The MS23-22Ex0-R direction discriminator features an intrinsically safe input circuit. It provides two relay outputs, each with one SPDT contact.

The MS23-22Ex0-R uses two sensors to determine forward or reverse direction of a system. One output relay will energise in the forward direction; the other relay will energise in the reverse direction. Each output has a yellow LED that turns on when the output is energised. At zero speed both relays are de-energised.

The direction discriminator receives input pulses from NAMUR sensors according to EN 50227. Both input circuits are monitored for wire-break and short-circuit. In case of a fault condition, both output relays de-energise automatically.

The direction of rotation is obtained by evaluating the 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.

A potentiometer located on the front cover of the housing serves to adjust the time delay (1...15 s) between consecutive input pulse sequences. If the input pulses cease, the relays de-energise after the time delay period.

The direction discriminator is approved for use in Zone 1 as per ATEX. The input and output circuits are isolated from the power supply. The input circuits are monitored for wire-break and short-circuit. In case of a fault condition, both output relays de-energise automatically.
## Direction Discriminators

<table>
<thead>
<tr>
<th>Type</th>
<th>MS23-22Ex0-R/230VAC</th>
<th>MS23-22Ex0-R/24VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ident-No.</td>
<td>53 421</td>
<td>53 427</td>
</tr>
</tbody>
</table>

### Supply Voltage $U_B$
- $184...250$ VAC
- $48...62$ Hz
- $\leq 3.5$ VA
- between input circuit, output circuit and supply voltage for $250 \, V_{rms}$, test voltage $2.5 \, kV_{rms}$
- $20...28$ VDC
- $\leq 10 \%$
- $\leq 3.6$ W
- between input circuit, output circuit and supply voltage for $250 \, V_{rms}$, test voltage $2.5 \, kV_{rms}$

### Direction Discrimination
- Input pulse overlap
  - $\geq 1$ ms
  - $\geq 1$ ms
- Time limit for input pulse sequence
  - $1...15 \, s$ (adjustable)
  - $1...15 \, s$ (adjustable)

### Input Circuits
- Operating characteristics
  - Voltage
    - $8$ V
  - Current
    - $8$ mA
  - Switching threshold
    - $1.55$ mA
  - Hysteresis
    - $0.2$ mA
- to EN 50227 (NAMUR), intrinsically safe
- to EN 50227 (NAMUR), intrinsically safe

### Output Circuits
- 2 relay outputs
- Number of contacts
  - 1 SPDT contact, AgCdO
  - $\leq 250$ VAC/60 VDC
  - $\leq 4$ A
  - $\leq 1000$ VA/30 W
- Switching voltage
  - $250$ VAC/60 VDC
  - $4$ A
  - $1000$ VA/30 W

### Ex Approvals acc. to Certificate of Conformity
- BVS 94.C.2006 X

### Maximum values
- No load voltage $U_0$
  - $11.0$ V
- Short-circuit current $I_k$
  - $27.0$ mA
- External inductances/capacitances
  - $[EEx \, ia] \, IIC$
    - $1 \, mH/550 \, nF$
  - $[EEx \, ib] \, IIC$
    - $1 \, mH/550 \, nF$

### LED Indications
- Status indication
  - Yellow

### Housing
- Mounting
  - 50 mm wide, Polycarbonate/ABS panel mounting or snap-on clamps for top-hat rail (DIN 50022)
- Connection
  - $2 \times 2 \times 2$ 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