

SECUTEST® SIII

Test Instrument for DIN EN 60601/60335/60950/61010, DIN VDE 0700/0701/0702/0751 and British Standards

3-349-112-03
4/6.01

The SECUTEST®SIII test instrument can be configured for international utilization. The test socket, user interface language and the desired test regulation can all be configured to this end.

Universal test instrument for testing the electrical safety of:

- Electrical measuring control and laboratory devices in accordance with EN 61010
- Electrical equipment in accordance with DIN VDE 0701, parts 1, 200 and 260
Limit values as per new standard DIN VDE 0701-1: 2000-09
- Data processing devices and equipment in accordance with DIN VDE 0701, part 240, and DIN EN 60950
- Periodic testing per DIN VDE 0702
- Electrical medical devices in accordance with DIN VDE 0751 and EN 60601, as well as for technical safety inspection in accordance with MPG ¹⁾
- Electrical equipment in accordance with British standards

High-voltage test in accordance with DIN VDE 0701, part 260, British standard, EN 60950, EN 61010, EN 60335 and EN 60601

QUALITY MANAGEMENT SYSTEM



DQS Certified per
DIN EN ISO 9001 reg. no. 1262



Industrie
Forum
Design
Hannover



Features

The device under test can be connected:

- to the test socket with or without adapter for various types of mains connection
- to the connector jacks if the device under test does not have a mains plug
- with an adapter for extension cables with or without multiple outlet sockets
- connection for BE ²⁾ and FE ³⁾
- 10 application parts can be connected individually or in groups

Mains Plug Polarity Reversal

Mains plug polarity need not be reversed manually. Polarity reversal is accomplished internally during the test sequence.

Automatic Recognition

of mains connection errors and protection class (I or II). Measurement is automatically disabled in the event of danger.

Display

Menus, setting options, measurement results, instructions and error messages, as well as online help and schematic diagrams for test setups, can all be displayed at the backlit, dot matrix LCD.

¹⁾ MPG = German medical product law

²⁾ BE = Operational earth

³⁾ FE = Functional earth

Menu Driven Test Sequences

Fully automatic or manual

Protective Conductor Testing

With 200 mA, 10 A or 25 A test current

Insulation Test

By means of insulation resistance or equivalent leakage current measurement (measuring circuit resistance depending upon the required standard), or high-voltage test

Leakage Current Test

With measurement of earth, housing or patient leakage current, patient auxiliary current, residual current (10 µA resolution) or current in accordance with DIN VDE 0751, figure 9, correct measurement of leakage current in IT systems as well

Basic Instrument and Expansion Features

The test instrument can be equipped with specific features required for the given application (see table on page 6).

Data Interface for PC and Printer

Expandable

The SECUTEST®PSI option expands the basic instrument into a unique data logger with memory, printer and alphanumeric keypad for data entry.

All required reports can be generated, and data can be analyzed and managed with the help of user-friendly WINDOWS software.

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Applications

Testing for the Electrical Safety of Electrical Equipment in Accordance with BGV A2

The test instrument can be utilized for quick and safe testing of repaired or modified electrical devices in accordance with DIN VDE 0701, as well as for periodic testing per DIN VDE 0702.

The following are measured in accordance with the standards:

- Protective conductor resistance
- Insulation resistance
- Protective conductor current for SK1 devices
- Contact current for SK2 devices
- Absence of voltage at exposed conductive parts (= contact current)

Measuring methods:

- Direct measurement
- Equivalent leakage current
- Residual current

Testing for the Electrical Safety of Electrical Medical Devices in Accordance with the German Medical Product Law (MPG) and the associated Operator's Regulations

The SECUTEST®SIII test instrument is used for quick and safe testing and measurement of repaired or modified electrical medical devices or their components (e.g. patient ports) in accordance with DIN VDE 0751 and EN 60601.

Observance of technical safety requirements allows the user of the test instrument to operate electrical medical devices in a hazard-free fashion. The safety of the patient is also assured through the use of tested electrical medical devices.

The following are measured in accordance with DIN VDE 0751 regulations:

- Protective conductor resistance
- Insulation resistance
- Equivalent device leakage current
- Equivalent patient leakage current
- Leakage current in accordance with Figure 9
- Device leakage current
- Patient leakage current

A software upgrade (optional) allows for measurement in accordance with EN 60601 regulations, see features on page 6 (with the following single-fault conditions: voltage at application part, interrupted neutral and interrupted protective conductor, with automatic polarity reversal L-N)

- Protective conductor resistance
- Insulation resistance
 - L and N connected to protective conductor
 - Application parts connected to protective conductor
- Earth leakage current, housing leakage current, patient leakage current, patient auxiliary current

The following additional test conditions can be selected:

- Interrupted operational earth \perp and equipotential bonding ∇
- Housing to ground, application parts to ground

Function Test with Power Analysis

(also suitable for high power devices under test up to 16 A)

The device under test can be subjected to a function test with mains voltage via the integrated test socket.

The following are measured or automatically calculated during the function test:

- Line voltage
- Residual current
- Power consumption
- Active and apparent power
- Power factor
- Electrical energy
- On-time

Multimeter Functions

Extensive multimeter functions including temperature measurement expand measuring options for the user in a sensible fashion. The following individual measurements can be performed:

- Direct and alternating voltage
- Resistance
- Phase detection
- Current and protective conductor resistance with clip-on meter (accessory)
- Temperature with Pt100 or Pt1000 (accessory)

High-Voltage Test with Direct Voltage

The mains plug of the device under test (safety class I and II devices) is connected to the test socket at the test instrument.

The test instrument monitors the mains connection. Incorrect or dangerous mains connection is indicated, and measurement is disabled in the event of danger.

Use of the test instrument for high-voltage testing is trouble-free because DIN VDE 0104 does not apply. The high-voltage test is performed with direct voltage. In order to comply with requirements for alternating voltage, testing is performed with 1.5-fold direct voltage. This multiplying factor is applied automatically during testing.

This DC high-voltage test complies with EN 60335/EN 50106, as well as with other standards.

Report Functions

All values required for electrical equipment approval reports or device log books (e.g. for ZVEH) can be measured with the test instrument.

The optional SECUTEST®PSI module (printer with memory, integrated interface and keypad which can be mounted inside the lid of the test instrument) expands the applications range of the test instrument.

All measured data can be documented and archived with the measurement and test report, which can be printed out either directly from the SECUTEST®PSI module or via adapter DA-II to an external printer or else saved to memory and printed out from a PC.

The measurement and test report substantiates regular maintenance and testing for users of electrical devices.

Test Instrument for DIN EN 60601/60335/60950/61010, DIN VDE 0700/0701/0702/0751 and British Standards

The test instrument has been manufactured and tested in accordance with the following standards:

| | |
|---|---|
| IEC 61010-1 DIN EN 61 010-1/ VDE 0411-1 | Safety requirements for electrical equipment for measurement, control and laboratory use – general requirements |
| DIN VDE 0404, Part 1 | Devices for technical safety testing of electrical equipment – general requirements |
| DIN VDE 0404, Part 2 | Devices for periodic testing |
| DIN EN 60 529/ VDE 0470, Part 1 | Test instruments and test procedures, protection provided by enclosures (IP code) |
| IEC 61 326/EN 61326 | Electromagnetic compatibility (EMC) |
| DIN 43 751, Part 1, 2 | Digital measuring instruments |

Regulations for the Use of the SECUTEST[®] SIII Test Instrument

| Devices under test to be tested in accordance with the following regulations | Testing after Repairs | | | | | Periodic Testing | | | Type Tests and Routine Testing | | | | | |
|--|-----------------------|------------------------|------------------------|------------------------|--------------|------------------------|--------------|------------------|--------------------------------|------------------------|--------------|--------------|--------------|------------------------|
| | DIN VDE 0701, Part 1 | DIN VDE 0701, Part 200 | DIN VDE 0701, Part 240 | DIN VDE 0701, Part 260 | DIN VDE 0751 | IEC 60601/DIN EN 60601 | DIN VDE 0702 | British Standard | DIN VDE 0751 | IEC 60601/DIN EN 60601 | DIN EN 60950 | DIN EN 61010 | DIN EN 60335 | IEC 60601/DIN EN 60601 |
| Electrical equipment | | | | | | • | • | | | | • | | | |
| Appliances and electric equipment | • | | | | | | • | | | | | | | • |
| Mains operated electronic devices | | • | | | | | • | | | | | | | |
| Hand-held electric tools | | | | • | | | • | | | | | | | |
| Extension cables | • | | | | | | • | | | | | | | |
| Data processing devices | | | • | | | | • | | | | • | | | |
| Electrical medical devices, application parts | | | | | • | • | | | • | • | | | | • |

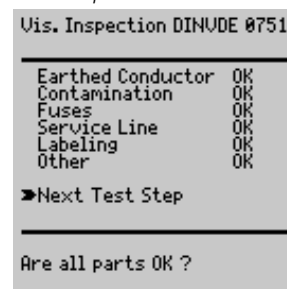
| | |
|-----|---|
| MPG | German medical product law Regulation for the setup and operation of active medical products |
|-----|---|

Sample displays, menu-driven operation:

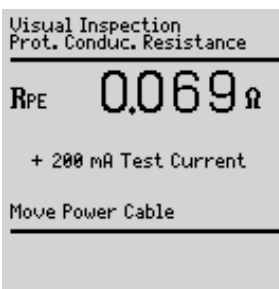
Test Sequence Setup



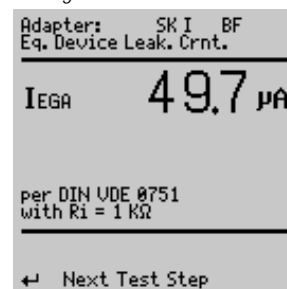
Visual Inspection



Protective Conductor Test

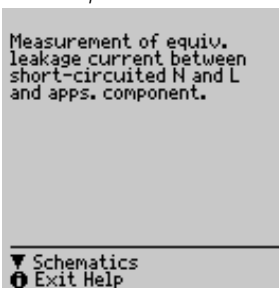


Leakage Current Measurement

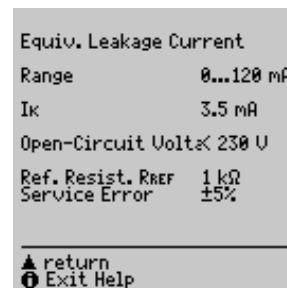


Sample displays, online help:

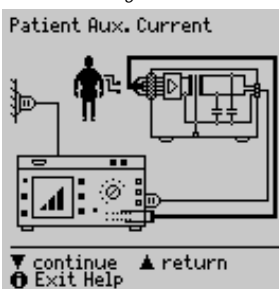
Online Help Texts



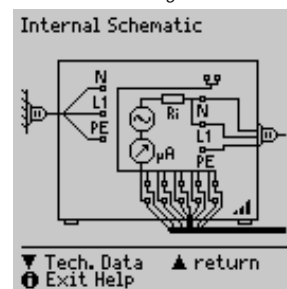
Technical Data



Schematic Diagrams

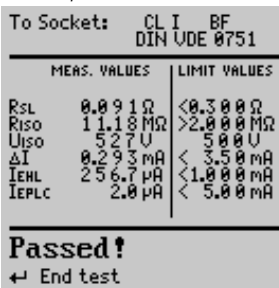


Internal Circuit Diagrams

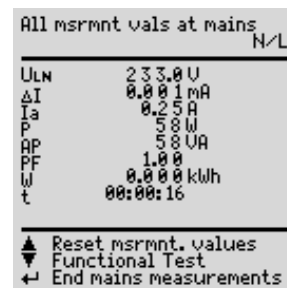


Sample reports with measurement results:

Test Sequence Results



Function Test Results



Characteristic Values

| Function | Measured Quantity | Meas. Range / Nominal Range of Use | Resolution | Nom. Voltage U_N | Open-Circuit Voltage U_0 | Nom. Current I_N | Short-Circuit Current I_K | Internal Resistance R_I | Ref. Resistance R_{REF} | Measuring Error | Intrinsic Error | Overload Capacity | | |
|---|---|--|------------------|--|--------------------------------|--------------------|-----------------------------|---------------------------|---------------------------------|---|--|--|------------------------|----|
| | | | | | | | | | | | | Value | Duration | |
| Tests per DIN VDE 0701 / 0702 | Device Protective Conductor Resistance R_{PE} | 0.000 ... 2.100 Ω | 1 m Ω | — | 4.5 ... 9 V DC | — | >200 mA DC | — | — | $\pm(5\% \text{ rdg.} + 10 \text{ d})$ > 10 d | $\pm(2.5\% \text{ rdg.} + 5 \text{ d})$ > 10 d | 253 V | cont. | |
| | | 2.11 ... 31.00 Ω | 10 m Ω | | | | | | | | | no protection ⁵⁾ | | |
| | Insulation Resistance R_{ISO} | 0.050 ... 1.500 M Ω | 1 k Ω | 50 ... 500 V DC | 1.0 • U_N ... 1.5 • U_N | > 1 mA | < 10 mA | — | — | $\pm(5\% \text{ rdg.} + 10 \text{ d})$ | $\pm(2.5\% \text{ rdg.} + 5 \text{ d})$ > 10 d | 253 V | cont. | |
| | | 1.01 ... 10.00 M Ω | 10 k Ω | | | | | | | | | | | |
| | | 10.1 ... 310.0 M Ω | 100 k Ω | | | | | | | $\pm(10\% \text{ rdg.} + 10 \text{ d})$ | $\pm(10\% \text{ rdg.} + 10 \text{ d})$ | | | |
| | Equivalent Leakage Current I_{EL} | 0.00 ... 21.00 mA | 10 μ A | — | 230 V ~ -20/+10% | — | < 3.5 mA | > 72 k Ω | 2 k Ω | $\pm(5\% \text{ rdg.} + 10 \text{ d})$ | $\pm(2.5\% \text{ rdg.} + 5 \text{ d})$ > 10 d | 253 V | cont. | |
| 20.1 ... 120.0 mA | | 100 μ A | | | | | | | | | | | | |
| Contact or Device Leakage Current I_{probe} or I_{DL} | 0 ... 3.500 mA | 1 μ A | — | — | — | — | — | 2 k Ω | — | $\pm(5\% \text{ rdg.} + 10 \text{ d})$ | $\pm(2.5\% \text{ rdg.} + 5 \text{ d})$ > 10 d | 253 V | cont. ²⁾ | |
| Residual Current ΔI between L and N per VDE 0702 | 0.00 ... 31.00 mA ~ | 10 μ A | — | — | — | — | — | — | — | $\pm(10\% \text{ rdg.} + 10 \text{ d})$ > 10 d | $\pm(5\% \text{ rdg.} + 5 \text{ d})$ > 10 d | 1) | 1) | |
| Tests per DIN VDE 0751 | Device Protective Conductor Resistance R_{PE} | 0.000 ... 2.100 Ω | 1 m Ω | — | < 6 V AC | — | >10 A ~ 4)/ > 5 s | — | — | $\pm(5\% \text{ rdg.} + 10 \text{ d})$ > 10 d | $\pm(2.5\% \text{ rdg.} + 5 \text{ d})$ > 10 d | no protection ⁵⁾ | | |
| | | 0.0 ... 310.0 μ A | 0.1 μ A | | | | | | | | | | | |
| | Equivalent Device or Patient Leakage Current I_{EDL} or I_{EPL} | 0.000 ... 2.100 mA | 1 μ A | — | 230 V ~ -20/ +10 % | — | < 3.5 mA | > 72 k Ω | 1 k Ω $\pm 10 \Omega$ | $\pm(5\% \text{ rdg.} + 10 \text{ d})$ | $\pm(2.5\% \text{ rdg.} + 5 \text{ d})$ > 10 d | 253 V | cont. ^{1) 3)} | |
| | | 2.101 ... 21.00 mA | 10 μ A | | | | | | | | | | | |
| 20.1 ... 120.0 mA | 100 μ A | — | — | | | | | | | | | | | |
| Tests per IEC 601 | Device Protective Conductor Resistance R_{PE} | 0.000 ... 2.100 Ω | 1 m Ω | — | < 6 V AC | — | > 10 A ~ 4)/ > 5 s | — | — | $\pm(5\% \text{ rdg.} + 10 \text{ d})$ > 10 d | $\pm(2.5\% \text{ rdg.} + 5 \text{ d})$ > 10 d | no protection ⁵⁾ | | |
| | | 0.0 ... 310.0 μ A | 100 nA | | | | | | | | | | | |
| | Leakage Current I_L ²⁾ | 0.000 ... 3.100 mA | 1 μ A | 110% of highest line voltage ⁶⁾ | — | — | — | 1 k Ω | — | $\pm(5\% \text{ rdg.} + 10 \text{ d})$ | $\pm(2.5\% \text{ rdg.} + 5 \text{ d})$ > 10 d | 253 V | cont. ^{1) 3)} | |
| 3.10 ... > 15.00 mA | | 10 μ A | | | | | | | | | | | | |
| Function Test | Line Voltage U_{L-N} | 103.5 ... 126.5 V / 207.0 ... 253.0 V ~ | 0.1 V | — | — | — | — | — | — | — | $\pm(2.5\% \text{ rdg.} + 5 \text{ d})$ | 253 V | cont. | |
| | Load Current I_Y | 0 ... 16.00 A R_{MS} | 10 mA | — | — | — | — | — | — | — | $\pm(2.5\% \text{ rdg.} + 5 \text{ d})$ | 20 A | 10 min | |
| | Active Power P | 0 ... 3700 W ⁷⁾ | 1 W | — | — | — | — | — | — | — | $\pm(5\% \text{ rdg.} + 10 \text{ d})$ > 20 d | 253 V | cont. | |
| | Apparent Power S | 0 ... 4000 VA | 1 VA | Calculated Value $U_{L-N} \cdot I_Y$ | | | | | | | | $\pm(10\% \text{ rdg.} + 5 \text{ d})$ > 20 d | | |
| | Power Factor PF sinusoidal: $\cos\phi$ | 0.00 ... 1.00 | 0.01 | Calculated Value P / S, Display > 10 W | | | | | | | | $\pm(10\% \text{ rdg.} + 5 \text{ d})$ | | |
| | Residual Current ΔI between L and N per VDE 0702 | 0.00 ... 31.00 mA ~ | 10 μ A | — | — | — | — | — | — | — | $\pm(10\% \text{ rdg.} + 10 \text{ d})$ > 10 d | $\pm(5\% \text{ rdg.} + 5 \text{ d})$ | 1) | 1) |
| $U_{AC/DC}$ | Voltage | 0 ... 253.0 V =, ~ and = | 0.1 V | — | — | — | — | — | — | — | $\pm(2.5\% \text{ rdg.} + 5 \text{ d})$ > 10 d | 253 V | cont. | |
| | Low-Voltage SC III | — | — | — | — | — | — | — | — | $\pm(5\% \text{ rdg.} + 10 \text{ d})$ | | | | |
| U_{probe} | Probe Voltage (phase detection) | 0 ... 253.0 V =, ~ and = | 0.1 V | — | — | — | — | — | — | — | $\pm(2.5\% \text{ rdg.} + 5 \text{ d})$ > 10 d | 253 V | cont. | |
| R | Resistance | 0 ... 150.0 k Ω | 100 Ω | — | < 20 V - | — | 1.1 mA | — | — | — | $\pm(1\% \text{ rdg.} + 3 \text{ d})$ | 253 V | cont. | |
| I_{clip} | Current via Clip-On Current-Voltage Converter WZ12C | 0.000 ... 10.00 A ~ | 1 mA | — | — | — | — | 1.5 M Ω | — | — | $\pm(3\% \text{ rdg.} + 10 \text{ d})$ > 10 d without clip | 253 V | cont. | |
| | | 0 ... 100 A ~ | 1 A | — | — | — | — | 1.5 M Ω | — | — | | 253 V | cont. | |
| Temp | Temperature with Pt100 / Pt1000 Sensor | -200 ... -50 $^{\circ}$ C | 1 $^{\circ}$ C | — | < 20 V - | — | 1.1 mA | — | — | — | $\pm(2\% \text{ rdg.} + 1 \text{ }^{\circ}\text{C})$ | 10 V | cont. | |
| | | -50.1 ... +300.0 $^{\circ}$ C | 0.1 $^{\circ}$ C | | | | | | | | | 10 V | cont. | |
| | | +300 ... +850 $^{\circ}$ C | 1 $^{\circ}$ C | | | | | | | | | 10 V | cont. | |

1) As of 25 mA: shutdown by residual current measurement within 100 ms

2) Except for earth leakage current: only 0.000 to 3.100 mA

3) Measuring circuit is highly resistive, indication at display

4) Feature G01: > 25 A:

Short-circuit current is less than 25 A if the SK5 special cable is used.

5) Test duration max. 40 s, protection against overheating: measurement cannot be restarted until a waiting period of 1 minute has elapsed.

6) Calculated value




7) Measured value P and calculated value S are compared, and the smaller value is displayed.

Key: rdg. = reading, d = digits
 I_L = patient, housing and earth leakage current,
as well as patient auxiliary current

Test Instrument for DIN EN 60601/60335/60950/61010, DIN VDE 0700/0701/0702/0751 and British Standards

Testing for Correct Mains Connection

The test instrument automatically recognizes mains connection errors, if the conditions in the following table have been fulfilled. The user is informed of the type of error, and all measuring functions are disabled in the event of danger.

| Type of Mains Connection Error | Message | Condition | Measurements |
|---|---|---|---|
| Voltage at protective conductor PE to finger contact | Text appears at LCD | Press  key $U > 40 \text{ V}$ | disabled |
| Protective conductor PE and phase conductor L reversed and/or neutral conductor N interrupted |  lamp lights up | Voltage at PE $> 65 \text{ V}$ | impossible (no supply power) |
| Contact voltage at protective conductor PE to neutral conductor N or phase conductor L | Text appears at LCD | $U > 25 \text{ V}$ | disabled, although disabling can be deactivated |
| Mains voltage too low |  lamp lights up | $U_{L-N} < 90/180 \text{ V}$ | possible under certain circumstances |

Reference Ranges

| | |
|---------------------|---|
| Line Voltage | $115/230 \text{ V} \pm 0.2\%$ |
| Line Frequency | $50/60 \text{ Hz} \pm 0.1\%$ |
| Waveshape | sine (deviation between effective and rectified value $< 0.5\%$) |
| Ambient Temperature | $+23 \text{ °C} \pm 2 \text{ K}$ |
| Relative Humidity | $45\% \dots 55\%$ |
| Load Impedance | linear |

Nominal Ranges of Use

| | |
|----------------|--|
| Line Voltage | $103.5 \text{ V} \dots 126.5 \text{ V}$ or $207 \text{ V} \dots 253 \text{ V}$ |
| Line Frequency | 50 Hz or 60 Hz |
| Line Voltage | sine |
| Temperature | $0 \text{ °C} \dots + 50 \text{ °C}$ |

Ambient Conditions

| | |
|---------------------|--|
| Storage Temperature | $-20 \text{ °C} \dots + 60 \text{ °C}$ |
| Operating Temp. | $-10 \text{ °C} \dots + 50 \text{ °C}$ |
| Accuracy Range | $0 \text{ °C} \dots + 50 \text{ °C}$ |
| Relative Humidity | max. 75%, no condensation allowed |
| Elevation | max. 2000 m |
| Deployment | indoors |

Electromagnetic Compatibility

| | |
|-----------------------|-------------|
| Interference Emission | EN 61326-1 |
| Interference Immunity | EN 61326/A1 |

Power Supply

| | |
|---|---|
| Line Voltage | $103.5 \text{ V} \dots 126.5 \text{ V}$ or $207 \text{ V} \dots 253 \text{ V}$ |
| Line Frequency | 50 Hz or 60 Hz |
| Power Consumption for 10 A test current for 25 A test current for function test | approx. 30 VA approx. 95 VA, test duration max. 40 s approx. 180 VA, test duration max. 40 s continuous max. 3600 VA, power is conducted through the instrument only, switching capacity $\leq 16 \text{ A}$ |

RS 232 Data Interface

| | |
|-----------|-------------------------------------|
| Type | RS 232C, serial, per DIN 19241 |
| Format | 9600, N, 8, 1 |
| Connector | 9-pin subminiature socket connector |

Electrical Safety

| | |
|----------------------|---|
| Safety Class | I per IEC 61010-1/EN 61010-1/ VDE 0411-1 |
| Nominal Voltage | 115/230 V |
| Test Voltage | 3.7 kV 50 Hz |
| Overvoltage Category | II |
| Contamination Level | 2 |
| Safety Shutdown | for residual current at device under test $> 25 \text{ mA}$, disconnecting time $< 100 \text{ ms}$ probe current $> 10 \text{ mA}$, $< 1 \text{ ms}$ |

Mechanical Design

| | |
|------------|---|
| Display | multiple backlit dot matrix display, 128 x 128 pixels |
| Protection | housing: IP 40 terminals: IP 20 per DIN VDE 0470, part 1/EN 60529 |
| Dimensions | test instruments without high-voltage module: LxWxH: 292 mm x 138 mm x 243 mm test instruments with high-voltage module: LxWxH: 292 mm x 138 mm x 300 mm |
| Weight | standard device: approx. 4.5 kg device with HV test: approx. 5.24 kg device with 25 A PE test: approx. 5.5 kg with 25 A PE and HV test.: approx. 5.9 kg |

High Voltage Test (feature F02)

Transducer

| | | |
|------------------------------------|--|--|
| Nominal Voltage, AC | U_{N-} adjustable in 10 V steps in 100 V steps | $0.5 \dots 0.99 \text{ kV}$ $1 \dots 3.5 \text{ kV}$ $((U_{N-} \cdot 1.5) \cdot 1.011) + 60 \text{ V}$ |
| Open-Circuit Voltage, DC | U_0 | $\pm 1.5\%$ |
| Intrinsic Error, U_0 | U_0 | $\pm 1.5\%$ |
| Nominal Current | per DIN VDE 0104 | $< 3.5 \text{ mA DC}$ |
| Short-Circuit Current | discharge current from $6 \times 2.7 \text{ nF}$ | $> 5 \text{ A}$ at 5 kV |
| Resistance to Interference Voltage | | none |

Measuring

| Measuring Range | Display Range | Intrinsic Error, U_0 |
|--------------------|-------------------------------------|------------------------|
| $0 \dots U_{0max}$ | $0.000 \dots > 10.00 \text{ kV DC}$ | $\pm 1.5\%$ |

SECUTEST®SIII

Test Instrument for DIN EN 60601/60335/60950/61010, DIN VDE 0700/0701/0702/0751 and British Standards

Standard Equipment for SECUTEST®SIII Basic Instrument (all features = 00)

- | | |
|--|---|
| 1 SECUTEST®SIII test instrument | 1 test report |
| 1 special cable with test probe depending upon test instrument features | 1 operating instructions |
| 1 plug-on alligator clip for test probes | 1 carrying strap |
| 3 plug-on quick-connect terminals | 1 CD ROM (demo) PS3 data management PC software |

Features, Options and Accessories

List of possible options for the SECUTEST®SIII instrument series:

| Feature | | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 99 |
|--|----|----------------------|--------------------|--|--------------------------------|---|----|----|-----|-----------|----|----|-------------|---------------------------------|
| Design | A | GMC | OEM | UK | | | | | | | | | | |
| Mains Connection for Country of Use | B | D | D + service socket | GB | F | I | DK | SA | USA | China/AUS | CH | | Adapter kit | |
| User Interface Language | C | D | GB | F | I | E | CZ | NL | | | | | | |
| Configuration (Settings in Setup) | D | GMC | OEM | OEM | | | | | | | | | | acc. to customer specifications |
| SECUTEST®PSI Printer Module | E | without | with | | | | | | | | | | | |
| High-Voltage Test HV DC | F | without | | max. 4) 6,126 kV DC ⚡ 4 kV AC) | | | | | | | | | | |
| AC Test Current 50/60 Hz for Protective Conductor Measurement | G | 10 A ³⁾ | 25 A | | | | | | | | | | | |
| DC Test Current for Protective Conductor Measurement | H | 200 mA ³⁾ | | | | | | | | | | | | |
| including Patient Ports | J | without | with | | | | | | | | | | | |
| Measurements per EN 60601 SECU 601 Option (Z853G) | KA | without | with | | | | | | | | | | | |
| Database DBmed Option (Z853H) | KB | without | with | | | | | | | | | | | |
| Modem Operation DFUmed Option (Z853K) | KC | without | with | | | | | | | | | | | |
| Remote Control SK5 Probe Cable (Z745K) | KD | without | with | | | | | | | | | | | |
| Direct Printing after each Measurement for Automatic Test Sequences ¹⁾ via RS232 SECU-dd Option (Z853L) | KE | without | with | | | | | | | | | | | |
| Calibration Certificate per DKD | L | without | standard version | including measurements per MPG (see J01) | including HV testing (see F02) | including measurements per MPG and HV testing (see J01 & F02) | | | | | | | | |

- 1) Each measured value is documented in this case, as opposed to the results of a test sequence for which the poorest value for each given test is displayed. (via SECUTEST®PSI, via printer adapter DA-II to an external printer or via a PC)
- 2) Adapter kit for international use (includes Feature B01)
- 3) Standard, not dependent on feature
- 4) Combining Feature F02 with B04 or B07 is not possible.

Enter the designation of the basic instrument to your order, i.e. M7010, and only those desired features which are other than 00!

Example of a complete type designation (= article number, = order designation) for a SECUTEST®SIII:

- with service socket and SECUTEST®PSI printer module as a test instrument for protective measures in accordance with DIN VDE 0701/0702: **M7010 B01 E01**
- with database and DA-II printer adapter for testing the electrical safety of electrical medical devices in accordance with DIN VDE 0751/DIN EN 60601 and MPG: **M7010 J01 KA01 KB01 KE01**

Test Instrument for DIN EN 60601/60335/60950/61010, DIN VDE 0700/0701/0702/0751 and British Standards

Features C00 ... C06: SE-L.med * Foreign Language Floppy Disk

User interface languages which are not included with the instrument can be uploaded from a floppy disk. One language can be uploaded to the test instrument.

Feature KA01: Tests per IEC 60601/EN 60601

Measurements in accordance with this standard are made possible by uploading the appropriate software to the instrument with the help of a PC via the included interface cable. Special features:

- Patient ports can be assigned to groups
- Automatic sequence under all single-fault conditions

Feature KB01: Database

Test sequences can be configured on-site and performed in the appropriate selector switch position in accordance with the respective regulations. Configurations for various test sequences are stored to the test instrument and can be reactivated as required. The measured values acquired during these test sequences are also stored to the test instrument. These can be read out to a printer as required using report forms which have been stored to the test instrument.

Feature KC01: Modem Operation

The use of two modems allows for the following functions:

- Transmission of report data from the test instrument to a PC via the telephone lines
- Remote control of the test instrument from a PC, e.g. for starting measurements and printing reports
- Standby operation for accepting data query calls

Two telephone numbers can be stored to the test instrument for this purpose.

Feature KD01: SK5 * Remote Control

The remote control feature consists of a 5 meter long cable with a test probe and includes upgrade software on a floppy disk. The protective conductor measurement is expanded to include the function: "automatic recognition of measuring point change". During protective conductor measurement, the instrument recognizes whether or not the probe is in contact with the protective conductor, and indicates these two possible conditions by means of acoustic signals.

This function is helpful if several protective conductor connections need to be tested.

Feature KE01: DA-II Printer Adapter

Test instruments can be connected to commercially available printers with the DA-II printer adapter (Z745M), even if they are not equipped with a parallel port. Test reports etc. can thus be printed out on-site.

* Software Installation Requirements

Hardware

IBM-AT PC or compatible types as of 80486-CPU with at least 4 MB RAM, VGA monitor, at least 3 MB available hard disk space, 3½" floppy disk drive (1.44 MB), serial port for connecting the test instrument

Software

Operating system: PC / MS DOS version 6.0 or higher
MICROSOFT WINDOWS version 3.1 or higher

Feature E01: SECUTEST®PSI

Values measured by the test instrument can be stored to and printed from the PSI module, and comments can be added with the alphanumeric keypad. The LCD at the test instrument is used as a display for the PSI module. Statistical analysis of measurement results can also be performed – percentage of successfully completed function tests.

The PSI module is mounted inside the lid of the test instrument in a space-saving fashion.



Please request our data sheet for the SECUTEST®PSI for additional information.

PS3 Intelligent Modular Software for Test Instruments

Measurement data acquired with test instruments is transferred to PS3 and are then automatically assigned to activities such as testing, maintenance or inspection. Ready-to-sign test and work reports can thus be prepared with a minimum of effort.

The basic module and the device module are sufficient for standard requirements such as reading in measurement data and report printing.

Additional requirements such as following up on deadlines, test data history, data selection and list generation, right on up to complete object management (devices and buildings) with inventory management, errors indication, work orders and repairs are handled with the expansion module and with add-on modules.

An overview of all of the features included with this software is available in the PS3 brochure.

PC.doc-win Standard Software for DIN VDE 0701/0702 and PC.doc-med+204 for Medical Applications (VDE 0751/EN 60601) (Windword 6.0 and/or ACCESS required in both cases)

Report and database software based on MICROSOFT WINWORD and ACCESS for all SECUTEST® and METRATESTER®5-F/5-F-E series test instruments.

Measurement results, as well as data entered to the PSI module, are entered to reports and device lists in accordance with the respective regulations in WINWORD.

Complete device and system management is made possible with the help of ACCESS, as well as documentation and management of master data and test data.

- Standard forms and device lists
- Automatic initialization of WINWORD and ACCESS
- Automatic preparation of deadline lists for periodic testing
- Management of master data for customers, work orders and devices
- Automatic allocation to the selected master data
- Search function
- Read-in PC.doc files (predecessor software in DOS)

SECUTEST® SIII

Test Instrument for DIN EN 60601/60335/60950/61010, DIN VDE 0700/0701/0702/0751 and British Standards

Order Information

| Designation | Type | Article Number |
|---|----------------------------|------------------------------------|
| Basic device and features for subsequent installation | | |
| Basic device with automatic test sequence, interface, German online instructions, earthing contact plug and socket, probe cable with test probe, plug-on alligator clip, 3 plug-on quick-connect terminals, test report, operating instructions. See table on page 6 for features and expansions. | SECUTEST®SIII | M7010 (all features: 00) |
| Features C00 ... C06: foreign language operating instructions (D, GB, F, I ...) ¹⁾ | SE-L.med | Z713B |
| Feature E01: PSI module with languages D, GB, F, NL, I, E and CZ including 2 rolls of recording chart paper, 1 ink ribbon cartridge, batteries and operating instructions | SECUTEST®PSI ^{D)} | GTM 5016 000 R0001 |
| Feature KA01: tests per IEC 601 with software upgrade ¹⁾ | SECU 601 | Z853G |
| Feature KB01: integrated database for max. 99 device specific test sequences /reports with software upgrade ^{1) 2)} | DB-med | Z853H |
| Feature KC01: modem operation for transmission of report data to a PC or for remote control of the test instrument via telephone lines, software upgrade ¹⁾ including 2 modems | DFU-med | Z853K |
| Feature KD01: remote control, probe cable, 5 m long ^{1) 3)} | SK5 | Z745K |
| Feature KE01: direct printing | SECU-dd | Z853L |
| Software upgrade to new DIN VDE 0701-1: 2000-09 standard for veteran instruments of the SII and SIII series (Prerequisite: Article No. M7xxx) | SE-701upgrade | Z713C |
| For standard types available from stock refer to the Test & Measurement Price List | | |
| PC Software | | |
| PS3 intelligent modular software for test instruments | | |
| SECUTEST device module (all versions) | Z530C | Z530C |
| Basic module | Z531A | Z531A |
| Expansion module ⁵⁾ | Z531B | Z531B |
| Add-on modules ⁶⁾ | | |
| - LHNavigatör + LHVviewer | Z531C | Z531C |
| - Client compatibility | Z531D | Z531D |
| - Inventory management | Z531E | Z531E |
| - Outdoor mode | Z531F | Z531F |
| - Remote module for SECUTEST | Z531G | Z531G |
| - Error indicator module | Z531H | Z531H |
| - Barcode module | Z531J | Z531J |
| - Repair management | Z531K | Z531K |
| - Network | upon request | upon request |
| Update from SE-Q.base to PS3 | Z530U | Z530U |
| Documentation & management software for measurements per DIN VDE 0701/0702 ¹⁾ | PC.doc-win | Z710F |
| Protocol and database software ¹⁾ for measurements per DIN VDE 0751/IEC 60601, prerequisite: Winword 6.0 | PC.doc-med+204 | Z710E |
| Windows software for remote control of SECUTEST... devices by entering test sequences specified by the customer | SE-Q.remote | Z710L |

| Designation | Type | Article Number |
|--|-----------------------|--------------------|
| Accessories | | |
| Test probe and cable (not coil cord), 2 m, suitable for high-voltage test | SK2 | Z745D |
| Pack of 10 rolls of recording chart paper SECUTEST®PSI (approx. 6.7 m per roll) | PS-10P | GTZ 3229 000 R0001 |
| Pack of 10 ink ribbon cartridges for the SECUTEST®PSI | Z3210 | GTZ 3210 000 R0001 |
| Barcode scanner | B3261 | GTZ 3261 000 R0001 |
| Barcode and label printer and software | Z721D | Z721D |
| Label set for Z721D printer | Z722D | Z722D |
| Printer adapter for direct connection to external printers with Centronics interface for SECUTEST®SIII as from manufacturing date 8/99 | DA-II | Z745M |
| 12 conductor patient connection cable, each conductor with 4 mm plug for test instruments with feature J01 | PA4 | Z745L |
| Pt100 temperature sensor for surface and immersion measurements, -40 ... +600 °C | Z3409A | GTZ 3409 000 R0002 |
| Pt100 oven sensor, -50 ... +550 °C | TF550 | GTZ 3408 000 R0001 |
| Clip-on current sensor, can be set to 1 mA to 15 A or 1 A to 150 A, Frequency range: 45 ... 65 ... 500 Hz, 1 mV/mA and 1 mV/A | WZ12C ^{D)} | Z219C |
| Shunt for measuring range matching when using the instrument with feature G01 in combination with WZ12C transformer | Z864A | Z864A |
| Adapter for testing single-phase extension cables including earthing contact and inlet plug inserts ³⁾ | EL1 | Z723 |
| Plug insert for EL1 in Switzerland per SEV | PRO-CH | GTZ 3225 000 R0001 |
| Plug insert for EL1 in Great Britain | PRO-GB | GTZ 3226 000 R0001 |
| Plug insert for EL1 GB measurement | PRO-GB/ring | GTZ 3226 000 R0002 |
| Plug insert for EL1 in Italy per IMQ | PRO-I | GTZ 3227 000 R0001 |
| Plug insert for EL1 in Denmark | PRO-DK | GTZ 3219 000 R0001 |
| Plug insert for EL1 in South Africa | PRO-RSA | Z501A |
| Plug insert for EL1 with 3 connector cables for any desired connection standards | PRO-UNI | GTZ 3214 000 R0003 |
| Plug insert for EL1 with 10 m cable for PE measurements and the like | PRO-RLO | GTZ 3214 000 R0002 |
| Adapter for connecting devices under test with 5-pole 16A/6h CEE plug | AT3-med | Z745E |
| Test case for measurements per DIN VDE 0701/0702/0751 for connection to the SECUTEST® SII/SIII and M701x test instrum. | AT3-III ^{D)} | Z745P |
| Adapter for connecting devices under test: 3-pole 16 A, 5-pole 16 A and 32 A, 5 ea. 4 mm jack | CEE-Adapter | Z745A |
| Cable set ³⁾ | KS13 | GTY 3624 065 P01 |
| Calibration adapter for test instruments per DIN VDE 0701/0702 (max. 200 mA) ⁴⁾ | SECU-cal 10 | Z715A |
| Pouch for all SECUTESTs w/o HV module | F2000 | Z700D |
| Carrying case for SECUTEST®SIII w/o HV | K701 | GTZ 3316 000 R0001 |
| Brush probe | Z745G | Z745G |

- ¹⁾ Includes: 3½" floppy disk and Z3241 interface cable for RS232.
- ²⁾ Values for high-voltage test per part 260 are not transferred.
- ³⁾ Cannot be used for high-voltage test per part 260.
- ⁴⁾ Cannot be used for high-voltage test per part 260 or for 10 A PE test.
- ⁵⁾ Prerequisite: device module and basic module
- ⁶⁾ Prerequisite: expansion module
- ^{D)} Data sheet available

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