Temperature Input Module mV Ex i / I.S. Inputs, 8 Channels
Series 9481

02073E00

- 8 channels for thermocouples (DIN, IEC, GOST) and mV sensors
- Suitable for grounded thermocouples
- Intrinsically safe inputs Ex ia IIC
- Galvanic isolation between inputs and between inputs and system
- Open-circuit monitoring for each field circuit
- Module can be replaced in operation (hot swap)

The Temperature Input Module mV is used for the connection of up to 8 thermocouples or mV-signals. Each input is individually monitored for open circuits.
The inputs are galvanically isolated with regard to their function so that interfering ground loops are prevented with grounded thermocouples.
The cold junction temperature is compensated internally on the connection terminals.
The interface of the Temperature Input Module with the internal data bus of the BusRail is designed with redundancy.

	ATEX / IECEx					
Zone	0	1	2	20	21	22
Ex interface	x	x	x	x	x	x
Installation in		x	x		x*)	x*)

	NEC 505 Class I			NEC 506		
Zone	0	1	2	20	21	22
Ex interface	x	x	x	x	x	x
Installation in		x	x		x*)	x*)

	NEC 500					
	Class I		Class II		Class III	
Division	1	2	1	2	1	2
Ex interface	x	x	x	x	x	x
Installation in	x	x	x*)	x*)	x*)	x*)

*) Restrictions see table explosion protection

WebCode 9481A

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Selection Table

Version	Description	Order number	Weight kg / lbs
Temperature Input Module mV	8 channels for thermocouples (DIN, IEC, GOST) and mV sensors	**9481/12-08-11**	0.321 / 0.708
Note	Please order terminal separately - see Accessories		

Explosion Protection

Global (IECEx)		
Gas	PTB 06.0001X Ex ib [ia] IIC/IIB T4	
Europe (ATEX)		
Gas and dust	PTB 00 ATEX 2124 ⟨Ex⟩ II 2 (1) G Ex ib [ia] IIC T4 ⟨Ex⟩ II (1) D [Ex ia] IIIC	
Certifications and certificates		
Certificates	IECEx, ATEX, Brazil (Inmetro), India (PESO), Canada (CSA), Kazakhstan (GOST K), Russia (GOST R), Serbia (SRPS), USA (FM), Belarus (operating authorisation)	
Ship approval	ABS, BV, ClassNK, DNV, GL, LR, RS	
Safety data		
Maximum values	max. voltage U_i / V_{max}	6.5 V
	max. voltage U_o / V_{oc}	1 V
	max. current I_o / I_{sc}	8.5 mA
	max. power P_o	2.2 mW
Cable parameters (ATEX) (for inductive or capacitive circuits)	max. capacitance C_o / C_a for IIC (∑ of input circuits)	11.1 µF
	max. capacitance C_o / C_a for IIB (∑ of input circuits)	174 µF
	max. inductance L_o / L_a for IIC (∑ of input circuits)	11.8 mH
	max. inductance L_o / L_a for IIB (∑ of input circuits)	47.2 mH
	The effective internal capacitances and inductances are negligible.	
Further parameters		
Installation in	Zones 1 & 2, Div. 1 & 2, Zones 21 & 22	
Further information	see respective certifcate and operating instructions	

Technical Data

Electrical data

Ex i / I.S. inputs

Number of channels	8
Signal	- 10 ... + 100 mV
Linearity (adjustable parameters)	linear to temperature / linear to voltage

Connectable thermocouples (adjustable parameters for every 2 channels)

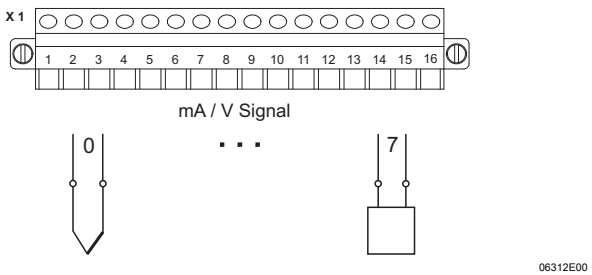
Type	Reference	Measuring range (ITS-90)	Medium resolution	Medium measurement deviation with regard to measuring range
B	IEC 60584-1	+400 ... +1800 °C / +752 ... +3272 °F	0.25 K	0.1 %
E	IEC 60584-1	-200 ... +1000 °C / -328 ... +1832 °F	0.1 K	0.013 %
J	IEC 60584-1	-200 ... +1200 °C / -328 ... +2192 °F	0.1 K	0.014 %
K	IEC 60584-1	-200 ... +1370 °C / -328 ... +2498 °F	0.1 K	0.02 %
N	IEC 60584-1	-200 ... +1300 °C / -328 ... +2372	0.1 K	0.02 %
R	IEC 60584-1	-50 ... +1767 °C / -58 ... +3213 °F	0.2 K	0.05 %
S	IEC 60584-1	-50 ... +1767 °C / -58 ... +3213 °F	0.2 K	0.053%
T	IEC 60584-1	-200 ... +400 °C / -328 ... +752 °F	0.1 K	0.042 %
L	DIN 43710	-200 ... +900 °C / -328 ... +1652 °F	0.1 K	0.027 %
U	DIN 43710	-200 ... +600 °C / -328 ... +1112 °F	0.1 K	0.038 %
XK	GOST 8.585	-50 ... +800 °C / -328 ... +1472 °F	0.1 K	0.02 %
mV	- -	0 ... +100 mV	3.6 µV	0.01 %

Input resistance	10 M Ω
Maximum delay from the input to the internal bus, 0 ... 90 % of the signal span	800 ms
Filter time constant (adjustable parameters)	50 Hz, 60Hz
Response threshold for open-circuit monitoring	> 1 k Ω

Galvanic separation

Isolation between the channels	Function up to 100 Vss (for explosion protection, the max. permissible potential difference between the earthing points, e.g. of earthed thermocouples, is 6.5 V)
between power supply and system components	1500 V AC
between two input / output modules	500 V AC
between inputs and system components	500 V AC

Electrical connection

Ex i field signals	Plug-in terminals 16-pole with catch, 2.5 mm² / up to 14 AWG, screw or spring type
Connection diagram	

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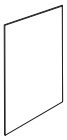
Technical Data

Electrical data	
Cold junction compensation	
Operating mode	Internal
Measuring range	- 40 ... + 80 °C / - 40 ... + 158 °F
Resolution	0.1 K
Auxiliary power	
Maximum power consumption	1.6 W
Maximum power dissipation	1.6 W
Diagnostics	
Retrievable parameters	Manufacturer, type, version, serial number
Module faults	• Internal primary bus faults • Internal redundant bus faults • No response • Module does not correspond to configuration • Hardware fault
Signal errors for each channel	
Open circuit	< > 1 k Ω
Measuring range	Over range / under range
Device-specific data	
Accuracy of measurement	
Note	All values in % of the signal span, at 23 °C / 73.4 °F
Measurement deviation	see table
Ambient temperature influence	0.05 % / 10 K
Settings	
Open-circuit monitoring	ON, OFF (for each channel)
Value to fieldbus during open circuit	Alarm code, hold last value
Mechanical data	
Module enclosure	Polyamide 6GF
Fire resistance (UL 94)	V2
Degree of protection (IEC 60529)	
Modules	IP30
Connections	IP20
Operator interface	
Operation	LED green "RUN"
Fault	LED red "ERR"
Ambient conditions	
Ambient temperature	-20 ... +65 °C / -4 ... +149 °F
Storage temperature	-40 ... +70 °C / -40 ... +158 °F
Maximum relative humidity	95 % (no condensation)
Sinusoidal vibration (IEC EN 60068-2-6)	1 g in frequency range between 10 ... 500 Hz 2 g in frequency range 45 ... 100 Hz
Semi-sinusoidal shock (IEC EN 60068-2-27)	15 g (3 shocks per axis and direction)
Electromagnetic compatibility	Tested according to the following standards and regulations: EN 61326-1 (1998) IEC 1000-4-1...6, NAMUR NE 21
Installation conditions	
Mounting type	on 35 mm DIN rail NS 35/15
Mounting orientation	horizontal and vertical

Accessories and Spare Parts

Designation	Figure	Description	Art. no.
Plug-in terminal	02079E00	2.5 mm² / 14 AWG with catch, 16-pole, screw connection, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits Designation: 1 ... 16 Attention: An additional terminal is necessary for I/O module Series 9470 and 9480. Designation: 17 ... 32	**162702**
	02077E00	2.5 mm² / 14 AWG with catch, 16-pole, spring connection, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits including test jacks Designation: 1 ... 16 Attention: An additional terminal is necessary for I/O module Series 9470 and 9480. Designation: 17 ... 32	**162695**
Labelling strips	05869E00	"FB Addr ... Mod No ..." for pluggable terminal, sheet with 26 strips	**162788**
DIN A4 sheet	 09900E00	For label plate on I/O modules; 6 labels on each sheet; print-out using IS Wizard; packaging unit = 20 sheets	**162832**
Warning sign	05872E00	"Clean modules only with a damp cloth."	**162796**
Partition	02078E00	For assembly between intrinsically safe and non-intrinsically safe connectors of the I/O modules, in order to adhere to the required 50 mm / 2 in distance	**162740**

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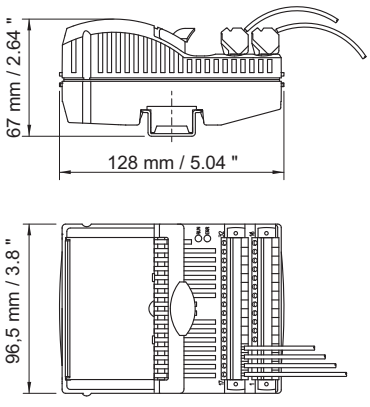
Dimensional Drawings (All Dimensions in mm / inches) - Subject to Alterations



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