PRODUCT OVERVIEW

vibro-meter®

SpeedSys300 ODS301 overspeed detection system

High-integrity overspeed protection

The SpeedSys300 ODS301 is a high-integrity overspeed detection and protection system from Meggitt's vibro-meter® product line. A dedicated safety system for critical rotating machinery, it was designed using the latest technology and standards for one main purpose – to accurately detect overspeed, underspeed and/or acceleration in order to shutdown a machine and protect plant and personnel.

The ODS301 module is a modular and versatile device, compatible with industry-standard speed sensors. In operation, the ODS301 compares speed and acceleration measurements against configured alarm limits and will activate its two safety relays and a safety analogue output to provide critical protection. Two additional (non-safety) relays provide non-critical protection or other alarm/status information for the module. All alarms, relays and outputs are user-configurable using proprietary Windows® application software.

The ODS301 incorporates advanced self-monitoring and diagnostics with redundant processing and data comparison in order to monitor the health/status of the complete system (sensor/measurement chain, cabling and ODS301). If a problem is detected, the safety outputs are driven to their safe states in order to ensure that the machine being monitored is safe.

Benefits

Safety by design

In order to provide a dependable, independent layer of protection, the ODS301 was designed to be simple, reliable and robust, and has an exceptionally long proof-test interval of 10 years. Safety related and non-safety related functionality are completely segregated, while advanced self-monitoring and diagnostics detects and communicates problems. As a result, fast and reliable protection is ensured.

Driven by certification

To meet and maintain the highest international safety levels, the ODS301 was developed in accordance with the IEC 61508 functional safety standard and is certified SIL 2 and SIL 3 capable "by design". Its speed inputs are galvanically separated and Ex certified to support sensors/measurement chains installed in hazardous areas. In addition, the ODS301 is compliant with the API 670 (machinery protection systems) and API 612 ("steam turbines") standards.

Easier to use – today and tomorrow

As it is SIL certified "by design", the ODS301 has fewer application restrictions compared to legacy "proven in use" systems. This enables low-impact retrofitting in many critical applications. And importantly, being a new design, it is cost-effective and there are no worrying component supply or obsolescence issues.

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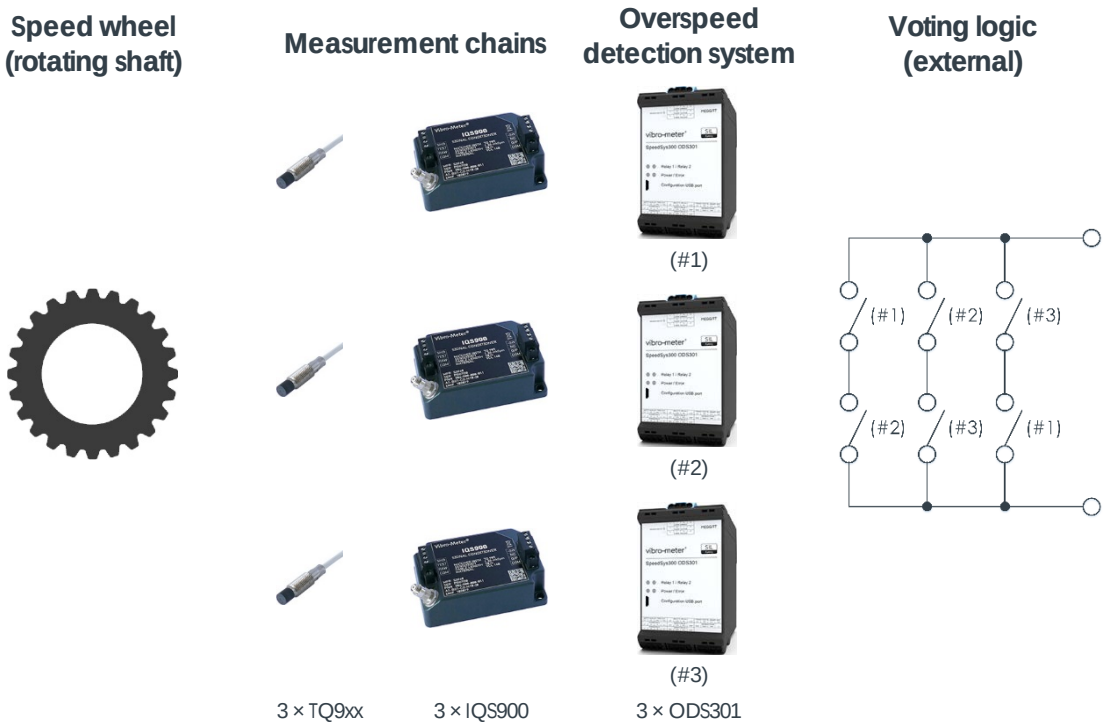
ODS301 module features

Sensor compatibility	Proximity (eddy current), electronic (Hall-effect) or magnetic (variable reluctance) speed sensors / measurement chains
Signal processing	The ODS301 counts sensor/measurement chain pulses and converts them to rotational speed and acceleration measurements, which are compared against configured alarm limits. Safety outputs are activated for critical alarms while non-safety outputs are used for other alarms/status information
Frequency range	0.025 Hz to 35 kHz
Response time	10 ms (typical)
Safety outputs	2 × double-pole single-throw (DPST) safety relays and 1 × analogue 4 to 20 mA current loop – certified for SIL safety loops
Non-safety outputs	2 × single-pole single-throw (SPST) relays, 1 × frequency (speed) output, 1 × binary (status) output and 1 × Modbus RTU serial interface (read only)
Diagnostics technology	Advanced self-monitoring and diagnostics (that is, built-in self-test (BIST)) monitors and reports the health/status of the complete system
Proof test interval	10 years (typical)

Example SIL 3 overspeed solution

For critical rotating machinery such as gas turbines, steam turbines and hydro turbines, complete turnkey SIL 3 overspeed solutions from Meggitt vibro-meter® include speed measurement using TQxxx-based proximity measurement systems and a SpeedSys300 ODS301 overspeed detection system, as shown below. Alternatively, the ODS301 modules can be used with other speed sensors (electronic or magnetic).



Notes

For a SIL 3 overspeed solution, a redundant architecture consisting of 3 × measurement chains / ODS301 modules with external 2oo3 voting logic is necessary. To implement the 2oo3 voting logic, the ODS301 module's safety relay outputs can either be wired directly together as shown above or connected to an external system such as a safety PLC that performs the required logic before initiating a shutdown (trip) of a machine.

SIL 2 solutions can consist of a single measurement chain and ODS301 module without voting logic. Example SIL 2 solutions include 1 × measurement chain / ODS301 module (1oo1, HFT=0 (not redundant)) or 2× measurement chains / ODS301 modules (1oo2, HFT=1 (redundant)).

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