

26.05.2009

Micropelt TE-Power RING Enables Wireless Condition Monitoring of Bearings

Monitoring and condition-based maintenance saves money for manufacturers and plant operators

Micropelt GmbH, Freiburg, Germany-based specialist in thin film thermoelectrics, introduces the TE-Power RING wireless condition monitoring system for bearings, transmissions, and similar parts that wear during operation. This fully integrated, battery-free, on-shaft device monitors the condition of these parts to determine if and when they need maintenance or replacing. Powered by a bearing's frictional heat, the TE-Power RING can measure temperature and pressure and record vibration signals to give manufacturers and plant operators direct access to actual condition information of the wear of rotating parts.



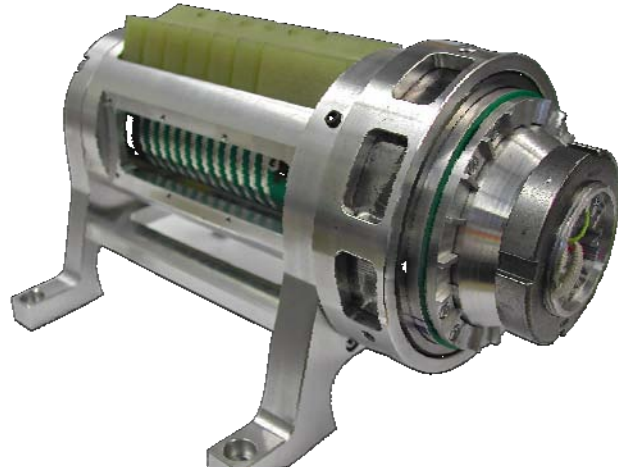
TE-Power RING with integrated radio module

The TE-Power RING is an economical, easy to install device that operates using Micropelt's high voltage energy harvesting thermogenerator chip technology. Each Micropelt MPG-D751 chip has an approximate footprint of 14mm². One to four chips are used to convert a bearing's frictional heat into milliwatts of electricity according to the demands of the powered monitoring device. One milliwatt harvested over one year equals the energy content

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of 10 to 15 AA primary cells. Tests on the company's simulator have shown that even a bearing without mechanical load generates enough frictional heat for the thermogenerator to effectively power measurements.

Integrating the TE-Power RING system to monitor bearings saves money because only parts that actually need replacing are replaced. Existing parts can be used for a longer period of time and the number of spare parts stocked and manufactured can be reduced. By monitoring which parts are wearing out, they can be replaced before they fail or jeopardize production quality. Productivity can be improved because of less and shorter scheduled maintenance. In addition, the system is economical because Micropelt's thermogenerator provides a free infinite energy supply for operation.



TE-Power Ring Simulator

The monitoring results of the TE-Power RING can be broadcast via a wireless network to those who need or are monitoring the information. Micropelt has worked with Texas Instruments to use its commercially available ultra-low power wireless technology, so expensive investment in new technology is not required. Volker Pruesser, EMEA marketing manager, MCU and Low-Power RF at Texas Instruments explains TI's support, "Micropelt's battery-free thermal energy harvesting technology can be used to power our ultra-low-power microcontrollers and RF transceivers, enabling endless possibilities for wireless sensing. With increased interest in wireless sensor systems across many markets, Micropelt's solution offers a renewable source of power and freedom from traditional batteries.

"Billions of dollars are spent and lost every year to replace flawless machine parts because constant and ubiquitous condition monitoring has always been considered too expensive and complex," explained Burkhard Habbe, VP of business development at Micropelt. "This equation changes with unlimited local power to run a monitoring system. Condition-based maintenance and process monitoring are available for just the cost of a wireless sensor node driven by a thermogenerator."

According to Dr. Joachim Nurnus, CTO of Micropelt, "We anticipate that the TE-Power RING concept can revolutionize on-shaft condition monitoring and become standard equipment, at least for critical transmission components. Monitoring replaces risk management with planning based on facts."

About Micropelt

Micropelt GmbH, a 2006 spin-off from the research cooperation between Infineon Technologies and Fraunhofer Institute IPM Freiburg, develops and markets the world's smallest and most effective thermoelectric elements for clean-tech power generation (energy harvesting) for sensing, cycling and cooling. Readily available standard products from the pilot-production plant at the company's headquarters in Freiburg, Germany are currently being evaluated by and incorporated into the products of more than 40 customers.

A large scale production facility, fully financed and currently under construction in Halle, Sachsen-Anhalt, Germany is expected to raise capacity to some 10 million devices per year by mid 2010.

About Micropelt's Thermoelectric Elements

Micropelt's thermoelectric elements are based on a proprietary scalable MEMS (Micro Electro-Mechanical Systems) micro-structuring platform technology. Compared to conventional thermoelectric elements, Micropelt's unique and patented technology reduces component and feature sizes by orders of magnitude, yielding 10 times higher cooling or heating power densities. Economies of scale through volume production break the existing cost and price barriers of conventional thermoelectrics, enabling Micropelt's devices to scavenge free electric power from waste heat to replace or recharge batteries in low power wireless sensor networks. For more information contact Micropelt at +49 (0) 761 156 337 0, info@micropelt.com, or visit our website at www.micropelt.com.

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