Technibel
UNE AVANCE DANS L'AIR DU TEMPS

MANUEL TECHNIQUE **F**

TECHNICAL MANUAL **GB**

MANUALE TECNICO **I**

MANUAL TÉCNICO **E**

TECHNISCHES HANDBUCH **D**

MANUAL TÉCNICO **P**


**ENSEMBLE DE CONTRÔLE ET RÉGULATION POUR SYSTÈMES DE CHAUFFAGE / CLIMATISATION AVEC POMPE À CHALEUR INVERTER ET APPOINT ÉLECTRIQUE.**

**APPLICATIONS :**
- 1 Zone Plancher
- 2 Zones Plancher
- 1 Zone Unités Terminales
- 1 Zone Radiateurs Basse Température (avec ou sans Eau Chaude Sanitaire)
- 2 Zones Mixte (Plancher + Unités Terminales)
- 2 Zones Mixte (Plancher + Radiateurs Basse Température)

**CONTROL UNIT FOR HEATING / COOLING SYSTEMS WITH INVERTER HEAT PUMP AND ELECTRIC SUPPORT HEATER.**

**APPLICATIONS:**
- 1 Floor Zone
- 2 Floor Zones
- 1 Terminal Units Zone
- 1 Low Temperature Radiators Zone (with or without Domestic Hot Water)
- 2 Mixed Zones (Floor + Terminal Units)
- 2 Mixed Zones (Floor + Low Temperature Radiators)

**INSIEME DI CONTROLLO E REGOLAZIONE PER SISTEMA DI RISCALDAMENTO / CLIMATIZZAZIONE CON POMPA DI CALORE INVERTER ED INTEGRAZIONE ELETTRICA .**

**APPLICAZIONI :**
- 1 Zona impianto a Pavimento
- 2 Zone impianto a Pavimento
- 1 Zona Unità Terminali
- 1 Zona Radiatori Bassa Temperatura (con o senza Acqua Calda Sanitaria)
- 2 Zone Mista (impianto a Pavimento + Unità Terminali)
- 2 Zone Mista (Impianto a Pavimento + Radiatori Bassa Temperatura)

**CONJUNTO DE CONTROL Y REGULACIÓN PARA SISTEMAS DE CALEFACCIÓN / CLIMATIZACIÓN CON BOMBA DE CALOR INVERTER Y APOYO ELÉCTRICO.**

**APLICACIONES :**
- 1 Zona Suelo
- 2 Zonas Suelo
- 1 Zona Unidades Terminales
- 1 Zona Radiadores Baja Temperatura (con o sin Agua Caliente Sanitaria)
- 2 Zonas Mixto (Suelo + Unidades Terminales)
- 2 Zonas Mixto (Suelo + Radiadores Baja Temperatura)

**KONTROLL- UND REGULIERGERÄT FÜR HEIZUNGS-/KLIMAANLAGEN MIT INVERTER WÄRMEPUMPE UND ELEKTRISCHER ZUSATZHEIZUNG.**

**ANWENDUNGSBEREICHE:**
- 1 Zone Fußboden
- 2 Zonen Fußboden
- 1 Zone Innengeräte
- 1 Zone Niedrigtemperatur-Heizkörper (mit oder ohne Brauchwarmwasser)
- 2 Zonen gemischt (Fußboden + Innengeräte)
- 2 Zonen gemischt (Fußboden + Niedertemperatur-Heizkörper)

**CONJUNTO DE CONTROLO E REGULAÇÃO PARA SISTEMAS DE AQUECIMENTO / CLIMATIZAÇÃO COM BOMBA DE CALOR INVERTER E COMPLEMENTO ELÉCTRICO.**

**APLICAÇÕES :**
- 1 Zona Soalho
- 2 Zonas Soalho
- 1 Zona de Unidades Terminais
- 1 Zona Radiadores Baixa Temperatura (com ou sem Água Quente Sanitária)
- 2 Zonas Mistas (Soalho + Unidades Terminais)
- 2 Zonas Mistas (Soalho + Radiadores Baixa Temperatura)

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**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.

## CONTENTS



## 1 - PRECAUTIONS

**IMPORTANT**

**Before doing any work on the installation, make sure it is switched off and all power supplies locked out.**
**All maintenance / servicing must be performed by qualified personnel, in accordance with current standards and recognized trade practices.**

- Consult the installation manuals of the system's various components:
  - **PHRIE** Inverter Heat Pump.
  - 2 zones module (for 2 floor or mixed zone applications) **M2Z**.
  - Domestic Hot Water kit **KPECS**.
  - System control kit **K60D070Z**.
- Also consult the user's manual.
- **This unit has been designed for the applications described in this document and must not be used for any other purpose.**

## 2 - CONTROL OPERATING PRINCIPLE

- 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 orders given by the control unit are transmitted (via a system BUS communication line) to the various elements of the installation via:
  - by the **A1** system control board (located in the indoor unit ) which controls:
    . the heat pump via the **CWC2** communication and control board,
    . the supplementary electric heater built into the heat pump.
  - zone boards, if any, which control the 2-zone modules.
- The control unit's rotating knob is used to select the desired operating mode:
  - **Heating**:
    The heat pump and any supplementary electric heater 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 heat pump is controlled according to a fixed set point (based on the ambient temperature for floor applications).

## Control flow diagram

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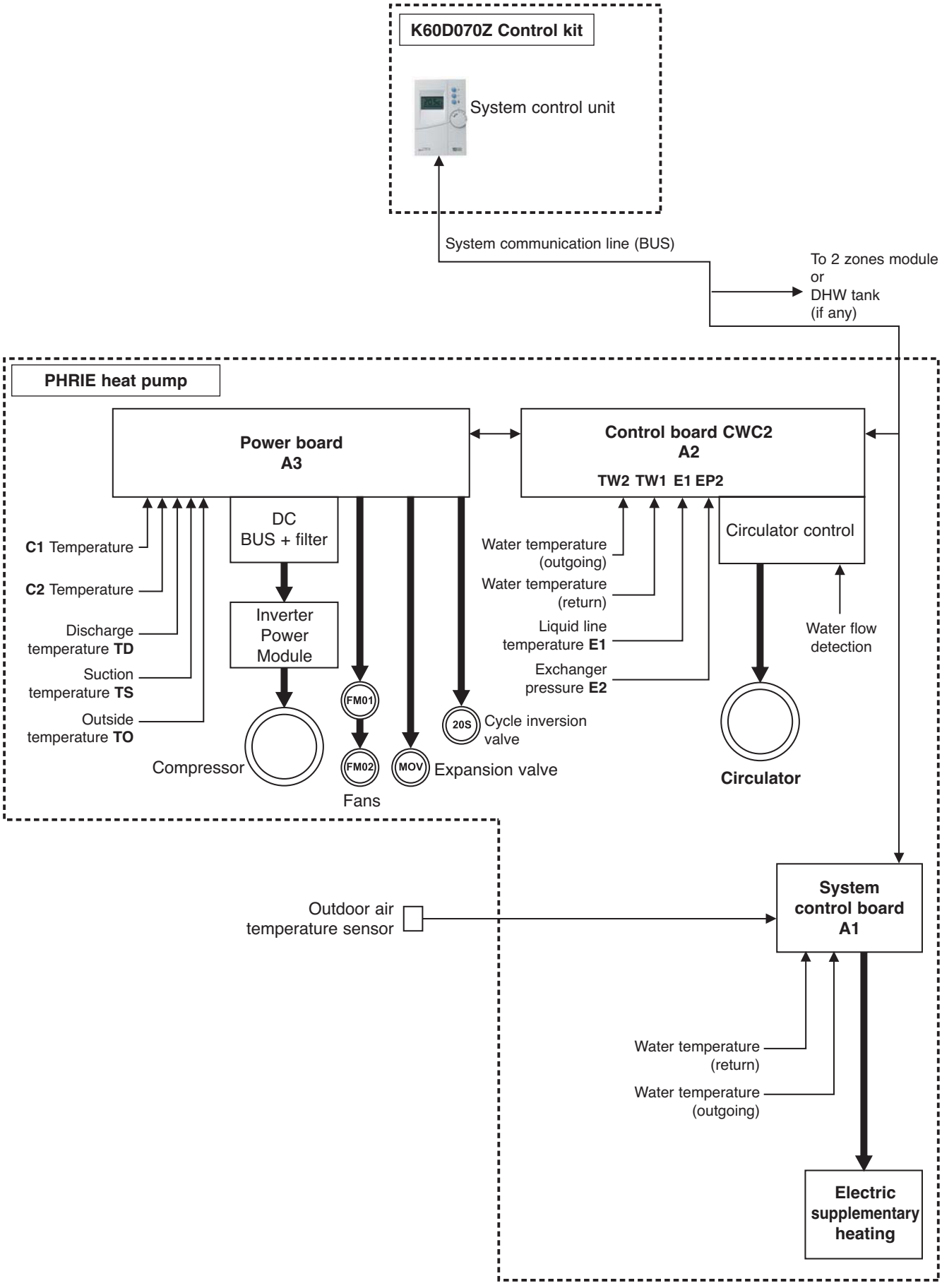

# 3 - PRESENTATION OF CONTROL ELEMENTS

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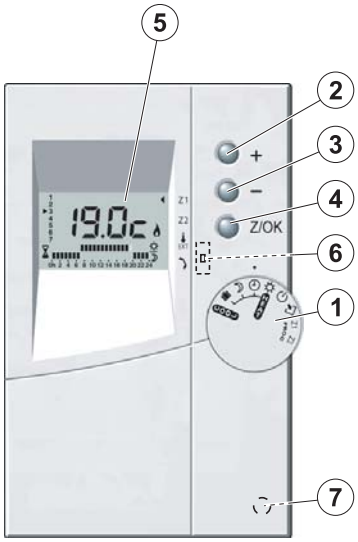
## 3.1 - SYSTEM REMOTE CONTROL UNIT - Included with control kit




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

COOL
- **Cooling**: Operation in cooling mode for reversible applications

or
- **DHW** (domestic hot water) only in summer: for the 1-zone radiators 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

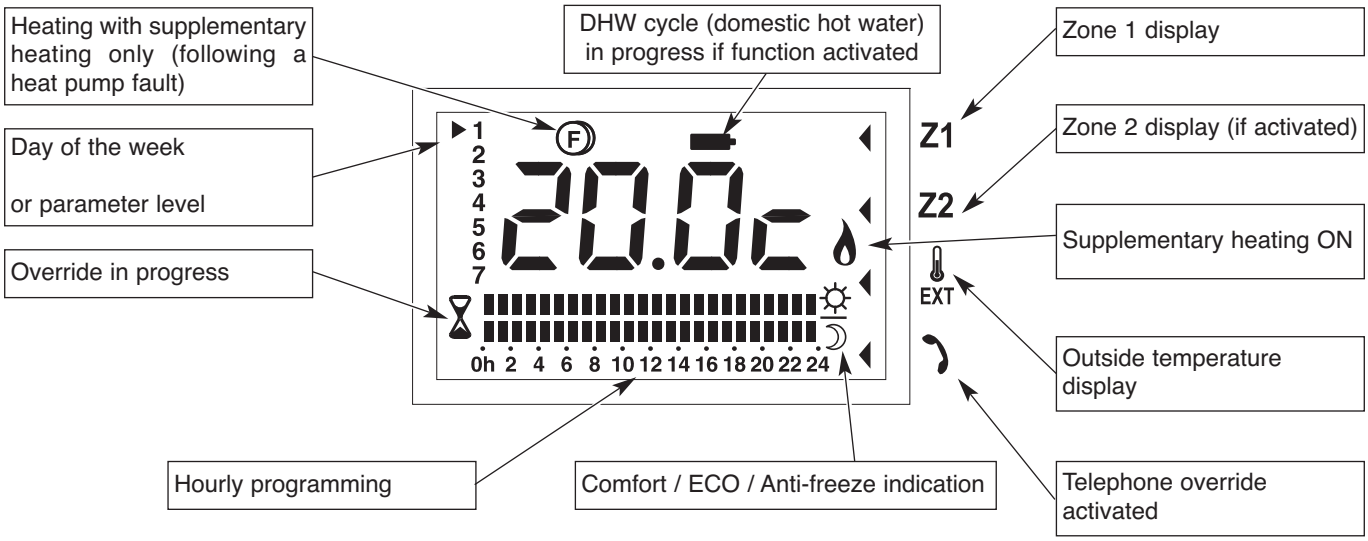
(3) Push-button ⊖ for setpoint and parameter modification

(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)

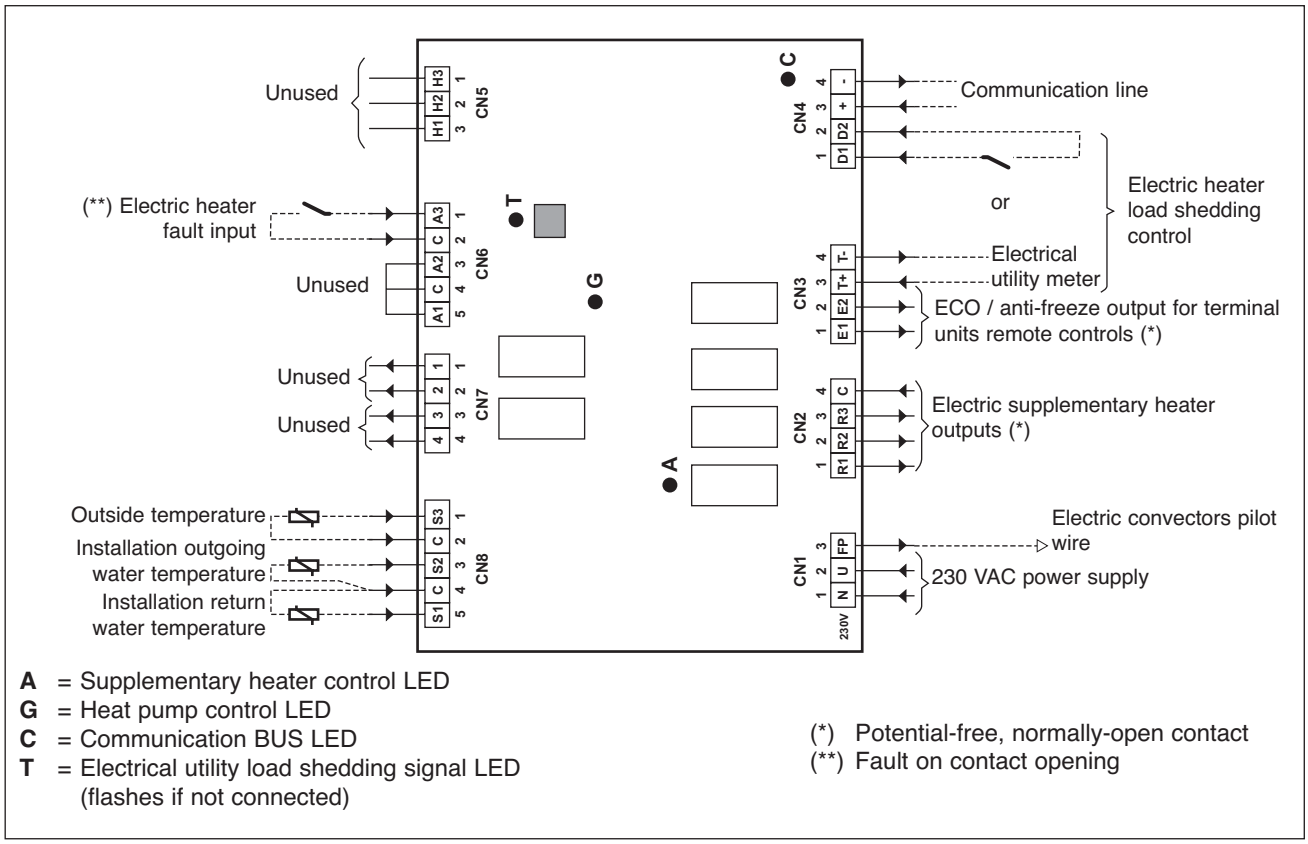
  - current day.

**Note:**

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

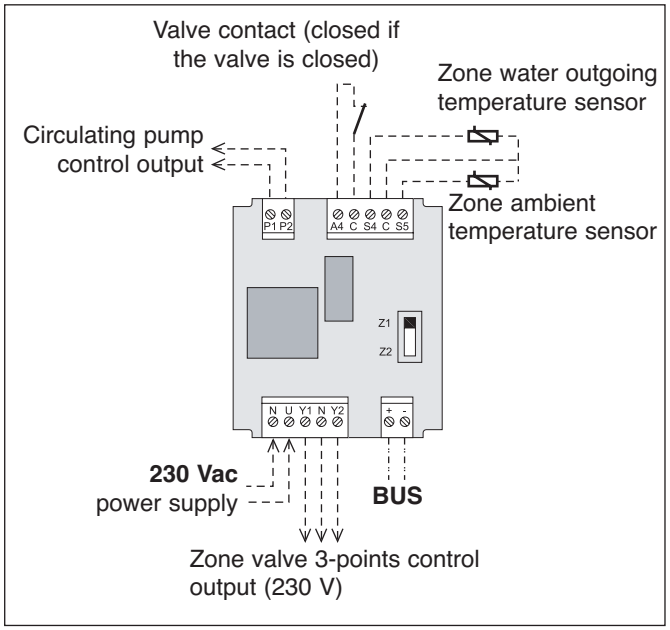
## 3.2 - SYSTEM CONTROL BOARD

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



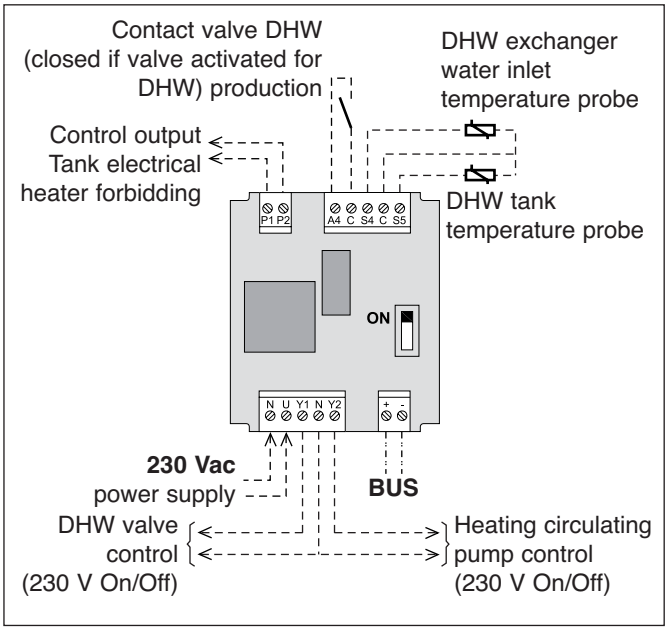

## 3.3 - ZONE BOARD

- Mounted in 2 zones 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 line (BUS).




## 3.4 - ECS BOARD

- Mounted in the Domestic Hot Water (DHW) tank control box.
- Only for use in the radiator heating <u>zone 1 application</u> (non reversible).
- Connected to the control unit and the heating board by the communication line (BUS).
- Controls the supply valve of the DHW tank exchanger.
- Controls the heating system circulating pump.



## 3.5 - CWC2 COMMUNICATION AND CONTROL BOARD A2 OF HEAT PUMP

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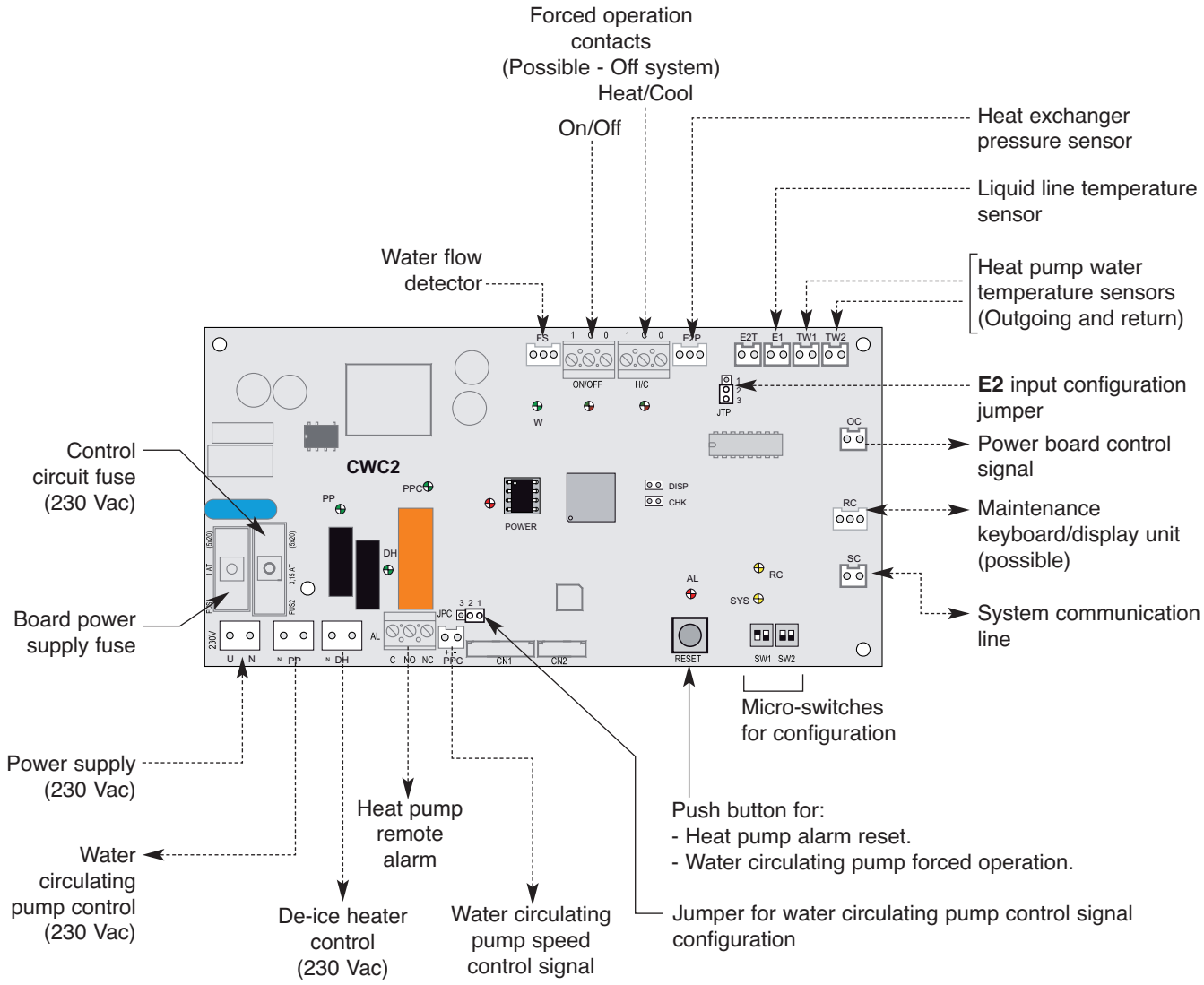
- It ensures 3 functions:
  - Communication interface between system control and heat pump control.
  - Management of the heat pump heat exchanger and water circulating pump.
  - Possible base de-ice electric heater control.




**LED lights**:

**Power** : Supply.
**PPC** : Water circulating pump speed control signal.
**PP** : Water circulating pump control.
**DH** : De-ice heater control.
**W** : Water flow.
**ON/OFF** : Forced operation status.
**H/C** : Forced operation status.
**AL** : Heat pump alarm.
**SYS** : System communication line.
**RC** : Maintenance keyboard/display.

## 3.6 - SYSTEM CONTROL TEMPERATURE SENSORS

• Type CTN 10 KΩ at 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** |

| Temperature (°C) | Ohmic value (Ohm) |
|---|---|
| 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 |

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## 3.7 - POWER FAILURE

• In case of power failure, the parameters and settings are maintained. If the power outage exceeds 6 hours, the time setting will have to be corrected.

# 4 - 1-ZONE FLOOR APPLICATION OPERATION

• The operating modes are selected using the rotary knob on the front of the control unit (see chapter 3.1 and user's manual).

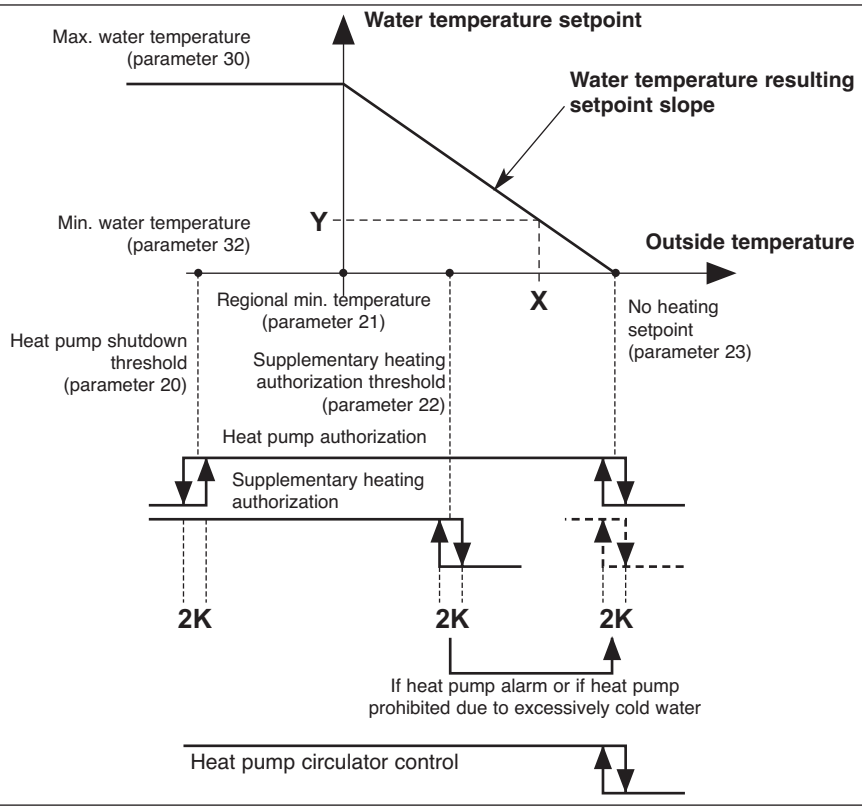
## 4.1 - HEATING MODE

### 4.1.1 - HEATING OPERATING DIAGRAM

An outside temperature **X** determines a resulting water temperature setpoint **Y**.

The parameters determining this water rule can be set by the installer (see the table in paragraph 4.6).

The resulting setpoint is displayed at parameter 04.
It can be corrected as required depending on the ambient temperature of the zone.

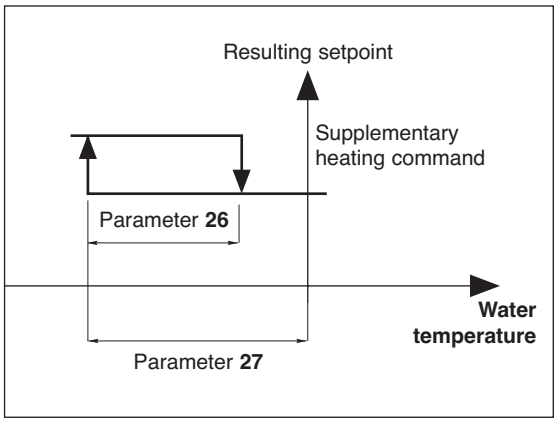



### 4.1.2 - "COMFORT" HEATING MODE ☼

• **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 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). Tiering is managed by a 10-minute time delay for the 2nd.
  - **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 authorized once again if the ambient temperature falls to the ambient set point value.

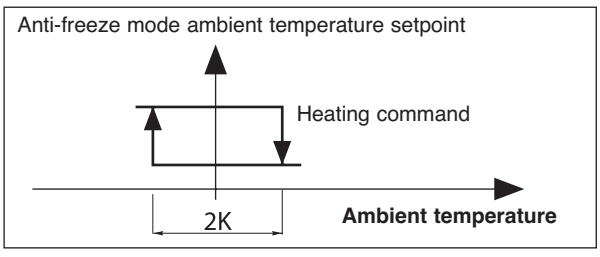
- **Control of the heat pump's circulator**
  - The heating mode, activated if the outside temperature is less than the non-heating temperature.
  - If the circulator is off:
    - an “anti-sticking” function starts the circulator for 5 seconds every 24 hours.
    - The “frost protection” function starts the circulator if the outside temperature is below 0°C.
      See details in paragraph 11.

### 4.1.3 - “ECONOMY” HEATING MODE ☽

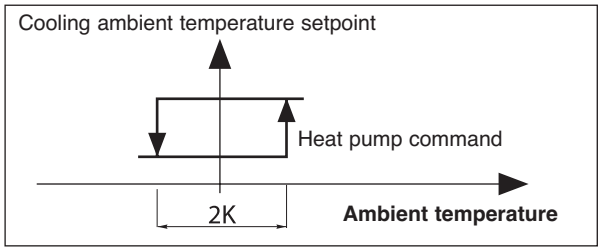
- The switch to “**ECO**” mode lowers the ambient temperature setpoint by a value than can be adjusted from 1 to 4 K (parameter 24).
- It can only be activated in heating mode (inactive in cooling mode).
- Switching from “**Comfort**” to “**ECO**” is accomplished either by hourly programming, weekly 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.

### 4.1.4 - “ANTI-FREEZE” HEATING MODE (prolonged absence)

- 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).



## 4.2 - COOLING MODE




- Selection is made using the rotary knob on the control unit.
- **Temperature setpoint**
  - The heat pump operates with the water temperature set point (installation return) given in parameter 42. It is recommended if the ambient temperature is greater than the cooling setpoint (adjustable from 20 to 30°C).
- **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.
  - 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.
- **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 11.
- **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 - ELECTRIC HEATER FORCING FOR MAINTENANCE

- See details in Service Manual.
- When installation system control is “**OFF**”, it is possible to activate, for a limited time, the electric support heater.
- This sequence can only be performed by a qualified technician during maintenance operation.

The sequence is controlled by mean of parameters 40 and 41 after being sure that water circulator is forced.

## 4.4 - 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**”.

## 4.5 - 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 1 K for the reset.

## 4.6 - PARAMETERS

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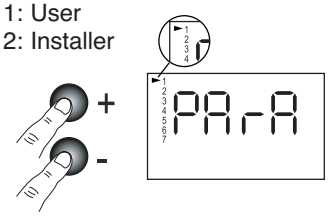
- **Access:**
  - 2 access levels:
    - Level 1, read only, with direct access for parameters 1 to 19,
    - Level 2, “technical level” accessible by password “**see last page**”.
      This level is entered via parameter 20, although all parameters are accessible.

1: User
2: Installer

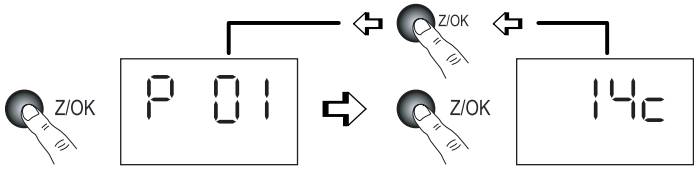



**Procedure**:

1°) Simultaneously press and hold the buttons ⊕ and ⊖ for 5 seconds, until the screen displays **PArA**.

2°) Select the **User** menu **= Level 1** or **Installer = Level 2** using the ⊕ and ⊖ buttons.

3°)* To access **level 1**, press “**Z/OK**.
The display indicates the first parameter “**P01**”.
Press the ⊕ or ⊖ keys to shift from one parameter to another.
To know the value of the parameter, press **“Z/OK”**.
To redisplay the value of the parameter, press **“Z/OK”** again.




Access to the 1st parameter (P01) Display of the parameter value

3Bis°)* To access **level 2**, press **“Z/OK”**.
The display shows “□□□□”.
Enter the password digit by digit, by selecting the desired digit using the ⊕ or ⊖ buttons and by confirming with **“Z/OK”**. Once the password is entered, the display then indicates “**P20**” which is the first parameter of this level.
To display the value of a parameter, select it using the ⊕ or ⊖ keys and press **“Z/OK”**.
To modify this parameter, if needed, press keys ⊕ or ⊖.
To redisplay the value of the parameter, press **“Z/OK”** again.

4°) To exit the parameterisation procedure, press and hold **“Z/OK”**.
In all cases (except the flow-rate calculation), the display returns to normal automatically after a few minutes of inactivity.
The parameters can be accessed and modified both in operation and when shut down, except for those for installation configuration and default parameterisation which can only be accessed and modified when the installation is shut down.
**Note**:
The flashing parameter values are those that can be modified. Otherwise, the display remains steady.

- **Configuration of installation type**

**IMPORTANT: THE FOLLOWING ELEMENTS MUST BE CARRIED OUT EACH TIME THE INSTALLATION IS PLACED INTO SERVICE**

- For 1 Floor Zone application, parameter 70 must be set to “**1**”.
- **Procedure**:
  1) Set the rotary knob on the control unit to the “**Stop**” position.
  2) Go to parameter 70. Press the **“Z/OK”** button; the value of the parameter is displayed. This value may be read or modified using the ⊕ and ⊖ buttons if the system is in the “**Stop**” position. If parameters are modified, an initialisation process is launched automatically (the “**init**” message is displayed). When initialisation is completed, the display returns to parameter 70.
     **Note**: If this parameter is set in other than the “**Stop**” position, the “**STOP**” message flashes and the parameter cannot be modified.
  3) Once the configuration parameters have been verified, disconnect and re-establish the system's power supply to reset the control system.

- **Default configuration**
  - This enables the default values (see list) of all parameters to be reset according to the type of installation.
  - 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.
      **Note**:
      If this parameter is set in other than the "**Stop**" position, the word "**STOP**" flashes and the configuration cannot be launched.
    - Press and hold the **"Z/OK"** button for 5 seconds to launch the default configuration. The "**init**" message flashes. When initialisation is completed, the display returns to parameter 60.
- **Calibration of temperature sensors ("Offset")**
  - The value displayed by certain sensors may be adjusted. To do this, move to the corresponding parameter and enter the desired value (+/- 3 degrees maximum).
- **Heat pump control 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.**

## 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 |
| | **Electric heater forcing** (for maintenance only)**:** | | | |
| 40 | Total electric heating capacity | T | 1 / 30 kW | 6 kW |
| 41 | Launch of the sequence | T | | |

GB

**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 | 50 °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 = FR; 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 | Load shedding action (1 = closed contact = load shedding) | T | 0/1 | 1 |
| 76 | CWC2 board activation (1 = Activated) | T | 0/1 | 1 |
| | **Software versions:** | | | Read only |
| 80 | Control unit | T | | |
| 81 | Heating board | T | | |
| 85 | CWC2 board | T | | |
| | **DHW: Not available in this application** | | | |
| 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 |

## 4.7 - ALARMS

GB

• The alarms are indicated by a message flashing alternately on the display.

| ALARM | CODE | ACTION | NTR (nothing to report) |
|---|---|---|---|
| Heat pump fault | **Gr (*)** | **In heating mode**: | Manu. |
| | | 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. | |
| 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 |
| Ambience sensor fault zone 1 | **SA1** | System shut-down | Auto |
| Communication or system fault | **Cn** | System shut-down | Auto |
| Water flowrate fault | **FL** | Prohibits supplementary heating operation (and the heat pump). | Manu. |
| Max. water outlet temperature fault (Adjustable threshold 70°C, parameter 37) | **tE** | System shut-down | Manu. |

• Manual reset: by system shut-down after clearing the source of the fault.
The heat pump alarms (**Gr, FL**) can also be reset by pressing the button on the **CWC2** board or by disconnecting the power supply.
• 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.

(*) The exact nature of the heat pump alarm can be known by connecting the specific maintenance keypad display to the heat pump.
(**) Overheat security with manual reset on the body of the heater. See the heat pump's installation instructions.

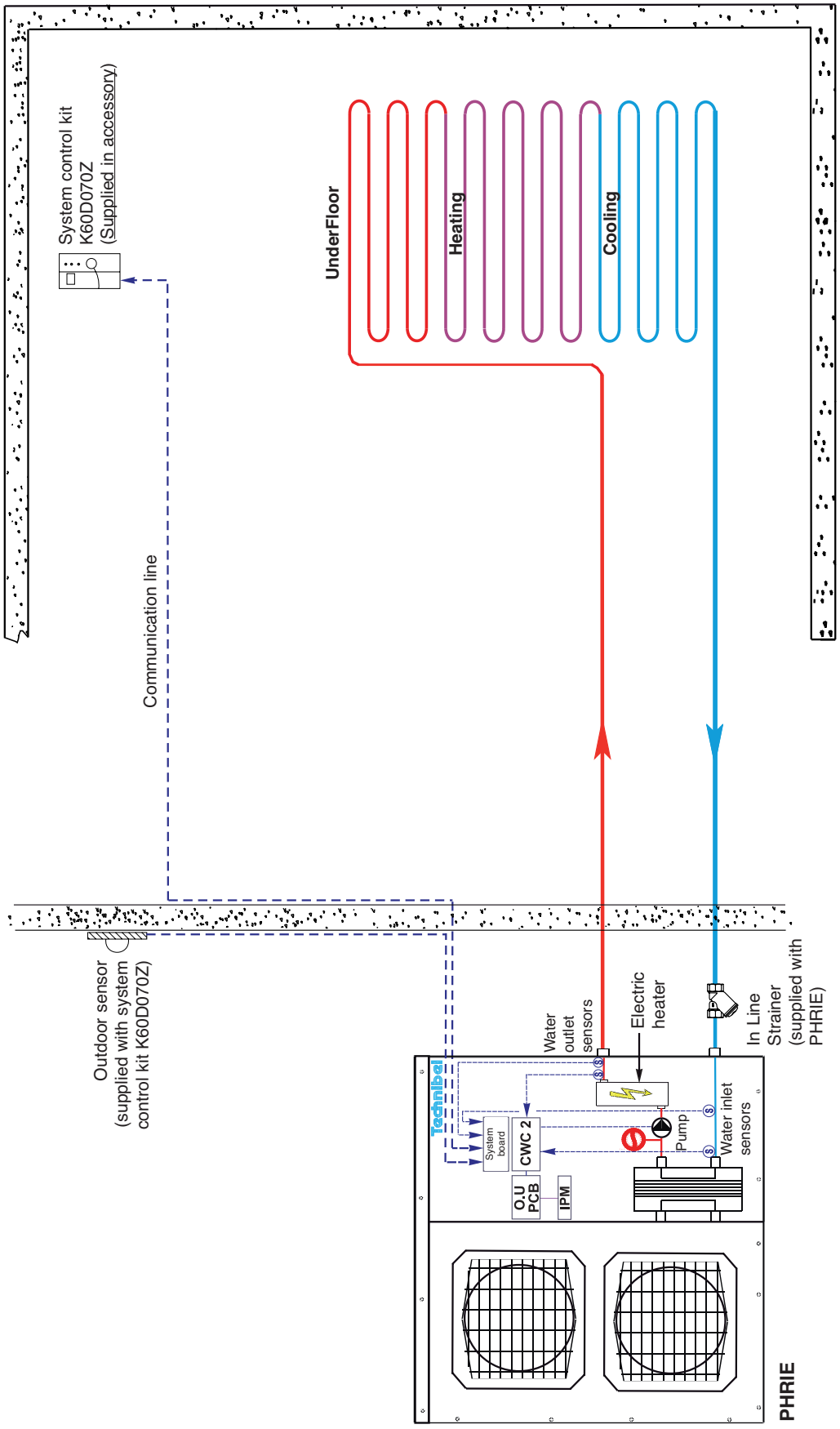
## 4.8 - HYDRAULIC SCHEMATIC DIAGRAM

GB

**Installation is to be performed in compliance with established trade practices and current standards.**

**Note:**
**For easy understanding, all isolation valves are not indicated on this drawing.**

**See accessories table.**



# 5 - 2 ZONES FLOOR APPLICATION OPERATION

• The operating modes are selected using the rotary knob on the front of the control unit (see chapter 3.1 and user's manual).

GB

## 5.1 - HEATING MODE

### 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 in paragraph 5.7).

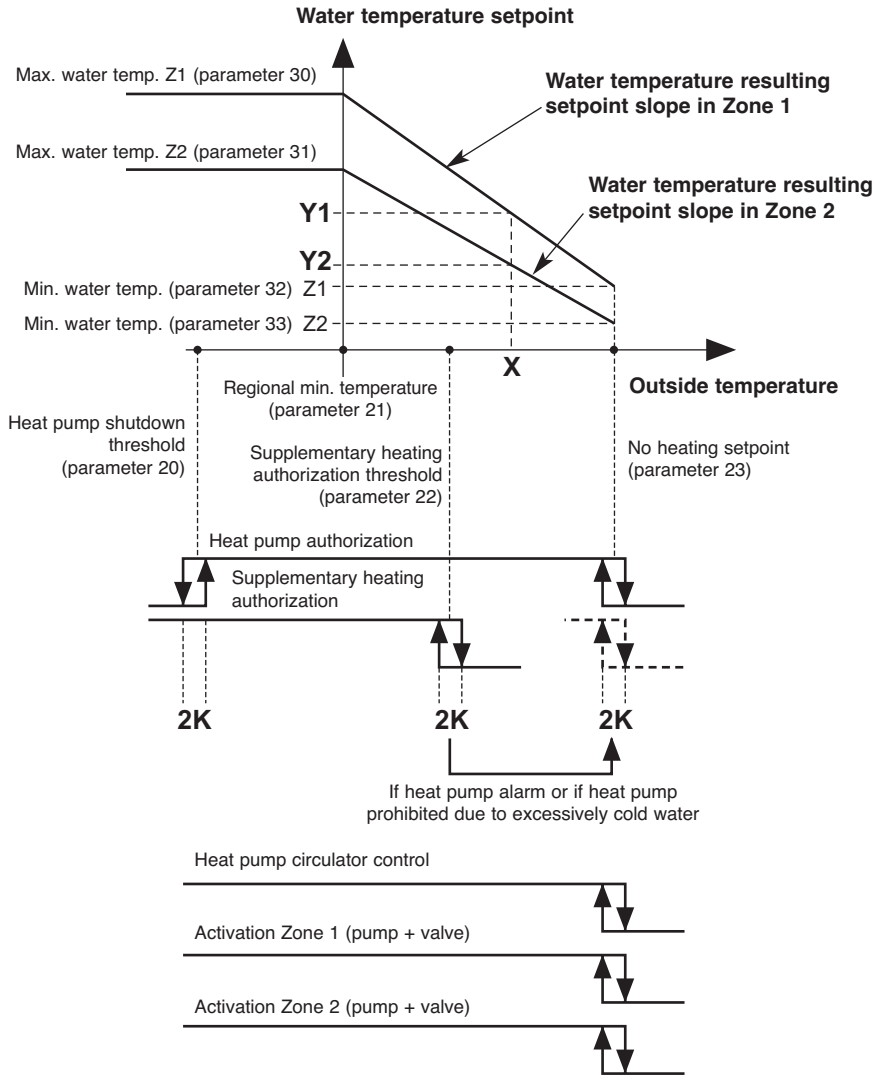
The resulting setpoint for zone 1 is displayed at parameter 04.

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.




### 5.1.2 - "COMFORT" HEATING MODE ☼

• **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.

  **Note:**

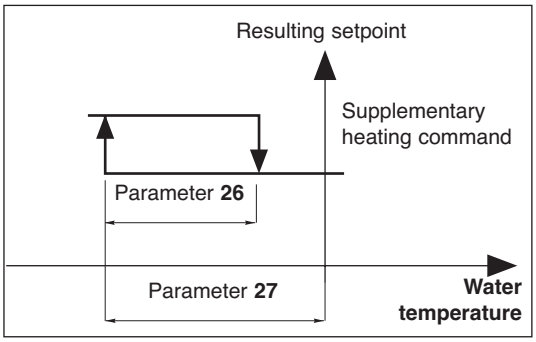
  **The set point value sent to the heat pump can be clipped to the maximum value given in parameter 43.**

  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.

- **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.
    - The “frost protection” function starts the circulator if the outside temperature is below 0°C. See details in paragraph 11.

- **Supplementary electric heating**
  - The heating elements are actuated 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). Tiering is managed by a 10 minute time delay for the 2nd.
  - **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.



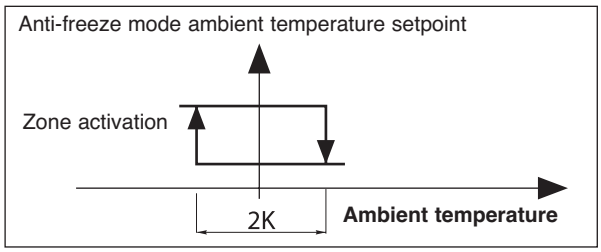

- **Heat pump operating safety features in heating mode**
  - A safety device on the water temperature (installation return) prohibits heat pump operation if this temperature is below the thermodynamic heating authorization threshold (parameter 36). In this case, only supplementary heating is authorized 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).

### 5.1.3 - “ECONOMY” HEATING MODE ☽

- The switch to “**ECO**” mode lowers the ambient temperature setpoint of the zone by a value than can be adjusted from 1 to 4 K (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.

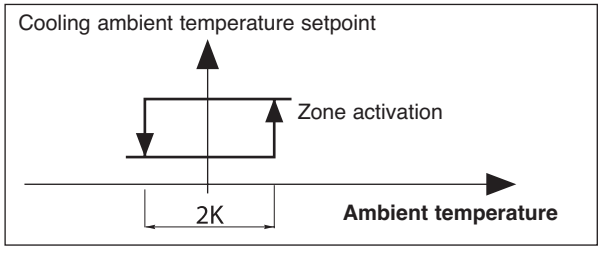
### 5.1.4 - “ANTI-FREEZE” HEATING MODE (prolonged absence) 🧳

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




## 5.2 - COOLING MODE

- Selection for the 2 zones is made using the rotary knob on the control unit.
- The heat pump operates with the water temperature set point (installation return) given in parameter 42.
- Each zone 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.

- **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).**

- **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.
  - An “anti-condensation” device on the installation's outgoing temperature prohibits heat pump operation if this temperature is below 15°C.
- **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 11.
- **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**”.

## 5.3 - ELECTRIC HEATER FORCING FOR MAINTENANCE

- See details in Service Manual.
- When installation system control is “**OFF**”, it is possible to activate, for a limited time, the electric support heater.
- This sequence can only be performed by a qualified technician during maintenance operation.

The sequence is controlled by mean of parameters 40 and 41 after being sure that water circulator is forced and zones activated.

## 5.4 - HEAT PUMP CONTROL

- **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.**

## 5.5 - CONTROL OF ZONE OUTGOING LINES

- Managed by the zone board.

### 5.5.1 - VALVES

- 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).

### 5.5.2 - CIRCULATING PUMPS

- Pump shutdown is delayed 1 minute.

GB

### 5.5.3 - FORCING

- When the system is "**OFF**", and for maintenance operations only, it is possible to force the operation of each zone (circulating pump on and opening of the control valve) by setting parameter 65 to "**1**" for zone 1 and setting parameter 66 to "**1**" for zone 2.

> **Caution:**
> **At the end of the operation, forcing must be deactivated (by returning parameters 65 and 66 to "0") before restarting the installation.**

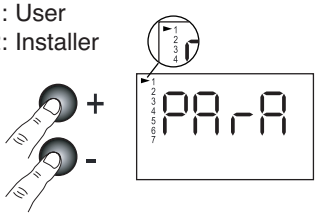
## 5.6 - MISCELLANEOUS

- 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 1 K for the reset.

## 5.7 - PARAMETERS

- **Access:**
  - 2 access levels:
    - Level 1, read only, with direct access for parameters 1 to 19,
    - Level 2, "technical level" accessible by password "**see last page**".
      This level is entered via parameter 20, although all parameters are accessible.

1: User
2: Installer

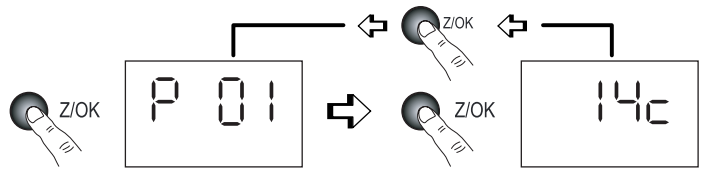



**Procedure**:

1°) Simultaneously press and hold the buttons ⊕ and ⊖ for 5 seconds, until the screen displays **PArA**.

2°) Select the **User** menu **= Level 1** or **Installer = Level 2** using the ⊕ and ⊖ buttons.

3°)* To access **level 1**, press "**Z/OK**.
The display indicates the first parameter "**P01**".
Press the ⊕ or ⊖ keys to shift from one parameter to another.
To know the value of the parameter, press **"Z/OK"**.
To redisplay the value of the parameter, press **"Z/OK"** again.




Access to the 1st parameter (P01) — Display of the parameter value

3Bis°)* To access **level 2**, press **"Z/OK"**.
The display shows "□□□□".
Enter the password digit by digit, by selecting the desired digit using the ⊕ or ⊖ buttons and by confirming with **"Z/OK"**. Once the password is entered, the display then indicates "**P20**" which is the first parameter of this level.
To display the value of a parameter, select it using the ⊕ or ⊖ keys and press **"Z/OK"**.
To modify this parameter, if needed, press keys ⊕ or ⊖.
To redisplay the value of the parameter, press **"Z/OK"** again.

4°) To exit the parameterisation procedure, press and hold **"Z/OK"**.
In all cases (except the flow-rate calculation), the display returns to normal automatically after a few minutes of inactivity.
The parameters can be accessed and modified both in operation and when shut down, except for those for installation configuration and default parameterisation which can only be accessed and modified when the installation is shut down.
**Note**:
The flashing parameter values are those that can be modified. Otherwise, the display remains steady.

• **Configuration of installation type**

**IMPORTANT: THE FOLLOWING ELEMENTS MUST BE CARRIED OUT EACH TIME THE INSTALLATION IS PLACED INTO SERVICE**

- For 2 Floor Zones application, parameter 70 must be set to "**2**".
- **Procedure**:
  1) Set the rotary knob on the control unit to the "**Stop**" position.
  2) Go to parameter 70. Press the **"Z/OK"** button; the value of the parameter is displayed. This value may be read or modified using the ⊕ and ⊖ buttons if the system is in the "**Stop**" position. If parameters are modified, an initialisation process is launched automatically (the "**init**" message is displayed). When initialisation is completed, the display returns to parameter 70.
     **Note**: If this parameter is set in other than the "**Stop**" position, the "**STOP**" message flashes and the parameter cannot be modified.
  3) Once the configuration parameters have been verified, disconnect and re-establish the system's power supply to reset the control system.

• **Default configuration**
- This enables the default values (see list) of all parameters to be reset according to the type of installation.
- 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.
    **Note**:
    If this parameter is set in other than the "**Stop**" position, the word "**STOP**" flashes and the configuration cannot be launched.
  - Press and hold the **"Z/OK"** button for 5 seconds to launch the default configuration. The "**init**" message flashes. When initialisation is completed, the display returns to parameter 60.

• **Calibration of temperature sensors ("Offset")**
- The value displayed by certain sensors may be adjusted. To do this, move to the corresponding parameter and enter the desired value (+/- 3 degrees maximum).

• **Zone 1 ambient temperature sensor**
- If the control unit is not located in zone 1, an ambient temperature sensor must be connected to the zone 1 board and the control unit's sensor deactivated. To do this, set parameter 69 to "**0**".

## 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 |

GB

## 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 |
| 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 |
| | **Electric heater forcing** (for maintenance only)**:** | | | |
| 40 | Total electric heating capacity | T | 1 / 30 kW | 6 kW |
| 41 | Launch of the sequence | 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 | 50 °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 = FR ; 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 | | | **Set to:** |
| | **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 | Load shedding action (1 = closed contact = load shedding) | T | 0/1 | 1 |
| 76 | CWC2 board activation (1 = Activated) | T | 0/1 | 1 |
| | **Software versions:** | | | Read only |
| 80 | Control unit | T | | |
| 81 | Heating board | T | | |
| 82 | Board zone 1 | T | | |
| 83 | Board zone 2 | T | | |
| 85 | CWC2 board | 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 |

## 5.8 - ALARMS

GB

• The alarms are indicated by a message flashing alternately on the display.

| ALARM | CODE | ACTION | NTR (nothing to report) |
|---|---|---|---|
| Heat pump fault | **Gr (*)** | **In heating mode**:<br>Suppression of the supplementary heating authorization threshold according to the outside temperature.<br>Supplementary heating load shedding prohibited.<br>Automatic switching to Anti-freeze Mode if case of a fault (indicated by the absence of the bar graph).<br>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.<br>**In cooling mode**: heat pump shutdown.<br>**In Anti-freeze mode**:<br>Suppression of the supplementary heating authorization threshold.<br>Supplementary heating load shedding prohibited. | 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:<br>- Pump shutdown.<br>- Valve closure. | Auto |
| Water sensor fault, zone 2 | **SE2** | Deactivation, zone 2:<br>- Pump shutdown.<br>- Valve closure. | Auto |
| Ambience sensor fault zone 1 | **SA1** | Deactivation, zone 1:<br>- Pump shutdown.<br>- Valve closure. | Auto |
| Ambience sensor fault zone 2 | **SA2** | Deactivation, zone 2:<br>- Pump shutdown.<br>- Valve closure. | Auto |
| Communication or system fault | **Cn** | System shut-down | Auto |
| Communication fault, zone 1 | **Cn1** | Deactivation, zone 1:<br>- Pump shutdown. (***)<br>- Valve closure. | Auto |
| Communication fault, zone 2 | **Cn2** | Deactivation, zone 2:<br>- Pump shutdown. (***)<br>- Valve closure. | Auto |
| Water flowrate fault | **FL** | Prohibits supplementary heating operation (and the heat pump). | Manu. |
| Max. water outlet temperature fault (Adjustable threshold 70°C, parameter 37) | **tE** | System shut-down | Manu. |

• Manual reset: by system shut-down after clearing the source of the fault.
The heat pump alarms (**Gr, FL**) can also be reset by pressing the button on the **CWC2** board or by disconnecting the power supply.

• 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.

(*) The exact nature of the heat pump alarm can be known by connecting the specific maintenance keypad display to the heat pump.

(**) Overheat security with manual reset on the body of the heater. See the heat pump's installation instructions.

(***) The sum of alarms **Cn1 + Cn2** causes the heat pump and supplementary heating to shut down.

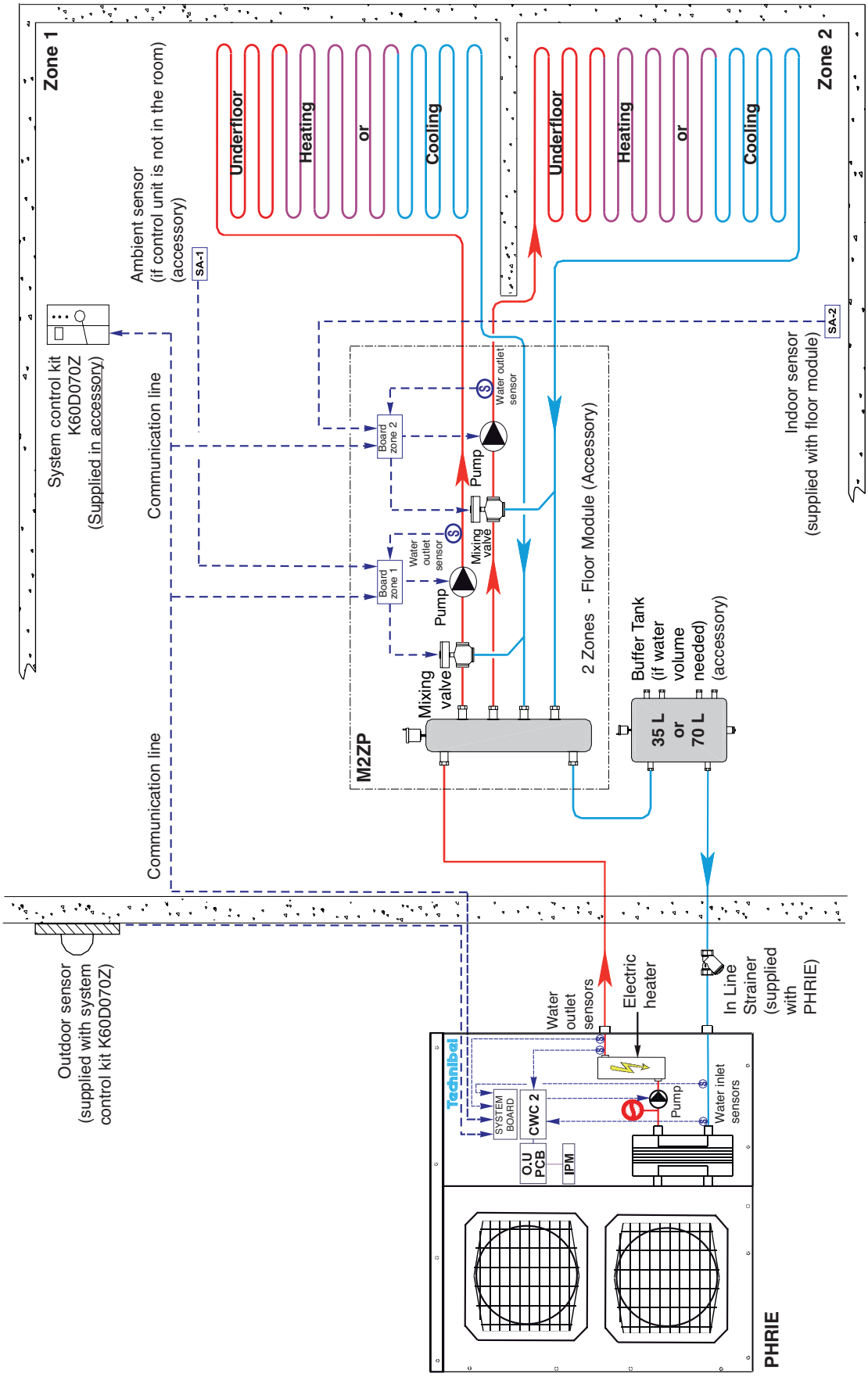
## 5.9 - HYDRAULIC SCHEMATIC DIAGRAM

GB

**Installation is to be performed in compliance with established trade practices and current standards.**

**Note:**
**For easy understanding, all isolation valves are not indicated on this drawing.**

**See accessories table.**



# 6 - MIXED 2 ZONES FLOOR APPLICATION OPERATION + TERMINAL UNITS

GB

- **ZONE 1 = FLOOR** **- with circulating pump and control valve (in the mixed 2-zone module).**
- **ZONE 2 = TERMINAL UNITS** **- with circulating pump (in the mixed 2-zone module).**
- The operating modes are selected using the rotary knob on the front of the control unit (see § 3.1 and user's manual).

## 6.1 - HEATING MODE

### 6.1.1 - 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 in § 6.7).

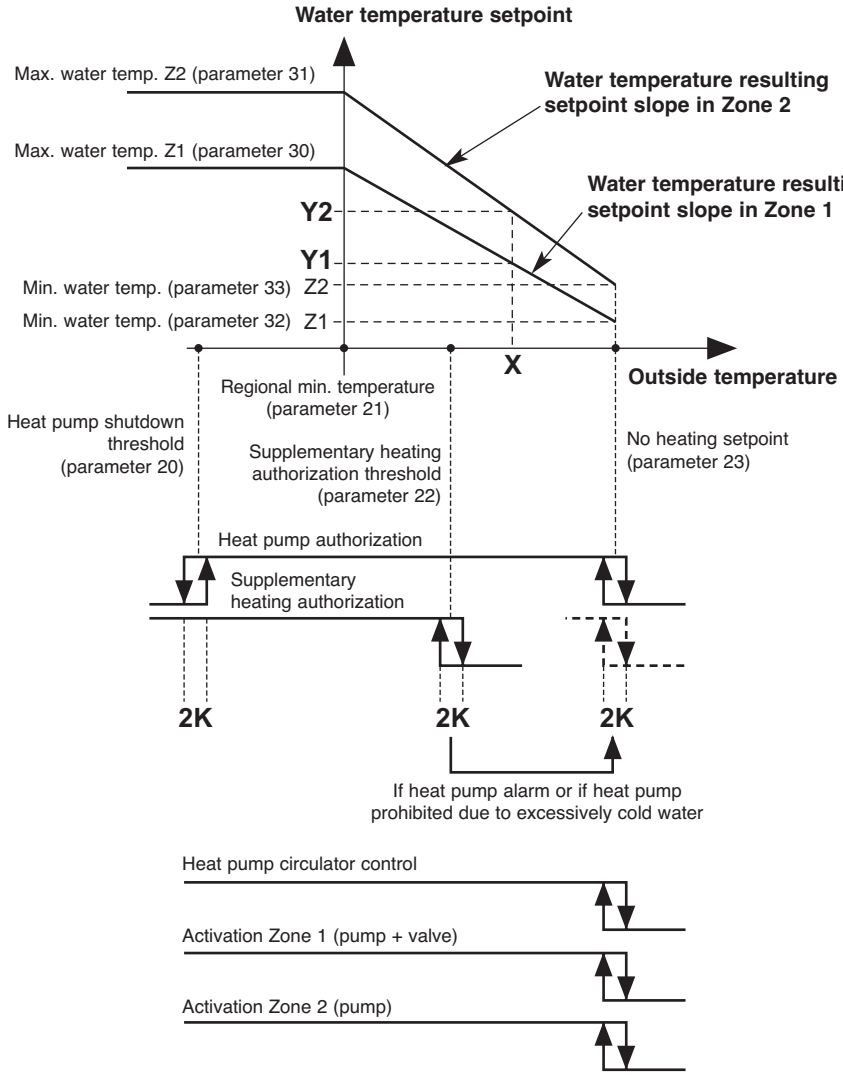
The resulting setpoint for zone 1 is displayed at parameter 04.

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

The resulting setpoint (zone 1) can be corrected as required according to the ambient temperature of the zone.

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

The control valve of zone 1 is controlled according to the resulting setpoint of the zone.




### 6.1.2 - "COMFORT" HEATING MODE ☼

- **<u>Water temperature setpoint</u>**
  - The circulating pump of each zone is actuated and the zone 1 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 water temperature resulting setpoint is calculated according to the outside temperature.
  - The heat pump and supplementary heating are then controlled (in relation to the installation's return temperature) according to the highest resulting setpoint (which will be that of zone 2 in the majority of cases - Terminal Units).

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

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.

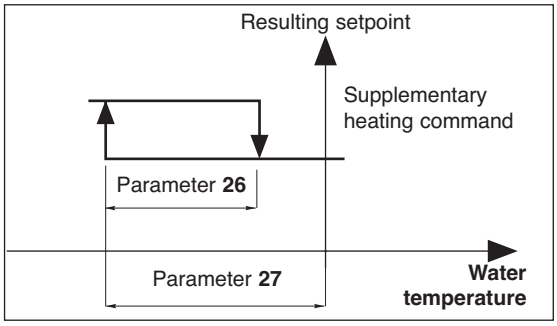
The resulting setpoint can be corrected by the ambient temperature of zone 1:
A difference of +/- 1 degree of ambient temperature in relation to the heating setpoint temperature of the zone (adjustable from 15 to 25°C) causes the resulting setpoint (water temperature) to decrease or increase of 2 degrees,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

**For zone 2, Terminal Units:**

This zone is supplied by the heat pump (and supplementary heating, if any). Ambient temperature is controlled by the thermostats of the Terminal Units.
Setting the zone 2 heating slope (minimum and maximum water temperature):
These settings concern the installation's return water temperature (= heat pump water inlet).
The resulting set point is displayed at parameter 05.

- **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.
    - The “frost protection” function starts the circulator if the outside temperature is below 0°C. See details in paragraph 11.

- **Supplementary electric heating**
  - The heating elements are actuated 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). Tiering is managed by a 10 minute time delay for the 2nd.




  - **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).

### 6.1.3 - “ECONOMY” HEATING MODE

- 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 4 K (parameter 24).

**For zone 2, Terminal Units:**

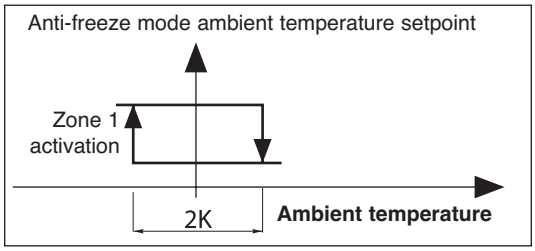
- Switching to “**ECO**” mode causes the “**ECO**” contact to close on the Terminal Units' remote controls.
  **Note: the potential-free “ECO” contact can be used with VLV only. Refer to the details in the indoor unit's installation instructions.**

### 6.1.4 - “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:**

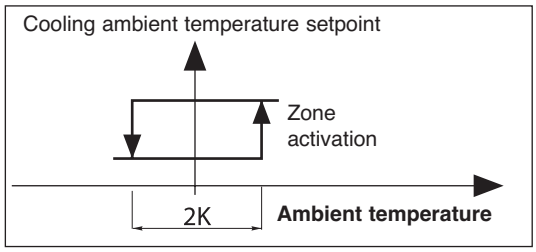
- The water temperature resulting setpoint of zone 2 is lowered 5°C.
- The "**ECO**" contact for the remote controls of the Terminal Units closes.
  **Note: the potential-free "ECO" contact can be used with VLV only. Refer to the details in the indoor unit's installation instructions.**

## 6.2 - COOLING MODE

- Selection for the 2 zones is made using the rotary knob on the control unit.
- The heat pump operates with the water temperature set point (installation return) given in parameter 42.

**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.




**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.

- **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.

- **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 11.

- **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**".

## 6.3 - ELECTRIC HEATER FORCING FOR MAINTENANCE

- See details in Service Manual.
- When installation system control is "**OFF**", it is possible to activate, for a limited time, the electric support heater.
- This sequence can only be performed by a qualified technician during maintenance operation.

The sequence is controlled by mean of parameters 40 and 41 after being sure that water circulator is forced and zone activated.

## 6.4 - HEAT PUMP CONTROL

• 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.**

GB

## 6.5 - CONTROL OF ZONE OUTGOING LINES

• Managed by the zone board.

### 6.5.1 - VALVE

• 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).

### 6.5.2 - CIRCULATING PUMPS

• Pump shutdown is delayed 1 minute.

### 6.5.3 - FORCING

• When the system is "**OFF**", and for maintenance operations only, it is possible to force the operation of each zone (circulating pump on and opening of the zone 1 control valve) by setting parameter 65 to "**1**" for zone 1 and setting parameter 66 to "**1**" for zone 2.

> **Caution:**
> **At the end of the operation, forcing must be deactivated (by returning parameters 65 and 66 to "0") before restarting the installation.**

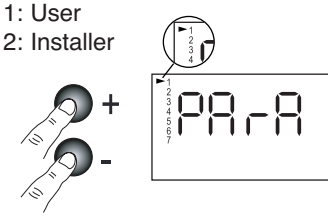
## 6.6 - MISCELLANEOUS

• 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 1 K for the reset.

## 6.7 - PARAMETERS

• **Access:**
- 2 access levels:
  - Level 1, read only, with direct access for parameters 1 to 19,
  - Level 2, "technical level" accessible by password "**see last page**".
    This level is entered via parameter 20, although all parameters are accessible.

1: User
2: Installer

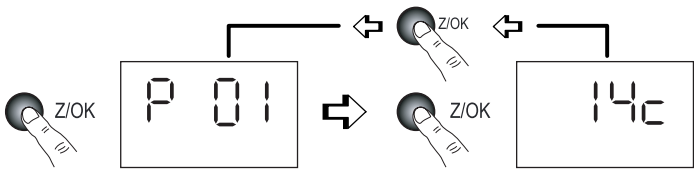



**Procedure**:

1°) Simultaneously press and hold the buttons ⊕ and ⊖ for 5 seconds, until the screen displays **PArA**.

2°) Select the **User** menu **= Level 1** or **Installer = Level 2** using the ⊕ and ⊖ buttons.

3°)* To access **level 1**, press "**Z/OK**".
The display indicates the first parameter "**P01**".
Press the ⊕ or ⊖ keys to shift from one parameter to another.
To know the value of the parameter, press **"Z/OK"**.
To redisplay the value of the parameter, press **"Z/OK"** again.




Access to the 1st parameter (P01) — Display of the parameter value

3Bis°)* To access **level 2**, press **"Z/OK"**.

The display shows "□□□□".

Enter the password digit by digit, by selecting the desired digit using the ⊕ or ⊖ buttons and by confirming with **"Z/OK"**. Once the password is entered, the display then indicates "**P20**" which is the first parameter of this level.

To display the value of a parameter, select it using the ⊕ or ⊖ keys and press **"Z/OK"**.

To modify this parameter, if needed, press keys ⊕ or ⊖.
To redisplay the value of the parameter, press **"Z/OK"** again.

4°) To exit the parameterisation procedure, press and hold **"Z/OK"**.
In all cases (except the flow-rate calculation), the display returns to normal automatically after a few minutes of inactivity.
The parameters can be accessed and modified both in operation and when shut down, except for those for installation configuration and default parameterisation which can only be accessed and modified when the installation is shut down.
**Note**:
The flashing parameter values are those that can be modified. Otherwise, the display remains steady.

• **Configuration of installation type**

**IMPORTANT: THE FOLLOWING ELEMENTS MUST BE CARRIED OUT EACH TIME THE INSTALLATION IS PLACED INTO SERVICE**

- For 2 Mixed Zones application, parameter 70 must be set to "**4**".
- **Procedure**:
  1) Set the rotary knob on the control unit to the "**Stop**" position.
  2) Go to parameter 70. Press the **"Z/OK"** button; the value of the parameter is displayed. This value may be read or modified using the ⊕ and ⊖ buttons if the system is in the "**Stop**" position. If parameters are modified, an initialisation process is launched automatically (the "**init**" message is displayed). When initialisation is completed, the display returns to parameter 70.
     **Note**: If this parameter is set in other than the "**Stop**" position, the "**STOP**" message flashes and the parameter cannot be modified.
  3) Once the configuration parameters have been verified, disconnect and re-establish the system's power supply to reset the control system.

• **Default configuration**
- This enables the default values (see list) of all parameters to be reset according to the type of installation.
- 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.
    **Note**:
    If this parameter is set in other than the "**Stop**" position, the word "**STOP**" flashes and the configuration cannot be launched.
  - Press and hold the **"Z/OK"** button for 5 seconds to launch the default configuration. The "**init**" message flashes. When initialisation is completed, the display returns to parameter 60.

• **Calibration of temperature sensors ("Offset")**
- The value displayed by certain sensors may be adjusted. To do this, move to the corresponding parameter and enter the desired value (+/- 3 degrees maximum).

• **Zone 1 ambient temperature sensor**
- If the control unit is not located in zone 1, an ambient temperature sensor must be connected to the zone 1 board and the control unit's sensor deactivated. To do this, set parameter 69 to "**0**".

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

| No. | DESIGNATION | ACCESS | RANGE | VALUE / DEFAULT |
|---|---|---|---|---|
| | **Status:** | | | Read only |
| 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 | (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 % | |

GB

## 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 - unused | 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 (installation return) | 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 (installation return) | 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 |
| | **Electric heater forcing** (for maintenance only): | | | |
| 40 | Total electric heating capacity | T | 1 / 30 kW | 6 kW |
| 41 | Launch of the sequence | 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 | 50 °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 = FR ; 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 | | | **Set to:** |
| | **4 = Mixed** ---------- | | | → (4) |
| | 5 = Terminal units | | | |
| | 6 = 1 Zone radiators | | | |
| 71 | Reversibility (1 = reversible - 0 = heating only) | T | 0/1 | 1 |
| 75 | Load shedding action (1 = closed contact = load shedding) | T | 0/1 | 1 |
| 76 | CWC2 board 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 | CWC2 board | 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 |

## 6.8 - ALARMS

GB

• The alarms are indicated by a message flashing alternately on the display.

| ALARM | CODE | ACTION | NTR (nothing to report) |
|---|---|---|---|
| Heat pump fault | **Gr (*)** | **In heating mode**: | Manu. |
| | | 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. | |
| 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:<br>- Pump shutdown.<br>- Valve closure. | Auto |
| Ambience sensor fault zone 1 | **SA1** | Deactivation, zone 1:<br>- Pump shutdown.<br>- Valve closure. | Auto |
| Communication or system fault | **Cn** | System shut-down | Auto |
| Communication fault, zone 1 | **Cn1** | Deactivation, zone 1:<br>- Pump shutdown. (***)<br>- Valve closure. | Auto |
| Communication fault, zone 2 | **Cn2** | Deactivation, zone 2:<br>- Pump shutdown. (***) | Auto |
| Water flowrate fault | **FL** | Prohibits supplementary heating operation (and the heat pump). | Manu. |
| Max. water outlet temperature fault (Adjustable threshold 70°C, parameter 37) | **tE** | System shut-down | Manu. |

• Manual reset: by system shut-down after clearing the source of the fault.
The heat pump alarms (**Gr, FL**) can also be reset by pressing the button on the **CWC2** board or by disconnecting the power supply.
• 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.

(*) The exact nature of the heat pump alarm can be known by connecting the specific maintenance keypad display to the heat pump.
(**) Overheat security with manual reset on the body of the heater. See the heat pump's installation instructions.
(***) The sum of alarms **Cn1 + Cn2** causes the heat pump and supplementary heating to shut down.

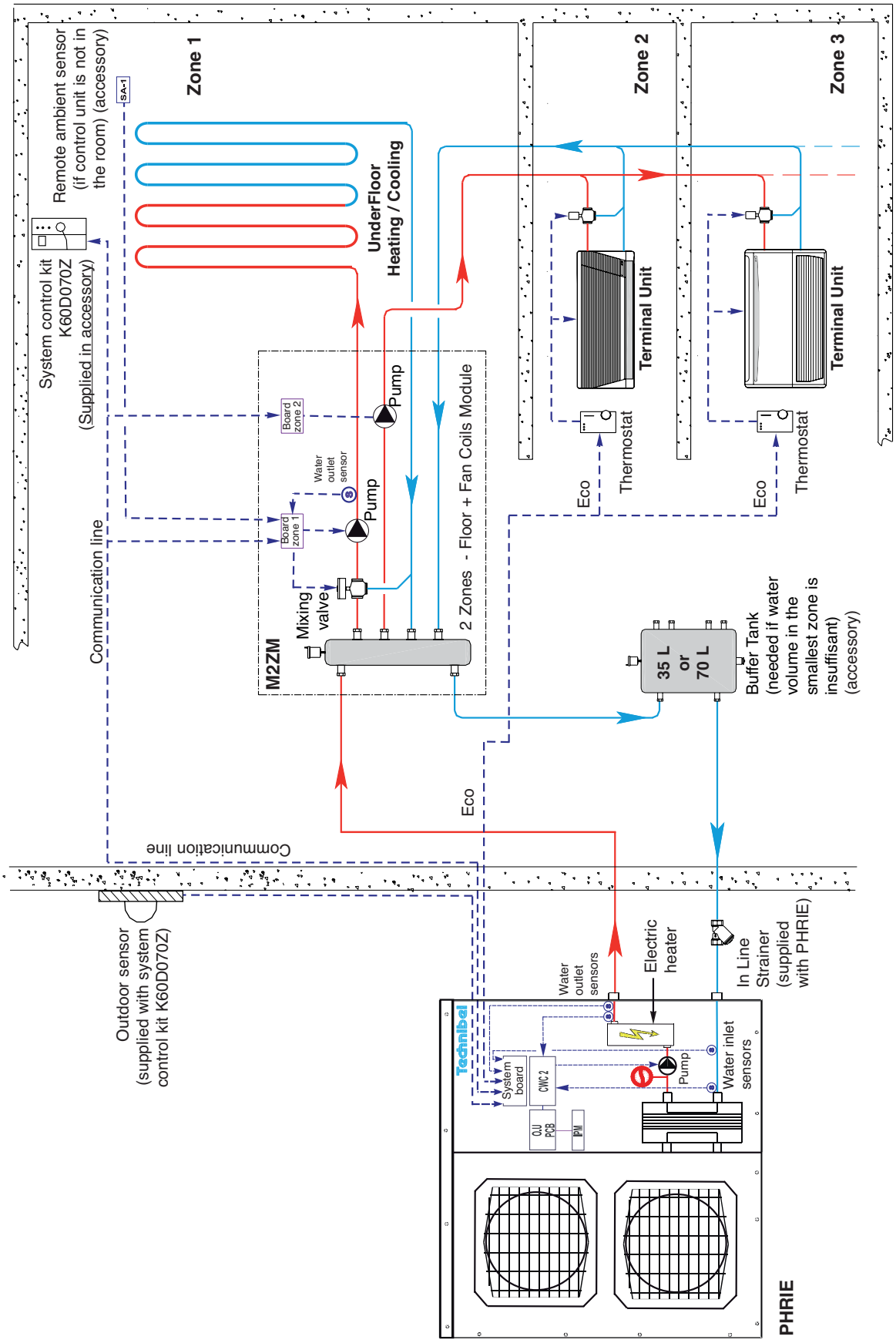
## 6.9 - HYDRAULIC SCHEMATIC DIAGRAM

GB

**Installation is to be performed in compliance with established trade practices and current standards.**

**Note:**
**For easy understanding, all isolation valves are not indicated on this drawing.**

**See accessories table.**



# 7 - MIXED 2 ZONES FLOOR APPLICATION OPERATION + LOW TEMPERATURE RADIATORS

GB

- **ZONE 1 = FLOOR - with circulating pump and control valve (in the M2Z M).**
- **ZONE 2 = LOW TEMPERATURE RADIATORS - with circulating pump (in the M2Z M).**

**Warning: In this application, only the heating mode is authorized (cooling mode inactive).**

- The operating modes are selected using the rotary knob on the front of the control unit (see § 3.1 and user's manual).

## 7.1 - HEATING MODE

### 7.1.1 - 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 in § 7.7).

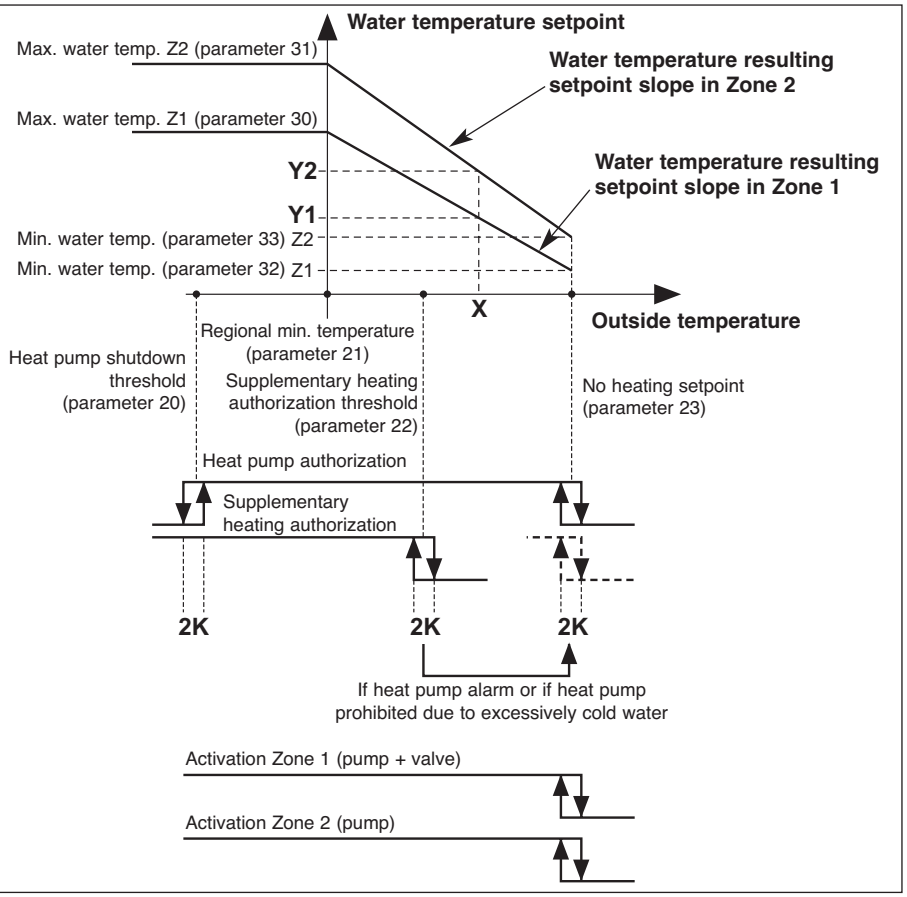
The resulting setpoint for zone 1 is displayed at parameter 04.

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

The resulting setpoint (zone 1) can be corrected as required according to the ambient temperature of the zone.

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

The control valve of zone 1 is controlled according to the resulting setpoint of the zone.




### 7.1.2 - "COMFORT" HEATING MODE ☼

- **<u>Water temperature setpoint</u>**
  - The circulating pump of each zone is actuated and the zone 1 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 water temperature resulting setpoint is calculated according to the outside temperature.
  - The heat pump and the supplementary heating are thus controlled **in relation to the installation's return temperature** according to the highest resulting setpoint (which will be that of zone 2 in the majority of cases - Radiators).

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

    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).

    **<u>For zone 1, Floor</u>:**

    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 calculated resulting set point is displayed at parameter 04.

**For zone 2, Radiators:**

This zone is supplied by the heat pump (and supplementary heating, if any). Ambient temperature is controlled by the thermostatically-controlled valves on the radiators.

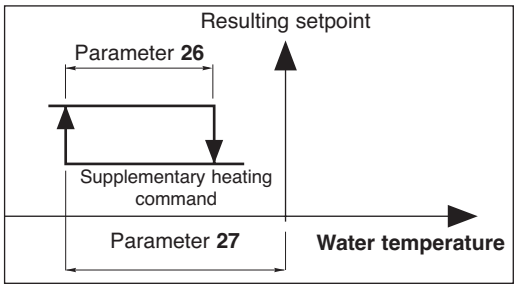
Setting the zone 2 heating slope (min. and max. water temperature):

These settings concern the installation water return temperature ( = heat pump water inlet).

As a result, the set water temperatures (parameter 31, 33) must correspond to the outgoing temperature value of the radiator zone less 5 K (typical water Inlet / water Outlet temperature difference for a heat pump).

The calculated resulting set point is displayed at parameter 05.

- **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.
    - The “frost protection” function starts the circulator if the outside temperature is below 0°C. See details in paragraph 11.
- **Supplementary electric heating**
  - The heating elements are actuated 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). Tiering is managed by a 10-minute time delay for the 2nd.




  - **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).

### 7.1.3 - “ECONOMY” HEATING MODE ☽

- It can only be activated in heating 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 4 K (parameter 24).

**For zone 2, Radiators:**

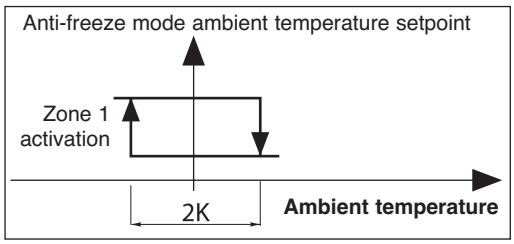
- No action.

### 7.1.4 - “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, Radiators:**

- The water temperature resulting setpoint of zone 2 is lowered 5 degrees.

## 7.2 - COOLING MODE

- Cooling mode prohibited.

Selecting the “**COOL**” position on the control unit will cause the system to shutdown. The “**OFF**” message is displayed.

## 7.3 - ELECTRIC HEATER FORCING FOR MAINTENANCE

- See details in Service Manual.
- When installation system control is "**OFF**", it is possible to activate, for a limited time, the electric support heater.
- This sequence can only be performed by a qualified technician during maintenance operation.

The sequence is controlled by mean of parameters 40 and 41 after being sure that water circulator is forced and zones activated.



## 7.4 - HEAT PUMP CONTROL

• 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 thus operates 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.**

## 7.5 - CONTROL OF ZONE OUTGOING LINES

• Managed by the zone board.

### 7.5.1 - VALVE

• 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).

### 7.5.2 - CIRCULATING PUMPS

• Pump shutdown is delayed 1 minute.

### 7.5.3 - FORCING

• When the system is "**OFF**", and for maintenance operations only, it is possible to force the operation of each zone (circulating pump on and opening of the zone 1 control valve) by setting parameter 65 to "**1**" for zone 1 and setting parameter 66 to "**1**" for zone 2.

**Caution:**
**At the end of the operation, forcing must be deactivated (by returning parameters 65 and 66 to "0") before restarting the installation.**

## 7.6 - MISCELLANEOUS

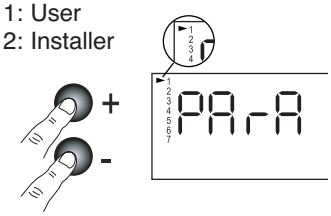
• Mode changes using the rotary knob (**Heating / Cooling / Anti-freeze / Stop**) are delayed 10 seconds in order to filter inappropriate actions. However, the "**Time Setting**" and "**Hourly Programming**" positions do not have the time delay feature.
• The authorization thresholds on the water temperature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

## 7.7 - PARAMETERS

GB

- **Access:**
  - 2 access levels:
    - Level 1, read only, with direct access for parameters 1 to 19,
    - Level 2, “technical level” accessible by password “**see last page**”.
      This level is entered via parameter 20, although all parameters are accessible.

1: User
2: Installer

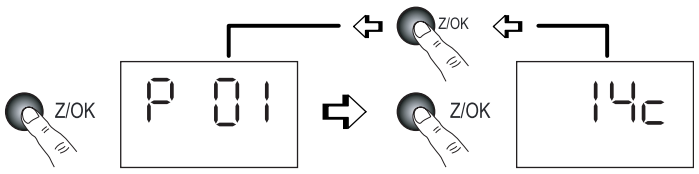



**Procedure**:

1°) Simultaneously press and hold the buttons ⊕ and ⊖ for 5 seconds, until the screen displays **PArA**.

2°) Select the **User** menu **= Level 1** or **Installer = Level 2** using the ⊕ and ⊖ buttons.

3°)* To access **level 1**, press “**Z/OK**.
The display indicates the first parameter “**P01**”.
Press the ⊕ or ⊖ keys to shift from one parameter to another.
To know the value of the parameter, press **“Z/OK”**.
To redisplay the value of the parameter, press **“Z/OK”** again.




Access to the 1st parameter (P01)

Display of the parameter value

3Bis°)* To access **level 2**, press **“Z/OK”**.
The display shows “□□□□”.
Enter the password digit by digit, by selecting the desired digit using the ⊕ or ⊖ buttons and by confirming with **“Z/OK”**. Once the password is entered, the display then indicates “**P20**” which is the first parameter of this level.
To display the value of a parameter, select it using the ⊕ or ⊖ keys and press **“Z/OK”**.
To modify this parameter, if needed, press keys ⊕ or ⊖.
To redisplay the value of the parameter, press **“Z/OK”** again.

4°) To exit the parameterisation procedure, press and hold **“Z/OK”**.
In all cases (except the flow-rate calculation), the display returns to normal automatically after a few minutes of inactivity.
The parameters can be accessed and modified both in operation and when shut down, except for those for installation configuration and default parameterisation which can only be accessed and modified when the installation is shut down.
**Note**:
The flashing parameter values are those that can be modified. Otherwise, the display remains steady.

• **Configuration of installation type**

**IMPORTANT: THE FOLLOWING ELEMENTS MUST BE CARRIED OUT EACH TIME THE INSTALLATION IS PLACED INTO SERVICE**

- For the application, the following parameters must be regulated:
  - **Parameter 70**: "Type of installation" set to "**4**" ("2 Mixed zones" application).
  - **Parameter 71**: "Reversibility" set to "**0**" (Heating mode only).
- **Procedure**:
  1) Set the rotary knob on the control unit to the "**Stop**" position.
  2) Go to parameter 70. Press the **"Z/OK"** button; the value of the parameter is displayed. Adjust the value using the ⊕ and ⊖ keys, then press **"Z/OK"**. If parameters are modified, an initialisation process is launched automatically (the "**init**" message is displayed). When initialisation is completed, the display returns to parameter 70.
     **Note**: If this parameter is set in other than the "**Stop**" position, the "**STOP**" message flashes and the parameter cannot be modified.
  3) Proceed in the same manner for parameter 71.
  4) Once the configuration parameters have been verified, disconnect and re-establish the system's power supply to reset the control system.
  5) Then, adjust other parameters as required, according to the installation.

• **Default configuration**
- This enables the default values (see list) of all parameters to be reset according to the type of installation.
- 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.
    **Note**:
    If this parameter is set in other than the "**Stop**" position, the word "**STOP**" flashes and the configuration cannot be launched.
  - Press and hold the **"Z/OK"** button for 5 seconds to launch the default configuration. The "**init**" message flashes. When initialisation is completed, the display returns to parameter 60.

**Important:**
**After a default parameterisation operation, set parameter 71 again to the value indicated above.**

• **Calibration of temperature sensors ("Offset")**
- The value displayed by certain sensors may be adjusted. To do this, move to the corresponding parameter and enter the desired value (+/- 3 degrees maximum).

• **Zone 1 ambient temperature sensor**
- If the control unit is not located in zone 1, an ambient temperature sensor must be connected to the zone 1 board and the control unit's sensor deactivated. To do this, set parameter 69 to "**0**".

## 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 % | |

GB

| 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 - unused | 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 (installation return) | 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 (installation return) | T | 20 / 35 °C | 30 °C |
| 34 | Outgoing cooling water temperature, zone 1 - unused | T | 15 / 25 °C | 20 °C |
| 35 | Cooling authorization threshold (installation return) - unused | 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 |
| | **Electric heater forcing** (for maintenance only): | | | |
| 40 | Total electric heating capacity | T | 1 / 30 kW | 6 kW |
| 41 | Launch of the sequence | T | | |
| | **Heat pump Inverter parameters:** | | | |
| 42 | Water temperature set point (return), cooling - unused | T | 10 / 30 °C | 12 °C |
| 43 | Maximum water temperature set point (return), heating | T | 40 / 50 °C | 50 °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 = FR ; 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 | | | **Set to:** |
| | **4 = Mixed** | | | (4) |
| | 5 = Terminal units | | | |
| | 6 = 1 Zone radiators | | | |
| 71 | Reversibility (1 = reversible - 0 = heating only) | T | 0/1 | 1 by default - **set to 0** |
| 75 | Load shedding action (1 = closed contact = load shedding) | T | 0/1 | 1 |
| 76 | CWC2 board 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 | CWC2 board | T | | |
| | **Ambience setpoints:** | D | | |
| | Cooling setpoint zone 1 - unused | Direct access Keypad | | |
| | Heating setpoint zone 1 | | 15 / 25 °C | 20 °C |

## 7.8 - ALARMS

GB

- The alarms are indicated by a message flashing alternately on the display.

| ALARM | CODE | ACTION | NTR (nothing to report) |
|---|---|---|---|
| Heat pump fault | **Gr (*)** | **In heating mode**:<br>Suppression of the supplementary heating authorization threshold according to the outside temperature.<br>Supplementary heating load shedding prohibited.<br>Automatic switching to Anti-freeze Mode if case of a fault (indicated by the absence of the bar graph).<br>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.<br>**In cooling mode**: no action.<br>**In Anti-freeze mode**:<br>Suppression of the supplementary heating authorization threshold.<br>Supplementary heating load shedding prohibited. | Auto |
| 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:<br>- Pump shutdown.<br>- Valve closure. | Auto |
| Ambience sensor fault zone 1 | **SA1** | Deactivation, zone 1:<br>- Pump shutdown.<br>- Valve closure. | Auto |
| Communication or system fault | **Cn** | System shut-down | Auto |
| Communication fault, zone 1 | **Cn1** | Deactivation, zone 1:<br>- Pump shutdown. (***)<br>- Valve closure. | Auto |
| Communication fault, zone 2 | **Cn2** | Deactivation, zone 2:<br>- Pump shutdown. (***) | Auto |
| Water flowrate fault (slaving with the circulating pump of the heat pump) | **FL** | Prohibits supplementary heating operation (and the heat pump). | Auto |
| Max. water outlet temperature fault (Adjustable threshold 70°C, parameter 37) | **tE** | System shut-down | Manu. |

- Manual reset: by system shut-down after clearing the source of the fault.
  The heat pump alarms (**Gr, FL**) can also be reset by pressing the button on the **CWC2** board or by disconnecting the power supply.
- 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.

(*) The exact nature of the heat pump alarm can be known by connecting the specific maintenance keypad display to the heat pump.

(**) Overheat security with manual reset on the body of the heater. See the heat pump's installation instructions.

(***) The sum of alarms **Cn1 + Cn2** causes the heat pump and supplementary heating to shut down.

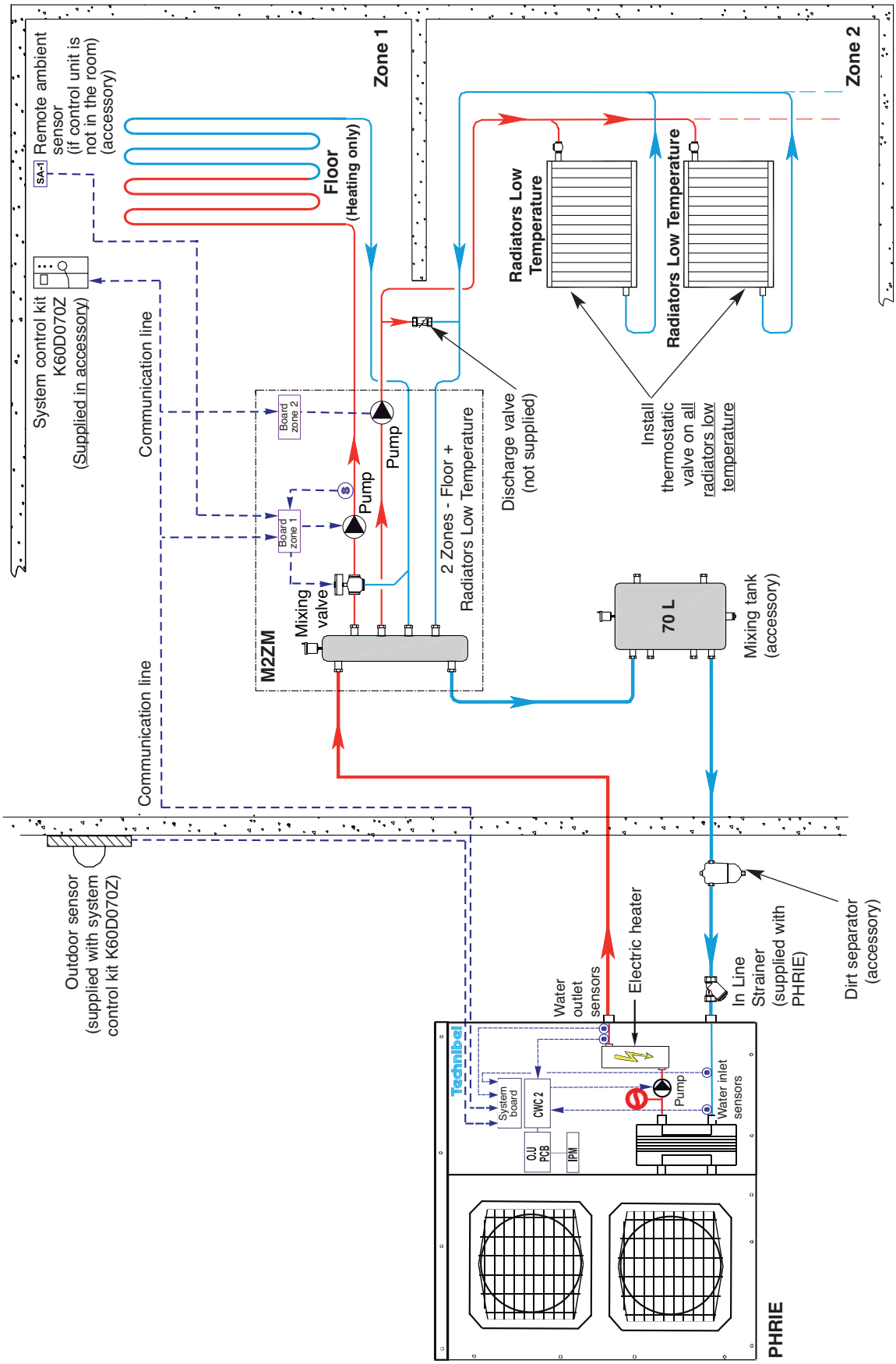
## 7.9 - HYDRAULIC SCHEMATIC DIAGRAM

GB

**Installation is to be performed in compliance with established trade practices and current standards.**

**Note:**
**For easy understanding, all isolation valves are not indicated on this drawing.**

**See accessories table.**



# 8 - 1-ZONE TERMINAL UNITS APPLICATION OPERATION

GB

- The operating modes are selected using the rotary knob on the front of the control unit (see § 3.1 and user's manual).
- In this application, the ambient temperature being controlled by the Terminal Unit thermostats, the control unit of the system displays, instead of the setpoints, the "**HEAT**" and "**COOL**" messages.

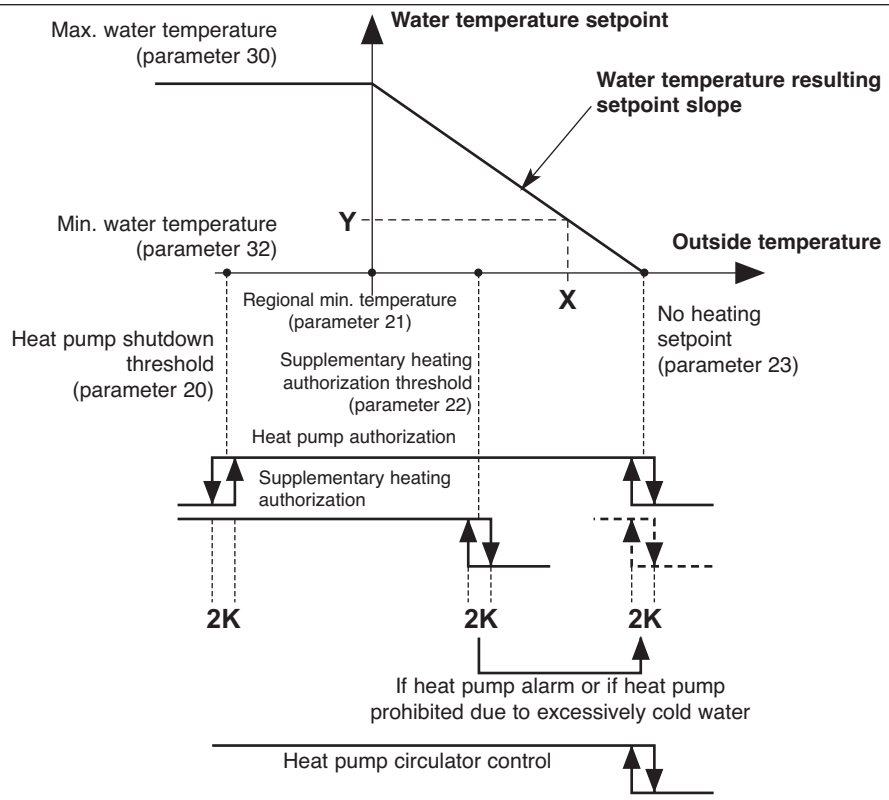
## 8.1 - HEATING MODE

### 8.1.1 - HEATING OPERATING DIAGRAM

An outside temperature **X** determines a resulting water temperature setpoint **Y**.

The parameters determining this water rule can be set by the installer (see the table in § 8.7).

The resulting setpoint is displayed at parameter 04.

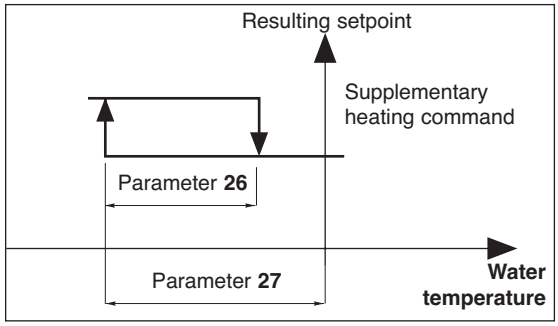



### 8.1.2 - "COMFORT" HEATING MODE ☼

- **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 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). Tiering is managed by a 10-minute time delay for the 2nd.




  - **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**
  - 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.
    - The “frost protection” function starts the circulator if the outside temperature is below 0°C. See details in paragraph 11.

### 8.1.3 - “ECONOMY” HEATING MODE ☽

- 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 heat pump'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.

### 8.1.4 - “ANTI-FREEZE” HEATING MODE (prolonged absence)

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

## 8.2 - COOLING MODE

- Selection is made using the rotary knob on the control unit for the entire installation.
- The heat pump operates with the water temperature set point (installation return) given in parameter 42.

- **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.

- **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 11.

- **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**”.

## 8.3 - ELECTRIC HEATER FORCING FOR MAINTENANCE

- See details in Service Manual.
- When installation system control is “**OFF**”, it is possible to activate, for a limited time, the electric support heater.
- This sequence can only be performed by a qualified technician during maintenance operation.

The sequence is controlled by mean of parameters 40 and 41 after being sure that water circulator is forced.

## 8.4 - 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**".

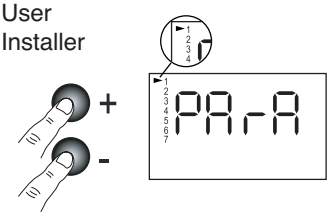
## 8.5 - MISCELLANEOUS

- 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 1 K for the reset.

## 8.6 - PARAMETERS

- **Access:**
  - 2 access levels:
    - Level 1, read only, with direct access for parameters 1 to 19,
    - Level 2, "technical level" accessible by password "**see last page**".
      This level is entered via parameter 20, although all parameters are accessible.

1: User
2: Installer

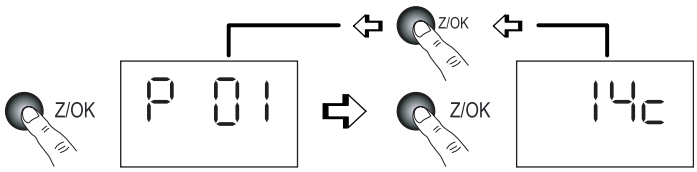



**Procedure**:

1°) Simultaneously press and hold the buttons ⊕ and ⊖ for 5 seconds, until the screen displays **PArA**.

2°) Select the **User** menu **= Level 1** or **Installer = Level 2** using the ⊕ and ⊖ buttons.

3°)* To access **level 1**, press "**Z/OK**.
The display indicates the first parameter "**P01**".
Press the ⊕ or ⊖ keys to shift from one parameter to another.
To know the value of the parameter, press **"Z/OK"**.
To redisplay the value of the parameter, press **"Z/OK"** again.




Access to the 1st parameter (P01) Display of the parameter value

3Bis°)* To access **level 2**, press **"Z/OK"**.
The display shows "□□□□".
Enter the password digit by digit, by selecting the desired digit using the ⊕ or ⊖ buttons and by confirming with **"Z/OK"**. Once the password is entered, the display then indicates "**P20**" which is the first parameter of this level.
To display the value of a parameter, select it using the ⊕ or ⊖ keys and press **"Z/OK"**.
To modify this parameter, if needed, press keys ⊕ or ⊖.
To redisplay the value of the parameter, press **"Z/OK"** again.

4°) To exit the parameterisation procedure, press and hold **"Z/OK"**.
In all cases (except the flow-rate calculation), the display returns to normal automatically after a few minutes of inactivity.
The parameters can be accessed and modified both in operation and when shut down, except for those for installation configuration and default parameterisation which can only be accessed and modified when the installation is shut down.
**Note**:
The flashing parameter values are those that can be modified. Otherwise, the display remains steady.

GB

• **Configuration of installation type**

**IMPORTANT: THE FOLLOWING ELEMENTS MUST BE CARRIED OUT EACH TIME THE INSTALLATION IS PLACED INTO SERVICE**

- For the Terminal Units application, parameter 70 must be set to "**5**".
- **Procedure**:
  1) Set the rotary knob on the control unit to the "**Stop**" position.
  2) Go to parameter 70. Press the **"Z/OK"** button; the value of the parameter is displayed. This value may be read or modified using the ⊕ and ⊖ buttons if the system is in the "**Stop**" position. If parameters are modified, an initialisation process is launched automatically (the "**init**" message is displayed). When initialisation is completed, the display returns to parameter 70.
     **Note**: If this parameter is set in other than the "**Stop**" position, the "**STOP**" message flashes and the parameter cannot be modified.
  3) Once the configuration parameters have been verified, disconnect and re-establish the system's power supply to reset the control system.

• **Default configuration**
- This enables the default values (see list) of all parameters to be reset according to the type of installation.
- 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.
    **Note**:
    If this parameter is set in other than the "**Stop**" position, the word "**STOP**" flashes and the configuration cannot be launched.
  - Press and hold the **"Z/OK"** button for 5 seconds to launch the default configuration. The "**init**" message flashes. When initialisation is completed, the display returns to parameter 60.

• **Calibration of temperature sensors ("Offset")**
- The value displayed by certain sensors may be adjusted. To do this, move to the corresponding parameter and enter the desired value (+/- 3 degrees maximum).

• **Heat pump control 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.**

## 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 |

## 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 |
| | **Electric heater forcing** (for maintenance only): | | | |
| 40 | Total electric heating capacity | T | 1 / 30 kW | 6 kW |
| 41 | Launch of the sequence | 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 | 50 °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 = FR; 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 | | | **Set to:** |
| | **5 = Terminal units** ----------→ | | | (5) |
| | 6 = 1 Zone radiators | | | |
| 71 | Reversibility (1 = reversible - 0 = heating only) | T | 0/1 | 1 |
| 75 | Load shedding action (1 = closed contact = load shedding) | T | 0/1 | 1 |
| 76 | CWC2 board activation (1 = Activated) | T | 0/1 | 1 |
| | **Software versions:** | | | |
| 80 | Control unit | T | | Read only |
| 81 | Heating board | T | | |
| 85 | CWC2 board | T | | |

## 8.7 - ALARMS

GB

- The alarms are indicated by a message flashing alternately on the display.

| ALARM | CODE | ACTION | NTR (nothing to report) |
|---|---|---|---|
| Heat pump fault | **Gr (*)** | **In heating mode**:<br>Suppression of the supplementary heating authorization threshold according to the outside temperature.<br>Supplementary heating load shedding prohibited.<br>Automatic switching to Anti-freeze Mode if case of a fault (indicated by the absence of the bar graph).<br>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.<br>**In cooling mode**: heat pump shutdown.<br>**In Anti-freeze mode**:<br>Suppression of the supplementary heating authorization threshold.<br>Supplementary heating load shedding prohibited. | Manu. |
| Heater fault | **HE** | Prohibits supplementary heating operation. | Auto (**) |
| Outside air sensor fault | **SAE** | **Heating**: operation with resulting setpoint 40 °C.<br>Suppression of outside temperature thresholds.<br>**Cooling**: no action. | Auto |
| Installation return water sensor fault | **SEIn** | System shut-down | Auto |
| Installation outlet water sensor fault | **SEOu** | System shut-down | Auto |
| Communication or system fault | **Cn** | System shut-down | Auto |
| Water flowrate fault | **FL** | Prohibits supplementary heating operation (and the heat pump). | Manu. |
| Max. water outlet temperature fault (Adjustable threshold 70°C, parameter 37) | **tE** | System shut-down | Manu. |

- Manual reset: by system shut-down after clearing the source of the fault.
  The heat pump alarms (**Gr, FL**) can also be reset by pressing the button on the **CWC2** board or by disconnecting the power supply.
- 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.

(*) The exact nature of the heat pump alarm can be known by connecting the specific maintenance keypad display to the heat pump.

(**) Overheat security with manual reset on the body of the heater. See the heat pump's installation instructions.

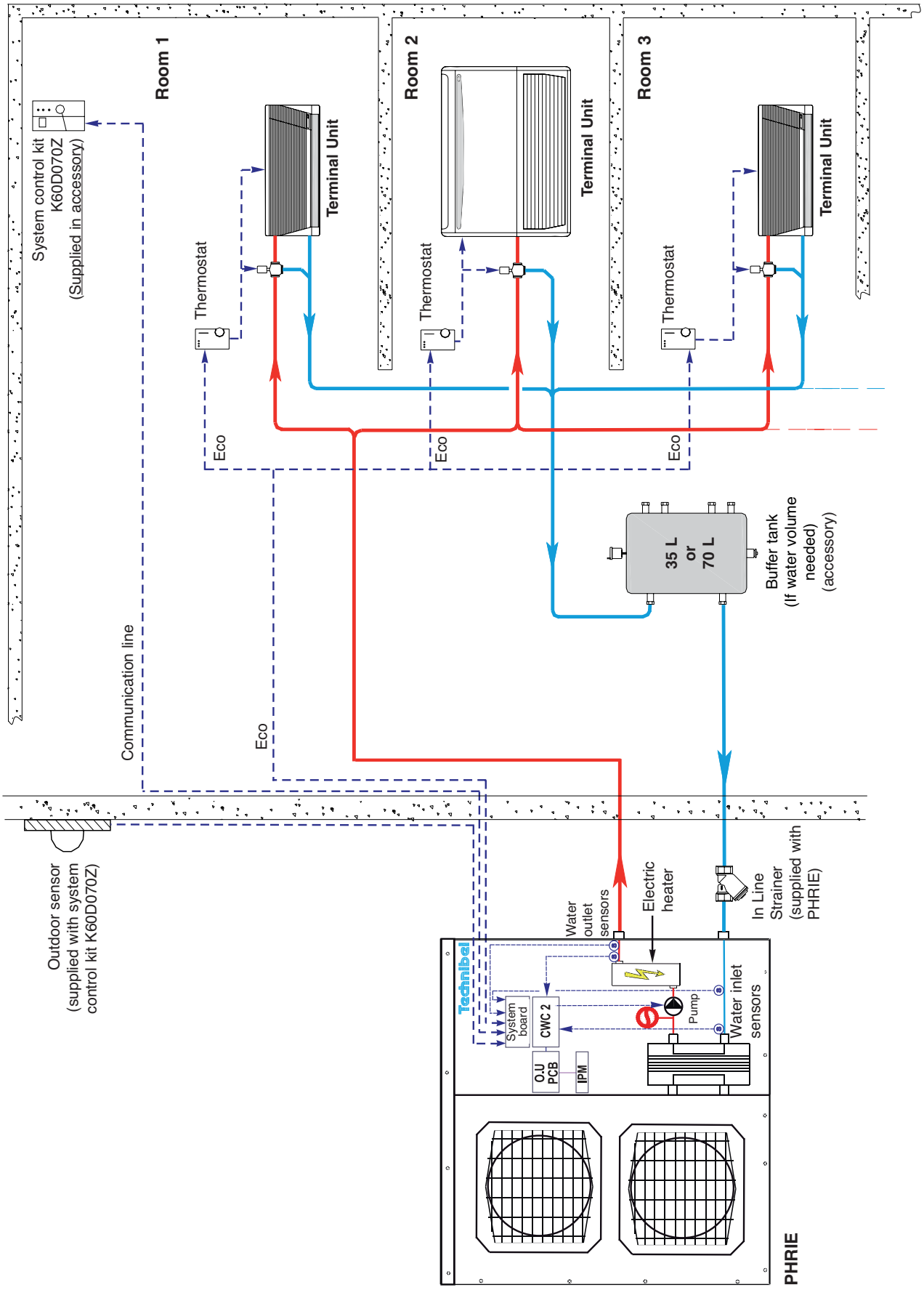
## 8.8 - HYDRAULIC SCHEMATIC DIAGRAM

**Installation is to be performed in compliance with established trade practices and current standards.**

**Note:**
**For easy understanding, all isolation valves are not indicated on this drawing.**

**See accessories table.**

GB



# 9 - 1-ZONE LOW TEMPERATURE RADIATORS APPLICATION OPERATION

GB

• The operating modes are selected using the rotary knob on the front of the control unit (see § 3.1 and user's manual).

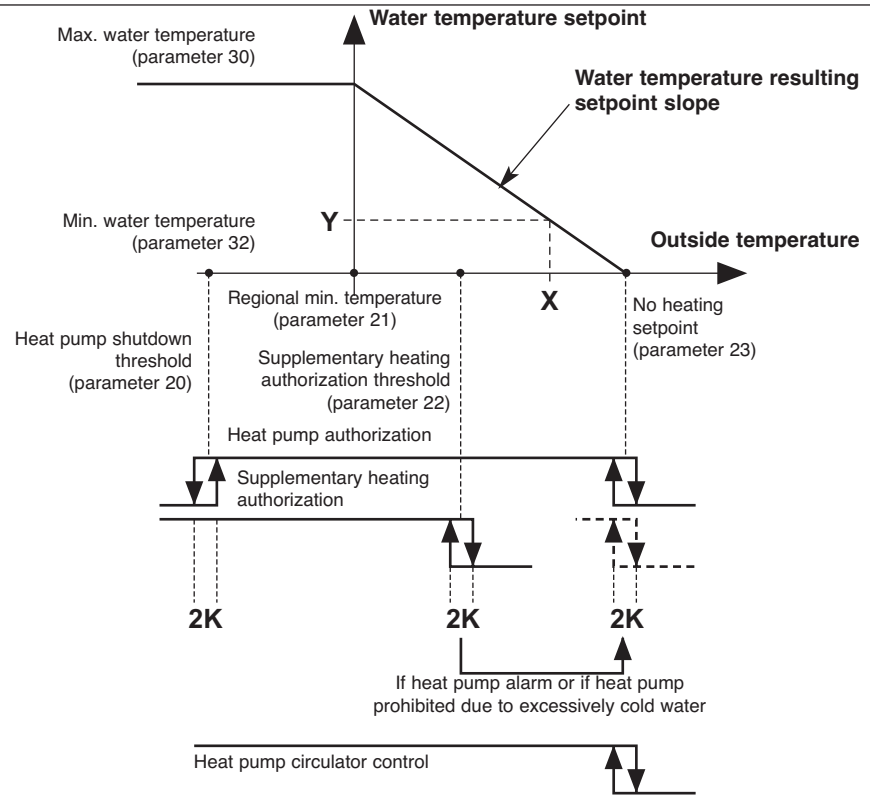
## 9.1 - HEATING MODE

### 9.1.1 - HEATING OPERATING DIAGRAM

An outside temperature **X** determines a resulting water temperature setpoint **Y**.

The parameters determining this water rule can be set by the installer (see the table in § 9.6).

The resulting setpoint is displayed at parameter 04.
It can be corrected as required depending on the ambient temperature of the zone.




### 9.1.2 - "COMFORT" HEATING MODE ☼

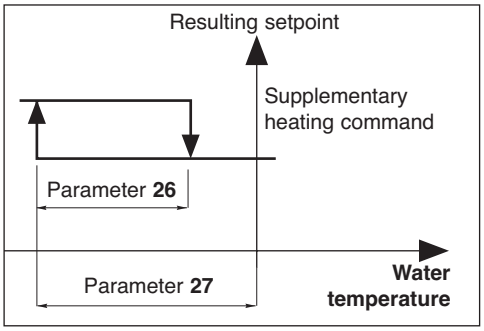
• **Temperature setpoint**

- The heat pump can operate only if the outside temperature is less than the non-heating temperature.
- The heat pump is controlled according to a **resulting set point** of the water temperature.
- **Control on installation return** calculated according to an adjustable water law, 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 3 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 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). Tiering is managed by a 10-minute time delay for the 2nd.
- **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.



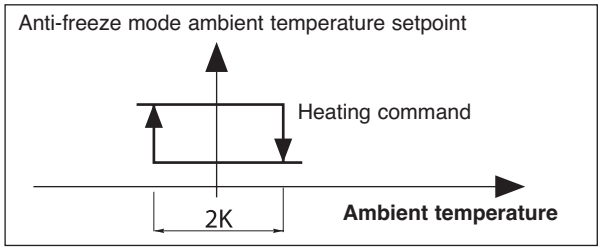
- **Heat pump operating safety features in heating mode**
  - A safety device on the water temperature (installation return) prohibits heat pump operation if this temperature is below the thermodynamic heating authorization threshold (parameter 36). In this case, only supplementary heating is authorized 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 authorized 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.
    - The “frost protection” function starts the circulator if the outside temperature is below 0°C. See details in paragraph 11.

### 9.1.3 - “ECONOMY” HEATING MODE ☽

- The switch to “**ECO**” mode lowers the ambient temperature setpoint by a value than can be adjusted from 1 to 4 K (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.

### 9.1.4 - “ANTI-FREEZE” HEATING MODE (prolonged absence)

- 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 35°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).




## 9.2 - COOLING MODE

**This mode cannot be activated in the application.**

- Selection of the “**COOL**” position (Summer) on the control unit has the same effect as switching off the system. “**OFF**” is displayed.

## 9.3 - ELECTRIC HEATER FORCING FOR MAINTENANCE

- See details in Service Manual.
- When installation system control is “**OFF**”, it is possible to activate, for a limited time, the electric support heater.
- This sequence can only be performed by a qualified technician during maintenance operation.

The sequence is controlled by mean of parameters 40 and 41 after being sure that the heat pump water circulator is forced and installation circulator is operating.

GB

## 9.4 - 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**".

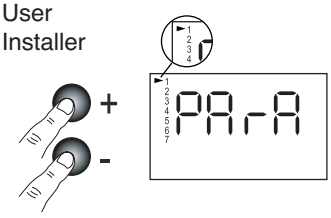
## 9.5 - MISCELLANEOUS

- 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 1 K for the reset.

## 9.6 - PARAMETERS

- **Access:**
  - 2 access levels:
    - Level 1, read only, with direct access for parameters 1 to 19,
    - Level 2, "technical level" accessible by password "**see last page**".
      This level is entered via parameter 20, although all parameters are accessible.

1: User
2: Installer

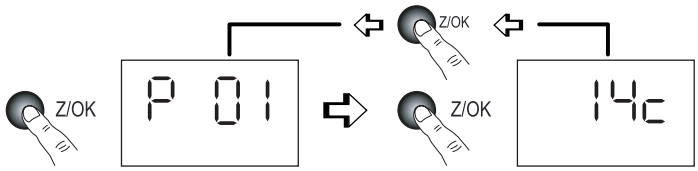



**Procedure**:

1°) Simultaneously press and hold the buttons ⊕ and ⊖ for 5 seconds, until the screen displays **PArA**.

2°) Select the **User** menu **= Level 1** or **Installer = Level 2** using the ⊕ and ⊖ buttons.

3°)* To access **level 1**, press "**Z/OK**.
The display indicates the first parameter "**P01**".
Press the ⊕ or ⊖ keys to shift from one parameter to another.
To know the value of the parameter, press **"Z/OK"**.
To redisplay the value of the parameter, press **"Z/OK"** again.




Access to the 1st parameter (P01) Display of the parameter value

3Bis°)* To access **level 2**, press **"Z/OK"**.
The display shows "□□□□".
Enter the password digit by digit, by selecting the desired digit using the ⊕ or ⊖ buttons and by confirming with **"Z/OK"**. Once the password is entered, the display then indicates "**P20**" which is the first parameter of this level.
To display the value of a parameter, select it using the ⊕ or ⊖ keys and press **"Z/OK"**.
To modify this parameter, if needed, press keys ⊕ or ⊖.
To redisplay the value of the parameter, press **"Z/OK"** again.

4°) To exit the parameterisation procedure, press and hold **"Z/OK"**.
In all cases (except the flow-rate calculation), the display returns to normal automatically after a few minutes of inactivity.
The parameters can be accessed and modified both in operation and when shut down, except for those for installation configuration and default parameterisation which can only be accessed and modified when the installation is shut down.
**Note**:
The flashing parameter values are those that can be modified. Otherwise, the display remains steady.

• **Configuration of installation type**

**IMPORTANT: THE FOLLOWING ELEMENTS MUST BE CARRIED OUT EACH TIME THE INSTALLATION IS PLACED INTO SERVICE**

- For the 1-zone radiator application, parameter 70 must be set to "**6**".
- **Procedure**:
  1) Set the rotary knob on the control unit to the "**Stop**" position.
  2) Go to parameter 70. Press the **"Z/OK"** button; the value of the parameter is displayed. This value may be read or modified using the ⊕ and ⊖ buttons if the system is in the "**Stop**" position. If parameters are modified, an initialisation process is launched automatically (the "**init**" message is displayed). When initialisation is completed, the display returns to parameter 70.
     **Note**: If this parameter is set in other than the "**Stop**" position, the "**STOP**" message flashes and the parameter cannot be modified.
  3) Once the configuration parameters have been verified, disconnect and re-establish the system's power supply to reset the control system.

• **Default configuration**
- This enables the default values (see list) of all parameters to be reset according to the type of installation.
- 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.

**Note**:
If this parameter is set in other than the "**Stop**" position, the word "**STOP**" flashes and the configuration cannot be launched.
  - Press and hold the **"Z/OK"** button for 5 seconds to launch the default configuration. The "**init**" message flashes. When initialisation is completed, the display returns to parameter 60.

• **Calibration of temperature sensors ("Offset")**
- The value displayed by certain sensors may be adjusted. To do this, move to the corresponding parameter and enter the desired value (+/- 3 degrees maximum).

• **Heat pump control 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.**

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

| No. | DESIGNATION | ACCESS | RANGE | VALUE / DEFAULT |
|---|---|---|---|---|
| | **Status:** | | | |
| 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) | | | 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 | (unused) | | | |
| 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 |

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| N° | DÉSIGNATION | ACCÈS | PLAGE | VALEUR / DÉFAUT |
|---|---|---|---|---|
| | **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 / 45 °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 |
| | **Electric heater forcing** (for maintenance only): | | | |
| 40 | Total electric heating capacity | T | 1 / 30 kW | 6 kW |
| 41 | Launch of the sequence | T | | |
| | **Heat pump parameters:** | | | |
| 42 | (unused) | | | |
| 43 | Maximum water temperature set point (return), heating | T | 40 / 50 °C | 50 °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 = FR; 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 | Load shedding action (1 = closed contact = load shedding) | T | 0/1 | 1 |
| 76 | CWC2 board activation (1 = Activated) | T | 0/1 | 1 |
| | **Software versions:** | | | |
| 80 | Control unit | T | | Read only |
| 81 | Heating board | T | | |
| 85 | CWC2 board | T | | |
| | **DHW :** | | | |
| 90 | ECS board 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 |

## 9.7 - ALARMS

- The alarms are indicated by a message flashing alternately on the display.

| ALARM | CODE | ACTION | NTR (nothing to report) |
|---|---|---|---|
| Heat pump fault | **Gr (*)** | **In heating mode**: | Manu. |
| | | 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 generator failure is present. | |
| | | **In Anti-freeze mode**: | |
| | | Suppression of the supplementary heating authorization threshold. | |
| | | Supplementary heating load shedding prohibited. | |
| 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 |
| Ambience sensor fault zone 1 | **SA1** | System shut-down | Auto |
| Communication or system fault | **Cn** | System shut-down | Auto |
| Water flowrate fault | **FL** | Prohibits supplementary heating operation (and the heat pump). | Manu. |
| Max. water outlet temperature fault (Adjustable threshold 70°C, parameter 37) | **tE** | System shut-down | Manu. |

- Manual reset: by system shut-down after clearing the source of the fault.
  The heat pump alarms (**Gr, FL**) can also be reset by pressing the button on the **CWC2** board or by disconnecting the power supply.
- 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.

(*) The exact nature of the heat pump alarm can be known by connecting the specific maintenance keypad display to the heat pump.

(**) Overheat security with manual reset on the body of the heater. See the heat pump's installation instructions.

## 9.8 - HYDRAULIC SCHEMATIC DIAGRAM

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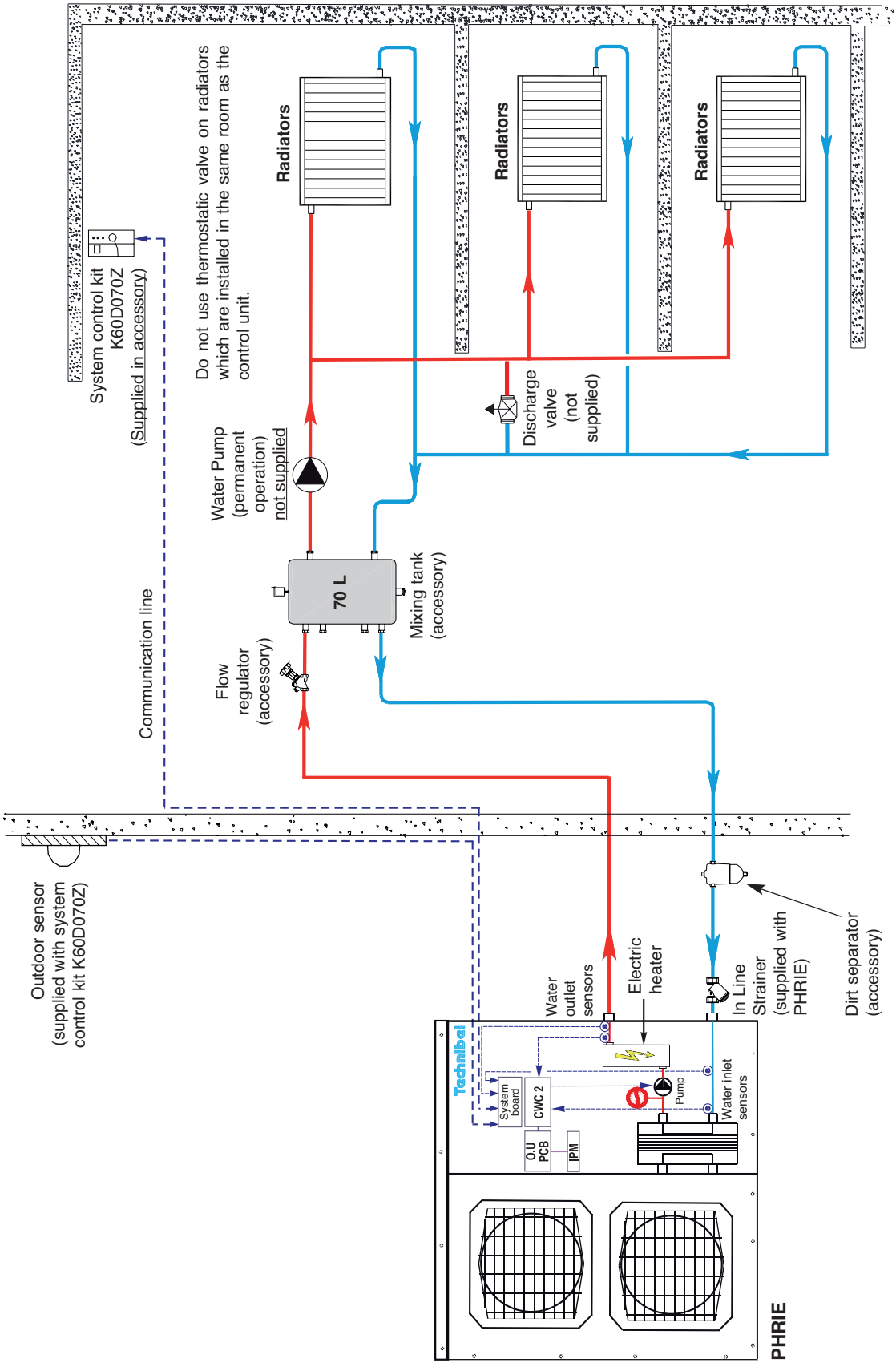
**Installation is to be performed in compliance with established trade practices and current standards.**

**Note:**
**For easy understanding, all isolation valves are not indicated on this drawing.**

**See accessories table.**



# 10 - DOMESTIC HOT WATER (DHW) PREPARATION OPERATION



- Only **1 zone Radiators** application.
- Function performed by the **ECS** board installed in the DHW tank control box.

**Note:**

The board micro-switch must be switched to "**ON**" and parameter 90 set to "**1**" in order to activate the function.

## 10.1 - PRINCIPLE (see hydraulic schematic diagram in § 10.6.)

- A three way **ON/OFF** valve (spring return) controlled by the **ECS** board allows the hot water produced by the heat pump:
  - either into the radiator circuit to heat the installation,
  - or to an exchanger located in the domestic hot water tank during an DHW cycle controlled by the **ECS** board.

## 10.2 - OPERATION

- If the probe located in the DHW tank detects a temperature lower than a predetermined threshold = 35°C, a thermodynamic DHW heating cycle is triggered:
  - DHW valve is activated,
  - the heat pump is forced in heating mode (see detail below),
  - the electrical supplementary heating is forbidden,
  - the DHW tank electrical heating is forbidden.
  - start-up of the heating circulating pump if stopped.
- The user is alerted to a DHW cycle by the pictogram displayed on the control unit.
- An DHW cycle stops in each of the following circumstances:
  - when the temperature read by the DHW tank probe exceeds an adjustable threshold on parameter 91,
  - when an DHW 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 heat pump is in safe mode (based on the water return temperature or the outside temperature).
- The stop sequence for an DHW cycle is the following:
  - the DHW valve is deactivated,
  - the heat pump and its electrical backup are controlled normally again by the heating system,
  - electric tank heating is authorized again.
  - shut-down of the heating circulating pump, if needed (see below).
- **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**").
- **Heating system circulating pump control**:
  - in "**OFF**" mode , circulating pump stopped,
  - in "**Summer**" mode, controls the circulating pump only when the DHW valve is activated (this prevents hot water from the system from being sent to the radiators, after a DHW cycle). Circulator start-up is delayed 20 seconds,
  - in "**Heating**" mode (**Comfort**, **Eco** or **Anti-freeze**), controls the circulating pump if the outside temperature is below the non-heating temperature threshold or if the DHW valve is activated,
  - a degripping device actuates the circulating pump for 3 seconds every 24 hours when not in operation.
- **Forcing of the heat pump in DHW mode**:
  - the heat pump operates using the following set point values:
    - in heating mode, the value of parameter 43,
    - in "**SUMMER**" mode (**DHW** alone), the value given at parameter 43 reduced by 5 K.

With the **DHW function**, it is recommended that **P43 be set at 50°C**.

## 10.3 - TIMER PROGRAMMING

- The DHW 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.

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## 10.4 - ALARM

- The DHW pictogram on the control unit display flashes and indicates that thermodynamic DHW heating is not available for the following reasons:
  - the board micro-switch is set to "**OFF**",
  - communication fault,
  - loss of power supply to the board,
  - faulty temperature probe (tank or water inlet).
- The **ECS** board goes into fallback:
  - DHW valve control stops,
  - tank electric heating forbidden output deactivated,
  - **PAC** (heat pump) forcing signal stops,
  - **circulating pump activated** (priority to the heating system).
- A positioning fault of the DHW valve causes the DHW cycle to stop and a specific alarm to be triggered (see § 9.7).

## 10.5 - SPECIFIC PARAMETERS

- See general points in § 9.6.

| No | DESIGNATION | ACCESS | RANGE | VALUE / DEFAULT |
|---|---|---|---|---|
| | **Software version:** | | | |
| 84 | ECS board | T | | Read only |
| | **DHW :** | | | |
| 90 | Board present | T | 0/1 | 0 |
| 91 | Tank temperature threshold for DHW cycle interruption | T | 40 / 60 °C | 45 °C |
| 92 | Exchanger/tank water inlet temperature difference threshold | T | 4 / 8 K | 4 K |
| 93 | Maximum DHW 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 | Forcing outputs OFF (DHW valve + circulating pump) | T | 0/1 | 0 |
| 98 | DHW tank temperature | D | - 40 / 90 °C | Read only |
| 99 | DHW exchanger water inlet temperature | D | - 40 / 90 °C | |

- Forced outlet:
  - Possibility (when stopped) to force the valve control to DHW position (**Y1**) and the circulating pump position (**Y2**) using parameter 97.
  - **At the end of the forcing operation, forcing must be deactivated (by returning parameter 97 to "0").**
    **After deactivation, the message "UA" is displayed for approximately 3 minutes. Wait for this message to disappear before restarting the system.**
- **Note**:

  If the ECS board 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.

## 10.6 - HYDRAULIC SCHEMATIC DIAGRAM

**Installation is to be performed in compliance with established trade practices and current standards.**

**Note:**
**For easy understanding, all isolation valves are not indicated on this drawing.**

**See accessories table.**

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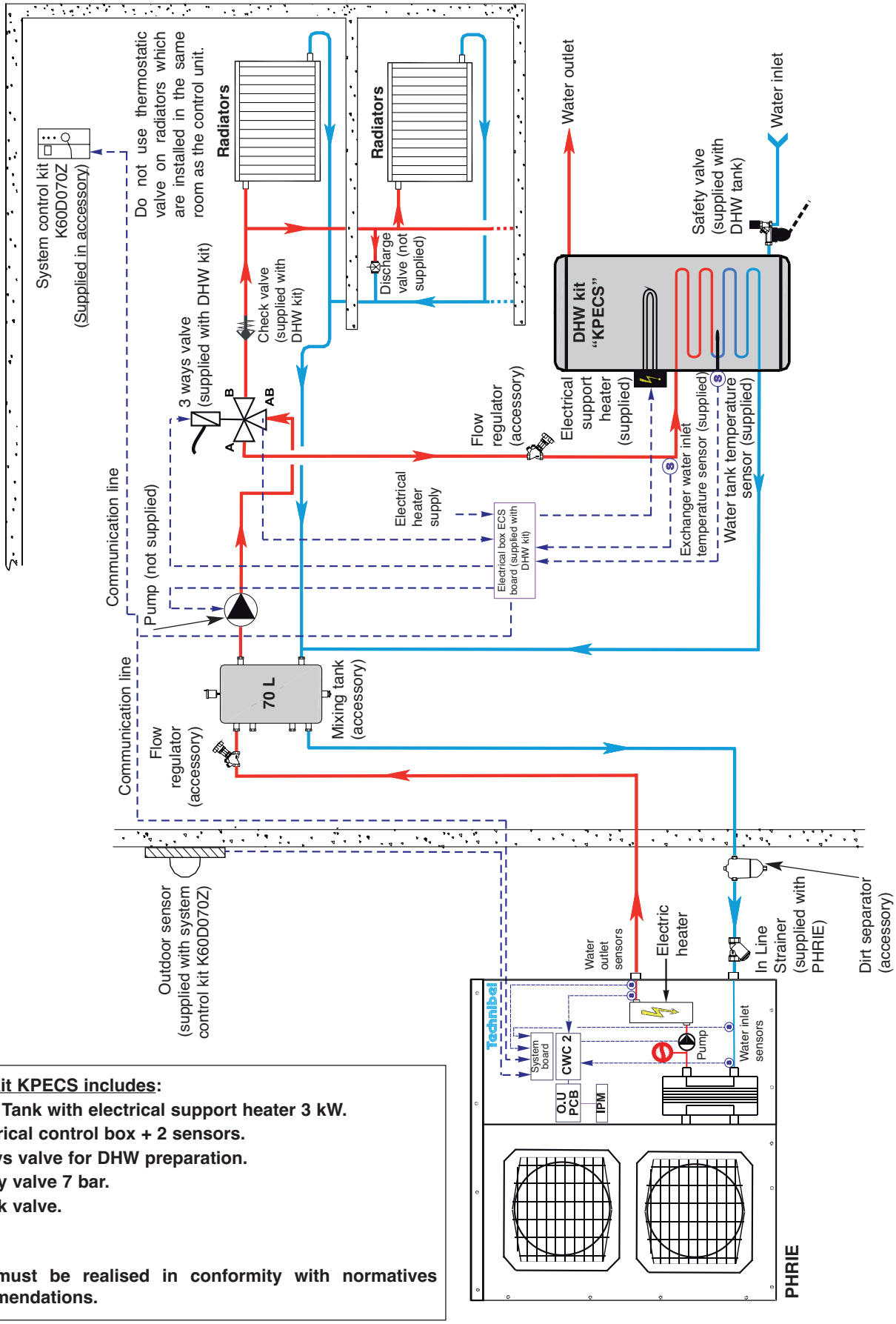


**DHW Kit KPECS includes:**

- **DHW Tank with electrical support heater 3 kW.**
- **Electrical control box + 2 sensors.**
- **3 ways valve for DHW preparation.**
- **Safety valve 7 bar.**
- **Check valve.**

**Note:**
**DHW must be realised in conformity with normatives recommendations.**

# 11 - CWC2 CONTROL BOARD PRESENTATION

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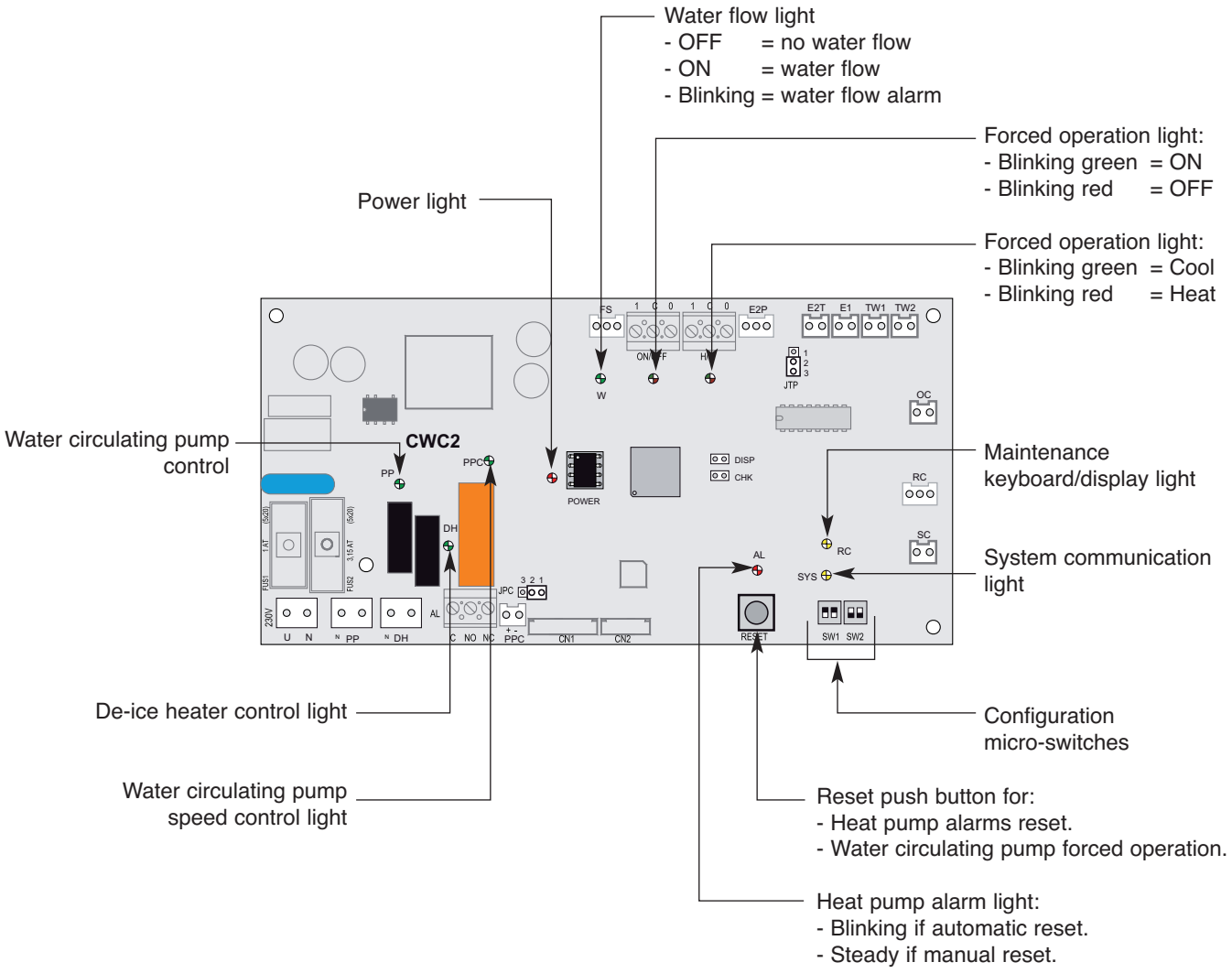
**CWC2** communication and control board is mounted inside the heat pump. It is connected to the system control by means of the BUS communication line.
It ensures 3 functions:

- Communication interface between system control and heat pump control.
- Management of the heat pump heat exchanger and water circulating pump.
- Possible base de-ice electric heater control.

A set of button/micro-switches/lights takes place on the board.




## 11.1 - COMMUNICATION FUNCTION

### 11.1.1 - SIGNALS SENT BY THE SYSTEM TO THE HEAT PUMP

- Stop/authorisation.
- Heating/Cooling operating mode.
- Temperature operating setpoints (installation outgoing water).

### 11.1.2 - HEAT PUMP ALARM SIGNALS FOR THE SYSTEM

- **“Gr” alarm**:
  Generated in the event of a water flow fault (see paragraph 11.2) or a heat pump fault.
  Heat pump faults are classified in 2 categories:
  - **Manual reset faults**:
    Stored by the board when they appear. The board's alarm light comes on steady.
  - **Automatic reset faults**:
    The board's alarm light blinks.
    The fault is stored in the board's memory only if it lasts longer than 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 maintenance manual.
  To determine the exact nature of the fault, refer to **LED1/LED2** on the power board, item **A3** or connect the specific maintenance keypad/display unit to the heat pump. (see maintenance manual).

## 11.2 - WATER CIRCULATION MANAGEMENT



• **Circulator control**:
- In heating mode, actuated if the outside temperature is less than the non-heating temperature.
- In cooling mode, actuated as soon as the mode is selected.
- By forcing during maintenance operations (see paragraph 11.4). Forcing is activated or deactivated by pressing and holding (5 seconds) the board 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**": function activated by setting micro-switch **SW1-1** to "**ON**" (delivery default setting). The pump is started if outside temperature is below 0°C.
- "**Forcing**".

• **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 alarm light "**AL**" 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 alarm light "**AL**" then remains on steady,
- the circulator stops,
- the "**FL**" alarm has to be sent to the system, for that, **the micro-switch SW1-2 must be set to "ON"**.

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

• **Water circulating pump speed control**:

Allows to drive the water circulating pump speed according heat pump operation conditions by means of output signal "**PPC**".

**NOT ACTIVATED ON THIS VERSION**

The type of this output is either "**PWM**" or "**0/10V**" according the type of the water pump:
- "**PWM**" configuration: - Jumper "**JPC**" on "**1-2**".
  - Micro-switch "**SW2-2**" on "**OFF**".
- "**0/10V**" configuration: - Jumper "**JPC**" on "**2-3**".
  - Micro-switch "**SW2-2**" on "**On**".

This speed control function is activated by setting micro-switch "**SW2-1**" on "**ON**" (delivery default setting = "**OFF**").

## 11.3 - DE-ICE HEATER CONTROL

Activated in heating mode only for a 30 minutes cycle if the heat pump starts a defrost sequence with a outdoor temperature lower than 0°C.

## 11.4 - STAND-ALONE OPERATION OF THE HEAT PUMP (Off-system)

For the maintenance and commissioning operations, the heat pump can be operated in a stand-alone configuration, off-system, using the specific maintenance keyboard / display.

The system can be disconnected in two ways:
- Either, with power off, disconnect the system communication line "BUS" from **CWC2** board.
- Or, by the system control unit, deactivate heat pump control by setting parameter 76 to "**0**".

**Note:**

**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 heat pump control is reactivated, a new parameterisation operation corresponding to the installation must performed.**

To operate the heat pump, force the circulator before initiate an order via the specific maintenance keyboard/display unit command.

Consult the maintenance manual.

**Note:**

Inputs for external contacts are available on **CWC2** border in order to force heat pump operation (**ON/OFF - HEAT/COOL**). These inputs have priority to the control signals initiated by means of the keyboard/display.

A voltage free change-over contact (use in 24 V max.) is available on **CWC2** board for remote heat pump alarm signalization.

For all details, please consult the maintenance contact.

# 12 - TELEPHONE CONTROL

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⚠ **Use in heating mode only**

- A **DELTA-DORE TYPHONE 500** type telephone control unit can be connected to the communication line (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 thus operates in "COMFORT" mode with the new setpoint.**

    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).

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