The MC13-241Ex0-R is a two-channel switching amplifier with intrinsically safe input circuits. Each channel has one relay output with two sets of hard gold-plated contacts. This allows reliable switching of circuits with minimum currents of 50 µA and maximum currents up to 2 A.

The device provides a dedicated common alarm circuit to indicate faults in the input circuits of the two channels. The input circuits are monitored for wire-break and short-circuit conditions. The monitoring function of the card can be disabled via jumper blocks on the card.

If a short-circuit or wire-break occurs in either input circuit, the common alarm output is turned OFF (relay de-energised). If no faults are in any of the input circuits, the common alarm output is enabled (relay closed).

- Intrinsically safe input circuits [EEx ia] IIC
- Galvanic isolation between input circuit, output circuit and supply voltage
- Input circuit monitoring for wire-break and short-circuit (can be disabled)
- Two relay outputs, each with 2 SPDT contacts
- Overvoltage protection
- Additional common alarm circuit
- For use with 32- and 48-pole edge connectors
- Sealed relays with hard gold-plated contacts
## Switching Amplifiers

<table>
<thead>
<tr>
<th>Type</th>
<th>MC13-241Ex0-R/24VDC</th>
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<tbody>
<tr>
<td>Ident-No.</td>
<td>90 247</td>
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### Supply Voltage $U_b$
- $20.4 \ldots 27.6 \text{ VDC}$
- Ripple $W_{pp} \leq 10 \%$
- Overvoltage release $33 \text{ V} \pm 1.5 \text{ V}$
- Reverse polarity protection $\leq 250 \text{ V}$
- Power/current consumption $\leq 100 \text{ mA}$
- Galvanic isolation between input circuit, output circuit and supply voltage for $250 \text{ V}_{\text{ins}}$, test voltage $2.5 \text{ kV}_{\text{rms}}$

### Input Circuits
- DIN 19234 (NAMUR), intrinsically safe per DIN EN 50020
- Operating characteristics
  - Voltage $8 \text{ V}$
  - Current $8 \text{ mA}$
  - Switching threshold $1.55 \text{ mA}$
  - Hysteresis $0.2 \text{ mA}$
  - Wire-break threshold $\leq 0.1 \text{ mA}$
  - Short-circuit threshold $\geq 6 \text{ mA}$
- Programming:
  - Channel $A$: Load current
  - Channel $R$: no-load current
  - Channel $N$: NAMUR
  - Channel $K$: Contact
  - The functions are programmed via jumper blocks on the card.

### Output Circuits
- Contacts
  - relay outputs, double SPDT contacts, silver-alloy + $3 \mu \text{m Au}$
  - Switching voltage $\leq 36 \text{ V}$
  - Switching current $\leq 2 \text{ A}$
  - Switching capacity $\leq 60 \text{ VA}/50 \text{ W}$
  - Switching frequency $\leq 10 \text{ Hz}$
- Programming:
  - Channel $d$: 48-pole
  - Channel $b$: 32-pole
  - The functions are programmed via jumper blocks on the card.

### Ex-Approval acc. to Certification of Conformity
- PTB No. Ex-84/2110X
- Maximum nominal values
  - No load voltage $U_0$ $9.6 \text{ V}$
  - Short-circuit current $I_k$ $42.3 \text{ mA}$
- Maximum external inductances/capacitances
  - $[\text{EEx ia}] IIC$ $1 \text{ mH}/720 \text{ nF}$ (alternatively: $5 \text{ mH}/560 \text{ nF}$)
  - $[\text{EEx ib}] IIC$ $19 \text{ mH}/4 \mu \text{F}$

### LED Indications
- Power "ON" green
- Status indication yellow
- Fault red (1 LED for each channel)

### Eurocard
- Material glass-fiber reinforced epoxy resin, quality class FR4
- Front panel plastic, $4\text{TE} = 20.32 \text{ mm}$
- Connection per DIN 41612, type F, 32-pole (series $z+d$) or 48-pole
- Operating temperature $-25 \ldots +60 \text{ °C}$
- Coding No.19