

# Relay Module

## KFD2-RSH-1.2E.L3

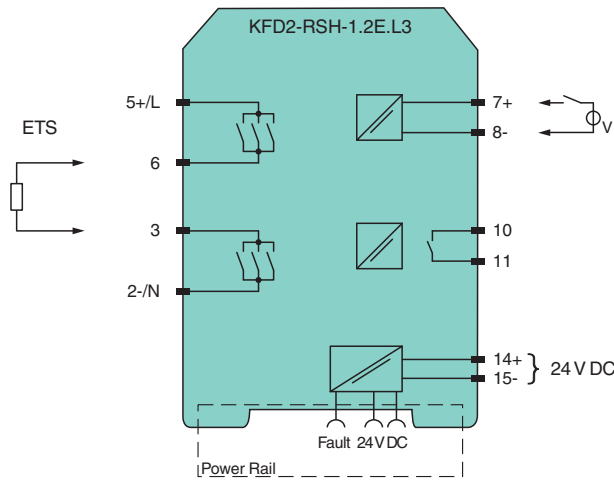
- 1-channel signal conditioner
- 24 V DC supply
- Logic input 19 V DC ... 26.4 V DC
- Recommended connectable voltage 50 V AC ... 230 V AC, 60 V DC ... 110 V DC
- Relay contact output for energized to safe function
- Line fault transparency (LFT)
- Diagnostic function
- Up to SIL 3 acc. to IEC/EN 61508



### 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 230 V AC 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".

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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: 19 ... 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: $\geq 36$ mA (minimum load current DO card)
Inrush current	< 200 mA after 100 $\mu$ s
Output	
Connection side	field side
Connection	external voltage : terminals 5+/L, 2-/N load : terminals 6, 3
Connectable voltage	50 ... 230 V AC 60 ... 110 V DC
Power dissipation	< 3.3 W at 5 A , see derating curves
Contact loading	253 V AC/5 A/cos $\phi$ 0.7; 30 V DC/5 A resistive load , see derating curves
Minimum switch current	10 mA
Mechanical life	5 x 10 <sup>6</sup> switching cycles
Line fault detection	low voltage < 35 V AC undercurrent: 10 mA AC; overcurrent: 5.5 A AC (relay energized) breakage: 48 k $\Omega$ ; short-circuit: 29 $\Omega$ (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 <sup>5</sup> 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 <sub>eff</sub>
Input/fault indication output	basic insulation according to IEC/EN 61010-1, rated insulation voltage 30 V <sub>eff</sub>
Output/other circuits	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>
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)
Low voltage	
Directive 2014/35/EU	EN 61010-1:2010
Conformity	
Electromagnetic compatibility	NE 21:2017 , IEC/EN 61326-3-2:2018 , EN 61326-3-1:2017
Degree of protection	IEC 60529:2013
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

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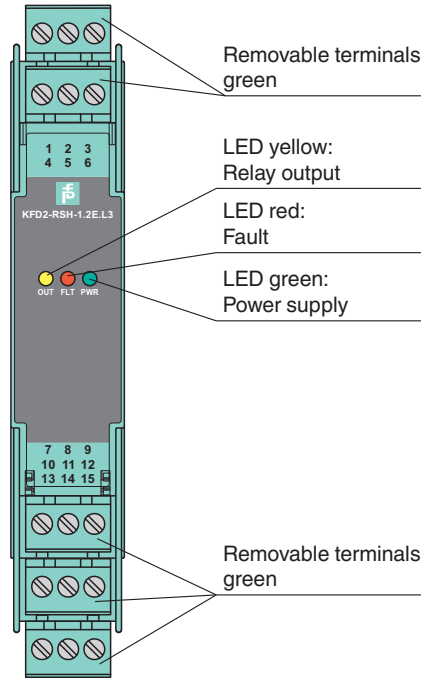
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### Technical Data

Dimensions	20 x 119 x 115 mm (0.8 x 4.7 x 4.5 inch) (W x H x D) , housing type B2
Mounting	on 35 mm DIN mounting rail acc. to EN 60715:2001
<b>General information</b>	
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-GY</b>	Profile rail, wiring comb field side, gray
	<b>K-DUCT-GY-UPR-03</b>	Profile rail with UPR-03-* insert, 3 conductors, wiring comb field side, gray


### Accessories

	<b>KF-ST-5GN</b>	Terminal block for KF modules, 3-pin screw terminal, green
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**Accessories**

	<b>KF-CP</b>	Red coding pins, packaging unit: 20 x 6
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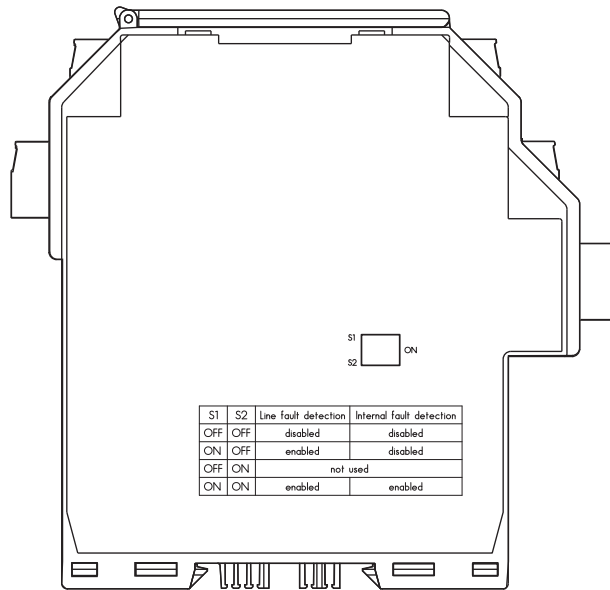
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**Configuration**



**Output switch settings**

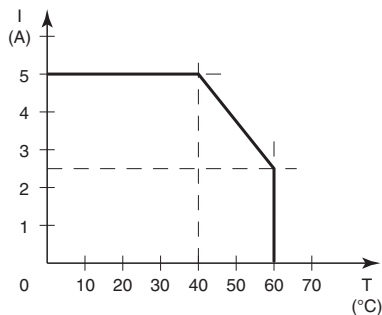
S1	S2	Line fault detection	Internal fault detection
OFF	OFF	disabled	disabled
ON	OFF	enabled	disabled
OFF	ON	not used	
ON	ON	enabled	enabled

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**

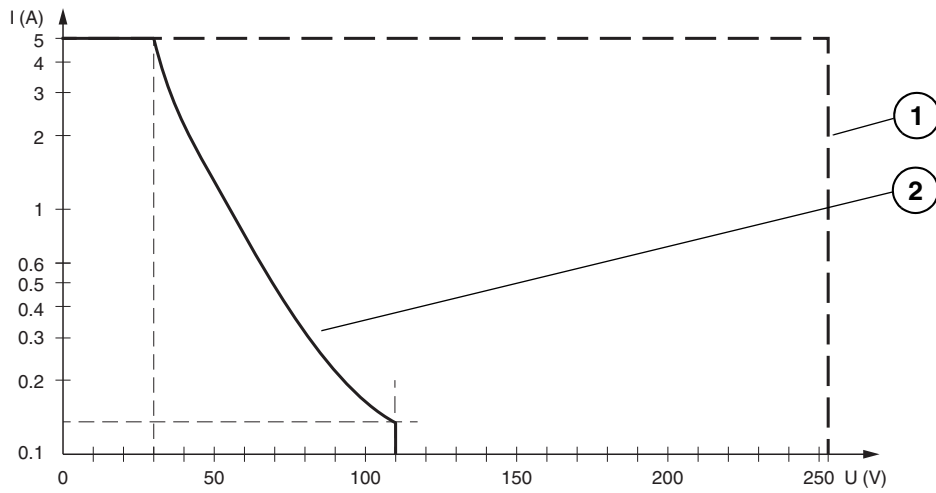


— unfused  
 $U_i$  26.4 V

**Characteristic Curve**

**Maximum Switching Power of Output Contacts**

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- Resistive load DC
- - - Resistive load AC
- 1** max.  $10^5$  switching cycles
- 2** max.  $10^5$  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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