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isolating voltage</td>
<td>5,000 V AC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switching current</td>
<td>max. 10 A AC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous current</td>
<td>max. 30 A AC / DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transition resistance</td>
<td>&lt; 30 mΩ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switching frequency</td>
<td>max. 3 / s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical switching cycles</td>
<td>&gt; 1 x 10⁶</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>10 – 55 Hz/g</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock strength</td>
<td>g – 11 ms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carrier material</td>
<td>PBT GF30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection system</td>
<td>IP 20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**RELAYS**

**MOUNTING CLIP MC 22**

To ensure the correct installation of SPS electronic high voltage relays the MC 22 mounting clip was developed. The sturdy polycarbonate mounting clip guarantees an easy and space-saving fastening of the high voltage relays RL 21, RL 42 and RL 42-l on a 35 mm DIN rail. The mounting clips can also be easily dismantled for any maintenance work that may be required.

**RELAYS**

**CONTACT PROTECTION DK 21**

The contact protection ensures the safety of your employees while handling voltage-carrying conductors. It was developed by SPS electronic to provide protection against accidental contact. This, according to relevant safety regulations necessary protection, can be attached to preexisting relays and removed just as easy. There are no additional modifications required. By using transparent materials the switching state of the relays can be observed during operation.
**RELAYS**

**RL 38-H / RL 42-H**

**Description**
Electromechanical relays for practical and robust application in system and switch cabinet manufacturing. Monostable DC relay with proven technology and almost unlimited life.

<table>
<thead>
<tr>
<th>Specifications</th>
<th>RL 38-h</th>
<th>RL 42-h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contacts</td>
<td>double pole single throw</td>
<td>double pole double throw</td>
</tr>
<tr>
<td>Field coil</td>
<td>Coil voltage 24 V DC (10 – 40 °C)</td>
<td>Coil voltage 24 V DC (10 – 40 °C)</td>
</tr>
<tr>
<td></td>
<td>Coil current 0,25 A (20 °C)</td>
<td>Coil current 0,25 A (20 °C)</td>
</tr>
<tr>
<td>Coil resistance</td>
<td>115 Ω (20 °C)</td>
<td>115 Ω (20 °C)</td>
</tr>
<tr>
<td>Connections</td>
<td>Free cable ends, 2 m (6.6 ft.) long</td>
<td>Free cable ends, 2 m (6.6 ft.) long</td>
</tr>
<tr>
<td>Switching voltage / capacity</td>
<td>For applications up to 10,000 V AC / max. 10,000 VA (ohmic load)</td>
<td>For applications up to 10,000 V AC / max. 10,000 VA (ohmic load)</td>
</tr>
<tr>
<td>Test voltage</td>
<td>Contact / field coil 25,000 V DC</td>
<td>Contact / field coil 25,000 V DC</td>
</tr>
<tr>
<td></td>
<td>Contact / contact 25,000 V DC</td>
<td>Contact / contact 25,000 V DC</td>
</tr>
<tr>
<td></td>
<td>Isolating voltage 10,000 V AC</td>
<td>Isolating voltage 10,000 V AC</td>
</tr>
<tr>
<td>Switching current</td>
<td>max. 10 A AC</td>
<td>max. 10 A AC</td>
</tr>
<tr>
<td>Continuous current</td>
<td>max. 30 A AC / DC</td>
<td>max. 30 A AC / DC</td>
</tr>
<tr>
<td>Transition resistance</td>
<td>&lt; 30 ms</td>
<td>&lt; 30 ms</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>max. 3 / s</td>
<td>max. 3 / s</td>
</tr>
<tr>
<td>Mechanical switching cycles</td>
<td>&gt; 1 x 10⁶</td>
<td>&gt; 1 x 10⁶</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>10 – 55 Hz/g</td>
<td>10 – 55 Hz/g</td>
</tr>
<tr>
<td>Shock strength</td>
<td>g – 11ms</td>
<td>g – 11ms</td>
</tr>
<tr>
<td>Carrier material</td>
<td>PBT GF30</td>
<td>PBT GF30</td>
</tr>
<tr>
<td>Protection system</td>
<td>IP 20</td>
<td>IP 20</td>
</tr>
<tr>
<td>General data</td>
<td>Dimensions (mm x W x D) 125 x 120 x 120 mm / approx. 2,000 g</td>
<td>Dimensions (mm x W x D) 125 x 120 x 120 mm / approx. 2,000 g</td>
</tr>
<tr>
<td></td>
<td>and weight: 4.9 x 4.7 x 4.7 in. / approx. 4.4 lbs.</td>
<td>and weight: 4.9 x 4.7 x 4.7 in. / approx. 4.4 lbs.</td>
</tr>
<tr>
<td>Storage / Operation temp.</td>
<td>-25 up to +40 °C / +10 up to +40 °C</td>
<td>-25 up to +40 °C / +10 up to +40 °C</td>
</tr>
<tr>
<td>Fastening</td>
<td>4-hole-mounting panel</td>
<td>4-hole-mounting panel</td>
</tr>
</tbody>
</table>

**Description**
Electromechanical relays for practical and robust application in system and switch cabinet manufacturing. Monostable DC relay with proven technology and almost unlimited life.

**Contacts**
- Double pole single throw
- Double pole double throw

**Field coil**
- Coil voltage: 24 V DC (10 – 40 °C)
- Coil current: 0.25 A (20 °C)

**Coil resistance**
- 115 Ω (20 °C)

**Connections**
- Free cable ends, 2 m (6.6 ft.) long

**Switching voltage / capacity**
- For applications up to 10,000 V AC / max. 10,000 VA (ohmic load)

**Test voltage**
- Contact / field coil: 25,000 V DC
- Contact / contact: 25,000 V DC
- Isolating voltage: 10,000 V AC

**Switching current**
- Max.: 10 A AC

**Continuous current**
- Max.: 30 A AC / DC

**Transition resistance**
- < 30 ms

**Switching frequency**
- Max.: 3 / s

**Mechanical switching cycles**
- > 1 x 10⁶

**Vibration resistance**
- 10 – 55 Hz/g

**Shock strength**
- g – 11ms

**Carrier material**
- PBT GF30

**Protection system**
- IP 20

**General data**
- Dimensions (mm x W x D): 125 x 120 x 120 mm / approx. 2,000 g
- Weight: 4.9 x 4.7 x 4.7 in. / approx. 4.4 lbs.

**Storage / Operation temp.**
- -25 up to +40 °C / +10 up to +40 °C

**Fastening**
- 4-hole-mounting panel
SOFTWARE
SOFTWARE

DAT

Description
On the basis of many years of experience and at the request of many customers SPS electronic developed its own basic software. This is continuously improved by internal software developers and is therefore always up-to-date. In addition the experiences of a variety of customer-specific projects are included in the remote control software. You have any special requirements? Just let us know - we are happy to consider this in an especially for you programmed application software. Combined with your ERP (enterprise resource planning) system we guarantee standardized tests and a simple and clear management of the test results with assignment to each one of your products.

Structure
Operating System Windows
Operation Intuitive and easy, freely programmable
Connection Network-compatible
User levels Password protected user hierarchy
Barcode filter Article number, device, serial number, note
Remote control via Ethernet, USB, RS 232
Languages German, English, French, Italian, Dutch, Czech, Polish, Turkish, Chinese, Spanish, Hungarian, Russian.

1. Creation and parameter setting

In editor mode intuitively different test programmes can be created which can be adapted flexibly in regard to the desired test methods and the cycle time:

- Easy creation of complex test sequences using the mouse and keyboard
- Free configuration of test sequence within the programmes
- Clear presentation of the programmed test methods, such as e.g.: continuity test, ground bond test, high voltage test etc.
- Storage of any number of programmes on the hard disk or in the network: XML format, ACCESS format, SQL format
- Password protection

2. Testing

After defining the requested test sequence the test procedure can be started:

- Complete and easy parameter setting of the individual test methods - e.g. with the high voltage test: test time, ramp time, test voltage, release current, etc.
- Via programme branches can - depending on the result of the test step - the continuing test sequence be controlled
- Text and picture view steps to guide the test personnel or query additional information
3. Results

- In the »TEST« module the selected procedure of the current test programme is shown.
- The results are displayed in the current test step and the progress of the executed steps is indicated.
- A manual single step mode facilitates the error search in complex tests.
- Large PASS/FAIL signaling.
- The results can be easily evaluated, stored and processed:
  - In order to allow traceability of the tests the test results are stored together with the measured values in the XML, ACCESS or SQL format.
  - Thus there is nothing that could interfere with the simple processing in external programmes.
  - Statistics function with extensive criteria selection.
  - Full-text search.
  - The test protocols can be printed or saved as PDF.
DUT ENCLOSURES

Overview

Versions

<table>
<thead>
<tr>
<th>Design types</th>
<th>Specialty</th>
<th>Max. dimensions of DUT (HxWxD) in mm (in.)</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple DUT enclosure</td>
<td>Device compartment 19” / 5 HU</td>
<td>180 x 410 x 350 (7.1 x 16.1 x 13.8)</td>
<td>HB 2100A</td>
</tr>
<tr>
<td>Simple DUT enclosure</td>
<td>Standard</td>
<td>200 x 500 x 350 (7.9 x 19.7 x 13.8)</td>
<td>HB 3400A</td>
</tr>
<tr>
<td>Extra wide DUT enclosure</td>
<td>Device compartment 19” / 5 HU</td>
<td>350 x 580 x 700 (13.8 x 22.8 x 27.6)</td>
<td>HB 5000A</td>
</tr>
<tr>
<td>Extra wide DUT enclosure</td>
<td>Double width, device compartment 2 x 19” / 4 HU</td>
<td>300 x 700 x 400 (11.8 x 27.6 x 15.7)</td>
<td>HB 6000A</td>
</tr>
<tr>
<td>Tandem DUT enclosure</td>
<td>Sliding hood, device compartment 2 x 19” / 3 HU</td>
<td>400 x 588 x 580 (15.7 x 22.4 x 22.8)</td>
<td>TK 6000A</td>
</tr>
<tr>
<td>DUT enclosure with trapdoor</td>
<td>Trapdoor</td>
<td>755 x 600 x 640 (29.7 x 23.6 x 25.2)</td>
<td>FK 1000A</td>
</tr>
<tr>
<td>DUT enclosure with light curtain</td>
<td>Light curtain on one side</td>
<td>790 x 640 x 680 (31.1 x 25.2 x 26.8)</td>
<td>PK 2000A</td>
</tr>
<tr>
<td>DUT enclosure with light curtain</td>
<td>Double width, displaced foot space</td>
<td>940 x 1,990 x 915 (37.0 x 74.4 x 36.4)</td>
<td>PK 6500A</td>
</tr>
</tbody>
</table>

DUT ENCLOSURE

HB 2100A (WITH DEVICE COMPARTMENT)

Simple DUT enclosure with swivelling acrylic glass hood for small quantities and low weight DUT.

- Housing made of PVC (colour: RAL 7011)
- Swivelling acrylic glass hood with damper cylinder
- Safety switch with positive opening or optional positively driven safety interlock type AZM 161
- External dimensions (HxWxD): 725 x 500 x 800 mm / maximum DUT dimensions (HxWxD): 180 x 410 x 350 mm
- Setup CE-compliant (European regulation)

DUT ENCLOSURE

HB 3400A (STANDARD)

Simple DUT enclosure with swivelling acrylic glass hood for small quantities and low weight DUT.

- Housing made of PVC (colour: RAL 7011)
- Swivelling acrylic glass hood with damper cylinder
- Forcibly guided safety switch or optional positively driven safety interlock type AZM 161
- External dimensions (HxWxD): 370 x 590 x 780 mm / maximum DUT dimensions (HxWxD): 200 x 500 x 350 mm
- Setup CE-compliant (European regulation)

DUT ENCLOSURE

HB 5000A (WITH DEVICE COMPARTMENT)

The extra wide DUT enclosures with swivelling acrylic glass hoods are suitable for small quantities and high weight DUT.

- Housing made of PVC (colour: RAL 7011) with device compartment 19” / 5 HU to house the test device
- Swivelling acrylic glass hood with damper cylinder
- Forcibly guided safety switch or optional positively driven safety interlock type AZM 161 (device compartment 4 HU)
- External dimensions (HxWxD): 1,050 x 680 x 1,100 mm / maximum DUT dimensions (HxWxD): 350 x 580 x 700 mm
- Setup CE-compliant (European regulation)
DUT ENCLOSURE
HB 6000A (DOUBLE WIDTH)

The extra wide DUT enclosures with swivelling acrylic glass hoods are suitable for small quantities and high weight DUT.

- Housing made of PVC (colour: RAL 7011) with device compartment 2 x 19” / 4 HU to house the test devices
- Swivelling acrylic glass hood with damper cylinder
- Safety switch with positive opening
- External dimensions (HxD): 900 x 1,200 x 880 mm / maximum DUT dimensions (HxD): 300 x 700 x 400 mm
- Setup CE-compliant (European regulation)

DUT ENCLOSURE
FK 1000A (WITH TRAPDOOR)

DUT enclosure with a trapdoor are particularly suitable for the ergonomic testing of large numbers of DUT and those with a high weight.

- Setup made of aluminium profile 40 x 40 mm
- Fully insulated test room made of PVC (colour: RAL 7011), casing made of Pertinax (colour: RAL 7035)
- Pneumatically moving trap door made of polycarbonate (PC) with safety edge
- Positively driven safety limit switch
- External dimensions (HxD): 2,020 x 963 x 855 mm / internal dimensions (HxD): 755 x 800 x 640 mm

DUT ENCLOSURE
TK 6000A (TANDEM)

Tandem DUT enclosures are particularly suitable for high quantities and test DUT with similar testing and handling time.

- Housing made of PVC (colour: RAL 7011) with device compartment 2 x 19” / 3 HU to house the test devices
- Movable acrylic glass hood
- Positively driven safety switch for each test station
- External dimensions (HxD): 740 x 1,200 x 910 mm / internal dimensions (HxD): 400 x 568 x 580 mm
DUT ENCLOSURE
PK 2000A (LIGHT CURTAIN)

Due to their simple and convenient handling, DUT enclosures with light curtain are particularly suitable for the testing of large numbers of DUT.

- Setup made of aluminium profile 30 x 30 mm
- Fully insulated test room made of PVC (colour: RAL 7011), casing made of Pertinax (colour: RAL 7035)
- Safety light curtain with finger protection, 14 mm (0.6 in.) (type 4, FIL3, PLe)
- Optional mobile base with device compartment 19" / 14 HU
- External dimensions (HxWxD): 1,008 x 720 x 850 mm / internal dimensions (HxWxD): 790 x 640 x 660 mm

DUT ENCLOSURE
PK 6000A (LIGHT CURTAIN DOUBLE WIDTH)

DUT enclosures with light curtain and double width are particularly suitable for the testing of large numbers of DUT.

- Setup made of aluminium profile 50 x 50 mm
- Fully insulated test room made of PVC (colour: RAL 7011), casing made of PVC (colour: RAL 7011)
- Safety light curtain with finger protection, 14 mm (type 4, FIL3, PLe)
- External dimensions (HxWxD): 1,910 x 2,000 x 1,030 mm / internal dimensions (HxWxD): 940 x 1,890 x 975 mm

Haven't found the right one?
Customised DUT enclosures are available on request: info@spselectronic.com
ACCESSORIES
## Accessories
### Connection and Control Panels

**Description**
It is often necessary and useful to optimise the work station design at test stations in the production of electrotechnical / electronic products. With the use of connection and control panels this is possible. The operation and connection to the DUT can be flexibly adapted to the requirements. From practical application two basic types result: Panels for electrical connection via sockets and / or terminals or respectively lab sockets as well as panels for electrical connection and for operation. In case of dangerous voltages there are also connection and control panels with 2-hand operation available in the delivery program. As always with SPS electronic highest attention was paid to the ergonomics with these products, too. Three console housings have been developed for various applications: Adapted to the requirements of the customer the optimal connection and control panels are taken from these three housing sizes. The equipping of the individual elements, sockets and lamps are always customer-specific and can also be changed later. The socket concept is designed to easily replace the sockets. In almost all applications it is the most economical solution to contact the DUT via standard sockets. However thereby it is important that the wear parts can be quickly and easily replaced. The connection to the test device or the test system is performed via a special cable with 3 m (9.8 ft.) length. Both the cable and the plug connection are designed for voltages up to 5,500 V AC and currents up to 30 A AC. For the connection to the ground bond test probe the connection and control panels have an additional high current socket. With this the ground bond test probe can be directly connected at the work station.

**Safety**
Application with safety current limitation, safety 2-hand operation

**Setup**
- Ergonomic setup as panel made of impact-proof plastic
- Equipping of sockets according to the application
- Additional terminals and laboratory sockets for free cable ends (flying leads) and manual measurements
- Bridges for the sensor cables at the ground bond test
- Special cable with high voltage plug
- High current socket for the connection to the ground bond test probe

**Versions**

<table>
<thead>
<tr>
<th></th>
<th>A3 / 1800</th>
<th>A7 / 3800</th>
<th>A8 / 3800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>3 sockets according to national standard</td>
<td>4 sockets according to national standard</td>
<td>1 socket according to national standard</td>
</tr>
<tr>
<td></td>
<td>4 mm (0.16 in.) laboratory sockets</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Quick-release-terminal</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Push button, lamps, emergency stop</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2-hand control buttons</td>
<td>Option</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Connection</td>
<td>Connection cable 3 m (9.8 ft.) long with high voltage plug for test cables and industrial plug for control wires</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dimensions (HxWxD)</td>
<td>130 x 390 x 265 mm (5.1 x 15.4 x 10.4 in.)</td>
<td>112 x 290 x 184 mm (4.4 x 11.4 x 7.2 in.)</td>
<td>66 x 190 x 153 mm (2.6 x 7.5 x 6.0 in.)</td>
</tr>
<tr>
<td>Accessories</td>
<td>User-specific equipping</td>
<td>Universal socket PP 20</td>
<td></td>
</tr>
</tbody>
</table>

### High Voltage Cable

**Description**
If voltages of more than 230 V / 400 V are applied, corresponding components are necessary meeting the requirements of these voltages. In this case the cable connections are of specific interest. Electric strength, insulation resistance and current load have to be exactly adapted to the application. As a leading manufacturer of high voltage test technique SPS electronic also offers high voltage cables for versatile applications. Most of these cables are in-house developments with highest quality standards and only available from us. We supply all quantities, from 1-metre (3.28 ft.) pieces to cable drums with several kilometres (miles). You can find more high voltage components in the categories “accessories” and “high voltage relays”.

**Versions**

<table>
<thead>
<tr>
<th>Outer diameter / mm (in.)</th>
<th>Voltage max. / kV</th>
<th>Current max. / A</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>8,1 (0.32)</td>
<td>10</td>
<td>10</td>
<td>HK 02</td>
</tr>
<tr>
<td>8,1 (0.32)</td>
<td>10</td>
<td>10</td>
<td>HK 03</td>
</tr>
<tr>
<td>7,0 (0.27)</td>
<td>4</td>
<td>16</td>
<td>HP 14</td>
</tr>
<tr>
<td>3,0 (0.12)</td>
<td>10</td>
<td>6</td>
<td>HK 10</td>
</tr>
<tr>
<td>4,0 (0.16)</td>
<td>10</td>
<td>16</td>
<td>HK 14</td>
</tr>
<tr>
<td>5,2 (0.20)</td>
<td>10</td>
<td>40</td>
<td>HK 16</td>
</tr>
<tr>
<td>2,3 (0.09)</td>
<td>6</td>
<td>10</td>
<td>HK 10-1</td>
</tr>
<tr>
<td>3,9 (0.15)</td>
<td>6</td>
<td>25</td>
<td>HK 14-1</td>
</tr>
<tr>
<td>6,0 (0.24)</td>
<td>8</td>
<td>40</td>
<td>HK 16-1</td>
</tr>
</tbody>
</table>
ACCESSORIES
CALIBRATORS

The battery-operated, mobile high-frequency transmitter can be used for testing and calibrating partial discharge testers. Despite its compact external dimensions, the CR 4000 has two separate antennas for VHF and SHF emission. A switch on the front of the instrument can be used to switch between the two frequencies. The transmission power of the calibrator is freely scalable from -85 dBm to -40 dBm in 5 dB steps. If the battery capacity is no longer sufficient, the CR 4000 can also be operated via an external power supply with standard USB cable.

Frequency range
- Wired: 317 MHz
- Antenna: 1.575 GHz

Impulse modulation
- Switchable in 10 binary steps: 50 Hz – 25.4 KHz

Transmission power
- Switchable in 5 dB-steps: -85 dBm up to -40 dBm

Antenna
- Beam width: 90°
- Switchable VHF / SHF emission

Power supply
- Battery-operated: 5x AA, 7.5 V / 2000 mA
- Operating time with battery: up to 40 hours
- USB: Type C

Description
Connection options on the underside of the CR 4000

ACCESSORIES
CALIBRATION RESISTANCES

In addition to the daily dummy tests the test device or the test system can be checked at regular intervals with calibration resistances. This is not a calibration of the test devices or the test systems, but an important part in a quality system. In contrast to the dummy test not only the function of the test technique is checked but the measuring system, too. The calibrators are supplied with a factory calibration or with a DAkkS document. For regular use the calibrators should be calibrated at least once a year. Only then it is ensured that the measured values of the test technique are retraceable.

The calibrators contain resistances with high precision and high long-term and temperature stability. The resistances are adapted to the application. Thus high voltage resistant resistance decades are used for the high voltage test. The calibrators for the ground bond tests are designed in 4-wire-technique, so that contact resistances are compensated. For the heat dissipation the resistances are mounted in thermoconductive material. To avoid measurement errors only capacitance and low-inductance components/ resistances are used. The connections are made via 4 mm (0.16 in.) laboratory sockets and are adapted to the high voltages and currents through the installation in plastic housings.

CR 0100
- Calibrator for 1 Ω
- Power is 100 W
- Connection via 4 mm (0.16 in.) laboratory sockets in 4-wire-technique
- Dimensions (HxWxD): 88 x 247 x 59 mm (3.5 x 9.7 x 2.3 in.)

Versions

<table>
<thead>
<tr>
<th>Data</th>
<th>Dimensions mm (in.)</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE: 1R // 100 W</td>
<td>88 x 247 x 59 (3.5 x 9.7 x 2.3)</td>
<td>CR 0100</td>
</tr>
<tr>
<td>PE: 100 mR / 200 mR / 300 mR // 300 W</td>
<td>88 x 247 x 106 (3.5 x 9.7 x 4.2)</td>
<td>CR 0101</td>
</tr>
<tr>
<td>CT: 3 mA / 250 mA / 450 mA // 22 V DC</td>
<td>80 x 160 x 55 (3.1 x 6.3 x 2.2)</td>
<td>CR 0200</td>
</tr>
<tr>
<td>HV: 25 kR / 50 kR / 220 kR / 440 kR // 200 W</td>
<td>80 x 247 x 55 (3.1 x 9.7 x 2.2)</td>
<td>CR 0300</td>
</tr>
<tr>
<td>HV: 1 mA / 2 mA // 1,500 V DC</td>
<td>80 x 160 x 55 (3.1 x 6.3 x 2.2)</td>
<td>CR 0301</td>
</tr>
<tr>
<td>HV: 1 mA / 2 mA // 1,875 V DC</td>
<td>80 x 160 x 55 (3.1 x 6.3 x 2.2)</td>
<td>CR 0302</td>
</tr>
<tr>
<td>IS: 1 M / 1.1 M / 2 M / 3 M / 10 M / 20 M / 30 M // U ≤ 500 V DC</td>
<td>80 x 200 x 55 (3.1 x 7.9 x 2.2)</td>
<td>CR 0400</td>
</tr>
<tr>
<td>IS: 0.5 M / 5 M / 50 M / 500 M / 1 G // U ≤ 3,000 V DC</td>
<td>80 x 200 x 55 (3.1 x 7.9 x 2.2)</td>
<td>CR 0401</td>
</tr>
<tr>
<td>IS: 0.5 M / 1 M / 5 M / 10 M / 50 M / 100 M / 250 M / 500 M / 1 G // U ≤ 6,000 V DC</td>
<td>120 x 200 x 70 (4.7 x 7.9 x 2.8)</td>
<td>CR 0402</td>
</tr>
</tbody>
</table>
ACCESSORIES

KELVIN TERMINALS

Description
If connections such as threaded bolts or free cable ends must be contacted, Kelvin terminals are used. The name Kelvin describes the applied 4-wire technique. This means that the test signal and the measurement signal (sensor line) is separately led to the DUT. This allows transfer resistances to be compensated. Only with this technique low-impedance measurements on cables or coils are possible.
The Kelvin terminal can also be applied with ground bond tests. Here low-impedance lines are to be measured with the ground bond test device. Depending on the application different versions are offered. By exchangeable jaws free cable ends or threaded bolts can be connected.

KL 25
• Standard version with 35 mm (1.4 in.) opening width
• Made of black plastic
• Contact area 20 mm² (0.03 in.²)
• Pressing force 100 N
• Jaws for free cable ends of 0.5 to 30 mm diameter (0.02 to 1.2 in.)
• Jaws for threaded bolts of 2 to 5 mm diameter (0.08 to 0.19 in.)
• Connection cable ca. 1.5 m (4.9 ft.) long with 4 mm (0.16 in.) laboratory plugs

Versions
<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple version with 25 mm (1.0 in.) opening width</td>
<td>Type</td>
</tr>
<tr>
<td>Small version with 20 mm (0.8 in.) opening width</td>
<td>KL 01</td>
</tr>
<tr>
<td>Standard version with 35 mm (1.4 in.) opening width</td>
<td>KL 20</td>
</tr>
<tr>
<td>Standard version with 35 mm (1.4 in.) opening width and cutting jaws</td>
<td>KL 25</td>
</tr>
</tbody>
</table>

ACCESSORIES

TEST VERIFICATION BOXES

Description
Regular use of test verification boxes is an absolute must in every production of electrotechnical/electronic devices. If verification tests are not carried out and afterwards an error is detected in the test system then a recall is unavoidable. The later the more expensive. The test verification box simulates FAIL and OK results in safety tests such as high voltage test and ground bond test. This is not a substitute for a calibration but ultimately just as important. The verification test is performed in a few minutes and should be recorded. All test devices and test systems of SPS electronic request daily or cyclic test intervals depending on the programming. The performance and the test result are automatically documented. SPS electronic recommends performing this test at least daily and at every change of shifts. The test verification box itself must just as the test device be checked and calibrated at least once a year. With high product quantities this test cycle has to be adjusted. Only with the daily verification test the performance of the safety testing in production of electrotechnical/electronic devices is ensured. Only with one test verification box, a verification test for all kinds of the safety test can be carried out. The OK and FAIL simulation is installed for the high voltage test, insulation measurement, ground bond test and line leakage test in a plastic housing. As there are many individual applications for the high voltage test additional test verification boxes are offered only for the high voltage test devices. Finally it should be mentioned that a built-in test verification box is no solution. Only if the test verification box is connected the same as the original DUT it is ensured that test voltages really get there where they are needed. Safety without compromise.

Safety
Application only in the test bay

Connection
IEC socket, test probe / high voltage test probe

Versions
<table>
<thead>
<tr>
<th>Test type</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function test (cos φ 0 / 0.5 for performance test)</td>
<td>D 1885</td>
</tr>
<tr>
<td>High voltage test (1 mA / kV)</td>
<td>D 2001</td>
</tr>
<tr>
<td>High voltage test (5 mA / kV)</td>
<td>D 2005</td>
</tr>
<tr>
<td>High voltage test / UL-application (120 kΩ)</td>
<td>D 2120</td>
</tr>
<tr>
<td>High voltage / insulation / ground bond / line leakage test</td>
<td>D 2012</td>
</tr>
</tbody>
</table>
**Accessories**

**Test Probes**

**Description**
The most important method of all safety tests is the high voltage test, which is still frequently carried out by hand. The high voltages test probe acts as the link between human, hipot tester and DUT. Its purpose is to safely contact the DUT while protecting the user against life-threatening contact with high voltage. The safety test probes SP 02 and SP 03 completely meet these requirements. Additionally special attention has been paid to the ergonomics and the handling of the probe. With hundreds of tests a day this aspect plays a crucial role in the convenient usage of the test probes.

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP 02</td>
<td>The test probe with a 2 m (6.6 ft.) connection cable and plug with start switch.</td>
</tr>
<tr>
<td>SP 03</td>
<td>Test probe with a 2 m (6.6 ft.) connection cable, plug and start switch.</td>
</tr>
<tr>
<td>ST 02</td>
<td>High voltage plug with a 2 m (6.6 ft.) high voltage cable with start switch.</td>
</tr>
<tr>
<td>BU 02</td>
<td>High voltage socket with start switch.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>DC voltage</th>
<th>Test voltage</th>
<th>Connection / start switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
<td>8,000 V AC</td>
<td>10,000 V DC</td>
<td>25,000 V DC</td>
</tr>
<tr>
<td>AC</td>
<td>10,000 V DC</td>
<td>25,000 V DC</td>
<td>25,000 V DC</td>
</tr>
</tbody>
</table>

**Setup**

- Teflon sleeve SP 02 / SP 03
- Tungsten tip SP 02 / SP 03
- Multilayer safety cable SP 02 / SP 03
- Impact-resistant plastic housing SP 02 / SP 03

**Connection**

- High voltage Plug ST 02
- Start switch Jack plug ST 01

**Ground Bond Test Probes**

**Description**
If a device of protection class I is tested at least one ground bond test is necessary. For many products several points have to be tested individually and one after the other. This makes the ground bond test the most complex type of test in safety testing. Most of the manually performed tests require much time in practice and therefore a large number of personnel. And it was at this point that SPS electronic started its development. All ground bond tests in the market were real “pins” which had to be held horizontally. An unnatural, tiring positioning for the hand of the test personnel was the result. Only with the ground bond test probe PE 81 a test probe is available in the market meeting the ergonomic requirements in a test bay. This is mainly achieved by the fact that the test probe PE 81 is actually a test pistol. Now the test personnel can carry out the often to be performed ground bond tests with a natural and therefore ergonomic positioning of the hand. In test series with customers the concept has been optimised with integrated start switches. It goes without saying that the test probe is built in 4-wire technique (Kelvin technique) which means that the measuring line and the test line are run separately. By that all supply lines are compensated. This is made possible with a highly flexible special cable which was developed especially for this application. Both the test line for currents up to 30 A AC and also the measuring and control line are integrated in one cable. Together with the test devices of SPS electronic it is possible to start the ground bond test automatically. For this purpose a small voltage is fed across the ground bond test probe PE 81 to the DUT. Once the DUT is contacted the ground bond test starts automatically - a considerable relief to many ground bond test points. Due to the high operating voltage of 1,500 V DC with the ground bond test probe also safety current limited insulation measurements and high voltage tests can be performed. At devices of protection class II insulation measurements / high voltage tests have to be performed at several points. The electrical connection for all test voltages and all control lines to the test device is made via a high-quality, multi-pole high current plug connector. The tungsten test probe is replaceable without tools and available as a spare part.

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE 81</td>
<td>Ground bond test probe with 2 m (6.6 ft) connection cable and free cable ends.</td>
</tr>
<tr>
<td>PE 81-i</td>
<td>Ground bond test probe with 2 m (6.6 ft) connection cable and high current plug ST 04-i</td>
</tr>
</tbody>
</table>

**Max. operating voltage**

<table>
<thead>
<tr>
<th>Type</th>
<th>DC voltage</th>
<th>Test voltage</th>
<th>Connection / start switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE 81</td>
<td>1,500 V DC</td>
<td>2,500 V DC</td>
<td>1,500 V DC</td>
</tr>
</tbody>
</table>

**Safety**

- Double control

**Setup**

- Integrated, high-quality start switch
- Ergonomic lightweight test pistol made of impact resistant plastic
- Exchangeable tungsten test probe for a long service life, spring bushing for easy replacement
- Electrical connection via multi-pole high current connector
- Multi-pole, highly flexible special cable for test voltage and control signals

**Connection**

- Electrical connection via multi-pole high current connector
- Electrical connection via multi-pole high current connector

**Cable lengths**

- 2 m (6.6 ft.): Standard
- 5 meters (16.4 ft.): - 5
- 10 meters (32.8 ft.): - 10
- 15 meters (49.2 ft.): - 15

**Versions**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE 81</td>
<td>Ground bond test probe with 2 m (6.6 ft) connection cable and free cable ends.</td>
</tr>
<tr>
<td>PE 81-i</td>
<td>Ground bond test probe with 2 m (6.6 ft) connection cable and high current plug ST 04-i</td>
</tr>
</tbody>
</table>
**ACCESSORIES**

**HIGH VOLTAGE CONNECTORS**

Description: When high voltages must be transferred in connection with high currents, the high voltage connectors ST / BU find their application. Both internally in the control cabinet and with device connections. Additionally available are suitable accessories for high voltages and high currents.

<table>
<thead>
<tr>
<th>Max. operating voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC voltage: 7,000 V AC</td>
</tr>
<tr>
<td>DC voltage: 10,000 V DC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. current</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 A AC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test current</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact / housing: 15,000 V DC</td>
</tr>
<tr>
<td>Contact / contact (mated): 15,000 V DC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teflon protection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strain relief</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Versions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>Cable plug 5-pole</td>
</tr>
<tr>
<td>Cable plug 7-pole</td>
</tr>
<tr>
<td>Cable plug 9-pole</td>
</tr>
<tr>
<td>Built-in socket 5-pole</td>
</tr>
<tr>
<td>Built-in socket 7-pole</td>
</tr>
<tr>
<td>Built-in socket 9-pole</td>
</tr>
</tbody>
</table>

**ACCESSORIES**

**WARNING LAMP SET**

Description: In Europe warning lamps are required at work stations with voltages ≥1,000 V. These red and green lights indicate the status of the high voltage generation in the test bay. If the red light is active high voltage can principally be produced. However this does not necessarily mean that high voltage is applied. If the green light is active it is confirmed that with certainty no high voltage is applied and generated. The warning lamp must not be associated with the test result “PASS” or “FAIL”. It solely serves for the protection of the test personnel.

<table>
<thead>
<tr>
<th>Operating voltage</th>
<th>230 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal current</td>
<td>17 mA</td>
</tr>
<tr>
<td>Technology</td>
<td>LED</td>
</tr>
<tr>
<td>Connection</td>
<td>4-pole round plug</td>
</tr>
<tr>
<td>Connection cable</td>
<td>1.5 m (4.9 ft) long</td>
</tr>
<tr>
<td>Dimensions (HxWxD)</td>
<td>120 x 170 x 85 mm (4.7 x 6.7 x 3.3 in.)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Versions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
</tr>
<tr>
<td>Warning lamp set</td>
</tr>
<tr>
<td>Replacement LED</td>
</tr>
<tr>
<td>Built-in socket</td>
</tr>
</tbody>
</table>
With our products we normally offer a suitable solution for all tasks in electrical safety testing. However, it can happen that very special requirements apply to a particular test task. Be it in terms of the sequence of parameters to be tested, the conditions under which it shall be tested or also the kind in which the approval of the test finally takes place.

Here we are also glad to help you – with special solutions which are fully coordinated with your individual needs and the desired requirements. You can learn more about this on the next pages.
When there is a testing task, there is always a solution.

And, at best, it comes from the experts for electric safety test technology: SPS electronic.

We would not be experts if we did not know everything about electric safety tests. Therefore we have the possibility to respond quickly and coherently even to new questions: in the form of customer-specific test systems, supporting you in your work and making it easier. Just put us to the test – what can we do for you?

A TEST SYSTEM – WHAT DOES THAT MEAN?

In a test system, different components from the field of electric test technology are combined with each other and thus summarised to an independent test system. That can mean that a whole production line comes into being on which various electric safety tests are carried out on several stations. Even automated, if it is desired. But it can also mean to develop a safety test for a special, completely new product, first-time where appropriate. The opportunities for that are almost unlimited.

FOR WHOM AND IN WHICH CASE DO TEST SYSTEMS COME INTO CONSIDERATION?

Test systems come into consideration for everyone who is not satisfied with the standardised procedures for electric safety testing. This might have different reasons. For example, if safety testing has not been applied in the required manner yet. This is often the case with new or also very exotic products. Or particular test parameters are required, for example whenever a product must also function underwater or in other extreme situations. No matter how unusual a customer wish is – we will find a solution.

FOR WHICH INDUSTRIES, APPLICATIONS AND APPLIANCES CAN TEST SYSTEMS BE REALISED?

Our individual test systems are used in almost all industries dealing with electric technology. Because once current is flowing within an appliance, it must be ensured that safety is guaranteed for the user at any time. In the process, it is rather unimportant whether it is about household appliances, lightings, tools, motors or even medical equipment. What is essential is always the type of carrying out the test.

THE KEY TEST PARAMETERS ARE YOUR WISHES.

The advantages of an individual test system are clearly obvious. Because it is especially designed to solve your day-to-day problems at the best. You would like to know whether a test system is also possible for you? Then please contact us. We will jointly analyse your task and develop a set of specifications. Then we will look after the development, realisation and commissioning of the system. On request, you and your employees will then get a comprehensive training and introduction, and we will, of course, continue to provide you with technical support. It almost sounds too simple, doesn’t it?

OUR TEST SYSTEMS CERTAINLY OFFER YOU MANY ADVANTAGES:

+ Individual problem solutions
+ Controllable via software
+ Complete integration into existing systems, on request
+ Comprehensive after-sales support
Customised test systems – and everything related

We inspire our customers with the almost unlimited combination possibilities of functions, test methods and components.
Our Service – Everything from a single source!

When it comes to service we do it thoroughly. The products we offer come with the appropriate advice and support – before and after purchasing. Do you have a question? Need a replacement part or support? Call one of our experienced team members: +49 791 20 212 327

Calibration and maintenance

The annual calibration of the testers is an essential prerequisite for the assured quality and is a requirement to be met by any company as part of the control of inspection, measuring and test equipment. We calibrate your safety testers – either directly at your location or in our premises. Thanks to our large service network, our numerous subsidiaries and our partners, we are represented worldwide and always close to you.

Regular firmware updates

All testers from SPS electronic always come with up-to-date software. We provide you with regular firmware updates to stay on the cutting edge of technology also in the course of operation of the device. You can download the latest version on our website: www.spselectronic.com

Service for unit on loan

No loss of time – even if your equipment and systems are under repair or maintenance. Numerous loaners are available from the product range of SPS electronic for the duration of the repair of your equipment. Whether they are hipot testers, insulation testers, ground bond testers, leakage current testers or multifunctional units. We also provide a trial unit if you are unsure about the new unit you want to buy. Just let us know about it!

OEM spare parts service

Using our OEM spare parts ensures optimum performance and maximum service life of your equipment. We at SPS electronic supply you with the spare parts for all device types and generations worldwide. Common spare parts are immediately available from stock. Should we not have something in stock, we will produce or procure it as quickly as possible.

After-sales support

We start exactly there, where others give up! And that is why our service does not end with the purchase of one of our units. We want you to have long-term satisfaction with us and our products. Especially for this purpose, we have a large service team that is always on-hand with technical advice and support.

On-site service

We are at your service wherever you need us! The optimum support provided by our service technicians restores the operation of your devices and customised systems. Our customer-focused field service is tailored to your needs, so as to consistently meet your technical requirements. We will work out the repair and maintenance plan jointly with you, so as to keep the downtime of your systems and equipment at a minimum.

Seminars and training programs

Get the best from your testers! The effectiveness of your equipment and customised systems not only depends on the technology but also its proper handling. We offer training programs that focus on the issues, needs and testing tasks of our customers. We first analyse the training needs together with you and then specifically design the contents according to your requirements. Thus, you get to know your safety tester in a practical and application-oriented way.

Remote service

Our service is also remotely available as an alternative to our on-site support. This saves considerable time and significantly reduces the cost especially when it comes to sites that are far away.