COOLING DISTRIBUTION UNIT WITH LEAK PREVENTION SYSTEM
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HOW IT WORKS

The Leak Prevention System works on the principle of a Venturi jet pump. This allows for the cooling media to be pulled through the system under a lower than atmospheric pressure, this is in contrast to normal systems where the cooling fluids are normally pushed through the system at above atmospheric pressure. The difference being in our system, if there is a leak, air is pushed into the pipe by the greater external atmospheric pressure against that of a traditional system where water would be pumped out of the system - the water would cause damage to the hardware, electric and fabric of the data center and could even shut down an entire center.

In traditional critical facilities, leak detection tape is used to alarm at the presence of water or other fluids being discharged from the cooling system which, in our opinion, is too late.

In data centers, and other critical industries, water being sprayed or pumped out of a fracture in a hose or pipe or a leak on a connection could cause irrevocable damage to infrastructure, equipment or loss of data and could cause significant downtime even in an N+N system facility.

Our system not only stops the water escaping but continues to operate, so that the air that is taken into the system is carried back to the CDU where the leak prevention system separates it from the cooling medium and the de-aerated medium is then drawn back around the cooling system. This allows your system to stay operational while the leak is corrected by either shutting a component or part of the system down in a planned and controlled environment, instead of an emergency shut down of the whole system.

THE QCooling DIFFERENCE

Benefits of a QCooling CDU with Leak Prevention System:

• The cooling heat exchanger is designed to operate within 3.6°F from the cooling water source inlet temperature to that of the secondary data center cooling loop. This ensures maximum efficiency from your cooling system or enabling natural sources of cooling such as rivers or bore holes to be used to cool your systems

• Inverter driven pumps for maximum efficiency

• N+1 on all key components, mechanical terms and control systems or N+N configurations available

• Leak detection at either unit level or pipe work and white space cooling unit level with our leak detection system Airsense

• Cabinet or skid based solution dependent on size

• Plug and play for ease of installation

• Can be used with rear door coolers, in-row, water cooled CRAC/CRAH, water cooled servers and many other cooling systems

• Remote monitoring and fault diagnosis

1. Leak occurs within the system
2. Without the CDU LPS in place, water rapidly escapes into the data center environment
3. With the CDU LPS in place, leak free cooling water operation is guaranteed

(Negative pressure contains the water within the hose and the data center continues operating as normal.
The leak/damage can be repaired in a controlled way.)
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INSTALLATION OPTIONS

Retrofit & Hot Spot Removal

The cooling distribution unit with Leak Prevention System can be installed and utilized in many different fashions. One of the most current and sought-after cooling solutions is that of retrofit and hot spot removal within existing data center facilities.

With densities increasing, older generation centers cannot handle the increased load and require a solution that can work with their current system and complement it. This also applies to hot spot removal which is an issue, many data center managers are in desperate need of a clear solution that they can install to a live data center with no down time.

FAQs

Q: Will I have to run pipes beneath my crowded raised floor?
A: No, with our leak-proof system we can install pipework above the racks as the space beneath the raised floor is usually at a premium or cramped and already restricting air flow from the perimeter cooling units that are already in place.

Q: Will I need more flow?
A: Our unit will not steal precious flow from your current chilled water system. We can operate on the return leg as it operates at such high temperature compared to that of traditional systems.

Q: What units can it operate with?
A: The CDU with LPS can be used on traditional CRAC/CRAH units, in-rows, rear door coolers and most recently with on chip/water cooled servers.

Q: What happens if my current overloaded N+1 system has issues?
A: If designed correctly, any retrofit or hot spot removal system should be able to ease cooling issues in the entire room and not just the hot spot or high density area. Lost standby capacity should be regained so that if a perimeter cooling unit fails, that load will automatically be taken up by the hot spot removal system.
New Facility

When designing a new data center or server room, one of the biggest concerns of chilled water CRAC/CRAH, water cooled in-row coolers or water cooled rear door systems, is if a leak occurs. How do you detect or contain that leak?

Leak detection tape senses water when it hits the floor but by this time, water could have sprayed onto valuable equipment and destroyed it already. If action is not taken quickly, power and communication couplings might already be engulfed by the water. Leak detection tape is not required with an LPS system because we sense air coming into our system, not water leaking out.

If you are planning to use in-row or rear door systems, you do not need a raised floor. With a Leak Prevention System, water pipework above your facility is a real possibility. If designed correctly it will also be designed on a sensible cooling solution so that it operates above dew point and therefore no condensation is created either.

The CDU with LPS can be installed into a data center that has both low and high density solutions working together. A low density area with CRAC/CRAHs will work seamlessly with its higher density contained aisle with in-rows or open architecture rear door cooler counterpart. The system will operate as one with all the benefits of leak free operation.

External Cooling Options

With the drive for higher efficiency and increased temperatures now allowed (ASHRAE 80°F with short term use up to 90°F) external cooling options are dramatically increased. With our CDU with LPS, we can use chillers operating at 86.4°F to maximize free cooling potential with the use of dry coolers or adiabatic coolers, cooling towers (should the climatic conditions allow) or natural sources such as borehole, river water or sea water.
## TECHNICAL DATA

### MODEL

<table>
<thead>
<tr>
<th>Model</th>
<th>LPS 25 CAB</th>
<th>LPS 50 CAB</th>
<th>LPS 100 CAB</th>
<th>LPS 150 SKID</th>
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</table>

### DESIGN CONDITIONS

- **Cooling Capacity at Design Conditions**: 25, 50, 100, 150
- **Design Water Inlet Temperature (Primary)**: 64.4°F
- **Design Water Outlet Temperature (Primary)**: 69.8°F
- **Design Fluid**: 25% Ethylene
- **Design Water Inlet Temperature (Secondary)**: 74.4°F
- **Design Water Outlet Temperature (Secondary)**: 69.4°F
- **Design Fluid**: Water

### STANDARD CONDITIONS

- **Nominal Cooling Capacity**: 25, 50, 100, 150, 200, 270, 350, 450, 650, 750, 1000
- **Power Input kW**: 1.1, 2.2, 4, 7.6
- **Unit COP kW/kW**: 22, 22, 25, 19, 26, 35, 31, 29, 21, 24, 32
- **Heat Exchanger Type**: Brazed Plate, Gasketed Plate
- **Cooling Medium Inlet Temperature (Primary)**: 60.8°F
- **Cooling Medium Outlet Temperature (Primary)**: 69.8°F
- **Cooling Medium Flow Rate GPM**: 20.1, 42.3, 84.8, 113.9
- **Heat Exchanger Pressure Drop PSI**: 2.3, 2.5, 2.5
- **Max. Working Pressure PSIG**: 28.8, 28.8, 28.8
- **Cooling Medium Inlet Temperature (Secondary)**: 73.4°F
- **Cooling Medium Outlet Temperature (Secondary)**: 64.4°F
- **Internal Volume G**: 2.0, 105.0, 175.0
- **Max. Available Flow Rate GPM**: 20.1, 37.7, 75.4
- **Max. Available Operating Pressure PSI**: 2.3, 2.9
- **Cooling Connections**:
  - **Flow & Return**: 1 1/2" PN16, 2" PN16, 2 1/2" PN16, 3" PN16

### ELECTRIC DATA

- **Power Input Unit kW**: 1.1, 2.2, 4, 7.6
- **Input Current Unit A**: 3.75, 7.5, 12.3
- **Max Input Current Unit A**: 3.75, 7.5, 12.3
- **Inrush Current Unit A**: 3.75, 7.5, 12.3
- **Electrical Supply Voltage V/Ph/Hz**: 460/3/60/M

### NOISE DATA

- **Sound Pressure (2) (dB(A))**: <85, <85, <85, <85

### DIMENSIONS AND WEIGHT

- **Length (inch)**: 45.8, 58.3, 58.3, 154.5
- **Width (inch)**: 25.2, 30.0, 30.0, 30.7
- **Height (inch)**: 62.3, 73.2, 73.2, 63.0
- **Weight (empty) lbs**: 760.6, 760.6, 1245.6, 1086.5

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*Please refer to QCooling for Pressure Drop Calc.

(1) 3.6°F between cooling water inlet and secondary cooling water outlet
(2) 3 ft from unit
TEMPERATION UNIT

The Temperation unit is specifically designed to tap directly into the return line of your cooling system so that it uses no more flow than you currently use or, if you have excess flow, it can be piped in to the flow and return as any cooling system would normally do.

The unit works by creating a secondary loop by allowing small amounts of cooling fluid into a recirculation circuit. This circuit is not separated from the primary circuit by any heat exchanger and therefore can be filled and vented very simply.

The temperation unit is specifically designed to operate with in-row or rear door coolers above dew point in a hot spot removal or high density retrofit application. It can be mounted either below a raised floor with greater than 300mm or in the bottom 8U of a server rack as depicted below.

In many data centers, the cooling system is run at 50°F or below and therefore condensation on in-row coolers or rear door coolers is a major concern when having previously used perimeter-based CRAH/CRAC units.

The temperation eliminates the need for condensate pumps and can simply and easily be installed to increase cooling capacity within certain areas, or the introduction of high density specific equipment within certain racks in the data center.

<table>
<thead>
<tr>
<th>Dimensions &amp; Weight</th>
<th>Connection</th>
<th>Inch</th>
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<tbody>
<tr>
<td>Width</td>
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</tr>
<tr>
<td>Length</td>
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<tr>
<td></td>
<td>Return from data</td>
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