



Frequency Converter with Trip Values KFD2-UFC-1.D

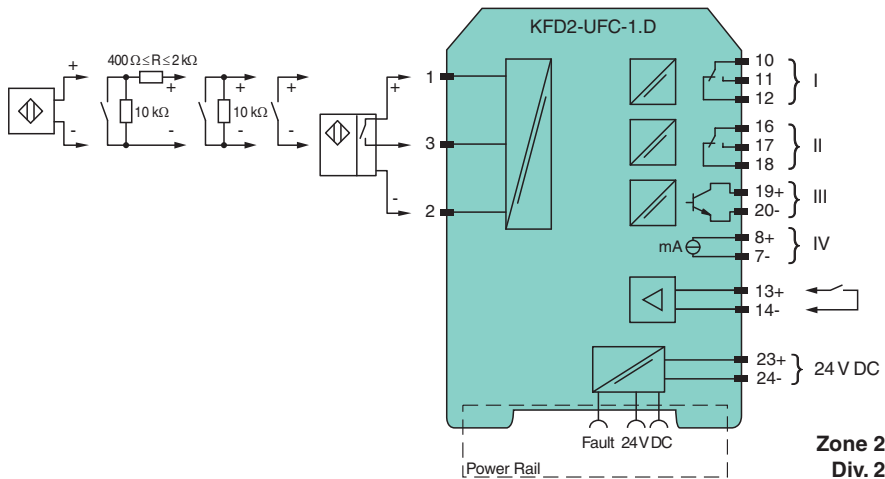
- 1-channel signal conditioner
- 24 V DC supply (Power Rail)
- Input for 2- or 3-wire sensors, NAMUR sensors or dry contacts
- Input frequency 1 mHz ... 10 kHz
- Current output 0/4 mA ... 20 mA
- Relay contact and transistor output
- Start-up override
- Line fault detection (LFD)
- Up to SIL 2 acc. to IEC/EN 61508 / IEC/EN 61511



Function

This signal conditioner provides the isolation for non-intrinsically safe applications. The device is a universal frequency converter that changes a digital input signal into a proportional free adjustable 0/4 mA ... 20 mA analog output signal and functions as a switch amplifier and a trip alarm. The functions of the switch outputs (2 relay outputs and 1 potential free transistor output) are easily adjustable [trip value display (min/max alarm), serially switched output, pulse divider output, error signal output]. The device is easily configured by the use of keypad or with the PACTware configuration software. A fault is signalized by LEDs acc. to NAMUR NE44 and a separate collective error message output. For additional information, refer to the manual and www.pepperl-fuchs.com.

Wiring Diagram



Technical Data

General specifications

Signal type Digital Input

Functional safety related parameters

Safety Integrity Level (SIL) SIL 2

Supply

Connection terminals 23+, 24- or power feed module/Power Rail

Rated voltage U_r 20 ... 30 V DC

Rated current I_r approx. 100 mA

Power dissipation/power consumption ≤ 2 W / 2.2 W

Interface

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

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Technical Data

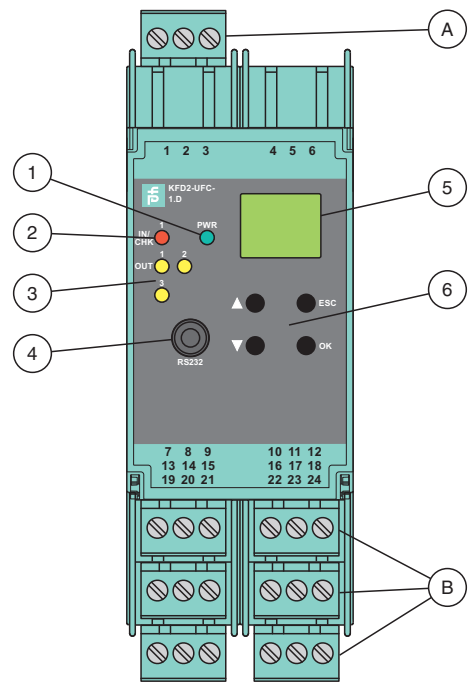
Programming interface	programming socket
Input	
Connection side	field side
Connection	Input I: 2-wire sensor: terminals 1+, 3- three wire sensor: terminals 1+, 2- and 3 input II: terminals 13+, 14- start-up override;
Input I	2- or 3-wire sensor, sensor acc. to EN 60947-5-6 (NAMUR) or mechanical contact
Open circuit voltage/short-circuit current	22 V / 40 mA
Input resistance	4.7 k Ω
Switching point/switching hysteresis	logic 1: > 2.5 mA ; logic 0: < 1.9 mA
Pulse duration	> 50 μ s
Input frequency	0.001 ... 10000 Hz
Line fault detection	breakage I $\leq$ 0.15 mA; short-circuit I > 4 mA
Input II	startup override: 1 ... 1000 s, adjustable in steps of 1 s
Active/Passive	I > 4 mA (for min. 100 ms) / I < 1.5 mA
Open circuit voltage/short-circuit current	18 V / 5 mA
Output	
Connection side	control side
Connection	output I: terminals 10, 11, 12 output II: terminals 16, 17, 18 output III: terminals 19+, 20- output IV: terminals 8+, 7-
Output I, II	signal, relay
Contact loading	250 V AC / 2 A / $\cos \phi \geq 0.7$; 40 V DC / 2 A
Mechanical life	5 x 10 ⁷ switching cycles
Energized/De-energized delay	approx. 20 ms / approx. 20 ms
Output III	electronic output, passive
Contact loading	40 V DC
Signal level	1-signal: (L+) -2.5 V (50 mA, short-circuit/overload proof) 0-signal: blocked output (off-state current $\leq$ 10 μ A)
Output IV	analog
Current range	0 ... 20 mA or 4 ... 20 mA
Open loop voltage	max. 24 V DC
Load	max. 650 Ω
Fault signal	downscale I $\leq$ 3.6 mA , upscale $\geq$ 21.5 mA (acc. NAMUR NE43)
Collective error message	Power Rail
Transfer characteristics	
Input I	
Measuring range	0.001 ... 10000 Hz
Resolution	0.1 % of the measurement value , $\geq$ 0.001 Hz
Accuracy	0.1 % of the measurement value , > 0.001 Hz
Measuring time	< 100 ms
Influence of ambient temperature	0.003 %/K (30 ppm)
Output I, II	
Response delay	$\leq$ 200 ms
Output IV	
Resolution	< 10 μ A
Accuracy	< 20 μ A
Influence of ambient temperature	0.005 %/K (50 ppm)
Galvanic isolation	
Input I/other circuits	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff}
Output I, II/other circuits	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff}
Mutual output I, II, III	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff}
Output III/power supply and collective error	basic insulation according to IEC/EN 61010-1, rated insulation voltage 50 V _{eff}
Output III/IV	basic insulation according to IEC/EN 61010-1, rated insulation voltage 50 V _{eff}
Output IV/power supply and collective error	functional insulation acc. to IEC 62103, rated insulation voltage 50 V _{eff}

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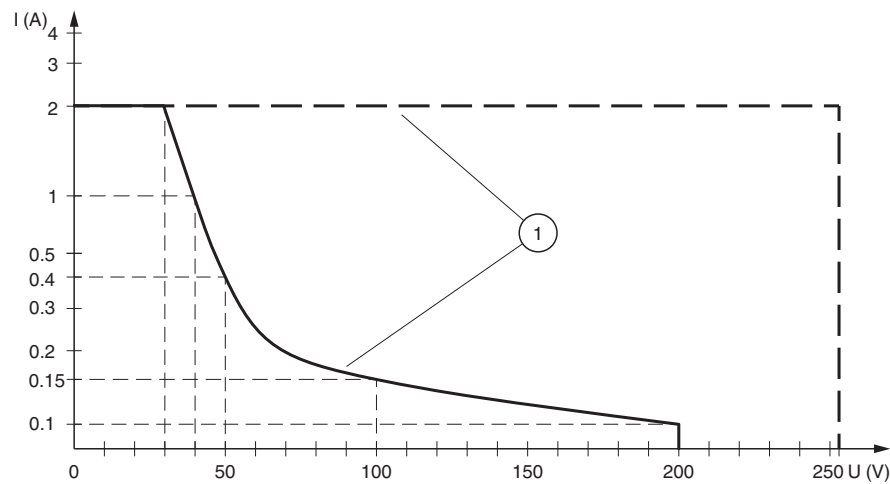
Start-up override/power supply and collective error		functional insulation acc. to IEC 62103, rated insulation voltage 50 V _{eff}
Interface/power supply and collective error		functional insulation acc. to IEC 62103, rated insulation voltage 50 V _{eff}
Interface/output III		basic insulation according to IEC/EN 61010-1, rated insulation voltage 50 V _{eff}
Indicators/settings		
Display elements		LEDs , display
Control elements		Control panel
Configuration		via operating buttons via PACTware
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 21:2006
Degree of protection		IEC 60529:2001
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications		
Degree of protection		IP20
Connection		screw terminals
Mass		300 g
Dimensions		40 x 119 x 115 mm (1.6 x 4.7 x 4.5 inch) (W x H x D) , housing type C2
Mounting		on 35 mm DIN mounting rail acc. to EN 60715:2001
Data for application in connection with hazardous areas		
Certificate		PF 08 CERT 1216 X
Marking		Ⓔ II 3G Ex nA nC IIC T4 Gc
Output I, II		
Contact loading		50 V AC/2 A/cos ϕ > 0.7; 40 V DC/1 A resistive load
Ambient conditions		
Ambient temperature		-20 ... 50 °C (-4 ... 122 °F)
Directive conformity		
Directive 2014/34/EU		EN 60079-0:2012+A11:2013 , EN 60079-15:2010
International approvals		
UL approval		E223772
General information		
Supplementary information		Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com .

Assembly



1	LED green: Power supply
2	LED yellow/red: Input pulses/fault signal
3	LED yellow: Output I to III
4	Programming socket
5	LCD display
6	Keypad
A	Removable terminal, green
B	Removable terminals, green

Characteristic Curve



Maximum Switching Power of Output Contacts	
-----	Resistive load DC
-----	Resistive load AC
1	max. 10 ⁵ switching cycles

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