GOSSEN METRAWATT

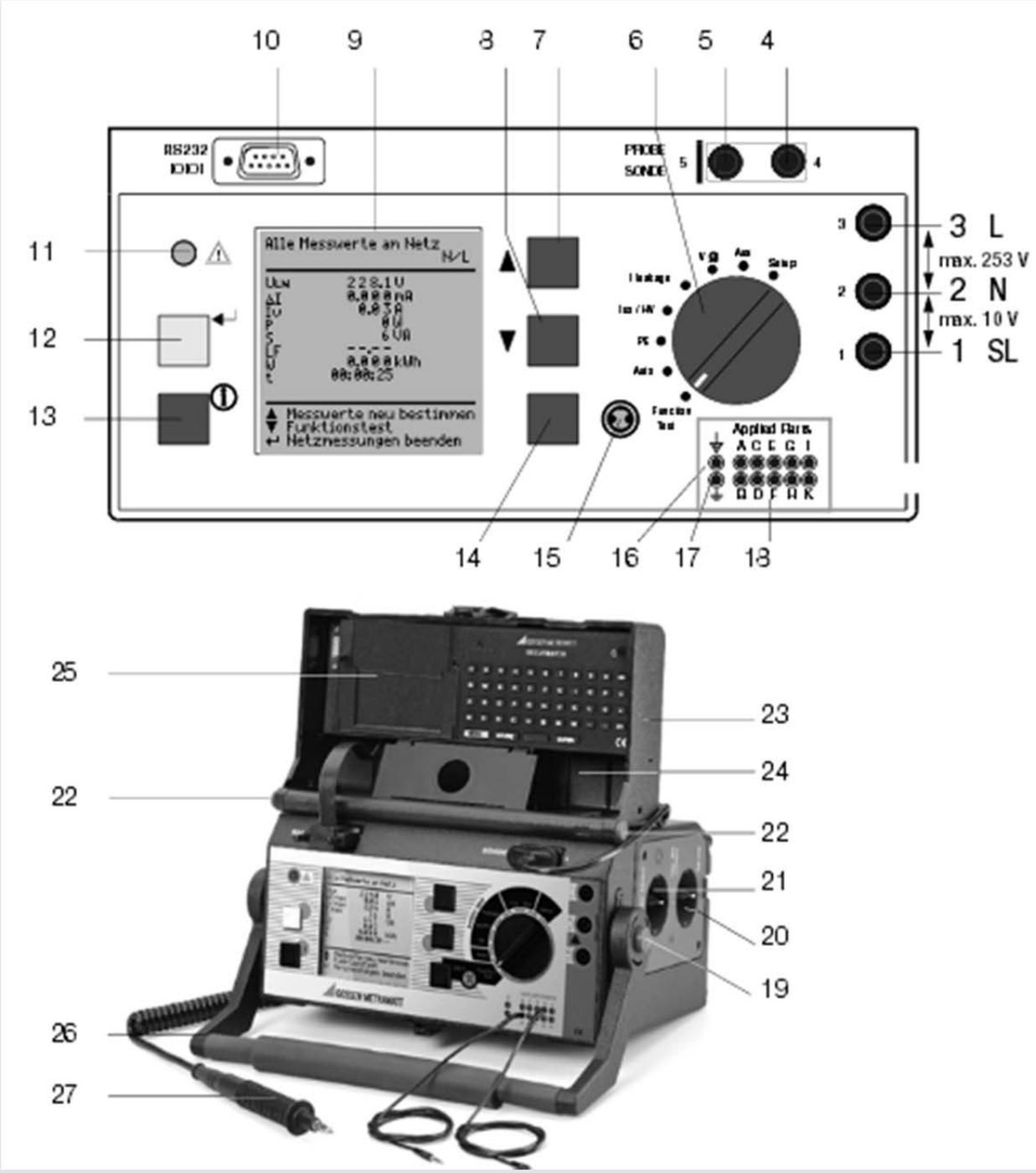
QUICK SETUP GUIDE

SECULIFE ST

SECULIFE®

As a multifunctional test instrument, the SECU**LIFE** ST is ideally suited for performing and documenting measurements at medical devices. It allows for precision testing of portable medical devices, and can also be used for large devices such as X-ray equipment and MRI scanners.

DAkkS Standard



1 Jack for protective conductor at device under test

2 Jack for neutral conductor at device under test

3 Jack for phase conductor at device under test

4 Jack for connecting the probe

5 Jack for connecting the probe

6 Function selector switch: – Function Test: Function test

– Auto: Automatic test sequence according to selected standard

– PE: Protective conductor test

– Iso/HV: Insulation test / high-voltage test

– I leakage: Leakage current measurement

– VΩ: Multimeter functions

– Aux: Auxiliary multimeter functions

– Setup: Device configuration

7 scroll key for menu and parameter selection

8 scroll key for menu and parameter selection

9 LCD window

10 Socket connector interface RS232 for (P)SI module SECUTEST PSI/SI+, storage adapter SECUSTORE, barcode or RFID scanner

11 Signal lamp for mains connection error

12 key for entry and for starting test sequences and finger contact

13 help key (context sensitive)

14 Key next to the symbol for switching test voltage to the test socket (only possible if symbol LED is blinking)

15 Signal lamp for the functions test

16 Functional earth (equipotential bonding)

17 Operational earth

18 Connector jacks for application parts

19 Push-buttons (left and right) for releasing the handle from its snap-in position

20 Earthing contact socket for service purposes (Feature B01), e.g. for connecting a notebook or an A4 format printer

21 Standard outlet socket (test socket) for connecting the device under test

22 Push-buttons (left and right) for releasing the lid

23 Lid

24 Compartment for probe and accessories

25 Cover or (P)SI module (accessory SECUTEST PS I or SECUTEST SI+)

26 Carrying handle and tilt stand

27 Test probe (accessory probe with coil-cable SK2W (Z745N)

Electrical safety testing:

- Electrical medical devices per DIN VDE 0751 / IEC 62353 and EN 60601 2nd and 3rd edition
- Electrical equipment per DIN VDE 0701-0702
- Routine tests, e.g. per EN 61010, EN 60950, EN 60335 etc.

Measuring options:

- Protective conductor resistance with 200 mA and 10 A test current
- Insulation resistance
- Earth leakage current
- Contact current (device leakage current)
- Patient leakage current, AC and DC
- Patient auxiliary current
- Equivalent leakage current procedure
- Direct measurement
- Differential current measurement

Look up the reasons for the measurement option that fit in DIN EN 62353:2008-08 / EN 62353:2008 (direct measurement / differential current measurement / Leakage current)

- Up to 10 application parts can be connected (4 mm) and individually assigned to groups
- Internal memory for 125 tests

Interfaces:

- RS 232 port
- SecuStore memory adapter (optional)

Power supply: mains connection for 110 V / 60 Hz, 230 V / 50 Hz

Options: printer-memory-interface (PSI module)

Software: The SECU**LIFE** ST is compatible with PS3, visualFM, Fundamed, MD Data and other software packages.

Hint: testing in the Auto Mode will test the device under predefined norms. You can store the values in the memory. Measurements that are done in the other modes cannot be stored in the memory!

Measuring Protective Conductor resistance

Definition

Protective conductor resistance is the sum of the following resistances:

- Connector cable or device connector cable resistance
- Contact resistance at plug and terminal connections
- Extension cable resistance if utilized

Resistance is measured:

- Between each conductive part of the housing and the earthing contacts at the mains and the device plug (if a removable mains connector cable is used), or the protective conductor terminal for permanently installed devices.
- as 4-pole measurement
- Between the earthing contacts at the mains plug and the earthing contacts at the device plug for device connector cables
- Between the earthing contacts at the mains plug and the earthing contacts at the coupling socket for extension cables

Connecting Safety Class I Devices to the Test Socket

When the DUT is connected, resistance is measured between the protective conductor terminal at the test socket or at the PE jack and the probe connection at the DUT (contact with conductive parts of the housing).

➔ In order to measure protective conductor resistance, contact a conductive part of the housing with the probe, which is connected to the protective conductor.

During measurement, the connector cable must only be moved in as far as it is accessible during repair, modification or testing. If a change in resistance occurs during the manual test step of the continuity test, it must be assumed that the protective conductor is damaged, or that one of the connector contacts is no longer in flawless condition.

Pay attention on the type of the DUT to define the limit of the measured values!

Connection DUT with the SECU**LIFE** ST and connection with the probe

Isolation Measurement

Isolation Resistance RINS

Definition

Safety Class I
Isolation resistance is measured between short-circuited mains terminals and the protective conductor.

Safety Classes I I and I I I
Isolation resistance is measured between short-circuited mains terminals and external conductive parts which can be contacted with the probe.

Sequence

Current is displayed during this type of equivalent leakage current measurement which would flow during leakage current measurement conducted in accordance with device regulations with nominal voltage. Leakage current measurement in accordance with the respective device regulations is usually not possible, because the device would have to be set up in an electrically isolated fashion, or connected to an earth isolated power supply to this end.

Equivalent Leakage Current IEL DIN VDE 0701-0702 / 2 K

➔ Select the I-EL measurement and start.

Equivalent leakage current is measured between short-circuited N and L, and the protective conductor PE. Measuring circuit resistance is equal to 2 kΩ for VDE 0701-0702 for the simulation of the mean body resistance of a human being.

Equivalent Device Leakage Current IEDL for IEC 62353 (VDE 0751-1) / 1 K

➔ Select the I-EDL measurement and start

Equivalent device leakage current is measured between short-circuited N and L, and the probe. Measuring circuit resistance is equal to 1 k Ω for IEC 62353/VDE 0751 for the simulation of mean patient resistance.

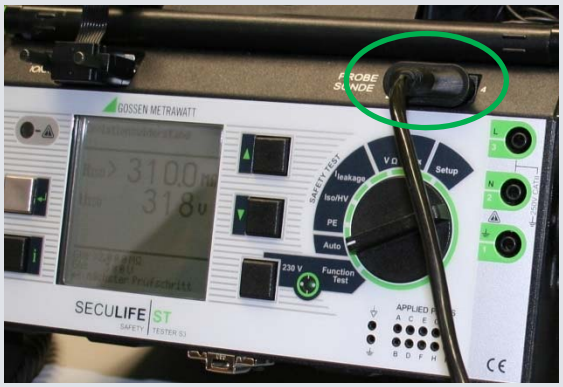
Equivalent Patient Leakage Current IEPL (IEC 62353 (VDE 0751-1))

➔ Select the I-EPL measurement and start

Equivalent patient leakage current is measured between short-circuited N and L and the respective application part. Jacks A through K (application parts) are connected separately for each application part. Groups of cables or sensors can be assigned to application parts in the test sequence start menu in accordance with IEC 62353 (VDE 0751-1) or EN 60601.

Pay attention on the type of the DUT to define the limit of the measured values!

B=Body, BF= Body Float, CF = Cardiac Float 



Connection DUT with the SECU**LIFE** ST and connection on the DUT (in this case: infusion pump)

Leakage Current Measurement

➔ Select the Ixx measurement and start
Each time line voltage is applied to the test socket, L and N are reversed,

Earth Leakage Current IPE (Feature KA01)
Current which flows from the power pack over the insulation to the protective conductor, and thus to earth.

Contact Current
Current which flows from housing parts which are not connected to the protective conductor via an external conductive connection to earth or another part of the housing. Flow of current via the protective conductor is excluded in this case.
The AC component is measured. The DC component can also be measured if individual measurement is performed (instead of a test sequence).

EN 60 601/VDE 0751:
The following sequence is programmed for measuring and documenting several exposed conductive parts:
If the acoustic signal chain changes from long to short intervals, it means that measurement is completed and the next measuring point can be selected and scanned (key).

Patient Leakage Current IPL
Current which flows from an application part via the patient to earth. This current may be caused by an unintentional interference voltage at the patient, and may flow via the patient and an insulated, floating type F application part to earth. Useful patient current is excluded in both cases. AC and DC components are measured.

Patient Auxiliary Current IPA (Feature KA01)
Current which flows within the patient between the electrodes of the application part. Use for intended purpose is assumed. Furthermore, the current should not cause any physiological effects.
For example, this is the case for input current from amplifiers, or current used for impedance plethysmography.
AC and DC components are measured.

Residual Current IRC
Sum of instantaneous current values which flow via the L and N conductors at the device mains connection (also known as differential current).
Residual current is practically identical to fault current in the event of an error. Fault current: Current which is caused by an insulation defect, and which flows via the defective point.

Device Leakage Current ILC per IEC 62353 (VDE 0751-1)
Device leakage current is the sum of all leakage currents from the housing, all accessible conductive parts and all application parts to PE. Measurement must be performed for both mains polarities and the largest value is documented.

Connection to the DUT

Multimeter Functions

Probe Voltage Uprobe– Max. 300 V

Voltage is measured between the mains PE terminal at the test instrument and the probe. In this case the probe can also be used as a phase finder.
For IEC 61 010: A selection can be made with the up scroll key as to whether testing will be conducted under normal conditions, or with interrupted protective conductor.For conducting the measurement the DUT must be put into service via key (14).

➔ Start the Uprobe measurement.

Alternating / Direct Voltage UAC/DC– Max. 253 V

Direct, alternating and pulsating voltages of up to 253 V can be measured between the 2 and 3 connector jacks.
Furthermore, it is possible to switch between minimum, maximum and momentary measured value via key. This is particularly useful in combination with the SECULOAD test adapter for welding equipment (article number Z745).

GMC INSTRUMENTS

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