Relay Module

KFD2-RSH-1.2E.L3

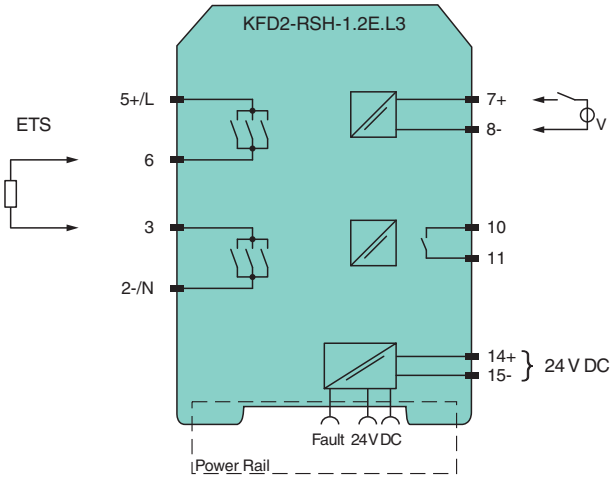
- 1-channel signal conditioner
- 24 V DC supply
- Logic input 19 V DC ... 26.4 V DC
- Recommended connectable voltage 50 V AC ... 230 V AC, 60 V DC ... 110 V DC
- Relay contact output for energized to safe function
- Line fault transparency (LFT)
- Diagnostic function
- Up to SIL 3 acc. to IEC/EN 61508

CE 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 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 signalized by the impedance change of the relay contact input and an additional relay contact output.
A fault is signalized 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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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: ≥ 36 mA (minimum load current DO card)
Inrush current		< 200 mA after 100 µs
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 ϕ 0.7; 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 < 35 V AC undercurrent: 10 mA AC; overcurrent: 5.5 A AC (relay energized) breakage: 48 kΩ; short-circuit: 29 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)
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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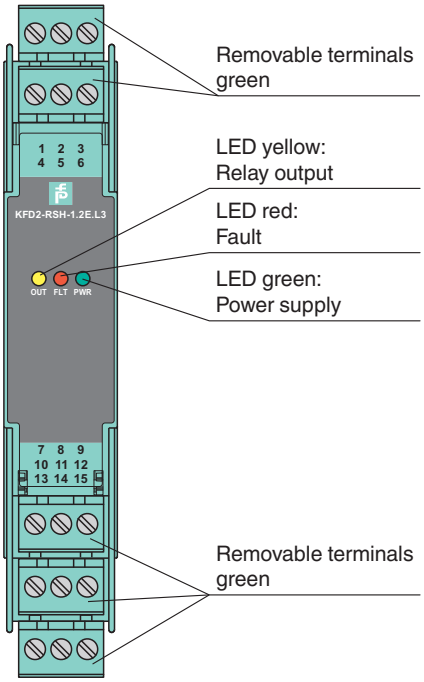
Technical Data

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
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

Accessories

	**KF-ST-5GN**	Terminal block for KF modules, 3-pin screw terminal, green

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Accessories

	**KF-CP**	Red coding pins, packaging unit: 20 x 6

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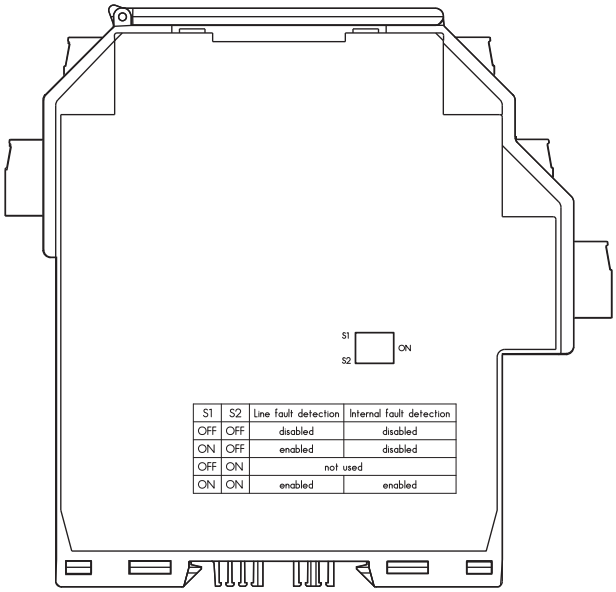
Configuration



Output switch settings

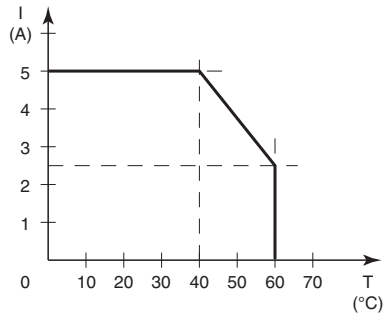
S1	S2	Line fault detection	Internal fault detection
OFF	OFF	disabled	disabled
ON	OFF	enabled	disabled
OFF	ON	not used	
ON	ON	enabled	enabled

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



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U_i 26.4 V

Characteristic Curve

Maximum Switching Power of Output Contacts

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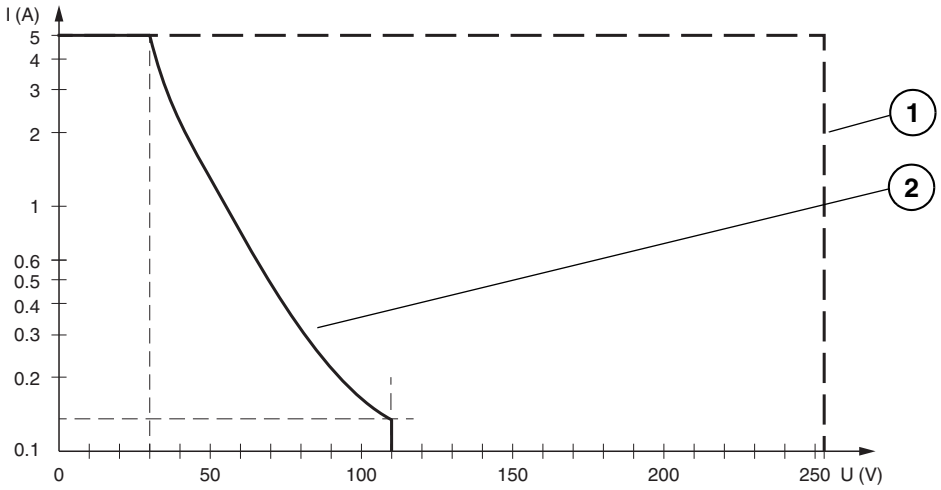

Resistive load DC

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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