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## Vibration Switches






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**ProvibTech's Vibration Switch Selection Guide**

	Digital Vibration Switch	Electronic Vibration Switch	Mechanical Vibration Switch
			
<b>Model Number</b>	<b>PT580</b>	<b>VS102</b>	<b>PT500</b>
Acceleration (g's)	•		•
Velocity (ips/sec, mm/sec)	•	•	
Displacement (mils, um)	E		
<b>Sensor Interfaces</b>			
Built in Sensor	•	•	•
Accelerometer	•		
Velocity Transducer	•		
<b>Available Outputs</b>			
4-20mA Output	•	•	
Relay Output	•	•	•
Triac Output	•	•	
Buffered Output	•	•	
Modbus Output	•		
<b>Available Options</b>			
Digital- Programmable/ Configurable	•		
Remote Reset	•	•	•
Local Reset	•	•	•
Local Display	•		
Hazardous Rating (CSA, ATEX) Class I Div.1 Zone 1	•	•	•
Environmental Rating- NEMA 4 or IP65	•	•	•
Power-Up Inhibit	•	•	•
Warranty (years)	2	2	2

• = Complete Offering      E = External Velocity Sensor

## PT580 Digital Vibration Switch

### Introduction

The PT580 Digital Vibration Switch is designed to be the “one stop shop” for all vibration switch applications. The PT580 is fully programmable, suitable for harsh environments and hazardous areas. It has a universal mounting feature, wide operating temperature range, dual alarms, 4-20mA output, Modbus communication, and works with an internal or a remote sensor.

### Applications

- ✓ Pumps
- ✓ Motors
- ✓ Industrial Fans
- ✓ Heat Exchangers/ Cooling Towers
- ✓ Engines
- ✓ Reciprocating Compressors
- ✓ Centrifuges
- ✓ Rock or Coal Crushers

### Features

- ✓ The first digital vibration switch
- ✓ Direct replacement for mechanical switches with universal mounting plates and studs
- ✓ Fully programmable
- ✓ 4-20mA output and Modbus
- ✓ Dual alarms with relays or triacs
- ✓ Works with internal or external sensor
- ✓ “Smart Design” universal power supply
- ✓ Wide operating temperature range of -40°C to +85°C (-40°F to +185°F)
- ✓ NEMA 4X, IP65 environmental rating
- ✓ Hazardous area approvals: CSA, CE, PCEC
- ✓ Additional API 670 features: trip-multiply, bypass, programmable alarm delay etc.

### Specifications

#### Frequency Range:

Internal sensor: 2 - 1,000 Hz  
External sensor: 2 - 2,000 Hz

#### Alarms: Dual alarms

Dry-contact relay: 5A 230VAC/115VAC or 5A 30VDC  
Triac: 5A 230VAC. Optically Isolated, Standard NC



<b>Temperature Limit:</b>	- 40 °C to +85 °C (-40 °F to +185 °F)
<b>Power Supply:</b>	95 - 250VAC@ 100mA, 50 - 60Hz, or 22 - 30VDC @ 200mA
<b>Enclosure:</b>	Cast Aluminum (copper free)
<b>Coating:</b>	Standard plastic coating for all cased aluminum parts outside. Mounting plate, mounting stud and local reset are 304 stainless steel.
<b>Environmental Rating:</b>	NEMA 4X, IP65
<b>Hazard Rating:</b>	See order information
<b>Programming (customer selects the option):</b>	Fully programmable with software or Pre-configured at factory

### Physical

<b>Temperature:</b>	
Operation:	-40 °C to +85 °C (-40 °F to +185 °F)
Storage:	-50 °C to +120 °C (-58 °F to +248 °F)
<b>Dimensions:</b>	As shown in the Mechanical drawing
<b>Weight:</b>	1.4kg (3 lbs)

## Order Information

### PT580-ABC-DEF-GGHI

#### A: Alarms\*\*\*

- A = 0\*: Dual SPDT Relays
- A = 1: Single SPDT Relay
- A = 2: Single SPST Triac, NO
- A = 3: Dual SPST Triacs, NO
- A = 4: Single SPST Triac, NC
- A = 5: Dual SPST Triacs, NC
- A = 6: None

#### B: Conduit Entries

- B = 0\*: 3/4" NPT
- B = 1: M20x1.5

#### C: Mounting Plate or Mounting Stud

- C = 0\*: Mounting Plate PT500-13
- C = 1: Mounting Plate PT500-14
- C = 2: Mounting Stud 3/4" NPT
- C = 3: Mounting Stud M20x1.5

#### D: Local Display

- D = 0\*: With display (No Local Reset)
- D = 1: No display (No Local Reset)
- D = 2: No display (With Local Reset)

#### E: Hazardous Area Approval

- E = 0\*: CE Mark
- E = 1: Multiple approvals:
  - CSA: Class I, Div 1, Groups B, C, D, T4 & T6
  - ATEX: II2G Ex d II B+ H<sub>2</sub>T4T6

T4@Ta= -40°C to +100°C

T6@Ta= -40°C to +70°C

PCEC: Ex d II CT4

CE Mark

- E = 2: Multiple approvals (D=1 only):
  - CSA: Class I, Div 1, Groups A, B, C, D, T4 & T6
  - ATEX: II2G Ex d II CT4T6

T4@Ta= -40°C to +100°C

T6@Ta= -40°C to +70°C

PCEC: Ex d II CT4

CE Mark

#### F: Outputs/Communication

- F = 0: None
- F = 1\*: 4-20mA
- F = 2: Modbus
- F = 3: 4-20mA and Modbus

#### GG: Full Scale

- GG = 09: 0 - 5.0g pk
- GG = 10: 0 - 10.0g pk
- GG = 11: 0 - 20.0g pk
- GG = 13: 0 - 200 um pk-pk (with H=2)
- GG = 14: 0 - 250 um pk-pk (with H=2)
- GG = 15: 0 - 500 um pk-pk (with H=2)
- GG = 16: 0 - 10 mil pk-pk (with H=2)
- GG = 17: 0 - 20 mil pk-pk (with H=2)
- GG = 20: 0 - 12.5 mm/s pk
- GG = 21: 0 - 20mm/s pk
- GG = 22: 0 - 25mm/s pk
- GG = 23: 0 - 50mm/s pk
- GG = 24: 0 - 100mm/s pk
- GG = 30: 0 - 12.5 mm/s rms
- GG = 31: 0 - 20mm/s rms
- GG = 32\*: 0 - 25mm/s rms
- GG = 33: 0 - 50mm/s rms
- GG = 34: 0 - 100mm/s rms
- GG = 40: 0 - 0.5ips pk
- GG = 41: 0 - 1.0ips pk
- GG = 42: 0 - 2.0ips pk
- GG = 43: 0 - 4.0ips pk
- GG = 50: 0 - 0.5ips rms
- GG = 51: 0 - 1.0ips rms
- GG = 52: 0 - 2.0ips rms
- GG = 53: 0 - 4.0ips rms

#### H: Sensors

- H = 0\*: Internal accelerometer
- H = 1: TM0782A or accelerometer with 100mV/g (purchase separately)
- H = 2: TM0793V or velocity sensors with 4.0 mV/mm/s (purchase separately)

#### I: Power Supply

- I = 0\*: 115VAC or 230VAC
- I = 1: 24VDC

#### Note:

\* Factory default

\*\*\* Alarm delays 6s and relay works in non-energized mode.

D=0/D=1 default setting is alarm non-latching.

D=2 default setting is alarm latching.

## Optional Accessories

### **PT580-CFG-K**

Configuration and calibration software kit includes:

- ✓ PT580-CFG configuration software CD
- ✓ RS485-USB converter with cable
- ✓ User manual

### **PT580-CFG**

Configuration and calibration software only includes:

- ✓ PT580-CFG configuration software CD
- ✓ User manual

### **RS485-USB**

Cable with RS485 to USB connections for configuration with laptop computer

### **DTM-96**

The system interface module converts the modbus output from the PT580 to an isolated RS232, RS422 or RS485 protocol for communication with PLC or DCS. Each DTM-96 can connect up to 32 PT580 switches.

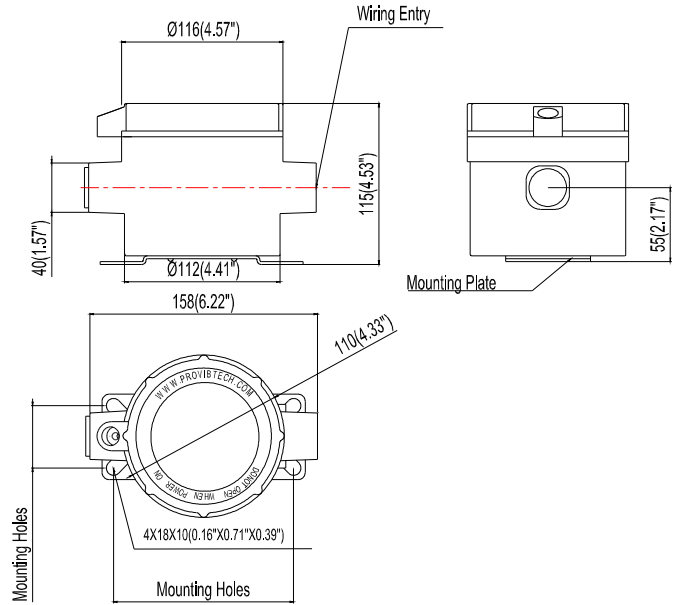
### **PCM370**

The PCM370 condition monitoring software is ideal for plant wide condition monitoring. The PCM370 requires the DTM96 to communicate with the PT580.

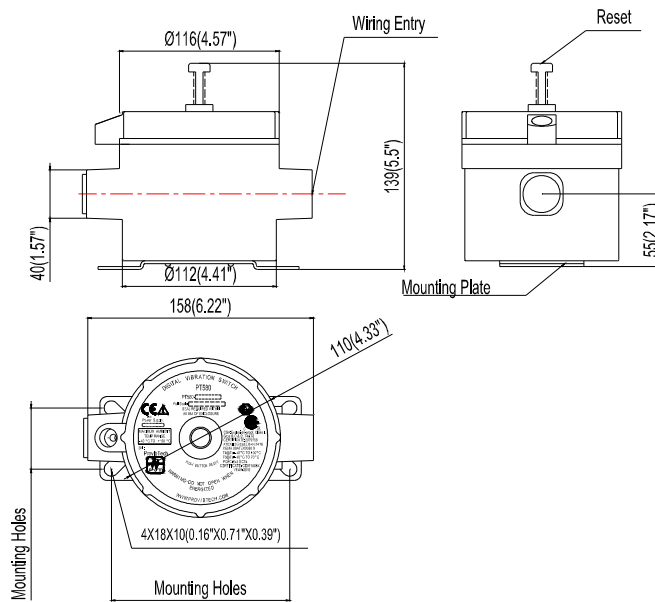
### **PCM-TOUCH**

Touch panel PC with IP65 rating. Ideal to work with PCM370 and PT580-CFG.

Mechanical Outline Drawing

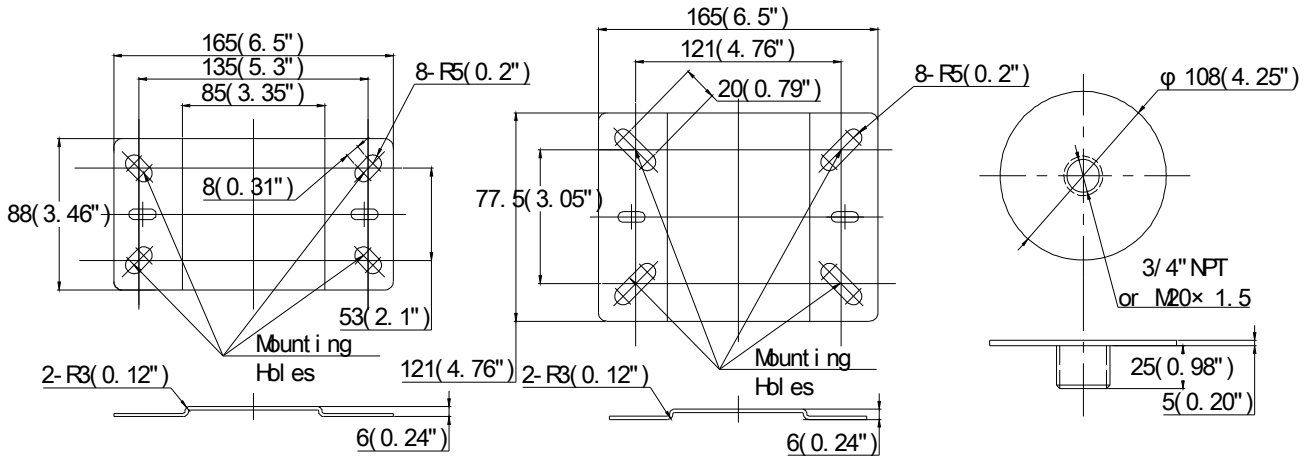


All dimensions in mm (inches)



All dimensions in mm (inches)

**Mounting Plate, Mounting Studs**



**PT500-13**

**PT500-14**

All dimensions in mm (inches)

**PT500-15 (3/4" NPT)**

**PT500-17 (M20×1.5)**

**Accessories**

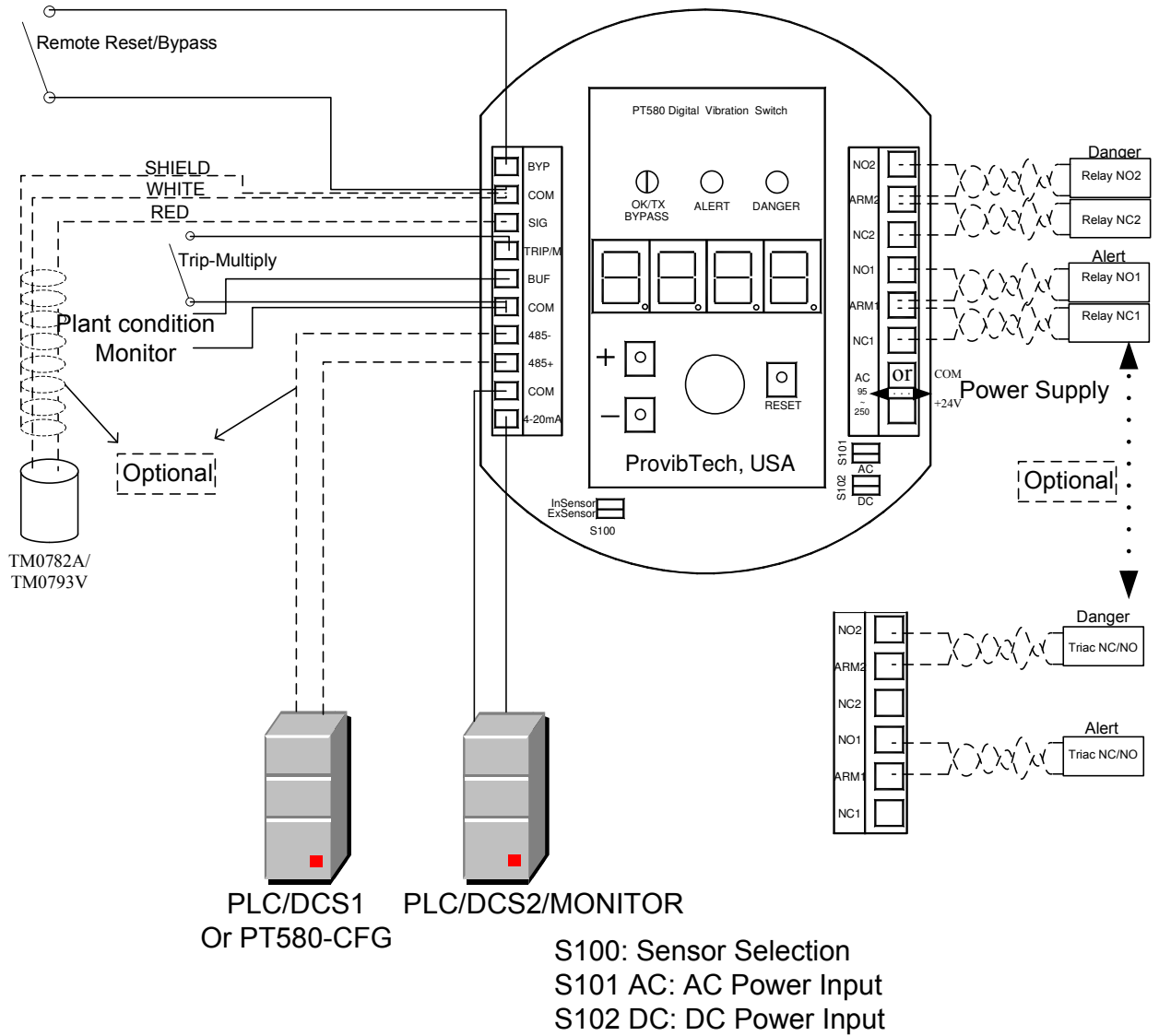


**3/4" NPT seal**

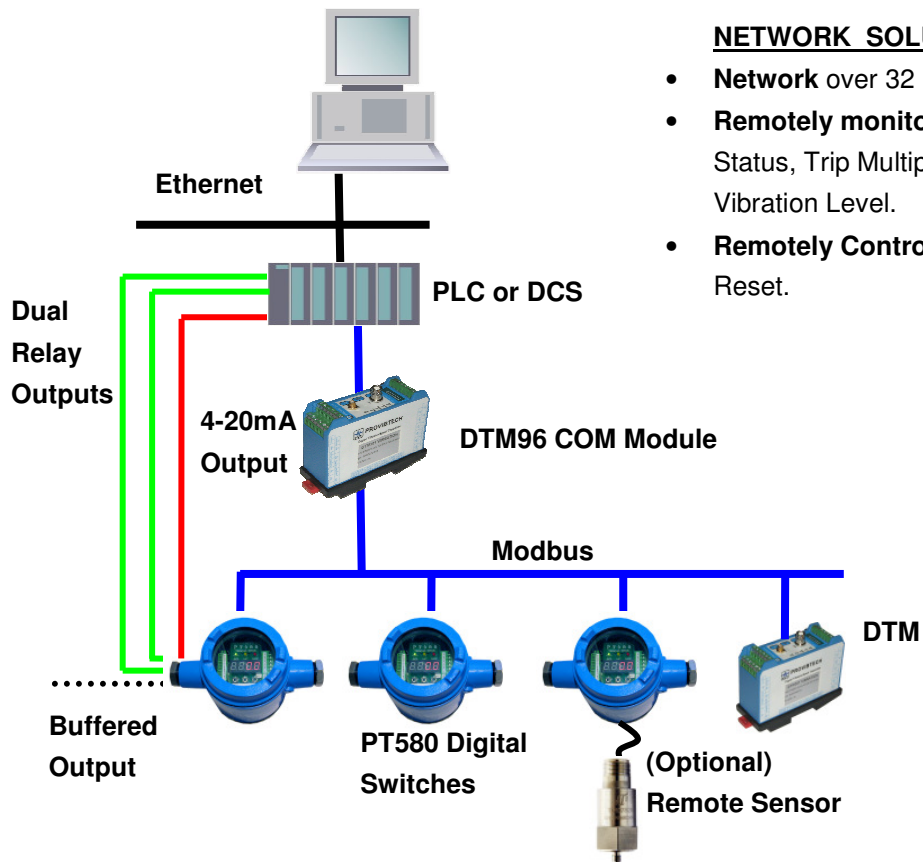
**PT500-18**



**Field-Wiring Diagram**



**Communication Diagram**

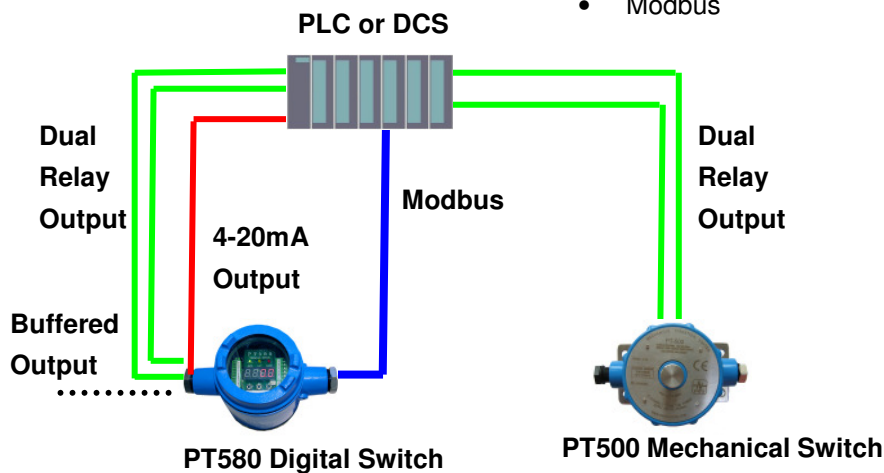


**NETWORK SOLUTIONS**

- **Network** over 32 ProvibTech devices together.
- **Remotely monitor:** Alarm and Channel OK Status, Trip Multiply, Bypass and Overall Vibration Level.
- **Remotely Control:** Trip Multiply, Bypass and Reset.

**Traditional Solution**

- 4-20mA
- Relay Outputs
- Modbus



## VS102 Electronic Vibration Switch

### Introduction

The VS102 Electronic Vibration Switch is designed to be the cost effective solution for vibration switch applications. The VS102's unique and rugged design is suitable for harsh environments and hazardous areas. It has a universal mounting feature, relays or triacs, and a 4-20mA output.

### Applications

- ✓ **Pumps**
- ✓ **Motors**
- ✓ **Industrial Fans**
- ✓ **Heat Exchangers/ Cooling Towers**
- ✓ **Engines**
- ✓ **Reciprocating Compressors**
- ✓ **Centrifuges**
- ✓ **Rock or Coal Crushers**

### Features

- ✓ **Direct replacement for mechanical switches with universal mounting plates and studs**
- ✓ **4-20mA output**
- ✓ **Dual alarms with relays or triacs**
- ✓ **NEMA 4X, IP65 environmental rating**
- ✓ **Hazardous area approvals: CSA, CE, PCEC**

### Specifications

<b>Frequency Range:</b>	2 to 1000 Hz
<b>Alarms:</b>	Dual alarms
Dry-contact relay:	5A 230VAC/115VAC or 5A 30VDC
Triac:	5A 230VAC. Optically Isolated, Standard NC
<b>Temperature Limit:</b>	-40°C to 85°C (-40°F to +185°F)
<b>Power Supply:</b>	95 - 250VAC@100mA, 50-60Hz, or 22 - 30VDC @ 200mA
<b>Enclosure:</b>	Cast Aluminum (copper free)
<b>Coating:</b>	Standard plastic coating for all cased aluminum parts outside. Mounting plate, mounting stud and local reset are 304 stainless steel.
<b>Environmental Rating:</b>	NEMA 4X, IP65
<b>Hazard Rating:</b>	See order information



### Physical

#### Temperature:

Operation: -40°C to +85°C (-40°F to +185°F)

Storage: -50°C to +120°C (-58°F to +248°F)

#### Dimensions:

As shown in the Mechanical drawing

#### Weight:

1.4kg (3 lbs)

**Order Information**

**VS102-ABCD-EFGG**

**A: Alarms\*\*\***

- A = 0: Dual SPDT Relays
- A = 1\*: Single SPDT Relay
- A = 2: Single SPST Triac, NO
- A = 3: Dual SPST Triacs, NO
- A = 4: Single SPST Triac, NC
- A = 5: Dual SPST Triacs, NC

**B: Conduit Entries**

- B = 0\*: 3/4" NPT
- B = 1: M20x1.5

**C: Mounting Plate or Mounting Stud**

- C = 0\*: Mounting Plate PT500-13
- C = 1: Mounting Plate PT500-14
- C = 2: Mounting Stud 3/4" NPT
- C = 3: Mounting Stud M20x1.5

**D: Power Supply**

- D = 0\*: 115VAC or 230VAC
- D = 1: 24VDC

**E: Hazardous Area Approvals**

- E = 0: CE Mark (With Local Reset)
- E = 1: Multiple approvals (With Local Reset):
  - CSA: Class I, Div 1, Groups B, C, D, T4 & T6
  - ATEX: II2G Ex dII B+ H<sub>2</sub>T4T6
    - T4@Ta= -40°C to +100°C
    - T6@Ta= -40°C to +70°C
  - PCEC: Ex d IIC T4
  - CE Mark
- E = 2: Multiple approvals (No Local Reset):
  - CSA: Class I, Div 1, Groups A, B, C, D, T4 & T6
  - ATEX: II2G Ex dII CT4T6
    - T4@Ta= -40°C to +100°C
    - T6@Ta= -40°C to +70°C
  - PCEC: Ex d IIC T4
  - CE Mark
- E = 3\*: CE Mark (No Local Reset)

**F: 4-20mA Outputs**

- F = 0: None
- F = 1\*: 4-20mA

**GG: Full Scale**

- GG = 09: 0 - 5.0g pk
- GG = 10: 0 - 10.0g pk
- GG = 11: 0 - 20.0g pk
- GG = 20: 0 - 12.5 mm/s pk
- GG = 21: 0 - 20mm/s pk
- GG = 22: 0 - 25mm/s pk
- GG = 23: 0 - 50mm/s pk
- GG = 24: 0 - 100mm/s pk
- GG = 30: 0 - 12.5 mm/s rms
- GG = 31: 0 - 20mm/s rms
- GG = 32\*: 0 - 25mm/s rms
- GG = 33: 0 - 50mm/s rms
- GG = 34: 0 - 100mm/s rms
- GG = 40: 0 - 0.5ips pk
- GG = 41: 0 - 1.0ips pk
- GG = 42: 0 - 2.0ips pk
- GG = 43: 0 - 4.0ips pk
- GG = 50: 0 - 0.5ips rms
- GG = 51: 0 - 1.0ips rms
- GG = 52: 0 - 2.0ips rms
- GG = 53: 0 - 4.0ips rms

**Note:**

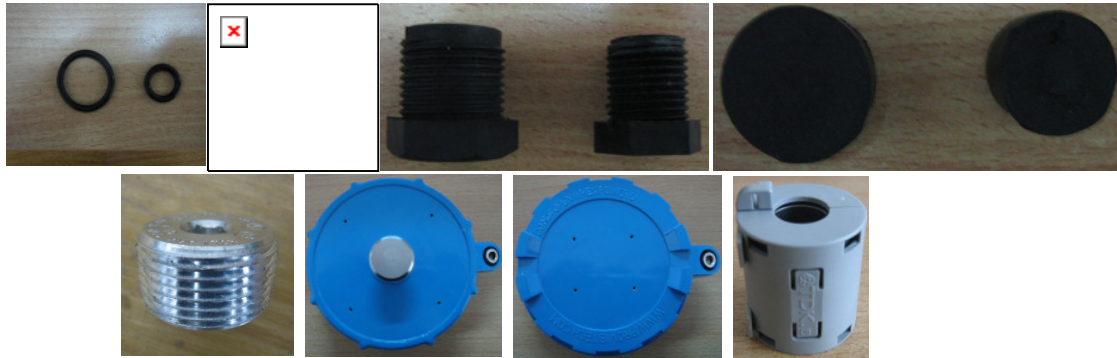
\* Factory default

\*\*\* Alarm delays 6s and relay works in non-energized mode.

E=0/ E=1 default setting is alarm latching.

E=2/ E=3 default setting is alarm non-latching.

### Accessories



**3/4" NPT seal**  
**PT500-18**

**Cover1\***  
**PT500-2**

**Cover2 \*\***  
**PT500-3**

**magnetic ring\*\*\***  
**PT580-10**

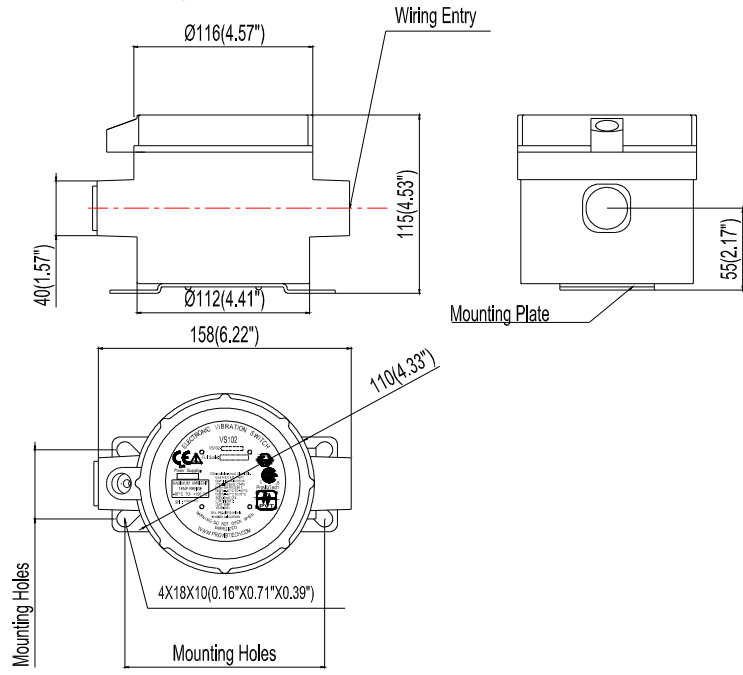
**Note:**

\* Cover1: Relates to the E option; if E=0 or 1, the factory default option is Cover1.

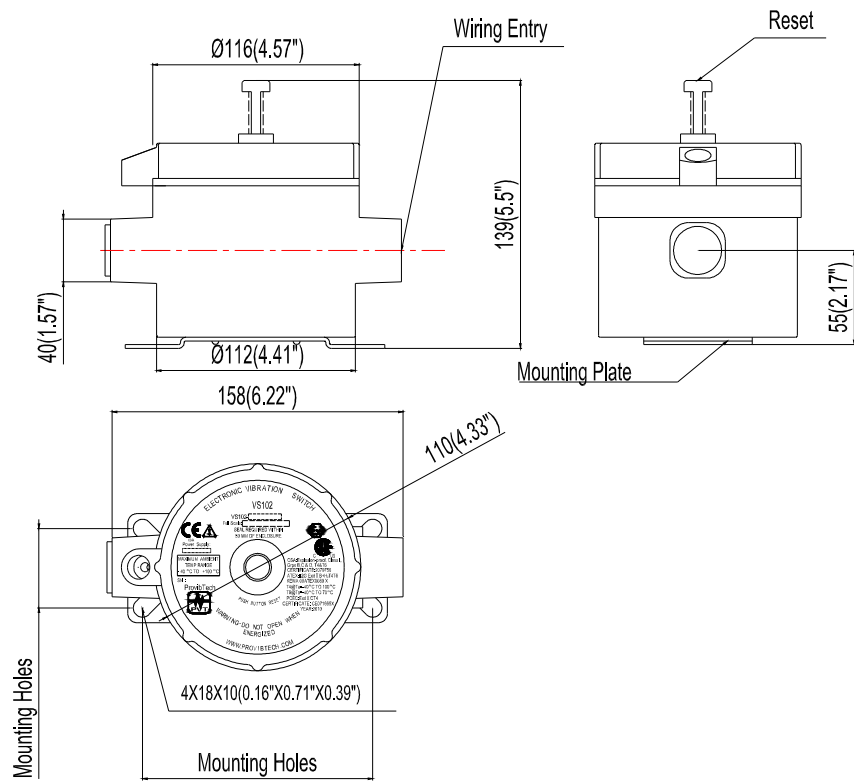
\*\* Cover2: Relates to the E option; if E=2 or 3, the factory default option is Cover2.

\*\*\* Magnetic ring: One at the factory default setting. When in extremely environment or both ends of the vibration switch have wires, user should order additional accessories to acquire good effects. Please refer to figure Trouble Shooting 6 for installation method.

**VS102 Mechanical Outline Drawing**



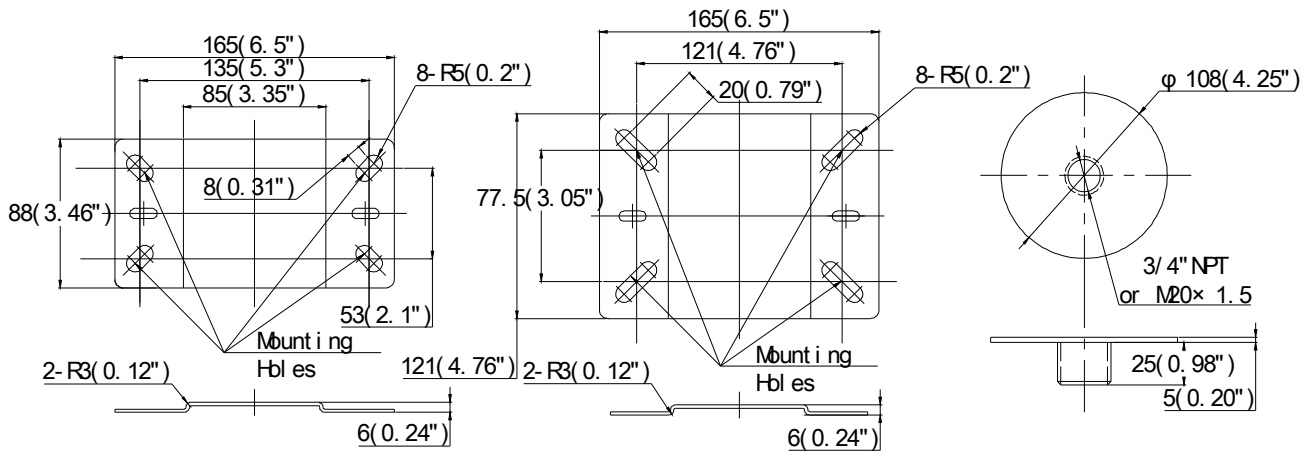
All dimensions in mm (inches)



All dimensions in mm (inches)

**Note:** The default case has no local Reset.

**Mounting Plate, Mounting Studs**



**PT500-13**

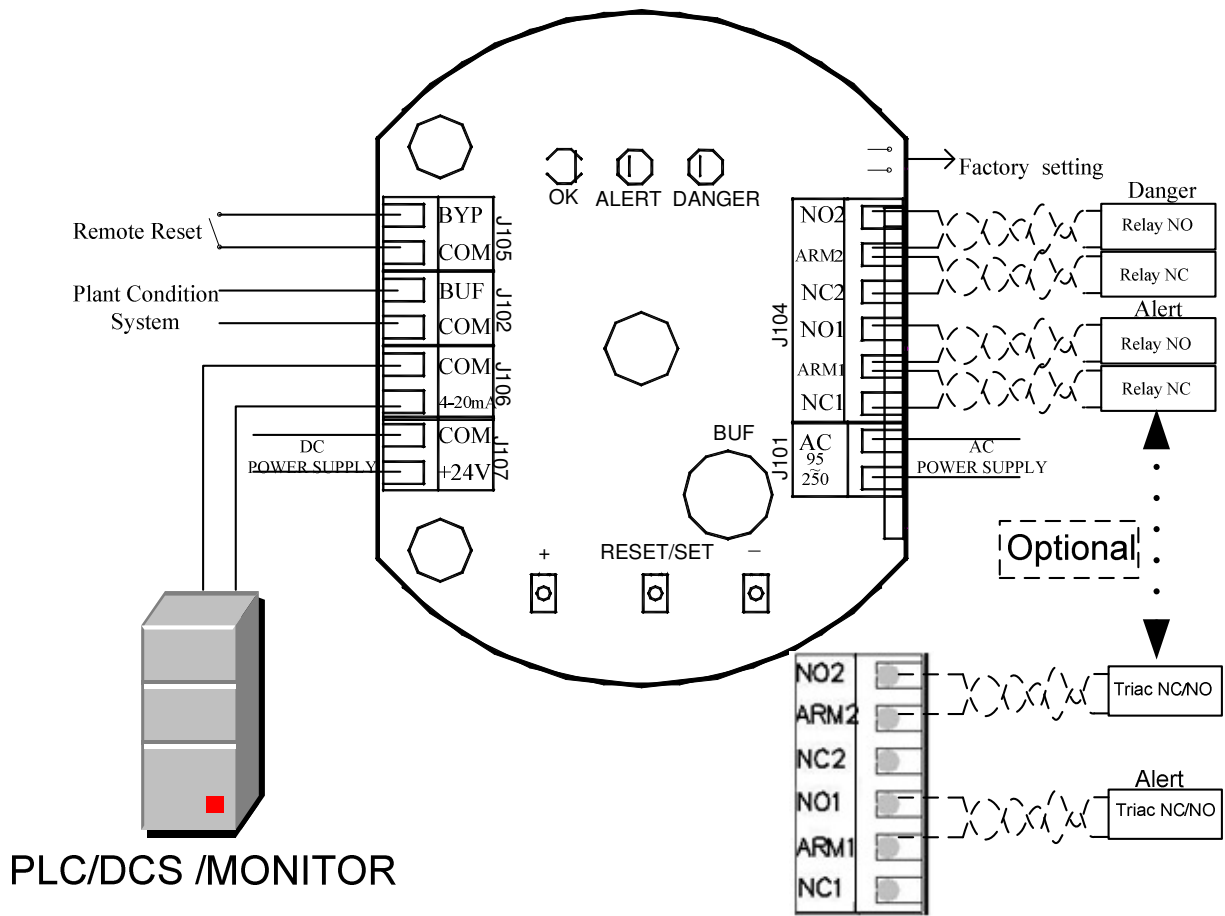
**PT500-14**

All dimensions in mm (inches)

**PT500-15 (3/4" NPT)**

**PT500-17 (M20x1.5)**

**Field-Wiring Diagram**



Note: 1. Select Relay/Triac NO/Triac NC as per Alarm option  
 2. If single alarm is selected, Alert is valid only



## PT500 Electro-Mechanical Vibration Switch Introduction

### Introduction

The PT 500 is an economical solution to provide basic vibration protection for your rotating or reciprocating machines. The PT 500 uses an inertia sensitive mechanism which actuates internal micro-switch contacts when the vibration level exceeds the adjustable set point. The PT 500 start-up delay feature prevents the switch from activating during the higher vibration levels present at the time of the start-up of the machine so that the set point may be adjusted closer to the vibration levels present during normal operation or running speed of the machine.

The PT 500 is your "one stop shopping" for all Electro-Mechanical Vibration Switch applications. Its unique design has all industry required environmental and hazardous area approvals. The E-coat option is suitable for offshore and very corrosive environmental applications. Universal mounting plate will mount in existing mounting holes when replacing older mechanical vibration switches.

Applications include:

- ✓ Fans
- ✓ Cooling Motor/Fans
- ✓ Fin Fans
- ✓ Heat Exchangers
- ✓ Engines
- ✓ Reciprocating Compressors
- ✓ Centrifuges
- ✓ Rock or Coal Crushers

### PT500 Features

- ✓ Wide operating temperature range of -40°C – 100°C (-40°F – 212°F)
- ✓ All industry environmental ratings
- ✓ Optional NEMA 4X (E-coat) IP65 environmental rating
- ✓ Hazardous area agency approvals CSA, ATEX, CE



- ✓ Universal mounting
- ✓ Local and remote reset
- ✓ Start up delay
- ✓ SPDT, (2) SPDT and gold plated contact options

### Specification

**Function:** Armature mechanism trips on high vibration and operates snap action switch.

**Vibration Range:** See How to Select "C"

**Frequency Range:** 0 to 3600 rpm

**Set Point Adjust:** 0 to 100% of range.  
Internal set point adjustment.

**Local Reset:** Local reset of the switch for field

**Remote reset with Start-up Delay:** Applying reset coil voltage at start up holds mechanism from tripping delay about 20-30 seconds, after which the switch is automatically activated.

**Reset Coil Power Supply:** 95 - 250VAC@100mA,  
50 - 60Hz or  
20 - 30VDC @ 200mA

**Temperature Limit:** -40°C to +100°C

**Enclosure:** Casted Aluminum

**Environmental Rating:** NEMA 4X, IP65

**Switch Contact(s) Rating:**  
15A, 125VAC, 250VAC, 480VAC  
1/8 HP 125VAC 1/4 HP 250VAC  
1/2A, 125VDC; 1/4A, 250VDC

Gold plated contact: 0.1A 125VAC; 0.1A 30VDC

**Hazard Rating:** See order information

## Physical

### Temperature

Operation: -40°C - + 100°C (-40°F - +212°F)

Storage: -50°C - + 120°C (-58°F - +248°F)

### Dimension

See attached drawing

### Weight

PT500	1285g (2.8 lb)
PT500-13	205g (0.45 lb)
PT500-14	279g (0.6 lb)
PT500-15(PT500-17)	440g (0.97 lb)
PT500-20	112g (0.25 lb)

### B: Relay Contact

B = 1: SPDT

B = 2: (2) SPDT

B = 3: SPDT (gold plated contact)

B = 4: (2) SPDT (gold plated contact)

### C: Full Scale

C = 1: 5g

C = 2: 2g

C = 3: 10g

### D: Reset Power with Start-up Inhibit; Local Reset

D = 0: Local Reset only

D = 1: Remote Reset and Inhibit; Local Reset

D = 5: Remote Reset and Inhibit; No Local Reset

### E: Conduit Entries/Mounting Plate or Mounting Stud

E = 1: 3/4" NPT, Mounting Plate PT500-13

E = 2: 3/4" NPT, Mounting Plate PT500-14

E = 4: M20×1.5, Mounting Plate PT500-14

E = 5: M20×1.5, Mounting Plate PT500-13

E = 6: 3/4" NPT, Mounting Stud 3/4" NPT

E = 7: M20×1.5, Mounting Stud M20×1.5

## Order Information

### PT500-ABC-DE

#### A: Hazardous Area

A = 0: CE Mark

A = 1: Multiple Approvals (With Local Reset)

CSA: Class I, Div 1, Groups B, C & D T4, T6

ATEX: II 2G, Ex dII B+ H<sub>2</sub>T4T6

PCEC: Ex dII CT4

CE Mark

A = 5: Multiple Approvals (No Local Reset)

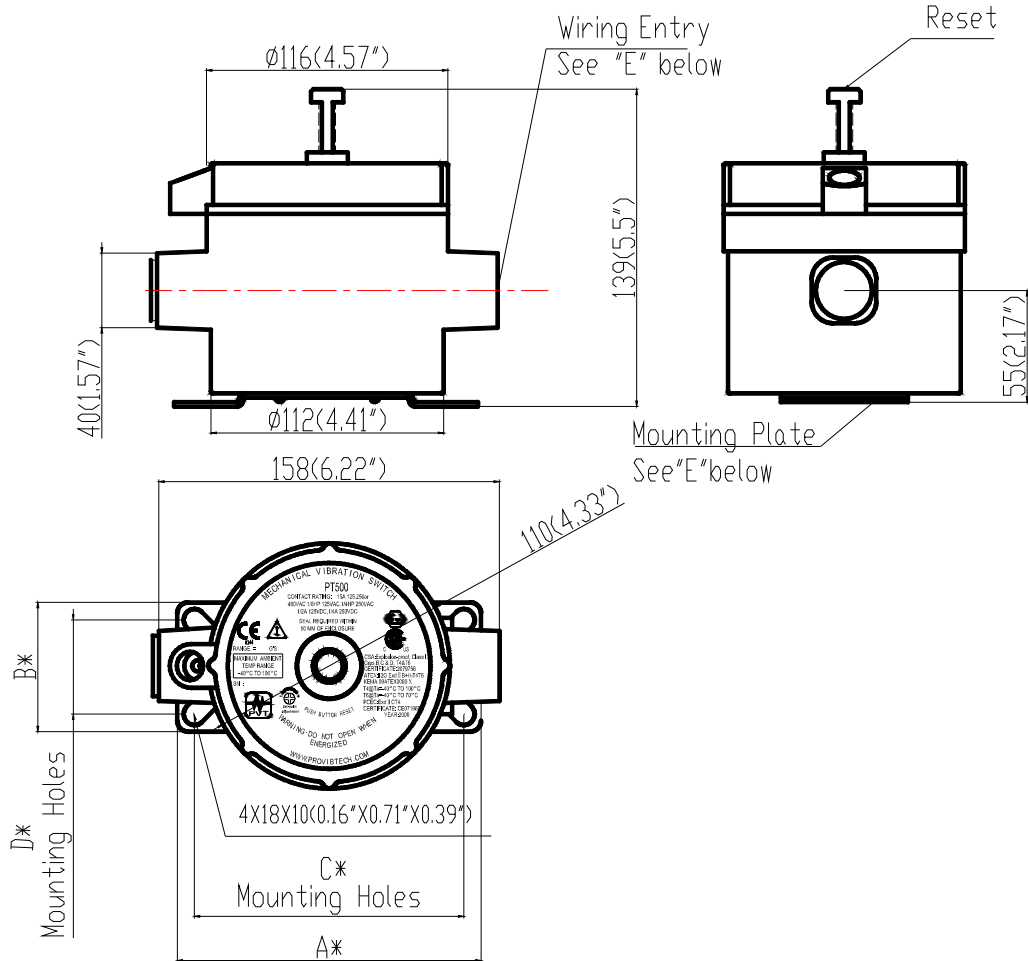
CSA: Class I, Div 1, Groups A, B, C & D, T4, T6

ATEX: II 2G, Ex dII CT4T6

PCEC: Ex d II CT4

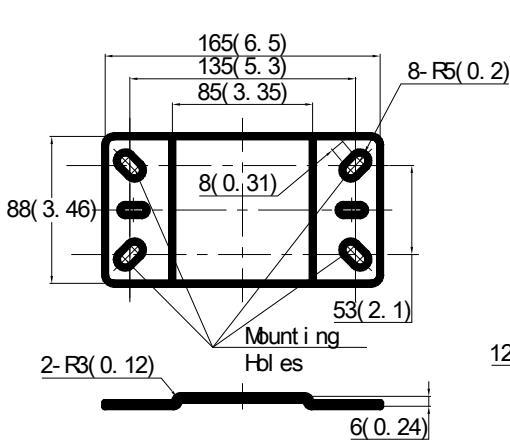
CE Mark

Mechanical Outline Drawings

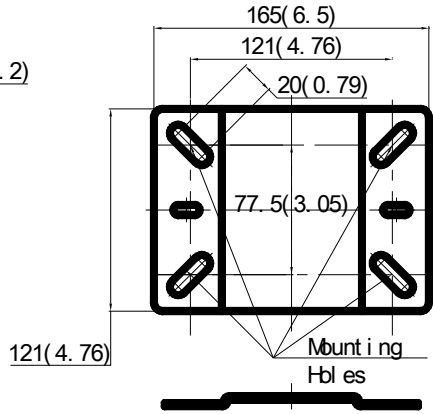


**Accessories**

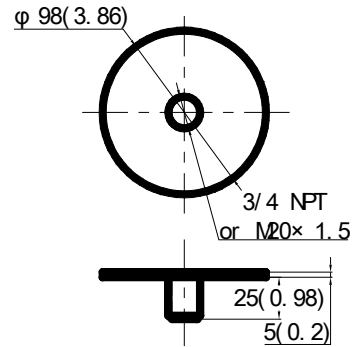
Mounting plate and mounting studs:



**PT500-13**



**PT500-14**



**PT500-15 (3/4' NPT)**

**PT500-17 (M20x1.5)**



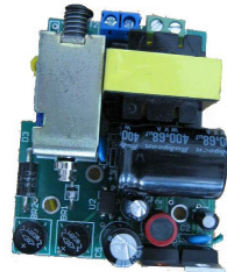
**3/4' NPT seal**  
**PT500-18**



**3/4' NPT cable feedthrough**  
**PT500-19**



**Blank cover**  
**PT500-3**



**Remote reset circuit**  
**PT500-20**

**Field-Wiring Diagram**

