



ColdLogik

CL20 Rear Door Cooler

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ColdLogik Rear Door 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**.

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 current Green 500 list, demonstrating the most efficient data centres in the world.

Since then, we have gone on to sell the ColdLogik solution in six continents for small, medium and large, prestige sites with continued success.



ColdLogik Rear Door Coolers are designed, developed, manufactured and sold internationally by **USystems**. They replace the traditional approach to data centre cooling, allowing load removal of up to **92 kW per cabinet**

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Quality, recycling, compliance and manufacturing statement

USystems is registered as meeting the quality manufacturing requirements of EN ISO 9001:2015, ISO 14001. Our products comply with CE, and RoHS standards and are UL listed. We recycle well over 90 per cent of our waste.

Overview and principle

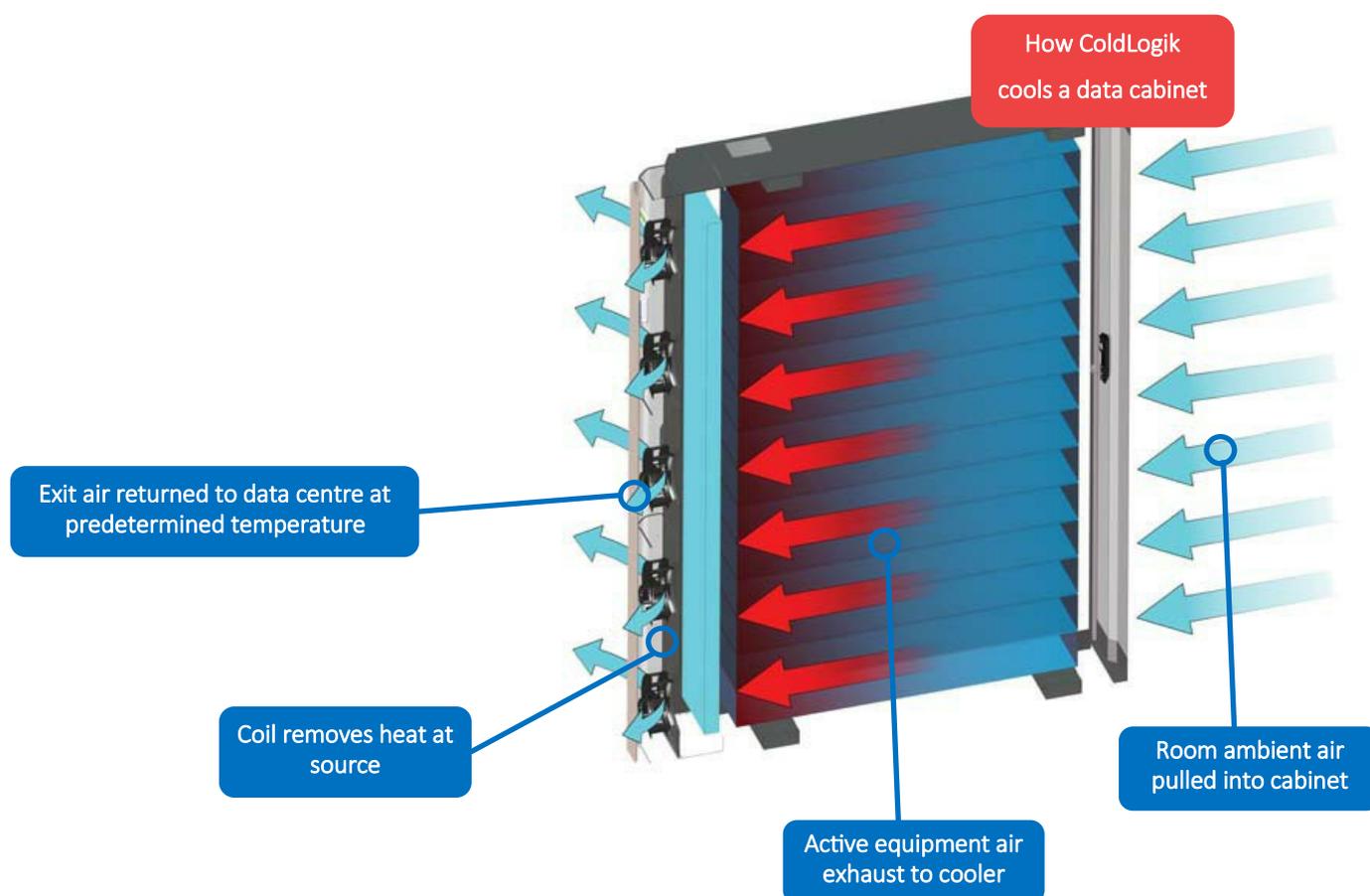
ColdLogik CL20 Rear Door Coolers are fitted to the back of an enclosure, typically being IEC 297 3 and EIA STD 310 compliant. The coolers ensure optimum thermal and energy performance by removing the heat generated by the active equipment directly at source, preventing hot exhaust air entering the data 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 being pulled through via EC centrifugal fans mounted in the CL20 door. The heat is rejected to coolant and chilled air is passed back into the room at a predetermined ambient temperature.

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

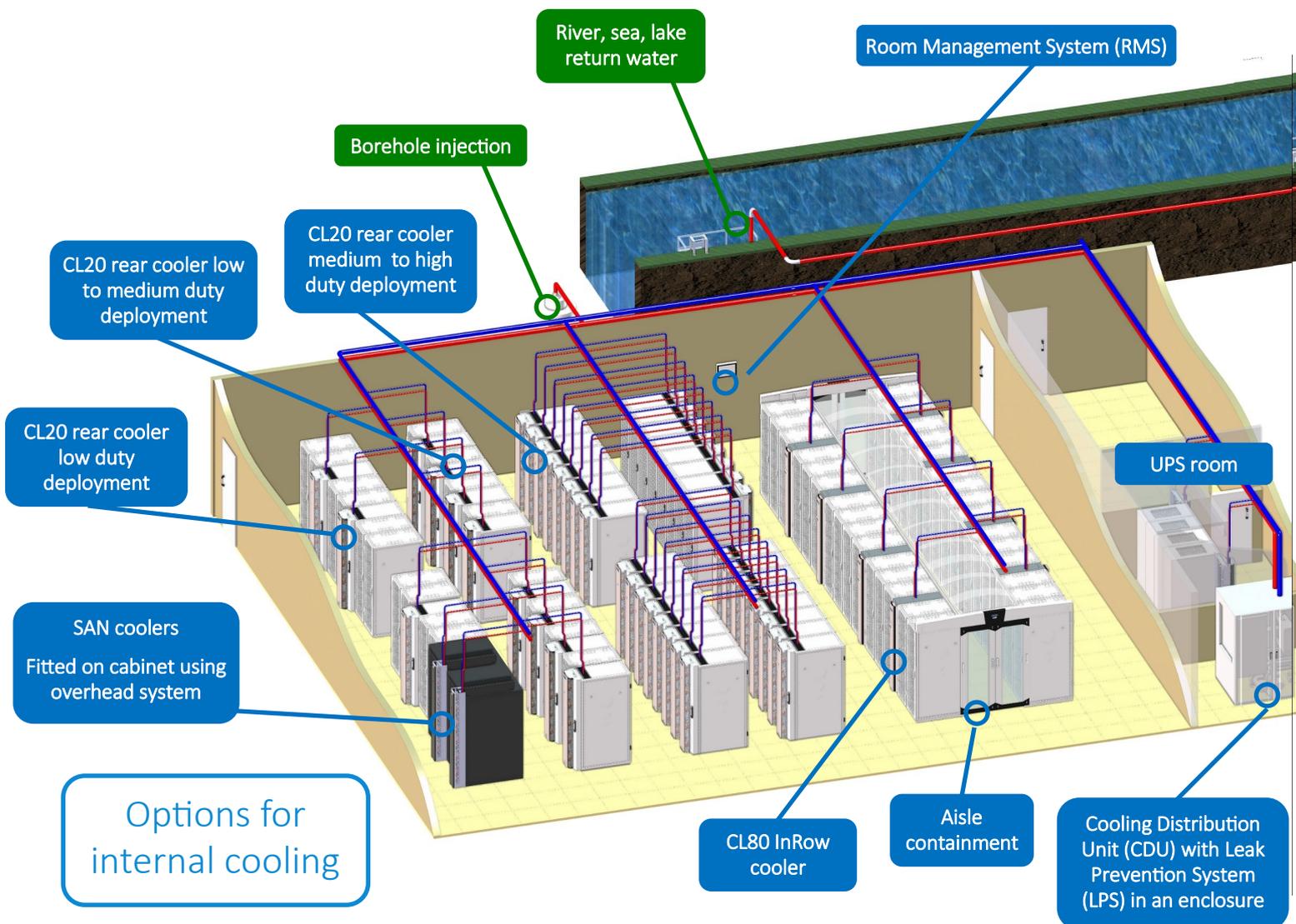
ColdLogik Management System – CMS

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 these continual load adjustments, the CMS controllers maintain the room ambient temperature. There's more information about CMS on page 20-21

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. The RMS can be viewed remotely and locally providing full access and control.



Another unique but 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.

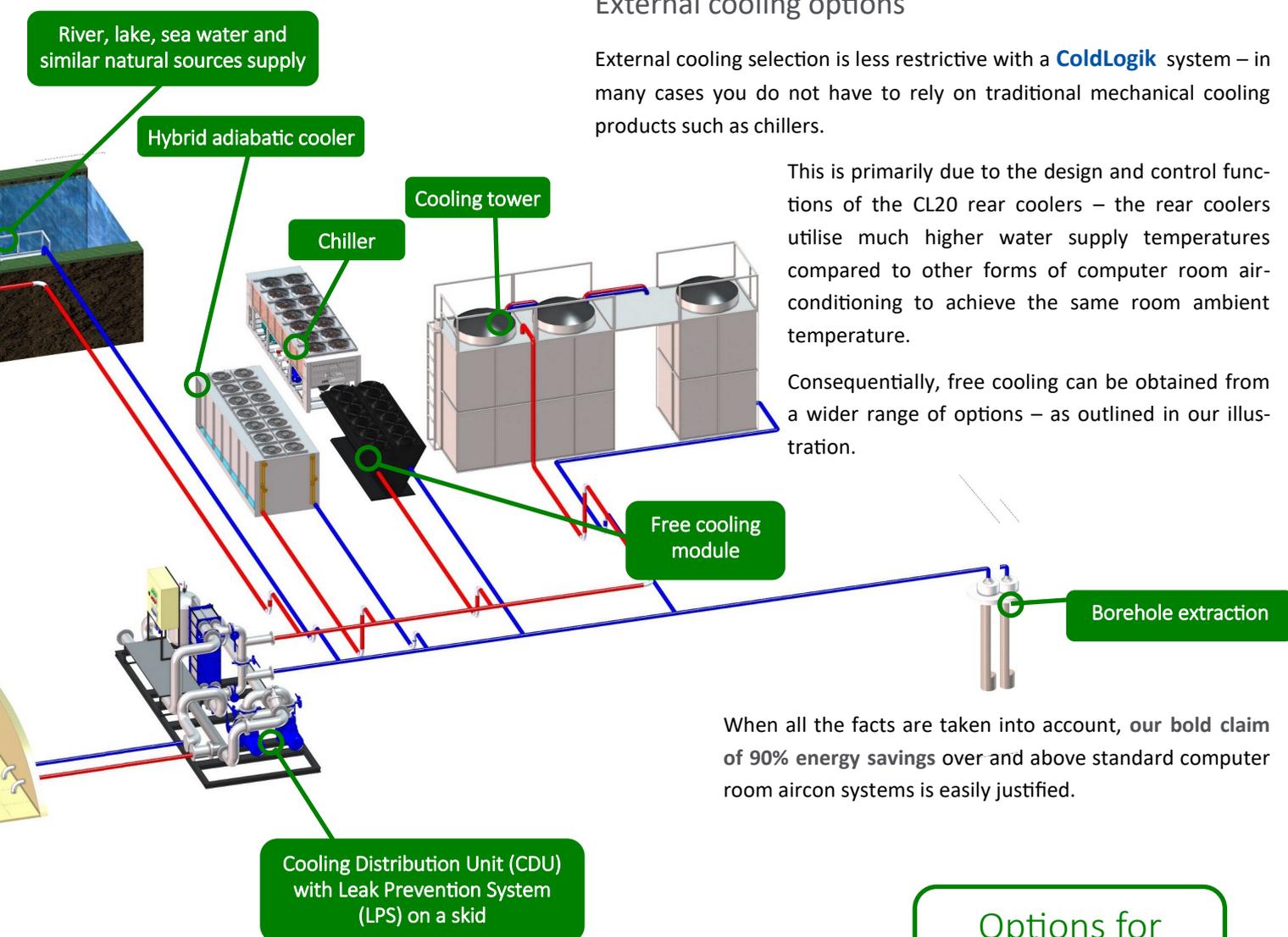
In the event of a pipework breach, the LPS – **Leak Prevention System** – stops water escaping from the pipework *and* allows the cooling system to continue running unimpaired, providing uptime, safety and system resilience.

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 90% energy savings** over and above standard computer room aircon systems is easily justified.

Options for external cooling

A proven solution

ColdLogik Rear Door Coolers replace the traditional approach to data centre cooling, allowing loads of up to **92kW 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 patented **Leak Prevention System (LPS)**.

ColdLogik Rear Door Coolers allow supply water temperatures to rise from the traditional 50°F/10°C for CRAH systems to between 57°F/13.9°C and 79°F/26.1°C, reducing chiller size and energy costs. They also increase the availability of energy efficient ‘free cooling’, delivering up to the ASHRAE maximum 81°F/27°C (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).

Power usage effectiveness (PUE)

The PUE may vary between 1.03 and 1.5 depending on the geographical location and external **ColdLogik** cooling solution chosen to pair with **ColdLogik** Rear Door Coolers, site conditions and architecture. Properly designed **ColdLogik** installations can be between 1.03 and 1.1 for the full datacentre at full load. **These figures are not based on partial PUE but refer to the full DC environment.**

A few examples of performance achieved on **ColdLogik** installed sites

USA west coast DC, large recent installation of 250+ coolers (4MW) which on IST showed the ColdLogik solution to need only 50% of the water flow compared to their ‘existing’ similar solution

USA – Texas DC, Two, 1MW rooms running with Chiller/Dry air cooler & LPS @ 74°F/23.3°C supply water and 80°F/26.7°C room temperatures. First USA DC with CEEDA Gold efficiency award for both design and operation.

UK data centre, 1MW design load, runs at approx. 700-750kW IT load – draws 25kW (winter) to 44kW (summer) cooling power. CEEDA Gold efficiency awarded site. Uses cooling towers (only) with LPS, no chillers.

UK University, 1.2MW design load, runs at approx. 900-1200kW IT load, building with three data halls, two using AHU and hot aisle containment (2-300kW) and one with ColdLogik coolers (7-900kW) – runs at 1.12 to 1.2 PUE. Uses Hybrid coolers, no chillers.

Kuwait Co-Lo, ColdLogik data hall uses 50% less cooling energy than the existing AHU data hall, both systems run on chillers (with up to 60°C/140°F ambient).



ColdLogik Rear Door Coolers utilise space far more efficiently than hot aisle cold aisle, in row cooling, CRAC cooling and aisle containment designs.

CL20 range

CL20 C8 Rear Door Cooler—Page 8

The C8 is capable of a maximum **45kW** of ‘sensible’ cooling and is complete with the ColdLogik Management System (CMS) and five EC fans.

CL20 C12 Rear Door Cooler—Page 9

The C12 is capable of a maximum **55kW** of ‘sensible’ cooling and is complete with the ColdLogik Management System (CMS) and five EC fans.

CL20 C14 Rear Door Cooler—Page 10

The C14 is capable of a maximum **85kW** of ‘sensible’ cooling with an air on of 52°C or 125°F and is complete with the ColdLogik Management System (CMS) and five or six EC fans.

CL20 C18 Rear Door Cooler—Page 11

The C18 for use in 48U/52U 29.5"/750mm 31.5"/800mm coolers is capable of a maximum **92kW** of ‘sensible’ cooling with an air on of 53°C or 127°F and is complete with the ColdLogik Management System (CMS) and six EC fans.

CL20 Smart Passive—Pages 14-20

The ColdLogik CL20 Smart Passive in its active build and has a unique modular upgrade path for a ‘pay as you grow’ ethos to counter costly and wasteful ‘rip out and replace’ upgrades—see performance charts on pages 16 to 19.

Available complete on a USpace 4210Z cabinet or on its own as retrofit option which can be fitted to any OEM cabinet via the CL20 interface frame.

What is Free cooling?

Free cooling is the ability of a chiller unit to utilise the environment it is in to make the system significantly more efficient. In the right geographical locations, and dependent on water design temperatures, this technique can be used to cool 100% of the requirement for over 90% of the year. This can lead to seasonal efficiency figures of well in excess of **100** and PUE's on projects to be as low as **1.03**.

What is Sensible cooling?

Sensible cooling is the process of cooling air so that the temperature and relative humidity doesn't pass below ‘dew point’. This is the point at which relative humidity becomes too high and water will start to be collected at the point of cooling., condensation will occur By operating at higher water temperatures, which is the preferred solution, and still neutralising the same amount of heat you can avoid the dew point and with it the need to manage condensate in the space.



ColdLogik Rear Door Coolers can be run with water temperatures of up to 75°F/23.9°C

Technical information

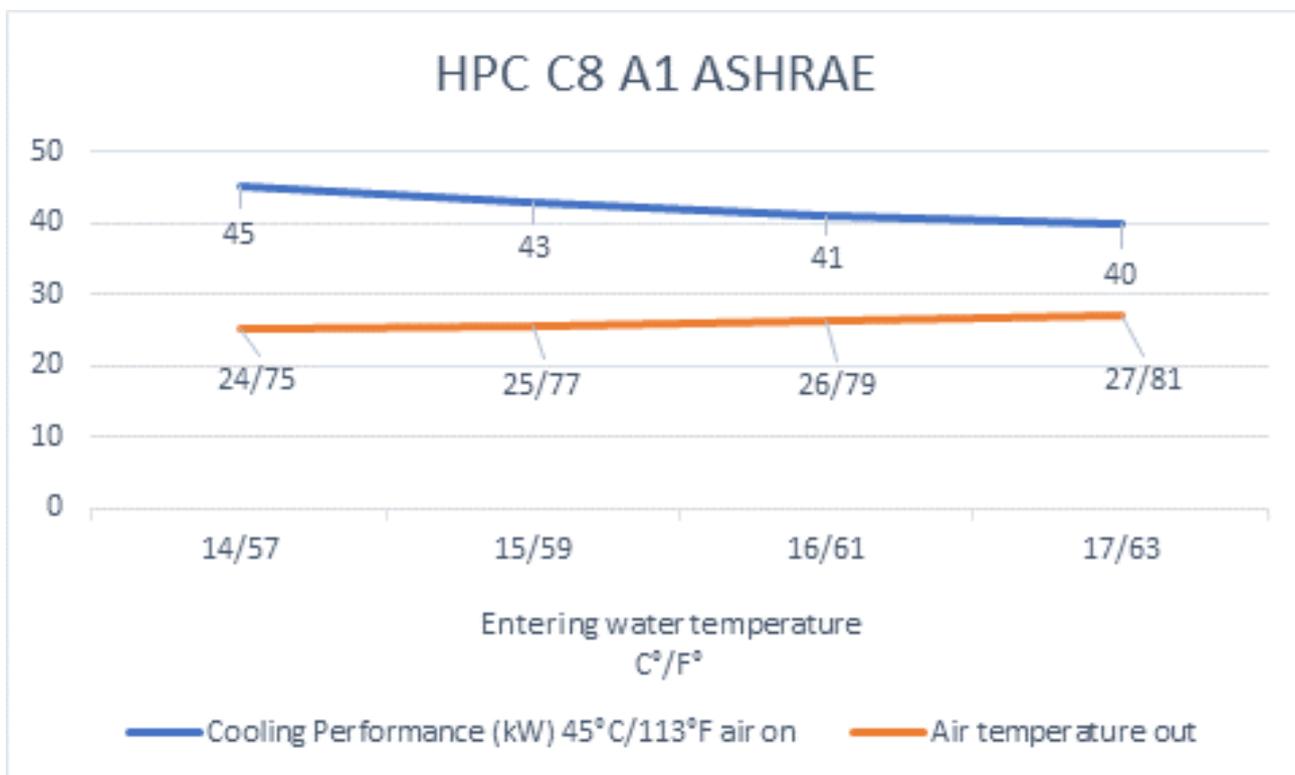
CL20 C8 Rear Door Coolers

General specification

Maximum capacity	45kW
EER at maximum capacity	36.3
Height	42U and 48U
Width	23.62"/600mm 29.53"/750mm 31.50"/800mm
<i>Other sizes available on request</i>	
Weight - dry	140lb/63.5kg
Weight - wet	168lb/76.3kg
Volume capacity	1.32 US gallons/5 litres
Power requirement	See page 12

CL20 C8 Rear Door Cooler—Liquid cooled

The C8 is capable of the capacity you see in the graph below. This is based on a flow and return differential of 6°C or 10.8°F utilising water as our standard medium.



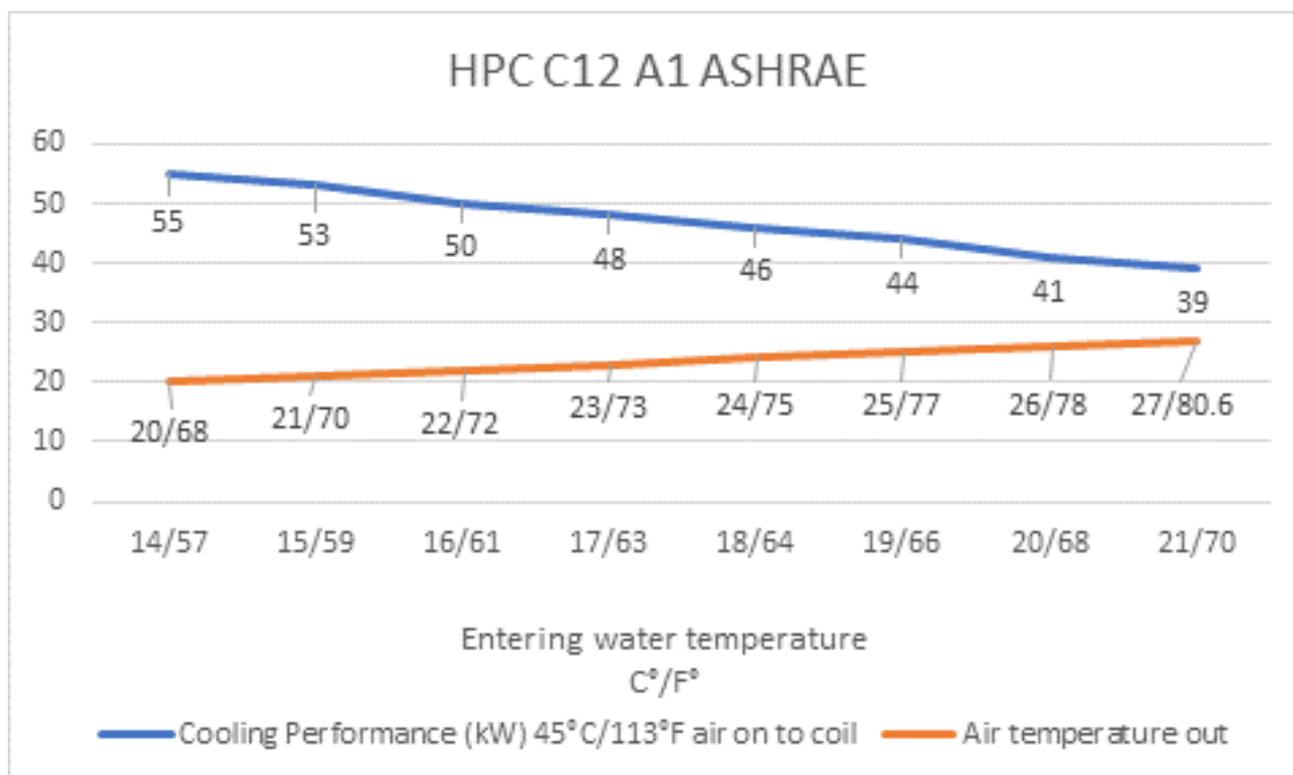
CL20 C12 Rear Door Coolers

General specification

Maximum Capacity	55kW
EER at maximum capacity	44.3
Height	42U and 48U
Width	23.62"/600mm 29.53"/750mm 31.50"/800mm
<i>Other sizes available on request</i>	
Weight - dry	145lb/65.8kg
Weight - wet	172lb/78.0kg
Volume capacity	1.95 US gallons/7.4 litres
Power requirement	See page 12

CL20 C12 Rear Door Cooler—Liquid cooled

The C12 is capable of the capacity you see in the graph below. This is based on a flow and return differential of 6°C or 10.8°F utilising water as our standard medium.



Technical information

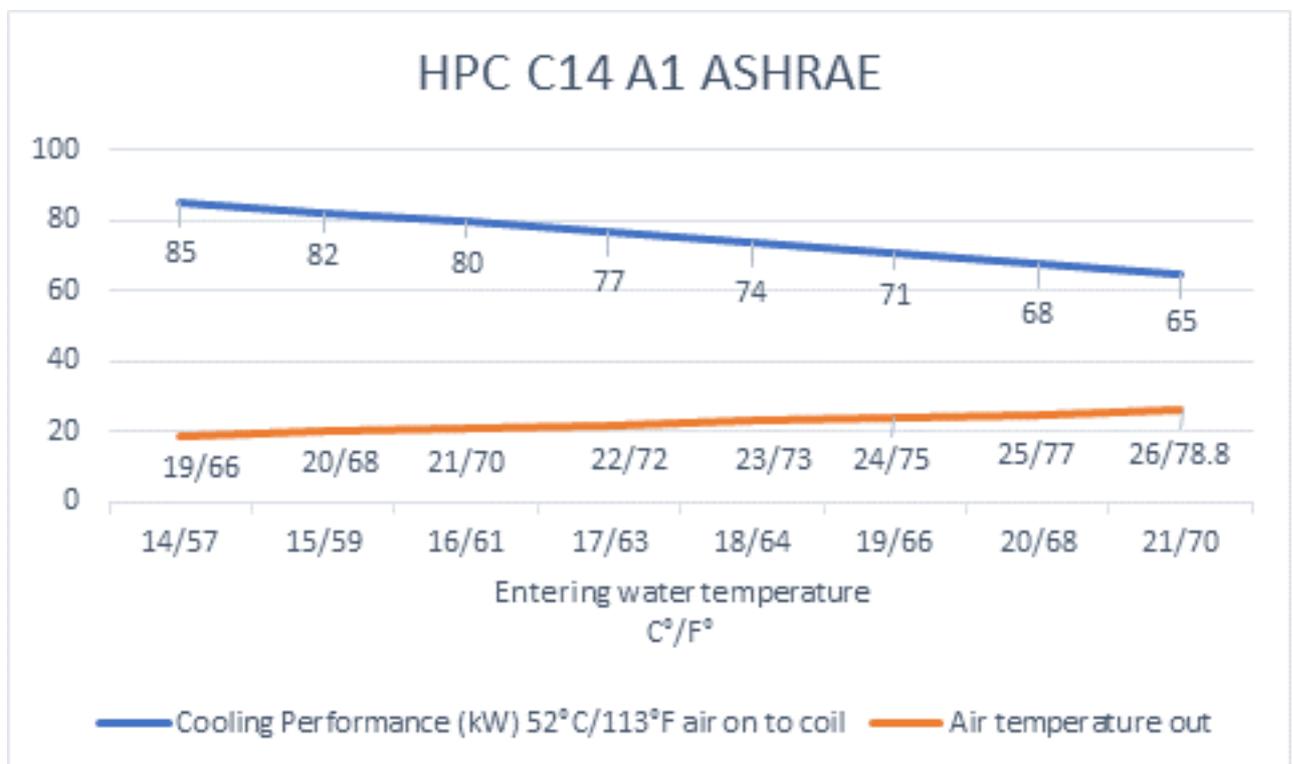
CL20 C14 Rear Door Coolers

General specification

Maximum capacity	85kW
EER at maximum capacity	57.5
Height	42U and 48U
Width	23.62"/600mm 29.53"/750mm 31.50"/800mm
<i>Other sizes available on request</i>	
Weight - dry	155lb/70.3kg
Weight - wet	188lb/85.3kg
Volume capacity	2.90 US gallons/10.96 litres
Power requirement	See page 12

CL20 C14 Rear Door Cooler —Liquid cooled

The C14 is capable of the capacity you see in the graph below. This is based on a flow and return differential of 6°C or 10.8°F utilising water as our standard medium.



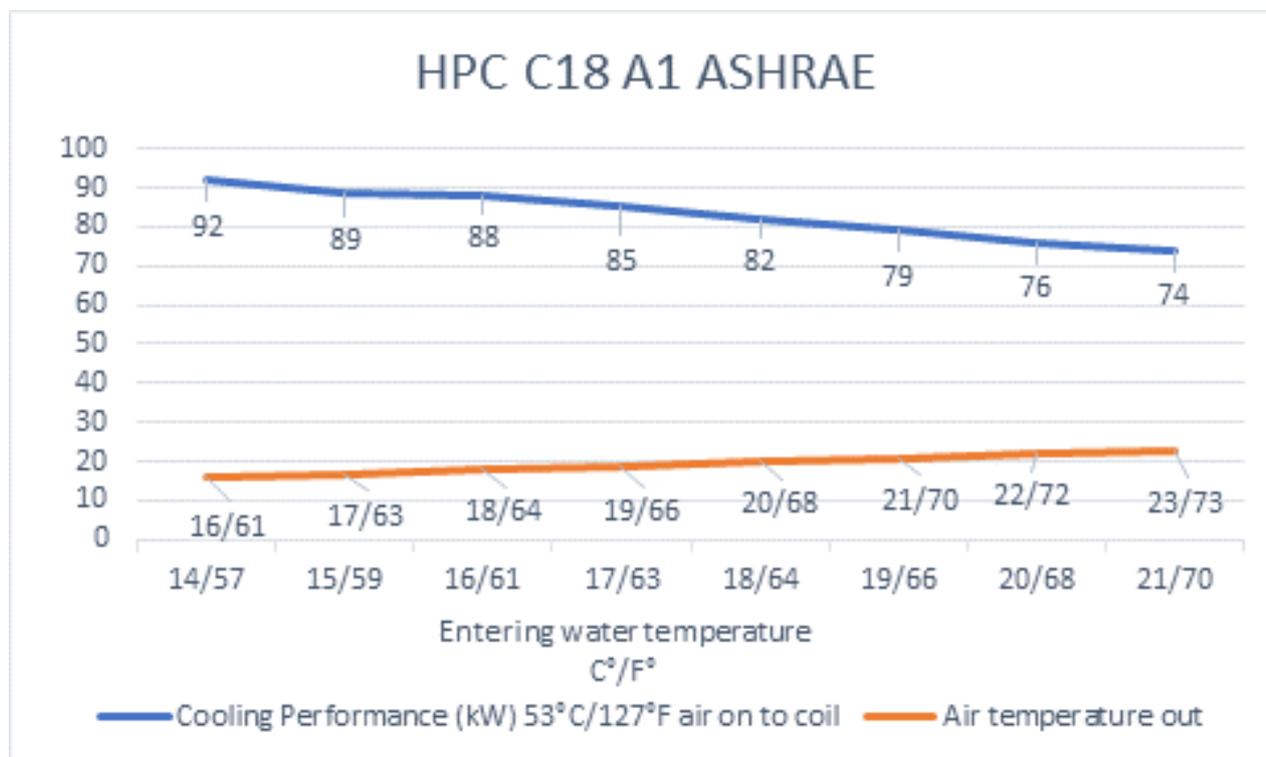
CL20 C18 Rear Door Coolers

General specification

Maximum capacity	92kW
EER at maximum capacity	62.2
Height	48U and 52U
Width	29.53"/750mm 31.50"/800mm
<i>Other sizes available on request</i>	
Weight - dry	176lb/79.8kg
Weight - wet	201lb/91.17kg
Volume capacity	2.41US gallons/10.96 litres
Power requirement	See page 12

CL20 C18 Rear Door Cooler —Liquid cooled

The C18 for use in 48U 29.5"/750mm 31.5"/800mm coolers is capable of the capacity you see in the graph below. This is based on a flow and return differential of 6°C or 10.8°F utilising water as our standard medium.



Power requirements for five fan doors

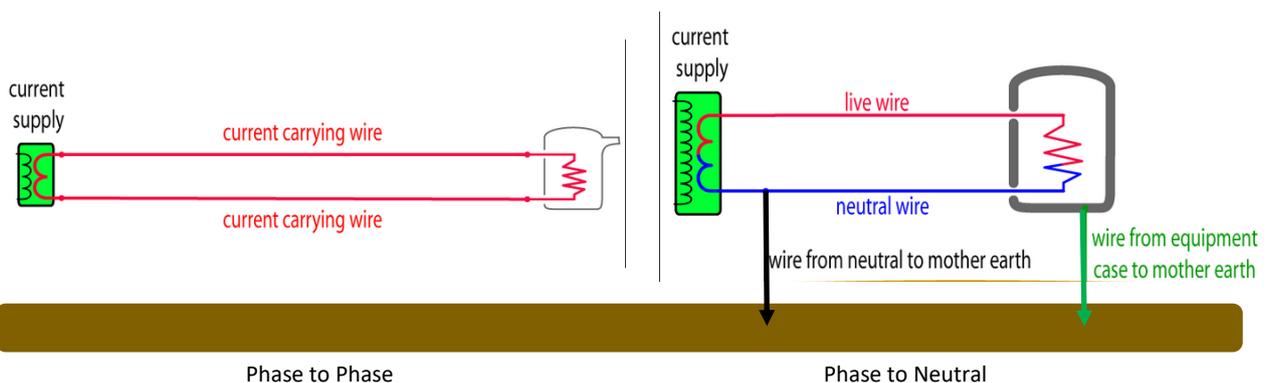
The ColdLogik rear door cooler is AC powered in the range 196-253Vac/50-60Hz/12.5A (max) and can be wired Phase to Neutral or Phase to Phase thus covering most configurations. Phase to Neutral or Phase to Phase must be specified at the time of ordering. Two supplies can be accommodated; the system has internal switchover and alarm functions.

A separate protective earth connection must be provided. The site must provide an appropriately rated single pole disconnect per door (either MCB or Contactor) for Phase to Neutral systems, and a dual pole disconnect for Phase to Phase systems so that both break simultaneously. Maximum rating 20A.

ColdLogik Rear Door Cooler Current Draw Readings

Five fan coolers @ 208V 60Hz /230V 50Hz

Fan Speed %/cfm	Power for five fans	Power for five fans
	@ 208V 60Hz	@ 230V 50Hz
25%/1045cfm	1.6A/333w	1.5A/302w
30%/1255cfm	1.9A/390w	1.7A/352w
35%/1463cfm	2A/410w	1.8A/370w
40%/1672cfm	2.2A/440w	2.0A/347w
45%/1881cfm	2.3A/480w	2.1A/434w
50%/2090cfm	2.5A/510w	2.3A/461w
60%/2509cfm	2.8A/570w	2.6A/515w
70%/2927cfm	3.3A/680w	3.0A/614w
80%/3345cfm	4A/829w	3.6A/750w
90%/3763cfm	4.7A/976w	4.4A/882w
100%/4181cfm	5.1A/1269w	4.7A/1147w



Power requirements for six fan doors

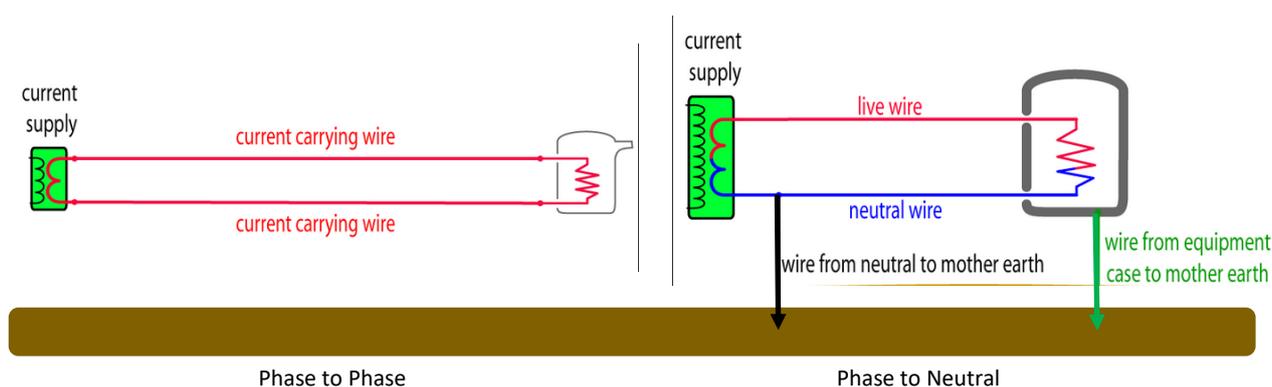
The ColdLogik rear door cooler is AC powered in the range 196-253Vac/50-60Hz/12.5A (max) and can be wired Phase to Neutral or Phase to Phase thus covering most configurations. Phase to Neutral or Phase to Phase must be specified at the time of ordering. Two supplies can be accommodated; the system has internal switchover and alarm functions.

A separate protective earth connection must be provided. The site must provide an appropriately rated single pole disconnect per door (either MCB or Contactor) for Phase to Neutral systems, and a dual pole disconnect for Phase to Phase systems so that both break simultaneously. Maximum rating 20A.

ColdLogik Rear Door Cooler Current Draw Readings

six fan coolers @ 208V 60Hz/230V 50Hz

Fan Speed %/cfm	Power for six fans @ 208V 60Hz	Power for six fans @ 230V 50Hz
25%/1255cfm	1.6A/333w	1.5A/302w
30%/1505cfm	1.8A/375w	1.6A/339w
35%/1756cfm	2A/416w	1.8A/376w
40%/2007cfm	2.3A/478w	2.1A/432w
45%/2258cfm	2.6A/541w	2.4A/489w
50%/2509cfm	2.9A/603w	2.7A/545w
60%/3011cfm	3.5A/728w	3.2A/658w
70%/3513cfm	4.3A/895w	3.9A/804w
80%/4015cfm	5.1A/1061w	4.7A/959w
90%/4516cfm	6.1A/1269w	5.5A/1147w
100%/5018cfm	7.1A/1477w	6.4A/1335w



CL20 Smart Passive

Why 'Smart Passive'?

As a worldwide community we all have a finite resource with which to work. At USystems we hold sustainability at the heart of our design philosophy.

The CL20 Smart Passive is designed with sustainability in mind, allowing you to plan for the future without discarding a proven energy efficient solution of today. This has been achieved by providing a unique upgrade path from a self cooling passive RDC to a proactively cooled RDC able to fully control both the environment within the cabinet and the room temperature itself.

Anticipating the next generation computer chip sets, heat load densities are set to rise in the next few years—will have major ramifications on the decisions you make today in designing your data centre with an upgrade path allowing for such higher density equipment.

The Smart Passive enables the installation of a passive solution now, without it becoming redundant once there is such a change in new active equipment.

The CL20 Smart Passive is available as a complete cabinet solution and is also compatible with the ColdLogik Adaptor frame enabling existing OEM or populated cabinets to be retrofitted on site without disruption.



Smart Passive

From passive to active

The upgrade path has been designed to enable a smooth transition from passive to active. This is achieved by removing the passive front grille and replacing with the active module which would initially contain 3 variable speed EC fans which ramp up and down together in order to provide a reliable airflow across all sections of the cabinet

Thermistors are positioned within the cabinet which are controlled by the introduction of the ColdLogik Management System and the system is ready to run.

At this point there is also the option to add in an additional two way valve to more accurately control the water flow and therefore the returning air to the room ambient, the CMS has capacity for the specific valve operation included as standard. The addition of such a 2 way valve can greatly increase the efficiency of inverter driven pumps on site by reducing the volumetric load required through the coil and still maintaining the desired room ambient temperature.

The further two upgrades consist of single fan upgrades. This allows for an improved duty that is available from the door whilst still maintaining the room temperature required. When these additional fans are added to also become part of the centrally controlled bank and will respond with all other fans to ensure smooth performance and maximum efficiency.



Smart Passive with interface frame

Upgrade path

Step 1



Remove vent panel and top cover

Step 2



Fit fan panel, ColdLogik Management System, fan panels and fan cover

PROS OF UPGRADABLE PASSIVE RDC	
	Zero running costs – no electrical components
	Lower capital cost – No fans, controller or monitoring
	Easy Installation – requires only water connection and hanging
	Silent running – no external fans
	The ColdLogik CL20 Smart Passive uniquely has a modular upgrade path for a ‘pay as you grow’ ethos to counter costly and wasteful ‘rip out and replace’ upgrades.
CONS OF NON UPGRADABLE PASSIVE RDC	
	Uncontrolled room environment – Without a controller, fans and monitoring, passive RDC’s cannot precisely control the local and general room temperature, not without additional costly cooling equipment, such as CRAC units.
	Passive RDC’s do not support energy efficient servers – As passive RDC’s rely upon on the air pressure and volume generated by the active equipment fans, only aggressive powerful server fans can generate the necessary air pressure and volume to meet the higher duty requirements.
	Undetected hot-spots – Passive RDC’s do not have monitoring capability, therefore hotspots can go undetected, increasing the likelihood of product downtime, software glitches and hardware failure.
	Life before ‘Smart Passive’ – In the event that the incumbent passive RDC’s prove to be insufficient for needs of the datacentre, then the only recourse was to replace the passive RDC with an active RDC or change the adopted cooling philosophy and replace with a new design, which can be costly and disruptive to operations.

Passive performance data 600w

Basic 42Ux600 Smart Passive unit performance table based on active IT equipment in the cabinet producing the following assumptive parameters of varying air flow and water temperatures entering and leaving the door

Entering and leaving water temp	14°C-(57°F)	14°C-(57°F)	14°C-(57°F)	14°C-(57°F)	14°C-(57°F)	14°C-(57°F)
	20°C-(68°F)	20°C-(68°F)	20°C-(68°F)	20°C-(68°F)	20°C-(68°F)	20°C-(68°F)
Max Duty	9kW	16kW	23kW	29kW	34kW	39kW
Airflow	1000m ³ h	2000m ³ h	3000m ³ h	4000m ³ h	5000m ³ h	6000m ³ h
Air pressure drop across coil	1.9pa	6.1pa	11.8pa	19.0pa	27.4pa	37.0pa
Fluid flow	1.3m ³ h (5.6US GPM)	2.4m ³ h (10.4US GPM)	3.4m ³ h (14.6US GPM)	4.2m ³ h (18.1US GPM)	5.0m ³ h (21.5US GPM)	5.7m ³ h (24.5US GPM)
Fluid pressure drop	0.89psi	2.54psi	4.57psi	6.89psi	9.13psi	11.61psi

Basic 48Ux600 Smart Passive unit performance table based on active IT equipment in the cabinet producing the following assumptive parameters of varying air flow and water temperatures entering and leaving the door

Entering and leaving water temp	14°C-(57°F)	14°C-(57°F)	14°C-(57°F)	14°C-(57°F)	14°C-(57°F)	14°C-(57°F)
	20°C-(68°F)	20°C-(68°F)	20°C-(68°F)	20°C-(68°F)	20°C-(68°F)	20°C-(68°F)
Max Duty	9kW	17kW	24kW	30kW	36kW	41kW
Airflow	1000m ³ h	2000m ³ h	3000m ³ h	4000m ³ h	5000m ³ h	6000m ³ h
Air pressure drop across coil	1.6pa	4.9pa	9.5pa	15.2pa	22.0pa	29.7pa
Fluid flow	1.3m ³ h (5.6US GPM)	2.4m ³ h (10.4US GPM)	3.4m ³ h (14.6US GPM)	4.4m ³ h (18.2US GPM)	5.2m ³ h (22.36US GPM)	6.0m ³ h (25.8US GPM)
Fluid pressure drop	0.98psi	2.91psi	5.3psi	7.91psi	10.77psi	13.73psi



Passive performance data 800w

Basic 42Ux800 Smart Passive unit performance table based on active IT equipment in the cabinet producing the following assumptive parameters of varying air flow and water temperatures entering and leaving the door

Entering and leaving water temp	14°C-(57°F) 20°C-(68°F)	14°C-(57°F) 20°C-(68°F)	14°C-(57°F) 20°C-(68°F)	14°C-(57°F) 20°C-(68°F)	14°C-(57°F) 20°C-(68°F)	14°C-(57°F) 20°C-(68°F)
Max Duty	9kW	17kW	24kW	31kW	37kW	43kW
Airflow	1000m ³ h	2000m ³ h	3000m ³ h	4000m ³ h	5000m ³ h	6000m ³ h
Air pressure drop across coil	1.3pa	3.9pa	7.7pa	12.3pa	17.8pa	24pa
Fluid flow	1.3m ³ h (5.6US GPM)	2.4m ³ h (10.4US GPM)	3.5m ³ h (15.1US GPM)	4.5m ³ h (19.4US GPM)	5.4m ³ h (23.2US GPM)	6.2m ³ h (26.7US GPM)
Fluid pressure drop	1.2 psi	3.4psi	6.3psi	9.43psi	12.97psi	16.66psi

Basic 48Ux800 Smart Passive unit performance table based on active IT equipment in the cabinet producing the following assumptive parameters of varying air flow and water temperatures entering and leaving the door

Entering and leaving water temp	14°C-(57°F) 20°C-(68°F)	14°C-(57°F) 20°C-(68°F)	14°C-(57°F) 20°C-(68°F)	14°C-(57°F) 20°C-(68°F)	14°C-(57°F) 20°C-(68°F)	14°C-(57°F) 20°C-(68°F)
Max Duty	9kW	17kW	25kW	32kW	39kW	45kW
Airflow	1000m ³ h	2000m ³ h	3000m ³ h	4000m ³ h	5000m ³ h	6000m ³ h
Air pressure drop across coil	1pa	3.2pa	6.2pa	9.9pa	14.3pa	19.3pa
Fluid flow	1.3m ³ h (5.6US GPM)	2.5m ³ h (10.75US GPM)	3.6m ³ h (15.5US GPM)	4.6m ³ h (19.8US GPM)	5.6m ³ h (24US GPM)	6.4m ³ h (27.5US GPM)
Fluid pressure drop	1.27psi	3.8psi	7.14psi	10.93psi	15.13psi	19.59psi

Under the right circumstances and with the correct active equipment in the cabinet, CL20 Smart Passive rear door coolers can make a tremendous difference to an individual sites efficiency - more commonly referred to as 'PUE'. Given this correct design environment in some Data Centres passive doors can make a real difference to the operation.

Active performance data 600w

42U 600w Active	Basic unit plus Upgrade One	Basic unit plus Upgrade Two	Complete system upgrade	up-
Backward curved centrifugal IP44 rated EC fans	3 fans	4 fans	5 fans	
Maximum Duty	30kW	37kW	44kW	
Fluid Flow	4.3m ³ h /19.33 USGPM	5.4m ³ h /23.77 USGPM	6.3m ³ h /27.9 USGPM	
Pressure drop	7.11psi	10.59psi	14.10psi	
Water Supply	14c/57f	14c/57f	14c/57f	
Max air flow	4200m ³ h /2472cfm	5600m ³ h/3296cfm	7000m ³ h/4120cfm	
Start up current	3.5A	5.5A	6A	
Max running current	2.9A	4A	5.1A	

48U 600w Active	Basic unit plus Upgrade One	Basic unit plus Upgrade Two	Complete system upgrade	up-
Backward curved centrifugal IP44 rated EC fans	3 fans	4 fans	5 fans	
Maximum Duty	31.8kW	39kW	46kW	
Fluid Flow	4.6m ³ h /20.5 USGPM	5.7m ³ h /24.9 USGPM	6.6m ³ h /29.1 USGPM	
Pressure drop	9.43psi	14.07psi	18.86psi	
Water Supply	14c/57f	14c/57f	14c/57f	
Max air flow	4200m ³ h /2472cfm	5600m ³ h/3296cfm	7000m ³ h/4120cfm	
Start up current	3.5A	5.5A	6A	
Max running current	2.9A	4A	5.1A	

Power Consumption—all active models

25%	189w	237w	285w
50%	325w	417w	510w
75%	512w	667w	822w
100%	761w	1000w	1239w

Active performance data 800w

42U 800w Active	Basic unit plus Upgrade One	Basic unit plus Upgrade Two	Complete system upgrade
Backward curved centrifugal IP44 rated EC fans	3 fans	4 fans	5 fans
Maximum Duty	32kW	42kW	50kW
Fluid Flow	4.6m ³ h /20.5 USGPM	5.9m ³ h /25.7 USGPM	7.2m ³ h /31.5 USGPM
Pressure drop	11.22psi	16.82psi	23.65psi
Water Supply	14c/57f	14c/57f	14c/57f
Max air flow	4200m ³ h /2472cfm	5600m ³ h/3296cfm	7000m ³ h/4120cfm
Start up current	3.5A	5.5A	6A
Max running current	2.9A	4A	5.1A

48U 800w Active	Basic unit plus Upgrade One	Basic unit plus Upgrade Two	Complete system upgrade
Backward curved centrifugal IP44 rated EC fans	3 fans	4 fans	5 fans
Maximum Duty	33kW	43kW	50.5kW
Fluid Flow	4.9m ³ h /21.7 USGPM	6.1m ³ h /26.5 USGPM	7.3m ³ h /31.9 USGPM
Pressure drop	11.74psi	17.77psi	24.14psi
Water Supply	14c/57f	14c/57f	14c/57f
Max air flow	4200m ³ h /2472cfm	5600m ³ h/3296cfm	7000m ³ h/4120cfm
Start up current	3.5A	5.5A	6A
Max running current	2.9A	4A	5.1A

An active CL20 door is up to 90% more efficient operationally than a traditional CRAC system

Where the CL20 Smart Passive really excels is the flexibility the upgrade path can provide in a typical data centre environment. Through a variety of methods, whether through a **'Pay as you grow'** methodology which would allow you to incrementally upgrade the door over periods of time in reaction to increases in duty, or though an efficiency drive to see if the passive will suffice before upgrading should the need arise - ensuring the highest possible efficiency.

CL20 Smart Passive Dimensions

ColdLogik CL20 Smart Passive door 600w

Height	42U	48U
Depth	6.18"/157mm	6.18"/157mm
Width	23.6"/600mm	23.6"/600mm
Weight (dry)	109.12lb/49.6kg	124.39lb/56.54kg
Weight (wet)	120.1lb/54.6kg	136.92lb/62.24kg

ColdLogik CL20 Smart Passive active upgrade 600w

Height	42U	48U
Depth	12.24"/311mm	12.24"/311mm
Width	23.6"/600mm	23.6"/600mm
Weight (dry)	164.12lb/74.6kg	187.09lb/85.05kg
Weight (wet)	175.13kg/79.6kg	199.65lb/90.75kg
Pipe Connections	1"/25mm	1"/25mm
Volume capacity	1.29 US gallons/5 L	1.47 US gallons/5.7 L

ColdLogik CL20 Smart Passive door 800w

Height	42U	48U
Depth	6.18"/157mm	6.18"/157mm
Width	31.5"/800mm	31.5"/800mm
Weight (dry)	145.51lb/66.14kg	165.88lb/75.4kg
Weight (wet)	160.2lb/72.8kg	182.6lb/83kg

ColdLogik CL20 Smart Passive active upgrade 800w

Height	42U	48U
Depth	12.24"/311mm	12.24"/311mm
Width	31.5"/800mm	31.5"/800mm
Weight (dry)	211.50lb/96.14kg	241.12lb/109kg
Weight (wet)	226.02lb/102.74kg	256.52lb/116.60kg
Pipe Connections	1"/25mm	1"/25mm
Volume capacity	1.72 US gallons/6.7L	1.96 US gallons/7.6 L



Smart Passive



Smart Passive—upgrade

CL20 Interface frame

One of the biggest advantages of the CL20 Rear Door Cooler is its ability to attach to a USystems cabinet or another manufacturer's cabinet via an interface frame.

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.

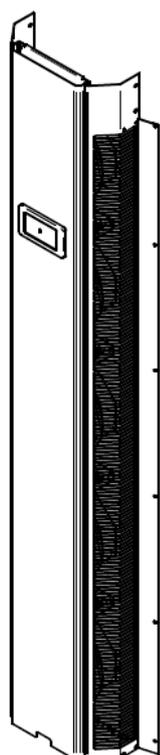
By working in harmony with the incumbent air conditioning system, many of the benefits of the **ColdLogik** system can be realised:

- 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.

NB. Standard recognisable manufacturer's racks can be accommodated without feet, castors or plinths. If these are used, a CAD step file would be required of the rack to enable us to design a made-to-order interface frame.



The CL20 interface frame fitted to a data cabinet



Standard sizes

42U x 600/750/800 (23.62"/29.53"/31.50")

48U x 600/750/800 (23.62"/29.53"/31.50")

Other non standard sizes are available

The CL20 ColdLogik Rear Door Cooler



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 chiller the result is a consistent delivery of cooled air into the data centre, with no operator intervention.

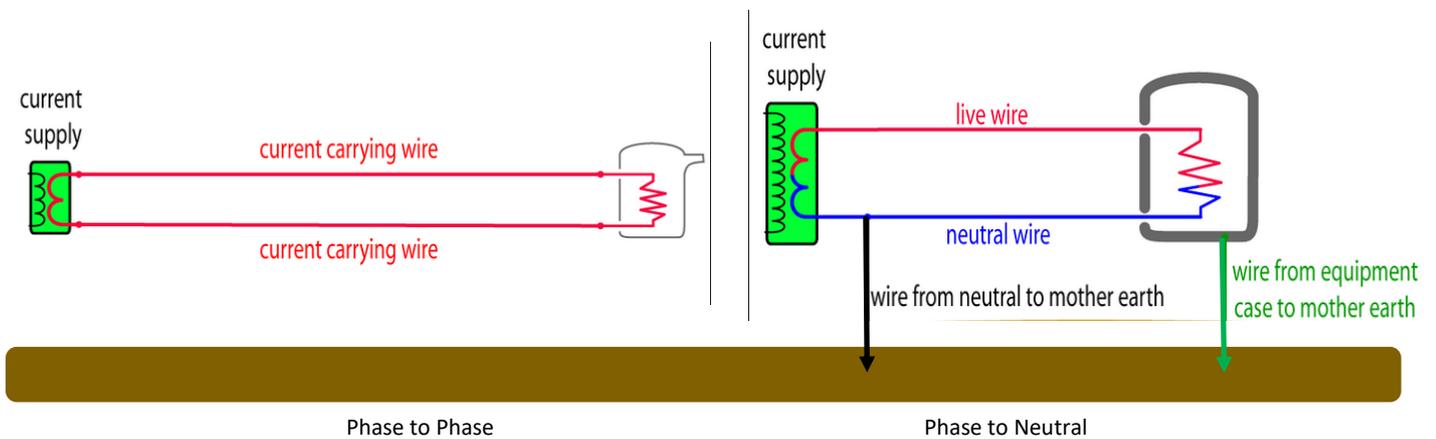
The whole process can also be overseen and controlled at individual cabinet level, room level and remotely via any of the industry standard communication protocols.

The CMS is built into the cooler. 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)

The ColdLogik Rear Door Cooler is AC powered in the range 196-253Vac/50-60Hz/12.5A (max) and can be wired Phase to Neutral or Phase to Phase thus covering most configurations. Phase to Neutral or Phase to Phase must be specified at the time of ordering. Dual supply (A&B) is incorporated as standard—the system has internal switchover and alarm functions.



A separate protective earth connection must be provided. The site must provide an appropriately rated single pole disconnect per door (either MCB or Contactor) for Phase to Neutral systems, and a dual pole disconnect for Phase to Phase systems so that both break simultaneously. Maximum rating 20A.

In order to better serve our customers we now offer both of these options on the CMS system.

Please see below a brief and basic explanation on the power scenarios typically found where the CMS box is installed.

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

- Coolant flow control (0 to 10V)
- Integral 24V AC motorised valve supply
- 0 to 10V EC fan control
- Industry standard thresholds and differentials on all user definable parameters
- Valve (coolant) position
- Individual fan monitoring
- Communication protocols Modbus, TCP/IP and RS-485, optional SNMP and BACnet protocols
- Network BMS or volt free contact connections for room monitoring 50+ alarms, including individual fan fail alarm and a common alarm
- Local door alarm indicator – colour change on door logo.
- High and low temperature alarm
- Full alarm log (requires commissioning tool to access and reset).
- User definable time delays on alarm functions
- Automatic dual supply change over
- Power fail alarm on supply change over.

Options:

- Leak detection alarm.
- Chiller regulation based on room values and set point
- Power monitoring
- Processor monitor fail safe
- Local individual cabinet display screen
- System display monitor and log up to 300 CMS via the RMS
- Set up/commissioning tool

ColdLogik Room Management System (RMS)

The ColdLogik solution may be supplied with an optional Room Management System (RMS). The Unit can be fitted in or outside of the DC at the entrance to the data hall for instance, monitoring the operational condition of the DC or any individual connected item.

It is designed to provide 'all' details of the ColdLogik Data Centre cooling, interfacing before the Building Management System, but working with any BMS installed (Modbus, TC/IP protocol).

The RMS uses Modbus over TCP/IP communication to access information from each ColdLogik unit (CMS - ColdLogik Management System – built into each cooler).

The RMS has IP address (Network port), six USB ports and options to upgrade the built-in software with various 'control or logic' options. The unit is "bare" until the ColdLogik installation data is programmed in.

User interface provides:

- A list of all devices including—In row Coolers, Rear Door Coolers, External plant, LPS
- Monitoring & logging of alarms – both active and cleared
- Monitoring of parameter changes including a log of changed details
- Logging of actual system parameters
- Output of history/logged information
- Different alarm priorities with e-mail alarm output
- Remote access via network or independent SIM/router (as an option)
- BMS output Modbus via TCP/IP – BACnet client and BACnet server available as options
- Parameter changes (including alarm reset) via password protected access



The entry level **ColdLogik** RMS monitor.

It can monitor up to 100 devices.

300 device option is also available

The ColdLogik Room Management System (RMS) is the complete and reliable solution for management, monitoring and optimisation of data centre cooling. It may work with a BMS providing more detailed information and allowing greater in-depth management of the ‘white space’ within the Data Hall.

Modbus TCP/IP connection to the ColdLogik coolers as standard.

Secure remote access is also available, as an option, allowing USystems to provide both training and support as required.

A keyboard, mouse and monitor may be attached to the RMS for local access.

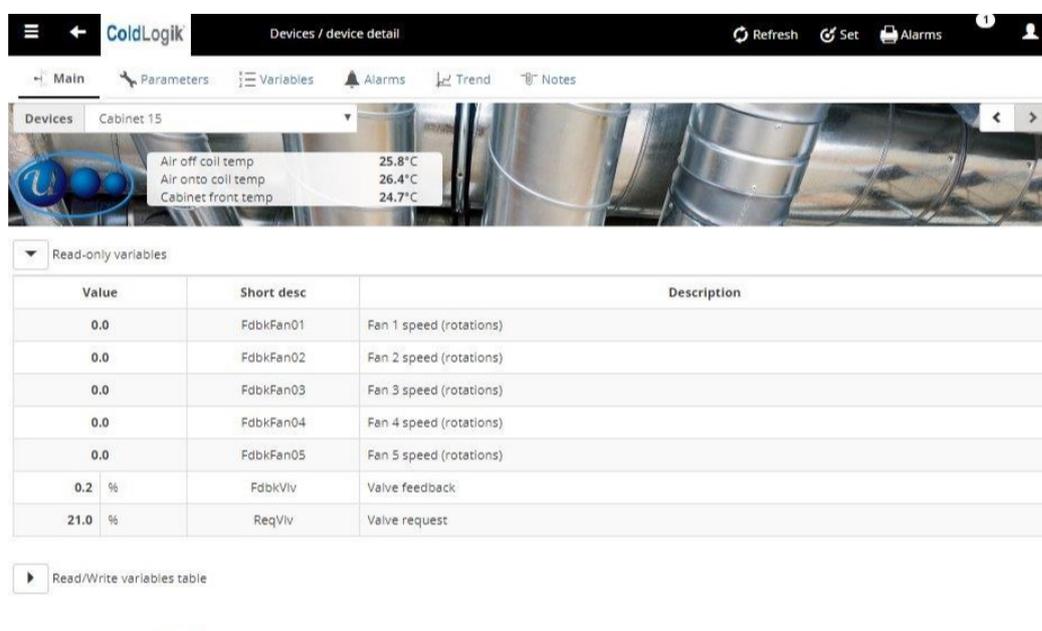
The RMS is password protected and allows remote viewing of monitored conditions on the ColdLogik CMS. Four user types may be configured on the RMS allowing different levels of access to the RMS facilities.

Cooler notifications and alarms may be transmitted by email, SMS or IM as well as being displayed on the RMS. There are also three no-volts relays for connection to legacy BMS systems, if required.

Customised reports may be created with PDF, CSV or HTML output format.

Parameter changes may be broadcast to individual or multiple cabinets and the RMS can reset concluded CMS alarms.

100 and 300 device versions are available.



system management on screen (example)

CL20 options

Cabinets

ColdLogik compliant cabinets

42U or 48U x 23.62"/600mm, 29.53"/750mm, 31.50"/800mm wide, 39.37"/1000mm or 47.24"/1200mm deep. These cabinets have a special cooler direct mounting facility, AirTech V front door, internally locking side panels and front and rear mounting angles.

Colour: light grey RAL 7035.

Other non standard sizes are available

ColdLogik anti-recirculation sealing kits

Standard with ColdLogik compliant cabinets, option for OEM cabinets. Anti-recirculation foam sealing kit – seals gaps in 42U and 48U 23.62"/600mm 29.53"/750mm and 31.50"/800mm wide cabinet to stop recirculation of airflow.

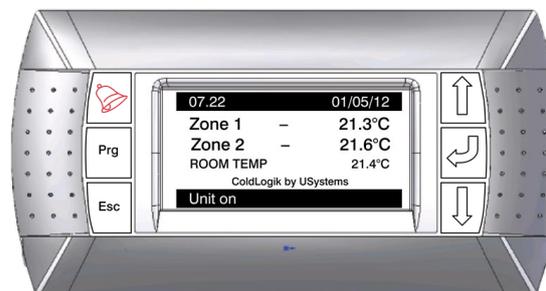
A range of 19" blanking panel options are also available from USystems to assist with directing airflow.



ColdLogik compliant cabinet

ColdLogik miscellaneous electronic options/accessories

- Commissioning (set up) tool with RJ11 lead.
- ColdLogik cooler leak detection
- SNMP protocol communications
- BACnet protocol communications



ColdLogik commissioning tool

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 or negative pressure and are supplied in pairs – one red and one blue in standard lengths of 13'/3.7m.

Hoses are supplied with 1"/25mm male cone to cone fittings with either 1"/25mm tapered BSP or 1"/25mm tapered NPT brass adaptors for pipe work connections.

ColdLogik CL20 general options and accessories

- Commissioning valves (FODRV/DRV)
- Flow control valve C8 and C12 up to 30 kW.*
- Flow control valve C12 and C14 up to 58 kW.*
- Flow control valve C18 up to 92kW.*
- Various size pipe work adaptors
- Custom length hoses (up to 5m max)



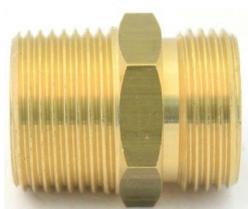
ColdLogik compliant hoses are ultra-pliable.

RDC pipe connections

1.26"/32mm headers with 1.1"/28mm flow and return pipes each with 1"/25mm female cone for hose attachment.



flow and return pipes



female cone

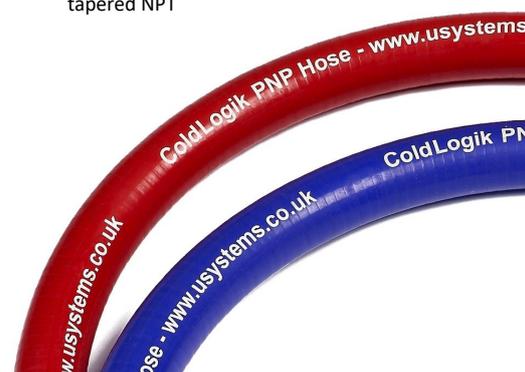


tapered BSP



tapered NPT

* Flow control valves may be standard 2-way ball valve or Electronic Pressure Independent Control (EPIC) with flow reading.



ColdLogik

Climate change—climate control

created by



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