Photos show CTC Eddy Current Probes which are not included with Item #5050 Probe Holders.
READ THIS MANUAL BEFORE USING REMOVABLE PROBE MOUNTS

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Warning

The CMS Removable Probe Mounts should only be attached to the bearing housings of machines that are shutdown. Attaching the Removable Probe Mounts to machines in operation is not recommended since working around rotating shafts is very dangerous.

Proximity probe cabling should be secured to prevent entanglement with the shaft. Failure to do this could result in damage to machinery, personal injury, or even death.

Follow all safety procedures and guidelines concerning working around rotating equipment, shaft guarding, caution tape, etc., provided by the plant where these removable probe mounts will be used.
Warranty

Custom Machinery Solutions L.L.C. warrants that the Removable Proximity Probe mounts will perform substantially in accordance with the accompanying documentation for a period of 1 year from the date of delivery and that any hardware will be free from defects in materials and workmanship for a period of 1 year from the date of delivery. During this period, Custom Machinery Solutions L.L.C will repair or provide replacement parts after inspection of the parts at our facility excluding delivery charges.

The warranty does not cover defects due directly or indirectly to misuse, abuse, negligence or accidents, normal wear, improper repair or alterations, operation outside of the environmental specification of the product or improper site preparation or maintenance.

How to Get Service: The product may be returned for inspection, postage prepaid to CMS LLC by emailing sales@custommachinerysolutions.com and requesting a return authorization. Proof of the initial purchase date and an explanation of the compliant must accompany the product. If our inspection discloses a defect, we will repair or replace the component, or refund the purchase price, at our option. We will return the repaired product or replacement at our expense unless it is determined by us that there is no defect, or that the defect resulted from causes not within the scope of our warranty in which case we will, at your direction, dispose of or return the product. In the event the customer chooses to have the product returned, the customer will be responsible for the shipping and handling cost of the return.
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CMS LLC shall in no event be liable for death, injuries to persons or property, or incidental, contingent, special, or consequential damages arising from the use of our products. Some states do not allow the exclusion or limitation of incidentals or consequential damages, so the above limitation or exclusion may not apply to you.

CMS LLC sells directly to customers and through distributors. The specifications for the CMS Removable Proximity Probe Mounts are given as general information and are not binding. CMS LLC reserves the right to effect at any time, without prior notice, those alterations to parts, fittings, and accessory equipment which they deem necessary for any reason whatsoever.
Warranty (cont):

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Introduction

Thank you for purchasing CMS Removable Proximity Probe Mounts. The removable mounts allow attaching proximity (eddy current, non-contact) probes to sleeve (fluid film) bearing housings using flat rare earth magnets. Sleeve type bearings are typically used on large Induced Draft Fans (ID), Forced Draft Fans (FD), process fans, turbines, large motors, etc. Temporary mounting of proximity probes is useful when diagnosing vibration of the machine’s shaft relative to the bearing housing of fluid film bearings. These removable proximity probe mounts allow temporary mounting of proximity probes to measure the shaft’s vibration and position within the bearing clearance. Probes and cables are available from several vendors including CTC, GE Bently, SKF, etc. Data may be acquired from the probes using instruments available from GE Bently, SKF, Shinkawa, IOtech, CSI, National Instruments, etc.

It is acknowledged beforehand that it is preferable to permanently install proximity probes on rotating machinery using either the internal or external bearing mounting procedures described in API Standard 670. However, due to both the time and cost typically involved to install such systems, it is not always practical or feasible to do so. This device is intended to be used for temporary or short duration mounting of proximity probes permitting the accurate measurement of shaft motion (vibration) either during load changes or transient conditions such as startup or shutdown. The probe mounts are not intended to be left permanently attached to the bearing housings.

Installation of the probe mounts is only recommended when the machine to be monitored is not running and the shaft not turning. Installation of the mounts while the shaft is turning is unsafe and could result in damage to the machine, process downtime or personal injury.

Proximity probe cabling should be secured prior to startup of the machine to prevent entanglement with the shaft. Failure to do this could result in damage to machinery, personal injury, or death.
**Description**

- Item #5050:
  - The CMS Proximity Probe Mounts use two rare earth flat magnets to secure them to the face of the bearing.
  
  - A movable bubble level with protractor angle gauge allows easy positioning of the probe bracket to the desired angle (such as 45 degrees).
  
  - Two ¼ -20 thd jacking screws are provided as aids to overcoming the strong magnetic pull when positioning or removing the probe mounts from the bearing housing.
  
  - The main body has machined surfaces which are provided as an aid to precise mounting.
  
  - Extension brackets are provided in two lengths to allow positioning the probes to a more desirable shaft region.

*Figure 1: Item #5050: Removable Proximity Probe Mounts, Extension Brackets & Bolts.*
Item #5067: In addition to the parts listed under Item #5050 includes the following:

- Two Proximity Probes: CTC DP100101-00-40-10-01-00, 1 m no armor.
- Two Extension Cables: CTC DC100130-040-03-00, 4 m, no armor.
- Two Proximity Probe Drivers: CTC DD100180-51-00, 5 m, din rail mounting.
- NEMA Enclosure with AC Power Supply (Proximity Probe Drivers listed above are installed on a din rail).

*Figure 2: Two Sets of Item #5050: Shown in Case with Extension Brackets and the Removable Tray.*
Instructions For Proper Use

**Step 1:**
8 mm proximity probes (not supplied with Item # 5050) should be screwed into the probe mount so that the probe tip extends about ½ to 1 inch from the mount as shown in Figures 2 or 3. The jam nut should be tightened after the probe is accurately positioned to sense the shaft with a gap voltage of approximately -10V. *The preferred mounting location of the probes is as close to the bearing housing as possible.*

![Figure 3: Probe Mount with Extension Bracket and 8 mm x 3 inch Probe Installed.](image)

**Step 2:**
*With the machine shutdown and the shaft not turning,* clean the bearing housing and/or seal housing surfaces of all oil and grease where the probe mounts will be attached. The surfaces where the magnets attach should be clean and free of burrs, loose paint, oil and grease.

The shaft surface that the proximity probes will sense will typically require cleaning or light dressing with 280 grit wet/dry abrasive paper especially if rust is present. The shaft surface that the probe will sense should be free of keyways, oil slingers, mechanical damage, plating or metal spray buildup. *Where needed, the extension brackets can be employed to move the probes away to a more desirable shaft location.*
Instructions For Proper Use (cont):

**Step 3:**
With the machine shut down and the shaft not turning, position either one of the Removable Probe Mounts on the end of the bearing housing where it is desired to measure shaft vibration. The mounting surface should be clean and free of paint and grease or oil. Use of a degreaser is recommended. A drop of 910 adhesive on each magnet will help prevent sliding of the mounts.

Adjust the ¼-20 thr jacking screws as needed to prevent the flat rare earth magnets fully contacting the end of the bearing housing or seal housing. The intent is to make moving the probe mounts into position easier before allowing the magnets full contact with the bearing or seal housing.

Position the Removable Probe Mounts so that the probes are in the desired location usually True Horizontal (X) and True Vertical (Y), see Figure 3, or 45 degrees right (X) and 45 degrees left (Y) of top dead center, see Figure 2.

![Figure 4: Probe Mounts Positioned at 45 Deg Right and 45 Deg Left of Top Dead Center.](image)

![Figure 5: Probe Mounts Positioned at 90 Right (X) and 0 Deg (Y) at Top Dead Center.](image)

Take care when positioning the probe mounts to not ausing potential damage to the probes. A gap of between ¼” to ½” should be maintained between the probe tips and shaft surface during initial positioning. Once initial positioning of the probe mounts is complete, the gap between the two probe tips and shaft should be roughly the same.

The adjustable level can be set to aid in positioning the probe the probe mount at the desired angle. Once the Removable Probe Mounts are in the desired position, screw the jacks out allowing the magnets to make full contact with the bearing housing or the seal housing. Insure that the removable probe mounts are securely attached to the bearing housing or seal housing and cannot be easily moved by hand. If the mounting is not secure, the probe mounts may move once the machine is started especially if the bearing housing has high vibration.
For vertical shaft applications such as vertical lift pumps, **Figure 8, 7**, the probe mounts may be aligned using a square as shown in **Figure 6**.

![Figure 6. CMS Probe Mounts Alignment Using a Square for Vertical Shaft Application.](image)

![Figure 7. Example of Vertical Shaft Application of CMS Probe Holders on a Vertical Lift Pump.](image)

**Figure 6. CMS Probe Mounts Alignment Using a Square for Vertical Shaft Application.**

**Figure 7. Example of Vertical Shaft Application of CMS Probe Holders on a Vertical Lift Pump.**

**Figure 8. Vertical Pump With Probe Holders Mounted.**
Instructions For Proper Use (cont):

Components provided with the NEMA Enclosure, Item #5079 (4 Probe Drivers), are shown in Figure 8, 11.

Figure 8. NEMA Enclosure With Components Labeled.

Figure 10. Handle on Top of Enclosure.

Figure 9. NEMA Enclosure BNC Bulkhead Connectors (Outside of Enclosure).

Figure 11. 120V Power Cord on Latch Side of Enclosure.
**Instructions For Proper Use (cont):**

**Step 5:**
Connect each Extension Cable to the Probe Cable. Then connect each extension cable to a Proximity Probe Driver. The extension cables may be inserted through the cord grips on the left side of the CTC NEMA Enclosure, see Figure 9 (Item #5068).

The power cord must be connected to 120V AC power.

Using a volt meter (not supplied) measure the voltage at the screw terminals Vt & COM on the Probe Driver, see Figure 12. The voltage (supply voltage) should measure approximately -24 V DC.

Read the proximity probe DC Gap Voltage at the Driver terminals OUT & COM with a volt meter or at the BNC Connector, shown in Figure 12. Adjust the probe tip distance to the shaft by rotating the probe until about -10V is read on the voltmeter. This will set the probe at about the center of its linear range. Then, tighten the probe jam nut to securely lock the probe in position.

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![Figure 12. Proximity Probe Driver (Proximitor).](image-url)
A set of Probe Mounts is shown installed on the bearing housing of a Generator, Figure 13, and an ID Fan in Figure 14.

![Figure 13: Adjustable Probe Holders Installed on a Generator, X/Y Arrangement.](image1)

![Figure 14: Adjustable Probe Holders Mounted on Sleeve Bearing Housing of an ID Fan.](image2)

**Step 6:**
Secure the probe cables using plastic wire ties or other acceptable means so that the cables cannot come into contact with the shaft during operation and potentially become entangled. Always use CAUTION when working around rotating equipment and follow all plant and government safety guidelines. Failure to follow these instructions could result in damage to the machine, process downtime, personal injury or even death.
Additional Information

- Proximity probes are calibrated for 4140 material per API Standard 670 to 200mV/mil. If the shaft material is different then calibration curves should be generated to obtain the correct calibration.

- The observed shaft surface should have roughness not exceeding 32 micro inches (<1 microns) and should be concentric to the bearing journal. If the shaft surface is rough or has discontinuities or there is excessive mechanical runout the vibration readings will be in error.

- Some software packages such as ADRE, System 1, IOtech eZ-Tomas, etc., allow compensating the data for magnetic and physical runout. This is accomplished by recording data from operating speed during coastdown and taking a data sample at slow speed. The slow speed data is algebraically summed to the data at other speeds to provided compensated data (compensated for runout, glitch, scratches, etc.).

- **Proximity Probe Interference:** The tips of 8 mm proximity probes should not be installed closer than 1.4 inch or 35.6 mm to avoid cross talk, see Figure 15.

![Figure 15: Minimum Recommended Distance Between Proximity Probes to Prevent Crosstalk.](image-url)