



- 1-channel
- Control circuit EEx ia IIC
- Switching amplifier with timing
- Maximum input frequency 80 Hz
- 1 relay output, 1 potential-free electronic output
- Pulse divider up to 1 kHz
- Time function: one shot output, one shot output retrigger, pulse extension, pulse limitation, on-delay, off-delay, auxiliary switch
- Time range of the output function from 10 ms ... 60 min
- Reset function
- Lead breakage (LB) monitoring and short-circuit (SC) monitoring

24 V DC
KFD2-DU-Ex1.D

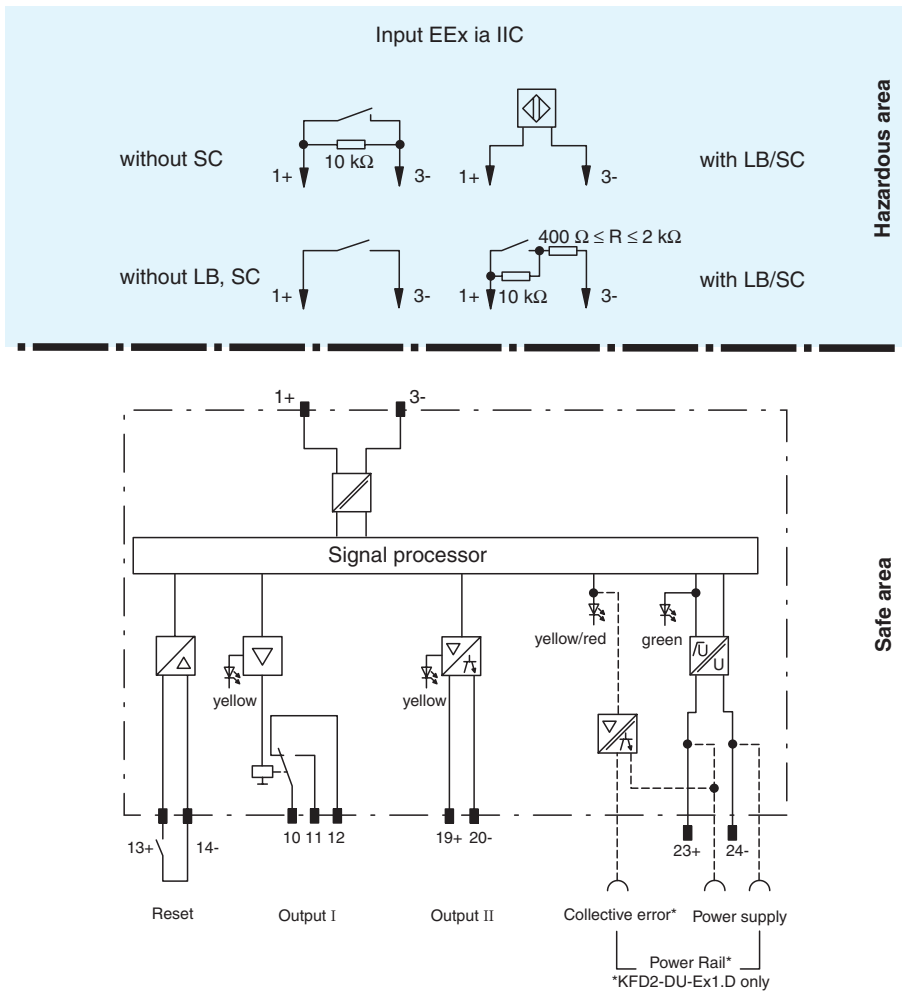
Function

The time relay offers the capability of switching input signals to outputs with a delay and extending the output signal. The switching duration is freely adjustable. In the case of rapid output signals, the relay can be turned off. A reset function that can be activated externally is used to terminate a time function once it has been started. The maximum input frequency is 80 Hz. Parameters can be entered using the control panel on the front of the device. By means of the pulse separator function integral or fractional step down ratios in a range of 1:1 to 9999:1 can be realized. When using the pulse separator function the max. input frequency is 1 kHz. The input and output circuits are separated galvanically. Power can be supplied to the KFD2-DU-Ex1.D through the Power Rail. The Power Rail also transfers the collective error message.

Range of application:

Extension of very short pulses to adjust to slow PLC inputs, for example, or to suppress very short input pulses, etc.

Connection

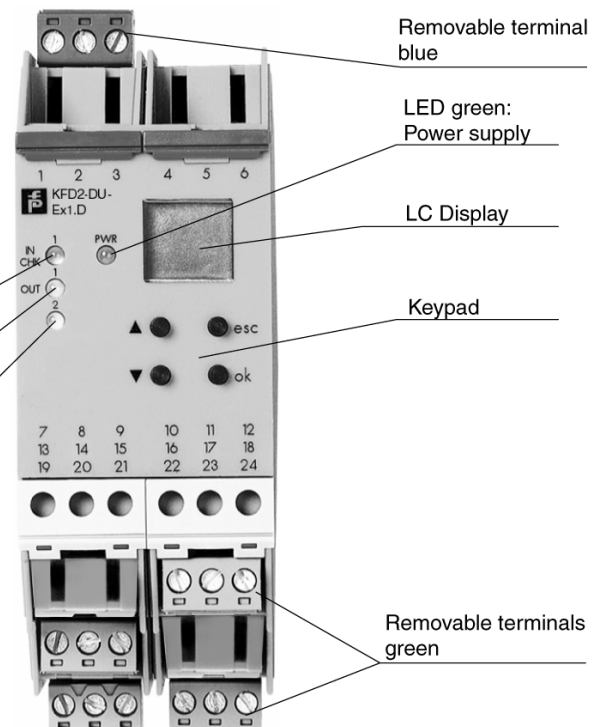


Composition

Front View

Housing type B2 (see system description)

- LED yellow/red: Input pulses/ Fault signal
- LED yellow: Output I
- LED yellow: Output II



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| | |
|---|---|
| Supply | |
| Connection | Power Rail or terminals 23+, 24- |
| Rated voltage | 20 ... 30 V DC |
| Rated current | approx. 100 mA |
| Power consumption | 1.8 W |
| Input | |
| Connection | Input I: terminals 1+, 3- ; input II: terminals 13+, 14- |
| Input I | acc. to EN 60947-5-6 (NAMUR), see system description for electrical data |
| Open-circuit voltage/short-circuit current | 8.2 V / 10 mA |
| Switching point/Switching hysteresis | 1.2 ... 2.1 mA / approx. 0.2 mA |
| Pulse duration | ≥ 50 μs / 1 ms see instruction manuals; the maximum input frequency has to be observed. |
| Input frequency | 0 ... 80 Hz pulse divider 0 ... 1 kHz |
| Lead monitoring | breakage I ≤ 0.15 mA; short-circuit I > 6.5 mA |
| Input II | reset |
| Active/passive | I > 4 mA / I < 1,5 mA |
| Open-circuit voltage/short-circuit current | 18 V / 5 mA |
| Pulse duration | ≥ 10 ms |
| Output | |
| Connection | output I: terminals 10, 11, 12 ; output II: terminals 19+, 20- |
| Output I | signal , relay output |
| Contact loading | 253 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 II | signal , electronic unit, isolated |
| Contact loading | 40 V / 50 mA |
| Energized/de-energized delay | after rising input flank 3 ms ; after falling input flank 2 ms |
| Signal level | 1-signal: (L+) -2.5 V (50 mA, short-circuit/overload proof) 0-signal: blocked output (off-state current ≤ 10 μA) |
| Transfer characteristics | |
| Input I | |
| Resolution | < 0.1 % of the set value, min. 10 ms |
| Accuracy | 2 ms |
| Influence of ambient temperature | 0,003 %/°C (50 ppm) |
| Electrical isolation | |
| Output I/power supply and reset | reinforced insulation acc. to IEC 61140, rated insulation voltage 300 V _{eff} |
| Output I and II: | reinforced insulation acc. to IEC 61140, rated insulation voltage 300 V _{eff} |
| Output II/power supply and collective error | reinforced insulation acc. to IEC 61140, rated insulation voltage 300 V _{eff} |
| Output II/Reset | function insulation acc. to EN 50178, rated insulation voltage 300 V _{eff} |
| Reset/power supply and collective error | reinforced insulation acc. to IEC 61140, rated insulation voltage 300 V _{eff} |
| Directive conformity | |
| Electromagnetic compatibility | |
| Directive 89/336/EC | EN 61326, EN 61000-6-4, NE 21 |
| Low voltage | |
| Directive 73/23/EEC | EN 50178 |
| Conformity | |
| Electromagnetic compatibility | NE 21 |
| Protection degree | IEC 60529 |
| Protection against electric shock | IEC 61140 |
| Ambient conditions | |
| Ambient temperature | -20 ... 60 °C (253 ... 333 K) |
| Mechanical specifications | |
| Protection degree | IP20 |
| Mass | approx. 300 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 | TÜV 99 ATEX 1408 , for additional certificates see www.pepperl-fuchs.com |
| Group, category, type of protection | ⊕ II (1) G [Ex ia] IIC [circuit(s) in zone 0/1/2] |
| Supply | |
| Safety maximum voltage U _m | 253 V AC (Attention! The rated voltage can be lower.) |
| Input I | terminals 1+, 3- EEx ia IIC |
| Voltage U _o | 10.1 V |

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| | | | | |
|---|----------|---|--------------|------------|
| Current | I_o | 13 mA | | |
| Power | P_o | 34 mW (linear characteristic) | | |
| Input II | | terminals 13+, 14- non-intrinsically safe | | |
| Safety maximum voltage | U_m | 40 V DC (Attention! The rated voltage can be lower.) | | |
| Output I | | terminals 10, 11, 12 non-intrinsically safe | | |
| Contact loading | | 253 V AC / 2 A / $\cos \varphi > 0.7$; 40 V DC / 2 A resistive load (TÜV 99 ATEX 1408) 50 V AC / 2 A / $\cos \varphi > 0.7$; 40 V DC / 2 A resistive load (TÜV 02 ATEX 1885 X) | | |
| Safety maximum voltage | U_m | 253 V AC (Attention! The rated voltage can be lower.) | | |
| Output II | | terminals 19+, 20- non-intrinsically safe | | |
| Safety maximum voltage | U_m | 40 V DC (Attention! The rated voltage can be lower.) | | |
| Statement of conformity | | TÜV 02 ATEX 1885 X , observe statement of conformity | | |
| Group, category, type of protection, temperature classification | | Ⓔ II 3 G EEx nAC IIC T4 [device in zone 2] | | |
| Electrical isolation | | | | |
| Input/other circuits | | safe electrical isolation acc. to EN 50020, voltage peak value 375 V | | |
| Directive conformity | | | | |
| Directive 94/9 EC | | EN 50014, EN 50020, EN 50021 | | |
| Entity parameter | | | | |
| FM control drawing | | No. 116-0200 | | |
| Suitable for installation in division 2 | | yes | | |
| Connection | | terminals 1+, 3- | | |
| Input I | | | | |
| Voltage | V_{OC} | 10.15 V | | |
| Current | I_t | 13.6 mA | | |
| Explosion group | | A&B | C&E | D, F&G |
| Max. external capacitance C_a | | 2.75 μ F | 8.25 μ F | 22 μ F |
| Max. external inductance L_a | | 180 mH | 540 mH | 1440 mH |
| Safety parameter | | | | |
| CSA control drawing | | 1206036 | | |
| Control drawing | | No. 116-0202 | | |
| Connection | | terminals 1+, 3- | | |
| Input I | | | | |
| Voltage | V_{OC} | 10.15 V | | |
| Current | I_{SC} | 13.6 mA | | |
| Explosion group | | A&B | C&E | D, F&G |
| Max. external capacitance C_a | | 2.75 μ F | 8.25 μ F | 22 μ F |
| Max. external inductance L_a | | 180 mH | 540 mH | 1440 mH |

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.

Accessories

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

Using Power Rail PR-03 or UPR-03 the devices are supplied with 24 V DC by means of the power feed modules. If no Power Rails are used, power supply of the individual devices is possible 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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