GOSSEN METRAWATT

Datasheet

SECULIFE ST PRO / SECULIFE ST PRIME

Test Instruments for Testing the Electrical Safety of Medical Devices



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- Antimicrobial effectiveness of the test device's surfaces, ideal for use in medical settings and environments
- 10 configurable ports for application modules, with an integrated switching matrix
- Integrated test sequences for quickly testing operating equipment (preconfigured standards-compliant series of individual tests with subsequent documentation)
- Suitable for use by trained persons
- Quick access to measuring and test functions via the double rotary switch, direct selection keys and softkeys
- Automatic detection of DUT connection and protection category
- Unique multiple measurement permits convenient recording of several measuring points.
- Testing of various PRCD types, such as PRCD-S and PRCD-K (including protective conductor resistance measurement for variants with a connected PE), using integrated test sequences
- Comprehensive, legally secure preparation of test reports
- Comprehensive data management and storage concept for test results and individual measurements (up to 50,000 data records) – Assignment of measurements/tests to devices and customers
  (1 data record = 1 test specimen or location node or customer or individual measurement value)
- USB interfaces for data entry and transmission
- High-resolution, brilliant 4.3" TFT color display
- Compact, impact resistant housing with integrated rubber protector
- Can be optimized for use by trained persons within the test team
- Extensive setting options for international use (language, keypad, character set, date, time)
- SECULIFE ST PRIME supports high-voltage testing as a single test or as a test sequence in accordance with DIN EN 60601, as well as other optional test sequences.

- R_{PE} test with a test current of 200 mA, 10 A, or 25 A (optional on the SECULIFE ST PRO; standard on the SECULIFE ST PRIME)
- Connections for a second test probe and voltage measurement (Second probe connection not available on the SECULIFE ST PRIME)
- Test procedures in accordance with IEC 62353 and IEC 60601 and measurements via AWT jacks
- Single Fault Conditions, configurable with or without power to the application unit
- Adjustable test conditions; data entry via touch screen
- Database functions enable the creation of a complete test structure with customer or device views

Includes the SECUTEST DB+ database extension

- Remote control via PC (IZYTRONIQ) is possible.
- Create up to 24 custom test sequences (max. 1,200 test steps in total) in IZYTRONIQ and import them into the test device
- Additional database elements:
  - Property, building, floor, and room—to better organize larger datasets
  - Department and cost center
  - Custom inspection interval for each item to be inspected
- Multiprint – Print multiple or all test reports available for a test object with the push of a button (on a connected Z721S thermal printer or USB flash drive)
- Report template can be customized directly in the testing device, including the company logo
- Export all data (master data and measured values) as a file to a USB flash drive or directly to IZYTRONIQ

- Import of all test object master data (excluding measured values) from IZYTRONIQ or a USB flash drive into the test device

Includes the SECUTEST DB COMFORT database extension

- Additional database elements:
  - "Medicine" Test Object for Medical Students, with Expanded Input Options
  - Custom inspection interval for each item to be inspected
- Touchedit – You can start editing by pressing and holding the detail view of a test object on the main screen
- The "Search All" soft key also searches the new "UDI" (Unique Device Identification) field for medical devices
- Moving Test Objects – By pressing and holding the tree view on the main screen, you can initiate the "movement" of a (medical) device within the tree.
- QuickEdit – When creating a new test item, you can not only enter the ID, but also fill in all the other fields at the same time
- Autostore – Test results from automated test sequences are immediately saved under the selected test object.
- Push/Print – Sends the measurement values/test results directly to the PC (IZYTRONIQ). (Data are not stored at the instrument).

Included features

Switch Position	Measuring Functions Test Current/Voltage		Measurement type Connection type
Single measurements (rotary switch level: green)			
Measurements at voltage-free DUTs			
R_{PE}	R_{PE}	Protective conductor resistance	PE(TS) - P1 active: PE(TS) - P1 PE(mains) - P1 [1] PE(mains) - P1 clamp [1 2] P1 - P2 [3]
	I_P	Test current: 200 mA Test current: 10 A [4] (feature G01) Test current: 25 A [4] (feature G02)	
R_{INS}	R_{ISO}	Insulation resistance	LN(TS) - PE(TS) LN(TS) - P1 P1 - P2 [3] PE(mains) - P1 PE(TS) - P1 LN(TS) - P1//PE(TS) LN(TS) - AP PE(mains) - AP PE(TS) - AP P1//PE(TS) - AP P2 - AP [3]
	U_{SIO}	Test voltage	
U_{HV} [5]		High-voltage testing	LN(TS) - P1 LN(TS) - P1//PE(TS) PHV - P1 [6]
	U_{min}	Determined minimum voltage value during the set test time	
	U_{Gen}	Test voltage	
Measurements at DUTs with line voltage			
I_{PE}	$I_{PE} \simeq$	Protective conductor current, TRMS value	Direct Differential Alternative AT3 adapter [2] Clamp [2]
	$I_{PE} \sim$	AC component	
	$I_{PE} =$	DC component	
	U_{LPE}	Voltage L-PE from the mains power	
	U_{Gen}	Test voltage (alternative method)	

Switch Position	Measuring Functions Test Current/Voltage		Measurement type Connection type
Single measurements (rotary switch level: green)			
I_T	$I_B \simeq$	Touch current, TRMS value	Direct P1 Differential P1 Alternative P1 Perm. conn. P1 Alternative P1–P2
	$I_B \sim$	AC component	
	$I_B =$	DC component	
	U_{LPE}	Voltage L-PE from the mains power	
	U_{Gen}	Test voltage (alternative method)	
I_E	$I_G \simeq$	Device leakage current, TRMS value	Direct Differential Alternative AT3 adapter [2] Clamp [2]
	$I_G \sim$	AC component	
	$I_G =$	DC component	
	U_{LPE}	Voltage L-PE from the mains power	
	U_{Gen}	Test voltage (alternative method)	
I_A	$I_A \simeq$	Leakage current from the applied part, TRMS value	Direct P1 Direct AP Alternative P1 Alternative AP Perm. conn. P1 Perm. conn. AP AP–P2 [7]
	U_{LPE}	Voltage L-PE from the mains power	
	U_{Gen}	Test voltage	
I_P	$I_P \simeq$	Patient leakage current, TRMS value	Direct P1 Direct AP Perm. conn. P1 Perm. conn. AP
	$I_P \sim$	AC component	
	$I_P =$	DC component	
	U_{LPE}	Voltage L-PE from the mains power	
I_{PA}	$I_P \simeq$	Patient auxiliary current, TRMS value	Direct AP Perm. conn. AP
	$I_P \sim$	AC component	
	$I_P =$	DC component	
	U_{LPE}	Line voltage	
U	U ≃	Measuring voltage, TRMS value	PE - P1 PE - P1 (with mains*) V – COM V – COM (with mains*) * Polarity setting
	U ∿	Alternating voltage component	
	U =	Direct voltage component	
P	**Function test at the test socket**		Polarity setting
	I	Current between L and N	
	U	Voltage between L and N	
	f	Frequency	
	P	Active power	
	S	Apparent power	
	PF	Power factor	

Switch Position	Measuring Functions Test Current/Voltage		Measurement type Connection type
Single measurements (rotary switch level: green)			
Special measuring functions			
EL1 [8]	Function test for extension cords Continuity, short-circuit, polarity (wire reversal [9])		EL1 adapter AT3-IIIE adapter VL2E adapter
EXTRA	Reserved for expansion within the framework of software updates		
	°C temperature measurement [2] with Pt100/Pt1000		V – COM
	ICL current clamp measurement with current clamp sensor		V – COM
	Relay continuity check [5]		N(TS) L(TS) PHV [6]
	t_{PRCD}	t_A Time to trip for 10/30 mA PRCD	
		U_{LN} Line voltage at the test socket	

1 Connection type not available with feature G02

2 Voltage measurement inputs with test instruments with feature I01 only

3 Connector socket for 2nd test probe for 2-pole measurement only with test instrument with feature H01

4 10 A/25 A RPE measurements are only possible with line voltages of 115 V/230 V and line frequencies of 50 Hz/60 Hz.

5 Only ST PRIME ... version.

6 Only with feature F02

7 For ME equipment (medical electrical equipment) with own supply

8 For version ... ST PRIME under the EXTRA rotary switch position.

9 No checking for reversed wires when the EL1 adapter is used.

Key

Alternative	= alternative measurement (equivalent leakage current measurement)
AP	= applied part
Differential	= differential current measurement
Direct	= direct measurement
LN(TS)	= short-circuited L and N conductors at test socket
P1	= measurement with test probe P1
P1-P2	= 2-pole measurement with test probes P1 and P2
PE(mains)	= protective conductor at the mains connection
PE(TS)	= protective conductor at the test socket
PE-P1	= measurement between PE and test probe P1
PHV	= measurement with high-voltage test pistol (only with feature F02)

2 Integrated Test Sequences

The test instrument includes preconfigured, integrated test sequences.

The integrated test sequences can be used to comply with the following standards:

- EN 50699 / VDE 0702 Periodic testing for electrical devices
- EN 50678 / VDE 0701 General procedure for verifying the effectiveness of the protective measures of electrical equipment after repair
- IEC 62353 / EN 62353 / VDE 0751-1 Medical electrical equipment – Recurrent test and test after repair of medical electrical equipment
- IEC 61010-1 / EN 61010-1 / VDE 0411-1 Safety requirements for electrical equipment for measurement, control and laboratory use[1] [2]
- IEC 60335 / EN 60335-1 / VDE 0700-1 Safety of electrical equipment for household use and other similar applications[1] [2]
- IEC 60601-1 / VDE 0750-1 Medical electrical equipment - Part 1: General requirements for safety and essential performance[1]
- VDE 0701-0702 (withdrawn) / ÖVE E 8701 / SNR 462638 Inspection after repair, modification of electrical appliances – Periodic testing of electrical devices
- IEC 60974-4 / EN 60974-4 / VDE 0544-4 Arc welding equipment – Part 4: Periodic inspection and testing
- NEN 3140 Operation of Electrical Installations – Low Voltage
- IEC 62368 / EN 62368 / VDE 0868-1 Audio/video, information and communication technology equipment[1]
- IEC 62911 / EN 62911 / VDE 0868-911 Audio, video and information technology equipment – Routine electrical safety testing in production[1]

Availability of the individual integrated test sequences depends on the test instrument type (SECUTEST ST... or SECULIFE ST...), the selected features (order features) and the enabled extensions (activations).

The built-in test sequences are executed in rotary orange rotary switch positions **A1** through **A9**. Each rotary switch position is factory-set with a built-in test sequence, but this can be changed. Therefore, if necessary, you can assign a different built-in test sequence to a rotary switch position or leave the preselected built-in test sequences as is.

[1] With feature F01/F02 the test procedure also includes high-voltage test steps

[2] Only with feature KA03 or subsequently enabled with Z853V

3 Mains connection check

Line voltage and frequency are measured and compared with the reference in the setup menu. For instance, if the test voltage is standardized per the reference, it is required for calculating the measured values for the leakage current measurement.

3.1 Automatic Detection of Mains Connection Errors

The device 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 (**START/STOP** key)	Display	Press the **START/STOP** key: U > 25 V key →PE: < 1 MΩ[1)]	All measurements disabled
Protective conductor PE and phase conductor L reversed and/or neutral conductor N interrupted		Voltage at PE > 100 V	Not possible (no supply power)
Line voltage < 180 V / < 90 V (depending on mains)		U_{L-N} < 180 V U_{L-N} < 90 V	Possible under certain circumstances [2)]
Test for IT/TN system	Display	Connection N →PE > 20 kΩ	Possible under certain circumstances

Table 1: Mains Connection Errors

[1)] If the location impedance of the inspector is very high, the following error message may appear: “Interference voltage at mains connection PE”

[2)] 10 A/25 A R_{PE} measurements are only possible with line voltages of 115 V/230 V and line frequencies of 50 Hz/60 Hz.

4 Analysis of DUT Connection and Condition

Depending on the measurement or how the DUT is connected, the following states are checked and displayed before measurement is begun:.

Test Function		Condition [1]
Short-circuit test L-N [2]	Short circuit/DUT starting current	R ≤ 2.5 Ω
	No short-circuit (AC test)	R > 2.5 Ω
Open-circuit voltage U_0 4.3 V, short-circuit current I_K < 250 mA		
Short-circuit test LN–PE	Short-circuit	R ≤ 2 kΩ
	No short-circuit (AC test)	R > 2 kΩ
Open-circuit voltage U_0 230 V AC, short-circuit current I_K < 1.5 mA		
On test	ON (DUT passive)	R < 250 kΩ
	OFF (DUT active)	R > 300 kΩ
Open-circuit voltage U_0 230 V AC, short-circuit current IK < 1.5 mA		
Switchable control	Mains power switched on automatically	R > 500 Ω
	Pop-up (switch off DUT first)	R < 500 Ω
Probe Check	No probe	R > 2 MΩ
	Probe detected	R < 500 kΩ
Protection category detection (only with country-specific version) [3]	Protective conductor found: PC I	R < 1 Ω
	No protective conductor: PC II	R > 10 Ω
Safety shutdown	Triggered at following residual current values (selectable)	> 10 mA / > 30 mA
	Triggered at following probe current values (electronic fuse)	
	During leakage current measurement	> 30 mA [4]
	During protective conductor resistance measurement	> 250 mA
Connection test (only with country-specific version) [3]	Checks whether the DUT is connected to the test socket.	
	DUT power cable found	R < 1 Ω
	No DUT power cable	R > 10 Ω
Insulation test	DUT set up in a well-insulated fashion	R ≥ 500 kΩ
	DUT set up in a poorly insulated fashion	R < 500 kΩ
PE(mains) – PE(socket): Open-circuit voltage U_0 500 V DC, I_K < 2 mA		

Test Function		Condition [1]
Overcurrent protection	Shutdown in the event of a continuous flow of current via the test socket at: Our SECUTEST ST BASE(10)/PRO, SECUTEST ST PRIME, and SECULIFE ST BASE(25) test instruments permit active testing of DUTs with a nominal current (load current) of up to 16 A. The test socket on the respective test instrument is equipped with 16 A fuses to this end, and the switching capacity of the internal relays is also 16 A. Starting current of up to 30 A is permissible. In the case of DUTs for which a starting current of greater than 30 A can be expected, we urgently recommend the use of a test adapter for larger starting currents, e.g., a test adapter from the AT3 series.	I > 16.5 A

[1] The specified values of instruments with features F01 and F02 are to be interpreted as reference values.

[2] Not for instruments with features F01 and F02.

[3] Applies to M7050 with feature B00, B09

[4] Firmware version 3.2.0 and lower: 12 mA

Table 2: Automatic Recognition of States when Connecting DUTs and Probes

5 Product Features

The instrument supports the following features:

	Features	SECULIFE ST PRO	SECULIFE ST PRIME
Touchscreen/keyboard	E01	×	×
High-voltage testing, LN–PE/P1	F01		×
High-voltage testing, LN–PE/P1 and P1–PHV	F02		o
10 A RPE test current	G01	×	o
25 A RPE test current	G02	o	×
2nd test probe (connector socket for 2nd test probe)	H01	×	o
Voltage measuring input [1]	I01	×	×
Integrated test sequences for EN 50678 / VDE 0701, EN 50699 / VDE 0702, IEC 62368 / EN 62368 / VDE 868-1, IEC 62911 / EN 62911/ VDE 868-911	KE	×	×
Additional test procedure for IEC 60601	KA01	×	×
Additional test procedures IEC 60601 / IEC 61010 / IEC 60335	KA03	o	o
SECUTEST DB+	KB01	×	×
SECUTEST DB COMFORT	KD01	×	×
Bluetooth®	M01	o	×
Antimicrobial housing	-	×	×
Key: × = included o = optional			

[1] For voltage measurement or for connecting a current clamp sensor or an AT3 adapter, and for temperature measurement via RTD

Table 3: Product Features

Detailed information on features and accessories ⇨ **"Order Information "** 🗋 **34**.

Testing several protective conductor connections with the function for "automatic detection of measuring point changes"

During protective conductor measurement, the test instrument recognizes whether or not test probe P1 is in contact with the protective conductor, which is indicated by means of two different acoustic signals.

This function is very useful where several protective conductor connections need to be tested.

Creating a Database

A test structure with data regarding customers and test objects can be created in the test instrument. This structure makes it possible to save single measurements or test sequences to DUTs belonging to various customers. Manual single measurements can be grouped together into a so-called "manual sequence."

Medical electrical devices can be entered as test objects (Medical Device) with the SECUTEST DB COMFORT database expansion (Z853S or feature KD01), and individual test dates can be assigned to all DUTs.

The SECUTEST DB+ database expansion (Z853R or feature KB01) extends the structure to include buildings, floors, and rooms. Furthermore, the test structure can be set up conveniently at a PC with the help of the IZYTRONIQ software, and subsequently transferred to the test instrument.

Logging Functions

All of the values required for approval reports or instrument logbooks for electrical DUTs (e.g., in accordance with ZVEH) can be measured by and stored in the test instrument. A due date for the next test is also determined.

Measurement data can be documented and archived thanks to the measurement and test report that can be printed with a thermal printer which has been connected to the USB port, or stored on a USB flash drive as an HTML report.

Alternatively, stored measurement data can be transferred to the IZYTRONIQ software in order to archive the data, add comments and create reports.

IZYTRONIQ software

Suitable, database-driven test software is available, namely IZYTRONIQ. This software facilitates test organization and the management of test data from a broad range of test instruments.

It also provides extended functions such as remote control in connection with the respective test instrument – support for extended functions depends on the test instrument and its order features or enabled extensions (activations).

The software is included with test instrument sets. If this is not the case or if you would like to take advantage of a variant with a larger scope of functions, you can purchase IZYTRONIQ separately. Detailed information can be found on our website:

https://www.gossenmetrawatt.de/en/products/software-and-accessories/software/

Display with Selectable Language

The display panel consists of a color LCD with LED backlighting on which menus, setting options, measurement results, instructions, and error messages, as well as schematics and wiring diagrams appear. Sample screenshots are shown on the next page.

The display and user prompting can be set to the desired language depending on the country in which the test instrument is used.

Data Entry

Data can be entered via a displayed softkey keyboard or a convenient touchscreen for test instruments including feature E01. The menu is controlled via softkeys.

Compatible barcode scanners, RFID scanners, USB keyboards, and printers can also be connected via USB.

Data Interfaces

The test instrument is equipped with USB interfaces which can be used for various purposes:

- Structures set up in, and measurement data saved to the test instrument can be transferred to the IZYTRONIQ database software.

  Data can then be archived in the program, comments can be added and reports can be generated
- Connection of compatible external input and output devices
- Data backup and restore with USB flash drive
- Report printing to USB flash drive or external printer

In the case of test instruments with Bluetooth® (feature M01), data can be transmitted to the IZYTRONIQ and the push-print function can be used.

A Bluetooth® keyboard can also be connected to these test instruments. Only Bluetooth® keyboards that support Bluetooth® Classic mode (3.0) are compatible.

Keyboards that can only connect to Bluetooth® Low Energy hosts (as of Bluetooth® 4.x) are not supported (including Bluetooth® Low Energy (LE)).

Antimicrobial Properties

The SECULIFE... test instruments feature antimicrobial properties.

This is intended to inhibit the growth of germs, counteract microbial colonization and destroy microorganisms.

Update

The test instrument is future-proof because firmware/software updates are released on a regular basis.

6 Scope of Delivery

The scope of delivery varies depending on which test instrument variant has been ordered, and is country-specific.

Information concerning the scope of delivery ⇨ **"Order Information "** 🗋 **34**.

Please check the scope of delivery for completeness and intactness.

7 Characteristic Values

Conducting tests

Measured Quantity	Display Range [1] / Nominal Operating Range	Resolution	Nominal voltage U_N	Open-circuit voltage U_0	Nominal Current I_N	Short-circuit current I_{SC}	Internal resistance R_i	Reference Resistor R_{REF}	Operational Measurement Uncertainty [2]	Self-Uncertainty [2]	Overload Capacity	
											Value	Time
Protective conductor resistance R_{PE}	1 MΩ ... 999 MΩ	1 mΩ	--	< 6 V AC or DC	-	>200 mA AC / DC > 10 A AC [3] >25 A AC [4]	-	-	±(15% rdg. + 10 D) > 10 D > 10,0 Ω: ±(10% rdg.+ 10 d)	±(10% rdg.+ 10 d) > 10 d	264 V 250 mA	continuous
	1.00 Ω ... 9.99 Ω	10 mΩ									16 A [5]	
	10.0 Ω ... 27.0 Ω	100 mΩ									>42 AA C [4]	15 s
Insulation resistance [4] R_{INS}	10 kΩ ... 999 kΩ	1 kΩ	50 ... 500 V DC	1.0× U_N... 1.5× U_N	> 1 mA	< 2 mA	-	-	±(5 % rdg.+ 4 d) > 10 d ≥20 MΩ: ±(10% rdg.+ 8 d)	±(2,5 % rdg.+2 d) > 10 ≥20 MΩ: ± (5% rdg. +4 d)	264 V	continuous
	1.00 MΩ ... 9.99 MΩ	10 kΩ										
	10.0 MΩ ... 99.9 MΩ	100 kΩ										
	100 MΩ ... 300 MΩ	1 MΩ										
Leakage Currents Alternative Measurement [6] I I_T, I_E, I_A	0 µA ... 99 µA	1 µA	-	50 ... 250 V~ –20/ +10 %	-	< 1,5 m A	>150 kΩ	1 kΩ ±10 Ω	(5 % rdg. + 4 d) > 10 d > 15 mA: ±(10% rdg.+ 8 d)	±(2 % rdg.+2 d) > 10 d > 15 mA ±(5% rdg.+ 4 d)	264 V	continuous
	100 µA ... 999 µA	1 µA										
	1.00 mA ... 9.99 mA	10 µA										
	10.0 mA ... 30.0 mA	100 µA										
Direct Measurement of Leakage Currents [6] I_{PE}, I_T, I_E, I_A, I_P, I_{PH}	Only I_P, I_{PA}: 0.0 µA ... 99.9 µA	100 nA	-	-	-	-	1 kΩ ±10 Ω	1 kΩ	(5% rdg. + 4 d) > 10 d	±(|2.5% rdg. +2 d)> 10 d	264 V	continuous
	0 µA ... 99 µA	1 µA										
	100 µA ... 999 µA	1 µA										
	1.00 mA ... 9.99 mA	10 µA										
	10.0 mA ... 30.0 mA	100 µA										

Measured Quantity	Display Range[1] / Nominal Operating Range	Resolution	Nominal voltage U_N	Open-circuit voltage U_0	Nominal Current I_N	Short-circuit current I_{SC}	Internal resistance R_I	Reference Resistor R_{REF}	Operational Measurement Uncertainty[2]	Self-Uncertainty[2]	Overload Capacity	
											Value	Time
Leakage Currents —Differential Current Measurement[6][6] I_{PE}, I_T, I_E	0 µA ... 99 µA	1 µA	-	-	-	-	-	-	(5% rdg. + 4 d) > 10 d	±(|2.5% rdg. +2 d)> 10 d	264 A	continuous
	100 µA ... 999 µA	1 µA										
	1.00 mA ... 9.99 mA	10 µA										
	10.0 mA ... 30.0 mA	100 µA										
rdg. = reading (measured value) d = digit(s)												

1 Under certain circumstances, the display range may be changed only if the value has fallen below the hysteresis range.

2 ">10D" means that the specified value only applies as of a display of > 10 digits (the same applies whenever ">XXD" is specified).

3 Measurement types IPE_clamp and IE_clamp.

4 Only with feature G02.

5 Only with feature G01.

6 Known as equivalent leakage current or equivalent patient leakage current from previous standards.

Table 4: Characteristic Values Conducting tests

Function Test at the Test Socket

Measured Quantity	Display Range[1]/ Nominal Range of Use	Resolution	Nominal Voltage U_N	Open-Circuit Voltage U_0	Nominal Current I_N	Short-Circuit Current I_K	Internal Resistance R_I	Reference Resistance R_{REF}	Measuring Uncertainty[2]	Intrinsic Uncertainty[2]	Overload Capacity	
											Value	Time
Line voltage U_{L-N}[3]	90.0 V~ ... 264.0 V~	0.1 V	-	-	-	-	-	-	-	±(2% rdg.+2 d)	264 V 16 A 20 A	Continuous Continuous <10 min
Load current I_V	0 A_{RMS} ... 20.00 A_{RMS}	10 mA	-	-	-	-	-	-	-	±(2% rdg.+2 d)		
Active power P	0 W ... 999 W	1 W	-	-	-	-	-	-	-	±(5% rdg.+10 d) 1.00 kW > 20 d		
	1.00 kW > 20 d ... 4.50 kW	10 W										
Apparent power S	0 VA ... 999 VA	1 VA	Calculated value $U_{L-N} \times I_V$							±(5% rdg.+10 d) 1.00 kVA > 20 d		
	1.00 kVA > 20 d ... 4.50 kVA	10 VA										

Measured Quantity	Display Range[1] / Nominal Range of Use	Resolution	Nominal Voltage U_N	Open-Circuit Voltage U_0	Nominal Current I_N	Short-Circuit Current I_K	Internal Resistance R_i	Reference Resistance R_{REF}	Measuring Uncertainty[2]	Intrinsic Uncertainty[2]	Overload Capacity	
											Value	Time
Power factor LF with sinusoidal waveform: cosφ	0.00 ... 1.00	0.01	Calculated value, P / S, display > 10 W							±(10% rdg.+5 d)		
Line frequency f	0 Hz ... 420.0 Hz	0.1 Hz	-	-	-	-	-	-	-	±(2% rdg.+2 d)		
rdg. = reading (measured value) d = digit(s)												

1 Under certain circumstances, the display range may be changed only if the value has fallen below the hysteresis range.

2 ">10D" means that the specified value only applies as of a display of > 10 digits (the same applies whenever ">XXD" is specified).

3 Voltage at the test socket may be lower than measured line voltage due to components which limit inrush current.

Table 5: Characteristic Values Function Test at the Test Socket

t_{PRCD}

Measured Quantity	Display Range[1] / Nominal Range of Use	Resolution	Nominal Voltage U_N	Open-Circuit Voltage U_0	Nominal Current I_N	Short-Circuit Current I_K	Internal Resistance R_i	Reference Resistance R_{REF}	Measuring Uncertainty[2]	Intrinsic Uncertainty[2]	Overload Capacity	
											Value	Time
Time to trip	0.1 ms ... 999.0 ms	0.1 ms	-	-	30 mA ±2%	-	-	-	±5 ms	-	264 V	Continuous
rdg. = reading (measured value) d = digit(s)												

1 Under certain circumstances, the display range may be changed only if the value has fallen below the hysteresis range.

2 ">10D" means that the specified value only applies as of a display of > 10 digits (the same applies whenever ">XXD" is specified).

Table 6: Characteristic Values t_{PRCD}

Voltage Measurement

Measured Quantity	Display Range[1] / Nominal Range of Use	Resolution	Nominal Voltage U_N	Open-Circuit Voltage U_0	Nominal Current I_N	Short-Circuit Current I_K	Internal Resistance R_i	Reference Resistance R_{REF}	Measuring Uncertainty[2]	Intrinsic Uncertainty[2]	Overload Capacity	
											Value	Time
Probe voltage (probe P1 to PE) DC, AC and DC/AC	0.0 V ... 99.9 V 100 V ... 264 V	100 mV 1 V	-	-	-	-	3 MΩ	-	-	±(2% rdg.+2 d)	264 V	Continuous

Measured Quantity	Display Range[1] / Nominal Range of Use	Resolution	Nominal Voltage U_N	Open-Circuit Voltage U_0	Nominal Current I_N	Short-Circuit Current I_K	Internal Resistance R_I	Reference Resistance R_{REF}	Measuring Uncertainty[2]	Intrinsic Uncertainty[2]	Overload Capacity	
											Value	Time
Measuring voltage Continuous (V–COM sockets[3]) DC, AC and DC/AC	0.0 V ... 99.9 V 100 V ... 300 V						1 MΩ			±(2% rdg.+2 d) > 45 Hz ... 65 Hz ±(2% rdg.+5 d) > 65 Hz ... 10 kHz ±(5% rdg.+5 d) > 10 kHz ... 20 kHz	300 V	
rdg. = reading (measured value) d = digit(s)												

1 Under certain circumstances, the display range may be changed only if the value has fallen below the hysteresis range.

2 ">10D" means that the specified value only applies as of a display of > 10 digits (the same applies whenever ">XXD" is specified).

3 Only with feature I01.

Table 7: Characteristic Values Voltage Measurement

I_{Abl}

Measured Quantity	Display Range[1] / Nominal Range of Use	Resolution	Nominal Voltage U_N	Open-Circuit Voltage U_0	Nominal Current I_N	Short-Circuit Current I_K	Internal Resistance R_I	Reference Resistance R_{REF}	Measuring Uncertainty[2]	Intrinsic Uncertainty[2]	Overload Capacity	
											Value	Time
Leakage current via AT3-IIIE adapter Z745S[3] [4]AC	0.00 mA ... 0.99 mA	0.01 mA	–	-	-	-	-	-	-	±(2% rdg.+2 d) > 10 d without adapter	253 V	Continuous
	1.0 mA ... 9.9 mA	0.1 mA										
	10 mA ... 20 mA	1 mA										
rdg. = reading (measured value) d = digit(s)												

1 Under certain circumstances, the display range may be changed only if the value has fallen below the hysteresis range.

2 ">10D" means that the specified value only applies as of a display of > 10 digits (the same applies whenever ">XXD" is specified).

3 Only with feature I01.

4 Measurement types IPE_AT3 adapter and IG_AT3 adapter.

Table 8: Characteristic Values I_{Abl}

Temp

Measured Quantity	Display Range [1] / Nominal Range of Use	Resolution	Nominal Voltage U_N	Open-Circuit Voltage U_0	Nominal Current I_N	Short-Circuit Current I_K	Internal Resistance R_i	Reference Resistance R_{REF}	Measuring Uncertainty [2]	Intrinsic Uncertainty [2]	Overload Capacity	
											Value	Time
Temperature with Pt100 sensor	– 200.0 °C ... +850.0 °C	0.1 °C	-	< 20 V		1.1 mA	-	-	-	±(2% rdg.+1 °C)	10 V	Continuous
Temperature with Pt1000 sensor	– 150.0 °C ... +850.0 °C											
rdg. = reading (measured value) d = digit(s)												

1 Under certain circumstances, the display range may be changed only if the value has fallen below the hysteresis range.

2 ">10D" means that the specified value only applies as of a display of > 10 digits (the same applies whenever ">XXD" is specified).

Table 9: Characteristic Values Temp

I_{clamp}

Measured Quantity	Display Range [1] / Nominal Range of Use	Resolution	Nominal Voltage U_N	Open-Circuit Voltage U_0	Nominal Current I_N	Short-Circuit Current I_K	Internal Resistance R_i	Reference Resistance R_{REF}	Measuring Uncertainty [2]	Intrinsic Uncertainty [2]	Overload Capacity	
											Value	Time
Current via current clamp sensor [1 mV: 1 mA] (V-COM sockets [3] [4]) AC	1 mA ... 99 mA	1 mA (1 mV)	-	-	-	-	-	-	-	±(2% rdg.+2 d) > 10 d 20 Hz ... 20 kHz without clamp	253 V	Continuous
	0.1 A ... 0.99 A	0.01 A (10 mV)										
	1.0 A ... 9.9 A	0.1 A (100 mV)										
	10 A ... 300 A	1 A (1 V)										
Current via current clamp sensor [10 mV: 1 mA] (V-COM sockets [3] [4]) AC	0.1 mA ... 9.9 mA	0.1 mA (1 mV)	-	-	-	-	-	-	-			
	10 mA ... 99 mA	1 mA (10 mV)										
	0.10 A ... 0.99 A	0.01 A (100 mV)										
	1.0 A ... 30.0 A	0.1 A (1 V)										
Current via current clamp sensor [100 mV: 1 mA] (V-COM sockets [3] [4]) AC	0.01 mA ... 0.99 mA	0.01 mA (1 mV)	-	-	-	-	-	-	-			
	1.0 mA ... 9.9 mA	0.1 mA (10 mV)										
	10 mA ... 99 mA	1 mA (100 mV)										
	0.10 A ... 3.00 A	0.01 A (1 V)										

Measured Quantity	Display Range[1] / Nominal Range of Use	Resolution	Nominal Voltage U_N	Open-Circuit Voltage U_0	Nominal Current I_N	Short-Circuit Current I_K	Internal Resistance R_I	Reference Resistance R_{REF}	Measuring Uncertainty[2]	Intrinsic Uncertainty[2]	Overload Capacity	
											Value	Time
Current via current clamp sensor [1000 mV: 1 mA] (V-COM sockets[3] [4]) AC	1 µA ... 99 µA	1 µA (1 mV)	-	-	-	-	-	-	-			
	0.10 mA ... 0.99 mA	0.01 mA (10 mV)										
	1.0 mA ... 9.9 mA	0.1 mA (100 mV)										
	10 mA ... 300 mA	1 mA (1 V)										
rdg. = reading (measured value) d = digit(s)												

1 Under certain circumstances, the display range may be changed only if the value has fallen below the hysteresis range.

2 ">10D" means that the specified value only applies as of a display of > 10 digits (the same applies whenever ">XXD" is specified).

3 Only with feature I01.

4 Measurement types IPE_clamp and IE_clamp.

Table 10: Characteristic Values I_{clamp}

Testing Times, Automatic Procedure

Testing times ("measurement duration ..." parameter) can be set separately for each rotary switch position during configuration of the sequence parameters. Testing times are neither tested nor calibrated.

Leakage current measurement

With all leakage current measurements (I_{PE}, I_T, I_E, I_A, I_P, I_{PH}) (direct, differential, alternative), the frequency response is taken into account.

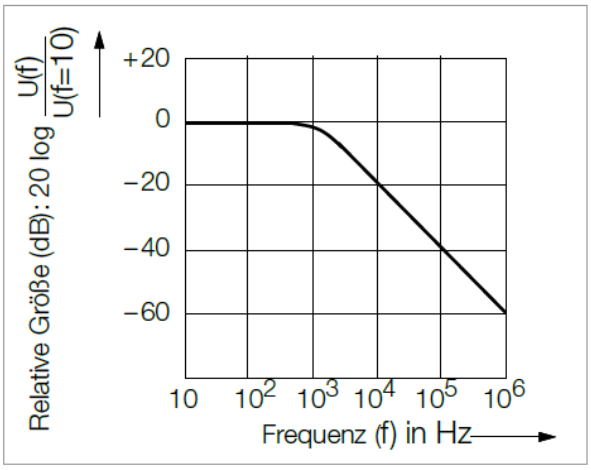


Fig. 1: Frequency response

Emergency Shutdown During Leakage Current Measurement

As of 10 mA of differential current (can also be set to 30 mA), automatic shutdown ensues within 500 ms. This shutdown does not take place during leakage current measurement with clamp meter or adapter.

SECUTEST ST PRIME with Integrated High-Voltage Testing

- High-voltage testing is available as a single test via the rotary switch position U_{HV}

- Test L/N - PE (protection category I) and L/N to handheld probe (protection category II) are possible
- Test voltages depend on country variant/test socket ⇨ **"Maximum adjustable test voltage"** 🗋 **20**
- Also with feature F02: optional high-voltage connection for high-voltage test pistol
  - This connection enables in conjunction with the optional high-voltage test pistol (Z746H), for example, the verification of the resistance to high voltages on electrical components with two handheld probes
  - In conjunction with the high-voltage pistol Z746H, the test voltage can be ramped up/down from the pistol
- High-voltage testing (F01/F02) in conjunction with SECUTEST DB+ (feature KB01)
  - Also enables the remote control of the test instrument including high-voltage testing[1] via PC data interface for integration[2] in customer-specific test systems
  - User-defined test sequences, including high-voltage test steps, can be created in IZYTRONIQ and imported into the test instrument.
- Integrated test procedures augmented with test steps for the high-voltage testing for protection category I and protection category II DUTs ⇨ **"Integrated Test Sequences "** 🗋 **6**

High-voltage source

DC test voltage	U_{Gen} adjustable in 50 V steps	0.50 ... 6.00 kV[1]
Open-circuit voltage	U_0	(U_{Gen} × 1.011) + 60 V
Accuracy of open-circuit voltage		±(2.5% U_0 + 5 digits) (resolution: 0.01 kV)
DC nominal current	In accordance with DIN VDE 0104	< 3 mA
Short-circuit current	Discharging current based on 6 × 2.7 nF	> 5 A at 5 kV
Interference Voltage Withstand		None

[1] See following table – Adjustable rise time and test time

Table 11: High-voltage source

Maximum adjustable test voltage (U_{Gen}) as a function of the measurement type and test socket

Test socket [country]	Measurement type	Limit value
B00 [Germany]	LN(TS) – PE(TS)||P1	max. 3.00 kV[1]
	LN(TS) - P1	max. 6.00 kV
B01 [Great Britain]	LN(TS) – PE(TS)||P1	max. 3.00 kV[1]
	LN(TS) - P1	max. 6.00 kV
B03 [France, Czech Republic, Poland]	LN(TS) – PE(TS)||P1	max. 3.00 kV[1]
	LN(TS) - P1	max. 6.00 kV
B04 [China]	LN(TS) – PE(TS)||P1	max. 3.00 kV[1]
	LN(TS) - P1	max. 6.00 kV
B05 [USA]	LN(TS) – PE(TS)||P1	max. 3.00 kV[1]
	LN(TS) - P1	max. 4.00 kV
B06 [Australia]	LN(TS) – PE(TS)||P1	max. 3.00 kV[1]
	LN(TS) - P1	max. 6.00 kV
B07 [Denmark]	LN(TS) – PE(TS)||P1	max. 3.00 kV[1]

[1] Remote control of the high-voltage testing using “IZYTRONIQ” software is not supported.

[2] Documentation of the remote control commands is available upon request.

Test socket [country]	Measurement type	Limit value
	LN(TS) - P1	max. 6.00 kV
B09 [Switzerland, with connector socket and detection of protection category]	LN(TS) – PE(TS)||P1	max. 3.00 kV[1]
	LN(TS) - P1	max. 6.00 kV
B00 - B09 With feature F02, optional high-voltage connection (for HV test pistol Z746H)	PHV - P1	max. 6.00 kV

[1] As from firmware 3.6.1; previously 2.25 kV

Table 12: Maximum adjustable test voltage (U_{Gen}) as a function of the measurement type and test socket

Voltage Measurement

Measuring range	Display Range	Resolution	Accuracy
0 ... U_{0max}DC	0.00 ... 9.99 kV	0.01 kV	±(2.5% rdg. + 5 digits)

Table 13: Voltage Measurement

Lower Supply Limit for High-Voltage Testing

In order to be able to conduct high-voltage testing, the load must always be greater than the respective characteristic curve (see following diagrams).

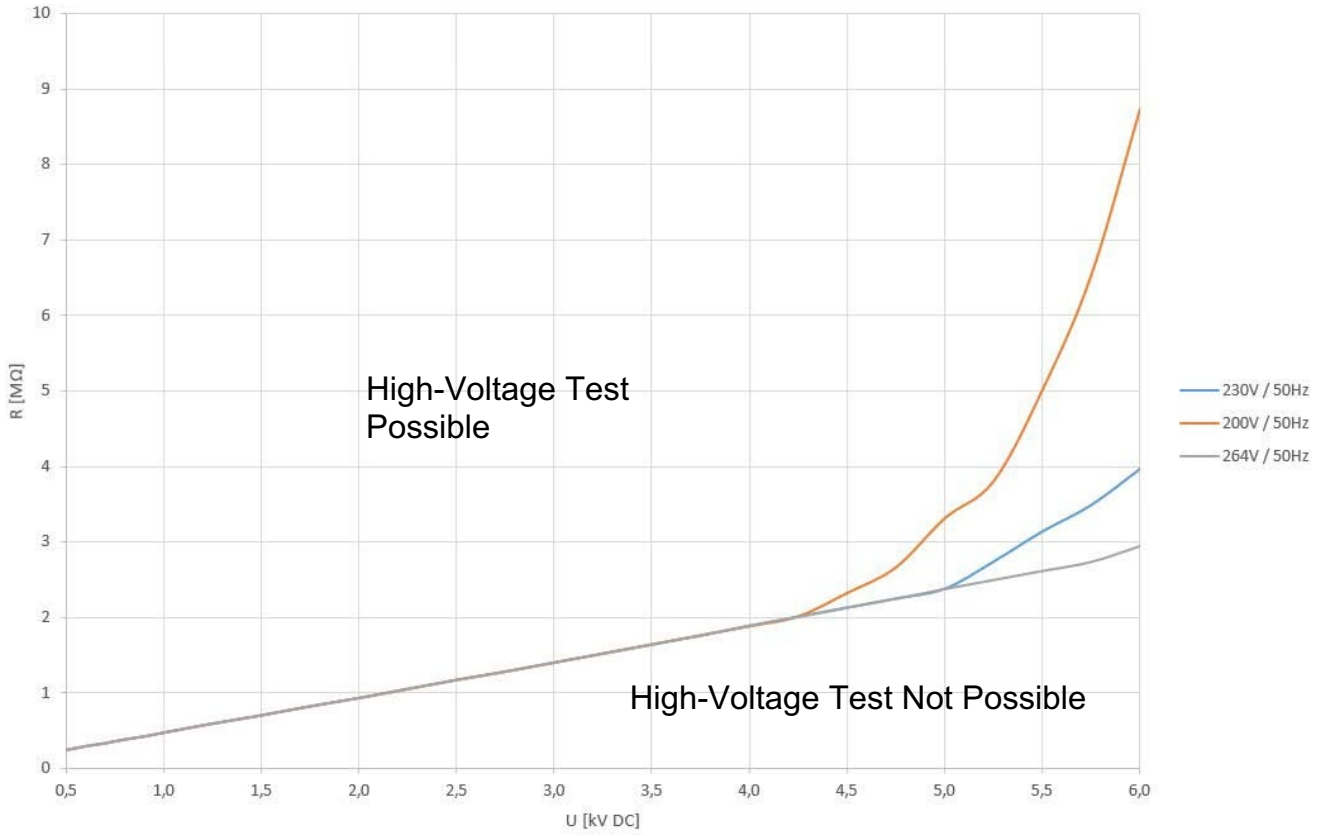


Fig. 2: Typical Maximum Load for the HV Source as a Function of Supply Voltage at 50 Hz

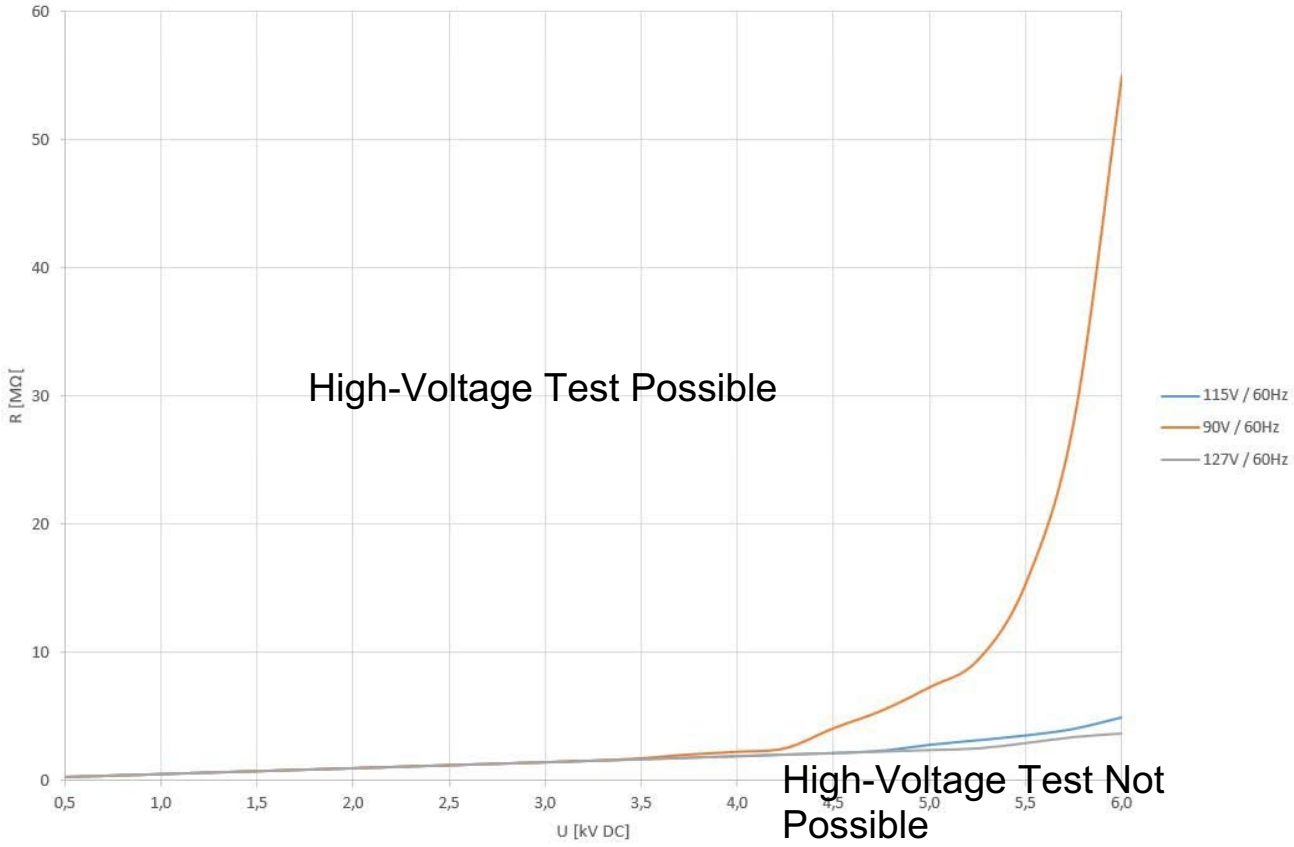


Fig. 3: Typical Maximum Load for the HV Source as a Function of Supply Voltage at 60 Hz

8 Technical Data

Reference Ranges	Line voltage:	230 V AC ±0.2%	
	Line frequency:	50 Hz ±2 Hz	
	Waveform:	Sinusoidal (deviation between RMS and rectified values < 0.5%)	
	Ambient temperature:	+23 °C ±2 K	
	Relative humidity:	40 ... 60%	
	Load resistance:	Linear	
Nominal Ranges of Use	Nominal line voltage:	90 V ... 264 V A	
	Nominal line frequency:	50 Hz ... 400 Hz	
	Line voltage waveform:	Sinusoidal	
	Temperature:	0 °C ... +40 °C	
Power Supply	Supply network:	TN, TT, or IT	
	Line voltage:	90 V ... 264 V AC	
	Line frequency:	50 Hz ... 400 Hz	
	Power consumption:	200 mA DUT: 10 A DUT: 25 A DUT:	approx. 32 VA approx. 105 VA approx. 280 VA
	Mains to test socket (e.g., for function test):	Continuous max. 3600 VA, power is conducted through the instrument only, switching capacity ≤ 16 A, ohmic load; the AT3-IIS32 (Z745X) adapter (for example) can be used for current > 16 A AC	
Ambient Conditions	Operating temperatures:	+0 ... +40 °C	
	Storage temperatures:	-20 ... +60 °C	
	Relative humidity:	Max. 75%, no condensation allowed	
	Elevation:	Max. 2000 m	
	Place of use:	Indoors; outdoors: only within specified ambient conditions	
		In order to avoid deviation due to excessive temperature fluctuation, e.g., after outdoor transport at low temperature and subsequent operation in a warm indoor environment, it is advisable to wait until the test instrument has acclimatized before starting any measurements. If the test instrument is colder than the ambient air, condensation may occur at high humidity, i.e., condensate may accumulate on components. This could result in the occurrence of parasitic capacitances and resistances which affect the measuring circuit and measuring accuracy.	

Electrical Safety	Measurement category:	Designed for 300 V CAT II (reduced to 250 V CAT II through the use of fuses for increased user safety. The user-friendly fuses are replaceable, and replacements are easily obtainable.)	
	Pollution degree:	2	
	Protection class:	I in accordance with EN 61140	
	Nominal voltage:	230 V	
	Test voltage:	2.3 kV AC 50 Hz or 3.3 kV DC (mains circuit/test socket to mains PE terminal, USB, finger contact, test probe(s), test socket, AP sockets)	
	Safety shutdown:	At DUT differential current of > 10 mA, shutdown time < 500 ms, can also be switched to > 30 mA with probe current (electronic fuse) during: Leakage current measurement > 30 mA~/< 500 ms [1] Protective conductor resistance measurement: > 250 mA~/< 1 ms in case of continuous current I > 16.5 A	
	Fuse links:	Mains fuses: 2 × 500 V/16 A T Probe fuse: M 250 V/250 mA 10 A RPE test current (feature G01 only): 1 × T 500 V/ 16 A Applied parts: 2 × M 250 V/250 mA	
Electromagnetic Compatibility (EMC)	Interference emission:	EN 55011 class A EN 55032 class A EN IEC 61000-3-2 EN IEC 61000-3-3	
	Interference immunity:	DIN EN 61326-1 DIN EN 61326-2-2	
Mechanical Design	Protection:	Housing: IP 40 (protection against penetration of solid foreign bodies: ≥ 1.0 mm ∅; protection against the ingress of water: not protected) Test socket: IP 20 (protection against penetration of solid foreign bodies: ≥ 12.0 mm ∅; protection against the ingress of water: not protected) Applied part: IP20 (protection against penetration of solid foreign bodies: ≥ 12 mm ∅; protection against the ingress of water: not protected) in accordance with DIN EN 60529 / IEC 60529 Housing with antimicrobial properties in accordance with JIS standard Z 2801	
	Housing (W × H × D):	approx. 295 mm ×145 mm × 150 mm SECULIFE ST PRIME: approx. 295 mm × 145 mm × 240 mm	
	Height with handle:	170 mm	
	Weight:	Feature G00/G01:	approx. 2.5 kg
		Feature G02:	approx. 4.0 kg
		(depending on test instrument version) SECULIFE ST PRIME:	approx. 6.0 kg

	Display:	4.3" multi-display (9.7 × 5.5 cm) with backlighting, 480 × 272 pixels with 24-bit color depth (true color)	
Data Interfaces	Bluetooth® 2.1 + EDR (test instruments with feature M01 only):	Frequency range:	2400 ... 2483.5 MHz
		Transmission intensity:	Max. 2.5 mW (class II)
		Connecting a Bluetooth® keyboard. Only Bluetooth® keyboards that support Bluetooth® Classic mode (3.0) are compatible. Keyboards that can only connect to Bluetooth® Low Energy hosts (as of Bluetooth 4.x) are not supported (including Bluetooth® Low Energy (LE)).	
	USB:	USB slave for PC connection/remote control [2] 2 × USB master, for data entry devices with HID boot interface, for USB flash drive for data backup, for USB flash drive for saving reports as HTML files for USB thermal report printer (Z721S) and label printer Z721D/E	
Database	Number of data records:	50,000 (1 data record = 1 DUT or location node or customer or single measurement)	

1 Firmware version 3.2.0 and lower: 12 mA

2 Remote control only with extension: "Remote Control via PC (IZYTRONIQ)" (included as standard feature with SECUTEST ST PRO, SECUTEST ST PRIME, and SECULIFE ST BASE(25), and available with SECUTEST DB+ (Z853R or feature KB01).

Influencing Quantities and Influence Error

Abbreviation	Influencing Quantity	R_{PE}	R_{ISO}	I_{PE}, I_B, I_G, I_A Leakage currents Alternative measurement	I_{PE}, I_B, I_G, I_A, I_P, I_{PH} Leakage currents Direct measurement	I_{PE}, I_B, I_GLeakage currents Differential current measurement
A	Intrinsic Uncertainty °	±(10% rdg. + 10 d) >10 d	±(2.5% rdg. +2 d) >10 d ≥ 20 Mμ: ±(5% rdg. + 4 d)	±(2% rdg. +2 d) >10 d > 15 mA: ±(5% rdg. + 4 d)	±(2.5% rdg. +2 d) > 10 d	±(2.5% rdg. +2 d) > 10 d
E1	Reference position ±90	0%	0%	0%	0%	0%
E2	Supply voltage	2.5%	2.5%	2.5%	2.5%	2.5%
E3	Temperature 0°C ... +40°C	2.5%	2.5%	2.5%	2.5%	2.5%
E9	Mains harmonics				1%	1%
E11	Low frequency magnetic fields	2.5%	2.5%	2.5%	2.5%	2.5%
E12	Load current					2.5%
E13	Touch current, common-mode voltage					
E15	Repetition accuracy					

Table 14: Influencing Quantities and Influence Error

9 Relevant Standards

The instrument has been manufactured and tested in accordance with the following safety regulations:

EN 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements
DIN EN 62353 DIN VDE 0751-1	Medical electrical devices – Recurrent test and test after repair of electrical medical devices
EN 60529	Test instruments and test procedures – Degrees of protection provided by enclosures (IP code)
EN 61326-1	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements
EN 61326-2	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 2-2: Particular requirements – Test configurations, operational conditions and performance criteria for sensitive test and measurement equipment for EMC unprotected applications
EN 61557-16	Electrical safety in low voltage distribution systems up to 1000 V AC and 1500 V DC – Equipment for testing, measuring or monitoring of protective measures– Part 16: Devices for testing the effectiveness of protective measures of electrical devices and/or electrical medical devices

10 Accessories

The accessories listed below are usually not included in the scope of delivery. This does not apply in the case of instrument sets which include accessories.

Ordering Information for Accessories ⇨ **"Order Information "** 🗋 **34**.

Barcode scanner (Z751A)

For reading 1 and 2D codes, for example barcodes and QR codes.

This makes it possible to conveniently insert the ID numbers of DUTs into single measurements and test sequences.

This device is based on the concept of an instinctive scanning distance and provides best possible reading performance. Green Spot technology provides a “good-read” projection directly on the code.

The device is connected via USB.



Barcode Printer (Z721E)

For printing barcode labels: Code39, Code128, EAN13, text, QR Code, Micro QR Code, DataMatrix, Aztec.

The device is connected via USB.



Thermal Printer (Z721S)

For printing test reports on thermal paper (accessory Z722S).

The device is connected via USB.



Scanbase RFID (Z751E) (RFID reader and writer)

Compact device for reading and writing RFID tags (13.56 MHz transponder in accordance with ISO 15693).

The device is connected via USB.



CEE Adapter for Testing Single and 3-Phase Electrical Devices (Z745A)

The Z745A CEE adapter allows for quick and efficient testing of devices equipped with a CEE plug. The adapter is equipped with the following CEE attachment outlets: 5-pole 16 A, 5-pole 32 A and 3-pole 16 A. Furthermore, the adapter includes five 4 mm safety sockets to which 3-phase devices without permanently attached plug or conventional measurement cables can be connected, e.g. by means of quick clamp terminals (not included).

The following tests can be performed on devices with CEE plugs with the help of the adapter: •

- Protective conductor continuity test
- Insulation resistance, alternative leakage current (equivalent leakage current)
- Function test (3-pole CEE outlet only)

The Z745A CEE adapter may also be used as an adapter for connecting devices with 3-pole CEE plugs to common earthing contact outlets.

VL2 E (Z745W) VL2 E CH (Z744B)

Test adapter with single and 3-phase plug connectors up to CEE 32A for the performance of measurements and tests at electrical devices and extension cords with CEE plug connectors.



AT16-DI (Z750A) 3-phase 16 A differential current adapter



The AT16-DI adapter allows you to quickly and efficiently test devices equipped with a 5-pin CEE plug rated at 16 A/6 h.
The following tests can be performed on devices with CEE plugs using the AT16-DI CEE adapter:

- Protective conductor continuity test
- Insulation resistance, alternative method
- Measurement of the protective conductor current using: the direct method / the differential current method
- Measurement of equipment leakage current using: the direct method (the differential current method is not supported by the AT16-DI—please use our "AT3" adapter series for this purpose)
- Measuring the touch current
- Function test

This active test adapter is also available in a variant with a 5-pole 32 A / 6 h CEE plug with the designation AT32-DI.

AT3-I II-E (Z745S) / AT3-III-CH phase current adapter (Z744A)



Test adapter for active and passive testing of single-phase and three-phase electrical devices as well as extension cords when used with the tester.
It is easy and safe to use. The test adapter is connected to a 16-amp three-phase outlet and to the respective test device.
Testing is performed automatically or manually without having to reconnect the test specimens, in each case controlled by the test device's program sequence. If the factory-set fault current is exceeded, a safety shutdown occurs.
The following tests can be performed:

- Protective conductor continuity test
- Insulation Resistance
- Measurement of the protective conductor current using: the direct method / the differential current method / the alternative method
- Measurement of the equipment leakage current using the following methods: direct method / differential current method / alternative method
- Measuring the touch current
- Function test
- Testing of single and 3-phase extension cords

EL1 Adapter for Testing Single-Phase Extension Cords (Z723A)



HV Test Pistol for M7050 (Z746H) (only for ... ST PRIME with attribute F02)



SECULOAD-N Test Adapter (Z745R)



Test adapter for testing open-circuit voltage at welding units per IEC 60974-4 / EN 60974-4 / VDE 0544-4.

In combination with a test instrument, the test adapter is used for testing welding units per IEC 60974-4 / EN 60974-4 / VDE 0544-4. The standards stipulate that peak values for open-circuit voltage may not exceed the limit values, regardless of the utilized settings.

A test sequence for testing welding units with the help of this adapter is integrated into the test instrument.

The peak-value rectifier in the SECULOAD-N uses the 1N4007 rectifier diode recommended in the standard. This is a mains rectifier diode which, due to its design, is only suitable for voltage sources with low cycle rates within the range of the line frequency, or for voltage sources with conventional transformer.

SECU-cal 10 calibration adapter (Z715A)



The calibration adapter is used for testing the measuring uncertainty of test instruments in accordance with DIN EN 61557-16 / VDE 0413-16 (previously DIN VDE 0404). In accordance with the requirements of DGUV Regulation 3 on accident prevention and for certification under the ISO 9000 quality standard, these testing devices must generally be inspected once a year.

All limit values for the required tests in accordance with DIN VDE—such as protective conductor resistance, insulation resistance, equivalent leakage current, residual current, and/or touch current or enclosure leakage current—must be checked.

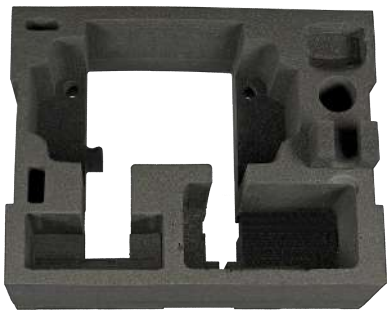
SORTIMO L-BOXX (Z503D)



(not for ... (ST PRIME)
Plastic System Case, External Dimensions: W × H × D 450 × 255 × 355 mm The Z701D foam insert for the test device and accessories must be ordered separately; see below.

Foam Insert for SORTIMO L-BOXX (Z701D)

(not for SECUTEST ST PRIME)
Foam insert for testing device and accessories



F2030 System Soft-Case (Z700H)

(not for ... (ST PRIME)
External Dimensions: W × H × D 393 × 275 × 248 mm (excluding carrying handle and carrying strap)



F2000 Universal Carrying Pouch (Z700D)

outside dimensions: W × H × D 380 × 310 × 200 mm (excluding buckles, carrying handle, and carrying strap)



F2010 Universal Carrying Pouch (Z700G)

(not for ... (ST PRIME)External Dimensions: W × H × D 380 × 310 × 200 mm (excluding carrying strap)



F2020 Universal Carrying Pouch (Z700F)

outside dimensions: W × H × D 430 × 310 × 300 mm (excluding buckles, carrying handle, and carrying strap)



Table 15: Accessories

Further information regarding accessories can be found: •

- Our Measuring Instruments and Testers catalog
- Our website at **https://www.gossenmetrawatt.com**

11 Order Information

Test instrument andare available with various features and accessories, and can be ideally matched to your requirements. When ordering you can select from amongst:

- A standard model (frequently selected combinations of basic instruments and features)
- A customized variant (instrument with features you select yourself)

Accessories can of course be purchased individually along with your instrument or at a later point in time.

Standard Models

Standard Models	Article Number	Features
SECULIFE ST PRO	M694C	Schuko version (test socket and power plug), selectable language for the user interface (German is the default setting upon delivery), protective conductor test current 200 mA and 10 A AC. 10 configurable connections for application components, touch screen, connection for a 2nd. Test probe and voltage measurement inputs. SECUTEST DB+ and SECUTEST DB COMFORT database expansion. Test sequence for IEC 60601.
SECULIFE ST PRIME	M694H	Schuko version (test socket and power plug); the language of the user interface is selectable (German is preset at delivery); protective conductor test current: 200 mA and 25 A AC; high-voltage test between the LN test socket and the PE test socket/probe P1. 10; configurable connections for application modules, touch screen, and voltage measurement inputs. Database extensions: SECUTEST DB+ and SECUTEST DB COMFORT. Test sequence for IEC 60601.
Included with each instrument: Mains power cable, test probe, USB cable, plug-on alligator clip, KS17-ONE cable set for voltage measuring inputs, condensed operating instructions in printed format (complete operating instructions available for download from Internet), DAkkS calibration certificate German, English and French, IZYTRONIQ BUSINESS Starter database and report generating software for PC (with professional version) (as registration card for access to download from the Internet)		

Features List for Freely Configured Instruments (customer-specific)

Article Number for Basic Instrument		**M7050**	
Device Variants		**SECULIFE ST PRO (M7050 A01 AA13 E01 G01 H01 I01 J01 KB01 KD01 M00)**	**SECULIFE ST PRIME (M7050 A01 AA14 E01 F01 G02 I01 J01 KA01 KB01 KC01 KD01 M01)**
	Variant ⇨	**AA13**	**AA14**
	Feature ⇩		
Connections – country-specific mains plug and test socket			
Germany with detection of connection and protection class	B00	■	■
UK	B01	▷	▷
FR/CZ/PL	B03	▷	▷
China	B04	▷	▷
USA	B05	▷	▷

AUS	B06	▷	▷
DK	B07	▷	▷
CH with detection of connection and protection category	B09	▷	▷
German version (B00) with international test adapter set for test jack and AC input	B11	▷	▷
User interface language (can be subsequently changed to any of the other languages listed below)			
German	C00	■	■
English	C01	▷	▷
French	C02	▷	▷
Italian	C03	▷	▷
Spanish	C04	▷	▷
Czech	C05	▷	▷
Dutch	C06	▷	▷
Polish	C07	▷	▷
Portuguese	C12	▷	▷
Data entry via touchscreen			
None	E00		
Included	E01	■	■
High-Voltage Test			
HV test, LN–PE/P1	F01		■
HV test, LN–PE/P1 and P1–THV	F02		□
R-PE test current for protective conductor measurement			
200 mA	G00		
200 mA and 10 A[1] (not in combination with G02)	G01	■	□
200 mA and 25 A	G02	□	■
connection for 2nd test probe			
None	H00		■
Included	H01	■	□
DVM function (digital voltmeter) with 2 additional measuring inputs, COM–V			
None	I00		□
Included	I01	■	■
Jacks for applied parts			
None	J00		
Included	J01	■	■
Additional test sequences			
None	KA00		
with IEC 60601	KA01	■	■
With IEC 61010 / IEC 60601/ IEC 60335	KA03	▷	▷

SECUTEST DB+ database expansion (corresponds to Z853R)			
None	KB00		
Included	KB01	■	■
SECUTEST DB COMFORT database expansion (corresponds to Z853S)			
None	KD00	■	■
Included	KD01	■	■
Bluetooth®			
None	M00	■	
Included	M01	□	■
DAkkS calibration certificate (language combinations)			
in DE-EN-FR	P00	■	■
in DE-EN-PL	P01	▷	▷
in DE-EN-IT	P02	▷	▷

[1] 10/25 A RPE measurements are only possible with line voltages of 115/ 230 V and line frequencies of 50/60 Hz.

Key: ■ default, □ optional, ▷ alternative

Sample order:

SECULIFE ST PRO with English user interface = M7050 AA13 C01 E01 J01

- AA13: SECULIFE ST PRO variant
- C01: English user interface, keyboard layout and test sequences
- E01: with touchscreen
- J01: with connection for application components

Accessories

Designation	Type	Article Number
Mains cable		
Cable set for connecting test instruments to the mains without using a an earthing contact outlet, and for connecting DUTs. Consists of coupling socket with 3 permanently connected cables, 3 measurement cables, 3 plug-on pick-up clips and 2 plug-on test probes.	KS13	GTY3624065P01
Adapter for Testing 3-Phase Current Consumers		
Adapter for connecting DUTs: 3-pole 16 A, 5-pole 16 A + 32 A, 5 ea. 4 mm socket ■ For all tests without line voltage at single and 3-phase electrical devices ■ for leakage current measurement in accordance with the direct or differential current method	CEE adapter	Z745A
16 A/32 A 3-phase current adapter (test case) ■ For all tests without line voltage at single and 3-phase electrical devices ■ For tests at single and 3-phase extension cords ■ For leakage current measurement, direct method	AT3-III-E[2] AT3-III-CH[2]	Z745S Z744A

Designation	Type	Article Number
■ for leakage current measurements using the differential current method [1]		
Test adapter for testing devices with CEE16 and CEE32 connectors(max. load capacity: 20 A)	AT3-IIS [2 2]	Z745T
Test adapter for testing devices with CEE16 and CEE32 connectors(max. load capacity: 32 A)	AT3-II S32 [2 2]	Z745X
3-phase 16 A differential current adapter	AT16-DI	Z750A
3-phase 32 A differential current adapter	AT32-DI	Z750B
Test adapter with single and 3-phase plug connectors up to CEE 32A ■ For all tests without line voltage at single and 3-phase electrical devices ■ For tests at single and 3-phase extension cords	VL2E VL2E CH	Z745W Z744B
Adapter cable, red 5-pole 16 A CEE plug to red 5-pole 32 A CEE coupling, 0.5 m, 5 x 1.5 sq. mm	CEE16/CEE32 adapter cable	Z750F
Adapter for Testing Single-Phase Extension Cords		
Adapter for testing single-phase extension cords including earth contact and inlet plug inserts	EL1	Z723A
Plug insert for using the EL1 adapter in Switzerland	PRO-CH	GTZ3225000R0001
Adapter for Testing Welding Units		
Test adapter for use with SECULIFE ST ... for testing welding machines in accordance with the IEC 60974-4 / EN 60974-4 / VDE 0544-4 standard. The peak-value rectifier in the SECULOAD-N uses the 1N4007 rectifier diode recommended by the standard. This diode is a mains rectifier diode and, by design, is only suitable for voltage sources with a low switching frequency in the range of the mains frequency or for voltage sources with a conventional transformer. The scope of delivery includes 4 test leads and 2 alligator clips.	SECULOAD-N	Z745R
Calibration Adapter		
Calibration adapter for test instruments per DIN VDE 61557-16/ VDE 0413 - 16 (DIN VDE 0404) (max. 200 mA) ***Not to be used for protective conductor test currents of 10 A / 25 A***	SECU-cal 10	Z715A
Probe Cables		
Probe cable with test probe and 2 m probe cable (not coiled), 300 V CAT II 16 A	PC2	Z745D
Probe cable with test probe and 2 m probe cable (coiled), 300 V CAT II 16 A	SK2W	Z745N
5 m probe cable for protective conductor measurement, 300 V CAT II up to 25 A	SK5-25A	Z746C
Probe with test tip and 15-meter probe cable (straight), 300 V CAT II up to 25 A (Suitable for 10 A test current / devices with feature G01)	SK15-25A	Z746D
Probe with test tip and 2-meter probe cable (straight), 300 V CAT II 25 A (Suitable for 25 A test current / devices with feature G02)	SK2-25A	Z746E

Designation	Type	Article Number
Brush probe	Z745G	Z745G
Distributor for connecting five 4 mm and five 2 mm test probes for measuring multiple, accessible housing parts or applied parts	SV5	Z745J
Cable set (1 pair of test leads), 1.2 m, with VDE-GS mark: 600 V CAT IV 1 A *, 1000 V CAT III 1 A *, 1000 V CAT II 16 A ** * with safety caps attached ** without safety caps attached	KS17-2	GTY3620034P0002
2 pieces in a plastic bag, diameter: 4 mm, length: 1.0 m, 1000 V CAT III, 19 A, blue	Measuring cable set, blue	Z746A
2 pieces in a plastic bag, diameter: 4 mm, length: 1.0 m, 1000 V CAT III, 19 A, black/red	Measuring cable set, black/red	Z746B
Clamp-on current sensors for SECULIFE ST PRO/SECULIFE ST PRIME		
Switchable clamp-on current sensor, 1 mA ... 15 A and 1 A ... 150 A, frequency range 45 ... 65 ... 500 Hz, transformation ratio: 1 mV/mA and 1 mV/A, Clamp opening: ∅Cable Max. 15 mm	WZ12C[2]	Z219C
Shunt Current Clamp (Clamp-On Current Sensor) for ... ST PRO 0.1 mA ... 25 mA AC Frequency range 50 Hz ... 1 MHz Transmission ratio: 100 mV/mA Jaw opening: ∅Cable Max. 40 mm	SECUTEST CLIP[2]	Z745H
Test pistol for ... ST PRIME[3]		
HV test pistol for M7050	PHV	Z746H
Temperature Sensor for SECULIFE ST PRO/SECULIFE ST PRIME		
Pt100 Temperature Sensor, –40 ... +500 °C, for surface and immersion measurements	Z3409	GTZ3409000R0001
Pt1000 temperature sensor, class B, for measurement in gases and liquids, -50 to +220 °C	TF220	Z102A
Oven sensor Pt100, –50 ... +550 °C	TF550	GTZ3408000R0001
Dip-stick oil temperature sensor, Pt1000, class B, -50 to +500 °C, sensor: 3 mm dia. x 810 mm long	TF400CAR	Z102C
Pouches and Cases		
Carrying pouch for test instrument	F2000[2]	Z700D
Large carrying pouch for test instrument sets	F2020	Z700F
Universal carrying pouch with flexible compartments and display guard for test instrument (not for ... ST PRIME)	F2010	Z700G
System Bag (not for ... ST PRIME)	F2030	Z700H
Plastic System Case (not for ... ST PRIME)	SORTIMO L-BOXX	Z503D
Foam insert for SORTIMO L-BOXX with compartments for test instrument and accessories (not for ... ST PRIME)	Foam SORTIMO L-BOXX Secutest4	Z701D
Foam insert for SORTIMO L-BOXX GM with compartment for adapter	Foam SORTIMO L-BOXX adapter	Z701E

Designation	Type	Article Number
Data Storage Accessories		
Database expansion: Remote control, 24 user-defined test sequences, additional database elements, individual test interval, multi-print, user-defined report templates, data import/export	SECUTEST DB+	Z853R [4]
Database expansion: Test Object: Medicine, Custom Test Interval, TouchEdit, Move Test Objects, QuickEdit, AutoStore, Push/Print – Sends the data directly to the PC (IZYTRONIQ).	SECUTEST DB COMFORT	Z853S [4]
Integrated test procedures in accordance with IEC 61010-1 and IEC 60335 (F01/F02 models also include a high-voltage test step)	IEC 61010/60335	Z853V [4]
Report Generating Accessories		
RFID system		
RFID reader/writer for USB connection (frequency: 13.56 MHz)	SCANBASE RFID	Z751E
RFID tags per ISO 15693, ∅ approx. 22 mm, self-adhesive, 500 pcs.	Z751R	Z751R
RFID tag per ISO 15693, ∅ approx. 30 mm, 2 mm thick with 3 mm hole, 500 pcs.	Z751S	Z751S
RFID tag per ISO 15693, pigeon ring, ∅ 7.5 mm dia., 250 pcs.	Z751T	Z751T
Barcode Scanner		
Barcode scanner for USB connection	Z751A	Z751A
Barcode Printer		
Barcode and label printer including software with USB connection for PC or test instrument Encryption: Code39, Code128, EAN13, Text, QR Code, Micro QR Code, DataMatrix, Aztec	Z721E	Z721E
Label set for Z721D barcode and label printer (qty.× width: 3 × 24 / 1 × 18 / 1 × 9 mm, 8 m long)	Z722D	Z722D
Label set for Z721D barcode and label printer (qty.× width: 5 × 18 mm, 8 m long)	Z722E	Z722E
Thermal printer		
Thermal printer for printing test reports including user manual on CD-ROM, lithium battery, power pack and mains cable, USB cable, 1 roll of thermal paper	Z721S	Z721S
Thermal paper for Z721S; 10 rolls of thermal paper, ∅ 12/50 mm, 30 m × 112 mm, coated on the outside	Z722S [2]	Z722S
See also separate ID systems data sheet for RFID scanner, barcode reader and printer		

1 Only with feature I01.

2 Data sheet available

3 Only with feature F02

4 The test instrument's serial number must be included with the order.

Gossen Metrawatt GmbH
Südwestpark 15
90449 Nürnberg
Germany

+49 911 8602-0

+49 911 8602-669

info@gossenmetrawatt.com

www.gossenmetrawatt.com

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