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GOSSEN METRAWATT

SECULIFE | ST and SECULIFE | ST HV
Test Instrument for DIN EN 60601/60335/60950/61010, DIN VDE 0700/0701-0702 and IEC 62353 (VDE 0751-1)

3-349-450-03
18/3.19

The SECULIFE ST/ST HV test instruments 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:

- after repair and for periodic testing of electrical devices in accordance with DIN VDE 0701-0702:2008
- after repair and for periodic testing as well as for technical safety checks of electrical medical devices per IEC 62353 (VDE 0751-1) and/or DIN EN 60601 on the basis of the MPG[1)]
- in the production of:
  - electrical measuring, control and laboratory devices per DIN EN 61010
  - data processing systems per DIN EN 60950
  - electrical medical devices per DIN EN 60601
  - household appliances per DIN EN 60335

DAkkS Calibration Certificate included

Power shutdown as soon as the leakage current exceeds approx. 15 mA provides a maximum of safety for the user

High-voltage test for:
DIN EN 60950, DIN EN 61010, DIN EN 60335 and DIN EN 60601

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 (except if 3-phase current adapters are used).

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

Selectable Test Current for Protective Conductor Testing (4-pole Measurement)

With 200 mA, 10 A or 25 A test current

Insulation Test

By means of insulation resistance or equivalent leakage current measurement or high-voltage test

Leakage Current Test

With measurement of earth, housing or patient leakage current, patient auxiliary current, protective conductor current, contact current, verification of absence of voltage by means of current measurement or device leakage current

Basic Instrument and Expansion Features

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

Data Interface for PC, Printer and Barcode

Expandable

The SECUTEST SI+ option expands the basic instrument into a unique data logger with memory 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 DGUV regulation 3 (formerly BGV A3)

The test instrument can be utilized for quick and safe testing of repaired or modified electrical devices and as well as for periodic testing in accordance with DIN VDE 0701-0702:2008.

The following are measured in accordance with the standards:

- Protective conductor resistance
- Insulation resistance
- Protective conductor current for SC1 devices
- Contact current for SC2 devices
- Absence of voltage at exposed conductive parts (= contact current)

Measuring methods for leakage current measurements:
– Direct measurement
– Equivalent leakage current
– Residual current

Suitable for persons with basic electro-technical training due to automatic evaluation of executed test sequences in consideration of measuring uncertainty

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 test instrument with feature KA01 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 IEC 62353/DIN EN 62353 (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 IEC 62353 (VDE 0751-1) regulations:

- Protective conductor resistance
- Insulation resistance
- Equivalent device leakage current
- Equivalent patient leakage current
- Device leakage current
- Patient leakage current (AC/DC portions are measured separately)

Measuring methods for leakage current measurements:
– Direct measurement
– Equivalent leakage current
– Residual 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 ⏚ 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 (momentary and min/max values)
- Resistance
- Voltage against PE, e.g. phase detection
- Current and protective conductor resistance with clip-on meter (accessory)
- Temperature with Pt100 or Pt1000 (accessory)

High-Voltage Test with Direct Voltage (SECULIFE ST HV)

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 60601 3rd edition/ EN 50106 (VDE 0700 part 500), as well as with other standards.

Report Functions

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

All measured data can be documented and archived with the measurement and test report, which can be saved to memory and printed out from a PC.

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

The SECUTEST SI+ module (accessory equipment), a memory with integrated interface and keypad which can be mounted inside the lid of the test instrument, expands the applications range of the test instrument.

Test Instrument for DIN EN 60601/60335/60950/61010, DIN VDE 0700/0701-0702 and IEC 62353 (VDE 0751-1)

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

IEC/EN 61 010-1:2011 VDE 0411-1:2011	Safety requirements for electrical measurement, control and laboratory devices – General requirements
DIN VDE 0404 Part 1: 2002	Test and measuring equipment for testing the safety of electrical devices – General requirements
DIN VDE 0404 Part 2: 2002	– Testing equipment for tests after repair, modification or in the case of periodical tests
DIN VDE 0404 Part 3: 2005	– Equipment for periodical tests and tests prior to commissioning medical electrical devices or systems
DIN EN 60 529/ VDE 0470 Part 1	Test instruments and test procedures, protection provided by enclosures (IP code)
DIN EN 61 326-1 VDE 0843-20-1	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements

Standards for the Use of the Test Instruments

	Testing after Repairs / Periodic Testing		Routine Testing			
Devices under test to be tested in accordance with the following regulations	DIN VDE 0701-0702:2008	IEC 62353:2014 DIN EN 62353:2015 (VDE 0751-1)	DIN EN 60950	DIN EN 61010	DIN EN 60335/EN 50106	IEC 60601/DIN EN 60601 *
Electrical devices	•			•		
Appliances and electric equipment	•				•	
Mains operated electronic devices	•					
Hand-held electric tools	•					
Extension cables	•					
Data processing devices	•		•			
Electrical medical devices, application parts		•				•

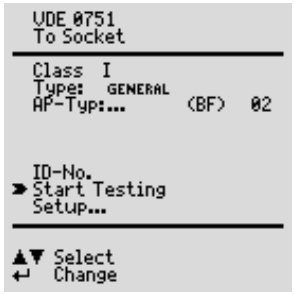
* only test instruments with Feature KA01

Table: Individual Measurements – Standards

Individual Measurements per Regulation	Test Current [A]	DIN VDE 0701-0702	DIN VDE 0701 Part 1	DIN VDE 0701 Part 240	DIN VDE 0701 attachment E	DIN EN 60950	DIN EN 61010	DIN EN 60335	IEC 62353 (VDE 0751-1)	IEC 601/EN 60 601 2nd	IEC 601/EN 60 601 3rd
Protective Conductor Resistance	0.2	•	•	•					•		
	10								•		
	25					•	•	•	•	•	•
Insulation Resistance		•	•								
Equivalent Leakage Current		•	•	•							
High-Voltage Test						•	•	•		AC	AC
Equivalent (Device) Leakage Current								•	•		
Equivalent Patient Leakage Current									•		
Residual Current		•	•						•		
Contact Current		•	•								
Absence of Voltage (exposed conductive parts)		•		•							
Housing Leakage Current						•	•			•	•
Earth Leakage Current										•	•
Patient Leakage Current									•	•	•
Total Patient Leakage Current											•
Patient Auxiliary Current										•	•
Device Leakage Current									•		
Single Fault Conditions N								•		•	•
PE							•			•	•
Mains at Application Part										•	•

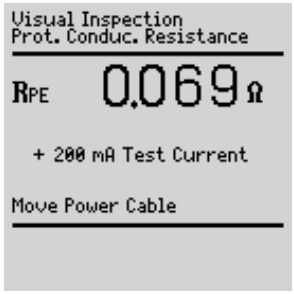
Sample displays, menu-driven operation:

Test Sequence Setup



Visual Inspection

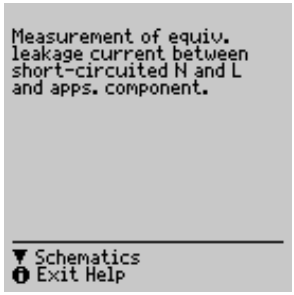
Protective Conductor Test



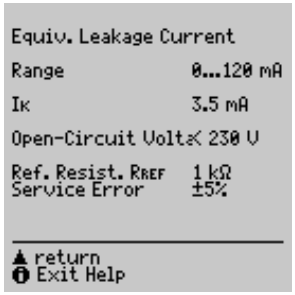
Leakage Current Measurement

Sample displays, online help:

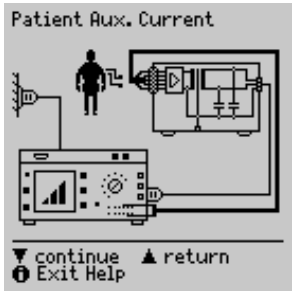
Online Help Texts



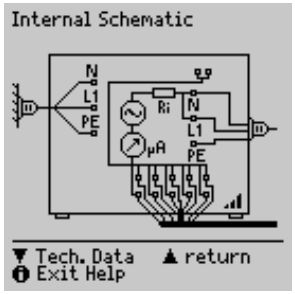
Technical Data



Schematic Diagrams

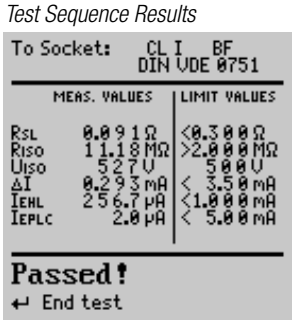


Internal Circuit Diagrams

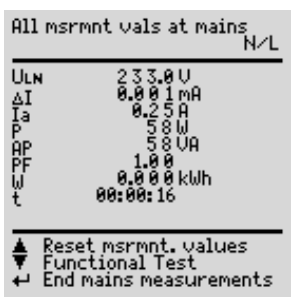


Sample reports with measurement results:

Test Sequence Results



Function Test Results



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Test Instrument for DIN EN 60601/60335/60950/61010, DIN VDE 0700/0701-0702 and IEC 62353 (VDE 0751-1)

Characteristic Values (Test durations for automatic sequence *: > 2 sec., except for device protecture conductor resistance R_{SL} > 7 sec.)

Refer to page 3 for assigning individual measurements to the regulations

Measured Quantity	Measuring Range/ Nominal Range of Use	Resolution	Nominal Voltage U_N	Open-Circuit Voltage U_0	Nominal Current I_N [10]	Short-Circuit Current I_K	Internal Resistance R_I	Reference Resistance R_{REF}	Measuring Uncertainty [8]	Intrinsic Uncertainty [8]	Overload Capacity Value	Overload Capacity Time
Device Protective Conductor Resistance R_{PE}	0.000 ... 2.100 Ω	1 mΩ	—	4.5 ... 9 V DC	—	> 200 mA DC	—	—	±(5% rdg.+10 digits) > 10 d	±(2.5% rdg.+ 5 digits) > 10 digits	253 V	cont.
	2.11 ... 31.00 Ω	10 mΩ										
	0.000 ... 2.100 Ω	1 mΩ	—	< 6 V AC	—	> 10 A AC[4] >5 s	—	—			no protection [5]	
Insulation Resistance R_{ISO}	0.050 ... 1.500 MΩ	1 kΩ	50 ... 500 V DC	1.0 • U_N ... 1.5 • U_N	> 1mA	< 10 mA	—	—	±(5% rdg.+10 digits)	±(2.5 % rdg.+5 digits) > 10 digits	253 V	cont.
	1.01 ... 10.00 MΩ	10 kΩ							±(10% rdg.+10 digits)	±(10 % rdg.+10digits)		
	10.1 ... 310.0 MΩ	100 kΩ										
Equivalent Leakage Current I_{EL}	0.00 ... 21.00 mA	10 µA	—	230 V ~ – 20/ +10 %	—	< 3.5 mA	> 72 kΩ	2 kΩ	±(5% rdg.+10 digits)	±(2.5 % rdg.+5 digits) > 10 digits	253 V	cont.
	20.1 ... 120.0 mA	100 µA										
Contact Current I_{probe}	0 ... 3.500 mA	1 µA	—	—	—	—	2 kΩ	—	±(5% rdg.+10 digits)	±(2.5 % rdg.+5 digits) > 10 digits	253 V	cont.
Residual Current I_{DI} between L and N	0.000 ... 3.100 mA ~	1 µA	—	—	—	—	—	—	±(10% rdg.+10 digits) > 10 digits	±(5 % rdg.+10 digits) > 10 digits	1)	1)
	3.00 ... 31.00 mA ~	10 µA										
Equivalent Device and/or Equivalent Patient Leakage Current I_{EDL} and/or I_{EPL}	0.0 ... 310.0 µA	0.1 µA	—	230 V ~ – 20/ +10 %	—	< 3.5 mA	> 72 kΩ	1 kΩ ±50 Ω	±(5% rdg.+10 digits)	±(2.5 % rdg.+5 digits) > 10 digits	253 V	cont. [1) 3)]
	0.000 ... 2.100 mA	1 µA										
	2.101 ... 21.00 mA	10 µA										
	20.1 ... 120.0 mA	100 µA										
Leakage Current I_L [2]	0.0 ... 310.0 µA	100 nA	approx. line voltage [6]	—	—	—	1 kΩ	—	±(5% rdg.+10 digits)	±(2.5 % rdg.+5 digit) > 10 digit	253 V	cont. [1) 3)]
All Leakage [7] Current I_L	0.210 ... 3.600 mA	1 µA										
	3.10 ... > 15.00 mA	10 µA										

Function	Measured Quantity	Measuring Range / Nominal Range of Use	Resolution	Open-Circuit Voltage U_0	Short-Circuit Current I_K	Internal Resistance R_I	Measuring Uncertainty	Intrinsic Uncertainty	Overload Capacity Value	Overload Capacity Duration
Functions Test	Nominal Voltage U_{L-N}	103,5 V ... 126,5 V 207.0 ... 253.0 V ~	0.1 V	—	—	—	—	±(2.5%rdg.+5 digits)	253 V	cont.
	Load Current I_V	0 ... 16.00 A_{RMS}	10 mA	—	—	—	—	±(2.5%rdg.+5 digits)	20 A	10 min
	Active Power P	0 ... 3700 W [9]	1 W	—	—	—	—	±(5% rdg.+10 digits) > 20 digits	253 V	cont.
									20 A	10 min
	Apparent Power S	0 ... 4000 VA	1 VA	Calculated Value U_{L-N} • I_V				±(5% rdg.+10 digits) > 20 digits		
	Power Factor PF, sinusoidal: cos φ	0.00 ... 1.00	0.01	Calculated Value P / S, Display > 10 W				±(10% rdg.+5 digits)		
	Residual Current ΔI between L and N	0.00 ... 31.00 mA ~	10 µA	—	—	—	±(10% rdg.+10 d) > 10 digits	±(5% rdg.+10 digits)	1)	1)
$U_{AC/DC}$	Voltage	0 ... 253.0 V ⎓, ~ and ≂	0.1 V	—	—	—	±(5% rdg.+10 d)	±(2.5%rdg.+5 digits) > 10 digits	253 V	cont.
U_{probe}	Probe Voltage	0 ... 253.0 V ⎓, ~ and ≂	0.1 V	—	—		—	±(2.5%rdg.+5 digits) > 10 digits	253 V	cont.
R	Resistance	0 ... 150.0 kΩ	100 Ω	< 20 V –	1.1 mA	—	—	±(1% rdg.+3 digits)	253 V	cont.
I_{clip}	Current via Clip-On Current-Voltage Converter WZ12C	0.000 ... 10.00 A ~	1 mA	—	—	1.5 MΩ	—	±(3% rdg.+10 digits) > 10 digits without clip	253 V	cont.
		0 ... 100 A ~	1 A	—	—	1.5 MΩ	—		253 V	cont.
Temp	Temperature with Pt100 / Pt1000 Sensor	– 200 ... – 50 °C	1 °C	< 20 V –	1.1 mA	—	—	±(2% rdg.+1 °C)	10 V	cont.
		– 50.1 ... + 300.0 °C	0.1 °C					±(1% rdg.+1 °C)	10 V	cont.
		+300 ... +850 °C	1 °C					±(2% rdg.+1 °C)	10 V	cont.

* The test durations are not tested and calibrated, but are determined on the basis of the processor cycle times.

1) As of 25 mA: shutdown by residual current measurement within 100 ms
2) Except for contact current: only 0.000 to 3.100 mA
3) Measuring circuit is highly resistive, indication at display
4) Measurement with AC test current is not possible at jacks (1) to (3); 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: max. 253 V
7) AC and DC are measured for patient leakage current and patient auxiliary current.
8) The data are only valid for the values displayed at the test instrument. Data which are transmitted via the RS232 interface may deviate.
9) Measured value P and calculated value S are compared, and the smaller value is displayed.
10) for U_N = 500 V and R = 500 kΩ

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

High Voltage Test (feature F02 or SECULIFE ST HV)

Transducer

Nominal Voltage, AC	$U_{N\sim}$ adjustable	in 10 V steps in 100 V steps	0.5 … 0.99 kV 1 … 4 kV*
Open-Circuit Voltage, DC	Uo		(($U_{N\sim}$ · 1.5) · 1.011) + 60 V
Intrinsic Uncertainty, Uo	Uo		±(2.5% rdg. + 5 digits)
Nominal Current	per DIN VDE 0104		< 3.5 mA DC
Short-Circuit Current	discharge current from 6 x 2.7 nF		> 5 A at 5 kV
Resistance to Interference Voltage			none

* for mains connections feature B02, B05, B07, B08 and/or if adapter (feature B11) is applied: HV-DC max. 1.5 kV DC

Measuring

Measuring Range	Display Range	Intrinsic Uncertainty, Uo
0 … Uomax	0.000 … > 10.00 kV DC	±(2.5% rdg. + 5 digits)

Test duration for automatic sequence per IEC 60601: approx. 60 sec., adjustable per DIN EN 60950, DIN EN 61010 and DIN EN 60335: approx. 5 sec. to 60 sec.

Test Instrument for DIN EN 60601/60335/60950/61010, DIN VDE 0700/0701-0702 and IEC 62353 (VDE 0751-1)

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 V	disabled
Protective conductor PE and phase conductor L reversed and/or neutral conductor N interrupted	⚠ lamp lights up	Voltage at PE > 65 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 V	disabled, although disabling can be deactivated (e.g. IT network)
Mains voltage too low	⚠ lamp lights up	U_{L-N} < 90/180 V	possible under certain circumstances

Influencing Quantities and Influence Error

Influencing Quantity/ Sphere of Influence	Designation per DIN VDE 0404	Influence Error ± … % of Measured Value
Position Change	E1	—
Change in Test Setup Supply Power	E2	2.5
Temperature Fluctuation	E3	Specified influence error applies per 10 K change in temperature:
0 … 21 °C and 25 … 40 °C		1 in case of PE measurement
		0.5 of all other measuring ranges
Current at Device Under Test	E4	2.5
Low-Frequency Magnetic Fields	E5	2.5
Impedance at Device Under Test	E6	2.5
Capacitance, Insulation Measurement	E7	2.5
Waveshape of Measured Current	E8	
49 … 51 Hz		2 for capacitive load (for equivalent leakage current)
45 … 100 Hz		1 (for contact current)
		2.5 for all other measuring ranges

Additional frequency influence for direct leakage current measurements

1kHz ... 10kHz	—	Leakage Current (direct) < 2.5 dB
10kHz ... 15kHz		Leakage Current (direct) < 6 dB
15kHz ... 20kHz		Leakage Current (direct) < 10 dB
20kHz ... 35kHz		Leakage Current (direct) < 20 dB
35kHz ... 100kHz		Leakage Current (direct) < 12 dB

Reference Ranges

Line Voltage	115/230 V ± 0.2%
Line Frequency	50/60 Hz ± 0.1%
Waveshape	sine (deviation between effective and rectified value < 0.5%)
Ambient Temperature	+23 °C ±2 K
Relative Humidity	40% … 60%
Load Impedance	linear

Nominal Ranges of Use

Line Voltage	103.5 V ... 126.5 V or 207 V ... 253 V
Line Frequency	50 Hz or 60 Hz
Line Voltage Waveshape	sine
Temperature	0 °C ... + 50 °C

Ambient Conditions

Storage Temperature	– 20 °C ... + 60 °C
Operating Temp.	– 10 °C ... + 50 °C
Accuracy Range	0 °C ... + 50 °C
Relative Humidity	max. 75%, no condensation allowed
Elevation	max. 2000 m

Electromagnetic Compatibility

Product standard DIN EN 61326-1

Interference emission		Class
EN 55011		B
Interference immunity	**Test Value**	**Evaluation Criteria**
EN 61000-4-2	Contact/Atmos. – 4 kV/8 kV	A
EN 61000-4-3	3 V/m or 1 V/m	A
EN 61000-4-4	1 kV	B
EN 61000-4-5	1 kV bzw. 2 kV	A
EN 61000-4-6	3 V/m	A
EN 61000-4-11	0.5/1/25 Periods	A
	250 Periods	C

Power Supply

Line Voltage	103.5 V ... 126.5 V or 207 V ... 253 V
Line Frequency	50 Hz or 60 Hz
Power Consumption	approx. 30 VA
for 10 A test current	approx. 95 VA, test duration max. 40 s
for 25 A test current	approx. 180 VA, test duration max. 40 s
for function test	continuous max. 3600 VA, power is conducted through the instrument only, switching capacity ≤ 16 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
Measuring Category	250 V CAT II (is not valid for the jacks 1, 2 and 3)
Pollution degree	2
Safety Shutdown	for residual current at device under test > 25 mA, disconnecting time < 100 ms probe current > 10 mA, < 1 ms

Mechanical Design

Display	multiple backlit dot matrix display, 128 x 128 pixels
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

SECULIFE | ST and SECULIFE | ST HV
Test Instrument for DIN EN 60601/60335/60950/61010, DIN VDE 0700/0701-0702 and IEC 62353 (VDE 0751-1)

Protection — housing: IP 40, connections: IP 20 per DIN VDE 0470 Part 1/EN 60529, Extract from table on the meaning of IP codes

IP XY (1st digit X)	Protection against foreign object entry	IP XY (2nd digit Y)	Protection against the penetration of water
2	≥ 12.5 mm Ø	0	not protected
4	≥ 1.0 mm Ø	0	not protected

Standard equipment SECULIFE ST/ST HV

1 test instrument with 10 + 2 connectors for application parts
1 probe cable with test probe
1 plug-on alligator clip for test probes
3 plug-on quick-connect terminals
10 conductor patient connection cable 2 mm
10 Clip-on alligator clip 2 mm
1 Calibration Certificate per DAkkS
1 operating instructions
1 carrying strap

Features and Options

List of possible options:

Feature		00	01	02	03	04	05	06	07	08	09	10	11	XX
Mains Connection for Country of Use	B	D	D + service socket	UK [4]	F/CZE		DK [4]		US [4]	China/ AUS [4]	CH		Adapter kit [2] [4]	
User Interface Language	C	D	UK	F	I	E	CZE	NL						
High-Voltage Test HV DC	F	without		max. 6,126 kV DC (≙ 4 KV AC)										
AC Test Current 50/60 Hz for Protective Conductor Measurement	G	10 A	25 A											
Test Sequence for IEC 60 601	KA	without	with											
Data Memory for up to 125 Tests [5]	KB	without	with											
Recognition of Probe on Protective Conductor	KD	without	with											
Direct Printing after each Measurement for Automatic Test Sequences [1] via RS232	KE	without	with											
Calibration Certificate per DAkkS	P	D/GB/F	GB/PL											

[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 the PSI module, the SECUSTORE memory adapter or a PC)

[2] Adapter kit for international use (equipped with Feature B01)

[4] for mains connections feature B02, B05, B07, B08 and/or if adapter (feature B11) is applied: HV-DC max. 1.5 kV DC

[5] without function test values and without comments on DUT

Enter the designation of the basic instrument to your order, i.e. M6930, and only those desired features which are other than 00!

Example of a complete type designation (= article number, = order designation) for a **SECULIFEST**:

SECULIFEST with Swiss plug and Swiss socket in French language, without high-voltage test, with AC test current 25 A, without test sequence for IEC 60601, without data memory, with recognition of probe on protective conductor, without direct print-out option, with Calibration Certificate per DAkkS in D/GB/F:

Features:
M6930 B09 C02 F00 **G01** KA00 KB00 **KD01** KE00 P00

For Standard types available from stock, see order information page 10.

Features which are additionally required can be retrofitted by GMC-I Service GmbH upon request.

Test Instrument for DIN EN 60601/60335/60950/61010, DIN VDE 0700/0701-0702 and IEC 62353 (VDE 0751-1)

Feature KA01: Tests per IEC 60 601/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:

Data memory for up to 125 tests
Memory expansion for test results

If no (P)SI module is connected, up to **125 test results*** are stored to the test instrument. The test results can be viewed on the display and printed out, for example, via a terminal program. The test results are sorted in chronological order and are shown with the associated ID number. If no ID number has been allocated, date and time of storage are automatically saved instead. Alternatively, a consecutive number can be entered.

* without function test values and without comments on DUT

Storage of parameter settings
for test sequences per IEC/DIN EN 60335/60950/61010

Test sequences can be configured on-site and performed in the appropriate selector switch position in accordance with the respective regulations. These **configurations for various test sequences** are stored to the test instrument and can be reactivated as required.

Feature KD01: (Recognition of Probe on Protective Conductor)

For freely configurable instruments the feature additionally includes a 5 m long probe cable with a test probe. 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: Direct Print-Out

After completion of each test (individual test or at the end of a test sequence), test results are read out directly via the RS232 interface.

User interface languages which are not included as a standard feature can also be uploaded from our homepage (www.gossenmetrawatt.com). One language at a time can be uploaded to the test instrument.

Accessories

Memory and Input Module SECUTEST SI+

Values measured by the test instrument can be stored to this module, and can be furnished with comments with the help of the alphanumeric keypad. The LCD panel at the test instrument is used as a display for the module. Statistical analysis of the measurement results is also possible (percentage of tests which have been successfully passed. The SI module is screwed into the lid of the test instrument in a space-saving fashion.

Please request our SECUTEST SI+ data sheet for further information.

Comparison of Memory Adapters / Testers with Memory Option

Features	SECUTEST SI+ (M702G)	SECUTEST PSI (GTM50160000R0001)	SECUTEST SIII+ Feature KB01 SECULIFEST	SECUTEST S2N+ Option DBmed	SECUSTORE no longer available
Integrated printer for recording charts	—	•	—	—	—
Annotations via keyboard	•	•	—	—	—
Data memory (flash)	•	—	—	—	•
Data memory (battery buffered)	•	•	•	•	—
Protocol functions	•	•	—	—	•
Statistical evaluation of up to 8 instrument classes	•	•	—	—	—
Data transmission to PC via RS232 interface	•	•	•	•	•
Data transmission to PC via USB interface	•	—	—	—	—
Connection of a barcode scanner	•	•	•	•	•
Connection of an RFID scanner	•	•	•	•	•
Storage of function test values	•	•	—	—	•
Storage of comments on DUT	•	•	—	—	—

SECULIFE | ST and SECULIFE | ST HV
Test Instrument for DIN EN 60601/60335/60950/61010, DIN VDE 0700/0701-0702 and IEC 62353 (VDE 0751-1)

SECU-cal 10 Calibration Adapter (Z715A)

The calibration adapter is used for testing the measuring uncertainty of test instruments in accordance with DIN VDE 0701-0702 and IEC 62353 (VDE 0751-1). As a rule, these instruments must be tested once each year, as set forth by accident prevention regulation DGUV regulation 3 (formerly BGV A3) as well as for certification in accordance with the ISO 9000 quality standard.

All limit values for the required tests per DIN VDE, as well as protective conductor resistance, insulation resistance, equivalent leakage current, differential and/or contact as well as housing leakage current must be tested.

3-phase current adapter AT3-II-S (Z745T)

Safety tester medicine set (M693E)

3-phase current adapter AT3-III-E (Z745S)

Universal carrying pouch F2000 (Z700D) for SECULIFEST and accessories (not suited for Feature F02 or SECULIFE ST HV)

Outside dimensions:
W x H x D
380 x 310 x 200 mm
(without buckles, handle and carrying strap)

Test Instrument for DIN EN 60601/60335/60950/61010, DIN VDE 0700/0701-0702 and IEC 62353 (VDE 0751-1)

Universal carrying pouch (small) F2010 (Z700G) for SECULIFEST without accessories (not suuited for Feature F02 or SECULIFE ST HV)

Outside dimensions:
W x H x D
380 x 230 x 270 mm
(without carrying strap)

Universal carrying pouch (large) F2020 (Z700F) for SECULIFEST or SECULIFE ST HV and accessories

Sample Contents

Outside dimensions:
W x H x D
430 x 310 x 300 mm
(without buckles, handle and carrying strap)

Order Information

Designation	Type	Article Number
Test instrument with automatic test sequence, interface, German online instructions, earthing contact plug and socket, with 10 + 2 connectors for application parts, probe cable with test probe, plug-on alligator clip, 3 plug-on quick-connect terminals, DAkkS calibration certificate, operating instructions. See table on page 6 for features and expansions.	**SECULIFEST**	**M6930** (all features: 00)
Standard types available from stock		
Test instrument with test current ±200 mA DC and 10 A AC Sequences for IEC 61010, IEC 60335, IEC 60950 and IEC 60601, data memory for up to 125 tests	**SECULIFEST**	M693A
Same instrument as M693A, however, suited to **international use** with adapter set for mains connection in the respective user country and English user interface language	**SECULIFEST**	M693B
Same instrument as M693A, however, with test current ±200 mA DC or 25 A AC, additionally with high-voltage test max. 6.126 kV DC (≙ 4 KV AC)	**SECULIFE ST HV**	M693C
Same instrument as M693C, however, suited to **international use** with adapter set (application of adapter: high-voltage test max. 1.5 kV DC) for mains connection in the respective user country and English user interface language	**SECULIFE ST HV**	M693D
Test instrument **SECULIFEST** (M6930 all features 00, standard equipment see above), pouch F2000, patient connection cable PA4, SI module SECUTEST SI+ and protocoll software GMST	**Safety tester medicine set**	M693E
PC Analysis Software		
For further information on software, please refer to our website www.gossenmetrawatt.com		
Accessories for Report Generation		
SI module with RS232 and USB interface, with user languagues D, GB, F, NL, I, E and CZ, batteries and operating instructions	SECUTEST SI+ D)	M702F
same as SECUTEST SI+, without USB interface, however, with additional integrated printer including 2 rolls of recording charts and 1 printer ribbon cartridge	SECUTEST PSI D)	GTM5016000R0001
Memory adapter for „direct print-out“ and internal test reports	SECUSTORE D)	Z745U
Firmware upgrade for SECUTEST data base: data memory for up to 125 tests (without function test values and without comments on DUT)	DBmed	Z853H
For barcode scanner, printer and RFID scanner see separate datasheet ID systems		
Accessory Probes, Sensors, Adapters and Cables		
Test probe with cable (no coil cord), 2 m, suitable for high-voltage test	SK2	Z745D
Test probe with cable (coil-cable),2 meters long, suitable for high-voltage test	SK2W	Z745N
Probe cable 5 m	SK5	Z745K
Brush probe	Z745G	Z745G
12 conductor patient connection cable, each conductor with 4 mm plug	PA4	Z745L

SECULIFE | ST and SECULIFE | ST HV

Test Instrument for DIN EN 60601/60335/60950/61010, DIN VDE 0700/0701-0702 and IEC 62353 (VDE 0751-1)

Designation	Type	Article Number
Pt100 temperature sensor for surface and immersion measurements, –40 .. +600 °C	Z3409	GTZ3409000R0001
Pt100 oven sensor, –50 ... +550 °C	TF550	GTZ3408000R0001
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, **do not use for high- voltage tests**	EL1	Z723A
Plug insert for EL1 in Switzerland per SEV	PRO-CH	GTZ3225000R0001
Plug insert for EL1 in Great Britain	PRO-GB	GTZ3226000R0001
Plug insert for EL1 GB measurement	PRO-GB/ring	GTZ3226000R0002
Plug insert for EL1 in Italy per IMQ	PRO-I	GTZ3227000R0001
Plug insert for EL1 in Denmark	PRO-DK	GTZ3219000R0001
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	GTZ3214000R0003
Plug insert for EL1 with 10 m cable for PE measurements and the like	PRO-RLO	GTZ3214000R0002
Plug insert Schuko or the like (replacement plug, included in EL1)	PRO-Schuko	GTZ3228000R0001
test adapter with single-phase and three-phase plug connectors up to CEE 32A – for all tests on single-phase and three-phase electrical devices without mains voltage per DIN VDE – for tests on single-phase and three-phase extension cables per DIN VDE	VL2E	Z745W
3 phase 16 A differential current adapter	AT16-DI	Z750A
3 phase 32 A differential current adapter	AT32-DI	Z750B
Test adapter for tests on devices with CEE16 and CEE32 connections (load rating of max 20 A)	AT3-II-S [D]	Z745T
same as AT3-II-S, however, with a load rating of 32 A	AT3-II S32 [d]	Z745X
3-phase current adapter 16A/32A (test case) for connection to the test instrument for tests per DIN VDE 0701-0702/IEC 62353 (VDE 0751) and IEC 601	AT3-III-E [D]	Z745S
Adapter for connecting devices under test: 3-pole 16 A, 5-pole 16 A and 32 A, 5 ea. 4 mm jack – for all tests in accordance with DIN VDE without line voltage at single and 3 phase electrical devices	CEE-Adapter	Z745A
Cable set for connecting test instruments to the mains without earthing contact socket and for connection of DUTs, **do not use for high-voltage tests**	KS13	GTY3624065P01
Cable set (1 pair of measuring cables) 1.2 m, with VDE-GS sign 1000 V/CAT III 1 A, 600 V/CAT IV 1 A, 1000 V/CAT II 16 A*	KS17-2	GTY3620034P0002

Designation	Type	Article Number
Further Accessories		
Calibration adapter for test instruments per DIN VDE 0701-0702 and IEC 62353 (VDE 0751) (max. 200 mA), **do not use**	SECU-cal 10	Z715A
Universal carrying pouch for **SECULIFEST**	F2000 [D]	Z700D
Universal carrying pouch small with flexible divider and display protection for **SECULIFEST** w/o accessories	F2010	Z700G
Universal carrying pouch big for **SECULIFE ST HV** and accessories	F2020	Z700F

[D] Data sheet available
* without safety cap applied

For additional information on accessories, please refer to:

- Measuring Instruments and Testers catalog
- our website www.gossenmetrawatt.com

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