

EXPERTISE BEYOND CONTROLS

GUARDIAN[®]

Over-Speed
Prevention System



Keep Your Plant Running at Peak Capacity.

The Guardian over-speed prevention (OSP) system offers end users the security and dependability of a two-out-of-three voting system with the flexibility and ease of do-it-yourself installation and configuration.



Security

The OSP system provides a reliable, economical solution for protecting your turbine. Its two-out-of-three voting feature monitors turbine speed, and will initiate a trip command to prevent an over-speed condition from occurring. The OSP system includes three identical speed modules, which individually measure a frequency input signal from a passive or active magnetic pickup sensor.

A supervisor module continually monitors the three-speed modules for proper operation, which helps eliminate unnecessary downtime and increase your system's availability.

Multi-Level Password

The OSP system provides users with a multilevel password function for added security. Each level provides access to higher system functions.

- 1. Peak speed reset**
- 2. Over-speed test mode**
- 3. Configuration mode**
- 4. Set new passwords**

Dependability

The three-speed modules provide a greater level of dependability. Each speed module is a microprocessor-based board, which independently monitors an active or passive magnetic pickup signal. Open-pickup detection on "passive" sensors is provided as well as "dynamic" sensor failure detection via the supervisor module, which knows when a speed module should be receiving a valid frequency input. Active sensor power is provided as an output as well. Each speed module can display its current speed and current set point. Additionally, each speed module includes four dedicated LEDs for indicating over-speed test, trip, mission processing unit? (MPU) failure, and fault conditions.

Self-Diagnostics — Supervisor Module

The OSP system also features complete continuous self-diagnostics. The supervisor module monitors proper operation of the speed modules and power supplies. A 4-line by 20-character alphanumeric display is integrated into the operator interface. A test mode provides testing of each speed module, including the verification of the voting relays operation. This module also includes a dedicated LED for indicating an alarm condition.

Configuration of the speed modules is performed from the supervisor user interface. The OSP system is configured through the supervisor module during setup. A single failure of the supervisor module will not affect normal operation of the OSP system. The supervisor operates as a background device collecting information and monitoring the operation of the speed modules.

The supervisor module provides additional features not available by other two-out-of-three voting OSP systems currently on the market. For example, the supervisor module handles high-overhead tasks such as Modbus communication, which allows the speed modules to concentrate on their primary task of monitoring the frequency input signal.

With the Guardian OSP system, an operator with proper access privilege can enable the over-speed test mode and test each speed module. All over-speed tests are verified and time-stamped in the history log. Alarms and peak-speed recordings are also time-stamped. An over-speed test cannot be activated if an alarm, trip, or fault condition is present, thereby eliminating accidental trips. During an over-speed test, the supervisor module turns on an LED indicator on the front panel of the effected speed module to indicate that a module is being tested.



Flexibility

Two power supply modules provide redundant power to the relay board, speed modules, and supervisor. These two modules provide all the system power, and each can be powered by 18 to 32Vdc and/or 85 to 265Vac. The outputs of the two power supply modules provide system power through circuitry located on the relay board. A failed power supply module can be replaced without interrupting the operation of the OSP system.

With the Guardian OSP system, you no longer have to order separate systems for specific power requirements or required trip logic. De-energize-to-trip or energize-to-trip logic is jumper selectable. By meeting a broad range of installation requirements, this OSP system can be installed with any turbomachinery train for virtually any application.

What's more, installation and configuration can be completed by your own in-house personnel.

Relay Board

The relay board contains the following output relays (all socketed):

- ▶ Alarm — double pole, double throw (DPDT) relay
- ▶ Over-speed trip output number 1 — DPDT relay
- ▶ Over-speed trip output number 2 — DPDT relay

Online replacement (hot swapping) of failed supervisor, power supply, and speed modules is a standard feature. The relay board includes the power supply diode-voting circuitry and contains connectors for different boards in the system that obtain DC power.

API / ISO Compliant

The Guardian OSP system is compliant with application programming interface (API) and independent system operator? OR International Standards Organization? (ISO), making integration with your existing system easier. This definitely gives the OSP system a huge advantage over other electronic over-speed systems on the market. Even though some competitive systems are available with simplex, redundant, and triplex speed switches, they may not comply with the latest API and ISO requirements. Many OSP systems lack self-diagnostic testing and data communication capability. These are standard features with the Guardian OSP system.



For more information

about our Guardian over-speed prevention system and other state-of-the-art products from the world leader in turbomachinery control, please contact a CCC office near you. We are uniquely qualified to solve turbomachinery control problems, and we will help you achieve maximum turbomachinery performance regardless of your equipment or process.



Step up to the Guardian — Advanced OPC System

The Guardian OSP system provides the security, dependability, and flexibility you need. For more information on this OSP system, or to discuss solutions for your specific turbomachinery control needs, contact your CCC sales representative or the CCC office nearest you.

Features

- ▶ API 670 machinery protection systems — compliant
- ▶ Multilevel password protected
- ▶ Redundant power supply modules
- ▶ Self-diagnostics
- ▶ 2 DPDT trip relays
- ▶ Less than 40-millisecond response time
- ▶ Time-stamped alarm and history log
- ▶ RPM deviation alarm
- ▶ Passive and active pickups
- ▶ Open pickup and dynamic sensor — failure detection
- ▶ Multiple alarms
- ▶ Manual over-speed test and verification
- ▶ Modbus RTU for remote monitoring
- ▶ Hot-swap modules
- ▶ Digital indication of trip set point and current speed
- ▶ IP65 (NEMA 4 type) enclosure
- ▶ Wide temperature range
- ▶ Cold-coil monitoring for energize-to-trip logic
- ▶ U.S. — Class 1, Division 2, Groups A-D, T4A
- ▶ European — atmosphere explosive (ATEX) — Group II, Cat. 3, G, EEx, nACL, IIC, and T4



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