**Eddy Current Probe Systems**

**AN INTRODUCTION**

Effective protection of rotating machinery requires that the proper type of measurement be performed. The most suitable type of transducers may then be defined. Finally, specific application circumstances (frequencies of interest, operating temperatures, mounting requirements) are considered to select the optimum transducer.

**THE EDDY PROBE SYSTEMS**

The Eddy Probe is used to measure radial or axial shaft motion. It is mounted through or to the side of a bearing cap and observes the shaft’s movement relative to its mounting position. An Eddy Probe System comprises a Probe, a Driver (oscillator demodulator), and an Extension Cable.

Eddy Probe Systems have excellent frequency response. They have no lower frequency limit and are used to measure shaft axial position as well as vibration.

While Eddy Probe Systems offer excellent high frequency response, displacement at typical blade pass and gear mesh frequencies is quite small (an accelerometer may be used to augment the Eddy Probe System when high frequencies are a concern).

**API STANDARD 670**

API 670 was written to define reliable protection systems for rotating equipment operating in harsh conditions found in oil production, refining, and chemical processing. DYMAC RYTON® based Eddy Current probes were designed using a unique temperature chamber to test the probes over the wide temperature range required by API. The output sensitivity of conventional Eddy Current probe systems typically falls off as temperature increases. A unique probe winding technique was developed by DYMAC that maintains output sensitivity not only over the entire API specified temperature range, but over an extended range as well.

**SELECTING AN EDDY PROBE SYSTEM**

A wide variety of DYMAC/Vibro-Meter systems are offered to meet the requirements of virtually any application. Probe range is limited largely by the probe’s diameter. The standard DYMAC/Vibro-Meter probe diameters are:

- **5 mm (CMSS 65)**
- **8 mm (CMSS 68)**
- **18 mm (TQ403)**

The following should be considered when selecting a system:

- **Range:** Gap over which the system must accurately operate.
- **Sensitivity:** Must be compatible with monitors or other companion instruments.
- **System Length:** The physical length of the systems is approximate to the electrical length. Excess cable in certain installations is typically coiled and tied with no harmful effects.
- **Probe Case:** The size of the probe mounting case may be a factor in some installations (several case options are available).
**STANDARD DYMACHE/b-VIBROMETER EDDY PROBE SYSTEMS**

Following is a summary of the standard DYMACHE/Vibro-Meter Eddy Current Probe Systems. Detailed datasheets containing specifications, order information and possible options such as armor, fiberglass sleeving, certification (EECS [SIRA]/CSA/FM), etc. are available on request.

<table>
<thead>
<tr>
<th>System</th>
<th>Usable Range</th>
<th>Sensitivity</th>
<th>System Length</th>
<th>Temperature Range</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMSS 65/CMSS 665</td>
<td>2 mm (0.25 mm to 2.25 mm)/80 Mils (10 Mils to 90 Mils)</td>
<td>7.87 mV/micron (200 mV/mil)</td>
<td>5*/10 Meters</td>
<td>-35°C (~30°F) to +177°C (~350.6°F)</td>
<td>SKF</td>
</tr>
<tr>
<td>CMSS 68/CMSS 668</td>
<td>2.29 mm (0.25 mm to 2.55 mm)/90 Mils (10 Mils to 100 Mils)</td>
<td>7.87 mV/micron (200 mV/mil)</td>
<td>5*/10/15 Meters</td>
<td>-35°C (~30°F) to +177°C (~350.6°F)</td>
<td>SKF</td>
</tr>
<tr>
<td>TQ403/IQS453</td>
<td>12 mm (1.2 mm to 13.2 mm)/470 Mils (47 Mils to 520 Mils)</td>
<td>1.33 mV/micron (34 mV/mil)</td>
<td>5/10 Meters</td>
<td>-40°C (~40°F) to +180°C (~356°F)</td>
<td>Vibro-Meter</td>
</tr>
</tbody>
</table>

* Meets API 670

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