

# SMART Transmitter Power Supply KCD2-STC-Ex1.20.ES

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Input for 2-wire SMART transmitters and current sources
- Signal splitter (1 input and 2 outputs)
- Dual output 0/4 mA ... 20 mA or 0/1 V ... 5 V
- Terminal blocks with test sockets
- Up to SIL 3 acc. to IEC/EN 61508



## Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire transmitters in the hazardous area, and can also be used with current sources.

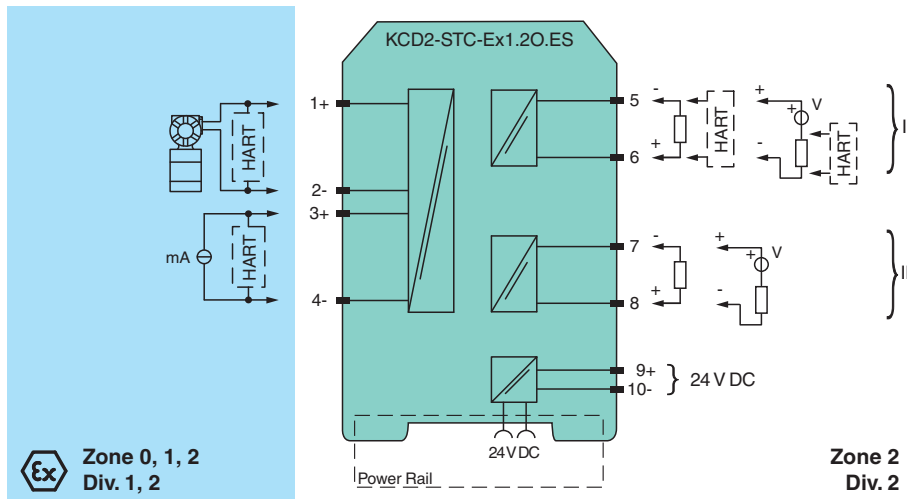
It transfers the analog input signal to the safe area as two isolated output signals.

Bi-directional communication is supported for SMART transmitters that use current modulation to transmit data and voltage modulation to receive data.

The output is selected as a current source, current sink, or voltage source via switches.

Test sockets for the connection of HART communicators are integrated into the terminals of the device.

## Connection



## Technical Data

### General specifications

|             |              |
|-------------|--------------|
| Signal type | Analog input |
|-------------|--------------|

### Functional safety related parameters

|                              |       |
|------------------------------|-------|
| Safety Integrity Level (SIL) | SIL 3 |
| Systematic capability (SC)   | SC 3  |

### Supply

|                   |                                                                       |
|-------------------|-----------------------------------------------------------------------|
| Connection        | Power Rail or terminals 9+, 10-                                       |
| Rated voltage     | $U_r$ 19 ... 30 V DC                                                  |
| Ripple            | within the supply tolerance                                           |
| Power dissipation | approx. 1.4 W at 20 mA transfer current, 250 $\Omega$ in both outputs |

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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## Technical Data

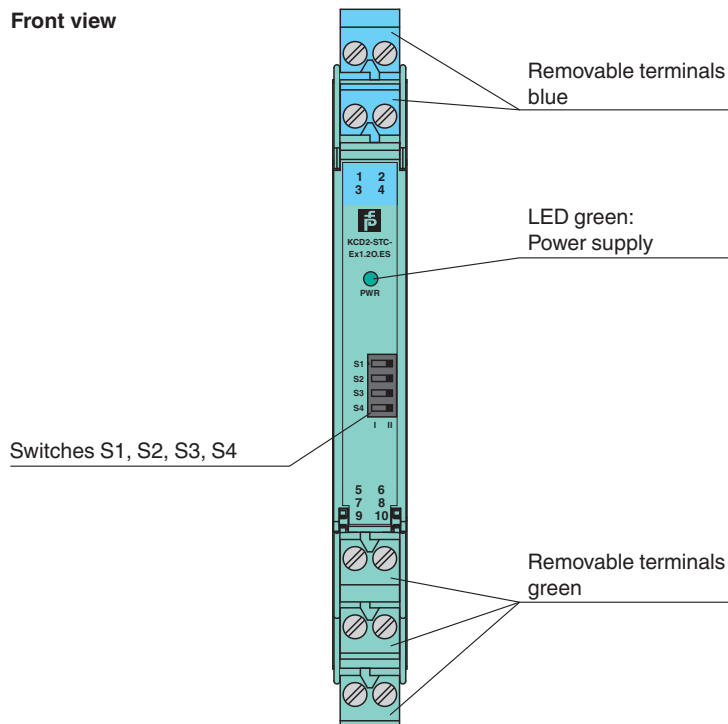
|                                                                |                                                                                                                                                                                                      |
|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power consumption                                              | 2 W                                                                                                                                                                                                  |
| <b>Input</b>                                                   |                                                                                                                                                                                                      |
| Connection side                                                | field side                                                                                                                                                                                           |
| Connection                                                     | terminals 1+, 2- (sink); 3+, 4- (source)                                                                                                                                                             |
| Input signal                                                   | 0/4 ... 20 mA                                                                                                                                                                                        |
| Voltage drop                                                   | terminals 3, 4: $\leq 6.1$ V at 20 mA                                                                                                                                                                |
| Short-circuit current                                          | terminals 1+, 2-: 25 mA                                                                                                                                                                              |
| Input resistance                                               | terminals 1+, 2-: max. 500 $\Omega$ (BRAIN)<br>(250 $\Omega$ load)                                                                                                                                   |
| Available voltage                                              | terminals 1+, 2-: $\geq 16$ V at 20 mA , $\geq 18.5$ V at 4 mA                                                                                                                                       |
| <b>Output</b>                                                  |                                                                                                                                                                                                      |
| Connection side                                                | control side                                                                                                                                                                                         |
| Connection                                                     | source: terminals 5-, 6+; 7-, 8+<br>sink: terminals 5+, 6-, 7+, 8-                                                                                                                                   |
| Load                                                           | channel 1: 0 ... 500 $\Omega$ (20 mA)/ $> 1$ M $\Omega$ (5 V)<br>channel 2: 0 ... 500 $\Omega$ (20 mA)/ $> 1$ M $\Omega$ (5 V)                                                                       |
| Output signal                                                  | 0/4 ... 20 mA or 0/1 ... 5 V                                                                                                                                                                         |
| Ripple                                                         | max. 50 $\mu$ A <sub>rms</sub>                                                                                                                                                                       |
| <b>Transfer characteristics</b>                                |                                                                                                                                                                                                      |
| Deviation                                                      | $I_{out} < 20$ $\mu$ A (0.1 %); $V_{out} < 10$ mV (0.2 %) incl. calibration, linearity, hysteresis and fluctuation of supply voltage, at 20 °C (68 °F), 0/4 ... 20 mA, 0/1 ... 5 V                   |
| Influence of ambient temperature                               | current output: 0.25 $\mu$ A/K<br>voltage output: 80 $\mu$ V/K                                                                                                                                       |
| Frequency range                                                | field side into the control side: bandwidth with 0.5 V <sub>pp</sub> signal 0 ... 6 kHz (-3 dB)<br>control side into the field side: bandwidth with 0.5 V <sub>pp</sub> signal 0.3 ... 6 kHz (-3 dB) |
| Settling time                                                  | 6 ms                                                                                                                                                                                                 |
| Rise time/fall time                                            | 2 ms                                                                                                                                                                                                 |
| <b>Galvanic isolation</b>                                      |                                                                                                                                                                                                      |
| Output/power supply                                            | functional insulation, rated insulation voltage 50 V AC                                                                                                                                              |
| Output/Output                                                  | functional insulation, rated insulation voltage 50 V AC                                                                                                                                              |
| <b>Indicators/settings</b>                                     |                                                                                                                                                                                                      |
| Display elements                                               | LED                                                                                                                                                                                                  |
| Control elements                                               | DIP switch                                                                                                                                                                                           |
| Configuration                                                  | via DIP switches                                                                                                                                                                                     |
| Labeling                                                       | space for labeling at the front                                                                                                                                                                      |
| <b>Directive conformity</b>                                    |                                                                                                                                                                                                      |
| Electromagnetic compatibility                                  |                                                                                                                                                                                                      |
| Directive 2014/30/EU                                           | EN 61326-1:2013 (industrial locations)                                                                                                                                                               |
| <b>Conformity</b>                                              |                                                                                                                                                                                                      |
| Electromagnetic compatibility                                  | NE 21:2012<br>EN 61326-3-2:2008                                                                                                                                                                      |
| Degree of protection                                           | IEC 60529:2001                                                                                                                                                                                       |
| Protection against electrical shock                            | UL 61010-1:2012                                                                                                                                                                                      |
| <b>Ambient conditions</b>                                      |                                                                                                                                                                                                      |
| Ambient temperature                                            | -20 ... 60 °C (-4 ... 140 °F)<br>extended ambient temperature range up to 70 °C (158 °F), refer to manual for necessary mounting conditions                                                          |
| <b>Mechanical specifications</b>                               |                                                                                                                                                                                                      |
| Degree of protection                                           | IP20                                                                                                                                                                                                 |
| Connection                                                     | screw terminals                                                                                                                                                                                      |
| Mass                                                           | approx. 100 g                                                                                                                                                                                        |
| Dimensions                                                     | 12.5 x 124 x 114 mm (0.5 x 4.9 x 4.5 inch) (W x H x D) , housing type A2                                                                                                                             |
| Mounting                                                       | on 35 mm DIN mounting rail acc. to EN 60715:2001                                                                                                                                                     |
| <b>Data for application in connection with hazardous areas</b> |                                                                                                                                                                                                      |
| EU-type examination certificate                                | BASEEFA 13 ATEX 0077 X                                                                                                                                                                               |

## Technical Data

|                                |       |                                                                                                                                                                                                 |
|--------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Marking                        |       | Ⓜ II (1)G [Ex ia Ga] IIC<br>Ⓜ II (1)D [Ex ia Da] IIIC<br>Ⓜ 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+, 2-                                                                                                                                                                                |
| Voltage                        | $U_o$ | 25.2 V                                                                                                                                                                                          |
| Voltage                        | $U_q$ | 28.2 V                                                                                                                                                                                          |
| Current                        | $I_o$ | 93 mA                                                                                                                                                                                           |
| Power                          | $P_o$ | 656 mW                                                                                                                                                                                          |
| Internal capacitance           | $C_i$ | 10 nF                                                                                                                                                                                           |
| Internal inductance            | $L_i$ | 0 mH                                                                                                                                                                                            |
| Equipment                      |       | terminals 3+, 4-                                                                                                                                                                                |
| Voltage                        | $U_i$ | 30 V                                                                                                                                                                                            |
| Current                        | $I_i$ | 115 mA                                                                                                                                                                                          |
| Power                          | $P_i$ | 700 mW                                                                                                                                                                                          |
| Voltage                        | $U_o$ | 5 V                                                                                                                                                                                             |
| Current                        | $I_o$ | 6.8 mA                                                                                                                                                                                          |
| Power                          | $P_o$ | 1.6 mW                                                                                                                                                                                          |
| Output                         |       |                                                                                                                                                                                                 |
| Maximum safe voltage           | $U_m$ | 250 V (Attention! The rated voltage can be lower.)                                                                                                                                              |
| Certificate                    |       | BASEEFA 13 ATEX 0078 X                                                                                                                                                                          |
| Marking                        |       | Ⓜ II 3G Ex nA II T4 Gc [device in zone 2]                                                                                                                                                       |
| 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 60079-15:2010                                                                                                                                    |
| <b>International approvals</b> |       |                                                                                                                                                                                                 |
| UL approval                    |       |                                                                                                                                                                                                 |
| Control drawing                |       | 116-0380 (cULus)                                                                                                                                                                                |
| IECEx approval                 |       |                                                                                                                                                                                                 |
| IECEx certificate              |       | IECEx BAS 13.0043X                                                                                                                                                                              |
| IECEx marking                  |       | [Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I                                                                                                                                                   |
| <b>General information</b>     |       |                                                                                                                                                                                                 |
| Note                           |       | Both output loads must be connected to ensure complete and correct operation within the technical specification.                                                                                |
| Supplementary information      |       | Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> . |

## Assembly

Front view



## Matching System Components

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

## Accessories

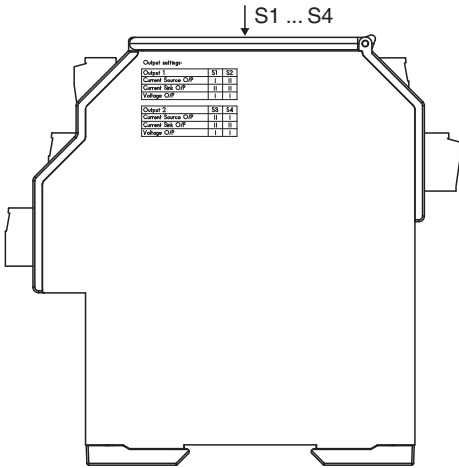
|                                                                                     |                   |                                                                               |
|-------------------------------------------------------------------------------------|-------------------|---------------------------------------------------------------------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

Application

The device supports the following SMART protocols:

- HART
- BRAIN

Configuration



Output switch settings

| Output 1              | S1 | S2 |
|-----------------------|----|----|
| Current source output | I  | II |
| Current sink output   | II | II |
| Voltage output        | I  | I  |
| Not valid             | II | I  |

| Output 2              | S3 | S4 |
|-----------------------|----|----|
| Current source output | II | I  |
| Current sink output   | II | II |
| Voltage output        | I  | I  |
| Not valid             | I  | II |

Factory settings: current source output, for both channels.