

**Features**

- 2-channel signal conditioner
- Universal usage at different power supplies
- Dry contact or NAMUR inputs
- Input frequency 1 mHz ... 1 kHz
- Current output 0/4 mA ... 20 mA
- Relay contact and transistor output
- Start-up override
- Configurable by PACTware or keypad
- Line fault detection (LFD)

**Function**

This signal conditioner analyzes 2 digital signals (NAMUR sensor/mechanical contact) and functions as a rotation direction indicator, slip monitor, frequency monitor or synchronization monitor.

Each proximity sensor or switch controls a passive transistor output. The 2 relay outputs indicate if the input signal is above or below the trip value or the rotational direction.

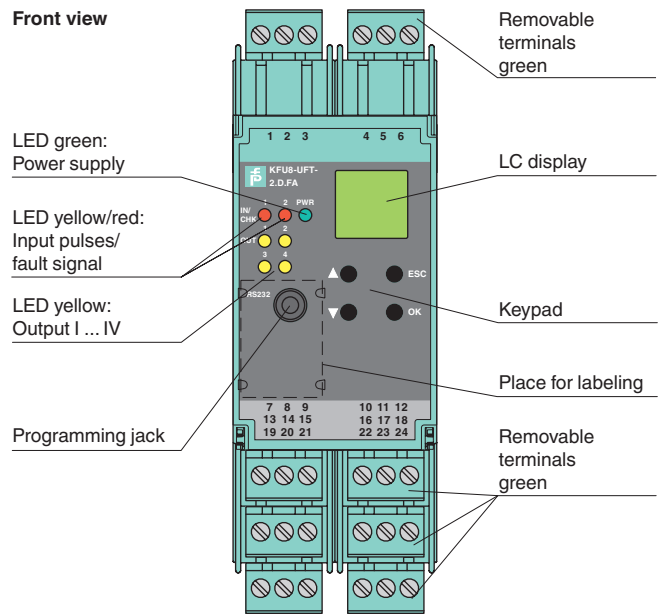
The analog output can be programmed to be proportional to the input frequency or slip differential.

The unit is easily programmed by the use of a keypad located on the front of the unit or with the **PACTware™** configuration software.

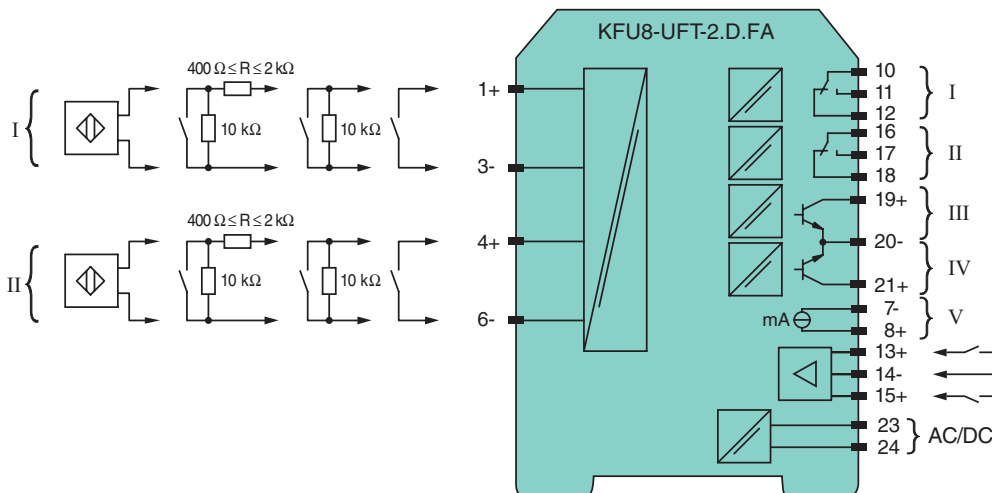
Line fault detection of the field current is indicated by a red LED.

For additional information, refer to the manual and [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).

**Assembly**



**Connection**



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

<b>General specifications</b>		
Signal type		Digital Input
<b>Supply</b>		
Connection		terminals 23, 24
Rated voltage	$U_r$	20 ... 90 V DC / 48 ... 253 V AC 50 ... 60 Hz
Rated current	$I_r$	approx. 130 mA
Power dissipation		2.2 W / 3.5 VA
Power consumption		2.5 W / 4 VA
<b>Interface</b>		
Programming interface		programming socket
<b>Input</b>		
Connection side		field side
Connection		input I: terminals 1+, 3- input II: terminals 4+, 6- input III: terminals 13+, 14- (control input 1) input IV: terminals 15+, 14- (control input 2)
Input III, IV		
Active/Passive		$I > 4 \text{ mA}$ (for min. 100 ms) / $I < 1.5 \text{ mA}$
Open circuit voltage/short-circuit current		18 V / 5 mA
<b>Output</b>		
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 21+, 20- output V: terminals 7-, 8+
Output I, II		signal, relay
Contact loading		250 V AC / 2 A / $\cos \phi \geq 0.7$ ; 40 DC / 2 A
Mechanical life		$5 \times 10^7$ switching cycles
Energized/De-energized delay		approx. 20 ms / approx. 20 ms
Output III and IV		signal , 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 $\leq 10 \mu\text{A}$ )
Output V		analog
Current range		0 ... 20 mA or 4 ... 20 mA
Open loop voltage		max. 24 V DC
Load		max. 650 $\Omega$
Fault signal		downscale $I \leq 3.6 \text{ mA}$ , upscale $I \geq 21.5 \text{ mA}$ (acc. NAMUR NE43)
Programming interface		
Connection		programming socket
Interface		RS 232
<b>Transfer characteristics</b>		
Input I and II		
Measurement range		0.001 ... 1000 Hz
Resolution		slip monitoring: 1% frequency measurement: 0,1% of measured value; but $>0.001\text{Hz}$
Accuracy		slip monitoring: 1% frequency measurement: 0.5% of measured value; but $>0.001\text{Hz}$
Measuring time		frequency measurement: $< 100 \text{ ms}$
Influence of ambient temperature		0.003 %/K (30 ppm)
Output I, II		
Response delay		$\leq 200 \text{ ms}$
Output V		
Resolution		$< 10 \mu\text{A}$
Accuracy		$< 30 \mu\text{A}$
Influence of ambient temperature		0.005 %/K (50 ppm)
<b>Galvanic isolation</b>		
Input I, II/other circuits		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 $V_{\text{eff}}$
Input III, IV/power supply		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 $V_{\text{eff}}$
Output I, II/other circuits		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 $V_{\text{eff}}$
Mutual output I, II, III		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 $V_{\text{eff}}$
Mutual output I, II, IV		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 $V_{\text{eff}}$
Output III, IV/power supply		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 $V_{\text{eff}}$
Output III, IV/input III, IV		basic insulation according to IEC/EN 61010-1, rated insulation voltage 50 $V_{\text{eff}}$
Output III, IV/V		basic insulation according to IEC/EN 61010-1, rated insulation voltage 50 $V_{\text{eff}}$
Output V/power supply		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 $V_{\text{eff}}$

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Interface/power supply	reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>
Interface/output III, IV	basic insulation according to IEC/EN 61010-1, rated insulation voltage 50 V <sub>eff</sub>
<b>Indicators/settings</b>	
Display elements	LEDs , display
Control elements	Control panel
Configuration	via operating buttons via PACTware
Labeling	space for labeling at the front
<b>Directive conformity</b>	
Electromagnetic compatibility	
Directive 2014/30/EU	EN 61326-1:2006
Low voltage	
Directive 2014/35/EU	EN 61010-1:2010
<b>Conformity</b>	
Electromagnetic compatibility	NE 21:2006
Degree of protection	IEC 60529:2001
Input	EN 60947-5-6:2000
<b>Ambient conditions</b>	
Ambient temperature	-20 ... 60 °C (-4 ... 140 °F)
<b>Mechanical specifications</b>	
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
<b>General information</b>	
Supplementary information	Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .

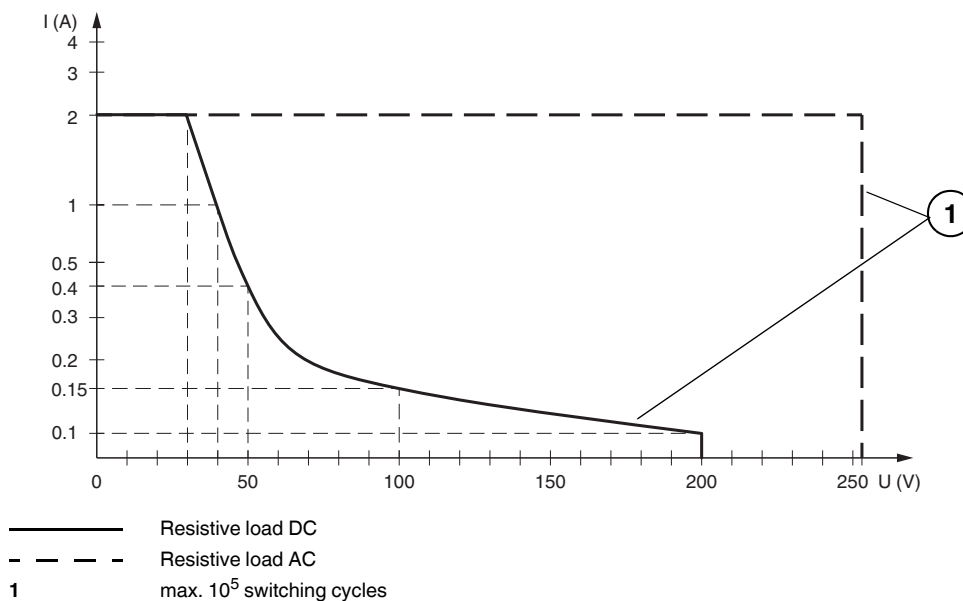
## Function

The device processes two input frequencies up to a max. of 1 kHz. The following functions are provided by the device:

- Frequency measurement with freely adjustable trip value monitoring for high and low alarm as well as for frequency-current-conversion (0/4 mA ... 20 mA)
- Slip monitoring: The slip is calculated from the two input frequencies at channel I and II. If the freely parameterisable trip value is exceeded, the respective output switches.
- Rotation direction signalling: The rotation direction is evaluated from the two input signals with the same frequency and a phase shift of 90°. The corresponding outputs switch according to the direction of rotation.
- The frequency monitoring can be used in combination with rotation direction signalling or slip monitoring.
- Synchronisation monitor: The synchronisation monitor compares the pulse counts of the two inputs. If the measured difference in the pulses is greater than the programmed value the corresponding outputs are switching.

The two electronic outputs serve to repeat the input signals.

## Maximum Switching Power of Output Contacts



## Accessories

### PACT<sub>ware</sub>™

Device-specific drivers (DTM)

### Adapter K-ADP1

Programming adapter for parameterisation via the serial RS 232 interface of a PC/Notebook

For programming, please use the new version of adapter K-ADP1 (part no. 181953, connector length 14mm). When using the previous version K-ADP1 (connector length 18 mm) the plug is exposed by approx. 3 mm. The function is not affected.

### Adapter K-ADP-USB

Programming adapter for parameterisation via the serial USB interface of a PC/Notebook