



PEPPERL FUCHS KFD2-UFC-Ex1.D Frequency Converter with Trip Values Instruction Manual

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PEPPERL FUCHS KFD2-UFC-Ex1.D Frequency Converter with Trip Values



Frequency Converter with Trip Values

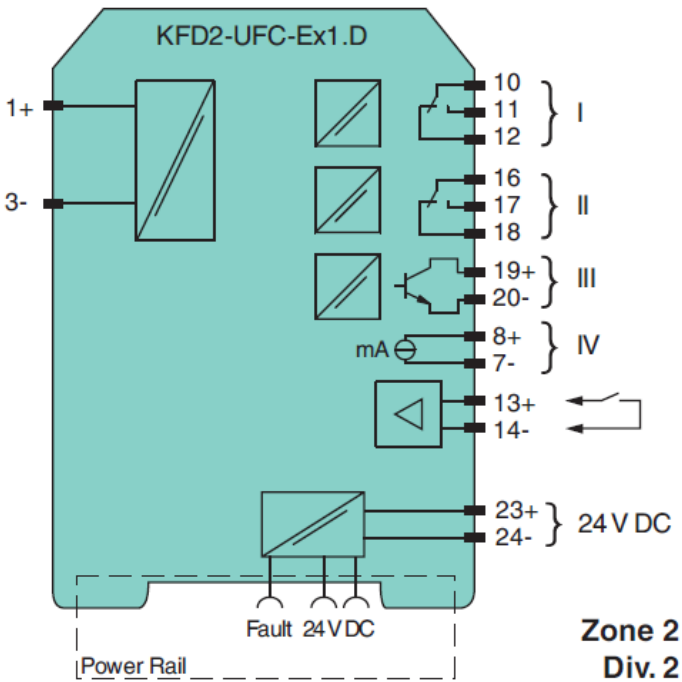
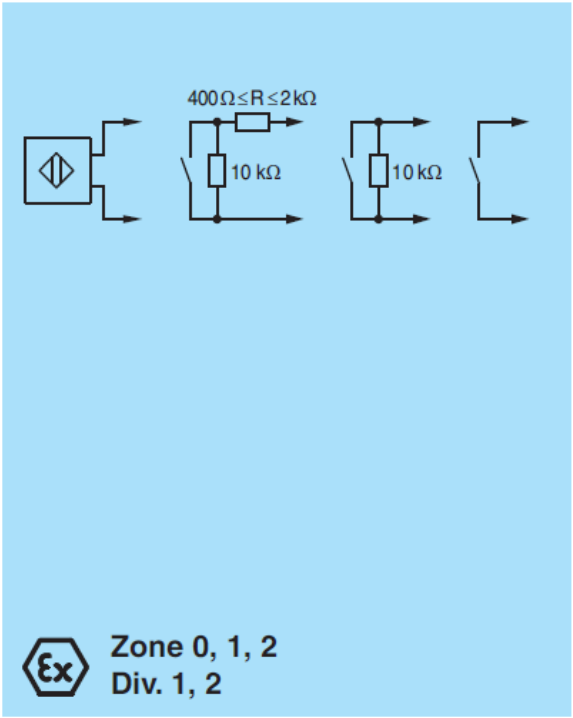
KFD2-UFC-Ex1.D

- 1-channel isolated barrier
- **24 V DC** supply (Power Rail)
- **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 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.

Connection



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		$\leq 2\text{ W} / 2.2\text{ W}$

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 contact		sensor acc. to EN 60947-5-6 (NAMUR) or mechanical

Pulse duration		> 50 μ s
Input frequency		0.001 ... 5000 Hz
Line fault detection		breakage $I \leq 0.15$ 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		253 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: switched off (off-state current ≤ 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 ≥ 21.5 mA (acc. NAMUR NE43)
Collective error message		Power Rail
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 μ A
Accuracy		< 20 μ A
Influence of ambient temperature		0.005 %/K (50 ppm)
Galvanic isolation		
Input I/other circuits rated insulation voltage 300 V _{eff}		reinforced insulation according to IEC/EN 61010-1, ra
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 on voltage 50 V _{eff}		basic insulation according to IEC/EN 61010-1, rated insulati
Output III/start-up override insulation voltage 50 V _{eff}		basic insulation according to IEC/EN 61010-1, rated
Output III/IV		basic insulation according to IEC/EN 61010-1, rated insulation voltage 50 V _{eff}
Output IV/power supply and collecti ve error		functional insulation acc. to IEC 62103, rated insulation voltage 50 V _{eff}

Start-up override/power supply and collective error		functional insulation acc. to IEC 62103, rated insulation voltage 50 V _{eff}
Interface/power supply and collecti ve error		functional insulation acc. to IEC 62103, rated insulation voltage 50 V _{eff}
Interface/output III sulation voltage 50 V _{eff}		basic insulation according to IEC/EN 61010-1, rated in
Indicators/settings		
Display elements		LEDs , display
Control elements		Control panel
Configuration via PACTware		via operating buttons
Labeling		space for labeling at the front
Directive conformity		
Electromagnetic compatibility		

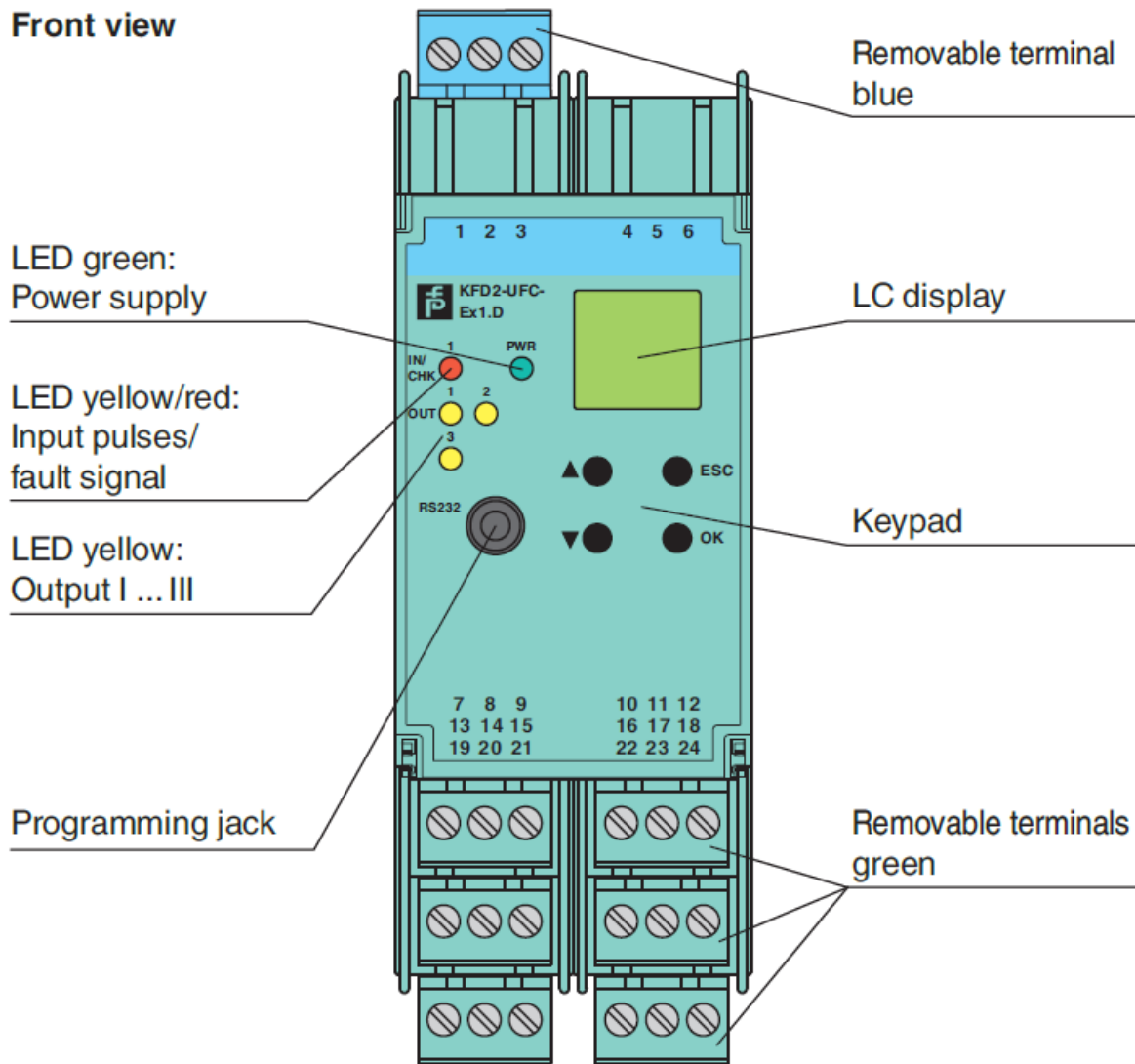
Directive 2014/30/EU		EN 61326-1:2013 (industrial locations)
Low voltage		
Directive 2014/35/EU		EN 61010-1:2010
Conformity		
Electromagnetic compatibility		NE 21:2006
Degree of protection		IEC 60529:2001
Input		EN 60947-5-6:2000
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications		
Degree of protection		IP20
Connection		screw terminals
Mass		300 g
Dimensions using type C2		40 x 119 x 115 mm (1.6 x 4.7 x 4.5 inch) (W x H x D) , ho
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		1 II (1)G [Ex ia Ga] IIC 1 II (1)D [Ex ia Da] IIIC 1 I (M1) [Ex ia Ma] I
Supply		
Maximum safe voltage	U _m	40 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

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.)
Certificate		TÜV 02 ATEX 1885 X
Marking		1 II 3G Ex nA nC IIC T4 Gc
Output I, II		
Contact loading		50 V AC/2 A/cos $\phi > 0.7$; 40 V DC/2 A resistive load
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 0079-15:2010		EN 60079-0:2012+A11:2013 , EN 60079-11:2012 , EN 60079-15:2012
International approvals		
FM approval		
Control drawing		16-538FM-12
UL approval		E223772
IECEx approval		
IECEx certificate		IECEx TUN 04.0007 IECEx TSA 18.0007X
IECEx marking		[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I Ex ec nC IIC T4 Gc
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

	DTM Interface Technology	Device type manager (DTM) for interface technology
	PACTware 5.X	FDT Framework
	K-ADP-USB	Programming adapter with USB interface
	KFD2-EB2	Power Feed Module

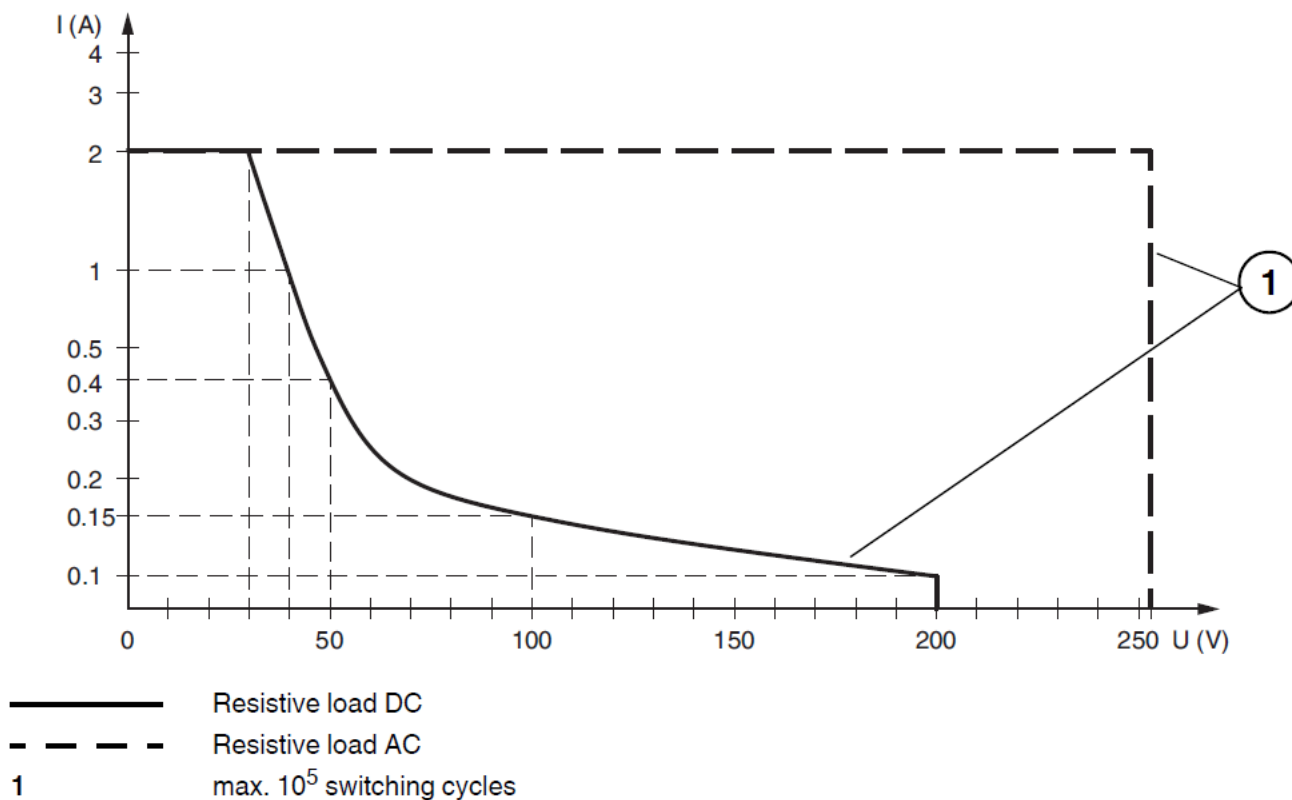
	UPR-03	Universal Power Rail with end caps and cover, 3 conductors, length: 2 m
	UPR-03-M	Universal Power Rail with end caps and cover, 3 conductors, length: 1,6 m
	UPR-03-S	Universal Power Rail with end caps and cover, 3 conductors, length: 0.8 m
	K-DUCT-BU	Profile rail, wiring comb field side, blue
	K-DUCT-BU-UPR-03	Profile rail with UPR-03- * insert, 3 conductors, wiring comb field side, blue

Accessories

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

Characteristic Curve

Maximum Switching Power of Output Contacts



Refer to “General Notes Relating to Pepperl+Fuchs Product Information”.

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Documents / Resources

	PEPPERL FUCHS KFD2-UFC-Ex1.D Frequency Converter with Trip Values [pdf] Instruction Manual KFD2-UFC-Ex1.D Frequency Converter with Trip Values, KFD2-UFC-Ex1.D, Frequency Converter with Trip Values, Trip Values, Values
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