

TD1 C-Load

User Manual



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The product information, specifications, and technical data embodied in this manual represent the technical status at the time of writing and are subject to change without prior notice.

We have done our best to ensure that the information given in this manual is useful, accurate and entirely reliable. However, OMICRON electronics does not assume responsibility for any inaccuracies which may be present.

The user is responsible for every application that makes use of an OMICRON product.

OMICRON electronics translates this manual from the source language English into a number of other languages. Any translation of this manual is done for local requirements, and in the event of a dispute between the English and a non-English version, the English version of this manual shall govern.

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Using This Manual

This User Manual provides information on how to use the *TD1 C-Load* safely, properly and efficiently. The *TD1 C-Load* User Manual contains important safety instructions for working with the *TD1 C-Load*, and gets you familiar with operating the *TD1 C-Load*. Following the instructions in this User Manual will help you to prevent danger, repair costs and possible down time due to incorrect operation.

The *TD1 C-Load* User Manual always has to be available at the site where the *TD1 C-Load* is used. It must be read and observed by all users of the *TD1 C-Load*.

Reading the *TD1 C-Load* User Manual alone does not release you from the duty of complying with all national and international safety regulations relevant to working with the *CPC 100*, *CP TD1* and *TD1 C-Load*. The regulation EN 50191 "Erection and Operation of Electrical Test Equipment" as well as all the applicable regulations for accident prevention in the country and at the site of operation has to be fulfilled.

Operator Qualifications and Safety Standards

Testing and measuring with the *TD1 C-Load* must be carried out only by qualified, skilled and authorized personnel. Before starting to work, clearly establish the responsibilities. Personnel receiving training, instructions, directions, or education on the *TD1 C-Load* must be under constant supervision of an experienced operator while working with the equipment.

Testing and measuring with the *TD1 C-Load* must comply with the relevant national and international safety standards listed below:

- EN 50191 (VDE 0104) "Erection and Operation of Electrical Test Equipment"
- EN 50110-1 (VDE 0105 Part 100) "Operation of Electrical Installations"
- IEEE 510 "IEEE Recommended Practices for Safety in High-Voltage and High-Power Testing"

Moreover, follow additional relevant laws and internal safety standards.

Conventions and Symbols Used

In this manual, the following symbols indicate paragraphs with special safety relevant meaning:



DANGER

Death or severe injury will occur if the appropriate safety instructions are not observed.



WARNING

Death or severe injury can occur if the appropriate safety instructions are not observed.



CAUTION

Minor or moderate injury may occur if the appropriate safety instructions are not observed.

NOTICE

Equipment damage or loss of data possible

Related Documents

The following documents complete the information covered in the TD1 C-Load User Manual:

Title	Description
CPC 100 User Manual	Contains information on how to use the <i>CPC 100</i> test system and relevant safety instructions.
CPC 100 Reference Manual	Contains detailed hardware and software information on the <i>CPC 100</i> including relevant safety instructions.
CP TD1 Reference Manual	Contains detailed hardware and software information on the <i>CP TD1</i> including relevant safety instructions.

1 Safety Rules

Before operating the *TD1 C-Load*, read the following safety rules carefully. If you do not understand some safety rules, contact OMICRON electronics before proceeding. The *TD1 C-Load* is designated for testing the *CP TD1* test system. Therefore, observe the safety rules both in this User Manual and in the *CP TD1 Reference Manual* when working with the *TD1 C-Load*.

Maintenance and repair of the *TD1 C-Load* is only permitted by qualified experts at OMICRON electronics repair centers.

- ▶ Never touch the plug of the *CP TD1* output cable when it is connected to the *CP TD1* since the plug is not insulated.
- ▶ The voltage output of the *CP TD1* is up to 12 kV. Therefore, make sure to keep the required distance of 1.4 m to the test object with a barrier height of 1 m and to position the device in a safe area.
- ▶ This product partly fulfills the requirements of the Safety Standards. To provide adequate safety for the operator, all instructions in this User Manual have to be observed.

1.1 Operating the Measurement Setup

Only personnel qualified in electrical engineering and trained by OMICRON electronics are authorized to operate the *TD1 C-Load*. Before starting the work, clearly establish the responsibilities.

Personnel receiving training, instructions, directions, or education on the *CPC 100*, *CP TD1* or *TD1 C-Load* must be under constant supervision of an experienced operator while working with the equipment.

The operator is responsible for the safety requirements during the whole test.

In principle, the safety instructions that apply to the *CPC 100*, *CP TD1* and their accessories (refer to "Safety Instructions for *CPC 100* and its Accessories" in the *CPC 100 Reference Manual* and "Safety Instructions" in the *CP TD1 Reference Manual*) also apply to the *TD1 C-Load*. Consequently, only safety instructions that exclusively apply to the *TD1 C-Load* are listed in this User Manual in 4 "Application" on page 13. Before performing tests using high voltage, observe the following instructions:

- ▶ During a test, the only power source for a test object may be the *CPC 100*.
- ▶ Before handling the *TD1 C-Load*, *CPC 100* or *CP TD1* in any way, connect them with a solid connection of at least 6 mm² cross-section to the substation ground.
- ▶ Keep clear from zones in which high voltages may occur. Set up a barrier or establish similar adequate means.
- ▶ Pay attention to the national and the international standards for the safe operation of high-voltage test equipment (EN 50191, IEEE 510).
- ▶ Do not insert objects (for example screwdrivers, etc.) into any input/output socket.

- ▶ Do not operate the *TD1 C-Load* under ambient conditions that exceed the temperature and humidity limits listed in 5 "Technical Data" on page 17.
- ▶ Make sure to position the test equipment on dry, solid ground.
- ▶ Do not operate the *TD1 C-Load* in the presence of explosives, gas or vapors.
- ▶ Opening the *TD1 C-Load* invalidates all warranty claims.
- ▶ If the *TD1 C-Load* does not seem to function properly, do not use it anymore. Please call the OMICRON electronics technical support.

1.2 Orderly Measures

The TD1 C-Load User Manual or alternatively the e-book in PDF format has always to be available on site where the *TD1 C-Load* is being used. It must be read and observed by all users of the *TD1 C-Load*.

The *TD1 C-Load* may be used only as described in 4 "Application" on page 13. Any other use is not in accordance with the regulations. The manufacturer and/or distributor is not liable for damage resulting from improper usage. The user alone assumes all responsibility and risk.

Following the instructions provided in this User Manual is also considered part of being in accordance with the regulations.

1.3 Disclaimer

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

2 Introduction

2.1 Designated Use

The *TD1 C-Load* is a *CP TD1* accessory for testing the functionality of the *CP TD1* device. The measuring modes **UST-A**, **UST-B** and **GST** can be used to check whether the *CP TD1* works properly prior to a measurement.

NOTICE

Equipment damage

The maximum working voltage of the *TD1 C-Load* is 1000 V AC. Higher voltages may damage the *TD1 C-Load*.

- ▶ Do not apply voltages higher than 1000 V AC.

2.2 Connectors

The *TD1 C-Load* provides the following connectors:

- 1 kV input
- LV output

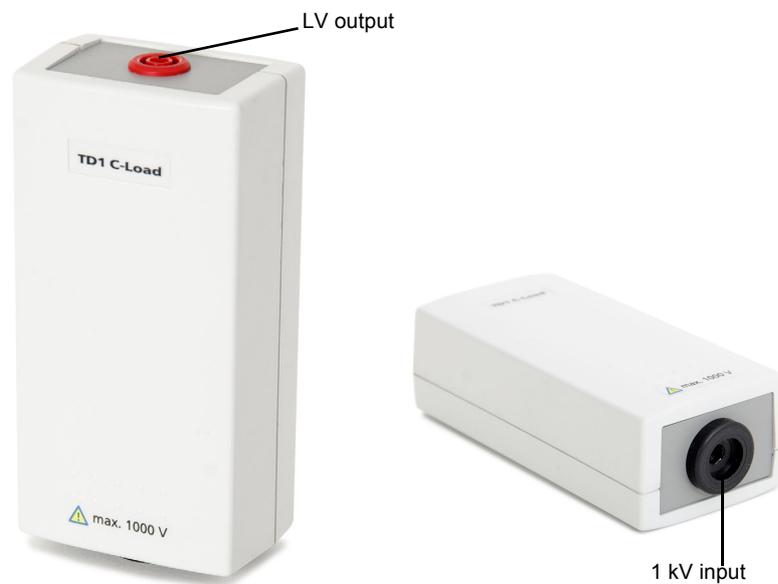


Figure 2-1 *TD1 C-Load*

3 Operation

3.1 Measurement Setup

The voltage output of the *CP TD1* is up to 12 kV. Therefore, make sure to keep the required distance and to position the device in a safe area. According to EN 50191, the required distance is 1.4 m to the test object with a barrier height of 1 m.



Figure 3-1 Measurement setup

4 Application

In this section, the application of the *TD1 C-Load* is described.

4.1 Safety Instruction for Connecting the *TD1 C-Load* to the *CP TD1*

DANGER



Death or severe injury caused by high voltage or current

- ▶ Never touch the plug of the *CP TD1* output cable when it is connected to the *CP TD1*. The plug is not insulated.

4.2 Connection

1. Press the **Emergency Stop** button on the *CPC 100* front panel. Continue with connecting only if the green warning light is on.
2. Connect the 1 kV input of the *TD1 C-Load* with the high-voltage output cable.
3. Connect the LV output of the *TD1 C-Load* with the respective measurement cable or grounding cable of the *CP TD1* as described below.
4. Place the *TD1 C-Load* behind the fence in the safe area.
5. Connect the measurement cable to the *CP TD1*.
6. Plug in the high-voltage cable to the high-voltage output of the *CP TD1*.
7. Conduct the measurement as described below.

4.3 Measurement

- ▶ Press the **I/O** (test start/stop) push-button to start the test.

Note: The red warning light on the *CPC 100* front panel indicates hazardous voltage and/or current levels at the *CPC 100* outputs (red light "I" on or flashing). If none or both warning lights are on, the unit is defective and must not be used anymore.

4.3.1 Measurement in UST-A Mode

After connecting the *TD1 C-Load* as described in 4.2 "Connection" using the red measurement cable, proceed as follows:

1. Open the **TanDelta** test card.
2. Set the voltage to maximum 1000 V.
3. Clear **Auto test points**.
4. Select measurement mode **UST-A**.

5. Start the measurement and check the measurement value. If required, save the measurement result.

4.3.2 Measurement in UST-B Mode

After connecting the *TD1 C-Load* as described in 4.2 "Connection" using the blue measurement cable, proceed as follows:

1. Open the **TanDelta** test card.
2. Set the voltage to maximum 1000 V.
3. Clear **Auto test points**.
4. Select measurement mode **UST-B**.
5. Start the measurement and check the measurement value. If required, save the measurement result.

4.3.3 Measurement in GST Mode

After connecting the *TD1 C-Load* as described in 4.2 "Connection" using the grounding cable of the *CP TD1*, proceed as follows:

1. Open the **TanDelta** test card.
2. Set the voltage to maximum 1000 V.
3. Clear **Auto test points**.
4. Select measurement mode **GST**.
5. Start the measurement and check the measurement value. If required, save the measurement result.

4.4 Disconnection

1. Reduce the output voltage to zero either using the handwheel or by setting the voltage to zero on the test card.
2. Deactivate the *CPC 100* by pressing the **I/O** (test start/stop) push-button. The green warning light indicates that the *CPC 100* outputs are not activated. As long as the red warning light is lit, there is still voltage and/or current potential on one or more of the outputs.
3. Press the **Emergency Stop** button on the *CPC 100* front panel.
4. Plug off the high-voltage cable from the high-voltage output of the *CP TD1*.
5. Disconnect the measurement cable from the *CP TD1*.
6. Remove the fence.
7. Disconnect the *TD1 C-Load*.

4.5 Troubleshooting

1. Connect the *TD1 C-Load* as shown in the following figure:



Figure 4-1 Measurement setup for checking the *TD1 C-Load* functionality

2. Measure the electric conductance, which should be $< 2 \text{ nS}$ (equals $> 500 \text{ M}\Omega$).

5 Technical Data

5.1 Specifications

Table 5-1 TD1 C-Load Specifications

Characteristic		Rating
Capacity		2.03 nF (± 0.03 nF)
Input:		
Connection		6 mm MC socket with interlock
Frequency range		50 to 60 Hz
Max. input voltage		1000 V AC/5 VA
Output:		
Connection		4 mm SI socket, red
DF (50 Hz)		0.32% (± 0.01)
PF (60 Hz)		0.27% (± 0.01)

5.2 Environmental Conditions

Table 5-2 Climate

Characteristic		Rating
Temperature	Operating	-10...+55 °C (+14...+131 °F)
	Storage and transportation	-20...+70 °C (-4...+158 °F)
Max. altitude		2000 m
Relative humidity		5...95%; no condensation Tested according to IEC 68-2-78

5.3 Mechanical Data

Table 5-3 Mechanical Data

Characteristic	Rating
Dimensions (W x H x D)	124 x 60 x 41 mm (4.9 x 2.4 x 1.6 in.)
Weight	171 g (0.4 lb)

5.4 CE Conformity and Safety Standards

Table 5-4 CE Conformity and Safety Standards

CE Conformity	
The product adheres to the specifications of the guidelines of the Council of the European Community for meeting the requirements of the member states regarding the low-voltage Directive 2006/95/EC.	
Certified Safety Standards	
Europe	EN 61010-1 (partly)
International	IEC 61010-1(partly)
USA	UL 61010-1 (partly)
Suitable for usage according to	IEEE 510, EN 50191 (VDE 0104), EN 50110-1 (VDE 0105 Part 100)

5.5 Cleaning



WARNING

Death or severe injury caused by high voltage or current possible

- ▶ Prior to cleaning disconnect the *TD1 C-Load*.
- ▶ To clean the *TD1 C-Load*, use a cloth dampened with isopropanol alcohol or water.

Support

When you are working with our products we want to provide you with the greatest possible benefits. If you need any support, we are here to assist you!



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