Preventa safety modules

XPSVNE

For zero speed detection

Catalogue

June 2014
Operating principle

Preventa safety modules XPSVNE for zero speed detection are used to detect the stop condition of electric motors. Their most common applications include: providing the unlock signal for electrically interlocked sliding or removable machine guards, controlling rotation direction signals for reversing motors and engaging locking brakes after a motor has come to a standstill.

As electric motors run down, a remanent voltage is produced in the windings of the motor due to residual magnetism. This voltage is proportional to the speed of the motor and, therefore, decreases as the motor comes to a standstill.

This remanent voltage is measured in a redundant manner so as to detect the stop condition of the motor. The cabling between the motor windings and the inputs of the XPSVNE module is also monitored to prevent a cabling breakage or fault being seen as a stopped motor.

A transformer should not be used to connect the motor to terminals Z1, Z2 and Z3 since there is no monitoring of the connection with the motor winding via the resistance monitoring.

Modules XPSVNE are suitable for detecting the stop condition of all types of AC or DC motor driven machines which, when the motor runs down, produce a remanent voltage in the windings due to residual magnetism. These machines can be controlled by electronic devices, such as variable speed drives or DC injection brakes.

The input filters for standard XPSVNE modules are designed for a frequency of up to 60 Hz.

For motors operating at a frequency higher than 60 Hz, which therefore produce a high frequency remanent voltage, special modules XPSVNEHS should be used.

Modules XPSVNE have 2 potentiometers mounted on the front face of the module which allow independent adjustment of the switching threshold for each input circuit. This allows adjustment for different types of motors and application requirements.

To aid diagnostics, modules XPSVNE have 4 LEDs and 2 solid-state outputs to provide information on the status of the zero speed detection circuit.

Maximum achievable safety level

- PL d/Category 3 conforming to EN/ISO 13849-1
- SIL CL 2 conforming to EN/IEC 62061

Product certifications

- UL
- CSA
- TÜV

References

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<thead>
<tr>
<th>Description</th>
<th>Connection</th>
<th>Number of safety circuits/ Solid-state outputs for PLC</th>
<th>Supply</th>
<th>Frequency of motor power supply</th>
<th>Reference</th>
<th>Weight kg/lb</th>
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</thead>
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<tr>
<td>Safety modules for zero speed detection</td>
<td>Captive screw clamp terminals Terminal block removable from module</td>
<td>2/2</td>
<td>24 V</td>
<td>≤ 60 Hz</td>
<td>XPSVNE1142P</td>
<td>0.500/1.102</td>
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<tr>
<td></td>
<td></td>
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<td>&gt; 60 Hz</td>
<td>XPSVNE1142HSP</td>
<td>0.500/1.102</td>
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<td>XPSVNE3442P</td>
<td>0.600/1.333</td>
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<td>0.600/1.323</td>
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<td>XPSVNE3742P</td>
<td>0.600/1.323</td>
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<td>&gt; 60 Hz</td>
<td>XPSVNE3742HSP</td>
<td>0.600/1.323</td>
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</table>
## Preventa safety modules
### Type XPSVNE
### For zero speed detection

### Operating principle

Preventa safety modules XPSVNE for zero speed detection are used to detect the stop condition of variable-speed motors. They find various applications, including providing the vehicle signal for vehicle safety systems or renewable machine guards, controlling counter direction signals for reversing motors and engaging locking inverter after a motor has come to a standstill.

An electric motor, such as a variable-speed DC motor, is equipped with an encoder to measure the speed of the motor. The encoder produces an electrical signal in pulses proportional to the speed of the motor. This signal is used to control the inverter and is also monitored to prevent inverter burnout and fault conditions. A programmable automation controller (PAC) should be used to control the inverter to terminals Z1, Z2 and Z3 since there is no monitoring of the connected inverter with the motor running under motor resistance monitoring.

Modules XPSVNE are suitable for detecting the stop condition of all types of AC or DC motor driven machines, which, when the motor is not running, produce a remanent voltage in the windings due to residual magnets. These machines can be controlled by variable-speed drives or DC regulators.

For DC motors, it is important to monitor the DC field current for zero speed detection. For AC motors operating at frequencies higher than 60 Hz, which therefore produce high frequency remanent voltage, special modules XPSVNHSP should be used.

Modules XPSVNE have 2 potentiometers mounted on the front face of the module which allow independent adjustment of the switching threshold for each input circuit. This allows adjustment for different types of motors and applications requirements.

To aid diagnostics, modules XPSVNE have 4 LEDs and 2 solid-state outputs to provide information on the status of the zero speed detection circuit.

### References

<table>
<thead>
<tr>
<th>Description</th>
<th>Connection</th>
<th>Number of variables</th>
<th>Function</th>
<th>Supply</th>
<th>Frequency range</th>
<th>Reference</th>
<th>notes</th>
</tr>
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<tbody>
<tr>
<td>Safety module for zero speed detection</td>
<td>Create some own circuit configuration</td>
<td>2</td>
<td>Transformer module</td>
<td>24 V, 48 V</td>
<td>&gt; 60 Hz</td>
<td>XPSVNE1142P</td>
<td>Direct access to Sizes and models of the module</td>
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