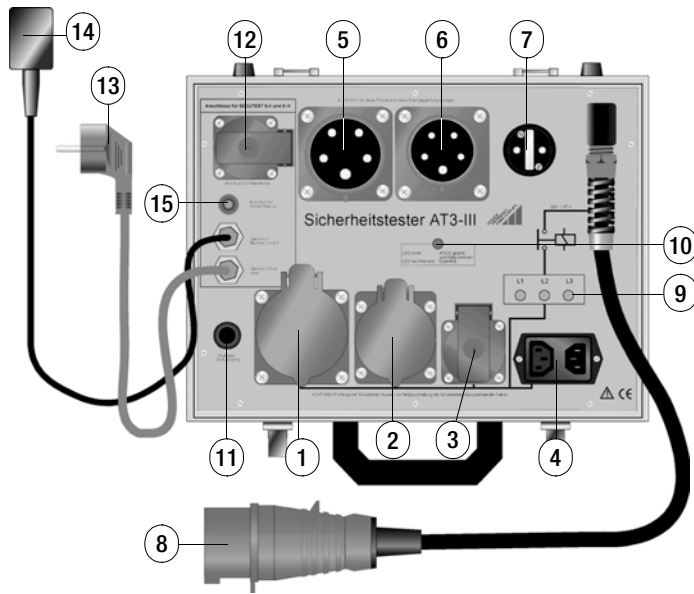


AT3-III Safety Tester

**For Testing Single and 3-Phase Consumers
and Extension Cables in Combination with
SECUTEST[®] SII and SIII Test Instruments**

3-349-155-37
2/7.02





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 and plug for cable testing
1P+N+PE, 16 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

AT3-III Power Supply

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

Indicator Displays

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

Self-Test

- 11 Test key for triggering DI (DI = residual current)

Connectors for

SECUTEST® SII and SIII (M701X) Test Instruments

- 12 Blue earthing contact outlet for power supply to SECUTEST® test instruments
- 13 Earthing contact plug with cable, for insertion into the test socket at SECUTEST® test instruments
- 14 DI measuring adapter, for insertion into sockets 2 and 3 at the SECUTEST® test instrument
- 15 Connector socket for test probe from the SECUTEST® test instrument (for testing cables only)

SECUTEST® series test instruments are not included in the scope of delivery.

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1 Applications

The portable safety tester, which can also be permanently mounted with the wall bracket, is used for measuring and testing single and 3-phase electrical devices and extension cables in combination with SECUTEST®SII and SIII test instruments, as well as instruments identified with order code M701X. The SECUTEST®0701S (article number GTM 5015), which was manufactured through the beginning of 1998, is not suitable for use with the safety tester.

Suitable instruments are identified in the following pages with the following abbreviated designation: SECUTEST®.

Testing must be performed by a qualified electrician with an appropriate test instrument after repair or modification in accordance with

DIN VDE 0701, and is also required for periodic testing per DIN VDE 0105/0702.

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 following values are tested by the safety tester in combination with a SECUTEST® test instrument:

- Protective conductor resistance
- Insulation resistance
- Dielectric strength (HV test) *
- Earth leakage current
- Residual current
- Contact current
- Protective conductor current (AC and DC are tested separately) *
- For extension cables:
 - Short-circuit
 - Conductor continuityAnd for 3-phase extension cables:
 - Phase reversal at L1, L2 and L3 for substantiation of clockwise rotation

* Only if the utilized SECUTEST® is capable of performing this measurement

Measurement results are displayed at the SECUTEST® test instrument.



Note!

The AT3-III safety tester 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 safety tester 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, generic EMC standard for interference emission and EN 61326/A1, generic EMC standard for interference immunity.

Safety is only assured for the user and the safety tester when used for its intended purpose in combination with SECUTEST® test instruments.

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 safety tester into service, and that you follow all instructions contained herein.

Due to the fact that all tests performed with the AT3-III must be executed in combination with a SECUTEST® test instrument, 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 has been disconnected from the mains and connected once again, the safety tester is defective. If this is the case, the AT3-III must be removed from service and repaired before it is used again.

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

Measurements within electrical systems are prohibited!

- The safety tester's 16 A CEE 3P+N+PE 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 to the mains, the SECUTEST® test instrument must first be connected to the AT3-III.



Attention!

Tests during which mains power is applied may only be selected with the function selector switch at the SECUTEST® 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.
- 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 safety tester, 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 safety tester may be connected to the device plugs (4 – 7) at the safety tester.
- Due to safety tester 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 SECUTEST® test instrument has been set for testing with mains power.
- If the safety tester 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 from service and secure it against inadvertent use in such cases.

3 Connecting the Safety Tester to the Mains

The following connections must first be established before connecting the safety tester to the mains:

- a) Insert the mains plug from the SECUTEST® into the earthing contact outlet (12) at the AT3-III.
- b) Insert the earthing contact plug (13) from the AT3-III into the test socket at the SECUTEST®.
- c) In order to measure protective conductor current, connect the DI measuring adapter (14) from the AT3-III into sockets 2 and 3 at the SECUTEST®.
- d) In order to test extension cables, insert the test probe at the end of the SECUTEST® probe cable into the socket (15) at the AT3-III.

Connect the safety tester to 230/400 V mains power.

The safety tester now performs a self-test. If the tester is intact, the red LED lights up briefly.

4 Connecting a Device Under Test to the Safety Tester

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

Connect the device under test to the safety tester 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 SECUTEST® test instrument!

Observe the following instructions when using the SECUTEST® in combination with the AT3-III:

5.1 Measuring Protective Conductor Resistance

The clip or the test probe at the end of the probe cable from the SECUTEST® 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 SECUTEST® test instrument under Individual Measurements → Protective Conductor Resistance → Zero Balancing.

If the AT3-III 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

The DUT is placed into operation during residual current measurement. The L1, L2 and L3 mains lamps light up at the AT3-III 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_{Δ} -DI measurement setting at the SECUTEST®.
- ◇ The line contactor switches mains power to the test outlets (1 – 4) at the AT3-III. 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 SECUTEST® 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 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 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 from the mains to reset. Reconnect the AT3-III to the mains. The safety tester is once again ready for use after a brief self-test.

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

5.4 High-Voltage Test



Caution: High-Voltage!

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

Do not unplug the AT3-III connector cable

(13) from the test socket at the SECUTEST®: the device under test may still be charged, and high voltage may be present at the earthing contact plug.

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

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 SECUTEST® test instrument.

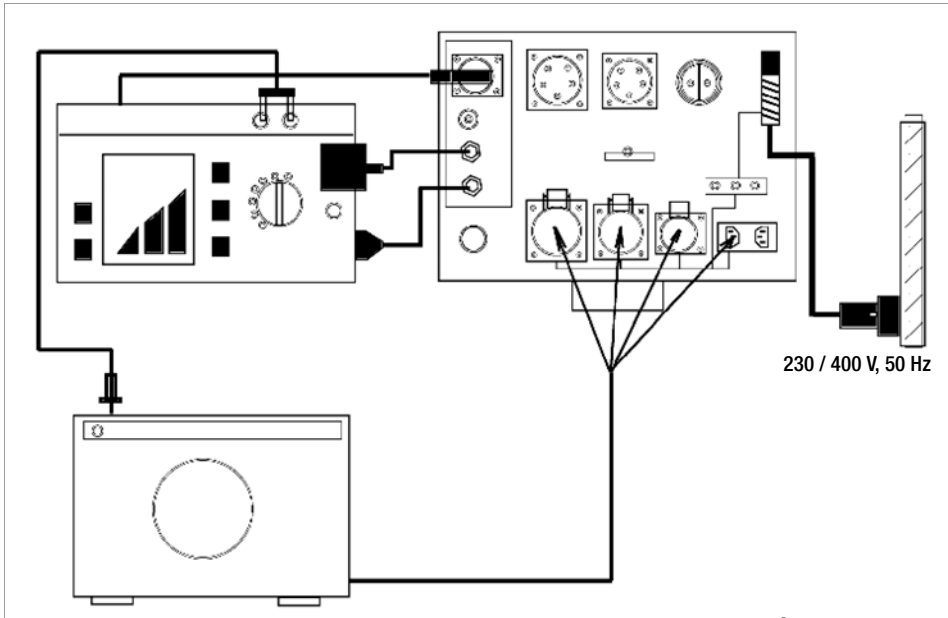


Figure 1 Connecting Single and 3-Phase Devices to the AT3-III and the SECUTEST®

6 Testing Extension Cables

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

Observe the following instructions when using the SECUTEST® in combination with the AT3-III:

The test probe at the end of the probe cable from the SECUTEST® must first be connected to the safety socket (15) at the AT3-III. 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. Select the following test sequence from the initial window at the SECUTEST® test instrument:

Extension cable: "X" WITH EL1



Note!

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

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 MΩ should not be significantly exceeded.

6.3 Testing for Short-Circuits, Interruptions and Reversed Conductors

Testing of single-phase cables is performed as described in the instructions included with the SECUTEST® under (optional EL1 adapter).

The EL1 adapter accessory is included in the AT3-III as a subassembly.

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.

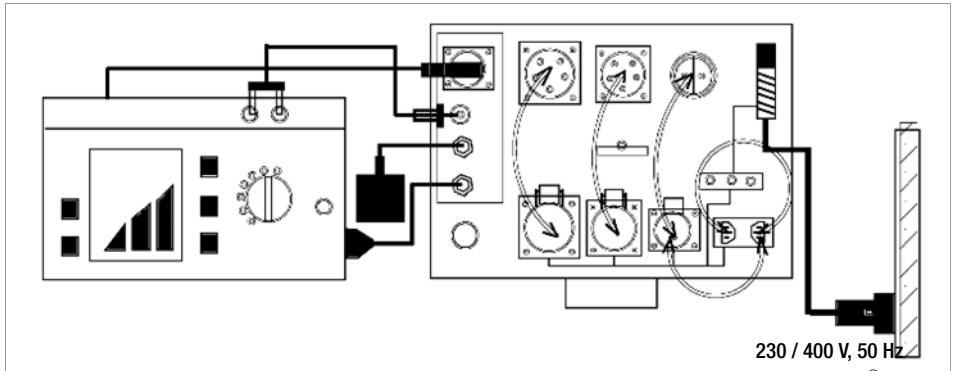


Figure 2 Connecting Single and 3-Phase Extension Cables to the AT3-III with the SECUTEST®

7 Self-Test

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

Performing the Protective Conductor Test

- Insert the mains plug from the SECUTEST® into the earthing contact outlet (12) at the AT3-III
- The earthing contact plug (13) and the DI measuring adapter (14) from the AT3-III may not be plugged into the SECUTEST®.
- Connect the AT3-III to mains power.
- Set the SECUTEST® to the protective conductor test individual measurement (RSL).
- Contact protective conductor potential at the mains system which is supplying power to the AT3-III with the test probe at the end of the probe cable from the SECUTEST®, 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 safety tester must be disconnected from the mains, and the error in the electrical system or the safety tester must be corrected.

The AT3-III is equipped with a "Trigger DI" test key in order to allow for testing the included DI safety shutdown function at any time.

Performing the DI Self-Test

- Remove the device under test (device or extension cable).
- Set the SECUTEST® to individual measurement.
- SECUTEST® SII and SIII: Select the "DI current" sub-menu (residual current).
- Signal lamps L1, L2 and L3 indicate the presence of line voltage.
- Activate the "Trigger DI" key (11).
- The AT3-III 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 from the mains to reset. Reconnect the AT3-III to the mains. The safety tester 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 may have blown. If the AT3-III 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

Residual Current Measuring Function

Measuring Range	0 ... 20 mA
Transformation Ratio	1 V per 10 mA
Intrinsic Error	±(5% + 0.05 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% ± 5%
Line Voltage	230 V/400 V ± 10%
Frequency	
of Measured Quantity	50 Hz ± 0,2%

Ambient Conditions

Operating Temperatures	-10 ... + 55 °C
Storage Temperatures	-25 ... + 70 °C
Humidity	max. 75%, no condensation allowed
Elevation	up to 2000 m

Power Supply

Nominal Line Voltage	230/400 V 50 Hz sine
Protection	16 A per phase

Electrical Safety

Safety Class	I
Overvoltage Category	300 V CAT II
Additional Safety:	
Residual Current Shutdown (4-pole) at	approx. 18 mA
Device Fuses	F0315 L250V (5 x 20 mm)

Mechanical Design

Protection	case: IP40 terminals: IP20
Dimensions	380 x 300 x 220 (mm) with lid

Weight

approx. 5 kg

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 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.

10 Repair and Replacement Parts Service DKD Calibration Lab and Rental Instrument Service

If required please contact:

GOSSSEN-METRAWATT GMBH
Service Center
Thomas-Mann-Str. 20
90471 Nürnberg • Germany
Phone: +49 911 86 02 - 410 / 256
Fax: +49 911 86 02 - 2 53
E-Mail service@gmc-instruments.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:

GOSSSEN-METRAWATT GMBH
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