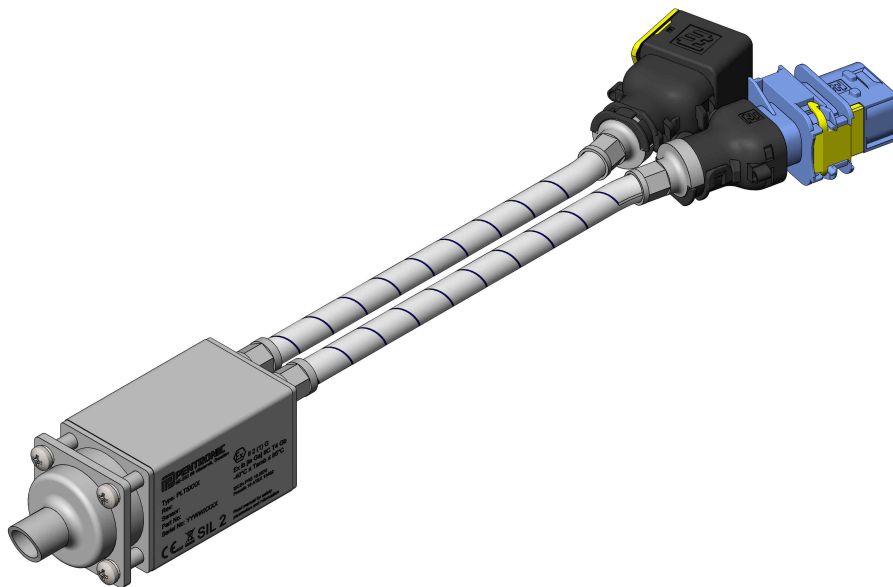


Safety instructions

PLB5000 Temperature transmitter

PLT5397, PLT5396, PLT5167



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1 | General information

1.1 Technical and commercial support

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1.2 About Pentronic AB

Pentronic is one of Europe's largest manufacturers of industrial temperature sensors. In Scandinavia Pentronic is the leading supplier of equipment for temperature measurement to industry, research and education. Pentronic manufactures temperature sensors in its own facility, primarily Pt100 and thermocouples.

Pentronic collaborates with world leading manufacturers of calibration equipment, measurement and control instrumentation, optical temperature measurement and measurement equipment for moisture, thickness and flow.

1.3 Document history

See table 1.1 for correlation between product revision of the PLT5397, PLT5396 and PLT5167 transmitters and the revision of this document. To locate the product revision of the transmitter see section 4.

Table 1.1: Document history

Document number	Document revision	Release date	Revision notes	Product revision
7-5-0-1-1/643	1 (56914)	2019-08-28	First release	1.0.X
7-5-0-1-1/643	2 (76238)	2025-06-19	Minor updates	1.0.X
7-5-0-1-1/643	3 (79616)	2026-06-25	Revised for certificate issue 1	1.0.X

2 | Introduction

2.1 Scope and purpose

The Ex safety instruction manual must be read and used by qualified personnel during installation and commissioning of the PLT5397, PLT5396 and PLT5167 transmitters. These instructions are provided as an addendum to the standard product manual.

The safety instructions in this document apply to PLT5397, PLT5396 and PLT5167 transmitters with IECEx approval **IECEx PRE 18.0070** and ATEX approval **Presafe 18 ATEX 13492**.

2.2 Documentation, standards and directives

The safety instructions shall be read in conjunction with the product documentation stated in table 2.1.

Table 2.1: Product documentation

Document
<i>PLT5397 SIL Safety manual</i>
<i>PLZ5291 Ex Safety instructions</i>
<i>PLG5465 Ex Safety instructions</i>

Compliance with the essential health and safety requirements is ensured by conformity to the directives and standards listed in table 2.2 and table 2.3.

Table 2.2: Associated directives

Directive	Title
2014/30/EU	DIRECTIVE 2014/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to electro-magnetic compatibility
2014/34/EU	DIRECTIVE 2014/34/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres
2011/65/EU	RoHS DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, as amended by Directive (EU) 2015/863

Table 2.3: Associated standards

Standard	Title
IEC 61508-1:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 1: General requirements
IEC 61508-2:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems
IEC 61508-3:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 3: Software requirements
EN 61326-1:2013	Electrical equipment for measurement, control and laboratory use – EMC requirements– Part 1: General requirements
IEC 61326-3-1:2008	Electrical equipment for measurement, control and laboratory use - EMC requirements- Part 3-1: Immunity requirements for safety-related systems and for equipment intended to perform safety-related functions (functional safety) - General industrial applications
EN 55011:2009	Industrial, scientific and medical equipment - Radio frequency disturbance characteristics - Limits and methods of measurement with amendment EN 55011:2009/A1:2010
EN IEC 60079-0:2018	Explosive atmospheres – Part 0: Equipment – General requirements
EN 60079-11:2012	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-0:2017 Edition:7.0	Explosive atmospheres – Part 0: Equipment – General requirements
IEC 60079-11:2011 Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

3 | General information

The Pentronic PLT5397, PLT5396 and PLT5167 transmitters is an intrinsically safe temperature transmitter designed for industrial use in potentially explosive areas in Zone 1 in accordance with directive 2014/34/EU and IECEx.

Ex marking:



II 2(1) G

Ex ib [ia Ga] IIC T4 Gb $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +85^{\circ}\text{C}$

In addition to the requirements in this document, the requirements of IEC/EN 60079-14 and IEC/EN 60079-25 installation instructions shall be observed.

3.1 General safety instructions

The following instructions should be observed to ensure safety:

- These operating instructions shall always be available to all persons carrying out installation and operation.
- Before installation ensure that the area group and the temperature class comply with the application area rating.
- Before installation, ensure there is no visible damage to the transmitter.
- Installation and commissioning of this transmitter shall be performed by qualified personnel.
- Do not operate the transmitter outside the electrical, thermal and mechanical specifications.
- In case of malfunction of the transmitter, the product shall be put out of service immediately. Pentronic AB must be informed when a transmitter is required to be replaced due to failure. Please contact Pentronic AB at quality@pentronic.se and ask for the Product return instructions or visit www.pentronic.se for return form.
- Modifications of the transmitter are not permitted.
- The transmitter is only intended to be used with compatible parts included in the PLB5000 cable-bus-based temperature measurement system.

4 | Product marking

Information regarding identification, Ex-marking, connection, sensor type etc is located on the transmitter side, see figure 4.1.



Figure 4.1: Product marking of the PLT5397, PLT5396 and PLT5167 transmitters

- ① Transmitter type, i.e PLT5167, PLT5396 or PLT5397
- ② Product revision of transmitter (unique identification of HW and SW)
NOTE! Verify that the revision of this document correlates with the revision on the product (see table 1.1)
- ③ Connected sensor type e.g thermocouple type K (TC K), PT100 4-wire etc
- ④ Transmitter part number
- ⑤ Transmitter serial number
- ⑥ Ex-marking

5 | Ex safety parameters

All inputs and outputs of the PLT5397, PLT5396 and PLT5167 transmitters are intrinsically safe. Any connected equipment shall comply with the Ex safety parameters specified below. If the transmitter is delivered with manufacturer-installed temperature sensors, the Ex safety parameters for the sensor channels have already been verified and do not require further verification.

DC/DC Supply bus 1 and 2

U_i :	13.9V
I_i :	1.26A
P_i :	5.3W
C_i :	1nF
L_i :	<i>negligible</i>

Sensor channel 1 - 3

U_o :	5.88V
I_o :	44.5mA
P_o :	65.4mW
R_i :	132.26Ω
C_o :	18.5μF
L_o :	17.9mH
C_i :	24.5μF
L_i :	<i>negligible</i>

PLB Bus 1

U_i, U_o :	4.02V
I_i, I_o :	45.1mA
P_i, P_o :	45.3mW
R_i :	89.3Ω
C_o :	519.5μF
L_o :	17.4mH
C_i :	15.5μF
L_i :	<i>negligible</i>

PLB Bus 2

U_i, U_o :	4.02V
I_i, I_o :	45.1mA
P_i, P_o :	45.3mW
R_i :	89.3Ω
C_o :	528μF
L_o :	17.4mH
C_i :	6.65μF
L_i :	<i>negligible</i>

6 | Installation requirements

In addition to the requirements in this document, the requirements of IEC/EN 60079-14 and IEC/EN 60079-25 installation instructions shall be observed.

6.1 Ambient temperature

The transmitter is certified for temperature class T4 with an ambient temperature between -40°C and +85°C. Ensure that the transmitter complies with the expected environmental limits of the application and that ambient temperature of the application is within this limits.

6.2 Supply and databus connection via PLZ5291

The transmitter shall only be used with the PLB5000 isolation barrier PLZ5291 which provides a safe supply and data bus.

6.3 Grounding of the transmitter

The transmitter is equipped with a functional earth (FE) and shall be grounded through the enclosure or the measuring probe during installation.

6.4 Manufacturer-installed sensor probe and cable arrangement

The following section applies when the transmitter is delivered with manufacturer-installed temperature sensors.

6.4.1 Sensor temperature measurement for Zone 0 applications

The PLT5397, PLT5396 and PLT5167 transmitters are certified for Ex ib protection and are suitable for installation in Zone 1. If the transmitter is delivered with manufacturer-installed temperature sensors, the sensor probe and/or cable arrangement is suitable for use in Zone 0. All other parts of the transmitter are limited to use in Zone 1.

6.4.2 Sensor temperature limits and process conditions

All parts of the transmitter, including the sensor probe and/or cable arrangement, are suitable for T4 environments, provided that the maximum surface temperature of any parts exposed to the explosive atmosphere does not exceed 135 °C.

The sensors shall not be used outside their specified measurement range, and the service temperature limits of the different sensor components shall always be considered during installation.

The sensor probe and/or cable arrangement may be exposed to process temperatures exceeding the T4 limits, provided that the installation ensures that the temperature of any parts exposed to the explosive atmosphere remains within the required temperature class.

Unless otherwise specified for specific models, no verification is required for processes up to 135 °C.

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