

Relay Module

KFD2-RSH-1.2D.FL3-Y1

- 1-channel signal conditioner
- 24 V DC supply
- Logic input 20.5 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 de-energized to safe function
- Line fault transparency (LFT)
- Diagnostic function
- Up to SIL 3 acc. to IEC/EN 61508
- Up to PL e acc. to EN/ISO 13849

CE SIL3 PL e

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 de-energized to safe (DTS) function is permitted for SIL 3 and PL e 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. The output must be protected against contact welding by an internal fuse or an external current limitation.

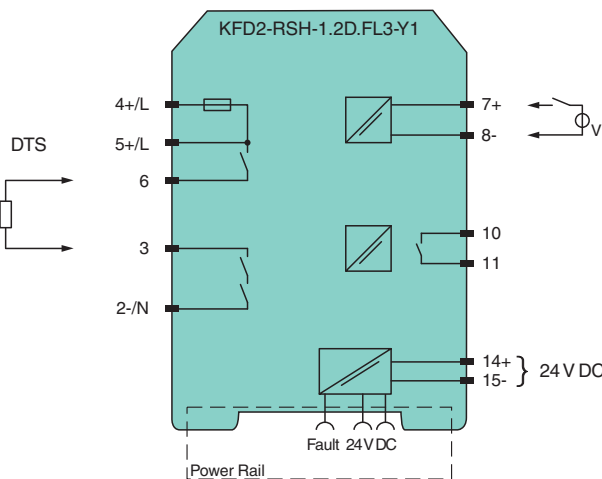
Application

This device is compatible to the following control:

- Emerson DeltaV CHARM

Compatibility check to other ESD/DCS systems on request.

Connection



Technical Data

General specifications	
Signal type	Digital Output
Functional safety related parameters	
Safety Integrity Level (SIL)	SIL 3
Systematic capability (SC)	SC 3

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

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Technical Data

Performance level (PL)	PL e	
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	
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: \geq 36 mA (minimum load current DO card)
Inrush current	< 200 mA after 100 μ s	
Output		
Connection side	field side	
Connection	external voltage : terminals 4+/L, 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 k Ω ; short-circuit: 29 Ω (load, relay de-energized)	
Fuse rating	2.5 A (scope of delivery) max. 5 AT, recommended maximum utilization of the fuse: 80 %	
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	EN 61326-1:2013 (industrial locations)	
Low voltage	EN 61010-1:2010	
Machinery Directive	EN 62061:2005+AC:2010+A1:2013+A2:2015 , EN/ISO 13849-1:2015	

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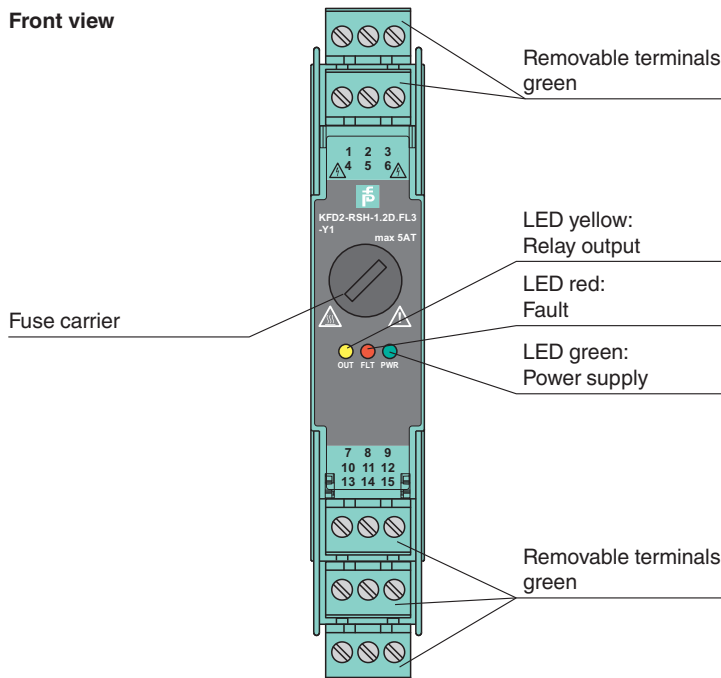
Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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


Technical Data

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. 142 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
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





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

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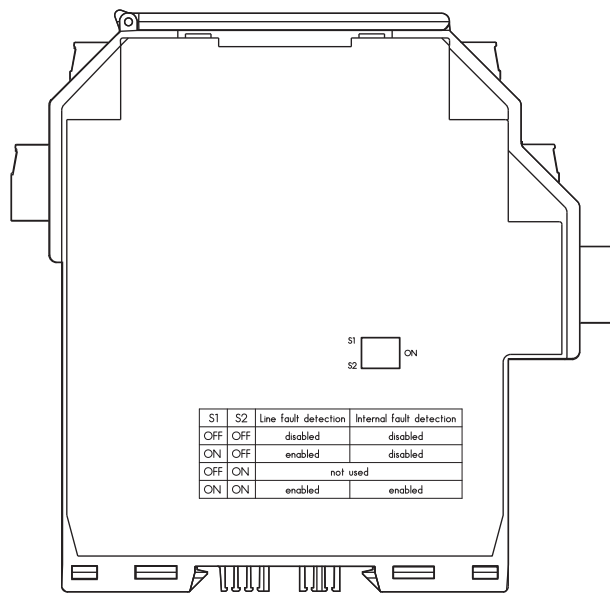
Matching System Components

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

Configuration



Output switch settings

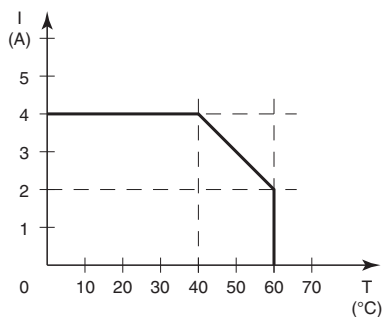
S1	S2	Line fault detection	Internal fault detection
OFF	OFF	disabled	disabled
ON	OFF	enabled	disabled
OFF	ON	not used	
ON	ON	enabled	enabled

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.

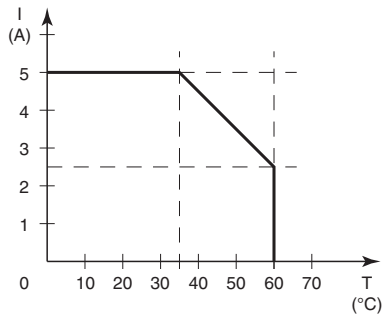
Characteristic Curve

Derating



— fused
 U_i 26.4 V

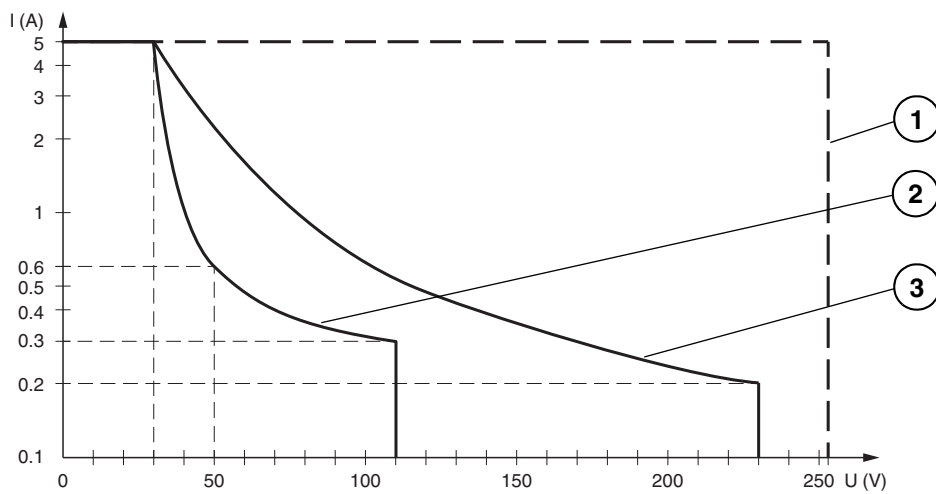
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— unfused
 U_i 26.4 V

Characteristic Curve

Maximum Switching Power of Output Contacts



- Resistive load DC
- - - Resistive load AC
- 1** max. 10⁵ switching cycles
- 2** max. 10⁵ switching cycles
- 3** max. 3 x 10⁴ 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.