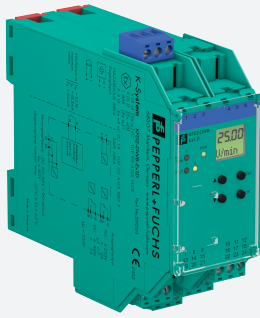


# Rotation Speed Monitor

## KFD2-DWB-Ex1.D

SIL 2



- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Dry contact or NAMUR inputs
- Input frequency 1 mHz ... 5 kHz
- 2 relay contact outputs
- Start-up override
- Configurable by keypad
- Line fault detection (LFD)
- Up to SIL 2 acc. to IEC 61508/IEC 61511

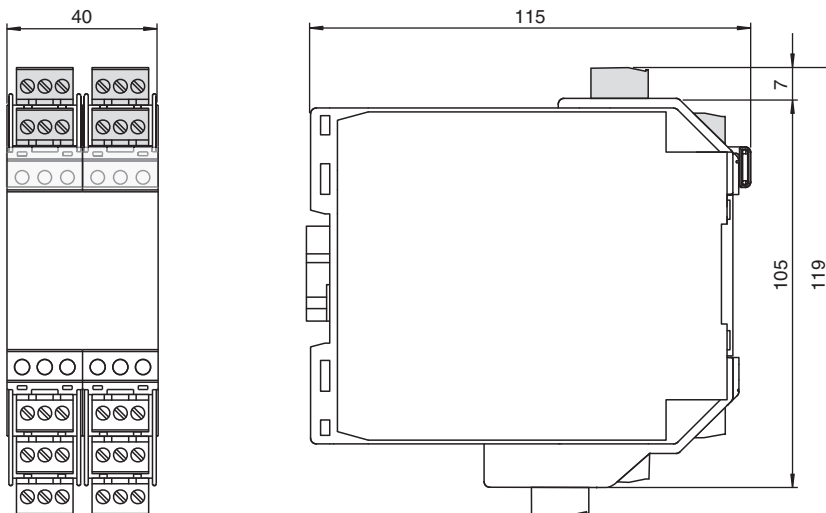
24 V DC



### Function

This isolated barrier is used for intrinsic safety applications. It monitors for an overspeed or underspeed condition of a digital signal (NAMUR sensor/ mechanical contact) from a hazardous area by comparing the input frequency to the user programmed reference frequency. An overspeed or underspeed condition is signaled via the relay outputs. Line fault detection of the field circuit is indicated by a red LED, Power Rail and relay. The start-up override feature sets relay outputs to default conditions programmed by the user for up to 1,000 seconds. The unit is easily programmed by the use of a keypad located on the front of the unit. A unique collective error messaging feature is available when used with the Power Rail system. For additional information, refer to the manual and [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).

### Dimensions



### Technical Data

#### General specifications

Signal type	Digital Input
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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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## Technical Data

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		$\leq 1.8 \text{ W} / 1.8 \text{ W}$
Input		
Connection side		field side
Connection		Input I: intrinsically safe: terminals 1+, 3- Input II: non-intrinsically safe: terminals 13+, 14-
Input I		acc. to EN 60947-5-6 (NAMUR), see manual for electrical data
Pulse duration		$> 50 \mu\text{s}$
Input frequency		0.001 ... 5000 Hz
Line fault detection		breakage $I \leq 0.15 \text{ mA}$ ; short-circuit $I > 6.5 \text{ mA}$
Input II		startup override: 1 ... 1000 s, adjustable in steps of 1 s
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
Output		
Connection side		control side
Connection		output I: terminals 10, 11, 12 output II: terminals 16, 17, 18
Output I, II		signal, relay
Contact loading		250 V AC / 2 A / $\cos \phi \geq 0.7$ ; 40 V DC / 2 A
Mechanical life		$5 \times 10^7$ switching cycles
Energized/De-energized delay		approx. 20 ms / approx. 20 ms
Collective error message		Power Rail
Transfer characteristics		
Input I		
Measurement range		0.001 ... 5000 Hz
Resolution		0.1 % of measured value , $\geq 0.001 \text{ Hz}$
Accuracy		0.1 % of measured value , $> 0.001 \text{ Hz}$
Measuring time		$< 100 \text{ ms}$
Influence of ambient temperature		0.003 %/K (30 ppm)
Output I, II		
Response delay		$\leq 200 \text{ ms}$
Galvanic isolation		
Input I/other circuits		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>
Output I, II against eachother		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>
Output I, II/other circuits		reinforced insulation according to IEC/EN 61010-1, rated insulation voltage 300 V <sub>eff</sub>
Start-up override/power supply and collective error		functional insulation acc. to IEC 62103, rated insulation voltage 50 V <sub>eff</sub>
Indicators/settings		
Display elements		LEDs , display
Control elements		Control panel
Configuration		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

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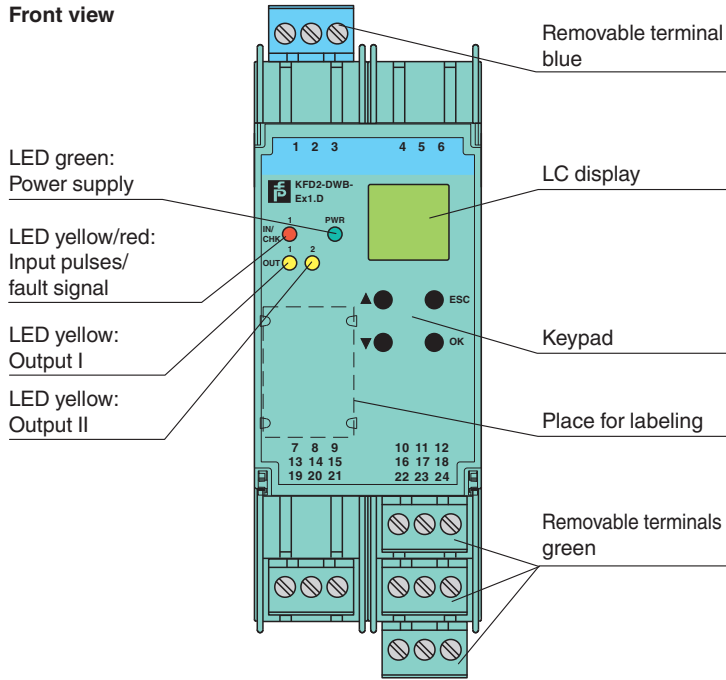
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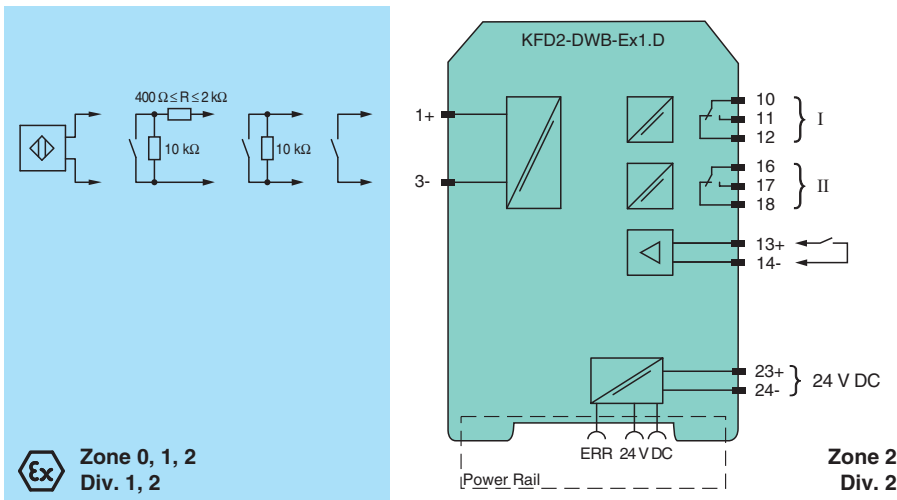
## Technical Data

Degree of protection	IEC 60529:2001	
<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>Data for application in connection with hazardous areas</b>		
EU-type examination certificate	TÜV 99 ATEX 1408	
Marking	Ⓜ II (1)G [Ex ia Ga] IIC Ⓜ II (1)D [Ex ia Da] IIIC Ⓜ I (M1) [Ex ia Ma] I	
<b>Supply</b>		
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 $\phi > 0.7$ ; 40 V DC/2 A resistive load (TÜV 99 ATEX 1471)	
Certificate	TÜV 02 ATEX 1885 X	
Marking	Ⓜ 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/1 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	EN 60079-0:2012+A11:2013 , EN 60079-11:2012 , EN 60079-15:2010	
<b>International approvals</b>		
FM approval		
Control drawing	16-538FM-12	
UL approval	E223772	
IECEx approval	IECEx TUN 03.0000	
Approved for	[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I	
<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> .	

**Assembly**



**Connection**



**Accessories**

	<b>KFD2-EB2</b>	Power Feed Module
	<b>UPR-03</b>	Universal Power Rail with end caps and cover, 3 conductors, length: 2 m
	<b>UPR-03-M</b>	Universal Power Rail with end caps and cover, 3 conductors, length: 1,6 m
	<b>UPR-03-S</b>	Universal Power Rail with end caps and cover, 3 conductors, length: 0.8 m
	<b>K-DUCT-BU</b>	

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## Accessories



**K-DUCT-BU-UPR-03**

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

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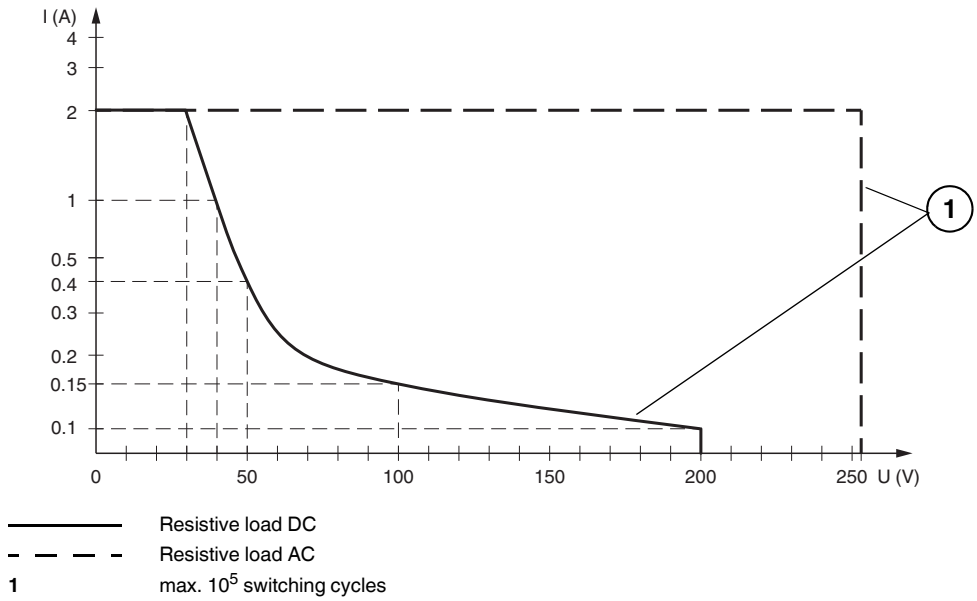
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**Characteristic Curve**

**Maximum Switching Power of Output Contacts**



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