

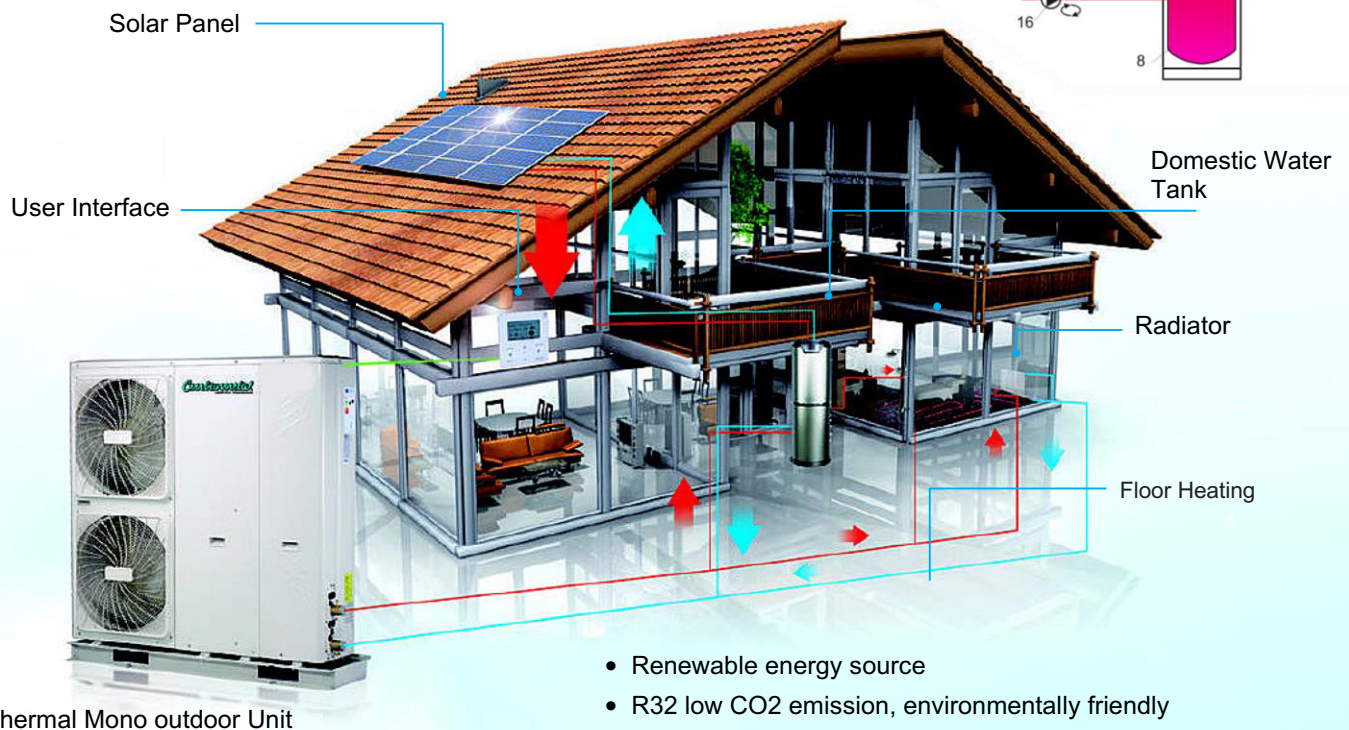
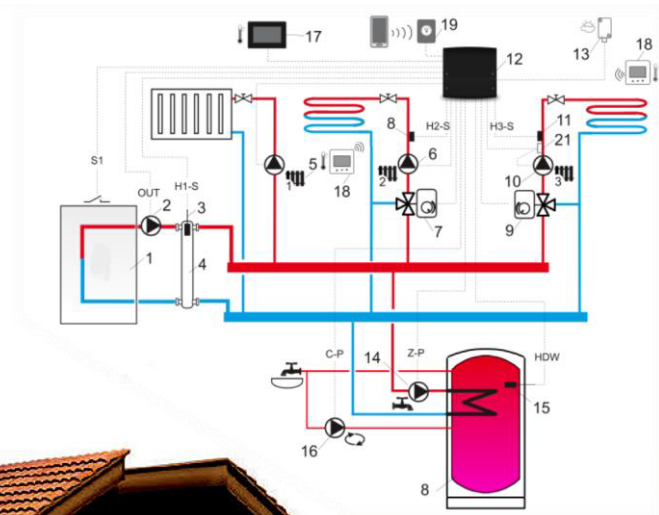
Heat pumps air-water

Total heat solution - Heating, cooling, domestic hot water in one system

Heat pumps is an integrated system that heats and cools space, as well as produces domestic hot water. It offers total heat solution all year round. This system can complete instead of the tradition gas or other fuel boilers, it also can work together with them.

NEW!

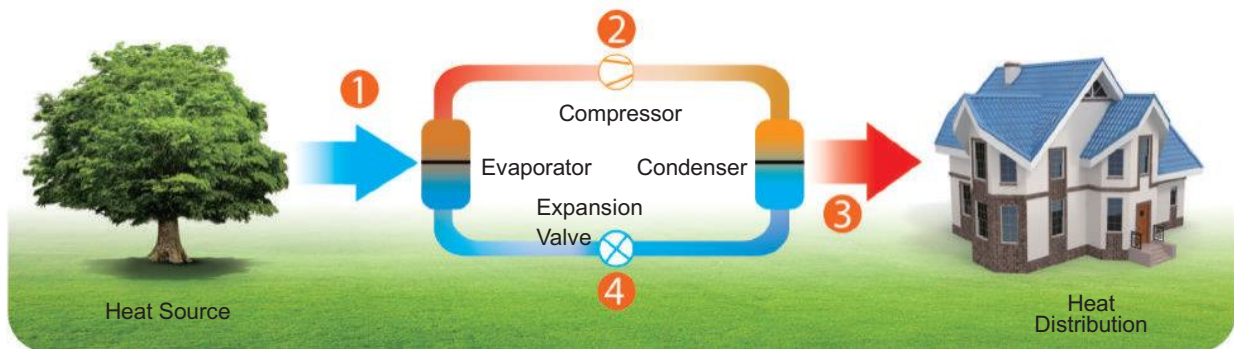
Color touch screen
management interface



- Renewable energy source
- R32 low CO2 emission, environmentally friendly
- DC inverter technology, high energy efficiency
- Sufficient heating capacity at low ambient temperature (even at -20°C)
- Provide space heating, cooling and domestic hot water, total heat solution
- Compatible with other heat source such as solar energy and boiler

How an air source heat pump works

A heat pump is an energy-efficient system that absorbs heat from the ambient air for heating and hot water. By using outside air and transferring this heat to the house through a water heating system such as underfloor heating, ventilation heat exchangers and / or radiators.



Stage One

1

The heat transfer medium (the refrigerant) is colder than the heat source (the outside air). As the outside air passes across the first heat exchanger (the evaporator) the liquid refrigerant absorbs the heat and evaporates.

Stage Two

2

The vapor passes to the compressor and is compressed. When compressed the pressure is increased and the temperature of the vapor rises, effectively concentrating the heat.

Stage Three

3

The hot vapor passes to the second heat exchanger (the condenser) where the heat is released to the water and the vapor condenses back into a liquid. The water heated in by the Thermal system is circuit to the indoors for central heating and domestic hot water heating.

Stage Four

4

The liquid refrigerant passes through an expansion valve, reducing its pressure and temperature, ready to start the next circuit.

Mono system

Thermal Mono System	User interface Solar panel Low temperature radiator Floor heating Mono Outdoor unit Domestic water tank
Application	Heating + Cooling + Domestic hot water
Heat pump type	Outdoor unit only (Compressor part and hydronic box are integrated)
Refrigerant piping	Inside outdoor unit
Water piping	Between outdoor unit and indoor heating appliances
Installation	Only need to install water piping
Combinational parts (field supply)	Floor heating coils Fan coil units Low temperature radiators Domestic hot water tank Auxiliary heat sources (such as solar collector, boiler and gas furnace)

Mono outdoor unit

Mono outdoor unit absorbs heat from the outside air and transfers it to the water in the hydronic modular, through water to supply heat to indoor side.

Domestic water tank (field supplied)

Domestic water tank is used to supply sanitary hot water. The hot water from the Mono unit release heat to water in the tank through the inner coil, and cold water in the tank is heated. Usually there is an addition electric heater in the domestic water tank.

User interface

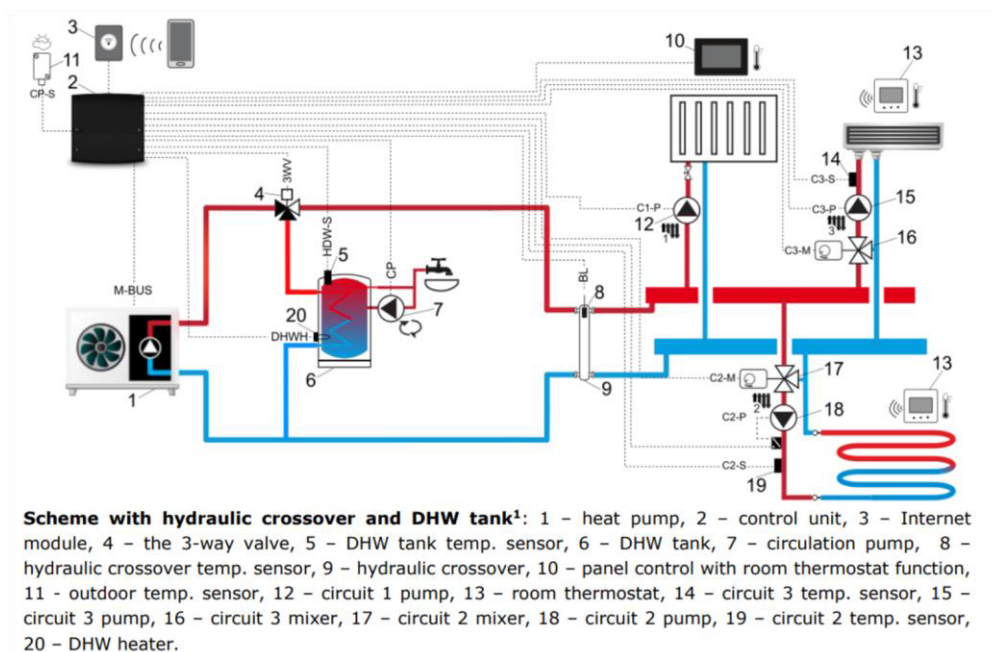
Control unit with colorful touchscreen panel controls the heat pump operation, and it can control system with up to two mixing heating/cooling circuits, one direct heating/cooling circuit and DHW preparation (with DHW recirculation pump operation control as well) (mandatory additional equipment). It can be connected to a web portal and mobile application afterwards.

Typical Applications



- Example: Application 2: Thermal Mono for space heating and domestic hot water**

Room thermostat is not connected to the Mono unit but to motorized valve. Each room's temperature is regulated by the motorized valve on every water circuit. Sanitary hot water is delivered by the domestic hot water tank connected to the Mono unit. In this situation, bypass valve is necessary.



SPECIFICATIONS MONO 5-30KW

			5kW	9kW	16kW P3	22kW P3	30kW P3
Power supply		V/ph/Hz	220-240/1/50		380-415/3/50	380-415/3/50	380-415/3/50
Capacity	Heating ² A7/W35	kW	6.50	10.00	16.00	22.00	30.10
Rated input		kW	1.23	2.13	3.56	5.00	7.70
COP			5.30	4.70	4.50	4.40	3.91
Capacity	Heating ³ A7/W55	kW	6.30	9.40	16.00	22.00	30.00
Rated input		kW	1.97	3.03	5.61	8.30	13.04
COP			3.20	3.10	2.85	2.65	2.30
Capacity	Cooling ⁴ A35/W18	kW	6.50	10.00	15.40	23.00	31.00
Rated input		kW	1.28	2.33	3.67	5.00	7.75
EER			5.10	4.30	4.20	4.60	4.00
Capacity	Cooling ⁵ A35/W7	kW	5.50	9.00	14.00	21.00	29.50
Rated input		kW	1.69	3.10	4.83	7.12	11.57
EER			3.25	2.90	2.90	2.90	2.55
Seasonal space heating	Main flow 35°C		A+++		A+++	A+++	A++
Energy efficiency class ⁶	Main flow 55°C		A++		A++	A++	A+
SCOP ⁶	Main flow 35°C		5.12	5.12	4.84	4.53	4.20
	Main flow 55°C		3.59	3.71	3.59	3.23	3.15
ηs	Main flow 35°C		201.8	201.9	190.5	178	165
	Main flow 55°C		140.7	145.5	140.7	126	123
SEER ⁶	Main flow 7°C		5.09	5.08	5.14	4.70	4.49
	Main flow 18°C		7.81	8.31	7.54	5.67	5.71
Sound power level ⁷			60	65	75	73	77
Sound pressure level ⁷			48	53	59	59.8	63.5
Compressor	Type		Twin rotary DC inverter				
Outdoor fan	Air flow		3900	4500	5200	10650	11200
Water side heat exchanger type			Plate				
Water pump	Pump head	m	9.0		9.0	12.0	12.0
Expansion vesse	Volume	L	5.0		5.0	8.0	8.0
Net dimensions (WxHxD)		mm	865x1040x410		865x1040x410	1129x1558x440	1129x1558x440
Packed dimensions (WxHxD)		mm	970x1190x560		970x1190x560	1220x1735x565	1220x1735x565
Net/Gross weight		kg	87/103	87/103	120/136	177/206	177/206
Piping connections (water)		R	1"		5/4"	5/4"	5/4"
Safety valve set pressure (water)		bar	3				
Operating temperature range	Cooling		-5 to 43		-5 to 43	-5 to 46	-5 to 46
	Heating	°C	-25 to 35		-25 to 35	-25 to 35	-25 to 35
	DHW	°C	-25 to 43		-25 to 43	-25 to 43	-25 to 43
Main flow temperature range	Cooling	°C	5 to 25		5 to 25	5 to 25	5 to 25
	Heating	°C	25 to 65		25 to 65	25 to 65	25 to 65
	DHW	°C	20 to 60		20 to 60	30 to 60	30 to 60
Reftigerant	Type/GWP	°C	R32 / 675				
	Factory charge	kg	1.25	1.25	1.8	5.0	5.0
Backup electric heateere	Standard mounted	kW	-	-	-	-	-
	Optional	kW	2/4	2/4	2/4	2/4	2/4
	Capacity steps		1	1	1	1	1

1. EU standards: EN14511: 2016; EN14825: 2016; EN50564: 2011; EN12102: 2017; (EU) N° 811/2013; (EU) N° 813/2013; OJ 2014/C 207/02; OJ 2017/C 229/01.

2. Outdoor air temperature 7°C, 85% R.H.; water temperature main flow/return 35/30°C.

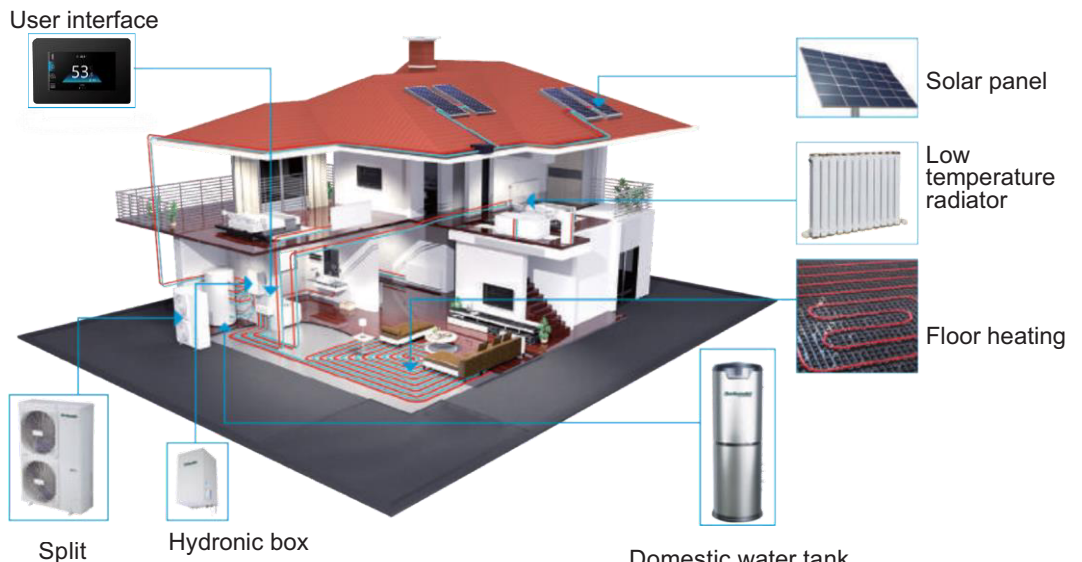
3. Outdoor air temperature 7°C, 85% R.H.; water temperature main flow/return 55/47°C.

4. Outdoor air temperature 35°C; water temperature main flow/return 18/23°C.

5. Outdoor air temperature 35°C; water temperature main flow/return 7/12°C.

6. Seasonal space heating energy efficiency class tested in average climate conditions

Split system

Thermal Split System	
Application	Heating + Cooling + Domestic hot water
Heat pump type	Outdoor unit (Compressor part) + Indoor unit (Hydronic box)
Refrigerant piping	Between outdoor unit and indoor unit
Water piping	Between indoor unit and indoor heating appliances
Installation	Refrigerant piping and water piping
Combinational parts (field supply)	Floor heating coils Fan coil units Low temperature radiators Domestic hot water tank Auxiliary heat sources (such as solarcollector,boiler and gas furnace)

Split type outdoor unit

The outdoor unit absorbs heat from the outside air and transfers it inside through refrigerant piping.

Hydronic box

The hydronic box heats the water by refrigerant from outdoor unit. The heated water circulates through heating device such as floor heating, radiators, fan coil units as well as inner coil of domestic hot water tank.

Domestic water tank (field supplied)

Domestic water tank is used to supply sanitary hot water. The hot water from the hydronic box release heat to water in the tank through the inner coil, and cold water in the tank is heated. Usually there is an addition electric heater in the domestic water tank.

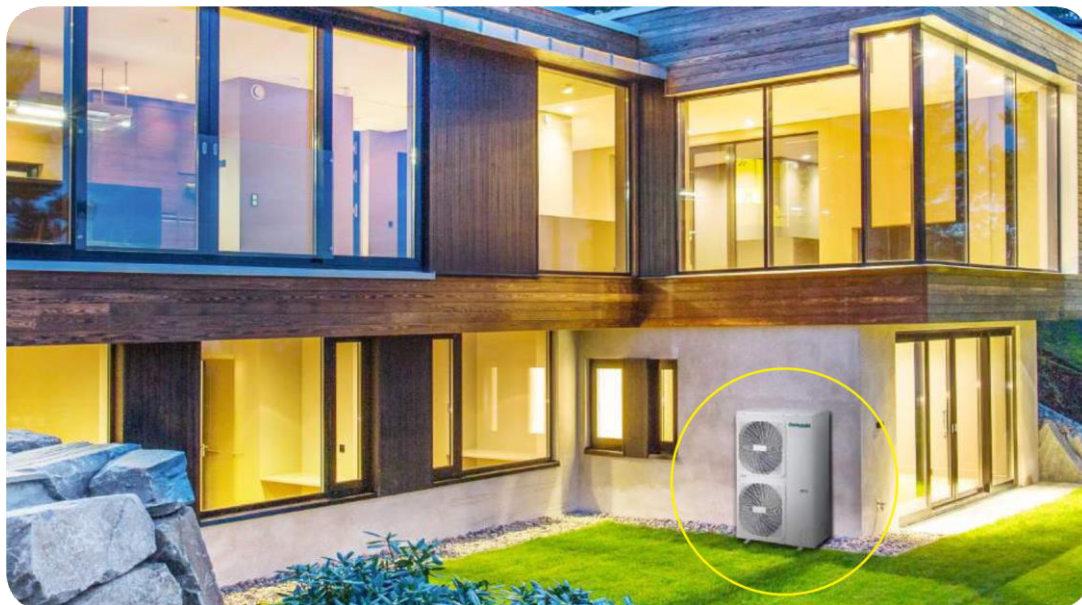
User interface

Control unit with colorful touchscreen panel controls the heat pump operation, and it can control system with up to two mixing heating/cooling circuits, one direct heating/cooling circuit and DHW preparation (with DHW recirculation pump operation control as well) (mandatory additional equipment). It can be connected to a web portal and mobile application afterwards.

Specifications

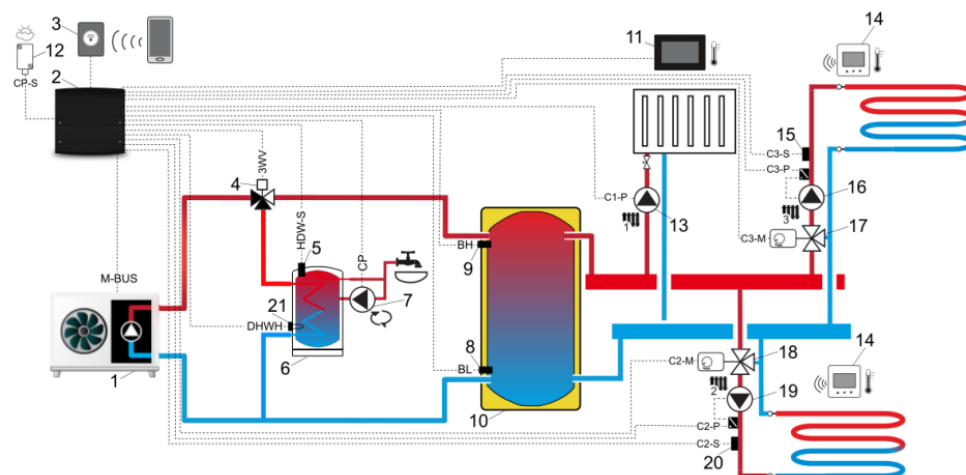
Flexible installation and easy maintenance

- Compact structure, independent hydronic box, flexible installation.
- Refrigerant pipes run indoors from the outdoor unit, no need extra insulation of water piping to protect from freezing up.
- No need extra refrigerant within 10m refrigerant pipe length.



• Example: Application 2: Thermal Split type unit for space heating and domestic hot water

Room thermostat is not connected to the indoor hydronic box but to motorized valve. Each room's temperature is regulated by the motorized valve on every water circuit. Sanitary hot water is delivered by the domestic hot water tank connected to the split indoor unit. In this situation, bypass valve is necessary.



Scheme with buffer and DHW tank²: 1 – heat pump, 2 – control unit, 3 – Internet module, 4 – the 3-way valve, 5 – DHW tank temp. sensor, 6 – DHW tank, 7 – circulation pump, 8 – lower buffer temp. sensor, 9 – upper buffer temp. sensor, 10 – buffer, 11 – panel control with room thermostat function, 12 – outdoor temp. sensor, 13 – circuit 1 pump, 14 – room thermostat, 15 – circuit 3 temp. sensor, 16 – circuit 3 pump, 17 – circuit 3 mixer, 18 – circuit 2 mixer, 19 – circuit 2 pump, 20 – circuit 2 temp. sensor, 21 – DHW heater.

SPLIT 6-16KW (with hydronic box)

Specifications - SPLIT:			6kW	10kW	16kW P3
Power supply		V/ph/Hz	220-240/1/50		380-415/3/50
Capacity	Heating ² A7/W35	kW	6.20	10.00	16.00
Rated input		kW	1.24	2.00	3.56
COP			5.00	5.00	4.50
Capacity	Heating ³ A7/W55	kW	6.00	9.50	16.00
Rated input		kW	2.00	3.06	5.52
COP			3.00	3.10	2.90
Capacity	Cooling ⁴ A35/W18	kW	6.55	10.00	14.90
Rated input		kW	1.34	2.08	4.38
EER			4.90	4.80	3.40
Capacity	Cooling ⁵ A35/W7	kW	7.00	8.20	14.00
Rated input		kW	2.33	2.48	5.71
EER			3.00	3.30	2.45
Seasonal space heating Energy efficiency class ⁶	Main flow 35°C		A+++	A+++	A+++
	Main flow 55°C		A++	A++	A++
SCOP ⁶	Main flow 35°C		4.95	5.20	4.62
	Main flow 55°C		3.52	3.47	3.41
η _s seasonal space heating efficiency	Main flow 35°C		195.0	204.8	181.6
	Main flow 55°C		137.9	135.7	133.2
SEER ⁶	Main flow 7°C		5.34	5.98	4.67
Maximum overcurrent protection (MOP)		A	18	189	14
Minimum circuit ampacity (MCA)		A	14	17	12
Sound power level ⁷		dB(A)	58	60	68
Compressor	Type		Twin rotary DC inverter		
Outdoor fan	Air flow	m³/h	2770	4030	4650
Net dimension (WxHxD)		mm	1008x712x426	1118x865x523	1118x865x523
Packed dimension (WxHxD)		mm	1065x800x485	1180x890x560	1180x890x560
Net/Gross weight		kg	58/64	77/88	112/125
Operating temperature range	Cooling	°C	-5 to 43	-5 to 43	-
	Heating	°C	-25 to 35	-25 to 35	-25 to 35
	DHW	°C	-25 to 43	-25 to 43	-25 to 43
Refrigerant	Type		R32	R32	R32
	Factory charge	kg	1.50	1.65	1.84
Piping connec- tions	Type		Flare		
	Liquid phase	mm	Ø 6.35	Ø 9.52	Ø 9.52
	Gas phase	mm		Ø 15.9	
	Min. pipe lenght	m	2		
	Max. pipe lenght	m	30	30	30
Installation height difference	Outdoor unit above	m	20	20	20
	Outdoor unit below	m	20	20	20

Hydronic box:				6kW	10kW	16kW
Compatible outdoor unit model				6	10	16
Sound power level			V/Ph/Hz	220-240/1/50	220-240/1/50	220-240/1/50
Sound power leve)			dB(A)	38	42	43
Dimensions (WxHxD)			mm	420x790x270	400x850x427	420x790x270
Net/Gross weight			kg	37/43	37/43	39/45
Water circuit	Piping connections		R	1"	1"	1"
	Safety valve		bar	3.0	3.0	3.0
	Internal water volume		L	5.0	5.0	5.0
	Drainage		mm	ø25	ø25	ø25
	Expansion vessel		L	8.00	8.00	8.00
	Water side heat exchanger	Type		Plate	Plate	Plate
	Water pump head		m	9.0	9.0	9.0
Water flow range			m³/h	0.4-1.25	0.4-2.10	0.7-3.00
Refrigerant circuit	Liquid phase		mm	ø 6.35	ø 9.52	ø 9.52
	Gas phase		mm	ø 15.9	ø 15.9	ø 15.9
Backup electric heater	Standard mounted		kW	3	3	9
	Optional		kW	2/4	2/4	2/4
	Capacity steps			1	1	1
Main flow temperature range	Cooling		°C	5 to 25		
	Heating		°C	25 to 65		
	DHW		°C	30 to 60		
Room temperature range			°C	5 to 35		