

# Air Handling Units



50 years of AHU manufacturing experience.  
Bespoke high quality air handling units made to any specification

**AHUs**

**CHILLERS**

**PROJECTS**

**SERVICE**

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# Daikin Applied

## Air Handling Units

### Why choose Daikin Applied Air Handling Units?

#### Made in the UK

- › Manufacturing and testing facilities from our dedicated AHU plant in Northumberland

#### Design

- › Inherent flexibility. can be configured specifically to meet the exact requirements of any building or specification
- › The most energy efficient on the market
- › Compact design maximising technical output in the smallest physical footprint

#### Panels

- › Outer panel is pre-painted with Corrosion Class RC5
- › Inner panel made from Aluzinc with Corrosion Class RC4

#### Gasket

- › Liquid gasket technology drastically reduces air leakage

#### Frame

- › Anodized aluminium with the highest corrosion resistance
- › Unique Daikin thermal break (35mm or 27mm thermal break). Polyamide bars enhance thermal break unit performances
- › Distinctive section to section thermal break profile to ensure thermal break design on the whole unit (see image)
- › Rounded profile for increased ease of cleaning

#### IAQ

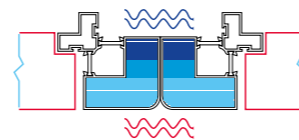
- › Flush internal surface and rounded corner flush surface to avoid the retention of dirt and to be easily cleanable
- › Wide filtration possibility to reduce pollution

#### Plug & Play Controls

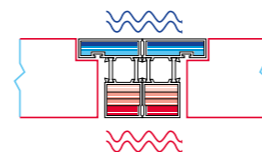
- › Pre-commissioned and factory-tested control for quicker on site commissioning
- › Sole manufacturer to provide a complete AHU DX & packaged control solution in house achieved via connection to Daikin ERQ/VRV Condensing Units
- › Controls come complete with plug & play connections at section joins for easy on-site installation on modular section deliveries.
- › Modbus or BACNet BMS communication protocols available.
- › As standard our packaged controls utilise Siemens Climatix controllers, though other controls options are available on request.

#### Certifications

- › **Eurovent certified performances**
- › Exceeding 2018 ErP - ECODESIGN requirements
- › Certified according to the Hygiene Directive VDI 6022 (Modular L and Professional ranges)
- › Certified according to the Hygiene Directive DIN 1946 (Professional range)
- › RLT certified performances



Conventional design



Daikin design



### Benefits for the contractor

#### Plug and play design

- › Factory-mounted package inclusive of package controls with digital interface, expansion valves, control boxes and all control ancillaries & sensors
- › Simple precise commissioning with pre-programmed and factory tested controls
- › Quick drill free installation with internal electrical wiring and external terminal connections
- › Bespoke and flexible controls options
- › Low voltage fast connectors between AHU sections for easy on-site unit assembly
- › Flush mounted control panel avoids risk of damage during transport and installation
- › Plug & Play connection of Professional or Modular AHU to Daikin VRV and ERQ

### Benefits for the consultant

#### Flexibility

- › Quick online selection tool allowing for professional report in a few clicks
- › Unlimited unit configuration and sizing options to meet the needs of any application

### Benefits for the end user

#### Customisable

- › Tailor made AHU solutions to meet the specific customer needs

#### Efficient control logic

- › Efficient and flexible controls allowing the user to determine a wide range of settings, resulting in excellent operational flexibility and reduced energy usage
- › Safe operation - fully integrated electrical panel for units taller than 800mm
- › Highest product efficiencies resulting in reduced energy usage

# Trust in Daikin's experts

## Research and development

Our in-house research and development team ensures we stay at the forefront of technology used in HVAC in line with new and developing legislation. More importantly it allows us to offer our customers the flexibility of bespoke design and development to suit individual building specifications.

## Design

Our Engineering and R&D teams are made up of highly skilled mechanical and electrical engineers who are experienced to help you meet complex specifications and requirements. All projects are supported with SolidWorks 3D models and BIM files for precise design, fast execution and improved computational analysis.

## After sales services

Our after sales and maintenance teams are here to provide you with spare parts, tailored maintenance packages and repairs, as well as upgrades, refurbishments and retrofits to help you get the most out of your investment. This is further enhanced by the option to implement Daikin On Site active remote monitoring to any existing AHU or Chiller.

## Daikin Industries

As a global company, Daikin has over 76,000 employees, with a turnover of over £35 million within Europe. Daikin is the only manufacturer involved in all facets of air conditioning products; including Daikin's own market leading compressor and inverter technologies.

# Our AHU manufacturing facilities

## Manufacture



Daikin Applied (UK) Ltd has over 30,000m2 of manufacturing and testing facilities across our dedicated plant for AHU manufacturing located in Northumberland.

Recent investment of £1.5million into machinery has meant further improvements to the quality of our products and increased production capacity to over 1000 units per year.

## Applications

- › Hospitals, theatres and laboratories
- › Process cooling / heating
- › Data centres; server and computer rooms
- › Low, medium and high density applications
- › Commercial cooling / heating;
- › Retail, office and leisure environments

## Factory witness testing

Our new state of the art factory testing facilities are located in Northumberland (AHUs) and Rome (chillers) offering full performance and witness tests, simulating the design conditions of our products. Our performance testing procedures are compliant with industry standards, including ISO 3744/5136 and BS EN1886:2007; offering a comprehensive report of product performance before delivery, ensuring ultimate peace-of-mind.

## Facilities

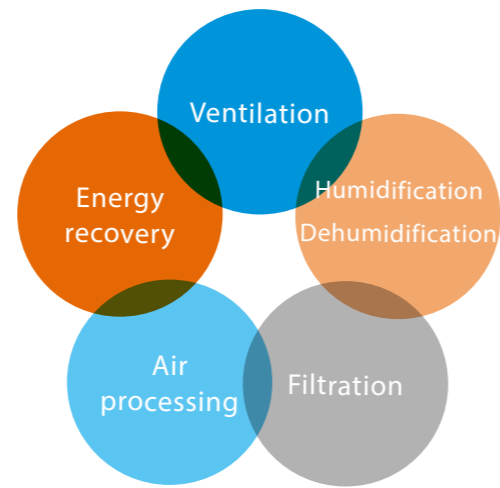
- › AHU Production
- › Engineering & R&D
- › Project Delivery
- › Service, Maintenance, Refurbishments & Spares
- › Sales & Marketing
- › HR & Finance
- › Factory witness testing
- › AHU retrofitting and refurbishment



# The need for clean fresh air

## Five components of Indoor Air Quality:

- › **Ventilation:** ensures the provision of fresh air
- › **Energy recovery:** delivers energy savings by transferring heat and moisture between airflows
- › **Air processing:** delivers the right supply temperature to decrease the indoor unit load
- › **Humidification / Dehumidification:** ensures relative indoor humidity levels are respected
- › **Filtration:** separates pollen, dust and pollution harmful to health



## Daikin IAQ sensor

Daikin IAQ sensor is an innovative sensor helping you monitoring air quality in indoor environments

Daikin IAQ sensor is an IoT device measuring your well-being, recording various values relating to indoor air quality, environmental comfort and electromagnetic pollution. It has 12 embedded sensors that monitor 15 different parameters.

Caelum monitoring and reporting platform  
Integration with remote monitoring Daikin on Site  
Easy and quick installation – just 1 minute  
Get green building projects certified with LEED thanks to Indoor Environmental Quality credits



## Did you know?

CO<sub>2</sub> levels and ventilation rates all have significant, independent impacts on cognitive function:

COGNITIVE FUNCTION SCORES ...



**+ 61%**  
IN GREEN BUILDING  
CONDITIONS



**+ 101%**  
IN ENHANCED  
GREEN BUILDING CONDITIONS

# Filter range

From our sister company



AAF has an in-depth understanding of the challenges for healthcare facilities. This understanding and technical ability makes AAF the preferred partner in protecting your patients, workers, and visitors. AAF products are designed with energy efficiency in mind, offering you the highest efficiency products with the lowest energy requirements.

## HEPA and ULPA filters

HEPA and ULPA filters are the most efficient air filters commercially available and are used in applications requiring ultra-clean air. AAF HEPA filters are available in a variety of efficiencies.



## Pleated panel filters

high performance, high capacity filters, including specialty and standard capacity options. offers consistent air quality, improved process performance and optimised Total Cost of Ownership. Pleated filters can be used as prefilters to protect and extend the life of higher efficiency, more expensive final filters.



## High efficiency extended surface filters

ideal for use in all high efficiency applications, including ICU, treatment rooms, laboratories and minor surgical suites.



## ISO16890 - The standard for air filter testing and rating

The world's leading health-related organizations consider PM10, PM2.5 and PM1 fine dust fractions as the most important and dangerous for humans. Their official documentation to the public always refers to these PM levels. It is therefore logical that filter test methods and classifications follow this approach to demonstrate filtration performance towards the most harmful fine dusts.

**ISO International Standards Organization** issues a new standard for filter testing and rating



**ISO coarse** – filters allocated to this range capture less than 50% of PM10 particles.



**PM10** – Refers to the particle size fraction in the range from 0,3 µm up to 10 µm.



**PM2,5** – Refers to the particle size fraction in the range from 0,3 µm up to 2,5 µm.



**PM1** – Refers to the particle size fraction in the range from 0,3 µm up to 1 µm.

The precise definition of PM10, PM2,5 and PM1 is quite complex and not simple to measure. Public authorities, like the US EPA or the German Federal Environmental Agency (Umweltbundesamt), increasingly use in their publications the simpler denotation of PM10 as being the particle size fraction less or equal to 10 µm. Since this deviation to the above-mentioned complex "official" definition does not have a significant impact on a filter elements particle removal efficiency, the ISO 16890 documents refer to this simplified definition of PM10, PM2,5 and PM1.

# Eurovent certified performance



# Product overview

## centralised and decentralised ventilation

Daikin Applied UK Limited participates in the Eurovent Certified Performance programme for Air Handling Units - certified under 14.05.003

Check ongoing validity of certificate: [www.eurovent-certification.com](http://www.eurovent-certification.com) or [www.certiflash.com](http://www.certiflash.com)

## What is Eurovent?

Established in 1993, Eurovent Certita Certification is recognized as a world leader in third-party product performance certification in the Heating, Ventilation, Air Conditioning, and Refrigeration fields.

Eurovent Certita Certification is accredited as a certification body compliant with ISO/IEC 17065:2012 standard by COFRAC (Accreditation Nb 5-5017). This accreditation is internationally recognized by the signatories of the International Accreditation Forum (IAF).

## Main certified characteristics

### Mechanical characteristics:

- a - Casing strength (CS)
- b - Casing air leakage (CAL)
- c - Filter bypass leakage (FBL)
- d - Thermal transmittance of the casing (TT)
- e - Thermal bridging factor (TBF)
- f - Acoustical insulation of casing

### Performance characteristics:

- a - Air flow - Available static pressure - power input
- b - Octave band in-duct sound power level
- c - Airborne sound power level
- d - Heating capacity\*
- e - Cooling capacity\*
- f - Heat recovery\*
- g - Pressure loss on water side\*

## BSEN1886 ratings for Daikin Applied UK air handling units

Results for D-AHU Professional, Modular R and Modular P		Eurovent Classification according to EN1886				
<b>D1(M)</b>	Casing strength (CS) Max. relative deflection mm x m <sup>-1</sup>	D1 4.00	D2 10.00	D3 EXCEEDING10		
<b>L1(M)</b>	Casing air leakage (CAL) at -400 Pa Max. leakage rate (f <sub>400</sub> ) l x s <sup>-1</sup> x m <sup>-2</sup>	L1 0.15	L2 0.44	L3 1.32		
<b>L2(M)</b>	Casing air leakage (CAL) at +700 Pa Max. leakage rate (f <sub>700</sub> ) l x s <sup>-1</sup> x m <sup>-2</sup>	L1 0.22	L2 0.63	L3 1.90		
<b>F9(M)</b>	Filter bypass leakage (FBL) Max. filter bypass leakage rate k in % of the volume flow rate	F9 0.50	F8 1	F7 2	F6 4	G1 TO F5 6
<b>T2</b>	Thermal transmittance of the casing (TT) (U-value) W x m <sup>2</sup> x K <sup>-1</sup>	T1 U <= 0.5	T2 0.5 < U <= 1	T3 1 < U <= 1.4	T4 1.4 < U <= 2	T5 No requirements
<b>TB2</b>	Thermal bridging factor (TBF) (kb)	TB1 75 < K <sub>b</sub> <= 1	TB2 0.6 < K <sub>b</sub> <= 0.75	TB3 0.45 < K <sub>b</sub> <= 0.6	TB4 0.3 < K <sub>b</sub> <= 0.45	TB5 No requirements



# Modular T

Top connected heat recovery unit

## Highlights

Available in two versions:

SMART - with Daikin F1/F2 - P1/P2 communication protocol for direct connectivity to the Daikin communication platform  
PRO - with plug and play open control platform for easy and quick start-up

- › 5 Predefined sizes
- › Plug & Play control solution
- › Compact unit from 550 mm width (for unit up to 1100 m<sup>3</sup>/h)
- › Wide air flow coverage from 200 to 4200 m<sup>3</sup>/h
- › Excellent indoor air quality (IAQ). Up to three filtration stages: more than 90% PM1 in outdoor air are deleted achieving the best IAQ
- › Low noise emission thanks to superior panel construction (50mm, mineral wool)
- › DX and water coil available as option
- › Recirculation mixing damper (option)
- › Available in right or left configuration, depending on position of airflow supply



From 200 m<sup>3</sup>/s up to 4200 m<sup>3</sup>/s

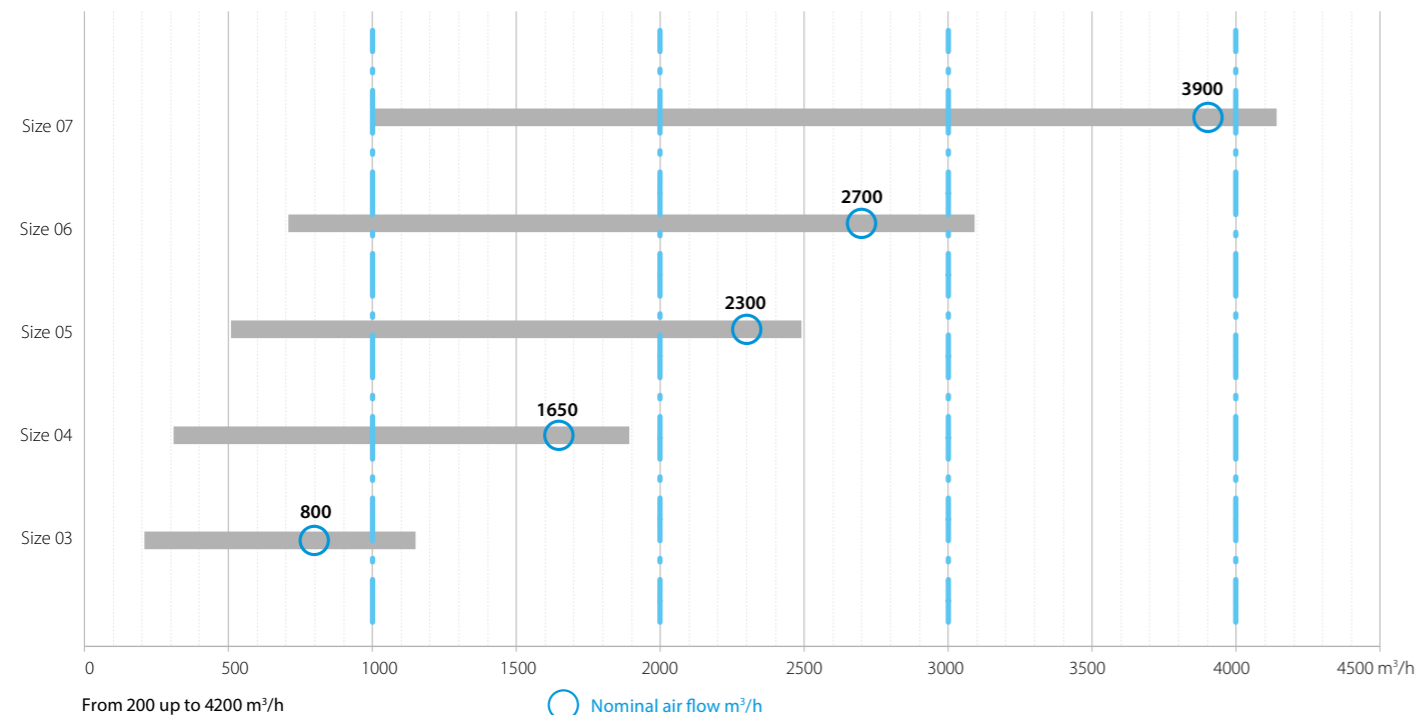
The modular T has a very low footprint and optimised design which allows passing through doors. Smaller sizes are configured as mono blocks and larger sizes are provided in sections for easy transportation and handling.

## Air flow range

Modular T is available in 5 sizes covering a wide range of applications such as hotels, offices, schools, gyms and light commercial buildings.

## Sectioning

To ensure an easy and quick installation Modular T size 05 will be provided in two sections, while size 06 and 07 in three sections to pass smoothly through standard doors<sup>1</sup>.



# Modular L

High-end solution with heat recovery



From 0.03 m<sup>3</sup>/s up to 0.95 m<sup>3</sup>/s

The Modular Light is a premium efficiency energy recovery unit that provides outdoor fresh air and guarantees ideal indoor air quality.

It represents one of the most effective solution on the market and perfectly fits and decentralised ventilation system requirements.

## Highlights

- › 6 Predefined sizes
- › Exceeding 2018 ErP – ECODESIGN requirements
- › Plug & Play control solution
- › Compact unit from 280 mm height (for unit up to 550 m<sup>3</sup>/h)
- › Wide air flow coverage from 150 to 3400 m<sup>3</sup>/h
- › Excellent indoor air quality (IAQ). Up to ePM1 80% (F9) filtration level with possibility to have a pre-filter up to ePM1 50% (F7) for the best IAQ
- › Low noise emission thanks to superior panel construction (50mm, mineral wool)
- › EPBD compliant
- › BIM file available at [www.daikin.eu/BIM](http://www.daikin.eu/BIM)

## EC centrifugal fan

- › Inverter driven with IE4 premium efficiency motor
- › High-efficient blade profiling
- › Reduced energy consumption
- › Optimized SFP (Specific Fan Power) for an efficient unit operation
- › Maximum ESP available 550 Pa (depending on model sizes and air-flow)

## Heat exchanger

- › Premium quality counter flow plate heat exchanger
- › Up to 92% of the thermal energy recovered
- › High grade aluminium allowing high grade corrosion protection

## Technical details

D-AHU Modular L			ALB02*B	ALB03*B	ALB04*B	ALB05*B	ALB06*B	ALB07*B
Airflow	m <sup>3</sup> /h		300	600	1,200	1,600	2,500	3,000
Heat exchanger thermal efficiency <sup>1</sup>	%		90		91	90	91	90
External static pressure	Nom. Pa		100					
Current	Nom. A		0.61	1.35	2.26	2.83	2.09	6.22
Power input	Nom. kW		0.14	0.31	0.52	0.65	1.17	1.43
SFPv <sup>2</sup>	kW/m <sup>3</sup> /s		1.25	1.52	1.3	1.35	1.47	1.51
Electrical supply	Phase	ph	1					
	Frequency	Hz	50/60					
	Voltage	V	220/240 Vac					
Main unit dimensions	Width	mm	920	1,100	1,600		2,000	
	Height	mm	280	350	415		500	
	Length	mm	1,660	1,800			2,000	
Rectangular duct flange	Width	mm	250	400	500		700	
	Height	mm	150	200	300		400	
Weight unit	kg		125	180	270	280	355	360

1. Winter design condition: Outdoor: -10°C, 90% Indoor: 22°C, 50%

2. SFPv is a parameter that quantifies the fan efficiency (the lower it is the better will be). The SFP figure shown in the above table is based at the nominal airflow and nominal ESP shown.

3. EN 3744. Surrounding, Directivity (Q) = 2, @1,5m distance

Notes:

Base unit includes, F7 Supply filter, and M5 Return filter Mineral wool insulation, Aluzinc internal skin and Aluzinc Pre-Painted external skin.

Ancillary modules include Silencers, Electric Frost Coils & various Heating/Cooling Coil Modules.

# Modular R

From 0.13 m<sup>3</sup>/s up to 6.95 m<sup>3</sup>/s



## Highlights

- › 10 Predefined sizes
- › IE4 premium efficiency motor
- › Compact design
- › Advanced control features
- › Easy installation
- › Indoor air quality compliant with VDI 6022 hygiene guideline
- › Operating limits from -25 °C, -40 °C with electric heaters, up to +46 °C ambient temperature
- › VRV IV and ERQ coupling capability
- › Indoor and outdoor versions
- › Free cooling capability
- › Economy and Night mode operation
- › Monitoring and control through Daikin iTM
- › Nominal air flow programmed at factory
- › Air flow or pressure control (Variable Air Volume – Constant Air Volume)



Modular R

## Heat exchanger

- › High efficiency heat wheel
- › Available in two versions: sorption and sensible technology
- › Up to 81% of the thermal energy recovered

## Simple, quick installation

The Modular series' plug and play design is more than just a convenient feature for installers. It offers cost-saving benefits as there is no need for expensive adjustments before the unit is commissioned. Plug and play makes everyone's life simpler, safer and more economical.

### NEW Now available with plug fan

D-AHU Modular R			1	2	3	4	5	6	7	8	9	10
Airflow	m <sup>3</sup> /h		1,200	1,700	2,700	4,100	5,500	6,100	7,000	9,100	11,500	15,000
Temp. efficiency winter	%		80	79.7	80.1	80.2	80.7	80.1	80.7	80.8	80.5	80.6
External static pressure	Nom.	Pa	200	200	200	200	200	200	200	200	200	200
Current	Nom.	A	2.59	3.65	3.13	4.95	6.4	7.78	8.78	10.48	14.23	19.03
Power input	Nom.	kW	0.6	0.84	1.25	1.98	2.56	3.11	3.51	4.19	5.69	7.61
SFPv		kW/m <sup>3</sup> /s	1.553	1.507	1.451	1.521	1.387	1.549	1.525	1.432	1.487	1.551
Electrical supply	Phase	ph	1	1	1	1	1	1	1	1	1	1
	Frequency	Hz	50	50	50	50	50	50	50	50	50	50
	Voltage	V	230	230	400	400	400	400	400	400	400	400
Dimensions unit	Width	mm	720	820	990	1,200	1,400	1,400	1,600	1,940	1,940	2,300
	Height	mm	1,320	1,320	1,540	1,740	1,740	1,920	1,920	2,180	2,460	2,570
	Length	mm	1,700	1,700	1,800	1,920	2,080	2,280	2,400	2,450	2,280	2,400
Weight unit		kg	325	350	475	575	750	790	950	1,330	1,410	1,750

# Modular P

From 0.13 m<sup>3</sup>/s up to 4.16 m<sup>3</sup>/s



## Highlights

- › 10 Predefined sizes
- › IE4 premium efficiency motor
- › Compact design
- › Advanced control features
- › Easy installation
- › Indoor air quality compliant with VDI 6022 hygiene guideline
- › Operating limits from -25 °C, -40 °C with electric heaters, up to +46 °C ambient temperature
- › VRV IV and ERQ coupling capability
- › Indoor and outdoor versions
- › Free cooling capability
- › Economy and Night mode operation
- › Monitoring and control through Daikin iTM
- › Nominal air flow programmed at factory
- › Air flow or pressure control (Variable Air Volume – Constant Air Volume)



Modular P

## Heat exchanger

- › Premium quality counter flow plate heat exchanger
- › Up to 92 % of the thermal energy recovered
- › No cross contamination

## Modular Design

Modular design allows to add at the base module accessories and components such as coil, attenuator, electrical heater in order to meet all customer requests.

### NEW Now available with plug fan

D-AHU Modular P			1	2	3	4	5	6	7	8	9	10
Airflow	m <sup>3</sup> /h		1,100	1,600	2,400	3,100	3,700	4,750	5,500	8,000	10,400	12,500
Thermal efficiency	%		91	91.5	92	91.9	91.9	92.2	92.3	91.7	93.1	93.1
External static pressure	Nom.	Pa	200	200	200	200	200	200	200	200	200	200
Current	Nom.	A	1.78	2.48	2.08	2.73	3.45	4.58	5.25	7.53	9.55	11.55
Power input	Nom.	kW	0.41	0.57	0.83	1.09	1.38	1.83	2.1	3.01	3.82	4.62
SFPv		kW/m <sup>3</sup> /s	1.183	1.092	1.09	1.113	1.188	1.21	1.207	1.216	1.148	1.166
Electrical supply	Phase	ph	1	1	1	1	1	1	1	1	1	1
	Frequency	Hz	50	50	50	50	50	50	50	50	50	50
	Voltage	V	230	230	400	400	400	400	400	400	400	400
Dimensions unit	Width	mm	720	820	990	1,200	1,400	1,400	1,600	1,940	1,940	2,300
	Height	mm	1,320	1,320	1,540	1,740	1,740	1,920	1,920	2,180	2,460	2,570
	Length	mm	2,030	2,200	2,610	2,660	2,800	3,210	3,340	3,840	4,060	4,190
Weight unit		kg	343	358	512	604	785	852	964	1,449	1,700	2,071

## EC Fan

- › Air flow or pressure control (Variable Air Volume - Constant Air Volume)
- › Nominal air flow programmed at factory
- › Quiet operation

## A lifetime of savings

While the initial investment and installation are major factors in the overall cost of an air handling unit, Modular series units are designed to reduce energy costs throughout their entire working life. Features such as Constant Air Flow (CAV) or Pressure Control (VAV), economy mode, night mode operation and the programmable timer all provide considerable savings. Savings that ensure a rapid payback of the investment.



# D-AHU Professional

## A customisable solution to meet any specification



### Flexible design and dimensions

Daikin Professional air handlers can be custom built to your specification, optimising the unit for the most cost-effective technically compliant selection.

- › Air flow from 750 m<sup>3</sup>/h up to 144,000 m<sup>3</sup>/h.
- › Custom size and dimensions to suit your requirement
- › All the units can be modularly designed to facilitate transport and assembly on site.
- › Eurovent certified



### Bespoke construction

AHU Solution is entirely customisable based on the needs of the project, whether that be HTM, Pharmaceutical, Data Centre, Clean Room, Coastal or Marine application. We have a solution available via bespoke considerations such as:

- › Epoxy coated components
- › Customisable panel materials
- › Bespoke coil materials
- › A multitude of energy efficient fan types & constructions.
- › Bespoke base materials (PFC, SS316L, SS304) & design to facilitate single piece lift
- › Multiple filter types & grades including Biocel, Activated Carbon & HEPA.
- › The most energy efficient heat recovery, including counterflow plate heat exchangers
- › Fully packaged units complete with DX & controls, fully wired & piped



### Internal corridor for external units

The D-AHU professional range can be configured to meet the exact specification of your premises requirements.

At Daikin Applied UK, we can incorporate an internal corridor within the AHU for service and maintenance. This solution addresses access requirements and also allows the AHU to be housed externally, thus not taking building space for additional plant room.

Utilised frequently in external HTM-03-01 applications, this compact solution can be shipped as a combined system across the width for simple site installation.



### Plug & Play control system:

The Daikin Digital Control Platform, with its 310 digital inputs and outputs, stands out of the crowd for the great flexibility, providing infinite possibilities and exactly meet any customer need. The Digital Control solution makes wiring easier and quicker than a traditional solution, thanks to a platform that simplifies the communication between the different sections and devices. Having less through the use of nodes which house pressure monitoring transducers

minimises the amount of internal cabling; making for easier maintenance and site installation. The Daikin Professional AHU is the most competitive bespoke package solution on the market.

All units with factory integrated control are delivered pre-programmed, tested and ready for installation.

### Main features

- › Free cooling/free heating management
- › VRF direct expansion systems management
- › Eco and reduced night modes
- › Up to 310 I/O (inputs/outputs)
- › All components internally wired
- › Fast connection between sections
- › Programming schedule
- › Indoor Air Quality (IAQ) controlled by CO<sub>2</sub> Probe
- › Regulation logic Temperature Supply, Return, Ambient
- › Preloaded control parameters simplify the field commissioning
- › Unit delivered tested and programmed in the factory ensuring high quality level
- › Integrated control ensures easy assembly on site with reduction of installation cost and time
- › Minimum maintenance required
- › Low voltage and high voltage in a unique solution excludes the



- › involvement of a second company with a cost saving and no additional warranty from a third party
- › User friendly control interface
- › Supervision and Control management local, remote options (Modbus, Bacnet)
- › Maximum flexibility in selecting the product and control feature directly from selection software
- › BMS integration via Modbus or BACNet communication modules

### BSEN1886 ratings

#### Results for D-AHU Professional, Modular R and Modular P

<b>D1(M)</b>	Casing strength (CS) Max. relative deflection mm x m <sup>-1</sup>
<b>L1(M)</b>	Casing air leakage (CAL) at -400 Pa Max. leakage rate (f <sub>400</sub> ) l x s <sup>-1</sup> x m <sup>-2</sup>
<b>L2(M)</b>	Casing air leakage (CAL) at +700 Pa Max. leakage rate (f <sub>700</sub> ) l x s <sup>-1</sup> x m <sup>-2</sup>
<b>F9(M)</b>	Filter bypass leakage (FBL) Max. filter bypass leakage rate k in % of the volume flow rate
<b>T2</b>	Thermal transmittance of the casing (TT) (U-value) W x m <sup>-2</sup> x K <sup>-1</sup>
<b>TB2</b>	Thermal bridging factor (TBF) (kb)

#### Eurovent Classification according to EN1886

<b>D1</b> 4.00	<b>D2</b> 10.00	<b>D3</b> EXCEEDING10		
<b>L1</b> 0.15	<b>L2</b> 0.44	<b>L3</b> 1.32		
<b>L1</b> 0.22	<b>L2</b> 0.63	<b>L3</b> 1.90		
<b>F9</b> 0.50	<b>F8</b> 1	<b>F7</b> 2	<b>F6</b> 4	<b>G1 TO F5</b> 6
<b>T1</b> U <= 0.5	<b>T2</b> 0.5 < U <= 1	<b>T3</b> 1 < U <= 1.4	<b>T4</b> 1.4 < U <= 2	<b>T5</b> No requirements
<b>TB1</b> 75 < K <sub>b</sub> <= 1	<b>TB2</b> 0.6 < K <sub>b</sub> <= 0.75	<b>TB3</b> 0.45 < K <sub>b</sub> <= 0.6	<b>TB4</b> 0.3 < K <sub>b</sub> <= 0.45	<b>TB5</b> No requirements

# D-AHU Professional

## A flexible solution for custom applications



From medium-sized heat recovery ventilation to large-scale air handling units, we ensure optimal climate conditions by providing a fresh, healthy, and comfortable environment for buildings of all sizes and different applications.

The Daikin Applied Professional range of air handlers are uniquely designed and tailored to the individual needs of a project. We ensure our designed system meets all your requirements and is the most energy efficient and cost-effective.

## The working principle at a glance

Typical configurations for Daikin air handling units provide a versatile range of functions.

Our system offers numerous options for customisation through an extensive range of variations and added functionality.

### Flexible control solutions on plug and play solutions and bespoke AHU systems

- › Air temperature control
- › Chilled water and DX cooling system control
- › Free cooling
- › CO<sub>2</sub> automatic control
- › BMS integration via MODBUS or BACNET

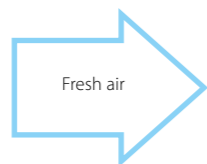
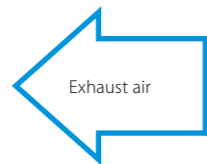
### Unique section to section thermal break profile

- › Thermal bridge free for the entire AHU
- › Smooth interior surface with improved IAQ (Indoor Air Quality)



### Supply side

- 1 Damper section including louvres and factory mounted actuators
- 2 Bag filter with factory mounted differential pressure manometer and hinged door to facilitate maintenance
- 3 Heat recovery system (plate heat exchanger, run-around coils or thermal wheel)
- 4 Mixing box with damper and factory-mounted actuators
- 5 Supply air fan (with hinged door, opening, drive monitoring, mounted and cabled lighting ON/OFF switch)
- 6 R-410A reverse Cycle DX for heating & cooling capabilities complete with condensate tray.



### Return side

- 7 Bag filter with factory-mounted differential gauge / switch and hinged door.
- 8 Exhaust air fan (with hinged door, opening, drive monitoring, mounted and cabled lighting ON/OFF switch)
- 9 Mixing box with damper and factory-mounted actuators
- 10 Heat recovery system (plate heat exchanger or rotation exchanger) see supply side
- 11 Damper section including ventilation grilles, factory-mounted actuators, see supply side



### Fans

- › Forward curved fan
- › Backward curved fan
- › Backward air-foil blades fan
- › Plug fan
- › EC plug fan
- › EC Fan Array (up to 12 fans)
- › Larger fan arrays available on special request

### Exchangers

- › Water coils
- › Steam coils
- › Direct expansion coil
- › Superheated water coils
- › Electric coils
- › Dehumidification

### Humidifiers

- › Evaporative humidifier without pump (loss water)
- › Evaporative humidifier with re-circulating pump
- › Air washer without pump (loss water)
- › Air washer with re-circulating pump
- › Steam humidifier with direct steam production
- › Steam humidifier with local distributor
- › Atomised water spray humidifier
- › Evaporative cooling

### Heat recovery systems

- › Heat wheel, sensible or sorption
- › Plate heat exchanger (optional bypass)
- › Run-around coils

### Other section

- › Attenuator section
- › Mixing box section with actuators or manual controlled dampers
- › Empty section

### Filters (ISO16890)

- › Synthetic pleated filter
- › Flat panel filter
- › Rigid bag filter
- › Soft bag filter
- › High efficiency filter
- › HEPA filter
- › Carbon absorption filter
- › Carbon deodorising filter

### Accessories

- › Control features
- › Frost protection
- › Magnehelics,
- › Minihelics
- › Drive guard
- › Roof

# D-AHU Professional

## customisable to your specification



### EC Fans

High efficiency EC fans complete with IES motors. Multiple fan arrangements available to meet the airflow and pressure needs of a variety of applications. Duty/Standby with auto-switchover also available where applicable.

### Coil features

Fog / frost heating coils constructed from plain tubing, wide fin space type or without fins, accessible from both sides for cleaning and maintenance. Protects downstream filters from low and high temperature humidity.

A range of fin & casing constructions are available dependant on application requirements, including:

- › Fins: Cu, Al, AlPr, Almg, CuSN, Electrofin
- › Casing: Galv, SS304, SS316

Generally all coil tubes are of Cu construction. For particularly aggressive corrosive environments we can offer Cu tube/Cu fins fully electro-tinned after manufacture.

Removable eliminators of varying construction are available to all cooling & RAR exhaust coils where required.

The above construction options are available to all LTHW, Steam, CHW, DX & Condenser coils.

### Filters

All filter categories securely mounted in fully sealed frame with additional vertical supports to seal filter joints and pressure drop monitoring system directly linked to the BMS. Easy access via side slide out or front withdrawal via a hinged access door

### Colour coding and labels

Casing available in a variety of colours. Permanent identification labels for air flow and test points.

### Controls

Our packaged controls include the internal wiring of the AHU complying with BS7671. See page 22 for more details on our controls systems.

### Coil options

We have a multitude of coil construction options to best meet the air handling needs given location & air quality.

### Packaged piped RAR coil

Design & supply of packaged RAR coil pumps, extract mounted and fully piped in the factory complying to the latest ERP directive.

### Bespoke design

Configured to meet the exact specification of your requirements, whether that be coastal, marine or clean-room. External units housing internal corridor also available, particularly for HTM-03-01 applications.



### Thermal wheel

Sensible & hygroscopic rotors available. We offer enhanced airtightness seals that reduce bypass leakage to 2% or even 0% using plates.

### Heat recovery

We offer a range of high efficiency heat recovery systems in line with EU regulation No 1253/2018. All our heat recoveries are available in a variety of material options to suit the needs of the application.

### Drain Trays

All drain trays are manufactured from stainless steel with a glass trap as standard, are easily accessible from both sides, and feature 4 way 1:40 or 1:20 sloping to prevent water pooling. (Plastic drain trays and trace heated pan and trap optional).



### External DX systems with outriggers

Our packaged AHU can be supplied with multiple factory fitted condensing units (ERQ or VRV) using a common outrigger AHU base frame, roof mounted to suit. Includes wiring, pipe work, and factory charged refrigerant, for a cost effective and hassle free installation.

### Attenuator units

Attenuator units with sound absorbing properties and suitable in-fills for air being handled, protected by membranes to stop fibrous particles entering the air stream.

### Access doors

Access to all elements requiring routine servicing via secure and lockable typically 500mm wide hinged access doors. Access from both sides with two stage opening sequence and viewing porthole with internal illumination.

### Frame and panel construction

Fully anodised and internally rounded aluminium frame joined with bolted composite corner blocks for improved sealing effect, in line with HTM 03-01, VDI 6022 and DIN 1946-4 standards.

All components and Inner skins feature ultra-smooth surface finish to prevent water and dust ingress for efficient cleaning. Wet sections are manufactured from stainless steel.

### Corrosion protection

Standard construction is C4, but is customisable based on the needs of project. We can offer coated components, C5 rated framework, fully SS316, SS304, pre-painted internal & external skins, bespoke base construction (painted PFC, SS316L) and fully stainless steel construction. Composite (MODAR) construction also available on special request to cater to extreme temperature handling.

### UV system

Ultra violet (UV) system to control microbiological growth, available as optional extra to be installed across heating, cooling and heat recovery systems.

### Site service

Shipping available in flat pack/kit form with build up on-site. Including heat recovery sections for example, where there is difficulty with on-site spatial constraints.

# Controls

## full control and flexible solutions

Our AHU Control Systems allow for more precise system control than ever before and reduce on-site installation costs and time. The user is able to determine a wide range of configurations resulting in exceptional operational flexibility that will optimise performance.

The factory-fitted or remote mounted electrical control panel, complete with Direct Digital Controller (DDC) can be combined with internal temperature, humidity, and CO2 sensors to control, dampers, heat recovery devices, water valves, and differential pressure transducers for filter monitoring and fans motor modulation.

The AHU Control system manages the chilled water coil, hot water coil, DX Cooling and / or heating coil(s) in conjunction with ERQ / VRV with single or multiple refrigerant circuits (maximum of four circuits per DX coil).

## Customised control systems

All Modular and Professional air handling units can be provided complete with integral control systems (with either BACnet or Modbus communication to BMS).

The new MicroTech IV controller is designed to integrate with most applications. It can manage a chilled water system or direct-expansion system while providing management of the heat recovery loop for constant or variable speeds. This allows for precise temperature control based upon PID control and constant optimisation of the operating parameters for the air handling unit.

### Features:

- › HMI with LCD display
- › Optional remote HMI display (Professional Units only)
- › Optional remote IP55 rated Control Panel (Professional Units only)
- › Integral Control Panels are available on both Modular and Professional AHU's
- › Control Panel and internal connections are IP55 rated
- › Password protected access for configuration changes
- › Alarm log to facilitate the analysis of incidents
- › BACnet or Modbus communication for BMS integration
- › Vastly improved I/O count allows for expansion for the most demanding application

The MicroTech IV controller provides the option of controlling the setpoints for either room, return or supply air temperatures/humidity and if required the regulation of air quality via the addition of a CO2 sensor.

**For additional information contact your local Daikin Applied representative.**



## Tailored bespoke solutions:

### Controls options:

- › Supply, fit and wire of complete controls systems package
- › Fit and wire of free issue controls
- › Fitting only of free issue controls
- › Containment runs and penetrations
- › Supply, fit and wire of thyristor controls
- › Supply only of controls package for fitting and wiring on-site

### Site connection options:

- › AHUs shipped as a single section (no internal wiring on-site)
- › Loomed back cables at section joins
- › Plug & Socket on all controls / power cables at section joins
- › Quick connector control panels

# Fresh air package

## plug and play connections to Daikin VRV and ERQ



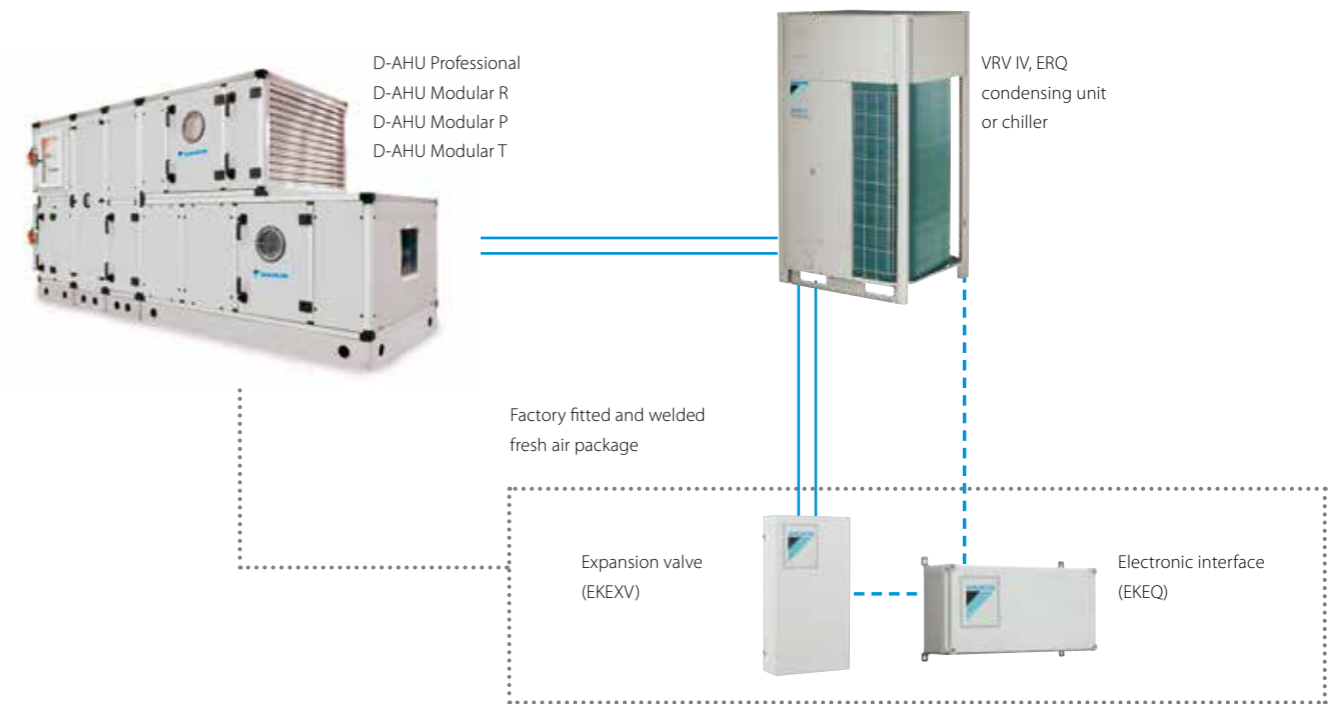
The Daikin fresh air package provides a complete solution, including all unit controls (expansion valve, control box and AHU controller) and sensors factory mounted and configured. Available as standard on AHU Modular systems and optional on all bespoke AHU Professional systems.

## Higher efficiency

Daikin heat pumps are renowned for their high energy efficiency. Integrating the AHU with a heat recovery system is even more effective since an office system can frequently be in cooling mode while the outdoor air is too cold to be brought inside in an unconditioned state. In this case heat from the offices is merely transferred to heat up the cold incoming fresh air.

## High comfort levels

Daikin ERQ and VRV units respond rapidly to fluctuations in supply air temperature, resulting in a steady indoor temperature and resulting in high comfort levels for the end user. The ultimate is the VRV range which improves comfort even more by offering continuous heating, also during defrost.



# AHU Refurbishment

Be smart! Replace components, not systems

If your equipment is more than 10 years old, it probably isn't running as efficiently as it could. This impacts indoor air quality, outdoor pollution, running costs, energy efficiency and equipment life-cycle

## Why refurbish your AHU?

- › Deterioration of components
- › Outdated technology
- › Space restrictions
- › Accessibility restrictions



## Benefits

- › Cost savings – capital costs, running costs and component costs
- › Improved performance
- › Reduced downtime
- › Environmental reasons – pollution levels and indoor air quality



## Why upgrade to an EC fan?

AC fans are fraught with issues. They contain more components and materials which lead to increased issues and failures. Combined with old technology that can lead to nuisance breakdowns. EC fans = less space, less noise, higher efficiency, better monitoring and control, fewer components...



## EC fan advantages:

- › High efficiency (up to 90%)
- › Lower running temperature leading to increased life expectancy
- › Quiet operation, even at low operational speed
- › Monitoring – operating data and statuses
- › Control – demand ventilation (adjustable air performance)
- › Plug and play – fast installation and commissioning
- › Compact – low space requirements
- › Fewer components = less maintenance requirements

# Daikin PROtect - Service & Maintenance

Daikin PROtect is a three year maintenance package (option to extend to five years) designed to protect and optimise your HVAC equipment. Because your maintenance is directly from the manufacturer, you can have peace of mind knowing that your assets are in the hands of the experts.

With Daikin PROtect maintenance package we can offer:

- ✓ Fast and reliable remote diagnostics with Daikin On Site active monitoring
- ✓ Rapid fault identification and resolution
- ✓ Protected three year parts warranty (option to extend to five years) plus labour in the first year
- ✓ Up to four hour response time for emergency call-outs
- ✓ Factory trained technicians (F-gas registered)

# Daikin Rental UK

Weather the unexpected

Whether you have long or short-term cooling needs, Daikin Rental UK delivers reliable rental solutions, applications expertise, and responsive support. As a building owner, facilities engineer or manager, you are always planning for "what ifs." Not to mention grappling with actual building emergencies. Daikin rental UK equipment and temporary heating/cooling capabilities are at your service 24/7 throughout the UK. We offer complete support that includes everything you need – from chillers and Air Handling units to heat and power.



## We've got your back - Emergency rentals

We supply everything you need with your rental including pumps and other equipment:

When your equipment fails, limiting downtime is mission critical. That's why Daikin Rental UK provides quick delivery and installation of reliable rental products to help you weather the outage. We're here to help get you back up and running, and can provide a full turnkey solution.

- ✓ Industry-leading efficiency and proven technology
- ✓ 24-hour turnaround on available inventory
- ✓ 8-hour average set up with on-site experts
- ✓ Comprehensive package, including pumps, flexible water piping connections, and electrical hookups



## Temporary pre-planned rentals

Forming a contingency plan for an outage can help you quickly get operations back to normal, limit financial loss, and help you breathe easier when the unexpected happens. Selecting the right-sized equipment is just one part of the process. The best contingency plans start by assessing and understanding your financial risk, and then using this information to drive the rest of your plan. Our Rental Solutions experts can specify the supplemental cooling system required to support any situation you're experiencing.

- ✓ System maintenance
- ✓ Building expansion
- ✓ Heat generation from server rooms and IT equipment
- ✓ Seasonal load swings from weather or staff changes
- ✓ Contingency plans

# Daikin on Site

## active remote monitoring

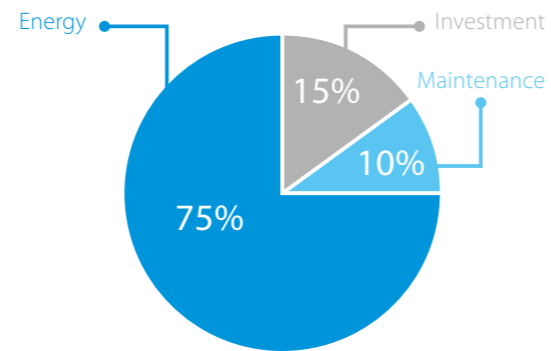
### What is Daikin on Site?

Daikin on Site (DoS) is a web-based 24/7/365 active remote monitoring system that collects complex operational data from the AHU or chiller control system.

Daikin's Smart Centre turns the operational data into useful information that allows the user to remotely monitor performance. It also allows Daikin professionals to remotely optimise and maintain the equipment.

### Lifetime cost of your system

Energy costs and maintenance typically account for 85% of the system's total lifetime cost. With DoS we can provide a preventative maintenance schedule to ensure maximum efficiency and reliability of your equipment, preventing costly downtime and major repairs and keeping your energy costs to a minimum.



Typical Life cycle Cost of a chiller (15 years)

### What you get with Daikin on Site

**Active monitoring and assistance**

- › 24/7/365 automated alarm via email
- › Remote diagnostic support from Daikin experts
- › Quick site assessment
- › Smart mobilisation of service personnel to site if necessary

**User friendly**

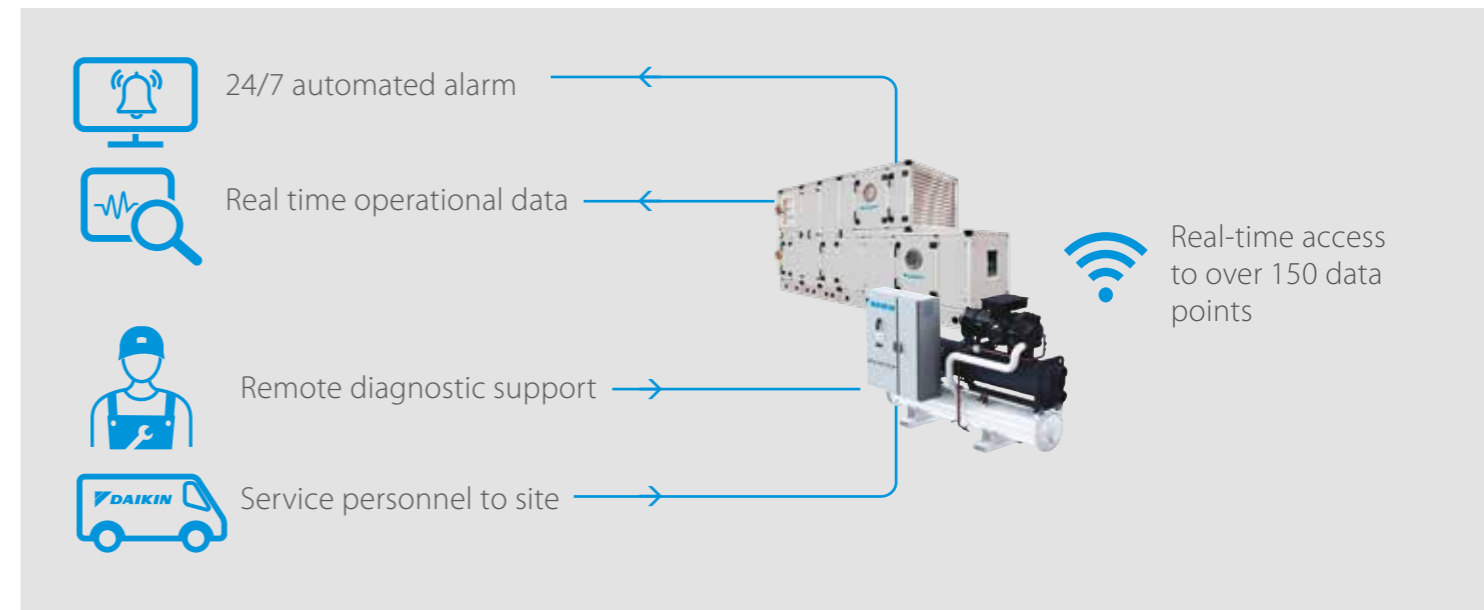
- › Access to DoS web app
- › Remote software upgrades
- › Interactive personalised dashboards

**Control and measuring**

- › Master / slave functionality
- › Real time operational data and trend insights 24/7/365
- › Life-cycle data log
- › Automated and tailored reports

**Efficiency and reliability**

- › Reduced operational costs
- › Optimised energy efficiency
- › Reduced waste
- › Reduced carbon footprint
- › Enhanced system reliability
- › Reduced system downtime



### How it works



#### Cloud technology to hand

Using cloud technology, process data is collected automatically in real time and stored centrally.



#### Simple, effective connection

Most Daikin Applied Chiller and AHU controllers allow connection through LAN or with a wireless modem.



#### Insight into operational data for enhanced control and reliability

Through enhanced operational data, Daikin engineers are able to remotely monitor system performance, run diagnostics and software upgrades. If an on-site visit is required, the service engineer will arrive already informed of the issue, reducing system downtime.

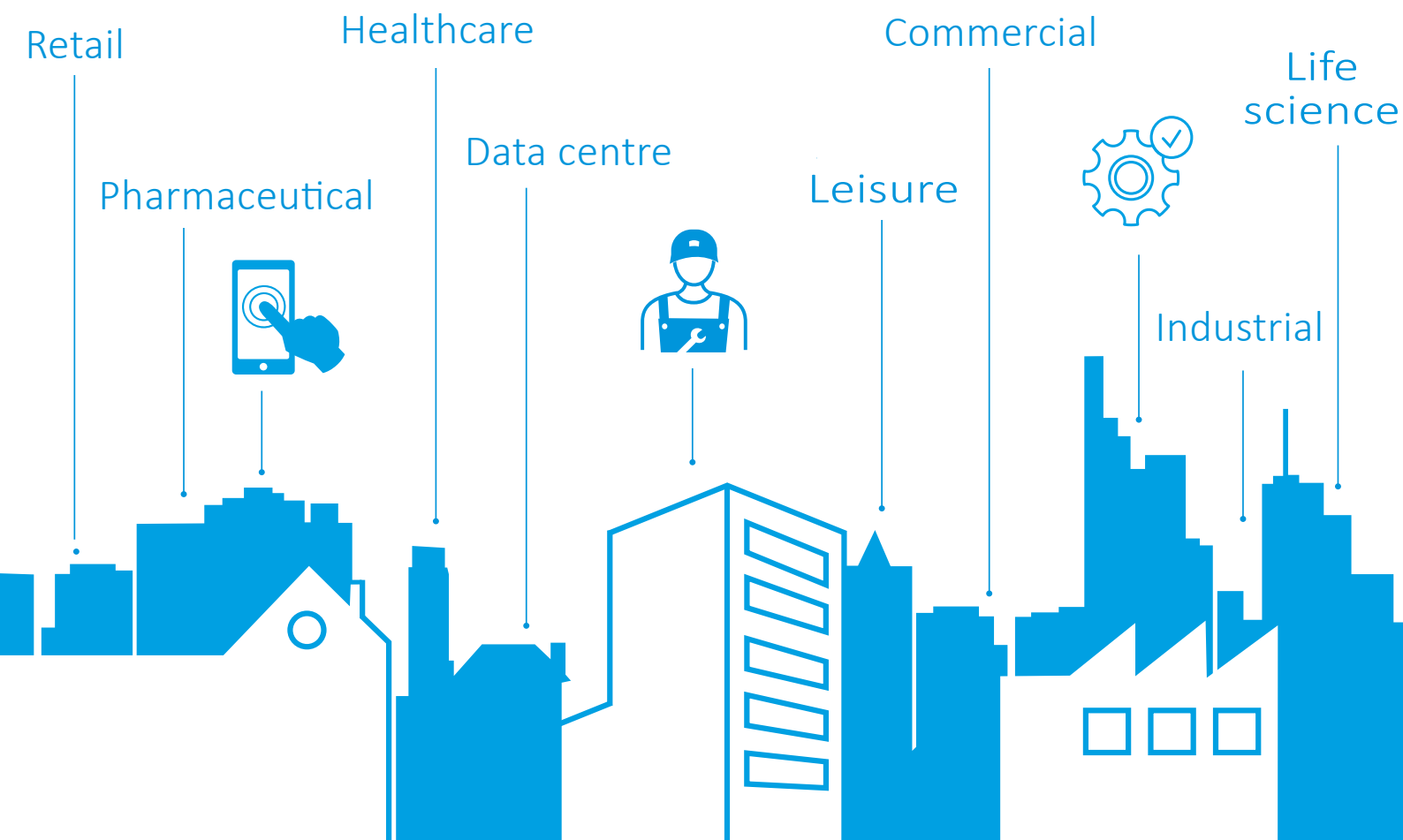


#### High security

Secure in all aspects such as data privacy, data storage security and data transport.

- › All connections are encrypted (HTTPS) to prevent wire-tapping and man-in-the-middle (MITM) attacks
- › CSA security attestation - security level 2.
- › EU General Data Protection GDPR compliant
- › Geo-redundant data storage in Northern Europe





For more information email [info@daikinapplied.uk](mailto:info@daikinapplied.uk) or visit [www.daikinapplied.uk](http://www.daikinapplied.uk)

For all Daikin Applied UK,  
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