

When the power goes out, Trane keeps it cool



Air-cooled chillers deliver Rapid Restart™ capability

Ascend® Air-Cooled Chiller, model ACR and Air-Cooled Oil-Free Magnetic Bearing Chiller, model TCAA.

For many mission-critical applications, bringing a chiller back online rapidly after a power loss is crucial. When every second counts, having this rapid restart capability proven on the test stand will demonstrate the chiller's ability to adapt to power-loss situations.

Trane systems deliver Rapid Restart capabilities, which offer industry-leading start-up times in the event of a power outage. Once power is restored, your Trane system is fully back in operation in two minutes or less. Competitive rooftop equipment can take up to 15 minutes, long enough for servers to overheat and shut down. With Trane Rapid Restart, the mechanical cooling starts up before the servers heat up.

Chiller Rapid Restart Sequence of Events

Time = -10 sec Chiller running at "X" TonR and power is turned off (controller on UPS power)

Time = 0 sec Main power is re-established on the unit.

Time = 64 sec Compressors get the start command and they all ramp up together

Time = 135 sec Compressor status become operational and keep loading with PID loop

Time = 160 sec Chiller is producing more than 80% "X" capacity

Time ~ 250 seconds to be at 100% load.

Notes: Without Rapid Restart, the time increased to 15 min till chiller gets on its 80% "X" capacity.

Trane understands that every second counts. Trane equipment, controls, and control sequences are designed to get your system back online and properly functioning should your facility experience a power cycle event.

- Trane HVAC system design is optimized for fast restart, and will provide mechanical cooling in 120 seconds or less.
- RTU controls and equipment provide an integrated, pre-engineered solution for fast restart.
- Proven operational procedures maximize uptime during critical outages and get the system up and running as quickly as possible.
- Rapid Restart can be programmed at the chiller control panel to occur anytime unit high voltage power is lost and restored. All compressors are started at once.
- No external signal is required to initiate Rapid Restart, programming done at unit level.
- Ramp up time to 80% load is about 3 minutes

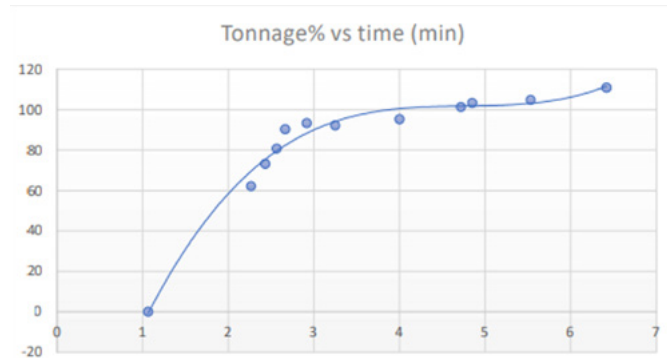
Reduce Thermal Storage Cost

The faster a chiller restarts, the smaller its chilled water tank needs to be. For buildings that utilize chilled water storage, the storage system can be smaller, less expensive and take up less space.

Use Trane chiller controls for even greater reliability and performance:

Standard:

- Control Protocol Options: BACnet, Lon and Modbus
- Variable Primary Flow Optimization offers the key to proper control. Trane chillers have the industry's fastest rate of change in flow.



The Complete Package

Trane not only provides customers with data center solutions, but we also ensure individual needs are met, installation is done properly, usage is understood and service is ongoing. Trane sets customers up for success through:

Pre-sale support: Trane experts make the most thorough recommendations possible.

Best-in-class service: Throughout the installment process, Trane is with our customers every step of the way. Trane experts go through a comprehensive training processes to be able to provide customers with the counsel needed for effective equipment use. Trane also offers technical training at our training facilities across the United States.

Post-sale support: Trane Intelligent Services enable real-time monitoring of your chiller operation 24/7/365, leading to improved energy efficiency, higher productivity and reduced costs.

With industry-leading expertise and a wide array of solutions and services, Trane—a holistic provider—can help customers ensure data center facilities are highly reliable, efficient and sustainable. Trane's application engineering expertise and systems approach allows for efficient, flexible and scalable integrated designs, meeting specific customer needs that ensure uptime and performance is at the forefront of any data center implementation project. Trane experts and its broad solutions portfolio can help transform data centers with experience, innovation and passion for making buildings better—all while helping reduce energy intensity and ensure uptime.



Trane – by Trane Technologies (NYSE: TT), a global climate innovator – creates comfortable, energy efficient indoor environments through a broad portfolio of heating, ventilating and air conditioning systems and controls, services, parts and supply. For more information, please visit trane.com or tranetechnologies.com.

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