

# SW-200B Speed Switch

The SW-200B™ Speed Switch provides three adjustable relay set points for engine overspeed protection, crank disconnect, generator field flashing, and speed monitoring with full field-programming capability.

## 2-Year Warranty

### FEATURES

- **Inputs:** Senses signal frequency from magnetic pickup or AC signal generator.
- **Outputs:** Three relays (speed setpoints) and one 0-1 mA proportional DC output.
- **Field-programmable:** Four DIP switches provide a variety of frequency input and overspeed relay logic configurations. Also three trim potentiometers to adjust setpoint range, and one potentiometer to adjust the proportional output.
- **Circuit:** High-reliability. Virtually immune to electrical and RFI noise.
- **Test/Verify:** Permits testing without over-speeding.
- **Case:** Sealed and gasketed.

### SPECIFICATIONS

#### Environment

- **Temperature:** (storage & operation) -40°F to +185°F (-40°C to +85°C).
- **Vibration:**
  - ◆ MIL STD 810C, Method 514.2, Curve P, Procedure V.
  - ◆ MIL STD 202F, Method 201A (10-55 Hz, continues displacement of 0.06 in. P-P).
  - ◆ Screws on all access holes are predrilled for safety wire.



- **Humidity:** SAE J1211, paragraph 4.2.3., figure 3A; 95% relative humidity at +150°F (+66°C).
- **Dust:** MIL STD 810C, Method 510.1, Procedure 1, Steps 1,4,5,6. (175 ft/min velocity: 0.3 g/ft<sup>3</sup> density; <176 M average particle size).
- **Sealing:** Can open and reseal case without damaging watertight integrity. O-ring sealed access holes for setpoint and proportional output adjustments. Case complies with NEMA Standard 250, Types 3, 4, 12, and 13.
- **Moisture protection:** Component board entirely dip-coated with moisture repellent sealant.

#### Functional

**Power:** 9–40 Vdc, 300 mA maximum.

Withstands:

- ◆ 800 volts peak reverse voltage.
- ◆ 80 volts peak forward voltage, 0.1 second maximum duration.
- ◆ 350 volts peak forward voltage, 1 milli-second maximum duration.

**Standard signal frequency ranges:** 0–11,200, 0–5,000, 0–1,000Hz. Field-selectable using built-in DIP switches.

#### Input Signal:

- ◆ **Minimum signal requirement:** 50 mVrms at frequencies below 1 kHz; 0.4 Vrms at 11 kHz.
- ◆ **Maximum signal:** 70 Vrms.
- ◆ **Minimum input resistance:** 10 kW.

# SPECIFICATIONS

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## NOTE

### **RPM/Frequency Conversion:**

Frequency may be calculated by multiplying the engine speed in RPM by the number of holes or teeth on the gear/flywheel being sensed, and then dividing by 60.

### **Grounding, phasing, referencing:**

All circuits are isolated from earth ground. The input circuit is referenced to the negative side of the battery so that the magnetic pickup can be paralleled with electric governors and other devices similarly constructed.

Signal cable shield can be grounded to the negative side of the battery.

**DC Power application:** At standstill or speeds below setpoints, applying dc power causes no flicker or change in the normally deenergized relays 1 and 2.

**Tach Output:** 0–1 mAdc proportional output for speed drives, speed indicators, recorders, programmers, etc.

Field-adjustable to 1 mA full-scale for any frequency between 25% and 100% of the selected full-scale frequency range.

- ◆ **Linearity:** 1.5% of selected frequency range.
- ◆ **Temperature Effect:** 1.5% of selected frequency range over the operating range.
- ◆ **Signal Amplitude:** 0.25% of selected frequency range.

## RELAYS

*Comments are for the SW-200B at standstill (powered-up, zero speed, no alarms).*

### TYPICAL USAGE

- ◆ **Standard:** One SPDT: Overspeed  
Two SPST: Relays 1 & 2
- ◆ **Option:** Relays 1 & 2 can be replaced by a single SPDT relay.

### Typical Usage

- ◆ **Overspeed Relay:** Energized. De-energizes and latches on overspeed or power loss.
- ◆ **Relay 1:** Deenergized. Energizes non-latched on alarm. *Typically used for crank disconnect.*
- ◆ **Relay 2:** Deenergized. Energizes non-latched on alarm. *Typically used for generator field flashing.*

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## NOTE

- *Relays 1 & 2 can be configured as: both Normally Open (NO); both Normally Closed (NC); or one NC, one NO.*
- *Overspeed relay can be configured as normally deenergized (energizes on overspeed).*

## CONTACT RATINGS

- ◆ **12 Vdc:** 10.0 A, resistive load;  
8.0 A, inductive load.
- ◆ **24 Vdc:** 5.0 A, resistive load;  
4.0 A, inductive load.
- ◆ **120 Vac:** 0.8 A, resistive or inductive load.

## SETPOINTS

**Resetting:** Integral reset push-button switch or by momentary removal and reapplication of power.

**Hysteresis (Nominal):** 3% for all relays.

**Setpoint adjustment range:** 3–100% of full-scale frequency range with integral 25-turn trim potentiometer for each relay.

### Stability of Setpoints

- ◆ **Signal amplitude effect:** 0.1% maximum from 0.4–100 Vrms.
- ◆ **Power Source Effect:** 0.1% of setpoint maximum with 25% fluctuation of power source.
- ◆ **Temperature Effect:** 2.5% of selected frequency range maximum over operating range.

**Response Time:** 50 milliseconds, maximum, any setpoint.

## TEST/VERIFY

Pressing the integral Overspeed Test push button lowers the overspeed setpoint to 60% ±3% of its original value to permit verifying the integrity of the alarm circuitry without overspeeding the engine.

## WEIGHT

2 lbs (0.9 kg)

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