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Bell & Gossett - McDonnell & Miller -  
A-C Pump - Hoffman Specialty



# ITT Industries Provides HVAC Service to Unique Airport Terminal Building

The new airport terminal building in Denver, Colorado is the world's largest internally heated and cooled fabric-covered structure. To help serve the HVAC needs of this massive space are pumps and control systems from ITT Industries' Bell & Gossett, ITT Standard, A-C Pump, McDonnell & Miller, and Hoffman Specialty units.

The city of Denver is now the 23rd largest U.S. metropolitan area with a population of almost 2 million. When Denver was settled by gold prospectors in the late 1850's, the first building put up in Denver was a saloon. Almost a century and a half later, the first building most people see when they come to Denver has a more important purpose.

Denver International Airport is the first new U.S. airport built from the ground up in the past 25 years. Constructed on 34,000 acres of what was formerly dry wheat farms and cattle ranges, DIA is bigger than Chicago O'Hare and Dallas Fort Worth airports combined and cost \$3.3 billion.

Designing and installing a \$45 million HVAC system for the world's largest airport is a monumental task in itself. And when you consider that the system must heat and cool several buildings on a site spread over the more than 53 square mile site, you can begin to appreciate the tremendous challenge.

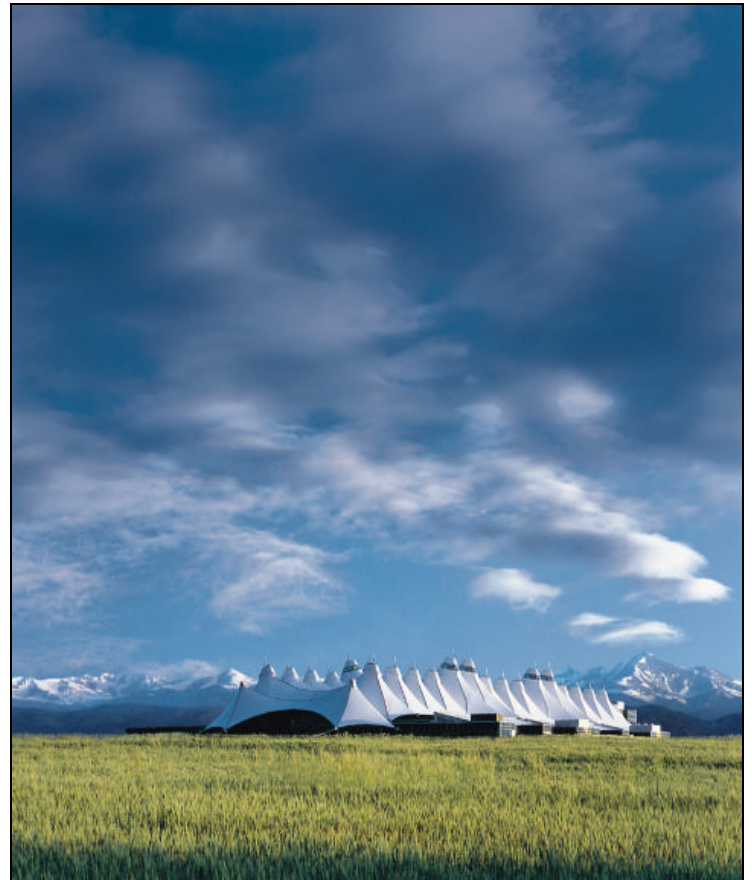
The HVAC design team faced many challenges. After carefully analyzing the special requirements, the team decided on a solution, based on the Bell & Gossett primary-secondary-tertiary pumping design as the most cost effective solution to avoid expensive high pressure pumps and related equipment.

Despite the enormous pipe runs between buildings, this innovative system has saved many thousands of dollars by allowing the use of standard 125-LB pressure rated components.

## Product Synergy

In addition to Bell & Gossett being at the heart of the HVAC system, the airport represents a true case of synergy for Fluid Technology.

Other ITT Industries units including McDonnell & Miller, A-C Pump, ITT Standard and Hoffman provide controls and instruments, pumps, valves, and heat exchangers to keep this gargantuan facility comfortable and safe from fire.



The new airport terminal building at Denver's airport is the largest internally heated and cooled structure covered by fabric - with great demands placed on the HVAC pumping system.

The HVAC system wasn't the only design challenge at Denver International Airport. Airline travelers are awed by the unique structure of the terminal building. Curt Fentress, a principal at the Denver based architectural firm, Fentress & Bradburn, who is responsible for the design of the terminal building, notes that, "the inspiration for the building design was the white, snow capped Rocky Mountains." The airport is certainly an arrival gateway to Colorado and to Denver.

Fentress continues, "We thought about the building as a grand gateway, or entrance to the city throughout the design...like Paris has the Eiffel Tower and Sydney has the opera house, Denver would have the international airport."

The main terminal building is the world's largest, internally heated and air conditioned space that is covered by a fabric structure (made from a Teflon-coated fiberglass). Because of the huge volume and the tremendous number of people in the building, passing through it...travelers, building services, retail, baggage systems and equipment systems moving around underneath and internally within the building, the structure has a tremendous amount of heat that it needs to get rid of. Because the people using the building are all in the lower 10 to 12 feet, the cooling systems are designed only to cool that space in the building through a concept called stratification that is used in most large atrium spaces.

As for the demands on the HVAC equipment, Fentress notes that, "An airport like this has few moments during the day that it is not going one hundred percent. I came through the airport recently at 2:00 a.m. and there were things going on. It is really a 24 hour space and the HVAC equipment has to work accordingly."