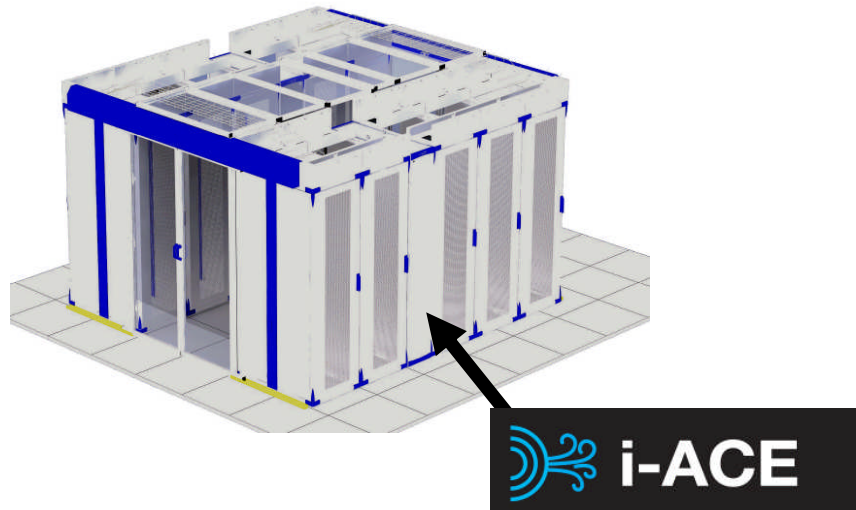


## Hot Aisle Containment

Cooper B-Line's i-ACS isle containment system can be coupled with i-ACE units to provide a room neutral hot aisle containment solution. Ideal for applications where either the equipment already deployed in the data room exceeds current cooling capacity or where the cooling duty required for a zone of cabinets exceeds the existing computer room air conditioning (CRAC) duty.



## System Layout

Based on a room layout adopting a conventional hot aisle / cold aisle set up the hot aisle containment system is configured as follows;

- As well as being set up in hot aisle / cold aisle configuration the cabinets themselves need to be configured with both 80% free area style doors at the front and rear. In addition the internal cabinet layout should be baffled to limit the possibility of the hot air exhausted from the active equipment recirculating within the cabinet envelope. Cooper B-Line has a range of the shelf tools available to allow any standard Access cabinet to be easily configured to meet this scenario.
- i-ACE 20kW duty 300mm wide heat exchanger units are mounted in series with the cabinets. The width of the unit crucially allows for a single 600mm wide cabinet to be replaced by two standard i-ACE units. The cooling duty per cell (group of cabinets) is configurable according to either the chiller capacity available or the desired cooling capacity for the cell. This solution has the added benefit that each i-ACE unit effectively serves a number of cabinets reducing the worry associated with single point failures.
- The ends of the hot aisle need to be enclosed. Cooper B-Line offer a range of sliding door options as retro fit upgrades compatible with our range of standard Access cabinets. As standard doors are supplied with Perspex panels fitted to provide a clear view inside the aisle space. Other options include mechanical as well as electronic locks offering the benefit that the cabinet doors on the enclosed hot aisle to be removed if desired without compromising cabinet security.

## Product Overview

- Roof panels also need to be employed. Again depending on the end users preference panels can be supplied offering both a simple fixed panel option and alternatively a sliding roof option if access is needed to overhead locations above the hot aisle space.

### **System Operation**

The hot aisle containment system works in the same way as a conventional hot aisle cold aisle layout. Cold air from the local room ambient is drawn through the perforated doors on the front of each cabinet. The cold air is drawn over the active equipment where the heat from the equipment transfers to the air.

The now hot air is expelled either out of the rear or side of the equipment collecting in the rear of the cabinet. At this point it is important that the hot exhaust air is stopped from circulating back to the front of the cabinet as failure to address this issue can lead to the generation of hot spots leading to equipment shut down or premature system failures. Air pressure generated by the internal fans in the active equipment effectively forces the hot air into the hot aisle where it is containment within the hot aisle envelope.

The i-ACE units now come in to play. Each i-ACE unit comprises of an air / water heat exchanger coil mounted centrally in the unit. Five hot swappable fan units are mounted at the front of the i-ACE unit. These fan units force hot air to be drawn from the hot aisle space through the rear of the i-ACE unit pulling the hot air across the i-ACE's heat exchanger coil. The now cold air is expelled back into the local room environment maintaining the local room ambient at the desired set point.

Each i-ACE unit has a controller built in to the system allowing users to set up the unit locally for optimum operation.

### **Basic Operation**

Once the power switch (located at the top rear of the unit) has been switched on the unit and the controller has permanent supply, i.e. the controller will always be on. The controller receives a signal from the NTC probe measuring the temperature at the supply airflow (effectively the temperature of the air entering the rear of the i-ACE unit). The controller then modulates the fan speed and the coolant flow rate via a three way valve to provide the optimum condition based on a pre assigned "set point" (set point being the temperature condition the unit is constantly trying to maintain). The fan and flow control valve are controlled in the following fashion;

#### **Condition 1 – Supply Air at Set Point.**

- Fans running at minimum set point to maintain air circulation. This avoids moisture build up – *Set by the user via the controller.*
- Coolant supply valve is in 100% bypass mode generating no load on the chiller circuit.

#### **Condition 2 – Supply Air Between Set Point & Set Point +xK.**

- Fans run proportionally up to 100%.
- Coolant supply valve modulates partially to a maximum based on  $x/x+y$ .

#### **Condition 3 – Supply Air Between Set Point +xK & Set Point +yK.**

- Fans run at 100%.
- Coolant supply valve modulates partially between maximum from condition 2 and 100%.



Kalkenstraat 91-93 B-8800 Roeselare (Roulers) - Belgium

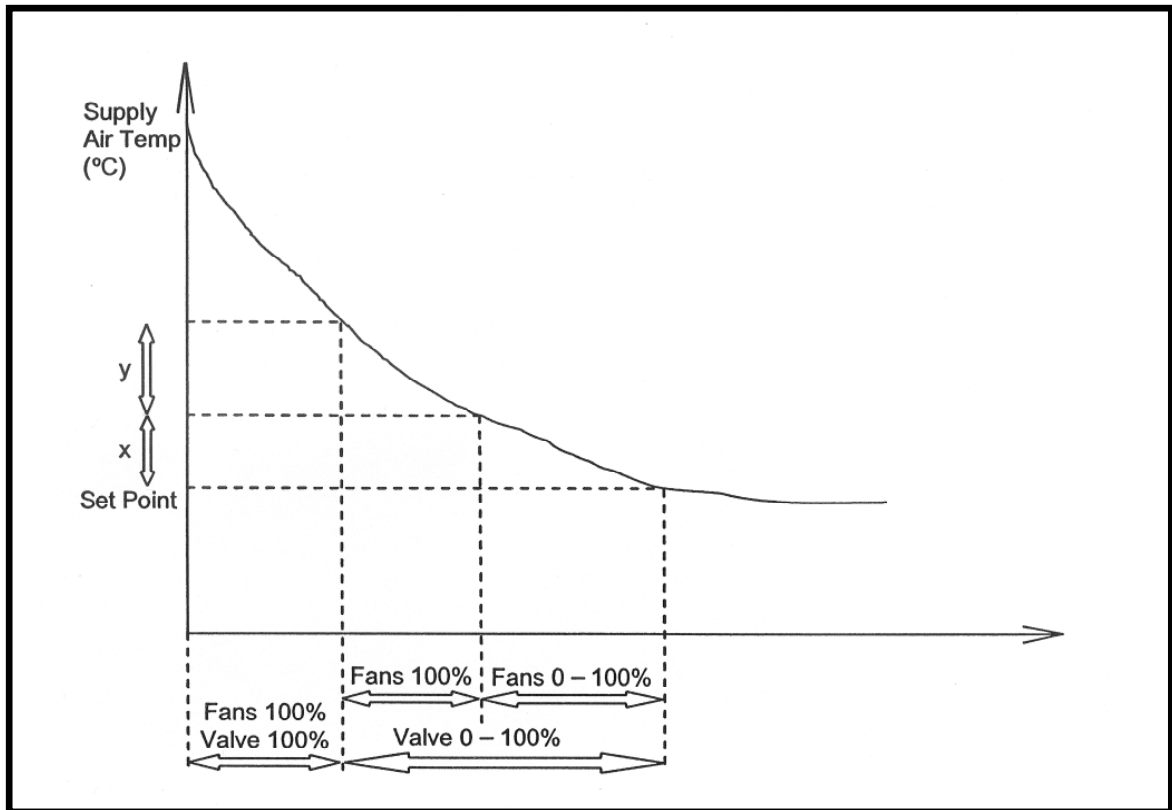
Tel. +32(0)51/25.06.10 Fax +32(0)51/24.02.57

Email: edp@eldeco.be website: www.rack19.be or www.eldeco.be or www.eldeco-edp.eu

### Condition 4 – Supply Air Above Set Point

- Fans run at 100%.
- Coolant supply valve open 100% in full cooling mode.

### i-ACE Operational Functionality



Kalkenstraat 91-93 B-8800 Roeselare (Roulers) - Belgium

Tel. +32(0)51/25.06.10 Fax +32(0)51/24.02.57

Email: edp@eldeco.be website: www.rack19.be or www.eldeco.be or www.eldeco-edp.eu