

The benefits of monitoring vibration within the building services industry



In many industries, there is a growing demand for companies to reduce and sustain low operating costs whilst maintaining high quality and delivery standards. Over the last 20 years there has been an increase in monitoring the condition of rotating machinery by tracking vibration levels and this method has proven to be highly successful. Many businesses encounter high expenditure due to damaged machinery and unplanned factory shutdowns.

Maintenance engineers are well aware of the benefits of monitoring vibration levels on industrial machinery; however, as you can see from the scenario below, the merits are not always appreciated by everyone.

Chris Hansford, Managing Director at Hansford Sensors Ltd, provides some insight by conveying a recent customer account.

'One of our customers provides facilities management services to office buildings and informed me of an incident with an end-customer. It all started on a hot summer's day at an Investment Bank in London. One of the Air Handling Units (AHU's) which powers the air conditioning for the building had failed. A member of staff at the bank complained to their manager, advising he could not work in the building when the temperature was so high. The Management Team were particularly worried that the lack of cool air was affecting the performance of staff so asked the Facilities Manager to investigate.

The Facilities Manager advised he was already aware of the failure and ensured it would be fixed by the end of the day. The Facilities Manager explained there was little he could do to prevent the AHU's failing – unfortunately Health and Safety laws inhibit him from accessing the AHU's therefore preventing the inspection of the machines on a regular basis. The Facilities Manager suggested he would speak to the company they employ to maintain the machinery for the building to see if there anything they could do to pre-warn them of any potential failures.

The Maintenance Provider suggested the method of monitoring the condition of industrial machinery by measuring the vibration levels. After searching on the Internet, they came across [Hansford Sensors Ltd] whose website demonstrated they had previous experience in the building services industry and in particular, for this application.

The Maintenance Provider telephoned [Hansford Sensors] for advice on the vibration monitoring process. [Hansford Sensors] enquired about the construction of the AHU, particularly if it was a direct drive or a belt drive unit.



The Maintenance Provider advised it was a combination of both and asked why this question was important. [Hansford Sensors] explained the particular product they would recommend has a limited field of vision so there is a requirement to monitor each bearing with the sensor. For example, in a machine with a belt drive, a sensor would be placed to monitor the motor on drive end and non-drive end with one sensor on each journal bearing. For direct drives, only the motor itself can be monitored. In this particular instance, a belt drive is used so four sensors were recommended.

[Hansford Sensors] provided advice to the Maintenance Provider regarding the various techniques for measuring the output from a sensor including offline and online modes.

Offline is the term used to describe for the process for mounting the sensors on the machinery and connecting them to a switch box. The switch box is fitted onto the outside of the AHU. This method requires an engineer to regularly take readings using a hand-held data collector. Alternatively, the Online system can be used by interfacing the sensors directly to a PLC/BMS (Programmable Logic Controller or Building Management System). This will present the facility to measure and analyse the output from each sensor.

The Maintenance Provider advised the preference would be to use sensors that could be directly interfaced into the existing PLC/BMS and if there was a future requirement for a more sophisticated analysis, then a specialised vibration analysis company could be introduced.

The Maintenance Provider placed an order with Hansford Sensors for the 4-20mA vibration sensors which were installed and interfaced with the existing PLC/BMS system.'

Chris Hansford concluded, 'the Facilities Manager was then able to confirm to the Management Team that the condition of the AHU's was being monitored and there is confidence there would be no similar situations in the future.'

