

Relay Module

KFD2-RSH-1.2E.L2-Y1

- 1-channel signal conditioner
- 24 V DC supply
- Logic input 20.5 V DC ... 26.4 V DC
- Recommended connectable voltage 8 V DC ... 60 V DC
- Relay contact output for energized to safe function
- Line fault transparency (LFT)
- Diagnostic function
- Up to SIL 3 acc. to IEC/EN 61508

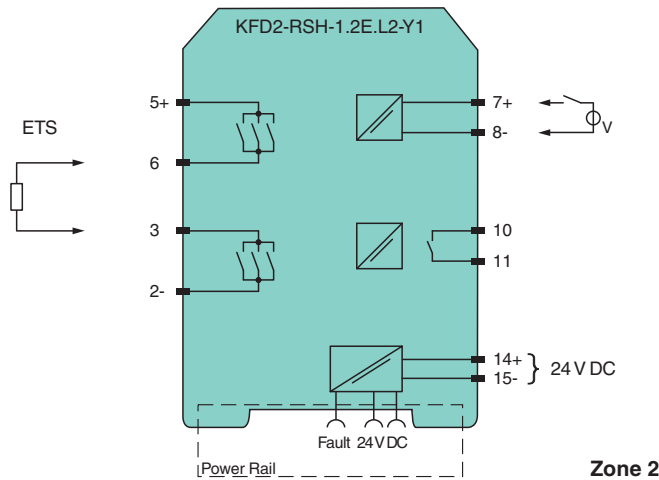


SIL 3

Function

This signal conditioner provides the galvanic isolation between field circuits and control circuits. The device is a relay module that is suitable for safely switching applications of a load circuit. The device isolates load circuits up to 60 V DC and the 24 V DC control circuit. The energized to safe (ETS) function is permitted for SIL 3 applications. An internal fault or a line fault is signaled by the impedance change of the relay contact input and an additional relay contact output. A fault is signaled by LEDs and a separate collective error message output.

Connection



Technical Data

| General specifications | |
|--------------------------------------|---|
| Signal type | Digital Output |
| Functional safety related parameters | |
| Safety Integrity Level (SIL) | SIL 3 |
| Systematic capability (SC) | SC 3 |
| Supply | |
| Connection | Power Rail or terminals 14+, 15- |
| Rated voltage | U_r 19 ... 26.4 V DC |
| Input current | max. 35 mA at 24 V DC , max. 44 mA at 19 V DC , with enabled internal fault detection |
| Power consumption | < 1.7 W , includes the power consumption of the digital input , see derating curves |

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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

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Technical Data

| | |
|-------------------------------------|---|
| Input | |
| Connection side | control side |
| Connection | terminals 7+, 8- |
| Pulse/Pause ratio | min. 150 ms / min. 150 ms with disabled internal fault detection min. 1 s / min. 1 s with enabled internal fault detection |
| Test pulse length | max. 2 ms from DO card |
| Signal level | 0-signal: -5 ... 5 V DC 1-signal: 20.5 ... 26.4 V DC |
| Rated current | I_r 0-signal: typ. 1.6 mA at 1.5 V DC; typ. 8 mA at 3 V DC (maximum leakage current DO card) 1-signal: ≥ 36 mA (minimum load current DO card) |
| Inrush current | < 200 mA after 100 μ s |
| Output | |
| Connection side | field side |
| Connection | external voltage : terminals 5+, 2- load : terminals 6, 3 |
| Connectable voltage | 8 ... 60 V DC |
| Power dissipation | < 3.3 W at 5 A , see derating curves |
| Contact loading | 30 V DC / 5 A resistive load , see derating curves |
| Minimum switch current | 10 mA |
| Mechanical life | 5 x 10 ⁶ switching cycles |
| Line fault detection | low voltage < 5 V DC undercurrent: 10 mA DC; overcurrent: 2.2 A DC (relay energized) breakage: 8.2 k Ω ; short-circuit: 11 Ω (load, relay de-energized) |
| Fault indication output | |
| Connection | terminals 10, 11 |
| Contact loading | 30 V DC/ 0.5 A resistive load |
| Reaction time | < 2 s |
| Mechanical life | 10 ⁵ switching cycles |
| Transfer characteristics | |
| Switching frequency | < 3 Hz with disabled internal fault detection < 0.5 Hz with enabled internal fault detection |
| Galvanic isolation | |
| Input/power supply | basic insulation according to IEC/EN 61010-1, rated insulation voltage 60 V _{eff} |
| Input/fault indication output | basic insulation according to IEC/EN 61010-1, rated insulation voltage 30 V _{eff} |
| Output/other circuits | reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff} |
| Indicators/settings | |
| Display elements | LEDs |
| 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 , IEC/EN 61326-3-2:2018 , EN 61326-3-1:2017 |
| Degree of protection | IEC 60529:2013 |
| Protection against electrical shock | EN 61010-1:2010 |
| Ambient conditions | |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) Observe the temperature range limited by derating, see section derating. |
| Mechanical specifications | |
| Degree of protection | IP20 |
| Connection | screw terminals |
| Mass | approx. 134 g |
| Dimensions | 20 x 119 x 115 mm (0.8 x 4.7 x 4.5 inch) (W x H x D) , housing type B2 |

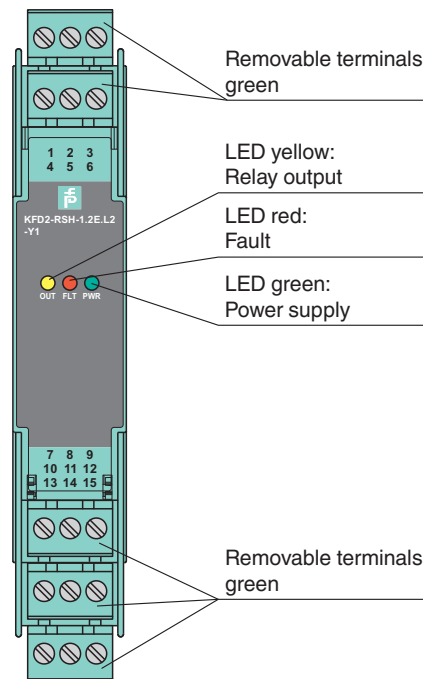
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Technical Data

| | | |
|--|---|--|
| Mounting | on 35 mm DIN mounting rail acc. to EN 60715:2001 | |
| Data for application in connection with hazardous areas | | |
| Certificate | PF 17 CERT 4305 X | |
| Marking | Ⓜ II 3G Ex nC ec IIC T4 Gc [device in zone 2] | |
| Directive conformity | | |
| Directive 2014/34/EU | EN 60079-0:2012+A11:2013 , EN 60079-7:2015 , EN 60079-15:2010 | |
| 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





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-GY | Profile rail, wiring comb field side, gray |
| | K-DUCT-GY-UPR-03 | Profile rail with UPR-03-* insert, 3 conductors, wiring comb field side, gray |

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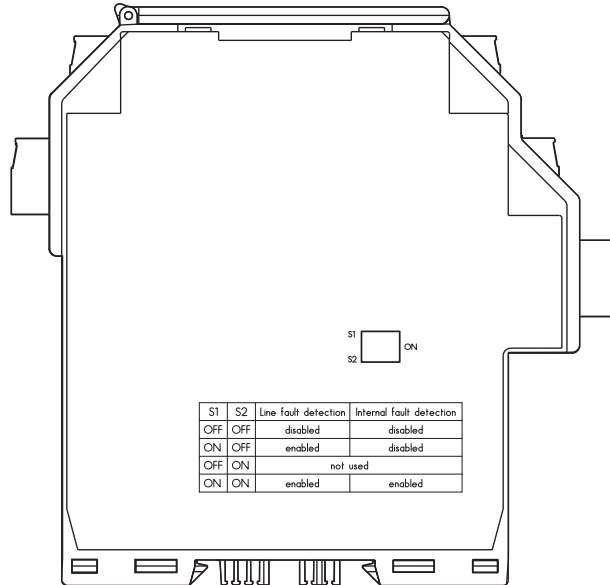
Accessories

| | | |
|---|------------------|--|
|  | KF-ST-5GN | Terminal block for KF modules, 3-pin screw terminal, green |
|  | KF-CP | Red coding pins, packaging unit: 20 x 6 |

Application

This device is compatible to the following control: Emerson DeltaV CHARM.
 Compatibility check to other ESD/DCS systems on request.

Configuration



Output switch settings

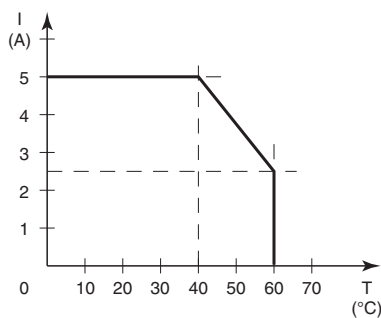
| S1 | S2 | Line fault detection | Internal fault detection |
|-----|-----|----------------------|--------------------------|
| OFF | OFF | disabled | disabled |
| ON | OFF | enabled | disabled |
| OFF | ON | not used | |
| ON | ON | enabled | enabled |

Factory settings: line fault detection enabled, internal fault detection enabled

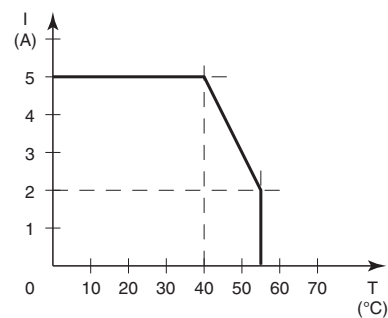
During a switching event the device detects an internal fault. A full test of all 3 redundant relay channels requires 3 consecutive switching events.

Characteristic Curve

Derating



unfused, non-hazardous area
 U_i 26.4 V



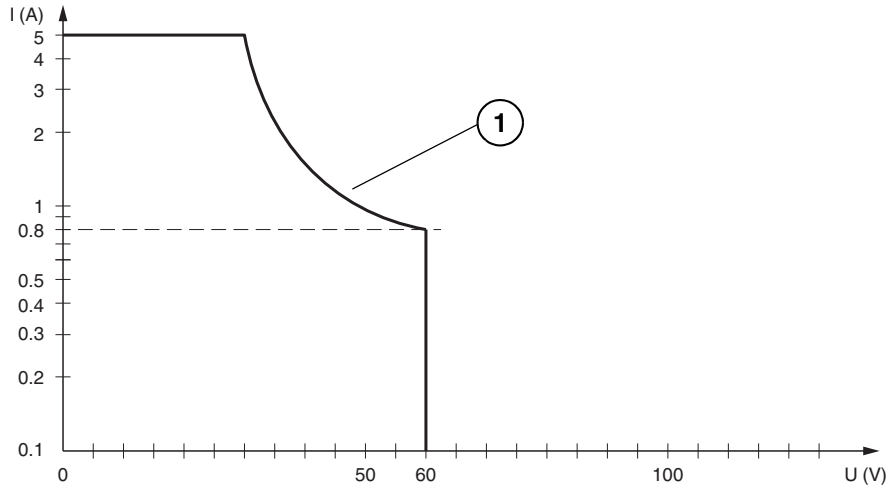
unfused, Zone 2
 U_i 26.4 V

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Characteristic Curve

Maximum Switching Power of Output Contacts



— Resistive load DC
1 max. 10⁵ switching cycles

The maximum number of switching cycles is depending on the electrical load and may be higher if reduced currents and voltages are applied.

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