

AT3-II S

3-Phase 16 (20) A Current Adapter with Residual Current Logging

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1 Application

With the help of the AT3-II S CEE adapter, devices which are equipped with a 16 A/6 h or 32 A/6 h 5-pin CEE plug can be quickly and efficiently connected to test instruments designed for testing portable devices and which are furnished with only an earthing contact outlet.

The following tests can be performed on devices with CEE plugs with the help of the AT3-II S adapter:

- Testing of protective conductor continuity
- Insulation resistance measurement
- Protective conductor current measurement in the following measuring modes:
 - Direct (direct method via test socket)
 - Differential (differential current measuring method)
 - Alternative (equivalent leakage current measuring method)

The CEE adapter is additionally equipped with an earthing contact outlet, to which single-phase devices under test can be connected, that are not suitable for direct connection to a test instrument, e.g. due to high starting current.

Attention!

Application Restrictions

The CEE adapter AT3-II S may only be used for its intended purpose and only with test instruments in accordance with DIN VDE 0404 or IEC 61557-16.

Other use of the adapter, in particular for continuous connection of 3-phase current devices to 3-phase electrical systems, is not permissible under any circumstances!

In any case, maximum permissible conventional thermal current is 16 A AC per phase (16 A AC at 16 A outlets).

2 Safety Features and Precautions

The AT3-II S CEE-Adapter is manufactured and tested in accordance with safety regulations IEC 61010-1 / EN 61010-1 / VDE 0411-1.

If used for its intended purpose, the safety of the user and of the device is assured.

Carefully read the operating instructions before use, in particular the operating instructions included with the test instrument with which you intend to use the adapter. Follow all instructions contained therein.

The instrument may only be connected to TN, TT or IT electrical systems with a maximum of 240/400 V 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 adapter may only be used for testing devices with 5-pin CEE plugs and current consumption of no greater than 3 x 20 A (AC-1).

The AT3-II S CEE adapter may not be used:

- With open housing
- If it demonstrates visible damage
- If the CEE outlet or the connector cable is damaged
- After excessive stress, i.e. if the load capacities specified in the technical data have been exceeded
- After long periods of storage under unfavorable conditions (e.g. humidity, dust or extreme temperature)

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).

3 Meanings of Symbols on the Instrument



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

CAT II Measuring category II device



Indicates EC conformity



The 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.

4 Connecting the AT3-II S

Before testing can be started, the AT3-II S must be connected to the test instrument and to mains power. Proceed as follows:

- Connect the mains cable from the test instrument to the earthing contact outlet labelled "Appliance tester" on the AT3-II S.
- Connect the earthing contact cable from the AT3-II S to the test/mains outlet at the test instrument. The connection at the AT3-II S is labelled "to appliance tester".



Note! Prerequisite for differential current measurement

A test instrument which is equipped with voltage inputs is required for the measurement of protective conductor current using the differential current method.

- **Differential current measurement:** Insert the 4 mm plugs on the cable from the AT3-II S, which are labelled "tester Bu. 2 & 3", into the voltage measuring socket at the test instrument.
- **Protective conductor current measurement:** This measurement is performed as described from the test instrument operating instructions.
- Plug the CEE connector cable from the AT3-II S into a suitable 16A/6h CEE outlet within your electrical installation. The connection at the AT3-II S is labelled "Mains, 3~ 400 V, 16 A 50...60 Hz". As of this point in time, the AT3-II S and the test instrument are supplied with electrical power.
- Finally, connect the device under test to the CEE outlet at the AT3-II S. The outlet or coupling is labelled "Test-socket appliance".

Testing can now be started (see section 5).

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5 Testing with the AT3-II S

You can now execute all tests on devices with CEE plugs which are otherwise possible with the test instrument, and which are supported by the AT3-II S adapter, just as you would for devices with earthing contact plugs. Proceed as described in the operating instructions for the test instrument to this end.

The following characteristics of the AT3-II S adapter must be taken into consideration when performing tests with the test instrument:

Testing Protective Conductor Resistance

When testing protective conductor resistance, measured protective conductor resistance is increased by the amount caused by the protective conductor system of the AT3-II S CEE adapter itself. In case of doubt, i.e. if measurement results are close to the permissible limit value, measure the adapter's protective conductor resistance at the PE terminal of its CEE outlet, and subtract the results from the measured value obtained for the DUT-adapter system. (use your test instrument's zero balancing function to this end).

Insulation Test

During insulation testing, the three phase terminals (L1, L2 and L3) and the neutral terminal (N) at the DUT are short-circuited.

Residual Current Measurement

During 3-phase residual current measurement, the resulting residual current is transmitted via the test cable to the test instrument as a voltage value, and recorded.

Observe and adhere to the necessary settings at your test instrument for this type of measurement.

The DUT is connected to line voltage via the AT3-II S. The DUT's residual current is measured, and it can be tested for correct functioning at the same time.

Protective Conductor Current Measurement

Current in the protective conductor can be measured directly via the protective conductor terminal at the adapter's earthing contact plug.

Leakage Current in the Operating State

Before executing the leakage current measurement, or any other tests for which the DUT is supplied with mains power and must be placed into operation, it must be assured that there are no short-circuits in the DUT between phase conductors L1, L2 and L3 and/or neutral conductor N! Non-observance may result in damage to, or destruction of the AT3-II S adapter, and possibly the device under test as well!

Always start the test with the test instrument (orange lamp on the AT3-II S lights up) **before switching the device under test on!** In the case of extreme initial current at the DUT, nonobservance of this start-up sequence may result in damage to, or destruction of the AT3-II S adapter!

Attention!

Disabling of Protective Devices – Max. Current Consumption

As soon as the orange lamp at the AT3-II S lights up, the terminals at the mains outlet from which power is supplied are connected to the test/mains outlet or coupling at the AT3-II S adapter without the use of a fuse or any other protective devices. Make sure that only devices designed

for use with 3-phase current with a **maximum current consumption of 3 x 20 A (AC-1)** are connected to this outlet or coupling.

Attention!

Testing the DUT for Short-Circuits

Short-circuiting of two or all three phases of the device under test cannot be detected by the test instrument until after residual current testing has been executed! In such cases, the AT3-II S adapter may be severely damaged as a result of current surges when this test is executed!

Before connecting a device to the AT3-II S, make sure that there are no short-circuits between the DUT's phases by means of appropriate testing, for example with a continuity tester!

Attention!

Connection of the DUT in Correct Phase Sequence

In particular after repairing 3-phase devices or connecting new CEE plugs to such devices, make sure that the phases are connected in the correct sequence.

Attention!

Test Sequence – Initial Current Problem

– Starting the test

Always start the test with the test instrument (orange lamp on the AT3-II S lights up) before switching the device under test on!

– Ending the test

Switch the DUT off first, and then stop testing at the test instrument. In the case of extreme initial current at the DUT or inductivity within the electrical circuit, nonobservance of this sequence may result in damage to, or destruction of the AT3-II S adapter!

6 Characteristic Values

Electrical Safety

Safety class	I per DIN EN 61140/VDE 0140-1
Operating voltage	300 V
Test voltage	2.2 kV
Current-carrying capacity	20 A 3-phase current
Proprietary connector cable "mains active"	7 VA, $\cos \varphi \sim 0.5$
Measuring category	II
Contamination degree	2
EMC	EN 61326-1

Residual Current

Measuring range	0.08 to 10.0 mA AC
Intrinsic error	4% rdg. $\pm 40 \mu\text{A}$
Operating uncertainty	6% rdg. $\pm 60 \mu\text{A}$

Mechanical Design

Protection	Housing: IP 40, connections: IP 20
Dimensions	W x H x D: 290 mm x 120 mm x 105 mm (without cables and grommets)
Weight	2.4 kg