

# IMI 686B vibration switch

INSTALLATION - OPERATION - MAINTENANCE

Z1070990 C ISSUED 9/2026

READ AND UNDERSTAND THIS MANUAL PRIOR TO OPERATING OR SERVICING THIS PRODUCT.



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## overview

The IMI 686B vibration switch is designed and applied specifically for cooling tower applications. The casing is stainless steel, hermetically sealed and the cable set is molded to the casing to prevent water vapor and contaminants from entering the switch or its connection points.

The switch is factory programmed by SPX specifically for cooling tower vibration protection and should not be reprogrammed unless directed by SPX.

Refer to wiring diagrams in this manual for interfacing with VFD and motor starter equipment. Typically the switch is wired to the shutdown circuit of a VFD or motor starter. The internal switch contact is rated at 20mA, do not exceed this value. Most VFDs have a 24 VDC low current safety circuit which is well under the 20mA value.

The IMI 686B vibration switch has a single contact. If two contacts are required use a Marley IB1 interface box or one of the output fault contacts on the VFD to indicate a VFD shutdown.

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### **Caution**

*Applying this switch directly in line with a motor starter operating coil may damage the switch due to high inrush current when energizing the coil. When applying the switch to a motor starter consider using the Marley IB1 interface box.*

### **General Features**

- Tested in cooling tower applications by SPX engineers who rated its performance superior to mechanical vibration switches.
- Factory-programmed by SPX specifically for cooling tower vibration protection.
- Switch may be reset remotely without entering the cooling tower.
- Repeatable trip-point includes built-in delay for startup and momentary vibration spikes.
- Monitors vibration velocity for consistent results.
- Able to sense low frequency vibrations better than a mechanical switch.
- Integral 30' (9m) cable with molded connection at the switch protects the connection point wiring from humidity and chemical exposure.
- NEMA4X/IP68 hermetically-sealed stainless steel enclosure withstands harsh internal environments in a cooling tower.
- Factory installed at location near primary source of vibration.
- 2-wire combination power and control circuit adaptable to most VFD circuits.
- Wide operation temperature range: -40 to 185°F.

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## installation

### Sequence of Operation

In normal operation the switch is in a N.C. (normally closed) position with or without power applied. Once powered, the switch will remain in a closed state allowing mechanical equipment to operate. If the switch is subjected to a continuous high vibration level for 3 seconds or more the switch will open and remain open in a latched state until reset back to a closed position. The three second delay allows the tower fan to accelerate through critical frequencies avoiding nuisance tripping.

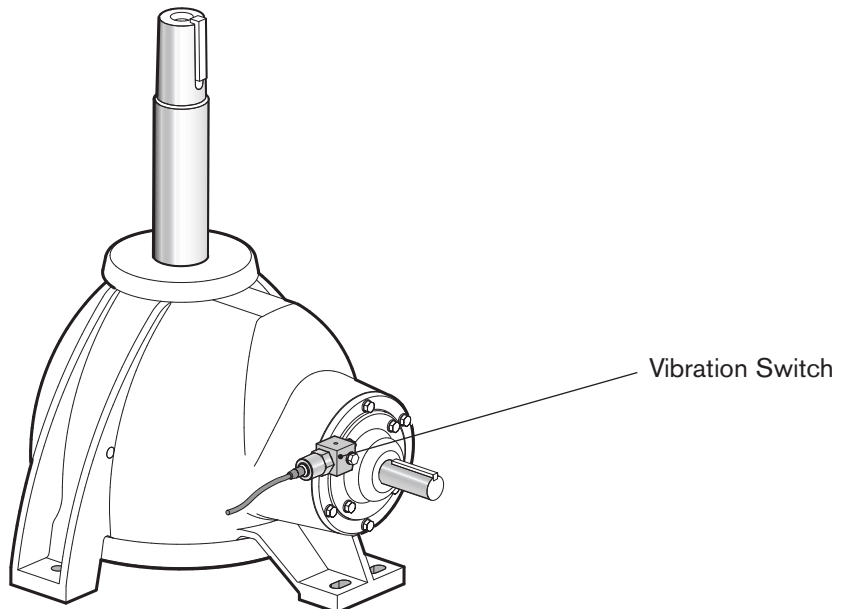
When the switch trips, the cooling tower has been subjected to a higher than normal vibration and should be inspected before being put back into service. Lockout the VFD or motor starter equipment and inspect the tower's mechanical equipment for possible vibration issues. An unbalanced driveshaft or coupling may cause enough vibration to trip the switch.

After the vibration issue is resolved and corrected, reset the vibration switch. To reset, power must be discharged then reapplied to the switch. When the switch is used in a VFD or motor starter safety circuit resetting may be accomplished by cycling power at the VFD or motor starter line side disconnect. Refer to the starter equipment wiring diagram or manual before attempting this operation. When cycling power off at a VFD, keep power off for 30 seconds allowing the VFD capacitors to totally discharge.

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### Warning

***Cooling tower controls are typically two wire circuits so once the switch is reset the fan motor may start automatically without warning. Make sure personnel are in a safe location.***



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### Caution

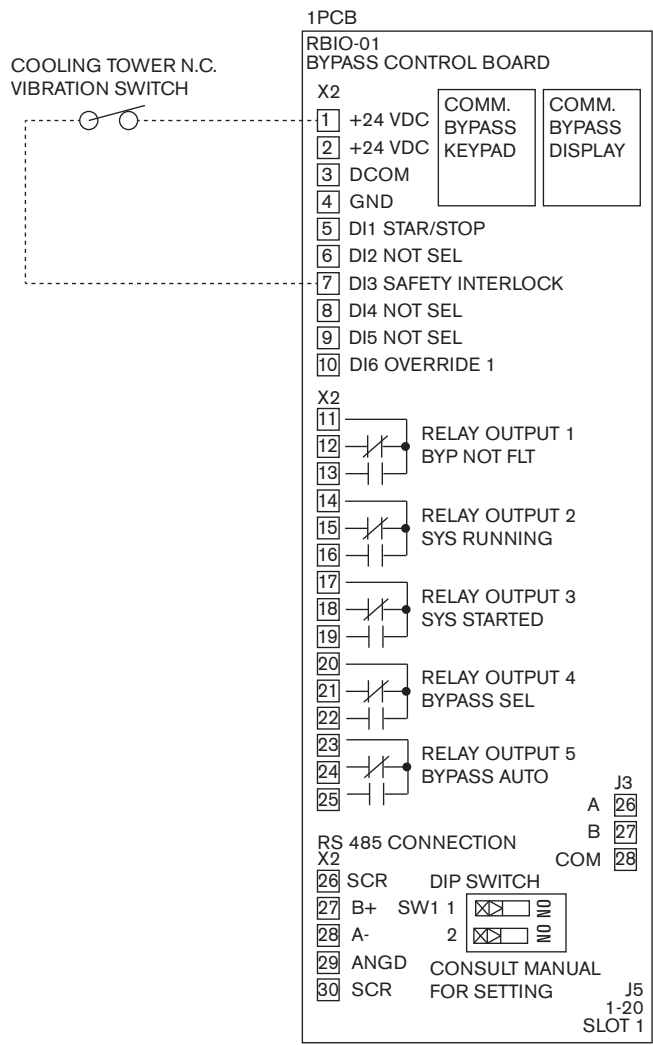
***Torque vibration switch 2-5 ft·lb<sub>f</sub> (3-7 N·m) when installing or reinstalling.***

# wiring

## Two-Wire Control Circuit using an SPST Switch

Typical connection points for the IMI 686B vibration switch used with the E-Clipse bypass terminal strip of an ABB ACH580 VFD.

Breaking the control circuit between points 1 and 7 will disable VFD and bypass operation. To reset the vibration switch remove incoming power to the VFD, wait a minute or two allowing the VFD capacitors to discharge then reapply power. At this point the switch will be in a closed state allowing VFD operation.





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## frequently asked questions

### **Voltage Ratings**

Q What are the available voltage ratings?

A 24 to 240 VDC/AC - 50/60Hz.

### **Sensor**

Q Is the switch solid state?

A Yes – a piezoelectric accelerometer senses the vibration level to activate a solid state relay when tripped. There are no mechanically moving parts.

Q Is the switch factory programmed?

A Yes – the switch is programmed for the specific use within a cooling tower.

Q Does the switch have two contacts?

A No – the switch has one contact that is factory programmed for N.C. operation and latches open upon a trip.

Q If two contacts are required can SPX accommodate this requirement?

A Yes – an interface box with two sets of mechanical dry relay contacts is available.

Q Is a 4-20mA vibration level output signal available?

A No – this device is only a switch.

Q Can the switch be reset remotely?

A Yes – removing the power to the switch will reset it back to normal operation.

Q Does the switch require maintenance?

A No.

### **Switch Mounting**

Q What is the standard mounting stud?

A 1/4-28 UNF threads.

Q What is a typical mounting location?

A On a gearbox.

Q Is an explosion-proof design available?

A Yes – as a special. The explosion-proof model meets Class 1 Division 2 Groups A, B, C, and D.

### **Wiring**

Q Is the switch furnished with a cable?

A Yes – the switch includes an integral 30' (9m) cable with blunt connection ends.

Q Can the probe leads be extended?

A Yes – using #18 gauge 2-wire stranded copper conductor plus a shield. SPX recommends using a junction box with terminal points to make connections for the extension wiring.

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## frequently asked questions

Q Can the leads be cut to length?

A Yes – excessive cable should be coiled and secured if wires are not cut to length.

Q Is the vibration switch replaceable without having to replace the cable?

A No – the cable is attached with an integrated molded connection. This connection helps prevent water entry into the switch.

Q Does the probe lead need to be in conduit?

A The sensor cable is rated for outdoor use. Follow local codes to determine if cable should be placed in conduit.

### **Integration**

Q Can the switch be interfaced with the VFD in the Marley AIO control panel?

A Yes – the Marley AIO panel provides circuits to shut down the VFD and a status contact used for a remote BMS.

Q Can the switch be interfaced with other equipment such as an electromechanical motor starter?

A Yes – SPX can provide an interface box.

## Specifications

| Part Number | Description                                     | Enclosure Rating                       | Cable                                                                                 | SPX Factory Programmed           | Standards |
|-------------|-------------------------------------------------|----------------------------------------|---------------------------------------------------------------------------------------|----------------------------------|-----------|
| 2598732     | Standard Vibration Switch                       | NEMA4X/IP68<br>Stainless Steel         | 30' (9m) with water-tight molded connection at switch and flying ends at opposite end | 0.7 ips peak with 3 second delay | CE        |
| 2695604     | Vibration Switch with Explosion-Proof Enclosure | CSA Class1, Div 2<br>Groups A, B, C, D | Conduit head with terminal blocks<br>No Cable                                         | 0.7 ips peak with 3 second delay | CSA       |
| 2600177     | IB1 Interface Box                               | NEMA 4X/IP56<br>Fiberglass             | No Cable                                                                              | N/A                              | CSA<br>UL |



**Standard Vibration Switch**



**Vibration Switch with  
Explosion Proof Enclosure**

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