

Air-to-Water Heat Pump Systems



Sustainable Building Comfort in New and Existing Buildings

Building electrification is reshaping HVAC design. As utilities reduce dependence on fossil fuels and more states and municipalities adopt electrification mandates and incentives, building owners face growing pressure to transition to electric heating and cooling systems. Government incentives and utility rebate programs are helping accelerate electrification by lowering upfront costs and encouraging broader adoption of high-efficiency technologies.¹



Trane® helps make that transition practical.

Whether the goal is to meet new regulations, support efficiency certifications, reduce carbon emissions, or advance net-zero objectives, Trane Air-to-Water Heat Pump Systems offer flexible configurations for a wide range of buildings. The result is a smarter path to electrification, one that helps reduce emissions while delivering reliable, year-round comfort.

1. Guidehouse Inc., Commercial HVAC Market, 2024.



Pump Up System Reliability, Efficiency, and Flexibility

Heat pumps are a key enabler for decarbonization. Because they move energy rather than generate it, a heat pump can be up to **three times more efficient** than traditional heating systems.

The Trane® Comprehensive Air-to-Water Heat Pump System provides controls, equipment and technical support packaged together for system success. When paired with the Trane Hydronic Branch Conductor, the system can help reduce both retrofit complexity and installed cost by converting separate boiler and chiller plants into one heat pump-based system. This approach can **improve**

system efficiency by up to four times compared to gas boilers and reduce piping and coil conversion costs by up to 50%.

When higher hot water temperatures are required, the cascade system option extends heat pump capability into traditional boiler temperature ranges, helping enable electrification without replacing existing piping and coils.

For projects with tighter installation needs, phased growth plans, or cold-climate requirements, the modular system adds even more flexibility with scalable, right-sized all-electric hydronic comfort.



Engineered for Year-Round Comfort

In colder climates, the consequences of heating system failure can potentially be significant, making it important to design an HVAC system for the possibility of an extreme weather event. That's why Trane Air-to-Water Heat Pump Systems are configured to meet the temperature, flows, and redundancy required for year-round heating and cooling.

The system has the flexibility to be configured to simultaneously support heating and cooling using

multiple heat pump units. One heat pump can be in heating mode while the other is cooling, with the proper system volume to match. Symbio® 800 unit controls help enable efficient equipment coordination, reliable system integration, and connected smart building management. Buffer tanks and supplemental or dual-fuel heating can also be incorporated when needed.



Electrified HVAC

At the center of the Trane Air-to-Water Heat Pump System is the fully electric Ascend Air-to-Water Heat Pump, model ACX. Ascend ACX helps meet efficiency and sustainability targets with:

- ✓ **Full and part-load efficiency** that meets ASHRAE® 90.1-2025 energy code requirements
- ✓ **Enhanced performance** through variable-speed fans, intermediate discharge valves, electronically commutated fan motors, and brazed-plate evaporator heat exchangers
- ✓ **Dual expansion valves**, one for heating and one for cooling, to improve control and reliability
- ✓ **Flexible capacity** from 80 to 230 tons nominal cooling and 960 to 2500 MBh heating
- ✓ **Vapor Injection Technology** for an expanded operating map in outdoor ambient temperatures down to -15°F (-26°C)



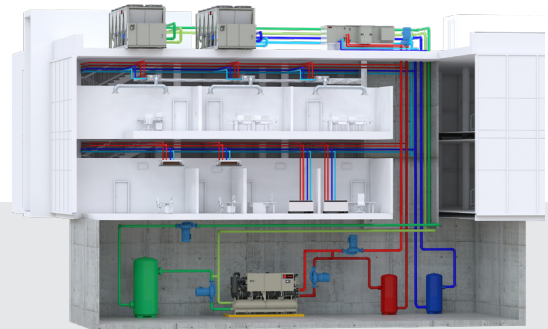
Ascend™ Air-to-Water
Heat Pump
Model ACX

System Options for More Applications

Air-to-Water Cascade Heat Pump System

Available as an option within the Trane® Air-to-Water Heat Pump System portfolio, the Air-to-Water Cascade Heat Pump System is a fully packaged high-temperature hydronic heating solution. By using multiple heat pump chillers in a cascade arrangement, it can deliver leaving water temperatures up to 210°F (99°C). That makes it well suited for boiler replacement projects where maintaining existing building distribution infrastructure is a priority.

- ✓ **Precise simultaneous heating and cooling** temperature control
- ✓ **Wide turndown** with minimum unloading to 20%
- ✓ **Reduced need** to replace existing heating pipes and coils
- ✓ **Up to three times** the efficiency of traditional boilers



The RTZA is a key component of the cascade system, increasing leaving water temperatures to support higher-temperature heating applications. It acts as a booster heat pump, raising a partially heated source fluid to achieve a maximum hot water temperature of 210°F (99°C), making it effective for boiler replacement strategies.

Direct-drive compressor design for improved uptime, precision, and efficiency.

Dual compressor design for added redundancy and reliability.

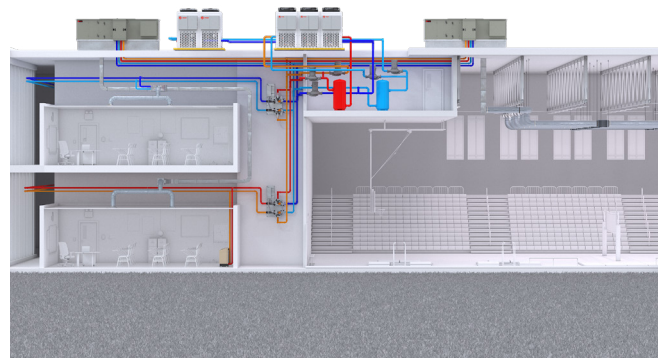
Modulating capacity to help deliver higher heating temperatures and more precise hot water control.

Capacity range from 80 to 250 tons cooling and 1,300 to 3,000 MBh heating.

Air-to-Water Thermafit® Modular Heat Pump System

Built for flexibility, the Air-to-Water Thermafit Modular Heat Pump System is a fully packaged all-electric hydronic comfort solution. Based on a modular 30 ton / 390 MBh platform, it helps simplify right-sizing, support future expansion, and adapt to buildings with space constraints, cold-climate demands, or phased growth.

- ✓ **Expansion up to 12 modules per bank**, with multiple banks available for greater flexibility
- ✓ **Up to 8.2 combined COP** through advanced control sequences that prioritize heat recovery and efficiency
- ✓ **Adaptable configurations**, including multipipe heat recovery unit and heating units that provide up to 3x efficiency improvements over traditional heating equipment
- ✓ **Integrated smart controls** for precise temperature control, reduced energy costs, and reliable operation



Designed to deliver simultaneous heating and cooling in one compact solution, **Thermafit MAS is a modular, dual-function heat pump chiller.** With scalable modular capacity, high efficiency, and next-generation refrigerant, it supports space-saving system design across a broad range of applications.

Modular configuration with 30-ton modules and 3 to 10 modules per bank for scalable capacity.

Simultaneous heating and cooling capability, with heating temperatures up to 140°F (60°C).

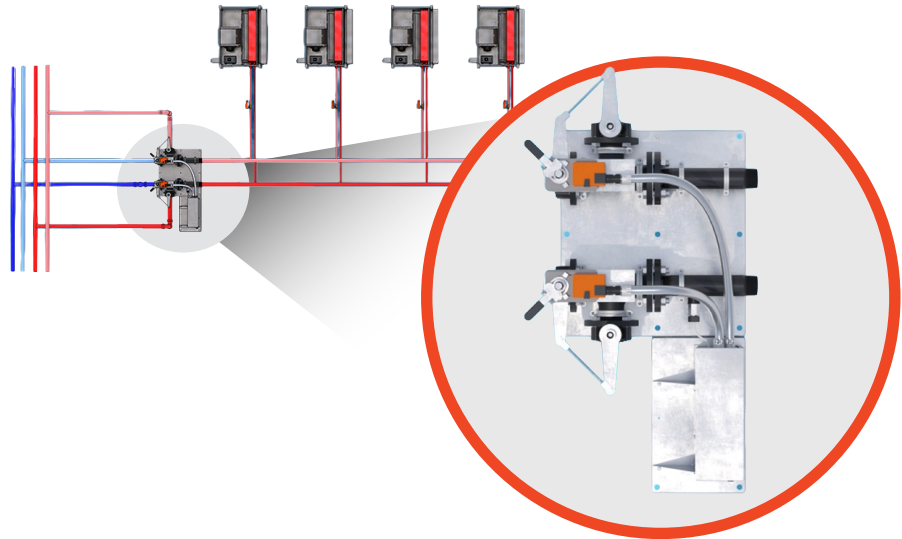
Tandem vapor-injection scroll compressors for efficient, reliable performance down to -18°F (-28°C) ambient in heating mode.

System Options for More Applications

Air-to-Water Heat Pump System with Hydronic Branch Conductor

When paired with the Trane® Air-to-Water Heat Pump System, the Hydronic Branch Conductor can help existing buildings convert from 140°F to 180°F hot water systems to a more efficient 105°F (41°C) hot water supply, without replacing existing branch piping. This approach can simplify the transition from two-pipe systems to four-pipe, year-round heating and cooling using lower-temperature hot water. In new construction, it can also help reduce first costs for both the piping distribution system and the heat pump plant.

- ✓ **Repurposes high-capacity cold-water piping and a single dual-purpose coil** for heating and cooling, helping reduce cost
- ✓ **Directs hot or cold-water flow** to each thermal area based on changing space needs throughout the day



Backed by Systems Knowledge and Expertise

Successful electrification requires more than equipment. It requires system strategy. Through a consultative approach, Trane experts support project success with industry-informed guidance and pre-engineered strategies for buffer tank location and sizing, defrost management, equipment sizing and selection, supplemental heat strategy and placement, and lower hot water supply temperature design, ideally 105°F (40°C). From early project planning through startup and post-installation support, Trane works alongside your team to help keep systems operating efficiently, reliably, and as intended.

Discover What's Possible with Trane.

→ **To learn more, contact your local Trane office or visit trane.com/chiller-heater-system today.**



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