



# OnRak™

## Up to 35kW

- + EER up to 114.5
  - + Up to 88% less power input
  - + Up to 50% saving in energy\*
- \* when integrated with a free-cooling chiller



# Cooling hot spots

## Flexibly, where it matters

The OnRak™ is a resilient rear door heat exchanger, designed to manage high discharge temperatures directly from the server into the aisle space.

In dealing with the heat load closer to the source, the OnRak™ is highly efficient in both power usage and floor space, and is ideal for targeting hot spots in medium to high density environments.

The OnRak™ has a slim configuration which adds only 200mm to the depth of the rack, reducing the cooling space claim whilst providing up to 35kW of cooling. The OnRak™ offers an expandable, adaptable chilled water cooling system that is extremely flexible. In any open aisle architecture it can easily be applied directly to a 42 – 48U rack or supplied with a mating frame to fit any manufacturer's rack.



The OnRak™ adds only 200mm to the depth of the rack

**OnRak™**  
**EER 114.5 (n)**  
**EER 183.0 (n + 1)**

EER Energy Efficiency Ratio



EC fans

**Up to 88% power saving\***

Electrically commutated axial fans give increased performance for reduced power input

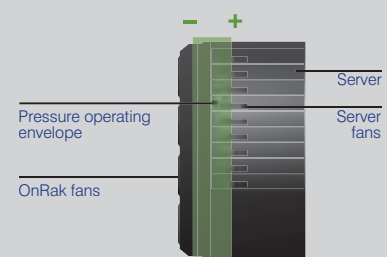
\* compared with a conventional CRAC unit



Aluminium fin heat exchanger

**Maximum heat exchange surface area**

Aluminium fins give a large surface area to maximise heat exchange; an integral coil guard is included



Active pressure management

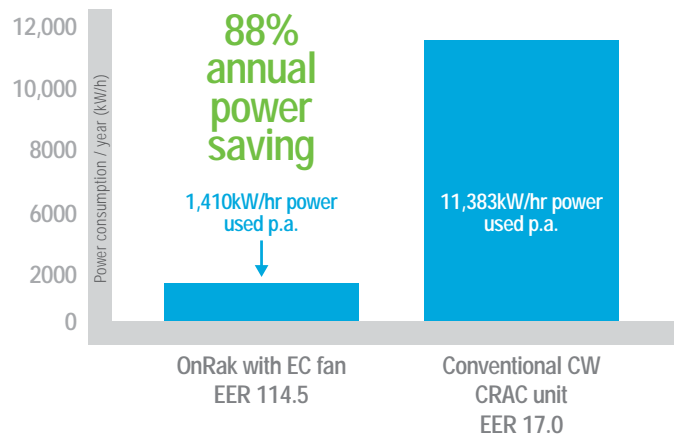
**Maintaining correct pressure**

By managing the pressure at the rear of the rack, the OnRak™ enables the hardware to work within the server design envelope

# OnRak™ with EC fan 88% power saving

The OnRak™ has been engineered with very low air flow resistance and accommodates latest EC axial fan technology. This enables it to modulate fan speed in response to load fluctuations and offer greatly enhanced fan efficiency particularly at part load.

**Saving in power consumption:**  
OnRak™ with EC fan compared with a conventional CW CRAC unit\*



\* Both units running in same application and delivering same amount of cooling performance

## 50% energy savings

when the OnRak™ is integrated with a concurrent free-cooling chiller compared with a conventional chiller

## Reducing operating costs and carbon emissions

The OnRak™ consumes substantially less power than conventional room cooling and offers the same amount of cooling with a smaller unit compared with a conventional CRAC unit. To create an integrated, flexible cooling solution for the data centre, multiple OnRak™ units can be linked with an Airedale large capacity air cooled chiller using sophisticated controls technology. Substantial energy savings and reduction in operating costs are achieved when the OnRak™ is matched with an Airedale free-cooling chiller.

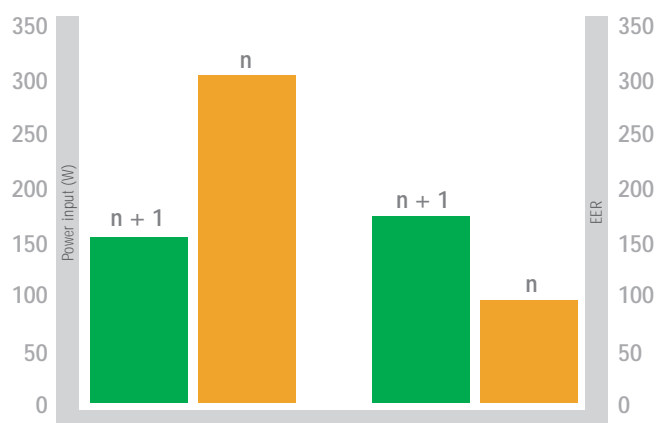
N + 1 fan configuration option

## EER up to 183.0

Optional n+1 fan configuration enhanced by smart control logic and EC fan technology, gives the OnRak™ built-in redundancy and excellent part load efficiencies. During part load operation, the OnRak™ EER increases from 114.5 to 183.0, significantly contributing to reduced operating costs and carbon emissions.



**OnRak™: Comparison of power inputs**  
n (33kW cooling), n+1 (28kW of cooling)\*



\* Performance at nominal conditions of 46°C/15% RH, water temperatures of 14/20

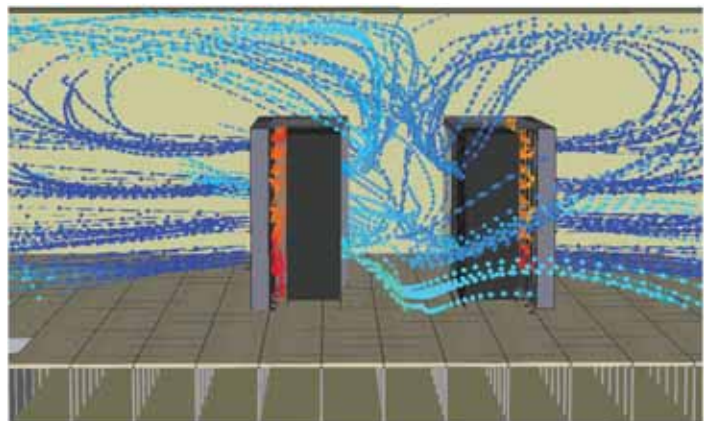
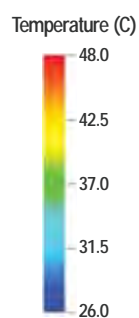


# PUE reduced in high density areas

In high density areas of over 20kW heat load per rack, hot spots abound and space is at a premium. Adding only 200mm to the depth of the server rack, the OnRak™ is perfect for dealing with hot spots.

The variable speed fans within the OnRak™ door respond seamlessly to load fluctuations, pulling hot air directly from the server cabinet across the door's high efficiency heat exchangers. The compact hot aisle is therefore contained between the rack and the OnRak™, which means that the entire data centre is at server inlet temperature creating a more comfortable working environment in the IT space.

The OnRak™ takes full advantage of the high air temperatures from the rack, increasing the efficiency of the cooling system and raising the free-cooling potential when integrated with free-cooling technology.



OnRak™ units each cooling a 20kW heat load; the OnRak™'s compact hot aisle temperature is 43°C and the cold aisle is 27°C



# Using heat to increase free-cooling

## Integration with a free-cooling chiller

The OnRak™ delivers even greater efficiency when integrated with one or more Airedale free-cooling chillers. Free-cooling saves vast amounts of energy, particularly when room temperatures are high. For free-cooling to operate, the temperature difference between the ambient air and hot return water can be as little as 1°C.

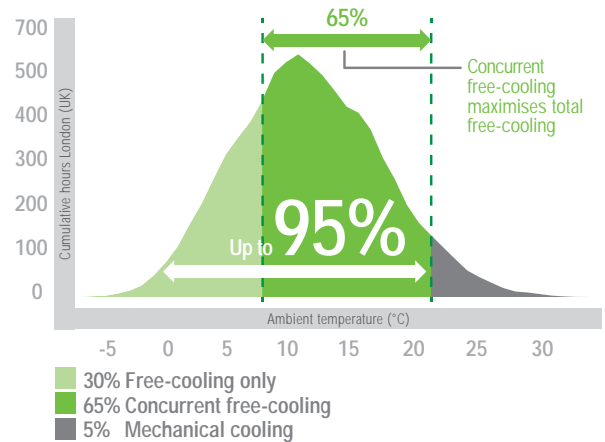
## Concurrent free-cooling

Airedale chillers offer concurrent free-cooling which is active whenever the ambient temperature is below the return water temperature. The system controls constantly monitor the temperature differences and will only switch on the mechanically-driven compressor when extra cooling is needed, introducing concurrent free-cooling - a mixture of free-cooling and mechanical cooling.

## Using heat to increase free-cooling

A higher water supply temperature of up to 17°C raises the free-cooling threshold of all Airedale free-cooling chillers including the more compact variants.

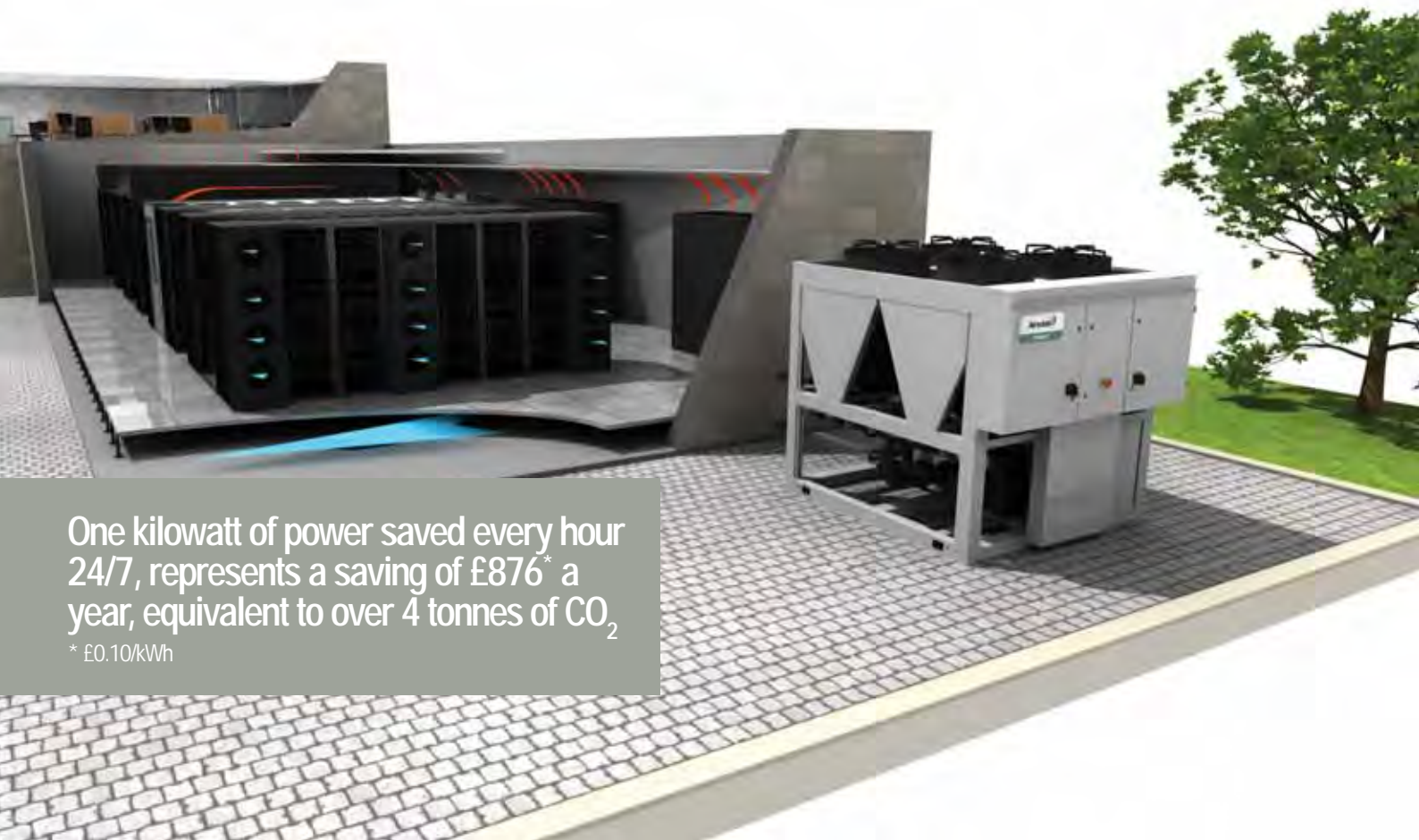
Up to 95% of the year spent in free-cooling



When an Airedale free-cooling chiller is linked with the OnRak™ in a 24/7 data centre with a typical room temperature of 24°C, free-cooling will be active for more than 95% of the year (cumulative hours, London, UK).

One kilowatt of power saved every hour 24/7, represents a saving of £876\* a year, equivalent to over 4 tonnes of CO<sub>2</sub>

\* £0.10/kWh



# Intelligent controls

## Seamlessly managing your system



The control centre of each of our cooling systems is a sophisticated electronic microprocessor with control logic specially developed by Airedale.

The microprocessor uses sensors to send and receive messages to and from active components such as compressors, fans and pumps so they interact with each other, balancing cooling duty, temperature, air flow and pressure to exactly match the application.

By integrating intelligent components, the controller manages and optimises the system's performance and reduces power draw.

### Smart networking solutions:

Fully-programmable via the control panel's user-friendly display, the microprocessor can be linked with all standard BMS protocols to:



Trigger alarm messages



Send alarm/service messages via email or SMS using an interface



Operate time scheduling



Allow adjustment of temperature setpoints

## Integration protocols

Modbus®



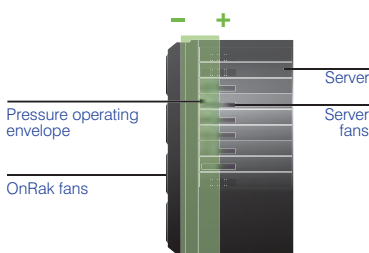
SNMP



### Pressure differential management (option)

By managing pressure at the rear of the server rack, the OnRak™ controls its fans to ensure they mirror the fans cooling the servers inside the rack cabinet. The server fans draw air through the servers to the back of the rack where the OnRak™ fans pull the air from the rack and cool it before discharging it into the room.

Through active pressure differential control, the OnRak™ maintains pressure in the rear of the rack within the server design envelope, whilst still ensuring temperature is controlled.



## 24/7 total confidence

Resilience is designed into OnRak™ units from day one and is managed by advanced controls logic to maintain cooling and give you complete confidence that your data centre is never put at risk.

### N+1 fans

The OnRak™ fans run at upto 75% capacity during normal operation. If one fan fails, the other three fans instantly speed up to 100% if required, to provide the same total amount of cooling and maintain temperature control. They then modulate back when a fourth fan is in operation again. All fans are 'hot swappable' as standard.

### Automatic transfer switch

In the event of a power failure, power supply is switched instantly to an alternative power supply and cooling continues, supporting redundancy power supply specifications in critical data centre builds.

### Hot swappable fan management

Each of the OnRak™ EC axial fans are 'hot swappable' whilst the unit is running. The other three fans speed up to maintain cooling performance.

### Expandable, versatile

Adaptable and versatile in managing hot spots, the OnRak™ can easily be applied directly to a 42 – 48U rack or supplied with a mating frame to fit any manufacturer's rack.

### Additional key features include:

- Door open air flow management
- Static transfer switch for instant power supply changeover\*
- Uninterruptable power supply (UPS)\*

\* available as options

# Data centre management

## Taken to another level

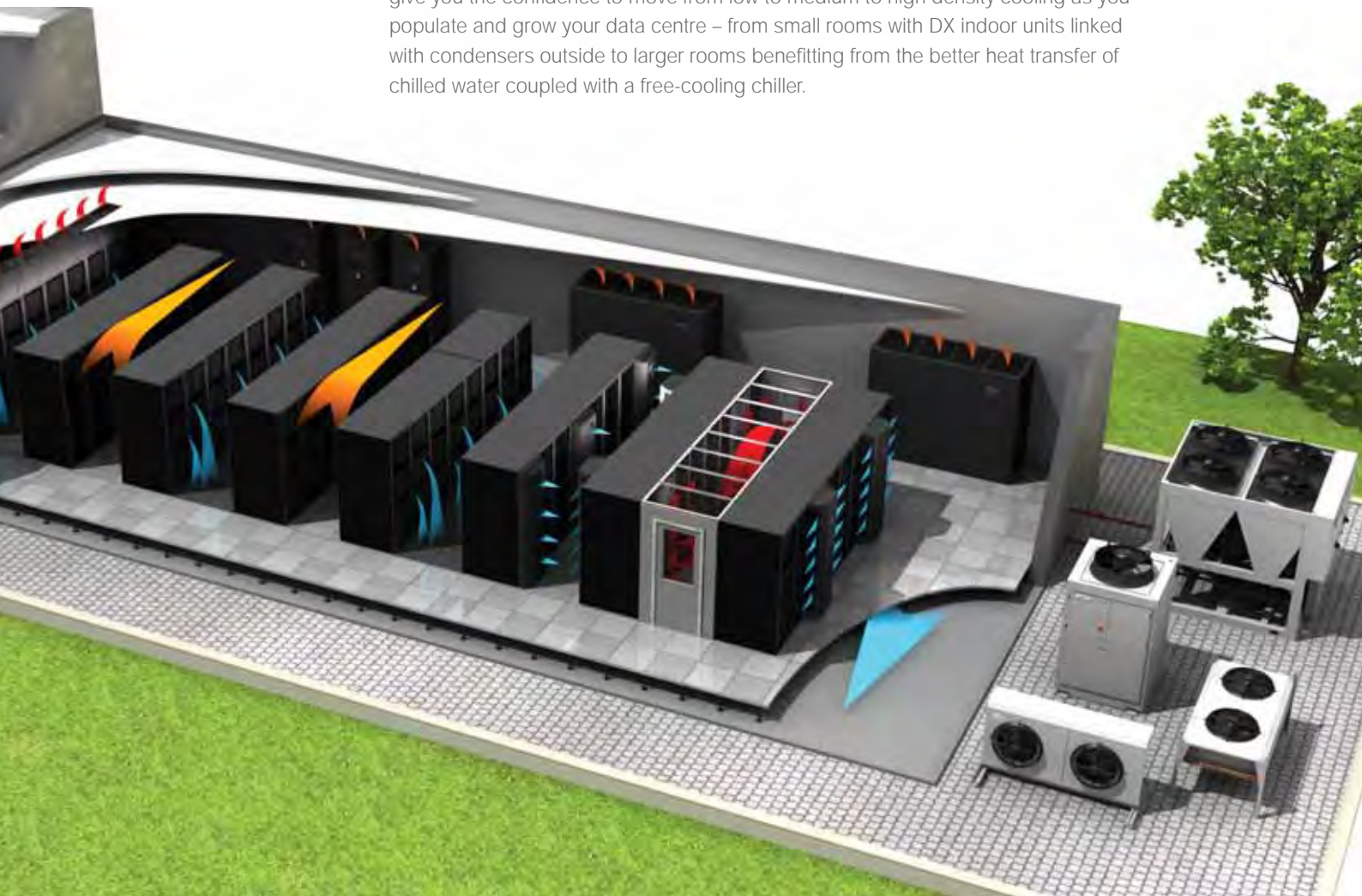
ACIS™ building management system developed by Airedale, enables you to manage smart cooling and other building services, from any manufacturer, in a single, integrated system across multiple sites and communication protocols. ACIS™ sits at the front end of a building system, putting you in control of reducing operating costs.

With the click of a button on a PC, tablet or phone, valuable and intelligent information can be pulled back automatically for remote 24/7 monitoring and maintenance, enhanced system operation and improved decisions.



### Integrated cooling solutions As you grow your data centre

Designed to be stand-alone, Airedale units are even more efficient when integrated together, sharing intelligence and reducing your total lifecycle costs. Our systems give you the confidence to move from low to medium to high density cooling as you populate and grow your data centre – from small rooms with DX indoor units linked with condensers outside to larger rooms benefitting from the better heat transfer of chilled water coupled with a free-cooling chiller.



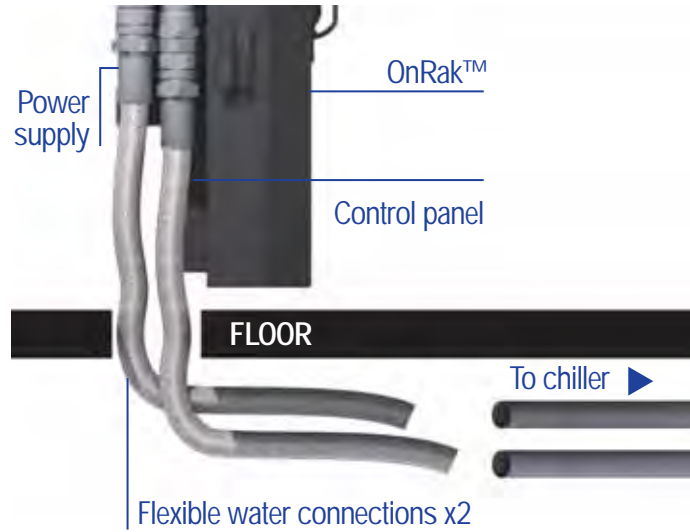


# Specifications at a glance

## Simple connections to customer-specific rack

To apply the OnRak™ to a customer-specific rack with a different width and /or U size, the OnRak™ can be supplied with an appropriate mating frame which is fitted to the rack cabinet. The OnRak™ door is then simply dropped onto the frame via lift-off hinges.

Two flexible, stainless steel braided hoses connect the coil to the chilled water supply. The flexibility of the hoses allows the OnRak™ door to be easily opened for accessing hardware within the server cabinet, without the need to disconnect services or disrupt cooling.



## Mechanical

- Two product configurations: n (100% air volume); optional n+1 (75% air volume)
- Cooling capacity: 35kW (n); 30kW (n+1)
- Flexible water connections maintain cooling when the door is open
- High efficiency aluminium fin heat exchanger and integral coil guard
- Compact 200mm profile minimising space claim

## Energy saving

- EER up to 183.0 (n+1, CW)
- EC axial fans for ultimate efficiency: EER of 114.5 (n); 183.0 (n+1)
- 88% energy saving p.a. with EC fan\*
- Variable speed fans for precise cooling between 3 – 35kW
- Integration with a free-cooling chiller for up to 50% energy savings (option)

\* compared with a conventional CRAC unit

## Resilience

- n + 1 fan configuration for increased efficiency and uptime (option)
- Aisle pressure control managing pressure between the hot and cold aisle (option)
- Automatic transfer switch (option)
- Hot swappable fans allowing fan assembly to be replaced while unit is running
- Door open air flow management
- Static transfer switch for instant power supply changeover (option)
- Uninterruptable power supply (UPS)\*
- Water detection and automatic isolation

## Electrical & Controls

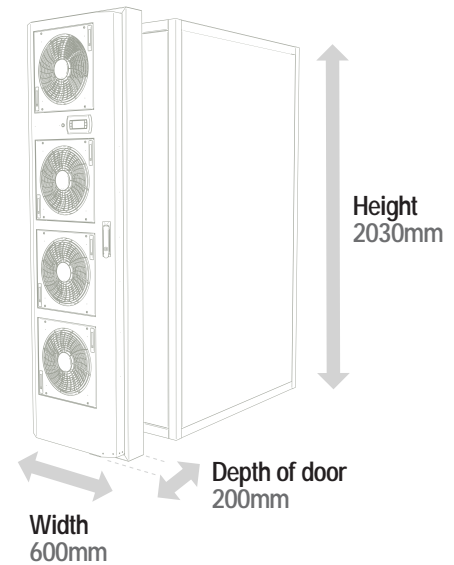
- Advanced control system solutions
- Self-regulating constant flow control simplifies commissioning
- Isolating solenoid valves (option)



## Nomenclature explained

	LOR	60	42U	-	C	033	-	0
LOR	LogiCool OnRak							
60 80	Case width in centimetres							
42U	Unit height in U							
C	Chilled water cooling							
028 033	Nominal cooling capacity in kW							
0	230V / 1Ph / 50Hz / 60Hz							

## OnRak™ standard door size



## OnRak™ technical specifications:

Model no.	Configuration	Cooling cooling (kW) <sup>1</sup>	Power consumption (kW)	EER	No. of fans	Air volume (m³/s)	Operating Weight (kg)
LOR6042U-C033-0	n	34.9	0.306	114.45	4	1.8	75
LOR6042U-C028-0	n + 1	29.4	0.161	183.02	4	1.4	75

1) Nominal cooling capacity based on 14 / 20°C water and 46°C air on temperature  
 Performance data calculated in accordance with BSEN 14511-2011 and Eurovent 6/6

## OnRak™ in action

### University of Leeds data centre

#### The challenge

Higher densities in the high performance computing (HPC) facility of the University of Leeds have created an extra 30kW of load per 42U rack, which could not be cooled by conventional CRAC units since this would involve space, design and cabling issues.

#### Airedale solution

- 3 x OnRak™ 30kW rear door heat exchangers cooling three high density racks in the HPC facility
- 2 x Ultima™ Compact FreeCool 240kW chillers offering free-cooling for up to 65% of the year



## “Meeting our needs for novel cooling

*By meeting our space constraints and slotting into our existing cooling loop, the OnRak™ doors have saved us space in an already densely packed environment. The OnRak™ also gives us the flexibility to fit rear door heat exchangers to legacy or new cabinets from any manufacturer.* //

Dr Jon Summers  
 Senior Lecturer, Institute of Thermofluids, Surfaces and Interfaces, School of Mechanical Engineering, University of Leeds

# Performance tested

## And proven

Quality is assured by our on-site, world-class testing and production facilities and the application of the latest manufacturing techniques and continuous improvement.

Airedale's dedicated test facility is the only purpose-built one of its kind in the UK. Here all our product lines are performance tested for a global market. Accurate test data is produced anywhere from -5°C to +55°C in controlled ambient environments. The climate test chambers include a hemi-anechoic chamber for accurate measurement of product sound data.

Load conditions are simulated right from early development of a new product through to final assembly. Cooling and heating capacities of test units range from 2kW up to 1MW. Customers can witness-test products to verify duty and energy performance to ensure they will meet operational requirements.



*// A factor influencing selection of Airedale was its transparency and facility to witness test. We prefer working with a UK manufacturer who is carrying out product development work and can give us support and reassurance throughout. //*

**Steve Vandyke**  
Head of Technical Services  
National Gallery



### // The InRak™ makes the aisle containment far more efficient

*"The InRak™ is perfectly designed, directing air sideways across the racks, providing even cooling top and bottom. The units communicate with each other to maintain pressure and temperature consistent with the room. ACIS gives us 24/7 control of the operation and peace of mind. //*

**Mike Marchant,**  
Data Centre Manager, EMIS

### // Free-cooling makes sense

*"Our target is to reduce building energy costs by 7% annually which we have achieved over the past two years. Airedale's free-cooling chillers are already contributing to 3% of this annual saving. //*

**Paul Lovegrove**  
General Affairs Assistant Manager  
Epson

### // Energy efficiency was the crucial factor

*"Airedale proved that its free-cooling chiller can save energy and is the right system for us. Anything that improves payback is of interest to the Society. We have also had good service from other Airedale products. //*

**Steven Ward**  
Premises Engineer  
Yorkshire Building Society

### // Iceland Frozen Foods has realised savings of £1.5m to date

*"By using an Airedale Controls solution, over 500 stores have been upgraded to date, with energy costs reduced on average by £3,000 per store p.a.. Across the whole group this equates to a saving of over £1.5m and a CO<sub>2</sub> reduction of 9,890 tonnes. //*

**Graham Ireland**  
Building Services Manager  
Iceland Frozen Foods

# Total support

## Whenever you need it

At Airedale, we don't just manufacture and supply cooling and refrigeration products; we also provide a broad range of supporting services to ensure our customers receive the best possible aftersales care.

With more than 40 years' experience in business critical cooling, investing in an Airedale cooling or refrigeration solution means that you can benefit from our advice, expertise and technical support too. From design and selection, through to commissioning and beyond, we make sure your system reduces your total cost of ownership, whilst providing maximum availability and longevity.

### Service plans

#### Maximising your system's effectiveness 24/7



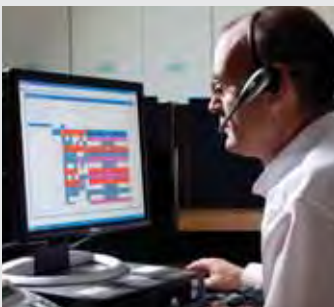
An Airedale service plan provides a planned, preventative maintenance package to sustain the optimum efficiency of your system, enabling the user to see real savings in energy costs and reduced carbon emissions.

With Airedale, you can rest assured that help is never far away. Our 24/7 emergency helpline and call out service is available 365 days of the year, ensuring that we are always on hand to provide expert advice and immediate help, day or night.

A guaranteed emergency response time means that a qualified Airedale engineer will be with you in no time, therefore maximising your system's uptime. Service plans also ensure F Gas compliance and incorporate a full parts and labour warranty for the first 12 months.

For more information visit  
[www.airedale.com](http://www.airedale.com)

\* For customers outside the UK, our international distributors trained by Airedale would be pleased to offer service on Airedale units



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an experienced  
engineer**

Find out how we design our systems to reduce your whole life costs. Our highly experienced engineers are adept at tailoring our systems to suit your requirements.

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**Have complete  
control of your site**

Customers with critical sites can benefit from our remote monitoring facility. Aftersales services include chiller sequencing, network setup and integration as well as a live demonstration and training centre at our head office.



**24/7 support;  
maintenance and  
spares**

Immediate help on hand to keep your critical cooling system operational. Realise the full potential of your system; improve its longevity and efficiency and be F Gas compliant. Avoid downtime with our fast, efficient spares service.



**Develop  
your skills**

Learn more about your cooling system by attending an air conditioning and refrigeration course in our purpose-built training school. Train on high-tech cooling systems and fully operational rigs in our dedicated workshops. Industry recognised courses also available. Email [training@airedale.com](mailto:training@airedale.com) for further details.



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