

Dr. Gross surgery suite: operating room humidity control

A TRICOIL unit replaced a standard rooftop unit that could not keep an operating room dry, and now holds the cool, steady conditions surgeons need.

Healthcare

Private surgery practice, operating room

Retrofit

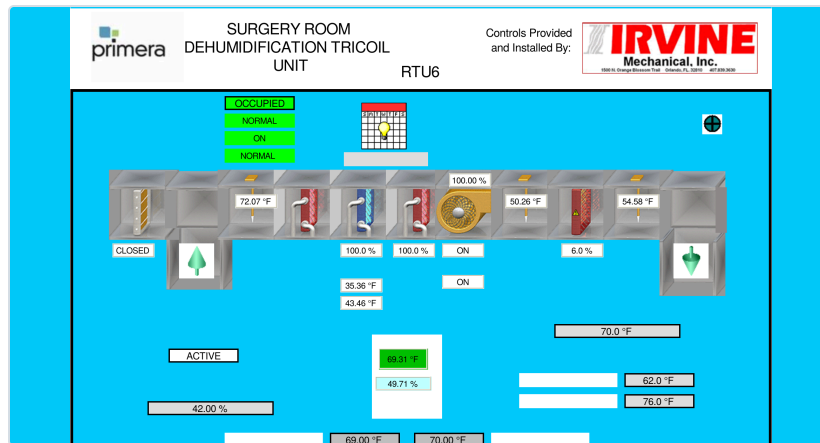
Replaced the standard RTU in the original design

5.5 tons

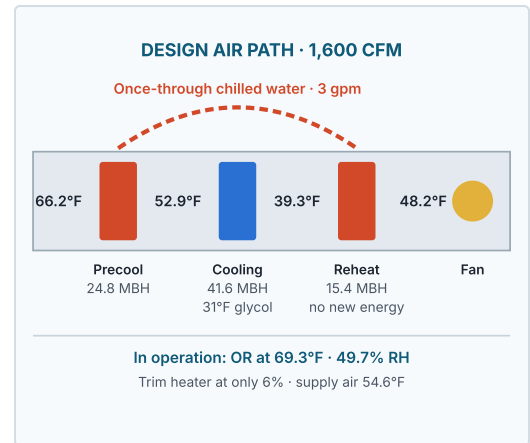
Total cooling from a nominal 4-ton medical-duty chiller

1,600 cfm

Air dried to a 39°F dew point; coils selected 2022



The building control screen for RTU6, the surgery room TRICOIL dehumidification unit, during an occupied period.



Design temperatures from the 2022 coil selections; the bottom line is a control-screen reading.

THE CHALLENGE

Operating rooms must stay cool for the surgical team and dry, typically 68–75°F and no more than 60% relative humidity under ASHRAE Standard 170. The original design used a standard rooftop unit, and it failed at the job. Standard units are built to cool, not dry: in a small, cool room they reach temperature and stop before enough moisture is removed, a risk to sterile supplies and infection control.

THE SOLUTION

Sensible Equipment Company replaced it with a TRICOIL unit served by a medical-duty chiller. Part of the chilled water is diverted through a precool coil ahead of the cooling coil, where it picks up heat from the incoming air. It then passes once through a reheat coil to rewarm the dried air and rejoins the chilled water return. Irvine Mechanical of Orlando provided the controls.

THE RESULT

- Operating room at 69.3°F and 49.7% RH, inside the ASHRAE 170 range
- 5.5 tons of total cooling from a nominal 4-ton chiller: the precool coil takes 24.8 MBH, so the cooling coil needs only 41.6 MBH instead of 66.4
- 15.4 MBH of reheat from water warmed in the precool coil, about 4.5 kW of electric heat the practice doesn't pay for; the trim heater ran at just 6%
- Temperature and humidity controlled separately

Why it carries over. Hospitals, surgery centers, VA medical centers, labs and pharmaceutical spaces all need tight humidity at cool temperatures. The same arrangement fits new rooftop units, air handlers, DOAS units and retrofits.