



## **UE SYSTEMS**

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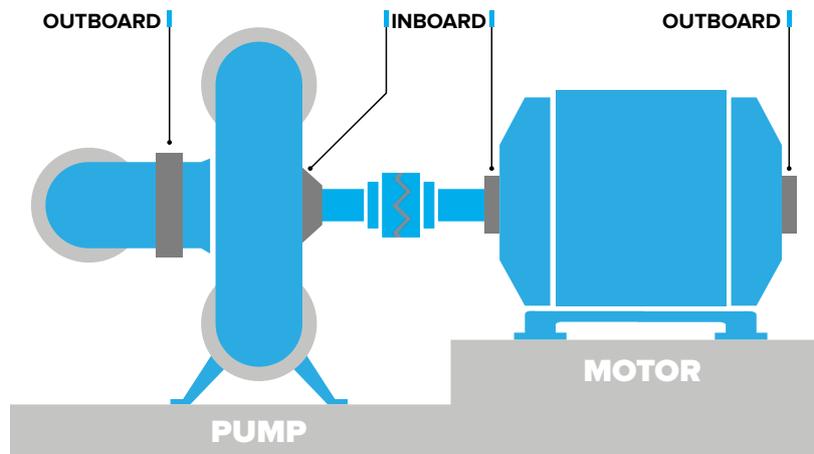
### **CONSIDERATIONS FOR THE PLACEMENT AND INSTALLATION OF ULTRASOUND SENSORS**

# SENSOR PLACEMENT

## GETTING STARTED

If you are thinking about improving your mechanical reliability program, then it is time to get familiar with and include Ultrasound Technology. Before you get started, the first question you will need to answer is, “how many data points will need to be collected and where should they be collected from?” If you intend to apply Ultrasound Technology as part of a remote monitoring solution, then this question becomes even more important to ensure you obtain the exact number of sensors and that they are properly installed.

Ideally, there will be one sensor for each bearing on the asset. As shown in this example, a typical motor and pump. The four bearings would require four sensors to properly monitor the entire asset.



## PRIMARY CONSIDERATIONS

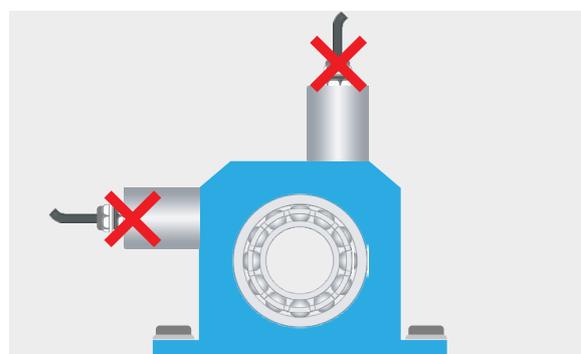
### BEARING PROXIMITY

Place the sensor directly on the machine housing as close as possible to where the bearing is located for the most direct path of sound and vibration transmission. Placing the sensor as close as possible to the centerline of the bearing can also be considered to further optimize the signal coming directly from the bearings and avoid any potential distortion.

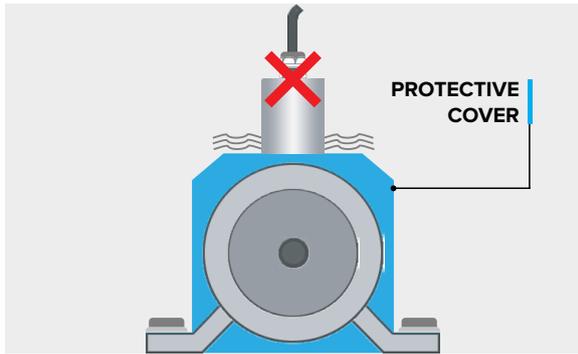


BOTH LOCATIONS ARE GOOD

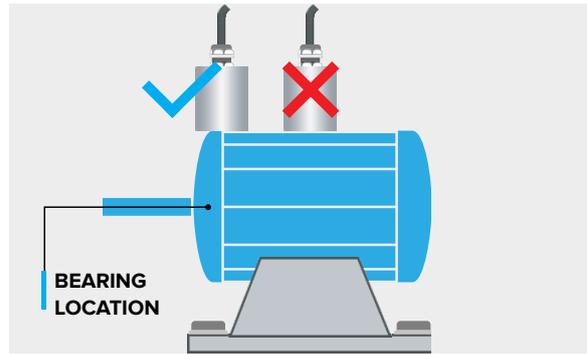
Both sensors are placed directly in line with the center of the bearing and are the shortest distance to it. Both the horizontal and vertical locations are acceptable, and either location can be used.



Both sensors are placed in locations furthest away from the centerline of the bearing and are not optimal for data collection.



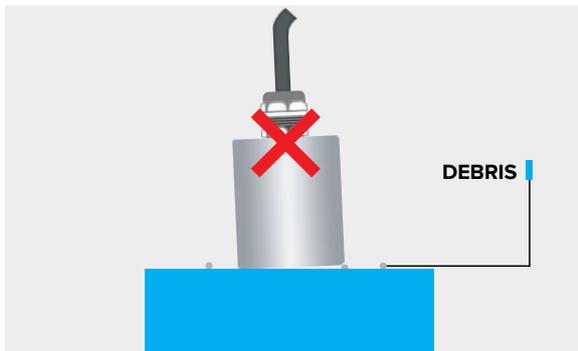
This sensor is placed on the protective cover and should not be used. It should be moved to a location on the machine housing that would allow for the most direct path of sound transmission from the bearing to the sensor.



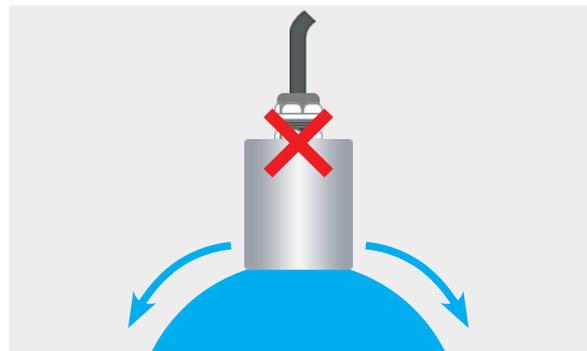
Both sensors are mounted vertically but the right sensor is not mounted as close as possible to the bearing and should not be used. The left sensor on the other hand is mounted in an acceptable location on the machine housing that is closest to the bearing.

### PROPER MOUNTING

Ensure the sensor can be firmly attached to the machine housing and is free of debris and obstructions that would impede its ability to maintain consistent and stable contact. Eliminating any contact with the sensor housing by structures external to the test location should also be considered.



The sensor is placed at a location with debris that is not allowing the sensor to fully contact that machine housing and/or firmly attach to it. The surface should be cleaned of all debris before placing the sensor to ensure there is instability or weakness in the readings coming from the bearing.



The sensor is placed at a location where it has limited surface contact area and is prone to rocking and movement side to side. This lack of stability will cause the readings to be inconsistent and potentially erroneous in nature and should not be used.

## ADDITIONAL CONSIDERATIONS

### COMPETING SOUNDS

Whenever possible the sensor should be placed in locations that best isolate it from other sounds, both internal and external to the machine, that could hamper consistent monitoring of the bearing. A common example would be the increased electrical related sounds that can be heard the closer the sensor is placed to an electric motor's wire termination junction box.

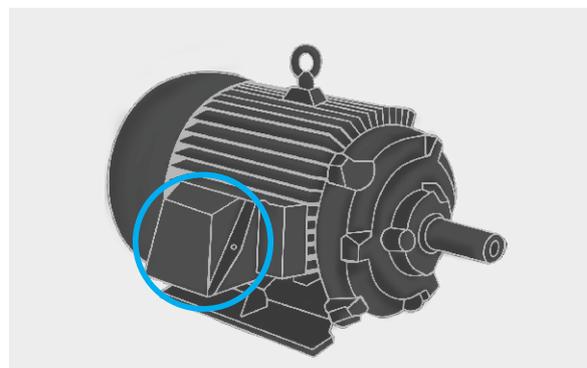
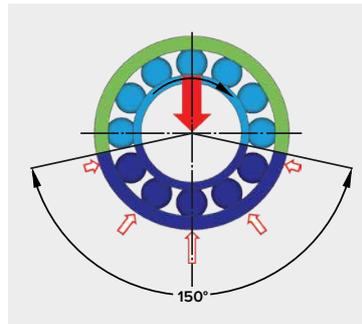


Image showing an electric motor's wire termination junction box.

## BEARING LOAD ZONE

The region of the bearing that is involved in the load transmission is referred to as the load zone. This area can potentially yield the highest readings, but it is often not feasible for most machine types.



- Load zone ( $\approx 150^\circ$ )
- Will enter the load zone during rotation
- Unloaded zone
- Load (shaft)
- Load distribution (housing)

Image showing the bearing load zone for a typical radial load on a horizontally mounted machine.

## MOUNTING OPTIONS

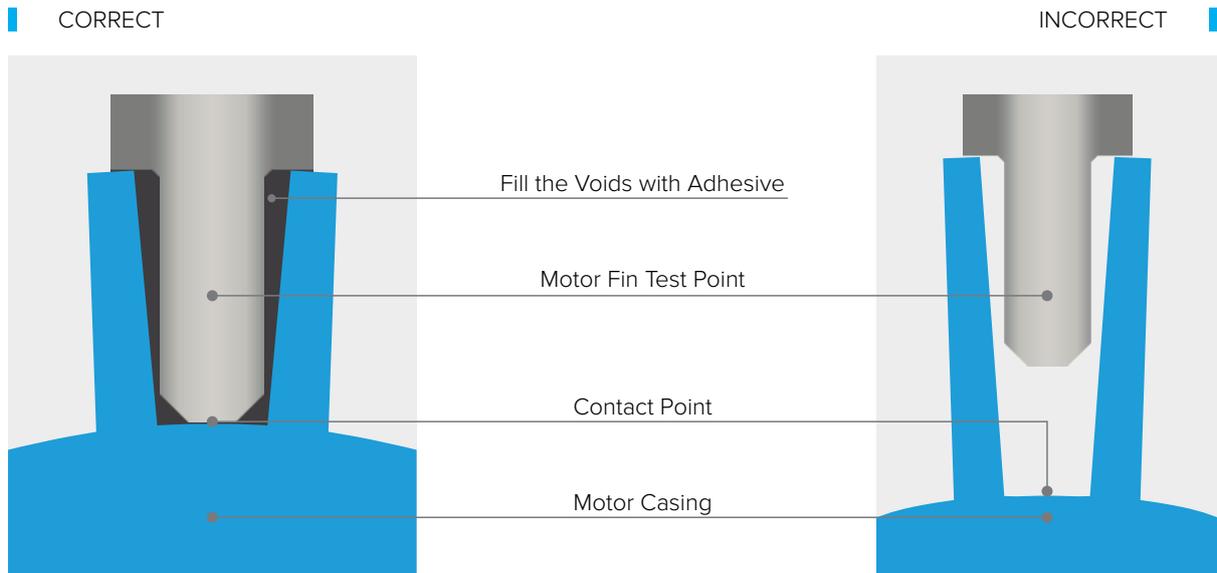
### ADHESIVE STUD MOUNT - KEY POINTS:



- 1 Improves Cycle Time**  
Adhesive-bonded fastening solutions maximize design and work sequence flexibility while reducing assembly time.
- 2 Reduces foreign object damage (FOD)**  
By eliminating the need for rivets, washers and bolts, FOD risk is reduced.
- 3 Reduces production costs**  
Elimination of drilling and associated steps streamlines and derisks production processes and lowers total cost.
- 4 Simplifies installation & maintenance**  
Our easy, three-step installation process can be performed in the factory, at sea, or even on the battlefield, facilitating production, retrofits and repairs.
- 5 Prevents corrosion**  
Our fastening solutions integrate an adhesive barrier between the substrate and the fastener, preventing galvanic corrosion.
- 6 Reduces weight**  
Adhesive-bonded fastening delivers hole elimination and localized reinforcement, permitting reduced material, weight optimized structure.
- 7 Avoids errors & rework**  
A major share of shop floor rework cost relate to misdrilled holes, eliminated by adhesive-bonded fastening.
- 8 Preserves structural integrity**  
Elimination of structural holes, removes stress concentrations and prevents fatigue crack initiation.

## FIN MOUNT

When a good spot to mount the sensor is not available, UE Systems' Motor Fin Mounts may be the perfect solution. Selecting the proper Motor Fin Mount is accomplished by measuring the depth and width of the cooling fins where you want to locate the remote ultrasound sensor. The Motor Fin Mount needs to be long enough to directly contact the motor case between the fins. Loctite AA H3300 adhesive is then used to hold the Motor Fin Mount in place. The thickness of the Motor Fin Mount should allow contact at the bottom and minimize the amount of adhesive needed.



## ULTRASOUND TEST POINTS TARGETS - UTP

Ultrasound Test Points are a great way to ensure consistency for your data collection using the stethoscope module or the magnetic sensor. The plate has the same diameter as the magnetic sensor and contains a center point to stabilize the stethoscope tip.



## THERMO ISOLATION YOKE

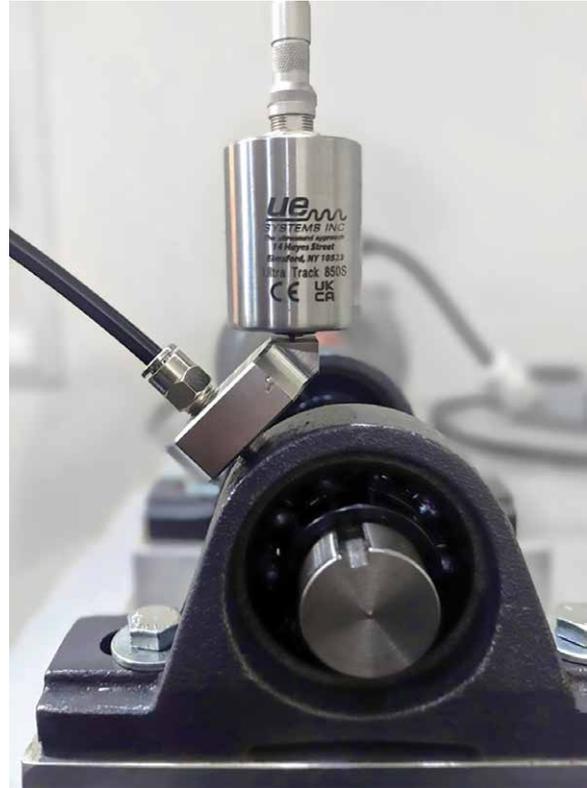
Mounting kit for thermal isolation, suitable for Ultra-Trak 750 and RAS sensors. Used in application where mounting location is above the rated temperature of the sensor. The thermo isolation yoke uses the ambient air to significantly reduce the temperature to the sensor.



## GREASE FITTING ADAPTERS

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Experience a trouble-free installation process for your ultrasound sensor with our Grease Fitting Adapter. Our adapter offers two configuration options for mounting a single point lubricator or zerk grease fitting, in both direct or remote mount positions. This adapter features an innovative design that allows for easy installation and seamlessly integrates your ultrasound sensor and single-point lubricator into one convenient solution.



Need further support?  
Want information regarding products or training?

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