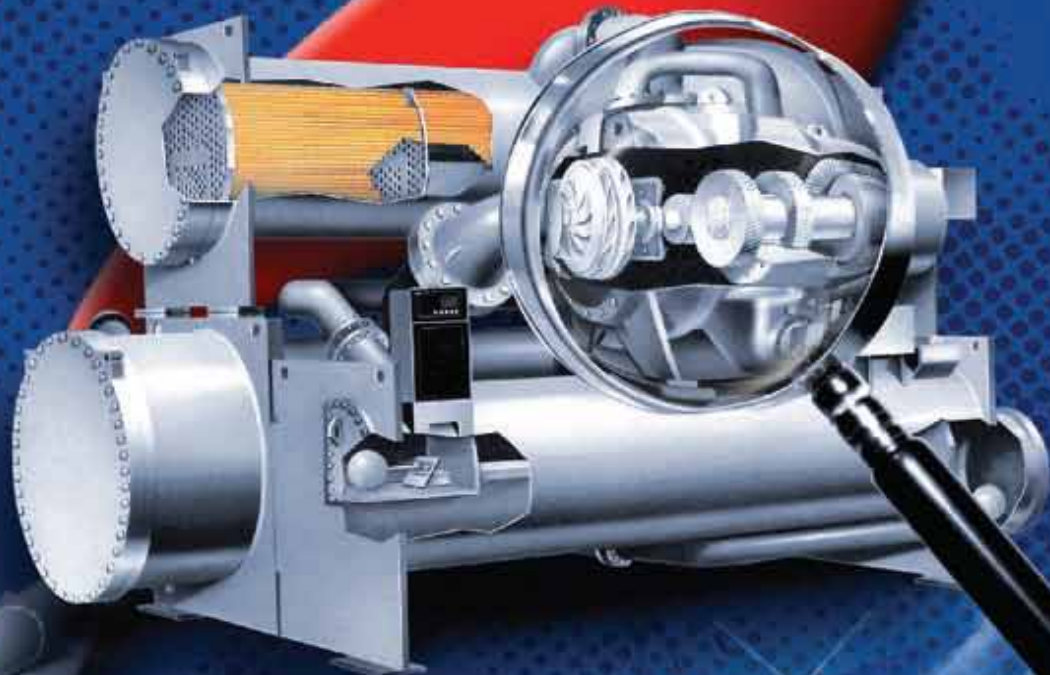




U.S. Chiller Services



PREDICTIVE MAINTENANCE NON DESTRUCTIVE TESTING



**PRECISION
COMES
STANDARD**



Demonstrated Capability

Competence & Expertise

U.S. Chiller Services provides and specializes in the Service, Repair, Retrofit, Modernization, and Maintenance of Centrifugal, Screw, Reciprocating and Absorption Liquid Chillers as well as Ancillary Equipment. Our scope of services and standards are far in excess of the standards specified by chiller manufacturers. These include an assortment of value added services such as Energy Services and Non Destructive Testing (NDT) service, performed by our Team of Western Service Engineers, including:

- Refrigerant Analysis (Analysis performed by Independent Lab in United States to ensure all refrigerant samples meet ARI 700 standards)
- Eddy Current Tube Analysis
- Vibration Analysis
- Thermographic Infrared Testing and Analysis.
- Spectrochemical Oil Analysis (A process performed by an independent Lab in United States that specializes in the analysis of refrigeration oil).
- Ultrasonic Water flow analysis and measurement.
- Motor Insulation Testing



Value Added Services

1. Energy and Environmental Services.

U.S.Chillers take an overall system perspective to providing mechanical services, which goes beyond routine maintenance to offer many advantages. Our goal will be to define, develop and deliver specific solutions to improve overall energy efficiency. By looking beyond the equipment room, U.S. Chillers will identify ways to control your energy operating expenses as well as ensure measures for conservation of environmental compliance.



2. Spectrochemical Oil Analysis

- Lubricant Condition: The assessment of the lubricant condition reveals whether the system fluid is healthy and fit for further service, or is ready for a change.
- Contamination: contaminants in the form of rust, dirt, water, acid are the leading cause of machine degradation and failure. Increased contamination alerts you to take action in order to save the oil and avoid unnecessary machine wear.
- Machine Wear: An unhealthy machine generates wear particles at an exponential rate. The detection and analysis of these particles assist in making critical maintenance decisions. Machine failure due to worn out components can be avoided.

3. Refrigerant Analysis

U.S. Chiller Services will perform and check that refrigerant is clean and not contaminated as well as meets ARI 700 standards. (Refrigerant testing is done by a third party independent laboratory in the United States)

4. Eddy Current Testing

Eddy current analysis is an electromagnetic technique and is completely non-destructive. It works on the principles of Electro Magnetic induction. There is no dangerous radiation or hazardous chemicals involved with this technique. At U.S.Chiller Services, we specialize in the inspection of installed heat exchanger tubing used in the Commercial Air Conditioning, Power, Pulp, Marine and Chemical Industries. Eddy Current is limited to testing metallic materials and works best on nonmagnetic alloys. It can be applied to magnetic materials, such as Monel, Nickel, Ferralium or other Ferritic Stainless steels using magnetic saturation techniques.



5. Vibration Analysis

The vibration data will be uploaded to a hand held data gathering computer and digitally transferred to our offices in the States for analysis and a full detailed report.

Vibration analysis is an important tool that enables our Service Engineer to "look inside" the compressor and determine the condition of bearings, gears and other rotating components. Worn bearings and components will emit a distinct signal corresponding to the severity of the damage and the rotational speed. Our sensitive vibration equipment can detect the signal and record it for diagnosis by a vibration engineer.



6. Thermographic Infrared Analysis

With heat-sensing scanners and imaging equipment, we detect any abnormal temperatures or heat build up in your mechanical system. If present, there are signs that a system has problems. For example, many building systems have electric motors which are costly to repair or replace. Our thermographic analysis will quickly spot the overly high operating temperatures that are the principal cause of costly motor winding failure.

Thermographic testing also pinpoints such problems as loose or corroded electrical connections, deteriorating wire insulation and inadequately lubricated bearing. This testing is a powerful tool for early problem identification and avoidance of potential breakdowns. Our written report will include specific recommendations for correcting any detected problems.



7. Ultrasonic water flow Testing

We utilize state of the art Ultra Sonic Flow meters with programmed software capable of measuring exact pipe thickness, exact GPM as well as built in energy measurement features.

8. Refrigerant Containment and Management

We will use recovery, recycling and reclamation of your refrigerants, as appropriate, to comply with current world wide refrigerant legislation. U.S.Chillers' Engineers are Environmental Protection Agency (EPA) Universally Certified to perform recovery, reclamation and recycling as per Section 608 of the Federal Clean Air Act. We will keep you informed regarding refrigerant issues and opportunities. We will make recommendations based on equipment age and the business objectives of your facility. U.S. Chillers is an authorized EPA training and testing organization.



9. Motor off line and on line circuit analysis (Insulation, Rotor and Electrical Signature & Power)

Motor failure and resulting downtime are usually caused by motor winding insulation breakdown. Regular motor insulation testing identifies insulation deterioration before failure occurs, permitting budgeted, scheduled repair. We use meg-ohm testing as well as ATIV off-line rotor testing for issues such as eccentricity, broken/fractured rotor bars and casting voids to evaluate the condition of electric motors in your systems without labor-intensive disassembly. Our testing will reveal any weak spots in motor windings or the presence of potentially damaging moisture, both indicate winding insulation deterioration. We will also evaluate starters and connecting wire insulation, perform Electrical Signature Analysis (ESA), which is an energized test method where voltage and current waveforms are captured while the motor system is running and then, via a Fast Fourier Transform (FFT), a spectral analysis is done by our software. From this FFT, faults related to incoming power, the control circuit, the motor itself and the driven load are detected and can then be trended for Condition Based Maintenance/Predictive Maintenance purposes.

You will receive a complete written evaluation, with problem-solving recommendations.

Hidden Problems Can Increase Operating Costs. Here's How to Catch and Cure Them.

Your building's systems seem to be running fine.

There aren't too many complaints about lack of comfort.

Energy costs keep inching up, but that's not unexpected.

There are no clear signs of problems.

Perhaps your systems are sound, but are they operating with maximum efficiency to minimize energy cost?

Are there hidden problems that could lead to costly repairs and downtime?

Could there be indoor air quality problems?

Have changes in building configuration made system modifications necessary?

The longer your building's systems have been in service, the greater the probability your costs are higher than they should be. Fortunately there's an easy cost-effective solution:

Predictive Maintenance by U.S. Chiller Services.

Welcome to U.S. Chiller Services' Predictive Maintenance

If equipment fails unexpectedly, you face downtime and, potentially, inconvenienced occupants. With predictive maintenance, you'll know about potential problems before they become more costly –and at times when they won't inconvenience you or your building's occupants.

Using today's best testing tools and technologies, we can discover or rule out virtually any kind of hidden building system problem. As a result, we can help you:

- Find, identify and correct minor problems inexpensively, before they lead to more complex and expensive repairs
- Avoid needless downtime and inconvenience or discomfort to occupants
- Ensure continued production when equipment is used in process application
- Control energy costs
- Prolong equipment life, deferring replacement expense
- Prevent overtime costs for unscheduled repairs

In short, U.S. Chiller Services' predictive maintenance is the key to optimal building systems management. With it, you can make the most informed decisions and achieve the lowest overall operating costs.

The Best Hardware and Software

With our comprehensive, international experience, we identify and invest in the best tools for complete, accurate building system evaluation. When you turn to U.S. Chiller Services for system evaluation, you do so knowing you can trust the results.

The Best-Trained Experts

We use the best educational technology and proven educational organizations to assure that we have the most highly trained personnel. We keep our technicians current on the latest systems testing technology – and ensure they have the most up-to-date testing tools.

WE PUT A LOT OF ENERGY INTO SAVING YOU ENERGY



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