



Anton Paar

Measure
what is measurable
and make measurable
that which is not.

Galileo Galilei (1564-1642)

Instruction Manual and Safety Information

Pico 3000 (RC)(Ex d)

Process Instrumentation Controller

Pico 3000 Firmware: 1.004.013 or higher

Pico 3000 Software: 1.4. or higher

(Original Instruction)

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Further information

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Instruction Manual and Safety Information

Pico 3000 (RC)(Ex d)

Process Instrumentation Controller

Pico 3000 Firmware: 1.004.008 or higher

Pico 3000 Software: 1.4. or higher

(Original Instruction)

1 Safety Instructions

- Read the documentation before using Pico 3000.
- Follow all hints and instructions contained in the documentation to ensure the correct use and safe functioning of Pico 3000.
- The documentation is a part of the product. Keep this document for the complete working life of the product and make sure it is easily accessible to all people involved with the product. If you receive any additions or revisions to the documentation from Anton Paar GmbH, these must be treated as part of the documentation.
- Do not use any accessories or spare parts other than those supplied or approved by Anton Paar GmbH.
- Make sure all operators are trained to use the instrument safely and correctly before starting any applicable operations.
- In case of damage or malfunction, do not continue operating Pico 3000. Do not operate the instrument under conditions which could result in damage to goods and/or injuries and loss of life.
- Check Pico 3000 RC housing for chemical resistance to the cleaning agents.
- Do not operate the instrument beyond its electrical, thermal and mechanical specifications.
- Do not step on the Pico 3000 RC.

1.1 General Safety Instructions

Liability

- This document does not claim to address all safety issues associated with the use of the instrument and samples. It is your responsibility to establish health and safety practices and determine the applicability of regulatory limitations.
- Anton Paar GmbH only warrants the proper functioning of Pico 3000 if no adjustments have been made to the mechanics, electronics, and firmware.
- Only use Pico 3000 for the purpose described in the documentation. Anton Paar GmbH is not liable for damages caused by incorrect use of Pico 3000.

Installation and use

- Comply with the local workplace safety regulations. Attention must be paid to all parts of a measuring system.
- Devices without an Ex-sign are **not** explosion-proof instruments and therefore must not be operated in areas with risk of explosion.
- Devices with Ex-marking are intended for use in areas with risk of explosion. Special Safety Instructions must be read and followed for installation and use (Chapter 1.2).
- The installation procedure should only be carried out by authorized personnel who are familiar with the installation instructions.

Maintenance and service

- The results delivered by Pico 3000 not only depend on the correct functioning of the instrument, but also on various other factors. We therefore recommend you have the results checked (e.g. plausibility tested) by skilled personnel before consequential actions are taken based on the results.
- Service and repair procedures may only be carried out by authorized personnel or by Anton Paar GmbH.

Disposal

- Concerning the disposal of Pico 3000, observe the legal requirements in your country.

Returns

- For repairs send the cleaned Pico 3000 (instrument) to your Anton Paar representative. Only return the instrument together with the filled out RMA (Return Material Authorization) and the form "Safety Declaration for Instrument Repairs". Please download the Safety Declaration form from our website www.anton-paar.com.
- Do not return instruments which are contaminated by radioactive materials, infectious agents or other harmful substances that cause health hazards.

1.2 Special Safety Instructions

Additional safety instructions are in the documents supplied depending on the ordered version. The additional documents are an integral part of this instruction manual. Always comply strictly with the instructions in the additional documents.

1.2.1 Operation in Hazardous Areas

This manual also provides the safety instructions, specifications and certifications of instruments designed for use in hazardous areas according to the Directive 94/9/EC (ATEX), IECEx, FM and CSA.

These instruments are marked with an Ex-sign. In areas with risk of explosion, only operate instruments marked with an Ex-sign.

By attaching the Ex-sign, Anton Paar GmbH confirms that the instruments meet the requirements of the examination certificate according to the guidelines therein (Appendix C).

It is your responsibility to ensure that the set-up, installation, commissioning, operation, maintenance and service of the measuring instrument is in full compliance with the

- Corporate, local and national regulations and electrical codes
- Data on the type plate
- Signs and Ex signs on the instrument
- Certificates (Appendix C)

Instructions given in the instruction manual and supplementary documentation.

Set-up, installation, commissioning, operation, maintenance and service of the instrument must be carried out by personnel who fulfill the following requirements:

- Be qualified for these tasks
- Be trained in explosion protection
- Be familiar with federal/national regulations (e. g. IEC/EN 60079-14)
- Be authorized by the plant owner/operator

Before beginning work, the authorized person must have read and understood the instructions in the instruction manual and the supplements to the instruction manual and in the certificates (depending on the application).

Refer to the technical specifications for the relationship between the permitted process and ambient

temperature depending on the temperature class.

Modifications on the instrument, repair works and/or change of components are not permitted.

In the event of potentially explosive gas/air mixtures, only operate the instrument under atmospheric conditions.

- Pressure: 80 to 110 kPa (0.8 to 1.1 bar)
- Air with normal oxygen content, usually 21% (V/V)

Integrate the instrument into the local potential equalization.

If the ground connection has been established via the pipe, it is also possible to integrate the instrument into the potential equalization system via the pipe.

Only open the electronics housing in a de-energized state (once a delay of 10 minutes has elapsed after switching off the power supply) or in environments which do not have a potentially explosive atmosphere.

Do not remove the USB port sealing plug in potentially explosive atmospheres. The USB connection must only be used in non-explosive atmospheres.

The plastic transport sealing plugs do not meet this requirement and must therefore be replaced during installation.

If a cable gland or conduit entry part is not used, it must be sealed by using an appropriate flameproof/explosion proof sealing plug with the plug entered to a depth of at least five threads.

If connected by a conduit entry approved for this purpose, mount the associated sealing unit directly at the housing.

In potentially explosive atmospheres:

- Do not disconnect the electrical connections (power supply, communication) when energized.
- Do not open the cover of the electronics housing when energized.

Choose the cables' diameters to ensure optimal sealing at the cable gland.

Take mechanical stress into consideration when choosing the connecting cables. Strain relief is provided by the correct assembly of the cable gland.

The specification of the connecting cables must comply with all applicable regulations for the environment of operation and with the instructions in the appropriate instruction manuals.

Only use certified cable entries and cable glands or conduits suitable for the application. Observe selection criteria as per federal/ national regulations (e.g. IEC/EN 60079-14).

Battery Replacement

Replace the battery with same battery type:

- CR1225
- Li/MnO2 Battery 3V, 48 mAh

Marking of the instrument

- ATEX: Ex II 2G Ex db IIB T4/T5 Gb
- IECEx: Ex db IIB T4/T5 Gb
- CSA/UL/FM:
 - Class I Division 1 Gr CD T4/T5
 - Ex db IIB T4/T5 Gb
 - Class I Zone 1, AEx db IIB T4/T5 Gb

1.3 Conventions for Safety Messages

The following conventions for safety messages are used in this document:



DANGER

Description of risk.

Danger indicates a hazardous situation which, if not avoided, **will** result in death or serious injury.



WARNING

Description of risk.

Warning indicates a hazardous situation which, if not avoided, **could** result in death or serious injury.



CAUTION

Description of risk.

Caution indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

Description of risk.

Notice indicates a situation which, if not avoided, could result in damage to property.

TIP: Tip gives extra information about the situation at hand.

1.4 Warning Signs on the Instrument

Pico 3000 RC

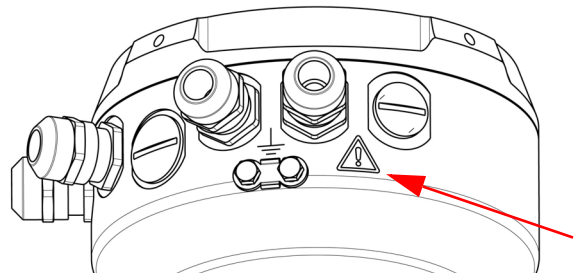


Fig. 1: Position of the warning sign on Pico 3000 RC

Pico 3000 RC Ex d

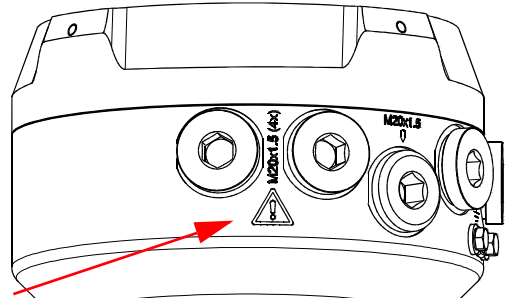


Fig. 2: Position of the warning sign on Pico 3000 RC Ex d



WARNING

Follow all warnings and cautions listed in this document.

NOTICE

Take care that the warning symbols remain clearly legible.

1.5 Special Conditions of Use



WARNING

Do not open the instrument when an explosive atmosphere may be present.

Seal all conduits within 18 inches.

In applications at an ambient temperature over 60 °C use a cable of thermal stability of its insulation no less than 90 °C.

For cable entrances use only already certified Ex d or Ex db cable glands suitable for application and rated for a minimum of 80 °C.

Unused openings must be closed by use of already certified Ex d or Ex db blind plugs suitable for application and rated for a minimum of 80 °C.

2 Pico 3000 - An Overview

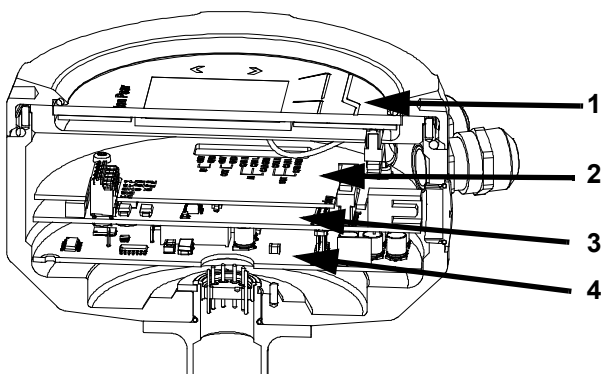
TIP: Please find detailed information on Pico 3000 in the Reference Guide available from the USB flash drive which is part of the delivery. This USB flash drive also contains other useful files such as GSD-, GSDML files needed e.g. for fieldbus integration.

2.1 General

Pico 3000 is a high-performance transmitter for the latest generation of Anton Paar Process Sensors:

- L-Dens 7000 Series
- L-Sonic 5100/6100
- L-Com 5500
- L-Rix 5000/5100/5200
- etc.

The Pico 3000 electronics board is either installed in the electronics housing of the sensor or in the Pico 3000 RC housing for remote control. Different interfaces are available for communication (Analog, Hart, PROFIBUS,)



- 1 Optional HMI 3) Pico 3000
2 Cover plate 4) Sensor board

Fig. 3: Electronics housing with Pico 3000

Features

- The modular design enables several configurations from simple analogue output to high-end utilization via fieldbus
- Integrated quality control and error management
- Calculation of the concentration of two- and three-component mixtures
- Display of real-time values and operation (e.g. offset/gain adjustments) directly at a sensor with HMI
- Simple and direct configuration of all values by a computer using the configuration software Pico 3000 Software

Benefits

- Standardized user interface for all sensors
- Higher plant availability and lower down times by data and diagnosis information
- Combination of various measurement parameters (e.g. density and sound velocity) and/or external devices (e.g. pump) by only one intelligent control unit
- Highest measurement accuracy by direct recording and compensation of influence parameters such as pressure, temperature, CO₂ etc.
- Easy integration
 - no modification of control cabinet required
 - all values and status information on site
 - no separate space for an external evaluation unit required

3 Installing the Pico 3000

Follow all instructions contained in this chapter to ensure the safe and proper function of the Pico 3000.

3.1 Installation Checklist

3.1.1 Pico 3000

1. The Pico 3000 with or without HMI is already installed in the electronics housing of the sensor or in the Pico 3000 RC housing.
2. Perform the electrical wiring according to Chapter 4 and refer to the chapter that corresponds to the transmitter version you have built in.
3. Make sure that the optional HMI has a correct connection to the Pico 3000.

3.1.2 Pico 3000 RC

1. Choose the location for installing the Pico 3000 RC depending if it is wall- or cabinet-mounted.
2. Perform the CAN wiring between sensor and Pico 3000 RC according to Chapter 5.3 .
3. Perform the electrical wiring to the PLC according to Chapter 4 and refer to the chapter that corresponds to the controller you have built in.
4. Make sure that the optional HMI has a correct connection to the Pico 3000.

3.2 Installation Requirements

Observe the requirements given in the following chapters.

- Read the Safety Instructions in Chapter 1
- Observe the technical specifications for the Pico 3000 in Appendix A.
- Devices with Ex-marking are intended for use in areas with risk of explosion. The additional safety instructions document XDPIB036EN is supplied with these devices and is to be considered as an integral part of this instruction manual. Always comply strictly with the instructions in the additional document, too.

3.3 Mechanical Installation

3.3.1 Pico 3000

The Pico 3000 is installed in the electronics housing of the sensor.

3.3.2 Pico 3000 RC

The Pico 3000 is installed in the **Pico 3000 RC** housing which is separated from the sensor and an own unit. You can mount it in different positions on walls or in a cabinet.

Find the corresponding dimensions in Appendix A.

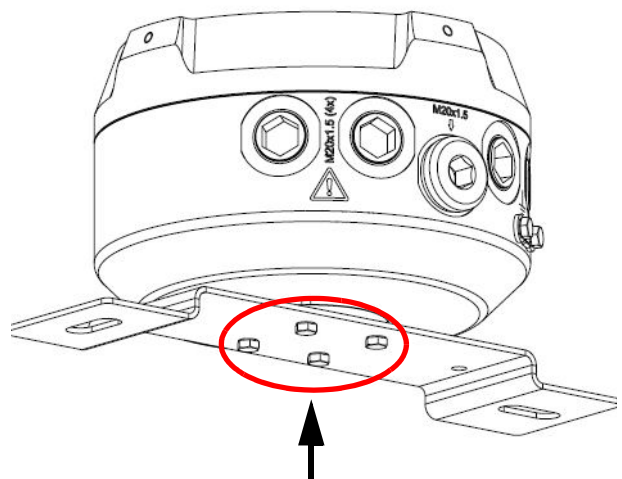


Fig. 4: Screws must be locked



WARNING

The sensor is only explosion-protected when all four screws are tightened.
All screws must be type A4-70.

3.3.3 Positioning the HMI

1. The electronics housing of the Ex version has a cover locking screw. Make sure this cover locking screw is not tightened

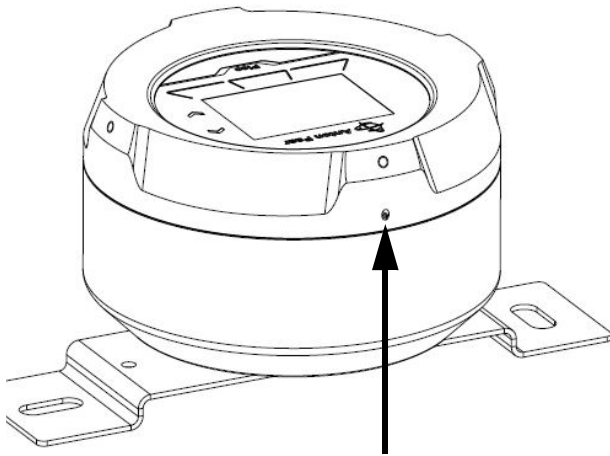


Fig. 5: Locking screw to secure the cover

2. Unscrew and remove the cover ring of the electronics housing.
3. Gently pull off the HMI.
4. Move the HMI gently and take care of the cable.
5. You can adapt the orientation of the HMI by $\pm 90^\circ$, based on the neutral position.
6. Screw on the cover ring of the electronics housing.
7. For the Ex-version of the Pico 3000: You must secure the cover ring with the locking screw.

3.3.4 Electronics Housing with Pico 3000 HMI Ex d

The cover ring and the display of the housing are parts of the explosion protection. The cover ring must be locked all the way to the stop with the delivered hook spanner. In addition, the cover ring must be secured with the locking screw (Fig. 6).

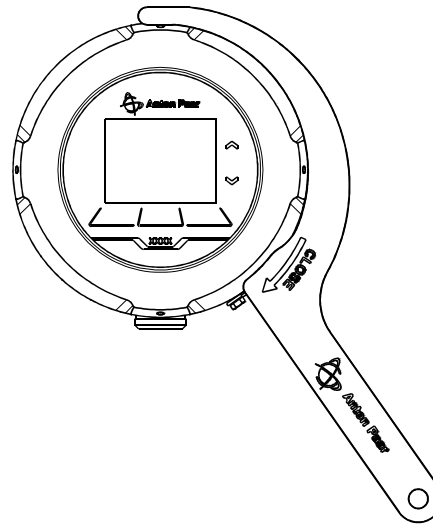


Fig. 6: Locking the cover ring with the hook spanner

4 Electrical Installation

4.1 General Information

The Pico 3000 offers several analog/digital and fieldbus interfaces.

The labeling and the cutouts of the controller cover plate depend on the installed Pico 3000.

The following Pico 3000 versions are available:

- AO/(AO Eco)/Analog (Chapter)
- Analog/Digital
- HART
- Frequency
- PROFIBUS DP
- Modbus RTU
- PROFINET IO, EtherNet/IP, Modbus TCP

Find the technical specifications for the transmitters in Appendix A.

4.1.1 Explosion Protection

The instruments marked with an Ex-type plate on the electronics housing are explosion-proof and flameproof instruments. Always comply strictly with the special safety instructions for Ex-type instruments Chapter 1.2.1 in this document.

4.1.2 Grounding

The Pico 3000 RC must be solidly grounded. If the holder is grounded, no additional grounding is necessary. If the holder is not grounded, the Pico 3000 RC must be connected to earth via the ground terminal, which is located on the housing.

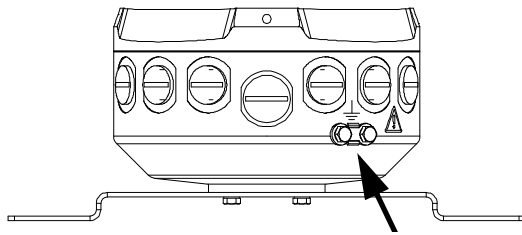


Fig. 7: Ground terminal for ground connection

4.1.3 Power Supply

It is recommended to use an insulated high quality power supply with low ripple to supply the Pico 3000. It may be supplied together with the sensor using the Anton Paar power supply. Make sure that the used power adapter is capable of providing enough current to both, the Pico 3000 and the sensor.

Refer to Appendix A for the technical specifications.

4.1.4 Cable Glands and Connectors

The electronics housing of the Pico 3000 is equipped with blind plugs, cable glands and optional plugs/connectors. Mount the blind plugs and the cable glands/connectors to the position you need them.

- Use cable glands with shield clamping.
- Make sure to position the cable glands or plugs at the bottom and tighten them properly.
- Make sure the cable is mounted with a loop to avoid water ingress.

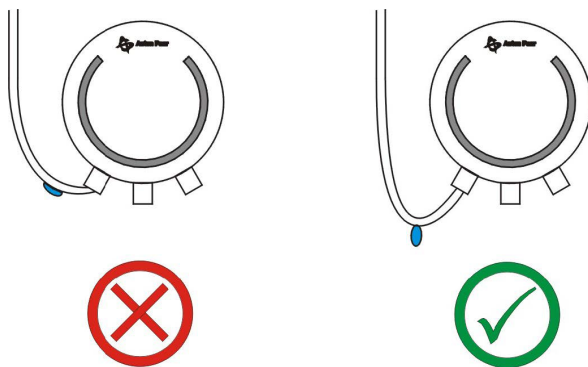


Fig. 8: Cable inlet

The central entry in the electronics housing is a port to the USB connector and cannot be used to wire the sensor.

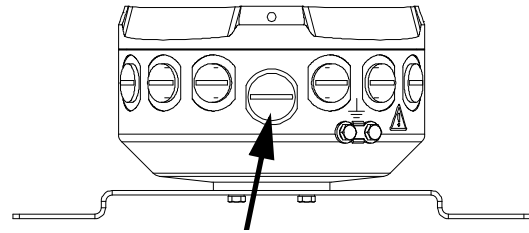


Fig. 9: USB connection

4.1.5 Cable Glands and Sealing Plugs for Ex d Housing

In addition to the requirements given in Chapter 1.5 "Special Conditions of Use" and Chapter 4.1.4 "Cable Glands", the thread of any cable gland and sealing plug must not protrude into the electronics housing.

The maximum permitted thread length L depends on the thickness of the seal when mounted, as shown in Fig. 10.

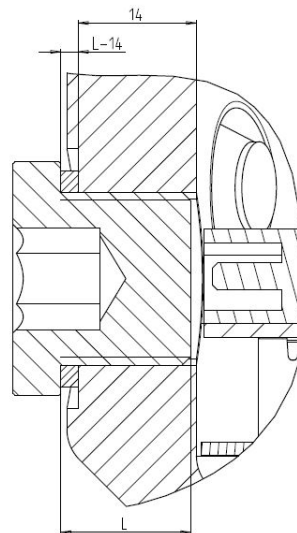


Fig. 10: Dimensions of thread

4.1.6 Cables and Preparation



WARNING

- The connecting cables must correspond to the local ambient conditions and the national regulations.
- Take mechanical stress into consideration when choosing the connecting cables.
- Choose the cables' diameters to ensure optimal sealing at the cable gland.
- Strain relief is provided by the correct assembly of the cable gland.
- Only use shielded cables.
- If connectors/plugs are used instead of cables glands, make sure that the connectors including cable are rated IP 67.

Recommended cables (non Ex-version):

Power supply	
Suggested cable type	LiYCY Shielded 2 pole cable
Wire cross section	min. 0.34 mm ² , max. 1.5 mm ² without wire end ferrule; max.0.75 mm ² with wire end ferrule
Diameter of cables	4.5 to 10 mm to ensure optimal sealing against the cable gland

CANopen	
Cable type	CANopen/DeviceNet cable 120 Ω impedance shielded twisted pair
Wire cross section	min 0.25 mm ² , max. 1.5 mm ² without wire end ferrule; max. 0.75 mm ² with wire end ferrule
Diameter of cables	4.5 to 10 mm to ensure optimal sealing against the cable gland
Max. length	250 m

Cable preparation

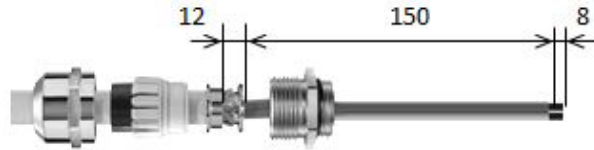


Fig. 11: Cable preparation

The L-Rix 5000 Transmitter always comes with a Pico 3000 Analog, no HMI.

4.2 Pico 3000 Frequency

Overview

The Pico 3000 Frequency is designed to transfer measuring data to a flow computer.

As a flow computer is equipped with different input interfaces such as a frequency input, a current input, a Pt100 input, check the electrical specifications of your flow computer interfaces before you start the installation.

The Pico 3000 Frequency has an analog output and a frequency output. It is only available for L-Dens 7000 density sensor series.

The following measuring values can be assigned to the frequency output:

- Density at process temperature
- Period of the U-tube

4.2.1 Wiring the Analog Output - AO

The analog output is an active galvanically isolated 4 to 20 mA interface.

The cable length is limited by the maximum load resistance of 500 Ω.

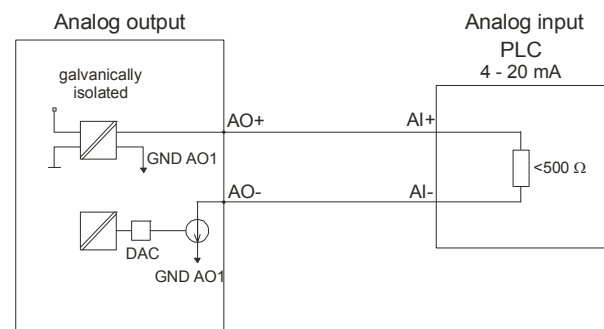


Fig. 12: Block diagram of an analog output

Assign the measurement value and scale the analog output.

4.2.2 Wiring the Frequency Output

The frequency output is a passive interface that has to be supplied by the flow computer or an external DC 24V power supply. It is able to modulate the loop current with measuring data (default channel: process density).

The low level current is 2 mA.
The high level current is 20 mA.

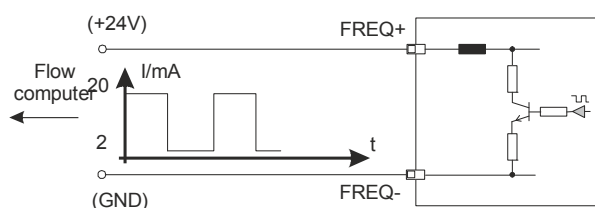


Fig. 13: Frequency modulation

Depending on the flow computer you use, perform one of the following installations.

1. Flow computer with internal power supply

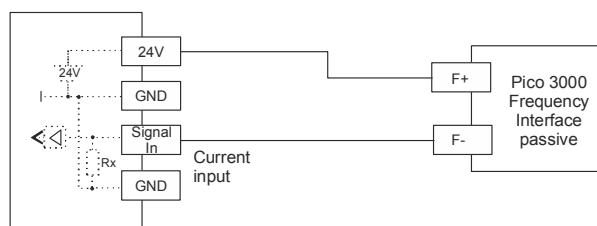


Fig. 14: Flow computer with internal power supply and current input

2. Flow computer with external power supply and current input

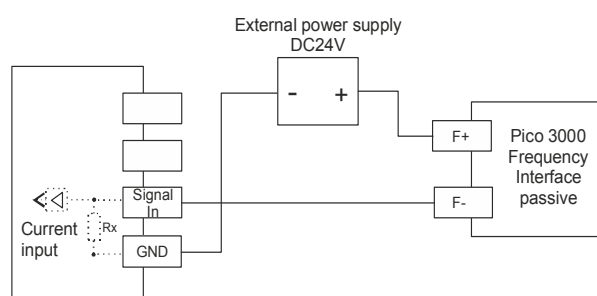


Fig. 15: Flow computer with external power supply

3. Flow computer with external power supply and voltage input

If your flow computer has got a voltage input, you have to connect an external shunt-resistor (R_x). The value of the resistor depends on the input trigger threshold of the interface.

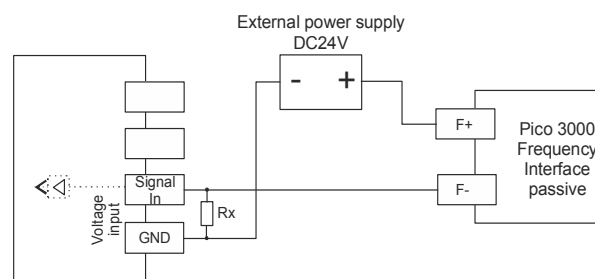


Fig. 16: Flow computer with external power supply and voltage input

4.3 Pico 3000 Version PROFIBUS DP

4.3.1 Wiring the Relay Output

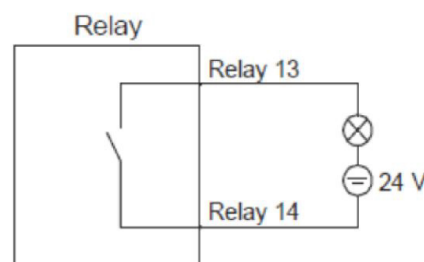


Fig. 17: Block diagram of the relay output

4.3.2 Wiring PROFIBUS

The non-Ex version of Pico 3000 PROFIBUS is delivered with a standard M12 socket.

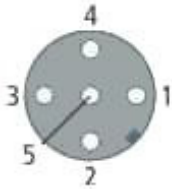


Fig. 18: M12 socket pin assignment

- 1 Pin 1: +5VDC
- 2 Pin 2: Data line A ("D-")
- 3 Pin 3: GND
- 4 Pin 4: Data line B ("D+")
- 5 Pin 5: Shield

TIP: Pin 1 (DC +5 V) and pin 3 (GND) are only needed for active termination plugs. In most applications pin 2 and pin 4 and the pin 5 (shield) are sufficient.

Table 1: Wiring parts PROFIBUS

Symbol	Pcs	Description	Mat.No.
	1	Female connector M12 715, 5 pole B-Cod. (For PROFIBUS input)	17043
	1	T-fitting PROFIBUS DP	79478
	1	Male connector M12 715 5, pole B-Cod. (for PROFIBUS output)	17044

4.3.2.1 Pico 3000 is the last Device in the Bus

Turn on the termination as shown in Fig. 19, if Pico 3000 is the last device in the bus.

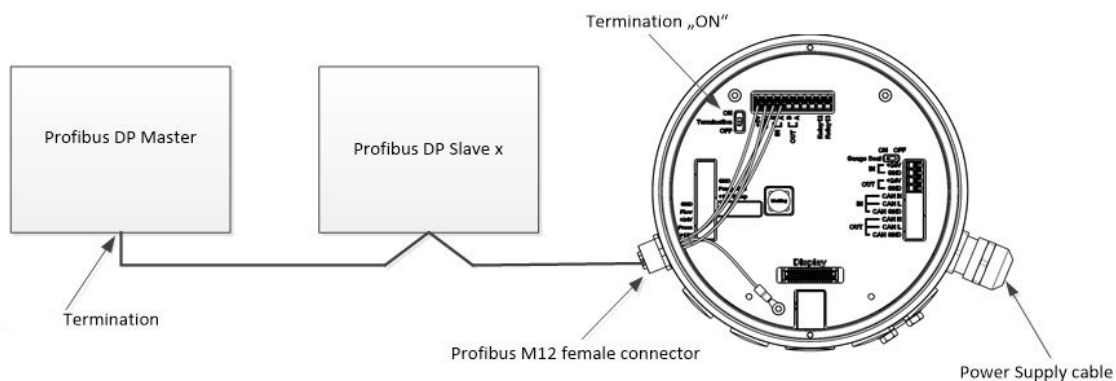


Fig. 19: Pico is the last device in the bus

4.3.2.2 Pico 3000 is not the last Device in the Bus

Turn off the termination as shown in Fig. 20, if Pico 3000 is not the last device in the bus.

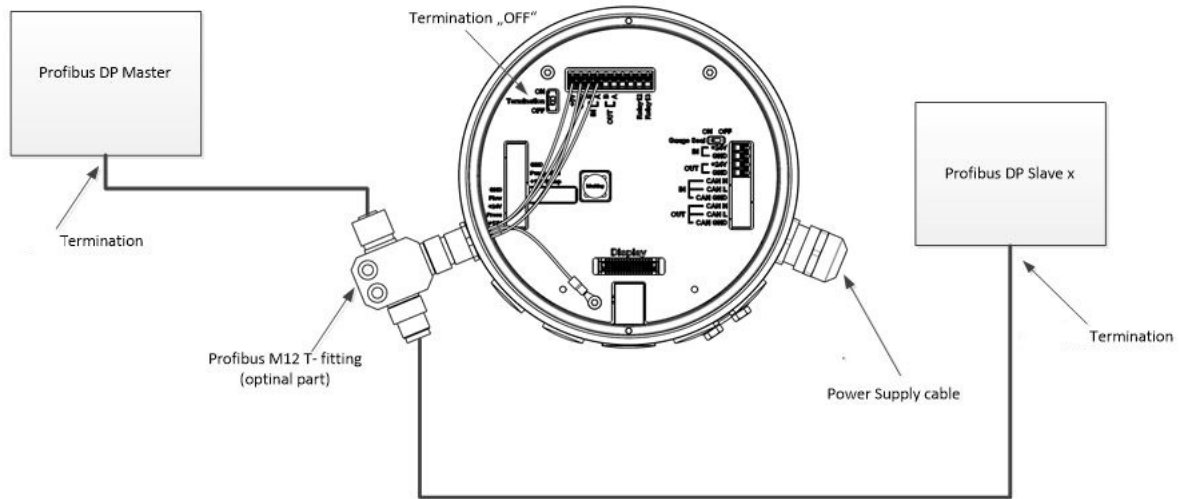


Fig. 20: Pico is not the last device in the bus

4.4 Pico 3000 Version Modbus RTU

4.4.1 Wiring Modbus

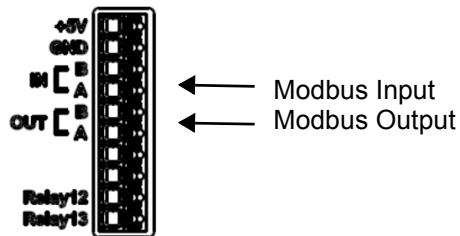


Fig. 21: Wiring Modbus

The Relay is not available with Pico 3000 Modbus!

TIP: The Modbus RTU interface (RS485) is galvanically isolated and therefore the 2 wires A/B are sufficient for the bus wiring. The "A" pin may be labeled "D-" and the "B" pin may be labeled "D+".

4 Electrical Installation

4.4.1.1 Pico 3000 is the last Device in the Bus

If Pico 3000 is the last device in the bus, the termination must be turned on.

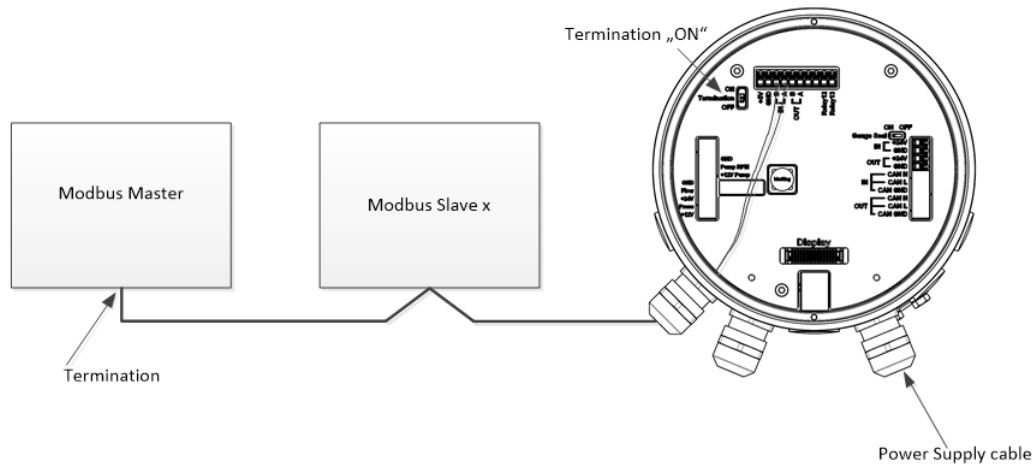


Fig. 22: Pico 3000 is the last device in the bus

TIP: Use the terminals marked with "IN".

4.4.1.2 Pico 3000 is not the last Device in the Bus

If Pico 3000 is not the last Device in the bus, the Termination must be turned off.

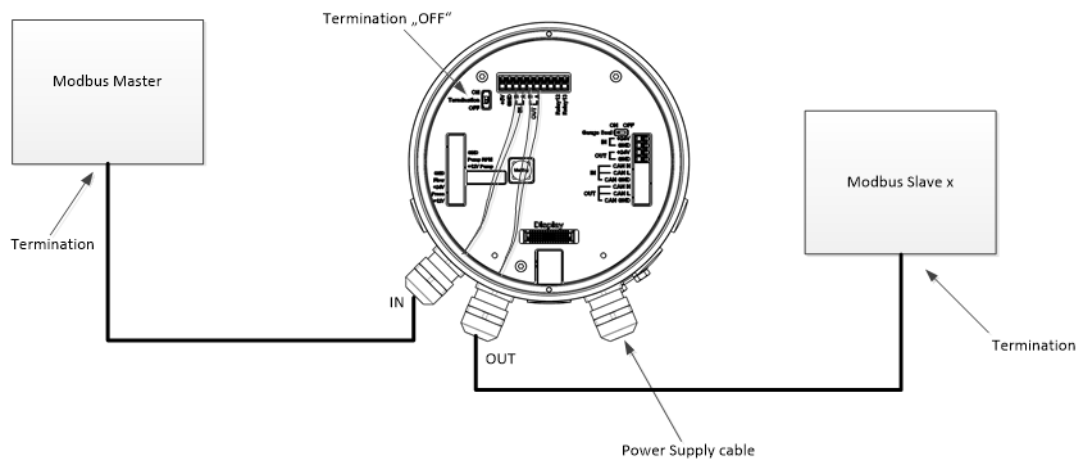
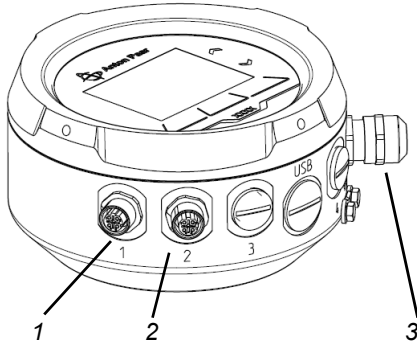


Fig. 23: Pico 3000 is not the last device in the bus

4.5 Wiring PROFINET IO, EtherNet/IP and Modbus TCP

The non-Ex version of Pico 3000 Version PROFINET IO, EtherNet/IP or Modbus TCP is delivered with 2 female M12 D-coded sockets. Each (port 1 and port 2) is already mounted into the housing:



- 1 Port 1
- 2 Port 2
- 3 Power supply

Fig. 24: PROFINET IO, EtherNet/IP and Modbus TCP wiring

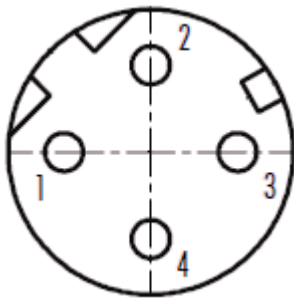


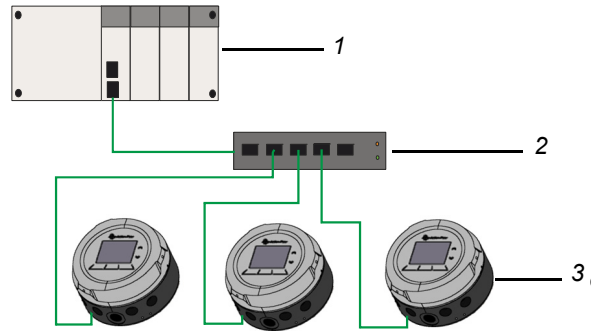
Fig. 25: 4-pole female M12 D-coded socket with wires (front view); pin assignment as in the following table:

	PROFINET IO, EtherNet/IP and Modbus TCP
Pin 1	Tx +
Pin 2	Rx +
Pin 3	Tx -
Pin 4	Rx -

Pico 3000 Version PROFINET IO, EtherNet/IP and Modbus TCP in Ethernet Networks.

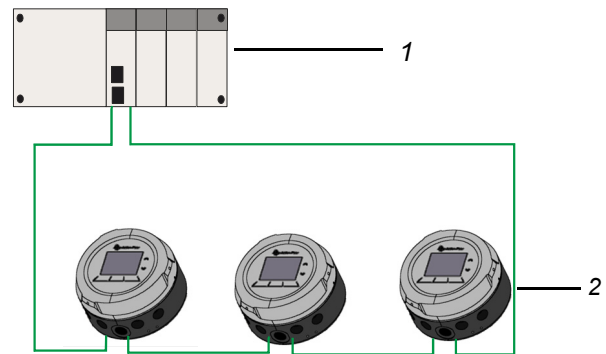
You can install each Pico 3000 Version PROFINET IO, EtherNet/IP and Modbus TCP in star, ring, or daisy-chain networks using industrial-rated CAT5 Ethernet cables:

- Make sure that the cable is not longer than 100 meters.
- Connect the Pico 3000 to the host system via a LAN (Local Area Network) and not a WAN (Wide Area Network).



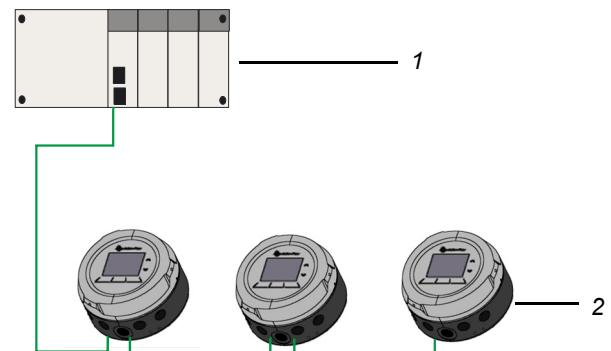
- 1 PLC
- 2 Switch
- 3 Pico 3000

Fig. 26: Star topology



- 1 PLC
- 2 Pico 3000

Fig. 27: Ring topology (if supported by PLC, otherwise a switch/router is needed)



- 1 PLC
- 2 Pico 3000

Fig. 28: Daisy chain topology

5 Troubleshooting

This chapter describes possible problems with the sensor, possible causes for a problem and how to solve it.

A problem can be caused by Pico 3000, by the sensor (L-Dens 7000, L-Sonic, ...) or by operating conditions which are outside specification.






CAUTION

Risk of injury and damage to property

Maintenance and service work must only be carried out by trained and authorized personnel.

Table 5-1: Possible sensor states according to NAMUR NE 107

Icon	Condition	Description	Reset
	Normal operation	---	---
	Out of specification Warning	A sensor parameter is outside the specification, but the sensor still works and provides a measuring value. The measuring value may be out of specification.	Warnings disappear automatically when the condition causing the warning is removed.
	Error	Sensor failure. The measurement is stopped. Affected parameters are displayed as "invalid". Affected data output channels are set to defined error states.	Error messages remain on the display until the cause for the error is removed and the sensor is reset.

According to the recommendations of NAMUR NE 107, deviations from normal sensor operation are classified as "out of specification" (Warning) and "failure" (Error). The sensor state is indicated by the symbol on the quick access menu bar (see table 5-1 and Fig. 29).

Pico 3000 provides the following means to obtain information about warnings and errors:

- Errors screen on the sensor display (if display available) (see Chapter 5.1)
- Internal logging (see Chapter 5.2)
- Data interface (Sensor state information)

You get a list of all warnings and errors which are currently present. Each entry consists of:

- Type
- Code
- Description

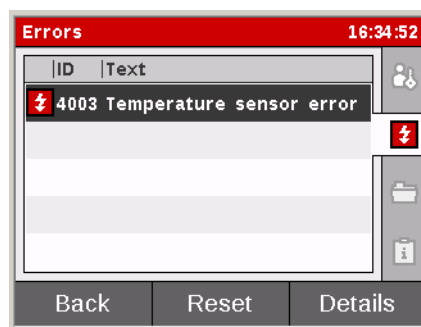


Fig. 29: Errors screen

5.1 Errors Screen

Information about warnings and errors is displayed on the Error screen. Therefore proceed as follows:

1. Select the Sensor state icon on the Quick access menu bar.
2. Press <Errors> to open the Error screen (Fig. 29).

Find a history of past warnings and errors in the Error Log (see Chapter 5.2.2).

To obtain further information about an error or warning, select the message with the up and down keys and press <OK>. A popup text window will appear on the screen.

5.2 Logging

Pico 3000 provides three types of logging.

5.2.1 System Log

A system log entry is generated upon the following events:

- Any (confirmed) change of the configuration
- Error request
- Firmware update
- Change of Application / Product

Each system log entry consists of:

- Time stamp
- Message

5.2.2 Error Log

An error log entry is generated when

- a warning or error state occurs
- a warning gets automatically deleted
- an error gets reset by the user

Each error log entry consists of

- Error code
- Source of Error (Pico 3000 or the connected sensor)
- Timestamp of error occurrence
- Timestamp of error reset

The error log stores a maximum of 50 entries. You can configure two different storage modes (see Pico 3000 configuration, Chapter 5.1).

- Ring storage: When 50 entries are already stored, the oldest entry gets automatically deleted when a new entry is stored.
- Freeze contents: After 50 entries are stored, no new entry is stored any more.

5.2.3 Data Log

For diagnosis purpose in case of problems with the sensor, measured parameters can be stored directly in the Pico 3000 data memory. The parameters can be

- measured and calculated sample parameters and
- parameters of the sensor (e.g. electronics temperature).

The data log cannot be used for continuous data recording.

The data are stored in a ring buffer. A maximum of 100000 data sets can be stored, each set can contain a maximum of 10 parameters. The actual number of storable data sets depends on the number of logged parameters and the logging interval. With the maximum number of parameters and the minimum logging interval (1 s), the data of the past 24 hours are available.

The specific parameters that are stored depend on the active application. Each application has a changeable set of parameters which are logged.

The logging interval can be set to 1 to 60 s. The interval is not application specific and can be configured via the Pico 3000 and the Pico 3000 Software.

Each data log entry consists of:

- time stamp
- parameter 1
- parameter2
- ...
- parameterN
- with N=1..10

The contents of the data log can be read out with the Pico 3000 Software. The data cannot be displayed on the sensor.

5.3 Sensor Output In Case Of Out-of-Specification And Error Condition

The information about warning- and error-states which can be obtained through the data interface depends on the type of interface.

5.3.1 Analog Output Signal For Out-of-Specification and Error Conditions

Condition	Code*	Output
Error	various	The error current can be selected in the menu "System Setup > Analog Outputs" . You can select between 2/3.6/4/22 mA
Channel not found or NaN	23x2	4 mA on affected AO
Measured value below specified range	23x0	Regular output to 3.8 mA, then output current fixed at 3.8 mA. Measurement values are shown down to 3.8 mA. When the values fall below this limit, the output will be 3.8 mA.
Measured value above specified range	23x1	Regular output to 20.5 mA, then output current fixed at 20.5 mA. Measurement values are shown up to 20.5 mA. When the values exceed this limit the output will be 20.5 mA.

* x...0 or 1, depending on the affected AO

5.3.2 Bus Interface Information For Out-of-Specification Conditions

In case of a warning or error, the value of the NAMUR state parameter is set and the error code is stored in the error code parameter.

The commands to read these values are described in the command list for the respective interface.

5.4.2 Reset Via Fieldbus Interface

The method for reset via the fieldbus interface depends on the Pico 3000 version.

Transmitter type	Command
Pico 3000 HART	HART reset command: Command 42

TIP For all other fieldbus models there is no reset command implemented.

5.4 Resetting the Sensor After Errors

You can reset the sensor in several ways as described below.

5.4.1 Manual Reset With the Human Machine Interface

Reset Pico 3000 and the sensor as follows:

1. Log in as User/Administrator/Service.
2. Switch to the Main screen.
3. Press <Errors> to show the Errors screen.
4. Press <Reset>.

5.4.3 Manual Reset via Pico 3000 Software

It is possible to reset errors via the Pico 3000 Software as well.

Go to menu "Edit > Service > Reset Errors"

5.5 Checksum for Certain Sensors (L-Dens, ...)

Certain versions of the L-Dens (Firmware/Hardware) are certified according to OIML. Among other details the OIML certificate specifies the firmware and a corresponding checksum to make sure that the sensor at hand is equipped with the correct firmware.

The Firmware Checksum can be called up via the HMI in the 'Info' screen.

Appendix A: Technical Specifications

Appendix A.1: General Technical Specifications

Table A-1: Ambient conditions non-Ex version

Temperature Pico 3000 with:	All versions except PROFINET IO	PROFINET IO
L-Dens 7000		
without Pico 3000	-40 to 70 °C	
with Pico 3000	-40 to 70 °C	-40 to 60 °C
with Pico 3000 and HMI	-20 to 60 °C	-20 to 60 °C
L-Sonic 5100/6100, L-Com 5500		
without Pico 3000	-25 to 65 °C	
with Pico 3000	-25 to 55 °C	-25 to 50 °C
with Pico 3000 and HMI	-20 to 55 °C	-20 to 50 °C
L-Rix 5100/5200*		
without Pico 3000	-25 to 60 °C	
with Pico 3000	-25 to 55 °C	-25 to 50 °C
with Pico 3000 and HMI	-20 to 55 °C	-20 to 50 °C
Temperature Pico 3000 RC housing (Ex d)	-20 to 60 °C	
Temperature Class Pico 3000 Ex d housing	T1 to T5	
Humidity	0 to 90 % rH (non-condensing)	
Degree of Protection	IP 65 / 67 (Pico 3000 RC Ex d: IP66)	
Pollution degree	2	

*) For L-Rix 5000 Transmitter the second line "with Pico 3000" applies.

Table A-2: Electrical specifications

Supply voltage	DC 24 V (range DC 20 - 28 V)
Power consumption	max. 3 W
Clamping terminals	Push-in spring connection 0.2 to 1.5 mm ² / AWG 24 to 16
Cable gland type (optionally supplied)	M16x1.5 EMC cable glands, metric, earthing cones acc. to DIN 89345, brass nickel-plated for cable OD 4.5 to 10 mm
Recommended type ATEX	M 20x1.5, shielded 1/2" - 14 NPT, shielded
Max. clock deviation (at 25 °C)	±1.735 s/day or 0.2 min/week
Cables (not supplied)	The cables must comply with the intended area of use, the cable gland type and the relevant national regulations and requirements.
Voltage supply cable	<u>Suggested cable type:</u> LiYCY, shielded 2 pole <u>Wire cross section:</u> min. 0.34 mm ² , max. 1.5 mm ² without wire end ferrule; max. 0.75 mm ² with wire end ferrule <u>Diameter of cables:</u> 4.5 to 10 mm to ensure optimal sealing against the cable gland
CANopen cable	<u>Cable type:</u> CANopen/DeviceNet cable 120 Ω impedance, shielded twisted pair <u>Wire cross section:</u> min. 0.20 mm ² , max. 1.5 mm ² without wire end ferrule; max. 0.75 mm ² with wire end ferrule
The device has functional isolation for max. DC 30 V. Protection against potentially hazardous touch current must be ensured by the customer in accordance with local regulations.	

Input and Output Specifications

All in- and outputs (including relay outputs) connected to Pico 3000 have to comply with PELV (protective extra-low voltage) of EN61140 or SELV specification of EN60950.

Appendix A.2: Dimensions and Weight of the Pico 3000 RC

179379 Pico 3000 RC remote control housing Version wall mounting with TFT-display

Weight

2.9 kg

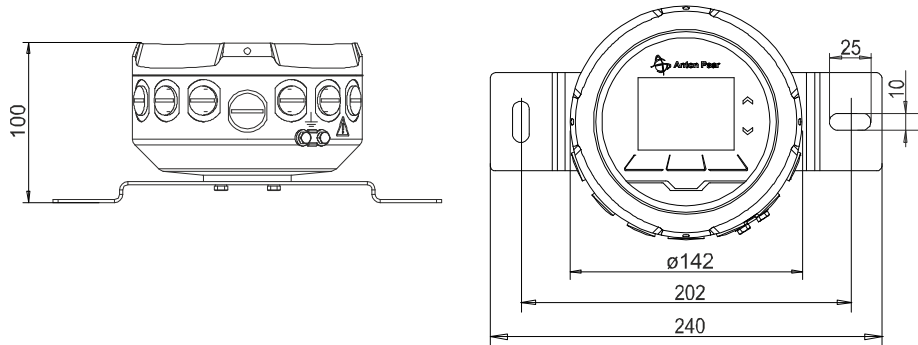


Fig. A-1: Dimensions Pico 3000 RC

179380 Pico 3000 RC Ex d remote control housing Version wall mounting with TFT-display**191812 Pico 3000 RC NPT Ex d remote control housing Version wall mounting with TFT-display**

Weight

2.4 kg

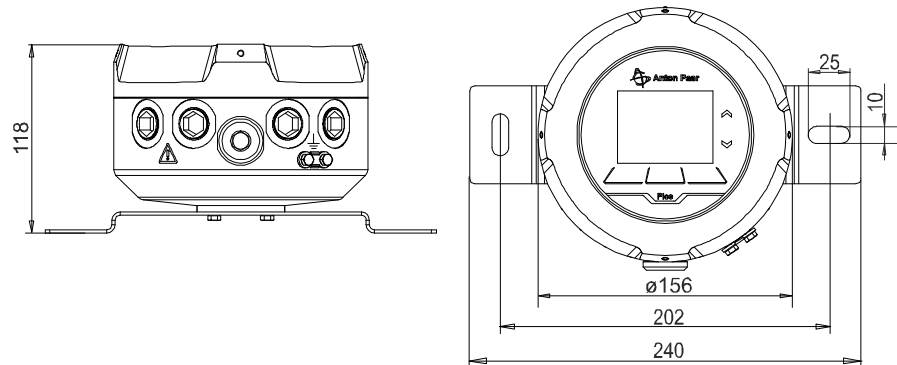


Fig. A-2: Dimensions Pico 3000 RC Ex

179382 Pico 3000 RC remote control housing Version cabinet mounting with TFT-display	
Weight	2.4 kg

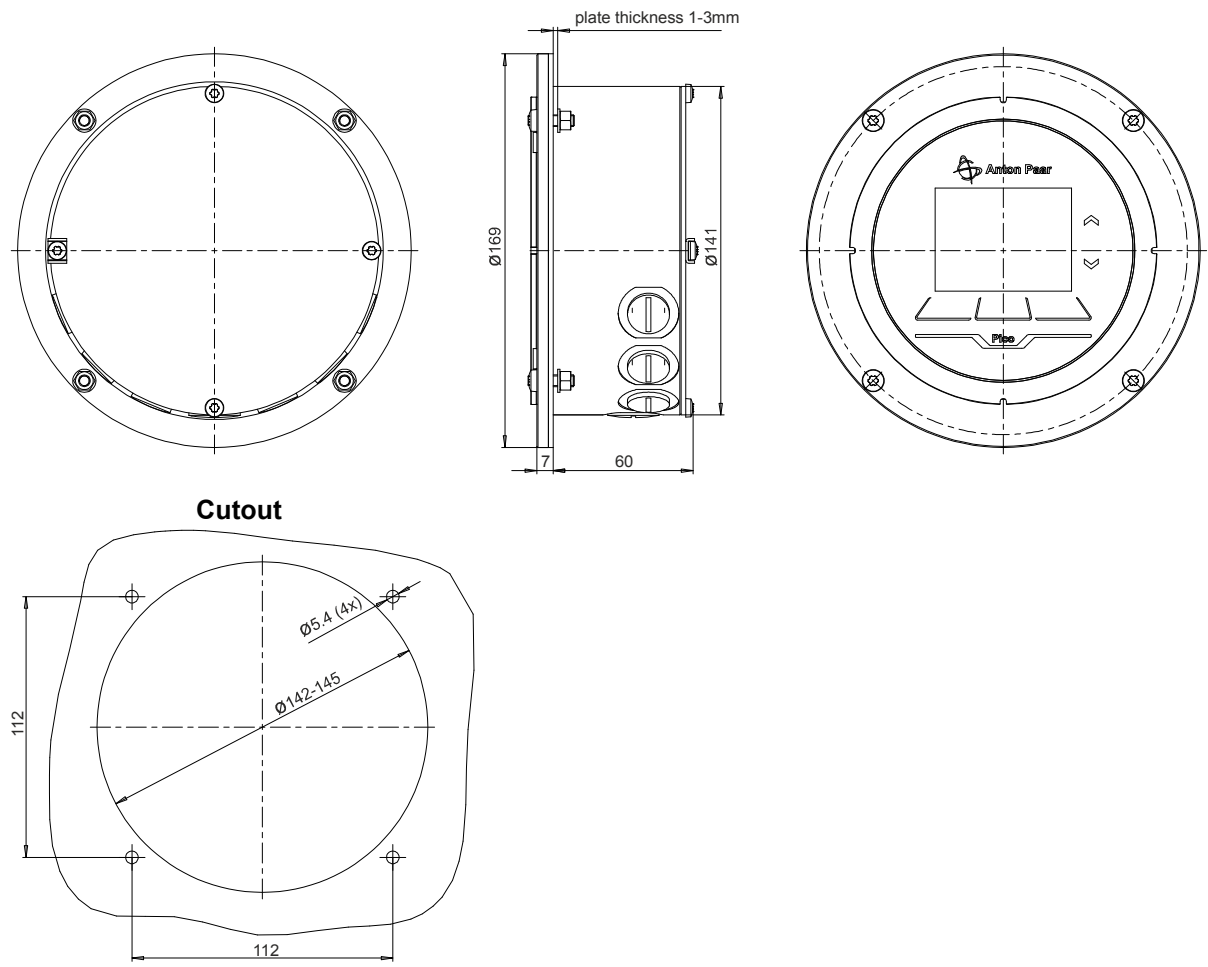


Fig. A-3: Dimensions Pico 3000 RC Cabinet Mounting

Appendix A.3: I/O Overview

Table 2: Input and output interfaces

Transmitter type	Analog Out	Analog In	Digital In	Relay	Frequency	HART	Fieldbus
Analog/Digital	2	1	5	1	-	-	-
AO*	2	1	2	1	--	--	--
Analog (AO Eco)**	2	--	--	--	--	--	--
Frequency***	1	--	--	--	1	--	--
HART	1	--	--	--	--	1	--
Modbus RTU	--	--	--	--	--	--	1
PROFIBUS DP	--	--	--	1	--	--	1
PROFINET IO	--	--	--	--	--	--	1
EtherNet/IP							1
Modbus TCP							1

* replaced by version Analog/Digital

** renamed AO Eco (as of September 2018). L-Rix 5000 Transmitter is equipped with this Pico 3000 version.

***Only available in combination with L-Dens 7000 Density Sensor Series

Appendix B: Label on Pico 3000 RC Ex d



Fig. 30: Label

Appendix C: Certificates

Appendix C.1: EU Declarations of Conformity

EU Declaration of Conformity (original)



The Manufacturer **Anton Paar GmbH**, Anton-Paar-Str. 20, A-8054 Graz, Austria – Europe hereby declares that the product listed below

Product designation: **Pico 3000 RC WALL MOUNTING
Pico 3000 RC CABINET MOUNTING**

Model: **Pico 3000 RC**

Material number: **179379, 179382**

is in conformity with the relevant European Union harmonisation legislation. This declaration of conformity is issued under the sole responsibility of the manufacturer.

Electromagnetic Compatibility (2014/30/EU, OJ L 96/79 of 29.3.2014)

Applied standards:

- EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
- EN 61326-2-3:2013 Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 2-3: Particular requirements – Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning

The product is classified as a class A equipment and is intended for the use in industrial area.

Low Voltage Directive (2014/35/EU, OJ L 96/357 of 29.3.2014)

Applied standards:

- EN 61010-1:2010 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements
- EN 61010-2-201:2013 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-201: Particular requirements for control equipment

RoHS Directive (2011/65/EU, OJ L 174/88 of 1.7.2011)

Place and date of issue: Graz, 2019-02-15

Ing. Peter Kettisch
Executive Director
Business Unit Solutions

Mag.(FH), BSc. Rainer Pirchegger
Head of Process Instrumentation
Business Unit Solutions

EU Declaration of Conformity

(original)



The Manufacturer **Anton Paar GmbH**, Anton-Paar-Str. 20, A-8054 Graz, Austria – Europe hereby declares that the product listed below

Product designation: **Pico 3000 RC Ex d WALL MOUNTING**
Pico 3000 RC NPT Ex d WALL MOUNTING

Model: **Pico 3000 RC Ex d, Pico 3000 RC NPT Ex d**

Material number: **179380, 191812**

is in conformity with the relevant European Union harmonisation legislation. This declaration of conformity is issued under the sole responsibility of the manufacturer.

Electromagnetic Compatibility (2014/30/EU, OJ L 96/79 of 29.3.2014)

Applied standards:

- EN 61326-1:2013
- EN 61326-2-3:2013

The product is classified as a class A equipment and is intended for the use in industrial area.

ATEX Directive (2014/34/EU, OJ L 96/309 of 29.3.2014)

Applied standards:

- IEC 60079-0:2017, IEC 60079-1:2014, EN 60079-0:2012, EN 60079-0:2012/A1:2013
- EU-Type Examination Certificate: TPS 18 ATEX 18013 013 X
 TÜV SÜD Product Service GmbH, Identification number: 0123
 Ridlerstrasse 65, 80339 München, Germany

Notified Body: TÜV AUSTRIA SERVICES GMBH, Identification number: 0408
 Deutschstrasse 10, 1230 Wien, Austria

Marking: Ex II 2G Ex db IIB T4/T5 Gb

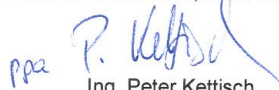
Safety objectives of the Low Voltage Directive (2014/35/EU, OJ L 96/357 of 29.3.2014)


Applied standards:

- EN 61010-1:2010
- EN 61010-2-201:2013

RoHS Directive (2011/65/EU, OJ L 174/88 of 1.7.2011)

Place and date of issue: Graz, 2019-02-15


 Ing. Peter Kettisch
 Executive Director
 Business Unit Solutions


 Mag.(FH), BSc Rainer Pirchegger
 Head of Process Instrumentation
 Business Unit Solutions

Appendix C.2: EU-Type Examination Certificate ATEX

NOTICE

Pico 3000 versions for ATEX

Only the following Pico 3000 versions can be used in combination with ATEX certified sensor models: Analog/Digital, Analog, HART, Modbus RTU, Frequency

ZERTIFIKAT ◆ CERTIFICATE ◆ 認 證 證 書 ◆ CERTIFICADO ◆ CERTIFICAT

(1) EU-Type Examination Certificate



Product Service

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres – **Directive 2014/34/EU**

(3) EU Certificate Number:



TPS 18 ATEX 18013 013 X

(4) Equipment: Density Sensor
Type: L-Dens Series 7000

(5) Manufacturer: Anton Paar GmbH

(6) Address: Anton-Paar-Straße 20
8054 Graz
Österreich

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) TÜV SÜD Product Service certifies, based on a voluntary testing, that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II of the Directive. The examination and test results are recorded in the confidential report 713099564_T.

(9) Compliance with the Essential Health and Safety Requirements has been assured by the following standards:

IEC 60079-0:2017

IEC 60079-1:2014

EN 60079-0:2012

EN 60079-0:2012/A1:2013

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This Type Examination Certificate relates only to the design and the construction of the specified equipment in accordance with Directive 2014/34/EU. Further requirements of this Directive apply to the manufacture and supply of this equipment.

(12) The marking of the equipment shall include the following:

Ex II 2G Ex db IIB T4/T5 Gb

Office of certification of explosion protection

München, 28.03.2018


Dipl.-Ing. Ulrich Jacobs



Page 1 / 3

Type Examination Certificate without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by TÜV SÜD Product Service. In case of dispute, the German text shall prevail. The document is administrated under the following number: EX5A 18 03 18013 013

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Product Service

- (13) **Schedule**
- (14) **EU-Type Examination Certificate TPS 18 ATEX 18013 013 X**
- (15) Description of equipment:

The L-Dens 7000 density sensors series (L-Dens 7400 / L-Dens 7500) are process measuring instruments that are used to measure the density values of liquids. The sensor consists of the encapsulated sensing element and a process instrument controller, which is connected to the sensing element with a feedthrough. The process instrument controller includes an HMI Variant, Pico 3000 HMI and a non HMI version Pico 3000. As an option, the process instrument controller can be a separate unit, Pico 3000 RC, connected to the L-Dens 7000 sensor with a cable.

Sensor models with the HMI are differentiated from non-HMI models by ambient temperature rating, whereby HMI version = $T_a = -20^{\circ}\text{C}$ to $+60^{\circ}\text{C}$ and non-HMI version = $T_a = -40^{\circ}\text{C}$ to $+70^{\circ}\text{C}$. The oscillator tube is the "Containment System".

Type Classification / Marking

Model	Marking and Values
L-Dens 7400 AAA Ex d L-Dens 7400 AAA NPT Ex d „AAA“ = Material options: HAS, SST, TAN, INC	II 2G Ex db IIB T4/T5 Gb $T_a = -40^{\circ}\text{C}$ to $+70^{\circ}\text{C}$ $T_p = -40^{\circ}\text{C}$ to 95°C for T5 and -40°C to 125°C for T4 Maximum pressure: 50 bar
L-Dens 7400 AAA Ex d (with HMI) L-Dens 7400 AAA NPT Ex d (with HMI) „AAA“ = Material options: HAS, SST, TAN, INC	II 2G Ex db IIB T4/T5 Gb $T_a = -20^{\circ}\text{C}$ bis $+60^{\circ}\text{C}$ $T_p = -40^{\circ}\text{C}$ to 95°C for T5 and -40°C to 125°C for T4 Maximum pressure: 50 bar
L-Dens 7400 HAS HP Ex d L-Dens 7400 HAS HP NPT Ex d (High Pressure Version)	II 2G Ex db IIB T4/T5 Gb $T_a = -40^{\circ}\text{C}$ to $+70^{\circ}\text{C}$ $T_p = -40^{\circ}\text{C}$ to 95°C for T5 and -40°C to 125°C for T4 Maximum pressure: 180 bar for $T_p \leq 70^{\circ}\text{C}$ 140 bar for $T_p \leq 125^{\circ}\text{C}$
L-Dens 7400 HAS HP Ex d (with HMI) L-Dens 7400 HAS HP NPT Ex d (with HMI)	II 2G Ex db IIB T4/T5 Gb $T_a = -20^{\circ}\text{C}$ to $+60^{\circ}\text{C}$ $T_p = -40^{\circ}\text{C}$ to 95°C for T5 and -40°C to 125°C for T4 180 bar to $T_p \leq 70^{\circ}\text{C}$ 140 bar to $T_p \leq 125^{\circ}\text{C}$
L-Dens 7500 HAS Ex d L-Dens 7500 HAS NPT Ex d	II 2G Ex db IIB T4/T5 Gb

Page 2 / 3

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Product Service

Model	Marking and Values
	$T_a = -40^{\circ}\text{C}$ to $+70^{\circ}\text{C}$ $T_p = -40^{\circ}\text{C}$ to 95°C for T5 and -40°C to 125°C for T4 Maximum pressure: 50 bar
L-Dens 7500 HAS Ex d (with HMI) L-Dens 7500 HAS NPT Ex d (with HMI)	Ex II 2G Ex db IIB T4/T5 Gb $T_a = -20^{\circ}\text{C}$ to $+60^{\circ}\text{C}$ $T_p = -40^{\circ}\text{C}$ to 95°C for T5 and -40°C to 125°C for T4 Maximum pressure: 50 bar
Pico 3000 RC Ex d (with HMI) Pico 3000 RC NPT Ex d (with HMI)	Ex II 2G Ex db IIB T5 Gb $T_a = -20^{\circ}\text{C}$ to $+60^{\circ}\text{C}$

Electrical Data:Nominal Voltage: 24 Vdc \pm 20%

Nominal Power: max. 2 W / max. 5W (Pico 3000)

(16) Test report: 713099564_T(17) Special conditions for safe use:

The specified ambient temperature range which deviates from the standard temperature range, is $-20^{\circ}\text{C} \leq T_{\text{amb}} < +60^{\circ}\text{C}$ for HMI models and $-40^{\circ}\text{C} \leq T_{\text{amb}} < +70^{\circ}\text{C}$ for non-HMI models.

According to IEC 60079-1:2014, cl. 16.1.2, the following routine tests shall be carried out:

- Static overpressure test with 13 bar on all oscillator tubes or one of the inspection methods listed in IEC 60079-1, Clause 16.3
- Hydrostatic overpressure test with 75 bar on all oscillator tubes (except as noted below)
- Hydrostatic overpressure test with 270 bar on all oscillator tubes for L-Dens 7400 HAS HP models

For power cable, use only a cable whose thermal stability of its insulation is minimum 90°C .

For cable entrances use only already certified Ex d or Ex db cable glands suitable for application and rated for a minimum of 80°C .

Unused openings shall be closed by use of already certified Ex d or Ex db stopping plugs suitable for application and rated for a minimum of 80°C

(18) Essential health and safety requirements:

met by standards

Office of certification of explosion protection

München, 28.03.2018


 Dipl.-Ing. Ulrich Jacobs



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Type Examination Certificate without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by TÜV SÜD Product Service. In case of dispute, the German text shall prevail. The document is administrated under the following number: EX5A 18 03 18013 013

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Appendix C.3: IECEx Certificate of Conformity

		<h2 style="text-align: center;">IECEx Certificate of Conformity</h2>	
INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres <small>for rules and details of the IECEx Scheme visit www.iecex.com</small>			
Certificate No.:	IECEX QPS 18.0002X	Issue No: 0	Certificate history: Issue No. 0 (2018-03-27)
Status:	Current	Page 1 of 4	
Date of Issue:	2018-03-27		
Applicant:	Anton Paar GmbH Anton-Paar-Strasse 20 Graz, 8054 Austria		
Equipment:	Density Sensor		
Optional accessory:			
Type of Protection:	d		
Marking:	IECEX QPS 18.0002X Ex db IIB T4/T5 Gb See equipment section for full marking details		
Approved for issue on behalf of the IECEx Certification Body:	D, Adams P.Eng.		
Position:	Manager, Hazardous Locations Department [Ex Equipment]		
Signature: (for printed version)			
Date:			
1. This certificate and schedule may only be reproduced in full. 2. This certificate is not transferable and remains the property of the issuing body. 3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website .			
Certificate issued by: <div style="display: flex; justify-content: space-around; align-items: center;"> <div> <p style="text-align: center;">QPS Evaluation Services Inc. 81 Kelfield St Unit 8 Toronto, Ontario M9W 5A3 Canada</p> </div> <div>  </div> </div>			

		IECEX Certificate of Conformity	
Certificate No:	IECEX QPS 18.0002X	Issue No:	0
Date of Issue:	2018-03-27	Page	2 of 4
Manufacturer:	Anton Paar GmbH Anton-Paar-Strasse 20 Graz, 8054 Austria		
Additional Manufacturing location(s):			
<p>This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.</p>			
STANDARDS:			
The apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:			
IEC 60079-0 : 2017 Edition: 7.0	Explosive atmospheres - Part 0: Equipment - General requirements		
IEC 60079-1 : 2014-06 Edition: 7.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"		
<i>This Certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.</i>			
TEST & ASSESSMENT REPORTS:			
<i>A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in</i>			
<u>Test Report:</u>			
CA/QPS/ExTR18.0005/00			
<u>Quality Assessment Report:</u>			
DE/TPS/QAR14.0002/02			

IEC		IECEx		IECEX Certificate of Conformity	
Certificate No:	IECEX QPS 18.0002X			Issue No:	0
Date of Issue:	2018-03-27			Page 3 of 4	
Schedule					
EQUIPMENT:					
<i>Equipment and systems covered by this certificate are as follows:</i>					
<p>The L-Dens 7000 density sensors series (L-Dens 7400 / L-Dens 7500) are process measuring instruments that are used to measure the density values of liquids. The sensor consists of the encapsulated sensing element and a process instrument controller, which is connected to the sensing element with a feedthrough. The process instrument controller includes an HMI Variant, Pico 3000 HMI and a non HMI version Pico 3000. As an option, the process instrument controller can be a separate unit, Pico 3000 RC, connected to the L-Dens 7000 sensor with a cable.</p> <p>Sensor models with the HMI are differentiated from non-HMI models by ambient temperature rating, whereby HMI version = Ta= -20°C to +60°C and non-HMI version= Ta= -40°C to +70°C</p> <p>Ratings: 24 Vdc ± 20%, max. 2 W / max. 5W (with Pico 3000)</p>					
Model Nomenclature:					
Model	Markings				
L-Dens 7400 AAA Ex d	Ex db IIB T4/T5 Gb				
L-Dens 7400 AAA NPT Ex d	Ta= -40°C to +70°C				
Where AAA denotes material options:	Tp= -40°C to 95°C for T5 and -40°C to 125°C for T4				
HAS, SST, TAN or INC	Maximum pressure: 50 bar				
L-Dens 7400 AAA Ex d (with HMI)	Ex db IIB T4/T5 Gb				
L-Dens 7400 AAA NPT Ex d (with HMI)	Ta= -20°C to +60°C				
Where AAA denotes material options:	Tp= -40°C to 95°C for T5 and -40°C to 125°C for T4				
HAS, SST, TAN or INC	Maximum pressure: 50 bar				
L-Dens 7400 HAS HP Ex d	Ex db IIB T4/T5 Gb				
L-Dens 7400 HAS HP NPT Ex d	Ta= -40°C to +70°C				
(High Pressure version)	Tp= -40°C to 95°C for T5 and -40°C to 125°C for T4				
	Maximum process pressure:				
	180 bar for Tp≤ 70°C				
	140 bar for Tp≤ 125°C				

IEC		IECEx		IECEX Certificate of Conformity	
Certificate No:	IECEX QPS 18.0002X		Issue No: 0		
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L-Dens 7400 HAS HP Ex d (with HMI)		Ex db IIB T4/T5 Gb			
L-Dens 7400 HAS HP NPT Ex d (with HMI)		Ta= -20°C to +60°C			
		Tp= -40°C to 95°C for T5 and -40°C to 125°C for T4			
		Maximum process pressure:			
		180 bar for Tp≤ 70°C			
		140 bar for Tp≤ 125°C			
L-Dens 7500 HAS Ex d		Ex db IIB T4/T5 Gb			
L-Dens 7500 HAS NPT Ex d		Ta= -40°C to +70°C			
		Tp= -40°C to 95°C for T5 and -40°C to 125°C for T4			
		Maximum pressure: 50 bar			
L-Dens 7500 HAS Ex d (with HMI)		Ex db IIB T4/T5 Gb			
L-Dens 7500 HAS NPT Ex d (with HMI)		Ta= -20°C to +60°C			
		Tp= -40°C to 95°C for T5 and -40°C to 125°C for T4			
		Maximum pressure: 50 bar			
Pico 3000 RC Ex d (with HMI)		Ex db IIB T5 Gb			
Pico 3000 RC NPT Ex d (with HMI)		Ta= -20°C to +60°C			
<p>SPECIFIC CONDITIONS OF USE: YES as shown below:</p> <ol style="list-style-type: none"> 1. For power cable, use only a cable whose thermal stability of its insulation is minimum 90°C. 2. For cable entrances use only already certified Ex d or Ex db cable glands suitable for application and rated for a minimum of 80°C. 3. Unused openings shall be closed by use of already certified Ex d or Ex db stopping plugs suitable for application and rated for a minimum of 80°C. 					

Appendix C.4: CSA/UL/FM Certificate of Compliance



QPS Evaluation Services Inc
 Testing, Certification and Field Evaluation Body
 Accredited in Canada, the USA, and Internationally

File
LR1437

CERTIFICATE OF COMPLIANCE (ISO TYPE 3 CERTIFICATION SYSTEM)	
Issued to	Anton Paar GmbH
Address	Anton-Paar-Strasse 20 Graz, Austria, 8054
Project Number	LR1437-1
Product	Density Sensors
Model Number	See below for model information
Ratings	24 Vdc \pm 20%, max. 2 W / max. 5W (with Pico 3000)
Markings	See below for markings
Applicable Standards	CSA C22.2 No. 60079-0:2015, CSA C22.2 No. 60079-1: 2016, CSA C22.2 No. 30-1986, CSA C22.2 No. 61010-1-12, CSA C22.2 No. 60529:16, CSA C22.2 no. 94.2-2015, UL 60079-0:2013, UL 60079-1:2015, FM 3615:2006, FM 3600:2011, UL 61010-1:2012 Edition 3, IEC/ANSI 60529-2004, UL 50E 2nd edition
Factory/Manufacturing Location	Same as above
<p>Statement of Compliance: The product(s) identified in this Certificate and described in the Report covered under the above referenced project number have been investigated and found to be in compliance with the relevant requirements of the above referenced standard(s). As such, they are eligible to bear the QPS Certification Mark shown below, in accordance with the provisions of QPS's Service Agreement.</p>	
<p>Issued By: Dave Adams, P.Eng</p>	
<p>Signature: </p>	<p>Date: April 9, 2018</p>

81 Kelfield St., Units 7-9, Toronto, ON M9W 5A3 Tel: 416-241-8857; Fax: 416-241-0682

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QSD 34HL

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File
LR1437

Model	Markings
L-Dens 7400 AAA Ex d L-Dens 7400 AAA NPT Ex d Where AAA denotes material options: HAS - Hastelloy C-276 SST - Stainless Steel 1.4404 TAN - Tantalum INC - Incoloy 825	Class I Division 1 Gr CD T4/T5 Ex db IIB T4/T5 Gb Class I Zone 1, AEx db IIB T4/T5 Gb Ta= -40°C to +70°C Tp= -40°C to 95°C for T5 and -40°C to 125°C for T4 Maximum pressure: 50 bar IP66/Enclosure Type 4X
L-Dens 7400 AAA Ex d (with HMI) L-Dens 7400 AAA NPT Ex d (with HMI) Where AAA denotes material options: HAS - Hastelloy C-276 SST - Stainless Steel 1.4404 TAN - Tantalum INC - Incoloy 825	Class I Division 1 Gr CD T4/T5 Ex db IIB T4/T5 Gb Class I Zone 1, AEx db IIB T4/T5 Gb Ta= -20°C to +60°C Tp= -40°C to 95°C for T5 and -40°C to 125°C for T4 Maximum pressure: 50 bar IP66/Enclosure Type 4X
L-Dens 7400 HAS HP Ex d L-Dens 7400 HAS HP NPT Ex d (High Pressure version)	Class I Division 1 Gr CD T4/T5 Ex db IIB T4/T5 Gb Class I Zone 1, AEx db IIB T4/T5 Gb Ta= -40°C to +70°C Tp= -40°C to 95°C for T5 and -40°C to 125°C for T4 Maximum process pressure: 180 bar for $T_p \leq 70^\circ\text{C}$ 140 bar for $T_p \leq 125^\circ\text{C}$ IP66/Enclosure Type 4X
L-Dens 7400 HAS HP Ex d (with HMI) L-Dens 7400 HAS HP NPT Ex d (with HMI)	Class I Division 1 Gr CD T4/T5 Ex db IIB T4/T5 Gb Class I Zone 1, AEx db IIB T4/T5 Gb Ta= -20°C to +60°C Tp= -40°C to 95°C for T5 and -40°C to 125°C for T4 Maximum process pressure: 180 bar for $T_p \leq 70^\circ\text{C}$ 140 bar for $T_p \leq 125^\circ\text{C}$ IP66/Enclosure Type 4X



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File
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L-Dens 7500 HAS Ex d L-Dens 7500 HAS NPT Ex d	Class I Division 1 Gr CD T4/T5 Ex db IIB T4/T5 Gb Class I Zone 1, AEx db IIB T4/T5 Gb Ta= -40°C to +70°C Tp= -40°C to 95°C for T5 and -40°C to 125°C for T4 Maximum pressure: 50 bar IP66/Enclosure Type 4X
L-Dens 7500 HAS Ex d (with HMI) L-Dens 7500 HAS NPT Ex d (with HMI)	Class I Division 1 Gr CD T4/T5 Ex db IIB T4/T5 Gb Class I Zone 1, AEx db IIB T4/T5 Gb Ta= -20°C to +60°C Tp= -40°C to 95°C for T5 and -40°C to 125°C for T4 Maximum pressure: 50 bar IP66/Enclosure Type 4X
Pico 3000 RC Ex d (with HMI) Pico 3000 RC NPT Ex d (with HMI)	Class I Division 1 Gr CD T5 Ex db IIB T5 Gb Class I Zone 1, AEx db IIB T5 Gb Ta= -20°C to +60°C IP66/Enclosure Type 4X
Notes: 1. Field wiring must be suitable for a minimum 90°C. 2. For conduit entries, use only already certified connection facilities suitable for application and rated for a minimum of 80°C. 3. Unused openings shall be closed using certified stopping plugs suitable for application and rated for a minimum of 80°C.	