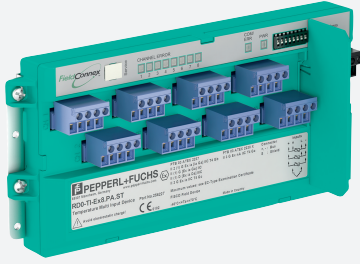


# Temperature Multi-Input Device for Cabinet Installation

## RD0-TI-Ex8.PA.\*



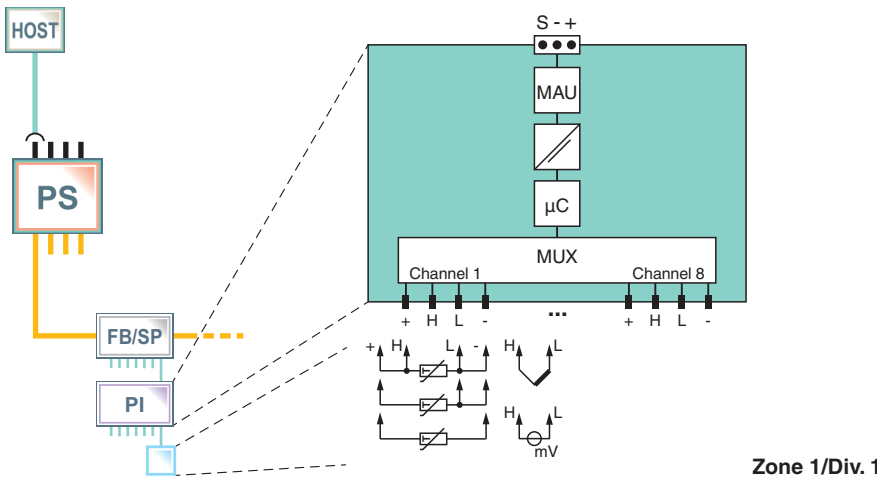
- For 8 temperature or analog sensors
- Installation in Zone 1/Div. 1, intrinsically safe
- Sensors in Zone 0/Div. 1
- Connection to fieldbus acc. to FISCO or Entity
- For PROFIBUS PA
- DCS integration via GSD and FDT/DTM
- Monitors sensor condition
- For T/C, RTD 2-, 3-, 4-wire, voltage and resistance
- Cold junction compensation
- Removable terminals



### Function

The Temperature Multi-Input (TM-I) for DIN rail installation connects up to 8 analog inputs to the DCS via fieldbus. It is installed in a typically pre-wired field enclosure close to the sensors in the hazardous area. The TM-I is certified intrinsically safe and as associated apparatus: inputs are intrinsically safe even when the fieldbus connection is not. Analog inputs can be resistance temperature sensors with 2, 3, and 4 wires, measuring sensors, thermocouples, or millivolt signals. The TM-I communicates all data, configuration, and alarms via one fieldbus address to the DCS. DCS integration utilizes GSD and FDT/DTM technology. Inputs can be configured all at once or individually. Fieldbus powers the sensors and the temperature interface itself. Additional power or wiring is not required. Cold junction compensation for thermocouples is integrated. The TM-I detects and reports lead breakage and short circuit conditions.

### Connection



### Technical Data

General specifications	
Design / Mounting	Cabinet installation
Fieldbus connection	
Fieldbus type	PROFIBUS PA
Firmware update	via separate plug connection
FDE (Fault Disconnect Equipment)	6.7 mA
Polarity	not polarity sensitive
Rated voltage	$U_N$ 9 ... 32 V

Release date: 2022-07-04 Date of issue: 2022-07-04 Filename: t163902\_eng.pdf

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## Technical Data

Rated current	$I_N$	max. 23 mA
<b>PROFIBUS PA</b>		
Profile		3.02
<b>Indicators/operating means</b>		
LED PWR		green: on, bus voltage existent
LED COM ERR		red, continuous lightning: hardware error; red, flashing: no bus activities or bus fault; off: no error
LED CHANNEL ERROR		red: 2 Hz flashing: lead breakage, overrange; off: no error
<b>Input</b>		
Number		8
Sensor types		see table 1
Grounding		grounding of thermoelements possible
Error detection		lead breakage, wiring error, hardware device error
Common mode voltage		Input to Input 600 V <sub>peak</sub>
<b>Transfer characteristics</b>		
Deviation		
Cold junction compensation		± 0.5 °C (32.9 °F)
Resolution/accuracy		see table 2
Influence of ambient temperature		see table 3
Linearization		T/C input 0.1°C RTD input 0.03°C
Internal measurement cycle		for all sensor types max. 1 s
<b>Galvanic isolation</b>		
Fieldbus/inputs		safe galvanic isolation acc. to EN 60079-11, voltage peak value 375 V
<b>Directive conformity</b>		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013
<b>Standard conformity</b>		
Galvanic isolation		EN 60079-11
Electromagnetic compatibility		NE 21:2011
Degree of protection		IEC 60529
Fieldbus standard		IEC 61158-2
Shock resistance		EN 60068-2-27
Vibration resistance		EN 60068-2-6
<b>Ambient conditions</b>		
Ambient temperature		-40 ... 70 °C (-40 ... 158 °F) hazardous area -40 ... 85 °C (-40 ... 185 °F) safe area
Storage temperature		-40 ... 85 °C (-40 ... 185 °F)
Relative humidity		≤ 95 % non-condensing
Shock resistance		15 g , 11 ms
Vibration resistance		5 g , 10 ... 150 Hz
Corrosion resistance		acc. to ISA-S71.04-1985, severity level G3
<b>Mechanical specifications</b>		
Connection type		plug-in terminals , spring terminal and screw terminal
Core cross section		
Bus		up to 2.5 mm <sup>2</sup>
Inputs		up to 2.5 mm <sup>2</sup>
Housing material		Polycarbonate
Degree of protection		IP20
Mass		360 g
Mounting		mounting on DIN rail in cabinet
<b>Data for application in connection with hazardous areas</b>		
EU-type examination certificate		PTB 03 ATEX 2237
Marking		Ⓜ II 2 (1) G Ex ia [ia Ga] IIC T4 Gb , Ⓜ II (1) G [Ex ia Ga] IIC , Ⓜ II (1) D [Ex ia Da] IIIC , Ⓜ II 3 G Ex ic IIC T4 Gc

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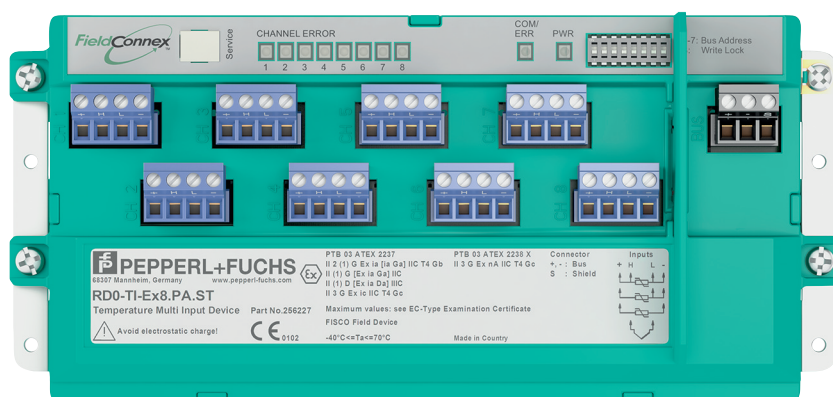
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## Technical Data

Bus	FISCO see EC-Type Examination Certificate
Voltage $U_i$	24 V
Inputs	see EC-Type Examination Certificate
Certificate	PTB 03 ATEX 2238 X
Marking	Ⓔ II 3 G Ex nA IIC T4 Gc
Galvanic isolation	
Bus	see Statement of Conformity
Input	see EC-Type Examination Certificate
Directive conformity	
Directive 2014/34/EU	EN 60079-0:2012 , EN 60079-11:2012 , EN 60079-15:2010
<b>International approvals</b>	
FM approval	CoC 3025732
CSA approval	CoC 3025732C
IECEX approval	IECEX PTB 05.0001 , IECEX PTB 05.0002X
Approved for	Ex ia [ia Ga] IIC T4 Gb , [Ex ia Ga] IIC , [Ex ia Da] IIIC , Ex ic IIC T4 Gc , Ex nA IIC T4 Gc
<b>Certificates and approvals</b>	
Marine approval	DNV A-14038
<b>General information</b>	
Supplementary information	EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .

## Assembly



## Matching System Components

	<b>F.TI0.P12.*08.P.0.*00</b>	Temperature Multi-Input Junction Box, Polyester (GRP)
	<b>F.TI0.S12.*08.P.0.*00</b>	Temperature Multi-Input Junction Box, Stainless Steel

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## Accessories

	<b>DTM FieldConnex</b>	FieldConnex® DTM Collection
	<b>Microsoft .NET</b>	Connection Software
	<b>PACTware 5.0</b>	FDT Framework
	<b>PACTware 4.1</b>	FDT Framework

**Additional Information**

**Type Code**

Type Code	Description
RD0-TI-Ex8.PA.ST	Fieldbus temperature interface with 8 inputs with screw terminals without field housing for mounting on DIN mounting rail in cabinet
RD0-TI-Ex8.PA.SC	Fieldbus temperature interface with 8 inputs with spring terminals without field housing for mounting on DIN mounting rail in cabinet

**Dimensions and Assembly**

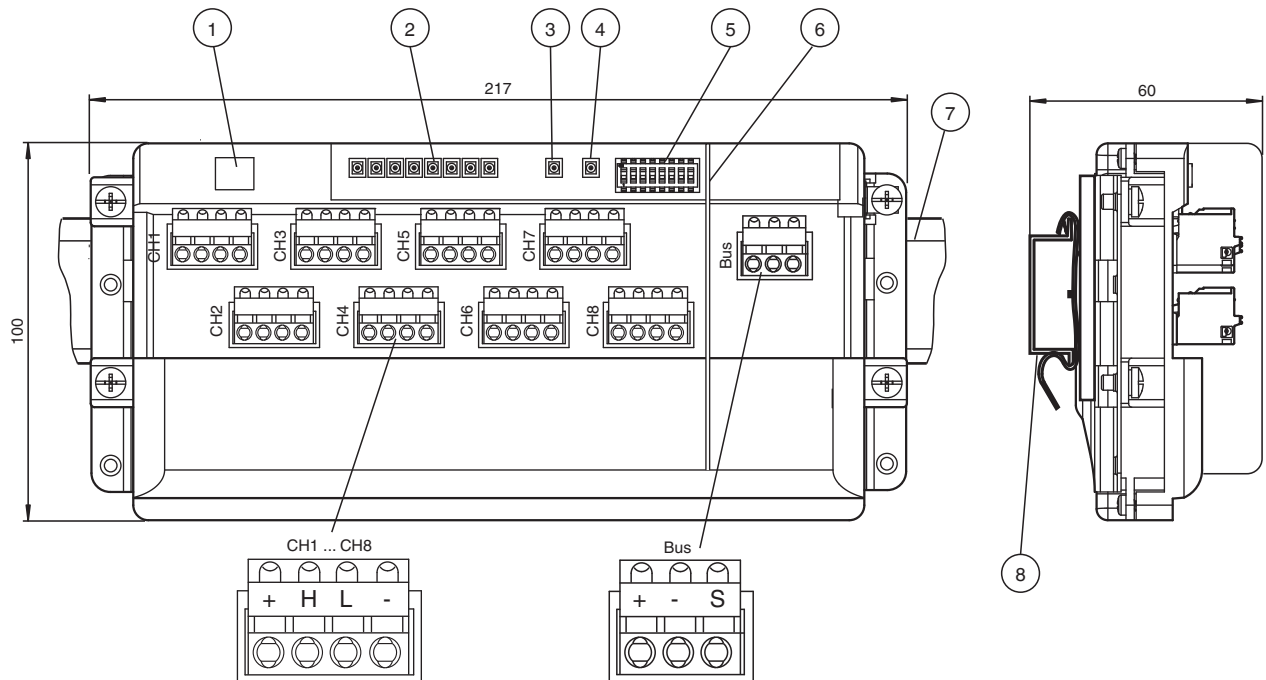


Figure 1: RD0-TI-Ex8.PA.SC

- 1 Service Interface, covered
- 2 LED CHANNEL ERROR: Issues channel errors
- 3 LED COM ERR: Issues communication errors
- 4 LED PWR: Issues power supply information
- 5 Dip switches for configuring the bus address
- 6 Separation wall (option): Meets the separation distances requirements of IEC/EN 60079-11. Wall is used when the device is installed in Zone 2 with inputs leading into Zone 1 or Zone 0.
- 7 DIN mounting rail for mounting the device
- 8 Mounting fixture on the device for mounting on DIN mounting rail

**Installation**

see manual

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Technical Features

Table 1: Sensor types

Thermocouple			
Type	Standard	Range (°C)	Range (°F)
B	EN 60584-1	300 ... 1800	572 ... 3272
E	EN 60584-1	-200 ... 1000	-328 ... 1832
J	EN 60584-1	-200 ... 1200	-328 ... 2192
K	EN 60584-1	-200 ... 1372	-328 ... 2502
N	EN 60584-1	-200 ... 1300	-328 ... 2372
R	EN 60584-1	0 ... 1768	-32 ... 3214
S	EN 60584-1	0 ... 1768	-32 ... 3214
T	EN 60584-1	-200 ... 400	-328 ... 752
W5Re/ W26Re	ASTM 988-96	0 ... 2000	-32 ... 3632

Input voltage	
Type	Range (mV)
Range 1	-100 ... 150

RTD			
Type	Standard	Range (°C)	Range (°F)
Pt50	EN 60751 (ITS90)	-200 ... 850	-328 ... 1562
Pt100	EN 60751 (ITS90)	-200 ... 850	-328 ... 1562
Pt100	JIS C 1604-1989	-200 ... 630	-328 ... 1166
Pt200	EN 60751 (ITS90)	-200 ... 850	-328 ... 1562
Pt500	EN 60751 (ITS90)	-200 ... 850	-328 ... 1562
Pt1000	EN 60751 (ITS90)	-200 ... 850	-328 ... 1562
Ni100	DIN 43760-1987	-60 ... 250	-76 ... 482
Ni120	Minco standard	-80 ... 320	-112 ... 608
Ni200	DIN 43760-1987	-60 ... 250	-76 ... 482
Cu10	SAMA RC21-4-1966	-70 ... 150	-94 ... 302

Resistance input	
Type	Range (Ohm)
Range 1	0 ... 650
Range 2	0 ... 1300
Range 3	0 ... 2600
Range 4	0 ... 5200

Table 2: Accuracy

Thermocouple				
Type	Range (°C)	Range (°F)	Accuracy	
			(°C)	(°F)
B	300 ... 600	572 ... 1112	± 3.32	± 5.98
	600 ... 1200	1112 ... 2192	± 1.77	± 3.19
	1200 ... 1800	2192 ... 3272	± 1.08	± 1.94
E	-200 ... -50	-328 ... -58	± 0.42	± 0.76
	-50 ... 1000	-58 ... 1832	± 0.31	± 0.56
J	-200 ... 0	-328 ... 32	± 0.48	± 0.86
	0 ... 1200	32 ... 2192	± 0.31	± 0.56
K	-200 ... 0	-328 ... 32	± 0.68	± 1.22
	0 ... 1372	32 ... 2502	± 0.43	± 0.77
N	-200 ... -100	-328 ... -148	± 1.03	± 1.85
	-100 ... 500	-148 ... 932	± 0.54	± 0.97
	500 ... 1300	932 ... 2372	± 0.39	± 0.70
R	0 ... 350	32 ... 662	± 1.93	± 3.47
	350 ... 1768	662 ... 3214	± 1.16	± 2.09
S	0 ... 550	32 ... 1022	± 1.92	± 3.46
	550 ... 1768	1022 ... 3214	± 1.15	± 2.07
T	-200 ... -50	-328 ... -58	± 0.66	± 1.19
	-50 ... 400	-58 ... 752	± 0.35	± 0.63
W5Re/ W26Re	0 ... 800	-32 ... 1472	± 0.80	± 1.45
	800 ... 2000	1472 ... 3632	± 1.05	± 1.89

Input voltage	
Type	Accuracy (µV)
Range 1	± 20

RTD		
Type	Accuracy	
	(°C)	(°F)
Pt50	± 0.77	± 1.39
Pt100	± 0.33	± 0.59
Pt100 JIS	± 0.33	± 0.59
Pt200	± 0.33	± 0.59
Pt500	± 0.31	± 0.56
Pt1000	± 0.31	± 0.56
Ni100	± 0.18	± 0.32
Ni120	± 0.18	± 0.32
Ni200	± 0.18	± 0.32
Cu10	± 2.99	± 5.38

Resistance input	
Type	Accuracy (mOhm)
Range 1	± 115
Range 2	± 230
Range 3	± 460
Range 4	± 920

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Table 3: Influence of ambient temperature

Thermocouple			
Type	Range (°C)	Range (°F)	Deviation (°C/K)
B	300 ... 600	572 ... 1112	± 0.0060
	600 ... 1200	1112 ... 2192	± 0.0131
	1200 ... 1800	2192 ... 3272	± 0.0242
E	-200 ... -50	-328 ... -58	± 0.0070
	-50 ... 200	-58 ... 392	± 0.0036
	200 ... 1000	392 ... 1832	± 0.0203
J	-200 ... 0	-328 ... 32	± 0.0072
	0 ... 200	32 ... 392	± 0.0039
	200 ... 1200	392 ... 2192	± 0.0243
K	-200 ... 0	-328 ... 32	± 0.0077
	0 ... 500	32 ... 932	± 0.0097
	500 ... 1372	932 ... 2502	± 0.0323
N	-200 ... -100	-328 ... -148	± 0.0080
	-100 ... 500	-148 ... 932	± 0.0088
	500 ... 1300	932 ... 2372	± 0.0264
R	0 ... 350	32 ... 662	± 0.0057
	350 ... 800	662 ... 1472	± 0.0129
	800 ... 1768	1472 ... 3214	± 0.0338
S	0 ... 550	32 ... 1022	± 0.0094
	550 ... 800	1022 ... 1472	± 0.0135
	800 ... 1768	1472 ... 3214	± 0.0355
T	-200 ... -50	-328 ... -58	± 0.0071
	-50 ... 200	-58 ... 392	± 0.0035
	200 ... 400	392 ... 752	± 0.0067
W5Re/ W26Re	0 ... 800	-32 ... 1472	± 0.0151
	800 ... 2000	1472 ... 3632	± 0.0552

Input voltage	
Type	Deviation (µV/K)
Range 1	± 2

RTD	
Type	Deviation (°C/K)
Pt50	± 0.010
Pt100	± 0.010
Pt100 JIS	± 0.010
Pt200	± 0.010
Pt500	± 0.010
Pt1000	± 0.010
Ni100	± 0.010
Ni120	± 0.010
Ni200	± 0.010
Cu10	± 0.010

Resistance input	
Type	Deviation (mOhm/K)
Range 1	± 6
Range 2	± 6
Range 3	± 13
Range 4	± 26

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