

TW PS300

OPERATING INSTRUCTIONS

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1 General information

Welcome to TriOS.

We are delighted that you have chosen a device from our TW Master series, the TW PS300 power supply unit. The TW PS300 is a power supply unit for connecting sensors from the TW Master series. The device has an interface module with functions such as relay output and analog 4-20 mA signal output.

In this manual you will find all the information about the TW PS300 that you need for commissioning. Technical specifications and dimensions can be found in chapter 7.

Please note that the user is responsible for complying with regional and national regulations for the installation of electronic devices. Any damage caused by incorrect use or unprofessional installation is not covered by the warranty.

All sensors and accessories supplied by TriOS Mess- und Datentechnik GmbH must be installed and operated in accordance with TriOS Mess- und Datentechnik GmbH specifications. All parts have been designed and tested according to international standards for electronic instruments. The device complies with international standards for electromagnetic compatibility. Please use only original TriOS accessories and cables to ensure smooth and professional use of the devices.

Read this manual carefully before using the device and keep it for future reference. Before using the sensor, make sure that you have read and understood the safety precautions described below. Always ensure that the sensor is operated correctly. The safety precautions described on the following pages are intended to ensure problem-free and correct operation of the device and the associated accessories and to prevent you, other persons or devices from being harmed.

NOTICE

If translations differ from the original German text, the German version is binding.

Software updates

This manual refers to HW V.1.1.4 and FW V.1.7.4 and higher. Updates include bug fixes and new functions and options. Devices with older software versions may not have all the functions described here.

Copyright notice

All contents of this manual, in particular texts, photographs and graphics, are protected by copyright. Unless expressly indicated otherwise, the copyright lies with TriOS Mess- und Datentechnik GmbH. Persons who violate the copyright are liable to prosecution in accordance with § 106 ff of the Copyright Act and will also be warned and liable to pay compensation.

1.1 Health and safety instructions

This manual contains important information on health and safety regulations. This information is marked in accordance with the international specifications of ANSI Z535.6 ("Product safety information in product manuals, instructions and other collateral materials") and must be followed. The following categories are distinguished:

⚠ DANGER

Danger / Will cause serious injury or death

⚠ WARNING

Warnings / May cause serious injury or death

⚠ CAUTION

Caution / May cause moderate injury

NOTICE

May lead to material damage



Tip / Useful information

Electromagnetic waves

Devices that emit strong electromagnetic waves can influence the measurement data or cause the sensor to malfunction. Avoid operating the following devices in the same room as the TriOS sensor: cell phones, cordless phones, transceivers or other electrical devices that generate electromagnetic waves.

1.2 Warning notices

NOTICE

TriOS does not guarantee the plausibility of the measured values. The user is always responsible for monitoring and interpreting the measured values.

1.3 User and operating requirements

The TW PS300 was developed for use in industry and science. Therefore, the target audience for operating the TW PS300 consists of technically skilled personnel at companies, sewage treatment plants, waterworks, and research institutes.

The application often requires the handling of hazardous substances. We assume that the operating personnel are familiar with the handling of hazardous substances due to their professional training and experience. In particular, the operating personnel must be able to correctly understand and implement the safety markings and safety instructions on the packaging and in the package inserts of the test kits.

1.4 Intended use

The TW PS300 is intended exclusively as a power supply for connecting sensor modules from the TW Master Series. Please refer to the technical specifications for the accessories. Any other use is considered improper.

According to current scientific knowledge, the device is safe to use if it is handled in accordance with the instructions in this manual.

NOTICE

Damage caused by improper use is excluded from the warranty.

1.5 Disposal instructions

At the end of its service life or useful life, the device and its accessories can be returned to the manufacturer (see address below) for disposal in an environmentally friendly manner. Proof of prior professional decontamination must be provided in the form of a certificate. Please contact us before returning the device for further details.

Address of the manufacturer:

TriOS Mess- und Datentechnik GmbH
Bürgermeister-Brötje-Str. 25
26180 Rastede
Rastede, Germany
Phone: +49 (0) 4402 69670 - 0
Fax: +49 (0) 4402 69670 - 20

1.6 Certificates and approvals

The product meets all requirements of the harmonized European standards. It therefore fulfills the legal requirements of the EU directives. TriOS Mess- und Datentechnik GmbH confirms the successful testing of the product by affixing the CE mark (see appendix).

2 Introduction

2.1 Product identification

All products from TriOS Mess- und Datentechnik GmbH are affixed with a product label that clearly displays the product designation.

In addition, the device features a type plate containing the following information, which allows you to uniquely identify the product:

TW PS300 type plate



The nameplate also contains the product barcode, the TriOS Optical Sensors logo and the CE quality mark.

Please note that the specifications given here are for illustrative purposes only and may vary depending on the product version.

2.2 Scope of delivery

The package includes the following components:

- TW PS300
- M12 connection cable, 1 m long
- Operating instructions
- Accessories (if applicable)

Please keep the device's original packaging in case you need to perform a return shipment for maintenance or repair.

3 Commissioning

This chapter deals with the commissioning of the power supply unit up to the first function test. Please pay particular attention to this section and follow the safety instructions to protect the product from damage and yourself from injury. The cables must be connected correctly.

3.1 Power Supply

The TW PS300 requires a safe power supply within the voltage range of 100 VAC to 240 VAC with a line frequency of 50 Hz to 60 Hz. The power supply must be protected in accordance with local safety standards. When the device is connected to a power supply, a blue LED on the cover of the TW PS300 lights up. The TW PS300 can be opened with a 2.5-mm Allen wrench.

- Fuse F1
 - 1 A, 250 V, slow-blow, 5x20 mm; Part No. 00P100009
- Fuse F2
 - 2A, 24 V, fast-acting, SMD without holder

⚠ CAUTION

The TW PS300 is shipped with a power cord intended for use in dry environments only. For outdoor use, this cord must be replaced with a suitable power cord.

⚠ DANGER

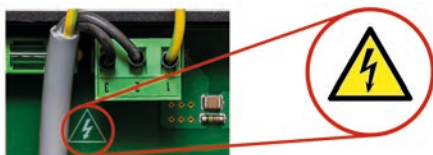
If you need to replace a defective fuse, first unplug the power cord and use only fuses of the same type. Make sure you have completely resolved the fault before putting the device back into operation.

⚠ DANGER

Danger of death from electric shock. A residual current circuit breaker (RCD) with a maximum tripping current of 30 mA must be used. For outdoor installations, a surge protector should be used.

⚠ DANGER

Disconnect the power supply before making any changes to the supply cable or plug. It is essential to verify that the circuit is de-energized and to ensure safety by securing it against accidental re-energization.



	color	Assignment
1	Green / Yellow	Protective conductor (PE)
2	Blue	Neutral conductor (N)
3	Brown	Phase (L)

⚠ DANGER

Danger of death from electric shock. Due to the unlimited voltage within the device, installation may only be performed by trained electricians who are authorized to do so based on their training. The relevant safety and VDE regulations must be observed. The device may only be opened when it is de-energized.

⚠ DANGER

If the device is permanently connected, an isolating device must be integrated into the power line. This isolating device must comply with the relevant standards and regulations. It must be installed near the device where it is accessible to the user and must be labeled as the disconnect device for the control unit. If a power cord permanently connected to the device is used, the power cord's plug can serve as a local disconnect switch.

⚠ DANGER

Use only grounded outlets to connect this device to the power supply. Check the grounding of the outlet if necessary.

NOTICE

If you are unsure whether the outlets are grounded, have a qualified electrician check them. The power plug is not only used to supply power but also to quickly disconnect the device from the power supply when necessary. This is recommended during prolonged periods of non-use and can prevent potential dangers in the event of a malfunction. Therefore, ensure that the outlets to which the device is connected are easily accessible to all users at all times.

NOTICE

Always use wire end ferrules for flexible conductors. Keep the flexible conductors short. Make the protective conductor longer than the other conductors.

The large cable gland at the bottom right is designed for jacket diameters of 5 to 10 mm.

The small cable glands are designed for jacket diameters of 3.5 to 7 mm.

⚠ WARNING

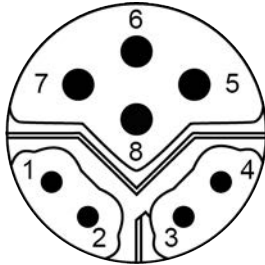
Use only a power cord whose insulation is sufficient for the line voltage and that has a protective conductor (PE). The cable cross-section must be at least 0.75^{mm²}.

⚠ WARNING

Before inserting the power cord into the TW PS300 or touching it, you must ensure that the TW PS300 is de-energized and cannot be turned back on.

3.2 Sensor Connection

The TW PS300 is equipped with an M12 hybrid connector. The interface supports RS-485 and Modbus RTU. A sensor module from the TW Master Series can be connected. Additional modules are connected to the first module. See the table below for the pin assignment.



Pin	color	function
1	White/Orange	RS-485 A
2	Orange	RS-485 B
3	White/Green	Do not connect
4	Green	Do not connect
5	Blue	Do not connect
6	White	Do not connect
7	Brown	+24 VDC
8	Black	Ground

3.3 Relays and Buzzers

The terminals for connecting the relay and an external trigger signal are located inside the TW PS300 and are accessible only when the device is open. The following sections describe how to connect the individual components.

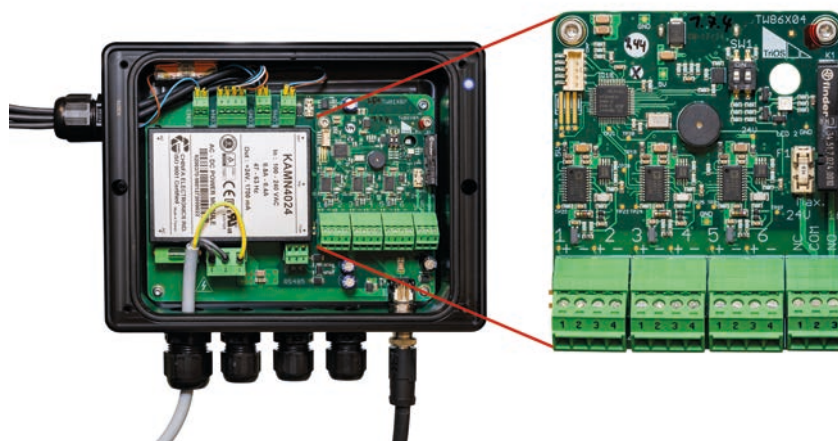
⚠ DANGER

Danger of death from electric shock! Due to the potentially high voltage inside the device, installation must only be performed by qualified professionals who are authorized to do so based on their training. The relevant safety and VDE regulations must be observed. Before opening the device, you must ensure that the power supply is disconnected and cannot be restored or turned on.

The TW PS300 features a potential-free relay changeover contact. The relay can switch small loads but should, if possible, be used only as a signal source for a power relay or a fuse. You can use the relay to implement a programmable alarm output. In this case, the relay switches when, for example, a selected measured value is exceeded or not reached.

Procedure

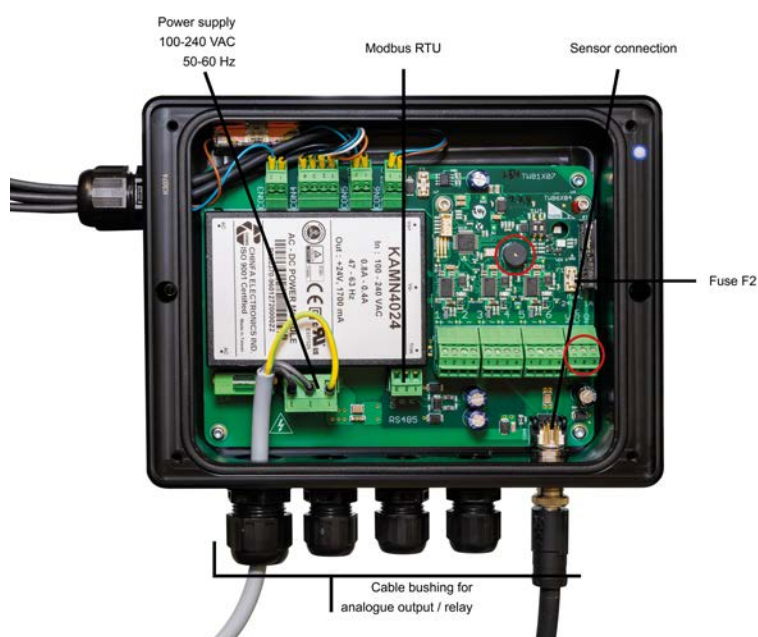
To connect the relay, open the TW PS300 and connect the corresponding wires according to the wiring diagram below.



Pin 1: Normally closed (NC)
contact
Pin 2: Changeover contact
(CO)
Pin 3: Normally Open (NO)

3.4 Analog output

The TW PS300 provides an analog output (4 .. 20 mA) for up to 6 parameter values and can be connected to a PLC or other control system. The analog output is configured in the corresponding module of the TW Master Series. The configuration is described in the corresponding manual.



NOTICE

Always use wire end ferrules for flexible conductors. Keep the flexible conductors short. Make the ground wire longer than the other wires.

The large cable gland at the bottom right is designed for jacket diameters of 5 to 10 mm.

The small cable glands are designed for jacket diameters of 3.5 to 7 mm.

⚠ DANGER

Danger of death from electric shock! Due to the potentially high voltage inside the device, installation must only be performed by qualified professionals who are authorized to do so based on their training. The relevant safety and VDE regulations must be observed. Before opening the device, you must ensure that the power supply is disconnected and cannot be restored or turned on.

NOTICE

Please note that only passive components may be connected to the analog outputs to prevent external voltage from entering. This could damage the TW PS300.

3.5 Modbus RTU

The TW PS300 can be used to communicate with the connected TW Master sensor via Modbus RTU. The Modbus communication protocol is described in the respective operating instructions for the TW Master sensor.



Pin	Assignment
1	RS-485 A
2	RS-485 B
3	Ground

The Modbus settings at the time of shipment are:

Protocol: Modbus

Hardware mode: RS-485

Baud rate: 9600

Flow control: None

Parity: None

Data bits: 8

Stop bits: 1

4 Technical data

4.1 Technical specifications

TW PS300

Application	Power supply for the TW Master System
--------------------	---------------------------------------

Interface

Digital	RS-485 (Modbus RTU)
Analog output	6x 4..20 mA
Load	Max. 500 Ohm
Connection terminals	1.5 mm ² (AWG 16)
Error indicator	0 mA

Relay	1x changeover contact 24 V, 1 A, potential-free	
Acoustic indicator	Buzzer	
Visual display	1x status LED	
LED Description	Illuminated blue	Switched on
	Illuminated blue and flashing white at the same time	Maintenance mode is activated
	Flashing red	Alarm & buzzer

Power supply	100 - 240 VAC, 50 - 60 Hz
Typical power consumption	6 W
Power consumption max.	50 W

Connection	Mains connection cable with safety plug
	1 x M20 cable gland
	3 x M16 cable gland
	1 x M12 industrial plug connector for TW Master System connection

Housing

Housing material	Housing: POM-C
-------------------------	----------------

	Front panel: Acrylic glass (PMMA)
Dimensions (L x H x D)	203 / 185 / 46 mm incl. screw connections (~ 7.99" / 7.28" / 1.81" incl. screw connections)
weight	1.4 kg (~3.09 lbs)

Operating conditions

Operating temperature	-10 to +50 °C (with pre-installed mains connection cable +5 °C to +50 °C)
Relative humidity	0 to 95 % rH (non-condensing)
Transportation conditions	Same as storage conditions

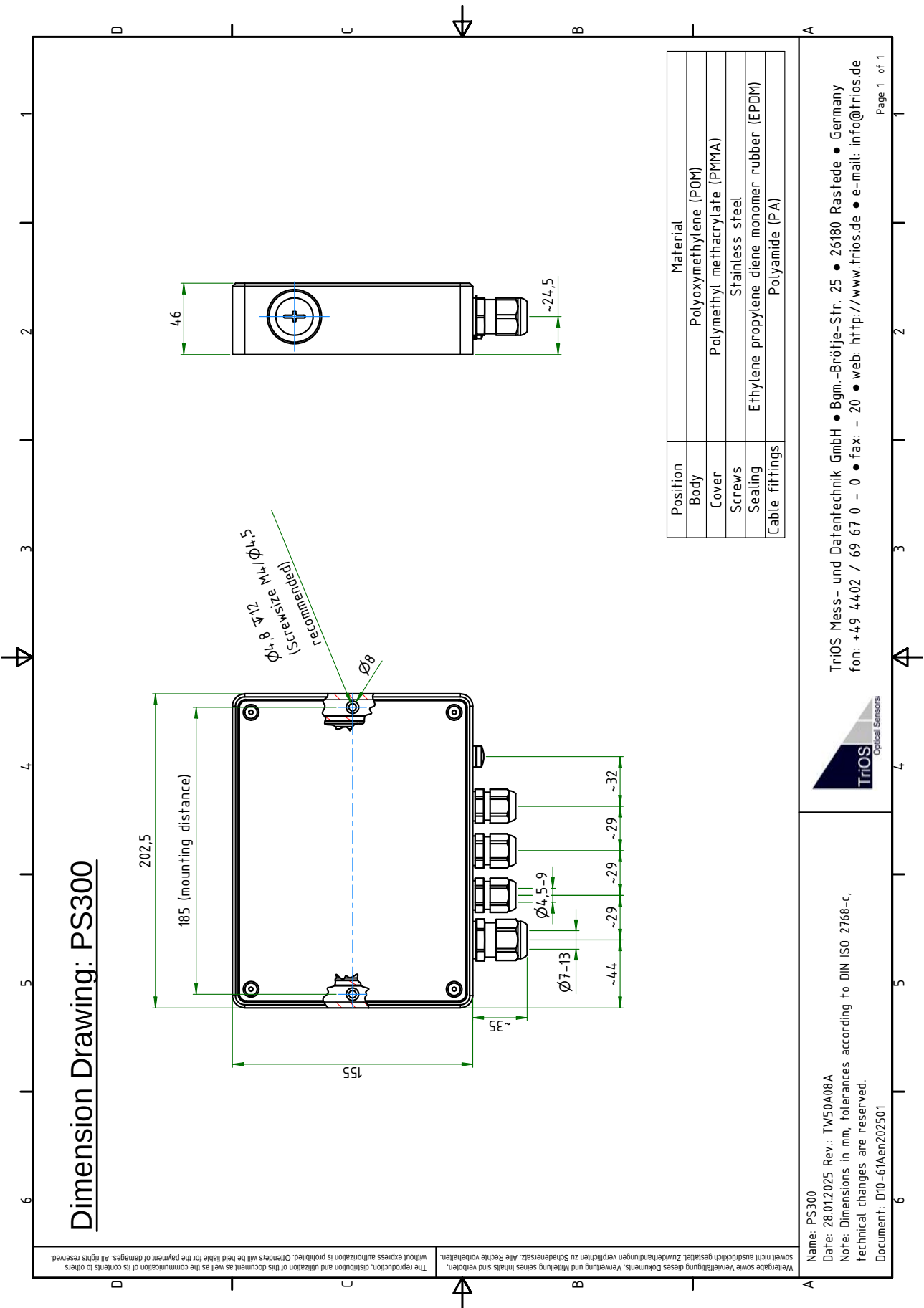
Storage conditions

Storage temperature	-20 to +70 °C
Relative humidity	0 to 95 % rH (non-condensing)

Protection class	IP64
Protection class	I
Overvoltage category	OVERVOLTAGE CATEGORY II
Pollution degree	2
Operating height	Max. Altitude 2000 m (6,561 ft)
Installation location	Indoor use only

System compatibility	TW Master series
Warranty period	1 year (EU & USA 2 years)

4.2 Outer Dimensions



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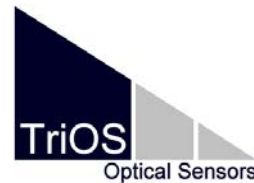
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6 Appendix

6.1 CE Declaration of Conformity



Hersteller/Manufacturer/Fabricant:

TriOS Mess- und Datentechnik GmbH
Bürgermeister-Brötje-Str. 25
D- 26180 Rastede

Konformitätserklärung Declaration of Conformity Déclaration de Conformité

Die TriOS GmbH bescheinigt die Konformität für das Produkt
The TriOS GmbH herewith declares conformity of the product
TriOS GmbH déclare la conformité du produit

Bezeichnung
Product name
Désignation

TW PS300

Typ / Type / Type

Art.Nr. 65Cx0000x

Mit den folgenden Bestimmungen
With applicable regulations
Avec les directives suivantes

2014/30/EU EMV-Richtlinie
2014/35/EU Niederspannungsrichtlinie
2011/65/EU RoHS-Richtlinie
+ (EU) 2015/863
+ (EU) 2017/2102

Angewendete harmonisierte Normen
Harmonized standards applied
Normes harmonisées utilisées

EN IEC 61326-1:2021
EN 61010-1:2010 +A1:2019
+A1:2019/AC:2019
EN IEC 63000:2018

Datum / Date / Date

Unterschrift / Signature / Signature

23.05.2024

R. Heuermann

D05-61Ade202405

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TriOS Mess- und Datentechnik GmbH
Bgm.-Brötje-Str. 25 · 26180 Rastede · Deutschland
Tel +49 (0)4402 69670-0
Fax +49 (0)4402 69670-20
info@trios.de
www.trios.de