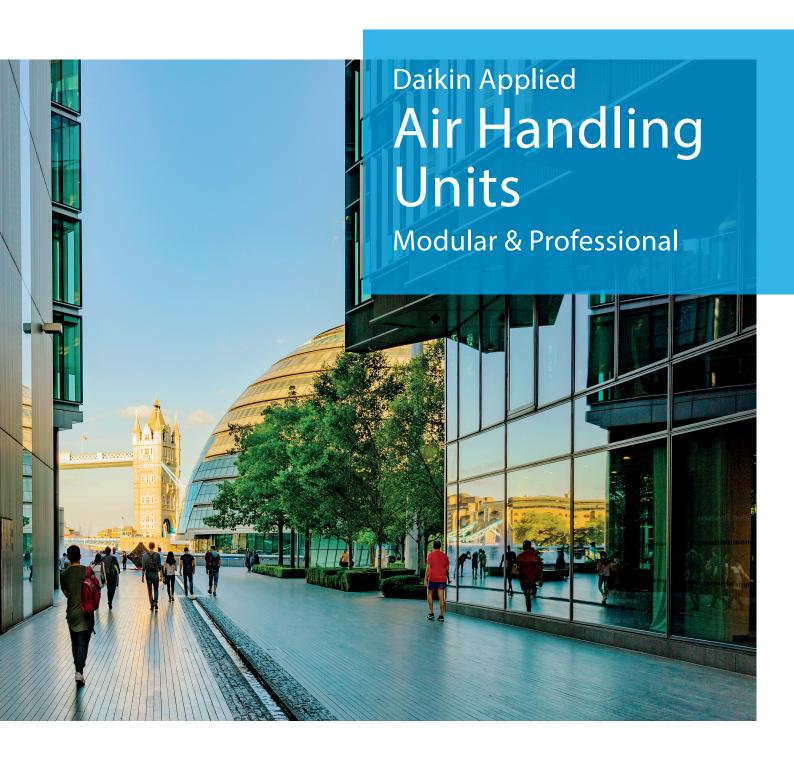


Technically better...



Optimal conditions through tailor made solutions

AHUs CHILLERS

PROJECTS

SERVICE

Daikin Applied

Air Handling Units

Daikin Applied Air Handling Units, with their plug-and-play design and inherent flexibility, can be configured and combined specifically to meet the exact requirements of any building, no matter what the application. Our systems are designed to be the most environmentally friendly and energy efficient on the market, thus reducing their ecological impact, whilst keeping costs down through the minimisation of energy consumption. Combined with the small physical footprint of the system, these features make our Air Handling Units ideal for all markets.

Why choose Daikin Applied Air Handling Units?

- > Maximum energy efficiency and indoor air quality
- > Wide range of functions and options
- High quality components
- > Innovative technology: Unique features and state of the art technology for short payback
- > Operational efficiency and energy savings
- > Outstanding reliability and performance
- Adaptable and versatile controls solutions for any application
- Unique Daikin Applied fresh air package available for connection of AHU to VRV or ERQ

Benefits for the contractor

- Simple precise commissioning through pre-programmed controller
- Reduced installation time thanks to internal electrical wiring and external terminal connections avoiding drilling into unit panels
- > Internal design team can provide bespoke and flexible controls options

Benefits for the consultant

- Quick selection tool in-house developed web software with improved user interface allowing for a professional report in a few clicks
- > Unlimited configuration options

Benefits for the end user

- Energy efficient controls, allowing the user to determine a wide range of settings, resulting in excellent operational flexibility
- Safe operation fully integrated electrical panel for units taller than 800mm
- > Tailor made AHU solutions to meet the specific customer needs



OUR AHU MANUFACTURING FACILITY



Daikin Applied (UK) Ltd has a large AHU manufacturing facility located in Cramlington, where a team of highly skilled engineers design and build a wide range of Air Handling Units. Our highly innovative and efficient Chillers are manufactured at our European Chiller manufacturing plant in Rome.

Daikin Applied's commitment to innovating beyond today
has resulted in proven solutions for commercial, industrial and
institutional buildings. Our expertise and continuous investments in
advanced technology and sustainability set Daikin Applied apart as
a proven partner.

AHU manufacturing facility: Cramlington

Office area: 450m2

Factory area: 5050m2

Total working area: 5500m2

Employees:108

Product capacity: 750 units(2018)



Facility includes:

> AHU Production

> Engineering & R&D

> Project Delivery

> Service, Maintenance & Spares

> Sales & Marketing

> HR & Finance



Applications

> Hospitals, theatres and laboratories

> Data centres; server and computer rooms; low, medium and high density applications

> Commercial cooling and heating; retail, office

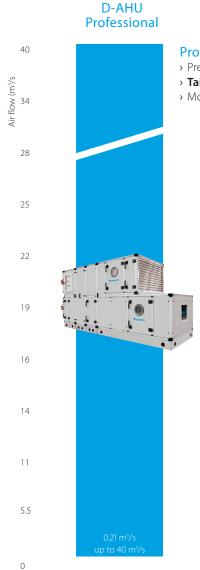
and leisure environments



OPTIMAL CONDITIONS THROUGH

TAILOR MADE SOLUTIONS

Optimum efficiency & air quality



Professional

- > Pre-configured sizes
- > Tailored to the individual customer
- > Modular construction

Modular R

- > Pre-configured sizes
- > Plug and play concept
- > EC fan technology
- > Heat recovery wheel (sorption and sensible technology)

Modular R

> Compact design

Modular P

- > Pre-configured sizes
- > Plug and play concept
- > EC Fan technology
- > High efficiency aluminium counter flow plate heat exchanger
- > Compact design

Modular L

- > Pre-configured sizes
- > Plug and play concept
- > EC Fan technology
- > High efficiency aluminium counter flow plate heat exchanger
- > Low height unit
- > For false ceiling applications







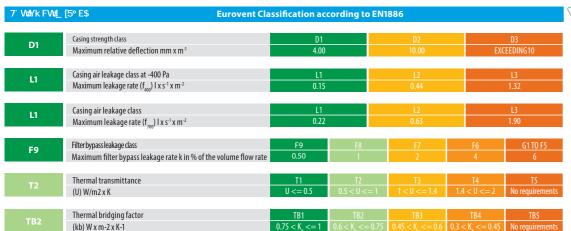
D-AHU Modular P



Eurovent certification

Daikin Applied Europe S.p.A. Participates in the Eurovent Certified Performance programme for Air Handling Units.

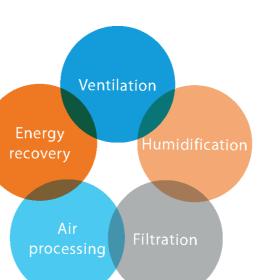
www.eurovent-certification.com or www.certiflash.com







DAMPER AND EC FAN





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
- > Humidification: Ensures relative indoor humidity levels are respected
- > Filtration: Separates pollen, dust and pollution odours that are harmful to individuals' health.



Modular L

High-end solution with heat recovery



From $0.03 \text{ m}^3/\text{s}$ up to $0.95 \text{ m}^3/\text{s}$

The new 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.

Features

- > Available in 6 sizes
- Compact design, with only 280mm height its ideal for false ceiling applications
- > Compliant with VDI 6022
- > Exceeding ERP 2018 requirement
- > Plug & Play Controls

Benefits

- Best choice when Compactness is needed (only 280 mm height up to 0.15 m³/s)
- > Easy installation and commissioning
- > Improve air quality
- > Lower running costs
- > Compact plug & play unit
- > Easy and quick installation & maintenance
- > User-friendly interface
- > Low noise
- > State of the art fan technology and plate heat exhanger

Heat exchanger

- > Premium quality counter flow plate heat exchanger
- > Up to 93% of the thermal energy recovered
- > High grade aluminum allowing high grade corrosion protection

	D-AHU Modular L		2	3	4	5	6	7	
Airflow	Nom.	m³/s	0.08	0.17	0.33	0.42	0.69	0.83	
Heat exchanger thermal efficiency ¹ . %			93	93	93	92	94	93	
External static pressure	Pa	100	100	100	100	100	100		
Current	Nom.	Α	0,52	1,17	1,91	2,48	4,39	5,39	
Power input	Nom.	kW	0,12	0,27	0,44	0,57	1,01	1,24	
SFPv ² .		kW/m³/s	1,24	1,49	1,25	1,31	1,42	1,46	
ERP compliant	ErP 2018 Compliant								
Electrical supply	Phase	ph	1	1	1	1	1	1	
	Frequency	Hz	50/60	50/60	50/60	50/60	50/60	50/60	
	Voltage	V	220/240 Vac						
Main unit dimensions	Width	mm	920	1100	1600	1600	2000	2000	
	Height	mm	280	350	415	415	500	500	
	Length	mm	1660	1800	2000	2000	2000	2000	
Rectangular duct flange	Width	mm	250	400	500	500	700	700	
	Height	mm	150	200	300	300	400	400	
Unit Sound Power Level (Lwa)			50	57	57	53	61	58	
Unit Sound Pressure Level		dBA	33	39	39	35	43	40	
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 m3/s up to 6.95 m3/s

Energy efficiency and indoor air quality

- > Predefined sizes
- > IE4 premium efficiency motor
- High efficiency heat wheel (heat recovery) (R) or plate heat exchanger (P)
- > 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
- > Remote monitoring and control avilable

EC Fan

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

Modular - P



From $0.13 \text{ m}^3/\text{s}$ up to $4.16 \text{ m}^3/\text{s}$

Quick and simple 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.

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 M	odular R	1	2	3	4	5	6	7	8	9	10
Airflow		m³/s	0.33	0.47	0.75	1.14	1.53	1.70	1.94	2.53	3.19	4.17
Temp. efficiency winter		96	81.30	76.60	76.90	77.20	76.80	77.10	78.10	77.20	77.20	77.90
External static pressure	Nom.	Pa	200	200	200	200	200	200	200	200	200	200
Current	Nom.	А	2.64	3.98	2.20	3.30	4.10	4.60	4.98	6.48	8.52	10.68
Power input	Nom.	kW	0.59	0.89	1.40	2.03	2.60	2.84	3.10	4.14	5.20	6.68
SFPv		kW/m³/s	1.78	1.88	1.86	1.78	1.70	1.68	1.60	1.64	1.63	1.60
Electrical supply	Phase	ph	1	1	3+N							
	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	Length	mm	1,320	1,320	1,540	1,740	1,740	1,920	1,920	2,180	2,460	2,570
	Depth	mm	1,700	1,700	1,800	1,920	2,080	2,280	2,400	2,450	2,280	2,400
	Height overall	mm	720	820	990	1,200	1,400	1,400	1,600	1,940	1,940	2,300
Weight unit		ka	325	350	475	575	750	790	950	1,330	1.410	1,750

D-AHU Modular P		1	2	3	4	5	6	7	8	9	10	
Airflow		m³/s	0.31	0.44	0.67	0.86	1.02	1.32	1.53	2.22	2.89	3.47
Temp. efficiency winter		96	93.9	93.6	93.2	93.1	93.1	93.1	93.1	93.3	93.1	93.1
External static pressure	Nom.	Pa	200	200	200	200	200	200	200	200	200	200
Current	Nom.	Α	1.75	2.51	1.28	1.67	2.09	2.69	3.04	4.14	5.88	6.97
Power input	Nom.	kW	0.40	0.58	0.89	1.15	1.45	1.86	2.11	2.87	4.07	4.83
SFPv		kW/m³/s	1.32	1.30	1.33	1.34	1.41	1.41	1.38	1.29	1.41	1.39
Electrical supply	Phase	ph	1	1	3+N							
	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	Length	mm	2,030	2,200	2,610	2,660	2,800	3,210	3,340	3,840	4,060	4,190
	Depth	mm	720	820	990	1,200	1,400	1,400	1,600	1,940	1,940	2,300
	Height overall	mm	1,320	1,320	1,540	1,740	1,740	1,920	1,920	2,180	2,460	2,570
Weight unit		kg	343	358	512	604	785	852	964	1,449	1,700	2,071

Notes

Base unit includes, G4/F7 filteration, foam insulation, Aluzinc internal skin and Aluzinc Pre-Painted external skin.

Ancillary modules include dual or single Silencers, Electric or LPHW Frost Coils, humidifier & various Heating/Cooling Coil Modules

Controls

Our AHU control system allows for more precise control than ever
The AHU control system can manage the chilled water coil, hot before, allowing the user to determine a wide range of settings, resulting in excellent operational flexibility.

The factory-fitted electrical control panel, complete with Direct Digital Control (DDC) is combined with in-built temperature, humidity and CO2 sensors to control mixing dampers, heat recovery wheels, water valves, pressure switches for filters and fans, fan motors and inverters.

water coil, DX cooling and/or heating coil(s) (in conjunction with ERQ/VRV) of single or multiple refrigerant circuits (up to a maximum of four circuits per DX coil).

Customised control systems

All Modular air handling systems come with a regulation and control system (with or without connection to a BMS). Professional AHU control system available on request.

The MicroTech III controller is designed to work with most applications. It can thus 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 on P.I.D. regulation, and constantly optimises the operating parameters of the air handling unit.

- > LCD display with 164 x 44 pixels.
- > 3-key control panel.
- > Rotating knob control for greater ease of use.
- > Memory for data backups.
- > Alarm relays for general types of incidents.
- > Password-controlled access for configuration changes.
- > Maintenance reports showing all run-time hours and general operating conditions.
- > Alarm log to facilitate the analysis of incidents.

The MicroTech III controller provides the option of controlling the set-points for ambient air temperature, air return and supply air, and the possibility of regulating air quality with the addition of a CO₂ probe. For additional information about these features, please contact your Daikin Applied representative.



The POL638 standard software has been customised to manage the control signals of Daikin's ERQ and VRV IV systems.

Flexible solutions

Tailored controls solutions for AHUs upon request, including:

- > Supply, fit and wire of complete controls system
- > Fit and wire of free issue controls > Fitting only of free issue controls
- Containment runs & penetrations
- > Supply, fit and wire of thyristor controls only
- > Supply only of controls for fitting and wiring on site

With range of different on site connection options to suit the installation needs:

- > AHUs shipped as single section (all controls complete monoblock – no internal wiring to be done on site)
- > Loomed back cables at section joins
- > Plug & socket on all controls/power cables at section joins
- > Ouick connector control panels

With full controls capability and flexible solutions to suit, Daikin Applied AHUs with Controls is a solution that will optimise performance and reduce on-site installation cost and time.

Daikin Applied fresh air package

Plug and play connection of AHU to Daikin Applied VRV and ERQ

The Daikin Applied fresh air package provides a complete solution, including all unit controls (expansion valve, control box and AHU controller) and sensors factory mounted and configured.

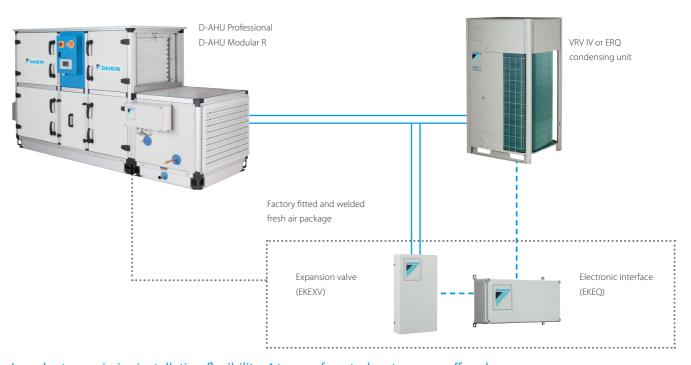
Higher efficiency

Daikin Applied 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 Applied 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.

Available as standard on AHU Modular systems and optional on all bespoke AHU Professional systems.



In order to maximise installation flexibility, 4 types of control systems are offered

W control: Off the shelf control of air temperature (discharge temperature, suction temperature, room temperature) via any DDC controller, easy to setup

X control: Precise control of air temperature (discharge temperature, suction temperature, room temperature) requiring a preprogrammed DDC controller (for special applications)

Z control: Control of air temperature (suction temperature, room temperature) via Daikin control (no DDC controller needed)

Y control: Control of refrigerant (Te/Tc) temperature via Daikin Applied control (no DDC controller needed)

AHU Professional

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.

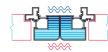
Flexible control solutions on plug and play solutions and bespoke AHU systems

- > Air temperature control
- > Chilled water and DX cooling system control
- > Free cooling
- > CO, 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)

Conventional design



Daikin Applied design



Supply side

- Damper section including louvres, factory mounted actuators
- Bag filter with factory mounted differential pressure manometer and hinged door as
- Heat recovery system (plate heat exchanger, run-around coils or thermal wheel)
- Mixing box with damper and factorymounted actuators
- R-410A with heat recovery system with galvanised condensate tray and drip protection
- Supply air fan (with hinged door, opening, drive monitoring, mounted and cabled lighting and ON/OFF switch)



Return side

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

- > Forward curved fan
- > Backward curved fan
- > Backward airfoil blades fan
- > Plug fan
- > EC plug fan
- > EC Fan Array (up 12 fans)

Exchangers

- > Water coils
- > Steam coils
- > Direct expansion coil
- > Superheated water coils
- > Electric coils

- > 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 coolin

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)

Supply air

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

> Roof

Accessories

> Control features

> Frost protection

> Magnehelics, > Minihelics

> Drive guard

10 11

ECONOMICAL SOLUTIONS

Bespoke Service & Maintenance Packages

Daikin Applied Service offers full after-sales support for the maintenance and repair of ALL brands of HVAC systems including, Chillers, Air Handling Units and Split Air Conditioning and VRV, as well as remote monitoring and management even for the most critical installations. Operating 24/7 throughout the UK, Daikin Applied Service offers world leading end-to-end service solutions for Facilities Managers and engineering professionals within the HVAC community. Daikin Applied Service are also well positioned to assist commercial clients with any Ground or Air Source Heat Pump service and maintenance requirements.

Service capabilities

- > Flexible maintenance contracts
- > 24/7 Emergency call out service
- > 4 hour response time
- > Site dedicated service engineers
- > F-Gas Register
- > Daikin on Site remote monitoring
- > On site training for 'front line' service requirements
- > Agreed service level requirements
- > Full chiller running logs taken on every service visit
- > Full spares availability & management
- > Retrofiting & refurbishments

Benefits

- > ALL manufacturers HVAC equipment maintained
- > Lower energy use for maintained systems
- > Reduce breakdown costs and business impact
- > Tailor made packages to suit your business needs
- > Extends the useful life-cycle of assets decreasing the need for capital replacements
- > Equipment downtime is decreased and the number of major repairs are reduced



REDUCE

Building Energy Costs

Complete service and energy solutions

Daikin Applied Service provides a range of service and maintenance packages which includes energy monitoring and retrofit solutions that are self financing with short term payback periods, where HVAC equipment replacement is not an option.

We can help to optimise your buildings' overall efficiency and energy performance through our range of service solution that incorporates managing plant replacement from project inception through to design, installation and commissioning, plus building energy rating surveys, as well as advice on best fit building management systems (BMS). With a bespoke Technical Service Solutions department we have full capability to meet any customer demand.

Pro-active maintenance

We understand that your HVAC equipment plays a crucial role in the smooth running of daily operations. Modern systems provide not only cooling, but heating, humidity control and air quality. All these factors are fundamental in providing an effective and efficient working environment. It is therefore vital that your equipment is operating at peak efficiency at all times.

Retrofitting and refurbishments

Many ageing AHUs and chillers can benefit from modernisation with upgrades and modifications to improve operation and efficiency, so that equipment can continue to provide years of dedicated cooling.

Where HVAC equipment replacement is not an option, we can optimise your buildings' overall efficiency and energy performance through a bespoke programme by:

- > Equipment servicing and surveys
- > Plant and equipment replacement
- > Installation and commissioning
- > Energy efficiency packages
- > Building energy rating surveys
- > Self-financing with short term payback periods
- > Building management system (BMS) advice

Health & safety

The health and safety of our people and customers is our number one priority. Our staff undertakes extensive, on-going training to ensure they understand how to create a safe working environment.

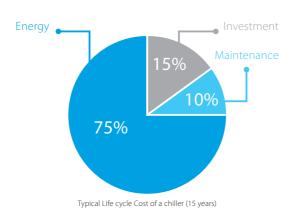


Daikin on Site

Operating costs like energy and maintenance typically account for 85% of the system's total lifetime cost. Undiscovered energy waste and incorrect operation will increase costs and can even lead to unscheduled interruptions.

Using Daikin Applied's remote monitoring results in optimum use and costs over the system's entire lifetime:

- > Enhanced control and measuring
- > Monitors the system
- > Reduces risks at the earliest possible moment
- > Keeps the system running as it was intended to



What is Daikin on Site?

A solution for customer specific needs

Daikin on Site (DOS) remote cloud server collects operational data from the control system of a Daikin Applied Chiller or Air Handling Unit plant.

Daikin Applied's Smart Centre then turns this data into useful on a web user interface.

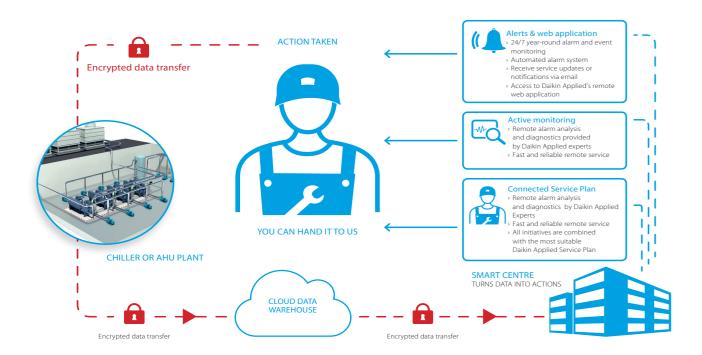
Daikin Applied's remote monitoring has predefined user roles like:

- > Operator
- > Service provider
- > Daikin Applied specialists

Features

- > Increase uptime, reduce unscheduled interruptions
- > Optimise efficiency and reduce energy waste
- > Increase lifetime and avoid wear by misuse
- > Gives insight into the optimum use of equipment, including advice from Daikin Applied expert's

We will combine Daikin Applied's remote monitoring with complementary service programme best suited to your needs.





Main features

- > Increase uptime, reduce unscheduled interpretations with real time information
- > Optimise efficienty and reduce energy waste
- > Insight into the optimum use of equipment via trend analysis



Cloud technology to hand

Remote maintenance allows your system to be accessed any time, anywhere. All important process data collected constantly and automatically stored centrally. This gives you a decisive lead in know-how, ideal for building a sustainable business.





Always up-to-date and in control

Standard web browsers, so it's suitable for any webcompatible devices and it operates in real time.



Insight into operational data for enhanced control and reliability

Daikin Applied's remote monitoring enhances control and maintenance programmes. Diagnostics, system upgrades and settings optimisation are carried out remotely where possible. If a visit is required, the service engineer will arrive already prepared, boosting your efficiency.



Available as part of the Daikin Applied Service Business Plus package

Daikin Applied Service can adopt DoS as part of their condition based maintenance packages, offering tailored monitoring programs within the Business Plus package, refer to our service brochure for more information.



Simple, effective connection

Most Daikin Applied Chiller and AHU controllers have a built-in IP interface. This allows connection for remote monitoring either through LAN or with wireless modem communication.



High security

You can trust Daikin Applied's remote monitoring to be secure in all aspects such as data privacy, data storage security and data transport.

- > All connections are encrypted (HTTPS) to prevent wiretapping and man-in-the-middle attacks
- > CSA security attestation
- > Data privacy conforming to EU data privacy
- > Geo-redundant data storage in Northern Europe

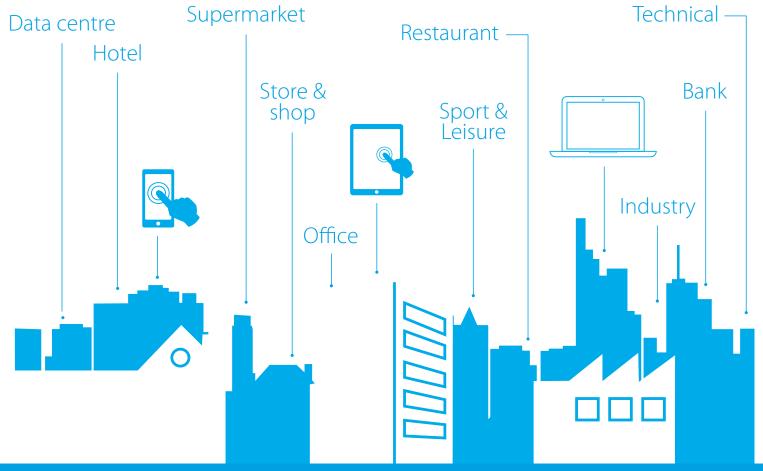


Operational data insights deliver long-term

Daikin Applied's remote monitoring is the ideal tool for optimising maintenance and operating costs long term, and for giving you a documented view of your system's capacity requirements.

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For more information email info@daikinapplied.uk or visit www.daikinapplied.uk

For all Daikin Applied UK, Daikin Applied Service & Spares enquiries call us on:

0345 565 2700



Chilling Packages (LCP), Air handling units (AHU), Fan coil units (FCU) and variable refrigerant flow systems (VRF) Check ongoing validity of certificate online: www.eurovent-certification.com or using: www.certiflash.com

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