Technibel Climatisation

TECHNICAL DATA & SERVICE MANUAL

R410A

Monobloc Inverter Air to Water Heat Pump PHRIA & Water System

Reference: TD&SM_TEC_1012191-01
Version: 01
Date: 02/2011

IMPORTANT!
Please read

This air conditioning system meets strict safety and operating standards.
For the installer or service person, it is important to install or service the system so that it operates safely and efficiently.

For safe installation and trouble-free operation, you must:

- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- Observe all local, state and national electrical codes.
- Pay close attention to all warning and caution notices given in this manual.

•The unit must be supplied with a dedicated electrical line.

WARNING

This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.

CAUTION

This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

If necessary, get help

These instructions are all you need for most installation sites and maintenance conditions.
If you require help for a special problem, contact our sale/service outlet or your certified dealer for additional instructions.

In case of improper installation

The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.

SPECIAL PRECAUTIONS

- During installation, connect before the refrigerant system and then the wiring one; proceed in the reverse orden when removing the units.

WARNING **When wiring**

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. ONLY A QUALIFIED, EXPERIENCED ELECTRICIANS SHOULD ATTEMPT TO WIRE THIS SYSTEM.

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked, to ensure the grounding.
- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring.
  Improper connections and inadequate grounding can cause **accidental injury and death**.
- **Ground the unit** following local electrical codes.
- The Yellow/Green wire cannot be used for any connection different from the ground connection.
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.
- Do not allow wiring to touch the refrigerant tubing, compressor, or any moving parts of the fan.
- Do not use multi-core cable when wiring the power supply and control lines. Use separate cables for each type of line.

When transporting

Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp edges or thin aluminium fins on the air conditioner can cut your fingers.

When installing...

... In a room

Properly insulate any tubing run inside a room to prevent "sweating", which can cause dripping and water damage to walls and floors.

... In moist or uneven locations

Use a raised concrete base to provide a solid level foundation for the outdoor unit.
This prevents damage and abnormal vibrations.

... In area with strong winds

Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

... In a snowy area (for heat pump-type systems)

Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.

When connecting refrigerant tubing

- Keep all tubing runs as short as possible.
- Use the flare method for connecting tubing.
- Apply refrigerant lubricant to the matching surfaces of the flare and union tubes before connecting them; screw by hand and then tighten the nut with a torque wrench for a leak-free connection.
- Check carefully for leaks before starting the test run.

NOTE:

Depending on the system type, liquid and gas lines may be either narrow or wide. Therefore, to avoid confusion, the refrigerant tubing for your particular model is specified as narrow tube for liquid, wide tube for gas.

When servicing

- Turn the power OFF at the main power board before opening the unit to check or repair electrical parts and wiring.
- Keep your fingers and clothing away from any moving parts.
- Clean up the site after the work, remembering to check that no metal scraps or bits of wiring have been left inside the unit being serviced.
- Ventilate the room during the installation or testing the refrigeration system; make sure that, after the installation, no gas leaks are present, because this could produce toxic gas and dangerous if in contact with flames or heat-sources.

NOTE: This symbol mark and recycle system are applied only to EU countries and not applied to the countries in the other area of the world.

Your product is designed and manufactured with high quality materials and components which can be recycled and reused.
This symbol means that electrical and electronic equipment, at their end-of-life, should be disposed separately from your household waste.
Please dispose of this equipment at your local community waste collection/recycling centre.
In the European Union there are separate collection systems for used electrical and electronic products.
Please help us to conserve the environment we live in!

INTRODUCTION

Destination of this document

This Technical and service manual is made to assist the service technician apply his knowledge and

training to this model monobloc. This manual is written both for experienced service persons and those who are new to heating by heat pump service. To help those with less experience or who are new to this kind of unit we have included more explanations of basic procedures in simple language than is usual in some service manuals. The experienced technician will of course find he knows many of these things already and can go directly to the procedures and information he needs; the less experienced technician will better understand what to do even before he arrives on the job, and therefore be better able to work by himself as well as assist the more experienced technician.

This document is dedicated to the global system:

Outdoor unit (Air to Water Heat Pump PHRIA)

Control Unit

2-zone hydraulic module (M2ZM) (Accessory not included)

Domestic Hot Water Production Kit (KPECS) (Accessory not included)

The PHRIA (AWHP plus Electric heater) is one of a global system. It is the Monobloc Outdoor unit of the system composed of :

Outdoor unit	Control unit	2-zone hydraulic module - if installed	Domestic Hot Water Production Kit
			
Installed outside the home	Installed inside the home within the unit's operating environment	Installed in a sheltered and frost protection equipment room	Installed in a sheltered and frost protection equipment room

- **This document gives you the limits and all the allowed possibilities with solutions proposed called Water System.**
- **It gives informations to understand, check and ensure the maintenance by a technician.**
- **You can read it as a book or going directly to the information requested guided by the Table contents and the first page of each parts' contents detailed.**

Heat pump principle

• The Monobloc outdoor unit "captures" heat from the air and transfers it to the water with a brased plate heat exchanger (include inside).
Then this heat is deliver into the home through a hydraulic circuit capable of supplying various types of transfer units (floor, low-temperature radiators, fan-coil units,...).
• The built-in control manages the system that supplies the hydraulic system with a water temperature adapted to current needs and according to the operating mode selected on the control unit.
• For installations with radiators or fan-coil units, the ambient temperature can be adjusted by means of commands specific to this type of transfer unit.

MARKING CE

This product, marked with the CE symbol, complies with the essential requirements of the following Directives:

- Low voltage No. 2006/95/EC.
- Electromagnetic Compatibility No. 2004/108/EC.

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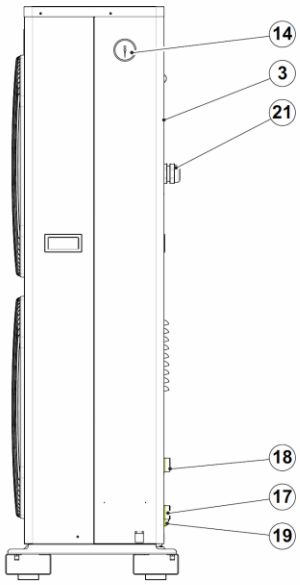
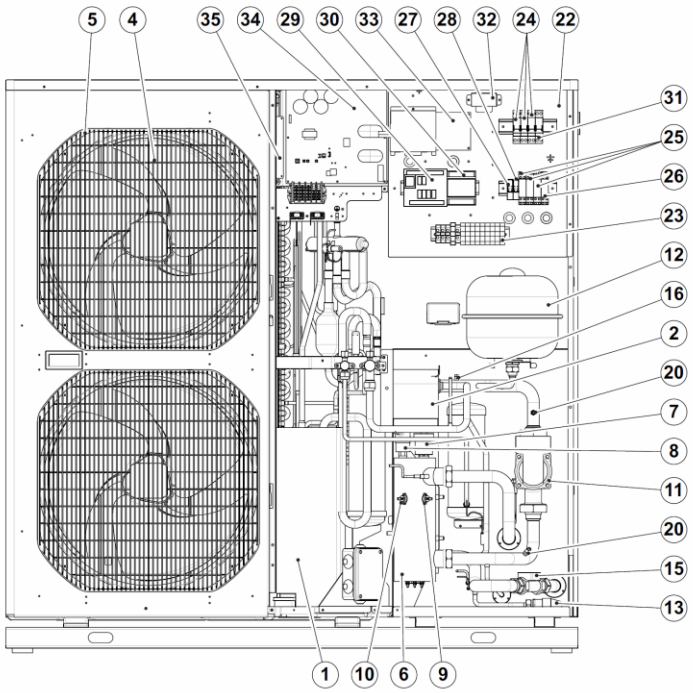
1 SPECIFICATIONS

1.1 Unit Specifications

PHRIA 10
PHRIA 14





1 - Sound-proofed hermetic compressor.
2 - Brazed plate heat exchanger.
3 - "Plate-Fin" air heat exchanger.
4 - Fan motor.
5 - Fan protection grille.
6 - Electric heater:
- 4 kW: 1st stage = 2 kW; 2nd stage = 2 kW.
- 6 kW: 1st stage = 4 kW; 2nd stage = 2 kW.

7 - Heater automatic air vent valve.
8 - Water pressostat.
9 - Automatic reset safety thermostat.
10 - Manual reset safety thermostat.
11 - Circulator pump.
12 - Surge tank.
13 - Safety valve.
14 - Hydraulic system pressure gauge.
15 - Water flow detector.
16 - Hydraulic circuit manual air purge valve.
17 - Water inlet connection.
18 - Water outlet connection.
19 - Hydraulic circuit fill / drain connection.
20 - Water system pressure tap for flow control.
21 - Electrical cable passage.
22 - Electrical box.
23 - Terminal strip.
24 - Heating element circuit breakers.
25 - Heating element contactors.
26 - Circulator contactors.
27 - Fault relays.
28 - Water flow rate relay.
29 - Heating control board.
30 - Communication module CC1.
31 - Control circuit circuit-breaker.
32 - Transformer.
33 - IU board.
34 - OU board.
35 - IPM board.

Materials:
- Copper piping.
- Copper / aluminium air heat exchanger.
- Stainless steel water heat exchanger.
- Painted sheet metal cabinet.
- Plastic grille.

1.1.1 Data at the normalized conditions

Modele / *Model*			PHRIA 10	PHRIA 14
COOLING MODE	Puissance frigorifique nomin *Nominal Cooling capacity (**N***	kW	10,5 [4-12,3]	13 [4,2-13]
	Puissance absorbée nomina *Nominal absorbed power (**N***	kW	2,62	3,7
	Intensité absorbée nominale *Nominal absorbed current*	A	13	20,7
	Efficacité énergétique **A35 W** *Energy Efficiency Rating **(NE***	EER w/w	4,00	3,51
	Debit d'eau nominal *Nominal water flow*	m3/h	1,87	2,25
	Pression disponible *Available pump head*	kPa	43	42
MODE FROID	*Puissance frigo (kW) / EER point A35 W23/18 (gross)*		10,4 / 4,09	12,9 / 3,55
	Puissance frigo (kW) / EER point A35 W12/7 (net)		6,9 / 2,65	9,1 / 2,5
	Puissance frigo (kW) / EER point A35 W12/7 (gross)		6,8 / 2,7	9 / 2,53
HEATING MODE	Puissance calorifique nomin *Nominal heating capacity (**N***	kW	10,2 [4,2-13,2]	13,5 [4,2-15]
	Puissance absorbée nomina *Nominal absorbed power (**N***	kW	2,535	3,375
	Intensité absorbée nominale *Nominal absorbed current*	A	12,8	18,6
	Coefficient de performance *Coefficient Of Performance (...*	COP w/w	4,02	4,00
	Debit d'eau nominal *Nominal water flow*	m3/h	1,8	2,3
	Pression disponible *Available pump head*	kPa	45	42
MODE CHAUD	*Puissance calo (kW) / COP point **A7/6 W30/35 (gross)***		10,3 / 4,2	13,6 / 4,08
	*Puissance calo (kW) / COP point **A-7/-8 W*/35 (net) / Nominal***		5,8 / 2,4	7,85 / 2,45
	*Puissance calo (kW) / COP point **A-7/-8 W*/35 (net) / Max***		7,58 / 2,14	9,34 / 2,18
	*Puissance calo (kW) / COP point **A2/1 W30/35 (net)***		6,8 / 2,68	8,13 / 2,6
	*Puissance calo (kW) / COP point **A7/6 W40/45 (gross)***		9,6 / 3,2	13 / 3,18
	*Puissance calo (kW) / COP point **A7/6 W40/45 (net)***		9,5 / 3,09	12,9 / 3,13
	*Puissance calo (kW) / COP point **A-7/-8 W */45 (net) / Nominal***		4,8 / 1,79	7,35 / 1,99
	*Puissance calo (kW) / COP point **A-7/-8 W*/45 (net) / Max***		6,98 / 1,94	7,97 / 1,85

Conditions nominales / appli	**Froid**	**Chaud**	***Nominal conditions / Floor application***
Température air extérieur (bs/bh)	35 °C (bs)	7/6 °C	*Outdoor air temperature (db/wb):*
Température entrée d'eau	23 °C	30 °C	*Inlet water temperature*
Température sortie d'eau	18 °C	35 °C	*Outlet water temperature*

Net : performances selon la norme EN14511

Gross : performances type Eurovent (le circulateur n'est pas pris en compte)

Net : performances according to the EN14511 standard

Gross : performances according to Eurovent standard (w ithout the circulating pump)

1.1.2 Specifications

Caractéristique techniques

Outdoor unit specifications

Modele / *Model*		**PHRIA 10**	**PHRIA 14**
Compresseur	n°/type	1 / twin rotary	
Compressor	*no/type*		
Vitesse nominale du compresseur (en planche	*Hz*	**44**	**57**
Nominal speed of compressor (for underfloor)			
Circuit réfrigérant	n°	1	
Refrigerant circuit	*no*		
Ventilateur	n°/type	2/helicoïde soufflage horizontal	
Fan	*no/type*	*2/axial flow horizontal discharge*	
Diametre ventilateur	mm	490	
Fan diameter			
Vitesse rotation	tr/min	800	
Fan speed	*rpm*		
Débit d'air	m3/h	6 600	
Air flow			
Réfrigérant	type	R410a	
Refrigerant	*type*		
Charge en réfrigérant	kg	3,6	3,6
Refrigerant charge			
Volume du vase d'expansion	l	6	6
Expansion tank volume			
Contenance en eau	l	4,7	4,9
Water content			
Diamètre raccordement hydraulique	inch	1"	1"
Hydraulic connection diameter			

Dimensions et poids

Dimensions and weights

Modele / *Model*				**PHRIA 10**		**PHRIA 14**	
				net	emballé	net	emballé
				net	*packed*	*net*	*packed*
	Largeur	*Width*	mm	1 390	1 470	1 390	1 470
	Profondeur	*Depth*	mm	420	440	420	440
	Hauteur	*Height*	mm	1 380	1 550	1 380	1 550
	Poids	*Weight*	kg	135	141	152	158

NIVEAUX SONORES

AIR-TO-WATER HEAT PUMPS - SOUND LEVELS

Modele / *Model*		**PHRIA 10**	**PHRIA 14**
Niveau de puissance sonore	dB-A	**70**	**72**
Sound power level			
Niveau de pression sonore	dB-A	**42**	**44**
Sound pressure level			

Conditions nominales		***Nominal conditions***	
Température air extérieur	35 °C	*Outdoor air temperature:*	*35 °C*
Niveau de pression sonore		***Sound pressure level***	
Groupe installé à l'extérieur (champ libre)		*Unit installed outdoor (free field)*	
Distance de mesure	10 m	*Measuring distance*	*10 m*

CARACTERISTIQUES ELECTRIQUE
AIR-TO-WATER HEAT PUMPS - ELECTRICAL DATA

Modele / Model		**PHRIA 10**	**PHRIA 14**
Alimentation électrique *Main power supply*	V/Ph/Hz	230/1/50	230/1/50
Limites de tension admissibles *Voltage permissible limit*	V	198 - 264	198 - 264
Puissance absorbée maxi (*) *Maximum absorbed power (*)*	kW	3,54	4,35
Intensité absorbée maxi (*) *Maximum absorbed current (*)*	A	17,3	23,9
Chauffage électrique *Electric heater*	kW	4 or 6	4 or 6
Intensité absorbée maxi du chauffage électr *Electric heater MAX absorbed current*	A	26	26
Intensité de démarrage *Start-up current*	A	3	3
Puissance absorbée nominale du ventilateu *Fan nominal absorbed current*	kW	0,18	0,18
Intensité absorbée nominale du ventilateur *Fan nominal absorbed current*	A	0,8	0,8
Puissance absorbée nominale pompe *Pump nominal absorbed current*	kW	0,16	0,165
Intensité absorbée nominale pompe *Pump nominal absorbed current*	A	0,7	0,72

(*) Dans la plage de fonctionnement et HORS appoint électrique

(*) Within the operating limits & without electric heater

Volume en eau
AIR-TO-WATER HEAT PUMPS - SYSTEM WATER CONTENT

Modele / ***Model***		**PHRIA 10**	**PHRIA 14**
Volume minimum en eau (*) *Minimum water content (*)*	l	50	65
Volume maximum en eau (**) *Maximum water content (**)*	l	200	200

(*) Si le volume d'eau du système est inférieur au minimum, l'installation d'un ballon tampon est nécessaire.

(*) If water content of the system is below minimum the installation of a storage tank is necessary

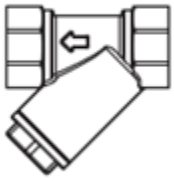
(**) si le volume d'eau du système est supérieur au maximum, l'installation d'un vase d'expansion supplémentaire est nécessaire

(**) If water content of the system is upper maximum the installation of an expansion tank is necessary.

1.2 Other Component Specifications

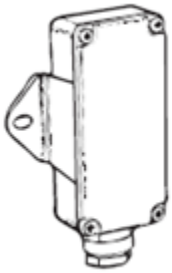
1.2.1 Accessories included

- **1" FF hydraulic filter**



- **Outside temperature sensor:**
  - Installed in a box with cable gland.

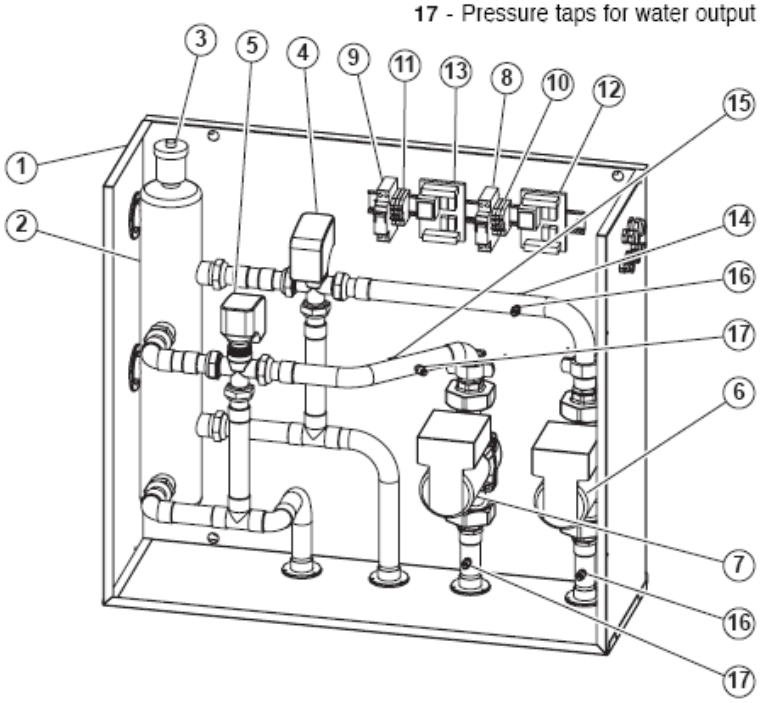
  Note:
  This sensor must be installed in a location that is sheltered from inclement weather.



- **Control unit:**
  - Plastic wall-mounted control unit.
  - Dimensions: height = 128 mm
    width = 86 mm
    depth = 34 mm
  - Colour: White
  - Class III
  - IP 30

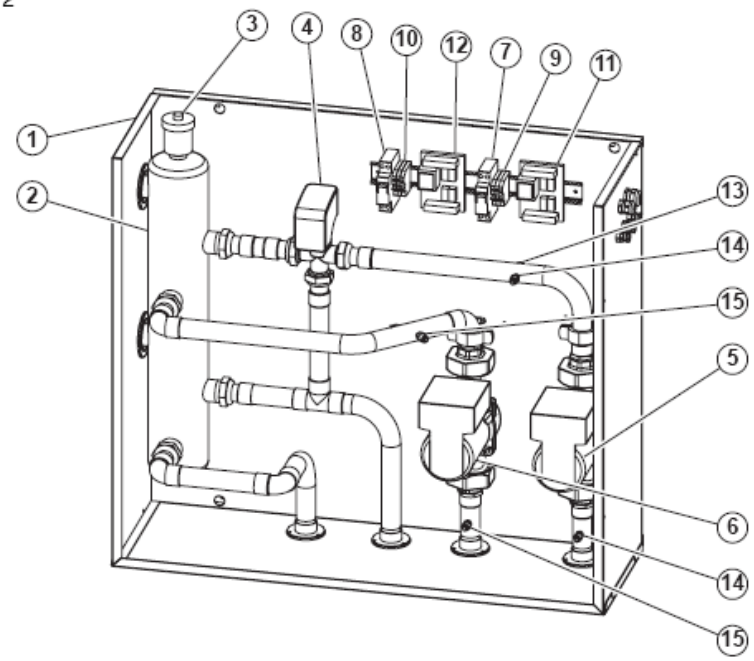
1.2.2 Accessories not included: 2 Zones Floor Module

1 - Housing
2 - Mixing cylinder
3 - Automatic air vent valve
4 - Motorised, 3-way valve, zone 1
5 - Motorised, 3-way valve, zone 2
6 - Circulator, zone 1
7 - Circulator, zone 2
8 - Circuit breaker, zone 1
9 - Circuit breaker, zone 2
10 - Circulator terminal strip, zone 1
11 - Circulator terminal strip, zone 2
12 - Control board, zone 1
13 - Control board, zone 2
14 - Outlet water sensor, zone 1
15 - Outlet water sensor, zone 2
16 - Pressure taps for water output measurement, zone 1
17 - Pressure taps for water output measurement, zone 2



1.2.3 Accessories not included: 2-zone mixed module (Floor + Fan coil Module or Radiators Low Temperature module)

1 - Housing
2 - Mixing cylinder
3 - Automatic air vent valve
4 - Motorised, 3-way valve, zone 1
5 - Circulator, zone 1
6 - Circulator, zone 2
7 - Circuit breaker, zone 1
8 - Circuit breaker, zone 2
9 - Circulator terminal strip, zone 1
10 - Circulator terminal strip, zone 2
11 - Control board, zone 1
12 - Control board, zone 2
13 - Outlet water sensor, zone 1
14 - Pressure taps for water output measurement, zone 1
15 - Pressure taps for water output measurement, zone 2



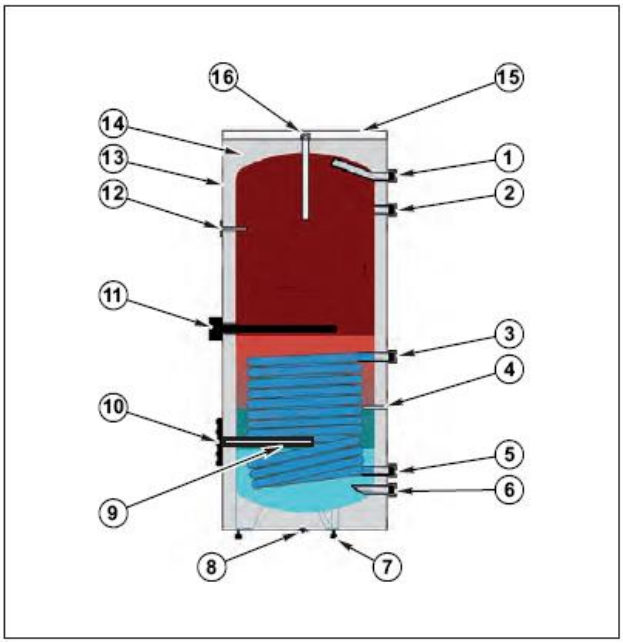
1.2.4 Accessory not included: Domestic Hot Water Production Kit (KPECS)

The **D**omestic **H**ot **W**ater **P**roduction **K**it **(KPECS)** contains the following elements:
- Domestic hot water tank equipped with an electric heating element (installed).
- 3-way On/Off valve to direct the hot water produced by the heat pump, from the heating network to the DHW tank's internal exchanger.
- Electrical control box to be connected **exclusively** to the system's Monitoring / Control unit via the bus.
- Safety valve with pressure relief valve and check valve designed for optimal protection against excessive pressure in closed-circuit water heaters in compliance with NF EN 1487.
- Water temperature sensors with pipe mounting bracket.

Note:
The 3-way valve, the electrical box + the sensors and the safety valve are to be mounted and connected to the installation.

Tank:

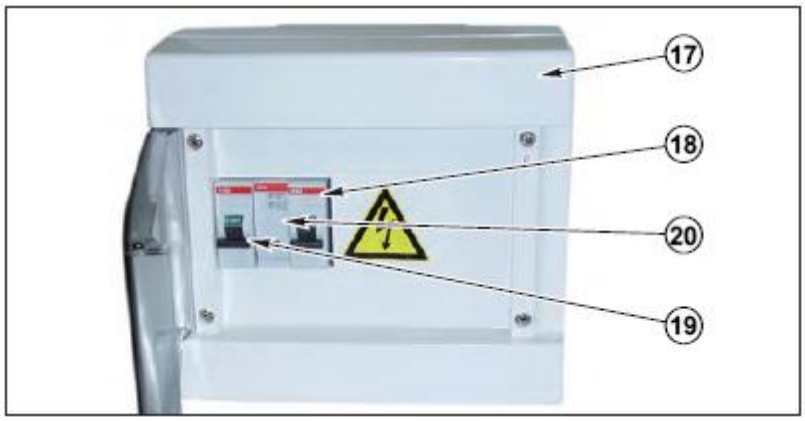
- Capacity : 300-litre model (KPECS 300) and 500-litre model (KPECS 500).
- Shell material : S 235 JR steel.
- internal exchanger : FE 280 steel.
- Exchanger surface area :
  . KPECS 300 = 2.4 m2
  . KPECS 500 = 3.2 m2.
- Internal coating : internal enamelled coating per DIN 4753-3 appropriate for food use.
- Insulation : . Injected polyurethane foam, 40 kg/m3 (CFC / HCFC free)
  . Thickness: 50 mm.
- Insulation quality : Consumption for steady temp at DT 40 °C (ambient temperature 20 °C / tank temperature 60 °C).
  . Ce <= 1.97 kWh/24h (DHW 300).
  . Ce <= 2.62 kWh/24h (DHW 500).
- External covering : Removable flexible PVC jacket - RAL 9006 (grey).
- Passive anode : Magnesium anode (quantity: 1 for model 300 / quantity: 2 for model 500).
- Temperature limits : Tank (95 °C) / internal exchanger (110 °C).
- Thermometer 0 - 120 °C on the upper part indicating the outgoing water temperature.
- Pressure limits : Tank (10 Bar) / internal exchanger (10 Bar).
- Test pressure : Tank (13 Bar) / internal exchanger (13 Bar).
- System pressure : Cold water system supply on the safety valve: 5.3 Bar maximum.
- Support : Metal brackets buried in the insulation + 3 M12 screws with plastic base.
- Weight : . KPECS 300 (Net weight: 125 kg empty - Gross weight: 136 kg with packaging - Weight full: 425 kg).
  . KPECS 500 (Net weight: 174 kg empty - Gross weight: 187 kg with packaging - Weight full: 674 kg).
- Electric heater element :
  . Immersion heater equipped with control thermostat (max. 65 °C ± 5 °C) and safety thermostat (98 °C +/- 7 °C)
  . IP 54. Shielded element
  . Power = 3 kW (+5/-10 %)
  . Mono 230 V/1/50 Hz. L = 400 mm
  . Cylindrical PVC housing Ø 100 mm
  . Max. torque = 100 Nm.



1 - Domestic Hot Water (DHW) outlet.
2 - Recirculation.
3 - DHW exchanger hot water inlet.
4 - Thermowell for tank temperature sensor.
5 - DHW exchanger hot water outlet.
6 - Cold water inlet.
7 - Tank support feet.
8 - Drain opening.
9 - Magnesium anode (on 500-litre model).
10 - Inspection hatch.
11 - Additional electric heater 3 kW - 230 V / 1 / 50.
12 - Thermometer.
13 - PVC protection (jacket).
14 - Polyurethane insulation.
15 - Plastic cover.
16 - Magnesium anode on 300 and 500-litre models.

Electrical box :
Accessories included (to be installed and connected)

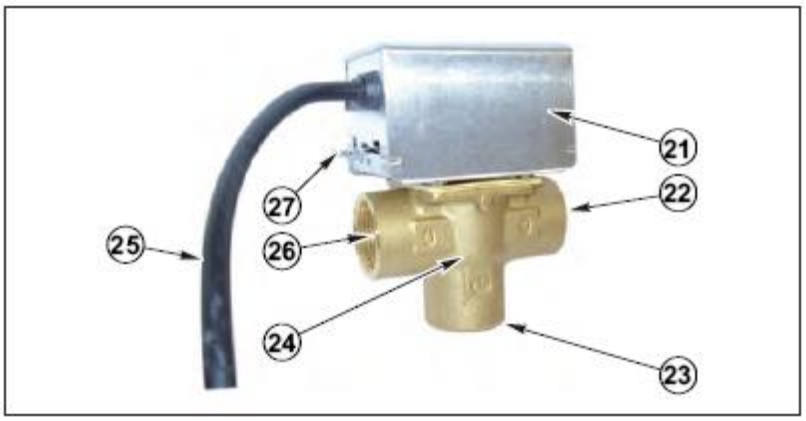
- Power supply voltage : Mono 230 V / 1 / 50 Hz - Rated conditional short-circuit current = 4.5 kA per EN 60 898.
- Plastic housing : IP 20 - WHITE - RAL 9001 - Transparent door.
- equipment : KPECS control electronic board.
  6 A circuit breaker for box protection.
  16 A circuit breaker for tank electric heater protection.
  Contactor for tank electric heating restriction.
  Ground terminal.
- Weight : 1 kg.



17 - Electrical box.
18 - Box circuit breaker.
19 - Tank electric heater circuit breaker.
20 - Tank electric heater disconnect contactor.

Motorised 3-way valve :
Accessories included (to be installed and connected)

- Model : Motorised 3-way distribution valve - On/Off.
- Power supply voltage : Mono 230 Volts - 50 Hz - Cable length 1.50 m - Protection rating IP = 20.
- Body : Swagged brass.
- Closure valve : Rubber, spherical shape, and rotational movement.
- Position : Passage A NC - with auxiliary position contact.
- Temperature limits : Max. fluid temperature = 93 °C / Max. ambience temperature = 52 °C.
- Pressure limits : Maximum static pressure = 8.6 Bar.
Maximum differential pressure = 0.55 Bar.
- Output limits : 1 m3/h < Fluid flow < 2 m3/h - Kv Coefficient = 8.1.
- Connections : Ø 1" (26-34) Threaded female.
- Motor : Metal housing with synchronous motor and drive unit with return spring.
- Opening time : 14 seconds.
- Closing time : 8 seconds.
- Consumption : 6 Watts.
- Weight : 1,25 kg.



21 - 3-way valve motor compartment.
22 - Outlet to heating system, Ø 1'' Female (B).
23 - Generator hot water inlet, Ø 1'' Female (AB).
24 - 3-way valve body.
25 - Electrical power cable.
26 - Outlet to ECS tank exchanger, Ø 1'' Female (A).
27 - Manual opening lever (for testing purposes).

Safety valve :
Accessories included (to be installed and connected)

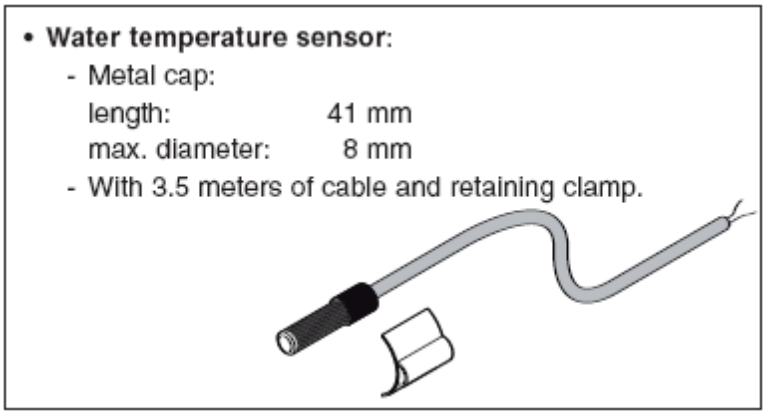
- Standard : Designed for closed-circuit water heaters per NF EN 1487.
- Equipment : Safety valve, check valve, shut-off valve, air break.
- Fluid : Materials are compatible for use with drinking water.
- Maximum supply pressure : 5.3 Bar (25% this side of the safety valve's set pressure).
- Set pressure : factory set at 7 Bar.
- Service temperature : 70 °C - Maximum 95°C / 1 hour.
- Weight : 0.4 kg.

28 - Safety valve control knob.
29 - Air break (to be connected to the supplied plastic siphon trap).
30 - Cold water outlet to DHW tank, Ø 3/4" Female.
31 - Cold water inlet from the system, Ø 3/4" Male.
32 - Shut-off valve.

Sensors:

Accessories included (to be installed and connected)

1 temperature sensor to be placed in the tank's thermowell.
1 temperature sensor + its support to be placed on the tank's exchanger inlet.



1.2.5 Accessory not included: Telephone Control

• For the applications:
- 1 zone, floor
- 2 zones, floor
- 2 zones, mixed
- 1 zone, Radiators (with Domestic Hot Water or not)

Does not operate for the Terminal Units application.

⚠ **Use in heating mode only**

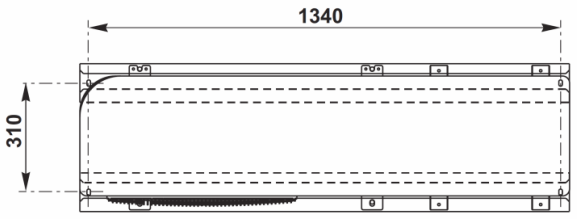
• A **DELTA-DORE TYPHONE 500** type telephone control box can be connected to the communication bus (available from **DELTA-DORE** distributors).
Caution: **Its date-code number must be greater than 05-24.**
Consult the manual supplied with the telephone control.
• By calling the telephone line on which the **TYPHONE** is recorded, the user can:
- know the ambient temperature of zone 1,
- know the setpoint temperature of the current mode of zone 1,
- send an override setpoint.

In case of setpoint modification, zone 1 and possible zone 2 operates in "COMFORT" mode (with the new setpoint for the floor zones).
This override is indicated by an index on the LCD.
Any action on the rotary knob deactivates the override and extinguishes the indicator.
• Parameters possibilities:
- access code change (parameter 62),
- interface language change - French / English (parameter 61).

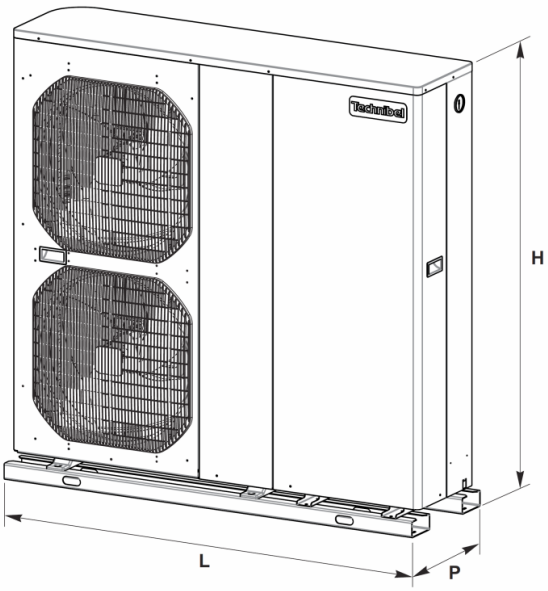
1.3 Dimensional data and weight

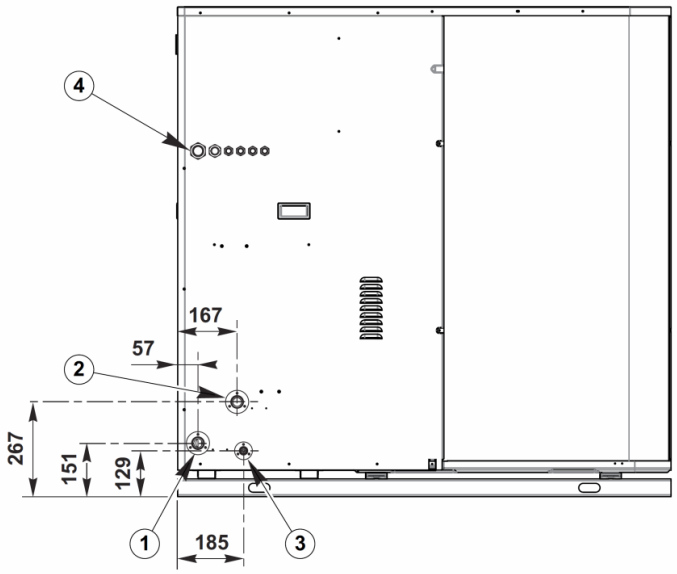
1.3.1 PHRIA

Model			PHRIA 10	PHRIA 14
Dimensions	L	mm	1,390	1,390
	H	mm	1,380	1,380
	P	mm	420	420
	Weight	kg	135	141
Dimensions packaged	L	mm	1,470	1,470
	H	mm	1,550	1,550
	P	mm	440	440
	Weight	kg	152	158



Ground fasteners





"Rear view"

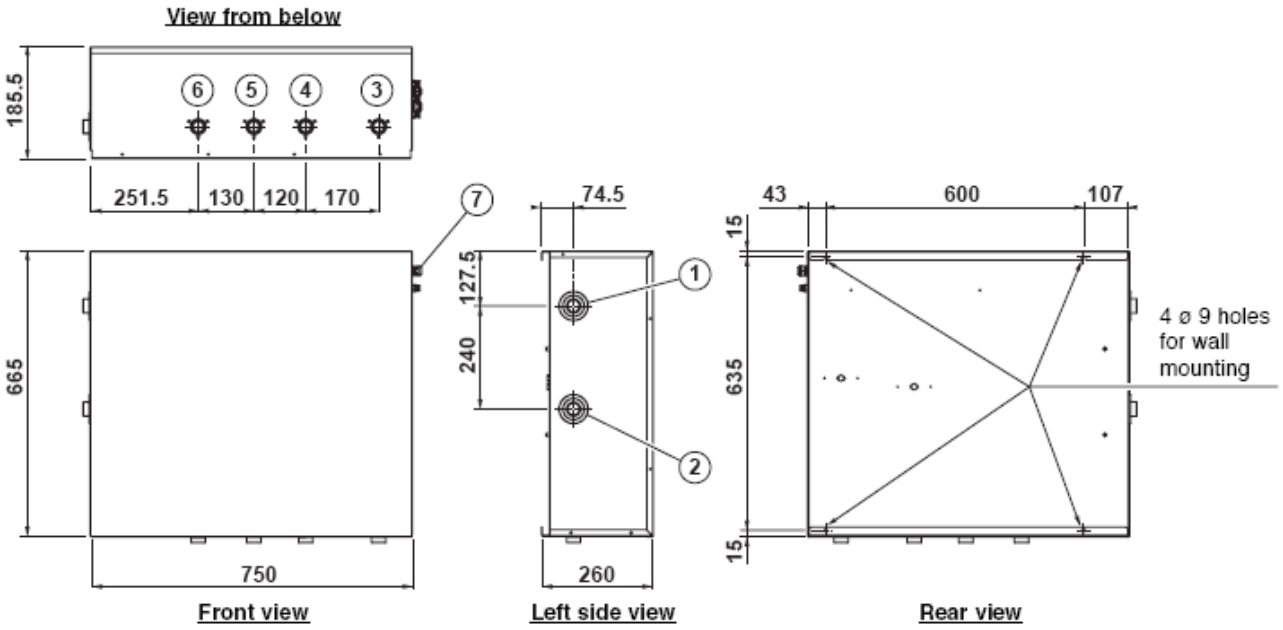
1	Water inlet connection 1" (male)
2	Water outlet connection 1" (male)
3	Water circuit fill / drain - 1/2" male
4	Holes for electric cables

1.3.2 M2ZP : 2-zone floor module

1	Module water inlet connection (heat pump side)
2	Module water outlet connection (heat pump side)
3	Outgoing connection, zone 1
4	Outgoing connection, zone 2
5	Return connection, zone 1
6	Return connection, zone 2
7	Holes for electric cables

Weight (kg)
39

All connections are 1" male.

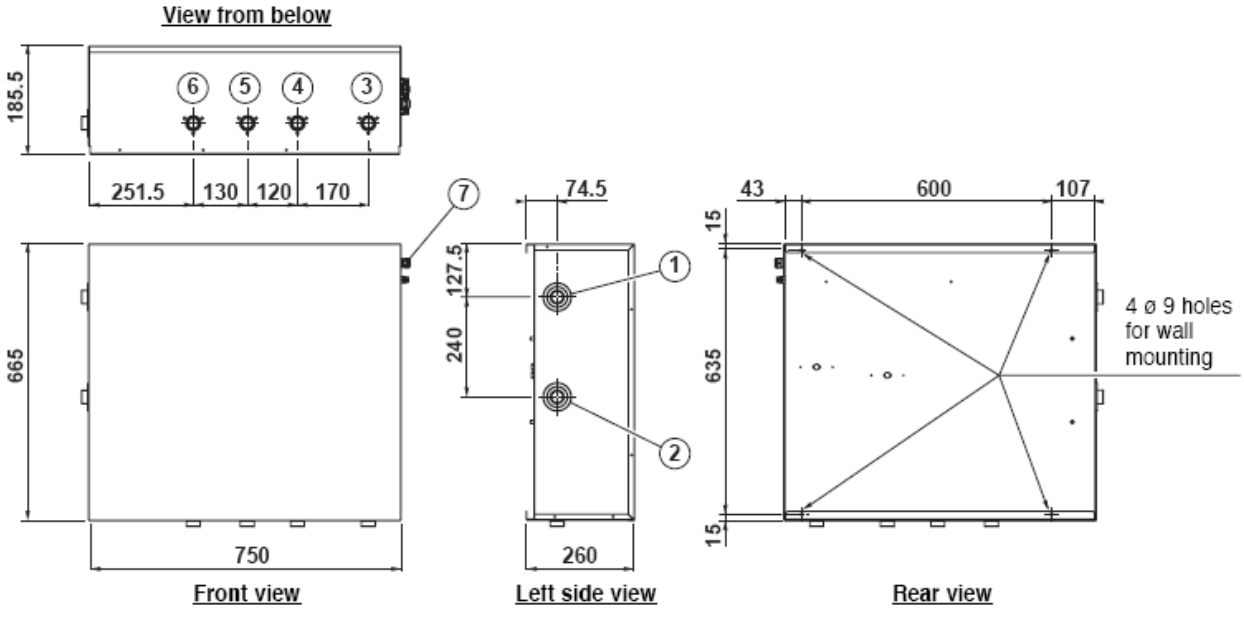


1.3.3 M2ZM : 2-zone mixed module

1	Module water inlet connection (heat pump side)
2	Module water outlet connection (heat pump side)
3	Outgoing connection, zone 1
4	Outgoing connection, zone 2
5	Return connection, zone 1
6	Return connection, zone 2
7	Holes for electric cables

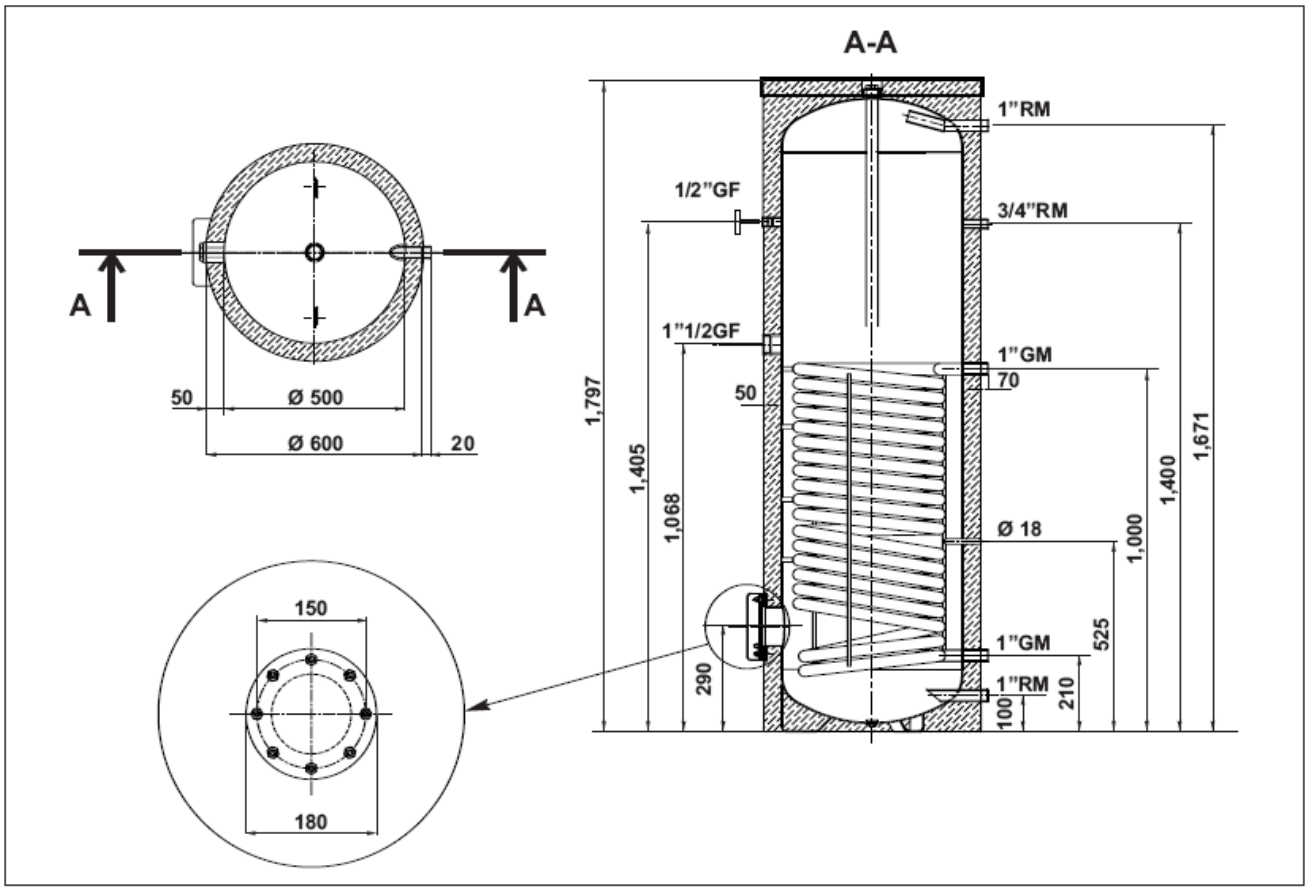
Weight (kg)
39

All connections are 1" male.

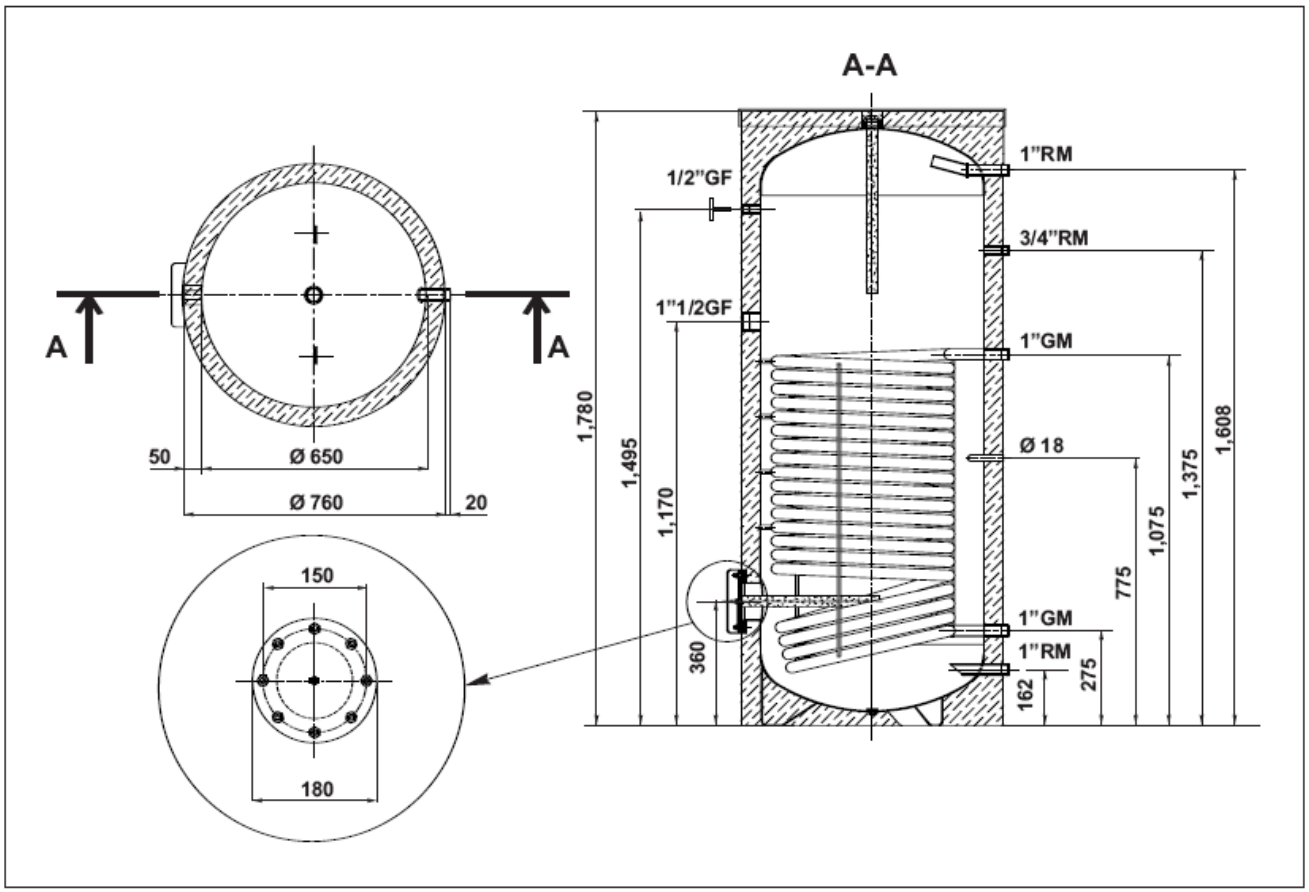


1.3.4 Domestic Hot Water Production Kit (KPECS)

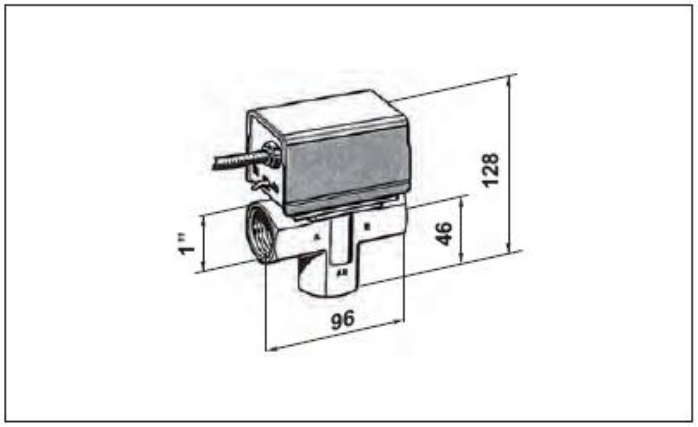
- 300-litre tank:



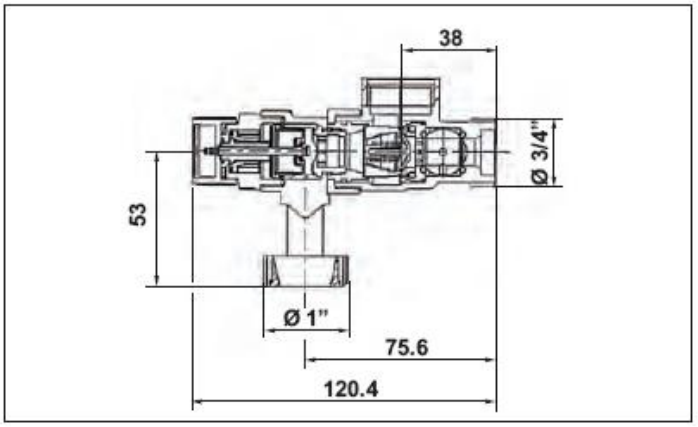
- 500-litre tank:



• 3-way valve:



• Safety valve:



1.4 Refrigerant and Water Flow Diagram

1.4.1 Water connections

• Connect the water pipes to the corresponding connections: See Ø and position section 1-3.
• Install the hydraulic filter (supplied) on the water intake. Connect it using 2 isolation valves (not supplied) for cleaning purposes.
• Install a shut-off valve (not supplied) if a fill / drainage connection is used.

NOTE:
"Water connection hose" accessories may be used (refer to the accessories catalogue).

Technibel Climatisation

REFRIGERANT FLOW DIAGRAM

PHRIA 10-14

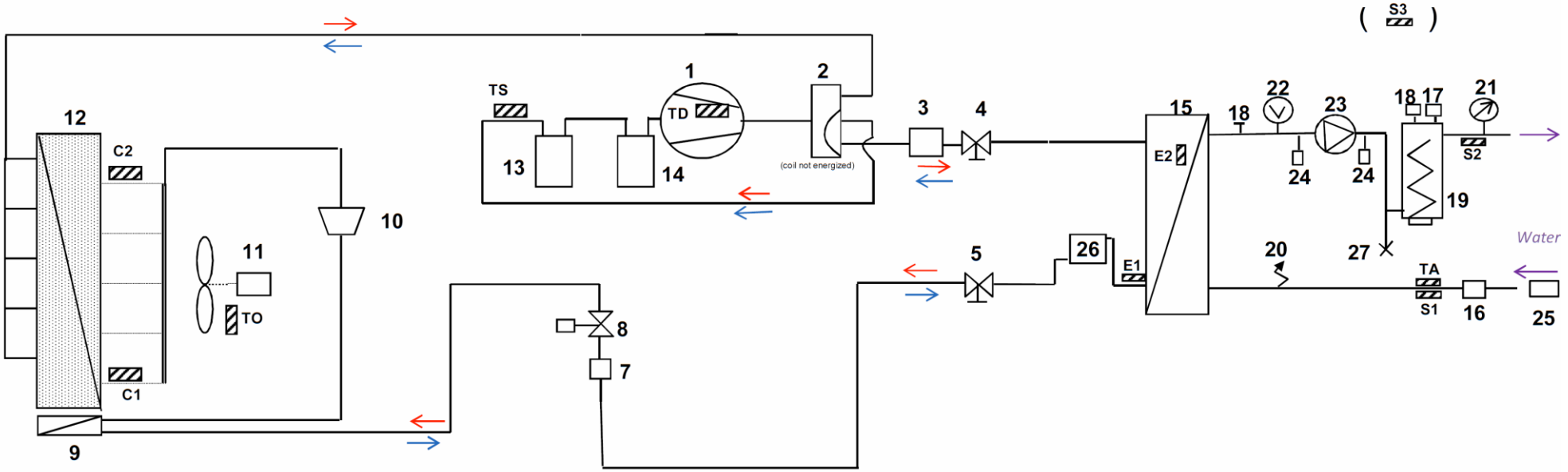
ind 01
FC, le 19/09/2009
(modif nom des sondes pac)

1 Compressor
2 4 way valve
3 Muffler (strainer included)
4 Gas line service valve
5 Liquid line service valve
7 Strainer
8 Electronic refrigerant control valve
9 Freeze-prevention coil
10 Distributor
11 Fan
12 Air heat exchanger
13 Accumulator
14 Accumulator attached to the compressor
15 Water heat exchanger
16 Water flow switch
17 Low pressure switch
18 air bleeder
19 Electric heater
20 Safety valve
21 Pressure gauge
22 Expansion tank
23 circulating pump
24 service connection
25 hydraulic filter
26 liquid receiver
27 filling / drainage

Temperature sensor for heat pump
TO = outdoor air temperature
C1 = air heat exchanger temperature 1
C2 = air heat exchanger temperature 2
TS = suction gas temperature
TD = discharge gas temperature
E1 = liquid temperature
E2 = heat exchanger middle point temperature
TA = water inlet temperature

S Temperature sensor for system
S1 = water inlet temperature
S2 = water outlet temperature
S3 = outdoor air temperature

heating mode
cooling mode



1.4.3 Water Flow Diagram

Here below, the different water flow diagram for the standard applications which are requested accessories not included with the PHRIA.
All the installations have to respect the water flow diagram like as explained below.

How the system is working ? :
The orders given by the control unit are transmitted (via a 2-wire BUS) to the various elements of the installation via:

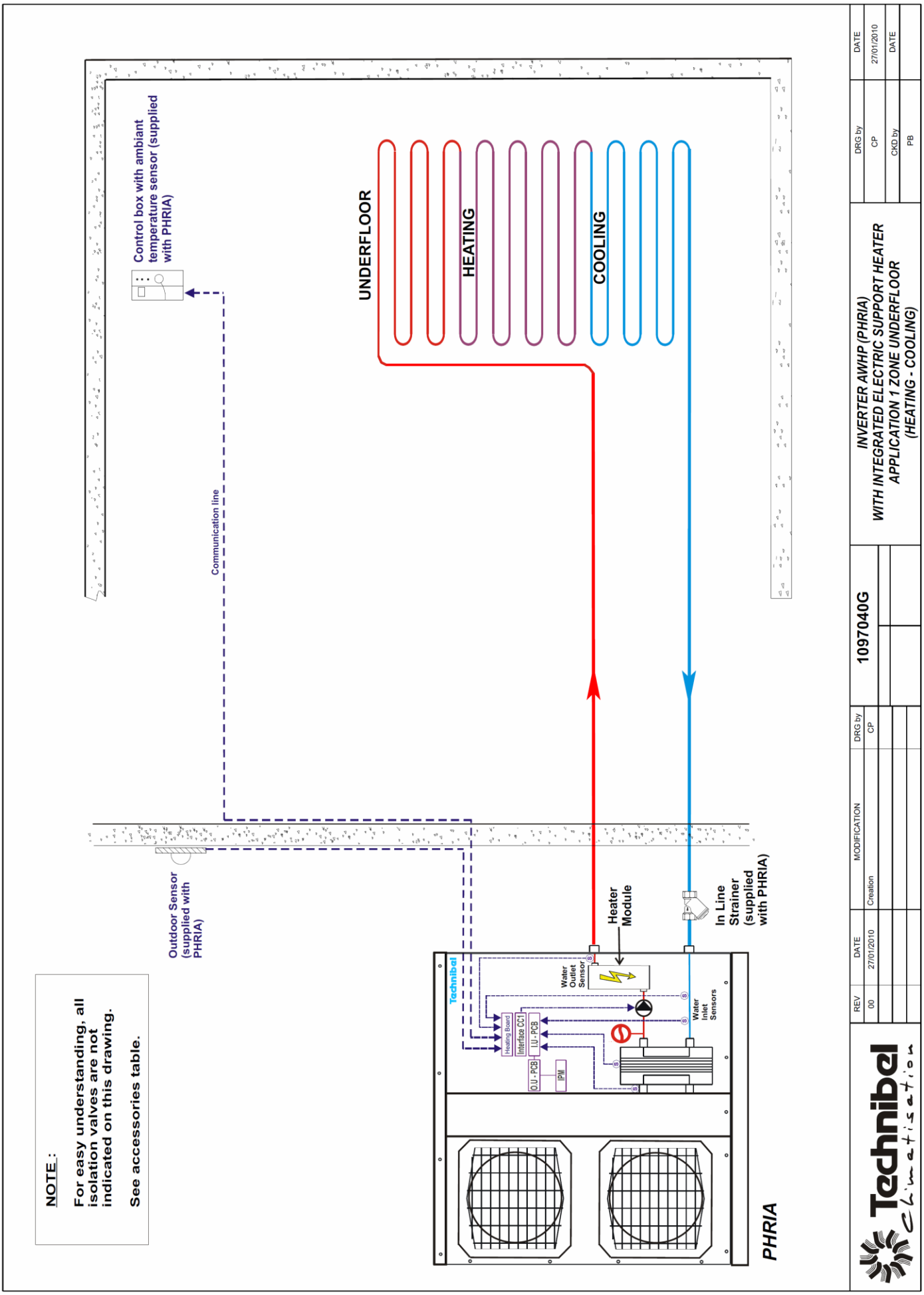
The heating control board A1 (located in the PHRIA) which controls the Inverter Gestion (via CC1) and the supplementary electric heating (located in the PHRIA), Zone boards, if any, which control the M2Z 2-zone modules and the domestic hot water board (Domestic Hot Water - KPECS), if any.

The control unit's rotating knob is used to select the desired operating mode:

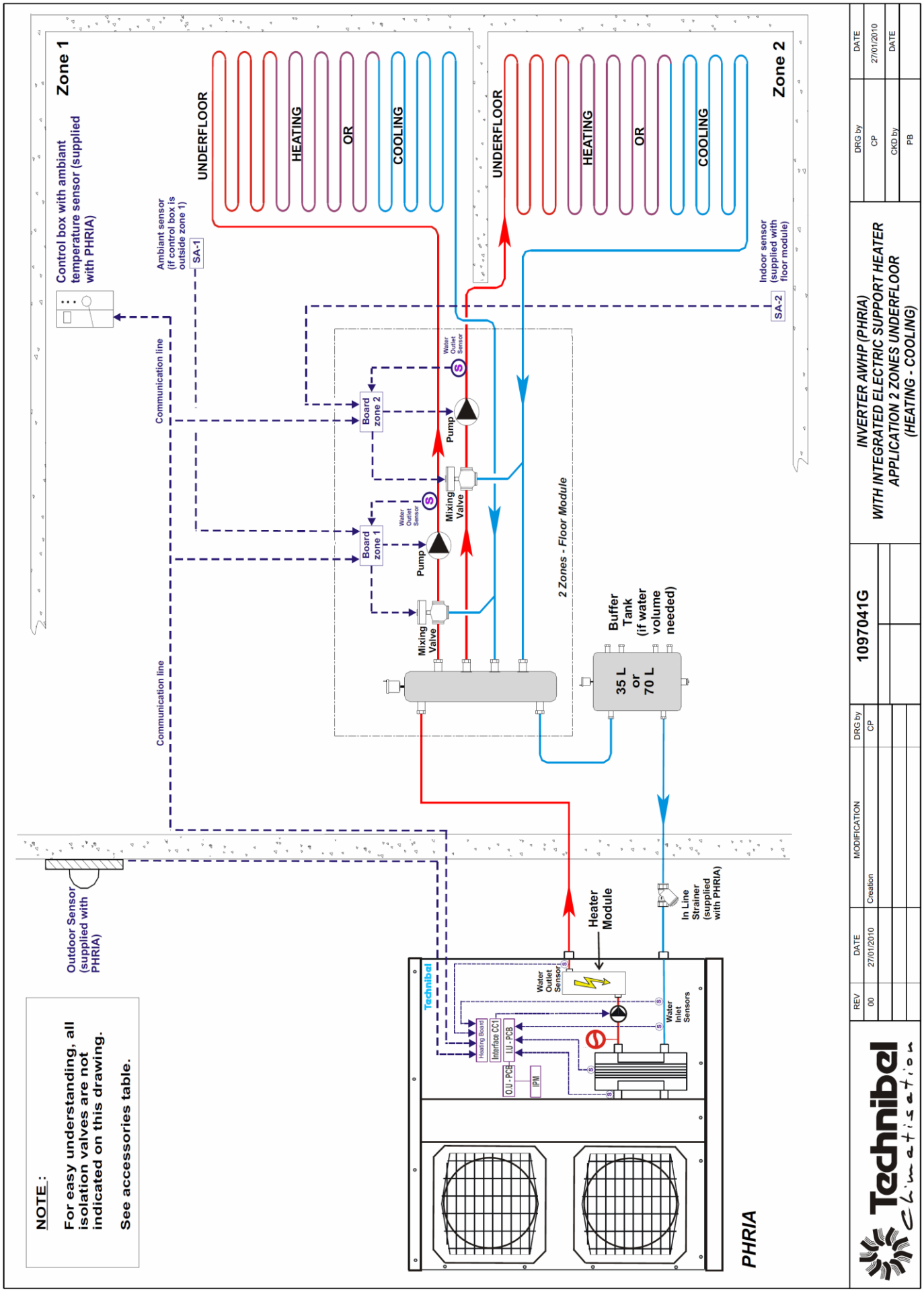
- Heating :
  The Inverter Gestion and any supplementary electric heating are controlled in relation to a setpoint resulting from the water temperature calculated according to a water rule (according to the outside temperature).

- Cooling (for applications compatible with this mode) :
  The Inverter Gestion is controlled according to its setpoint (based on the ambient temperature for floor applications).

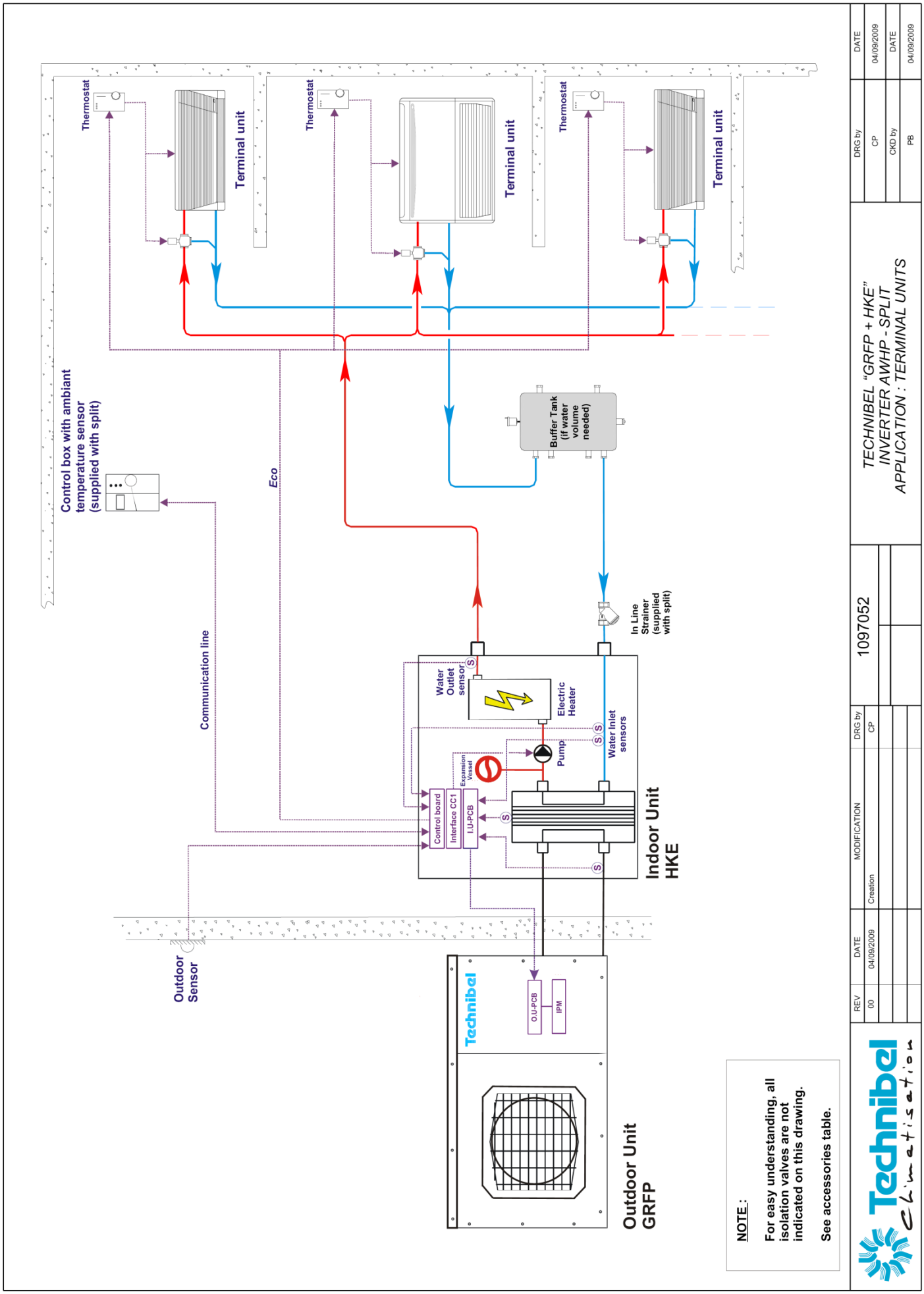
1.4.3.1 APPLICATION: 1 ZONE UNDERFLOOR(S < 150 m2)



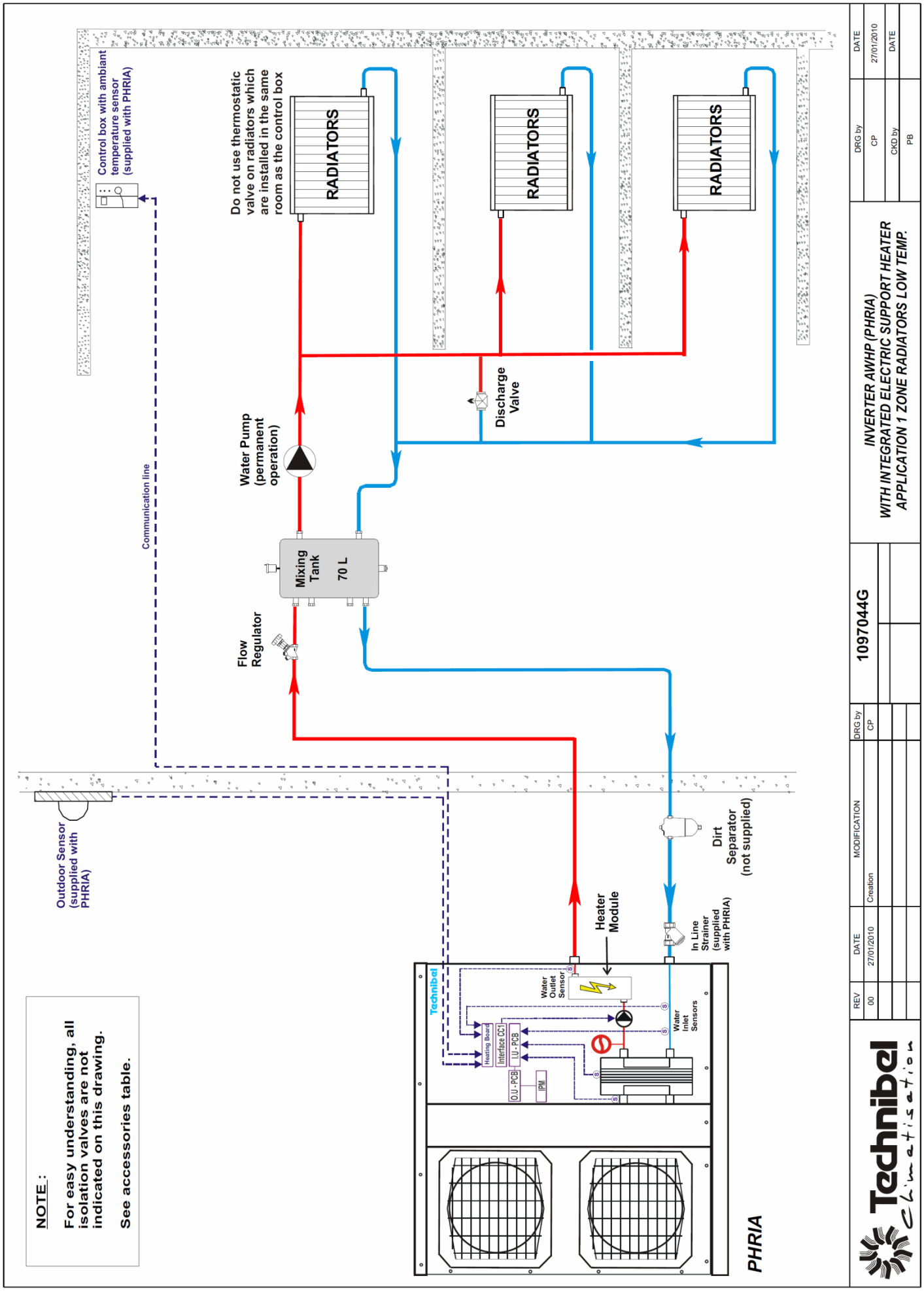
1.4.3.2 APPLICATION: 2 ZONES UNDERFLOOR (S > 150 m2)



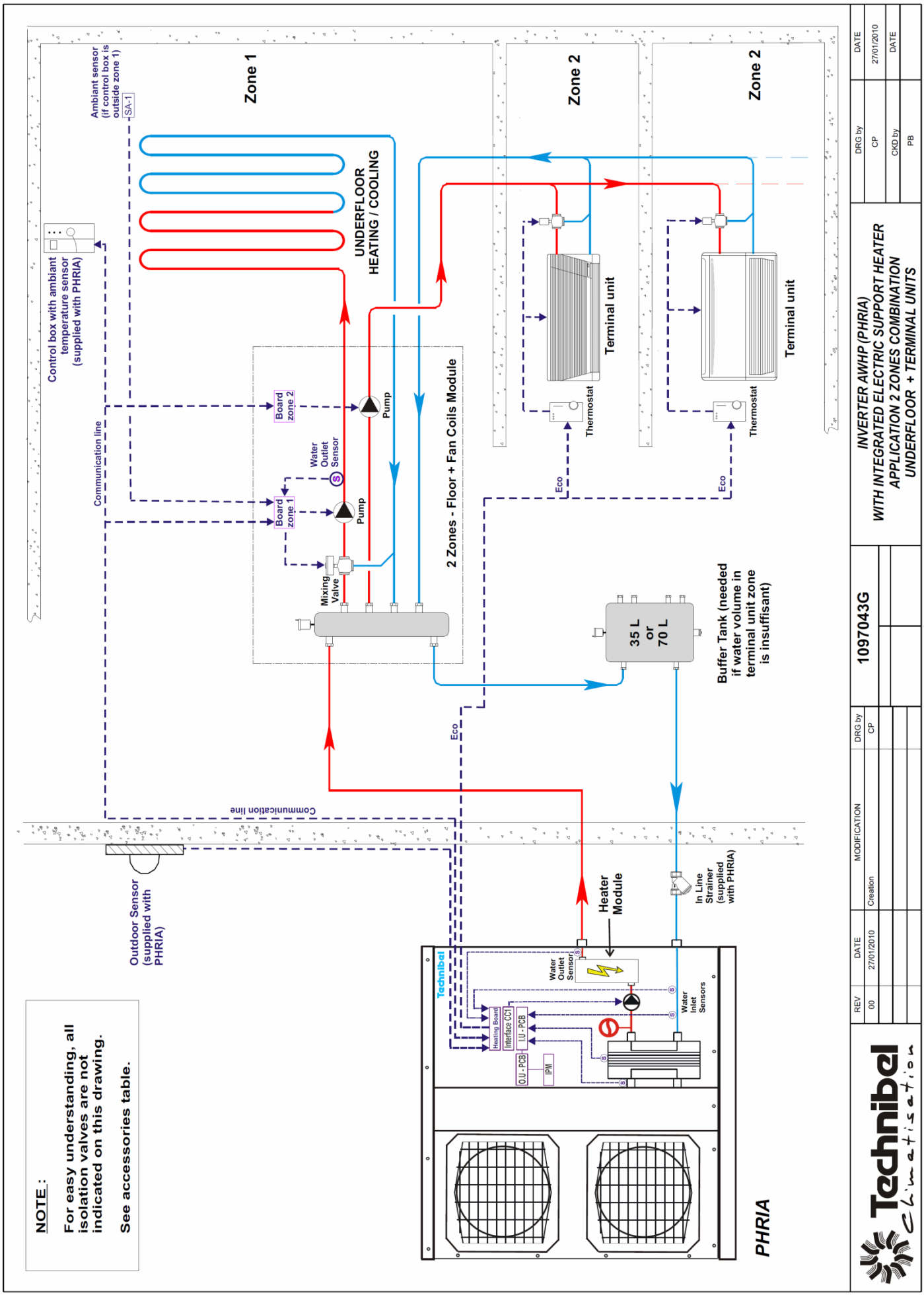
1.4.3.3 APPLICATION: TERMINAL UNITS



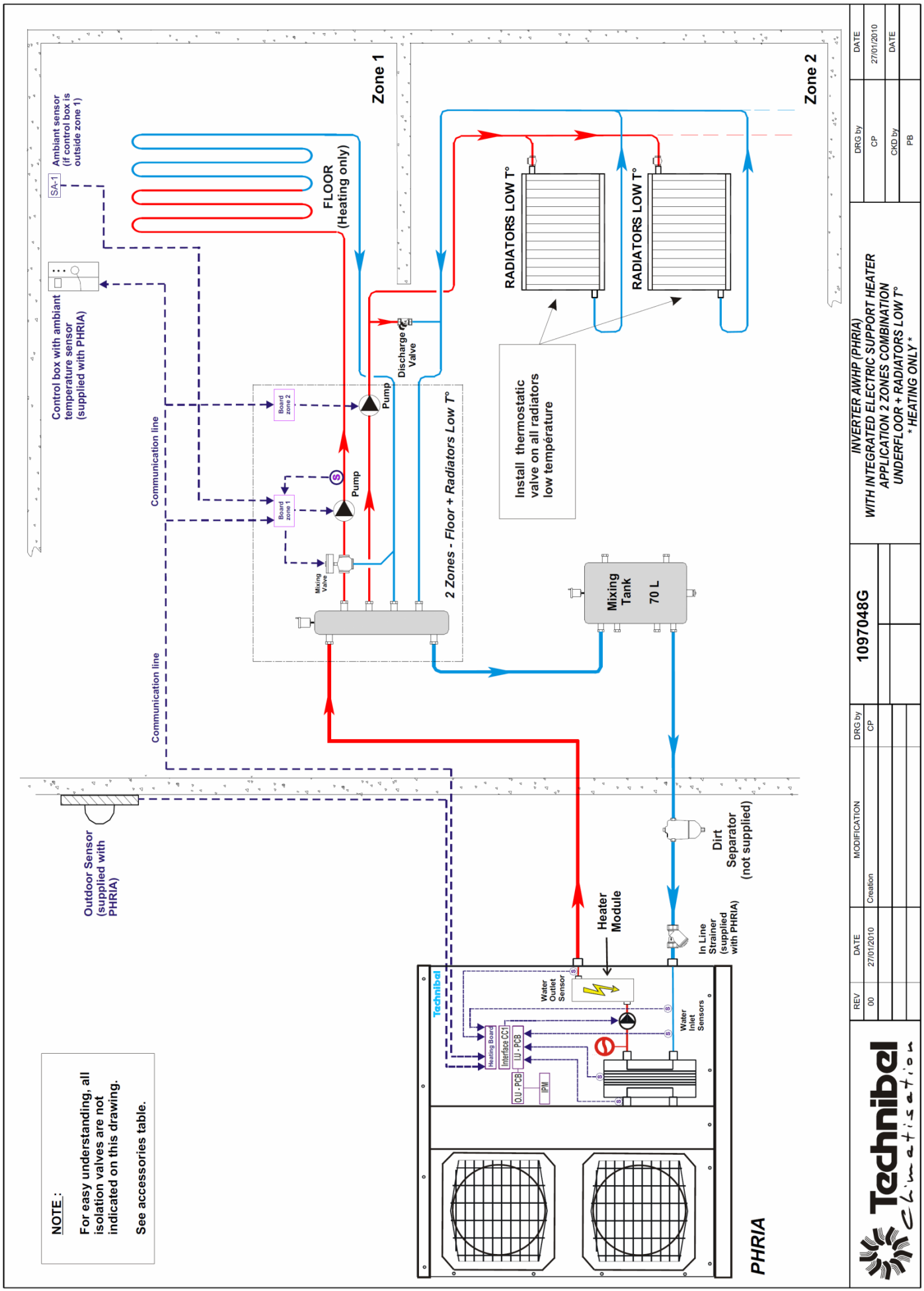
1.4.3.4 APPLICATION : 1 ZONE RADIATORS LOW T°



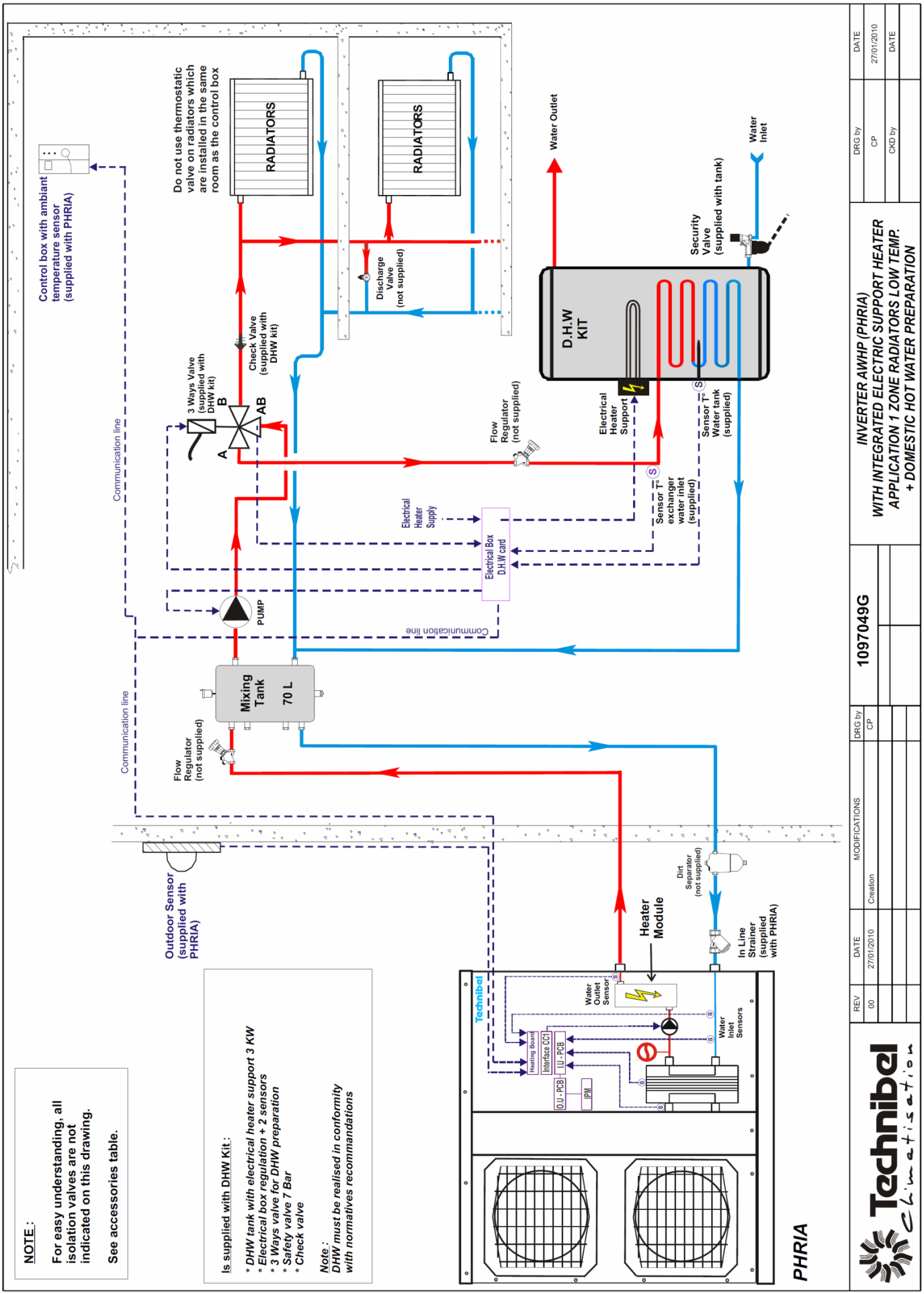
1.4.3.5 APPLICATION: 2 ZONES COMBINATION UNDERFLOOR + TERMINAL UNITS



1.4.3.6 Application: 2 Zones UNDERFLOOR + Radiators Low Temperature



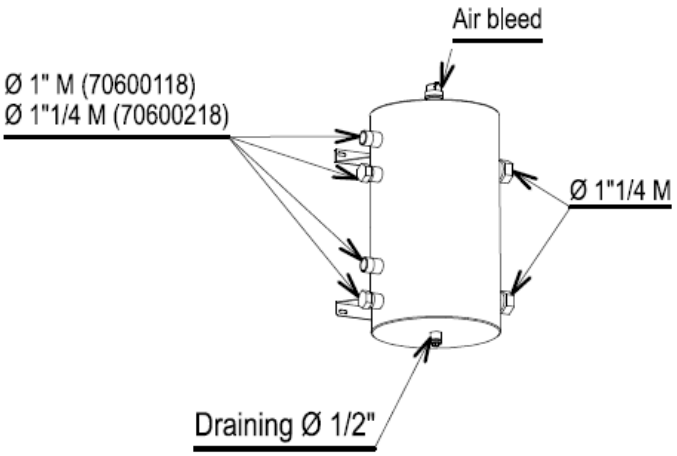
1.4.3.7 Application: 1 Zone Radiators Low Temperature + Domestic Hot Water (DHW)



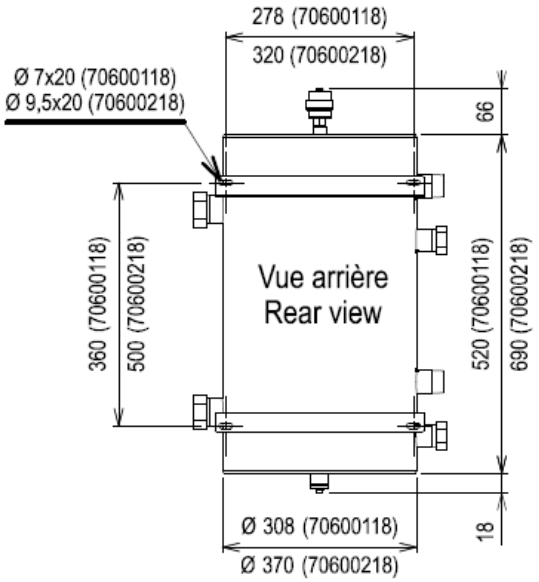
1.4.3.8 Buffer or mixing Tank

70600118 (35L) - 70600218 (70L)
Buffer or mixing tank

DESCRIPTION :

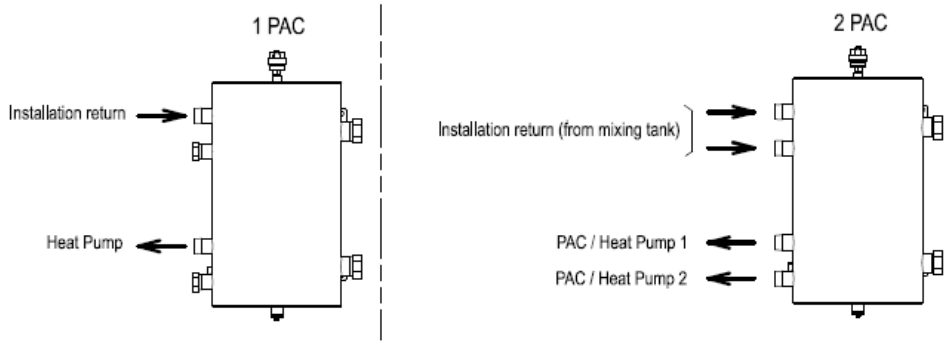


- Insulation : Polyethylene

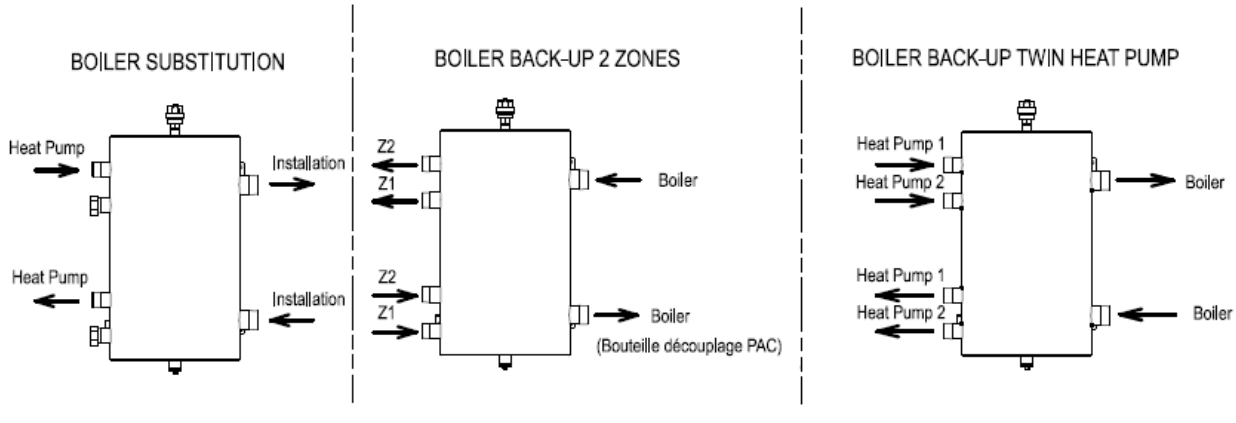


INSTALLATION :

BUFFER TANK



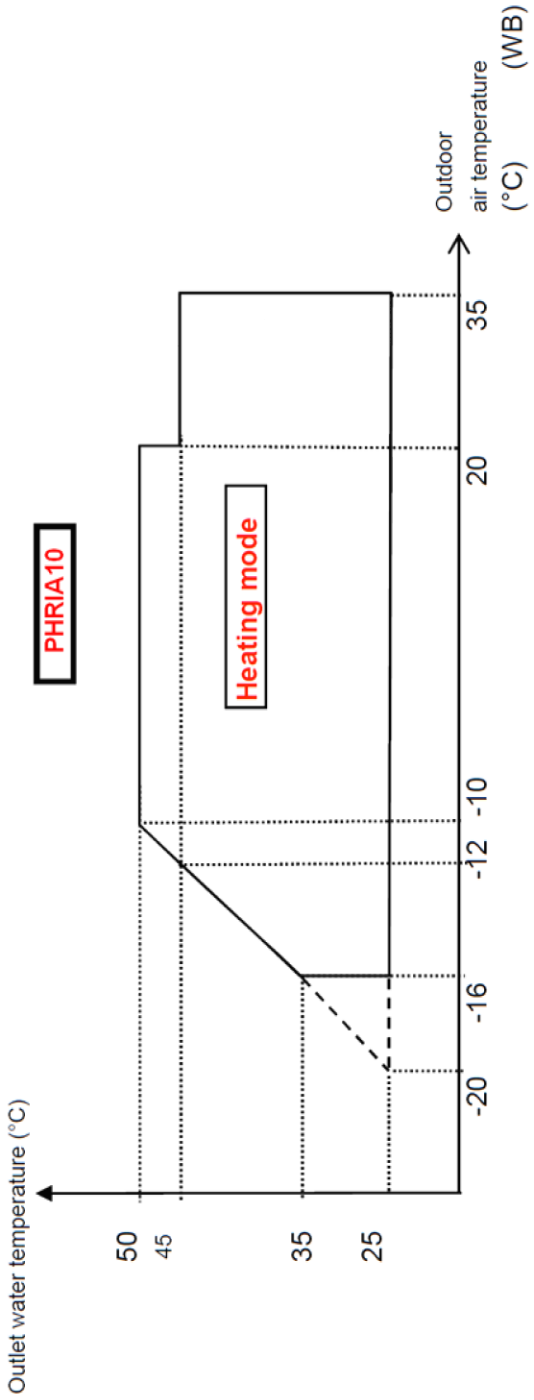
MIXING TANK

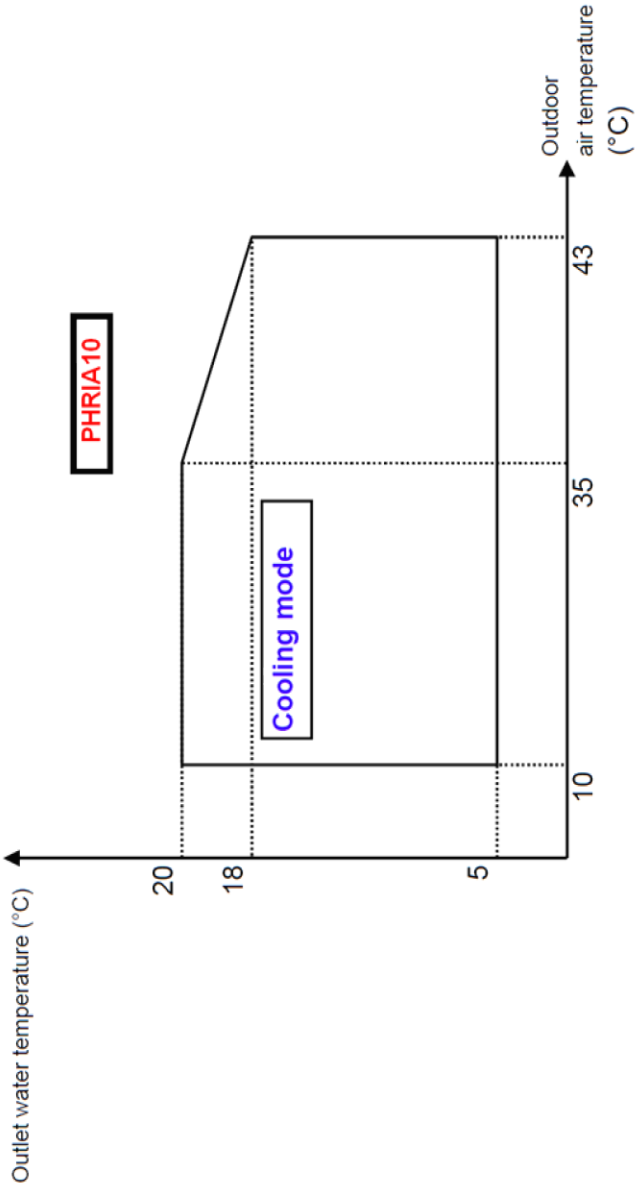


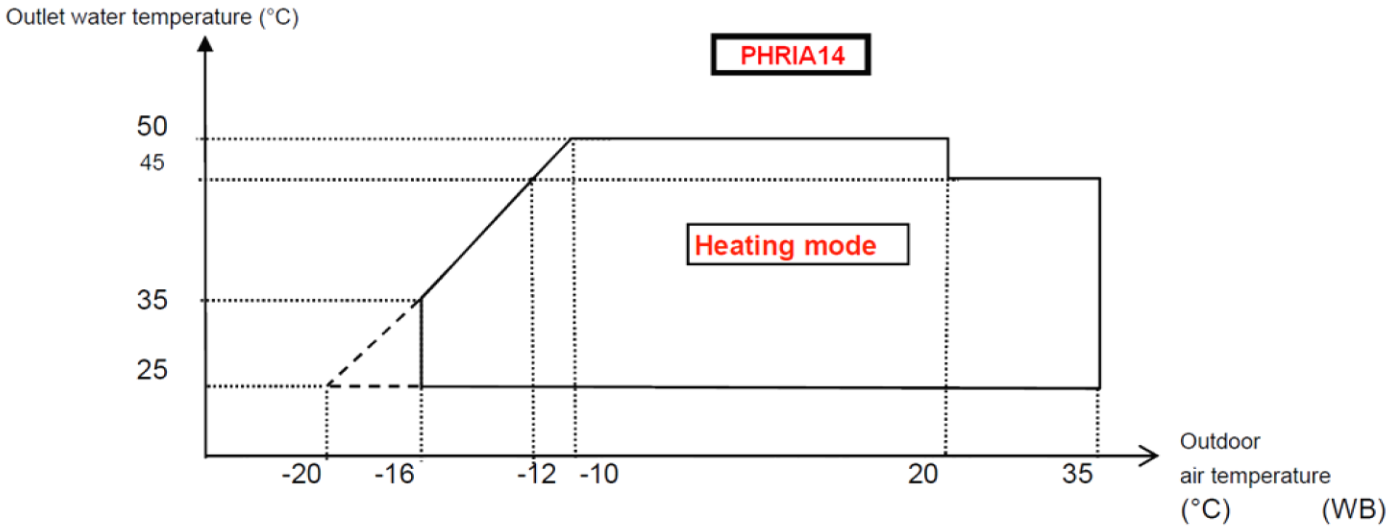
1011528-00

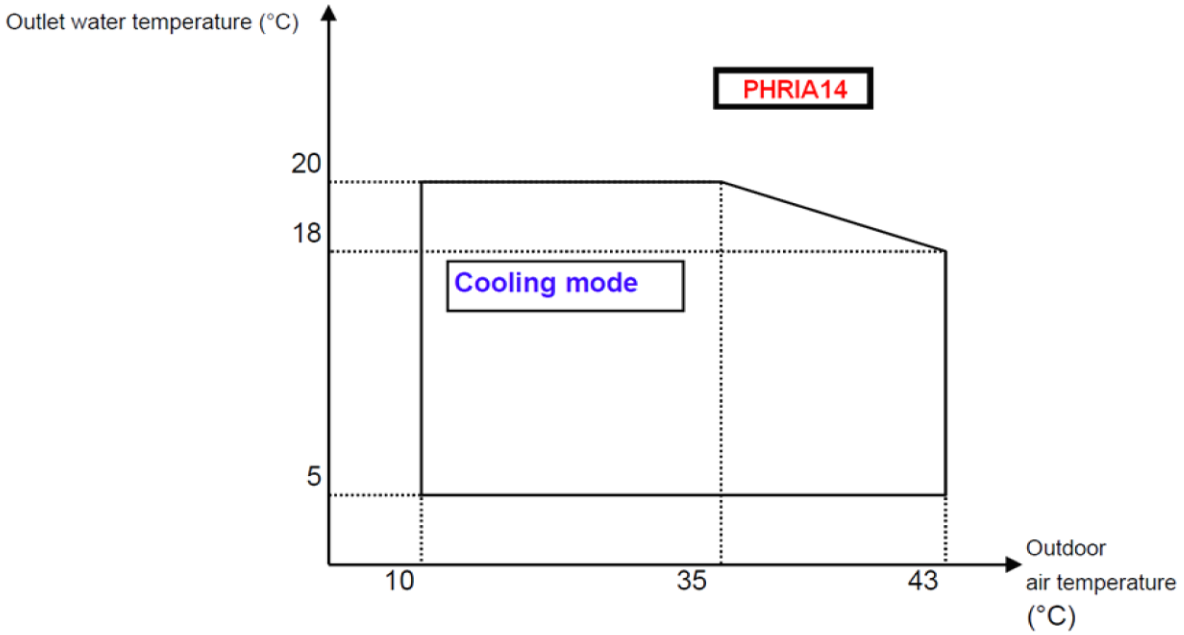
1.5 Operating Range

- Water system pressure: 2 bar
- Operating limits:






Outlet water temperature (°C)
PHRIA14
50
45
35
25
Heating mode
-20
-16
-12
-10
20
35
Outdoor
air temperature
(°C)
(WB)


Outlet water temperature (°C)
PHRIA14
20
18
5
Cooling mode
10
35
43
Outdoor
air temperature
(°C)

1.6 Capacity correction Graph

1.6.1 Capacity PHRIA10

MAXIMUM Heating Capacity (KW)			
		Outlet water temp (°C)	
		35	45
Outdoor air intake temp (°C WB)	-20	6,02	
	-19	6,32	
	-18	6,57	
	-17	6,77	
	-16	6,93	
	-15	7,04	
	-14	7,15	
	-13	7,26	
	-12	7,36	6,09
	-11	7,47	6,22
	-10	7,58	6,36
	-9	7,69	6,49
	-8	7,80	6,63
	-7	7,91	6,77
	-6	8,02	6,90
	-5	8,12	7,04
	-4	8,23	7,17
	-3	8,34	7,31
	-2	8,45	7,44
	-1	8,56	7,58
	0	8,67	7,71
	1	8,78	7,85
	2	9,66	8,41
	3	10,55	8,98
	4	11,44	9,54
	5	12,32	10,11
	6	13,21	10,67
	7	13,40	10,82
	8	13,59	10,96
	9	13,79	11,11
	10	13,98	11,25
	11	14,17	11,40
	12	14,37	11,54
	13	14,56	11,69
	14	14,75	11,83
	15	14,94	11,98
	16	15,14	12,12
	17	15,33	12,27
	18	15,52	12,41
	19	15,72	12,56
	20	15,91	12,70

COP mini		
	Outlet water temp (°C)	
	35	45
	1,71	
	1,80	
	1,87	
	1,92	
	1,96	
	1,99	
	2,02	
	2,05	
	2,08	1,75
	2,11	1,78
	2,14	1,82
	2,17	1,86
	2,20	1,89
	2,23	1,93
	2,26	1,97
	2,29	2,01
	2,32	2,04
	2,35	2,08
	2,38	2,12
	2,41	2,15
	2,44	2,19
	2,47	2,23
	2,72	2,38
	2,97	2,54
	3,21	2,70
	3,46	2,86
	3,71	3,01
	3,79	3,08
	3,87	3,14
	3,96	3,20
	4,04	3,27
	4,13	3,34
	4,22	3,40
	4,31	3,47
	4,40	3,54
	4,49	3,61
	4,58	3,68
	4,68	3,76
	4,78	3,83
	4,87	3,91
	4,97	3,99

Input Power at MAXIMUM Capacity (KW)			
		Outlet water temp (°C)	
		35	45
Outdoor air intake temp (°C WB)	-20	3,52	
	-19	3,52	
	-18	3,52	
	-17	3,53	
	-16	3,53	
	-15	3,53	
	-14	3,53	
	-13	3,53	
	-12	3,53	3,49
	-11	3,54	3,49
	-10	3,54	3,49
	-9	3,54	3,50
	-8	3,54	3,50
	-7	3,54	3,50
	-6	3,54	3,51
	-5	3,54	3,51
	-4	3,55	3,51
	-3	3,55	3,51
	-2	3,55	3,52
	-1	3,55	3,52
	0	3,55	3,52
	1	3,55	3,53
	2	3,55	3,53
	3	3,56	3,53
	4	3,56	3,53
	5	3,56	3,54
	6	3,56	3,54
	7	3,53	3,52
	8	3,51	3,49
	9	3,48	3,47
	10	3,46	3,44
	11	3,43	3,42
	12	3,41	3,39
	13	3,38	3,37
	14	3,35	3,34
	15	3,33	3,32
	16	3,30	3,29
	17	3,28	3,27
	18	3,25	3,24
	19	3,23	3,21
	20	3,20	3,18

The defrosting has been included in the heating data here enclosed.

Capacity PHRIA10

MAXIMUM Cooling Capacity (KW)

Outdoor air intake temp (°C DB)	Outlet water temp (°C) 7	18
25	10,25	15,30
26	10,13	15,00
27	10,00	14,70
28	9,88	14,40
29	9,75	14,10
30	9,63	13,80
31	9,50	13,50
32	9,38	13,20
33	9,25	12,90
34	9,13	12,60
35	9,00	12,30
36	8,53	11,65
37	8,05	11,00
38	7,58	10,35
39	7,10	9,70
40	6,63	9,05
41	6,15	8,40
42	5,68	7,75
43	5,20	7,10

EER mini

Outlet water temp (°C) 7	18
3,78	4,78
3,66	4,67
3,55	4,55
3,44	4,44
3,33	4,34
3,23	4,23
3,13	4,12
3,04	4,01
2,94	3,90
2,86	3,80
2,77	3,69
2,66	3,55
2,54	3,40
2,42	3,25
2,30	3,09
2,18	2,93
2,05	2,76
1,92	2,59
1,78	2,41

Input Power at MAXIMUM Capacity (KW)

Outdoor air intake temp (°C DB)	Outlet water temp (°C) 7	18
25	2,71	3,20
26	2,76	3,21
27	2,82	3,23
28	2,87	3,24
29	2,93	3,25
30	2,98	3,27
31	3,03	3,28
32	3,09	3,29
33	3,14	3,30
34	3,20	3,32
35	3,25	3,33
36	3,21	3,28
37	3,17	3,24
38	3,13	3,19
39	3,09	3,14
40	3,04	3,09
41	3,00	3,05
42	2,96	3,00
43	2,92	2,95

1.6.2 Capacity PHRIA14

MAXIMUM Heating Capacity (KW)			
		Outlet water temp (°C)	
		35	45
Outdoor air intake temp (°C WB)	-20	6,84	
	-19	7,24	
	-18	7,64	
	-17	7,94	
	-16	8,23	
	-15	8,41	
	-14	8,58	
	-13	8,75	
	-12	8,92	7,42
	-11	9,09	7,56
	-10	9,27	7,69
	-9	9,44	7,83
	-8	9,61	7,96
	-7	9,78	8,10
	-6	9,95	8,23
	-5	10,13	8,37
	-4	10,30	8,50
	-3	10,47	8,63
	-2	10,64	8,77
	-1	10,81	8,90
	0	10,99	9,04
	1	11,16	9,17
	2	11,93	9,94
	3	12,70	10,70
	4	13,46	11,47
	5	14,23	12,23
	6	15,00	13,00
	7	15,14	13,09
	8	15,29	13,17
	9	15,43	13,26
	10	15,57	13,34
	11	15,72	13,43
	12	15,86	13,52
	13	16,00	13,60
	14	16,14	13,69
	15	16,29	13,77
	16	16,43	13,86
	17	16,57	13,95
	18	16,72	14,03
	19	16,86	14,12
	20	17,00	14,20

COP mini			
		Outlet water temp (°C)	
		35	45
Outdoor air intake temp (°C WB)	-20	1,60	
	-19	1,69	
	-18	1,78	
	-17	1,85	
	-16	1,92	
	-15	1,96	
	-14	2,00	
	-13	2,04	
	-12	2,08	1,72
	-11	2,12	1,75
	-10	2,16	1,78
	-9	2,21	1,81
	-8	2,25	1,85
	-7	2,29	1,88
	-6	2,33	1,91
	-5	2,37	1,94
	-4	2,41	1,98
	-3	2,45	2,01
	-2	2,50	2,04
	-1	2,54	2,07
	0	2,58	2,10
	1	2,62	2,14
	2	2,80	2,32
	3	2,98	2,50
	4	3,17	2,68
	5	3,35	2,86
	6	3,53	3,04
	7	3,57	3,06
	8	3,60	3,08
	9	3,63	3,10
	10	3,67	3,12
	11	3,70	3,14
	12	3,74	3,16
	13	3,77	3,18
	14	3,81	3,20
	15	3,84	3,22
	16	3,88	3,24
	17	3,91	3,27
	18	3,95	3,29
	19	3,98	3,31
	20	4,02	3,33

Input Power at MAXIMUM Capacity (KW)			
		Outlet water temp (°C)	
		35	45
Outdoor air intake temp (°C WB)	-20	4,28	
	-19	4,28	
	-18	4,29	
	-17	4,29	
	-16	4,29	
	-15	4,29	
	-14	4,29	
	-13	4,29	
	-12	4,29	4,32
	-11	4,28	4,32
	-10	4,28	4,32
	-9	4,28	4,31
	-8	4,28	4,31
	-7	4,28	4,31
	-6	4,27	4,31
	-5	4,27	4,31
	-4	4,27	4,30
	-3	4,27	4,30
	-2	4,27	4,30
	-1	4,26	4,30
	0	4,26	4,30
	1	4,26	4,29
	2	4,26	4,29
	3	4,26	4,29
	4	4,25	4,29
	5	4,25	4,29
	6	4,25	4,28
	7	4,25	4,28
	8	4,25	4,28
	9	4,25	4,28
	10	4,24	4,28
	11	4,24	4,28
	12	4,24	4,28
	13	4,24	4,28
	14	4,24	4,27
	15	4,24	4,27
	16	4,24	4,27
	17	4,24	4,27
	18	4,24	4,27
	19	4,24	4,27
	20	4,23	4,27

The defrosting has been included in the heating data here enclosed.

Capacity PHRIA14

MAXIMUM Cooling Capacity (KW)

Outdoor air intake temp (°C DB)	Outlet water temp (°C)	
	7	18
25	12,83	16,10
26	12,55	15,75
27	12,27	15,40
28	11,99	15,05
29	11,71	14,70
30	11,43	14,37
31	11,15	14,07
32	10,87	13,77
33	10,59	13,47
34	10,31	13,17
35	10,03	12,90
36	9,55	12,65
37	9,07	12,40
38	8,59	12,15
39	8,12	11,90
40	7,64	11,65
41	7,16	11,40
42	6,68	11,15
43	6,20	10,90

COP mini

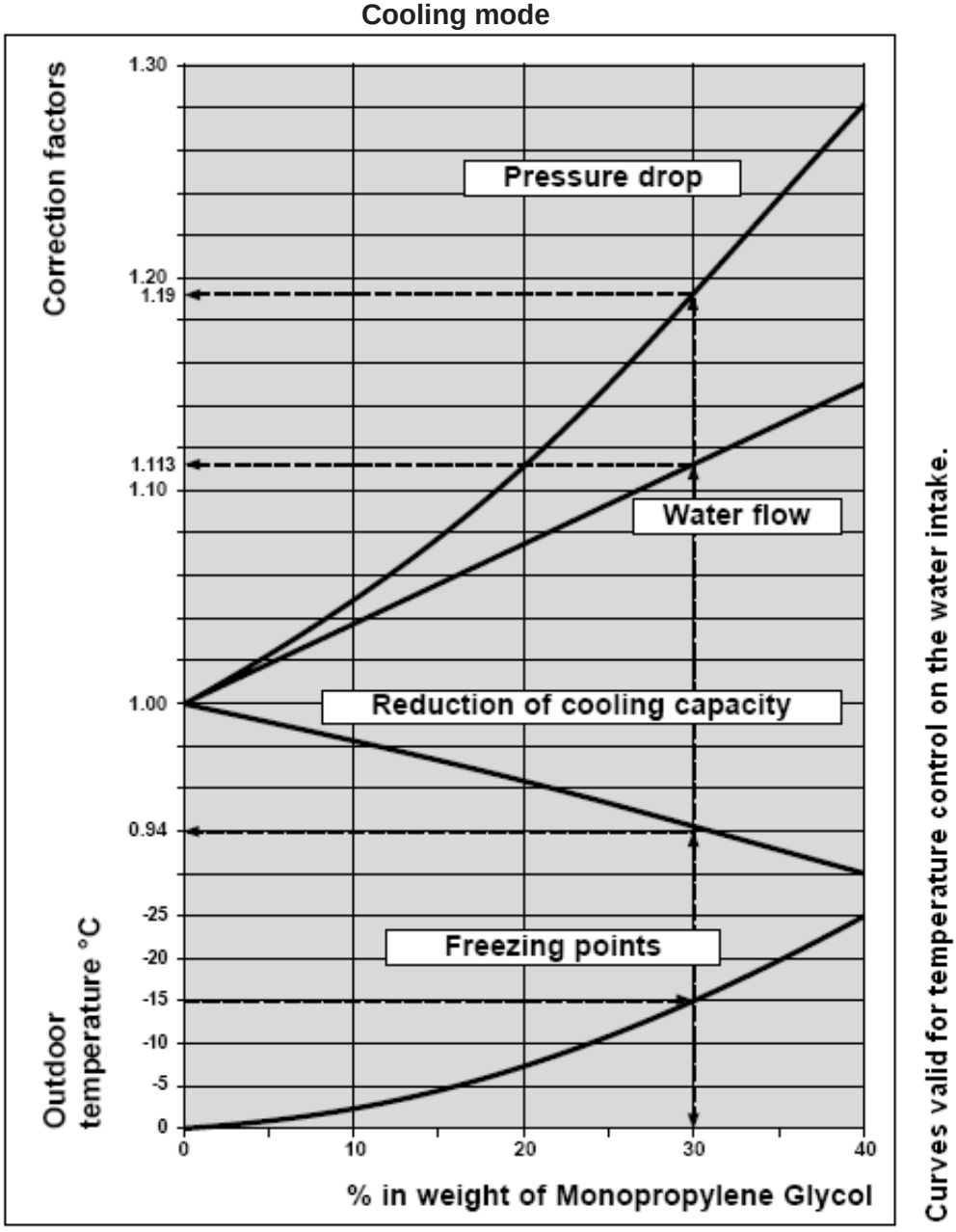
Outlet water temp (°C)	
7	18
3,26	3,94
3,18	3,84
3,09	3,75
3,01	3,65
2,92	3,56
2,84	3,47
2,75	3,39
2,67	3,30
2,59	3,22
2,51	3,14
2,43	3,07
2,32	3,03
2,22	2,98
2,11	2,94
2,01	2,90
1,90	2,85
1,79	2,80
1,68	2,76
1,57	2,71

Input Power at MAXIMUM Capacity (KW)

Outdoor air intake temp (°C DB)	Outlet water temp (°C)	
	7	18
25	3,93	4,09
26	3,95	4,10
27	3,97	4,11
28	3,99	4,12
29	4,01	4,13
30	4,03	4,15
31	4,05	4,16
32	4,07	4,17
33	4,09	4,18
34	4,11	4,19
35	4,13	4,20
36	4,11	4,18
37	4,09	4,16
38	4,07	4,13
39	4,05	4,11
40	4,02	4,09
41	4,00	4,07
42	3,98	4,04
43	3,96	4,02

1.6.3 Graph correction factors according to percentage of ANTI-FREEZE

1.6.3.1 Cooling mode



Use monopropylene glycol.

A minimum rate of 15% to 20% is needed to avoid any risk of corrosion.

Choose the percentage of glycol according to the minimum temperature to protect the hydraulic circuit against frost and determine the coefficients to be applied to the power, the water flow rate and the pressure drop.

Example:
• Protection at an external temperature of -15°C, which gives 30% glycol ("Freezing points" curve).
• The "Reduction of cooling capacity" curve gives the coefficient to be applied to the refrigerating capacity (0.94).
• The "Water flow" curve gives the coefficient to be applied to the water flow rate (1,113).
• The "Pressure drop" curve gives the coefficient to be applied to the pressure drop (1,19).

1.6.3.2 Heating mode

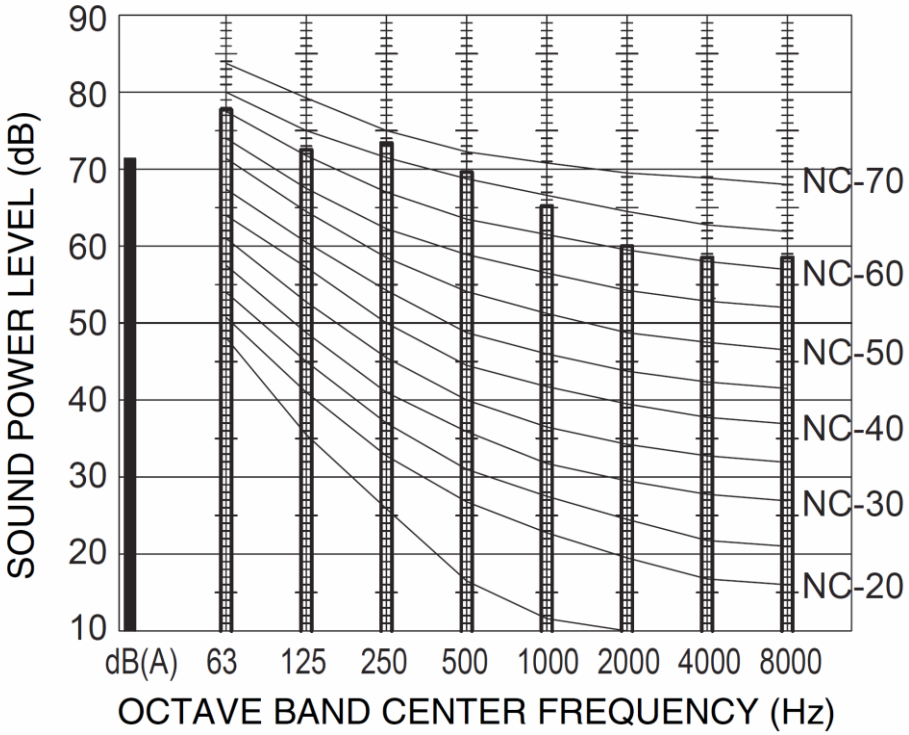
Performance correction with 30% glycol (protection to -15° C):

- Heating capacity = coefficient 1
- Water flow = coefficient 1,04
- Loss of water pressure = coefficient 1,23

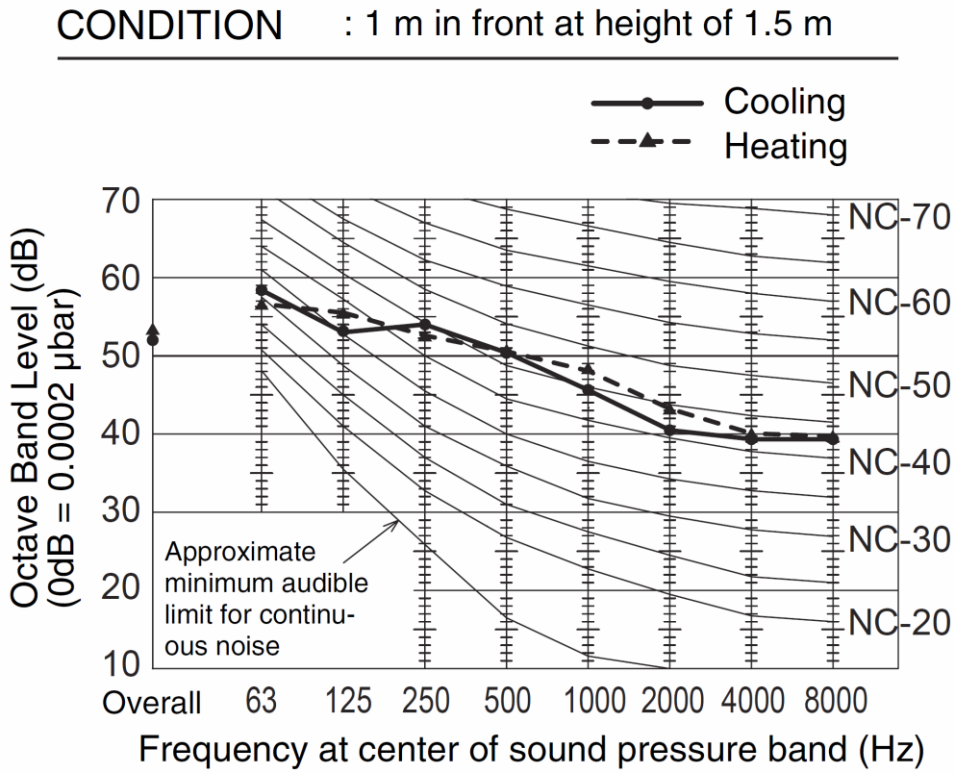
1.7 Noise Curves

All the sound powers and sound levels are at nominal conditions.

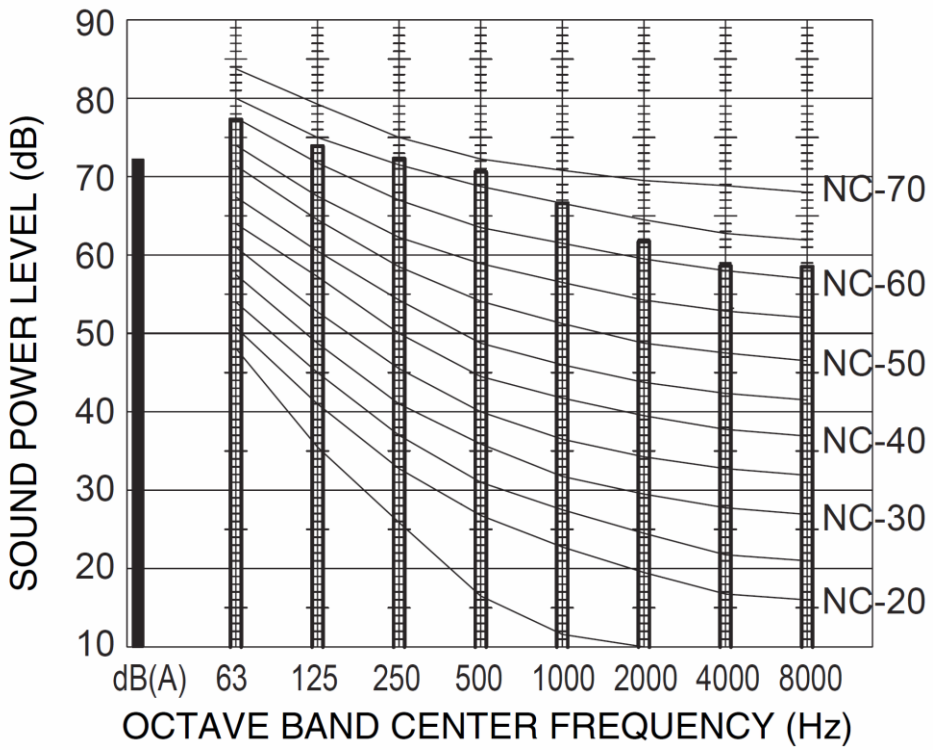
1.7.1 PHRIA10: Sound Power Level



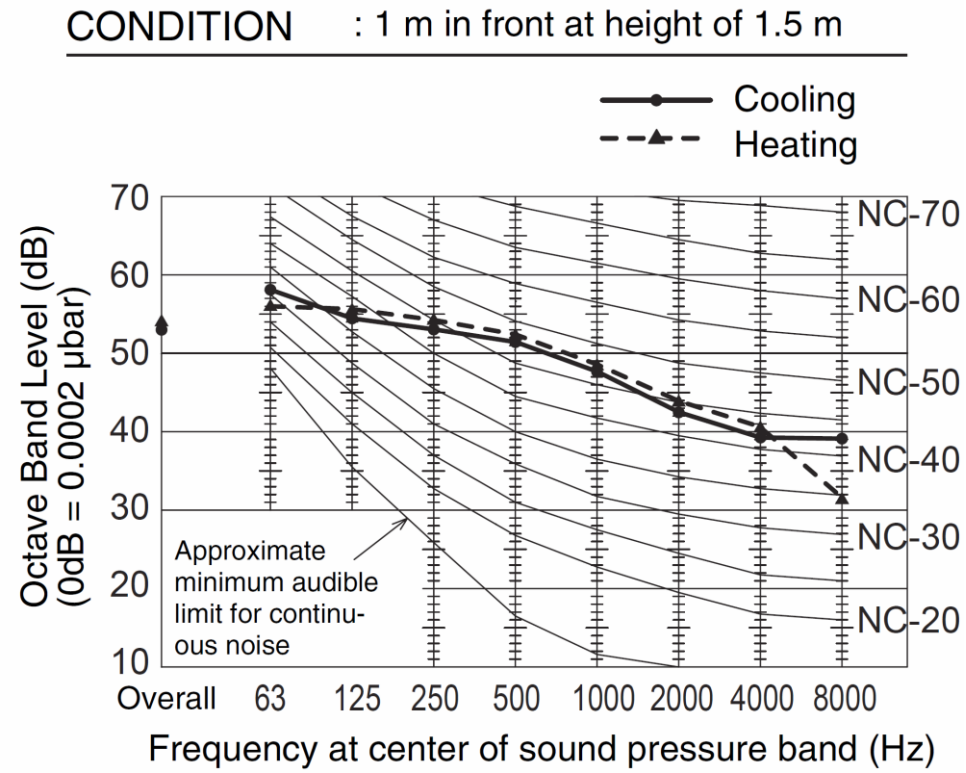
1.7.2 PHRIA10: Sound Level



1.7.3 PHRIA14: Sound Power Level



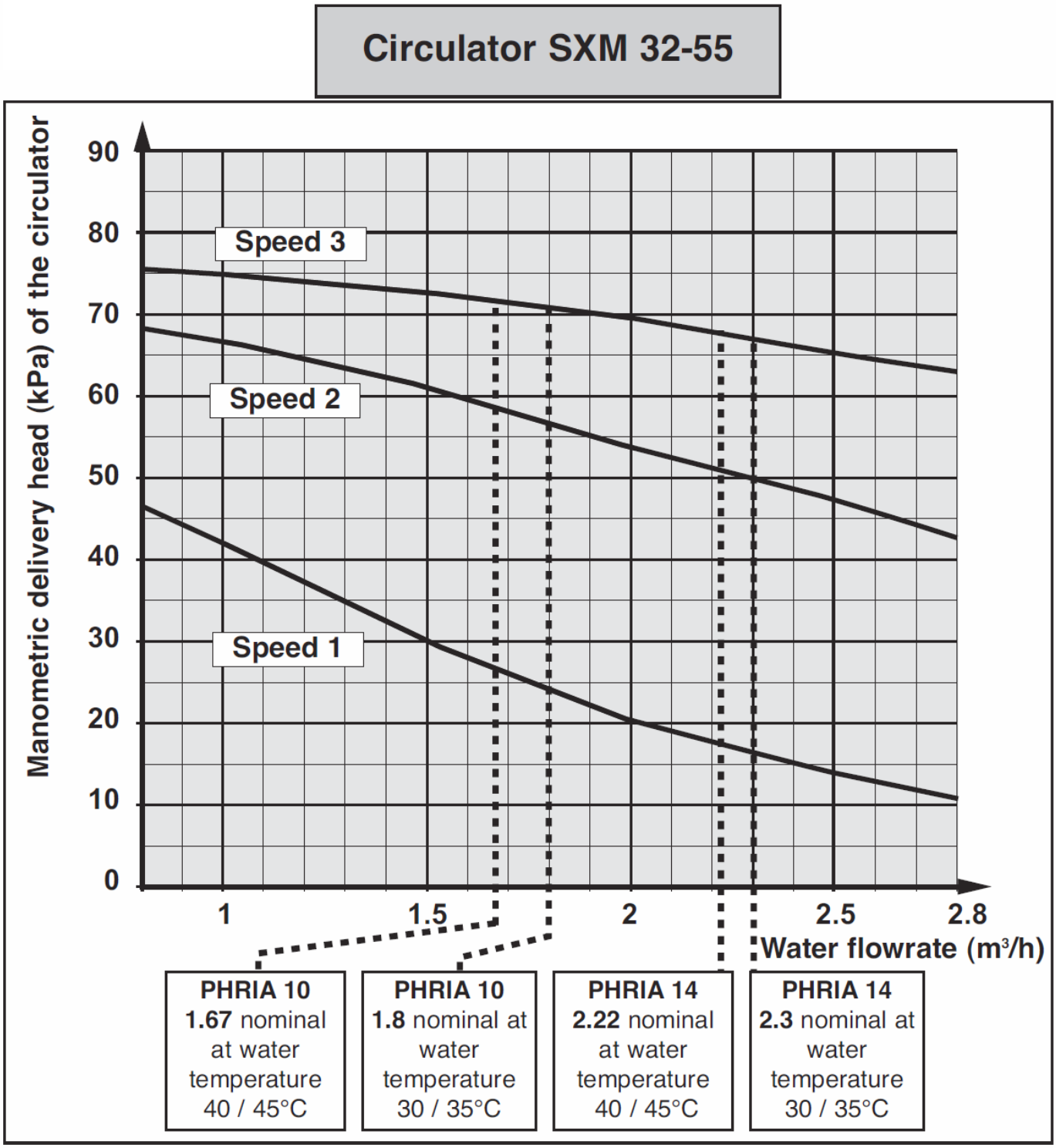
1.7.4 PHRIA14: Sound Level



1.8 Water pump Performance

1.8.1 PHRIA: Circulator curves

How to measure the pressure loss and so to find the water flow rate ? :
The PHRIA's outgoing water lines are equipped with 1/4 SAE pressure taps at the inlet and outlet of each circulator, to enable the pressure loss to be measured using a hydraulic pressure gauge.
Use the following circulator curves below to find the water flow rate.



1.8.2 PHRIA: Flow estimation calculation by the water system

A flow rate estimation sequence can be launched with special intervention on parameter 41 by calculating the water temperature difference between the water outlet and return points after forcing the heating resistances for 240 seconds. During this period, generator operation is prohibited. The flow rate is displayed at the end of this period. During the measurement operation, the alarms remain active (and notably the supplementary heating fault and water pump slaving).
This operation can only be performed with installation shut down “OFF” and by a qualified technician.

Procedure:

-> Ensure that the installation is ready to operate and notably that water is circulating and that the circuit has been purged.
-> Force circulator operation on the CC1 (see Section 2.).
-> Go to parameter 40 and enter the total electric heating power (6 kW by default).
-> Go to parameter 41 (If this parameter is set in other than the "Stop" position, the word "STOP" is displayed and the calculation cannot be launched.)
-> Press and hold the "OK" button for 5 seconds to launch the measurement.
-> The countdown display flashes.
-> When the countdown is completed, the flow rate is displayed (in m3/h).
-> Exit the parameters to reinitialize this function.
-> Deactivate zone forcing (see Section 2.).

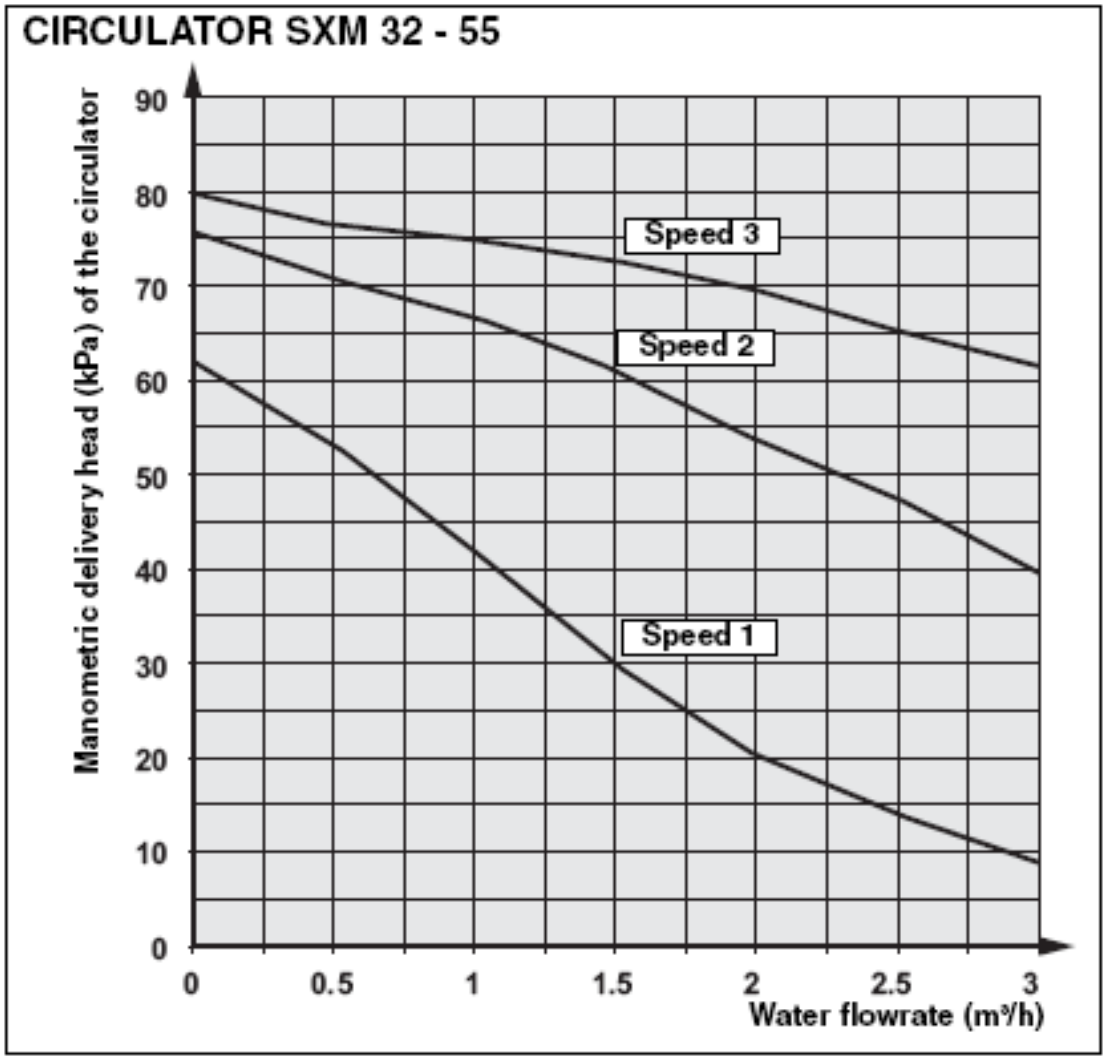
If a fault appears during the countdown, the sequence is stopped immediately and the heating elements are disconnected. The display automatically exits the parameter menu.

Note: The value displayed is only an indication; a more precise result requires the appropriate measuring equipment.

1.8.3 Two Zones Module : Circulator curves

The speeds of the circulators have to be adapting in order to respect the flow rates.

How to measure the pressure loss and so to find the water flow rate ? :
The module's outgoing water lines are equipped with 1/4 SAE pressure taps at the inlet and outlet of each circulator, to enable the pressure loss to be measured using a hydraulic pressure gauge.
Use the following circulator curves below (circulator SXM 32 - 55) to find the water flow rate.

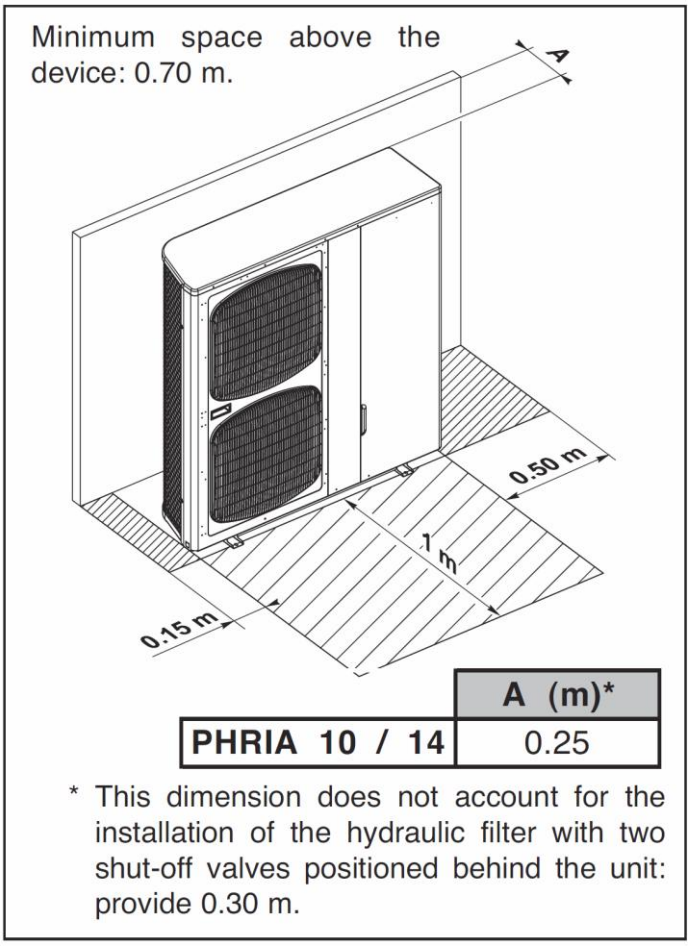


1.9 Installation Instructions

1.9.1 Location

• Protection index of the unit: IP 24.
• Select the location for the unit on the basis of the following criteria:
- the unit must be installed outside, on a slab or anti-vibration pads isolating the unit from the building,
- the unit must not be installed near the following:
. sources of heat,
. combustible materials,
. return / air intake of an adjacent building,
- avoid:
. exposure to salty air or sulphuric gas,
. the proximity of the extractor fan,
. projections of mud (next to a roadway or path, for example),
. areas where there is strong wind blowing against the unit's air exhaust.

- due to disturbance which may be caused by the noise, the blown air must not be directed towards surrounding windows,
- it is necessary to make sure that the free space around the unit is provided (see the minimum dimensions on the drawing opposite),
- installation must be simple and make maintenance work easy,
- the unit must be fixed on a hard base and must be protected from risks of flooding,
- the unit must be raised approximately 100 mm above the ground to facilitate the drainage of condensates from the coil and to prevent it from being encased of ice. The drain pan is equipped with several Ø32 mm drainage holes under the air exchanger.
- use the anti-vibration mountings supplied, making sure that they are not compressed too much when the fastening screws are tightened,
- vibrations and noise must not be transmitted to a nearby building.

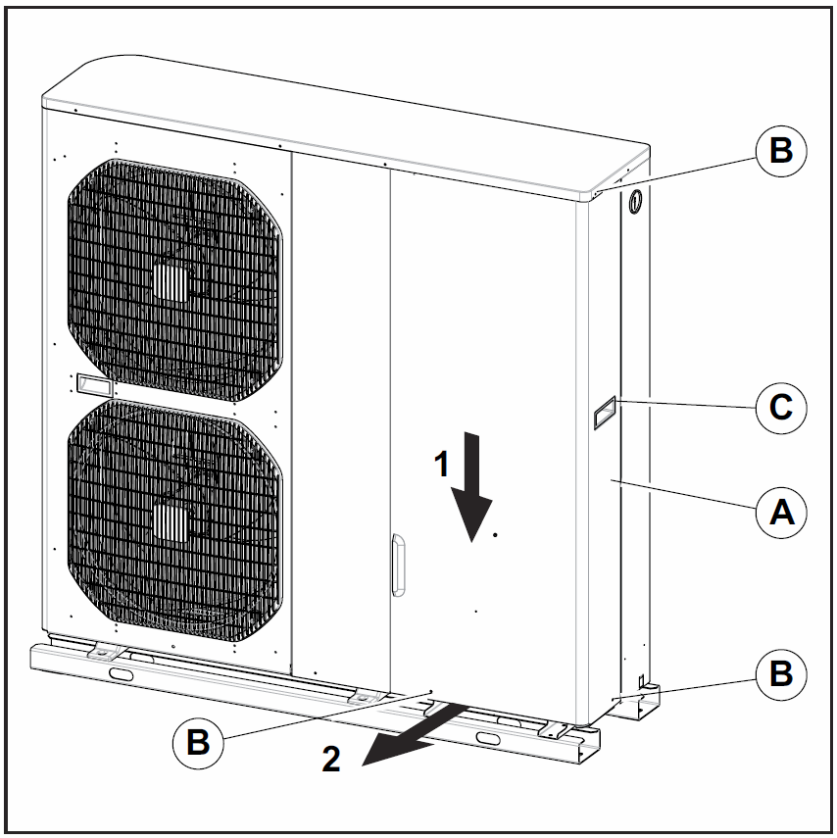


	A (m)*
PHRIA 10 / 14	0.25

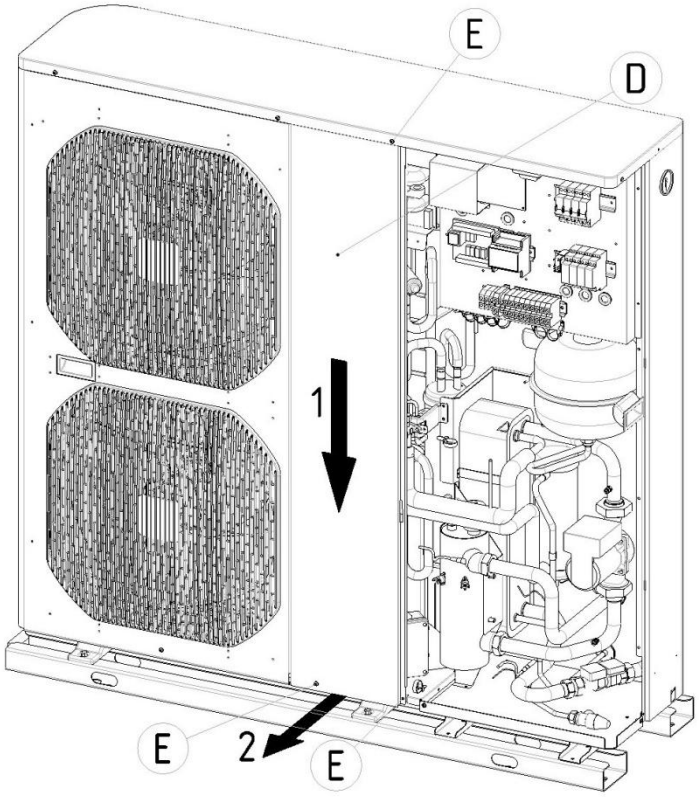
* This dimension does not account for the installation of the hydraulic filter with two shut-off valves positioned behind the unit: provide 0.30 m.

1.9.2 Disassembly/Mounting PHRIA

• To remove side panel **A**:
- remove the 3 retaining screws **B**,
- lower the panel **(1)** using the handle **C**,
- pull the lower part of the panel toward you **(2)**.

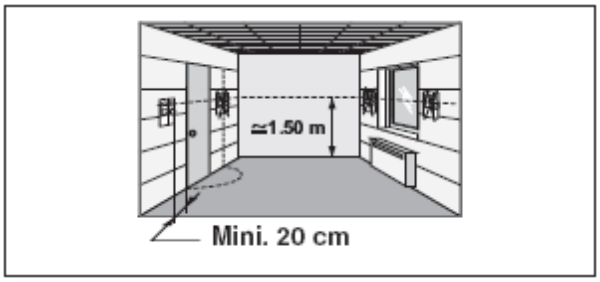


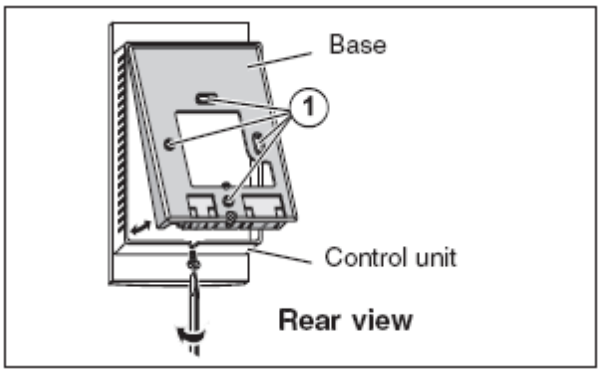
To remove side panel **D**:
- remove the 3 retaining screws **E**,
- lower the panel **(1)**
- pull the lower part of the panel toward you **(2)**.



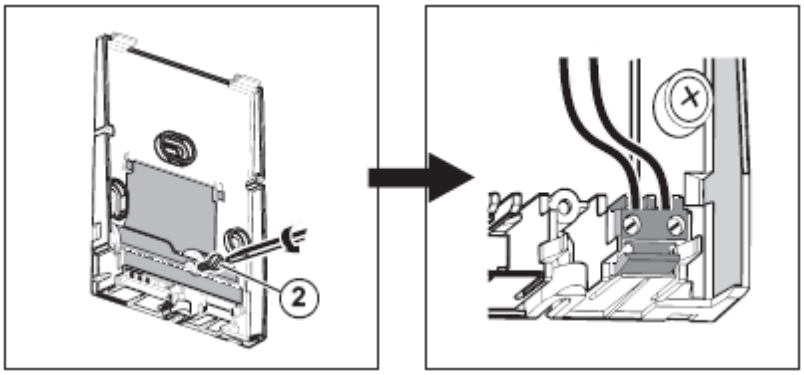
1.9.3 Control unit installation

• As the control unit is equipped with a temperature sensor, it must be installed in a location that is representative of the temperature in zone 1.
• Note: For 2-zone applications, an ambient temperature sensor (zone 1) (accessory) can be connected on the 2-zone module thus doing away with the need to install the control unit in zone 1.
• Wall mounting: the unit must not be installed in corners, on shelves or behind curtains, near sources or heat or directly exposed to sunlight. The unit should be installed approximately 1.5 m above the floor.
• Open the box by removing the lower screw and secure the base to the wall (mounting holes, item (**1**)).



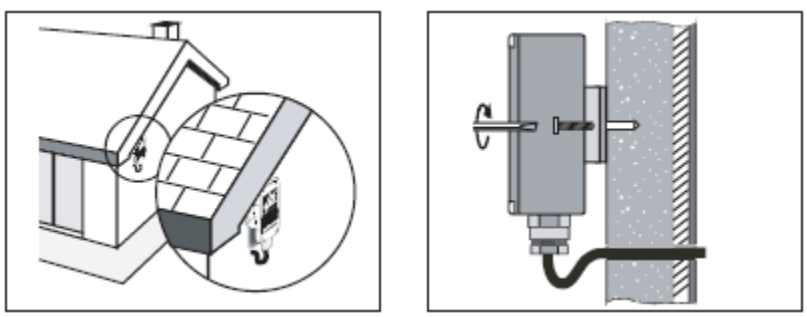


• Open the protective cover (screw (**2**)) and connect the BUS link to the control board (see diagram Section 3-2).
• Fit the control unit back on its base.



1.9.4 Installation of the outdoor temperature sensor

• This sensor must be located outside in a location that is representative of the temperature to be measured (on a wall facing North / North-west) and located away from parasitic heat sources (chimney, thermal bridge, etc..) and sheltered from inclement weather (under a roof overhand, for example).
• Connection as per paragraph 3-2.



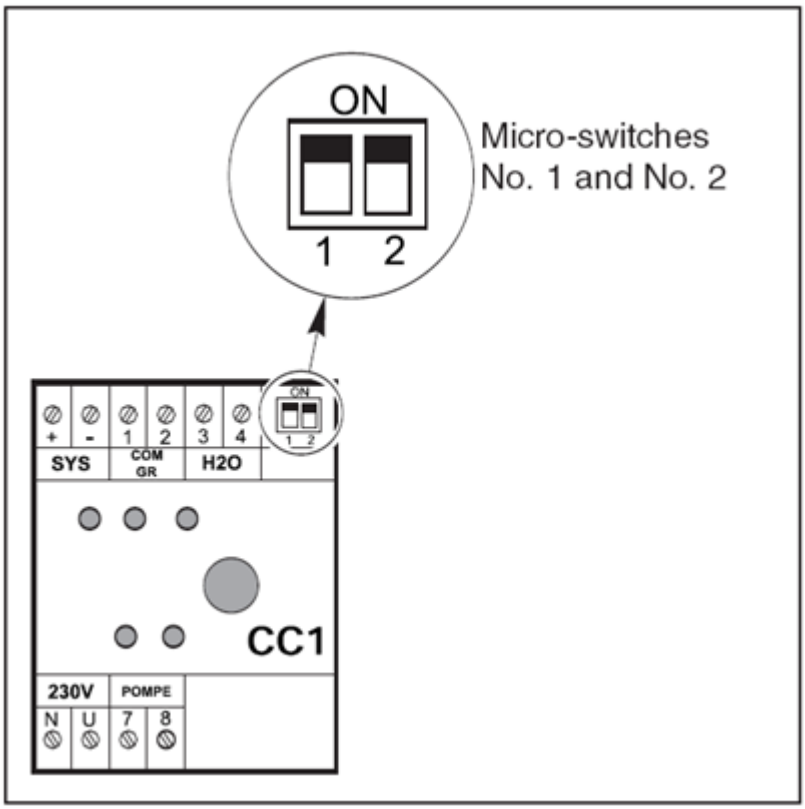
2 TEST RUN and CONFIGURATION

2.1 PHRIA: CC1 Module

CC1 is included in the PHRIA.

2.1.1 Micro-switch configuration

The communication and control module manage the circulator and the communication interface between the system and the generator.
It is equipped with 2 micro-switches, No. 1 and No. 2.



Micro-switch No. 1:
The factory default setting for this micro-switch is "**ON**".
In "**ON**" position, the circulator starts automatically if the outdoor temperature is below 0°C to prevent the hydraulic circuit from freezing. This position is recommended if the water circuit is not protected with antifreeze.
Caution: In "**OFF**" position, this function is deactivated.

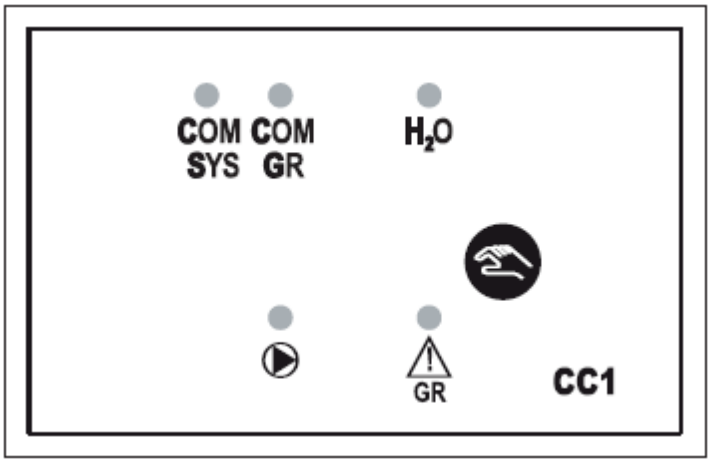
Micro-switch No. 2:
The factory default setting for this micro-switch is "**ON**".
In "**ON**" position, it activates the water flow safety on the system
For the safety of the system it must be set to "**ON**".

2.1.2 Forced circulator operation

In order to conduct the verifications of the hydraulic circuit, force the water pump to start as follows (installation power ON).

Procedure:

- Set the system control unit to "**OFF**".
- Press and hold the button for 5 seconds.
  - ➔ The circulator starts.
  - ➔ The circulator indicator light flashes.
- Check that the "**H2O**" flow indicator is illuminated.



Thanks to forced the water pump it allows the verification of the water flow rate.
The pressure lost can be measured with the ¼ SAE pressure taps at the circulator.
Use the circulator curves (See Section 1-7-1.) to determine the water flow rate.
It is possible to determine the water flow rate with another method (See Section 1-8.) and so to confirm it.
If necessary, change the speed of the water pump to deliver the right water flow as recommended or requested by the system due to the water temperatures (See Section 1-8.).

2.1.3 Shutdown forced circulator

Press and hold the button for 5 seconds.

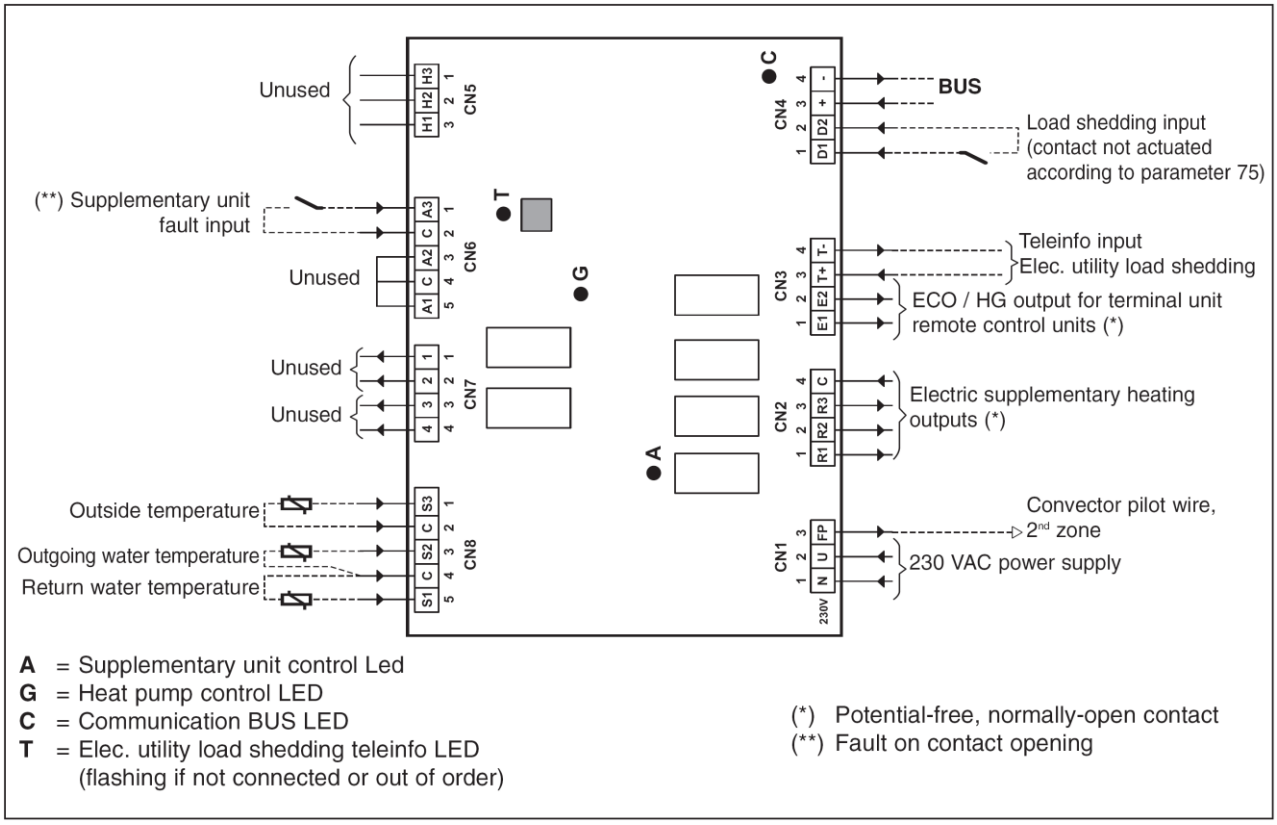
- ➔ The circulator stops.
- ➔ The circulator indicator light and the "**H2O**" flow rate light do out.

2.2 PHRIA: A1 - Heating board

2.2.1 Designation

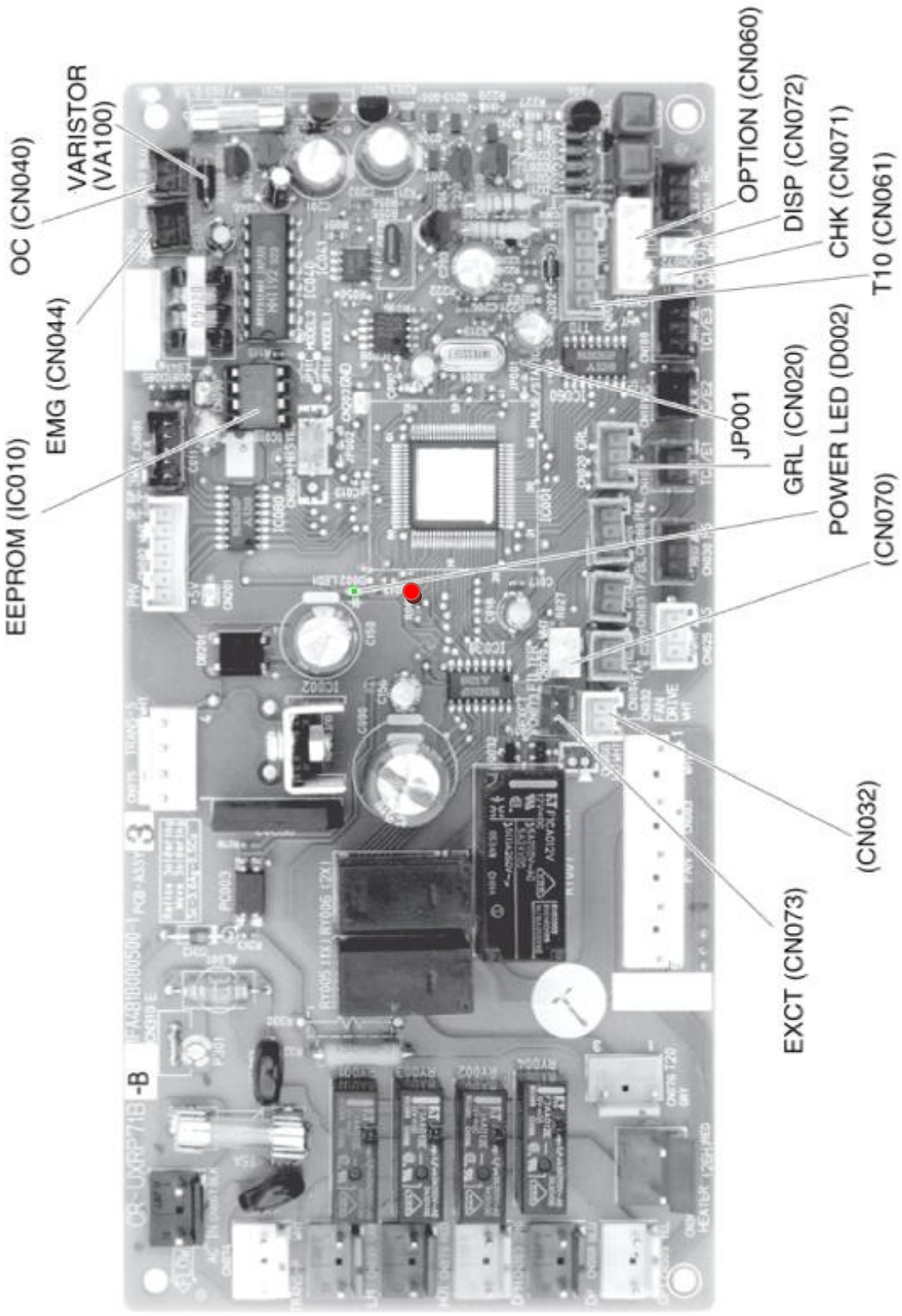
Mounted in the PHRIA, it communicates with the Inverter Gestion (via CC1) and controls the electric heater unit.

It is connected to the control unit by the communication BUS.



2.3 PHRIA: A2 - Inverter Gestion

2.3.1 Switches and functions



T10 (CN061): 6P plug (YEL)
It can be use with the optional remote control operation. (Refer to section 7.)
Control items: 1 - Start/stop input
2 - Remote controller prohibit input
3 - Start signal output
4 - Alarm signal output

EXCT (CN073): 2P plug (RED)
It can be used for demand control.
When input is present, forces the hydro kit to operate with the thermostat OFF.

DISP (CN072): 2P plug (WHT)
It allows testing the hydro kit's functions without outdoor unit or when it is not operational.
Short-circuiting this plug allows operation to be controlled by the optional remote controller even when an outdoor unit is not connected or running.
In this case, alarm "**E04**," which indicates trouble in the serial communication between the indoor and outdoor unit, does not occur.

CHK: 2P plug (WHT) / Test pin.
This plug can be used for short-term tests.
Short-circuiting this pin allows electronic expansion valve full-open position to be checked.
However this function turns OFF if the indoor unit protection mechanism is activated.
The component will operate even if the remote controller and outdoor unit are not connected, however the optional remote control cannot be used for control even if it is connected.

JP1 (J01): Jumper wire
It allows selection of the T10 terminal start/stop signal.
Setting at time of shipment: Pulse signal
Jumper wire cut: Static signal (continuous signal)

Power LED (RED):
LED illuminates when the power is ON.
Flashes when there is trouble with the EEPROM (IC010: nonvolatile memory).

EEPROM (IC10): Nonvolatile memory
It is used to store model information and other data.
When replacing the PCB, remove the EEPROM from the old PCB and install it onto the new PCB. If there is IC trouble, replace with a new IC (provided with the servicing PCB), and set the necessary
information using the wired remote controller. (For the setting procedure, refer to the servicing technical materials.)

2.3.2 Auto-Addressing between A2 and A3 boards

The addressing sequence of the A3 and A2 boards takes place when the power is initially turned on at the factory. It can be repeated when a board is changed.

Procedure:

- ➔ Set the control unit selector to "OFF".
- ➔ Turn on the power supply. The unit cycles through an automatic addressing phase when the power is first turned on. This phase may take 2 to 3 minutes and is indicated by the alternate blinking of LED1 and LED2 on the A3.
- ➔ When these indicator lights cease blinking, addressing is completed and communication between the A2 and A3 boards.

Note 1:
The addressing phase is display on the optional remote control **K70D052Z** (if connected) by the flashing "**SETTING**" message.
Note 2:
Should a problem arise during this automatic addressing phase, a new phase can be restarted. To do this, simply disconnect the power supply for at least 1 minute and when power is restored, press the black "**AUTO ADD**" button on the A3 board.

Meaning of **LED1** and **LED2** activity :

- **LED1 and LED2 indicator lights**:

○ = ON steady.
☼ = ON blinking.
● = OFF.

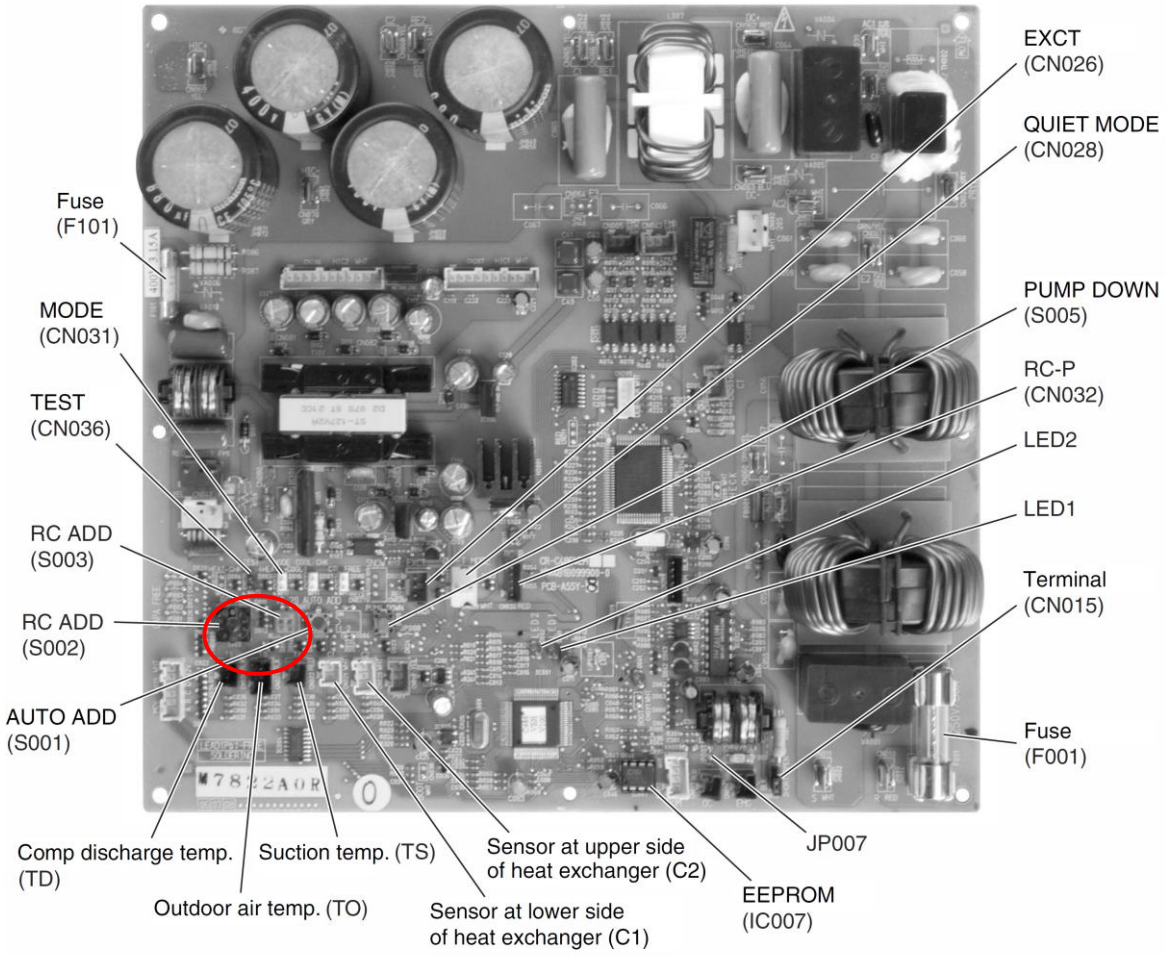
Meaning	LED1	LED2	
Auto-addressing in progress (*)	☼	☼	Alternating blinking
Power ON: **Step 1**: no communication **Step 2**: communication received from the indoor unit **Step 3**: normal communication	 ○ ● ●	 ○ ○ ●	
Alarm message	☼	☼	Simultaneous blinking
No charge indicator	☼	●	
Refrigerant recovery mode	☼	○	
Alarms (Refer to the details in the outdoor unit's maintenance)	☼	☼	Repeated and alternating blinking (of each indicator light)

2.4 PHRIA: A3 - Inverter Gestion

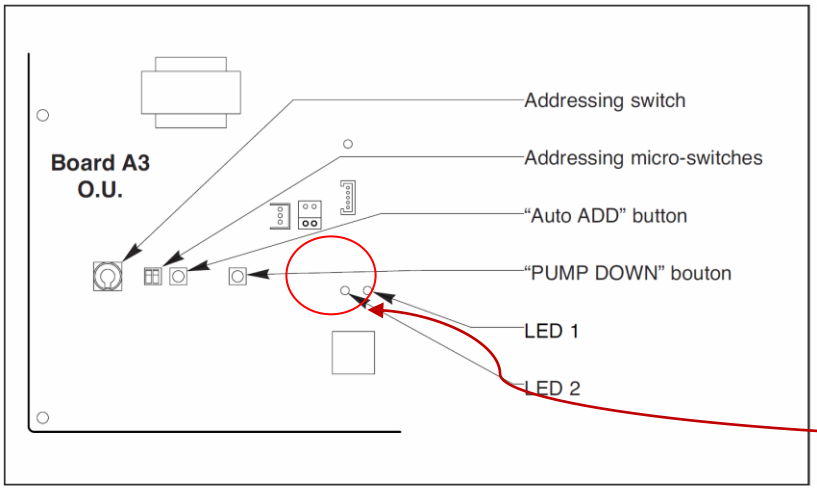
It provides a set of command/control in inverter technology for the thermodynamic circuit, and so ensures:

- The variation of compressor speed (via HIC board).
- The variation of the speed of the motor fan.
- Controlling the electronic expansion valve bi flow
- The control valve to reverse the cycle.
- Safety limits in frequency, intensity, temperatures (TS, TD, TO, C1, C2).

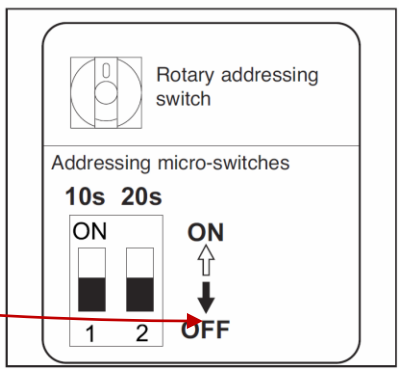
2.4.1 Switches and functions



Configuration of A3 switches:

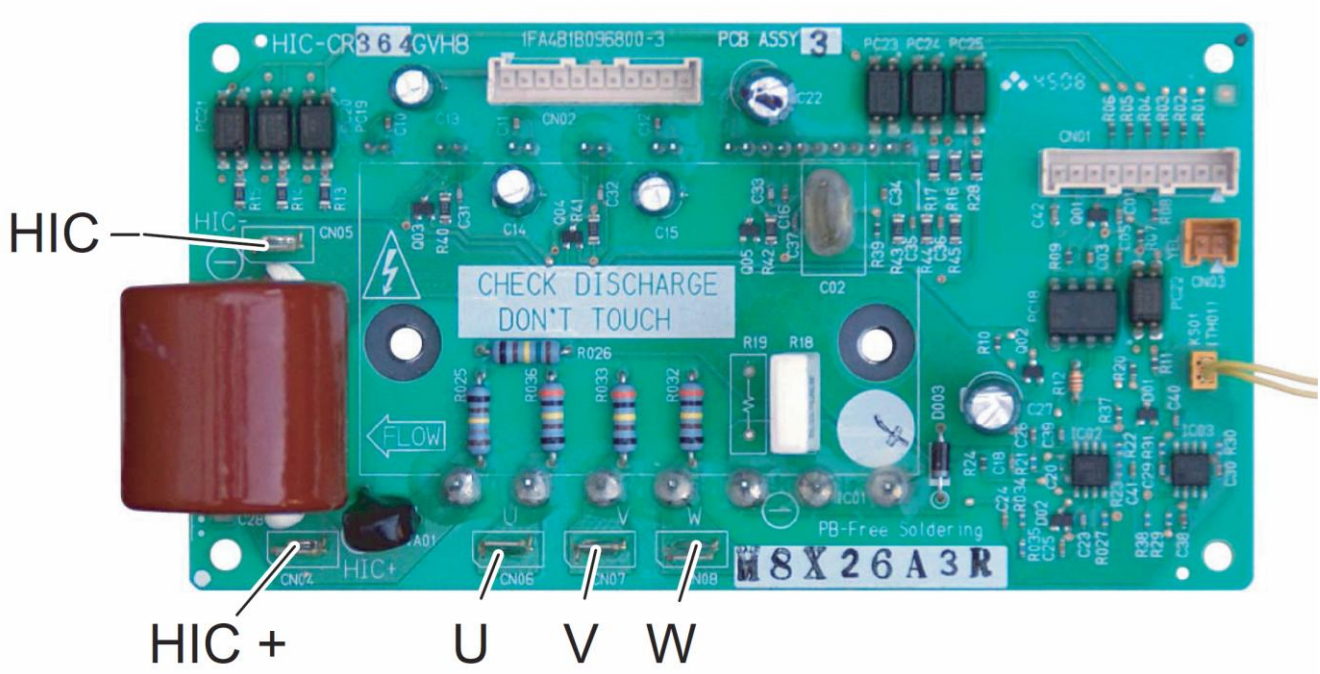


• **Addressing switch positions**:
- Factory settings: **must not be modified**.



2.5 PHRIA: HIC - Power board

2.5.1 Specification



2.5.2 Test Run Resistance

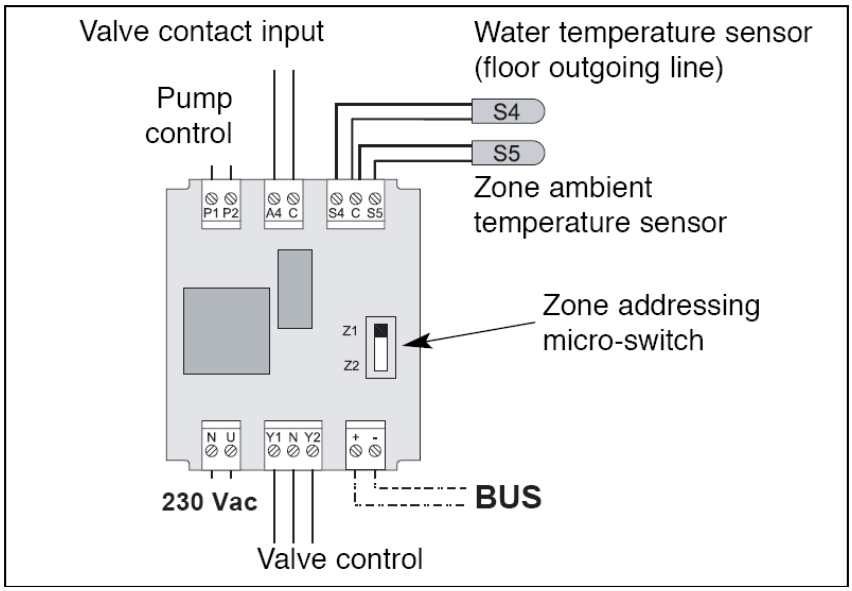
Resistance (Common use in reversed tester measuring terminal)

Between terminals		Resistance	Between terminals		Resistance
Tester terminal (-)	Tester terminal (+)		Tester terminal (-)	Tester terminal (+)	
HIC +	HIC –	100 kΩ ~ ∞ Ω	HIC –	HIC +	100 kΩ ~ ∞ Ω
HIC +	U	100 kΩ ~ ∞ Ω	HIC –	U	1 kΩ ~ 5 kΩ
HIC +	V	100 kΩ ~ ∞ Ω	HIC –	V	1 kΩ ~ 5 kΩ
HIC +	W	100 kΩ ~ ∞ Ω	HIC –	W	1 kΩ ~ 5 kΩ

* Be sure to measure by an analog tester.
* The table shows the value measured in kΩ.

2.6 M2Z (2-zone module): Zone board

2.6.1 Switches and functions



Check the position of the zone addressing micro-switches (Z1/Z2) in regard of the zone it has to manage.

2.6.2 Auto-test Run

The Zone boards have auto-test software included.
The software allows testing the proper operation of the card.

Procedure:

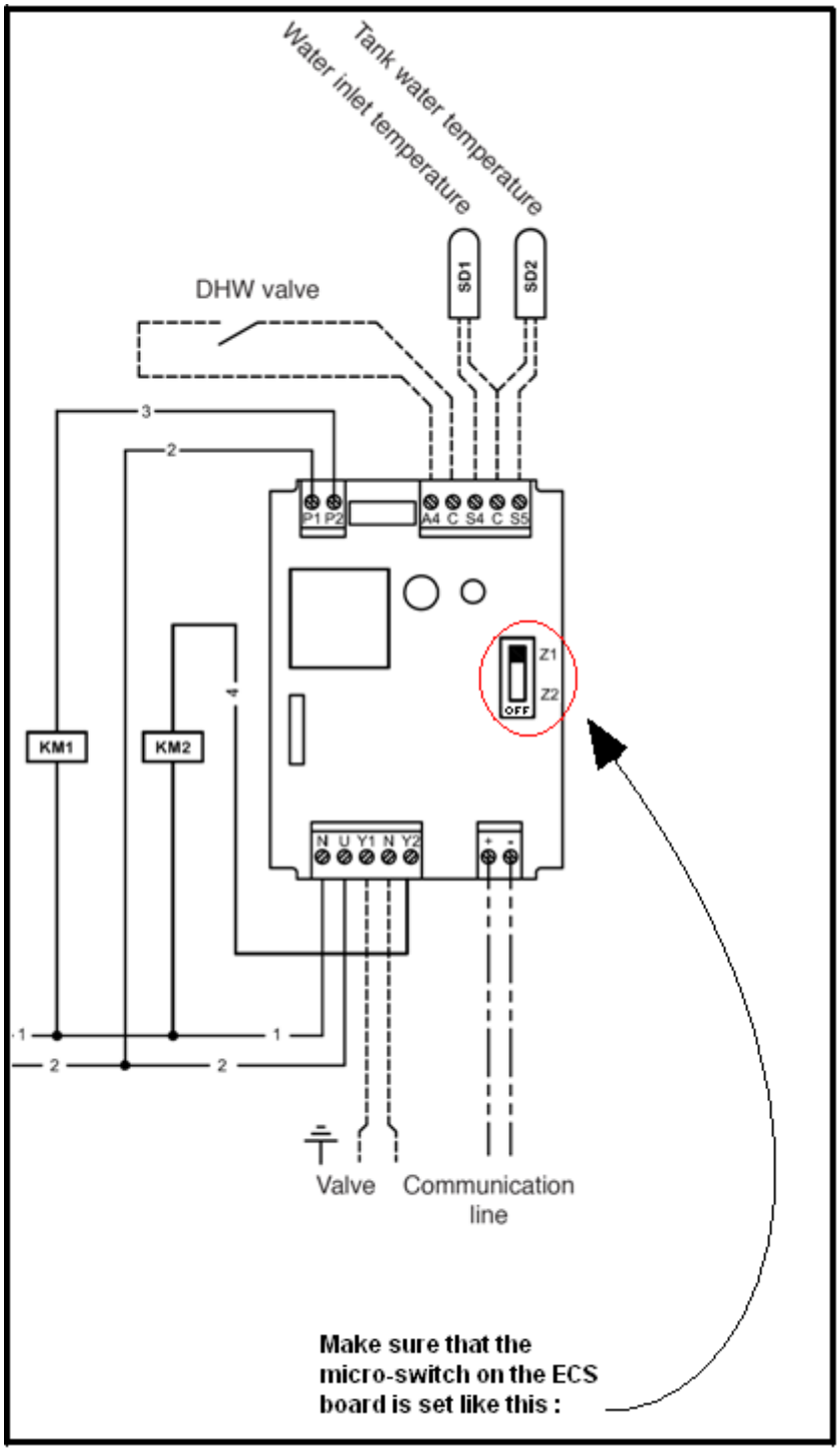
Initial state = Valve control in open position

- ➔ Switch power on.
- ➔ Less than 10 seconds after power on, make 2 consecutive switching of the micro-switch.
- ➔ Check that during 5-seconde pump control is activated. (Exit P1/P2)
- ➔ Check that the valve control is activating (Y2)
- ➔ Check that Valve control is closed
- ➔ Sleep time 10-seconde
- ➔ Check that the pump control is activated again for a second time during 5-seconde
- ➔ If the pump control is not active a second time that means a problem on the water temperature sensor
- ➔ Switch power off to exit the auto-test run.

Note:
If the valve control is closed when the test start, it will not run. This valve must be open to perform the test.

2.7 KPECS (Domestic Hot Water Kit): Control board

2.7.1 Micro-switch configuration



- Open circuit breaker Q1 (tank electric heater protection).
- Set circuit breaker Q2 (DHW box control system).

2.7.2 Auto-test Run

The ECS (Domestic Hot Water Kit) PCB has auto-test software included.
The software allows testing the proper operation of the card.

Procedure:

Initial state = Contact open / valve heating position (no domestic hot water demand)

- ➔ Switch power on.
- ➔ Less than 10 seconds after power on, make 2 consecutive switching of the micro-switch.
- ➔ Check that the DHW valve is activating (output Y1 / N)
- ➔ Check that after the closure of the contact Y1, output ban electric heating of the tank is activated. (Exit P1/P2) (Relay KM1).
- ➔ Switch power off to exit the auto-test run.

Note:
If the DHW valve is closed when the test start, it will not run. This valve must be open (heating position) to performed the test.

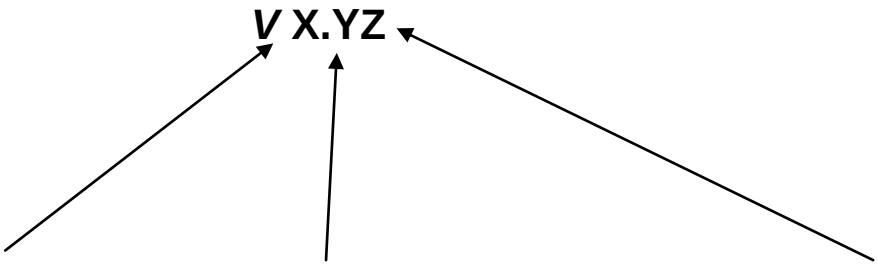
2.8 Water System: Control box, Boards and Software compatibles

In the water system the electronics elements are in communication each other thought the bus. The electronic elements can work together only if they are compatible (see code) and if they are using the right software (see version).

Date	Modification	Control box Code : 2220125-αβ		Heating board Code : 2220126-αβ		Zone board Code : 2220103-αβ		CC1 Module code 2220121-αβ		DHW board code 2220114-αβ	
		Software version	code αβ	Software version	code αβ	Software version	code αβ	Software version	code αβ	Software version	code αβ
Fév-09	1st version	V 3.00	without	V 3.00	without	V1.00	without	V1.00	without	**No**	
mars-09	Evolution CC1 for : Modification temporisation water flow alarm. Integration code alarm P04 (8/10HP)	V 3.00	without	V 3.00	without	V1.00	without	V1.01	without	**No**	
mai-09	Modification of a reset function in the Heating board (A2).	V 3.00	without	V 3.01	without	V1.00	without	V1.01	without	**No**	
oct-09	New application: 1 zone radiators + ECS (DHW- Domestic Hot Water)	V 3.00	without	V 3.01	without	V1.00	without	V1.02	1	V1.01	.01

SOFTWARE VERSION

For maintenance, the version software gives you the compatibility between the electronic boards:



X = n° of version; evolution in case of **major modification**. **No compatibility between versions.** The switch from « X » to « X+1 » : only when major modification are done. For example, in an old installation with components version V1.YZ, the replacement of one component must include the replacement of all the components: Control unit + Heating board version 2.YZ.	**Y** = n° of version; evolution in case of **major modification**. **Compatibility between the different versions**. For maintenance, the replacement of one component does not necessary include the replacement of the other one (unless we want new functions).	**Z** = n° of indice version; evolution in case of **minor modification**. **Compatibility between the different indice versions**. For maintenance, the replacement of one component does not necessary include the replacement of the other one (unless we want the minor modification).

2.9 Inverter Gestion: Test Run

Reminder : Don't forget to turn the **remote power switch ON at least 5 hours in advance** in order to energize the crank case heater. Without respect of this recommendation, you could definitively damage the compressor.

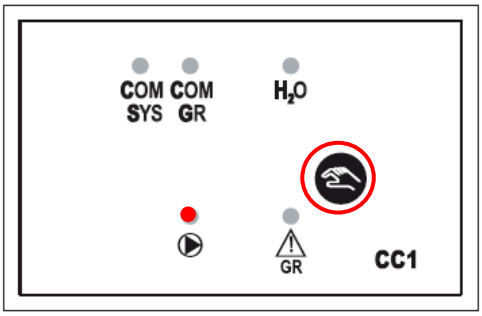
- Procedure:

(1) Forced circulator operation: Forced the water pump allows the flow rate in the water system giving a thermal load for the test run.

➔ Set the system control box to "**OFF**".

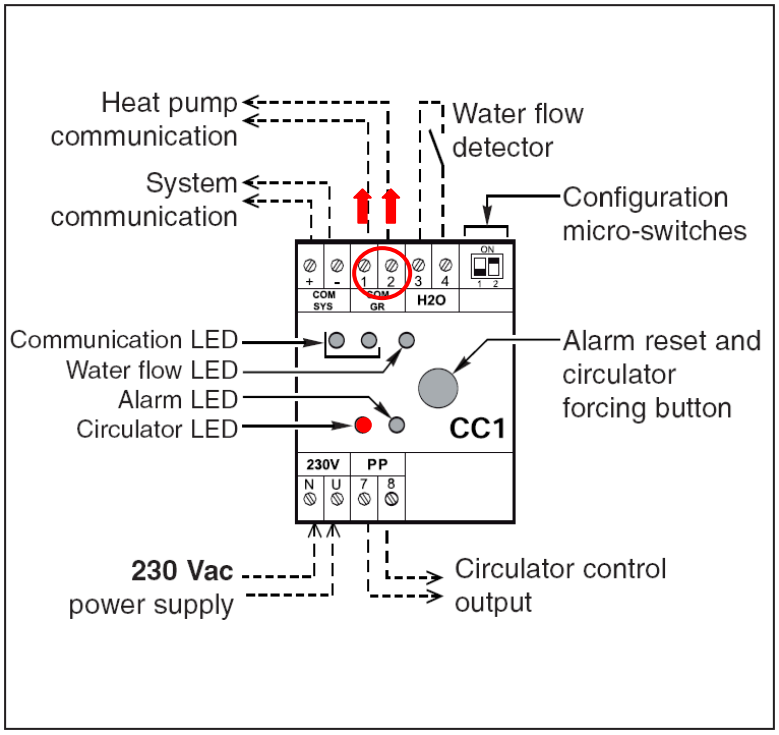
➔ Press and hold the CC1 button for 5 seconds. The circulator starts.

➔ The circulator indicator light flashes.

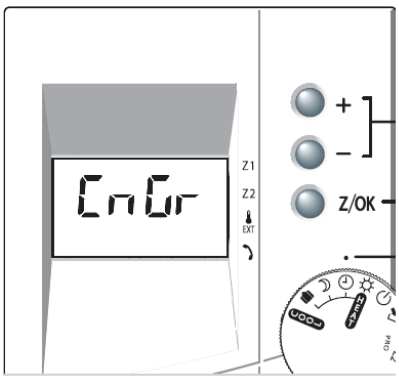


➔ Check that the "**H_2O**" flow indicator is illuminated.

(2) Disconnect the bus *"Heat pump Communication"* **between CC1 and board A2:** It allowed Inverter regulation working alone without temperature order from the water system.

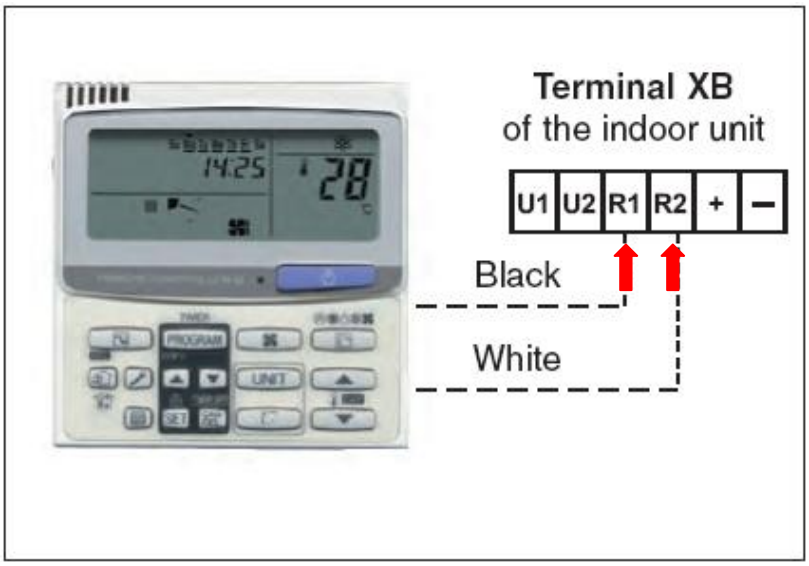


- Due to the disconnection of the bus, **"Alarm LED"** is going to blinking on the CC1. After 30 minutes alarm **"CnGR"** appears on the system control box and **"Alarm LED"** on CC1 pass from blinking to fixed light.



➔ Don't take care of those Alarms; they are going to disappear at the end of the Test Run.

(3) Connect the optional Controller K70D052Z

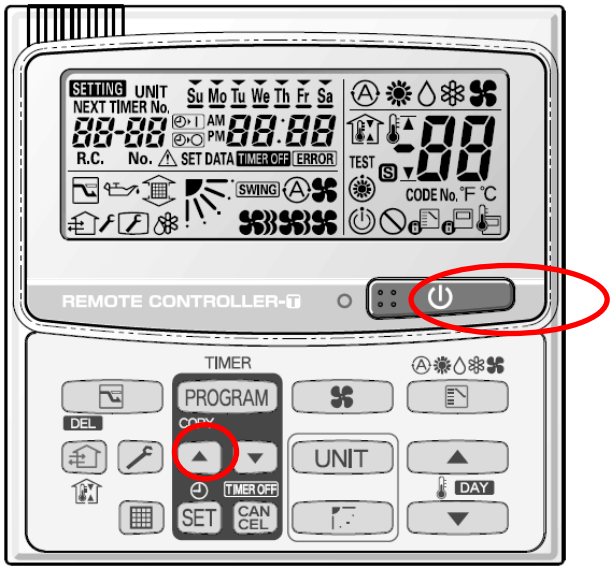


(4) Starting the Test Run: Temperature control is not possible when test run mode is engaged. (This mode places a large load on the devices. Use it only when performing the test run.)

- Press and hold the remote controller button for 4 seconds or longer.

  ➔ **"TEST"** appears in the LCD display during the test run.

  ➔ Then press the button.



➔ Use either Heating or Cooling mode to perform the test run.

TEST RUN COOLING MODE WITH TERMINAL UNIT APPLICATION ONLY.

Note: Taking care of the water temperature to avoid brazed plate heat exchanger freezing in case of low outdoor temperature.

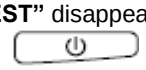
➔ If normal operation is not possible, a code appears on the optional controller LCD display: Refer to the section 5 (5-1-2.).

(5) End of the Test Run

- For the test run of the inverter regulation, operate the compressors for a minimum of 10 minutes (in order to check for open phase) or when code appears.
  This optional controller includes a function that cancels after a 60 minutes timer has elapsed, in order to prevent continuous test run operation.

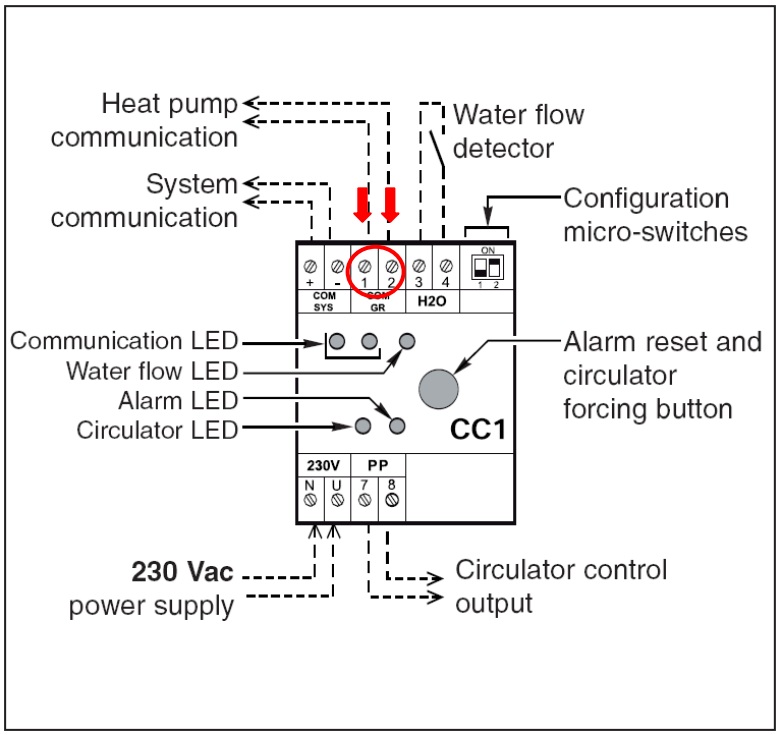
- After the test run is completed, press the button  again.

  ➔ Check that **"TEST"** disappears from the LCD display.

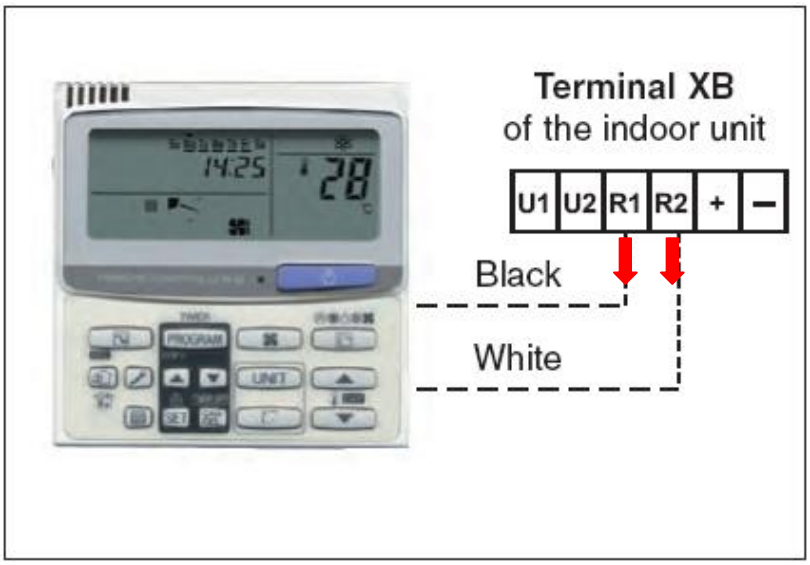
  ➔ Then press the  button.

  ➔ Check that Inverter regulation have stopped the compressor and the fans (fans may run few minutes after stopped to equilibrate pressures).

(6) Re-connect the bus between CC1 and board A2



(7) Disconnect the optional Remote Control



(8) Shutdown forced circulator on CC1

Press and hold the button for 5 seconds.

➔ The circulator stops.

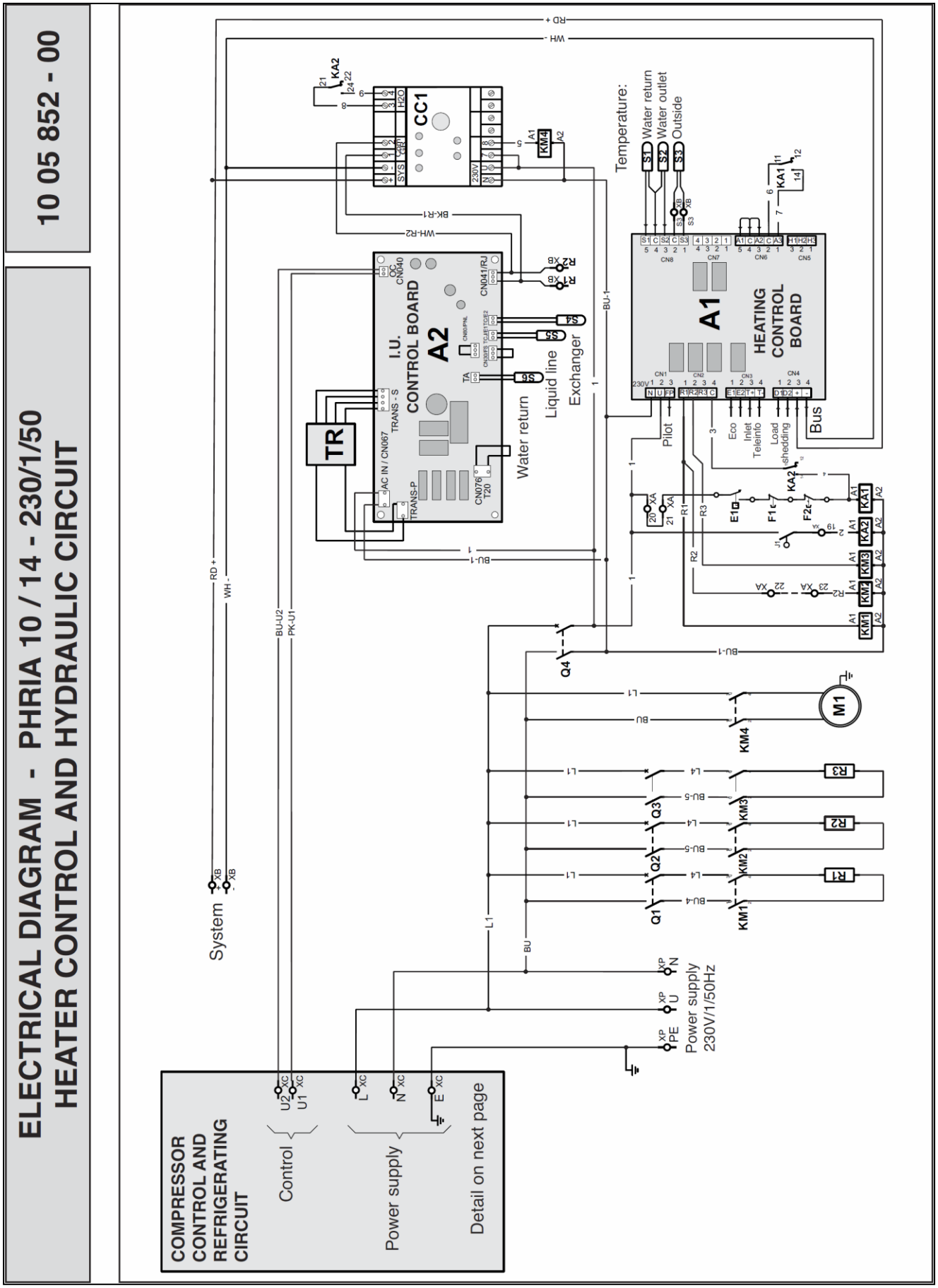
➔ The circulator indicator light and the "**H2O**" flow rate light do out.

➔ Check **"CnGr"** default disappeared from the System control box (If it is not consult Section 6.).

3 ELECTRICAL DATA

3.1 PHRIA: Schematic Diagrams, Electrical connections

3.1.1 Schematic Diagrams



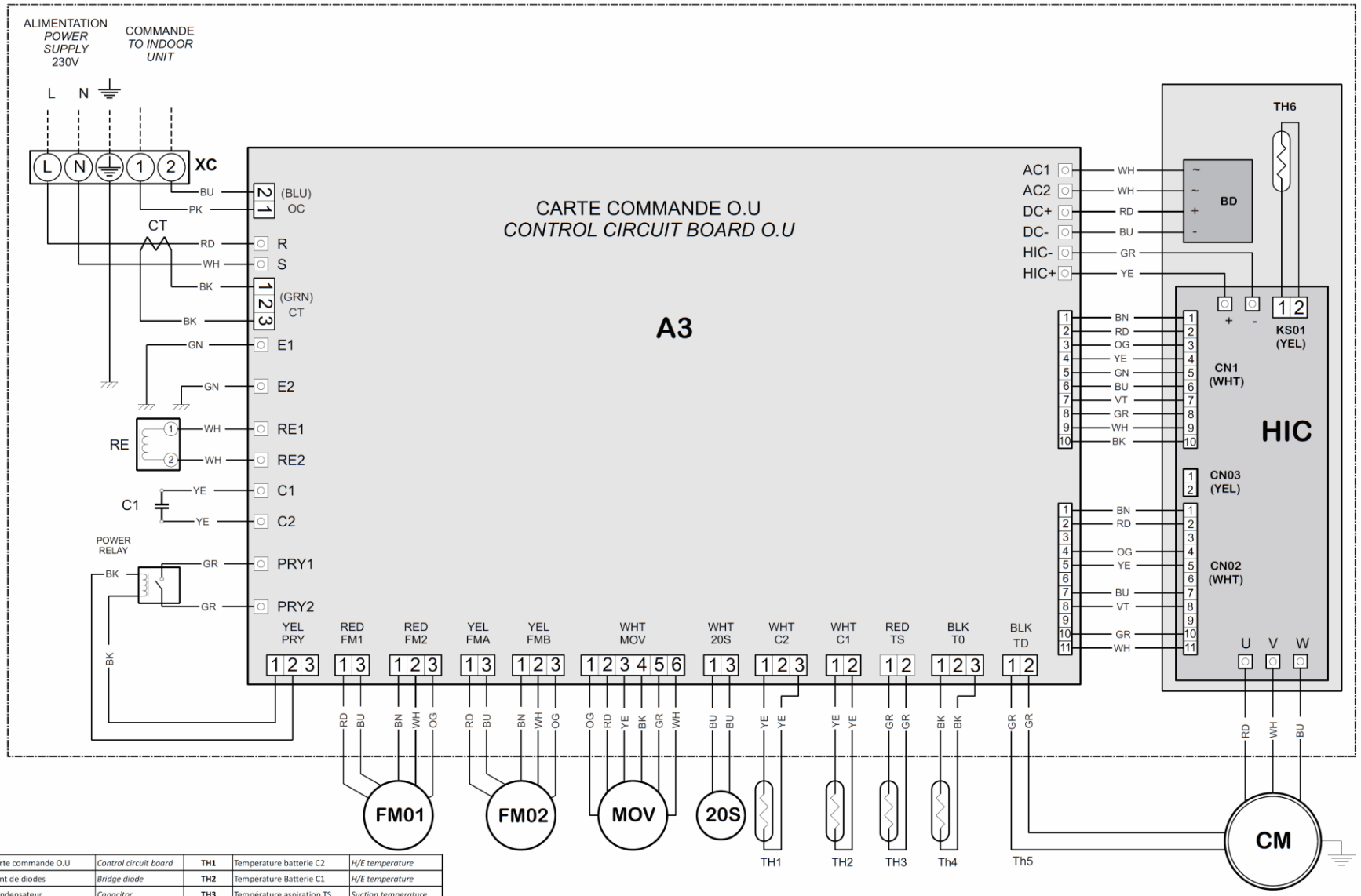
Symbols of the components

Heater control and hydraulic circuit

A1 Heating control board
A2 I.U. control board
CC1 Communication and control module
E1 Water pressostat
F1 Automatic - heater safety thermostat
F2 Manual - heater safety thermostat
J1 Water flow switch
KA1 Fault relay
KA2 Water flow relay
KM1 R1 contactor
KM2 R2 contactor
KM3 R3 contactor
KM4 M1 contactor
M1 Circulator pump
Q1 R1 circuit breaker
Q2 R2 circuit breaker
Q3 R3 circuit breaker
Q4 Control circuit breaker
R1 Support heating element
R2 Support heating element
R3 Support heating element
S1 Water inlet temperature sensor (system)
S2 Water outlet temperature sensor (system)
S3 Outdoor air temperature sensor (system)
S4 Exchanger temperature sensor (Heat pump - E2)
S5 Liquid line temperature sensor (Heat pump - E1)
S6 Water return temperature sensor (Heat pump - TA)
TR Transformer
XA Control terminal strip
XB Control terminal strip
XC Refrigerating circuit terminal strip
XP Power terminal strip

Colours of the wires

BK Black
BN Brown
BU Blue
GN Green
GR Grey
OG Orange
PK Pink
RD Red
WH White
YE Yellow



A3	Carte commande O.U	*Control circuit board*	**TH1**	Temperature batterie C2	*H/E temperature*
BD	Pont de diodes	*Bridge diode*	**TH2**	Température Batterie C1	*H/E temperature*
C1	Condensateur	*Capacitor*	**TH3**	Température aspiration TS	*Suction temperature*
CT	Transformateur d'intensité	*Current transformer*	**TH4**	Température air extérieur TO	*Outdoor temperature*
CM	Compresseur	*Compressor motor*	**TH5**	Température refoulement TD	*Discharge temperature*
FM 01/02	Moteur ventilation	*Outdoor fan motor*	**TH6**	Température radiateur	*Heat sink temperature*
MOV	Détendeur électronique	*Motor operated valve*	**XC**	Bornier	*Terminal board*
PR	Relais de puissanc	*Power relay*	**20S**	Vanne inversion de cycle	*Four way valve*
RE	Inductance	*Reactor*			

DESSINE : EM				Dossier N° : 1005853	Schéma électrique / Electrical diagram PHRIA 10 et 14
VERIFIE : X					Commande compresseur et circuit frigorifique
DATE DE CREATION : 20/10/2009	00 INDICE	/ DATE	/ MODIFICATION	/ DES	Tension : 230V/1/50

FOLIO 01 ◄ 00 00 ►

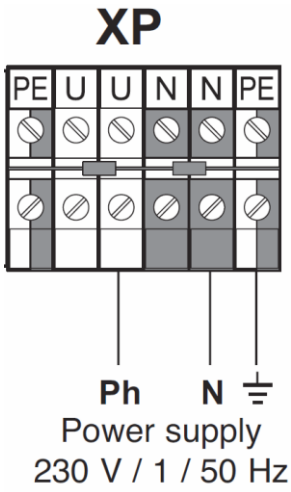
3.1.2 Electrical connections

• The acceptable voltage variation is: ± 10% during operation.
• The electrical connection conduits must be fixed.
• Use the cable clamps at the rear of the unit and route the wires under the electric panel, at the level of the terminal strips.
• Class 1 unit.
• The electrical installation must comply with the standards and regulations applicable where the unit is being installed (in particular NF C 15-100 ≈ IEC 364).

3-1-2-1. Power supply

• The power supply must come from an isolation and electric protection device (not supplied) in accordance with existing regulations.
• The installation must be protected by a **double-pole circuit-breaker** (not included). See ratings in the table below.

Note:
• The unit is designed to be connected to a power supply having a TT neutral regime (neutral to ground) or TN.S regime
(to neutral) as per NF C 15-100.



3-1-2-2. Currents and cross-sections

• Section: see table below.
• The sections are given as an indication only. They have to be verified and adapted, if necessary, according to the installation conditions and the standards in force.
• Connect to the electrical panel's power terminal strip as per the wiring diagram.

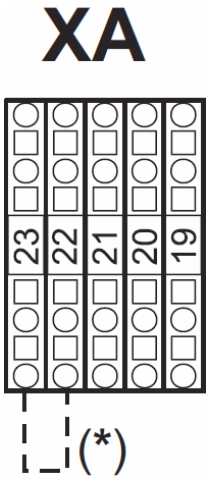
		PHRIA 10 230/1/50	PHRIA 14 230/1/50
Nominal current - heat pump only	A	13	20.7
Maximum current - heat pump only	A	17.3	23.9
Maximum total current with 4 kW additional heating	A	34.7	41.3
Maximum total current with 6 kW additional heating	A	43.4	50
Starting current	A	3	3
Protection rating	A	50	63
Cross-section of power cable (*)		3 G 10 mm^2	3 G 16 mm^2

(*) With the maximum Electric heater power, see below.

3.1.2.1 Selection of the electric heating module powers

The unit is configured for 4 kW additional heating (2+2). The additional power can be configured for 6 kW (4+2) by placing the jumper between terminals (**22**) and (**23**) (jumper included).

Model	PHRIA10		PHRIA14	
Jumper Between 22 and 23 of the terminal trip XA	no	yes (*)	no	yes (*)
Electric heating module powers kW	**4** (2+2)	**6 (*)** (4+2)	**4** (2+2)	**6 (*)** (4+2)

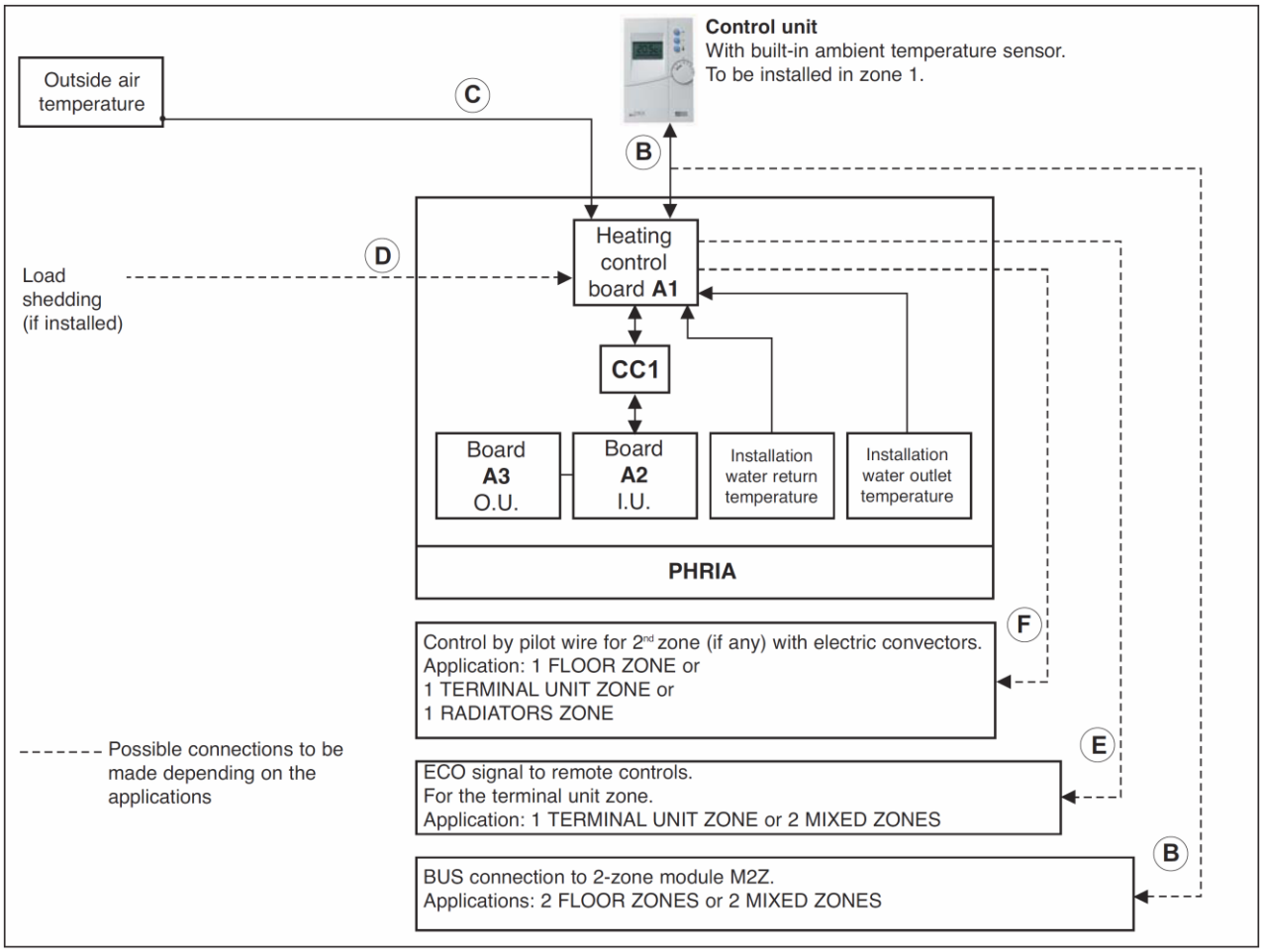


(*) The selection of the additional electric heating must be done in accordance of the thermal residential calculation made by a professional.

Note: The total heating of the heat pump and their repartitions (Total electric heating and Thermodynamic heating capacity at the outdoor base temperature) must respect the legislation of the country where it is installed.

3.2 Connections of the PHRIA with the Water System

Caution: To avoid problems related to electromagnetic disturbances, do not route these cables near power cables.



3.2.1 BUS (B)

- 2-conductor shielded cable, minimum size 1 mm2 with grounded shielding on heat pump side (*).
- Total length of the BUS connection: 40 meters (control unit connections + 2-zone module, if present).
- To be connected to the (+) and (-) terminals if terminal strip XB.

(*) Refer to the ground shielding principle in Section 3-2-8.

3.2.2 Outside temperature sensor (C)

- 2-conductor cable, min. size 0.5 mm^2.
- Maximum length 25 meters.
- To be connected to terminals (**S3**) on terminal strip **XB**.

Note:
This sensor must be located outside in a location that is representative of the temperature to be measured (on a wall facing
North / North-west) and located away from parasitic heat sources (chimney, thermal bridge, etc..) and sheltered from inclement weather (under a roof overhand, for example).

3.2.3 Module additional heating load shedding signal (if installed) (D)

- Two possibilities:
  1) By a "remote info" signal coming from the electrical utility meter: 1 twisted pair (6/10) cable with shielding (shielding grounded on module side).
  2) By a good quality, potential-free external contact.
- Contact closed = load shedding of the additional electric heating.
- 2-conductor cable, min. size 0.5mm^2.
- Maximum length 25 meters.
- To be connected to the heating board **A1**.

3.2.4 ECO signal for remote controls (if installed) (E)

- In order to send reduced mode orders (**Eco** or **standby**) to the terminal unit remote control units in the case of applications such as 1 terminal unit zone or 2 mixed zones.
- In the form of a potential-free contact which can used in VLV (Very Low Voltage), 2A max.
- To be connected to the heating board **A1**.

Note:
The contact can control up to 10 **RCC10** (**70250051**) or **RCC20** (**70250052**) type controls.
Consult the terminal unit and remote control documentation to connect this contact.

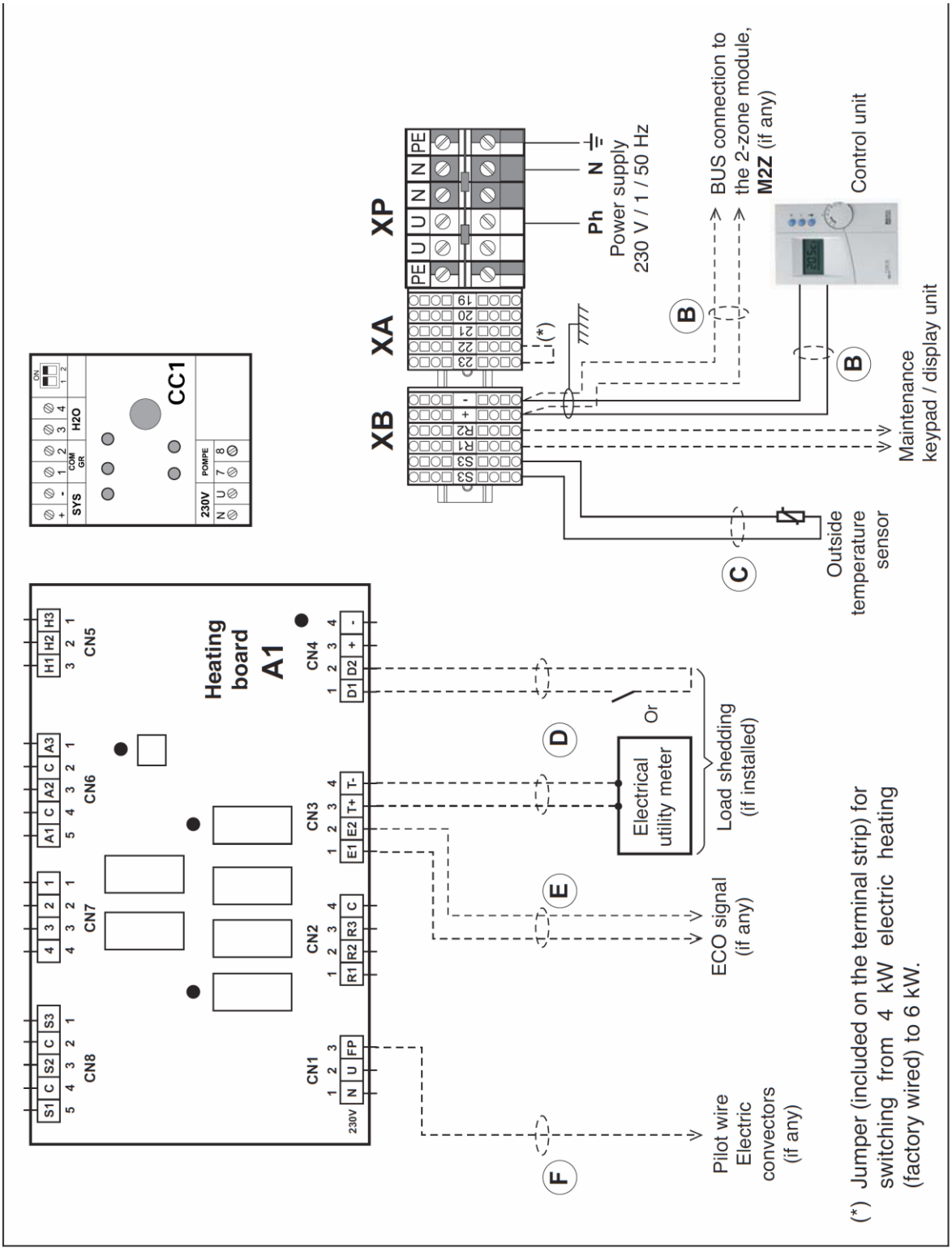
3.2.5 Pilot wire for electric convectors (if any) (F)

- The pilot wire sends shut-down, "**anti-freeze**" (long term absence) or "**Economy**" mode instructions to the electric convectors in zone 2, and possibly in the case of 1 floor zone or 1 terminal unit zone applications.
Convector control (not supplied) must be adapted to receive this type of signal (standard GIFAM 4).
Consult the manual of the electric convectors.
- 230 VAC signal from the heating board.
- 1.5 mm^2 single-pole cable adapted for the operating voltage.
- Max. number of convectors controlled by the pilot wire: 20.
- To be connected to the heating board **A1**.

Note:
The electrical power supplied to the convectors must be the same as that of the module.

3.2.6 Control part connection diagram

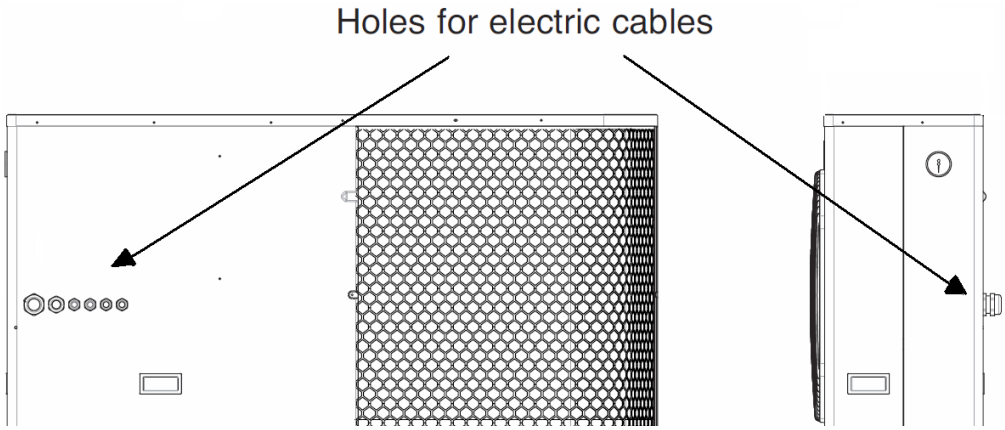
- Route the pilot wire (230 V) separately from the other control connections.



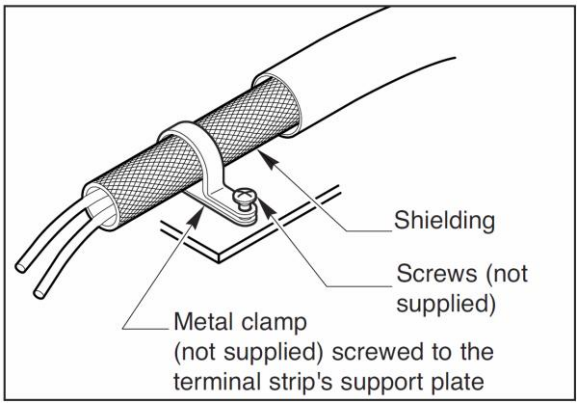
3.2.7 Routing of cables

• To avoid problems related to electromagnetic disturbances, avoid routing control cables near power cables.

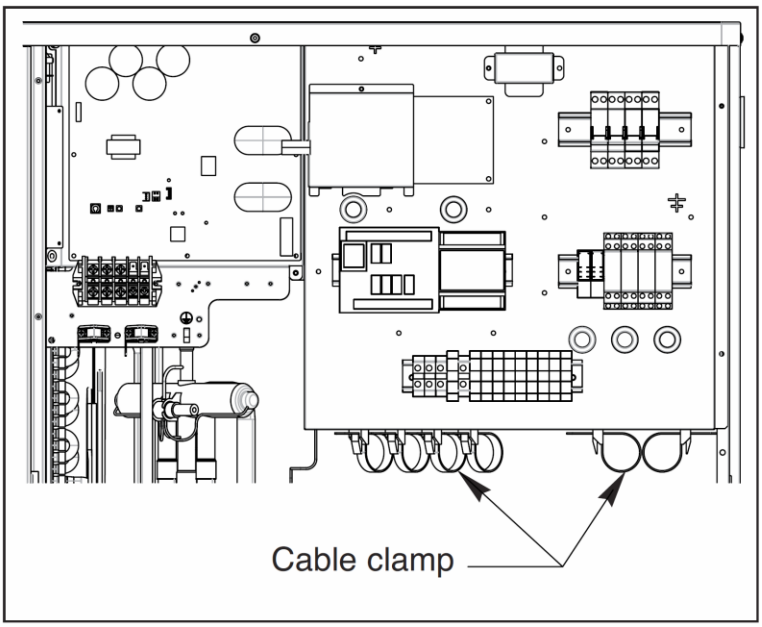
• Route the cables through the cable glands (included in the holes) located at the back of the unit:



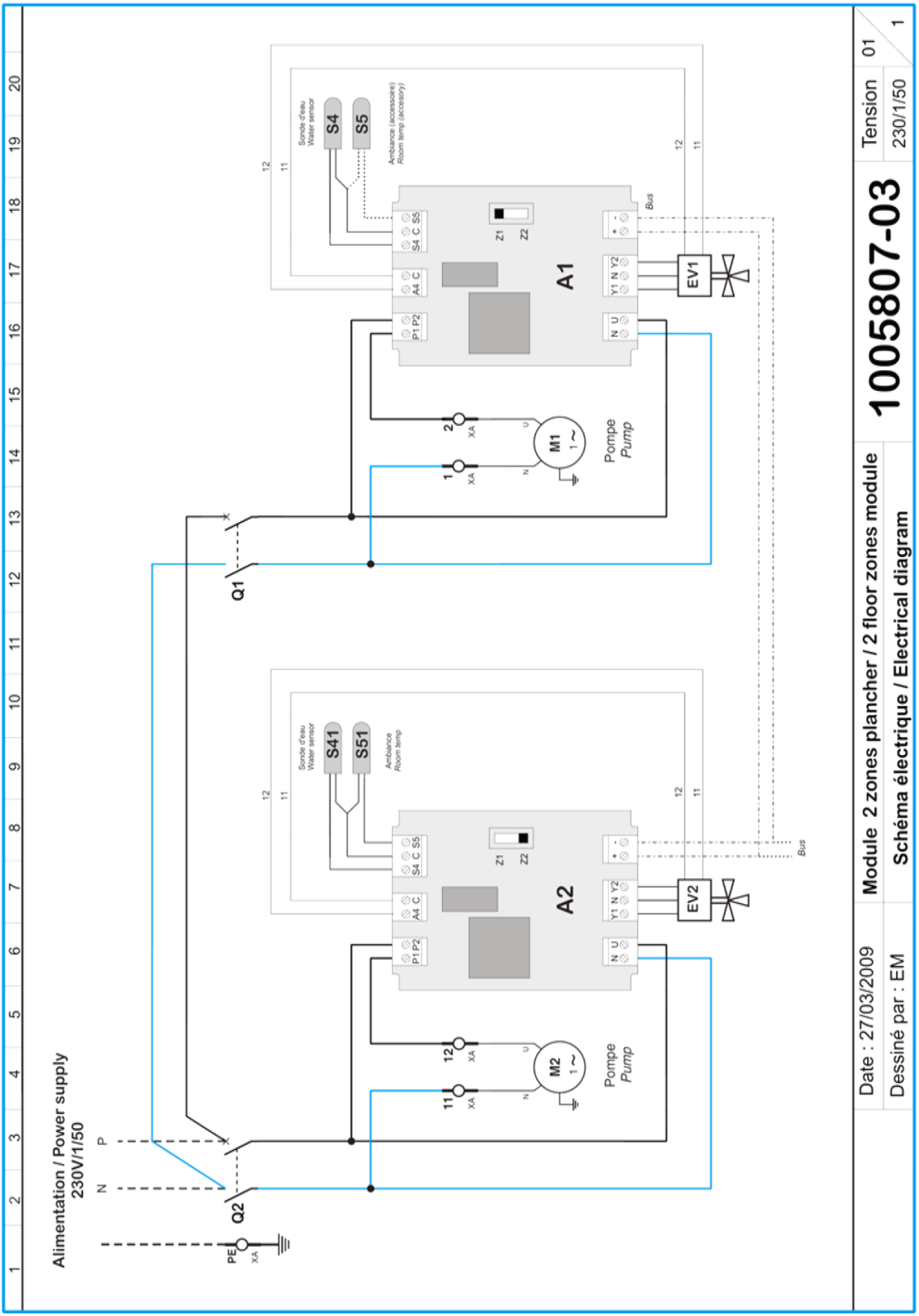
• Ground the **BUS** cable:



• Use the cable clamps mounted on the lower edge of the electrical panel to secure the cables:



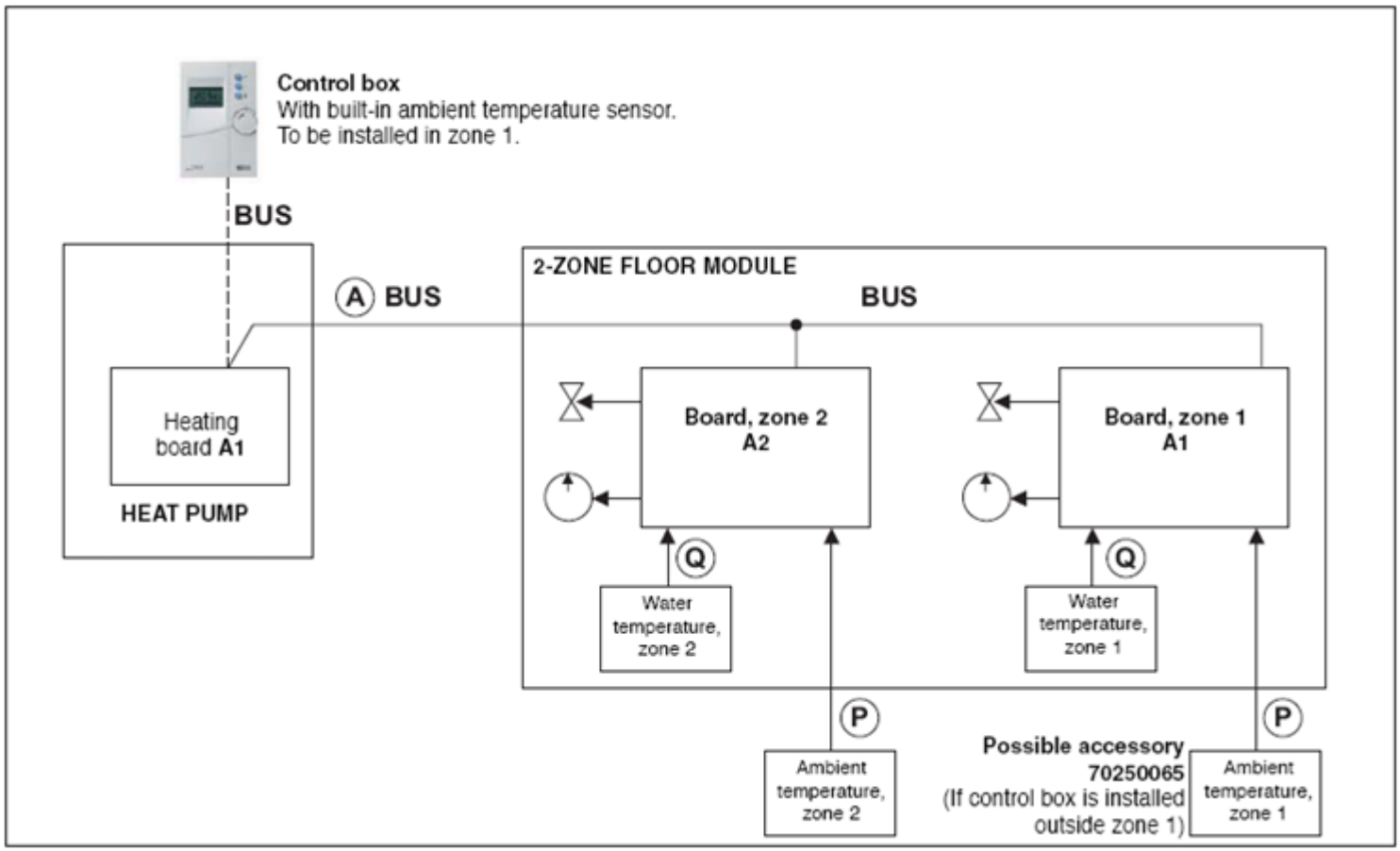
3.3 2 Zone floor module: Schematic Diagram, Electrical connection



3.3.1 Mains supply

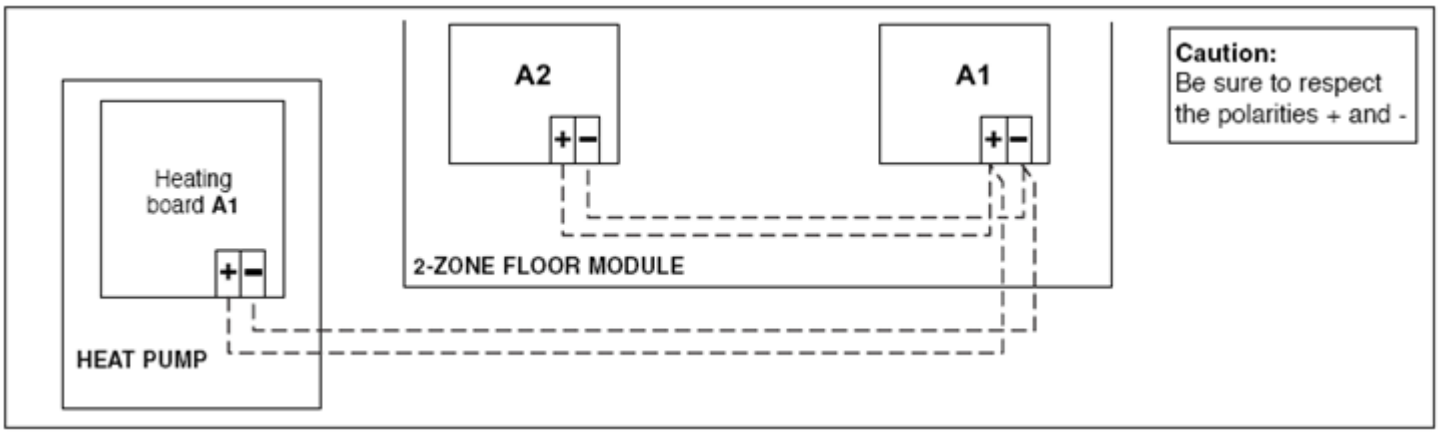
• **230 V,** single-phase, **50 Hz**, input amperage = **1.6 A.**
• The electrical power supply must come from protection and disconnecting means (not supplied) in compliance with the standards and regulations in force. The circuit must be protected by a two-pole circuit breaker.
• Cable **3G 1.5 mm²**.
• Power supply to be connected directly on the zone 2 circuit breaker ("**Q2**") located in the module.

Caution: To avoid problems related to electromagnetic disturbances, do not route these cables near power cables.



3.3.2 BUS (A)

- 2-conductor cable, min. size 1 mm².
- Total length of the BUS connection: 40 meters (heating board / control box connection + heating board / zone board if any connection).
- To be connected on the terminal strip of the boards, zones A1 and A2, located in the module.



3.3.3 Zone ambient temperature sensor (P)

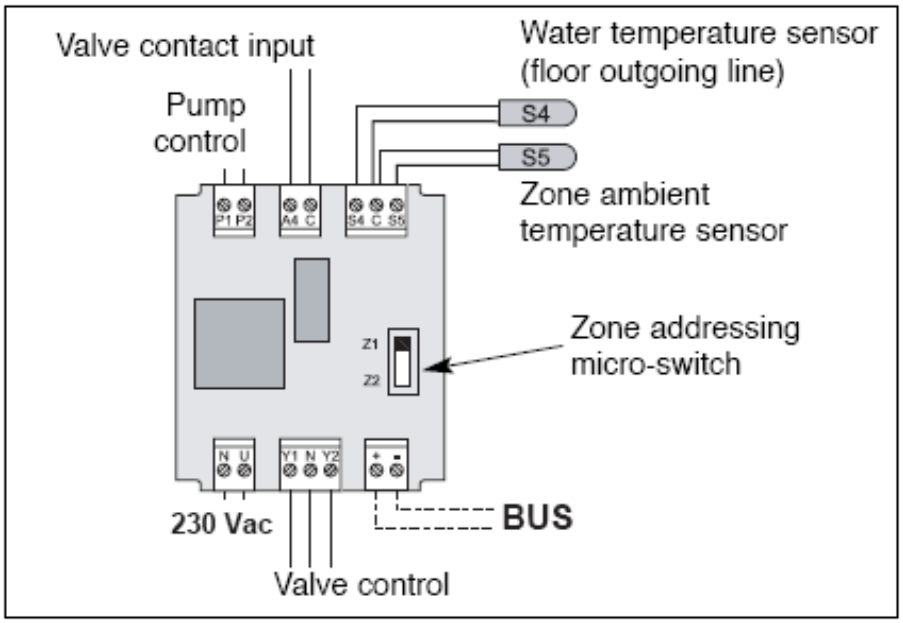
- For zone 2, Floor: mandatory, supplied with the module.
- For zone 1, Floor: required only if the control unit is not placed in a location that is representative of the temperature in zone 1.

Caution:
In this case, the remote zone 1 sensor must be activated through parameterisation on the control unit (refer to control's technical manual). This sensor is proposed as accessory **70250065**.
- Wall mounting: the sensor is designed to be mounted in a "Mosaïc" type (45 x 45), flush-mounted electrical box (not supplied).
It is to be installed in a location that is representative of the temperature in the zone.
- The sensor must not be installed in corners, on shelves or behind curtains, near sources or heat or directly exposed to sunlight.
The unit should be installed approximately 1.5 m above the floor.
- Use a 2-conductor cable for installation, minimum size: 0.5 mm^2 and max. length: 25 meters.
- To be connected directly on the corresponding zone board (terminals **C** and **S5**).

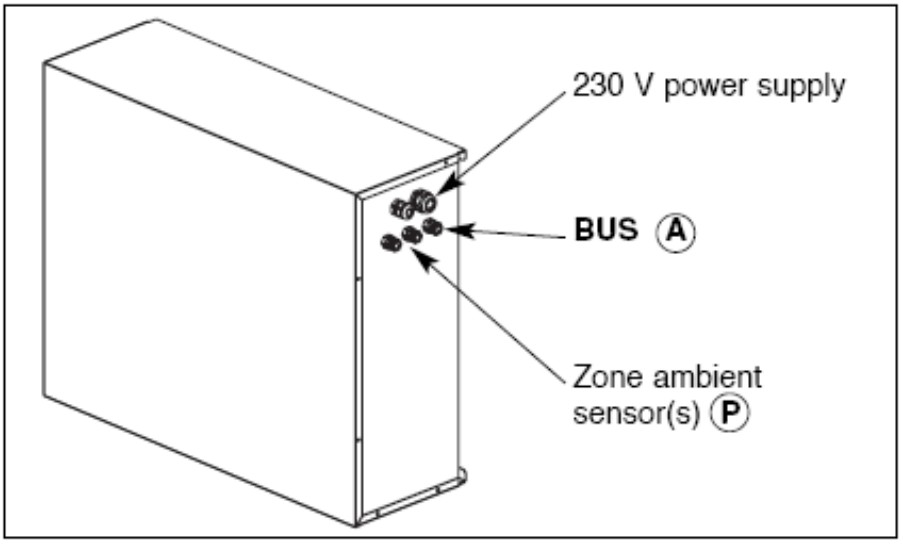
3.3.4 Floor zone outgoing line (Q):

Water temperature outgoing line
- Indicated for informational purposes as it is already connected in the module.

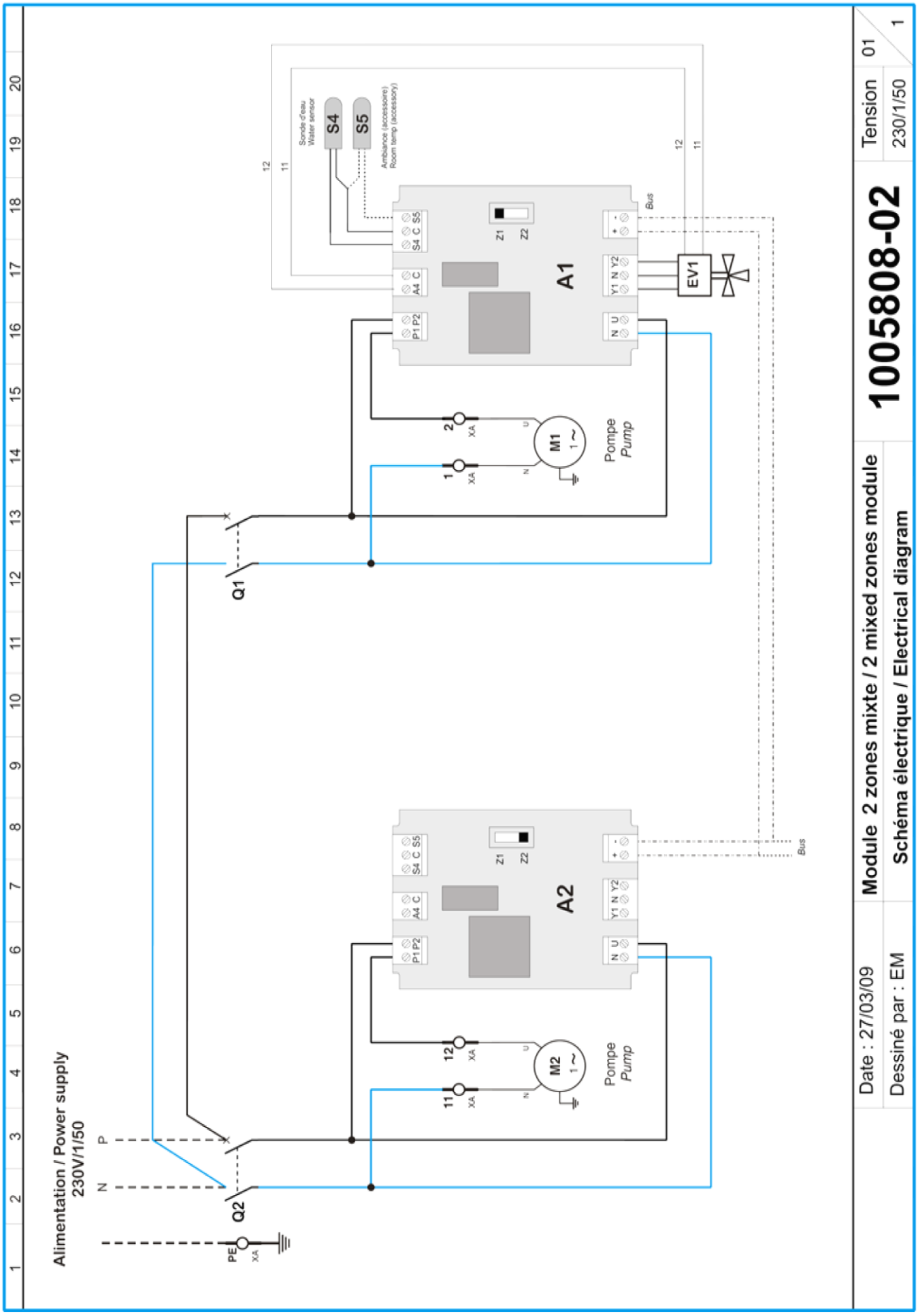
3.3.5 Zone board connection detail



3.3.6 Cable routing



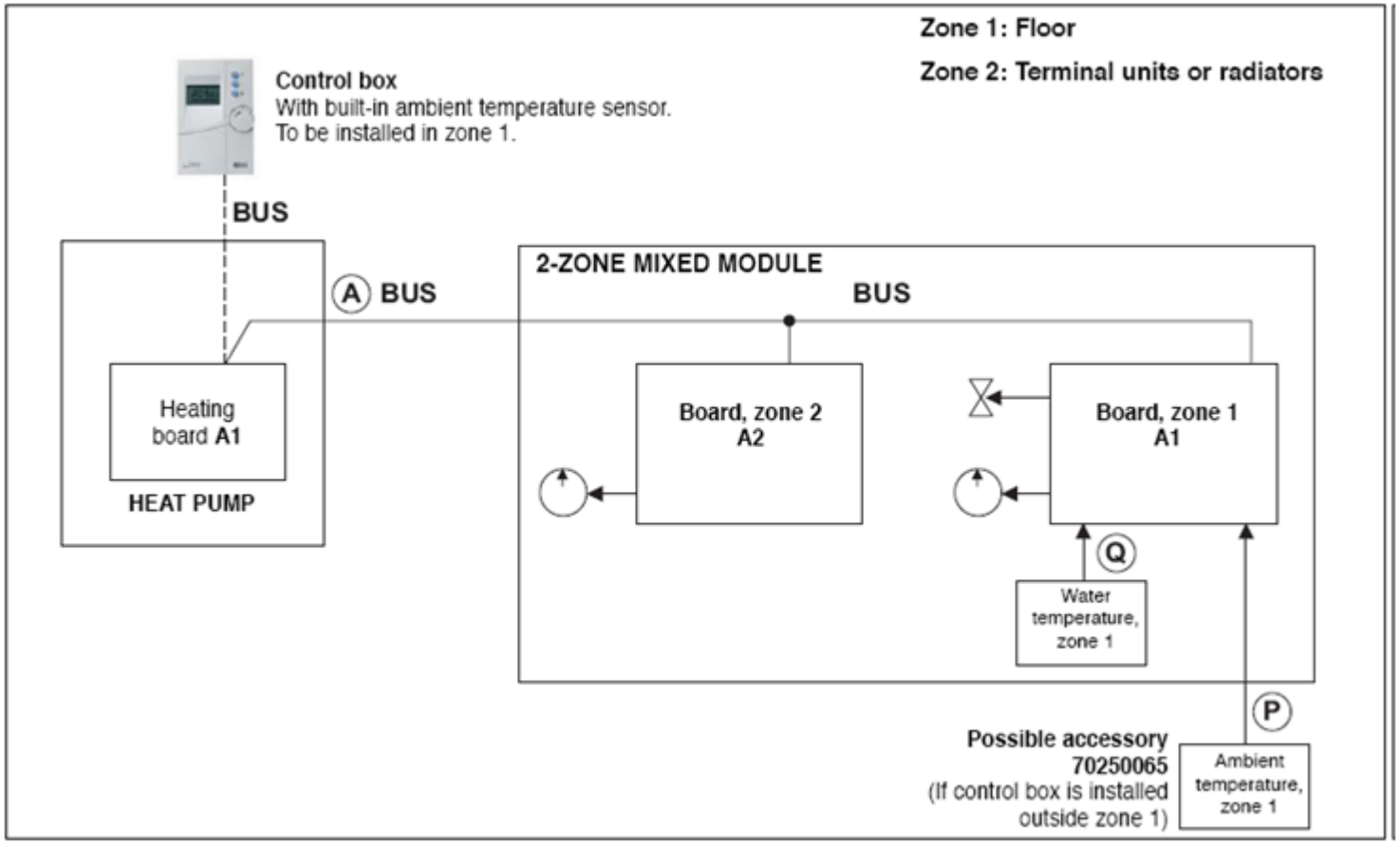
3.4 2 zone mixed module : Schematic Diagram, Electrical connection



3.4.1 Mains supply

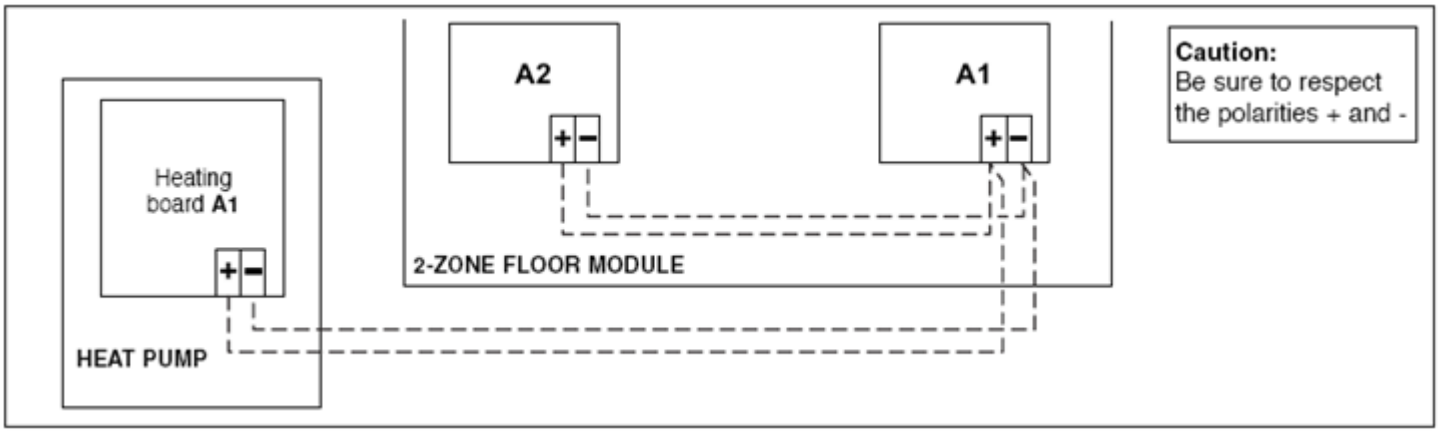
• **230 V,** single-phase, **50 Hz**, input amperage = **1.6 A.**
• The electrical power supply must come from protection and disconnecting means (not supplied) in compliance with the standards and regulations in force. The circuit must be protected by a two-pole circuit breaker.
• Cable **3G 1.5 mm2**.
• Power supply to be connected directly on the zone 2 circuit breaker ("**Q2**") located in the module.

Caution: To avoid problems related to electromagnetic disturbances, do not route these cables near power cables.



3.4.2 BUS (A)

- 2-conductor cable, min. size 1 mm^2.
- **Total** length of the BUS connection: 40 meters (heating board / control box connection + heating board / zone board if any connection).
- To be connected on the terminal strip of the boards, zones **A1** and **A2**, located in the module.



3.4.3 Zone ambient temperature sensor (P)

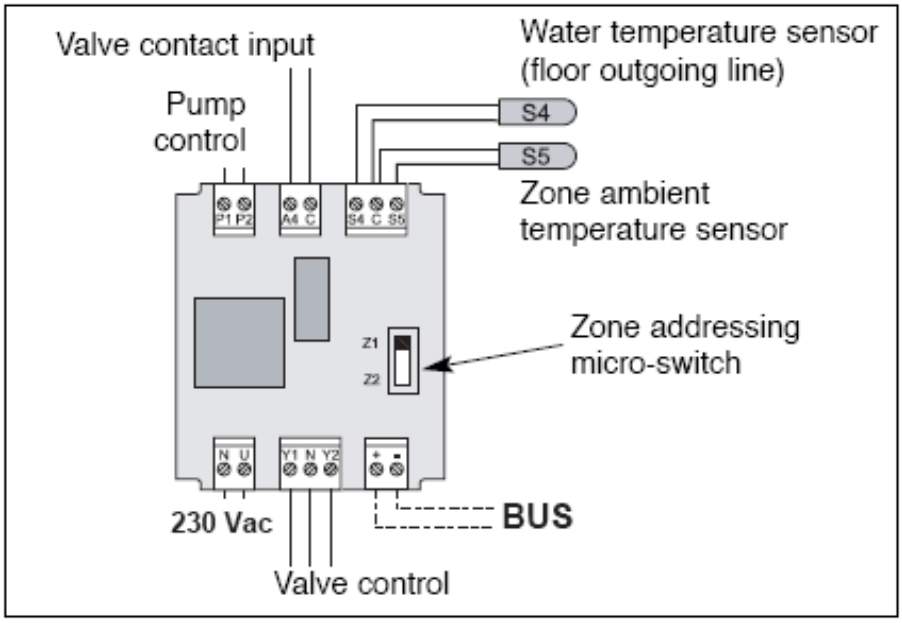
- For zone 2, Floor: mandatory, supplied with the module.
- For zone 1, Floor: required only if the control unit is not placed in a location that is representative of the temperature in zone 1.

Caution:
In this case, the remote zone 1 sensor must be activated through parameterisation on the control unit (refer to control's technical manual).
This sensor is proposed as accessory **70250065**.
- Wall mounting: the sensor is designed to be mounted in a "Mosaïc" type (45 x 45), flush-mounted electrical box (not supplied).
It is to be installed in a location that is representative of the temperature in the zone.
- The sensor must not be installed in corners, on shelves or behind curtains, near sources or heat or directly exposed to sunlight.
The unit should be installed approximately 1.5 m above the floor.
- Use a 2-conductor cable for installation, minimum size: 0.5 mm_2 and max. length: 25 meters.
- To be connected directly on the corresponding zone board (terminals **C** and **S5**).

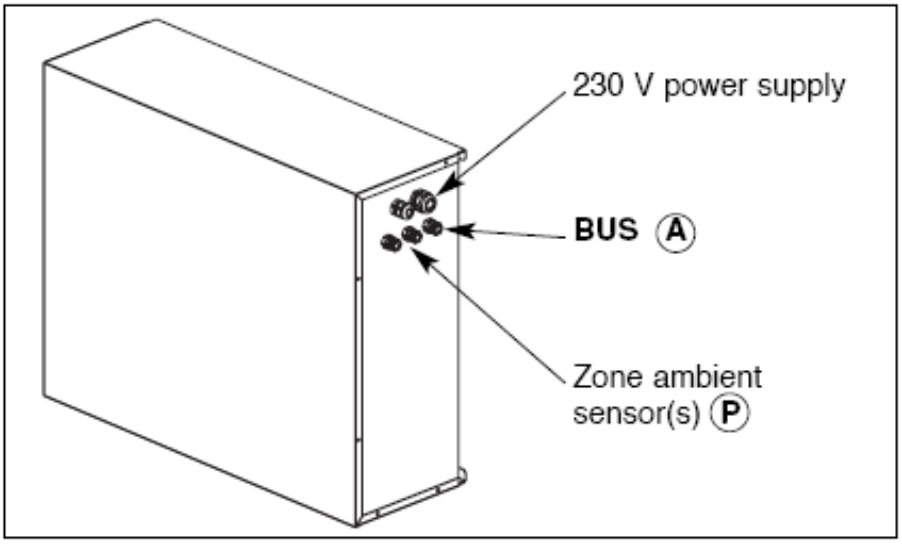
3.4.4 Floor zone outgoing line (Q):

Water temperature outgoing line
- Indicated for informational purposes as it is already connected in the module.

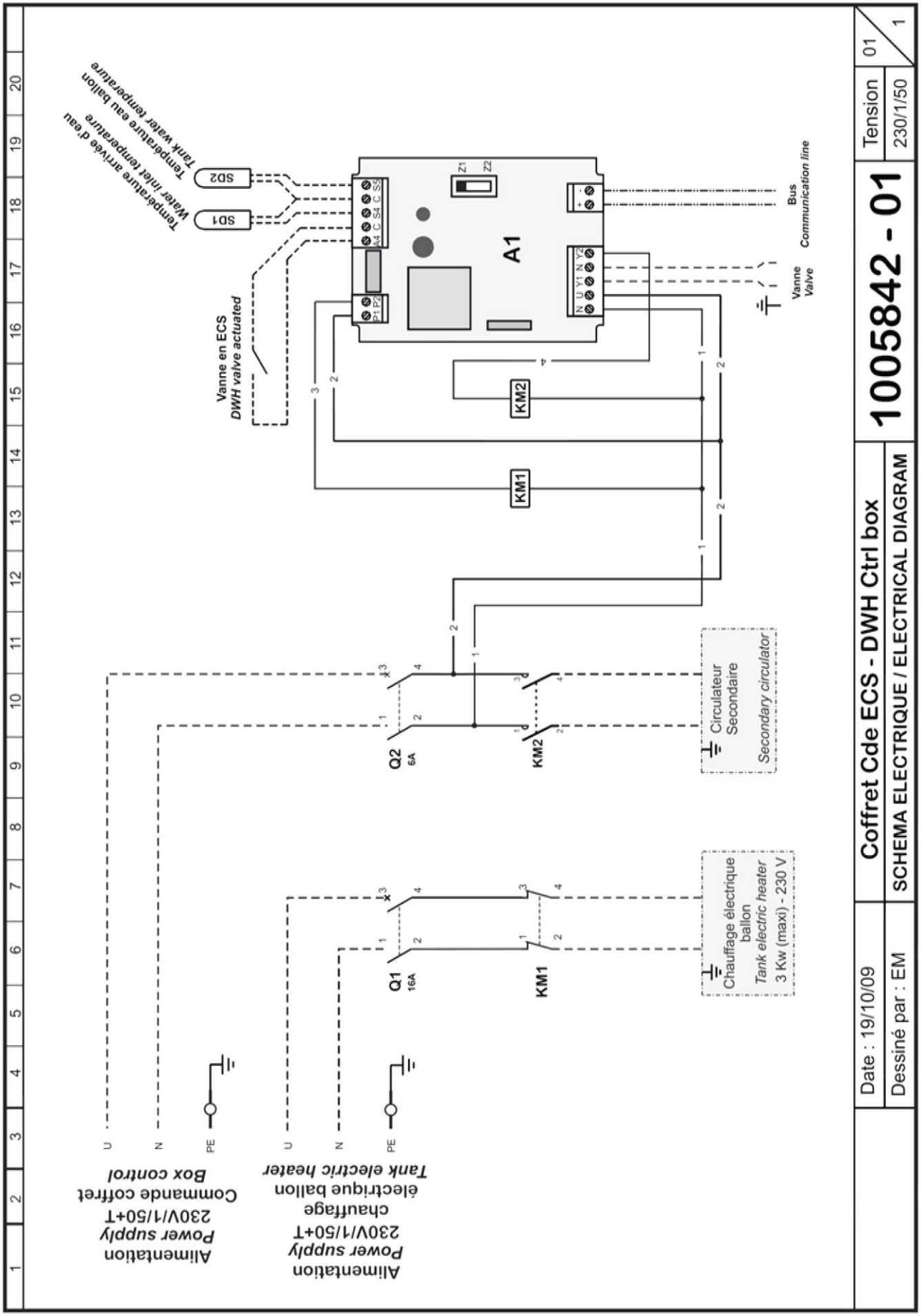
3.4.5 Zone board connection detail



3.4.6 Cable routing



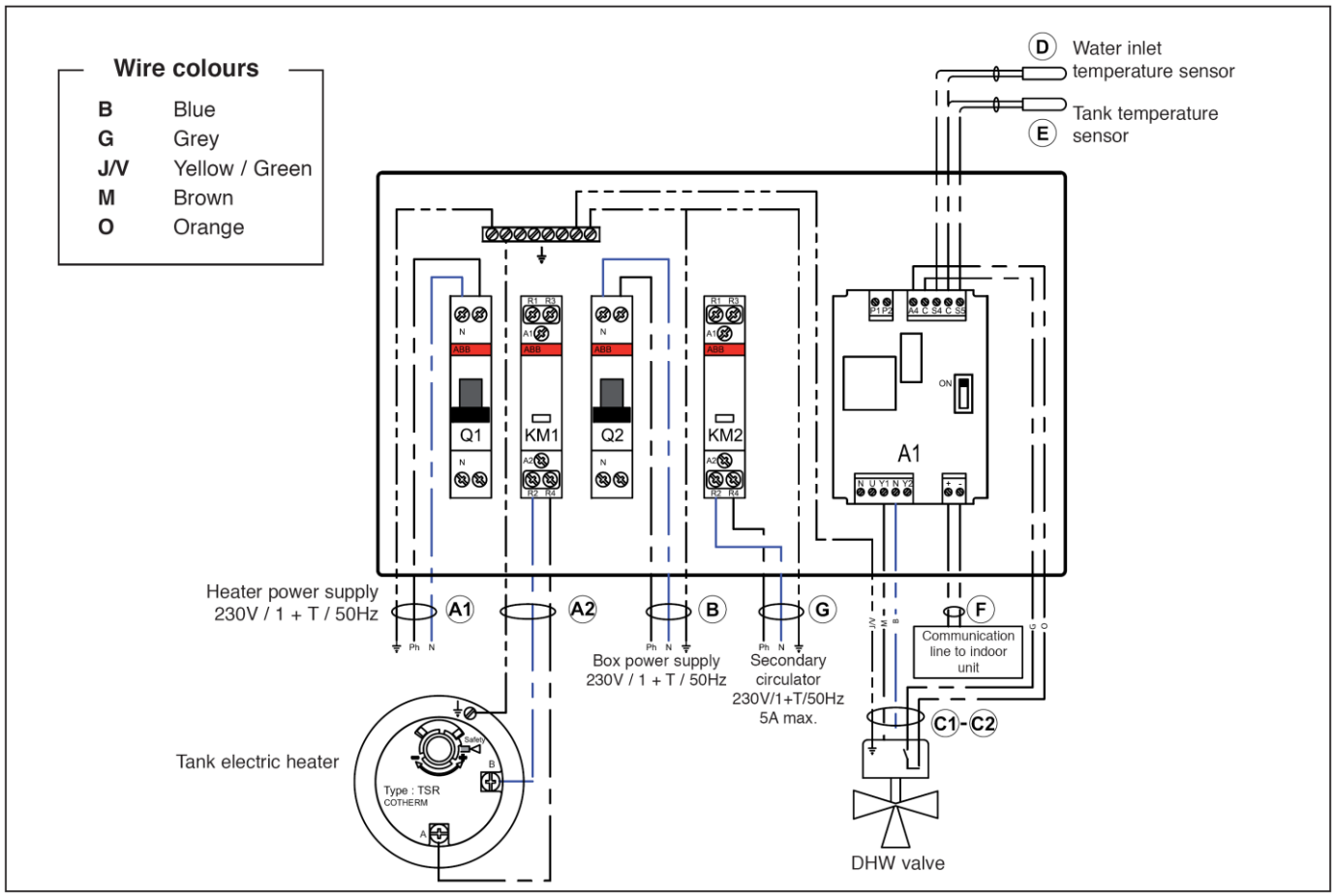
3.5 1 zone radiators low temperature + Domestic Hot Water : Schematic Diagram, Electrical connection

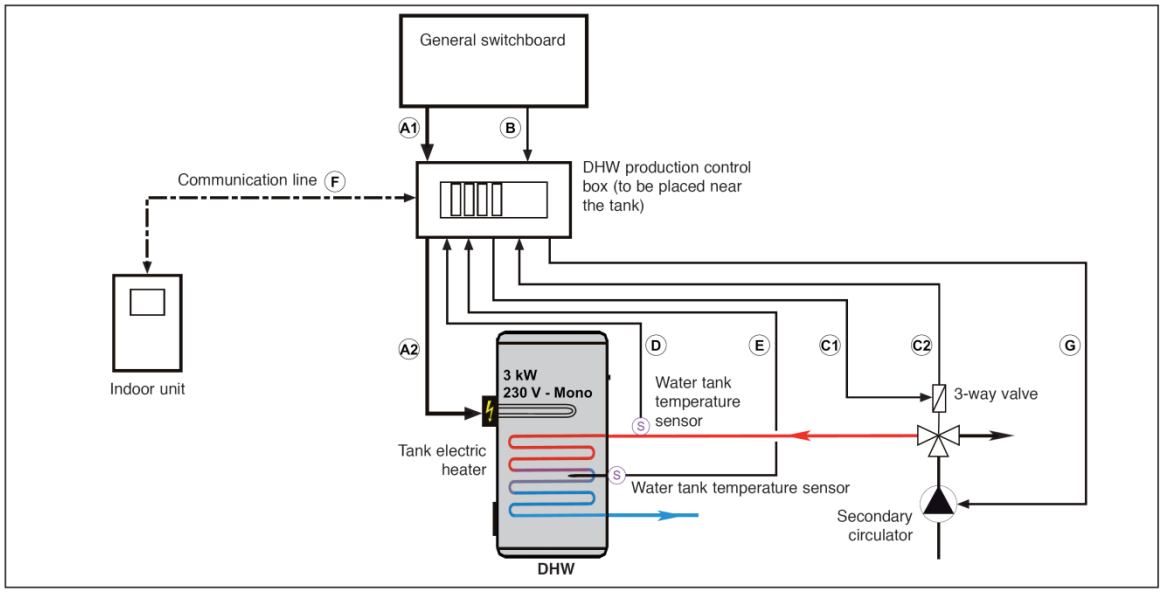


3.5.1 Mains supply

. Electrical box per EN 60 335-1.
. The electrical installation must be installed in accordance with the standards and regulations applicable at the site of installation (notably NF C 15-100 = IEC 364).
. Box power supply **230V/1/50Hz**. Acceptable voltage variation is +/- 10 % during operation.
. Class 1 appliance.
. Rated conditional short-circuit current: **4.5 kA** (per EN 60 898).
. Equipment to be connected to a general power supply with a TT neutral point connection (Neutral to ground – per NF C 15-100).
. The electrical conduits must be secured. Cables entering the box must pass via cable glands and grommets.

Caution: To avoid problems related to electromagnetic disturbances, do not route these cables near power cables.





3.5.2 Power supply of the tank's electric heater (A1) (A2)

230 V single-phase 50Hz + Ground (class 1).
Min. cable conductor size 3G 2.5 mm^2 (with 16 A protection).
(A1) Power must be supplied from a protection and disconnect device in compliance with current regulations.
To be connected directly on the input terminals of circuit breaker Q1 located in the control box.
(A2) To be connected to the output terminals of contactor KM1 in the control box.

3.5.3 Control box power supply (B)

230 V single-phase 50Hz + Ground (class 1).
It must be supplied from a protection and disconnect device in compliance with current regulations.
Min. conductor cable size 3G 1.5 mm^2.
To be connected directly on the input terminals of circuit breaker Q2 located in the control box.

3.5.4 DHW production tank 3-way supply valve (C1) (C2)

(C1) 230 V/ 50Hz + Ground (30 VA max.) "On/Off" control signal to be connected to the DHW electronic board in the control box (terminals Y1 and N) + Ground.
(C2) 3-way valve in actuated position signal = DHW, to be connected to the electronic control board (terminals A4 and C).
Note: The solenoid valve is delivered with a 1.5 m cable containing all the conductors. For installation reasons, this connection may be extended as required (maximum distance = 20 m).
In this case, use 2 two cables separated with a unitary size of 0.75 mm2 (one to control the valve and one for the position signal) - Rated voltage: 300 V min.

3.5.5 Water temperature sensors (tank water inlet temperature and water temperature in the tank) (D) (E)

Sensors are delivered as standard with a cable measuring 3.5 m long.
This connection may be extended with a 2-conductor cable (minimum size 0.5 mm^2) and with a maximum length of 25 meters.
To be connected to the electronic control board (see box connection Section 3.5.1).

3.5.5.1 Tank water inlet temperature sensor (D)

It must be positioned on the tank exchanger's hot water supply pipe (as close to the tank as possible) using the metal bracket supplied. Apply conductive paste prior to placement and assemble it with the 2 plastic clamps provided.
Insulate the assembly with the length of insulation provided.

3.5.5.2 Water temperature sensor in the tank (E)

The sensor is to be inserted into the Ø 18 mm thermowell provided for this purpose.
Use conductive paste to create a hermetic installation for the sensor.
Secure the conductor to prevent the sensor from moving accidentally.

3.5.6 Communication bus (F)

2-conductor shielded cable, min. size 1 mm^2.
Total length of the bus connection: 40 meters (heating board A1 + control unit + DHW box connection).
To be connected to the specific + and - terminals of the electronic control board.

3.5.7 Secondary circulator (G)

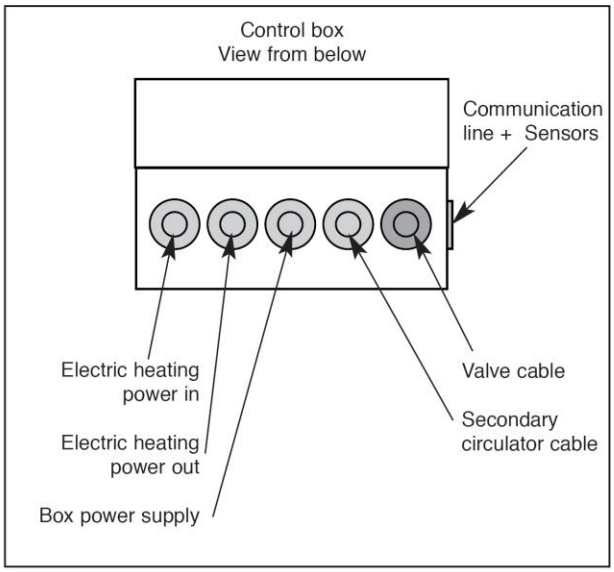
230 V single-phase 50Hz + Ground - 5A max.
Min. conductor cable size 3G 1,5 mm^2 .
To be connected directly on the output terminals of contactor KM2 in the control box.
Caution:
Make sure that the circulator (not supplied) is equipped with the necessary safety devices adapted to the type of used circulator (thermal protection, etc.).

IMPORTANT COMMENT

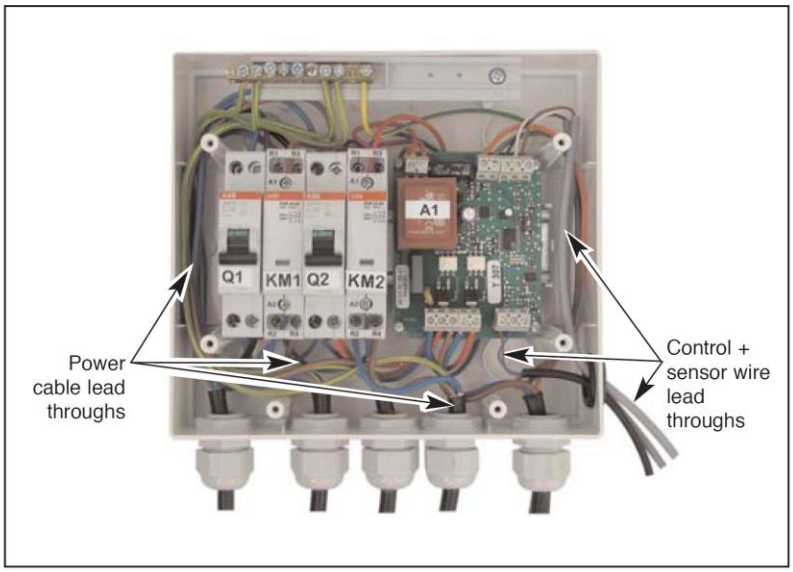
The power supply of the tank's electric heating element must be connected to ensure a domestic hot water temperature greater than 50 °C in order to prevent risks associated with the development of bacteria or legionella.

3.5.8 Cable routing

Box:



Wiring:



4 PROCESS AND FONCTIONS

4.1 Control operating principle

4.1.1 Basic principle

The Water System manages a water temperature adapted to current needs and according to the operating mode selected on the control unit:

The control assembly enables a complete installation to be controlled from a parameterable system control unit, depending on the type and conditions of the installation.
The control unit's rotating knob is used to select the desired operating mode:

- HEAT (Heating):
  The heat pump and any supplementary electric heating are controlled in relation to a setpoint resulting from the water temperature calculated according to a water rule (according to the outside temperature).
- COOL (Cooling) (for applications compatible with this mode):
  The heat pump is controlled according to a fixed set point (based on the ambient temperature for floor applications).

The orders given by the control unit are transmitted (via a system communication BUS) to the various elements of the installation via:

- A1 heating board which controls:
  . The Inverter Gestion (CC1 communicates to A2 board)
  . The PHRIA's electric heater.
- Zone boards, if any, which control the 2-zone modules.
- DHW board, if any, which control the KPECS kit.

The Inverter Gestion manages a set of Command/Control in inverter technology for the thermodynamic circuit, and it ensures:

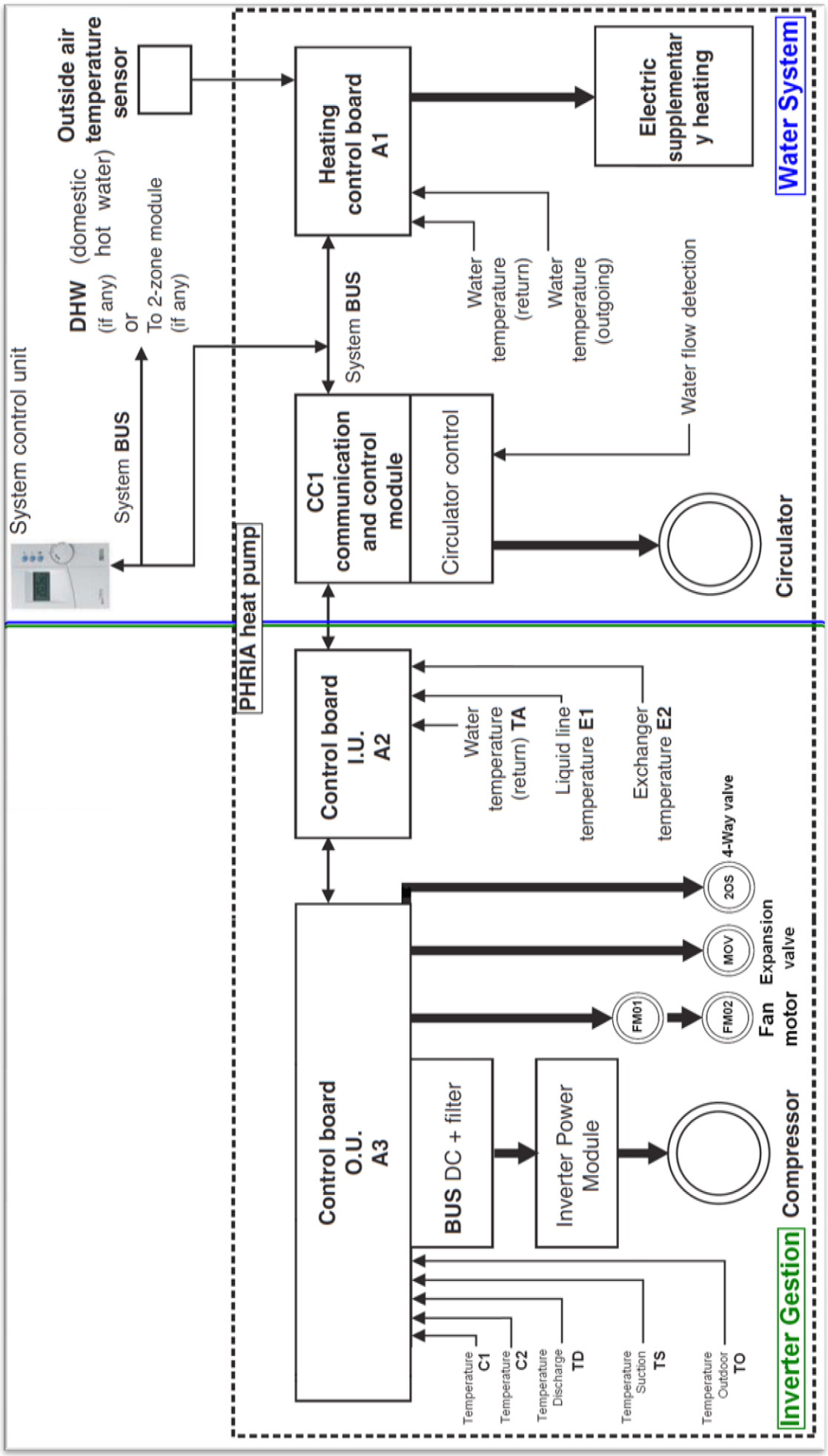
The speed variation of compressor (order from A3 trough HIC board).
The speed variation of the motor fan (order from A3 board).
Controlling the electronic expansion valve Bi-flow (order from A3 board).
Control valve to reverse the cycle (order from A3 board).
Safety limits in frequency, intensity, temperatures (TS, TD, TO, C1, C2, E1, E2, TA); (order from A2 and A3 boards):

- Max./Min. Frequency Control
- Current Release Control
- Cooling Prevention Control
- Heating Prevention Control
- Freeze Prevention Control

The Inverter Gestion receives the mode and a temperature set point from the water system (CC1) to produce most effectively the temperature and so the power requested by the water system.

Caution: This PHRIA has been designed for the applications described in this document and must not be used for any other purpose.

4.1.2 Control flow diagram



4.2 Presentation of control elements

4.2.1 Control unit

(1) Rotary function selection knob (9 positions, left to right):

COOL
- **Cooling**: Operation in cooling mode for reversible Hot / Cold applications without DHW (domestic hot water)

or

- **DHW** (domestic hot water) **only in summer:** For the Zone1 radiator application only (non reversible)

HEAT
- **Heating, anti-freeze**: **Anti-freeze** mode operation
- **Heating, ECO**: Heating mode operation with **ECO** setting
- **Heating, Auto**: Heating mode operation with hourly programming
- **Heating**: Heating mode operation with **Comfort** setting

- **Stop**
- **Time setting**
- Z1 - **Prog. Z1**: Zone 1 program control (hourly / weekly)
- Z2 - **Prog. Z2**: Zone 2 program control (hourly / weekly) if activated

(2) Push-button ⊕ for setpoint and parameter modification

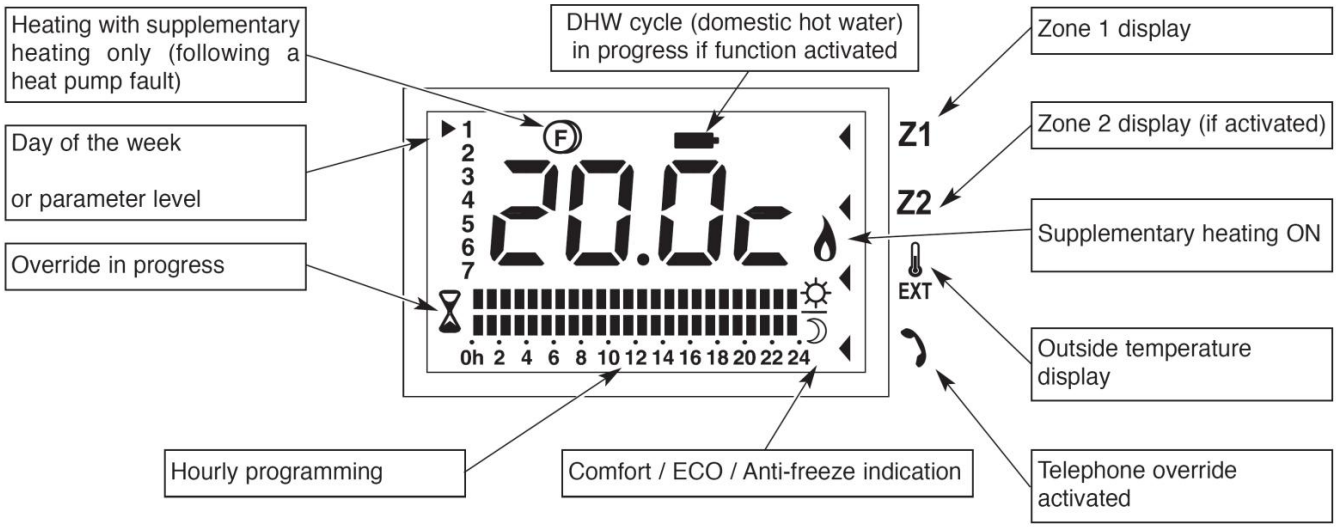
(3) Push-button ⊖ for setpoint and parameter modification

(4) "**Z/OK**" push-button Display selection zone 1 / zone 2 / outside temperature and validation

(5) Liquid crystal display (LCD)

(6) Micro-switch to activate a 2nd heating zone using electric convectors (for 1 zone floor or 1 zone terminal unit applications).
This micro-switch is located on the back of the unit's printed circuit board. Remove the base to gain access to this switch.

(7) Ambient temperature sensor



- When off, the display indicates "**OFF**".
- When in operation, the normal reference display indicates:
  - the setpoint temperature of zone 1 (for a floor zone),
  - the current setting with the hourly program bar graph:

☼ = **Comfort**

☽ = **ECO**

No indication = **Anti-freeze** (prolonged absence)

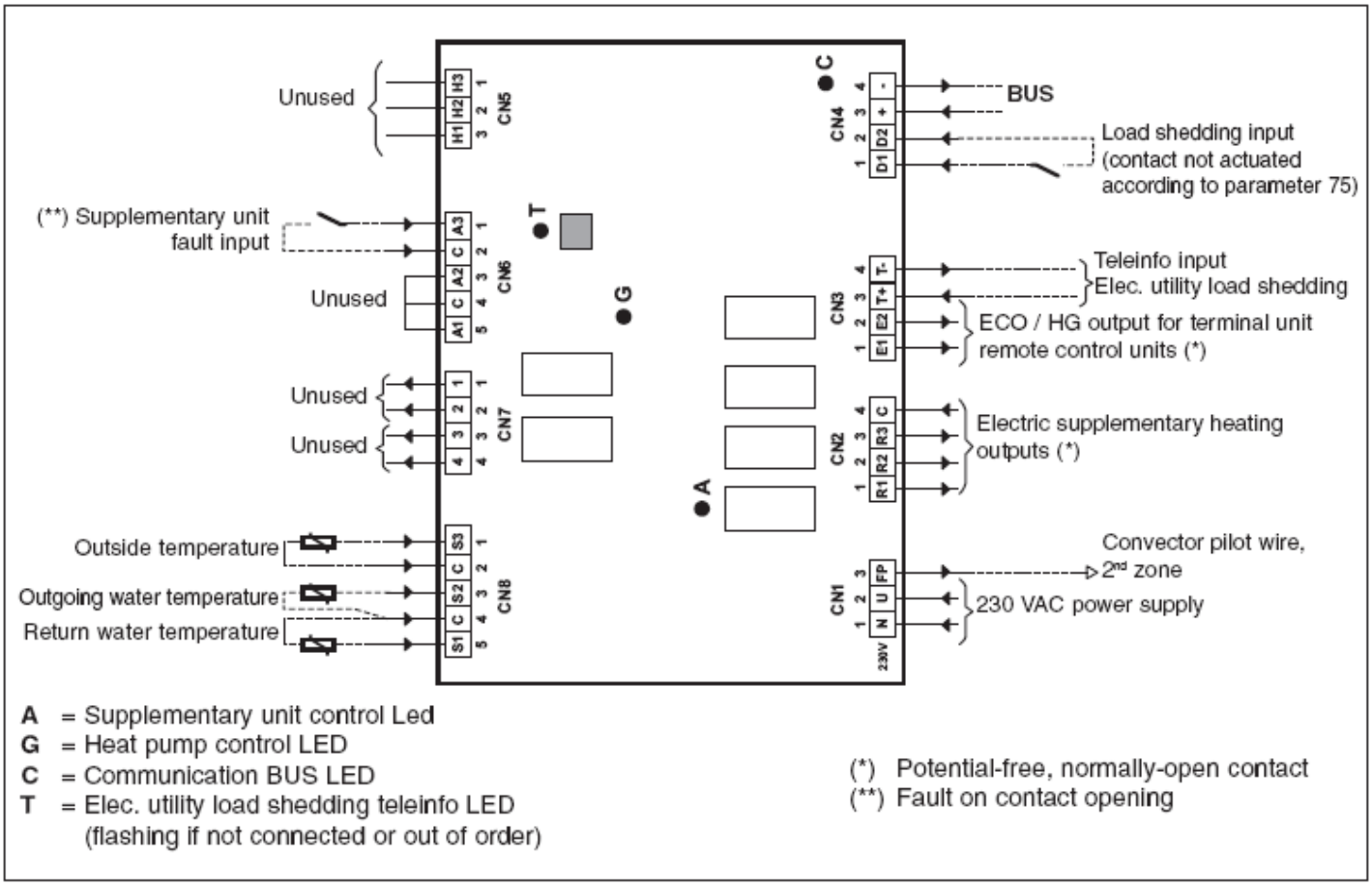
  - current day.

Note:

In the case of a 2nd zone with electric convectors or a terminal units zone, there is no centralized setpoint or ambient temperature measurement. The display indicates "HEAT" (or "COOL" in cooling mode for the terminal units).

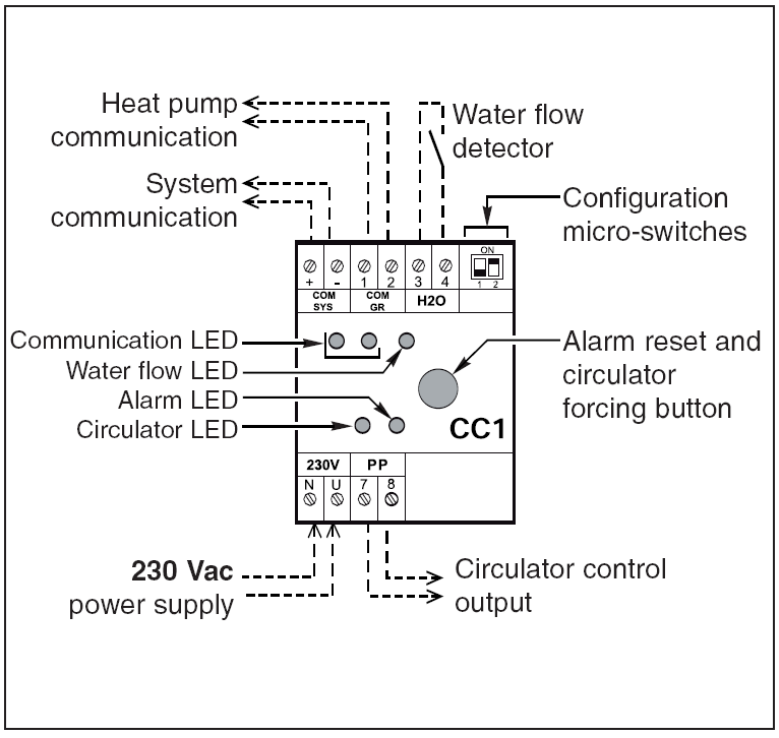
4.2.2 Heating board

- Mounted in the indoor unit, it controls the heat pump and its electric heater unit.
- It is connected to the control unit by the communication BUS.



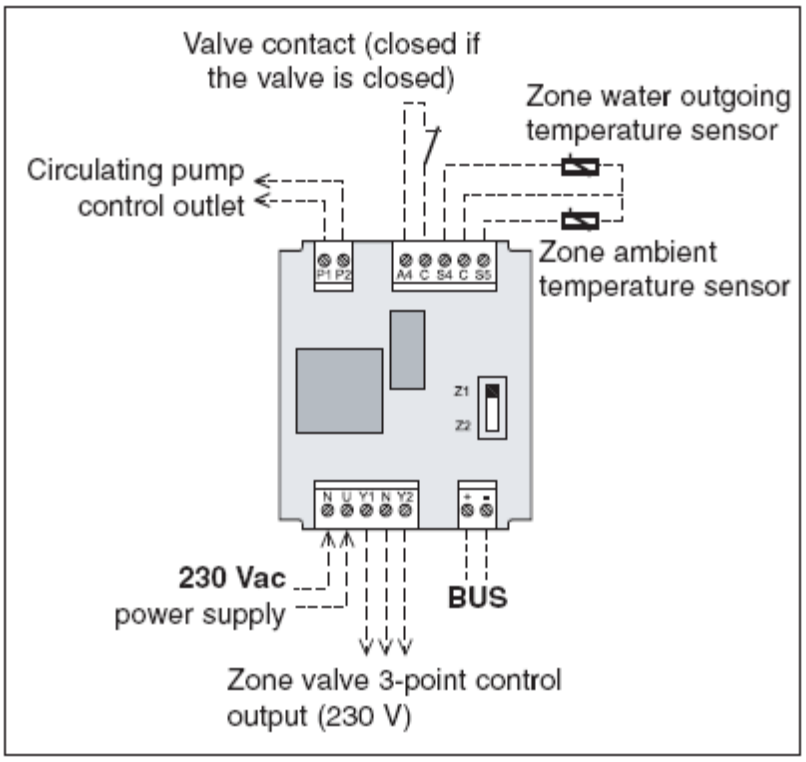
4.2.3 Communication and control module

- Mounted in the indoor unit, it ensures 2 functions:
  - Communication interface between Water System and the Inverter Gestion.
  - Management of the PHRIA's circulator with water flow sensor control.



4.2.4 Zone board

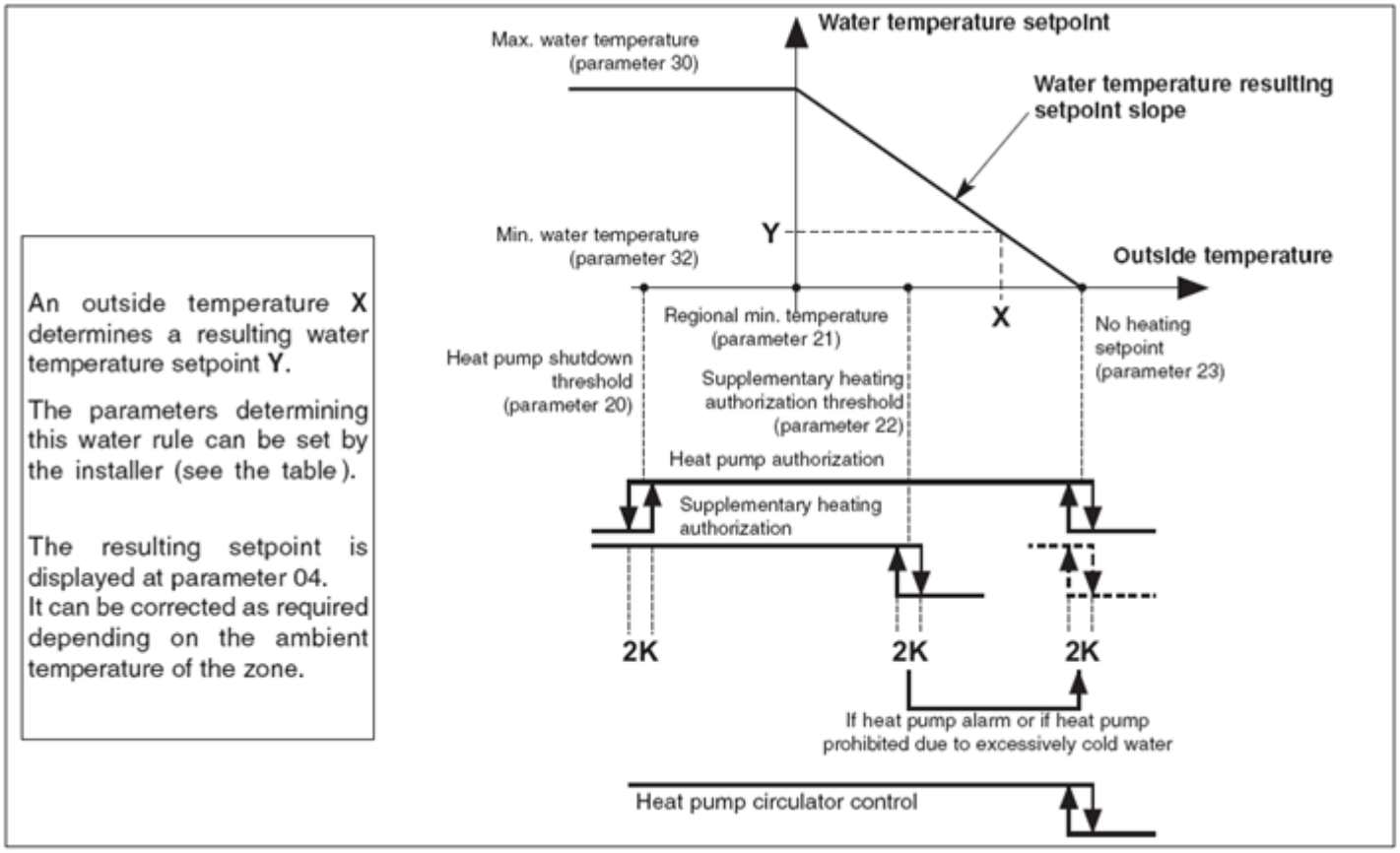
• Mounted in 2-zone modules, it is designed to control the circulating pump and control valve for each zone.
• There is one board per zone.
• It is connected to the control unit and to the heating board by the communication BUS.



4.3 1-zone floor application operation

4.3.1 Heating mode

4.3.1.1 Heating operating diagram



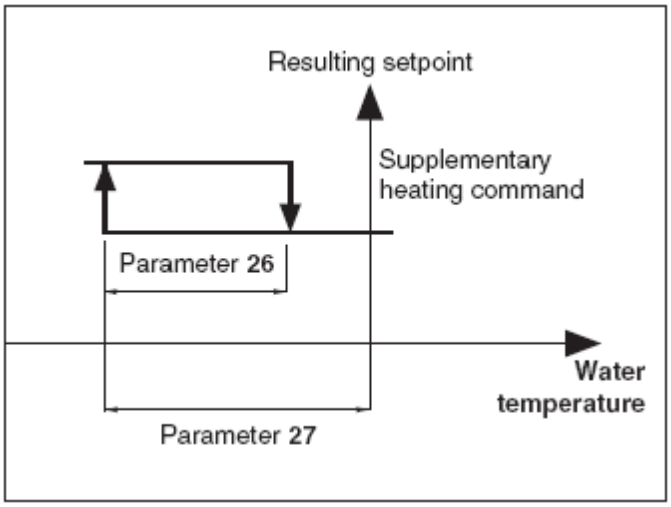
4.3.1.2 "Comfort" heating mode

Selection is made using the rotary knob on the control unit.

- **Water temperature setpoint**
  - The heat pump can operate only if the outside temperature is less than the non-heating temperature.
  - The heat pump is controlled via the heating board according to a **resulting setpoint** of the water temperature (control on the installation return) calculated according to an adjustable water rule determined by:
    - The non-heating temperature (parameter 23),
    - The regional minimum temperature (parameter 21),
    - The minimum temperature of the water circuit (parameter 32),
    - The maximum temperature of the water circuit (parameter 30).

The resulting setpoint calculated in this manner can be corrected by the temperature of the zone:
A difference of +/- 1 degree of ambient temperature in relation to the heating setpoint temperature of the zone (adjustable from 15 to 25°C) causes the resulting setpoint (water temperature) to decrease or increase of 2 degrees, respectively. However, this variation cannot exceed +/- 5 degrees.
The calculated resulting set point is displayed at parameter 04.
Note:
The set point value sent to the heat pump can be clipped to the maximum value given in parameter 43.

• Supplementary electric heating
- The heating elements are actuated on if the heat pump is not able to maintain the water return temperature at the calculated value. The supplementary heating by electrical heating elements is staged (2 stages). The second stage is managed by a 10-minute time delay for is activation.



- **Caution**:
During normal operation, the supplementary heating is authorized only if the outside temperature falls below the authorization threshold (parameter 22) corresponding to the installation's equilibrium temperature and the absence of a load shedding signal. However, if can be authorized for greater temperatures if the heat pump is experiencing an alarm or if heat pump operation is prohibited by a safety device (and even if a load shedding signal is present).
Supplementary heating is prohibited if it is experiencing an alarm.

• Heat pump operating safety features in heating mode
- A safety device on the water temperature (installation return) prohibits heat pump operation if this temperature is below the thermodynamic heating authorization threshold (parameter 36). In this case, only supplementary heating is authorized to raise the water temperature and allow the heat pump to operate, regardless of the outside temperature (load shedding is thus inoperative). The activation of this safety feature is indicated by the flashing of
the display.
- Heat pump operation is prohibited if the outside temperature is below the shut-off threshold (parameter 20). Only supplementary heating is authorized (load shedding is thus inoperative).

• Limitation on ambient temperature
- In heating mode, operation of the heat pump and the electric heater (if any) is prohibited if the ambient temperature of the zone exceeds the ambient set point temperature by 3.5°C. The operation is authorised once again if the ambient temperature falls to the ambient set point value.

• Control of the heat pump's circulator
- The heating mode, activated if the outside temperature is less than the non-heating temperature.
- If the circulator is off, an “anti-sticking” function starts the circulator for 5 seconds every 24 hours.
See details in paragraph *6-9. CC1 module operation*

4.3.1.3 “ECO” heating mode

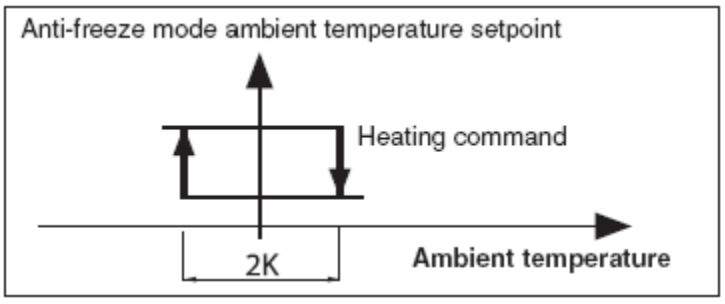
Selection is made using the rotary knob on the control unit.

• The switch to "**ECO**" mode lowers the ambient temperature setpoint by a value than can be adjusted from 1 to 4K (parameter 24).
• It can only be activated in heating mode (inactive in cooling mode).
• Switching from "**Comfort**" to "**ECO**" is accomplished either by hourly programming, weekly programming by zone or by actuating the rotary knob for the entire installation.
• In the case of hourly programming, the user can activate a temporary override (1 hour + periods of 1 hour during the current day) per zone.

4.3.1.4 “Anti-freeze” Heating mode (prolonged absence)

Selection is made using the rotary knob on the control unit.

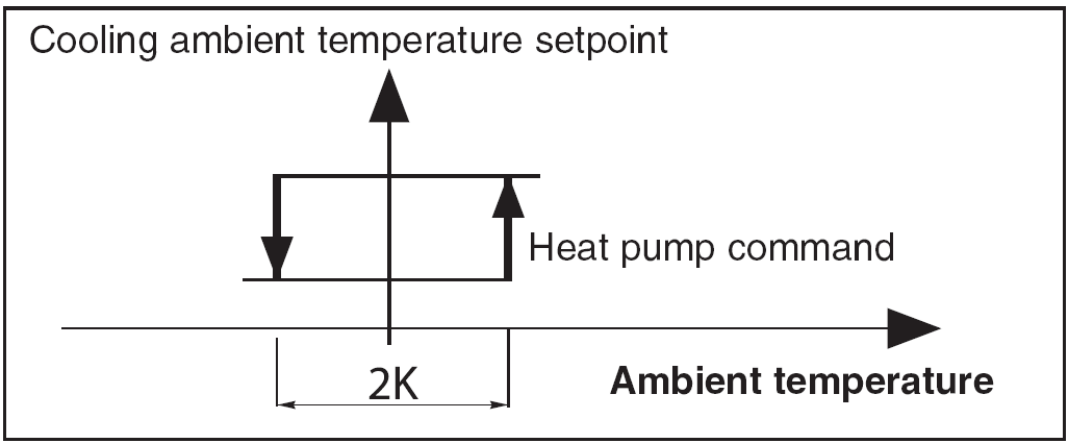
• Selection is made using the rotary knob on the control unit for the entire installation.
• The water temperature resulting setpoint passes to an adjustable value (parameter 29 is factory-set at 25°C).
Heating (heat pump + supplementary heating, if any) is actuated depending on the ambient temperature setpoint adjustable (parameter 25 set to 12°C in the factory).



4.3.2 Cooling mode

Selection is made using the rotary knob on the control unit.

4.3.2.1 Cooling operating diagram



The heat pump operates with the water temperature set point (installation return) given in parameter 42. It is activating if the ambient temperature is greater than the cooling setpoint (adjustable from 20 to 30°C).

4.3.2.2 Heat pump safety in cooling mode

Heat pump operation is prohibited if the installation return water temperature is above a threshold (parameter 35). The activation of this safety feature is indicated by the flashing of the display.
An "anti-condensation" device on the installation's outgoing temperature prohibits heat pump operation if this temperature is below 15°C. This device is designed to limit the risks of condensation.

4.3.2.3 Control of the heat pump's circulator

- In cooling mode, actuated as soon as the mode is selected.
- If the circulator is off, an “anti-sticking” function starts the circulator for 5 seconds every 24 hours.
See details in paragraph *6-9. CC1 module operation*.

4.3.2.4 Cooling mode restriction

- The cooling mode can be restricted by setting parameter 71 to "**0**".
- At this time, selecting “**COOL**” on the control unit will cause shutdown “**OFF**”.

4.3.3 2nd Zone : Electric convectors

• A 2nd zone equipped with electric convectors can also be managed (Max. number = 20). These appliances must be equipped with an electronic thermostat (not included) able to receive signals via a 230 VAC pilot wire (standard GIFAM 4).
• The 2nd zone is activated by setting the micro-switch in the back of the control unit to the "**ON**" position.
- In "**Comfort**", "**ECO**" or "**Anti-freeze**" heating modes, the corresponding signals are transmitted to the 2nd zone.
- In **cooling** mode and in the **Stop** position, the shut-down signal is transmitted to the 2nd zone.
- In **heating mode with hourly programming**, the "**Comfort**" or "**ECO**" signals are transmitted to the 2nd zone according to the corresponding hourly programming.
- In **heating mode**, the display unit indicates for the zone 2 "**HEAT**".

Note:
In case of load shedding, a shut-down signal is transmitted to the 2nd zone.

4.3.4 Miscellaneous

• Mode changes using the rotary knob (**Heating / Cooling / Anti-freeze / Stop**) are delayed 10 seconds in order to filter inappropriate actions. However, the "**Time Setting**" and "**Hourly Programming**" positions do not have the time delay feature.
• The authorization thresholds on the water temperature are cut-off values with a differential of 1K for the reset.

4.4 2 zone floor application operation

4.4.1 Heating mode

4.4.1.1 Heating operating diagram

A water rule is determined for each zone.

An outside temperature **X** determines a water temperature resulting setpoint **Y1** for zone 1 and **Y2** for zone 2.

The parameters determining this water rule can be set by the installer (see the table).

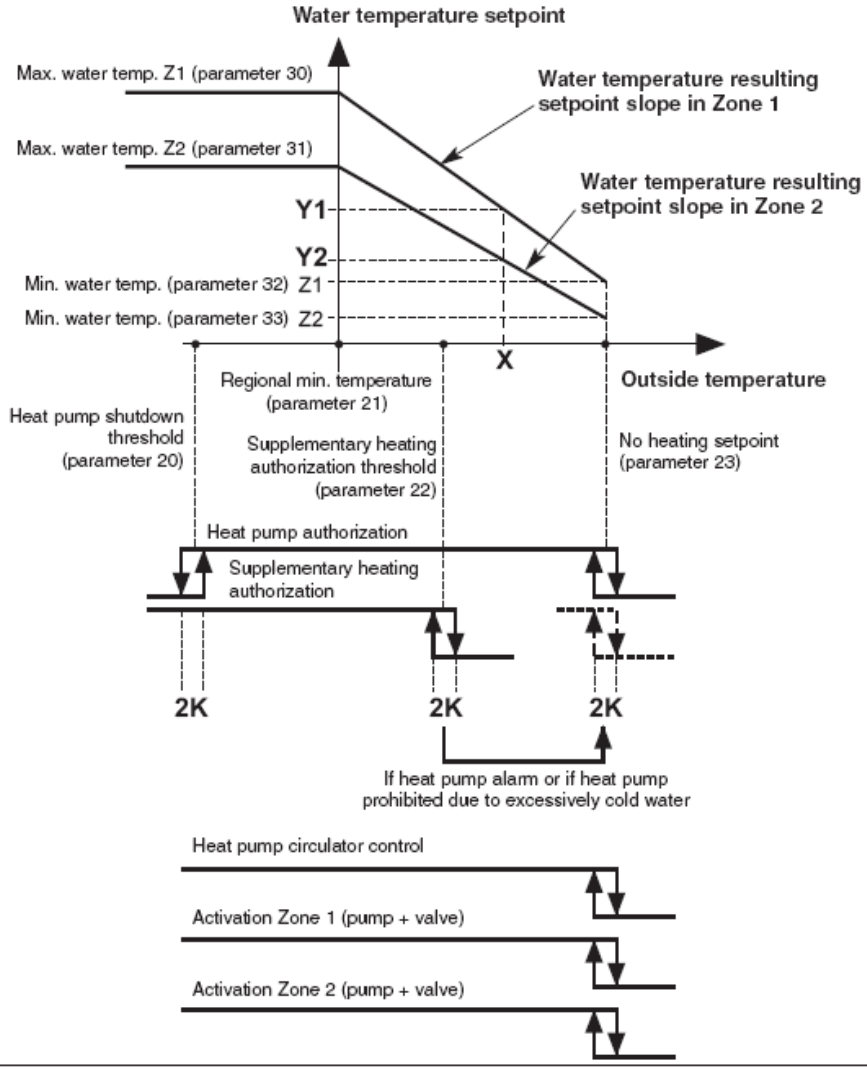
The resulting setpoint for zone 1 is displayed at parameter 04.

The resulting setpoint for zone 2 is displayed at parameter 05.

Each resulting setpoint can be corrected as required depending on the ambient temperature of the zone.

The heat pump is controlled according to the highest resulting setpoint.

The control valve of each zone is controlled according to the resulting setpoint of the zone.



4.4.1.2 “Comfort” heating mode

Selection for the 2 zones is made using the rotary knob on the control unit.

• Water temperature setpoint

- The circulating pump of each zone is actuated and the control valve activated if the outside temperature is less than the non-heating temperature.
- The heat pump can operate only if the outside temperature is less than the non-heating temperature.
- A water rule is determined for each zone according to the settings that are specific to the zone. A resulting setpoint of the water temperature is calculated according to the outside temperature and the ambient temperature of the zone.

The control valve is controlled by the zone board according to this resulting setpoint and the water temperature read by the sensor placed on the outlet of the zone considered.

- The heat pump and the supplementary heating are thus controlled (in relation to the installation's return temperature) according to the highest resulting setpoint of the 2 circuits.

For each zone, the water rule is determined by:

- the non-heating temperature (parameter 23),
- the regional minimum temperature (parameter 21),
- the minimum temperature of the water circuit (parameters 32 for zone 1, 33 for zone 2),
- the maximum temperature of the water circuit (parameters 30 for zone 1, 31 for zone 2).

The resulting setpoint calculated in this manner can be corrected by the ambient temperature of the zone: A difference of +/- 1 degree of ambient temperature in relation to the heating setpoint temperature of the zone
(adjustable from 15 to 25°C) causes the resulting setpoint (water temperature) to decrease or increase of 2 degrees, respectively. However, this variation cannot exceed +/- 5 degrees.
The resulting zone 1 and zone 2 set points are displayed at parameters 04 and 05.

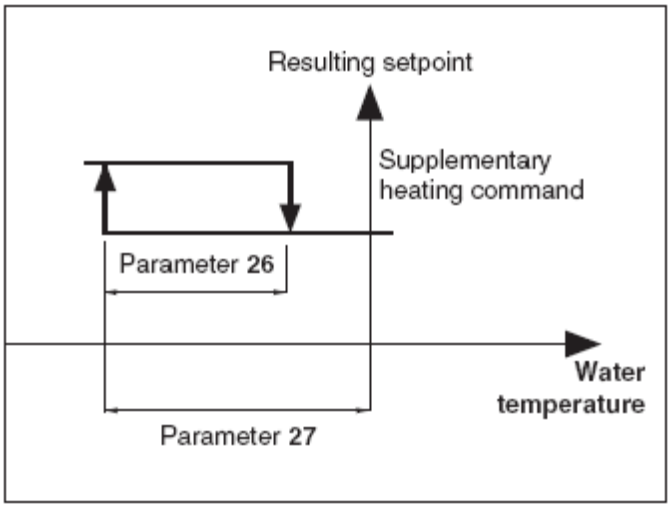
Note:
The set point value sent to the heat pump can be clipped to the maximum value given in parameter 43.

• Control of the heat pump's circulator

- The heating mode, activated if the outside temperature is less than the non-heating temperature.
- If the circulator is off, an “anti-sticking” function starts the circulator for 5 seconds every 24 hours. See details in paragraph 6-9.

• Supplementary electric heating

- The heating elements are actuated on if the heat pump is not able to maintain the water return temperature at the calculated value. The supplementary heating by electrical heating elements is staged (2 stages). The second stage is managed by a 10-minute time delay for is activation.



- **Caution**:
During normal operation, the supplementary heating is authorized only if the outside temperature falls below the authorization threshold (parameter 22) corresponding to the installation's equilibrium temperature and the absence of a load shedding signal. However, if can be authorized for greater temperatures if the heat pump is experiencing an alarm or if heat pump operation is prohibited by a safety device (and even if a load shedding signal is present).
Supplementary heating is prohibited if it is experiencing an alarm.

• Heat pump operating safety features in heating mode
- A safety device on the water temperature (installation return) prohibits heat pump operation if this temperature is below the thermodynamic heating authorization threshold (parameter 36). In this case, only supplementary heating is authorized to raise the water temperature and allow the heat pump to operate, regardless of the outside temperature (load shedding is thus inoperative). The activation of this safety feature is indicated by the flashing of
the display.
- Heat pump operation is prohibited if the outside temperature is below the shut-off threshold (parameter 20). Only supplementary heating is authorized (load shedding is thus inoperative).
• Limitation on ambient temperature
- In heating mode, operation of the heat pump and the electric heater (if any) is prohibited if the ambient temperature of the zone exceeds the ambient set point temperature by 3.5°C. The operation is authorised once again if the ambient temperature falls to the ambient set point value.
• Control of the heat pump's circulator
- The heating mode, activated if the outside temperature is less than the non-heating temperature.
- If the circulator is off, an “anti-sticking” function starts the circulator for 5 seconds every 24 hours.
See details in paragraph *6-9. CC1 module operation*

4.4.1.3 “ECO” heating mode

Selection for the 2 zones is made using the rotary knob on the control unit.

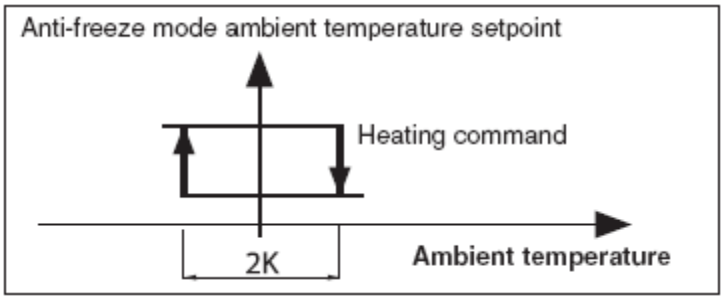
• The switch to "**ECO**" mode lowers the ambient temperature setpoint by a value than can be adjusted from 1 to 4K (parameter 24).
• It can only be activated in heating mode (inactive in cooling mode).
• Switching from "**Comfort**" to "**ECO**" is accomplished either by hourly programming, weekly programming by zone or by actuating the rotary knob for the 2 zones.
• In the case of hourly programming, the user can activate a temporary override (1 hour + periods of 1 hour during the current day) per zone.

4.4.1.4 “Anti-freeze” Heating mode (prolonged absence)

Selection for the 2 zones is made using the rotary knob on the control unit.

• Selection for the 2 zones is made using the rotary knob on the control unit for the entire installation.
• The water temperature resulting setpoint passes to an adjustable value (parameter 29 is factory-set at 25°C) identical for the 2 zones.

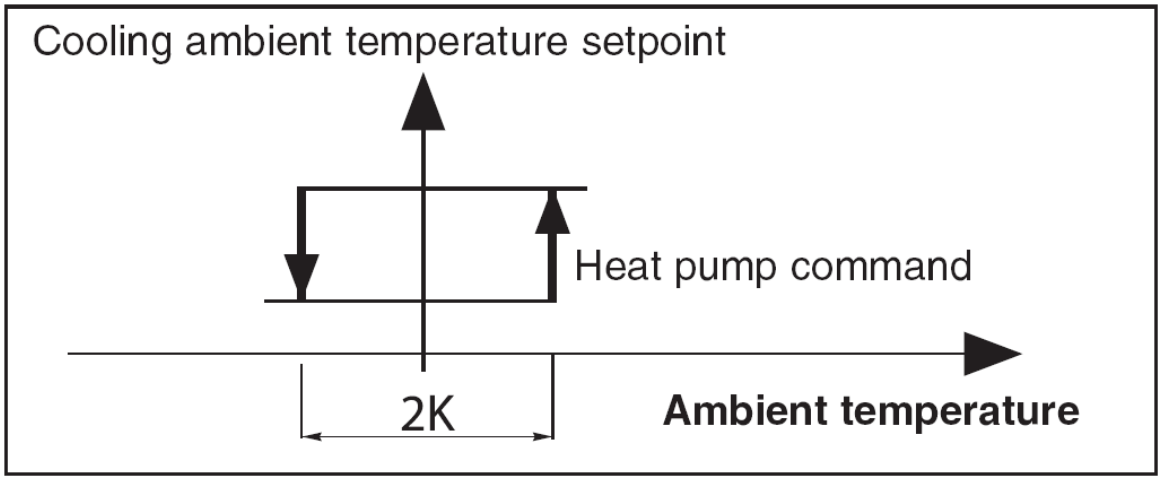
Each zone can only be activated (circulating pump and control valve) if the ambient temperature of the zone is less than an adjustable set point (parameter 25 set to 12°C in the factory).
If ambient temperature in the zone rises above this set point, the circulating pump stops (after a 1 minute delay) and the valve is closed.
• In order to guarantee a minimal thermal load, the heat pump can only operate if at least one zone is activated (circulating pump in operation and valve open).



4.4.2 Cooling mode

Selection for the 2 zones is made using the rotary knob on the control unit.

4.4.2.1 Cooling operating diagram



The heat pump operates with the water temperature set point (installation return) given in parameter 42.

4.4.2.2 Heat pump safety in cooling mode

Heat pump operation is prohibited if the installation return water temperature is above a threshold (parameter 35). The activation of this safety feature is indicated by the flashing of the display.
An "anti-condensation" device on the installation's outgoing temperature prohibits heat pump operation if this temperature is below 15°C. This device is designed to limit the risks of condensation.

4.4.2.3 Control of the heat pump's circulator

- In cooling mode, actuated as soon as the mode is selected.
- If the circulator is off, an “anti-sticking” function starts the circulator for 5 seconds every 24 hours.
See details in paragraph *6-9. CC1 module operation*.

4.4.2.4 Cooling mode restriction

- The cooling mode can be restricted by setting parameter 71 to "**0**".
- At this time, selecting “**COOL**” on the control unit will cause shutdown “**OFF**”.

4.4.3 Activation of the heat pump

• In order to guarantee a minimal thermal load, the heat pump can only operate if at least one zone is activated (circulating pump in operation and valve open).
• Forcing: for maintenance operations only, when the system is "**OFF**", it is possible to force heat pump control by setting to parameter 67 to "**1**".
The heat pump operates in heating mode at the set point given at parameter 43.

Caution:
At the end of the operation, forcing must be deactivated (by returning parameter 67 to "0") before restarting the installation.

4.4.4 Control of zone outgoing lines

• Managed by the zone board.
• Valves operating in mix.
• "3-point" motor (230 VAC) with proportional chrono control:

- Time base = $\frac{\text{Valve action time (parameter 63)}}{10}$

- Percentage of the control time = $\frac{\text{Difference (setpoint / water outlet temperature)}}{\text{Proportional strip (parameter 38)}}$

This percentage is displayed at parameter 17 for zone 1 and 18 for zone 2,
("**+**" sign = open, "**–**" sign = closed)
In the neutral zone (parameter 39), the valve is not controlled.
• The valves are equipped with a limit switch which detect valve closure (contact closed = valve closed).
• Pump shutdown is delayed 1 minute.

4.4.5 Miscellaneous

• Mode changes using the rotary knob (**Heating / Cooling / Anti-freeze / Stop**) are delayed 10 seconds in order to filter inappropriate actions. However, the "**Time Setting**" and "**Hourly Programming**" positions do not have the time delay feature.
• The authorization thresholds on the water temperature are cut-off values with a differential of 1K for the reactivation.

4.5 Mixed 2-zone application operation

4.5.1 Heating mode

4.5.1.1 Heating operating diagram

A water rule is determined for each zone.

An outside temperature **X** determines a water temperature resulting setpoint **Y1** for zone 1 and **Y2** for zone 2.

The parameters determining this water rule can be set by the installer (see the table).

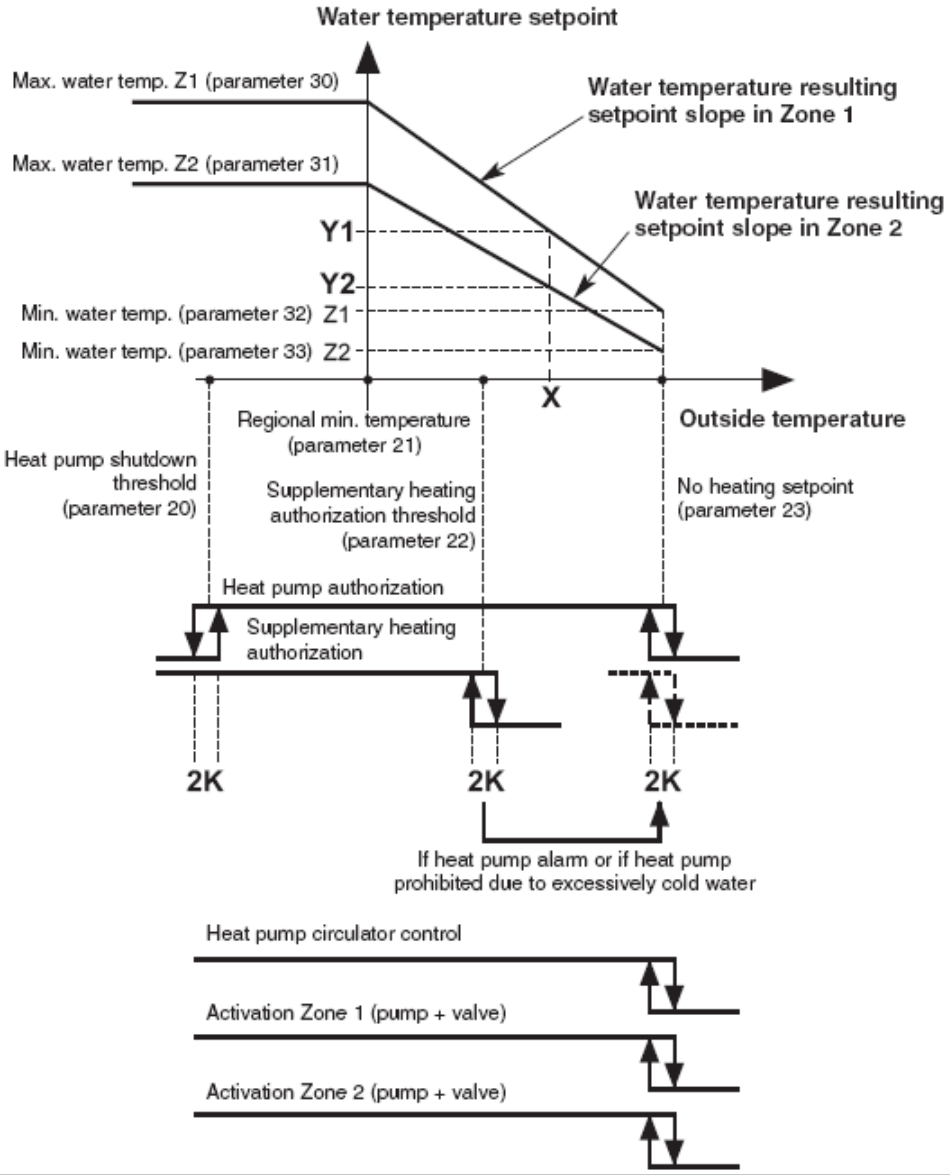
The resulting setpoint for zone 1 is displayed at parameter 04.

The resulting setpoint for zone 2 is displayed at parameter 05.

Each resulting setpoint can be corrected as required depending on the ambient temperature of the zone.

The heat pump is controlled according to the highest resulting setpoint.

The control valve of each zone is controlled according to the resulting setpoint of the zone.



4.5.1.2 “Comfort” heating mode 

Selection for the 2 zones is made using the rotary knob on the control unit.

• **Water temperature setpoint**

- The circulating pump of each zone is actuated and the control valve activated if the outside temperature is less than the non-heating temperature.
- The heat pump can operate only if the outside temperature is less than the non-heating temperature.
- A water rule is determined for each zone according to the settings that are specific to the zone. A resulting setpoint of the water temperature is calculated according to the outside temperature and the ambient temperature of the zone. The control valve is controlled by the zone board according to this resulting setpoint and the water temperature read by the sensor placed on the outlet of the zone considered.
- The heat pump and the supplementary heating are thus controlled (in relation to the installation's return temperature) according to the highest resulting setpoint of the 2 circuits.

For each zone, the water rule is determined by:

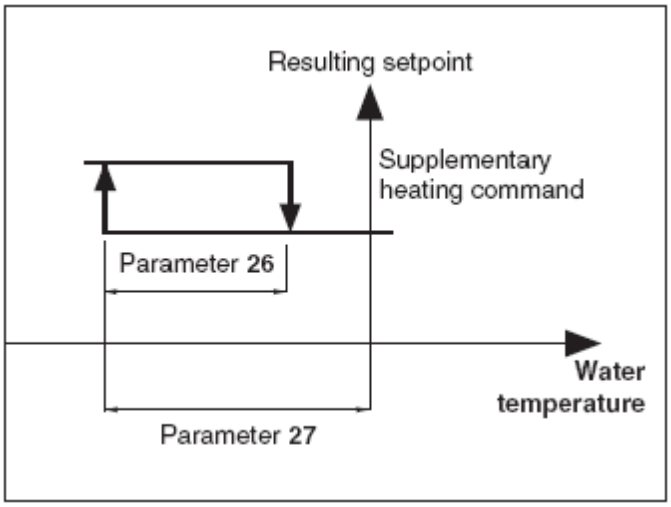
- the non-heating temperature (parameter 23),
- the regional minimum temperature (parameter 21),
- the minimum temperature of the water circuit (parameters 32 for zone 1, 33 for zone 2),
- the maximum temperature of the water circuit (parameters 30 for zone 1, 31 for zone 2).

For zone 1, Floor:
The control valve is controlled by the zone board according to the resulting setpoint of the zone and the water temperature read by the sensor placed on the zone 1 outgoing line, Floor.

The resulting setpoint can be corrected by the ambient temperature of zone 1:
A difference of +/- 1 degree of ambient temperature in relation to the heating setpoint temperature of the zone
(adjustable from 15 to 25°C) causes the resulting setpoint (water temperature) to decrease or increase of 2 degrees, respectively. However, this variation cannot exceed +/- 5 degrees.
The resulting set point is displayed at parameter 04.

For zone 2 :
This zone is supplied by the heat pump (and supplementary heating, if any). Ambient temperature is controlled by the thermostats of the Terminal Units or the thermostatic valves of the radiators (excepted for control box area).
The resulting set point is displayed at parameter 05.

• Supplementary electric heating
- The heating elements are actuated on if the heat pump is not able to maintain the water return temperature at the calculated value. The supplementary heating by electrical heating elements is staged (2 stages). The second stage is managed by a 10-minute time delay for is activation.



- **Caution**:
During normal operation, the supplementary heating is authorized only if the outside temperature falls below the authorization threshold (parameter 22) corresponding to the installation's equilibrium temperature and the absence of a load shedding signal. However, if can be authorized for greater temperatures if the heat pump is experiencing an alarm or if heat pump operation is prohibited by a safety device (and even if a load shedding signal is present).
Supplementary heating is prohibited if it is experiencing an alarm.

• Heat pump operating safety features in heating mode
- A safety device on the water temperature (installation return) prohibits Heat pump operation if this temperature is below the thermodynamic heating authorization threshold (parameter 36). In this case, only supplementary heating is authorized to raise the water temperature and allow the Heat pump to operate, regardless of the outside temperature (load shedding is thus inoperative). The activation of this safety feature is indicated by the flashing of
the display.
- Heat pump operation is prohibited if the outside temperature is below the shut-off threshold (parameter 20). Only supplementary heating is authorized (load shedding is thus inoperative).

• Limitation on ambient temperature
- In heating mode, operation of the heat pump and the electric heater (if any) is prohibited if the ambient temperature of the zone exceeds the ambient set point temperature by 3.5°C. The operation is authorised once again if the ambient temperature falls to the ambient set point value.

• Control of the Heat pump's circulator
- The heating mode, activated if the outside temperature is less than the non-heating temperature.
- If the circulator is off, an “anti-sticking” function starts the circulator for 5 seconds every 24 hours.
See details in paragraph *6-9. CC1 module operation*

4.5.1.3 “ECO” heating mode

Selection for the 2 zones is made using the rotary knob on the control unit.

• It can only be activated in heating mode (inactive in cooling mode).
• Switching from "**Comfort**" to "**ECO**" is accomplished either by hourly programming, weekly programming by zone or by actuating the rotary knob for the 2 zones.
• In the case of hourly programming, the user can activate a temporary override (1 hour + periods of 1 hour during the current day) per zone.

For zone 1, Floor:
- The switch to "**ECO**" mode lowers the ambient temperature setpoint of the zone by a value than can be adjusted
from 1 to 4K (parameter 24).

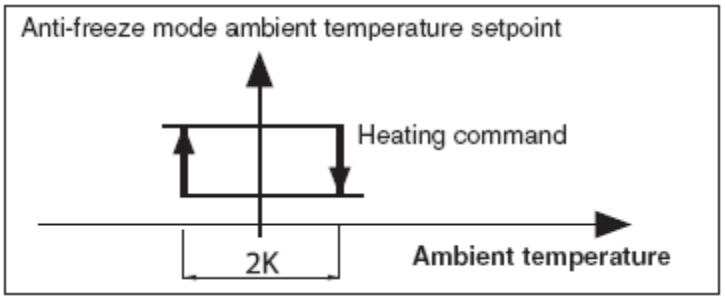
For zone 2, Terminal Units:
- Switching to "**ECO**" mode causes the "**ECO**" contact to close on the Terminal Units' remote controls.

Note: the potential-free "ECO" contact can be used with VLV only. Refer to the details in the installation instructions.

4.5.1.4 “Anti-freeze” Heating mode (prolonged absence)

Selection for the 2 zones is made using the rotary knob on the control unit.

For zone 1, Floor:
- The water temperature resulting setpoint passes to an adjustable value (parameter 29 is factory-set at 25°C).
Zone 1 cannot be activated (circulation pump and regulation valve) unless ambient temperature in the zone is less than an adjustable set point (parameter 25 set to 12°C in the factory).
If ambient temperature in the zone 1 rises above this set point, the circulating pump stops (after a 1 minute delay) and the valve is closed.



For zone 2, Terminal Units:
- The water temperature resulting setpoint of zone 2 is lowered 5°C.
- The "**ECO**" contact for the remote controls of the Terminal Units closes.

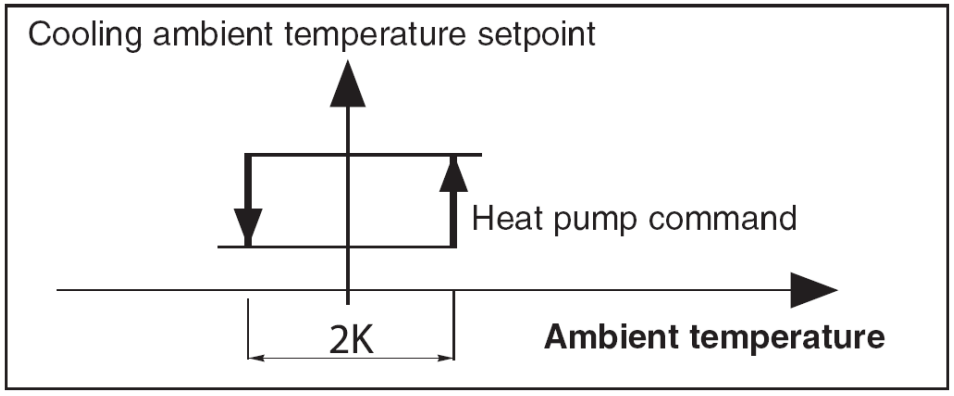
Note: the potential-free "ECO" contact can be used with VLV only. Refer to the details in the indoor unit's installation instructions.

4.5.2 Cooling mode

Selection for the 2 zones is made using the rotary knob on the control unit.

With radiators low temperature in zone 2, the cooling mode is not allowed.

4.5.2.1 Cooling operating diagram



4.5.2.2 For zone 1, Floor

- Zone 1 can only be activated (circulating pump and control valve) if the ambient temperature of the zone is greater than the zone's setpoint. At this moment, the zone valve adjusts the water temperature of the floor outgoing line according to an adjustable setpoint (parameter 34 is factory-set at 20°C).
If the ambient temperature of the zone drops below this threshold, the circulating pump stops (after a 1 minute delay) and the valve is closed.

4.5.2.3 For zone 2, Terminal Units

- The circulating pump of zone 2 is engaged as soon as the cooling mode is selected.
- This zone is supplied by the heat pump. Ambient temperature is controlled by the thermostats of the Terminal Units.

4.5.2.4 Heat pump safety in cooling mode

Heat pump operation is prohibited if the installation return water temperature is above a threshold (parameter 35). The activation of this safety feature is indicated by the flashing of the display.

4.5.2.5 Control of the heat pump's circulator

- In cooling mode, actuated as soon as the mode is selected.
- If the circulator is off, an “anti-sticking” function starts the circulator for 5 seconds every 24 hours.
See details in paragraph *6-9. CC1 module operation*.

4.5.2.6 Cooling mode restriction

- With radiators low temperature in zone 2, the cooling mode is not allowed. It must be restricted by setting parameter 71 to "**0**".
- At this time, selecting “**COOL**” on the control unit will cause shutdown “**OFF**”.

4.5.3 Activation of the heat pump

Forcing: for maintenance operations only, when the system is "**OFF**", it is possible to force heat pump control by setting to parameter 67 to "**1**".
The heat pump operates in heating mode at the set point given at parameter 43.

Caution:
At the end of the operation, forcing must be deactivated (by returning parameter 67 to "0") before restarting the installation.

4.5.4 Control of zone outgoing lines

• Managed by the zone board.
• Valve, zone 1, Floor in mixed operation.
• "3-point" motor (230 VAC) with proportional chrono control:

- Time base = $\frac{\text{Valve action time (parameter 63)}}{10}$

- Percentage of the control time = $\frac{\text{Difference (setpoint / water outlet temperature)}}{\text{Proportional strip (parameter 38)}}$

This percentage is displayed at parameter 17 for zone 1 and 18 for zone 2,
("**+**" sign = open, "**–**" sign = closed)
In the neutral zone (parameter 39), the valve is not controlled.
• The valve is equipped with a limit switch which detect valve closure (contact closed = valve closed).
• Pump shutdown is delayed 1 minute.

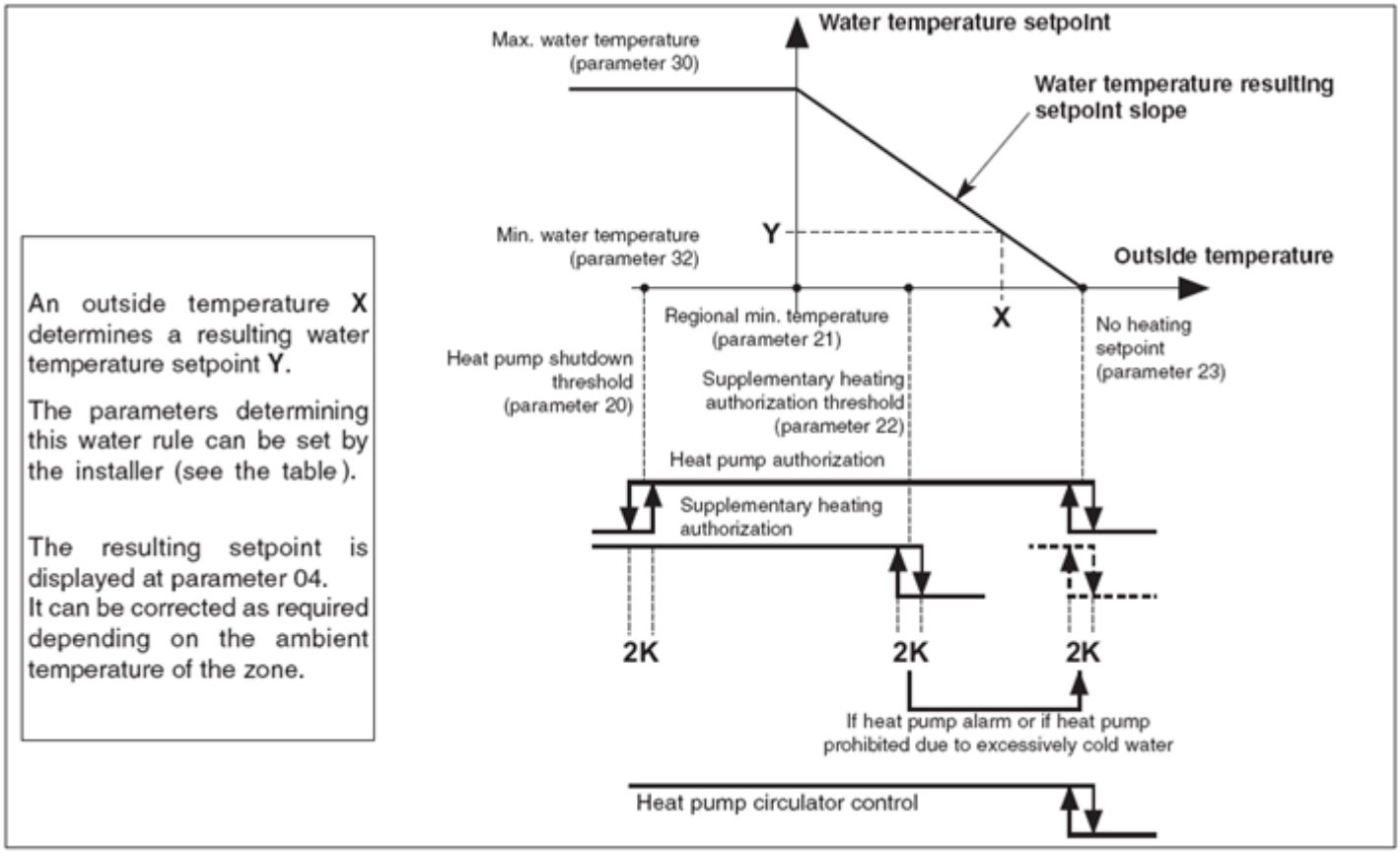
4.5.5 Miscellaneous

• Mode changes using the rotary knob (**Heating / Cooling / Anti-freeze / Stop**) are delayed 10 seconds in order to filter inappropriate actions. However, the "**Time Setting**" and "**Hourly Programming**" positions do not have the time delay feature.
• The authorization thresholds on the water temperature are cut-off values with a differential of 1K for the reactivation.

4.6 1 zone terminal units application operation

4.6.1 Heating mode

4.6.1.1 Heating operating diagram



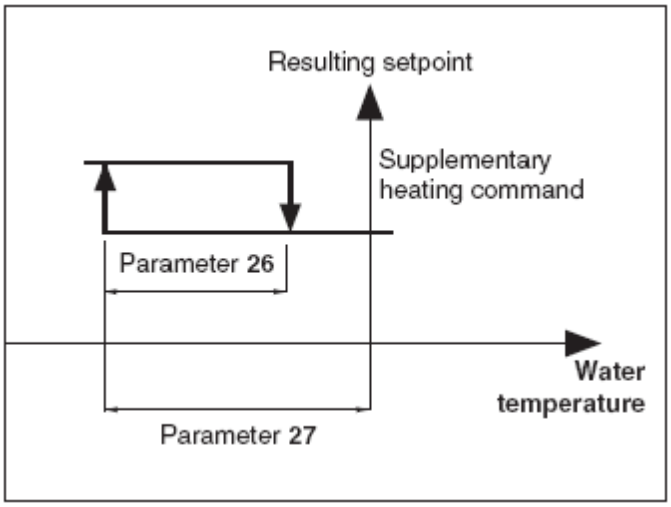
4.6.1.2 "Comfort" heating mode

Selection is made using the rotary knob on the control unit.

- **Water temperature setpoint**
  - The heat pump can operate only if the outside temperature is less than the non-heating temperature.
  - The heat pump is controlled via the heating board according to a **resulting setpoint** of the water temperature (control on the installation return) calculated according to an adjustable water rule determined by:
    - The non-heating temperature (parameter 23),
    - The regional minimum temperature (parameter 21),
    - The minimum temperature of the water circuit (parameter 32),
    - The maximum temperature of the water circuit (parameter 30).

The calculated resulting set point is displayed at parameter 04.
Note:
The set point value sent to the heat pump can be clipped to the maximum value given in parameter 43.

• **Supplementary electric heating**
- The heating elements are actuated on if the heat pump is not able to maintain the water return temperature at the calculated value. The supplementary heating by electrical heating elements is staged (2 stages). The second stage is managed by a 10-minute time delay for is activation.



- **Caution**:
During normal operation, the supplementary heating is authorized only if the outside temperature falls below the authorization threshold (parameter 22) corresponding to the installation's equilibrium temperature and the absence of a load shedding signal. However, if can be authorized for greater temperatures if the heat pump is experiencing an alarm or if heat pump operation is prohibited by a safety device (and even if a load shedding signal is present).
Supplementary heating is prohibited if it is experiencing an alarm.

• **Heat pump operating safety features in heating mode**
- A safety device on the water temperature (installation return) prohibits heat pump operation if this temperature is below the thermodynamic heating authorization threshold (parameter 36). In this case, only supplementary heating is authorized to raise the water temperature and allow the heat pump to operate, regardless of the outside temperature (load shedding is thus inoperative). The activation of this safety feature is indicated by the flashing of
the display.
- Heat pump operation is prohibited if the outside temperature is below the shut-off threshold (parameter 20). Only supplementary heating is authorized (load shedding is thus inoperative).
• **Control of the heat pump's circulator**
- If the circulator is off, an “anti-sticking” function starts the circulator for 5 seconds every 24 hours.
See details in paragraph *6-9. CC1 module operation*

4.6.1.3 “ECO” heating mode

Selection is made using the rotary knob on the control unit.

• Switching to "**ECO**" mode causes the "**ECO**" contact to close on the Terminal Units' remote controls.
Note: the potential-free "ECO" contact can be used with VLV only. Refer to the details in the indoor unit's installation instructions.
• It can only be activated in heating mode (inactive in cooling mode).
• Switching from "**Comfort**" to "**ECO**" is accomplished either by hourly programming, weekly programming by zone or by actuating the rotary knob for the entire installation.
• In the case of hourly programming, the user can activate a temporary override (1 hour + periods of 1 hour during the current day) per zone.

4.6.1.4 "Anti-freeze" Heating mode (prolonged absence)

Selection is made using the rotary knob on the control unit.

• Selection is made using the rotary knob on the control unit for the entire installation.
• The water temperature resulting setpoint is lowered 5 K.

4.6.2 Cooling mode

Selection is made using the rotary knob on the control unit.

4.6.2.1 Heat pump operating safety features in cooling mode

Heat pump operation is prohibited if the installation return water temperature is above a threshold (parameter **35**). The activation of this safety feature is indicated by the flashing of the display.

4.6.2.2 Control of the heat pump's circulator

- In cooling mode, actuated as soon as the mode is selected.
- If the circulator is off, an "anti-sticking" function starts the circulator for 5 seconds every 24 hours.
See details in paragraph *6-9. CC1 module operation*.

4.6.2.3 Cooling mode restriction

- In cooling mode, actuated as soon as the mode is selected.
- If the circulator is off, an "anti-sticking" function starts the circulator for 5 seconds every 24 hours.
See details in paragraph *6-9. CC1 module operation*.

4.6.3 2nd Zone: Electric convectors

• A 2nd zone equipped with electric convectors can also be managed (Max. number = 20). These appliances must be equipped with an electronic thermostat (not included) able to receive signals via a 230 VAC pilot wire (standard GIFAM 4).
• The 2nd zone is activated by setting the micro-switch in the back of the control unit to the "**ON**" position.
- In "**Comfort**", "**ECO**" or "**Anti-freeze**" heating modes, the corresponding signals are transmitted to the 2nd zone.
- In **cooling** mode and in the **Stop** position, the shut-down signal is transmitted to the 2nd zone.
- In **heating mode with hourly programming**, the "**Comfort**" or "**ECO**" signals are transmitted to the 2nd zone according to the corresponding hourly programming.
Note:
In case of load shedding, a shut-down signal is transmitted to the 2nd zone.
- In heating mode, the display unit indicates for the zone 2 "**HEAT**".

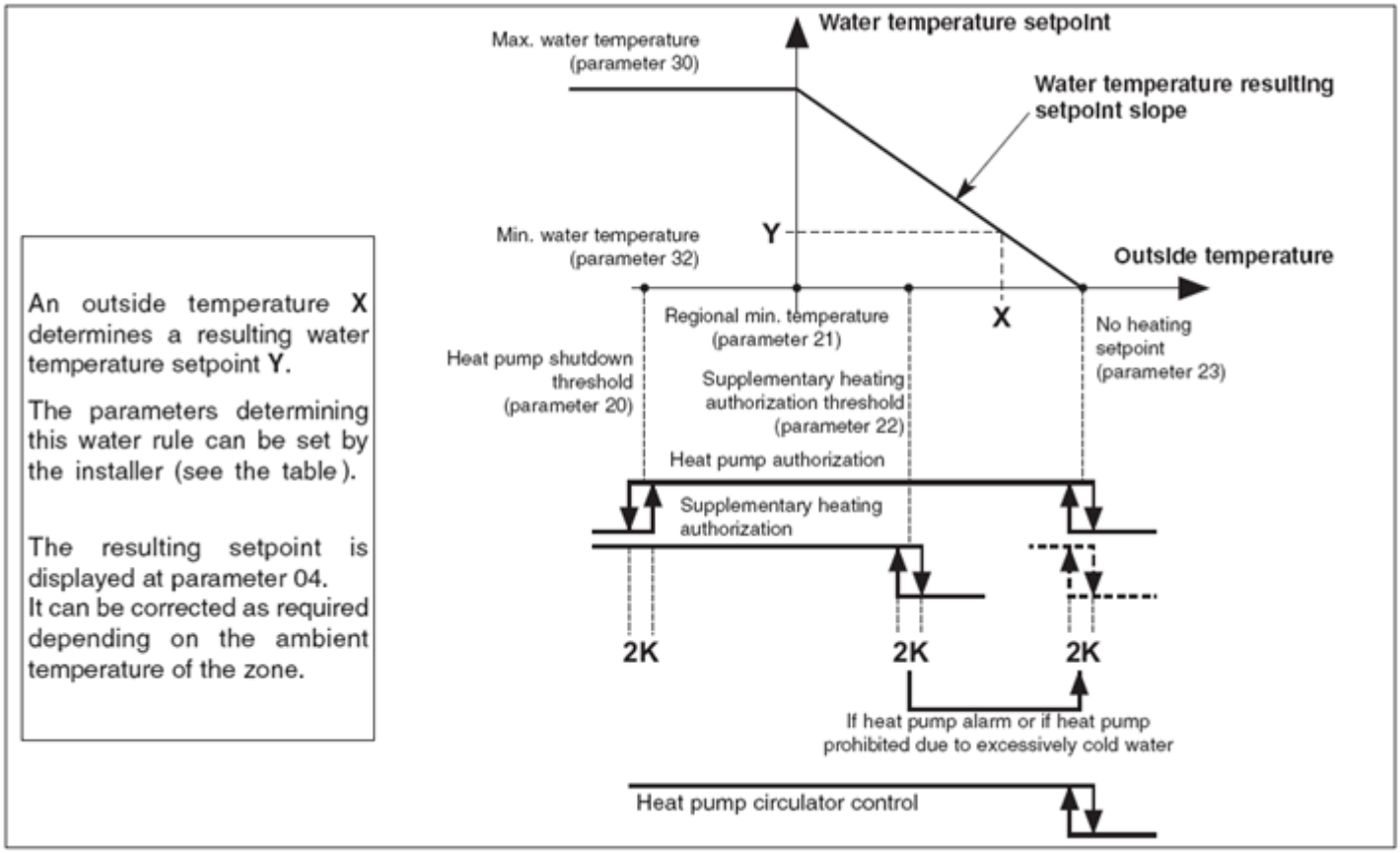
4.6.4 Miscellaneous

• Mode changes using the rotary knob (**Heating / Cooling / Anti-freeze / Stop**) are delayed 10 seconds in order to filter
inappropriate actions. However, the "**Time Setting**" and "**Hourly Programming**" positions do not have the time delay feature.
• The authorization thresholds on the water temperature are cut-off values with a differential of 1K for the reset.

4.7 1-zone low temperature radiators application operation

4.7.1 Heating mode

4.7.1.1 Heating operating diagram



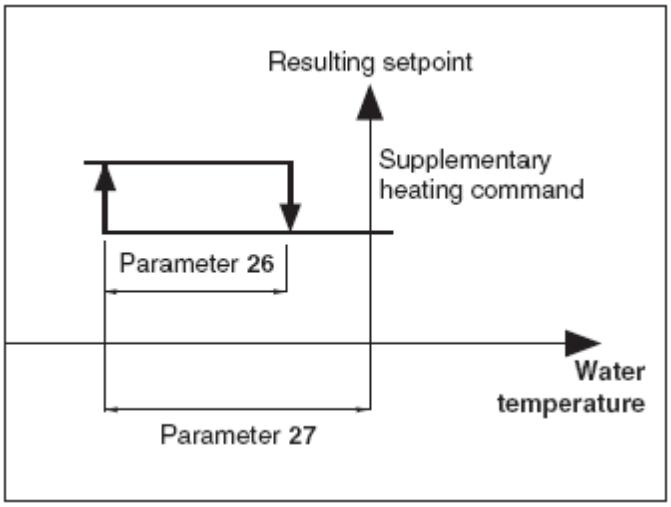
4.7.1.2 "Comfort" heating mode

Selection is made using the rotary knob on the control unit.

- **Water temperature setpoint**
  - The heat pump can operate only if the outside temperature is less than the non-heating temperature.
  - The heat pump is controlled via the heating board according to a **resulting setpoint** of the water temperature (control on the installation return) calculated according to an adjustable water rule determined by:
    - The non-heating temperature (parameter 23),
    - The regional minimum temperature (parameter 21),
    - The minimum temperature of the water circuit (parameter 32),
    - The maximum temperature of the water circuit (parameter 30).

The resulting setpoint calculated in this manner can be corrected by the temperature of the zone:
A difference of +/- 1 degree of ambient temperature in relation to the heating setpoint temperature of the zone (adjustable from 15 to 25°C) causes the resulting setpoint (water temperature) to decrease or increase of 2 degrees, respectively. However, this variation cannot exceed +/- 5 degrees.
The calculated resulting set point is displayed at parameter 04.
Note:
The set point value sent to the heat pump can be clipped to the maximum value given in parameter 43.

• **Supplementary electric heating**
- The heating elements are actuated on if the heat pump is not able to maintain the water return temperature at the calculated value. The supplementary heating by electrical heating elements is staged (2 stages). The second stage is managed by a 10-minute time delay for is activation.



- **Caution**:
During normal operation, the supplementary heating is authorized only if the outside temperature falls below the authorization threshold (parameter 22) corresponding to the installation's equilibrium temperature and the absence of a load shedding signal. However, if can be authorized for greater temperatures if the heat pump is experiencing an alarm or if heat pump operation is prohibited by a safety device (and even if a load shedding signal is present).
Supplementary heating is prohibited if it is experiencing an alarm.

• **Heat pump operating safety features in heating mode**
- A safety device on the water temperature (installation return) prohibits heat pump operation if this temperature is below the thermodynamic heating authorization threshold (parameter 36). In this case, only supplementary heating is authorized to raise the water temperature and allow the heat pump to operate, regardless of the outside temperature (load shedding is thus inoperative). The activation of this safety feature is indicated by the flashing of
the display.
- Heat pump operation is prohibited if the outside temperature is below the shut-off threshold (parameter 20). Only supplementary heating is authorized (load shedding is thus inoperative).
• **Limitation on ambient temperature**
- In heating mode, operation of the heat pump and the electric heater (if any) is prohibited if the ambient temperature of the zone exceeds the ambient set point temperature by 3.5°C. The operation is authorised once again if the ambient temperature falls to the ambient set point value.
• **Control of the heat pump's circulator**
- The heating mode, activated if the outside temperature is less than the non-heating temperature.
- If the circulator is off, an “anti-sticking” function starts the circulator for 5 seconds every 24 hours.
See details in paragraph *6-9. CC1 module operation*

4.7.1.3 “ECO” heating mode

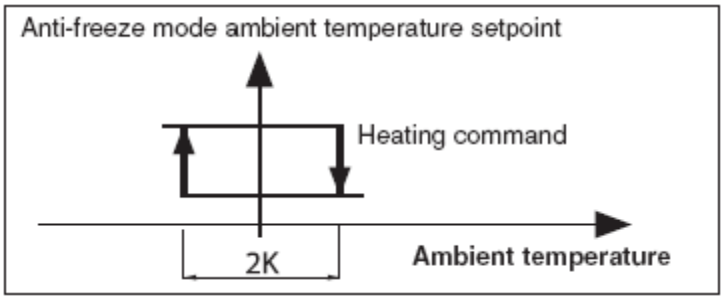
Selection is made using the rotary knob on the control unit.

• The switch to "**ECO**" mode lowers the ambient temperature setpoint by a value than can be adjusted from 1 to 4K (parameter 24).
• It can only be activated in heating mode (inactive in cooling mode).
• Switching from "**Comfort**" to "**ECO**" is accomplished either by hourly programming, weekly programming by zone or by actuating the rotary knob for the entire installation.
• In the case of hourly programming, the user can activate a temporary override (1 hour + periods of 1 hour during the current day) per zone.

4.7.1.4 "Anti-freeze" Heating mode (prolonged absence)

Selection is made using the rotary knob on the control unit.

• Selection is made using the rotary knob on the control unit for the entire installation.
• The water temperature resulting setpoint passes to an adjustable value (parameter 29 is factory-set at 25°C).
Heating (heat pump + supplementary heating, if any) is actuated depending on the ambient temperature setpoint adjustable (parameter 25 set to 12°C in the factory).



4.7.2 Cooling mode

Selection is made using the rotary knob on the control unit.

This mode cannot be activated in the application.
• Selection of the "**COOL**" position (Summer) on the control box has the same effect as switching off the system. "**OFF**" is displayed.

4.7.3 2nd Zone : Electric convectors

• A 2nd zone equipped with electric convectors can also be managed (Max. number = 20). These appliances must be equipped with an electronic thermostat (not included) able to receive signals via a 230 VAC pilot wire (standard GIFAM 4).
• The 2nd zone is activated by setting the micro-switch in the back of the control unit to the "**ON**" position.
- In "**Comfort**", "**ECO**" or "**Anti-freeze**" heating modes, the corresponding signals are transmitted to the 2nd zone.
- In **cooling** mode and in the **Stop** position, the shut-down signal is transmitted to the 2nd zone.
- In **heating mode with hourly programming**, the "**Comfort**" or "**ECO**" signals are transmitted to the 2nd zone according to the corresponding hourly programming.
Note:
In case of load shedding, a shut-down signal is transmitted to the 2nd zone.
- In heating mode, the display unit indicates for the zone 2 "**HEAT**".

4.7.4 Miscellaneous

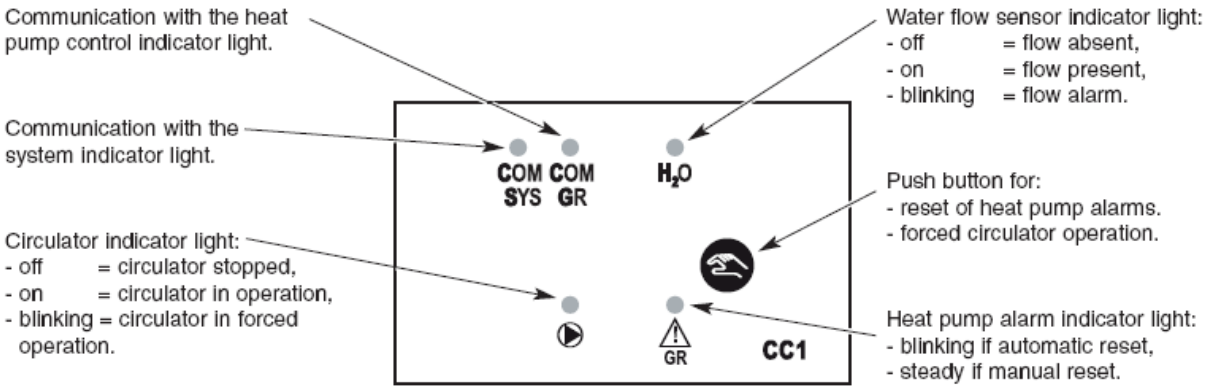
• Mode changes using the rotary knob (**Heating / Cooling / Anti-freeze / Stop**) are delayed 10 seconds in order to filter inappropriate actions. However, the "**Time Setting**" and "**Hourly Programming**" positions do not have the time delay feature.
• The authorization thresholds on the water temperature are cut-off values with a differential of 1K for the reset.

4.8 CC1 module operation

The **CC1** communication and control module is mounted inside the PHRIA.
It is connected to the system communication **BUS** and ensures 2 functions:

- Exchange of signals with the heat pump required for system operation.
- Management of the PHRIA's circulator and control of the water flow sensor.

A set of buttons / indicator lights on the front of the module indicates the main functions ensured by the module.
Note: the front panel of the CC1 is accessible via a small door located on the right-hand side of the indoor unit.



4.8.1 Communication function

4.8.1.1 Signals sent by CC1 to Inverter Gestion

- Stop / Authorisation.
- Heating / Cooling operating mode.
- Temperature operating set points (installation return).

4.8.1.2 Signals sent by CC1 and display on Control Unit

Messages below appear on the control unit installed in zone 1.

• **"Gr" alarm**:
Generated in the event of a water flow fault (see paragraph 4-8-2.) or a heat pump fault.
Heat pump faults are classified in 2 categories:

- **Manual reset faults**:
  Stored by the module when they appear. The module's alarm light comes on steady.
- **Automatic reset faults**:
  The module's alarm light blinks.
  The fault is stored in the module's memory only if it lasts longer 30 minutes. The alarm light then remains steady and the "**Gr**" alarm is sent to the system.

The detailed list of faults is provided in the SECTION 5.
To determine the exact nature of the fault, refer to **LED1/LED2** on the outdoor unit's board or connect the **K70D052Z** optional remote control to the indoor unit. (see Section 5).

• **"GnGr" alarm**:
Generated in the event a communication problem occurs between the **CC1** module and Inverter Gestion board (A2).
It is treated as an automatic reset fault.

Note: in the event a communication problem occurs between the system and the **CC1** module, the "**Cn**" alarm is not activated.

• **"FL" alarm**:
Generated in the event of a water flow fault (see paragraph 4-8-2.).

4.8.2 Water circulation management

4.8.2.1 Circulator control

- In heating mode, actuated if the return water temperature is less than the CC1 is requested.
- In cooling mode, actuated as soon as the mode is selected.
- By forcing during maintenance operations (see paragraph 4-8-3.). Forcing is activated or deactivated by pressing and holding (5 seconds) the **CC1** control button. Forcing is indicated by the blinking of the circulator indicator light.

The shutdown of the circulator is delayed for 3 minutes (but immediate in the case forcing is stopped or a flow fault).

If the pump is stopped, it can be restarted by 3 functions:

- "**Anti-sticking**": automatic operation for 5 seconds every 24 hours.
- "**Anti-freeze**": this function can be activated by setting micro-switch No. 1 to "**ON**". The pump is started if outside temperature is below 0°C.
- "**Forcing**".

4.8.2.2 Monitoring of water flow

When the circulator is in operation, a lack of water flow longer than 10 seconds will cause the heat pump to stop. The **CC1** module's alarm light blinks. If the lack of water flow continues for more than one minute (or if it happens more than 3 in the last hour), the water flow fault is stored in memory:

- the **CC1** alarm indicator light then remains on steady,
- the circulator stops,
- the "**FL**" alarm is sent to the system (the micro-switch No. 2 must be set to "**ON**").

The alarm is reset by pressing the **CC1** button, or turning the system "**OFF**", or by disconnecting the power.

4.8.3 Stand-alone operation of the outdoor unit (off-system)

For the maintenance and commissioning operations, the heat pump can be operated in a stand-alone configuration, off-system, using the **K70D052Z** Optional remote control connected to the A2 board.

The system can be disconnected in two ways:

- Either, with power off, disconnect the **CC1** module's system communication line ("**BUS**").
- Or, by the control unit, deactivate the module by setting parameter 76 to "**0**".

Caution: all changes made to parameter 76 will result in an initialisation of the control and cause all parameters to return to their default value.
When the CC1 module is reactivated, a new parameterisation operation corresponding to the installation must perform.

To operate the heat pump, force the circulator (Section 2) before initiation an order via the **K70D052Z** command. Consult the maintenance manual of the outdoor unit.

4.9 ECS (domestic hot water - DHW) mode

• Only 1 zone Radiator application.
• Function performed by the ECS card installed in the ECS kit box.
Note:
The card's microswitch must be switched to "ON" and parameter 90 set to "1" for the card to operational.

4.9.1 Basic principle

• A three way ON/OFF valve (spring return) controlled by the ECS card allows the hot water produced by the generator:
- Either into the radiator circuit to heat the installation,
- Or to an exchanger located in the ECS hot water tank during an ECS cycle controlled by the ECS card.

4.9.2 Operation

• If the probe located in the ECS tank detects a temperature lower than a predetermined threshold = 35 °C, a thermodynamic ECS heating cycle is triggered:
- ECS valve is activated,
- forcing the generator in heating mode (it can only be stopped by an instruction from its own regulator),
- electrical supplementary heating for the generator forbidden (via the BUS),
- ECS tank electrical heating forbidden.

• The user is alerted to a ECS cycle by the pictogram displayed on the control unit.

• An ECS cycle stops in each of the following circumstances:
- When the temperature read by the ECS tank probe exceeds an adjustable threshold on parameter 91,
- When an ECS heating cycle reaches the maximum time adjustable on parameter 93,
- When the average difference (calculated over 15 minutes) between the water inlet temperature in the exchanger and the temperature in the tank is lower than a value which can be adjusted by parameter 92. This indicates that the heat exchange is not sufficient,
- when the system is switched to “OFF”,
- when the system triggers an alarm (except the “HE” backup default or when the generator is in safe mode (based on the water return temperature or the outside temperature).

• The stop sequence for an ECS cycle is the following:
- the ECS valve is deactivated,
- the generator and its electrical backup are controlled normally again by the heating system,
- electric tank heating is authorised again.

• Safety time delay: the minimum time between two cycles is five hours. This time delay is either activated at the end of a cycle, or by “OFF”. The time delay is not activated if a system alarm is triggered (excluding “VA”).

• Subjection of the secondary circulator (not supplied) of the heating zone and preparation ECS:
- In Stop mode, the secondary circulator does not work.
- In Heating mode "Comfort" / "Eco" / "Frost free", the circulator is actuated if the outside temperature is less than the non-heating temperature or when a cycle ECS is actuated.
- In Cooling mode (ECS mode), the secondary circulator is actuated only when an ECS cycle is requested. The starting up of the circulator is delayed 20 seconds. This temporization in the starting up allows the 3-way valve to be in position ECS before the activation of the cycle to avoid hot water circulation in zone 1 in summer.

• Note:
In the case of limited used and occasional of the Domestic Hot Water, it is advised to add a time switch on the supply electrical heating of the tank. A management of the supply electrical heating of the tank in "low electric cost periods" is the best solution.

CAUTION

To ensure proper operation, the DHW control board (located in the box) must be connected via the installation's Monitoring / Control system via the bus.

4.9.3 Timer programming

• The ECS cycle triggering mode can be selected using parameter 94:
- either free mode with no programmed time slots via tank probe temperature detection,
- or timer mode with the possibility of programming 1 or 2 one-hour time slots during which the tank is analysed and a cycle can be triggered. Parameters 95 and 96 correspond to the start time for each time slot.

4.10 Telephone control

• For the applications:
- 1 zone, floor
- 2 zones, floor
- 2 zones, mixed
- 1 zone, Radiators (with or without Domestis Hot Water)

Does not operate for the Terminal Units application.

⚠ **Use in heating mode only**

• A DELTA-DORE TYPHONE 500 type telephone control box can be connected to the communication bus (available from DELTA-DORE distributors).
Consult the manual supplied with the telephone control.

• By calling the telephone line on which the TYPHONE is recorded, the user can:
- know the ambient temperature of zone 1,
- know the setpoint temperature of the current mode of zone 1,
- send an override setpoint.

• In case of setpoint modification, zone 1 and possible zone 2 operates in “COMFORT” mode (with the new setpoint for the floor zones).
This override is indicated by an index on the LCD.
Any action on the rotary knob deactivates the override and extinguishes the indicator.

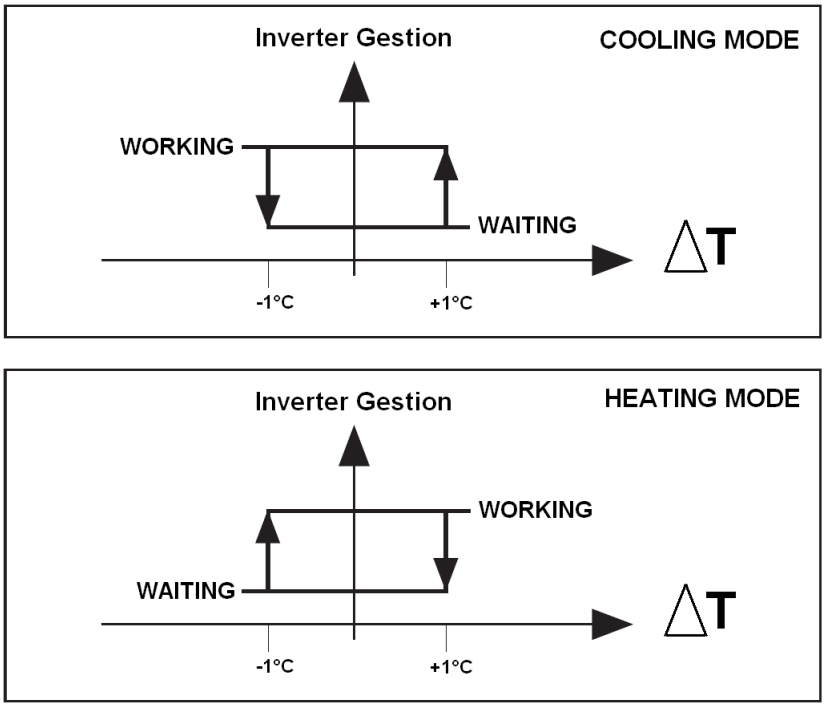
• Parameters possibilities:
- Access code change (parameter 62),
- Interface language change - French / English (parameter 61).

4.11 Water temperature control

- The Inverter gestion is working or waiting in accordance with ΔT shown below.

$$\Delta T = T_A - T_Y$$

T_A : Return water temperature from the installation.
T_Y : Resulting water temperature Setpoint Y (From Heating Board A1 through CC1, see Section 6)



Note 1: 10-minute mask time of the Inverter Gestion from WORKING to WAITING to avoid cycling.
Note 2: 3-minute mask time of the Inverter Gestion from WAITING to WORKING to avoid cycling.

- By the control method the frequency of the compressor's inverter is controlled in accordance with ΔT and the return water temperature from the installation.
  Inverter frequency is controlled as follows:

When ΔT is high (not yet reached the water temperature setpoint). ⇒ Controlled so that the inverter frequency is increased.

When ΔT is low (approximately+1.0 or less in the cooling mode or approximately -1.0 or more in the heating mode). ⇒ Controlled so that the inverter frequency is decreased or kept.

When the return water temperature is increased.
rising in the cooling mode and
dropping in the heating mode. ⇒ Controlled so that the inverter frequency is increased.

When the return water temperature is decreased.
dropping in the cooling mode and
rising in the heating mode. ⇒ Controlled so that the inverter frequency is decreased.

Note: The fluctuations of the compressor inverter frequency adjustments are calculated taking into account not only ΔT, but also-fluctuations in T_A.

4.12 Compressor Frequency Control

The frequency of the compressor's inverter is limited by either of the following controls depending on whether the cooling or heating mode is in operation.

Cooling Mode : · Water Inlet temperature control
· Maximum and minimum frequency control
· Current release control
· Cooling high-load prevention control
· Cooling freeze prevention control
· Discharge temperature control

Heating Mode : · Water Inlet temperature control
· Maximum and minimum frequency control
· Current release control
· Heating high-load prevention control
· Discharge temperature control

4.13 Max./Min. Frequency Control

The compressor's inverter frequency is controlled in accordance with the model and operation mode.

The maximum and minimum frequencies for each model are shown in the table below.

Note: There are cases in which frequency is limited with other control functions depending on operational conditions, so operations are not always carried out in accordance with the maximum frequencies listed below.

	Cooling Mode		Heating Mode	
	Minimum Hz	Maximum Hz	Minimum Hz	Maximum Hz
PHRIA10	18,0 Hz*	54,0 Hz	18,0 Hz*	72,0 Hz
PHRIA14	18,0 Hz*	69,6 Hz	18,0 Hz*	78,0 Hz

*There are cases in which the frequency is set at 24.0Hz~28.0Hz to protect the compressor in accordance with outdoor air temperature and thermal loads.

4.14 Current Release Control

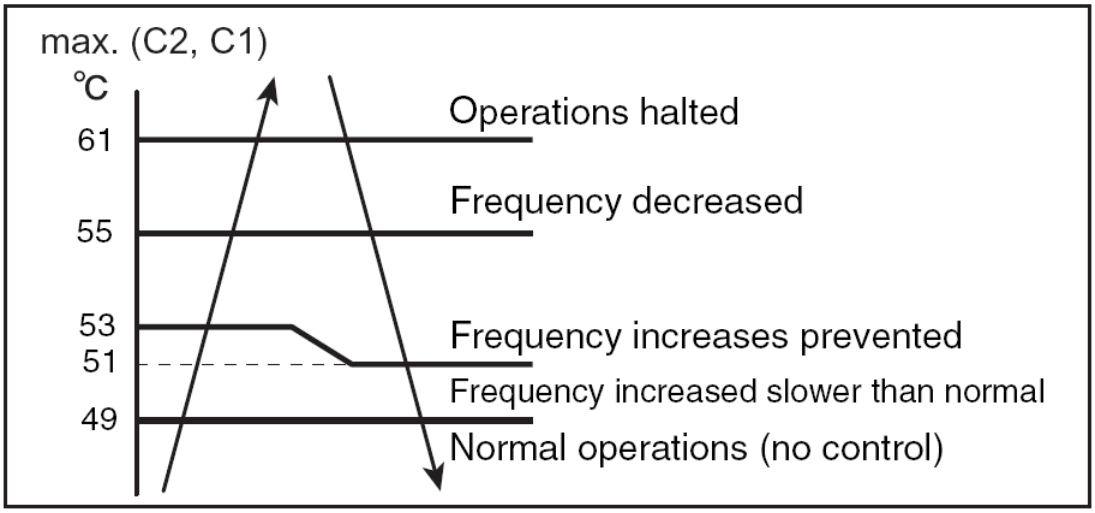
The inverter frequency is controlled so that the current value for the inverter compressor is less than the value listed in the table below.
This current release control is required in the cooling mode in order to prevent abnormal temperature increases in the inverter circuit located within the electrical box and avoid HIC board damages.
The limited values of the primary current are modified in accordance with outdoor air temperature (T_O).

	Is (A)	
	Cooling Mode	Heating Mode
PHRIA10	16,5 A	18,0 A
PHRIA14	23,0 A	23,5 A

Note: The limited values are lowered when the outdoor air temperature is higher than 40°C in the cooling mode and higher than 14°C in the heating mode.

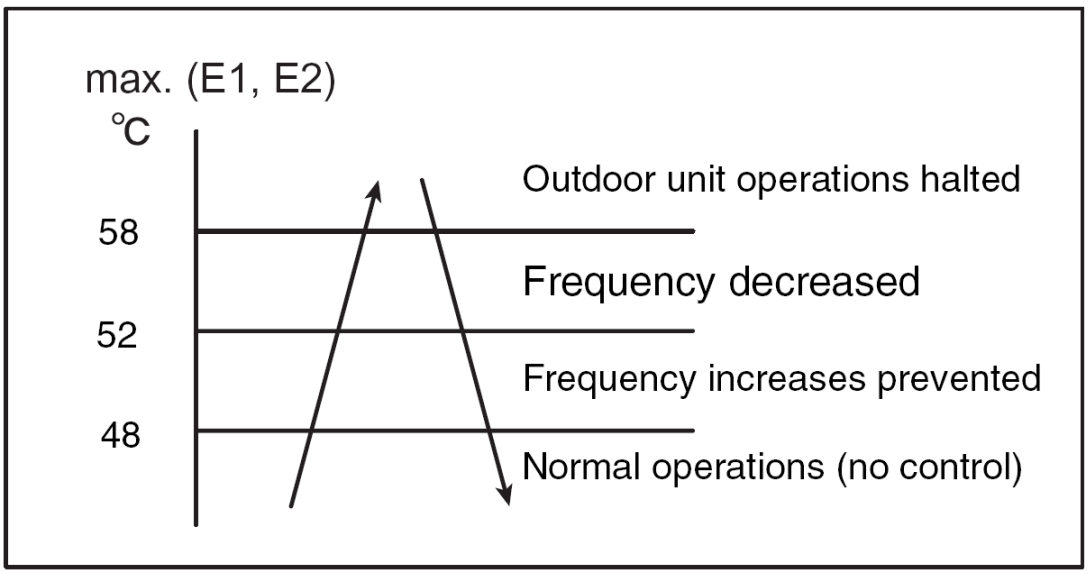
4.15 Cooling High-Load Prevention Control

This control is performed to limit the inverter frequency in order to restrict abnormal increases in pressure and high-load operations in the cooling mode. In accordance with the temperature of the outdoor heat exchanger temperature sensors (C1, C2), decreasing the inverter frequency and restricting its increase, etc.
If the temperature max (C1, C2) exceeds 64°C, operations are halted and then restarted 3 minutes later. If this start/stop activity is repeated 10 times consecutively, alarm "P20" (cooling high-load error) occurs.



4.16 Heating High-Load Prevention Control

This system controls the inverter frequency when the high pressure's abnormal increase and high-load operating prevention occur in the heating mode.
In accordance with the temperature of the water heat exchanger temperatures sensor (E1, E2), such controls are performed as to limiting the increase of inverter frequency, decreasing it or halting operation of the compressor.
When the maximum temperatures (E1, E2) exceeds 64°C, the operation is halted and restarted after 3 minutes.



4.17 Freeze Prevention Control in cooling mode.

The following control is performed during cooling operations, in accordance with the lowest water heat exchanger temperatures (E1 or E2). (See the chart below.)

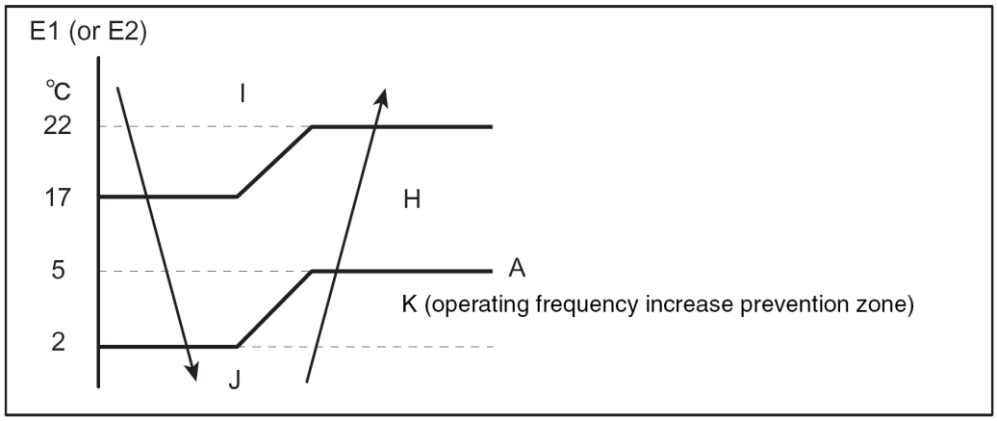
(1) If the temperature remains in the "J" zone (decreasing operation frequency) for 6 minutes, the operating frequency of the compressor is decreased.
The operation frequency is amended every 30 seconds as long as the temperature is in this zone.

(2) If the temperature is in the "K" zone (operating frequency increase prevention zone), the operating frequency of the compressor is maintained.

(3) If the temperature is in the "H" zone (operating frequency restriction zone) and the outdoor air temperature is less than 32°C, the maximum operating frequency of the compressor is limited.

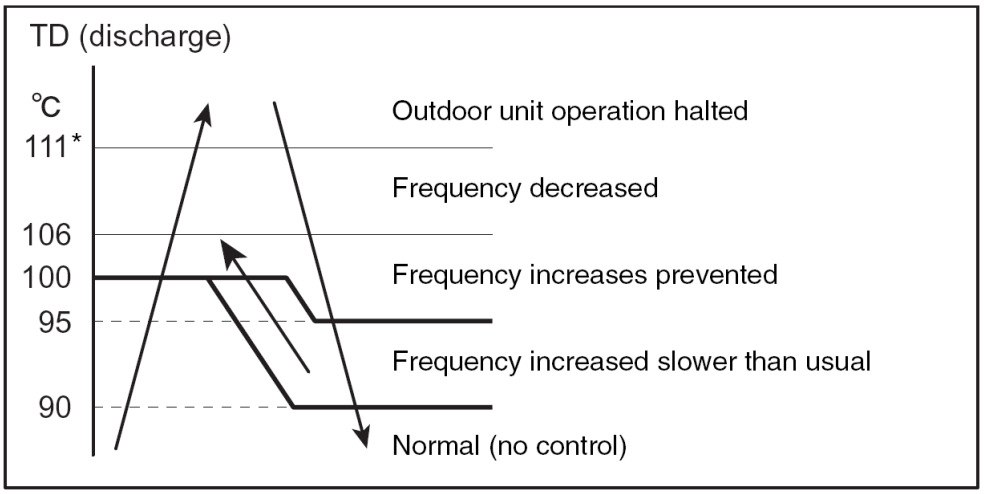
(4) If the temperature is in the "I" zone (normal operation zone), normal operations are performed.

(5) If the temperature is continuously in the "J" zone with the compressor's operating frequency reaches "0", then temperature A, which is temperature for changing from the "J" zone to the "H" zone, is raised from 5°C to 8°C, and operation continues until the temperature enters the "H" zone.



4.18 Discharge Temperature Control

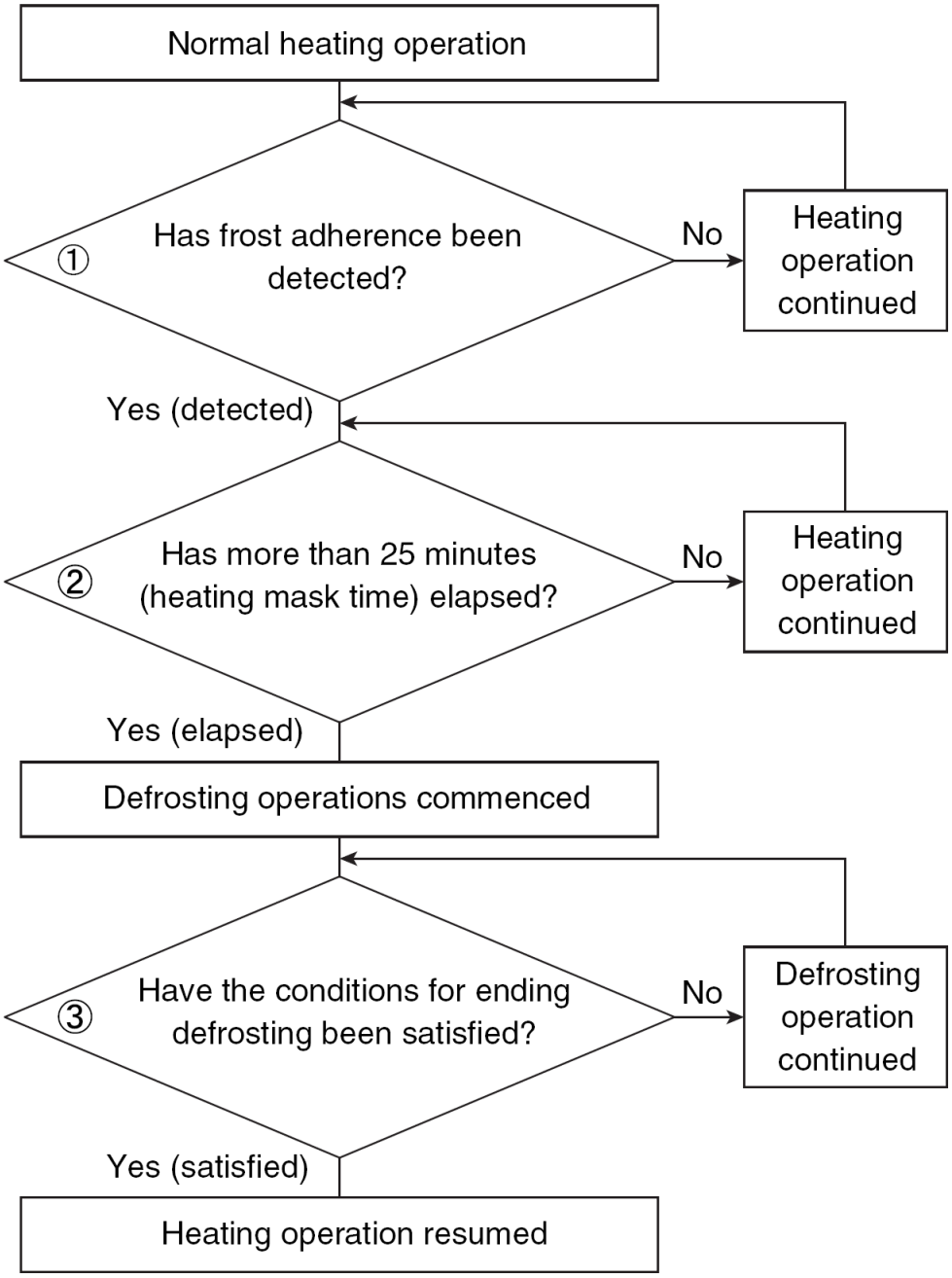
The following control is performed to prevent the discharge temperature from rising abnormally in order to protect the inverter compressor. In accordance with the temperature of the discharge sensor TD, such controls are performed as to limiting the increase of inverter frequency, decreasing it or halting operation of the compressor.



* If the discharge temperature exceeds 111°C, operations of the compressor are halted and then restarted 3 minutes later.
If this start/stop activity is repeated 4 times consecutively, the alarm "P03" (abnormal discharge temperature) occurs.

4.19 Defrosting Control

4.19.1 Flowchart of Defrosting Control (1) (2) (3)



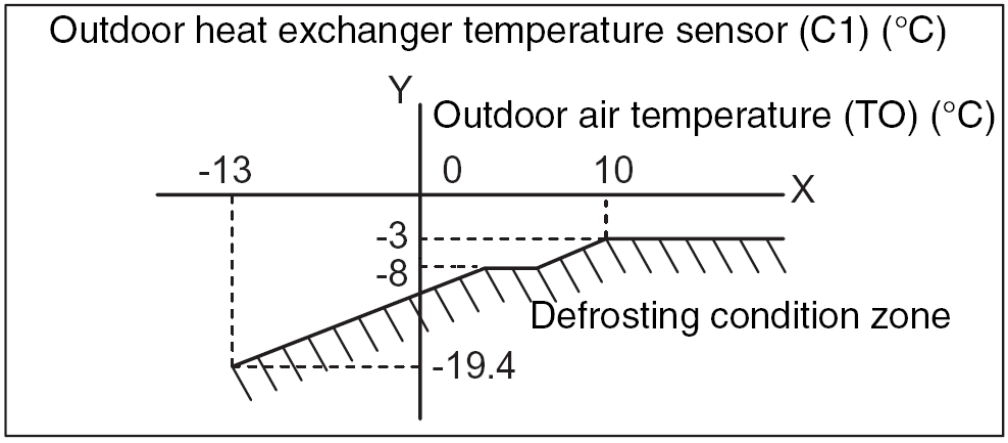
4.19.2 Frost Adherence Detection (1)

If the following conditions are satisfied during heating operations, it is regarded as "frost adherence is detected".

• Frost adherence detection is performed in accordance with the outdoor air temperature (TO) and the outdoor heat exchanger temperature sensor (C1).
Note: Frost adherence detection is not performed for the first 15-minute of compressor operations in the normal heating mode.

• Frost adherence detection conditions

(a) With the outdoor air temperature (TO) being -13°C or above, the frost adherence condition shown below are satisfied for whether 3 consecutive minutes or a total of 60 intermittent minutes, or the outdoor heat exchanger temperature sensor (C1) remains -18°C or below for 20 consecutive seconds.



(b) With the outdoor air temperature (TO) being less than -13°C, the outdoor heat exchanger temperature sensor:
(C1) ≤ [(TO) – 5°C] for 20 consecutive seconds → Defrosting condition

(c) With the outdoor heat exchanger temperature sensor (C1) being less than -3°C, a total of 90 minutes has elapsed (defrosting carried out periodically in accordance with the time).

4.19.3 Heating Mask Time (2)

This refers to the shortest time that heating operations must be performed without defrosting operations being executed.
The mask time for this model is 25 minutes.

Note: Defrosting operations will not be commenced until the defrosting mask time has elapsed, even if frost adherence has been detected.

4.19.4 Ending Defrosting (3)

Defrosting operations are ended when the following conditions are aligned:

(a) When the temperature of the outdoor heat exchanger temperature sensor (C1) is 12 or higher.

(b) When the temperature of the outdoor heat exchanger temperature sensor (C1) is 7 or higher for 60 consecutive seconds.

(c) When defrosting has been initiated for 10 minutes.

4.20 PHRIA Fan Control

Cooling Mode:
The appropriate rotations per minute for the PHRIA's fan are determined in accordance with the outdoor air temperature and the frequency of the compressor inverter.
The PHRIA's fan step is controlled between a range of W1 (Step 1) and WF (Step 16).

Heating Mode:
The appropriate rotations per minute for the PHRIA's fan are determined in accordance with the outdoor air temperature and the frequency of the compressor inverter.
The PHRIA's fan step is controlled between a range of W1 (Step 1) and WF (Step 16).

Note: However, the PHRIA's fan is halted (Step 0) when defrosting is being carried out.

4.21 Electrical Expansion Valve

The electrical expansion valve controls the amount of refrigerant that is allowed to flow in accordance with the operation status.
The valve is adjusted in accordance with the discharge temperature (TD), the outdoor heat exchanger temperature sensor (C1), the suction temperature sensor (TS), and the indoor unit's heat exchanger temperature sensors (E1 and E2).

Cooling Mode:
Controlled so that the suction temperature (TS) - water heat exchange temperature minimum (E1 and E2) is between 1°C and 5°C under normal conditions.
There are cases where the aperture opens wider than usual if the discharge temperature increases.

Heating Mode:
Controlled so that the Suction Temperature (TS) - Outdoor heat exchange temperature (C1) is between 1°C and 5°C under normal conditions.
There are cases where the aperture opens wider than usual if the discharge temperature increases.

5 SERVICE PROCEDURES

5.1 Meaning of Alarm Messages

5.1.1 Water System: Alarm Messages

The alarms are indicated by a code flashing alternately on the control box.

ALARM	CODE	ACTION	NTR (nothing to report)
Heat pump fault	**Gr (*)**	**In heating mode**: Suppression of the supplementary heating authorization threshold according to the outside temperature. Supplementary heating load shedding prohibited. Automatic switching to Anti-freeze Mode if case of a fault (indicated by the absence of the bar graph). Restart in the heating mode selected by pressing and holding the "OK" button. This acknowledgement is stored in memory and signalled by the "coin" icon which is displayed as long as the heat pump failure is present. **In cooling mode**: heat pump shutdown. **In Anti-freeze mode**: Suppression of the supplementary heating authorization threshold. Supplementary heating load shedding prohibited.	Manu.
Heat pump communication fault	**CnGr**	Ditto "**GR**" alarm	Manu.
Heater fault	**HE**	Prohibits supplementary heating operation.	Auto (**)
Outside air sensor fault	**SAE**	System shut-down	Auto
Installation return water sensor fault	**SEIn**	System shut-down	Auto
Installation outlet water sensor fault	**SEOu**	System shut-down	Auto
Water sensor fault, zone 1	**SE1**	Deactivation, zone 1: - Pump shutdown. - Valve closure.	Auto
Water sensor fault, zone 2	**SE2**	Deactivation, zone 2: - Pump shutdown. - Valve closure.	Auto
Ambience sensor fault zone 1	**SA1**	Deactivation, zone 1: - Pump shutdown. - Valve closure.	Auto
Ambience sensor fault zone 2	**SA2**	Deactivation, zone 2: - Pump shutdown. - Valve closure.	Auto
Communication or system fault	**Cn**	System shut-down	Auto
Communication fault, zone 1	**Cn1**	Deactivation, zone 1: - Pump shutdown. (***) - Valve closure.	Auto
Communication fault, zone 2	**Cn2**	Deactivation, zone 2: - Pump shutdown. (***) - Valve closure.	Auto
Water flowrate fault	**FL**	Prohibits supplementary heating operation.	Manu.
Max. water outlet temperature fault (Adjustable threshold 70°C, parameter 37)	**tE**	System shut-down	Manu.

The following alarms can only appear if the ECS function (domestic hot water) is activated.

ECS valve default position in **heating mode** (3 minute time delay from activation)	**VA**	System stops if valve remains in ECS position outside an ECS cycle	Auto
ECS valve default position during an **ECS cycle** (3 minute time delay from activation)	**VA** **+** **ECS symbol flashes**	ECS cycle stops System operation in the selected mode	Manu.

(*) See the type of fault on the generator.
(**) Overheat security with manual reset on the body of the heater. Refer to the **MCE** installation manual.
(***) The sum of alarms **Cn1 + Cn2** causes the generator and supplementary heating to shut down.

Manual reset: By system shut-down after clearing the source of the fault.
Automatic reset: The alarm disappears when the source of the fault is corrected.

Note:
The alarms are displayed even if the system is shutdown.
If several alarms occur simultaneously, the various codes are displayed alternately.

5.1.2 Inverter regulation: Alarm Messages

The alarms are indicated by a message on the optional controller when it is connected for maintenance or during a test run operation.

ALARM	CODE	ACTION	NTR
Poor reception of the signal on the optional remote controller.	E01	stop	automatic
Poor transmission of the signal on the optional remote controller.	E02	stop	automatic
Poor reception of the A2 board from the optional remote controller(central process control).	E03	stop	automatic
Poor reception of the A2 board from the A3 board.	E04	stop	automatic
Poor transmission of the A2 board to the A3 board.	E05	stop	automatic
Poor reception of the A3 board from the A2 board.	E06	stop	automatic
Poor transmission of the A3 board to the A2 board.	E07	stop	automatic
A2 board nothing (during Automatic address setting).	E20	stop	manual
Communication is abnormal (A3 board).	E31	stop	automatic
Abnormal sensor for the inlet temp. on the brased plate exchanger of the A2 board. (E1)	F01	stop	automatic
Abnormal sensor for the outlet temp. on the brased plate exchanger of the A2 board. (E2)	F02	stop	automatic
Abnormal sensor for the discharge temperature of the compressor. (TD)	F04	stop	automatic
Abnormal sensor for the inlet temp. of the outdoor heat exchanger on the A3 board. (C1)	F06	stop	automatic
Abnormal sensor for the outlet temp. of the outdoor heat exchanger on the A3 board. (C2)	F07	stop	automatic
Abnormal sensor for outdoor temperature. (TO)	F08	stop	automatic
Abnormal sensor for water inlet temperature of A2 board. (TA)	F10	stop	automatic
Abnormal sensor for compressor suction temperature. (TS)	F12	stop	automatic
Abnormal non-volatile memory (EEPROM) in A2 board.	F29	stop	manual
Abnormal non-volatile memory (EEPROM) in A3 board.	F31	stop	manual
Incorrect current value for compressor(over current).	H01	stop	manual
Mismatch of A2 board and A3 board.	L02	stop	manual
No Setting of A2 board address.	L08	stop	manual
No Setting of A2 board capacity.	L09	stop	manual
No Setting of A3 board capacity.	L10	stop	manual
Poor setting of A2 board's type.	L13	stop	manual
High discharge temperature of compressor.	P03	stop	manual
High pressure switch is activated: for 8 and 10HP models only.	P04	stop	manual
Abnormally jump CN030 on A2 board.	P10	stop	manual
Complete running out of gas	P15	stop	manual
Abnormally four way valve.	P19	stop	manual
Abnormally high refrigerant gas pressure.	P20	stop	manual
PHRIA's fan abnormality	P22	stop	manual
Incorrect current value for compressor(over current)	P26	stop	manual
Incorrect current value for compressor(over current)	P29	stop	manual

5.2 Replacing PHRIA PCB (A2) (A3)

5.2.1 Replacing PCB (A2)

Replace the PCB by following the instructions “How to replace PCB (A2)” on the next page.

Pay special attention to the following points:

(1) Before replacing the PCB (A2), be sure to turn off the power source (at mains). And check that Power LED (red) is OFF before beginning work.

(2) When replacing, **be sure to install the EEPROM that was attached to the original PCB (A2).**

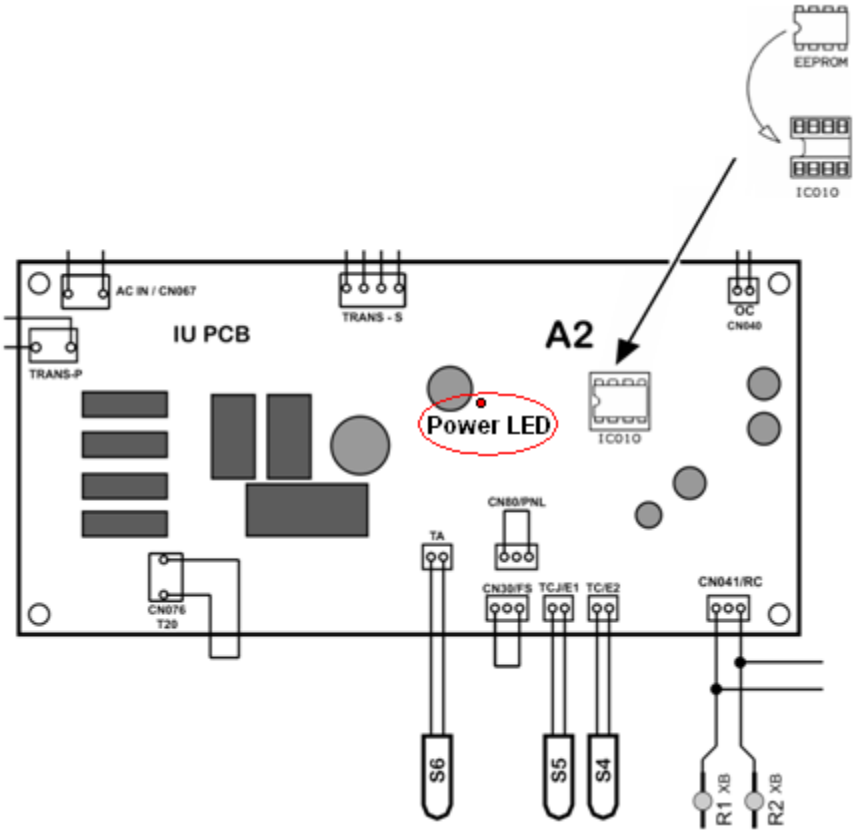
(3) Some connectors on the PCB such as CN076/T20, CN080/PNL and CN30/FS include jumper wires.
When removing the PCB of a malfunctioning, disconnect these jumper wires together with the EEPROM and install them onto the new PCB.

(4) Be careful when handling the EEPROM, as its pins easily bent.

(5) Securely install the EEPROM in the location and orientation shown in the figure below.

(6) The alarm message (F29) may appear in cases of malfunction in the EEPROM.

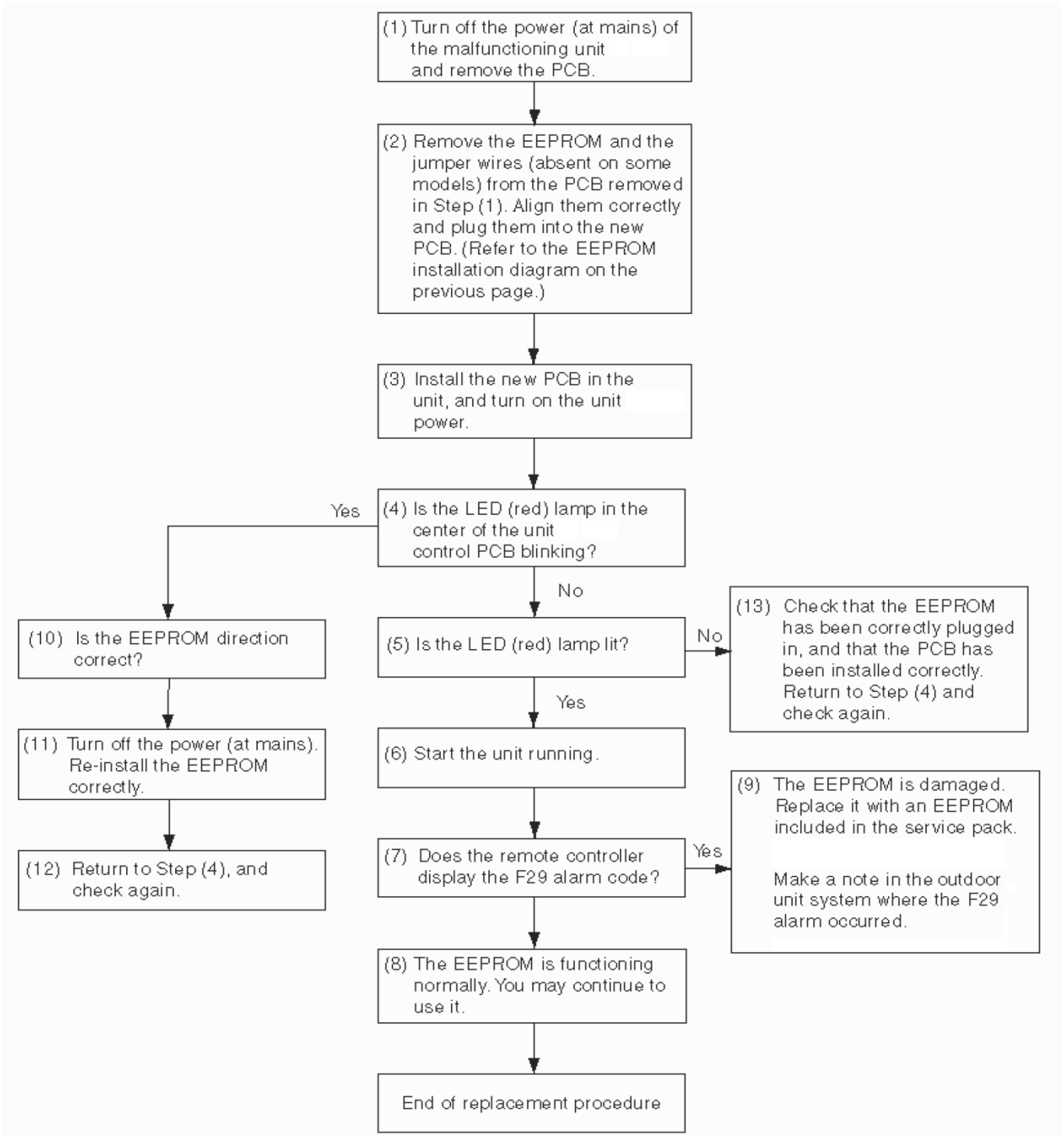
(7) After turning on power source, start a Test Run procedure (2-7) to check the success of the replacement and to discover other possible malfunctions.



5.2.2 How to replace PHRIA PCB (A2)

The setting data for the PHRIA are stored in the EEPROM (IC010) on the A2 control PCB.
When replacing a PCB, remove the EEPROM from the malfunctioning PCB and re-install it on the new PCB.
In some cases the EEPROM itself may be damaged.
Check the EEPROM using the procedure below.
In addition, depending on the model, some connectors such as T20, PNL and FS on the original PCB include jumper wires. Disconnect these wires together with the EEPROM and install them onto the new PCB.

Procedure:



5.2.3 How to replace EEPROM (A2) with EEPROM included in “PCB service pack”

It is necessary to store the setting parameters of the Heat pump into the new EEPROM like it was in the old one.

Procedure:

(1) Replace the EEPROM like the first time when replaced the PCB (see Section 5-2-1.)

(2) Program the memory setting through the optional remote control like explained section 7 (see Section 7-1 & 7-2)

(3) Check the new EEPROM (see Section 5-2-2) like you done first time when you discovered that the old one was damaged.

(4) To be sure that the repair is a success and no other parts of the Inverter Gestion have been damaged, start a Test Run (see Section 2-7.)

5.2.4 Replacing PHRIA PCB (A3)

Replace the PCB by following the instructions “How to replace PCB (A3)” on the next page.

Pay special attention to the following points:

(1) Before replacing the PCB (A3), be sure to turn off the power source (at mains). And check that Power LED is OFF before beginning work.

(2) When replacing, **be sure to install the EEPROM that was attached to the original PCB (A3).**

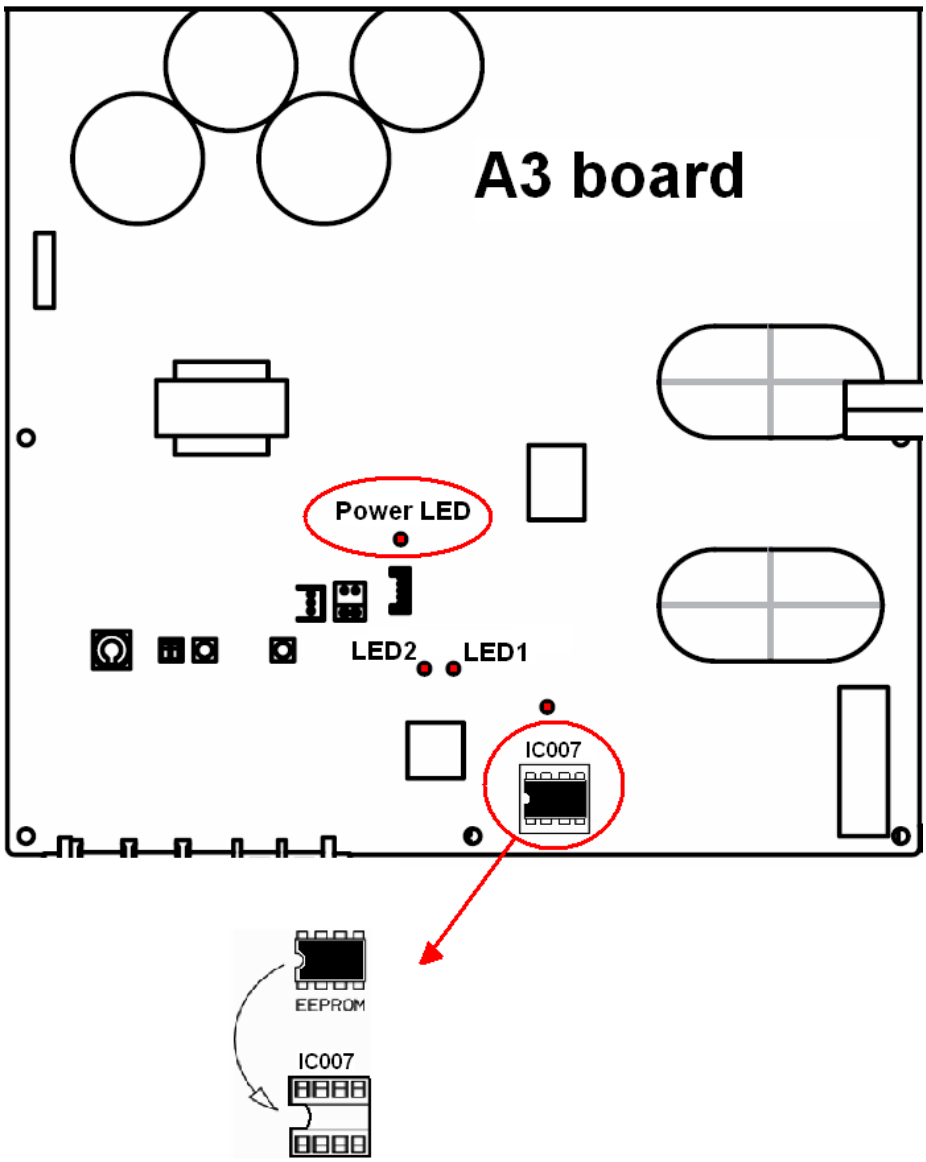
(3) Some connectors on the PCB may include jumper wires.
When removing the PCB of a malfunctioning, disconnect these jumper wires together with the EEPROM and install them onto the new PCB.

(4) Be careful when handling the EEPROM, as its pins easily bent.

(5) Securely install the EEPROM in the location and orientation shown in the figure below.

(6) The alarm message (**F31**) may appear in cases of malfunction in the EEPROM.

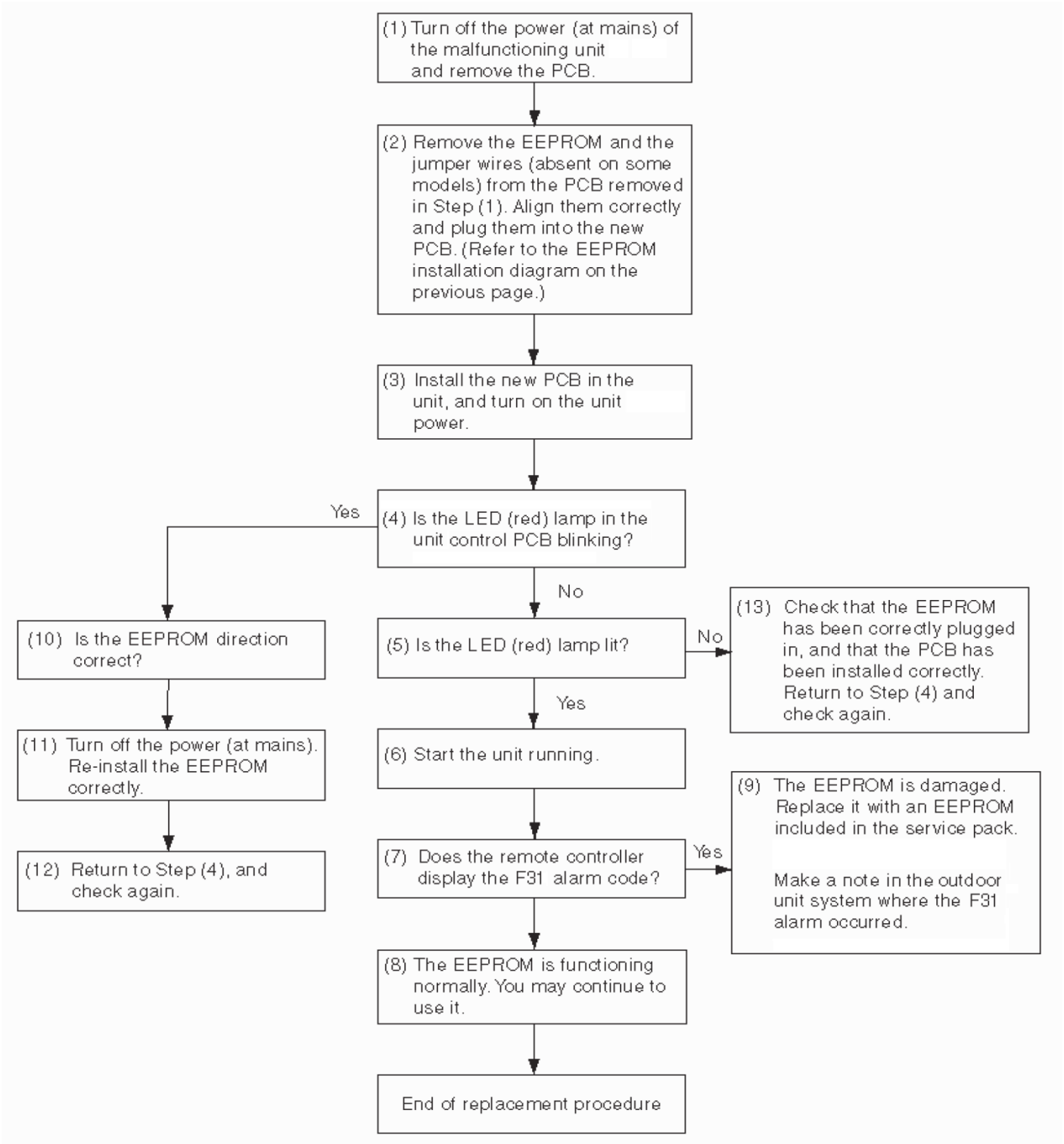
(7) After turning on power source, start a Test Run procedure (2-7) to check the success of the replacement and to discover other possible malfunctions.



5.2.5 How to replace PHRIA PCB (A3)

The setting data for the PHRIA are stored in the EEPROM (IC007) on the A3 control PCB.
When replacing a PCB, remove the EEPROM from the malfunctioning PCB and re-install it on the new PCB.
In some cases the EEPROM itself may be damaged.
Check the EEPROM using the procedure below.
In addition, depending on the model, some connectors on the original PCB include jumper wires. Disconnect these wires together with the EEPROM and install them onto the new PCB.

Procedure:



5.2.6 How to replace EEPROM (A3) with EEPROM included in “PCB service pack”

It is necessary to store the setting parameters of the Heat pump into the new EEPROM like it was in the old one.

Procedure:

(5) Replace the EEPROM like the first time when replaced the PCB (see Section 5-2-4.)

(6) Program the memory setting through the optional remote control and the special service checker like explained section 7 (see Section 7-3 & 7-4)

(7) Check the new EEPROM (see Section 5-2-5) like you done first time when you discovered that the old one was damaged.

(8) To be sure that the repair is a success and no other parts of the Inverter Gestion have been damaged, start a Test Run (see Section 2-7.)

5.3 Symptoms and Parts to Inspect: Troubleshooting

5.3.1 Troubleshooting Global Water System

PROBLEM	POSSIBLE CAUSE	ACTION
The control unit is turned off.	Power supply circuit breaker has tripped (open).	Check short circuit. Check circuit breaker caliber.
The system does not operate at all.	The function switch is set to "**OFF**".	Select the desired mode.
	An alarm is displayed on the control unit.	See list Section 6.
	Power supply circuit breaker has tripped (open).	Check short circuit. Check circuit breaker caliber.
	Line voltage very low.	Consult the installer.
The heat pump starts but stops rapidly.	Obstacle in front of the unit's exchanger.	Clear a space around the unit.
Insufficient heating (or cooling).	Doors and/or windows are open.	Close.
	Heat source in cooling mode.	Remove the source of heat.
	Setpoints (set on the control unit) are inappropriate (too low in heating mode / too high in cooling mode).	Modify the settings.
	Incorrect settings on radiator and fan-coil unit thermostats (if any).	Modify the settings.
	Air filter on terminal units (if any) obstructed or dirty.	Clean the filter.
	Low water pressure on the hydraulic system	Add water to the system. If the problem continues, call After-Sales Service.
	Hydraulic system poorly purged.	Purge the system. If the problem continues, call After-Sales Service.
	Faulty outdoor unit defrosting.	Check code Alarm of Inv. Reg. See section 5-3-2.

5.3.2 Troubleshooting PC Boards Water System

Thanks to informations below, it is possible to check and establish a diagnosis of a possible failure on the control system PC Boards by type of input.

Sensors input:

- Sensors are 10 K Ohms at 25°C.
- A very large displayed value matches an ohmic value low: Check if sensor is short circuit.
- A very low (negative) displayed value matches an ohmic value large: Check if sensor is not cut.
- Check ohmic value (disconnected) sensor.
  - . Not wired sensor: Voltage at this input is 5 volts DC.
  - . Short circuit sensor: Voltage at this input is 0 volt DC.
  - . Value 10 K ohms (or 25 ° C): Voltage at this input is about 3-Volt DC.

Digital input :

- Inputs are polarised NRV (Not Regulated Voltage) / Raised Voltage but not regulated
  - . Not wired input: The tension at this input should be around 10 to 16 volt DC.
  - . Shunted input: The tension at this input drops to 0 Volt.

Load shedding input:

-The input is polarized in 5-volt DC.
- . Not wired input: the voltage is 5-Volt DC.
- . The shunted input: voltage is 0 Volt.

System bus (communication line):

- This system bus is a bus powered, it provides in certain cases not only transmit information but also power for a product. This is the case of the control box which is bus-powered.
  - . Bus voltage: Between 10 and 16 V DC (voltage rectified, unregulated).

Load shedding signal (teleinfo):

-This signal issued by an electronic utility meter or a meter Simulator provides information for load shedding.
-A LED lets you know the status of this information :
- . Led fixed: good link.
- . Flashing Led: no communication (this is the case when this signal is connected) or meter in sleeping mode.
- . Led off: the binding does not exist.

-The signal is modulated type 50 kHz, the amplitude moves between 2.4 and 5 AC volts centered at 0 volts.

Power :

-The two Voltages to check are the NRV and 5-volt.
-The NRV can be measured on the digital input not wired.
-The 5-volt can be measured on the sensor inputs not wired.
-The NRV is also used for the relays and digital inputs. This NRV is also used after regulating to provide power to all components.
-The 5-volt is mainly used for processing as well as sensor inputs and load shedding.

5.3.3 Troubleshooting Inverter Gestion

Optional Remote controller alarm display	Alarm contents	Judgement conditions	Eliminating condition of alarm	Judgement and correction	
E06	A3 board detected a signal error from the A2 board (or CC1 via A2).	Serial signals receiving failure (including faulty board quantity confirmation)	Automatic recovery	1.Check inter-board control wiring. 2.Check A2 and A3 boards.	
E07	A3 board sending failure to A2 board.	Serial signal sending failure	Automatic recovery	1.Check inter-board control wiring. 2.Check A3 board.	
E20	Automatic address setting failure.	A3 board cannot receive any serial signals from A2 board.	Power reset recovery	1.Check inter-board control wiring. 2.Check A2 and A3 boards.	
E31	Communications trouble within boards.	No communication possible with MDC for 3 minutes or longer.	Automatic recovery	Check A3 board.	→ See Section 5-4. Alarm details

Optional Remote controller alarm display	Alarm contents	Judgement conditions	Eliminating condition of alarm	Judgement and correction	
F04	Disconnection, open circuit or short circuit in discharge temperature sensor (TD)	Sensor detection error (90°C or more after 60 minutes has elapsed since the compressor was halted.)(Open circuit)	Automatic recovery	1.Check discharge temp. sensor (TD). 2.Check A3 board.	→ *See Section 5-4. Alarm details*
F06	Disconnection, open circuit or short circuit in sensor (C1)	Open circuit or short circuit	Automatic recovery	1.Check Air heat exchanger temperature sensor (C1). 2.Check A3 board.	→ *See Section 5-4. Alarm details*
F07	Disconnection, open circuit or short circuit in outdoor unit heat exchanger temp. sensor (C2)	Open circuit or short circuit	Automatic recovery	1.Check Air heat exchanger temperature sensor (C2). 2.Check A3 board.	→ *See Section 5-4. Alarm details*
F08	Disconnection, open circuit or short circuit in sensor (TO)	Open circuit or short circuit	Automatic recovery	1.Check outdoor air temp. sensor (TO). 2.Check A3 board.	→ *See Section 5-4. Alarm details*
F10	Disconnection, open circuit or short circuit in water inlet temp. sensor (TA)	Open circuit or short circuit	Automatic recovery	1.Check water inlet temp. sensor (TA). 2.Check A3 board.	
F12	Disconnection, open circuit or short circuit in suction temp. sensor (TS)	Open circuit or short circuit	Automatic recovery	1.Check suction temp. sensor (TS). 2.Check A3 board.	→ *See Section 5-4. Alarm details*
F29	EEPROM trouble	Reading/writing failure	Power reset recovery	1.Check EEPROM (IC010). 2.Check A2 board.	→ *See Section 5-2.*
F31	EEPROM trouble	Reading/writing failure	Power reset recovery	1.Check EEPROM (IC007). 2.Check A3 board.	→ *See Section 5-2.*

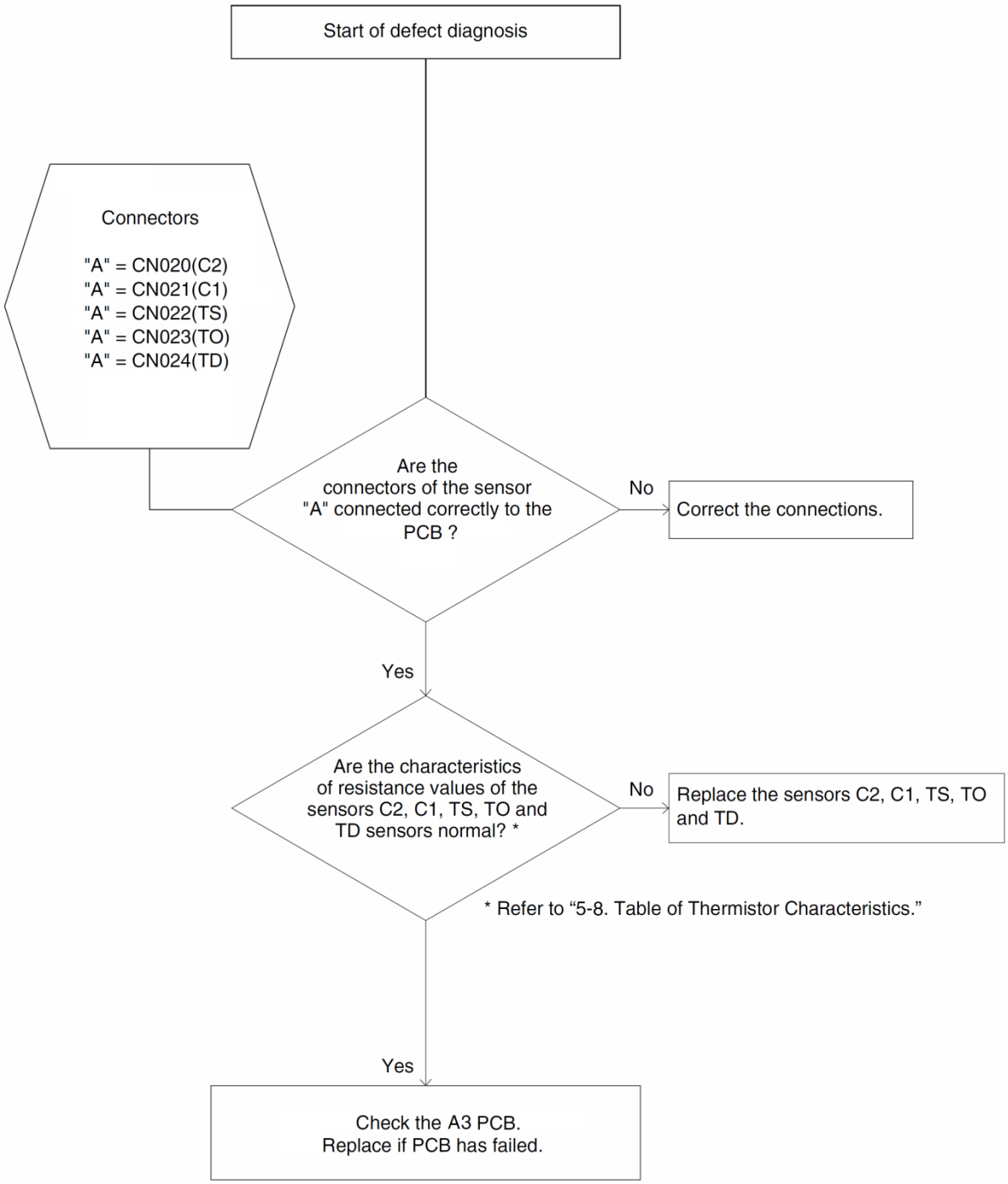
Optional Remotecontrolleralarm display	Alarmcontents	Judgement conditions	Eliminatingcondition of alarm	Judgement and correction
H01	Over-current error	Inverter stops after alarm is detected.	Recovery at restart	1.Refrigerant cycle abnormal overload operations 2.Screws connecting the HIC circuit between the heat sink are loose 3.Faulty cooling of heat sink 4.Check A3 PCB wiring
L02	A2 and A3 boards are incompatible	A2 board judged incompatible with the A3 board type due to a wrong spare part or a wrong setting parameters.	Power reset recovery	1.Check EEPROM (IC010) (setting parameters). 2.Check A2 board.
L08	Settings failure	Adress not set in EEPROM (IC010).	Power reset recovery	Check EEPROM (IC010)
L09	Settings failure	Capacity not set in EEPROM (IC010).	Power reset recovery	Check EEPROM (IC010)
L10	Settings failure	Capacity not set in EEPROM (IC007).	Power reset recovery	Check EEPROM (IC007)
L13	Settings failure	A3 board judged incompatible with the A2 board type due to a wrong spare part or a wrong setting parameters.	Automatic recovery	1.Check EEPROM (IC010). 2.Check A3 board.

Optional Remote controller alarm display	Alarm contents	Judgement conditions	Eliminating condition of alarm	Judgement and correction	
P03	Abnormal discharge temperature error: Discharge temp. detected at or above the specified value.	Stops when temp. Exceeds 111°C . Alarm output on 4 pre-trips.	Recovery at restart	1. Check refrigerant cycle (gas leak). 2.Trouble with electronic expansion valve. 3.Check discharge temperature sensor (TD).	
P05	Current Transmition disconnected or AC power supply error.	The current value transmitted on the A3 board is low. When no AC power input for more than 3 minutes: Pre-trip 5 times	Recovery at restart	1.Check current transmition. 2.Check A3 board.	
P10	Communications trouble	Abnormally on jump CN030.	Automatic recovery	Check jump CN030 on A2 board.	
P15	Insufficient gas level detected.	• Discharge temperature is 95°C or higher. • Electronic expansion valve is at Step 480. • The current value from the MDC is 2.0A or less. When the above has continued for 1 minute.	Recovery at restart	1.Check refrigerant cycle (gas leak). 2.Trouble with electronic expansion valve 3.Check outdoor unit valve opening.	
P19	4-way valve locked trouble: Judged after 5 minutes had elapsed since the compressor was switched on.	The brased plate heat exchanger temperature drops even though the compressor is switched on during the heating mode. [min(E1,E2)] is 10°C or lower. The brased plate heat exchanger temperature rises even though the compressor is switched on during the cooling mode. E2 is 50°C or higher Pre-trip 2 times.	Recovery at restart	1. Check 4-way valve. 2. Check 4-way valve wiring. 3. Check A3 board.	
P20	High-pressure protection error caused by cooling high-load max (C1, C2) temperature	Halted if the temperature exceeds 61°C Error output on 10 consecutive pre-trips.	Recovery at restart	1.Overload operation of refrigerant cycle 2.Check sensors C1 and C2.	
P22	PHRIA's fan motor trouble: Inverter protection circuit was activated, or lock was detected at outdoor unit fan motor.	Inverter stops after alarm is detected. Pre-trip 4 times	Recovery at restart	1.Position detection trouble. 2.PHRIA's fan motor overcurrent Protection circuit is activated: • Check outdoor unit control PCB. • Refer to outdoor unit fan judgement methods.	→ *See Section 5-4. Alarm details*
P26	Inverter protector circuit was activated. G-Tr short-circuit within the HIC circuit. (Short time / 0.8 seconds or less) HIC temperature protection	Inverter stops after alarm is detected. Alarm is output when inverter stops (pre-trip) consecutively 4 times.	Recovery at restart Temperature dropped	1.Stops immediately even when operations restarted. • Layer short on the compressor 2.Check HIC circuit. • Wiring trouble 3.Heat sink and PCB (HIC) • Contact trouble	→ *See Section 5-4. Alarm details*
P29	Error in current detection circuit: • AC current value is high, even while compressor is halted.	• Inverter halted after alarm detected. • Alarm output on 4 consecutive (pre-trips.)	Recovery at restart	1.Stops immediately even when operations restarted. • Layer short on the compressor 2.Check HIC circuit • Wiring trouble	→ *See Section 5-4. Alarm details*

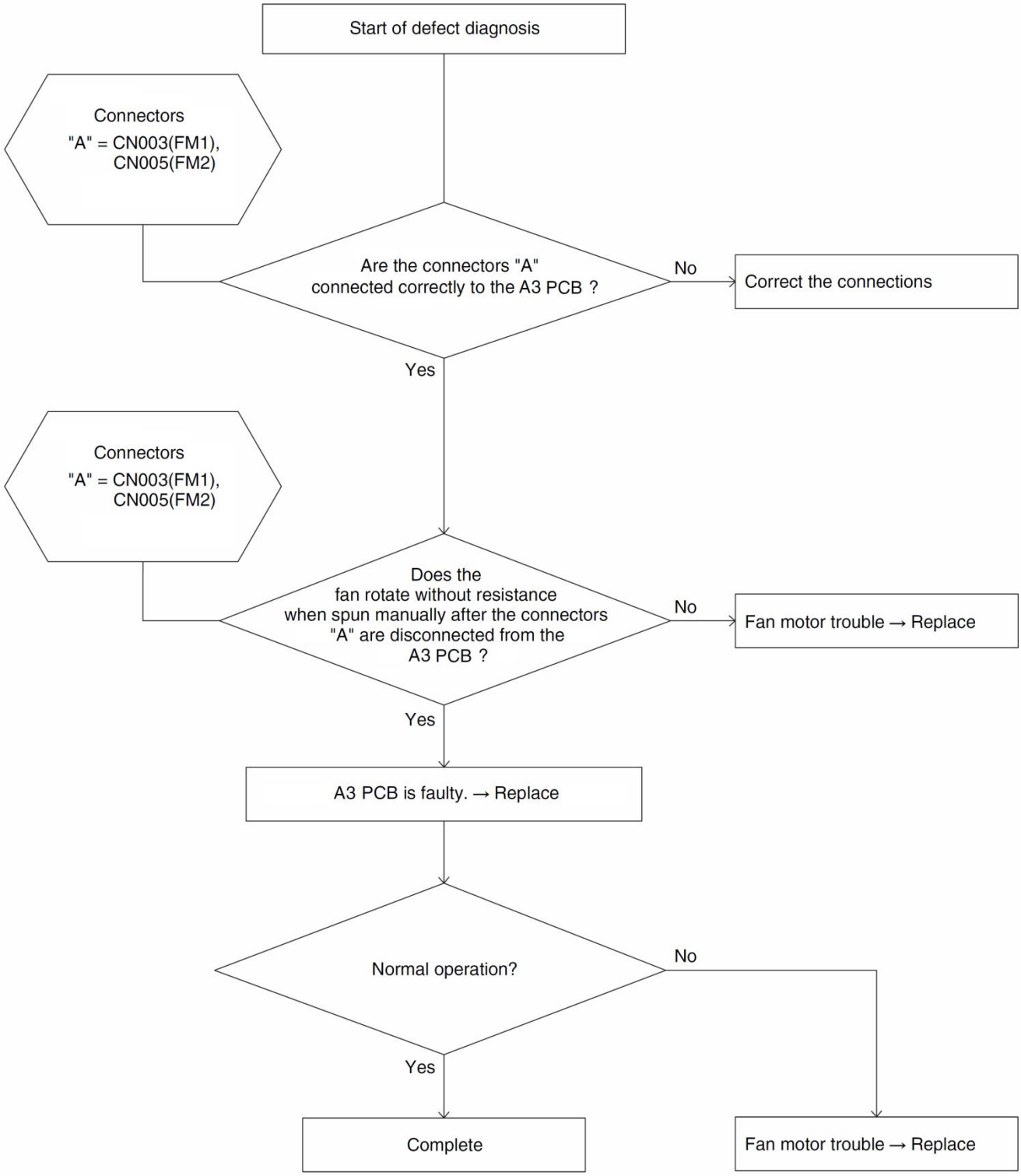
5.4 Alarm details: “E31”-“F04”-“F06”-“F07”-“F08”-“F12”-“P22”-“P26”-“P29”

[Alarm “E31”]
(communications trouble)

[Alarms “F04,” “F06,” “F07,” “F08,” “F12,”]————Sensor trouble



[Alarm "P22"] ——— Fan motor drive circuit trouble



[Alarm "P26"] ——— Excessive current alarm of HIC PCB

Start of defect diagnosis

① Is the power voltage correct?

No → Improve the power voltage line.

Check the following:
Check to ascertain that the power voltage is within the permissible range of 198 to 264V regardless of whether the compressor is operating or not.
*Pay special attention to whether the voltage drops after compressor operations while measuring.

Yes ↓

② Are the wiring connector connections OK?

No → Repair the wiring connectors.

Check the following wiring:

Display on PCB	HIC PCB side	A3 PCB side	Display on PCB	HIC PCB side	A3 PCB side
HIC+	CN04	CN069 (wire : yellow)	HIC1	CN01	CN207 (10P white)
HIC-	CN05	CN070 (wire : gray)	HIC2	CN02	CN206 (8P white)

Yes ↓

③ Are the U/V/W connections on the HIC PCB and compressor terminal OK?

No → Repair the wiring connectors.

HIC PCB side
U (CN06) pink
V (CN07) white
W (CN08) blue

Yes ↓

④ Are the screws of HIC PCB tightened firmly?

No → Tighten the screws firmly.

Abnormal temperature rise in the HIC PCB is prevented by radiating the heat, with the heat sink being attached firmly to the HIC PCB by screws.
The HIC PCB cannot radiate properly if the screws are loose. Consequently, the temperature inside the HIC PCB can rise abnormally and the alarm P26 occurs.

Yes (No problem on tightening) ↓

⑤ Is the high-pressure for the refrigerant cycle within the range? (High load operating?)

No → **Operating on high load.**
Recovery methods differ in accordance with the cause.
• Recharge refrigerant
• Replace the thermistor
• Repair the pipes, etc.

1. Potential Causes
• Refrigerant overcharge
Has the refrigerant been overcharged?
* Verifying Overcharge
There is no problem if the difference between the temperature "E2" and the saturated temperature of the gas pipe service valve pressure is within 2 ℃ during the heating mode. Any of the following could be the reason if the former is two or more degrees lower than latter.
• Faulty operations of the outdoor unit electronic expansion valve.
• Pipe blockage, crushed pipes, etc.
(Assumed to be on the liquid pipes during the cooling mode and the gas pipes during the heating mode.)
• C1 and C2 thermistor error (during the cooling mode.)
• E1 and E2 thermistor error (during the heating mode.)
2. Temperature on the high-pressure side during normal operations.
Cooling: Temperature of the C2 thermistor is approximately between 45 ℃ and 55℃.
Heating: Temperature of the E2 thermistor is approximately between 40 ℃ and 50 ℃.

* There are cases in which the above temperatures will be lower depending on the operation conditions.

Yes (Not operating on high load) ↓

⑥ Does the alarm P26 occur when the U / V / W wires (pink/white/blue) are disconnected from the HIC PCB and operation was started?

No (alarm P26 output) → Replace the HIC PCB.

The HIC PCB is considered faulty if the alarm P26 occurs even if the compressor is not operating owing to the U, V and W wires being disconnected.
Replace the HIC PCB.

Yes (An alarm other than the alarm P26 occur) ↓

⑦ Are the resistance values permissible at all areas in HIC PCB?

No (Abnormal resistance value) → Replace the HIC PCB.

• Verification method: Remove the HIC PCB and measure the resistance at all areas.
→ Refer to the Verification method HIC PCB (area 5)
Replace the HIC PCB if the readings are below permissible values.

Yes (No problem with the resistance value) ↓

⑧ Is the insulation on the compression OK?

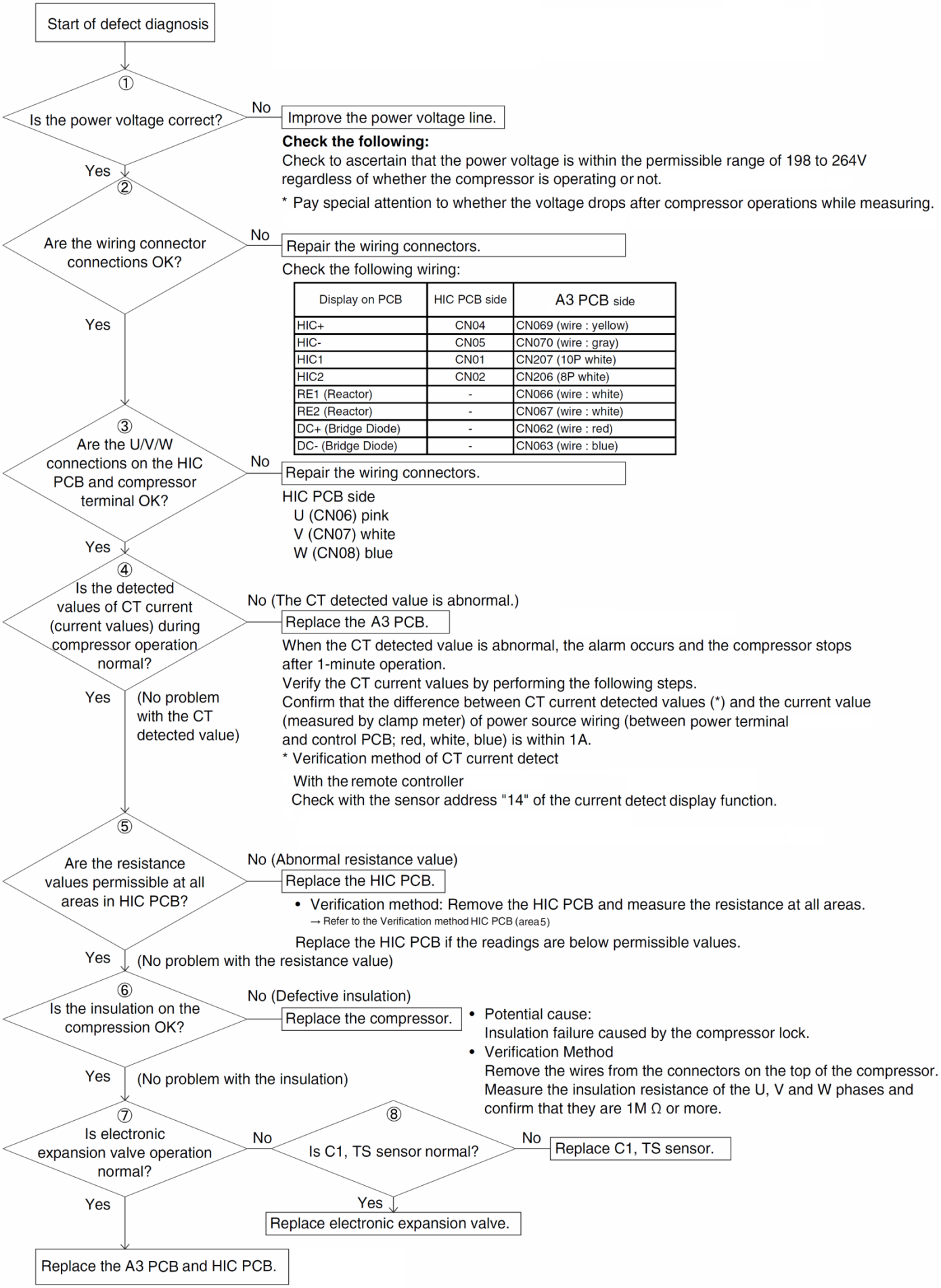
No (Defective insulation) → Replace the compressor.

• Potential cause: Insulation failure caused by the compressor lock.
• Verification Method
Remove the wires from the connectors on the top of the compressor. Measure the insulation resistance of the U, V and W phases and confirm that they are 1MΩ or more.

Yes (No problem with the insulation) ↓

Replace the A3 PCB and HIC PCB.

[Alarm "P29"] ——— **Start-up failure of the compressor (will not start up)** (HIC PCB,A3 PCB)



Check the following:

Check to ascertain that the power voltage is within the permissible range of 198 to 264V regardless of whether the compressor is operating or not.

* Pay special attention to whether the voltage drops after compressor operations while measuring.

Check the following wiring:

Display on PCB	HIC PCB side	A3 PCB side
HIC+	CN04	CN069 (wire : yellow)
HIC-	CN05	CN070 (wire : gray)
HIC1	CN01	CN207 (10P white)
HIC2	CN02	CN206 (8P white)
RE1 (Reactor)	-	CN066 (wire : white)
RE2 (Reactor)	-	CN067 (wire : white)
DC+ (Bridge Diode)	-	CN062 (wire : red)
DC- (Bridge Diode)	-	CN063 (wire : blue)

HIC PCB side
U (CN06) pink
V (CN07) white
W (CN08) blue

When the CT detected value is abnormal, the alarm occurs and the compressor stops after 1-minute operation.
Verify the CT current values by performing the following steps.
Confirm that the difference between CT current detected values (*) and the current value (measured by clamp meter) of power source wiring (between power terminal and control PCB; red, white, blue) is within 1A.
* Verification method of CT current detect
With the remote controller
Check with the sensor address "14" of the current detect display function.

- Verification method: Remove the HIC PCB and measure the resistance at all areas.
  → Refer to the Verification method HIC PCB (area 5)

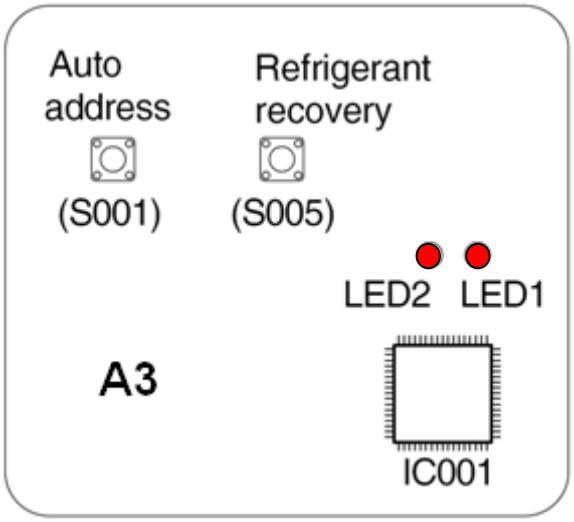
Replace the HIC PCB if the readings are below permissible values.

- Potential cause:
  Insulation failure caused by the compressor lock.
- Verification Method
  Remove the wires from the connectors on the top of the compressor. Measure the insulation resistance of the U, V and W phases and confirm that they are 1M Ω or more.

5.5 Reading an Alarm Code without optional remote control

During maintenance or troubleshooting, it is possible to read the Alarm code without connection of the optional remote control (see Section 2-7).

The Alarm Code is display by the A3 Board LED (LED1 and LED2).



Alarm Code is composed of two parts. First part is a letter, second part is a number.

The blinking of LED 1 is for the Letter / The blinking of LED 2 is for the Number

LED 1	
Number of Blinks	**Letter of Alarm Code**
0	No alarm
2	P
3	H
4	E
5	F
6	L

LED 2	
Number of Blinks	**Number of Alarm Code**
0	No alarm
1	1
2	2
….	….
….	….
16	16
17	17

Example:
LED1 blinks 2 times and LED2 blinks 15 times. Then the cycle repeats.
Alarm Code is “P15”

Note: In case of PC board’s malfunction, some Blinking could have no sense (check with the optional remote control the alarm code).

5.6 PHRIA: Refrigerant Pump Down Operation

Observe the following items when using pump down operation to recover the refrigerant.

⚠ CAUTION

Pay a special attention to the rotating of the fan while operating.

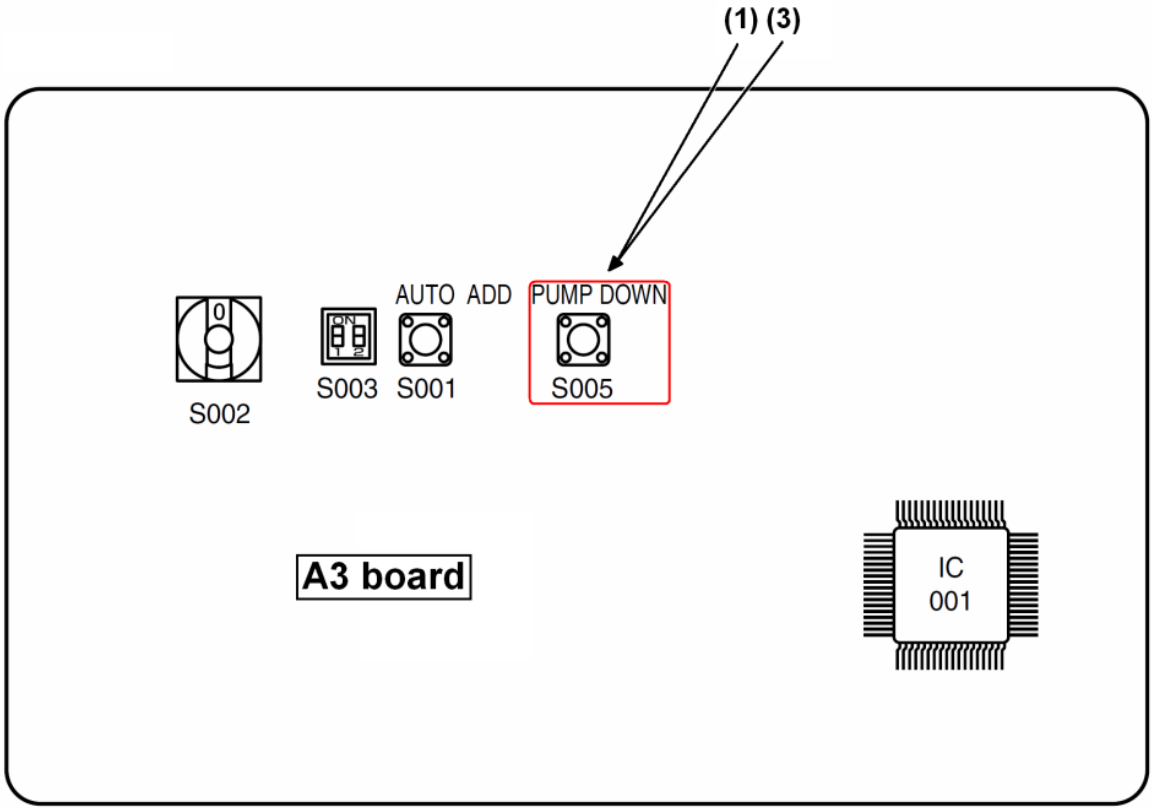
Procedure:

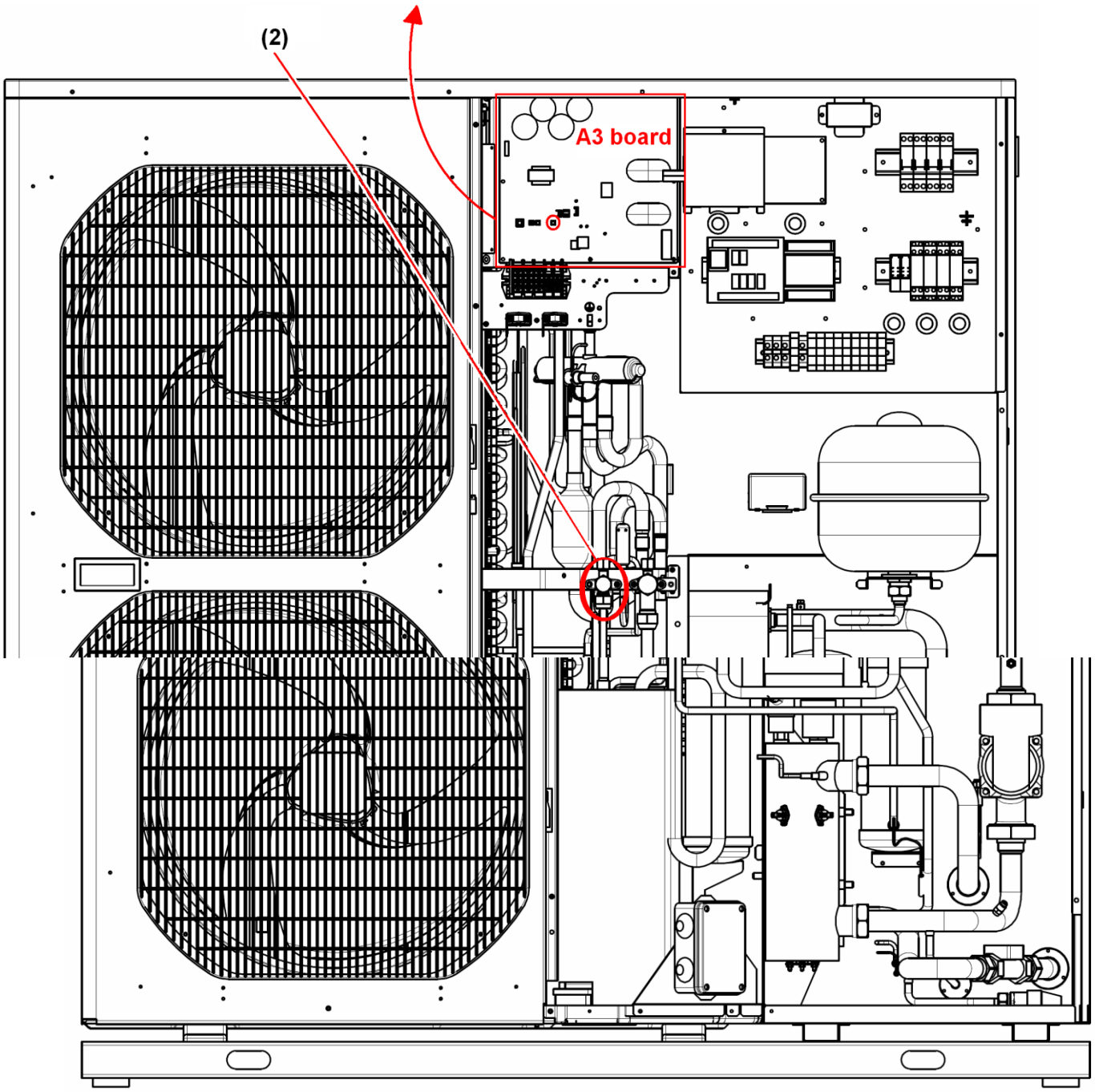
(1) Press and hold the S005 (PUMP DOWN) button on A3 board for 1 second or longer.
• During refrigerant recovery, LED 1 blinks and LED 2 is lit.

(2) Close the liquid-side valve during refrigerant recovery.
If the unit is operated for 10 minutes or longer with the liquid-side valve open, operation will be stopped, although no alarm will be displayed on the optional remote controller (if any). If this occurs, close the valve and restart operation.

(3) When the valve service port pressure is approximately 0.1 MPa, press the S005 (PUMP DOWN) button again to end refrigerant recovery.
• In order to protect the compressor, do not continue operating to generate a negative pressure in the inter-unit tubing.

➔ **See button S005 and valve service in the above figures.**




(2)
A3 board

5.7 Maintenance instructions

5.7.1 Important note

• Before doing any work on the installation, make sure it is switched off and all power supplies locked out.
• Also check that the capacitors are discharged.
• Any work must be carried out by personnel qualified and authorised to work on this type of machine.
• Prior to all maintenance and servicing on the refrigerating circuit, one must first shut down the unit then wait a few minutes before installing temperature or pressure sensors. Certain equipment, such as the compressor and piping, may reach temperatures above 100°C and high pressures may lead to serious burns.

5.7.2 General Maintenance

All equipment must be properly maintained in order to provide optimum performance over time. Faulty maintenance can result in the cancellation of the product guaranty. Depending on the products, maintenance operations consist in the cleaning of filters (air, water), internal and external exchangers, casings, and the cleaning and protection of condensate tanks. Treating odors and the disinfection of room surfaces and volumes also contributes to the cleanliness of the air breathed by users.

• **On a yearly basis:**

The following operations at least once a year (the frequency depends on the installation and operating conditions):
- Check for leaks on the refrigerating circuit (according to the order of 7th May 2007).
- Check for traces of corrosion or oil stains around the refrigerating components.
- Inspect the composition and the condition of the coolant and check that it does not contain traces of refrigerating fluid.
- Cleaning the exchangers.
- Checking the wear parts.
- Checking the operating instructions and points.
- Check the safety devices.
- De-dusting the electrical equipment cabinet.
- Checking that the electrical connections are secure.
- Checking the earth connection.
- Check the hydraulic circuit (clean the filter, water quality, purge, flowrate, pressure, etc.).

5.7.3 Heater Safety

• The PHRIA's heater is equipped with an automatic-reset and a manual-reset safety thermostat.
• These thermostats trip in case of excessive temperature on the heater wall.

• Possible causes:
- Excessively low or inexistent water flowrate.
- Improperly purged water system.

• If the manual thermostat trips, correct the fault then reset the thermostat as follows:
- Turn off and lock out the unit.
- Remove the cover.
- The thermostats are located against the heater partition, on the front. (See Section 1-1.)
- Press the button in the centre of the manual thermostat.

5.7.4 Protection of Heater circuits

• The heater features three heating elements each supplied with 230 V between phases and neutral. Each of these circuits are protected by a modular circuit breaker (Q1, Q2, Q3).

5.7.5 Control circuit protection

• The PHRIA's control circuit is protected by a modular circuit breaker Q4 located next to module CC1. It is accessible through the small window on the right-hand side of the unit (without removing the cover panel).
• If tripped:
- Turn off and lock out the unit.
- Correct the fault.
- Reset the circuit breaker.

Note:
The opening of circuit breaker Q4 disconnects only the control part. In the event of maintenance /servicing, all circuits must be disconnected by opening the main circuit breaker.

5.7.6 Domestic Hot Water production maintenance (DHW)

Note 1:
Water quality can have an influence on the recommended service intervals below.
Note 2:
In the event of a problem with the DHW production installation, this function can be stopped by disconnecting the power to the box's control circuit (Q2 open).
When placing the unit back into service (re-supplying power to the box's control circuit), the DHW board requires 60 seconds to reset ("init" message on the control unit).
Note 3:
This power outage cancels the 5-hour time delay between 2 DHW cycles.
The power supply of the tank's electric heating element must be connected to ensure a domestic hot water temperature greater than 50°C in order to prevent risks associated with the development of bacteria or legionella.
Note 4: Never operate the tank's electric heating system without water in the tank.

---- Service intervals ----

On a monthly basis:

. Check that circuit breaker Q1 (tank electric heater) is not tripped.
. On the safety valve, operate the shut-off valve and the safety valve to check that they operate correctly.

On a yearly basis:

. Inspect the hydraulic system (water quality, purge, pressure…) and check for leaks (connections, seals…).
. On the safety valve, verify the check-valve by turning the shut-off valve and opening the plug located on the opposite side of the valve (no water must flow).
. Check the ground connections.
. Dust the electrical box.
. Check the control thermostat's setpoint threshold on the tank's electric heater (minimum positioning).

Operational checks:
• Set circuit breaker Q1 and check the power supply on the tank's electric heater. Make sure that power to the corresponding output on the main electrical switchboard is on (Off-Peak power hours not engaged, etc.).
• On the control unit, set the operation selector to "**COOL**" (= summer = DHW only).
• After a few seconds, a DHW cycle should start (if the water temperature detected by the tank sensor is below 35°C):
- Generator operation.
- DHW valve activation and start-up of the secondary circulator.
- Restriction of the tank electric heating.
• The pictogram corresponding to a DHW cycle appears on the control unit display.
• Allow the DHW cycle to operate a few minutes while checking the temperature rise (tank temperature + water supply temperature) and by adjusting the flow rate in the exchanger (1 to 2m^3/h).
• Return the control unit selector to the "OFF" position. The DHW cycle should stop. Ensure that all electrical connections are properly tight.

Once every 2 to 3 years (according to water hardness):

. Check the anode(s) (see Section 1-2-5.)
. Check the condition of the tank's electric heater element (replace the seal).
. Remove the inspection hatch and inspect interior of the tank (replace the hatch seal).
Note: Drain the tank completely.
To drain the tank, close the safety valve (on the water inlet), open a hot water faucet to facilitate create an air flow via the siphon trap, then operate the safety valve's control knob.

Water quality: In order for the heat pump to operate under good conditions and provide optimum performance, it is essential to ensure that the system’s water circuit is clean. If the water circuit becomes clogged, this will significantly affect the machine’s performance.
The circuit must therefore be cleaned with suitable products in compliance with current standards as soon as it is installed, both for new and renovation work.
We recommend the use of products which are compatible with all metals and synthetic materials and approved by official bodies.

Recommendations regarding water quality:

- PH: 6 to 9
- TH: 10 to 20°F
- Dry material in suspension: < 2 g/l
- Chloride: 50 mg/l maximum
- Granulometry: < 0,4 mm
- Conductivity: 50 to 500 µS/cm2
- Resistivity: 1 to 10 kΩ
- Fibre: no fibres

Any disorder which may occur on our machines due to the poor quality of the fluid in the installation will not be covered by the warranty.

5.7.7 Recommendations

• All maintenance and servicing operations on the refrigerating circuit must be conducted in accordance with standard trade practices and safety rules: recovery of the refrigerant, inert shielded (nitrogen) brazing, etc…
• All brazing operations must be conducted by qualified welders.
• For equipment charged with R 410 A, refer to the various applicable directives.
• This PHRIA is equipped with pressurised equipment, for example compressor.
Use only genuine parts listed in the spare parts list for replacing defective refrigeration components.
• Pipes may only be replaced by copper tubing in compliance with standard NF EN 12735-1.

• Leak detection, in the case of pressure testing:
- Never use oxygen or dry air, as the risk of fire or explosion is present.
- Use dehydrated nitrogen or a nitrogen and refrigerant mix indicated on the manufacturer's plate.
- For units equipped with pressure gauges, the test pressure must not exceed the gauges' maximum allowable pressure rating.

• All part replacement with other than genuine parts, all modifications of the refrigerating circuit, all replacement of refrigerant by a fluid other than that indicated on the manufacturer's plate, all use of the unit outside the application limits defined in the documentation, shall result in the cancellation of PED EC marking compliance which shall fall under the liability of the individual who carried out these modifications.
• The technical information, relative to the safety requirements of the various applicable directives, is indicated on the manufacturer's plate of the heat pump and mentioned on the 1st page of this manual.

5.8 Table of Thermistor Characteristics

5.8.1 Thermistor Characteristics of the Water system

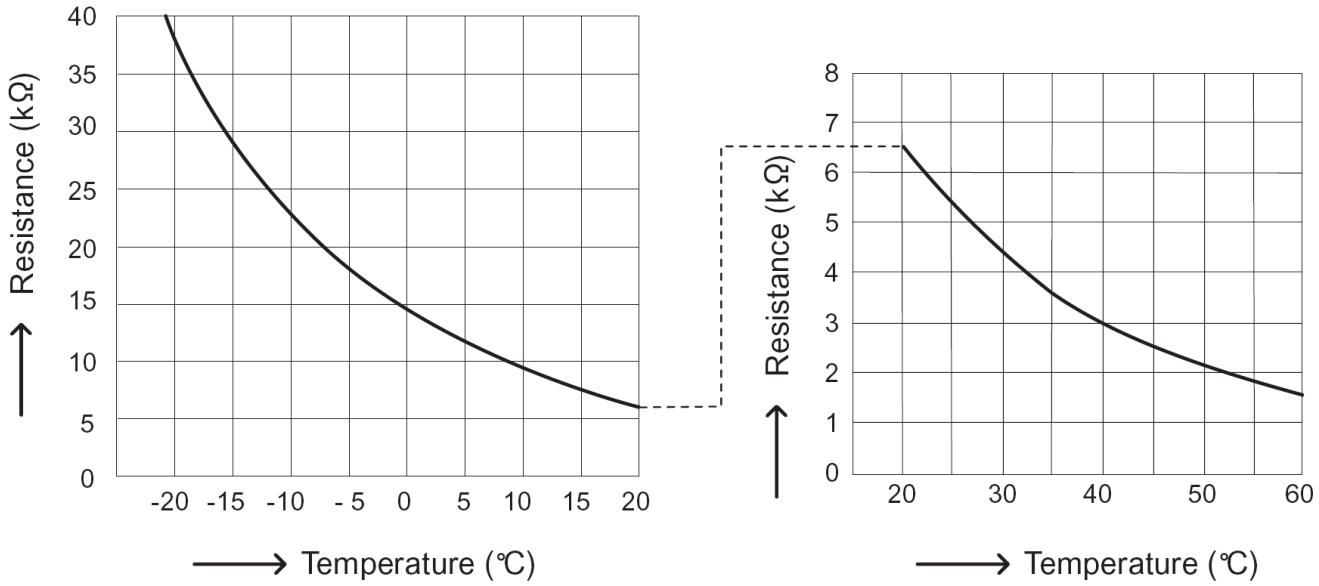
All the water sensors used for the System Water have the same characteristics:

Sensors: Type CNT 10 kΩat 25 °C

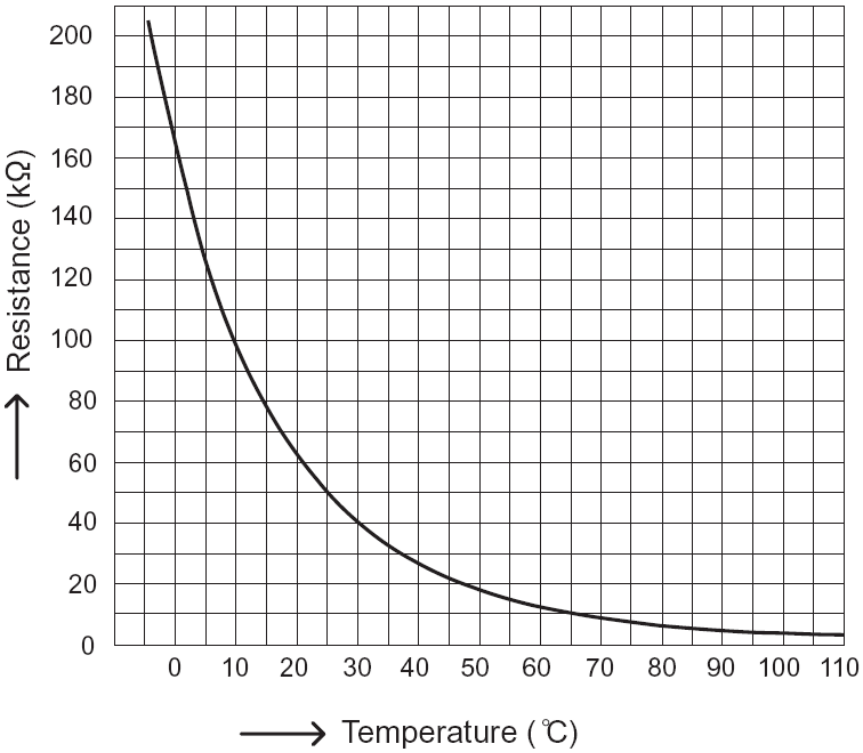
Temperature (°C)	Ohmic value (Ohm)
-20	97,120
-15	72,980
-10	55,340
-5	42,340
0	32,660
5	25,400
10	19,900
15	15,710
20	12,490
25	**10,000**
30	8,058
35	6,532
40	5,326
45	4,368
50	3,502
55	2,936
60	2,488
65	2,082
70	1,751

5.8.2 Thermistor Characteristics of the Inverter Regulation

(1) Outdoor Air Temp. (TO) Sensor,
Intake Temp. (TS) Sensor,
Heat Exchanger Temp. (C1) Sensor,
Heat Exchanger Temp. (C2) Sensor,
Liquid temperature Temp. (E1) Sensor,
Heat exchanger middle point temperature Temp. (E2) Sensor,
Water inlet temperature Temp. (TA) Sensor

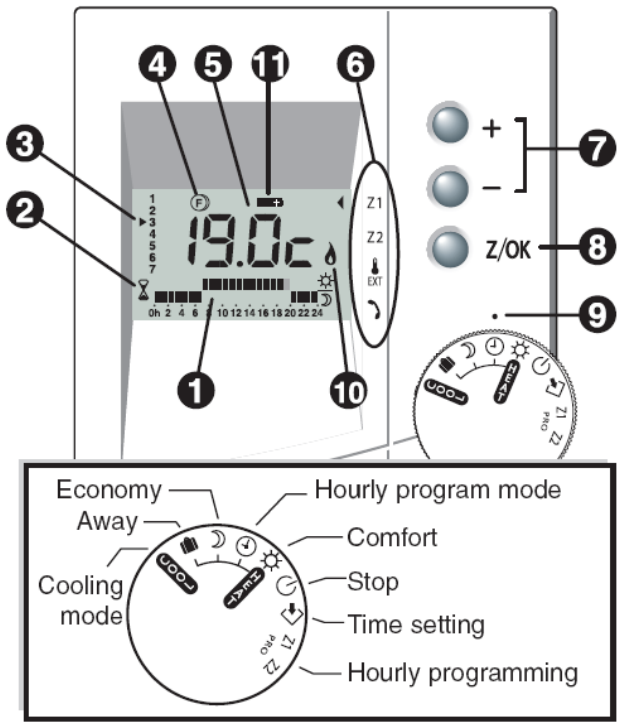


(2) Discharge Temp. (TD) Sensor



6 WATER SYSTEM: CONTROL BOX FUNCTIONS

6.1 Control unit operation



1. Current program (☼: Comfort, ☽: Economy)
2. Comfort override activated
3. Current day
4. Electric heating only
5. Temperatures
6. Display zone 1, zone 2 (if any) or outside temperature
7. Modification or override keys
8. Validation or zone change key
9. Button selection mark
10. Electric heating ON
11. DHW cycle in duty

Note: electronic controller configuration is to be set by a technician during starting up according the installation type.

6.2 Temperature display

Zone selection with key **Z/OK**

Display of the current setpoint and program of zone 1.

Display of the current setpoint and program of zone 2 (possible).

Outside temperature display

At any time, pressing and holding (5 sec.) the key will display the ambient temperature of the zone

By default, the current set point is displayed.

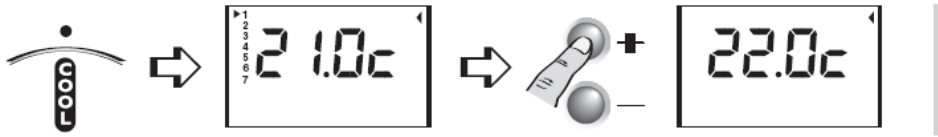
The cursor is displayed near the symbol when the system is operating in override with a Typhone 500 telephone remote control unit (Heating mode - ZONE 1 - only).

Two cases are possible in the case of an installation with 2 zones:

- **zone 2** = floor: the unit displays the temperatures for each zone,
- **zone 2** = terminal units: the unit displays either **HEAT** in heating mode or **COOL** in cooling mode.

The configuration is determined when commissioned.

6.3 Cooling mode



The setting mode is exited after 5 seconds if no key is pressed.

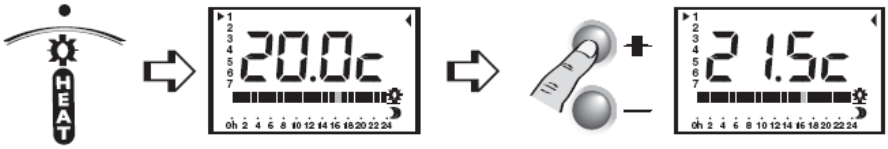
Set the knob to COOL

The setpoint temperature is displayed

Cooling setpoint temperature adjustment (20°C to 30°C)

6.4 Heating Mode

6.4.1 Comfort mode



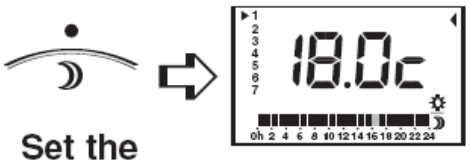
The setting mode is exited after 5 seconds if no key is pressed.

Set the knob to ☼

the ***Comfort*** *setpoint is displayed*

*Set the new **Comfort** setpoint from 15°C to 25°C (ex: 21.5°C)*

6.4.2 Economy mode

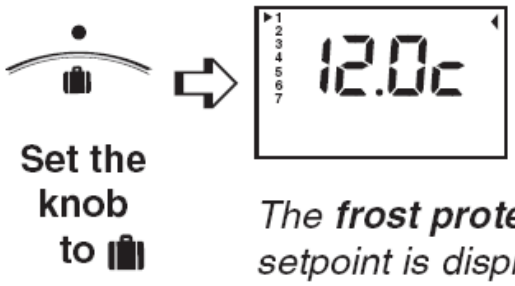


*The **Economy** temperature is indexed to the **Comfort** temperature (adjustable in the installer menu). Default value: Economy = Comfort - 2°C.*

Set the knob to ☽

*The **Economy** setpoint is displayed*

6.4.3 Long-term absence mode (away) - Frost protection

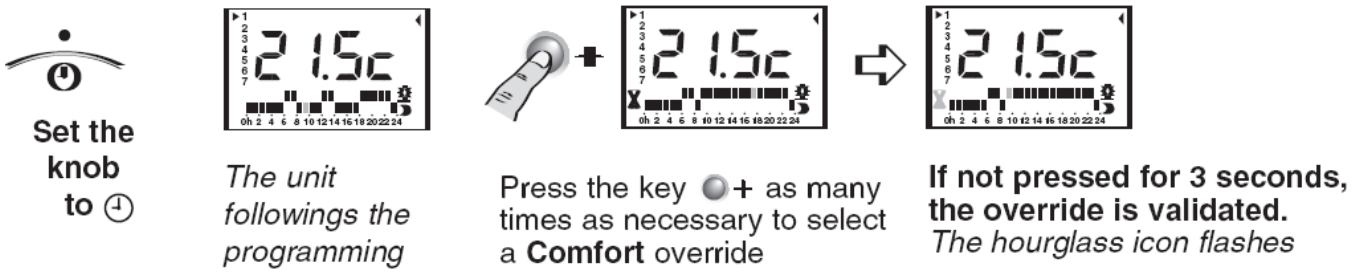


Set the knob to

*The **frost protection** temperature is 12°C - factory set (adjustable during installation)*

*The **frost protection** setpoint is displayed*

6.4.4 Hourly programming mode



Set the knob to

The unit followings the programming

Press the key + as many times as necessary to select a **Comfort** override

If not pressed for 3 seconds, the override is validated.
The hourglass icon flashes

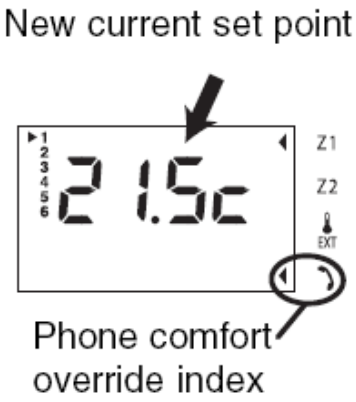
The – key enables you to go back during the override duration programming step.

6.4.5 Set point override by telephone control TYPHONE 500

The telephone control TYPHONE is an accessory (not included) available with the distribution networks professional of electrical equipment and regulation.

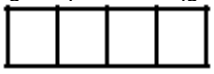
Only in **heating** mode (do not operate in cooling mode).
The user can:

- know the ambient temperature of zone 1,
- know the current set point temperature of zone 1,
- send a common override set point for zone 1 and 2.



During override, zone 1 and 2 operate in **Comfort** mode with the **new temperature set point**.
This override is indicated by an index on the display.
Any action on the rotary knob deactivates the override.

Note:
This function is possible only after entering the password (given by the installer) by means of the phone keyboard.



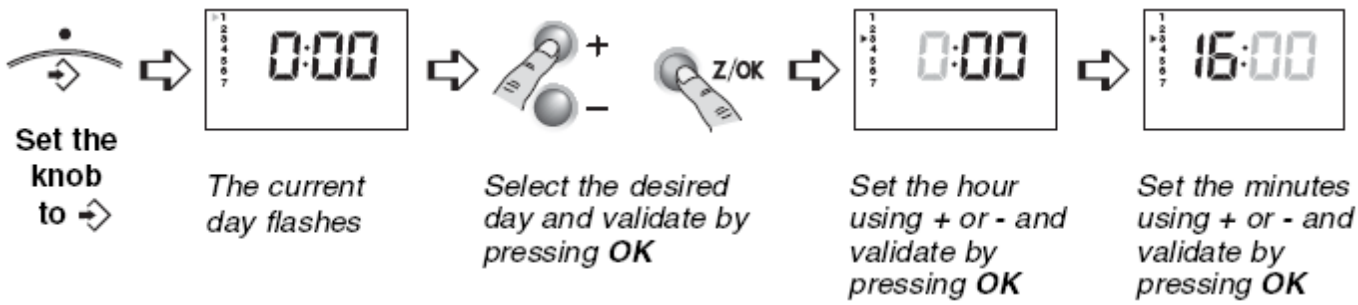
6.5 Domestic Hot Water preparation (DHWP)

If installed - Activated according to the type of installation

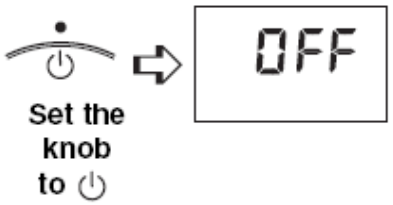
• Available on installations 1 zone heating only (No cooling).
• Function activated during installation. Actuates the heat pump, in a cyclic way, for an adapted DHW preparation tank pre-heating.
• A running DHW cycle can be stopped by setting the system to "**OFF**" (Then start it again in the selected function).

Out of the heating season: The end user must activate this DHW function by selecting the cool mode (="Summer"). At that time, message "DHW" is appearing on the display.

6.6 Programming



6.7 Stop

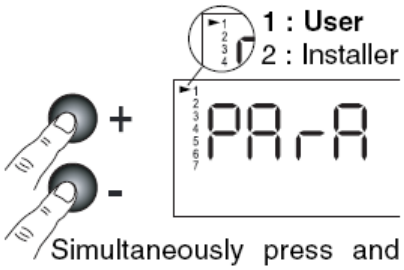


6.8 Monitoring operations: Display of the water system.

From any knob position, simultaneously press and hold keys + and − for 5 seconds, until the screen displays **PArA**, then select User / Installer menu.

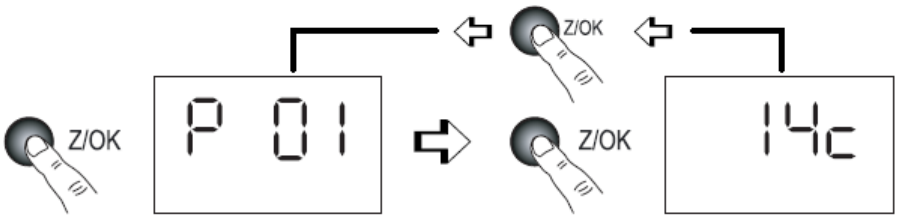
To move from the user menu to the installer menu, press + or − :

- ▶1 = user menu: certain parameters may only be consulted,
- ▶2 = installer menu: protected access by password for modification (for installer use only).



Simultaneously press and hold the + and − keys for 5 seconds

Select the first parameter by pressing on **Z/OK**.



Access to the 1st parameter (P01)

Display of the parameter value

Press the + or − keys to shift from one parameter to another.

To exit the parameterisation menu, press and hold Z/OK for 5 seconds or modify the position of the selector knob.

List of parameters that can be consulted by the user:

P00	DHW (domestic hot water) preparation temperature (if activated)	P 10	Heat pump control status
P01	Outside temperature	P 11	Heat pump mode control status
P02	Installation water return temperature	P 12	Outlet status, Support heater Elec. - 1
P03	Installation water outlet temperature	P 13	Outlet status, Support heater Elec. - 2
P04	Resulting water temperature setpoint, ZONE 1	P 14	Outlet status, Support heater Elec. - 3
P05	Resulting water temperature setpoint, ZONE 2	P 15	Outlet status - water pump ZONE 1
P06	Water temperature, ZONE 1	P 16	Outlet status - water pump ZONE 2
P07	Water temperature, ZONE 2 (floor)	P 17	ZONE1 valve control status
P08	Ambient Temperature ZONE 1	P 18	ZONE 2 (floor) valve control status
P09	Ambient Temperature ZONE 2 (floor)	P 19	DHW valve control status (if the function is activated)

Parameters available for installations with 2 ZONES

6.9 Water system parameters: Technical password 1958

6.9.1 Parameters: 1 Zone UNDERFLOOR

ACCESS: "D" = direct without password "T" = technical with password

No.	DESIGNATION	ACCESS	RANGE	VALUE / DEFAULT
	Status:			
01	Outside temperature	D	- 40 / + 90 °C	
02	Installation return water temperature	D	- 40 / + 90 °C	
03	Installation outgoing water temperature	D	- 40 / + 90 °C	
04	Water temperature resulting setpoint	D		
05	(unused)			
06	(unused)			
07	(unused)			Read only
08	Ambient temperature, zone 1	D	- 40 / + 90 °C	
09	(unused)			
10	Heat pump outlet status (0 = off; 1 = authorised)	D	0/1	
11	Operating mode output status (1 = heating; 0 = cooling)	D	0/1	
12	Outlet status, supp. 1	D	0/1	
13	Outlet status, supp. 2	D	0/1	
14	Outlet status, supp. 3	D	0/1	
	Air temperature settings:			
20	Heat pump shut-down threshold	T	- 20 / 0 °C	- 16 °C
21	Regional min. temperature	T	- 20 / 5 °C	- 7 °C
22	Supplementary authorization threshold	T	- 5 / 20 °C	7 °C
23	No heating threshold	T	10 / 25 °C	17 °C
24	Lowering of ECO temperature (ambience)	T	1 / 4 K	2 K
25	Ambient temperature set point at anti-freeze	T	8 / 18 °C	12 °C
	Water temperature settings:			
26	Supplementary heating control hysteresis	T	2 / P27 K	2 K
27	Supplementary heating control lag	T	P26 / 6 K	3,5 K
28	Heat pump control hysteresis - unused	T	1 / 4 K	2,5 K
29	Water temperature setpoint in "anti-freeze" mode	T	20 / 35 °C	25 °C
30	Heating water max. temperature (installation return)	T	25 / 40 °C	35 °C
31	(unused)			
32	Heating water min. temperature (installation return)	T	20 / 30 °C	20 °C
33	(unused)			
34	(unused)			
35	Cooling authorization threshold (installation return)	T	25 / 50 °C	30 °C
36	Thermodynamic heating authorization threshold (installation return)	T	10 / 20 °C	15 °C
37	Water outlet temperature max. alarm threshold	T	60 / 90 °C	70 °C
	Water flowrate calculation:			
40	Total electric heating power	T	1 / 30 kW	6 kW
41	Launch and calculation result	T		

(Continuous) ->

ACCESS: "D" = direct without password "T" = technical with password

No.	DESIGNATION	ACCESS	RANGE	VALUE / DEFAULT
	Heat pump parameters:			
42	Water temperature set point (return), cooling	T	20 / 30 °C	23 °C
43	Maximum water temperature set point (return), heating	T	40 / 50 °C	45 °C
	Sensor offset:			
50	Outside sensor	T	+ or - 3 K	0
51	Zone 1 air temperature sensor	T	+ or - 3 K	0
52	(unused)			
53	Installation return water temperature sensor	T	+ or - 3 K	0
54	Installation outlet water temperature sensor	T	+ or - 3 K	0
	Miscellaneous:			
60	Default configuration	T		
61	TYPHONE language selection (1 = F; 2 = GB)	T	1/2	1
62	TYPHONE access code	T	0/9999	1234
63	(unused)			
67	Heat pump forcing (active when off)	T	0/1	0
68	(unused)			
	Configuration:			
70	Installation type	T	1/5	
	1 = 1 zone, floor ----------→			(1)
	2 = 2 zones, floor			
	3 = unused			
	4 = mixed			
	5 = terminal units			
	6 = 1 zone radiators			
71	Reversibility (1 = reversible - 0 = heating only)	T	0/1	1
75	To load shedding (1 = closed = load shedding)	T	0/1	1
76	CC1 module activation (1 = Activated)	T	0/1	1
	Software versions:			
80	Control unit	T		Read only
81	Heating board	T		
85	CC1 Module	T		
	DHW:			
90	ECS card activation (0 = deactivated)	T	0/1	0
	Ambience setpoints:	D		
	Cooling setpoint zone 1 (if reversible)	Direct access Keypad	20 / 30 °C	25 °C
	Heating setpoint zone 1		15 / 25 °C	20 °C

6.9.2 Parameters: 2 zones UNDERFLOOR

ACCESS: "D" = direct without password "T" = technical with password

No.	DESIGNATION	ACCESS	RANGE	VALUE / DEFAULT
	Status:			
01	Outside temperature	D	- 40 / + 90 °C	
02	Installation return water temperature	D	- 40 / + 90 °C	
03	Installation outgoing water temperature	D	- 40 / + 90 °C	
04	Water temperature resulting setpoint, zone 1	D		
05	Water temperature resulting setpoint, zone 2	D		
06	Water temperature, zone 1	D	- 40 / + 90 °C	
07	Water temperature, zone 2	D	- 40 / + 90 °C	
08	Ambient temperature, zone 1	D	- 40 / + 90 °C	
09	Ambient temperature, zone 2	D	- 40 / + 90 °C	Read only
10	Heat pump outlet status (0 = off; 1 = authorised)	D	0/1	
11	Operating mode output status (1 = heating; 0 = cooling)	D	0/1	
12	Outlet status, supp. 1	D	0/1	
13	Outlet status, supp. 2	D	0/1	
14	Outlet status, supp. 3	D	0/1	
15	Outlet status, circulator zone 1	D	0/1	
16	Outlet status, circulator zone 2	D	0/1	
17	Control valve zone 1	D	- 100 / + 100 %	
18	Control valve zone 2	D	- 100 / + 100 %	
	Air temperature settings:			
20	Heat pump shut-down threshold	T	- 20 / 0 °C	- 16 °C
21	Regional min. temperature	T	- 20 / 5 °C	- 7 °C
22	Supplementary authorization threshold	T	- 5 / 20 °C	7 °C
23	No heating threshold	T	10 / 25 °C	17 °C
24	Lowering of ECO temperature (ambience)	T	1 / 4 K	2 K
25	Ambient temperature set point at anti-freeze	T	8 / 18 °C	12 °C

(Continuous) ->

ACCESS: "D" = direct without password "T" = technical with password

No.	DESIGNATION	ACCESS	RANGE	VALUE / DEFAULT
	Water temperature settings:			
26	Supplementary heating control hysteresis - Unused	T	2 / P27K	2 K
27	Supplementary heating control lag	T	P26 / 6 K	3,5 K
28	Heat pump control hysteresis	T	1 / 4 K	2,5 K
29	Water temperature setpoint in "anti-freeze" mode	T	20 / 35 °C	25 °C
30	Outgoing heating water max. temperature, zone 1	T	25 / 40 °C	35 °C
31	Outgoing heating water max. temperature, zone 2	T	25 / 40 °C	35 °C
32	Outgoing heating water min. temperature, zone 1	T	20 / 30 °C	20 °C
33	Outgoing heating water min. temperature, zone 2	T	20 / 30 °C	20 °C
34	Outgoing cooling water temperature, zones 1 and 2	T	15 / 25 °C	20 °C
35	Cooling authorization threshold (installation return)	T	25 / 50 °C	30 °C
36	Thermodynamic heating authorization threshold (installation return)	T	10 / 20 °C	15 °C
37	Water outlet temperature max. alarm threshold	T	60 / 90 °C	70 °C
38	Zone valve control proportional strip	T	1 / 10 K	5 K
39	Zone valve control neutral zone	T	1 / 4 K	1 K
	Water flowrate calculation:			
40	Total electric heating power	T	1 / 30 kW	6 kW
41	Launch and calculation result	T		
	Heat pump parameters:			
42	Water temperature set point (return), cooling	T	20 / 30 °C	23 °C
43	Maximum water temperature set point (return), heating	T	40 / 50 °C	45 °C
	Sensor offset:			
50	Outside sensor	T	+ or - 3 K	0
51	Zone 1 air temperature sensor	T	+ or - 3 K	0
52	Zone 2 air temperature sensor	T	+ or - 3 K	0
53	Installation return water temperature sensor	T	+ or - 3 K	0
54	Installation outlet water temperature sensor	T	+ or - 3 K	0
	Miscellaneous:			
60	Default configuration	T		
61	TYPHONE language selection (1 = F ; 2 = GB)	T	1/2	1
62	TYPHONE access code	T	0/9999	1234
63	Zone valve action time	T	60 / 300 sec.	150 sec.
64	Heat pump min. operating time - Unused	T	0 / 200 sec.	100 sec.
65	Forcing, zone 1 (off)	T	0/1	0
66	Forcing, zone 2 (off)	T	0/1	0
67	Heat pump control forcing (active when off)	T	0/1	0
68	(unused)			
69	Ambient temperature sensor, zone 1 (1 = control unit)	T	0/1	1
	Configuration:			
70	Installation type	T	1/5	
	1 = 1 zone, floor			
	2 = 2 zones, floor ----------→ (2)			
	3 = unused			
	4 = mixed			
	5 = terminal units			
	6 = 1 zone radiators			
71	Reversibility (1 = reversible - 0 = heating only)	T	0/1	1
75	To load shedding (1 = closed = load shedding)	T	0/1	1
76	CC1 module activation (1 = Activated)	T	0/1	1
	Software versions:			
80	Control unit	T		Read only
81	Heating board	T		
82	Board zone 1	T		
83	Board zone 2	T		
85	CC1 Module	T		
	Ambience setpoints:	D		
	Cooling setpoint zone 1 - If reversible	Direct access Keypad	20 / 30 °C	25 °C
	Cooling setpoint zone 2 - If reversible		20 / 30 °C	25 °C
	Heating setpoint zone 1		15 / 25 °C	20 °C
	Heating setpoint zone 2		15 / 25 °C	20 °C

6.9.3 Parameters: 1 Terminal Units

ACCESS: "D" = direct without password "T" = technical with password

No.	DESIGNATION	ACCESS	RANGE	VALUE / DEFAULT
	Status:			
01	Outside temperature	D	- 40 / + 90 °C	
02	Installation return water temperature	D	- 40 / + 90 °C	
03	Installation outgoing water temperature	D	- 40 / + 90 °C	
04	Water temperature resulting setpoint	D		
05	(unused)			
06	(unused)			
07	(unused)			Read only
08	Ambient temperature, zone 1	D	- 40 / + 90 °C	
09	(unused)			
10	Heat pump outlet status (0 = off; 1 = authorised)	D	0/1	
11	Operating mode output status (1 = heating; 0 = cooling)	D	0/1	
12	Outlet status, supp. 1	D	0/1	
13	Outlet status, supp. 2	D	0/1	
14	Outlet status, supp. 3	D	0/1	
	Air temperature settings:			
20	Heat pump shut-down threshold	T	- 20 / 0 °C	- 16 °C
21	Regional min. temperature	T	- 20 / 5 °C	- 7 °C
22	Supplementary authorization threshold	T	- 5 / 20 °C	7 °C
23	No heating threshold	T	15 / 30 °C	17 °C

(Continuous) ->

ACCESS: "D" = direct without password "T" = technical with password

No.	DESIGNATION	ACCESS	RANGE	VALUE / DEFAULT
	Water temperature settings:			
26	Supplementary heating control hysteresis	T	2 / P27 K	2 K
27	Supplementary heating control lag	T	P26 / 6 K	3,5 K
28	Heat pump control hysteresis - Unused	T	1 / 4 K	2,5 K
30	Heating water max. temperature (installation return)	T	35 / 45 °C	40 °C
31	(unused)			
32	Heating water min. temperature (installation return)	T	25 / 35 °C	30 °C
33	(unused)			
34	(unused)			
35	Cooling authorization threshold (installation return)	T	25 / 50 °C	30 °C
36	Thermodynamic heating authorization threshold (installation return)	T	10 / 20 °C	15 °C
37	Water outlet temperature max. alarm threshold	T	60 / 90 °C	70 °C
	Water flowrate calculation:			
40	Total electric heating power	T	1 / 30 kW	6 kW
41	Launch and calculation result	T		
	Heat pump parameters:			
42	Water temperature set point (return), cooling	T	10 / 30 °C	12 °C
43	Maximum water temperature set point (return), heating	T	40 / 50 °C	45 °C
	Sensor offset:			
50	Outside sensor	T	+ or - 3 K	0
51	Zone 1 air temperature sensor	T	+ or - 3 K	0
52	(unused)			
53	Installation return water temperature sensor	T	+ or - 3 K	0
54	Installation outlet water temperature sensor	T	+ or - 3 K	0
	Miscellaneous:			
60	Default configuration	T		
61	TYPHONE language selection (1 = F; 2 = GB)	T	1/2	1
62	TYPHONE access code	T	0/9999	1234
64	Heat pump min. operating time - Unused	T	0 / 200 sec.	100 sec.
67	Heat pump forcing (active when off)	T	0/1	0
68	(unused)			
	Configuration:			
70	Installation type	T	1/5	
	1 = 1 zone, floor			
	2 = 2 zones, floor			
	3 = unused			
	4 = mixed			
	5 = terminal units ----------→			(5)
	6 = 1 zone radiators			
71	Reversibility (1 = reversible - 0 = heating only)	T	0/1	1
75	To load shedding (1 = closed = load shedding)	T	0/1	1
76	CC1 module activation (1 = Activated)	T	0/1	1
	Software versions:			
80	Control unit	T		Read only
81	Heating board	T		
85	CC1 Module	T		

6.9.4 Parameters: 1 Zone Radiators Low Temperature

ACCESS: "D" = direct without password "T" = technical with password

No.	DESIGNATION	ACCESS	RANGE	VALUE / DEFAULT
	Status:			Read only
00	DHW tank temperature (if activated)	D	- 40 / + 90 °C	
01	Outside temperature	D	- 40 / + 90 °C	
02	Installation return water temperature	D	- 40 / + 90 °C	
03	Installation outgoing water temperature	D	- 40 / + 90 °C	
04	Water temperature resulting setpoint	D		
05	(unused)			
06	(unused)			
07	(unused)			
08	Ambient temperature, zone 1	D	- 40 / + 90 °C	
09	(unused)			
10	Heat pump outlet status (0 = off; 1 = authorised)	D	0/1	
11	Operating mode output status (1 = heating; 0 = cooling)	D	0/1	
12	Outlet status, supp. 1	D	0/1	
13	Outlet status, supp. 2	D	0/1	
14	Outlet status, supp. 3	D	0/1	
19	DHW valve control	D	- 100 / +100 %	
	Air temperature settings:			
20	Heat pump shut-down threshold	T	- 20 / 0 °C	- 16 °C
21	Regional min. temperature	T	- 20 / 5 °C	- 7 °C
22	Supplementary authorization threshold	T	- 5 / 20 °C	5 °C
23	No heating threshold	T	10 / 25 °C	17 °C
24	Lowering of ECO temperature (ambience)	T	1 / 4 K	2 K
25	Ambient temperature set point at anti-freeze	T	8 / 18 °C	12 °C

(Continuous)
->

ACCESS: "D" = direct without password "T" = technical with password

No.	DESIGNATION	ACCESS	RANGE	VALUE / DEFAULT
	Water temperature settings:			
26	Supplementary heating control hysteresis	T	2 / P27 K	2 K
27	Supplementary heating control lag	T	P26 / 6 K	3,5 K
28	Heat pump control hysteresis - Unused	T	1 / 4 K	3 K
29	Water temperature setpoint in "anti-freeze" mode	T	20 / 40 °C	35 °C
30	Heating water max. temperature (Installation return)	T	30 / 40 °C	40 °C
31	(unused)			
32	Heating water min. temperature (nstallation return)	T	25 / 35 °C	30 °C
33	(unused)			
34	(unused)			
35	(unused)			
36	Thermodynamic heating authorization threshold (installation return)	T	10 / 20 °C	15 °C
37	Water outlet temperature max. alarm threshold	T	60 / 90 °C	70 °C
	Water flowrate calculation:			
40	Total electric heating power	T	1 / 30 kW	6 kW
41	Launch and calculation result	T		
	Heat pump parameters:			
42	(unused)			
43	Maximum water temperature set point (return), heating	T	40 / 50 °C	45 °C
	Sensor offset:			
50	Outside sensor	T	+ or - 3 K	0
51	Zone 1 air temperature sensor	T	+ or - 3 K	0
52	(unused)			
53	Installation return water temperature sensor	T	+ or - 3 K	0
54	Installation outlet water temperature sensor	T	+ or - 3 K	0
57	Regulation reference temperature selection (1 = installation return point)	T	Non-adjustable	1
	Miscellaneous:			
60	Default configuration	T		
61	TYPHONE language selection (1 = F; 2 = GB)	T	1/2	1
62	TYPHONE access code	T	0/9999	1234
63	(unused)			
67	Heat pump forcing (active when off)	T	0/1	0
68	(unused)			
	Configuration:			
70	Installation type	T	1/6	
	1 = 1 zone, floor			
	2 = 2 zones, floor			
	3 = unused			
	4 = mixed			
	5 = terminal units			
	6 = 1 zone radiators ----------→			(6)
71	(unused)			
75	To load shedding (1 = closed = load shedding)	T	0/1	1
76	CC1 module activation (1 = Activated)			
	Software versions:			
80	Control unit	T		Read only
81	Heating board	T		
85	CC1 Module	T		
	DHW :			
90	ECS card activation (0 = deactivated)	T	0/1	0
	Ambience setpoints:	D		
	Cold setpoint: inactive	Direct access Keypad		
	Heating setpoint zone 1		15 / 25 °C	20 °C

6.9.5 Parameters: **Mixed 2 Zones UNDERFLOOR + (Terminal Units or Radiators Low Temp.)**

ACCESS: "D" = direct without password "T" = technical with password

No.	DESIGNATION	ACCESS	RANGE	VALUE / DEFAULT
	Status:			
01	Outside temperature	D	- 40 / + 90 °C	Read only
02	Installation return water temperature	D	- 40 / + 90 °C	
03	Installation outgoing water temperature	D	- 40 / + 90 °C	
04	Water temperature resulting setpoint, zone 1	D		
05	Water temperature resulting setpoint, zone 2	D		
06	Water temperature, zone 1	D	- 40 / + 90 °C	
07	(unused)			
08	Ambient temperature, zone 1	D	- 40 / + 90 °C	
09	(unused)			
10	Heat pump outlet status (0 = off; 1 = authorised)	D	0/1	
11	Operating mode output status (1 = heating; 0 = cooling)	D	0/1	
12	Outlet status, supp. 1	D	0/1	
13	Outlet status, supp. 2	D	0/1	
14	Outlet status, supp. 3	D	0/1	
15	Outlet status, circulator zone 1	D	0/1	
16	Outlet status, circulator zone 2	D	0/1	
17	Control valve zone 1	D	- 100 / + 100 %	

(Continuous)
->

->..**(Continuation): 6-9-5. Parameters: Mixed 2 Zones UNDERFLOOR + (Terminal Units or Radiators Low Temp.)**

For the application with radiators Low Temperature, always use with parameter 71 = 0 (heating only)

ACCESS: "D" = direct without password "T" = technical with password

No.	DESIGNATION	ACCESS	RANGE	VALUE / DEFAULT
	Air temperature settings:			
20	Heat pump shut-down threshold	T	- 20 / 0 °C	- 16 °C
21	Regional min. temperature	T	- 20 / 5 °C	- 7 °C
22	Supplementary authorization threshold	T	- 5 / 20 °C	7°C
23	No heating threshold	T	10 / 25 °C	17 °C
24	Lowering of ECO temperature (ambience)	T	1 / 4 K	2 K
25	Ambient temperature set point at anti-freeze	T	8 / 18 °C	12 °C
	Water temperature settings:			
26	Supplementary heating control hysteresis	T	2 / P27 K	2 K
27	Supplementary heating control lag	T	P26 / 6 K	3,5 K
28	Heat pump control hysteresis - Inutilisée	T	1 / 4 K	2,5 K
29	Water temperature setpoint in "anti-freeze" mode	T	20 / 35 °C	25 °C
30	Outgoing heating water max. temperature, zone 1	T	25 / 40 °C	35 °C
31	Heating water max. temperature, zone 2	T	35 / 45 °C	40 °C
32	Outgoing heating water min. temperature, zone 1	T	20 / 30 °C	20 °C
33	Heating water min. temperature, zone 2	T	20 / 35 °C	30 °C
34	Outgoing cooling water temperature, zone 1	T	15 / 25 °C	20 °C
35	Cooling authorization threshold (installation return)	T	25 / 50 °C	30 °C
36	Thermodynamic heating authorization threshold (installation return)	T	10 / 20 °C	15 °C
37	Water outlet temperature max. alarm threshold	T	60 / 90 °C	70 °C
38	Zone 1 valve control proportional strip	T	1 / 10 K	5 K
39	Zone 1 valve control neutral zone	T	1 / 4 K	1 K
	Water flowrate calculation:			
40	Total electric heating power	T	1 / 30 kW	6 kW
41	Launch and calculation result	T		
	Heat pump parameters:			
42	Water temperature set point (return), cooling	T	10 / 30 °C	12 °C
43	Maximum water temperature set point (return), heating	T	40 / 50 °C	45 °C
	Sensor offset:			
50	Outside sensor	T	+ or - 3 K	0
51	Zone 1 air temperature sensor	T	+ or - 3 K	0
52	(unused)			
53	Installation return water temperature sensor	T	+ or - 3 K	0
54	Installation outlet water temperature sensor	T	+ or - 3 K	0
	Miscellaneous:			
60	Default configuration	T		
61	TYPHONE language selection (1 = F ; 2 = GB)	T	1/2	1
62	TYPHONE access code	T	0/9999	1234
63	Zone 1 valve action time	T	60 / 300 sec.	150 sec.
64	Heat pump min. operating time	T	0 / 200 sec.	100 sec.
65	Forcing, zone 1 (off)	T	0/1	0
66	Forcing, zone 2 (off)	T	0/1	0
67	Heat pump forcing (active when off)	T	0/1	0
68	(unused)			
69	Ambient temperature sensor, zone 1 (1 = control unit)	T	0/1	1
	Configuration:			
70	Installation type	T	1/5	
	1 = 1 zone, floor			
	2 = 2 zones, floor			
	3 = unused			
	4 = mixed ----------→ (4)			
	5 = terminal units			
	6 = 1 zone radiators			
71	Reversibility (1 = reversible - 0 = heating only)	T	0/1	1
75	To load shedding (1 = closed = load shedding)	T	0/1	1
76	CC1 module activation (1 = Activated)	T	0/1	1
	Software versions:			
80	Control unit	T		
81	Heating board	T		Read only
82	Board zone 1	T		
83	Board zone 2	T		
85	CC1 Module	T		
	Ambience setpoints:	D		
	Cooling setpoint zone 1 - If reversible	Direct access Keypad	20 / 30 °C	25 °C
	Heating setpoint zone 1		15 / 25 °C	20 °C

Note: With radiators low temperature in zone 2, the cooling mode is not allowed. It must be restricted by setting parameter 71 to "0".

6.9.6 Parameters: 1 Zone Radiators Low Temperature + Domestic Hot Water

See general parameters 1 Zone Radiators Low Temperature in 6-9-4.

Specific parameters for Domestic Hot Water:
If the ECS card is activated by parameter 90, you are advised to switch off power to the whole system and then switch back on again to ensure regulation is reinitialised.

No	DESIGNATION	ACCESS	RANGE	VALUE / DEFAULT
	Software version:			
84	ECS card	T		Read only
	ECS :			
90	Card present	T	0/1	0
91	Tank temperature threshold for ECS cycle interruption	T	40 / 60 °C	45 °C
92	Exchanger/tank water inlet temperature difference threshold	T	4 / 8 K	4 K
93	Maximum ECS cycle time	T	0.5 / 2 H	1 H
94	Programming (0 = without ; 1 = 1 cycle / d ; 2 = 2 cycles / d)	T	0/1/2	0
95	Time slot 1° cycle	T	0/23 H	1 H
96	Time slot 2° cycle	T	P95+P93+5/23H	12 H
97	ECS valve forcing OFF	T	0/1	0
98	ECS tank temperature	D	- 40 / 90 °C	Read only
99	ECS exchanger water inlet temperature	D	- 40 / 90 °C	

6.9.7 Reload factory setting: Initialisation according to the type of installation

This enables all parameters to be reset and reload according to the type of installation and the factory setting (see list).

- Procedure:

-> Set the rotary knob on the control unit to the "**Stop**" position.
-> Go to parameter **60**. Press the "**Z/OK**" button; the "**init**" message is displayed.
-> Press and hold the "**Z/OK**" button for 5 seconds to launch the default configuration. The "**init**" message flashes.
-> Returns to parameter **60** when initialisation is completed

Note:
If this parameter is set in other than the "**Stop**" position, the word "**STOP**" flashes and the configuration cannot be
launched.

7 INVERTER GESTION: OPTIONAL CONTROLLER FUNCTIONS

Warning

This section explains how to access and modifying the setting parameters of the Inverter Gestion. It is only reserved to technicians who are fluent in those manipulations.
The technician must be sure of his capability: A wrong manipulation may damage definitively the material.

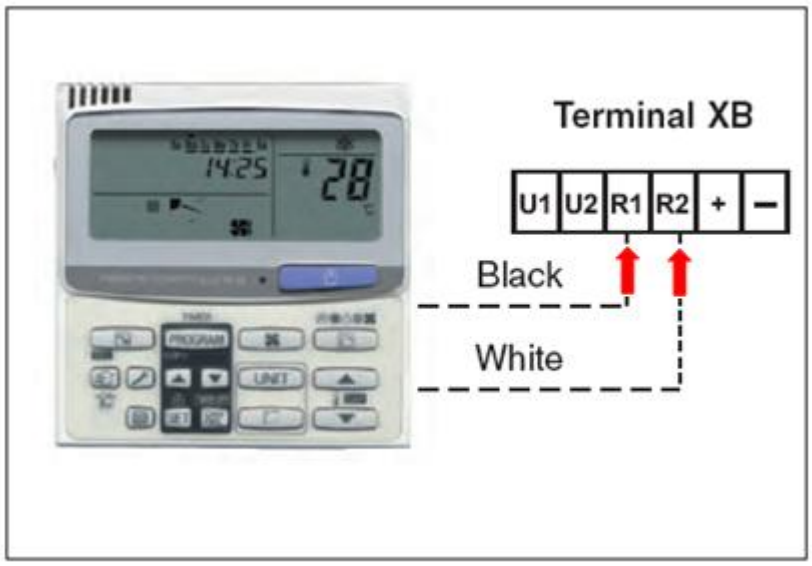
7.1 Access to the settings parameters of the EEPROM (A2)

This procedure allows the optional remote control to consult and change the settings parameters of the A2 board EEPROM.

- Procedure:

(0) -> Set the system control box to "**OFF**".

-> Connect the Optional Remote Controller K70D052Z



(1) Press and hold the , SET and CANCEL buttons simultaneously for 4 seconds or longer.

(2) " SETTING ," unit No. " 1- 1 ", item code " 10 ," and settings data " 00 XX " are displayed blinking on the remote controller LCD display (Fig. here enclosed).

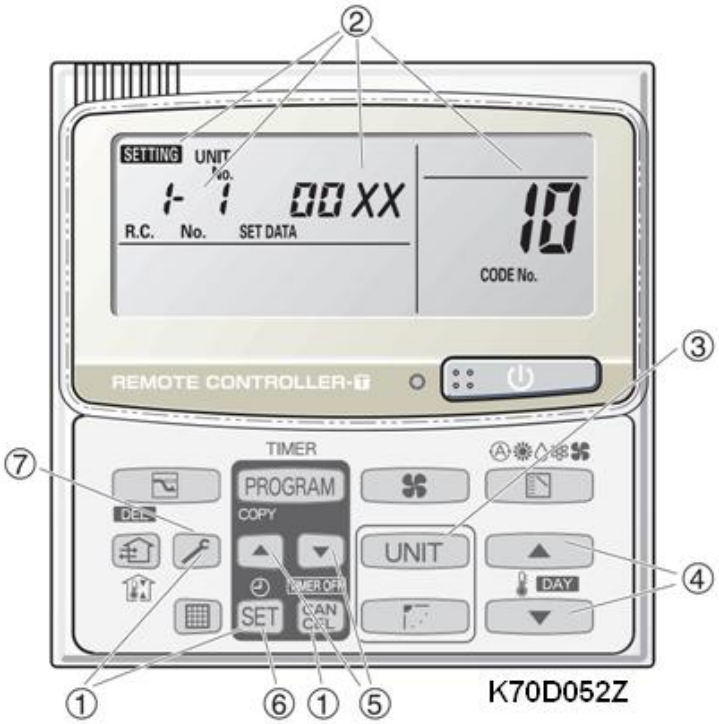
(3) If it is not, press the UNIT button and select the address 1- 1 (unit No.).

(4) Press the temperature setting ▲/▼ buttons to select the item code to consult or change.

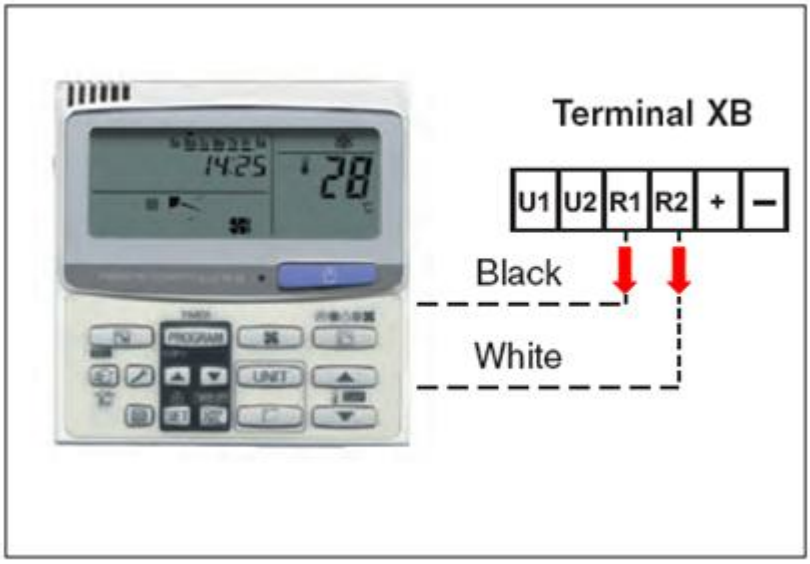
(5) Press the timer time ▲/▼ buttons to select the desired setting data.
For item codes and setting data, refer to the following page (Section 7-2. List of Settings parameter).

(6) Press the SET button. (The display stops blinking and remains lit, and setting is completed.)

(7) Press the button to return to normal remote controller display.



->Disconnect the Optional Remote Controller



7.2 List of Settings parameters EEPROM (A2)

		Model name	
Item code	Description	PHRIA10	PHRIA14
10	Type	30 (Hydro module)	30 (Hydro module)
11	Capacity	15 (36,000 BTU/h)	17 (48,000 BTU/h)
20	Minimum temperature setting for cooling	10 degrees Celsius	10 degrees Celsius
21	Maximum temperature setting for heating	55 degrees Celsius	55 degrees Celsius
28	Automatic restart after a power failure	01 (Effectively)	01 (Effectively)
2C	Motor operated valve presence	2 (nothing)	2 (nothing)
2D	Operating mode select	10 (heating & cooling only)	10 (heating & cooling only)

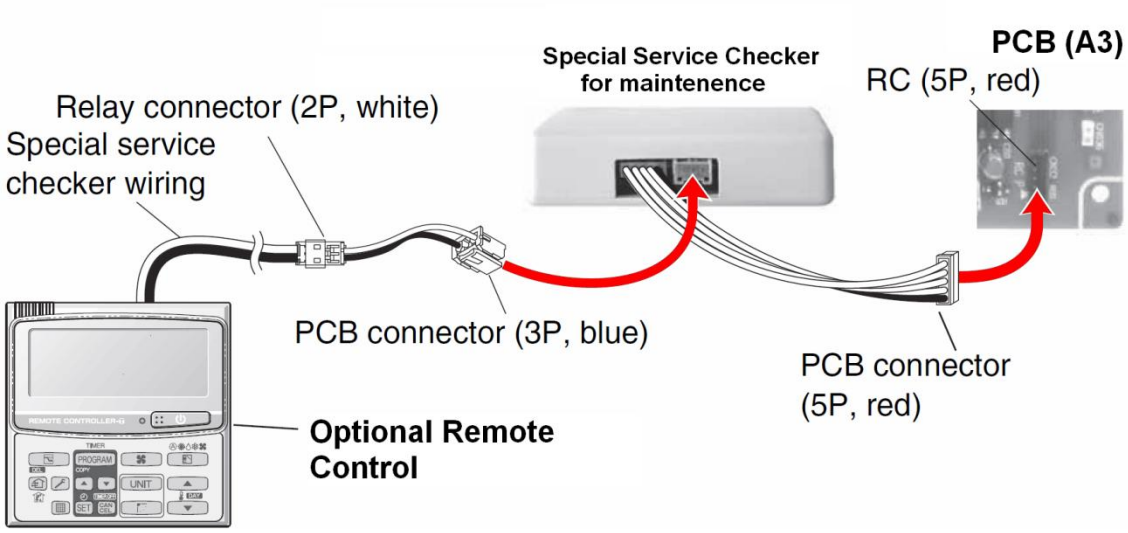
NOTES:

***1.The renewal of data carry out only the data of the capacity code.**

***2.Please never push the setting button except for Item code "11".**

7.3 Access to the settings parameters of the EEPROM (A3)

To have access to the settings parameters of the PCB (A3) EEPROM, you must connect the special Service Checker wiring to the PCB (A3).
The connection is show in the figure below.



7.3.1 Procedure to access to the setting parameters: Replacement of the EEPROM (A3)

- Procedure:

(0) -> Set the system control box to "**OFF**".

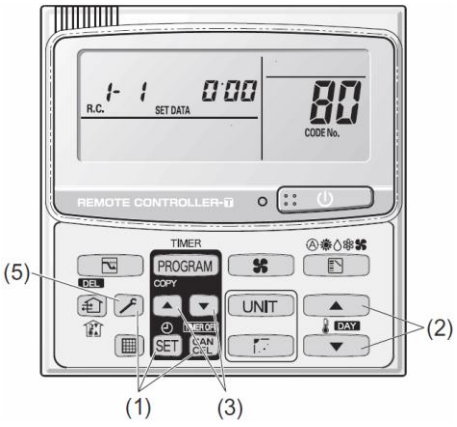
-> Connect the Optional Remote Controller + Special Service Checker at PCB (A3) as show above (see Section 7-3.).

(1) Press and hold the , SET and CANCEL buttons simultaneously for 4 seconds or longer.

(2) Press the temperature setting ▲/▼ buttons to select the item code to change. The item codes and setting data for replacement of the EEPROM (A3) are show in the table below (Section 7-4-1.)

(3) Press the timer time ▲/▼ buttons to change the setting data.

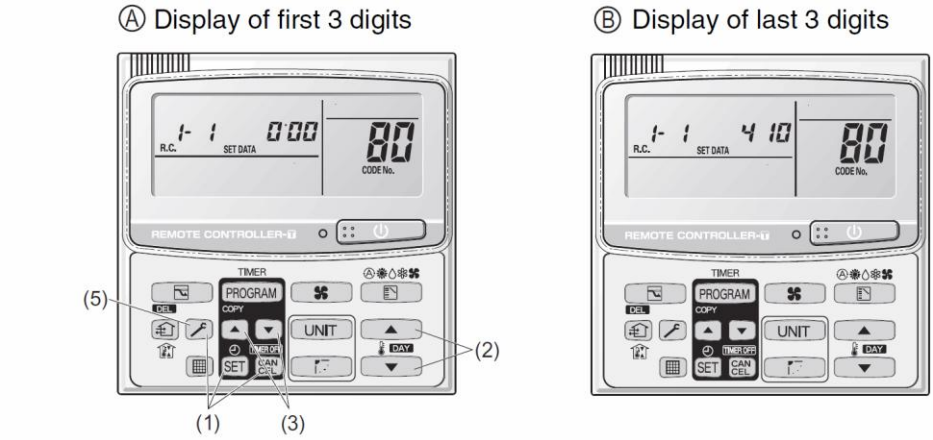
To confirm the changed setting data, press the SET button. "SET DATA" stop blinking and remain lit.



(4) During this mode, “SET DATA” is display, blinking.

The display show the address of A2 and A3 boards as : No. “ 1- 1”; if it is not stop the procedure and start and auto addressing procedure (see Section 2-3.)
The setting data corresponding at an item code is display in 6 digits. The display changes between the first 3 digits (see fig. A) and the last 3 digits (see fig. B). It is possible to know if it is the first or the second digits du to the top point (see fig. A), the top point of the colon is lit only for the first 3 digits.

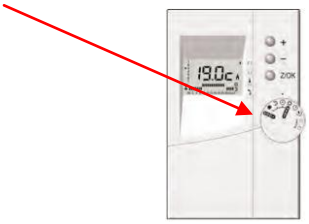
(5) To end the setting mode, press the button  .



80: <Refrigerant type> Ⓐ and Ⓑ are displayed alternately. (Example shows 000 410 (R410A).)

(6) -> Disconnect the Optional Remote Controller + Special Service Checker from PCB (A3).

-> Set the system control box to mode needed.



7.3.2 Procedure to access to the setting parameters: Advanced functions

- Procedure:

(0) -> Set the system control box to "**OFF**".

-> Connect the Optional Remote Controller + Special Service Checker at PCB (A3) as show above (see Section 7-3.).

(1) Press and hold the , buttons simultaneously for 4 seconds or longer.

(2) Press the temperature setting / buttons to select the item code to change. The item codes and setting data for replacement of the EEPROM (A3) are show in the table below (Section 7-4-2.)

(3) Press the timer time / buttons to change the setting data.

To confirm the changed setting data, press the SET button. "SET DATA" stop blinking and remain lit.

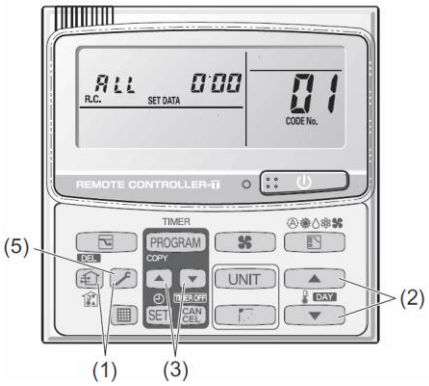
(4) During this mode, "SET DATA" is display, blinking.

The display show the address of A2 and A3 boards as : No. " "; if it is not stop the procedure and start and auto addressing procedure (see Section 2-3.)

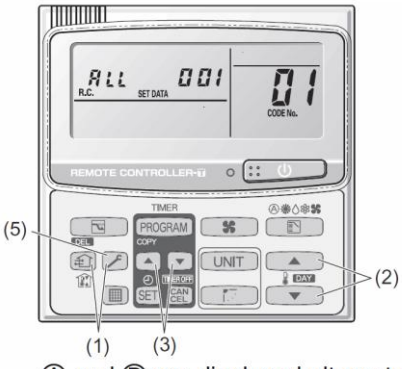
The setting data corresponding at an item code is display in 6 digits. The display changes between the first 3 digits (see fig. A) and the last 3 digits (see fig. B). It is possible to know if it is the first or the second digits du to the top point (see fig. A), the top point of the colon is lit only for the first 3 digits.

(5) To end the setting mode, press the button .

Ⓐ Display of first 3 digits



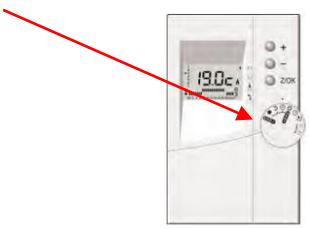
Ⓑ Display of last 3 digits



Ⓐ and Ⓑ are displayed alternately.
(Example shows display of 000 001.)

(6) -> Disconnect the Optional Remote Controller + Special Service Checker from PCB (A3).

-> Set the system control box to needed mode.



7.4 List of Setting parameters EEPROM (A3)

7.4.1 Setting parameters: Replacement of the EEPROM (A3)

The setting parameters below have to be set during servicing operation when EEPROM (A3) is replaced by the new one included in the service pack.

CODE	Item	Setting Data	
		No	Meaning
81	Capacity	**112**	36,000 BTU/h (**PHRIA10**)
		140	48,000 BTU/h (**PHRIA14**)
84	3-phase / Single-phase	000	3-phase*
		001	**Single-phase**
OE	Heat pump / Cooling only	**000**	**Heat pump**
		001	Cooling only*

* Not used for PHRIA_R5I

7.4.2 Setting parameters: Advanced functions

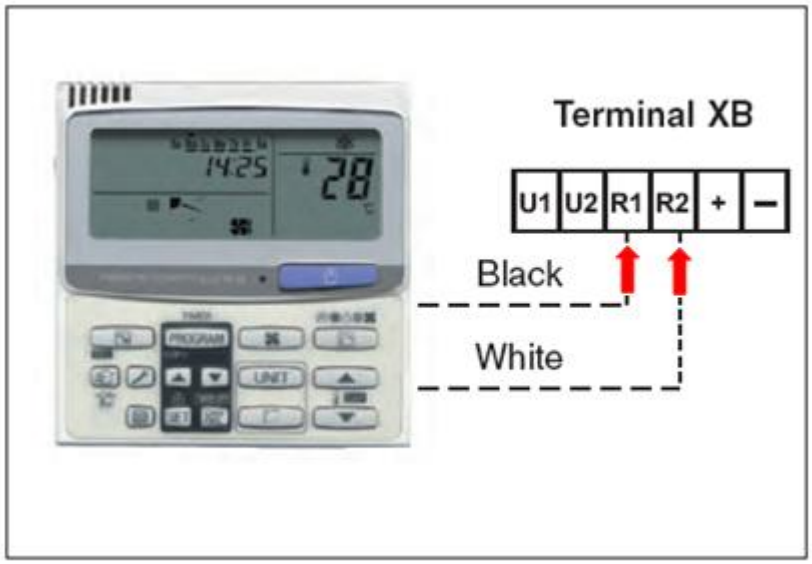
CODE	Item	Setting Data	
		No	Meaning
04	Snowfall sensor operation	0	No sensor, control performed
		1	No sensor, control not performed
		2	Sensor present, control performed
		3	Sensor present, control not performed
07	Capacity ratio	0	Disabled (limited)
		1	Ignores capacity ratio
52	Current control level		from 70% to 100%
		1	No Control: from 40% to 160% setting capable
57	Silent mode	0	Normal (at shipment)
		1	Auto silent
		2	Capacity priority
58	Silent mode starting time (hour)	22	22 o'clock (at shipment)
59	Silent mode starting time (minute)	00	00 minute (at shipment)
5A	Silent mode finishing time (hour)	08	8 o'clock (at shipment)
5B	Silent mode finishing time (minute)	00	00 minute (at shipment)

7.5 Monitoring Operations: Display of Sensors

This procedure allows the optional remote control to consult the sensors of the inverter gestion : Temperature, current value, frequency. Contrary to the other procedures, this one can be done with the system in functioning to be able to display the values of the sensors.

- Procedure:

(0) -> Connect the optional Controller K70D052Z



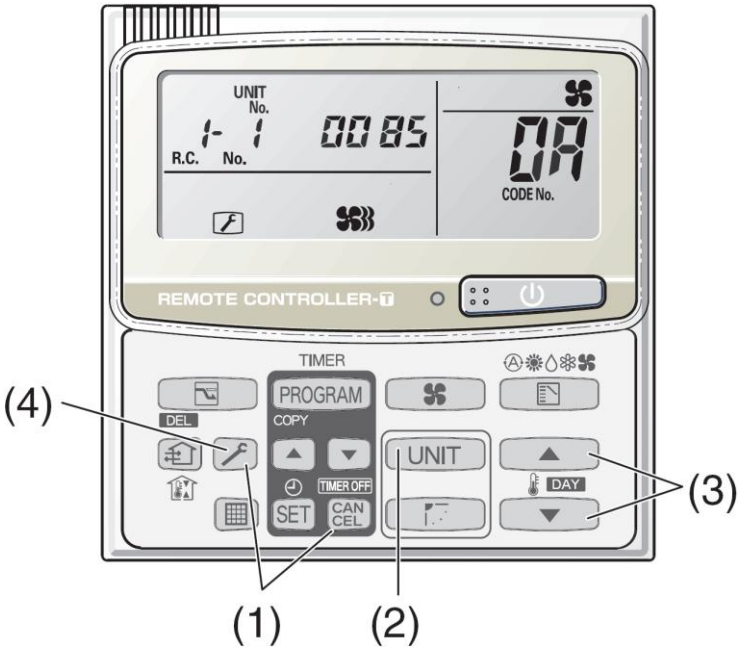
(1) Press and hold the button and CANCEL button simultaneously for 4 seconds or longer to switch to temperature monitor mode.
During temperature monitoring, “Service Monitor” is lit.

(2) Unit No. “ 1- 1” is display, if it is not, press the UNIT button and select the address 1- 1 (unit No.) of the Hydro Kit.

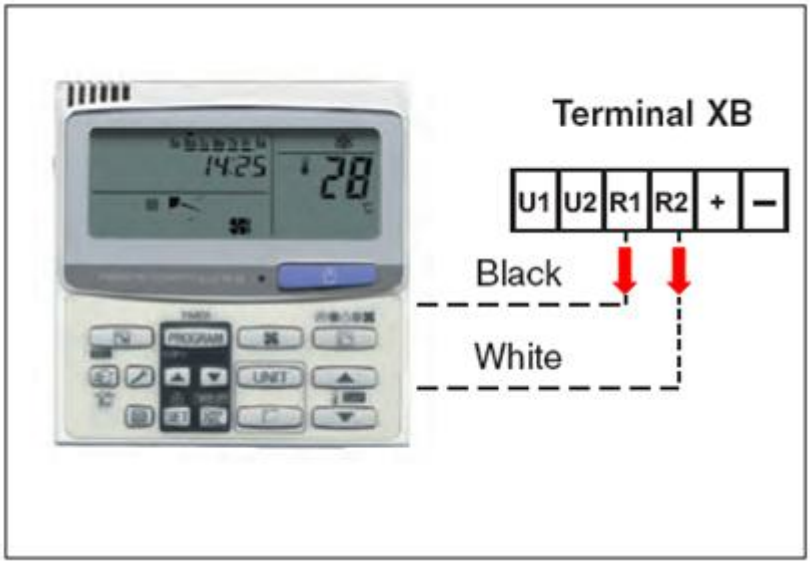
(3) Use the temperature setting ▲/▼ buttons to select the item code of the temperature to monitor.
The selected item code and the sensor data are displayed.

(4) To end monitoring, press the  button. The display returns to the normal display.

* The display does not blink.



->Disconnect the optional Remote Control



7.6 List of display sensors

Meaning of Code	Item code	Remarks
Water temperature for control	00	not used
Optional Remote control temperature	01	not used
Water temperature for control (TA)	02	
Liquid line temperature (E1)	03	
Heat exchanger temperature (E2)	04	
Heat exchanger temperature (E3)	05	not used
discharge air temperature	06	not used
-	07	not used
-	08	not used
-	09	not used
Discharge temperature (TD)	0A	
-	0B	not used
-	0C	not used
Suction temperature (TS)	0D	
Heat exchanger temperature (C1)	0E	
Heat exchanger temperature (C2)	0F	
-	10	not used
Outdoor temperature	11	
-	12	not used
-	13	not used
Compressor current	14	
Valve position	15	
-	16	not used
-	17	not used
-	18	not used
Compressor operating frequency	19	
	> = 1A	not used

* Depending on the model, some items may not be displayed.

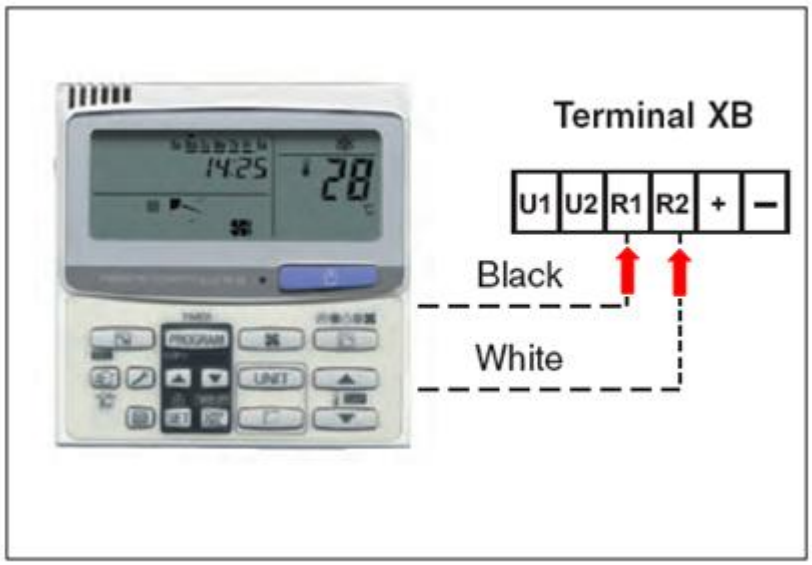
7.7 Monitoring Alarm History: Display of Alarm History

7.7.1 Optional remote controller alone: the last 4th alarm history

Using this procedure allows displays the last four alarm history.

- Procedure:

(0) -> Connect the optional Controller K70D052Z



(1) Press and hold the button and SET button simultaneously for 4 seconds or longer to change to outdoor unit alarm history mode.

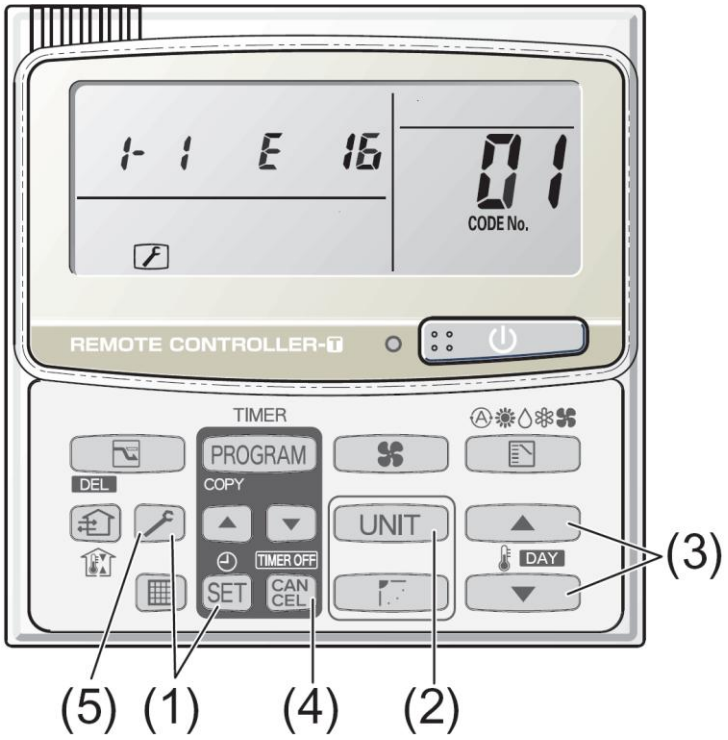
(2) Unit No. " 1- 1" is display, if it is not, press the UNIT button and select the address 1- 1 (unit No.)

(3) Use the temperature setting ▲/▼ buttons to select the item code for the alarm history.
The display shows the address of the Outdoor Unit, the item code, and the alarm history (alarm data).

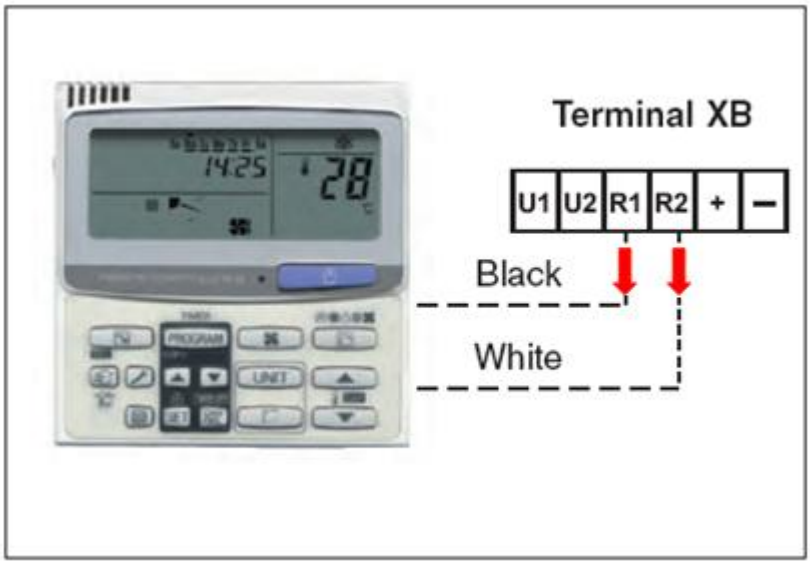
The item code is displayed as "CODE No." 01 to 04, 01 indicates the most recent alarm and 04 the latest.
The alarm history is indicated by the alarm code. (If there have been no alarm codes, " ---- " is displayed.)
Consult section 5. for the meaning of alarm code.

(4) To clear the alarm history, press the CANCEL button: The alarm history of A2 board's EEPROM will be cleared.

(5) To end, press the button.



->Disconnect the optional Remote Control



7.7.2 Optional remote controller and Service Checker: the last 8th alarm history

Using this procedure allows displays the last four alarm history.

- Procedure:

(0) -> Set the system control box to "**OFF**".

-> Connect the Optional Remote Controller + Special Service Checker at PCB (A3) as show above (see Section 7-3.).

(1) Press and hold the button and SET button simultaneously for 4 seconds or longer to change to outdoor unit alarm history mode.

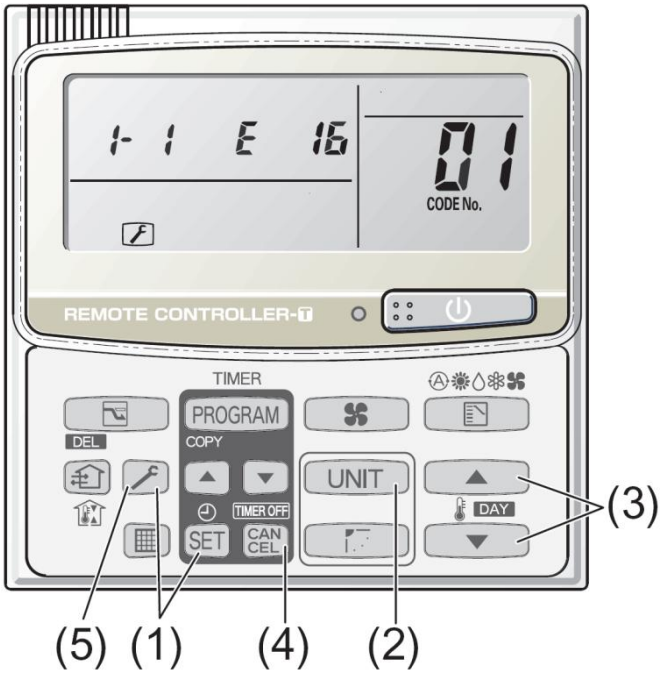
(2) Unit No. " 1- 1 " is display, if it is not, press the UNIT button and select the address 1- 1 (unit No.)

(3) Use the temperature setting ▲/▼ buttons to select the item code for the alarm history.
The display shows the address of the Outdoor Unit, the item code, and the alarm history (alarm data).

The item code is displayed as "CODE No." 01 to 08, 01 indicates the most recent alarm and 08 the latest.
The alarm history is indicated by the alarm code. (If there have been no alarm codes, " ---- " is displayed.)
Consult section 5. for the meaning of alarm code.

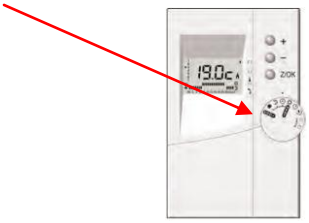
(4) To clear the alarm history, press the CANCEL button: The alarm history of A3 board's EEPROM will be cleared.

(5) To end, press the button.



(6) -> Disconnect the Optional Remote Controller + Special Service Checker from PCB (A3).

-> Set the system control box to needed mode.



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Reference: TD&SM_TEC_1012191-01
Version: 01
Date: 02/2011