

ED2-SH-Ex1.R1 ED2-SH-Ex2.R1

- 1-Channel Model: ED2-SH-Ex1.R1
- 2-Channel Model: ED2-SH-Ex2.R1
- Control circuit EEx ia IIC
- DC 24 V Supply voltage
- Lead breakage (LB) and short circuit (SC) monitoring
- 1 or 2 relay outputs with 2 change-over contacts per VDE 0116 Number 8.7
- TÜV - Nr. 70/007/10.D00101/96
TÜV DIN v 19 250 Requirements class AK 1 ... 3
- 1 or 2 passive transistor outputs, fault signal
- EMC per NAMUR NE 21

This Model replaces Models EKSH-04 (1 channel) and EKSH-03 (2 channel)

These devices meet the safety requirements for the electrical equipment of firing systems.

It is constructed in accordance with DIN prEN 50 156-1 or DIN VDE 0116 and is suited for requirement classes 1 ... 3 per DIN v 19 250.

The conformity of the device has been tested and approved by TÜV.

Function:

The transformer isolated amplifier is fail safe. This means that in a fault condition, for example short circuit or component failure, the unit shuts down. This is accomplished by means of dynamic signal transmission channels.

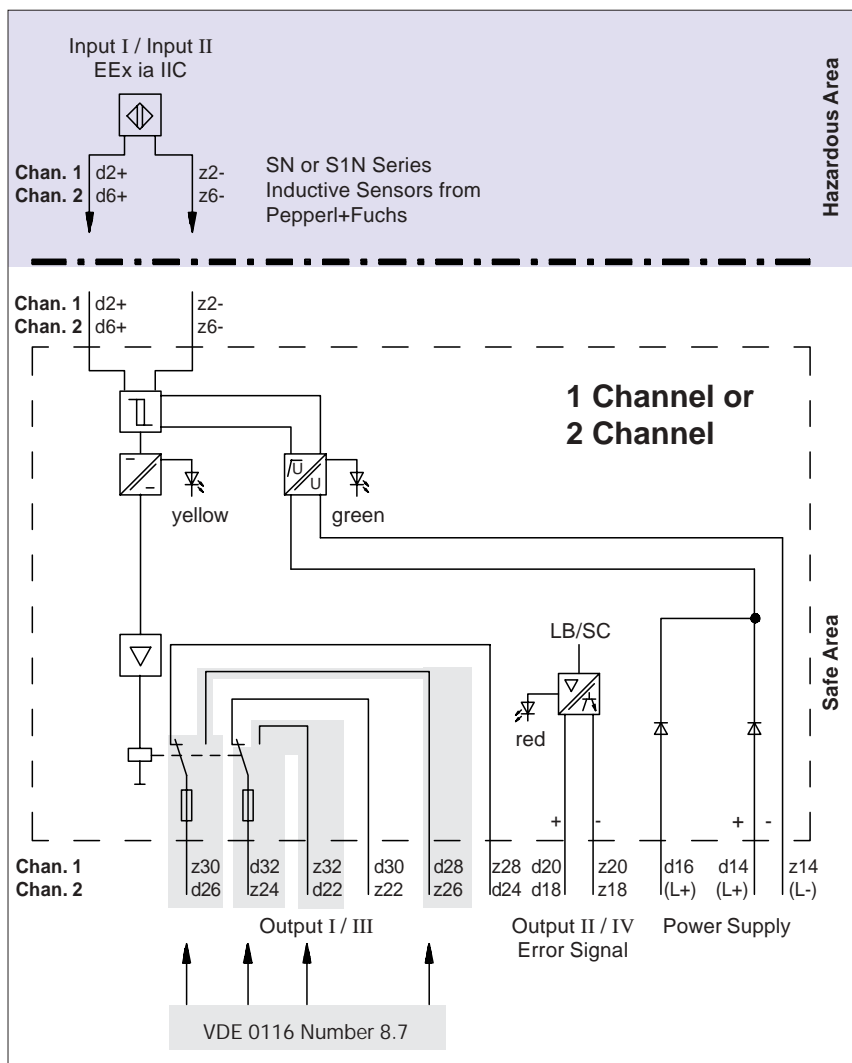
When a fault occurs, the oscillation required for a Logic-1 signal breaks, forcing the output into an inactive state.

Application:

The explosion protected, intrinsic safety control circuit is designed for Pepperl+Fuchs intrinsic safety sensors (Model-series ...-SN or ...-S1N). An intrinsically safe contact can be used instead of a sensor. In this case, the contact must be switched before a resistor with 1.5 kOhm in series and 10 kOhm in parallel.

Observation:

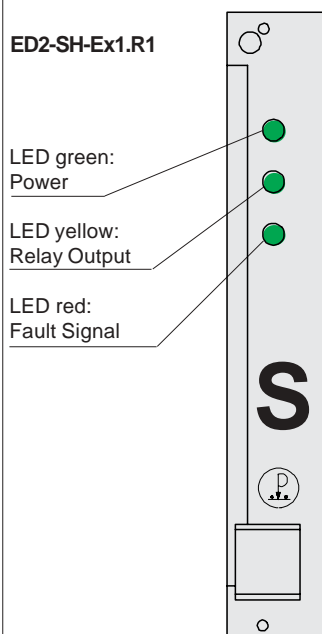
The safety fuse in the relay circuit prevents the fusing of the contacts and **may only be replaced by the manufacturer**. The A-contacts of the relays are to be used for intrinsic safety applications.



Front View

Type A

(dimensions see page 16)



ED2-SH-Ex2.R1

LED green:
Power

LED yellow:
Relay Output Chan. 1


LED yellow:
Relay Output Chan. 2

LED red:
Fault Signal Chan. 1

LED red:
Fault Signal Chan. 2





<p>Technical data Power supply Nominal voltage Maximum voltage U_m Ripple Nominal current</p>	<p>DC 20 V ... 35 V DC 40 V $\leq 10\%$ ≤ 100 mA</p> <p>Connections d14 (L+), z14 (L-), d16 (L+)</p>									
<p>Inputs (intrinsically safe) Input I: Input II: Nominal circuit values Open circuit voltage / short circuit current Circuit ranges: Relay decrease Relay increase Input delay</p>	<p>Connections d2+, z2- Connections d6+, z6-</p> <p>about DC 8.4 V / about 11.7 mA</p> <p>J < 2.1 mA; J > 5.8mA 2.8 mA < J < 4.9 mA ≤ 1ms</p>									
<p>Certificate of Conformity Peak Values Max. voltage U_0 Max. current I_0 Max. power P_0 Allowable circuit values Ignition protection method, category Explosion group Max. external capacitance Max. external inductance</p>	<p>PTB Nr. Ex-95.D.2172X other certifications see www.pepperl-fuchs.com 9.6 V 17 mA 41 mW</p> <p>[EEx ia] [EEx ib] IIB / IIC IIB / IIC 2.6 μF / 0.7 μF 41 μF / 4.8 μF 6 mH / 4 mH 450 mH / 130 mH</p>									
<p>Outputs (not intrinsically safe) Output I: Output III: Contact load</p> <p>Mechanical life Energized / De-energized delay Fuses</p> <p>Output II: Output IV: Nominal voltage Nominal current Voltage drop Leakage current</p>	<p>Relay output, 2 change-over contacts Connections z30, z28, d28, d32, d30, z32 Relay output, 2 change-over contacts Connections d26, d24, z26, z24, z22, d22 AC: 253 V; 4.0 A; $\cos \varphi > 0.3$ / DC: 120 V / 2 A Ohm load At voltages < 60 V the individual contacts are considered safely isolated and can be used in different circuits. $\geq 2.5 \times 10^5$ switchings ≤ 12 ms / ≤ 5 ms 1.6 A per fuse "not replaceable"</p> <p>Transistor output, passive Connections d20+, z20- Transistor output, passive Connections d18+, z18- DC 10 V ... 30 V 15 mA (current limited) about 2.5 V ≤ 10 μA</p>									
<p>Transfer characteristics Switch frequency: Input-Output I, III</p>	<p>25 Hz</p>									
<p>Galvanic isolation Output I, III from output I, II, III, IV, Supply voltage Output I, III from output I, II, III, IV, Supply voltage Output II, IV from output II, IV, power supply</p>	<p>Basic insulation per DIN EN 50 178, design isolation voltage 253 V_{eff} Safe isolation per DIN VDE 0106, design isolation voltage 50 V_{eff} Function insulation per DIN EN 50 178, design isolation voltage 50 V_{eff}</p>									
<p>Conformity to standards Isolation Climatic conditions EMC / Electromagnetic compatibility</p>	<p>per DIN EN 50 178 per DIN IEC 721 per EN 50 081-2 / EN 50 082-2, NAMUR NE 21</p>									
<p>Intrinsic safety symbol of the transformer isolated amplifier per DIN VDE 0116 Number 8.7 Symbol for Pepperl+Fuchs products for safety applications</p>	<p> S</p> <p>The safe isolation of the output levels is only guaranteed to 60 V. If a safe isolation of 230 V is required, the contacts of the output relays must be switched according to the following:</p> <table border="1" data-bbox="625 1868 1489 2069"> <thead> <tr> <th></th> <th>B-contact</th> <th>A-contact</th> </tr> </thead> <tbody> <tr> <td>Channel 1</td> <td>Bridge from d30 to z30 Output d32 and z28</td> <td>Bridge from z32 to z30 Output d32 and z28</td> </tr> <tr> <td>Channel 2</td> <td>Bridge from d24 to z24 Output d26 and z22</td> <td>Bridge from z26 to z24 Output d26 and d22</td> </tr> </tbody> </table>		B-contact	A-contact	Channel 1	Bridge from d30 to z30 Output d32 and z28	Bridge from z32 to z30 Output d32 and z28	Channel 2	Bridge from d24 to z24 Output d26 and z22	Bridge from z26 to z24 Output d26 and d22
	B-contact	A-contact								
Channel 1	Bridge from d30 to z30 Output d32 and z28	Bridge from z32 to z30 Output d32 and z28								
Channel 2	Bridge from d24 to z24 Output d26 and z22	Bridge from z26 to z24 Output d26 and d22								

Issue Date 20.02.02



Transformer Isolated Amplifier ED2-SH-Ex1.R1, ED2-SH-Ex2.R1 in Safety Applications



Additional Technical Data Ambient temperature Connection method Coding Weight	- 25 °C ... +65 °C (248 K ... 338 K) 32-pin plug connector per DIN 41 612, Series 2, Design F; z and d provided a1 / c3 about 190 g
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Operating Mode:	Input SN-Sensor	Input S1N-Sensor	Mech. Contact	Output I / III: LED yellow	Status Indicator Fault Signal	Output II / IV: LED red	Status Indicator
				Energized	On	Cut-off	Off
				De-energized	Off	Cut-off	Off
	Component Fault incl. Static Fault			De-energized	Off	-	-
	Lead Breakage or Short Circuit			De-energized	Off	Switched Through	On

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