



**DAIKIN APPLIED (UK) LTD**

**R-454C**

# Air to Water Inverter Heat Pump

EWYE-CZ



High temperature & low carbon solution  
for heating Decarbonisation

AIR TO WATER HEAT PUMP

High temperature & Low carbon solution

High temperature Heat Pump

Heat Pump version with One and Two independent refrigerant circuits characterized by the optimised and compact design from 1 to 4 fans in line.



Installation flexibility

The new R-454C Small Inverter Heat Pump EWYE-CZ comes in three different layouts, all providing a very compact footprint despite the capacity they can deliver. That makes the series a great solution for projects dealing with space issues such as: residential, hotels and hospitals. No need for extra safety countermeasures due to the fact that the R-454C is an A2L refrigerant as the largely used R-32.



Product Benefits

Daikin Core Technology

Daikin Scroll Compressors can benefit from Inverter technology that increases this Series' efficiency performance, while the Vapor Injection with Economizer guarantees the Series Capacity steps and extended operating heating envelope.

Great energy efficiency levels are also granted by the Daikin Inverter Driven Fans, with high efficiency design glass reinforced resin maximize performances.

Daikin Inverter Scroll Compressors and Pump with Vapor Injection, make this new R-454C Small Inverter Heat Pump a full Inverter Series.

Daikin Tube & Fins (Cu/Al) Heat Exchanger: Reversible heat exchanger optimised for most extreme heating operation. Aluminum fins are covered by acrylic layer to ease flowing of condensate moisture and provide resistance to corrosion and protection from UV.



Product overview

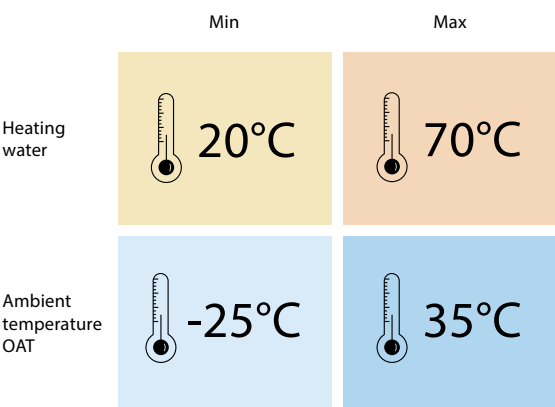
The most complete and unique solution on the market for Decarbonisation. EWYE-CZ reaches 70 °C of heating water temperature even in extreme ambient conditions. That is, during winter season in Nordic Countries (low ambient temperature) and even in summer when Domestic Hot Water production would still be required. Moreover, EWYE-CZ can work in high delta T conditions allowing the supply of heating water to different heating applications in the installation space.

EWYE-CZ is available in 9 sizes from 16 to 85 kW capacity, all equipped with Daikin inverter scroll compressors. As well, fans used on EWYE-CZ are designed by Daikin. The product range also integrates an inverter water pump, facilitating installation operations and saving space.

The product is also available in reduced noise configuration, particularly suitable for noise-sensitive applications as: residential buildings, hotels and hospitals. Comfort heating can be supplied in many different applications, and on top of that EWYE-CZ allows domestic hot water production, including anti-legionella control function for the external storage tank.

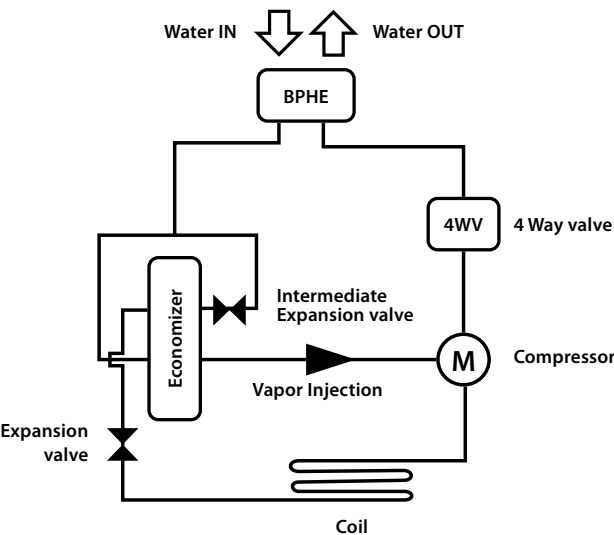


Operating range

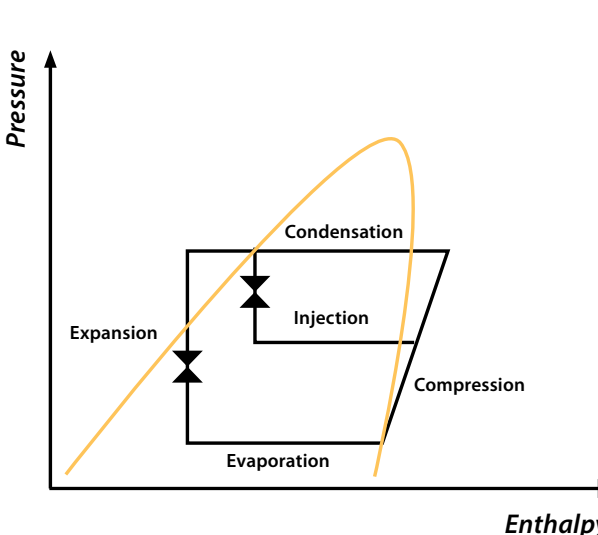


New compressor technology with Vapor Injection

Refrigerant piping diagram with economizer for Vapor Injection



Refrigerant cycle with Vapor Injection





# Product applications

## High Temperature Heating for boiler replacement and Domestic Hot Water (DHW)

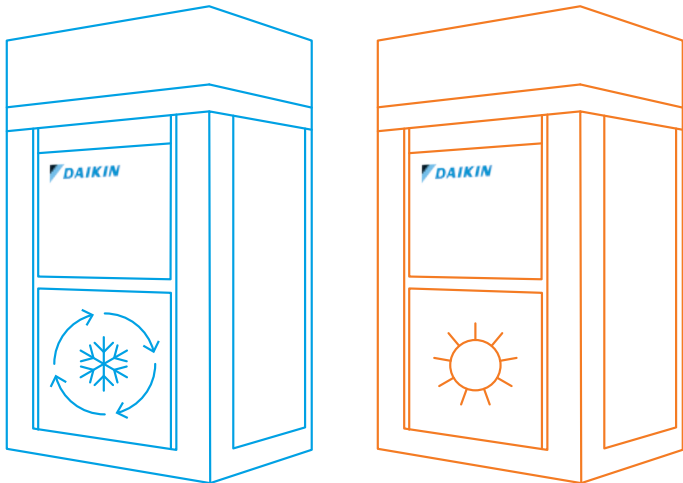
### Space Heating + DHW configurations

- Centralized heating, eventually in combination with gas boilers. DHW supply managed via integration with centralized heating, or independent DHW supply. Groups of units can be managed in master / slave up to 4 per single master
- Applications: residential, light commercial, hotels, gym
- Installation: replacement and new building
- Possible terminals are:
  - Existing radiators (70 °C)
  - Heating floor (30-35 °C)
  - Fan coils (40-45 °C)

### Optimised DeFrost Management

Integrated Defrost logic optimised for multiple units to sequence the non-simultaneity of the defrost cycle. Plant up to 4 units are optimised in terms of overall defrost impact:

- Less plant water content
- Higher customer comfort due to minimized temperature drop
- Heating load uniformity over time



### Low operating costs

Thanks to its Full Inverter design, this new unit can closely follow the cooling and heating load profile of the building. This is particularly important as it ensures low operating costs for the HVAC system at part load conditions, which represent most of the operating time.

### Contribution to Green Building

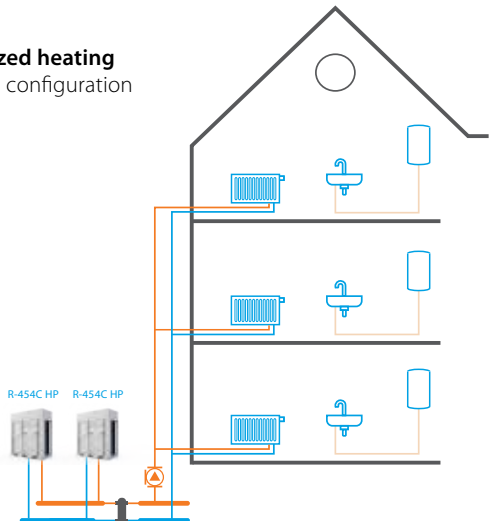
The most popular green building protocols are BREEAM and LEED. EWYE-CZ can contribute to project's credits when evaluating energy efficiency of the hydronic system, thanks to inverter driven compressors. The limited GWP of R-454C also result in a possible contribution when evaluating the impact of refrigerants. On top of that, the Smart Grid accessory allows to control the heat pump maximizing consumptions when renewable energy is produced. Thereby, potentially resulting in credits under BREEAM and LEED protocols, as carbon footprint would be reduced.

### F-Gas Ready Solution

The new Small Inverter Heat Pump provides low direct and indirect CO<sub>2</sub> emissions levels. That makes it an environmentally friendly series, also thanks to the use of R-454C, which is known for being a low GWP (148) and sustainable refrigerant, fully compliant with the new F-gas regulation.

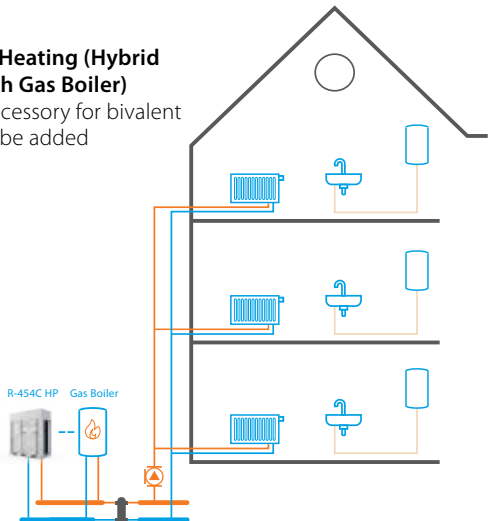


### Centralized heating Standard configuration



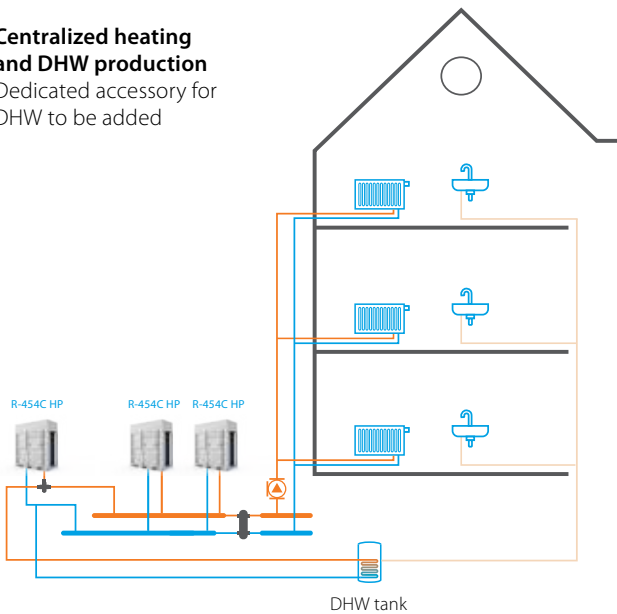
### Centralized Heating (Hybrid Solution with Gas Boiler)

Dedicated accessory for bivalent operation to be added



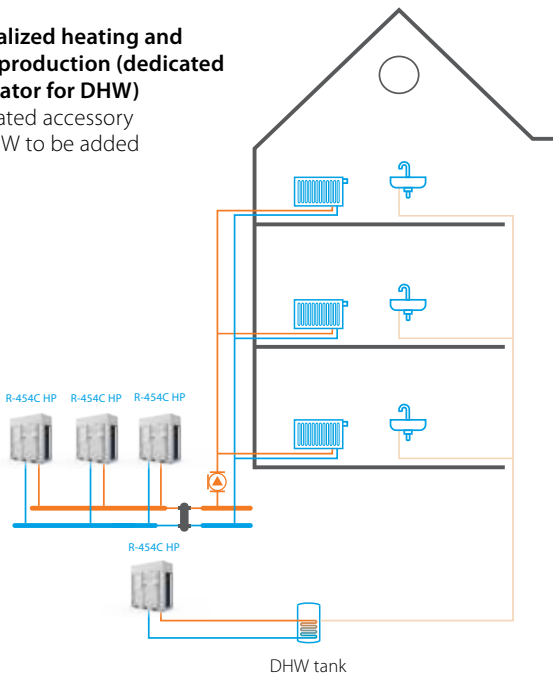
### Centralized heating and DHW production

Dedicated accessory for DHW to be added



### Centralized heating and DHW production (dedicated generator for DHW)

Dedicated accessory for DHW to be added



# Product applications

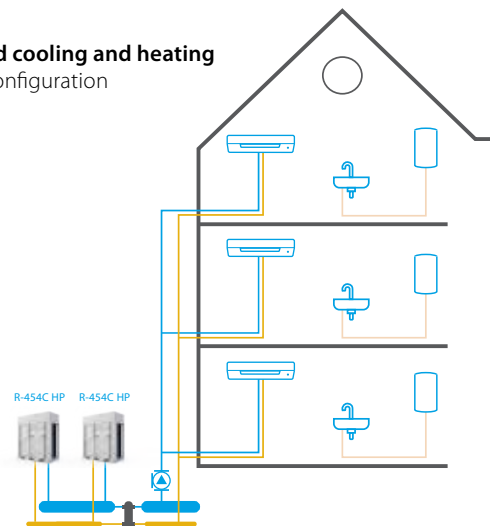
## Seasonal Comfort Heating and Cooling + Domestic Hot Water (DHW)

### Comfort cooling & heating

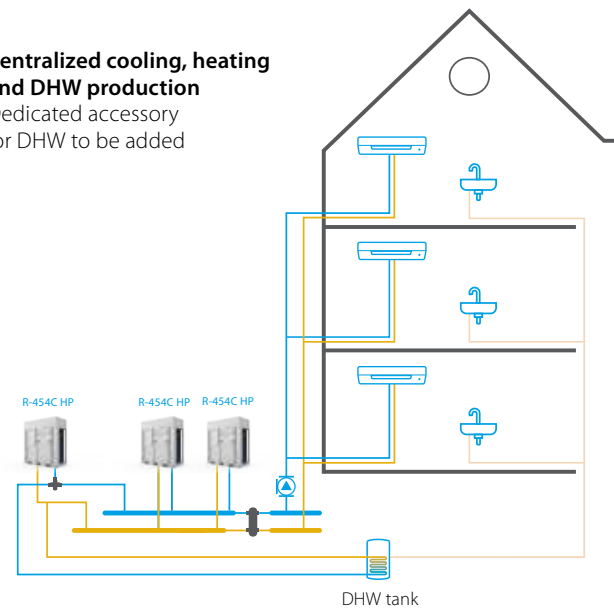
- Centralized comfort heating and cooling. DHW managed via three way valves (priority on DHW demand) or independent DHW supply. Groups of units can be managed in master / slave up to 4 per single master
- Applications: residential, light commercial, hotels, gym

- Installation: replacement and new building
- Possible terminals are:
  - Cooling (23-18°C) and Heating floor (30-35°C)
  - Heating and Cooling Fan Coils

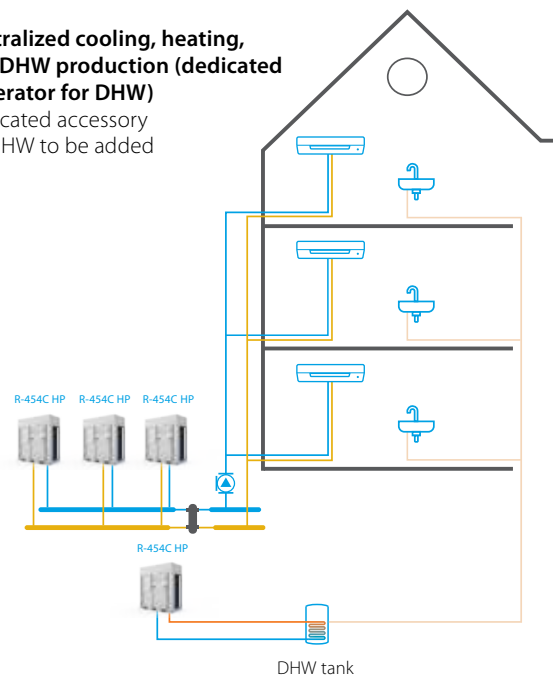
### Centralized cooling and heating Standard configuration



### Centralized cooling, heating and DHW production Dedicated accessory for DHW to be added



### Centralized cooling, heating, and DHW production (dedicated generator for DHW) Dedicated accessory for DHW to be added



# Product options and accessories

## Standard

### Hydronic Kit

#### Description

The Small Inverter Heat Pump is equipped with an inverter pump on board with electrical protection as standard. Possibility to order the unit also without the pump.



### Plant management & connectivity

Master/Slave or Modbus RTU are standard to ensure a perfect plant Connectivity.

Remote monitoring and system optimization with Daikin proprietary cloud platform Daikin On Site.

- Predictive maintenance to prevent breakdowns
- Visualize energy consumption to reduce energy costs
- Monitor and control your building no matter where you are via the **Daikin On Site**
- Remote diagnostic support to increase your system lifetime
- Manage Multiple sites



#### Dashboards



OPERATOR

#### Diagnostics



SERVICE

#### Remote software upgrade



DAIKIN

## Master Slave Control

#### Description

The Small Inverter Heat Pump is able to operate in Master/Slave mode optimizing the plant operation up to 4 units. The Master unit manages the Slave units connected in parallel on the same hydraulic plant balancing the running hours and load of each unit and each compressor.



# Product options and accessories

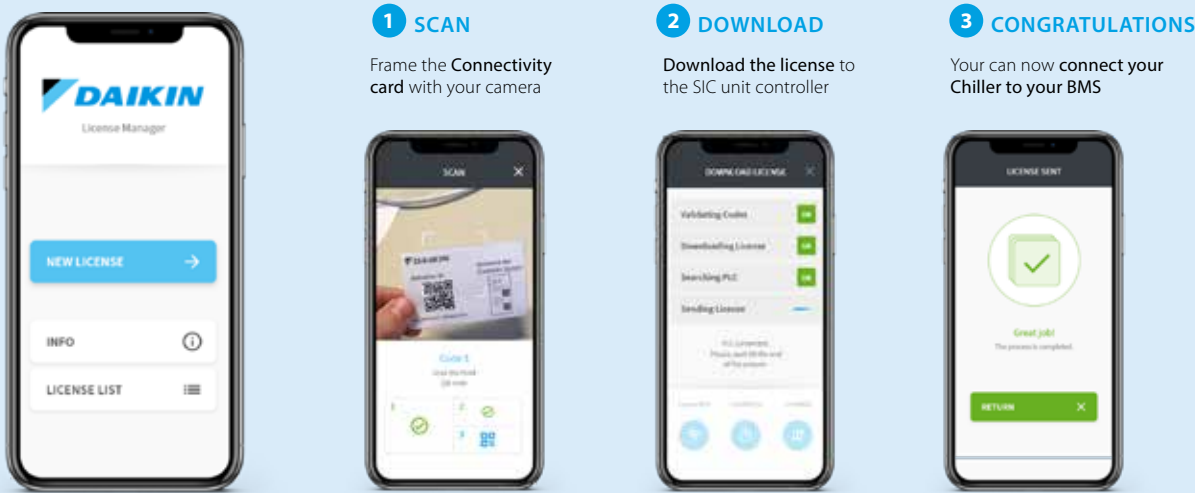
## On-demand

### License Manager



Description

The mobile App to enable BMS communication protocols on the new Small Inverter Chiller



### Connectivity Kit

Description

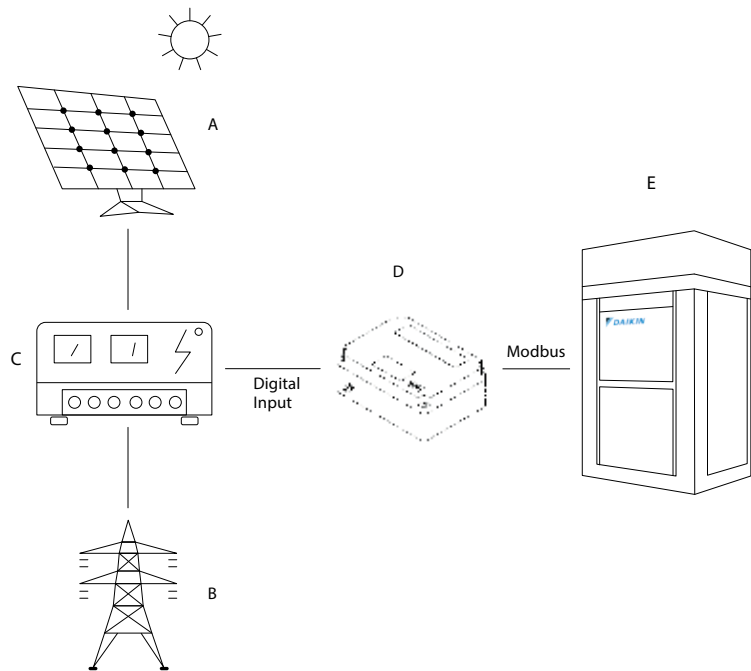
When ordering the Connectivity Kit, you will receive a Connectivity card. The card will report a unique Activation ID (QR code) identifying the license for a specific SIC unit controller. The SIC controller has a sticker that must be put on the Connectivity card in order to use it with the app.

### Smart grid ready box

Description

The Smart Grid Box is an accessory that allows the integration of the Heat Pump control for a Smart Grid application, maximizing use of green energy to run the Heat Pump.

- A: Solar panels
- B: Grid
- C: Interface-compatible system components (Solar inverter / energy management system)
- D: Smart Grid Box
- E: Heat Pump



# Plant water content

The heating water content of the systems should have a minimum water amount to avoid excessive decrease of the water setpoint during the defrost cycle to guarantee the proper environmental comfort.  
As a general indication the system water content should not be less than the values deriving from the following fomula:

Single circuit Unit →  $16 \frac{\text{lt}}{\text{kW nominal}}$

Dual circuit Unit →  $8 \frac{\text{lt}}{\text{kW nominal}}$

$\text{kWnominal} = \text{Heating capacity at } 40/45^{\circ}\text{C OAT}=7^{\circ}\text{C}$

The above rule of thumb derives from the following formula, as the relative volume of water capable of maintaining the system temperature within an acceptable  $\Delta T$  (which depends on the heating application) during the defrost transient:

Water volume=  $\frac{\text{CC [W]} * \text{MDD [s]}}{\text{FD} \left[ \frac{\text{g}}{\text{L}} \right] * \text{SH} \left[ \frac{\text{J}}{\text{g}^{\circ}\text{C}} \right] * (\text{DT}) [^{\circ}\text{C}]}$

- CC = Cooling Capacity during defrost operation
- MDD = Max Defrost Duration
- FD = Fluid Density
- SH = Specific Heat
- DT = Acceptable Water Temperature Differential

The water temperature difference is considered acceptable for the Comfort Heating application which allows to operate with the minimum volume mentioned in the previous formula.  
However, if a smaller water temperature difference is considered acceptable, a larger minimum water volume will be required.  
A properly designed storage tank should be added if the system components do not provide sufficient water volume.  
In case of more than one installed unit, the overall capacity of the installation must be considered in the calculation so summing the water content of each unit.  
These considerations refer to the water volume always flowing through the unit. If there are bypasses, branch of the system that can be excluded, that parts should not be accounted in the water content calculation.

# Product dimensions



Model	Dimensions (mm)
EWYE016CZ(N)(P)-A1	1878x1152x802
EWYE021CZ(N)(P)-A1	1878x1152x802
EWYE025CZ(N)(P)-A1	1878x1152x802
EWYE032CZ(N)(P)-A1	1878x1752x802
EWYE040CZ(N)(P)-A1	1878x1752x802
EWYE040CZ(N)(P)-A2	1878x2306x814
EWYE050CZ(N)(P)-A2	1878x2306x814
EWYE064CZ(N)(P)-A2	1878x2906x814
EWYE090CZ(N)(P)-A2	1878x3506x814

Minimum access distances to be respected: 500 mm all around the unit (single unit installation) or 1000 mm from each condensing section in case of multiple units' installation.

Technical data

			Model 01	Model 02	Model 03	Model 04	Model 05	Model 06	Model 07	Model 08	Model 09	
Cooling performance 12/7 35°C	Cooling capacity	kW	16.8	20.8	24.5	28.7	31.3	41.6	49.1	54.3	63.5	
	Capacity control	Type	Inverter Controlled									
	Unit power input	kW	4.7	6.7	8.6	9.4	10.8	13.3	17.1	19.0	21.7	
	EER		3.55	3.12	2.85	3.06	2.90	3.13	2.86	2.86	2.93	
Heating performance 40/45 7°C	Heating capacity	kW	19.0	23.5	27.6	32.0	34.9	47.2	55.3	62.0	70.0	
	Unit power input	Heating kW	5.6	7.0	8.4	9.5	10.9	14.2	17.0	19.7	22.0	
	COP		3.40	3.36	3.28	3.36	3.21	3.32	3.25	3.13	3.17	
Heating performance 60/70 -15°C	Heating capacity	kW	13.4	21.2	23.6	25.6	27.1	42.5	47.3	50.3	54.3	
	Unit power input	Heating kW	9.6	12.0	13.6	14.4	15.5	24.3	27.5	29.4	31.0	
	COP		1.39	1.76	1.73	1.78	1.75	1.75	1.72	1.71	1.75	
Water heat exchanger heating	Water flow rate	l/s	0.9	1.1	1.3	1.5	1.7	2.3	2.7	3.0	3.4	
	Water pressure drop	kPa	9.8	14.2	18.9	19.0	22.2	12.8	17.2	21.1	13.8	
Water heat exchanger cooling	Water flow rate	l/s	0.8	1.0	1.2	1.4	1.5	2.0	2.3	2.6	3.0	
	Water pressure drop	kPa	7.7	11.3	15.2	15.5	18.2	9.9	13.5	16.2	11.3	
Air heat exchanger	Type		Al Fins & Cu Tubes									
Water heat exchanger			Brazeed Plate									
Fan	Type		Axial									
	Drive		VFD									
	Quantity	N°	1			2				3	4	
	Speed	rpm	700	800	900	800	800	800	900	900	800	
Dimensions	Height	mm	1878									
	Width	mm	1152			1752		2306		2906	3506	
	Length	mm	802					814				
Compressor	Type		Scroll - Vapor Injection									
	Quantity	N°	1					2				
	Economizer	N°	1					2				



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