

Frequency Converter with Trip Values

KFU8-UFC-Ex1.D

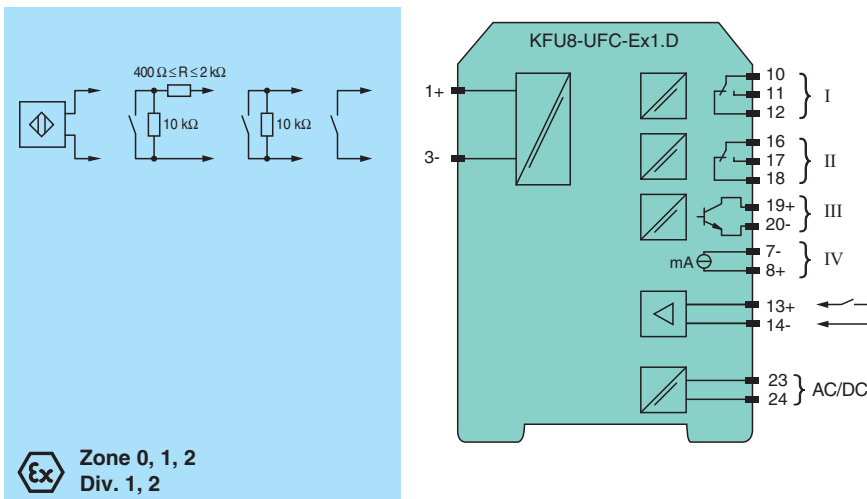
- 1-channel isolated barrier
- Universal usage at different power supplies
- Input for NAMUR sensors or dry contacts
- Input frequency 1 mHz ... 5 kHz
- Current output 0/4 mA ... 20 mA
- Relay contact and transistor output
- Start-up override
- Line fault detection (LFD)
- Up to SIL 2 acc. to IEC 61508/IEC 61511



Function

This isolated barrier is used for intrinsic safety 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 signaled by LEDs acc. to NAMUR NE44. For additional information, refer to the manual and www.pepperl-fuchs.com.

Connection



Technical Data

General specifications

Signal type Digital Input

Functional safety related parameters

Safety Integrity Level (SIL) SIL 2

Supply

Connection terminals 23, 24

Rated voltage U_r 20 ... 90 V DC / 48 ... 253 V AC 50 ... 60 Hz

Power dissipation/power consumption ≤ 2 W ; 2.5 VA / 2.2 W ; 3 VA

Interface

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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: intrinsically safe: terminals 1+, 3- Input II: non-intrinsically safe: terminals 13+, 14-
Input I	sensor acc. to EN 60947-5-6 (NAMUR) or mechanical contact
Pulse duration	> 50 µs
Input frequency	0.001 ... 5000 Hz
Line fault detection	breakage I ≤ 0.15 mA; short-circuit I > 6.5 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 φ ≥ 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: switched off (off-state current ≤ 10 µA)
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 ≤ 3.6 mA , upscale ≥ 21.5 mA (acc. NAMUR NE43)
Transfer characteristics	
Input I	
Measurement range	0.001 ... 5000 Hz
Resolution	0.1 % of the measurement value , ≥ 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	≤ 200 ms
Output IV	
Resolution	< 10 µA
Accuracy	< 20 µA
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	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff}
Output III/start-up override	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	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff}
Start-up override/power supply	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff}
Interface/power supply	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V _{eff}
Interface/output III	basic insulation according to IEC/EN 61010-1, rated insulation voltage 50 V _{eff}

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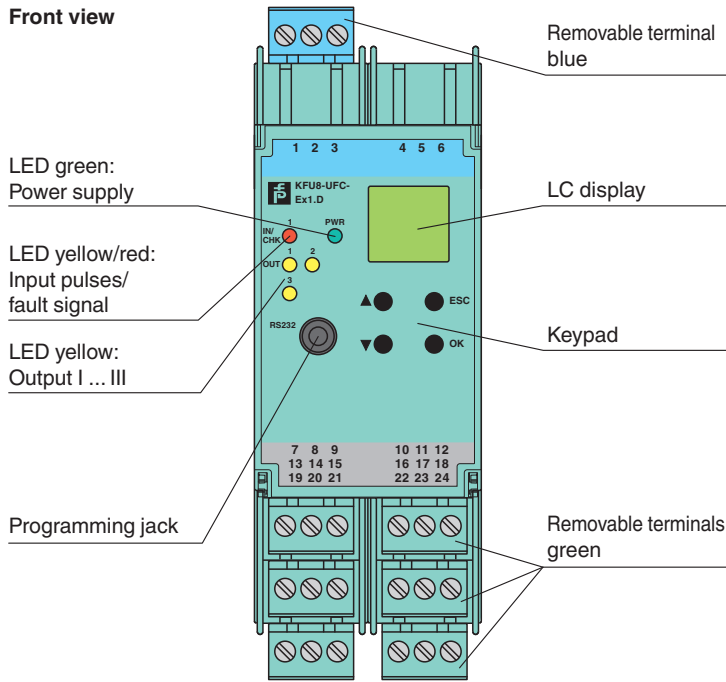
Indicators/settings			
Display elements			LEDs , display
Control elements			Control panel
Configuration			via operating buttons via PACTware
Labeling			space for labeling at the front
Directive conformity			
Electromagnetic compatibility			
Directive 2014/30/EU			EN 61326-1:2013 (industrial locations)
Low voltage			
Directive 2014/35/EU			EN 61010-1:2010
Conformity			
Electromagnetic compatibility			NE 21:2006
Degree of protection			IEC 60529:2001
Input			EN 60947-5-6:2000
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			
EU-type examination certificate			TÜV 99 ATEX 1471
Marking			Ⓜ II (1)G [Ex ia Ga] IIC Ⓜ II (1)D [Ex ia Da] IIIC Ⓜ I (M1) [Ex ia Ma] I
Supply			
Maximum safe voltage	U _m		253 V AC / 125 V DC (Attention! U _m is no rated voltage.)
Input I			
Voltage U _o			10.1 V
Current I _o			13.5 mA
Power P _o			34 mW (linear characteristic)
Input II			
Maximum safe voltage U _m			40 V (Attention! The rated voltage can be lower.)
Output I, II			
Maximum safe voltage	U _m		253 V (Attention! The rated voltage can be lower.)
Contact loading			253 V AC/2 A/cos φ > 0.7; 40 V DC/2 A resistive load (TÜV 99 ATEX 1471)
Output III			
Maximum safe voltage U _m	U _m		40 V (Attention! U _m is no rated voltage.)
Output IV			
Maximum safe voltage	U _m		40 V DC (Attention! U _m is no rated voltage.)
Interface			
Maximum safe voltage	U _m		40 V (Attention! U _m is no rated voltage.)
Galvanic isolation			
Input I/other circuits			safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Directive conformity			
Directive 2014/34/EU			EN IEC 60079-0:2018 , EN 60079-11:2012
International approvals			
FM approval			
Control drawing			16-538FM-12
IECEx approval			

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Technical Data

IECEX certificate	IECEX TUN 04.0007
IECEX marking	[Ex ia Ga] IIC , [Ex ia Da] IIIC , [Ex ia Ma] I
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

	DTM Interface Technology	Device type manager (DTM) for interface technology
	PACTware 5.X	FDT Framework
	K-ADP-USB	Programming adapter with USB interface
	K-DUCT-BU	Profile rail, wiring comb field side, blue




Accessories

	F-NR3-Ex1	NAMUR Resistor Network
	K-250R	Measuring resistor
	K-500R0%1	Measuring resistor

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Accessories

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

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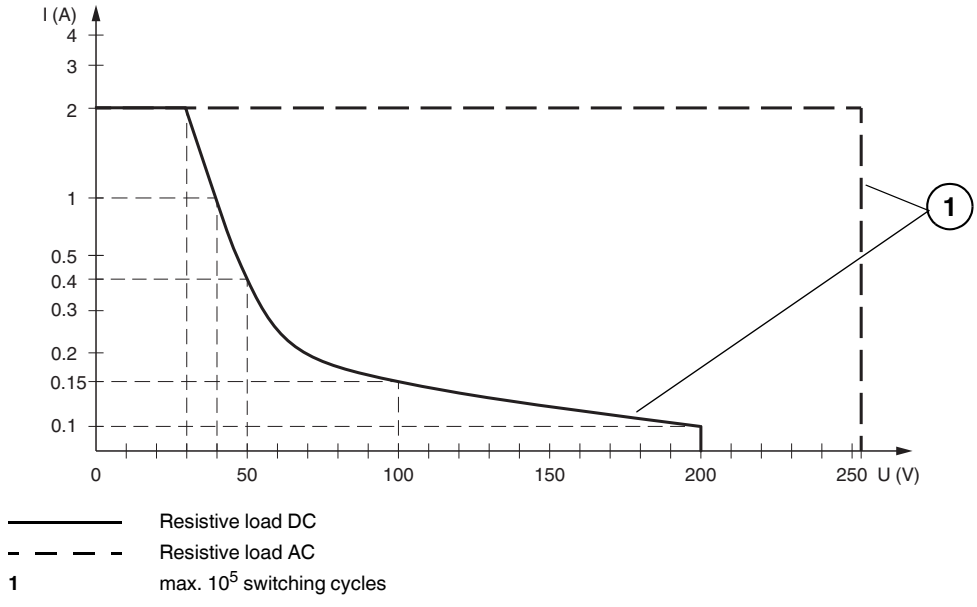
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Characteristic Curve

Maximum Switching Power of Output Contacts



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