

CTC AppNotes

A series of technical documents written by members of the CTC community

Proximity Probe Mounting Options

Executive Summary

This edition of CTC's PRO APPnotes will discuss the three primary methods for mounting proximity or eddy current probes for radial measurements.



Monitoring of journal bearings (also known as sleeve bearings or plain bearings) is generally accomplished by using "eddy current" or "proximity" probes. These probes use the fluctuations induced in an electromagnetic field generated by the probe to determine the bearing shaft position relative to the bearing casing and the dynamic vibration of the rotating shaft. Proper probe mounting will have a significant effect on the validity of the data measured by the monitoring system.

Proximity probes are often used to monitor turbine shafts in power plants.

In general two probes mounted 90 degrees apart are the most commonly used configuration for mounting radial proximity probes. Each probe monitors the position of the shaft relative to the "X" or "Y" location. DP1001 and DX3301 series probes are recommended for most applications.

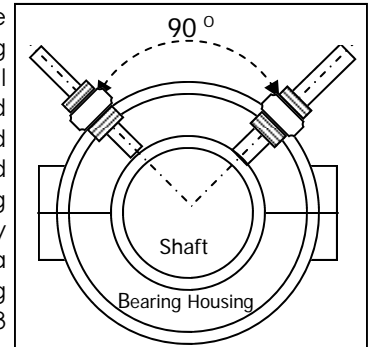
There are three primary methods of mounting the probes, internally mounted, through mount (internal/external), where the probes are mounted through the bearing casing and the casing is counter bored to prevent the probe from side sensing; and externally mounted, where the probes are mounted on the outside of the machine and measure an exposed portion of the shaft.

1. **Internal mounting**
By mounting the eddy current probes completely inside the machine or bearing housing with PRO DM902 series brackets (or with custom designed and manufactured brackets) three things are accomplished, the probe measures the shaft surface, the costs of installation are minimized, and the measurement of the shaft position and vibration is very precise. *Advantages/Disadvantages:* The probes must be installed and properly spaced before the bearing cover is reinstalled. An accommodation must be made for the probe cable to exit the bearing housing. This can be accomplished by using an existing plug or fitting, or by drilling and tapping a hole above the oil line and properly sealing to avoid leaks. The cables must also be tied down inside the bearing housing to prevent cable damage or failure from contact with the shaft. On the down side there is no access to the probe at all when the machine is running, all fasteners inside the bearing housing should be safety wired, or otherwise prevented from working loose inside the machine, and extra care must be taken at the cable exits to prevent leakage.

2. Through mounting

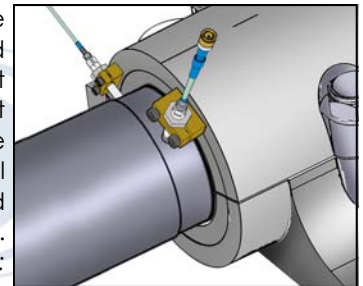
3. External mounting

Through mounting (sometimes called internal/external), is where the probe is mounted through the bearing casing and the casing is counter bored to prevent the probe from side sensing or providing false readings from the bearing housing. Internal/external mounting is accomplished when an appropriately sized hole is drilled and tapped directly through the bearing housing or the proximity probes are mounted with a Mounting Adapter Bushing like PRO's DM901 and DM903 series. These adapters allow external access to the probe but allows the probe tip to be internal to the machine or bearing housing. *Advantages/Disadvantages:* Care must be taken in drilling and tapping the bearing housing or cover to insure that the probes will be perpendicular to the shaft center line. The benefits of this standard mounting include the ability to replace or adjust the probes without disassembly of the bearing and the location usually offers a good viewing area for the probe.



External mounting probe diagram

External proximity probe mounting is typically used when other methods are not available. Special care must be given to the quality of the shaft surface and mechanical protection of the exposed probes and cables is required. *Advantages/Disadvantages:* Exposed areas of the shaft may have scuffing, scratching or rust limit the measurement quality of the probes. If the shaft is inspected and found to be clean and smooth then this location may be used for measurement. The advantages of this mounting style are the low cost and the easy access to the probes.



Parts included in this discussion
DM901, DM902, & DM903 Proximity probe mounting options
DP1001 Series proximity probes, cables and drivers
DX3301 Series Bently compatible proximity probes, cables and drivers.

If you have any questions or for further information please contact CTC directly via Email at dgripe@ctconline.com or sales@ctconline.com or feel free to call 1-800-999-5290 in the US and Canada or +1-585-924-5900 internationally.

If any PRO product should ever fail, we will repair or replace it at no charge, as long as the product was not subjected to misuse, natural disasters, improper installation or modification which caused the defect.