Condensed Operating Instructions

GOSSEN METRAWATT

SECUTEST ST BASE(10) / PRO and SECULIFE ST BASE(25)

Test Instruments for Checking the Electrical Safety of Devices

3-447-066-03
3/3.22

Important

Read carefully before use.
Keep on file for future reference!

Read the full operating instructions which are available in PDF format at **www.gossenmetrawatt.com**.
The condensed operating instructions do not replace the full operating instructions!

Download Center

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1 Safety Instructions

Observe this documentation, in particular all included safety information, in order to protect yourself and others from injury, and to prevent damage to the test instrument.

- Carefully and completely read and adhere to these condensed operating instructions, as well as the test instrument's operating instructions.
  The respective documents can be found at http://www.gossenmetrawatt.com.
  Retain these documents for future reference.
- Tests/measurements may only be performed by a qualified electrician, or under the supervision and direction of a qualified electrician. The user must be instructed by a qualified electrician concerning performance and evaluation of the tests/measurements.
- Observe and comply with all safety regulations which are applicable for your work environment.
- Wear suitable and appropriate personal protective equipment (PPE) whenever working with the test instrument.
  Be aware that PPE may be required for the device under test and wear it if necessary.
- The functioning of active medical devices (e.g. pacemakers, defibrillators) and passive medical devices may be affected by voltages, currents and electromagnetic fields generated by the test instrument and the health of their users may be impaired. Implement corresponding protective measures in consultation with the manufacturer of the medical device and your physician. If any potential risk cannot be ruled out, do not use the test instrument.
- Use only the specified accessories (included in the scope of delivery or listed as options) with the test instrument.
- Carefully and completely read and adhere to the product documentation for optional accessories. Retain these documents for future reference.
- Use the test instrument in undamaged condition only.
  Inspect the test Instrument before use. Pay particular attention to damage, interrupted insulation or kinked cables. Damaged components must be replaced immediately.
- Accessories and cables may only be used as long as they're fully intact. Inspect accessories and all cables before use. Pay particular attention to damage, interrupted insulation or kinked cables.
- If the test instrument or its accessories don't function flawlessly, permanently remove the instrument/accessories from operation and secure them against inadvertent use.
- If the test instrument or accessories are damaged during use, for example if they're dropped, permanently remove the instrument/accessories from operation and secure them against inadvertent use.
- Do not use the test instrument and its accessories after long periods of storage under unfavorable conditions (e.g. humidity, dust or temperature).
- Do not use the test instrument and its accessories after extraordinary stressing due to transport.
- Only use the test instrument and its accessories within the limits of the specified technical data and conditions (ambient conditions, IP protection code, measuring category etc.).
- The test instrument and the accessories may only be used for the tests/measurements described in the documentation for the test instrument.
- The test instrument may only be connected to TN, TT or IT electrical systems with a maximum of 240 V (nominal voltage) which comply with applicable safety regulations (e.g. IEC 60346, VDE 0100) and are protected with a fuse or circuit breaker with a maximum rating of 16 A.

- The test instrument is equipped with fuses. The test instrument may only be used as long as the fuses are in flawless condition. Defective fuses must be replaced.
- Do not perform any measurements in electrical systems with the test Instrument. It has been neither designed nor approved for this purpose.
- Plugging in the measurement cables must not necessitate any undue force.
- Never touch conductive ends (e.g. of test probes).
- Fully unroll all measurement cables before starting a test/measurement. Never perform a test/measurement with the measurement cable rolled up.
- Avoid short circuits due to incorrectly connected measurement cables.
- Conduct a probe check after completing each test.
- The test instrument must be operated within the same electrical system as the test object.
- Unexpected voltages may occur at devices under test (for example, capacitors can be dangerously charged). Take appropriate precautions.
- The fuses may only be replaced when the test instrument is voltage-free, i.e. it must be disconnected from mains supply power and may not be connected to a measuring circuit.
  The fuse type must comply with the specifications in the technical data or the labeling on the test instrument.
- Test instruments with feature M01: The test instrument is equipped with a Bluetooth® module. Determine whether or not use of the implemented frequency band of 2.402 to 2.480 GHz is permissible in your country.
- Always create a backup copy of your measurement data.
  Please refer to the operating instructions for further information (see section 3, “Documentation”).
- Observe and comply with the respectively applicable national data protection regulations. Use the corresponding functions provided by the test instrument such as password protection, as well as other appropriate measures.

2 Applications

Please read this important information!

2.1 Intended Use / Use for Intended Purpose

Safety of the operator, as well as that of the test instrument, is only assured when it's used for its intended purpose.

The SECUTEST ST BASE, the SECUTEST ST BASE10, the SECUTEST ST PRO, SECULIFE ST BASE and the SECULIFE ST BASE25 are test instruments for testing the electrical protective measures of electrical devices, electrical medical devices and electric welding equipment.

All test instruments include measuring and test functions for checking the effectiveness of the protective measures required in accordance with the respective test standards for the particular field of technology. Single measurements and test sequences can be executed.

Test sequences (semi-automatic test procedures) can be used in an integrated, i.e. preconfigured form, or defined individually by the user.

The integrated test sequences consist of a preconfigured series of individual tests with subsequent documentation, as stipulated in the respective standard. They can thus be used to repeatedly and efficiently perform standards-compliant tests. Their progress is interrupted by safety-related pauses, as well as associated warnings and instructions. As a result, the level of protection provided to the user is greater than demanded by sections 4.1.6 and 4.1.7 of standard "IEC / 61557-16 / DIN EN 61557-16 / VDE 0413-16" with regard to "automated test sequences".

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

- VDE 0701-0702 / ÖVE E 8701 / SNR 462638
  Inspection after repair, modification of electrical appliances – Periodic inspection on electrical appliances
- IEC 62353 / EN 62353 / VDE 0751-1
  Medical electrical equipment – Recurrent test and test after repair of medical electrical equipment
- IEC 60974-4 / EN 60974-4 / VDE 0544-4
  Arc welding equipment
  Part 4: Periodic inspection and testing
- NEN 3140
  Bedrijfsvoering van elektrische installaties - Laagspanning
- EN 50678 / VDE 0701
  General procedure for verifying the effectiveness of the protective measures of electrical equipment after repair
- EN 50699 / VDE 0702
  Recurrent Test of Electrical Equipment
- IEC 62368 / EN 62368 / VDE 0868-1
  Audio/video, information and communication technology equipment
- IEC 62911 / EN 62911 / VDE 0868-911
  Audio, video and information technology equipment – Routine electrical safety testing in production

Attention!

The integrated, preconfigured test sequences do not include all of the tests prescribed by the product standard which are required for type testing! They're restricted to the tests which are required as a rule after repair or during maintenance work and for occupational health and safety measures, as well as for quality assurance in production.

Note

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).
Refer to your order / test instrument and data sheet for details.

Associated, database-driven test software is available, i.e. 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 itself is included with test equipment sets, or can be purchased separately.

The test instrument housing is compact, impact resistant and includes an integrated rubber protector for mobile use, e.g. in factories, on construction sites and in industrial environments.

The front panels and housings of SECULIFE ST BASE and SECULIFE ST BASE25 test instruments are also furnished with antimicrobial properties, which make it possible to use them in hygienically sensitive areas.

Standards Table – by Device and Reason for Testing

	Reason for Testing		
Device Under Test	**Repair**	**Periodic Testing (occupational safety, DGUV)**	**Testing in Production / Routine Testing**
Electric devices (as a rule with mains power cable) including extension cords and multiple outlets	EN 50678 / VDE 0701 VDE 0701-0702 / ÖVE E 8701 / SNR 462638 NEN 3140	EN 50699 / VDE 0702 VDE 0701-0702 / ÖVE E 8701 / SNR 462638 NEN 3140	
IT equipment	Not defined To a given extent: IEC 62368 / EN 62368 / VDE 0868-1 IEC 62911 / EN 62911 / VDE 0868-911 VDE 0701-0702 / ÖVE E 8701 / SNR 462638	EN 50699 / VDE 0702 VDE 0701-0702 / ÖVE E 8701 / SNR 462638 NEN 3140	IEC 62911 / EN 62911 / VDE 0868-911
Medical electrical devices	IEC 62353 / EN 62353 / VDE 0751-1	IEC 62353 / EN 62353 / VDE 0751-1	IEC 62353 / EN 62353 / VDE 0751-1 To a given extent: IEC 60601-1 / EN 60601-1 / VDE 0750-1
Arc welding equipment	IEC 60974-4 / EN 60974-4 / VDE 0544-4	IEC 60974-4 / EN 60974-4 / VDE 0544-4	

Table of Standard Designations for Available Tests

	EN 50678 / VDE 0701 EN 50699 / VDE 0702 VDE 0701-0702 / ÖVE E 8701 / SNR 462638	IEC 60974-4 / EN 60974-4 / VDE 0544-4	IEC 62353 / EN 62353 / VDE 0751-1	IEC 60601-1 / EN 60601-1 / VDE 0750-1	IEC 62368 / EN 62368 / VDE 0868-1 IEC 62911 / EN 62911 / VDE 0868-911
Single Measurements					
Protective conductor resistance	•			•	
Insulation resistance	•				
Protective conductor current	•				
Earth leakage current				•	
Primary leakage current		•			
Device leakage current			•		
Touch current	•	•	•	•	•
Current from welding circuit		•			
Patient leakage current				•	
Leakage current from applied part			•		
Measuring Method					
Alternative (equivalent [device] leakage current)	•		•		
Differential current	•	•	•		
Direct	•	•	•	•	•

2.2 Use for Other than Intended Purpose

Using the test instrument for any purposes other than those described in these condensed operating instructions, or in the test instrument's operating instructions, is contrary to use for intended purpose.

2.3 Liability and Guarantee

Gossen Metrawatt GmbH assumes no liability for property damage, personal injury or consequential damage resulting from improper or incorrect use of the product, in particular due to failure to observe the product documentation. Furthermore, all guarantee claims are rendered null and void in such cases.

Nor does Gossen Metrawatt GmbH assume any liability for data loss.

2.4 Opening the Instrument / Repairs

The test instrument may only be opened by authorized, trained personnel in order to ensure flawless, safe operation and to assure that the guarantee isn't rendered null and void. Even original replacement parts may only be installed by authorized, trained personnel.

Unauthorized modification of the test instrument is prohibited.

If it can be ascertained that the test instrument has been opened by unauthorized personnel, no guarantee claims can be honored by the manufacturer with regard to personal safety, measuring accuracy, compliance with applicable safety measures or any consequential damages.

If the guarantee seal is damaged or removed, all guarantee claims are rendered null and void.

3 Documentation

These condensed operating instructions describe initial steps for using the test instrument. Read the corresponding operating instructions for full information regarding the test instrument.

Note
The operating instructions are available for download on the Internet at http://www.gossenmetrawatt.com.

Scope of Validity

These condensed operating instructions describe a test instrument with software/ firmware version FW 3.3.0.

Refer to the operating instructions with regard to updates.

Terminology

Test instrument	SECUTEST ST... or SECULIFE ST...
Device under test	Electrical device to be tested, medical electrical device or electric welding equipment (DUT)
Test object	Electronic representation of a specific test object in the internal test instrument database (unequivocal allocation to a real DUT by means of an ID)
Test sequence	Series of semi-automatic tests or test steps
Integrated test sequence	Test sequence (see above) which is available upon delivery or after enabling in the instrument. Cannot be changed (test parameters are configurable).
User-defined test sequence	A test sequence (see above) which is created individually by the user

4 Getting Started

- Read and adhere to the product documentation. In particular observe all safety information in the documentation, on the test instrument and on the packaging.
  - See “Safety Instructions” on page 3.
  - See “Applications” on page 5.
- Familiarize yourself with the test instrument.
  - See “Test Instrument” on page 9.
  - See “Initial Startup” on page 15.
  - See “Operation” on page 17.
- Prepare the test instrument for use.
  - See “Test Instrument Settings” on page 19.
  - See “Inspector Management” on page 22.
  - See “Internal Database” on page 22.
- Perform measurements:
  - See “Important Basic Information on Tests and Measurements” on page 23.
  - See “Single Measurements” on page 25.
  - See “Test Sequences (automatic test sequences)” on page 44.
- Generate a report if required. See “Reports” on page 51.
- Transfer measurement data to IZYTRONIQ software if required. See “Test Data Management – IZYTRONIQ Software” on page 51.

5 Test Instrument

5.1 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 can be found in your order and in the data sheet, in which all order information is listed.

5.2 Features

The test instruments are available with various features. These can be selected when placing an order.
The basic test instruments include the following features:

	Features	SECUTEST ST BASE	SECUTEST ST BASE10	SECUTEST ST PRO	SECUTEST ST PRO BT comfort	SECULIFE ST BASE	SECULIFE ST BASE25
Touchscreen / keyboard	E01			•	•	•	•
10 A RPE test current	G01		•	•	•	•	
25 A RPE test current	G02						•
2nd test probe	H01			•	•	•	•
Voltage measuring input*	I01			•	•	•	•
Integrated test sequences for EN 50678 / VDE 0701, EN 50699 / VDE 0702, IEC 62368 / EN 62368 / VDE 868-1, IEC 62911 / EN62911/ VDE 868-911	KE	•	•	•	•	•	•
SECUTEST DB+	KB01	o	o	•	•	•	•
SECUTEST DB COMFORT	KD01	o	o	o	•	o	•
Bluetooth®	M01				•		
Antimicrobial housing	—					•	•

* For voltage measurement, or for connecting a current clamp sensor for current measurement or an AT3 adapter, and for temperature measurement via a Pt100 or Pt1000 temperature sensor

Key: • Included, o Optional

5.3 Symbols on the Test Instrument

The symbols on the test instrument have the following meanings:

250 V CAT II — Maximum permissible voltage and measuring category between connections P1 (test probe), the test socket and ground


Warning regarding dangerous electrical voltage

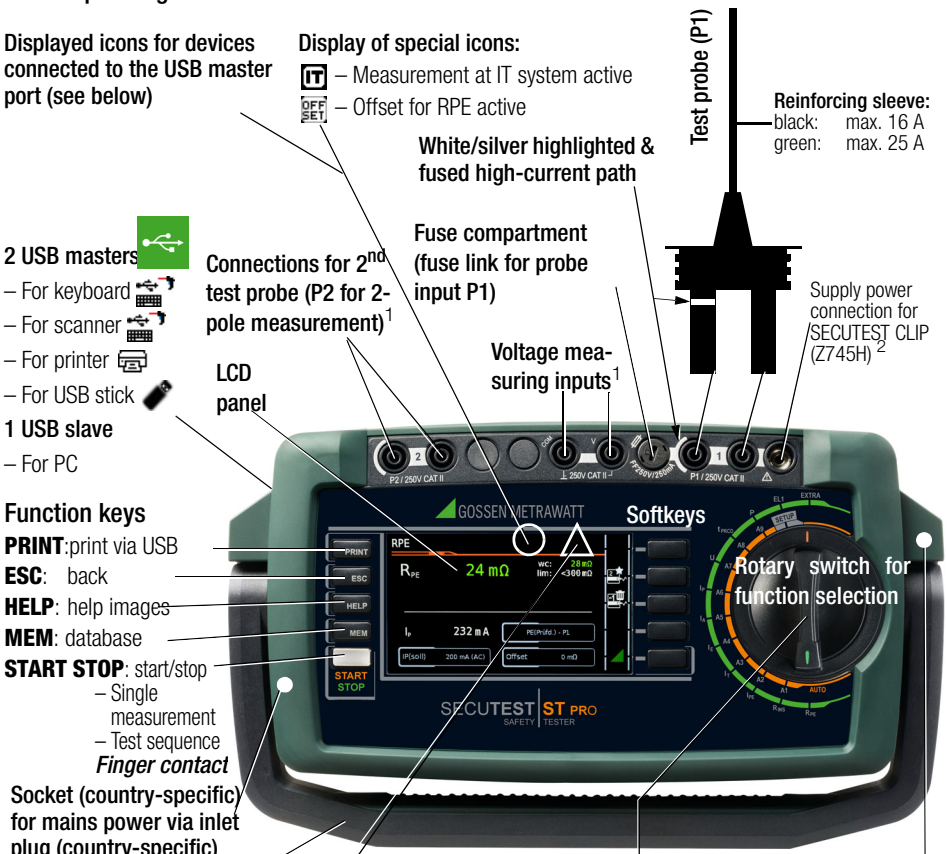

Warning concerning a point of danger
(attention: observe documentation!)


European conformity marking


The test instrument may not be disposed of with household trash (see section 18, “Returns and Environmentally Sound Disposal”).
Further information regarding the WEEE mark can be accessed on the Internet at www.gossenmetrawatt.com by entering the search term “WEEE”.


If the guarantee seal is damaged or removed, all guarantee claims are rendered null and void.

5.4 Operating and Connection Overview



[1] Only test instruments with feature H01, e.g. SECUTEST ST PRO
[2] See also operating instructions for the device.

Note
Features such as touchscreen, Bluetooth® etc. can be found in your order, on the instrument and in the data sheet.

5.5 Overview of the Test Instruments' Scope of Functions

Single measurements and test sequences can be executed with the test instruments.

Single Measurements

Switch Positions in Green Rotary Switch Level

Switch setting description as of	**Measuring functions,** test current/voltage	
Single measurements, *rotary switch level: green*		
Measurements at voltage-free objects		
R_{PE}	R_{PE}	**Protective conductor resistance**
	I_P	Test current (200 mA) Feature G01 (e.g. SECUTEST ST BASE(10)/PRO and SECULIFE ST BASE): 10 A [1]
Page 27		and feature G02 (e.g. SECULIFE ST BASE25): 25 A [1]
R_{INS}	R_{INS}	Insulation resistance
Page 28	U_{INS}	Test voltage
Measurements at DUTs with line voltage		
I_{PE}	$I_{PE}\simeq$	**Protective conductor current, TRMS**
	$I_{PE\sim}$	AC component
	$I_{PE=}$	DC component
Page 30	U_{LPE}	Test voltage
	U_{Gen}	Reference voltage (alternative)
I_T	$I_B\simeq$	**Touch current, TRMS**
	$I_{B\sim}$	AC component
	$I_{B=}$	DC component
	U_{LPE}	Test voltage
Page 31	U_{Gen}	Reference voltage (alternative)
I_E	$I_G\simeq$	**Device leakage current, TRMS**
	$I_{G\sim}$	AC component
	$I_{G=}$	DC component
	U_{LPE}	Test voltage
Page 32	U_{Gen}	Reference voltage (alternative)
I_A	$I_A\simeq$	**Leakage current from the applied part**
	U_{LPE}	Test voltage
Page 33	U_{Gen}	Reference voltage (alternative)
I_P	$I_P\simeq$	**Patient leakage current, TRMS**
	$I_{P\sim}$	AC component
	$I_{P=}$	DC component
Page 34	U_{LPE}	Test voltage

Switch setting description as of	**Measuring functions,** test current/voltage	
U	$U\simeq$	**Probe voltage, TRMS**
	$U_\sim$	Alternating voltage component
	$U_=$	Direct voltage component
	$U\simeq$	**Measuring voltage, TRMS** [2]
	$U_\sim$	Alternating voltage component [2]
Page 35	$U_=$	Direct voltage component [2]
t_{PRCD} [3]	t_a	PRCD time to trip for 10/30 mA PRCD
Page 37	U_{LN}	Line voltage at the test socket
P	**Function test at the test socket**	
	I	Current between L and N
	U	Voltage between L and N
	f	Frequency
	P	Active power
	S	Apparent power
Page 38	**PF**	Power factor
Probe measuring functions		
EL1	Function test for extension cords with EL1/VL2E/AT3-IIIE adapters: continuity, short circuit & reversed wires [4]	
Page 39		
EXTRA	Reserved for extensions within the framework of software updates	
Page 40	°C temperature measurement [2] with Pt100/ Pt1000	
	IZ current clamp measurement with current clamp sensor	

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

2 Voltage measuring inputs only with test instruments including feature I01 (e.g. SECUTEST ST PRO and SECULIFE ST BASE(25))

3 Measurement of time to trip isn't possible in IT systems.

4 No testing for reversed wires with EL1 adapter

Integrated Test Sequences

The test instrument is equipped with pre-configured, integrated test sequences which are selected via the switch positions at the orange rotary switch level.

Note

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).
Refer to your order / test instrument and data sheet for details.

The integrated test sequences are freely assignable, i.e. they can be individually assigned to the rotary switch positions (because there are more integrated test sequences than rotary switch positions). But the test instrument is preconfigured upon delivery.
Which integrated test sequences are assigned to the rotary switch positions on your test instrument upon delivery depends on several factors: test instrument type (SECUTEST ST... or SECULIFE ST...), selected features and enabled extensions.
Due to the great variety of possible combinations, a listing of all delivery statuses would go beyond the scope of this documentation.

In order to provide you with an impression, the delivery status of a standard test instrument is listed below as an example.
SECUTEST ST PRO, German version, default settings:

Integrated Test Sequences
Switch Positions at Orange Rotary Switch Level

Rotary switch position	Standard/ test sequence	Meas. type	Connection	type	Protection category	Voltage spec.
A1	EN 50699	Auto	Auto		Auto	
A2	EN 50678	Auto	Auto		Auto	
A3	VDE 0701-0702	Auto	Auto		Auto	
A4	IEC 60974-4	Active	Auto		Auto	U(0) DC
A5	IEC 62353	Passive	Auto	BF	Auto	
A6	EN 50699	Passive	Test socket		Auto	
A7	EN 50678	Passive	Test socket		Auto	
A8	EN 50699-VLTG	VLTG	EL1 adapter		PC I	
A9	EN 50699	Active	Auto		Auto	

Auto = automatic detection

Details concerning test sequences can be found in the operating instructions (see section 3 on page 8).

6 Characteristic Values

Attention!
Complete characteristic values can be found in the operating instructions (see section 3 on page 8).

Reference Ranges

Line voltage	230 V AC ±0.2%
Line frequency	50 Hz ±2 Hz
Waveform	Sine (deviation between effective and rectified value < 0.5%)
Ambient temperature	+23 °C ±2 K
Relative humidity	40 … 60%
Load resistors	Linear

Nominal Ranges of Use

Nominal line voltage	100 V … 240 V AC
Nominal line frequency	50 … 400 Hz
Line voltage waveform	Sinusoidal
Temperature	0 … +40 °C

Ambient Conditions

Storage temperature	-20 °C … +60 °C
Relative humidity	Max. 75%, no condensation allowed
Elevation	Max. 2000 m
Place of use	Indoors, except within specified ambient conditions

In order to avoid deviation due to excessive temperature fluctuation, e.g. after transport in low outdoor temperatures and subsequent operation in a warm indoor environment, it's 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, in turn, affect the measuring circuit and measuring accuracy.

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 test: approx. 32 VA 10 A test: approx. 105 VA 25 A test: approx. 280 VA
Mains to test socket (e.g. during 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

Electrical Safety

Protection category	I per 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)
Measuring category	Designed for 300 V CAT II (but 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

Safety shutdown: At DUT differential current of > 10 mA, shutdown time: < 500 ms, can also be set to > 30 mA, in the event of probe current (electronic fuse) during:
- Leakage current measurement: > 30 mA~/< 500 ms*
- Protective conductor resistance measurement: > 250 mA~/< 1 ms in case of continuous current I > 16.5 A

Fuse links: Mains fuses: 2 ea. FF 500V/16A
Special fuse: M 250V/250mA
10 A RPE test current (feature G01) only: 1 ea. FF 500V/16A

Electromagnetic Compatibility

Product standard: EN 61326-1, EN 61326-2-2

USB Data Port

Type: USB slave for PC connection / remote control**

Type: 2 ea. 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 printers *

* See operating instructions for compatible test instruments

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

Bluetooth ® data interface 2.1 + EDR (test instruments with feature M01 only)

Frequency range: Max. 2.5 mW (class II)
Transmission intensity: 2400 … 2483.5 MHz

* Firmware version 3.2.0 and lower: 12 mA

Mechanical Design

Display: 4.3" multi-display (9.7 × 5.5 cm), backlit, 480 x 272 pixels with 24 bit color depth (true color)

Dimensions: W × H × D: 295 ×145 × 150 mm
Height with handle: 170 mm

Weight: SECUTEST ST BASE(10)/ PRO: approx. 2.5 kg
SECULIFE ST BASE25: Approx. 4.0 kg
(depending on the test instrument version)

Protection: Housing: IP 40, Test socket: IP 20 per EN 60529

Database

Number of data records: 50,000
1 data record = 1 DUT or location node or customer or individual measurement

6.1 Relevant Standards

The test 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
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

7 Initial Startup

Initial startup of the test instrument is conducted by connecting it to the power supply. The following sections describe operation, as well as how to select various basic settings.

7.1 Connecting the Test Instrument to the Mains

- ⇨ See section 6 for nominal mains values (nominal ranges of use).
- ⇨ Connect the mains cable to the test instrument via its inlet plug and insert the mains plug into an electrical outlet. Any rotary switch position can be selected. If a mains outlet (earthing contact outlet) isn't available, or if only a 3-phase outlet is available, the adapter socket can be used to connect the phase conductor, the neutral conductor and the protective conductor. The adapter socket has three permanently attached cables and is included with the KS13 cable set.

Attention!
If connection isn't possible via an earthing contact outlet: Shut down mains power first.
Then connect the cables from the coupling socket to the mains using pick-off clips in accordance with the diagram.
Disconnection from mains power is only possible via the mains plug.

Measurements in IT Systems

The **IT System** setting can be activated in the **SETUP** switch position (Setup 1/3) in the **All Measurements** submenu:

With **"Measurement at IT system" set to Yes:** active leakage current measurements (or all measurements with reference to PE at the mains connection side) are disabled. Test sequences which include measurements of this sort are also disabled.

7.2 Automatic Recognition 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 [2]	All measurements disabled
Protective conductor PE & 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 [1]
Test for IT/TN system	Display	Connection N → PE > 20 kΩ	Possible under certain circumstances

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

[2] If the user of the test instrument is too well insulated, the following error message may appear: "Interference voltage at mains connection PE"

Attention!
In the event of mains connection errors as described in either of the first two cases in the table above, immediately disconnect the test instrument from the mains and arrange to have the error eliminated!

Attention!
If, while testing protective conductor potential, you determine that **the mains protective conductor is conducting voltage** (in accordance with the first two mentioned cases), **no further measurements may be performed with the test instrument**. If this is the case,

potentially dangerous voltage is also present at the accessible earthing contacts of the standard socket (test socket). Immediately disconnect the test instrument from the mains and arrange to have the fault eliminated at the mains connection.

Note

Voltage at the electrical system's protective conductor PE may result in distorted measurement values during testing for the absence of voltage, or during leakage voltage measurements.

Note

Finger Contact

During this test for correct mains connection, a voltage measurement is performed between the finger contact and PE at the test instrument's mains connection, and its reference potential is acquired via the user's body resistance to the conductive start key. In order to obtain reliable measurement results, this resistance value must be less than 1 MΩ. If the user is wearing insulating shoes or gloves, or is standing on an insulating floor covering, erroneous measurements may result and the following message may appear at the display "Interference voltage at mains connection PE". Try to reduce resistance in this case, for example by touching ground potential with the other hand (e.g. a radiator, but not an insulating wall etc.).

7.3 Connecting Test Probe P1 or P2

Insert the double plug from test probe P1 or P2 into socket 1 or 2 respectively such that the plug with the white ring makes contact with the socket with the vertical bar.

The white ring identifies the terminal for the high current conductor which is safeguarded by the neighboring fuse link.

Attention!

Test probe with coil cord (SK2W): Grip the tip of the test probe firmly, for example if it has been inserted into a jack socket. Tensioning at the coil cord may otherwise cause the test probe to snap back resulting in possible injury.

Attention!

Probe Check

Conduct a probe check after completing each test.

If the fuse at test probe P1 is defective after testing has been started, all subsequent measurements conducted using this measuring path will be incorrectly evaluated as good!

Note

Difficultly in contacting exposed conductive parts when using the standard probe with test tip

In order to assure good contact, surface coatings must be removed from devices under test with special tools at a suitable location.

The tip of test probe P1 isn't suitable for scratching away paint, because this may impair its coating and/or mechanical strength. Brush probe Z745G may be more suitable than the test probe in certain individual cases.

7.4 International Use

The test instrument can be used internationally. Refer to the operating instructions in this regard.

8 Operation

8.1 Basic Test Instrument Operation

The test instrument is operated using the keys and the rotary switch on the test instrument (see section 5.4 on page 10).

Softkeys

The softkeys are assigned to different functions depending on the operating level (see section 8.3 on page 18).

Function Keys

Fundamentally, these keys have a permanently assigned function:

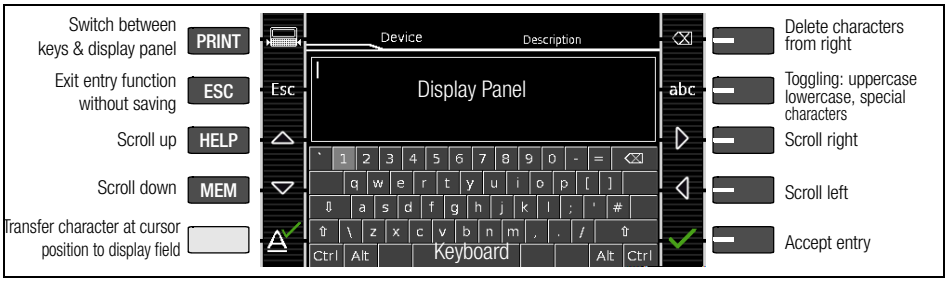
PRINT	Print via USB		**MEM**	Database		**START** **STOP**	Start/stop – Single measurement – Test sequence ***Finger Contact***
ESC	Back		**HELP**	Help images			

In some situations, for example when using the softkey keyboard (see below), an alternative function appears at the display.

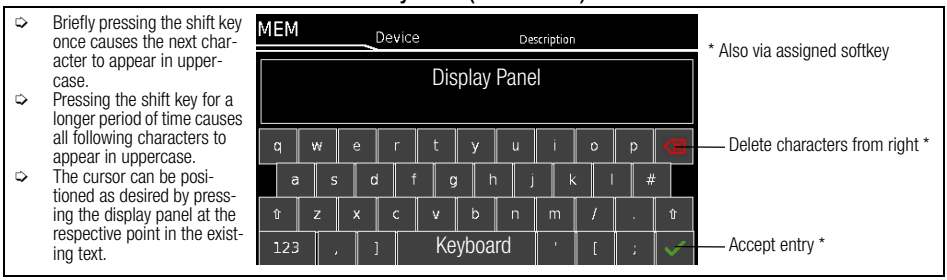
8.2 Entering Text and Numbers

A softkey keyboard is displayed for entering text, numbers and characters (e.g. for entering an offset, a test object ID number, type designations, comments etc.), which is operated by means of the softkeys. In the case of test instruments with touchscreen (feature E01), entry is more convenient via the touchscreen keyboard. Alternatively, entries can also be made with the help of a USB keyboard which is connected to the instrument.

Overview: Entry via Softkey Keyboard



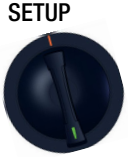
Overview of Entries via the Touchscreen Keyboard (feature E01)



8.3 User Interface Icons – Parameter and Softkey Icons

Icon	Setup Page	Parameters and Their Significance *Complete overviews of all icons are included in the full operating instructions.*
	1/3	**All measurements:** Ref. voltage: Voltage to which measured leakage current values are standardized; residual current protection: value for residual current monitoring (10/30 mA)
	1/3	**Auto measurements**: Set test sequence parameters: start and end view, consider measuring uncertainty (yes/no), auto measuring point (yes/no)
	1/3	**Database**: deletion, statistics, **with inserted USB stick** : Database: backup, restore
	1/3	**System**: set general device parameters: date/time, brightness, volume, default settings, CHECK self-test
	2/3	**Printer**: printer selection for USB master port connected, disconnected
	2/3	**Inspector**: select inspector from list, add new inspector
	2/3	**Culture**: select language for user interface, keyboard and measuring sequences by acknowledging the respective national flag; required!
	2/3	Optionally connected external devices USB stick, keyboard / barcode scanner, printer
	3/3	**System information**: query software and hardware version, serial number, build number, calibration data and memory occupancy
	—	**Functions and their significance**
		Set classification parameters for the respective test sequence (test sequences at switch positions A1 to A9)
		Accept parameters, acknowledge message
		Cancel single measurement or test sequence
		Evaluate measurement of visual inspection with **OK** or **not OK** (toggle key)
		Continue test, next test step in the test sequence
		Left icon: Direct selection key for measuring type (connection type ...) or measuring method (direct ...) / Right icon: Selection between two statuses (no submenu)
		Start evaluation – record measured value. Each time this softkey is pressed, an additional measured value is saved and the number is increased by one.
		Left icon: Repeat measured value recording Right icon: Repeat test step
		Left icon: Delete measured value Right icon: Skip individual tests in a test sequence
		Display measured values from performed measurements and test sequences
		**Magnifying glass icon:** show (+) or hide (–) details regarding database objects or selected measurements
		Enter a new ID for a test object either before or after a test, and in case the ID has not yet been entered to the structure
		Save measurement data / save measurement data as (with display of directory path / ID or new entry of an ID other than the preselected one)

9 Test Instrument Settings



After initial startup (see section 7), basic system parameters must first be configured. Then you'll need to decide which standard designations will be used for the integrated, preconfigured test sequences and, if necessary, change the assignment of test sequences to rotary switch positions.

Attention!
The standard designation cannot be changed retroactively! Stored measurements retain the standard designation and it's used in the test report. For this reason, select the standard designation carefully during initial startup.
As soon as the standard designation has been changed, the new designation is used in all future tests.

9.1 System Parameters

Basic system parameters must first be set:
Setup 1/3 > System 1/2 > Culture > **Language**
Setup 1/3 > System 1/2 > Culture > **Keyboard Layout**
Setup 1/3 > System 1/2 > **Date/Time** (for report generation)
Setup 1/3 > System 2/2 > **Brightness** (display brightness as %)

9.2 Test Standards / Configuration of Integrated Test Sequences

Test sequences in accordance with the standards (also called measurement or test sequences) are preconfigured and integrated into the test instrument. They consist of a series of individual tests with subsequent documentation, as stipulated in the respective standard. They can thus be used to repeatedly and efficiently perform standards-compliant tests. Additional information is available in section 14, "Test Sequences (automatic test sequences)".
In order to use the integrated test sequences, they have to be prepared during initial startup:
The integrated test sequences are identical in terms of content, but they have different national designations depending on the country (DIN, VDE, ÖNORM, SNR etc.). Furthermore, there are variants for each integrated test sequence, e.g. for testing PRCDs.
This is why a standard designation must first be selected in the test instrument for the integrated test sequences.

Attention!
Selection of the standard designation is mandatory and must be completed during initial startup.

Standards which are not needed can be deactivated in order to increase clarity.
The integrated test sequences are run in orange rotary switch positions A1 through A9. Integrated test sequences are preassigned to each rotary switch position at the factory, but these assignments can be changed. You can assign a different integrated test sequence to a rotary switch position if required, or leave the preselected, integrated test sequences as they are.

9.2.1 Selecting the Standard Designation and Deactivating Standards

During initial startup, the desired national standard designation must be selected for each integrated test sequence.
The integrated test sequences are identified with this designation:

- For display at the test instrument (routine daily work)
- In the test results saved to the test instrument (and when these results are exported, e.g. to IZYTRONIQ test software) (data management)
- In reports (verification requirement)

Attention!
The standard designation cannot be changed retroactively! Stored measurements retain the standard designation and it's used in the test report. For this reason, select the standard designation carefully during initial startup.
As soon as the standard designation has been changed, the new designation is used in all future tests.

Standards which are not needed can be deactivated in order to increase clarity.
The settings can be found under **SETUP** > **Auto Measurements**. Each standard for which a test sequence is integrated is displayed there.

- ➪ **SETUP 1/3** > **Auto Measurements**.
- ➪ Scroll through the menu pages until the individual standards appear.
- ➪ Select the first standard via the softkey. All possible standard designations are displayed.
  (An overview of all available standard designations can be found on the following page).
- ➪ Select the desired standard designation with the corresponding softkey.
  Alternatively, the standard (the test sequence) can be deactivated by selecting the **off** entry.
  The menu is returned to the standards display in **Auto Measurements**.
- ➪ Repeat this procedure for all standards.
- ➪ Finally, confirm with the green checkmark. The settings are saved.

Overview of Integrated Standards

Note
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). Refer to your order / test instrument and data sheet for details.

SETUP > Auto Measurements

4/7 > VDE 0701-0702 >
- Off
- OVE E 8701
- SNR 462638
- VDE 0701-0702

5/7 > IEC 62353 >
- Off
- EN 62353
- IEC 62353
- VDE 0751-1

5/7 > IEC 60974-4 >
- Off
- EN 60974-4
- IEC 60974-4
- VDE 0544-4

5/7 > NEN 3140 >
- Off
- NEN 3140

6/7 > EN 50678 >
- Off
- EN 50678
- VDE 0701

6/7 > EN 50699 >
- Off
- EN 50699
- VDE 0702

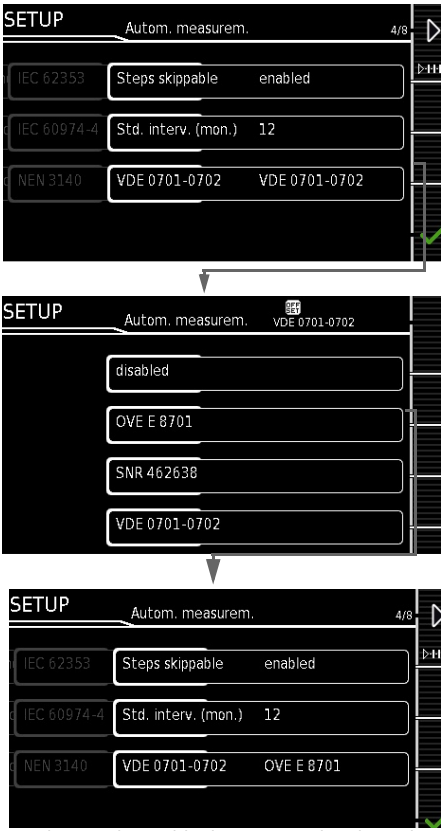
6/7 > IEC 62368 >
- Off
- EN 62368
- IEC 62368
- VDE 0868-1

7/7 > IEC 62911 >
- Off
- EN 62911
- IEC 62911
- VDE 0868-911

Example

Configure the standard designations in the SECUTEST ST PRO.

SETUP 1/3 > Auto Measurements 4/7 >VDE 0701-0702



Save the setting with the green checkmark.

The “OVE E 8701” designation is then used in the test instrument.

9.2.2 Configuring Rotary Switch Positions

We recommend assigning frequently used test sequences to A1 through A8 and reserving switch position A9 for special sequences, for which parameters often need to be adjusted.

- Select an orange rotary switch position (**A1** … **A9**), after which the start page for the respective test sequence is displayed (i.e. the integrated test sequence set at the factory).
- Select classification parameters. 
  The **Classification Parameters 1/2** page appears.
  The standard which is currently assigned to the respective rotary switch position is displayed under **Standard / Test Sequence**.
- Select **Standard / Test Sequence**.
  The **Standard / Test Sequence** page appears. All standards available on the test instrument are displayed here according to the selected setting (off / national designation – see section 9.2.1).
- Select the desired standard.
  The menu is returned to the **Classification Parameters 1/2** page.
- Finally, confirm with the green checkmark. 
  The settings are saved.
- Repeat the above described procedure for each of the respective rotary switch positions.

10 Inspector Management

The test instrument is equipped with inspector management under **Setup 2/3** > **Inspectors**. You can set up several inspectors and switch amongst them.
The “active” (selected) inspector appears in completed tests as the “Inspector”: tests are saved under the inspector’s name and can thus be allocated unequivocally to the inspector. Upon delivery (default setting) the inspector is set up in the test instrument as “not defined”.

Note
Create new users and delete the “not defined” default user for security reasons.

Note
Test instrument settings are valid for all inspectors. Separate settings are not saved for the individual inspectors.

A complete description of inspector management is included in the full operating instructions.

Adding an Inspector

Setup 2/3 > Inspector > New Inspector
See section 8.1 regarding data entry. The inspector is added by pressing the green checkmark.

Password Protection

Select the inspector to be edited from the list under Setup 2/3 > Inspector > Edit Inspector, and confirm by pressing the softkey. A password can be assigned to the inspector using the “Create Password” option. See section 8.1 regarding data entry. The password is assigned by pressing the green checkmark.

Deleting an Inspector

The currently selected inspector cannot be deleted. In order to delete, first select another inspector. Then select the inspector to be deleted under Setup 2/3 > Inspectors > Edit Inspectors > Delete Inspectors.
The inspector is deleted by pressing the green checkmark after acknowledging a security prompt.

11 Internal Database

11.1 Creating Test Structures

A complete test structure with data regarding customer properties, buildings, floors, rooms and test objects can be created in the test instrument.

Attention!
Sensitive Data – Mandatory Data Protection!
Customer data are sensitive data which have to be protected. Observe and comply with the respectively applicable national data protection regulations. Use the corresponding functions provided by the test instrument such as password protection (see section 10), as well as other appropriate measures.

This structure makes it possible to save the results of single measurements or test sequences to test objects belonging to various customers.
Up to 50,000 data records can be stored in the test instrument. The following applies in this regard: 1 data record = 1 DUT or location node or customer or individual measurement.
Structures can be created directly at the test instrument or at a PC (IZYTRONIQ software), and then transferred accordingly. They can also be saved to and restored from a USB flash drive.

Note
The scope of functions provided by the database structure and the transfer options depend on the instrument variant and its features.

A complete description of database creation is included in the full operating instructions.

12 Important Basic Information on Tests and Measurements

12.1 Important Safety Information

Observe and comply with the following safety information when performing individual measurements and test sequences.

12.1.1 Switching Loads – Maximum Starting Current

The 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.

Attention!
Despite extensive protective measures targeted at preventing overloading, the relay contacts may be fused together if **starting current exceeds 30 A**.
Follow the procedure described below and observe information concerning defective relays.

Procedure

Be absolutely sure to adhere to the sequence specified below when switching the live device under test. This prevents excessive wear of the mains relays at the test instrument.

Before measurement:

1 **Device under test**: Turn the DUT off via its own switch.
2 **Test instrument**: Switch line voltage to the test socket.
3 **Device under test**: Turn the DUT on via its own switch.

Perform the measurement.

After measurement:

4 **Device under test**: Turn the DUT off via its own switch.
5 **Test instrument**: Deactivate line voltage to the test socket.

Safer Testing with Test Adapter

In the case of test objects 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: for example test adapters from the AT3 series (AT3- IIIE, AT3- IIS, AT3-IIS32, AT16DI or AT32DI).

Alternative: Passive Test

If necessary on the basis of the hazard assessment, testing can be conducted as a passive test (equivalent leakage current method), i.e. without switching line voltage to the test socket.

12.2 Measurement with DUT Connected to Line Voltage

Attention!
Dangerous Touch Voltage!
Exposed parts may conduct dangerous touch voltage during testing.
Do not touch under any circumstances!
Use a special cover in order to avoid touch contact.

Mains power is disconnected by the test instrument if leakage current exceeds approximately 10 mA (can also be set to 30 mA) (see “Residual Current Monitoring” in the operating instructions). However, this does not fulfill the requirements specified for a PRCD.

Attention!
If the “PROCEED in case of limit violation” setting is used (see operating instructions), enhanced safeguarding against touch contact and a 30 mA RCD must be used, and personal protective equipment (PPE) must be worn (secure workstation).

Attention!
The function test may only be performed after the DUT has successfully passed the safety test!

12.3 Measurement of insulation resistance and equivalent leakage current (alternative leakage current measuring method)

Attention!
Electric shock!
Risk of Consequential Accidents!
Testing is conducted with up to 500 V. If terminals L or N at the test socket or the test probe are touched, electric shock may occur which could result in consequential accidents.
Do not touch terminals L or N at the test socket or the test probe.

12.4 Measuring Parameters for Single Measurements and Test Sequences

Measuring parameters which apply to individual measurements, as well as to test sequences, must be entered in the **SETUP** switch position.

Setup 1/3 > All Measurements

Meas. Parameter	Meaning
Measuring at IT System **(Yes/No)**	**Yes:** active leakage current measurements (or all measurements with reference to PE at the mains connection side) are disabled. Test sequences which include measurements of this sort are also disabled.
Ref. Voltage L-PE **(110 V, 115 V, 220 V, 230 V, 240 V)**	Reference (line) voltage is the voltage to which the measured values for leakage current have been standardized. It's used in the case of leakage current to mathematically adjust measured current values to the specified voltage. **Measurements with line voltage at the test socket:** The setting value has no influence on the voltage with which the test object is supplied via the test instrument's test socket. **Leakage current measurements with "Alternative" measurement type:** The setpoint value of the synthetic test voltage is derived from the value specified here.
Alt. Test Freq. **(48 Hz ... 400 Hz)**	Selectable frequency setpoint value for synthetic test voltage for all leakage current measurements of measurement type "Alternative", affecting the following measurements and/or rotary selector switch positions: – Single Measurements (rotary switch level: green) – Measurements in integrated test sequences – Measurements in user-defined test sequences (only with DSECUTEST DB+ – Z853R or feature KB01)

13 Single Measurements

13.1 General

- Any measuring duration is possible.
- The respective measurement is started and ended by pressing **START/**STOP.
- No limit values can be specified for single measurements, and thus there's no evaluation.
- Checking is performed before each measurement in order to assure a trouble-free sequence, and to prevent any damage to the DUT.

13.2 Measurement Procedure and Storage

The measured value can be captured by pressing the save key or several measured values, i.e. a measurement series, can be acquired by repeatedly pressing the key. The save key indicates in each case whether one or several measured values have been acquired.

The measurements or measurement series can be saved after measurement has been completed.

Note

Measured values can only be added to the clipboard during a measurement.
If no measured values have been copied to the clipboard before the **STOP** key (interrupt/pause, end) is pressed, the last value is automatically saved so that no "empty" measurements or measurement series are saved.

The procedure for saving data depends on whether or not the DUT has already been created as a test object in the test instrument's database. Only the latter is described in this document. Refer to the operating instructions for saving data under test objects that have already been created.

1 Start the measurement by pressing the **START/**STOP key
The icon shown at the right appears and indicates how many measurements have already been performed.

2 End the measurement by pressing the **START/**STOP key (unless a specified measuring time has been stipulated).
The save icon (floppy disk with a number) appears and indicates that one or more valid measured values have been captured, which can now be saved.

3 Press the **save icon** (floppy disk).
You're informed that you haven't selected a test object in the database.

4 Optional: If you want to view the measured values, press the **AΩV** key. Details concerning the individual measured value can be accessed via the **magnifying glass** icon. Use the green checkmark in order to return to the memory menu.

5 Optional: Enter a comment via the icon which depicts a sheet of paper and a pencil.

6 Press the **ID** key.
You now have the option of entering a test object ID number. If you enter an ID here which is **not yet** included in the database, a prompt appears asking you if you want to enter a new test object.

Note

If you haven't yet set up a customer, you must do so now. Follow the instructions which appear in the dialog.

7 The test object can then be created:
– Select either device or (medical) ME device.

– (De)activate the QEDIT function (quick edit – with SECUTEST DB COMFORT only – Z853S or feature KD01).

If QEDIT is activated, you can fill in additional fields for the test object in the next step.

Confirm with the green checkmark.

8 If you activated the QEDIT function in the previous step, you can now fill in all the test object's fields. Confirm with the green checkmark.

9 An overview of the database appears along with the newly created test object.

Press the **save icon** (floppy disk) in order to store the measurement results. A message appears indicating that the data have been successfully saved and the display is switched to the measuring view.

Note

The storage process can be aborted by pressing the **ESC** key. The display is returned to the memory menu. All measured values can be deleted by once again pressing the **ESC** key.

Note

You can send the test results to a PC on which IZYTRONIQ software is running. This function is known as "push-print" and can be implemented via USB or Bluetooth®.
Database extension SECUTEST DB COMFORT (Z853S or feature KD01) and, if applicable, feature M01 (Bluetooth®) are required to this end.
Complete information regarding push-print and a description of the application can be found in IZYTRONIQ online help.

13.3 RPE – Protective Conductor Resistance for Protection Category I DUTs

1 Select measuring function

2 Select parameters

3 Set parameters

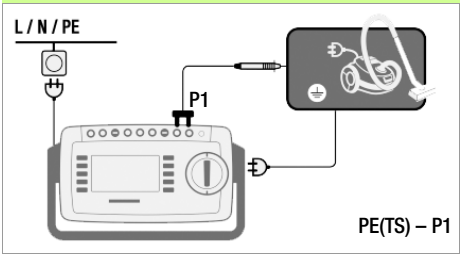
Meas. Parameter	Meaning
Measurement type Permissible test current IT	
Passive: PE(TS) – P1 @ IT = 200 mA/10 A/ 25 A	Testing is conducted between the two protective conductor terminals: at the test socket[3] and test probe P1.
Active: PE(TS)-P1 @ IP = 200 mA	Same as **PE(TS) – P1**, but with line voltage to the test socket and continuously rising DC test current (PRCDs)
PE(mains) – P1 *Perm. connected DUTs* @ IT = 200 mA/10 A	Testing is conducted between the ground terminal at the mains and test probe P1.
PE(mains) - P1 clamp	@ IT = 10 A (see section 13.18)
P1 – P2 @ IT = 200 mA/10 A/25 A	Only test instruments with feature H01: 2-pole measurement between test probes 1 and 2 (see section 13.17)
IT(set)	**It**
200 mA	Test current: 200 mA AC (+/–/± DC)
10 A [1]	10 A test current (feature G01)
25 A [1]	25 A test current (feature G02)
f – only at 200 mA ~ (AC)	
50 ... 200 Hz	Test frequency (adjustable in steps)
Offset	
> 0 ... < 5 Ω [2]	Zero balancing for a selected reference point.

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

[2] The selected offset value is permanently saved and used in measurements performed in switch positions **A1 to A9**.

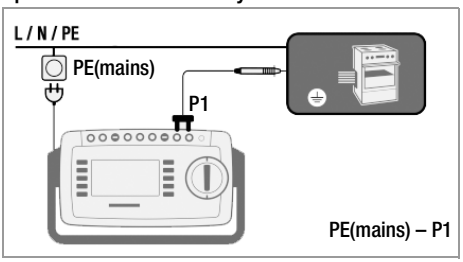
[3] Connection also via EL1, VL2E, AT3 adapter, AT16DI/AT32DI

4 Connect the DUT



- Connect the DUT to the test socket.
- Contact all conductive parts which are connected to the protective conductor with test probe P1.

Special Case: Permanently Installed DUT



- Contact all conductive housing parts with test probe P1.

5 Start test

START STOP

6 Acknowledge line voltage warning

Only when active: PE(TS)-P1

6 Save measured values to clipboard

7 Stop test

START STOP

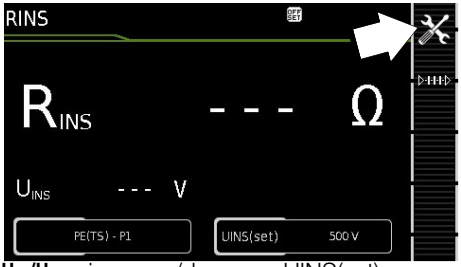
8 Save measurements under ID no.

13.4 RINS – Insulation Resistance Measurement for Protection Category I DUTs

1 Select measuring function

RINS

2 Select parameters



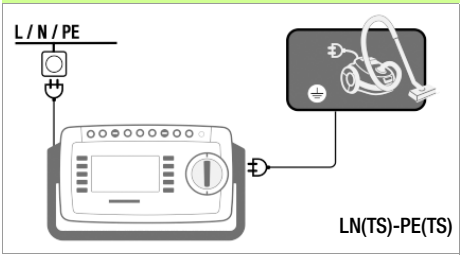
U+/U– = increase/decrease UINS(set)

3 Set parameters

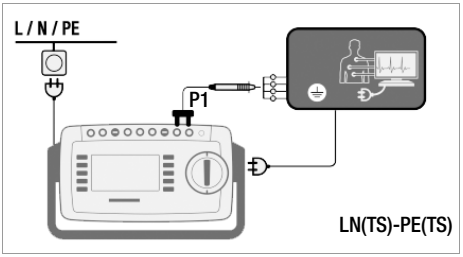
Meas. Parameter	Meaning
Measurement type	
LN(TS) – PE(TS)	PC I: Testing is conducted between short-circuited LN mains terminals at the test socket and the DUT's PE terminal.[1]
LN(TS) – P1	See section 13.5
P1 – P2	Only test instruments with feature H01: 2-pole measurement between test probes P1 and P2 (see section 13.17)
PE(mains) – P1 *Permanently connected DUTs*	Cable test: Testing is conducted between the ground terminal at the mains and test probe P1.
PE(TS) – P1	Testing is conducted between the PE terminal at the test socket and test probe P1.
LN(TS) – P1//PE(TS)	Testing is conducted between short-circuited LN mains terminals at the test socket and test probe P1, including PE at the test socket.
UISO(set)	**U+/U–**
> 50 ... < 500 V	Variable test voltage can be entered with the numeric keypad

[1] Connection also via EL1, VL2E, AT3-IIIE, AT3-IIS, AT3-II S32, AT16DI/AT32DI or CEE adapter

4 Connect the DUT



Special Case: Inputs for Applied Parts



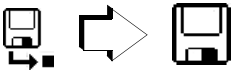
- Connect the DUT to the test socket.
- Contact the short-circuited inputs for the applied parts with test probe P1.

5 Start test

6 Save measured values to clipboard

7 Stop test

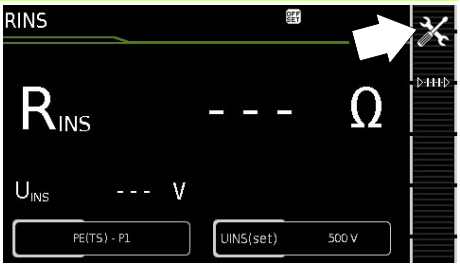
8 Save measurements under ID no.



13.5 RINS – Insulation Resistance Measurement for Protection Category II DUTs

1 Select measuring function

2 Select parameters

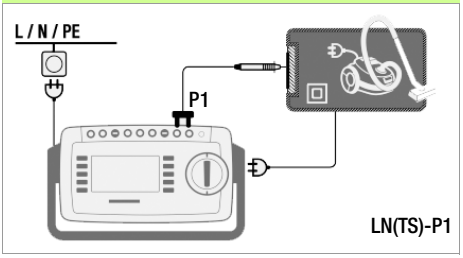


U+ = increase UISO(set)
U– = decrease UISO(set)

3 Set parameters

Meas. Parameter	Meaning
Measurement type	
LN(TS) – P1	Testing is conducted between short-circuited LN mains terminals at the test socket and test probe P1. (connection via test socket, via VL2E, AT3-IIIE, AT3-IIS, AT3-II S32 or AT16DI/AT32DI adapter)
UISO(set)	**U+/U–**
> 50 ... < 500 V	Variable test voltage can be entered with the numeric keypad

4 Connect the DUT



- Connect the DUT to the test socket.
- Contact all conductive, exposed parts with test probe P1.

5 Start test

6 Save measured values to clipboard

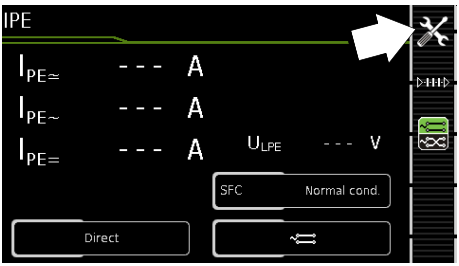
7 Stop test

8 Save measurements under ID no.

13.6 IPE – Protective Conductor Current

1 Select measuring function

2 Select parameters



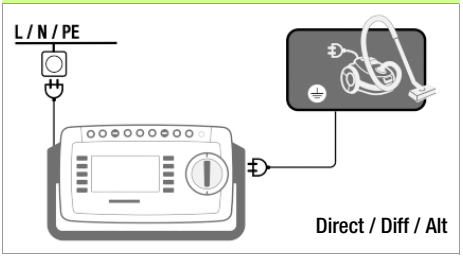
3 Set parameters

Meas. Parameter	Meaning
Measurement type	
Direct	Direct measuring method (via test socket, AT16DI/AT32DI)
Differential	Differential current measurement (via test socket)
Alternative	Equivalent leakage current method (via test socket[1])
AT3 adapter	Only test instruments with feature I01: measurement with AT3 adapter: AT3-IIIE, AT3-IIS or AT3-II S32 See section 13.19
Clamp	Only test instruments with feature I01:See section 13.18
Single fault (SFC) – only with direct measurement type	
Normal status	Single fault simulation not active
N interrupted	Fault simulation – only phase and protective conductor are connected to the DUT[2]
Polarity – only with measurement type direct, differential and AT3 adapter	
Normal / Reversed	Selection of polarity for mains voltage to the test socket

[1] Connection also via VL2E, AT3 adapter, AT16DI/AT32DI
[2] Only suitable for connecting the DUT to the test socket. Not suitable for measurements with AT16DI or AT32DI adapter.

Before conducting any leakage current measurements, make sure that the "Ref. voltage L-PE" and "Alt. Test Freq." measurement parameters have been set correctly in SETUP (see section 12.4).

4 Connect the DUT



➪ Connect the DUT (to test socket).

5 Start test

6 Acknowledge line voltage warning

Direct & differential & AT3 adapter:

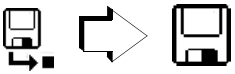
➪ Switch DUT on

7 Save measured values to clipboard

➪ Switch DUT off

8 Stop test

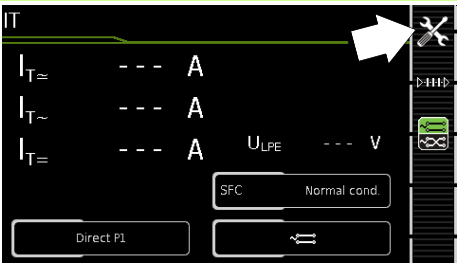
9 Save measurements under ID no.



13.7 IT – Touch Current

1 Select measuring function

2 Select parameters



3 Set parameters

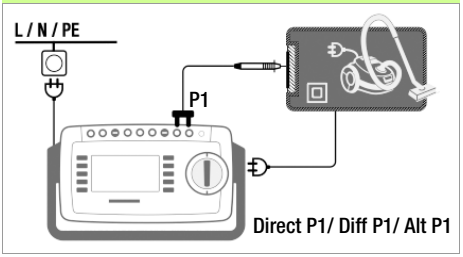
Meas. Parameter	Meaning
Measrement type	
Direct P1	Direct measuring method (via test socket[1])
Differential P1	Differential current measurement (via test socket)
Alternative P1	Equivalent leakage current method (via test socket[1] or VL2E)
Perm. connection P1	Permanently installed DUT
Alternative P1–P2	Only test instruments with feature H01: Equivalent leakage current measuring method: 2-pole measurement between test probes 1 and 2 (see section 13.17)
Single fault (SFC) – only with direct measurement type	
Normal status	Single fault simulation not active
N interrupted	Fault simulation – only phase and protective conductor are connected to the DUT[2]
PE interrupted	Fault simulation active – the protective conductor is disconnected from the DUT for the duration of the measurement.
Polarity – only with measurement type direct, differential and AT3 adapter	
Normal	Selection of polarity for mains voltage to the test socket
Reversed	

[1] Connection also via AT3-IIIE, AT3-IIS, AT3-II S32, AT16DI/AT32DI

[2] Only suitable for connecting the DUT to the test socket. Not suitable for measurements with AT16DI or AT32DI adapter.

Before conducting any leakage current measurements, make sure that the "Ref. voltage L-PE" and "Alt. Test Freq." measurement parameters have been set correctly in SETUP (see section 12.4).

4 Connect the DUT



- Connect the DUT to the test socket.
- Contact additional, accessible, conductive parts which are not connected to the protective conductor with test probe P1.

5 Start test

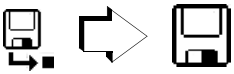
6 Acknowledge line voltage warning

Direct & differential:

7 Save measured values to clipboard

8 Stop test

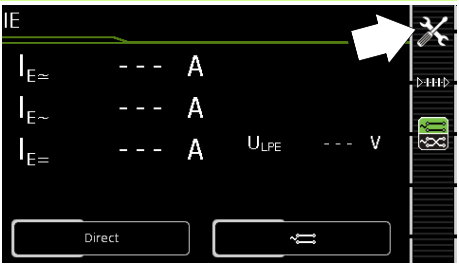
9 Save measurements under ID no.



13.8 IE – Device Leakage Current

1 Select measuring function

2 Select parameters



3 Set parameters

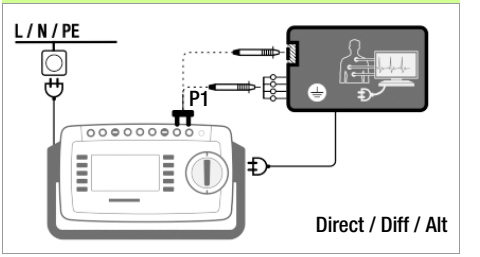
Measuring Parameter	Meaning
Measurement type	
Direct	Direct measuring method (via test socket[1]), optional probe contact
Differential	Differential current measurement (via test socket)
Alternative	Equivalent leakage current measuring method with probe contact (via test socket, AT16DI/AT32DI)
AT3 adapter	Only test instruments with feature I01: Measurement with AT3-IIIE, AT3-IIS or AT3-II S32 adapter See section 13.19
Clamp	Only test instruments with feature I01: See section 13.18
Polarity[2] – only with measurement type direct, differential and AT3 adapter	
Normal / Reversed	Selection of polarity for mains voltage to the test socket

1 Connection also via AT16DI/AT32DI (only sensible with differential method)

2 Measurement must be performed with mains polarity in both directions. The largest value is documented.

Before conducting any leakage current measurements, make sure that the "Ref. voltage L-PE" and "Alt. Test Freq." measurement parameters have been set correctly in SETUP (see section 12.4).

4 Connect the DUT



- Connect the DUT to the test socket.
- Contact accessible, conductive parts which are not connected to the protective conductor with test probe P1.
- For DUTs with applied parts: Additionally contact the short-circuited inputs for the applied parts with test probe P1.

5 Start test

START STOP

6 Acknowledge line voltage warning

Direct & differential & AT3 adapter:

7 Save measured values to clipboard

8 Stop test

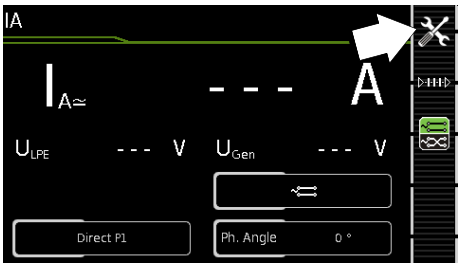
START STOP

9 Save measurements under ID no.

13.9 IA – Leakage Current from the Applied Part

1 Select measuring function

2 Select parameters

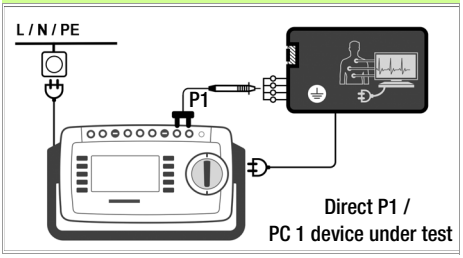


3 Set parameters

Meas. Parameter	Meaning
Measurement type	
Direct P1	Direct measuring method (via test socket) with test probe P1
Alternative P1	Equivalent leakage current measuring method (via test socket) with test probe P1
Perm. conn. P1	Permanently installed DUT
Phase angle – for direct (P1) & perm. conn. (P1) only	
0° or 180°	Selectable phasing for the internal generator relative to mains phasing
Polarity – only with measurement type direct, differential and AT3 adapter	
Normal / Reversed	Selection of polarity for mains voltage to the test socket

Before conducting any leakage current measurements, make sure that the "Ref. voltage L-PE" and "Alt. Test Freq." measurement parameters have been set correctly in SETUP (see section 12.4).

4 Connect the DUT



- Connect the DUT (to test socket).
- Contact the short-circuited inputs for the applied parts with test probe P1.

5 Start test

START STOP

6 Acknowledge line voltage warning

Direct:

6 Save measured values to clipboard

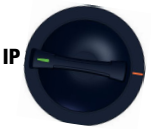
7 Stop test

START STOP

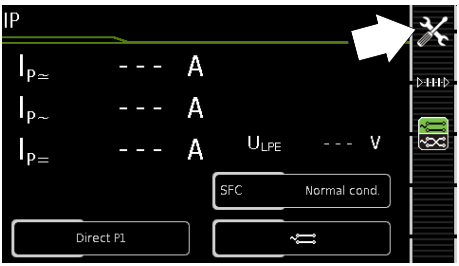
9 Save measurements under ID no.

13.10 IP – Patient Leakage Current

1 Select measuring function



2 Select parameters



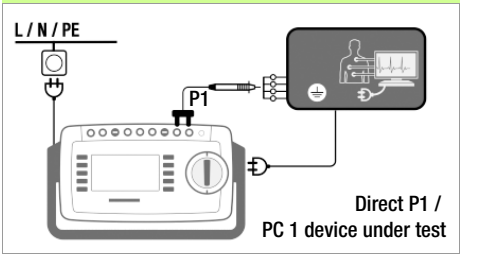
3 Set parameters

Meas. Parameter	Meaning
Measurement type	
Direct P1	Direct measuring method (via test socket) with test probe P1
Perm. connection P1	Permanently installed DUT
Single fault (SFC) – only with measurement type direct P1	
Normal status	Single fault simulation not active
N interrupted	Fault simulation active – only phase and protective conductor are connected to the DUT[1]
PE interrupted	Fault simulation active – the protective conductor is disconnected from the DUT for the duration of the measurement.
U low to APP	Fault simulation active – low voltage to applied part
Polarity – only with measurement type direct, differential and AT3 adapter	
Normal / Reversed	Selection of polarity for mains voltage to the test socket

[1] Connection also via AT16DI/AT32DI (only sensible with differential method)

Before conducting any leakage current measurements, make sure that the "Ref. voltage L-PE" and "Alt. Test Freq." measurement parameters have been set correctly in SETUP (see section 12.4).

4 Connect the DUT



- Connect the DUT to the test socket.
- Contact the short-circuited inputs for the applied parts with test probe P1.

5 Start test

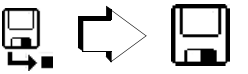
6 Acknowledge line voltage warning

Direct: 

7 Save measured values to clipboard

8 Stop test

9 Save measurements under ID no.



13.11 U – Probe Voltage

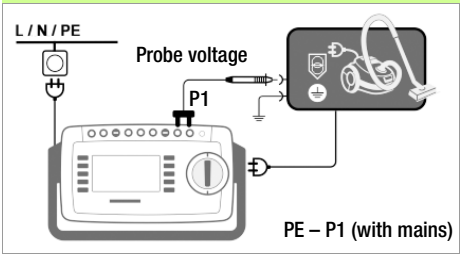
1 Select measuring function

2 Select parameters

3 Set parameters

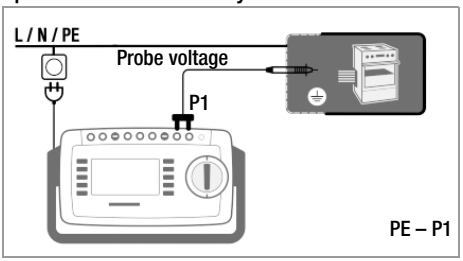
Meas. Parameter	Meaning
Measurement type	
PE – P1	Measurement of voltages with reference to PE, test socket remains voltage-free, for permanently connected DUTs
PE – P1 (with mains)	Measurement of voltages with reference to PE, line voltage is applied to the test socket
Polarity	
Normal Reversed	Selection of polarity for mains voltage to the test socket (only for PE-P1 with mains)

4 Connect the DUT



- Connect the DUT to the test socket.
- Contact the ungrounded output for safety extra-low voltage with test probe P1.
- Select line voltage polarity.

Special Case: Permanently Installed DUT



- Contact all voltage conducting parts with test probe P1.

5 Start test

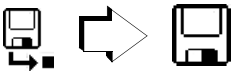
6 Acknowledge line voltage warning

Only for meas. type: **(with mains)**

7 Save measured values to clipboard

8 Stop test

9 Save measurements under ID no.



13.12 U – Measuring Voltage

(only with feature I01, e.g. SECUTEST ST PRO and SECULIFE ST BASE):

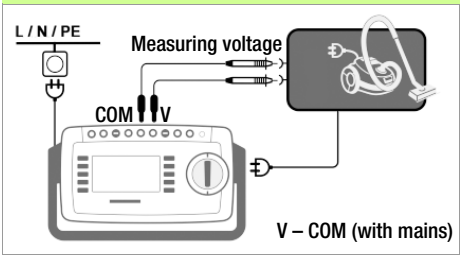
❶ Select measuring function

❷ Select parameters

❸ Set parameters

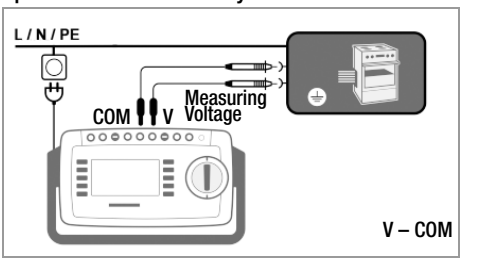
Meas. Parameter	Meaning
Measurement type	
V – COM	TRMS value + AC + DC for permanently connected DUTs
V – COM (with mains)	TRMS value + AC + DC, with mains to test socket
Polarity	
Normal **Reversed**	Selection of polarity for mains voltage to the test socket (only with V – COM (with mains))

❹ Connect the DUT



Attention!
Use only the included, contact-protected KS17-ONE measurement cables when measuring dangerous voltage.

Special Case: Permanently Installed DUT



- **When testing mains power packs or chargers:** Connect the DUT's mains plug to the test instrument's test socket.
- Connect the DUT's output, e.g. for measuring safety extra-low voltage, to the **V** and **COM** sockets.

❺ Start test

❻ Acknowledge line voltage warning

Only for meas. type: **(with mains)**

❼ Save measured values to clipboard

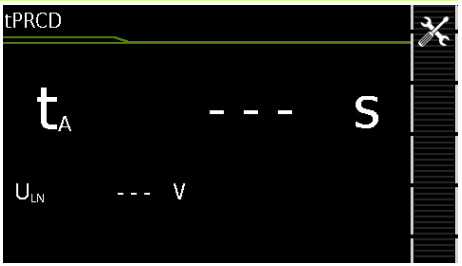
❽ Stop test

❾ Save measurements under ID no.

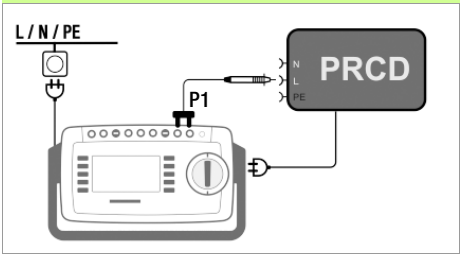
13.13 tPRCD – Measuring Time to Trip for PRCDs

1 Select measuring function

2



3 Connect the DUT



➪ Connect the PRCD to the test socket.

4 Start test (test current: 30 mA)

5 Acknowledge line voltage warning

6 Execute test

➪ Activate the PRCD.

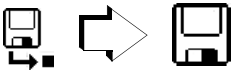
➪ Contact neutral conductor L at the PRCD with test probe P1
(If necessary, ascertain by trial and error.)

The PRCD is tripped.

7 Testing is stopped automatically.

Ascertained time to trip is displayed.

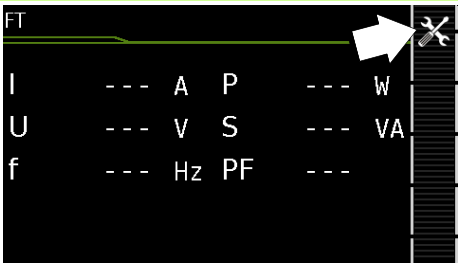
8 Save measurements under ID no.



13.14 P – Functions Test

1 Select measuring function

2 Select parameters



3 Set parameters

Meas. Parameter	Meaning
Polarity	
Normal	Selection of polarity for mains voltage to the test socket
Reversed	

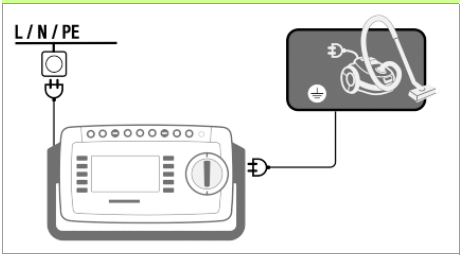
The following connection types are possible:

- Test socket
- CEE adapter (only for connection via single-phase CEE or “caravan socket”)
- AT3 adapter (AT3-IIIE, AT3-IIS, AT3-IIS32)
- AT16DI/AT32DI

Note

These or similar adapters can be used for the function test (initial startup of the DUT), but measurement of apparent and active power, power factor and current consumption is only possible when the DUT is directly connected to the test socket or via the CEE adapter (single-phase CEE socket only).

4 Connect the DUT



➪ Connect the DUT to the test socket.

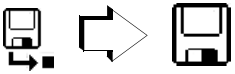
5 Start test

6 Acknowledge line voltage warning

7 Save measured values to clipboard

8 Stop test

9 Save measurements under ID no.



13.15 EL1 – Function Test for Extension Cords

1 Select measuring function

EL1

2 Select parameters

3 Set parameters

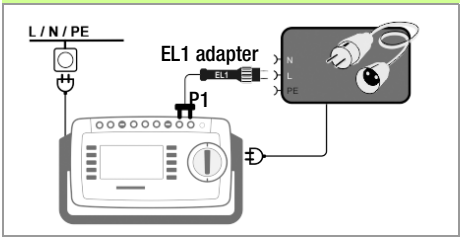
Meas. Parameter	Test for		
Measurement type	Continuity L(1/2/3), N	Short-circuit between L(1/2/3), N	Reversed polarity / clockwise phase sequence
EL1 adapter	X	X	—
EL1 adapter (continuity only)	X	—	—
VL2E adapter	X	X	X
AT3-IIIE adapter	X	X	X

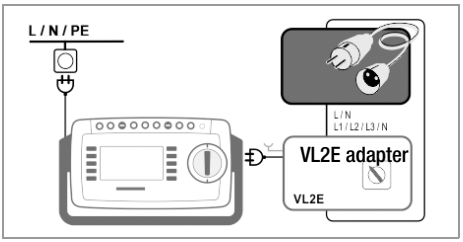
Attention!
This function permits an evaluation of the continuity of the active conductors L(1, 2, 3) and N of an extension cord. The PE conductor isn't tested in this case!

See corresponding single measurements for the testing of R_{PE} and R_{INS}.

Note
See section 14 with regard to testing extension cords per DIN VDE 0701-0702, for which R_{PE} and R_{INS} are measured.

4 Connect the DUT





Connecting the EL1 Adapter

- Connect the EL1 adapter to the P1 special sockets at the test instrument.
- Connect the plug at the end of the extension cord to the test socket.
- Connect the coupling socket at the end of the extension cord to the plug at the EL1 adapter.

Connecting Test Adapters VL2E and AT3-IIIE

- Connection examples can be found in section 13.19.

5 Start test START STOP

Continuity test for L and N

6 Save measured values to clipboard

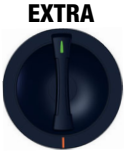
7 Stop test START STOP

9 Save measurements under ID no.

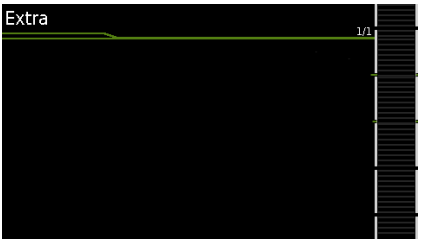
13.16 EXTRA – Special Functions

SECUTEST ST BASE(10)

1 Select measuring function



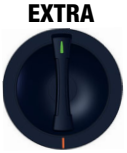
2



If a QR code is displayed:
Scanning the code makes it possible to download the current operating instructions from www.gossenmetrawatt.com, which can be read at a tablet.

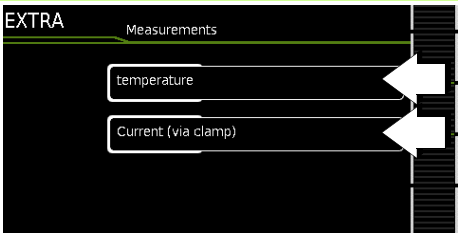
Featurel01 (e.g. SECUTEST ST PRO & SECULIFE ST BASE(25))

1 Select measuring function



In this case, the additional functions are assigned to the rotary switch's EXTRA position.

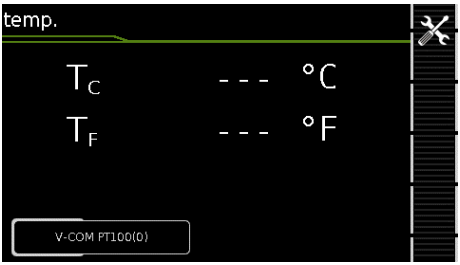
2 Temp. or IZ



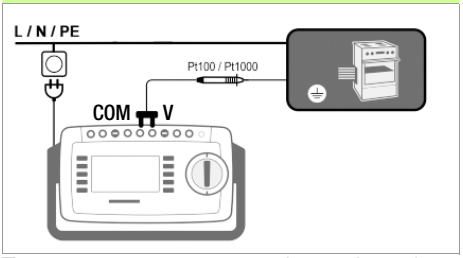
➪ Select the desired measuring function.

Temp. – Temperature Measurement

3



4 Connect the DUT



Temperature measurement is conducted with either a Pt100 or a Pt1000 temperature sensor – the sensor type is automatically detected internally.

5 Start test 

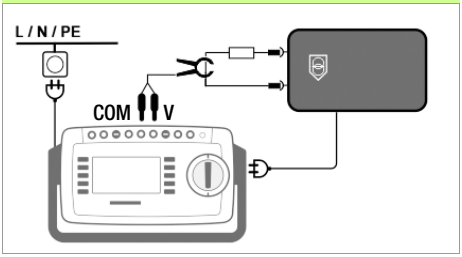
6 Save measured values to clipboard 

7 Stop test 

ICL – Current Clamp Measurement

3

4 Connect the DUT



5 Set parameters

Meas. Parameter	Meaning
Measurement type	
V – COM	A AC for permanently connected DUTs
V – COM (with mains)	A AC, with mains to test socket
Polarity – only with measurement type direct, differential and AT3 adapter	
Normal / **Reversed**	Selection of polarity for mains voltage to the test socket

➪ Set the clamp factor (Za. factor):
– At the current clamp sensor
– At the test instrument

6 Start test START STOP

7 Save measured values to clipboard

8 Stop test START STOP

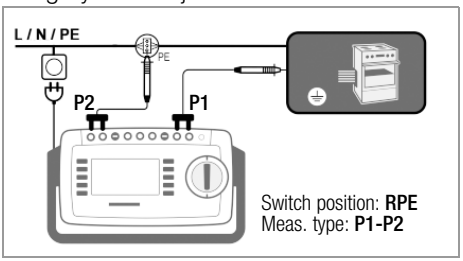
13.17 2-Pole Measurement with Test Probes P1 and P2

Only for instruments with feature H01 (e.g. SECUTEST ST PRO and SECULIFE ST BASE(25))

If the device under test isn't equipped with a country-specific mains plug which fits into the test socket at the test instrument, or if a permanently installed DUT is involved, the second test probe, in combination with the first test probe, permits 2-pole measurement (dual-lead-measurement) of RPE, RINS and equivalent leakage current.
Measurements with test probe 1 to test probe 2 (P1 – P2) are electrically isolated from the mains. There's no voltage at the test socket.

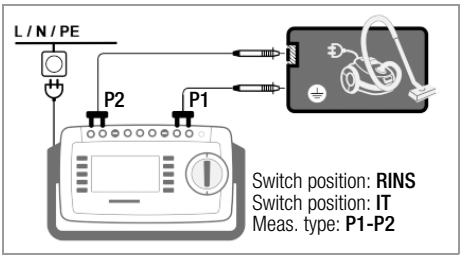
Connection Example for Measuring RPE

Measuring protective conductor resistance RPE for permanently installed, protection category I test objects



Connection Example for Measuring RINS or IT

Measuring insulation resistance RINS or the touch current IT at protection category I DUTs



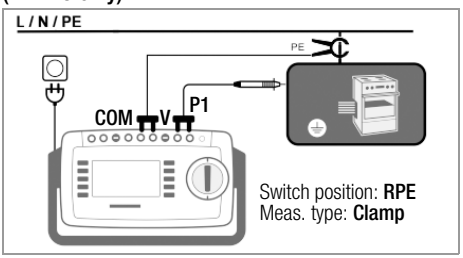
13.18 Measurement with Current Clamp Sensor for Permanently Installed PC I DUTs

Only for instruments with feature I01 (e.g. SECUTEST ST PRO and SECULIFE ST BASE(25))

Tester	Clamp		Tester
Parameter: transformation ratio	transformation ratio (switch*)	Measuring range	Display range With clamp
1 mV : 1 mA	WZ12C		
	1 mV : 1 mA	1 mA ... **15 A**	0 mA ... 300 A

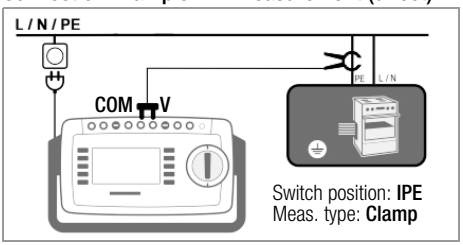
* Only with WZ12C

Connection Example: RPE Measurement (WZ12C only)



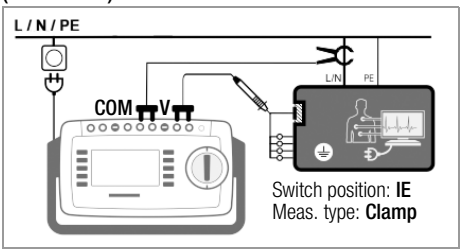
Measurement of test current by closing the clamp around **PE** at the mains. This measurement type can only be selected if test current is set to 10 A AC.

Connection Example: IPE Measurement (direct)



Measurement of protective conductor current by closing the clamp around **PE** in the mains cable.

Connection Example: IE Measurement (differential)



Measurement of device leakage current by closing the clamp around the **L and N** conductors in the mains cable.

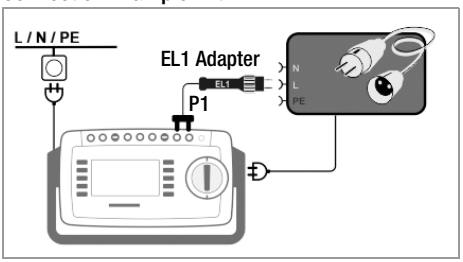
13.19 Measurements with Test Adapter

Test with Adapter	EL1	VL2E	AT3-IIIE[2]	AT16DI AT32DI	CEE adapter
Connectors for the DUT					
Non-heating devices, 1P+N+PE 16 A	—	✔	✔	—	—
Earthing contact, 1P+N+ PE 16 A	—	✔	—	—	—
CEE, 1P+N+PE 16 A	—	✔	✔	—	✔
CEE, 3P+N+PE 16 A	—	✔	✔	✔ / —	✔
CEE, 3P+N+PE 32 A	—	✔	✔	— / ✔	✔
5 x 4 mm sockets	—	—	—	—	✔
Connectors for the test instrument					
Earthing contact, 1P+N+ PE 16 A	—	—	✔	✔	—
Socket for test probe	—	✔	✔	—	—
Plug for V–COM[1]	—	—	✔	—	—
Active test					
Protective conductor current **IPE**					
– Direct method	—	—	✔	✔	—
– Differential current	—	—	✔[1]	✔	—
Device leakage current **IE**					
– Direct method	—	—	✔	✔	—
– Differential current	—	—	✔[1]	✔	—
Touch current **T**	—	—	✔	✔	—
Passive test					
Pro. con. resistance **RPE**	✔	✔	✔	✔	✔
Insulation resistance **RINS**	✔	✔	✔	✔	✔
Protective conductor current **IPE** (equivalent leakage current method)	—	✔	✔	✔	✔
Extension cords: the following measurements, in addition to RPE & RINS, are performed in switch position **EL1**					
Single-phase (3-pole)	✔	✔	✔	—	—
3-phase (5-pole)	—	✔	✔	—	—
Wire short-circuit	✔	✔	✔	—	—
Wire break	✔	✔	✔	—	—
Reversed wires	—	✔	✔	—	—

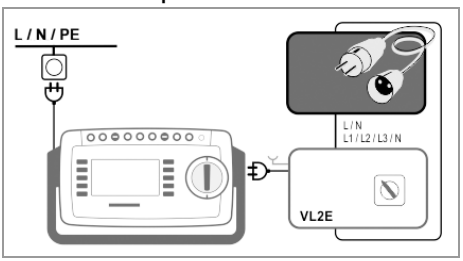
1 Differential current method only with test instruments including feature I01 (e.g. SECUTEST ST PRO)
2 Alternatively AT3-IIS or AT3-II S32 for IPE and IE

Attention!
Please read and observe the operating instructions for the test adapters regarding correct connection of the test adapter and the DUT, as well as peculiarities involved in the test procedure.

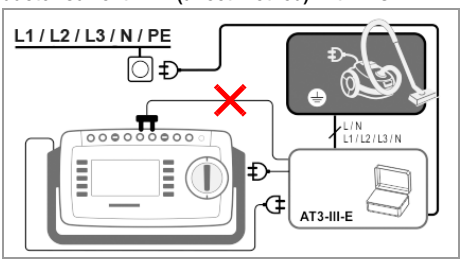
Connection Example with EL1



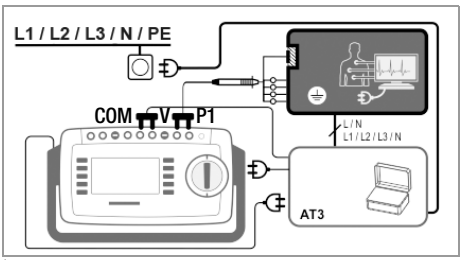
Connection Example with VL2E



Connection Example for Measuring Protective Conductor Current IPE[1] (direct method) with AT3-IIIE



Connection Example for Measuring Device Leakage Current IG[1] (differential current method) with AT3-IIIE



1 Only with feature I01(e.g. SECUTEST ST PRO or SECULIFE ST BASE(25))

14 Test Sequences (automatic test sequences)

A test sequence is a series of semi-automatic tests or test steps. If the same sequence of individual tests will be run frequently (one after the other with subsequent report generation), for example as specified in the standards, it's advisable to make use of such test sequences.

The test instrument includes two types of test sequences:

- Integrated Test Sequences
  Available ex works or after enabling at the test instrument. Cannot be changed (test parameters are configurable).

Attention!
The integrated test sequences do not include all of the tests stipulated by the product standard which are required for type testing! They're restricted to the tests which are required as a rule after repair or during maintenance work and for occupational health and safety measures, as well as for quality assurance in production.

- User-Defined Test Sequences
  Created individually by the user with IZYTRONIQ software and transferred to the tester.
  (This function is available depending on test instrument model or features.)

Note
The user selects the standard designation (national designations) for the integrated test sequences during initial configuration. If the designations need to be changed, follow the instructions in the operating instructions. Please note that designations cannot be changed retroactively (standard designations in previously saved tests cannot be changed).

All test sequences are run in orange rotary switch positions A1 through A9. Each of the rotary switch positions is preconfigured at the factory with integrated test sequences, but they can be adapted to suit your needs, i.e. the integrated and user-defined test sequences can be subsequently assigned to the various rotary switch positions as required.

The measurements included in the test sequences are evaluated – either automatically by the test instrument (in the case of limit values) or manually by the user (e.g. visual inspection). Automatic evaluation by the test Instrument is based on the worst-case and, depending on settings, in consideration of measuring uncertainty. Results:

- Green: the momentary measured value lies within the limits specified in the standard.
- Orange: further entries are required after the test step (e.g. cable length), which are decisive as to whether or not the test has been passed.
- Red: limit value violation. The measured value does not comply with the specifications stipulated in the standard.

Note
Even if the DUT fails just one single measurement, the test sequence is aborted and testing in accordance with the selected standard is failed.

Note
With the help of the SECUTEST DB COMFORT feature (Z853S or feature KD01), test sequences can be modified such that they're not interrupted in the event of a limit value violation. Amongst other things, this is helpful for troubleshooting during repair. Please refer to the operating instructions for further information.

14.1 Measuring Procedure and Storage

1 Connect the DUT.

2 Select the desired test sequence with the rotary switch (**A1** ... **A9**).
The test instrument initializes connection type recognition.

3 Start the test sequence by pressing the **START**/STOP key

4 The measured value recording icon shown at the right appears.
Each time this key is pressed, the measuring or evaluation procedure is restarted (see case B in section).

5 Proceed to the next measurement by pressing the key shown to the right.

6 When the test sequence has been completed, “Sequence Finished” is displayed.
At the end of the test sequence, a list of results can be generated for the individual test steps.

7 If you want to view details such as the settings for the individual test steps, select the desired measurement with the cursor and press the **+ magnifying glass key**.

8 The display is returned to the list of test steps by pressing the **magnifying glass–** key.

9 Save the results of a successful test sequence by pressing the **Save** key.
The following message appears: “No test object selected!”.

10 Press the **ID** key.
You now have the option of entering a test object ID number.
If you enter an ID here which is **not yet** included in the database, a prompt appears asking you if you want to enter a new test object.

11 The test object can then be created:
- Select either device or (medical) ME device.
- (De)activate the QEDIT function (quick edit – with SECUTEST DB COMFORT only – Z853S or feature KD01).
If QEDIT is activated, you can fill in additional fields for the test object in the next step.

Confirm with the green checkmark.

12 If you activated the QEDIT function in the previous step, you can now fill in all the test object’s fields. Confirm with the green checkmark.

13 An overview of the database appears along with the newly created test object.

Press the **save icon** (floppy disk) in order to store the measurement results. A message appears indicating that the data have been successfully saved and the display is switched to the measuring view.

Note

The storage process can be aborted by pressing the **ESC** key. The display is returned to the memory menu. All measured values can be deleted by once again pressing the **ESC** key.

Note

You can send the test results to a PC on which IZYTRONIQ software is running. This function is known as “push-print” and can be implemented via USB or Bluetooth®.
Database extension SECUTEST DB COMFORT (Z853S or feature KD01) and, if applicable, feature M01 (Bluetooth®) are required to this end.
Complete information regarding push-print and a description of the application can be found in IZYTRONIQ online help.

Evaluation Procedure

During a measurement procedure, evaluation is performed automatically for some test steps within a test sequence, while for others it must be performed manually:

- **Case A – automatic triggering of evaluation:**
  Evaluation (with a duration of, for example, 5 seconds) is started automatically as soon as the measured value has stabilized. The worst value which occurs during this duration is saved, and automatic switching to the next test step ensues.
- **Case B – manual triggering of evaluation:**
  

  Evaluation is started after pressing the measurement value recording icon (display: 0). After a specified period of time has elapsed, the worst value is saved to the right of **wc:** (worst case), and the number 1 is displayed in the measurement value recording icon indicating that the first measured value has been saved. Pressing the measured value recording icon again restarts the evaluation procedure. If the worst value is worse than the value obtained for the previous measurement, the new value is used. However, if this value is better than the previous worst value, the original value remains in the display. Depending on whether you want to delete the last value saved to the clipboard or all values, press the
  

  icon an appropriate number of times.

  Proceed to the next test by pressing the icon shown at the right.
  

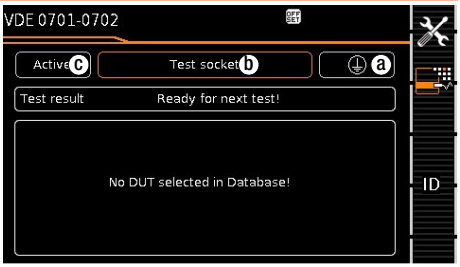
Attention!
Danger of electric arcs and damage to surfaces (feature G01 or G02 only).
High test current is applied during test steps of sequence parameter RPE IP with 10 or 25 A test current. It's activated as soon as the evaluation period starts and remains active until the evaluation period has ended. Maintain contact between the probe and the DUT for the entire duration of the evaluation!

14.2 Example of an Integrated Test Sequence

1 Select test sequence

A3

2 Initial page



3 Set sequence parameters

Individual test steps can be configured with the sequence parameters (see operating instructions).

4 Set classification parameters

Meas. Parameter	Meaning
Standard	Test standard / extension cord
Protection category * (a)	PC1/PC2/PC3
Connection type * (b)	Test socket / permanent / adapter
Measurement type (MA) * (c)	Active or passive DUT (on test: on = passive, off = active)
Detected classification	**No auto-detection:** all classification parameters such as connection, protection category and measurement type must be entered manually. **Always accept:** All classification parameters activated under "Auto-detection of" are detected automatically and accepted.
Meas. Parameter	**Meaning**
Auto-detection of	Any desired combinations for automatic detection of: – Connection (b) – Protection category (PC) (a) – Measurement type (MT) (c)

* **If the settings of the classification parameters are detected automatically, they're identified by an orange border (in this case (a) and (b)).** However, they have to be entered manually if they're not automatically detected, or if they're detected incorrectly.

5 Connect the DUT

➪ Connect the DUT to the test instrument in accordance with the selected test sequence.
– Test socket
– Permanent connection
– Adapter

Connection depends on the type of DUT. For testing extension cords in accordance with standards: connection to the test socket via the following adapter

– **EL1:** for single-phase extension cords
– **VL2E/AT3-III E:** for single and 3-phase extension cords

6 Checking Connection and Starting the Test

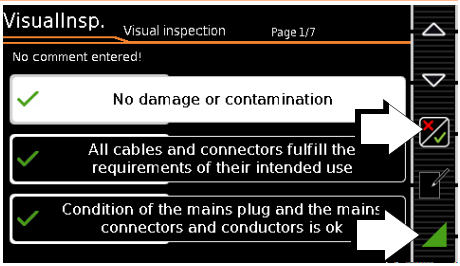
The following checks are run automatically before the test sequence is started:

- Probe check P1 (determines whether or not test probe P1 is connected and fuse link P1 is intact)
- Insulation test (whether or not the DUT is set up in a well-insulated fashion)
- On test and short-circuit test. In order to be able to detect a short-circuit at the DUT, testing is conducted between L and N, as well as LN and PE.

If you've set the "**Detected classification**" parameter for the respective test sequence to "Always accept" and the "**Auto-detection of**" parameter to "Connection and SK" (before triggering **Start**), the following additional checks will be run before the test sequence is started:

- Protection category detection for DUTs with protective conductor
- Connection test: checks whether the DUT is connected to the test socket. In the case of protection class I: whether or not the two protective conductor terminals are short-circuited.

7 Manual evaluation of visual inspection



Visual inspection passed

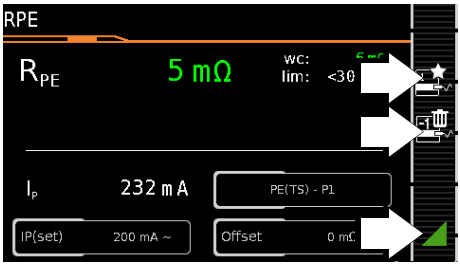
Visual inspection not passed (test sequence is terminated, test failed)

Resume test sequence

Note

If the plug is pulled out of the test socket during the test sequence, the test sequence is aborted immediately.

8 Test step – start evaluation



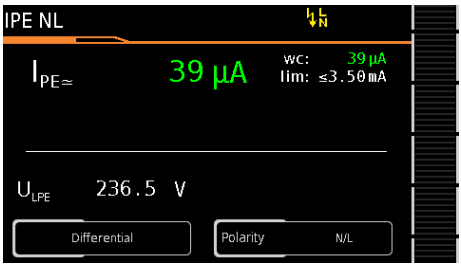
Green measured value: complies with standard

Record measuring point

Delete last measuring point

Resume test sequence

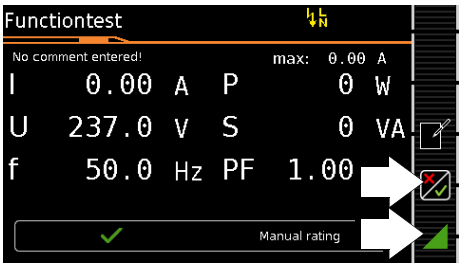
9 Test step – automatic evaluation



The measured value is ascertained automatically within a specified period of time. The test sequence is then automatically resumed.

Green measured value: complies with standard

10 Manual evaluation of the function test



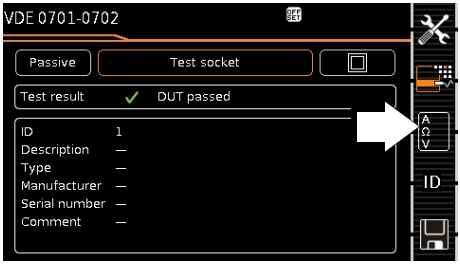
Function test passed

Function test not passed (test sequence is terminated, test failed)

Resume test sequence

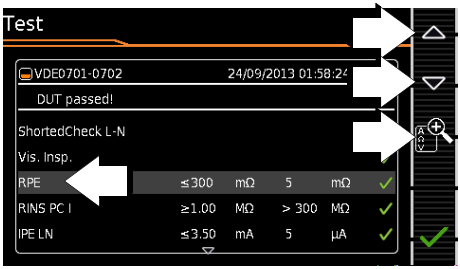
➪ Remove DUT from service (per instructions in the test sequence).

11 Optional: Display results



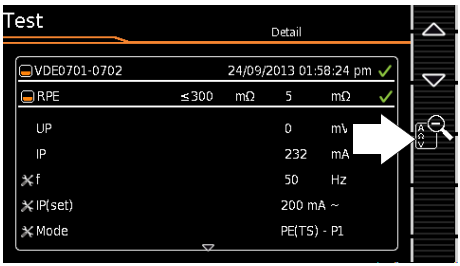
(display of the memory screen depends on the parameter setting in the **SETUP** switch position:
Setup 1/3 > Auto Measurements > At End of Sequence > **"Memory Screen"**.
When set to **events list**, 12 is omitted.)

Show details:



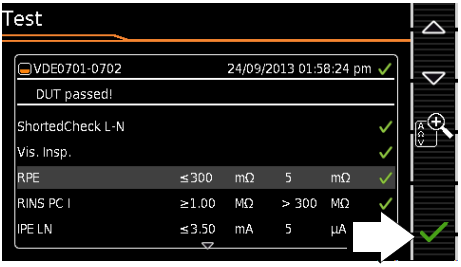
(Consideration of measuring error depends on the parameter setting in the **SETUP** switch position: Setup 1/3 > Auto Measurements> Error Considered. > **Yes**)

Hide details:



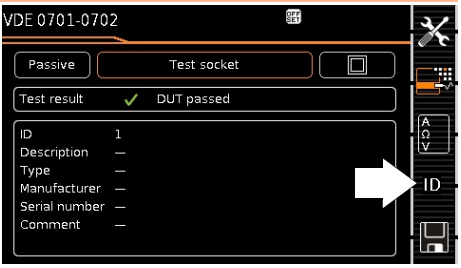
Return to the list of test steps

Confirm results:



Return to the memory screen

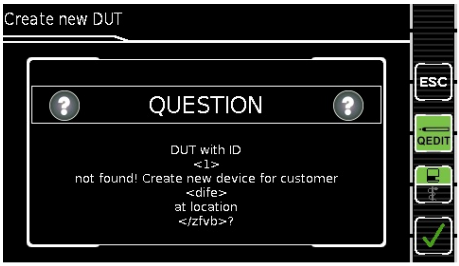
13 Save results



➪ Press the **ID** key.
You now have the option of entering a test object ID number. If you enter an ID here which is **not yet** included in the database, a prompt appears asking you if you want to enter a new test object.
The ID dialog appears.

Note
Since no test object is selected, a corresponding note is displayed when the save key is pressed.

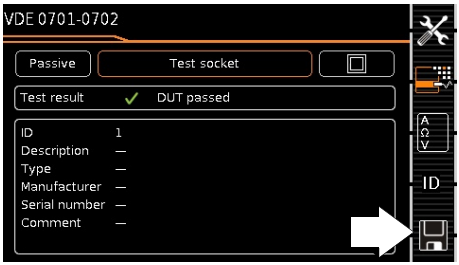
➪ Enter an ID that hasn't yet been used and confirm your selection.
The "Create test object" prompt appears:



QEDIT On/Off
(QuickEdit function, only with SECUTEST DB COMFORT – Z853S or feature KD01)
If QEDIT is activated, you can fill in all of the test object's fields as a further step. Refer to operating instructions for further information.

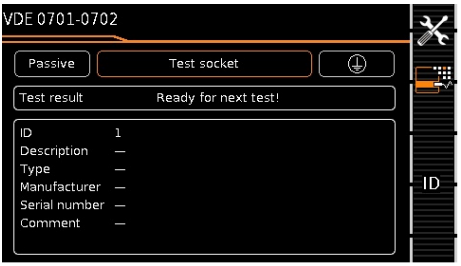
Toggle between device and medical device

Return to results screen



➪ Save the results by pressing the save key.

The measurement is saved and the test instrument is ready for the next measurement:



Note

You can send the test results to a PC on which IZYTRONIQ software is running. This function is known as "push-print" and can be implemented via USB or Bluetooth®.
Database extension SECUTEST DB COMFORT (Z853S or feature KD01) and, if applicable, feature M01 (Bluetooth®) are required to this end.
Complete information regarding push-print and a description of the application can be found in IZYTRONIQ online help.

15 Reports

A report can be read out showing the results of individual measurements or test sequences stored to the internal database.
Various output formats can be selected:

- Print directly at the test instrument with a printer (thermal printer Z721S).
- Print as an HTML file to a USB flash drive connected to the test instrument
- by transferring the stored measurement data to IZYTRONIQ software on the PC and printing it out there as a report.

Please refer to the operating instructions for complete information.

16 Test Data Management – IZYTRONIQ Software

IZYTRONIQ software facilitates test organization and the management of test data from a broad range of test equipment.
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).

Note

IZYTRONIQ test software may be included in the scope of delivery, for example with standard models and test instrument sets (see data sheet). 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 is available at:

https://www.izytron.com/

17 Contact, Support and Service

Gossen Metrawatt GmbH can be reached directly and simply – we have a single number for everything! Whether you require support or training, or have an individual inquiry, we can answer all of your questions here:

+49-911-8602-0

Monday to Thursday:	8 a.m. to 4 p.m.
Friday:	8 a.m. to 2 p.m.

Or contact us by e-mail at:

info@gossenmetrawatt.com

Do you prefer support by e-mail?

Measuring and Test Technology:

support@gossenmetrawatt.com

Industrial Measuring Technology:

support.industrie@gossenmetrawatt.com

Inquiries concerning English seminars can be submitted by e-mail:

training@gossenmetrawatt.com

Please contact GMC-I Service GmbH for repairs, replacement parts and calibration*:

+49-911-817718-0

service@gossenmetrawatt.com

www.gmci-service.com

Beuthener Str. 41
90471 Nürnberg
Germany

* DAkkS calibration laboratory per DIN EN ISO/IEC 17025 – accredited by the Deutsche Akkreditierungsstelle GmbH under reference number D-K-15080-01-01.

18 Returns and Environmentally Sound Disposal

This test Instrument is subject to directive 2012/19/EC on Waste Electrical and Electronic Equipment (WEEE) and its German national equivalent implemented as the Waste Electrical and Electronic Equipment Act (ElektroG) on the marketing, return and environmentally sound disposal of electrical and electronic equipment. The test instrument is a category 9 product (monitoring and control instrument) in accordance with ElektroG (German Waste Electrical and Electronic Equipment Act).

The symbol at the left indicates that this test Instrument and its electronic accessories must be disposed of in accordance with applicable legal regulations, and not together with household trash. In order to dispose of the test instrument, bring it to a designated collection point or contact our product support department (see section 17, “Contact, Support and Service”).

This test instrument is also subject to directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators and its German national equivalent implemented as the Battery Act (BattG) on the marketing, return and environmentally sound disposal of batteries and accumulators.

The symbol at the left indicates that batteries and rechargeable batteries must be disposed of in accordance with applicable legal regulations. Batteries and rechargeable batteries may not be disposed of with household trash. In order to dispose of batteries or rechargeable batteries, remove them from the test instrument and bring them to a designated collection point.

Segregated disposal and recycling conserves resources and protects our health and the environment.

Current and further information is available on our website at http://www.gossenmetrawatt.com under the search terms “WEEE” and “environmental protection”.

19 CE Declaration

The test instrument fulfills all requirements of applicable EU directives and national regulations. We confirm this with the CE mark.

Gossen Metrawatt GmbH	Begleitende Formulare zum PEP EU-Konformitätserklärung / EU Declaration of Conformity	Form E0F34

Hersteller / Manufacturer:	Gossen Metrawatt GmbH
Anschrift / Address:	Südwestpark 15, 90449 Nürnberg
Produktbezeichnung/	Prüfgerät für elektische Sicherheit
Product name:	Safety Tester
Typ / Type:	SECUTEST ... / SECUTEST ST ... / SECULIFE ST ...
Bestell-Nr / Order No:	M7050

Der oben beschriebene Gegenstand der Erklärung erfüllt die einschlägigen Harmonisierungsvorschriften der Union: / The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

2014/53/EU	RED - Richtlinie	RED Directive

Anforderungen an die Sicherheit gemäß 2014/35/EU (Niederspannungsrichtlinie) /
Safety requirements according to 2014/35/EU (Low Voltage Directive)

EN/Norm/Standard:

EN 61010-1 : 2010

Anforderungen an die elektromagnetische Verträglichkeit gemäß 2014/30/EU (EMV Richtlinie) /
Requirements for electromagnetic compatibility according to 2014/30/EU (EMC Directive)

EN/Norm/Standard:

EN 61326-1 : 2013

2011/65/EU	RoHS - Richtlinie	RoHS Directive
(EU) 2015/863	Deligierte Richtlinie	Deligate Directive

EN/Norm/Standard:

None

Nürnberg, 07.07.2021
Ort, Datum / Place, Date:

Geschäftsführung / Managing Director

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller. Sie beinhaltet jedoch keine Zusicherung von Eigenschaften. Die Sicherheitshinweise der mitgelieferten Produktdokumentationen sind zu beachten.

This Declaration of Conformity is issued under the sole responsibility of the manufacturer but does not include a property assurance. The safety notes given in the product documentation which are part of the supply, must be observed.

Datei:	Ausgabe:	Erstellt:	Freigabe:
21-2-005-M7050-CE-Entwurf	15.01.2021	Eckl	Weiß

GOSSEN METRAWATT

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