Airedale
APPLIED THERMAL INNOVATION



AireFlow™

100 - 440kW

Indirect adiabatic cooling for resilient, optimised data centre cooling

+ Delivers all year round free-cooling*
+ Zero air mixing ensures no contaminants enter your data centre
+ No requirement for internal CRAC units maximises your IT footprint
+ Adiabatic system with full UV sterilisation

*Based on 26°C supply temperature and above and a London ambient profile

HFC R410A — HFC R410A
FREE COOL — FREE-COOLING
ADIABATIC
CW — CHILLED WATER
AIR DX — AIR COOLED
INVERTER — INVERTER COMPRESSOR
EC — EC FAN

www.airedale.com

BRITISH MANUFACTURER | ENERGY EFFICIENCY | CONTROLS | SERVICE | TRAINING

Next generation data centre cooling

Unparalleled efficiency

Available in five footprints between 100kW and 440kW, with either wall or roof optimised connections, the AireFlow™ is a versatile free cooling and indirect adiabatic air handling unit (AHU), designed to make your data centre more productive and efficient.

Reduced operating costs & carbon footprint

By selecting the AireFlow™ you are investing in an AHU that will significantly reduce your running costs and carbon footprint. The AireFlow™ is configured to optimise free-cooling potential even in high ambient temperatures.

Using fresh air as the predominant cooling source, the power consumption for the AireFlow™ is reduced dramatically, compared to alternative technologies and traditional chiller solutions.

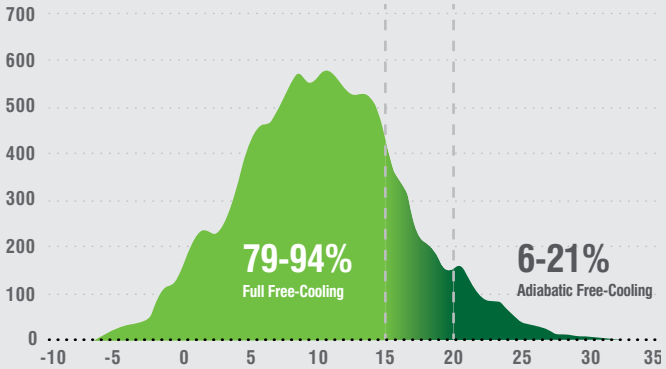
Industry leading PUEs

Overall energy savings by way of full free cooling can lead to systems achieving a PUE below 1.1.

A typical PUE, based on a load of 100kW per unit in London and with a supply air temperature of 27°C, would be 1.035.

100% free-cooling 365 days a year

Based on London, UK ambient temperatures, systems can achieve 100% free-cooling year round (operating inside the ASHRAE recommended envelope)

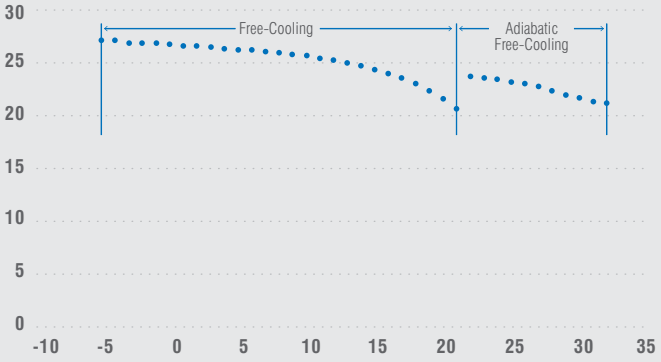


Full free-cooling		Adiabatic free-cooling		Mechanical cooling	
up to 15°C	79%	up to 15°C	21%	up to 15°C	0%
up to 20°C	94%	up to 20°C	6%	up to 20°C	0%

y axis: CUMULATIVE HOURS LONDON (UK)
x axis: DRY BULB TEMPERATURE (°C)

EER up to 27.1

N+1 fan configuration enhanced by smart control logic and EC fan technology, give the AireFlow™ built-in redundancy and excellent part load efficiencies



EER up to 27.1

EER

y axis: EER
x axis: DRY BULB TEMPERATURE (°C)

*based on a 100kW unit

Resilient, powerful indirect adiabatic cooling

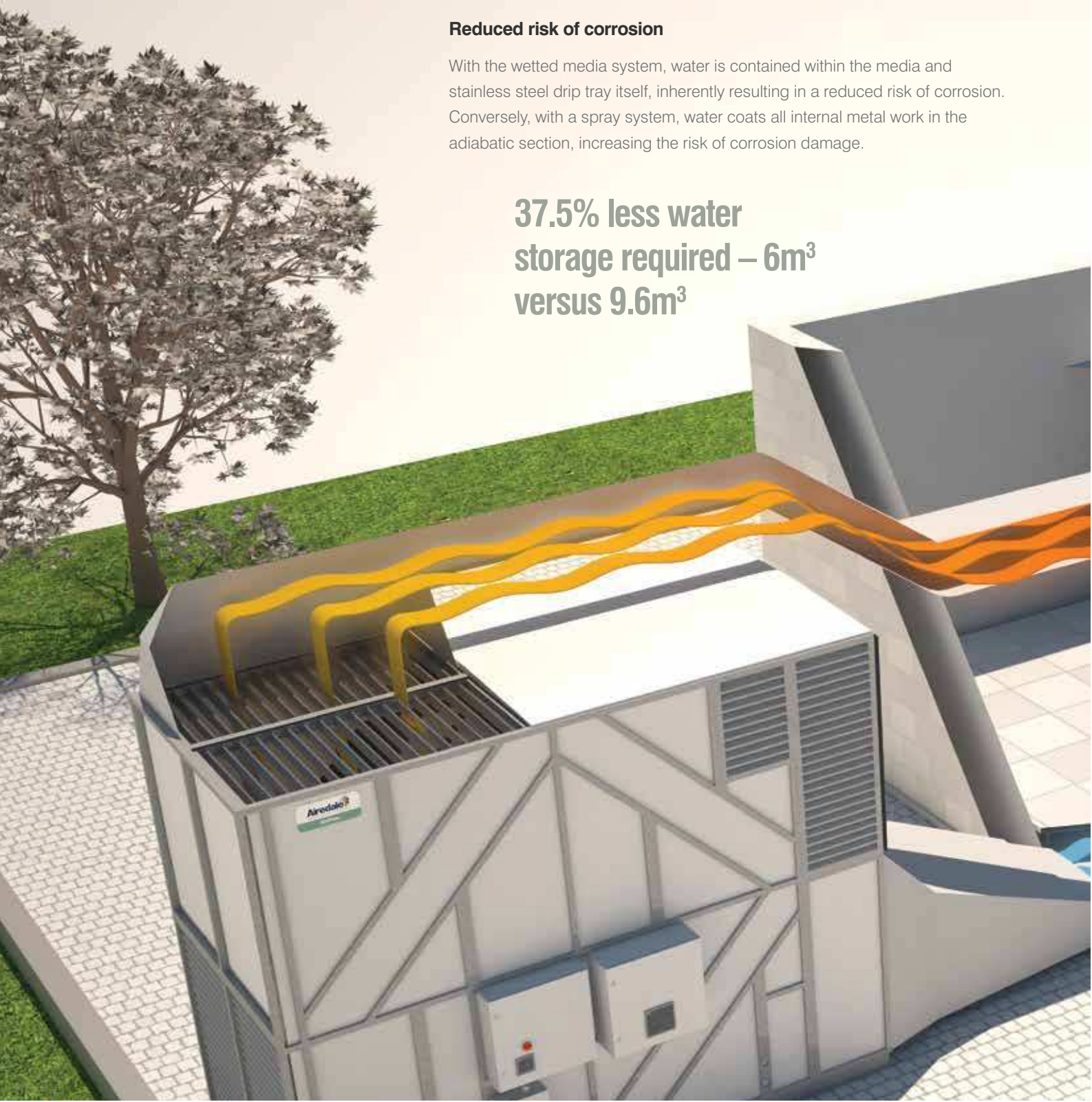
For your data centre

Wetted media versus spray systems – the benefits

Reduced risk of corrosion

With the wetted media system, water is contained within the media and stainless steel drip tray itself, inherently resulting in a reduced risk of corrosion. Conversely, with a spray system, water coats all internal metal work in the adiabatic section, increasing the risk of corrosion damage.

37.5% less water storage required – 6m³ versus 9.6m³



Less water consumption

The AireFlow™ consumes just 0.25m³ of water per hour whereas typically a spray system will use up to 0.40m³ of water per hour at peak UK ambient temperatures.

Typical water consumption for a 1MW data centre in London would be 600m³ per annum.*

* Based on a datacentre with N+1 redundancy, operating with a 12K ΔT and supplying air at 27°C.

No water treatment required

As opposed to spray systems, where you may need to soften or deionise the water prior to use, no treatment is required with the wetted media system.

Low maintenance cost

Unlike with spray systems the heat exchanger does not require regular descaling and there are no nozzles to be replaced/ cleaned.

A sterile environment

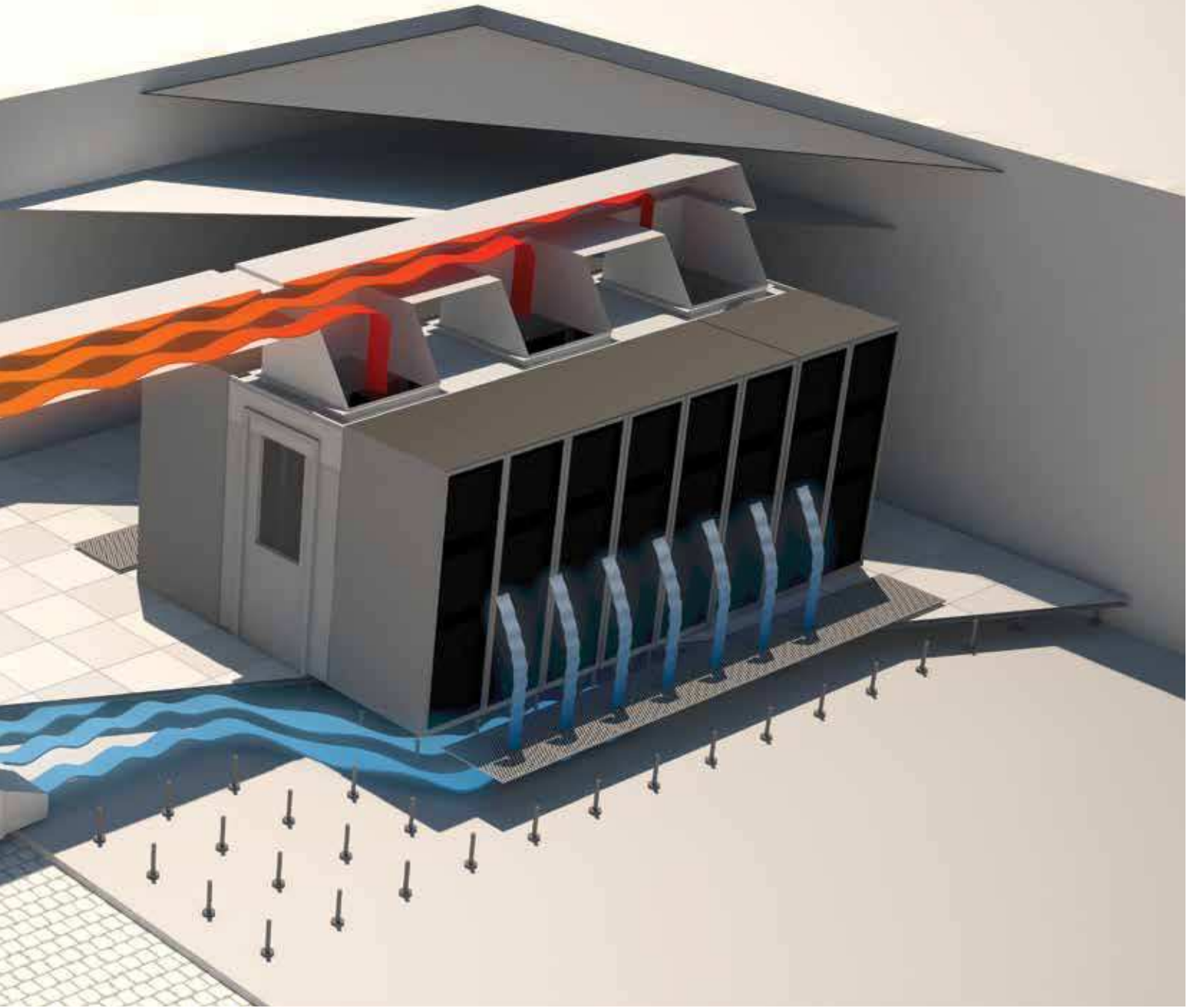
The AireFlow™ unit is designed to ensure a sterile environment. Circulating water is constantly passed through a UV system to sterilise it and kill any bacteria and the self-cleaning adiabatic system automatically drains itself periodically.

Zero indoor footprint

As the AireFlow™ is an outdoor unit, sitting either at ground level next to a building or on the rooftop of a building, there is no need for indoor CRAC units. This means that it can deliver cooling with no internal footprint, freeing up further floor space inside your datacentre for IT related operations.

A contaminant free data centre

Using outdoor air to indirectly cool the indoor air supply, the AireFlow™ ensures your data centre is isolated from outdoor pollutants.



Brilliantly engineered

For increased reliability

High efficiency air-to-air aluminium plate heat exchanger

A robust construction of aluminium with an epoxy coating ensures significantly increased thermal conductivity, over plastic or composites, along with protecting against corrosion and high relative humidity on the ambient side.

Designed for airflows from 3m³/s up to 21m³/s, its sealed and alternate air paths prevent mixing, and gives a large heat exchange surface area for increased cooling capacity.

Wetted media adiabatic system

The wetted media adiabatic system requires low water consumption, only using what is required, and no water treatment is necessary.

An activation temperature can be specified to prioritise either energy or water consumption on this extremely low maintenance system.

N+1 fan configuration for increased efficiency and uptime

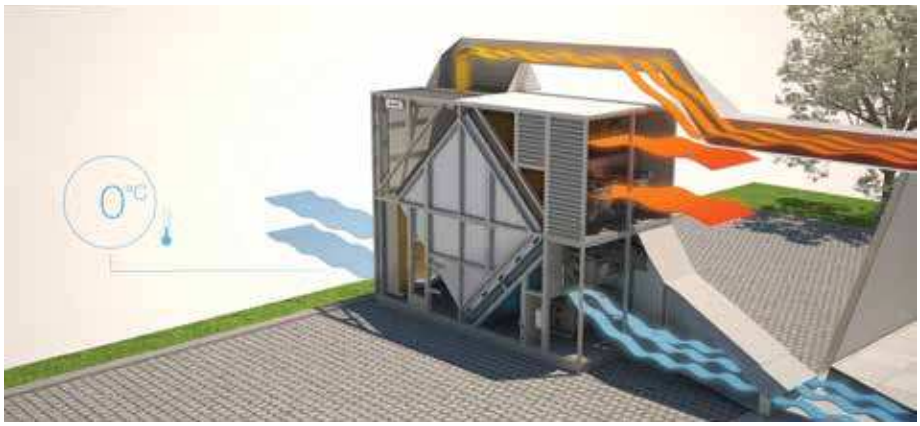
N+1 fan configuration enhanced by smart control logic and EC fan technology, gives the AireFlow™ built-in redundancy and excellent part load efficiencies, saving up to 70% energy at part load.

Key Features

- Adiabatic wetted media with UV system sterilisation
- Iconographic display
- Maintenance and access from one side
- Air flow and pressure monitoring
- Internal components rated at IP54 or above
- 2 case sizes with either wall or roof fitting connections
- Painted galvanised steel casing for corrosion protection
- Epoxy coated aluminium heat exchanger – highly efficient and robust
- Air flow rates of between 3m³/s and 21m³/s

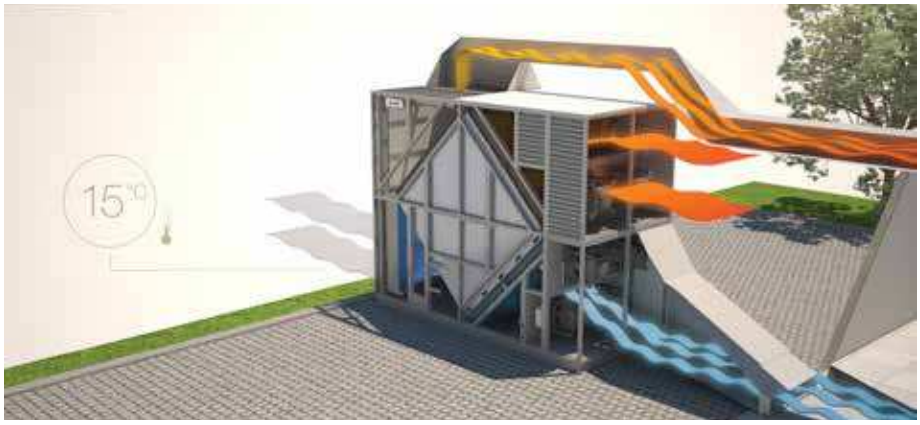
Adaptive energy efficient operation

Three distinctive operating modes



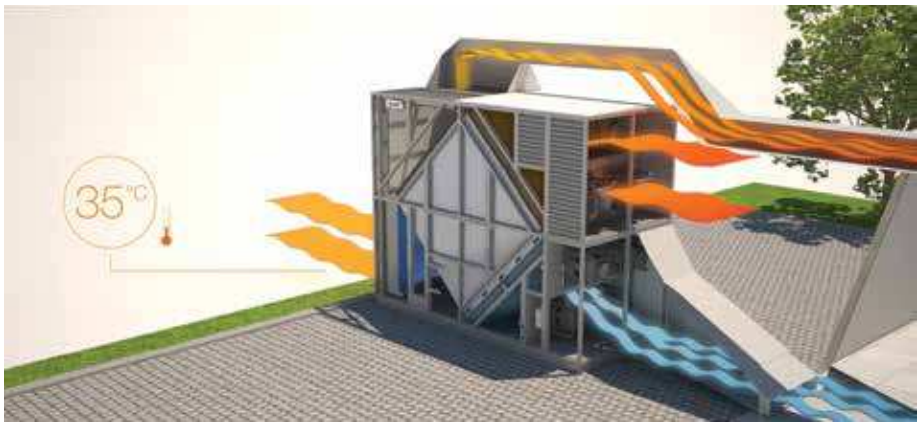
Free Cooling – 0˚C – 15˚C Dry bulb temperature

At low ambient temperatures the AireFlow™ can achieve 100% free cooling. The heat exchanger requires less ambient airflow to deliver the cooling capacity, resulting in a lower power input.



Adiabatic Free Cooling – 15˚C – 35˚C Dry bulb temperature (Max wet bulb approx. 24˚C)

As the ambient temperature begins to increase, the heat exchanger requires more airflow to deliver the required cooling, the ambient fans ramp up accordingly.



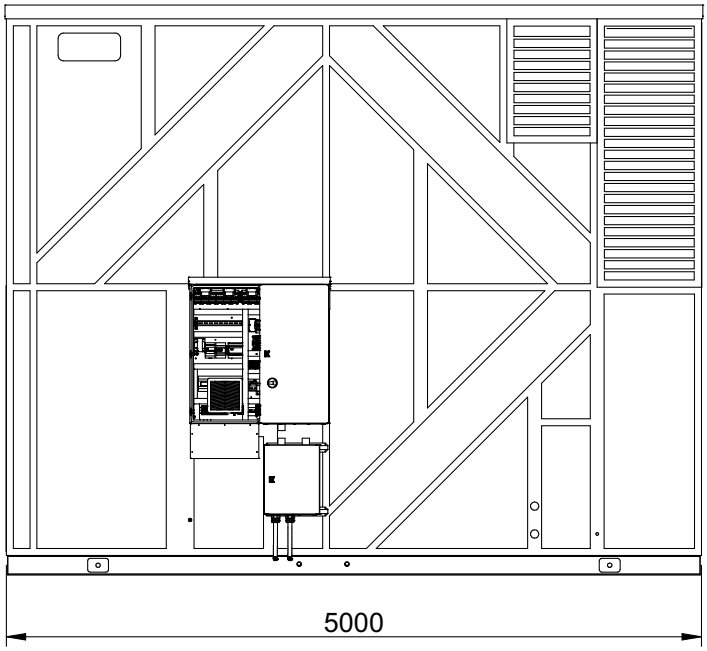
Top up Operation (Concurrent Mechanical & Free Cooling) – Above 24˚C wet bulb temperature

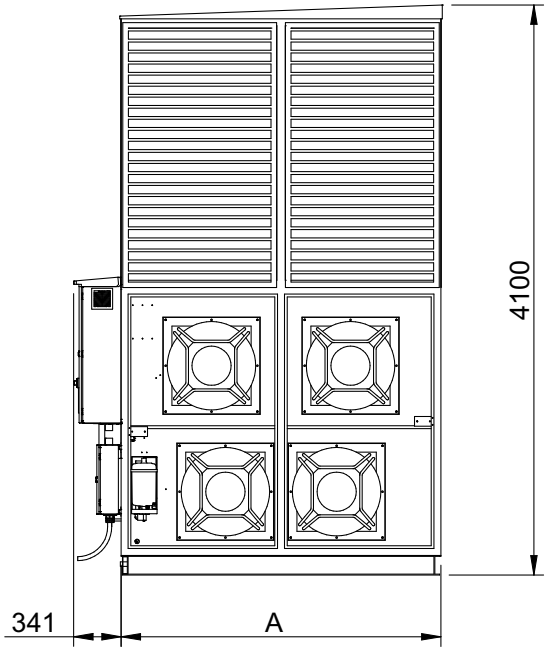
If the supply temperature cannot be met via free-cooling alone (i.e. where lower supply temperatures or higher more humid ambient conditions are present), the DX or CW system will activate. This makes up the required cooling not achievable through free-cooling.

* All temperatures based on meeting ASHRAE recommended supply envelope.

Specifications at a glance

AireFlow™ - standard case sizes





*A = 2300mm (165kW), A = 3400mm (220kW)

The AireFlow™ is available in two case sizes, suitable for both roof or wall mounted connections, and units can be positioned next to each other, by having a left and right handed unit respectively giving a space claim reduction.

Mechanical

- Available in five footprints between 100kW and 440kW, with either wall or roof optimised connections
- Two case sizes (H x L x W) 165kW – 4.1m x 5.0m x 2.3m, (H x L x W) 220kW – 4.1m x 5.0m x 3.4m
- Painted galvanised steel casing for corrosion protection
- Adiabatic wetted media with UV system sterilisation
- Air flow rates of between 3m³/s and 21m³/s achievable on a 220kW unit
- Internal components rated at IP54 or above
- Hinged access doors to the following – exhaust fans, supply fans, wetted media
- Modular electrical panels
- Packaged R410A system (DX only)
- Variable speed compressor (DX only)
- Liquid line sight glass and filter drier (DX only)
- High face area, hydrophilic coated RTPF evaporator (DX only)
- High face area, phenolic coated RTPF condenser (DX only)
- Discharge non-return valve (Magnetic type - DX only)
- 2 and 3 way control valves (CW only)
- Grooved copper connections (CW only)
- Flanged or threaded connections (CW only)
- Bypass balancing valve (CW only)

Optional:

- Return damper to prevent recirculation when on standby
- Immersed electrode humidifier

Energy Saving

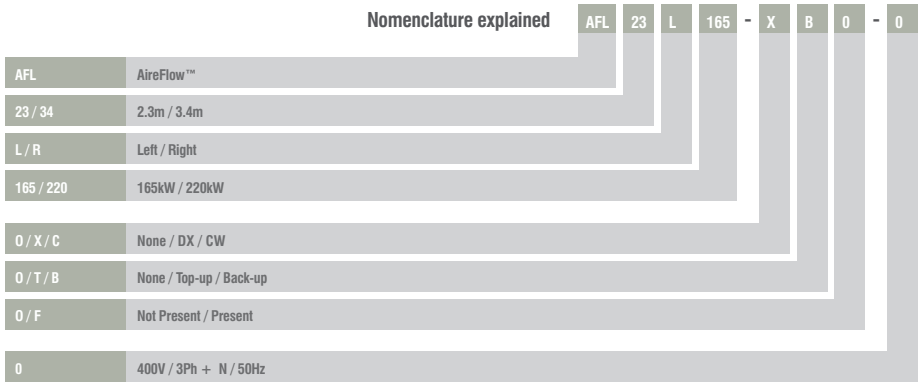
- Based on London, UK ambient temperatures, systems can achieve 100% free-cooling year round (operating inside the ASHRAE recommended envelope)
- EER up to 27.1 (based on a 100kW unit)
- Full free cooling can lead to systems achieving a PUE below 1.1
- High efficiency EC fans with optimised control
- High efficiency coated aluminium plate heat exchanger

Nominal capacities

Nominal capacities are based upon the following conditions and delivering 100% free-cooling:

Supply Air	27°C
Return Air	39°C
Delta T	12K
Ambient DB	33.7°C (20yr max. Gatwick Airport)
Ambient WB	23.4°C (Extreme max. Gatwick Airport)
Ambient RH	41.8%
ESP	100Pa

Range Nomenclature



AireFlow™ - technical specifications:

									Aireflow	
Configuration	**Unit 1**	**Unit 2**	**Height** (mm)	**Length** (mm)	**Width** (mm)	**Nominal Capacity** [1] (kW)	**Footprint** (m^2)	**Cooling Density** (kW/m^2)	**Datacentre** (m^3/s)	**Ambient** (m^3/s)
Single	AFL23x165	-	4100	5000	2300	167	11.5	14.5	11.8	14.0
Single	AFL34x220	-	4100	5000	3400	218	17.0	12.8	15.5	21.1
Pair	AFL23L165	AFL23R165	4100	5000	4600	334	23.0	14.5	23.7	28.0
Pair	AFL23L165	AFL34R220	4100	5000	5700	385	28.5	13.5	27.3	35.1
Pair	AFL34L220	AFL34R220	4100	5000	6800	436	34.0	12.8	30.9	42.2

[1] Nominal capacity is given at 39°C return air temperature, 27°C supply air temperature, and 33.7°C DB/23.4° WB ambient temperature.

Environment

- Zero air mixing ensures no contaminants enter your data centre
- G2/G3/G4 filtration

Optional:

- Refrigerant leak detection (DX only)
- Contaminant filtration
- Integrated fresh air inlet unit

Electrical

- 400V / 3Ph / 50Hz single power supply
- Mains isolator switch
- Ultra capacitive module (controller power backup)
- Electronic expansion valve (DX only)

Optional:

- Dual power supply (ATS)

Controls

- BMS compatibility
- Supply air temperature control
- Air flow and pressure monitoring
- pCO5+ microprocessor technology (With built in iconographic display)

Optional:

- Power meter
- Programming key

Resilience

- N+1 fan configuration for increased efficiency and uptime
- Mechanical cooling available to provide an element of redundancy where full free-cooling cannot be maintained year round

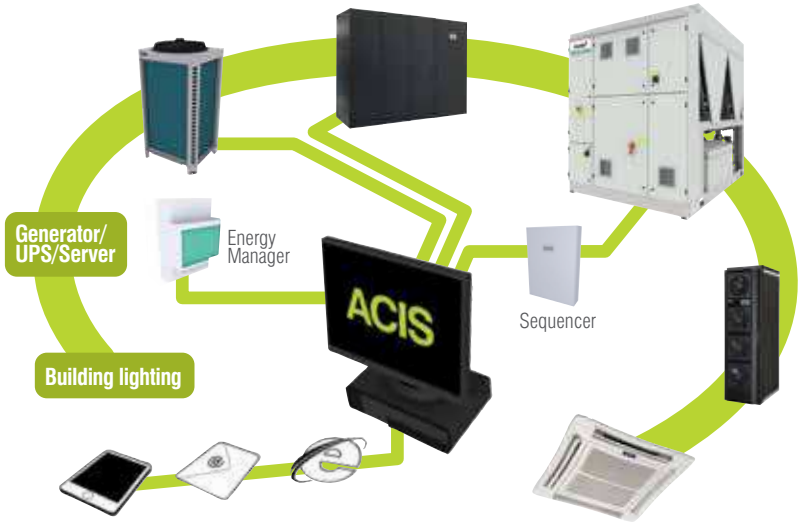
Intelligent controls

Seamlessly managing your system

The control centre of each of our cooling systems is a sophisticated electronic microprocessor specially developed by Airedale. The intelligent microprocessor uses sensors which allow active components to interact. By interacting and sequencing components, the controller manages and optimises the system's performance, availability and power draw, giving the operator complete system control.

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**

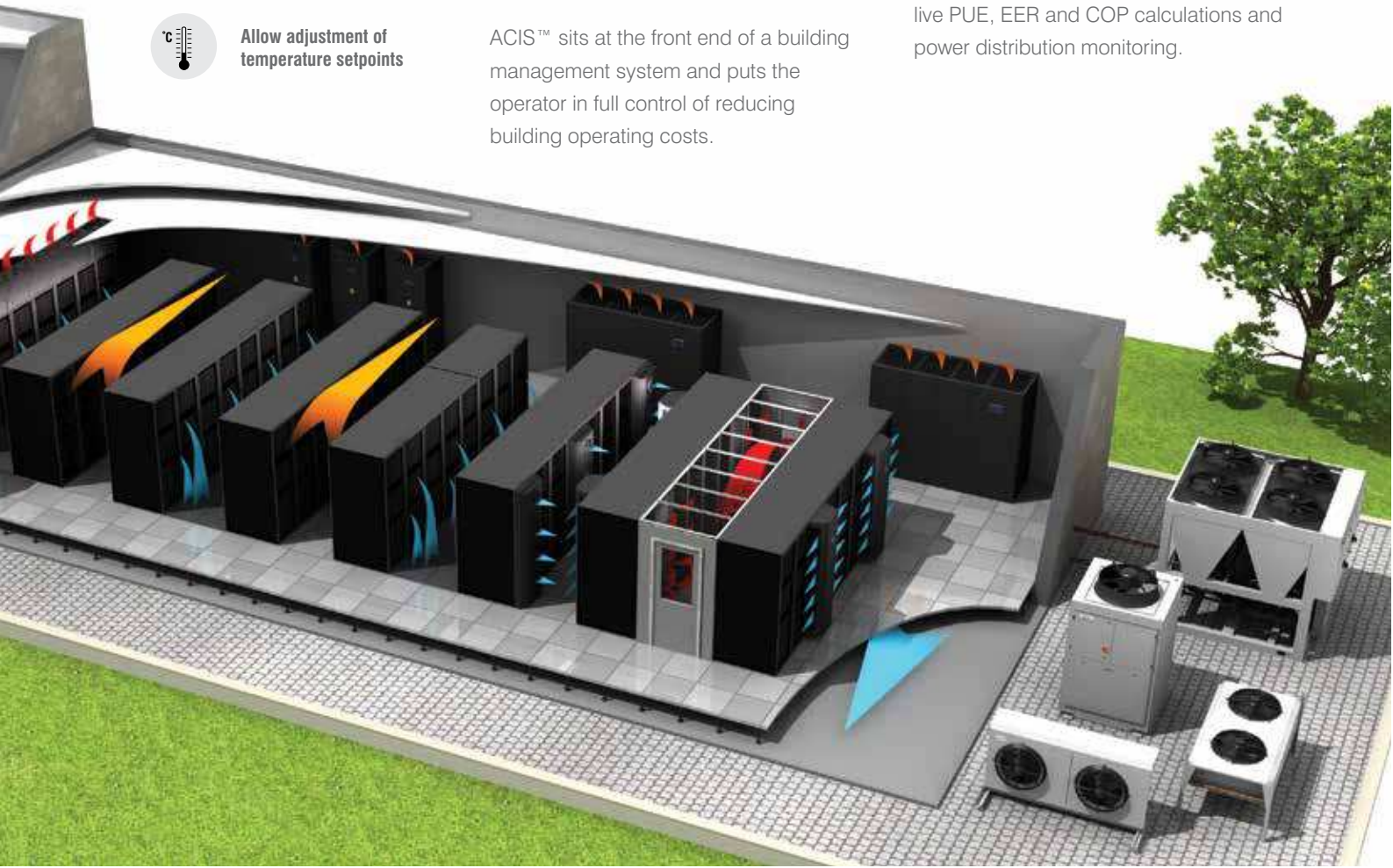


ACIS™

ACIS™ is a building management system developed by Airedale, which enables smart cooling and other building services, from any manufacturer, to be managed through a single, integrated solution across multiple sites and communication protocols.

ACIS™ sits at the front end of a building management system and puts the operator in full control of reducing building operating costs.

Through the click of a button on a PC, tablet or phone, intelligent information can be retrieved automatically allowing informed, data driven decisions to be made. With 24/7 access, ACIS™ provides an ideal solution for remote monitoring and maintenance, including live PUE, EER and COP calculations and power distribution monitoring.



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**

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

Talk directly with 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.

+44 (0)113 239 1000

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** for further details.

Distributed by:

SYSTEMY HVAC Sp. z o.o.
ul.Rydygiera 8, 01-793 Warszawa
tel.: +48 22 101 74 00
fax: +48 22 101 74 01
e-mail: biuro@systemy-hvac.pl
www.systemy-hvac.pl

Airedale
APPLIED THERMAL INNOVATION
www.airedale.com

Airedale International Air Conditioning Limited | Leeds Road, Rawdon, Leeds LS19 6JY, England
Tel: +44 (0) 113 239 1000 **Fax:** +44 (0) 113 250 7219 **E-Mail:** enquiries@airedale.com

A MODINE Company