



# Protect your servers and keep downtime to a minimum.

Specify Trane chillers with rapid restart.



## How Trane delivers rapid restart.

- Trane HVAC system design is optimized for fast restart.
- Advanced features and functionality are built into the chiller.
- Trane chiller controls are designed and engineered for fast restart.
- We provide proven operational procedures detailing how to get the system back online as quickly as possible.

## The mechanics of superior protection

Many factors influence chiller restart times:

- Chiller configuration
- Type of power loss (brownout vs. blackout)
- Operation prior to restart attempt
- Stop to start timer of the chiller controller
- Oil pressure
- Chiller controller reboot time
- Chiller controller's ability to manage diagnostics
- Time needed for chiller to achieve near full load capacity

In addition to protecting your data center from catastrophic loss due to overheating, a Trane chiller offers other advantages. The faster a chiller restarts, the smaller its chilled water tank needs to be. For data centers that utilize chilled water storage, the storage system can be smaller, less expensive and take up less space.

How long can your data center go without cooling before your servers begin to overheat? Three minutes? Five?

Trane understands that when a power loss knocks a data center's chiller offline, every second counts. That's why we designed our chillers to restart in a matter of seconds.

Other chillers can take four to six minutes at best to restart. Some will take as long as 15 minutes.

A Trane chiller restarts in *as little as 43 seconds*. Thanks to fast restart like this, you can substantially minimize the risks of financially devastating data loss and asset damage from overheating due to power outages.

Trane chiller design optimizes for fast restart at every point in the process.

## Use Trane chiller controls for even greater reliability and performance:

### Standard:

- Adaptive Controls enable the chiller to adapt to changes and adverse conditions so it stays on as long as possible.
- Control Protocol Options: Bacnet, Lon, Modbus.

### Optional:

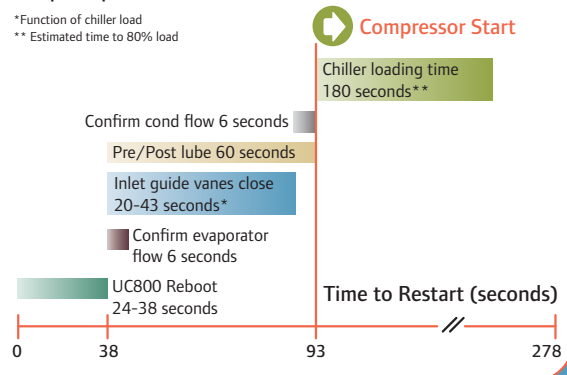
- Variable Primary Flow Optimization, the key to proper control of VPF systems. Trane chillers have the industry's fastest rate of change in flow.

While chillers from Trane offer a host of other benefits—high energy efficiency, future scalability and industry-leading reliability, to name a few—fast restart may be the one that has the most potential impact on your data center.

We will be happy to detail more specifics with you regarding how a Trane chiller can fit into your data center's plans and budget. Just call one of our representatives today.

### CTV Adaptiview simplex restart time complete power loss (without UPS)

\*Function of chiller load  
\*\* Estimated time to 80% load

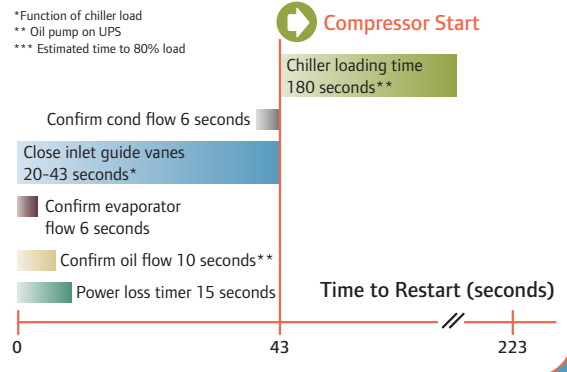


You'll save even more time when your unit controller is backed up by an uninterruptible power supply.

### CTV Adaptiview simplex restart time power loss (with UPS)

Assumes chiller starter power restored within 120 seconds

\*Function of chiller load  
\*\* Oil pump on UPS  
\*\*\* Estimated time to 80% load



#### Restart times are calculated with the following assumptions:

1. No latching diagnostics to prevent the chiller from starting
2. Oil temperature above setpoint
  - a. Oil temp > Saturated evaporator temperature + 30°F and oil temperature minimum must be 100°F
3. Motor temperature sufficient for a start below 235°F
4. Restart inhibit not activated
5. Power up Start Delay setpoint set to 0 minutes
6. Stop to Start Timer set to 5 seconds
7. Evaporator and Condenser water flow (6 seconds of flow needed for verification)
8. Inlet Guide-Vanes fully open at time of power loss (IGVCT = 43 seconds)
9. There is a call for cooling (differential to start or stop)



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