

## 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 SERVICEMAN" menu - italian language



## SETUP OF THE SYSTEM

1.1 MOD0 ACS

dT5_ON	4	°C
dT100	10	°C
T4_OHMAX	43	°C
T4_OHMIN	-10	°C
t_INTERVAL_DHH	5	MIN

SCORRERE

1.2 RISCALD. ACC.

dT5_TBH_OFF	5	°C
T4_TBH_ON	5	°C
t_TBH_DELAY	90	MIN

SCORRERE

1.3 ANTILEGIONELLA

T20_DI	65	°C
t_DI_HIGHTEMP	15	MIN
t_DI_MAX	210	MIN

SCORRERE

1.4 PRIORITA ACS

t_DHHIP_MAX	180	MIN
t_DHHIP_RESTRICT	180	MIN

SCORRERE

1.5 POMPA ACS

FUNCTION_TIMER	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NON
ANTILEGIONELLA	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NON
TEMPO FUNZ. POMPA	5 MIN

SCORRERE

7.1 RISC. SUPPORTO

MOD0_R2100	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NON
MOD0_ACS	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NON
T4_TBH_ON	-5 °C
dT1_TBH_ON	5 °C
t_TBH_DELAY	30 MIN
t_TBH12_DELAY	5 MIN

SCORRERE

7.2 AHS (CALDATA)

MOD0_R2100	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NON
MOD0_ACS	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NON
T4_AHS_ON	-5 °C
dT1_AHS_ON	5 °C
dT1_AHS_OFF	0 °C
t_AHS_DELAY	30 MIN

SCORRERE

## SETUP OF THE SYSTEM



## SETUP OF THE SYSTEM



## SETUP OF THE SYSTEM

### "FOR SEVICEMAN" menu - english language





## SETUP OF THE SYSTEM

1.1 DHW MODE

gT5_ON	4	°C
gT1S5	10	°C
T4DHRMAX	43	°C
T4DHRMIN	-10	°C
t_INTERVAL_DHW	5	MIN

SCROLL

1.2 TANK HEATER

gT5_TBH_ON	5	°C
T4_TBH_ON	5	°C
t_TBH_DELAY	90	MIN

SCROLL

1.3 DISINFECT

T55_DI	65	°C
t_DI_HIGHTEMP	15	MIN
t_DI_MAX	210	MIN

SCROLL

1.4 DHW PRIORITY

t_GHWP_MAX	180	MIN
t_DHWP_RESTRICT	180	MIN

SCROLL

1.5 DHW PUMP

TIMER RUNNING	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NON
DISINFECT	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NON
PUMP RUNNING TIME	5	MIN

SCROLL

7.1 BACKUP HEATER

HEAT MODE	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NON
DHW MODE	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NON
T4_IDH_ON	-5	°C
gT1_IDH_ON	5	°C
t_IDH_DELAY	30	MIN
t_IDH12_DELAY	5	MIN

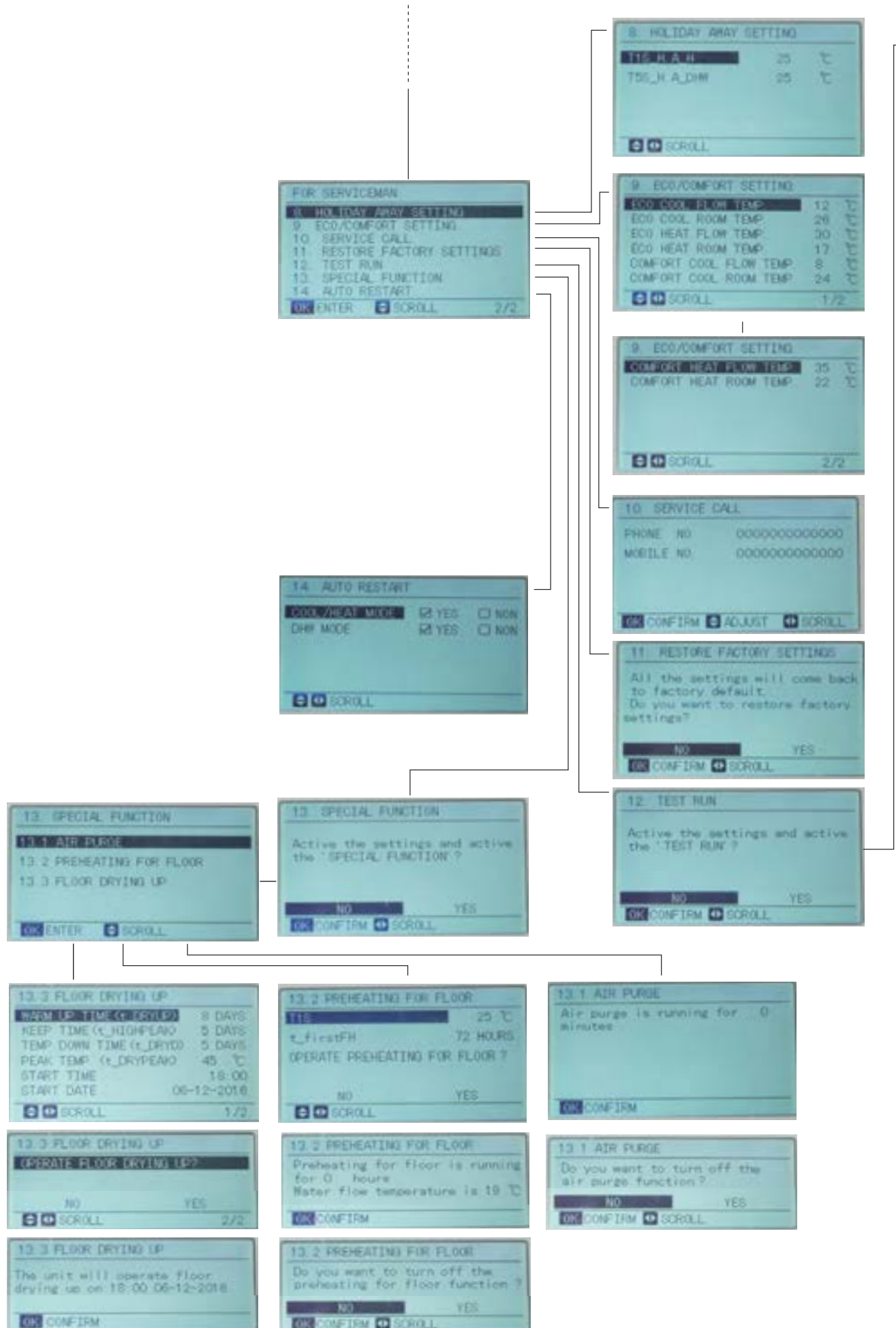
SCROLL

7.2 ADDITIONAL HEATING SOURCE

HEAT MODE	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NON
DHW MODE	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NON
T4_AHS_ON	-5	°C
gT1_AHS_ON	5	°C
gT1_AHS_OFF	0	°C
t_AHS_DELAY	30	MIN

SCROLL

## SETUP OF THE SYSTEM



## SETUP OF THE SYSTEM





## SETUP OF THE SYSTEM

### How to go to FOR SERVICEMAN

Go to MENU> FOR SERVICEMAN. Press OK

FOR SERVICEMAN

Please input the password:

0 0 0

OK ENTER ↵ ADJUST ⬅➡ SCROLL

The password is 666. 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.

FOR SERVICEMAN

1. DHW MODE SETTING

2. COOL MODE SETTING

3. HEAT MODE SETTING

4. AUTO MODE SETTING

5. TEMP.TYPE SETTING

6. ROOM THERMOSTAT

7. OTHER HEATING SOURCE

OK ENTER ⬅➡ SCROLL

FOR SERVICEMAN

8. HOLIDAY AWAY MODE SETTING

9. ECO/COMFORT MODE SETTING

10. SERVICE CALL SETTING

11. INITIALIZE MANUALLY

12. TEST RUN

13. SPECIAL FUNCTION

14. AUTO RESTART

OK ENTER ⬅➡ SCROLL



### 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

### 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 DHW MODE SETTING	
1.1. DHW MODE	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NON
1.2. TANK HEATER	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NON
1.3. DISINFECT	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NON
1.4. DHW PRIORITY	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NON
1.5. DHW PUMP	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NON
OK ENTER    ⬅️ ➡️ SCROLL	

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

Use ◀ ▶ and ▼ ▲ to scroll and adjust parameters. Use BACK to exit.

1.1 DHW MODE	
dT5_ON	5°C
dT1S5	10°C
T4DHWMAX	43°C
T4DHWMIN	-10°C
t INTERVAL DHW	5 MIN
⬅️ ➡️ SCROLL	



### NOTE

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

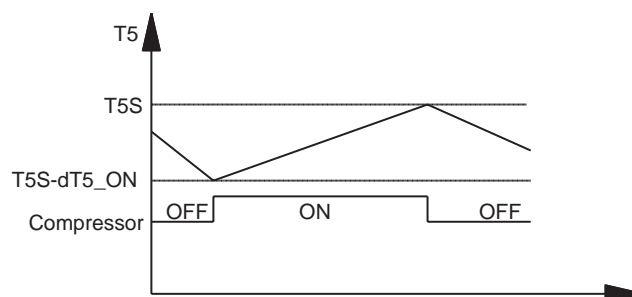
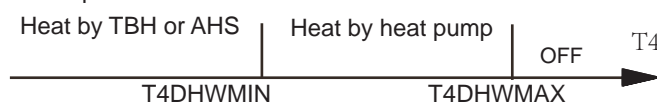
dT5\_ON is the temperature difference for starting the heat pump, the picture below illustrates the dT5\_ON function.

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 ( $T5 \leq T5S - dT5\_ON$ ) 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.

## SETUP OF THE SYSTEM

### Tank heater (electrical heater for DHW tank)

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

1.2 TANK HEATER	
dT5_TBH_OFF	5°C
T4_TBH_ON	20°C
_TBH_DELAY	90 MIN
SCROLL	

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 ( $T5 \geq T5S + dT\_TBH\_OFF$ ) 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.

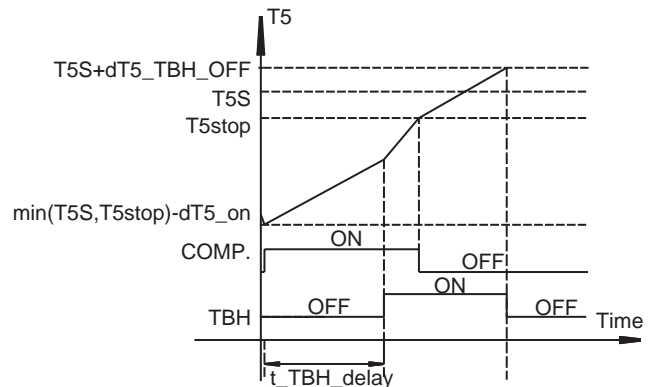
t\_TBH\_DELAY is the time that the compressor has run before starting the booster heater (if  $T5 < \min(T5S, T5stop)$ ).

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  $T5 \geq T5stop$ , 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 (TBH) 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.

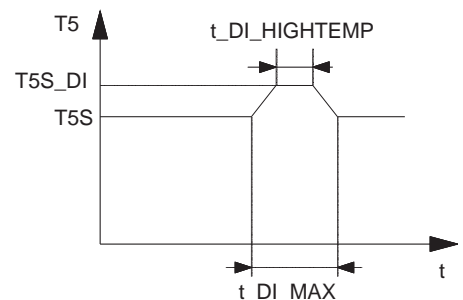
1.3 DISINFECT	
T5S_DI	5°C
t_DI_HIGHTMEP.	30 MIN
t_DI_MAX	120 MIN
SCROLL	

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.



## SETUP OF THE SYSTEM



### 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**:

1.4 DHW PRIORITY	
t_DHWHP_MAX	180MIN
t_DHWHP RESTRICT	180MIN
<div> <div></div> <div></div> <div>SCROLL</div> </div>	

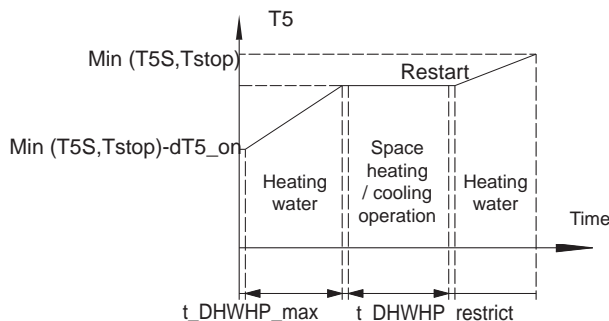
The function of the DHW PRIORITY is used to set the operation priority between domestic water heating and space (heating/cooling) operation. You can use ◀▶ and ▼▲ to scroll and adjust parameters. Using BACK to exit.

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 available, 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 a 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  $T5 \geq T5S\_DI-2$ . Pump run time is t+5min.

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

1.5 DHW PUMP	
TIMER RUNNING	ON
DISINFECT	ON
PUMP RUNNING TIME	10MIN
<div> <div>ON/OFF</div> <div>ON/OFF</div> <div>SCROLL</div> </div>	

## SETUP OF THE SYSTEM

### 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:

2 COOL MODE SETTING	
COO MODE	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NON
T1S RANGE	<input checked="" type="checkbox"/> LOW <input type="checkbox"/> HIGH
T4CMAX	43°C
T4CMIN	20°C
dT1SC	5°C
◀ ▶ SCROLL 1/2	

2 COOL MODE SETTING	
dTSC	2°C
t_INTERVAL_C	5MIN
◀ ▶ SCROLL 2/2	

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.

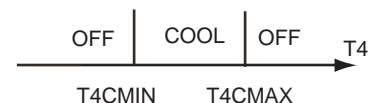


#### NOTE

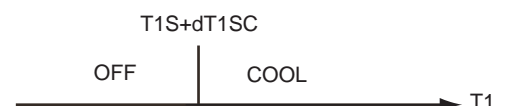
If COOL MODE is set "NON", the function is not available and so could not be selected by the user.

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:

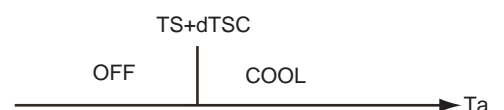
dT1SC is the temperature difference between T1 (actual outlet water temperature) and T1S (target outlet water temperature) for starting the unit in cool mode. Only when T1 is high enough will the unit turn on, and will turn off if T1 drops to a certain value. See the diagram below:



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:



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 to 10.7 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:





## SETUP OF THE SYSTEM

### 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:

3 HEAT MODE SETTING	
HEAT MODE	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NON
T1S RANGE	<input checked="" type="checkbox"/> LOW <input type="checkbox"/> HIGH
T4HMAX	25°C
T4HMIN	-15°C
dTISH	5°C
◀ ▶ SCROLL	

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.**

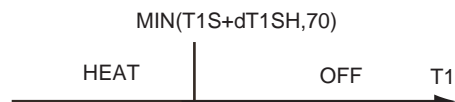
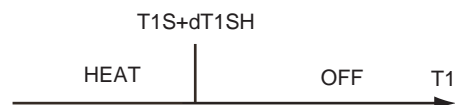
T4HMAX is the maximum outdoor air operating temperature for heat mode. The unit will not work if the outdoor air temperature is higher.

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

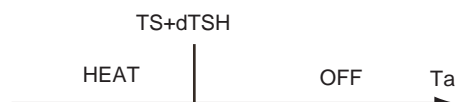
The relationship between the operation of the unit and outdoor air temperature can be seen in the picture below:

dT1SH is the temperature difference between T1 and T1S for starting the unit in heat mode.

When the target outlet water temperature  $T1S < 47$ , the unit will turn 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 to 10.7 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.

## SETUP OF THE SYSTEM

### 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.

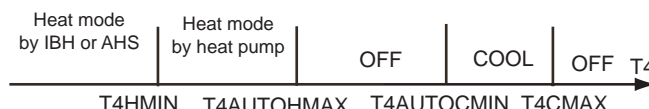
4 AUTO MODE SETTING	
T4AUTOCMIN	25°C
T4AUTOHMAX	17°C
⏮ ⏭ SCROLL	

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:

5 TEMP. TYPE SETTING	
WATER FLOW TEMP.	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NON
ROOM TEMP.	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NON
⏮ ⏭ SCROLL	

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.

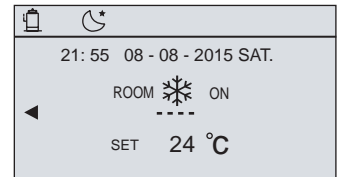
In this state, the first target outlet water temperature can be set in the main page, the second one can be calculated from the climate-related curves. In heat mode, the higher one will be the real target outlet temperature, while in cool mode, the lower one will be selected.

21:55 08-08-2015 SAT.	
MAIN  OFF	DHW  ON
SET 18 °C	TANK 55 °C

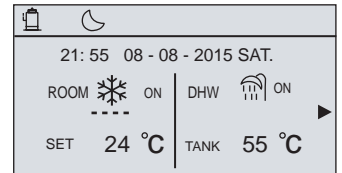
21:55 08-08-2015 SAT.	
MAIN  ON	DHW  ON
SET 12 °C	TANK 55 °C

## SETUP OF THE SYSTEM

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

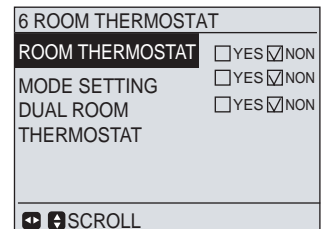


If you set WATER FLOW TEMP. to NON, and set ROOM TEMP. to YES, then the room temperature will be displayed on the home page, and the room temperature will work as the target temperature. The target outlet water temperature can be calculated from the climate related curves.



### 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 schedule 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".

## SETUP OF THE SYSTEM

### 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:

7 OTHER HEATING SOURCE	
7.1.BACKUP HEATER	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NON
7.2.AHS	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NON
7.3.SOLAR ENERGY	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NON
<div> <div></div> <div>SCROLL</div> </div>	



### 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:

7.1 BACKUP HEATER	
HEAT MODE	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NON
DHW MODE	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NON
T4_AHS_ON	-5°C
dT1_AHS_ON	5°C
t_IBH_DELAY	30MIN
t_IBH12_DELAY	5MIN
<div> <div></div> <div>SCROLL</div> </div>	

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.

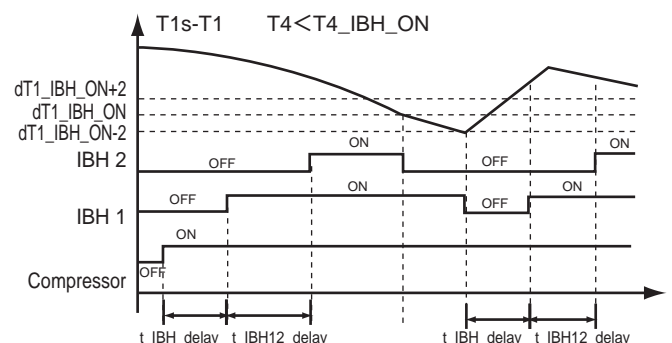


dT1\_IBH\_ON is the temperature difference between T1S and T1 for starting the backup heater. Only when at the  $T1 < T1S - dT1\_IBH\_ON$  can the backup heater turn on. When a second backup heater is installed, if the temperature difference between T1S and T1 is larger than  $dT1\_IBH\_ON + 2$ , the 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.



## SETUP OF THE SYSTEM

### AHS (Additional Heating Source, gas boiler)

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:

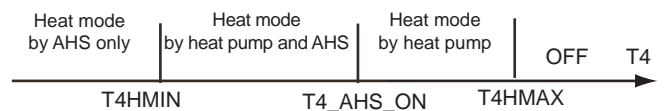
7.2 ADDITIONAL HEATING SOURCE	
HEAT MODE	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NON
DHW MODE	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NON
T4_AHS_ON	-5°C
dT1_AHS_ON	5°C
dT1_AHS_OFF	0°C
t_AHS_DELAY	30MIN
◀ ▶ SCROLL	

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.

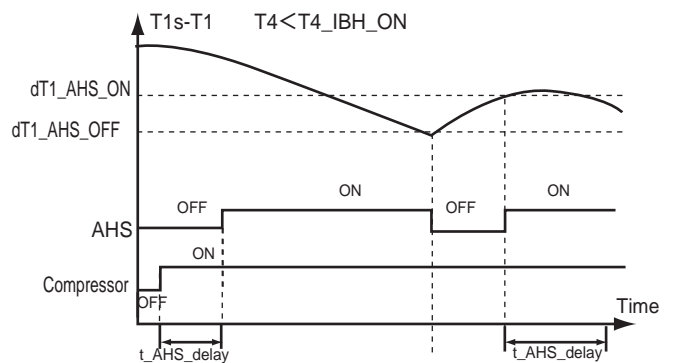
NOTE: If YES is selected in DHW MODE, the installation of an additional heating source should follow “8.5 Application 5/Application b”

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 T1 for turning the additional heating source on (only when  $T1 < T1S - dT1\_AHS\_ON$ ), dT1\_AHS\_OFF is the temperature difference between T1S and T1 for turning the additional heating source off (when  $T1 \geq T1S + dT1\_AHS\_OFF$  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:

8 HOLIDAY AWAY SETTING	
T1S_H.A._H	20°C
T5S_H.M._DHW	15°C
◀ ▶ SCROLL	

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.



## SETUP OF THE SYSTEM

### Eco/comfort mode setting

The ECO/COMFORT MODE SETTING is used to set the target room temperature or outlet water temperature when in ECO/COMFORT MODE.

To enter the ECO/COMFORT MODE SETTING, go to MENU> FOR SERVICEMAN> COMFORT MODE SETTING. Press OK. The following page is displayed:

9 ECO/COMFORT MODE SETTING	
ECO COOL FLOW TEMP	20°C
ECO COOL ROOM TEMP.	26°C
ECO HEAT FLOW TEMP.	35°C
ECO HEAT ROOM TEMP.	17°C
COMFORT COOL FLOW TEMP.	7°C
COMFORT COOL ROOM TEMP.	24°C
◀ ▶ ⬆ ⬇ ⬆ ⬇ SCROLL	1/2

Use ◀ ▶ and ▼ ▲ to scroll and adjust the parameter.

ECO COOL FLOW TEMP is the setpoint of the water temperature sent to the system (T1S) in COOL mode when ECO mode is active.

ECO COOL ROOM TEMP is the setpoint of the room temperature (TS) in COOL mode when ECO mode is active.

ECO HEAT FLOW TEMP is the setpoint of the water temperature sent to the system (T1S) in HEAT mode when ECO mode is active.

ECO HEAT ROOM TEMP is the setpoint of the room temperature (TS) in HEAT mode when ECO mode is active.

COMFORT COOL FLOW TEMP is the setpoint of the water temperature sent to the system (T1S) in COOL mode when COMFORT mode is active.

COMFORT COOL ROOM TEMP is the setpoint of the room temperature (TS) in COOL mode when COMFORT mode is active.

COMFORT HEAT FLOW TEMP is the setpoint of the water temperature sent to the system (T1S) in HEAT mode when COMFORT mode is active.

COMFORT HEAT ROOM TEMP is the setpoint of the room temperature (TS) in HEAT mode when COMFORT mode is active.

### 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:

10 SERVICE CALL	
PHONE NO.	0000000000000
MOBILE NO.	0000000000000
OK CONFIRM ⬇ ADJUST ▶ SCROLL	

10 SERVICE CALL	
PHONE NO.	*****
MOBILE NO.	*****
OK CONFIRM ⬇ ADJUST ▶ SCROLL	

# **SETUP OF THE SYSTEM**

## **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:

11 RESTORE FACTORY SETTINGS

All the settings will revert to factory default. Do you want to restore factory setting?

NOYES

OK CONFIRM SCROLL

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

11 RESTORE FACTORY SETTINGS

Please wait...

5%

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:

12 TEST RUN

Activate the settings and activate "TEST RUN"?

NOYES

OK CONFIRM SCROLL

If YES is selected, the following page is displayed:

12 TEST RUN

12.1 POINT CHECK

AIR PURGE

CIRCULATION PUMP RUNNING

COOL MODE RUNNING

HEAT MODE RUNNING

DHW MODE RUNNING

OK ENTER SCROLL

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:

12.1 POINT CHECK

3-WAY VALVE OFF

2-WAY VALVE OFF

PUMP1 OFF

PUMP0 OFF

PUMP0 OFF

PUMPSOLAR OFF

SCROLL ON/OFF ON/OFF

12.1 PIONT CHECK

PUMPDHW OFF

BACKUP HEATER1 OFF

BACKUP HEATER2 OFF

TANK HEATER OFF

SCROLL ON/OFF ON/OFF

## SETUP OF THE SYSTEM

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:

12 TEST RUN
Test run is on. Air purge is on.
OK CONFIRM

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:

12 TEST RUN
Test run is on. Circulation pump is on.
OK CONFIRM

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:

12 TEST RUN
Test run is on. Cool mode is on. Leaving water temperature is 15°C.
OK CONFIRM

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:

12 TEST RUN
Test run is on. Heat mode is on. Leaving water temperature is 15°C.
OK CONFIRM

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:

12 TEST RUN
Test run is on. DHW mode is on. Water flow temper. is 45°C Water tank temper. is 30°C
OK CONFIRM

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:

12 TEST RUN
Do you want to turn of the test run(air purge) function?
NO YES
OK CONFIRM ➡ SCROLL

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

## SETUP OF THE SYSTEM

### 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(SCHEDULE,HOLIDAY AWAY, HOLIDAY HOME) can't be used.

Go to MENU> FOR SERVICEMAN> SPECIAL FUNCTION.

13 SPECIAL FUNCTION	
13.1 AIR PURG	
13.2 PREHEATING FOR FLOOR	
13.3 FLOOR DRYING UP	
OK ENTER ⬅️ ➡️ SCROLL	

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:

13.1 AIR PURGE	
Air purge is running for 25 minutes.	
OK CONFIRM	

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:

13.1 AIR PURGE	
Do you want to turn off the air purge function?	
NO	YES
OK CONFIRM ⬅️ ➡️ SCROLL	

Use ◀ ▶ to scroll and use OK to confirm.

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

13.2 PREHEATING FOR FLOOR	
T1S	30°C
dT1SH	5°C
t_fristFH	72 HOURS
OPERATE PREHEATING FOR FLOOR?	
NO	YES
⬅️ ➡️ SCROLL	

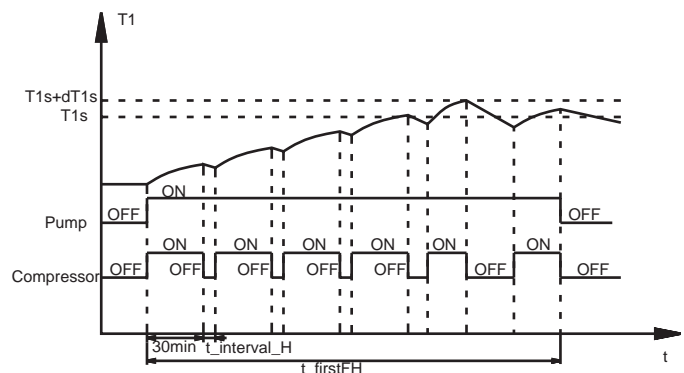
When the cursor is on T1S, dT1SH or t\_fristFH, Use ◀ ▶ and ▼ ▲ to scroll and adjust the parameter.

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  $T1 \geq T1S + dT1S$  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:



## SETUP OF THE SYSTEM

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

13.2 PREHEATING FOR FLOOR	
Preheat for floor is running for 25 minutes. Water flow temperature is 20°C.	
OK CONFIRM	

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:

13.2 PREHEATING FOR FLOOR	
Do you want to turn off the preheating for floor function?	
NO	YES
OK CONFIRM ⏮ SCROLL	

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

Before floor heating, if large 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 be 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.

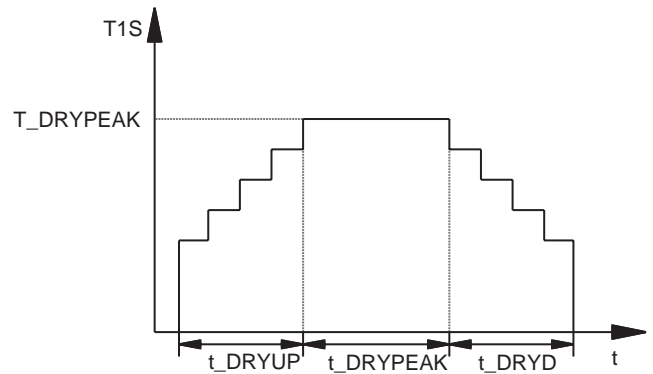
t\_HIGHPEAK is the last day of high temperature.

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:



13.3 FLOOR DRYING UP	
The unit will operate floor drying on 09:00 16-12-2015.	
OK CONFIRM	

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 malfunctions, 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.

14 AUTO RESTART	
COOL/HEAT MODE	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
DHW MODE	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
⏮ SCROLL	



## START-UP

### DIP switch settings

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
<b>S1 (3*)</b>	Electrical booster (IBH1-first stage) (OFF if installed)	Not installed	Installed
<b>S1 (4*)</b>	Electrical booster (IBH2-second stage) (OFF if installed)	Not installed	Installed
<b>S2 (1*)</b>	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 or double-stage)	Electrical booster (double-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

### 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.

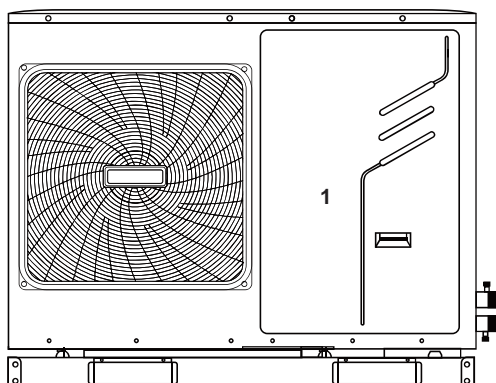
### Powering up the unit

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.

## SAFETY AND MAINTENANCE

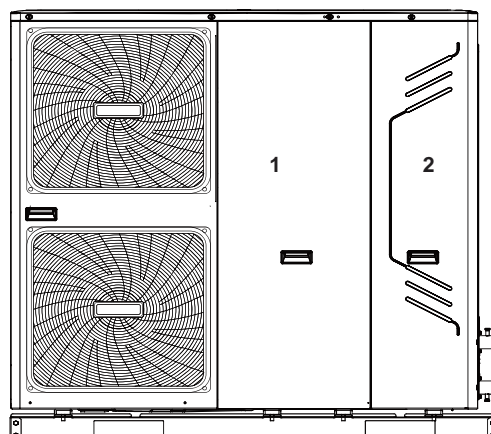
### Opening the unit

MOD. 5-7



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

MOD. 10-14-14T



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

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



#### WARNING

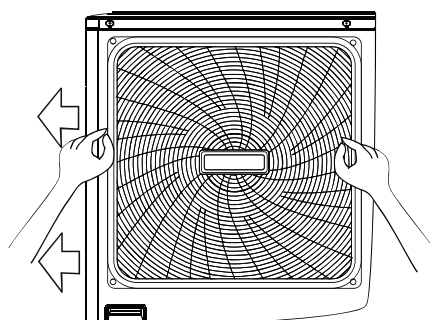
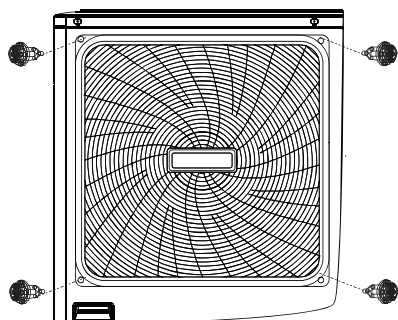
Switch off all power — i.e. unit power supply and backup heater and domestic hot water tank power supply (if applicable) — before removing doors 1 and 2.



#### 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

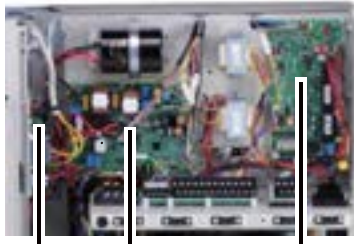
That during the first running period of the unit, required power input may be higher than stated on the nameplate of the unit. This phenomenon originates from the compressor that needs elapse of a 50 hours run in period before reaching smooth operation and stable power consumption.

### 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**".

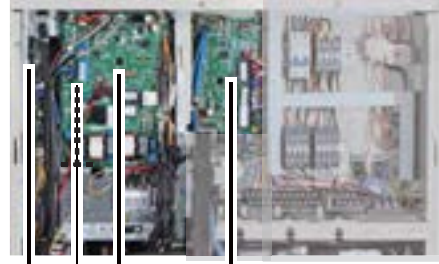
## SAFETY AND MAINTENANCE

**Control box for Mod. 5-7**



PCB A      PCB B      Main control board of hydraulic module

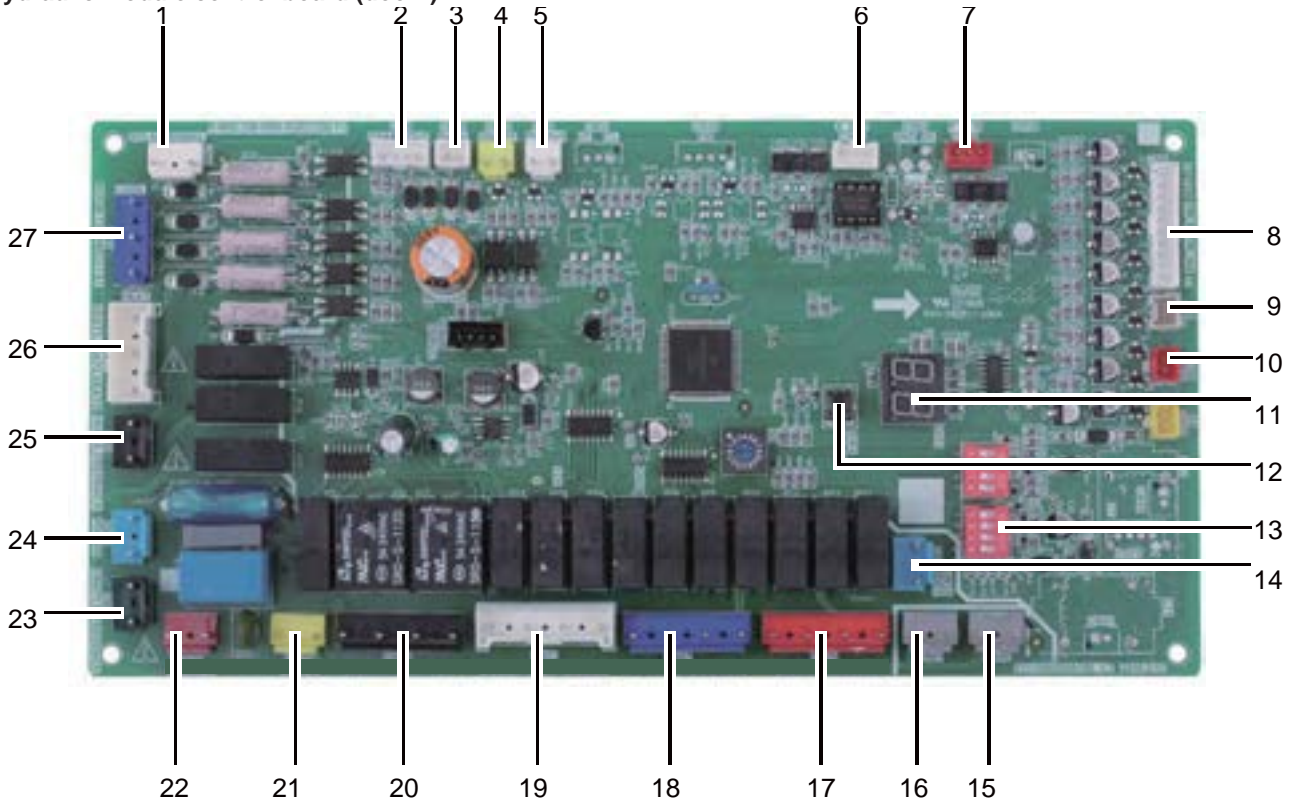
**Control box for Mod. 10-14**



PCB A      PCB B      main control board of hydraulic module  
PCB C  
(at back of the PCB B, only for 3 phase unit)

The image shown here is indicative only. If there is inconsistency between the image and the actual product, the actual product shall govern.

### Hydraulic module control board (door2)



**1-phase Mod. 5-7-10-14**

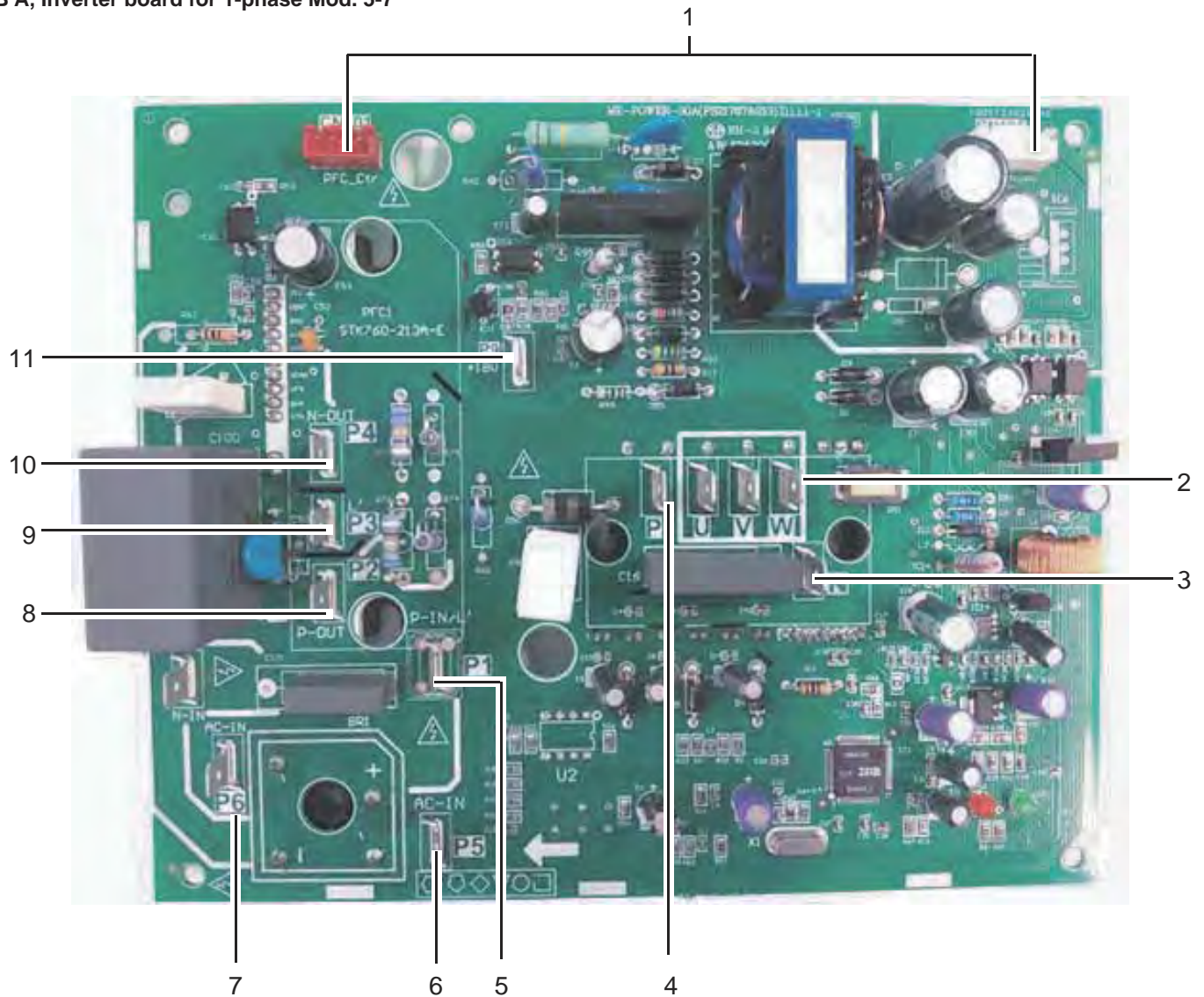
**3-phase Mod.14T**

- 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 electric heating tape (internal)(CN40)
- 16 Port for anti-freeze electric heating tape (internal)(CN41)
- 17 Output port for external heating source / operation output port(CN25)
- 18 Port for anti-freeze electric 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)

## SAFETY AND MAINTENANCE

**PCB A, Inverter board for 1-phase Mod. 5-7**

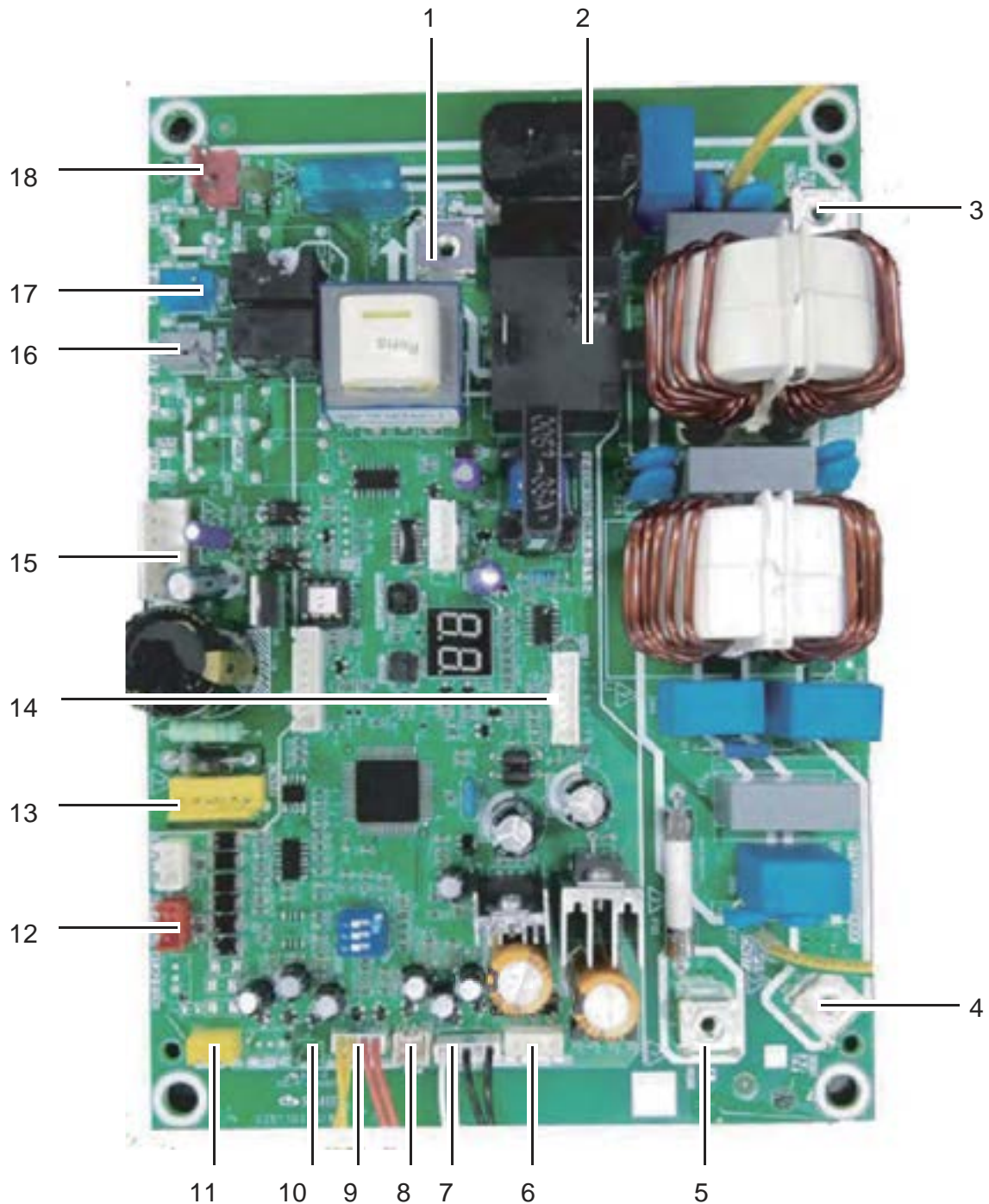


- 1 To main board (CN101,CN105)
- 2 Compressor connection port U V W (U,V,W)
- 3 Input port N for IPM module(N)
- 4 Input port P for IPM module(P)
- 5 Input port for PFC inductance P1(P1)
- 6 Input port for bridge Rectifiers(P5)
- 7 Input port for Bridge Rectifiers(P6)
- 8 Output port P of PFC(P2)
-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



## SAFETY AND MAINTENANCE

PCB B, Main control board for 1-phase Mod. 5-7



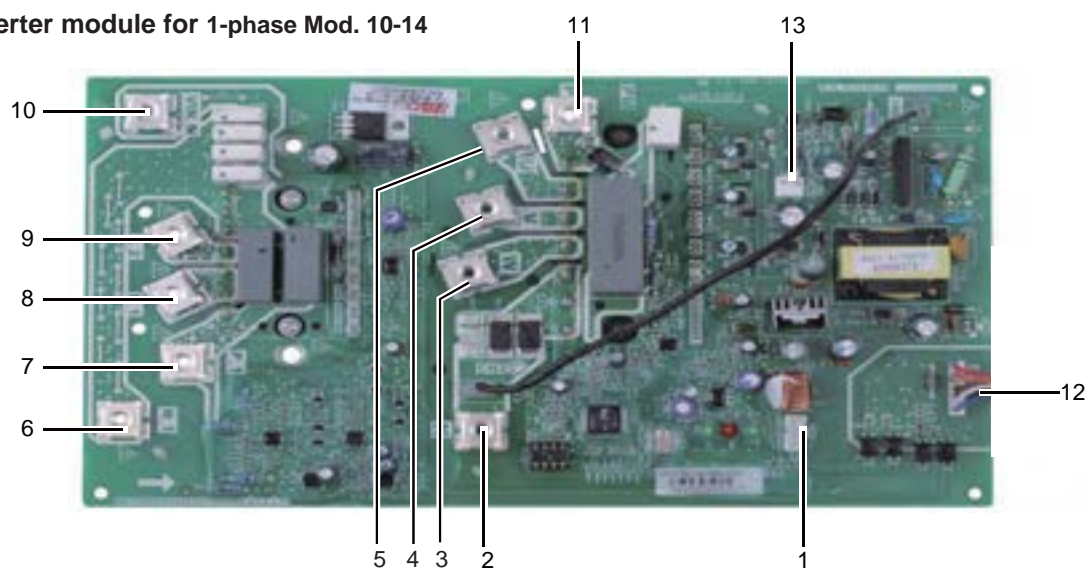
- |                                     |   |
|-------------------------------------|---|
| 1 Rectifier bridge input port L     | 10 Th temperature sensor port                 |
| 2 Hydraulic compartment input port2 | 11 Pressure sensor port                       |
| 3 Rectifier bridge input port N 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



## SAFETY AND MAINTENANCE

### PCB for refrigerant system

#### PCB A, Inverter module for 1-phase Mod. 10-14

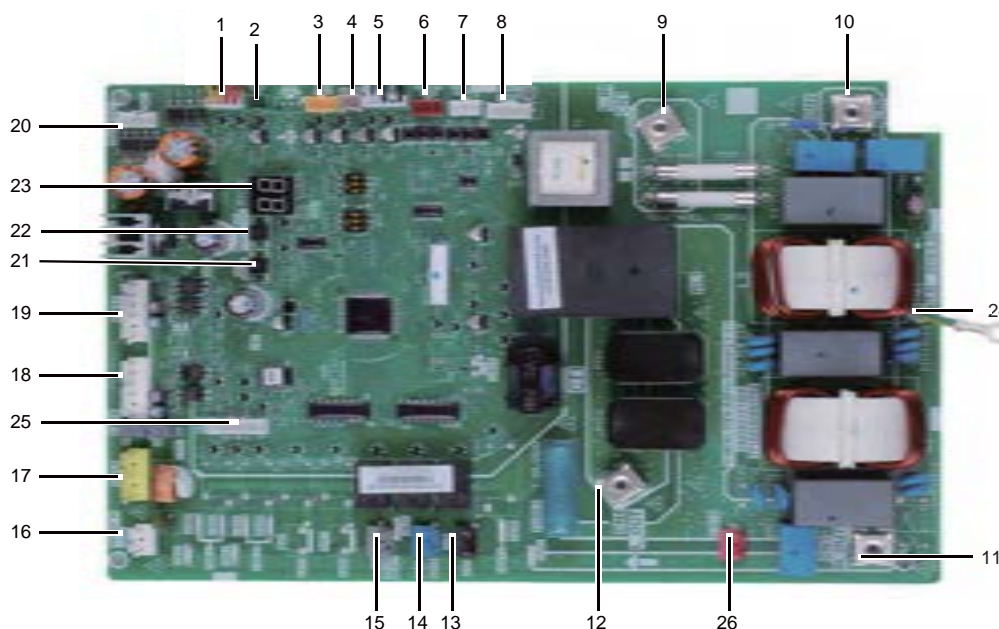


- 1 Reserved(CN2)
- 2 Input Port N For Ipm Module(N)
- 4 Power Supply Of V Phase For Compressor(V)
- 3 Power Supply Of W Phase For Compressor(W)

- 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 For Pfc Module(P)
- 12 Communicate Port Between Pcb A And Pcb B(CN1)
- 13 +15V(CN6)

#### PCB B, Main control board for 1-phase Mod. 10-14



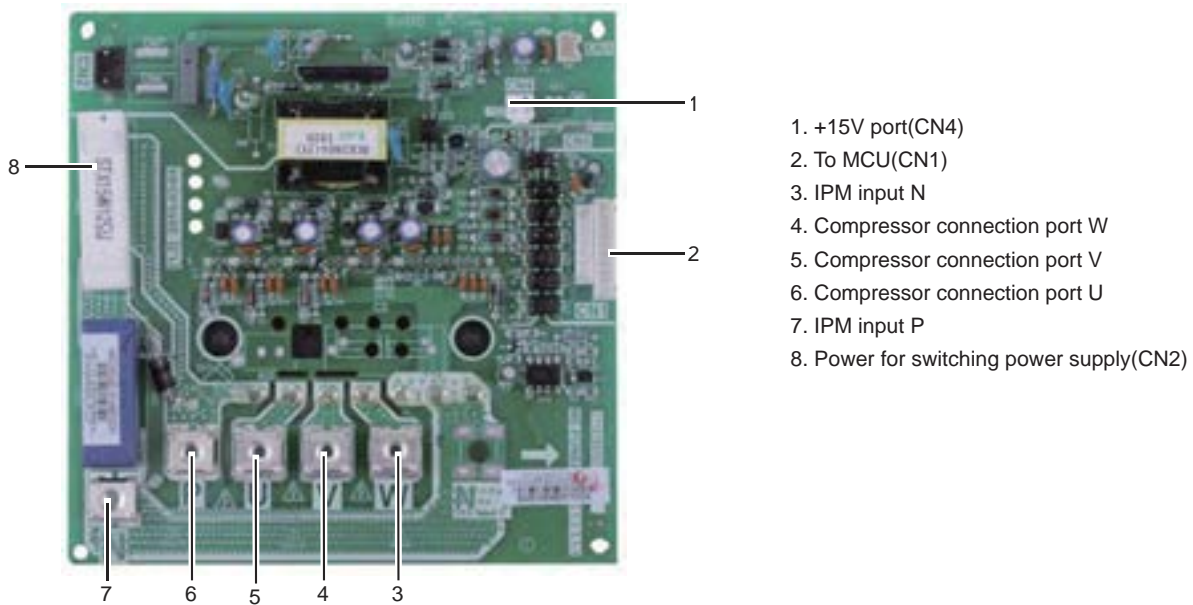
- 1 Port For Pressure Switch(CN12)
- 2 Port For Suction Temperature Sensor(CN24)
- 3 Port For Pressure Sensor(CN28)
- 4 Port For Discharge Temperature Sensor(CN8)
- 5 Port For Outdoor air Temperature And Condenser Outlet Temperature Sensor(CN9)
- 6 Port For Communication Between Outdoor Unit And Hydro-box(CN10)
- 7 Reserved(CN30)

- 8 Port For Electrical Expansion Valve(CN22)
- 9 Input Port For Live Wire(CN1)
- 10 Input Port For Neutral Wire(CN2)
- 11 Output Port For Neutral Wire(CN3)
- 12 Output Port For Live Wire(CN4)
- 13 Reserved(CN7)
- 14 Port For 4-way Valve(CN13)
- 15 Port For Electric Heating Tape(CN14)
- 16 Input Port For Transformer(CN26)
- 17 Power Supply Port For Fan(CN18)
- 18 Port For Down Fan(CN19)

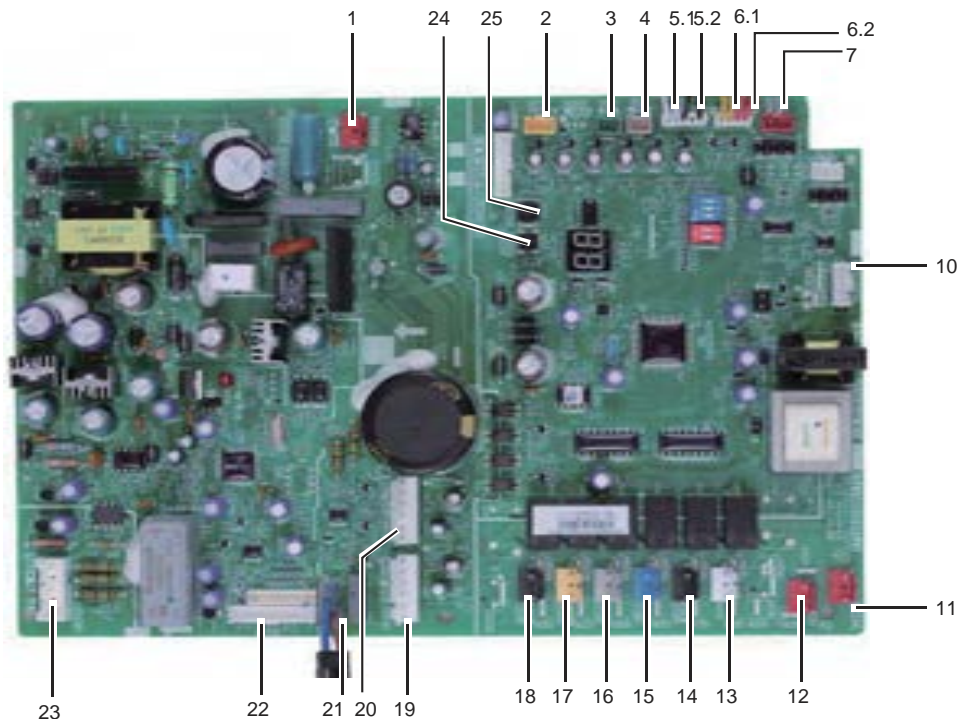
- 19 Port For Up Fan(CN17)
- 20 Output Port For Transformer(CN51)
- 21 Check Button(SW2)
- 22 Refrigerant Recovery Button
- 23 Digital Displays(DIS1)
- 24 Ground Wire(CN11)
- 25 Communication Port For PCBA(CN6)
- 26 Power supply port for hydro-box control board(CN16)

## SAFETY AND MAINTENANCE

### PCB A, Inverter module for 3-phase Mod. 14T

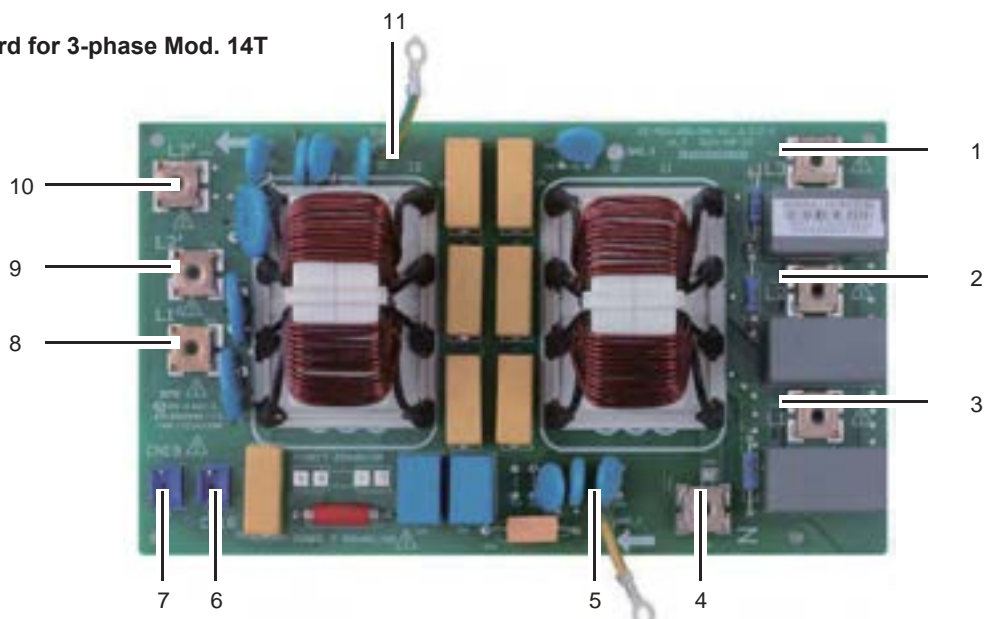


### PCB B, Main control board for 3-phase Mod. 14T



## SAFETY AND MAINTENANCE

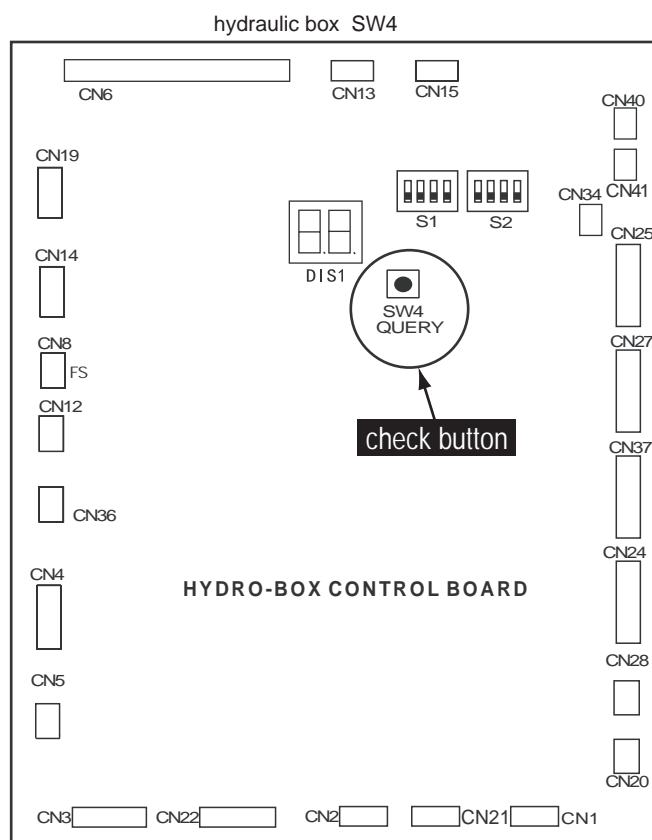
PCB C, filter board for 3-phase Mod. 14T



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

### Parameters check in the unit

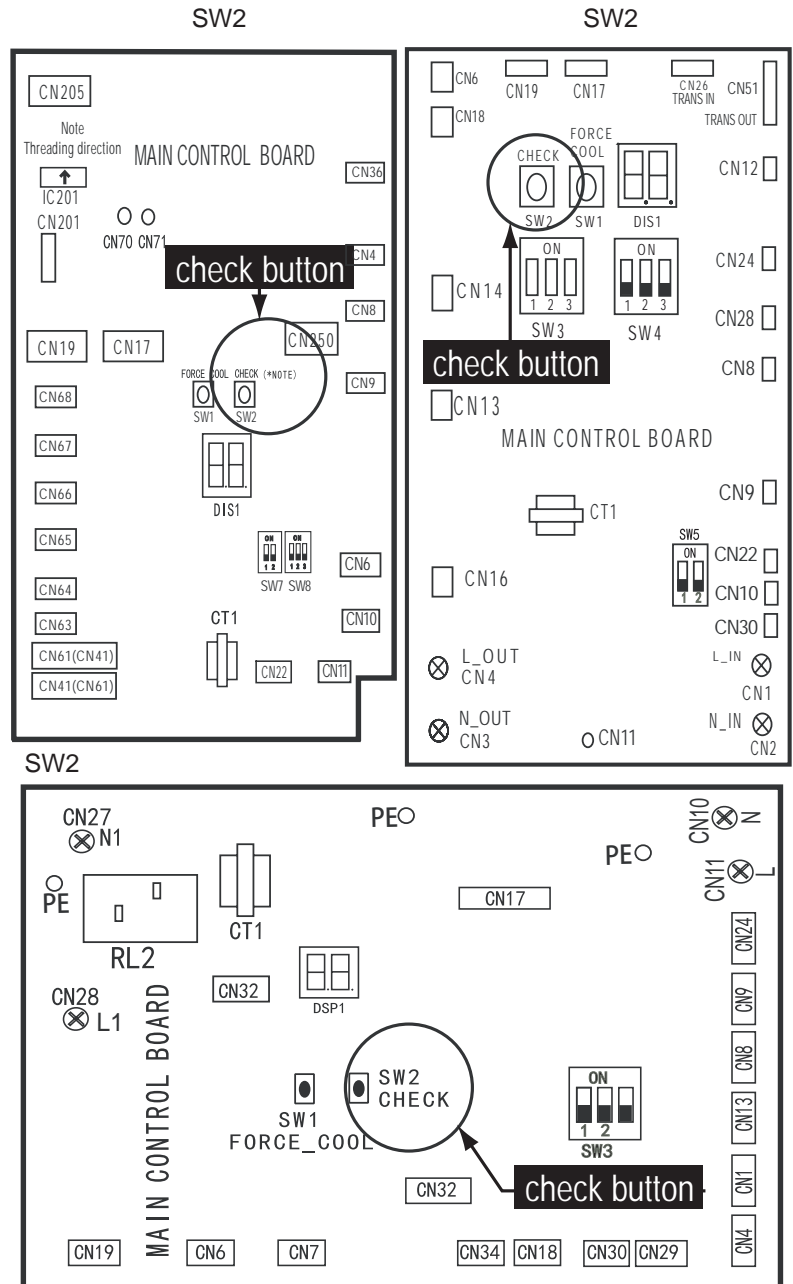
To check the parameters of hydraulic box, open door 2 and you'll see the PCB like following, the digital display will show the temperature of outlet water in normal condition ('0' will display if the unit is off or error code will display if error occurs). Long press the check button and the digital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



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)

## SAFETY AND MAINTENANCE

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	--



## SAFETY AND MAINTENANCE

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.	<ul style="list-style-type: none"><li>• Check that all shut off valves of the water circuit are completely open.</li><li>• Check if the water filter needs cleaning.</li><li>• Make sure there is no air in the system (purge air).</li><li>• Check on the manometer that there is sufficient water pressure. The water pressure must be &gt;1 bar (water is cold).</li><li>• Make sure that the expansion vessel is not broken.</li><li>• Check that the resistance in the water circuit is not too high for the pump</li></ul>
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").

## SAFETY AND MAINTENANCE

### 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.	<ul style="list-style-type: none"> <li>• Check on the manometer that there is sufficient water pressure. The water pressure must be &gt; 1 bar (water is cold).</li> <li>• Check that the manometer is not broken.</li> <li>• Check that the expansion vessel is not broken.</li> <li>• 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").</li> </ul>

### 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.	<p>Check for correct operation of the pressure relief valve by turning the red knob on the valve counter clockWise:</p> <ul style="list-style-type: none"> <li>• If you do not hear a clacking sound, contact your local dealer.</li> <li>• 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.</li> </ul>

### Space heating capacity shortage at low outdoor temperatures

POSSIBLE CAUSES	CORRECTIVE ACTION
Backup heater operation is not activated.	<p>Check that the "OTHER HEATING SOURCE/ BACKUP HEATER" is enabled, see "10.7 Field settings"</p> <p>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.</p>
Too much heat pump capacity is used for heating domestic hot water (applies only to installations with a domestic hot water tank).	<p>Check that the 't_DHWHP_MAX' and "t_DHWHP_RESTRICT" are configured appropriately:</p> <ul style="list-style-type: none"> <li>• Make sure that the 'DHW PRIORITY' in the user interface is disabled.</li> <li>• Enable the "T4_TBH_ON" in the user interface/FOR SERVICEMAN to activate the booster heater for domestic water heating.</li> </ul>

## 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.

# SAFETY AND MAINTENANCE

## 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/m<sup>3</sup>  
 Pentafluoroethane (R125): Recommended exposure limits: AEL (8h and 12h TWA) = 1000 ml/m<sup>3</sup>  
 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 halocarbons; HGWP (R-11 = 1) = 0.84  
 Potential impoverishment of the ozone; ODP (R-11 = 1) = 0

## SAFETY AND MAINTENANCE

### 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.

CEPIC 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 Maintenance

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.

## SAFETY AND MAINTENANCE

### 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.

## ERP DATA

### Product fiche 1

Heat pump space heater		unit	5	7	10	14	14T
Indoor unit sound power (*)		[dB(A)]	/	/	/	/	/
Outdoor unit sound power (*)		[dB(A)]	61	65	66	71	71
Capacity of the back-up heater integrated in the unit	Psup back-up heater	[kW]	0	0	0	0	0
off peak operation function integrated in Heat pump		Y/N	No	No	No	No	No
Space heating	Energy efficiency class 35°C (Low temp. app.)	-	A++	A++	A++	A++	A++
Space heating	Energy efficiency class 55°C (Medium temp. app.)	-	A++	A++	A++	A++	A++
Average climate (Design temperature = -10°C)							
Space heating 35°C	Prated (declared heating capacity) @ -10°C	[kW]	5	7	10	14	14
	Seasonal space heating efficiency (ηs)	[%]	176	178	162	173	168
	Annual energy consumption	[kWh]	2,143	2,989	4,896	6,630	6,551
Space heating 55°C	Prated (declared heating capacity) @ -10°C	[kW]	7	7	11	13	13
	Seasonal space heating efficiency (ηs)	[%]	126	126	129	129	128
	Annual energy consumption	[kWh]	4,228	4,228	7,025	8,550	8,291
Part load conditions space heating average climate low temperature							
(A) condition (-7°C)	Pdh (declared heating capacity)	[kW]	4.1	5.80	9.1	12.8	12.0
	COPd (declared COP)	-	2.85	2.80	2.74	2.78	2.66
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(B) condition (2°C)	Pdh (declared heating capacity)	[kW]	2.4	3.6	5.3	7.8	7.2
	COPd (declared COP)	-	4.53	4.18	4.10	4.09	3.97
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(C) condition (7°C)	Pdh (declared heating capacity)	[kW]	1.7	2.3	3.5	4.8	4.9
	COPd (declared COP)	-	6.08	6.39	5.90	6.12	6.36
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(D) condition (12°C)	Pdh (declared heating capacity)	[kW]	1.3	1.4	1.4	3.1	3.8
	COPd (declared COP)	-	8.92	9.24	4.40	8.83	9.00
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90

## ERP DATA

### Product fiche 2

Heat pump space heater		unit	5	7	10	14	14T
(E) Tol (temperature operating limit)	Tol (temperature operating limit)	[°C]	-10	-10	-10	-10	-10
	Pdh (declared heating capacity)	[kW]	4.2	6.3	9.8	11.8	10.8
	COPd (declared COP)	-	2.62	2.61	2.48	2.59	2.41
	WTOL (Heating water Operation Limit)	[°C]	49	49	49	49	49
(F) Tbivalent temperature	Tblv	[°C]	-7	-7	-10	-8	-7
	Pdh (declared heating capacity)	[kW]	4.1	5.8	9.8	13.0	12.0
	COPd (declared COP)	-	2.85	2.80	2.48	2.84	2.66
Supplementary capacity at P_design	Psup (@Tdesignh: – 10°C)	[kW]	0.5	0.3	0	2.2	2.7
Part load conditions space heating average climate medium temperation							
(A) condition (-7°C)	Pdh (declared heating capacity)	[kW]	5.8	5.8	10.0	12.0	11.6
	COPd (declared COP)	-	1.97	1.97	2.01	2.06	2.02
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(B) condition (2°C)	Pdh (declared heating capacity)	[kW]	3.7	3.7	6.3	7.4	7.5
	COPd (declared COP)	-	3.06	3.06	3.18	3.12	3.10
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(C) condition (7°C)	Pdh (declared heating capacity)	[kW]	2.6	2.6	4.0	4.7	4.7
	COPd (declared COP)	-	4.46	4.46	4.54	4.68	4.68
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(D) condition (12°C)	Pdh (declared heating capacity)	[kW]	1.3	1.3	2.6	2.1	2.8
	COPd (declared COP)	-	5.65	5.65	5.37	4.82	5.20
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(E) Tol (temperature operating limit)	Tol (temperature operating limit)	[°C]	-10	-10	-10	-10	-10
	Pdh (declared heating capacity)	[kW]	6.6	6.6	10.9	11.0	11.7
	COPd (declared COP)	-	1.71	1.72	1.76	1.75	1.77
	WTOL (Heating water Operation Limit)	[°C]	49	49	49	49	49
(F) Tbivalent temperature	Tblv	[°C]	-7	-7	-7	-7	-7
	Pdh (declared heating capacity)	[kW]	5.8	5.8	10.0	12.0	11.6
	COPd (declared COP)	-	1.97	1.97	2.01	2.06	2.02
Supplementary capacity at P_design	Psup (@Tdesignh: – 10°C)	[kW]	0	0	0.4	2.6	1.5



## ERP DATA

### Product fiche 3

Heat pump space heater		unit	5	7	10	14	14T
Colder climate (Design temperature = -22°C)							
Space heating 35°C	Prated (declared heating capacity) @ -22°C	[kW]	5	7	11	14	14
	Seasonal space heating efficiency ( $\eta_s$ )	[%]	133	158	132	136	145
	Annual energy consumption	[kWh]	3,331	4,116	7,747	10,032	9,430
Space heating 55°C	Prated (declared heating capacity) @ -22°C	[kW]	5	7	10	12	12
	Seasonal space heating efficiency ( $\eta_s$ )	[%]	100	106	99	94	108
	Annual energy consumption	[kWh]	4,459	6,436	9,946	12,303	10,956
Part load conditions space heating colder climate low temperature							
condition (-15°C)	Pdh (declared heating capacity)	[kW]	3.7	5.5	8.6	9.9	10.3
	COPd (declared COP)	-	2.23	2.41	2.35	2.21	2.42
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(A) condition (-7°C)	Pdh (declared heating capacity)	[kW]	2.7	4.0	6.3	8.9	9.2
	COPd (declared COP)	-	3.04	3.25	3.11	2.90	3.15
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(B) condition (2°C)	Pdh (declared heating capacity)	[kW]	1.6	2.5	3.8	5.2	6.0
	COPd (declared COP)	-	3.91	5.16	4.01	4.19	4.55
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(C) condition (7°C)	Pdh (declared heating capacity)	[kW]	1.3	1.8	2.4	3.4	3.5
	COPd (declared COP)	-	5.98	7.13	5.82	5.85	6.03
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(D) condition (12°C)	Pdh (declared heating capacity)	[kW]	1.2	1.1	1.1	4.4	2.6
	COPd (declared COP)	-	8.59	7.57	3.56	8.72	5.65
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(E) Tol (temperature operating limit)	Tol (temperature operating limit)	[°C]	-20	-20	-20	-20	-20
	Pdh (declared heating capacity)	[kW]	4.5	4.9	8.2	7.6	8.2
	COPd (declared COP)	-	1.83	2.00	1.87	1.88	2.00
	WTOL (Heating water Operation Limit)	[°C]	40	40	40	40	40
(F) Tbivalent temperature	Tblv	[°C]	-15	-15	-15	-12	-13
	Pdh (declared heating capacity)	[kW]	3.7	5.5	8.6	10.4	10.8
	COPd (declared COP)	-	2.23	2.41	2.35	2.36	2.58
Supplementary capacity at P_design	Psup (@Tdesignh: -22°C)	[kW]	0	1.5	1.8	5.0	4.9

## ERP DATA

### Product fiche 4

Heat pump space heater		unit	5	7	10	14	14T
Part load conditions space heating colder climate medium temperation							
condition (-15°C)	Pdh (declared heating capacity)	[kW]	3.8	5.0	8.4	10.1	9.3
	COPd (declared COP)	-	1.66	1.66	1.68	1.82	1.80
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(A) condition (-7°C)	Pdh (declared heating capacity)	[kW]	3.0	4.4	6.2	7.8	7.8
	COPd (declared COP)	-	2.12	2.26	2.17	2.14	2.32
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(B) condition (2°C)	Pdh (declared heating capacity)	[kW]	1.7	2.5	3.9	4.4	4.5
	COPd (declared COP)	-	3.01	3.43	3.00	2.77	3.35
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(C) condition (7°C)	Pdh (declared heating capacity)	[kW]	1.2	1.6	2.5	2.9	2.9
	COPd (declared COP)	-	3.91	4.39	4.09	4.16	4.44
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(D) condition (12°C)	Pdh (declared heating capacity)	[kW]	1.1	1.0	1.2	1.3	2.4
	COPd (declared COP)	-	5.84	5.39	3.10	3.33	4.73
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(E) Tol (temperature operating limit)	Tol (temperature operating limit)	[°C]	-20	-20	-20	-20	-20
	Pdh (declared heating capacity)	[kW]	4.2	4.2	7.1	7.1	7.3
	COPd (declared COP)	-	1.37	1.34	1.31	1.29	1.40
	WTOL (Heating water Operation Limit)	[°C]	40	40	40	40	40
(F) Tbivalent temperature	Tblv	[°C]	-15	-13	-15	-11	-14
	Pdh (declared heating capacity)	[kW]	3.8	5.4	8.4	8.6	9.8
	COPd (declared COP)	-	1.66	1.77	1.68	1.59	1.89
Supplementary capacity at P_design	Psup (@Tdesignh: -22°C)	[kW]	0.2	2.5	2.6	4.4	4.4
Warmer climate (Design temperature =2°C)							
Space heating 35°C	Prated (declared heating capacity) @ 2 °C	[kW]	5	7	10	14	14
	Seasonal space heating efficiency (ηs)	[%]	229	248	272	237	188
	Annual energy consumption	[kWh]	1,105	1,392	2,021	3,223	4,023
Space heating 55°C	Prated (declared heating capacity) @ 2 °C	[kW]	5	7	10	12	12
	Seasonal space heating efficiency (ηs)	[%]	145	167	153	160	147
	Annual energy consumption	[kWh]	1,660	2,121	3,534	3,928	4,445

## ERP DATA

### Product fiche 5

Heat pump space heater		unit	5	7	10	14	14T
Part load conditions space heating warmer climate low temperature							
(B) condition (2°C)	Pdh (declared heating capacity)	[kW]	4.7	6.6	10.1	14.0	13.7
	COPd (declared COP)	-	3.82	3.45	3.89	2.98	3.21
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(C) condition (7°C)	Pdh (declared heating capacity)	[kW]	3.1	4.2	6.7	9.3	9.2
	COPd (declared COP)	-	5.70	5.59	5.61	5.17	5.31
	Cdh(degradation coefficient)	-	0.90	0.90	0.9	0.9	0.90
(D) condition (12°C)	Pdh (declared heating capacity)	[kW]	1.3	2.1	3.9	4.2	3.8
	COPd (declared COP)	-	7.76	8.15	10.18	8.01	7.51
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(E) Tol (temperature operating limit)	Tol (temperature operating limit)	[°C]	2	2	2	2	2
	Pdh (declared heating capacity)	[kW]	4.7	6.6	10.1	14.0	13.7
	COPd (declared COP)	-	3.82	3.45	3.89	2.98	3.21
	WTOL (Heating water Operation Limit)	[°C]	60	60	60	60	60
(F) Tbivalent temperature	Tblv	[°C]	7	7	7	7	7
	Pdh (declared heating capacity)	[kW]	3.1	4.2	6.7	9.3	9.2
	COPd (declared COP)	-	5.70	5.59	5.61	5.17	5.31
Supplementary capacity at P_design	Psup (@Tdesignh: 2° C)	[kW]	0.1	0	0.3	0.5	0.6
Part load conditions space heating warmer climate medium temperature							
(B) condition (2°C)	Pdh (declared heating capacity)	[kW]	4.7	6.8	10.2	12.5	12.2
	COPd (declared COP)	-	2.07	2.18	2.35	2.37	2.42
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(C) condition (7°C)	Pdh (declared heating capacity)	[kW]	3.0	4.4	6.6	7.7	8.0
	COPd (declared COP)	-	3.29	3.45	3.38	3.37	3.50
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(D) condition (12°C)	Pdh (declared heating capacity)	[kW]	1.4	2.1	3.0	3.6	3.4
	COPd (declared COP)	-	4.74	6.01	4.95	5.35	5.25
	Cdh(degradation coefficient)	-	0.90	0.90	0.90	0.90	0.90
(E) Tol (temperature operating limit)	Tol (temperature operating limit)	[°C]	2	2	2	2	2
	Pdh (declared heating capacity)	[kW]	4.7	6.8	10.2	12.5	12.2
	COPd (declared COP)	-	2.07	2.18	2.35	2.37	2.42
	WTOL (Heating water Operation Limit)	[°C]	60	60	60	60	60

## ERP DATA

### Product fiche 6

Heat pump space heater		unit	5	7	10	14	14T
(F) Tivalent temperature	Tblv	[°C]	7	7	7	7	7
	Pdh (declared heating capacity)	[kW]	3.0	4.4	6.6	7.7	8.0
	COPd (declared COP)	-	3.29	3.45	3.38	3.37	3.50
Supplementary capacity at P_design	Psup (@Tdesignh: – 10°C)	[kW]	0	0	0.1	0	0.3
Ecodesign technical data							
Product description	Air-to-water heat pump	Y/N	Yes	Yes	Yes	Yes	Yes
	Water-to-water heat pump	Y/N	No	No	No	No	No
	Brine-to-water heat pump	Y/N	No	No	No	No	No
	Low-temperature heat pump	Y/N	No	No	No	No	No
	Equipped with a supplementary heater	Y/N	No	No	Yes	Yes	Yes
	Heat pump combination heater	Y/N	No	No	No	No	No
Air to water unit	Rated airflow (outdoor)	[m³/h]	3350	3050	6150	6150	6150
Brine/water to water unit	Rated water/brine flow (outdoor H/E)	[m³/h]	/	/	/	/	/
Other	Capacity control	-	Inverter	Inverter	Inverter	Inverter	Inverter
	Poff (Power consumption Off mode)	[kW]	0.016	0.016	0.017	0.017	0.027
	Pto (Power consumption Thermostat off mode)	[kW]	0.016	0.016	0.006	0.006	0.006
	Psb (Power consumption Standby mode)	[kW]	0.016	0.016	0.017	0.017	0.027
	PCK (Power crankcase heater model)	[kW]	0.034	0.034	0.018	0.018	0.001
	Qelec (Daily electricity consumption)	[kWh]	/	/	/	/	/
	Qfuel (Daily fuel consumption)	[kWh]	/	/	/	/	/

Details and precautions on installation, maintenance and assembly are in the manual or operation manual.  
 Product fiche data according to energy label directive 2010/30/EC (EU) 811/2013

### Technical parameters

Model(s):		5	
Air-to-water heat pump:	YES		
Water-to-water heat pump:	NO		
Brine-to-water heat pump:	NO		
Low-temperature heat pump:	NO		
Equipped with a supplementary heater:	NO		
Heat pump combination heater:	NO		
Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.			
Parameters shall be declared for average, colder and warmer climate conditions			
Item	Symbol	Value	Unit
Rated heat output (*)	Prated	7	kW
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7°C	Pdh	5.8	kW
Tj = 2°C	Pdh	3.7	kW
Tj = 7°C	Pdh	2.6	kW
Tj = 12°C	Pdh	1.3	kW
Tj = bivalent temperature	Pdh	5.8	kW
Tj = operating limit	Pdh	6.6	kW
For air-to-water heat pumps: Tj = -15°C	Pdh	-	kW
Bivalent temperature	Tbiv	-7	°C
Cycling interval capacity for heating	Pcych	-	kW
Degradation co-efficient (**)	Cdh	0.9	--
Power consumption in modes other than active mode			
off mode	Poff	0.016	kW
standby mode	Psb	0.016	kW
thermostat-off mode	Pto	0.016	kW
crankcase heater mode	Pck	0.034	kW
Other items			
Capacity control	variable		
Sound power level, indoors/outdoors	LWA	-61	dB
Annual energy consumption	QHE	4228	kWh or GJ
Item	Symbol	Value	Unit
Seasonal space heating energy efficiency	ηs	126	%
Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7°C	COPd	1.97	-
Tj = 2°C	COPd	3.06	-
Tj = 7°C	COPd	4.46	-
Tj = 12°C	COPd	5.65	-
Tj = bivalent temperature	COPd	1.97	-
Tj = operating limit	COPd	1.71	-
For air-to-water heat pumps: Tj = -15°C	COPd	-	-
For air-to-water heat pumps: Operation limit temperature	TOL	-10	°C
Cycling interval efficiency	COPcyc or PERcyc	-	%
Heating water operating limit temperature	WTOL	49	°C
Supplementary heater			
Rated heat output (**)	Psup	0	kW
Type of energy input	-		
For air-to-water heat pumps: Rated air flow rate, outdoors			
	-	3050	m³/h
For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger			
	-	-	m³/h
For heat pump combination heater:			
Declared load profile	-		
Daily electricity consumption	Qelec	-	kWh
Annual electricity consumption	AEC	-	kWh
Water heating energy efficiency	ηwh	-	%
Daily fuel consumption	Qfuel	-	kWh
Annual fuel consumption	AFC	-	GJ
Contact details	Ferroli spa - 37047 San Bonifacio (Verona) Italy - Via Ritonda 78/A - tel. +39.045.6139411 - fax +39.045.6100933 - www.ferroli.com		
(*) For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the rated heat output of a supplementary heater Psup is equal to the supplementary capacity for heating sup(Tj).			
(**) If Cdh is not determined by measurement then the default degradation coefficient is Cdh = 0.9.			

# ERP DATA

**Ferroli** RVL-I PLUS 5 - Colder climate condition

Technical parameters							
Model(s):		5					
Air-to-water heat pump:		YES					
Water-to-water heat pump:		NO					
Brine-to-water heat pump:		NO					
Low-temperature heat pump:		NO					
Equipped with a supplementary heater:		NO					
Heat pump combination heater:		NO					
Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.							
Parameters shall be declared for average, colder and warmer climate conditions							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output (*)	Prated	5	kW	Seasonal space heating energy efficiency	$\eta_s$	100	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7°C	Pdh	3	kW	Tj = -7°C	COPd	2.12	-
Tj = 2°C	Pdh	1.7	kW	Tj = 2°C	COPd	3.01	-
Tj = 7°C	Pdh	1.2	kW	Tj = 7°C	COPd	3.91	-
Tj = 12°C	Pdh	1.1	kW	Tj = 12°C	COPd	5.84	-
Tj = bivalent temperature	Pdh	3.8	kW	Tj = bivalent temperature	COPd	1.66	-
Tj = operating limit	Pdh	4.2	kW	Tj = operating limit	COPd	1.37	-
For air-to-water heat pumps: Tj = -15°C	Pdh	3.8	kW	For air-to-water heat pumps: Tj = -15°C	COPd	1.66	-
Bivalent temperature	T <sub>biv</sub>	-15	°C	For air-to-water heat pumps: Operation limit temperature	TOL	-20	°C
Cycling interval capacity for heating	P <sub>cych</sub>	-	kW	Cycling interval efficiency	COP <sub>cyc</sub> or PER <sub>cyc</sub>	-	%
Degradation co-efficient (**)	C <sub>dh</sub>	0.9	-	Heating water operating limit temperature	W <sub>TOL</sub>	40	°C
Power consumption in modes other than active mode				Supplementary heater			
off mode	P <sub>off</sub>	0.016	kW	Rated heat output (**)	P <sub>sup</sub>	0.2	kW
standby mode	P <sub>sb</sub>	0.016	kW	Type of energy input	-		
thermostat-off mode	P <sub>to</sub>	0.016	kW				
crankcase heater mode	P <sub>ck</sub>	0.034	kW				
Other items							
Capacity control	variable			For air-to-water heat pumps: Rated air flow rate, outdoors	-	3050	m³/h
Sound power level, indoors/outdoors	L <sub>WA</sub>	-61	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	-	m³/h
Annual energy consumption	Q <sub>HE</sub>	4459	kWh or GJ				
For heat pump combination heater:							
Declared load profile	-			Water heating energy efficiency	$\eta_{wh}$	-	%
Daily electricity consumption	Q <sub>elec</sub>	-	kWh	Daily fuel consumption	Q <sub>fuel</sub>	-	kWh
Annual electricity consumption	AEC	-	kWh	Annual fuel consumption	AFC	-	GJ
Contact details		Ferroli spa - 37047 San Bonifacio (Verona) Italy - Via Ritonda 78/A - tel. +39.045.6139411 - fax +39.045.6100933 - www.ferroli.com					
(*) For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the rated heat output of a supplementary heater Psup is equal to the supplementary capacity for heating sup(Tj).							
(**) If Cdh is not determined by measurement then the default degradation coefficient is Cdh = 0.9.							

# ERP DATA

## Technical parameters

Model(s):	5
Air-to-water heat pump:	YES
Water-to-water heat pump:	NO
Brine-to-water heat pump:	NO
Low-temperature heat pump:	NO
Equipped with a supplementary heater:	NO
Heat pump combination heater:	NO

Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.

Parameters shall be declared for average, colder and warmer climate conditions

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output (*)	Prated	5	kW	Seasonal space heating energy efficiency	$\eta_s$	145	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7°C	Pdh	-	kW	Tj = -7°C	COPd	-	-
Tj = 2°C	Pdh	4.7	kW	Tj = 2°C	COPd	2.07	-
Tj = 7°C	Pdh	3.0	kW	Tj = 7°C	COPd	3.29	-
Tj = 12°C	Pdh	1.4	kW	Tj = 12°C	COPd	4.74	-
Tj = bivalent temperature	Pdh	3.0	kW	Tj = bivalent temperature	COPd	3.29	-
Tj = operating limit	Pdh	4.7	kW	Tj = operating limit	COPd	2.07	-
For air-to-water heat pumps: Tj = -15°C	Pdh	-	kW	For air-to-water heat pumps: Tj = -15°C	COPd	-	-
Bivalent temperature	Tbiv	7	°C	For air-to-water heat pumps: Operation limit temperature	TOL	2	°C
Cycling interval capacity for heating	Pcy ch	-	kW	Cycling interval efficiency	COP <sub>cyc</sub> or PER <sub>cyc</sub>	-	%
Degradation co-efficient (**)	Cdh	0.9	-	Heating water operating limit temperature	WTOL	60	°C
Power consumption in modes other than active mode				Supplementary heater			
off mode	Poff	0.016	kW	Rated heat output (**)	Psup	0.2	kW
standby mode	Psb	0.016	kW	Type of energy input	-	-	-
thermostat-off mode	Pto	0.016	kW				
crankcase heater mode	Pck	0.034	kW				

Other items							
Capacity control	variable			For air-to-water heat pumps: Rated air flow rate, outdoors	-	3050	m³/h
Sound power level, indoors/ outdoors	LWA	-61	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	-	m³/h
Annual energy consumption	QHE	1660	kWh or GJ				

For heat pump combination heater:							
Declared load profile	-			Water heating energy efficiency	$\eta_{wh}$	-	%
Daily electricity consumption	Qelec	-	kWh	Daily fuel consumption	Qfuel	-	kWh
Annual electricity consumption	AEC	-	kWh	Annual fuel consumption	AFC	-	GJ

Contact details: Ferroli spa - 37047 San Bonifacio (Verona) Italy - Via Ritonda 78/A - tel. +39.045.6139411 - fax +39.045.6100933 - www.ferroli.com

(\*) For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the rated heat output of a supplementary heater Psup is equal to the supplementary capacity for heating sup(Tj).

(\*\*) If Cdh is not determined by measurement then the default degradation coefficient is Cdh = 0,9.



# ERP DATA

**Ferroli** RVL-I PLUS 7 - Average climate condition

Technical parameters															
Model(s):		7													
Air-to-water heat pump:		YES													
Water-to-water heat pump:		NO													
Brine-to-water heat pump:		NO													
Low-temperature heat pump:		NO													
Equipped with a supplementary heater:		NO													
Heat pump combination heater:		NO													
Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.															
Parameters shall be declared for average, colder and warmer climate conditions															
Item				Symbol				Value				Unit			
Rated heat output (*)				Prated				7				kW			
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj								Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj							
Tj = -7°C				Pdh				5.8				kW			
Tj = 2°C				Pdh				3.7				kW			
Tj = 7°C				Pdh				2.6				kW			
Tj = 12°C				Pdh				1.3				kW			
Tj = bivalent temperature				Pdh				5.8				kW			
Tj = operating limit				Pdh				6.6				kW			
For air-to-water heat pumps: Tj = -15°C				Pdh				-				kW			
Bivalent temperature				Tbiv				-7				°C			
Cycling interval capacity for heating				Pcy ch				-				kW			
Degradation co-efficient (**)				Cdh				0.9				--			
Power consumption in modes other than active mode								Supplementary heater							
off mode				Poff				0.016				kW			
standby mode				Psb				0.016				kW			
thermostat-off mode				Pto				0.016				kW			
crankcase heater mode				Pck				0.034				kW			
Other items								For air-to-water heat pumps: Rated air flow rate, outdoors							
Capacity control				variable				-				3050			
Sound power level, indoors/ outdoors				LWA				-65				dB			
Annual energy consumption				QHE				4228				kWh or GJ			
For heat pump combination heater:								For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger							
Declared load profile				-				Water heating energy efficiency				ηwh			
Daily electricity consumption				Qelec				-				kWh			
Annual electricity consumption				AEC				-				kWh			
Contact details								Ferrolì spa - 37047 San Bonifacio (Verona) Italy - Via Ritonda 78/A - tel. +39.045.6139411 - fax +39.045.6100933 - www.ferrolì.com							
(*) For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the rated heat output of a supplementary heater Psup is equal to the supplementary capacity for heating sup(Tj).															
(**) If Cdh is not determined by measurement then the default degradation coefficient is Cdh = 0,9.															

# ERP DATA

**ferroli** RVL-I PLUS 7 - Colder climate condition

## Technical parameters

Model(s):	7
Air-to-water heat pump:	YES
Water-to-water heat pump:	NO
Brine-to-water heat pump:	NO
Low-temperature heat pump:	NO
Equipped with a supplementary heater:	NO
Heat pump combination heater:	NO

Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.

Parameters shall be declared for average, colder and warmer climate conditions

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output (*)	Prated	7	kW	Seasonal space heating energy efficiency	$\eta_s$	106	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7°C	Pdh	4.4	kW	Tj = -7°C	COPd	2.26	-
Tj = 2°C	Pdh	2.5	kW	Tj = 2°C	COPd	3.43	-
Tj = 7°C	Pdh	1.6	kW	Tj = 7°C	COPd	4.39	-
Tj = 12°C	Pdh	1.0	kW	Tj = 12°C	COPd	5.39	-
Tj = bivalent temperature	Pdh	5.4	kW	Tj = bivalent temperature	COPd	1.77	-
Tj = operating limit	Pdh	4.2	kW	Tj = operating limit	COPd	1.34	-
For air-to-water heat pumps: Tj = -15°C	Pdh	5.0	kW	For air-to-water heat pumps: Tj = -15°C	COPd	1.66	-
Bivalent temperature	T <sub>biv</sub>	-13	°C	For air-to-water heat pumps: Operation limit temperature	TOL	-20	°C
Cycling interval capacity for heating	P <sub>cych</sub>	-	kW	Cycling interval efficiency	COP <sub>cyc</sub> or PER <sub>cyc</sub>	-	%
Degradation co-efficient (**)	C <sub>dh</sub>	0.9	-	Heating water operating limit temperature	W <sub>TOL</sub>	40	°C
Power consumption in modes other than active mode				Supplementary heater			
off mode	P <sub>off</sub>	0.016	kW	Rated heat output (**)	P <sub>sup</sub>	2.5	kW
standby mode	P <sub>sb</sub>	0.016	kW	Type of energy input	-	-	-
thermostat-off mode	P <sub>to</sub>	0.016	kW				
crankcase heater mode	P <sub>ck</sub>	0.034	kW				

Other items							
Capacity control	variable			For air-to-water heat pumps: Rated air flow rate, outdoors	-	3050	m³/h
Sound power level, indoors/outdoors	L <sub>WA</sub>	-65	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	-	m³/h
Annual energy consumption	Q <sub>HE</sub>	6436	kWh or GJ				

For heat pump combination heater:							
Declared load profile	-			Water heating energy efficiency	$\eta_{wh}$	-	%
Daily electricity consumption	Q <sub>elec</sub>	-	kWh	Daily fuel consumption	Q <sub>fuel</sub>	-	kWh
Annual electricity consumption	AEC	-	kWh	Annual fuel consumption	AFC	-	GJ

Contact details	Ferroli spa - 37047 San Bonifacio (Verona) Italy - Via Ritonda 78/A - tel. +39.045.6139411 - fax +39.045.6100933 - www.ferroli.com
-----------------	--

(\*) For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the rated heat output of a supplementary heater Psup is equal to the supplementary capacity for heating sup(Tj).

(\*\*) If Cdh is not determined by measurement then the default degradation coefficient is Cdh = 0.9.

# ERP DATA

**Ferrolli** RVL-I PLUS 7 - Warmer climate condition

Technical parameters							
Model(s):		7					
Air-to-water heat pump:		YES					
Water-to-water heat pump:		NO					
Brine-to-water heat pump:		NO					
Low-temperature heat pump:		NO					
Equipped with a supplementary heater:		NO					
Heat pump combination heater:		NO					
Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.							
Parameters shall be declared for average, colder and warmer climate conditions							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output (*)	Prated	7	kW	Seasonal space heating energy efficiency	$\eta_s$	167	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7°C	Pdh	-	kW	Tj = -7°C	COPd	-	-
Tj = 2°C	Pdh	6.8	kW	Tj = 2°C	COPd	2.18	-
Tj = 7°C	Pdh	4.4	kW	Tj = 7°C	COPd	3.45	-
Tj = 12°C	Pdh	2.1	kW	Tj = 12°C	COPd	6.01	-
Tj = bivalent temperature	Pdh	4.4	kW	Tj = bivalent temperature	COPd	3.45	-
Tj = operating limit	Pdh	6.8	kW	Tj = operating limit	COPd	2.18	-
For air-to-water heat pumps: Tj = -15°C	Pdh	-	kW	For air-to-water heat pumps: Tj = -15°C	COPd	-	-
Bivalent temperature	Tbiv	7	°C	For air-to-water heat pumps: Operation limit temperature	TOL	2	°C
Cycling interval capacity for heating	Pcych	-	kW	Cycling interval efficiency	COPcyc or PERcyc	-	%
Degradation co-efficient (**)	Cdh	0.9	-	Heating water operating limit temperature	WTOL	60	°C
Power consumption in modes other than active mode				Supplementary heater			
off mode	Poff	0.016	kW	Rated heat output (**)	Psup	0	kW
standby mode	Psb	0.016	kW	Type of energy input	-		
thermostat-off mode	Pto	0.016	kW				
crankcase heater mode	Pck	0.034	kW				
Other items							
Capacity control	variable			For air-to-water heat pumps: Rated air flow rate, outdoors	-	3050	m³/h
Sound power level, indoors/ outdoors	LWA	-65	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	-	m³/h
Annual energy consumption	QHE	2121	kWh or GJ				
For heat pump combination heater:							
Declared load profile	-			Water heating energy efficiency	$\eta_{wh}$	-	%
Daily electricity consumption	Qelec	-	kWh	Daily fuel consumption	Qfuel	-	kWh
Annual electricity consumption	AEC	-	kWh	Annual fuel consumption	AFC	-	GJ
Contact details							
Ferrolli spa - 37047 San Bonifacio (Verona) Italy - Via Ritonda 78/A - tel. +39.045.6139411 - fax +39.045.6100933 - www.ferrolli.com							
(*) For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the rated heat output of a supplementary heater Psup is equal to the supplementary capacity for heating sup(Tj).							
(**) If Cdh is not determined by measurement then the default degradation coefficient is Cdh = 0,9.							

# ERP DATA

**ferroli** RVL-I PLUS 10 - Average climate condition

Technical parameters							
Model(s):		10					
Air-to-water heat pump:		YES					
Water-to-water heat pump:		NO					
Brine-to-water heat pump:		NO					
Low-temperature heat pump:		NO					
Equipped with a supplementary heater:		NO					
Heat pump combination heater:		NO					
Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.							
Parameters shall be declared for average, colder and warmer climate conditions							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output (*)	Prated	11	kW	Seasonal space heating energy efficiency	$\eta_s$	129	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7°C	Pdh	10.0	kW	Tj = -7°C	COPd	2.01	-
Tj = 2°C	Pdh	6.3	kW	Tj = 2°C	COPd	3.18	-
Tj = 7°C	Pdh	4.0	kW	Tj = 7°C	COPd	4.54	-
Tj = 12°C	Pdh	2.6	kW	Tj = 12°C	COPd	5.37	-
Tj = bivalent temperature	Pdh	10.0	kW	Tj = bivalent temperature	COPd	2.01	-
Tj = operating limit	Pdh	10.9	kW	Tj = operating limit	COPd	1.76	-
For air-to-water heat pumps: Tj = -15°C	Pdh	-	kW	For air-to-water heat pumps: Tj = -15°C	COPd	-	-
Bivalent temperature	T <sub>biv</sub>	-7	°C	For air-to-water heat pumps: Operation limit temperature	TOL	-10	°C
Cycling interval capacity for heating	P <sub>cych</sub>	-	kW	Cycling interval efficiency	COP <sub>cyc</sub> or PER <sub>cyc</sub>	-	%
Degradation co-efficient (**)	C <sub>dh</sub>	0.9	--	Heating water operating limit temperature	W <sub>TOL</sub>	49	°C
Power consumption in modes other than active mode				Supplementary heater			
off mode	P <sub>off</sub>	0.017	kW	Rated heat output (**)	P <sub>sup</sub>	0.4	kW
standby mode	P <sub>sb</sub>	0.017	kW	Type of energy input	-		
thermostat-off mode	P <sub>to</sub>	0.006	kW				
crankcase heater mode	P <sub>ck</sub>	0.018	kW				
Other items							
Capacity control	variable			For air-to-water heat pumps: Rated air flow rate, outdoors	-	6150	m³/h
Sound power level, indoors/ outdoors	L <sub>WA</sub>	-66	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	-	m³/h
Annual energy consumption	Q <sub>HE</sub>	7025	kWh or GJ				
For heat pump combination heater:							
Declared load profile	-			Water heating energy efficiency	$\eta_{wh}$	-	%
Daily electricity consumption	Q <sub>elec</sub>	-	kWh	Daily fuel consumption	Q <sub>fuel</sub>	-	kWh
Annual electricity consumption	AEC	-	kWh	Annual fuel consumption	AFC	-	GJ
Contact details	Ferroli spa - 37047 San Bonifacio (Verona) Italy - Via Ritonda 78/A - tel. +39.045.6139411 - fax +39.045.6100933 - www.ferroli.com						
(*) For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the rated heat output of a supplementary heater Psup is equal to the supplementary capacity for heating sup(Tj).							
(**) If Cdh is not determined by measurement then the default degradation coefficient is Cdh = 0,9.							

Technical parameters							
Model(s):		10					
Air-to-water heat pump:		YES					
Water-to-water heat pump:		NO					
Brine-to-water heat pump:		NO					
Low-temperature heat pump:		NO					
Equipped with a supplementary heater:		NO					
Heat pump combination heater:		NO					
Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.							
Parameters shall be declared for average, colder and warmer climate conditions							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output (*)	Prated	10	kW	Seasonal space heating energy efficiency	$\eta_s$	99	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T <sub>J</sub>				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T <sub>J</sub>			
T <sub>J</sub> = -7°C	P <sub>dh</sub>	6.2	kW	T <sub>J</sub> = -7°C	COP <sub>d</sub>	2.17	-
T <sub>J</sub> = 2°C	P <sub>dh</sub>	3.9	kW	T <sub>J</sub> = 2°C	COP <sub>d</sub>	3.00	-
T <sub>J</sub> = 7°C	P <sub>dh</sub>	2.5	kW	T <sub>J</sub> = 7°C	COP <sub>d</sub>	4.09	-
T <sub>J</sub> = 12°C	P <sub>dh</sub>	1.2	kW	T <sub>J</sub> = 12°C	COP <sub>d</sub>	3.10	-
T <sub>J</sub> = bivalent temperature	P <sub>dh</sub>	8.4	kW	T <sub>J</sub> = bivalent temperature	COP <sub>d</sub>	1.68	-
T <sub>J</sub> = operating limit	P <sub>dh</sub>	7.1	kW	T <sub>J</sub> = operating limit	COP <sub>d</sub>	1.31	-
For air-to-water heat pumps: T <sub>J</sub> = -15°C	P <sub>dh</sub>	8.4	kW	For air-to-water heat pumps: T <sub>J</sub> = -15°C	COP <sub>d</sub>	1.68	-
Bivalent temperature	T <sub>biv</sub>	-15	°C	For air-to-water heat pumps: Operation limit temperature	TOL	-20	°C
Cycling interval capacity for heating	P <sub>cych</sub>	-	kW	Cycling interval efficiency	COP <sub>cyc</sub> or PER <sub>cyc</sub>	-	%
Degradation co-efficient (**)	C <sub>dh</sub>	0.9	--	Heating water operating limit temperature	W <sub>TOL</sub>	40	°C
Power consumption in modes other than active mode				Supplementary heater			
off mode	P <sub>off</sub>	0.017	kW	Rated heat output (**)	P <sub>sup</sub>	2.6	kW
standby mode	P <sub>sb</sub>	0.017	kW	Type of energy input	-		
thermostat-off mode	P <sub>to</sub>	0.006	kW				
crankcase heater mode	P <sub>ck</sub>	0.018	kW				
Other items							
Capacity control	variable			For air-to-water heat pumps: Rated air flow rate, outdoors	-	6150	m³/h
Sound power level, indoors/outdoors	L <sub>WA</sub>	-/66	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	-	m³/h
Annual energy consumption	Q <sub>HE</sub>	9946	kWh or GJ				
For heat pump combination heater:							
Declared load profile	-			Water heating energy efficiency	$\eta_{wh}$	-	%
Daily electricity consumption	Q <sub>elec</sub>	-	kWh	Daily fuel consumption	Q <sub>fuel</sub>	-	kWh
Annual electricity consumption	AEC	-	kWh	Annual fuel consumption	AFC	-	GJ
Contact details	Ferrolli spa - 37047 San Bonifacio (Verona) Italy - Via Ritonda 78/A - tel. +39.045.6139411 - fax +39.045.6100933 - www.ferrolli.com						
(*) For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the rated heat output of a supplementary heater Psup is equal to the supplementary capacity for heating sup(Tj).							
(**) If Cdh is not determined by measurement then the default degradation coefficient is Cdh = 0,9.							

Technical parameters							
Model(s):		10					
Air-to-water heat pump:		YES					
Water-to-water heat pump:		NO					
Brine-to-water heat pump:		NO					
Low-temperature heat pump:		NO					
Equipped with a supplementary heater:		NO					
Heat pump combination heater:		NO					
Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.							
Parameters shall be declared for average, colder and warmer climate conditions							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output (*)	Prated	10	kW	Seasonal space heating energy efficiency	$\eta_s$	153	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7°C	Pdh	-	kW	Tj = -7°C	COPd	-	-
Tj = 2°C	Pdh	10.2	kW	Tj = 2°C	COPd	2.35	-
Tj = 7°C	Pdh	6.6	kW	Tj = 7°C	COPd	3.38	-
Tj = 12°C	Pdh	3.0	kW	Tj = 12°C	COPd	4.95	-
Tj = bivalent temperature	Pdh	6.6	kW	Tj = bivalent temperature	COPd	3.38	-
Tj = operating limit	Pdh	10.2	kW	Tj = operating limit	COPd	2.35	-
For air-to-water heat pumps: Tj = -15°C	Pdh	-	kW	For air-to-water heat pumps: Tj = -15°C	COPd	-	-
Bivalent temperature	Tbiv	7	°C	For air-to-water heat pumps: Operation limit temperature	TOL	2	°C
Cycling interval capacity for heating	Pcyh	-	kW	Cycling interval efficiency	COPcyc or PERcyc	-	%
Degradation co-efficient (**)	Cdh	0.9	-	Heating water operating limit temperature	WTOL	60	°C
Power consumption in modes other than active mode				Supplementary heater			
off mode	Poff	0.017	kW	Rated heat output (**)	Psup	0.1	kW
standby mode	Psb	0.017	kW	Type of energy input	-		
thermostat-off mode	Pto	0.006	kW				
crankcase heater mode	Pck	0.018	kW				
Other items							
Capacity control	variable			For air-to-water heat pumps: Rated air flow rate, outdoors	-	6150	m³/h
Sound power level, indoors/outdoors	LWA	-66	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	-	m³/h
Annual energy consumption	QHE	3534	kWh or GJ				
For heat pump combination heater:							
Declared load profile	-			Water heating energy efficiency	$\eta_{wh}$	-	%
Daily electricity consumption	Qelec	-	kWh	Daily fuel consumption	Qfuel	-	kWh
Annual electricity consumption	AEC	-	kWh	Annual fuel consumption	AFC	-	GJ
Contact details	Ferroli spa - 37047 San Bonifacio (Verona) Italy - Via Ritonda 78/A - tel. +39.045.6139411 - fax +39.045.6100933 - www.ferroli.com						
(*) For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the rated heat output of a supplementary heater Psup is equal to the supplementary capacity for heating sup(Tj).							
(**) If Cdh is not determined by measurement then the default degradation coefficient is Cdh = 0,9.							



### Technical parameters

Model(s):	14
Air-to-water heat pump:	YES
Water-to-water heat pump:	NO
Brine-to-water heat pump:	NO
Low-temperature heat pump:	NO
Equipped with a supplementary heater:	NO
Heat pump combination heater:	NO

Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.

Parameters shall be declared for average, colder and warmer climate conditions

Item	Symbol	Value	Unit
Rated heat output (*)	Prated	13	kW
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7°C	Pdh	12.0	kW
Tj = 2°C	Pdh	7.4	kW
Tj = 7°C	Pdh	4.7	kW
Tj = 12°C	Pdh	2.1	kW
Tj = bivalent temperature	Pdh	12.0	kW
Tj = operating limit	Pdh	11.0	kW
For air-to-water heat pumps: Tj = -15°C	Pdh	-	kW
Bivalent temperature	Tbiv	-7	°C
Cycling interval capacity for heating	Pcy ch	-	kW
Degradation co-efficient (**)	Cdh	0.9	--
Power consumption in modes other than active mode			
off mode	Poff	0.017	kW
standby mode	Psb	0.017	kW
thermostat-off mode	Pto	0.006	kW
crankcase heater mode	Pck	0.018	kW

Item	Symbol	Value	Unit
Seasonal space heating energy efficiency	ηs	129	%
Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7°C	COPd	2.05	-
Tj = 2°C	COPd	3.12	-
Tj = 7°C	COPd	4.68	-
Tj = 12°C	COPd	4.82	-
Tj = bivalent temperature	COPd	2.06	-
Tj = operating limit	COPd	1.75	-
For air-to-water heat pumps: Tj = -15°C	COPd	-	-
For air-to-water heat pumps: Operation limit temperature	TOL	-10	°C
Cycling interval efficiency	COPcyc or PERcyc	-	%
Heating water operating limit temperature	WTOL	49	°C
Supplementary heater			
Rated heat output (**)	Psup	2.6	kW
Type of energy input	-		

Other items			
Capacity control	variable		
Sound power level, indoors/outdoors	$L_{WA}$	-71	dB
Annual energy consumption	$Q_{HE}$	8550	kWh or GJ

For air-to-water heat pumps: Rated air flow rate, outdoors	-	6150	m³/h
For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	-	m³/h

For heat pump combination heater:							
Declared load profile	-			Water heating energy efficiency	$\eta_{wh}$	-	%
Daily electricity consumption	$Q_{elec}$	-	kWh	Daily fuel consumption	$Q_{fuel}$	-	kWh
Annual electricity consumption	AEC	-	kWh	Annual fuel consumption	AFC	-	GJ

Contact details	Ferrolli spa - 37047 San Bonifacio (Verona) Italy - Via Ritonda 78/A - tel. +39.045.6139411 - fax +39.045.6100933 - www.ferrolli.com
-----------------	--

(\*) For heat pump space heaters and heat pump combination heaters, the rated heat output  $P_{rated}$  is equal to the design load for heating  $P_{designh}$ , and the rated heat output of a supplementary heater  $P_{sup}$  is equal to the supplementary capacity for heating  $sup(T_j)$ .

(\*\*) If  $C_{dh}$  is not determined by measurement then the default degradation coefficient is  $C_{dh} = 0.9$ .

# ERP DATA

Technical parameters							
Model(s):		14					
Air-to-water heat pump:		YES					
Water-to-water heat pump:		NO					
Brine-to-water heat pump:		NO					
Low-temperature heat pump:		NO					
Equipped with a supplementary heater:		NO					
Heat pump combination heater:		NO					
Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.							
Parameters shall be declared for average, colder and warmer climate conditions							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output (*)	Prated	12	kW	Seasonal space heating energy efficiency	$\eta_s$	94	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7°C	Pdh	7.8	kW	Tj = -7°C	COPd	2.14	-
Tj = 2°C	Pdh	4.4	kW	Tj = 2°C	COPd	2.77	-
Tj = 7°C	Pdh	2.9	kW	Tj = 7°C	COPd	4.16	-
Tj = 12°C	Pdh	1.3	kW	Tj = 12°C	COPd	3.33	-
Tj = bivalent temperature	Pdh	8.6	kW	Tj = bivalent temperature	COPd	1.59	-
Tj = operating limit	Pdh	7.1	kW	Tj = operating limit	COPd	1.29	-
For air-to-water heat pumps: Tj = -15°C	Pdh	10.1	kW	For air-to-water heat pumps: Tj = -15°C	COPd	1.82	-
Bivalent temperature	Tbiv	-11	°C	For air-to-water heat pumps: Operation limit temperature	TOL	-20	°C
Cycling interval capacity for heating	Pcy ch	-	kW	Cycling interval efficiency	COPcyc or PERcyc	-	%
Degradation co-efficient (**)	Cdh	0.9	-	Heating water operating limit temperature	WTOL	40	°C
Power consumption in modes other than active mode				Supplementary heater			
off mode	Poff	0.017	kW	Rated heat output (**)	Psup	4.4	kW
standby mode	Psb	0.017	kW	Type of energy input	-		
thermostat-off mode	Pto	0.006	kW				
crankcase heater mode	Pck	0.018	kW				
Other items							
Capacity control	variable			For air-to-water heat pumps: Rated air flow rate, outdoors	-	6150	m³/h
Sound power level, indoors/outdoors	LWA	-71	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	-	m³/h
Annual energy consumption	QHE	12303	kWh or GJ				
For heat pump combination heater:							
Declared load profile	-			Water heating energy efficiency	$\eta_{wh}$	-	%
Daily electricity consumption	Qelec	-	kWh	Daily fuel consumption	Qfuel	-	kWh
Annual electricity consumption	AEC	-	kWh	Annual fuel consumption	AFC	-	GJ
Contact details	Ferroli spa - 37047 San Bonifacio (Verona) Italy - Via Ritonda 78/A - tel. +39.045.6139411 - fax +39.045.6100933 - www.ferroli.com						
(*) For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the rated heat output of a supplementary heater Psup is equal to the supplementary capacity for heating sup(Tj).							
(**) If Cdh is not determined by measurement then the default degradation coefficient is Cdh = 0,9.							

Technical parameters															
Model(s):		14													
Air-to-water heat pump:		YES													
Water-to-water heat pump:		NO													
Brine-to-water heat pump:		NO													
Low-temperature heat pump:		NO													
Equipped with a supplementary heater:		NO													
Heat pump combination heater:		NO													
Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.															
Parameters shall be declared for average, colder and warmer climate conditions															
Item				Symbol				Value				Unit			
Rated heat output (*)				Prated				12				kW			
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj								Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj							
Tj = -7°C				Pd <sub>h</sub>				-				kW			
Tj = 2°C				Pd <sub>h</sub>				12.5				kW			
Tj = 7°C				Pd <sub>h</sub>				7.7				kW			
Tj = 12°C				Pd <sub>h</sub>				3.6				kW			
Tj = bivalent temperature				Pd <sub>h</sub>				7.7				kW			
Tj = operating limit				Pd <sub>h</sub>				12.5				kW			
For air-to-water heat pumps: Tj = -15°C				Pd <sub>h</sub>				-				kW			
Bivalent temperature				T <sub>biv</sub>				7				°C			
Cycling interval capacity for heating				P <sub>cych</sub>				-				kW			
Degradation co-efficient (**)				C <sub>d<sub>h</sub></sub>				0.9				--			
Power consumption in modes other than active mode								Supplementary heater							
off mode				P <sub>off</sub>				0.017				kW			
standby mode				P <sub>sb</sub>				0.017				kW			
thermostat-off mode				P <sub>to</sub>				0.006				kW			
crankcase heater mode				P <sub>ck</sub>				0.018				kW			
Other items								Seasonal space heating energy efficiency							
Capacity control				variable				η <sub>s</sub>				160			
Sound power level, indoors/outdoors				L <sub>WA</sub>				-71				dB			
Annual energy consumption				Q <sub>HE</sub>				3928				kWh or GJ			
For heat pump combination heater:								Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj							
Declared load profile				-				Water heating energy efficiency				η <sub>wh</sub>			
Daily electricity consumption				Q <sub>elec</sub>				-				kWh			
Annual electricity consumption				AEC				-				kWh			
Contact details								Ferroli spa - 37047 San Bonifacio (Verona) Italy - Via Ritonda 78/A - tel. +39.045.6139411 - fax +39.045.6100933 - www.ferroli.com							
(*) For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the rated heat output of a supplementary heater Psup is equal to the supplementary capacity for heating sup(Tj).								Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj							
(**) If Cdh is not determined by measurement then the default degradation coefficient is Cdh = 0.9.								Tj = -7°C							
								COPd							
								-							
								Tj = 2°C							
								COPd							
								2.37							
								Tj = 7°C							
								COPd							
								3.37							
								Tj = 12°C							
								COPd							
								5.35							
								Tj = bivalent temperature							
								COPd							
								3.37							
								Tj = operating limit							
								COPd							
								2.37							
								For air-to-water heat pumps: Tj = -15°C							
								COPd							
								-							
								For air-to-water heat pumps: Operation limit temperature							
								TOL							
								2							
								°C							
								Cycling interval efficiency							
								COP <sub>cyc</sub> or PER <sub>cyc</sub>							
								-							
								%							
								Heating water operating limit temperature							
								W <sub>TOL</sub>							
								60							
								°C							
								Supplementary heater							
								Rated heat output (**)							
								P <sub>sup</sub>							
								0							
								kW							
								Type of energy input							
								-							
								For air-to-water heat pumps: Rated air flow rate, outdoors							
								-							
								6150							
								m³/h							
								For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger							
								-							
								-							
								m³/h							

# ERP DATA

Technical parameters							
Model(s):		14T					
Air-to-water heat pump:		YES					
Water-to-water heat pump:		NO					
Brine-to-water heat pump:		NO					
Low-temperature heat pump:		NO					
Equipped with a supplementary heater:		NO					
Heat pump combination heater:		NO					
Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.							
Parameters shall be declared for average, colder and warmer climate conditions							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output (*)	Prated	13	kW	Seasonal space heating energy efficiency	$\eta_s$	128	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7°C	Pdh	11.6	kW	Tj = -7°C	COPd	2.02	-
Tj = 2°C	Pdh	7.5	kW	Tj = 2°C	COPd	3.10	-
Tj = 7°C	Pdh	4.7	kW	Tj = 7°C	COPd	4.68	-
Tj = 12°C	Pdh	2.8	kW	Tj = 12°C	COPd	5.20	-
Tj = bivalent temperature	Pdh	11.6	kW	Tj = bivalent temperature	COPd	2.02	-
Tj = operating limit	Pdh	11.7	kW	Tj = operating limit	COPd	1.77	-
For air-to-water heat pumps: Tj = -15°C	Pdh	-	kW	For air-to-water heat pumps: Tj = -15°C	COPd	-	-
Bivalent temperature	Tbiv	-7	°C	For air-to-water heat pumps: Operation limit temperature	TOL	-10	°C
Cycling interval capacity for heating	Pcych	-	kW	Cycling interval efficiency	COPcyc or PERcyc	-	%
Degradation co-efficient (**)	Cdh	0.9	-	Heating water operating limit temperature	WTOL	49	°C
Power consumption in modes other than active mode				Supplementary heater			
off mode	Poff	0.027	kW	Rated heat output (**)	Psup	1.5	kW
standby mode	Psb	0.027	kW	Type of energy input	-		
thermostat-off mode	Pto	0.006	kW				
crankcase heater mode	Pck	0.001	kW				
Other items							
Capacity control	variable			For air-to-water heat pumps: Rated air flow rate, outdoors	-	6150	m³/h
Sound power level, indoors/outdoors	LWA	-71	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	-	m³/h
Annual energy consumption	QHE	8291	kWh or GJ				
For heat pump combination heater:							
Declared load profile	-			Water heating energy efficiency	$\eta_{wh}$	-	%
Daily electricity consumption	Qelec	-	kWh	Daily fuel consumption	Qfuel	-	kWh
Annual electricity consumption	AEC	-	kWh	Annual fuel consumption	AFC	-	GJ
Contact details	Ferroli spa - 37047 San Bonifacio (Verona) Italy - Via Ritonda 78/A - tel. +39.045.6139411 - fax +39.045.6100933 - www.ferroli.com						
(*) For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the rated heat output of a supplementary heater Psup is equal to the supplementary capacity for heating sup(Tj).							
(**) If Cdh is not determined by measurement then the default degradation coefficient is Cdh = 0,9.							

Technical parameters							
Model(s):		14T					
Air-to-water heat pump:		YES					
Water-to-water heat pump:		NO					
Brine-to-water heat pump:		NO					
Low-temperature heat pump:		NO					
Equipped with a supplementary heater:		NO					
Heat pump combination heater:		NO					
Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.							
Parameters shall be declared for average, colder and warmer climate conditions							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output (*)	Prated	12	kW	Seasonal space heating energy efficiency	$\eta_s$	108	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T <sub>J</sub>				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T <sub>J</sub>			
T <sub>J</sub> = -7°C	P <sub>dh</sub>	7.8	kW	T <sub>J</sub> = -7°C	COP <sub>d</sub>	2.32	-
T <sub>J</sub> = 2°C	P <sub>dh</sub>	4.5	kW	T <sub>J</sub> = 2°C	COP <sub>d</sub>	3.35	-
T <sub>J</sub> = 7°C	P <sub>dh</sub>	2.9	kW	T <sub>J</sub> = 7°C	COP <sub>d</sub>	4.44	-
T <sub>J</sub> = 12°C	P <sub>dh</sub>	2.4	kW	T <sub>J</sub> = 12°C	COP <sub>d</sub>	4.73	-
T <sub>J</sub> = bivalent temperature	P <sub>dh</sub>	9.8	kW	T <sub>J</sub> = bivalent temperature	COP <sub>d</sub>	1.89	-
T <sub>J</sub> = operating limit	P <sub>dh</sub>	7.3	kW	T <sub>J</sub> = operating limit	COP <sub>d</sub>	1.40	-
For air-to-water heat pumps: T <sub>J</sub> = -15°C	P <sub>dh</sub>	9.3	kW	For air-to-water heat pumps: T <sub>J</sub> = -15°C	COP <sub>d</sub>	1.80	-
Bivalent temperature	T <sub>biv</sub>	-14	°C	For air-to-water heat pumps: Operation limit temperature	TOL	-20	°C
Cycling interval capacity for heating	P <sub>cych</sub>	-	kW	Cycling interval efficiency	COP <sub>cyc</sub> or PER <sub>cyc</sub>	-	%
Degradation co-efficient (**)	C <sub>dh</sub>	0.9	--	Heating water operating limit temperature	W <sub>TOL</sub>	40	°C
Power consumption in modes other than active mode				Supplementary heater			
off mode	P <sub>off</sub>	0.027	kW	Rated heat output (**)	P <sub>sup</sub>	4.4	kW
standby mode	P <sub>sb</sub>	0.027	kW	Type of energy input	-		
thermostat-off mode	P <sub>to</sub>	0.006	kW				
crankcase heater mode	P <sub>ck</sub>	0.001	kW				
Other items							
Capacity control	variable			For air-to-water heat pumps: Rated air flow rate, outdoors	-	6150	m³/h
Sound power level, indoors/outdoors	L <sub>WA</sub>	-71	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	-	m³/h
Annual energy consumption	Q <sub>HE</sub>	10956	kWh or GJ				
For heat pump combination heater:							
Declared load profile	-			Water heating energy efficiency	$\eta_{wh}$	-	%
Daily electricity consumption	Q <sub>elec</sub>	-	kWh	Daily fuel consumption	Q <sub>fuel</sub>	-	kWh
Annual electricity consumption	AEC	-	kWh	Annual fuel consumption	AFC	-	GJ
Contact details	Ferrolli spa - 37047 San Bonifacio (Verona) Italy - Via Ritonda 78/A - tel. +39.045.6139411 - fax +39.045.6100933 - www.ferrolli.com						
(*) For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the rated heat output of a supplementary heater Psup is equal to the supplementary capacity for heating sup(Tj).							
(**) If Cdh is not determined by measurement then the default degradation coefficient is Cdh = 0,9.							

# ERP DATA

**ferroli** RVL-I PLUS 14T - Warmer climate condition

Technical parameters							
Model(s):		14T					
Air-to-water heat pump:		YES					
Water-to-water heat pump:		NO					
Brine-to-water heat pump:		NO					
Low-temperature heat pump:		NO					
Equipped with a supplementary heater:		NO					
Heat pump combination heater:		NO					
Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.							
Parameters shall be declared for average, colder and warmer climate conditions							
Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output (*)	Prated	12	kW	Seasonal space heating energy efficiency	ηs	147	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj			
Tj = -7°C	Pdh	-	kW	Tj = -7°C	COPd	-	-
Tj = 2°C	Pdh	12.2	kW	Tj = 2°C	COPd	2.42	-
Tj = 7°C	Pdh	8.0	kW	Tj = 7°C	COPd	3.50	-
Tj = 12°C	Pdh	3.4	kW	Tj = 12°C	COPd	5.25	-
Tj = bivalent temperature	Pdh	8.0	kW	Tj = bivalent temperature	COPd	3.50	-
Tj = operating limit	Pdh	12.2	kW	Tj = operating limit	COPd	2.42	-
For air-to-water heat pumps: Tj = -15°C	Pdh	-	kW	For air-to-water heat pumps: Tj = -15°C	COPd	-	-
Bivalent temperature	Tbiv	7	°C	For air-to-water heat pumps: Operation limit temperature	TOL	2	°C
Cycling interval capacity for heating	Pcy ch	-	kW	Cycling interval efficiency	COPcyc or PERcyc	-	%
Degradation co-efficient (**)	Cdh	0.9	--	Heating water operating limit temperature	WTOL	60	°C
Power consumption in modes other than active mode				Supplementary heater			
off mode	Poff	0.027	kW	Rated heat output (**)	Psup	0.3	kW
standby mode	Psb	0.027	kW	Type of energy input	-		
thermostat-off mode	Pto	0.006	kW				
crankcase heater mode	Pck	0.001	kW				
Other items							
Capacity control	variable			For air-to-water heat pumps: Rated air flow rate, outdoors	-	6150	m³/h
Sound power level, indoors/outdoors	LWA	-71	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	-	-	m³/h
Annual energy consumption	QHE	4445	kWh or GJ				
For heat pump combination heater:							
Declared load profile	-			Water heating energy efficiency	ηwh	-	%
Daily electricity consumption	Qelec	-	kWh	Daily fuel consumption	Qfuel	-	kWh
Annual electricity consumption	AEC	-	kWh	Annual fuel consumption	AFC	-	GJ
Contact details							
Ferroli spa - 37047 San Bonifacio (Verona) Italy - Via Ritonda 78/A - tel. +39.045.6139411 - fax +39.045.6100933 - www.ferroli.com							
(*) For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the rated heat output of a supplementary heater Psup is equal to the supplementary capacity for heating sup(Tj).							
(**) If Cdh is not determined by measurement then the default degradation coefficient is Cdh = 0,9.							





