

SMART Transmitter Power Supply KCD2-STC-Ex1

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Input for 2-wire SMART transmitters and current sources
- Output for 4 mA ... 20 mA or 1 V ... 5 V
- Housing width 12.5 mm
- Up to SIL 2 (SC 3) acc. to IEC/EN 61508



SIL 2



HART
COMMUNICATION PROTOCOL

Function

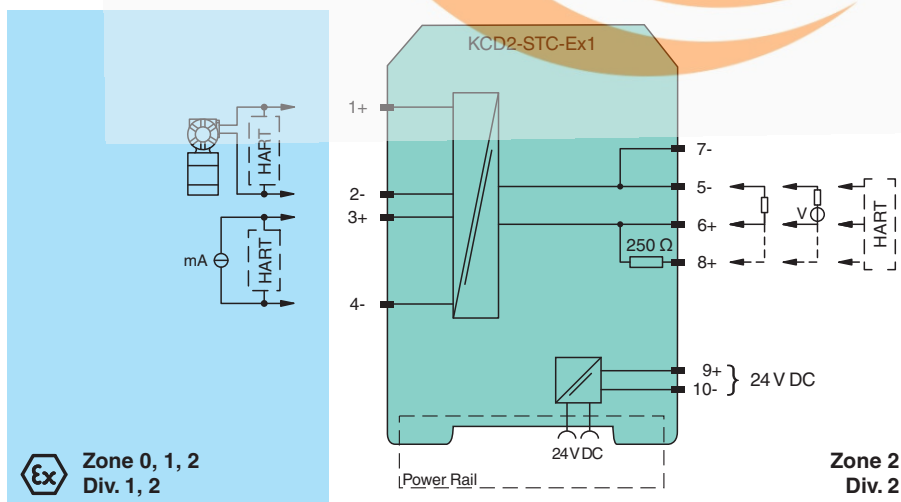
This isolated barrier is used for intrinsic safety applications. The device supplies 2-wire SMART transmitters in a hazardous area, and can also be used with 2-wire SMART current sources. It transfers the analog input signal to the safe area as an isolated current value. Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally. Selectable output of current source, sink mode, or voltage output is available via DIP switches. If the HART communication resistance in the loop is too low, the internal resistance of 250 Ω between terminals 6 and 8 can be used. 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

Connection



Technical Data

General specifications

Signal type Analog input

Technical Data

Functional safety related parameters

Safety Integrity Level (SIL)	SIL 2
Systematic capability (SC)	SC 3

Supply

Connection	Power Rail or terminals 9+, 10-
Rated voltage	U_r 19 ... 30 V DC
Ripple	$\leq 10 \%$
Rated current	I_r $\leq 45 \text{ mA}$ at 24 V and 20 mA source mode output
Power dissipation	$\leq 800 \text{ mW}$
Power consumption	$\leq 1.1 \text{ W}$

Input

Connection side	field side
Connection	terminals 1+, 2-; 3+, 4-
Input signal	4 ... 20 mA limited to approx. 26 mA
Open circuit voltage/short-circuit current	terminals 1+, 2-: 22 V / 26 mA
Voltage drop	terminals 3+, 4- : approx. 5 V
Available voltage	terminals 1+, 2-: $\geq 15 \text{ V}$ at 20 mA ; $\geq 18 \text{ V}$ at 4 mA

Output

Connection side	control side
Connection	terminals 5-, 6+ terminals 5-, 8+ for HART resistor
Load	0 ... 350 Ω (source mode)
Output signal	source mode: 4 ... 20 mA or 1 ... 5 V (internal resistor: 250 Ω , 0.1 %) sink mode: 4 ... 20 mA, operating voltage 10 ... 30 V For additional internal or external loads (e. g. terminal +8) the voltage drop has to be considered, e. g. 250 Ω x 20 mA = 5 V.
Ripple	20 mV _{rms}

Transfer characteristics

Deviation	at 20 °C (68 °F) < 0.1 % of full scale, incl. non-linearity and hysteresis (source mode and sink mode 4 ... 20 mA) $\leq \pm 0.2 \%$ incl. non-linearity and hysteresis (source mode 1 ... 5 V)
Influence of ambient temperature	< 2 $\mu\text{A/K}$ (-20 ... 70 °C (-4 ... 158 °F)); < 4 $\mu\text{A/K}$ (-40 ... -20 °C (-40 ... -4 °F)) (source mode and sink mode 4 ... 20 mA) < 0.5 mV/K (-20 ... 70 °C (-4 ... 158 °F)); < 1 mV/K (-40 ... -20 °C (-40 ... -4 °F)) (source mode 1...5 V)
Frequency range	field side into the control side: bandwidth with 0.5 V _{pp} signal 0 ... 3 kHz (-3 dB) control side into the field side: bandwidth with 0.5 V _{pp} signal 0 ... 3 kHz (-3 dB)
Settling time	$\leq 50 \text{ ms}$
Rise time/fall time	$\leq 10 \text{ ms}$

Galvanic isolation

Input/Output	basic insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff}
Input/power supply	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff}
Output/power supply	basic insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff}

Indicators/settings

Display elements	LED
Control elements	DIP switch
Configuration	via DIP switches
Labeling	space for labeling at the front

Directive conformity

Electromagnetic compatibility	
Directive 2014/30/EU	EN 61326-1:2013 (industrial locations)

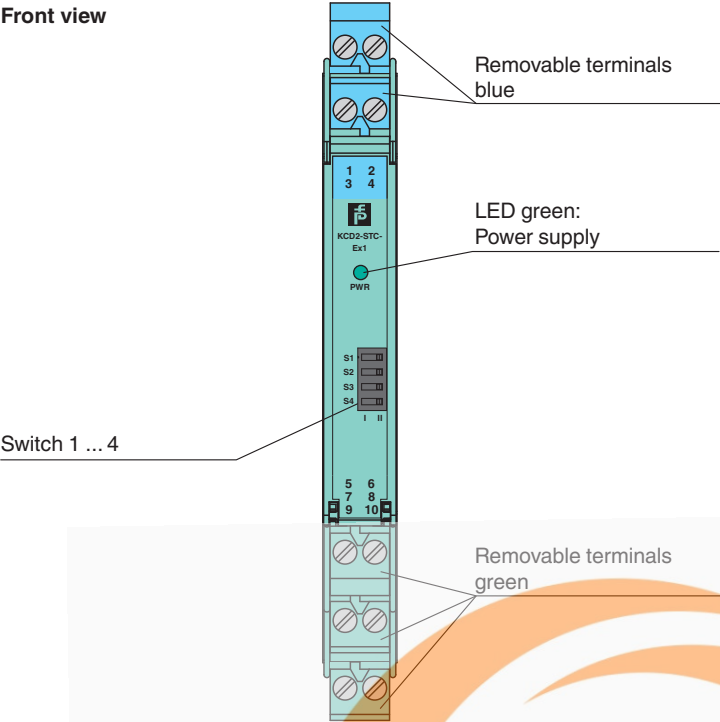
Conformity

Electromagnetic compatibility	NE 21:2017 EN 61326-3-2:2018
Degree of protection	IEC 60529:2001
Protection against electrical shock	UL 61010-1:2012







Technical Data

Ambient conditions		
Ambient temperature		-40 ... 70 °C (-40 ... 158 °F)
Mechanical specifications		
Degree of protection		IP20
Connection		screw terminals
Mass		approx. 100 g
Dimensions		12.5 x 119 x 114 mm (0.5 x 4.7 x 4.5 inch) (W x H x D) , housing type A2
Mounting		on 35 mm DIN mounting rail acc. to EN 60715:2001
Data for application in connection with hazardous areas		
EU-type examination certificate		CESI 06 ATEX 021
Marking		Ⓔ II (1)G [Ex ia Ga] IIC Ⓔ II (1)D [Ex ia Da] IIIC Ⓔ I (M1) [Ex ia Ma] I
Input		Ex ia
Supply		
Maximum safe voltage	U _m	250 V AC (Attention! U _m is no rated voltage.)
Equipment		terminals 1+, 2-
Voltage	U _o	25.2 V
Current	I _o	100 mA
Power	P _o	630 mW
Internal capacitance	C _i	5.7 nF
Internal inductance	L _i	negligible
Equipment		
Voltage	U _i	30 V
Current	I _i	128 mA
Voltage	U _o	7.2 V
Current	I _o	100 mA
Power	P _o	25 mW
Internal capacitance	C _i	5.7 nF
Internal inductance	L _i	negligible
Certificate		CESI 19 ATEX 021 X
Marking		Ⓔ II 3G Ex ec IIC T4 Gc
Galvanic isolation		
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
Directive conformity		
Directive 2014/34/EU		EN 60079-0:2012+A11:2013 , EN 60079-11:2012 , EN 60079-7:2015
International approvals		
FM approval		
FM certificate		FM 18 CA 0116 X , FM 19 US 0117 X
Control drawing		116-0469 (cFMus)
UL approval		
Control drawing		116-0459 (cULus)
IECEx approval		
IECEx certificate		IECEx CES 06.0001X
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 .





Assembly



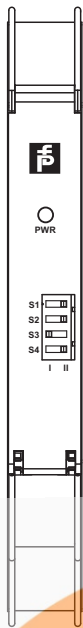
Matching System Components

	KFD2-EB2	Power Feed Module
	UPR-03	Universal Power Rail with end caps and cover, 3 conductors, length: 2 m
	UPR-03-M	Universal Power Rail with end caps and cover, 3 conductors, length: 1,6 m
	UPR-03-S	Universal Power Rail with end caps and cover, 3 conductors, length: 0.8 m
	K-DUCT-BU	Profile rail, wiring comb field side, blue
	K-DUCT-BU-UPR-03	Profile rail with UPR-03- * insert, 3 conductors, wiring comb field side, blue

Accessories

	KC-ST-5GN	Terminal block for KC modules, 2-pin screw terminal, green
	KC-STP-5GN	Terminal block for KC modules, 2-pin screw terminal, with test sockets, green
	KC-STP-5BU	Terminal block for KC modules, 2-pin screw terminal, with test sockets, blue
	KF-CP	Red coding pins, packaging unit: 20 x 6

Configuration



Output switch settings

Mode of operation	S1	S2	S3	S4
Current source output 4 ... 20 mA	II	II	I	II
Voltage source output 1 ... 5 V	II	II	I	I
Current sink output 4 ... 20 mA	II	I	II	II

Factory setting: current source output 4 ... 20 mA