PROXIMITY PROBE SYSTEMS

PXD100 Series Monitoring System
4 Channel
Product Manual

Table of Contents

Introduction

CTC offers Relay and Display solutions that provide a visual display of machinery vibration/displacement values, while also allowing a customer-defined input level to trigger a relay and shut down equipment that is operating outside of tolerance.

PXD100

The PXD100 Series system monitors a machine's condition based on its vibration/displacement. The system can be integrated into a circuit to shut down a machine when preset threshold levels are reached. The system detects high vibration energy and displacement values sensed via the input proximity probes and actuates relays based on alert and alarm set points. The system will indicate the instantaneous vibration/displacement levels and relay status at each channel through the display meters.

The PXD100 Series system is contained within a standard fiberglass enclosure. Mounting brackets are provided for wall-mounting the enclosure (wall anchoring screws are not included).

Rated for NEMA 4X (IP66), the PXD100 Series can withstand harsh environments including temperatures ranging from -58 °F to 180 °F (-50 °C to 82 °C). The box is also resistant to hose-directed fluid and corrosion. A snap latch is installed on the door allowing the box to be sealed from the elements when not in use.

Product Dimensions

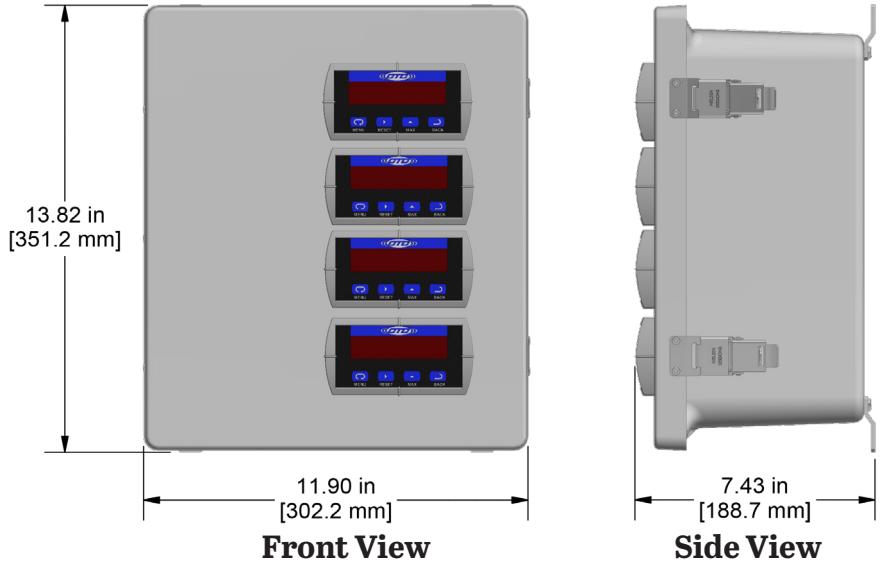


Figure 1. Dimensions

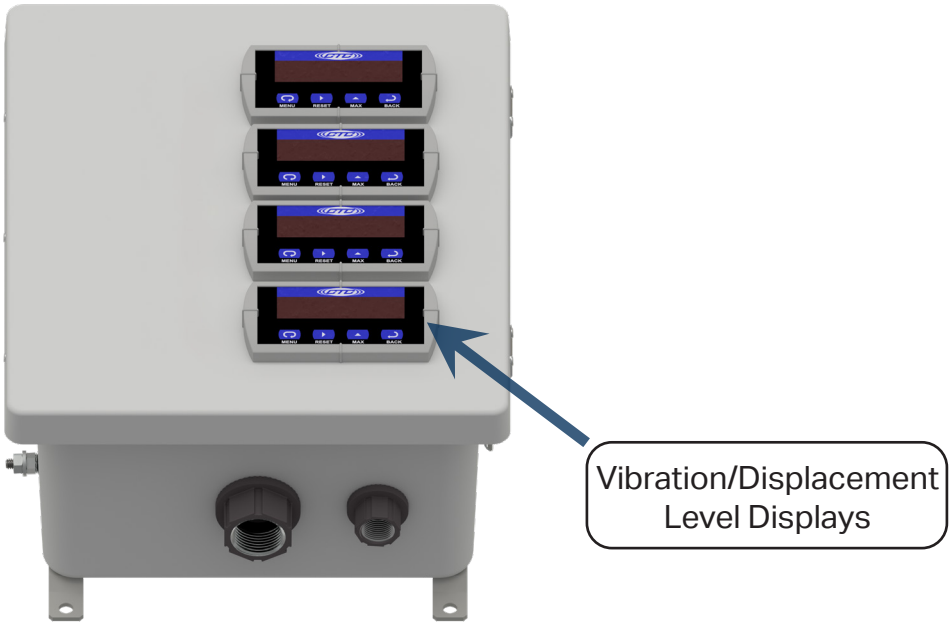


Figure 2. Diagram

Mounting Instructions

Independent stainless steel mounting feet are included on the enclosure. Wall anchoring screws are not included. **Note:** If you have purchased a PXD100 series enclosure 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 the enclosure due to access and moisture concerns.

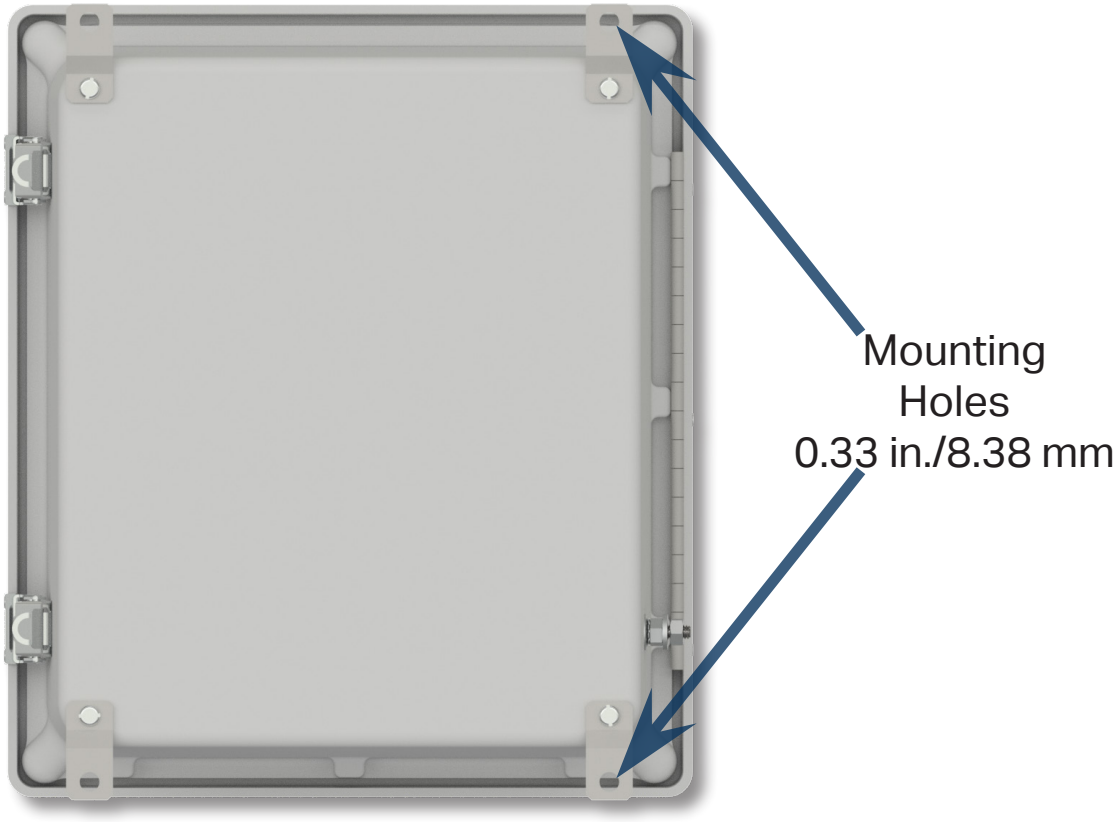


Figure 3. PXD100 Series Rear View

Conduit Entry

If you are running conduit to your enclosure, ensure the conduit cable entry enters from the bottom of the enclosure when mounted.

Note: To ensure moisture will not flow into the enclosure, a hole should be drilled at the lowest point in the conduit to provide drainage for any moisture.

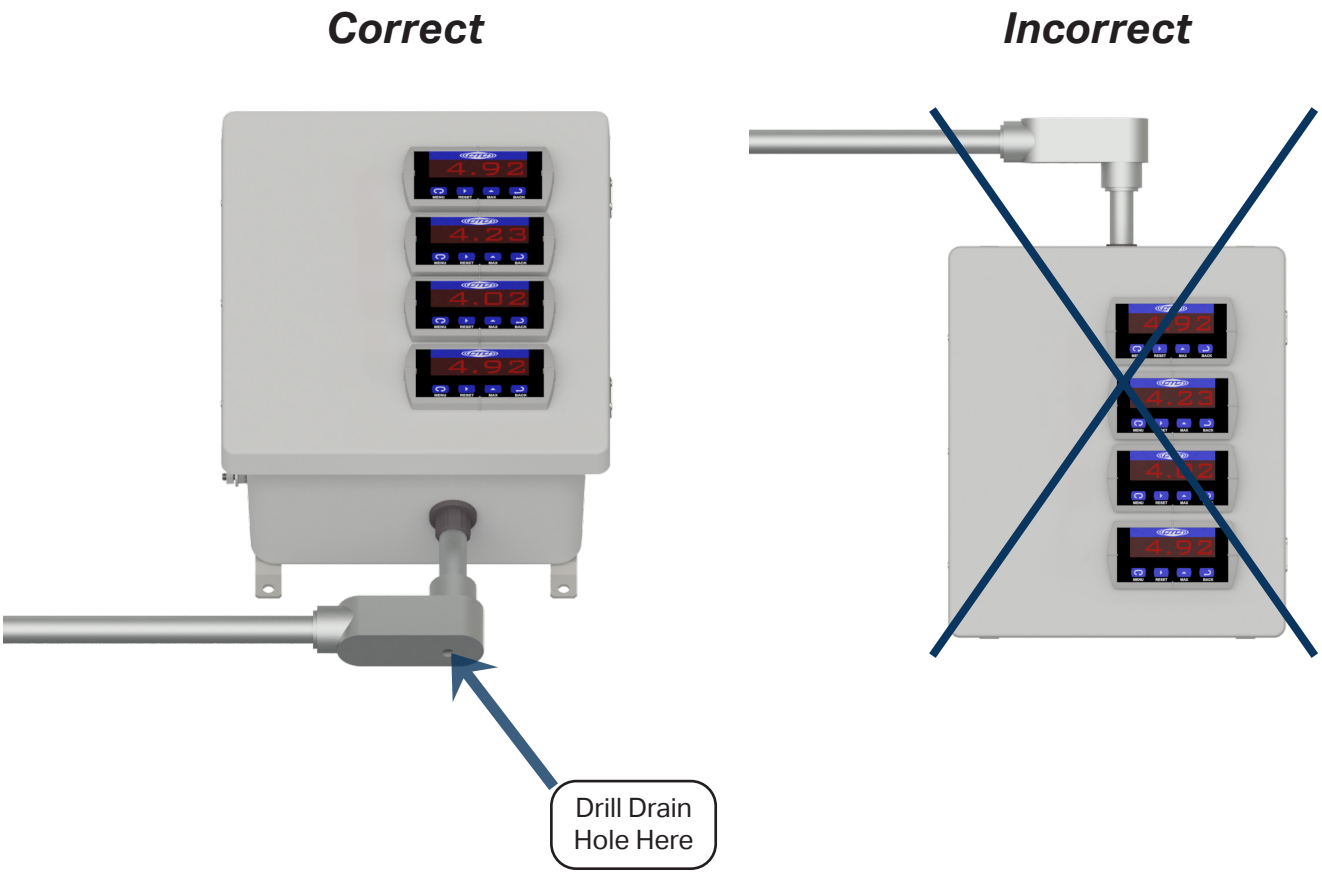


Figure 4. Conduit Entry for PXD100

Grounding

Ensure the shield ground wire on the PXD100 Series enclosure is grounded to earth ground.

A. Mounting to Earth Ground

When mounting PXD100 Series enclosures 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.

Figure 5. Proper Shield Grounding Technique

B. Mounting to Non-Grounded Structure

When mounting the PXD100 enclosure to a non-grounded structure, ensure the shield ground wire or customer-supplied ground wire is tied to a source of earth ground.

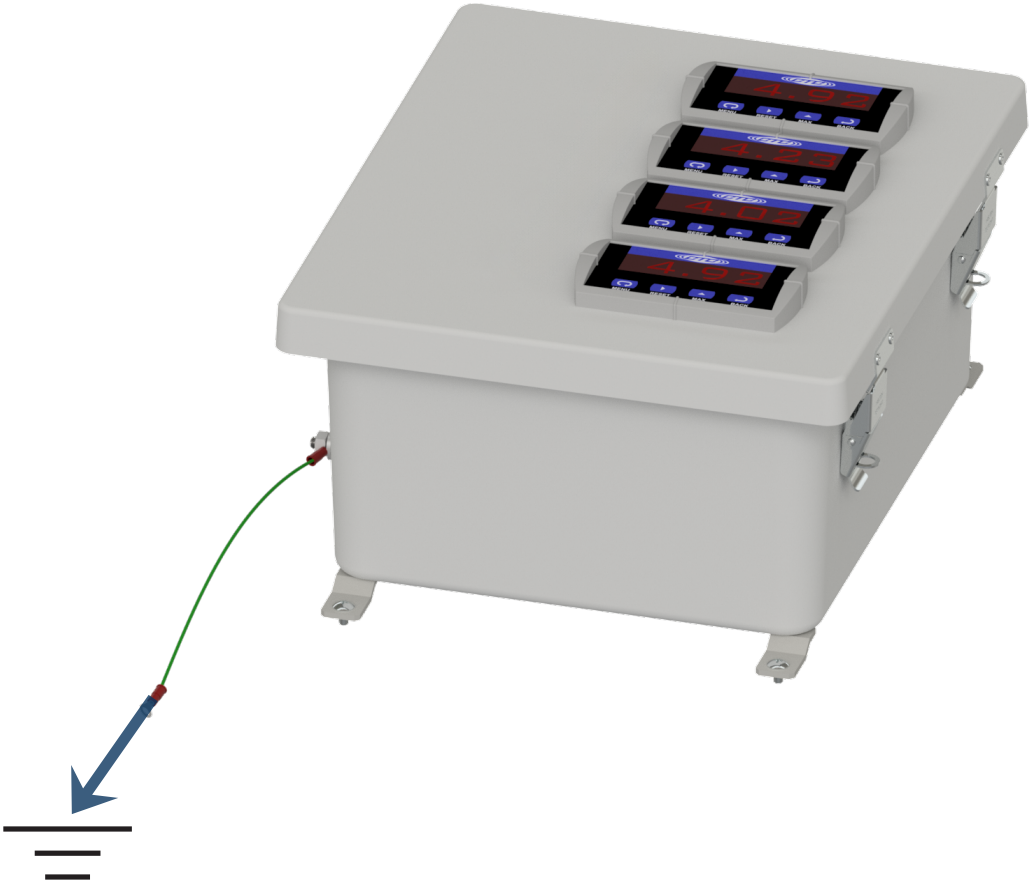


Figure 6. Ground Wire Placement

Electrical Connectons

Cables enter and exit the enclosure through conduit fittings or cord grips on the bottom of the unit. All input and output wiring is connected to the terminal blocks and proximity probe drivers inside the unit. Inputs are routed through a 1.00 in. conduit fitting or cord grips (one per channel), output wiring is routed through a 1.00 in. conduit fitting. 110 VAC is needed to power the unit through the terminal on the right side of the enclosure. If input options are selected when ordering, a 0.50 in. conduit fitting is provided for AC power entry.

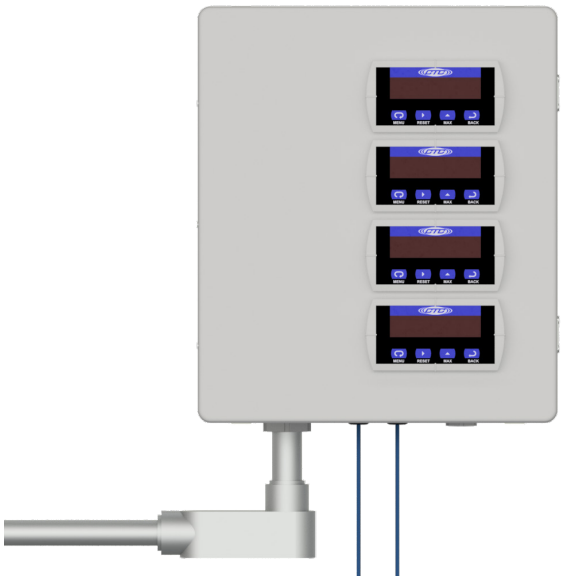


Figure 7. Front View

Figure 8. Bottom View

Wiring Inputs and Outputs

When purchasing proximity probe drivers with an PXD100 Series enclosure, CTC will install and wire the proximity probe drivers inside the enclosure prior to shipment. If a proximity probe driver requires a replacement post installation, use the following pages to determine the correct wiring application.

Wiring Single Channel Vibration (4-20 mA)

Wiring Inputs

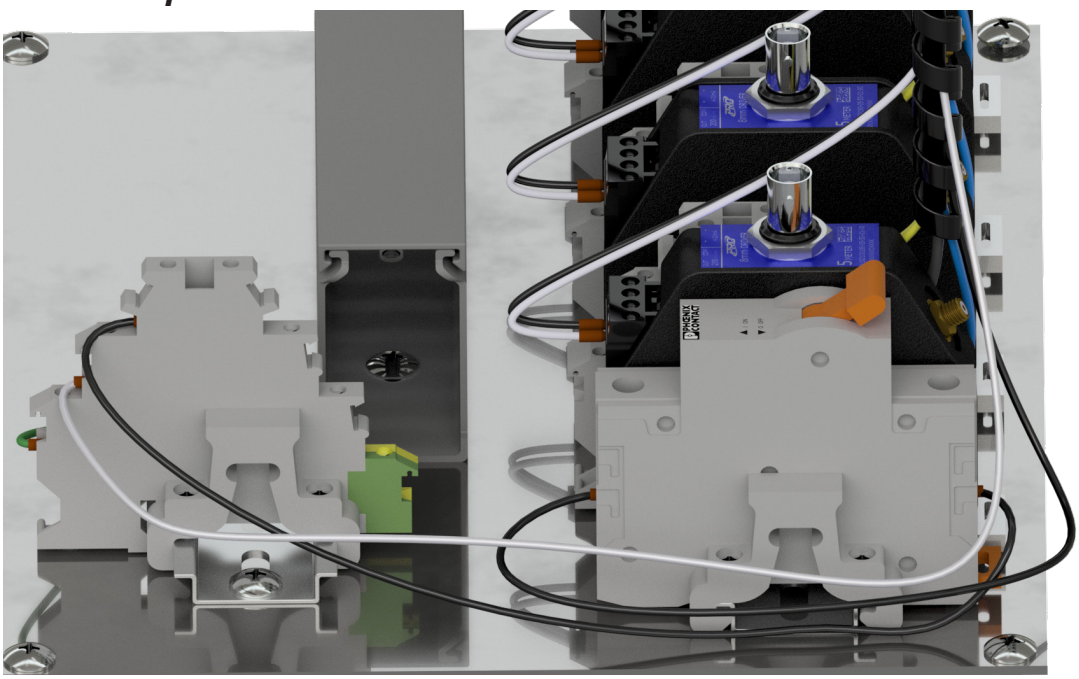
Probe Driver Terminal Block Position	Display Terminal Block Position	Cable Color	Destination
+	P+	White	Power In (+)
-	mA+	Black	Power In (-)
N/A	P-/COM	Black	Power In (-)

Wiring Outputs

Terminal Block Position	Display Terminal Block Position	Cable Color	Destination
Top	NO	Yellow	Normal Open
Middle	NC	Brown	Normal Closed
Bottom	C	Blue	Common Out

Wiring Power

In order to supply power to the proximity probe drivers, the PXD100 features a terminal for power input and a circuit breaker. Below is the wiring configuration to bring live power into the enclosure. ***Note: Do not connect proximity probe drivers to live AC power.***



Cable	Cable Color
Ground	Green
Neutral Power	White
Live Power	Black

Wiring for the Warning Light and Horn

Stack Lights with optional horn functionality come factory wired and no additional field installation is required.

Configuring Relays

The input to the internal controller comes from the proximity probe system. They are built with a specific full-scale range and frequency band. The full-scale range of the transmitters must be known for the controllers to display the correct vibration value. The transmitter will not display any vibration energy present at frequencies outside the filtering range. Refer to the user manual for your specific PRO proximity probe driver for instructions on calibration and operation.

Example: 8 mm Probe System w/ "90" Series Radial Driver, Full Scale Range of 0-10 mils pk-pk
A 8 mm Probe System has an 80 mil linear range of 10-90 mils of displacement between the probe tip and target material. A "90" Series Radial Proximity Probe Driver outputs a 4-20 mA process signal output that is proportional to overall peak-to-peak vibration severity relative to the face of the Probe Tip. While the machine is at rest and not vibrating, the output from the probe driver will be 0 mA, at 10 mils pk-pk of vibration 20 mA flows from the probe driver to the PD765 controller. The monitoring channel provides two relay outputs. The "90" series Probe Driver comes with a factory configured full scale amplitude range measured in mils pk-pk. The configured Full Scale Range of the Probe Driver must be known in order to accurately program relay set points. It is recommended that baseline and typical alarm values of vibration for the specific machine being monitored are also known before setup is attempted. The relays provided by the internal controller are highly configurable. Refer to the PD765 user manual for detailed programming instructions.

All of the following parameters can be adjusted:

- Relay Action – Automatic, Latching, Auto + Manual Reset, Latch with Clear
- Relay Operation – Set and Reset points (Hysteresis), On and Off Time Delays

Example Setup:
A "90" series Radial Proximity Probe Driver configured with a full scale amplitude range of 0-10 mils pk-pk. Assume the historic baseline vibration on the shaft being monitored during normal operation is 2.0 mils pk-pk. Alarm and shutdown levels of radial vibration are defined as 5.0 mils and 7.0 mils, respectively. Reset points are specified as 4 mils and 6 mils pk-pk. Using the provided PD765 Process Controller manual, select the relay operation and action desired. For this example, we will have LOC, Latching Operation with Clear relays. Then program "Set 1" as 5.0 and "Set 2" as 7.0, then program reset points, "rST 1" as 4.0 and "rST 2" as 6.0. After the relays have been programmed, their scaling must now be set. For this example a 4-20 mA input with a 0-10 mil display. Program "inP1" as 4.00, then

"diS1" as 0.00 then "inP2" as 20.00, then "diS2" as 10.00. This will create an input of 4.0 mA, display 0.0 mils of vibration pk-pk, and at an input of 20.0 mA, 10 mils pk-pk of vibration will be displayed on the meter. The system will now actuate the LOC Relay (Relay 1) when the vibration level reaches 5 mils of vibration pk-pk and another LOC relay (Relay 2) when the vibration level reaches 7 mils pk-pk. To reset each LOC relay, the vibration level must fall below their programmed reset value and the ACK button on the PD765 display must be pressed.

Troubleshooting

If there is no probe connected to the input, the corresponding transmitter for that channel will not power on. This will cause the Output Display to read low or negative values. Be sure to power the system on AFTER the probe has been connected.

If the display fails to output a value after power has been turned on and the probe has been connected, turn off the unit, wait several seconds, and reapply power. The internal electronics require some time to ramp up and settle before they are fully operational.

Intermittent Power Failure:

- Ensure that there is no other power source connected to the dynamic pins.
- Depending on where the dynamic pins being wired to/measured from, try measuring the dynamic outputs with a standard multimeter to rule out other equipment interference/failure.
- Is the problem present on both dynamic outputs (the BNC and the pins)? Test them each individually with the other disconnected and ensure proper wiring. If it is only occurring on one of them, it can be faulty wiring or something coming unsoldered from the board due to stress. Also, make sure the ± of the dynamic outputs are not shorted together during measurement.

Warranty & Refund

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

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