VIBRATION ANALYSIS HARDWARE

PAB110 Series Phase Analysis Box
12 Sensor Inputs
Product Manual

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Introduction

CTC phase analysis box solutions allow for the monitoring of remotely-mounted vibration sensors, which would otherwise be restricted to human access due to safety considerations.

PAB110 Series Phase Box Overview: ***Four to 12 sensor inputs (four to 12 measurement channel outputs), fiberglass enclosure***

The PAB110 standard size, premium fiberglass phase analysis box is used to streamline phase analysis with a compact test interface that consolidates wiring from up to 12 sensors into a single enclosure. Two switched outputs to BNC Jacks make it easy to verify phase across multiple measurement points without disconnecting sensors or modifying system wiring. PAB Series enclosures are designed to have field input cabling installed behind the board. A flip-down panel allows the user to wire connections on location.

Rated for NEMA 4X (IP66), the PAB110 is resistant to hose-directed fluid and corrosion. The box can also withstand harsh environments, including temperatures ranging from -58°F to 180°F (-50°C to 82°C). A snap latch is installed on the door, allowing the box to be sealed from the elements when not in use.

Product Dimensions

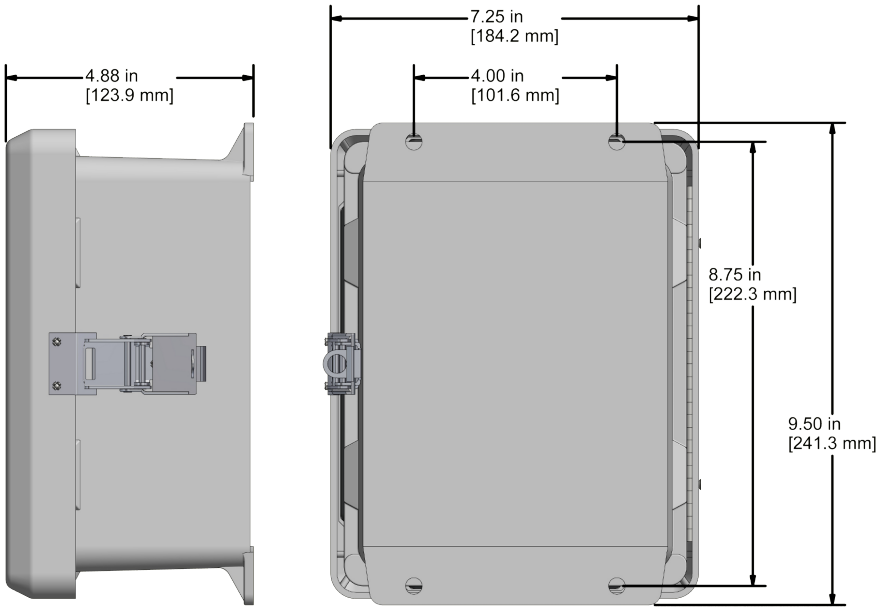


Figure 1. Dimensions

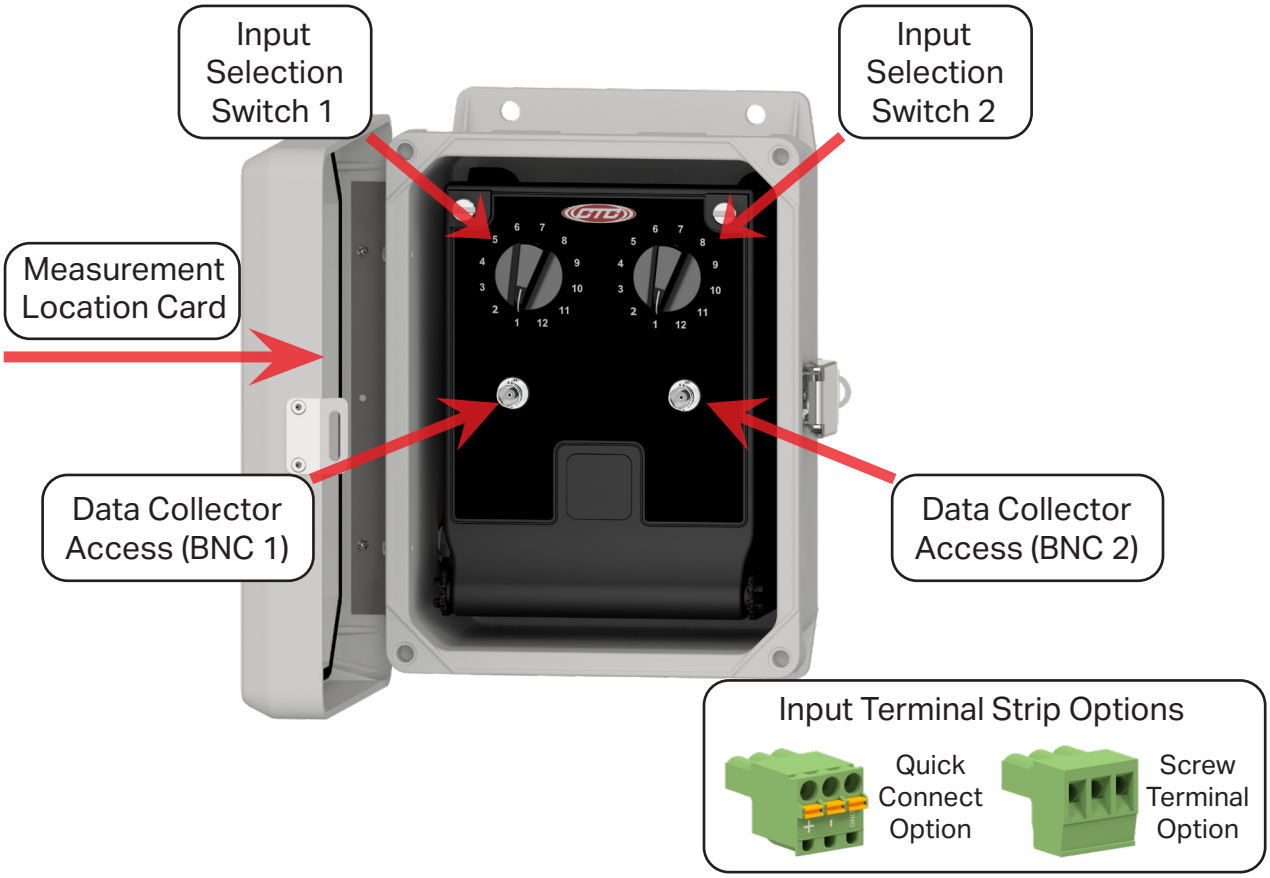


Figure 2. Diagram

Mounting Instructions

Molded mounting brackets are included on the enclosure. Wall anchoring screws are not included.

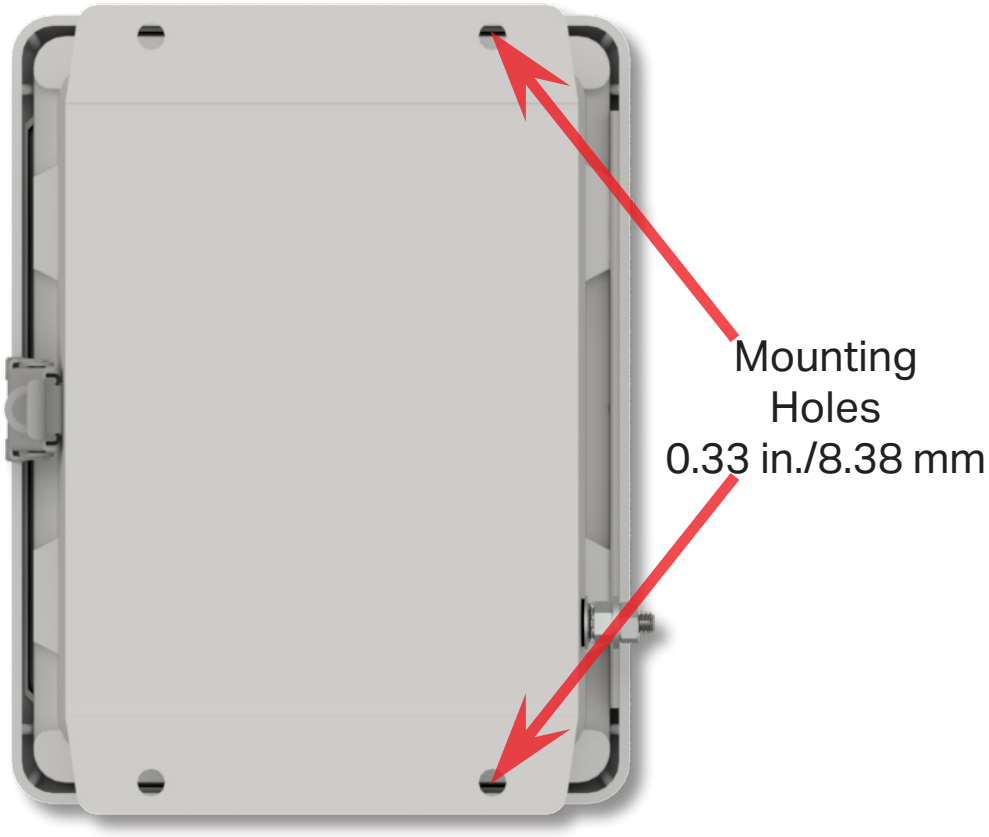
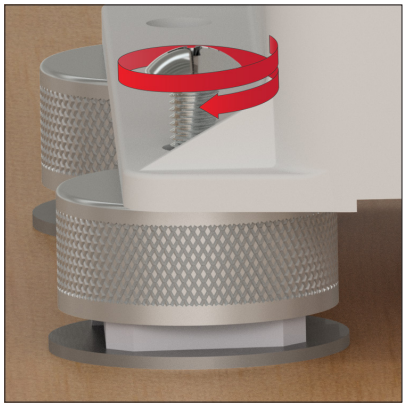


Figure 3. Vibration Phase Analysis Box Rear View

Magnet Mounting with BOXMOUNT-2A

The BOXMOUNT-2A is a separate, optional accessory that is ideal for mounting the PAB110 onto any magnetically attractive metal surface.

1. Leaving the magnets attached to their shunts, arrange them on a flat, level surface. Place the junction box on top of the magnets.



2. Insert the screw through the channel on the junction box foot into the tapped hole of the magnet and tighten until the screw is hand tight.

3. Repeat this process for the remaining three screws.

4. Remove the shunts from the magnetic bases. Attach the assembly to a metal surface at the intended location.

Conduit Entry

If you have purchased a phase analysis box without cable entries provided, you should add your own entry prior to mounting the enclosure. CTC does not recommend putting holes in the top of enclosures as it will cause restricted access to the wire termination connection points and also allow possible moisture ingress.

Note: To prevent a buildup of condensation inside the enclosure, provide drainage by drilling a hole in the lowest point of the conduit.

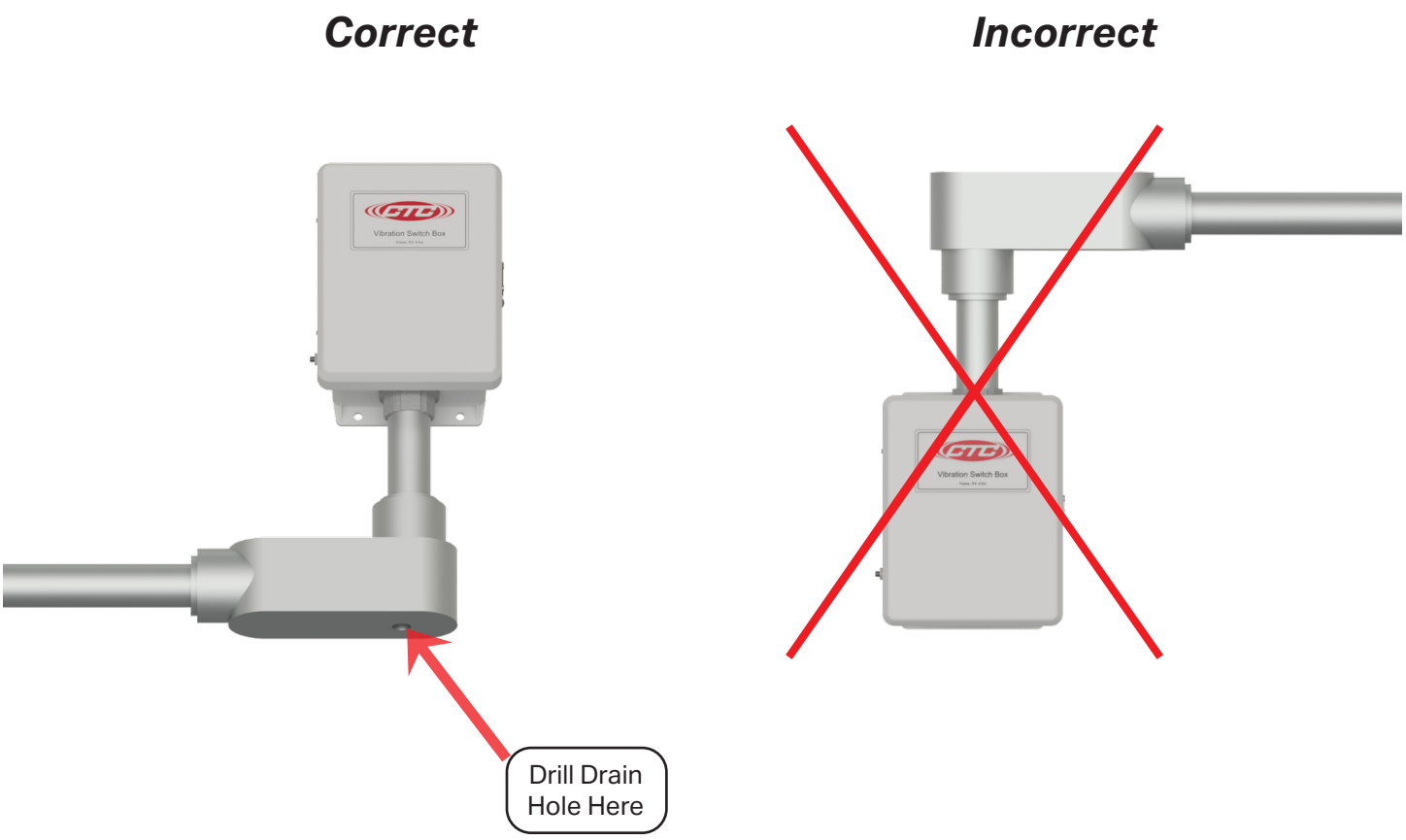


Figure 4. Conduit Entry for Phase Analysis Box

Grounding

Ensure the shield ground wire on the PAB110 Series Phase Analysis Box is grounded to earth ground.

A. Mounting to Earth Ground

When mounting PAB110 Series Switch boxes to earth ground (such as an I-Beam), mount the shield ground wire using a mounting bolt through one of the mounting brackets on the enclosure. See Figure 5 below.

Figure 5. Proper Shield Grounding Technique

B. Magnet Mounting or Mounting to Non-Grounded Structure

When mounting the phase analysis box to a non-grounded structure, or by using BOXMOUNT-2A, ensure the shield ground wire or customer-supplied ground wire is tied to a source of earth ground.

Figure 6. Ground Wire Placement

Sensor Installation

Installation of Sensors/Signal Input Cable

1. Feed blunt-cut end through the cable entry at the bottom of the enclosure.
   Note: It is recommended that cables are marked on both ends.

For cord grip cable entry, take off the cord grip cover with bushing and run cable through it then into the enclosure. Hand-tighten cord grip cover to base to prevent damage of cord grip.

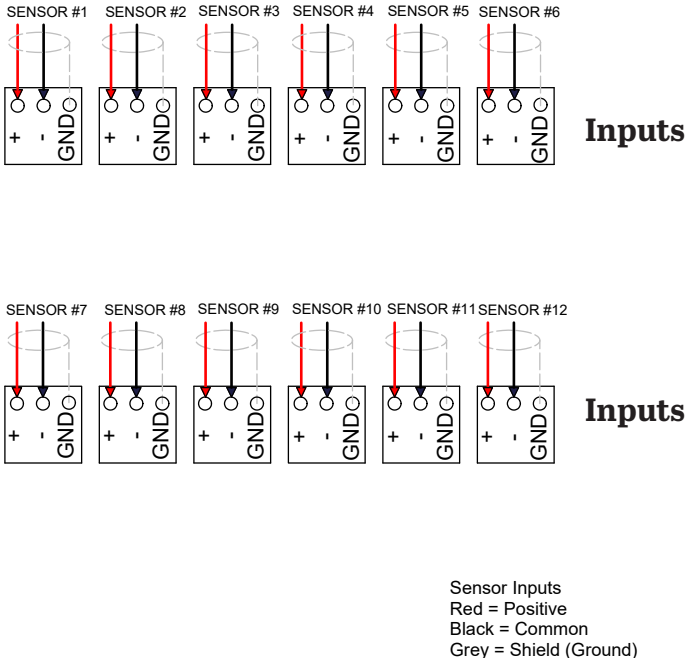
Figure 7. Front View

Figure 8. Bottom View with Cord Grips Installed

1. Strip outer jacket of cable back 1¼ in. and remove all of the shielding.
2. Separate the internal wires from the shield.
3. Strip red and black insulation back ¼ in.

Figure 9. Stripped Wire

4. Locate the appropriate plug (identified by channel number), remove it, and install the wires using a small flathead screwdriver. Push plug back into location. Orientation is as follows:
   a. Red insulated conductor wire is connected to (+).
   b. Black insulated conductor wire is connected to (-).
   c. Shield drain wire is connected to ground (GND).
   d. Depress selected position button to open terminal for respective wire (may require a mini flathead screwdriver).



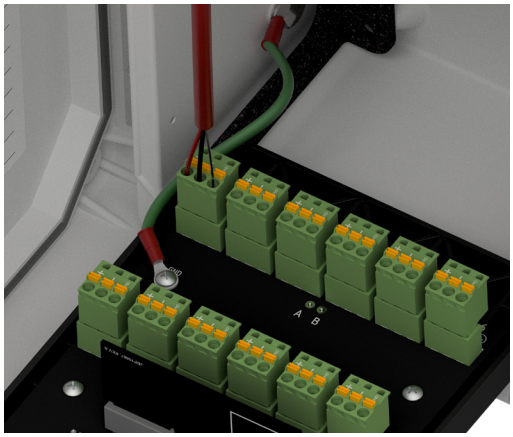


Figure 10. Field Wiring for Two-Conductor Sensor Inputs

5. Insert plug into the appropriate PC board connector and double check to ensure that the cable is going to the correct channel.
6. Mark the Measurement Location Card located on the inside front cover with a description of each measurement location.

Grounding for Sensors in a Hazardous Environment

When using the PAB110 with sensors installed in a hazardous area, do not connect the cable shield/drain wire to the GND terminal on the PAB110 terminal block. Refer to the sensor's approved installation control drawing for required mounting and grounding practices. The diagram below is intended as a guide only for junction box wiring and installation in the safe zone.

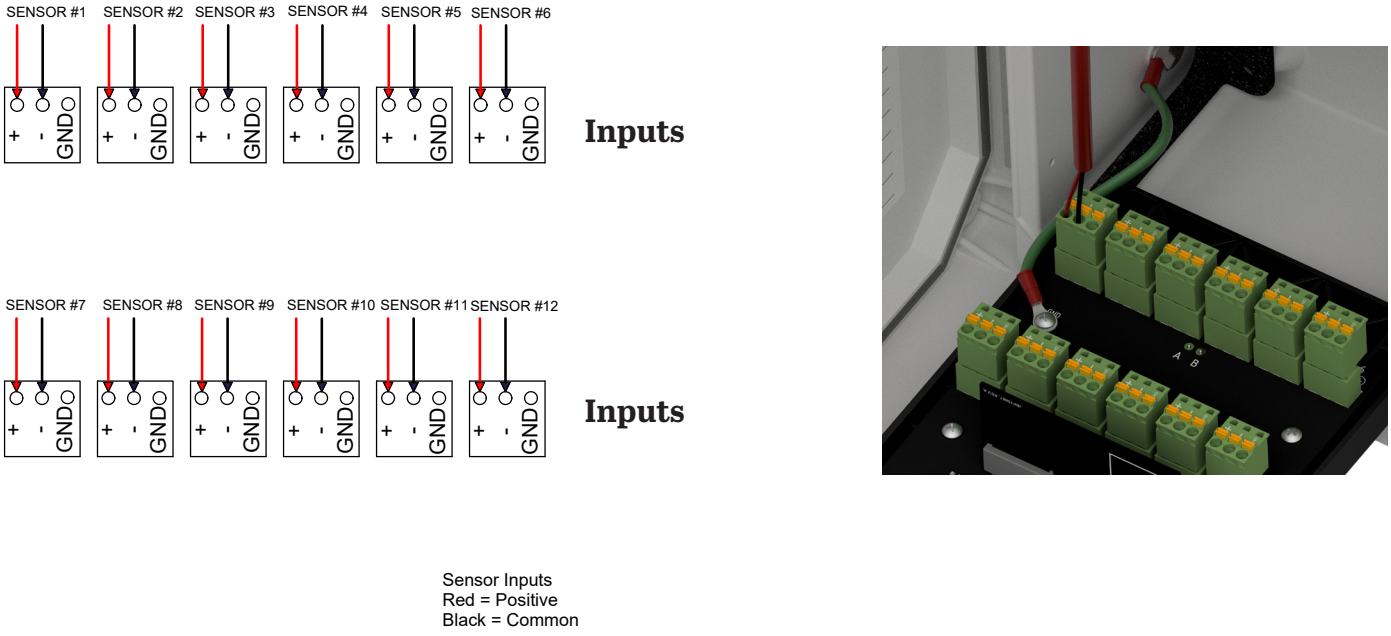


Figure 11. Field Wiring for Two-Conductor Hazardous Sensor Inputs

Post-Installation Testing

The TM1223 Accelerometer Verification Meter can be used to verify cable conductivity, sensor location and proper wiring connections. The Verification Meter will indicate if the sensor, cable and/or junction box is in working condition. It will also confirm bias voltage of the accelerometer, which will inform you of the operation of the internal accelerometer amplifier.

Figure 12. TM1223 Accelerometer Verification Meter

Testing Method:

1. Utilizing two personnel, Person A will be located at the phase analysis box, while Person B will be located at the measurement location.
2. Once positioned, Person A will connect the TM1223 to the data collector output on the phase analysis box and turn the Channel Selector to the channel that corresponds to the referenced measurement. Person A should observe a "NORMAL" LED reading.
3. Person B disconnects the cable from the accelerometer, and the TM1223 should respond with an "OPEN" LED. Reconnect the cable to the accelerometer, and the TM1223 should respond with a "NORMAL" LED.
4. Repeat for each measurement location to verify that accelerometer location is properly identified at the phase analysis box.

The following LED Readout indicates the circuit integrity:

1. Green LED: Normal. Indicates proper connection and an output bias will be given, indicating the health of the sensor (4 – 16 V indicates a healthy accelerometer).
2. Yellow LED: Open Circuit. Indicates one of the following:
   a. Cable connector is not connected to accelerometer.
   b. Cable is open circuit (broken or not connected at one end).
   c. Accelerometer is not functioning correctly.
3. Red LED: Short Circuit. Indicates one of the following:
   a. Water or contamination in the connector.
   b. Reverse wiring ((+) and (-) leads are reversed) at terminal block inputs of the phase analysis box.
   c. Wires in phase analysis box or cable connector (+) & (-) are touching.

Maintenance

Once the system has been installed, it requires minimal maintenance. Basic checks to ensure system integrity should be made periodically.

Visual inspection should include examinations for the following:

1. No visible electrical burns or smoke inside the enclosure.
2. Enclosure hinges are free from rust and securely latched.
3. No moisture or condensation is present inside the enclosure.

Warranty & Refund

Please visit www.ctconline.com to view a complete recapitulation of our warranty and refund policies.

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