

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.

ADVICE

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

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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

Warning / May cause serious injury or death

⚠ CAUTION

Caution / May cause moderate injury

ADVICE

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 Warnings

ADVICE

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. The target group for operating the TW PS300 is therefore technically experienced specialist personnel in companies, sewage treatment plants, waterworks and 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 unit for connecting sensor modules from the TW Master series. Please observe the technical data of 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 operating manual.

ADVICE

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 TriOS Mess- und Datentechnik GmbH products are provided with a product label that clearly shows the product designation.

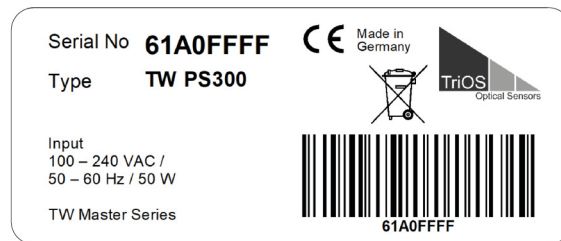
There is also a type plate on the device with the following information, which you can use to clearly identify the product:

TW PS300 rating plate

Serial number
Product type

Power supply

Interface



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 delivery includes the following components:

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

Keep the original packaging of the device for possible return for maintenance or repair purposes.

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 in the voltage range of 100 VAC to 240 VAC with a mains frequency of 50 Hz to 60 Hz. The power supply must be secured 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. TW PS300 can be opened with a 2.5 mm Allen key.

- Fuse F1
 - 1A, 250 V, slow-blow, 5x20mm; item no. 00P100009
- Fuse F2
 - 2A, 24 V, fast, SMD without holder

⚠ CAUTION

The TW PS300 is supplied with a mains cable that is only intended for use in dry environments. For outdoor use, this must be replaced with a suitable mains cable.

⚠ DANGER

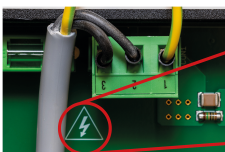
If you need to replace a defective fuse, unplug the mains plug first and only use fuses of the same type. Ensure that you have completely rectified the fault before putting the appliance back into operation.

⚠ DANGER

Danger to life due to electric shock. A residual current circuit breaker with a maximum ignition current of 30 mA must be used. Overvoltage protection should be used for outdoor installations.

⚠ DANGER

Disconnect the mains voltage before making any changes to the supply cable or plug. It is essential to check that there is no voltage and to secure it against being switched on again.



	Color	Assignment
1	Green / money	Protective earth conductor (PE)
2	Blue	Neutral conductor (N)
3	Brown	Phase (L)

⚠ DANGER

Danger to life due to electric shock. Due to the unlimited voltage in the appliance, installation may only be carried out by qualified electricians who are authorized to do so on the basis of their training. The relevant safety and VDE regulations must be observed. The appliance may only be opened when it is de-energized.

⚠ DANGER

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

⚠ DANGER

Only use earthed sockets to connect this appliance to the mains. If necessary, check that the socket outlet is earthed.

ADVICE

If you are not sure whether the sockets are earthed, have this checked by a qualified electrician. The mains plug is not only used to supply power, but also to quickly disconnect the appliance from the mains if necessary. This is recommended for longer periods of non-use and can prevent potential hazards in the event of a fault. Therefore, make sure that the sockets to which the appliance is connected are easily accessible to all users at all times.

ADVICE

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

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

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

⚠ WARNING

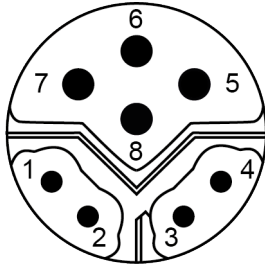
Only use a mains cable with sufficient insulation for the mains voltage and a protective earth conductor (PE). The cross-section of the cable must be at least 0.75 mm².

⚠ WARNING

Before the mains cable is inserted into the TW PS300 or touched, it is essential to ensure that the TW PS300 is disconnected from the power supply and cannot be switched on again.

3.2 Sensor connection

The TW PS300 is equipped with an M12 hybrid cable socket. The interface supports RS-485 and Modbus RTU. One sensor module from the TW Master series can be connected. Additional modules are connected to the first module. The pin description can be found in the table below.



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 Relay and buzzer

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

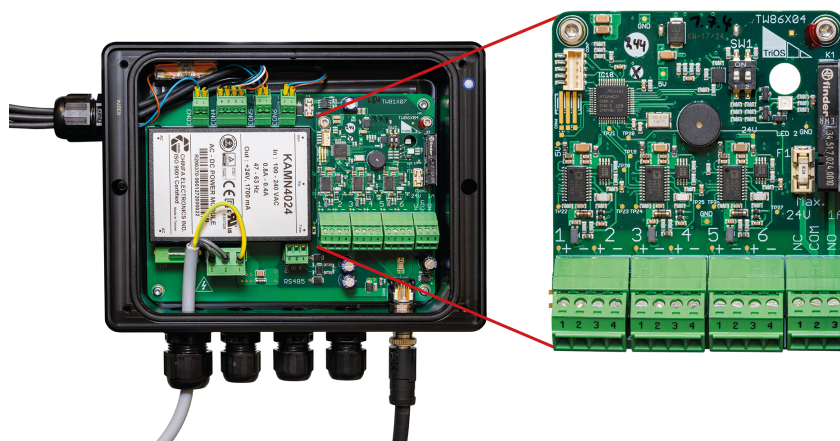
⚠ DANGER

Danger to life due to electric shock! Due to the unlimited voltage in the device, installation may only be carried out by specialists who are authorized to do so based on their training. The relevant safety and VDE regulations must be observed. Before opening the appliance, it is essential to ensure that the power supply has been disconnected and cannot be restored or switched on again.

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

Procedure

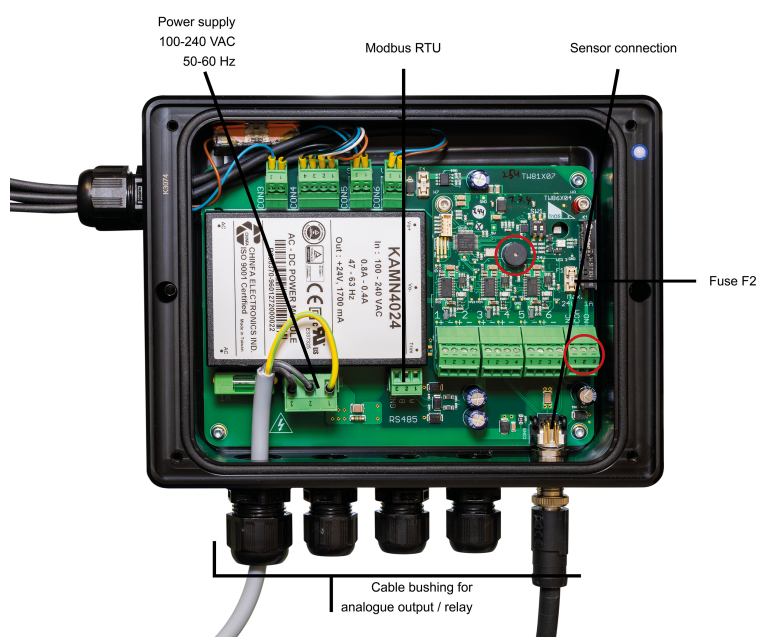
To connect the relay, open the TW PS300 and connect the corresponding wires according to the connection diagram below.



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

3.4 Analog output

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



ADVICE

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 sheath diameters of 5 to 10 mm.

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

⚠ DANGER

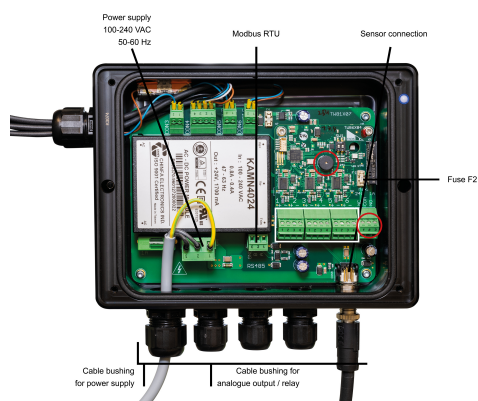
Danger to life due to electric shock! Due to the unlimited voltage in the device, installation may only be carried out by specialists who are authorized to do so based on their training. The relevant safety and VDE regulations must be observed. Before opening the appliance, it is essential to ensure that the power supply has been disconnected and cannot be restored or switched on again.

ADVICE

Please ensure that only passive components are connected to the analog outputs so that no external voltage can penetrate. 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 included 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 are as delivered:

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
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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
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	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

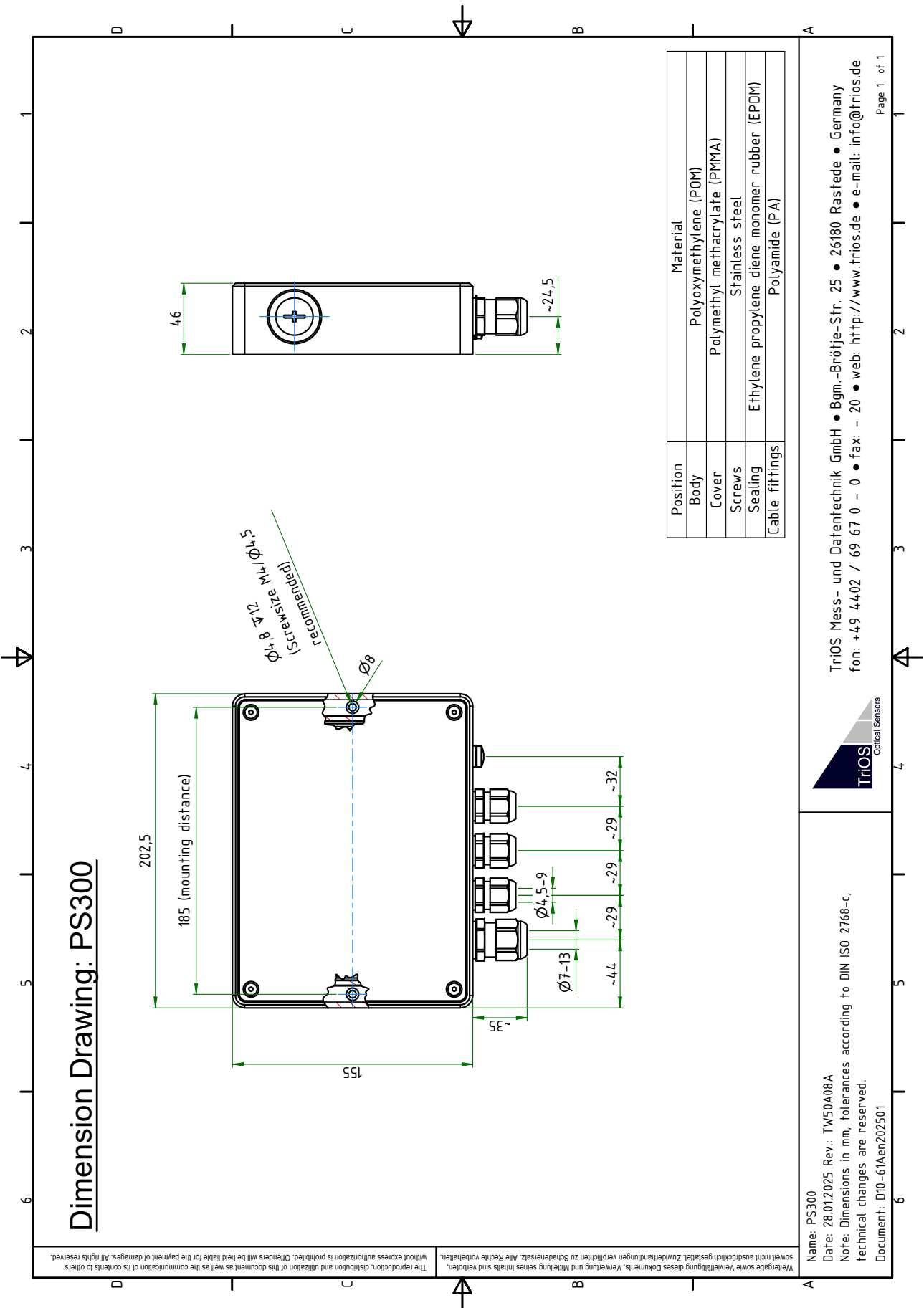
Storage conditions

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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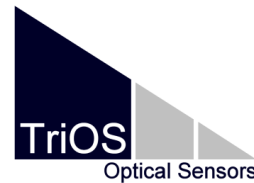
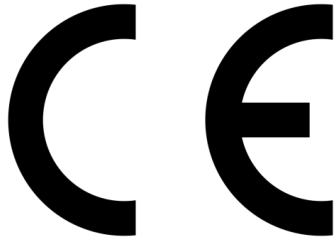
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6 Appendix

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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