T-Series Climate Changer™ Air Handler
The Trane tradition of excellence continues with the T-Series Climate Changer air handler. Using state-of-the-art technology, the T-Series air handler sets new standards in outdoor air-handling systems. Envisioned as a turnkey solution—and developed with input from industry leaders and end users—the T-Series air handler combines a flexible, modular approach to design with innovative, customized features that are hard to find in any other cataloged air-handling system.

The T-Series air handler addresses the customer's desire for a customizable system with the value and delivery cycles of cataloged units. Modular design and numerous component options provide a system that meets specific needs without the long lead times and expense usually associated with custom units.

The T-Series air handler is designed to meet the highest indoor air quality and performance standards. In developing the T-Series air-handling system, Trane's experienced engineers gave the utmost attention to meeting ASHRAE (American Society of Heating, Refrigeration and Air Conditioning Engineers) standards, while maximizing operational efficiency. The design integrity of the T-Series air handler is unsurpassed in today's marketplace.

The T-Series air handler was designed for ease of installation. Factory-mounted turnkey control options eliminate the cost and delay of separate controls installation onsite. The integration of Trane controls in the T-Series air handler provides the optimal efficiency and comfort available in an air-handling system.

The T-Series air handler's flexibility, engineering, and systems approach results in proven performance and provides exceptional value—not only today, but throughout the life of the air handler.
Trane’s state-of-the-art manufacturing facility employs a system of checks and verifications at each work station to ensure consistent quality.
As T-Series Climate Changer air handlers roll down the production line, one would be hard-pressed to find any two alike, indicative of how flexible a “cataloged” air handler can truly be.
The T-Series air handler, with its modular design, is very adaptable in meeting the market’s ever-changing needs. Trane understands that some projects call for an air handler that incorporates new, emerging technologies or a job-specific requirement. Trane’s experienced team of professionals can tailor the T-Series air handler to meet these requirements—with proven, tested performance.

These factory-packaged specials deliver Trane quality, enable simplified on-site installation and startup, and are usually more cost effective than a fully custom-built unit.

Some of the popular, emerging technologies and custom features that Trane can incorporate into the cataloged T-Series air handler are:

- ARI 1060-certified energy wheel
- Silencers
- Indirect gas heat modules
- Single point power connection
- Top air inlet/outlet
- Shortened fan section and mixing box/discharge plenums
- Optional fan types
- Special flooring and paint

Another distinctive aspect of the T-Series air handler is its configuration flexibility. Components and casing can be configured to meet a variety of specialized applications, including:

- Low sound levels
- Energy efficiency
- Hot and humid climates
- Coastal climates
- Cold climates
- Labs and hospitals
- Distribution centers
An outdoor central-station air handler must move and condition air, maintain high air quality standards, and withstand the elements. Extreme temperature changes, humidity levels, salt air, high winds and indoor air quality standards were all taken into consideration when Trane engineered the T-Series air handler. Some of the design elements of the T-Series air handler that ensure a reliable product throughout its life are:

- A sloped roof with overhang promotes complete drainage and directs water away from the top of the access doors.
- All unit joints are sealed and fastened with a galvanized steel joint strip to improve unit integrity.
- Formulated, double-wall panels with rigid, closed-cell foam insulation mean fewer seams and no moisture absorption.

In addition to keeping water out, T-Series air handlers are designed to provide extraordinary insulating capabilities for efficient and cost-effective performance.

- Standard double-wall panels with two-inch closed-cell insulation provide a minimum R-value of 12.
- Panels include internal and external gasketing for a proper thermal break.
- Energy recovery options help meet ventilation requirements while lowering energy costs.

Contributing both to water resistance and thermal performance is the innovative T-Series air handler door and latch design, which offers distinct advantages over traditional air handler doors.

- Double-wall doors with a single handle allow for easier access for maintenance and cleaning, while ensuring a positive seal across the entire door frame.
- The door latch is surface mounted instead of piercing the door, eliminating the possibility of water entry and improving the thermal performance of the door.
Formulated double-wall panels with rigid closed-cell foam insulation provide unsurpassed panel strength and deflection resistance.
All Trane factory-mounted controls are engineered, installed and tested by experienced technicians before leaving the factory. This ensures an easy, trouble-free installation, fast system start-up and rapid building commissioning.
The T-Series Climate Changer air handler provides one of the most comprehensive factory-packaged controls systems available. This simplifies job-site coordination, saves installation time, reduces expenses and minimizes risks.

- Trane provides a full range of controls and end devices, including starters, variable-frequency drives, disconnects, control valves, sensors and switches.
- Factory mounting assures correct and properly sized control components.
- Components are computer-tested to simulate actual operating conditions.

The T-Series air handler turnkey control package can be used in a stand-alone operation, or it can be fully integrated into a comprehensive control system. Trane’s Integrated Comfort system (ICS) incorporates the benefits of factory-installed controls and links the air handler to the Tracer Summit™ building management system. For owners, facility managers, designers and contractors, ICS means:

- System optimization through system-wide information sharing. This enables maximum operating efficiency for each building subsystem, resulting in reduced building energy consumption.
- The ability to tie in to existing equipment and systems. End devices can be wired to terminal strips for a generic field interface to DDC controllers. Also, BACnet, ASHRAE’s industry standard open protocol, allows full two-way communication.
- Single-source responsibility for warranty and service.

The T-Series air handler was engineered to address the complex issues of indoor air quality (IAQ). Building owners must give particular attention to maintaining and documenting IAQ to ensure tenant comfort and to meet industry and government regulatory standards.

- A standard T-Series option, the patented Traq™ damper airflow monitoring station, can be coupled with a Tracer building management system to monitor, control and document ventilation airflow in compliance with ASHRAE Standard 62 guidelines.
- ICS provides comprehensive monitoring and diagnostic capabilities—a powerful tool for scheduling preventative maintenance and reducing equipment downtime and service expense.

FACTORY-ENGINEERED AND INSTALLED CONTROLS MEAN IMMEDIATE AND RELIABLE OPERATION—AS A STAND-ALONE UNIT OR AS PART OF AN INTEGRATED COMFORT™ SYSTEM.
Electrical usage of mechanical systems in commercial buildings is typically about 50 percent for lighting, 25 percent for the “waterside” of the comfort system (chillers, cooling towers and pumps) and 25 percent for the building’s air distribution system. Delivering conditioned air and water throughout the building carries a considerable cost impact.

Therefore, reducing the amount of air and water circulated through an HVAC system should decrease operating costs—significantly. This is mainly because the relationship of flow to the amount of power consumed to achieve that flow is not proportional.

- The airflow rate (cfm) required is dependent on the leaving air temperature of the air handler.
- The component and system pressure drop has a squared relationship ($x^2$) to the flow rate.
- The power required to move the air and water varies with the cube ($x^3$) of the flow rate.

What this all means is that a decrease in the airflow temperature delivered to a building, delivered at a lower flow rate, ensures occupant comfort while decreasing costs. Example:

<table>
<thead>
<tr>
<th>Air Handler Selection Strategy</th>
<th>Supply Air (°F)</th>
<th>Airflow (cfm)</th>
<th>Coil Area (ft²)</th>
<th>Discharge Velocity (fpm)</th>
<th>Fan Horsepower (bhp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>55</td>
<td>18,750</td>
<td>34.1</td>
<td>2,514</td>
<td>17.8</td>
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<tr>
<td>First-cost optimized</td>
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<td>11,360</td>
<td>20.8</td>
<td>2,225</td>
<td>12.8</td>
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<tr>
<td>Operating-cost optimized</td>
<td>48</td>
<td>11,360</td>
<td>24.4</td>
<td>1,803</td>
<td>9.6</td>
</tr>
</tbody>
</table>

Looking at both first cost and life cycle costs, the savings are dramatic. In addition to the obvious energy savings, moving less air reduces the physical size of air handlers and ductwork, which can result in quieter, smaller mechanical equipment rooms, plenums and duct chases. This means lower first costs and less space used for the comfort system infrastructure leaving more room for occupants and your business.

- The insulation integrity of the T-Series air handler is key in maintaining system efficiency by reducing cabinet heat gain and minimizing troublesome condensation on cabinet surfaces.
- Foamed, double-wall panels standard on T-Series air handlers are superior to traditional double-wall systems due to their inherent airtightness.
- An almost infinite coil selection allows heat transfer and air pressure drop performance to be tuned

Although low temperature, low flow systems can challenge conventional outdoor air-handling units, the T-Series Climate Changer air handler is designed to optimize systems like EarthWise.
Distinguishing characteristics of the EarthWise system are low flowrate and low temperature for the water and air distribution elements of the system, along with high efficiency equipment. This design philosophy reduces HVAC system first cost, lowers operating cost and is right for the environment.
specifically to optimize building requirements.

- Fan selection flexibility allows for energy efficient fans, super quiet fans or anything in between.
- Factory-engineered, mounted and tested controls deliver optimal operating efficiencies throughout the life of the building and provide the ability to document that performance.

Economically and environmentally, Trane’s EarthWise system is right for business. Few building design and construction strategies win on as many fronts. Trane Climate Changer air handlers and high-efficiency water chillers have been engineered to capitalize on the benefits of the EarthWise low flow, low temperature, low emissions design. Moving less air and water can result in so much more for your building:

- More usable space for tenants
- More operating capital
- Increased comfort for building occupants
- A cleaner environment