HazardPRO™

Wireless Hazard Monitoring

ELECTRO-SENSORS

Node & Sensor Installation Manual

Volume Two

Introduction

This document will provide guidance for your HazardPRO™ Sensors and Nodes. This includes documents on the following: Sending Antenna Installation, Node Users Manual, Node Installation Guidelines, Temperature and Shaft RPM Sensors, Bearing Installation, Belt Alignment Installation, Rub Block Installation Template, Antenna Mounting Template, and Plug Chute Sensor. For any additional questions please contact our Technical Department via Tech@electro-sensors.com or by telephone at (800)328-6170.

Table of Contents

Section A

Antenna Guideline Instructions

Guidelines for Antenna Placement: Best results are achieved when a direct visual or a reflective signal can be maintained between the antennas. This applies to **all** antenna options below.

Antenna Options:

- External antenna whip (multi-directional, adjustable)
- Omni antenna (multi-directional)
- Patch/Panel antenna (directional, requires aiming & precision)

Mounting Options:

- **Never drill holes in the antenna body.** This can damage the antenna. Only drill holes in the bracket or the mounting structure.
- Use the template to predrill the holes in the metal plate or the RAM bracket then mount the antenna.
- Always mount the antennas with the **cable exiting the antenna pointing down.**
- Multiple antennas can be mounted in the same area but require appropriate spacing and separation.
- If the antenna is located outside, place it high enough to be above a snow level (i.e. 24" above the roof line). Antennas must stay uncovered, and not get hit or damaged.

RAM bracket mounts, hardware:

- The antenna can be hard mounted to a bracket, you can utilize the RAM bracket to allow easy attachment or directional aiming.
- Tighten the lock ball on the RAM bracket so that it is firm and secure and aimed in the appropriate direction.
- Utilize the template to mark the holes, and pre drill the bracket.
- Firmly secure the antenna to ensure that it will not become loose and change direction due to wind or inclement weather.

Mounting for the antenna options:

External Whip Antennas (multi-directional)

- The antenna can be mounted directly to the node.
- A coaxial cable can be attached to the antenna and securely hard mounted. (not supplied)

Omni Antennas

- Use the mounting brackets provided, then secure to a sturdy surface to ensure signal integrity
- The omni antennas do not need to be directed or aimed toward other antennas. However. they can be adjusted at different positions or angles to optimize the signal strength. **Note:** Neither the top nor bottom of omni antennas can be pointed at other antennas.
- Multiple antennas must be at least 12-24" apart, optimally placed at different levels or heights.

Patch/Panel Antennas (Directional, requires aiming)

- Multiple antennas must be at least 6" apart, optimally at different levels or heights.
- Patch/Panel Antennas require aiming to provide a direct visual or reflective signal between the antennas

Antenna Guideline Instructions

Coax Cables and Connections

Cable:

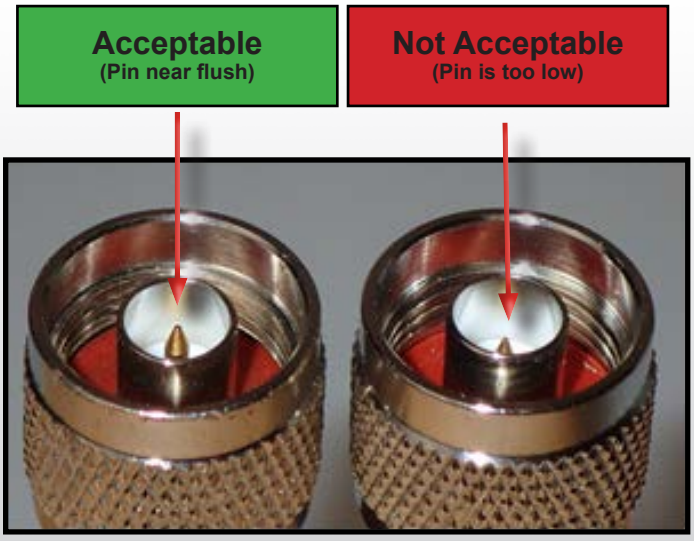
- Utilize the Coaxial cables provided, ensure the end connectors are clean and free of debris. If you are terminating a coaxial cable ensure that the center pin and grounding shields are correct (detailed coaxial termination instructions are available on page #: 4)
- Do not nick, or kink the coaxial cable, use gentle bends (8” diameter bends) around corners or through conduit.
- Always allow a drip loop to ensure that moisture does not accumulate in the connection or migrate into the antenna or the connection.
- Mount all antennas so that the cable exits the antenna from the bottom (dropping down).

Connections:

- Tighten as tight as possible by hand. Then apply 1/8” to 1/4” additional turn using a wrench.
- Use Silicone Self-Fusing Tape (1” x 12”), to wrap external coaxial connections and/or any connections that are exposed to moisture or corrosion. This is required to ensure that the connections are sealed and protected. **Note**: If this connection isn’t properly sealed, mois ture can enter the connection and the signal strength can degrade over time. The Silicone Self-Fusing Tape is required to ensure the connections are sealed and protected.

Pin Placement:

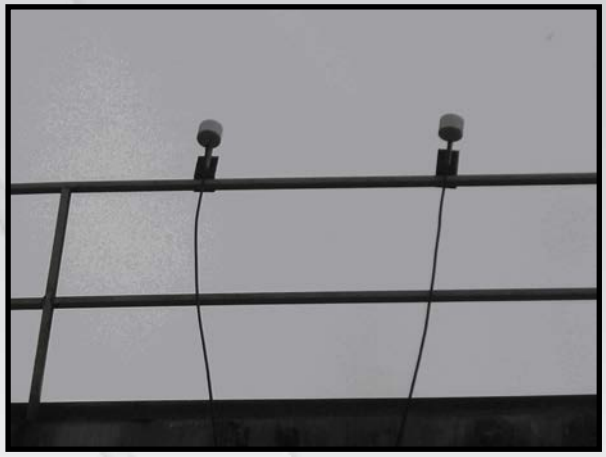
- If the pin placement does not meet the following requirements then the signal strength will be greatly diminished.



Examples and Templates

Single Patch antenna mounted to a RAM bracket.

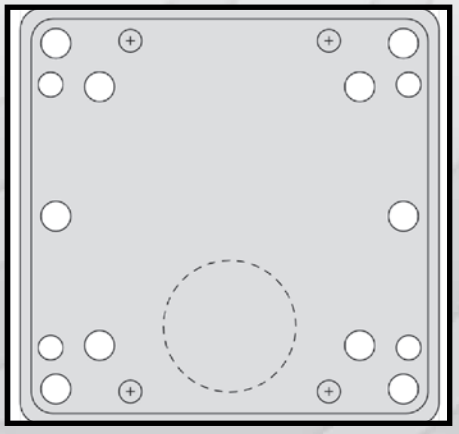
Two Omni Antennas mounted to a rail.



External Whip attached to side of Node

Two panel antennas mounted to RAM brackets.

Single bracket template (you will need to select or drill holes to match the antenna and the mounting method)



Two omni antennas using antenna hardware

Alternatively you can navigate to this Web Page with the following link.
https://www.electro-sensors.com/support/esi-file-download-page

Section B
Coaxial Termination Instructions

This Section Covers Basic instructions on how to install end connectors for coaxial cable. There are different types of cables and end connectors.

Safety: Wear safety glasses to prevent metal braid from injuring eyes. The sharp edges of the cable can easily cut or scratch you. The tools also have sharp cutting blades.

Typical Connector Installations:

- Installation of sending and receiving antennas. Establish the proper length of the cable and how it will be routed. Both ends of the cable will need to be properly terminated.
- Node sending antenna with an attached coaxial cable.
- The System Manager receiving antennas with coaxial connections.

Components:

Coaxial Cable:

- 400 Series coaxial, low-loss 50 ohm
- 200 Series coaxial, low-loss 50 ohm

Tools:

- Razor Knife
- Pliers
- Stripping Tools (Set-up document available upon request)

Tool Index Table:

Termination Type	Coaxial Type	Connector	Stripper	Crimp Tool	Center pin Crimp notch	Ferrule crimp notch
Male End	400	ANM-1406	L-Com # AT-strip-02	L - C o m # H T - Crimp03	0.1	0.429
Female End	400	ANF-1406	L-Com # AT-strip-02	L - C o m # H T - Crimp03	0.1	0.429
Male End	200	ANM-1202	L-Com # AT-strip-01	L - C o m # H T - Crimp04	0.068	0.429
Female End	200	ANF-1202	L-Com # AT-strip-01	L - C o m # H T - Crimp04	0.068	0.429

Male End Connector

Female End Connector

Pin, Ferrule, Connectors

Stripping tools:
400 top, 200 bottom

Coaxial Termination Instructions

Step 1: Prepare the coaxial cable end

1) Make a clean cut on the cable and prepare for cable stripping

Note: You will need to have the correct end connector (components section), stripping tool, and crimp tool (tool index table) before proceeding to the next steps.

Step 2: Cut and strip the coaxial cable end. Select the proper stripping tool (based on the size of the coax cable, see tool index).

1) Insert the ferrule onto the coaxial cable
2) Insert the Cable into the jaws of the stripping tool, on top of the blades.
   - Ensure the coaxial cable extends beyond the body of the stripping tool (see illustration)
   - Insert your index finger into the cable strippers finger ring; turn the cable stripper clockwise 3.5 times (or until cut is complete).
   - Open the crimp jaws and remove the cable.
   - Carefully remove the small segment of coaxial cable shield.

Note: trim the center conductor to the appropriate length prior to crimping the center pin (see pin termination table below)

Pin Termination Table: Measure the coaxial cable conductor length against the corresponding ruler measurements.

Termination type	Coaxial Type	Center Conductor pin length
Male End	400	.25”
Female End	400	.25”
Male End	200	.20”
Female End	200	.20”

Pin length should match values in Pin termination table

Red Bar = .25 In
Green Bar = .20 In

- Carefully remove the second cut segment of the outer jacket material. This will expose the braid (you can use a utility knife to split this jacket, **CAUTION**: Do **NOT** cut the braid).

Step 3: Install the connector pin on the coaxial cable center conductor.

1) Make sure the ferrule is properly seated on the coaxial cable
2) Slide the pin over the center copper conductor. Allow the pin to bottom out.
3) Crimp the pin using the crimp tool. Seat the pin using the appropriate crimp (tool index table)

Step 4: Install the connector body over the connector pin.

1) Fold the braid back to the outer jacket.
2) Slide connector onto the coaxial cable so the pin protrudes as far as possible through the connector (it is critical to get this seated as deep as possible, (See photos on page #: 6)
3) Fold the metal braid forward over the connector
4) Slide the ferrule onto the connector
5) Confirm that the pin depth through the connector is nearly flush with the connector body (this must be acceptable prior to crimping, See photos on page #: 6).
6) Crimp the ferrule using the crimp tool. **Seat the ferrule using the appropriate crimp. (Tool Index Table on Page #: 4).** Confirm that the connector is firmly secured to the cable.

Photos and Examples for each Termination Step

Step 1: Prepare the End

Step 2: Cut and strip (Extend the Coaxial Cable beyond the body of the stripping tool, after stripping, check and center conductor length. Reference the Pin Termination Table on Page #: 4

Remove this end piece

Do not cut into metal braid

Step 3: Install the Pin on conductor end

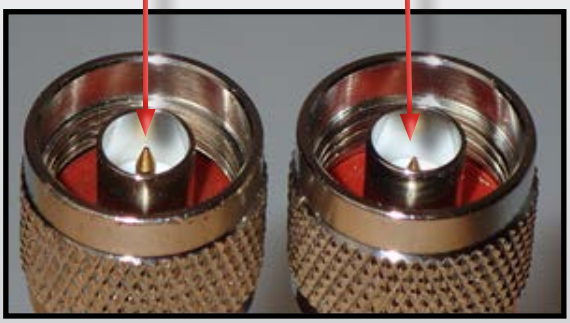
Step 4: Install the body: Push the connector body on as far as possible, confirm the pin depth before crimping

Slide ferrule onto connector

Crimp the ferrule (Further Instructions on next page)

Finished Connector

Acceptable (Pin near flush)	Not Acceptable (Pin is too low)



Further Crimping Techniques

Place the pin in the correct crimp jaws

Close the crimp tool to barely hold the pin

Fully Insert the conductor into the pin, then crimp the pin

Section C

Node Installation Guidelines

This Document is for reference only, see the specific node manual for details.
The nodes are certified for use in:
• Class II Div. 1, Groups E, F, G; Class III
•Class II Div. 2, Groups F, G; Class III

Safety: Do not open the enclosure when an explosive atmosphere is present.

Class II Div. 1 Node

Class II Div. 2 Node

Node Types:

Nodes can have an internal or an external antenna. The external type will require an antenna (multiple options). Refer to the antenna guideline instructions (page #: 2) for specific details regarding antennas.

Internal Antenna Node:

This has an antenna inside the Node and provides easy communication with the receiving antenna set.

- The node must be oriented so that its left/right side or top/bottom side is facing the target receiving antenna. This placement makes the best use of the node antenna's radio signal pattern.

External Antenna Node:

These Nodes require an antenna; either directly attached to the node or via a Coaxial cable attachment. The Available antenna options are as follows.

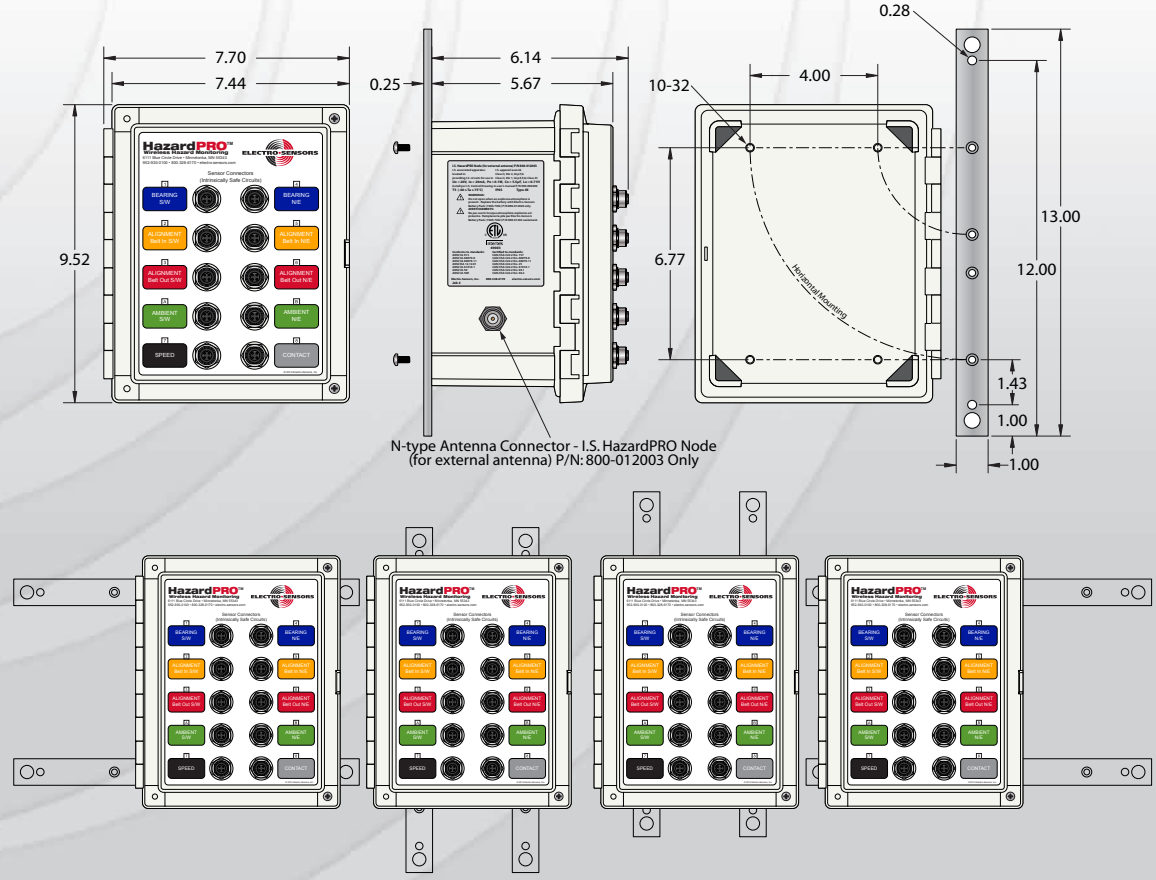
- External adjustable whip (multi-directional), This antenna can be adjusted in different directions to find the optimal sending position.
- Patch/Panel (direction specific) antennas are longer range antennas which need to be hard mounted to a fixed surface or RAM Bracket. These Antennas require aiming toward the appropriate receiving antenna.
- Omni (all direction) antennas send out a signal in a circle from the antenna head. These antennas offer a broad signal range.

Mounting Guidelines:

The HazardPRO node user manual provides addition information for mounting.

- The HazardPRO node has two mounting bars that run across the back side of its enclosure.
- These mounting bars attach to the node in either a horizontal or vertical position, This allows the node to be mounted to either vertical or horizontal structural framework.
- The node is typically mounted so that its front panel door is positioned vertically.

Reference Diagrams *(Reference only)*



Optional Mounting Brackets

Magnetic mounting bracket

L-Bracket for recessed ledges and rail mounting

Magnetic Mount

Attach the brackets accross the back of the node running from right to left. Do not attach the brackets in the up or down position, this could interfere with the speed reset function of the node.

Activation and Maintenance

- Open the Node (Loosen the 2 captive screws in the corners of the front panel.
- Turn the power switch to the "On" position.
- Make sure that the LED light is illuminated in Green.
- Immediately, Close the enclosure door, and tighten the screws that were loosened in the opening procedure.

⚠ **Note:** Keep the enclosure closed at all time to ensure IS compliance and to protect node internal components.

Battery Replacement

- Open the node (Loosen the two front panel screws). ***Note: If location regulations must be met at all times move the node from the classified location to a safe area prior to opening the node.***
- Unplug the battery cable connector from the PCB.
- While supporting the battery, loosen and remove the battery screws. (Keep Screws)
- Remove the battery with care. (Do not damage internal components)
- Position the replacement battery, insert the screws by hand if possible.
- Secure the screws without over tightening them.
- Reconnect the battery plug to the connector on the PCB.
- Repeat the Previous activation Steps Above.

Speed Calibration, Manual Method

- Locate the calibration target on the bottom of the node.
- Locate your 1/2 inch magnet that came with the node. (Do not store inside node)
- While the shaft is turning in a stable and normal operating condition (10 RPM or more), hold the magnet against the calibration target for 3 second, then remove the magnet.
- This will initiate the manual reset and automatically recalibrate node speed set-points.

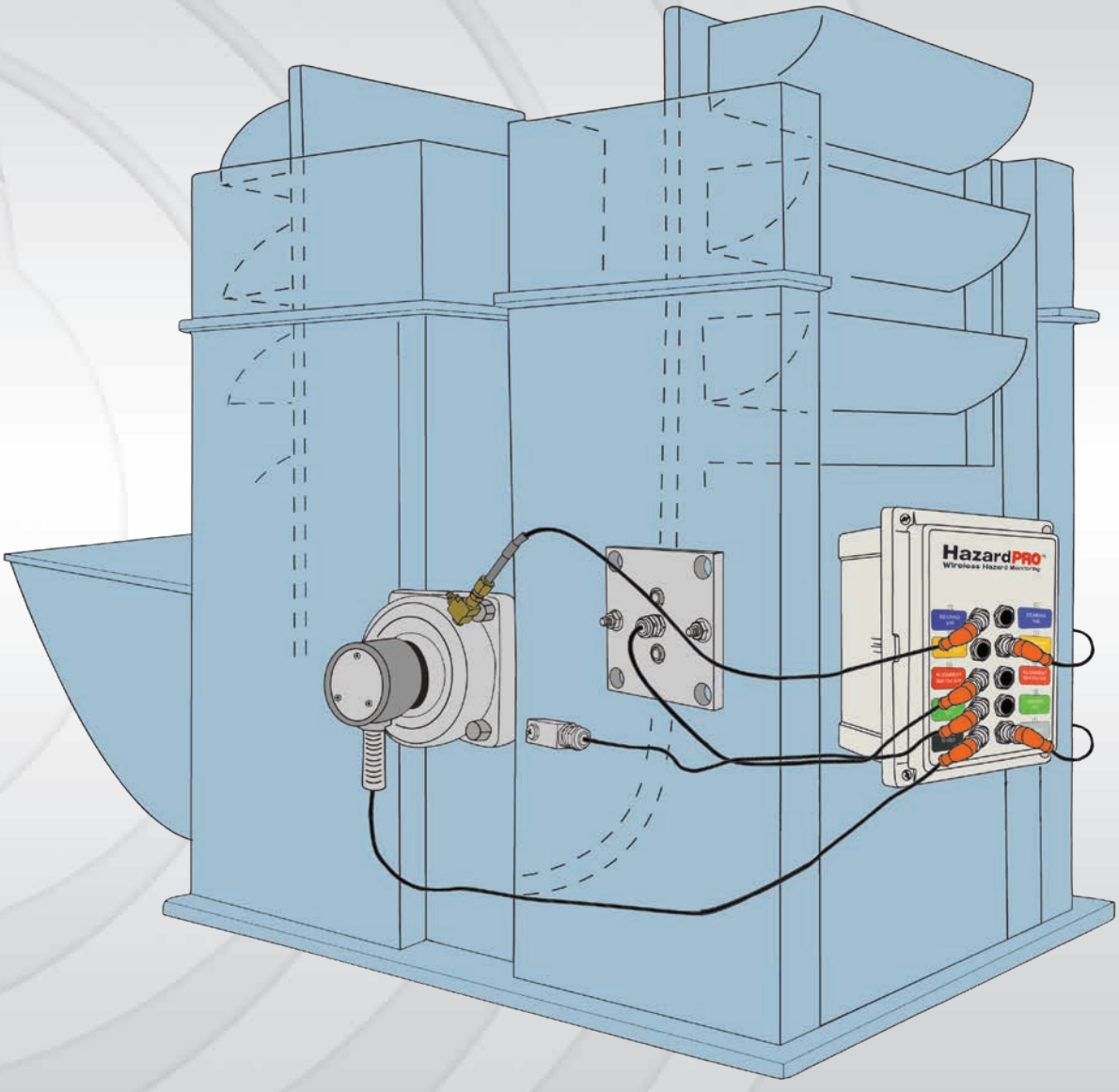
Section D

I.S. HazardPRO™

Temperature and Shaft RPM Sensors

USERS MANUAL

(with I.S. Control Drawing)



Note: This document is meant to reference the original document from ETL. This is not a controlled I.S. document. Electro-Sensors, Inc. is not responsible for changes to this document. For the official I.S. Document please contact Electro-Sensors, Inc. at 1(800)328-6170 or follow below links.

Scan QR Code link with your smartphone to navigate to the newest I.S. Manual.

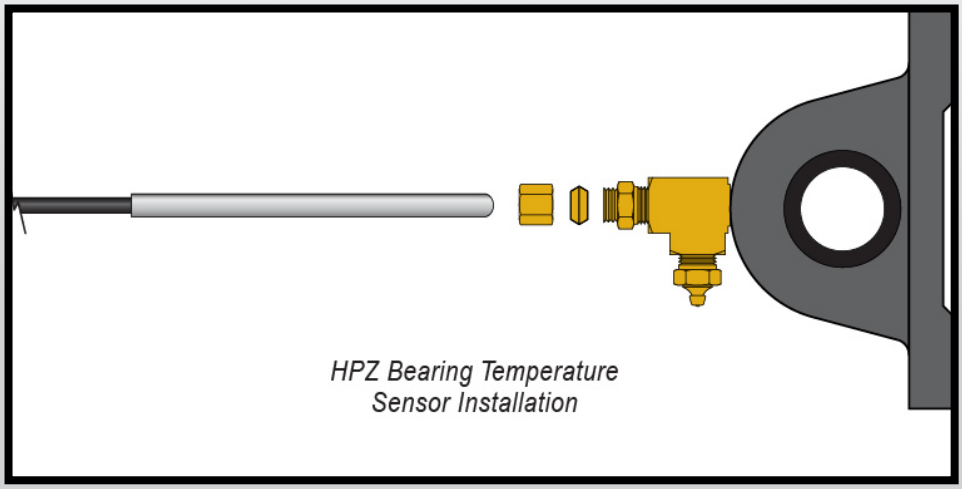
Alternatively you can navigate to this document with the following link.
https://www.electro-sensors.com/application/files/2515/2027/3204/180_HazardPRO_Users_Manual_Temp_and_Speed_Rev_A_010615.pdf

Description

HazardPRO temperature sensors read the temperature of bearings, rub blocks, and equipment surfaces and are 2-wire, loop-powered devices. All models are compatible with HazardPRO nodes, standard I.S. barriers, and PLC analog inputs and are identical with the exception of the measurement probe.
HazardPRO temperature sensors are optimized for bearing temperature measurement (probe), belt alignment temperature measurement (brass rub block), and measuring the ambient surface temperature on a machine.
HazardPRO shaft RPM sensors measure the speed of the tail shaft of the equipment being monitored. The sensor sends a pulse output to the HazardPRO node which calculates the speed of the shaft. All models come ready to use and require no user calibration. The HPZ bearing temperature sensor mounts into 1/8" or 1/4" NPT grease fitting (zerk) taps. The HPA ambient temperature sensor mounts onto a flat surface with a #12 screw. The HPS stud-mount temperature sensor is mounted into a 3/8"-16 tapped hole. The HPB belt alignment sensor is an assembly for measuring the temperature of a brass belt alignment block.
The HPR shaft RPM sensor mounts into an EZ 1 Mag bracket assembly which installs on the mounted shaft via a 1/2"-13 UNC-tapped hole that is drilled in the center of the shaft.

Installation

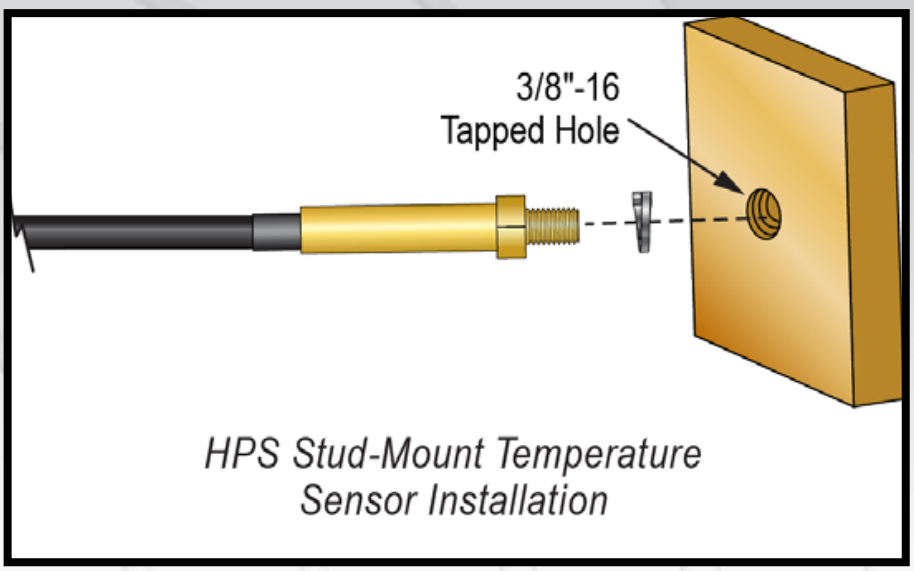
HazardPRO Bearing Temperature Sensor (HPZ)
HPZ has a brass fitting that replaces the existing bearing grease zerk and allows proper placement of the bearing temperature sensor. Unscrew the existing zerk from the bearing and replace it with the HazardPRO zerk fitting. Assemble the sensor probe into the fitting as shown using the brass compression ring or the rubber o-ring. Before tightening the hex cap, push the probe all the way in until it touches the bearing race and then back it out 0.1 inch. This allows grease to flow freely around the probe. Tighten the hex cap nut enough to seal the brass compression ring and hold the probe in position – do not over-tighten.



HPZ Bearing Temperature Sensor Installation

HazardPRO Stud-Mount Temperature Sensor (HPS)

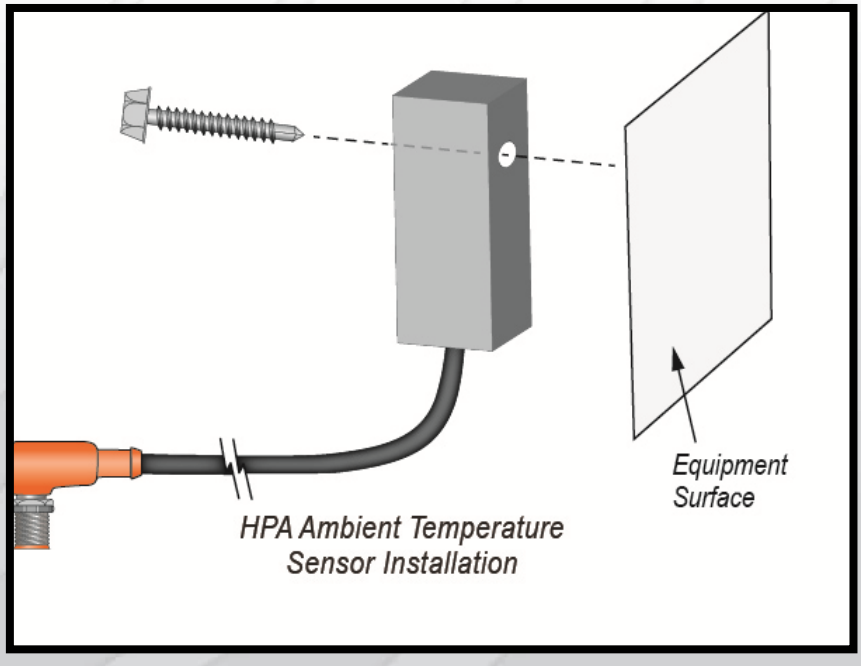
The HPS screws into a 3/8"-16 tapped hole. Use a lock washer or Loc-Tite™ to prevent loosening after installation. With the cable unconnected (to prevent twisting) screw the brass probe all the way into the threaded hole. An optional magnet-mount brass block with a 3/8"-16 tapped hole in the center is available to be used if tapping on the equipment is not preferred.



HPS Stud-Mount Temperature Sensor Installation

HazardPRO Ambient Sensor (HPA)

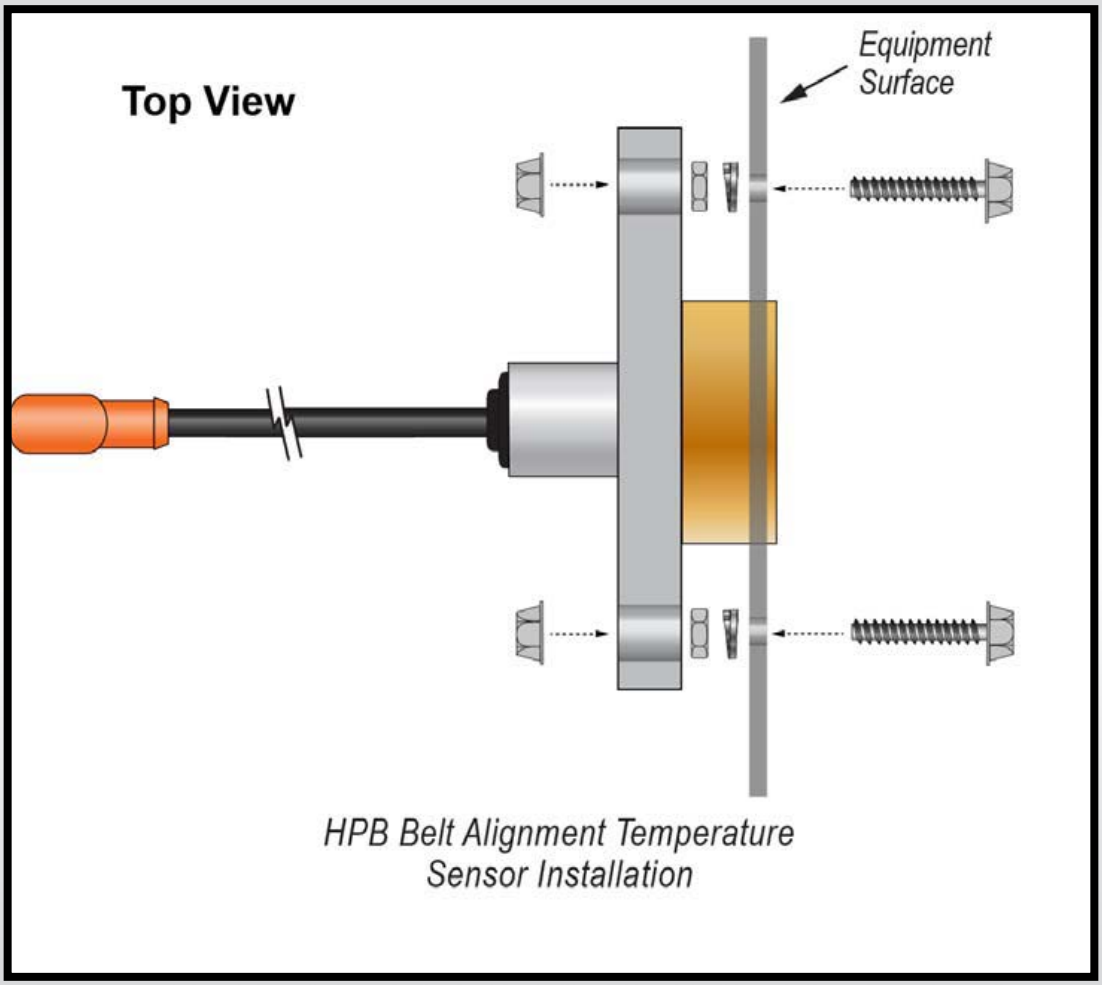
The HPA mounts onto a flat surface with a #12 self-tapping screw or a #10 bolt, lock washer, and nut can be used instead. When used as the ambient compensation sensor in a HazardPRO system, mount the HPA sensor on the machine such that it gets equal sunlight exposure as the bearing and belt alignment sensors do on that side of the machine.



HPA Ambient Temperature Sensor Installation

HazardPRO Belt Alignment Temperature Sensor (HPB)

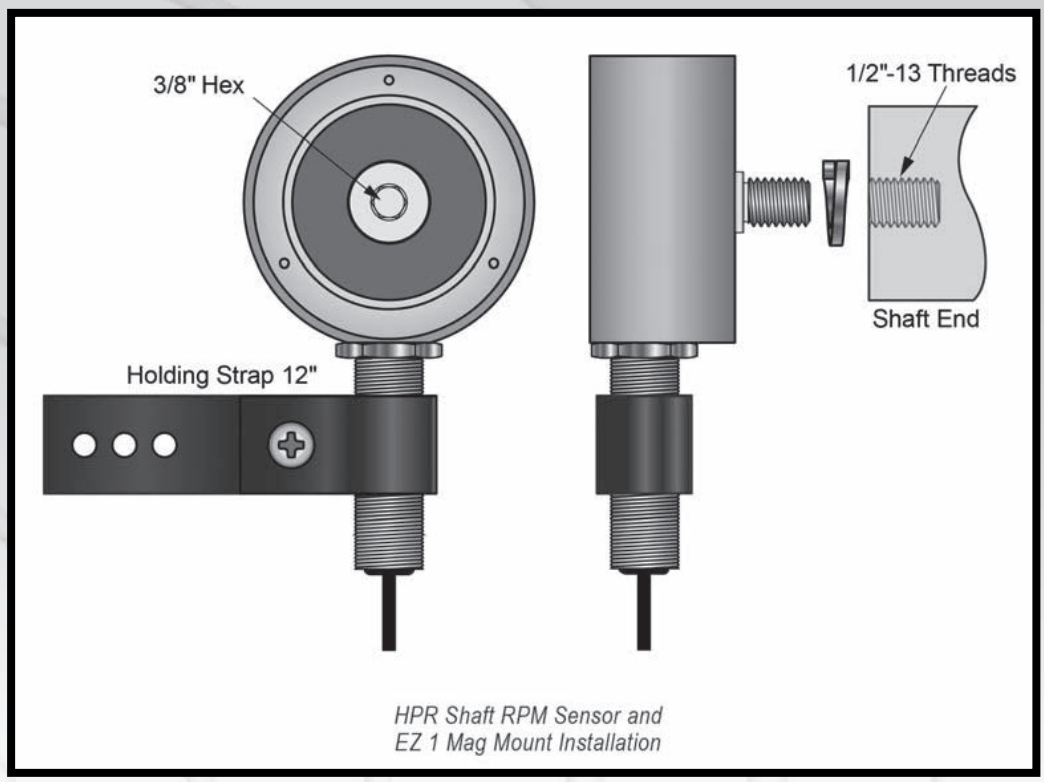
The HPB is mounted in a 2.5" hole centered on the belt of the equipment being monitored. The HPB is held in place with two 1/4"-20 bolts, lock washers, and nuts. Measure the distance from the center of the shaft to the center of the belt. On tail sections, determine the location of the pulley when the tension adjustment is at its highest point. Mark this location for a vertical reference. Use a template to mark hole locations and drill one 2.5" hole for the belt alignment block and two 1/4" holes for the mounting bolts so that the center of the belt alignment brass block is over the center of the belt using the measurement distance from the center of the shaft to the center of the belt. On head sections where there is no tension adjustment, measure the distance from the center of the shaft to the center of the belt. Drill one 2.5" hole and two 1/4" holes so that the center of the belt alignment brass block is over the center of the belt using this measurement distance.



HPB Belt Alignment Temperature Sensor Installation

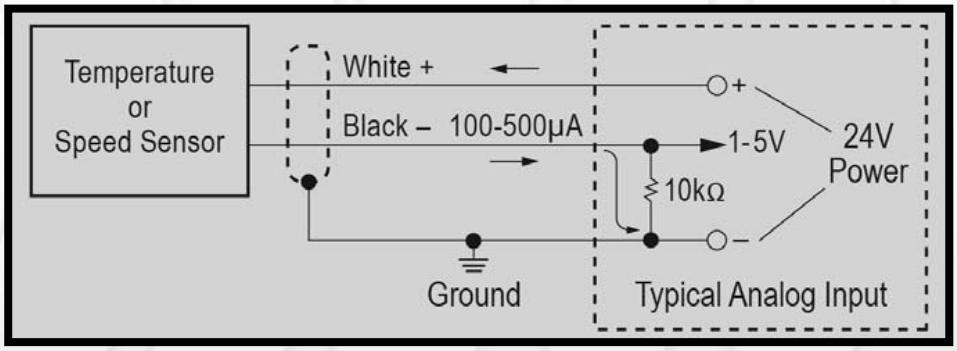
HazardPRO Shaft RPM Sensor (HPR)

The HPR is mounted in an EZ 1 Mag bracket. The bracket has a 1/2"-13 UNC mounting thread. Many shafts are already center-drilled and tapped for this thread. If not, the shaft must be center-drilled and tapped for 1/2"-13 UNC to a depth of 1". Attach the EZ 1 Mag bracket following the instructions. An optional MM-1.25" mounting magnet can be used if the shaft is not tapped. The surface of the shaft must be free of rust and lightly coated with silicone grease to prevent rust and allow the magnet to be moved into the center position.



HPR Shaft RPM Sensor and EZ 1 Mag Mount Installation

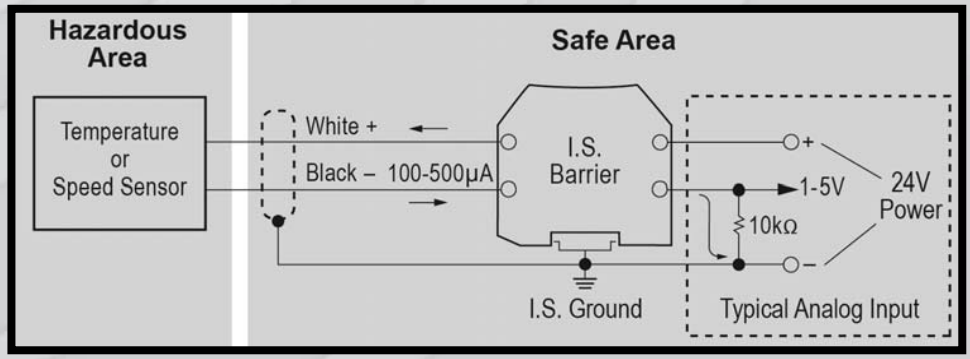
Wiring Diagram (non I.S.)



I.S. Control Drawing (990-006700)

Entity Parameters

Vmax	21 Vdc
Imax	21 mA
Pmax	0.11 W
Ci	0 uF
Li	0 uH



I.S. Requirements

Equip	Barrier	Notes
Vmax ≥	Voc	Voc is the barrier max open-circuit voltage
I max ≥	Isc	Isc is the barrier max short-circuit current
Pmax ≥	Po	If Po is not known, use Po = (Voc * Isc)/4
Ci + Cc ≤	Ca	Cc = (cable pF/ft) * length (in ft), Ca is the barrier max allowed external capacitance
Li + Lc ≤	La	Lc = (cable µH/ft) * length (in ft), La is the barrier max allowed external inductance

Selected barriers must be third party approved as providing intrinsically safe circuits for the application. The transmitter-barrier cable length is limited by the Cc, Lc restrictions given above. If the cable pF/ft and/or µH/ft values are unknown, use 60 pF/ft and/or 0.2µH/ft. The DIN rail (I.S. Ground) must be insulated from the surrounding cabinet (and all other potentials) and connected to earth ground at the 24V supply only. See NEC Article 504, CEC Section 18. Barrier output current must be limited by a resistor such that the output voltage-current plot is a straight line drawn between open-circuit voltage and short-circuit current. Barriers must be installed in accordance with barrier manufacturer's control drawing and Article 504 of the National Electrical Code, ANSI/NFPA 70, for installation in the United States, or Section 18 of the Canadian Electrical Code for installations in Canada. When required by the manufacturer's control drawing, the barrier must be connected to a suitable ground electrode per the National Electrical Code, ANSI/NFPA 70 or the Canadian Electrical Code, as applicable. The resistance of the ground path must be less than 1 ohm.
Control equipment must not use or generate more than 250 V rms or dc with respect to earth.

Warning: Substitution of components may impair intrinsic safety.
Warning: To prevent ignition of flammable or combustible atmospheres, read, understand and adhere to the manufacturer's procedures.

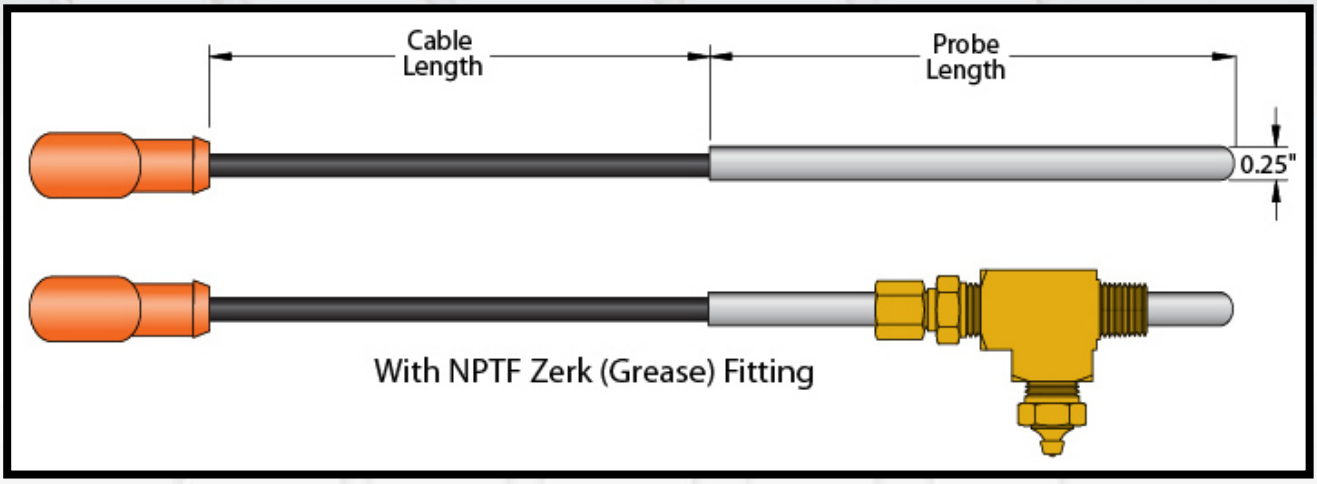
Sensor Output:
Celsius I = 273.2µA + (T° * (1µA/°C))
T(°C) = (I – 273.2µA)
Fahrenheit I =255.4 µA + (T° * ((1µA/°F)/1.8))
T(°F) = (I – 255.4) * 1.8

Specifications:
Vin (min → max) 5 → 21 Vdc
Operating Temp -40 → 120 °C (measurement probe)
-25 → 75 °C (ambient)
Accuracy ±1 °C (at 25 °C)
±3 °C (at -40 °C, 120 °C)

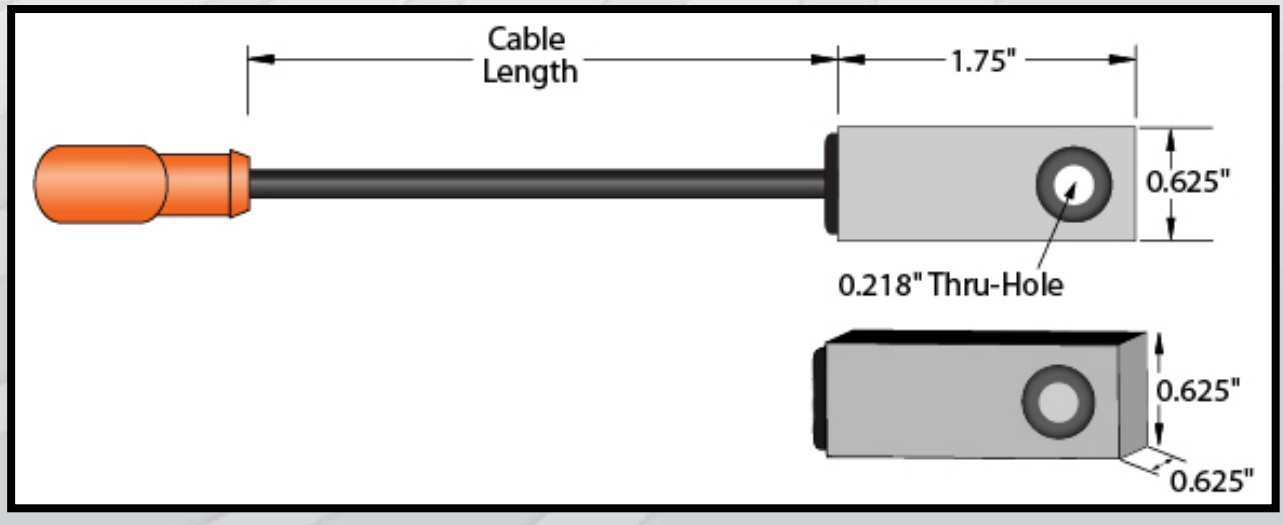
Cable:
Connection M12, 4-pin keyed
Length 2 m (6 ft) and 5 m (16 ft) standard cable lengths
(Other lengths are custom ordered)

Protection:
Class II, Div 1, Groups E, F, G, Class III, Div 1
Zone 20, AEx ia IIIC T100 °C Da T5
-25 °C ≤ Ta ≤ 75 °C Type 4, IP65
Install per user's manual (990-006600) and control drawing (990-006700)

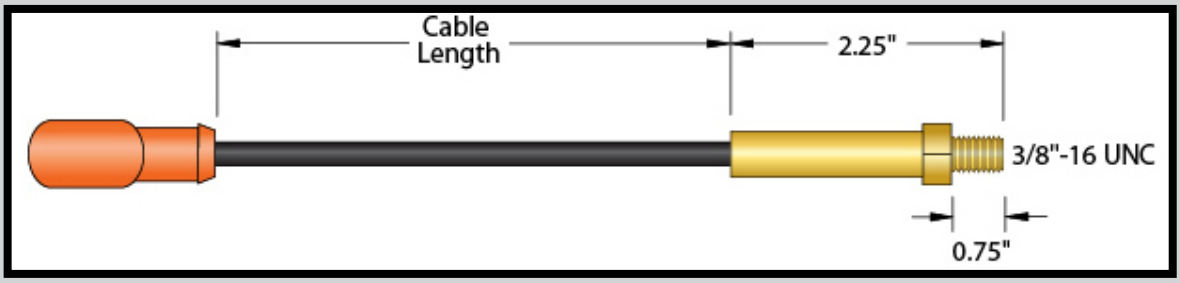
HPZ Bearing Temperature Sensor:



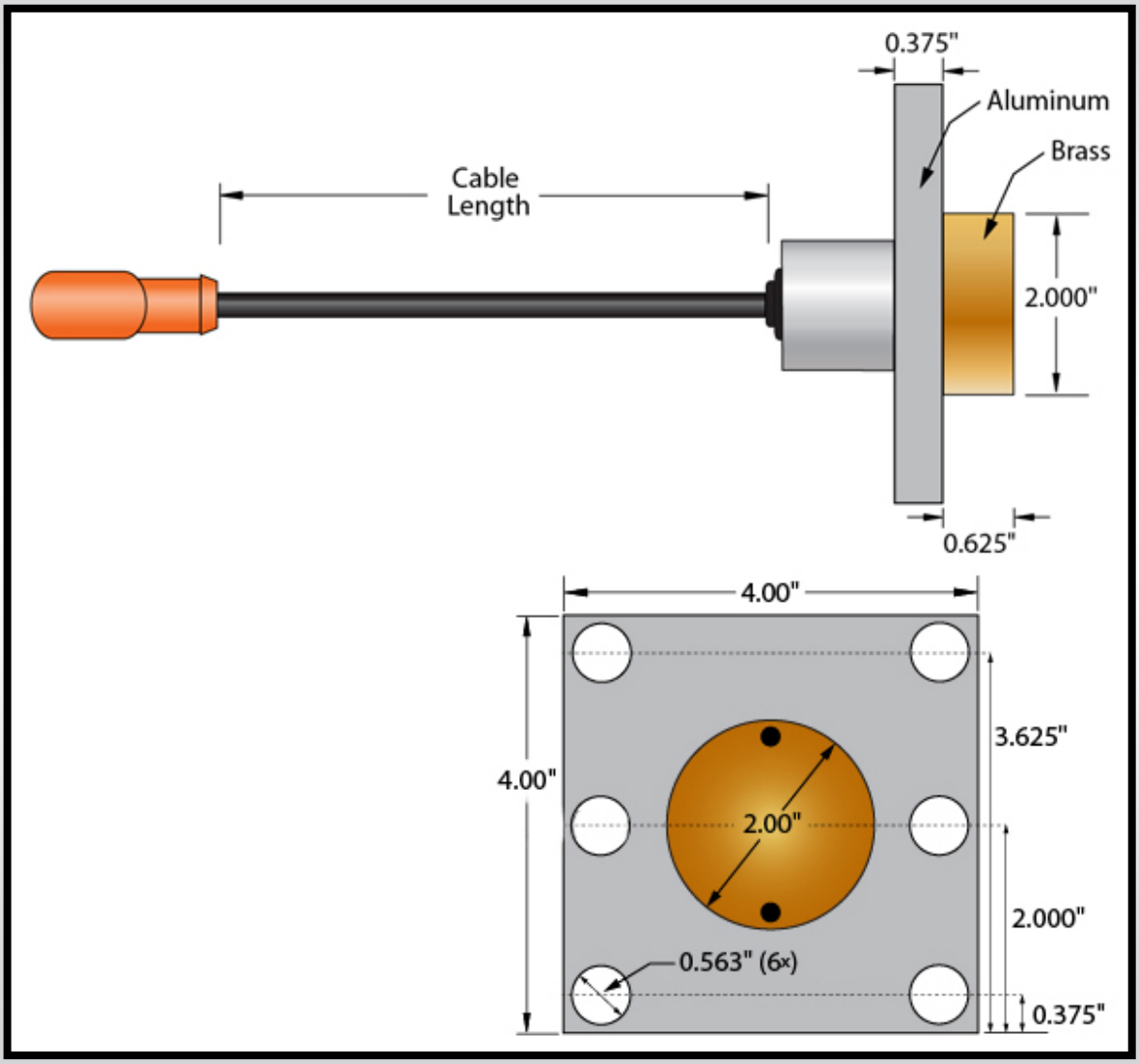
HPA Ambient Temperature Sensor:



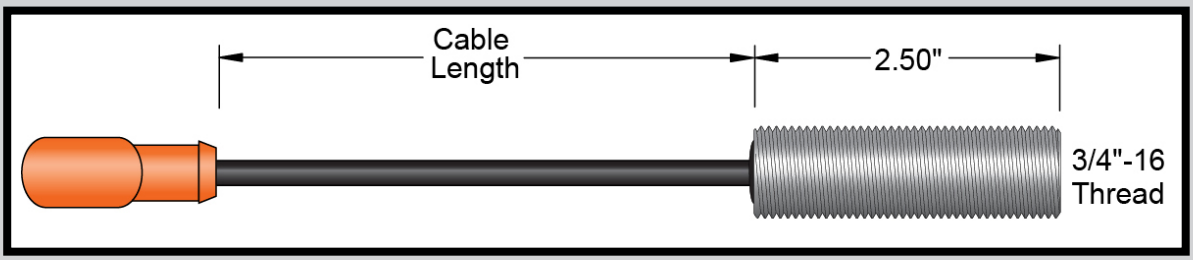
HPS Stud-Mount Temperature Sensor:



HPB Belt Alignment Sensor:

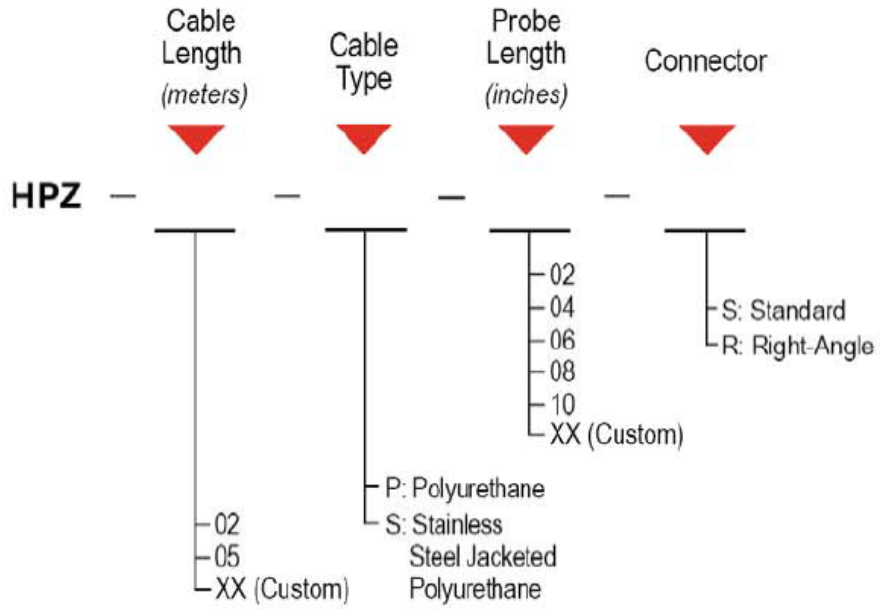


HPR Shaft RPM Sensor:

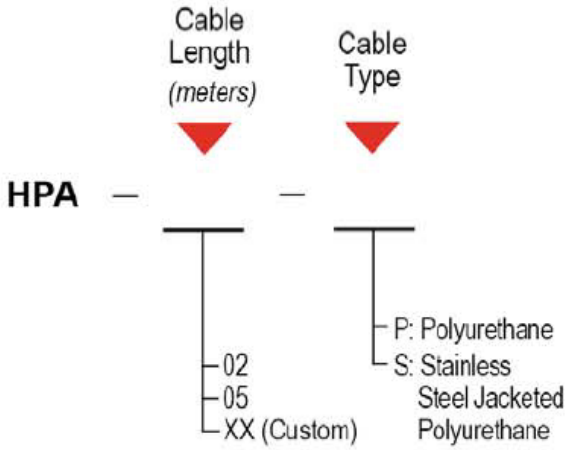


Models

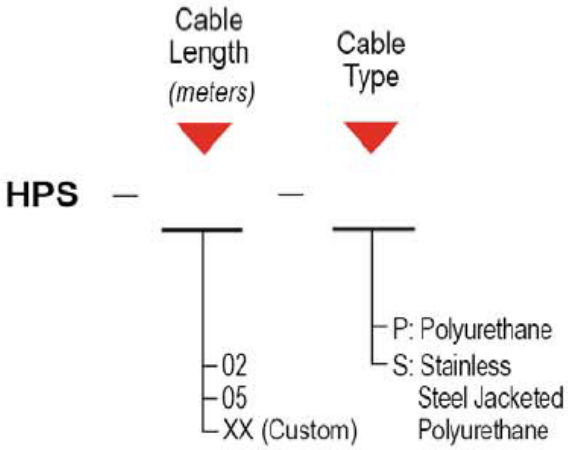
Bearing Temperature Sensor



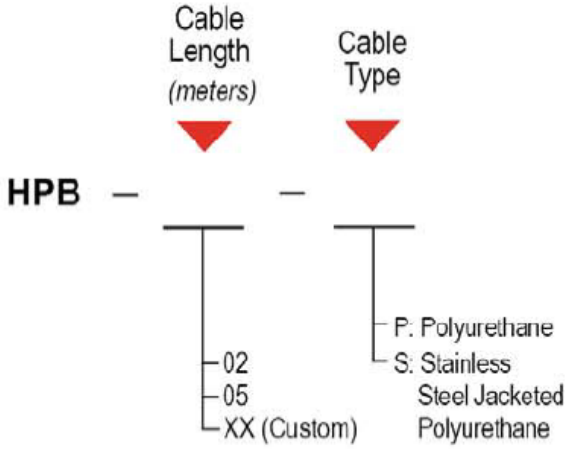
Ambient Temperature Sensor



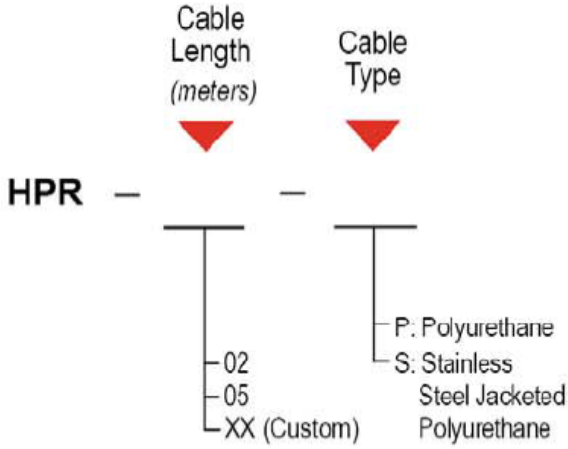
Stud-Mount Temperature Sensor



Belt Alignment Sensor



Shaft RPM Sensor



Section E
Sensor Installation

Bearing Temperature sensor installation instructions.

The bearing temperature sensors are installed into the bearing block. Some locations provide limited clearance. This document provides basic instructions for different configuration.

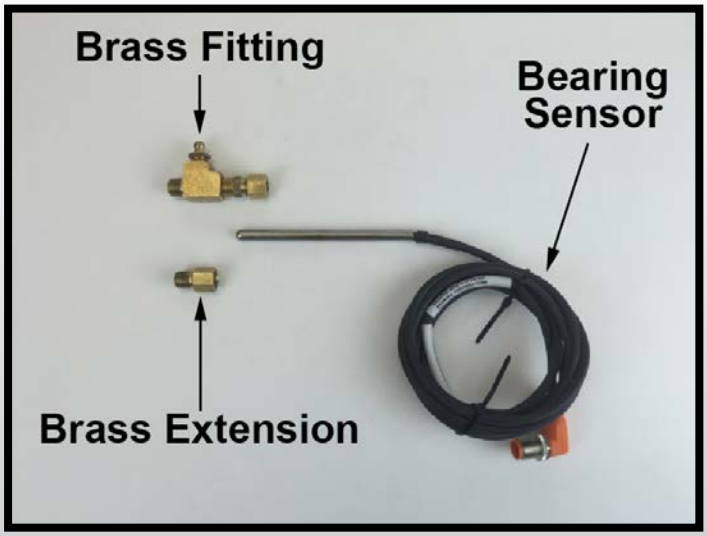
Safety: "Lock out tag out" the system, or determine that the system is safe while installing the fittings.

Typical sensor installation:

- Pillow block bearing
- Flange bearing requiring an extension
- Bearing with insufficient clearance requiring a 90 degree sensor probe placement.

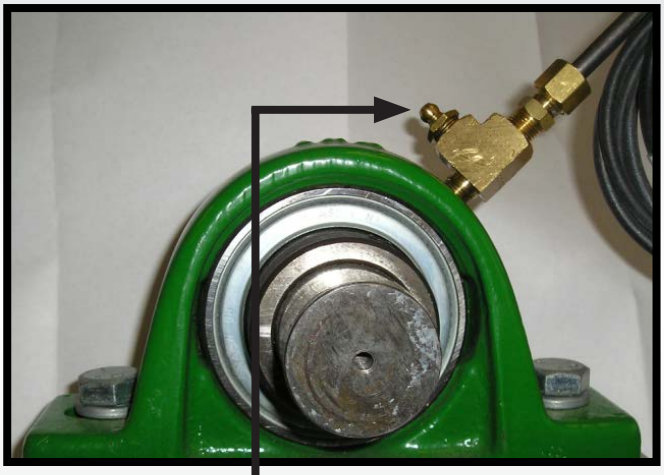
Components are: Bearing sensor, Brass fitting, Brass extension

Tools: 7/16", 9/16" wrench or adjustable wrenches.

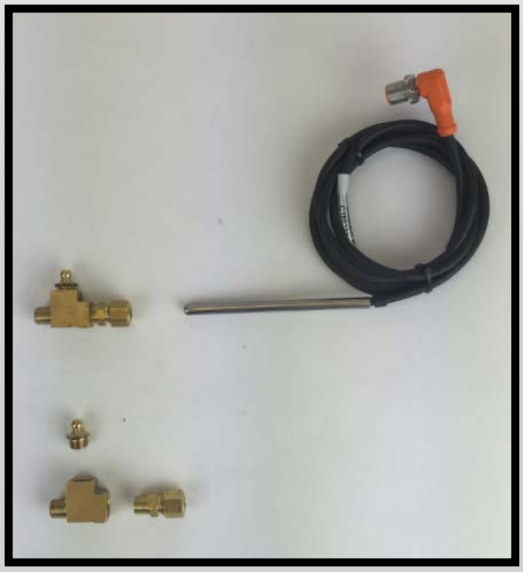


Pillow Block Bearing Installation.

1. Remove zerk fitting from the bearing
2. Tighten the brass fitting into the zerk fitting hole.
3. Insert the bearing sensor probe through the brass fitting until it touches the bearing, **back out it out 1/10".**
4. Firmly tighten the compression fitting; this will hold the sensor probe in position.

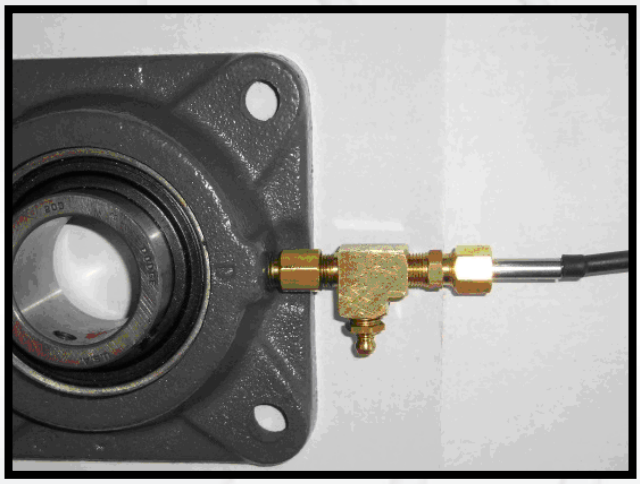


Standard pillow block bearing, in-line, without a clearance issue.



Flange Bearing Installation requiring an extension.

1. Remove zerk fitting from the bearing
2. Tighten the 5/8" brass extension into the zerk fitting hole.
3. Tighten the brass fitting onto the 5/8" brass extension.
4. Insert the bearing sensor probe through the brass fitting until it touches the bearing race, **then back it out 1/10".**
5. Firmly tighten the compression fitting; this will hold the sensor probe in position.



Bearing with insufficient clearance requiring a 90 degree sensor probe placement.

1. Remove zerk fitting from the bearing.
2. Thread the 5/8" brass extension into the zerk fitting hole.
3. Tighten the zerk into the end of the brass fitting.
4. Tighten the brass fitting into the 5/8" brass extension.
5. Insert the bearing sensor probe through the brass fitting until it touches the bearing race, **then back it out 1/10"**.
6. Firmly tighten the compression fitting;

Belt Alignment Temperature Sensor Installation Instructions.

Safety:

"Lock out tag out" the system, or determine that the system is safe while installing the fittings.

How to determine the location of the Belt.

"Lock out, tag out" the system. Look inside the access panel and determine the center point of the belt. Mark the location for a vertical reference and then run a straight line centered on that location up or down the elevator.

Components are:

Belt Alignment Temperature Sensor.

Tools:

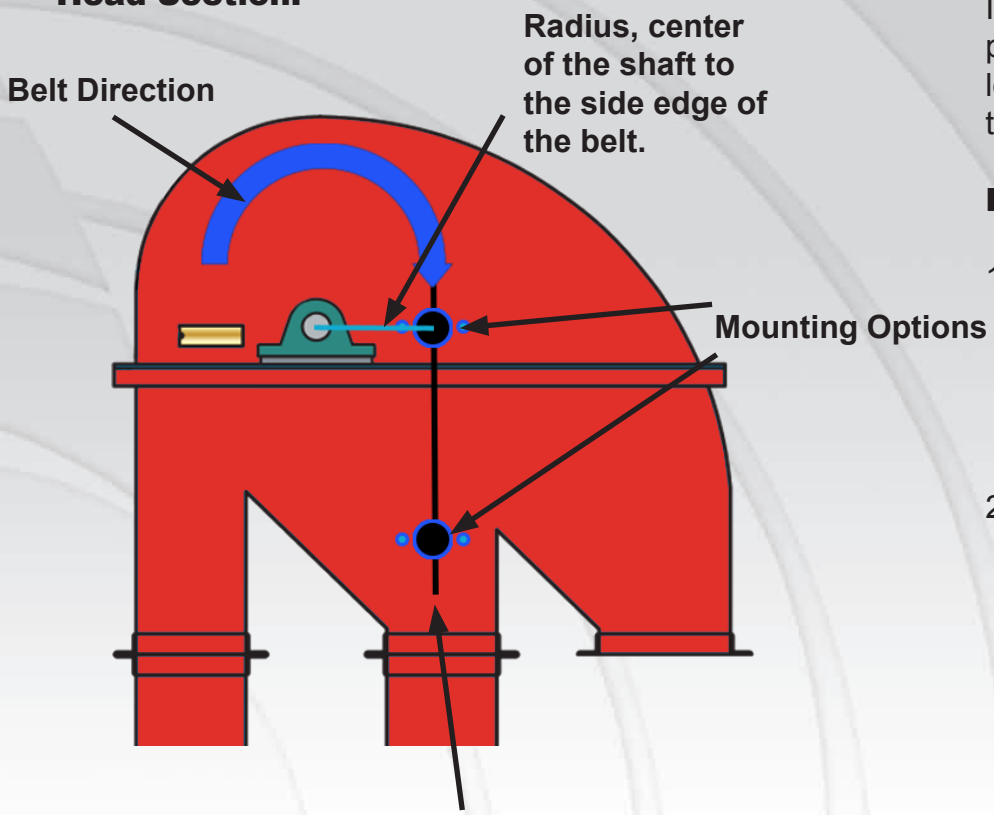
Drill, 2-1/4” hole saw, ¼” drill bit, tape measure, marking pen, template, tools to access the panels on the equipment.

Installation Warning:

1. When installing the belt alignment sensor you need to ensure that it is installed so the belt travels across the block in the proper direction. Review the instructions in the template and assembly diagram section of this document.
2. When mounting the belt alignment sensor, you will need a space greater than or equal to 1/4" from the belt to the sensor. If the belt rubs on the sensor it will damage the sensor. This may require the belt to be aligned prior to installation.

Belt Alignment Temperature Sensor Placement

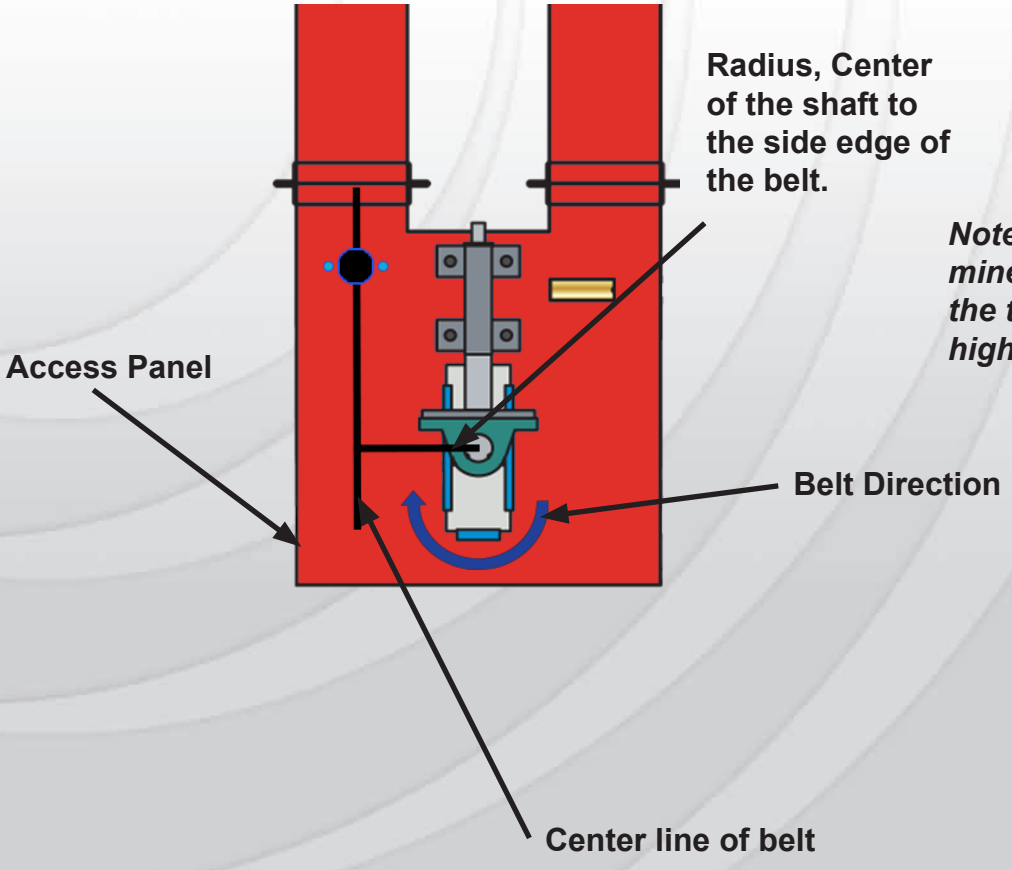
Head Section:



It is optimal if the sensor can be placed on the exiting side of the pulley (See arrow above for belt direction) on both the head and the boot.

Head Placement Options:

1. On the head, the sensor can be placed to detect the head pulley and the belt. This would be on the top side of the head, where the radius and center line intersect.
2. If there is not enough room or clearance the sensor can be placed lower on the equipment.



Note: On the tail sections, determine the location of the belt when the tension adjustment is at its highest point

Template and Assembly Diagram

Template:
Utilize a template to place on the equipment with the proper belt orientation, then, mark the center and the mounting holes. A scaled size .PDF template is available.

Installation diagram illustrates the proper assembly.

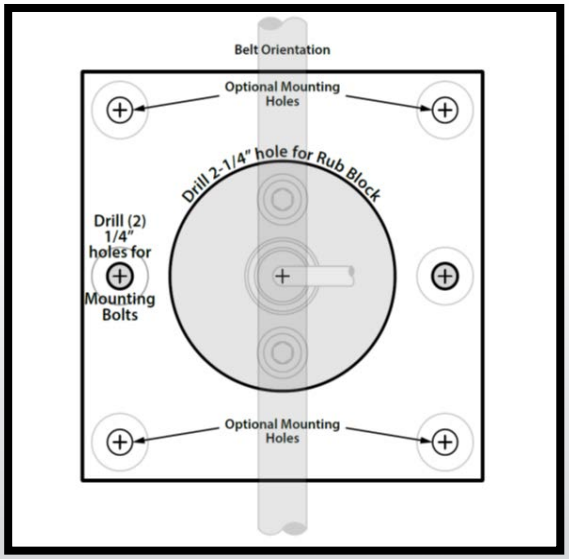
Use a smartphone to scan QR code.

Or view full size templates here:

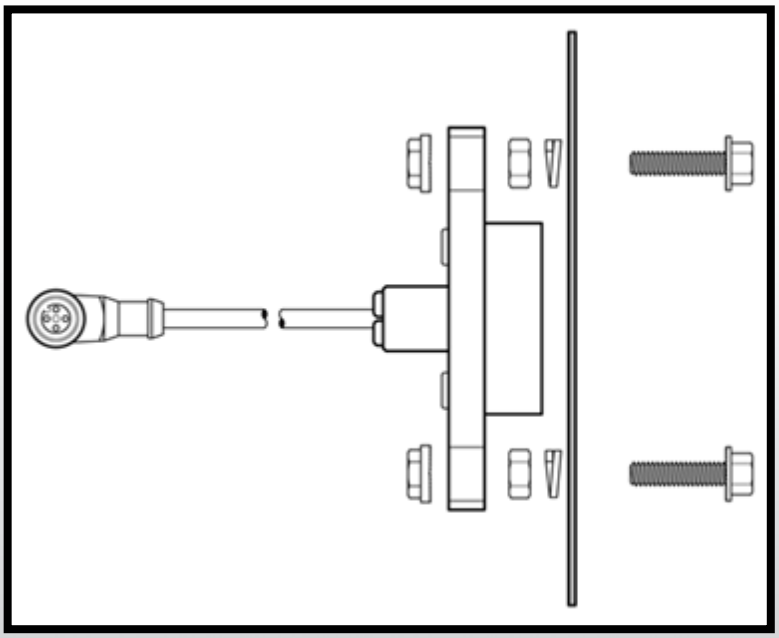
https://www.electro-sensors.com/support/esi-file-download-page

When installing the belt alignment sensor you need to ensure that it is installed so the belt travels across the block in the proper direction.

Template



Installation Diagram

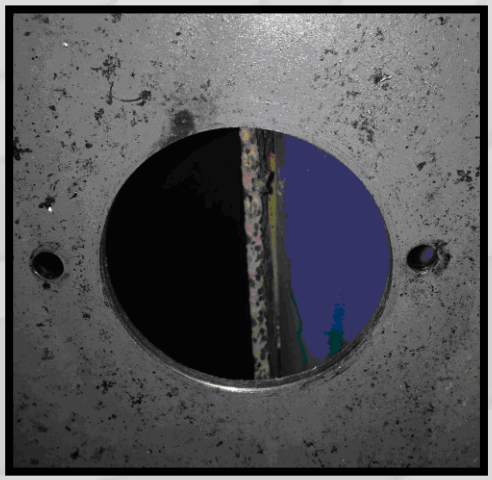


Marking and Cutting Examples

1. Use a template (plate template used in this example) to mark the mounting holes and the center drilling guide hole.
2. Cutting the hole...
3. Once the proper location is marked, cut a 2-1/4" hole.
4. Use cutting grease and do not let the blank fall into the equipment.
5. Pre-drill two holes 1/4" mounting holes.

*Note the belt edge should be centered in the hole.

When mounting the belt alignment sensor, you will need a space greater than or equal to 1/4" from the belt to the sensor. If the belt rubs on the sensor it will damage the sensor. This may require the belt to be aligned prior to installation.



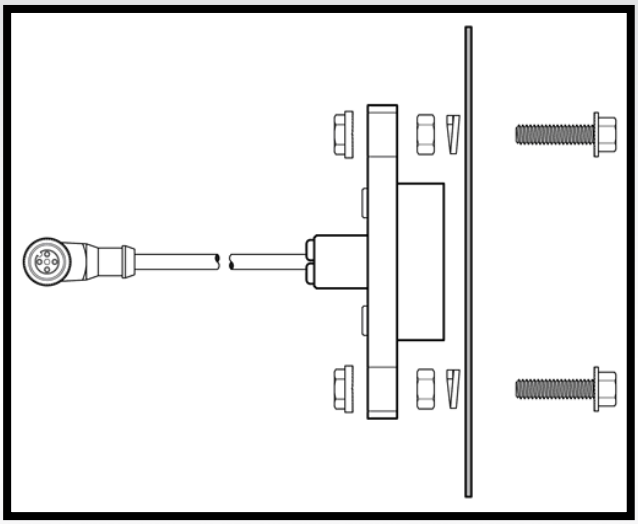
1)

2)

4)

Final Installation

1. Insert the 1/4"-20 bolts from the inside of the equipment through the holes.
2. Attach the split lock washers and nuts to the inserted bolts.
3. Next the sensor should be placed over the 1/4"-20 bolts and secure the exterior nut.
4. Seal the top and sides with silicone if exposed to moisture.



Section F
HazardPRO System Templates

- **Rub Block Hole Diagram**
- **Patch antenna Mounting Diagram**
- **Limit Switch / Plug Chute Detector Wiring Diagram**

The following Templates are for reference only. If templates are needed please contact Bruce Brink or Electro-Sensors Tech Department.

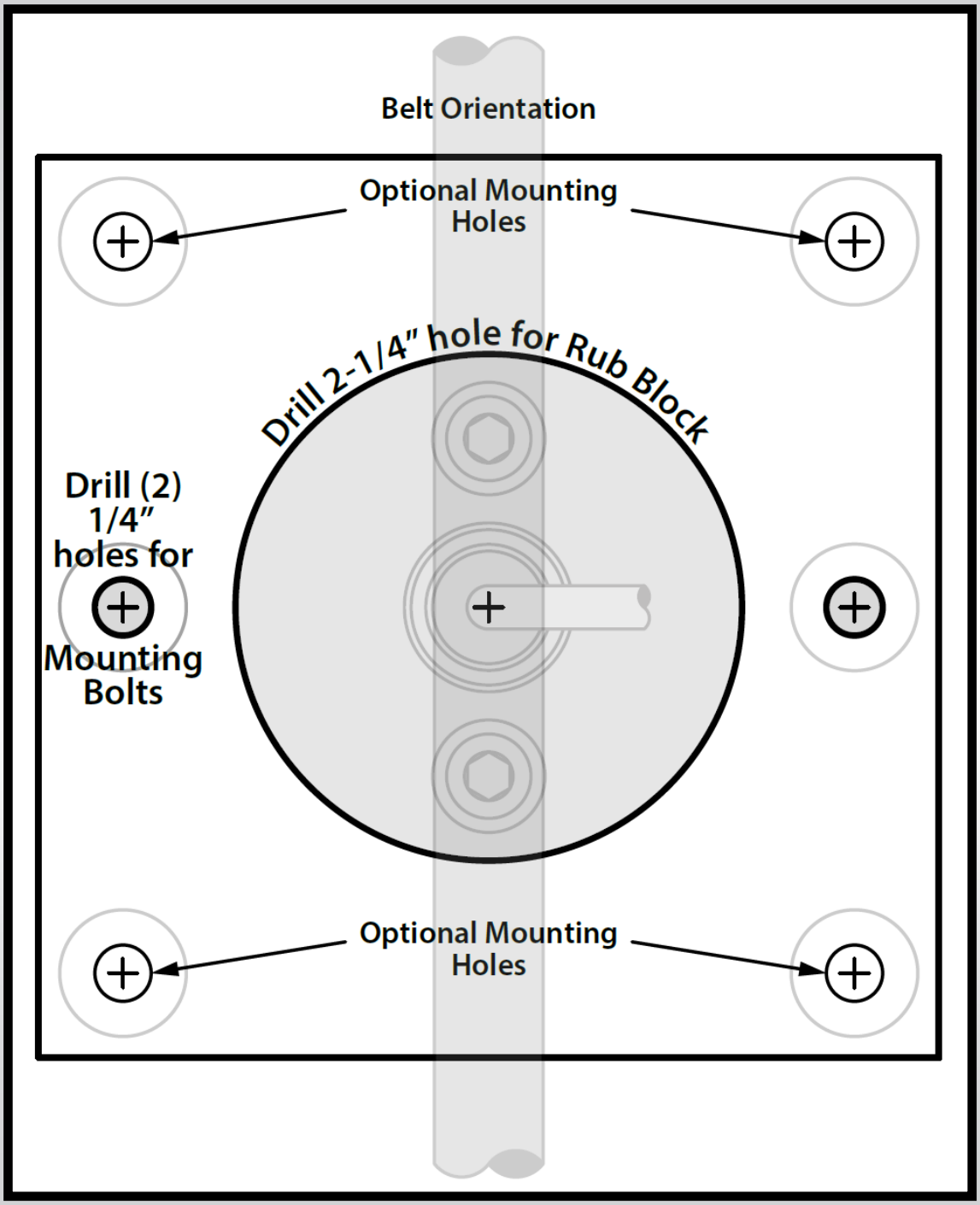
E-mail:
tech@electro-sensors.com
sales@electro-sensors.com

Telephone:
800-328-6170

QR Code to access Template Page.

(Use a QR scanner app on your phone to easily and quickly access our templates.)

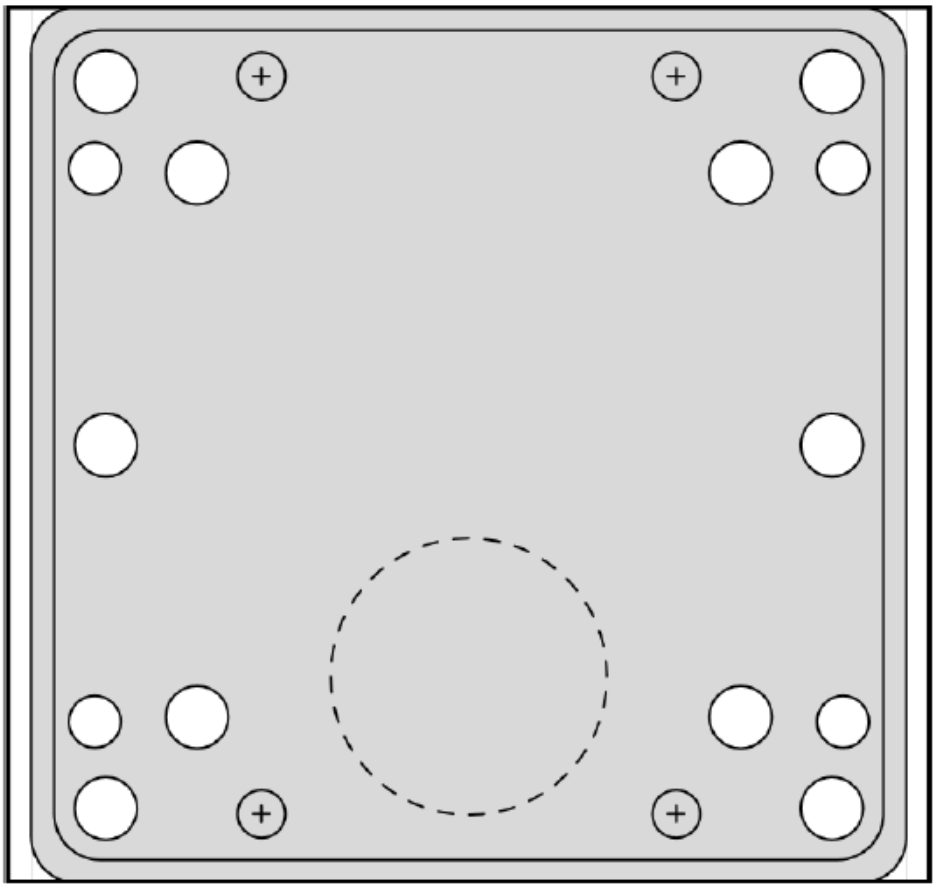
Alternatively you can navigate to this Web Page with the following link.
https://www.electro-sensors.com/support/esi-file-download-page



Not to Scale

For printing please see digital version via: Website or System Manager.

Antenna Template in full size print.
The top two plus markings will fit the top holes in the
Patch or the Panel antenna



Not to Scale, access website for template.

QR Code to access Template Page.

(Use a QR scanner app on your phone to easily and quickly access our templates.)

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For printing please see digital version via: Website or System Manager.

How to wire Plugged Chute Sensors or Limit Switches

White

Black

Com

N.C.

N.C.
Contact

- Clip off Blue
and Brown wires

Plugged Chute Sensor
or
Limit Switch

The Normally Closed contact will open when the Plugged Chute Sensor detects a plugged condition. In the case of the Limit Switch, the Normally Closed contact will open when the Limit Switch is pushed.

For printing please see digital version via: Website or System Manager.

Notes

Notes

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Web: electro-sensors.com • Email: Tech@electro-sensors.com