

SMART Transmitter Power Supply

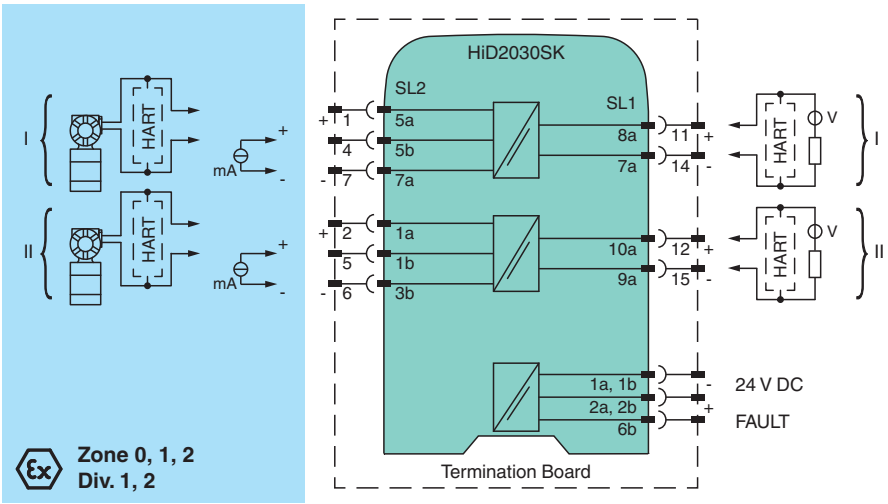
HiD2030SK

- 2-channel isolated barrier
- 24 V DC supply (bus powered)
- 2-wire SMART transmitters or current sources
- Usable as signal splitter (1 input and 2 outputs)
- Dual output 4 mA ... 20 mA, current sink
- Line fault detection (LFD)
- Up to SIL 2 acc. to IEC/EN 61508

Function

This isolated barrier is used for intrinsic safety applications. It provides a fully floating supply to power 2-wire SMART transmitters in the hazardous area, and repeats the current to drive a safe area load. It is also used with 2-wire current sources. It is designed to provide a sink mode output on the safe area terminals.
Digital signals may be superimposed on the analog values in the hazardous or safe area, which are transferred bidirectionally.
A separate fault output on the bus is signaled if the input signal is outside the range 0.2 mA ... 24 mA. The fault conditions can be monitored via a Fault Indication Board.
This module 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
Rated current	I_r	40 mA at 24 V, 20 mA output (per channel)
Power dissipation		1.05 W at 20 mA and 24 V external from PCS or PLC (per channel)
Input		

Release date: 2022-01-05 Date of issue: 2022-01-05 Filename: 121500_eng.pdf

Technical Data

Connection side		field side
Connection		SL2: 5a(+), 5b, 7a(-); 1a(+), 1b, 3b(-)
Input current		4 ... 20 mA , current limit 26 mA typ.
Input resistance		40 Ω , for current source
Ripple		10 mV_{eff}
Voltage		min. 15.5 V at 20 mA
Communication		pass-through of HART signal to safe area The current sink terminals 4, 7 and 5, 6 do not pass the HART signal to safe area.
Output		
Connection side		control side
Connection		SL1: 8a(+), 7a(-); 10a(+), 9a(-)
Output		sink mode from external supply
Output signal		4 ... 20 mA , current limit 24 mA
Voltage		working voltage 7 ... 30 V
Response time		70 ms , 10 ... 90 % step change
Signal level		no fault: 1 mA ... 23.5 mA input current fault detection: < 0.2 mA or > 24 mA input current
Fault indication output		
Connection		SL1: 6b
Output type		open collector transistor (common to both channels) fault bus signal, collective error message
Transfer characteristics		
Calibrated accuracy		< ± 0.1 % of full-scale value
Influence of temperature		< ± 0.01 %/ K
Frequency range		communication channel: 0.5 ... 40 kHz within 3 db, (-6 db at 100 kHz), Tx to output and output to Tx, suitable for use with SMART transmitters using HART or similar protocol
Linearity		< ± 0.05 % of full-scale value
Galvanic isolation		
Output/power supply		functional insulation acc. to DIN EN 50178, rated insulation voltage 50 V_{eff}
Output/Output		functional insulation acc. to DIN EN 50178, rated insulation voltage 50 V_{eff}
Indicators/settings		
Display elements		LEDs
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 1 and 3 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
Input		Ex ia, Ex iaD
Voltage	U_o	26 V

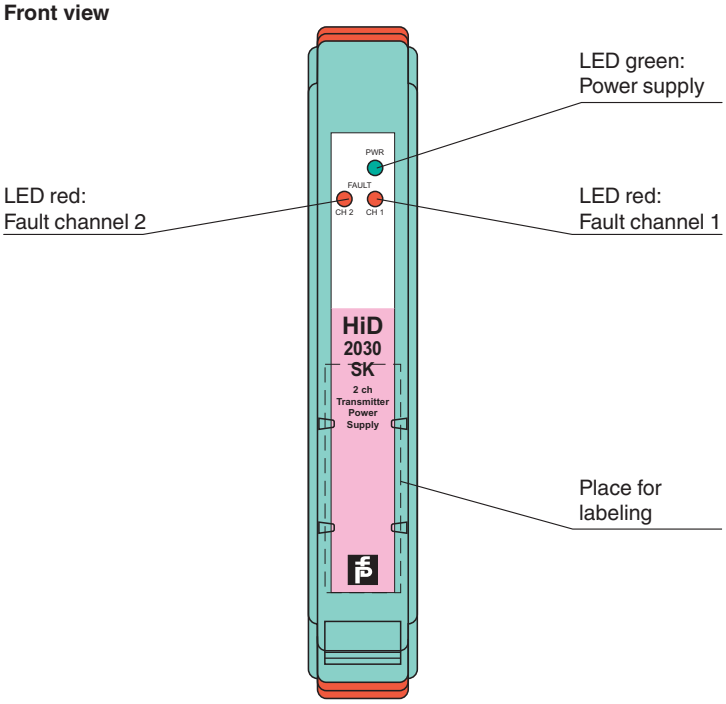
Release date: 2022-01-05 Date of issue: 2022-01-05 Filename: 121500_eng.pdf

Technical Data

Current	I_o	93 mA
Power	P_o	605 mW
Supply		
Maximum safe voltage	U_m	250 V AC (Attention! U_m is no rated voltage.)
Certificate		PF 11 CERT 2109 X
Marking		⟨Ex⟩ II 3G Ex nA IIC T4 Gc [device in zone 2]
Galvanic isolation		
Input/input		safe electrical isolation acc. to EN 60079-11:2007, voltage peak value 60 V
Input/Output		safe electrical isolation acc. to IEC 60079-11:2007, voltage peak value 375 V
Input/power supply		safe electrical isolation acc. to IEC 60079-11:2007, 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		366-005CS-12B (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.

Assembly

Front view



Release date: 2022-01-05 Date of issue: 2022-01-05 Filename: 121500_eng.pdf

Application

The device supports the following SMART protocols:

- HART
- BRAIN
- Bailey (only STT02 communication, e. g. BCN series)
- Foxboro

Configuration

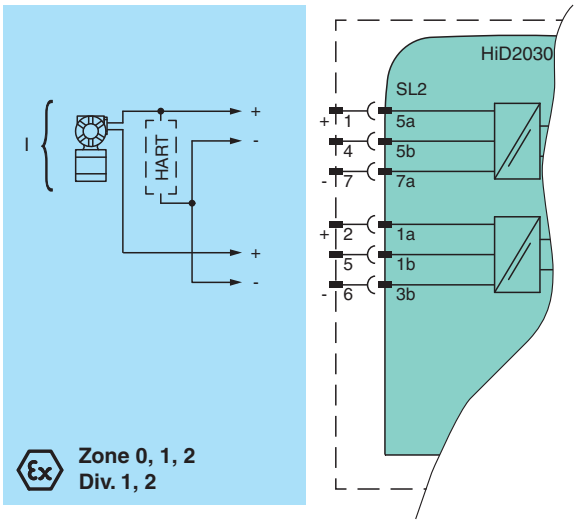
No user configuration available for this device.

Safety Information

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

Application

Connection for signal splitter function: 1 input → 2 outputs



Note:

- Communication for SMART transmitter is provided only on output channel 1.
- Minimum supply voltage available for field transmitters is 14.7 V at 20 mA.
- Safety parameters are now:
  - U_o = 27.2 V
  - I_o = 93 mA
  - P_o = 633 mW
- See operating instructions for other connection options and for more details.

Release date: 2022-01-05 Date of issue: 2022-01-05 Filename: 121500_eng.pdf