

Instruction Manual

***Pulscon***

**LTC50, LTC51, LTC57  
PROFIBUS PA**

**Control Drawing IS**



**SI005730-B  
116-0418**

Safety instructions for electrical apparatus for explosion-hazardous areas

SI005730-B/98/EN/02.14  
116-0418  
71266539





# ***Pulscon*** **LTC50, LTC51, LTC57**

## **PROFIBUS PA**

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**Associated documentation**

This document is an integral part of the following Operating Instructions:  
BA01005O, BA01006O, BA01009O  
The Operating Instructions pertaining to the device apply.

**Extended order code**

The extended order code is indicated on the nameplate, which is affixed to the device in such a way that it is clearly visible. Additional information about the nameplate is provided in the associated Operating Instructions.

Structure of the extended order code

<b>Device type</b>		<b>Basic specifications</b>		<b>Optional specifications</b>
LTC5X	-	X-XXXXX-XXXXX-XX XXXXX	+	XXXXXXXXXX

X = Placeholder

At this position, an option (number or letter) selected from the specification is displayed instead of the placeholders.

**Basic specifications**

The features that are absolutely essential for the device (mandatory features) are specified in the basic specifications. The number of positions depends on the number of features available. The selected option of a feature can consist of several positions.

**Optional specifications**

The optional specifications describe additional features for the device (optional features). The number of positions depends on the number of features available.

More detailed information about the device is provided in the following tables. These tables describe the individual positions and IDs in the extended order code which are relevant to hazardous locations.

**Basic specifications**

Selected option	Position	Description
Approval	LTC50-X-XXXXX-XXXXX- <b>XX</b> XXXXX FM	FM IS Cl.I Div.1 Gr.A-D
	LTC5X-X-XXXXX-XXXXX- <b>XX</b> XXXXX FI	FM IS Cl.I,II,III Div.1 Gr.A-G, AEx ia, NI Cl.I Div.2
Electrical output	LTC5X-X-XXXXX-XX <b>XX</b> X-XX XXXXX PA	2-wire, PROFIBUS PA, switching output (PFS)
Display, operation	LTC5X-X-XXXXX-XXXX <b>X</b> -XX XXXXX B	without display, via communication
		SD02, 4-line, push-buttons and data backup function
		SD03, 4-line, illuminated, touch control and data backup function
Housing	LTC5X-X-XXXXX- <b>XX</b> XXX-XX XXXXX A1 *	GT19 dual compartment, plastics PBT
		GT20 dual compartment, alu coated
	LTC51-X-XXXXX- <b>XX</b> XXX-XX XXXXX LTC57-X-XXXXX- <b>XX</b> XXX-XX XXXXX A3	GT18 dual compartment, 316L
Seal	LTC50-X-XXXX <b>X</b> -XXXXX-XX XXXXX 2	Viton, -20 °C ... 80 °C
	LTC51-X-XXXX <b>X</b> -XXXXX-XX XXXXX 3	EPDM, -40 °C ... 120 °C
		Kalrez, -20 °C ... 200 °C
		Viton, -30 °C ... 150 °C
	LTC57-X-XXXX <b>X</b> -XXXXX-XX XXXXX 3	EPDM, -40 °C ... 120 °C
	Viton, -30 °C ... 150 °C	

\* only with approval FM

**Optional specifications**

Selected option	Position	Description
Probe design	XXXXXXXX <b>X</b> XXX B	Sensor remote, 3 m cable, detachable, with mounting bracket

**Safety instructions:**  
**General**

- Staff must meet the following conditions for mounting, electrical installation, commissioning and maintenance of the device:
  - Be suitably qualified for their role and the tasks they perform
  - Be trained in explosion protection
  - Be familiar with national regulations
- Install the device according to the manufacturer's instructions and national regulations.
- Do not operate the device outside the specified electrical, thermal and mechanical parameters.
- Only use the device in media to which the wetted materials have sufficient durability.
- Avoid electrostatic charging:
  - Of plastic surfaces (e. g. housing, sensor element, special varnishing , attached additional plates, ...)
  - Of isolated capacities (e. g. isolated metallic plates)
- Refer to the temperature tables for the relationship between the permitted ambient temperature for the sensor and/or transmitter, depending on the range of application, and the temperature class.
- Modifications to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Pepperl+Fuchs.

**Safety instructions:**  
**Special conditions**

Permitted ambient temperature range at the electronics housing:  $-40\text{ °C} \leq T_{\text{amb}} \leq +80\text{ °C}$ .

- Observe the information in the temperature tables.
- Use supply wires suitable for 20 K above the ambient temperature.

Electrostatic/impact sparks

- Warning: Avoid electrostatic charging of the plastic surfaces, for plastic process connections or plastic coatings.
- Warning: Install the device to exclude impact and friction sparks on the aluminum housing.

Device type LTC57

- The probes (rod and rope) with plastic coated surfaces can be electrostatically charged.

Safety instructions:  
Installation

FISCO

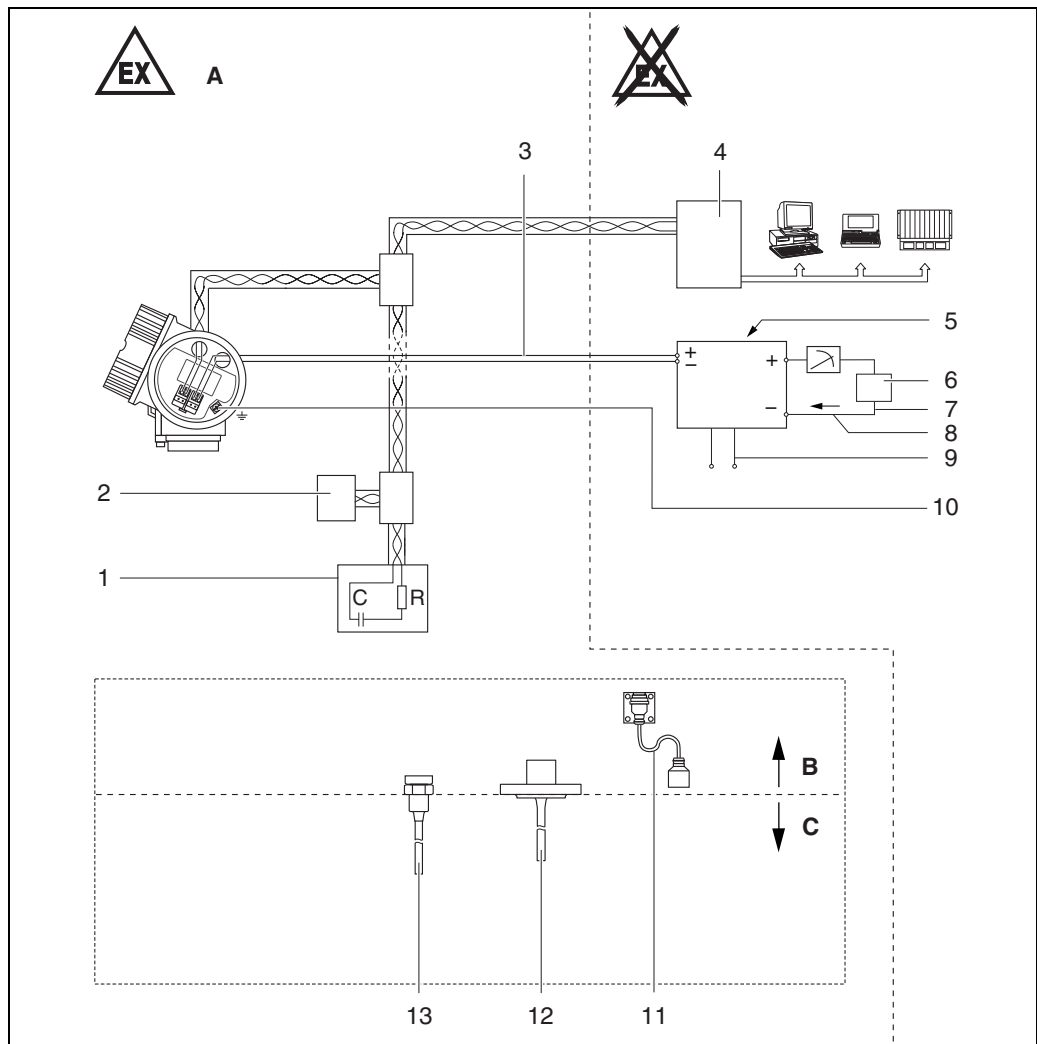


Figure 1

- A Class I, Div. 1, Groups A, B, C, D;  
Class I, Zone 0;  
Class II, Div. 1, Groups E, F, G;  
Class III
- B Zone 1
- C Zone 0

- 1 Any CSA certified termination with  $R = 90$  to  $100 \Omega$ ,  $C = 0$  to  $2.2 \mu\text{F}$
- 2 Any CSA certified intrinsically safe apparatus suitable for FISCO concept
- 3 Output PFS passive
- 4 Any CSA certified associated apparatus or associated nonincendive field wiring apparatus suitable for FISCO concept
- 5 Barrier/associated equipment
- 6 External load
- 7 Loop
- 8 4 mA ... 20 mA
- 9 Supply
- 10 Ground stud
- 11 Remote cable
- 12 Flanges acc. international standards DN40 ... DN200, resp. 1-1/2 in to 8 in
- 13 G/NPT3/4 in, G/NPT1-1/2 in

Option:  
Interconnection with CSA certified service interface.

Entity

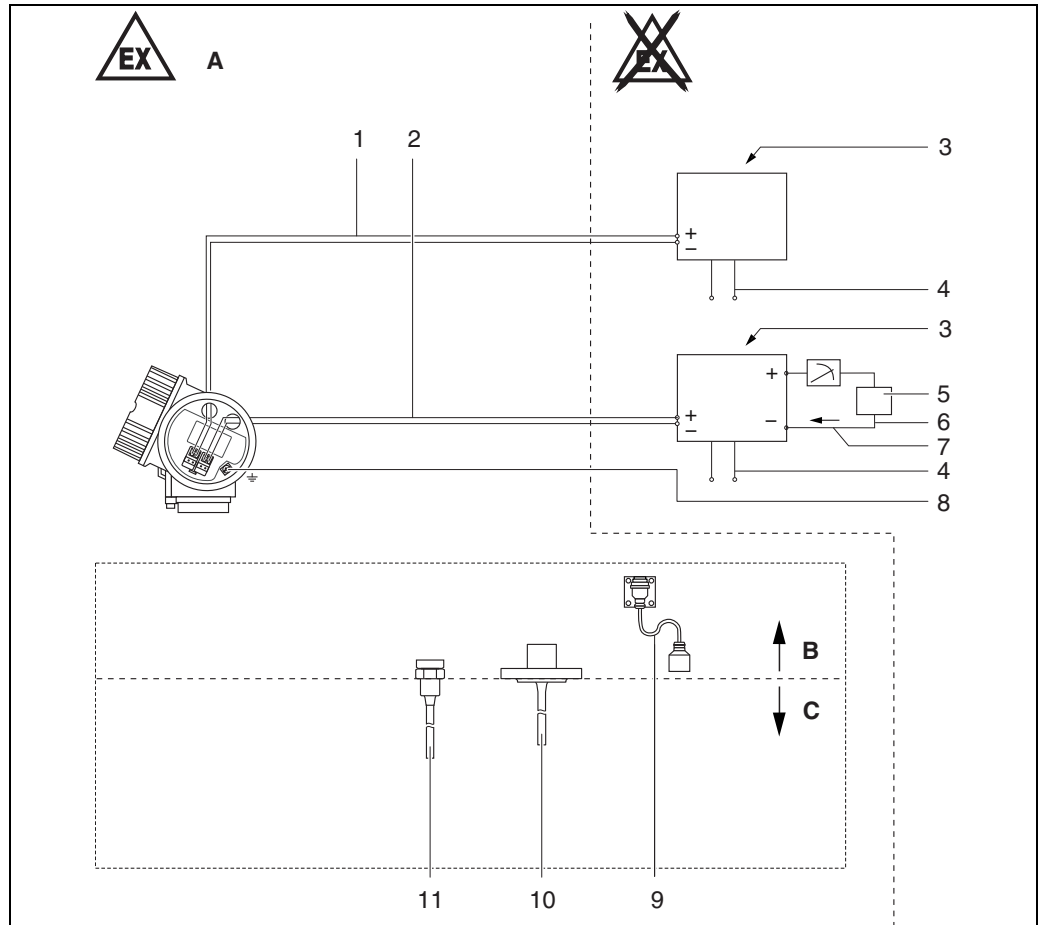


Figure 2

- A Class I, Div. 1, 2, Groups A, B, C, D; Zone 0, AEx ia IIC T6/Ex ia IIC T6  
Class II, Div. 1, 2, Groups E, F, G;  
Class III
- B Zone 1
- C Zone 0

- 1 Fieldbus
- 2 Output PFS passive
- 3 Any CSA certified associated apparatus or associated nonincendive field wiring apparatus
- 4 Supply
- 5 External load
- 6 Loop
- 7 4 mA ... 20 mA
- 8 Ground stud
- 9 Remote cable
- 10 Flanges acc. international standards DN40 ... DN200, resp. 1-1/2 in to 8 in
- 11 G/NPT3/4 in, G/NPT1-1/2 in

Option:  
Interconnection with CSA certified service interface.

## Intrinsic safety

Intrinsically safe, Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III Class I, Zone 0 or Zone 1, AEx ia IIC/Ex ia IIC

### General

- Control room equipment may not use or generate over 250 V<sub>rms</sub>.
- Install as per National Electrical Code (NFPA70) or Canadian Electrical Code, Part I (C22.1), as applicable.
- Warning: Substitution of components may impair intrinsic safety.
- Always follow the installation drawing provided by the intrinsic safety barrier manufacturer when installing this equipment. The configuration of the intrinsic safety barrier(s) must be approved for the country in use.

For Class II and III

- Keep cover tight unless power has been switched off.

### FISCO Installation (terminals 1 and 2)

The FISCO concept allows interconnection of intrinsically safe apparatus to associated apparatus not specifically examined in such combination. The criteria for interconnection is that the voltage ( $U_i$ ), the current ( $I_i$ ) and the power ( $P_i$ ) which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal or greater than the voltage ( $U_o$ ), the current ( $I_o$ ) and the power ( $P_o$ ) levels which can be delivered by the associated apparatus, considering faults and applicable factors. In addition, the maximum unprotected capacitance ( $C_i$ ) and inductance ( $L_i$ ) of each apparatus (other than the termination) connected to the fieldbus must be less than or equal to 5 nF and 10 µH respectively.

For transmitter parameters: see "Connection data" section.

In each segment only one active device, normally the associated apparatus, is allowed to provide the necessary energy for the fieldbus system. The voltage  $U_o$  of the associated apparatus has to be limited to the range of 14 V to 24 V DC. All other equipment connected to the bus cable has to be passive, meaning that they are not allowed to provide energy to the system, except to a leakage current of 50 µA for each connected device. Separately powered equipment needs a galvanic isolation to assure that the intrinsically safe fieldbus circuit remains passive.

The cable used to interconnect the devices needs to have the parameters in the following range:

- loop resistance, R: 15 to 150 Ω/km
- inductance per unit length, L: 0.4 to 1 mH/km
- capacitance per unit length, C: 80 to 200 nF/km
- $C = C_{\text{line/line}} + 0.5 C_{\text{line/screen}}$ , if both lines are floating, or
- $C = C_{\text{line/line}} + C_{\text{line/screen}}$ , if the screen is connected to one line
- length of spur cable: 30 m
- length of trunk cable: 1 km
- length of splice: 1 m

At each end of the trunk cable an approved infallible line termination with the following parameters is suitable:

- R = 90 to 100 Ω
- C = 0 to 2.2 µF

One of the allowed terminations might already be integrated in the associated apparatus.

The number of passive devices connected to the bus segment is not limited due to I.S. reasons. If the above rules are respected, up to a total length of 1000 m (sum of the length of trunk cable and all spur cables), the inductance and capacitance of the cable will not impair the intrinsic safety of the installation.

### Entity installation (terminals 1, 2 and 3, 4)

- Use an intrinsic safety barrier, or other associated equipment, that is approved for the country in use and satisfies the following conditions:

$$U_o (V_{oc}) \leq U_i (V_{max}), I_o (I_{sc}) \leq I_i (I_{max}), C_o (C_a) \geq C_i + C_{cable}, L_o (L_a) \geq L_i + L_{cable} \text{ and } P_o \leq P_i$$

- For transmitter parameters: see "Connection data" section.



**Class I, Div. 2, Groups A-D** Only for device type LTC5X, basic specification, option "Approval" = FI  
Device type LTC50, basic specification, option "Approval" = FM is not marked for use in Class I, Division 2; however, these devices are suitable for this application when installed using the explosionproof instructions for Class I, Division 1.

**Nonincendive field wiring (NIFW) installation**

- The Nonincendive Field Wiring circuit concept allows interconnection of nonincendive field wiring apparatus with associated nonincendive field wiring apparatus or associated apparatus not specifically examined in combination as a system using any of the wiring methods permitted for unclassified locations, when the following conditions are met:  
 $V_{max} \geq V_{oc}$  or  $V_t$ ,  $C_a \geq C_i + C_{cable}$ ,  $L_a \geq L_i + L_{cable}$ .
- For transmitter parameters: see "Connection data" section.
- The transmitter provides a current controlled circuit; therefore, the parameter  $I_{max}$  is not required and need not to be aligned with  $I_{sc}$  of the associated nonincendive field wiring apparatus or associated apparatus.
- Control room equipment may not use or generate over 250 V<sub>rms</sub>.
- Install per National Electrical Code (NFPA 70) or Canadian Electrical Code, Part I (C22.1), as applicable.
- Warning: Substitution of components may impair suitability for Class I, Div. 2.
- Always follow the installation drawing provided by the associated apparatus manufacturer. The configuration of the associated apparatus must be approved for the country in use.
- Probe is intrinsically safe, AEx ia/Ex ia, and suitable for installation in Class I, II, III, Div.1 or Class I, Zone 0/1.

**Standard wiring installation (only for NPT conduit entries)**

- Install per the National Electrical Code (NFPA 70) or Canadian Electrical Code, Part I (C22.1), as applicable, using wiring methods appropriate for the location.
- Associated apparatus or associated nonincendive field wiring apparatus not required.
- For the maximum supply voltage: see "Connection data" section.
- Warning: Explosion hazard – Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
- Warning: Substitution of components may impair suitability for Class I, Div. 2.
- Probe is intrinsically safe, AEx ia/Ex ia, and suitable for installation in Class I, II, III, Div. 1 or Class I, Zone 0/1.

**Process seals** The following models are dual seal devices per ANSI/ISA 12.27.01 and do not require the use of an external secondary process seal:

Device type	Basic specification, option "Approval"	MWP *	Method of annunciation
LTC51	FI	40 bars	Electronic firmware is incorporated to detect and signal any significant increases or decreases of measurement signal reflection caused by combustible or flammable process fluid between the primary and secondary seal.

\* MWP = Maximum Working Pressure for the dual seal rating to be effective and may be a value less than the MWP for the device.

**Connection data**

Basic specification, option "Approval" = FM

Basic specification, Position 3 (Power Supply; Output) = PA (TRC [26])

IS, Class I, II, III, Div. 1; AEx ia/Ex ia

Terminal 1 (+), 2 (-)		Terminal 3 (+), 4 (-)
FISCO:	Entity:	Entity:
$U_i = 17.5 \text{ V}$	$U_i = 30 \text{ V}$	$U_i = 30 \text{ V}$
$I_i = 550 \text{ mA}$	$I_i = 300 \text{ mA}$	$I_i = 300 \text{ mA}$
$P_i = 5.5 \text{ W}$	$P_i = 1.2 \text{ W}$	$P_i = 1 \text{ W}$
effective inner inductance $L_i = 10 \mu\text{H}$		effective inner inductance $L_i = 0 \mu\text{H}$
effective inner capacitance $C_i = 5 \text{ nF}$		effective inner capacitance $C_i = 3 \text{ nF}$
		effective inner capacitance to ground $C_i = 5.28 \text{ nF}$

NIFW: Class I, Div. 2

Terminal 1 (+), 2 (-)		Terminal 3 (+), 4 (-)
FISCO/FNICO:	Entity:	Entity:
$U_i = 17.5 \text{ V}$	$U_i = 32 \text{ V}$	$U_i = 35 \text{ V}$
$I_i = \text{NA}$ (current controlled circuit)	$I_i = 15 \text{ mA}$	$I_i = 300 \text{ mA}$
		$P_i = 1 \text{ W}$
effective inner inductance $L_i = 10 \mu\text{H}$		effective inner inductance $L_i = 0 \text{ mH}$
effective inner capacitance $C_i = 5 \text{ nF}$		effective inner capacitance $C_i = 3 \text{ nF}$
		effective inner capacitance to ground $C_i = 5.28 \text{ nF}$

Class I, Div. 2

Terminal 1 (+), 2 (-)	Terminal 3 (+), 4 (-)
Input voltage = 32 V	Input voltage = 35 V *
Input current = 25 mA	Input current = 46 mA

\* The power consumption of I/O modules with passive PFS output can be limited for certain applications.

- Recommended: Power consumption = 1 W.  
This is obtained for a supply voltage at the terminals of 27 V DC.
- For higher supply voltages ( $U_{\text{max}}$ ): Insert a serial resistance ( $R_V$ ) in order to limit the power consumption, see table below.

**Table for the PFS serial resistance ( $R_V$ )**

Power consumption	1.0 W
Total power consumption	1.88 W
Internal resistance $R_i$	760 $\Omega$

$U_{\text{max}}$ [V]	$R_V$ min
35	205 $\Omega$
34	177 $\Omega$
33	150 $\Omega$
32	122 $\Omega$
31	95 $\Omega$
30	67 $\Omega$
29	39 $\Omega$
28	12 $\Omega$
27	0 $\Omega$

**Note!**

For values associated with a higher or lower internal power consumption please contact Pepperl+Fuchs.

**Service interface (CDI)**

Taking the following values into consideration, the device can be connected to the certified service tool or a similar interface:

Service interface												
$U_i = 7.3 \text{ V}$ effective inner inductance $L_i = \text{negligible}$ effective inner capacitance $C_i = \text{negligible}$												
$U_o = 7.3 \text{ V}$ $I_o = 100 \text{ mA}$ $P_o = 160 \text{ mW}$												
$L_o \text{ (mH)} =$	5.00	2.00	1.00	0.50	0.20	0.10	0.05	0.02	0.01	0.005	0.002	0.001
$C_o \text{ (}\mu\text{F)} =$	0.73	1.20	1.60	2.00	2.60	3.20	4.00	5.50	7.30	10.00	12.70	12.70



# Temperature tables

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**General notes**

Unless otherwise indicated, the positions always refer to the basic specification.

**Note!**

Observe the permitted temperature range at the probe.

**Selection table**

Approval		Housing	
FM	FM IS Cl.I Div.1 Gr.A-D	A1	GT19 dual compartment, plastics PBT
FI	FM IS Cl.I,II,III Div.1 Gr.A-G, AEx ia, NI Cl.I Div.2	A2	GT20 dual compartment, Alu coated
		A3	GT18 double compartment, 316L

Electrical output	Transmission code of the terminal module	Channels
PA	2-wire, PROFIBUS PA, switching output (PFS)	TRC [26]
		1 or 2 channels used

**Diagram**

Example diagrams to the temperature tables

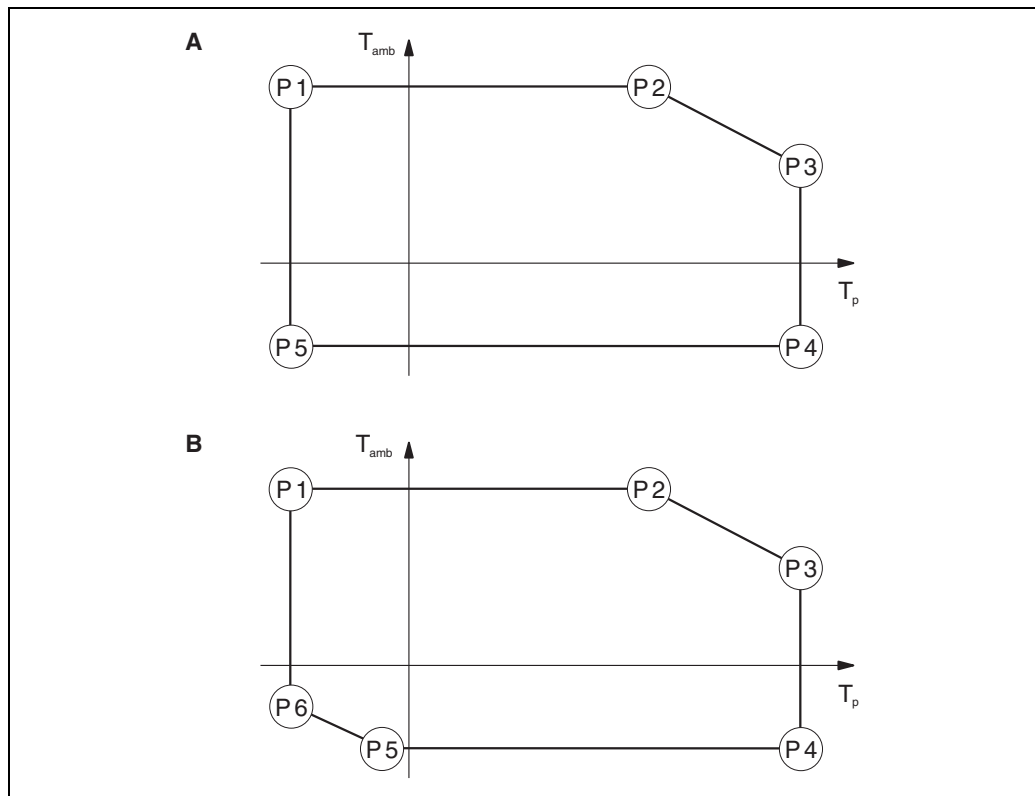


Figure 1

- A Version 1
- B Version 2

$T_{amb}$  Ambient temperature  
 $T_p$  Process temperature

**Intrinsically safe (IS)**

**Probe: Class I, Zone 0/Class I, Division 1**

**Electronics housing: Class I, Zone 1/Class I, Division 1**

**LTC50**

**Electrical output = PA (TRC [26])**

Housing = A1													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-20 °C	60 °C	60 °C	60 °C	80 °C	53 °C	80 °C	-20 °C	-20 °C	-20 °C	-	-
2 channels used	T6 (85 °C)	-20 °C	51 °C	51 °C	51 °C	80 °C	46 °C	80 °C	-20 °C	-20 °C	-20 °C	-	-

Housing = A2													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-20 °C	60 °C	60 °C	60 °C	80 °C	56 °C	80 °C	-20 °C	-20 °C	-20 °C	-	-
2 channels used	T6 (85 °C)	-20 °C	57 °C	57 °C	57 °C	80 °C	55 °C	80 °C	-20 °C	-20 °C	-20 °C	-	-

**LTC51**

**Electrical output = PA (TRC [26])**

Housing = A2													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	53 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	68 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	80 °C	80 °C	135 °C	69 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	80 °C	80 °C	200 °C	56 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 ( 85 °C)	-40 °C	57 °C	57 °C	57 °C	85 °C	51 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	72 °C	72 °C	72 °C	100 °C	66 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	75 °C	75 °C	75 °C	135 °C	63 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	75 °C	75 °C	75 °C	200 °C	50 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-

Housing = A3													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	51 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	66 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	80 °C	80 °C	135 °C	67 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	80 °C	80 °C	200 °C	48 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	57 °C	57 °C	57 °C	85 °C	50 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	72 °C	72 °C	72 °C	100 °C	65 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	75 °C	75 °C	75 °C	135 °C	61 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	75 °C	75 °C	75 °C	200 °C	45 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-

**Intrinsically safe (IS)**

**Probe: Class I, Zone 0/Class I, Division 1**

**Electronics housing: Class I, Zone 1/Class I, Division 1**

**LTC57**

**Electrical output = PA (TRC [26])**

Housing = A2													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	55 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	70 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	80 °C	80 °C	135 °C	71 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	80 °C	80 °C	185 °C	64 °C	185 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 ( 85 °C)	-40 °C	57 °C	57 °C	57 °C	85 °C	52 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	72 °C	72 °C	72 °C	100 °C	67 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	75 °C	75 °C	75 °C	135 °C	65 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	75 °C	75 °C	75 °C	185 °C	58 °C	185 °C	-40 °C	-40 °C	-40 °C	-	-

Housing = A3													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	53 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	68 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	80 °C	80 °C	135 °C	69 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	80 °C	80 °C	185 °C	60 °C	185 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 ( 85 °C)	-40 °C	57 °C	57 °C	57 °C	85 °C	51 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	72 °C	72 °C	72 °C	100 °C	66 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	75 °C	75 °C	75 °C	135 °C	63 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	75 °C	75 °C	75 °C	185 °C	54 °C	185 °C	-40 °C	-40 °C	-40 °C	-	-

**LTC5X**

optional specification, option "Probe design" = B

**Electrical output = PA (TRC [26])**

Housing = A1													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-	58 °C	-	58 °C	-	58 °C	-	-40 °C	-	-40 °C	-	-
2 channels used	T6 (85 °C)	-	51 °C	-	51 °C	-	51 °C	-	-40 °C	-	-40 °C	-	-

Housing = A2, A3													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-	60 °C	-	60 °C	-	60 °C	-	-40 °C	-	-40 °C	-	-
	T5 (100 °C)	-	75 °C	-	75 °C	-	75 °C	-	-40 °C	-	-40 °C	-	-
2 channels used	T6 (85 °C)	-	57 °C	-	57 °C	-	57 °C	-	-40 °C	-	-40 °C	-	-
	T5 (100 °C)	-	72 °C	-	72 °C	-	72 °C	-	-40 °C	-	-40 °C	-	-

T<sub>p</sub> = dependent on the sensor



**Nonincendive Field Wiring (NIFW)**

**Probe: Class I, Zone 0 or Zone 1/Class I, Division 1 or Division 2**

**Electronics housing: Class I, Division 2**

**LTC50**

**Electrical output = PA (TRC [26])**

Housing = A2													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-20 °C	60 °C	60 °C	60 °C	80 °C	56 °C	80 °C	-20 °C	-20 °C	-20 °C	-	-
2 channels used	T5 (100 °C)	-20 °C	60 °C	60 °C	60 °C	80 °C	56 °C	80 °C	-20 °C	-20 °C	-20 °C	-	-

**LTC51**

**Electrical output = PA (TRC [26])**

Housing = A2													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	53 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	68 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	80 °C	80 °C	135 °C	69 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	80 °C	80 °C	200 °C	56 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 ( 85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	53 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	68 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	75 °C	75 °C	75 °C	135 °C	63 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	75 °C	75 °C	75 °C	200 °C	50 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-

Housing = A3													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	51 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	66 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	80 °C	80 °C	135 °C	67 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	80 °C	80 °C	200 °C	48 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	51 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	66 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	75 °C	75 °C	75 °C	135 °C	61 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	75 °C	75 °C	75 °C	200 °C	45 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-

**Nonincendive Field Wiring (NIFW)**

**Probe: Class I, Zone 0 or Zone 1/Class I, Division 1 or Division 2  
Electronics housing: Class I, Division 2**

**LTC57**

**Electrical output = PA (TRC [26])**

Housing = A2													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	55 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	70 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	80 °C	80 °C	135 °C	71 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	80 °C	80 °C	185 °C	64 °C	185 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 ( 85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	55 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	70 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	75 °C	75 °C	75 °C	135 °C	65 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	75 °C	75 °C	75 °C	185 °C	58 °C	185 °C	-40 °C	-40 °C	-40 °C	-	-

Housing = A3													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	53 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	68 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	80 °C	80 °C	135 °C	69 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	80 °C	80 °C	185 °C	60 °C	185 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 ( 85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	53 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	68 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	75 °C	75 °C	75 °C	135 °C	63 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	75 °C	75 °C	75 °C	185 °C	54 °C	185 °C	-40 °C	-40 °C	-40 °C	-	-

**LTC5X**

optional specification, option "Probe design" = B

**Electrical output = PA (TRC [26])**

Housing = A2, A3													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-	60 °C	-	60 °C	-	60 °C	-	-40 °C	-	-40 °C	-	-
	T5 (100 °C)	-	80 °C	-	80 °C	-	80 °C	-	-40 °C	-	-40 °C	-	-
2 channels used	T6 (85 °C)	-	59 °C	-	59 °C	-	59 °C	-	-40 °C	-	-40 °C	-	-
	T5 (100 °C)	-	74 °C	-	74 °C	-	74 °C	-	-40 °C	-	-40 °C	-	-

T<sub>p</sub> = dependent on the sensor

Standard Division 2 Wiring

Probe: Class I, Zone 0 or Zone 1/Class I, Division 1 or Division 2  
Electronics housing: Class I, Division 2

LTC50

Electrical output = PA (TRC [26])

Housing = A2													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-20 °C	60 °C	60 °C	60 °C	80 °C	56 °C	80 °C	-20 °C	-20 °C	-20 °C	-	-
2 channels used	T5 (100 °C)	-20 °C	60 °C	60 °C	60 °C	80 °C	56 °C	80 °C	-20 °C	-20 °C	-20 °C	-	-

LTC51

Electrical output = PA (TRC [26])

Housing = A2													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	53 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	68 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	80 °C	80 °C	135 °C	69 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	80 °C	80 °C	200 °C	56 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	53 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	68 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	75 °C	75 °C	75 °C	135 °C	63 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	75 °C	75 °C	75 °C	200 °C	50 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-

Housing = A3													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	51 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	66 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	80 °C	80 °C	135 °C	67 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	80 °C	80 °C	200 °C	48 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	51 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	66 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	75 °C	75 °C	75 °C	135 °C	61 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	75 °C	75 °C	75 °C	200 °C	45 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-

**Standard Division 2 Wiring**

**Probe: Class I, Zone 0 or Zone 1/Class I, Division 1 or Division 2**  
**Electronics housing: Class I, Division 2**

**LTC57**

**Electrical output = PA (TRC [26])**

Housing = A2													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	55 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	70 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	80 °C	80 °C	135 °C	71 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	80 °C	80 °C	185 °C	64 °C	185 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 ( 85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	55 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	70 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	75 °C	75 °C	75 °C	135 °C	65 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	75 °C	75 °C	75 °C	185 °C	58 °C	185 °C	-40 °C	-40 °C	-40 °C	-	-

Housing = A3													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	53 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	68 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	80 °C	80 °C	135 °C	69 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	80 °C	80 °C	185 °C	60 °C	185 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 ( 85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	53 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	68 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	75 °C	75 °C	75 °C	135 °C	63 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	75 °C	75 °C	75 °C	185 °C	54 °C	185 °C	-40 °C	-40 °C	-40 °C	-	-

**LTC5X**

optional specification, option "Probe design" = B

**Electrical output = PA (TRC [26])**

Housing = A2, A3													
Electrical output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>	T <sub>p</sub>	T <sub>amb</sub>
1 channel used	T6 (85 °C)	-	60 °C	-	60 °C	-	60 °C	-	-40 °C	-	-40 °C	-	-
	T5 (100 °C)	-	80 °C	-	80 °C	-	80 °C	-	-40 °C	-	-40 °C	-	-
2 channels used	T6 (85 °C)	-	59 °C	-	59 °C	-	59 °C	-	-40 °C	-	-40 °C	-	-
	T5 (100 °C)	-	74 °C	-	74 °C	-	74 °C	-	-40 °C	-	-40 °C	-	-

T<sub>p</sub> = dependent on the sensor

**Probe and electronics housing: Class II, III, Division 1**

**LTC5X**

**Electrical output = PA (TRC [26])**

Housing = A2, A3	
1 channel used	2 channels used
T = T <sub>amb</sub> + 6 K	T = T <sub>amb</sub> + 12 K





With regard to the supply of products, the current issue of the following document is applicable: The General Terms of Delivery for Products and Services of the Electrical Industry, published by the Central Association of the "Elektrotechnik und Elektroindustrie (ZVEI) e.V." including the supplementary clause: "Erweiterter Eigentumsvorbehalt".

# PROCESS AUTOMATION – PROTECTING YOUR PROCESS



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SI005730-B/98/EN/02.14  
116-0418  
FM7.2

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DOCT-4785A

277667  
09/2016