

Dehumidification: Hospitals

Cost-Effective Climate Control for Hospitals





Munters Delivers Major Benefits for Hospitals

Controlling humidity in operating rooms provides a host of benefits which contribute to a healthier and more cost-efficient building, including:

Total Surgeon Control

With a Munters system, the surgeon can personally set the temperature and humidity that is most appropriate for each procedure. That condition will be met regardless of the season of the year or capacity limitations of the mechanical system in the rest of the building. Relative humidity (RH) can be easily controlled to 45% or lower, even at temperatures below 65°F.

Operating Room RH in Full Compliance

Most local codes require stringent humidity control in operating rooms – a very difficult challenge at room temperatures of 62° - 68°F. Munters allows you to meet all regulatory criteria for operating room humidity without disturbing the HVAC system in the balance of the building. Also, because Munters eliminates high RH in duct work, the HVAC system will comply with guidelines in ASHRAE standard 62, which calls for keeping humidity in duct work below 70% RH to avoid the risk of microbial contamination.

Improves Chiller Efficiency and Increases Capacity

When operating room humidity is controlled by Munters, there is no need to run the main chillers at a low chilled water temperature. With a higher temperature, your central system chillers run more efficiently, providing additional capacity on those hot days that require extra sensible cooling.

Fresh Air Means High Moisture Loads

In order to assure indoor air quality, large quantities of outdoor air must be brought into the building through the ventilation system. This outdoor air accounts for over 90% of the moisture load in health care buildings. For example, in humid areas like the Gulf Coast, every 5,000 cfm of ventilation air carries more than 42 gallons of excess moisture into the building every hour. Even in more moderate climates like the Great Lakes, 5,000 cfm carries over 32 gallons of extra water per hour. To avoid microbial growth and surgeon discomfort, this moisture must be removed before the fresh air enters the building.

High Humidity Creates Problems

In critical care facilities, high humidity can cause problems and expose the institution to needless risk.

Surgeon Discomfort

Today's highly complex surgical procedures and heavy gowning requirements demand cooler temperatures. Where 72°F may have been adequate for operating rooms ten years ago, surgeons now require temperatures of 65°F or below. When air is cooled this low, humidity can rise to over 75%RH. Such damp conditions can cause the hard-working surgical staff to perspire and become very uncomfortable.

Hazardous Microbiological Growth

Many bacteria flourish in humid air. According to a study done by Pennsylvania State University, the bacteria responsible for Legionnaire's disease (*Legionella pneumophila*) survive best at a Relative Humidity of 65%. At 35% RH, the bacterium dies quite rapidly. Many viruses also thrive in high humidity. The Polio virus not only survives, but multiplies when air is above 80% RH. Fungi and dust mites also thrive in humid building materials, which can lead to musty odors and respiratory problems associated with sick building syndrome. The high humidity in ductwork downstream for cooling coils is, unfortunately, an ideal environment for these organisms.

Conventional Cooling Creates High Humidity

Cooling coils dehumidify by cooling air below its dew



point, so moisture is forced to condense and drip off the coil into a drain pan. The air leaving the coil is essentially saturated – 95% Relative Humidity. In normal air conditioning applications with room temperatures at 72° to 75°F, there is no particular difficulty with cooling-based dehumidification. But when a surgeon needs a room temperature of 65°F or even 62°F, the humidity leaving the cooling coil is much too high for comfort. Desiccant dehumidifiers offer a time-tested alternative for humidity control at cool temperatures. Unlike cooling equipment the moisture removal capacity of desiccant systems actually improves at lower air temperatures.

Munters Maintains Low RH

Munters removes moisture from the air with a desiccant rather than with a cooling coil. Humid

outdoor air is passed through a desiccant wheel, which removes moisture by attracting the water molecules in the vapor state. The dry fresh air is then cooled by the building HVAC system. Since the makeup air is dry, no moisture condenses to allow contamination to grow in drain pans. And with low RH downstream of the coil, moisture is not absorbed into duct linings and building materials where it could support microbial growth. Most of all, the air can be supplied to the room at 45% RH no matter how cool the room must be kept, so the surgical staff is kept cool, dry and comfortable.

Reduces Energy Costs

Desiccant dehumidifiers primarily use thermal energy rather than electrical power. Heat is used to reactivate the moist desiccant. This means the system can operate with very little electrical power when either steam, hot water or natural gas is available on site. Often, utility companies provide very favorable rates for natural gas during the summer time when moisture loads peak and when electrical power costs are especially high. When gas is inexpensive and power is costly, removing moisture with heat rather than with electricity can reduce overall energy costs.

Ideal for Both Retrofit and New Construction

The Munters system makes an ideal supplement to an overworked air conditioning system. The Munters unit is placed on the makeup air inlet for the surgical HVAC system. With Munters, your system can deliver air at 45% RH at any temperature between 60°F and 75°F. By removing moisture from the outside air before it reaches the chilled water coil, your chilled water temperature can be raised for greater efficiency with no loss of humidity control.

The Unique Advantages of the Munters System

- Unique 2-inch double wall construction that has an R-14 insulation value
- Smooth metal interior provides a clean surface to prevent the growth of fungus, mold, etc.
- Energy recovery from the exhaust air stream provides economical operation.
- Desiccant wheel removes moisture in vapor state, eliminating wet coils and duct work
- Eliminating latent work from cooling coils allows them to run at higher, more economic temperatures.

Munters is the world leader in humidity control with products and services for dehumidification, humidification and cooling of air. Customers are found in a wide range of segments, the most important being insurance-, utilities-, food-, pharma- and electronics-industries.

Manufacturing and sales are carried out via the Group's own companies in more than 25 countries in Europe, Americas, and Asia. The Group has 2,900 employees and net sales of SEK 4,100 million. Munters is listed on Stockholmsbörsen, the Stockholm Stock Exchange. For more information see www.munters.us

Typical Conditions for Surgical Suites

Munters	Cool to 56°F, dehumidify to 45 gr/lb	Cool to 53°F, dehumidify to 40 gr/lb	Cool to 48°F, dehumidify to 32 gr/lb
Operating Room Space Conditions	68°F, 50% RH	65°F, 50% RH	60°F, 50% RH
Conventional	Cool to 45°, Reheat to 56°F	Cool to 42°F, Reheat to 53°F	Cool to 37°F, Reheat to 48°F



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BR 0014 Rev. 02, 01/08