Temperature Converter

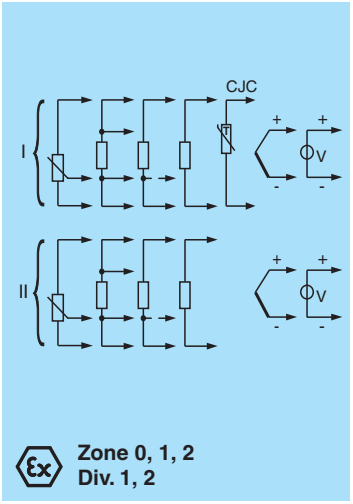
HiD2082

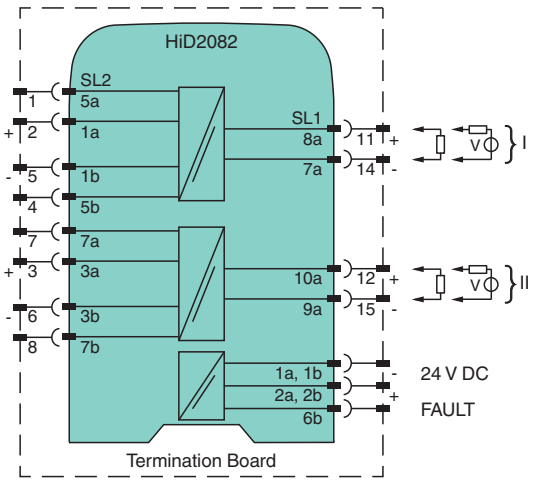
- 2-channel isolated barrier
- 24 V DC supply (bus powered)
- Thermocouple, RTD or potentiometer input
- Usable as signal splitter (1 input and 2 outputs)
- Linearized output 4 mA ... 20 mA, sink/source or 1 V ... 5 V
- Sensor breakage detection
- Configurable by PACTware
- Line fault detection (LFD)
- Up to SIL 2 acc. to IEC 61508/IEC 61511

Function

This isolated barrier is used for intrinsic safety applications.
This device accepts thermocouples (TC), millivolts, potentiometers, or resistance temperature detectors (RTD) from a hazardous area and converts them to an isolated, linearized analog output in the safe area.
The outputs can be selected as a current source, current sink, or voltage source with DIP switches on the side panel.
The device can also be configured as a signal splitter.
Line fault detection of the field circuit is indicated by a red LED and an output on the fault bus. The fault conditions are monitored via a Fault Indication Board.
The device is easily configured by the use of the PACTware configuration software.
This device mounts on a HiD Termination Board.

Connection





Technical Data

General specifications		
Signal type		Analog input
Functional safety related parameters		
Safety Integrity Level (SIL)		SIL 2
Supply		
Connection		SL1: 1a(-), 1b(-); 2a(+), 2b(+)
Rated voltage	U_r	20.4 ... 30 V DC bus powered via Termination Board
Ripple		within the supply tolerance

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Technical Data

Current	≤ 95 mA at 20.4 V and ≤ 63 mA at 30 V
Power consumption	≤ 1.95 W
Interface	
Programming interface	programming socket
Input	
Connection side	field side
Connection	SL2: 5a(+), 1a(+), 1b(-), 5b(-); 7a(+), 3a(+), 3b(-), 7b(-)
RTD	type Cu10, Cu50, Cu100, Pt10, Pt50, Pt100, Pt500, Pt1000, Ni100 (EN 60751: 1995) type Pt10GOST, Pt50GOST, Pt100GOST, Pt50GOST, Pt1000GOST (P50353-92)
Measuring current	approx. 200 µA with RTD
Types of measuring	2-, 3-, 4-wire connection
Lead resistance	max. 50 Ω per line
Measurement loop monitoring	sensor breakage, sensor short-circuit
Thermocouples	type B, E, J, K, N, R, S, T (IEC 584-1: 1995) type L (DIN 43710: 1985) type TXK, TXKH, TXA (P8.585-2001)
Cold junction compensation	at field terminals
Measurement loop monitoring	sensor breakage
Potentiometer	0.1 ... 20 kΩ
Types of measuring	3-wire connection
Voltage	selectable within the range -100 ... 100 mV
Input resistance	min. 1 MΩ (-100 ... 100 mV)
Output	
Connection side	control side
Connection	SL1: 8a(+), 7a(-); 10a(+), 9a(-)
Output I, II	analog, current or voltage output
Current range	0/4 ... 20 mA
Voltage range	0 ... 5 V or 1 ... 5 V (on 250 Ω, 0.1 % internal shunt)
Fault signal	downscale 0 or 2 mA, upscale 21.5 mA (acc. NAMUR NE43)
Source	load 0 ... 550 Ω , open-circuit voltage ≤ 18 V
Sink	Voltage across terminals 7 ... 30 V. If the current is supplied from a source > 20 V, series resistance of ≥ (V - 20)/0.0215 Ω is needed, where V is the source voltage. The maximum value of the resistance is (V - 7)/0.0215 Ω.
Fault indication output	
Connection	SL1: 6b
Output type	open collector transistor (internal fault bus)
Transfer characteristics	
Deviation	
After calibration	Pt100: ± (0.05 % of measurement value in °C + 0.05 % of span + 0.1 K (4-wire connection)) thermocouple: ± (0.05 % of measurement value in °C + 0.05 % of span + 1 K (1.2 K for types R and S)) This includes ± 0.8 K fault of the cold junction compensation (CJC)
Influence of ambient temperature	current output (deviation of CJC included): Pt100: ± (0.0015 % of measurement value in K + 0.006 % of span)/K ΔT_{amb} *) thermocouple: ± (0.02 K + 0.01 % of measurement value in K + 0.006 % of span)/K ΔT_{amb} *) *) ΔT_{amb} = ambient temperature change referenced to 23 °C (296 K)
Influence of supply voltage	< 0.01 % of span
Influence of load	≤ 0.1% of full scale from 0 ... 550 Ω
Reaction time	worst case value (sensor breakage and/or sensor short circuit detection enabled) mV: 1.2 s, thermocouples with CJC: 1.4 s, thermocouples with fixed ref. temp: 1.4 s, 3- or 4-wire RTD: 1.1 s, 2-wire RTD: 920 ms
Galvanic isolation	
Power supply/programming input	There is no electrical isolation between the programming input and the supply. The programming cable provides galvanic isolation so that ground loops are avoided.
Indicators/settings	
Display elements	LEDs

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Control elements		DIP switch
Configuration		via DIP switches via PACTware
Labeling		space for labeling at the front
Directive conformity		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013 (industrial locations)
Conformity		
Electromagnetic compatibility		NE 21:2006 For further information see system description.
Degree of protection		IEC 60529:2001
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Relative humidity		5 ... 90 %, non-condensing up to 35 °C (95 °F)
Mechanical specifications		
Degree of protection		IP20
Mass		approx. 140 g
Dimensions		18 x 114 x 130 mm (0.7 x 4.5 x 5.1 inch) (W x H x D)
Mounting		on Termination Board
Coding		pin 2 and 4 trimmed For further information see system description.
Data for application in connection with hazardous areas		
EU-type examination certificate		CESI 02 ATEX 086
Marking		⟨Ex⟩ II (1)G [Ex ia Ga] IIC ⟨Ex⟩ II (1)D [Ex ia Da] IIIC , (-20 °C ≤ T_{amb} ≤ 60 °C)
Input		[Ex ia Ga] IIC, [Ex ia Da] IIIC
Voltage	U_o	10 V
Current	I_o	15 mA
Power	P_o	38 mW
Analog outputs, power supply, collective error		
Maximum safe voltage	U_m	250 V (Attention! This is not the rated voltage.)
Interface		
Maximum safe voltage	U_m	250 V (Attention! The rated voltage is lower.), RS 232
Certificate		PF 11 CERT 2109 X
Marking		⟨Ex⟩ II 3G Ex nA nC IIC T4
Galvanic isolation		
Input/input		125 V AC max. common voltage between isolated channels (mV or thermocouple inputs only)
Input/Output		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Input/power supply		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Input/Programming input		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Directive conformity		
Directive 2014/34/EU		EN 60079-0:2012+A11:2013 , EN 60079-11:2012 , EN 60079-15:2010
International approvals		
CSA approval		
Control drawing		366-017CS-12 (cCSAus)
IECEx approval		
IECEx certificate		IECEx TUN 04.0012
IECEx marking		[Ex ia] IIC
General information		
Supplementary information		Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com.

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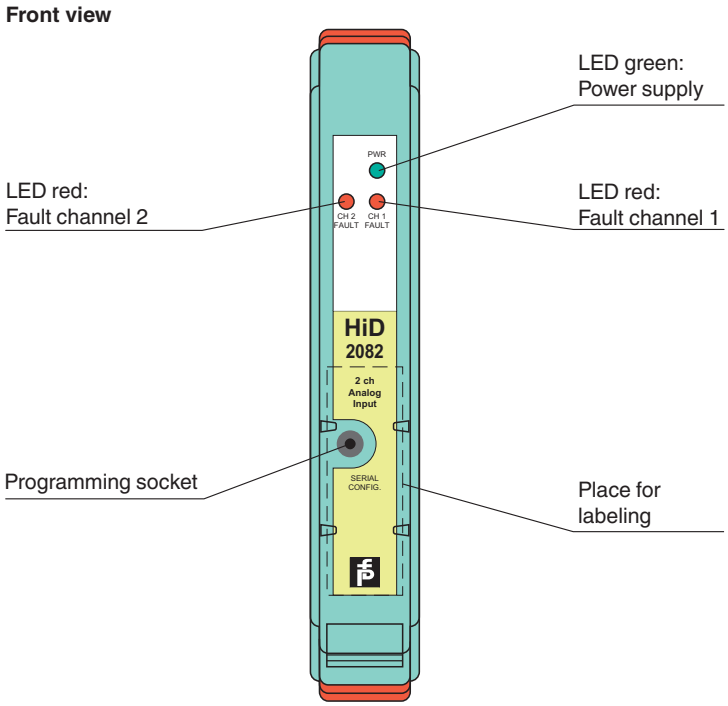
Assembly

Front view



Matching System Components

	DTM Interface Technology	Device type manager (DTM) for interface technology
	PACTware 5.X	FDT Framework
	K-ADP-USB	Programming adapter with USB interface

Accessories

	H-CJC-SP-8	Resistance thermometer for cold junction compensation for H-System termination boards
	H-CJC-SC-8	Resistance thermometer for cold junction compensation for H-System termination boards

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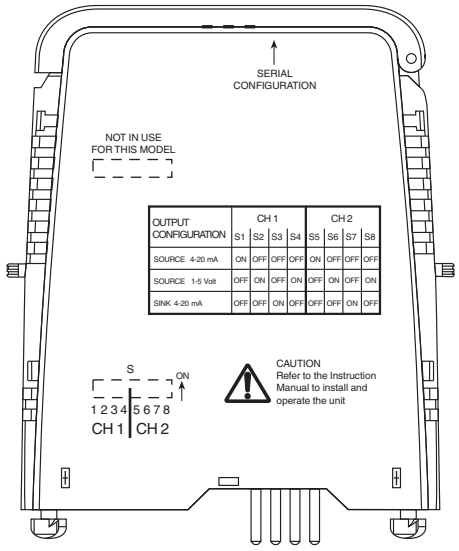
Application

The resistance thermometer for cold junction compensation H-CJC-**-8 is available as an accessory for temperature measurements with thermocouples.

Configuration



Switch position

Channel	Switch	Function		
		Source 4 mA ... 20 mA	Source 1 V ... 5 V	Sink 4 mA ... 20 mA
I	S1	ON	OFF	OFF
	S2	OFF	ON	OFF
	S3	OFF	OFF	ON
	S4	OFF	ON	OFF
II	S5	ON	OFF	OFF
	S6	OFF	ON	OFF
	S7	OFF	OFF	ON
	S8	OFF	ON	OFF

Configuration

Configure the device in the following way:

- Push the red Quick Lok Bars on each side of the device in the upper position.
- Remove the device from Termination Board.
- Set the DIP switches according to the figure.

The pins for this device are trimmed to polarize it according to its safety parameter. Do not change! For further information see system description.

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