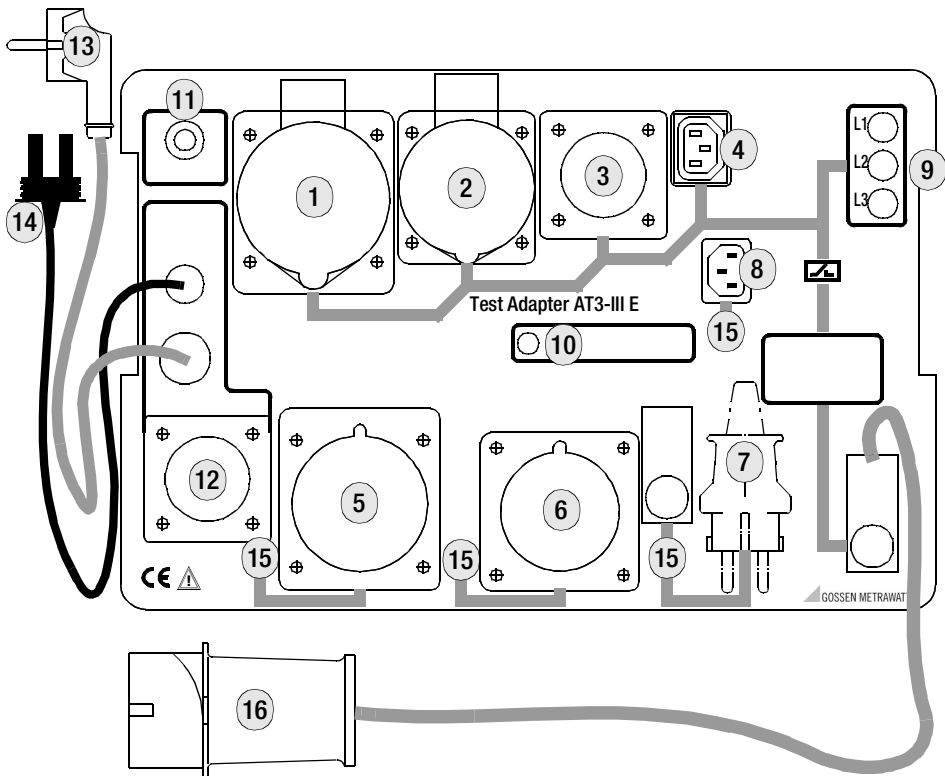


AT3-III E Test Adapter

For the Active and Passive Testing of Single and 3-Phase
Electric Devices and Extension Cables in Combination
with SECUTEST.../SECULIFE ST Test Instruments
(M7050..., M7010... and M6930...)

3-349-155-37
17/3.21





Device Plugs and Outlets

- 1 CEE outlet
3P+N+PE, 32 A, 400 V
- 2 CEE outlet
3P+N+PE, 16 A, 400 V
- 3 Earthing contact outlet
1P+N+PE, 16 A, 250 V
- 4 Device outlet for cable testing
1P+N+PE, 10 A, 250 V
- 5 CEE plug for cable testing
3P+N+PE, 32 A, 400 V
- 6 CEE plug for cable testing
3P+N+PE, 16 A, 400 V
- 7 Earthing contact plug for cable testing
1P+N+PE, 16 A, 250 V
- 8 Device plug for cable testing
1P+N+PE 10 A 250 V

Indicator Displays

- 9 Mains indicator lamps for L1, L2 and L3
- 10 Function LED

Self-Test

- 11 Test key for triggering $I_{\Delta n}$ ($I_{\Delta n}$ = residual current)

Connectors for Test Instruments

- 12 Earthing contact outlet for power supply to test instruments
- 13 Earthing contact plug with cable, for insertion into the test socket at the test instrument
- 14 **SECUTEST SIII / SIII+ / SIII+H; SECUTEST S2N+ / S2N+10/ N+w; SECULIFE ST / ST HV port:**
for insertion into sockets 2 and 3 at the test instrument
SECUTEST PRO / ST PRO, SECULIFE ST BASE / ST BASE25 port and/or feature I01: for insertion into the sockets V and COM at the test instrument
- 15 Connector sockets for probe cable of the test instrument (for testing cables only)

AT3-III E Power Supply

- 16 Via connector cable with CEE plug
3P+N+PE, 16 A

Test instruments are not included in the scope of delivery.

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1 Applications

The portable AT3-III E test adapter (Z745S) is used for measuring and testing single and 3-phase electrical devices and extension cables in combination with the test instruments with the following article numbers (basic device):

M7010	(SECUTEST SIII / SIII+ / SIII+H; SECUTEST S2N+ / S2N+10 / N+w)
M6930	(SECLIFE ST / ST HV)
M7050	(SECUTEST BASE / BASE10 / PRO; SECUTEST ST BASE / ST BASE10 /

ST PRO;
SECLIFE ST BASE / ST BASE25)

In these operating instructions, suitable instruments are referred to as test instrument for short. Testing must be performed by a qualified electrician with an appropriate test instrument after repair or modification, and is also required for periodic testing per DIN VDE 0105/0701-0702.

According to these regulations, testing must be performed for protective conductor resistance, insulation resistance, equivalent leakage current, residual current and contact current, as well as for the absence of voltage depending upon the type of device under test.

The test adapter, in combination with the test instrument, allows for

– **the passive testing:**

- of protective conductor resistance
- of insulation resistance
- of protective conductor current by means of equivalent leakage current method
- of dielectric strength (HV test up to 1.5 kV)¹
- at extension cables:
 - testing for conductor short-circuiting,
 - testing for conductor interruption and additionally at 3-phase extension cables:
 - testing for conductor reversal on L1, L2 and L3 for the determination of clockwise rotation.
- with protection by means of electronic residual current monitoring with mains shutdown at DUTs with residual current of more than 20 mA and visual error messages

– **the active testing:**

- (nominal current 16 A – maximum 20 A current consumption by DUT, also at the 32 A test socket)
- of protective conductor current^{1 3}
 - by means of the differential current method (requires voltage measurement sockets at the test instrument²)
 - by means of direct method (requires direct measurement of protective conductor current at the test instrument)
- of contact current³

¹ Only if the utilized test instrument is capable of performing this measurement

² Not with SECUTEST BASE / BASE10 or without feature I01, respectively

³ Please note that the pole reversal function is not active with the applied test instrument if you use the AT3-III E adapter for the testing of single-phase test objects (socket 3 / earthing contact plug). In this case, all leakage current measurements must be performed manually in **both** pole directions.

Measurement results are displayed at the test instrument.

 **Note!**

The AT3-III E test adapter is equipped with electronic error monitoring which disconnects the device under test from the mains in the event of fault currents of greater than 18 mA.

2 Safety Precautions

The test adapter has been manufactured and tested in accordance with the following regulations:

IEC 61010-1/DIN EN 61010-1/VDE 0411-1 "Regulations for electronic testers and controllers, part 1: Safety measures for electrical measuring instruments"

DIN VDE 0404 "Devices for technical safety testing of electrical equipment, parts 1 and 2."

EN 61326-1 product standard EMC requirements.

Safety is only assured for the user and the test adapter when used for its intended purpose in combination with the test instruments mentioned in chapter 1 "Applications".

In order to maintain flawless technical safety conditions, and to assure safe use, it is imperative that you read these operating instructions thoroughly and carefully before placing your test adapter into service, and that you follow all instructions contained herein.

Due to the fact that all tests performed with the AT3-III E must be executed in combination with a test instrument mentioned in chapter 1 "Applications", you must also read the safety precautions and liability limitations included in the operating instructions for this instrument.

Observe the following safety precautions:



Attention!

If the red LED (10) remains lit even after the AT3-III E has been disconnected from the mains and connected once again, the test adapter is defective. If this is the case, the AT3-III E must be removed from service and repaired before it is used again.

- In order to assure compliance with technical safety requirements, the AT3-III E test adapter should only be repaired by the manufacturer.
- The AT3-III E must be disconnected from the mains and from the test instrument before it is opened.

Measurements within electrical systems are prohibited!

- The test adapter's 16 A CEE 3P+N+PE (16) plug may only be connected to 230/400 V

50 Hz mains power. In order to avoid undesired shutdown of defective devices under test, the electrical circuit for the device under test should be separately fused.

- Before connecting the AT3-III E to the mains, the test instrument must first be connected to the AT3-III E.



Attention!

Tests during which mains power is applied may only be selected with the function selector switch at the test instrument after safety class I devices under test have passed the protective conductor test. If the protective conductor is defective (interruptions / reversed conductors), line voltage may be present at the housing of a defective device under test, at the earthing contacts of the test plugs (4 – 7) and at the safety socket (15)!

- For **REASONS OF SAFETY**, the device under test must be turned off before switching to "MAINS" so that dangerous devices under test (e.g. a circular saw) can only be switched on intentionally.
- **Measurement with line 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.
Under certain circumstances, full mains disconnection at the device side may not occur in the event of leakage current, or it may be inadequate to meet the requirements of a PRCD.
Work only at a protected workstation, i.e. use enhanced touch protection, use a 30 mA RCD and wear personal safety equipment (PSE).
- Be prepared for the occurrence of unexpected voltages at devices under test (e.g. due to charged capacitors).
- Before connecting the device under test to the test adapter, subject it to a thorough **VISUAL INSPECTION** first. Damaged devices under test must be repaired prior to testing.
- Only extension cables which have been plugged into the test outlets (1-4) at the test adapter may be connected to the device plugs (4- 7) at the test adapter.
- Due to test adapter design in accordance with DIN VDE 0404, the "PE" contacts at the outlets (1-4) are only connected to the mains protective conductor when the test instrument has been set for testing with mains power.

- If the test adapter and/or its connector cables demonstrate visible damage, no longer function, have been stored for a lengthy period of time under unfavorable conditions or have been subject to excessive stress during transport, it must be assumed that hazard-free operation is no longer possible. Remove the AT3-III E from service and secure it against inadvertent use in such cases.

Opening of Equipment / Repair

The equipment may be opened only by authorized service personnel to ensure the safe and correct operation of the equipment and to keep the warranty valid.

Even original spare parts may be installed only by authorized service personnel.

In case the equipment was opened by unauthorized personnel, no warranty regarding personal safety, measurement accuracy, conformity with applicable safety measures or any consequential damage is granted by the manufacturer.

Meanings of Symbols on the Instrument



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



European conformity label



This device may not be disposed of with the trash. Further information regarding the WEEE mark can be accessed on the Internet at www.gossenmetrawatt.com by entering the search term 'WEEE'.

3 Connecting the AT3-III E Test Adapter to the Mains

The following connections must first be established before connecting the test adapter to the mains:

- Insert the mains plug from the test instrument into the earthing contact outlet (12) at the AT3-III E.
- Insert the earthing contact plug (13) from the AT3-III E into the test socket at the test instrument.
- In order to measure protective conductor current, connect the test instrument port (14) of the AT3-III E into sockets 2 and 3 at the SECUTEST SIII / SIII+ / SIII+H; SECUTEST S2N+ / S2N+10 / N+w; SECULIFE ST / ST HV or into sockets V and COM at the SECUTEST PRO; SECUTEST ST PRO; SECULIFE ST BASE / ST BASE25.

- In order to test extension cables, insert the test probe at the end of the probe cable of the test instrument into the socket (15) at the AT3-III E.

Connect the test adapter to 230/400 V mains power. The test adapter now performs a self-test. If the tester is intact, the red LED lights up briefly.

4 Connecting a Device Under Test to the Test Adapter

After the device under test has passed a visual inspection and before connecting it to the appropriate plug or socket at the test adapter, as well as before each new test, the test instrument must be returned to its initial setting depending upon the type of test.

Connect the device under test to the test adapter and switch all of its functions on, making sure that, for example, thermostat contacts are closed etc. Always MEASURE PROTECTIVE CONDUCTOR RESISTANCE first for safety class I devices, because if the protective conductor is defective, insulation resistance, equivalent leakage current and protective conductor current cannot be measured, and high-voltage testing cannot be performed.

5 Testing Devices

Perform testing in accordance with the operating instructions included with the test instrument!

Observe the following instructions when using the test instrument in combination with the AT3-III E during automatic test sequence :

For some test sequences, a suitable AT3 adapter must be used as connection type.

5.1 Measuring Protective Conductor Resistance

The clip or the test probe at the end of the probe cable from the test instrument must be connected to the housing of the device under test such that good contact is assured.

Note!

Connector cable (13) resistance is 0.07 Ω . In order to compensate for this error, proceed as described in the operating instructions included with the test instrument under Individual Measurements → Protective Conductor Resistance → Zero Balancing.

If the AT3-III E is out of use for a prolonged period of time, the earthing contact faces of the plug-and-socket connectors and the connecting plug (13) may corrode, thus leading to slightly elevated resistance measurement values. In this case, plug and unplug the connections several times until the expected values are reached again.

5.2 Measuring Insulation Resistance and Equivalent Leakage Current

L1, L2, L3 and N (short-circuited) are measured against PE during insulation testing.

5.3 Measuring Protective Conductor Resistance with the Residual Current Method (except for SECUT-EST BASE / BASE10 / ST BASE / ST BASE10)

The DUT is placed into operation during residual current measurement. The L1, L2 and L3 mains lamps light up at the AT3-III E during this test.

This measurement may not be performed on safety class I devices until after the protective conductor test has been passed in accordance with chapter 5.1.

- ⇨ Turn off the device under test.
- ⇨ Select the I_L -DI measurement setting at the test instrument.
- ⇨ The line contactor switches mains power to the test outlets (1 – 4) at the AT3-III E. Signal lamps L1, L2 and L3 indicate the presence of line voltage.
- ⇨ Now switch on the DUT (as described in chapter 2).

Contact current is measured by means of residual current measurement for safety class II devices, and safety class I devices with accessible conductive parts which are not connected to the protective conductor. Contact all accessible conductive parts at the device under test with the test probe at the end of the probe cable from the test instrument to this end.

These measurements must be performed with the plug in both positions for DUTs with earthing contact plugs!

Note!

This test must be performed in accordance with the specified test sequence. **Mains power must be indicated by signal lamps L1, L2 and L3 (9) before switching the device under test on.**

The test outlets (1 – 4) are disconnected from the mains by the safety shutdown function included with the AT3-III E for devices under test with fault currents of greater than 18 mA during measurement of protective conductor current with residual current.

Mains power may be disconnected if the AT3-III E is used in systems protected with RCCBs rated less than 30 mA. Mains signal lamps L1, L2 and L3 (9) go out. The function LED (10) blinks.

Disconnect the AT3-III E from the mains to reset. Reconnect the AT3-III E to the mains. The test adapter is once again ready for use after a brief self-test.

The short-circuit test displayed at the test instrument cannot be performed due to safety impedances which have been integrated into the AT3-III E for testing 3-phase devices.

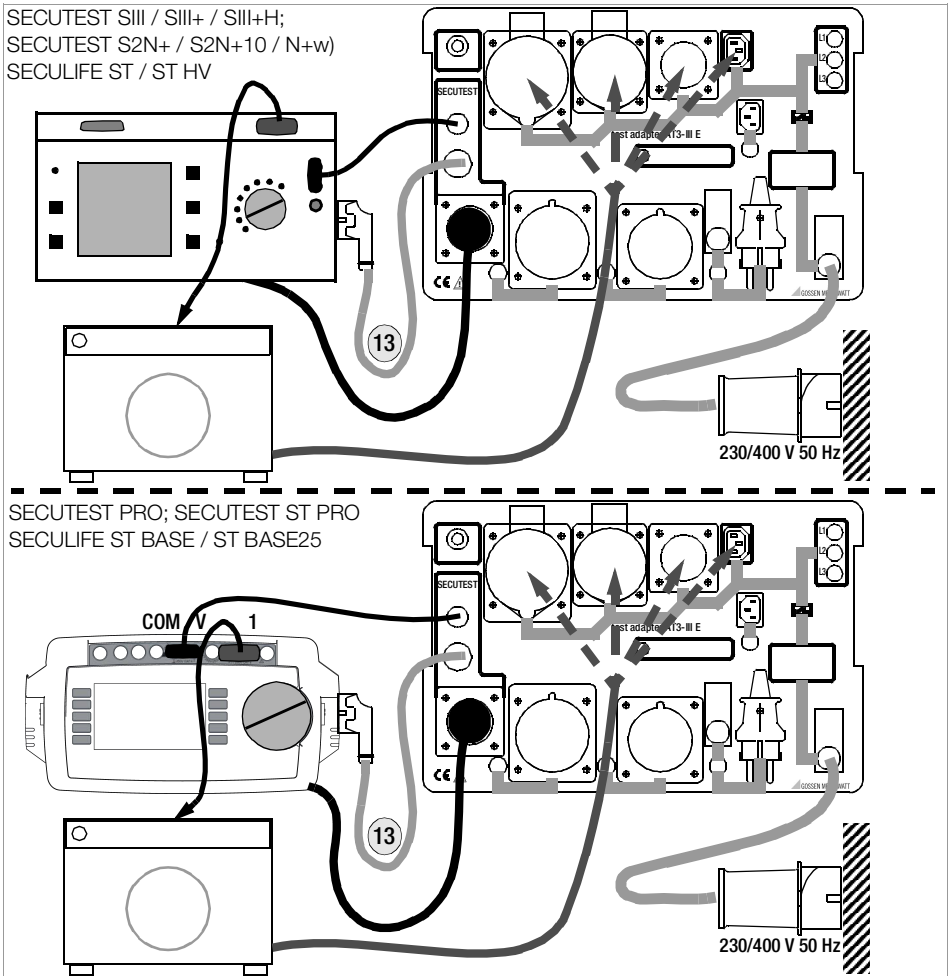


Figure 1 Connecting Single and 3-Phase Devices to the AT3-III E and the test instrument

5.4 Testing of Differential Current during Automatic Testing per Test Standard

SECUTEST SIII / SIII+ / SIII+H; SECULIFE ST / ST HV:

- Initiate the standard-specific setup.
- Select „Sequence“ and deactivate the automatic test method.

During testing according to standard, a menu appears which proposes two options, i.e. equivalent leakage current and differential current.

- Select „Differential current“.

SECUTEST S2N+ / S2N+10 / N+w:

- Select switch position „active“ here.

Line voltage is applied to the DUT via the AT3-III E tester. The differential current of the DUT is measured while allowing for a function test of the DUT.

SECUTEST PRO / ST PRO; SECULIFE ST BASE / ST BASE25 and/or feature I01:

- Select connection type AT3-adapter for I_{PE} measurement in the setup of the test sequence.

5.5 High-Voltage Test



Caution: High-Voltage!

Prior to performing the test remove the probe including probe tip from sockets 4 and 5 of the test instrument. Do not touch the DUT, the device plug and the earthing contact cable of the AT3-III E during the voltage test.

Do not unplug the AT3-III E connector cable (13) from the test socket at the test instrument: the device under test may still be charged, and high voltage may be present at the earthing contact plug.

During this test, L1, L2, L3 and N (short-circuited) are measured against PE with the preset high voltage (**max. 1.5 kV!**).

Please observe all additional safety precautions on performing the test as well as the note on the exclusion of liability in the operating instructions of the test instrument.

6 Testing Extension Cables

The SECUTEST port (14) may remain connected to sockets 2 and 3 at the test instrument during this test. Perform testing in accordance with the operating instructions included with the test instrument!

Observe the following instructions when using the test instrument in combination with the AT3-III E: The test probe at the end of the probe cable of the test instrument must first be connected to the respective socket (15) (probe 1 to 4) of the associated plug at the AT3-III E. In order to test, only

connect the plug and socket at the ends of the respective extension cable to be tested to the associated device plug and socket at the AT3-III E. The associated connection diagrams are shown on the following pages.

SECUTEST SIII / SIII+ / SIII+H; SECULIFE ST / ST HV:

Select the following test sequence from the initial window at the test instrument:

Extension cable: “X” WITH EL1

Note!

Testing cables by means of the AT3-III E is only possible with this setting.

SECUTEST S2N+ / S2N+10 / N+w:

- Select the following switch position: VDE 0701-0702
- Select EL1 as connection type.

SECUTEST PRO / ST PRO; SECULIFE ST BASE / ST BASE25 and/or feature I01:

- Select AT3-III E as connection type.

6.1 Measuring Protective Conductor Resistance

Testing is performed according to the instructions included in chapter 5.1.

6.2 Measuring Insulation Resistance

L1, L2, L3 and N (short-circuited) are measured against PE during insulation testing. Due to good cable insulation, a value of 2 M Ω should not be significantly exceeded.

Note!

In conductors with control lamp (usually glow lamp in the switch), the result of the continuity test for L and N may be distorted by the additional resistance of the glow lamp.

In case of doubt, we recommend performing a continuity test for L and N by means of resistance measurement (R-PE or R-ISO): e.g. SECUTEST SIII / SIII+ / SIII+H; SECULIFE ST / ST HV; SECUTEST S2N+ / S2N+10 / N+w: R-PE between probe and socket 3 or R between socket 1 and 2. SECUTEST PRO / ST PRO; SECULIFE ST BASE / ST BASE25: R-PE between probe 1 and probe 2. SECUTEST BASE / BASE10 / ST BASE / ST BASE10: R-PE between probe 1 and measurement cable at the earth contacts of the test socket (test type PE(PD)-P1).

6.3 Functional Testing for Short-Circuits, Interruptions and Reversed Conductors of Cables L1, L2, L3 and N

Testing of single-phase cables is performed as described in the instructions included with the test instrument under (optional EL1 test adapter). The EL1 test adapter accessory is included in the AT3-III E as a subassembly.



Note!

While testing the continuity of **single-phase** extension cables, AT3-III E may **NOT** be supplied with line voltage.

While testing the continuity of **3-phase** extension cables, AT3-III E **must** be connected with **line voltage**.

Note: When testing device cable connections (socket 4/plug 4) polarity L/N is not being checked.

Testing of 3-phase cables is the same, except that it also includes an additional test for reversing of conductors L1, L2, L3 and N.

3-phase cables have only passed testing for short-circuits, interruptions and reversed conductors (clockwise rotation) if the following test result appears: "Cable OK".

Messages such as "interruption / short-circuit" always indicate that the cable is defective. If this is the case, conductors L1, L2, L3 and N may also be reversed. The actual defect must be determined.

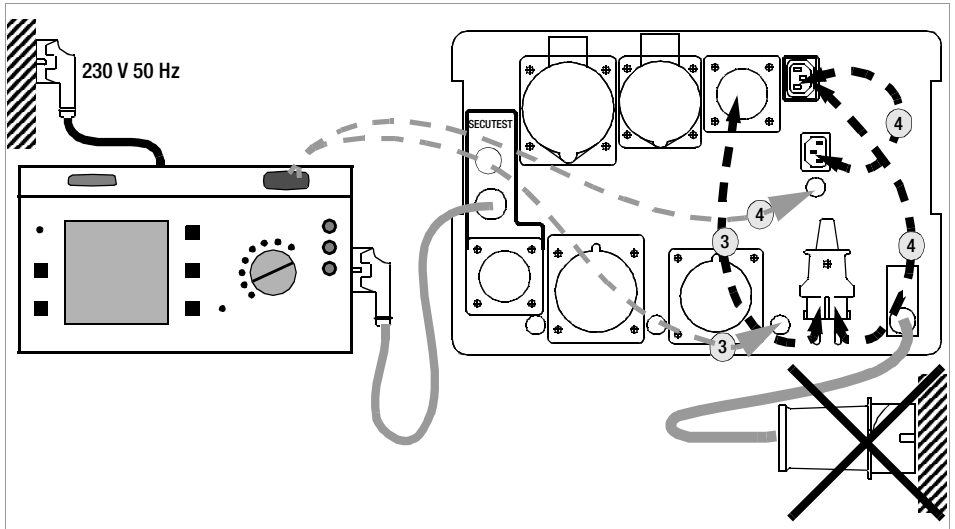


Figure 2 Connecting Single Phase Extension Cables to the AT3-III E and the SECUTEST SIII / SIII+ / SIII+H; SECUTEST S2N+ / S2N+10 / N+w; SECULIFE ST / ST HV

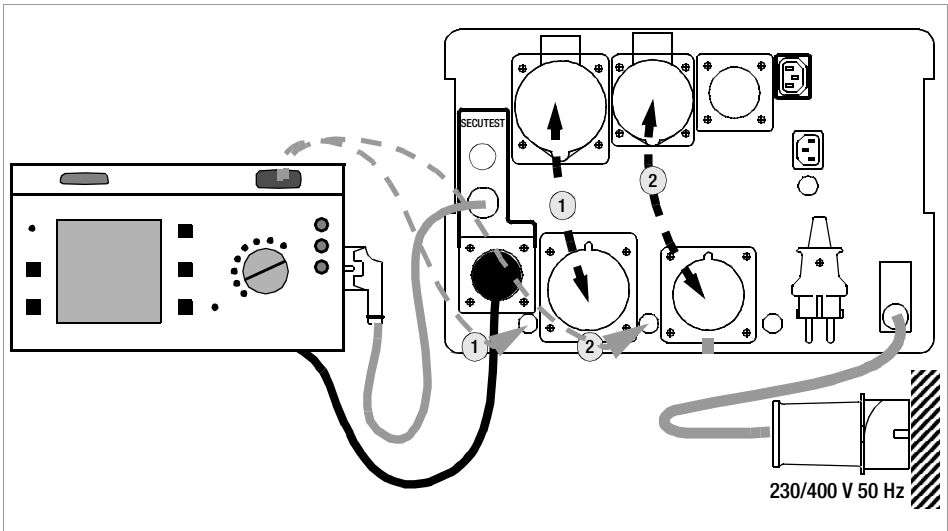


Figure 3 Connecting 3-Phase Extension Cables to the AT3-III E and the SECUTEST SIII / SIII+ / SIII+H; SECUTEST S2N+ / S2N+10 / N+w; SECULIFE ST / ST HV

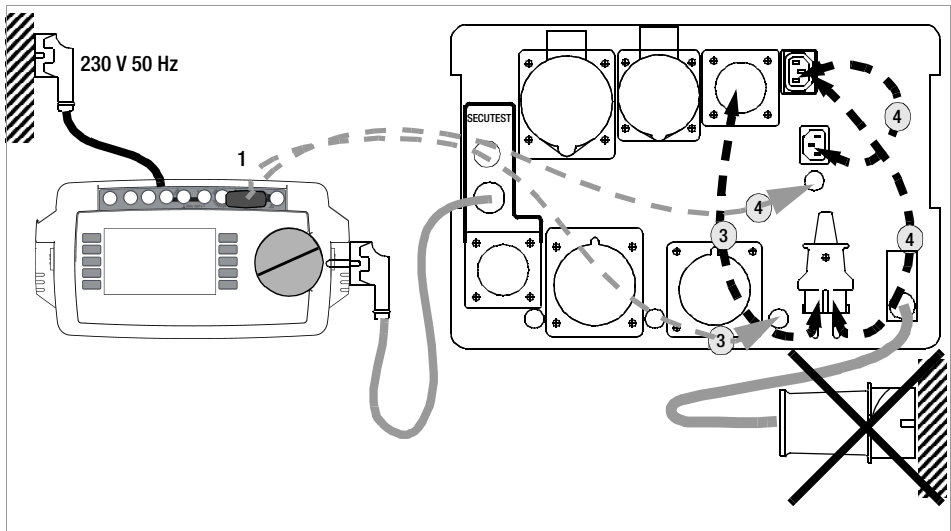


Figure 4 Connecting Single Phase Extension Cables to the AT3-III E and the SECUTEST BASE / BASE10 / PRO; SECUTEST ST BASE / ST BASE10 / ST PRO; SECULIFE ST BASE / ST BASE25

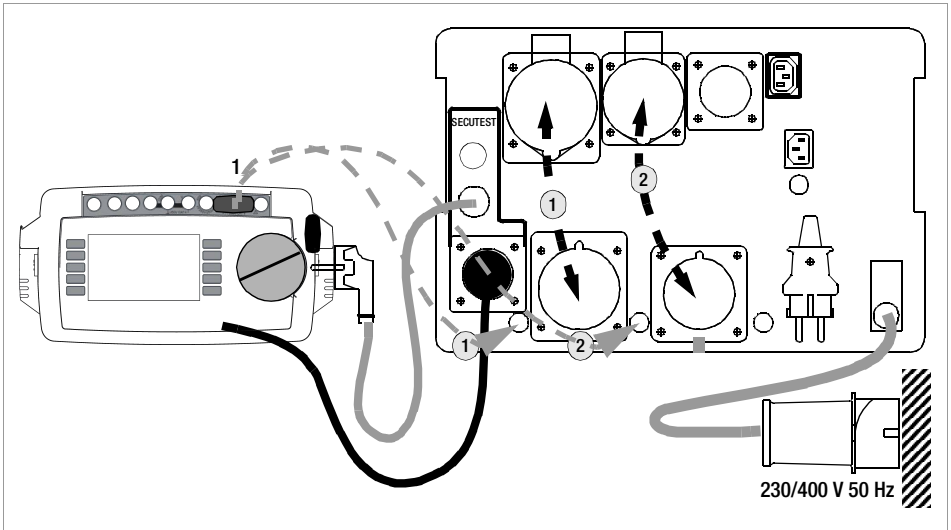


Figure 5 Connecting 3-Phase Extension Cables to the AT3-III E and the SECUTEST BASE / BASE10 / PRO; SECUTEST ST BASE / ST BASE10 / ST PRO; SECULIFE ST BASE / ST BASE25

7 Self-Test

Because it is so easy to perform, the self-test should be conducted before each use of the AT3-III E.

Please be careful to ensure that the case of the AT3-III E is not being contacted with devices under PE or earth potential during the self-test.

Performing the Protective Conductor Test

- Insert the mains plug from the test instrument into the earthing contact outlet (12) at the AT3-III E.
- The earthing contact plug (13) and the test instrument port (14) of the AT3-III E may not be plugged into the test instrument.
- Connect the AT3-III E to mains power.
- Set the test instrument to the protective conductor test individual measurement (R_{SL}/R_{PE}).
- Contact protective conductor potential at the mains system which is supplying power to the AT3-III E with the test probe at the end of the probe cable from the test instrument, e.g. at the earthing contact of an earthing contact outlet. If an excessively high value or interruption is indicated, the protective conductor is interrupted.

The AT3-III E test adapter must be disconnected from the mains, and the error in the electrical system or the test adapter must be corrected. The AT3-III E is equipped with a "Trigger $I_{\Delta n}$ " test key in order to allow for testing the included $I_{\Delta n}$ safety shutdown function at any time.

Performing the $I_{\Delta n}$ Self-Test

- Remove the device under test (device or extension cable).
- Set the test instrument to individual measurement.
- Test instrument: Select the "DI current" sub-menu (residual current).
- Signal lamps L1, L2 and L3 indicate the presence of line voltage.
- Activate the "Trigger $I_{\Delta n}$ " key (11).
- The AT3-III E disconnects mains power from the outlets (1 – 4).
- Signal lamps L1, L2 and L3 go out.
- The function LED (10) blinks. Disconnect the AT3-III E from the mains to reset. Reconnect the AT3-III E to the mains. The test adapter is once again ready for use after a brief self-test.

Note!

If mains power is not switched during this test, the fuses in the AT3-III E may have blown. If the AT3-III E still does not function correctly after replacing the fuses, it must be removed from service and repaired. Measurement is no longer possible!

8 Technical Data

Article Number

Z745S

Residual Current Measuring Function

Measuring Range 0 ... 20 mA
Transformation Ratio 1 V per 10 mA
Intrinsic Uncertainty $\pm(5\% \text{ of rdg.} + 0.05 \text{ mA})$

Nominal Ranges of Use

Line Voltage
L1/L2/L3/N 207 ... 253 V AC
Frequency 49 ... 51 Hz
Temperature 0 °C ... +40 °C
Line Voltage
Waveshape sinusoidal

Reference Conditions

Ambient Temperature +23 °C ± 2 K
Relative Humidity 50% $\pm 5\%$
Line Voltage 230 V/400 V $\pm 10\%$
Frequency
of Measured Quantity 50 Hz $\pm 0.2\%$

Ambient Conditions

Operating Temperatures -10 ... +40 °C
Storage Temperatures -25 ... +60 °C
Humidity max. 75%, no condensation allowed
Elevation up to 2000 m

Power Supply

Nominal Line Voltage 3~230/400 V/50 Hz/CAT II

Connection only permissible with overload protection device $I_n = 16 \text{ A}$ $I_2 \leq 1.45 I_n$

Electrical Safety

Pollution degree 2
Safety Class I per DIN EN 61140/
VDE 0140-1
Residual Current
Shutdown (4-pole) at $I_{dN} = 14,6 \text{ mA}$,
 $t_a = 82 \text{ ms}$
Device Fuses F0315 L250V
5 x 20 T32mA L 250 V
DIN EN 60127-2

Electromagnetic Compatibility

Intrinsic Uncertainty EN 61326-1:2013 class B
Intrinsic Uncertainty EN 61326:2013

Mechanical Design

Protection case: IP40
terminals: IP20

Extract from table on the meaning of IP codes

IP XY (1 st digit X)	Protection against foreign object entry	IP XY (2 nd digit Y)	Protection against the penetration of water
0	not protected	0	not protected
1	$\geq 50.0 \text{ mm dia.}$	1	vertically falling drops
2	$\geq 12.5 \text{ mm dia.}$	2	vertically falling drops with enclosure tilted 15°
3	$\geq 2.5 \text{ mm dia.}$	3	spraying water
4	$\geq 1.0 \text{ mm dia.}$	4	splashing water

Dimensions 405 x 300 x 220 (mm)
with lid

Weight approx. 6.7 kg



Note!

Observe the technical data of the respective test instrument.

9 Maintenance

Front Panel / Housing

No special maintenance is required for the housing. Keep outside surfaces clean. Use only a cloth for cleaning, which has been slightly dampened with water. Avoid the use of cleansers, abrasives and solvents.



Note!

According to DIN VDE 0701-0702, measuring instruments used for periodic testing must be tested and calibrated in accordance with the manufacturer's specifications on a regular basis. Depending upon usage, the manufacturer recommends an interval of 1 to 3 years for this test instrument.

Device Return and Environmentally Compatible Disposal

The instrument is a category 9 product (monitoring and control instrument) in accordance with ElektroG (*German Electrical and Electronic Device Law*). This device is subject to the WEEE directive. Furthermore, we make reference to the fact that the current status in this regard can be accessed on the Internet at www.gossenmetrawatt.com by entering the search term WEEE.

We identify our electrical and electronic devices in accordance with WEEE 2012/19/EU and ElektroG with the symbol shown to the right per DIN EN 50419.



These devices may not be disposed with the trash. Please contact our service department regarding the return of old devices.

10 Repair and Replacement Parts Service, Calibration Center and Rental Instrument Service

If required please contact:

GMCI-Service GmbH

Service-Center

Beuthener Straße 41

90471 Nürnberg • Germany

Phone: +49 911 817718-0

Fax: +49 911 817718-253

E-Mail service@gossenmetrawatt.com

www.gmci-service.com

This address is only valid in Germany.

Please contact our representatives or subsidiaries for service in other countries.

11 Product Support

If required please contact:

Gossen Metrawatt GmbH

Product Support Hotline

Phone: +49 911 8602-0

Fax: +49 911 8602-709

E-Mail support@gossenmetrawatt.com

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