

Features

- 1-channel
- Input EEx ia IIC
- Device installation in Zone 2
- Lead breakage (LB) and short-circuit (SC) monitoring
- Frequency measurement, pulse-rate measurement, flow-rate measurement
- Rotation direction detection, flow direction detection
- Rotational speed monitoring
- Standstill monitoring
- Batch controller
- EMC acc. to NAMUR NE 21

Function

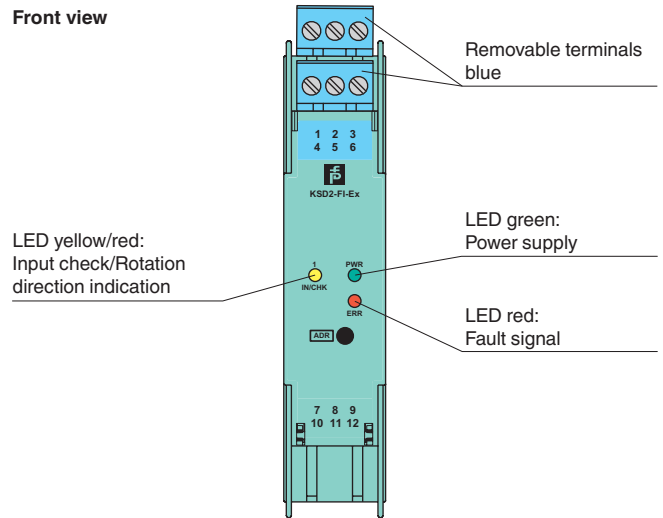
The KSD2-FI-Ex transfers frequencies of digital input signals from the hazardous area into the safe area via the Power Rail bus. Inputs for both channels can be EN 60947-5-6 (NAMUR) proximity sensors, which register the rotation speed of flow switches. Optocouplers and mechanical contacts can also be linked to the module.

Depending on its configuration, the KSD2-FI-Ex can serve as a dual channel frequency meter, signal rate meter, a flow control gauge when using rotary encoders, a rotation direction indicator, rotation speed monitor, standstill monitor or a batch controller.

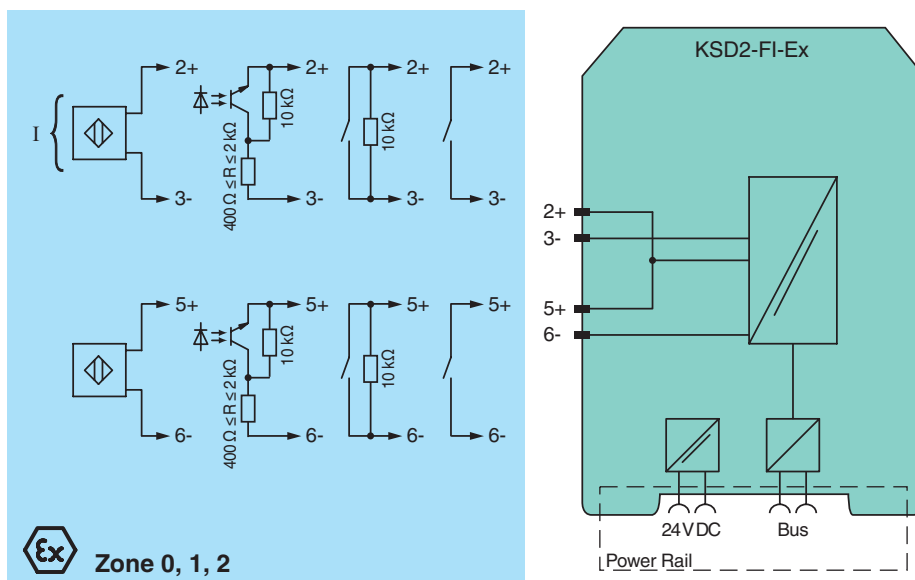
The KSD2-FI-Ex has a signal input and an additional auxiliary input which is only used for rotation and flow determination. Lead monitoring checks both the leads of the signal input and the auxiliary signal input. Lead monitoring and/or mode of operation is indicated by the yellow LED IN/CHK.

Both inputs have a common reference (plus) and are galvanically isolated from output and power supply in accordance to EN 50020.

Assembly



Connection



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| | |
|---|--|
| Supply | |
| Connection | Power Rail |
| Rated voltage | 20 ... 30 V DC |
| Ripple | < 10 % |
| Power consumption | 1 W |
| Input | |
| Connection | terminals 2+, 3-; 5+, 6- |
| Rated values | acc. to EN 60947-5-6 (NAMUR) |
| 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 | 40 ... 60 % of period at 1000 Hz , 10 ... 90 % of period at 250 Hz |
| Lead monitoring | breakage I < 0.1 mA , short-circuit I > 6 mA |
| Output | |
| Interface | CAN protocol via Power Rail bus |
| Connection | Power Rail |
| Transfer characteristics | |
| Deviation | < 0.1 % |
| Switching frequency | 0.3 ... 1500 Hz If the maximum input frequency of 1500 Hz is exceeded, the signal value is undefined! No further messages. |
| Rotation direction detection | < 350 Hz Phase difference between pulse input signal and auxiliary pulse signal min. ± 700 µs (= ± 90 ° at 350 Hz) |
| Directive conformity | |
| Electromagnetic compatibility Directive 2004/108/EC | EN 61326-1:2006 |
| Conformity | |
| Insulation coordination | EN 50178:1997 |
| Electromagnetic compatibility | NE 21:2006 |
| Protection degree | IEC 60529 |
| Ambient conditions | |
| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |
| Mechanical specifications | |
| Protection degree | IP20 |
| Connection | terminal connection ≤ 2.5 mm ² |
| Mass | approx. 100 g |
| Dimensions | 20 x 100 x 115 mm (0.8 x 3.9 x 4.5 in) |
| Mounting | DIN rail mounting |
| Data for application in connection with Ex-areas | |
| EC-Type Examination Certificate | BVS 07 ATEX E 066 X , for additional certificates see www.pepperl-fuchs.com |
| Group, category, type of protection | ⊕ II (1)GD [EEx ia] IIC [EEx ia D] ⊕ I (M1) [EEx ia] I |
| Voltage U _o | 9.6 V |
| Current I _o | 16 mA |
| Power P _o | 38 mW (linear characteristic) |
| Statement of conformity | Pepperl+Fuchs |
| Group, category, type of protection, temperature classification | ⊕ II 3G EEx nA II T4 X |
| Electrical isolation | |
| Input/power supply, internal bus | safe electrical isolation acc. to IEC 60079-11:2007, voltage peak value 375 V |
| Directive conformity | |
| Directive 94/9/EC | EN 60079-0:2006, EN 60079-15:2005 , EN 61326-1:2006 |
| General information | |
| Supplementary information | EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see www.pepperl-fuchs.com . |

Application

Frequency measurement, signal rate measurement, flow measurement with rotary encoders, rotation direction monitoring, flow direction monitoring, rotation speed monitoring, standstill monitoring or batch controller.

Notes

Software functions

Adjustable via the DTM in connection with the FDT frame **PACTware™**:

- Information on devices may be saved in PC memory
- TAG numbers, 28 alphanumeric characters, can be programmed into device
- Commentary, may be saved in PC memory
- Physical units are adjustable
 - for a list see system description RPI
- Lead monitoring selectable
- Collective lead monitoring for both signal input and auxiliary signal input
- separate detection and indication of lead breakage and lead short circuit
- Malfunction output status
 - user defined
 - maintenance of the last accepted signal value
- Simulation
 - of the measurement value
 - of the device diagnosis
 - of the process channel diagnosis
- The signal value is undefined when the maximum input frequency of 1500 Hz is exceeded! In this case, no further reports are displayed.

Frequency measurement, signal rate measurement, flow measurement, rotation speed monitoring

Only the signal input is evaluated.

- Conversion of the input frequency into various signal ranges, i. e. 0 l/s ... 20 l/s or 10 kg/min ... 500 kg/min
- 4 limit values
 - upper alarm level limit
 - upper warn level limit
 - lower warn level limit
 - lower alarm level limit

Rotation direction monitoring, flow direction monitoring with flow control measurement, pulse rate measurement, flow control measurement, rotation direction monitoring

- Functions such as frequency measurement, however, the pulse input as well as the auxiliary signal input are evaluated. The frequency is determined by the signal input. In addition, the phase relationship of the input signal is checked at the auxiliary signal input for the determination of the rotation direction monitoring.
- The measurement signal is evaluated with the sign:
 - positive = forward, signal input is damped first, LED IN/CHK illuminates yellow
 - negative = backward, auxiliary signal input is damped first, LED IN/CHK is not illuminated

Batch controller

Only the signal input is evaluated.

- Conversion of the input frequency into various signal ranges, i. e. 0 ... 20 l/s or 10 ... 500 kg/min
- 4 limit values
 - upper alarm level limit
 - upper warn level limit
 - lower warn level limit
 - lower alarm level limit
- 2 summary counters, resettable
- Batch Controller with pre-set warnings and pre-set alarm
- Entry of the pre-set alarm limit
- Entry of the pre-set warning limit
- Start of the counter process and deactivation of the alarm signals through the set command, as long as the shut-down values are not exceeded
- Activation of the alarm signals through stop command
- Reset of the counter process and activation of the alarm signals through the set command
- After activation of the alarm signals, input signals continue to be registered in the counter
- Entry of the shut-down values and the control commands from the control system via the external bus or via a PC using the DTM in connection with the FDT frame **PACTware™** via the parameterization interface of the gateway.

Batch controller with rotation direction monitoring, flow direction monitoring

Functions as in the case of batch controller, however the signal input as well as the auxiliary signal input are evaluated.

- The direction of the input signal is indicated:
 - positive = forward, signal input is damped first, LED IN/CHK yellow, batch controller is incremented
 - negative = backward, auxiliary power input is damped first, LED IN/CHK is not illuminated, batch controller is decremented
 - negative counting is possible

Standstill monitoring

- In all modes of operation, such as frequency measurement, rotation direction signalling and batch controller, a standstill monitoring can be achieved by setting the 4 limit values accordingly.