Isolating Switching Amplifier  
MS13-231Ex0-R  
2 channels

- Intrinsically safe input circuits [EEx ia] IIC
- Galvanic isolation between input circuit, output circuit and power supply
- Input circuit monitoring for short-circuit and wire-break (can be disabled)
- 2 relay outputs, each with one NO contact
- Additional common alarm output
- Selectable NO/NC output function of each channel

The MS13-231Ex0-R switching amplifiers are dual channel devices with intrinsically safe input circuits. Each channel has a relay output with one NO contact.

The output of each channel is programmable for normally open mode (NO/A) or normally closed mode (NC/R). Select NO mode by installing a jumper between terminals 11 and 12. Leave terminals 11 and 12 open for NC mode. Terminals 13 and 14 perform the same function for channel 2.

The input circuits are monitored for wire-break and short-circuit conditions. If a short-circuit or a wire-break occurs in one of the input circuits, the affected output de-energises and the green LED turns off.

The MS13-231Ex0-R features an additional relay output for common alarm indications. If a fault occurs in one or both input circuits, the alarm output de-energises and the green LED turns off. The alarm output is enabled (relay energised, green LED on) if there is no fault in any of the input circuits and power is on.

When mechanical contacts are used as input devices, resistors (II) must be added to the contacts. This will prevent the monitoring control circuit from recognising the mechanical contacts as a wire-break or short-circuit.
**Isolating Switching Amplifiers**

<table>
<thead>
<tr>
<th>Type</th>
<th>MS13-231Ex0-R/230VAC</th>
<th>MS13-231Ex0-R/24VDC</th>
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</thead>
<tbody>
<tr>
<td>Ident-No.</td>
<td>53 355</td>
<td>53 357</td>
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</table>

**Supply Voltage $U_B$**
- Line frequency/ripple $W_{pp}$
  - MS: 48...62 Hz
- Power/current consumption: $\leq 3.5$ VA
- 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...250 VAC</th>
<th>20...28 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line frequency/ripple $W_{pp}$</td>
<td>48...62 Hz</td>
<td>$\leq 10$ %</td>
</tr>
<tr>
<td>Power/current consumption</td>
<td>$\leq 3.6$ W</td>
<td>$\leq 0.1$ mA</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></td>
</tr>
</tbody>
</table>

**Input Circuits**
- acc. to EN 50227 (NAMUR), intrinsically safe according to EN 50020

<table>
<thead>
<tr>
<th>Operating characteristics</th>
<th>acc. to EN 50227 (NAMUR), intrinsically safe according to EN 50020</th>
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</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>8 V</td>
</tr>
<tr>
<td>Current</td>
<td>8 mA</td>
</tr>
<tr>
<td>Switching threshold</td>
<td>1.55 mA</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>0.2 mA</td>
</tr>
<tr>
<td>Wire-break threshold</td>
<td>$\leq 0.1$ mA</td>
</tr>
<tr>
<td>Short-circuit threshold</td>
<td>$R_a$ approx. 200 $\Omega$</td>
</tr>
</tbody>
</table>

**Output Circuits**
- 3 relay outputs
- Contacts: 1 NO contact, AgCdO
- Switching voltage: $\leq 250$ VAC/60 VDC
- Switching current: $\leq 4$ A
- Switching capacity: $\leq 1000$ VA/60 W
- Switching frequency: $\leq 10$ Hz

**Ex-Approval acc. to Certificate of Conformity**
- BVS 94.C.2006 X

**Maximum nominal values**
- No load voltage $U_0$
  - MS: 11.0 V
- Short-circuit current $I_k$
  - MS: 27.0 mA

**Maximum external inductances/capacitances**
- [EEx ia] IIC
  - 1 mH/550 nF
- [EEx ib] IIC
  - -

**LED Indications**
- Power "ON" green
- Status indication yellow

**Housing**
- 50 mm wide, Polycarbonate/ABS panel mounting or snap-on clamps for top-hat rail (DIN 50022)
- Connection profile: 2 x 8 self-lifting pressure plates
- Degree of protection (IEC 60529/EN 60529): IP20
- Operating temperature: -25... +60 °C