

# ProTech<sup>®</sup> 203

## Overspeed Protection System



### APPLICATIONS

The ProTech<sup>®</sup> 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.

### 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 setpoint. Because it uses digital speed-sensing technology, the ProTech device's setpoint is configured simply by programming the value from the touch panel on the front. To insure 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 setpoint 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.

- Unmatched accuracy and repeatability
- Two-of-three voting
- 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 approved with Canadian acceptance for Class I, Div. 2, Groups A, B, C, and D
- NEMA 4X

# 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
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 @ 0.6 A 90–150 Vdc @ 0.1 A 88–132 Vac @ 0.17 A 180–264 Vac @ 80 mA
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 $\Omega$
Accuracy	0.05% of point $\pm$ 2 Hz over the operating temperature range
Sample Time	5 milliseconds
Total Response Time	40 ms maximum

## General

Certification	UL approved with Canadian acceptance for Class I, Division 2, Groups A, B, C, and D hazardous locations available in some versions; CE-marked versions available
Enclosure	IP65 enclosure with conduit entry (similar to NEMA 4)
Weight	16 lbs (7.3 kg)

## Environmental

Humidity	MIL-STD-810D, Method 507.2, Procedure II
Shock	MIL-STD-810D, Method 516.3, Procedure I
Vibration	MIL-STD-167, Type 1

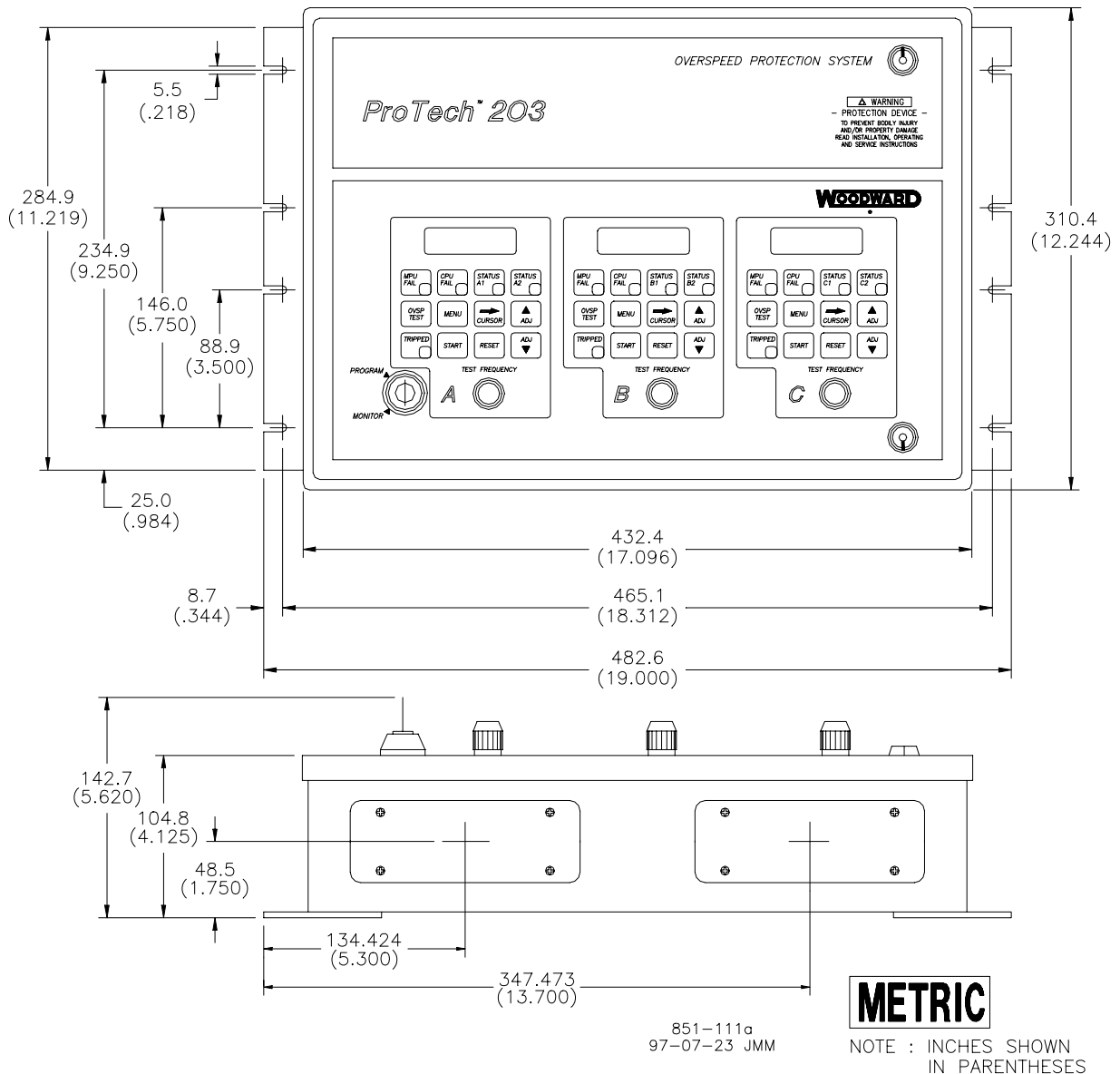
## EMC

Radiated and Conducted Emissions	EN 55011, Class A
ESD	EN61000-4-2, 8 kV air and 4 kV contact
Radiated Susceptibility	ENV50140, 10 V/m, 27–500 MHz, @ 80% AM @ 1 kHz
Fast Transients	EN61000-4-4, 2 kV direct to power leads, 2 kV capacitive to I/O leads
Conducted Susceptibility	ENV50141, 10 Vrms, 0.15–100 MHz, all ads
Operating Temperature	–25 to +60 °C (–13 to +140 °F)

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.





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