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MEGGiTT
Vibro-Meter®

PRODUCT OVERVIEW

vibro–meter

SpeedSys300 ODS301 overspeed detection system

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SIL Safety

High-integrity overspeed protection

The SpeedSys300 ODS301 overspeed detection system from Meggitt's Vibro-Meter® product line is a high-integrity overspeed detection and protection system. It is a dedicated safety system, designed using the latest technology and standards for one purpose only – to accurately detect overspeed conditions in a rotating machine in order to shutdown (trip) the machine and protect plant and personnel.

The ODS301 module is a modular and versatile device, compatible with all industry-standard speed sensors, that uses safety relays and an analogue output (4 to 20 mA) to provide critical overspeed protection. Additionally, it uses user-configurable relays to provide non-critical speed and/or acceleration alarms, and digital outputs for system status monitoring and communications.

The ODS301 incorporates advanced self-monitoring and diagnostics (that is, built-in test equipment (BITE)) that continually monitors the health/status of the complete overspeed protection system (sensor/measurement chain, cabling and the ODS301 module itself). 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 and this is remotely indicated.

Benefits

Safety by design

In order to provide an independent overspeed protection system that can be trusted, the ODS301 was designed to be fundamentally simple, reliable and robust. For example, safety related and non-safety related functionality are completely segregated, while advanced self-monitoring and diagnostics detects and communicates system problems. As a result, fast and reliable protection is ensured for your machinery.

Driven by certification

Users expect solutions that meet and maintain the highest international safety standards. Accordingly, the ODS301 module was developed in accordance with the IEC 61508 functional safety standard and is certified "by design". The speed inputs are galvanically separated and Ex certified to support sensors installed in hazardous areas. The ODS301 is also an electronic overspeed detection system (ODS) in accordance with API 670 (5th edition).

Easier to use – today and tomorrow

Compared to legacy overspeed systems which are often "proven in use", SIL certification "by design" results in fewer application restrictions. The up-to-date design using the latest technology helps avoid worrying supply and obsolescence issues.

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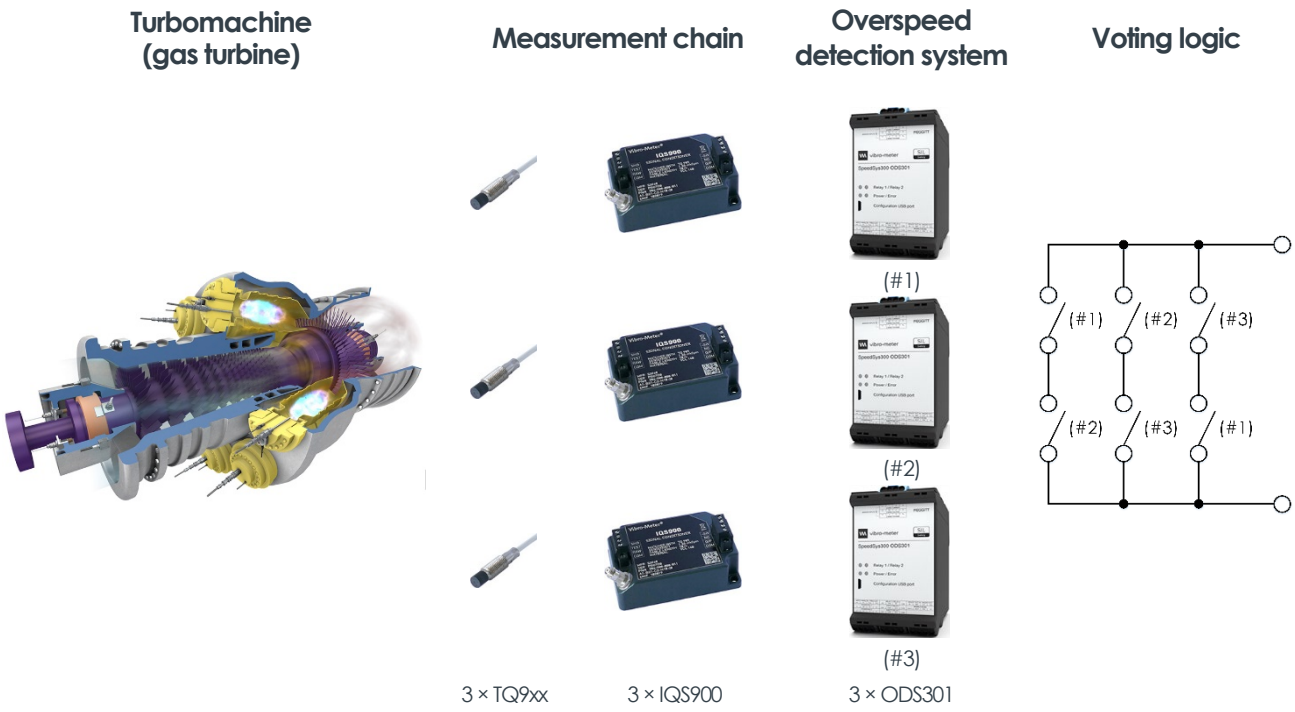
ODS301 module features

Sensor compatibility	Proximity (eddy current), electronic (Hall-effect) or magnetic (variable reluctance) speed sensors
Signal processing	Sensor/measurement chain pulses (frequency) are counted by the ODS301 module and converted to a speed measurement, which is compared against a critical safety limit and safety outputs are activated if the limit is exceeded
Frequency range	Up to 35 kHz (2100 000 RPM)
Response time	≤ 10 ms
Safety outputs	Two double-pole single-throw (DPST) safety relays and one analogue 4 to 20 mA current loop – certified for SIL safety loops
Non-safety outputs	Additional relays, frequency (speed) output, binary (status) output and Modbus serial interface
Diagnostics technology	Advanced self-monitoring and diagnostics (that is, built-in test equipment (BITE)) continually monitors and reports the health/status of the complete system
Proof test interval	≥ 10 years

SIL 3 overspeed solutions

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 and IQSxxx proximity measurement chains and SpeedSys300 ODS301 overspeed detection systems, as shown below. Alternatively, the ODS301 module can be used with other speed sensors (electronic or magnetic).



Notes

For a SIL 3 overspeed solution, a redundant architecture consisting of three measurement chains and ODS301 modules with external 2oo3 voting logic are necessary.

To implement the 2oo3 voting logic, the ODS301 module's safety relay outputs can either be wired directly together as shown above or they can be connected to an external system such as a safety PLC that performs the required logic before initiating a shutdown.

Document reference PO-016/EN
Version 0 (For Review) – 19.05.2020