

TIC™ (TEMPERATURE INDICATING CAPTOR)  
APPLICATION / SUPPLEMENT  
010504

With TIC, a hot bearing indicator or bearing monitor, an early indication will prevent damage to the bearing, thus prevents damage to shafts, pins, housings, drives, etc.... As a result, there will be reduced costs and downtime will be more readily planned and scheduled.

The following are **repetitive, continued** costs incurred as a result of not locating a misalignment, lack of grease, high tension belt driven load, wrong applied bearing style, contamination, and other corrective related issues. Downtime/hour cost included in the examples can easily be five times the number shown.

- A **4-section scroll conveyor** could contain 5 bearings. If misalignment is prevalent, it won't be determined until wear is found. All 4 section pins and bearings could be affected by one bad bearing. Installation of the system costing \$500.00 could save downtime (\$5000 - \$ ? K / Hr) + damaged pins (\$500 ea) + damaged bearings (\$1000 ea) + labor (5 x \$ ? / Hr).

If the damaged scroll results in 3 hours of production downtime, and at \$6,000/hr for downtime, at \$50/hr for labor, cost for not using the device:

Downtime (\$6,000 x 3) + damaged pins (\$500 ea) + 1 damaged bearing (\$1000 ea) + labor (3 men x \$50 x 5 hours) = **\$20,250**.

- A **pump motor** bearing failure for a critical load. The rotor could be severely damaged which would require a new motor (\$1 K - \$ ? K ) + labor (2 x \$ ? / Hr) plus \$6,000/hr for downtime. Whereas the installation of an add-on would have cost \$200.

\$2000 + \$100 + \$12,000 = **\$14,100**

- One **large gearbox** repair for damages could cost anywhere from \$10,000 to \$250,000 for overhaul. Whereas an add on of temperature sensors for \$1000 could alert warning of impending failure and could reduce collateral damage costs to a fraction of what it would cost for major damaged failure. Average downtime could easily be 8 hours.

Downtime (\$6,000 x 8) + spare damaged drive (\$125,000) + collateral damage (\$8000) + labor (8 men x \$50 x 8 hours) = **\$184,200**.

- In addition to savings for bearing monitoring for proactive maintenance, **insurance premiums** may be affected with the installation of, or lack of hot bearing indicators for all areas subject to ignition, combustion, explosion, or fire.

**\$**

Placing an inexpensive TIC on all critical bearings provides a proactive approach to preventing: damage, excessive collateral damage, and reactive maintenance practices.

TIC provides greater accuracy in temperature measurement than IR guns, because it is performed at the exact location every time, and is taking the actual bearing temperature to allow you to decipher the condition of the lubrication and what actions must be performed. Bearings can be 10 to 20 degrees higher in temperature than the bearing housing, so TIC is reading actual bearing temperature, not affected by ambient conditions or optical drift.

TIC can replace PM Rounds or the act of performing the task. The first problem to occur with bearings is the break down of lubrication. After losing proper lubrication, friction will cause heat. After the heat is sufficient, the raceways and bearings themselves begin to fail. Your station operator, from any shift can provide the alert that a problem exists, without waiting for the shift PM Mechanic employee who normally performs the task.

The measurement is taken every 6 seconds of every minute, of every hour, of every day of the year, and is designed to perform this twice the normal lifespan of a bearing (4.5 years).

Also, if TIC starts to flash red soon after commissioning, the problem would be found quickly and with proper correction made, the asset will operate much longer. If TIC flashes red once (10 degrees over 1<sup>st</sup> Temperature Limit), either grease could be applied, or maintenance personnel could inspect/remedy the cause, long before bearing fatigue would occur.

Grease will last longer if operated within normal limits. Oil in some greases, will begin to break down after 150 degrees F. Some greases will reduce life expectancy by 50% for every 10 degrees over 180 degrees. TIC will help increase the knowledge base of the maintenance personnel by providing an on-line condition monitoring tool, for 1/10<sup>th</sup> the cost of most DCS systems.

With the anticipated retirement of skilled craftsmen, TIC's could be installed to help prevent damage that might require more numbers in a higher reactive environment.

No calibration - No wiring. Purchase the magnetic mount, and bolting or welding becomes unnecessary. Use a common compression fitting in grease or oil line from the bearing housing, insert the TIC temperature probe to close proximity of the bearing, plug in the connector and you have Asset Management – PM Alert Style.

“This is what the Lord says: Let not the wise man boast of his wisdom or the strong man boast of his strength or the rich man boast of his riches, but let him who boasts boast about this: that he understands and knows me, that I am the Lord, who exercises kindness, justice and righteousness on earth, for in these I delight,’ declares the Lord.”

-Jeremiah 9:23-24