The MS23-R direction discriminators receive input signals from either two pnp 3-wire sensors or NAMUR sensors conforming to EN 50227. The device is used to determine forward or reverse rotation of a system.

The direction of rotation is obtained by evaluating the attenuation sequence and the overlap from the two sensor signals. The target used must be suitable for simultaneous damping of both sensors for a period of at least 1 ms.

One output relay with SPDT contacts will energise in the forward direction; the other relay will energise in the reverse direction. Each output has a yellow LED for status indications.

Leaving terminals 12/13 (Mem.) open activates the switch-off delay. The adjustable switch off delay function enables monitoring of the time interval between the input pulses and detection of an underspeed condition.

A potentiometer (AV) located on the front cover of the housing serves to adjust the switch-off time delay (0.1...30 s). The output relay energised last will stay permanently energised during the adjusted time delay. If the input pulses cease, the relays will de-energise after the time delay. The adjustable switch off delay also allows to blank out short periods of suddenly missing input pulses.

If terminals 12/13 are linked (Mem.), the switch-off delay is disabled. In this mode, the relays retain their switching status until the direction of rotation changes.

This device should not be used in safety applications where accurate zero speed detection is required.
### Type

<table>
<thead>
<tr>
<th>Type</th>
<th>MS23-R/85...265VUC</th>
<th>MS23-R/24VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident-No.</td>
<td>05 081 10</td>
<td>05 081 07</td>
</tr>
</tbody>
</table>

### Supply Voltage $U_B$

<table>
<thead>
<tr>
<th>Line frequency/ripple $W_{PP}$</th>
<th>$85...265$ VUC</th>
<th>$18...30$ VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power/current consumption</td>
<td>$4.5$ VA</td>
<td>$2.5$ W</td>
</tr>
</tbody>
</table>

### Clearances and Creepage Distances

- Input circuit to output circuit: $\geq 4$ mm
- Input circuit to power supply: $\geq 4$ mm
- Test voltage: $2$ kV

### Rotational Speed Monitoring

<table>
<thead>
<tr>
<th>Input frequency</th>
<th>$\leq 150000$ min$^{-1}$</th>
<th>$\leq 150000$ min$^{-1}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pause duration</td>
<td>$\geq 0.2$ ms</td>
<td>$\geq 0.2$ ms</td>
</tr>
<tr>
<td>Pulse duration</td>
<td>$\geq 0.2$ ms</td>
<td>$\geq 0.2$ ms</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>approx. $10%$</td>
<td>approx. $10%$</td>
</tr>
<tr>
<td>Switch off delay</td>
<td>$0.1...30$ s (adjustable)</td>
<td>$0.1...30$ s (adjustable)</td>
</tr>
<tr>
<td>Repeat accuracy</td>
<td>$\pm 0.5%$</td>
<td>$\pm 0.5%$</td>
</tr>
<tr>
<td>Temperature drift</td>
<td>$\leq 0.020%$/K</td>
<td>$\leq 0.020%$/K</td>
</tr>
</tbody>
</table>

### Input Circuits

- **NAMUR input**
  - Operating characteristics
    - Voltage: $8.2$ V
    - Current: $8.2$ mA
  - Switching threshold
    - $1.4$ mA $\leq I_e \leq 1.8$ mA
    - pnp, terminals 9...11; 14...16
  - Operating characteristics
    - Voltage: $15$ VDC
    - Current: $\leq 15$ mA
    - "ON" signal: $0...5$ VDC
    - "OFF" signal: $10...30$ VDC

### Output Circuits

- 2 relay outputs
  - Number of contacts: 1 SPDT contact, AgCdO + 3 µ Au
  - Switching voltage: $\leq 250$ V
  - Switching current: $\leq 2$ A
  - Switching capacity: $\leq 500$ VA/60 W

### LED Indications

| Power "ON" | green |
| Status indication (forward or reverse motion) | yellow |
| Input pulses | yellow |

### Housing

- 50 mm wide, Polycarbonate/ABS panel mounting or snap-on clamps for top-hat rail (DIN 50022)
- Connection
  - 2 x 8 self-lifting pressure plates
  - $\leq 2 \times 2.5$ mm$^2$ or $2 \times 1.5$ mm$^2$
  - with wire sleeves
- Degree of protection (IEC 60529/EN 60529) IP20
- Operating temperature $-25...+60$ °C