Proximity Sensors
XSAV Tubular, Inductive Sensors
30mm Diameter, Motion Detection, DC or AC/DC

The XSAV is a self-contained device used to detect and send output alarms for machinery under speed or zero-speed conditions, as well as early jamming detection. The early detection of the under speed condition is useful in reducing downtime due to jamming or transmission failure, especially in the cases of medium and large motors.

The zero speed condition is used extensively for safety interlocking applications, including: conveyors, pumps, mixers, centrifugal separators, elevators, saws, and crushers.

As long as the speed (number of pulses/min.) is above the threshold level – adjustable via 25 turn potentiometer within the threshold range – the output circuit assumes its closed state. When the actual speed falls below the threshold level – the output circuit assumes its open state. To preserve the start up delay, the switch should be reset by removing and reapplying the power supply.

When the line voltage is initially applied, the output automatically assumes its closed state for the duration of the start-up delay. This allows the mechanical assembly to overcome inertia and reach its nominal speed, greatly simplifying the interlocking circuit. After the start-up delay, the switch will perform as described above.

Care should be taken not to exceed the maximum frequency rating above which the sensor cannot detect the target and therefore assumes “zero speed” condition.

Features:
• Universal AC/DC versions
• AC/DC models are PLC compatible
• Linear speed threshold adjustment
• Two adjustment ranges: 6 - 150 pulses/min. for zero-speed, 120 - 3,000 pulses/min. for jamming detection
• Built-in fixed power-up delay to overcome start-up inertia
• Radio frequency immunity (RFI)
• Reverse polarity protection on DC models
• Noise and transient protection
• Overload and short circuit protection (SCP) on DC models
• LED indicators for switch in “closed” state
• 25-turn potentiometer provides fine adjustment of the under speed threshold

<table>
<thead>
<tr>
<th>Circuit Type</th>
<th>Max. Load</th>
<th>Residual Leakage</th>
<th>Threshold Range (Pulse/Min.)</th>
<th>Max. Frequency (Pulse/Min.)</th>
<th>Start-up Delay</th>
<th>LED/SCP</th>
<th>Catalog Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNP DC models, 10-58 Vdc (including ripple)</td>
<td>200 mA</td>
<td>0</td>
<td>6-150</td>
<td>6000</td>
<td>9 sec.</td>
<td>Yes/Yes</td>
<td>XSAV11373</td>
</tr>
<tr>
<td>PNP</td>
<td>200 mA</td>
<td>0</td>
<td>6-150</td>
<td>6000</td>
<td>3 sec.</td>
<td>Yes/Yes</td>
<td>XSAV31373</td>
</tr>
<tr>
<td>PNP</td>
<td>200 mA</td>
<td>0</td>
<td>120-3000</td>
<td>48000</td>
<td>9 sec.</td>
<td>Yes/Yes</td>
<td>XSAV32373</td>
</tr>
<tr>
<td>PNP</td>
<td>200 mA</td>
<td>0</td>
<td>120-3000</td>
<td>48000</td>
<td>9 sec.</td>
<td>Yes/No</td>
<td>XSAV12801</td>
</tr>
<tr>
<td>2 wires</td>
<td>0.35 A Vac/0.2 A Vdc</td>
<td>1.5 mA (P)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6-150</td>
<td>6000</td>
<td>0 sec.</td>
<td>Yes/No</td>
<td>XSAV11801</td>
</tr>
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<td>120-3000</td>
<td>48000</td>
<td>0 sec.</td>
<td>Yes/No</td>
<td>XSAV02801</td>
</tr>
</tbody>
</table>

For devices without SCP, see p. 298 for protective fuses.

<p>| Minimum Mounting Clearances (mm/Inches) |</p>
<table>
<thead>
<tr>
<th>Side by side</th>
<th>Face to face</th>
<th>Facing a metal object</th>
<th>Mounting in a metal support</th>
</tr>
</thead>
<tbody>
<tr>
<td>e: 20.73</td>
<td>e: 120.47</td>
<td>e: 30/1.2</td>
<td>d: 30/1.2, R: 0.0</td>
</tr>
</tbody>
</table>

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Courtesy of Steven Engineering, Inc. • 230 Ryan Way, South San Francisco, CA 94080-6370 • Main Office: (650) 588-9200 • Outside Local Area: (800) 258-9200 • www.stevenengineering.com
Proximity Sensors
XSAV Tubular, Inductive Sensors
30mm Diameter, Motion Detection, DC or AC/DC

Specifications

Mechanical

- Usable sensing range:
  - 0.7" (18 mm)
  - 1.18" (30 mm)
  - 0.015" (0.4 mm)
  - 0.031" (0.8 mm)
- Standard temperature range: -13°F to +158°F (-25°C to +70°C)
- Enclosure rating:
  - NEMA Type: 1, 3, 4, 6, 12, 13
  - IEC Type: IP67
- Vibration resistance: 25 G, amplitude ±2 mm, f=10-55 Hz
- Shock resistance: 50 G duration 11 ms
- Standard target size (steel):
  - 0.7" (18 mm) diameter: 0.7" x 0.7" (18mm x 18mm)
  - 1.18" (30 mm) diameter: 1.18" x 1.18" (30mm x 30mm)
- Repeatability (% of Sr): 3%
- Differential (hysteresis): 5-15% of pre-set frequency
- Cable: PVR 20 AWG

Electrical

- Voltage drop (across switch) max.:
  - AC/DC: 0.5 V
  - DC: 1.8 Vdc
- Inrush current (inductive @ 20 ms):
  - 2 A
- Minimum load current:
  - 5 mA
- Current Consumption (no load):
  - 15 mA
- Start-up delay (max.):
  - XSAV1 models: 9 sec. ±20% + 1/Fr
  - XSAV3 models: 3 sec. ±20% + 1/Fr
  - XSAV0 models: 0 sec.

Agency Listings

- 1/Fr in the start up delay formula is the actual preset frequency adjusted via potentiometer. (1/Fr is not significant if threshold is above 60 pulses/min.).
- Refer to page 351 for target material correction coefficient Km.

Options

- Description
  - Extended temperature range (only one option per device):
  - to +185°F (+85°C)
  - TT
  - to -40°F (-40°C)
  - TF
- 5 meter cable length
  - L05
- 10 meter cable length
  - L10

Ex: XSAV11373 TT L05

Accessories

- Description
  - Metal locknuts (1 pair included)
  - XSZE130
  - Mounting bracket, 90° steel
  - 9006PA30
  - Mounting bracket, plastic
  - XSZB130
  - 0.5" NPT conduit adapter
  - 7427

Application Notes:

- The number of targets is determined knowing that the actual number of pulses per minute n, is n=mN where m is the number of targets and N the speed in rpm.
- This number (n) should be within the operating frequency range given in the selection table. For reasons of mechanical balance, even numbers are recommended (2, 4, 6 etc.).

Frequency threshold adjustment:

- As long as the speed (number of pulses/min.) is above the threshold level – adjustable via 25 turn potentiometer within the threshold range – the output circuit assumes its closed state. When the actual speed falls below the threshold level, the output circuit assumes its open state. To preserve the start-up delay, the switch should be reset by removing and reapplying the power supply.
- When the line voltage is initially applied, the output automatically assumes its closed state for the duration of the start-up delay. This allows the mechanical assembly to overcome inertia and reach its nominal speed, greatly simplifying the interlocking circuit. After the start-up delay, the switch will perform as described above.
- Care should be taken not to exceed the maximum frequency rating above which the sensor cannot detect the target, therefore, assuming zero speed condition.

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