



# SMART Transmitter Power Supply HiC2027DE

- 1-channel isolated barrier
- 24 V DC supply (bus powered)
- 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
- Up to SIL 2 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.

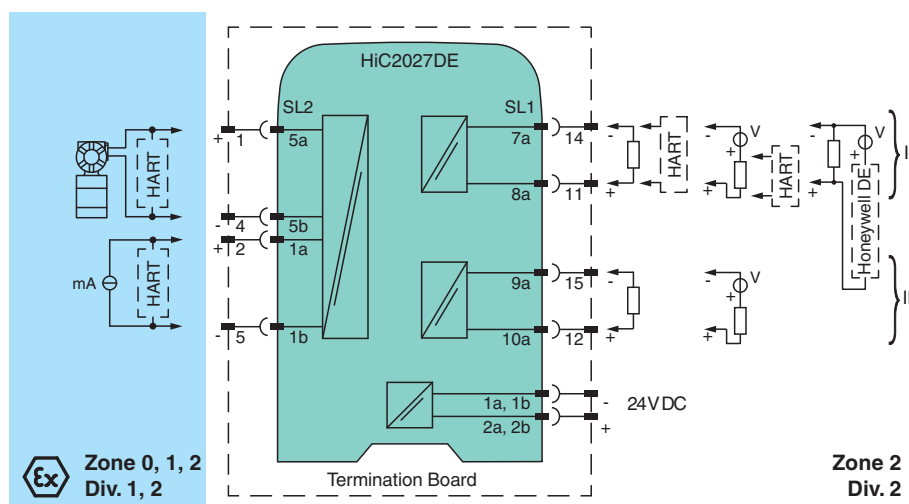
This device mounts on a HiC Termination Board.

## Application

The device supports the following SMART protocols:

- HART
- BRAIN
- Honeywell DE

## Connection



## Technical Data

### General specifications

Signal type Analog input

### Functional safety related parameters

Safety Integrity Level (SIL) SIL 2

### Supply

Release date: 2023-06-05 Date of issue: 2023-06-05 Filename: 272953\_eng.pdf

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

Pepperl+Fuchs Group  
www.pepperl-fuchs.com

USA: +1 330 486 0002  
pa-info@us.pepperl-fuchs.com

Germany: +49 621 776 2222  
pa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091  
pa-info@sg.pepperl-fuchs.com

**PEPPERL+FUCHS**

## Technical Data

|                                     |       |                                                                                                                                                                                                                         |
|-------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection                          |       | SL1: 1a, 1b(-); 2a, 2b(+)                                                                                                                                                                                               |
| Rated voltage                       | $U_r$ | 20 ... 30 V DC bus powered via Termination Board                                                                                                                                                                        |
| Ripple                              |       | within the supply tolerance                                                                                                                                                                                             |
| Power dissipation                   |       | approx. 1.4 W at 20 mA transfer current, 250 $\Omega$ in both outputs                                                                                                                                                   |
| Power consumption                   |       | 2 W                                                                                                                                                                                                                     |
| <b>Input</b>                        |       |                                                                                                                                                                                                                         |
| Connection side                     |       | field side                                                                                                                                                                                                              |
| Connection                          |       | SL2: 5a(+), 5b(-): sink<br>SL2: 1a(+), 1b(-), 7a(-): source                                                                                                                                                             |
| Input signal                        |       | 0/4 ... 20 mA                                                                                                                                                                                                           |
| Voltage drop                        |       | SL2: 1a(+), 1b(-), 7a(-): $\leq 6.1$ V at 20 mA                                                                                                                                                                         |
| Short-circuit current               |       | SL2: 5a(+), 5b(-): 25 mA , wake up pulse: 36 mA, 20 ms (Honeywell DE)                                                                                                                                                   |
| Input resistance                    |       | SL2: 5a(+), 5b(-): max. 500 $\Omega$ (BRAIN)<br>(250 $\Omega$ load)                                                                                                                                                     |
| Available voltage                   |       | SL2: 5a(+), 5b(-): $\geq 16$ V at 20 mA , $\geq 18.5$ V at 4 mA                                                                                                                                                         |
| <b>Output</b>                       |       |                                                                                                                                                                                                                         |
| Connection side                     |       | control side                                                                                                                                                                                                            |
| Connection                          |       | SL1: 8a(+), 7a(-), channel 1: source and sink<br>SL1: 10a(+), 9a(-), channel 2: source and sink                                                                                                                         |
| 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) [DE 1 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)                                                                                                                                                                                           |
| <b>Mechanical specifications</b>    |       |                                                                                                                                                                                                                         |
| Degree of protection                |       | IP20                                                                                                                                                                                                                    |
| Mass                                |       | approx. 100 g                                                                                                                                                                                                           |
| Dimensions                          |       | 12.5 x 106 x 128 mm (0.5 x 4.2 x 5.1 inch) (W x H x D)                                                                                                                                                                  |
| Mounting                            |       | on termination board                                                                                                                                                                                                    |

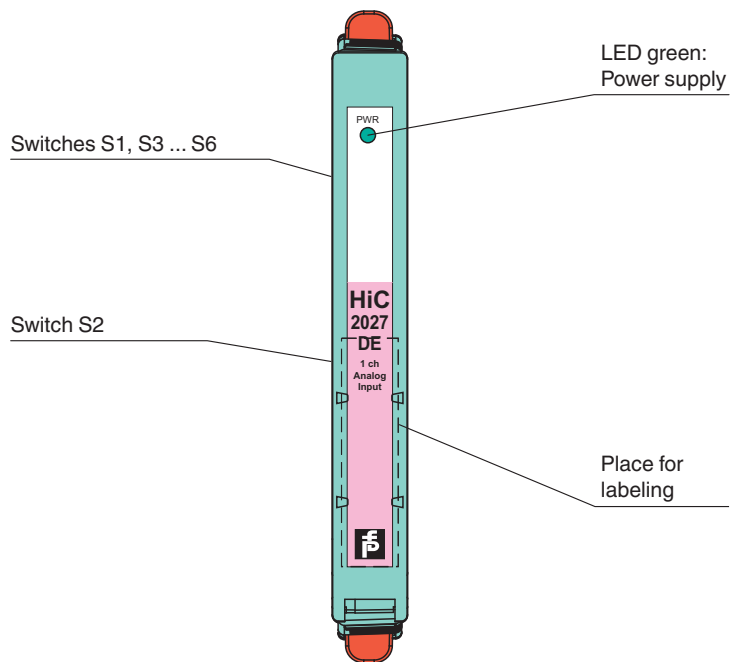
Release date: 2023-06-05 Date of issue: 2023-06-05 Filename: 272953\_eng.pdf

## Technical Data

|                                                                |                |                                                                                                                                                                                                 |
|----------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Coding                                                         |                | pin 2 and 3 trimmed<br>For further information see system description.                                                                                                                          |
| <b>Data for application in connection with hazardous areas</b> |                |                                                                                                                                                                                                 |
| EU-type examination certificate                                |                | BASEEFA 13 ATEX 0075 X                                                                                                                                                                          |
| 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                                                                                                                                                                                           |
| <b>Supply</b>                                                  |                |                                                                                                                                                                                                 |
| Maximum safe voltage                                           | U <sub>m</sub> | 250 V (Attention! The rated voltage can be lower.)                                                                                                                                              |
| Equipment                                                      |                | terminals 5a, 5b                                                                                                                                                                                |
| Voltage                                                        | U <sub>o</sub> | 25.2 V                                                                                                                                                                                          |
| Voltage                                                        | U <sub>q</sub> | 28.2 V                                                                                                                                                                                          |
| Current                                                        | I <sub>o</sub> | 93 mA                                                                                                                                                                                           |
| Power                                                          | P <sub>o</sub> | 656 mW                                                                                                                                                                                          |
| Internal capacitance                                           | C <sub>i</sub> | 12 nF                                                                                                                                                                                           |
| Internal inductance                                            | L <sub>i</sub> | 0 mH                                                                                                                                                                                            |
| Equipment                                                      |                | terminals 1a, 1b, 7a                                                                                                                                                                            |
| Voltage                                                        | U <sub>i</sub> | 30 V                                                                                                                                                                                            |
| Current                                                        | I <sub>i</sub> | 115 mA                                                                                                                                                                                          |
| Power                                                          | P <sub>i</sub> | 700 mW                                                                                                                                                                                          |
| Voltage                                                        | U <sub>o</sub> | 5 V                                                                                                                                                                                             |
| Current                                                        | I <sub>o</sub> | 6.8 mA                                                                                                                                                                                          |
| Power                                                          | P <sub>o</sub> | 1.6 mW                                                                                                                                                                                          |
| <b>Output</b>                                                  |                |                                                                                                                                                                                                 |
| Maximum safe voltage                                           | U <sub>m</sub> | 250 V (Attention! The rated voltage can be lower.)                                                                                                                                              |
| Certificate                                                    |                | BASEEFA 13 ATEX 0076 X                                                                                                                                                                          |
| Marking                                                        |                | Ⓔ II 3G Ex nA IIC T4 Gc                                                                                                                                                                         |
| <b>Galvanic isolation</b>                                      |                |                                                                                                                                                                                                 |
| 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                                                                                                                     |
| <b>Directive conformity</b>                                    |                |                                                                                                                                                                                                 |
| Directive 2014/34/EU                                           |                | EN IEC 60079-0:2018+AC:2020 , EN 60079-11:2012 , EN 60079-15:2010                                                                                                                               |
| <b>International approvals</b>                                 |                |                                                                                                                                                                                                 |
| UL approval                                                    |                | E106378                                                                                                                                                                                         |
| Control drawing                                                |                | 116-0349 (cULus)                                                                                                                                                                                |
| <b>IECEx approval</b>                                          |                |                                                                                                                                                                                                 |
| IECEx certificate                                              |                | IECEx BAS 13.0042X                                                                                                                                                                              |
| 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



## Configuration

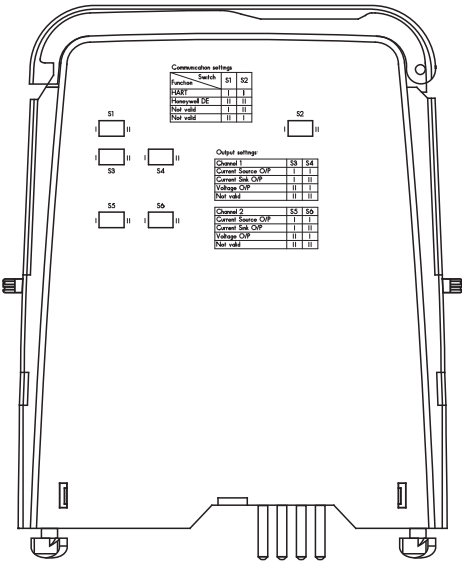
Configure the device in the following way:

- Push the red Quick Lok Bars on each side of the device in the upper position.
- Remove the device from termination board.
- Set the switches according to the figure in the **Configuration** section.

### Note

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

Configuration



Communication switch settings

| Function                  | S1 | S2 |
|---------------------------|----|----|
| HART transparency         | I  | I  |
| Honeywell DE transparency | II | II |
| Not valid                 | I  | II |
| Not valid                 | II | I  |

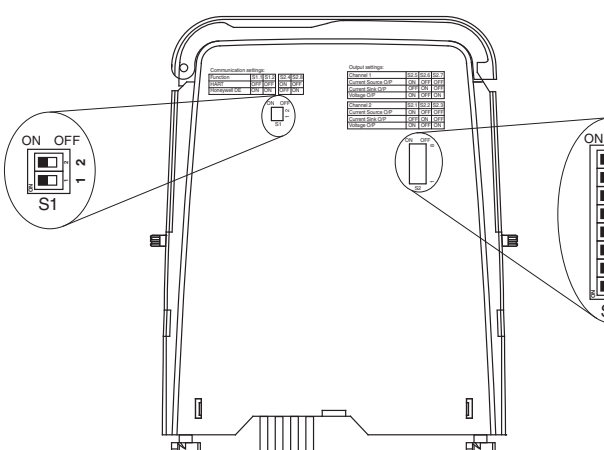
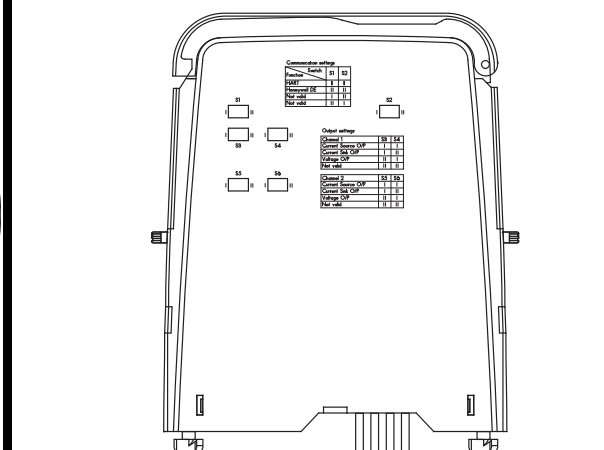
Output switch settings

| Channel 1             | S3 | S4 |
|-----------------------|----|----|
| Current source output | I  | I  |
| Current sink output   | I  | II |
| Voltage output        | II | I  |
| Not valid             | II | II |

| Channel 2             | S5 | S6 |
|-----------------------|----|----|
| Current source output | I  | I  |
| Current sink output   | I  | II |
| Voltage output        | II | I  |
| Not valid             | II | II |

Factory settings: current source output, for both channels with HART transparency.

The device has a predecessor which has other position and function of the switches. The differences between the switches and their function can be seen in the following table.

| Previous device                                                                   |      |      |      |      | New device                                                                         |    |    |
|-----------------------------------------------------------------------------------|------|------|------|------|------------------------------------------------------------------------------------|----|----|
| HiC2027DE, part number 230687                                                     |      |      |      |      | HiC2027DE, part number 272953                                                      |    |    |
|  |      |      |      |      |  |    |    |
| Communication switch settings                                                     |      |      |      |      | Communication switch settings                                                      |    |    |
| Function                                                                          | S1.1 | S1.2 | S2.4 | S2.8 | Function                                                                           | S1 | S2 |
| HART transparency                                                                 | OFF  | OFF  | ON   | OFF  | HART transparency                                                                  | I  | I  |
| Honeywell DE transparency                                                         | ON   | ON   | OFF  | ON   | Honeywell DE transparency                                                          | II | II |
| –                                                                                 |      |      |      |      | Not valid                                                                          | I  | II |
| –                                                                                 |      |      |      |      | Not valid                                                                          | II | I  |
| Output switch settings                                                            |      |      |      |      | Output switch settings                                                             |    |    |
| Channel 1                                                                         | S2.5 | S2.6 | S2.7 |      | Channel 1                                                                          | S3 | S4 |
| Current source output                                                             | ON   | OFF  | OFF  |      | Current source output                                                              | I  | I  |
| Current sink output                                                               | OFF  | ON   | OFF  |      | Current sink output                                                                | I  | II |
| Voltage output                                                                    | ON   | OFF  | ON   |      | Voltage output                                                                     | II | I  |
| –                                                                                 |      |      |      |      | Not valid                                                                          | II | II |
| Channel 2                                                                         | S2.1 | S2.2 | S2.3 |      | Channel 2                                                                          | S5 | S6 |
| Current source output                                                             | ON   | OFF  | OFF  |      | Current source output                                                              | I  | I  |
| Current sink output                                                               | OFF  | ON   | OFF  |      | Current sink output                                                                | I  | II |
| Voltage output                                                                    | ON   | OFF  | ON   |      | Voltage output                                                                     | II | I  |
| –                                                                                 |      |      |      |      | Not valid                                                                          | II | II |

Factory settings: current source output, for both channels with HART transparency.