PowerAire®

Fan Assisted Airflow to Eliminate Hot Spots

In almost any data center today there is at least one high density server rack that possesses a unique cooling challenge. Providing enough cooling to satisfy the load of these few racks often leads to over-cooling the other racks and significantly deteriorates the energy efficiency of the facility. Finding the balance to ensure proper air flow to each individual rack while not wasting energy in over-cooling is the key to achieving reliability.

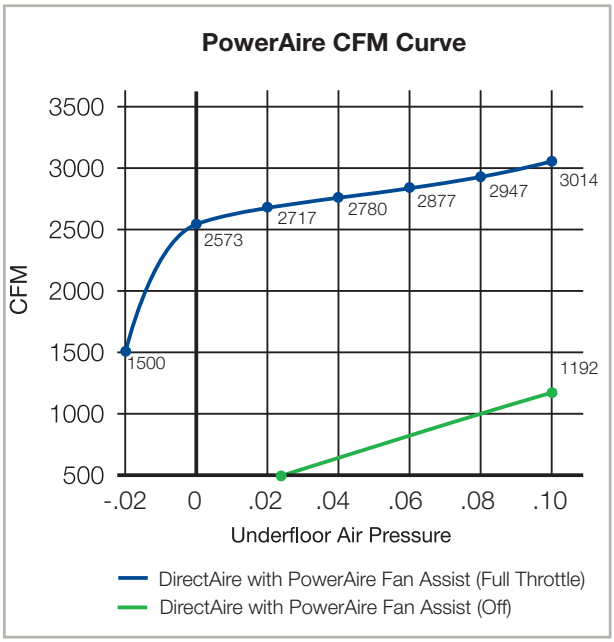
Effectively Manage Dense Server Racks & Blades

Tate's PowerAire fan assist module is designed to provide a blast of cooling through an individual airflow panel. Multiple Control options are avaliable to automatically turn on when conditions require additional cooling.

- **PowerAire C** - client sensor network
- **PowerAire S** - 1 rack mounted sensor
- **PowerAire M** - 3 rack mounted sensor

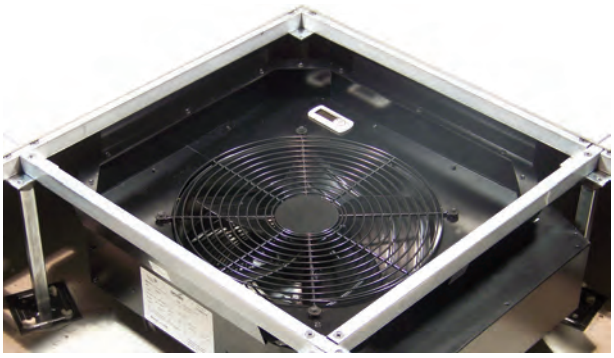
Equiped with a variable speed fan drive the fan can be throttled up or down based on the heat load requirements. This powerful solution is ideal for solving the toughest hot spots in a data center.

The easy to install PowerAire fan assist is ideal for retrofit into existing data centers or as part of a new advanced cooling strategy. PowerAire is an excellent choice for cooling the most stubborn hot spots



The graph above shows the CFM delivered through a DirectAire panel equiped with PowerAire fan assist at full speed compared to a DirectAire with fan assist off.

PowerAire Product Specifications



In-floor Fan Assist Device: High volume EC variable speed fan for use in raised floor roll formed stringer system. 20 gauge steel construction with a single electrical commutated fan that varies its speed based on temperature feedback from four temperature probes installed at the equipment rack. PowerAire device will have the following air distribution capabilities when used with a DirectAire: 3014 CFM at 0.1" of H2O (static pressure).

The In-floor fan assist device shall have the following features.

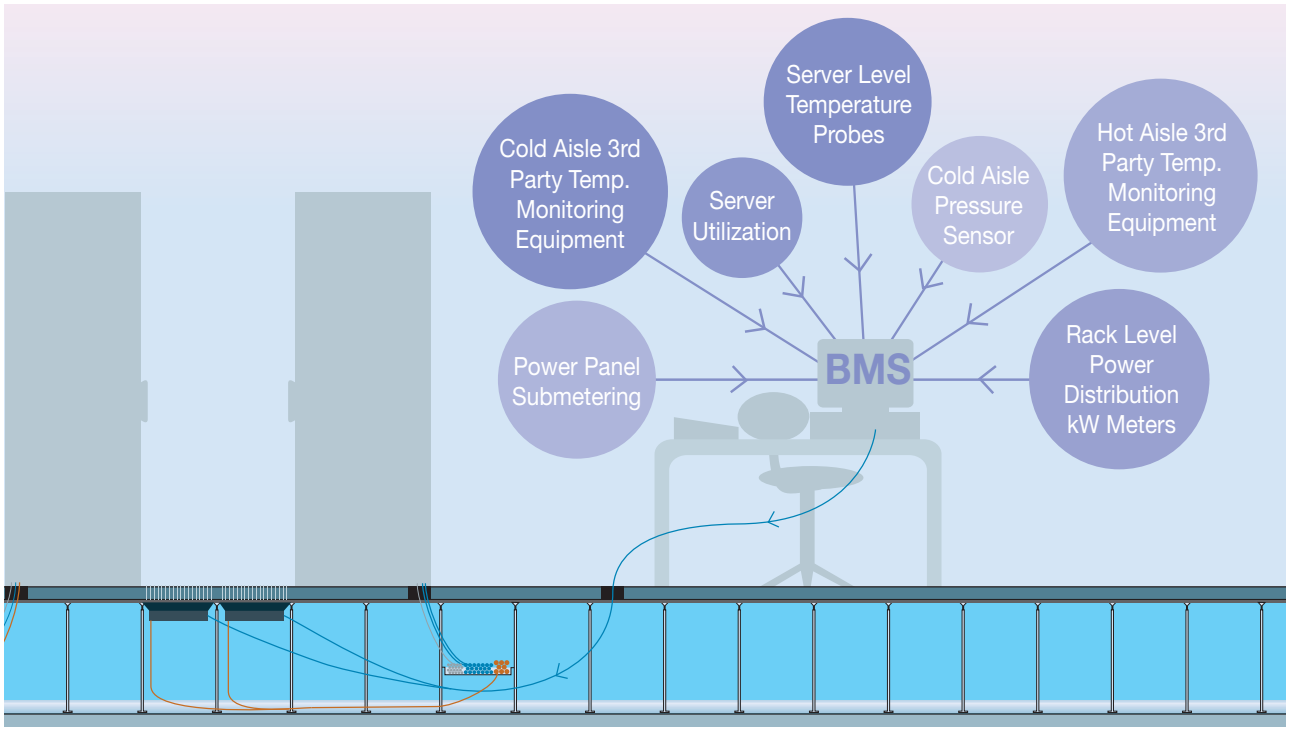
1. Fail Safe Operation
   a. Fan unit must provide greater than 1192 CFM when power is lost at 0.1" of H2O (static pressure)
2. 0-25kW supportable IT load per panel/fan combination
3. No regularly schedule maintenance required
4. The control method shall be one of the following
   a. 3 Temperature Probe, Rack-level, Multiple-sensor Internal control system to evaluate each probe and fan speed based on the current peak input value
   b. 1 Temperature Probe, Rack-level, Single-sensor Internal control system to evaluate the single probe and set fan speed based on this input value
   c. 0-10V control input, Rack-level, Client-unit
5. User selectable set point from 50-100F
6. PID multiloop control system
7. Fan speed shall be infinitely variable between 0-100%
8. Viewable temperature control unit through airflow panel
9. Unit shall draw less than 400VA during peak operation

Control Options for **SmartAire**® and **PowerAire**®

Tate offers several product variations of the SmartAire and PowerAire products to allow for the perfect balance between accurate and efficient cooling and first cost effectiveness for your data center. Here is a list with a brief explanation of our full line of products.

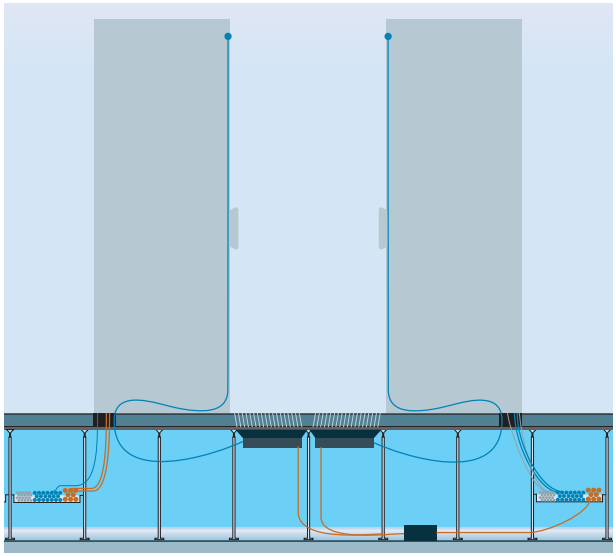
SmartAire C or PowerAire C

C or (rack-level **C**lient-sensor) – this option provides the highest level of control flexibility and is ideal for clients with existing sensor networks. Often data that is already being collected that can be used to accurately drive these devices.



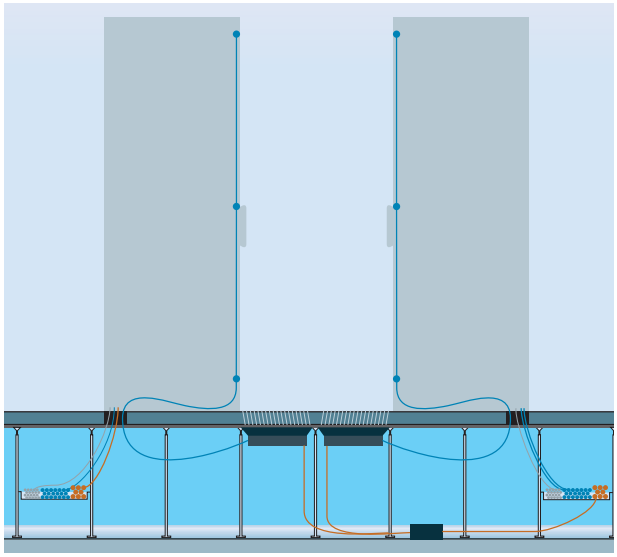
SmartAire S or PowerAire S

S or (rack-level **S**ingle-sensor) – this option offers a single temperature probe for monitoring inlet air temperature. Typically the probe would be mounted near the top of the rack face to monitor the recirculation path over the top of the rack. For racks that are not fully loaded it is recommended to load equipment from bottom to top and place the probe as high as the equipment is in the rack. This option is best utilized for racks installed in the interior of an aisle.



SmartAire M or PowerAire M

M or (rack-level **M**ultiple-sensor) – this option offers multiple (3) temperature probes for full rack height monitoring of the inlet air temperature. Full height monitoring ensures that all recirculation paths are monitored. This option is best utilized for stand alone racks or on racks at the end of aisles.



BMS Interface Cards (for M units only)

This option allows the M units to interface with the existing BMS. Currently BACnet IP, BACnet MS/TP, LonWorks, and SNMP protocols are available for remotely monitoring and controlling the units. This interface allows for the retrieval of current inlet temperatures and damper positions or fan speeds, as well as adjusting individual unit temperature set points.

Application of M and S Units

Tate recommends placing the M units on racks at the end of aisles or on stand alone racks where recirculation air has the potential to enter the rack along the entire height of the rack. S units with the sensor mount as high on the rack face as the equipment in the rack are recommended for racks within the interior portion of a row. The S unit will detect any recirculation air that will raise the inlet air temperature on these racks since the only path is over the top. This method of applying these units will provide the most cost effective means for ensuring that you are always providing the right amount of air to any rack in your data center.