

AT16-DI

3-Phase 16 A Current Adapter with Residual Current Logging

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1 Applications

Devices which are equipped with a 5-pole, AT16-DI 16 A / 6 h CEE plug can be quickly and efficiently tested with the CEE adapter. Connect the adapter to a test instrument which is designed for testing portable devices, is equipped with an earthing contact outlet for connecting the device under test and is capable of directly measuring protective conductor current.

The following tests can be performed on devices with CEE plugs with the help of the AT16-DI 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)



Attention!

Application Restrictions

The CEE adapter AT16-DI 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.

2 Safety Features and Precautions

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

When used for its intended purpose, safety of the operator, as well as that of the instrument, is assured.

The instrument may only be connected to electrical systems (TN, TT or IT) with a maximum of 240 V which complies with applicable safety regulations (e.g. IEC 60346, VDE 0100) and is protected with a fuse or circuit breaker with a maximum rating of 16 A.

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 adapter may only be used for testing devices with 5-pin CEE plugs and current consumption of no greater than 3 x 16 A (AC1).

The AT16-DI CEE adapter may not be used:

- With open housing
- If external damage is apparent
- 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 a long period 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



CE Conformity Marking



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".

4 Connecting the AT16-DI

Before testing can be started, the AT16-DI 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 labeled "Tester Outlet" included on the AT16-DI.
- ⇨ Connect the earthing contact cable from the AT16-DI to the test/mains outlet at the test instrument. The connection at the AT16-DI is labeled "to test instrument test/mains outlet".
- ⇨ Plug the CEE connector cable from the AT16-DI into a suitable 16 A / 6 h CEE outlet within your electrical installation. The connection at the AT16-DI is labeled "Mains, 3~ 400 V, 16 A 50...60 Hz". As of this point in time, the AT16-DI and the test instrument are supplied with electrical power.
- ⇨ Finally, connect the device under test to the CEE outlet at the AT16-DI. The outlet is labeled "To test/mains outlet for DUT connection".

Testing can now be started (see section 5).

5 Testing with the AT16-DI

You can now execute all tests which are otherwise possible with the test instrument, and which are supported by the AT16-DI adapter, on devices with CEE plugs just as you would for devices with earthing contact plugs. Proceed as described in the operating instructions for the test instrument to this end.

AT16-DI

3-Phase 16 A Current Adapter with Residual Current Logging

The following characteristics of the AT16-DI adapter must be taken into consideration when performing tests with the test instrument:

- During insulation or equivalent leakage current testing, the three phase terminals (L1, L2 and L3) and the neutral terminal (N) at the DUT are short circuited.
- When testing protective conductor resistance, measured protective conductor resistance is increased by an amount which results from the protective conductor system of the AT16-DI CEE adapter itself.
If the adapter has not been used for a long period of time, contact resistances in the internal relays may increase. If this is the case, the relays should be activated several times. Connect the adapter several times in succession to an earthing contact outlet with a nominal voltage of 230 V to this end (orange lamp on the AT16-DI lights up). 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).
- In order to measure protective conductor resistance using the residual current method, set the measurement type selector switch to ΔI (residual current). During 3-phase residual current measurement, the resulting residual current is transmitted via the protective conductor to the test instrument as protective conductor current, and recorded.
- In order to measure protective conductor current **directly**, set the measurement type selector switch to I_{direct} .

Note

Protective conductor current can only be detected by test instruments which offer direct leakage current measurement as a measuring method. The operating instructions for the test instrument must be observed in this regard.

- 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! Nonobservance may result in damage to, or destruction of the AT16-DI adapter, and possibly the device under test as well!
- Always start the test at the test instrument (orange lamp on the AT16-DI lights up) before switching the device under test on! In the case of extreme initial current at the DUT, nonobservance of this startup sequence may result in damage to, or destruction of the AT16-DI adapter!



Attention!

Disabling of Protective Devices – Max. Current Consumption

As soon as the orange lamp at the AT16-DI lights up, the terminals at the mains outlet from which power is supplied are connected to the test/mains outlet at the AT16-DI 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 16 A (AC1)** are connected to this outlet.



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 AT16-DI adapter may be severely damaged as a result of current surges when this test is executed!

Before connecting a device to the AT16-DI, 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 at the test instrument (orange lamp on the AT16-DI 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 AT16-DI adapter!

6 Characteristic Values

Electrical Safety

Protection 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
Intrinsic connected load	
“Mains active”	7 VA, $\cos \varphi \sim 0.5$
Measuring category	II
Pollution degree	2
EMC	EN 61326-1

Residual Current

Measuring range	0.08 to 10.0 mA AC
Inherent 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 x 120 x 105 mm (without cables and grommets)
Weight	2.0 kg