- Control circuit EEx ia IIC
- 24 V DC nominal supply voltage
- Reversible mode of operation
- Lead monitoring (short-circuit LK and interruption LB) with LED indicator (red flashing), switching output and signal on Power Rail
- 50 % less wiring 2:1
- 2 relay outputs, 1 NO contact per channel, grouped into single-pole pairs
- EMC acc. to NAMUR NE 21

2-channel

KFD2-SRA-Ex2

Function

The transformer isolated barrier transfers digital signals from the hazardous area. The inputs are designed for the connection of NAMUR sensors (alternating polarity) per EN 60947-5-6 or a mechanical contact.

The input, output and power supply are galvanically isolated from each other.

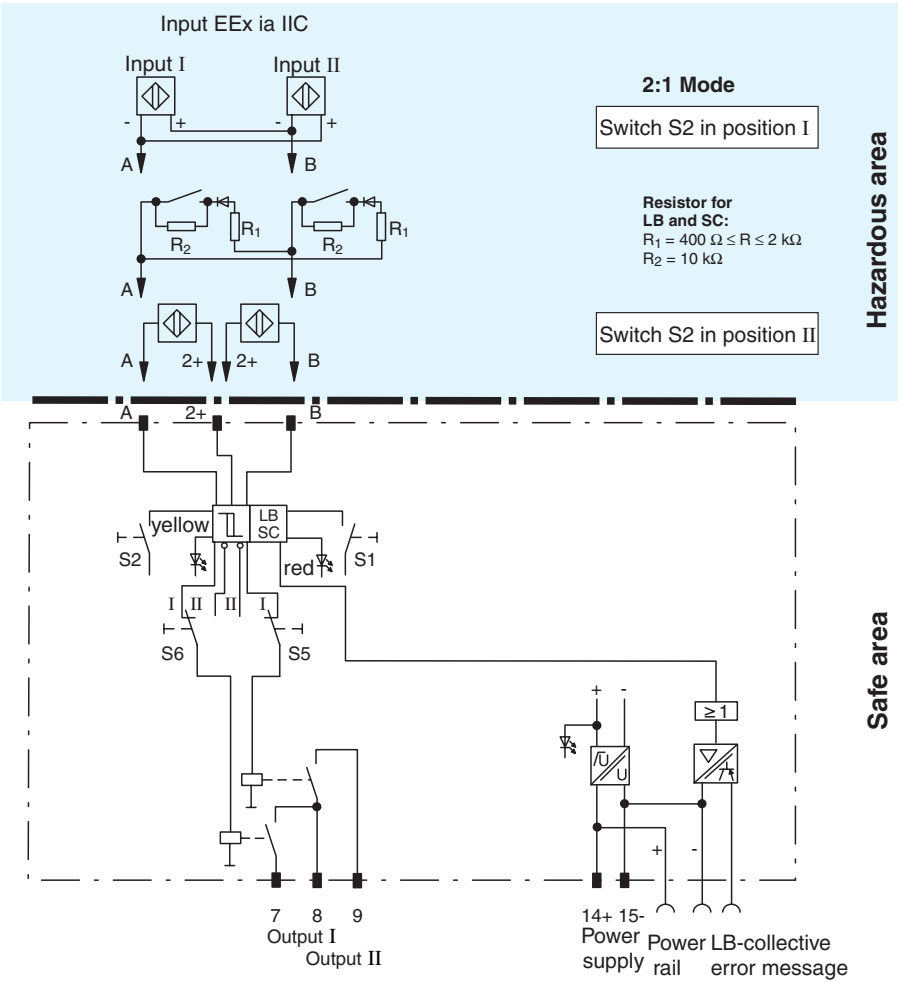
The relay output and the power supply are galvanically isolated from each other per IEC 61140 with a rated insulation voltage of 50 V_{eff}.

Application

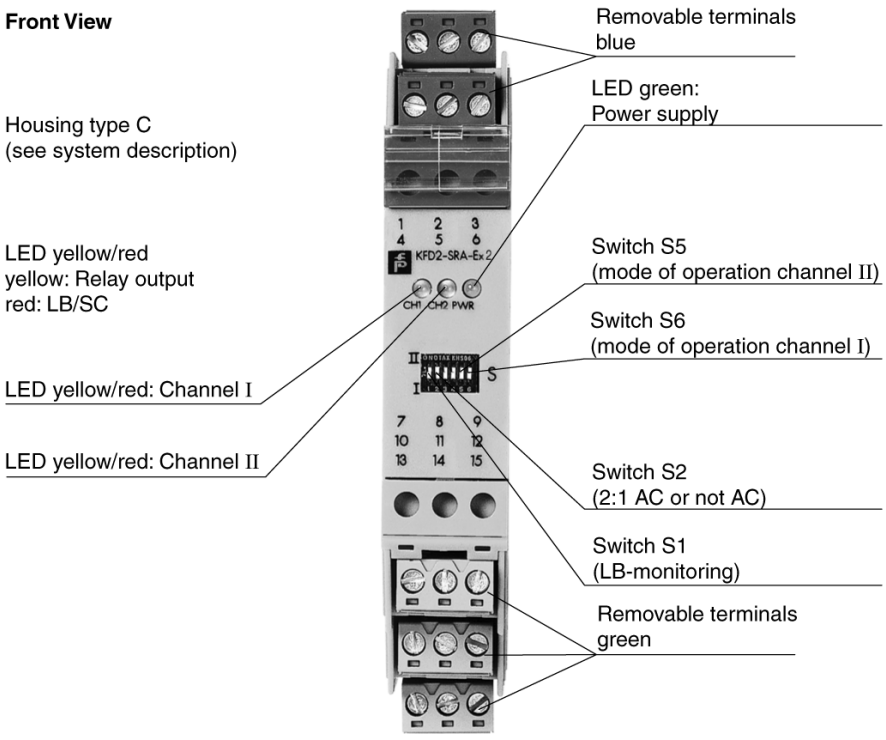
Min/Max manometer, valve positioners, magnetic immersion probes with 2 switch points.

Two signals can be monitored through one dual lead in the 2:1 mode of operation (AC), reducing wiring by 50 %.

Connection



Composition



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Supply	
Connection	Power Rail or terminals 14+, 15-
Rated voltage	20 ... 30 V DC
Ripple	≤ 10 %
Rated current	45 ... 70 mA
Power loss	approx. 1.26 W
Input	
Connection	terminals 1-, 2+, 3-
Rated values	acc. to 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	≥ 20 ms / ≥ 20 ms
Lead monitoring	breakage I ≤ 0.15 mA
Output	
Connection	output I: terminals 7, 8 ; output II: terminals 8, 9
Collective error message	Power Rail
Output I and II	signal I/II ; relay
Contact loading	253 V AC / 2 A / cos ϕ > 0.7; 40 V DC / 2 A resistive load;
Energized/de-energized delay	approx. 20 ms / approx. 20 ms
Mechanical life	5 x 10^6 switching cycles
Transfer characteristics	
Switching frequency	≤ 10 Hz (non-AC operation) ≤ 3 Hz (AC operation)
Electrical isolation	
Input/output	safe electrical isolation acc. to EN 50020, voltage peak value 375 V
Input/power supply	safe electrical isolation acc. to EN 50020, voltage peak value 375 V
Output/power supply	basic insulation acc. to DIN EN 50178, rated insulation voltage 50 V_{eff} AC
Directive conformity	
Electromagnetic compatibility	
Directive 89/336/EC	EN 61326
Conformity	
Insulation coordination	EN 50178
Electrical isolation	EN 50178
Electromagnetic compatibility	NE 21
Protection degree	IEC 60529
Input	EN 60947-5-6
Ambient conditions	
Ambient temperature	-20 ... 60 °C (253 ... 333 K)
Mechanical specifications	
Protection degree	IP20
Mass	approx. 150 g
Dimensions	20 x 119 x 115 mm (0.8 x 4.6 x 4.5 in)
Data for application in conjunction with hazardous areas	
EC-Type Examination Certificate	ZELM 99 ATEX 0009
Group, category, type of protection	⟨Ex⟩ II (1)G [EEx ia] IIC
Voltage U_o	10 V
Current I_o	14 mA
Power P_o	35 mW (linear characteristic)
Supply	
Safety maximum voltage U_m	40 V DC
Type of protection [EEx ia]	
Explosion group	IIC
External capacitance	3 µF
External inductance	180 mH
Electrical isolation	
Input/output	safe electrical isolation acc. to EN 50020, voltage peak value 375 V
Directive conformity	
Directive 94/9 EC	EN 50014, EN 50020
General information	
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.

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Notes

Accessories

Power feed modules KFD2-EB2...

The power feed module is used to supply the devices with 24 V DC via the Power Rail. The fuse-protected power feed module can supply up to one hundred individual devices depending on the power consumption of the devices. A galvanically isolated mechanical contact uses the Power Rail to transmit collective error messages.

Power Rail UPR-03

The Power Rail UPR-03 is a complete unit consisting of the electrical inset and an aluminium profile rail 35 mm x 15 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!

External diodes (field installation) F-KD-Ex2 (diode) and F-KDR-Ex2 (diode and resistor)

The transformer isolated barrier transfers binary signals from the hazardous area by means of the patented new 2:1-transfer method. This method allows to transfer two independent binary signals by means of a single pair of conductors.
The prerequisite for the use of the 2:1-transfer method is that sensors with reverse polarity protected diode are used. Pepperl+Fuchs offers suitable sensors for alternating polarity (see table). When using sensors without integrated reverse polarity protection diode, external diodes F-KD-Ex2 have to be fitted.In case of F-KDR-Ex2, a resistor combination has been fitted in addition for cable error detection of mechanical switches.

Comments:
When installing a serial diode, it has to be assured that the current in reverse direction is below a value of 0.15 mA in order to enable the lead monitoring.

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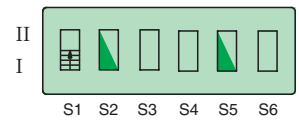
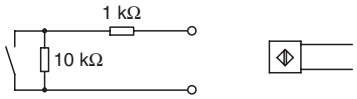
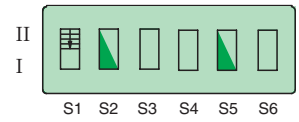
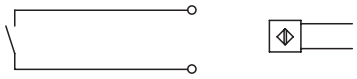
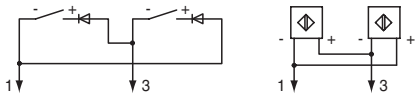
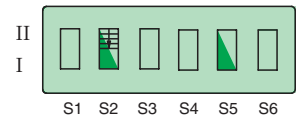
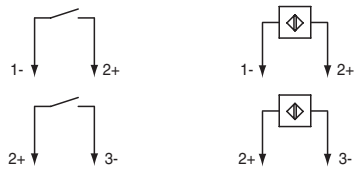
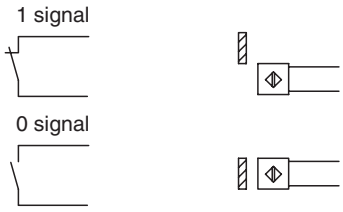
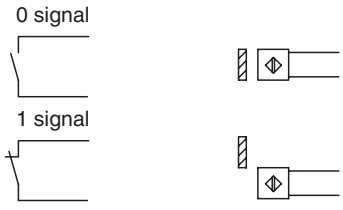
Functions of the switch

Lead breakage and short circuit monitoring	Input	
		with lead breakage and short circuit monitoring
		without lead breakage and short circuit monitoring

AC function	Input	
		AC function (2:1 transfer technique)
		none AC function

Mode of operation	Input	
 S3: channel IV S4: channel III S5: channel II S6: channel I		energised de-energised
 S3: channel IV S4: channel III S5: channel II S6: channel I		energised de-energised

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Pepperl+Fuchs sensors for alternating polarity

Model number	External diode necessary	Operating temperature T_u/°C
FJ 6-110-F	yes	-25 °C ... 100 °C
FJ 7-N	yes	-25 °C ... 100 °C
NCB1,5-6,5M25-NO	no	-25 °C ... 70 °C
NCB1,5-6,5M25-NO-V1	no	-25 °C ... 70 °C
NCB1,5-8GM25-NO	no	-25 °C ... 70 °C
NCB1,5-8GM25-NO 1OM	no	-25 °C ... 70 °C
NCB1,5-8GM25-NO 5M	no	-25 °C ... 70 °C
NCB1,5-8GM25-NO-V1	no	-25 °C ... 70 °C
NCB2-12GM35-NO	no	-25 °C ... 70 °C
NCB2-12GM35-NO 1OM	no	-25 °C ... 70 °C
NCN15-30GM40-N0-V1	no	-25 °C ... 70 °C
NCN15-M1K-N0	no	-25 °C ... 70 °C
NCN20+U1+N0	no	-25 °C ... 70 °C
NCN30+U1+N0	no	-25 °C ... 70 °C
NCN3-F24L-N4	no	-25 °C ... 70 °C
NCN3-F24R-N4	no	-25 °C ... 70 °C
NCN3-F25F-N4-V1	no	-25 °C ... 70 °C
NCN3-F25-N4-014	no	-25 °C ... 70 °C
NCN3-F25-N4-075	no	-25 °C ... 70 °C
NCN3-F25-N4-V1	no	-25 °C ... 70 °C
NCN3-F31-N4-K	no	-25 °C ... 70 °C
NCN3-F31-N4-K-K	no	-25 °C ... 70 °C
NCN3-F31-N4-V16-V16	no	-25 °C ... 70 °C
NCN3-F31-N4-V18	no	-25 °C ... 70 °C
NCN40+U1+N0	no	-25 °C ... 70 °C
NCN4-12GM35-NO	no	-25 °C ... 70 °C
NCN4-12GM35-NO 1OM	no	-25 °C ... 70 °C
NCN4-12GM35-NO 5M	no	-25 °C ... 70 °C
NCN4-12GM35-NO-V1	no	-25 °C ... 70 °C
NCN4-M3K-N4	no	-25 °C ... 70 °C
NCN8-18GM4O-NO	no	-25 °C ... 70 °C
NCN8-18GM4O-NO 5M	no	-25 °C ... 70 °C
NCN8-18GM4O-NO-V1	no	-25 °C ... 70 °C
NJ 0,8-4,5-N	no	-25 °C ... 100 °C
NJ 0,8-5GM-N	no	-25 °C ... 100 °C
NJ 0,8-5GM-N 5M	no	-25 °C ... 100 °C
NJ 0,8-5GM-N 10M	no	-25 °C ... 100 °C
NJ 0,8-F-N	yes	-25 °C ... 100 °C
NJ 1,5-6,5-N	no	-25 °C ... 100 °C
NJ 1,5-6,5-N 15M	no	-25 °C ... 100 °C
NJ 1,5-6,5-N 5M	no	-25 °C ... 100 °C
NJ 1,5-8GM-N	no	-25 °C ... 100 °C
NJ 1,5-8GM-N 10M	no	-25 °C ... 100 °C
NJ 1,5-8GM-N 5M	no	-25 °C ... 100 °C
NJ 1,5-8GM-N-V1	no	-25 °C ... 100 °C
NJ 1,5-F-N	yes	-25 °C ... 100 °C
NJ 1-N2-G 82	yes	-25 °C ... 100 °C
NJ 1-N-728	no	-25 °C ... 70 °C
NJ 2,5-F-N	yes	-25 °C ... 100 °C
NJ 2-11-N	no	-25 °C ... 100 °C
NJ 2-11-N 5M	no	-25 °C ... 100 °C
NJ 2-11-N-G	no	-25 °C ... 100 °C
NJ 2-11-N-G 15M	no	-25 °C ... 100 °C
NJ 2-11-N-G 5M	no	-25 °C ... 100 °C

Model number	External diode necessary	Operating temperature T_u/°C
NCB2-12GM35-NO 5M	no	-25 °C ... 70 °C
NCB2-12GM35-NO-V1	no	-25 °C ... 70 °C
NCB5-18GM4O-NO	no	-25 °C ... 70 °C
NCB5-18GM4O-NO 1OM	no	-25 °C ... 70 °C
NCB5-18GM4O-NO 5M	no	-25 °C ... 70 °C
NCB5-18GM4O-NO-V1	no	-25 °C ... 70 °C
NCB10-30GM40-N0	no	-25 °C ... 70 °C
NCB10-30GM40-N0-V1	no	-25 °C ... 70 °C
NCB15+U1+N0	no	-25 °C ... 70 °C
NCN15-30GM40-N0	no	-25 °C ... 70 °C
NJ 2-N-H42	yes	-25 °C ... 100 °C
NJ 2-V3-N	yes	-25 °C ... 100 °C
NJ 2-V3-N-V5	yes	-25 °C ... 100 °C
NJ 3-18GK-S1N	no	-25 °C ... 100 °C
NJ 4-12GK-N	no	-25 °C ... 100 °C
NJ 4-12GK-N 10M	no	-25 °C ... 100 °C
NJ 4-12GK-N 5M	no	-25 °C ... 100 °C
NJ 4-12GM-N	no	-25 °C ... 100 °C
NJ 4-12GM-N 10M KA	no	-25 °C ... 100 °C
NJ 4-12GM-N 15M	no	-25 °C ... 100 °C
NJ 4-12GM-N 20M	no	-25 °C ... 100 °C
NJ 4-12GM-N 5M	no	-25 °C ... 100 °C
NJ 4-12GM-N-V1	no	-25 °C ... 100 °C
NJ 4-F-N	yes	-25 °C ... 100 °C
NJ 4-N-H31	yes	-25 °C ... 100 °C
NJ 5-11-N	no	-25 °C ... 100 °C
NJ 5-11-N 15M KA.	no	-25 °C ... 100 °C
NJ 5-11-N 5M KA.	no	-25 °C ... 100 °C
NJ 5-11-N-G	no	-25 °C ... 100 °C
NJ 5-11-N-G 10M KA.	no	-25 °C ... 100 °C
NJ 5-11-N-G 5M KA.	no	-25 °C ... 100 °C
NJ 5-11-N-G 6M	no	-25 °C ... 100 °C
NJ 5-18GK-N	no	-25 °C ... 100 °C
NJ 5-18GK-N 10M KA	no	-25 °C ... 100 °C
NJ 5-18GK-N 5M KA.	no	-25 °C ... 100 °C
NJ 5-18GK-SN	yes	-25 °C ... 100 °C
NJ 5-18GK-SN 5M KA.	yes	-25 °C ... 100 °C
NJ 5-18GK-SN 10M	yes	-25 °C ... 100 °C
NJ 5-18GM-N	no	-25 °C ... 100 °C
NJ 5-18GM-N 10M KA	no	-25 °C ... 100 °C
NJ 5-18GM-N 5M KA.	no	-25 °C ... 100 °C
NJ 5-18GM-N-V1	no	-25 °C ... 100 °C
NJ 5-30GK-S1N	yes	-25 °C ... 100 °C
NJ 5-30GK-S1N 10M	yes	-25 °C ... 100 °C
NJ 5-30GK-S1N 5M	yes	-25 °C ... 100 °C
NJ 6-22-SN	yes	-25 °C ... 100 °C
NJ 6-22-SN 10M	yes	-25 °C ... 100 °C
NJ 6-22-SN-G	yes	-25 °C ... 100 °C
NJ 6-22-SN-G 10M	yes	-25 °C ... 100 °C
NJ 6-22-SN-G 3M	yes	-25 °C ... 100 °C
NJ 6-F-N	yes	-25 °C ... 100 °C
NJ 6S1+U1+N1	yes	-25 °C ... 100 °C
NJ 8-18GK-N	no	-25 °C ... 100 °C
NJ 8-18GK-N 10M KA.	no	-25 °C ... 100 °C

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Model number	External diode necessary	Operating temperature T_u/°C
NJ 2-11-SN	yes	-25 °C ... 100 °C
NJ 2-11-SN	yes	-25 °C ... 100 °C
NJ 2-11-SN-G	yes	-25 °C ... 100 °C
NJ 2-11-SN-G 10M	yes	-25 °C ... 100 °C
NJ 2-11-SN-G 5M	yes	-25 °C ... 100 °C
NJ 2-12GK-N	no	-25 °C ... 100 °C
NJ 2-12GK-N 5M	no	-25 °C ... 100 °C
NJ 2-12GM-N	no	-25 °C ... 100 °C
NJ 2-12GM-N 10M	no	-25 °C ... 100 °C
NJ 2-12GM-N 21M	no	-25 °C ... 100 °C
NJ 2-12GM-N 5M	no	-25 °C ... 100 °C
NJ 2-12GM-N-V1	no	-25 °C ... 100 °C
NJ 2-F1-N	yes	-25 °C ... 100 °C
NJ 40+U1+N	yes	-25 °C ... 100 °C
RJ 10-14-N	yes	-25 °C ... 100 °C
RJ 10-N	yes	-25 °C ... 100 °C
RJ 15-14-N	yes	-25 °C ... 100 °C
RJ 15-N	yes	-25 °C ... 100 °C
RJ 21-N	yes	-25 °C ... 100 °C
RJ 43-N	yes	-25 °C ... 100 °C
SC2-N0	no	-25 °C ... 100 °C
SC3,5-N0	no	-25 °C ... 100 °C
SC3,5-N0 BLAU	no	-25 °C ... 100 °C
SC3,5-N0 GELB	no	-25 °C ... 100 °C
SC3,5-N0 GRÜN	no	-25 °C ... 100 °C
SC3,5-N0 WEIß	no	-25 °C ... 100 °C
SJ 2-N	no	-25 °C ... 100 °C
SJ 2-N 5M KA	no	-25 °C ... 100 °C
SJ 2-SN	yes	-25 °C ... 100 °C

Model number	External diode necessary	Operating temperature T_u/°C
NJ 8-18GM-N	no	-25 °C ... 100 °C
NJ 8-18GM-N 5M	no	-25 °C ... 100 °C
NJ 8-18GM-N-V1	no	-25 °C ... 100 °C
NJ 10-F-N	yes	-25 °C ... 100 °C
NJ 15+U1+N	yes	-25 °C ... 100 °C
NJ 15-M1K-N	yes	-25 °C ... 100 °C
NJ 15-M1-N	yes	-25 °C ... 100 °C
NJ 15-M1-N-V	yes	-25 °C ... 100 °C
NJ 15S+U1+N	yes	-25 °C ... 100 °C
NJ 20+U1+N	yes	-25 °C ... 100 °C
NJ 20S+U1+N	yes	-25 °C ... 100 °C
NJ 30+U1+N	yes	-25 °C ... 100 °C
NJ 30P+U1+1N	yes	-25 °C ... 100 °C
SJ 2-SN XM KA	yes	-25 °C ... 100 °C
SJ 3,5-G-N	no	-25 °C ... 100 °C
SJ 3,5-N	no	-25 °C ... 100 °C
SJ 3,5-N BLAU	no	-25 °C ... 100 °C
SJ 3,5-N GELB	no	-25 °C ... 100 °C
SJ 3,5-N GRÜN	no	-25 °C ... 100 °C
SJ 3,5-N LED	yes	-25 °C ... 100 °C
SJ 3,5-N WEISS	no	-25 °C ... 100 °C
SJ 3,5-S1N	yes	-25 °C ... 100 °C
SJ 3,5-SN	yes	-25 °C ... 100 °C
SJ 5 MIT LÖTSTIFTEN	yes	-25 °C ... 100 °C
SJ 5-G-N	yes	-25 °C ... 100 °C
SJ 5-K-N	yes	-25 °C ... 100 °C
SJ 5-N	yes	-25 °C ... 100 °C
SJ 10-N	yes	-25 °C ... 100 °C
SJ 15-N	yes	-25 °C ... 100 °C

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