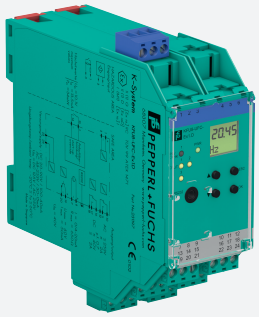

Frequency Converter with Trip Values

KFU8-UFC-Ex1.D

SIL 2

- 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

48 V AC ... 253 V AC/20 V DC ... 90 V DC

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 signalized by LEDs acc. to NAMUR NE44.
For additional information, refer to the manual and www.pepperl-fuchs.com.

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		
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 outout III: terminasl 19+, 20- output IV: terminals 8+, 7-

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Technical Data

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}
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)

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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) , housing type C3
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		⟨Ex⟩ II (1)G [Ex ia Ga] IIC ⟨Ex⟩ II (1)D [Ex ia Da] IIIC ⟨Ex⟩ 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		terminals 1+, 3-: Ex ia
Voltage U_o		10.1 V
Current I_o		13.5 mA
Power P_o		34 mW (linear characteristic)
Input II		terminals 13+, 14- non-intrinsically safe
Maximum safe voltage U_m		40 V (Attention! The rated voltage can be lower.)
Output I, II		terminals 10, 11, 12; 16, 17, 18 non-intrinsically safe
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		terminals 19+, 20- non-intrinsically safe
Maximum safe voltage U_m	U_m	40 V (Attention! U_m is no rated voltage.)
Output IV		terminals 8+, 7- non-intrinsically safe
Maximum safe voltage	U_m	40 V DC (Attention! U_m is no rated voltage.)
Interface		RS 232
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 60079-0:2012+A11:2013 , EN 60079-11:2012
International approvals		
FM approval		
Control drawing		16-538FM-12
IECEx approval		IECEx TUN 04.0007
Approved for		[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.

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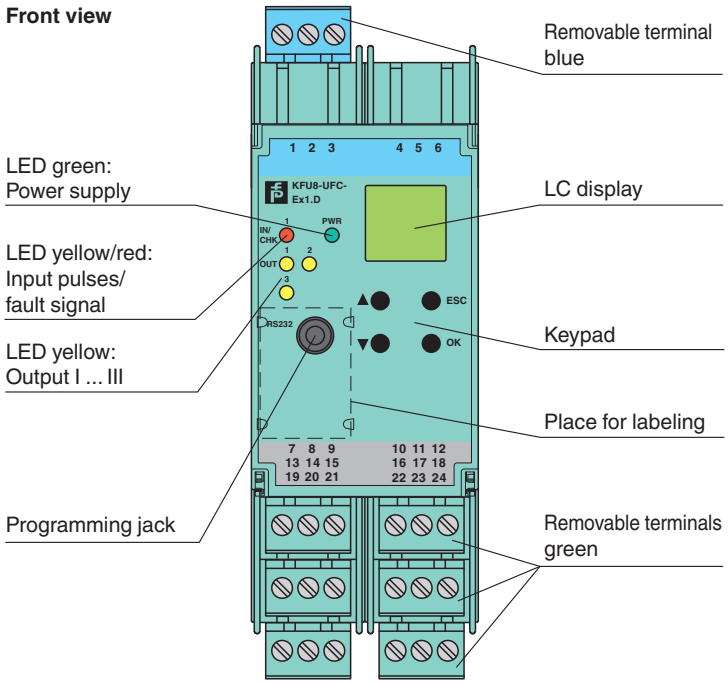
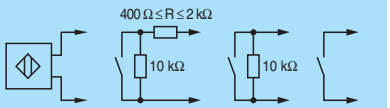
Assembly

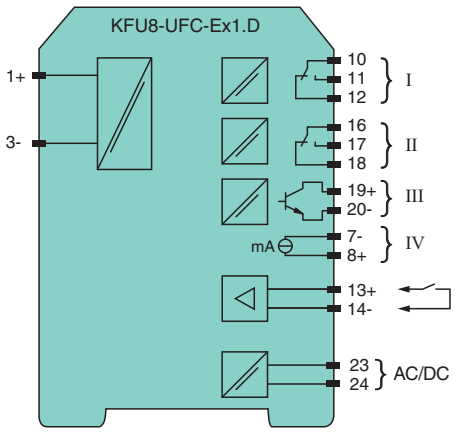
Front view



Connection



Zone 0, 1, 2
Div. 1, 2



Accessories

	DTM Interface Technology	
	PACTware 5.X	FDT Framework
	K-ADP-USB	
	KFD2-EB2	Power Feed Module
	UPR-03	Universal Power Rail with end caps and cover, 3 conductors, length: 2 m

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Accessories

	**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-BU**	
	**K-DUCT-BU-UPR-03**	Profile rail with UPR-03- * insert, 3 conductors, wiring comb field side blue

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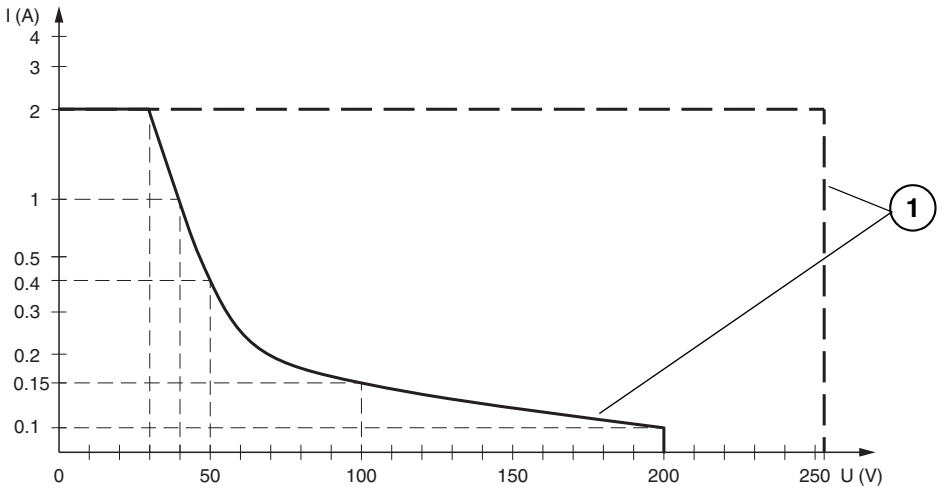
Characteristic Curve

Maximum Switching Power of Output Contacts



Resistive load DC

Resistive load AC

1 max. 10^5 switching cycles

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