Vital Natatorium Features

Description

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CHAPTER TEN

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In order to ensure the system performs reliably and that the equipment is suitable for an indoor pool environment, there are several features that must be included.

FLUID COOLED DESIGN

Refrigerant charges must be kept at a minimum. As refrigerants get phased down/out, costs increase. The phasing out of R22 refrigerant, for example, has made these systems very expensive to run.

Fluid cooled units typically reduce the system charge by 50-60%. An industry-leading unit can enhance efficiency by reducing refrigerant charges by as much as 80-90%.

Due to the operational requirements of the compressorized dehumidifier, they are very different to an air conditioner and have very large refrigeration charges. Attaining lifetime equipment support may also pose a challenge as service technicians seldom encounter these units on a regular basis.

Simplifying the refrigeration circuit and reducing the overall complexity results in a system that is easier to service and is also more environmentally friendly. Less refrigerant equates to less liability and exposure to unnecessary service costs.

MICROPROCESSOR CONTROL

The dehumidification system controls the entire natatorium environment. It needs to operate reliably and be easy to support.

Consequently, a control system that is tried and proven is in the best interests of the facility.

An operator will get much better support over the life of the system when people are familiar with the equipment. A proper microprocessor controller has a full range of unit-mounted sensors, pressure transducers, and remote sensors that can all be accessed from the keypad, building management system interface, or over the Internet. All necessary information regarding the system operation and conditions in the space should always be at the fingertips of the operator and support team.

INTERNET CONNECTION

Web monitoring redefines the concept of factory service and support by remotely monitoring, analyzing, and reporting all the critical functions of the dehumidifier â?? in real time via the Internet. All necessary information regarding unit operation can be viewed from any web-enabled device. Setpoints can be adjusted, sensors can be recalibrated, and unit performance can be monitored.

Unit alarms will generate emails to any email address on the pool ownerâ??s contact list. Contractors who install or service the equipment can be set up to access the units. The facility owner, especially those in remote locations, will have a more efficient means of ensuring their units are monitored and service is supervised by factory technicians.

Factory certified service companies offer pool operators 24-hour monitoring, a new standard in customer satisfaction and unit reliability.

REFRIGERANT PRESSURE TRANSDUCERS

Unit-mounted pressure transducers allow the operator or service technician to access the vital refrigerant pressures through the operator panel of the microprocessor (or remotely via the Internet) rather than having to connect a set of refrigerant manifold gauges. This is the most important operation

and diagnostic information for any refrigeration system, and the ability to access this information at any time is a significant benefit. Systems without refrigerant pressure transducers require a service technician to physically visit the site and connect gauges when information regarding the refrigeration circuit operation is desired.

The refrigeration pressure information from these transducers is used in the control of the dehumidifier. The operational history of the operating pressures is also stored in the controller. This provides access to critical historical information for diagnostics and trouble shooting. A system without refrigerant pressure transduces is considerably more costly and difficult to service over its lifetime.

EXHAUST AIR HEAT RECOVERY

The exhaust air is energy rich and can be used to preheat the incoming outdoor air. Heat recovery has an immediate and significant return on investment, even in milder climates. The reason for this is the exhausted air is warmer than traditional rooms and has relative humidity levels typically between 50-60%.

A glycol runaround loop approach is recommended because it is service friendly and has the best annualized performance.

There are software tools available to provide an ROI analysis to help illustrate the savings from this option.

POOL WATER HEATING

This option satisfies ASHRAE Energy Standard 90.1 and can contribute considerable operating cost savings.

The pool water heat exchanger should be either potable water rated cupronickel or titanium.

As with exhaust air heat recovery, there are software tools available to provide an ROI analysis to help illustrate the savings from this option.

RECEIVER REFRIGERANT LEVEL INDICATORS

Sight glasses mounted on the receiver allow for easy refrigerant charge adjustment without the expense of evacuation and weigh-in techniques.

DIRECT DRIVE PLENUM FANS WITH VFD

Direct drive ECM and plenum fans with VFD offer the most efficient means of moving air while using the lowest possible fan energy. Belt-driven systems are antiquated and a maintenance concern. They can also consume as much as 25% more fan energy. ECM fans and VFDs allow for easy supply air balancing without changing pulleys or belts.

COATED AIRSIDE COILS

All coils exposed to the pool air must be corrosion protected. It is best practice for all coils to be fully dipped to ensure the entire coil is protected from corrosion. Coil coatings should also have hydrophilic properties to allow the condensate on the evaporator to drain more efficiently.

COMMISSIONING AND STARTUP

The startup must be performed by an experienced and qualified professional. If the startup is not being carried out by a factory technician, it should be performed by someone who regularly and routinely starts up these systems. The best unit in the world will not operate to expectations if not started up correctly. The final performance review and adjustment of a dehumidifier can only be completed once the natatorium is operating at design conditions. Often, the initial startup is done with a cold pool; however, all facilities require a follow-up visit once the water has reached design conditions. It is highly recommended that a factory technician perform the startup to ensure optimal performance.

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