Inductive proximity sensors
OsiSense XS Application
Sensors for rotation monitoring, slip detection, shaft overload detection
Cylindrical form

Functions
These self-contained rotation speed monitoring sensors have the special feature of incorporating, in the same case, the pulse sensing and processing electronics as well as the output switching amplifier that are required to establish an integrated rotation monitoring device.

The unit provides an economical solution for detecting slip, belt breakage, drive shaft shear and overloading, etc., in the following applications: conveyor belts, bucket elevators, Archimedian screws, grinders, crushers, pumps, centrifugal driers, mixers, etc.

Operating principle
The output signal of this type of sensor is processed by an impulse comparator incorporated in the sensor. The impulse frequency \( F_c \) generated by the moving part to be monitored is compared to the frequency \( F_r \) preset on the sensor. The output switching circuit of the sensor is in the closed state for \( F_c > F_r \) and the open state for \( F_c < F_r \).

Sensors XSA-V are particularly suitable for the detection of underspeed: when the speed of the moving part \( F_c \) falls below a preset threshold \( F_r \), this causes the output circuit of the sensor to switch off.

Note: Following power-up, the operational status of the sensor is subject to a delay of 9 seconds in order for the moving part being monitored to run-up to its nominal speed. During this time, the output of the sensor remains in the closed state.

Adjustment of frequency threshold
- Adjustment of sensor’s frequency threshold: using potentiometer, 15 turns approximately.
- To increase the frequency threshold: turn the adjustment screw clockwise (+).
- To decrease the frequency threshold: turn the adjustment screw anti-clockwise (–).

Potentiometer

<table>
<thead>
<tr>
<th>Potentiometer adjustment curves (for XSA V1801, 2-wire ~ or ~ sensors)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low speed version (6…150 impulses/minute)</td>
</tr>
<tr>
<td>High speed version (120…3000 impulses/minute)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Potentiometer</th>
<th>Diameter of sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED</td>
<td>a</td>
</tr>
<tr>
<td>Metal target</td>
<td>M30</td>
</tr>
</tbody>
</table>

Setting-up

Minimum distances (mm)

<table>
<thead>
<tr>
<th>Side by side</th>
<th>Face to face</th>
</tr>
</thead>
<tbody>
<tr>
<td>( e \geq 20 )</td>
<td>( e \geq 120 )</td>
</tr>
<tr>
<td>Facing a metal object</td>
<td>Mounted in a metal support</td>
</tr>
<tr>
<td>( e \geq 30 )</td>
<td>( d \geq 30, h \geq 0 )</td>
</tr>
</tbody>
</table>

Fixing nut tightening torque: < 50 N.m
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Flush mountable in metal

<table>
<thead>
<tr>
<th>Nominal sensing distance (Sn)</th>
<th>DC 10 mm</th>
<th>DC 10 mm</th>
<th>AC/DC 10 mm</th>
<th>AC/DC 10 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustable frequency range</td>
<td>6…150 impulses/min</td>
<td>120…3000 impulses/min</td>
<td>6…150 impulses/min</td>
<td>120…3000 impulses/min</td>
</tr>
</tbody>
</table>

References

3-wire PNP / NC
- XSA V11373
- XSA V12373

2-wire
- XSA V11801
- XSA V12801

Weight (kg)
- 0.300

Characteristics

- Connection: Pre-cabled, 3 x 0.34 mm², length 2 m (1)
- Pre-cabled, 2 x 0.34 mm², length 2 m (1)

Degree of protection
- Conforming to IEC 60529
- IP 67

Operating zone
- 0…8 mm

Repeat accuracy
- 3% of Sr

Differential travel
- 3…15% of Fr

Operating temperature
- -25…+70 °C

Output state indication
- Red LED

Rated supply voltage
- 12…48 V with protection against reverse polarity
- ~ 24…240 V (50/60 Hz) or ~ 24…210 V

Voltage limits (including ripple)
- ~ 10…58 V
- ~ or ~ 20…264 V

Switching capacity
- ≤ 200 mA with overload and short-circuit protection
- ~ 5…350 mA or ~ 5…200 mA (2)

Voltage drop, closed state
- ≤ 1.8 V
- ≤ 5.7 V

Residual current, open state
- ≤ 1.5 mA

Current consumption, no-load
- ≤ 15 mA

Maximum switching frequency
- 6000 impulses/min (for XSA V11373); 48,000 impulses/min (for XSA V12373)

"Run-up" delay following power-up
- 9 seconds ± 20% + 1/Fr (3)

Wiring schemes

3-wire
- XSA V11373

2-wire
- XSA V11801

(1) For a 5 m long cable add L05 to the reference, for a 10 m long cable add L10 to the reference.
Example: XSA V11373 becomes XSA V11373L05 with a 5 m long cable.

(2) These sensors do not incorporate overload or short-circuit protection and therefore, it is essential to connect a 0.4 A "quick-blow" fuse in series with the load, see page 3/112.

(3) For a sensor without a "run-up" delay following power-up, replace XSA V1 in the reference by XSA V0. Example: XSA V11801 becomes XSA V01801 without a "run-up" delay. For a reduced "run-up" delay of 3 s, replace XSA V1 in the reference by XSA V3.