

SMART Transmitter Power Supply
KFD2-STC5-Ex1.H

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Input 2-wire and 3-wire SMART transmitters and 2-wire SMART current sources
- Output 4 mA ... 20 mA current sink/current source
- Terminals with test points
- High field voltage 17 V DC
- Up to SIL 2 (SC 3) acc. to IEC/EN 61508

Function

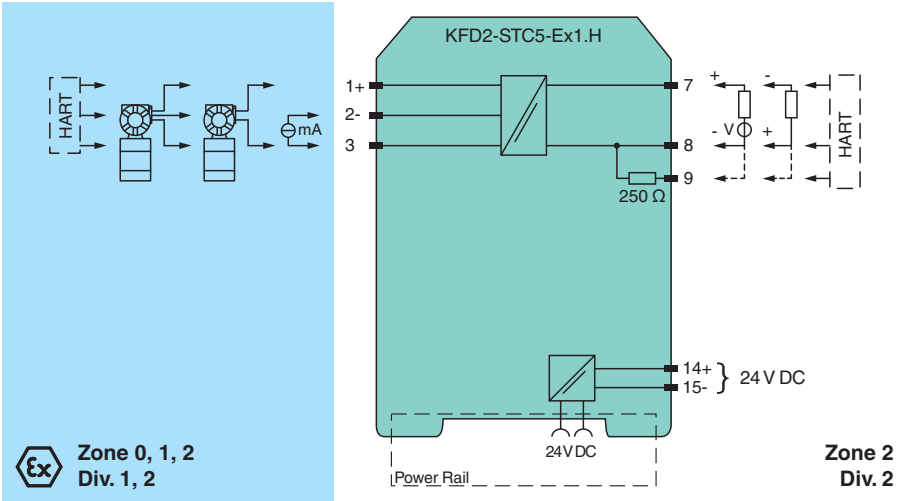
This isolated barrier is used for intrinsic safety applications.
The device supplies 2-wire and 3-wire SMART transmitters, and can also be used with 2-wire SMART current sources.
It transfers the analog input signal to the safe area as an isolated current value.
Digital signals may be superimposed on the input signal in the hazardous or non-hazardous area and are transferred bi-directionally.
The device provides a sink mode or a source mode output on the safe area terminals.
The device has an internal resistor. Use this resistor if the HART communication resistance in the control circuit is too low.
Test sockets for the connection of HART communicators are integrated into the terminals of the device.

Application

The device supports the following SMART protocols:

- HART
- BRAIN
- Foxboro

Wiring Diagram



Technical Data

General specifications		
Signal type		Analog input
Functional safety related parameters		
Safety Integrity Level (SIL)		SIL 2
Systematic capability (SC)		SC 3

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Technical Data

Supply		
Connection		Power Rail or terminals 14+, 15-
Rated voltage	U_r	18 ... 30 V DC
Ripple		within the supply tolerance
Power dissipation		≤ 1 W at maximum load
Power consumption		≤ 1.6 W at maximum load
Input		
Connection side		field side
Connection		terminals 1+, 2-, 3
Input signal		4 ... 20 mA
Open circuit voltage/short-circuit current		terminals 1+, 3: 24 V / 25 mA
Input resistance		max. 265 Ω terminals 2-, 3 , max. 330 Ω terminals 1+, 3
Available voltage		≥ 17 V at 20 mA ; ≥ 21 V at 4 mA , terminals 1+, 3
Output		
Connection side		control side
Connection		terminals 7+, 8-, 9- (sink) terminals 7-, 8+, 9+ (source) see additional information
Load		0 ... 800 Ω
Output signal		4 ... 20 mA (overload > 25 mA)
Ripple		max. 50 µA $_{rms}$
External supply (loop)		2 ... 30 V DC If the external voltage is > 19 V, a load ≥ ((V - 19) / 0.02) Ω is required. V represents the value of the external voltage. The internal 250 Ω resistor at terminal 9 can be used as a load.
Transfer characteristics		
Deviation		at 20 °C (68 °F), 4 ... 20 mA ≤ 10 µA incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature		≤ 0.25 µA/K
Frequency range		field side into the control side: bandwidth with 0.5 V_{pp} signal 0 ... 7.5 kHz (-3 dB) control side into the field side: bandwidth with 0.5 V_{pp} signal 0.3 ... 7.5 kHz (-3 dB)
Settling time		500 µs
Rise time/fall time		100 µs
Galvanic isolation		
Output/power supply		functional insulation, rated insulation voltage 50 V AC
Indicators/settings		
Display elements		LED
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 21:2012 EN 61326-3-2:2008
Degree of protection		IEC 60529:2001
Protection against electrical shock		UL 61010-1:2012
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F) extended ambient temperature range up to 70 °C (158 °F), refer to manual for necessary mounting conditions
Mechanical specifications		
Degree of protection		IP20
Connection		screw terminals
Mass		approx. 200 g
Dimensions		20 x 124 x 115 mm (0.8 x 4.9 x 4.5 inch) (W x H x D) , housing type B2
Mounting		on 35 mm DIN mounting rail acc. to EN 60715:2001
Data for application in connection with hazardous areas		

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Technical Data

EU-type examination certificate		CML 17 ATEX 2029X
Marking		⟨Ex⟩ II (1)G [Ex ia Ga] IIC ⟨Ex⟩ II (1)D [Ex ia Da] IIIC ⟨Ex⟩ I (M1) [Ex ia Ma] I
Input		[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I
Supply		
Maximum safe voltage	U_m	250 V (Attention! The rated voltage can be lower.)
Equipment		terminals 1+, 3-
Voltage	U_o	27.2 V
Current	I_o	93 mA
Power	P_o	633 mW
Internal capacitance	C_i	5 nF
Internal inductance	L_i	0 mH
Equipment		terminals 2-, 3
Voltage	U_i	30 V
Current	I_i	115 mA
Power	P_i	1 W
Voltage	U_o	2 V
Current	I_o	8.5 mA
Power	P_o	1.1 mW
Equipment		terminals 1+, 2 / 3-
Voltage	U_o	27.2 V
Current	I_o	115 mA
Power	P_o	782 mW
Internal capacitance	C_i	5 nF
Internal inductance	L_i	0 mH
Output		
Maximum safe voltage	U_m	250 V (Attention! The rated voltage can be lower.)
Certificate		CML 17 ATEX 3028X
Marking		⟨Ex⟩ II 3G Ex ec IIC T4 Gc
Galvanic isolation		
Input/Output		safe electrical isolation acc. to IEC/EN 60079-11:2007, voltage peak value 375 V
Input/power supply		safe electrical isolation acc. to IEC/EN 60079-11:2007, voltage peak value 375 V
Directive conformity		
Directive 2014/34/EU		EN IEC 60079-0:2018+AC:2020 , EN 60079-7:2015+A1:2018 , EN IEC 60079-11:2024
International approvals		
UL approval		E106378
Control drawing		116-0439 (cULus)
IECEx approval		
IECEx certificate		IECEx CML 17.0015X
IECEx marking		[Ex ia Ga] IIC , [Ex ia Da] IIIC , [Ex ia Ma] I Ex ec IIC T4 Gc
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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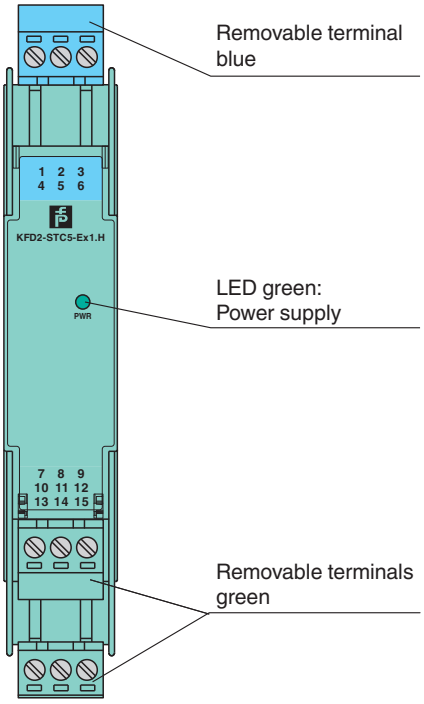
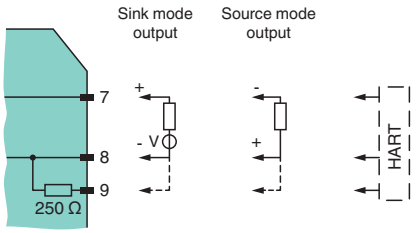
Assembly

Front view



Connection



The device provides an output on the control side terminals. This output can be operated in the current sink operating mode or current source operating mode. Please refer to the connection diagram.

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