

ProTech® 203

Overspeed Protection System

Applications

The ProTech® 203 Overspeed Protection System monitors three individual magnetic pickups (MPUs) to provide overspeed protection for steam and gas turbines and other prime movers. The system replaces mechanical overspeed devices, especially in high-speed applications (above 10 000 rpm) when a mechanical overspeed device becomes unreliable.

The ProTech 203 can be applied as a component of protection and safety systems to allow the overall system to meet IEC61508 SIL-3 or API-670 compliance standards. IEC 61508 calculations and application assistance are available upon request.

Benefits

Ease of calibration and testing, accuracy, and repeatability are the hallmarks of this system. The ProTech device is unlike mechanical overspeed devices which require considerable trial and error to set the overspeed trip set point. Because it uses digital speed-sensing technology, the ProTech device's set point is configured simply by programming the value from the touch panel on the front. To ensure its accuracy and functionality, each of the three speed-sensing units can be individually tested while the prime mover is running, using the integral frequency generator. A key lock prevents programming and testing by unauthorized personnel.

Accuracy is achieved through the three digital units which sense and indicate speed to within 0.1%. No mechanical overspeed device can match this accuracy level.

The ProTech system's two-out-of-three voting scheme assures that the device will not shut down your prime mover because of transient conditions or conditions affecting only one of the three isolated units. Each unit is fully isolated and only connected to the other two units via voting relay outputs.

To further decrease the chance of a false trip, each speed-sensing unit is operated from a separate power source.

The ProTech device does not have problems of mechanical wear, susceptibility to temperature or other atmospheric conditions, or susceptibility to conditions related to a turbine's rotating element. It will hold its trip set point and will repeat consistently for long periods with no adjustments, since it does not depend on mechanical moving parts, with their unavoidable friction, wear, and other problems.



- Applicable in IEC61508 SIL-3 systems
- API670 Compliant
- Two-out-of-three voting
- Independent power supply for each channel
- Unmatched accuracy and repeatability
- Each unit can be independently tested on-line
- Each unit is replaceable on-line
- Stores and displays highest speed
- Sample time is 5 ms
- Total response time is 40 ms (maximum)
- UL Listed versions available with Canadian acceptance for Class I, Division 2, Groups A, B, C, and D
- CE Marked
- NEMA 4X

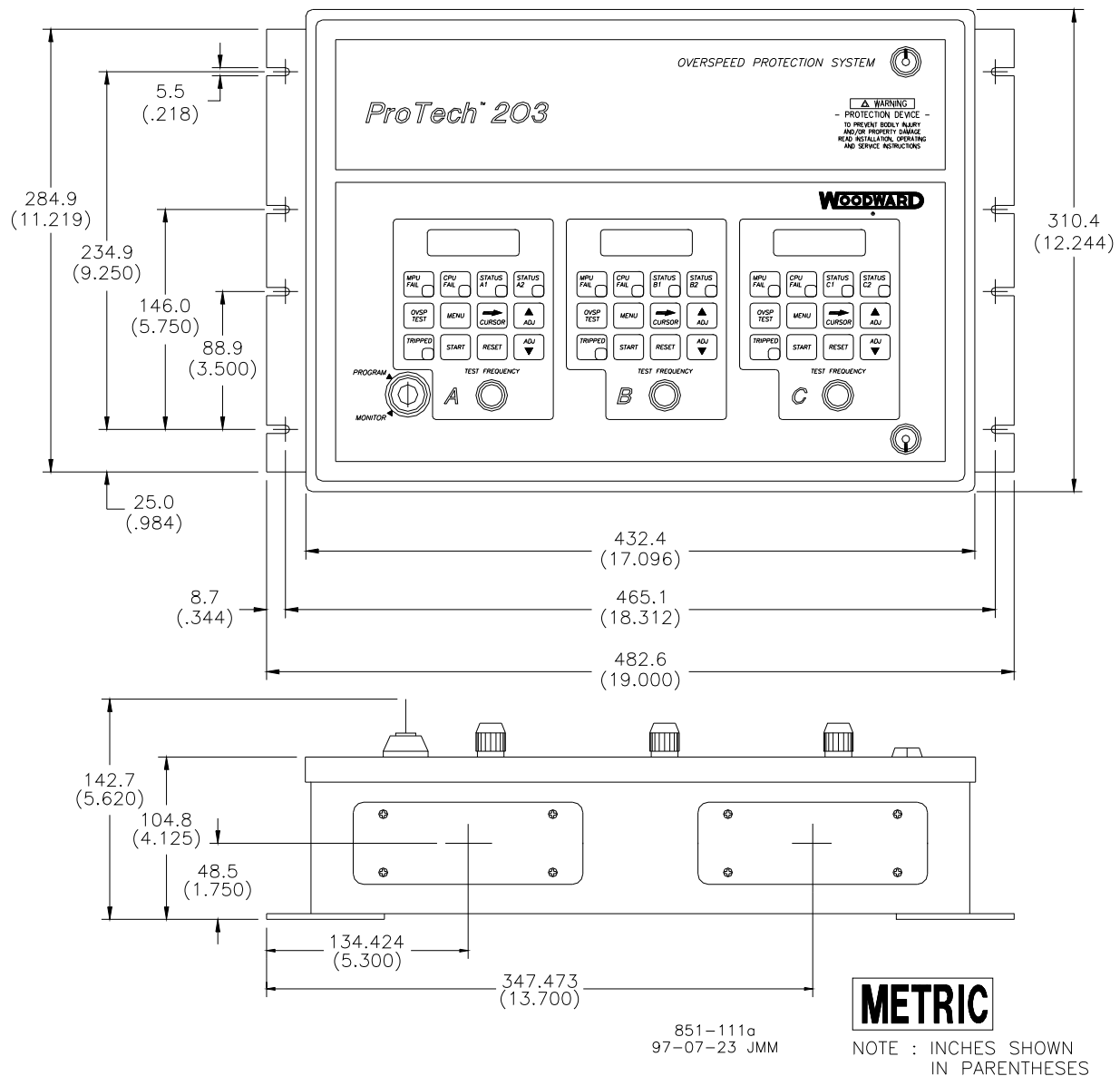
Installation

When a shutdown has occurred, the ProTech system stores and can display the highest overspeed rpm the prime mover reached. Because primer mover damage is higher at higher speeds, this "peak hold" feature provides valuable information on probable damage.

A single speed-sensing unit can be replaced while the ProTech system remains on-line using the other two units. Such "hot replacement" provides uninterrupted overspeed protection in the unlikely event that one unit has a fault.

The net result is an extremely fast digital overspeed protection system that offers user configurability, accuracy, and repeatability, and is available with UL approval with Canadian acceptance for Class I, Division 2, Groups A, B, C, and D hazardous locations. It is packaged in a NEMA 4X enclosure. CE Marked versions are available.

NOTE—When API670 requirements dictate, a cold coil monitoring device must be used with the ProTech 203.



Outline Drawing
(Do not use for construction)

Specifications

Performance

Trip Methods	De-energize relay to trip or Energize relay to trip
Remote Reset	Can be reset from a remote location
Remote Start	MPU fail timer can be started from a remote location
Built-In Self-Test	A built-in frequency generator permits testing of each unit individually while the prime mover is on-line
Key Lock	Prevents any programming or testing by unauthorized personnel
Hot Replacement	Each unit can be replaced with the device running 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 Trip	Immediately after a start operation, a timer starts; 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 speed are programmable
MPU Fail Option	Each unit can be configured so that on the loss of that unit's MPU, the unit can either output both an alarm plus a trip signal, or the unit can output an alarm only
CPU Failure Indications	A separate LED indicates if any unit's CPU is not operating normally
Digital LCD Display	Two 16-character lines show present speed, peak speed, trip point, teeth/revolution, or trip cause for each unit
Lamp Test Feature	Illuminates all LEDs to test
Speed Sensing Frequency Range	100 Hz to 32 kHz
Trip Point Range	250 to 25 000 rpm
MPU Input Amplitude	1 Vrms minimum @ 100 Hz to 25 kHz 2 Vrms minimum @ 25 kHz to 32 kHz maximum 25 Vrms
Power Supply Inputs	The ProTech system can be ordered with each unit's separate power supply input accepting one of the following input voltages: 18–32 Vdc @ 5.12 W 90–150 Vdc @ 4.77 W 88–132 Vac @ 12.5 VA 180–264 Vac @ 16.4 VA
Field Wiring	Both normally open and normally closed contacts are provided in both the de-energized-to-trip and energized-to-trip models
MPU Measurement Circuit	
Input Impedance	2 k Ω
Accuracy	0.05% of point \pm 2 Hz over the operating temperature range
Sample Time	5 milliseconds
Total Response Time	40 ms maximum

Regulatory Compliance

These listings are limited only to those units bearing the UL logo and/or the CE Mark:

European Compliance for CE Mark	Compliant with EMC, ATEX, and Low Voltage Directives
North American Compliance	UL Listed for Class I, Division 2, Groups A, B, C, D
Compliance	API670

Environmental

Operating Temperature	-25 to +60 °C (-13 to +140 °F)
Humidity	US MIL-STD-810D, Method 507.2, Procedure II
Shock	US MIL-STD-810D, Method 516.3, Procedure I
Vibration	US MIL-STD-167, Type 1
Enclosure	IP65 enclosure with conduit entry (similar to NEMA 4)
Weight	7 kg (16 lb)



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