Cold Logik
Perfect climate - Perfect control

New generation computer room cooling

CL20 Rear Cooler
Technical data - metric/imperial
Issue 3 2018
CL20 Rear cooler

Product guide

This document

- This is not a controlled document.
- Distributed copies will not be updated.
- This document has been designed for viewing as a PDF file and double sided printing for a hard copy (subject to copyright – see below).
- Copies can be obtained from USystems Limited or downloaded from our website – www.usystems.co.uk/ColdLogik_CL20_Rear_Cooler.pdf

Copyright notice

The confidential information contained in this document is provided solely for use by USystems Limited employees and system owners and is not to be released to, or produced for, anyone else.

Neither is it to be used for reproduction of this unit or any of its components. All specifications are nominal and subject to change without prior notice as design improvements occur.

Disclaimer

USystems Limited shall not be liable for any damages resulting from misapplication or misuse of its products.

GENERAL STATEMENT

Quality Management System

USystems Limited is a registered company to ISO 9001:2008 Quality management standards. This standard covers all manufacturing areas and associated processes.

Product standards

Unless otherwise stated, products marketed and supplied by USystems Limited, when installed and operated in accordance with USystems’ instructions, conform to EMC directive and essential Health and Safety requirements of the Machinery Directive 91/368/EEC 93/44/EEC and 93/68/EEC. This includes the EMC compatibility directive 89/336/EEC.

As standard, units comply with an IP21 rating.

The standards are also met where compliance to CE, FCC and UL are specific market requirements attained for that product. The units are designed in accordance with TUV and CSA. The units conform to UL/CSA 61010-1.
A new approach | 4
Overview an principle | 5 to 7
CL20 Rear Cooler range | 8 to 9
Technical information

C2 and C3 | 10
C4 | 11
C8 | 12
C12 | 13
C12+ | 14
C14 | 15
C14+ | 16

Leak Prevention System (LPS) Cooling Distribution Unit (CDU) | 17
ColdLogik Management System (CMS) | 18 to 19
Room Management System (RMS) | 20 to 21
CL20 Interface frame | 22
CL20 accessories and cabinets | 23 to 24
Contact information | 25

ColdLogik Rear Coolers are designed, developed and manufactured by USystems in the UK, which markets them internationally. They replace the traditional approach to data centre cooling, allowing load removal of up to 92 kW per cabinet.

ColdLogik Rear Coolers are the award winning data centre cooling solution – recognised with the award of the UK’s most prestigious business prize: the Queen’s Award for Enterprise: Innovation, 2013.

Just in 2013/2014, two major UK data centres, where ColdLogik is used exclusively, have won the BCS, The Chartered Institute for IT, Certified Energy Efficient Datacentre (CEEDA) award – one won Gold for best in class capability, the other Silver for advanced capability. The Gold winner also won the 2012 Project Excellence Award, an annual prize given to a public or private sector entrant for the most outstanding data centre project. We are also in the unrivalled position of having two top 10 projects in the Green 500 list, demonstrating the most efficient data centres in the world.
A new approach

ColdLogik Rear Coolers replace the traditional approach to data centre cooling, allowing loads of up to 92 kW per cabinet with the added benefit of removing real estate inherent with hot aisle cold aisle, in row cooling, CRAC cooling and aisle containment designs.

The waste heat generated by active equipment within a cabinet is removed at source using water cooling – without the risk of leakage – by deploying a unique, patented Leak Prevention System (LPS).

ColdLogik Rear Coolers allow supply water temperatures to rise from the traditional 50°F for CRAC systems to between 57 and 75°F, reducing chiller size and energy costs. They also increase the availability of energy efficient ‘free cooling’, delivering up to the ASHRAE maximum 81°F (2013) room Temperature via hybrid, adiabatic or dry air coolers.

Energy saving

There are many energy metrics used within different industries – the air conditioning industry uses the energy efficiency ratio (EER) and data centres often refer to PUE (power usage effectiveness).

Another metric used within the air conditioning field is the estimated seasonal energy efficiency ratio (ESEER) which takes into account both part load and seasonal variance and focuses purely on cooling equipment and not other power consuming products in the data centre.

Cooling power consumption vs computer power

The tables give indicative percentage figures of cooling power consumption against computer power at full and partial cooling loads. These are more in line with ESEER calculations and a useful and accurate base for your data centre’s cooling system efficiency when planning a new build.

<table>
<thead>
<tr>
<th>External ambient air</th>
<th>Part load</th>
<th>Full load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max air temp</td>
<td>6.0%</td>
<td>6.0%</td>
</tr>
<tr>
<td>Min air temp</td>
<td>1.5%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Average air temp</td>
<td>4.0%</td>
<td>2.25%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Naturally sourced water</th>
<th>Part load</th>
<th>Full load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact water temperature</td>
<td>1.5%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

Examples: dry air coolers, adiabatic coolers, cooling towers

Power usage effectiveness (PUE)

The PUE may vary between 1.04 and 1.5 depending on the geographical location and external ColdLogik cooling solution chosen to pair with ColdLogik Rear Coolers, site conditions and architecture. Properly designed ColdLogik installations are between 1.04 and 1.1, even on part load.
Overview and principle

ColdLogik CL20 Rear Coolers are fitted to the back of an enclosure, typically being IEC 297 3 and EIA STD 310 compliant. The coolers ensure optimum thermal and energy performance by removing the heat generated by the active equipment directly at source, preventing hot exhaust air entering the data room.

Ambient air is pulled into the cabinet by the active equipment fans – the hot air produced by the equipment passes over a heat exchanger matrix, either by its own velocity or pulled through via EC centrifugal fans mounted in the CL20 door. The heat is rejected to coolant and chilled air passed back into the room at a predetermined ambient temperature.

Active or passive models

CL20 Rear Coolers are available in passive and active models – the passive version relies upon the active equipment fans to produce enough air volume and pressure to, in effect, ‘self cool’; active units for all duties are fitted with EC fans.

The coolers can be sited within an existing data centre to work with existing computer room air-conditioning to provide additional cooling. They also reduce energy consumption, remove hot spots and can be retrofitted to existing or new build OEM cabinets using an interface frame or fitted directly to a ColdLogik compliant USpace cabinet.

Single source solution

To gain the optimum energy performance from ColdLogik, the coolers should be deployed as a single source – i.e. used to control the entire computer room / data centre without additional air conditioning, including retrofit scenarios.
Overview and principle

ColdLogik Management System – CMS

The key element in controlling the room environment is the ColdLogik Management System (CMS).

Each rear cooler is intelligently managed for optimum efficiency by embedded computers which continually adjust the operational parameters in response to the heat removal demands placed on the system. By making continual load adjustments, the CMS controllers maintain the room ambient temperature. There’s more information about CMS on page 16.

ColdLogik Room Management System – RMS

The Room Management System (RMS) monitors and manages devices and plant on the ColdLogik network by best optimisation, ensuring the room environment is maintained in the most energy efficient way. RMS can be viewed remotely and locally and provide full access and control. There’s more information about RMS on page 18.
Leak Prevention System – LPS

Another unique and important attribute of the ColdLogik solution is the option of a patented Leak Prevention System (LPS), which is incorporated within the Cooling Distribution Unit (CDU).

As water is present in most data centres, they have the same inherent weaknesses – such as leak detection systems shutting down parts of the cooling system when moisture is detected.

In the event of a pipework breach, the LPS – Leak Prevention System – stops water escaping from the pipework and allows the cooling system to continue running unimpaired, providing uptime, safety and system resilience.

There’s more information about LPS on page 15.

External cooling options

External cooling selection is less restrictive with a ColdLogik system – in many cases you do not have to rely on traditional mechanical cooling products such as chillers.

This is primarily due to the design and control functions of the CL20 rear coolers – the rear coolers utilise much higher water supply temperatures compared to other forms of computer room air-conditioning to achieve the same room ambient temperature.

Consequently, free cooling can be obtained from a wider range of options – as outlined in our illustration.

When all the facts are taken into account, our bold claim of 98% energy savings over and above standard computer room aircon systems is easily justified.
Overview and principle

Product definitions

**ColdLogik** CL20 Rear Coolers are designed to run at optimum performance – even when not requiring high density cooling, they are the most energy efficient data centre cooling system.

**CL20 C2 Rear Cooler (fan assist)**

C2 coolers are capable of up to 6 kW maximum cooling and include as standard three EC fans. Two additional fans can be fitted to provide N+N. All fans have fixed or thermistor (temperature) speed control. The cooler is not fitted with a CMS (ColdLogik Management System), but does include LED power indication. It works as part of a **ColdLogik** cooling solution.

**CL20 C3 Rear Cooler (active)**

C3 coolers are capable of up to 8 kW maximum cooling and include as standard three EC fans. Two additional fans can be fitted with thermistor speed control to provide N+N. C3 coolers include CMS (ColdLogik Management System), to control two rear coolers. The CMS is designed to run at optimum performance at all times, ensuring maximum energy savings. It tracks the air off the cooler into the room and water temperatures back to the cooling medium – by doing so, it is able make minor adjustments, thereby ensuring the room ambient temperature is maintained at all times. For more information about the CMS, see page 16.

The C3 cooler is designed to work as a low duty or co-locate **ColdLogik** system. The set point adjustment is controlled via a commissioning tool, alarm output and BMS signalling via Modbus / CAREL / BACnet RS485 connection option.

**CL20 C4 Rear Coolers**

Available in two variants, each C4 is capable of up to 20 kW maximum ‘sensible cooling’. The performance of any coil relies on airflow passing over the coil matrix – in the case of C4 variants, which are supplied passive (i.e. no active fans fitted as standard), they are preconfigured to allow for fans to be retrofitted. For optimum performance, equipment should supply an airflow of 3,100 m³/hr evenly spread over the coil for maximum cooling and duty.
CL20 Rear Cooler range, continued

CL20 C4nc Rear Cooler (passive)

The C4nc is the entry level version of the rear cooler and, being passive, has no fan management system, coolant control or communication protocol – however the retrofitting of thermostatically controlled fans does offer some degree of control; fixed speed EC fans can be factory or retro-fitted.

CL20 C4sc Rear Cooler (active)

The C4sc version comes with the full ColdLogik Management System (CMS) control. EC fans can be factory or retro-fitted. The CMS is designed to run at optimum performance at all times, ensuring maximum energy savings. It tracks the air off the cooler into the room and water temperatures back to the cooling medium – by doing so, it is able make minor adjustments, thereby ensuring the room ambient temperature is maintained at all times. For more information about the CMS, see page 16.

CL20 C8sc Rear Cooler (active)

The C8sc is capable of a maximum 35 kW of ‘sensible’ cooling and is complete with the ColdLogik Management System (CMS) – as above – and five EC fans.

CL20 C12sc Rear Cooler (active)

The C12sc is capable of a maximum 45 kW of ‘sensible’ cooling and is complete with the ColdLogik Management System (CMS) – as above – and five EC fans.

CL20 C12+ Rear Cooler (active)

The C12+ for use in 48U 750/800 coolers is capable of a maximum 70 kW of ‘sensible’ cooling and is complete with the ColdLogik Management System (CMS) – as above – and six EC fans.

CL20 C14sc Rear Cooler (active)

The C14sc is capable of a maximum 85 kW of ‘sensible’ cooling and is complete with the ColdLogik Management System (CMS) – as above – and five EC fans.

CL20 C14+ Rear Cooler (active)

The C14+ for use in 48U 750/800 coolers is capable of a maximum 92 kW of ‘sensible’ cooling and is complete with the ColdLogik Management System (CMS) – as above – and six EC fans.

ColdLogik Rear Coolers can be run with water temperatures of up to 75°F
Technical information

CL20 C2 and C3 Rear Coolers

General specification

<table>
<thead>
<tr>
<th>Specification</th>
<th>42U and 48U</th>
<th>23.62 / 29.53 / 31.50 inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight - dry</td>
<td>121 lb</td>
<td></td>
</tr>
<tr>
<td>Weight - wet</td>
<td>143 lb</td>
<td></td>
</tr>
<tr>
<td>Volume capacity</td>
<td>0.54 gallons</td>
<td></td>
</tr>
<tr>
<td>Power requirement</td>
<td>115V / 16A and 230V / 8A</td>
<td></td>
</tr>
<tr>
<td>Normal power consumption</td>
<td>50W</td>
<td></td>
</tr>
</tbody>
</table>

Fans

- Backward curved centrifugal fans
- Incorporating EC technology, IP44 rated
- 3 fans
- Current consumption, each fan: 1.2A maximum
- Air flow, each fan: 839 cfm
- Noise level - 3 fans: 60 dBA @ 1 metre
- Full speed

Cooling performance

- Maximum duty (room 71.6 to 75.2°F)
  - Fluid flow: 12 kW
  - Pressure drop: 11.4 gpm
  - Water supply: 9.86 psi
  - Fan air flow: 57.2°F
  - Fan air flow: 1,889 cfm (75%)

- Normal duty (room 71.6 to 75.2°F)
  - Fluid flow: 6 kW
  - Pressure drop: 6.6 gpm
  - Water supply: 4.21 psi
  - Fan air flow: 64.4°F
  - Fan air flow: 1,766 cfm (70%)

- ASHRAE Class 1 running (room 77 to 80.6°F)
  - ASHRAE duty: 5 kW
  - Fluid flow: 4.62 gpm
  - Pressure drop: 2.03 psi
  - Water supply: 70°F
  - Fan air flow: 1,766 cfm (70%)

RDC pipe connections

- 28mm copper pipe flow and return tails with 25mm F cone
- NB Hoses supplied with 25mm M cone to 1” M tapered NPT adapter

¹ Inclusive of CMS—see page 16
² At normal running
## Technical information

### CL20 C4 Rear Coolers

#### General specification

<table>
<thead>
<tr>
<th>Specification</th>
<th>CL20 42U</th>
<th>CL20 48U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>23.62</td>
<td>29.53</td>
</tr>
<tr>
<td>Width</td>
<td>29.53</td>
<td>31.50</td>
</tr>
<tr>
<td>Weight - dry</td>
<td>140 lb</td>
<td></td>
</tr>
<tr>
<td>Weight - wet</td>
<td>168 lb</td>
<td></td>
</tr>
<tr>
<td>Volume capacity</td>
<td>1.09 gallons</td>
<td></td>
</tr>
<tr>
<td>Power requirement</td>
<td>115V / 16A and 230V / 8A</td>
<td></td>
</tr>
<tr>
<td>Normal power consumption</td>
<td>50W</td>
<td></td>
</tr>
</tbody>
</table>

#### Fans

<table>
<thead>
<tr>
<th>Fan Specification</th>
<th>CL20 42U</th>
<th>CL20 48U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>0 to 5 fans</td>
<td>0 to 5 fans</td>
</tr>
<tr>
<td>Current consumption, each fan</td>
<td>1.2A maximum</td>
<td>1.2A maximum</td>
</tr>
<tr>
<td>Air flow, each fan</td>
<td>839 cfm</td>
<td>839 cfm</td>
</tr>
<tr>
<td>Noise level - 3 fans</td>
<td>60 dBA @ 1 metre</td>
<td>60 dBA @ 1 metre</td>
</tr>
<tr>
<td>Full speed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Cooling performance

<table>
<thead>
<tr>
<th>Duty Description</th>
<th>CL20 42U</th>
<th>CL20 48U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum duty (room 71.6 to 75.2°F)</td>
<td>25 kW</td>
<td></td>
</tr>
<tr>
<td>Fluid flow</td>
<td>15.4 gpm</td>
<td></td>
</tr>
<tr>
<td>Pressure drop</td>
<td>7.54 psi</td>
<td></td>
</tr>
<tr>
<td>Water supply</td>
<td>57.2°F</td>
<td></td>
</tr>
<tr>
<td>Required air flow for duty</td>
<td>1824 cfm</td>
<td></td>
</tr>
<tr>
<td>Normal duty (room 71.6 to 75.2°F)</td>
<td>15 kW</td>
<td></td>
</tr>
<tr>
<td>Fluid flow</td>
<td>15.4 gpm</td>
<td></td>
</tr>
<tr>
<td>Pressure drop</td>
<td>7.54 psi</td>
<td></td>
</tr>
<tr>
<td>Water supply</td>
<td>64.4°F</td>
<td></td>
</tr>
<tr>
<td>Required air flow for duty</td>
<td>1471 cfm</td>
<td></td>
</tr>
<tr>
<td>ASHRAE Class 1 running (room 77 to 80.6°F)</td>
<td>12 kW</td>
<td></td>
</tr>
<tr>
<td>ASHRAE duty</td>
<td>12 kW</td>
<td></td>
</tr>
<tr>
<td>Fluid flow</td>
<td>9.25 gpm</td>
<td></td>
</tr>
<tr>
<td>Pressure drop</td>
<td>3.33 psi</td>
<td></td>
</tr>
<tr>
<td>Water supply</td>
<td>70°F</td>
<td></td>
</tr>
<tr>
<td>Required air flow for duty</td>
<td>1412 cfm</td>
<td></td>
</tr>
</tbody>
</table>

#### RDC pipe connections

- 28mm copper pipe flow and return tails with 25mm F cone
- **NB** Hoses supplied with 25mm M cone to 1” M tapered NPT adapter

---

¹ Inclusive of CMS—see page 16
² At normal running
## Technical information

### CL20 C8 Rear Coolers

#### General specification

<table>
<thead>
<tr>
<th>Specification</th>
<th>CL20 C8 Rear Coolers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>42U and 48U</td>
</tr>
<tr>
<td>Width</td>
<td>23.62 / 29.53 / 31.50 inches</td>
</tr>
<tr>
<td>Other sizes available on request</td>
<td>42U and 48U</td>
</tr>
<tr>
<td>Weight - dry</td>
<td>140 lb</td>
</tr>
<tr>
<td>Weight - wet</td>
<td>168 lb</td>
</tr>
<tr>
<td>Volume capacity</td>
<td>1.09 gallons</td>
</tr>
<tr>
<td>Power requirement</td>
<td>115V / 16A and 230V / 8A</td>
</tr>
<tr>
<td>Normal power consumption</td>
<td>100W</td>
</tr>
</tbody>
</table>

#### Fans

- Backward curved centrifugal fans
- Incorporating EC technology, IP44 rated
- Current consumption, each fan: 1.2A maximum
- Air flow, each fan: 839 cfm
- Noise level - 5 fans:
  - Full speed: 73.6 dBA @ 1 metre
  - Normal running (35% fan speed): 47 dBA @ 1 metre

#### Cooling performance

<table>
<thead>
<tr>
<th>Condition</th>
<th>CL20 C8 Rear Coolers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum duty (room 71.6 to 75.2°F)</td>
<td>35 kW</td>
</tr>
<tr>
<td>Fluid flow</td>
<td>23.34 gpm</td>
</tr>
<tr>
<td>Pressure drop</td>
<td>13.92 psi</td>
</tr>
<tr>
<td>Water supply</td>
<td>57.2°F</td>
</tr>
<tr>
<td>Fan air flow</td>
<td>2590 cfm (60%)</td>
</tr>
<tr>
<td>Normal duty (room 71.6 to 75.2°F)</td>
<td>18 kW</td>
</tr>
<tr>
<td>Fluid flow</td>
<td>15 gpm</td>
</tr>
<tr>
<td>Pressure drop</td>
<td>5.80 psi</td>
</tr>
<tr>
<td>Water supply</td>
<td>64.4°F</td>
</tr>
<tr>
<td>Fan air flow</td>
<td>1500 cfm (36%)</td>
</tr>
<tr>
<td>ASHRAE Class 1 running (room 77 to 80.6°F)</td>
<td>17 kW</td>
</tr>
<tr>
<td>ASHRAE duty</td>
<td>13.65 gpm</td>
</tr>
<tr>
<td>Pressure drop</td>
<td>4.64 psi</td>
</tr>
<tr>
<td>Water supply</td>
<td>70°F</td>
</tr>
<tr>
<td>Fan air flow</td>
<td>1648 cfm (40%)</td>
</tr>
</tbody>
</table>

#### RDC pipe connections

- 28mm copper pipe flow and return tails with 25mm F cone
- NB Hoses supplied with 25mm M cone to 1” M tapered NPT adapter

---

¹ Inclusive of CMS—see page 16
² At normal running
Technical information

CL20 C12 Rear Cooler

General specification

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>42U and 48U</td>
</tr>
<tr>
<td>Width</td>
<td>23.62 / 29.53 / 31.50 inches</td>
</tr>
<tr>
<td>Other sizes available on request</td>
<td></td>
</tr>
<tr>
<td>Weight - dry</td>
<td>145 lb</td>
</tr>
<tr>
<td>Weight - wet</td>
<td>172 lb</td>
</tr>
<tr>
<td>Volume capacity</td>
<td>1.62 gallons</td>
</tr>
<tr>
<td>Power requirement</td>
<td>115V / 16A and 230V / 8A</td>
</tr>
<tr>
<td>Normal power consumption</td>
<td>400W</td>
</tr>
</tbody>
</table>

Fans

- Backward curved centrifugal fans
- Incorporating EC technology, IP44 rated
- Current consumption, each fan: 1.2A maximum
- Air flow, each fan: 839 cfm
- Noise level - 5 fans
  - Full speed: 73.6 dBA @ 1 metre
  - Normal running (35% fan speed): 47 dBA @ 1 metre

Cooling performance

- Maximum duty (room 71.6 to 75.2°F): 45 kW
  - Fluid flow: 22 gpm
  - Pressure drop: 8.26 psi
  - Water supply: 57.2°F
  - Fan air flow: 3001.74 cfm (72%)
- Normal duty (room 71.6 to 75.2°F): 35 kW
  - Fluid flow: 21.13 gpm
  - Pressure drop: 5.22 psi
  - Water supply: 64.4°F
  - Fan air flow: 2560.31 cfm (62%)
- ASHRAE Class 1 running (room 77 to 80.6°F)
  - ASHRAE duty: 35 kW
  - Fluid flow: 21.13 gpm
  - Pressure drop: 5.22 psi
  - Water supply: 70°F
  - Fan air flow: 2925 cfm (70%)

RDC pipe connections

- 28mm copper pipe flow and return tails with 25mm F cone
- NB Hoses supplied with 25mm M cone to 1” M tapered NPT adapter

¹ Inclusive of CMS—see page 16
² At normal running
Technical information

CL20 C12+ Rear Cooler

General specification

<table>
<thead>
<tr>
<th>Specification</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>48U</td>
</tr>
<tr>
<td>Width</td>
<td>29.53 / 31.5 inches</td>
</tr>
<tr>
<td>Other sizes available on request</td>
<td></td>
</tr>
<tr>
<td>Weight - dry</td>
<td>165 lb</td>
</tr>
<tr>
<td>Weight - wet</td>
<td>180 lb</td>
</tr>
<tr>
<td>Volume capacity</td>
<td>1.62 gallons</td>
</tr>
<tr>
<td>Power requirement</td>
<td>115V / 16A and 230V / 8A</td>
</tr>
<tr>
<td>Normal power consumption ¹²</td>
<td>3-500W</td>
</tr>
</tbody>
</table>

Fans

- Backward curved centrifugal fans
- Incorporating EC technology, IP44 rated
- Current consumption, each fan: 1.2A maximum
- Air flow, each fan: 839 cfm
- Noise level - 5 fans
  - Full speed: 75 dBA @ 1 metre
  - Normal running (35% fan speed): 47 dBA @ 1 metre

Cooling performance

- Maximum duty (room 71.6 to 75.2°F)
  - Fluid flow: 70 kW
  - Pressure drop: 19.4 gpm
  - Water supply: 8.2 psi
  - Fan air flow: 57.2°F
- Fan air flow: 4559 cfm (90%)
- Normal duty (room 71.6 to 75.2°F)
  - Fluid flow: 45 kW
  - Pressure drop: 15 gpm
  - Water supply: 5 psi
  - Fan air flow: 64.4°F
- Fan air flow: 3298 cfm (65%)
- ASHRAE Class 1 running (room 77 to 80.6°F)
  - ASHRAE duty: 40 kW
  - Fluid flow: 13-87 gpm
  - Pressure drop: 4.35 psi
  - Water supply: 70°F
  - Fan air flow: 3887 cfm (76%)

RDC pipe connections

- 28mm copper pipe flow and return tails with 25mm F cone
- NB Hoses supplied with 25mm M cone to 1” M tapered NPT adapter

¹ Inclusive of CMS—see page 16
² At normal running
## Technical information

### CL20 C14 Rear Coolers

#### General specification

<table>
<thead>
<tr>
<th>Specification</th>
<th>Specification Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>42U and 48U</td>
</tr>
<tr>
<td>Width</td>
<td>23.62 / 29.53 / 31.50 inches</td>
</tr>
<tr>
<td>Other sizes available on request</td>
<td></td>
</tr>
<tr>
<td>Weight - dry</td>
<td>155 lb</td>
</tr>
<tr>
<td>Weight - wet</td>
<td>188 lb</td>
</tr>
<tr>
<td>Volume capacity</td>
<td>2.41 gallons</td>
</tr>
<tr>
<td>Power requirement</td>
<td>115V / 16A and 230V / 8A</td>
</tr>
<tr>
<td>Normal power consumption¹²</td>
<td>200-400W</td>
</tr>
</tbody>
</table>

#### Fans

<table>
<thead>
<tr>
<th>Fans Specification</th>
<th>Specification Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backward curved centrifugal fans</td>
<td>0 to 5 fans</td>
</tr>
<tr>
<td>Incorporating EC technology, IP44 rated</td>
<td></td>
</tr>
<tr>
<td>Current consumption, each fan</td>
<td>1.2A maximum</td>
</tr>
<tr>
<td>Air flow, each fan</td>
<td>839 cfm</td>
</tr>
<tr>
<td>Noise level - 3 fans</td>
<td>73.6 dBA @ 1 metre</td>
</tr>
<tr>
<td>Full speed</td>
<td>50 dBA @ 1 metre</td>
</tr>
<tr>
<td>Normal running (35% fan speed)</td>
<td></td>
</tr>
</tbody>
</table>

#### Cooling performance

<table>
<thead>
<tr>
<th>Performance Description</th>
<th>Specification Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum duty (room 71.6 to 75.2°F)</td>
<td>58 kW</td>
</tr>
<tr>
<td>Fluid flow</td>
<td>22 gpm</td>
</tr>
<tr>
<td>Pressure drop</td>
<td>8.55 psi</td>
</tr>
<tr>
<td>Water supply</td>
<td>57.2°F</td>
</tr>
<tr>
<td>Fan air flow</td>
<td>3163.60 cfm (75%)</td>
</tr>
<tr>
<td>Normal duty (room 71.6 to 75.2°F)</td>
<td>48 kW</td>
</tr>
<tr>
<td>Fluid flow</td>
<td>18 gpm</td>
</tr>
<tr>
<td>Pressure drop</td>
<td>4.93 psi</td>
</tr>
<tr>
<td>Water supply</td>
<td>64.4°F</td>
</tr>
<tr>
<td>Fan air flow</td>
<td>3001.94 cfm (75%)</td>
</tr>
<tr>
<td>ASHRAE Class 1 running (room 77 to 80.6°F)</td>
<td>45 kW</td>
</tr>
<tr>
<td>ASHRAE duty</td>
<td>18 gpm</td>
</tr>
<tr>
<td>Pressure drop</td>
<td>4.93 psi</td>
</tr>
<tr>
<td>Water supply</td>
<td>70°F</td>
</tr>
<tr>
<td>Fan air flow</td>
<td>3160.66 cfm (100%)</td>
</tr>
</tbody>
</table>

#### RDC pipe connections

- 28mm copper pipe flow and return tails with 25mm F cone
- NB Hoses supplied with 25mm M cone to 1” M tapered NPT adapter

¹ Inclusive of CMS—see page 16
² At normal running
Technical information

**CL20 C14+ Rear Coolers**

### General specification

<table>
<thead>
<tr>
<th>Specification</th>
<th>CL20 C14+ Rear Coolers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>42U and 48U</td>
</tr>
<tr>
<td>Width</td>
<td>23.62 / 29.53 / 31.50 inches</td>
</tr>
<tr>
<td>Other sizes available on request</td>
<td></td>
</tr>
<tr>
<td>Weight - dry</td>
<td>176 lb</td>
</tr>
<tr>
<td>Weight - wet</td>
<td>201 lb</td>
</tr>
<tr>
<td>Volume capacity</td>
<td>2.41 gallons</td>
</tr>
<tr>
<td>Power requirement</td>
<td>115V / 16A and 230V / 5A</td>
</tr>
<tr>
<td>Normal power consumption</td>
<td>3-500W</td>
</tr>
</tbody>
</table>

### Fans

- Backward curved centrifugal fans
- Incorporating EC technology, IP44 rated
- Current consumption, each fan: 1.2A maximum
- Air flow, each fan: 839 cfm
- Noise level - 3 fans:
  - Full speed: 75 dBA @ 1 metre
  - Normal running (35% fan speed): 50 dBA @ 1 metre

### Cooling performance

- **Maximum duty (room 71.6 to 75.2°F)**
  - Fluid flow: 22 gpm
  - Pressure drop: 3.19 psi
  - Water supply: 57.2°F
  - Fan air flow: 5036 cfm (100%)

- **Normal duty (room 71.6 to 75.2°F)**
  - Fluid flow: 21.35 gpm
  - Pressure drop: 3.04 psi
  - Water supply: 64.4°F
  - Fan air flow: 4241 cfm (85%)

- **ASHRAE Class 1 running (room 77 to 80.6°F)**
  - Fluid flow: 21.35 gpm
  - Pressure drop: 3.04 psi
  - Water supply: 70°F
  - Fan air flow: 5006 cfm (100%)

**NB.** C14+ to 107kW+ under testing

### RDC pipe connections

- 28mm copper pipe flow and return tails with 25mm F cone
- **NB** Hoses supplied with 25mm M cone to 1” M tapered NPT adapter

---

1. Inclusive of CMS—see page 16
2. At normal running
Leak Prevention System (LPS) with Cooling Distribution Unit (CDU)

The patented Leak Prevention System (LPS) with Cooling Distribution Unit (CDU) enables the flow and return water supply within the data centre – including all pipe work, hoses and rear coolers – to be put on a negative water circuit. This allows the system to operate without the fear of leaks or water damage to critical equipment or room infrastructure.

In the event of a breach in the water circuit, air is drawn into the system preventing leaks – the resulting air is taken back to the CDU / LPS or strategically placed vents in the circuit where it is vented out of the system and reported to the Room Management System (RMS).

Critically, this ensures that the system continues to operate without affecting the room ambient temperature and any remedial work can be carried out when convenient ensuring maximum uptime.

As with all aspects of ColdLogik, the LPS can be retrofitted to an existing circuit. It is modular and scalable in design – as your data centre grows, so can the ColdLogik liquid cooling system.

In many cases it is necessary to tap a water supply off a chiller which already supplies chilled water to an existing systems within the same building but at much lower temperatures than are required by ColdLogik.

If chilled water from the primary circuit were to remain at this temperature, it would create condensation within the ColdLogik coolers. The CDU / LPS provides close control cooling to the rear coolers, eliminating the potential of condensate.

The process side, or secondary circuit, is a sealed pressurised system with the heat extracted from the coolers being rejected to a raw chilled water circuit via a stainless steel plate heat exchanger.

Unlike most CDU units however, our heat exchangers are much larger and can accept water up to 75.2°F while still maintaining the data centre below 80.6°F (ASHRAE class 1).
ColdLogik Management System (CMS)

The ColdLogik Management System (CMS) lies at the heart of the ColdLogik solution.

The room ambient temperature is controlled locally at cabinet level by the CMS. It automatically adjusts the fan speed, water flow rate and, if necessary, the output water temperature from the cooling medium – the result is a consistent delivery of cooled air into the data centre, with no operator intervention.

The whole process can also be overseen and controlled at individual cabinet level, room level and remotely via any of the industry standard communication protocols.

The CMS is either built into the cooler or a 2U high and can be rack mounted or fitted on top of the cabinet or under floor. It ensures all variants of the ColdLogik system operate on a ‘sensible cooling’ principle – ‘water above dew point’ – and the system remaining free of condensation.

▲ The ColdLogik Management System (CMS) unit. It lies at the heart of the ColdLogik Rear Cooler solution.
▼ The CMS set up/commissioning tool is used to define all the required parameters at commissioning.
ColdLogik Management System (CMS), continued

The ColdLogik Management System (CMS) is configurable to suit each installation and includes these:

- Coolant flow control (0 to 10V).
- Integral 24V AC motorised valve supply.
- 0 to 10V or 5V PWM EC fan control.
- Single or dual bank fan speed control.
- Fan periodic functionality test.
- Chiller regulation based on room values and set point.
- Industry standard thresholds and differentials on all user definable parameters.
- Valve (coolant) opening command monitoring.
- Return water temperature monitoring.
- Individual fan monitoring with the communication protocols Modbus, Transparent Local Area Network (TLAN) and fieldbus system options – other industry standards available.
- Full status monitoring via Modbus.
- Network BMS or volt free contact connections for room monitoring, individual fan fail alarm and a common alarm.
- Local door alarm indicator – colour change on door logo.
- High and low temperature alarm.
- User definable periodic preventative maintenance alarms.
- Full alarm log (requires commissioning tool to access and reset).
- User definable time delays on alarm functions.

System options

- Dual and single power supply change over.
- Power fail alarm on supply change over.
- Leak prevention detection alarm.
- Processor monitor fail safe.
- Programming key for simplistic transfer of commissioning data to another CMS.
- Local individual cabinet display screen.
- System display monitor and log up to 300 CMS via the RMS.
- Set up/commissioning tool.
Room Management System (RMS)

The ColdLogik Room Management System (RMS) is the complete and reliable solution for air management, monitoring and optimisation of data centres.

The ColdLogik Management System (CMS) has slots for a communication card – RS485 Modbus compliant option – allowing system monitoring via the RMS or the building’s BMS.

There are three units (small, medium and large) – all include a facility to email alarms (via a built in RJ45 port with IP address) and log system information.

The RJ45 port can be accessed from any PC, tablet or smart phone with internet access – it is password protected and allows remote viewing of monitored conditions on the ColdLogik CMS. It can also reset concluded CMS alarms.

ColdLogik RMS / small

This is the entry level ColdLogik RMS unit (right) with built in alarm management, data logging and email. It’s compact, weatherproof and efficient with a 4” touch screen display.

It is available in 14 languages and can monitor up to 50 devices (CMS units, chiller etc), with remote management via internet or phone line access.

It can display and log any number of the 169 parameters within each CMS unit – the number of units / plant depends on the number of parameters displayed for each, i.e. four per device = 63 units.

The entry level ColdLogik RMS monitor.
It can monitor up to 50 devices.
Room Management System (RMS), continued

**ColdLogik RMS / medium and large (optional)**

These are the professional-level units for monitoring and managing data centre air systems, with full optimisation, control and remote access to all devices in the system.

They feature a large (9.05 x 12 inches, h x w) colour touch screen. The intuitive interface can be customised for displaying and configuring the system. The ‘medium’ unit can monitor and display up to 90 devices (ColdLogik units, chiller etc) on 2 x RS485 Modbus lines – the ‘large’ unit can monitor and display up to 300 devices.

They can log and display the 300+ parameters within each CMS unit. 14 languages are available. User level access allows ‘view only’ or ‘administrator level’ – the administrator is able to modify individual or groups of CMS controllers.

Both these RMS units will monitor and control all the ColdLogik units in the data centre at all stages of their operation:

- **Setup** – centralised configuration of all the parameters for the units installed.
- **Daily operation** – system interface, data logging, reports, activity scheduling, automatic optimisation of operation.
- **Maintenance** – remote access, alarm management with automatic signals and actions.
- **Site maps (optional)** – can be uploaded with status indication on individual cabinets.
- **Security** – managed using sophisticated IT techniques.
- **Complete tools** – for reports and production of documents such as HACCP and system reports.
CL20 Interface frame

One of the biggest advantages of the CL20 Rear Cooler is its ability to couple with either a new build or a retrofit on to an existing cabinet.

The interface frame is a universal product, so all standard and some nonstandard enclosures can be accommodated. It allows a secure fixing of the rear cooler without transferring any additional weight to the existing cabinet.

The frame brings many of the benefits of the CL20 cooler family without the need to decommission old cabinets – or even entire data centres.

By working in harmony with the incumbent air conditioning system, many of the benefits of the ColdLogik system can be realised:

- Removal of hot spots.
- Increase cabinet kW density – and data centre density by housing more active equipment.
- Reduce carbon footprint.
- Save HVAC energy.
- Save energy costs.
CL20 accessories and cabinets

Accessories

ColdLogik compliant hoses

ColdLogik compliant RDC silicone hoses are manufactured from a mix of galvanised wire, fabric, rubber and silicone – making them ultra-pliable and with a smaller bend radius than all other hoses. Their construction helps prevent twisting while still being extremely flexible.

They are suitable for positive pressure and leak prevention systems (LPS) and are supplied in pairs – one red and one blue in lengths of 1, 2, 3 or 4m.

1.4 inches O/D, 0.75 inches I/D – standard connections 1 inch cone (coil) to coned 1 inch cone with a cone to male 1” NPT adaptor (pipe work end) adaptor.

They are also available with Zero Aisle overhead runner system components.

ColdLogik CL20 general options and accessories

- Commissioning valve.
- Flow control valve C3 and C4 up to 12 kW.*
- Flow control valve C4, C8 and C12 up to 30 kW.*
- Flow control valve C12 and C14 up to 58 kW.*
- Flow control valve C12+ and C14+ up to 107 kW.*

*Modulated flow control valves for all SC rear coolers.

ColdLogik Room Management System (RMS)

- Includes monitors, screens and systems for up to 300 x CL20 coolers.
- RMS – medium / large BMS uplink conversion. Allows the RMS to be a sub-slave, enabling the BMS master to monitor up to 1,000 parameters.
- ColdLogik RMS set up and programming – up to 300 coolers.

ColdLogik Management System (CMS) control box

- Single power supply (115V or 230V).
- Dual power supply (115V and 230V).
- LPS venting upgrade.
- CMS box rack mount kit.
CL20 accessories and cabinets, continued

ColdLogik miscellaneous electronic accessories

- Commissioning (set up) tool with RJ11 lead.
- Program key – pictured right.
- CMS Modbus RS485 comms card.
- CMS communications cards – TCP / IP, BACnet and SMS.
- CMS 0-10V converter.
- Processor fan and valve fail backup to pre-set value on a CMS failure.
- ColdLogik cooler leak detection.
- CL20 C4nc temperature probe kit.

Cabinets

ColdLogik compliant cabinets

42U or 48U x 23.62 / 29.53 / 31.50 inches wide, 39.37 or 47.24 inches deep. These cabinets have a special cooler direct mounting facility, AirTech curved front door, internally locking side panels and front and rear mounting angles.

Colour: light grey RAL 7035. They are also available with Zero Aisle overhead runner system components.

ColdLogik retro-fit adaptor frames for OEM cabinets

Retro-fit adaptor frame to floor and top support plates/ unitstrut mounting for attaching a ColdLogik CL20 Rear Cooler to a third party OEM cabinet. Colour: light grey RAL 7035. Left or right hand hinges. Available in 39U / 42U and 45U /48U 23.62 / 29.53 / 31.50 inches wide formats. Other sizes available on request.

ColdLogik anti-recirculation sealing kits

Advanced computer room cooling systems – quiet, cool and space efficient

New generation computer room cooling