High-Temperature Monobloc Air-to-Water Heat Pumps with Integrated Hydronic Module

PRO-DIALOG

AQUASNAP Heating

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Heating system control (accessory)

61AF 022-105

Nominal heating capacity 21-102 kW

The Aquasnap high-temperature heat pump range was designed for commercial applications such as the heating of offices, apartments and hotels as well as domestic hot water production in new and refurbished buildings.

Features

The main features of this product range are:

- Energy savings
  The 61AF range is certified to the Eurovent energy efficiency class A with a coefficient of performance (COP) of over 4. This complies with the COP required by the Ecolabel certification.
- Ease-of-installation
  The high-temperature Aquasnap heat pumps incorporate an optional hydronic module with a multi-speed pump.
- Easy integration
  The low noise levels of the 61AF heat pump and its very compact chassis reduce the noise disturbance from the unit.
- Application flexibility
  The operating range allows outside temperatures down to -20°C and leaving water temperatures up to 65°C for domestic hot water applications.
- Availability
  - Intelligent unit control permits unit operation in extreme conditions, minimising unit shut-down times.
  - Hot water production at 65°C is available continuously.

Carrier quality is your guarantee for the safety and durability of the installation.

The Aquasnap high-temperature heat pumps incorporate the latest technological features:
- scroll compressors with vapour injection
- low-noise fans made of a composite material
- auto-adaptative microprocessor control
- electronic expansion valve
- multi-speed pump.

The Aquasnap high-temperature heat pumps can be equipped with a hydronic module that is integrated into the heat pump chassis, limiting the installation to straight-forward operations like the wiring and the connection of the hot water supply and return piping.

Quiet operation

- Compressors
  - Low-noise scroll compressors with low vibration level.
  - The compressor assembly is installed on an independent chassis and supported by anti-vibration mountings.
  - Dynamic suction and discharge piping supports, minimising vibration transmission (Carrier patent).
- Evaporator section
  - Vertical evaporator coils
  - Protection grilles on anti-vibration mountings to protect the heat exchanger against possible shocks.
  - Latest-generation low-noise Flying Bird fans, made of a composite material (Carrier patent), are now even quieter and do not generate intrusive low-frequency noise.
  - Rigid fan installation for reduced start-up noise (Carrier patent).

Easy and fast installation

- Integrated hydronic module (option)
  - Multi-speed centrifugal water pump, based on the pressure loss of the hydronic installation.
  - Water filter protects the water pump against circulating debris.
  - Pump protected against cavitation by a pressure transducer that measures the entering water pressure.
  - Overpressure valve, set to 4 bar.
  - Thermal insulation and frost protection down to -20°C, using an electric resistance heater (see table of options).
- Physical features
  - The unit has a small footprint and a low height (1329 mm) allowing it to blend in with any architectural styles.
  - The unit is enclosed by easily removable panels, covering all components (except condensers and fans).
- Simplified electrical connections
  - Single power supply point without neutral.
  - Main disconnect switch with high trip capacity.
  - Transformer for safe 24 V control circuit supply included.
- Fast commissioning
  - Systematic factory operation test before shipment.
  - Quick-test function for step-by-step verification of the instruments, electrical components and motors.

Economical operation

- Increased energy efficiency
  - Eurovent energy efficiency class A (in accordance with EN14511-3:2011).
  - The exceptional energy efficiency level (COP) of the high-temperature Aquasnap heat pumps in the heating mode is the result of a long qualification and optimisation process.
  - The electronic expansion device (EXV) allows operation at a lower condensing pressure (COP optimisation).
  - Dynamic superheat management for better utilisation of the condenser surface.
- Reduced maintenance costs
  - Maintenance-free scroll compressors with vapour injection.
  - Pro-Dialog+ control offers fast diagnosis of possible incidents and their history.

Environmental care

- Ozone-friendly R-407C refrigerant
  - Chlorine-free refrigerant of the HFC group with zero ozone depletion potential.
  - Very efficient - ensures an increased energy efficiency ratio (COP).
- Leak-tight refrigerant circuit
  - Brazed refrigerant connections for increased leak-tightness.
  - Reduction of leaks due to elimination of capillary tubes (TXVs).
  - Verification of pressure transducers and temperature sensors without transferring refrigerant charge.

Superior reliability

- State-of-the-art concept
  - Cooperation with specialist laboratories and use of limit simulation tools (finite element calculations) for the design of the critical components, e.g. motor supports, suction/discharge piping etc.
- Auto-adaptive control
  - Control algorithm prevents excessive compressor cycling and permits reduction of the water quantity in the hydronic circuit (Carrier patent).
- Exceptional endurance tests
  - Corrosion resistance tests in salt mist in the laboratory.
  - Accelerated ageing test on components that are submitted to continuous operation: compressor piping, fan supports.
  - Transport simulation test in the laboratory on a vibrating table.

Pro-Dialog+ control

Pro-Dialog+ combines intelligence with operating simplicity. The control constantly monitors all machine parameters and precisely manages the operation of compressors, expansion devices, fans and of the condenser water pump for optimum energy efficiency.

- Energy management
  - Seven-day internal time schedule clock: permits unit on/off control and operation at a second set point.
  - Set point reset based on the outside air temperature or the return water temperature or on the water heat exchanger delta T.
  - Master/slave control of two heat pumps operating in parallel with operating time equalisation and automatic change-over in case of a unit fault (option).
  - Start/stop based on the outside air temperature.
- Ease-of-use
  - The new backlighted LCD interface includes a manual control potentiometer to ensure legibility under any lighting conditions.
  - The information is displayed clearly in English, French, German, Italian and Spanish (for other languages please consult Carrier).
  - The Pro-Dialog+ navigation uses intuitive tree-structure menus, similar to the Internet browers. They are user-friendly and permit quick access to the principal operating parameters: number of compressors operating, suction/discharge pressure, compressor operating hours, set point, air temperature, entering/leaving water temperature.
  - As standard the unit includes a board for the control of a boiler and four electric resistance heater stages.

Pro-Dialog+ operator interface

Remote operating mode with volt-free contacts (standard)

A simple two-wire communication bus between the RS485 port of the Aquasnap high-temperature heat pumps and the Carrier Comfort Network offers multiple remote control, monitoring and diagnostic possibilities.

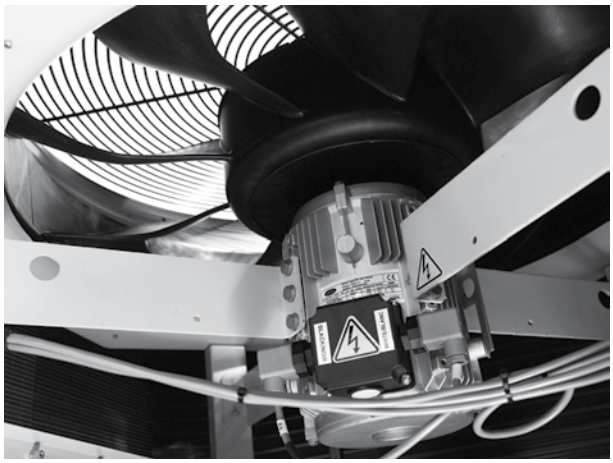
Carrier offers a vast choice of control products, specially designed to control, manage and supervise the operation of a heating system. Please consult your Carrier representative for more information on these products.

- Start/stop: opening of this contact will shut down the heat pump.
- Dual set point: closing of this contact activates a second heating set point (example: unoccupied mode).
- Demand limit: closing of this contact limits the maximum heat pump capacity to a predefined value.
- User safety: this contact is connected in series with the water flow switch and can be used for any customer safety loop.
- Water pump control.
- Alert indication: this volt-free contact indicates the presence of a minor fault.
- Alarm indication: this volt-free contact indicates the presence of a major fault that has led to the shut-down of the refrigerant circuit.

Remote interface (accessory)

This accessory includes a box that can be mounted inside the building. The power supply is provided via a 220 V/24 V transformer supplied. This interface allows access to the same menus as the unit interface and can be installed up to 300 m from the 61AF unit.

Flying Bird IV fan



Options and accessories

Options	No.	Description	Advantages	Use
Anti-corrosion protection, traditional coils	3A	Fins made of pre-treated aluminium (polyurethane or epoxy)	Improved corrosion resistance, recommended for marine environments	61AF 022-105
Unit with discharge air ducts	11	Fans with available pressure - max. 100 Pa	Enhances unit adjustment during installation (e.g. under a roof)	61AF 022-105
Low noise level	15	Acoustic compressor cover	Noise emission reduction	61AF 022-105
Very low noise level	15LS	Acoustic compressor cover and fan speed reduction, when ambient air temperature is above 20°C.	Noise emission reduction	61AF 022-105
Soft starter	25	Electronic compressor starter	Reduced compressor start-up current	61AF 022-105
Frost protection down to -20°C	42	Electric heater on the hydronic module (option 116)	Hydronic module frost protection at low outside temperature	61AF 022-105 with option 116F
Master/slave operation	58	Unit equipped with an additional field-installed leaving water temperature sensor, allowing master/slave operation of two units connected in parallel	Operation of two units connected in parallel with operating time equalisation	61AF 022-105
Low-pressure single-pump hydronic module	116F	See hydronic module chapter	Easy and fast installation	61AF 022-105
JBus gateway	148B	Two-directional communications board, complies with JBus protocol	Easy connection by communication bus to a building management system	61AF 022-105
BacNet gateway	148C	Two-directional communications board, complies with BacNet protocol	Easy connection by communication bus to a building management system	61AF 022-105
LonTalk gateway	148D	Two-directional communications board, complies with LonTalk protocol	Easy connection by communication bus to a building management system	61AF 022-105
Water screw connection between the customer's condenser and the unit	265	Victaulic screw connection at the condenser (standard on sizes 022-030)	Permits customer connections to be screwed to the unit	61AF 035-055
Welded water connection between the customer's condenser and the unit	267	Welded Victaulic connection	Permits customer connections to be welded to the unit	61AF 035-055
Remote user interface	275	Remotely installed user interface (via communication bus).	Remote heat pump control up to 300 m	61AF 022-105
Accessories		**Description**	**Advantages**	**Use**
00PPG000488000- Heating System Manager type A: controls one heat emitter type with an auxiliary electric heater or boiler		Additional control box not supplied with the unit, to be installed remotely	Heating system control facilitated	61AF 022-105
00PPG000488100- Heating System Manager type B: controls two heat emitter types (or independent zones) and domestic hot water production with an auxiliary electric heater or boiler		Additional control box not supplied with the unit, to be installed remotely	Heating system control facilitated	61AF 022-105
00PPG000488200- Heating System Manager type C: controls two heat emitter types (or independent zones) and domestic hot water production with a district heating system as auxiliary source		Additional control box not supplied with the unit, to be installed remotely	Heating system control facilitated	61AF 022-105

Units with fans with available pressure for indoor installation (option 11)

This option applies to 61AF units installed inside the building in a plant room. For this type of installation the cold air leaving the air-cooled evaporators is discharged by the fans to the outside of the building, using a duct system.

The installation of a duct system at the air evaporator discharge line causes a pressure drop due to the resistance caused by the air flow.

Therefore more powerful fan motors than those used for the standard units are installed in the units with this option. For each installation of a unit installed inside a plant room the duct pressure drops differ, depending on the duct length, duct section and direction changes.

61AF units equipped with fans with available pressure are designed to operate with air discharge ducts with maximum pressure drops of 100 Pa.

Fan discharge connection

A square flange is supplied mounted on the unit. An available standard round flange can easily be installed at the fan discharge, if the installer prefers the use of a round connection duct.

The unit is supplied with a grille on the discharge side. This grille has to be removed before connection to the duct system.

It is advisable to make the connection to the duct system with a flexible sleeve. If this recommendation is not observed, a lot of vibration and noise may be transmitted to the building structure.

Applicable rules for units incorporated into an air duct system

Ensure that the suction or discharge inlets are not accidentally obstructed by the panel positioning (e.g. low return or open doors etc.).

Electrical data for 61AF units with option 11

61AF - units with option 11 (without hydronic kit)		022	030	035	045	055	075	105
Power circuit								
Nominal power supply	V-ph-Hz	400-3-50						
Voltage range	V	360-440						
Control circuit supply		24 V, via internal transformer						
Maximum start-up current (Un)*								
Standard unit	A	107,1	105,1	133,5	173,5	193,5	159,5	226,5
Unit with electronic starter option	A	58,6	57,6	72,5	93,3	103,7	106,5	147,5
Unit power factor at maximum capacity**		0,82	0,82	0,82	0,82	0,82	0,82	0,82
Maximum unit power input**	kW	9,8	12,7	14	15,7	17,9	28	35,9
Nominal unit current draw***	A	16,4	19	22,3	25,3	30	43,9	59,3
Maximum unit current draw (Un)****	A	18,5	23,7	26,5	29,5	33,5	52,3	66,3
Maximum unit current draw (Un-10%)†	A	23,2	30,5	34,3	38,5	44,1	67,9	87,5
Customer-side unit power reserve		Customer reserve at the 24 V control power circuit						
Short-circuit stability and protection		See table on page 6						

* Maximum instantaneous start-up current (maximum operating current of the compressor + fan current + locked rotor current of the compressor).
** Power input, compressor and fan, at the unit operating limits (saturated suction temperature 10°C, saturated condensing temperature 65°C) and nominal voltage of 400 V (data given on the unit nameplate).
*** Standardised Eurovent conditions: condenser entering/leaving water temperature = 40°C/45°C, outside air temperature db/wb = 7°C/6°C.
**** Maximum unit operating current at maximum unit power input and 400 V (values given on the unit nameplate).
† Maximum unit operating current at maximum unit power input and 360 V.

Hydronic module (option 116)

The hydronic module option reduces the installation time. The heat pump is factory-equipped with the main hydronic components required for the installation: screen filter, water pump, safety valve, water pressure transducer, flow switch.

The Pro-Dialog+ control allows integration of system and water pump protection devices (insufficient water flow rate, water pressure, water flow rate etc.).

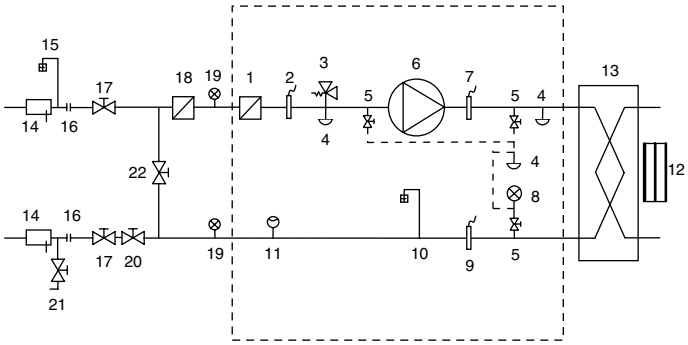
The pump supplied with the hydronic module is a multi-speed pump.

An automatic pump start-up algorithm protects the heat exchanger and the hydronic module piping against frost down to -10°C outside air temperature, as standard. If necessary, increased frost protection down to -20 °C is possible by adding heaters to the hydronic module piping (see option 42).

The hydronic module option is integrated into the heat pump without increasing its dimensions and saves the space normally used for the water pump.

Hydronic module

Typical hydronic circuit diagram



Legend

Components of the unit and hydronic module
1 Victaulic screen filter
2 Pressure sensor
Note: Gives pump suction pressure information (see installation manual)
3 Safety valve
4 Water drain valve
5 Shut-off valve
6 Water pump
7 Temperature sensors, BPHE inlet
Note: Gives heat exchanger entering temperature information (see installation manual)
8 Pressure gauge
Note: Allows measuring of the pump suction pressure, the pump leaving pressure and the heat exchanger leaving pressure
9 Temperature sensor, BPHE outlet
Note: Gives heat exchanger leaving temperature information (see installation manual)
10 Automatic air vent
11 Flow switch
12 Plate heat exchanger frost protection heater
13 Plate heat exchanger

Installation components
14 Temperature probe well
15 Air vent
16 Flexible connection
17 Shut-off valve
18 Screen filter (obligatory for a unit without hydronic module)
19 Pressure gauge
20 Water flow control valve
21 Charge valve
22 Frost protection bypass valve (when shut-off valves [17] are closed during winter)

--- Hydronic module (unit with hydronic module)

Notes:
- Units without hydronic module (standard units) are equipped with a flow switch and two temperature sensors (7 and 9).
- For units equipped with hydronic module, the pressure sensor located upstream of the pump to prevent cavitation is installed on a connection without Schraeder valves. Depressurise and drain the system before any intervention.

Physical and electrical data, units with hydronic module

61AF		022	030	035	045	055	075	105
Operating weight*								
Unit with hydronic module	kg	349	403	436	524	549	926	1044
Hydronic module								
Maximum operating pressure	kPa	400	400	400	400	400	400	400
Water filter		Victaulic screen filter						
Pumps								
Water pump		TOP-S 25	TOP-S 25	TOP-S40	TOP-S40	TOP-S40	TOP-S50	TOP-S50
Shaft power input	kW	0.18	0.18	0.35	0.35	0.35	0.45	0.45
Power input**	kW	0.42	0.42	0.63	0.63	0.63	0.95	0.95
Nominal operating current draw	A	0.4	0.4	0.6	0.6	0.7	1.3	1.5
Maximum current draw at 400 V***	A	0.8	0.8	1.3	1.3	1.3	1.7	1.7
Water connections (with hydronic module)								
Connections	inch	1-1/4	1-1/4	1-1/2	1-1/2	1-1/2	2	2
Outside diameter	mm	42.4	42.4	48.3	48.3	48.3	60.3	60.3

* Weight shown is a guideline only. To find out the unit refrigerant charge, please refer to the unit nameplate.
** To obtain the maximum power input for a unit with hydronic module, add the maximum unit power input to the pump power input.
*** To obtain the maximum operating current draw for a unit with hydronic module, add the maximum unit current draw to the pump current draw.

Heating System Manager (HSM)

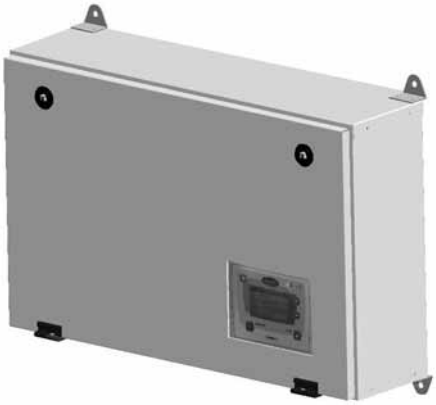
This accessory allows improved integration of the 61AF heat pump to maximise the energy efficiency performance. With three system levels for nine typical configurations, most heating only applications are covered - from the simplest to the most complex, such as interfacing with a district heating system.

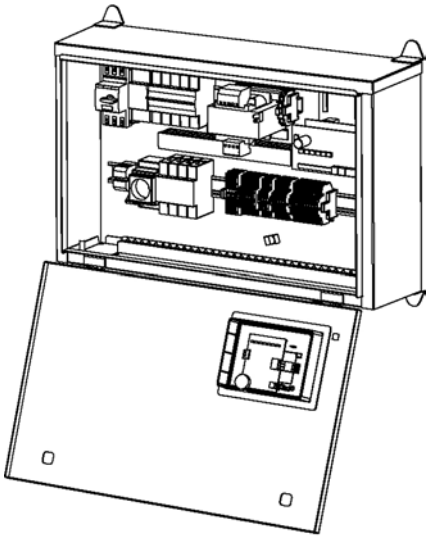
Each of these accessory configurations is described in detail the installation manual for this accessory:
- Choice of control options (on/off volt-free contact or 0-10 V signal for increased performance),
- Domestic hot water production temperature control and distribution.

The control box can supply all auxiliary devices such as the circulating pumps or the mixing or switching valves.

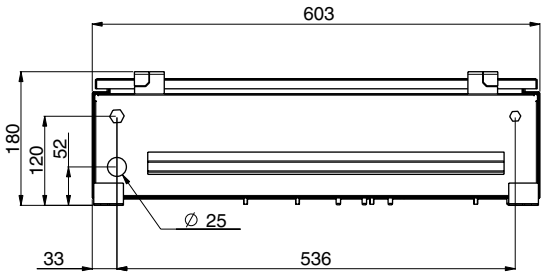
The heat pump is controlled by a CCN bus and the control box includes an NRCP2-BASE board, a ProDialog interface as well as all required sensors.

Control box



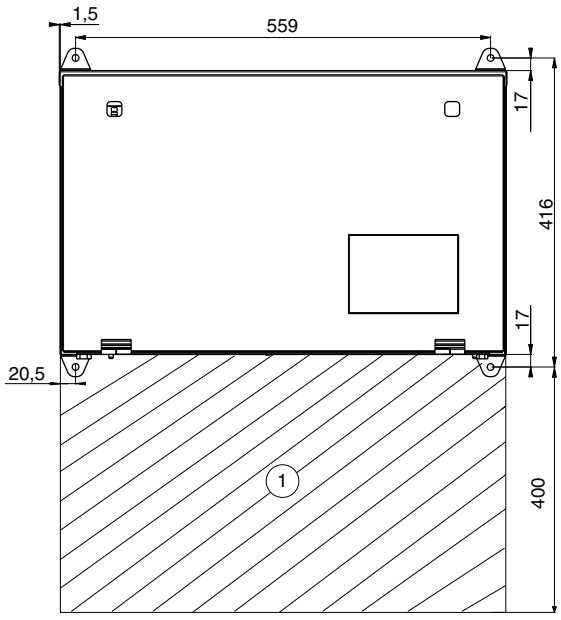


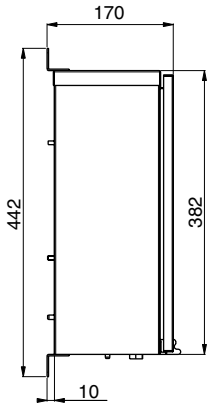
Control box dimensions



Installation safety notes

- The hydronic installation must be carried out by qualified personnel in accordance with applicable laws and following standard accepted practices.
- The hydronic installation must be regularly serviced.
- An incorrect hydronic installation that does not comply with the safety, electrical and thermal standards, as well as lacking/poor maintenance can lead to excessive pressures and cause piping breaks.





Legend:
All dimensions are in mm.

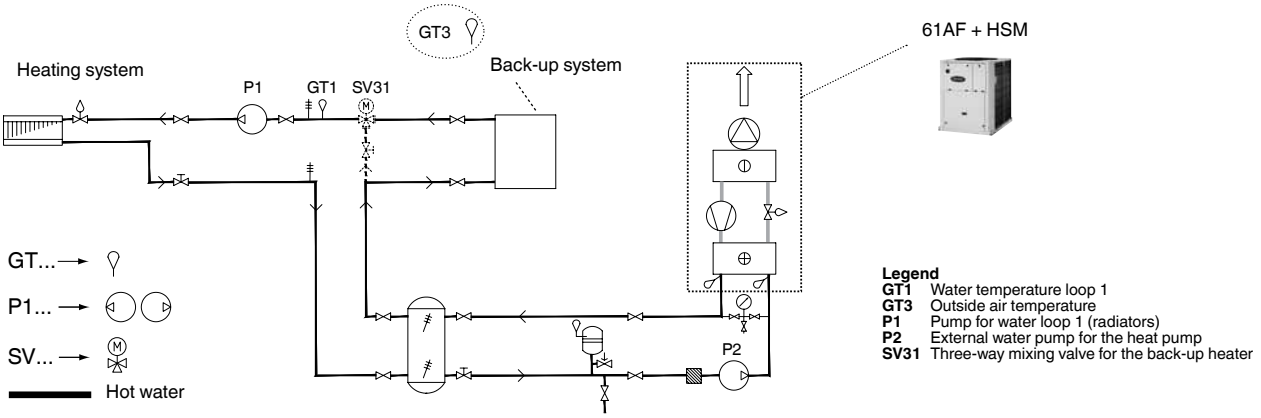
① Clearance required to open the door and for customer connection

Heating System Manager (HSM) - continued

Accessory 00PPG000488000- Heating System Manager type A

■ Heating System Manager: one heat emitter type with supplementary electric heater or boiler:
- Allows control of a non-reversible heating system that includes a 61AF heat pump and a single heat emitter type or a single comfort zone. For optimised energy efficiency the heat pump is controlled by a configurable weather compensation system. The control box controls a supplementary electric heater or a standy-by boiler. The control box supplies power to the circulating pumps.

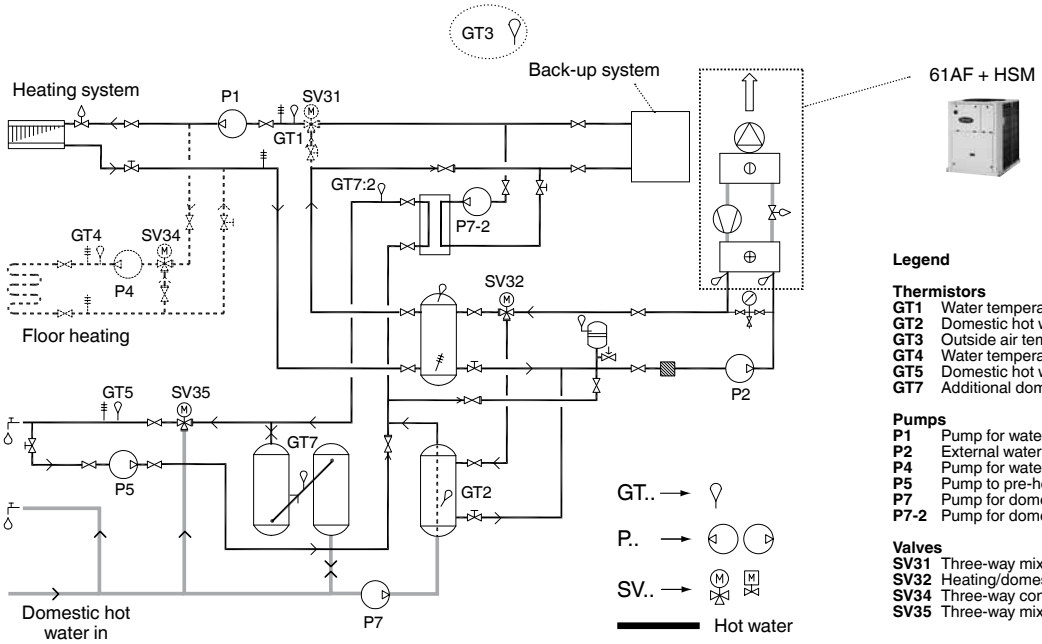
Heating system example: one heat emitter type with supplementary electric heating or stand-by boiler



Legend
GT1 Water temperature loop 1
GT3 Outside air temperature
P1 Pump for water loop 1 (radiators)
P2 External water pump for the heat pump
SV31 Three-way mixing valve for the back-up heater

Accessory 00PPG000488100- Heating System Manager type B

■ Heating System Manager (as accessory 00PPG000488000-) two heat emitter types or independent zones and domestic hot water production:
- Allows control of a non-reversible heating system that includes a 61AF heat pump and two different heat emitter types and/or two independent comfort zones. For optimised energy efficiency the heat pump is controlled by a configurable weather compensation system. The control box controls a supplementary electric heater or a standy-by boiler. The control box supplies power to the circulating pumps. Hot-water production can be permanent or programmable with a second setpoint at the heat pump and control of a switching valve.



Legend

Thermistors
GT1 Water temperature loop 1
GT2 Domestic hot water tank temperature
GT3 Outside air temperature
GT4 Water temperature loop 2
GT5 Domestic hot water temperature
GT7 Additional domestic hot water tank temperature

Pumps
P1 Pump for water loop 1 (radiators)
P2 External water pump for the heat pump
P4 Pump for water loop 2 (floor heating)
P5 Pump to pre-heat the domestic hot water valve loop
P7 Pump for domestic hot water circulation
P7-2 Pump for domestic hot water circulation in an aditional tank

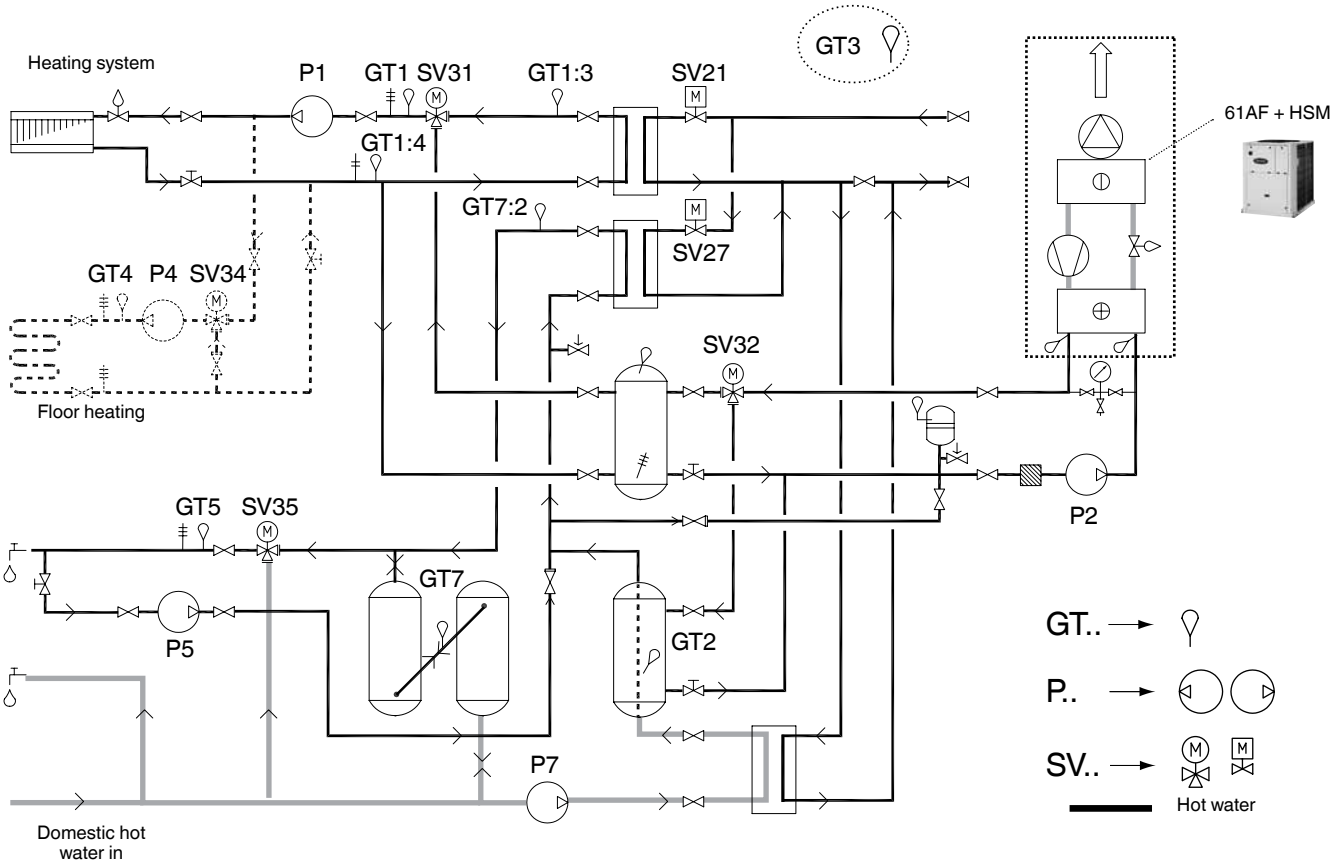
Valves
SV31 Three-way mixing valve for the back-up heater
SV32 Heating/domestic hot water change-over valve
SV34 Three-way control valve for water loop 2
SV35 Three-way mixing valve for domestic hot water

NOTES:
This application example includes two zones and a supplementary boiler and domestic hot-water production.
The installation includes a switching valve (SV32) that allows switching from the heat pump capacity of the heating system to domestic hot-water production.
The primary heating circuit is the domestic hot-water production circuit. It includes a tank with an equivalent pressure drop to simplify system balancing.

Heating System Manager (HSM) - continued

Accessory 00PPG000488200- Heating System Manager type C

- Heating System Manager (as accessory 00PPG000488100-) with the possibility to obtain additional heating and domestic hot-water production capacity from a district heating system:
  - Allows control of a non-reversible heating system that includes a 61AF heat pump and two different heat emitter types and/or two independent comfort zones. For optimised energy efficiency the heat pump is controlled by a configurable weather compensation system. The control box controls the heating and/or domestic hot-water production support from a district heating system. The control box supplies power to the circulating pumps. Hot-water production can be permanent or programmable with a second setpoint at the heat pump and control of a switching valve.



Legend

Thermistors
GT1 Water temperature loop 1
GT1:3 Heat exchanger leaving water temperature, district heating
GT1:4 Heat exchanger entering water temperature, district heating
GT2 Domestic hot water tank temperature
GT3 Outside air temperature
GT4 Water temperature loop 2
GT5 Domestic hot water temperature
GT7 Additional domestic hot water tank temperature
GT7:2 Back-up heat exchanger temperature for domestic hot water

Pumps
P1 Pump for water loop 1 (radiators)
P2 External water pump for the heat pump
P4 Pump for water loop 2 (floor heating)
P5 Pump to pre-heat the domestic hot water valve loop
P7 Pump for domestic hot water circulation

Valves
SV21 Valve for district heating heat exchanger for heating
SV27 Valve for district heating heat exchanger for domestic hot water
SV31 Three-way mixing valve for the back-up heater
SV32 Heating/domestic hot water change-over valve
SV34 Three-way control valve for water loop 2
SV35 Three-way mixing valve for domestic hot water

Physical data

61AF		022	030	035	045	055	075	105
Heating application as per EN14511-3:2011*								
Condition 1								
Nominal heating capacity	kW	20.8	25.7	32.3	43.8	52.3	66.9	101.9
COP	kW/kW	3.45	3.45	3.37	3.56	3.65	3.41	3.58
Eurovent class, heating		A	A	A	A	A	A	A
Condition 2								
Nominal heating capacity	kW	20.8	25.7	32.3	43.7	52.2	66.8	101.7
COP	kW/kW	4.11	4.14	4.07	4.31	4.36	3.97	4.25
Heating application**								
Condition 1								
Nominal heating capacity	kW	20.8	26.2	32.6	44.2	52.1	64.9	101.9
COP	kW/kW	3.46	3.47	3.39	3.58	3.67	3.43	3.61
Condition 2								
Nominal heating capacity	kW	20.8	26.2	32.5	44.1	52.0	64.8	101.6
COP	kW/kW	4.13	4.17	4.10	4.34	4.39	4.00	4.29
Operating weight***								
Standard unit (without hydronic kit)	kg	343	396	421	509	533	900	1020
Standard unit (plus hydronic module option)	kg	349	403	436	524	549	926	1044
Sound levels								
Sound power level 10^{-12} W****	dB(A)	81	82	83	83	84	84	85
Sound pressure level at 10 m†	dB(A)	50	51	51	51	53	52	53
Dimensions								
Length x depth x height	mm	1110 x 1327 x 1330			1114 x 2100 x 1330		2273 x 2100 x 1330	
Compressor		Hermetic scroll 48.3 r/s						
Quantity		1	1	1	1	1	2	2
Number of capacity stages		1	1	1	1	1	2	2
Refrigerant		R-407C						
Charge	kg	8.0	8.8	9.7	10.0	13.2	22.0	26.5
Capacity control		Pro-Dialog+						
Minimum capacity	%	100	100	100	100	100	50	50
Condenser		Direct-expansion plate heat exchanger						
Water volume	l	4.9	6.4	8.2	9.6	12.1	16.4	22.7
Max. water-side operating pressure without hydronic module	kPa	1000	1000	1000	1000	1000	1000	1000
Max. water-side operating pressure with hydronic module	kPa	400	400	400	400	400	400	400
Fan		Axial with rotating shroud, Flying Bird IV						
Quantity		1	1	1	1	1	2	2
Total air flow (high speed)	l/s	3770	3748	3736	4035	4036	7479	8072
Speed, standard unit	r/s	12	12	12	12	12	12	12
Speed, unit with option 11	r/s	16	16	16	16	16	16	16
Evaporator		Grooved copper tubes and aluminium fins						
Hydronic module (option 116)								
Three-speed single pump		Pump, Victaulic screen filter, safety valve, purge valves (water and air), cavitation pressure sensor						
Water connections with/without hydronic module		Victaulic						
Connections††	inch	1-1/4	1-1/4	1-1/2	1-1/2	1-1/2	2	2
Outside diameter	mm	42.4	42.4	48.3	48.3	48.3	60.3	60.3
Chassis paint colour		Colour code: RAL 7035						

* Eurovent-certified performances in accordance with standard EN14511-3:2011
Condition 1: Heating mode conditions: water heat exchanger water entering/leaving temperature 40°C/45°C, outside air temperature 7°C db/6°C wb.
Condition 2: Heating mode conditions: water heat exchanger water entering/leaving temperature 30°C/35°C, outside air temperature 7°C db/6°C wb.

** Gross performances, not in accordance with EN14511-3:2011. These performances do not take into account the correction for the proportional heating capacity and power input generated by the water pump to overcome the internal pressure drop in the heat exchanger.
Condition 1: Heating mode conditions: water heat exchanger water entering/leaving temperature 40°C/45°C, outside air temperature 7°C db/6°C wb.
Condition 2: Heating mode conditions: water heat exchanger water entering/leaving temperature 30°C/35°C, outside air temperature 7°C db/6°C wb.

*** Weight shown is a guideline only. To find out the unit refrigerant charge, please refer to the unit nameplate..

**** In accordance with ISO 9614-1 and certified by Eurovent. The values have been rounded and are for information only and not contractually binding

† For information, calculated from the sound power level Lw(A)

†† Units 61AF 022 and 61AF 030 include two sleeves for a 1-1/4" Victaulic to 1-1/4" screw connection as standard.

Electrical data

61AF - standard unit (without hydronic module)		022	030	035	045	055	075	105
Power circuit								
Nominal power supply	V-ph-Hz	400-3-50						
Voltage range	V	360-440						
Control circuit supply		24 V, via internal transformer						
Maximum start-up current (Un)*								
Standard unit	A	104	102	130	170	190	157	229
Unit with electronic starter option	A	56	55	70	91	101	101	142
Unit power factor at maximum capacity**		0.82	0.82	0.82	0.82	0.82	0.82	0.82
Maximum unit power input**	kW	8.7	11.6	12.9	14.6	16.8	25.8	33.7
Nominal unit current draw***	A	13.6	16.4	20.1	23.2	27.7	40.2	55.4
Maximum unit current draw (Un)****	A	16.8	21.1	27.0	32.8	38.8	54.0	77.6
Maximum unit current draw (Un-10%)†	A	18.6	23.3	29.9	36.2	43.0	59.8	86.0
Customer-side unit power reserve		Customer reserve at the 24 V control power circuit						
Short-circuit stability and protection		See table below.						

* Maximum instantaneous start-up current (maximum operating current of the compressor + fan current + locked rotor current of the compressor).
** Power input, compressor and fan, at the unit operating limits (saturated suction temperature 10°C, saturated condensing temperature 65°C) and nominal voltage of 400 V (data given on the unit nameplate).
*** Standardised Eurovent conditions: condenser entering/leaving water temperature = 40°C/45°C, outside air temperature db/wb = 7°C/6°C.
**** Maximum unit operating current at maximum unit power input and 400 V (values given on the unit nameplate).
† Maximum unit operating current at maximum unit power input and 360 V.

Short-circuit stability current, main disconnect without fuse (TN system*)

61AF - standard unit (main disconnect switch)		022	030	035	045	055	075	105
Value with unspecified upstream protection								
Short-term current at 1 s (Icw)	kA rms	0.6	0.6	0.6	1.26	1.26	1.26	2
Admissible peak current (Ipk)	kA pk	4.5	4.5	4.5	6	6	6	10
Maximum value with upstream protection by Siemens circuit breaker								
Conditional short-circuit current (Icc)	kA rms	5.4	7	7	7.7	7.7	6.1	10
Siemens circuit breaker - Compact range		32	40	40	50	63	80	100
Reference number**		5SY6332-7	5SY6340-7	5SY6340-7	5SY4350-7	5SY4363-8	5SP4380-7	5SP4391-7
Maximum value with upstream protection by fuses (gL/gG)								
Conditional short-circuit current (Icc)	kA rms	17	50	50	50	50	14.5	22
Siemens fuse (gL/gG)		40	40	40	63	63	80	125

* Earthing system type
** If another current limitation protection system is used, its time-current and thermal constraint (I^2t) trip characteristics must be at least equivalent to those of the recommended Siemens circuit breaker. Contact your nearest Carrier office.
The short-circuit stability current values above are in accordance with the TN system.

Electrical data and operating conditions notes:

- 61AF 022-105 units have a single power connection point located immediately upstream of the main disconnect switch.
- The control box includes the following standard features:
  - a main disconnect switch,
  - starter and motor protection devices for the compressor, the fan and the pump,
  - the control devices.
- Field connections:
  All connections to the system and the electrical installations must be in full accordance with all applicable local codes.
- The Carrier 61AF units are designed and built to ensure conformance with these codes. The recommendations of European standard EN 60204-1 (machine safety - electrical machine components - part 1: general regulations - corresponds to IEC 60204-1) are specifically taken into account, when designing the electrical equipment.

Notes:

- Generally the recommendations of IEC 60364 are accepted as compliance with the requirements of the installation directives. Conformance with EN 60204-1 is the best means of ensuring compliance with the Machinery Directive § 1.5.1.
- Annex B of EN 60204-1 describes the electrical characteristics used for the operation of the machines.
- The operating environment for the 61AF units is specified below:

1. Environment* - Environment as classified in EN 60721 (corresponds to IEC 60721):
   - outdoor installation*
   - ambient temperature range: -20°C to +40°C, class 4K4H
   - altitude: ≤ 2000 m
   - presence of hard solids, class 4S2 (no significant dust present)
   - presence of corrosive and polluting substances, class 4C2 (negligible)
2. Power supply frequency variation: ± 2 Hz.
3. The neutral (N) conductor must not be connected directly to the unit (if necessary use a transformer).
4. Overcurrent protection of the power supply conductors is not provided with the unit.
5. The factory-installed disconnect switch is of a type suitable for power interruption in accordance with EN 60947-3 (corresponds to IEC 60947-3)
6. The units are designed for connection to TN networks (IEC 60364). For IT networks the earth connection must not be at the network earth. Provide a local earth, consult competent local organisations to complete the electrical installation.

Caution: If particular aspects of an actual installation do not conform to the conditions described above, or if there are other conditions which should be considered, always contact your local Carrier representative.

* The required protection level for this class is IP43BW (according to reference document IEC 60529). All 61AF units are protected to IP44CW and fulfil this protection condition.

Operating limits

Operating range

61AF		Minimum	Maximum
Condenser			
Entering water temperature at start-up	°C	8	57
Leaving water temperature during operation	°C	30	65
Entering/leaving water temperature difference	K	3	**
Evaporator			
Entering air temperature, standard unit*	°C	-20	40
Entering air temperature, unit with option 11	°C	-15	40

* Outside temperature: For transport and storage of the 61AF units the minimum and maximum allowable temperatures are -20°C and +50°C. It is recommended that these temperatures are used for transport by container.
** Refer to the minmum unit flow rate.

Note: Do not exceed the maximum operating temperature.

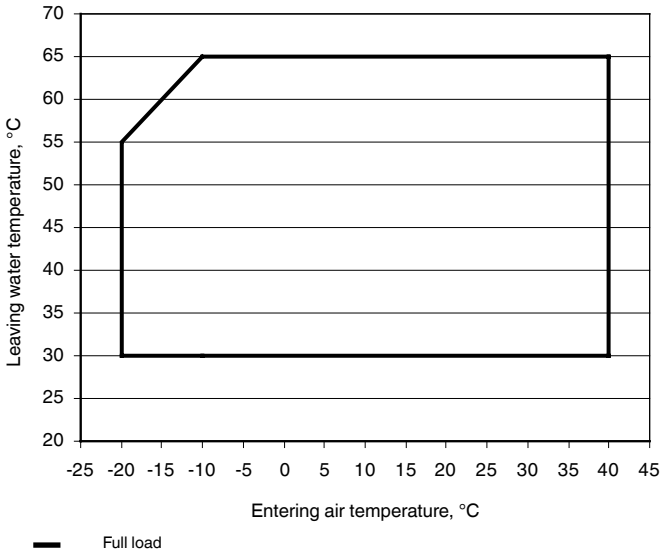
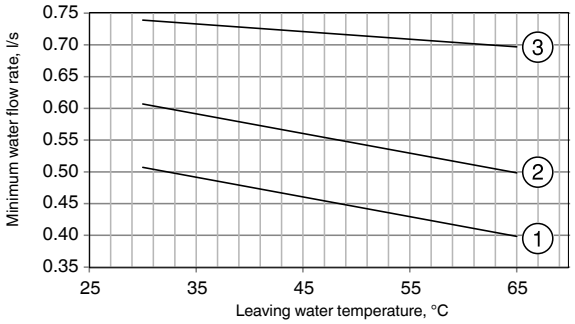


Plate heat exchanger water flow rate

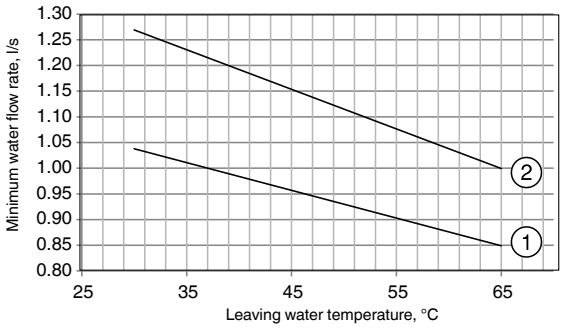
61AF	Maximum* with hydronic module	Maximum** without hydronic module
022	1.6	1.8
030	1.7	2.4
035	3.3	3.1
045	3.3	3.8
055	3.2	4.6
075	5.9	6.4
105	6.1	8.5

* Maximum flow rate at an available pressure of 15 kPa.
** Maximum flow rate at a water temperature difference of 3 K in the plate heat exchanger.

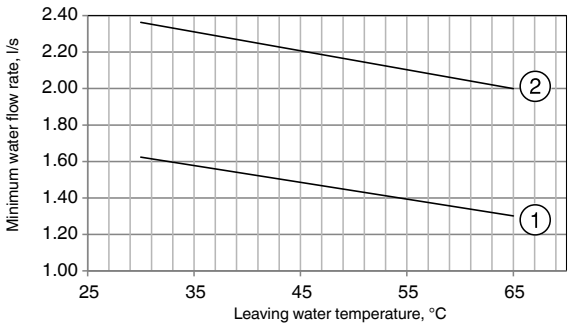
Note: For a domestic hot water application (leaving water temperature = 65°C), the water temperature difference must be at least 8 K for operation at 100% capacity.



1 61AF 022
2 61AF 030
3 61AF 035



1 61AF 045
2 61AF 055

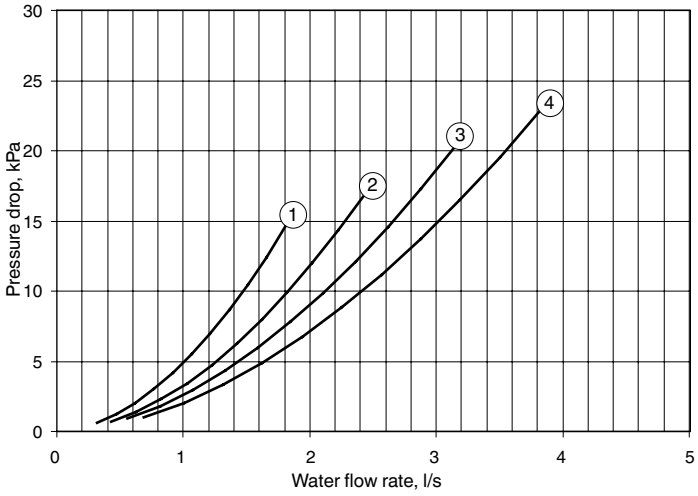


1 61AF 075
2 61AF 105

Available static system pressure

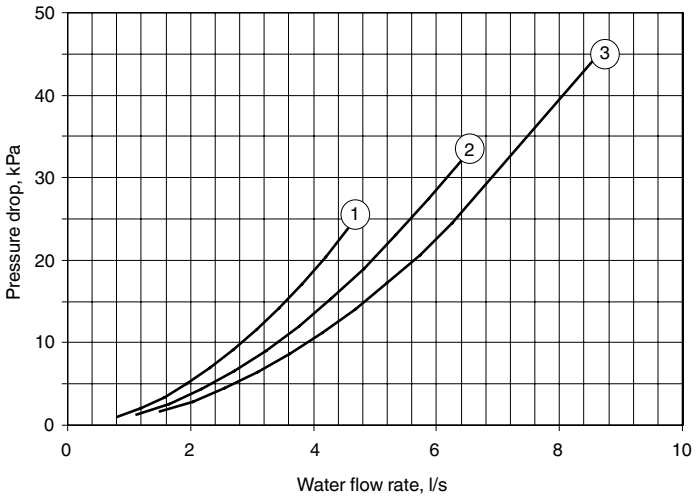
Plate heat exchanger pressure drop - for pure water at 20°C

61AF 022-045



1 61AF 022
2 61AF 030
3 61AF 035
4 61AF 045

61AF 055-105



1 61AF 055
2 61AF 075
3 61AF 105

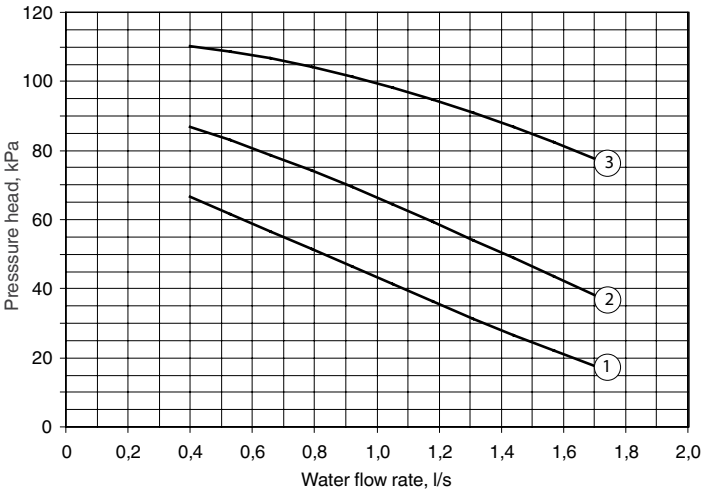
Available static system pressure (cont.)

Pump pressure/flow rate curves for units with hydronic module - for pure water at 20°C

The 61AF units are equipped with a fixed-speed pump with three different speeds. These speeds can be manually adjusted by changing the speed terminal board inside the terminal box (this operation can only be carried out by approved personnel).

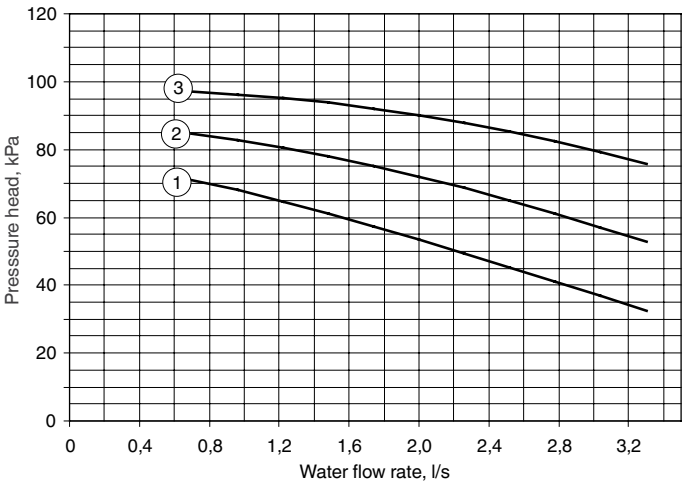
The speed initially selected corresponds to standard use for heating water loops. If this speed needs to be changed, the pressure/flow curves for the three speeds are shown below.

61AF 022-030



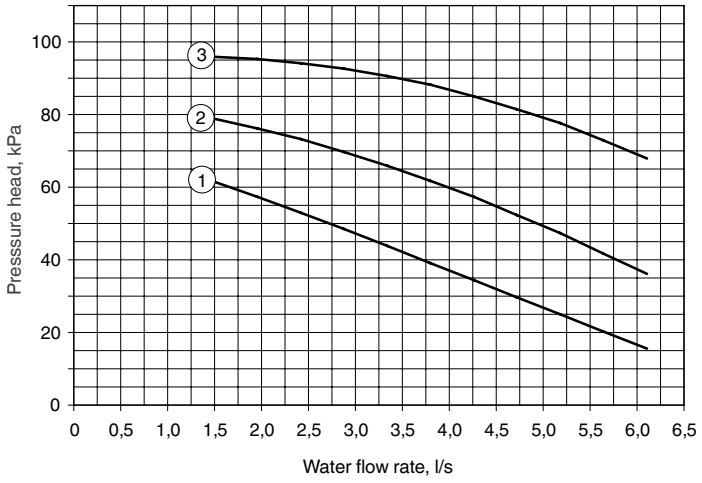
1 61AF 022-030 (speed 1)
2 61AF 022-030 (speed 2)
3 61AF 022-030 (speed 3): selected

61AF 035-055



1 61AF 035-055 (speed 1)
2 61AF 035-055 (speed 2)
3 61AF 035-055 (speed 3): selected

61AF 075-105



1 61AF 075-105 (speed 1)
2 61AF 075-105 (speed 2)
3 61AF 075-105 (speed 3): selected

Available static system pressure (cont.)

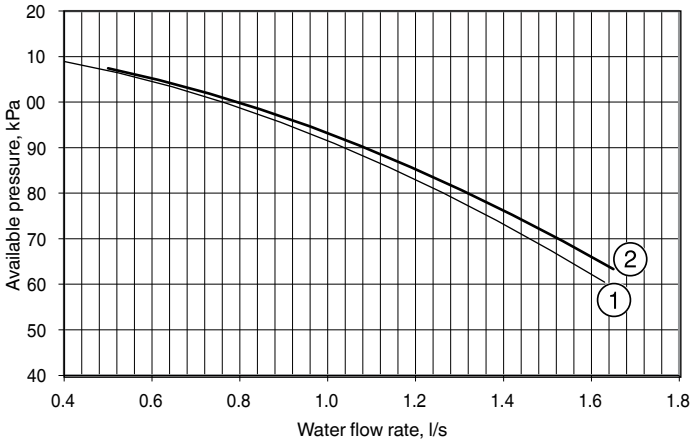
Available system pressure for units with hydronic module - for pure water at 20°C

The available pressure curves for the 61AF units are given for the speed initially selected. If the speed is changed by the user, the curves below do not apply.

61AF	Maximum condenser water flow rate, l/s'
022	1.6
030	1.7
035	3.3
045	3.3
055	3.2
075	5.9
105	8.5

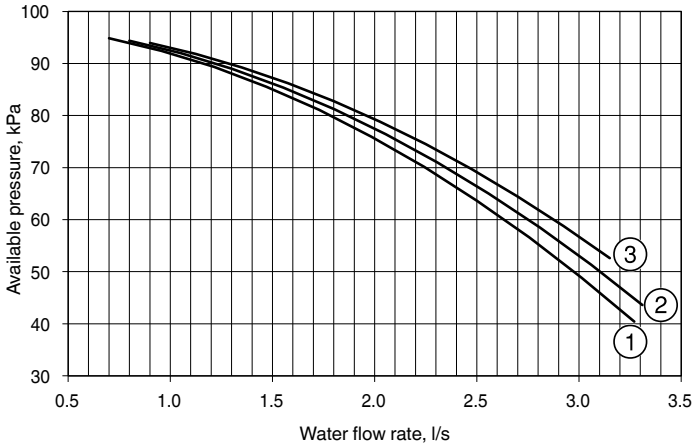
* Maximum flow rate at an available pressure of 15 kPa (unit with hydronic module).

61AF 022-030



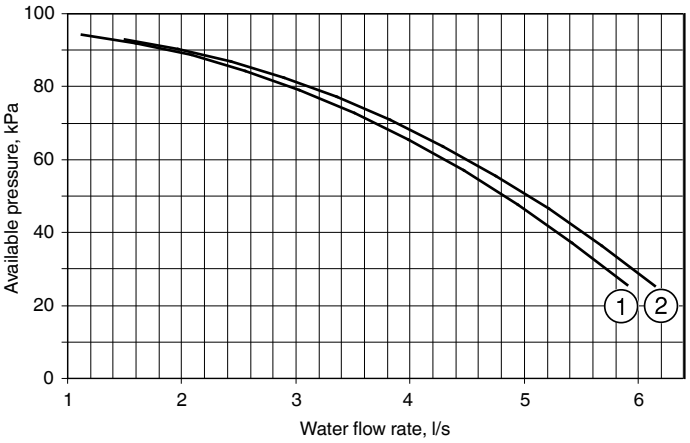
1 61AF 022
2 61AF 030

61AF 035-055



1 61AF 035
2 61AF 045
3 61AF 055

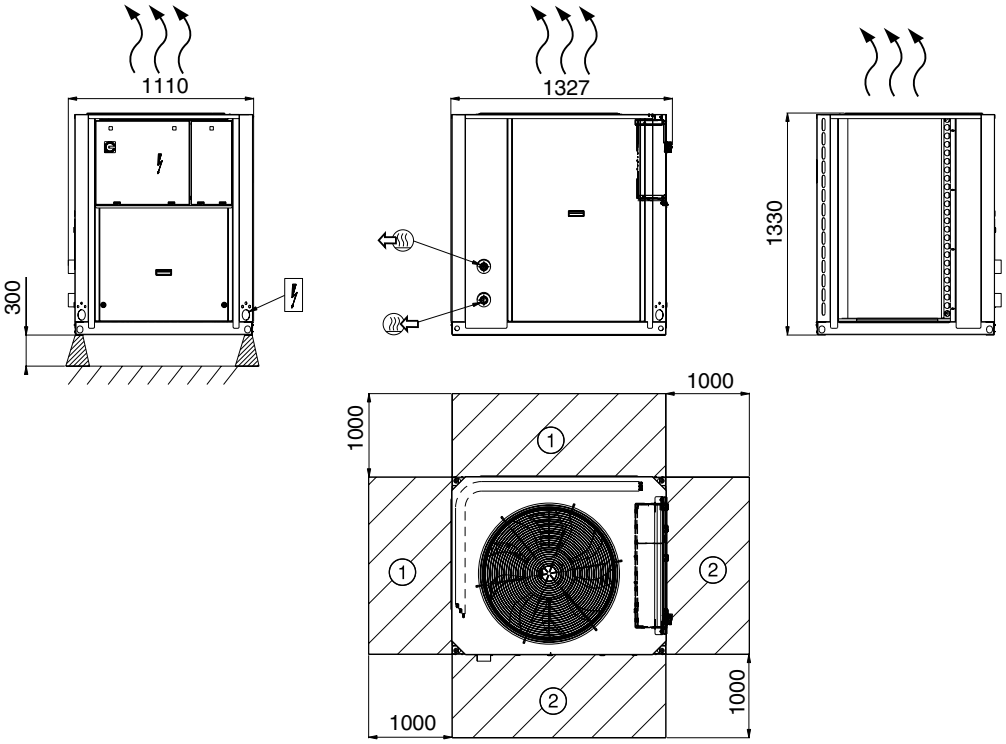
61AF 075-105



1 61AF 075
2 61AF 105

Dimensions/clearances

61AF 022-035 units with and without hydronic module

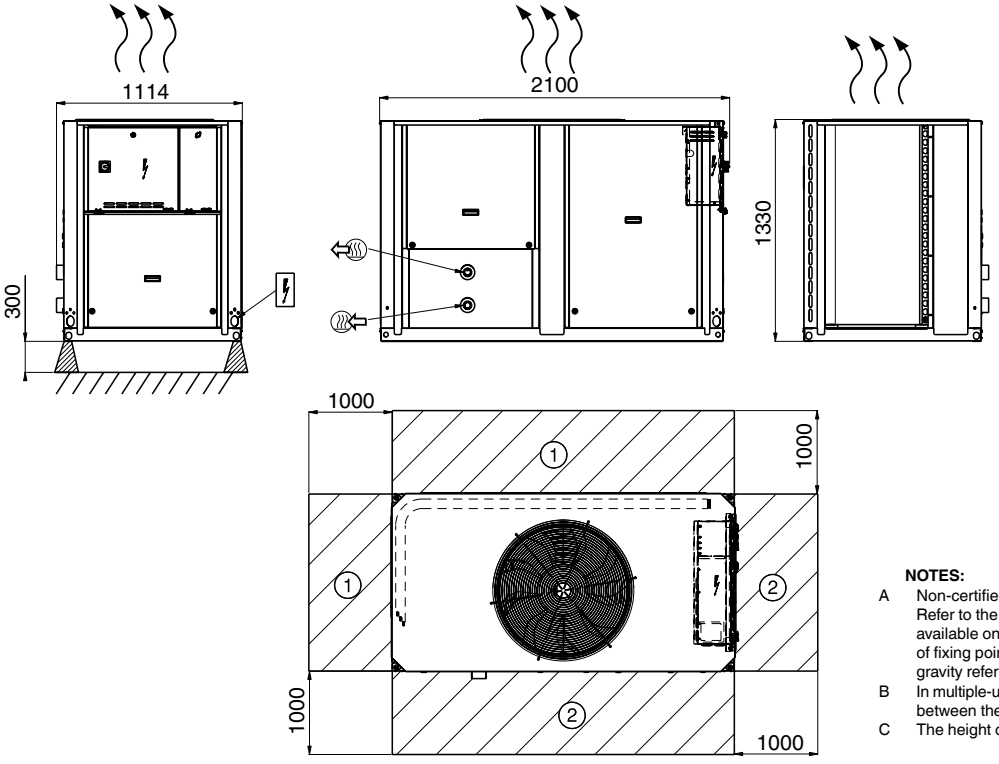


Legend

All dimensions are in mm

- ① Required clearances for air flow
- ② Recommended space for maintenance
- Water inlet
- Water outlet
- Air outlet, do not obstruct
- Control box
- Power cable connection

61AF 045-055 units with and without hydronic module



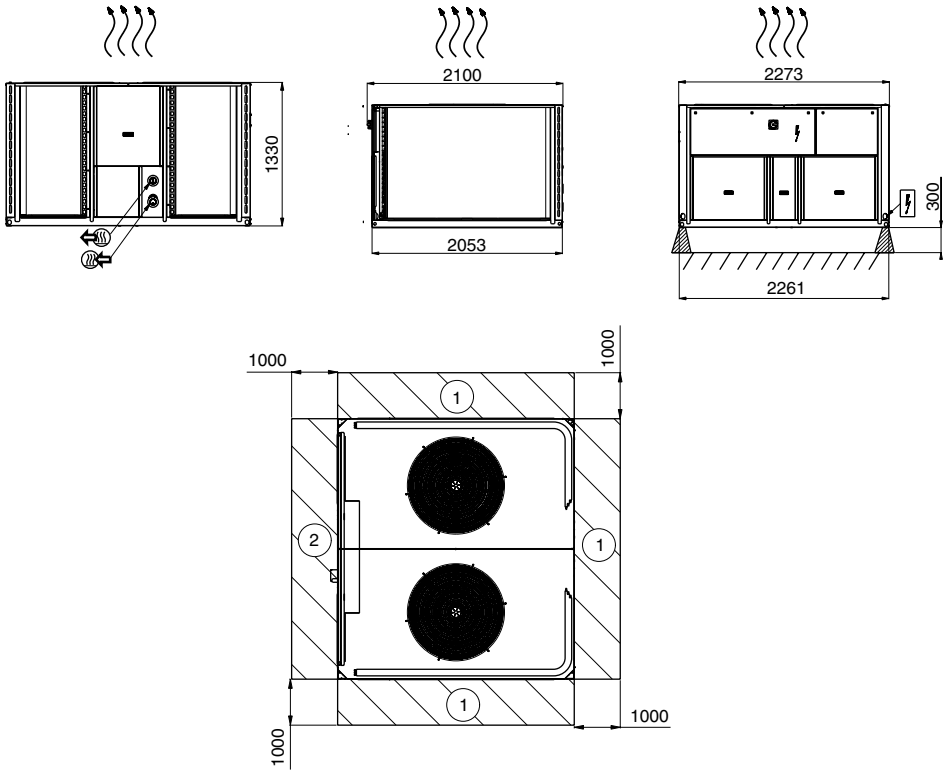
NOTES:

A Non-certified drawings.
Refer to the certified dimensional drawings supplied with the unit or available on request, when designing an installation. For the location of fixing points, weight distribution and coordinates of the centre of gravity refer to the certified dimensional drawings.

B In multiple-unit installations (maximum four units), the side clearance between the units should be increased from 1000 to 2000 mm.

C The height of the solid surface must not exceed 2 m.

61AF 075-105 units with and without hydronic module

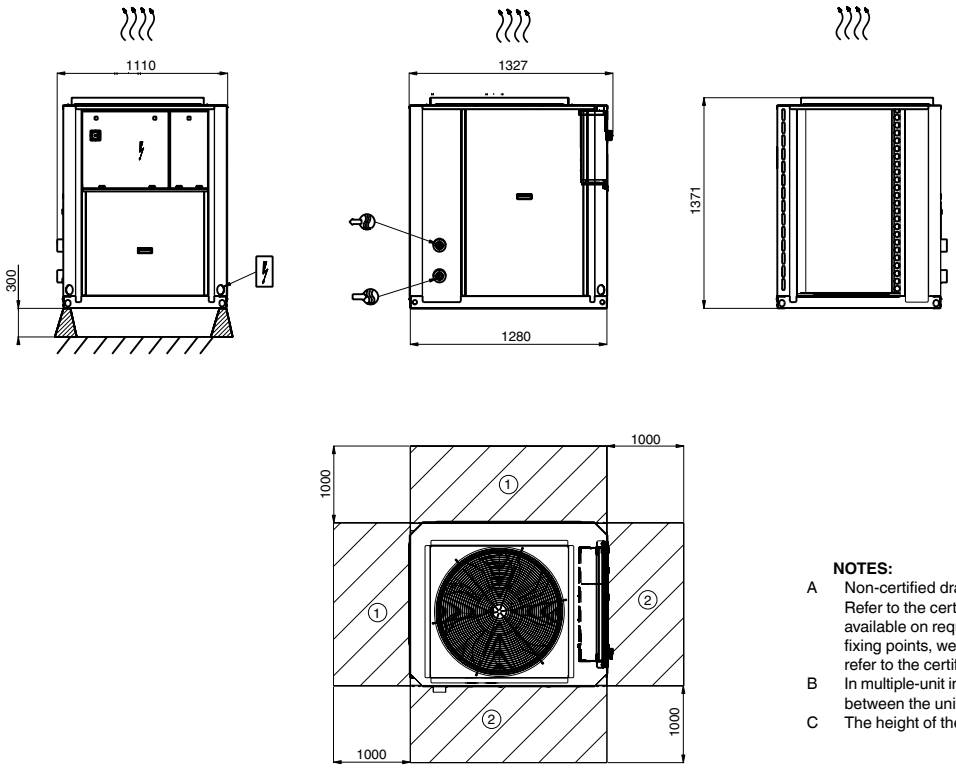


Legend

All dimensions are in mm

1. Required clearances for air flow
2. Recommended space for maintenance
- Water inlet
- Water outlet
- Air outlet, do not obstruct
- Control box
- Power cable connection

61AF 022-035 with option 11, units with and without hydronic module



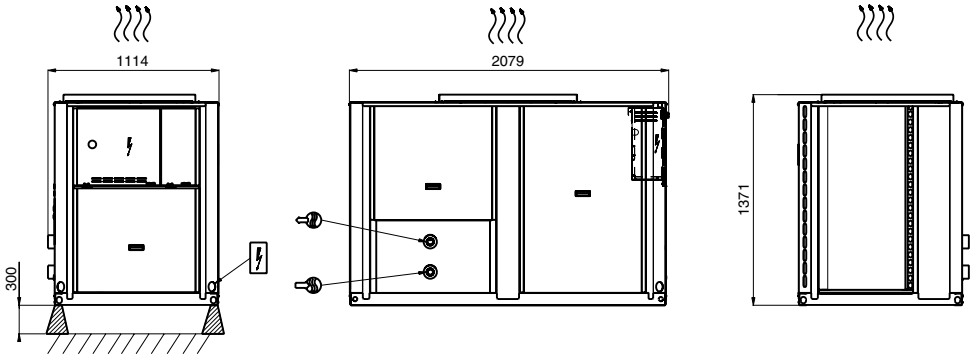
NOTES:

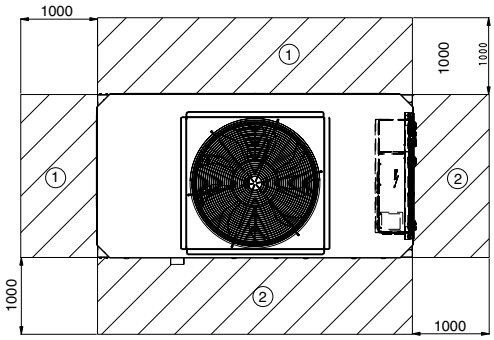
A Non-certified drawings.
Refer to the certified dimensional drawings supplied with the unit or available on request, when designing an installation. For the location of fixing points, weight distribution and coordinates of the centre of gravity refer to the certified dimensional drawings.

B In multiple-unit installations (maximum four units), the side clearance between the units should be increased from 1000 to 2000 mm.

C The height of the solid surface must not exceed 2 m.

61AF 045-055 with option 11, units with and without hydronic module



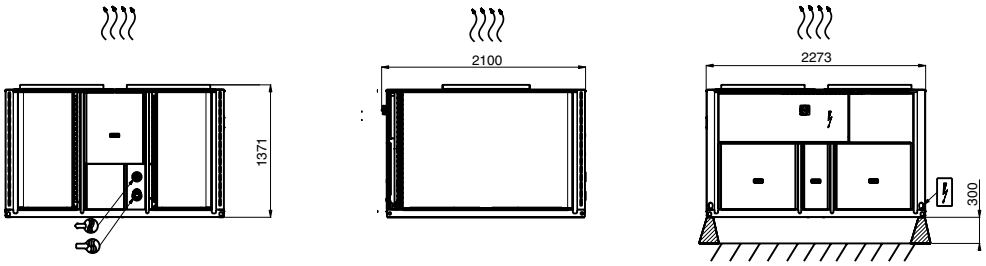


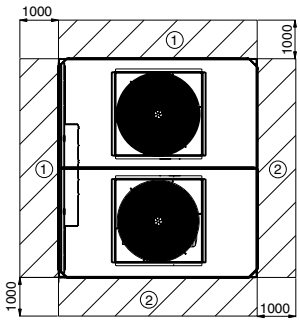
Legend

All dimensions are in mm

- (1) Required clearances for air flow
- (2) Recommended space for maintenance
- Water inlet
- Water outlet
- Air outlet, do not obstruct
- Control box
- Power cable connection

61AF 075-105 with option 11, units with and without hydronic module





NOTES:

A Non-certified drawings.
Refer to the certified dimensional drawings supplied with the unit or available on request, when designing an installation. For the location of fixing points, weight distribution and coordinates of the centre of gravity refer to the certified dimensional drawings.

B In multiple-unit installations (maximum four units), the side clearance between the units should be increased from 1000 to 2000 mm.

C The height of the solid surface must not exceed 2 m.

Heating capacities in accordance with EN14511-3 : 2011

61AF 022-105

		Outside air dry-bulb (wet-bulb) temperature, °C																							
		-20 (-20,5)				-15 (-16)				-10 (-11)				-7 (-8)				2 (1)				7 (6)			
	LWT	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp
	°C	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa
022	30	9.0	1.95	0.49	1.2	10.3	2.20	0.58	1.6	11.5	2.47	0.66	2.1	12.3	2.63	0.72	2.5	15.2	3.38	0.91	3.8	21.1	4.48	1.01	4.6
030		10.5	1.95	0.58	1.1	12.1	2.19	0.68	1.5	13.7	2.44	0.79	2.0	14.7	2.60	0.86	2.4	18.5	3.34	1.11	3.8	26.5	4.52	1.27	4.9
035		13.5	2.05	0.74	1.5	15.5	2.29	0.86	2.0	17.5	2.54	1.01	2.6	18.8	2.70	1.10	3.0	23.6	3.39	1.41	4.7	32.6	4.45	1.57	5.7
045		18.0	2.25	0.99	1.8	20.5	2.49	1.15	2.4	23.2	2.75	1.33	3.2	24.9	2.91	1.46	3.7	31.6	3.58	1.89	5.9	44.4	4.71	2.13	7.4
055		21.8	2.33	1.19	2.0	25.1	2.58	1.40	2.6	28.4	2.86	1.63	3.5	30.5	3.03	1.78	4.1	37.9	3.66	2.27	6.3	52.3	4.73	2.51	7.6
075		28.1	2.04	1.54	2.2	32.3	2.29	1.81	3.0	36.6	2.55	2.10	4.0	39.3	2.72	2.30	4.7	49.5	3.43	2.96	7.4	64.3	4.29	3.08	8.0
105		41.8	2.21	2.29	3.5	47.2	2.42	2.64	4.6	53.5	2.68	3.08	6.2	57.5	2.84	3.36	7.3	72.5	3.50	4.33	11.9	102.2	4.59	4.90	15.0
022	35	9.0	1.84	0.49	1.2	10.2	2.06	0.57	1.6	11.5	2.30	0.66	2.1	12.3	2.45	0.72	2.4	15.1	3.13	0.90	3.7	20.8	4.11	1.00	4.4
030		10.5	1.85	0.58	1.1	12.1	2.06	0.68	1.5	13.7	2.29	0.79	2.0	14.7	2.43	0.86	2.3	18.5	3.09	1.11	3.7	26.2	4.14	1.26	4.7
035		13.4	1.92	0.73	1.4	15.3	2.13	0.86	1.9	17.3	2.35	1.00	2.5	18.6	2.49	1.09	2.9	23.4	3.10	1.40	4.5	32.6	4.07	1.57	5.5
045		18.1	2.11	0.99	1.8	20.6	2.32	1.15	2.4	23.1	2.55	1.33	3.1	24.9	2.69	1.45	3.6	31.3	3.29	1.87	5.7	44.2	4.31	2.12	7.2
055		21.8	2.18	1.20	1.9	25.0	2.39	1.40	2.6	28.3	2.64	1.63	3.4	30.4	2.79	1.78	4.0	38.0	3.39	2.27	6.2	52.1	4.35	2.50	7.4
075		27.9	1.91	1.53	2.1	32.1	2.13	1.79	2.9	36.4	2.36	2.09	3.8	39.1	2.51	2.28	4.5	49.1	3.14	2.93	7.1	64.9	3.97	3.12	8.0
105		41.9	2.08	2.30	3.5	47.4	2.26	2.65	4.6	53.5	2.48	3.08	6.0	57.4	2.63	3.36	7.1	72.3	3.23	4.32	11.5	101.9	4.24	4.89	14.6
022	40	8.9	1.72	0.49	1.2	10.1	1.90	0.57	1.5	11.2	2.09	0.66	2.0	11.9	2.21	0.71	2.3	14.9	2.87	0.90	3.5	20.8	3.77	1.00	4.3
030		10.5	1.73	0.58	1.1	12.0	1.91	0.68	1.5	13.4	2.09	0.79	1.9	14.3	2.21	0.86	2.3	18.3	2.84	1.10	3.6	26.0	3.78	1.25	4.6
035		13.2	1.78	0.73	1.4	15.0	1.95	0.85	1.8	16.8	2.12	0.99	2.4	18.0	2.23	1.08	2.8	23.0	2.82	1.38	4.3	32.6	3.72	1.57	5.4
045		18.1	1.97	1.00	1.8	20.4	2.14	1.16	2.3	22.6	2.31	1.33	3.0	24.1	2.42	1.45	3.5	31.0	3.00	1.86	5.5	44.1	3.93	2.12	7.0
055		21.7	2.03	1.20	1.9	24.7	2.20	1.40	2.5	27.7	2.38	1.63	3.3	29.5	2.50	1.77	3.9	37.9	3.11	2.28	6.1	52.2	3.99	2.51	7.3
075		27.7	1.78	1.53	2.1	31.5	1.96	1.79	2.8	35.4	2.14	2.08	3.7	37.8	2.25	2.27	4.3	48.4	2.87	2.91	6.9	65.8	3.68	3.17	8.0
105		42.0	1.95	2.31	3.4	47.1	2.09	2.67	4.5	52.5	2.26	3.08	5.9	56.0	2.37	3.36	7.0	71.7	2.97	4.31	11.2	101.9	3.91	4.90	14.3
022	45	9.0	1.65	0.49	1.2	10.2	1.81	0.57	1.5	11.2	1.97	0.66	2.0	11.9	2.07	0.71	2.3	14.9	2.62	0.90	3.5	20.8	3.44	1.00	4.2
030		10.6	1.67	0.58	1.1	12.1	1.83	0.68	1.5	13.5	1.98	0.79	1.9	14.3	2.07	0.86	2.2	18.1	2.60	1.09	3.5	25.7	3.45	1.24	4.4
035		13.3	1.70	0.73	1.3	15.1	1.84	0.85	1.8	16.8	1.99	0.98	2.3	17.9	2.08	1.07	2.7	22.7	2.56	1.37	4.2	32.3	3.37	1.56	5.2
045		18.5	1.88	1.01	1.8	20.7	2.02	1.17	2.3	22.9	2.17	1.34	3.0	24.2	2.25	1.45	3.5	30.8	2.73	1.86	5.4	43.8	3.56	2.11	6.8
055		22.1	1.94	1.21	1.9	25.1	2.08	1.41	2.5	27.9	2.23	1.63	3.2	29.6	2.32	1.78	3.8	37.7	2.83	2.27	5.9	52.3	3.64	2.52	7.2
075		28.1	1.70	1.53	2.0	31.8	1.85	1.79	2.7	35.5	2.01	2.08	3.6	37.8	2.10	2.26	4.2	48.2	2.62	2.90	6.7	66.9	3.41	3.22	8.1
105		42.9	1.88	2.34	3.4	48.0	1.99	2.70	4.5	53.1	2.13	3.11	5.9	56.3	2.22	3.38	6.9	71.7	2.72	4.31	11.0	101.9	3.58	4.91	14.0
022	50	9.1	1.55	0.50	1.1	10.3	1.69	0.58	1.5	11.4	1.83	0.66	1.9	12.0	1.92	0.72	2.3	14.9	2.38	0.90	3.4	20.9	3.13	1.01	4.2
030		10.7	1.58	0.58	1.1	12.2	1.72	0.68	1.4	13.5	1.85	0.79	1.9	14.3	1.93	0.86	2.2	18.0	2.38	1.08	3.4	25.4	3.13	1.23	4.2
035		13.3	1.59	0.73	1.3	15.1	1.72	0.85	1.7	16.8	1.85	0.98	2.2	17.9	1.92	1.07	2.6	22.6	2.33	1.36	4.0	32.0	3.04	1.55	5.1
045		18.8	1.77	1.02	1.8	21.0	1.89	1.18	2.3	23.1	2.01	1.35	3.0	24.4	2.08	1.46	3.4	30.8	2.48	1.85	5.3	43.6	3.21	2.10	6.6
055		22.3	1.83	1.22	1.9	25.3	1.95	1.42	2.5	28.2	2.07	1.65	3.2	29.9	2.14	1.79	3.8	37.8	2.57	2.28	5.8	52.7	3.32	2.54	7.1
075		28.2	1.60	1.53	2.0	31.9	1.73	1.80	2.7	35.6	1.87	2.08	3.5	37.9	1.95	2.27	4.1	48.0	2.39	2.90	6.5	68.1	3.15	3.28	8.2
105		43.4	1.78	2.37	3.4	48.6	1.88	2.73	4.5	53.7	1.98	3.14	5.9	57.0	2.06	3.41	6.9	71.9	2.48	4.33	10.8	102.0	3.27	4.92	13.8
022	55	9.2	1.51	0.31	0.5	10.4	1.64	0.36	0.6	11.5	1.77	0.42	0.8	12.1	1.85	0.45	0.9	15.0	2.29	0.56	1.4	20.9	3.02	0.63	1.8
030		10.7	1.53	0.37	0.4	12.2	1.66	0.43	0.6	13.6	1.79	0.50	0.8	14.4	1.87	0.54	0.9	17.9	2.29	0.68	1.4	25.3	3.02	0.76	1.7
035		13.4	1.54	0.46	0.6	15.1	1.66	0.53	0.7	16.8	1.78	0.61	1.0	17.9	1.86	0.67	1.1	22.5	2.25	0.85	1.7	31.9	2.94	0.97	2.1
045		19.0	1.72	0.65	0.8	21.2	1.83	0.74	1.0	23.3	1.95	0.85	1.3	24.6	2.02	0.92	1.5	30.7	2.40	1.16	2.2	43.5	3.13	1.31	2.8
055		22.4	1.78	0.77	0.8	25.5	1.88	0.90	1.0	28.4	1.99	1.04	1.4	30.2	2.06	1.13	1.6	37.8	2.46	1.43	2.4	52.9	3.19	1.60	3.0
075		28.3	1.54	0.96	0.8	32.1	1.67	1.13	1.1	35.8	1.80	1.31	1.5	38.1	1.87	1.42	1.7	48.0	2.29	1.81	2.7	68.0	3.02	2.06	3.4
105		43.7	1.74	1.49	1.4	49.1	1.82	1.72	1.9	54.1	1.92	1.98	2.4	57.5	1.99	2.15	2.8	72.0	2.39	2.72	4.4	102.0	3.15	3.08	5.6
022	60	9.3	1.45	0.25	0.3	10.5	1.56	0.30	0.4	11.6	1.68	0.34	0.6	12.3	1.75	0.37	0.6	15.0	2.14	0.45	0.9	21.0	2.81	0.51	1.2
030		10.8	1.47	0.30	0.3	12.3	1.59	0.35	0.4	13.6	1.70	0.40	0.5	14.5	1.77	0.43	0.6	17.8	2.14	0.54	0.9	25.1	2.81	0.61	1.1
035		13.4	1.47	0.37	0.4	15.2	1.58	0.43	0.5	16.9	1.69	0.49	0.6	18.0	1.75	0.54	0.7	22.5	2.10	0.68	1.1	31.8	2.74	0.77	1.4
045		19.3	1.64	0.53	0.5	21.5	1.75	0.60	0.7	23.6	1.85	0.69	0.9	24.9	1.91	0.74	1.0	30.8	2.25	0.93	1.5	43.4	2.92	1.05	1.8
055		22.7	1.71	0.62	0.5	25.8	1.79	0.72	0.7	28.7	1.88	0.84	0.9	30.5	1.95	0.91	1.1	38.0	2.29	1.15	1.6	53.3	2.98	1.29	2.0
075		28.4	1.47	0.78	0.6	32.3	1.58	0.91	0.7	36.0	1.70	1.05	1.0	38.3	1.77	1.14	1.1	48.0	2.14	1.45	1.8	67.9	2.82	1.65	2.2
105		44.3	1.67	1.21	0.9	49.8	1.74	1.40	1.2	54.9	1.82	1.60	1.6	58.3	1.89	1.74	1.8	72.5	2.24	2.19	2.9	102.3	2.94	2.48	3.6
022	65	9.6	1.38	0.26	0.3	10.8	1.48	0.30	0.4	11.9	1.57	0.35	0.6	12.6	1.63	0.37	0.6	15.3	1.96	0.46	1.0	21.2	2.54	0.52	1.2
030		10.9	1.41	0.30	0.3	12.4	1.50	0.35	0.4	13.8	1.60	0.40	0.5	14.6	1.65	0.43	0.6	17.7	1.96	0.54	0.9	24.8	2.55	0.60	1.1
035		13.5	1.39	0.37	0.4	15.3	1.48	0.43	0.5	17.0	1.57	0.50	0.6	18.1	1.63	0.54	0.7	22.5	1.92	0.68	1.1	31.7	2.49	0.77	1.4
045		19.7	1.55	0.54	0.5	21.9	1.64	0.62	0.7	24.0	1.72	0.70	0.9	25.3	1.77	0.75	1.0	31.0	2.05	0.94	1.5	43.4	2.64	1.05	1.8
055		23.0	1.63	0.63	0.5	26.2	1.69	0.74	0.7	29.2	1.76	0.85	0.9	31.1	1.81	0.92	1.1	38.5	2.10	1.16	1.6	54.0	2.71	1.31	2.0
075		28.8	1.39	0.79	0.6	32.7	1.49	0.92	0.7	36.5	1.59	1.06	1.0	38.8	1.65	1.15	1.1	48.3	1.97	1.46	1.7	68.0	2.58	1.65	2.2
105		45.1	1.60	1.23	0.9	50.8	1.65	1.43	1.2	56.0	1.72	1.63	1.6	59.5	1.77	1.77	1.9	73.5	2.06	2.22	2.9	103.1	2.69	2.50	3.6

Legend
LWT Leaving water temperature, °C
Qh Heating capacity, kW
COP Coefficient of performance, kW/kW
q Condenser water flow rate, l/s
Δp Condenser pressure drop, kPa

Application data

Standard units, refrigerant: R-407C
Condenser entering/leaving water temperature difference: 5 K for LWT values <55°C
Condenser entering/leaving water temperature difference: 8 K for LWT values = 55°C
Condenser entering/leaving water temperature difference: 10 K for LWT values >55°C
Condenser fluid: water
Fouling factor: 0.18 x 10^{-4} (m^2 K)/W

Performances in accordance with EN14511-3:2011.

Heating capacities

61AF 022-105

		Outside air dry-bulb (wet-bulb) temperature, °C																							
		-20 (-20,5)				-15 (-16)				-10 (-11)				-7 (-8)				2 (1)				7 (6)			
	LWT	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp
	°C	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa
022	30	10.3	2.19	0.49	1.2	12.0	2.52	0.58	1.6	13.8	2.89	0.66	2.1	15.0	3.13	0.72	2.5	18.9	4.08	0.91	3.8	21.1	4.51	1.01	4.6
030		12.0	2.19	0.58	1.1	14.1	2.51	0.68	1.5	16.4	2.86	0.79	2.0	17.9	3.09	0.86	2.4	23.1	4.03	1.11	3.8	26.4	4.55	1.27	4.9
035		15.3	2.30	0.74	1.5	18.0	2.62	0.86	2.0	21.0	2.98	1.01	2.6	22.9	3.21	1.10	3.0	29.4	4.10	1.41	4.7	32.6	4.48	1.57	5.7
045		20.5	2.53	0.99	1.8	23.9	2.86	1.15	2.4	27.7	3.22	1.33	3.2	30.3	3.46	1.46	3.7	39.2	4.33	1.89	5.9	44.3	4.74	2.13	7.4
055		24.9	2.61	1.19	2.0	29.2	2.96	1.40	2.6	34.0	3.35	1.63	3.5	37.1	3.60	1.78	4.1	47.2	4.43	2.27	6.3	52.2	4.76	2.51	7.6
075		32.0	2.29	1.54	2.2	37.6	2.62	1.81	3.0	43.8	2.99	2.10	4.0	47.9	3.23	2.30	4.7	61.5	4.15	2.96	7.4	64.1	4.32	3.08	8.0
105		47.6	2.48	2.29	3.5	54.9	2.77	2.64	4.6	64.0	3.14	3.08	6.2	70.0	3.38	3.36	7.3	90.2	4.23	4.33	11.9	101.9	4.64	4.90	15.0
022	35	10.2	2.06	0.49	1.2	11.9	2.35	0.57	1.6	13.7	2.69	0.66	2.1	14.9	2.90	0.72	2.4	18.8	3.76	0.90	3.7	20.8	4.13	1.00	4.4
030		12.0	2.07	0.58	1.1	14.1	2.36	0.68	1.5	16.4	2.68	0.79	2.0	17.9	2.88	0.86	2.3	23.0	3.72	1.11	3.7	26.2	4.16	1.26	4.7
035		15.2	2.15	0.73	1.4	17.8	2.43	0.86	1.9	20.7	2.75	1.00	2.5	22.6	2.95	1.09	2.9	29.0	3.72	1.40	4.5	32.5	4.09	1.57	5.5
045		20.6	2.36	0.99	1.8	23.9	2.66	1.15	2.4	27.6	2.98	1.33	3.1	30.2	3.19	1.45	3.6	38.9	3.95	1.87	5.7	44.1	4.34	2.12	7.2
055		24.9	2.44	1.20	1.9	29.1	2.74	1.40	2.6	33.8	3.08	1.63	3.4	36.9	3.31	1.78	4.0	47.2	4.08	2.27	6.2	52.0	4.38	2.50	7.4
075		31.8	2.14	1.53	2.1	37.3	2.43	1.79	2.9	43.5	2.76	2.09	3.8	47.5	2.97	2.28	4.5	60.9	3.78	2.93	7.1	64.8	3.99	3.12	8.0
105		47.8	2.33	2.30	3.5	55.1	2.59	2.65	4.6	63.9	2.91	3.08	6.0	69.8	3.12	3.36	7.1	89.7	3.89	4.32	11.5	101.6	4.28	4.89	14.6
022	40	10.2	1.94	0.49	1.2	11.8	2.20	0.57	1.5	13.6	2.49	0.66	2.0	14.8	2.68	0.71	2.3	18.6	3.44	0.90	3.5	20.7	3.79	1.00	4.3
030		12.0	1.95	0.58	1.1	14.1	2.22	0.68	1.5	16.4	2.50	0.79	1.9	17.8	2.68	0.86	2.3	22.8	3.41	1.10	3.6	25.9	3.80	1.25	4.6
035		15.1	2.01	0.73	1.4	17.7	2.26	0.85	1.8	20.5	2.53	0.99	2.4	22.4	2.71	1.08	2.8	28.7	3.38	1.38	4.3	32.5	3.73	1.57	5.4
045		20.7	2.22	1.00	1.8	24.0	2.48	1.16	2.3	27.6	2.76	1.33	3.0	30.1	2.94	1.45	3.5	38.6	3.60	1.86	5.5	44.0	3.95	2.12	7.0
055		24.9	2.29	1.20	1.9	29.1	2.55	1.40	2.5	33.8	2.84	1.63	3.3	36.8	3.04	1.77	3.9	47.2	3.74	2.28	6.1	52.1	4.01	2.51	7.3
075		31.7	2.01	1.53	2.1	37.1	2.26	1.79	2.8	43.2	2.55	2.08	3.7	47.1	2.74	2.27	4.3	60.5	3.45	2.91	6.9	65.7	3.70	3.17	8.0
105		48.0	2.20	2.31	3.4	55.4	2.42	2.67	4.5	64.0	2.69	3.08	5.9	69.8	2.88	3.36	7.0	89.4	3.57	4.31	11.2	101.6	3.94	4.90	14.3
022	45	10.2	1.82	0.49	1.2	11.9	2.06	0.57	1.5	13.7	2.32	0.66	2.0	14.8	2.48	0.71	2.3	18.6	3.14	0.90	3.5	20.8	3.46	1.00	4.2
030		12.0	1.85	0.58	1.1	14.1	2.08	0.68	1.5	16.4	2.33	0.79	1.9	17.8	2.49	0.86	2.2	22.6	3.12	1.09	3.5	25.7	3.46	1.24	4.4
035		15.1	1.88	0.73	1.3	17.6	2.10	0.85	1.8	20.4	2.34	0.98	2.3	22.2	2.50	1.07	2.7	28.4	3.08	1.37	4.2	32.3	3.38	1.56	5.2
045		20.9	2.08	1.01	1.8	24.2	2.31	1.17	2.3	27.8	2.55	1.34	3.0	30.1	2.71	1.45	3.5	38.5	3.28	1.86	5.4	43.7	3.57	2.11	6.8
055		25.0	2.15	1.21	1.9	29.2	2.37	1.41	2.5	33.9	2.62	1.63	3.2	36.9	2.79	1.78	3.8	47.1	3.40	2.27	5.9	52.2	3.66	2.52	7.2
075		31.7	1.88	1.53	2.0	37.1	2.11	1.79	2.7	43.1	2.36	2.08	3.6	46.9	2.53	2.26	4.2	60.1	3.15	2.90	6.7	66.8	3.43	3.22	8.1
105		48.4	2.08	2.34	3.4	55.9	2.27	2.70	4.5	64.3	2.50	3.11	5.9	70.0	2.66	3.38	6.9	89.4	3.27	4.31	11.0	101.7	3.60	4.91	14.0
022	50	10.3	1.72	0.50	1.1	12.0	1.93	0.58	1.5	13.7	2.15	0.66	1.9	14.9	2.29	0.72	2.3	18.6	2.86	0.90	3.4	20.9	3.14	1.01	4.2
030		12.1	1.75	0.58	1.1	14.2	1.95	0.68	1.4	16.4	2.18	0.79	1.9	17.8	2.31	0.86	2.2	22.4	2.86	1.08	3.4	25.4	3.14	1.23	4.2
035		15.0	1.76	0.73	1.3	17.6	1.96	0.85	1.7	20.3	2.17	0.98	2.2	22.1	2.30	1.07	2.6	28.2	2.80	1.36	4.0	32.0	3.06	1.55	5.1
045		21.2	1.95	1.02	1.8	24.4	2.15	1.18	2.3	28.0	2.36	1.35	3.0	30.2	2.50	1.46	3.4	38.4	2.98	1.85	5.3	43.5	3.23	2.10	6.6
055		25.2	2.03	1.22	1.9	29.4	2.22	1.42	2.5	34.1	2.43	1.65	3.2	37.1	2.57	1.79	3.8	47.1	3.09	2.28	5.8	52.6	3.33	2.54	7.1
075		31.8	1.76	1.53	2.0	37.1	1.97	1.80	2.7	43.1	2.19	2.08	3.5	46.9	2.34	2.27	4.1	59.9	2.87	2.90	6.5	67.9	3.17	3.28	8.2
105		48.9	1.97	2.37	3.4	56.5	2.14	2.73	4.5	64.9	2.33	3.14	5.9	70.6	2.47	3.41	6.9	89.6	2.99	4.33	10.8	101.7	3.28	4.92	13.8
022	55	10.4	1.67	0.31	0.5	12.0	1.86	0.36	0.6	13.8	2.07	0.42	0.8	14.9	2.21	0.45	0.9	18.6	2.74	0.56	1.4	20.9	3.02	0.63	1.8
030		12.1	1.69	0.37	0.4	14.2	1.89	0.43	0.6	16.4	2.10	0.50	0.8	17.8	2.23	0.54	0.9	22.4	2.74	0.68	1.4	25.3	3.02	0.76	1.7
035		15.1	1.70	0.46	0.6	17.6	1.89	0.53	0.7	20.3	2.09	0.61	1.0	22.1	2.22	0.67	1.1	28.1	2.69	0.85	1.7	31.9	2.95	0.97	2.1
045		21.4	1.89	0.65	0.8	24.6	2.08	0.74	1.0	28.1	2.29	0.85	1.3	30.4	2.41	0.92	1.5	38.3	2.88	1.16	2.2	43.5	3.14	1.31	2.8
055		25.3	1.96	0.77	0.8	29.6	2.13	0.90	1.0	34.2	2.33	1.04	1.4	37.2	2.46	1.13	1.6	47.2	2.95	1.43	2.4	52.8	3.20	1.60	3.0
075		31.9	1.70	0.96	0.8	37.2	1.89	1.13	1.1	43.1	2.10	1.31	1.5	47.0	2.24	1.42	1.7	59.9	2.74	1.81	2.7	67.9	3.03	2.06	3.4
105		49.3	1.92	1.49	1.4	57.0	2.07	1.72	1.9	65.3	2.25	1.98	2.4	71.0	2.38	2.15	2.8	89.8	2.87	2.72	4.4	101.9	3.16	3.08	5.6
022	60	10.5	1.60	0.25	0.3	12.2	1.77	0.30	0.4	14.0	1.97	0.34	0.6	15.1	2.09	0.37	0.6	18.8	2.56	0.45	0.9	21.0	2.81	0.51	1.2
030		12.2	1.63	0.30	0.3	14.2	1.80	0.35	0.4	16.4	1.99	0.40	0.5	17.8	2.11	0.43	0.6	22.2	2.56	0.54	0.9	25.1	2.81	0.61	1.1
035		15.1	1.62	0.37	0.4	17.6	1.79	0.43	0.5	20.3	1.97	0.49	0.6	22.1	2.09	0.54	0.7	28.0	2.51	0.68	1.1	31.8	2.74	0.77	1.4
045		21.7	1.81	0.53	0.5	24.9	1.98	0.60	0.7	28.4	2.16	0.69	0.9	30.6	2.28	0.74	1.0	38.4	2.69	0.93	1.5	43.4	2.92	1.05	1.8
055		25.5	1.88	0.62	0.5	29.9	2.03	0.72	0.7	34.6	2.20	0.84	0.9	37.5	2.32	0.91	1.1	47.4	2.75	1.15	1.6	53.3	2.98	1.29	2.0
075		32.1	1.62	0.78	0.6	37.4	1.80	0.91	0.7	43.3	1.99	1.05	1.0	47.1	2.11	1.14	1.1	59.9	2.56	1.45	1.8	67.9	2.82	1.65	2.2
105		49.9	1.85	1.21	0.9	57.7	1.98	1.40	1.2	66.0	2.14	1.60	1.6	71.7	2.25	1.74	1.8	90.4	2.68	2.19	2.9	102.3	2.95	2.48	3.6
022	65	10.8	1.52	0.26	0.3	12.5	1.67	0.30	0.4	14.3	1.84	0.35	0.6	15.4	1.94	0.37	0.6	19.0	2.34	0.46	1.0	21.2	2.55	0.52	1.2
030		12.3	1.55	0.30	0.3	14.4	1.70	0.35	0.4	16.5	1.87	0.40	0.5	17.8	1.97	0.43	0.6	22.1	2.35	0.54	0.9	24.8	2.55	0.60	1.1
035		15.2	1.53	0.37	0.4	17.7	1.68	0.43	0.5	20.4	1.83	0.50	0.6	22.1	1.93	0.54	0.7	28.0	2.30	0.68	1.1	31.6	2.49	0.77	1.4
045		22.2	1.71	0.54	0.5	25.4	1.86	0.62	0.7	28.8	2.01	0.70	0.9	31.0	2.11	0.75	1.0	38.6	2.45	0.94	1.5	43.4	2.64	1.05	1.8
055		25.9	1.79	0.63	0.5	30.3	1.91	0.74	0.7	35.1	2.06	0.85	0.9	38.1	2.15	0.92	1.1	47.9	2.51	1.16	1.6	54.0	2.71	1.31	2.0
075		32.4	1.53	0.79	0.6	37.8	1.69	0.92	0.7	43.7	1.86	1.06	1.0	47.5	1.97	1.15	1.1	60.1	2.36	1.46	1.7	68.0	2.58	1.65	2.2
105		50.8	1.76	1.23	0.9	58.8	1.88	1.43	1.2	67.1	2.01	1.63	1.6	72.8	2.10	1.77	1.9	91.5	2.47	2.22	2.9	103.1	2.69	2.50	3.6

Legend
LWT Leaving water temperature, °C
Qh Heating capacity, kW
COP Coefficient of performance, kW/kW
q Condenser water flow rate, l/s
Δp Condenser pressure drop, kPa

Application data

Standard units, refrigerant: R-407C
Condenser entering/leaving water temperature difference: 5 K for LWT values <55°C
Condenser entering/leaving water temperature difference: 8 K for LWT values = 55°C
Condenser entering/leaving water temperature difference: 10 K for LWT values >55°C
Condenser fluid: water
Fouling factor: 0.18 x 10^{-4} (m^2 K)/W

Gross performances, not in accordance with EN14511-3:2011. These performances do not take into account the correction for the proportional heating capacity and power input generated by the water pump to overcome the internal pressure drop in the heat exchanger.

Heating capacities in accordance with EN14511-3 : 2011

61AF 022-105

		Outside air dry-bulb (wet-bulb) temperature, °C																							
		12 (11)				15 (14)				20 (19)				25 (24)				30 (29)				35 (34)			
	LWT	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp
	°C	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa
022	30	23.2	4.87	1.11	5.5	23.3	4.90	1.12	5.6	23.5	4.94	1.12	5.6	23.6	4.99	1.13	5.7	23.7	5.03	1.14	5.7	23.9	5.10	1.10	5.8
030		29.9	5.03	1.44	6.2	32.0	5.33	1.53	7.0	35.1	5.75	1.68	8.3	37.1	6.03	1.78	9.2	38.2	6.19	1.83	9.7	39.3	6.30	1.90	10.2
035		35.4	4.77	1.70	6.6	37.2	4.98	1.79	7.2	40.4	5.34	1.94	8.3	43.4	5.68	2.08	9.4	44.8	5.85	2.15	10.0	46.3	6.00	2.20	10.6
045		49.2	5.08	2.36	8.9	52.3	5.30	2.50	9.9	55.7	5.55	2.67	11.1	57.4	5.67	2.75	11.7	59.1	5.79	2.83	12.4	60.8	5.90	2.90	13.0
055		57.7	5.04	2.77	9.1	60.8	5.21	2.92	10.0	64.1	5.38	3.07	11.0	67.2	5.52	3.22	12.0	69.1	5.61	3.31	12.6	71.0	5.70	3.40	13.3
075		67.8	4.51	3.25	8.9	69.9	4.64	3.35	9.4	73.5	4.86	3.52	10.3	77.1	5.09	3.70	11.2	80.8	5.31	3.87	12.3	84.5	5.50	4.00	13.3
105		113.9	4.94	5.46	18.4	121.3	5.13	5.81	20.8	123.7	5.20	5.93	21.6	126.0	5.26	6.04	22.3	128.3	5.32	6.15	23.1	130.7	5.40	6.30	23.9
022	35	23.5	4.55	1.13	5.5	23.7	4.59	1.14	5.6	23.8	4.64	1.14	5.6	23.9	4.68	1.15	5.7	24.1	4.71	1.16	5.8	24.2	4.80	1.20	5.8
030		29.6	4.59	1.42	5.9	31.6	4.85	1.52	6.7	34.8	5.25	1.67	8.0	37.4	5.56	1.79	9.1	38.5	5.70	1.85	9.6	39.6	5.80	1.90	10.1
035		35.3	4.34	1.70	6.4	37.0	4.52	1.78	7.0	40.1	4.83	1.93	8.0	43.4	5.14	2.08	9.2	45.2	5.31	2.17	9.9	46.6	5.46	2.24	10.5
045		48.8	4.61	2.34	8.6	51.8	4.81	2.49	9.5	56.3	5.09	2.70	11.1	58.0	5.19	2.78	11.7	59.7	5.30	2.86	12.3	61.4	5.40	2.95	12.9
055		57.2	4.64	2.75	8.8	60.6	4.81	2.91	9.7	64.2	4.99	3.08	10.8	67.5	5.14	3.24	11.9	69.6	5.23	3.34	12.5	71.4	5.31	3.43	13.1
075		68.2	4.15	3.28	8.8	70.3	4.26	3.38	9.3	73.9	4.46	3.55	10.2	77.5	4.66	3.72	11.1	81.2	4.86	3.90	12.1	84.9	5.06	4.08	13.1
105		112.9	4.56	5.41	17.7	120.1	4.75	5.76	19.9	124.9	4.87	5.99	21.5	127.2	4.94	6.10	22.2	129.5	4.99	6.21	23.0	131.8	5.05	6.32	23.8
022	40	23.2	4.14	1.12	5.3	24.1	4.28	1.16	5.6	24.2	4.31	1.17	5.7	24.4	4.35	1.17	5.8	24.5	4.38	1.18	5.8	24.6	4.42	1.19	5.9
030		29.3	4.18	1.41	5.7	31.2	4.40	1.50	6.4	34.5	4.77	1.66	7.7	37.5	5.09	1.80	9.0	38.8	5.23	1.86	9.5	39.9	5.35	1.92	10.1
035		35.3	3.96	1.70	6.2	37.0	4.10	1.78	6.8	40.0	4.36	1.92	7.8	43.2	4.62	2.07	8.9	45.6	4.82	2.19	9.9	47.1	4.94	2.26	10.5
045		48.6	4.20	2.34	8.3	51.5	4.35	2.48	9.2	56.5	4.62	2.71	10.9	58.6	4.73	2.82	11.7	60.4	4.82	2.90	12.3	62.1	4.91	2.98	12.9
055		57.2	4.26	2.75	8.6	60.4	4.41	2.90	9.5	64.5	4.59	3.10	10.7	67.8	4.74	3.26	11.7	70.3	4.84	3.38	12.5	72.1	4.92	3.47	13.1
075		68.9	3.83	3.31	8.7	71.0	3.93	3.41	9.2	74.5	4.09	3.58	10.1	78.1	4.26	3.75	11.0	81.7	4.44	3.93	12.0	85.5	4.62	4.11	13.0
105		112.6	4.20	5.41	17.3	119.3	4.37	5.73	19.3	126.5	4.54	6.08	21.5	128.8	4.60	6.19	22.3	131.1	4.65	6.30	23.0	133.4	4.71	6.41	23.8
022	45	23.0	3.75	1.11	5.1	24.5	3.95	1.18	5.7	24.8	3.99	1.19	5.8	24.9	4.02	1.20	5.9	25.0	4.05	1.21	5.9	25.2	4.08	1.21	6.0
030		29.0	3.80	1.40	5.5	30.9	3.99	1.49	6.2	34.1	4.30	1.64	7.4	37.1	4.59	1.78	8.6	39.1	4.77	1.88	9.5	40.2	4.88	1.93	10.0
035		35.4	3.60	1.70	6.1	37.0	3.72	1.78	6.7	40.0	3.93	1.93	7.7	43.1	4.15	2.07	8.7	46.2	4.36	2.22	9.9	47.6	4.46	2.29	10.5
045		48.6	3.80	2.34	8.2	51.4	3.94	2.47	9.0	56.2	4.15	2.71	10.6	59.5	4.29	2.86	11.8	61.2	4.37	2.95	12.4	63.0	4.44	3.03	13.0
055		57.4	3.88	2.76	8.5	60.5	4.02	2.91	9.3	65.1	4.21	3.14	10.7	68.3	4.34	3.29	11.6	71.2	4.44	3.43	12.5	73.0	4.51	3.52	13.1
075		69.7	3.53	3.36	8.7	71.8	3.61	3.46	9.2	75.3	3.76	3.63	10.1	78.9	3.91	3.80	11.0	82.5	4.06	3.97	12.0	86.2	4.21	4.15	13.0
105		112.8	3.85	5.43	17.0	119.4	4.01	5.75	18.9	128.4	4.21	6.18	21.7	130.7	4.26	6.29	22.5	133.0	4.31	6.40	23.2	135.3	4.36	6.51	24.0
022	50	22.9	3.38	1.11	5.0	24.5	3.56	1.18	5.6	25.4	3.67	1.23	6.0	25.6	3.69	1.23	6.1	25.7	3.72	1.24	6.1	25.9	3.75	1.25	6.2
030		28.6	3.43	1.38	5.2	30.6	3.61	1.48	5.9	33.7	3.87	1.62	7.1	36.6	4.11	1.76	8.2	38.8	4.29	1.87	9.2	38.9	4.30	1.87	9.2
035		35.5	3.27	1.71	6.1	37.2	3.37	1.79	6.6	40.1	3.55	1.93	7.5	43.2	3.73	2.08	8.6	46.3	3.90	2.23	9.8	48.4	4.01	2.33	10.6
045		48.7	3.44	2.35	8.0	51.4	3.55	2.48	8.9	56.2	3.73	2.71	10.4	60.7	3.88	2.93	12.0	62.4	3.94	3.01	12.6	64.2	3.99	3.10	13.2
055		57.7	3.53	2.78	8.4	60.8	3.65	2.93	9.2	66.0	3.84	3.18	10.7	69.2	3.95	3.34	11.7	72.4	4.06	3.49	12.7	74.3	4.12	3.58	13.3
075		70.7	3.25	3.41	8.8	72.8	3.33	3.51	9.3	76.4	3.46	3.68	10.2	80.0	3.59	3.86	11.1	83.6	3.7	4.0	12.0	87.3	3.84	4.21	13.0
105		113.3	3.52	5.46	16.8	119.9	3.67	5.78	18.7	130.9	3.89	6.31	22.1	133.2	3.94	6.42	22.9	135.5	4.0	6.5	23.6	137.8	4.03	6.64	24.4
022	55	22.9	3.26	0.69	2.1	24.5	3.44	0.74	2.3	25.7	3.58	0.78	2.6	25.8	3.61	0.78	2.6	25.9	3.6	0.8	2.6	26.1	3.66	0.79	2.6
030		28.4	3.31	0.86	2.1	30.4	3.50	0.92	2.4	33.5	3.77	1.01	2.9	36.4	4.03	1.10	3.4	38.5	4.2	1.2	3.8	38.6	4.23	1.17	3.8
035		35.5	3.18	1.07	2.6	37.2	3.29	1.12	2.8	40.1	3.47	1.21	3.2	43.1	3.66	1.30	3.7	46.3	3.9	1.4	4.2	48.4	3.98	1.46	4.5
045		48.7	3.37	1.47	3.4	51.4	3.49	1.55	3.8	56.1	3.69	1.70	4.4	60.7	3.87	1.83	5.1	62.4	3.9	1.9	5.3	64.1	4.00	1.94	5.6
055		57.8	3.40	1.75	3.5	60.9	3.53	1.84	3.9	66.2	3.73	2.00	4.5	69.4	3.85	2.10	4.9	72.6	4.0	2.2	5.4	74.6	4.03	2.25	5.6
075		71.1	3.14	2.15	3.7	73.2	3.21	2.21	3.9	76.8	3.34	2.32	4.3	80.4	3.47	2.43	4.6	84.0	3.6	2.5	5.0	87.6	3.72	2.65	5.4
105		113.5	3.42	3.43	6.8	120.0	3.56	3.62	7.6	131.3	3.81	3.97	9.0	133.8	3.86	4.04	9.4	136.0	3.9	4.1	9.7	138.3	3.96	4.18	10.0
022	60	23.1	3.03	0.56	1.4	24.5	3.18	0.59	1.5	26.3	3.37	0.64	1.7	26.4	3.39	0.64	1.8	26.5	3.4	0.6	1.8	26.7	3.43	0.65	1.8
030		28.1	3.07	0.68	1.4	30.1	3.24	0.73	1.6	33.2	3.49	0.80	1.9	36.2	3.74	0.88	2.2	37.7	3.9	0.9	2.4	37.8	3.89	0.92	2.4
035		35.7	2.98	0.87	1.7	37.4	3.07	0.91	1.9	40.2	3.24	0.97	2.1	43.3	3.41	1.05	2.4	46.4	3.6	1.1	2.8	49.0	3.71	1.19	3.0
045		48.8	3.14	1.18	2.3	51.5	3.25	1.25	2.5	56.2	3.43	1.36	2.9	61.1	3.61	1.48	3.4	63.3	3.7	1.5	3.6	65.0	3.74	1.57	3.8
055		58.3	3.17	1.41	2.4	61.3	3.28	1.49	2.6	66.6	3.47	1.61	3.0	70.3	3.59	1.70	3.3	73.5	3.7	1.8	3.6	75.8	3.77	1.83	3.8
075		72.3	2.96	1.75	2.5	74.2	3.02	1.80	2.6	77.8	3.14	1.88	2.8	81.4	3.25	1.97	3.1	85.0	3.4	2.1	3.4	88.6	3.49	2.15	3.6
105		114.1	3.20	2.76	4.5	120.6	3.34	2.92	5.0	131.8	3.57	3.19	5.9	135.8	3.65	3.29	6.2	138.1	3.7	3.3	6.4	140.3	3.74	3.40	6.6
022	65	23.4	2.74	0.57	1.4	24.6	2.85	0.60	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
030		27.7	2.77	0.67	1.3	29.6	2.90	0.72	1.5	32.8	3.13	0.80	1.8	35.8	3.33	0.87	2.1	36.8	3.4	0.9	2.2	36.9	3.45	0.90	2.2
035		35.6	2.69	0.87	1.7	37.7	2.79	0.92	1.9	40.6	2.92	0.98	2.1	43.5	3.06	1.06	2.4	46.7	3.2	1.1	2.7	49.2	3.31	1.19	3.0
045		48.7	2.82	1.18	2.2	51.8	2.92	1.26	2.5	56.4	3.06	1.37	2.9	61.2	3.20	1.48	3.3	65.1	3.3	1.6	3.7	65.7	3.33	1.60	3.8
055		59.0	2.87	1.43	2.4	62.1	2.97	1.51	2.6	67.3	3.13	1.63	3.0	71.7	3.26	1.74	3.4	75.0	3.3	1.8	3.7	77.8	3.42	1.89	3.9
075		74.1	2.74	1.80	2.6	75.7	2.79	1.84	2.7	79.3	2.89	1.92	2.9	82.9	2.99	2.01	3.2	86.6	3.1	2.1	3.4	90.2	3.20	2.19	3.7
105		115.4	2.93	2.80	4.5	121.8	3.05	2.96	5.0	132.9	3.25	3.22	5.9	139.2	3.36	3.38	6.4	141.5	3.4	3.4	6.6	143.7	3.45	3.49	6.8

Legend
LWT Leaving water temperature, °C
Qh Heating capacity, kW
COP Coefficient of performance, kW/kW
q Condenser water flow rate, l/s
Δp Condenser pressure drop, kPa

Application data

Standard units, refrigerant: R-407C
Condenser entering/leaving water temperature difference: 5 K for LWT values <55°C
Condenser entering/leaving water temperature difference: 8 K for LWT values = 55°C
Condenser entering/leaving water temperature difference: 10 K for LWT values >55°C
Condenser fluid: water
Fouling factor: 0.18 x 10^{-4} (m^2 K)/W

Performances in accordance with EN14511-3:2011.

Heating capacities

61AF 022-105

		Outside air dry-bulb (wet-bulb) temperature, °C																							
		12 (11)				15 (14)				20 (19)				25 (24)				30 (29)				35 (34)			
	LWT	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp
	°C	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa
022	30	23.2	4.91	1.11	5.5	23.3	4.94	1.12	5.6	23.4	4.98	1.12	5.6	23.5	5.03	1.13	5.7	23.7	5.08	1.14	5.7	23.8	5.1	1.1	5.8
030		29.9	5.07	1.44	6.2	31.9	5.38	1.53	7.0	35.0	5.82	1.68	8.3	37.0	6.11	1.78	9.2	38.1	6.27	1.83	9.7	39.2	6.4	1.9	10.2
035		35.4	4.81	1.70	6.6	37.2	5.03	1.79	7.2	40.3	5.39	1.94	8.3	43.3	5.75	2.08	9.4	44.7	5.92	2.15	10.0	46.2	6.1	2.2	10.6
045		49.1	5.12	2.36	8.9	52.1	5.35	2.50	9.9	55.6	5.61	2.67	11.1	57.3	5.74	2.75	11.7	59.0	5.86	2.83	12.4	60.7	6.0	2.9	13.0
055		57.6	5.09	2.77	9.1	60.7	5.26	2.92	10.0	63.9	5.43	3.07	11.0	67.1	5.59	3.22	12.0	68.9	5.67	3.31	12.6	70.8	5.8	3.4	13.3
075		67.6	4.54	3.25	8.9	69.8	4.68	3.35	9.4	73.3	4.90	3.52	10.3	77.0	5.13	3.70	11.2	80.6	5.37	3.87	12.3	84.3	5.6	4.0	13.3
105		113.6	4.99	5.46	18.4	121.0	5.20	5.81	20.8	123.3	5.27	5.93	21.6	125.6	5.33	6.04	22.3	127.9	5.40	6.15	23.1	130.2	5.5	6.3	23.9
022	35	23.4	4.59	1.13	5.5	23.6	4.63	1.14	5.6	23.8	4.67	1.14	5.6	23.9	4.71	1.15	5.7	24.0	4.75	1.16	5.8	24.2	4.8	1.2	5.8
030		29.6	4.62	1.42	5.9	31.6	4.89	1.52	6.7	34.7	5.30	1.67	8.0	37.3	5.63	1.79	9.1	38.4	5.77	1.85	9.6	39.5	5.9	1.9	10.1
035		35.2	4.37	1.70	6.4	37.0	4.55	1.78	7.0	40.1	4.87	1.93	8.0	43.3	5.19	2.08	9.2	45.1	5.37	2.17	9.9	46.5	5.52	2.24	10.5
045		48.7	4.65	2.34	8.6	51.7	4.85	2.49	9.5	56.1	5.14	2.70	11.1	57.8	5.25	2.78	11.7	59.5	5.36	2.86	12.3	61.2	5.46	2.95	12.9
055		57.1	4.67	2.75	8.8	60.5	4.85	2.91	9.7	64.1	5.04	3.08	10.8	67.3	5.19	3.24	11.9	69.4	5.29	3.34	12.5	71.3	5.37	3.43	13.1
075		68.1	4.18	3.28	8.8	70.2	4.29	3.38	9.3	73.7	4.49	3.55	10.2	77.4	4.70	3.72	11.1	81.0	4.90	3.90	12.1	84.7	5.11	4.08	13.1
105		112.5	4.60	5.41	17.7	119.8	4.80	5.76	19.9	124.5	4.93	5.99	21.5	126.8	5.00	6.10	22.2	129.1	5.06	6.21	23.0	131.4	5.12	6.32	23.8
022	40	23.2	4.17	1.12	5.3	24.0	4.31	1.16	5.6	24.2	4.34	1.17	5.7	24.3	4.38	1.17	5.8	24.5	4.42	1.18	5.8	24.6	4.45	1.19	5.9
030		29.3	4.21	1.41	5.7	31.2	4.43	1.50	6.4	34.4	4.81	1.66	7.7	37.4	5.15	1.80	9.0	38.7	5.29	1.86	9.5	39.8	5.41	1.92	10.1
035		35.2	3.98	1.70	6.2	36.9	4.13	1.78	6.8	39.9	4.39	1.92	7.8	43.1	4.66	2.07	8.9	45.5	4.87	2.19	9.9	47.0	4.99	2.26	10.5
045		48.5	4.22	2.34	8.3	51.4	4.39	2.48	9.2	56.3	4.66	2.71	10.9	58.5	4.78	2.82	11.7	60.2	4.87	2.90	12.3	61.9	4.96	2.98	12.9
055		57.1	4.28	2.75	8.6	60.2	4.44	2.90	9.5	64.3	4.63	3.10	10.7	67.6	4.78	3.26	11.7	70.1	4.89	3.38	12.5	71.9	4.97	3.47	13.1
075		68.7	3.85	3.31	8.7	70.8	3.95	3.41	9.2	74.3	4.12	3.58	10.1	77.9	4.30	3.75	11.0	81.6	4.48	3.93	12.0	85.3	4.66	4.11	13.0
105		112.3	4.24	5.41	17.3	119.0	4.41	5.73	19.3	126.1	4.59	6.08	21.5	128.4	4.65	6.19	22.3	130.7	4.71	6.30	23.0	132.9	4.77	6.41	23.8
022	45	23.0	3.77	1.11	5.1	24.5	3.97	1.18	5.7	24.7	4.02	1.19	5.8	24.9	4.05	1.20	5.9	25.0	4.08	1.21	5.9	25.1	4.11	1.21	6.0
030		29.0	3.82	1.40	5.5	30.8	4.01	1.49	6.2	34.0	4.34	1.64	7.4	37.0	4.63	1.78	8.6	39.0	4.82	1.88	9.5	40.1	4.93	1.93	10.0
035		35.3	3.62	1.70	6.1	37.0	3.74	1.78	6.7	39.9	3.96	1.93	7.7	43.0	4.18	2.07	8.7	46.0	4.39	2.22	9.9	47.5	4.50	2.29	10.5
045		48.5	3.83	2.34	8.2	51.3	3.96	2.47	9.0	56.1	4.19	2.71	10.6	59.4	4.33	2.86	11.8	61.1	4.40	2.95	12.4	62.8	4.48	3.03	13.0
055		57.3	3.91	2.76	8.5	60.4	4.05	2.91	9.3	65.0	4.24	3.14	10.7	68.1	4.37	3.29	11.6	71.0	4.48	3.43	12.5	72.9	4.55	3.52	13.1
075		69.5	3.54	3.36	8.7	71.6	3.63	3.46	9.2	75.2	3.78	3.63	10.1	78.7	3.94	3.80	11.0	82.3	4.09	3.97	12.0	86.0	4.24	4.15	13.0
105		112.5	3.88	5.43	17.0	119.1	4.04	5.75	18.9	128.0	4.25	6.18	21.7	130.3	4.31	6.29	22.5	132.6	4.36	6.40	23.2	134.9	4.41	6.51	24.0
022	50	22.9	3.39	1.11	5.0	24.5	3.58	1.18	5.6	25.4	3.69	1.23	6.0	25.5	3.72	1.23	6.1	25.7	3.74	1.24	6.1	25.8	3.77	1.25	6.2
030		28.6	3.45	1.38	5.2	30.5	3.63	1.48	5.9	33.6	3.90	1.62	7.1	36.5	4.14	1.76	8.2	38.7	4.33	1.87	9.2	38.8	4.34	1.87	9.2
035		35.5	3.28	1.71	6.1	37.1	3.39	1.79	6.6	40.0	3.57	1.93	7.5	43.1	3.75	2.08	8.6	46.2	3.93	2.23	9.8	48.2	4.04	2.33	10.6
045		48.6	3.45	2.35	8.0	51.3	3.57	2.48	8.9	56.1	3.75	2.71	10.4	60.5	3.91	2.93	12.0	62.3	3.97	3.01	12.6	64.0	4.02	3.10	13.2
055		57.6	3.55	2.78	8.4	60.7	3.67	2.93	9.2	65.8	3.87	3.18	10.7	69.0	3.98	3.34	11.7	72.2	4.09	3.49	12.7	74.1	4.15	3.58	13.3
075		70.5	3.26	3.41	8.8	72.6	3.34	3.51	9.3	76.2	3.47	3.68	10.2	79.8	3.61	3.86	11.1	83.4	3.7	4.0	12.0	87.0	3.87	4.21	13.0
105		113.0	3.55	5.46	16.8	119.6	3.69	5.78	18.7	130.5	3.93	6.31	22.1	132.8	3.98	6.42	22.9	135.0	4.0	6.5	23.6	137.3	4.07	6.64	24.4
022	55	22.9	3.27	0.69	2.1	24.5	3.45	0.74	2.3	25.6	3.59	0.78	2.6	25.8	3.61	0.78	2.6	25.9	3.6	0.8	2.6	26.1	3.67	0.79	2.6
030		28.4	3.32	0.86	2.1	30.4	3.51	0.92	2.4	33.5	3.78	1.01	2.9	36.4	4.04	1.10	3.4	38.5	4.2	1.2	3.8	38.5	4.24	1.17	3.8
035		35.5	3.19	1.07	2.6	37.2	3.30	1.12	2.8	40.0	3.48	1.21	3.2	43.1	3.67	1.30	3.7	46.2	3.9	1.4	4.2	48.3	3.99	1.46	4.5
045		48.6	3.38	1.47	3.4	51.3	3.50	1.55	3.8	56.1	3.70	1.70	4.4	60.6	3.88	1.83	5.1	62.3	3.9	1.9	5.3	64.1	4.01	1.94	5.6
055		57.8	3.41	1.75	3.5	60.9	3.54	1.84	3.9	66.2	3.74	2.00	4.5	69.4	3.86	2.10	4.9	72.6	4.0	2.2	5.4	74.5	4.04	2.25	5.6
075		71.1	3.14	2.15	3.7	73.2	3.22	2.21	3.9	76.7	3.34	2.32	4.3	80.3	3.47	2.43	4.6	83.9	3.6	2.5	5.0	87.6	3.73	2.65	5.4
105		113.3	3.42	3.43	6.8	119.8	3.57	3.62	7.6	131.1	3.82	3.97	9.0	133.6	3.88	4.04	9.4	135.9	3.9	4.1	9.7	138.1	3.97	4.18	10.0
022	60	23.1	3.03	0.56	1.4	24.5	3.18	0.59	1.5	26.2	3.37	0.64	1.7	26.4	3.39	0.64	1.8	26.5	3.4	0.6	1.8	26.7	3.44	0.65	1.8
030		28.1	3.08	0.68	1.4	30.1	3.24	0.73	1.6	33.2	3.50	0.80	1.9	36.2	3.74	0.88	2.2	37.7	3.9	0.9	2.4	37.8	3.90	0.92	2.4
035		35.7	2.98	0.87	1.7	37.4	3.08	0.91	1.9	40.2	3.24	0.97	2.1	43.2	3.41	1.05	2.4	46.4	3.6	1.1	2.8	49.0	3.72	1.19	3.0
045		48.8	3.15	1.18	2.3	51.5	3.26	1.25	2.5	56.1	3.44	1.36	2.9	61.0	3.61	1.48	3.4	63.2	3.7	1.5	3.6	65.0	3.75	1.57	3.8
055		58.2	3.17	1.41	2.4	61.3	3.28	1.49	2.6	66.6	3.47	1.61	3.0	70.2	3.60	1.70	3.3	73.4	3.7	1.8	3.6	75.7	3.78	1.83	3.8
075		72.2	2.96	1.75	2.5	74.2	3.02	1.80	2.6	77.7	3.14	1.88	2.8	81.3	3.26	1.97	3.1	84.9	3.4	2.1	3.4	88.6	3.49	2.15	3.6
105		114.1	3.20	2.76	4.5	120.5	3.34	2.92	5.0	131.7	3.57	3.19	5.9	135.7	3.66	3.29	6.2	138.0	3.7	3.3	6.4	140.2	3.75	3.40	6.6
022	65	23.4	2.75	0.57	1.4	24.6	2.85	0.60	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
030		27.7	2.77	0.67	1.3	29.6	2.91	0.72	1.5	32.7	3.13	0.80	1.8	35.7	3.33	0.87	2.1	36.8	3.4	0.9	2.2	36.9	3.46	0.90	2.2
035		35.6	2.69	0.87	1.7	37.7	2.79	0.92	1.9	40.5	2.92	0.98	2.1	43.5	3.06	1.06	2.4	46.7	3.2	1.1	2.7	49.2	3.31	1.19	3.0
045		48.7	2.83	1.18	2.2	51.7	2.93	1.26	2.5	56.3	3.07	1.37	2.9	61.2	3.20	1.48	3.3	65.0	3.3	1.6	3.7	65.7	3.33	1.60	3.8
055		59.0	2.88	1.43	2.4	62.1	2.97	1.51	2.6	67.3	3.13	1.63	3.0	71.7	3.26	1.74	3.4	74.9	3.3	1.8	3.7	77.7	3.42	1.89	3.9
075		74.0	2.75	1.80	2.6	75.6	2.79	1.84	2.7	79.2	2.89	1.92	2.9	82.9	3.00	2.01	3.2	86.5	3.1	2.1	3.4	90.2	3.20	2.19	3.7
105		115.3	2.93	2.80	4.5	121.7	3.05	2.96	5.0	132.8	3.26	3.22	5.9	139.1	3.37	3.38	6.4	141.3	3.4	3.4	6.6	143.6	3.45	3.49	6.8

Legend
LWT Leaving water temperature, °C
Qh Heating capacity, kW
COP Coefficient of performance, kW/kW
q Condenser water flow rate, l/s
Δp Condenser pressure drop, kPa

Application data

Standard units, refrigerant: R-407C
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Condenser entering/leaving water temperature difference: 8 K for LWT values = 55°C
Condenser entering/leaving water temperature difference: 10 K for LWT values >55°C
Condenser fluid: water
Fouling factor: 0.18 x 10^{-4} (m^2 K)/W

Gross performances, not in accordance with EN14511-3:2011. These performances do not take into account the correction for the proportional heating capacity and power input generated by the water pump to overcome the internal pressure drop in the heat exchanger.

Order No.: 16110-20, 06.2013. Supersedes order No.: 16110-20, 04.2013.
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Manufactured by: Carrier SCS, Montluel, France.
Printed in the European Union.