

# How Important Is Your Chiller System?

## Application Note



In many commercial facilities and industrial plants, a breakdown of chiller would easily cost more than \$4000 for urgent repair and also even greater operation interruption loss.

A simple example relates to hospitals, where emergency and operating rooms are vital, the chiller has to be up and running for the safety and convenience of patients. Another example would be in any large commercial building, a chiller failure can overheat the IT server room or data center quickly, causing IT equipment damage and service disruption.

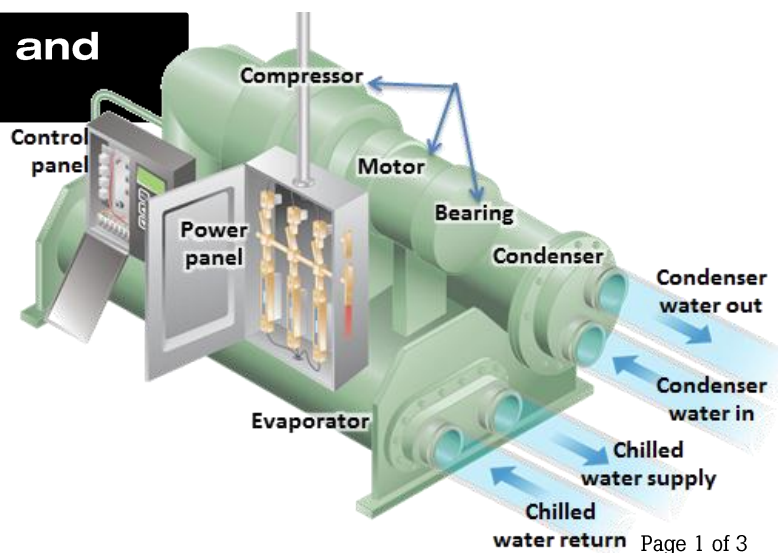
Chiller system is also critical for industrial plants, especially process cooling applications, such as injection molding, press equipment, food & beverage processing, etc.

At the heart of the chiller plant is the compressor. If it fails, the entire system is at risk of experiencing a shutdown. A variety of technologies, such as thermography, oil & refrigerant analysis, have been used to evaluate the condition of the chiller compressor. However, when it comes to mechanical maintenance, none is as powerful as vibration condition testing.

## Vibration Condition Testing and Predictive Maintenance

Vibration diagnostic technique gives you answer to the root cause of problems such as degrading bearing condition, looseness, misalignment and imbalance.

You will know exactly what the problem is, where it is (bearing, impeller unbalance or shaft misaligned etc.) and how bad it is.



As vibration testing can provide the earliest indication of mechanical problems, it is great for Predictive Maintenance (PDM). As the saying goes, *“Prevention is better than cure”*, ‘Run-to-failure’ is too costly. This is absolutely true for your chiller. PDM applies technology such as vibration condition testing to diagnose condition of chiller and track it overtime to foresee upcoming problems. Thus, the maintenance team can act early to prevent chiller failure.



“Compared to a major chiller failure, a sound preventive and predictive maintenance program is a minor cost. Implementing a best-practice maintenance plan will save money over the life of the chiller and ensure longer chiller life.”

*BetterBricks initiative by Northwest Energy Efficiency Alliance (NEEA)*

## Fluke 810 Vibration Tester, an Outstanding Predictive Maintenance Tool for Everyone

How do you use it? Fluke 810 is designed for both expert and novice users. Simple icons and on-screen help to guide you through a 3-step process:

**Easy Setup:** Enter machine power, speed of rotation, type of compressor & overall configuration.

**Fast Measurement:** Place the sensor at each bearing location to measure. More accurate and 3 times faster data gathering with supplied tri-axial vibration sensor.

**Built-in Automated Diagnosis:** Press Diagnose button & Get answers to your machine condition, root cause and actionable results on the spot.



Software is provided to record, review, report and trend vibration condition score for Predictive Maintenance. Comprehensive training and workshops are offered to ensure successful application in chiller system maintenance.

While Fluke 810 is easy to learn and use for non-expert, it is also appreciated by vibration experts in various industry. Besides vibration diagnosis, the 810 displays vibration graphs in details on-screen for the expert and his team's quick review. Considering an increasing workload of hundreds of machines, the expert uses Fluke 810 to liberate his time to focus on more complex machines. Hence, it becomes an assistance for the expert.

# Fluke Leverages on Proven Vibration Diagnostic Technology to Create a Breakthrough Solution for Mechanical Maintenance

The built-in automated diagnostic engine is a key element of vibration condition testing. While it is not possible to describe every component of the engine in this short application note, the background and proven reliability of this technology is worth mentioning. 30 years ago, US Navy came to Azima DLI Corp., a vibration analysis technology leader, to develop an automated diagnostic system to be used offshore. Based on empirical database of more than 20,000 machine tests collected over years of operation, DLI developed a diagnostic system up based on the demanding requirement of US Navy. The automated diagnostic engine effectively put powerful vibration condition experience such as synthetic baseline assessment and vibration pattern recognition in your hand.

The technology has been used in mechanical maintenance in various industries such as F&B, pharmaceutical, semiconductor, oil refineries, nuclear power plant, etc. Fluke leverages on the proven reliability of automated diagnostic engine to create Fluke 810 Vibration Tester. Contact us to request more information or free demonstration of Fluke 810.

How reliable is the automated diagnostic engine?

“A review of 3971 machine tests from US Navy ships found a system accuracy of greater than 90%.” (*Watts and Van Dyke, 1993.*)

## Other Applications

Vibration condition testing is applicable for the whole chiller & HVAC mechanical system. Cooling tower fans, condenser water pumps, chilled water pumps, auxiliary oil pumps, etc. are some equipment where vibration testing can pinpoint problems in bearing, misalignment, looseness and imbalance effectively. Many chiller manufacturers & service providers have already offered vibration testing service to their customers. Fluke 810 is also used for chiller commissioning.

### Air conditioning and cooling systems

- Centrifugal chillers
- Reciprocating chillers
- Chilled water pumps
- Condenser water pumps
- Cooling tower fans
- Fans and pumps on variable speed systems

### Air handlers

- Supply fan motors
- Return fan motors
- Fan motors on variable speed systems

### Heating systems

- Hot water pumps
- Condensate pumps
- Makeup water pumps
- Pumps on variable speed systems

### Product refrigeration

- Refrigerant pumps
- Screw chillers
- Motors on variable speed systems

**Fluke.** *The Most Trusted Tools in the World.*

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