- Control circuit EEx ia IIC
- Lead breakage (LB) monitoring and short-circuit (SC) monitoring
- 1 electronic output, frequency-split
- 1 relay output, frequency-split
- Adjustable output pulse length
- 1 passive electronic output, serially switched
- 1 passive electronic output, error message

24 V DC:

KFD2-IT-Ex1

Successor KFD2-UFC-Ex1

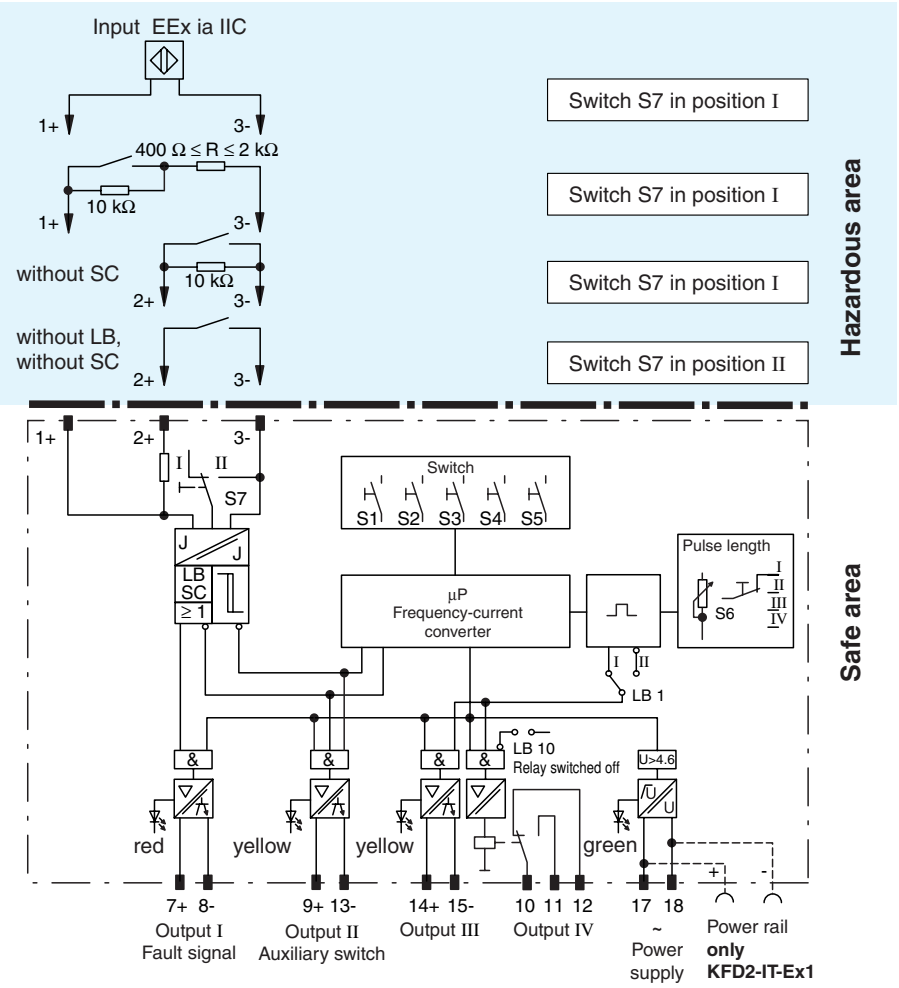
Function

Integers or broken reduction ratios can be realized in a total range of 1:1 and 9.999 x 10^4:1 with the logic control unit. It can be controlled with a sensor per DIN EN 60947-5-6 or NAMUR, a non-rebounding mechanical switch or preferably an electronic switch.

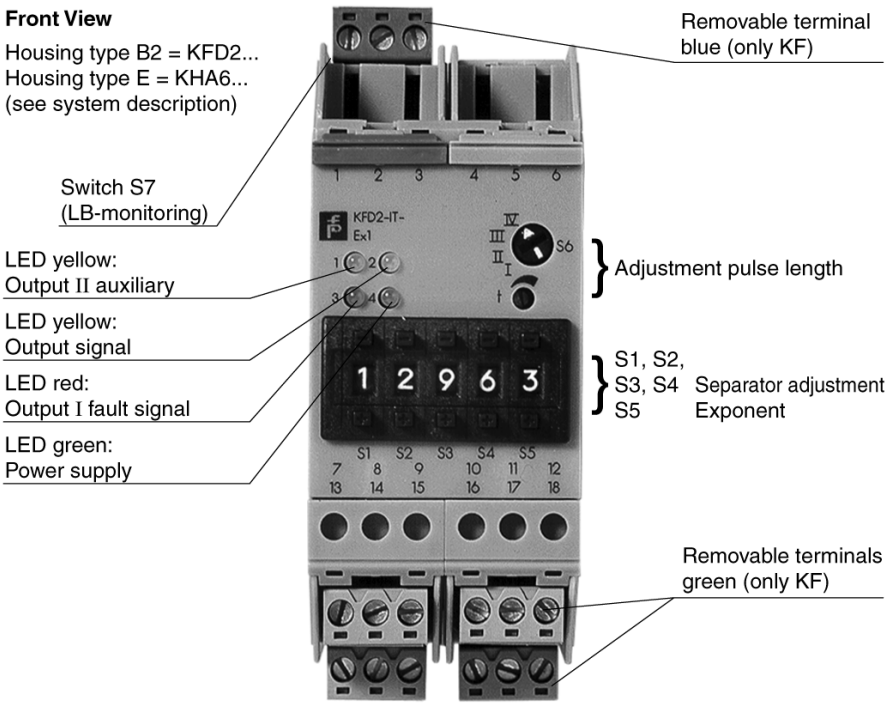
Lead breakage and short circuit monitoring

The frequency separated outputs and the serially switched output are cut off when the current in the control circuit is J < 0.1 mA (lead breakage monitoring response) or J > 6 mA (short circuit monitoring response); the fault signal output is switched and indicates a fault through the illumination of LED 3 (red). In addition, the microprocessor is reset.

Connection



Composition



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Supply	
Connection	Power Rail or terminals 17+, 18-
Rated voltage	20 ... 35 V DC
Ripple	≤ 10 %
Rated current	≤ 52 mA
Input	
Connection	terminals 1+, 2+, 3-
Rated values	EN 60947-5-6 (NAMUR), see system description for electrical data
Open circuit voltage/Short-circuit current	approx. 8 V DC / approx. 8 mA
Switching point/Switching hysteresis	1.2 ... 2.1 mA / approx. 0.2 mA
Pulse/Pause ratio	≥ 0.1 ms / ≥ 0.1 ms
Lead monitoring	breakage I = 0.05 ... 0.15 mA , short-circuit 6.2 ... 7.4 mA
Output	
Connection	output I: terminals 7+, 8- ; output II: terminals 9+, 13- ; output III: terminals 14+, 15- ; output IV: terminals 10, 11, 12
Output I	fault signal ; electronic output, passive
Output I and II	
Signal level	1-signal: (L+) -2.5 V (100 mA, short-circuit proof) 0-signal: blocked output (off-state current ≤ 10 µA)
Output II	serial switching ; electronic output, passive
Output III	signal ; electronic output, passive
Output III and IV	
Pulse length	adjustable 0.05 ... 500 ms
Output IV	signal ; Relay
Contact loading	250 V AC / 2 A / cos φ ≥ 0.7 ; 40 V DC / 2 A resistive load
Mechanical life	5 x 10^7 switching cycles
Energised/De-energised delay	approx. 20 ms / approx. 20 ms
Transfer characteristics	
Redundancy	
Output I	≤ 5 kHz
Output II	≤ 10 Hz
Electrical isolation	
Input/Output	safe electrical isolation acc. to EN 50020
Input/power supply	safe electrical isolation acc. to EN 50020
Output/power supply	according to EN 50178, rated insulation voltage 253 V AC
Output/Output	according to EN 50178, rated insulation voltage 253 V AC
Directive conformity	
Electromagnetic compatibility	
Directive 89/336/EC	on request
Conformity	
Insulation coordination	EN 50178
Electrical isolation	EN 50178
Input	EN 60947-5-6 (NAMUR), see system description for electrical data
Ambient conditions	
Ambient temperature	-25 ... 65 °C (248 ... 338 K)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 275 g
Dimensions	40 x 100 x 115 mm (1.6 x 3.9 x 4.5 in)
Data for application in conjunction with hazardous areas	
EC-Type Examination Certificate	PTB No. Ex-89.C.2145 , for additional certificates refer to the approval list
Group, category, type of protection	[EEx ia] IIC resp. [EEx ia] IIB
Voltage U_0	12.7 V
Current I_0	17.3 mA
Power P_0	55 mW
Supply	
Safety maximum voltage U_m	40 V DC (Attention! The rated voltage can be lower.)
Type of protection [EEx ia]	
Explosion group	IIB IIC
External capacitance	1.1 µF 0.45 µF
External inductance	5 mH 2 mH
Type of protection [EEx ib]	
Explosion group	IIB IIC
External capacitance	5 µF 1.2 µF

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External inductance	410 mH 114 mH
Outputs	
Safety maximum voltage U_m	40 V DC (Attention! The rated voltage can be lower.)
Electrical isolation	
Input/Output	safe electrical isolation acc. to EN 50020
Input/power supply	safe electrical isolation acc. to EN 50020
Directive conformity	
Directive 94/9 EC	on request

Supplementary information

EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity and instructions have to be observed. For information see www.pepperl-fuchs.com.

Notes

Divider ratio adjustment

By means of the thumbwheel switch S1 ... S4 any speed reducing ratio between 1 : 1 and 9,999 : 1 can be adjusted.

By means of the thumbwheel switch S5 the exponent for the basis 10 is set, i.e. the figure that is set by means of S1 to S4 is multiplied by 1, 10, 100, 1000 or 10000 depending on the figure that is set at S5.

Example:

For a volumetric counter the following data are given: Desired indication in m³

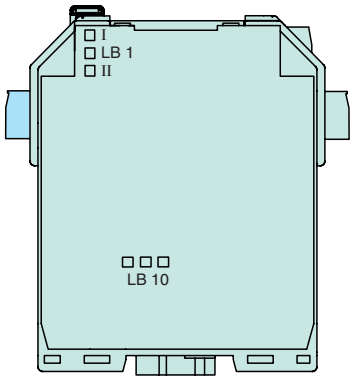
- 1 rotation corresp. 2.145 l
- 1 rotation corresp. 1 pulse
- 1 m^3 corresp. = 466.2 pulses

The reduction ratio is 466.2 : 1

Adjustment: S1 : 4, S2 : 6, S3 : 6, S4 : 2, S5 : 2 → 4.662 x 102 : 1

Adjustment of the jumpers LB1 and LB10:

After removal of the cover and of the left side part the jumpers are visible on the printed circuit board.



Adjustment of the pulse length

The pulse length can be set by means of the multi position switch S6 (rough) and the potentiometer t (fine) at the front of the housing. By changing the soldering of the jumper 1 the frequency separated outputs are inverted.

Delivery: Solder bridge LB1 in position I
Solder bridge LB1 open

Multi position switch S6 Position	Potentiometer t	
	Left-hand stop	Right-hand stop
I	≥ 50 µs	≤ 500 µs
II	≥ 500 µs	≤ 5 ms
III	≥ 5 ms	≤ 50 ms
IV	≥ 50 ms	≤ 500 ms

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Accessories

Power Rail PR-03
Power Rail UPR-03
Power feed module KFD2-EB2...

By means of the Power Rail PR-03 or UPR-03 the devices can be provided with 24 V DC via the power feed module. If no Power Rails are used, power supply of the individual devices is realised directly via their device terminals.

Each power feed module is used for fusing and monitoring groups with up to 100 individual devices. The Power Rail PR-03 is an inset component for the DIN rail. The Power Rail UPR-03 is a complete unit consisting of the electrical inset and an aluminium profile rail 35 mm x 15 mm x 2000 mm. To make electrical contact, the devices are simply engaged.

The Power Rail must not be fed via the device terminals of the individual devices!

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