

# Air Handling Unit kits for connection to DX outdoor units EKEACB/EKEXVA



Expansion valve kit and control box for easy connection between  
DX outdoor unit and air handling unit

- › Create an optimal indoor comfort for commercial spaces
- › Integration of an AHU into a DX system ensures a fast response to changing loads, high energy efficiency and easy design
- › No space is too small or too big with expansion valve kits ranging from 5 up to 69.3 kW
- › Future proof system minimising carbon footprint
- › Customised control possibilities thanks to five different control algorithms

# Why use DX outdoor units with Air Handling Units?



## High comfort levels

- › Rapid response of supply air temperature to changing loads, results in a steady indoor temperature
- › VRV offers the ultimate comfort thanks to continuous heating, also during defrost

## Low carbon footprint and operating costs

- › DX heat pumps are highly efficient inverter units using a lower GWP refrigerant
- › By integrating a VRV heat recovery system, excess heat from rooms in cooling can be reused to heat up incoming fresh air

## Easy design, all components integrated

- › A DX system is an all-in-one system, no boilers, tanks or pumps are needed reducing the total investment cost

## One-stop shop, Daikin's fresh air package

- › A plug & play package with a Daikin DX outdoor unit and Daikin Air Handling Unit
- › One point of contact for the design, installation and commissioning, streamlining the process

## Total solution operation example



# Daikin Air Handling Unit kits for connection to DX outdoor units

**R-32**

## NEW Expansion valve kits

- 3 new capacities (300,350,400) offer a complete range of expansion valve kits from 5 to 69.3kW
- Improved flexibility thanks to combination ratio from 65% up to 110%
- Unified range connectable both to R-32 and R-410A systems
- Can be used in the most extreme outdoor conditions, down to -20°C
- Fully compliant to IEC60335-2-40, thanks to Shirudo Technology

5.0 kW ← → 69.3 kW

← →  
-20°CWB 52°CDB

## NEW Control box

- Complete offer of 5 control possibilities
  - Daikin integrated or third-party controller
  - Control of return air or fresh air supply temperature
- All control methods unified in one box
- Hinged door for easy servicing

Unified control box



### Expansion valve set (EKEXVA\*)

- Controls the refrigerant flow in the AHU DX coil
- Fully brazed and wired in case of a Daikin AHU



### Control box (EKEACB)

- Controls the expansion valve set and outdoor unit(s) capacity
- Mounted and wired in case of a Daikin AHU



## Specifications

### EKEA – Expansion valve kit

Ventilation		EKEXVA		50	63	80	100	120	140	200	250	300	350	400	450	500
Dimensions	Unit	mm		404x217x80.5												
Weight	Unit	kg		2.9												
Operation range	On coil temperature	Heating	Min.	°CDB 10.0												
		Cooling	Max.	°CDB 35.0												
Ambient installation conditions	Min.	°CDB		-20.0												
	Max	°CDB		52.0												
Sound pressure level	Cooling	Nom.	dBA	36.5	37.5	38.6	39.5	40.5	41.1	42.5	43.5	44.3	45.1	45.6	46.1	46.5
	Nom.		dBA	24.8	25.8	26.8	27.8	28.8	29.4	30.8	31.8	32.5	33.3	33.8	34.3	34.8
Refrigerant	Type / GWP			R-32 / 675    R-410A / 2,087.5												
Piping connections	Liquid	Type	mm	Braze connection (only liquid line connected)												
	OD		mm	6.35				9.52				12.7				

### EKEACB – Control box

			EKEACB		
Layout			Pair   Multi   Mix		
Dimensions	Unit	mm	300x400x150		
Weight	Unit	kg	5.1		
Ambient installation conditions	Min	°CDB	-20		
	Max	°CDB	52		
Power supply	Phase		1~		
	Frequency	Hz	50/60		
	Voltage	V	220-240/220		

Click more information on [EKEA](#) or [EKEXVA](#) outdoor units



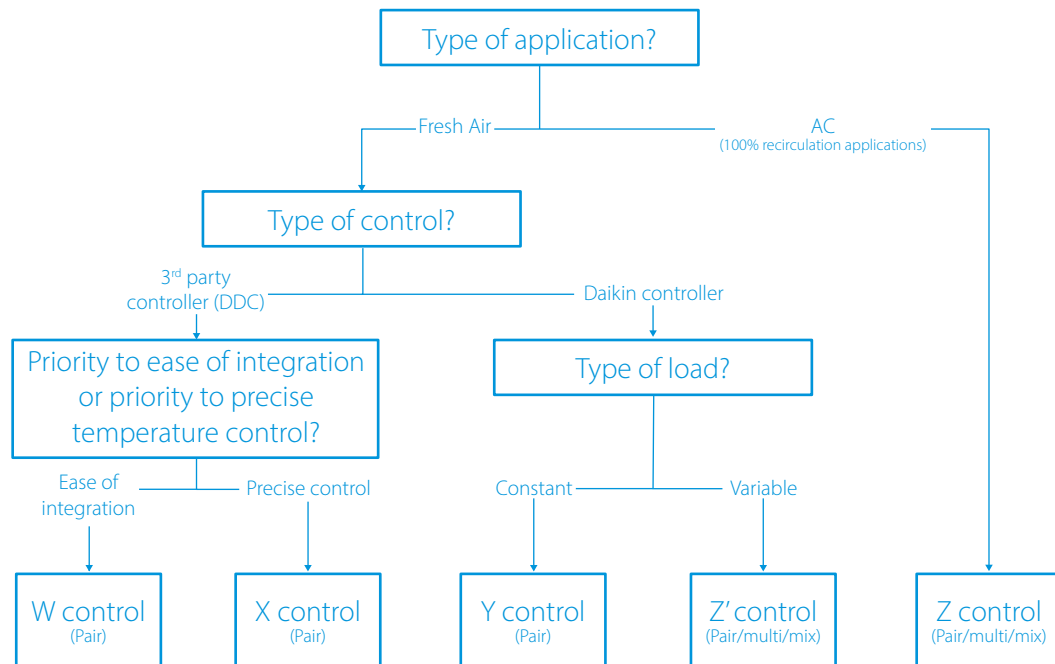
# Air Handling Unit kits - Control possibilities

Every application is different.

Is there a constant load or not, how to control your temperature and which controls are available?

**With our complete offering of 5 control possibilities**, anything is possible.

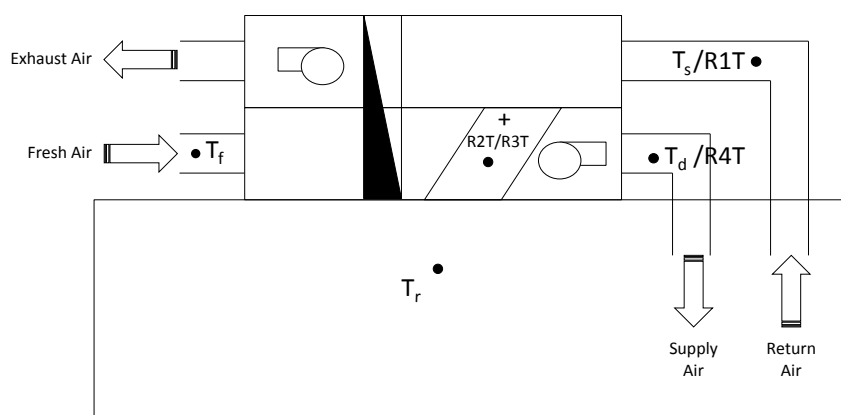
Flow chart to select your control type



Control type benefits	Sensor Used	Controller
<b>W control – control of supply or return air temperature</b> <ul style="list-style-type: none"><li>› <b>Responds to load variation</b> (capacity is changed as a function of measured temperature, but slower than X- control)</li><li>› <b>Air temperature control</b></li><li>› <b>Easy to integrate</b>, as <b>no additional programming</b> is needed for most standard AHU controllers</li></ul>	<b>Td, Ts/f or Tr</b> (field supplied)	External controller (DDC) using a proportional 0~10 V signal for capacity control <b>(5 steps)</b>
<b>X control – control of supply or return air temperature</b> <ul style="list-style-type: none"><li>› <b>Fastest response to load variation</b> (capacity is immediately changed as a function of measured temperature)</li><li>› <b>Precise air temperature control</b></li><li>› <b>Ideal for comfort sensitive applications</b>. This is also used <b>by default</b> in Daikin AHU controls</li></ul>	<b>Td, Ts/f or Tr</b> (field supplied)	External controller (DDC) using a proportional 0~10 V signal for capacity control <b>(Stepless)</b>
<b>Y control – control of evaporating/condensing temperature</b> <ul style="list-style-type: none"><li>› <b>Cost effective and simple solution</b>, no additional DDC controller required</li><li>› <b>Fixed evaporating/condensing temperature</b>, no direct temperature control</li><li>› <b>Ideal for applications with a constant cooling/heating load</b></li></ul>	<b>R2T/R3T</b> (Daikin supplied)	<b>3rd party thermostat</b> (Daikin controller for field settings)



## Sensors used



### Legend

$T_d$  : discharge (supply) air temperature  
 $T_s$  : suction (return) air temperature  
 $T_f$  : fresh air temperature  
 $T_r$  : room air temperature  
 $R2T/R3T$  : Refrigerant (liquid/gas line) temperature

Control type benefits	Sensor Used	Controller
<b>Z' control – control of supply air temperature</b> <ul style="list-style-type: none"> <li>› <b>Cost efficient and simple</b> solution, no additional DDC controller required</li> <li>› You can <b>combine VRV indoor units and AHUs</b> in one system or connect <b>several AHUs to 1 outdoor unit</b></li> <li>› <b>Ideal for pre-conditioning of fresh air</b> via <math>T_d</math> temperature control</li> <li>› Less accurate room temperature control compared to X/W/Z control</li> </ul>	<b>R4T</b> Daikin supplied)	Daikin controller (set point can be set via field setting)
<b>Z control – return air temperature control</b> <ul style="list-style-type: none"> <li>› <b>Cost efficient and simple solution</b>, no additional DDC controller required</li> <li>› You can <b>combine VRV indoor units and AHUs</b> in one system or connect <b>several AHUs to 1 outdoor unit</b></li> <li>› <b>Ideal for AHU's that operate at 100% recirculation</b> like indoor units or if no particular supply temperature required</li> <li>› <b>No supply temperature control</b></li> </ul>	<b>R1T</b> (Daikin supplied)	Daikin controller (set point can be set via remocon or via C1C2)



# Air Handling Unit kits – Layout possibilities

With our wide capacity range and different control options, a variety of layout possibilities to match your application:

- › **Pair layout:** one or more outdoor units combined with 1 air handling unit
- › **Multi layout:** one outdoor unit combined with multiple air handling units
- › **Mix layout:** one outdoor unit combined with an air handling unit AND indoor units

## Pair layout

**One ERQ or VRV heat pump (system) connected to one AHU through one refrigerant circuit**

- › with W, X, Y, Z, Z' control
- › not allowed for VRV H/R



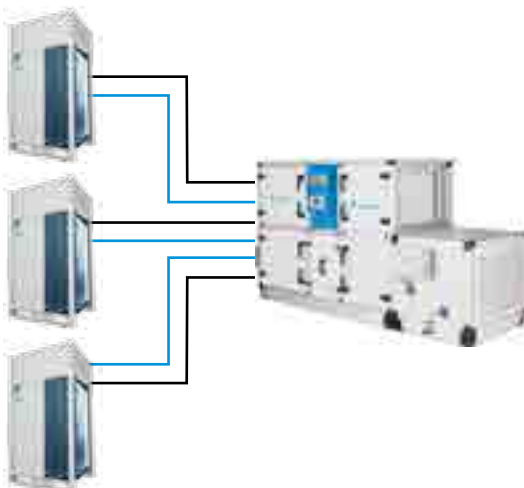
**One VRV heat pump (system) connected to the interlaced coil of one AHU through several refrigerant circuits**

- › with W, X, Y control
- › not allowed for VRV H/R and VRV-i



**Several ERQ or VRV heat pumps connected to the interlaced coil of one AHU through several refrigerant circuits**

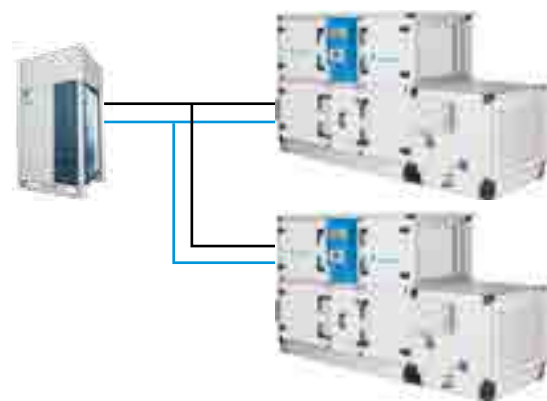
- › with W, X, Y control
- › not allowed for VRV H/R and VRV-i



## Multi layout

**One VRV heat pump connected to several AHUs**

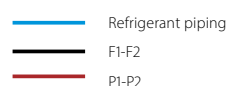
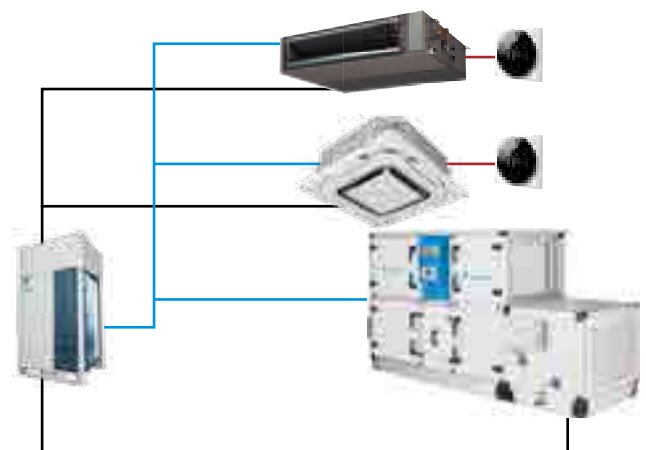
- › with Z, Z' control and field supplied controls on AHU side.
- › not allowed for VRV H/R
- › no interlaced coil possible



## Mix layout

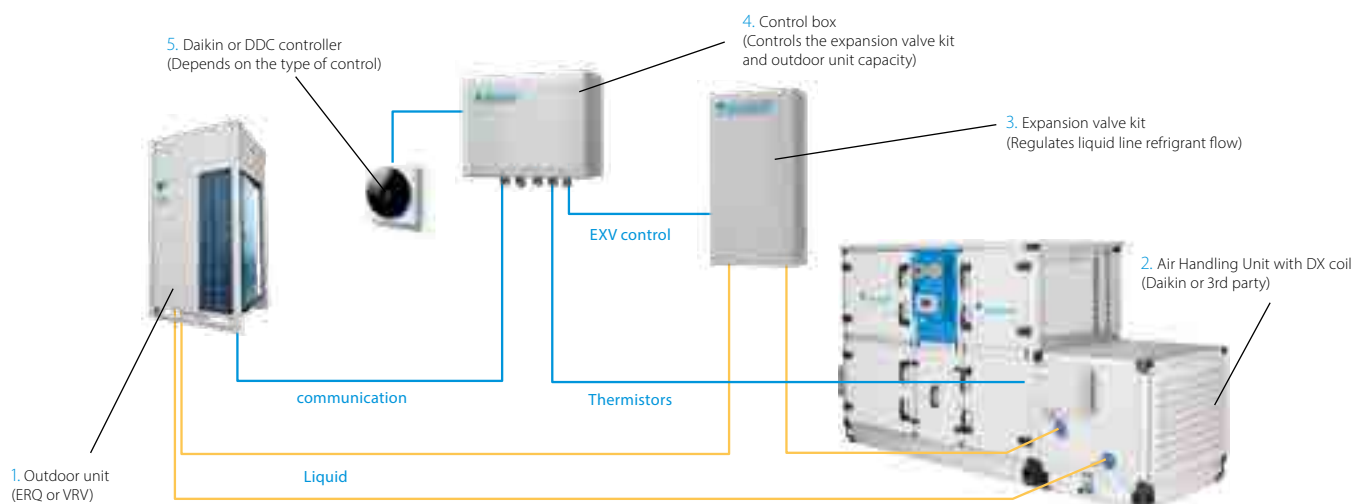
**VRV indoor units and AHU(s) mixed in the same VRV heat pump or heat recovery system**

- › with Z, Z' control and field supplied controls on AHU side
- › no interlaced coil possible
- › hydrobox not possible





## Main components with detailed piping and wiring principle



### Detailed combination table

Range	Outdoor Unit	Control box EKEACBVE	Expansion valve kits EKEXVA***												
			50	63	80	100	125	140	200	250	300	350	400	450	500
ERQ	ERQ100A7V1B	P	-	P	P	P	P	-	-	-	-	-	-	-	-
	ERQ125A7V1B	P	-	P	P	P	P	P	-	-	-	-	-	-	-
	ERQ140A7V1B	P	-	-	P	P	P	P	-	-	-	-	-	-	-
	ERQ125A7W1B	P	-	P	P	P	P	P	-	-	-	-	-	-	-
	ERQ200A7W1B	P	-	-	-	P	P	P	P	P	-	-	-	-	-
	ERQ250A7W1B	P	-	-	-	-	P	P	P	P	-	-	-	-	-
<b>VRV IV</b> & <b>VRV IV+</b>	H/P (RYYQ, RXYQ, RXYSQ, RXYTQ, RXYLQ, RXYSC(C), RWEYQ (H/P))	P/M	Pair and multi: 65% <sup>(1)</sup> < CR < 110% Mix: CR < 110% and 50% < IU CR < 110%												
	VRV-i (RKXYQ)	P <sup>(2)</sup> /M	Pair and multi: 65% <sup>(1)</sup> < CR < 110% Mix: CR < 110% and 50% < IU CR < 110%												
	H/R (REYQ, RWEYQ (H/R))	M <sup>(3)</sup>	Multi <sup>(3)</sup> : 65% <sup>(1)</sup> < CR < 110% Mix: CR < 110% and 50% < IU CR < 110%												
<b>VRV 5</b>	H/P (RXYS A, RXYA)	P/M	Pair and multi: 65% <sup>(1)</sup> < CR < 110% Mix: CR < 110% and 50% < IU CR < 110%												
	H/R REYA	M <sup>(3)</sup>	Multi <sup>(3)</sup> : 65% <sup>(1)</sup> < CR < 110% Mix: CR < 110% and 50% < IU CR < 110%												

P: Pair layout - One or more outdoor units connected to an (interlaced) coil of one AHU.

M: Mix or multi layout - Combination of (multiple) AHU(s) with (mix combination) or without (multi combination) VRV DX indoor(s). Only Z or Z' control possible (no interlaced coils).

(1): For 65% < CR < 75% please refer to the specifically required coil size

(2): Only Z or Z' control possible (no interlaced coils)

(3): Technically is possible to connect H/R in pair combination, but there's no benefit to do it



# Daikin Fresh Air package

## What is included?

- › A plug & play package with a Daikin DX outdoor unit and Daikin Air Handling Unit
- › Factory fitted and welded DX coil, expansion valve kit and control box
- › One point of contact



VRV or ERQ  
outdoor condensing unit



Daikin Air Handling Unit



Factory fitted and welded DX coil,  
expansion valve kit and control box

## Simplified business

- › Unique total solution approach of heating, cooling and ventilation
- › Off-the-shelf compatibility between Daikin outdoor unit and Daikin AHU
- › Plug&play control for outstanding reliability
- › **Peace-of-mind thanks to a single point of contact**

## Simple selection in 2-steps

### STEP 1



Select your design in  
ASTRA software

### STEP 2



Add the AHU design in Xpress  
(including capacity, dimensions,  
refrigerant connection location,...)

Share with Xpress

## Complete range of possibilities



750 m³/h up to 144,00m³/h

### D-AHU Professional

- › Infinite variable sizes
- › Tailored to the individual customer



500 m³/h up to 25,00m³/h

### D-AHU Modular R

- › Pre-configured sizes
- › Plug and play concept
- › EC Fan technology
- › Heat recovery wheel (sorption and sensible technology)
- › Compact design



500 m³/h up to 25,00m³/h

### D-AHU Modular P

- › Pre-configured sizes
- › Plug and play concept
- › EC Fan technology
- › High efficiency aluminium counter flow PHE
- › Compact design



# Integration with 3<sup>rd</sup> party Air Handling Units

Also for the integration with 3<sup>rd</sup> party AHU's Daikin provides expert support for the design and installation.

## Selection of the expansion valve kit – Fresh air application

- › Define the required heating/cooling load of your project
- › Define 3<sup>rd</sup> party AHU heat exchanger capacity
- › Use the Xpress selection software or the below table to select the correct expansion valve kit
- › The 3<sup>rd</sup> party AHU design should respect the allowed heat exchanger volume
- › Xpress selection software will select the correct outdoor unit at the design ambient temperatures.

### Cooling

EKEXVA Class	Allowed heat exchanger capacity (kW)			Allowed heat exchanger volume (dm <sup>3</sup> )		
	Minimum	Nominal	Maximum	Minimum		Maximum
				General Limits	(65%<CR<75%) Only for pair and multi layout	
50	5.0	5.6	6.2	0.95	1.09	1.65
63	6.3	7.1	7.8	1.02	1.18	2.08
80	7.9	9.0	9.9	1.42	1.64	2.64
100	10.0	11.2	12.3	1.51	1.74	3.30
125	12.4	14.0	15.4	1.98	2.29	4.12
140	15.5	16.0	17.6	2.54	2.94	4.62
200	17.7	22.4	24.6	3.02	3.49	6.60
250	24.7	28.0	30.8	3.97	4.58	8.25
NEW 300	30.9	33.5	36.9	4.53	5.25	9.9
NEW 350	37.0	40.0	44.0	5.48	6.32	11.55
400	44.1	45.0	49.5	6.04	6.97	13.2
NEW 450	49.6	50.4	55.4	6.99	8.07	14.5
500	55.5	56.0	61.6	7.55	8.72	16.5

Saturated evaporating temperature: +6°C  
Air temperature: +27°C DB / +19°C WB

### Heating

EKEXVA Class	Allowed heat exchanger capacity (kW)			Allowed heat exchanger volume (dm <sup>3</sup> )		
	Minimum	Nominal	Maximum	Minimum		Maximum
				General Limits	(65%<CR<75%) Only for pair and multi layout	
50	5.6	6.3	7.0	0.95	1.09	1.65
63	7.1	8.0	8.8	1.02	1.18	2.08
80	8.9	10.0	11.1	1.42	1.64	2.64
100	11.2	12.5	13.8	1.51	1.74	3.30
125	13.9	16.0	17.3	1.98	2.29	4.12
140	17.4	18.0	19.8	2.54	2.94	4.62
200	19.9	25.0	27.7	3.02	3.49	6.60
250	27.8	31.5	34.7	3.97	4.58	8.25
NEW 300	34.8	37.5	41.5	4.53	5.23	9.9
NEW 350	41.6	45.0	49.5	5.48	6.32	11.55
400	49.6	50.0	55.7	6.04	6.97	13.2
NEW 450	55.8	56.5	62.4	6.99	8.07	14.85
500	62.5	63.0	69.3	7.55	8.72	16.5

Saturated evaporating temperature: +46°C  
Air temperature: +20°C DB

## Selection of the expansion valve kit – Recirculation application

- › Define the required heating/cooling load of your project
- › Use the Xpress selection software or the below table to select the correct expansion valve, following the procedure used as for standard VRV indoor units
- › The 3<sup>rd</sup> party AHU design should respect the allowed heat exchanger volume
- › Xpress selection software will select the correct outdoor unit at the design ambient temperatures

### Cooling

EKEXVA Class	On-coil air temperature [°C]						
	14WB 20DB	16WB 23DB	18WB 26DB	19WB 27DB	20WB 28DB	22WB 30DB	24WB 32DB
	kW	kW	kW	kW	kW	kW	kW
50	3.8	4.5	5.2	5.6	5.9	6.0	6.2
63	4.8	5.7	6.6	7.1	7.5	7.7	7.8
80	6.1	7.2	8.4	9.0	9.5	9.7	9.9
100	7.6	9.0	10.5	11.2	11.8	12.1	12.3
125	9.5	11.3	13.1	14.0	14.8	15.1	15.4
140	10.8	12.9	15.0	16.0	16.9	17.3	17.6
200	15.1	18.0	21.0	22.4	23.6	24.2	24.6
250	18.9	22.5	26.2	28.0	29.5	30.2	30.8
NEW 300	22.6	26.9	31.3	33.5	35.3	36.1	36.9
NEW 350	27.0	32.2	37.4	40.0	42.1	43.1	44.0
400	30.4	36.2	42.1	45.0	47.4	48.5	49.5
NEW 450	34.0	40.5	47.2	50.4	53.1	54.3	55.4
500	37.8	45.0	52.4	56.0	59.0	60.4	61.6

### Heating

EKEXVA Class	On-coil air temperature [°C]						
	10.0	16.0	18.0	20.0	21.0	22.0	24.0
	kW	kW	kW	kW	kW	kW	kW
50	6.6	6.6	6.6	6.3	6.1	5.9	5.5
63	8.4	8.4	8.4	8.0	7.7	7.5	7.0
80	10.5	10.5	10.5	10.0	9.7	9.4	8.7
100	13.1	13.1	13.1	12.5	12.1	11.7	10.9
125	16.8	16.8	16.8	16.0	15.5	15.0	13.9
140	18.9	18.9	18.9	18.0	17.4	16.8	15.7
200	26.2	26.2	26.2	25.0	24.2	23.4	21.8
250	33.1	33.1	33.1	31.5	30.5	29.5	27.5
NEW 300	39.4	39.4	39.4	37.5	36.3	35.1	32.7
NEW 350	47.2	47.2	47.2	45.0	43.6	42.1	39.2
400	52.4	52.4	52.4	50.0	48.4	46.8	43.6
NEW 450	59.2	59.2	59.2	56.5	54.7	52.9	49.3
500	66.0	66.0	66.0	63.0	61.0	59.0	54.9

# Daikin, your partner

## in decarbonising your building



Every building requires a different solution to match its unique properties. That's why it is important to have an HVAC-R partner with expert knowledge and a product portfolio designed to achieve your objectives while staying within budget.

### How will Daikin enable you to lower your carbon footprint?

- › We continuously develop products with lower CO<sub>2</sub> footprints by using **lower GWP refrigerants** such as R-32
- › We reuse materials where possible, even refrigerants through the **LOOP by Daikin programme** aimed at reusing available resources and fully supporting the EU circular economy
- › We maximise **real life seasonal efficiencies**, delivered in a transparent and trustworthy way
- › Our **team of experts goes beyond product support** to reach your green objectives by providing in-depth knowledge in the use of EPDs, EPDB legislation and green building schemes such as BREEAM, LEED, WELL, etc.
- › We provide **support** to continuously monitor our systems, ensuring they operate as intended, keeping running costs low and maximising uptime **throughout the entire building life cycle**
- › We **help customers make the right choice** by offering easy to use tools to select the best solutions for their residential, commercial or industrial building

### We're there for you!

Let's act now to decarbonise buildings, creating a healthy environment for generations to come. Contact us here: [https://www.daikin.eu/en\\_us/about/environmental-responsibility/epd.html](https://www.daikin.eu/en_us/about/environmental-responsibility/epd.html)

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