

Technical Submission



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Ref:

P01

Project Name:	New Road Triangle
Tech Sub No.	T4261-M02
Date Submitted:	27/09/2022
Issued to:	NRT Team
Submitted By:	Ashley Cooper

Tech Sub Title:	Internal Heat Pumps
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Items For Approval (Description):

Apartment - Daikin Altherma 3 WS Internal Heat pump

Please Respond By:

04.10.2022

Signed:

A. Cooper

Please select one of the below and provide comments if applicable

		✓
Status A - The above item(s) has been reviewed and is accepted:		
Status B - The above item(s) has been reviewed and is accepted subject to the following comments:		
Status C - The above item(s) has been rejected for the following reasons:		

Signed:

Date:

On Behalf Of:

Daikin Altherma 3 WS for Collective Housing



Economy, efficiency and environmental performance - all in one



Daikin Altherma 3 WS for Collective Housing provides an innovative approach to reducing the carbon footprint of apartment buildings. Individual heat pumps deliver economical heating, hot water and optional cooling for each apartment connected via a central water loop. So use of renewable energy is optimised and heat losses in distribution are minimised, improving the environmental performance of the apartment building.

The number of people living in urban areas is continuously increasing in the recent years. Multi-family dwellings in Europe are a good portion of the European building stock. Especially if we consider that, in 2018, 46.0 % of the EU-27 population lived in flats. (*) Therefore, apartment buildings are among the most relevant contributors to the energy consumption and CO₂ emissions of the EU building sector.

As a consequence, the higher demand for living space makes the collective building sector grow in the future cities. Building sector plays a significant role for the energy consumption as it represents 40% of energy used in the EU.

New European Directives are driving the efficiency of modern buildings in order to reach future goals. In this perspective, heat pumps play a key role to achieve these goals not only in single dwellings but also in multi-family apartment buildings.

Daikin, the innovation leader for more than 90 years, takes the challenge in multi-family apartment building to apply full renewable solutions based on in-house heat pump technology. From low to high-rise apartment buildings, from individual to centralized heating systems, from retrofit to new built Daikin has the units, the experience and the solution for you.

(*) https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Living_conditions_in_Europe_-_housing_quality

Daikin Altherma 3 WS

for Collective Housing

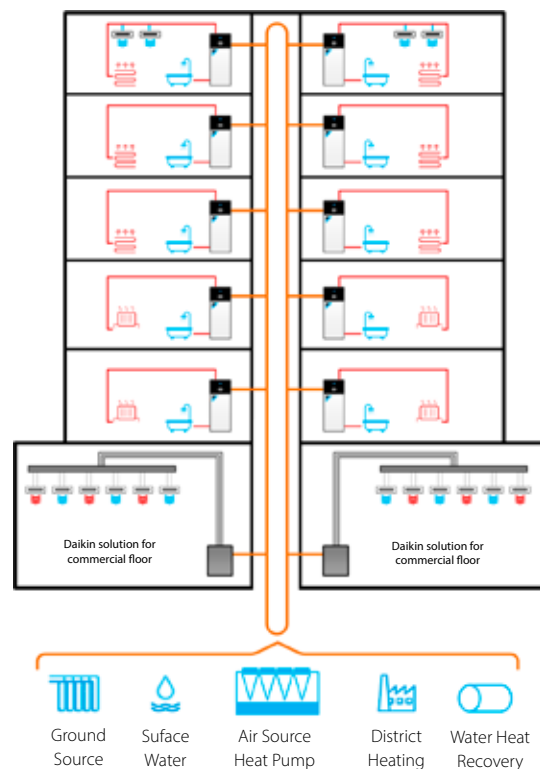
Individual heat pumps connected to a central loop

This innovative system consists of a network of heat pumps connected to a common central water loop. In each apartment is a Daikin Altherma 3 WS unit - a high-efficiency water-to-water heat pump with integrated domestic hot water (DHW) tank.

The heat pump in each apartment works independently, but is connected to a common central water loop to form a communal system. The central water loop must be maintained between +10°C and below +30°C. Thanks to this wide temperature range, the central water loop can be warmed/or cooled via several different means:

- › Ground or air source heat pump
- › Shared ground array, borehole or thermal piles
- › Surface water source such as a river, canal or seawater
- › District heat network
- › Waste heat recovery

This offers the designer full flexibility to select the most appropriate form of renewable energy available to the site: ground, water or air



Low ambient temperatures for minimal heat loss

This highly efficient heat pump network can provide economical heating, hot water and optional cooling for an entire apartment building at relatively low ambient water temperatures.

Compared with the high distribution losses that occur in typical communal heating systems - which lead to overheated buildings and wasted energy - the low ambient loop means that heat losses are reduced by more than 90%. Hence it is a much more economical solution, that reduces the carbon footprint of the entire building.

Key system advantages:

- Utilises renewable (or recovered) energy
- Low carbon heat pump solution delivers significant CO₂ reductions over traditional systems
- Low carbon solution helps reduce carbon offset payments
- Energy centre not required, saving valuable space
- Heating, hot water & cooling via a 2 pipe network offers capital savings over a traditional 4 pipe solution
- Intuitive user controls and internet connectivity as standard
- In-apartment heat pump has integrated back up heater, so heating & hot water is maintained in any eventuality.
- Simplified connection with water loop thanks to the embedded pressure independent control, for automatic flow from the heat pump
- Pressure rating of 16 bar (water loop side) to simplify installation in high-rise buildings: no need of pressure breakers up to 20 floors

Designed to suit modern living



Optimised for comfort

With a leaving water temperature up to 65°C and high efficiencies, the Daikin Altherma 3 WS is designed to ensure the lowest running costs and highest comfort levels for each apartment.



Versatility by design

Daikin Altherma 3 WS is highly versatile and works with various heat emitters, such as radiators, underfloor heating, heat pump convectors or fan coil units for maximum design flexibility.



All in one integrated model

The floor standing indoor unit with integrated DHW tank has a minimal footprint, utilising as little floorspace as possible.



Delivering decarbonisation

Compared with a typical Combined Heat & Power (CHP) and boiler system often used in apartments, the Daikin Altherma 3 WS system delivers a reduction in carbon emissions of 143 tonnes.¹



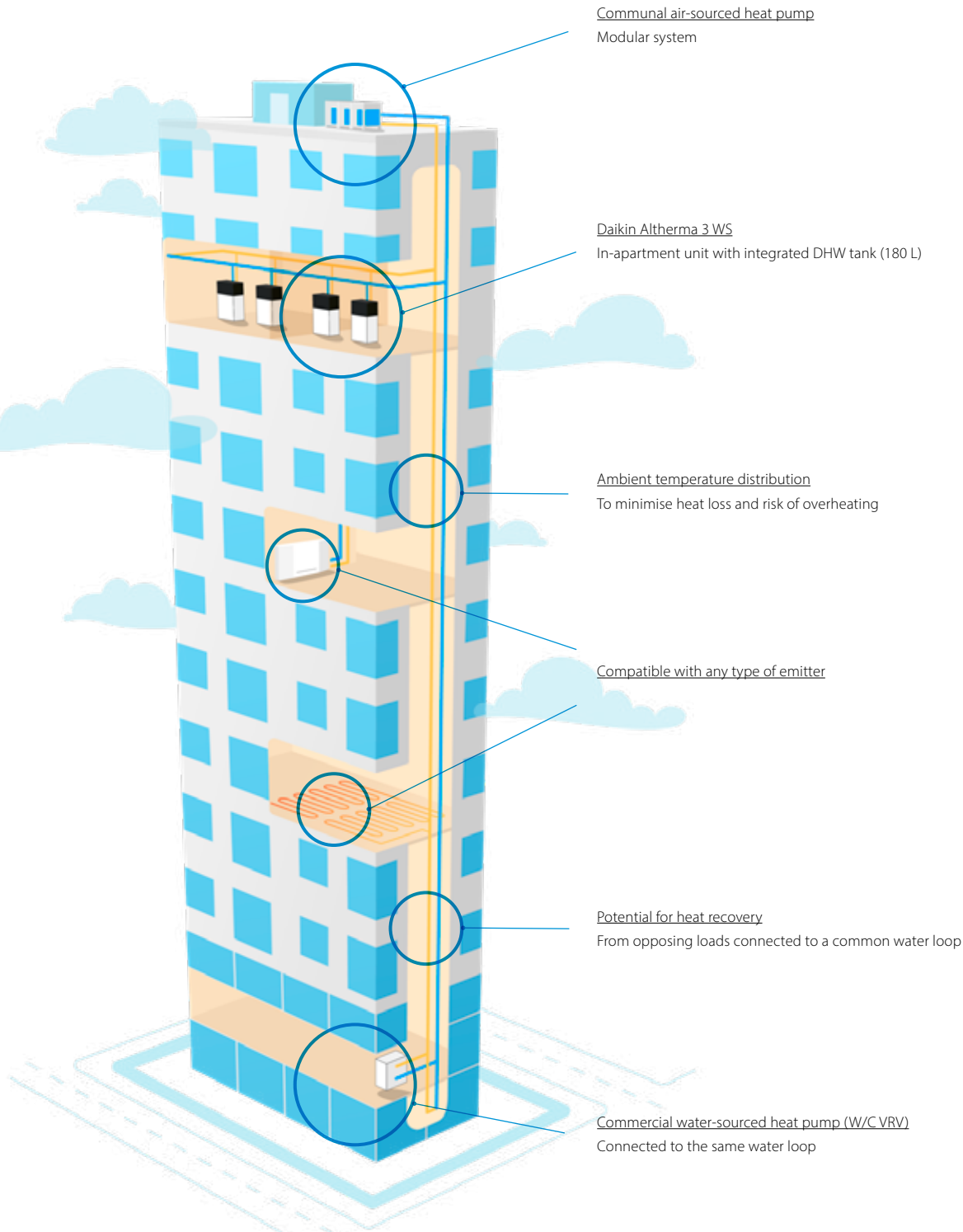


Reduction in capital costs

With a low temperature water loop connected to a heat pump chiller on the roof or in the plant rooms, plus a Daikin Altherma 3 WS unit in each apartment linked to Daikin heat pump convectors or fan coil units, the total system will deliver lower carbon emissions compared with a typical heating system. This could reduce a developer's carbon offset payments, so delivering a low carbon heating and cooling system makes both excellent environmental and economic sense.

BLUEEVOLUTION

Heat pump technology reduces carbon emissions compared with any traditional fossil fuel heating system. But the Daikin Altherma 3 WS goes further to reduce the Global Warming Potential (GWP) of system, as it features Daikin's Bluevolution technology which uses R-32 refrigerant. R-32 has a lower GWP than other refrigerants typically used in heat pump systems - and less refrigerant is required too - so it's more environmentally friendly overall.

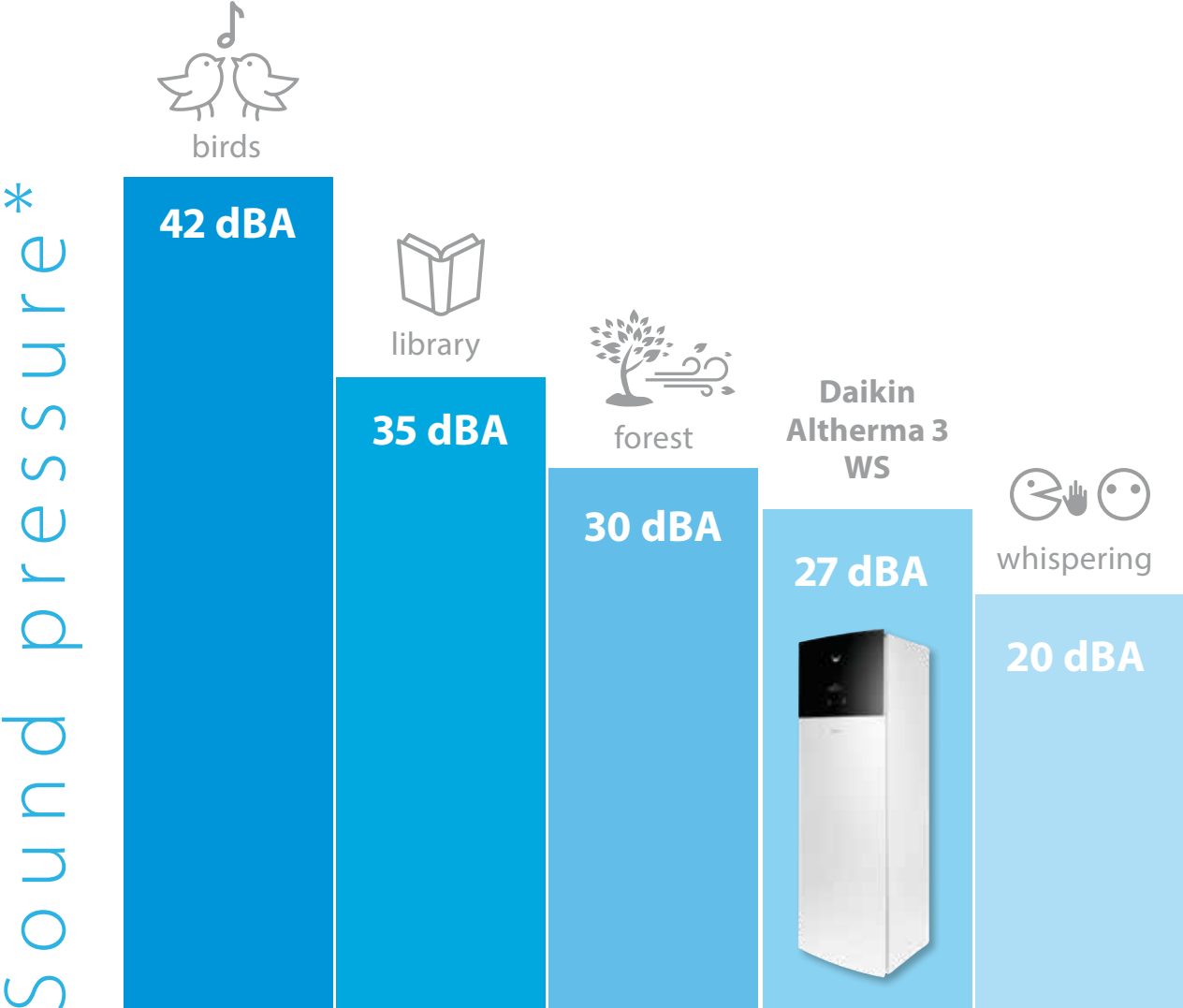


¹ Based on a block of 277 apartments with a Combined Heat & Power (CHP) system and Heat Interface Units (HIU) with CHP thermal efficiency of 48% and electrical efficiency of 32%, 60% CHP / 40% boiler, compared with a Heat Pump with a SCOP of 3.7 based on SAP2012

Caring for customers' peace of mind

Daikin Altherma 3 WS promises almost silent operation, thanks to a specially designed swing compressor module, which limits vibrations and is sound insulated, to minimise noise levels.

Exceptionally quiet operation



*at 1 meter.

Always in Control

Daikin offers a range of control options, so residents can enjoy full control of their heating system, anywhere, at any time.



Smart control

Daikin' smart control offers the end user full control of the heating and hot water system, as well as saving money on energy bills, thanks to Daikin's modulating room control logic.

Madoka for heating

Increase end user energy savings even further, with the elegant Madoka controller. Madoka ensures a more stable room temperature, by adjusting the water temperatures depending on room temperature requirement, as well as reducing on/off cycling times.



BRC1HHDW



BRC1HHDS



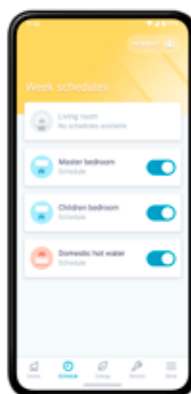
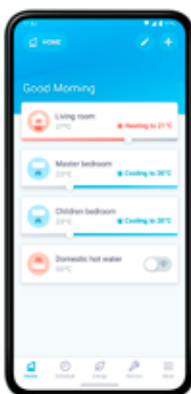
BRC1HHDK

- ✓ Sleek and elegant design
- ✓ Match any interior scheme
- ✓ Easy to use with intuitive controls



Onecta app

The Daikin Residential Controller is a smart phone app that allows end users to monitor and control their heating system, whenever and wherever they wish.



-  Monitor the status of the heating system
-  Control the operation mode and set temperature
-  Schedule the set temperature and operation mode

Quick and easy installation



Each apartment unit consists of a sealed R-32 low GWP heat pump, a highly insulated, integrated DHW tank and an electrical back up heater, so no F-gas qualifications are required to install and service the unit. Installation and servicing are quick and easy too, thanks to a small footprint, factory-fitted piping on top of the unit, and a swappable hydro module.

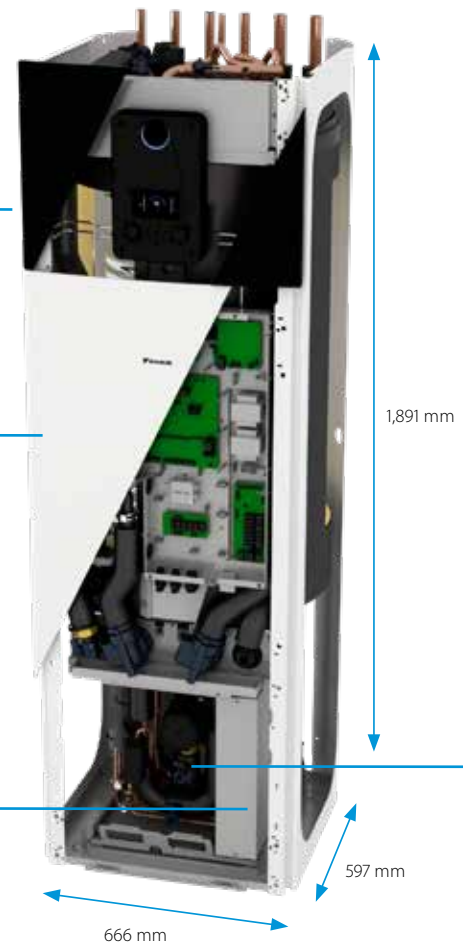


All pipe connections
on top, paired in
and out

Standard electrical
connections pre-cabled



Removable compressor module
reduces the overall weight by 70 kg



Intuitive interface

The Daikin Eye

The intuitive Daikin Eye shows in real time the status of the system.



Blue:

When the Daikin Eye indicates a blue colour, it means the boiler is functioning properly. The Daikin Eye will flash on and off when it's running on stand by mode.



Red:

When the Daikin Eye indicates a red colour, it means the boiler is out of commission and requires a maintenance check.



Quick to configure

Log in and you'll be able to completely configure the unit via the new user interface in 9 steps. You can even check if the unit is ready for use by running test cycles. You can upload the settings on a USB stick and download it directly into the unit, or via the cloud.

Easy operation

Work super-fast with the new user interface. It's easy to use with just a few buttons and two navigational knobs.

Beautiful design

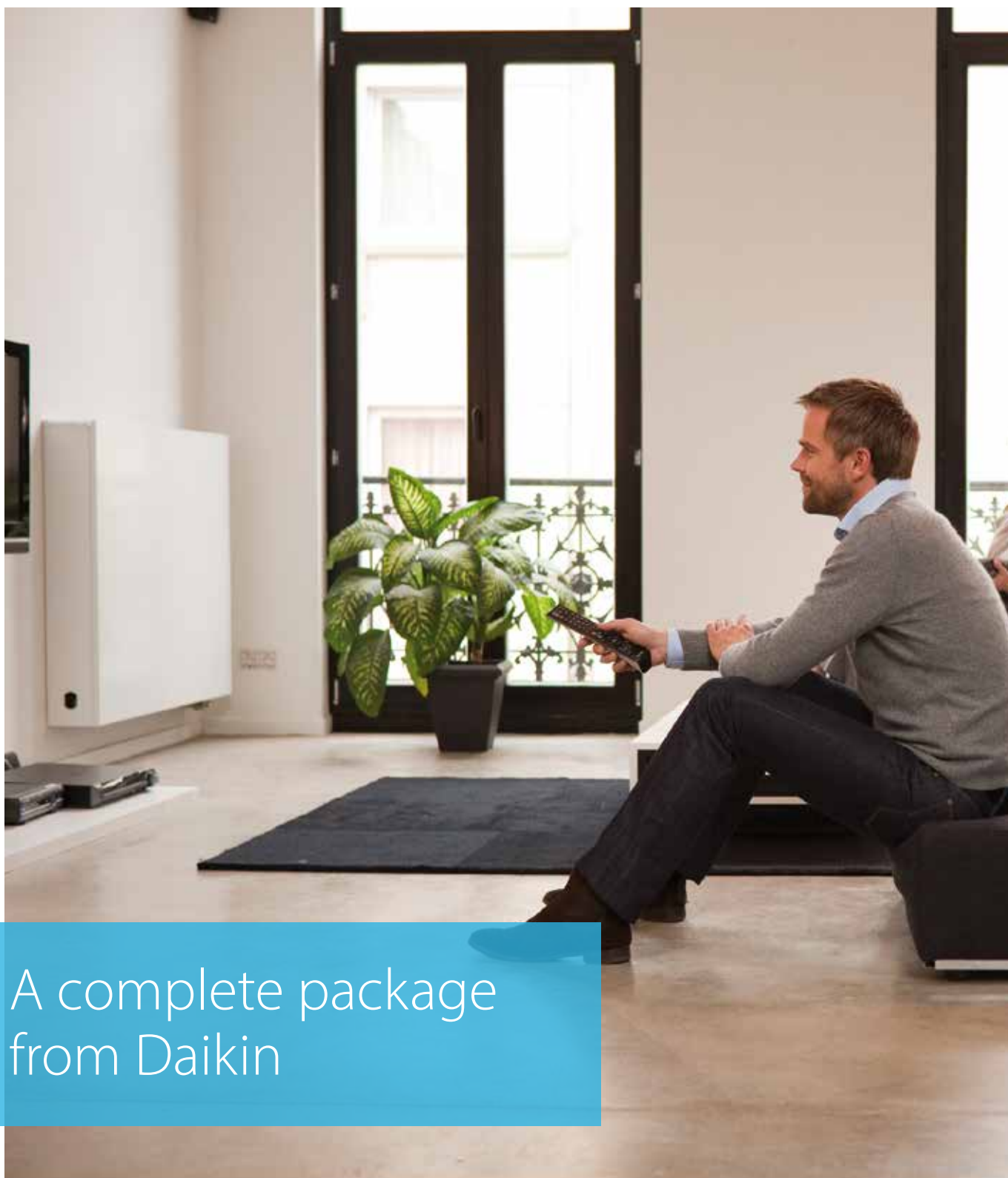
The user interface is especially designed to be very intuitive. The high contrasted colour screen delivers stunning and practical visuals that really help you as installer or service engineer.

Can be installed easily in confined spaces thanks to a small footprint and integrated handles



16 bar pressure rating of all hydraulic components on water loop side, to best fit high-rise buildings

Factory fitted pressure independant control valve for flow regulation from the common water loop (design flow: 9,6 L/min)



A complete package from Daikin

The beauty of the Daikin Altherma 3 WS system is that each in-apartment heat pump can connect to a wide variety of heat emitters and controls, all of which can be provided as a complete package by Daikin. This ensures seamless integration and consistency of the heating solution within each apartment.

Similarly, the communal water loop can be powered by range of different heat pump solutions. And once again, Daikin can offer a wide range of water source heat pumps, 2 and 4 pipe air source heat pumps, in an even wider range of configurations, to provide the central energy source for the collective heating system.

So for a highly efficient system that reduces the carbon footprint and offset payments of your apartment building, Daikin has the total solution.



EWSA(H/X)-D9W for Collective Housing

Indoor Unit				EWSA	H06D9W	X06D9W
B0/W35	Heating capacity	Nom.		kW	6.44	
	Power input	Max.		kW	1.67	
	COP				3.85	
W10/W35	Heating capacity	Nom.		kW	6.13	
	Power input	Nom.		kW	1.15	
	COP				5.33	
W10/W55	Heating capacity	Nom.		kW	5.61	
	Power input	Nom.		kW	1.72	
	COP				3.27	
W20 / W35	Heating capacity	Nom.		kW	6.17	
	Power input	Nom.		kW	0.82	
	COP				7.49	
W20 / W55	Heating capacity	Nom.		kW	6.30	
	Power input	Nom.		kW	1.48	
	COP				4.26	
W25 / W35	Heating capacity	Nom.		kW	5.80	
	Power input	Nom.		kW	0.6	
	COP				9.62	
W25 / W55	Heating capacity	Nom.		kW	6.36	
	Power input	Nom.		kW	1.35	
	COP				4.71	
Space heating according to EN14825 and EN14511:2018	Average climate	ηs (Seasonal space heating efficiency)	%	158		162
	Water in 10°C	Efficiency class			A+++	
	Water out 55°C	sCOP		4.15		4.24
	Average climate	ηs (Seasonal space heating efficiency)	%	253		260
	Water out 35°C	Efficiency class			A+++	
Space heating according to real application conditions	Average climate	Average space heating efficiency	%		360.4	
	water in 20°C	Average COP			9.21	
Space cooling W30 / W7	Cooling capacity	Nom.		kW	-	5.81
	Power input	Nom.		kW	-	1.38
	EER				-	4.21
Space cooling W30 / W18	Cooling capacity	Nom.		kW	-	6.11
	Power input	Nom.		kW	-	1.21
	EER				-	5.07
Domestic hot water	General	Declared load profile			L	
	Average climate	ηwh	%		115	
Casing	Colour	Efficiency class			A+	
	Material				White + Black	
Dimensions	Unit	Height x Width x Depth	mm		1,891 x 597 x 666	
Weight	Unit		kg		222	
Hot water tank	Material				Stainless steel (EN 14521)	
	Water volume		l		180	
	Insulation	Heat loss	kWh/24h		1.2	
Operation range	Corrosion protection				Pickling	
	Installation space	Min.~Max.	°C		5 / 35	
	Water inlet	Min.~Max.	°C		-10 / +30	
	Heating	Water side	Min.~Max.	°C	5 / 65	
	Domestic hot water	Water side	Min.~Max.	°C	25 / 60	
Refrigerant	Type				R-32	
	GWP				675	
	Charge		kg		1.70	
	Charge		TCO ₂ Eq		1.15	
Water loop side	Pressure rating		bar		16	
Design flow rate	Independent control valve		l/min		9.6	
Sound power level	Nom.		dBA		39.0	
Sound pressure level at 1 meter	Nom.		dBA		27.0	
Power supply	Name/Phase/Frequency/Voltage		Hz/V		3~/50/400 or 1~/50/230	
Current	Recommended fuses		A		3P 16A or 1P 32A	

Accessories

Type	Description	Product name	Note
Controller	Madoka wired room thermostat	BRC1HHDK/S/W	
	Wireless room thermostat	EKRTR1	
	NEW wireless room thermostat	EKRTR1B	
	Wired digital thermostat	EKRTRWA	
	LAN Adapter	BRP069A61	Equivalent of BRP069A61 built-in.
Sensors	Daikin Altherma Modbus Gateway	DCOM-LT/MB-IO	
	Remote indoor sensor	KRCS01-1	
	External sensor for EKRTR	EKRTERS	Can only be used in combination with the wireless room thermostat EKRTR1
	Dew sensor for underfloor cooling applications	EKRTERSb	Can only be used in combination with the wireless room thermostat EKRTRB
Heat pump convector	Current sensor	EKCSNS	
	Floor standing / wall mounted / concealed	FWXV/T/M*	Multi combination (quantity, depends on capacity class). EKVHPC needs to be installed mandatory on heat pump convectors (exception: LT - H/O)
Other options	Digital I/O PCB	EKRTR1HBA	Additional relays to allow bivalent control in combination with external room thermostat are field supply.
	Demand PCB	EKRTR1AHTA	
	Power cable for back-up heater	EKGSPOWCAB	
	Fernox magnetic filter 1"	K.FERNOXTF1	
	Fernox magnetic filter 1" and F1 inhibitor fluid (500ml)	K.FERNOXTF1FL	
	G3 kit 8 liter	EKUHWG3DS	For UK, mandatory combination. Recommended option.
	G3 kit 18 liter	EKUHWG3D	For UK, mandatory combination. Alternative to EKUHWG3DS.



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