



ProTech[®] 203 Overspeed Protection System

**8200-200, -201, -202, -203, -204, -205,
9907-344, -345**

Installation and Operation Manual

Chapter 1.

General Information

Introduction

This manual describes the ProTech® 203 electronic two-out-of-three Overspeed Protection System. The manual explains the operation and gives the configuration procedures for the system. This manual does not contain instructions for the operation of the complete turbine system. For turbine- or plant-operating instructions, contact the plant-equipment manufacturer.

Before doing any installation, maintenance, adjustments, or configuration on the ProTech 203 system, read Woodward manual 82715, *Guide for Handling and Protection of Electronic Controls, Printed Circuit Boards, and Modules*.

Description

The ProTech 203 Overspeed Protection System is a digital overspeed trip device that senses prime mover speed through three magnetic pickups (MPUs). It consists of three identical, independent, speed-sensing units which continuously monitor prime mover speed and activate a trip relay when an overspeed condition is detected. The trip relays of the three units are connected in a two-out-of-three voting configuration so that if any single unit fails, the ProTech system will still provide the correct output. The units' functions include the ability to display the actual speed from each speed probe, display the highest speed signal, on-line testing, and modular design that allows a single failed unit to be replaced while the device is running. Light emitting diodes (LEDs) and digital displays on the unit's front panel indicate the functional status.

Applications

The ProTech system can be ordered in either a de-energize-to-trip model or an energize-to-trip model.



Woodward strongly recommends use of the de-energize-to-trip model for reasons of general safety. With an energize-to-trip model, the prime mover may not trip on loss of power. That failure to trip could result in property damage or personal injury and loss of life. However, Woodward recognizes that some applications will require the energize-to-trip option.

The ProTech system can also be configured to be compatible with various combinations of power sources. Tables 1-1, 1-2, and 1-3 show the available ProTech models, the corresponding part numbers, and the voltage ranges.

Table 1-1. De-energize-to-Trip ProTech Models

Part Number	Unit A	Unit B	Unit C
9907-345 8200-201	24 Vdc	24 Vdc	24 Vdc
8200-203	120 Vac/dc	120 Vac/dc	120 Vac/dc
8200-205	220 Vac	220 Vac	220 Vac

Table 1-2. Energize-to-Trip ProTech Models

Part Number	Unit A	Unit B	Unit C
9907-344 8200-200	24 Vdc	24 Vdc	24 Vdc
8200-202	120 Vac/dc	120 Vac/dc	120 Vac/dc
8200-204	220 Vac	220 Vac	220 Vac

Table 1-3. Voltage Ranges

Input Power Requirements Per Kernel
24 Vdc = 18–32 Vdc, 5.12 W
120 Vac/dc = 88–132 Vac, 12.5 VA
90–150 Vdc, 4.77 W
220 Vac = 180–264 Vac, 16.4 VA

References

The following Woodward publications contain additional product or installation information on overspeed protection systems and related components.

	Manual Title
82715	<i>Guide for Handling and Protection of Electronic Controls, Printed Circuit Boards and Modules</i>
82510	<i>Magnetic Pickups and Proximity Switches for Electronic Governors</i>
50532	<i>EMI Control for Electronic Governing Systems</i>

Specifications

Enclosure Approved for use in Type 4 and 4x environments for North America. Enclosure rated IP54 for Europe.

Remote Reset Can be reset from a remote location.

IMPORTANT

The external field wiring to the Remote Reset and Contact Input terminals must be protected from user accessibility. It must be hard-wired like a hazardous voltage circuit.

Contact Input Depending on how the unit is configured, this input can act as a remote start input, or as an indication to the ProTech system that it should be sensing speed greater than the MPU fail set point.

Built-In Self-Test A built-in frequency generator permits testing of each unit individually while prime mover is on-line.

Key Lock Prevents any programming or testing by unauthorized personnel.

Replacement Each subsystem can be replaced (after disconnecting the supply power at the external disconnecting means) while the other two subsystems are powered without tripping the prime mover

Outputs A separate alarm output and LED indicate if an individual speed-sensing unit has tripped.

MPU Failure Indications Separate LEDs indicate if an MPU or its wiring has failed.

MPU Fail Timer A timer is provided for start-up. If prime mover speed is not up to the value programmed when this timer times out, the device will trip the prime mover. Both the time and the speed are programmable.

MPU Fail Option Each unit can be configured so that on the sudden loss of that unit's MPU, the unit can either output both an alarm plus a trip signal, or the unit can output only an alarm.

CPU Failure Indication A separate LED indicates if any unit's CPU is not operating normally.

Speed-Sensing Frequency Range 100 Hz to 32 kHz

Trip-Point Frequency Range 250 Hz to 25 kHz

MPU Input Amplitude
1 Vrms minimum @ 100 Hz to 25 kHz
2 Vrms minimum @ 25 kHz to 32 kHz
maximum 25 Vrms

Shutdown Contact Ratings

European Ratings European ratings restrict use to applications with voltages not subject to the Low Voltage Directive (73/23/EEC).

Rated Voltage	Resistive
28 Vdc	5.0 A
<50 Vrms, 50/60 Hz	0.5 A

UL Ratings

Rated Voltage	Resistive
28 Vdc	5.0 A
115 Vrms, 50/60 Hz	0.3 A

Alarm Contact Ratings

European Ratings European ratings restrict use to applications with voltages not subject to the Low Voltage Directive (73/23/EEC).

Rated Voltage	Resistive
28 Vdc	2.0 A
<50 Vrms, 50/60 Hz	0.3 A

UL Ratings

Rated Voltage	Resistive
28 Vdc	2.0 A
115 Vrms, 50/60 Hz	0.3 A

IMPORTANT

The alarm relay de-energizes when a trip occurs, and momentarily after reset or power-up. An alarm only annunciates a situation that may require attention, it is not synonymous with a trip.

MPU Measurement**Circuit Input**

Impedance 2 k Ω

Accuracy $\pm(0.05\% \times \text{Trip Point in Hz} + 2 \text{ Hz})$

Operating Temperature -25 to +60 °C (-13 to +140 °F)

Display Operating Temperature -15 to +60 °C (+5 to +140 °F)

Sample Time Speed is sampled every 5 ms

Total Response Time 40 ms max

Humidity US MIL-STD-810D, Method 507.2, Procedure II

Vibration US MIL-STD-810D, Method 516.3, Procedure I