Guardian ODS Overspeed Detection System Specifications

The Guardian ODS is an overspeed safety device designed to safely shut compressors and turbines of all sizes upon sensing an overspeed or over-acceleration event. This device accurately monitors rotor speed and acceleration via active or passive MPUs (magnetic pickups) and issues a shutdown command to the trip valve(s) or corresponding trip system.

- Functions and Features
- Installation Information
- Input Signals
- Output Signals
- Regulatory Compliance



Figure 1 Guardian ODS

The Guardian ODS can be purchased with two dual redundant trip relay outputs using a 2-out-of-3 voted architecture. Individual alarm relays, 4–20 mA speed readouts, and Modbus® * communications make this overspeed device easy to integrate into any safety system.

* Modbus is a trademark of Schneider Automation Inc.

Functions and Features

On-line Testing—Each Guardian ODS module can be tested manually from the module's front panel, Modbus communications port, or automatically via its auto-test routine function. The Guardian ODS allows users to configure an overspeed test to be performed automatically on a periodic basis, testing each module (A, B, C) one at a time, and logging the result of each test or halting the test for a sensed error.

On-line Repair—The Guardian ODS's triple-modular design allows users to easily replace one of its modules (A, B, C) while the turbine is on-line and operating normally. Ease of replacement is enhanced by the unit's backplane plug-and-operate structure, and its module-to-module learning function.

Trip, Alarm, & Overspeed Logs—The Guardian ODS log function logs (saves to memory) all trips, alarms, trip valve response times, and overspeed events. The trip-log function uses a scrolling buffer and records the last 50 sensed trip or alarm events and the last 20 overspeed events to memory, with associated times. Each log file can be viewed from the unit's front panel or in TrainTools. Each module utilizes non-volatile memory to ensure that all logged events are saved, even on loss of power.

Real Time Clock—Each Guardian ODS module utilizes a real-time clock to ensure accurate time logging. A special time averaging function is utilized between modules to ensure module-to-module clock synchronization.

Acceleration Detection—Optionally the Guardian ODS can be configured to protect from high acceleration events, in addition to overspeed. The derivative of the speed signal is used to detect turbine acceleration and issue an associated trip command.

MPU Detection—Each module's speed sensor input uses special MPU open-wire detection circuitry to validate that the MPU is properly connected before turbine operation, and special loss-of-speed detection logic to validate MPU functionality during turbine operation.

Automatic Overspeed Test Routine—Optionally the Guardian ODS can be configured to routinely perform an overspeed test of each module, then log and report the test results. With this test routine, each module goes through its test sequence using an internal frequency generator to simulate an overspeed condition.

Sulfur Contamination Resistant—The Guardian ODS utilizes a special conformal coating material that has demonstrated excellent long-term protection against H2S and SO2 gases at levels classified in international standard IEC 721-3-3 1994 - environment Class 3C2.

Installation Information

Approximate dimensions, including faceplate: 330 x 445 x 159 mm (13 x 17.5 x 6.25”)

Rated for IP56 (ingress protection level 5-6) based locations

Temperature range: -20 to +60°C (-4 to 140°F)

Table 1 Input Signals

Power Source (2 redundant)	2 redundant: • High Voltage Power Supply (88–264 Vac/47–63 Hz, 90–150 Vdc) @ 90 W • Low Voltage Power Supply (18–32 Vdc) @ 100 W
Speed Signals	1 per module, 3 total
Inputs configurable to accept signals from	• MPUs (100–32 000 Hz) @ (1–35 Vrms) • Proximity probes (0.5–25 000 Hz) @ 24 Vdc • Gear Tooth Range (1–320 teeth)
Discrete Inputs	3 per module, 9 total: • Alarm/Trip Reset Command • Start Command • Speed Fail Override Command

Table 2 Output Signals

Discrete Output Relays	Voted Relay Models • Shutdown relay output (2 total, 2-out-of-3 voted) • Rated for 8 A @ 220 Vac or 8 A @ 24 Vdc • Alarm relay output (1/module, 3 total) • Rated for 2 A @ 24 Vdc
4–20 mA Analog Output	1 per module, 3 total: • Dedicated to function as a speed meter readout
Communication Ports	1 per module, 3 total: • Serial RS-232, RS-422, RS-485 Modbus port

Table 3 Regulatory Compliance

North American Compliance	CSA Certified for Class I, Division 2, Groups A, B, C, and D, T4 at 60 °C Ambient for use in Canada and the United States
European Compliance	• EMC Directive: 2014/30/EU • ATEX Directive: 2014/34/EU Zone 2, Category 3, Group II G, Ex nA II T4 • WEEE Directive: Exempt/Compliant as a component with 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE). • EuP Directive: Exempt/Compliant from 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products.
Other International Compliance	• TÜV: TÜV certified for SIL-3 per IEC 61508 Parts 1-7, Function Safety of Electrical / Electronic / Programmable Electronic Safety Related Systems. • C-Tick: Declared to Australian Radio communications Act of 1992 and the New Zealand Radio communications Act of 1989.
Other Compliance	• IEC60068-2-60:1995 Part 2.60 Methods 1 and 4 (conformal coating) • API670, API612, & API611 compliant

Compressor Controls Corporation
4745 121st Street
Des Moines, IA 50323-2316 USA
+1-515-270-0857
process.honeywell.com/us/en/ccc
dl-ccc-solutions@honeywell.com

Guardian ODS Overspeed Detection System Specifications | v3 | 09/24
© 2024 Honeywell International Inc.