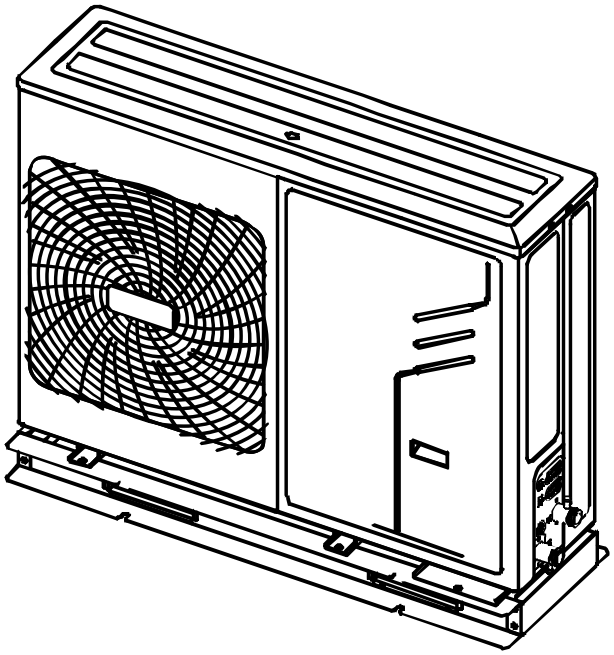
Ferroli

RVL-I PLUS

REVERSIBLE HEAT PUMP FOR OUTDOOR INSTALLATION
WITH DC INVERTER COMPRESSOR

ECO-FRIENDLY R410A REFRIGERANT GAS



CE

INSTALLATION AND MAINTENANCE MANUAL

Dear Customer,
Thank you for having purchased a FERROLI product. It is the result of many years of experiences and of particular research studies and has been made with top quality materials and advanced technologies. The CE mark guarantees that the products satisfy all the applicable European Directives.
The qualitative level is kept under constant control and FERROLI products therefore offer SAFETY, QUALITY and RELIABILITY.
Due to the continuous improvements in technologies and materials, the product specification as well as performances are subject to variations without prior notice.

Thank you once again for your preference
FERROLI S.p.A

SUMMARY

THIS MANUAL IS DIVIDED INTO SECTIONS. THEIR NAMES APPEAR IN THE HEADING OF EACH PAGE.

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The manufacturer declines all responsibility for any inaccuracies in this manual due to printing or typing errors.
The manufacturer reserves the right to modify the products contents in this catalogue without previous notice.

SAFETY INFORMATION

CONTAINS FLUORINATED GREENHOUSE GASES COVERED BY THE KYOTO PROTOCOL:
- R410A (GLOBAL WARMING POTENTIAL GWP = 2088)

• This manual supplied with the unit must be kept in a dry place and ready to hand for future consultation when required.
• This manual has been compiled to ensure that the unit is installed in the correct way and to supply comprehensive information about how to correctly use and service the appliance. **Before proceeding with the installation phase, please carefully read all the information in this manual, which describes the procedures required to correctly install and use the unit.**
• Strictly comply with the instructions in this manual and conform to the current safety standards.
• The appliance must be installed in accordance with the laws in force in the country in which the unit is installed.
• Unauthorized tampering with the electrical and mechanical equipment will **VOID THE WARRANTY.**
• Check the electrical specifications on the identification plate before making the electrical connections. Read the instructions in the specific section where the electrical connections are described.
• If the unit must be repaired for any reason, this must only be done by a specialized assistance center recognized by the manufacturer and using geuine spare parts.
• The manufacturer also declines all liability for any damage to persons or property deriving from failure of the information in this manual to correspond to the actual machine in your possession.

The precautions listed here are divided into the following types.They are quite important, so be sure to follow them carefully.
Meanings of DANGER, WARNING, CAUTION and NOTE symbols.

DANGER
Indicates an imminently hazardous situation which if not avoided, will result in death or serious injury.

WARNING
Indicates a potentially hazardous situation which if not avoided, could result in death or serious injury.

CAUTION
Indicates a potentially hazardous situation which, if not
avoided, may result in minor or moderate injury. It is also used to alert against unsafe practices.

NOTE
Indicates situations that could only result in accidental equipment or property damage.

DANGER

■ Before touching electric terminal parts, turn off power switch.

■ When service panels are removed, live parts can be easily touched by accident.
Never leave the unit unattended during installation or servicing when the service panel is removed.

■ Do not touch water pipes during and immediately after operation as the pipes may be hot and could burn your hand. To avoid injury, give the piping time to return to normal temperature or be sure to wear protective gloves.

■ Do not touch any switch with wet fingers. Touching a switch with wet fingers can cause electrical shock.

■ Before touching electrical parts, turn off all applicable power to the unit.

WARNING

■ Tear apart and throw away plastic packaging bags so that children will not play with them. Children playing with plastic bags face danger of death by suffocation.

■ Safely dispose of packing materials such as nails and other metal or wood parts that could cause injuries.

■ Ask your dealer or qualified personnel to perform installation work in accordance with this manual. Do not install the unit yourself.
Improper installation could result in water leakage, electric shocks or fire

■ Be sure to use only specified accessories and parts for installation work. Failure to use specified parts may result in water leakage, electric shocks, fire, or the unit falling from its mount.

■ Install the unit on a foundation that can withstand its weight.

■ Insufficient physical strength may cause the equipment to fall and possible injury

■ Perform specified installation work with full consideration of strong wind, hurricanes, or earthquakes. Improper installation work may result in accidents due to equipment falling.

■ Make certain that all electrical work is carried out by

qualified ersonnel according to the local laws and regulations and this manual using a separate circuit. Insufficient capacity of the power supply circuit or improper electrical construction may lead to electric shocks or fire.

■ Be sure to install a ground fault circuit interrupter according to local laws and regulations. Failure to install a ground fault circuit interrupter may cause electric shocks and fire.

■ Make sure all wiring is secure. Use the specified wires and ensure that terminal connections or wires are protected from water and other adverse external forces. Incomplete connection or affixing may cause a fire.

■ When wiring the power supply, form the wires so that the front panel can be securely fastened. If the front panel is not in place there could be overheating of the terminals, electric shocks or fire.

■ After completing the installation work, check to make sure that there is no refrigerant leakage.

■ Never directly touch any leaking refrigerant as it could cause severe frostbite.

■ Do not touch the refrigerant pipes during and immediately after operation as the refrigerant pipes may be hot or cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor and other refrigerant cycle parts. Burns or frostbite are possible if you touch the refrigerant pipes. To avoid injury, give the pipes time to return to normal temperature or, if you must touchthembe sure to wear protective gloves.

■ Do not touch the internal parts (pump, backup heater, etc.) during and immediately after operation. Touching the internal parts can cause burns. To avoid injury, give the internal parts time to return to normal temperature or, if you must touch them, be sure to wear protective gloves.

CAUTION

■ Ground the unit.

Grounding resistance should be according to local laws and regulations. Do not connect the ground wire to gas or water pipes, lightning conductors or telephone ground wires.

Incomplete grounding may cause electric shocks.

a) Gas pipes. Fire or an explosion might occur if the gas leaks.

b) Water pipes. Hard vinyl tubes are not effective grounds.

c) Lightning conductors or telephone ground wires.

Electrical threshold may rise abnormally if struck by a lightning bolt.

■ Install the power wire at least 3 feet (1 meter) away from televisions or radios to prevent interference or noise. (Depending on the radio waves, a distance of 3 feet (1 meter) may not be sufficient to eliminate the noise.)

■ Do not wash the unit. This may cause electric shocks or fire. The appliance must be installed in accordance with national wiring regulations. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

■ Do not install the unit in the following places:

a) Where there is mist of mineral oil, oil spray or vapors.

Plastic parts may deteriorate, and cause them to come loose or water to leak.

b) Where corrosive gases (such as sulphurous acid gas) are produced.

Where corrosion of copper pipes or soldered parts may cause refrigerant to leak.

c) Where there is machinery which emits electromagnetic waves.

Electromagnetic waves can disturb the control system and cause equipment malfunction.

d) Where flammable gases may leak, where carbon fiber or ignitable dust is suspended in the air or where volatile flammables such as paint thinner or gasoline are handled. These types of gases might cause a fire.

e) Where the air contains high levels of salt such as near the ocean.

f) Where voltage fluctuates a lot, such as in factories.

g) In vehicles or vessels.

h) Where acidic or alkaline vapors are present.

■ This appliance can be used by children 8 years old and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they are supervised or given instruction on using the unit in a safe manner and understand the hazards involved. Children should not play with the unit. Cleaning and user maintenance should not be done by children without supervision.

■ Children should be supervised to ensure that they do not play with the appliance.

■ If the supply cord is damaged, it must be replaced by the manufaturer or its service agent or a similarly qualified person.

■ DISPOSAL: Do not dispose this product as unsorted municipal waste. Collection of such waste seperatelly for special treatment is necessary. Do not dispose of electrical appliances as municipal waste, use seperate collection facilities. Contact your local goverment for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substance can leak into the groudwater and get into the food chain, damaging your health and well-being.

■ The wiring must be performed by professional technicians in accordance with national wiring regulation and this circuit diagram.

An all-pole disconnection device which has at least 3mm seperation distance in all pole and a residualcurrent device(RCD) with the rating not exceeding 30mA shall be incorporated in the fixed wiring according to the national rule.

GENERAL FEATURES

European Directives

The company hereby declares that the machine in question complies with the matters prescribed by the following Directives:

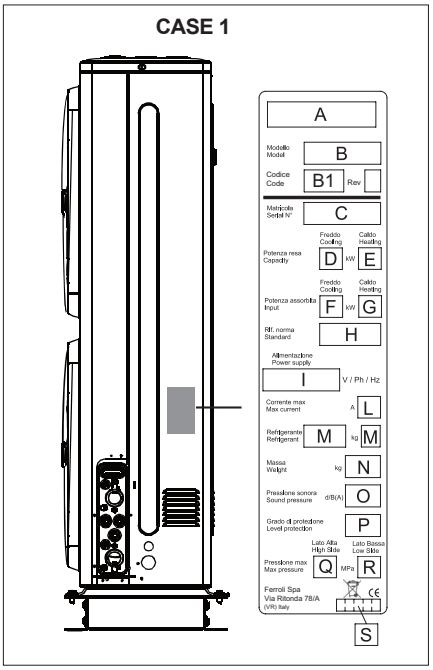
- Low voltage directive 2014/35/EU
- Electromagnetic Compatibility directive 2014/30/EU
- ERP directive 2009/125/EC (EU) No 811/2013 (EU) No 813/2013
- Energy labelling directive 2010/30/UE
- WEE directive 2002/96/EC
- RoHS directive 2011/65/EU
- REACH (EC) European regulation No 1907/2006

Any other Directives have to be considered not applicable.

Identification plate of the Unit

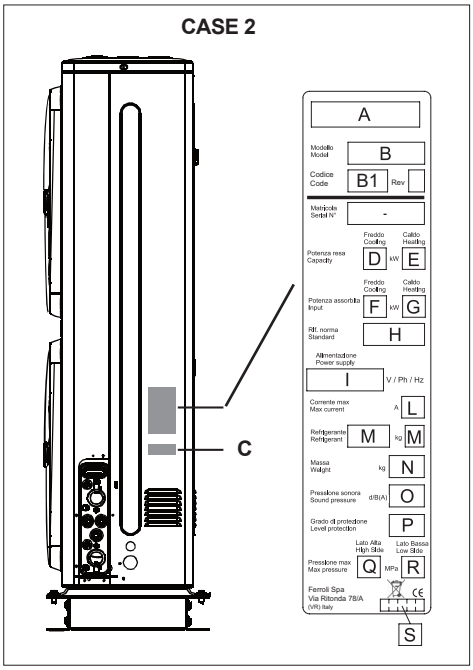
The figure on the left depicts the identification plate of the unit, affixed to the outer left-hand side of the Electric Panel. A description of the data is given below:

CASE 1



A - Trademark
B - Model
B1- Code
C - Serial number
D - Cooling Capacity
E - Heating Capacity
F - Power input in COOLING mode
G - Power input in HEATING mode
H - Reference standard
I - Electric power supply
L - Maximum load current
M - Type of refrigerant and charge
N - Shipping weight of the unit
O - Sound pressure level at 1m
P - IP Level Protection
Q - Maximum pressure - High Side
R - Maximum pressure - Low Side
S - PED certification authority

CASE 2

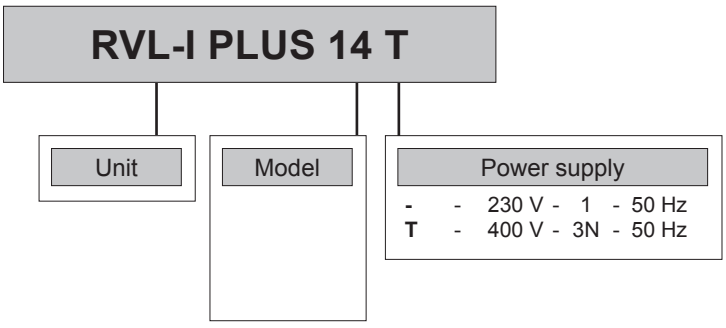


Presentation of the unit

This series of air-water heat pumps meets the needs of winter and summer air conditioning of residential and commercial installations of small and medium power.
All units are suitable for outdoor installation and being able to produce water up to 60 ° C may be employed in systems with radiant floor, fancoils, radiators and for the indirect production of domestic hot water (DHW) via an external boiler (not provided).
The units are characterized by the use of a DC inverter compressor that allows you to modulate the capacity from 30 to 120% of the rated capacity and are complete with a hydronic kit including all the essential components for a quick and safe installation.
The units are characterized by high energy efficiency and low noise level and they can be used as the sole generator of the system or integrated with other energy sources such as backup electric heaters or boiler.
All units are supplied with temperature probe (included) for domestic hot water tank (DHW) and with external air temperature probe (already installed on the unit) to realize the climatic control in heating and cooling modes.
All the units are accurately built and individually tested in the factory. The installation only requires the electrical and hydraulic connections.

Unit identification code

The codes that identify the units and the meaning of the letters used are described below.



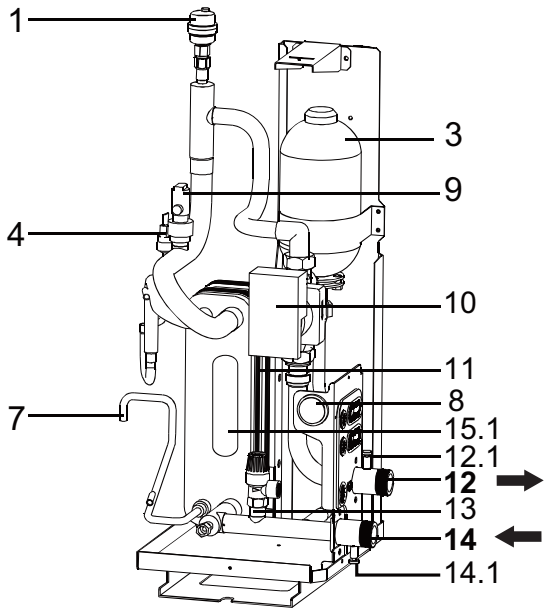
GENERAL FEATURES

Main components of the unit

■ **REFRIGERANT CIRCUIT**: contained in a compartment protected from the air flow to simplify the maintenance operations, is equipped with DC inverter motor driven compressor twin rotary type to ensure greater dynamic balancing and reduce vibrations. It is placed on vibration-damping rubber supports and wrapped by a double layer of sound-absorbing material to reduce the noise. Furthermore, the compressor is equipped with crankcase oil heater. The circuit is equipped with stainless steel brazed plates heat exchanger complete with antifreeze heater, bi-flow electronic expansion valve, 4-way valve, axial fans with brushless DC motor complete with safety protection grilles, finned coil made of copper tubes and aluminium fins. The circuit is controlled by means of temperature probes and pressure transducers and protected by high and low pressure switches.

■ **HYDRAULIC CIRCUIT:** contained in a compartment protected from the air flow to simplify the maintenance operations, is equipped with electronic circulator (brushless DC motor), water flow switch, automatic air vent, water manometer, expansion vessel, safety valve, Y water filter (supplied with the unit but not installed). The plate heat exchanger and all the hydraulic pipes are thermally insulated to avoid the formation of condensation and reduce heat loss.

MOD. 5-7-9



1.Air purge valve. Remaining air in the water circuit will be automatically removed via the air purge valve.

3.Expansion vessel (2 L)

4.Pressure Sensor

7.Refrigerant liquid connection

8.Manometer. The manometer provides a water pressure readout of the water circuit.

9.Flow switch. The flow switch checks the flow in the water circuit and protects the heat exchanger against freezing and the pump against damage.

10.Pump. The pump circulates the water in the water circuit.

11.Heat exchanger

12.WATER OUTLET CONNECTION

12.1 Air purge valve

13.Pressure relief valve. The pressure relief valve prevents excessive water pressure in the water circuit by opening 3 bar and discharging water.

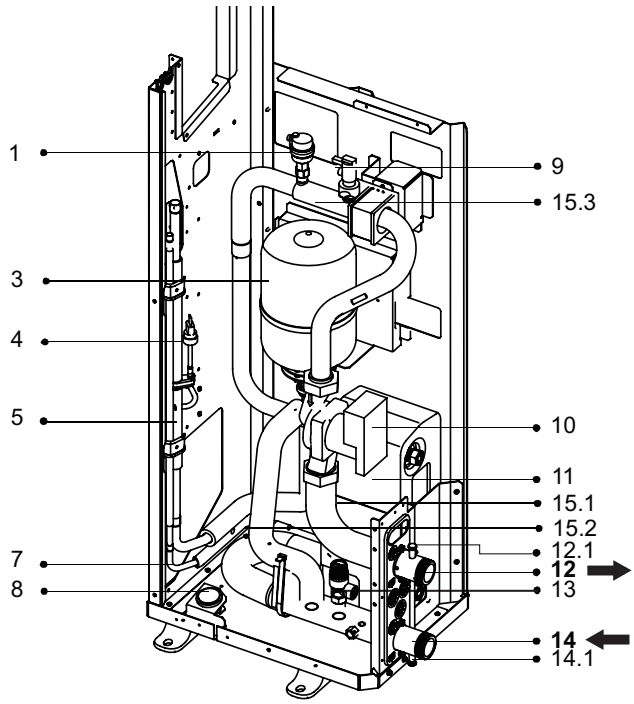
14.WATER INLET CONNECTION

14.1 Drain valve

15.1.Electrical heating tape

- Temperature probes. Four temperature probes determine the water and refrigerant temperatures at various points in the water circuit.

MOD. 10-12-12T-14-14T-16-16T



1. Air purge valve. Remaining air in the water circuit will be automatically removed via the air purge valve.

3.Expansion vessel (5 L)

4.Pressure Sensor

5.Refrigerant gas connection

7.Refrigerant liquid connection

8.Manometer. The manometer provides a water pressure readout of the water circuit

9.Flow switch. The flow switch checks the flow in the water circuit and protects the heat exchanger against freezing and the pump against damage

10.Pump. The pump circulates the water in the water circuit.

11.Heat exchanger. The manometer provides a water pressure readout of the water circuit

12.WATER OUTLET CONNECTION

12.1 Air purge valve

13.Pressure relief valve. The pressure relief valve prevents excessive water pressure in the water circuit by opening 3 bar and discharges water.

14.WATER INLET CONNECTION

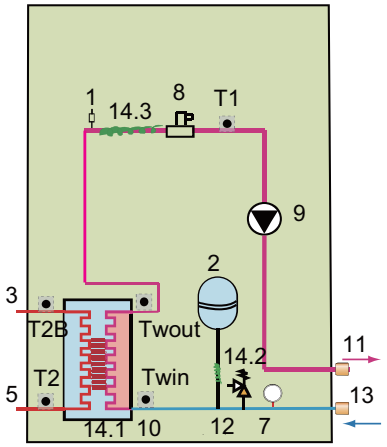
14.1 Drain valve

15.Electrical heating tape(15.1-15.3)

- Temperature probes. Four temperature probes determine the water and refrigerant temperatures at various points in the water circuit.

GENERAL FEATURES

Functional diagram of hydraulic compartment



1 Air purge valve
2 Expansion vessel
3 Refrigerant gas connection
5 Refrigerant liquid connection
7 Manometer
8 Flow switch
9 Circulation Pump
10 Heat exchanger
11 Water outlet connection
12 Pressure relief valve
13 Water inlet connection
14.1 Electrical heating tape
14.2 Electrical heating tape
14.3 Electrical heating tape
Temperature probes: TW_in; TW_out; T1 (water probes)
T2B; T2 (refrigerant probes)

The control system

The user interface consists of a wired remote controller (up to 50 m from the unit) which allows the management of:



- HEATING AND COOLING SYSTEM, where the heat pump is the sole energy source. The unit, if activated in heat or cool mode, works by modulating the frequency of the compressor to maintain the temperature of the produced water to the setpoint value set by the controller. Through parameter you can use the remote controller (eg. For single-zone systems) as a room thermostat.

- DOMESTIC HOT WATER PRODUCTION (DHW). The unit is activated in a heatt mode to keep the temperature of a DHW tank (not supplied) to the setpoint value. It requires a 3-way diverter valve (not supplied) and a temperature sensor (T5 probe, L = 10m, provided) to be inserted into one well of the DHW tank.

- ADDITIONAL SOURCES OF ENERGY (boiler or electrical heater). Depending on the parameters set, these sources can be activated in integration or replacement of the heat pump when the system is used for space heating or for DHW production.
The controller also activate additional energy sources in case the heat pump is not working.

- ELECTRIC HEATER OF THE DHW TANK. The controller can manage the activation of an electric heater inserted in the DHW tank as a heat integration to the heat pump, for disinfecting function, or as a source of energy reserve for DHW production in case the heat pump is not working.

FAST DHW. This function can be activated manually and it allows you to give priority to DHW production by activating all energy sources (heat pumps, electric heaters, boiler) available for DHW heating to bring in the shortest time possible the DHW tank to the setpoint required.

- DISINFECT FUNCTION. You can set from the controller weekly cycles for disinfecting the water in the Dhw tank. In order to successfully execute these cycles, the heat pump must be integrated with DHW electric heater or boiler.

- SILENT MODE. If active it allows a reduction of the maximum frequency of the compressor and of the fan speed in order to reduce the noise emitted and the power absorbed by the unit. There are 2 levels of silencing. Through time programming, you can define for 2 daily time bands the desired silent level (eg. during the night).

- ON / OFF using an external contact. The unit can be turned on and off (eg. thermostat / remote switch) via an external contact: in this case the unit will operate in the mode set by the controller keyboard.

- HEAT / COOL via external contacts. The unit can be activated in heat or cool mode via two external contacts (eg. thermostat that manages the heat and cool demand / remote switch).

- ECO MODE. For heating mode it is possible to define daily time band and corresponding set point for ECO mode.

- WEEKLY SCHEDULING. It allows a schedulation of 6 time bands for each day of the week: for each time band it is possible to define the mode (COOL / HEAT / DHW) and the required setpoint.

- Antifreeze protection. Guaranteed for outdoor air temperature down to -20°C, thanks to the management of the electronic board of the unit which allows you to heat water using antifreeze heater (standard on the plate heat exchanger), the heat pump itself working in heating mode and the electric booster (if installed).

- Detailed alarms diagnostics with alarms history.

- Display of all operating parameters.

GENERAL FEATURES

Components supplied with the unit

NAME	SHAPE	5-7-9	Mod. 10-12-12T-14-14T-16-16T
Outdoor unit installation & owner's manual(this book)		1	1
Wire control owner's manual		1	1
Y- shape filter *		1	1
Water outlet connection pipe assembly		2	1
User interface kit(digital remote controller)		1	1
Tighten belt for customer wiring use		0	2
		3	3
T5: Thermistor for domestic hot water tank		1	1
temperature sensor clamp		1	0
Transit line		1	1

* : It is mandatory to install it at the water inlet connection of the unit.

ACCESSORIES

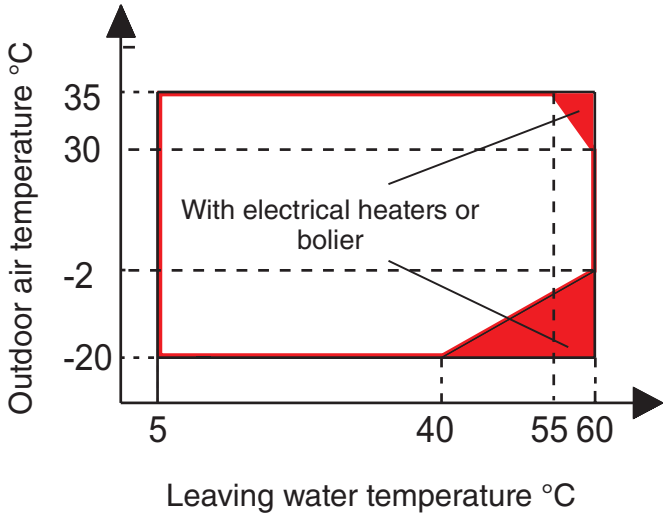
Electrical booster (backup heater box). Suitable for indoor installation, is constituted by an electrical heater (3kW, 230V-1-50) mounted inside a painted sheet metal box and complete with electrical control panel. The booster is then handled by the heat pump to integrate / replace in heating mode the hot water production in case the heat pump is stopped for having reached operational limits or for alarm.

Rubber antivibration dampers.

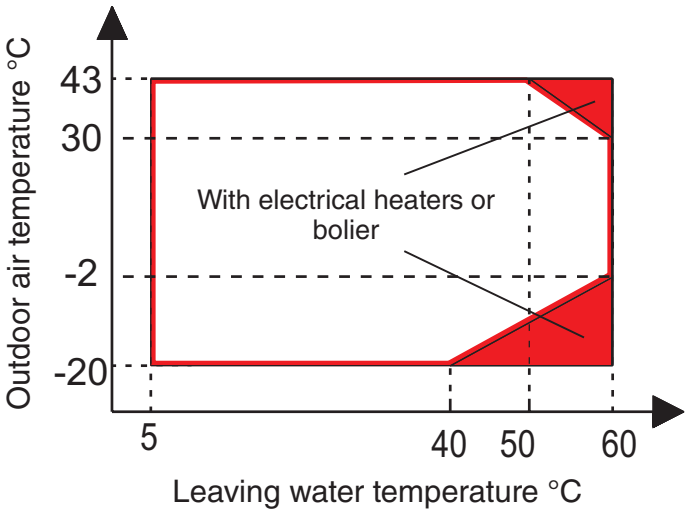
Inertial water tank. It is constitued of a 60-liter tank in painted sheet metal, thermally insulated and placed inside a painted sheet metal box that can be positioned below the unit. The tank is supplied complete with automatic air vent and water tap (components to be assembled by the installer).

OPERATING LIMITS

HEATING MODE

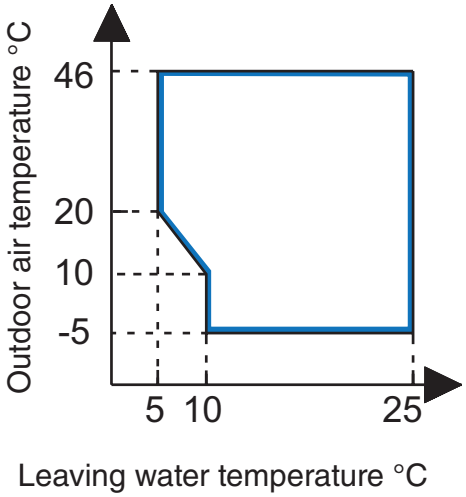


ACS MODE



NOTE FOR DHW MODE: leaving water temperature is the temperature of the water produced by the unit and not the DHW temperature available to the user; the DHW temperature is in fact a function of this parameter and of the coil surface of the DHW boiler.

COOLING MODE



TECHNICAL DATA AND PERFORMANCE

Technical data

Efficiency capacity in heating mode - Average climate

Models	5	7	9	10	12	12T	14	14T	16	16T
Efficiency capacity - medium temperature (water 55°C)	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++
Efficiency season - medium temperature (water 55°C)	126	126	127	129	129	131	128	128	125	126
Efficiency capacity - low temperature (water 35°C)	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++
Efficiency season - low temperature (water 35°C)	176	178	163	162	166	175	173	168	167	164

NOTA: Declared according to **European regulation 811/2013**. The values are referred to units without options and accessories.

Performances data

-	Modelli		5	7	9	10	12	12T	14	14T	16	16T	UM
A7W35	Heating capacity	nom	4600	6600	8600	10400	12200	12400	14800	14100	16300	16300	W
		min-max	1341 - 5800	1909 - 7574	2507 - 9500	3032 - 11200	3556 - 12776	3615 - 13697	4314 - 15400	4110 - 16700	4752 - 16730	4752 - 17000	W
	Power input	nom	970	1460	2000	2280	2740	2760	3410	3260	3890	3880	W
		min-max	283 - 1280	420 - 1957	580 - 2561	660 - 2605	793 - 2957	803 - 3349	989 - 3747	944 - 4578	1128 - 4584	1125 - 4533	W
	COP		4,72	4,52	4,30	4,57	4,46	4,48	4,34	4,33	4,19	4,20	W/W
	Water flow rate		791	1135	1474	1789	2093	2128	2546	2425	2809	2804	l/h
	Available static pressure		61	49	32	53	41	40	25	29	14	15	kPa
A7W45	Heating capacity	nom	4700	6700	9200	10200	12600	12000	14100	14100	16100	16100	W
		min-max	1370 - 5500	1953 - 7700	2682 - 9200	2973 - 10200	3673 - 12600	3498 - 12720	4106 - 14930	4110 - 15200	4693 - 17066	4693 - 16583	W
	Power input	nom	1440	2055	2640	3090	3870	3720	4480	4460	5210	5240	W
		min-max	417 - 1833	595 - 2628	764 - 2636	896 - 3377	1121 - 3870	1077 - 4293	1297 - 5166	1293 - 5241	1511 - 6020	1521 - 5888	W
	COP		3,27	3,26	3,49	3,30	3,26	3,23	3,15	3,16	3,09	3,07	W/W
	Water flow rate		808	1152	1577	1754	2164	2067	2425	2425	2773	2762	l/h
	Available static pressure		61	48	33	55	39	42	29	29	16	16	kPa
A35W18	Cooling capacity	nom	4550	6450	8350	10300	12200	12600	14600	14000	14800	15100	W
		min-max	1320 - 4921	1872 - 7000	2423 - 9100	2989 - 10800	3541 - 12800	3657 - 12800	4237 - 14800	4063 - 14800	4295 - 15400	4382 - 15400	W
	Power input	nom	1000	1470	2100	2070	2650	2740	3320	3260	3650	3780	W
		min-max	304 - 1158	445 - 1719	632 - 2364	628 - 2395	806 - 2943	832 - 2943	1008 - 3515	992 - 3601	1110 - 3990	11470 - 3990	W
	EER		4,55	4,39	3,97	4,98	4,60	4,60	4,40	4,29	4,05	4,00	W/W
	Water flow rate		783	1109	1431	1772	2097	2174	2511	2408	2549	2597	l/h
	Available static pressure		61	50	37	55	41	38	26	30	25	23	kPa
A35W7	Cooling capacity	nom	4600	6700	8100	10400	12210	12580	13000	13800	13720	15260	W
		min-max	1479 - 5430	1947 - 7000	2351 - 8300	3018 - 10700	3541 - 12688	3657 - 13003	3773 - 13000	4005 - 13800	3976 - 14317	4440 - 15759	W
	Power input	nom	1560	2570	3520	3270	4160	4330	4550	5150	5150	6430	W
		min-max	527 - 2011	773 - 2857	1058 - 3756	994 - 3627	1265 - 4665	1316 - 4603	1386 - 4545	1565 - 5149	1565 - 5544	1953 - 6820	W
	EER		2,95	2,61	2,30	3,18	2,93	2,91	2,86	2,68	2,66	2,38	W/W
	Water flow rate		791	1152	1389	1789	2100	2164	2236	2374	2360	2625	l/h
	Available static pressure		61	48	37	53	41	39	36	31	32	22	kPa

The values are referred to units without options and accessories.
Data declared according to **EN 14511**:
EER (Energy Efficiency Ratio) = ratio of the total cooling capacity to the effective power input of the unit
COP (Coefficient Of Performance) = ratio of the total heating capacity to the effective power input of the unit

A35W7 = source : air in 35°C d.b. / plant : water in 12°C out 7°C
A35W18 = source : air in 35°C d.b. / plant : water in 23°C out 18°C
A7W45 = source : air in 7°C d.b. 6°C w.b. / plant : water in 40°C out 45°C
A7W35 = source : air in 7°C d.b. 6°C w.b. / plant : water in 30°C out 35°C

General data

Models	5	7	9	10	12	12T	14	14T	16	16T	UM
Power supply	230-1-50	230-1-50	230-1-50	230-1-50	230-1-50	400-3-50	230-1-50	400-3-50	230-1-50	400-3-50	V-ph-Hz
Compressor type	Twin Rotary DC										-
N° compressors / N° refrigerant circuits	1 / 1										n°
Plant side heat exchanger type	stainless steel brazed plates										-
Source side heat exchanger type	finned coil										-
Fans type	DC axial										-
N° fans	1			2							n°
Expansion tank volume	2			5							l
Water safety valve set	3										bar
Hydraulic fittings	1" M			1-1/4" M							"
Minimum water content onf the system	20										l
DHW boiler - minimum surface of the coil	1,4			1,7							m^2
Refrigerant type	R410A										-
Refrigerant charge	2,40			3,60							kg
Control type	Remote wired										-
SWL - Sound power level*	63	67	70	68	69	70	73	73	73	75	dB(A)
SPL - Sound pressure level at 1mt **	48	52	55	53	54	55	58	58	58	60	dB(A)
Maximum current input	16	16	20	32	32	16	32	16	32	16	A

*** SWL = Sound power levels, with reference to $1x10^{-12}$ W.**
The Total sound power level in dB(A) measured in compliance with ISO 9614 standards. The Total Sound Power in db(A) the only binding acoustic specification.

**** SPL = Sound pressure levels, with reference to $2x10^{-5}$ Pa.**
The sound pressure levels are values calculated by applying the ISO-3744 relation.

TECHNICAL DATA AND PERFORMANCE

Performance

Mod. 5 - Heating mode

Tw_out (°C)	Ta (°C)	PT (kW)						COP					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
	-20	2,646	2,205	1,838	1,286	0,978	/	2,32	2,53	2,58	2,64	2,69	/
	-15	2,859	2,423	2,053	1,458	1,890	/	2,40	2,59	2,67	2,75	2,84	/
	-7	3,865	3,248	2,730	1,883	1,450	/	3,23	3,46	3,53	3,60	3,67	/
	-2	5,036	4,341	3,742	2,769	2,049	1,434	3,63	4,06	4,18	4,31	4,44	4,04
	2	5,378	4,596	3,929	2,907	2,209	1,502	4,03	4,40	4,63	4,87	5,13	4,77
30	7	5,858	4,922	4,136	3,020	2,174	1,435	4,60	5,10	5,26	5,41	5,58	5,13
	15	6,216	5,405	4,700	3,337	2,436	1,632	6,52	7,17	7,46	7,76	8,07	7,34
	20	5,996	4,996	4,164	3,081	2,218	1,353	7,27	7,85	8,01	8,17	8,33	7,66
	25	5,747	4,997	4,345	3,259	2,314	1,458	8,28	8,70	8,96	9,23	9,50	8,84
	30	6,408	5,476	4,681	3,464	2,390	1,482	9,71	10,29	10,39	10,50	10,60	9,54
	35	6,876	5,827	4,938	3,555	2,418	1,523	10,71	11,03	11,14	11,25	11,36	10,11
	-20	2,567	2,139	1,782	1,248	0,948	/	2,10	2,29	2,33	2,38	2,43	/
	-15	2,647	2,244	1,901	1,350	1,750	/	2,04	2,21	2,27	2,34	2,41	/
	-7	3,799	3,192	2,682	1,851	1,425	/	2,63	2,81	2,87	2,93	2,99	/
	-2	4,751	4,095	3,531	2,613	1,933	1,353	3,05	3,42	3,52	3,63	3,74	3,40
	2	5,011	4,283	3,661	2,709	2,059	1,400	3,11	3,39	3,57	3,76	3,96	3,68
35	7	5,800	4,600	3,866	2,822	2,032	1,341	4,53	4,72	4,86	5,01	5,16	4,75
	15	5,899	5,130	4,461	3,167	2,312	1,549	5,48	6,03	6,27	6,53	6,79	6,18
	20	5,721	4,768	3,973	2,940	2,117	1,291	6,08	6,56	6,69	6,83	6,96	6,41
	25	5,642	4,906	4,266	3,200	2,272	1,431	6,97	7,31	7,53	7,76	7,99	7,43
	30	6,149	5,256	4,492	3,324	2,294	1,422	7,88	8,35	8,43	8,52	8,60	7,74
	35	6,480	5,492	4,654	3,351	2,279	1,436	8,44	8,69	8,78	8,87	8,96	7,97
	-20	2,443	2,036	1,696	1,187	0,902	/	1,84	2,01	2,05	2,09	2,13	/
	-15	2,831	2,399	2,033	1,443	1,871	/	2,04	2,21	2,27	2,34	2,41	/
	-7	3,759	3,159	2,654	1,832	1,410	/	2,42	2,59	2,64	2,69	2,74	/
	-2	4,382	3,778	3,257	2,410	1,783	/	2,67	2,99	3,08	3,18	3,27	/
	2	4,583	3,917	3,348	2,478	1,883	1,280	2,62	2,85	3,01	3,17	3,33	3,10
40	7	5,256	4,416	3,711	2,709	1,951	1,287	3,50	3,89	4,01	4,13	4,25	3,91
	15	5,034	4,377	3,806	2,702	1,973	1,322	4,72	5,19	5,40	5,62	5,84	5,32
	20	4,556	3,797	3,164	2,342	1,686	1,028	5,35	5,77	5,89	6,01	6,13	5,64
	25	4,964	4,317	3,754	2,815	1,999	1,259	5,89	6,19	6,37	6,57	6,76	6,29
	30	5,461	4,667	3,989	2,952	2,037	1,263	6,63	7,03	7,10	7,17	7,24	6,52
	35	5,831	4,941	4,187	3,015	2,050	1,292	7,22	7,43	7,51	7,58	7,66	6,82
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	2,446	2,073	1,757	1,247	1,617	/	1,66	1,79	1,84	1,90	1,95	/
	-7	3,641	3,060	2,571	1,774	1,366	/	2,26	2,42	2,47	2,52	2,57	/
	-2	4,156	3,582	3,088	2,285	1,691	/	2,49	2,79	2,88	2,96	3,05	/
	2	4,767	4,074	3,482	2,577	1,958	/	2,68	2,92	3,08	3,24	3,41	/
45	7	5,500	4,700	3,950	2,884	2,076	1,370	3,00	3,27	3,37	3,47	3,57	3,29
	15	3,948	3,433	2,985	2,119	1,547	1,037	4,11	4,52	4,70	4,89	5,09	4,63
	20	3,940	3,283	2,736	2,025	1,458	0,889	4,64	5,01	5,11	5,21	5,32	4,89
	25	4,167	3,623	3,151	2,363	1,678	1,057	4,96	5,21	5,36	5,53	5,69	5,29
	30	3,924	3,354	2,866	2,121	1,464	0,907	5,53	5,86	5,92	5,98	6,04	5,44
	35	3,876	3,285	2,784	2,004	1,363	0,859	5,47	5,64	5,69	5,75	5,81	5,17
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	2,933	2,465	2,071	1,429	1,101	/	1,89	2,02	2,06	2,10	2,14	/
	-2	3,483	3,003	2,589	1,916	1,418	/	2,02	2,27	2,33	2,40	2,48	/
	2	3,972	3,395	2,902	2,147	1,632	/	2,38	2,60	2,74	2,88	3,03	/
50	7	4,400	3,697	3,107	2,268	1,633	/	2,55	2,84	2,92	3,01	3,10	/
	15	3,346	2,910	2,530	1,797	1,312	/	3,52	3,87	4,03	4,19	4,36	/
	20	3,422	2,852	2,377	1,759	1,266	/	3,85	4,16	4,24	4,33	4,41	/
	25	3,339	2,904	2,525	1,894	1,344	/	4,08	4,28	4,41	4,55	4,68	/
	30	3,702	3,164	2,704	2,001	1,381	/	4,59	4,86	4,91	4,96	5,01	/
	35	3,685	3,123	2,647	1,905	1,296	/	4,57	4,71	4,76	4,80	4,85	/
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	2,771	2,328	1,957	1,350	1,040	/	1,80	1,93	1,97	2,01	2,05	/
	-2	3,056	2,634	2,271	1,680	1,243	/	2,20	2,46	2,54	2,61	2,69	/
	2	3,178	2,716	2,321	1,718	1,306	/	2,12	2,31	2,43	2,56	2,70	/
55	7	3,544	2,979	2,503	1,827	1,316	/	2,45	2,72	2,81	2,89	2,98	/
	15	2,254	1,960	1,705	1,210	0,884	/	2,89	3,18	3,31	3,44	3,58	/
	20	2,139	1,782	1,485	1,099	0,791	/	2,96	3,20	3,26	3,33	3,39	/
	25	1,970	1,713	1,489	1,117	0,793	/	3,06	3,21	3,31	3,41	3,51	/
	30	2,067	1,766	1,510	1,117	0,771	/	3,28	3,47	3,51	3,54	3,58	/
	35	2,966	2,514	2,130	1,534	1,043	/	3,87	3,99	4,03	4,07	4,11	/
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	/	/	/	/	/	/	/	/	/	/	/	/
	-2	2,689	2,318	1,998	1,479	1,094	/	1,77	1,98	2,04	2,10	2,16	/
	2	2,933	2,507	2,143	1,586	1,205	/	1,96	2,14	2,25	2,37	2,50	/
60	7	3,239	2,722	2,287	1,670	1,202	/	2,62	2,90	2,99	3,08	3,17	/
	15	2,139	1,860	1,617	1,148	0,838	/	2,28	2,51	2,61	2,71	2,82	/
	20	2,078	1,731	1,443	1,068	0,769	/	2,66	2,88	2,93	2,99	3,05	/
	25	2,017	1,754	1,525	1,144	0,812	/	2,80	2,94	3,03	3,12	3,21	/
	30	1,978	1,691	1,445	1,069	0,738	/	3,00	3,18	3,21	3,24	3,27	/
	35	/	/	/	/	/	/	/	/	/	/	/	/

PT = Heating capacity
COP (Coefficient Of Performance) = ratio of the total heating capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 5 - Cooling mode

Tw_out (°C)	Ta (°C)	PF (kW)						EER					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
22	45	4,274	3,562	2,968	2,078	1,579	/	3,05	3,33	3,39	3,46	3,53	/
	40	5,502	4,663	3,951	2,805	3,637	/	3,80	4,11	4,23	4,36	4,49	/
	35	5,622	4,725	3,970	2,739	2,109	1,371	5,63	6,02	6,14	6,27	6,39	5,75
	30	5,653	4,873	4,201	3,109	2,300	1,610	5,73	6,42	6,62	6,81	7,02	6,39
	25	5,683	4,858	4,152	3,072	2,335	1,588	6,56	7,15	7,53	7,93	8,35	7,76
	20	5,256	4,416	3,711	2,709	1,951	1,287	7,58	8,41	8,67	8,93	9,19	8,46
	15	5,133	4,464	3,882	2,756	2,012	1,348	7,73	8,50	8,84	9,19	9,56	8,70
	10	5,211	4,342	3,619	2,678	1,928	1,176	7,96	8,60	8,77	8,94	9,12	8,39
	5	5,350	4,652	4,046	3,034	2,154	1,357	8,09	8,49	8,75	9,01	9,28	8,63
	0	5,234	4,474	3,824	2,829	1,952	1,210	8,64	9,15	9,25	9,34	9,43	8,49
	-5	5,286	4,480	3,796	2,733	1,859	1,171	7,94	8,18	8,26	8,34	8,43	7,50
18	45	3,645	3,038	2,531	1,772	1,347	/	2,68	2,92	2,98	3,04	3,10	/
	40	4,889	4,143	3,511	2,493	3,232	/	2,96	3,20	3,29	3,39	3,50	/
	35	**4,921**	**4,550**	3,824	2,638	2,031	**1,320**	**4,25**	**4,55**	4,64	4,73	4,83	**4,35**
	30	5,683	4,899	4,224	3,125	2,313	1,619	5,82	6,52	6,71	6,91	7,12	6,48
	25	5,622	4,805	4,107	3,039	2,310	1,571	6,08	6,63	6,98	7,35	7,74	7,20
	20	5,194	4,365	3,668	2,678	1,928	1,272	8,17	9,07	9,34	9,62	9,91	9,12
	15	5,011	4,357	3,789	2,690	1,964	1,316	8,26	9,09	9,45	9,83	10,22	9,30
	10	5,011	4,176	3,480	2,575	1,854	1,131	8,42	9,09	9,28	9,46	9,65	8,88
	5	4,809	4,182	3,637	2,727	1,937	1,220	8,48	8,90	9,17	9,44	9,73	9,04
	0	4,828	4,126	3,527	2,610	1,801	1,116	8,22	8,71	8,80	8,88	8,97	8,08
	-5	4,813	4,078	3,456	2,489	1,692	1,066	8,68	8,94	9,03	9,12	9,21	8,19
15	45	3,502	2,918	2,432	1,702	1,294	/	2,38	2,59	2,64	2,70	2,75	/
	40	4,769	4,041	3,425	2,432	3,152	/	2,70	2,91	3,00	3,09	3,18	/
	35	5,500	4,622	3,884	2,680	2,064	1,341	3,44	3,68	3,75	3,83	3,90	3,51
	30	5,622	4,847	4,178	3,092	2,288	1,602	3,74	4,19	4,32	4,45	4,58	4,17
	25	5,317	4,544	3,884	2,874	2,184	1,485	5,41	5,90	6,21	6,54	6,89	6,41
	20	4,833	4,061	3,413	2,491	1,794	1,184	5,94	6,60	6,80	7,00	7,21	6,63
	15	4,767	4,145	3,604	2,559	1,868	1,252	7,13	7,84	8,16	8,48	8,82	8,03
	10	4,723	3,936	3,280	2,427	1,748	1,066	6,86	7,41	7,56	7,71	7,87	7,24
	5	4,773	4,150	3,609	2,707	1,922	1,211	7,05	7,41	7,63	7,86	8,09	7,53
	0	4,036	3,450	2,949	2,182	1,506	0,933	7,08	7,50	7,58	7,65	7,73	6,96
	-5	3,978	3,371	2,857	2,057	1,399	0,881	7,39	7,61	7,69	7,76	7,84	6,98
13	45	3,211	2,676	2,230	1,561	1,186	/	2,21	2,41	2,46	2,51	2,56	/
	40	4,435	3,758	3,185	2,261	2,932	/	2,57	2,77	2,85	2,94	3,03	/
	35	5,439	4,570	3,841	2,650	2,041	1,326	2,81	3,11	3,17	3,24	3,30	2,97
	30	5,401	4,656	4,014	2,970	2,198	1,539	3,78	4,23	4,36	4,49	4,62	4,20
	25	5,194	4,440	3,795	2,808	2,134	1,451	4,45	4,85	5,10	5,37	5,66	5,26
	20	4,118	3,461	2,908	2,123	1,529	1,009	6,12	6,80	7,00	7,21	7,43	6,83
	15	3,473	3,020	2,626	1,864	1,361	0,912	6,00	6,60	6,86	7,14	7,42	6,75
	10	3,584	2,987	2,489	1,842	1,326	0,809	5,97	6,45	6,58	6,71	6,84	6,30
	5	3,670	3,191	2,775	2,081	1,478	0,931	6,08	6,38	6,57	6,77	6,97	6,49
	0	3,588	3,067	2,621	1,940	1,338	0,830	6,12	6,49	6,55	6,62	6,68	6,01
	-5	3,523	2,986	2,530	1,822	1,239	0,780	6,18	6,37	6,43	6,50	6,56	5,84
10	45	2,749	2,291	1,909	1,336	1,016	/	1,94	2,12	2,16	2,20	2,25	/
	40	3,965	3,360	2,848	2,022	2,621	/	2,37	2,56	2,64	2,71	2,80	/
	35	4,972	4,700	3,950	2,725	2,098	1,364	2,65	3,05	3,11	3,17	3,24	2,91
	30	5,133	4,425	3,815	2,823	2,089	1,462	2,98	3,34	3,44	3,54	3,65	3,32
	25	4,826	4,125	3,525	2,609	1,983	1,348	4,35	4,74	5,00	5,26	5,54	5,15
	20	3,571	3,001	2,522	1,841	1,325	0,875	5,11	5,67	5,84	6,02	6,20	5,70
	15	3,147	2,736	2,379	1,689	1,233	0,826	5,52	6,07	6,31	6,56	6,83	6,21
	10	3,159	2,632	2,194	1,623	1,169	0,713	5,47	5,90	6,02	6,14	6,27	5,76
	5	3,205	2,787	2,424	1,818	1,291	0,813	5,44	5,71	5,88	6,06	6,24	5,80
	0	3,254	2,781	2,377	1,759	1,214	0,753	5,64	5,98	6,04	6,10	6,16	5,55
	-5	3,197	2,709	2,296	1,653	1,124	0,708	5,67	5,84	5,90	5,96	6,02	5,35
7	45	2,279	1,899	1,583	1,108	0,842	/	1,66	1,81	1,84	1,88	1,92	/
	40	3,431	2,907	2,464	1,749	2,268	/	2,11	2,28	2,34	2,42	2,49	/
	35	**5,430**	**4,600**	3,866	2,667	2,054	**1,479**	**2,70**	**2,95**	3,00	3,06	3,12	**2,81**
	30	4,875	4,202	3,623	2,681	1,984	1,389	2,92	3,27	3,37	3,47	3,58	3,25
	25	3,919	3,350	2,863	2,119	1,610	1,095	4,13	4,50	4,74	4,99	5,25	4,88
	20	2,510	2,109	1,772	1,294	0,932	0,615	3,96	4,40	4,53	4,66	4,80	4,42
	15	2,371	2,061	1,792	1,273	0,929	0,622	3,38	3,72	3,87	4,02	4,18	3,81
	10	/	/	/	/	/	/	/	/	/	/	/	/
	5	/	/	/	/	/	/	/	/	/	/	/	/
	0	/	/	/	/	/	/	/	/	/	/	/	/
	-5	/	/	/	/	/	/	/	/	/	/	/	/

PF = Cooling mode
ER (Energy Efficiency Ratio) = ratio of the total cooling capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 7 - Heating mode

Tw_out (°C)	Ta (°C)	PT (kW)						COP					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
	-20	3,464	2,887	2,406	1,684	1,280	/	2,21	2,40	2,45	2,50	2,55	/
	-15	3,742	3,172	2,688	1,908	2,474	/	2,28	2,46	2,54	2,61	2,69	/
	-7	5,060	4,252	3,573	2,466	1,898	/	3,07	3,28	3,35	3,41	3,48	/
	-2	6,592	5,683	4,899	3,625	2,683	1,878	3,44	3,85	3,97	4,09	4,21	3,83
	2	7,040	6,017	5,143	3,806	2,892	1,967	3,83	4,17	4,39	4,62	4,87	4,53
30	7	7,668	6,444	5,415	3,953	2,846	1,878	4,36	4,84	4,99	5,14	5,29	4,87
	15	8,138	7,076	6,153	4,369	3,189	2,137	6,19	6,80	7,08	7,36	7,65	6,96
	20	7,849	6,541	5,451	4,033	2,904	1,771	6,89	7,45	7,59	7,75	7,90	7,27
	25	7,523	6,542	5,689	4,266	3,029	1,908	7,86	8,25	8,50	8,75	9,01	8,38
	30	8,388	7,169	6,128	4,534	3,129	1,940	9,21	9,76	9,86	9,96	10,06	9,05
	35	9,001	7,628	6,464	4,654	3,165	1,994	10,16	10,46	10,57	10,67	10,78	9,59
	-20	3,360	2,800	2,333	1,633	1,241	/	1,99	2,17	2,21	2,26	2,30	/
	-15	3,466	2,937	2,489	1,767	2,291	/	1,94	2,09	2,16	2,22	2,29	/
	-7	4,973	4,179	3,512	2,423	1,866	/	2,49	2,67	2,72	2,78	2,83	/
	-2	6,219	5,361	4,622	3,420	2,531	1,772	2,90	3,24	3,34	3,44	3,55	3,23
	2	6,560	5,607	4,792	3,546	2,695	1,833	2,95	3,22	3,39	3,57	3,76	3,49
35	7	**7,574**	**6,600**	5,504	4,018	2,893	**1,909**	**3,87**	**4,52**	4,66	4,80	4,94	**4,54**
	15	7,722	6,715	5,839	4,146	3,026	2,028	5,20	5,72	5,95	6,19	6,44	5,86
	20	7,490	6,241	5,201	3,849	2,771	1,690	5,76	6,22	6,35	6,48	6,61	6,08
	25	7,386	6,423	5,585	4,189	2,974	1,874	6,61	6,94	7,15	7,36	7,58	7,05
	30	8,050	6,880	5,880	4,351	3,003	1,862	7,47	7,92	8,00	8,08	8,16	7,35
	35	8,483	7,189	6,093	4,387	2,983	1,879	8,01	8,25	8,33	8,41	8,50	7,56
	-20	3,198	2,665	2,221	1,554	1,181	/	1,75	1,90	1,94	1,98	2,02	/
	-15	3,706	3,140	2,661	1,890	2,449	/	1,94	2,09	2,16	2,22	2,29	/
	-7	4,921	4,135	3,475	2,398	1,846	/	2,29	2,45	2,50	2,55	2,60	/
	-2	5,737	4,946	4,263	3,155	2,335	1,634	2,54	2,84	2,93	3,01	3,10	2,82
	2	6,000	5,128	4,383	3,243	2,465	1,676	2,48	2,71	2,85	3,00	3,16	2,94
40	7	6,880	5,782	4,858	3,547	2,554	1,685	3,32	3,69	3,80	3,91	4,03	3,71
	15	6,590	5,730	4,983	3,538	2,583	1,730	4,48	4,93	5,12	5,33	5,54	5,04
	20	5,965	4,971	4,142	3,065	2,207	1,346	5,07	5,48	5,59	5,70	5,81	5,35
	25	6,498	5,651	4,914	3,685	2,617	1,648	5,59	5,87	6,05	6,23	6,42	5,97
	30	7,149	6,110	5,222	3,864	2,667	1,653	6,29	6,67	6,74	6,80	6,87	6,18
	35	7,633	6,468	5,482	3,947	2,684	1,691	6,85	7,05	7,12	7,19	7,27	6,47
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	3,202	2,714	2,300	1,633	2,117	/	1,57	1,70	1,75	1,80	1,85	/
	-7	4,766	4,005	3,366	2,322	1,788	/	2,14	2,29	2,34	2,39	2,43	/
	-2	5,440	4,690	4,043	2,992	2,214	/	2,37	2,65	2,73	2,81	2,89	/
	2	6,240	5,333	4,558	3,373	2,564	1,743	2,54	2,77	2,92	3,07	3,24	3,01
45	7	**7,700**	**6,700**	5,630	4,110	2,959	**1,953**	**2,93**	**3,26**	3,29	3,38	3,49	**3,28**
	15	5,168	4,494	3,908	2,775	2,025	1,357	3,90	4,29	4,46	4,64	4,82	4,39
	20	5,158	4,298	3,582	2,650	1,908	1,164	4,40	4,75	4,85	4,94	5,04	4,64
	25	5,454	4,743	4,124	3,093	2,196	1,384	4,71	4,94	5,09	5,24	5,40	5,02
	30	5,137	4,390	3,753	2,777	1,916	1,188	5,25	5,56	5,62	5,67	5,73	5,16
	35	5,074	4,300	3,644	2,624	1,784	1,124	5,19	5,35	5,40	5,45	5,51	4,90
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	3,840	3,227	2,712	1,871	1,441	/	1,79	1,91	1,95	1,99	2,03	/
	-2	4,560	3,931	3,389	2,508	1,856	/	1,92	2,15	2,21	2,28	2,35	/
	2	5,200	4,444	3,799	2,811	2,136	1,453	2,26	2,46	2,59	2,73	2,88	2,68
50	7	5,760	4,840	4,068	2,969	2,138	1,411	2,42	2,69	2,77	2,85	2,94	2,70
	15	4,381	3,809	3,313	2,352	1,717	1,150	3,34	3,68	3,82	3,98	4,13	3,76
	20	4,480	3,733	3,111	2,302	1,658	1,011	3,65	3,94	4,02	4,10	4,19	3,85
	25	4,371	3,801	3,305	2,479	1,760	1,109	3,87	4,06	4,19	4,31	4,44	4,13
	30	4,846	4,142	3,540	2,619	1,807	1,121	4,35	4,61	4,66	4,71	4,75	4,28
	35	4,824	4,088	3,465	2,494	1,696	1,069	4,34	4,47	4,51	4,56	4,60	4,10
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	3,627	3,048	2,561	1,767	1,361	/	1,71	1,83	1,87	1,90	1,94	/
	-2	4,000	3,448	2,973	2,200	1,628	/	2,09	2,34	2,41	2,48	2,55	/
	2	4,160	3,556	3,039	2,249	1,709	/	2,01	2,19	2,31	2,43	2,56	/
55	7	4,640	3,899	3,277	2,392	1,722	/	2,33	2,58	2,66	2,74	2,82	/
	15	2,951	2,566	2,232	1,584	1,157	/	2,74	3,02	3,14	3,26	3,39	/
	20	2,800	2,333	1,944	1,439	1,036	/	2,81	3,03	3,09	3,16	3,22	/
	25	2,578	2,242	1,950	1,462	1,038	/	2,90	3,05	3,14	3,24	3,33	/
	30	2,706	2,312	1,976	1,463	1,009	/	3,11	3,30	3,33	3,36	3,40	/
	35	3,883	3,291	2,789	2,008	1,365	/	3,67	3,78	3,82	3,86	3,90	/
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	/	/	/	/	/	/	/	/	/	/	/	/
	-2	3,520	3,034	2,616	1,936	1,432	/	1,76	1,97	2,03	2,09	2,15	/
	2	3,840	3,282	2,805	2,076	1,578	/	1,95	2,13	2,24	2,36	2,49	/
60	7	4,240	3,563	2,994	2,186	1,574	/	2,60	2,89	2,98	3,07	3,16	/
	15	2,800	2,435	2,117	1,503	1,097	/	2,27	2,49	2,59	2,70	2,81	/
	20	2,720	2,267	1,889	1,398	1,006	/	2,65	2,86	2,92	2,98	3,04	/
	25	2,640	2,296	1,996	1,497	1,063	/	2,79	2,93	3,02	3,11	3,20	/
	30	2,590	2,213	1,892	1,400	0,966	/	2,98	3,16	3,19	3,23	3,26	/
	35	/	/	/	/	/	/	/	/	/	/	/	/

PT = Heating capacity
COP (Coefficient Of Performance) = ratio of the total heating capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 7 - Cooling mode

Tw_out (°C)	Ta (°C)	PF (kW)						EER					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
	45	5,595	4,663	3,886	2,720	2,067	/	2,93	3,19	3,25	3,32	3,39	/
	40	7,202	6,104	5,173	3,673	4,761	/	3,65	3,94	4,06	4,18	4,30	/
	35	7,360	6,185	5,197	3,586	2,761	1,795	5,40	5,77	5,89	6,01	6,13	5,51
	30	7,400	6,379	5,499	4,070	3,011	2,108	5,50	6,16	6,34	6,53	6,73	6,12
	25	7,440	6,359	5,435	4,022	3,057	2,079	6,29	6,85	7,22	7,60	8,00	7,44
22	20	6,880	5,782	4,858	3,547	2,554	1,685	7,27	8,07	8,31	8,56	8,82	8,11
	15	6,720	5,843	5,081	3,608	2,634	1,765	7,41	8,15	8,47	8,81	9,17	8,34
	10	6,822	5,685	4,737	3,506	2,524	1,540	7,63	8,24	8,41	8,58	8,75	8,05
	5	7,004	6,090	5,296	3,972	2,820	1,777	7,75	8,14	8,39	8,64	8,90	8,27
	0	6,852	5,856	5,005	3,704	2,556	1,585	8,28	8,78	8,86	8,95	9,04	8,14
	-5	6,920	5,864	4,970	3,578	2,433	1,533	7,61	7,84	7,92	8,00	8,08	7,19
	45	4,772	3,977	3,314	2,320	1,763	/	2,57	2,80	2,86	2,91	2,97	/
	40	6,400	5,424	4,596	3,263	4,231	/	2,84	3,07	3,16	3,25	3,35	/
	35	**7,000**	**6,450**	5,420	3,740	2,880	**1,872**	**4,07**	**4,39**	4,49	4,58	4,67	**4,20**
	30	7,440	6,414	5,529	4,092	3,028	2,119	5,58	6,25	6,43	6,63	6,83	6,21
	25	7,360	6,291	5,377	3,979	3,024	2,056	5,83	6,36	6,69	7,05	7,42	6,90
18	20	6,800	5,714	4,802	3,505	2,524	1,666	7,84	8,70	8,96	9,23	9,50	8,74
	15	6,560	5,704	4,960	3,522	2,571	1,723	7,92	8,71	9,06	9,42	9,80	8,92
	10	6,560	5,467	4,556	3,371	2,427	1,481	8,07	8,72	8,89	9,07	9,25	8,51
	5	6,296	5,475	4,761	3,571	2,535	1,597	8,13	8,53	8,79	9,05	9,32	8,67
	0	6,320	5,402	4,617	3,416	2,357	1,462	7,88	8,35	8,43	8,52	8,60	7,74
	-5	6,300	5,339	4,525	3,258	2,215	1,396	8,32	8,57	8,65	8,74	8,83	7,86
	45	4,584	3,820	3,183	2,228	1,694	/	2,28	2,48	2,53	2,58	2,64	/
	40	6,242	5,290	4,483	3,183	4,126	/	2,58	2,79	2,87	2,96	3,05	/
	35	7,200	6,050	5,084	3,508	2,701	1,756	3,29	3,53	3,60	3,67	3,74	3,37
	30	7,360	6,345	5,470	4,048	2,995	2,097	3,59	4,02	4,14	4,26	4,39	4,00
	25	6,960	5,949	5,084	3,762	2,859	1,944	5,19	5,66	5,96	6,27	6,60	6,14
15	20	6,326	5,316	4,467	3,261	2,348	1,550	5,70	6,33	6,52	6,71	6,91	6,36
	15	6,240	5,426	4,718	3,350	2,446	1,638	6,84	7,52	7,82	8,13	8,46	7,70
	10	6,183	5,153	4,294	3,177	2,288	1,396	6,58	7,11	7,25	7,39	7,54	6,94
	5	6,248	5,433	4,724	3,543	2,516	1,585	6,76	7,10	7,31	7,53	7,76	7,22
	0	5,284	4,516	3,860	2,856	1,971	1,222	6,79	7,19	7,27	7,34	7,41	6,67
	-5	5,208	4,414	3,740	2,693	1,831	1,154	7,08	7,30	7,37	7,44	7,52	6,69
	45	4,203	3,503	2,919	2,043	1,553	/	2,12	2,31	2,36	2,41	2,46	/
	40	5,806	4,920	4,169	2,960	3,838	/	2,46	2,66	2,74	2,82	2,90	/
	35	7,120	5,983	5,028	3,469	2,671	1,736	2,70	2,88	2,94	3,00	3,06	2,75
	30	7,070	6,095	5,254	3,888	2,877	2,014	3,62	4,05	4,18	4,30	4,43	4,03
	25	6,800	5,812	4,967	3,676	2,794	1,900	4,26	4,65	4,89	5,15	5,43	5,05
13	20	5,391	4,530	3,807	2,779	2,001	1,321	5,87	6,52	6,71	6,91	7,12	6,55
	15	4,546	3,953	3,438	2,441	1,782	1,194	5,75	6,33	6,58	6,84	7,12	6,48
	10	4,692	3,910	3,258	2,411	1,736	1,059	5,72	6,18	6,31	6,43	6,56	6,04
	5	4,804	4,177	3,633	2,724	1,934	1,219	5,83	6,12	6,30	6,49	6,69	6,22
	0	4,698	4,015	3,432	2,539	1,752	1,086	5,87	6,22	6,28	6,34	6,41	5,77
	-5	4,612	3,908	3,312	2,385	1,622	1,022	5,93	6,11	6,17	6,23	6,29	5,60
	45	3,598	2,999	2,499	1,749	1,329	/	1,86	2,03	2,07	2,11	2,16	/
	40	5,190	4,399	3,728	2,647	3,431	/	2,27	2,45	2,53	2,60	2,68	/
	35	6,509	5,470	4,596	3,171	2,442	1,587	2,54	2,72	2,77	2,83	2,89	2,60
	30	6,720	5,793	4,994	3,696	2,735	1,914	2,86	3,20	3,30	3,39	3,50	3,18
	25	6,318	5,400	4,615	3,415	2,596	1,765	4,17	4,55	4,79	5,04	5,31	4,94
10	20	4,674	3,928	3,301	2,410	1,735	1,145	4,90	5,44	5,60	5,77	5,94	5,47
	15	4,119	3,582	3,115	2,211	1,614	1,082	5,29	5,82	6,05	6,29	6,55	5,96
	10	4,135	3,446	2,872	2,125	1,530	0,933	5,24	5,66	5,77	5,89	6,01	5,53
	5	4,196	3,649	3,173	2,380	1,690	1,064	5,21	5,48	5,64	5,81	5,98	5,56
	0	4,260	3,641	3,112	2,303	1,589	0,985	5,41	5,74	5,79	5,85	5,91	5,32
	-5	4,185	3,546	3,005	2,164	1,471	0,927	5,44	5,60	5,65	5,71	5,77	5,13
	45	2,983	2,486	2,072	1,450	1,102	/	1,59	1,73	1,77	1,80	1,84	/
	40	4,491	3,806	3,226	2,290	2,969	/	2,02	2,18	2,25	2,32	2,39	/
	35	**7,000**	**6,700**	5,639	3,891	2,996	**1,947**	**2,45**	**2,61**	2,66	2,72	2,77	**2,52**
	30	6,382	5,501	4,743	3,510	2,597	1,818	2,80	3,14	3,23	3,33	3,43	3,12
	25	5,130	4,385	3,748	2,773	2,108	1,433	3,96	4,31	4,54	4,78	5,03	4,68
7	20	3,286	2,761	2,320	1,694	1,219	0,805	3,80	4,21	4,34	4,47	4,60	4,24
	15	3,103	2,698	2,346	1,666	1,216	0,815	3,24	3,56	3,71	3,86	4,01	3,65
	10	/	/	/	/	/	/	/	/	/	/	/	/
	5	/	/	/	/	/	/	/	/	/	/	/	/
	0	/	/	/	/	/	/	/	/	/	/	/	/
	-5	/	/	/	/	/	/	/	/	/	/	/	/

PF = Cooling mode
ER (Energy Efficiency Ratio) = ratio of the total cooling capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 9 - Heating mode

Tw_out (°C)	Ta (°C)	PT (kW)						COP					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
	-20	4,330	3,608	3,007	2,105	1,600	/	2,11	2,30	2,35	2,40	2,44	/
	-15	4,678	3,964	3,360	2,385	3,092	/	2,18	2,36	2,43	2,50	2,58	/
	-7	6,325	5,315	4,466	3,082	2,373	/	2,94	3,14	3,21	3,27	3,34	/
	-2	8,240	7,103	6,124	4,532	3,353	2,347	3,30	3,69	3,80	3,92	4,04	3,67
	2	8,800	7,521	6,429	4,757	3,615	2,458	3,67	4,00	4,21	4,43	4,67	4,34
30	7	9,585	8,055	6,769	4,941	3,558	2,348	4,18	4,64	4,78	4,92	5,07	4,66
	15	10,172	8,845	7,691	5,461	3,987	2,671	5,93	6,52	6,78	7,05	7,33	6,67
	20	9,811	8,176	6,813	5,042	3,630	2,214	6,61	7,14	7,28	7,42	7,57	6,97
	25	9,404	8,177	7,111	5,333	3,786	2,385	7,53	7,91	8,14	8,39	8,64	8,03
	30	10,485	8,962	7,659	5,668	3,911	2,425	8,83	9,36	9,45	9,54	9,64	8,67
	35	11,251	9,535	8,080	5,818	3,956	2,492	9,73	10,02	10,12	10,23	10,33	9,19
	-20	4,200	3,500	2,917	2,042	1,552	/	1,91	2,08	2,12	2,16	2,21	/
	-15	4,332	3,671	3,111	2,209	2,864	/	1,86	2,01	2,07	2,13	2,19	/
	-7	6,216	5,224	4,390	3,029	2,332	/	2,39	2,56	2,61	2,66	2,71	/
	-2	7,774	6,702	5,777	4,275	3,164	2,215	2,78	3,11	3,20	3,30	3,40	3,09
	2	8,200	7,009	5,990	4,433	3,369	2,291	2,83	3,08	3,25	3,42	3,60	3,35
35	7	**9,500**	**8,600**	7,227	5,276	3,798	**2,507**	**3,71**	**4,30**	4,43	4,56	4,70	**4,32**
	15	9,653	8,394	7,299	5,182	3,783	2,535	4,99	5,48	5,70	5,93	6,17	5,61
	20	9,362	7,802	6,501	4,811	3,464	2,113	5,52	5,97	6,08	6,21	6,33	5,82
	25	9,233	8,029	6,981	5,236	3,718	2,342	6,33	6,65	6,85	7,05	7,27	6,76
	30	10,062	8,600	7,350	5,439	3,753	2,327	7,16	7,59	7,67	7,74	7,82	7,04
	35	10,604	8,986	7,616	5,483	3,729	2,349	7,67	7,90	7,98	8,06	8,14	7,25
	-20	3,997	3,331	2,776	1,943	1,477	/	1,67	1,82	1,86	1,90	1,93	/
	-15	4,632	3,925	3,327	2,362	3,062	/	1,86	2,01	2,07	2,13	2,19	/
	-7	6,151	5,169	4,344	2,997	2,308	/	2,20	2,35	2,40	2,45	2,49	/
	-2	7,171	6,182	5,329	3,944	2,918	2,043	2,43	2,72	2,80	2,89	2,98	2,71
	2	7,500	6,410	5,479	4,054	3,081	2,095	2,38	2,60	2,73	2,88	3,03	2,82
40	7	8,600	7,227	6,073	4,433	3,192	2,107	3,19	3,54	3,64	3,75	3,86	3,55
	15	8,237	7,163	6,228	4,422	3,228	2,163	4,29	4,72	4,91	5,11	5,31	4,83
	20	7,456	6,213	5,178	3,832	2,759	1,683	4,86	5,25	5,35	5,46	5,57	5,12
	25	8,123	7,063	6,142	4,607	3,271	2,061	5,36	5,63	5,79	5,97	6,15	5,72
	30	8,936	7,638	6,528	4,831	3,333	2,067	6,03	6,39	6,46	6,52	6,59	5,93
	35	9,541	8,086	6,852	4,934	3,355	2,114	6,56	6,76	6,83	6,89	6,96	6,20
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	4,003	3,392	2,875	2,041	2,646	/	1,50	1,63	1,67	1,72	1,78	/
	-7	5,958	5,007	4,207	2,903	2,235	/	2,05	2,20	2,24	2,29	2,33	/
	-2	6,800	5,862	5,054	3,740	2,767	/	2,27	2,54	2,61	2,69	2,77	/
	2	7,800	6,667	5,698	4,217	3,205	2,179	2,44	2,66	2,80	2,95	3,10	2,88
45	7	**9,200**	**9,200**	7,731	5,644	4,063	**2,682**	**3,49**	**3,49**	3,59	3,70	3,81	**3,51**
	15	6,460	5,617	4,885	3,468	2,532	1,696	3,74	4,11	4,27	4,45	4,62	4,21
	20	6,447	5,373	4,477	3,313	2,385	1,455	4,22	4,55	4,64	4,74	4,83	4,45
	25	6,818	5,929	5,155	3,867	2,745	1,730	4,51	4,73	4,88	5,02	5,17	4,81
	30	6,421	5,488	4,691	3,471	2,395	1,485	5,03	5,33	5,38	5,44	5,49	4,94
	35	6,343	5,375	4,555	3,280	2,230	1,405	4,97	5,12	5,18	5,23	5,28	4,70
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	4,800	4,034	3,390	2,339	1,801	/	1,71	1,83	1,87	1,91	1,95	/
	-2	5,700	4,914	4,236	3,135	2,320	/	1,84	2,06	2,12	2,18	2,25	/
	2	6,500	5,556	4,748	3,514	2,670	1,816	2,17	2,36	2,49	2,62	2,76	2,56
50	7	7,200	6,050	5,084	3,712	2,672	1,764	2,32	2,58	2,66	2,74	2,82	2,59
	15	5,476	4,762	4,141	2,940	2,146	1,438	3,20	3,52	3,66	3,81	3,96	3,61
	20	5,600	4,667	3,889	2,878	2,072	1,264	3,50	3,78	3,86	3,93	4,01	3,69
	25	5,464	4,751	4,132	3,099	2,200	1,386	3,71	3,89	4,01	4,13	4,26	3,96
	30	6,057	5,177	4,425	3,274	2,259	1,401	4,17	4,42	4,47	4,51	4,56	4,10
	35	6,030	5,110	4,331	3,118	2,120	1,336	4,16	4,28	4,32	4,37	4,41	3,93
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	4,534	3,810	3,202	2,209	1,701	/	1,64	1,75	1,79	1,82	1,86	/
	-2	5,000	4,310	3,716	2,750	2,035	/	2,00	2,24	2,31	2,38	2,45	/
	2	5,200	4,444	3,799	2,811	2,136	/	1,93	2,10	2,21	2,33	2,45	/
55	7	5,800	4,874	4,096	2,990	2,153	/	2,23	2,48	2,55	2,63	2,71	/
	15	3,689	3,208	2,789	1,980	1,446	/	2,63	2,89	3,01	3,13	3,25	/
	20	3,500	2,917	2,431	1,799	1,295	/	2,69	2,91	2,97	3,03	3,09	/
	25	3,223	2,803	2,437	1,828	1,298	/	2,78	2,92	3,01	3,10	3,19	/
	30	3,382	2,891	2,471	1,828	1,261	/	2,98	3,16	3,19	3,22	3,25	/
	35	4,854	4,114	3,486	2,510	1,707	/	3,52	3,63	3,66	3,70	3,74	/
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	/	/	/	/	/	/	/	/	/	/	/	/
	-2	4,400	3,793	3,270	2,420	1,791	/	1,73	1,94	2,00	2,06	2,12	/
	2	4,800	4,103	3,506	2,595	1,972	/	1,93	2,10	2,21	2,33	2,45	/
60	7	5,300	4,454	3,743	2,732	1,967	/	2,57	2,85	2,94	3,02	3,11	/
	15	3,500	3,043	2,647	1,879	1,372	/	2,24	2,46	2,56	2,66	2,77	/
	20	3,400	2,833	2,361	1,747	1,258	/	2,62	2,82	2,88	2,94	3,00	/
	25	3,300	2,870	2,495	1,871	1,329	/	2,75	2,89	2,97	3,06	3,16	/
	30	3,237	2,767	2,365	1,750	1,207	/	2,94	3,12	3,15	3,18	3,21	/
	35	/	/	/	/	/	/	/	/	/	/	/	/

PT = Heating capacity
COP (Coefficient Of Performance) = ratio of the total heating capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 9 - Cooling mode

Tw_out (°C)	Ta (°C)	PF (kW)						EER					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
22	45	6,994	5,828	4,857	3,400	2,584	/	2,89	3,15	3,21	3,27	3,34	/
	40	9,003	7,630	6,466	4,591	5,951	/	3,60	3,88	4,00	4,12	4,24	/
	35	9,200	7,731	6,497	4,483	3,452	2,244	5,32	5,69	5,81	5,92	6,04	5,44
	30	9,250	7,974	6,874	5,087	3,764	2,635	5,42	6,07	6,25	6,44	6,64	6,04
	25	9,300	7,949	6,794	5,027	3,821	2,598	6,20	6,76	7,12	7,49	7,89	7,34
	20	8,600	7,227	6,073	4,433	3,192	2,107	7,17	7,96	8,19	8,44	8,69	8,00
	15	8,400	7,304	6,352	4,510	3,292	2,206	7,30	8,03	8,36	8,69	9,04	8,22
	10	8,527	7,106	5,922	4,382	3,155	1,925	7,53	8,13	8,29	8,46	8,63	7,94
	5	8,755	7,613	6,620	4,965	3,525	2,221	7,65	8,03	8,27	8,52	8,77	8,16
	0	8,565	7,321	6,257	4,630	3,195	1,981	8,16	8,65	8,74	8,83	8,92	8,03
	-5	8,650	7,331	6,212	4,473	3,042	1,916	7,51	7,73	7,81	7,89	7,97	7,09
18	45	5,965	4,971	4,142	2,900	2,204	/	2,53	2,76	2,82	2,87	2,93	/
	40	8,865	7,513	6,367	4,520	5,860	/	2,80	3,02	3,11	3,21	3,30	/
	35	**9,100**	**8,350**	7,017	4,842	3,728	**2,423**	**3,85**	**3,97**	4,05	4,13	4,21	**3,83**
	30	9,100	7,845	6,763	5,004	3,703	2,592	4,65	5,21	5,36	5,53	5,69	5,18
	25	9,200	7,863	6,721	4,973	3,780	2,570	5,75	6,27	6,60	6,95	7,32	6,81
	20	8,500	7,143	6,002	4,382	3,155	2,082	7,73	8,58	8,83	9,10	9,37	8,62
	15	8,200	7,130	6,200	4,402	3,214	2,153	7,81	8,59	8,93	9,29	9,66	8,79
	10	8,200	6,833	5,694	4,214	3,034	1,851	7,96	8,60	8,77	8,95	9,12	8,39
	5	7,870	6,843	5,951	4,463	3,169	1,996	8,01	8,41	8,67	8,93	9,20	8,55
	0	7,900	6,752	5,771	4,271	2,947	1,827	7,77	8,23	8,32	8,40	8,48	7,64
	-5	7,875	6,674	5,656	4,072	2,769	1,744	8,20	8,45	8,53	8,62	8,71	7,75
15	45	5,730	4,775	3,979	2,785	2,117	/	2,25	2,45	2,50	2,55	2,60	/
	40	7,803	6,613	5,604	3,979	5,158	/	2,55	2,75	2,83	2,92	3,01	/
	35	9,000	7,563	6,355	4,385	3,377	2,195	3,25	3,48	3,55	3,62	3,69	3,32
	30	9,200	7,931	6,837	5,059	3,744	2,621	3,54	3,96	4,08	4,20	4,33	3,94
	25	8,700	7,436	6,355	4,703	3,574	2,431	5,12	5,58	5,87	6,19	6,51	6,06
	20	7,908	6,645	5,584	4,077	2,935	1,937	5,62	6,24	6,43	6,62	6,82	6,27
	15	7,800	6,783	5,898	4,188	3,057	2,048	6,74	7,42	7,71	8,02	8,34	7,59
	10	7,729	6,441	5,367	3,972	2,860	1,744	6,49	7,01	7,15	7,29	7,44	6,84
	5	7,810	6,791	5,905	4,429	3,145	1,981	6,67	7,00	7,21	7,43	7,65	7,12
	0	6,605	5,645	4,825	3,571	2,464	1,527	6,69	7,09	7,16	7,24	7,31	6,58
	-5	6,510	5,517	4,675	3,366	2,289	1,442	6,98	7,19	7,27	7,34	7,41	6,60
13	45	5,254	4,378	3,649	2,554	1,941	/	2,09	2,28	2,33	2,37	2,42	/
	40	7,257	6,150	5,212	3,700	4,797	/	2,43	2,62	2,70	2,78	2,86	/
	35	8,900	7,479	6,285	4,337	3,339	2,170	2,66	2,84	2,90	2,96	3,02	2,72
	30	8,838	7,619	6,568	4,860	3,597	2,518	3,57	4,00	4,12	4,24	4,37	3,98
	25	8,500	7,265	6,209	4,595	3,492	2,375	4,20	4,58	4,82	5,08	5,35	4,98
	20	6,739	5,663	4,759	3,474	2,501	1,651	5,79	6,43	6,62	6,82	7,02	6,46
	15	5,683	4,942	4,297	3,051	2,227	1,492	5,67	6,24	6,49	6,75	7,02	6,39
	10	5,865	4,888	4,073	3,014	2,170	1,324	5,64	6,10	6,22	6,34	6,47	5,95
	5	6,005	5,222	4,541	3,405	2,418	1,523	5,75	6,03	6,21	6,40	6,59	6,13
	0	5,872	5,019	4,290	3,174	2,190	1,358	5,79	6,13	6,19	6,26	6,32	5,69
	-5	5,765	4,886	4,140	2,981	2,027	1,277	5,85	6,02	6,08	6,14	6,20	5,52
10	45	4,498	3,748	3,124	2,187	1,662	/	1,84	2,00	2,04	2,08	2,13	/
	40	6,488	5,498	4,660	3,308	4,289	/	2,24	2,42	2,49	2,57	2,64	/
	35	8,136	6,837	5,745	3,964	3,053	1,984	2,51	2,68	2,73	2,79	2,85	2,56
	30	8,400	7,241	6,243	4,620	3,418	2,393	2,82	3,15	3,25	3,35	3,45	3,14
	25	7,897	6,750	5,769	4,269	3,244	2,206	4,12	4,49	4,72	4,97	5,24	4,87
	20	5,843	4,910	4,126	3,012	2,169	1,431	4,83	5,36	5,53	5,69	5,86	5,39
	15	5,149	4,477	3,893	2,764	2,018	1,352	5,22	5,74	5,97	6,21	6,46	5,87
	10	5,169	4,308	3,590	2,656	1,913	1,167	5,17	5,58	5,69	5,81	5,92	5,45
	5	5,245	4,561	3,966	2,974	2,112	1,330	5,14	5,40	5,56	5,73	5,90	5,49
	0	5,325	4,551	3,890	2,879	1,986	1,231	5,34	5,66	5,71	5,77	5,83	5,24
	-5	5,231	4,433	3,757	2,705	1,839	1,159	5,36	5,52	5,58	5,63	5,69	5,06
7	45	3,729	3,108	2,590	1,813	1,378	/	1,57	1,71	1,74	1,78	1,81	/
	40	5,614	4,758	4,032	2,863	3,711	/	1,99	2,15	2,22	2,28	2,35	/
	35	**8,300**	**8,100**	6,807	4,697	3,616	**2,351**	**2,21**	**2,30**	2,35	2,39	2,44	**2,22**
	30	7,977	6,877	5,928	4,387	3,246	2,272	2,76	3,09	3,19	3,28	3,38	3,08
	25	6,413	5,481	4,685	3,467	2,635	1,792	3,90	4,25	4,48	4,71	4,96	4,62
	20	4,107	3,451	2,900	2,117	1,524	1,006	3,74	4,16	4,28	4,41	4,54	4,18
	15	3,879	3,373	2,933	2,082	1,520	1,019	3,20	3,51	3,66	3,80	3,95	3,60
	10	/	/	/	/	/	/	/	/	/	/	/	/
	5	/	/	/	/	/	/	/	/	/	/	/	/
	0	/	/	/	/	/	/	/	/	/	/	/	/
	-5	/	/	/	/	/	/	/	/	/	/	/	/

PF = Cooling mode
ER (Energy Efficiency Ratio) = ratio of the total cooling capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 10 - Heating mode

Tw_out (°C)	Ta (°C)	PT (kW)						COP					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
	-20	4,634	4,213	3,511	2,458	1,868	/	1,92	2,10	2,14	2,18	2,23	/
	-15	5,133	4,583	3,884	2,757	3,575	/	2,08	2,24	2,31	2,38	2,45	/
	-7	7,565	6,815	5,727	3,952	3,043	/	2,65	2,84	2,89	2,95	3,01	/
	-2	9,451	8,363	7,210	5,335	3,948	2,764	3,14	3,52	3,63	3,73	3,85	3,50
	2	10,141	9,055	7,739	5,727	4,352	2,960	3,33	3,63	3,82	4,02	4,24	3,94
30	7	11,212	10,577	8,888	6,488	4,672	3,083	4,42	4,77	4,92	5,06	5,22	4,80
	15	10,963	9,966	8,666	6,153	4,492	3,010	6,06	6,66	6,93	7,20	7,49	6,82
	20	10,940	9,768	8,140	6,024	4,337	2,646	7,71	8,32	8,49	8,66	8,83	8,13
	25	9,335	8,118	7,059	5,294	3,759	2,368	8,79	9,23	9,51	9,79	10,09	9,38
	30	10,573	9,357	7,997	5,918	4,083	2,532	10,56	11,19	11,30	11,42	11,53	10,38
	35	10,247	9,149	7,754	5,583	3,796	2,392	10,51	10,82	10,93	11,04	11,15	9,92
	-20	3,827	3,479	2,899	2,029	1,542	/	1,48	1,61	1,65	1,68	1,71	/
	-15	5,548	4,954	4,198	2,981	3,864	/	2,08	2,25	2,31	2,38	2,46	/
	-7	7,938	7,151	6,009	4,146	3,193	/	2,50	2,68	2,73	2,78	2,84	/
	-2	9,084	8,039	6,930	5,128	3,795	2,657	2,79	3,13	3,22	3,32	3,42	3,11
	2	9,934	8,870	7,581	5,610	4,264	2,899	2,98	3,25	3,42	3,60	3,79	3,52
35	7	**11,200**	**10,400**	8,739	6,380	4,593	**3,032**	**4,30**	**4,57**	4,71	4,85	4,99	**4,59**
	15	10,660	9,691	8,427	5,983	4,368	2,926	5,28	5,81	6,05	6,29	6,54	5,95
	20	9,939	8,874	7,395	5,472	3,940	2,403	6,24	6,74	6,87	7,01	7,15	6,58
	25	9,139	7,947	6,910	5,183	3,680	2,318	7,33	7,69	7,92	8,16	8,41	7,82
	30	9,574	8,473	7,242	5,359	3,698	2,293	8,01	8,49	8,57	8,66	8,74	7,87
	35	9,705	8,665	7,343	5,287	3,595	2,265	8,27	8,52	8,60	8,69	8,78	7,81
	-20	2,446	2,224	1,853	1,297	0,986	/	1,25	1,36	1,38	1,41	1,44	/
	-15	5,401	4,822	4,087	2,902	3,761	/	1,99	2,15	2,22	2,28	2,35	/
	-7	7,775	7,004	5,886	4,061	3,127	/	2,30	2,46	2,51	2,56	2,61	/
	-2	8,846	7,828	6,748	4,994	3,695	2,587	2,48	2,77	2,86	2,94	3,03	2,76
	2	10,202	9,109	7,786	5,761	4,379	2,978	2,77	3,02	3,18	3,34	3,52	3,28
40	7	11,000	10,377	8,720	6,366	4,583	3,025	3,64	4,05	4,17	4,29	4,42	4,07
	15	8,944	8,131	7,071	5,020	3,665	2,455	4,65	5,12	5,32	5,54	5,76	5,24
	20	8,880	7,929	6,607	4,889	3,520	2,147	5,40	5,83	5,94	6,06	6,18	5,69
	25	8,812	7,662	6,663	4,997	3,548	2,235	6,39	6,71	6,91	7,12	7,33	6,82
	30	9,235	8,173	6,985	5,169	3,567	2,211	6,91	7,33	7,40	7,47	7,55	6,79
	35	9,464	8,450	7,161	5,156	3,506	2,209	7,11	7,33	7,40	7,48	7,55	6,72
	-20		/	/	/	/	/	/	/	/	/	/	/
	-15	4,788	4,275	3,623	2,572	3,334	/	1,64	1,77	1,83	1,88	1,94	/
	-7	7,885	7,103	5,969	4,119	3,171	/	2,13	2,28	2,32	2,37	2,42	/
	-2	8,820	7,805	6,729	4,979	3,685	/	2,25	2,52	2,59	2,67	2,75	/
	2	10,091	9,010	7,700	5,698	4,331	2,945	2,45	2,67	2,82	2,97	3,12	2,90
45	7	**10,200**	**10,200**	8,571	6,257	4,505	**2,973**	**3,02**	**3,30**	3,39	3,49	3,60	**3,32**
	15	8,403	7,639	6,643	4,716	3,443	2,307	4,03	4,43	4,61	4,79	4,99	4,54
	20	7,393	6,601	5,501	4,071	2,931	1,788	4,60	4,96	5,06	5,16	5,27	4,85
	25	8,316	7,231	6,288	4,716	3,348	2,109	5,42	5,69	5,86	6,03	6,21	5,78
	30	8,047	7,121	6,086	4,504	3,108	1,927	4,87	5,17	5,22	5,27	5,32	4,79
	35	7,361	6,573	5,570	4,010	2,727	1,718	5,71	5,88	5,94	6,00	6,06	5,39
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	7,026	6,330	5,319	3,670	2,826	/	1,85	1,98	2,02	2,06	2,10	/
	-2	7,824	6,924	5,969	4,417	3,268	/	2,06	2,31	2,38	2,45	2,53	/
	2	9,471	8,456	7,227	5,348	4,065	2,764	2,46	2,68	2,82	2,97	3,13	2,91
50	7	8,319	7,848	6,595	4,814	3,466	2,288	2,94	3,27	3,37	3,47	3,57	3,28
	15	6,589	5,990	5,209	3,698	2,700	1,809	3,46	3,81	3,96	4,12	4,28	3,90
	20	6,683	5,967	4,972	3,679	2,649	1,616	3,86	4,17	4,26	4,34	4,43	4,07
	25	7,058	6,137	5,337	4,002	2,842	1,790	4,60	4,83	4,97	5,12	5,27	4,91
	30	7,176	6,350	5,427	4,016	2,771	1,718	4,75	5,03	5,08	5,13	5,18	4,66
	35	6,592	5,886	4,988	3,591	2,442	1,539	4,70	4,84	4,89	4,94	4,99	4,44
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	6,507	5,862	4,926	3,399	2,617	/	1,73	1,85	1,89	1,92	1,96	/
	-2	6,769	5,991	5,164	3,822	2,828	/	1,79	2,01	2,07	2,13	2,19	/
	2	3,776	3,371	2,881	2,132	1,621	/	2,19	2,39	2,52	2,65	2,79	/
55	7	6,608	6,234	5,238	3,824	2,753	/	2,49	2,77	2,85	2,94	3,02	/
	15	5,466	4,969	4,321	3,068	2,240	/	2,83	3,12	3,24	3,37	3,50	/
	20	5,876	5,246	4,372	3,235	2,329	/	3,22	3,48	3,55	3,62	3,69	/
	25	7,387	6,423	5,585	4,189	2,974	/	4,05	4,26	4,38	4,51	4,65	/
	30	5,999	5,309	4,538	3,358	2,317	/	3,32	3,52	3,55	3,59	3,63	/
	35	2,523	2,252	1,909	1,374	0,935	/	3,82	3,93	3,97	4,01	4,05	/
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	/	/	/	/	/	/	/	/	/	/	/	/
	-2	4,042	3,577	3,083	2,282	1,688	/	1,36	1,52	1,56	1,61	1,66	/
	2	4,199	3,749	3,204	2,371	1,802	/	3,94	4,29	4,52	4,76	5,01	/
60	7	3,929	3,707	3,115	2,274	1,637	/	6,11	6,78	6,98	7,19	7,41	/
	15	4,313	3,921	3,410	2,421	1,767	/	3,39	3,73	3,88	4,04	4,20	/
	20	5,878	5,248	4,374	3,237	2,330	/	3,44	3,72	3,79	3,87	3,95	/
	25	5,627	4,893	4,255	3,191	2,266	/	3,31	3,47	3,58	3,68	3,80	/
	30	4,945	4,376	3,740	2,768	1,910	/	3,14	3,33	3,36	3,39	3,43	/
	35	/	/	/	/	/	/	/	/	/	/	/	/

PT = Heating capacity
COP (Coefficient Of Performance) = ratio of the total heating capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 10 - Cooling mode

Tw_out (°C)	Ta (°C)	PF (kW)						EER					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
22	45	7,877	7,161	5,968	4,177	3,175	/	3,39	3,59	3,67	3,74	3,81	/
	40	9,688	8,971	7,602	5,398	6,997	/	3,65	3,84	3,95	4,07	4,19	/
	35	11,200	10,275	8,635	5,958	4,588	2,982	4,61	4,75	4,84	4,94	5,04	4,54
	30	12,064	11,068	9,541	7,061	5,225	3,657	5,76	6,11	6,29	6,48	6,68	6,08
	25	12,246	11,445	9,782	7,239	5,501	3,741	6,84	7,05	7,42	7,81	8,23	7,65
	20	12,747	11,694	9,827	7,174	5,165	3,409	7,09	7,24	7,45	7,68	7,91	7,27
	15	11,935	10,850	9,435	6,699	4,890	3,276	11,06	11,18	11,62	12,09	12,57	11,44
	10	12,076	10,880	9,066	6,709	4,831	2,947	11,51	11,74	11,98	12,22	12,46	11,46
	5	12,124	10,923	9,498	7,123	5,058	3,186	12,00	12,12	12,48	12,86	13,24	12,32
	0	12,061	10,769	9,204	6,811	4,700	2,914	12,60	12,85	12,98	13,11	13,24	11,92
	-5	11,992	10,612	8,993	6,475	4,403	2,774	13,45	13,85	13,99	14,13	14,27	12,70
18	45	6,573	5,975	4,979	3,485	2,649	/	2,86	3,03	3,09	3,15	3,21	/
	40	8,302	7,687	6,514	4,625	5,996	/	3,43	3,60	3,71	3,82	3,94	/
	35	**10,800**	**10,300**	8,655	5,972	4,599	**2,989**	**4,51**	**4,98**	5,08	5,18	5,28	**4,76**
	30	11,200	10,275	8,858	6,555	4,851	3,395	5,13	5,43	5,60	5,76	5,94	5,40
	25	11,400	10,654	9,106	6,739	5,121	3,482	5,57	5,73	6,04	6,36	6,69	6,22
	20	11,342	10,406	8,744	6,383	4,596	3,033	6,28	6,40	6,59	6,79	7,00	6,44
	15	10,811	9,828	8,546	6,068	4,429	2,968	9,77	9,87	10,26	10,67	11,10	10,10
	10	10,541	9,497	7,914	5,856	4,216	2,572	9,62	9,81	10,00	10,20	10,41	9,58
	5	10,550	9,505	8,265	6,199	4,401	2,773	9,53	9,62	9,91	10,21	10,51	9,78
	0	10,497	9,373	8,011	5,928	4,090	2,536	9,92	10,12	10,22	10,32	10,42	9,38
	-5	10,711	9,479	8,033	5,784	3,933	2,478	11,93	12,28	12,41	12,53	12,66	11,26
15	45	5,900	5,363	4,469	3,129	2,378	/	2,60	2,76	2,81	2,87	2,92	/
	40	8,246	7,635	6,471	4,594	5,956	/	3,09	3,24	3,34	3,44	3,54	/
	35	10,017	9,190	7,723	5,329	4,103	2,667	3,44	3,54	3,61	3,68	3,76	3,38
	30	11,000	10,092	8,700	6,438	4,764	3,335	4,11	4,36	4,49	4,63	4,76	4,34
	25	11,944	11,162	9,540	7,060	5,366	3,649	4,56	4,70	4,95	5,21	5,49	5,10
	20	10,448	9,585	8,055	5,880	4,234	2,794	6,76	6,90	7,11	7,32	7,54	6,94
	15	9,093	8,266	7,188	5,103	3,726	2,496	9,73	9,82	10,22	10,63	11,05	10,06
	10	9,196	8,285	6,904	5,109	3,679	2,244	10,23	10,43	10,64	10,85	11,07	10,18
	5	9,008	8,115	7,056	5,292	3,758	2,367	9,37	9,46	9,74	10,04	10,34	9,61
	0	9,202	8,216	7,022	5,196	3,586	2,223	9,95	10,15	10,25	10,35	10,45	9,41
	-5	9,267	8,201	6,950	5,004	3,403	2,144	12,49	12,86	12,99	13,12	13,25	11,79
13	45	5,820	5,290	4,409	3,086	2,345	/	2,58	2,73	2,79	2,84	2,90	/
	40	7,596	7,033	5,960	4,232	5,486	/	2,86	3,01	3,10	3,19	3,28	/
	35	9,505	8,720	7,328	5,056	3,893	2,531	3,27	3,37	3,43	3,50	3,57	3,22
	30	12,382	11,359	9,792	7,246	5,362	3,754	3,43	3,64	3,75	3,86	3,98	3,62
	25	10,875	10,164	8,687	6,428	4,885	3,322	4,56	4,70	4,95	5,21	5,49	5,10
	20	8,912	8,176	6,871	5,016	3,611	2,384	6,82	6,96	7,17	7,38	7,61	7,00
	15	8,378	7,616	6,623	4,702	3,433	2,300	8,86	8,95	9,30	9,68	10,06	9,16
	10	8,320	7,495	6,246	4,622	3,328	2,030	9,56	9,75	9,94	10,14	10,34	9,52
	5	8,394	7,562	6,576	4,932	3,501	2,206	9,52	9,62	9,91	10,20	10,51	9,78
	0	8,472	7,564	6,465	4,784	3,301	2,047	9,77	9,96	10,06	10,16	10,26	9,24
	-5	8,696	7,696	6,522	4,696	3,193	2,012	11,70	12,05	12,17	12,30	12,42	11,05
10	45	5,168	4,698	3,915	2,740	2,083	/	2,37	2,52	2,57	2,62	2,67	/
	40	7,295	6,755	5,724	4,064	5,269	/	2,85	3,00	3,09	3,18	3,27	/
	35	8,259	7,577	6,367	4,393	3,383	2,199	2,92	3,00	3,06	3,13	3,19	2,87
	30	11,382	10,442	9,002	6,661	4,929	3,451	3,22	3,41	3,51	3,62	3,73	3,39
	25	10,028	9,372	8,010	5,927	4,505	3,063	4,26	4,39	4,62	4,86	5,12	4,76
	20	8,058	7,392	6,212	4,535	3,265	2,155	6,20	6,33	6,52	6,71	6,92	6,36
	15	7,621	6,929	6,025	4,278	3,123	2,092	7,99	8,07	8,40	8,73	9,08	8,26
	10	7,496	6,753	5,628	4,164	2,998	1,829	8,00	8,16	8,33	8,49	8,66	7,97
	5	7,234	6,517	5,667	4,250	3,018	1,901	7,80	7,88	8,12	8,36	8,61	8,01
	0	7,328	6,543	5,593	4,138	2,856	1,770	8,25	8,41	8,50	8,58	8,67	7,80
	-5	7,525	6,659	5,643	4,063	2,763	1,741	9,58	9,86	9,96	10,06	10,16	9,04
7	45	4,000	3,636	3,030	2,121	1,612	/	1,68	1,78	1,82	1,85	1,89	/
	40	6,620	6,130	5,195	3,688	4,781	/	2,34	2,46	2,53	2,61	2,69	/
	35	**10,700**	**10,400**	8,739	6,030	4,643	**3,018**	**2,95**	**3,18**	3,24	3,31	3,37	**3,04**
	30	11,400	10,400	8,966	6,634	4,910	3,437	3,00	3,25	3,35	3,45	3,55	3,23
	25	8,294	7,751	6,625	4,903	3,726	2,534	3,98	4,10	4,32	4,55	4,79	4,45
	20	5,983	5,489	4,612	3,367	2,424	1,600	5,43	5,54	5,70	5,87	6,05	5,57
	15	5,966	5,424	4,717	3,349	2,445	1,638	7,41	7,48	7,78	8,09	8,42	7,66
	10	/	/	/	/	/	/	/	/	/	/	/	/
	5	/	/	/	/	/	/	/	/	/	/	/	/
	0	/	/	/	/	/	/	/	/	/	/	/	/
	-5	/	/	/	/	/	/	/	/	/	/	/	/

PF = Cooling mode
ER (Energy Efficiency Ratio) = ratio of the total cooling capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 12 - Heating mode

Tw_out (°C)	Ta (°C)	PT (kW)						COP					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
	-20	5,535	5,031	4,193	2,935	2,231	/	1,91	2,09	2,13	2,17	2,21	/
	-15	6,127	5,471	4,636	3,292	4,267	/	2,06	2,23	2,30	2,37	2,44	/
	-7	9,179	8,269	6,949	4,795	3,692	/	2,68	2,87	2,92	2,98	3,04	/
	-2	11,461	10,142	8,743	6,470	4,788	3,351	3,18	3,56	3,66	3,77	3,89	3,54
	2	12,304	10,986	9,390	6,948	5,281	3,591	3,37	3,67	3,86	4,07	4,28	3,98
30	7	13,299	12,546	10,543	7,696	5,541	3,657	4,44	4,53	4,66	4,80	4,95	4,55
	15	13,034	11,849	10,304	7,316	5,340	3,578	6,00	6,60	6,86	7,14	7,42	6,76
	20	12,855	11,477	9,565	7,078	5,096	3,109	7,55	8,15	8,31	8,48	8,65	7,96
	25	11,141	9,688	8,424	6,318	4,486	2,826	8,74	9,18	9,45	9,74	10,03	9,33
	30	12,561	11,116	9,501	7,031	4,851	3,008	10,37	10,99	11,10	11,21	11,32	10,19
	35	12,117	10,819	9,169	6,601	4,489	2,828	10,18	10,49	10,59	10,70	10,81	9,62
	-20	4,577	4,161	3,467	2,427	1,845	/	1,48	1,61	1,64	1,67	1,71	/
	-15	6,577	5,872	4,977	3,533	4,580	/	2,06	2,22	2,29	2,35	2,43	/
	-7	9,516	8,573	7,204	4,971	3,828	/	2,50	2,67	2,73	2,78	2,84	/
	-2	10,868	9,618	8,291	6,136	4,540	3,178	2,79	3,12	3,21	3,31	3,41	3,10
	2	11,869	10,597	9,057	6,703	5,094	3,464	2,97	3,23	3,40	3,58	3,77	3,51
35	7	**12,776**	**12,200**	10,252	7,484	5,389	**3,556**	**4,32**	**4,46**	4,59	4,73	4,87	**4,48**
	15	12,779	11,618	10,102	7,173	5,236	3,508	5,28	5,81	6,04	6,28	6,53	5,94
	20	11,870	10,598	8,832	6,536	4,706	2,870	6,21	6,70	6,84	6,98	7,11	6,55
	25	10,952	9,523	8,281	6,211	4,410	2,778	7,32	7,68	7,91	8,15	8,40	7,81
	30	11,512	10,188	8,707	6,443	4,446	2,757	7,32	7,76	7,83	7,91	7,99	7,19
	35	11,708	10,454	8,859	6,379	4,337	2,733	7,55	7,77	7,85	7,93	8,01	7,13
	-20	2,935	2,669	2,224	1,557	1,183	/	1,25	1,36	1,38	1,41	1,44	/
	-15	6,421	5,733	4,858	3,449	4,472	/	1,97	2,13	2,20	2,26	2,33	/
	-7	9,302	8,380	7,042	4,859	3,741	/	2,29	2,45	2,50	2,55	2,60	/
	-2	10,610	9,390	8,094	5,990	4,433	3,103	2,48	2,77	2,86	2,94	3,03	2,76
	2	12,195	10,889	9,307	6,887	5,234	3,559	2,76	3,00	3,16	3,33	3,51	3,26
40	7	15,155	14,297	12,014	8,770	6,315	4,168	3,63	4,03	4,15	4,28	4,40	4,05
	15	10,701	9,728	8,459	6,006	4,384	2,937	4,64	5,10	5,31	5,52	5,74	5,22
	20	10,631	9,492	7,910	5,854	4,215	2,571	5,38	5,81	5,93	6,05	6,17	5,68
	25	10,521	9,148	7,955	5,966	4,236	2,669	6,36	6,68	6,88	7,08	7,29	6,78
	30	10,981	9,718	8,306	6,146	4,241	2,629	6,90	7,31	7,38	7,46	7,53	6,78
	35	11,207	10,007	8,480	6,106	4,152	2,616	7,12	7,33	7,41	7,48	7,56	6,73
	-20		/	/	/	/	/	/	/	/	/	/	/
	-15	5,745	5,129	4,347	3,086	4,001	/	1,53	1,66	1,71	1,76	1,81	/
	-7	9,415	8,482	7,128	4,918	3,787	/	1,98	2,12	2,16	2,20	2,25	/
	-2	10,555	9,341	8,052	5,959	4,409	/	2,09	2,34	2,41	2,49	2,56	/
	2	12,074	10,781	9,214	6,819	5,182	3,524	2,29	2,49	2,62	2,76	2,91	2,70
45	7	**12,600**	**12,600**	10,588	7,729	5,565	**3,673**	**3,26**	**3,26**	3,36	3,46	3,56	**3,28**
	15	10,115	9,196	7,996	5,677	4,145	2,777	3,77	4,15	4,32	4,49	4,67	4,25
	20	8,940	7,983	6,652	4,923	3,544	2,162	4,32	4,67	4,76	4,86	4,96	4,56
	25	10,019	8,712	7,576	5,682	4,034	2,541	5,08	5,33	5,49	5,66	5,83	5,42
	30	9,696	8,581	7,334	5,427	3,745	2,322	4,57	4,85	4,89	4,94	4,99	4,49
	35	8,873	7,922	6,714	4,834	3,287	2,071	5,36	5,52	5,57	5,63	5,68	5,06
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	8,411	7,578	6,368	4,394	3,383	/	1,84	1,97	2,01	2,05	2,09	/
	-2	9,439	8,354	7,201	5,329	3,943	/	2,08	2,32	2,39	2,47	2,54	/
	2	11,452	10,225	8,740	6,467	4,915	3,342	2,48	2,70	2,84	2,99	3,15	2,93
50	7	10,062	9,492	7,977	5,823	4,193	2,767	2,97	3,29	3,39	3,49	3,60	3,31
	15	7,961	7,237	6,293	4,468	3,262	2,185	3,48	3,83	3,99	4,14	4,31	3,92
	20	8,006	7,148	5,957	4,408	3,174	1,936	3,86	4,17	4,25	4,33	4,42	4,07
	25	8,533	7,420	6,452	4,839	3,436	2,165	4,63	4,86	5,01	5,16	5,31	4,94
	30	8,676	7,678	6,562	4,856	3,351	2,077	4,80	5,09	5,14	5,19	5,25	4,72
	35	7,971	7,117	6,031	4,342	2,953	1,860	4,78	4,93	4,97	5,02	5,07	4,52
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	7,796	7,023	5,902	4,072	3,136	/	1,73	1,85	1,88	1,92	1,96	/
	-2	8,097	7,165	6,177	4,571	3,382	/	1,79	2,00	2,06	2,12	2,19	/
	2	4,555	4,067	3,476	2,572	1,955	/	2,20	2,40	2,53	2,66	2,80	/
55	7	7,961	7,510	6,311	4,607	3,317	/	2,50	2,78	2,86	2,95	3,04	/
	15	6,605	6,005	5,222	3,707	2,706	/	2,85	3,14	3,26	3,39	3,53	/
	20	7,002	6,252	5,210	3,855	2,776	/	3,20	3,45	3,52	3,59	3,67	/
	25	8,900	7,739	6,730	5,047	3,584	/	4,07	4,27	4,40	4,53	4,67	/
	30	7,171	6,346	5,424	4,014	2,770	/	3,31	3,51	3,54	3,58	3,61	/
	35	2,992	2,671	2,264	1,630	1,108	/	3,77	3,89	3,93	3,97	4,01	/
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	/	/	/	/	/	/	/	/	/	/	/	/
	-2	4,856	4,297	3,704	2,741	2,028	/	1,36	1,52	1,57	1,61	1,66	/
	2	5,072	4,528	3,870	2,864	2,177	/	3,97	4,32	4,55	4,79	5,05	/
60	7	4,743	4,475	3,760	2,745	1,976	/	6,14	6,82	7,02	7,23	7,45	/
	15	5,211	4,738	4,120	2,925	2,135	/	3,42	3,76	3,91	4,06	4,23	/
	20	7,024	6,271	5,226	3,867	2,784	/	3,43	3,70	3,78	3,85	3,93	/
	25	6,792	5,906	5,136	3,852	2,735	/	3,33	3,49	3,60	3,71	3,82	/
	30	5,945	5,261	4,497	3,328	2,296	/	3,15	3,34	3,37	3,41	3,44	/
	35	/	/	/	/	/	/	/	/	/	/	/	/

PT = Heating capacity
COP (Coefficient Of Performance) = ratio of the total heating capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 12 - Cooling mode

Tw_out (°C)	Ta (°C)	PF (kW)						EER					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
	45	9,407	8,552	7,127	4,989	3,791	/	3,37	3,58	3,65	3,72	3,80	/
	40	11,565	10,709	9,075	6,443	8,353	/	3,93	4,13	4,25	4,38	4,51	/
	35	12,900	12,404	10,423	7,192	5,538	3,600	3,79	3,90	3,98	4,06	4,14	3,73
	30	14,630	13,422	11,571	8,562	6,336	4,435	5,82	6,17	6,36	6,55	6,75	6,14
	25	14,858	13,886	11,868	8,783	6,675	4,539	6,92	7,12	7,50	7,90	8,32	7,74
22	20	15,120	13,871	11,656	8,509	6,127	4,044	7,01	7,15	7,37	7,59	7,82	7,19
	15	14,190	12,900	11,217	7,964	5,814	3,895	10,96	11,07	11,52	11,98	12,45	11,33
	10	14,189	12,783	10,653	7,883	5,676	3,462	11,27	11,50	11,73	11,96	12,20	11,22
	5	14,470	13,036	11,336	8,502	6,036	3,803	11,93	12,05	12,42	12,79	13,17	12,25
	0	14,329	12,793	10,935	8,092	5,583	3,462	12,37	12,62	12,75	12,87	13,00	11,70
	-5	14,180	12,549	10,635	7,657	5,207	3,280	13,04	13,43	13,56	13,70	13,83	12,31
	45	7,861	7,147	5,956	4,169	3,168	/	2,85	3,02	3,08	3,14	3,20	/
	40	9,841	9,112	7,722	5,483	7,108	/	3,39	3,56	3,67	3,78	3,89	/
	35	**12,800**	**12,200**	10,252	7,074	5,447	**3,541**	**4,35**	**4,60**	4,69	4,79	4,88	**4,39**
	30	13,500	12,385	10,677	7,901	5,847	4,093	5,11	5,42	5,58	5,75	5,92	5,39
	25	14,401	13,459	11,504	8,513	6,470	4,399	5,54	5,71	6,01	6,33	6,66	6,20
18	20	13,630	12,505	10,508	7,671	5,523	3,645	6,29	6,41	6,60	6,80	7,01	6,44
	15	12,960	11,782	10,245	7,274	5,310	3,558	9,76	9,86	10,25	10,66	11,09	10,09
	10	12,590	11,342	9,452	6,994	5,036	3,072	9,57	9,76	9,96	10,16	10,36	9,53
	5	12,643	11,390	9,904	7,428	5,274	3,323	9,51	9,61	9,90	10,19	10,50	9,77
	0	12,622	11,269	9,632	7,128	4,918	3,049	9,06	9,25	9,34	9,43	9,53	8,57
	-5	12,923	11,436	9,691	6,978	4,745	2,989	10,88	11,21	11,32	11,43	11,55	10,28
	45	7,079	6,436	5,363	3,754	2,853	/	2,60	2,76	2,81	2,87	2,92	/
	40	9,804	9,077	7,693	5,462	7,080	/	3,06	3,21	3,31	3,40	3,51	/
	35	14,300	13,119	11,025	7,607	5,857	3,807	3,43	3,53	3,60	3,67	3,75	3,37
	30	13,100	12,018	10,361	7,667	5,673	3,971	4,11	4,36	4,49	4,62	4,76	4,33
	25	12,000	11,215	9,585	7,093	5,391	3,666	4,55	4,68	4,93	5,19	5,47	5,08
15	20	12,490	11,458	9,629	7,029	5,061	3,340	6,74	6,87	7,08	7,29	7,51	6,91
	15	10,878	9,889	8,599	6,106	4,457	2,986	9,70	9,79	10,19	10,59	11,02	10,03
	10	11,010	9,919	8,266	6,117	4,404	2,686	10,20	10,41	10,61	10,83	11,04	10,16
	5	10,754	9,688	8,425	6,319	4,486	2,826	9,32	9,41	9,69	9,99	10,28	9,56
	0	10,941	9,769	8,350	6,179	4,263	2,643	9,93	10,13	10,23	10,33	10,43	9,39
	-5	10,973	9,711	8,229	5,925	4,029	2,538	12,50	12,87	13,00	13,13	13,26	11,81
	45	6,983	6,349	5,290	3,703	2,815	/	2,54	2,69	2,75	2,80	2,86	/
	40	9,115	8,440	7,152	5,078	6,583	/	2,86	3,01	3,10	3,19	3,28	/
	35	13,000	12,476	10,484	7,234	5,570	3,621	3,25	3,35	3,42	3,49	3,56	3,20
	30	14,817	13,594	11,719	8,672	6,417	4,492	3,42	3,63	3,74	3,85	3,97	3,61
	25	11,400	10,654	9,106	6,739	5,121	3,482	4,55	4,69	4,94	5,20	5,47	5,09
13	20	10,721	9,836	8,266	6,034	4,344	2,867	6,84	6,98	7,19	7,40	7,62	7,01
	15	10,085	9,168	7,972	5,660	4,132	2,768	8,88	8,97	9,33	9,71	10,09	9,19
	10	10,061	9,064	7,554	5,590	4,025	2,455	9,63	9,82	10,02	10,22	10,42	9,59
	5	10,112	9,110	7,922	5,941	4,218	2,658	9,56	9,66	9,95	10,25	10,55	9,81
	0	10,209	9,115	7,791	5,765	3,978	2,466	9,81	10,00	10,10	10,21	10,31	9,28
	-5	10,481	9,275	7,861	5,660	3,849	2,425	11,75	12,11	12,23	12,35	12,47	11,10
	45	6,201	5,637	4,698	3,288	2,499	/	2,41	2,55	2,60	2,66	2,71	/
	40	8,754	8,105	6,869	4,877	6,322	/	2,90	3,04	3,13	3,22	3,32	/
	35	13,000	12,381	10,404	7,179	5,528	3,593	2,91	3,00	3,06	3,12	3,18	2,86
	30	13,732	12,598	10,861	8,037	5,947	4,163	3,24	3,43	3,53	3,64	3,75	3,41
	25	10,800	10,093	8,627	6,384	4,852	3,299	4,29	4,42	4,66	4,90	5,16	4,80
10	20	9,746	8,941	7,513	5,485	3,949	2,606	6,25	6,38	6,57	6,77	6,97	6,41
	15	9,208	8,371	7,279	5,168	3,773	2,528	8,05	8,13	8,45	8,79	9,14	8,32
	10	8,981	8,091	6,742	4,989	3,592	2,191	7,99	8,15	8,31	8,48	8,65	7,96
	5	8,747	7,880	6,852	5,139	3,649	2,299	7,86	7,94	8,18	8,42	8,67	8,07
	0	8,861	7,911	6,762	5,004	3,453	2,141	8,35	8,51	8,60	8,68	8,77	7,89
	-5	9,098	8,052	6,823	4,913	3,341	2,105	9,74	10,03	10,13	10,23	10,33	9,20
	45	4,495	4,086	3,405	2,383	1,811	/	1,66	1,76	1,79	1,83	1,86	/
	40	7,763	7,188	6,091	4,325	5,606	/	2,31	2,42	2,50	2,57	2,65	/
	35	**12,688**	**12,200**	10,252	7,074	5,447	**3,541**	**2,72**	**2,93**	2,99	3,05	3,11	**2,80**
	30	13,000	12,200	10,517	7,783	5,759	4,031	2,80	2,97	3,06	3,15	3,24	2,95
	25	9,706	9,071	7,753	5,737	4,360	2,965	4,00	4,12	4,34	4,57	4,82	4,48
7	20	6,838	6,273	5,272	3,848	2,771	1,829	5,45	5,56	5,73	5,90	6,08	5,59
	15	6,751	6,138	5,337	3,789	2,766	1,853	7,46	7,54	7,84	8,15	8,48	7,71
	10	/	/	/	/	/	/	/	/	/	/	/	/
	5	/	/	/	/	/	/	/	/	/	/	/	/
	0	/	/	/	/	/	/	/	/	/	/	/	/
	-5	/	/	/	/	/	/	/	/	/	/	/	/

PF = Cooling mode
ER (Energy Efficiency Ratio) = ratio of the total cooling capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 12T - Heating mode

Tw_out (°C)	Ta (°C)	PT (kW)						COP					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
	-20	5,549	5,044	4,203	2,942	2,236	/	2,01	2,19	2,23	2,28	2,32	/
	-15	6,876	6,140	5,203	3,694	4,789	/	2,39	2,59	2,66	2,74	2,83	/
	-7	10,643	9,589	8,058	5,560	4,281	/	2,97	3,17	3,24	3,30	3,37	/
	-2	12,110	10,717	9,239	6,837	5,059	3,541	3,22	3,61	3,72	3,83	3,95	3,59
	2	11,905	10,629	9,085	6,723	5,109	3,474	3,39	3,69	3,89	4,09	4,31	4,01
30	7	13,070	12,330	10,361	7,564	5,446	3,594	4,17	4,63	4,77	4,91	5,06	4,66
	15	13,430	12,209	10,616	7,538	5,502	3,687	6,34	6,98	7,26	7,55	7,85	7,14
	20	12,322	11,002	9,168	6,784	4,885	2,980	7,84	8,47	8,64	8,81	8,99	8,27
	25	11,219	9,755	8,483	6,362	4,517	2,846	9,47	9,94	10,24	10,55	10,87	10,11
	30	12,325	10,907	9,322	6,899	4,760	2,951	10,89	11,54	11,66	11,78	11,89	10,70
	35	11,837	10,569	8,956	6,449	4,385	2,763	10,51	10,83	10,93	11,04	11,15	9,93
	-20	5,060	4,600	3,833	2,683	2,039	/	1,71	1,87	1,90	1,94	1,98	/
	-15	6,502	5,805	4,919	3,493	4,528	/	2,13	2,30	2,37	2,44	2,51	/
	-7	10,092	9,092	7,640	5,272	4,059	/	2,61	2,79	2,85	2,90	2,96	/
	-2	11,468	10,148	8,749	6,474	4,791	3,354	2,81	3,15	3,25	3,34	3,44	3,13
	2	11,609	10,365	8,859	6,556	4,982	3,388	3,03	3,30	3,48	3,66	3,85	3,59
35	7	**13,697**	**12,400**	10,420	7,607	5,477	**3,615**	**4,09**	**4,48**	4,61	4,75	4,90	**4,50**
	15	12,683	11,530	10,026	7,119	5,197	3,482	5,36	5,90	6,14	6,38	6,64	6,04
	20	11,717	10,461	8,718	6,451	4,645	2,833	6,42	6,94	7,08	7,22	7,36	6,77
	25	10,872	9,454	8,221	6,166	4,378	2,758	7,67	8,05	8,29	8,54	8,80	8,18
	30	11,924	10,552	9,019	6,674	4,605	2,855	8,02	8,50	8,58	8,67	8,76	7,88
	35	11,470	10,242	8,679	6,249	4,249	2,677	7,77	8,00	8,08	8,16	8,25	7,34
	-20	4,170	3,791	3,159	2,211	1,681	/	1,41	1,53	1,56	1,59	1,63	/
	-15	5,822	5,198	4,405	3,127	4,054	/	1,88	2,03	2,09	2,15	2,22	/
	-7	10,011	9,019	7,579	5,229	4,027	/	2,41	2,58	2,63	2,68	2,74	/
	-2	11,404	10,092	8,700	6,438	4,764	3,335	2,57	2,88	2,97	3,06	3,15	2,87
	2	11,829	10,562	9,027	6,680	5,077	3,452	2,78	3,03	3,19	3,36	3,53	3,29
40	7	12,824	12,099	10,167	7,422	5,344	3,527	3,64	4,04	4,16	4,29	4,42	4,06
	15	10,403	9,458	8,224	5,839	4,262	2,856	4,70	5,17	5,38	5,59	5,81	5,29
	20	10,542	9,412	7,843	5,804	4,179	2,549	5,57	6,02	6,14	6,26	6,39	5,88
	25	10,403	9,046	7,866	5,900	4,189	2,639	6,62	6,95	7,16	7,38	7,60	7,07
	30	10,687	9,457	8,083	5,982	4,127	2,559	7,03	7,45	7,53	7,60	7,68	6,91
	35	11,072	9,886	8,378	6,032	4,102	2,584	7,44	7,67	7,74	7,82	7,90	7,03
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	5,687	5,078	4,303	3,055	3,961	/	1,46	1,58	1,62	1,67	1,72	/
	-7	9,973	8,984	7,550	5,209	4,011	/	1,90	2,03	2,07	2,11	2,16	/
	-2	10,795	9,553	8,236	6,094	4,510	/	2,10	2,35	2,42	2,49	2,57	/
	2	11,643	10,396	8,885	6,575	4,997	3,398	2,26	2,47	2,60	2,73	2,88	2,68
45	7	**12,720**	**12,000**	10,084	7,361	5,300	**3,498**	**2,96**	**3,23**	3,33	3,43	3,53	**3,25**
	15	10,505	9,550	8,305	5,896	4,304	2,884	3,75	4,12	4,29	4,46	4,64	4,22
	20	9,812	8,760	7,300	5,402	3,890	2,373	4,53	4,89	4,99	5,09	5,19	4,77
	25	10,297	8,954	7,786	5,840	4,146	2,612	5,12	5,37	5,53	5,70	5,87	5,46
	30	10,623	9,401	8,035	5,946	4,103	2,544	5,42	5,74	5,80	5,86	5,91	5,32
	35	9,338	8,338	7,066	5,087	3,459	2,179	5,43	5,59	5,64	5,70	5,76	5,12
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	8,854	7,976	6,703	4,625	3,561	/	1,94	2,08	2,12	2,16	2,20	/
	-2	10,203	9,029	7,784	5,760	4,262	/	2,07	2,32	2,39	2,46	2,54	/
	2	11,237	10,033	8,575	6,346	4,823	3,279	2,39	2,60	2,74	2,89	3,04	2,83
50	7	9,716	9,166	7,703	5,623	4,048	2,672	2,97	3,30	3,40	3,50	3,60	3,31
	15	7,920	7,200	6,261	4,445	3,245	2,174	3,59	3,95	4,11	4,28	4,45	4,05
	20	7,333	6,547	5,456	4,038	2,907	1,773	3,71	4,01	4,09	4,17	4,25	3,91
	25	8,093	7,037	6,119	4,589	3,258	2,053	4,62	4,85	5,00	5,15	5,30	4,93
	30	8,768	7,760	6,632	4,908	3,386	2,100	5,06	5,37	5,42	5,47	5,53	4,98
	35	8,132	7,260	6,153	4,430	3,012	1,898	4,76	4,91	4,96	5,00	5,05	4,50
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	7,848	7,070	5,941	4,099	3,157	/	1,76	1,88	1,92	1,96	2,00	/
	-2	8,560	7,575	6,530	4,833	3,576	/	1,76	1,97	2,03	2,09	2,15	/
	2	9,697	8,658	7,400	5,476	4,162	/	2,13	2,32	2,44	2,57	2,71	/
55	7	7,023	6,625	5,568	4,064	2,926	/	2,39	2,65	2,73	2,81	2,90	/
	15	7,074	6,431	5,592	3,971	2,899	/	3,16	3,48	3,62	3,76	3,91	/
	20	6,606	5,898	4,915	3,637	2,619	/	3,17	3,42	3,49	3,56	3,63	/
	25	7,920	6,887	5,989	4,492	3,189	/	3,81	4,00	4,12	4,24	4,37	/
	30	8,348	7,388	6,315	4,673	3,224	/	4,25	4,51	4,55	4,60	4,65	/
	35	6,661	5,947	5,040	3,629	2,468	/	3,45	3,55	3,59	3,62	3,66	/
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	/	/	/	/	/	/	/	/	/	/	/	/
	-2	7,161	6,337	5,463	4,042	2,991	/	1,74	1,95	2,00	2,06	2,13	/
	2	4,955	4,424	3,781	2,798	2,127	/	1,75	1,90	2,00	2,11	2,22	/
60	7	4,399	4,150	3,487	2,546	1,833	/	1,95	2,17	2,23	2,30	2,37	/
	15	4,868	4,425	3,848	2,732	1,995	/	2,13	2,34	2,44	2,53	2,63	/
	20	5,232	4,672	3,893	2,881	2,074	/	2,30	2,48	2,53	2,58	2,63	/
	25	2,345	2,039	1,773	1,330	0,944	/	1,72	1,81	1,86	1,92	1,97	/
	30	6,740	5,964	5,098	3,772	2,603	/	3,05	3,23	3,26	3,29	3,33	/
	35	/	/	/	/	/	/	/	/	/	/	/	/

PT = Heating capacity
COP (Coefficient Of Performance) = ratio of the total heating capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 12T - Cooling mode

Tw_out (°C)	Ta (°C)	PF (kW)						EER					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
22	45	9,407	8,552	7,127	4,989	3,791	/	3,37	3,58	3,65	3,72	3,80	/
	40	11,565	10,709	9,075	6,443	8,353	/	3,93	4,13	4,25	4,38	4,51	/
	35	12,408	11,384	9,566	6,601	5,082	3,304	3,79	3,90	3,98	4,06	4,14	3,73
	30	14,630	13,422	11,571	8,562	6,336	4,435	5,82	6,17	6,36	6,55	6,75	6,14
	25	14,858	13,886	11,868	8,783	6,675	4,539	6,92	7,12	7,50	7,90	8,32	7,74
	20	15,120	13,871	11,656	8,509	6,127	4,044	7,01	7,15	7,37	7,59	7,82	7,19
	15	14,190	12,900	11,217	7,964	5,814	3,895	10,96	11,07	11,52	11,98	12,45	11,33
	10	14,189	12,783	10,653	7,883	5,676	3,462	11,27	11,50	11,73	11,96	12,20	11,22
	5	14,470	13,036	11,336	8,502	6,036	3,803	11,93	12,05	12,42	12,79	13,17	12,25
	0	14,329	12,793	10,935	8,092	5,583	3,462	12,37	12,62	12,75	12,87	13,00	11,70
	-5	14,180	12,549	10,635	7,657	5,207	3,280	13,04	13,43	13,56	13,70	13,83	12,31
18	45	7,861	7,147	5,956	4,169	3,168	/	2,85	3,02	3,08	3,14	3,20	/
	40	9,841	9,112	7,722	5,483	7,108	/	3,39	3,56	3,67	3,78	3,89	/
	35	**12,800**	**12,600**	10,588	7,306	5,626	**3,657**	**4,35**	**4,60**	4,69	4,79	4,88	**4,39**
	30	12,775	11,720	10,104	7,477	5,533	3,873	5,11	5,42	5,58	5,75	5,92	5,39
	25	14,401	13,459	11,504	8,513	6,470	4,399	5,54	5,71	6,01	6,33	6,66	6,20
	20	13,630	12,505	10,508	7,671	5,523	3,645	6,29	6,41	6,60	6,80	7,01	6,44
	15	12,960	11,782	10,245	7,274	5,310	3,558	9,76	9,86	10,25	10,66	11,09	10,09
	10	12,590	11,342	9,452	6,994	5,036	3,072	9,57	9,76	9,96	10,16	10,36	9,53
	5	12,643	11,390	9,904	7,428	5,274	3,323	9,51	9,61	9,90	10,19	10,50	9,77
	0	12,622	11,269	9,632	7,128	4,918	3,049	9,06	9,25	9,34	9,43	9,53	8,57
	-5	12,923	11,436	9,691	6,978	4,745	2,989	10,88	11,21	11,32	11,43	11,55	10,28
15	45	7,079	6,436	5,363	3,754	2,853	/	2,60	2,76	2,81	2,87	2,92	/
	40	10,400	9,630	8,161	5,794	7,511	/	3,06	3,21	3,31	3,40	3,51	/
	35	14,300	13,119	11,025	7,607	5,857	3,807	3,43	3,53	3,60	3,67	3,75	3,37
	30	13,937	13,148	11,334	8,387	6,207	4,345	4,11	4,36	4,49	4,62	4,76	4,33
	25	13,300	12,430	10,624	7,862	5,975	4,063	4,55	4,68	4,93	5,19	5,47	5,08
	20	12,490	11,458	9,629	7,029	5,061	3,340	6,74	6,87	7,08	7,29	7,51	6,91
	15	10,878	9,889	8,599	6,106	4,457	2,986	9,70	9,79	10,19	10,59	11,02	10,03
	10	11,010	9,919	8,266	6,117	4,404	2,686	10,20	10,41	10,61	10,83	11,04	10,16
	5	10,754	9,688	8,425	6,319	4,486	2,826	9,32	9,41	9,69	9,99	10,28	9,56
	0	10,941	9,769	8,350	6,179	4,263	2,643	9,93	10,13	10,23	10,33	10,43	9,39
	-5	10,973	9,711	8,229	5,925	4,029	2,538	12,50	12,87	13,00	13,13	13,26	11,81
13	45	6,983	6,349	5,290	3,703	2,815	/	2,54	2,69	2,75	2,80	2,86	/
	40	10,200	9,444	8,004	5,683	7,367	/	2,86	3,01	3,10	3,19	3,28	/
	35	13,300	12,202	10,254	7,075	5,448	3,541	3,25	3,35	3,42	3,49	3,56	3,20
	30	14,817	13,594	11,719	8,672	6,417	4,492	3,42	3,63	3,74	3,85	3,97	3,61
	25	13,013	12,162	10,395	7,692	5,846	3,975	4,55	4,69	4,94	5,20	5,47	5,09
	20	10,721	9,836	8,266	6,034	4,344	2,867	6,84	6,98	7,19	7,40	7,62	7,01
	15	10,085	9,168	7,972	5,660	4,132	2,768	8,88	8,97	9,33	9,71	10,09	9,19
	10	10,061	9,064	7,554	5,590	4,025	2,455	9,63	9,82	10,02	10,22	10,42	9,59
	5	10,112	9,110	7,922	5,941	4,218	2,658	9,56	9,66	9,95	10,25	10,55	9,81
	0	10,209	9,115	7,791	5,765	3,978	2,466	9,81	10,00	10,10	10,21	10,31	9,28
	-5	10,481	9,275	7,861	5,660	3,849	2,425	11,75	12,11	12,23	12,35	12,47	11,10
10	45	6,400	6,095	5,079	3,556	2,702	/	2,41	2,55	2,60	2,66	2,71	/
	40	10,100	9,352	7,925	5,627	7,294	/	2,90	3,04	3,13	3,22	3,32	/
	35	13,100	12,018	10,099	6,969	5,366	3,488	2,91	3,00	3,06	3,12	3,18	2,86
	30	13,732	12,834	11,064	8,187	6,058	4,241	3,24	3,43	3,53	3,64	3,75	3,41
	25	12,200	11,402	9,745	7,211	5,481	3,727	4,29	4,42	4,66	4,90	5,16	4,80
	20	9,746	8,941	7,513	5,485	3,949	2,606	6,25	6,38	6,57	6,77	6,97	6,41
	15	9,208	8,371	7,279	5,168	3,773	2,528	8,05	8,13	8,45	8,79	9,14	8,32
	10	8,981	8,091	6,742	4,989	3,592	2,191	7,99	8,15	8,31	8,48	8,65	7,96
	5	8,747	7,880	6,852	5,139	3,649	2,299	7,86	7,94	8,18	8,42	8,67	8,07
	0	8,861	7,911	6,762	5,004	3,453	2,141	8,35	8,51	8,60	8,68	8,77	7,89
	-5	9,098	8,052	6,823	4,913	3,341	2,105	9,74	10,03	10,13	10,23	10,33	9,20
7	45	6,316	6,073	5,061	3,543	2,693	/	1,85	1,96	2,00	2,04	2,08	/
	40	9,700	9,300	7,881	5,596	7,254	/	2,58	2,70	2,79	2,87	2,96	/
	35	**13,003**	**12,600**	10,588	7,306	5,626	**3,657**	**2,83**	**2,91**	2,97	3,03	3,09	**2,78**
	30	13,500	12,617	10,877	8,049	5,956	4,169	3,09	3,27	3,37	3,47	3,58	3,26
	25	11,700	11,337	9,690	7,171	5,450	3,706	4,07	4,19	4,41	4,65	4,89	4,55
	20	10,200	9,808	8,242	6,016	4,332	2,859	6,08	6,20	6,39	6,58	6,78	6,24
	15	9,600	7,680	6,678	4,742	3,461	2,319	7,72	7,80	8,11	8,44	8,78	7,99
	10	/	/	/	/	/	/	/	/	/	/	/	/
	5	/	/	/	/	/	/	/	/	/	/	/	/
	0	/	/	/	/	/	/	/	/	/	/	/	/
	-5	/	/	/	/	/	/	/	/	/	/	/	/

PF = Cooling mode
ER (Energy Efficiency Ratio) = ratio of the total cooling capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 14 - Heating mode

Tw_out (°C)	Ta (°C)	PT (kW)						COP					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
	-20	6,454	5,867	4,890	3,423	2,601	/	1,96	2,14	2,18	2,23	2,27	/
	-15	7,058	6,302	5,341	3,792	4,915	/	2,08	2,25	2,32	2,39	2,46	/
	-7	10,481	9,442	7,935	5,475	4,216	/	2,66	2,85	2,91	2,97	3,02	/
	-2	12,429	10,999	9,482	7,017	5,192	3,635	3,12	3,49	3,60	3,70	3,82	3,47
	2	13,332	11,903	10,174	7,529	5,722	3,891	3,27	3,57	3,76	3,96	4,17	3,88
30	7	15,600	14,717	12,367	9,028	6,500	4,290	4,21	4,38	4,51	4,65	4,78	4,40
	15	14,443	13,130	11,417	8,106	5,918	3,965	5,56	6,11	6,36	6,61	6,87	6,26
	20	14,301	12,768	10,640	7,874	5,669	3,458	6,92	7,48	7,63	7,78	7,93	7,30
	25	12,434	10,812	9,402	7,052	5,007	3,154	8,04	8,44	8,69	8,95	9,22	8,58
	30	14,064	12,446	10,638	7,872	5,432	3,368	9,56	10,13	10,24	10,34	10,44	9,40
	35	13,612	12,153	10,299	7,415	5,043	3,177	9,42	9,70	9,80	9,90	10,00	8,90
	-20	5,507	5,007	4,172	2,920	2,220	/	1,57	1,72	1,75	1,78	1,82	/
	-15	7,779	6,946	5,886	4,179	5,418	/	2,14	2,31	2,38	2,45	2,52	/
	-7	11,061	9,965	8,374	5,778	4,449	/	2,54	2,72	2,77	2,83	2,88	/
	-2	11,977	10,599	9,137	6,762	5,004	3,502	2,79	3,13	3,22	3,32	3,42	3,11
	2	13,040	11,643	9,951	7,364	5,596	3,806	2,94	3,21	3,38	3,56	3,75	3,48
35	7	**15,400**	**14,800**	12,437	9,079	6,537	**4,314**	**4,11**	**4,34**	4,47	4,60	4,74	**4,36**
	15	14,279	12,981	11,288	8,014	5,851	3,920	4,99	5,48	5,70	5,93	6,17	5,61
	20	13,298	11,873	9,894	7,322	5,272	3,216	5,80	6,26	6,38	6,51	6,64	6,11
	25	12,268	10,668	9,277	6,958	4,940	3,112	6,81	7,15	7,36	7,59	7,81	7,27
	30	12,896	11,412	9,754	7,218	4,980	3,088	7,44	7,89	7,97	8,05	8,13	7,31
	35	13,116	11,711	9,924	7,145	4,859	3,061	7,69	7,92	8,00	8,08	8,16	7,26
	-20	3,509	3,190	2,659	1,861	1,414	/	1,32	1,43	1,46	1,49	1,52	/
	-15	7,494	6,691	5,670	4,026	5,219	/	2,04	2,20	2,27	2,34	2,41	/
	-7	10,578	9,529	8,008	5,525	4,255	/	2,29	2,45	2,50	2,55	2,60	/
	-2	11,399	10,088	8,696	6,435	4,762	3,333	2,44	2,73	2,81	2,89	2,98	2,71
	2	13,026	11,630	9,940	7,356	5,590	3,802	2,68	2,92	3,08	3,24	3,41	3,17
40	7	16,856	15,902	13,363	9,755	7,024	4,636	3,45	3,83	3,94	4,06	4,18	3,85
	15	11,568	10,517	9,145	6,493	4,740	3,176	4,28	4,71	4,90	5,09	5,30	4,82
	20	11,503	10,271	8,559	6,334	4,560	2,782	4,93	5,32	5,43	5,54	5,65	5,19
	25	11,399	9,912	8,619	6,464	4,590	2,892	5,82	6,11	6,29	6,48	6,67	6,21
	30	11,914	10,544	9,012	6,669	4,601	2,853	6,31	6,68	6,75	6,82	6,89	6,20
	35	12,177	10,872	9,214	6,634	4,511	2,842	6,51	6,70	6,77	6,84	6,91	6,15
	-20		/	/	/	/	/	/	/	/	/	/	/
	-15	6,790	6,063	5,138	3,648	4,729	/	1,73	1,86	1,92	1,98	2,04	/
	-7	10,764	9,697	8,149	5,623	4,329	/	2,14	2,29	2,34	2,38	2,43	/
	-2	11,339	10,034	8,650	6,401	4,737	/	2,21	2,48	2,55	2,63	2,71	/
	2	12,866	11,487	9,818	7,265	5,522	3,755	2,39	2,61	2,75	2,89	3,05	2,83
45	7	**14,930**	**14,100**	11,836	8,640	6,221	**4,106**	**2,89**	**3,15**	3,24	3,34	3,44	**3,17**
	15	10,829	9,844	8,560	6,078	4,437	2,973	3,74	4,12	4,28	4,45	4,63	4,21
	20	9,567	8,542	7,118	5,267	3,793	2,313	4,24	4,58	4,67	4,77	4,86	4,47
	25	10,702	9,306	8,093	6,069	4,309	2,715	4,93	5,18	5,33	5,49	5,66	5,26
	30	10,340	9,151	7,821	5,788	3,993	2,476	4,45	4,71	4,76	4,81	4,85	4,37
	35	9,446	8,434	7,147	5,146	3,499	2,205	5,22	5,37	5,43	5,48	5,54	4,93
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	9,887	8,907	7,485	5,165	3,977	/	1,92	2,06	2,10	2,14	2,18	/
	-2	10,376	9,182	7,916	5,858	4,335	/	2,11	2,36	2,44	2,51	2,58	/
	2	12,442	11,109	9,495	7,026	5,340	3,631	2,49	2,71	2,85	3,00	3,16	2,94
50	7	11,308	10,668	8,965	6,544	4,712	3,110	2,89	3,21	3,31	3,41	3,51	3,23
	15	8,629	7,845	6,822	4,843	3,536	2,369	3,29	3,62	3,77	3,92	4,08	3,71
	20	8,659	7,731	6,443	4,767	3,433	2,094	3,61	3,90	3,97	4,05	4,13	3,80
	25	9,423	8,194	7,125	5,344	3,794	2,390	4,41	4,63	4,77	4,91	5,06	4,71
	30	9,517	8,422	7,199	5,327	3,676	2,279	4,53	4,81	4,85	4,90	4,95	4,46
	35	8,686	7,755	6,572	4,732	3,218	2,027	4,47	4,61	4,65	4,70	4,75	4,22
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	9,433	8,498	7,142	4,928	3,794	/	1,86	1,99	2,03	2,07	2,12	/
	-2	9,115	8,066	6,953	5,146	3,808	/	1,88	2,10	2,17	2,23	2,30	/
	2	5,056	4,515	3,859	2,855	2,170	/	2,27	2,48	2,61	2,75	2,89	/
55	7	9,092	8,578	7,208	5,262	3,789	/	2,50	2,77	2,85	2,94	3,03	/
	15	7,247	6,588	5,729	4,067	2,969	/	2,75	3,02	3,14	3,27	3,40	/
	20	7,647	6,828	5,690	4,211	3,032	/	3,05	3,29	3,36	3,43	3,50	/
	25	9,746	8,475	7,369	5,527	3,924	/	3,86	4,05	4,17	4,29	4,42	/
	30	7,873	6,967	5,955	4,407	3,041	/	3,15	3,33	3,37	3,40	3,44	/
	35	3,293	2,940	2,492	1,794	1,220	/	3,60	3,71	3,75	3,79	3,82	/
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	/	/	/	/	/	/	/	/	/	/	/	/
	-2	5,401	4,779	4,120	3,049	2,256	/	1,40	1,57	1,62	1,67	1,72	/
	2	5,569	4,973	4,250	3,145	2,390	/	4,04	4,40	4,63	4,88	5,14	/
60	7	5,373	5,069	4,260	3,110	2,239	/	6,06	6,73	6,93	7,14	7,35	/
	15	5,683	5,166	4,493	3,190	2,328	/	3,26	3,59	3,73	3,88	4,03	/
	20	7,634	6,816	5,680	4,203	3,026	/	3,24	3,50	3,57	3,64	3,71	/
	25	7,469	6,495	5,648	4,236	3,007	/	3,16	3,32	3,42	3,52	3,63	/
	30	6,524	5,774	4,935	3,652	2,520	/	2,98	3,16	3,20	3,23	3,26	/
	35	/	/	/	/	/	/	/	/	/	/	/	/

PT = Heating capacity
COP (Coefficient Of Performance) = ratio of the total heating capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 14 - Cooling mode

Tw_out (°C)	Ta (°C)	PF (kW)						EER					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
	45	10,970	9,973	8,311	5,818	4,421	/	3,46	3,67	3,74	3,82	3,89	/
	40	13,323	12,336	10,454	7,422	9,622	/	3,97	4,17	4,30	4,42	4,56	/
	35	15,400	14,808	12,443	8,586	6,611	4,297	4,45	4,58	4,68	4,77	4,86	4,38
	30	15,867	14,556	12,549	9,286	6,872	4,810	5,72	6,06	6,24	6,43	6,62	6,03
	25	16,099	15,046	12,860	9,516	7,232	4,918	6,73	6,93	7,30	7,69	8,09	7,53
22	20	17,137	15,722	13,212	9,644	6,944	4,583	6,71	6,84	7,05	7,26	7,48	6,88
	15	15,724	14,294	12,430	8,825	6,442	4,316	10,15	10,25	10,66	11,09	11,53	10,50
	10	15,785	14,221	11,851	8,770	6,314	3,852	10,34	10,55	10,76	10,97	11,19	10,30
	5	16,149	14,549	12,651	9,488	6,737	4,244	10,97	11,08	11,41	11,76	12,11	11,26
	0	16,043	14,324	12,243	9,060	6,251	3,876	11,41	11,64	11,75	11,87	11,99	10,79
	-5	15,929	14,096	11,946	8,601	5,849	3,685	12,06	12,42	12,55	12,67	12,80	11,39
	45	9,459	8,599	7,166	5,016	3,812	/	3,04	3,22	3,28	3,35	3,41	/
	40	11,640	10,778	9,134	6,485	8,407	/	3,53	3,70	3,81	3,93	4,05	/
	35	**14,800**	**14,600**	12,269	8,466	6,518	**4,237**	**4,21**	**4,40**	4,49	4,58	4,67	**4,20**
	30	15,000	13,761	11,863	8,779	6,496	4,547	5,12	5,43	5,59	5,76	5,93	5,40
	25	15,822	14,787	12,638	9,352	7,108	4,833	5,50	5,67	5,97	6,28	6,62	6,15
18	20	15,618	14,328	12,041	8,790	6,329	4,177	6,17	6,29	6,48	6,68	6,88	6,33
	15	14,481	13,165	11,447	8,128	5,933	3,975	9,22	9,31	9,68	10,07	10,47	9,53
	10	14,104	12,706	10,588	7,835	5,642	3,441	8,94	9,11	9,30	9,48	9,67	8,90
	5	14,163	12,759	11,095	8,321	5,908	3,722	8,85	8,94	9,21	9,49	9,77	9,09
	0	14,139	12,624	10,790	7,985	5,509	3,416	9,22	9,40	9,50	9,59	9,69	8,72
	-5	14,476	12,811	10,857	7,817	5,315	3,349	11,09	11,42	11,54	11,65	11,77	10,47
	45	8,463	7,694	6,412	4,488	3,411	/	2,75	2,91	2,97	3,03	3,09	/
	40	11,442	10,595	8,979	6,375	8,264	/	3,16	3,31	3,41	3,52	3,62	/
	35	13,629	12,503	10,507	7,250	5,582	3,629	3,72	3,83	3,91	3,99	4,07	3,66
	30	14,973	13,737	11,842	8,763	6,485	4,539	4,04	4,29	4,42	4,55	4,69	4,26
	25	15,249	14,251	12,181	9,014	6,850	4,658	4,42	4,55	4,80	5,05	5,32	4,95
15	20	13,892	12,745	10,710	7,818	5,629	3,715	6,40	6,53	6,72	6,92	7,13	6,56
	15	11,761	10,691	9,297	6,601	4,819	3,228	8,95	9,04	9,40	9,77	10,16	9,25
	10	11,913	10,732	8,943	6,618	4,765	2,907	9,34	9,52	9,71	9,91	10,10	9,30
	5	11,652	10,497	9,128	6,846	4,861	3,062	8,52	8,61	8,87	9,13	9,41	8,75
	0	11,871	10,599	9,059	6,704	4,626	2,868	9,08	9,26	9,35	9,44	9,54	8,59
	-5	11,922	10,551	8,941	6,438	4,378	2,758	11,42	11,77	11,88	12,00	12,12	10,79
	45	8,048	7,316	6,097	4,268	3,243	/	2,64	2,80	2,86	2,91	2,97	/
	40	10,773	9,975	8,454	6,002	7,781	/	3,01	3,16	3,25	3,35	3,45	/
	35	12,976	11,904	10,004	6,903	5,315	3,455	3,29	3,38	3,45	3,52	3,59	3,23
	30	15,917	14,603	12,589	9,316	6,894	4,826	3,38	3,59	3,69	3,80	3,92	3,57
	25	13,866	12,959	11,076	8,196	6,229	4,236	4,45	4,59	4,83	5,09	5,36	4,98
13	20	11,844	10,866	9,131	6,666	4,799	3,168	6,50	6,63	6,83	7,04	7,25	6,67
	15	10,796	9,814	8,534	6,059	4,423	2,964	8,23	8,31	8,64	8,99	9,35	8,51
	10	10,766	9,699	8,083	5,981	4,306	2,627	8,82	9,00	9,18	9,36	9,55	8,78
	5	10,802	9,732	8,463	6,347	4,506	2,839	8,67	8,75	9,02	9,29	9,57	8,90
	0	10,887	9,721	8,308	6,148	4,242	2,630	8,91	9,09	9,18	9,27	9,36	8,43
	-5	11,158	9,875	8,368	6,025	4,097	2,581	10,69	11,02	11,13	11,24	11,35	10,10
	45	7,106	6,460	5,383	3,768	2,864	/	2,36	2,50	2,55	2,60	2,66	/
	40	10,031	9,288	7,871	5,588	7,244	/	2,84	2,98	3,07	3,16	3,26	/
	35	11,622	10,663	8,960	6,182	4,760	3,094	3,03	3,13	3,19	3,25	3,32	2,98
	30	15,094	13,848	11,938	8,834	6,537	4,576	3,29	3,49	3,59	3,70	3,81	3,47
	25	13,174	12,312	10,523	7,787	5,918	4,025	4,31	4,44	4,67	4,92	5,18	4,82
10	20	10,953	10,048	8,444	6,164	4,438	2,929	6,10	6,22	6,41	6,60	6,80	6,25
	15	9,981	9,074	7,890	5,602	4,089	2,740	7,61	7,68	7,99	8,31	8,64	7,87
	10	9,713	8,750	7,292	5,396	3,885	2,370	7,47	7,62	7,78	7,93	8,09	7,44
	5	9,659	8,702	7,567	5,675	4,029	2,538	7,49	7,56	7,79	8,02	8,26	7,68
	0	9,720	8,679	7,418	5,489	3,787	2,348	7,88	8,04	8,12	8,20	8,28	7,45
	-5	9,914	8,774	7,435	5,354	3,640	2,293	9,11	9,38	9,47	9,57	9,66	8,60
	45	4,979	4,526	3,772	2,640	2,007	/	1,72	1,83	1,86	1,90	1,94	/
	40	8,228	7,619	6,456	4,584	5,942	/	2,40	2,52	2,60	2,68	2,76	/
	35	**13,000**	**13,000**	10,924	7,538	5,804	**3,773**	**2,86**	**2,86**	2,91	2,97	3,02	**2,72**
	30	12,251	11,240	9,689	7,170	5,306	3,714	3,00	3,18	3,28	3,38	3,48	3,16
	25	11,107	10,380	8,872	6,565	4,990	3,393	4,13	4,26	4,48	4,72	4,97	4,62
7	20	8,232	7,553	6,347	4,633	3,336	2,202	5,44	5,55	5,71	5,89	6,06	5,58
	15	7,910	7,191	6,253	4,440	3,241	2,171	7,18	7,26	7,55	7,85	8,16	7,43
	10	/	/	/	/	/	/	/	/	/	/	/	/
	5	/	/	/	/	/	/	/	/	/	/	/	/
	0	/	/	/	/	/	/	/	/	/	/	/	/
	-5	/	/	/	/	/	/	/	/	/	/	/	/

PF = Cooling mode
ER (Energy Efficiency Ratio) = ratio of the total cooling capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 14T - Heating mode

Tw_out (°C)	Ta (°C)	PT (kW)						COP					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
	-20	6,470	5,882	4,902	3,431	2,608	/	2,06	2,24	2,29	2,33	2,38	/
	-15	7,921	7,073	5,994	4,256	5,517	/	2,42	2,61	2,69	2,77	2,85	/
	-7	12,153	10,949	9,201	6,348	4,888	/	2,95	3,16	3,22	3,28	3,35	/
	-2	13,134	11,623	10,020	7,414	5,487	3,841	3,16	3,54	3,65	3,76	3,87	3,52
	2	12,899	11,517	9,844	7,284	5,536	3,765	3,29	3,59	3,78	3,98	4,19	3,90
30	7	14,814	13,975	11,744	8,573	6,172	4,074	3,99	4,39	4,52	4,66	4,80	4,41
	15	14,881	13,528	11,764	8,352	6,097	4,085	5,87	6,46	6,72	6,99	7,27	6,61
	20	13,708	12,239	10,199	7,548	5,434	3,315	7,20	7,77	7,93	8,08	8,25	7,59
	25	12,521	10,887	9,467	7,100	5,041	3,176	8,71	9,14	9,42	9,70	9,99	9,29
	30	13,800	12,212	10,438	7,724	5,330	3,304	10,04	10,65	10,75	10,86	10,97	9,87
	35	13,296	11,872	10,061	7,244	4,926	3,103	9,73	10,02	10,12	10,22	10,32	9,19
	-20	6,346	5,769	4,808	3,365	2,558	/	1,82	1,99	2,03	2,07	2,11	/
	-15	7,849	7,008	5,939	4,217	5,466	/	2,21	2,39	2,46	2,54	2,61	/
	-7	13,527	12,186	10,241	7,066	5,441	/	2,65	2,84	2,89	2,95	3,01	/
	-2	15,030	13,301	11,466	8,485	6,279	4,395	2,82	3,16	3,26	3,35	3,45	3,14
	2	15,097	13,479	11,521	8,525	6,479	4,406	3,01	3,28	3,45	3,63	3,83	3,56
35	7	**16,700**	**14,100**	11,849	8,650	6,228	**4,110**	**3,65**	**4,33**	4,46	4,59	4,73	**4,35**
	15	14,172	12,883	11,203	7,954	5,806	3,890	5,07	5,57	5,80	6,03	6,27	5,70
	20	13,125	11,719	9,766	7,227	5,203	3,174	6,00	6,48	6,61	6,74	6,88	6,33
	25	12,179	10,590	9,209	6,907	4,904	3,089	7,14	7,50	7,72	7,95	8,19	7,62
	30	13,358	11,821	10,103	7,476	5,159	3,198	8,15	8,64	8,73	8,82	8,90	8,01
	35	12,849	11,473	9,723	7,000	4,760	2,999	7,92	8,16	8,24	8,32	8,40	7,48
	-20	4,985	4,532	3,776	2,643	2,009	/	1,49	1,62	1,65	1,68	1,72	/
	-15	6,795	6,067	5,141	3,650	4,732	/	1,94	2,10	2,16	2,22	2,29	/
	-7	11,384	10,256	8,619	5,947	4,579	/	2,41	2,58	2,63	2,68	2,74	/
	-2	12,252	10,842	9,347	6,917	5,118	3,583	2,53	2,84	2,92	3,01	3,10	2,82
	2	12,635	11,281	9,642	7,135	5,423	3,687	2,70	2,94	3,10	3,26	3,44	3,20
40	7	14,264	13,457	11,308	8,255	5,944	3,923	3,46	3,84	3,95	4,07	4,19	3,86
	15	11,247	10,225	8,891	6,313	4,608	3,087	4,33	4,77	4,96	5,16	5,36	4,88
	20	11,406	10,184	8,487	6,280	4,522	2,758	5,10	5,51	5,62	5,73	5,85	5,38
	25	11,272	9,802	8,523	6,392	4,539	2,859	6,06	6,36	6,55	6,75	6,95	6,46
	30	11,595	10,261	8,770	6,490	4,478	2,776	6,43	6,81	6,88	6,95	7,02	6,32
	35	12,030	10,741	9,103	6,554	4,457	2,808	6,80	7,01	7,08	7,15	7,22	6,43
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	7,144	6,379	5,406	3,838	4,975	/	1,69	1,82	1,88	1,93	1,99	/
	-7	12,312	11,092	9,321	6,431	4,952	/	2,11	2,26	2,30	2,35	2,39	/
	-2	13,680	12,106	10,436	7,723	5,715	/	2,28	2,55	2,63	2,71	2,79	/
	2	13,741	12,269	10,486	7,760	5,897	4,010	2,43	2,65	2,79	2,94	3,10	2,88
45	7	**15,200**	**14,100**	11,849	8,650	6,228	**4,110**	**2,90**	**3,16**	3,26	3,35	3,45	**3,18**
	15	10,558	9,599	8,347	5,926	4,326	2,898	3,81	4,20	4,36	4,54	4,72	4,30
	20	9,857	8,801	7,334	5,427	3,908	2,384	4,56	4,92	5,02	5,12	5,22	4,81
	25	10,327	8,980	7,809	5,857	4,158	2,620	5,10	5,35	5,51	5,68	5,85	5,44
	30	10,636	9,413	8,045	5,953	4,108	2,547	5,40	5,73	5,79	5,84	5,90	5,31
	35	9,334	8,334	7,062	5,085	3,458	2,178	5,42	5,59	5,64	5,70	5,76	5,12
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	10,408	9,376	7,879	5,437	4,186	/	2,02	2,16	2,21	2,25	2,30	/
	-2	11,215	9,925	8,556	6,331	4,685	/	2,11	2,36	2,43	2,51	2,58	/
	2	12,208	10,900	9,316	6,894	5,239	3,563	2,40	2,61	2,75	2,90	3,05	2,84
50	7	10,919	10,301	8,657	6,319	4,550	3,003	2,90	3,22	3,31	3,41	3,51	3,23
	15	8,585	7,804	6,786	4,818	3,517	2,357	3,40	3,74	3,89	4,04	4,21	3,83
	20	7,931	7,081	5,901	4,367	3,144	1,918	3,47	3,75	3,82	3,90	3,98	3,66
	25	8,936	7,771	6,757	5,068	3,598	2,267	4,40	4,62	4,76	4,90	5,05	4,70
	30	9,619	8,512	7,275	5,384	3,715	2,303	4,78	5,06	5,12	5,17	5,22	4,70
	35	8,861	7,912	6,705	4,827	3,283	2,068	4,45	4,59	4,63	4,68	4,73	4,21
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	9,496	8,555	7,189	4,961	3,820	/	1,90	2,03	2,08	2,12	2,16	/
	-2	9,636	8,528	7,352	5,440	4,026	/	1,85	2,07	2,13	2,19	2,26	/
	2	10,765	9,612	8,215	6,079	4,620	/	2,20	2,39	2,52	2,65	2,79	/
55	7	8,021	7,567	6,359	4,642	3,342	/	2,38	2,65	2,73	2,81	2,89	/
	15	7,761	7,056	6,135	4,356	3,180	/	3,04	3,35	3,48	3,62	3,77	/
	20	7,215	6,442	5,368	3,972	2,860	/	3,02	3,27	3,33	3,40	3,46	/
	25	8,673	7,542	6,558	4,918	3,492	/	3,61	3,79	3,90	4,02	4,14	/
	30	9,166	8,111	6,933	5,130	3,540	/	4,05	4,29	4,33	4,37	4,42	/
	35	7,333	6,547	5,548	3,995	2,716	/	3,29	3,39	3,42	3,46	3,49	/
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	/	/	/	/	/	/	/	/	/	/	/	/
	-2	7,964	7,048	6,076	4,496	3,327	/	1,80	2,01	2,07	2,13	2,20	/
	2	5,441	4,858	4,152	3,073	2,335	/	1,78	1,94	2,04	2,15	2,26	/
60	7	4,983	4,701	3,950	2,884	2,076	/	1,92	2,14	2,20	2,27	2,33	/
	15	5,308	4,826	4,196	2,979	2,175	/	2,03	2,23	2,32	2,42	2,51	/
	20	5,686	5,077	4,231	3,131	2,254	/	2,17	2,34	2,39	2,44	2,49	/
	25	2,578	2,242	1,949	1,462	1,038	/	1,63	1,72	1,77	1,82	1,87	/
	30	7,396	6,546	5,595	4,140	2,857	/	2,89	3,06	3,09	3,12	3,15	/
	35	/	/	/	/	/	/	/	/	/	/	/	/

PT = Heating capacity
COP (Coefficient Of Performance) = ratio of the total heating capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 14T - Cooling mode

Tw_out (°C)	Ta (°C)	PF (kW)						EER					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
	45	10,970	9,973	8,311	5,818	4,421	/	3,46	3,67	3,74	3,82	3,89	/
	40	13,323	12,336	10,454	7,422	9,622	/	3,97	4,17	4,30	4,42	4,56	/
	35	15,400	14,808	12,443	8,586	6,611	4,297	4,45	4,58	4,68	4,77	4,86	4,38
	30	15,867	14,556	12,549	9,286	6,872	4,810	5,72	6,06	6,24	6,43	6,62	6,03
	25	16,099	15,046	12,860	9,516	7,232	4,918	6,73	6,93	7,30	7,69	8,09	7,53
22	20	17,137	15,722	13,212	9,644	6,944	4,583	6,71	6,84	7,05	7,26	7,48	6,88
	15	15,724	14,294	12,430	8,825	6,442	4,316	10,15	10,25	10,66	11,09	11,53	10,50
	10	15,785	14,221	11,851	8,770	6,314	3,852	10,34	10,55	10,76	10,97	11,19	10,30
	5	16,149	14,549	12,651	9,488	6,737	4,244	10,97	11,08	11,41	11,76	12,11	11,26
	0	16,043	14,324	12,243	9,060	6,251	3,876	11,41	11,64	11,75	11,87	11,99	10,79
	-5	15,929	14,096	11,946	8,601	5,849	3,685	12,06	12,42	12,55	12,67	12,80	11,39
	45	9,459	8,599	7,166	5,016	3,812	/	3,04	3,22	3,28	3,35	3,41	/
	40	11,640	10,778	9,134	6,485	8,407	/	3,53	3,70	3,81	3,93	4,05	/
	35	**14,800**	**14,000**	11,765	8,118	6,251	**4,063**	**4,11**	**4,29**	4,38	4,46	4,55	**4,10**
	30	15,000	13,761	11,863	8,779	6,496	4,547	5,12	5,43	5,59	5,76	5,93	5,40
	25	15,822	14,787	12,638	9,352	7,108	4,833	5,50	5,67	5,97	6,28	6,62	6,15
18	20	15,618	14,328	12,041	8,790	6,329	4,177	6,17	6,29	6,48	6,68	6,88	6,33
	15	14,481	13,165	11,447	8,128	5,933	3,975	9,22	9,31	9,68	10,07	10,47	9,53
	10	14,104	12,706	10,588	7,835	5,642	3,441	8,94	9,11	9,30	9,48	9,67	8,90
	5	14,163	12,759	11,095	8,321	5,908	3,722	8,85	8,94	9,21	9,49	9,77	9,09
	0	14,139	12,624	10,790	7,985	5,509	3,416	9,22	9,40	9,50	9,59	9,69	8,72
	-5	14,476	12,811	10,857	7,817	5,315	3,349	11,09	11,42	11,54	11,65	11,77	10,47
	45	8,463	7,694	6,412	4,488	3,411	/	2,75	2,91	2,97	3,03	3,09	/
	40	11,442	10,595	8,979	6,375	8,264	/	3,16	3,31	3,41	3,52	3,62	/
	35	13,629	12,503	10,507	7,250	5,582	3,629	3,42	3,53	3,60	3,67	3,74	3,37
	30	14,973	13,737	11,842	8,763	6,485	4,539	4,04	4,29	4,42	4,55	4,69	4,26
	25	15,249	14,251	12,181	9,014	6,850	4,658	4,42	4,55	4,80	5,05	5,32	4,95
15	20	13,892	12,745	10,710	7,818	5,629	3,715	6,40	6,53	6,72	6,92	7,13	6,56
	15	11,761	10,691	9,297	6,601	4,819	3,228	8,95	9,04	9,40	9,77	10,16	9,25
	10	11,913	10,732	8,943	6,618	4,765	2,907	9,34	9,52	9,71	9,91	10,10	9,30
	5	11,652	10,497	9,128	6,846	4,861	3,062	8,52	8,61	8,87	9,13	9,41	8,75
	0	11,871	10,599	9,059	6,704	4,626	2,868	9,08	9,26	9,35	9,44	9,54	8,59
	-5	11,922	10,551	8,941	6,438	4,378	2,758	11,42	11,77	11,88	12,00	12,12	10,79
	45	8,048	7,316	6,097	4,268	3,243	/	2,64	2,80	2,86	2,91	2,97	/
	40	10,773	9,975	8,454	6,002	7,781	/	3,01	3,16	3,25	3,35	3,45	/
	35	12,976	11,904	10,004	6,903	5,315	3,455	3,29	3,38	3,45	3,52	3,59	3,23
	30	15,917	14,603	12,589	9,316	6,894	4,826	3,38	3,59	3,69	3,80	3,92	3,57
	25	13,866	12,959	11,076	8,196	6,229	4,236	4,45	4,59	4,83	5,09	5,36	4,98
13	20	11,844	10,866	9,131	6,666	4,799	3,168	6,50	6,63	6,83	7,04	7,25	6,67
	15	10,796	9,814	8,534	6,059	4,423	2,964	8,23	8,31	8,64	8,99	9,35	8,51
	10	10,766	9,699	8,083	5,981	4,306	2,627	8,82	9,00	9,18	9,36	9,55	8,78
	5	10,802	9,732	8,463	6,347	4,506	2,839	8,67	8,75	9,02	9,29	9,57	8,90
	0	10,887	9,721	8,308	6,148	4,242	2,630	8,91	9,09	9,18	9,27	9,36	8,43
	-5	11,158	9,875	8,368	6,025	4,097	2,581	10,69	11,02	11,13	11,24	11,35	10,10
	45	7,106	6,460	5,383	3,768	2,864	/	2,36	2,50	2,55	2,60	2,66	/
	40	10,031	9,288	7,871	5,588	7,244	/	2,84	2,98	3,07	3,16	3,26	/
	35	11,622	10,663	8,960	6,182	4,760	3,094	3,03	3,13	3,19	3,25	3,32	2,98
	30	15,094	13,848	11,938	8,834	6,537	4,576	3,29	3,49	3,59	3,70	3,81	3,47
	25	13,174	12,312	10,523	7,787	5,918	4,025	4,31	4,44	4,67	4,92	5,18	4,82
10	20	10,953	10,048	8,444	6,164	4,438	2,929	6,10	6,22	6,41	6,60	6,80	6,25
	15	9,981	9,074	7,890	5,602	4,089	2,740	7,61	7,68	7,99	8,31	8,64	7,87
	10	9,713	8,750	7,292	5,396	3,885	2,370	7,47	7,62	7,78	7,93	8,09	7,44
	5	9,659	8,702	7,567	5,675	4,029	2,538	7,49	7,56	7,79	8,02	8,26	7,68
	0	9,720	8,679	7,418	5,489	3,787	2,348	7,88	8,04	8,12	8,20	8,28	7,45
	-5	9,914	8,774	7,435	5,354	3,640	2,293	9,11	9,38	9,47	9,57	9,66	8,60
	45	6,740	6,127	5,106	3,574	2,716	/	1,72	1,83	1,86	1,90	1,94	/
	40	11,130	10,306	8,734	6,201	8,038	/	2,40	2,52	2,60	2,68	2,76	/
	35	**13,800**	**13,800**	11,597	8,002	6,161	**4,005**	**2,68**	**2,68**	2,73	2,79	2,84	**2,56**
	30	16,570	15,202	13,105	9,698	7,176	5,023	3,00	3,18	3,28	3,38	3,48	3,16
	25	15,020	14,037	11,998	8,878	6,748	4,588	4,13	4,26	4,48	4,72	4,97	4,62
7	20	11,140	10,220	8,588	6,270	4,514	2,979	5,44	5,55	5,71	5,89	6,06	5,58
	15	10,700	9,727	8,458	6,006	4,384	2,937	7,18	7,26	7,55	7,85	8,16	7,43
	10	/	/	/	/	/	/	/	/	/	/	/	/
	5	/	/	/	/	/	/	/	/	/	/	/	/
	0	/	/	/	/	/	/	/	/	/	/	/	/
	-5	/	/	/	/	/	/	/	/	/	/	/	/

PF = Cooling mode
ER (Energy Efficiency Ratio) = ratio of the total cooling capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 16 - Heating mode

Tw_out (°C)	Ta (°C)	PT (kW)						COP					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
	-20	7,160	6,509	5,424	3,797	2,886	/	1,90	2,07	2,11	2,15	2,20	/
	-15	7,809	6,972	5,909	4,195	5,438	/	2,01	2,17	2,24	2,30	2,37	/
	-7	11,557	10,412	8,749	6,037	4,649	/	2,56	2,74	2,79	2,85	2,91	/
	-2	13,589	12,026	10,367	7,672	5,677	3,974	3,02	3,38	3,48	3,58	3,69	3,36
	2	14,582	13,020	11,128	8,235	6,258	4,256	3,16	3,44	3,63	3,82	4,02	3,74
30	7	16,900	16,250	13,655	9,968	7,177	4,737	3,81	4,23	4,36	4,49	4,62	4,25
	15	16,187	14,715	12,796	9,085	6,632	4,444	5,34	5,87	6,11	6,35	6,61	6,01
	20	16,046	14,327	11,939	8,835	6,361	3,880	6,61	7,14	7,28	7,43	7,58	6,97
	25	13,971	12,149	10,564	7,923	5,625	3,544	7,63	8,01	8,25	8,50	8,75	8,14
	30	15,824	14,004	11,969	8,857	6,111	3,789	9,09	9,64	9,73	9,83	9,93	8,93
	35	15,336	13,693	11,604	8,355	5,681	3,579	8,97	9,24	9,33	9,42	9,52	8,47
	-20	6,190	5,627	4,689	3,283	2,495	/	1,54	1,68	1,71	1,75	1,78	/
	-15	8,706	7,773	6,587	4,677	6,063	/	2,09	2,26	2,32	2,39	2,47	/
	-7	12,298	11,079	9,310	6,424	4,947	/	2,46	2,63	2,68	2,74	2,79	/
	-2	13,183	11,666	10,057	7,442	5,507	3,855	2,72	3,05	3,14	3,23	3,33	3,03
	2	14,341	12,804	10,944	8,099	6,155	4,185	2,86	3,12	3,28	3,46	3,64	3,39
35	7	**16,730**	**16,300**	13,697	9,999	7,199	**4,752**	**3,65**	**4,19**	4,32	4,45	4,58	**4,21**
	15	16,063	14,603	12,698	9,016	6,581	4,410	4,82	5,30	5,51	5,73	5,96	5,43
	20	14,976	13,371	11,143	8,246	5,937	3,622	5,59	6,04	6,16	6,28	6,41	5,89
	25	13,847	12,041	10,470	7,853	5,575	3,513	6,56	6,89	7,09	7,31	7,53	7,00
	30	14,587	12,909	11,033	8,165	5,634	3,493	7,16	7,59	7,67	7,74	7,82	7,04
	35	14,868	13,275	11,250	8,100	5,508	3,470	7,39	7,61	7,69	7,76	7,84	6,98
	-20	3,998	3,635	3,029	2,120	1,611	/	1,31	1,43	1,46	1,49	1,52	/
	-15	8,475	7,567	6,413	4,553	5,902	/	2,01	2,17	2,24	2,30	2,37	/
	-7	11,878	10,701	8,992	6,205	4,778	/	2,24	2,40	2,44	2,49	2,54	/
	-2	12,637	11,183	9,641	7,134	5,279	3,695	2,39	2,68	2,76	2,84	2,92	2,66
	2	14,425	12,879	11,008	8,146	6,191	4,210	2,63	2,87	3,02	3,18	3,35	3,11
40	7	17,100	16,132	13,556	9,896	7,125	4,703	3,43	3,81	3,92	4,04	4,16	3,83
	15	13,066	11,878	10,329	7,333	5,353	3,587	4,17	4,59	4,77	4,96	5,16	4,70
	20	13,007	11,613	9,678	7,162	5,156	3,145	4,79	5,17	5,28	5,38	5,49	5,05
	25	12,924	11,238	9,772	7,329	5,204	3,278	5,64	5,92	6,10	6,28	6,47	6,02
	30	13,545	11,987	10,245	7,581	5,231	3,243	6,10	6,47	6,53	6,60	6,66	6,00
	35	13,881	12,394	10,503	7,562	5,142	3,240	6,28	6,47	6,53	6,60	6,66	5,93
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	8,566	7,648	6,482	4,602	5,966	/	1,60	1,73	1,78	1,83	1,89	/
	-7	13,413	12,084	10,154	7,006	5,395	/	1,96	2,10	2,14	2,18	2,23	/
	-2	13,932	12,329	10,629	7,865	5,820	/	2,03	2,28	2,35	2,42	2,49	/
	2	15,776	14,085	12,039	8,909	6,771	4,604	2,19	2,39	2,52	2,65	2,79	2,60
45	7	**17,066**	**16,100**	13,529	9,876	7,111	**4,693**	**2,83**	**3,09**	3,18	3,28	3,38	**3,11**
	15	13,520	12,291	10,688	7,588	5,539	3,711	3,41	3,75	3,90	4,06	4,22	3,84
	20	11,942	10,662	8,885	6,575	4,734	2,888	3,85	4,16	4,24	4,32	4,41	4,06
	25	13,379	11,634	10,117	7,588	5,387	3,394	4,46	4,68	4,83	4,97	5,12	4,76
	30	12,946	11,457	9,792	7,246	5,000	3,100	4,02	4,26	4,30	4,34	4,39	3,95
	35	11,844	10,575	8,962	6,452	4,388	2,764	4,70	4,84	4,89	4,94	4,99	4,44
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	10,885	9,806	8,241	5,686	4,378	/	1,85	1,98	2,02	2,06	2,10	/
	-2	11,250	9,956	8,583	6,351	4,700	/	2,04	2,29	2,35	2,42	2,50	/
	2	13,442	12,002	10,258	7,591	5,769	3,923	2,39	2,61	2,74	2,89	3,04	2,83
50	7	12,657	11,941	10,034	7,325	5,274	3,481	2,83	3,14	3,24	3,33	3,43	3,16
	15	9,475	8,614	7,490	5,318	3,882	2,601	3,15	3,47	3,60	3,75	3,90	3,55
	20	9,775	8,728	7,273	5,382	3,875	2,364	3,54	3,82	3,90	3,98	4,06	3,73
	25	10,708	9,311	8,097	6,073	4,312	2,716	4,35	4,57	4,70	4,85	4,99	4,64
	30	10,887	9,635	8,235	6,094	4,205	2,607	4,49	4,76	4,81	4,86	4,90	4,41
	35	10,002	8,930	7,568	5,449	3,705	2,334	4,45	4,58	4,63	4,68	4,72	4,20
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	10,480	9,441	7,934	5,474	4,215	/	1,81	1,94	1,98	2,01	2,06	/
	-2	9,955	8,810	7,595	5,620	4,159	/	1,83	2,05	2,11	2,17	2,24	/
	2	5,494	4,905	4,193	3,103	2,358	/	2,20	2,40	2,53	2,66	2,80	/
55	7	10,237	9,658	8,116	5,924	4,266	/	2,46	2,73	2,81	2,90	2,98	/
	15	7,985	7,259	6,312	4,482	3,272	/	2,64	2,90	3,02	3,14	3,27	/
	20	8,664	7,736	6,446	4,770	3,435	/	3,01	3,25	3,32	3,38	3,45	/
	25	11,100	9,652	8,393	6,295	4,469	/	3,82	4,01	4,13	4,26	4,38	/
	30	9,015	7,978	6,819	5,046	3,482	/	3,13	3,32	3,35	3,38	3,42	/
	35	3,791	3,385	2,868	2,065	1,404	/	3,60	3,71	3,75	3,78	3,82	/
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	/	/	/	/	/	/	/	/	/	/	/	/
	-2	5,877	5,201	4,484	3,318	2,455	/	1,36	1,52	1,57	1,62	1,67	/
	2	6,034	5,388	4,605	3,407	2,590	/	3,89	4,24	4,47	4,70	4,95	/
60	7	6,032	5,691	4,782	3,491	2,513	/	5,95	6,60	6,80	7,01	7,22	/
	15	6,251	5,683	4,942	3,508	2,561	/	3,13	3,44	3,58	3,72	3,87	/
	20	8,633	7,708	6,423	4,753	3,422	/	3,19	3,44	3,51	3,58	3,65	/
	25	8,497	7,389	6,425	4,819	3,421	/	3,12	3,28	3,38	3,48	3,58	/
	30	7,467	6,608	5,648	4,179	2,884	/	2,96	3,14	3,17	3,20	3,24	/
	35	/	/	/	/	/	/	/	/	/	/	/	/

PT = Heating capacity
COP (Coefficient Of Performance) = ratio of the total heating capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 16 - Cooling mode

Tw_out (°C)	Ta (°C)	PF (kW)						EER					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
	45	12,170	11,064	9,220	6,454	4,905	/	3,35	3,55	3,62	3,69	3,77	/
	40	14,740	13,648	11,566	8,212	10,646	/	3,83	4,02	4,14	4,27	4,39	/
	35	15,623	14,333	12,045	8,311	6,399	4,160	4,10	4,22	4,31	4,39	4,48	4,03
	30	17,347	15,915	13,720	10,152	7,513	5,259	5,53	5,86	6,04	6,22	6,41	5,83
	25	17,609	16,457	14,066	10,409	7,911	5,379	6,49	6,69	7,04	7,42	7,81	7,26
22	20	19,474	17,866	15,013	10,960	7,891	5,208	6,57	6,70	6,90	7,11	7,32	6,73
	15	17,622	16,020	13,930	9,891	7,220	4,837	9,76	9,86	10,25	10,66	11,09	10,09
	10	17,712	15,957	13,297	9,840	7,085	4,322	9,87	10,07	10,27	10,48	10,69	9,83
	5	18,145	16,347	14,215	10,661	7,569	4,769	10,42	10,52	10,84	11,16	11,50	10,69
	0	18,051	16,117	13,775	10,194	7,034	4,361	10,85	11,06	11,18	11,29	11,40	10,26
	-5	17,947	15,882	13,460	9,691	6,590	4,152	11,48	11,83	11,95	12,06	12,19	10,84
	45	10,632	9,665	8,055	5,638	4,285	/	2,97	3,15	3,21	3,28	3,34	/
	40	13,027	12,062	10,222	7,258	9,408	/	3,45	3,62	3,73	3,84	3,95	/
	35	**15,400**	**14,800**	12,437	8,582	6,608	**4,295**	**3,86**	**4,05**	4,13	4,21	4,30	**3,87**
	30	16,500	15,138	13,050	9,657	7,146	5,002	4,99	5,29	5,45	5,61	5,78	5,26
	25	17,401	16,263	13,900	10,286	7,817	5,316	5,34	5,50	5,80	6,10	6,43	5,98
18	20	17,849	16,375	13,761	10,045	7,233	4,774	6,13	6,25	6,44	6,63	6,83	6,28
	15	16,290	14,809	12,877	9,143	6,674	4,472	8,91	9,00	9,36	9,73	10,12	9,21
	10	15,884	14,310	11,925	8,824	6,354	3,876	8,62	8,79	8,97	9,15	9,33	8,58
	5	15,985	14,401	12,523	9,392	6,668	4,201	8,53	8,62	8,87	9,14	9,41	8,76
	0	15,993	14,279	12,205	9,031	6,232	3,864	8,87	9,05	9,14	9,23	9,32	8,39
	-5	16,410	14,522	12,307	8,861	6,025	3,796	10,66	10,98	11,09	11,20	11,31	10,06
	45	9,642	8,765	7,305	5,113	3,886	/	2,73	2,90	2,96	3,01	3,08	/
	40	12,940	11,981	10,154	7,209	9,346	/	3,11	3,27	3,36	3,47	3,57	/
	35	15,304	14,040	11,799	8,141	6,269	4,075	3,55	3,66	3,73	3,80	3,88	3,49
	30	16,599	15,228	13,128	9,715	7,189	5,032	3,97	4,21	4,33	4,46	4,60	4,18
	25	16,887	15,782	13,489	9,982	7,586	5,159	4,34	4,47	4,70	4,95	5,22	4,85
15	20	15,962	14,644	12,306	8,983	6,468	4,269	6,37	6,49	6,69	6,89	7,10	6,53
	15	13,283	12,075	10,500	7,455	5,442	3,646	8,72	8,80	9,16	9,52	9,90	9,01
	10	13,470	12,135	10,113	7,483	5,388	3,287	9,08	9,26	9,44	9,63	9,83	9,04
	5	13,211	11,902	10,349	7,762	5,511	3,472	8,27	8,35	8,60	8,86	9,12	8,49
	0	13,496	12,050	10,299	7,621	5,259	3,260	8,78	8,96	9,05	9,14	9,23	8,30
	-5	13,591	12,027	10,193	7,339	4,990	3,144	11,02	11,35	11,47	11,58	11,70	10,41
	45	9,145	8,314	6,928	4,850	3,686	/	2,61	2,77	2,83	2,88	2,94	/
	40	12,291	11,381	9,645	6,848	8,877	/	3,00	3,15	3,24	3,34	3,44	/
	35	14,623	13,416	11,274	7,779	5,990	3,893	3,24	3,34	3,40	3,47	3,54	3,19
	30	17,688	16,228	13,989	10,352	7,661	5,362	3,35	3,55	3,65	3,76	3,88	3,53
	25	15,376	14,370	12,282	9,089	6,907	4,697	4,39	4,52	4,76	5,01	5,28	4,91
13	20	13,616	12,492	10,497	7,663	5,517	3,641	6,51	6,65	6,84	7,05	7,26	6,68
	15	12,190	11,082	9,636	6,842	4,995	3,346	8,07	8,15	8,47	8,81	9,17	8,34
	10	12,154	10,950	9,125	6,752	4,862	2,966	8,61	8,78	8,96	9,13	9,32	8,57
	5	12,213	11,003	9,568	7,176	5,095	3,210	8,44	8,52	8,78	9,04	9,32	8,66
	0	12,327	11,006	9,407	6,961	4,803	2,978	8,66	8,83	8,92	9,01	9,10	8,19
	-5	12,653	11,197	9,489	6,832	4,646	2,927	10,37	10,68	10,79	10,90	11,01	9,80
	45	7,895	7,177	5,981	4,187	3,182	/	2,31	2,45	2,50	2,55	2,60	/
	40	12,500	11,574	9,809	6,964	9,028	/	2,77	2,91	3,00	3,09	3,18	/
	35	14,400	13,211	11,102	7,660	5,898	3,834	2,92	3,01	3,07	3,13	3,19	2,87
	30	17,100	15,688	13,524	10,008	7,406	5,184	3,18	3,37	3,47	3,58	3,69	3,35
	25	15,800	14,766	12,621	9,339	7,098	4,827	4,14	4,27	4,49	4,73	4,98	4,63
10	20	12,259	11,247	9,451	6,899	4,967	3,279	5,97	6,08	6,27	6,46	6,65	6,12
	15	10,959	9,963	8,663	6,151	4,490	3,008	7,28	7,35	7,64	7,95	8,27	7,52
	10	10,965	9,878	8,232	6,092	4,386	2,675	7,33	7,48	7,63	7,78	7,94	7,30
	5	10,976	9,888	8,599	6,449	4,579	2,885	7,38	7,46	7,68	7,91	8,15	7,58
	0	11,119	9,928	8,485	6,279	4,333	2,686	7,80	7,96	8,04	8,12	8,20	7,38
	-5	11,417	10,104	8,562	6,165	4,192	2,641	9,06	9,33	9,43	9,52	9,62	8,56
	45	6,920	6,719	5,599	3,919	2,979	/	1,66	1,76	1,79	1,83	1,86	/
	40	11,762	11,309	9,584	6,805	8,821	/	2,31	2,43	2,50	2,57	2,65	/
	35	**14,317**	**13,700**	11,513	7,944	6,117	**3,976**	**2,58**	**2,66**	2,71	2,77	2,82	**2,54**
	30	16,949	16,219	13,982	10,346	7,656	5,359	2,84	3,01	3,10	3,20	3,29	3,00
	25	15,526	14,901	12,736	9,424	7,162	4,870	3,89	4,00	4,22	4,44	4,68	4,35
7	20	11,684	11,235	9,441	6,892	4,962	3,275	5,21	5,31	5,47	5,64	5,81	5,34
	15	10,782	10,468	9,103	6,463	4,718	3,161	6,71	6,78	7,05	7,33	7,63	6,94
	10	/	/	/	/	/	/	/	/	/	/	/	/
	5	/	/	/	/	/	/	/	/	/	/	/	/
	0	/	/	/	/	/	/	/	/	/	/	/	/
	-5	/	/	/	/	/	/	/	/	/	/	/	/

PF = Cooling mode
ER (Energy Efficiency Ratio) = ratio of the total cooling capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 16T - Heating mode

Tw_out (°C)	Ta (°C)	PT (kW)						COP					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
	-20	7,178	6,525	5,438	3,807	2,893	/	1,99	2,17	2,21	2,26	2,30	/
	-15	8,764	7,825	6,631	4,708	6,104	/	2,33	2,52	2,59	2,67	2,75	/
	-7	13,401	12,073	10,145	7,000	5,390	/	2,83	3,03	3,09	3,16	3,22	/
	-2	14,359	12,707	10,954	8,106	5,999	4,199	3,06	3,43	3,53	3,64	3,75	3,41
	2	14,109	12,597	10,767	7,968	6,055	4,118	3,18	3,46	3,65	3,84	4,05	3,76
30	7	16,834	15,881	13,345	9,742	7,014	4,629	3,91	4,34	4,47	4,60	4,74	4,36
	15	16,678	15,162	13,184	9,361	6,833	4,578	5,65	6,21	6,46	6,72	6,99	6,36
	20	15,381	13,733	11,444	8,469	6,097	3,719	6,87	7,42	7,57	7,72	7,87	7,24
	25	14,068	12,233	10,637	7,978	5,664	3,569	8,27	8,68	8,94	9,21	9,48	8,82
	30	15,527	13,741	11,744	8,691	5,997	3,718	9,55	10,12	10,22	10,33	10,43	9,39
	35	14,981	13,376	11,336	8,162	5,550	3,496	9,26	9,54	9,63	9,73	9,83	8,74
	-20	6,843	6,221	5,184	3,629	2,758	/	1,79	1,95	1,98	2,02	2,07	/
	-15	8,606	7,684	6,512	4,623	5,993	/	2,16	2,34	2,41	2,48	2,55	/
	-7	13,043	11,750	9,874	6,813	5,246	/	2,57	2,75	2,80	2,86	2,92	/
	-2	13,910	12,310	10,612	7,853	5,811	4,068	2,75	3,08	3,17	3,27	3,37	3,06
	2	14,027	12,524	10,704	7,921	6,020	4,094	2,92	3,18	3,35	3,53	3,72	3,46
35	7	**17,000**	**16,300**	13,697	9,999	7,199	**4,752**	**3,75**	**4,20**	4,33	4,46	4,59	**4,22**
	15	15,942	14,493	12,602	8,948	6,532	4,376	4,90	5,39	5,60	5,83	6,06	5,51
	20	14,782	13,198	10,999	8,139	5,860	3,575	5,79	6,25	6,37	6,50	6,63	6,10
	25	13,746	11,953	10,394	7,795	5,535	3,487	6,88	7,22	7,44	7,66	7,89	7,34
	30	15,109	13,371	11,428	8,457	5,835	3,618	7,84	8,32	8,40	8,48	8,57	7,71
	35	14,566	13,005	11,021	7,935	5,396	3,400	7,61	7,84	7,92	8,00	8,08	7,19
	-20	5,679	5,163	4,302	3,012	2,289	/	1,48	1,61	1,64	1,68	1,71	/
	-15	7,723	6,895	5,844	4,149	5,378	/	1,91	2,07	2,13	2,19	2,26	/
	-7	12,795	11,527	9,687	6,684	5,147	/	2,36	2,53	2,58	2,63	2,68	/
	-2	13,856	12,950	11,164	8,261	6,113	4,279	2,48	2,78	2,87	2,95	3,04	2,77
	2	13,970	13,407	11,459	8,479	6,444	4,382	2,65	2,89	3,04	3,20	3,37	3,14
40	7	16,783	16,215	13,626	9,947	7,162	4,727	3,44	3,82	3,93	4,05	4,17	3,84
	15	12,761	12,153	10,568	7,503	5,477	3,670	4,22	4,65	4,83	5,02	5,23	4,76
	20	11,749	11,243	9,369	6,933	4,992	3,045	4,96	5,36	5,46	5,57	5,69	5,23
	25	12,050	11,509	10,008	7,506	5,329	3,357	5,88	6,17	6,35	6,55	6,74	6,27
	30	12,632	12,076	10,321	7,638	5,270	3,267	6,22	6,59	6,66	6,72	6,79	6,11
	35	11,180	9,982	8,459	6,091	4,142	2,609	6,56	6,76	6,83	6,90	6,97	6,20
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	7,523	6,717	5,692	4,041	5,239	/	1,53	1,65	1,70	1,75	1,80	/
	-7	12,595	11,347	9,535	6,579	5,066	/	1,89	2,02	2,06	2,10	2,14	/
	-2	13,756	12,785	11,021	8,156	6,035	/	2,05	2,29	2,36	2,43	2,50	/
	2	13,870	13,311	11,377	8,419	6,398	4,351	2,18	2,37	2,50	2,63	2,77	2,58
45	7	**16,583**	**16,100**	13,529	9,876	7,111	**4,693**	**2,82**	**3,07**	3,16	3,26	3,35	**3,09**
	15	12,561	12,078	10,503	7,457	5,443	3,647	3,40	3,74	3,89	4,04	4,20	3,83
	20	11,649	11,180	9,316	6,894	4,964	3,028	4,04	4,36	4,45	4,54	4,63	4,26
	25	11,950	11,413	9,925	7,443	5,285	3,329	4,51	4,73	4,88	5,02	5,17	4,81
	30	12,532	11,980	10,240	7,577	5,228	3,242	4,77	5,06	5,11	5,16	5,21	4,69
	35	11,080	9,893	8,384	6,036	4,105	2,586	4,78	4,92	4,97	5,02	5,07	4,51
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	11,458	10,323	8,674	5,985	4,609	/	1,95	2,08	2,12	2,17	2,21	/
	-2	12,160	10,761	9,277	6,865	5,080	/	2,04	2,28	2,35	2,42	2,49	/
	2	13,189	11,776	10,065	7,448	5,660	3,849	2,30	2,51	2,64	2,78	2,93	2,73
50	7	12,222	11,530	9,689	7,073	5,093	3,361	2,83	3,15	3,24	3,34	3,44	3,16
	15	9,426	8,569	7,451	5,290	3,862	2,588	3,25	3,58	3,72	3,87	4,02	3,66
	20	8,953	7,994	6,661	4,929	3,549	2,165	3,41	3,68	3,75	3,83	3,90	3,59
	25	10,155	8,830	7,679	5,759	4,089	2,576	4,34	4,56	4,69	4,83	4,98	4,63
	30	11,003	9,737	8,322	6,159	4,249	2,635	4,73	5,02	5,07	5,12	5,17	4,65
	35	10,204	9,111	7,721	5,559	3,780	2,382	4,43	4,57	4,61	4,66	4,70	4,19
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	10,550	9,505	7,987	5,511	4,243	/	1,85	1,98	2,02	2,06	2,10	/
	-2	10,525	9,314	8,029	5,942	4,397	/	1,80	2,01	2,07	2,14	2,20	/
	2	11,697	10,444	8,926	6,605	5,020	/	2,12	2,32	2,44	2,57	2,70	/
55	7	9,031	8,520	7,160	5,226	3,763	/	2,35	2,61	2,69	2,77	2,85	/
	15	8,552	7,775	6,760	4,800	3,504	/	2,93	3,22	3,35	3,48	3,62	/
	20	8,174	7,298	6,082	4,501	3,240	/	2,98	3,22	3,29	3,35	3,42	/
	25	9,878	8,590	7,469	5,602	3,977	/	3,58	3,76	3,87	3,98	4,10	/
	30	10,495	9,288	7,938	5,874	4,053	/	4,03	4,27	4,31	4,35	4,40	/
	35	8,441	7,537	6,387	4,599	3,127	/	3,29	3,39	3,42	3,45	3,49	/
	-20	/	/	/	/	/	/	/	/	/	/	/	/
	-15	/	/	/	/	/	/	/	/	/	/	/	/
	-7	/	/	/	/	/	/	/	/	/	/	/	/
	-2	8,667	7,670	6,612	4,893	3,621	/	1,74	1,95	2,01	2,07	2,13	/
	2	5,895	5,263	4,499	3,329	2,530	/	1,71	1,87	1,97	2,07	2,18	/
60	7	5,594	5,277	4,435	3,237	2,331	/	1,89	2,10	2,16	2,22	2,29	/
	15	5,839	5,308	4,616	3,277	2,392	/	1,95	2,14	2,23	2,32	2,41	/
	20	6,431	5,742	4,785	3,541	2,549	/	2,14	2,31	2,35	2,40	2,45	/
	25	2,933	2,550	2,218	1,663	1,181	/	1,62	1,70	1,75	1,80	1,85	/
	30	8,465	7,491	6,403	4,738	3,269	/	2,87	3,04	3,07	3,10	3,13	/
	35	/	/	/	/	/	/	/	/	/	/	/	/

PT = Heating capacity
COP (Coefficient Of Performance) = ratio of the total heating capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

Mod. 16T - Cooling mode

Tw_out (°C)	Ta (°C)	PF (kW)						EER					
		130%	**100%**	90%	70%	50%	30%	130%	**100%**	90%	70%	50%	30%
	45	12,170	11,064	9,220	6,454	4,905	/	3,35	3,55	3,62	3,69	3,77	/
	40	14,740	13,648	11,566	8,212	10,646	/	3,83	4,02	4,14	4,27	4,39	/
	35	15,623	14,333	12,045	8,311	6,399	4,160	4,10	4,22	4,31	4,39	4,48	4,03
	30	17,347	15,915	13,720	10,152	7,513	5,259	5,53	5,86	6,04	6,22	6,41	5,83
	25	17,609	16,457	14,066	10,409	7,911	5,379	6,49	6,69	7,04	7,42	7,81	7,26
22	20	19,474	17,866	15,013	10,960	7,891	5,208	6,57	6,70	6,90	7,11	7,32	6,73
	15	17,622	16,020	13,930	9,891	7,220	4,837	9,76	9,86	10,25	10,66	11,09	10,09
	10	17,712	15,957	13,297	9,840	7,085	4,322	9,87	10,07	10,27	10,48	10,69	9,83
	5	18,145	16,347	14,215	10,661	7,569	4,769	10,42	10,52	10,84	11,16	11,50	10,69
	0	18,051	16,117	13,775	10,194	7,034	4,361	10,85	11,06	11,18	11,29	11,40	10,26
	-5	17,947	15,882	13,460	9,691	6,590	4,152	11,48	11,83	11,95	12,06	12,19	10,84
	45	10,632	9,665	8,055	5,638	4,285	/	2,97	3,15	3,21	3,28	3,34	/
	40	13,027	12,062	10,222	7,258	9,408	/	3,45	3,62	3,73	3,84	3,95	/
	35	**15,400**	**15,100**	12,689	8,755	6,742	**4,382**	**3,86**	**4,00**	4,08	4,16	4,24	**3,82**
	30	16,500	15,138	13,050	9,657	7,146	5,002	4,99	5,29	5,45	5,61	5,78	5,26
	25	17,401	16,263	13,900	10,286	7,817	5,316	5,34	5,50	5,80	6,10	6,43	5,98
18	20	17,849	16,375	13,761	10,045	7,233	4,774	6,13	6,25	6,44	6,63	6,83	6,28
	15	16,290	14,809	12,877	9,143	6,674	4,472	8,91	9,00	9,36	9,73	10,12	9,21
	10	15,884	14,310	11,925	8,824	6,354	3,876	8,62	8,79	8,97	9,15	9,33	8,58
	5	15,985	14,401	12,523	9,392	6,668	4,201	8,53	8,62	8,87	9,14	9,41	8,76
	0	15,993	14,279	12,205	9,031	6,232	3,864	8,87	9,05	9,14	9,23	9,32	8,39
	-5	16,410	14,522	12,307	8,861	6,025	3,796	10,66	10,98	11,09	11,20	11,31	10,06
	45	9,642	8,765	7,305	5,113	3,886	/	2,73	2,90	2,96	3,01	3,08	/
	40	12,940	11,981	10,154	7,209	9,346	/	3,11	3,27	3,36	3,47	3,57	/
	35	15,304	14,040	11,799	8,141	6,269	4,075	3,55	3,66	3,73	3,80	3,88	3,49
	30	16,599	15,228	13,128	9,715	7,189	5,032	3,97	4,21	4,33	4,46	4,60	4,18
	25	16,887	15,782	13,489	9,982	7,586	5,159	4,34	4,47	4,70	4,95	5,22	4,85
15	20	15,962	14,644	12,306	8,983	6,468	4,269	6,37	6,49	6,69	6,89	7,10	6,53
	15	13,283	12,075	10,500	7,455	5,442	3,646	8,72	8,80	9,16	9,52	9,90	9,01
	10	13,470	12,135	10,113	7,483	5,388	3,287	9,08	9,26	9,44	9,63	9,83	9,04
	5	13,211	11,902	10,349	7,762	5,511	3,472	8,27	8,35	8,60	8,86	9,12	8,49
	0	13,496	12,050	10,299	7,621	5,259	3,260	8,78	8,96	9,05	9,14	9,23	8,30
	-5	13,591	12,027	10,193	7,339	4,990	3,144	11,02	11,35	11,47	11,58	11,70	10,41
	45	9,145	8,314	6,928	4,850	3,686	/	2,61	2,77	2,83	2,88	2,94	/
	40	13,291	12,306	10,429	7,405	9,599	/	3,00	3,15	3,24	3,34	3,44	/
	35	16,023	15,407	12,947	8,933	6,879	4,471	3,24	3,34	3,40	3,47	3,54	3,19
	30	17,688	17,008	14,662	10,850	8,029	5,620	3,35	3,55	3,65	3,76	3,88	3,53
	25	15,376	14,785	12,636	9,351	7,107	4,833	4,39	4,52	4,76	5,01	5,28	4,91
13	20	13,616	13,092	11,002	8,031	5,783	3,817	6,51	6,65	6,84	7,05	7,26	6,68
	15	12,190	11,082	9,636	6,842	4,995	3,346	8,07	8,15	8,47	8,81	9,17	8,34
	10	12,154	10,950	9,125	6,752	4,862	2,966	8,61	8,78	8,96	9,13	9,32	8,57
	5	12,213	11,003	9,568	7,176	5,095	3,210	8,44	8,52	8,78	9,04	9,32	8,66
	0	12,327	11,006	9,407	6,961	4,803	2,978	8,66	8,83	8,92	9,01	9,10	8,19
	-5	12,653	11,197	9,489	6,832	4,646	2,927	10,37	10,68	10,79	10,90	11,01	9,80
	45	7,895	7,177	5,981	4,187	3,182	/	2,31	2,45	2,50	2,55	2,60	/
	40	12,103	11,728	9,939	7,057	9,148	/	2,77	2,91	3,00	3,09	3,18	/
	35	15,959	15,419	12,957	8,941	6,884	4,475	2,92	3,01	3,07	3,13	3,19	2,87
	30	17,387	16,782	14,468	10,706	7,922	5,546	3,18	3,37	3,47	3,58	3,69	3,35
	25	14,732	14,165	12,107	8,959	6,809	4,630	4,14	4,27	4,49	4,73	4,98	4,63
10	20	12,374	11,898	9,999	7,299	5,255	3,469	5,97	6,08	6,27	6,46	6,65	6,12
	15	11,468	11,027	9,589	6,808	4,970	3,330	7,28	7,35	7,64	7,95	8,27	7,52
	10	10,965	9,878	8,232	6,092	4,386	2,675	7,33	7,48	7,63	7,78	7,94	7,30
	5	10,976	9,888	8,599	6,449	4,579	2,885	7,38	7,46	7,68	7,91	8,15	7,58
	0	11,119	9,928	8,485	6,279	4,333	2,686	7,80	7,96	8,04	8,12	8,20	7,38
	-5	11,417	10,104	8,562	6,165	4,192	2,641	9,06	9,33	9,43	9,52	9,62	8,56
	45	7,161	6,886	5,738	4,017	3,053	/	1,48	1,57	1,60	1,64	1,67	/
	40	11,903	11,590	9,822	6,974	9,040	/	2,07	2,17	2,24	2,30	2,37	/
	35	**15,759**	**15,300**	12,857	8,871	6,831	**4,440**	**2,31**	**2,38**	2,43	2,48	2,53	**2,27**
	30	17,287	16,622	14,329	10,603	7,847	5,493	2,54	2,70	2,78	2,86	2,94	2,68
	25	14,532	14,081	12,035	8,906	6,769	4,603	3,48	3,58	3,77	3,97	4,18	3,89
7	20	11,974	11,514	9,675	7,063	5,085	3,356	4,66	4,75	4,90	5,04	5,19	4,78
	15	11,168	10,728	9,329	6,624	4,835	3,240	6,01	6,07	6,31	6,56	6,83	6,21
	10	/	/	/	/	/	/	/	/	/	/	/	/
	5	/	/	/	/	/	/	/	/	/	/	/	/
	0	/	/	/	/	/	/	/	/	/	/	/	/
	-5	/	/	/	/	/	/	/	/	/	/	/	/

PF = Cooling mode
ER (Energy Efficiency Ratio) = ratio of the total cooling capacity to the effective power input of the unit

Tw_out = Plant outlet water temperature °C
Ta : Source inlet air temperature °C

WATER PUMP WORKING HEAD

Setting the pump speed



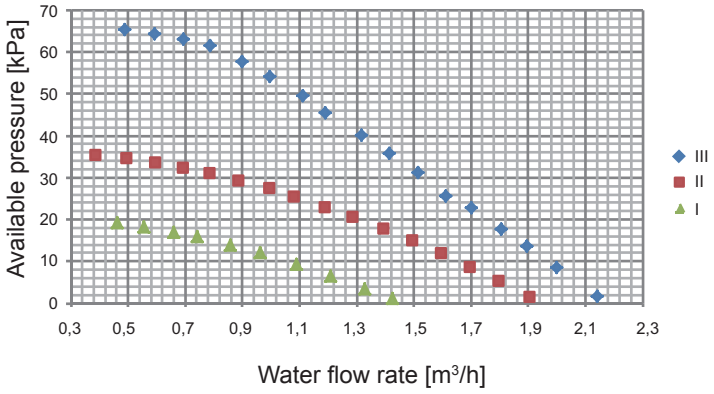
The pump speed can be selected by adjusting the red knob on the pump. The notch point indicates pump speed.

The default setting is the highest speed (III).

If the water flow in the system is too high the speed can be set to low (I).

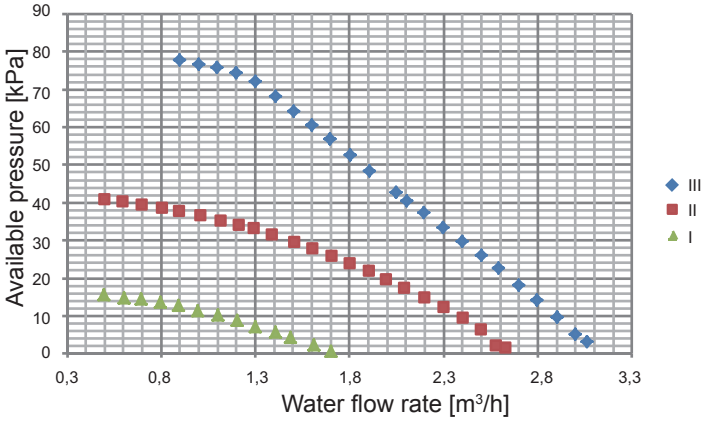
The available external static pressure for the plant function for water flow is shown in the graph below.

Constant speed I II III



Mod. 5-7-9

Constant speed I II III



Mod. 10-12-12T-14T-14T-16T

Pump LED diagnosis and solutions

The pump has an LED operating status display. This makes it easy for the technician to search for the cause of a fault in the heating system.

1. If the LED display lights up continuously green, it means the pump is running normally.

2. If the LED display is flashing green, it means the pump is running the venting function. The pump runs during the 10 minute venting function. After its cycle, the installer needs to adjust the targeted performance.

3. If the LED is flashing green/red, it means that the pump has stopped operating due to an external reason. The pump will restart by itself after the abnormal situation disappears. The probable reason causing the problem is pump undervoltage or overvoltage (U<160V or U>280V), and you should check the voltage supply. Another reason is module overheating, and you should check the water and ambient temperatures.

4. If the LED is flashing red, it means the pump has stopped operating, and a serious fault has happened (e.g. pump blocked). The pump cannot restart itself due to a permanent failure and the pump should be changed.

5. If the LED does not light up, it means no power supply to the pump, possibly the pump is not connected to power supply. Check the cable connection. If the pump is still running, it means the LED is damaged. Or the electronics are damaged and the pump should be changed.

Failure diagnosis at the moment of first installation

■ If nothing is displayed on the user interface, it is necessary to check for any of the following abnormalities before diagnosing possible error codes.

■ Disconnection or wiring error (between power supply and unit and between unit and user interface).

■ The fuse on the PCB may have blown.

■ If the user interface shows "E8"or"E0" as an error code, there is a possibility that there is air in the system, or the water level in the system is less than the required minimum.

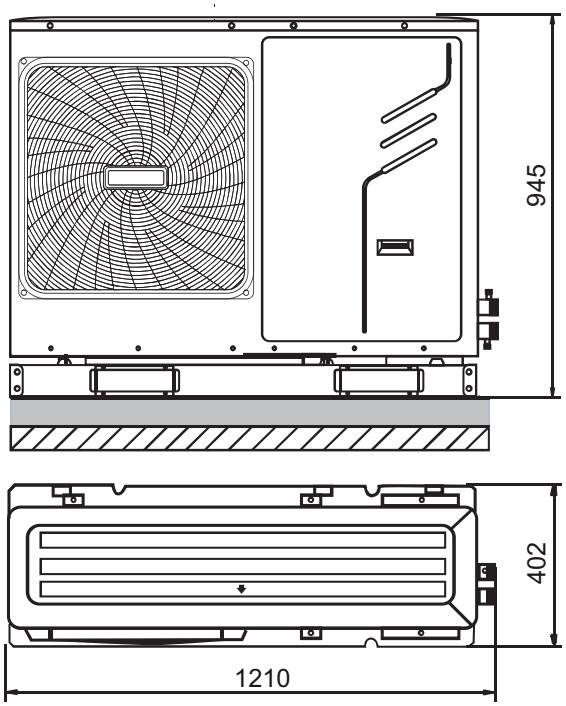
■ If the error code E2 is displayed on the user interface, check the wiring between the user interface and unit.

More error code and failure causes can be found in 13.3 Error codes.

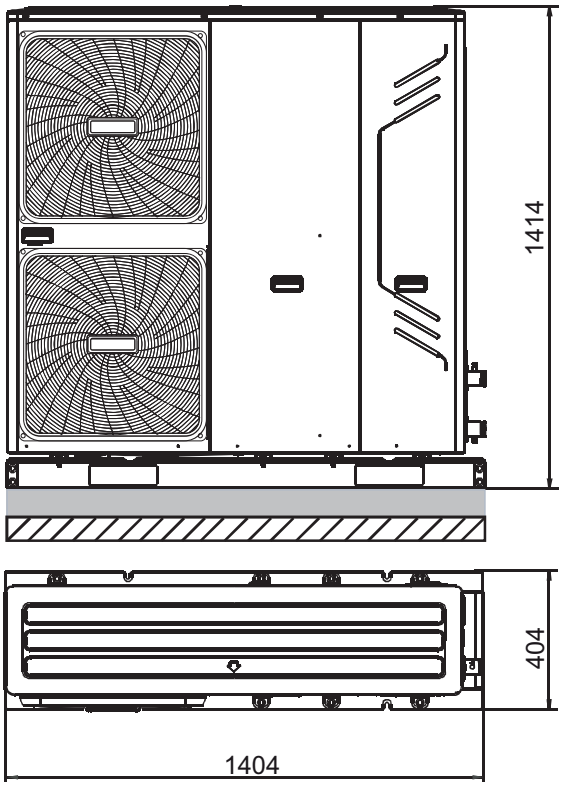
DIMENSIONAL AND PHYSICAL DATA

Dimensional data base version

Mod. 5 - 7 - 9



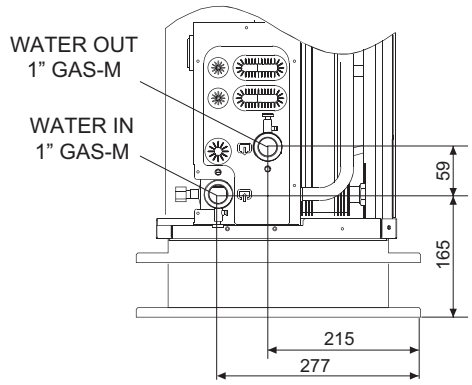
Mod. 10-12-12T-14-14T-16-16T



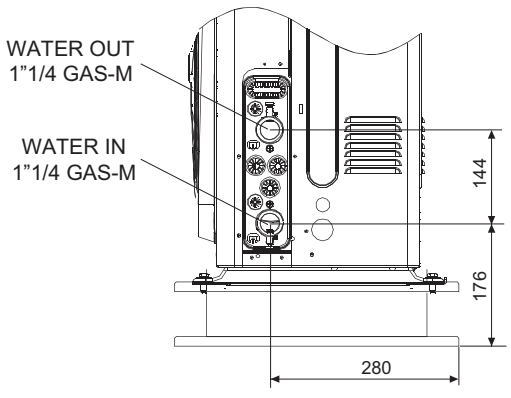
Models	5	7	9	10	12	12T	14	14T	16	16T	UM
Packaging (W×D×H)	1500x1140x450			1475x1580x440							mm
Weight Net \ Gross	99 / 117	99 / 117	99 / 117	162 / 178	162 / 178	177 / 193	162 / 178	177 / 193	162 / 178	177 / 193	kg

Hydraulic connections base version

Mod. 5 - 7 - 9



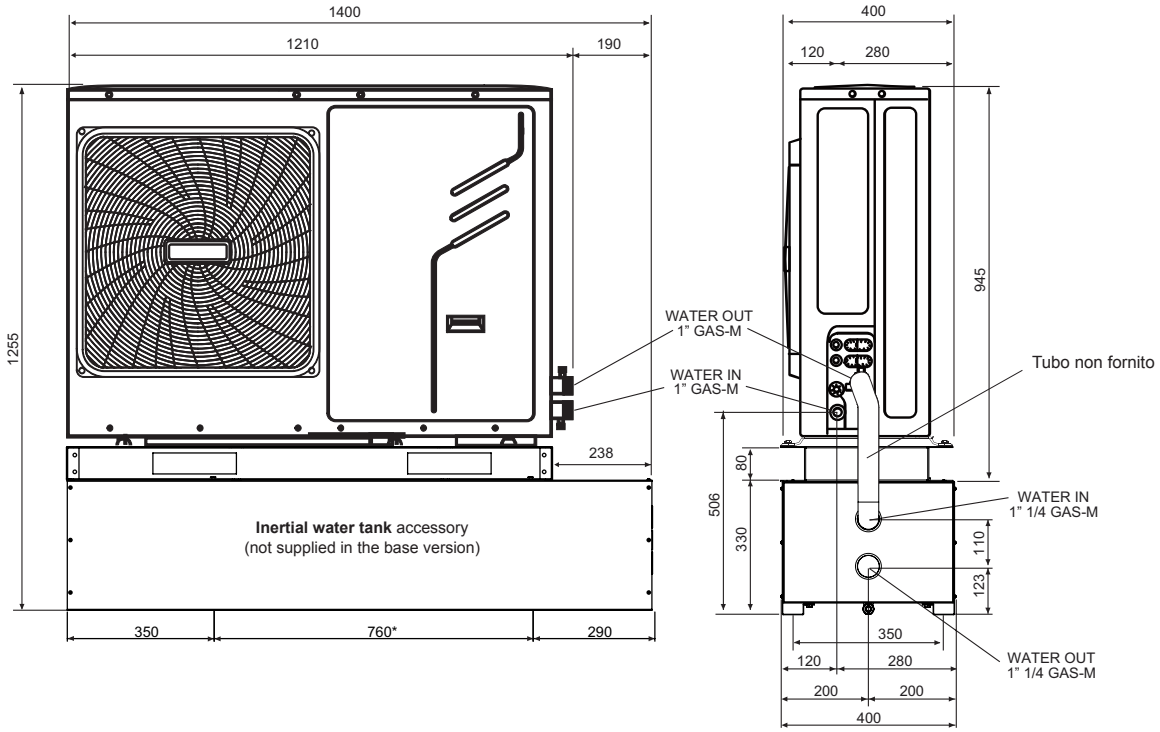
Mod. 10 - 12 - 12T - 14 - 14T - 16 - 16T



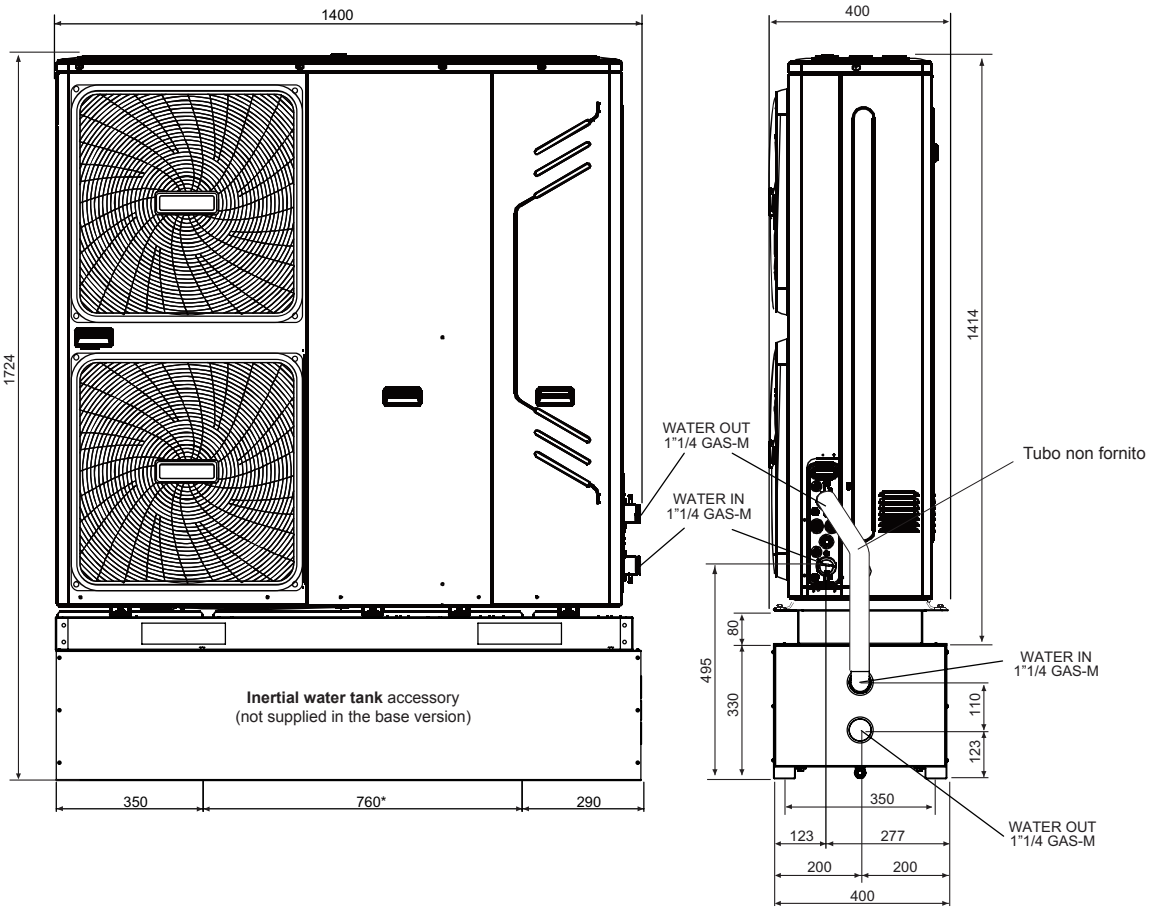
DIMENSIONAL AND PHYSICAL DATA

Dimensional data base version + "Inertial water tank" accessory

Mod. 5 - 7 - 9



Mod. 10 - 12 - 12T - 14 - 14T - 16 - 16T



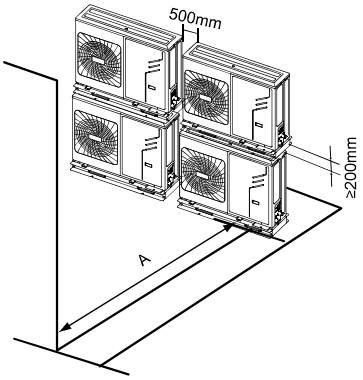
DIMENSIONAL AND PHYSICAL DATA

Minimum operating area

To correctly install the unit, comply with the measurements for the free area that must be left around the unit, as shown in the drawing.

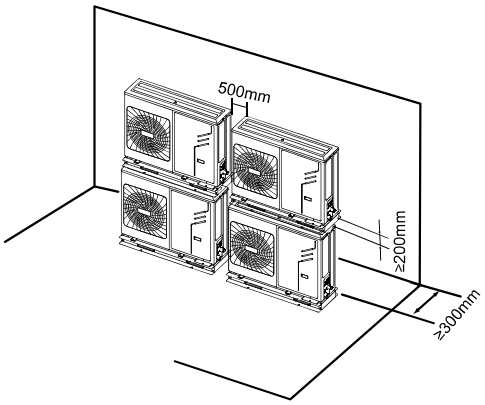
(A) In case of stacked installation

1. In case obstacles exist in front of the outlet side.



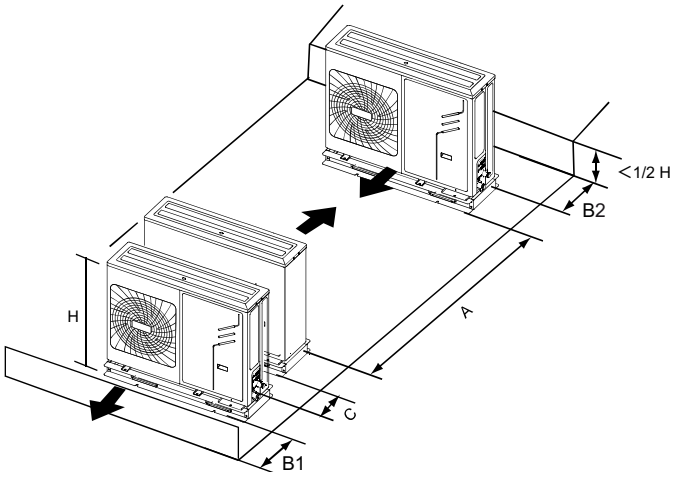
Unit	A (mm)
5 - 7 - 9	1000
10 - 12 - 12T - 14 - 14T - 16 - 16T	1500

2. In case obstacles exist in front of the air inlet.



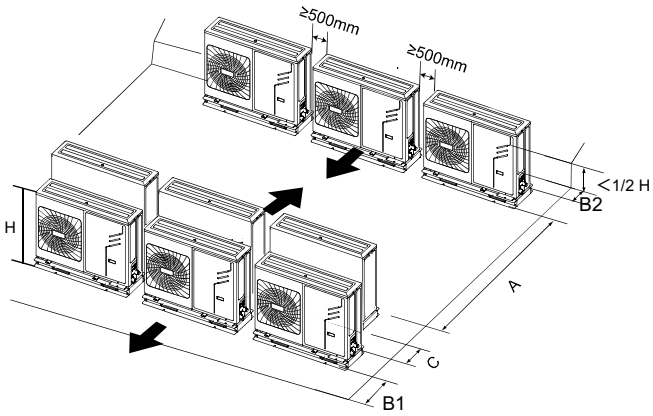
(B) In case of multiple-row installation (for roof top use, etc.)

1. In case of installing one unit per row.



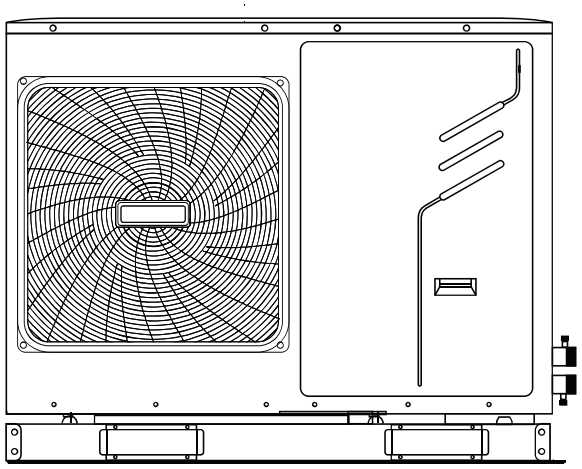
Unit	A (mm)	B1 (mm)	B2 (mm)	C (mm)
5 - 7 - 9	1500	500	300	300
10 - 12 - 12T - 14 - 14T - 16 - 16T	2000	1000	300	300

2. In case of installing multiple units (2 units or more) in lateral connection per row.



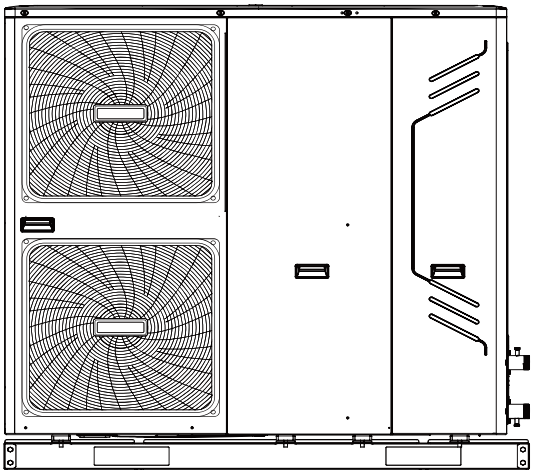
Unit	A (mm)	B1 (mm)	B2 (mm)	C (mm)
5 - 7 - 9	2000	500	300	300
10 - 12 - 12T - 14 - 14T - 16 - 16T	2500	1000	300	300

Fig.1

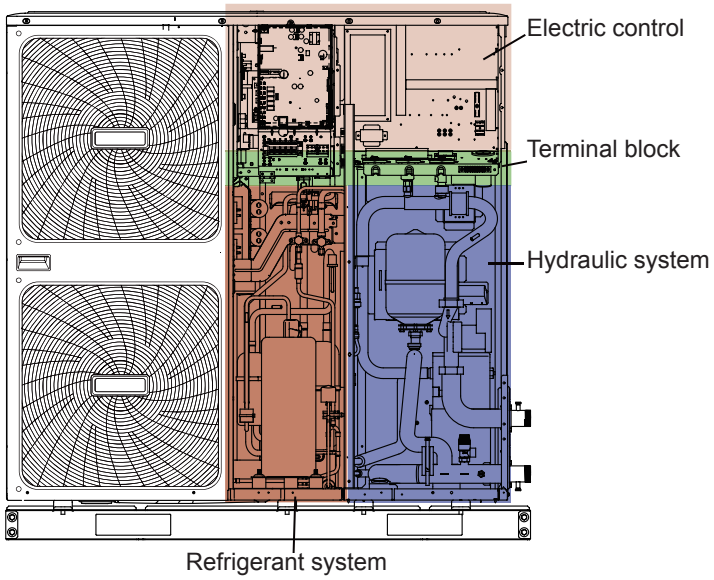


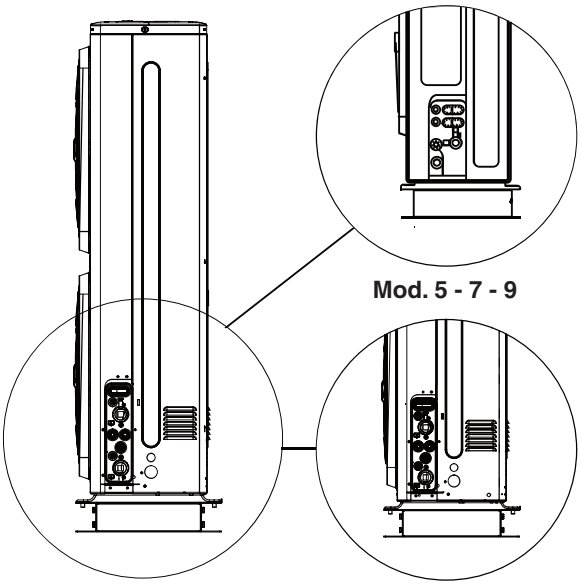
Mod. 5 - 7 - 9

Fig.2



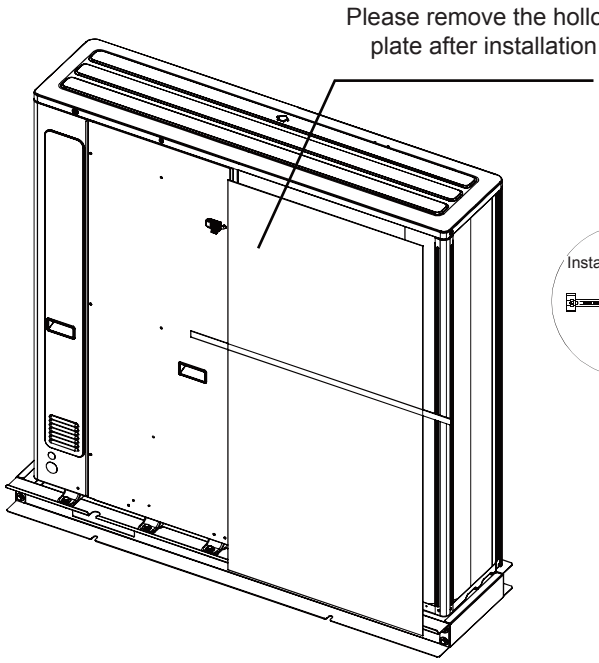
Mod. 10-12-12T-14-14T-16-16T

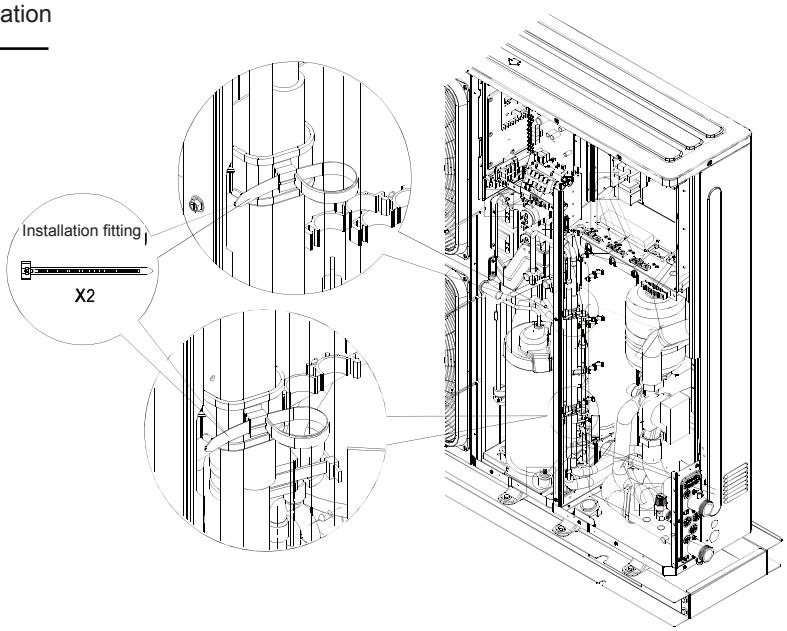




Mod. 5 - 7 - 9

Mod. 10-12-12T-14-14T-16-16T





RECEPTION AND POSITIONING

Storage
The units must be stored in a dry place, sheltered from the sun, rain, sand and wind.
Comply with the storage conditions given below:
• Do not stack the units
• Maximum temperature = 60°C
• Minimum temperature = -10°C
• Humidity = 90%
• Avoid placing the units packaged with thermoretractable protection under the sun since the pressure inside the refrigerant circuits can increase up to values such as to open the safety valve.

Packing removing
Recycle and dispose of packing material in conformity with local regulations, be extremely careful not to damage the unit.

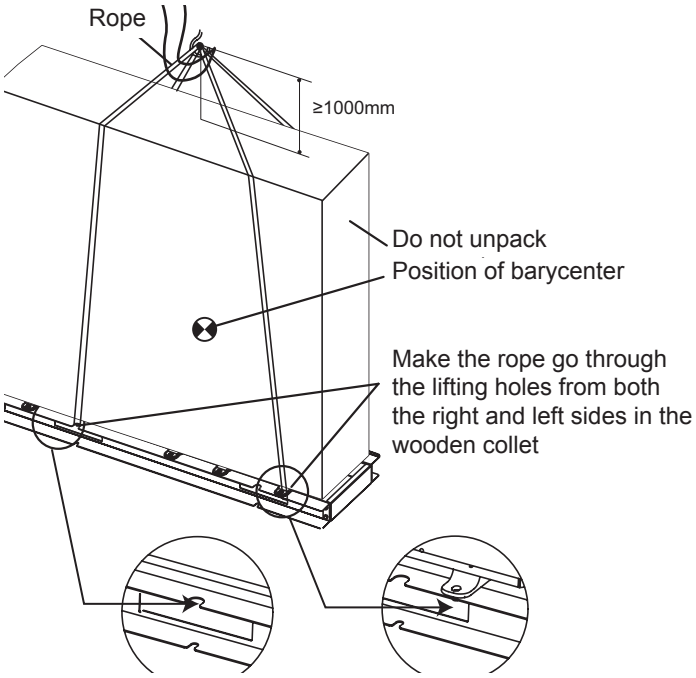
Inspections on arrival
As soon as the appliance is consigned, it is essential to make sure that all the ordered items have been received and that the shipment is complete. Carefully check that the equipment has not been damaged. If visible damage is discovered, immediately inform the haulage contractor and write “Collected with reserves owing to evident damage” on the consignment note.
Delivery ex works means that, as established by law, reimbursement of any damages is at the insurance company’s charge.

Before installation

Be sure to confirm the model name and the serial number of the unit.

Handling

Due to relatively large dimensions and heavy weight, the unit should only be handled using lifting tools with slings. The slings can be fitted into foreseen sleeves at the base frame that are made specifically for this purpose.



CAUTION

■ To avoid injury, do not touch the aluminum fins of the unit.

■ Do not use the grips in the fan grills to avoid damage.



■ The unit is top heavy! Prevent the unit from falling due to improper inclination during handling.

RECEPTION AND POSITIONING

Selecting the installation site

Select an installation site where the following conditions are satisfied and one that meets with your customer's approval.

- Places that are well-ventilated.
- Places where the unit does not disturb next-door neighbors.
- Safe places which can bear the unit's weight and vibration and where the unit can be installed at an even level.
- Places where there is no possibility of flammable gas or product leak.
- The equipment is not intended for use in a potentially explosive atmosphere.
- Places where servicing space can be well ensured.
- Places where the units' piping and wiring lengths come within the allowable ranges.
- Places where water leaking from the unit cannot cause damage to the location (e.g. in case of a blocked drain pipe).
- Places where rain can be avoided as much as possible.
- Do not install the unit in places often used as a work space. In case of construction work (e.g. grinding etc.) where a lot of dust is created, the unit must be covered.
- Do not place any objects or equipment on top of the unit (top plate)
- Do not climb, sit or stand on top of the unit.
- Be sure that sufficient precautions are taken in case of refrigerant leakage according to relevant local laws and regulations.

WARNING

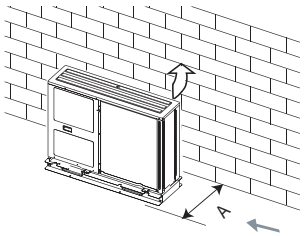
■ Be sure to provide for adequate measures in order to prevent that the unit be used as a shelter by small animals. Small animals making contact with electrical parts can cause malfunctions, smoke or fire. Please instruct the customer to keep the area around the unit clean.

■ When installing the unit in a place exposed to strong wind, pay special attention to the following.

Strong winds of 5 m/sec or more blowing against the unit's air outlet causes a short circuit (suction of discharge air), and this may have the following consequences:

- Deterioration of the operational capacity.
- Frequent frost acceleration in heating operation.
- Disruption of operation due to rise of high pressure.
- When a strong wind blows continuously on the front of the unit, the fan can start rotating very fast until it breaks.

Refer to the figures for installation of this unit in a place where the wind direction can be foreseen.



Unit	A (mm)
5 - 7 - 9	1000
10 - 12 - 12T - 14 - 14T - 16 - 16T	1500

■ Turn the air outlet side toward the building's wall, fence or screen.

Make sure there is enough room to do the installation

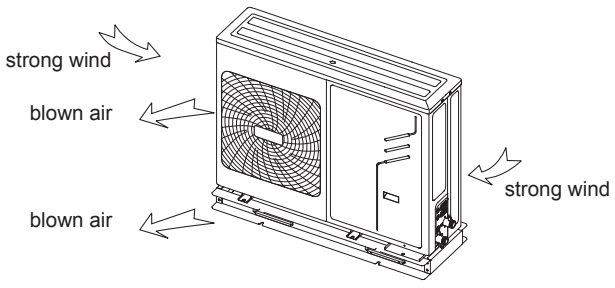
■ Set the outlet side at a right angle to the direction of the wind.

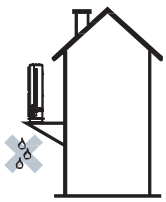
■ Prepare a water drainage channel around the foundation, to drain waste water from around the unit.

■ If water does not easily drain from the unit, mount the unit on a foundation of concrete blocks, etc. (the height of the foundation should be about 100 mm.

■ If you install the unit on a frame, please install a waterproof plate (about 100 mm) on the underside of the unit to prevent water from coming in from the low side.

■ When installing the unit in a place frequently exposed to snow, pay special attention to elevate the foundation as high as possible.





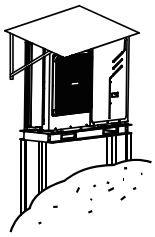
■ In heavy snowfall areas it is very important to select an installation site where the snow will not affect the unit. If lateral snowfall is possible, make sure that the heat exchanger coil is not affected by the snow (if necessary construct a lateral canopy).

■ As the outdoor temperature is measured via the outdoor unit air thermistor, make sure to install the outdoor unit in the shade, or a canopy should be constracted to avoid direct sunlight, so that it is not influenced by the sun’s heat, otherwise protection may be possible to the unit.

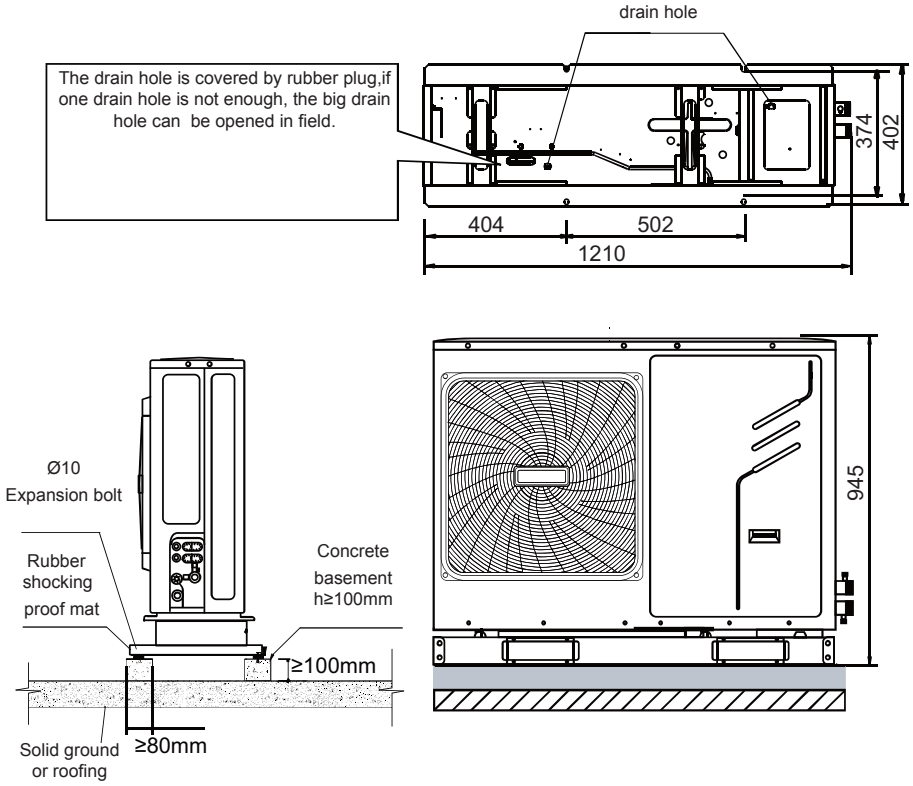
■ Check the strength and level of the installation ground so that the unit will not cause any operating vibration or noise after installation.

■ In accordance with the foundation drawing in the figure, fix the unit securely by means of the foundation bolts. (Prepare four sets each of Ø10 Expansion bolts, nuts and washers which are readily available on the market.)

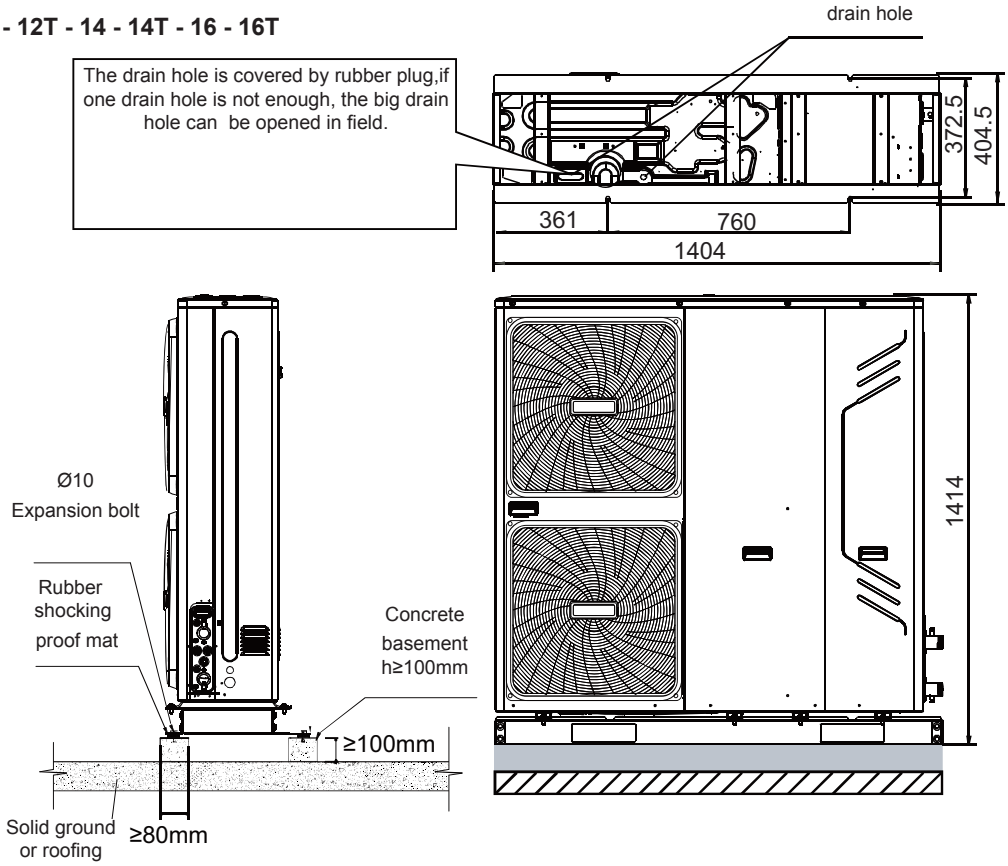
■ It is best to screw in the foundation bolts until their length is 20 mm from the foundation surface.



Mod. 5 - 7 - 9



Mod. 10 - 12 - 12T - 14 - 14T - 16 - 16T



NOTE

If drain holes in the unit are covered by a mounting base or by floor surface, raise the unit in order to provide a free space of more than 100 mm under the unit.

HYDRAULIC CONNECTIONS

Tips for a successful installation

For a correct design and installation of the hydraulic plant comply the local laws governing safety matters and sound.
The following information is suggestion for a correct installation of the unit:
• Before connecting the unit to the system wash adequately the pipes using clean water, filling and emptying and cleaning the filters. Only after that proceed connecting the unit to the system; this operation is crucial to ensure proper start-up without the need to have repeated stops to clean the filter, with the possible risk of damage to heat exchangers and other components.
• Check by qualified personnel the quality of the water or of the mixture used; avoid the presence of inorganic salts, biological load (seaweeds, etc.) suspended solids, dissolved oxygen and the pH. Water with inadequate characteristics can cause a pressure drop increase due to a rapid fouling of the filter, energy efficiency decrease and corrosive symptom increase that can damage the unit.
• The pipes must have the least possible number of bends to minimize load losses and must be adequately supported in order to prevent the connections of the unit from being excessively stressed.
• Install on-off valves near components that need to be serviced to isolate them when maintenance work needs to be done and to allow them to be replaced without having to discharge the system.
• Before isolating the pipes and charging the system, carry out preliminary inspections to make sure that there are no leaks.
• Isolate all the chilled water pipes to prevent condensation from forming along the pipes themselves. Make sure that the material used is the steam barrier type, failing this, cover the insulation with an appropriate protection. Also make sure that the air venting valves can be accessed through the insulation.
• It is recommended to use flexible couplings before and after the water circulation pump and near the unit.
• Avoid that the weight of the connection pipes pushes on the hydraulic connections of the unit using approved supports.
• Always use materials that are compatible with the water used in the system and with the materials used in the unit.
• Ensure that components installed in the field piping can withstand the water pressure and temperature.
• Drain taps must be provided at all low points of the system to permit complete drainage of the circuit during maintenance.
• Air vents must be provided at all high points of the system. The vents should be located at points that are easily accessible for servicing. An automatic air purge is provided inside the unit. Check that this air purge valve is not tightened too much so that automatic release of air in the water circuit remains possible.

Water filter

It is mandatory to install at the inlet of the unit the Y-shape water filter (supplied with the unit).

Water component for corrosion limit

To avoid corrosion problems in water exchangers make sure that the water used in the plant meets the requirements listed in the table.

pH	7.5 ÷ 9.0	-
SO4 --	< 100	ppm
HCO3 -/ SO4 --	>1.0	
Total hardness	8.0 ÷ 15.2	°F
Cl-	< 50	ppm
PO4 3-	< 2.0	ppm
NH3	< 0.5	ppm

Free Chlorine	< 0.5	ppm
Fe3+	< 0.5	ppm
Mn++	< 0.05	ppm
CO2	< 50	ppm
H2S	< 50	ppb
Temperature	< 65	°C
Oxygen content	< 0.1	ppm

Water pipework

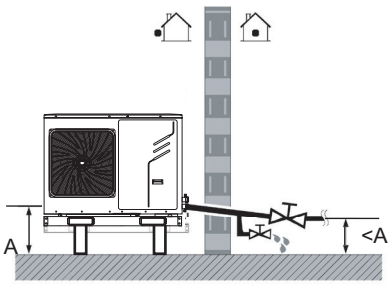
All piping lengths and distances have been taken into consideration.

Requirements
The maximum allowed thermistor cable length is 20m. This is the maximum allowable distance between the domestic hot water tank and the unit (only for installations with a domestic hot water tank).The thermistor cable supplied with the domestic hot water tank is 10m in length. In order to optimize efficiency we recommend installingthe 3-way valve and the domestic hot water tank as close as possible to the unit

NOTE

■ If the installation is equipped with a domestic hot water tank (optional), please refer to the domestic hot water tank Installation & Owner's Manual.

■ If there is no glycol (anti-freeze) in the system there is a power supply or pump failure, drain the system (as shown in the figure below).



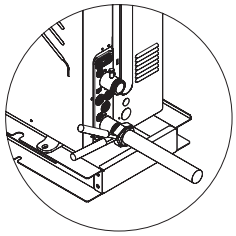
HYDRAULIC CONNECTIONS

The unit is only to be used in a closed water system. Application in an open water circuit can lead to excessive corrosion of the water piping.

Water connections must be made in accordance with the outlook diagram delivered with the unit, with respect to the water intake and water outlet (refer to section "DIMENSIONAL AND PHYSICAL DATA").

If air, moisture or dust gets in the water circuit, problems may occur. Therefore, always take into account the following when connecting the water circuit:

- Use clean pipes only.
- Hold the pipe end downwards when removing burrs
- Cover the pipe end when inserting it through a wall so that no dust and dirt enter.
- Use a good thread sealant for sealing the connections. The sealing must be able to withstand the pressures and temperatures of the system.
- When using non-brass metallic piping,make sure to insulate both materials from each other to prevent galvanic corrosion. Never use Zn-coated parts in the water circuit. Excessive corrosion of these parts may occur as copper piping is used in the unit's internal water circuit.
- Because brass is a soft material, use appropriate tools for connecting the water circuit. Inappropriate tools will cause damage to the pipes.



Be careful not to deform the unit's piping by using excessive force when connecting the piping. Deforming the piping can cause the unit to malfunction.

- When using a 3-way valve in the water circuit. Preferably choose a ball type 3-way valve to guarantee full separation between the domestic hot water and floor heating water circuit.
- When using a 3-way valve or a 2-way valve in the water circuit. The recommended maximum changeover time of the valve should be less than 60 seconds.

Protecting the water circuit against freezing

Frost can cause damage to the hydraulic system. As this unit is installed outdoors and thus the hydraulic system is exposed to

freezing temperatures, care must be taken to prevent freezing of the system.

All hydraulic parts are insulated to reduce heat loss. Insulation must be present on the field piping.

The unit is already equipped with several features to prevent freezing.

- The software contains special functions using the heat pump to protect the entire system against freezing.

When the temperature of the water flow in the system drops to a certain value, the software will heat the water, either using the heat pump, the electric heating tap, or the backup heater(if backup heater box is installed). The freeze protection function will turn off only when the temperature increases to a certain value.

In case of a power failure, the features mentioned above cannot protect the unit from freezing. Since a power failure could happen when the unit is unattended, the supplier recommends adding glycol to the water system. Refer to "Caution: Use of glycol".

Since a power failure could happen when the unit is unattended, the supplier recommends adding glycol to the water system. Refer to "Caution: Use of glycol".

Depending on the expected lowest outdoor temperature, make sure the water system is filled with a concentration of glycol as mentioned in the table below.

When glycol is added to the system, the performance of the unit will be affected. The correction factor of the unit capacity, flow rate and pressure drop of the system is listed in the table below:

Correction factor for the use of glycol in heating mode

ETHYLENE GLYCOL with water produced between 30 ÷ 55 º C.

Percentage Of glycol in mass / volume	0 / 0	10 / 8,9	20 / 18,1	30 / 27,7	40 / 37,5
Freezing point [°C]	0	-3,2	-8	-14	-22
CCPT - Heating capacity	1,000	0,995	0,985	0,975	0,970
CCPA - Power input	1,000	1,010	1,015	1,020	1,030
CCQA - Water flow rate	1,000	1,038	1,062	1,091	1,127
CCDP - Water pressure drop	1,000	1,026	1,051	1,077	1,103

PROPYLENE GLYCOL with water produced between 30 ÷ 55ºC.

Percentage Of glycol in mass / volume	0 / 0	10 / 9,6	20 / 19,4	30 / 29,4	40 / 39,6
Freezing point [°C]	0	-3,3	-7	-13	-21
CCPT - Heating capacity	1,000	0,990	0,975	0,965	0,955
CCPA - Power input	1,000	1,010	1,020	1,030	1,040
CCQA - Water flow rate	1,000	1,018	1,032	1,053	1,082
CCDP - Water pressure drop	1,000	1,026	1,051	1,077	1,103

Correction factor for the use of glycol in cooling mode

ETHYLENE GLYCOL with water produced between 5 ÷ 20 º C.

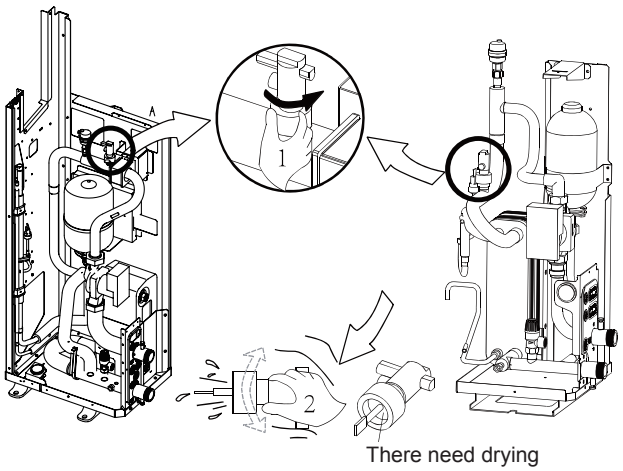
Percentage Of glycol in mass / volume	0 / 0	10 / 8,9	20 / 18,1	30 / 27,7	40 / 37,5
Freezing point [°C]	0	-3,2	-8	-14	-22
CCPF - Cooling capacity	1,00	0,99	0,98	0,97	0,95
CCPA - Power input	1,00	1,00	0,99	0,99	0,98
CCQA - Water flow rate	1,00	1,04	1,08	1,12	1,16
CCDP - Water pressure drop	1,00	1,08	1,16	1,25	1,35

PROPYLENE GLYCOL with water produced between 5 ÷ 20 º C.

Percentage Of glycol in mass / volume	0 / 0	10 / 9,6	20 / 19,4	30 / 29,4	40 / 39,6
Freezing point [°C]	0	-3,3	-7	-13	-21
CCPF - Cooling capacity	1,00	0,98	0,96	0,94	0,92
CCPA - Power input	1,00	0,99	0,98	0,95	0,93
CCQA - Water flow rate	1,00	1,01	1,03	1,06	1,09
CCDP - Water pressure drop	1,00	1,05	1,11	1,22	1,38

HYDRAULIC CONNECTIONS

Water may enter into the flow switch and cannot be drained out and may freeze when the temperature is low enough. The flow switch should be removed and dried, then can be reinstalled in the unit.



There need drying

NOTE

- CounterclockWise rotation, remove the flow switch.
- Drying the flow switch completely.

WARNING

ETHYLENE GLYCOL IS TOXIC

CAUTION

Use of glycol

- Glycol use for installations with a domestic hot water tank:

- Only propylene glycol having a toxicity rating or class of 1, as listed in "Clinical Toxicology of Commercial Products, 5th edition" may be used.

- If there is too much pressure when using glycol, connect the safety valve to a drain pan to recover the glycol.
- Uninhibited glycol will turn acidic under the influence of oxygen. This process is accelerated by presence of copper and at higher temperatures. The acidic uninhibited glycol attacks metal surfaces and forms galvanic corrosion cells that cause severe damage to the system.

It is of extreme importance:

- That the water treatment is correctly executed by a qualified water specialist.
- That a glycol with corrosion inhibitors is selected to counteract acids formed by the oxidation of glycols.
- That in case of an installation with a domestic hot water tank, only the use of propylene glycol is allowed. In other installations the use of ethylene glycol is fine.
- That no automotive glycol is used because their corrosion inhibitors have a limited lifetime and contain silicates that can foul or plug the system;
- That galvanized piping is not used in glycol systems since it may lead to the precipitation of certain elements in the glycol's corrosion inhibitor;
- To ensure that the glycol is compatible with the materials used in the system.
- Be aware of the hygroscopic property of glycol. It absorbs moisture from the environment.
- Leaving the cap off the glycol container causes the concentration of water to increase. The glycol concentration is then lower and the water could freeze.
- Preventive actions must be taken to ensure minimal exposure of the glycol to air.

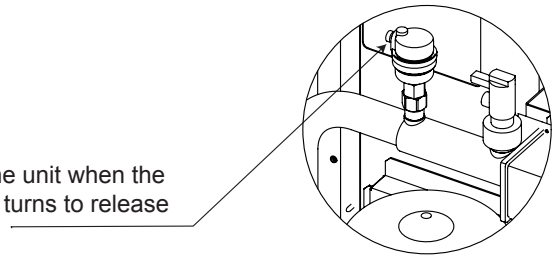
Filling with water

1. Connect the water supply to the fill valve and open the valve.

2. Make sure the automatic air purge valve is open (at least 2 turns).

3. Fill with water until the manometer indicates a pressure of approximately 2.0 bar. Remove air in the circuit as much as possible using the air purge valves. Air present in the water circuit might cause malfunctioning of the backup heater.

Do not fasten the black plastic cover on the vent valve at the topside of the unit when the system is running. Open air purge valve, turn anticlockWise at least 2 full turns to release air from the system.



NOTE

During filling, it might not be possible to remove all air in the system. Remaining air will be removed through the automatic air purge valves during the first operating hours of the system. Topping up the water afterwards might be required.

- The water pressure indicated on the manometer will vary depending on the water temperature (higher pressure at higher water temperature). However, at all times water pressure should remain above 0.3 bar to avoid air entering the circuit.
- The unit might drain-off too much water through the pressure relief valve.
- Water quality must be according to "Safe Drinking water Act "

Piping insulation

The complete water circuit including all piping, must be insulated to prevent condensation during cooling operation and reduction of the heating and cooling capacity as well as prevention of freezing of the outside water piping during winter. The thickness of the sealing materials must be at least 13 mm with λ= 0.039 W/mK in order to prevent freezing on the outside water piping.

If the temperature is higher than 30°C and the humidity is higher than RH 80%, then the thickness of the sealing materials should be at least 20 mm in order to avoid condensation on the surface of the seal.

Cheking the maximum water volume and expansion vessel precharge

Before filling the water system, it is advisable to consider the type of installation in question, i.e. check the difference in level between the wet module and user. The following table gives the maximum water content of the water supply system in liters, depending on the capacity of the standard expansion vessel supplied and the pressure at which it should be charged. The expansion vessel setting must be regulated to suit the maximum positive difference in level of the user.

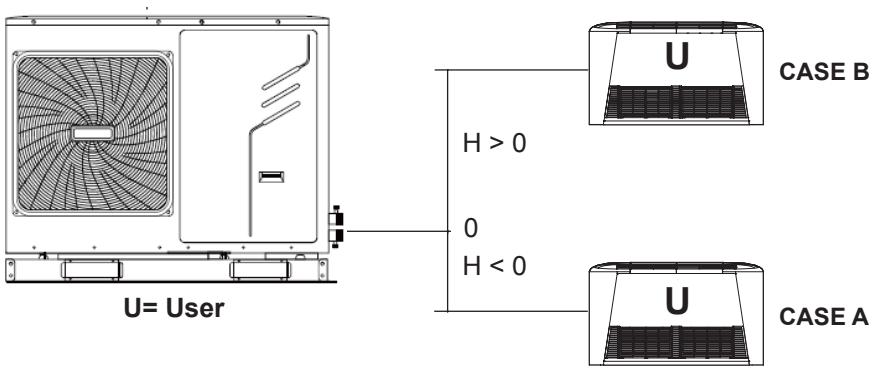
Expansion vessel precharge= [H/10.2+0.3] x100 = [kPa]

NOTE. if H<0 make sure that the user's lowest point is able to withstand the global pressure.

Tab.1

			H [m]			
			7	12	15	20
			expansion vessel precharge as function of H [bar]			
Mod.	Exp. tank vol [l]	Twater max [°C]	1	**1,5**	1,8	2,3
5 - 7 - 9	2	40	133	**100**	80	47
	2	60	60	**45**	36	21
10 - 12 - 12T - 14 -	5	40	333	**250**	200	117
14T - 16 - 16T	5	60	150	**112**	90	52

NB standard precharge of expansion tank = 1.5 bar
If H is <0 meters, ie the unit is installed at a higher level to the highest point of the system served (eg on the roof) you can use the expansion tank with the factory setting, or reduce it up to minimum 1 bar increase the volume of water plant operated Ciol unit vessel.



NOTE: If the unit operates with glycol, calculate the real volume of the system by taking into account the corrective factors for the volume of the system given in the table below.

Corrective factors per total maximum volume of the system with glycol.

% of brine	0%	10%	20%	30%	40%
Cooling Mode	1,000	0,738	0,693	0,652	0,615
Heating Mode	1,000	0,855	0,811	0,769	0,731

Cheking the minimum water volume

Check that the total water volume in the installation, excluding the internal water volume of the unit, is at least 20L.

NOTE

- In most applications this minimum water volume will be satisfactory.
- In critical processes or in rooms with a high heat load though, extra water might be required.
- When circulation in each space heating loop is controlled by remotely controlled valves, it is important that this minimum water volume is kept even if all the valves are closed.

Maximum water pressure and temperature

- The maximum water pressure = 3 bar.
- The maximum water temperature is 70°C according to safety device setting.

ELECTRICAL CONNECTIONS

WARNING

- A main switch or other means of disconnection, having a contact separation in all poles, must be incorporated in the fixed wiring in accordance with relevant local laws and regulations.
- Switch off the power supply before making any connections.
- Use only copper wires.
- Never squeeze bundled cables and make sure they do not come in contact with the piping and sharp edges. Make sure no external pressure is applied to the terminal connections.
- All field wiring and components must be installed by a licensed electrician and must comply with relevant local laws and regulations.
- The field wiring must be carried out in accordance with the wiring diagram supplied with the unit and the instructions given below.
- Be sure to use a dedicated power supply. Never use a power supply shared by another appliance.
- Be sure to establish a ground. Do not ground the unit to a utility pipe, surge protector, or telephone ground. Incomplete grounding may cause electrical shock.
- Be sure to install a ground fault circuit interrupter (30 mA). Failure to do so may cause electrical shock.
- Be sure to install the required fuses or circuit breakers.

Precautions on electrical wiring work

- Fix cables so that cables do not make contact with the pipes (especially on the high pressure side).
- Secure the electrical wiring with cable ties as shown in figure so that it does not come in contact with the piping, particularly on the high-pressure side.
- Make sure no external pressure is applied to the terminal connectors.
- When installing the ground fault circuit interrupter make sure that it is compatible with the inverter (resistant to high frequency electrical noise) to avoid unnecessary opening of the ground fault circuit interrupter.

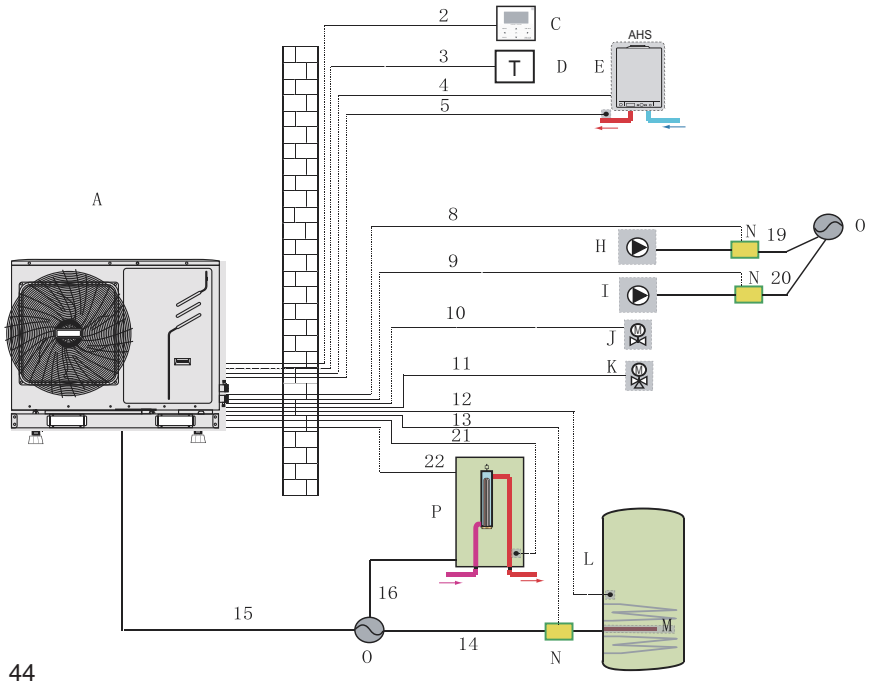
NOTE

The ground fault circuit interrupter must be a high- speed type breaker of 30 mA (<0.1 s).

- This unit is equipped with an inverter. Installing a power factor corrector not only will reduce the power factor improvement effect, but also may cause abnormal heating of the capacitor due to high- frequency waves. Never install a power factor corrector as it could lead to an accident.

Overview

The illustration below gives an overview of the required field wiring between several parts of the installation.



A Heat pump
C User interface
D Room thermostat (field supply)
E Boiler (field supply) (AHS)
H Outside circulation pump (field supply) (P_o)
I DHW pump (field supply) (P_d)
J 2-way valve (field supply) (SV2)
K 3-way valve for domestic hot water tank (field supply) (SV1)
L Domestic hot water tank (field supply)
M Booster heater for DHW tank (field supply) (TBH)
N Contactor
O Power supply
P Backup heater box (field supply) (IBH)

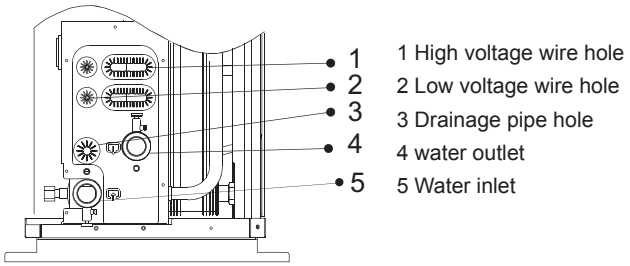
ELECTRICAL CONNECTIONS

Item	Description	AC / DC	Required number of conductor	Maximum running current
2	User interface	**AC**	5	200mA
3	Room thermostat cable	**AC**	2 or 3	200mA
4	Boiler control cable (AHS) (dry contact)	/	2	200mA
5	Temperature probe cable for T1B	**DC**	2	-
8	Outside circulation pump (P_o)	**AC**	2	200mA
9	DHW pump control cable (P_d)	**AC**	2	200mA
10	2-way valve control cable (SV2)	**AC**	2	200mA
11	3-way valve control cable (SV1)	**AC**	2 or 3	200mA
12	Temperature probe cable for T5	**DC**	2	-
13	DHW tank booster heater control cable (TBH)	**AC**	2	200mA
14	Power supply cable for booster heater (TBH)	**AC**	2	200mA
15	Power supply cable for unit	**AC**	2+PE (1-phase) 3+PE N+ (3-phase)	Ref. to electrical data
16	Power supply cable for backup heater (IBH)	**AC**	2+PE (IBH 1-phase)	Ref. to electrical data
19	Power supply cable for outside circulation pump (P_o)	**AC**	2	200mA
20	Power supply cable for DHW pump (P_d)	**AC**	2	200mA
21	Temperature probe cable for T1 (only if IBH is installed)	**AC**	2	200mA
22	Backup heater control cable (IBH)	**AC**	2	200mA

NOTE:

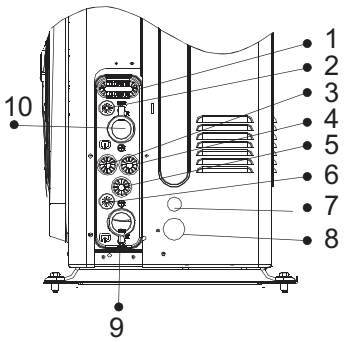
- Minimum cable section AWG18 (0.75 mm^2)
- Please use H07RN-F for the power wire, all the cable are connect to high voltage except for thermistor cable and cable for user interface.
- Equipment must be grounded. All high-voltage external loads, if it is metal or a grounded port, must be grounded.
- All external loads current is needed less than 1.5A, if the loads current is greater than 1.5A,Single external load current is needed less than 0.2A, if the single load current is greater than 0.2A, the load must be controlled through AC contactor.

MOD. 5 - 7 - 9



1 High voltage wire hole
2 Low voltage wire hole
3 Drainage pipe hole
4 water outlet
5 Water inlet

MOD. 10 - 12 - 12T - 14 - 14T - 16 - 16T



1 High voltage wire hole
2 Low voltage wire hole
3 High voltage wire hole
4 High voltage wire hole
5 Drainage pipe hole
6 Low voltage wire hole
7 Low voltage wire hole(backup)
8 Low voltage wire hole(backup)
9 Water inlet
10 water outlet

■ Most field wiring on the unit is to be made on the terminal block inside the switch box. To gain access to the terminal block, remove the switch box service panel.

WARNING

Switch off all power including the unit power supply and backup heater and domestic hot water tank power supply (if applicable) before removing the switch box service panel.

■ Fix all cables using cable ties.
■ A dedicated power circuit is required for the backup heater.
■ Installations equipped with a domestic hot water tank (optional) require a dedicated power circuit for the booster heater. Please refer to the domestic hot water tank Installation & Owner's Manual.
Secure the wiring in the order shown below.
■ Lay out the electrical wiring so that the front cover does not rise up when doing wiring work and attach the front cover securely (see figure).
■ Follow the electric wiring diagram supplied with the unit.

Precautions on wiring of power supply

■ Use a round crimp-style terminal for connection to the power supply terminal board. In case it cannot be used due to unavoidable reasons, be sure to observe the following instructions.

- Do not connect different diameter wires to the same power supply terminal. (Loose connections may cause overheating.)

■ Use the correct screwdriver to tighten the terminal screws. Small screwdrivers can damage the screw head and prevent appropriate tightening.



ELECTRICAL CONNECTIONS

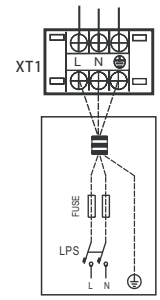
Connections to the terminals of the unit

Procedure

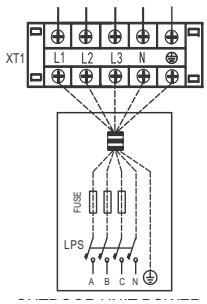
1. Connect the cable to the appropriate terminals as shown on the diagram.
2. Fix the cable with cable ties to the cable tie mountings to ensure stress relief.

Power supply connection

Door 1: compressor compartment and electrical parts: XT1



MOD. 5 - 7 - 9 - 14
1-PHASE



MOD. 14T
3-PHASE

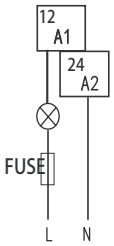
MOD.	5 - 7 - 9	10 - 12 - 14	12T - 14T - 16T
Maximum overcurrent protector(MOP)	25A	40A	20A
Wiring size	4mm²	6mm²	4mm²

Connection for other components

Electrical parts of the hydraulic compartment: The XT7 contains terminals for remote alarm, 2-way valve, 3-way valve,pump, booster heater and external heating source.

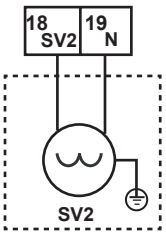
The parts wiring is illustrated below:

Remote alarm



Voltage	Passive signal port (dry contact)
Maximum running current	0.5A
Wiring size	0.75mm²

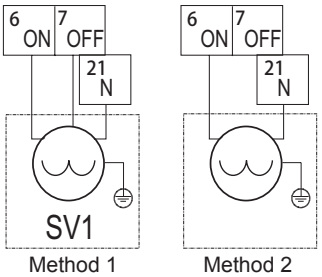
2-way valve (SV2)



Voltage	220-240VAC
Maximum running current	0.2A
Wiring size	0.75mm²

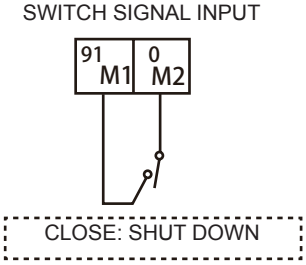
NOTE: Use only a normal closed valve or use the command to activate a relay with denied logic

3-way value (SV1)



Voltage	220-240VAC
Maximum running current	0.2A
Wiring size	0.75mm²

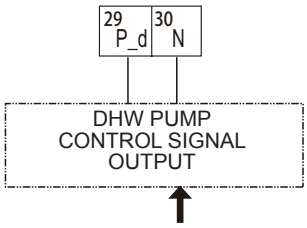
Remote shutdown



NOTE: when this digital input is closed the unit and the remote controller are locked. To unlock theme is necessary to open the digital input.

ELECTRICAL CONNECTIONS

DHW pump (P_d)

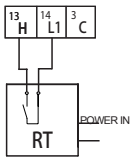


NOTE
For 5/7 kW unit, the terminal number is 37 and 38.

Voltage	220-240VAC
Maximum running current	0.2A
Wiring size	0.75mm²

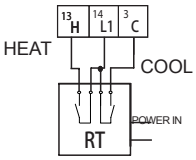
Room thermostat (ON/OFF - HEAT/COOL by digital input)

External ON/OFF (thermostat)



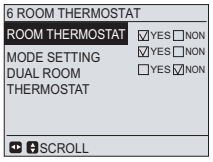
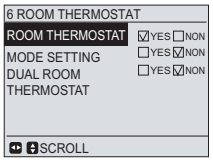
Method B

External COOL/HEAT



Method A

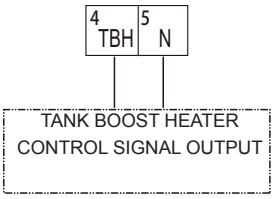
Voltage	220-240VAC
Maximum running current	0.2A
Wiring size	0.75mm²

Method	ON/OFF	HEAT / COOL	Digital input effect	Remote controller	Setup*
A		√	The operation mode is defined by the digital input. The unit will be ON in COOL mode when L1-C is closed. The unit will be on in HEAT mode when H-L1 is closed. If both digital input are closed the unit will be ON in COOL mode.	The user can only set the target water flow temp.	
B	√		The unit will be ON when the digital input is closed. The unit will operate in the mode defined by the controller.	The user can set the operation mode and the target water flow temp.	

Nota

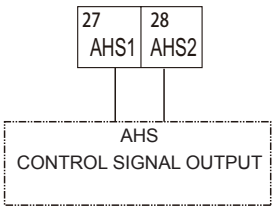
For more details refer to paragraph " ROOM THERMOSTAT (ON/OFF - HEAT/COOL by digital input)" in the section "SET UP OF THE SYSTEM".

Booster heater of the DHW tank (TBH)



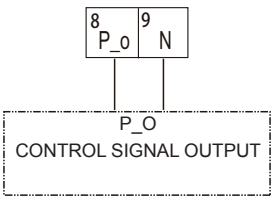
Voltage	220-240VAC
Maximum running current	0.2A
Wiring size	0.75mm²

Boiler (AHS) and outside circulation pump (P_o)



For 5/7/9 kW unit, the terminal number is 25 and 26.

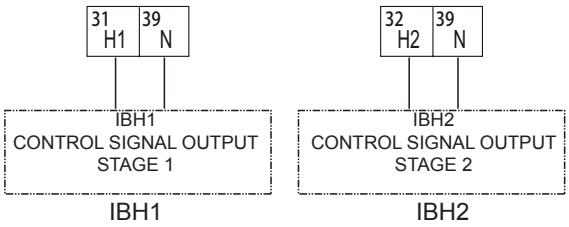
Voltage	220-240VAC
Maximum running current	0.2A
Wiring size	0.75mm²



Voltage	220-240VAC
Maximum running current	100mA
Wiring size	0.75mm²

ELECTRICAL CONNECTIONS

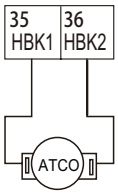
Electrical booster



The unit can manage an electrical booster (as backup hater) with 2 stages (for example 2 electrical heater 1.5 kW). Connect to IBH1 the stage 1, to IBH2 the stage 2. If the booster has only one stage connect it to IBH1.

Safety thermal switch of the electrical booster

Connect to these terminals the safety thermal switch of the electrical booster IBH

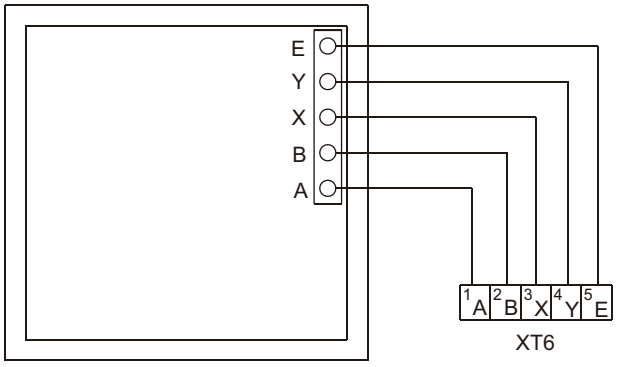


It must be connected to thermal protector!

If these 2 terminals are closed, it is possible to power the 2 relays of the hydronic board that manage IBH1 and IBH2. So, if these 2 terminals are open (for example if the thermal protector is open for overtemperature), IBH1 and IBH2 can not work. If the booster is not equipped with thermal switch output (alarm), these two terminals must be bridged.

User interface

COMMUNICATION

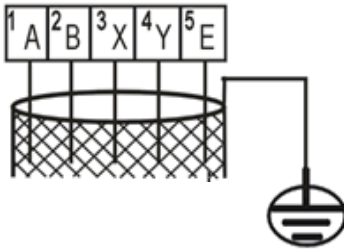


NOTE

This equipment supports MODBUS RTU communication protocol.

Wire type	5 wire shielded cable
Wire section	AWG18-AWG16(0.75~1.25mm2)
Maximum wire length	50m

As described above, during wiring, port A in the unit terminal XT6 corresponds to port A in the user interface. Port B corresponds to port B. Port X corresponds to port X. Port Y corresponds to port Y, and port E corresponds to port E..



Procedure:

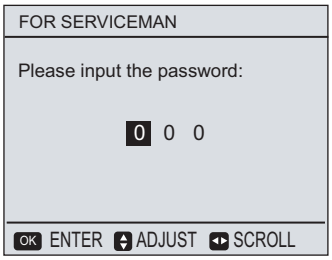
1. Remove the rear part of the user interface.
2. Connect the cable to the appropriate terminals as shown in the picture
3. Reattach the rear part of the user interface

“PLEASE USE SHIELDED WIRE AND EARTH THE WIRE.”

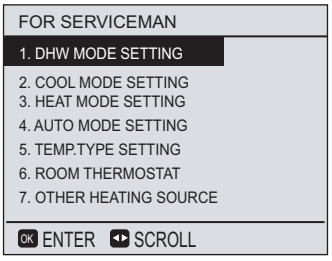
SETUP OF THE SYSTEM

How to go to FOR SERVICEMAN

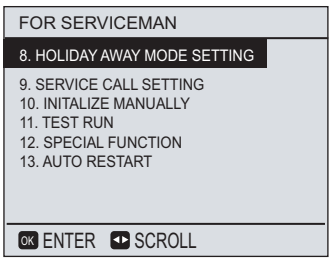
Go to MENU> FOR SERVICEMAN. Press OK



The password is 666 or 234. Use ◄ ► to navigate and use ▼ ▲ to adjust the numerical value. Press OK. The following page is displayed:



Use ▼ ▲ to scroll and use “ok” to enter submenu for setting the parameters.



NOTA

ON/OFF by digital input or switch .(refer to room thermostat)

COOL/HEAT mode managment by digital input. (refer to room thermostat)

Description of terms

The terms related to this unit are shown in the table below

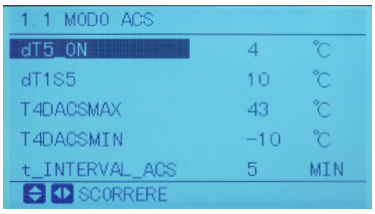
Parameter	Description
T1	Outlet water temperature of the unit or of the backup heater (if installed)
T1B	Outlet water temperature sent to the system (in case of additional heating source as a gas boiler is installed)
T1S	Target outlet water temperature
T2	Temperature of refrigerant at outlet/inlet of plate heat exchanger when in heat mode/cool mode
T2B	Temperature of refrigerant at inlet/outlet of plate heat exchanger when in heat mode/cool mode
T3	Temperature of tube at outlet/inlet of condenser when in cool/heat mode
T4	Outdoor air temperature
T5	Temperature of domestic hot water (misured by the temperature probe installed on the DHW tank)
Th	Refrigerant suction temperature
Tp	Refrigerant discharge temperature
TW_in	Inlet water temperature of plate heat exchanger
TW_out	Outlet water temperature of plate heat exchanger
AHS	Additional heating source (for example a gas boiler)
IBH1	The first stage of the backup heater (if installed)
IBH2	The second stage of the backup heater (if installed)
TBH	Backup heater in the domestic hot water tank (if installed)
Pe	Refrigerant evaporate/condense pressure in cool/heat mode

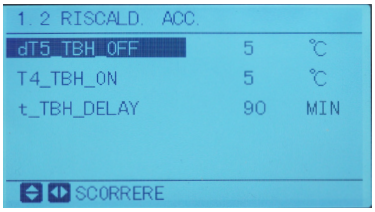
SETUP OF THE SYSTEM

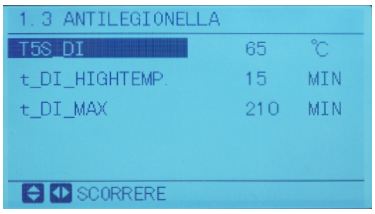
The unit should be configured by the installer to be able to properly handle all elements of the system, depending on the application climate and the users' requests. Various settings are available. These settings are accessible and programmable through the "FOR SERVICEMAN" menu.

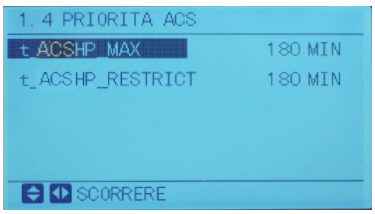
"FOR SEVICEMAN" menu - italian language

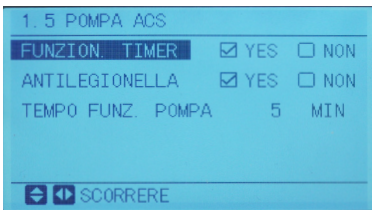


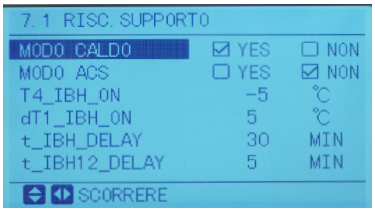

1.1 MODO ACS
dT5_ON 4 ℃
dT1S5 10 ℃
T4DACSMAX 43 ℃
T4DACSMIN -10 ℃
t_INTERVAL_ACS 5 MIN
SCORRERE

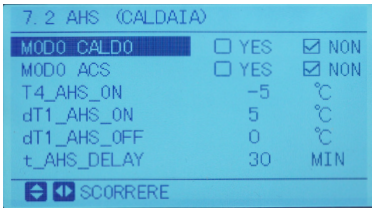

1.2 RISCALD. ACC.
dT5_TBH_OFF 5 ℃
T4_TBH_ON 5 ℃
t_TBH_DELAY 90 MIN
SCORRERE


1.3 ANTILEGIONELLA
T5S_DI 65 ℃
t_DI_HIGHTEMP. 15 MIN
t_DI_MAX 210 MIN
SCORRERE


1.4 PRIORITA ACS
t_ACSHP_MAX 180 MIN
t_ACSHP_RESTRICT 180 MIN
SCORRERE


1.5 POMPA ACS
FUNZION. TIMER ☑ YES ☐ NON
ANTILEGIONELLA ☑ YES ☐ NON
TEMPO FUNZ. POMPA 5 MIN
SCORRERE


7.1 RISC. SUPPORTO
MODO CALDO ☑ YES ☐ NON
MODO ACS ☐ YES ☑ NON
T4_IBH_ON -5 ℃
dT1_IBH_ON 5 ℃
t_IBH_DELAY 30 MIN
t_IBH12_DELAY 5 MIN
SCORRERE

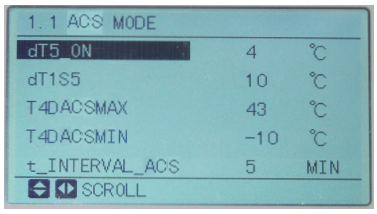

7.2 AHS (CALDAIA)
MODO CALDO ☐ YES ☑ NON
MODO ACS ☐ YES ☑ NON
T4_AHS_ON -5 ℃
dT1_AHS_ON 5 ℃
dT1_AHS_OFF 0 ℃
t_AHS_DELAY 30 MIN
SCORRERE

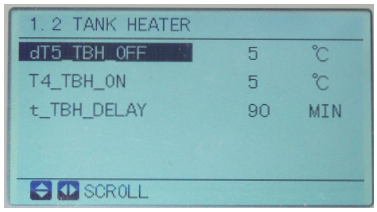

PER ASSISTENZA TECNICA
8. IMPOST. MODO VACANZA LONTANA
9. IMPOSTAZIONE NUM. ASS. TECNICA
10. RICARICARE PARAMETRI FABBRICA
11. MODO TEST
12. FUNZIONI SPECIALI
13. RIAVVIO AUTOMATICO
OK CONFERMA SCORRERE 2/2
8. IMPOST. MODO VACANZA LONTANA
T1S_H. A_H 25 ℃
T5S_H. A_DHW 25 ℃
SCORRERE
9. IMPOSTAZIONE NUM. ASS. TECNICA
TELEF. NO. 0000000000000
MOBILE NO. 0000000000000
OK CONFERMA MODIFICA SCORRERE
10. RICARICARE PARAMETRI FABBRICA
Tutte le impostazioni saranno ripristinate ai valori di fabbricaRipristinare?
NO SI
OK CONFERMA SCORRERE
11. MODO TEST
Attivare le impostazioni per modo test?
NO SI
OK CONFERMA SCORRERE
13. RIAVVIO AUTOMATICO
MODO FREDDO/CALDO YES NON
MODO ACS YES NON
SCORRERE
12. FUNZIONI SPECIALI
12.1 SFIATO ARIA
12.2 PRERISCALD. PAVIM.
12.3 ASCIUGATURA PAVIM.
OK CONFERMA SCORRERE
12. FUNZIONI SPECIALI
Attivare le impostazioni per "FUNZIONI SPECIALI"?
NO SI
OK CONFERMA SCORRERE
12.3 ASCIUGATURA PAVIMENTO
TEMPO RISC. (t_DRYUP) 8 GG
TEMPO MANT. (t_HIGHPEAK) 5 GG
TEMPO DEC. TEMP. (T_DRYD) 5 GG
TEMP. PICCO (T_DRYPEAK) 45 ℃
ORA INIZIO 13:00
DATA INIZIO 01-12-2016
SCORRERE 1/2
12.2 PRERISCALD. PAVIM.
T1S 25 ℃
t_firstFH 72 HOURS
ATTIVARE PRERISCALD. PAVIM. ?
NO SI
SCORRERE
12.1 SFIATO ARIA
Funzione sfiato aria attiva per 0 minuti.
OK CONFERMA
12.3 ASCIUGATURA PAVIMENTO
ATTIVARE LA FUNZIONE ASCIUGATURA PAVIMENTO?
NO SI
SCORRERE 2/2
12.2 PRERISCALD. PAVIM.
Il preriscaldamento pavimento è attivo per 0 ore.
La temperatura acqua è 36 ℃.
OK CONFERMA
12.1 SFIATO ARIA
Disattivare la funzione sfiato aria?
NO SI
OK CONFERMA SCORRERE
12.3 ASCIUGATURA PAVIMENTO
L'unità funzionerà in modo asciugatura pavimento alle 13:00 del 01-12-2016.
OK CONFERMA
12.2 PRERISCALD. PAVIM.
Il preriscaldamento pavimento è attivo per 0 ore.
La temperatura acqua è 37 ℃.
OK CONFERMA

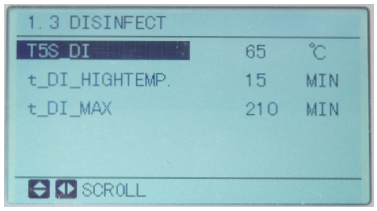

11. MODO TEST
CONTROLLO PUNTI
SFIATO ARIA
ATTIVAZIONE POMPA CIRCOL.
ATTIVAZIONE MODO FREDDO
ATTIVAZIONE MODO CALDO
ATTIVAZIONE MODO ACS
OK CONFERMA SCORRERE
11. MODO TEST (CONTROLLO PUNTI)
VALVOLA 3VIE OFF
VALVOLA 2VIE OFF
POMPA I OFF
POMPA O OFF
POMPA C OFF
POMPA SOLARE OFF
ON/OFF ON/OFF SCORRERE
11. MODO TEST (CONTROLLO PUNTI)
POMPA ACS OFF
RISC. SUPP. 1 OFF
RISC. SUPP. 2 OFF
RISC. SUPP. ACCUMULO ACS OFF
ON/OFF ON/OFF SCORRERE
11. MODO TEST
Modo test attivo.
Sfiato aria attivo.
OK CONFERMA
11. MODO TEST
Disattivare modo test (SFIATO ARIA)?
NO SI
OK CONFERMA SCORRERE
11. MODO TEST
Modo test attivo.
Pompa circolazione attiva.
OK CONFERMA
11. MODO TEST
Disattivare modo test (POMPA CIRCOLAZIONE ATTIVA)?
NO SI
OK CONFERMA SCORRERE
11. MODO TEST
Modo test attivo.
Modo freddo attivo.
Temperatura uscita acqua 17 °C.
OK CONFERMA
11. MODO TEST
Disattivare modo test (MODO FREDDO ATTIVO)?
NO SI
OK CONFERMA SCORRERE
11. MODO TEST
Modo test attivo.
Modo caldo attivo.
Temperatura uscita acqua 17 °C.
OK CONFERMA
11. MODO TEST
Disattivare modo test (MODO CALDO ATTIVO)?
NO SI
OK CONFERMA SCORRERE
11. MODO TEST
Modo test attivo.
Modo ACS attivo.
Temperatura uscita acqua 17 °C.
Temperatura uscita acqua accumulo ACS 51 °C.
OK CONFERMA
11. MODO TEST
Disattivare modo test (MODO ACS ATTIVO)?
NO SI
OK CONFERMA SCORRERE

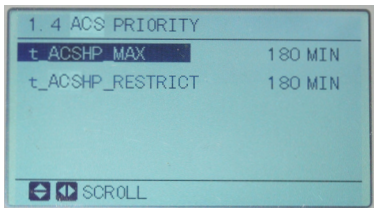
"FOR SEVICEMAN" menu - english language

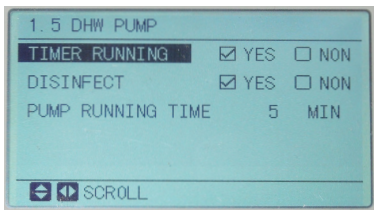


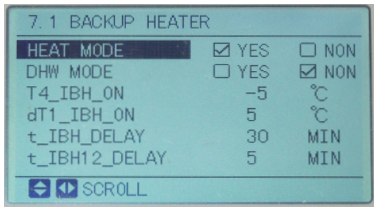

1.1 ACS MODE
dT5_ON 4 ℃
dT1S5 10 ℃
T4DACSMAX 43 ℃
T4DACSMIN -10 ℃
t_INTERVAL_ACS 5 MIN
SCROLL

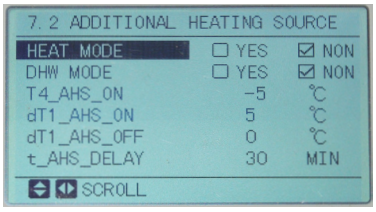

1.2 TANK HEATER
dT5_TBH_OFF 5 ℃
T4_TBH_ON 5 ℃
t_TBH_DELAY 90 MIN
SCROLL


1.3 DISINFECT
T5S_DI 65 ℃
t_DI_HIGHTEMP. 15 MIN
t_DI_MAX 210 MIN
SCROLL


1.4 ACS PRIORITY
t_ACSHP_MAX 180 MIN
t_ACSHP_RESTRICT 180 MIN
SCROLL


1.5 DHW PUMP
TIMER RUNNING ☑ YES ☐ NON
DISINFECT ☑ YES ☐ NON
PUMP RUNNING TIME 5 MIN
SCROLL


7.1 BACKUP HEATER
HEAT MODE ☑ YES ☐ NON
DHW MODE ☐ YES ☑ NON
T4_IBH_ON -5 ℃
dT1_IBH_ON 5 ℃
t_IBH_DELAY 30 MIN
t_IBH12_DELAY 5 MIN
SCROLL


7.2 ADDITIONAL HEATING SOURCE
HEAT MODE ☐ YES ☑ NON
DHW MODE ☐ YES ☑ NON
T4_AHS_ON -5 ℃
dT1_AHS_ON 5 ℃
dT1_AHS_OFF 0 ℃
t_AHS_DELAY 30 MIN
SCROLL

SETUP OF THE SYSTEM




11. TEST RUN
POINT CHECK
AIR PURGE
CIRCULATED PUMP RUNNING
COOL MODE RUNNING
HEAT MODE RUNNING
DHW MODE RUNNING
OK ENTER SCROLL
11. TEST RUN (POINT CHECK)
3WAY-VALVE OFF
2WAY-VALVE OFF
PUMPI OFF
PUMPO OFF
PUMPC OFF
PUMPSOLAR OFF
ON/OFF ON/OFF SCROLL
11. TEST RUN (POINT CHECK)
PUMPDHW OFF
BACKUP HEATER1 OFF
BACKUP HEATER2 OFF
TANK HEATER OFF
ON/OFF ON/OFF SCROLL
11. TEST RUN
Test run is on.
Air purge is on.
OK CONFIRM
11. TEST RUN
Do you want to turn off the test run (AIR PURGE) function ?
NO YES
OK CONFIRM SCROLL
11. TEST RUN
Test run is on.
Circulated pump is on.
OK CONFIRM
11. TEST RUN
Do you want to turn off the test run (CIRCULATED PUMP RUNNING) function ?
NO YES
OK CONFIRM SCROLL
11. TEST RUN
Test run is on.
Cool mode is on.
Leaving water temperature is 15 ℃.
OK CONFIRM
11. TEST RUN
Do you want to turn off the test run (COOL MODE RUNNING) function ?
NO YES
OK CONFIRM SCROLL
11. TEST RUN
Test run is on.
Heat mode is on.
Leaving water temperature is 15 ℃.
OK CONFIRM
11. TEST RUN
Do you want to turn off the test run (HEAT MODE RUNNING) function ?
NO YES
OK CONFIRM SCROLL
11. TEST RUN
Test run is on.
DHW mode is on.
Leaving water temperature is 15 ℃.
Water tank temperature is 28 ℃
OK CONFIRM
11. TEST RUN
Do you want to turn off the test run (DHW MODE RUNNING) function ?
NO YES
OK CONFIRM SCROLL

DHW mode setting

DHW:domestic hot water

DHW MODE SETTING typically consists of the following:

1. DHW MODE: enable or disable the DHW mode

2. TANK HEATER: set whether the booster heater is available or not

3. DISINFECT: set the parameters for disinfection

4. DHW PRIORITY: set the priority between domestic hot water heating and space operation

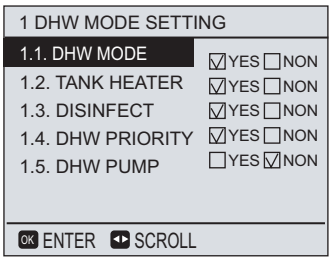
5. DHW PUMP: set the parameters for DHW pump operation. The functions above apply only to installations with a domestic hot water tank.

How to set the DHW mode

To determine whether the DHW mode is effective.

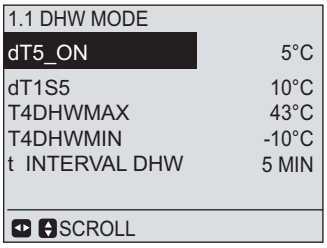
Go to MENU> FOR SERVICEMAN> DHW MODE SETTING. Press OK. The following page is displayed:

Use ◄ ► to scroll and OK for enter. When the cursor is on ☐ press YES, Press OK to set the DHW MODE as effective. When the cursor is on ☐ NON,press OK to set the DHW MODE as ineffective.



1. Go to MENU> FOR SERVICEMAN>DHW MODE SETTING>1.1 DHW MODE

Use ◄ ►and ▼▲ to scroll and adjust parameters. Use BACK to exit.

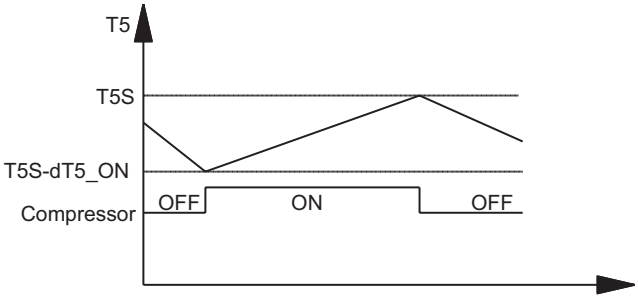


NOTE

If DHW MODE is set "NON", the function is not available and so could not be selected by the user.

dT5_ON is the temperature difference for starting the heat pump, the picture below illustrates the dT5_ON function.

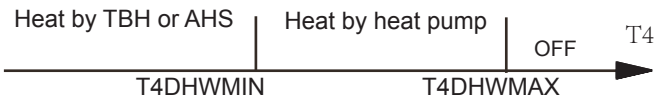
T5S is the target temperature for domestic hot water. T5 is the actual temperature of domestic hot water. When T5 drops to a certain temperature (T5≤T5S-dT5_ON) the heat pump will be available. dT1S5 is the correct value for the target outlet water temperature (T1S=T5+dT1S5).



T4DHWMAX is the maximum outdoor air temperature that the heat pump can operate at for domestic water heating. The unit will not operate if the outdoor air temperature goes above it in DHW mode.

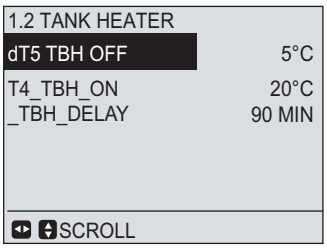
T4DHWMIN is the minimum outdoor air temperature that the heat pump can operate for domestic water heating. The heat pump will turn off if the outdoor air temperature drops below it in water heating mode. The relationship between operation of the unit and outdoor air

temperature can be illustrated in the picture below:



T_INTERVAL_DHW is the start time interval of the compressor in DHW mode. When the compressor stops running, the next time the compressor turns on it should be T_INTERVAL_DHW plus one minute later at least.

Tank heater (electrical heater for DHW tank)



If tank heater (booster heater) is avaliable, Go to FOR SERVICEMAN >DHW MODE SETTING>1.2 TANK HEATER and select “Yes”, when “OK” pressed, the following page will appear:

Use ◄ ► and ▼▲ to scroll and adjust parameters. Use BACK to exit.

dT5_TBH_OFF is the temperature difference between T5 and T5S that turns the booster heater off. The booster heater will turn off (T5≥T5S+dT_TBH_OFF) when the heat pump malfunctions.

T4_TBH_ON is the temperature only when the outdoor air temperature is lower than its parameter and the booster heater will be available.

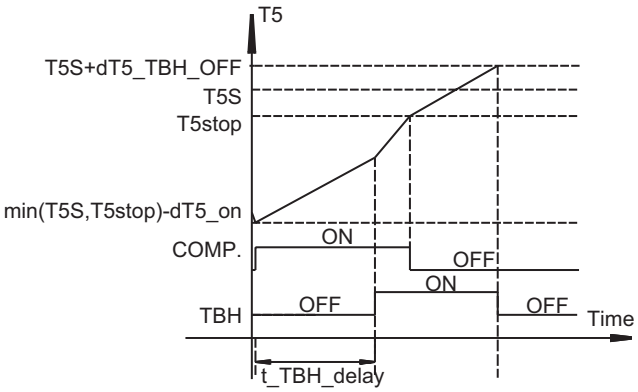
t_TBH_DELAY is the time that the compressor has run before starting the booster heater (if T5<min (T5S,T5stop)).

The operation of the unit during DHW mode described in the picture below:

In the picture, T5stop is a parameter related to outdoor air temperature, which cannot be changed in the user interface. When T5≥T5stop, the heat pump will turn off.

Note:

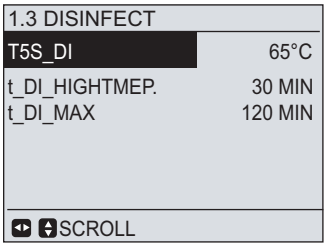
If the booster heater is unavailable (1.2 TANK HEATER NON is selected), the dT5_ON cannot be adjusted and is fixed at 2.



NOTE

The booster heater of DHW tank (THB) and backup heater of the system (electrical booster IBH) can’t operate simultaneously, if the booster heater has been on, the backup heater will be off and viceversa.

Disinfect

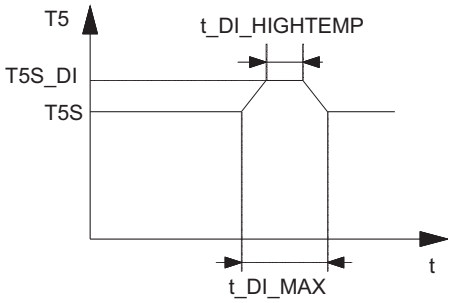


To enable disinfect function,Go to MENU> FOR SERVICEMAN>DHW MODE SETTING>1.3 DISINFECT and select “YES”, when “OK” pressed, the following page will appear.

T5S_DI is the target temperature of water in the domestic hot water tank in the DISINFECT function.

t_DI_HIGHTEMP is the time that the hot water will last.

t_DI_MAX is the time that disinfection will last. The change of domestic water temperature is described in the picture below:



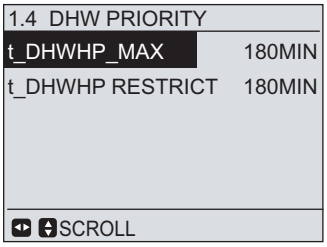
Be aware that the domestic hot water temperature at the hot water tap will be equal to the value selected in FOR SERVICEMAN “T5S_DI” after a disinfection operation.

WARNING

If this high domestic hot water temperature can be a potential risk for human injuries, a mixing valve (field supply) should be installed at the hot water outlet connection of the domestic hot water tank. This mixing valve will ensure that the hot water temperature at the hot water tap never rises above a set maximum value. This maximum allowable hot water temperature shall be selected according to local laws and regulations.

DHW priority

To set the priority between domestic water heating and space operation Go to SERVICEMAN>DHW MODE SETTING>1.4DHW PRIORITY:



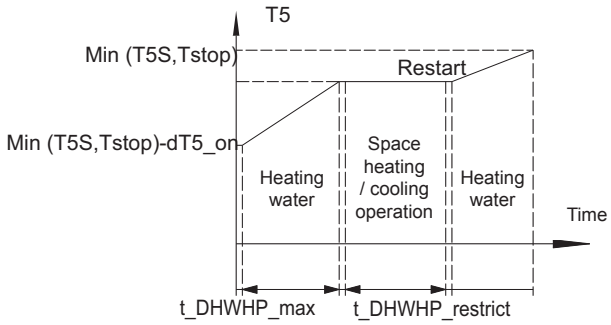
The function of the DHW PRIORITY is used to set the operation priority between domestic water heating and space (heating/cooling) operation. You can use ◄ ► and ▼▲ to scroll and adjust parameters. Using BACK to exit.

T_DHWHP_MAX is the maximum continuous working period of the heat pump in DHW PRIORITY mode.

T_DHWHP_RESTRICT is the operation time for the space heating/cooling operation.

If DHW PRIORITY is enabled, the operation of the unit is described in the picture below:

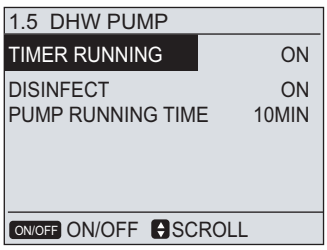
If NON is selected in the DHW PRIORITY mode, when it is available and the space heating/cooling is OFF, the heat pump will heat the water as required. If space heating/cooling is ON, the water will be heated as required when the booster heater is unavailable. Only when the space heating/cooling is OFF will the heat pump operate to heat domestic water.



DHW pump

If the DHW pump(P_d) is avaliable, Go to FOR SERVICEMAN >DHW MODE SETTING>1.5DHW PUMP and select “YES”, when “OK” pressed, the following page will appear,You can use ◄► and ▼▲ to scroll and adjust parameters. Use BACK to exit.

When the TIMER RUNNING is ON, the DHW pump will run as timed and keeps running for an certain time (as defined in PUMP RUNNING TIME), this can ensure the temperature of water in the system are uniform.



When DISINFECT is ON, the DHW pump will operate when the unit is in disinfect mode and T5≥T5S_DI-2. Pump run time is t+5min.

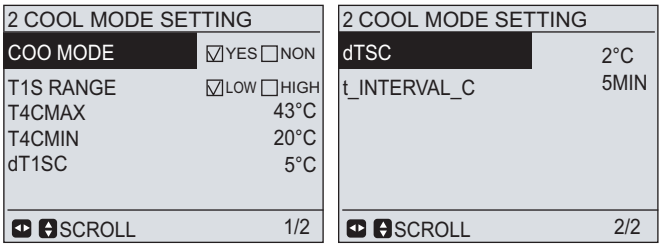
The recirculation pump ACS allows you to mix the water tank and make more effective the disinfect function.

COOL mode setting

COOL MODE SETTING typically consists of the following:

1. COOL MODE: to set if the COOL mode is active or not
2. T1S RANGE: Selecting the range of target outlet water temperature
3. T4CMAX: Setting the maximum outdoor air operation temperature
4. T4CMIN: Setting the minimum outdoor air operating temperature
5. dT1SC: Setting the temperature difference for starting the heat pump
6. t_INTERVAL_C: to set the compressor stop time before the next start in cool mode

To determine whether the COOL mode is effective, go to MENU> FOR SERVICEMAN> COOL MODE SETTING. Press OK. The following page will be displayed:



When the cursor is on COOL MODE, Use ◄► to select YES or NON. Then press OK to enable or disable the cool mode. When the cursor is on T1S RANGE. Use ◄►to select the range of outlet water temperature. When LOW is selected, the minimum target temperature is 5°C. If the climate-related curve function (corresponds to “weather temperature set” in the user interface) is enabled , the curve selected is the low temperature curve. When HIGH is selected, the minimum target temperature is 18°C, if the climate-related curve function (corresponds to “weather temperature set” in the user interface) is enabled, the curve selected is the high temperature curve.

When the cursor is on T4CMAX,T4CMIN,dT1SC,dTSC or t_INTERVAL_C, Use ◄► and ▼▲ to scroll and adjust the parameter.

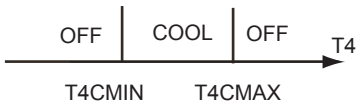
NOTE

If COOL MODE is set "NON", the function is not available and so could not be selected by the user.

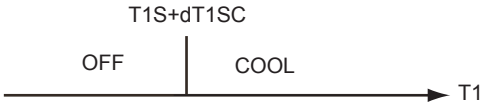
T4CMAX is the maximum outdoor air temperature in COOL mode. The unit cannot work if the outdoor air temperature is higher.

T4CMIN is the minimum outdoor air operating temperature in COOL mode. The unit will turn off if the outdoor air temperature drops below it. The relationship between the operation of the unit and outdoor air temperature is shown in the picture below:

dT1SC is the temperature difference between T1 (actual outlet water temperature) and T1S (target outlet water temperature) for starting the unit in cool mode. Only when T1 is high enough will the unit turn on, and will turn off if T1 drops to a certain value. See the diagram below:



dT1SC is the temperature difference between T1 (actual outlet water temperature) and T1S (target outlet water temperature) for starting the unit in cool mode. Only when T1 is high enough will the unit turn on, and will turn off if T1 drops to a certain value. See the diagram below:



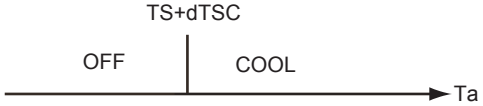
Operation note

Minimum water outlet temperature (Twout min) according to the outdoor air temperature read by the T4 probe.

T4 [°C]	≤10	11	12	13	14	15	16	17	18	19	≥20
Twout min [°C]	10	9	9	8	8	7	7	6	6	6	5

With set-point T1S ≤10 the unit starts again when min (T1, Twout) ≥ 12 ° C; so for example with T1S = 7 ° C and dT1SC = 3 ° C the unit does not start again when T1 = 10 (7 + 3), but it can start again only if T1 and Twout reach at least 12 ° C.

dTSC is the temperature difference between Ta (actual room temperature) and TS (target room temperature) To start the unit when ROOM TEMP is enabled in TEMP. TYPE SETTING (refer to10.7 Field setting/TEMP.TYPE SETTING). Only when the Ta is high enough will the unit turn on, and the unit will turn off if the Ta drops to a certain value. Only when the ROOM TEMP is enabled will this function be available. See picture below:

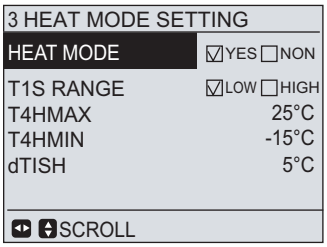


HEAT mode setting

HEAT MODE SETTING typically consists of the following:

1. HEAT MODE: to set if the HEAT mode is active or not
2. T1S RANGE: Selecting the range of target outlet water temperature
3. T4HMAX: Setting the maximum outdoor air operating temperature
4. T4HMIN: Setting the minimum operating outdoor air operating temperature
5. dTISH: Setting the temperature difference for starting the unit
6. t_INTERVAL_H: to set the compressor stop time before the next start in heat mode

To determine whether the HEAT mode is effective, go to MENU> FOR SERVICEMAN> HEAT MODE SETTING. Press OK. The following page be displayed:



When the cursor is on HEAT MODE, Use◄► to scroll to YES or NON and press OK to enable or disable the heat mode. When the cursor is on the T1S RANGE, use ◄► to scroll to YES or NON and press OK to select the range of outlet water temperature. When LOW is selected, the maximum target temperature is 55°C. If the climate-related curve function (corresponds to “weather temperature set” in the user interface) is enabled, the curve selected is the low temperature curve. When HIGH is selected, the maximum target temperature is 60°C. If the climate-related curve function (corresponds to “weather temperature set” in the user interface) is enabled, the curve selected is the high temperature curve.

When the cursor is on T4HMAX,T4HMIN,dT1SH,dTSH or t_INTERVAL_H, Use ◄► and ▼▲ to scroll and adjust the parameter.

NOTE

If HEAT MODE is set "NON", the function is not available and so could not be selected by the user.

T4HMAX is the maximum outdoor air operating temperature for heat mode. The unit will not work if the outdoor air temperature is higher.

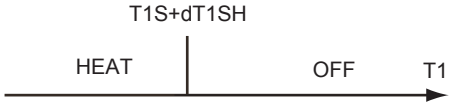
T4HMIN is the minimum outdoor air operating temperature for heat mode. The unit will turn off if the outdoor air temperature is lower.

The relationship between the operation of the unit and outdoor air temperature can be seen in the picture below:

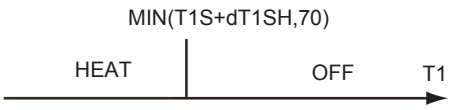


dT1SH is the temperature difference between T1 and T1S for switch-off the unit in heat mode.

When the target outlet water temperature T1S<47, the unit will turn on or off as described below :



When the target outlet water temperature T1S≥47, the unit will on or off as described below:



dTSH is the temperature difference between Ta (Ta is the room temperature) and TS for starting the unit when ROOM TEMP is enabled in TEMP.TYPE SETTING (refer to10.7 Field setting/ TEMP.TYPE SETTING). Only when Ta drops to a certain value will the unit turn on, and the unit will turn off if the Ta high enough. See diagram below. (only when ROOM TEMP is enabled will this function be available).



t_INTERVAL_H is the compressor start time interval in heat mode. When the compressor stops running, the next time that the compressor turns on should be “ t_INTERVAL_H” and one minute later at least.

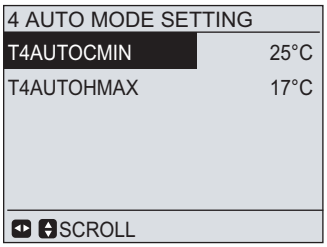
AUTO mode setting

Controlling AUTO mode typically consists of the following:

1. T4AUTOCMIN:setting the minimum operating outdoor air temperature for cooling

2. T4AUTOHMAX: setting the maximum operating outdoor air temperature for heating

To determine whether the AUTO mode is effective, go to MENU> FOR SERVICEMAN> AUTO MODE SETTING. Press OK. The following page is displayed.

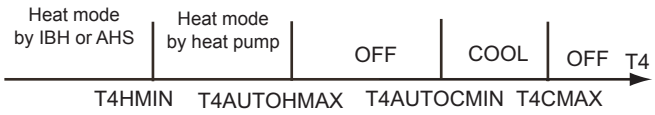


Use ◄ ► and ▼ ▲ to scroll and adjust the parameter.

T4AUTOCMIN is the minimum operating outdoor air temperature for cooling in auto mode. The unit will turn off if the outdoor air temperature is lower when in space cooling operation.

T4AUTOHMAX is the maximum operating outdoor air temperature for heating in auto mode. The unit will turn off if the outdoor air temperature is higher when in space heating operation.

The relationship between heat pump operation and outdoor air temperature is described in the picture below



In the picture, AHS is an additional heating source. IBH is a backup heater in the unit.

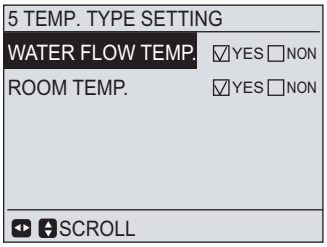
Temp. Type setting (to activate the internal temperature probe of the controller as room thermostat)

NOTE

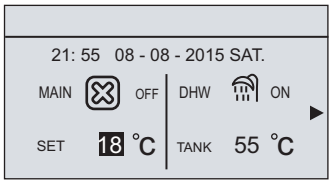
Through this submenu, you can define whether the unit will operate according to water setpoint sent to the system and / or based on the room temperature setpoint.

The TEMP. TYPE SETTING is used for selecting whether the waterflow temperature or room temperature to control the heat pump is ON/OFF. When ROOM TEMP. is enabled, the target outlet water temperature will be calculated from climate-related curves.

To enter the TEMP.TYPE SETTING, go to MENU> FOR SERVICEMAN> TEMP. TYPE SETTING. Press OK. The following page is displayed:

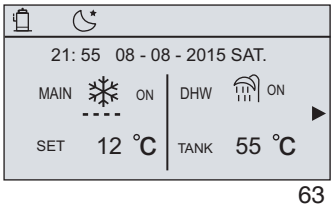


If you set WATER FLOW TEMP. to YES, and set ROOM TEMP. to NON, the water flow temperature will be displayed on the home page, and the water flow temperature will work as the target temperature.

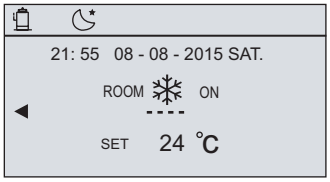


If you set WATER FLOW TEMP. to YES, and set ROOM TEMP. to YES, then the water temperature will be displayed on the home page. Both water temperature and room temperature will be detected and when either the water temperature or the room temperature reaches the target temperature the unit will turn off.

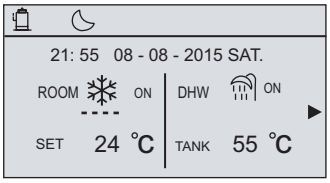
In this state, the first target outlet water temperature can be set in the main page, the second one can be calculated from the climate-related curves. In heat mode, the higher one will be the real target outlet temperature, while in cool mode, the lower one will be selected.



If ►is pressed, the main page will display the room temperature:

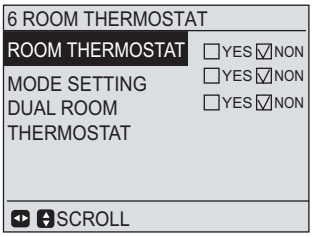


If you set WATER FLOW TEMP. to NON, and set ROOM TEMP. to YES, then the room temperature will be displayed on the home page, and the room temperature will work as the target temperature. The target outlet water temperature can be calculated from the climate related curves.



Room thermostat (ON/OFF - HEAT/COOL by digital input)

To set the ROOM THERMOSTAT, go to MENU> FOR SERVICEMAN> ROOM THERMOSTAT. Press OK. The following page is displayed:



If you want to connect a room thermostat (or a remote switch) for the activation and turning off the unit, ROOM THERMOSTAT must be set to YES and the MODE SETTING must be set to NON. With this setting, the unit will operate in the mode set as a user interface only when the thermostat closes the contact.

If you want to connect instead a double contact thermostat (or 2 remote switches) to determine the activation of the unit in HEAT or COOL, ROOM THERMOSTAT must be set to YES and the MODE SETTING must be set to YES. With this setting, the unit will operate in the mode required by the thermostat (or by one of two remote switches) and therefore will not be possible to activate the unit nor to change the operation mode through the user interface.

If you set the unit to be activated via digital inputs the timer function and weekly scedule are not available;

The temperature adjustment can be performed from the user interface.

NOTE

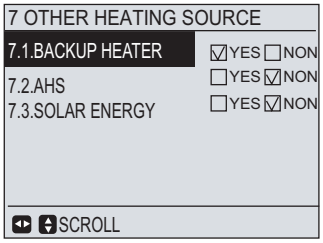
"DUAL ROOM THERMOSTAT" must not be used: set to NON.

NOTE: The setting in the user interface MUST match the thermostat wiring (or remote switches). For more information also see "ELECTRICAL CONNECTIONS".

Other heating source

The OTHER HEATING SOURCE is used to set whether the backup heater, and additional heating sources like a boiler or solar energy kit is available.

To set the OTHER HEATING SOURCE, go to MENU> FOR SERVICEMAN> OTHER HEATING SOURCE, Press OK. The following page will appear:

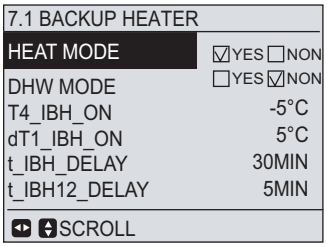


NOTE

"SOLAR ENERGY" must not be used: set to NON.

Backup heater (electrical booster)

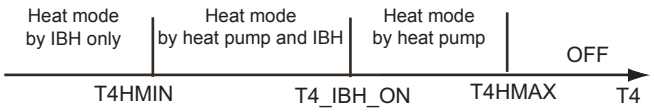
If backup heater is available, please select YES at BACKUP HEATER. Press OK and the following page is displayed:



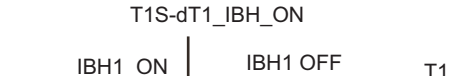
When the cursor is on HEAT MODE or DHW MODE, Use ◄ ► to select YES or NON. If YES is selected, the backup heater will be available in the corresponding mode, otherwise it will be unavailable.

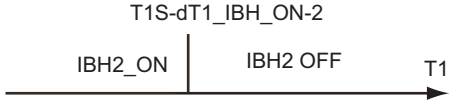
When the cursor is on T4_IBH_ON, dT1_IBH_ON, t_IBH_DELAY, or t_IBH12_DELAY, Use ◄ ► and ▼ ▲ to scroll and adjust the parameter.

T4_IBH_ON is the outdoor air temperature for starting the backup heater. If the outdoor air temperature rises above T4_IBH_ON, the backup heater will be unavailable. The relationship between operation of the backup heater and the outdoor air is shown in the picture below.



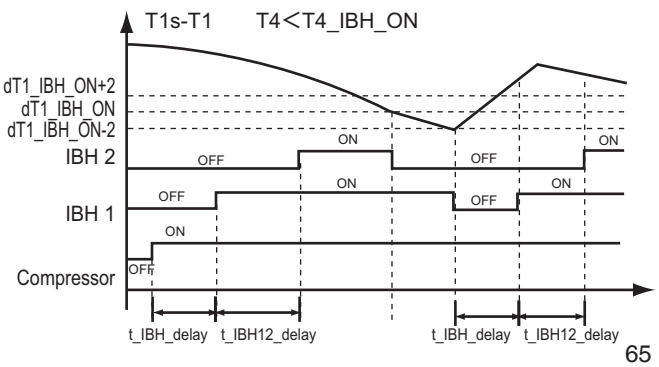
dT1_IBH_ON is the temperature difference between T1S and T1 for starting the backup heater. Only when at the T1<T1S-dT1_IBH_ON can the backup heater turn on. When a second backup heater is installed, if the temperature difference between T1S and T1 is larger than dT1_IBH_ON+2, the second backup heater will turn on. The relationship between operation of the backup heater and the temperature difference is shown in the diagram below.





t_IBH_DELAY is the time that the compressor has run before the first backup heater turns on (if T1<T1S).

t_IBH12_DELAY is the time that the first backup heater has run before the second backup heater turns on.



AHS (Additional Heating Source, gas bolier)

If an additional heating source (for example a gas boiler) is available, please select YES at the corresponding position. Press OK and the following page is displayed:

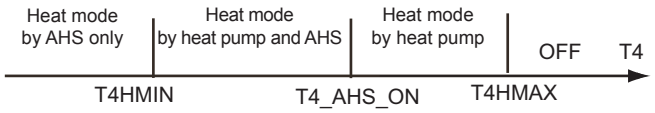
7.2 ADDTIONAL HEATING SORUCE	
HEAT MODE	☑YES ☐NON
DHW MODE	☐YES ☑NON
T4_AHS_ON	-5°C
dT1_AHS_ON	5°C
dT1_AHS_OFF	0°C
t_AHS_DELAY	30MIN
◄► ▲▼SCROLL	

When the cursor is on HEAT MODE or DHW MODE, Use ◄► to select YES or NON. If YES is selected, the additional heating source will be available in the corresponding mode, otherwise it will be unavailable.

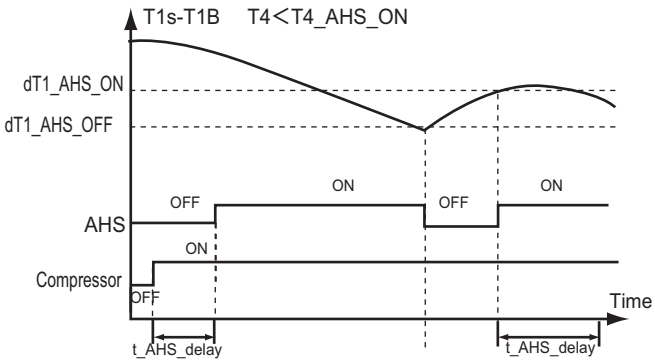
NOTE: If YES is selected in DHW MODE, the installation of an additional heating source should follow “8.5 Application 5/Applica--tion b”

When the cursor is on T4_AHS_ON, dT1_AHS_ON, dT1_AHS_OFF or t_AHS_DELAY, Use ◄ ► and ▼ ▲ to scroll and adjust the parameter.

T4_AHS_ON is the outdoor air temperature for starting the additional heating source. When the outdoor air temperature rises above T4_AHS_ON, the additional heating source will be unavailable. The relationship between the operation of additional heating source and outdoor air temperature is shown in the picture below:



dT1_AHS_ON is the temperature difference between T1S and T1B for turning the additional heating source on(only when T1B<T1S-dT1_AHS_ON), dT1_AHS_OFF is the temperature difference between T1S and T1B for turning the additional heating source off (when T1B≥T1S+dT1_AHS_OFF the additional heating source will turn off), t_AHS_DELAY is the time that the compressor has run before starting the additional heating source. It should be shorter than the additional heating source start time interval.The operation of the heat pump and the additional heating source is shown below:

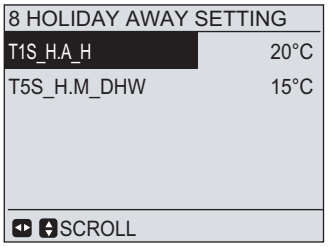


If solar energy kit is installed, please select YES at “7.3 SOLAR ENERGY”, then the solar pump will operate when the solar energy kit operating for domestic hot water heating, and the heat pump will stop operating for domestic hot water heating.

Holiday away setting

The HOLIDAY AWAY SETTING is used to set the outlet water temperature to prevent freezing when away for holiday.

To enter the HOLIDAY AWAY SETTING, go to MENU> FOR SERVICEMAN> HOLIDAY AWAY SETTING. Press OK. The following page is displayed:



When the cursor is on T1S_H.A._H or T5S_H.M_DHW, Use◄ ► and ▼ ▲ to scroll and adjust the parameter, T1S_H.A._H is the target outlet water temperature for space heating when in holiday away mode.

T1S_H.M_DHW is the target outlet water temperature for water heating when in holiday away mode.

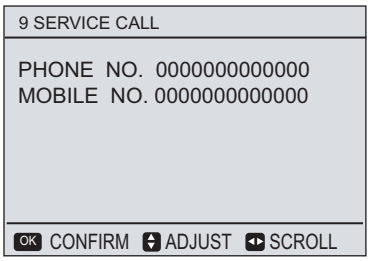
Service call

About SERVICE CALL

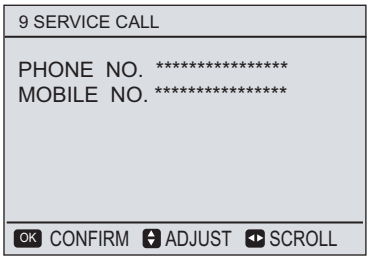
The installers can set the phone number of the local dealer in SERVICE CALL. If the unit doesn't work properly, call this number for help.

How to set the SERVICE CALL

To set the SERVICE CALL, go to MENU> FOR SERVICEMAN> SERVICE CALL. Press OK. The following page is displayed:

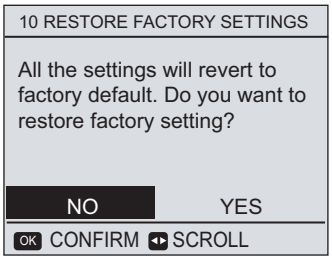


Use ▼ ▲ to scroll and set the phone number. The maximum length of the phone number is 13 digits, if the length of phone number is short than 12, please input ■, as shown below:



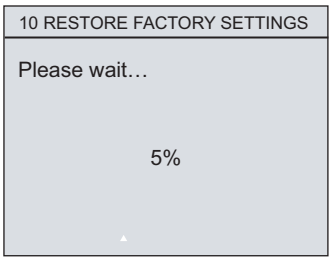
Restore factory settings

The RESTORE FACTORY SETTING is used to restore all the parameters set in the user interface to the factory setting.



To restore factory settings, go to MENU> FOR SERVICEMAN> RESTORE FACTORY SETTINGS. Press OK. The following page is displayed:

Use ◄ ► to scroll the cursor to YES and press OK. the following page will be displayed:

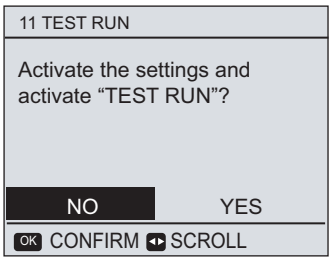


After a few seconds, all the parameters set in the user interface will be restored to factory settings

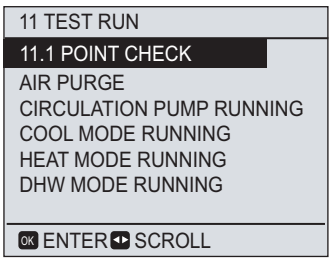
Test run

TEST RUN is used to check correct operation of the valves, air purge, circulation pump operation, cooling, heating and domestic water heating.

To enter test run, go to MENU> FOR SERVICEMAN> TEST RUN. Press OK. The following page is displayed:

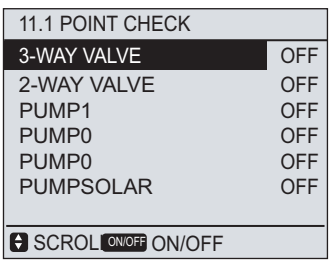


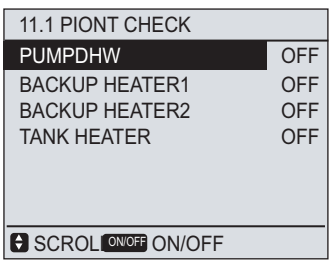
If YES is selected, the following page is displayed:



Use ▼ ▲ to scroll to the mode you want to run and press OK. The unit will run as selected.

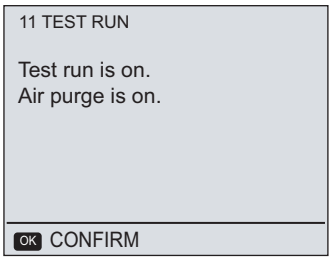
If 12.1 POINT CHECK is selected, the following page will not be displayed:





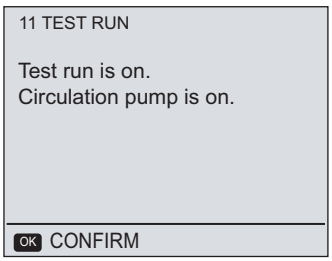
Use ▼ ▲ to scroll to the components you want to check and press ON/OFF. For example, when 3-WAY VALVE is selected and ON/OFF is pressed, if the 3-way valve is open/close, then the operation of 3-way valve is normal, and so are other components.

If you select AIR PURGE and OK is pressed, the page will displayed as follows:



When in air purge mode, the 3-way valve will open, the 2-way valve will close. 60s later the pump in the unit (PUMPI) will operate for 10min during which the flow switch will not work. After the pump stops, the 3-way valve will close and the 2-way valve will open. 60s later both the PUMPI and PUMPO will operate until the next command is received.

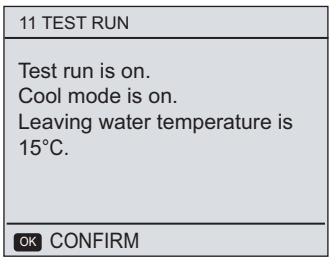
When CIRCULATION PUMP RUNNING is selected, the page will displayed as follows:



When circulation pump running is turned on, all running components will stop. 60 minutes later, the 3-way valve will open, the 2-way valve will close, 60 seconds later PUMPI will operate. 30s later, if the flow switch checked normal flow, PUMPI will operate for 3min, after the pump stops, the 3-way valve will close and the 2-way valve will open. 60s later the both PUMPI and PUMPO will operate, 2 mins later, the flow switch will check the water flow. If the flow switch closes for 15s,

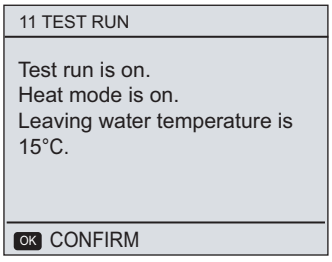
PUMPI and PUMPO will operate until the next command is received.

When the COOL MODE RUNNING is selected, the page will displayed as follows:



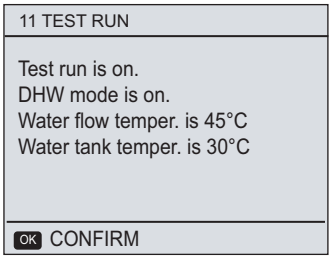
During COOL MODE test running, the default target outlet water temperature is 7°C. The unit will operate until the water temperature drops to a certain value or the next command is received.

When the HEAT MODE RUNNING is selected, the page will displayed as follows:



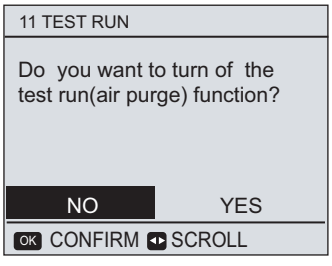
During HEAT MODE test running, the default target outlet water temperature is 35°C. The first backup heater will turn on after the compressor runs for 10 min, 60s later the second backup heater will turn on. After the two backup heater runs for 3 min, both backup heaters will turn off, the heat pump will operate until the water temperature increase to a certain value or the next command is received.

When the DHW MODE RUNNING is selected, the page will displayed as follows:



During DHW MODE test running, the default target temperature of the domestic water is 55°C. The booster heater will turn on after the compressor runs for 10min. The booster heater will turn off 3 min later, the heat pump will operate until the water temperature increase to a certain value or the next command is received.

During test run, all buttons except OK are invalid. If you want to turn off the test run, please press OK. For example ,when the unit is in air purge mode, after you press OK, the page will displayed as follows:



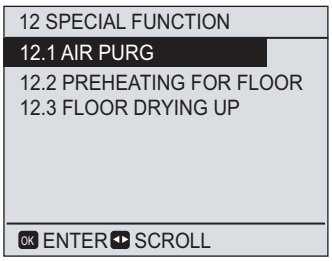
Use ◄ ► to scroll the cursor to YES and press OK. The test run will turn off.

Special function

The SPECIAL FUNCTION contains AIR PURGE, PREHEATING FOR FLOOR, and FLOOR DRYING UP. It's used in special situations. For example: the initial start of the unit, initial running of floor heating.

NOTE: the special functions can be used by service man only, during special function operating other functions(SCHDULE,HOLIDAY AWAY, HOLIDAY HOME) can't be used.

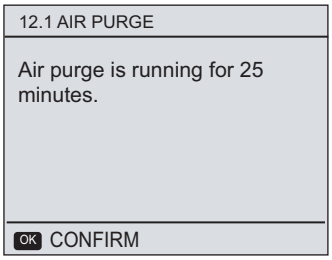
Go to MENU> FOR SERVICEMAN> SPECIAL FUNCTION.



Use ▼ ▲ to scroll and use OK to enter.

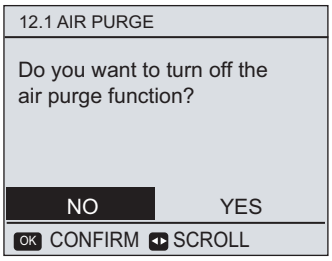
During first operation of the unit, air may remain in the system which can case malfunctions during operation. It is necessary to run the air purge function to release the air (make sure the air purge valve is open).

Go to FOR SERVICEMAN > 13 SPECIAL FUNCTION>13.1AIR PURGE:



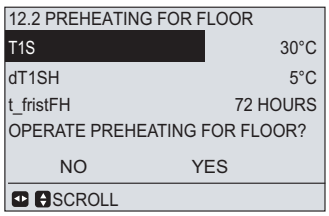
During air purge, the 3-way valve will open, and the 2-way valve will close. 60 seconds later the pump in the unit (PUMPI) will operate for 10 min, during which the flow switch will not work. After the pump stops, the 3-way valve will close and the 2-way valve will open. 60s later the both the PUMPI and PUMPO will operate until the stop command is received.

The number displayed on the page is the time that the air purge has run. During air purge, all the buttons except OK are invalid. If you want to turn off the air purge, please press OK, then the following page is displayed:



Use◄ ► to scroll and use OK to confirm.

If PREHEATING FOR FLOOR is selected, after press OK ,the page will displayed as follows:



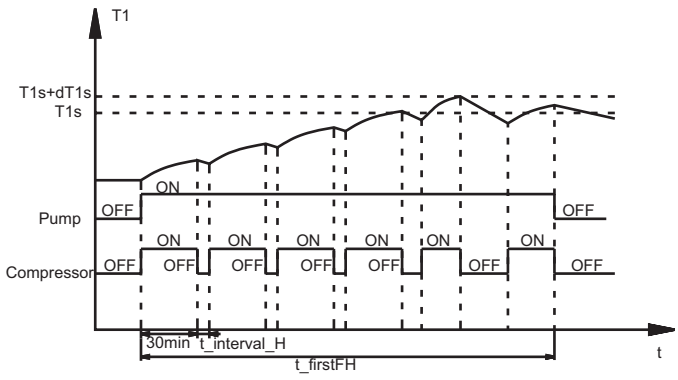
When the cursor is on T1S, dT1SH or t_fristFH, Use ◄ ► and ▼ ▲ to scroll and adjust the parameter.

T1S is the target outlet water temperature in preheating for floor mode. The T1S set here should be equal to the target outlet water temperature set in the main page.

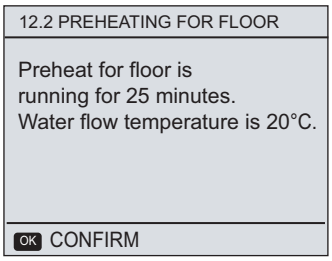
dT1SH is the temperature difference for stopping the unit. (When T1≥T1S+dT1S occurs the heat pump will turn off)

t_fristFH is the time last for preheating floor.

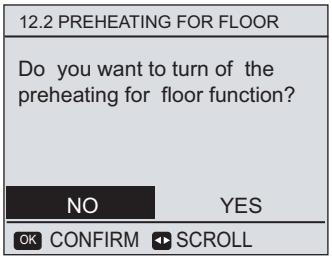
The operation of the unit during preheating for floor described in the picture below:



When the cursor is on OPERATE PREHEATING FOR FLOOR, Use ◄ ► to scroll to YES and press OK. The page will be displayed as follows:



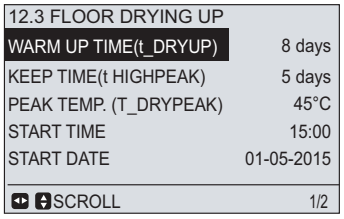
During preheating for floor, all the buttons except OK are invalid. If you want to turn off the preheating for floor, please press OK. The following page will be displayed:



Use ◄ ►to scroll the cursor to YES and press OK, the preheating for floor will turn off.

Before floor heating, if large a amount of water remains on the floor, the floor may be warped or even rupture during floor heating operation, in order to protect the floor, floor drying is necessary, during which the temperature of the floor should be increased gradually.

If FLOOR DRYING UP is selected, after press OK ,the page will displayed as follows:



When the cursor is on WARM UP TIME (t_DRYUP), KEEP TIME (t_HIGHPEAK), TEMP. DOWN TIME (t_DRYD), PEAK TEMP. (T_DRYPEAK), START TIME or START DATA, Use ◄ ► and ▼ ▲ to scroll and adjust the parameter.

t_DRYUP is the day for warming up.

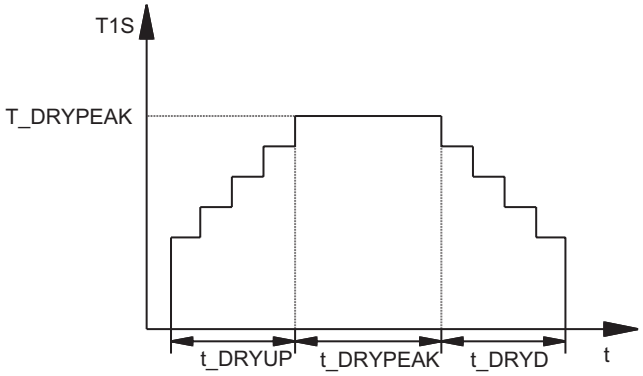
t_HIGHPEAK is the last day of high temperature.

t_DRYD is the day of dropping temperature

T_DRYPEAK is the target peak temperature of water flow during floor drying up.

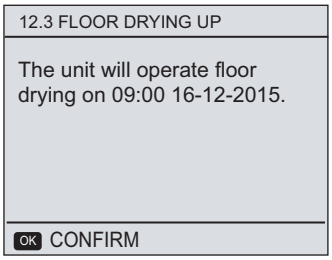
The target outlet water temperature during floor drying up described

in the picture below:



When the cursor is on OPERATE FLOOR DRYING? Use ◄ ► to scroll to YES and press OK. The page will be displayed as follows:

During floor drying, all the buttons except OK are invalid. When the heat pump mal-functions, the floor drying mode will turn off when the backup heater and additional heating source is unavailable. If you want to turn off floor drying up, please press OK. The following page will be displayed:

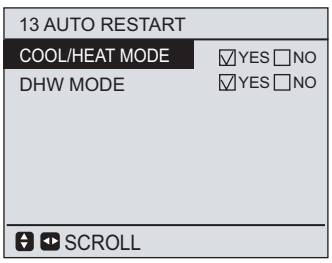


Use ◄ ► to scroll the cursor to YES and press OK. Floor drying will turn off.

Auto restart

The AUTO RESTART function is used to select whether the unit reapplies the user interface settings at the time when power returns after a power supply.

Go to MENU> FOR SERVICEMAN> AUTO RESTART

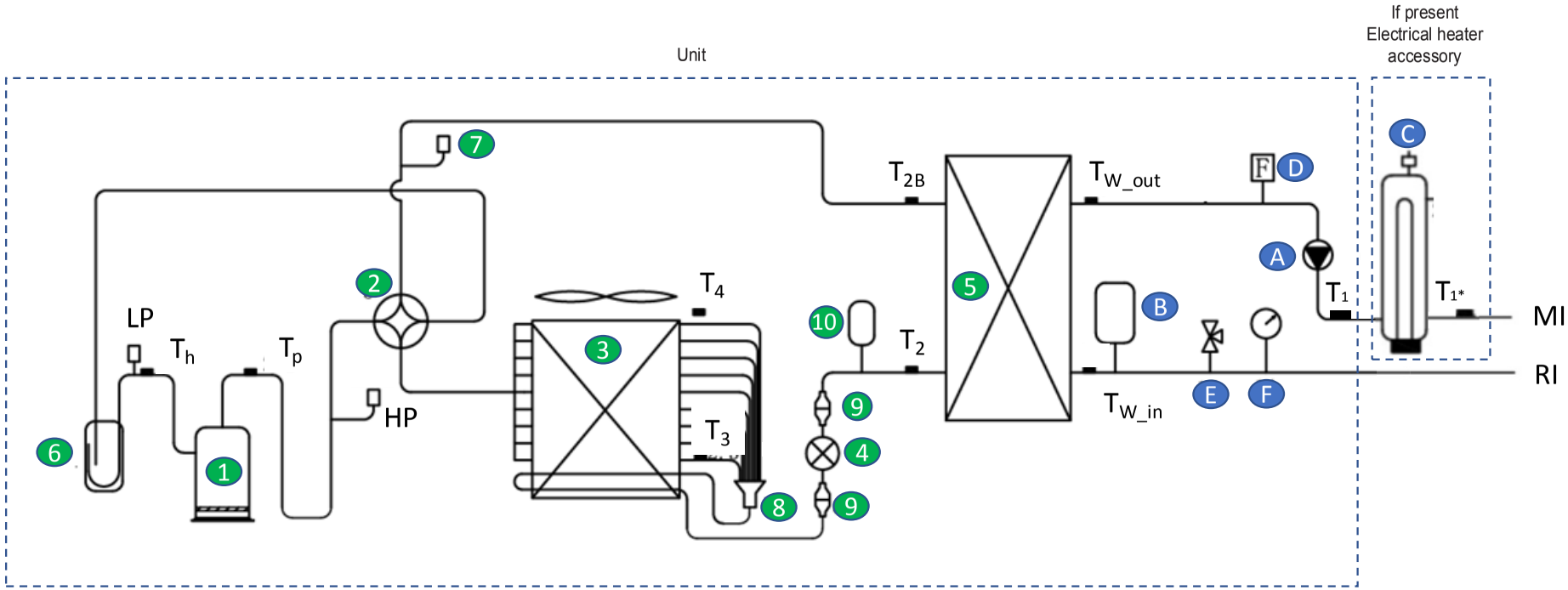


Use ▼, ▲, ◄, ► to scroll and use OK to select YES or NON to enable or disable the auto restart function. If the auto restart function is enabled, when power returns after a power supply failure, the AUTO RESTART function reapplies the user interface settings at the time of the power supply failure. If this function is disabled, when power returns after a power supply failure, the unit won't auto restart.

Parameters list

N°	Code	Meaning	Setting range	Default	Adjust precision	UM
1	-	Working Mode	Auto, Cool, Heat, DHW	Heat/ DHW	/	/
2	-	Room setting temp	cooling:17~30	24	1	ºC
			heating:17~30	24	1	ºC
			auto:17~30	24	1	ºC
3	-	Water outlet setting temp	Cooling 1: 5~25	7	1	ºC
			Cooling 2: 18~30	18	1	ºC
			Heating 1: 25~55	35	1	ºC
			Heating 2: 35~60	45	1	ºC
4	-	Domestic hot water tank DHW setting temp	40~60	50	1	ºC
5	-	Screen lock time	60~300	120	10	S
6	-	Disinfect time	0:00~23:00	23.00	10	MIN
7	Pump running time (DHW time)	DHW water pump running time	5-120	5	1	MIN
8	-	Time	0:00~24:00		1	HOUR/ MIN
9	-	Date	01-01-2000~31-12-2099	01/01/2016	1	/
10	-	Silent level	1~2	1	1	/
11	T1S	Water outlet setting temp of the first heating floor	25~35	25	1	ºC
12	t_firstFH	Running time of the first time heating floor	48~96	72	12	HOUR
13	T4DHWMAX	Max. operation ambient of DHW mode	35~43	43	1	ºC
14	T4DHWMIN	Min. operation ambient of DHW mode	-20~5	-10	1	ºC
15	dT1SC	Temp difference to start of water outlet temp in cooling mode (flow sensor)	2~10	5	1	ºC
16	dTSC	Temp difference to start of room temp in cooling mode (room sensor)	1~10	2	1	ºC
17	T4CMAX	Max. operation ambient temp in cooling mode	35~46	43	1	ºC
18	T4CMIN	Min. operation ambient temp in cooling mode	-5~25	10	1	ºC
19	dT1SH	Temp difference to start of water outlet temp in heating mode (flow sensor)	2~10	5	1	ºC
20	dTSH	Temp difference to start of room temp in heating mode (room sensor)	1~10	2	1	ºC
21	T4HMAX	Max. operation temp of heating mode	20~35	25	1	ºC
22	T4HMIN	Min. operation temp of heating mode	-20~5	-15	1	ºC
23	T4AUTOCMIN	Min. operation temp of cooling in Auto mode	20-29	25	1	ºC
24	T4AUTOHMAX	Max. operation temp of heating in Auto mode	10-17	17	1	ºC
25	T1S_H.A_H	Water outlet setting temp in holiday mode	20~25	25	1	ºC
26	T5S_H.A_DHW	Water tank setting temp in holiday mode	20~25	25	1	ºC
27	T5S_disinfect	Setting temp of Disinfect mode	60~70	65	1	ºC
28	t_DI_HIGHTEMP.	Keep time when reach setting temp in disinfect mode	5~60	15	5	MIN

N°	Code	Meaning	Setting range	Default	Adjust precision	UM
29	t_DI_max	Operation time of disinfect mode	90~300	210	5	MIN
30	t_DHWHP_MAX	Max. running time of DHW mode	10~600	120	5	MIN
31	t_DHWHP_RESTRICT	Max. running time of heat pump mode	10~600	10	5	MIN
32	dT5_ON	Temp difference to start of water temp in DHW mode	2~10	5	1	ºC
33	dT1S5	Temp difference to start of water outlet temp in DHW mode	5~20	10	1	ºC
34	t_TBH_DELAY	Activation delay time of DHW tank electrical heater	0~240	90	5	MIN
35	dT5_TBH_ OFF	DHW tank temperature difference for DHW resistance deactivation	0~10	5	1	ºC
36	T4_TBH_ON	Ambient temp of TBH start	-5~20	5	1	ºC
37	T4_IBH_ON	Ambient temp of IBH start	-15~10	-5	1	ºC
38	dT1_IBH_ON	Temp difference to start IBH	2~10	5	1	ºC
39	t_IBH_DELAY	IBH delay Start Time	15~120	30	5	MIN
40	t_IBH12_DELAY	IBH1,2 delay Start time	5~30	5	5	MIN
41	T4_AHS_ON	Ambient setting temp of AHS start	-15~10	-5	1	ºC
42	dT1_AHS_ON	Temp different of AHS start	2~10	2	1	ºC
43	dT1_AHS_OFF	Temp different of AHS stop	-5~0	0	1	ºC
44	t_AHS_DELAY	AHS Delay start time	5~120	30	5	MIN
45	t_INTERVAL_C	Compressor start interval time in cooling mode	5~30	5	1	MIN
46	t_INTERVAL_H	Compressor start interval time in heating mode	5~60	5	1	MIN
47	t_INTERVAL_DHW	Compressor start interval time in DHW mode	5~30	5	1	MIN
48	t_DRYUP	Running time of rise to T_DRYPEAK	4~15	8	1	DAY
49	t_HIGHPEAK	Keep time of reach the T_DRYPEAK	3~7	5	1	DAY
50	t_DRYD	Running time of reduce the water outlet temp	4~15	5	1	DAY
51	T_DRYPEAK	Water outlet Setting temp of floor drying mode	30~55	45	1	ºC



1	compressor
2	4-way valve
3	coil
4	electronic expansion valve
5	plates exchanger
6	suction accumulator
7	pressure sensor
8	coil liquid distributor
9	filter
10	liquid receiver
A	water pump
B	expansion tank
C	air purge valve
D	water flow switch

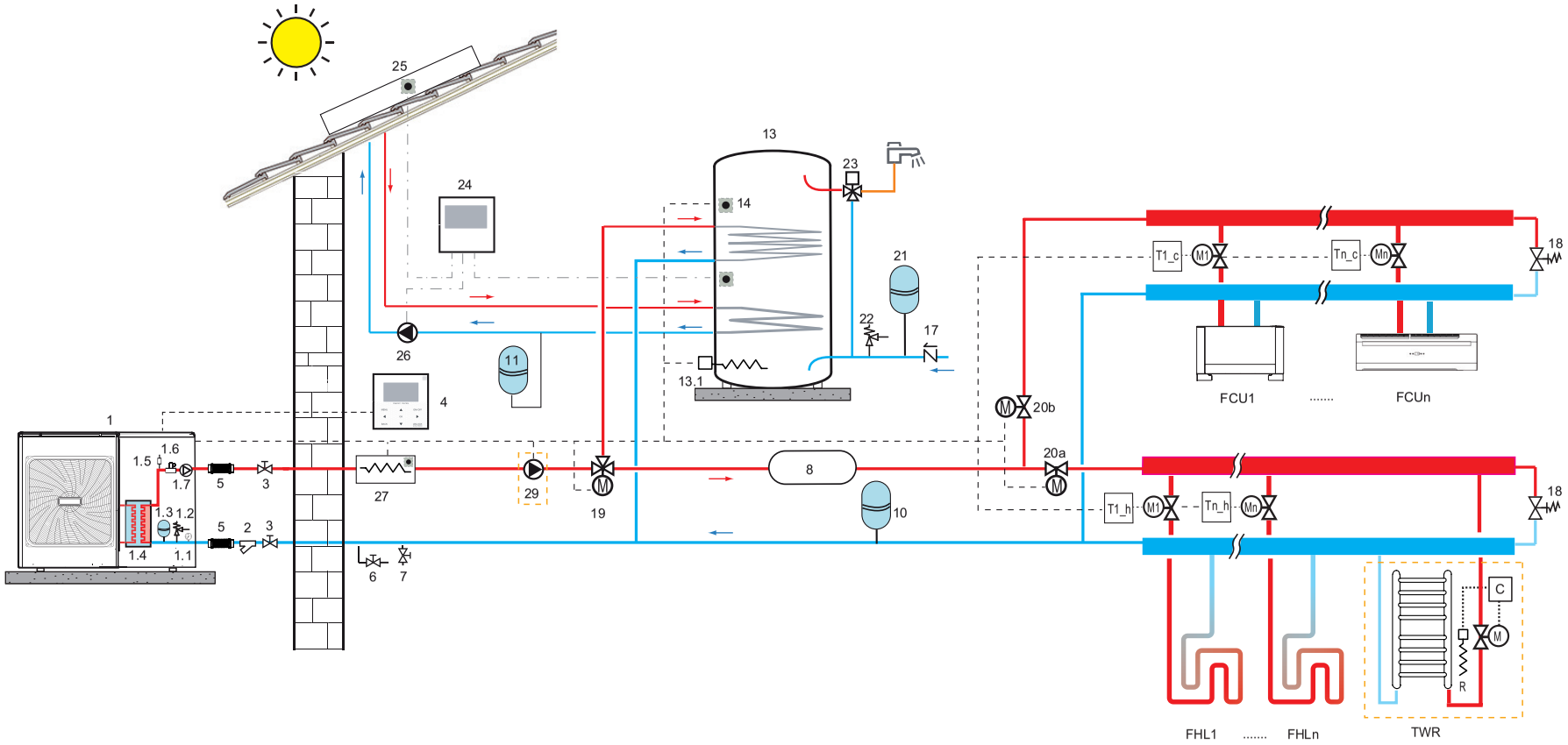
E	water safety valve
F	water pressure gauge
LH	high pressure switch
LP	low pressure switch
MI	plant delivery
RI	plant return
T_1	plant delivery water temperature probe (installed as standard into the unit)
T_1*	plant delivery water temperature probe (installed as standard into the Backup electrical heater)
T_2	plate exchanger liquid temperature
T_{2B}	plate exchanger gas temperature
T_3	coil liquid temperature
T_4	outdoor air temperature

T_h	compressor suction temperature
T_P	compressor discharge temperature
T_{w_in}	plate exchanger inlet water temperature probe
T_{w_ou}	plate exchanger outlet water temperature probe

NOTE:
With external electric booster accessory, the T_1 probe must be disconnected from the hydronic board of the unit and replaced by the T_1 * probe, which in this case will perform the plant delivery temperature probe function. For details please refer to the "Backup electric heater" installation manual.

EXAMPLES OF APPLICATION SYSTEM

FE 1S - Cooling / heating integrated with optional electrical booster / DHW production integrated with optional solar system

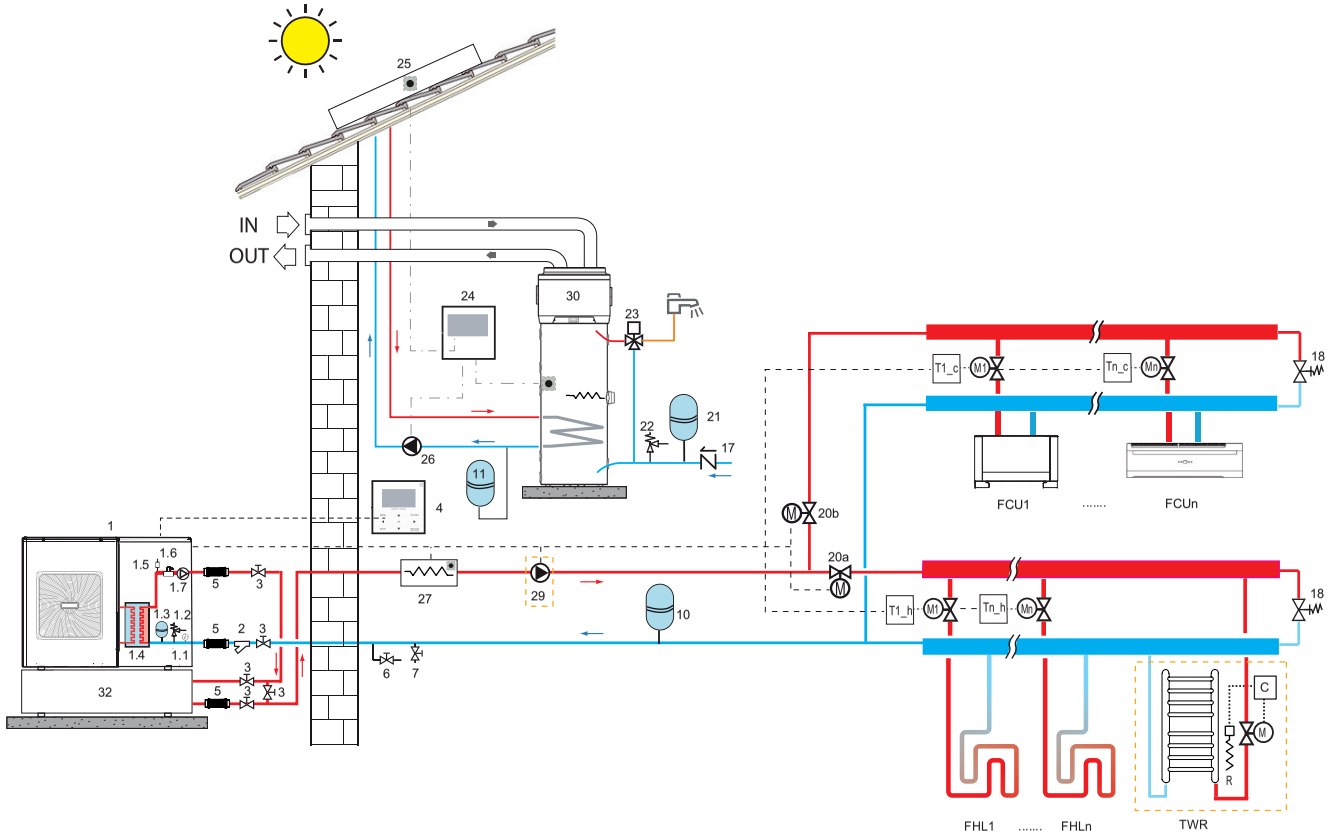


LEGEND

1 Heat pump
1.1 Manometer
1.2 Water safety valve
1.3 Expansion Vessel
1.4 Plate Heat Exchanger (complete with antifreeze electric heater)
1.5 Air Purge Valve
1.6 Flow Switch
1.7 Pump inside the unit (P_i)
2 Y-shape water filter (supplied, mounting by the installer)
3 Shut-off valve (not supplied)
4 Wired remote control (supplied as standard with the unit)
5 Flexible joint (not supplied)
6 Drain Valve (not supplied)
7 Fill Valve (not supplied)
8 Buffer Tank (available as accessory): required if you use air terminals for cooling or if the system water content (excluding the content of the unit) is less than 20 liters
10 Expansion tank (not supplied)
11 Solar expansion tank
12 Hydraulic separator and booster pump (not supplied), evaluate the need for installation in case of high water pressure drop in the system.
13 DHW boiler (not supplied), Minimum surface of the coil for heat pump (1,4 m^2 for mod. 5-7, 1,7 m^2 for mod. 10-14-14T)
13.1 Electrical Heater DHW boiler (not supplied)
14 Temperature probe T5 (supplied, mounting by the installer)
15 Temperature probe (available as accessory of the gas boiler)
17 Check-valve (not supplied)
18 Bypass valve (not supplied)
19 3-way valve SV1 (not supplied)
20a 2-way valve (not supplied), controlled by SV2 - **20b** 2-way valve (not supplied), controlled by SV2 with denied logic
21 DHW Expansion Vessel (not supplied)
22 DHW safety valve (not supplied)
23 Thermostatic mixing valve(not supplied)
24 Solar system control box with its own probes(not supplied)
25 Solar panel (not supplied)
26 Solar system pump (not supplied)
27 Electrical Booster (available as accessory)
28 Temperature probe T1B (available as heat pump accessory)
29 External pump (P_o), (not supplied), to evaluate possible need for installation according to the plant water pressure drop, managed by the heat pump.
T1_c - Tn_c Room thermostat for cool demand (not supplied)
T1_h - Tn_h Room thermostat for heat demand (not supplied)
FCU 1...n Air terminal: it can be used only for cooling with radiant floor heating or cooling and heating without radiant floor.
FHL 1...n only heating radiant floor with n areas
TWR Towel water radiator for bath integration: if connected to the heating system it MUST be iIntegrated with electrical heater (R) activated by the control (C) that at the same time closes the valve (M); if not connected to the system, the heating is granted only by the electrical heater (R) activated via the control (C)
AHS Additional boiler for heating and DHW integration (with disinfect function for heating only versions**)**

- - - - - - electrical connections to the heat pump
. _ . _ . _ . electrical connections to the solar system control box
— — — connection to the boiler of the DHW boiler water probe (not supplied)

FE 2S - Cooling / heating integrated with optional electrical booster / DHW production with water heater heat pump (floor installation) integrated with optional solar system

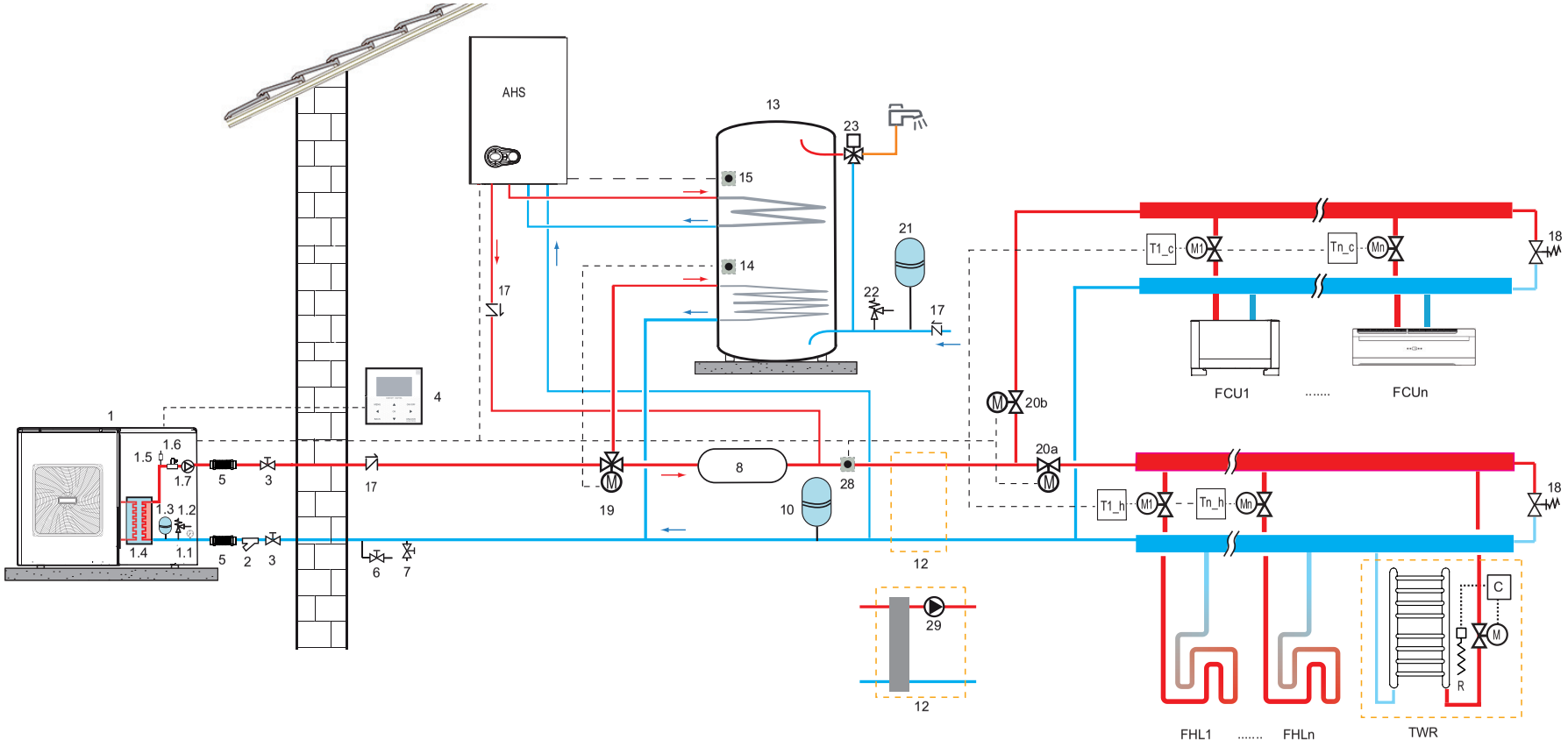


LEGEND

1 Heat pump
1.1 Manometer
1.2 Water safety valve
1.3 Expansion Vessel
1.4 Plate Heat Exchanger (complete with antifreeze electric heater)
1.5 Air Purge Valve
1.6 Flow Switch
1.7 Pump inside the unit (P_i)
2 Y-shape water filter (supplied, mounting by the installer)
3 Shut-off valve (not supplied)
4 Wired remote control (supplied as standard with the unit)
5 Flexible joint (not supplied)
6 Drain Valve (not supplied)
7 Fill Valve (not supplied)
8 Buffer Tank (available as accessory): required if you use air terminals for cooling or if the system water content (excluding the content of the unit) is less than 20 liters
10 Expansion tank (not supplied)
11 Solar expansion tank
12 Hydraulic separator and booster pump (not supplied), evaluate the need for installation in case of high water pressure drop in the system.
13 DHW boiler (not supplied), Minimum surface of the coil for heat pump (1,4 m^2 for mod. 5-7, 1,7 m^2 for mod. 10-14-14T)
13.1 Electrical Heater DHW boiler (not supplied)
14 Temperature probe T5 (supplied, mounting by the installer)
15 Temperature probe (available as accessory of the gas boiler)
17 Check-valve (not supplied)
18 Bypass valve (not supplied)
19 3-way valve SV1 (not supplied)
20a 2-way valve (not supplied), controlled by SV2 - **20b** 2-way valve (not supplied), controlled by SV2 with denied logic
21 DHW Expansion Vessel (not supplied)
22 DHW safety valve (not supplied)
23 Thermostatic mixing valve(not supplied)
24 Solar system control box with its own probes(not supplied)
25 Solar panel (not supplied)
26 Solar system pump (not supplied)
27 Electrical Booster (available as accessory)
28 Temperature probe T1B (available as heat pump accessory)
29 External pump (P_o), (not supplied), to evaluate possible need for installation according to the plant water pressure drop, managed by the heat pump.
T1_c - Tn_c Room thermostat for cool demand (not supplied)
T1_h - Tn_h Room thermostat for heat demand (not supplied)
FCU 1...n Air terminal: it can be used only for cooling with radiant floor heating or cooling and heating without radiant floor.
FHL 1...n only heating radiant floor with n areas
TWR Towel water radiator for bath integration: if connected to the heating system it MUST be iIntegrated with electrical heater (R) activated by the control (C) that at the same time closes the valve (M); if not connected to the system, the heating is granted only by the electrical heater (R) activated via the control (C)
AHS Additional boiler for heating and DHW integration (with disinfect function for heating only versions)

- - - - - - electrical connections to the heat pump
· — · — · - electrical connections to the solar system control box
— — — connection to the boiler of the DHW boiler water probe (not supplied)

HY 1 - Cooling / heating and DHW production integrated with boiler heating only

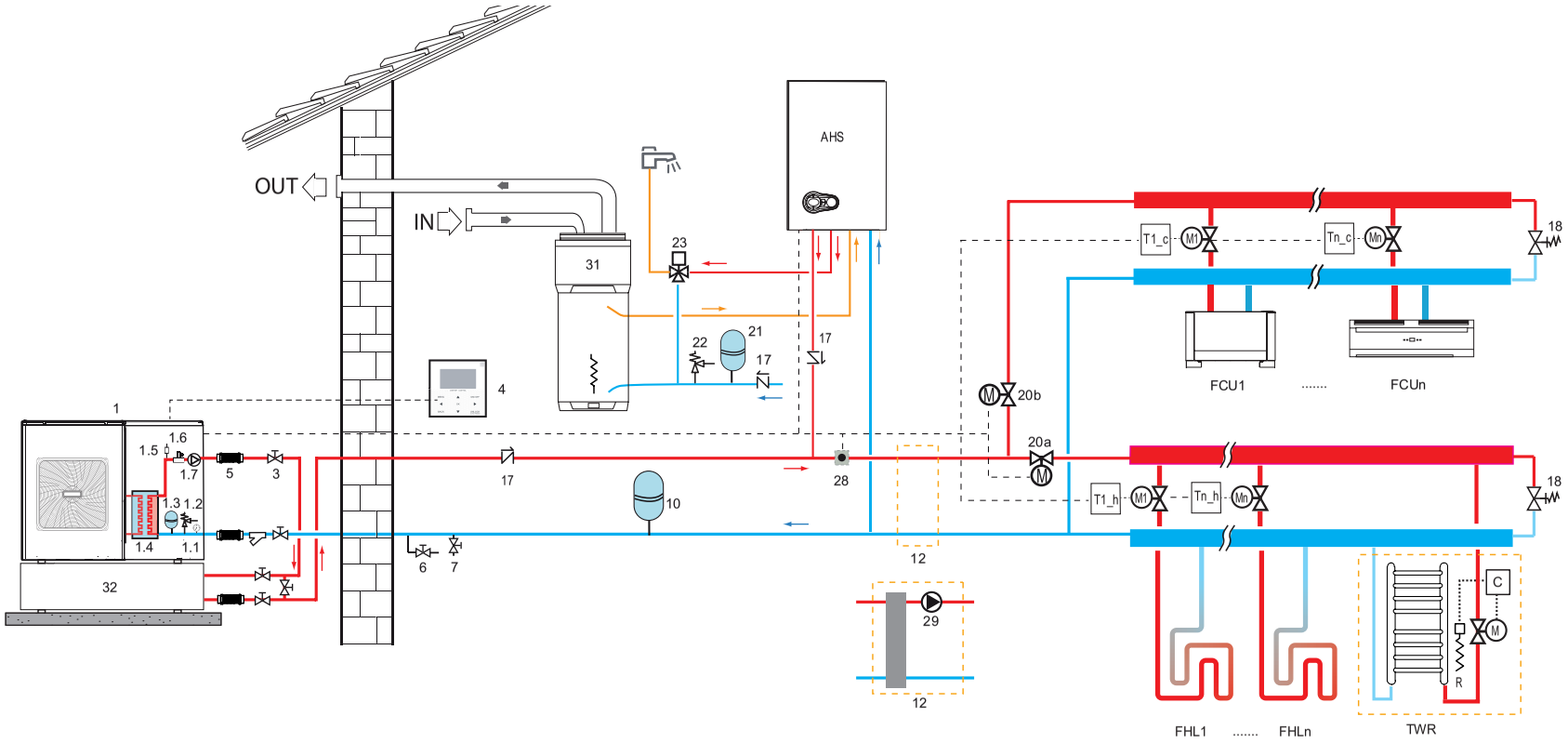


LEGEND

1 Heat pump
1.1 Manometer
1.2 Water safety valve
1.3 Expansion Vessel
1.4 Plate Heat Exchanger (complete with antifreeze electric heater)
1.5 Air Purge Valve
1.6 Flow Switch
1.7 Pump inside the unit (P_i)
2 Y-shape water filter (supplied, mounting by the installer)
3 Shut-off valve (not supplied)
4 Wired remote control (supplied as standard with the unit)
5 Flexible joint (not supplied)
6 Drain Valve (not supplied)
7 Fill Valve (not supplied)
8 Buffer Tank (available as accessory): required if you use air terminals for cooling or if the system water content (excluding the content of the unit) is less than 20 liters
10 Expansion tank (not supplied)
11 Solar expansion tank
12 Hydraulic separator and booster pump (not supplied), evaluate the need for installation in case of high water pressure drop in the system.
13 DHW boiler (not supplied), Minimum surface of the coil for heat pump (1,4 m^2 for mod. 5-7, 1,7 m^2 for mod. 10-14-14T)
13.1 Electrical Heater DHW boiler (not supplied)
14 Temperature probe T5 (supplied, mounting by the installer)
15 Temperature probe (available as accessory of the gas boiler)
17 Check-valve (not supplied)
18 Bypass valve (not supplied)
19 3-way valve SV1 (not supplied)
20a 2-way valve (not supplied), controlled by SV2 - **20b** 2-way valve (not supplied), controlled by SV2 with denied logic
21 DHW Expansion Vessel (not supplied)
22 DHW safety valve (not supplied)
23 Thermostatic mixing valve(not supplied)
24 Solar system control box with its own probes(not supplied)
25 Solar panel (not supplied)
26 Solar system pump (not supplied)
27 Electrical Booster (available as accessory)
28 Temperature probe T1B (available as heat pump accessory)
29 External pump (P_o), (not supplied), to evaluate possible need for installation according to the plant water pressure drop, managed by the heat pump.
T1_c - Tn_c Room thermostat for cool demand (not supplied)
T1_h - Tn_h Room thermostat for heat demand (not supplied)
FCU 1...n Air terminal: it can be used only for cooling with radiant floor heating or cooling and heating without radiant floor.
FHL 1...n only heating radiant floor with n areas
TWR Towel water radiator for bath integration: if connected to the heating system it MUST be iIntegrated with electrical heater (R) activated by the control (C) that at the same time closes the valve (M); if not connected to the system, the heating is granted only by the electrical heater (R) activated via the control (C)
AHS Additional boiler for heating and DHW integration (with disinfect function for heating only versions**)**

- - - - - - electrical connections to the heat pump
. — . — . — electrical connections to the solar system control box
— — — connection to the boiler of the DHW boiler water probe (not supplied)

HY 2 - Cooling / heating integrated with instant combi boiler / DHW production with water heater heat pump (wall hung installation) and post-heating with instant combi boiler

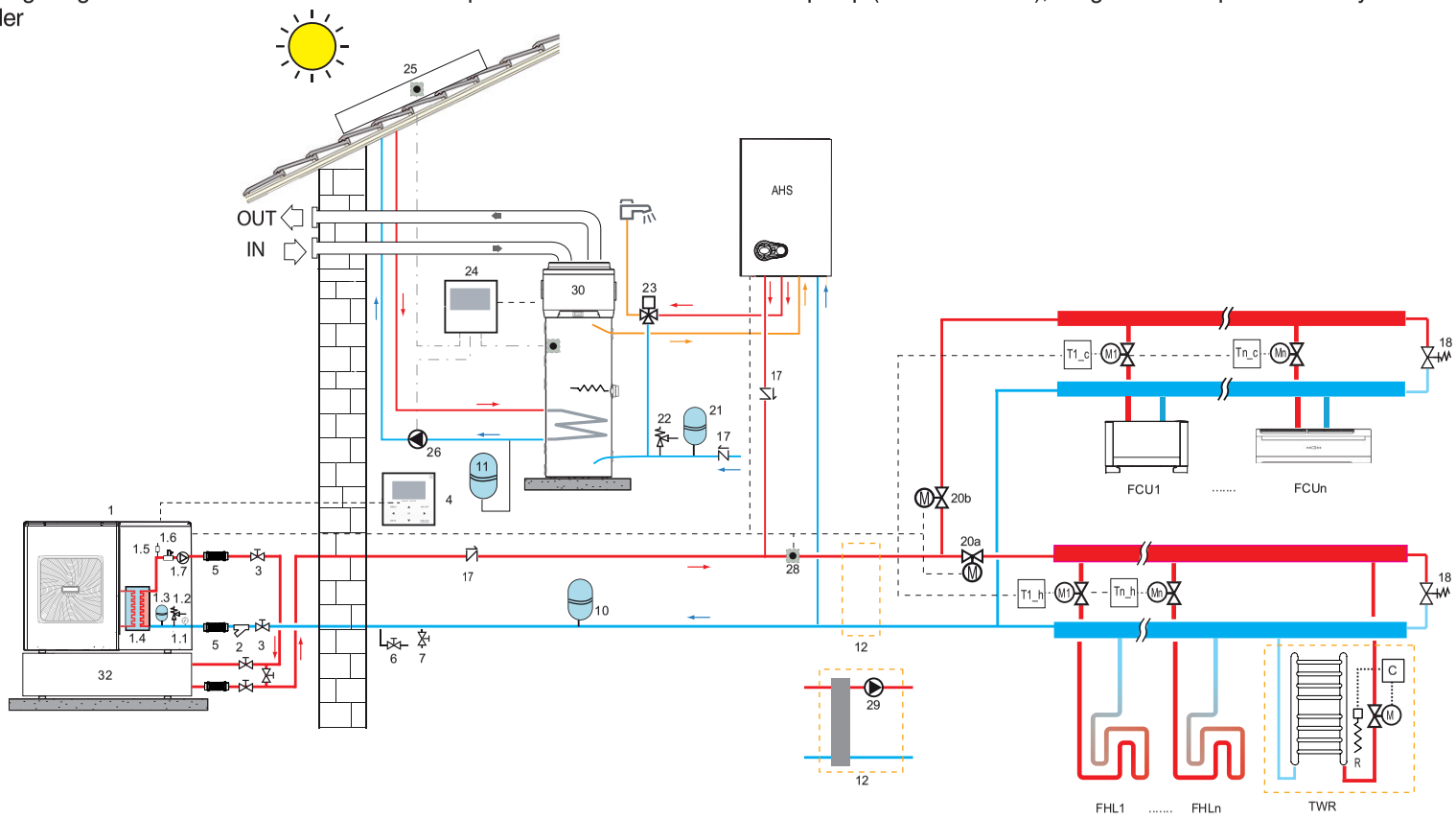


LEGEND

1 Heat pump
1.1 Manometer
1.2 Water safety valve
1.3 Expansion Vessel
1.4 Plate Heat Exchanger (complete with antifreeze electric heater)
1.5 Air Purge Valve
1.6 Flow Switch
1.7 Pump inside the unit (P_i)
2 Y-shape water filter (supplied, mounting by the installer)
3 Shut-off valve (not supplied)
4 Wired remote control (supplied as standard with the unit)
5 Flexible joint (not supplied)
6 Drain Valve (not supplied)
7 Fill Valve (not supplied)
8 Buffer Tank (available as accessory): required if you use air terminals for cooling or if the system water content (excluding the content of the unit) is less than 20 liters
10 Expansion tank (not supplied)
11 Solar expansion tank
12 Hydraulic separator and booster pump (not supplied), evaluate the need for installation in case of high water pressure drop in the system.
13 DHW boiler (not supplied), Minimum surface of the coil for heat pump (1,4 m^2 for mod. 5-7, 1,7 m^2 for mod. 10-14-14T)
13.1 Electrical Heater DHW boiler (not supplied)
14 Temperature probe T5 (supplied, mounting by the installer)
15 Temperature probe (available as accessory of the gas boiler)
17 Check-valve (not supplied)
18 Bypass valve (not supplied)
19 3-way valve SV1 (not supplied)
20a 2-way valve (not supplied), controlled by SV2 - **20b** 2-way valve (not supplied), controlled by SV2 with denied logic
21 DHW Expansion Vessel (not supplied)
22 DHW safety valve (not supplied)
23 Thermostatic mixing valve(not supplied)
24 Solar system control box with its own probes(not supplied)
25 Solar panel (not supplied)
26 Solar system pump (not supplied)
27 Electrical Booster (available as accessory)
28 Temperature probe T1B (available as heat pump accessory)
29 Extemal pump (P_o), (not supplied), to evaluate possible need for installation according to the plant water pressure drop, managed by the heat pump.
T1_c - Tn_c Room thermostat for cool demand (not supplied)
T1_h - Tn_h Room thermostat for heat demand (not supplied)
FCU 1...n Air terminal: it can be used only for cooling with radiant floor heating or cooling and heating without radiant floor.
FHL 1...n only heating radiant floor with n areas
TWR Towel water radiator for bath integration: if connected to the heating system it MUST be iIntegrated with electrical heater (R) activated by the control (C) that at the same time closes the valve (M); if not connected to the system, the heating is granted only by the electrical heater (R) activated via the control (C)
AHS Additional boiler for heating and DHW integration (with disinfect function for heating only versions**)**

- - - - - - electrical connections to the heat pump
. — . — . — electrical connections to the solar system control box
— — — connection to the boiler of the DHW boiler water probe (not supplied)

HY 3S - Cooling / heating integrated with instant combi boiler / DHW production with water heater heat pump (floor installation), integrated with optional solar system and post-heating with instant combi boiler

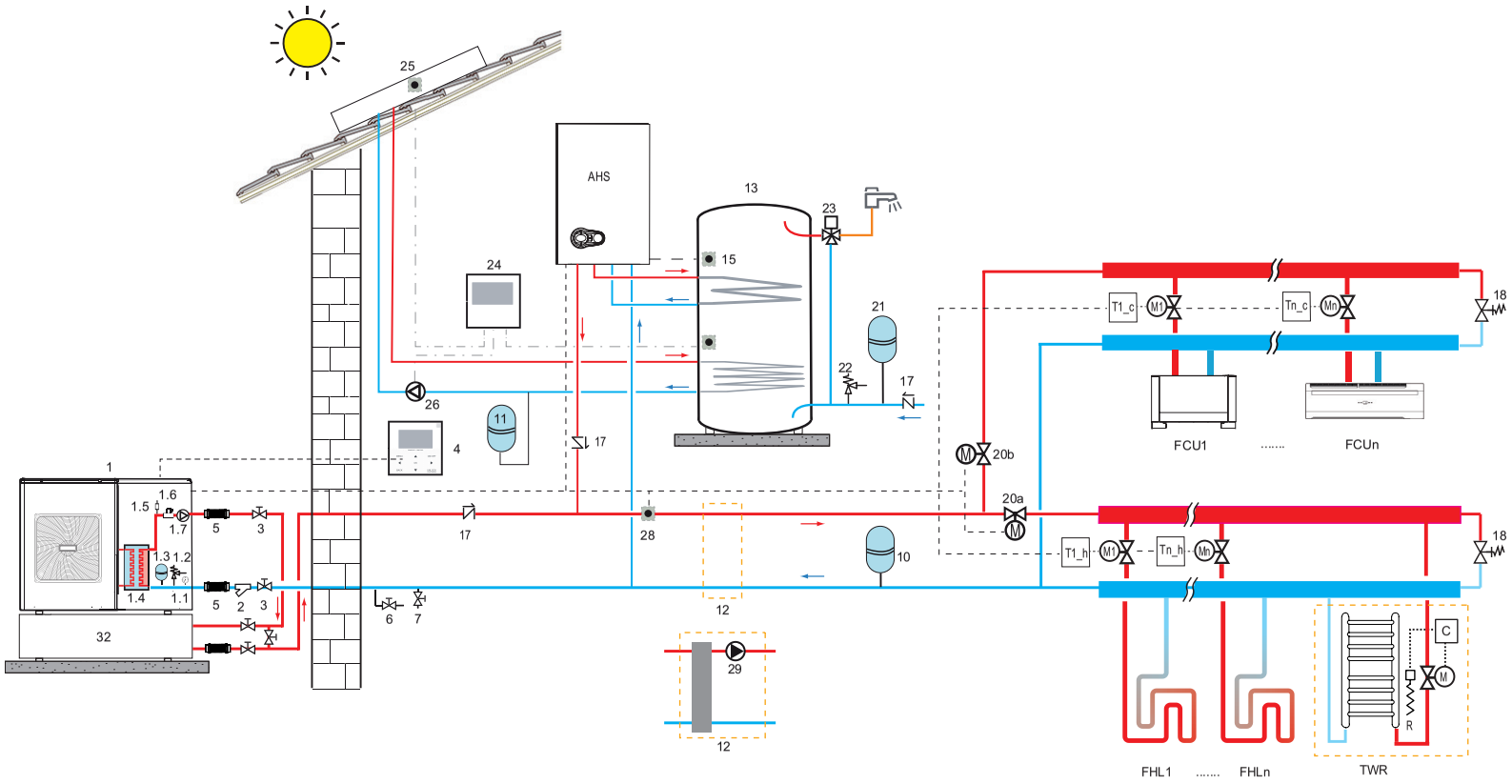


LEGEND

1 Heat pump
1.1 Manometer
1.2 Water safety valve
1.3 Expansion Vessel
1.4 Plate Heat Exchanger (complete with antifreeze electric heater)
1.5 Air Purge Valve
1.6 Flow Switch
1.7 Pump inside the unit (P_i)
2 Y-shape water filter (supplied, mounting by the installer)
3 Shut-off valve (not supplied)
4 Wired remote control (supplied as standard with the unit)
5 Flexible joint (not supplied)
6 Drain Valve (not supplied)
7 Fill Valve (not supplied)
8 Buffer Tank (available as accessory): required if you use air terminals for cooling or if the system water content (excluding the content of the unit) is less than 20 liters
10 Expansion tank (not supplied)
11 Solar expansion tank
12 Hydraulic separator and booster pump (not supplied), evaluate the need for installation in case of high water pressure drop in the system.
13 DHW boiler (not supplied), Minimum surface of the coil for heat pump (1,4 m^2 for mod. 5-7, 1,7 m^2 for mod. 10-14-14T)
13.1 Electrical Heater DHW boiler (not supplied)
14 Temperature probe T5 (supplied, mounting by the installer)
15 Temperature probe (available as accessory of the gas boiler)
17 Check-valve (not supplied)
18 Bypass valve (not supplied)
19 3-way valve SV1 (not supplied)
20a 2-way valve (not supplied), controlled by SV2 - **20b** 2-way valve (not supplied), controlled by SV2 with denied logic
21 DHW Expansion Vessel (not supplied)
22 DHW safety valve (not supplied)
23 Thermostatic mixing valve(not supplied)
24 Solar system control box with its own probes(not supplied)
25 Solar panel (not supplied)
26 Solar system pump (not supplied)
27 Electrical Booster (available as accessory)
28 Temperature probe T1B (available as heat pump accessory)
29 External pump (P_o), (not supplied), to evaluate possible need for installation according to the plant water pressure drop, managed by the heat pump.
T1_c - Tn_c Room thermostat for cool demand (not supplied)
T1_h - Tn_h Room thermostat for heat demand (not supplied)
FCU 1...n Air terminal: it can be used only for cooling with radiant floor heating or cooling and heating without radiant floor.
FHL 1...n only heating radiant floor with n areas
TWR Towel water radiator for bath integration: if connected to the heating system it MUST be iIntegrated with electrical heater (R) activated by the control (C) that at the same time closes the valve (M); if not connected to the system, the heating is granted only by the electrical heater (R) activated via the control (C)
AHS Additional boiler for heating and DHW integration (with disinfect function for heating only versions**)**

- - - - - - electrical connections to the heat pump
. _ . _ . _ electrical connections to the solar system control box
— — — connection to the boiler of the DHW boiler water probe (not supplied)

HY 4S - Cooling / heating integrated with boiler heating only / DHW production with boiler heating only with optional solar system

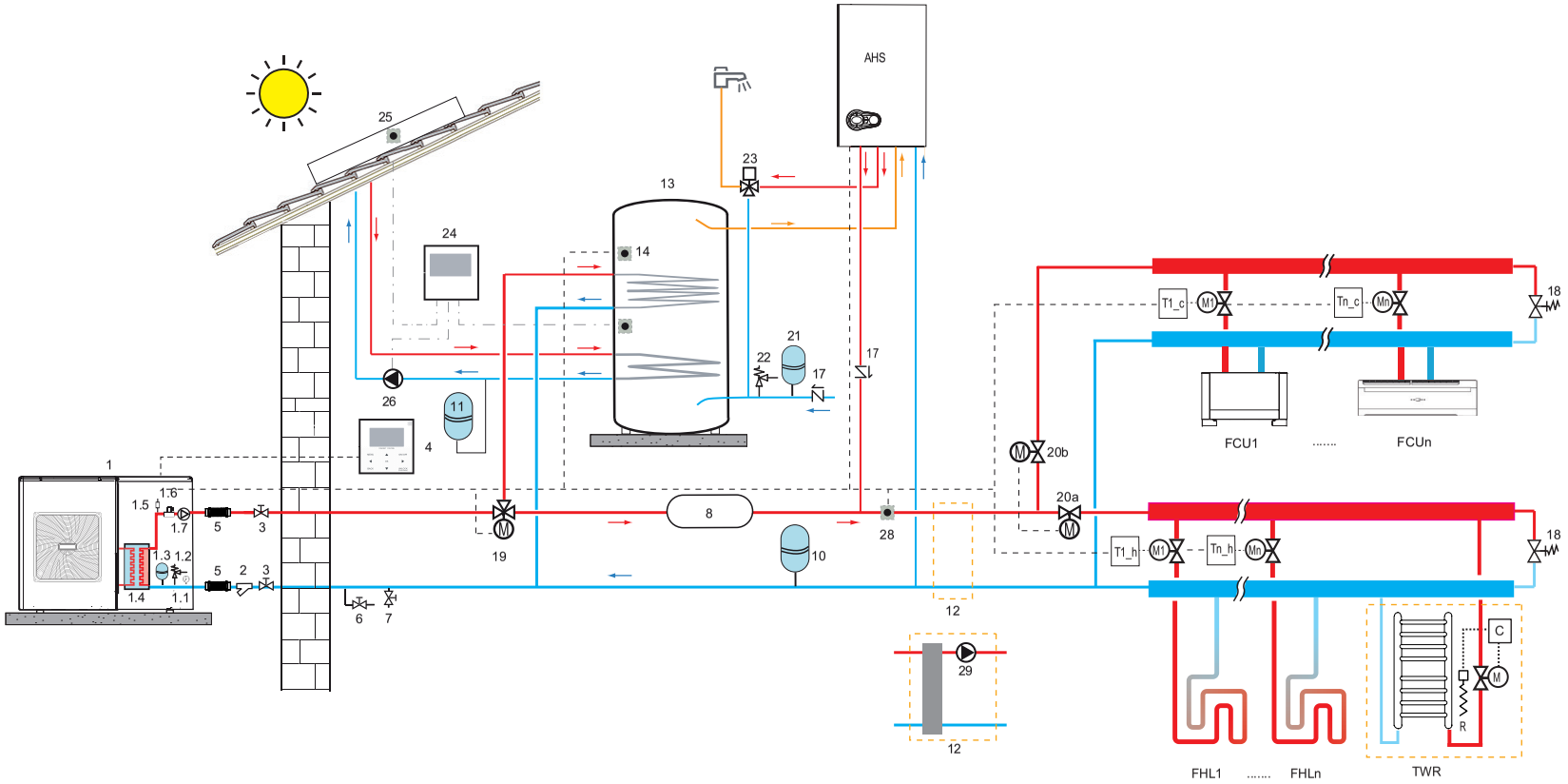


LEGEND

1 Heat pump
1.1 Manometer
1.2 Water safety valve
1.3 Expansion Vessel
1.4 Plate Heat Exchanger (complete with antifreeze electric heater)
1.5 Air Purge Valve
1.6 Flow Switch
1.7 Pump inside the unit (P_i)
2 Y-shape water filter (supplied, mounting by the installer)
3 Shut-off valve (not supplied)
4 Wired remote control (supplied as standard with the unit)
5 Flexible joint (not supplied)
6 Drain Valve (not supplied)
7 Fill Valve (not supplied)
8 Buffer Tank (available as accessory): required if you use air terminals for cooling or if the system water content (excluding the content of the unit) is less than 20 liters
10 Expansion tank (not supplied)
11 Solar expansion tank
12 Hydraulic separator and booster pump (not supplied), evaluate the need for installation in case of high water pressure drop in the system.
13 DHW boiler (not supplied), Minimum surface of the coil for heat pump (1,4 m^2 for mod. 5-7, 1,7 m^2 for mod. 10-14-14T)
13.1 Electrical Heater DHW boiler (not supplied)
14 Temperature probe T5 (supplied, mounting by the installer)
15 Temperature probe (available as accessory of the gas boiler)
17 Check-valve (not supplied)
18 Bypass valve (not supplied)
19 3-way valve SV1 (not supplied)
20a 2-way valve (not supplied), controlled by SV2 - **20b** 2-way valve (not supplied), controlled by SV2 with denied logic
21 DHW Expansion Vessel (not supplied)
22 DHW safety valve (not supplied)
23 Thermostatic mixing valve(not supplied)
24 Solar system control box with its own probes(not supplied)
25 Solar panel (not supplied)
26 Solar system pump (not supplied)
27 Electrical Booster (available as accessory)
28 Temperature probe T1B (available as heat pump accessory)
29 External pump (P_o), (not supplied), to evaluate possible need for installation according to the plant water pressure drop, managed by the heat pump.
T1_c - Tn_c Room thermostat for cool demand (not supplied)
T1_h - Tn_h Room thermostat for heat demand (not supplied)
FCU 1...n Air terminal: it can be used only for cooling with radiant floor heating or cooling and heating without radiant floor.
FHL 1...n only heating radiant floor with n areas
TWR Towel water radiator for bath integration: if connected to the heating system it MUST be iIntegrated with electrical heater (R) activated by the control (C) that at the same time closes the valve (M); if not connected to the system, the heating is granted only by the electrical heater (R) activated via the control (C)
AHS Additional boiler for heating and DHW integration (with disinfect function for heating only versions**)**

- - - - - - electrical connections to the heat pump
. — . — . — electrical connections to the solar system control box
— — — connection to the boiler of the DHW boiler water probe (not supplied)

HY 5S - Cooling / heating integrated with instant combi boiler / DHW production with optional solar system and post-heating with instant combi boiler

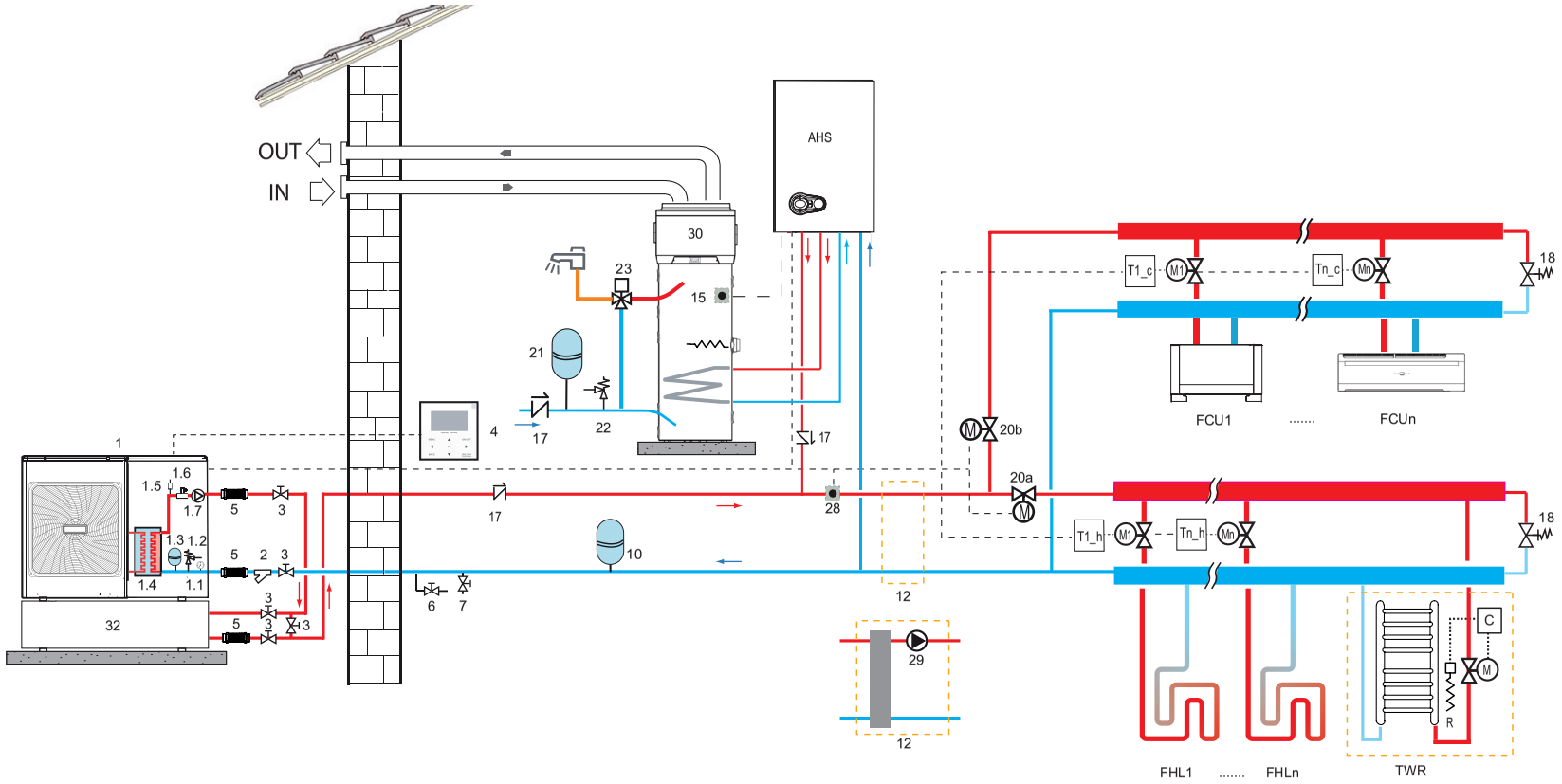


LEGEND

1 Heat pump
1.1 Manometer
1.2 Water safety valve
1.3 Expansion Vessel
1.4 Plate Heat Exchanger (complete with antifreeze electric heater)
1.5 Air Purge Valve
1.6 Flow Switch
1.7 Pump inside the unit (P_i)
2 Y-shape water filter (supplied, mounting by the installer)
3 Shut-off valve (not supplied)
4 Wired remote control (supplied as standard with the unit)
5 Flexible joint (not supplied)
6 Drain Valve (not supplied)
7 Fill Valve (not supplied)
8 Buffer Tank (available as accessory): required if you use air terminals for cooling or if the system water content (excluding the content of the unit) is less than 20 liters
10 Expansion tank (not supplied)
11 Solar expansion tank
12 Hydraulic separator and booster pump (not supplied), evaluate the need for installation in case of high water pressure drop in the system.
13 DHW boiler (not supplied), Minimum surface of the coil for heat pump (1,4 m^2 for mod. 5-7, 1,7 m^2 for mod. 10-14-14T)
13.1 Electrical Heater DHW boiler (not supplied)
14 Temperature probe T5 (supplied, mounting by the installer)
15 Temperature probe (available as accessory of the gas boiler)
17 Check-valve (not supplied)
18 Bypass valve (not supplied)
19 3-way valve SV1 (not supplied)
20a 2-way valve (not supplied), controlled by SV2 - **20b** 2-way valve (not supplied), controlled by SV2 with denied logic
21 DHW Expansion Vessel (not supplied)
22 DHW safety valve (not supplied)
23 Thermostatic mixing valve(not supplied)
24 Solar system control box with its own probes(not supplied)
25 Solar panel (not supplied)
26 Solar system pump (not supplied)
27 Electrical Booster (available as accessory)
28 Temperature probe T1B (available as heat pump accessory)
29 External pump (P_o), (not supplied), to evaluate possible need for installation according to the plant water pressure drop, managed by the heat pump.
T1_c - Tn_c Room thermostat for cool demand (not supplied)
T1_h - Tn_h Room thermostat for heat demand (not supplied)
FCU 1...n Air terminal: it can be used only for cooling with radiant floor heating or cooling and heating without radiant floor.
FHL 1...n only heating radiant floor with n areas
TWR Towel water radiator for bath integration: if connected to the heating system it MUST be iIntegrated with electrical heater (R) activated by the control (C) that at the same time closes the valve (M); if not connected to the system, the heating is granted only by the electrical heater (R) activated via the control (C)
AHS Additional boiler for heating and DHW integration (with disinfect function for heating only versions**)**

- - - - - - electrical connections to the heat pump
— · — · — · electrical connections to the solar system control box
— — — connection to the boiler of the DHW boiler water probe (not supplied)

HY 6 - Cooling / heating integrated with boiler heating only / DHW production with water heater heat pump (floor installation), integrated with boiler heating only

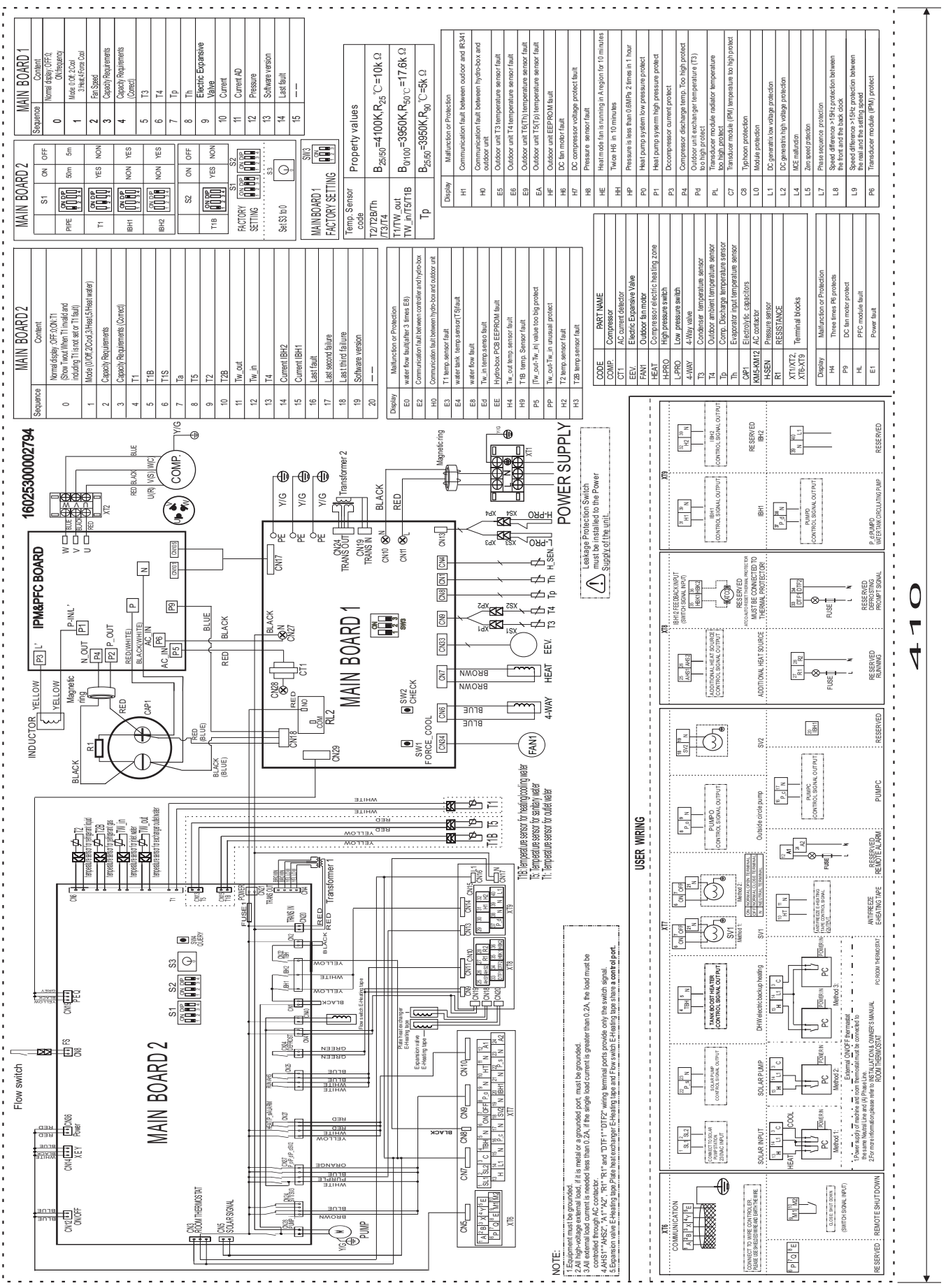


LEGEND

1 Heat pump
1.1 Manometer
1.2 Water safety valve
1.3 Expansion Vessel
1.4 Plate Heat Exchanger (complete with antifreeze electric heater)
1.5 Air Purge Valve
1.6 Flow Switch
1.7 Pump inside the unit (P_i)
2 Y-shape water filter (supplied, mounting by the installer)
3 Shut-off valve (not supplied)
4 Wired remote control (supplied as standard with the unit)
5 Flexible joint (not supplied)
6 Drain Valve (not supplied)
7 Fill Valve (not supplied)
8 Buffer Tank (available as accessory): required if you use air terminals for cooling or if the system water content (excluding the content of the unit) is less than 20 liters
10 Expansion tank (not supplied)
11 Solar expansion tank
12 Hydraulic separator and booster pump (not supplied), evaluate the need for installation in case of high water pressure drop in the system.
13 DHW boiler (not supplied), Minimum surface of the coil for heat pump (1,4 m^2 for mod. 5-7, 1,7 m^2 for mod. 10-14-14T)
13.1 Electrical Heater DHW boiler (not supplied)
14 Temperature probe T5 (supplied, mounting by the installer)
15 Temperature probe (available as accessory of the gas boiler)
17 Check-valve (not supplied)
18 Bypass valve (not supplied)
19 3-way valve SV1 (not supplied)
20a 2-way valve (not supplied), controlled by SV2 - **20b** 2-way valve (not supplied), controlled by SV2 with denied logic
21 DHW Expansion Vessel (not supplied)
22 DHW safety valve (not supplied)
23 Thermostatic mixing valve(not supplied)
24 Solar system control box with its own probes(not supplied)
25 Solar panel (not supplied)
26 Solar system pump (not supplied)
27 Electrical Booster (available as accessory)
28 Temperature probe T1B (available as heat pump accessory)
29 External pump (P_o), (not supplied), to evaluate possible need for installation according to the plant water pressure drop, managed by the heat pump.
T1_c - Tn_c Room thermostat for cool demand (not supplied)
T1_h - Tn_h Room thermostat for heat demand (not supplied)
FCU 1...n Air terminal: it can be used only for cooling with radiant floor heating or cooling and heating without radiant floor.
FHL 1...n only heating radiant floor with n areas
TWR Towel water radiator for bath integration: if connected to the heating system it MUST be iIntegrated with electrical heater (R) activated by the control (C) that at the same time closes the valve (M); if not connected to the system, the heating is granted only by the electrical heater (R) activated via the control (C)
AHS Additional boiler for heating and DHW integration (with disinfect function for heating only versions)

- - - - - - electrical connections to the heat pump
. — . — . — electrical connections to the solar system control box
— — — connection to the boiler of the DHW boiler water probe (not supplied)

Mod. 5 - 7 - 9



MAIN BOARD 1	
Sequence	Content
0	Normal display, OFF:0 ON:1
1	Mode 0:Off 2:Cool 3:Heat 4:Force Cool
2	Fan Speed
3	Capacity Requirements
4	Capacity Requirements (Correct)
5	T3
6	T4
7	Tp
8	Th
9	Electric Expansive Valve
10	Current
11	Current AD
12	Pressure
13	Software version
14	Last fault
15	– –

MAIN BOARD 2																							
		S1																					
		ON	OFF																				
PIPE		50m	5m																				
T1		YES	NON																				
IBH1		NON	YES																				
IBH2		NON	YES																				
	S2	ON	OFF																				
T1B		YES	NON																				
FACTORY SETTING		S1	S2																				
		S3																					
Set:S3 to:0																							

MAIN BOARD 2	
Sequence	Content
0	Normal display, (OFF:0,ON:1) (Show 1 wout When T1 invalid and including T1 is not set or T1 fault)
1	Mode (0:Off,2:Cool,3:Heat,5:Heat water)
2	Capacity Requirements
3	Capacity Requirements (Correct)
4	T1
5	T1B
6	T1S
7	Ta
8	T5
9	T2
10	T2B
11	Tw_out
12	Tw_in
13	T4
14	Current IBH2
15	Current IBH1
16	Last fault
17	Last second failure
18	Last third failure
19	Software version
20	– –

Temp.Sensor code	Property values
T2/T2B/Th /T3/T4	$B_{25/50}$=4100K,R_{25} ℃=10k Ω
T1/TW_out TW_in/T5/T1B	$B_{0/100}$=3950K,$R_{50℃}$=17.6k Ω
Tp	$B_{25/80}$=3950K,R_{90} ℃=5k Ω

Display	Malfunction or Protection
E0	water flow fault(after 3 times E8)
E2	Communication fault between controller and hydro-box
H0	Communication fault between hydro-box and outdoor unit
E3	T1 temp. sensor fault
E4	water tank temp.sensor(T5)fault
E8	water flow fault
Ed	Tw_in temp.senso fault
EE	Hydro-box PCB EEPROM fault
H4	Tw_out temp. sensor fault
H9	T1B temp. Sensor fault
P5	(Tw_out-Tw_in) value too big protect
PP	Tw_out-Tw_in unusual protect
H2	T2 temp. sensor fault
H3	T2B temp.sensor fault

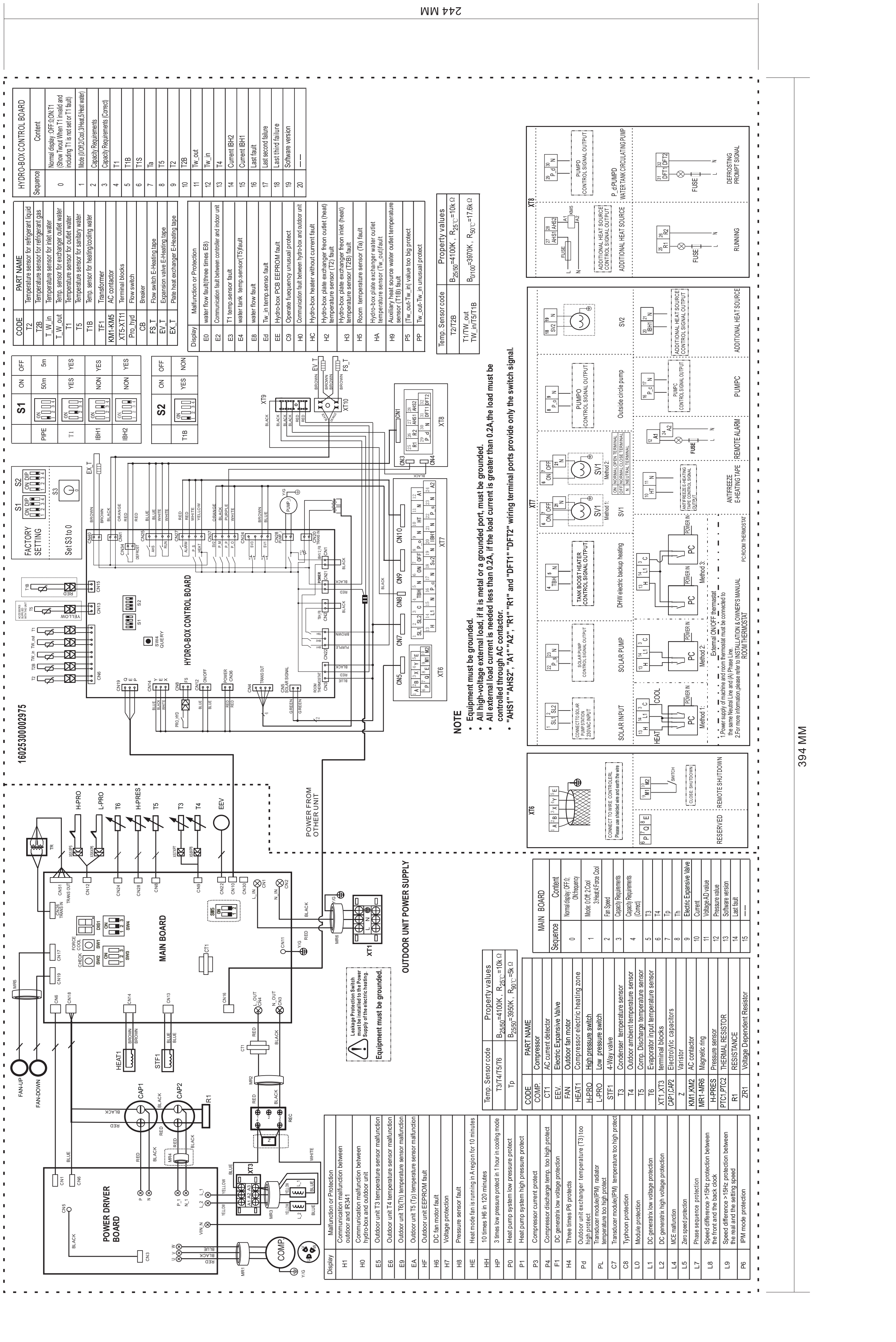
Display	Malfunction or Protection
H1	Communication fault between outdoor and IR341
H0	Communication fault between hydro-box and outdoor unit
E5	Outdoor unit T3 temperature sensor fault
E6	Outdoor unit T4 temperature sensor fault
E9	Outdoor unit T5(Th) temperature sensor fault
EA	Outdoor unit T5(Tp) temperature sensor fault
HF	Outdoor unit EEPROM fault
H6	DC fan motor fault
H7	DC compressor voltage protect fault
H8	Pressure sensor fault
HE	Heat mode fan is running in A region for 10 minutes
HH	Twice H6 in 10 minutes
HP	Pressure is less than 0.6MPa 2 times in 1 hour
P0	Heat pump system low pressure protect
P1	Heat pump syswrm high pressure protect
P3	Dcompressor current protect
P4	Compressor discharge temp. Too high protect
Pd	Outdoor unit exchanger temperature (T3) too high protect
PL	Transducer module radiator temperature too high protect
C7	Transducer module (IPM) temperature too high protect
C8	Typhoon protection
L0	Module protection
L1	DC generatrix low voltage protection
L2	DC generatrix high voltage protection
L4	MCE malfunction
L5	Zero speed protection
L7	Phase sequence protection
L8	Speed difference >15Hz protection between the front and the back clock
L9	Speed difference >15Hz protection between the real and the setting speed
P6	Transducer module (IPM) protect

CODE	PART NAME
COMP	Compressor
CT1	AC current detector
EEV	Electric Expansive Valve
FAN1	Outdoor fan motor
HEAT	Compressor electric heating zone
H-PRO	High pressure switch
L-PRO	Low pressure switch
4-WAY	4-Way valve
T3	Condenser temperature sensor
T4	Outdoor ambient temperature sensor
Tp	Comp. Discharge temperature sensor
Th	Evaporator input temperature sensor
CAP1	Electrolytic capacitors
KM1-KM12	AC contactor
H-SEN	Pressure sensor
R1	RESISTANCE
XT1/XT2, XT6-XT9	Terminal blocks

Display	Malfunction or Protection
H4	Three times P6 protects
P9	DC fan motor protect
HL	PFC module fault
E1	Power fault

WIRING DIAGRAMS

Mod. 10-12-14-16



HYDRO-BOX CONTROL BOARD	
Sequence	Content
0	Normal display :OFF:0;ON:T1 (Show Twout When T1 invalid and including T1 is not set or T1 fault)
1	Mode (0/Off,2/Cool,3/Heat,5/Heat water)
2	Capacity Requirements
3	Capacity Requirements (Correct)
4	T1
5	T1B
6	T1S
7	Ta
8	T5
9	T2
10	T2B
11	Tw_out
12	Tw_in
13	T4
14	Current IBH2
15	Current IBH1
16	Last fault
17	Last second failure
18	Last third failure
19	Software version
20	——

CODE	PART NAME
T2	Temperature sensor for refrigerant liquid
T2B	Temperature sensor for refrigerant gas
T_W_in	Temperature sensor for inlet water
T_W_out	Temp. sensor for exchanger outlet water
T1	Temperature sensor for outlet water
T5	Temperature sensor for sanitary water
T1B	Temp. sensor for heating/cooling water
TF1	Transformer
KM1-KM5	AC contactor
XT5-XT11	Terminal blocks
Pro_hyd	Flow switch
CB	Breaker
FS_T	Flow switch E-Heating tape
EV_T	Expansion valve E-Heating tape
EX_T	Plate heat exchanger E-Heating tape

Display	Malfunction or Protection
E0	water flow fault(three times E8)
E2	Communication fault between controller and indoor unit
E3	T1 temp.sensor fault
E4	water tank temp.sensor(T5)fault
E8	water flow fault
Ed	Tw_in temp.senso fault
EE	Hydro-box PCB EEPROM fault
C9	Operate fuequency unusual protect
H0	Communication fault between hydro-box and outdoor unit
HC	Hydro-box heater without current fault
H2	Hydro-box plate exchanger freon outlet (heat) temperature sensor (T2) fault
H3	Hydro-box plate exchanger freon inlet (heat) temperature sensor (T2B) fault
H5	Room temperature sensor (Ta) fault
HA	Hydro-box plate exchanger water outlet temperature sensor (Tw_out)fault
H9	Auxiliary heat source water outlet temperature sensor (T1B) fault
P5	|Tw_out-Tw_in| value too big protect
PP	Tw_out-Tw_in unusual protect

Temp. Sensor code	Property values
T2/T2B	$B_{25/50}$=4100K，$R_{25℃}$=10k Ω
T1/TW_out TW_in/T5/T1B	$B_{0/100}$=3970K，$R_{50℃}$=17.6k Ω

S1		ON	OFF
PIPE		50m	5m
T1		YES	YES
IBH1		NON	YES
IBH2		NON	YES

S2		ON	OFF
T1B		YES	NON

NOTE

- **Equipment must be grounded.**
- **All high-voltage external load, if it is metal or a grounded port, must be grounded.**
- **All external load current is needed less than 0.2A, if the load current is greater than 0.2A,the load must be controlled through AC contactor.**
- **"AHS1" "AHS2", "A1" "A2", "R1" "R2" and "DFT1" "DFT2" wiring terminal ports provide only the switch signal.**

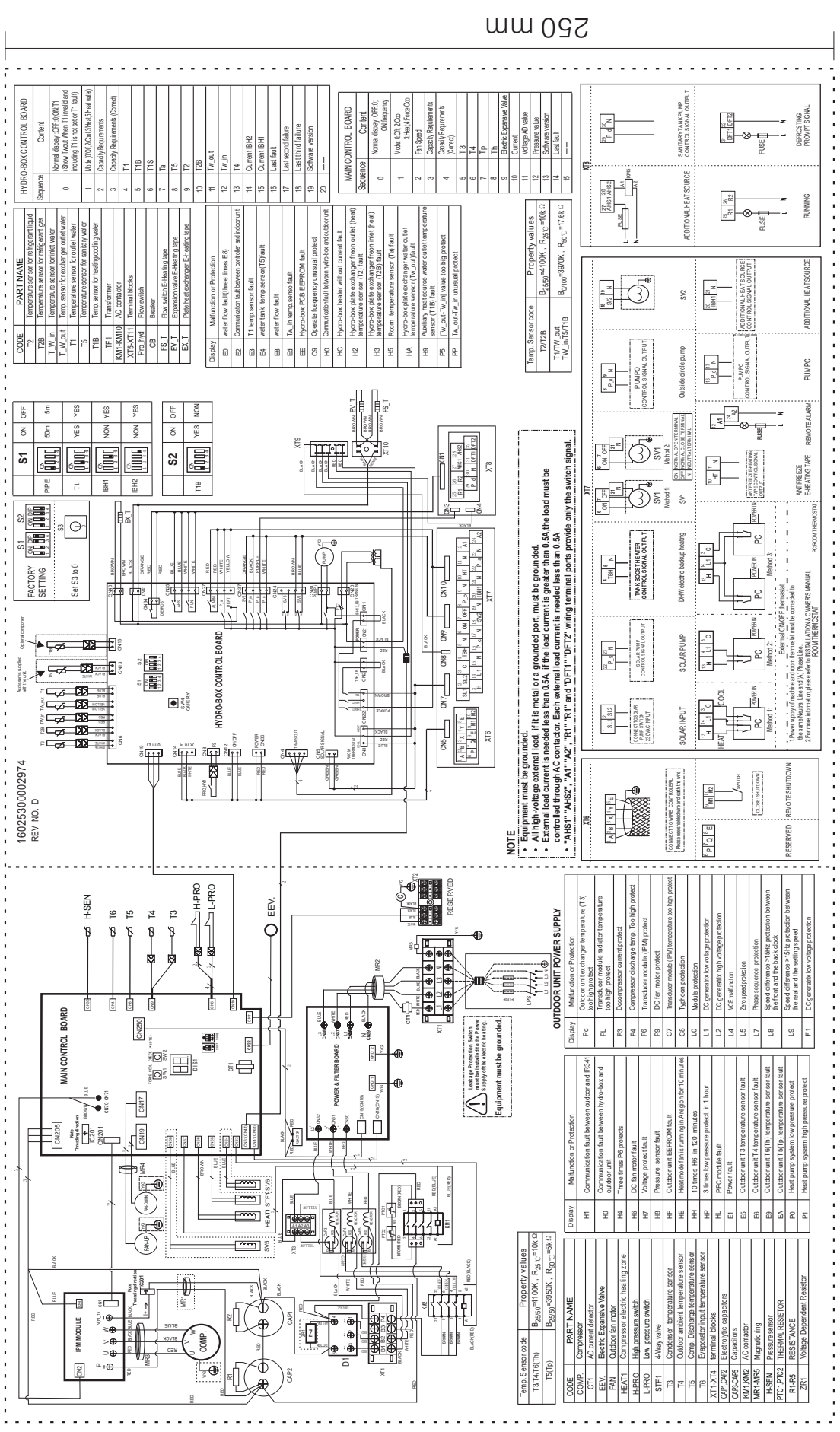
Display	Malfunction or Protection
H1	Communication malfunction between outdoor and IR341
H0	Communication malfunction between hydro-box and outdoor unit
E5	Outdoor unit T3 temperature sensor malfunction
E6	Outdoor unit T4 temperature sensor malfunction
E9	Outdoor unit T6(Th) temperature sensor malfunction
EA	Outdoor unit T5 (Tp) temperature sensor malfunction
HF	Outdoor unit EEPROM fault
H6	DC fan motor fault
H7	Voltage protection
H8	Pressure sensor fault
HE	Heat mode fan is running in A region for 10 minutes
HH	10 times H6 in 120 minutes
HP	3 times low pressure protect in 1 hour in cooling mode
P0	Heat pump system low pressure protect
P1	Heat pump system high pressure protect
P3	Compressor current protect
P4	Compressor discharge temp. too high protect
F1	DC generatrix low voltage protection
H4	Three times P6 protects
Pd	Outdoor unit exchanger temperature (T3) too high protect
PL	Transducer module(IPM) radiator temperature too high protect
C7	Transducer module(IPM) temperature too high protect
C8	Typhoon protection
L0	Module protection
L1	DC generatrix low voltage protection
L2	DC generatrix high voltage protection
L4	MCE malfunction
L5	Zero speed protection
L7	Phase sequence protection
L8	Speed difference >15Hz protection between the front and the back clock
L9	Speed difference >15Hz protection between the real and the setting speed
P6	IPM mode protection

Temp. Sensor code	Property values
T3/T4/T5/T6	$B_{25/50}$=4100K，$R_{25℃}$=10k Ω
Tp	$B_{25/50}$=3950K，$R_{90℃}$=5k Ω

CODE	PART NAME
COMP.	Compressor
CT1	AC current detector
EEV.	Electric Expansive Valve
FAN	Outdoor fan motor
HEAT1	Compressor electric heating zone
H-PRO	High pressure switch
L-PRO	Low pressure switch
STF1	4-Way valve
T3	Condenser temperature sensor
T4	Outdoor ambient temperature sensor
T5	Comp. Discharge temperature sensor
T6	Evaporator input temperature sensor
XT1,XT3	terminal blocks
CAP1,CAP2	Electrolytic capacitors
Z	Varistor
KM1,KM2	AC contactor
MR1-MR6	Magnetic ring
H-PRES	Pressure sensor
PTC1,PTC2	THERMAL RESISTOR
R1	RESISTANCE
ZR1	Voltage Dependent Resistor

MAIN BOARD	
Sequence	Content
0	Normal display: OFF:0; ON:frequency
1	Mode: 0:Off; 2:Cool 3:Heat;4:Force Cool
2	Fan Speed
3	Capacity Requirements
4	Capacity Requirements (Correct)
5	T3
6	T4
7	Tp
8	Th
9	Electric Expansive Valve
10	Current
11	Voltage AD value
12	Pressure value
13	Software version
14	Last fault
15	——

Mod. 12T-14T-16T



CODE	PART NAME
T2	Temperature sensor for refrigerant liquid
T2B	Temperature sensor for refrigerant gas
T_W_in	Temperature sensor for inlet water
T_W_out	Temp. sensor for exchanger outlet water
T1	Temperature sensor for outlet water
T5	Temperature sensor for sanitary water
T1B	Temp. sensor for heating/cooling water
TF1	Transformer
KM1-KM10	AC contactor
X1T5-X1T11	Terminal blocks
Pro_flyd	Flow switch
CB	Breaker
FS_T	Flow switch E-Heating tape
EV_T	Expansion valve E-Heating tape
EX_T	Plate heat exchange E-Heating tape

Display	Malfunction or Protection
E0	water flow fault(three times E8)
E2	Communication fail between controller and indoor unit
E3	T1 temp.sensor fault
E4	water tank temp.sensor(T5)Fault
E8	water flow fault
Ed	Tw_in temp.sensor fault
EE	Hydro-box PCB EEPROM fault
C9	Operate fuequency unusual protect
H0	Communication fault between hydro-box and outdoor unit
HC	Hydro-box heater without current fault
H2	Hydro-box plate exchanger freon outlet (heat) temperature sensor (T2) fault
H3	Hydro-box plate exchanger freon inlet (heat) temperature sensor (T2B) fault
H5	Room temperature sensor (Ta) fault
HA	Hydro-box plate exchanger water outlet temperature sensor (Tw_out) fault
H9	Auxiliary heat source water outlet temperature sensor (T1B) fault
P5	[Tw_out-Tw_in] value too big protect
PP	Tw_out-Tw_in unusual protect

HYDRO-BOX CONTROL BOARD	
Sequence	Content
0	Normal display,OFF:0;ON:Tw1 (Show Twout When T1 is off and including T1 is not set at T1dsH)
1	Mode (0:Off, 2:Cool, 3:Heat+Extra Coil
2	Capacity Requirements
3	Capacity Requirements (Consol)
4	T1
5	T1B
6	T1S
7	Ta
8	T5
9	T2
10	T2B
11	Tw_out
12	Tw_in
13	T4
14	Current IBH2
15	Current IBH1
16	Last fault
17	Last second failure
18	Last third failure
19	Software version
20	---

MAIN CONTROL BOARD	
Sequence	Content
0	Normal display,OFF:0;On:Frequency
1	Mode (0:Off, 2:Cool 3:Heat+Extra Coil
2	Fan Speed
3	Capacity Requirements
4	Capacity Requirements (Consol)
5	T3
6	T4
7	Tp
8	Th
9	Electric Expansive Valve
10	Current
11	Voltage AD value
12	Pressure value
13	Software version
14	Last fault
15	---

Temp. Sensor code	Property values
T2/T2B	$B_{25/50}$=4100K , $R_{25°C}$=10kΩ
T1/T1V_out/ T1V_in/T5/T1B	$B_{0/100}$=3970K , $R_{90°C}$=17.6kΩ

Temp. Sensor code	Property values
T3/T4/T6(Th)	$B_{25/50}$=4100K , $R_{25°C}$=10kΩ
T5(Tp)	$B_{25/50}$=3950K , $R_{90°C}$=5kΩ

CODE	PART NAME
COMP.	Compressor
CT1	AC current detector
EEV.	Electric Expansive Valve
FAN	Outdoor fan motor
HEAT1	Compressor electric heating zone
H-PRO	High pressure switch
L-PRO	Low pressure switch
STF1	4-Way valve
T3	Condenser temperature sensor
T4	Outdoor ambient temperature sensor
T5	Comp. Discharge temperature sensor
T6	Evaporator input temperature sensor
XT1~XT4	terminal blocks
CAP1,CAP2	Electrolytic capacitors
CAP3~CAP5	Capacitors
KM1,KM2	AC contactor
MR1,MR5	Magnetic ring
H-SEN	Pressure sensor
PTC1,PTC2	THERMAL RESISTOR
R1-R5	RESISTANCE
ZR1	Voltage Dependent Resistor

Display	Malfunction or Protection
H1	Communication fault between outdoor and IR34H
H0	Communication fault between hydro-box and outdoor unit
H4	Three times P6 protects
H6	DC fan motor fault
H7	Voltage protect fault
H8	Pressure sensor fault
HF	Outdoor unit EEPROM fault
HE	Heat mode fan is running in A region for 10 minutes
HH	10 times H6 in 120 minutes
HP	3 times low pressure protect in 1 hour
HL	PFC module fault
E1	Power fault
E5	Outdoor unit T3 temperature sensor fault
E6	Outdoor unit T4 temperature sensor fault
EB	Outdoor unit T6(Th) temperature sensor fault
EA	Outdoor unit T5(Tp) temperature sensor fault
P0	Heat pump system low pressure protect
P1	Heat pump system high pressure protect

Display	Malfunction or Protection
Pd	Outdoor unit exchange temperature (T3) to high protect
PL	Transducer module radiator temperature too high protect
P3	Drocompressor current protect
P4	Compressor discharge temp. Too high protect
P6	Transducer module (IPM) protect
P9	DC fan motor protect
C7	Transducer module (IPM) temperature too high protect
C8	Typhoon protection
L0	Module protection
L1	DC generatrix low voltage protection
L2	DC generatrix high voltage protection
L4	MCE malfunction
L5	Zero speed protection
L7	Phase sequence protection
L8	Speed difference > 15Hz protection between the front and the back clock
L9	Speed difference >15Hz protection between the real and the setting speed
F1	DC generatrix low voltage protection

OUTDOOR UNIT POWER SUPPLY

PROBE CHARACTERISTICS

Temperature probe B_{2550}=3950K, R90°C=5kΩ - Tp compressor discharge

NTC type temperature probes are used.
When the probe bulb is at a temperature of 90°C the electrical resistance measurable at the probe ends with a multimeter is R_{nom}=5 kΩ (with tolerance $R_{min} \div R_{max}$). The thermistor of these probes has a negative temperature coefficient: the electrical resistance value decreases as the temperature increases.

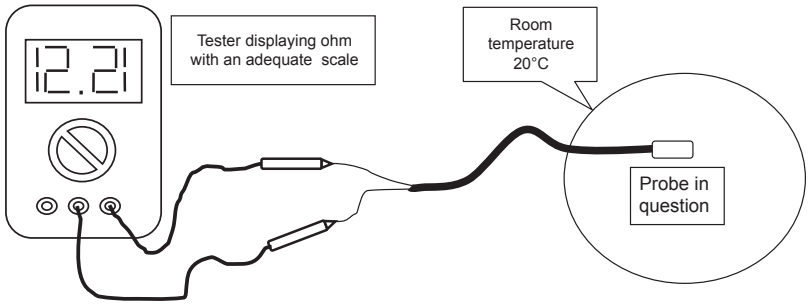
To find out if a temperature probe is faulty or disconnected, check the correspondence between the resistance value in kW and the bulb temperature in °C according to the following table.

- Compressor discharge temperature (Tp)

Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)
-20	542.7	20	68.66	60	13.59	100	3.702
-19	511.9	21	65.62	61	13.11	101	3.595
-18	483.0	22	62.73	62	12.65	102	3.492
-17	455.9	23	59.98	63	12.21	103	3.392
-16	430.5	24	57.37	64	11.79	104	3.296
-15	406.7	25	54.89	65	11.38	105	3.203
-14	384.3	26	52.53	66	10.99	106	3.113
-13	363.3	27	50.28	67	10.61	107	3.025
-12	343.6	28	48.14	68	10.25	108	2.941
-11	325.1	29	46.11	69	9.902	109	2.860
-10	307.7	30	44.17	70	9.569	110	2.781
-9	291.3	31	42.33	71	9.248	111	2.704
-8	275.9	32	40.57	72	8.940	112	2.630
-7	261.4	33	38.89	73	8.643	113	2.559
-6	247.8	34	37.30	74	8.358	114	2.489
-5	234.9	35	35.78	75	8.084	115	2.422
-4	222.8	36	34.32	76	7.820	116	2.357
-3	211.4	37	32.94	77	7.566	117	2.294
-2	200.7	38	31.62	78	7.321	118	2.233
-1	190.5	39	30.36	79	7.086	119	2.174
0	180.9	40	29.15	80	6.859	120	2.117
1	171.9	41	28.00	81	6.641	121	2.061
2	163.3	42	26.90	82	6.430	122	2.007
3	155.2	43	25.86	83	6.228	123	1.955
4	147.6	44	24.85	84	6.033	124	1.905
5	140.4	45	23.89	85	5.844	125	1.856
6	133.5	46	22.89	86	5.663	126	1.808
7	127.1	47	22.10	87	5.488	127	1.762
8	121.0	48	21.26	88	5.320	128	1.717
9	115.2	49	20.46	89	5.157	129	1.674
10	109.8	50	19.69	90	5.000	130	1.632
11	104.6	51	18.96	91	4.849		
12	99.69	52	18.26	92	4.703		
13	95.05	53	17.58	93	4.562		
14	90.66	54	16.94	94	4.426		
15	86.49	55	16.32	95	4.294		
16	82.54	56	15.73	96	4.167		
17	78.79	57	15.16	97	4.045		
18	75.24	58	14.62	98	3.927		
19	71.86	59	14.09	99	3.812		

For a reliable check it is not necessary to control each single value, but just several sample values. If the instrument gives an infinite resistance, this means the probe is disconnected.

Example. With a temperature of 20°C on the probe, the ohmmeter display will indicate approx. 68,66 kΩ



PROBE CHARACTERISTICS

Temperature probe $B_{0/100}$=3970K, R50°C=17,6kΩ - T_{win} / T_{wout} / T1 / T5 / T1B

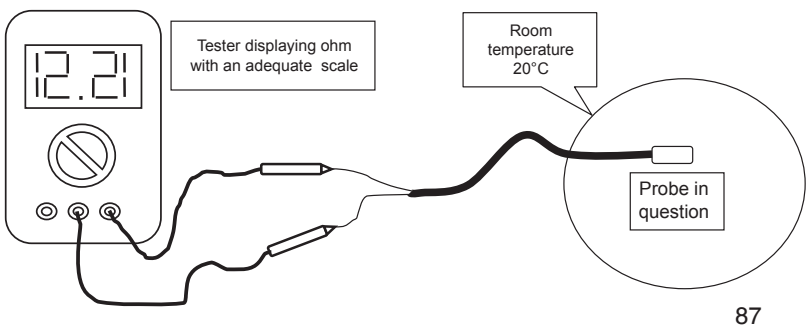
NTC type temperature probes are used.
When the probe bulb is at a temperature of 50°C the electrical resistance measurable at the probe ends with a multimeter is R_{nom}=17,6 kΩ (with tolerance R_{min} ÷ R_{max}). The thermistor of these probes has a negative temperature coefficient: the electrical resistance value decreases as the temperature increases.
To find out if a temperature probe is faulty or disconnected, check the correspondence between the resistance value in kW and the bulb temperature in °C according to the following table.

- Inlet / outlet evaporator temperature (T_{win} / T_{wout})
- Flow temperature (T1) or electric heater output (T1 *), if present
- Domestic hot water temperature (T5)

Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)
-30	867.29	10	98.227	50	17.600	90	4.4381
-29	815.80	11	93.634	51	16.943	91	4.3022
-28	767.68	12	89.278	52	16.315	92	4.1711
-27	722.68	13	85.146	53	15.713	93	4.0446
-26	680.54	14	81.225	54	15.136	94	3.9225
-25	641.07	15	77.504	55	14.583	95	3.8046
-24	604.08	16	73.972	56	14.054	96	3.6908
-23	569.39	17	70.619	57	13.546	97	3.5810
-22	536.85	18	67.434	58	13.059	98	3.4748
-21	506.33	19	64.409	59	12.592	99	3.3724
-20	477.69	20	61.535	60	12.144	100	3.2734
-19	450.81	21	58.804	61	11.715	101	3.1777
-18	425.59	22	56.209	62	11.302	102	3.0853
-17	401.91	23	53.742	63	10.906	103	2.9960
-16	379.69	24	51.396	64	10.526	104	2.9096
-15	358.83	25	49.165	65	10.161	105	2.8262
-14	339.24	26	47.043	66	9.8105		
-13	320.85	27	45.025	67	9.4736		
-12	303.56	28	43.104	68	9.1498		
-11	287.33	29	41.276	69	8.8387		
-10	272.06	30	39.535	70	8.5396		
-9	257.71	31	37.878	71	8.2520		
-8	244.21	32	36.299	72	7.9755		
-7	231.51	33	34.796	73	7.7094		
-6	219.55	34	33.363	74	7.4536		
-5	208.28	35	31.977	75	7.2073		
-4	197.67	36	30.695	76	6.9704		
-3	187.66	37	29.453	77	6.7423		
-2	178.22	38	28.269	78	6.5228		
-1	168.31	39	27.139	79	6.3114		
0	160.90	40	26.061	80	6.1078		
1	152.96	41	25.031	81	5.9117		
2	145.45	42	24.048	82	5.7228		
3	138.35	43	23.109	83	5.5409		
4	131.64	44	22.212	84	5.3655		
5	125.28	45	21.355	85	5.1965		
6	119.27	46	20.536	86	5.0336		
7	113.58	47	19.752	87	4.8765		
8	108.18	48	19.003	88	4.7251		
9	103.07	49	18.286	89	4.5790		

For a reliable check it is not necessary to control each single value, but just several sample values. If the instrument gives an infinite resistance, this means the probe is disconnected.

Example. With a temperature of 20°C on the probe, the ohmmeter display will indicate approx. 61,535 kΩ



PROBE CHARACTERISTICS

Temperature probe B_{2550}=4100K, R25°C=10kΩ - T2 / T2B / T3 / T4 / Th

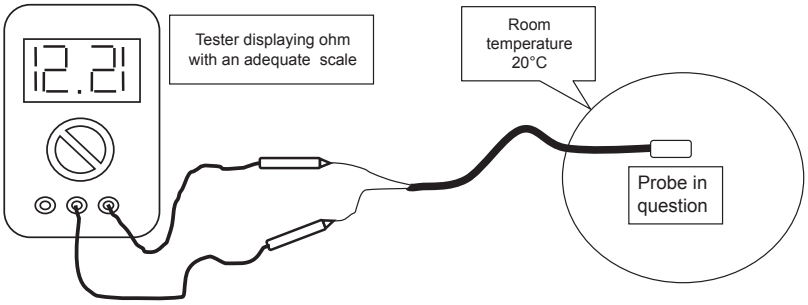
NTC type temperature probes are used.
When the probe bulb is at a temperature of 25°C the electrical resistance measurable at the probe ends with a multimeter is R_{nom}=10 kΩ (with tolerance R_{min} ÷ R_{max}). The thermistor of these probes has a negative temperature coefficient: the electrical resistance value decreases as the temperature increases.
To find out if a temperature probe is faulty or disconnected, check the correspondence between the resistance value in kW and the bulb temperature in °C according to the following table.

- Outdoor air temperature (T4)
- Liquid inlet refrigerant temperature (T2) and gas outlet (T2B)
- Output coil temperature (T3)
- Input compressor temperature (Th)

Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)
-20	115.3	20	12.64	60	2.358	100	0.6297
-19	108.1	21	12.06	61	2.272	101	0.6115
-18	101.5	22	11.50	62	2.191	102	0.5939
-17	96.34	23	10.97	63	2.112	103	0.5768
-16	89.59	24	10.47	64	2.037	104	0.5604
-15	84.22	25	10.00	65	1.965	105	0.5445
-14	79.31	26	9.551	66	1.896	106	0.5291
-13	74.54	27	9.124	67	1.830	107	0.5143
-12	70.17	28	8.720	68	1.766	108	0.4999
-11	66.09	29	8.336	69	1.705	109	0.4860
-10	62.28	30	7.971	70	1.647	110	0.4726
-9	58.71	31	7.624	71	1.591	111	0.4596
-8	56.37	32	7.295	72	1.537	112	0.4470
-7	52.24	33	6.981	73	1.485	113	0.4348
-6	49.32	34	6.684	74	1.435	114	0.4230
-5	46.57	35	6.400	75	1.387	115	0.4116
-4	44.00	36	6.131	76	1.341	116	0.4006
-3	41.59	37	5.874	77	1.291	117	0.3899
-2	39.82	38	5.630	78	1.254	118	0.3796
-1	37.20	39	5.397	79	1.2133	119	0.3695
0	35.20	40	5.175	80	1.174	120	0.3598
1	33.33	41	4.964	81	1.136	121	0.3504
2	31.56	42	4.763	82	1.100	122	0.3413
3	29.91	43	4.571	83	1.064	123	0.3325
4	28.35	44	4.387	84	1.031	124	0.3239
5	26.88	45	4.213	85	0.9982	125	0.3156
6	25.50	46	4.046	86	0.9668	126	0.3075
7	24.19	47	3.887	87	0.9366	127	0.2997
8	22.57	48	3.735	88	0.9075	128	0.2922
9	21.81	49	3.590	89	0.8795	129	0.2848
10	20.72	50	3.451	90	0.8525	130	0.2777
11	19.69	51	3.318	91	0.8264	131	0.2708
12	18.72	52	3.192	92	0.8013	132	0.2641
13	17.80	53	3.071	93	0.7771	133	0.2576
14	16.93	54	2.959	94	0.7537	134	0.2513
15	16.12	55	2.844	95	0.7312	135	0.2451
16	15.34	56	2.738	96	0.7094	136	0.2392
17	14.62	57	2.637	97	0.6884	137	0.2334
18	13.92	58	2.540	98	0.6682	138	0.2278
19	13.26	59	2.447	99	0.6486	139	0.2223

For a reliable check it is not necessary to control each single value, but just several sample values. If the instrument gives an infinite resistance, this means the probe is disconnected.

Example. With a temperature of 20°C on the probe, the ohmmeter display will indicate approx. 12,64 kΩ



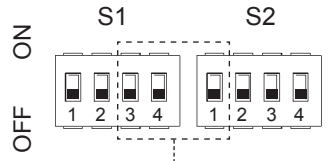
DIP-SWITCH SETTING

DIP switch settings of the hydraulic module control board

The DIP switch are located on the hydraulic module control board inside the unit's electrical panel (for more details see also MAINTENANCE AND SAFETY section). These allow you to specify whether the system includes the electric booster (IBH), the boiler (AHS).

WARNING Switch off the power supply before opening the switch box service panel and making any changes to the DIP switch settings.

DIP SWITCH	Description	ON	OFF
S1 (1)	Set always OFF	50m	5m
S1 (2)	Set always OFF	Installed	Installed
S1 (3*)	Electrical booster (IBH1-first stage) (OFF if installed)	Not installed	Installed
S1 (4*)	Electrical booster (IBH2-second stage) (OFF if installed)	Not installed	Installed
S2 (1*)	Temperature probe (necessary if AHS-gas boiler is installed, in this case set ON)	Installed	Not installed
S2 (2)	Set always OFF	/	/
S2 (3)	Set always OFF	/	/
S2 (4)	Set always OFF	/	/



*** These are the only dip switch to be configured based on the hydraulic system managed, all other DIP switches should be set to OFF.**

DIP SWITCH SETTING			Hydraulic system configuration		
S1 (3)	**S1 (4)**	**S2 (1)**	**Electrical booster (single-stage o duoble-stage)**	**Electrical booster (duoble-stage)**	**Gas boiler**
ON	ON	OFF	NP	NP	NP
OFF	ON	OFF	P	NP	NP
OFF	OFF	OFF	P	P	NP
ON	ON	ON	NP	NP	P

NP: Not present, P: Present

DIP switch settings of the main control board (only for single phase units)

The DIP switch are located on the main control board inside the unit's electrical panel (for more details see also MAINTENANCE AND SAFETY section). These allow you to limit the maximum current adsorbed by the unit.

MOD. 5-7-9

SW3	
Setting	**Maximum current**
ON OFF 1 2 3	20A
ON OFF 1 2 3	18A
ON OFF 1 2 3	18A
ON OFF 1 2 3	18A

SW3	
Setting	**Maximum current**
ON OFF 1 2 3	15A
ON OFF 1 2 3	12A
ON OFF 1 2 3	11A
ON OFF 1 2 3	11A

MOD. 10-12-14-16

SW4	
Setting	**Maximum current**
ON OFF 1 2 3	31A
ON OFF 1 2 3	28A
ON OFF 1 2 3	26A
ON OFF 1 2 3	24A

SW4	
Setting	**Maximum current**
ON OFF 1 2 3	22A
ON OFF 1 2 3	20A
ON OFF 1 2 3	18A
ON OFF 1 2 3	18A

START-UP

Pre-operation checks

Checks before initial start-up

WARNING Switch off the power supply before making any connections.

After the installation of the unit, check the following before switching on the circuit breaker:

1. Field wiring

Make sure that the field wiring between the local supply panel and unit and valves (when applicable), unit and room thermostat (when applicable), unit and domestic hot water tank, and unit and backup heater box have been connected according to the instructions described in the chapter 9.6 Field wiring, according to the wiring diagrams and to local laws and regulations.

2. Fuses, circuit breakers, or protection devices

Check that the fuses or the locally installed protection devices are of the size and type specified in the chapter 14 Technical specifications. Make sure that no fuses or protection devices have been bypassed.

3. Backup heater circuit breaker

Do not forget to turn on the backup heater circuit breaker in the switchbox (it depends on the backup heater type). Refer to the wiring diagram.

4. Booster heater circuit breaker

Do not forget to turn on the booster heater circuit breaker (applies only to units with optional domestic hot water tank installed).

5. Ground wiring

Make sure that the ground wires have been connected properly and that the ground terminals are tightened.

6. Visually check the switch box for loose connections or damaged electrical components.

7. Mounting

Check that the unit is properly mounted, to avoid abnormal noises and vibrations when starting up the unit.

8. Damaged equipment

Check the inside of the unit for damaged components or squeezed pipes.

9. Refrigerant leak

Check the inside of the unit for refrigerant leakage. If there is a refrigerant leak, call your local dealer.

10. Power supply voltage

Check the power supply voltage on the local supply panel. The voltage must correspond to the voltage on the identification label of the unit.

11. Air purge valve

Make sure the air purge valve is open (at least 2 turns).

12. Shut-off valves

Make sure that the shut-off valves are fully open

Final check

Before switching on the unit, read following recommendations:

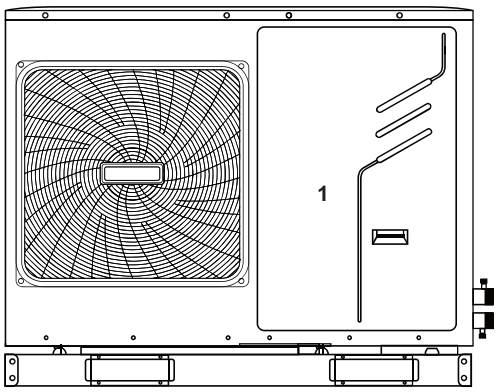
- When the complete installation and all necessary settings have been carried out, close all front panels of the unit and refit the unit cover.
- The service panel of the switch box may only be opened by a licensed electrician for maintenance purposes.

Powering up the unit

When power to the unit is turned on, "1%~99%" is displayed on the user interface during initialization. During this process the user interface cannot be operated.

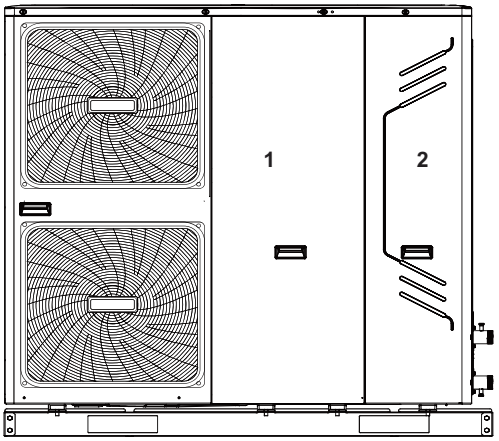
Opening the unit

MOD. 5-7-9



Door 1: Gives access to the compressor compartment, to the hydraulic compartment and to the electrical parts

MOD. 10-12-12T-14-14T-16T



Door 1: Gives access to the compressor compartment and electrical parts

Door 2: Gives access to the hydraulic compartment and electrical parts

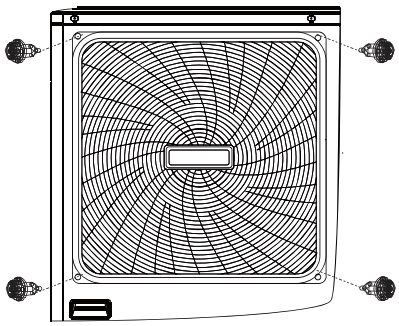
WARNING

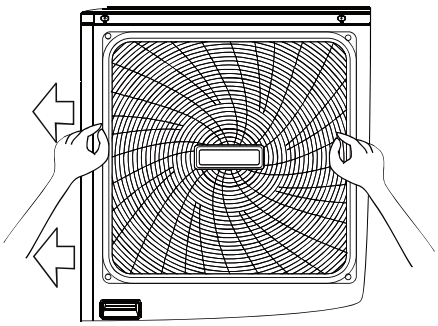
Switch off all power — i.e. unit power supply and backup heater and domestic hot water tank power supply (if applicable) — before removing doors 1 and 2.

CAUTION

Parts inside the unit may be hot.

Push the grill to the left until it stops. then pull its right edge, the grill can now be removed. You can also reverse the procedure. Exercise caution to avoid a possible hand injury.





The installer is obliged to verify correct operation of unit after installation.

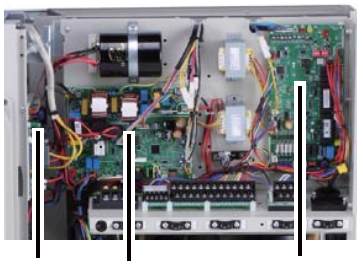
NOTE

That during the first running period of the unit, required power input may be higher than stated on the nameplate of the unit. This phenomenon originates from the compressor that needs elapse of a 50 hours run in period before reaching smooth operation and stable power consumption.

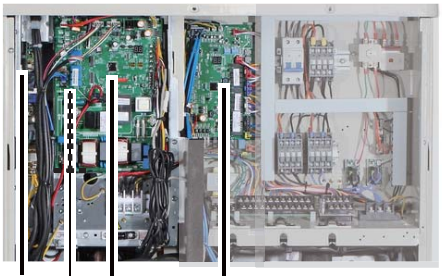
Test run operation (manual)

If required, the installer can perform a manual test run operation at any time to check correct operation of air purge, heating, cooling and domestic water heating, refer to section **"SETUP OF THE SYSTEM".**

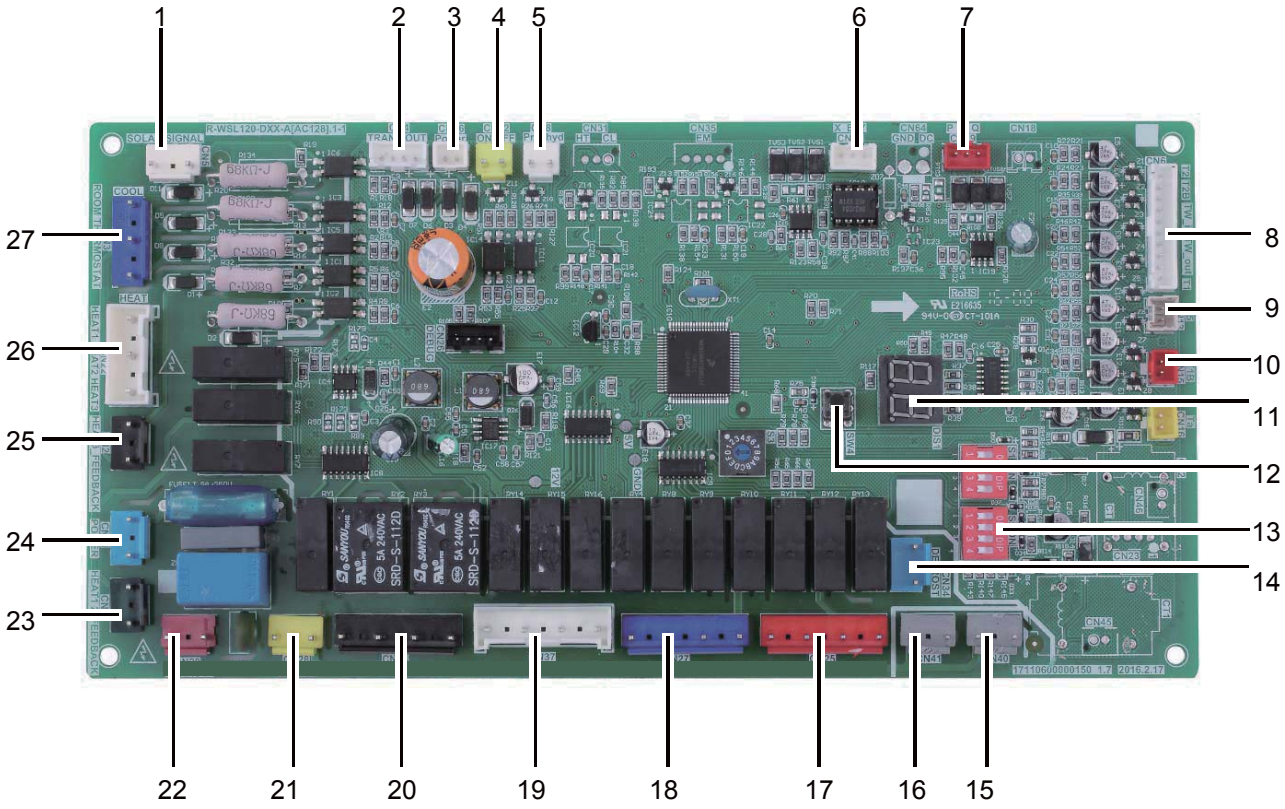
Control box for Mod. 5-7-9



Control box for Mod. 10-12-12T-14-14T-16-16T



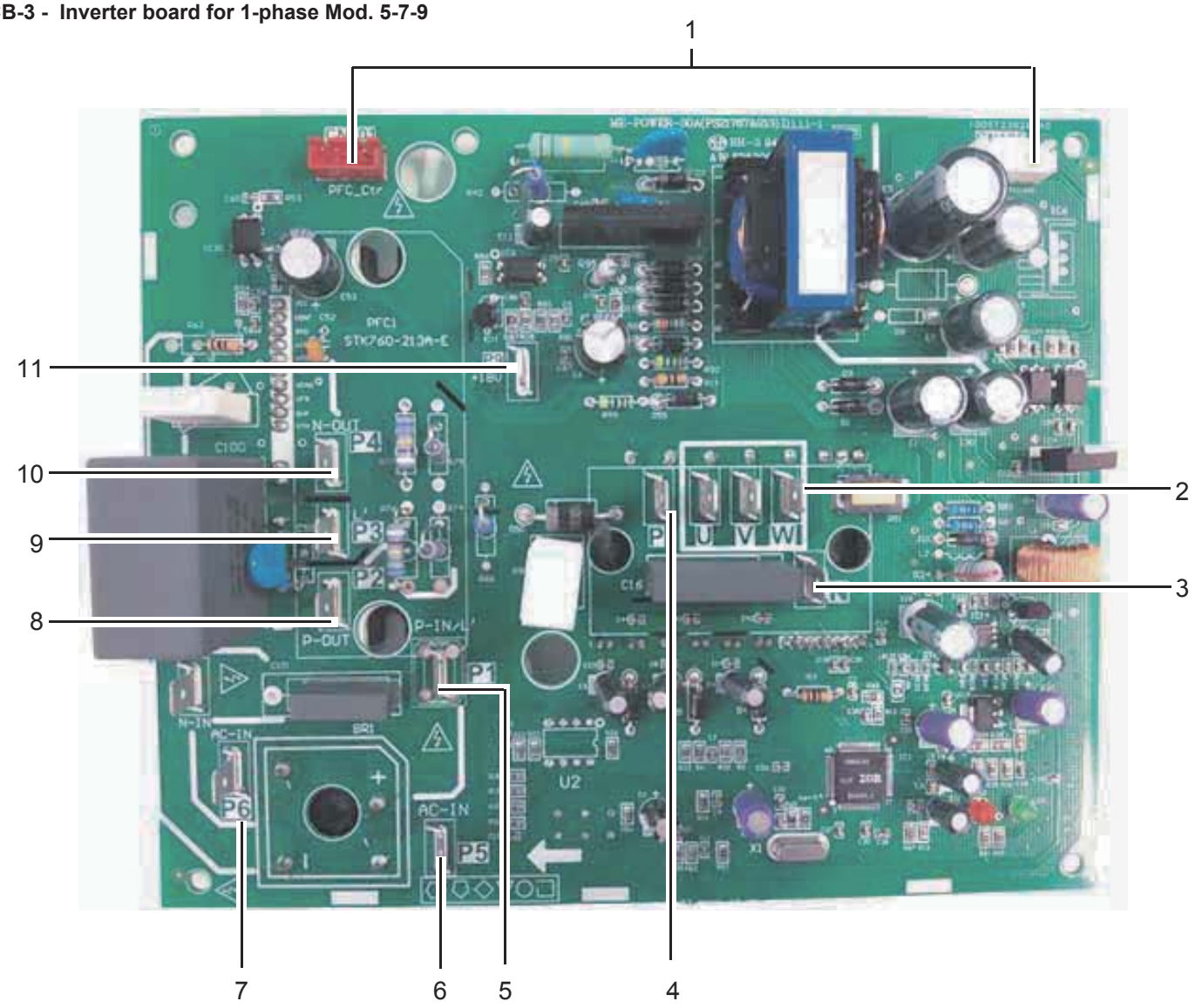
PCB-1 - Hydraulic module control board



1-phase Mod. 5-7-9-10-12-14-16
3-phase Mod.12T-14T-16T

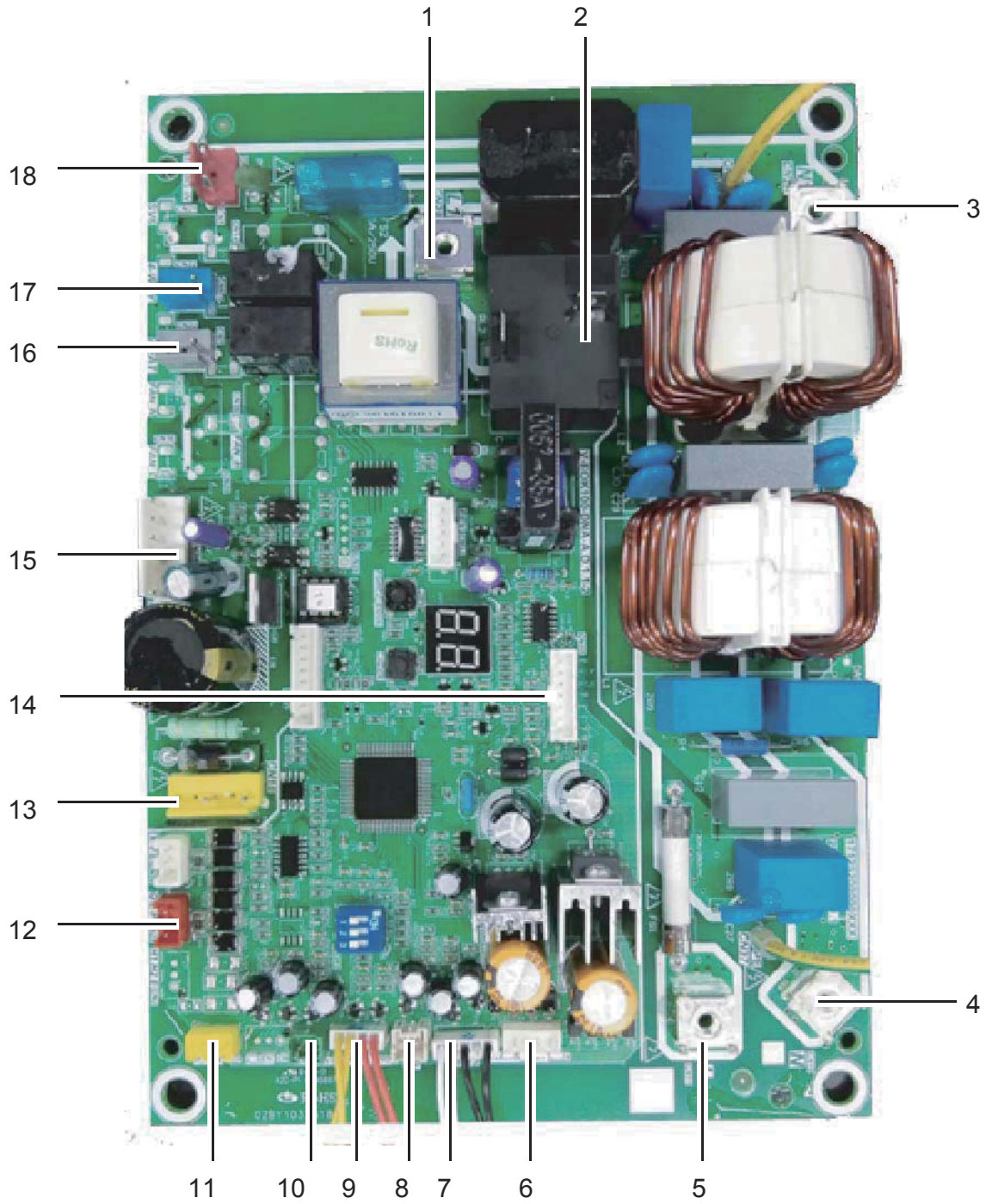
1 Input port for solar energy(CN5)
2 Output port for transformer(CN4)
3 Power supply port for user interface(CN36)
4 Port for remote switch(CN12)
5 Port for flow switch(CN8)
6 Communicate port between door PCB B and door PCB(CN14)
7 Communicate port between door PCB and user interface(CN19)
8 Port for temperature sensors(TW_out, TW_in, T1, T2,T2B)(CN6)
9 Port for temperature sensor(CN13)
10 Port for temperature sensor(T1B, the final outlet temp.)(CN15)
11 Digital displays(DIS1)
12 Check button(SW4)
13 DIP switch(S1,S2)
14 output port for deforst(CN34)
15 Port for anti-freeze eletric heating tape (internal)(CN40)
16 Port for anti-freeze eletric heating tape (internal)(CN41)
17 Output port for external heating source / operation output port(CN25)
18 Port for anti-freeze eletric heating tape(external) /port for solar energy pump/output port for remote alarm(CN27)
19 Port for external circulted pump/pipe pump/mix pump/2-way valve SV2(CN37)
20 Port for SV1(3-way valve) and SV3(CN24)
21 Port for internal pump(CN28)
22 Input port for transformer(CN20)
23 Feedback port for temperature switch(CN1)
24 Port for power supply(CN21)
25 Feedback port for external temp. switch(shorted in default)(CN2)
26 Control port backup heater/booster heater(CN22)
27 Control port for room thermostat(CN3)

PCB-3 - Inverter board for 1-phase Mod. 5-7-9



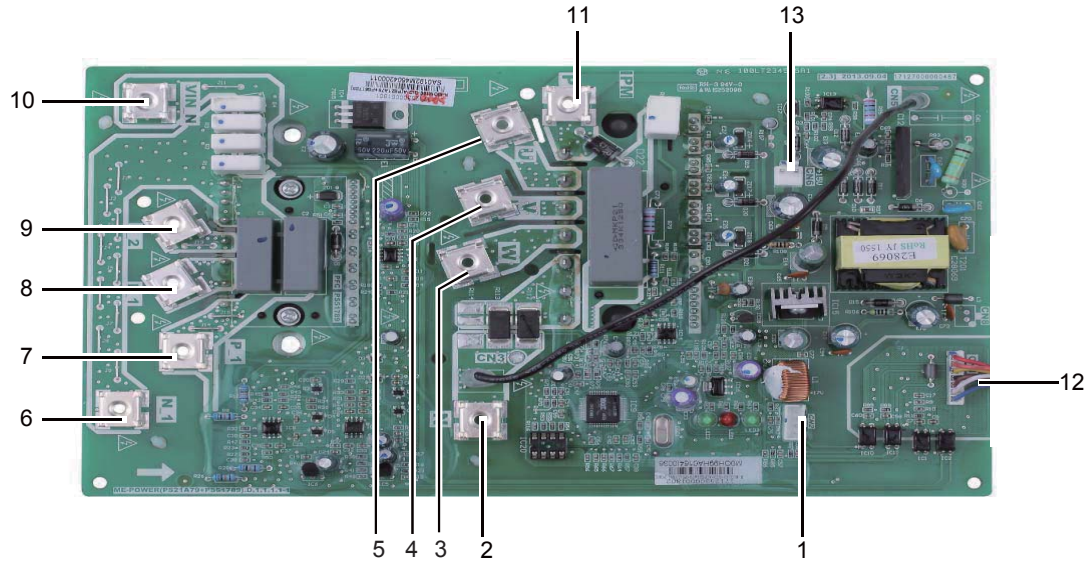
1 To main board (CN101,CN105)
2 Compressor connection port U V W (U,V,W)
3 Input port N for IPM module(N)
4 Input port P for IPM module(P)
5 Input port for PFC inductance P1(P1)
6 Input port for bridge Rectifiers(P5)
7 Input port for Bridge Rectifiers(P6)
8 Output port P of PFC(P2)
9 Input port for PFC inductance 3(P3)
10 Output port N of PFC(P4)
11 +18V(P9)

PCB-2 - Main control board for 1-phase Mod. 5-7-9



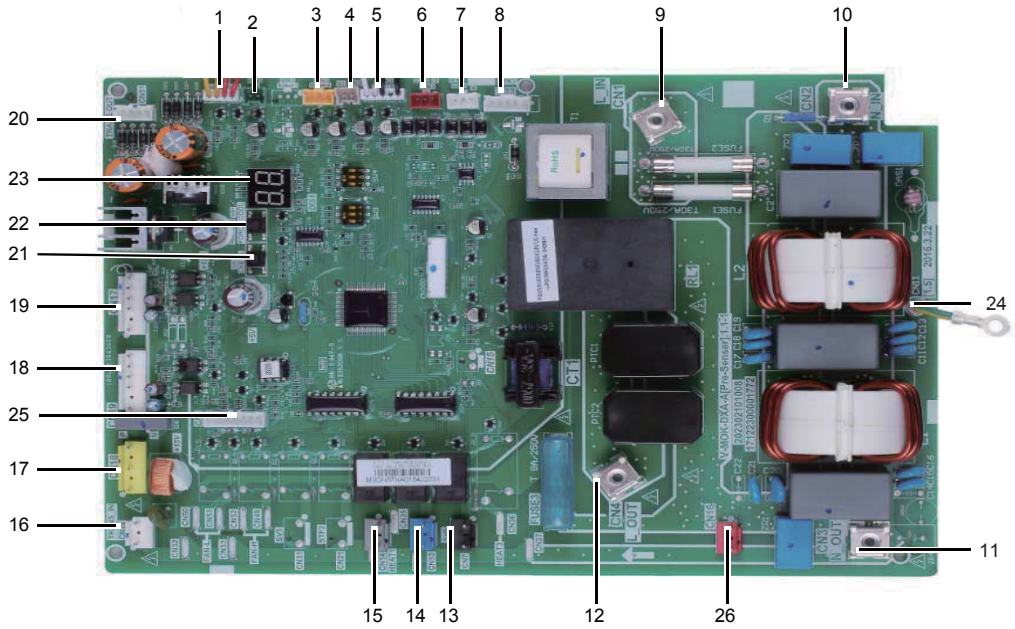
1 Rectifier bridge input port L
2 Hydraulic compartment input port2
3 Rectifier bridge input port N
4 Power supply N
5 Power supply L
6 Transformer output port
7 BLACK: T3 temperature sensor port
WHITE:T4 temperature sensor port
8 TP temperature sensor port
9 YELLOW: High pressure switch
RED: Low pressure switch
10 Th temperature sensor port
11 Pressure sensor port
12 Wire controller port
13 P/N/+18V port
14 To IPDU/PFC
15 DC fan port
16 Compression electromechanical heating belt
17 4-way valve port
18 Transformer input port

PCB-3 - Inverter module for 1-phase Mod. 10-12-14-16



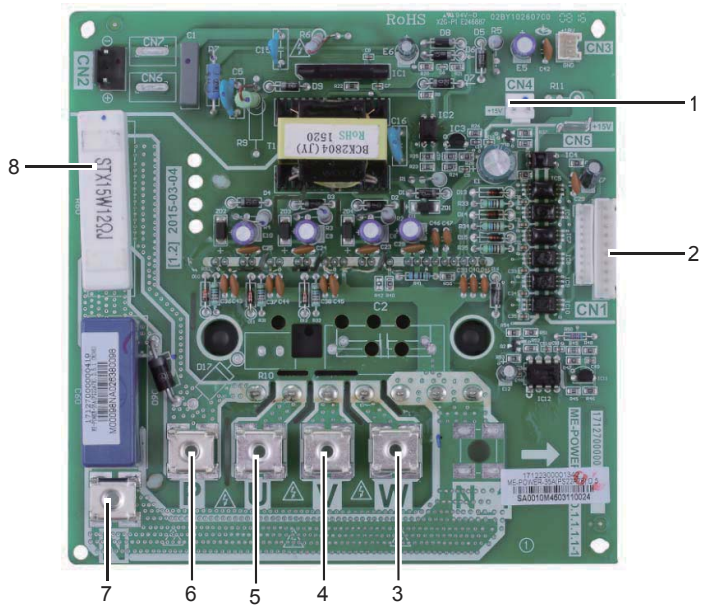
1 Reserved(CN2)
2 Input Port N For Ipm Module(N)
4 Power Supply Of V Phase For Compressor(V)
3 Power Supply Of W Phase For Compressor(W)
5 Power Supply Of U Phase For Compressor(U)
6 Output Port N Of Pfc Module(N_1)
7 Output Port P Of Pfc Module(P_1)
8 Input Port For Pfc Inductance L_1(L_1)
9 Input Port For Pfc Inductance L_2(L_2)
10 Input Port N For Pfc Module(VIN-N)
11 Input Port P Foripm Modele(P)
12 Communicate Port Between Pcb A And Pcb B(CN1)
13 +15V(CN6)

PCB-2 - Main control board for 1-phase Mod. 10-12-14-16



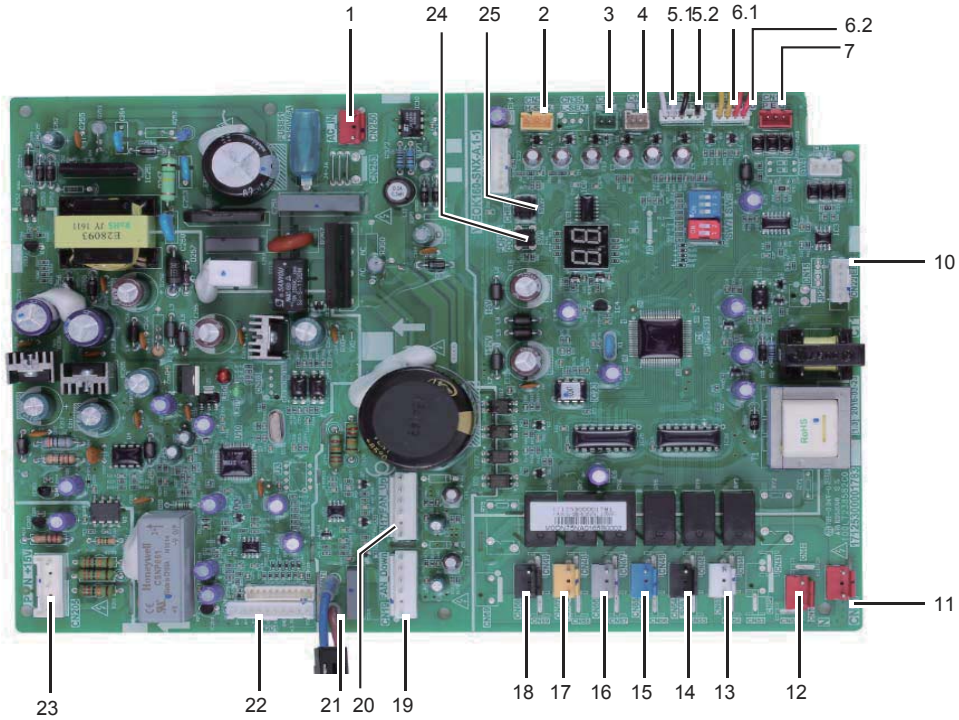
1 Port For Pressure Switch(CN12)
2 Port For Suction Temperature Sensor(CN24)
3 Port For Pressure Sensor(CN28)
4 Port For Discharge Temperature Sensor(CN8)
5 Port For Outdoor air Temperature And Condenser Outlet Temperature Sensor(CN9)
6 Port For Communication Between Outdoor Unit And Bydro-box(CN10)
7 Reserved(CN30)
8 Port For Electrical Expansion Value(CN22)
9 Input Port For Live Wire(CN1)
10 Input Port For Neutral Wire(CN2)
11 Output Port For Neutral Wire(CN3)
12 Ourput Port For Live Wire(CN4)
13 Reserved(CN7)
14 Port For 4-way Value(CN13)
15 Port For Eletric Heating Tape(CN14)
16 Input Port For Transformer(CN26)
17 Power Supply Port For Fan(CN18)
18 Port For Down Fan(CN19)
19 Port For Up Fan(CN17)
20 Output Port For Transformer(CN51)
21 Check Button(SW2)
22 Refrigerant Recovery Button
23 Digital Displays(DIS1)
24 Ground Wire(CN11)
25 Comunication Port For PCBA(CN6)
26 Power supply port for hydro-box control board(CN16)

PCB-3 - Inverter module for 3-phase Mod. 12T-14T-16T



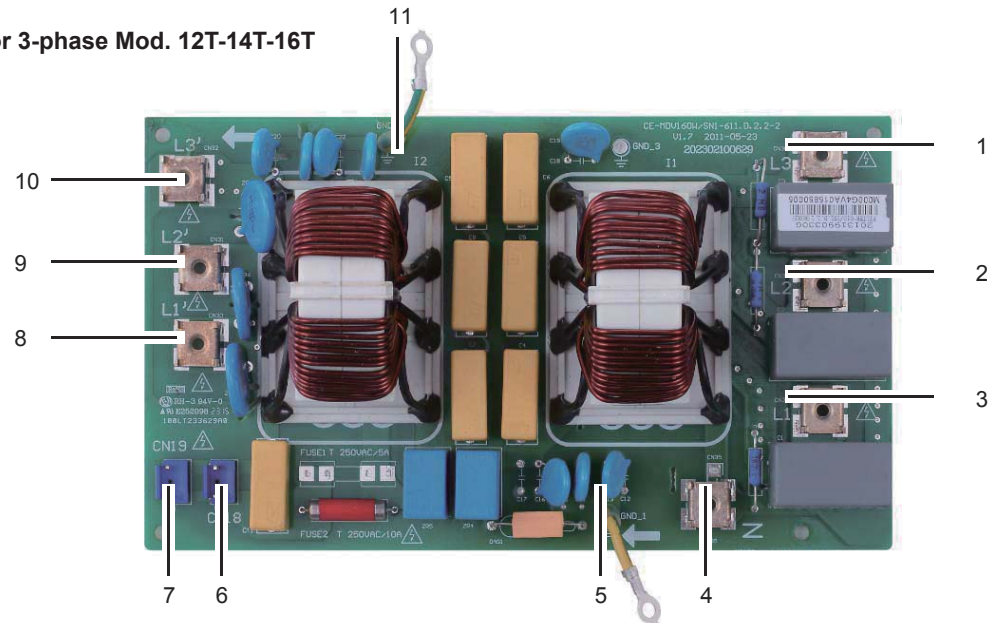
1. +15V port(CN4)
2. To MCU(CN1)
3. IPM input N
4. Compressor connection port W
5. Compressor connection port V
6. Compressor connection port U
7. IPM input P
8. Power for switching power supply(CN2)

PCB-2 - Main control board for 3-phase Mod. 12T-14T-16T



1 Power supply for the main PCB(CN250)
2 Port for pressure sensor(CN36)
3 Port for sunction temperature sensor(CN4)
4 Port for discharge temperature sensor(CN8)
5.1 Port for outdoor temperature sensor(CN9)
5.2 Port for condenser outlet temperature sensor(CN9)
6.1 Port for high pressure switch(CN6)
6.2 Port for low pressure switch(CN6)
10 Port for electrical expansion value(CN22)
11 Port for power supply(CN41)
12 Power supply for hydro-box
control board(CN6)
13 PFC control port(CN63)
14 Reserved(CN64)
15 Port for 4-way value(CN65)
16 Port for eletric heating tape(CN66)
17 PTC control(CN67)
18 Reserved(CN68)
19 Port for down fan(CN19)
20 Port for up fan(CN17)
21 Power supply port for module(CN70\71)
22 Communication port for IPDU(CN201)
23 Port for voltage check(CN205)
24 Refrigerant recovery button(SW1)
25 Check button(SW2)

PCB-4 - filter board for 3-phase Mod. 12T-14T-16T

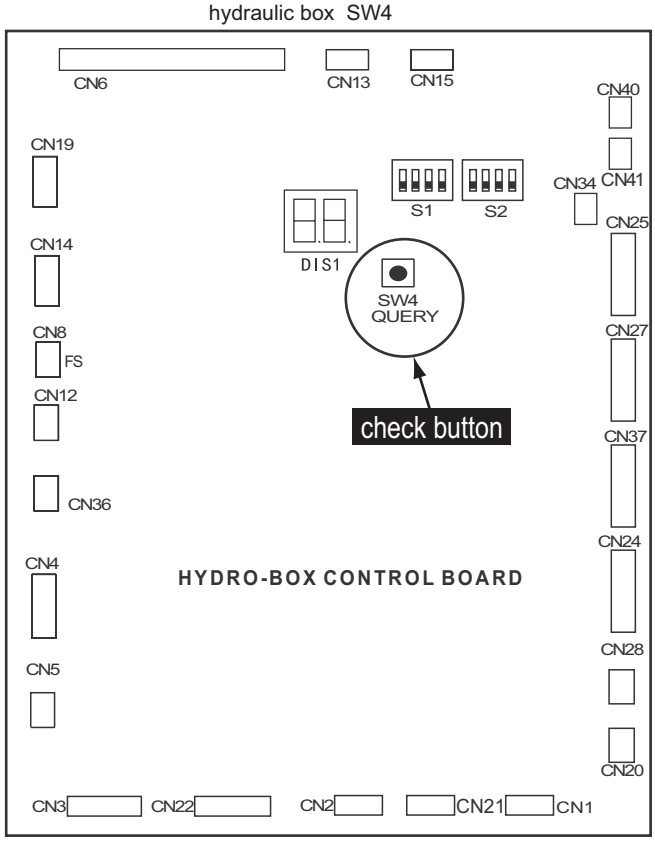


1 Power supply L3(L3)
2 Power supply L2(L2)
3 Power supply L1(L1)
4 Power supply N(N)
5 Ground wire(GND_1)
6 Power supply for load(CN18)
7 Power supply for main control board(CN19)
8 Power filtering L1(L1')
9 Power filtering L2(L2')
10 Power filtering L3(L3')
11 Ground wire(GND_2)

Parameters check in the unit

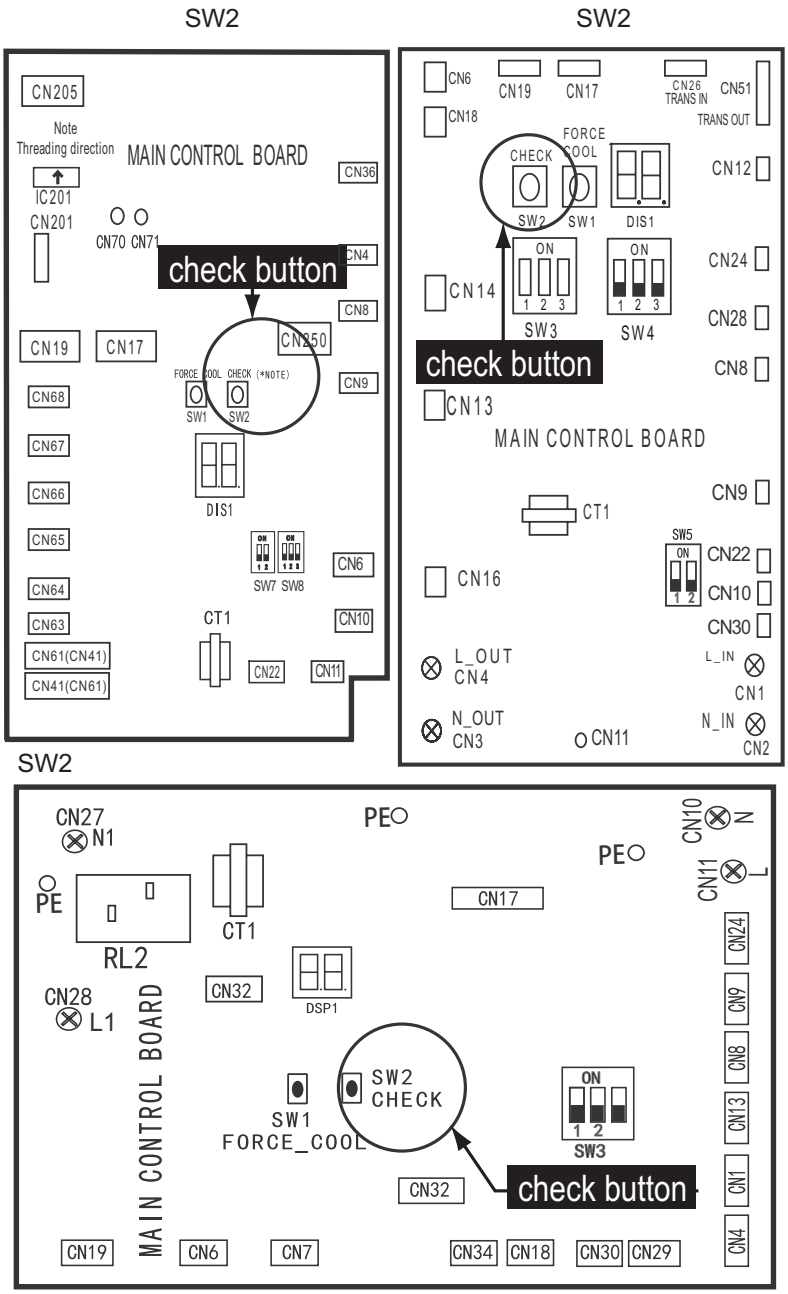
To check the parameters of hydraulic box, open door 2 and you'll see the PCB like following, the digital display will show the temperature of outlet water in normal condition ('0' will display if the unit is off or error code will display if error occurs). Long press the check button and the digital display will show the operating mode. Then press the check button in sequence. The digital display will show the value, the implication of the value illustrated in the diagram below:

hydraulic box SW4



Number	Implication
0	Temperature of outlet water when unit is on, when the unit is off, '0' will display
1	Operation mode(0——OFF, 2——COOL, 3——HEAT, 5——Water heating)
2	Capacity requirement before correction
3	Capacity requirement after correction
4	Outlet water temperature of backup heater
5	Outlet water temperature of additional heating source
6	Target outlet water temperature calculated from climate-related curves
7	Room temperature
8	Temperature of domestic hot water
9	Temperature of refrigerant at outlet /inlet of plate heat exchanger when in heat mode/cool mode
10	Temperature of refrigerant at inlet /outlet of plate heat exchanger when in heat mode/cool mode
11	Temperature of water at outlet of plate heat exchanger
12	Temperature of water at inlet of plate heat exchanger
13	Outdoor air temperature
14	Current of backup heater 1
15	Current of backup heater 2
16	Error/protection code for the last time,"—" will display if no error/protection occur
17	Error/protection code for the second last time, "—" will display if no error/protection occur
18	Error/protection code for the third last time, "—" will display if no error/protection occur
19	Version of software (hydraulic module)

To check the parameters on the refrigerant side, open door 1 and you'll see the PCB like the following (different for 1-phase and 3-phase unit): the digital display will show the present compressor frequency ('0' will display if the unit is off or error code will display if error occurs). Long press the check button and the digital display will show the operating mode, and then press the check button in sequence. The digital display will show the value, the implication of the value is shown in the diagram below:



Number	Implication
0	Frequency of compressor at present
1	Operation mode (0——Standby, 2——COOL, 3——HEAT, 5——refrigerant recovery)
2	Fan speed
3	Frequency from hydraulic module
4	Frequency after restriction by the outdoor unit
5	Temperature of tube at outlet/inlet of condenser when in cool/heat mode
6	Outdoor air temperature
7	Discharge temperature

Number	Implication
8	Suction temperature (when the temperature lower than -9°C"." Will stand for negative sign)
9	The opening of EEV (the value display multiply 8 will be the actual opening)
10	Actual current
11	Actual voltage
12	Pressure of refrigerant (evaporate/condense pressure when in cool /heat mode)
13	Version of software (outdoor unit)
14	Error/protection code for the last time, "nn"will display if no error/protection occurs
15	--

This section provides useful information for diagnosing and correcting certain troubles which may occur in the unit.
This troubleshooting and related corrective actions may only be carried out by your local technician.

General guidelines

Before starting the troubleshooting procedure, carry out a thorough visual inspection of the unit and look for obvious defects such as loose connections or defective wiring.

WARNING

When carrying out an inspection on the switch box of the unit, always make sure that the main switch of the unit is switched off.

When a safety device was activated, stop the unit and find out why the safety device was activated before resetting it. Under no circumstances can safety devices be bridged or changed to a value other than the factory setting. If the cause of the problem cannot be found, call your local dealer.

If the pressure relief valve is not working correctly and is to be replaced, always reconnect the flexible hose attached to the pressure relief valve to avoid water dripping out of the unit!

NOTE

For problems related to the optional solar kit for domestic water heating, refer to the troubleshooting in the Installation & Owner's manual for that kit.

Possible malfunctioning

The unit is turned on but the unit is not heating or cooling as expected

POSSIBLE CAUSES	CORRECTIVE ACTION
The temperature setting is not correct.	Check the controller set point.T4HMAX, T4HMIN in heat mode.T4CMAX,T4CMIN in cool mode. T4DHWMAX,T4DHWMIN in DHW mode.
The water flow is too low.	• Check that all shut off valves of the water circuit are completely open. • Check if the water filter needs cleaning. • Make sure there is no air in the system (purge air). • Check on the manometer that there is sufficient water pressure. The water pressure must be>1 bar (water is cold). • Make sure that the expansion vessel is not broken. • Check that the resistance in the water circuit is not too high for the pump
The water volume in the installation is too low.	Make sure that the water volume in the installation is above the minimum required value (refer to "9.3 water pipework/Checking the water volume and expansion vessel pre-pressure").

Pump is making noise (cavitation)

POSSIBLE CAUSES	CORRECTIVE ACTION
There is air in the system.	Purge air.
Water pressure at pump inlet is too low.	• Check on the manometer that there is sufficient water pressure. The water pressure must be > 1 bar (water is cold). • Check that the manometer is not broken. • Check that the expansion vessel is not broken. • Check that the setting of the pre- pressure of the expansion vessel is correct (refer to "9.3 water pipework/Checking the water volume and expansion vessel pre-pressure").

The water pressure relief valve opens

POSSIBLE CAUSES	CORRECTIVE ACTION
The expansion vessel is broken.	Replace the expansion vessel.
The filling water pressure in the installation is higher than 0.3MPa.	Make sure that the filling water pressure in the installation is about 0.15~0.20MPa (refer to "9.3 water pipework/Checking the water volume and expansion vessel pre-pressure").

The water pressure relief valve leaks

POSSIBLE CAUSES	CORRECTIVE ACTION
Dirt is blocking the water pressure relief valve outlet.	Check for correct operation of the pressure relief valve by turning the red knob on the valve counter clockWise: • If you do not hear a clacking sound, contact your local dealer. • In case the water keeps running out of the unit, close both the water inlet and outlet shut-off valves first and then contact your local dealer.

Space heating capacity shortage at low outdoor temperatures

POSSIBLE CAUSES	CORRECTIVE ACTION
Backup heater operation is not activated.	Check that the "OTHER HEATING SOURCE/ BACKUP HEATER"is enabled, see "10.7 Field settings" Check whether or not the thermal protector of the backup heater has been activated (refer to 9.2.3 Switch box main components (door 2), "Backup heater thermal protector" for location of the reset button).Check if booster heater is running, the backup heater and booster heater can't operate simultaneously.
Too much heat pump capacity is used for heating domestic hot water (applies only to installations with a domestic hot water tank).	Check that the 't_DHWHP_MAX' and "t_DHWHP_RESTRICT" are configured appropriately: • Make sure that the 'DHW PRIORITY' in the user interface is disabled. • Enable the"T4_TBH_ON "in the user interface/FOR SERVICEMAN to activate the booster heater for domestic water heating.

SAFETY AND MAINTENANCE

In order to ensure optimal availability of the unit, a number of checks and inspections on the unit and the field wiring have to be carried out at regular intervals.

This maintenance needs to be carried out by your local technician. In order to ensure optimal availability of the unit, a number of checks and inspections on the unit and the field wiring have to be carried out at regular intervals.

This maintenance has to be carried out by your local Midea technician.

DANGER

ELECTRIC SHOCK

- Before carrying out any maintenance or repair activity, always switch off the circuit breaker on the supply panel, remove the fuses (or switch off the circuit breakers) or open protection devices of the unit.
- Make sure that before starting any maintenance or repair activity that the power supply to the outdoor unit is switched off.
- Do not touch live parts for 10 minutes after the power supply is turned off because of high voltage risk.
- The heater for the compressor may operate even in stop mode.
- Please note that some sections of the electric component box are hot.
- Make sure you do not touch a conductive section.
- Do not rinse the unit. This may cause electric shocks or fire.
- When service panels are removed, live parts can be easily touched by accident.

  Never leave the unit unattended during installation or servicing when service panel is removed.

The described checks must be executed at least once a year by qualified personnel.

1. Water pressure

Check if the water pressure is above 1 bar. If necessary add water.

2. Water filter

Clean the water filter.

3. Water pressure relief valve

Check for correct operation of the pressure relief valve by turning the black knob on the valve counter-clockWise:

- If you do not hear a clacking sound, contact your local dealer.
- In case the water keeps running out of the unit, close both the water inlet and outlet shut-off valves first and then contact your local dealer.

4. Pressure relief valve hose

Check that the pressure relief valve hose is positioned appropriately to drain the water.

5. Backup heater vessel insulation cover

Check that the backup heater insulation cover is fastened tightly around the backup heater vessel.

6. Domestic hot water tank pressure relief valve (field supply)

Applies only to installations with a domestic hot water tank. Check for correct operation of the pressure relief valve on the domestic hot water tank.

7. Domestic hot water tank booster heater

Applies only to installations with a domestic hot water tank. It is advisable to remove lime buildup on the booster heater to extend its life span, especially in regions with hard water. To do so, drain the domestic hot water tank, remove the booster heater from the domestic hot water tank and immerse in a bucket (or similar) with lime-removing product for 24 hours.

8. Unit switch box

- Carry out a thorough visual inspection of the switch box and look for obvious defects such as loose connections or defective wiring.
- Check for correct operation of contactors with an ohm meter. All contacts of these contactors must be in open position.

9. Use of glycol

(Refer also to section "HYDRAULIC CONNECTIONS") Document the glycol concentration and the pH-value in the system at least once a year.

- A PH-value below 8.0 indicates that a significant portion of the inhibitor has been depleted and that more inhibitor needs to be added.
- When the PH-value is below 7.0 then oxidation of the glycol occurred, the system should be drained and flushed thoroughly before severe damage occurs. Make sure that the disposal of the glycol solution is done in accordance with relevant local laws and regulations.

SAFETY AND MAINTENANCE

Basic safety rules

Recall that the use of products that use electricity and water entails the observance of some basic safety rules , such as: This appliance is not intended for use by persons (including children) with reduced physical , sensory or mental capabilities or lack of experience and knowledge, unless supervised or instructed on the use of the appliance by a person responsible for their safety . Children should be supervised to ensure that they do not play with the appliance.

It is forbidden to any technical intervention or maintenance without first disconnecting the unit from the mains power supply by can to “Off” .
You may not modify safety equipment or settings.
Do not pull, detach or twist the electrical cables coming from the unit even if it is disconnected from the mains supply.
It is forbidden to leave containers of flammable substances near the unit.
Do not touch the appliance when barefoot or with wet or damp parts of the body .
It is forbidden to open the doors of access to the internal parts of the unit without first ensuring that the system switch to “Off”.
Not dispose of, abandon or leave within reach of children packaging materials as it can be a potential source of danger.

IMPORTANT SAFETY INFORMATION
There is no guarantee proper operation as a result of a fire, before restarting the machine, contact an authorized service center. If equipped with safety valves refrigerant, in case of excessive pressure the safety valves can discharge high temperature refrigerant gas to the atmosphere. Wind, earthquakes and other natural phenomena of exceptional intensity were not considered. When using the unit in an aggressive atmosphere and or with aggressive water consult the factory.

Residual Risks

The machine has been designed with a view to reducing the risks to persons and the environment in which it is installed, to the minimum. To eliminate residual risks, it is therefore advisable to become as familiar as possible with the machine in order to avoid accidents that could cause injuries to persons and/or damage to property.

a. Access to the unit
Only qualified persons who are familiar with this type of machine and who are equipped with the necessary safety protections (footwear, gloves, helmet, etc.) may be allowed to access the machine. Moreover, in order to operate, these persons must have been authorized by the owner of the machine and be recognized by the actual Manufacturer.

b. Elements of risk
The machine has been designed and built so as not to create any condition of risk. However, residual risks are impossible to eliminate during the designing phase and are therefore listed in the following table along with the instructions about how to neutralize them.

Part in question	Residue hazard	Mode	Precautions
Compressor and delivery pipe	Burns	Contact with the pipes and/or compressor	Avoid contact by wearing protective gloves
Delivery pipes, heat recovery exchanger and coils	Explosion	Excessive pressure	Turn off the machine, check the high pressure switch and safety valve, the fans and condenser
Pipes in general	Ice burns	Leaking refrigerant	Do not pull on the pipes
Electrical cables, metal parts	Electrocution, serious burns	Defective cable insulation, live metal parts	Adequate electrical protection (correctly ground the unit)
Heat exchange coils	Cuts	Contact	Wear protective gloves
Fans	Cuts	Contact with the skin	Do not push the hands or objects through the fan grille

Disconnection and disposal

The machine contains lubricating oil and refrigerant gas for which, during the destruction of the unit, these fluids will be recovered and disposed of in accordance with the rules in force in the country where it is installed.
During the disconnection thus avoid spills or leaks of refrigerant gas and of the plant water if treated with additives or antifreeze substances.
The machine must not be abandoned in the process of destruction, but it can also be stored outdoors with gas, water and electrical circuits intact and closed.
For dismissing and disposal, deliver the units to specialized centres according to your national laws.

General recommendations about the R410A refrigerant used

1 PRODUCT IDENTIFICATION

Product	R-410A

2 COMPOSITION / INFORMATION ON INGREDIENTS

Substance / Preparation	Preparation
Components / Impurities	Contains the following components : Difluoromethane (R32) 50 % in weight Pentafluoroethane (R125) 50 % in weight
EEC No.	Non-applicable for mixtures
Trade-name	/ /

3 IDENTIFICATION OF HAZARDS

Identification of hazards	Liquefied gas. The vapours are heavier than air and can cause suffocation, reducing the oxygen available for breathing. Rapid evaporation of the fluid can cause freezing. Can cause cardiac arrhythmia.

4 FIRST-AID MEASURES

Inhalation	Do not administer anything if the person has fainted. Take the person outdoors. Use oxygen or artificial respiration if necessary. Do not administer adrenaline or similar substances.
Contact with eyes	Rinse thoroughly with plenty of water for at least 15 minutes and see a doctor.
Contact with skin	Wash immediately with plenty of water. Immediately remove all contaminated garments.
Swallowing	

5 FIRE-PREVENTION MEASURES

Specific hazards	Increase in pressure.
Dangerous fumes	Halogen acids, traces of carbonyl halides.
Fire-extinguishing means usable	All the known fire-extinguishing means can be used.
Specific methods	Cool the containers/tanks with water sprays.
Special protection equipment	Use self-contained breathing apparatus in confined spaces.

6 MEASURES AGAINST ACCIDENTAL SPILLING OF THE PRODUCT

Personal protection	Evacuate personnel to safe areas. Provide for adequate ventilation. Use personal protection equipment
Protection for the environment	It evaporates.
Product removal methods	It evaporates.

7 HANDLING AND STORAGE

Handling and storage	Ensure an adequate air change and/or extraction in the workplaces. Only use well-ventilated rooms. Do not breathe vapours or aerosols. Carefully close the containers and keep them in a cool, dry and well-ventilated place. Keep in the original containers.
Incompatible products	Explosives, flammable materials, organic peroxides.

8 CONTROL OF EXPOSURE / PERSONAL PROTECTION

Personal protection	Ensure adequate ventilation, especially in closed areas.
Control parameters	Difluoromethane (R32): Recommended exposure limits: AEL (8h and 12h TWA) = 1000 ml/m3 Pentafluoroethane (R125): Recommended exposure limits: AEL (8h and 12h TWA) = 1000 ml/m3
Respiratory tract protection	For rescue and for maintenance works in tanks, use self-contained breathing apparatus. The vapours are heavier than air and can cause suffocation, reducing the oxygen available for breathing.
Eye protection	Total protection glasses.
Hand protection	Rubber gloves.
Hygiene measures	Do not smoke.

9 CHEMICAL-PHYSICAL PROPERTIES

Relative density, gas (air=1)	Heavier than air.
Solubility in water (mg/l)	Not known, but deemed very low.
Appearance	Colourless liquefied gas.
Odour	Similar to ether.
Fire point	Does not ignite.

10 STABILITY AND REACTIVITY

Stability and reactivity	No decomposition if used according to the special instructions.
Materials to be avoided	Alkali metals, alkali-earth metals, granulated metal salts, Al, Zn, Be, etc. in powder.
Hazardous products of decomposition	Halogen acids, traces of carbonyl halides.

11 TOXICOLOGICAL INFORMATION

Local effects	Concentrations substantially above the value TLV (1000 ppm) can cause narcotic effects. Inhalation of highly concentrated products of decomposition can cause respiratory insufficiency (pulmonary oedema).
Long-term toxicity	No carcinogenic, teratogenic or mutagenic effects have been recorded in experiments on animals.
Specific effects	Rapid evaporation of the fluid can cause freezing. Can cause cardiac arrhythmia.

12 ECOLOGICAL INFORMATION

Effects linked to ecotoxicity	Pentafluoroethane (R125) Potential global warming with halocarbides; HGWP (R-11 = 1) = 0.84 Potential impoverishment of the ozone; ODP (R-11 = 1) = 0

13 CONSIDERATIONS ON DISPOSAL

General	Do not dispose of where accumulation can be hazardous.
	Usable with reconditioning.
	The depressurised containers must be returned to the supplier.
	Contact the supplier if instructions for use are deemed necessary.

14 INFORMATION FOR TRANSPORT

Designation for transport	LIQUEFIED GAS N.A.S. (DIFLUOROMETHANE, PENTAFLUOROETHANE)
UN No.	3163
Class/Div	2.2
ADR /RID No.	2, 2nd A
ADR/RID hazard no.	20
ADR label	Label 2 : non-toxic non-flammable gas.
CEFIC Groupcard	20g39 - A
Other information for transport	Avoid transport on vehicles where the loading zone is not separate from the cab. Make sure the driver is informed about the potential risk of the load and knows what to do in case of accident or emergency. Before starting transport, make sure the load is properly secured and : make sure the valve of the container is closed and does not leak; make sure the blind cap of the valve (when provided) is correctly fitted; make sure the cap (when provided) is correctly fitted and that there is an adequate ventilation passage; ensure compliance with the current provisions.

15 INFORMATION ON REGULATIONS

The product must not be labelled according to Directive 1999/45/EC.
Comply with the regulations given below, and the relevant applicable updates and amendments.
Circulars no. 46/79 and 61/81 of the Ministry of Labour : Risks related to the use of products containing aromatic amines
Leg. Decree no. 133/92 : Regulations on the discharge of hazardous substances in waters
Leg. Decree no. 277/91 : Protection of workers against noise, lead and asbestos
Law 256/74, Decree 28/1/92, Leg. Decree no. 52 dated 3/2/97, Decree dated 28/4/97 as amended : Classification, packing and labelling of hazardous substances and preparations
Decree no. 175/88, as amended : Activities with significant accident risks (Seveso Law)
Decree no. 203/88 : Emissions into the atmosphere
Decree no. 303/56 : Work hygiene
Decree no. 547/55 : Regulations on accident prevention
Leg. Decree no.152 dated 11/5/99 : Protection of waters

16 OTHER INFORMATION

Recommended uses Refrigerant
Can cause suffocation in high concentration.
Keep in a well-ventilated place.
Do not breathe the gas.
The risk of suffocation is often underestimated and must be clearly explained during the training of operators.
Ensure compliance with all the national and regional regulations.
Before using this product in any new process or trial, an in-depth study on safety and compatibility of the product with the materials must be carried out.
The above information is based on our current know-how and describes the product according to the safety requirements. It does not however represent a guarantee and assurance of the qualities in a legal sense. Each person responds personally for compliance with such regulations.

First aid

• Move the victim away from the toxic source, keep him warm and allow him to rest.
• Administer oxygen if necessary.
• Proceed with artificial respiration if necessary.
• Give heart massage in the case of heart failure.
• Immediately seek medical help.

Contact with the skin:
• Immediately thaw the affected parts under running lukewarm water.
• Remove contaminated clothing (garments may stick to the skin in the case of ice burns) if they have not adhered to the skin.
• Seek medical assistance if necessary.

Contact with the eyes:
• Immediately rinse the eyes with physiologic eyewash or clean water for at least 10 minutes with the eyelids pulled open.
• Seek medical assistance if necessary.

Swallowing:
• Do not make the victim vomit. If the victim is conscious, have him rinse his mouth out with clean water and then drink 200, 300 ml of water.
• Immediately seek medical help.
• Do not administer adrenaline or sympathomimetic drugs after exposure owing to the risk of cardiac arrhythmia.
For further information about the characteristics of the refrigerant, consult the technical briefs that can be obtained from manufacturers of refrigerant products.

SAFETY AND MAINTENANCE

General Rules for Maintanance

The maintenance is extremely important for the functioning of the system and the regular working of the unit over time.
In accordance with the European Regulation EC 303/2008 , it should be noted that companies and engineers in maintenance , repair, leak testing and recovery / recycle refrigerant gases should be CERTIFIED in accordance with local regulations.
Maintenance must be performed in compliance with the safety rules and tips given in the manual supplied with the unit.
Routine maintenance helps maintain unit efficiency, reduce the rate of deterioration which each device is subject in time and gather information and data to understand the efficiency of the unit and prevent failures.
For extraordinary maintenance or in case you need service , contact only to a specialized service center approved by the manufacturer and use original spare parts.
In accordance with the European Regulation EC 1516/2007 it is necessary to prepare a “equipment record”.
Provide anyway a databook (not supplied) that allows you to keep track of interventions made on the unit; in this way it will be easier to properly program the various interventions and will facilitate a possible troubleshooting.
Bring on the databook : date, type of intervention made, description of the intervention , measurements , reported anomalies , alarms recorded in the alarm history , etc. ...

Routine maintenance

The inspections described below, to which the unit must be subjected, do not require specific technical know-how.
They merely include a few simple inspections involving certain parts of the unit.
The table below gives a recommended list of inspections which should be carried out at the indicated intervals.
Provide controls and interventions more frequently in case of heavy (continuous or intermittent high, close to operating limits, etc ...) or critical (essential service such as data centres, hospital etc ...) use.

DESCRIPTION	WEEKLY	MONTHLY	EVERY SIX MONTHS
Visual inspection of the unit			•
Inspection of hydraulic circuit		•	
Inspection of electrical system		•	
Inspection of condensing system		•	
Inspection of the water heat exchanger			•
Inspection of the water filter		•	
Inspection of the water pumps (if present)			•
Reading and adjustment of the operating parameters	•		

• Visual inspection of the structure of the unit
When checking the condition of the parts that form the structure of the unit, pay particular attention to the parts liable to rust.
If traces of rust are noted, they must be treated with rust-inhibitor paint in order to eliminate or reduce the problem.
Check to make sure that the external panels of the unit are well fixed.
Bad fixing gives rise to noise and abnormal vibrations.

• Inspection of hydraulic circuit
Check visually to make sure that there are no leaks in the hydraulic circuit. Check that water filters are clean.

• Inspection of electrical system
Make sure that power cables that supply the unit are not torn, cracked or damaged in a way that could impair its insulation.

• Inspection of the ventilated condensing/evaporating section
WARNING: The finned pack exchanger has fins made of aluminium or some other thin material, thus even accidental contact could cause cuts.

Condensing/Evaporating coils
In view of the function of this component, it is very important for the surface of the exchanger to be as free as possible from clogging caused by items that could reduce the fan’s air flow rate and, thus, the performances of the unit itself.
The following operations may be required:
- Remove all impurities (such as paper scraps, leaves, etc.) that could be clogging the surface of the bank either by hand or using a brush (comply with the above mentioned safety prescriptions).
- If the dirt has deposited on the fins and is difficult to remove by hand, use a flow of compressed air or pressurized water on the aluminium surface of the coils, remembering to direct the flow in a vertical and opposite to the standard flow direction to prevent the fins from being damaged.
- “Comb” the coils with the relative tool, using the appropriate comb spacing for the fins if some parts of them are bent or squashed.

Axial fans
Visually inspect these parts to make sure that the fans are well fixed to the bearing grille and that this latter is fixed to the structure of the unit. Check the fan bearings, and close the terminal box and cable glands. Bearings damaged and bad fixing are the source of abnormal noise and vibrations,

• Inspection of the water heat exchangers
The exchangers must ensure the maximum heat transfer possible so keep them clean and free from dirt that may reduce efficiency; make sure that the temperature difference between water outlet temperature and evaporation/condensation does not increase over time, if the difference exceeds 8 -10 ° C it is necessary to proceed cleaning the water side of the exchanger, keeping in mind the following: water circulation must be in the opposite direction than normal, the fluid velocity does not exceed 1.5 times the nominal velocity and use just water or moderately acid products but only water for final washing.

• Inspection of the water filters
Make sure to clean the filter and remove any impurities that block the proper flow of water, contributing to increase pressure drop and therefore energy consumption of the pumps. Refer to the section “Hydraulic Connections” too.

• Inspection of the water pumps
Check water leakages, the state of the bearings, the closing of the terminal box and integrity of the cable. Bearings damaged and bad fixing are the source of abnormal noise and vibrations,

• Reading and adjustment of the operating parameters
This control can be done using the pressure gauges (if installed) of the refrigerant circuits and using the pressure and temperature gauges (if installed) of the hydraulic circuits of the unit (evaporator + heat recovery - if present)

NOTE:
FOR THE PLANT WATER FILL AND DRAIN REFER TO THE SECTION HYDRAULIC CONNECTIONS

CAUTION
As a result of extraordinary maintenance on the cooling circuit with component replacement, before restarting the machine, perform the following steps:
- Pay attention to restore the refrigerant charge indicated on the name plate of the machine.
- Open all the ball valves in the refrigerant circuit.
- Correctly connect the power supply and grounding.
- Check the hydraulic connections.
- Check that the water pump is working properly.
- Clean water filters.
- Check that the finned coils are not dirty or clogged.
- Check the proper rotation of fans.
- Check correct operation of safety devices with particular attention to differential water pressure switch and / or water flow switch.

FIRST CHECKUP STARTUP MODULE

SECTION 1 ; user data/ installer

Custumer data: _____ Installer : _____

Street: _____ n.° _____

City : _____ Zip Code: _____ Country: _____

Model : _____ Serial number : _____

SECTION 2 : **Designer o person in charge** ;

Designer: _____ Idraulic diagram : YES ☐ NO ☐

Variation found in the original diagram : _____

_____

Note: attach the hydraulic project if available

SECTION 3: Plant data

Unit model : ☐ Out let water tank ☐ Inlet water tank

☐ Primary/secondary water tank ☐ no water tank

Water tank: Model _____ Capacity _____

Expantion vassel YES ☐ NO ☐ Model _____ Capacity _____

Secondary circuit pump: YES ☐ NO ☐ Model _____

Secondary circuit management:

TERMINAL UNIT	HEATING	COOLING
Fan-coil		
Radiant pannels/ ground floor system		
Radiators		
In-wall water unit		

SECTION 4: **DOMESTIC HOT WATER SYSTEM**

DHW coil ☐ DHW coil on Heat pump ☐ DHW tank for instantly hot water ☐

3 way valve YES ☐ NO ☐ Valve type : electrical actuator ☐ pneumatic actuator ☐

	DHW tank with coil	Buffer
Model		
Volume		
DHW coil surface (square meter)		

SECTION 5 : **SUPPLEMENTARY HEATING SOURCE**

plant : ☐ Boiler ☐ Electrical Heater ☐ Solar Panel

Sanitary water : ☐ Boiler ☐ Electrical Heater ☐ Solar panel

PRELIMINARY CHECK LIST

		YES	NO
1.	Pipes isolation	☐	☐
2.	Drain water valve	☐	☐
3.	Rubber vibration pipe joint	☐	☐
4.	Rubber vibration dumpers	☐	☐
5.	Sanitary water expantion vessel	☐	☐
6.	Plant expantion vassel	☐	☐
7.	Safety sanitary valve	☐	☐
8.	Idraulic separator in the plant side	☐	☐
9.	Automatic air vent in the	☐	☐
10.	Circuit filled and purged	☐	☐
11.	Manometers on the inlet andoutled water	☐	☐
12.	Termometers on inlet and outlet water	☐	☐
13.	Check valve before and after the idraulic filter	☐	☐
14.	Water filter on the inlet o the unit OTHERWISE THE WARRENTY WILL BE INVALIDATED	☐	☐
15.	Automatic water refill tap	☐	☐
16.	Minimun operation area (free area around the unit as show in the manual)	☐	☐
17.	Electrical connection as raccomended in the manual	☐	☐
18.	Ground cable	☐	☐
19.	Fase sequence	☐	☐
20.	Power supply refer to manul	☐	☐
21.	Service contract with someone	☐	☐

SECTION 6:

If Ferroli plant solution were used report wich : PLANT SOLUTION n° _____

If during the starup of the unit will be detected some failings or inconsistensies , restoring the sistem will be on charge of the client

SEZIONE 7: DOCUMENT VALIDIATION

IF THE FIRST STARTUP IS NOT VALID FOR UNDECLARED CAUSES , A NEW INTERVENTION WILL BE DIRECTLY CHARGED TO THE CUSTOMER .

Costumenr signature:	**Date of startup request:**	**First statup date:**
_____	_____	_____

NOTE

NOTE

NOTE

Ferroli

COD. 3QE44217

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