Isolating Switching Amplifier
MK13-33Ex0-T
3 channels

- 3-channel switching amplifier
- Intrinsically safe input circuit [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)
- 3 isolated, short-circuit and reverse polarity protected transistor outputs
- Selectable NO/NC output function

The MK13-33Ex0-T type switching amplifiers are 3-channel devices featuring intrinsically safe input circuits. They can be connected to sensors according to EN 50227 (NAMUR), variable resistors or potential-free contacts.

Each channel has one isolated, short-circuit and reverse polarity protected transistor output.

Eight front panel programming switches select the output function of each channel (switch positions A and R represent normally open mode (NO) and normally closed (NC) mode, respectively) and enable input circuit monitoring.

Switches D (wire-break) and K (short-circuit) determine which of their conditions should be monitored for all channels with activated input circuit monitoring (switch position N).

When using mechanical contacts as the input device, input circuit monitoring must be disabled (switch position K) or shunt resistors must be connected to the contacts (II). (See next page for contact configuration).

The green LED on the front cover indicates that the device is powered. The three dual colour LEDs indicate the switching status (yellow) as well as fault conditions (red). When the input circuit monitoring feature is activated, red illuminates to indicate a fault condition in the input circuit and the respective transistor output is disabled.
### Isolating Switching Amplifiers

<table>
<thead>
<tr>
<th>Type</th>
<th>MK13-33Ex0-T/230VAC</th>
<th>MK13-33Ex0-T/24VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident-No.</td>
<td>75 421 40</td>
<td>75 421 47</td>
</tr>
</tbody>
</table>

#### Supply Voltage $U_b$
- **Line frequency/ripple** $W_{PP}$: 48...62 Hz
- **Power/current consumption**: between input circuit, output circuit and supply voltage for 250 $V_{rms}$, test voltage 2.5 $kV_{rms}$
- **Galvanic isolation**: between input circuit, output circuit and supply voltage for 250 $V_{rms}$, test voltage 2.5 $kV_{rms}$

<table>
<thead>
<tr>
<th>Supply Voltage $U_b$</th>
<th>196...253 VAC</th>
<th>10...30 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line frequency/ripple $W_{PP}$</td>
<td>48...62 Hz</td>
<td>10 %</td>
</tr>
<tr>
<td>Power/current consumption</td>
<td>between input circuit, output circuit and supply voltage for 250 $V_{rms}$, test voltage 2.5 $kV_{rms}$</td>
<td>2 VA</td>
</tr>
<tr>
<td>Galvanic isolation</td>
<td>between input circuit, output circuit and supply voltage for 250 $V_{rms}$, test voltage 2.5 $kV_{rms}$</td>
<td>10 %</td>
</tr>
</tbody>
</table>

#### Input Circuits
- **Operating characteristics**
  - Voltage: 8 V
  - Current: 8 mA
  - Switching threshold: 1.55 mA
  - Hysteresis: typ. 0.2 mA
  - Wire-break threshold: 0.1 mA
  - Short-circuit threshold: 6.0 mA

#### Contact Configuration
- Of mechanical switches with active input circuit monitoring function

#### Output Circuits
- **Switching voltage**: 2...22 kΩ
- **Switching current per output**: 0.1 mA
- **Switching frequency**: 6.0 mA
- **Switching frequency**: 3 kHz
- **Voltage drop**: ≤ 6.0 V

#### Ex-Approval acc. to Certificate of Conformity
- **PTB 99 ATEX 2084**

#### Maximum nominal values
- **No load voltage $U_0$**: ≤ 11.5 V
- **Short-circuit current $I_0$**: ≤ 51.2 mA
- **Maximum external inductances/capacitances**
  - [EEx ia/ib] IIC: 1.64 $\mu$F/14 mH
  - [EEx ia/ib] IIB: 11.2 $\mu$F/55 mH

#### LED Indications
- **Status indication/fault indication**: 3 x yellow/red (2-colour LED)
- **Power "ON"**: green

#### Terminal Housing
- **Connection profile**: 2 x 2.5 mm$^2$ or 2 x 1.5 mm$^2$ with wire sleeves
- **Degree of protection (IEC 60529/EN 60529)**: IP20
- **Operating temperature**: -25...+60 °C

**Isolating Switching Amplifiers**

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- MK13-33Ex0-T/24VDC

**Ident-No.**
- 75 421 40
- 75 421 47

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- Line frequency/ripple $W_{PP}$: 48...62 Hz
- Power/current consumption: between input circuit, output circuit and supply voltage for 250 $V_{rms}$, test voltage 2.5 $kV_{rms}$
- Galvanic isolation: between input circuit, output circuit and supply voltage for 250 $V_{rms}$, test voltage 2.5 $kV_{rms}$

**Input Circuits**
- Operating characteristics:
  - Voltage: 8 V
  - Current: 8 mA
  - Switching threshold: 1.55 mA
  - Hysteresis: typ. 0.2 mA
  - Wire-break threshold: ≤ 0.1 mA
  - Short-circuit threshold: ≥ 6.0 mA

**Contact Configuration**
- Of mechanical switches with active input circuit monitoring function

**Output Circuits**
- Switching voltage: ≤ 30 VDC
- Switching current per output: ≤ 50 mA
- Switching frequency: ≤ 3 kHz
- Voltage drop: ≤ 2.5 V

**Ex-Approval acc. to Certificate of Conformity**
- PTB 99 ATEX 2084

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- No load voltage $U_0$: ≤ 11.5 V
- Short-circuit current $I_0$: ≤ 51.2 mA
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