

Z1 Pilot

Hydraulic pilot for heat pumps



Installation manual

Z1 Pilot

78 litres - 10 hydraulic outlets

Ref. 753041



The information contained in this document is non-contractual. We reserves the right to modify the technical specifications or characteristics of any of their appliances without prior notice.

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1 - SAFETY

Danger resulting from improper qualifications

- Any work carried out by an unqualified person can result in damage to the installation or in physical injury.
- Do not perform maintenance on this appliance unless you are a qualified professional.
- If the appliance is malfunctioning or not working, cut the electricity supply to the electrical components and seek advice from a qualified professional.

Danger resulting from improper use

This appliance should not be used by anyone (including children under the age of 8 years old) with reduced physical, sensory or mental capabilities, or by anyone with insufficient experience or knowledge of the appliance; unless they are being supervised by someone who is responsible for their safety and in possession of the operating instructions of the appliance, or if they have been instructed in the proper use and in the risks of operating the appliance.

Children must not play with the appliance. Cleaning and maintenance of the appliance must not be undertaken by children without supervision.

Applicable areas of use

The appliance is intended for use as an appliance for the production of domestic hot water: it must be connected to a heating installation, and while complying with the instructions, connected to the drinking water network.

The intended use of the appliance includes the following points:

- Following the instructions for operating, installing and maintaining this appliance and all of its components.
- Ensuring the compliance of the appliance to all inspection and maintenance conditions which are listed in this manual.

Danger of death by electrocution

- Touching live electrical wires can cause severe bodily injury, and lead to death by electrocution. All installation and maintenance work must be carried out with the appliance switched off and by a qualified professional. Before carrying out any work on the appliance:
 - Cut-off the electricity supply.
 - Ensure that there is no possibility of the power supply becoming active again.
 - Wait at least 5 minutes for the capacitors to lose their charge.
- Do not get water on any of the control or electrical components. Always disconnect the appliance from the electricity supply before carrying out work on any of the electrical components.

Danger of death if the pressure relief valves are missing or defective

A defective pressure relief valve may prove dangerous and could lead to burns or other injuries by, for example, the pipes bursting.

The information presented in this document does not contain all of the schematic diagrams needed for a professional installation of the pressure relief valves.

- Install the necessary pressure relief valves on the circuit.
- Inform the user concerning the function and the placement of the pressure relief valves.
- Respect all applicable national and international regulations, standards and decrees.

Risk of corrosion

The appliance should be installed in an area where it is not exposed to humidity and without any risk of being splashed by water.

Risk of damage related to frost

The pilot MUST be installed in an area where it is not subject to frost or freezing.

Risk of material damage

The pilot can only work when filled with water. Never switch on the appliance if it is not completely filled with water and purged of air.

Rules and regulations (decrees, standards, laws)

Once the appliance is installed and switched on, all decrees, directives, technical rules, safety measures and standards, must be respected in their current version in effect.

The electrical supply must conform to all applicable regulations in the country of installation, as well as the NFC 15-100 standard.

- A method of disconnection ensuring a complete cut-off must be installed in the fixed piping to conform to installation regulations (do not use a movable outlet).
- Protect the appliance with a 2-pole circuit breaker with a minimum contact opening of 3mm and must be grounded.
- The devices for electrical cut-off must remain accessible.
- Water and/or R290 flammable gas can flow through the discharge pipe of the pressure limiting device (safety valve). This pipe must be kept open outside the building. The end of this pipe must be placed downwards (see § Connecting the pressure relief valve).

Maintenance - Troubleshooting

Maintenance and cleaning of the pilot must be carried out at least once a year by a qualified professional.

2 - PLEASE READ IMMEDIATELY

This technical installation manual forms part of the appliance which it refers to. In order for the warranty to be valid, the instructions must be read prior to using the appliance.

The safety advice and instructions provided in this manual must be strictly respected.

Our society is not liable for any damages caused from not following the instructions provided, or improper handling, installation or use.

This technical installation manual can be modified without prior notice.

2.1 - Conservation of documents

This manual must be safeguarded and passed on to successive users for future reference.

It will be considered as evidence in case of litigation.

2.2 - Symbols used



Indicates warnings and important recommendations.



Consult the installation manual before any intervention on the product, before handling, installation, use, and maintenance.



Contains regulated substances, do not throw in the garbage. If disposing, please respect all regulations pertaining to the recovery of electric and electronic equipment.



Indicates the maximum water temperature in operation.

PS_{max} Maximum working pressure.

2.3 - Abbreviations and acronyms

DHW Domestic Hot Water

DCW Domestic Cold Water

T° Temperature

HP Heat pump

2.4 - Delivery terms and conditions

In general, the material is transported at the recipient's own risk.

It is important to ensure that all components have been received and that no damage has been sustained during transport upon receipt of the appliance, and before beginning the installation procedures

2.5 - Storage and transport

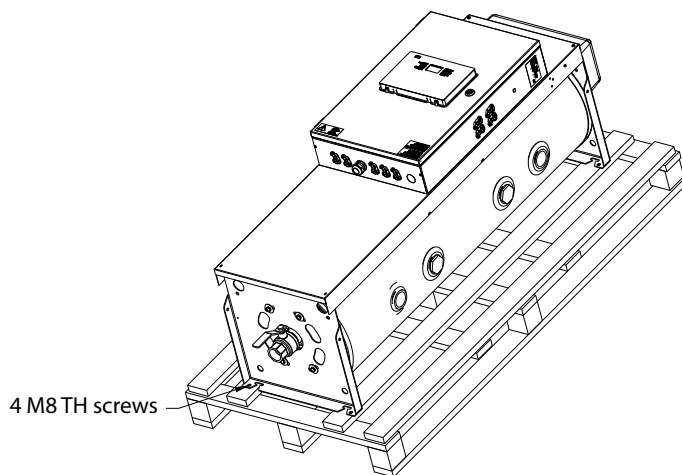
Admissible storage and transport temperatures are from -20°C to +60°C.

The **Z1 Pilot** must be stored in its packaging. It must be transported empty of water, horizontally, in its original packaging.

2.6 - Unpacking

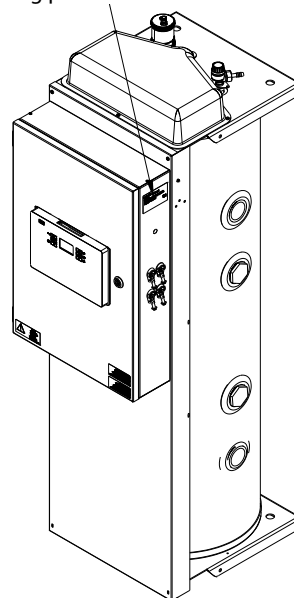
On receipt of the pilot, check the state of the packaging and the general condition of the appliance before unpacking.

The pilot is secured to the transport pallet by 4 TH8 screws. Remove these screws to install the driver.



2.7 - Rating plate

Rating plate



2.8 - End of life of the appliance

Our products are designed and manufactured using components made of recyclable materials.

The appliance must never, in any case, be disposed of with household waste, or in a dump.

The dismantling and recycling of the appliances must be taken charge of by a qualified professional and in compliance with all local and national standards in effect.



3 - INTRODUCTION

3.1 - General information

Z1 pilot is a hydraulic pilot which ensures working installations with high power heat pumps. Its integrated tank ensures the decoupling of the heat pumps circuits as well as the air bleeding and the evacuation of the sludge.

If the power required by the installation is greater than the power delivered by the heat pump, the pilot can call on an electric booster (optional) or an external boiler.

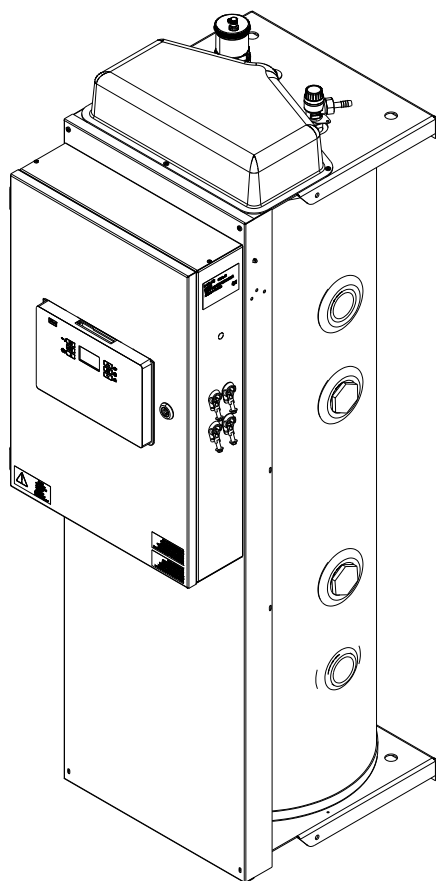
The **Z1 pilot** is equipped with :

- One 78 litres wall tank with air bleed, pressure sensor, pilot sensor, 6bars pressure relief valve and settling valve.
- One electronic control to monitor the installation and control external boiler backup.

Optional distribution branches can be added (up to 2 branches) for installation including several circuits or heat pumps :

- up to 3 heat pumps;
- up to 4 sanitary circuits or heating circuit.

The distribution branches dedicated to heat pumps ensure the circulation in heat pumps. They must not be connected in the case of heat pumps which have their own circulator (HRC⁷⁰ 40 kW).



3.2 - Packaging

	Weight (kg)	Number of packages	W (mm)	H (mm)	P (mm)
Z1 Pilot	75	-	738	800	1536

3.3 - Accessories (included)

The components described below are supplied with the pilot :

• Exterior sensor

Gives the pilot the outside temperature to adapt its heating set point.



• USB memory stick

Allows downloading of the operating history.



Ensure to keep the original delivered USB flash drive.
It will facilitate your exchanges with your technical contacts.

• Caps 1"1/2

Used to caps unused hydraulic inlets and outlets on the pilot cylinder.

• Ambient temperature thermostat (TA)

2 wires - allows to control the temperature in the heating zone.
(Ref. 710043)



3.4 - Optional accessories available

• Hydraulic distribution branch

For distribution to a heating circuit or domestic hot water cylinder.
(Ref. 755823)

• Ambient temperature sensor (SA) Only for a heating circuit in circuit 1.

2 wires - allows to control the temperature of the heating zone on a variety of comfort levels (programmable from the pilot).
(Ref. 751009)



• Ambient temperature thermostat radio non-chronoproportional -TH_{Rnc}

(on/off type). Wireless, programmable thermostat, transmitting through radio-frequency. Necessary when a wired connection between the **Z1 Pilot** and the ambient temperature thermostat is not possible.
(Ref. 770001)

• Thermo-Net gateway

Communication gateway for remote comfort control via an Internet box.
(Ref. 770002)

• DHW sensor

For the production of domestic hot water.
(Ref. 710029)

• DHW aquastat

For the production of domestic hot water.
(Ref. 752202)

• Shielded bus connection cable - length 20 m

For bus connection between pilot and heat pump.
(Ref. 753102)

• Shielded bus connection cable - length 50 m

For bus connection between pilot and heat pump.
(Ref. 754103)

• Heat pump hydraulic branch

For models below 40kW with PWM circulator.
(Ref. 754205)

• 6kW Electrical back-up

(Ref. 754105)

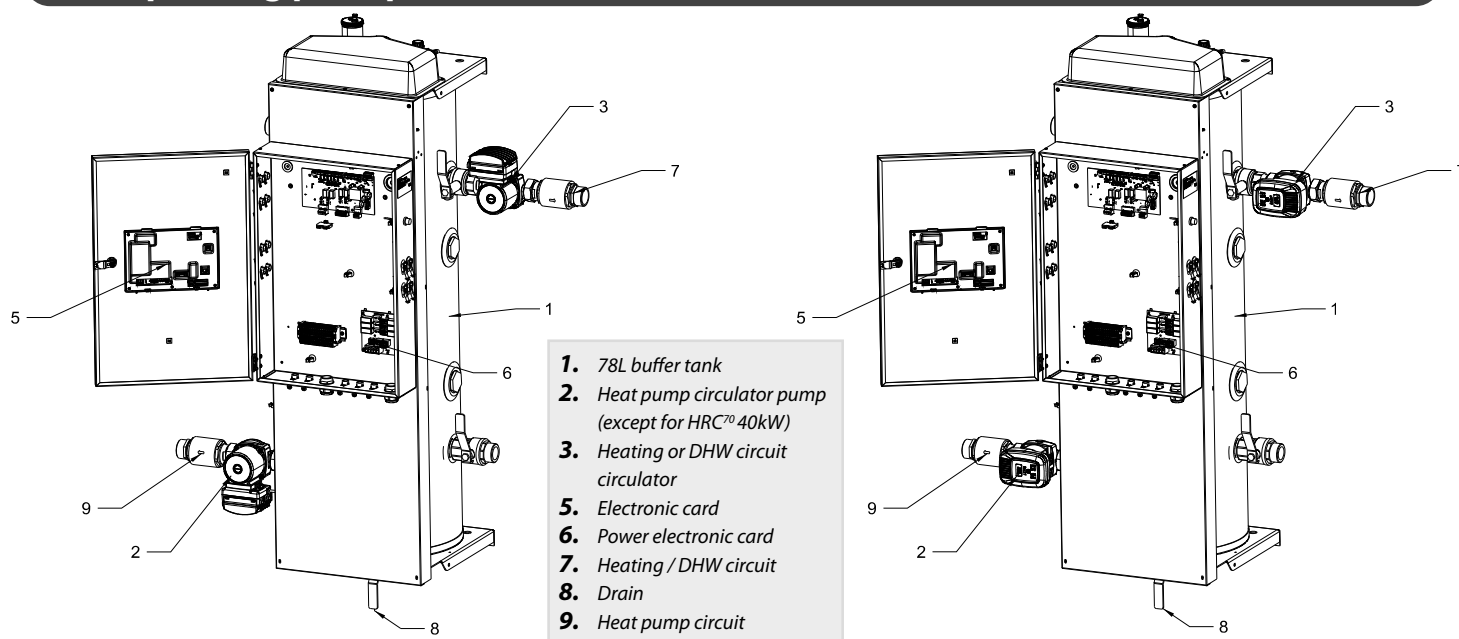
• V3V start sensor

Underfloor heating temperature sensor for installations with a second high-temperature circuit.
(Ref. 710158)

3.5 - Choice and compatibility of ambient controllers

Controller compatibility table by heating zone			
Heating zone 1	Heating zone 2	Heating zone 3	Heating zone 4
Ambient thermostat (Ref. 710043) supplied as standard	Ambient thermostat (Ref. 710043)	Ambient thermostat (Ref. 710043)	Ambient thermostat (Ref. 710043)
Non chronoproportional ambient temperature radio thermostat TH RNC/2 (Ref. 770001)	Non chronoproportional ambient temperature radio thermostat TH RNC/2 (Ref. 770001)	Non chronoproportional ambient temperature radio thermostat TH RNC/2 (Ref. 770001)	Non chronoproportional ambient temperature radio thermostat TH RNC/2 (Ref. 770001)
Ambient temperature sensor with display (Ref. 751009)			

3.6 - Operating principles



4 - INSTALLATION

4.1 - Placement choice

4.1.1 - Appropriate placement choice

The Pilot must be placed in an area which is free from frost and adverse weather conditions.

It must be placed as close as possible to the heat pump without exceeding the maximum distance.

The maximum distance depends on the diameter of piping and the number of elbows used (see «Hydraulic connection» tables).

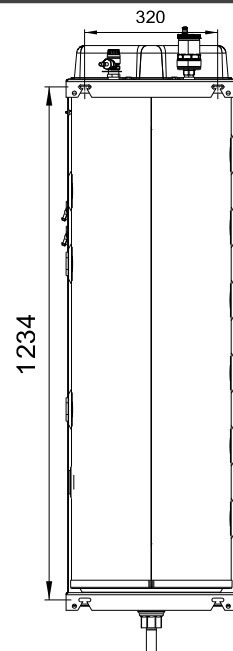
The 2-core sheathed cable which connects the Pilot and the heat pump is 10 m long. There is a 20 m length available as an optional extra (Ref. 753102) or 50 m (Ref. 754103).



The Pilot filled with water can be heavy, watch over the resistance of the wall stand.

4.1.2 - Wall mounting

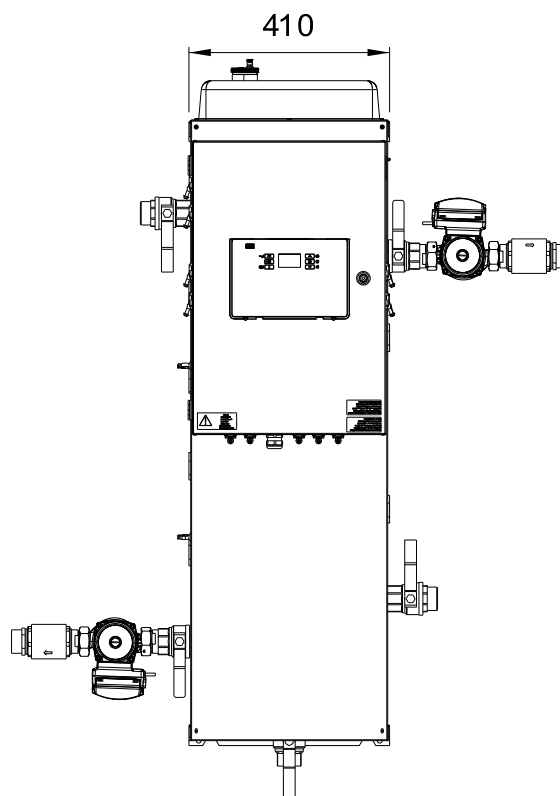
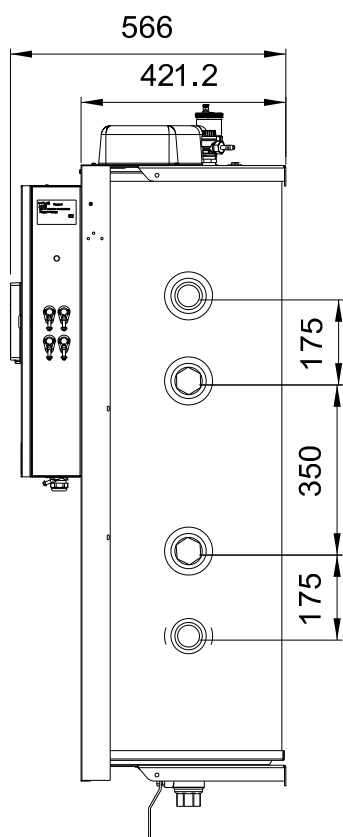
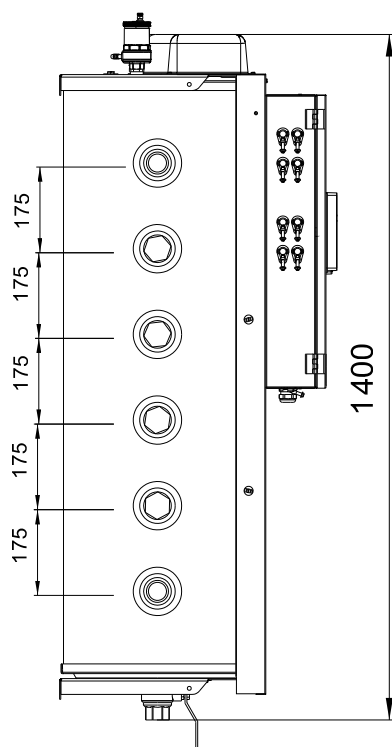
The pilot must be fixed on a resistant wall.



4.1.3 - Space requirement

The pilot must be placed at least 200 mm above the floor or any obstacle the enable it to be drained.

It must be placed at least 400mm under the ceiling to facilitate the access to the air bleed and to the electrical back-up.



4.2 - Hydraulic installation

Consult the hydraulic schematic diagrams in the appendix.

4.2.1 - Recommendations

4.2.1.1 - Back-flow prevention device

A type CA back-flow prevention device may be installed. This device must be at different, non-regulated pressure zones. Check your national laws and regulations to know if this is an obligatory requirement. The back-flow prevention device is designed to prevent incoming heating water from entering the drinking water circuit. It must be connected to the mains drainage system.

4.2.1.2 - Cross sections, purging of the heating circuits

Sufficient flow must be ensured in the circuits connected to the **Z1 Pilot**. In the case of an installation with thermostatic valves, this check must be carried out with all the valves open.

The power actually required will determine the flow of heating water and, by the same token, the calculation of the distribution network.

All measures must be taken to ensure that the system can be vented at all times by installing automatic drains at each high point of the system and manual drains on each radiator.

4.2.1.3 - Desludging tank

Plan for a desludging tank with a sufficient volume at a low point on the inlet of the heating circuit. This tank must be equipped with a drain so it can collect the oxides, particles, and calamines which detach from the inner walls of the heating circuit while it is in operation.

4.2.1.4 - Preparing the hydraulic circuit (rinsing)

Before placing the pilot and heat pump, it is necessary to rinse the installation with an appropriate product. This allows to eliminate all traces of soldering waste, joint filler, grease, sludge, metallic particles, etc... in the radiators, underfloor heating, etc...

4.2.1.5 - Insulation of the pipes

All the apparent pipes and accessories (circulator, expansion vessel, valve, ...) must be insulated or placed in insulated box.

4.2.1.6 - Expansion vessel

The installation must be equipped with an expansion vessel with a sufficient capacity (which depends on the static height of the installation, the blowing-up pressure of the expansion vessel and the volume of the installation).

4.2.1.7 - Frost protection

Frost protection is necessary if the pilot is switched off during the winter months (ex: secondary residence, etc...).



If the pilot is connected to electricity, the distribution circuits are protected from the risk of freezing. If there is no power supply to the pilot (e.g. power cut) or if there is a fault and there is a risk of freezing, the appliance **MUST BE completely drained.**

4.2.1.8 - Thermostatic valves

Thermostatic valves: these valves should prioritise rooms with higher levels of heat gain.



In an installation with both thermostatic valves and a room temperature thermostat, the radiator(s) in the room in which the thermostat is located **MUST be equipped with a manual valve(s).**



It is **IMPERATIVE to refer to the installation instructions for the initial installation of the ambient temperature thermostat to ensure satisfactory operation.**

4.2.1.9 - Treatment of the water in the heating circuit



It is **MANDATORY to read the additional document concerning the quality of water used for filling the installation. This document is included with this manual as well as in the packet with the warranty information. This document also contains information which is **PERTINENT** to the **WARRANTY** of the material.**

4.2.1.9.1 - Filling water

Refer to the water quality leaflet supplied with the pilot manual.



Central heating installations must be cleaned in order to eliminate debris (copper, filings, soldering waste) related to the set-up of the installation or from chemical reactions between the metals.

Furthermore, it is important to protect the central heating installations from risks of corrosion, limescale, and microbiological development through use of a corrosion inhibitor which is suitable for all kinds of installations (steel or cast-iron radiators, PEX underfloor heating).

PRODUCTS USED FOR HEATING WATER TREATMENT MUST BE APPROVED BY THE LOCAL OR NATIONAL PUBLIC HYGIENE AND HEALTH AUTHORITY.

4.2.1.9.2 - Treatment of the heating circuit

We recommend the use of products in the **SENTINEL** range by **GE BETZ** for preventative and curative treatment of the heating circuit.

• **For new installations : (less than 6 months old):**

- Clean the installation with a universal cleaner to eliminate the debris from the installation (copper, fibres, soldering fluxes) Example : **SENTINEL X300**
- Thoroughly rinse the installation until the water runs clear, with no traces of impurities left.
- Protect the installation against corrosion with a corrosion inhibitor, example: **SENTINEL X100**. Or against corrosion and freezing with an inhibitor with an anti-freeze additive. Example : **SENTINEL X500**.

• **For existing installations:**

- Desludge the installation with a desludging product to eliminate any sludge from the installation. Example: **SENTINEL X400**.
- Thoroughly rinse the installation until the water runs clear, with no traces of impurities left.
- Protect the installation against corrosion with a corrosion inhibitor, example: **SENTINEL X100**. Or against corrosion and freezing with an inhibitor with an anti-freeze additive. Example : **SENTINEL X500**.

Corrosion inhibitor :

- protects against the formation of limescale
- prevents «pinhole» type corrosion
- prevents, in new installations, the formation of sludge and the proliferation of bacteria (in low temperature networks: algae)
- prevents the formation of hydrogen
- eliminates the sound of the generators

Treatment products from other manufacturers can be used if they guarantee that the product is appropriate for all the materials used in the appliance and offers efficient resistance to corrosion. To find this information refer to their user manual.

4.2.1.10 - Installation of the DHW circuit

It is **mandatory** to refer to the technical manual provided with each water tank.

It is **mandatory** to install a safety group on the cold water inlet of each water tank.

Do not place a stop valve between the safety group and the water tank.

The number of elbows and pressure losses will have to be minimize, taps will have to be adapted.



The maximum temperature of domestic hot water at taps should never exceed 50°C for washing and 60°C for other uses. Install suitable thermostatic mixing valves to avoid any risk of scalding.

4.2.1.11 - Purging the installation

The oxygen present in the air is extremely corrosive. All necessary measures must be taken to ensure that the installation can be continuously purged. Automatic air purging valves should be placed at each high point of the installation, and manual air purging valves should be installed on each radiator.



CANCELLATION OF WARRANTY

Any damage to the appliance caused by unsuitable filling water and/or corrosion in the absence of treatment products as described above and/or incorrect degassing of the installation will invalidate the warranty.



Do not exceed a pressure of 2.5 bar in the system when venting. It is forbidden to vent the system through the safety valves. If these safety devices are activated for degassing, this may lead to malfunctions during operation of the appliances.

4.2.1.12 - Connecting the pressure relief valve

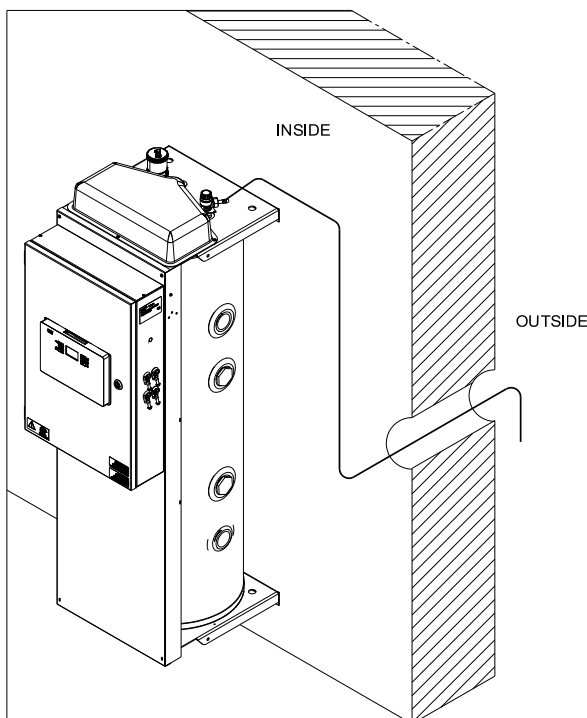
The Heat Pump and the **Pilot** are both equipped with pressure-relief valves. The **Pilot's** pressure-relief valve is set at 3 bar.

The pressure-relief valve on the Heat Pump sets the maximum acceptable pressure in the installation (2.5 bar when hot). The maximum service pressure in the Heat Pump must, consequently, be lower than 2.5 bar.

*Example : If the Heat Pump is positioned 5 m below the **Pilot**, the pressure reading on the **Pilot** would be 0.5 bar less than the real pressure of the water in the Heat Pump. In this case, the maximum service pressure for the **Pilot** would be 2 bar. Therefore it would be advisable to fill the heating circuit at an intermediary pressure (between 1 and 1.5 bar).*

For safety reasons (potential presence of flammable R290 gas), drainage of the Pilot's pressure-relief valve must **MANDATORY** be done **outside the building**. The outlet of the drainage pipe (4m length provided with the pilot) must be placed downwards in order to avoid any introduction of water inside, any risk of obstruction due to frozen water or any other pollution (see drawing).

If the provided drainage pipe is too short, it's mandatory to use a well-adapted length (can be supplied on demand). It will have to be installed as well as there will be no pinch on it, it will then ensure the drainage of the overpressure from the 6 bar safety valve outside the building.



The Pilot's pressure-relief valve drainage pipe must be properly secured until the outside of the building without any pinching zone.



WARNING
Failure to comply with this requirement concerning the evacuation of overpressure outside the building releases the heat pump manufacturer from any liability in case of incident.

4.2.1.13 - Water inlet filter for each heat pump (supplied)

It is **mandatory** to install the 1" 1/4 filter with incorporated 500 µm filter on the water inlet pipe of each heat pump :

- Mind the flow direction of the filter (Arrow).



- It is mandatory to install the 500 µm filter provided with the heat pump to prevent the heat pump's exchanger from clogging.
- Before heat pump(s) hydraulic connections, you have to desludge and to rinse the installation.



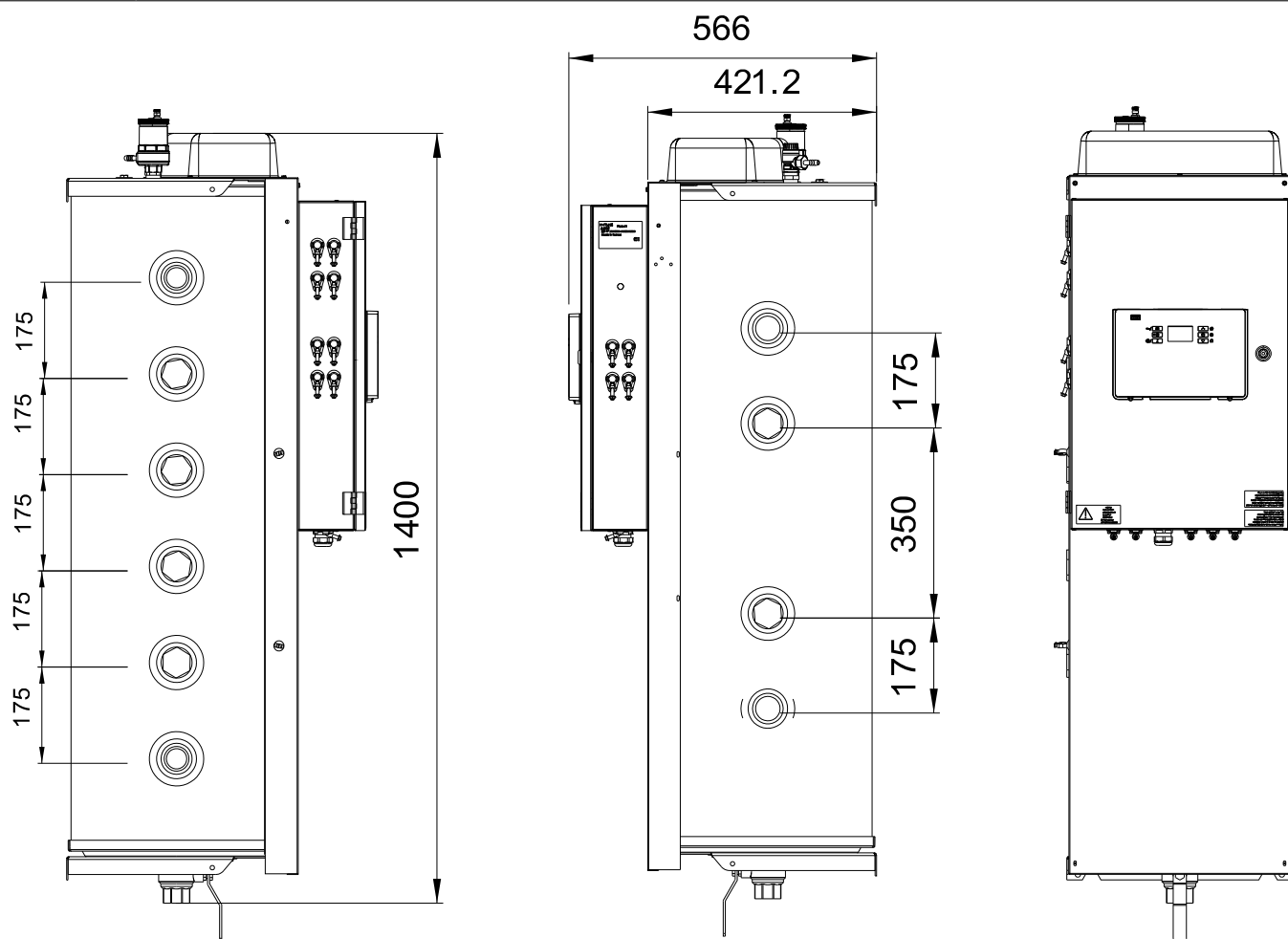
Clean the filter several times when the circulator pump of each heat pump is working for the first time. (do not forget to stop the circulator pump of each heat pump when cleaning).

- Clean the filter at least once a year.



Depending on the heat pump connected to the pilot, the filter is replaced by a filter valve.

4.2.2 - Hydraulic connections



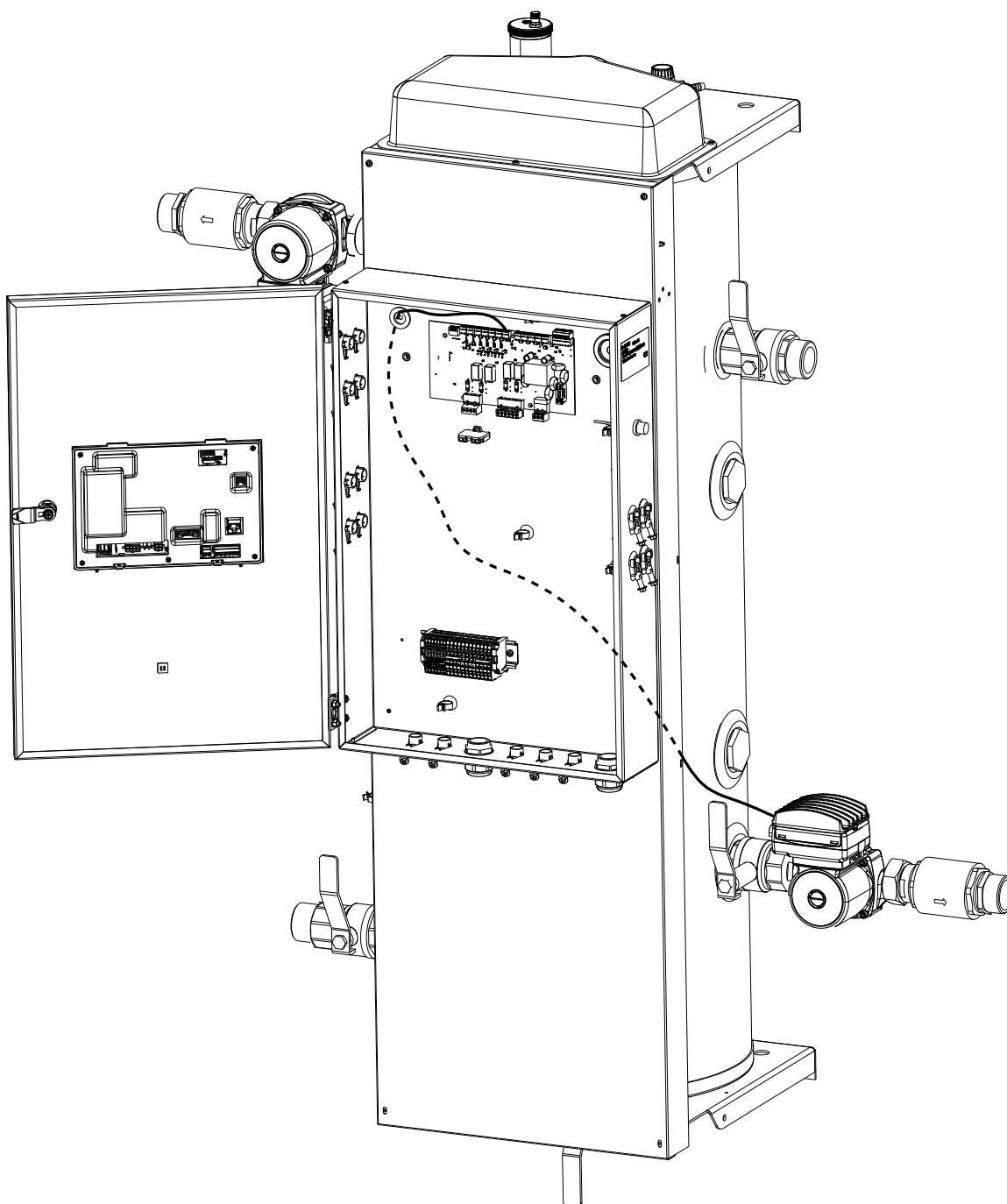
1"½ plumbing fittings apart from drain valve (1"¼).



Do not rotate the cylinder until it has been connected to the hydraulic inlets and outlets of the Z1 Pilot.

The hydraulic connection of the heat pump circuits can be made either to the left or to the right of the pilot, as can the hydraulic connection of the emitter circuits. The choice depends on the number of heat pump/emitter circuits and the configuration of the installation.

If the heat pump(s) are connected on the side with four hydraulic inlets/outlets (the side opposite the six hydraulic inlets/outlets), the PWM cable must be connected as follows:



4.2.2.1 - Installation of control devices to balance the hydraulic network

The installation of control devices (balancing valve, flow meter, etc.) is mandatory on the hydraulic circuit of each heat pump and on each emitter circuit connected to the pilot to allow balancing of the hydraulic network (QualiPAC requirements). If an existing boiler is connected to the pilot, a control device must be installed on the boiler's hydraulic circuit. These control devices must allow the flow rate to be read and adjusted in order to set the operating point. They should preferably be installed on the return side of the circuits and at a distance of :

- 10 x D from the circulator positioned upstream of the control device or 5 x D from an elbow positioned upstream of the control device.
- 2 x D from any element or change of direction downstream of the control device.

(Where D is the diameter of the pipe on which the control device is installed).

4.2.2.2 - Circulator degumming

To avoid blocking the circulators during a prolonged shutdown, take care not to de-energise the pilot.

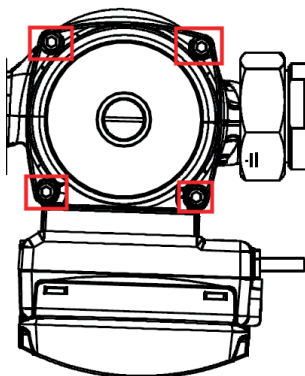
4.2.2.3 - Connection of heat pump circulators and emitter circuits

4.2.2.3.1 - Connection of heat pump circulators

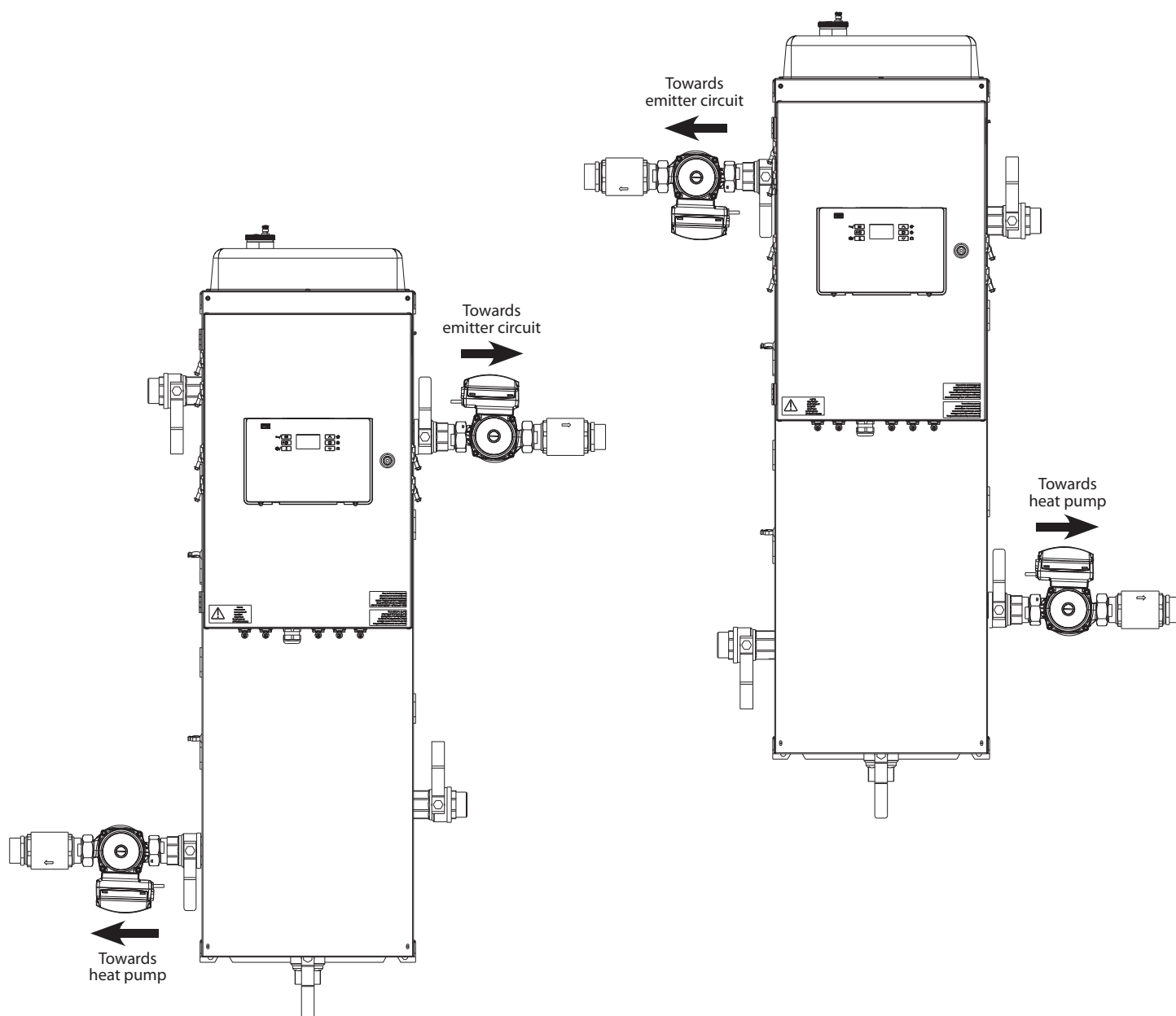
For HRC⁷⁰ 40kW heat pumps, the flow rate is provided by the circulator built into the heat pump.

For heat pumps with an output of less than 40 kW, the flow rate is provided by the PWM branch circulator (**Ref. 754205**). The heat pump circulator is controlled by a PWM signal. When installing the hydraulic branch, connect the power cable and the PWM cable to the branch circulator and to the hydraulic pilot. The power supply is connected to the pilot terminal block. The PWM signal is connected to the control board (see §A2 - Connection diagrams).

In order to have the pump fins pointing upwards, change the orientation of the motor by removing the four screws framed in red in the diagram below using a hexagonal key. Turn the motor over and replace the four screws. Make sure that the motor seals properly against the cast iron body of the circulator after reassembly.



Check the direction of the arrow on the cast iron body of the circulator.



4.2.2.3.2 - Connection of the circulators in the source circuits

The flow rate in the sending circuits is provided by the AUTO circulators, supplied in the AUTO branch (**Ref. 755823**).

The power supply is connected to the control board.
(See §A2 - Connection diagrams)



If the circulator supplying the flow to the emitters is not the one supplied in the AUTO branch (Ref. 755823), install a relay between the control board and the circulator, to avoid any risk of the relay sticking to the electronic board.

4.2.2.3.3 - Circulator speed adjustment

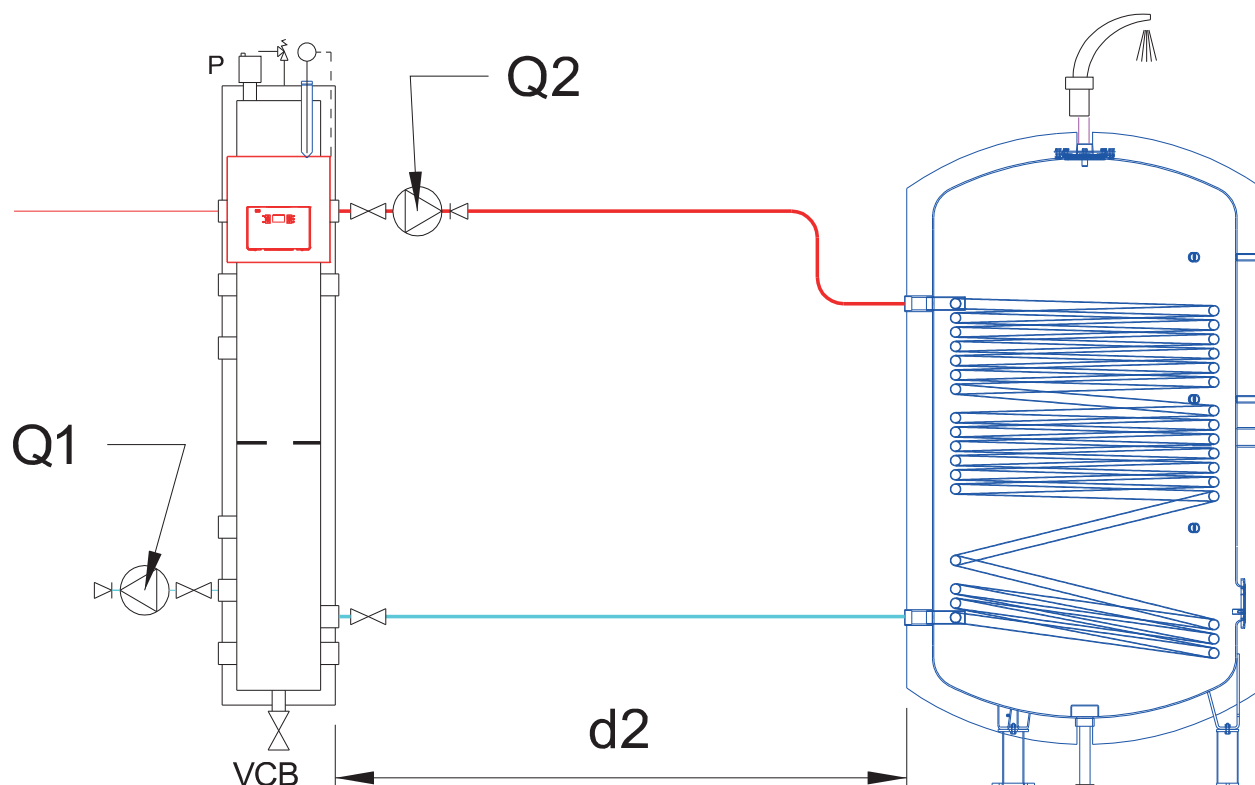
Circulator speed settings - depending on the model - are detailed in the manual supplied with the hydraulic branches.

4.2.2.4 - Sizing of hydraulic circuits between HRC70 pilot and primary exchangers of DHW heaters

Domestic hot water systems are characterised by their domestic hot water capacity, the surface area of their heat exchanger (power) and their insulation (heat loss).

Sanitary tank	litre	300	500	750	1000	1500	2000	2500	3000
Tank reference		342148	342149	342150	342151	342152	342153	342154	342155
Heat exchanger surface	m ²	1,7	3	3,7	5,1	5,6	5,6	6,9	6,9
Primary flow rate	m ³ /h	1,4	2,4	3,2	4,4	4,8	4,8	5,9	5,9
Load loss at primary flow rate	mCE	0,16	0,83	1,77	4,62	5,79	5,79	10,62	10,62
Power at primary flow rate*	kW	33	56	74	102	112	112	138	138
Loss at standstill UA	W/h	58,6	85	126,71	129,8	152,58	161,43	288,84	314,37
Storage capacity	L	317	510	743	913	1550	1726	2550	2746

* Primary temperature of 70°C / ΔT primary = 20°C / DHW at 60°C / DCW inlet temperature 10°C.



4.2.2.5 - Underfloor heating connection

4.2.2.5.1 - Connecting one or more underfloor heating systems

If the system has only one underfloor heating circuit or several underfloor heating circuits (exclusively), the circuit(s) must be equipped with the following elements:

- AUTO hydraulic branch (**Ref. 755823**) or other AUTO circulator (not controlled by external signal);
- Floor Temperature Limiter (OPT) with manual reset to protect the underfloor heating system in the event of overheating (See § 4.5- Connecting the Floor Temperature Limiter(s)).

4.2.2.5.2 - Connecting an underfloor heating system with a second high-temperature circuit

The underfloor heating circuit must be fitted with the following components:

- Three-way mixing valve for mixing water to the underfloor heating system (not supplied);
- Circulating pump to circulate the mixed water in the underfloor heating system (not supplied);
- Underfloor temperature limiter (OPT) with manual reset to protect the underfloor heating system in the event of overheating (see section 4.5 - Connecting the underfloor temperature limiter(s));
- Underfloor heating temperature sensor to monitor the water temperature in the underfloor heating circuit (**Ref. 710158**).

The circulator installed must be capable of delivering the required flow rate according to the pressure drops in the underfloor heating circuit.

The three-way mixing valve must have the following characteristics: Controlled by 3 wires (neutral, phase for opening, phase for closing) and a travel time of 4 minutes (or 240 seconds). The 4-minute travel time corresponds to the time it takes to go from fully closed to fully open.

The underfloor heating temperature sensor must be installed on the underfloor heating flow. It must not be installed too close to the **Z1 pilot** to avoid any distorted temperature measurement due to heat conduction from the pilot tank.

4.3 - Electrical connections

4.3.1 - Power electrical connections



The rules and regulations in the country of installation MUST be respected (standard C15-100).

- **The electrical lines for general power supply to the circuits must be made in compliance with your country's current rules and regulations (standard C15-100).**
- **Standard C15-100 determines the cable section to be used based on acceptable currents.**
- **Standard C15-100 determines the cable section to be used based on the following elements:**
 - *Nature of the conductor :*
 - . type of insulation, number of strands, etc...
 - *Installation mode :*
 - . influence of conductor and cable groups
 - . ambient temperature
 - . tightly or non-tightly installed
 - . length of cables, etc...



• During the transport, an accidental loosening of the electrical connections can occur.

- **In order to eliminate any risk of anomalous overheating, a control of the tightening of the connections is strongly recommended.**
See § «Spare parts list - electrical boxes»

4.3.2 - Prior recommendations before power electrical connections

Check:

- **The power consumption**
- **Number and thickness of the power supply cables**
- **Fuse or circuit breaker ratings**

The power supply must come from an electrical protection and sectioning device which complies with all current rules and regulation in effect in the country of use.

Ensure that the installation is equipped with a properly sized and connected grounding cable.

Ensure that the voltage and frequency of the general power supply fits requirements. The acceptable variation in voltage is:

230 V $\pm 10\%$ 50Hz for single-phase models + Ground.

Under no circumstances will the manufacturer be held liable for any problems which may arise due to improper installation and/or choice of power supply cable.

Electrical supply of each device must be done power off by a qualified professional.

4.3.3 - Connecting the hydraulic pilot electrical board

A dedicated switch/circuit breaker should be installed in the electrical panel to supply the **Z1 Pilot**. It must allow total mains disconnection (all-pole) to eliminate any danger during maintenance work on the device.

Electrical safety - Z1

Power supply	Cable cross-section	Circuit breaker (C curve)
230 V single-phase	3G 2,5 mm ²	10 A

How to proceed :

- Check that the «ground» cable is connected properly to the grounding peg or grounding network of the building.
- Connect the **Pilot's** electrical cable to the dedicated plug, equipped with a circuit breaker.
- Leave the pilot switched off until set-up.
- If a back-up boiler has to be connected ensure it is powered off before any action.

The proper voltage is 230 V (±10%) single-phase.

Each appliance is delivered from the factory completely pre-wired. However, it is necessary to connect the following elements to the relevant terminals:

- The general electricity supply.
- The different sensors or thermostats on the **Pilot**.
- The shielded connection cable (3 wires) between the **Pilot** and the heat pump (10 m supplied).
- The planned back-up (electric back-up and/or boiler).

Under no circumstances will the manufacturer be held liable for any problems which may arise due to improper installation and/or choice of power supply cable.

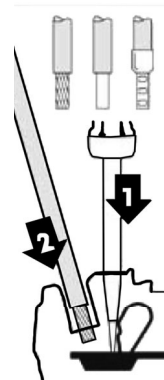
Terminal block

The terminals connection are «Cage Clamp» terminals spring.

For Handling, use the following :

- for 2.5 mm² or 4 mm² control terminals, use a 3.5 x 0.5 mm flat-head screwdriver.
- for 6 mm² power terminal, use a 5.5 x 0.8 mm flat-head screwdriver.
- for 10 mm² power terminal, use a 5.5 x 0.8 mm flat-head screwdriver.

- 1 : Insert the screwdriver into the rectangular window located on top of the terminal block.
- 2 : Insert the wire into the «Cage Clamp» when the flap is open.
- 3 : Remove the screwdriver.



Note : The wires must be stripped to the following lengths :

- For 2,5 mm² control terminals : between 10 et 12 mm
- For principal powers terminals : between 18 et 20 mm
- For intermediate powers terminals : between 11 et 13 mm

4.3.4 - Power connection of the HRC⁷⁰ heat pump



It is MANDATORY to read the installation manual provided with each HRC⁷⁰ heat pump.

4.3.5 - Control connection of the heat pump



• To avoid interference from the controller reading the probes, wire the control lines independently of the mains supply cables (trunking, cable tray) and avoid using junction boxes.

• The conductors must be made of electrolytic copper (no oxidation of the bare strands at the connections).

• Telephone wires must not be used (multi-stranded wires with too small a cross-section and therefore break when connected).

• The cross-section of control cables must be between 0.5 and 1mm².

- Connect the two wires of the connection cable to terminals **A** and **B** of the «**Modbus**» terminal block, taking care to observe the **A/B** polarity (terminal **A** of **Pilot Z1** to be connected to terminal **A** of the heat pump; same for terminal **B**):

- the brown cable to A
- the white cable on B
- the shielding braid (or black cable) on GND

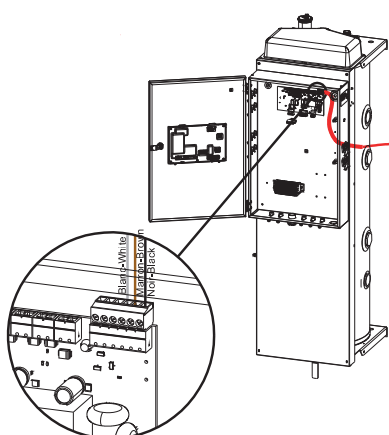
- If you use another cable, make sure that the A and B polarity is correct and that the shield is connected to GND on both appliances.



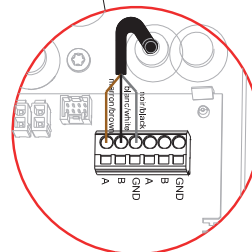
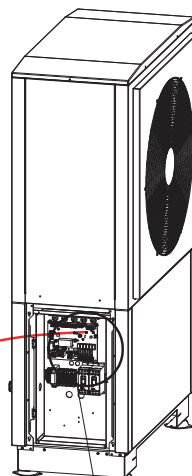
Ensure that the connecting cable is distanced from any source of electrical disturbance (ex: washing machine, neon lighting, power supply cable....)



It is **IMPERATIVE** to connect the shield of the connecting cable to the GND terminal.

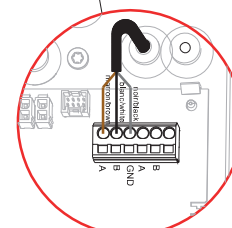
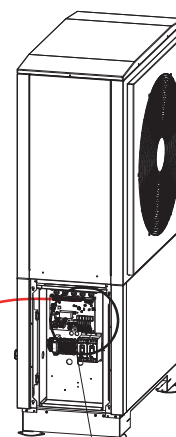
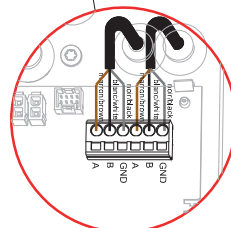
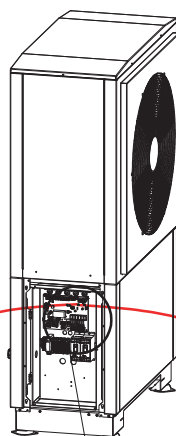
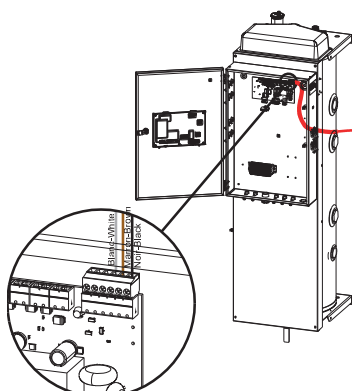


Plan for the appropriate length of cable between the pilot and the heat pump. Do not hesitate to cut the cable to the appropriate length to **AVOID LOOPS**.



4.3.6 - Cascade of heat pumps

Use the communication wire connected on the heat pump to realize the connections between the heat pumps. The communication wire must be cut to avoid loop and must be connected to the closest heat pump.



Configure the addresses of the heat pumps thanks to the red selector on the heat pump electronic card.

Pay attention to respect the numbering (address 1 for HP1, address 2 for HP2,...)



address = 1
Heat Pump n°1



address = 2
Heat Pump n°2



address = 3
Heat Pump n°3

4.3.7 - Connection of electrical back-up (optional)

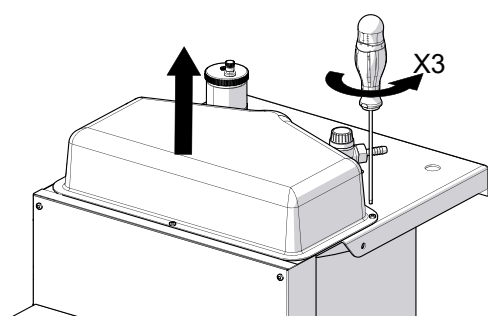
The 6kW (3x2kW) electric back-up (Ref. 754105) complements the heat pump on the coldest days.



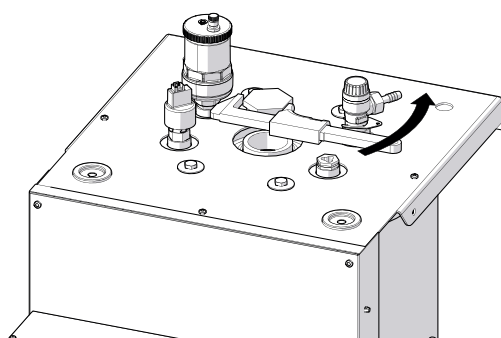
Be sure to turn off the power when connecting the electrical back-up.



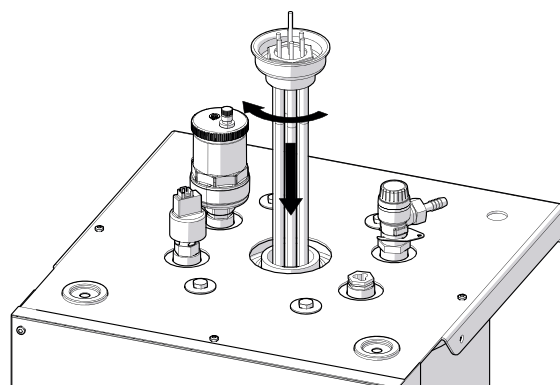
Be sure to install the electrical back-up heater when the tank is empty of water.



1. Remove the cover above the pilot using a Torx T20 screwdriver.



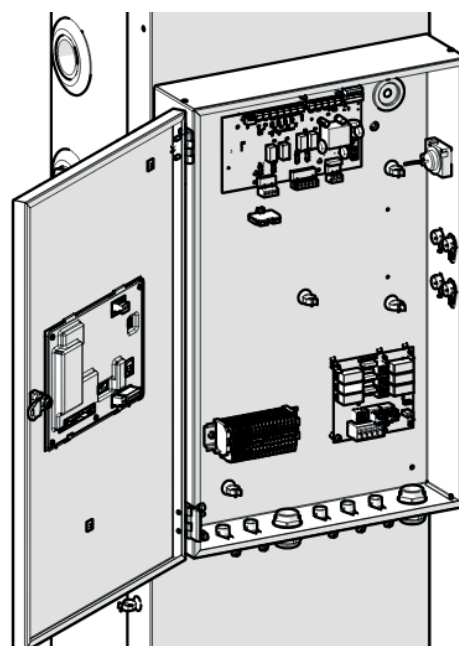
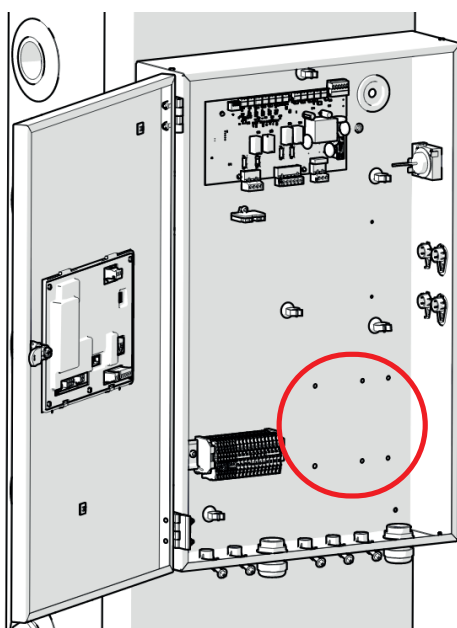
2. Remove the plug above the tank using a 49 mm open-end wrench.



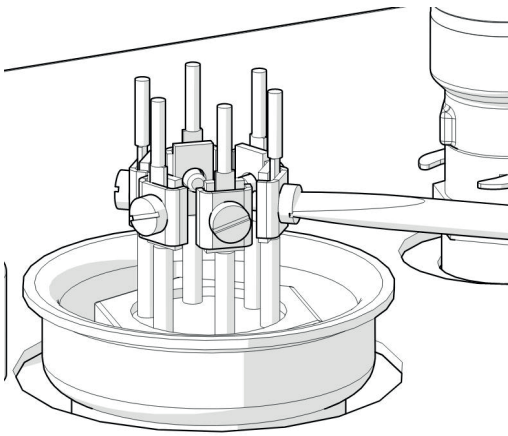
3. Insert and screw on the electrical back-up heater using a 60 mm open-end wrench, ensuring a watertight seal during connection.

4. Fit the supplied studs in the holes provided (see red box below).

5. Mount the power board on the studs provided.



6. Connect the three electrical resistor power connectors to the power board. Check the electrical continuity of the electrical back-up heater terminals with a multimeter to identify each resistance. Screw the phase and neutral of each connector to the terminals with electrical continuity using a torque wrench. Tightening torque should be 1.1 N.m.

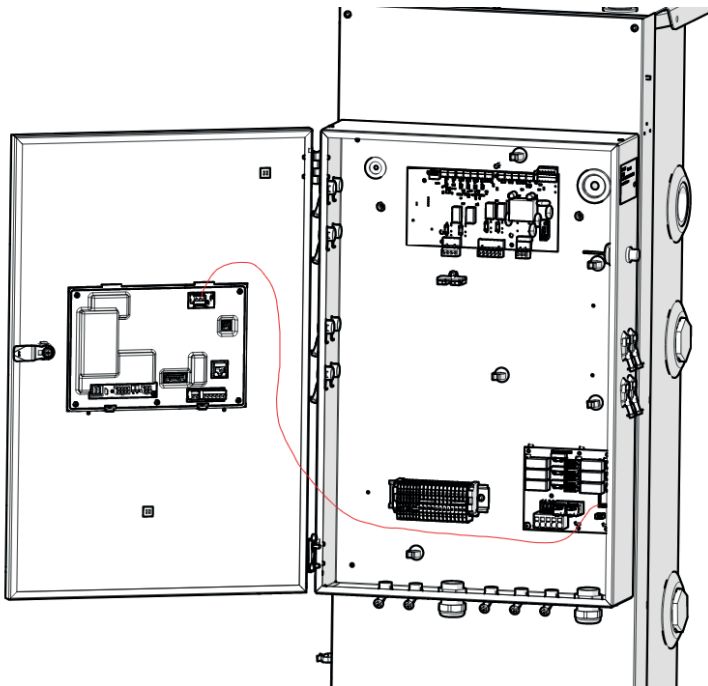


Make sure the terminals on the electrical back-up heater are tight.

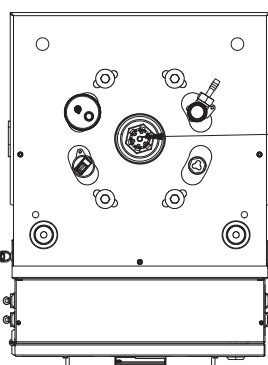


After a few days of operation and at least once a year, check electrical power connections for tightness.

7. Connect the link cable between the power board and the display board. (See diagram below).

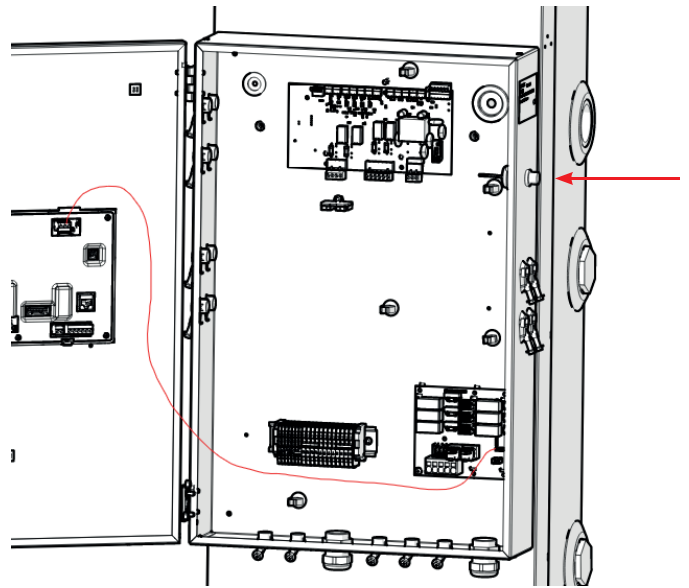


8. Remove the pre-cut cover on the side of the housing and screw the thermal cut-out into the hole provided. Place the bulb in the immersion sleeve above the pilot.



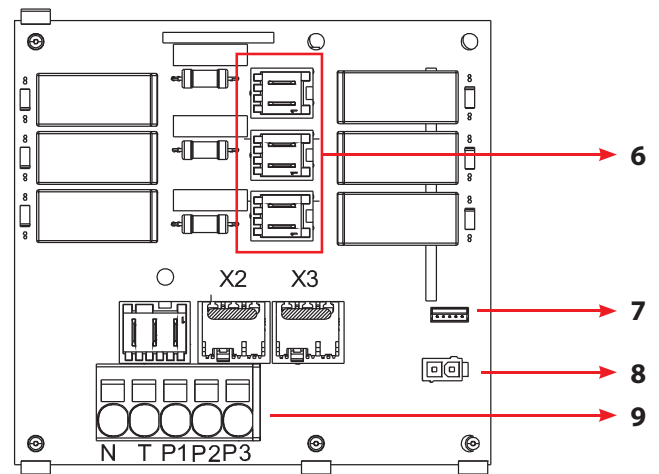
Immersion sleeve

Connect the thermal cut-out to the power board (see diagram below). Connect the wires to terminals A1 and A2 on the thermal cut-out. Protect terminal A3 with the plastic cap supplied.



Ensure that the capillary does not come into contact with live parts.

9. Remove the pre-cut cover on the bottom right-hand side of the electrical box. Connect the power supply to the power board (single-phase or three-phase).



For single-phase connection, the phase must be connected to terminal **P3**.

Connect the phase distribution bridges supplied in the plastic bag to connectors **X2** and **X3** (see the four coloured and numbered lugs in the diagram below).



The phase must be connected to terminal P3 and not to terminals P1 or P2.

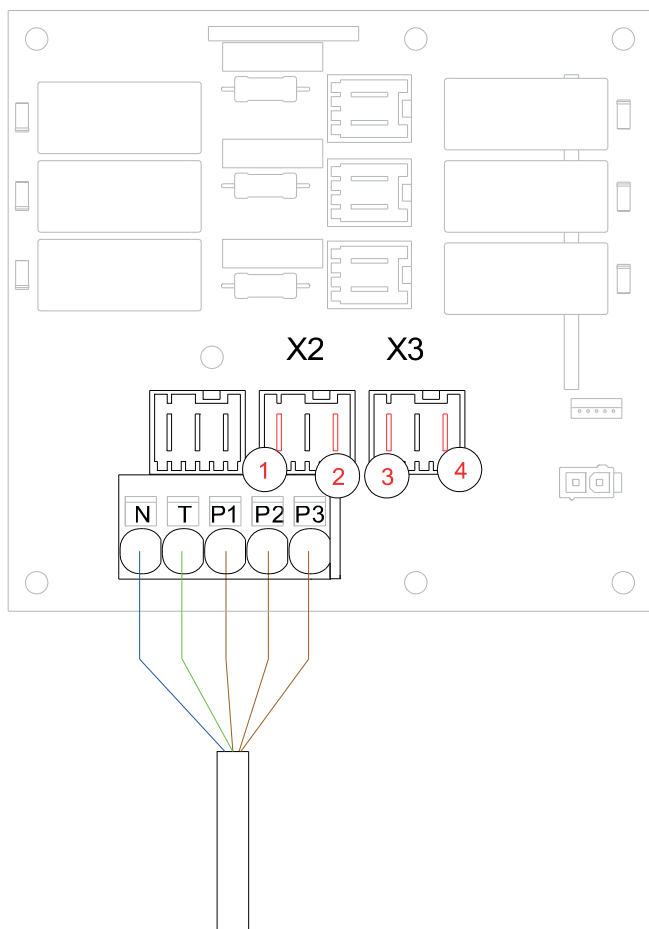
For three-phase connection, the phases must be connected to terminals P1, P2 and P3.

Connect the protectors supplied in the plastic bag to the four coloured and numbered terminals shown in the diagram below.

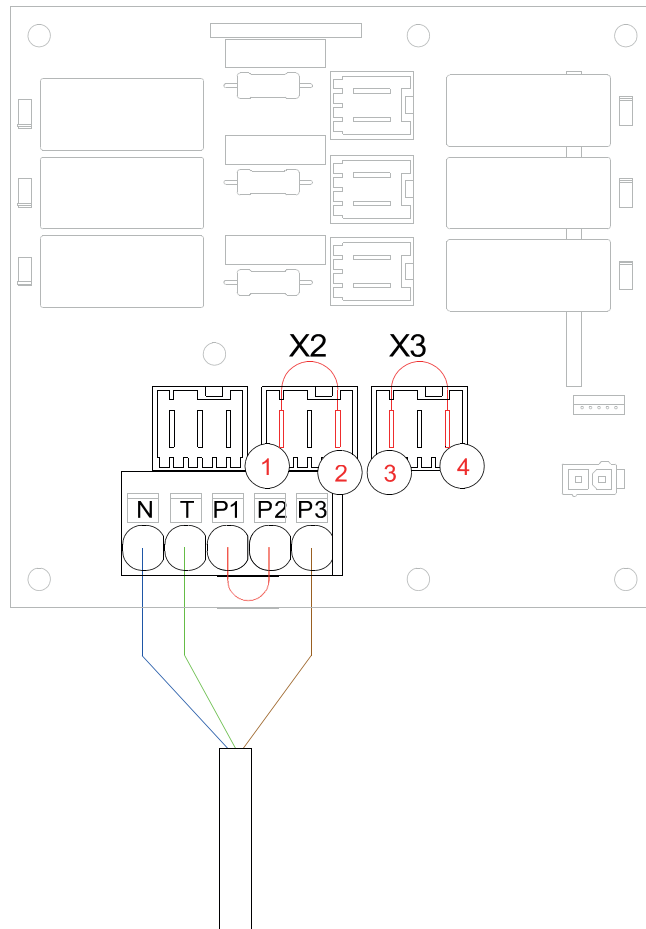


Do not apply power without first checking that connectors X2 and X3 are not equipped with phase distribution bridges.

Three-phase power supply :



Single-phase power supply :





The electrical back-up and the Z1 pilot must be supplied by two separate supply circuits.

Electrical auxiliaries must be protected by a dedicated single-pole + neutral or double-pole circuit breaker, depending on the type of installation and its electrical protection requirements (single-phase connection) or four-pole (three-phase connection), independently of the Z1 pilot supply circuit.

Connection	Single-phase	Three-phase
Maximum intensity	26,1 A	8,7 A
Circuit-breaker rating	32 A - C curve	tetrapolar 10 A - C curve
Wiring section	3 G 6 mm ²	5 G 2,5 mm ²

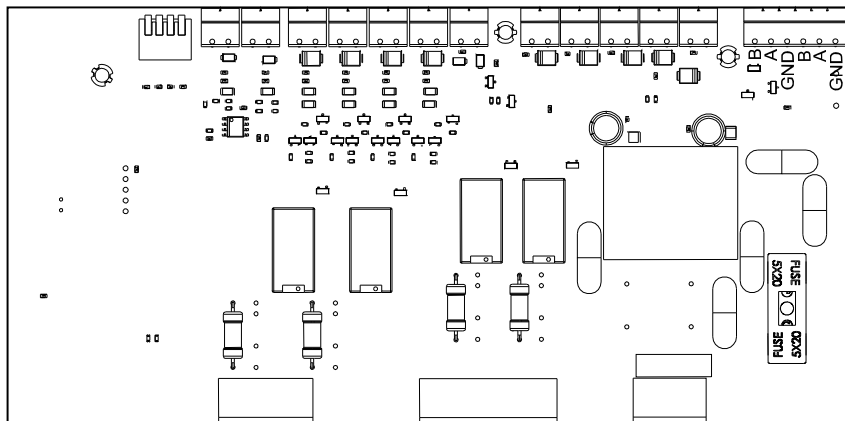


The rules and regulations in the country of installation **MUST** be respected (standard C15-100).

- The electrical lines for general power supply to the circuits must be made in compliance with your country's current rules and regulations (standard C15-100).
- Standard C15-100 determines the cable section to be used based on acceptable currents.
- Standard C15-100 determines the cable section to be used based on the following elements:
 - Nature of the conductor :
 - . type of insulation, number of strands, etc...
 - Installation mode :
 - . influence of conductor and cable groups
 - . ambient temperature
 - . tightly or non-tightly installed
 - . length of cables, etc...

10. Replace the cover above the pilot using a Torx T20 screwdriver.

4.3.8 - Addressing for transmitter circuit management



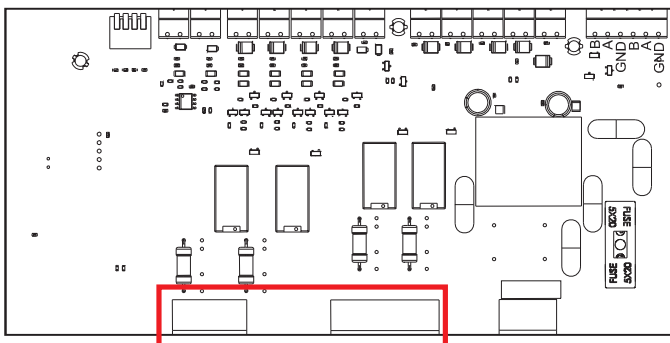
Configuration with 4 direct circuits at the same temperature: All 4 tabs must be raised.



Configuration with 1 direct circuit and 1 mixed circuit at different temperatures: Tab n°1 must be lowered.

4.4 - Connection of control circuits and accessories

4.4.1 - Distribution circulators - heating or DHW circuits



4.4.2 - Room thermostat

In an installation with both thermostatic valves and a room temperature thermostat, the radiator(s) in the room in which the thermostat is located **MUST** be equipped with a manual valve(s). It is mandatory to install the ambient temperature control on an interior wall of the room and not a wall that lets out onto the outside of the building.

Installation against an exterior facing wall is prohibited.

Do not place the ambient temperature controller too close to a window, a curtain, or a door. Avoid placing it in an alcove, a closet, or behind drapes.

Do not place above a heat source (radiator,...) or against a wall with a chimney.

Do not place in reach of sun's rays, or near powerful lighting.

Place the sensor 1.50 m above floor level, and at least 50 cm away from neighbouring walls. Insulate the extremities of the electrical cabling of the installation on the side of the appliance to prevent air currents from influencing the measures taken.



EXCLUSIVELY connect either :

- The **AMBIENT TEMPERATURE SENSOR with DISPLAY** (Ref. 751009 - For circuit 1 only) ;
- The **AMBIENT TEMPERATURE RADIO THERMOSTAT** (Ref. 770001);
- The **AMBIENT THERMOSTAT** (Ref. 710043) ;
- Any other on/off type ambient thermostat.

All other thermostats which are chronoproportional may cause malfunctioning and render the warranty null and void.

4.4.3 - Exterior sensor

The connection of the exterior sensor is recommended (if it is not the heat curve is calculated using the temperature read by the air sensor).

Place the sensor on the coldest exterior wall of the building (usually the north-facing wall). It must not be exposed to the morning sun.

It is preferred to mount the exterior sensor in the middle of the wall of the building or of the heating zone, at least 2.5 m above ground level.

Do not place the sensor:

- above windows, doors, air exhausts, or other heat sources,
- beneath balconies or gutters.

To prevent mistakes in the temperatures measured due to air circulation, insulate the extremities of the sensor's electrical conduit.

Do not paint the exterior sensor.

Note :

After connection, go to the «*DISPLAY*» menu and check that the «*EXTERIOR*» screen appears with the value read by the probe. If not, check the connection of the probe or the pilot connector.

4.4.4 - Domestic water aquastat



EXCLUSIVELY connect the water sensor
(Ref. 752202).

If DHW is produced by a domestic hot water tank:

- Place the aquastat bulb in the well of the tank to inspect the temperature of the hot water immediately available.
- Connect the aquastat to the terminals of the **Pilot**.

4.4.5 - Domestic water sensor



EXCLUSIVELY connect the water sensor
(Ref. 710029).

If DHW is produced by a domestic hot water tank:

- Place the sensor in the well of the tank to inspect the temperature of the hot water immediately available.
- Connect the water sensor to the terminals of the **Pilot**.

Note :

For DHW tanks equipped with an aquastat, the setting of the temperature target corresponds to the temperature of the tank circulating in the exchanger. For DHW tanks equipped with a water sensor, the setting of the temperature target corresponds to the water temperature in the tank.

If the water temperature is controlled by aquastat, the temperature target set to the pilot must be 5°C to 10°C higher than the temperature target set to the aquastat.

4.5 - Connection of overhear protection thermostat (OPT)



Be sure to install the OPT when the pilot is powered down.

The optional overhear protection thermostat kit (Ref. 710111) is required if one or more underfloor heating systems are connected to the **Z1 Pilot**. The OPT is compulsory to protect the underfloor heating system in the event of overheating.

The manually reset 65°C OPT must be installed on the underfloor heating feeder, as close as possible to the loop feeder.

The OPT must cut off the power supply phase to the underfloor heating circulator.

If several underfloor heating systems are connected to the **Z1 Pilot**, each of them must be fitted with its own manual reset OPT.

Do not use the wiring included in the OPT kit.

5 - SET-UP



Set-up must be done by a qualified professional.

5.1 - Before set-up

Ensure that:

- All work carried out on the hydraulic circuits and the electrical circuits are in compliance with the regulations in effect (inspection by a qualified professional)
- The pressure relief valve on the cold water inlet of the domestic hot water tank is working properly and is properly connected to a drain in compliance with the regulations in effect.
- All piping is watertight.
- All hydraulic connections are properly tightened.
- The correct voltage at the mains switch.
- All of the valves are open and nothing is obstructing the circulation of water in the exchanger and in the hydraulic circuit.
- The installation is equipped with a filter valve or a filter on its inlet and that the filter is not clogged.
- The automatic air purger's cap is open.
- The exterior sensor and the ambient temperature control (if present on the installation) are connected properly.
- If using an ambient thermostat, ensure that it is actually being used and set to be on demand (turn it to its maximum set point).

Once all of these checks have been done, turn on the heat pump and **Pilot**.



Installation should not be started WITHOUT WATER inside

5.2 - Check watertightness

Check all hydraulic connections (nuts with washers, O-rings or anything assembled with glue which may have become loose during transportation of the appliance or during installation).

After pressurising the appliance, it is important to check the watertightness (both visually and by any lowering of pressure) of all internal and external connections.



Any deterioration of the appliance due to a lack of watertightness renders the warranty null and void.

5.3 - Starting set-up

This factory setting must be changed, if necessary, in the «Installer» Menu.



When the **Pilot** is turned on for the first time, it will ask you to confirm the language of use (French, English, German, Italian, Spanish, or Polish), and will request to start set-up:



Choose **YES** and confirm by pressing .

The pilot guides you through the steps described opposite.

NOTE : Don't select **NO**.

5.3.1 - Step 1 : Number of heat pump

HP NUMBER
1

Indicate the number of heat pump(s)

5.3.2 - Step 2 : Choice of circuits and control devices

RADIATORS
C-1

Select the type of circuit connected (domestic hot water, radiators), and the control device associated with the circuit.

5.3.3 - Step 3 : Filling

Activate the back-flow prevention device of the installation to fill the heating circuit to just over 1.5 bar of pressure.

FILLING
0.8 bar

During the filling stage, the **Pilot** indicates the pressure measured in the heating circuit.

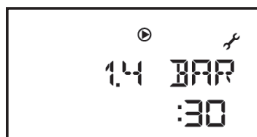
The **Pilot** automatically confirms the filling of the installation once the pressure reaches 1.6 bar.

A manual confirmation (press ) is possible starting at 0.6 bar of pressure.

5.3.4 - Step 4 : Purging the installation



The purging cycle activates the circulator pump at an alternating rhythm to allow the displacement and purging of any air bubbles accumulated at high points of the installation using the **Pilot's** automatic purger.



During the purging cycle, the screen indicates the countdown until the automatic stop of the cycle as well as the pressure in the circuit.

During the cycle, check that the automatic purgers are open and regularly activate the manual purgers.

If the pressure in the circuit becomes insufficient due to the volume of air purged, the **Pilot** will indicate it and will pause the purging cycle.

Activate the backflow prevention device or the filling valve to raise the pressure. The purging cycle will resume automatically once there is sufficient pressure.

The purging cycle is launched for a duration of 30 minutes and will automatically stop after that time is up.

At any time during the cycle, you can:

- Interrupt (or resume) the cycle by pressing on
- End the cycle and continue to the next step by pressing

5.3.5 - Step 5 : Choosing the back-up

It is possible to select the electrical back-up (ELEC if connected), the back-up boiler (BOIL), simultaneous operation of both back-up (E-BO) or not to declare a back-up.

5.3.6 - Step 6 : Finishing set-up

The **Pilot** will indicate when set-up has been achieved:



And will automatically put itself in standby mode.

The **Pilot** can be left in this state until first use.

5.4 - First use

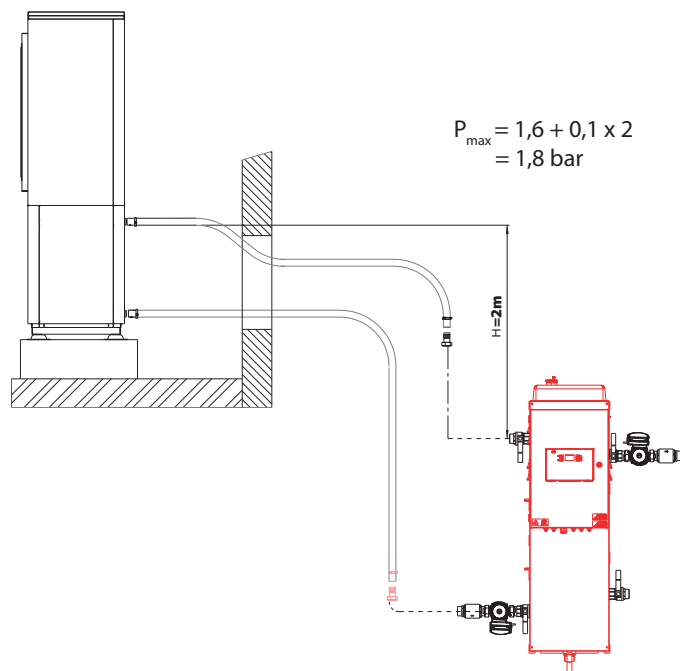
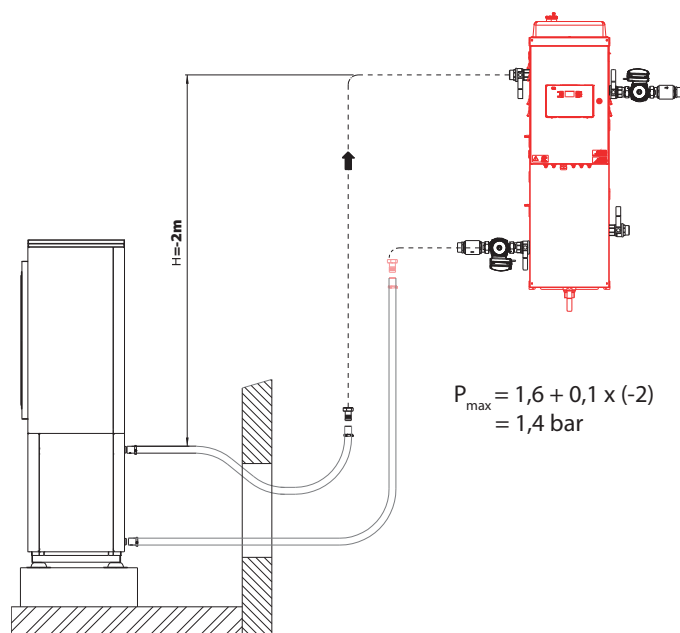
To turn on the **Pilot**, press

Long pressing puts the **Pilot** in standby mode.

When the pilot is switched on for the first time, if heating function doesn't work, maybe the pilot is not in «WINTER» mode (unlocking the heating function).



Do not leave a filling pressure upper than 1.6 bar + 0.1 x (height of the lowest heat pump relative to the pilot) when the pilot is standstill.



6 - SETTINGS AND FUNCTIONS

6.1 - Control panel

6.1.1 - Keypad

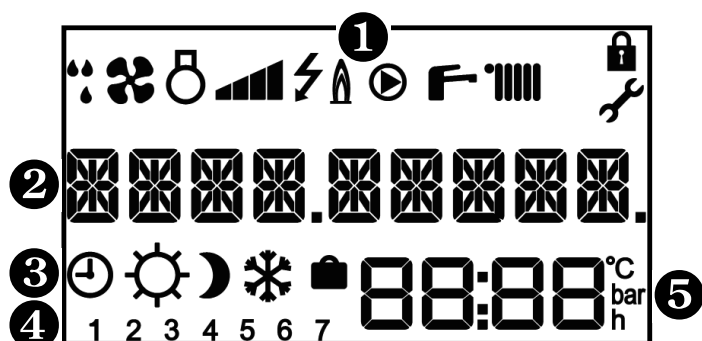


Button Primary function
ex.: decrease / scroll down

Secondary function
ex.: holiday mode

Primary function (Short press)	Secondary function (Long press)
- menu access - return / cancel	locking / unlocking of the keypad
- switch on	standby mode
- setting the temperatures	program scheduled comfort modes
- increase the setting - scroll up	activate temporary comfort mode
- confirm / remove error - display pressure or T°	information on temperatures and current operating state
- decrease the setting - scroll down	activation of holiday mode

6.1.2 - Display



① Symbols of current operating state

	defrosting in progress		circulating pump working
	ventilator working		domestic hot water activated
	compressor working		heating activated
	power level		keypad locked
	electrical back-up		installer menu
	back-up boiler		

② 9 character message

③ Current comfort mode

Programming active	Comfort mode	Eco mode
Frost protection mode	Holiday mode	

④ Day of the week: (1= Monday; 2= Tuesday...)

⑤ Display zone: temperatures, pressure, settings, time...

6.2 - Menus

Menus (and sub-menus)	Access buttons
menu USER	
menu INSTALLER <i>(Display here under will be shown or hidden according to product configuration)</i> - HP CIRC : Setting the speed of HP circulating pump - OUTS.TMAX : Outside temperature on the warmest day - OUTS.TMIN : Outside temperature on the coldest day - MODE : Choice of Z1 pilot operation - HP : HP only operation - HP+B BACKUP : Operation with the heat pump and authorised back-up - BACK UP : Operation with back-up only - HEAT CURV : Setting the heat curve - Radiator circuit - HEAT TMAX : Radiator circuit heat curve set-point on the coldest day - HEAT TMIN : Radiator circuit heat curve set-point on the warmest day - HEAT CURV : Setting the heat curve - Underfloor heating - TMAX HEAT : Underfloor heating heat curve set-point on the coldest day - TMIN HEAT : Underfloor heating heat curve set-point on the warmest day - SHARING : Activation of priority sharing - ANTI-BACT. : Activation of anti-bacteria function	 + 
menu EXPERT - SETTINGS : Access to all parameters - DISPLAY : State of operation of the pilot - DATA CALC : Temperatures and time delays in progress - COUNTERS : Operation counters - CONFIGURA. : Choice of circuits and their controls - AIR BLEED : Activation of a special air purge cycle - MANUAL : Manual operation of component for diagnostics - COMMISSIO : Access to the set-up - MODBUS : Remote control setting up - SOFTWARE : Manage software version	 + 

Press  to exit the menus and sub-menus.

6.3 - Actions to be activated using a combination of buttons

Action	combination of buttons
Reset counters to zero Certain counters cannot be reset to zero. Only the counters which can be reset are affected by this action.	in the «counters» menu  +  press for 5s
Reset to default settings (return to factory settings)	in the «settings» menu  +  press for 5s

6.4 - List of adjustable parameters

Parameter N°	Description	Unit	Range of setting	Factory setting
P202	Maximum exterior temperature (warmest day for heat curve)	°C	11 to 25	20
P203	Minimum exterior temperature (coldest day for heat curve)	°C	-30 to 10	-5
P204	Summer/winter changeover: choice of changeover method	-	AUTO: changeover is done automatically based on the exterior temperature MANU: changeover is done manually by the user	MANU
P205	Summer/winter time delay: time period for observation of the exterior temperature before automatic season changeover. Only used if automatic changeover is activated.	hour	0 to 48	12
P206	Reactivity: the temperature for heating takes into account the ambient temperature to accelerate heating time when heating is switched on or restarted.	-	YES: reactivity activated NO: reactivity deactivated	NO
P207	Anticipation of heating: heating restarted before return from holidays (for getting a home already at the set temperature on return)	-	YES: anticipation activated NO: anticipation deactivated	NO
P208	Minimum exterior temperature for operation using only the HP. The back-up is authorised to operate in colder temperatures.	°C	P209 to 20	2
P209	Maximum exterior temperature for operation using only the back-up. The heat pump is authorised to operate in warmer temperatures.	°C	-20 to P323	-20
P210	Operation in peak hours (HP/HC contact open)	-	0: no operation allowed 1: HP limited to 1st power stage 2: HP limited to 2nd power stage 3: full HP without back-up 4: HP + 1 stage back-up (2kW) 5: HP + 2 stages back-up (4kW) 6: Full authorization: HP + back-up (electrical or boiler) 7: back-up only (6kW or boiler) or both 8: anti-frost comfort level 9: eco 10: do not use	6
P212	Type of back-up	-	NO: no backup ELEC: electrical back-up BOIL: back-up boiler E-BO: Electrical back-up + boiler	NO
P213	Heat pump time-out: allows the heat pump to continue running for a period of time after intervention of the back-up	min.	1 to 20	5
P214	Difference in temperature between the back-up and the heat pump	°K	0 to 7	P212 ELEC: 4 P212 BOIL: 7
P215	Presence of a heat pump	-	0: operation without heat pump 1: presence of a heat pump 2: presence of two heat pumps 3: presence of three heat pumps	1
P216 to P220	Not concerned	-	Do not change the setting	-
P221	Choice of heat pump 1 compressor in operation	-	0 to 2	0
P222	Choice of heat pump 2 compressor in operation	-	0 to 2	0
P223	Choice of heat pump 3 compressor in operation	-	0 to 2	0
P224 to P226	Not concerned	-	Do not change the setting	-

Parameter N°	Description	Unit	Range of setting	Factory setting
P227	Speed of heat pump circulator pump	%	10 to 100	100
P228	Post-circulation of the heat pump circulator pump	-	Do not change the setting	3
P230	Not concerned	-	Do not change the setting	-
P231	Direct circuit ⁽¹⁾ - Set-point temperature for heating circuit	°C	AUTO: automatic set temperature from the air sensor or exterior sensor (if connected) or 20 to 70: setting fixed in °C	AUTO
P232	Direct circuit ⁽¹⁾ - Set-point temperature at the coldest day	°C	P233 to 70	70
P233	Direct circuit ⁽¹⁾ - Set-point temperature at the warmest day	°C	20 to P232	40
P234	Direct circuit ⁽¹⁾ - Action of circulating pump for heating circuit	-	0: permanent 1: controlled by room temperature / room thermostat 2: room-controlled, with «anti-cold radiator» function (requires a room sensor)	1
P235	Direct circuit ⁽¹⁾ - Lowering of the Heating set-point : lowering applied to the heating temperature when room has reached the temperature target	°K	0 to 30	4
P236	Direct circuit ⁽¹⁾ - Lowering in ECO: temperature lowering applied to the heating set-point during ECO mode.	°K	0 to P237	10
P237	Direct circuit ⁽¹⁾ - Lowering in Frost protection : temperature lowering applied to the heating set-point during Frost protection mode	°K	P236 to 40	20
P238	Direct circuit ⁽¹⁾ - Self-adaptability: automatic correction of the heat curve based on the room temperature on a 24h cycle	-	YES: correction activated NO: correction deactivated	NO
P239	Direct circuit ⁽¹⁾ - Complementary self-adaptability: automatic correction of the temperature on a 3h cycle of room temperature	-	YES: correction activated NO: correction deactivated	NO
P247	Direct circuit ⁽¹⁾ - Room temperature hysteresis (requires an room temperature sensor) : room temperature deviation triggering a heating demand	°K	0.1 to 1	0.5
P250	Not concerned	-	Do not change the setting	-
P251	Mixed circuit ⁽²⁾ - Set-point temperature for heating circuit	°C	AUTO : automatic set-point from air or outside probe if connected or 20 to 70 : fixed set point in °C	AUTO
P252	Mixed circuit ⁽²⁾ - Set-point temperature at the coldest day	°C	P253 to 70	70
P253	Mixed circuit ⁽²⁾ - Set-point temperature at the warmest day	°C	20 to P252	40
P254	Mixed circuit ⁽²⁾ - Action of circulating pump for heating circuit	-	0: permanent 1: controlled by room temperature / room thermostat 2: room-controlled, with «anti-cold radiator» function (only 2nd mixed circuit kit + room sensor)	1
P255	Mixed circuit ⁽²⁾ - Lowering the heating set-point: lowering applied to the heating set-point during periods when the room is not in demand	°K	0 to 30	4
P256	Mixed circuit ⁽²⁾ - Lowering in ECO: temperature lowering applied to the heating set-point during ECO mode.	°K	0 to P257	10
P257	Mixed circuit ⁽²⁾ - Lowering in Frost protection : temperature lowering applied to the heating set-point during Frost protection mode	°K	P256 to 40	20
P258	Mixed circuit ⁽²⁾ - Self-adaptability: automatic correction of the heat curve based on the room temperature on a 24h cycle	-	ON: correction enabled NON: correction disabled	NON
P259	Mixed circuit ⁽²⁾ - Complementary self-adaptability: automatic correction of the temperature on a 3h cycle of room temperature	-	ON: correction enabled NON: correction disabled	NON

⁽¹⁾ Radiator or underfloor heating circuits with direct distribution (not managed by a 3-way valve).

⁽²⁾ Radiator or underfloor heating circuits managed by a 3-way mixing valve.

Parameter N°	Description	Unit	Range of setting	Factory setting
P267	Mixed circuit ⁽²⁾ - Room temperature hysteresis (requires a room sensor): room temperature deviation triggering a heating demand	°K	0.1 to 1	0.5
P271	Sanitary sharing: Priority between Domestic hot water circuits and heating circuits.	-	0 : DHW circuits have priority over heating circuits. DHW cylinders are served in circuit order (DHW cylinder 1 has priority over DHW cylinder 2, etc.). 1 : DHW circuits have priority over heating circuits. No priority between DHW cylinders, as soon as a cylinder is in demand, its circulation is activated. No sharing with heating circuits.	1
P272	Anti-legionellosis – activation and choice of frequency: the cycle raises the temperature in the domestic hot water tank. This cycle eliminates the bacteria through thermal shock.	-	0: protection deactivated 1: (monthly) : the cycle is carried out at the beginning of each month, on the first day P273 of the month 2: (weekly): the cycle is carried out each week on day P273	0
P273	Anti-legionellosis – choice of day to carry out anti-legionellosis cycle	-	1 (Monday) to 7 (Sunday)	2
P275	Circulating pump speed during production of domestic hot water	%	10 to 100	100
P278	Lowering of the domestic hot water temperature in ECO mode.	°K	0 to 40	10
P279	Maximum heating time of the domestic hot water tank (too long heating time function)	min.	5 to 60	20
P281*	Domestic hot water demand differential for storage tank no. 1: temperature loss of the hot water storage tank in relation to the set point to trigger a new domestic hot water load.	°K	2 to 15	5
P282*	Domestic hot water demand differential for storage tank no. 2: temperature loss of the hot water storage tank in relation to the set point to trigger a new domestic hot water load.	°K	2 to 15	6
P283*	Domestic hot water demand differential for storage tank no. 3: temperature loss of the hot water storage tank in relation to the set point to trigger a new domestic hot water load.	°K	2 to 15	7
P284*	Domestic hot water demand differential for storage tank no. 4: temperature loss of the hot water storage tank in relation to the set point to trigger a new domestic hot water load.	°K	2 to 15	8
P285 to P291	Not concerned	-	Do not change the setting	-

* Not relevant in the case of control by sanitary aquastat

⁽²⁾ Radiator or underfloor heating circuits managed by a 3-way mixing valve.

6.5 - Description of functionalities

6.5.1 - Functions related to heating

6.5.1.1 - AUTO temperature (heat curve)

The set temperature for heating decreases with the exterior temperature, which allows the installation to operate at a low temperature throughout the majority of the heating season and improves the seasonal efficiency of the installation.

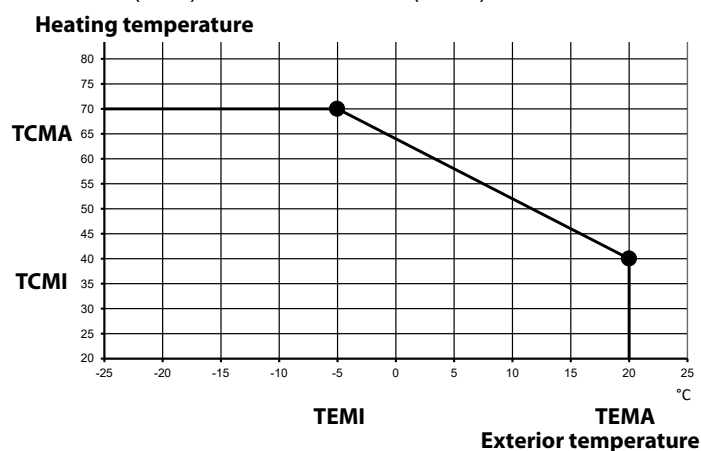
This function can be activated by setting *P231* to *AUTO*.

Setting the heat curve is done using parameters *P202*, *P203*, *P232* and *P233*.

Example n°1 :

P202 (TEMA) = 20°C *P233* (TCMI) = 40°C

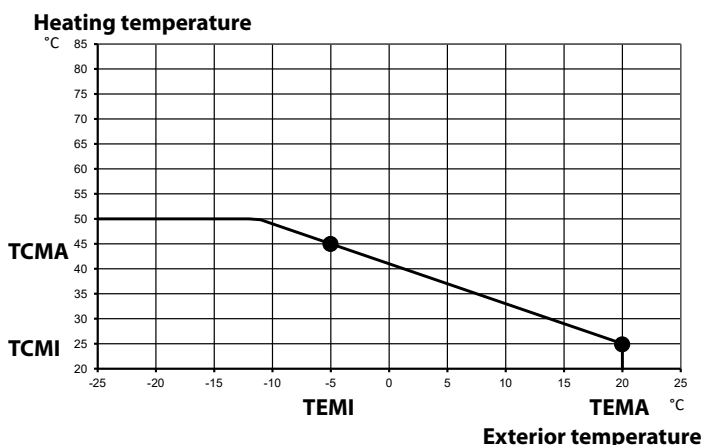
P203 (TEMI) = -5°C *P232* (TCMA) = 70°C



Example n°2 :

P202 (TEMA) = 20°C *P233* (TCMI) = 25°C

P203 (TEMI) = -5°C *P232* (TCMA) = 45°C



Note:

In manual operation, it is possible for the user to set the set temperature in the range of TCMI to TCMA.

6.5.1.2 - Lowering of the temperature

The set temperature of heating can be lowered at the same time as the ambient temperature when in Eco or Frost protection modes to improve the heat pump's performance.

The set temperature in comfort mode is the reference point. The set temperature applied in Eco or Frost protection mode is the temperature in comfort mode lowered by the differential:

- *P236*: lowering of the temperature in ECO mode.

- *P237*: lowering of the temperature in Frost protection mode.

6.5.1.3 - Auto-adaptability

The auto-adaptability function allows to continually correct the heat curve to correspond to the needs of the household.

Auto-adaptability operates on two modes, which can be independently activated:

- primary auto-adaptability (activated by *P238*-circuit 1 [*P258* circuit 2]) examines the heating needs over 24h cycles and adjusts the set temperature for heating when ambient temperature is requested.
- complementary auto-adaptability (activated by *P239*-circuit 1 [*P259* circuit 2]) examines the heating needs over 3h cycles and adjusts the set temperature when ambient temperature is not requested. Complementary auto-adaptability requires the presence of an ambient temperature sensor and the activation of the anti-cold radiators function (*P234* = 2).

6.5.1.4 - Ambient temperature reactivity

The reactivity function allows the pilot to increase its set temperature for heating when the temperature read by the ambient temperature sensor is far from the set temperature.

In particular, it allows an accelerated increase in ambient temperature when returning to comfort mode.

This function is activated using parameter *P206* and requires the presence of an ambient temperature sensor.

6.5.2 - Programming and time-out functions

6.5.2.1 - Anticipation of return from holiday

When this function is activated, the time of return from holiday mode is no longer considered as the time for heating to resume, but instead is considered as the time that the ambient temperature should be at the set temperature. And so, the heating will resume in advance based on the planned return from holiday mode.

This anticipation can vary based on if the heating circuit has a weak inertia (*RADIATOR* setting) or strong inertia (*FLOOR* setting). It also depends on the exterior temperature read (advanced anticipation on cold days).

The pilot uses a arbitrary initial time-delay which may cause discomfort on the first use of the function (first return from holiday). The length of anticipation is automatically adjusted after the first use.

This function can be activated by setting parameter *P207* to *YES*.

6.5.2.2 - Automatic summer/winter changeover

With the automatic summer/winter changeover function activated, the pilot decides when to enact the changeover from one season to another, independently from the choice made by the user via the on/off button.

The pilot examines the exterior temperature for an extended period of time (standby time) and uses the maximum exterior temperature for heating («*TMAXEXTER*», corresponding to parameter *P202*) as a reference point:

- If the observed exterior temperature is continually above the maximum temperature, the pilot switches to summer mode.
- If the observed exterior temperature is continually below the maximum temperature, the pilot switches to winter mode.

This function can be activated by setting parameter *P204* to *YES*.

Parameter *P205* allows the adjustment of the length of standby time observed by the pilot before the changeover from one season to the other.

6.5.3 - Ambient temperature and heating circulation control functions

6.5.3.1 - Ambient temperature sensor hysteresis

Differential between the set ambient temperature and the measured ambient temperature to activate or deactivate a heating request.

Only applicable if an ambient temperature sensor is connected.

Controlled by parameter *P247*.

6.5.3.2 - Circulator pump speed

Speed is adjustable through parameter *P230*.

Also adjustable through the installer menu *INSTALLER: «CIRC. PUMP»*.

6.5.3.3 - Heating circulator control

Heating circulation can be permanent or controlled by an ambient temperature control.

If being controlled, the heating circulator will only be activated when there is an ambient temperature request.

Control activated through parameter *P234*.

6.5.3.4 - Anti-cold radiators

This function is only possible with an ambient temperature sensor.

Circulation is always controlled by the ambient temperature control. When the set ambient temperature is reached, the pilot adopts a lower set water temperature but continues to circulate so the radiators do not become cold.

This function can be activated by setting parameter *P234* to *2*.

The set temperature can be lowered through parameter *P235*.

6.5.4 - Functions related to the production of domestic hot water



Sanitary sharing and anti-Legionella protection are not possible with temperature control using a sanitary aquastat.

6.5.4.1 - Domestic priority sharing

Allows the operation of the heating circuit at the end of the domestic hot water heating cycle when the tank's temperature has been raised sufficiently but before the cycle has been completed).

This function can be activated by setting parameter *P271*.

The Domestic Hot Water sharing is only done with the boiler equipped with the DHW probe.

6.5.4.2 - Anti-legionellosis protection

This function activates a cycle which raises the temperature in the domestic hot water tank above the set temperature so as to eliminate any bacteria. This cycle is carried out at regular intervals.

If the function is activated, the cycle will be carried out at the chosen frequency and on the day of week chosen:

- Activation / choice of frequency at *P272*: deactivated, monthly, or weekly.
- Choice of day at *P273*: if the frequency is weekly, the cycle will be carried out each week on the selected day. If the frequency is monthly, the cycle will be carried out on the first day chosen in the month (ex. first Monday of the month).

Note: If holiday mode is engaged for more than 3 days, an anti-legionellosis cycle will run at the exiting of holiday mode.

Note:

The cycle starts by default at 22:00 with a set temperature of 60°C.

6.6 - Heat pump circulator speed

Speed adjustable through the installer menu *INSTALLER: «HP CIRC»*.

Note :

The speed change applies to all the circulators on the heat pumps connected to the **Z1 Pilot**.

7 - MAINTENANCE AND TROUBLESHOOTING

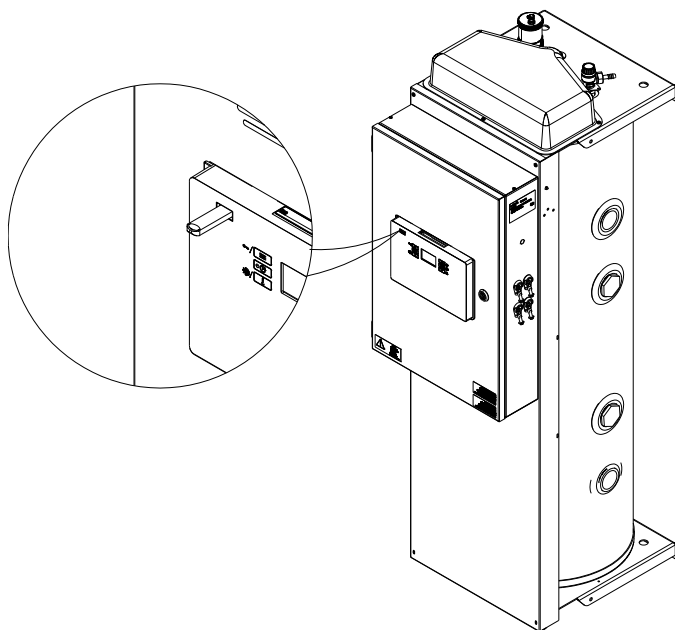


- All work on the pilot must be carried out by a qualified professional.
- Follow all safety instructions!
- Disconnect the pilot from the electrical supply before opening it.
- Except for certain operations, it is not necessary to drain the system to work on the components.
- If the system must be drained, close the overflow valves and open the drainage valve.
- Do not get water on the control components.

7.1- Diagnostics

7.1.1 - Loading the operating history

The operating history is saved in the memory of the electronic board. This data can be loaded onto the USB stick provided. The USB port is located on the left of the electronic card.



- 1) Get the USB stick that comes with the pilot.
- 2) Insert the key into the USB port (on the front)
- 3) As soon as the USB stick is recognized* the file transfer will begin. This can take several minutes (depending on the amount of operating history to transfer).
- 4) When the transfer is complete there will be a sound signal and the message: «REMOVE USB STICK» will appear.

Remove the USB stick, **BUT ENSURE NOT TO REMOVE IT BEFORE THIS MESSAGE IS DISPLAYED.**

- 5) A file named «C14_historique» will be generated onto the USB stick. It contains the recent operating history of the pilot and the heat pump.

* If the USB stick is not recognized, disconnect and reconnect the electrical supply to the appliance and try again.

If the USB stick is still not being recognized, try a different USB stick.

In the user menu, the **USB** sub-menu allows you to set the frequency of monitoring of operating history (every minute, every 30 seconds....).

These changes are not retroactive, they will only be visible in the **USB** history in the period following the changes being applied.

7.1.2 - Consulting the current operating state of the system

Enter the **EXPERT** menu (+) and then in the **DISPLAY** sub-menu, or enter the **DISPLAY** sub-menu directly by long pressing .

The **DISPLAY** sub-menu gives you access to the following values:

THERMOSTA	State of contact (if using a thermostat): 0 = open (no request) 1 = closed (request)
T_WATER	Temperature of domestic hot water
OUTSIDE	Exterior temperature
O/1 ECO	State of peak hours contact : 0 = open (peak hours) 1 = close (standard operation)
HEAT CURVE	Current radiator heating set-point (determined by the heat curve)
HEAT CURVE P	Current underfloor heating set-point (determined by the heat curve)
T_PILOTE	Temperature at pilot outlet
VERSION	Pilot version number

The data specific to each heat pump is accessible in the **HP1**; **HP2** and **HP3** sub-menus (according to the number of heat pumps connected to the pilot) :

T_FLOW	Temperature at heat pump outlet
T_RETURN	Temperature at heat pump inlet
T_AIR	Temperature of heat pump air
T_EVAPOR	Temperature of evaporator
T_COMP 1	Temperature of compressor n°1
T_COMP 2	Temperature compressor n°2
T_COND	Condenser temperature (sensor or probe)
COMP 1	Compressor 1 working state
COMP 2	Compressor 2 working state
VERSION	Heat pump version number

The specific make-up data can be accessed in the **BACK UP** sub-menu :

BACK UP1	Operating status of stage 1 of the electrical back-up system
BACK UP2	Operating status of stage 2 of the electrical back-up system
BACK UP3	Operating status of stage 3 of the electrical back-up system
POWER	Electric back-up power in use
T(S) BCKP1	Meter for operation of stage 1 of the electrical back-up system
T(S) BCKP2	Meter for operation of stage 2 of the electrical back-up system
T(S) BCKP3	Meter for operation of stage 3 of the electrical back-up system

7.1.3 - Water sensors

Ohmic values for T_{PILOTE} (pilot outlet) and T_{WATER} (domestic water sensor placed in the tank) sensors

10 K Ω à 25°C

T (°C)	R (ohms)	T (°C)	R (ohms)
0	32 550	50	3 605
5	25 340	55	2 990
10	19 870	60	2 490
15	15 700	65	2 084
20	12 490	70	1 753
25	10 000	75	1 481
30	8 060	80	1 256
35	6 535	85	1 070
40	5 330	90	915
45	4 372		

7.1.4 - Exterior sensor

Ohmic values for OUTSIDE (exterior) sensor.

12 K Ω à 25°C

T (°C)	R (ohms)	T (°C)	R (ohms)
-30	171 800	5	28 600
-25	129 800	10	22 800
-20	98 930	15	18 300
-15	76 020	20	14 770
-10	58 880	25	12 000
-5	45 950	30	9 804
0	36 130		

7.1.5 - Consulting the counters

To consult the pilot and heat pump counters, enter the **EXPERT** menu by pressing simultaneously on  + , and select the **COUNTERS** sub-menu.

Counter n°	Description	Unit
C-00*	Time of DHW request from tank	h
C-01*	Time of heating request from ambience (demand for ambience)	h
C-06*	Time of heat pump operation	h
C-07*	Time of boiler heating request	h
C-08*	Time of the electrical back-up operation	h
C-11*	Defrosting cycles	quantity
HEAT PUMP		
C-20	Heat pump operating time	h
C-21	Number of start-ups from compressor n°1	quantity
C-22	Number of start-ups from compressor n°2	quantity
C-23	Operating time of compressor n°1	h
C-24	Operating time of compressor n°2	h
C-25	Defrosting cycles	quantity
C-26	Frequent defrosting errors	quantity
C-27	High pressure (switch) on compressor n°1	quantity

Counter n°	Description	Unit
C-28	Activation of high pressure switch for compressor n°2	quantity
C-29	Activation of low pressure switch for refrigerant fluid	quantity
C-30	Activation of high temperature for compressor n°1 exhaust	quantity
C-31**	Activation of high temperature for compressor n°2 exhaust	quantity
C-32	Overheating at heat pump outlet	quantity
C-35	Insufficient flow rate	quantity
C-36	BUS error	quantity
PILOT		
C-40	Time of DHW request from tank	h
C-41	Time of heating request from ambience	h
C-45	Time of heating request for back-up boiler	h
C-46	Time of the electrical back-up operating	h
C-49	Overheating at pilot outlet error	quantity
C-50	Lack of water pressure error	quantity
C-51	Lack of water flow defect	quantity
C-52	Error loss of BUS connection	quantity

BACK-UP

C-46	Operating status of stage 1 of the electrical back-up system	h
C-47	Operating status of stage 2 of the electrical back-up system	h
C-48	Operating status of stage 3 of the electrical back-up system	h

*counters which can be reset to zero by long pressing (5s) on  +  in the **COUNTERS** menu.

Note :

If several heat pumps are connected, each of them will have its own counters, readable via **HP1**, **HP2**, **HP3** sub-menus in **COUNTERS** menu.

7.1.6 - Manual forcing of components

Enter the **EXPERT** menu ( + ) and then the **MANUAL** sub-menu.

7.1.6.1 - Circulator pump

Activate the forced operation of the circulator pump to check that circulation is working properly. To activate forced operation press .

7.1.6.2 - Electrical back-up

Activate (always in the **MANUAL** menu of the pilot) the forced operation of the electrical back-up by pressing .

7.1.6.3 - Back-up boiler

Activate (always in the **MANUAL** menu of the pilot) the forced operation of the Back-up boiler by pressing .

7.1.7 - Errors indicated by the pilot

Press  to stop the sound signal (the error persists)

Whatever the number of connected heat pumps, errors denomination is the same. If several heat pumps are connected, error alternately appears with the heat pump which is concerned.

Display	Error	Possible causes	Consequences	Reset
<i>AIR HP</i>	T _{air} error	The heat pump temperature sensor (T _{air}) is defective or not connected properly	Heat pump stopped*	Automatic after repair
<i>CIRC PUMP</i>	Power cable or PWM circulator cable error	The cables for the heat pump circulator are defective or not connected properly	Complete stop	Manual
<i>AMBI ENCE</i>	Amb error	The ambient temperature sensor is defective (error when measuring the ambient temperature)	Heating circuit stopped	Automatic after repair
<i>BLOC. CIRC</i>	Circulator pump blocked	The circulator (heating/water) is blocked or is working with a load loss which is too high	Complete stop	Manual
<i>BUS</i>	BUS	BUS communication error	Complete stop	Automatic after repair
<i>AMB BUS</i>	Amb BUS error	The ambient temperature sensor («Amb» terminals on the pilot) is defective or not connected properly	Heating circuit stopped	Automatic after repair
<i>BUS HP 1</i>	BUS	BUS communication problem between the two Z1 pilot boards	Complete stop	Automatic after repair
<i>COND. SENS DIAG</i>	Condenser fluid pressure sensor error	The refrigerant circuit pressure sensor is defective or not connected properly	Operation in downgraded mode	Automatic after repair
<i>EVAP. SENS</i>	Evaporator fluid pressure sensor error	The refrigerant circuit pressure sensor is defective or not connected properly	Heat pump stopped*	Automatic after repair
<i>PRES. SENS</i>	Pressure sensor error	The heating water pressure sensor is defective or not connected properly	Complete stop	Automatic after repair
<i>INVR. COMM.</i>	Inverter communication error	HP circuit board is disconnected or defective	Heat pump stopped*	Manual
<i>CP CTRL</i>	Loss of control of inverter	Error detected by the HP circuit board	Heat pump stopped*	Manual
<i>CP ELEC</i>	Inverter having electrical problems	Error detected by the HP circuit board	Heat pump stopped*	Manual
<i>CP MECA</i>	Inverter having mechanical problems	Error detected by the HP circuit board	Heat pump stopped*	Manual
<i>CP THERM</i>	Inverter having thermal problems	Error detected by the HP circuit board	Heat pump stopped*	Manual
<i>CP1 OVRHT. ERR</i>	Multiple overheating on compressor 1	- The set temperature for heating during warmer months is too high - Problem with refrigerant fluid load	Heat pump stopped*	Manual
<i>CP2 OVRHT. ERR</i>	Multiple overheating on compressor 2	- The set temperature for heating during warmer months is too high - Problem with refrigerant fluid load	Heat pump stopped*	Manual
<i>FLOW OR FLOW 1</i>	No flow HP circuit	- The filter valve needs maintenance - A valve on the distribution circuit is closed - The circuit is blocked	Heat pump stopped*	Manual
<i>REV. FLOW</i>	Flow rate is reversed	- The hydraulic connection between the heat pump and the pilot is reversed - The heat pump's inlet and outlet sensors are reversed	Heat pump stopped*	Manual

Press  for 2 seconds to remove the errors manually (indicated by «press  »).

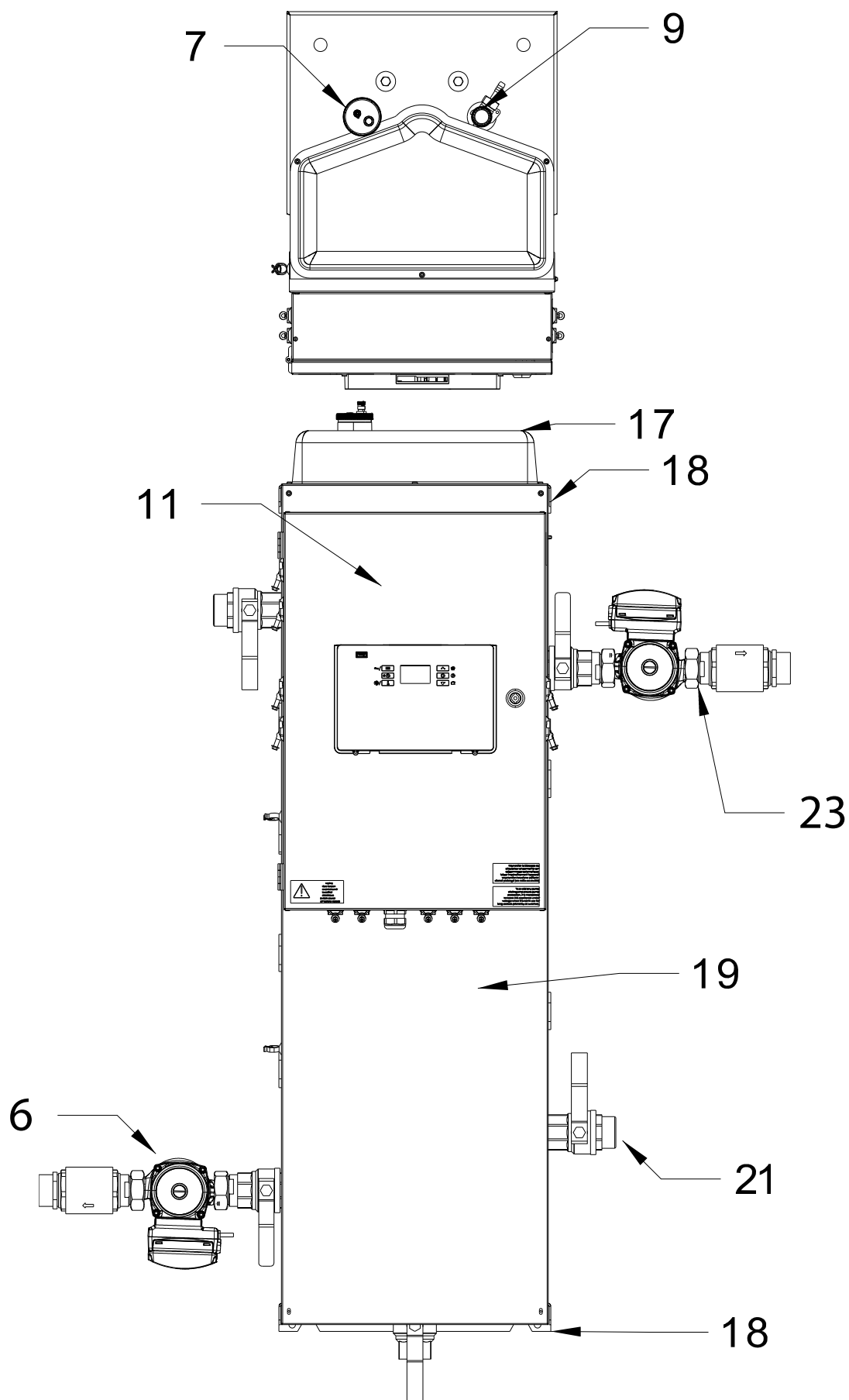
Display	Error	Possible causes	Consequences	Reset
FREQ. DEFRO.	Defrosting too often error	- The heat pump's evaporator or the grills of the crankcase heater are obstructed and are preventing proper air flow - The free space around the heat pump to ensure sufficient air flow has not been respected - Problem with refrigerant fluid load	Heat pump stopped*	Manual
LONG DEFRO.	Defrosting cycle is too long error	- Defrosting valve blocked	Heat pump stopped*	Manual
"MAIN TENANT EXCHANGER"	Maintenance is needed on the hot water exchanger	- Hot water exchanger is clogged - The tank's water sensor is misplaced	Informative message	Manual
CLOCK	Clock	Clock is defective	Permanent operation in ECO mode	Replace circuit board
INV T1/T2	Compressor sensors reversed error	The sensors for compressor 1 and compressor 2 have been reversed (affects the heat pumps and both compressors)	Heat pump stopped*	Manual
SOFTWARE	Software update necessary	The software versions of the heat pump and pilot are incompatible	Complete stop	Automatic after repair
HP MEMORY	HP memory card	Heat pump memory card defect	Heat pump stopped*	Automatic after repair
MEMORY	Pilot memory card	Pilot memory card defect	Complete stop	Automatic after repair
HP NUMBER DIAG	Number of HPs connected error	- The HP has been unplugged or switched off - the number of heat pumps declared at P215 is not accurate	Informative message	Automatic after repair
HP OUTPUT.	Overheating at HP outlet	The temperature at the heat pump outlet is abnormally high	Heat pump stopped*	Automatic
HP OUTPUT ERR	Multiple overheating at HP outlet	- Drop in flow rate when traveling through the heat pump - Repeated heating requests for low heating needs (installation design)	Heat pump stopped*	Manual
CP1 POWER	Compressor 1 power supply error	There is a problem with the power supply to the compressor (cable,...)	Heat pump stopped*	Manual
CP2 POWER	Compressor 2 power supply error	There is a problem with the power supply to the compressor (cable,...)	Heat pump stopped*	Manual
EXT. SENS. DIAG	Exterior sensor placement error	- The exterior sensor is badly positioned and is being influenced by heat or cold sources - The exterior sensor or the air sensor is defective	Informative message	Manual
PRESSURE	Lack of water pressure	Water pressure is less than 0.3 bars	Complete stop	Automatic after pressure is returned
CP1 RAMP	Temperature ramp is insufficient for Compressor 1	- Compressor blocked or error in power supply (cable, voltage) - Defrosting valve blocked	HP stopped and restart (with anti-short cycle)	Automatic
CP2 RAMP	Temperature ramp is insufficient for Compressor 2	- Compressor blocked or error in power supply (cable, voltage) - Defrosting valve blocked	HP stopped and restart (with anti-short cycle)	Automatic
REPROGRAM / PILOT / HP	Reprogramming error	An error is detected on the reprogramming circuit on one the bus's circuit boards	Informative message	Automatic after repair

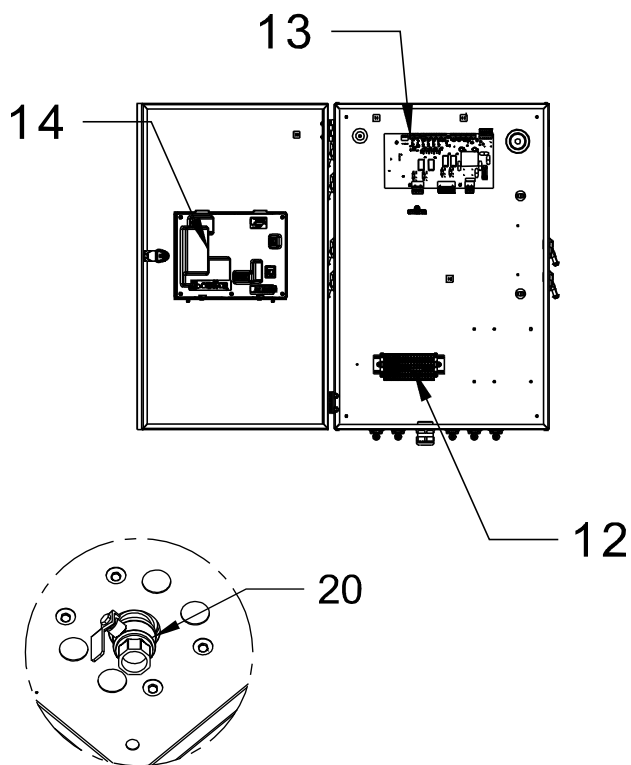
The messages signalled by «**DIAG**» are informative and do not interrupt the operating of the **Pilot**. This information comes from the analysis of the operating history of the **Pilot** and is designed to assist you in the maintenance of your installation.

Display	Error	Possible causes	Consequences	Reset
<i>CUTO. AUX 1</i>	Thermal safety fault	The factory-fitted shunt is not in place or incorrectly connected to the control board.	Complete stop	Automatic when the shunt is replaced
<i>CUTO. LPRE</i>	Low pressure error	- The set temperature for heating during colder months is too low - Problem with refrigerant fluid load	Heat pump stopped*	Automatic
<i>CUTO. LPRE ERR</i>	Low pressure error	- The set temperature for heating during colder months is too low - Problem with refrigerant fluid load	Heat pump stopped*	Manual
<i>CUTO. HPRE1</i>	High pressure switch HP1	- The set temperature for heating during warmer months is too high - Problem with refrigerant fluid load	Heat pump stopped*	Manual
<i>CUTO. HPRE2</i>	High pressure switch HP2	- The set temperature for heating during warmer months is too high - Problem with refrigerant fluid load	Heat pump stopped*	Manual
<i>T CY LIND</i>	Tank sensor out of place	The water sensor is out of place in the tank, or it is placed too low in the tank (placed below the heat exchanger or near the cold water inlet)	DHW circuit stopped**	Manual
<i>CP1 SENSO.</i>	T1 defect	Defect of incorrect connection of the temperature sensor for the compressor – or compressor n°1 depending on the model (connector TCP1 on the HP)	Heat pump stopped*	Automatic after repair
<i>CP2 SENSO.</i>	T2 defect	Defect of incorrect connection of the temperature sensor for compressor n°2 (TCP2)	Heat pump stopped*	Automatic after repair
<i>T-WA TER</i>	TTANK defect	Defect of incorrect connection of the temperature sensor for the DHW tank (terminal «Bal»)	DHW circuit stopped**	Automatic after repair
<i>T-FLOW</i>	TsPAC defect	Defect of incorrect connection of the temperature sensor at the heat pump outlet (TwOUT)	Heat pump stopped*	Automatic after repair
<i>T-PI LOTE</i>	TsEAU defect	Defect of incorrect connection of the temperature sensor of the pilot	Back-up stopped*	Automatic after repair
<i>T-PI LOTE DIAG</i>	Overheating at pilot outlet	- insufficient flow rate to irrigate the pilot	Back-up stopped*	Automatic
<i>T-PI LOTE ERR</i>	Multiple overheating at pilot outlet	- insufficient flow rate to irrigate the pilot	Back-up stopped*	Manual
<i>T-RE TURN</i>	TePAC defect	Defect of incorrect connection of the temperature sensor at the heat pump inlet (TwIN)	Heat pump stopped*	Automatic after repair
<i>T-V3V 1 or T-V3V 2</i>	Underfloor heating flow sensor failure	The sensor is incorrectly connected to the control board input. The sensor is out of range.	Complete shut-down of underfloor heating circuit	Automatic after repair

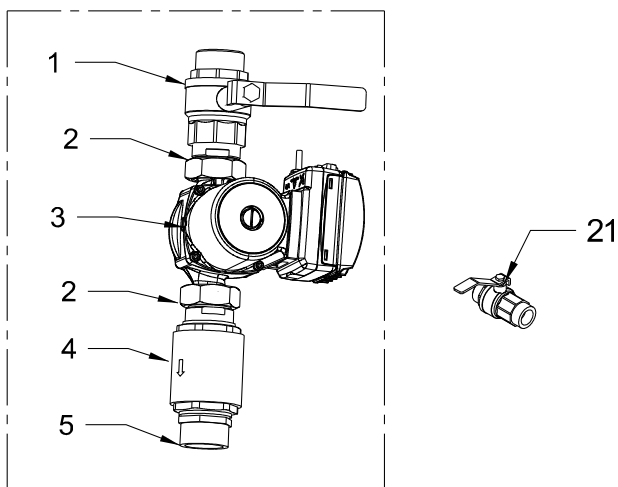
8 - SPARE PARTS

8.1 - Z1 Pilot

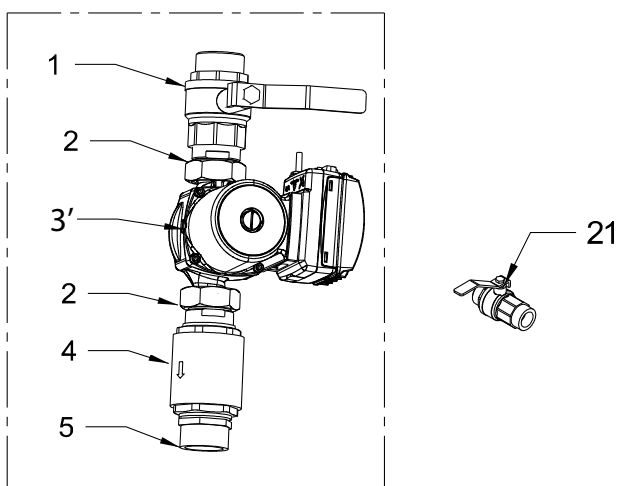




A: PWM hydraulic branch for heat pump circuit(s).



B: AUTO hydraulic branch for transmitter circuit(s) (Heating and/or DHW tank).



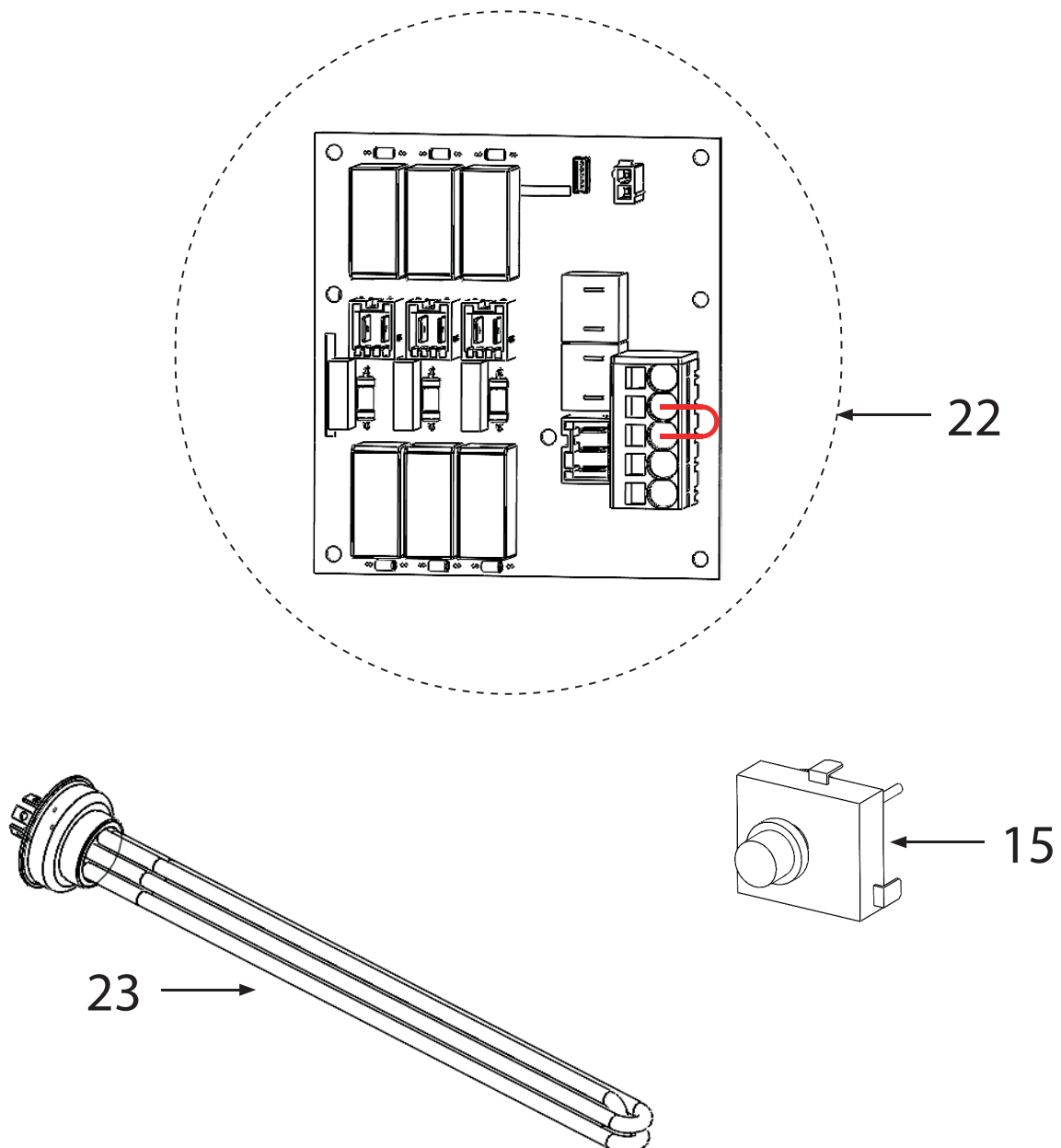
Rep.	Ref.	Description
1	B1239277	1"1/2 valve
2	B1593083	2 pieces 1"1/2 --> 1"1/2 plumbing fitting
3	B4995936	UPMXL 25-125-130 PWM circulator pump + power supply cable + PWM cable
3'	B4995937	UPMXL 25-125-130 PWM circulator pump + power supply cable
4	B1239287	1"1/2 check valve
5	B1134481	1"1/2 plumbing fitting
7	B1239216	1/2" automatic air bleed
non visible	B1242069	6 bar pressure sensor
9	B1239239	6 bar pressure relief valve
non visible	B1244901	6 kW electrical back-up
11	B4995443	Electronic set
12	B1242035	Terminal block
13	B4942181	Electronic power board
14	B4994836	Electronic control board
15	B1238802	Aquastat
17	B1759512	Electrical back-up patch
18	B4480011	Holder
19	B4485867	Electronic base
20	B1238928	Desludging valve
21	B1239275	1"1/2 M/M valve

Note : Availability of spare parts :

Spare parts which belong our products are available during 10 years, from the end of the mass production, except from an event beyond our control.

8.2 - Electrical boxe

Mark	Z1 Pilot	Description
22	B49951051	C11 Circuit board replacement kit
15	B1238802	Aquastat
23	B1244901	6 kW electrical back-up



Note : Availability of spare parts :

Spare parts which belong our products are available during 10 years, from the end of the mass production, except from an event beyond our control.

9 - WARRANTY

9.1 - Warranty coverage

The spare parts (see attached list - excluding 78l tank) are guaranteed for a period of **two (2) years** starting from the date of first use if the warranty form was returned to the manufacturer. In the absence of this form, the date of manufacture will be used as a reference point for the start of warranty.

The appliance is guaranteed against all manufacturing defects, provided that it was installed according to the instructions provided in this manual and in compliance with all current rules and regulations in the country of installation. All electrical connections should comply with the C15-100 standard.

Under no circumstances does a defective part warrant the replacement of the whole appliance.

The warranty only applies to parts which we (intuis) identify as having been defective at manufacture. If necessary, the part or product should be returned to the manufacturer, but only with prior agreement from our technical department. Labour, transport, and packaging costs are the responsibility of the user. Repairs on a device will not result in compensation. The warranty on replacement parts ends at the same time as the warranty of the appliance.

The warranty only applies to the appliance and its components and excludes any part or installation external to the appliance: electrical parts, hydraulic components, etc...

The warranty will not apply in the absence of, insufficient, or improper, maintenance of the appliance.

It is essential to carry out regular annual maintenance on the appliances and on the installation to ensure sustained use and durability. This maintenance should be carried out by your installer, or by an intuis-approved technical centre. In the absence of regular maintenance the warranty is rendered null and void.

If an appliance is presumed to be the cause of any damage, it must not be moved or tampered with before an expert assessment has been carried out.

9.2 - Limitations of warranty

9.2.1 - General information

The warranty does not apply to defects or damage caused by situations or events such as:

- Misuse, abuse, negligence, improper transport or handling.
- Incorrect installation, or installation which has been carried out without following the instructions in the manual and user guide.
- Insufficient maintenance.
- Modifications or changes carried out on the appliance.
- Impacts from foreign objects, fire, earthquakes, floods, lightning, ice, hailstones, hurricanes or any other natural disaster.
- Movement, imbalance, collapse or settling of the ground or the structure where the appliance is installed.
- Any other damage which is not due to defects in the product.

The Pilot is not guaranteed against:

- Variations in the colour of the appliance or damage caused by air pollution, exposure to chemical elements, or changes brought about by adverse weather conditions
- Dirt, rust, grease or stains which occur on the surface of the appliance.

9.2.2 - Cases (not limited to) for exclusion from warranty

9.2.2.1 - Usages

Cases (not limited) for exclusion from warranty:

- Filling with anything other than domestic cold waste from the drinking water network; such as rain-water, well-water, ..., or using domestic cold water which is particularly aggressive and not in compliance with the national regulations in effect in the country of use (DTU 60-1 addendum 4 concerning hot water).
- Switching on the appliance without first having filled it with water.

9.2.2.2 - Handling

Cases (not limited) for exclusion from warranty:

- Any damage sustained by impacts or falls during handling after delivery from the factory.
- Deterioration in the condition of the appliance after handling where the instructions in the manual have not been followed.

9.2.2.3 - Installation site

Cases (not limited) for exclusion from warranty:

- Placement of the **Pilot** in a location where it could be subject to ice frost or other adverse weather conditions.
- Not positioning the appliance in accordance with the instructions in the installer manual.
- Installation of the appliance against a wall which cannot support the weight of the appliance when filled with water.
Costs incurred due to access difficulties are not the manufacturer's responsibility.

9.2.2.4 - Electrical connections

Cases (not limited) for exclusion from warranty:

- Faulty electrical connection which does not conform to the national standards in effect.
- Not following the electrical connection diagrams provided in the installer manual.
- Electrical supply being significantly over- or under- the required voltage.
- Not respecting the supply cable sections.
- Absence of, or insufficient electrical protection throughout the appliance (fuses / circuit breaker, grounding...).
- Damages caused after the neutralisation of the safety aquastat, or due to not having installed an appropriate safety aquastat for underfloor heating.

9.2.2.5 - Hydraulic connections

Cases (not limited) for exclusion from warranty:

- Reversing the inlet/outlet connections.
- Water pressure over 7 bars.
- Absence of, improper mounting of, or obstruction of pressure-relief valves.
- Not installing pressure relief valves directly on the outlet for domestic cold water of the appliance.
- Installing pressure relief valves which do not comply with the national regulations in effect (NF EN 1487 for France).
- Using pressure relief valves which are previously used.
- Not respecting the plumbing of the pressure relief valves.
- Abnormal corrosion due to improper hydraulic connections (direct contact between iron/copper) without a sleeve (cast iron, steel, or insulated).
- External corrosion due to piping being improperly sealed.
In no case can compensation be claimed due to damages caused by the absence of thermostatic mixing valves.

9.2.2.6 - Accessories

The warranty does not cover faults or defects resulting from:

- Installation of accessories which do not comply with our recommendations.
- The use of accessories which do not come from the manufacturer of the appliance.

9.2.2.7 - Maintenance

Cases (not limited) for exclusion from warranty:

- Not maintaining the appliance.
- Not maintaining the pressure relief valves leading to high pressures.
- Abnormal levels of limescale on the heating elements and of the safety devices.
- Not using parts issued by the manufacturer.
- Outer casing and bodywork being subjected to any external damage.

APPENDICES

A1 - Technical specifications

A1.1 - General characteristics

	Z1
Electrical supply	230 V mono
Power supply cable cross-section*	3G 2,5 mm ²
Circuit breaker	10 A
Buffer tank	78 L
Dimensions W x H x D	410 x 1512 x 536 mm
Weight when empty	50 kg
Hydraulic connection	1" 1/2
Back-up	Electric or simultaneous operation of external boiler
Electrical back-up output	0 à 6 kW
Maximum hydraulic pressure	6 bar

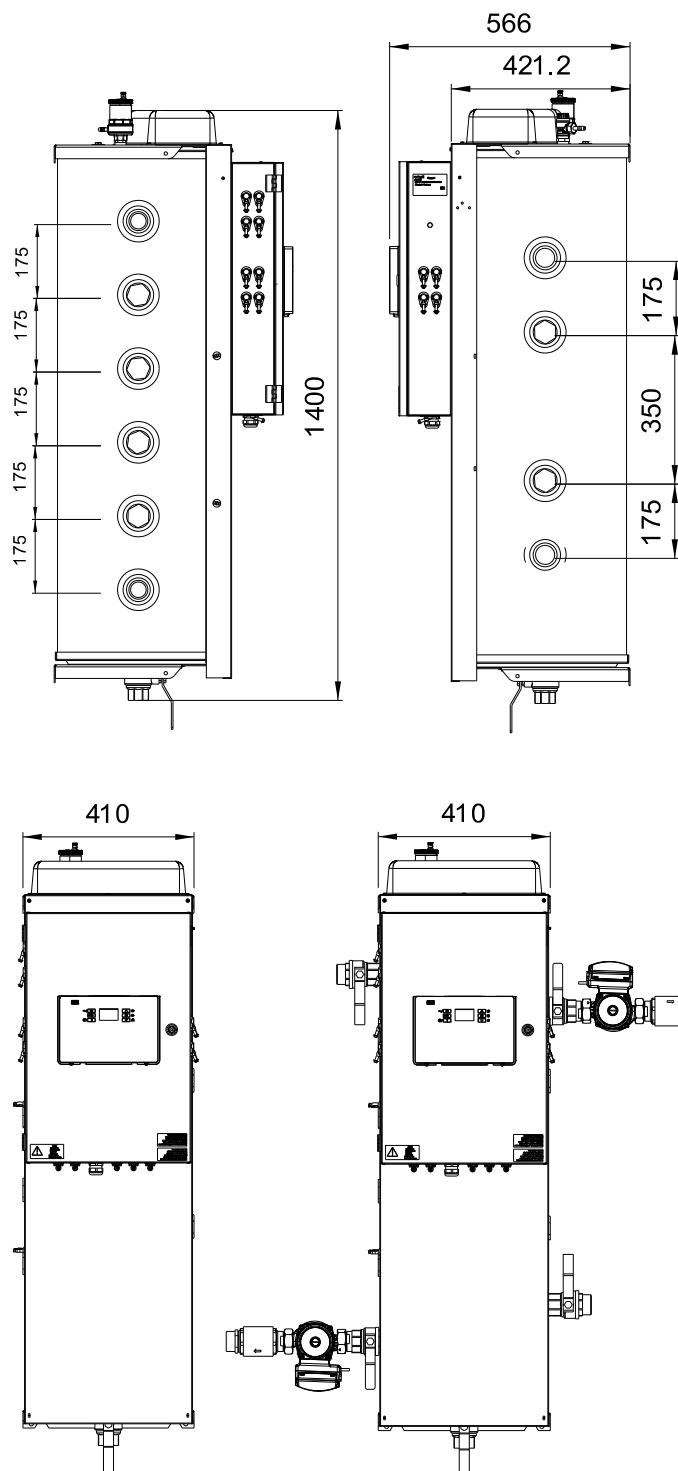
* Minimum cross-section for copper cables.

A1.2 - UE declaration

This device complies with CEI 60335-1, CEI 60335-2-40 electrical securities international norms. CE marking on the device attests its conformity to the following Communal Guidelines, which he answers to essential requirements :

- Low Voltage guideline (BT) : 2014/35/UE.
- Electromagnetic Compatibility : (EMC) : 2014/30/UE.
- Eco conception guideline applicable to products related to energy : 2009/125/CE.
- Restriction of Hazardous substances in electrical and electronic equipment (ROHS) : 2011/65/UE.

A1.3 - Dimensions



A2 - Hydraulic connections between the pilot and the heat pumps

A2.1 - HRC⁷⁰ 17 kW heat pump

	Minimum Ø of piping to respect			
	Steel	Copper	Multilayer	PEX
If distance between HP and Pilot < 10 m <i>(the equivalent of 20 m linear of loss of load)</i>	1"	25/28	26/32	26/32
If distance between HP and Pilot > 10 m and < 20 m <i>(the equivalent of 40 m linear of loss of load)</i>	1"1/4	32/35	33/40	32,6/40
If distance between HP and Pilot > 20 m and < 35 m <i>(the equivalent of 70 m linear of loss of load)</i>	1"1/4	32/35	33/40	32,6/40
If distance between HP and Pilot > 35 m and < 50 m <i>(the equivalent of 100 m linear of loss of load)</i>	1"1/4	39/42	33/40	32,6/40
If distance between HP and Pilot > 50 m and < 75 m <i>(the equivalent of 150 m linear of loss of load)</i>	1"1/2	39/42	42/50	40,8/50
If distance between HP and Pilot > 75 m and < 100 m <i>(the equivalent of 200 m linear of loss of load)</i>	1"1/2	39/42	42/50	40,8/50

A2.2 - HRC⁷⁰ 20 kW heat pump

	Minimum Ø of piping to respect			
	Steel	Copper	Multilayer	PEX
If distance between HP and Pilot < 10 m <i>(the equivalent of 20 m linear of loss of load)</i>	1"	25/28	26/32	26/32
If distance between HP and Pilot > 10 m and < 20 m <i>(the equivalent of 40 m linear of loss of load)</i>	1"1/4	32/35	33/40	32,6/40
If distance between HP and Pilot > 20 m and < 35 m <i>(the equivalent of 70 m linear of loss of load)</i>	1"1/4	32/35	33/40	32,6/40
If distance between HP and Pilot > 35 m and < 50 m <i>(the equivalent of 100 m linear of loss of load)</i>	1"1/4	39/42	33/40	32,6/40
If distance between HP and Pilot > 50 m and < 75 m <i>(the equivalent of 150 m linear of loss of load)</i>	1"1/2	39/42	42/50	40,8/50
If distance between HP and Pilot > 75 m and < 100 m <i>(the equivalent of 200 m linear of loss of load)</i>	1"1/2	39/42	42/50	40,8/50

A2.3 - HRC⁷⁰ 25 kW heat pump

	Minimum Ø of piping to respect			
	Steel	Copper	Multilayer	PEX
If distance between HP and Pilot < 10 m <i>(the equivalent of 20 m linear of loss of load)</i>	1"	25/28	26/32	26/32
If distance between HP and Pilot > 10 m and < 20 m <i>(the equivalent of 40 m linear of loss of load)</i>	1"1/4	32/35	33/40	32,6/40
If distance between HP and Pilot > 20 m and < 35 m <i>(the equivalent of 70 m linear of loss of load)</i>	1"1/4	32/35	33/40	32,6/40
If distance between HP and Pilot > 35 m and < 50 m <i>(the equivalent of 100 m linear of loss of load)</i>	1"1/4	39/42	33/40	32,6/40
If distance between HP and Pilot > 50 m and < 75 m <i>(the equivalent of 150 m linear of loss of load)</i>	1"1/2	39/42	42/50	40,8/50
If distance between HP and Pilot > 75 m and < 100 m <i>(the equivalent of 200 m linear of loss of load)</i>	1"1/2	39/42	42/50	40,8/50

A2.4 - HRC⁷⁰ 32 kW heat pump

	Minimum Ø of piping to respect			
	Steel	Copper	Multilayer	PEX
If distance between HP and Pilot < 10 m (the equivalent of 20 m linear of loss of load)	1"1/4	32/35	33/40	32,6/40
If distance between HP and Pilot > 10 m and < 20 m (the equivalent of 40 m linear of loss of load)	1"1/4	32/35	33/40	32,6/40
If distance between HP and Pilot > 20 m and < 35 m (the equivalent of 70 m linear of loss of load)	1"1/4	39/42	42/50	40,8/50
If distance between HP and Pilot > 35 m and < 50 m (the equivalent of 100 m linear of loss of load)	1"1/2	39/42	42/50	40,8/50
If distance between HP and Pilot > 50 m and < 75 m (the equivalent of 150 m linear of loss of load)	1"1/2	39/42	42/50	40,8/50
If distance between HP and Pilot > 75 m and < 100 m (the equivalent of 200 m linear of loss of load)	2"	51/54	42/50	51,4/63

A2.5 - HRC⁷⁰ 40 kW heat pump

	Minimum Ø of piping to respect			
	Steel	Copper	Multilayer	PEX
If distance between HP and Pilot < 10 m (the equivalent of 20 m linear of loss of load)	1"1/4	32/35	42/50	40,8/50
If distance between HP and Pilot > 10 m and < 20 m (the equivalent of 40 m linear of loss of load)	1"1/2	38/40	42/50	40,8/50
If distance between HP and Pilot > 20 m and < 35 m (the equivalent of 70 m linear of loss of load)	2"	51/54	42/50	51,4/63
If distance between HP and Pilot > 35 m and < 50 m (the equivalent of 100 m linear of loss of load)	2"	51/54	51/63	51,4/63
If distance between HP and Pilot > 50 m and < 75 m (the equivalent of 150 m linear of loss of load)	2"	51/54	51/63	51,4/63
If distance between HP and Pilot > 75 m and < 100 m (the equivalent of 200 m linear of loss of load)	2"1/2	51/54	51/63	51,4/63

A3 - Wiring diagrams

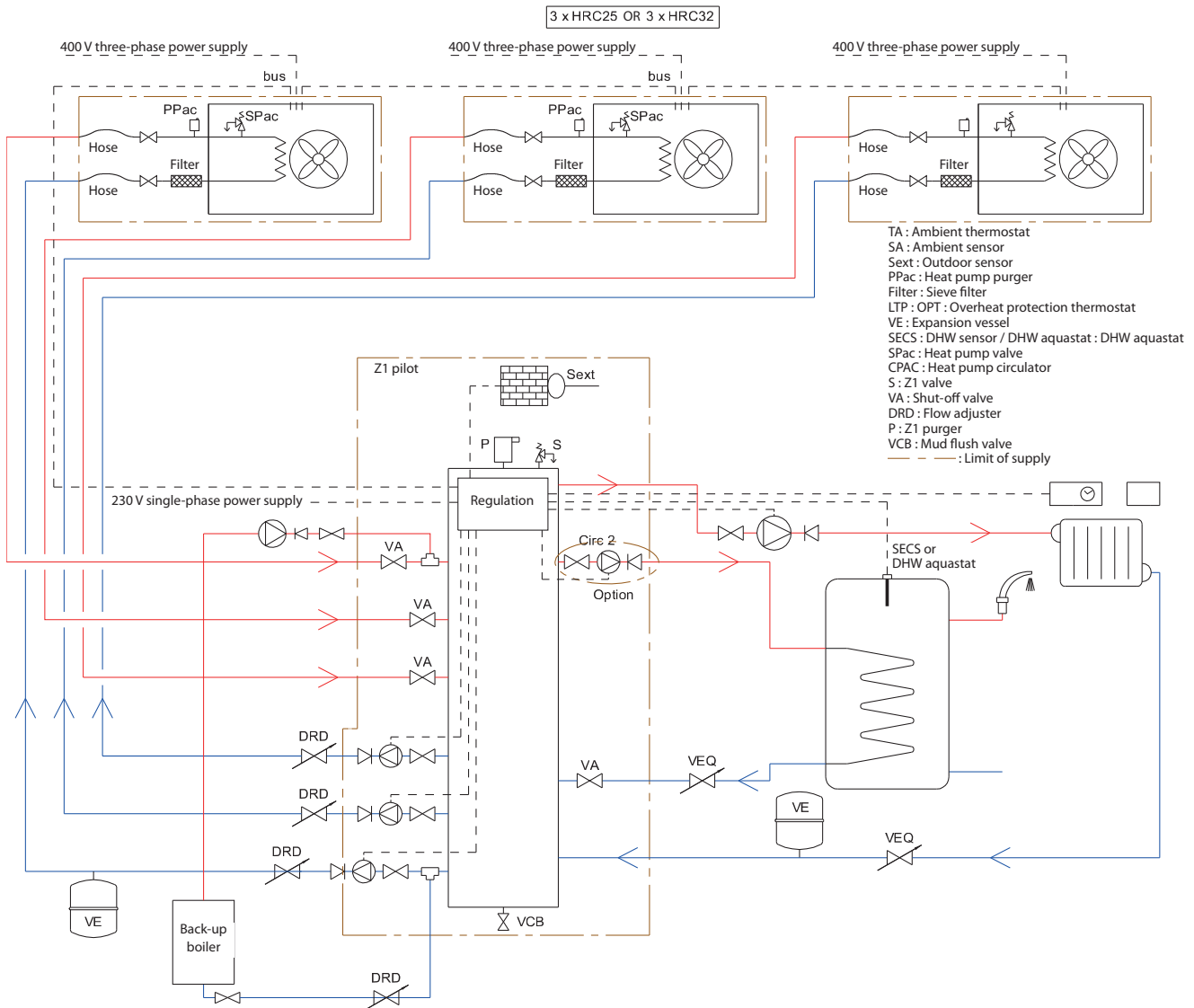
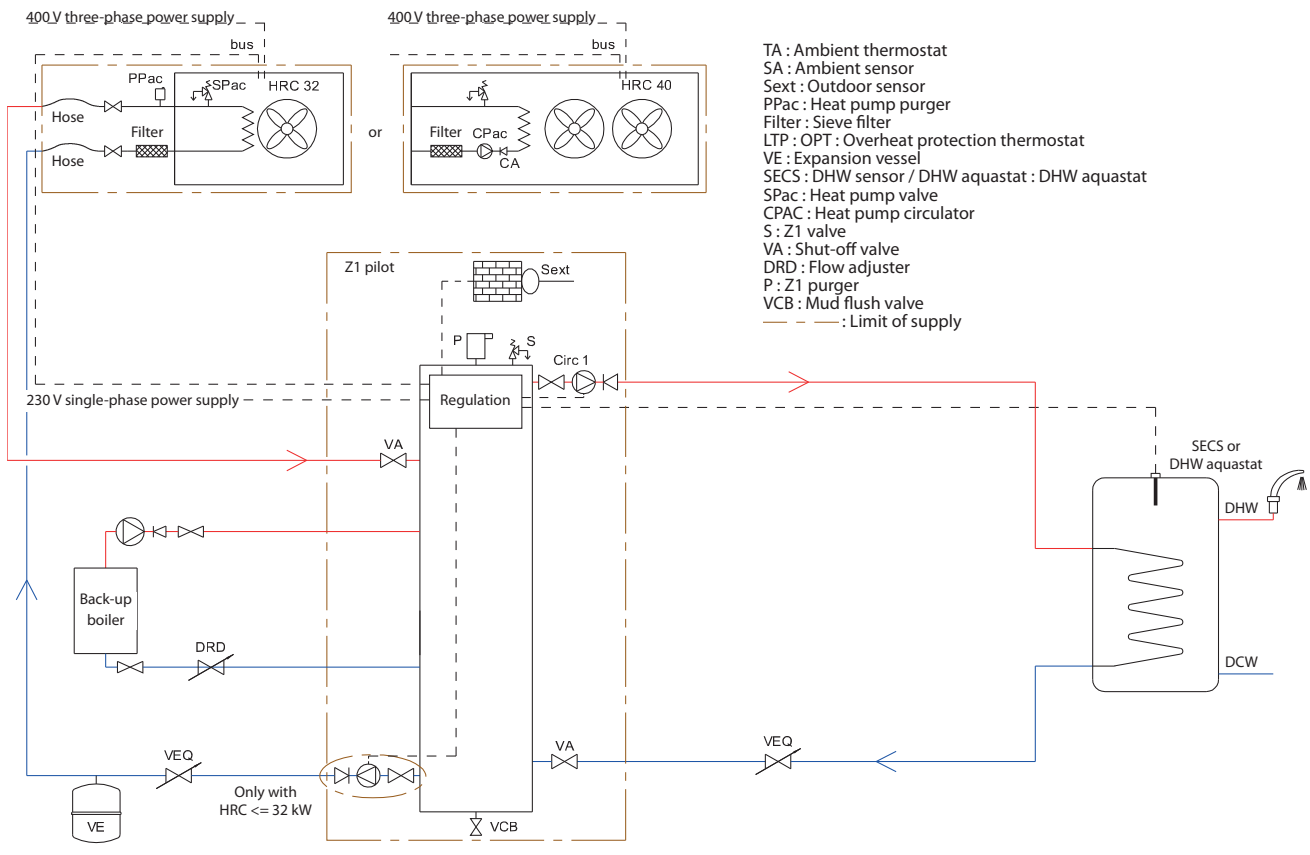
How to find the diagram corresponding to your installation...

Access by table :

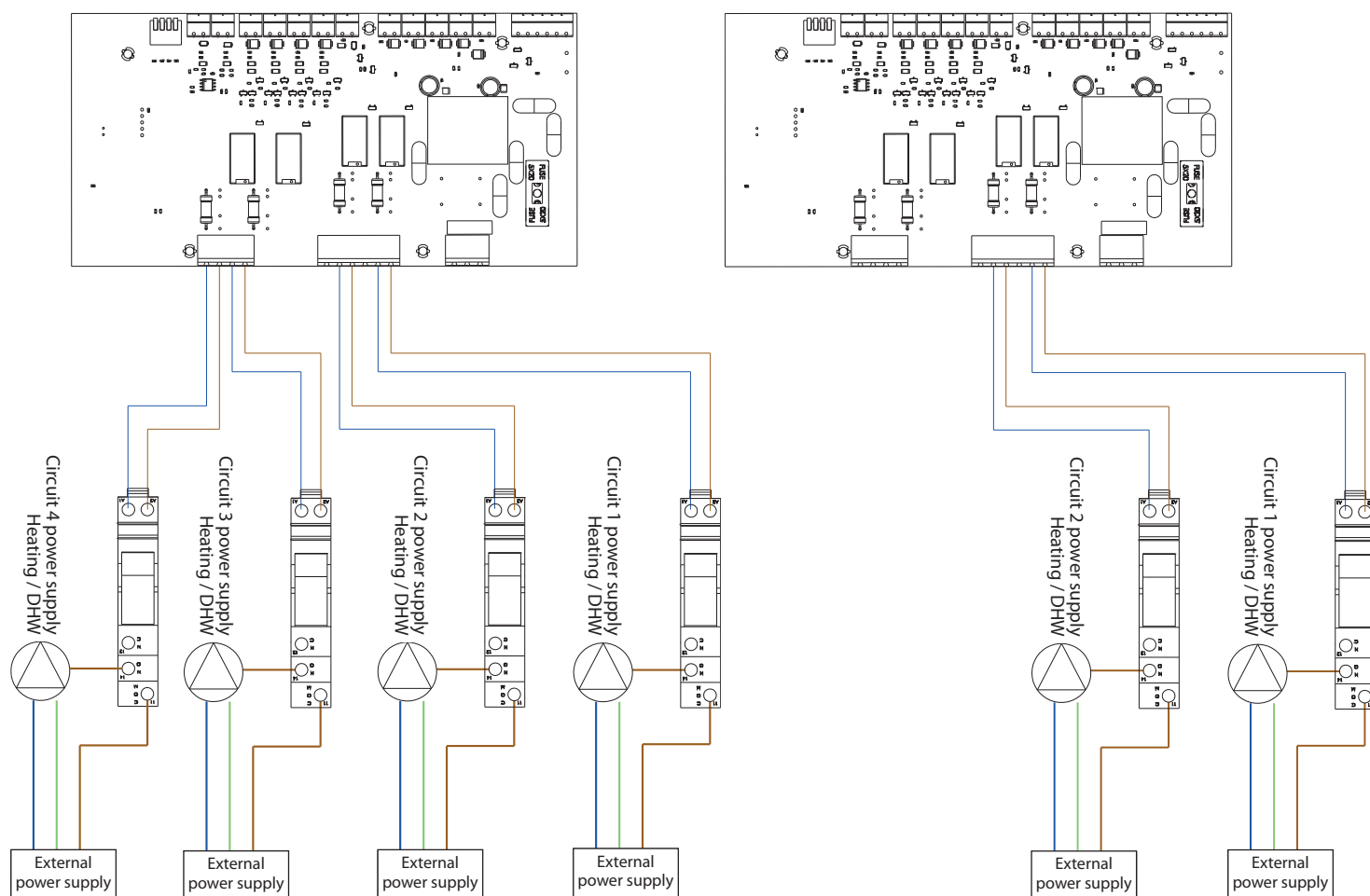
	1 circuit		2 circuits			3 circuits			
	Heating	DHW	Heating Heating	Heating DHW	DHW DHW	Heating Heating Heating	Heating Heating DHW	Heating DHW DHW	DHW DHW DHW
1 HP	CASE n°1 page 47	CASE n°2 page 49	CASE n°3 page 50 and CASE n°28 page 82	CASE n°4 page 52 and CASE n°29 page 83	CASE n°5 page 53	CASE n°6 page 54	CASE n°7 page 55	CASE n°8 page 56	CASE n°9 page 57
2 HP	CASE n°10 page 8	CASE n°11 page 60	CASE n°12 page 61 and CASE n°30 page 84	CASE n°13 page 63 and CASE n°31 page 85	CASE n°14 page 64	CASE n°15 page 65	CASE n°16 page 67	CASE n°17 page 68	CASE n°18 page 69
3 HP	CASE n°19 page 70	CASE n°20 page 72	CASE n°21 page 73 and CASE n°32 page 86	CASE n°22 page 75 and CASE n°33 page 87	CASE n°23 page 76	CASE n°24 page 77	CASE n°25 page 79	CASE n°26 page 80	CASE n°27 page 81

Note : In the following diagrams, when connecting a HRC⁷⁰ 40kW heat pump, the circulator is directly integrated into the heat pump.

In the following diagrams, the back-up boiler is not shown. Use the available inlets/outlets to make the hydraulic connection. If no inlet/outlet is available, use two bypass tees and install them on the branch of one of the heat pumps (see example below).



If the circulator installed on the emitter circuit(s) is not the one supplied in the AUTO hydraulic branch (Ref. 755823), install a relay between the control board and the circulator as follows:

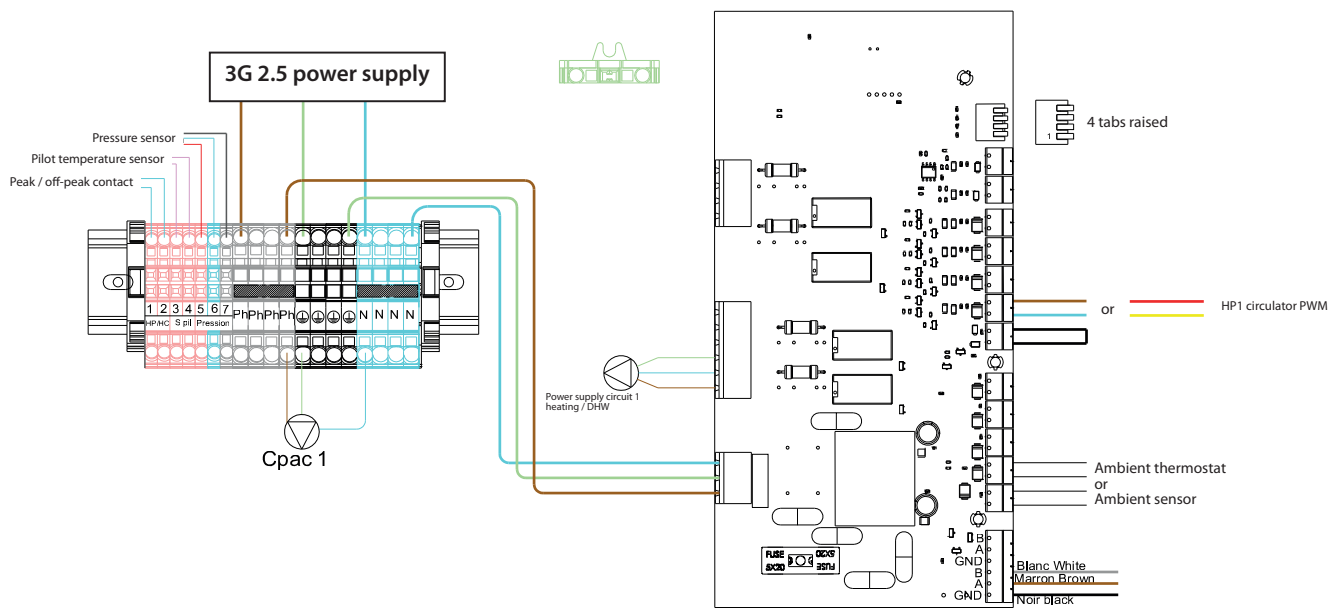


In this case, the circulator must have its own power supply. Do not supply the circulators from the **Z1 Pilot**.

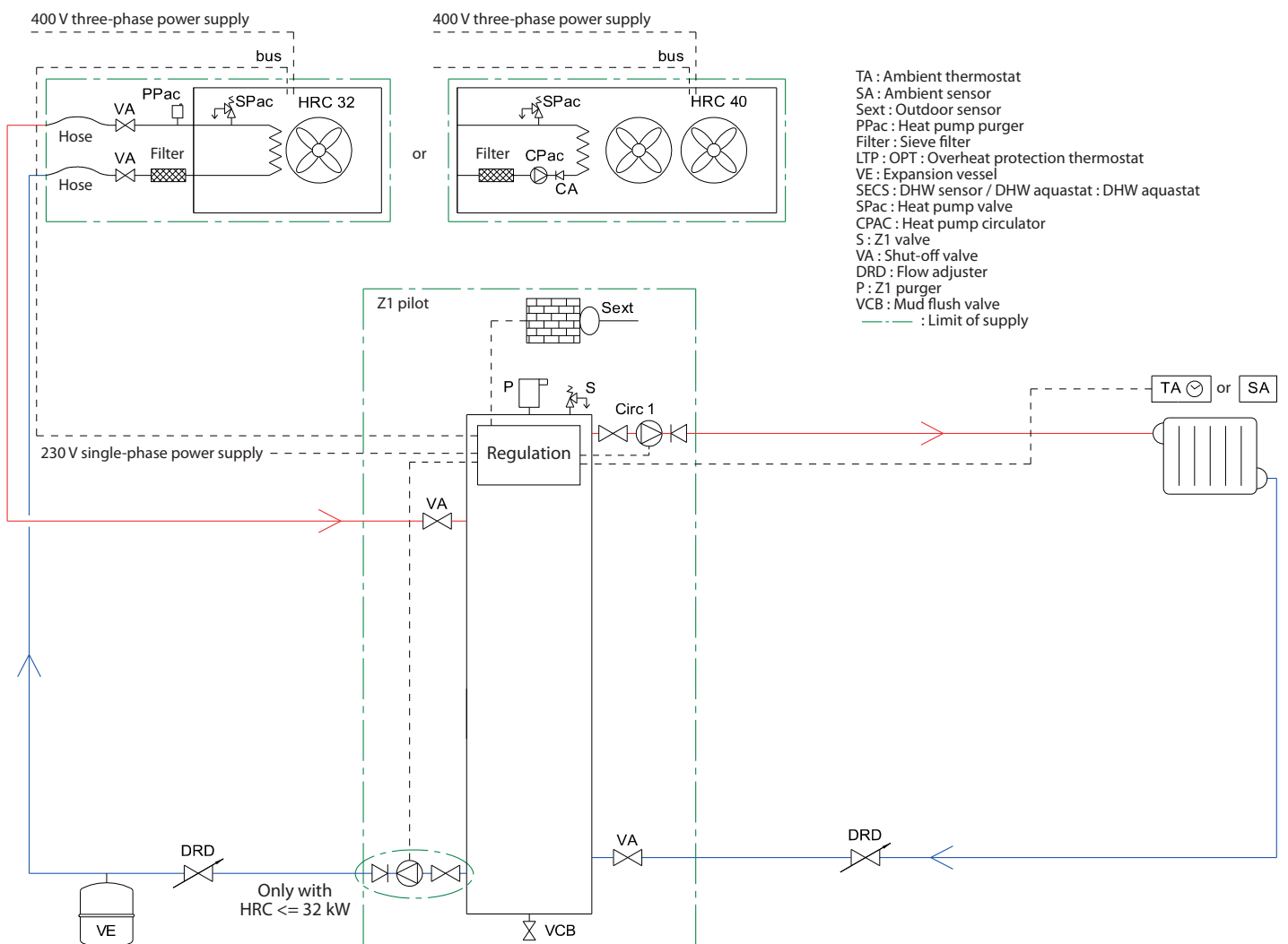
The relay installed must be normally open (NO) so that the contact closes when there is a demand on the circuit(s). Otherwise, the operation of the circulators will be reversed and the system will not operate correctly.

Make sure that the relay is correctly sized. It must be correctly sized in relation to the characteristics of the circulator installed.

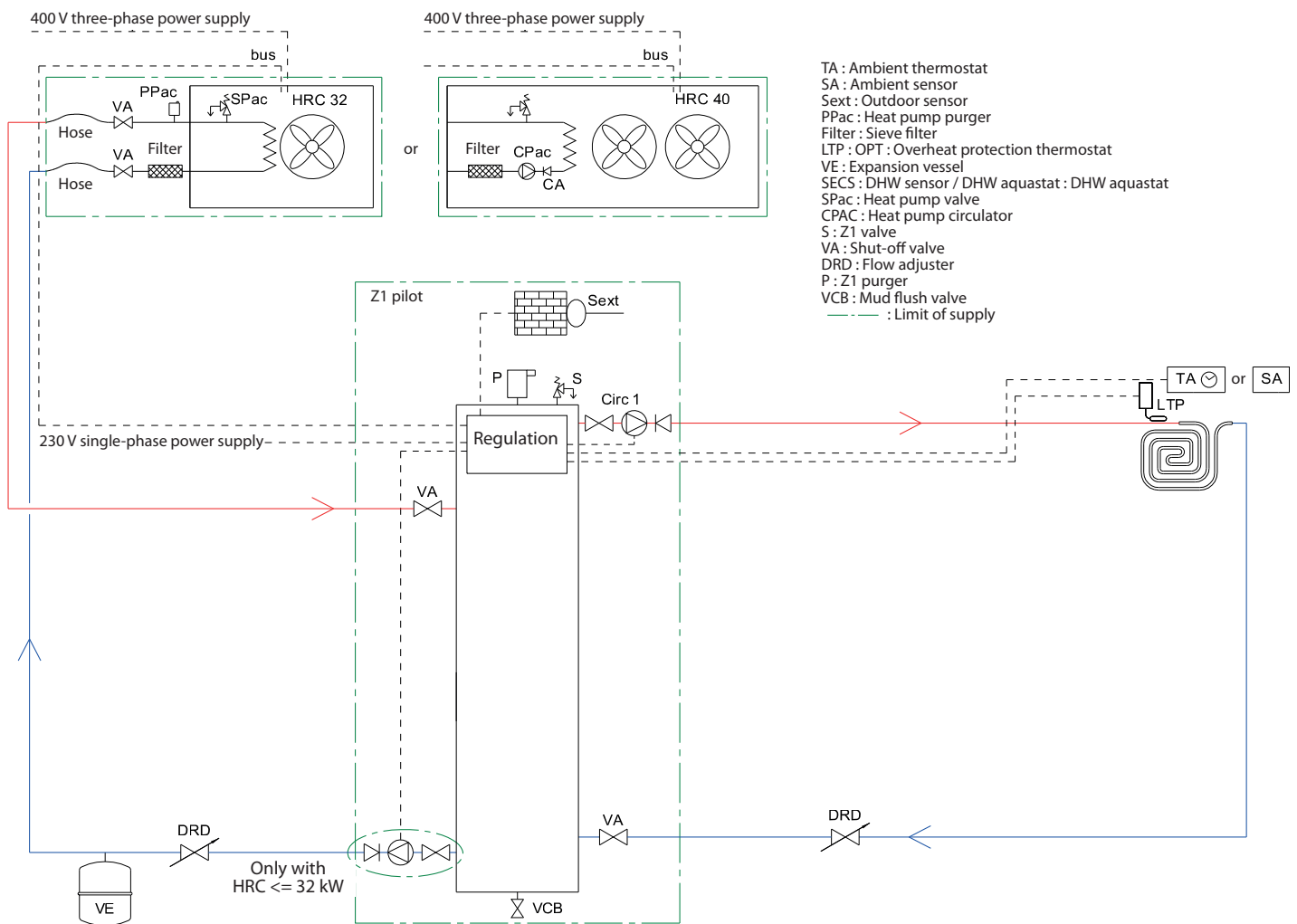
A3.1 - CASE n°1 - 1 HRC⁷⁰ heat pump + 1 heating circuit



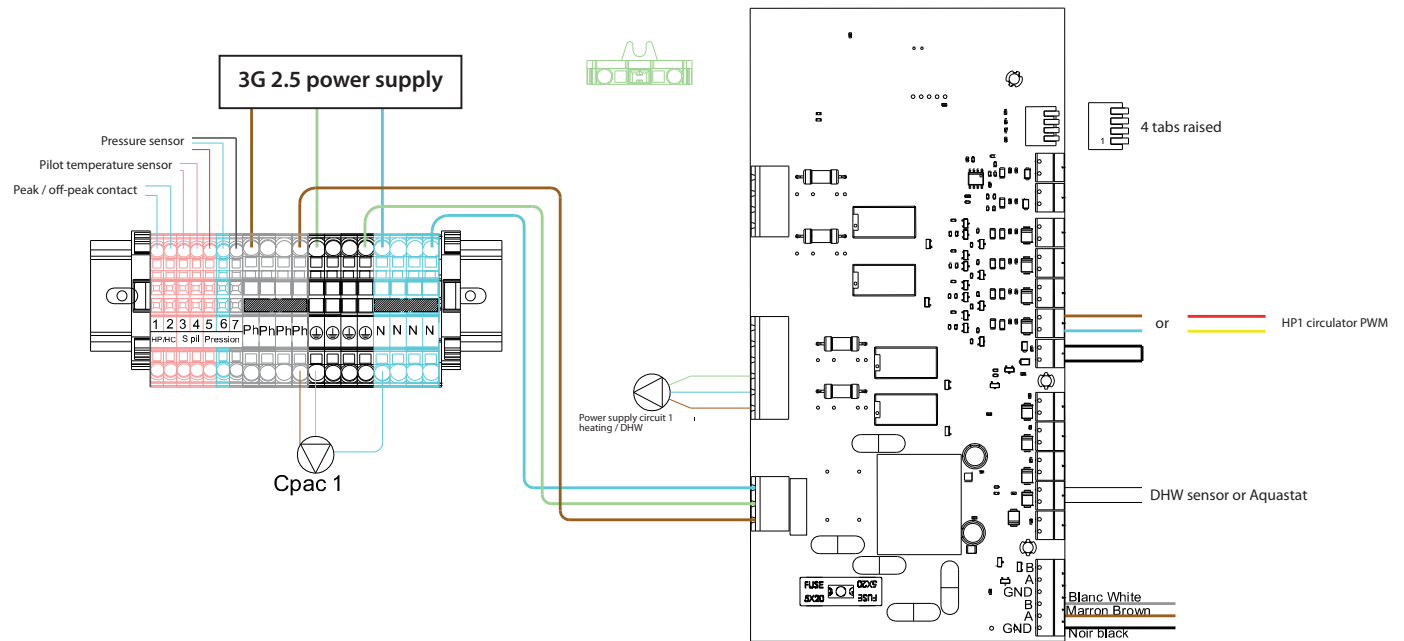
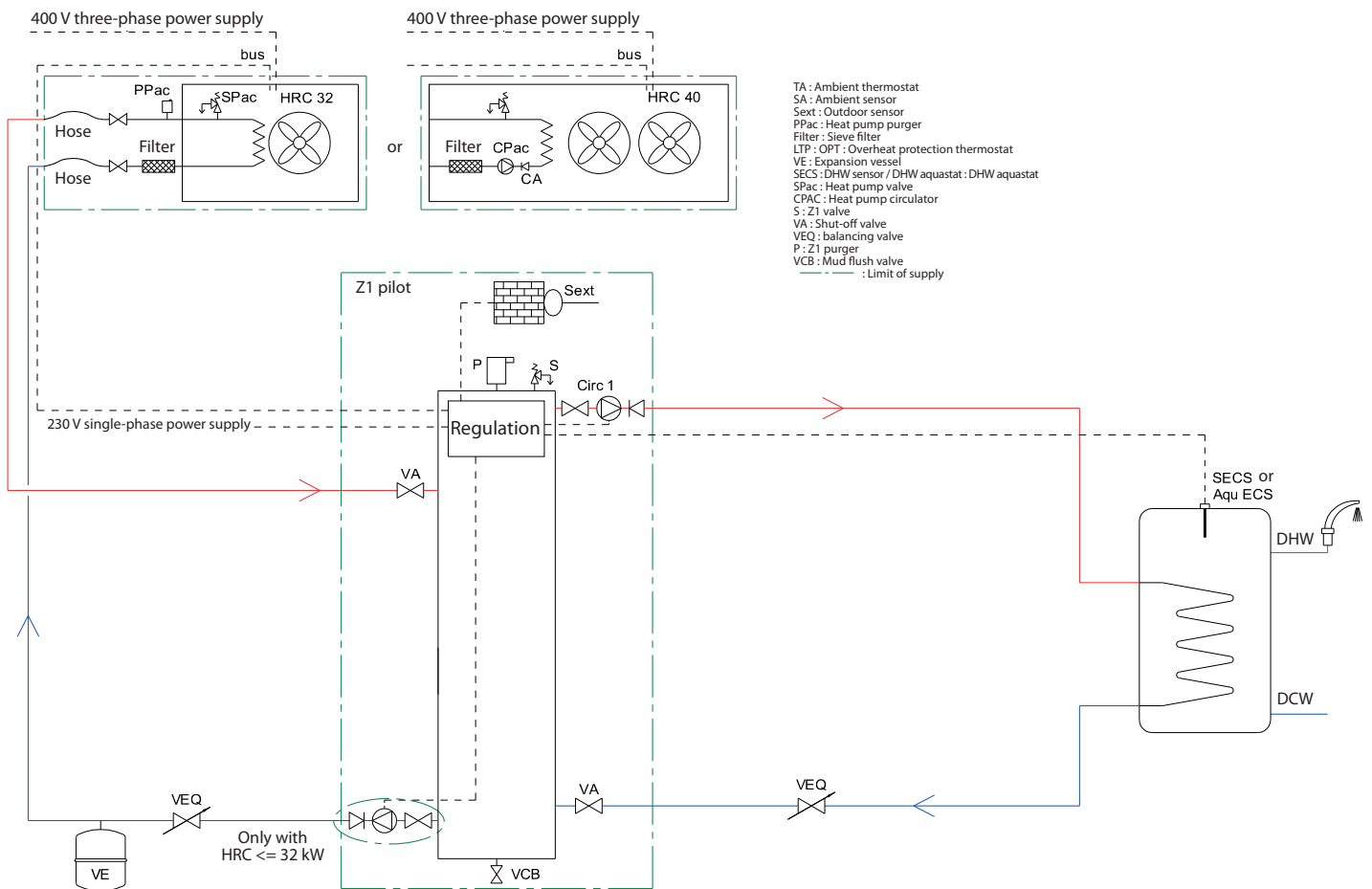
A3.1.1 - Heating circuit - Radiator



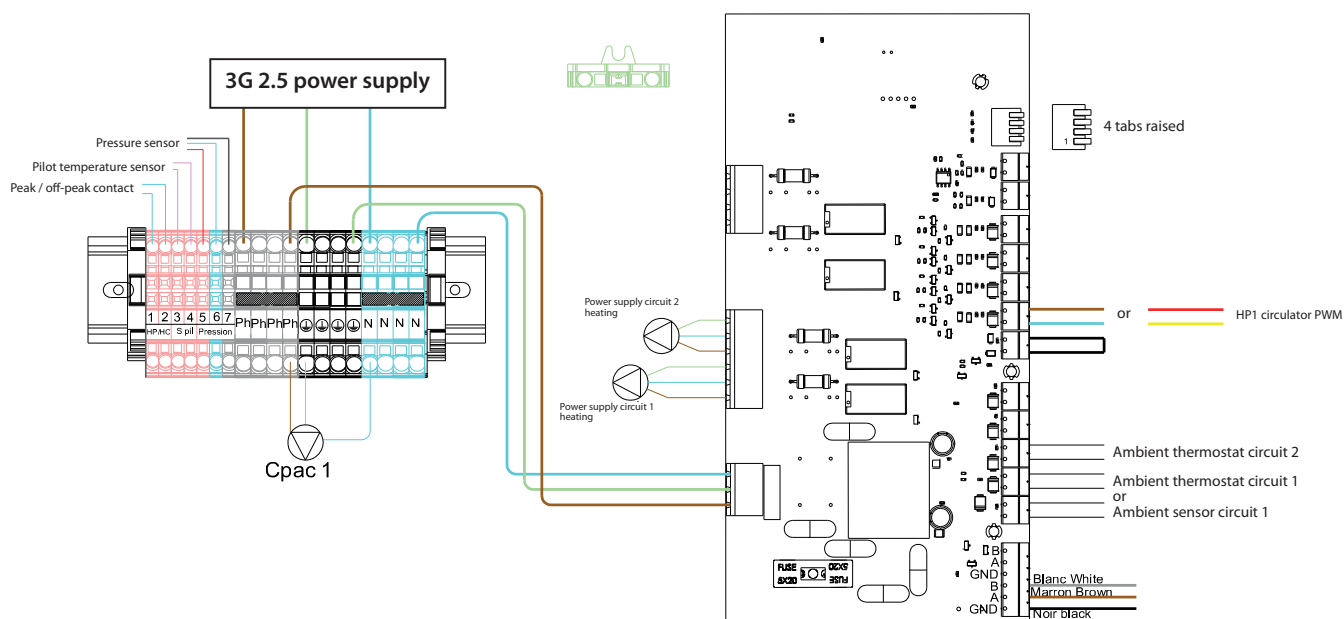
A3.1.2 - Heating circuit - Underfloor heating



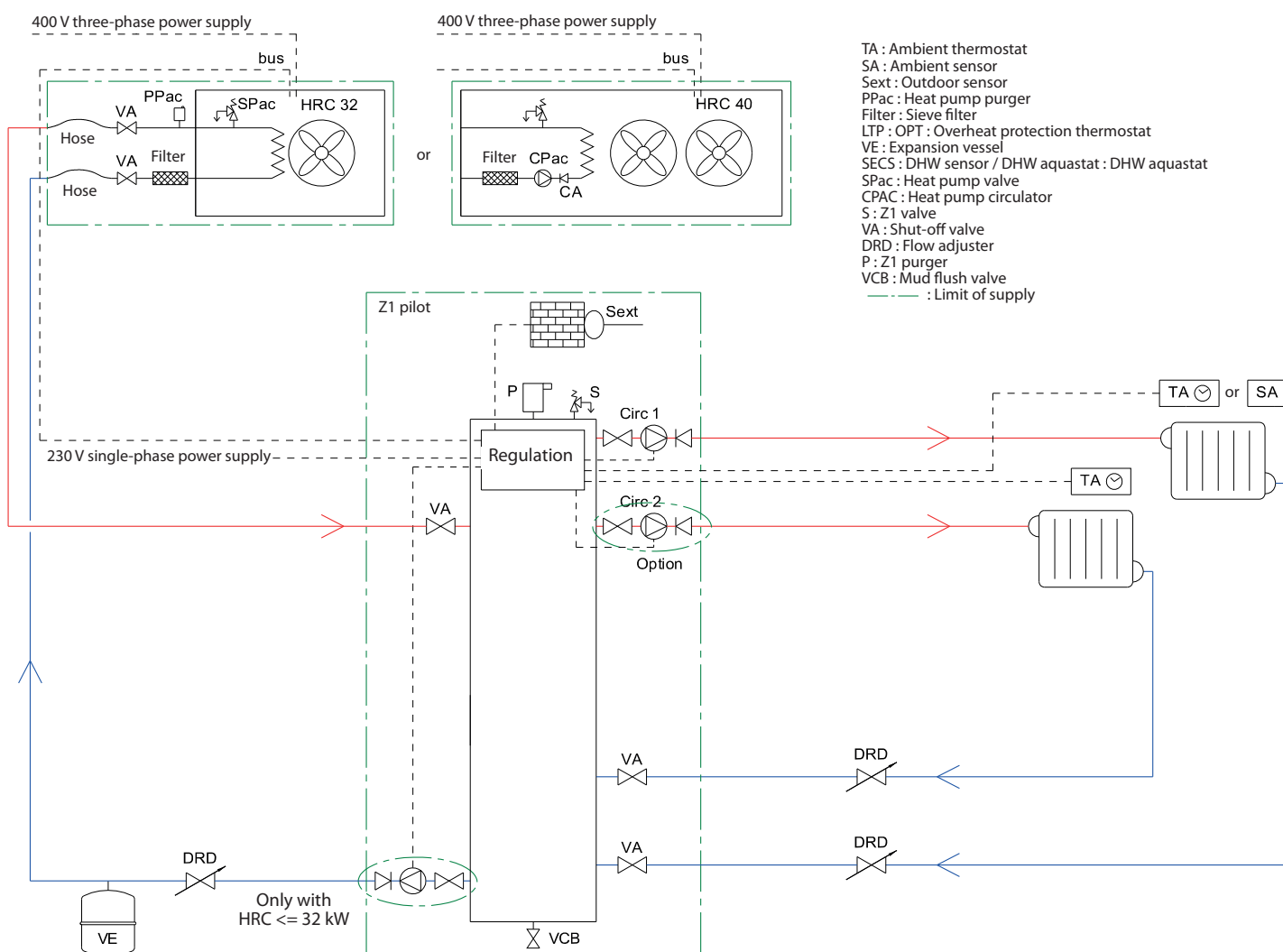
A3.2 - CASE n°2 - 1 HRC⁷⁰ heat pump + 1 DHW tank



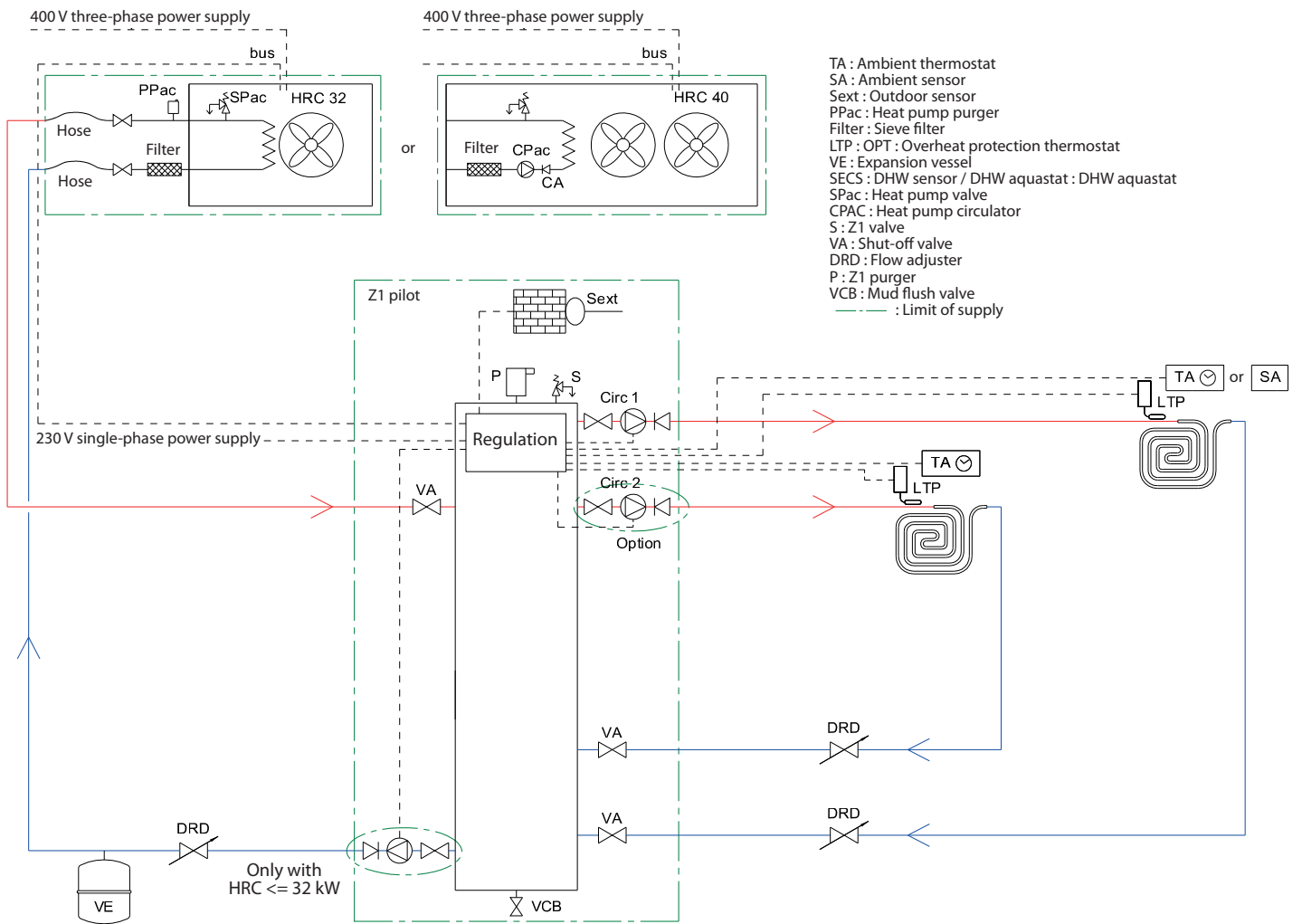
A3.3 - CASE n°3 - 1 HRC⁷⁰ heat pump + 2 heating circuits



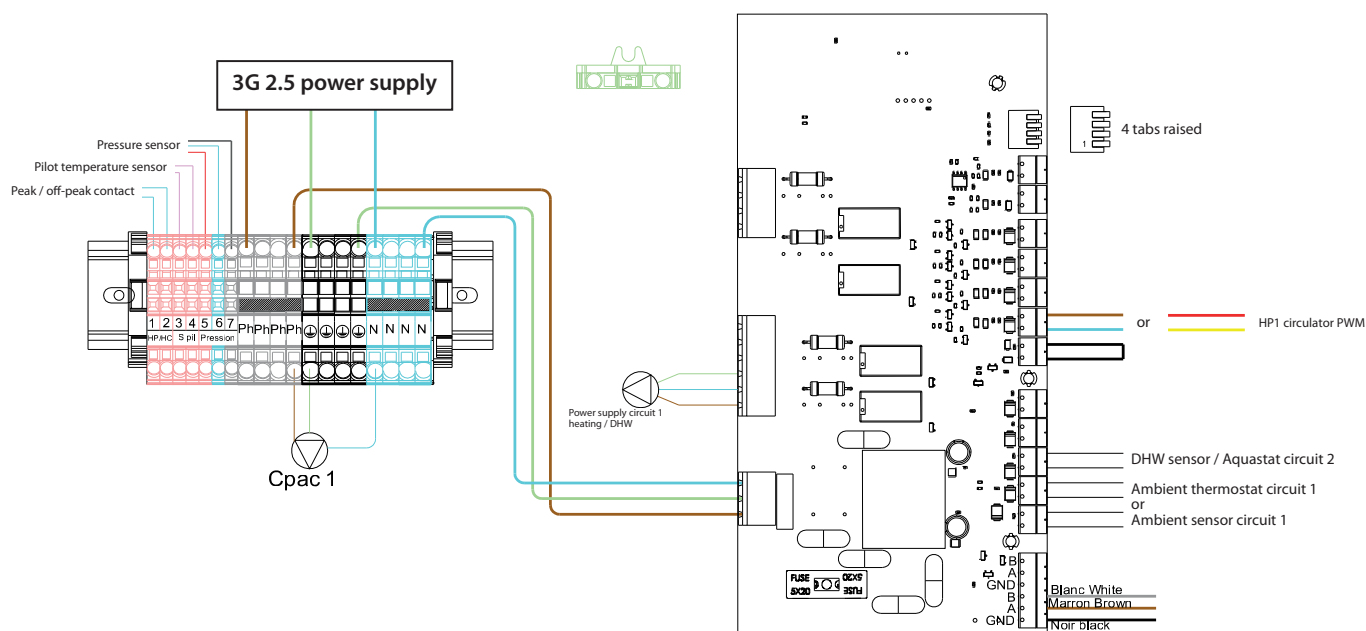
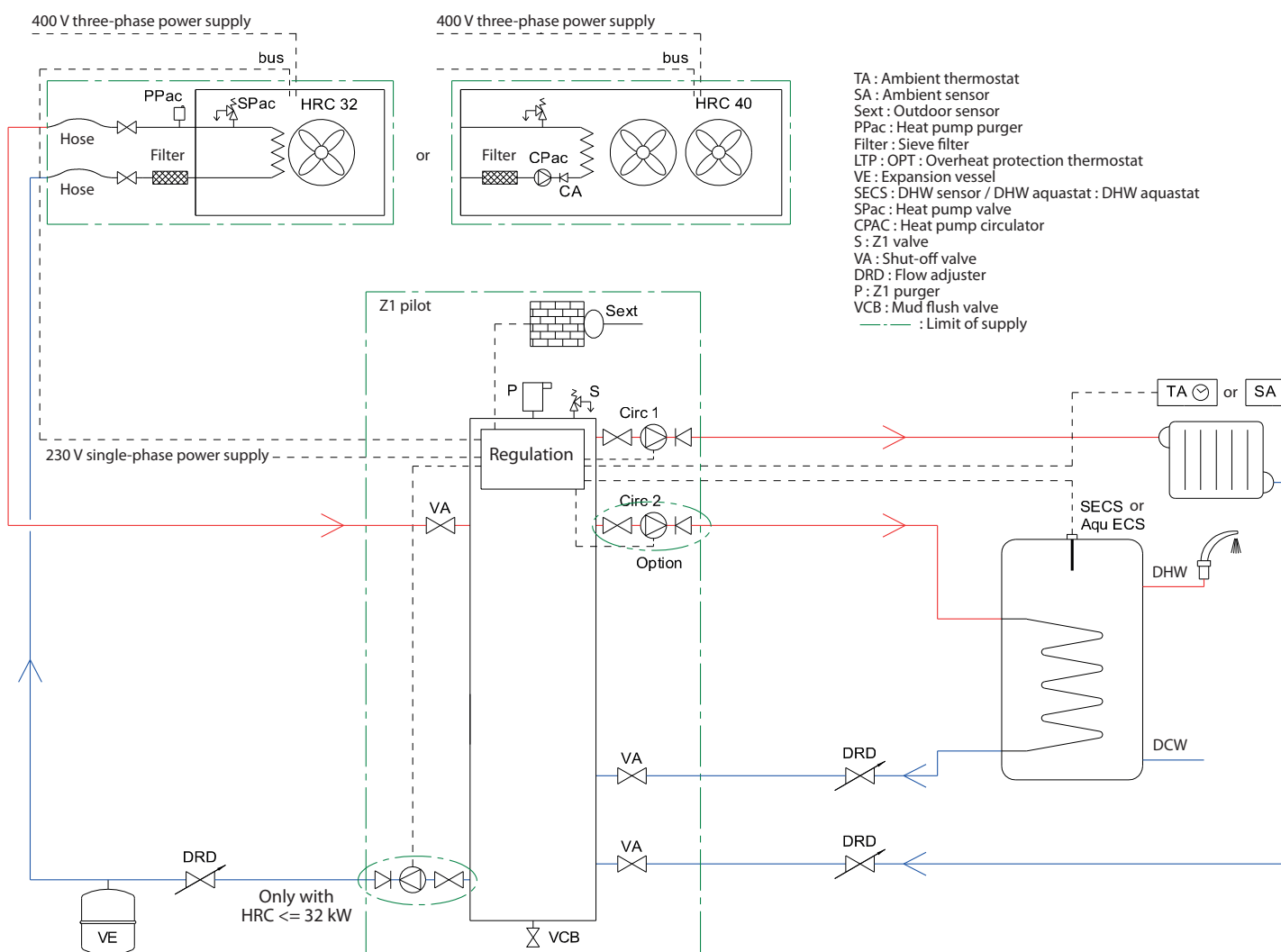
A3.3.1 - Heating circuit - Radiator



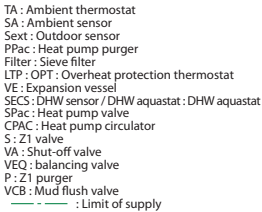
A3.3.2 - Heating circuit - Underfloor heating



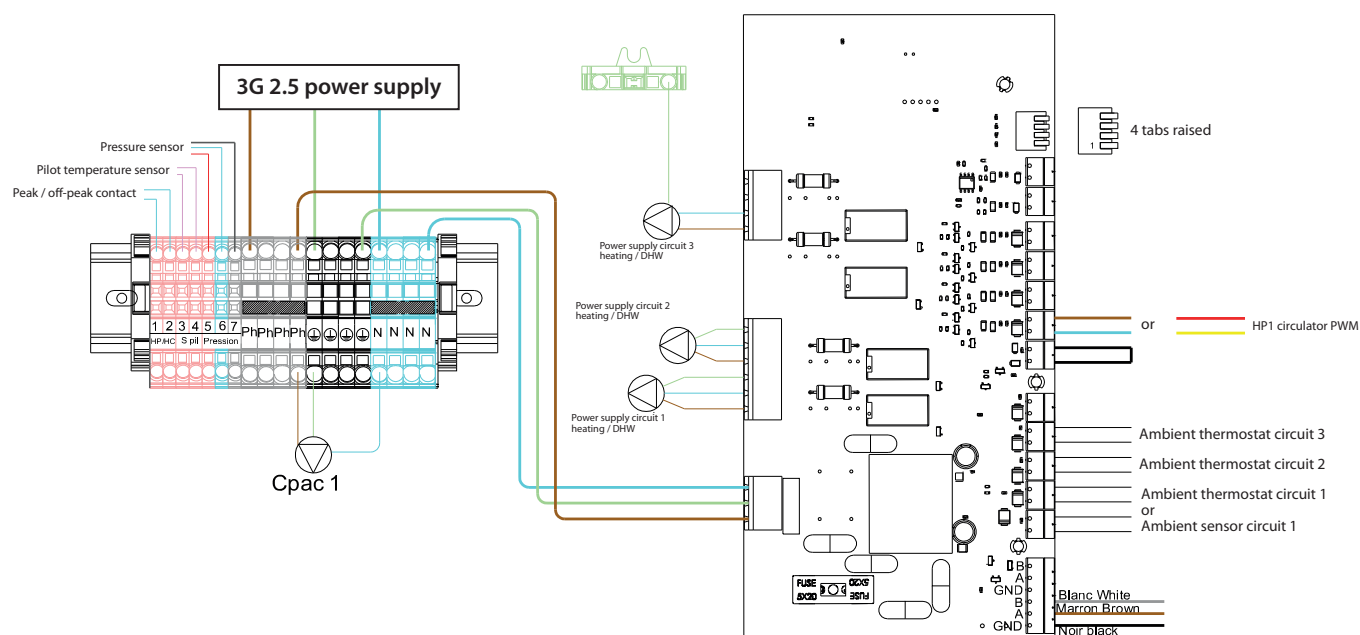
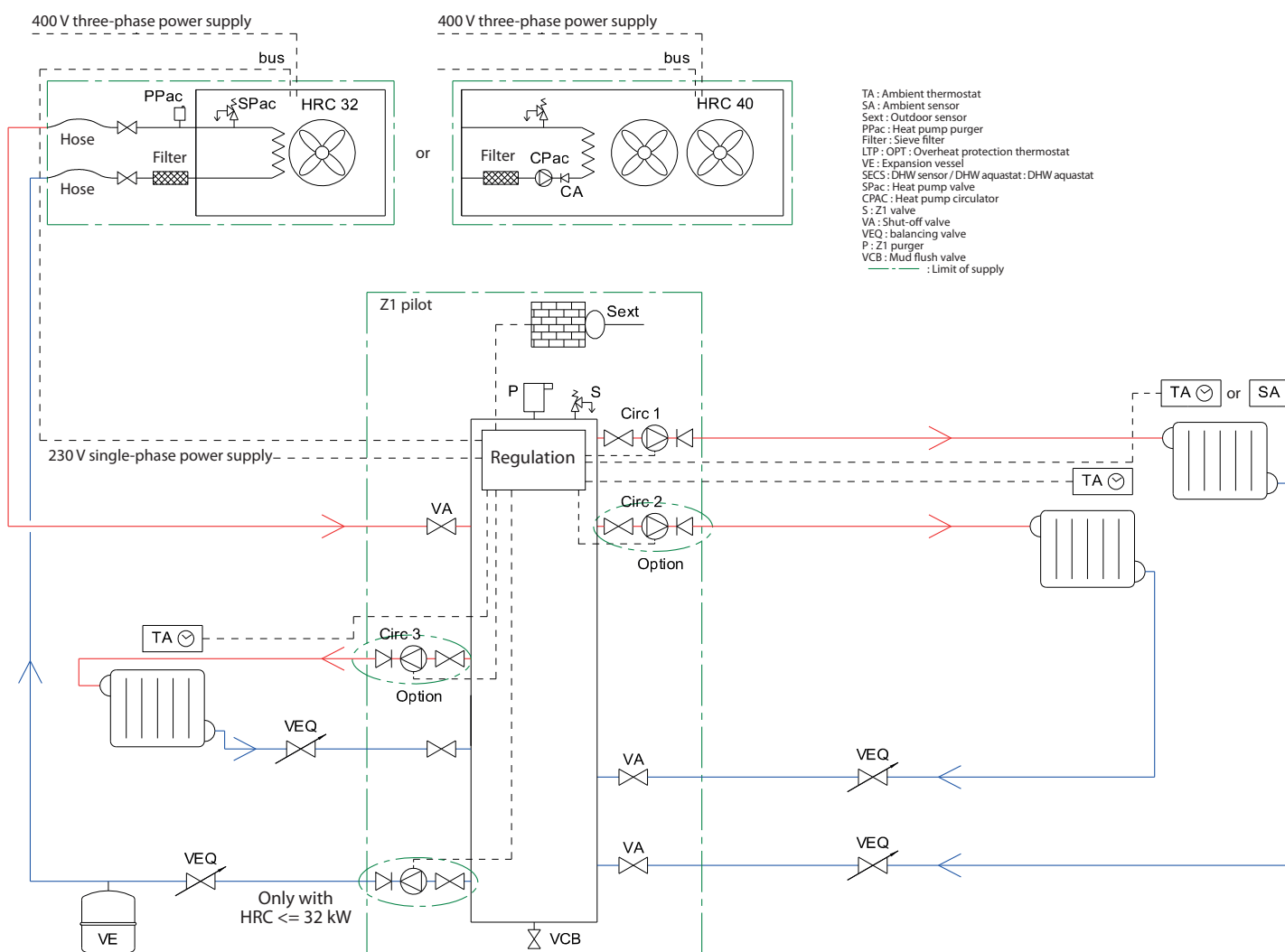
A3.4 - CASE n°4 - 1 HRC⁷⁰ heat pump + 1 DHW tank + 1 heating circuit (radiator)



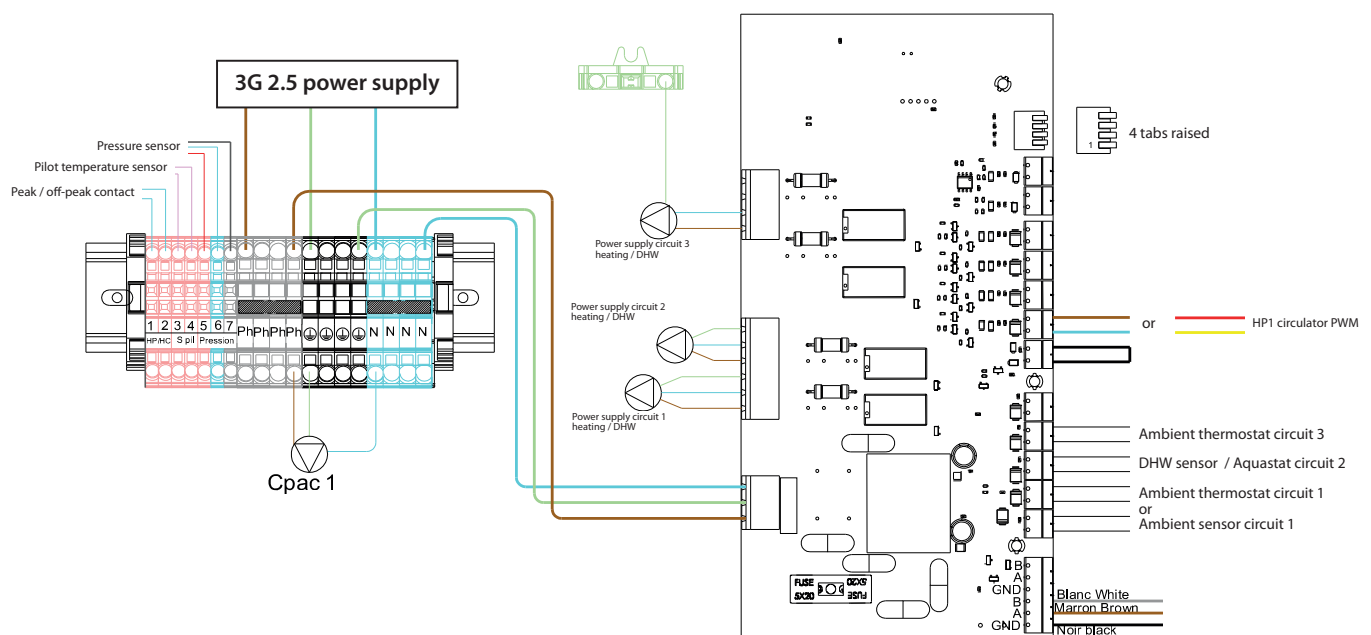
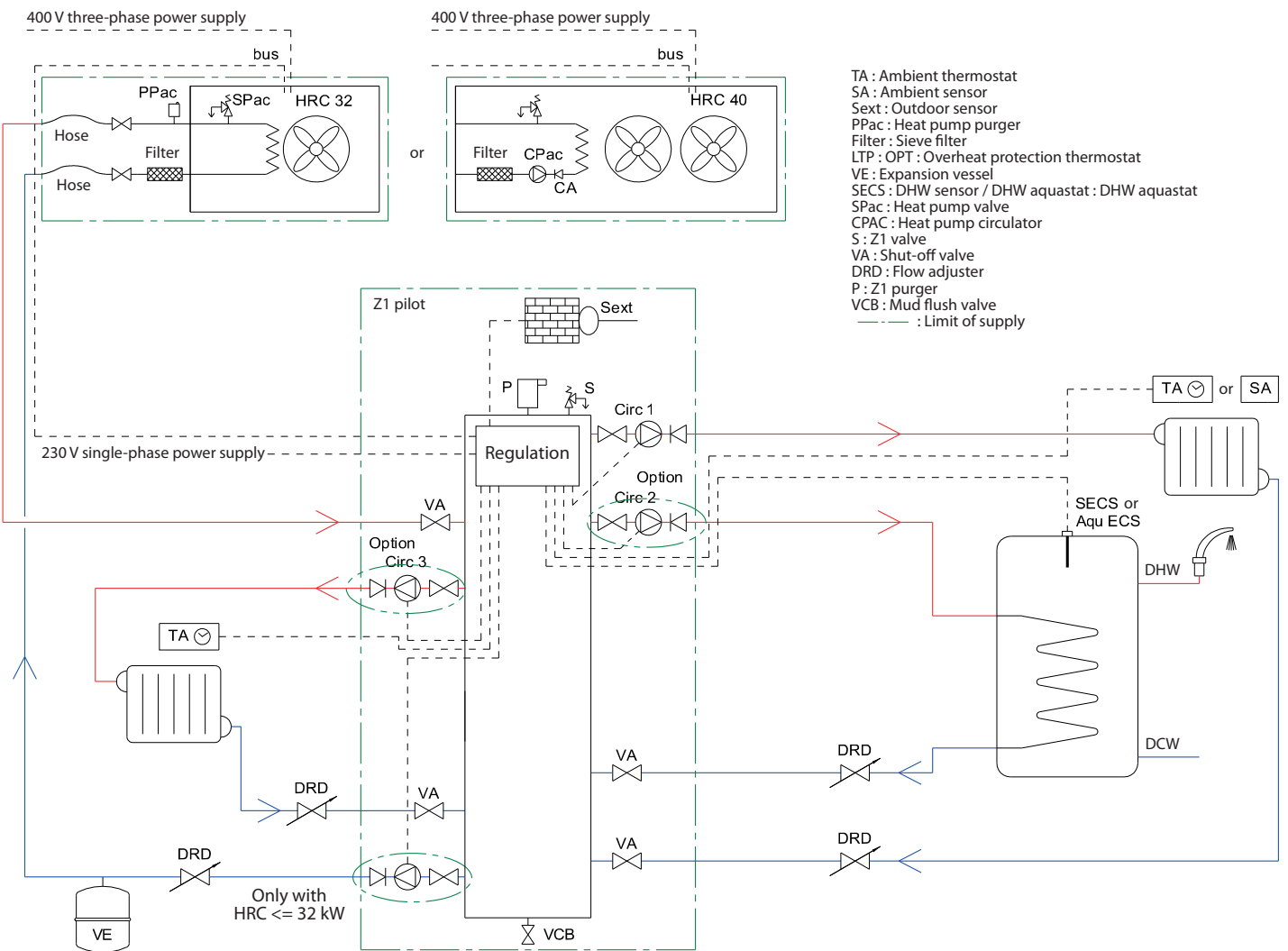
A3.5 - CASE n°5 - 1 HRC⁷⁰ heat pump + 2 DHW tanks



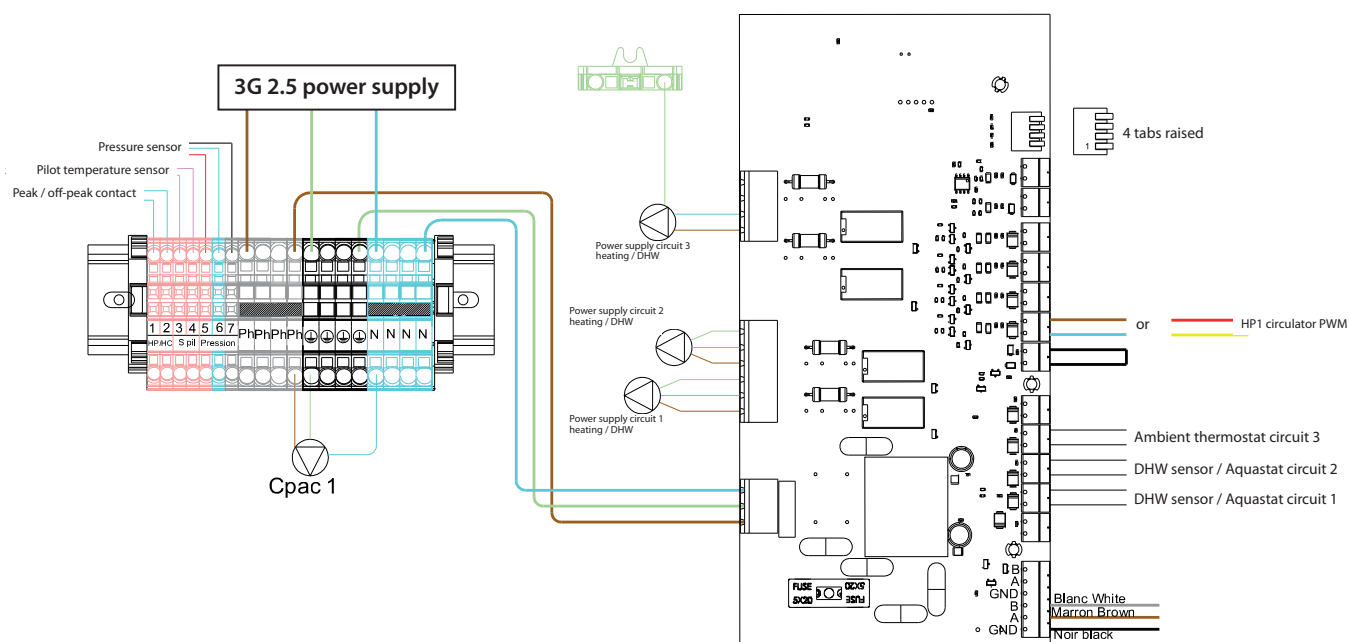
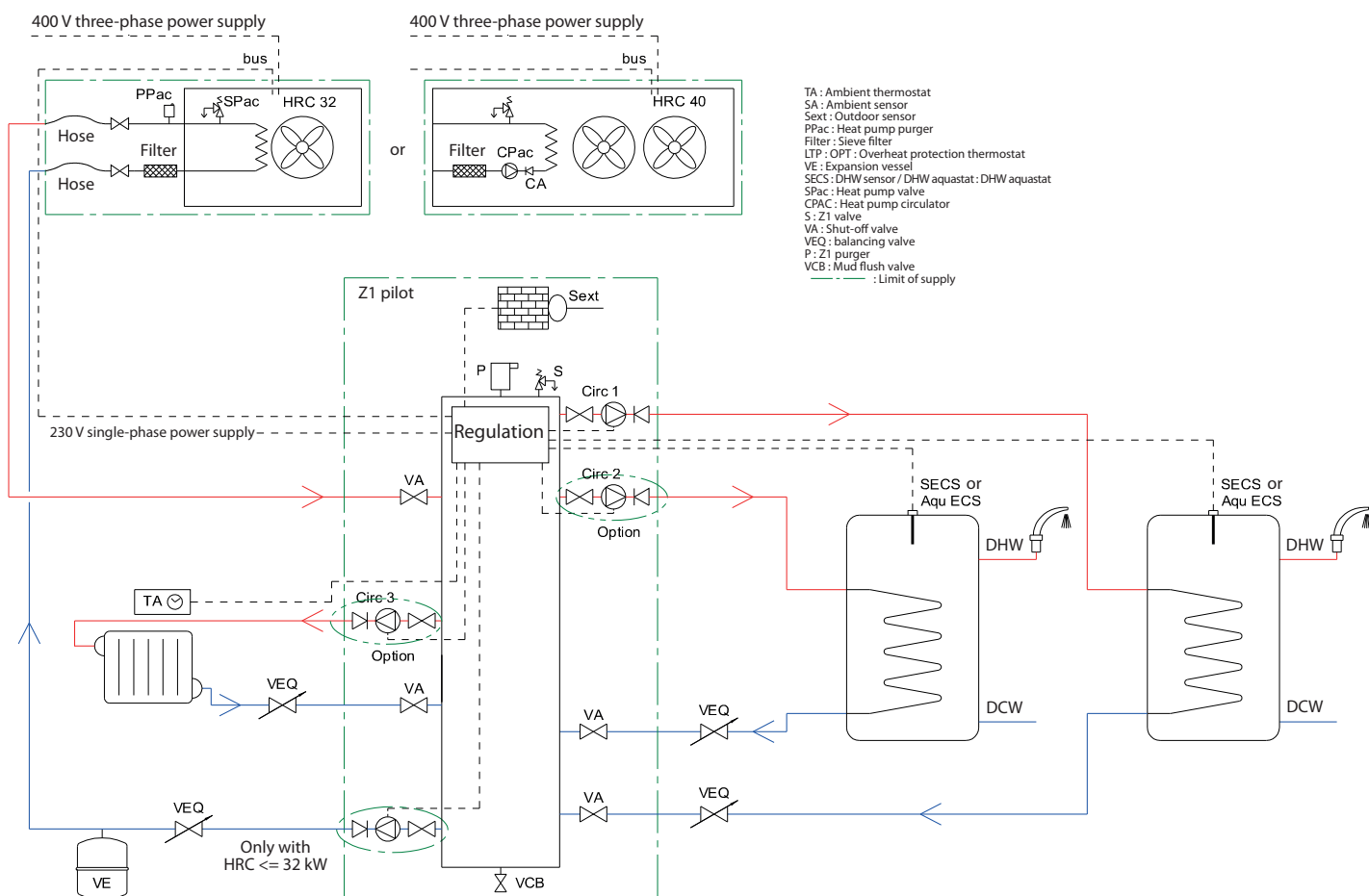
A3.6 - CASE n°6 - 1 HRC⁷⁰ heat pump + 3 heating circuits (radiator)



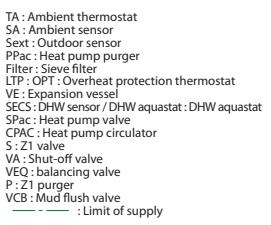
A3.7 - CASE n°7 - 1 HRC⁷⁰ heat pump + 1 DHW tank + 2 heating circuits (radiator)



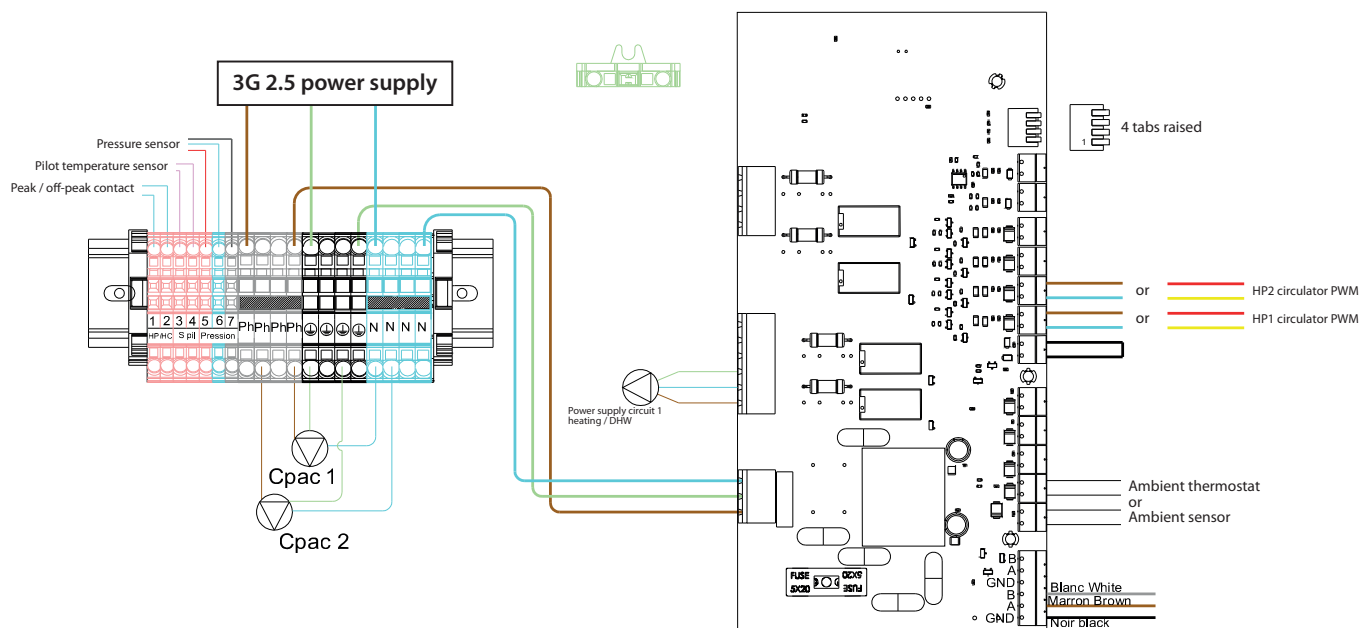
A3.8 - CASE n°8 - 1 HRC⁷⁰ heat pump + 2 DHW tanks + 1 heating circuit (radiator)



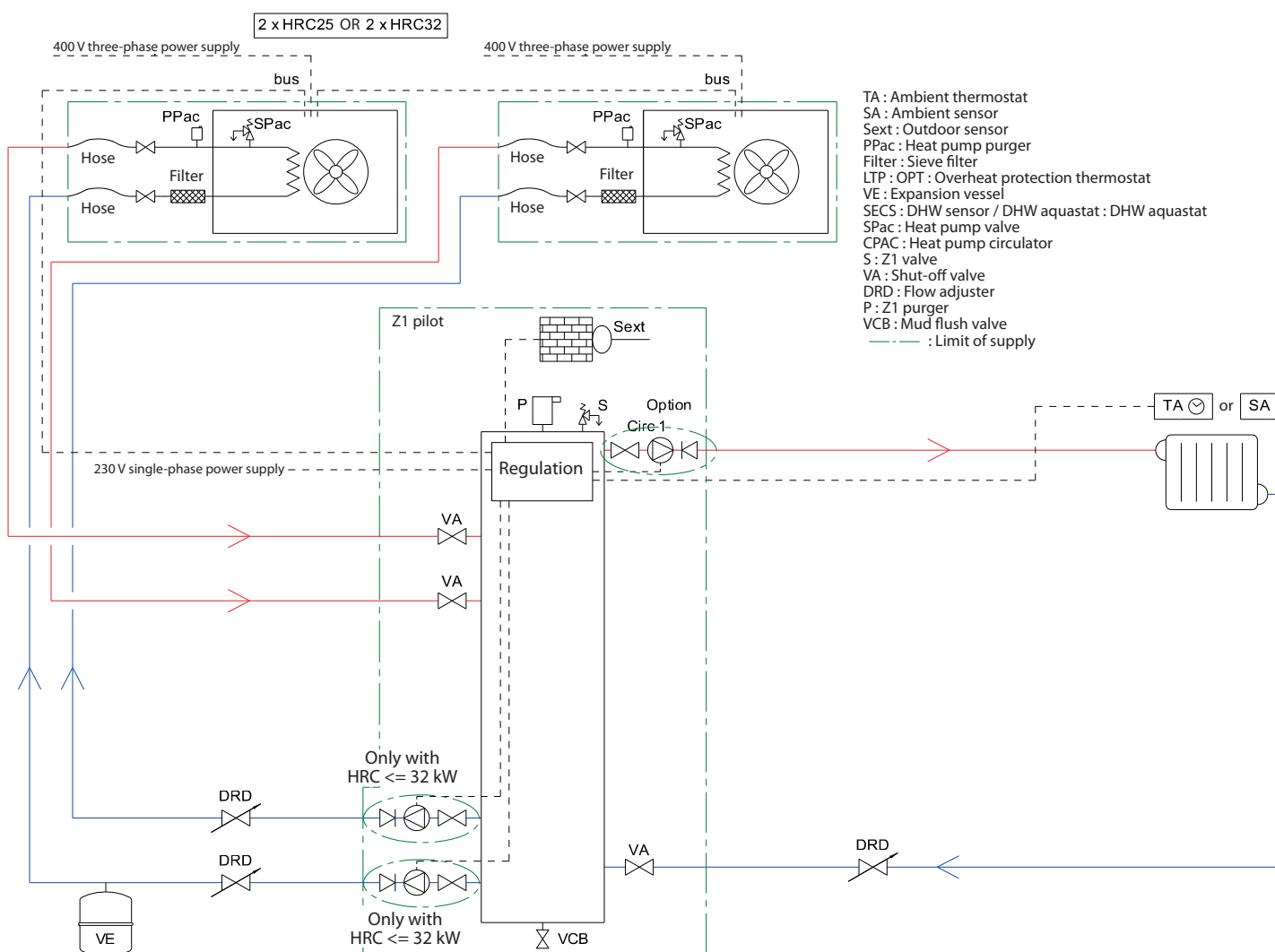
A3.9 - CASE n°9 - 1 HRC⁷⁰ heat pump + 3 DHW tanks



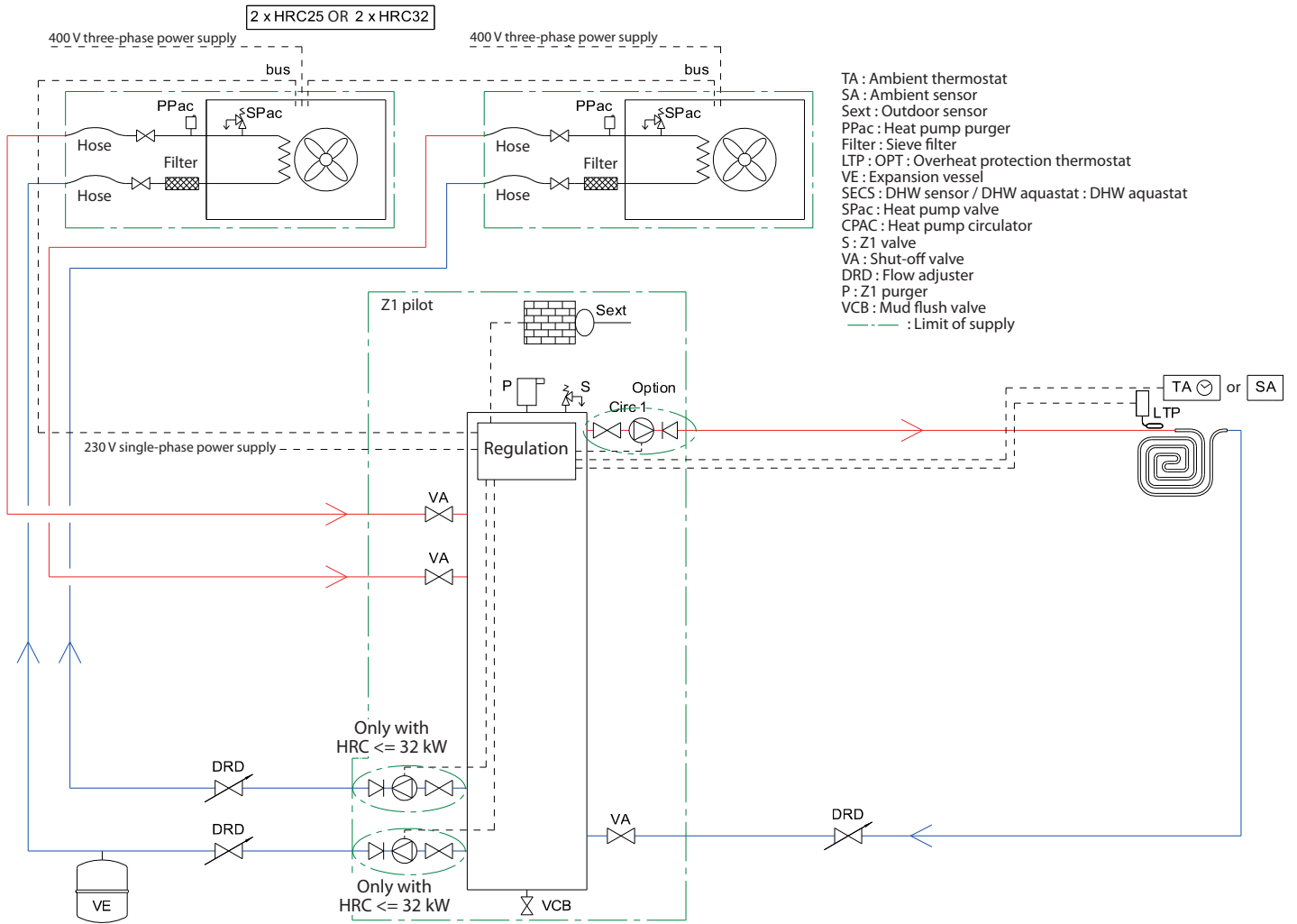
A3.10 - CASE n°10 - 2 HRC⁷⁰ heat pumps + 1 heating circuit



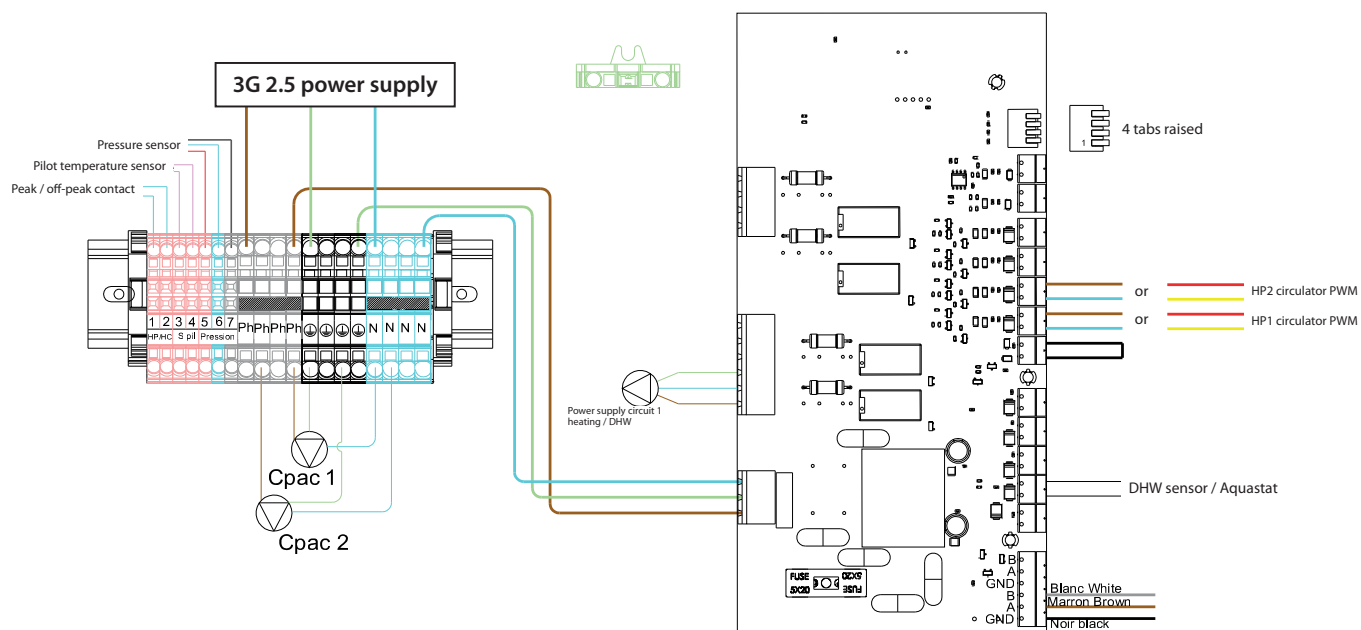
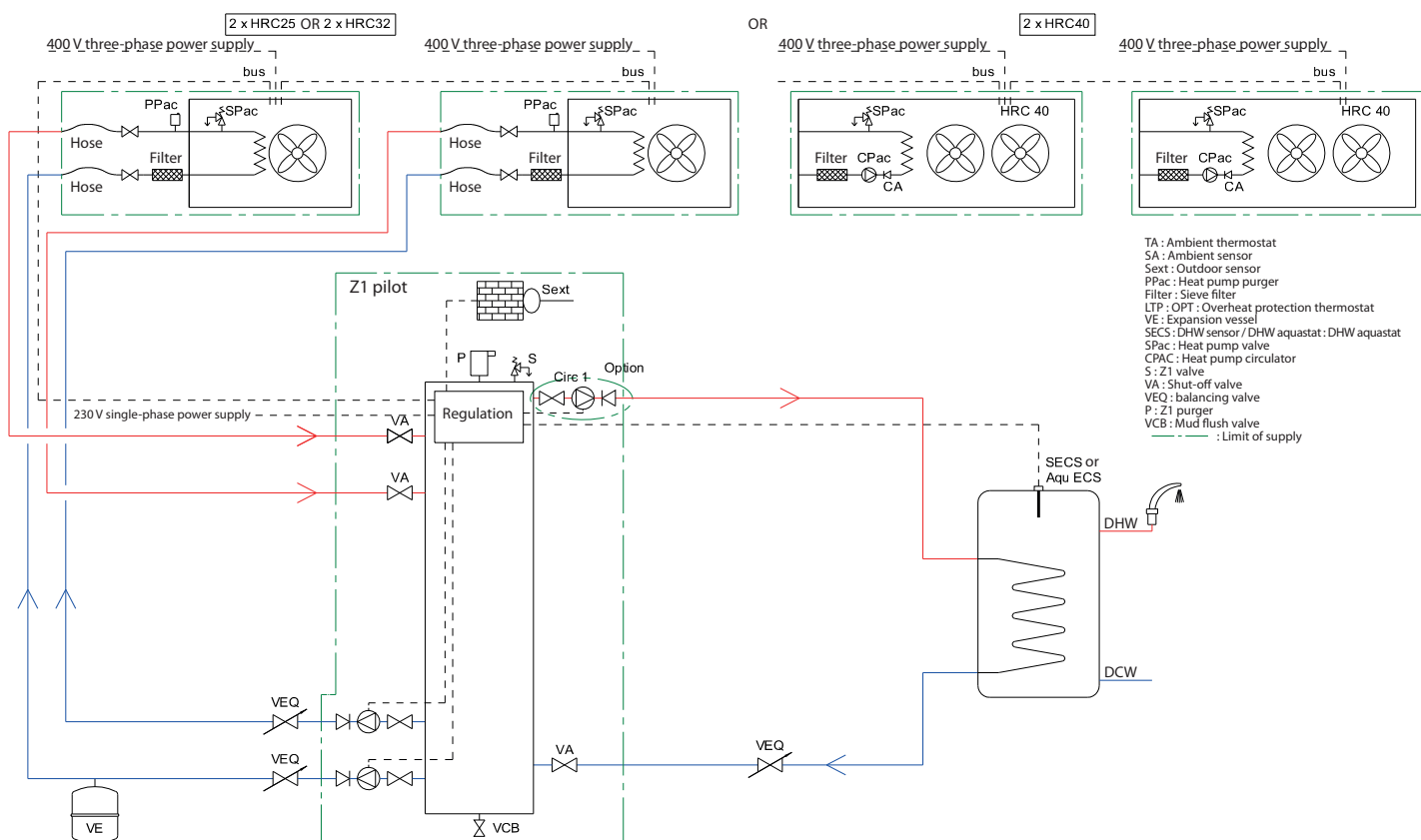
A3.10.1 - Heating circuit - Radiator



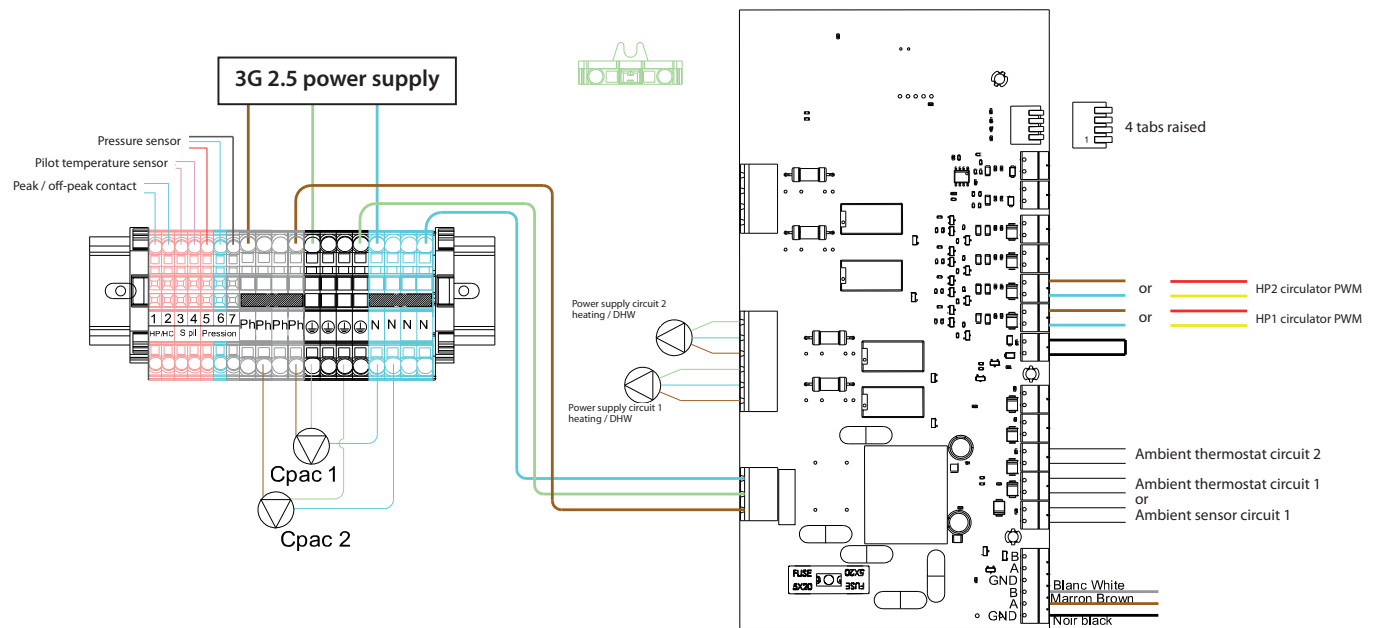
A3.10.2 - Heating circuit - Underfloor heating



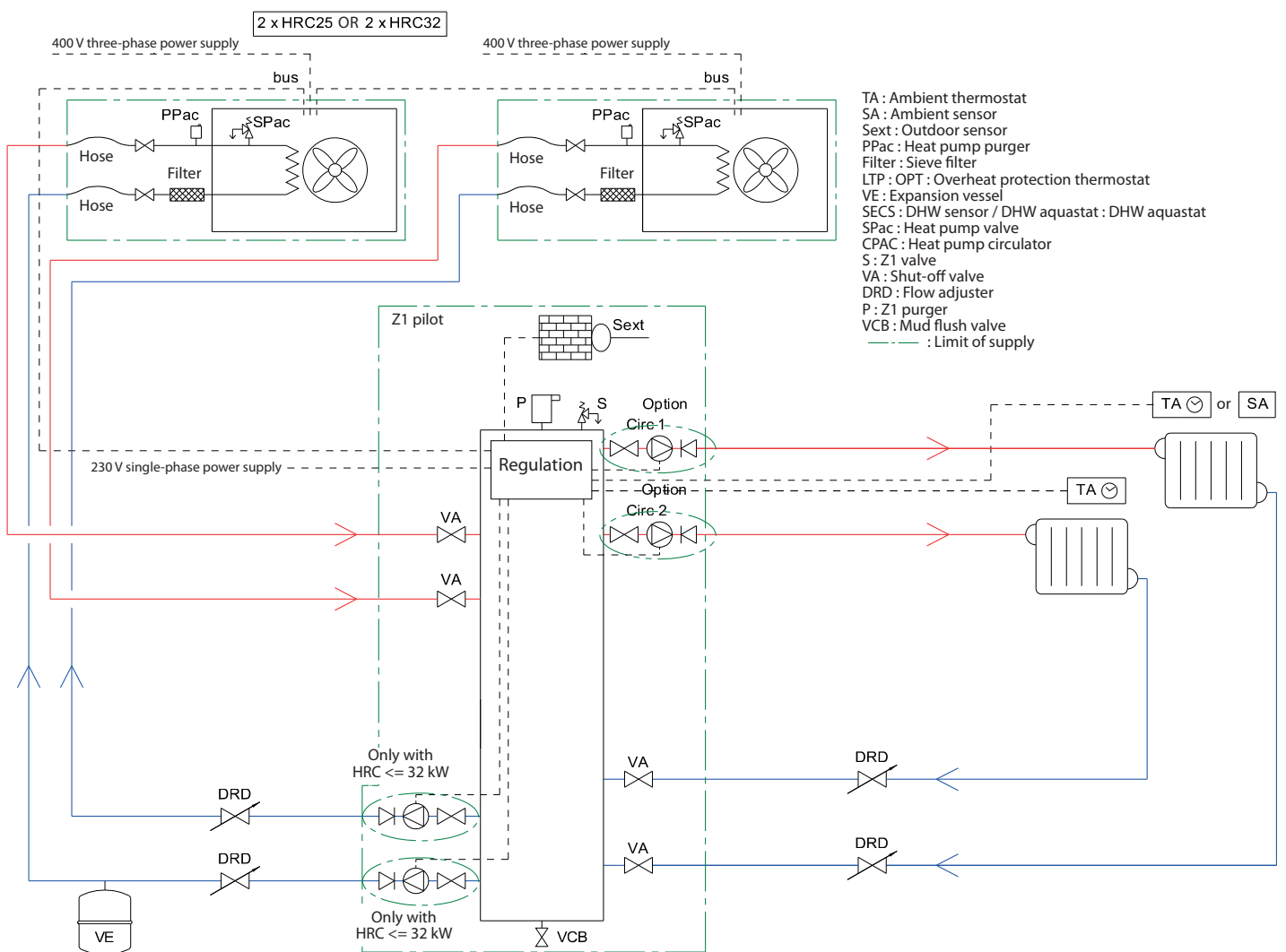
A3.11 - CASE n°11 - 2 HRC⁷⁰ heat pumps + 1 DHW tank



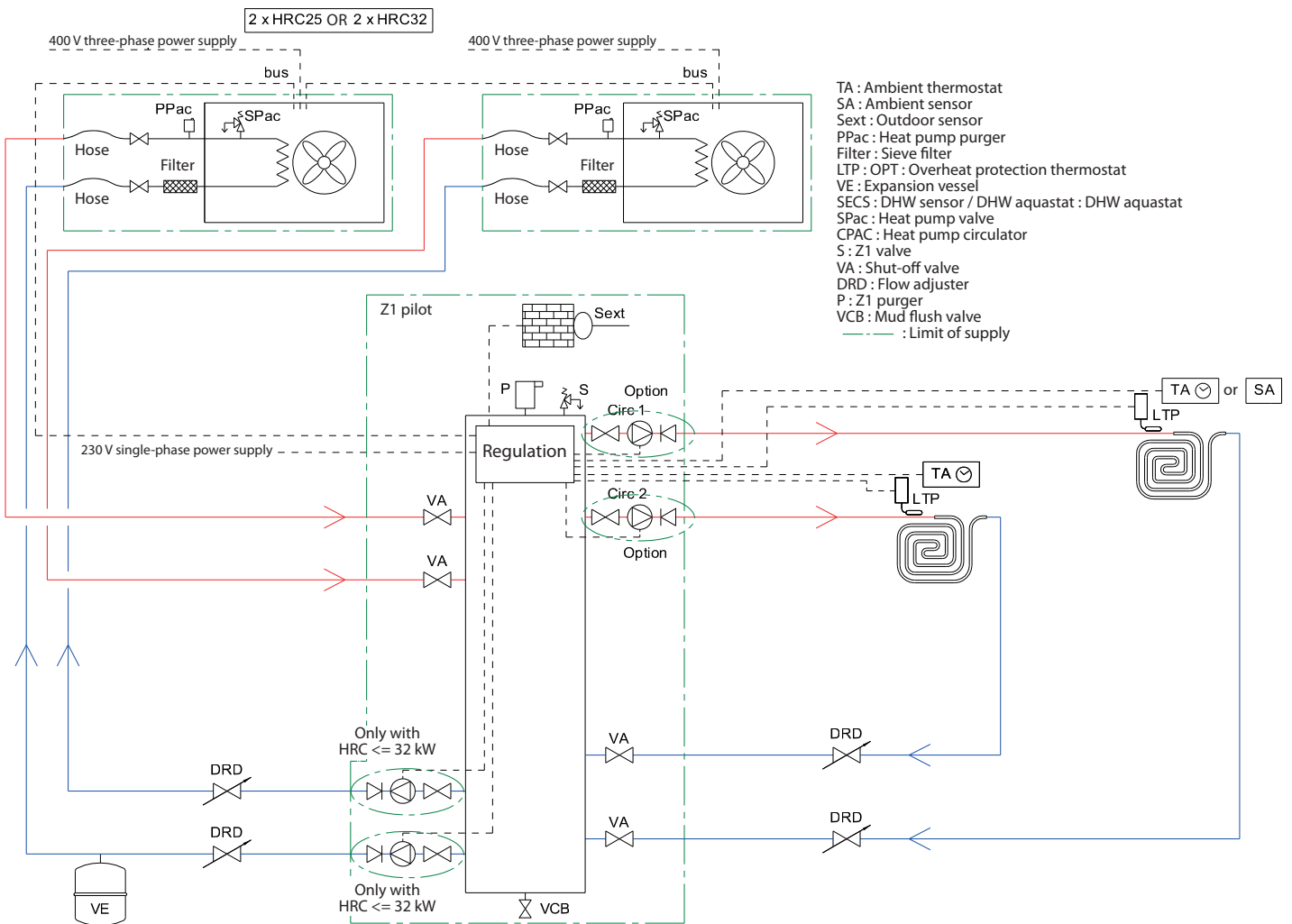
A3.12 - CASE n°12 - 2 HRC⁷⁰ heat pumps + 2 heating circuits (radiator)



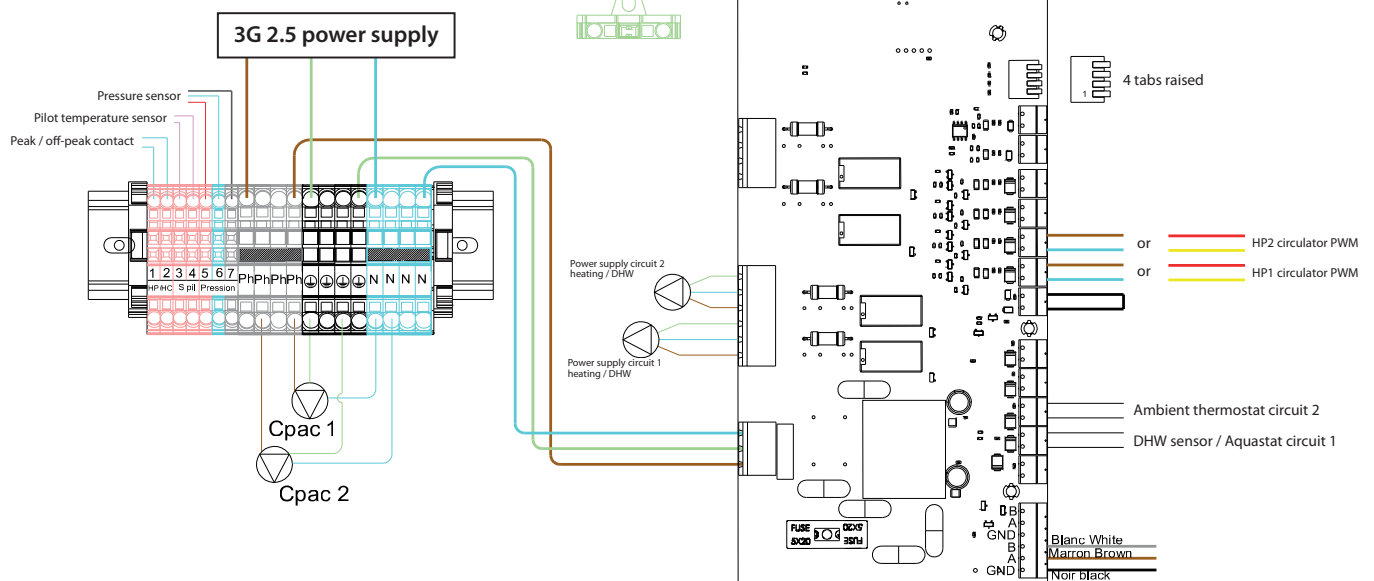
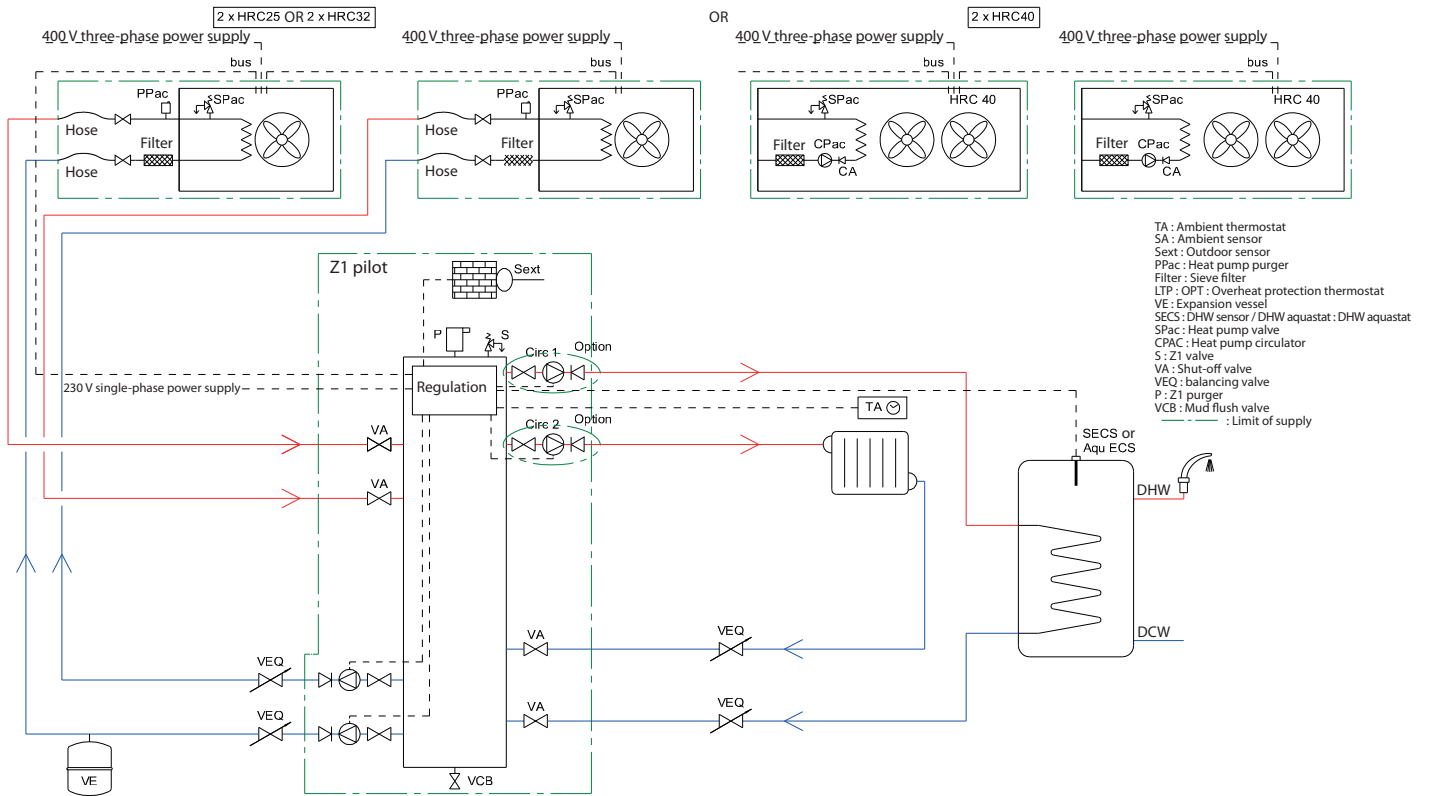
A3.12.1 - Heating circuit - Radiator



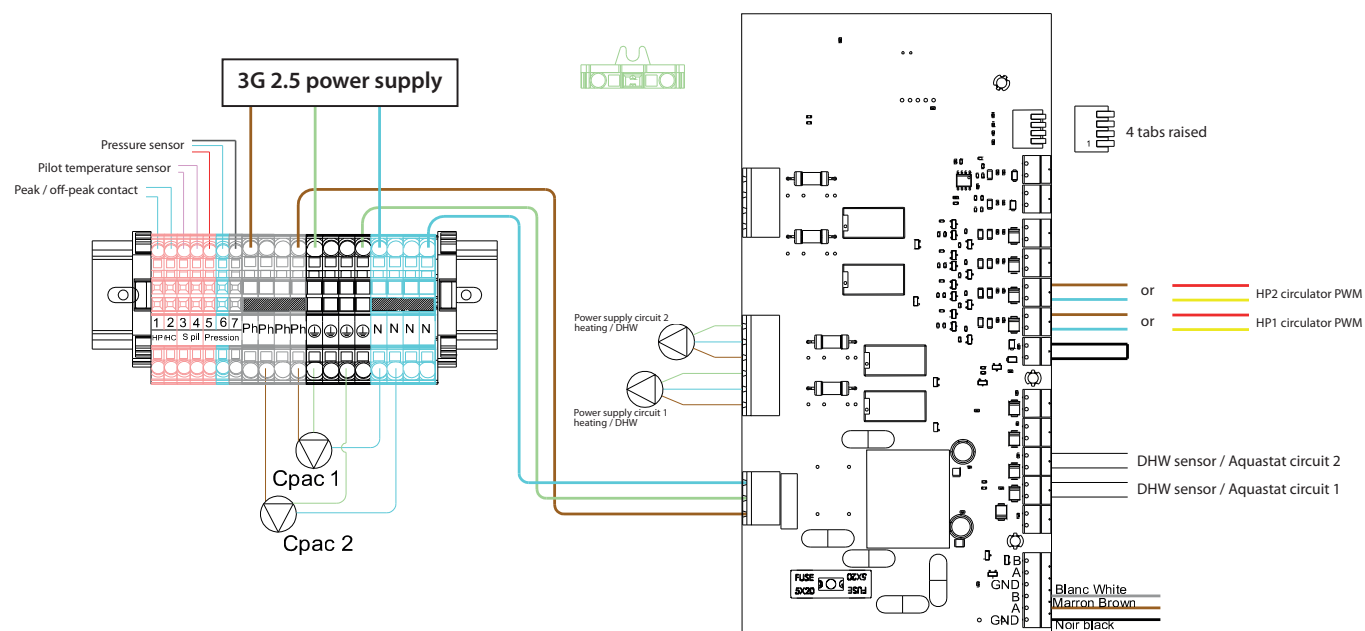
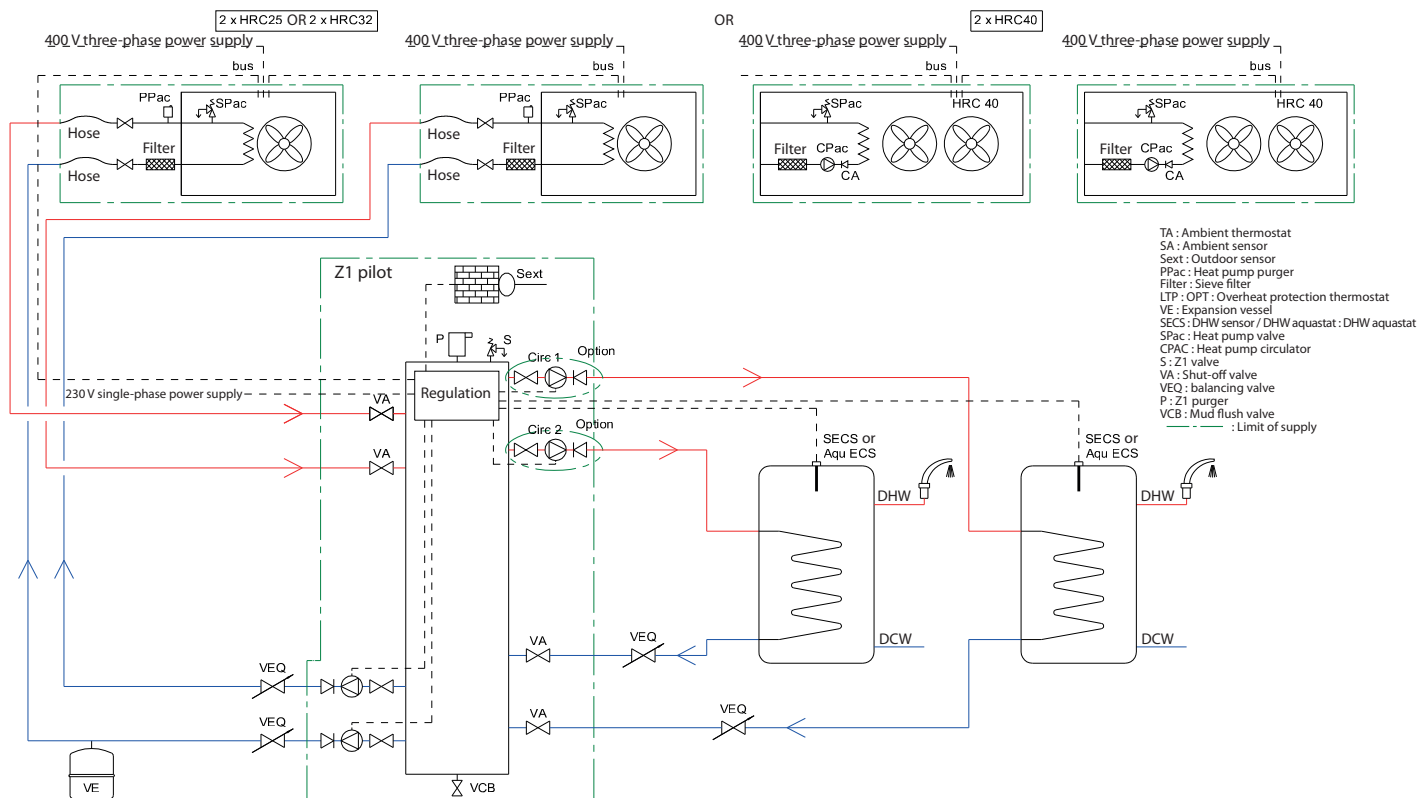
A3.12.2 - Heating circuit - Underfloor heating



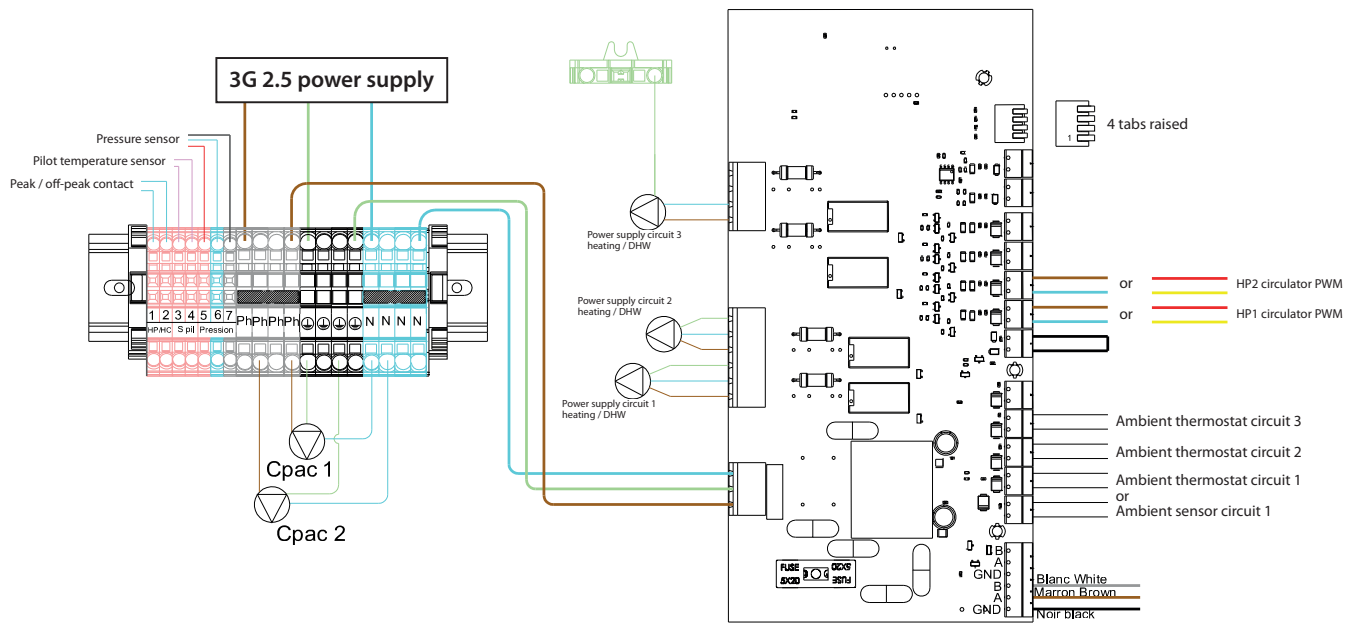
A3.13 - CASE n°13 - 2 HRC⁷⁰ heat pumps + 1 DHW tank + 1 heating circuit



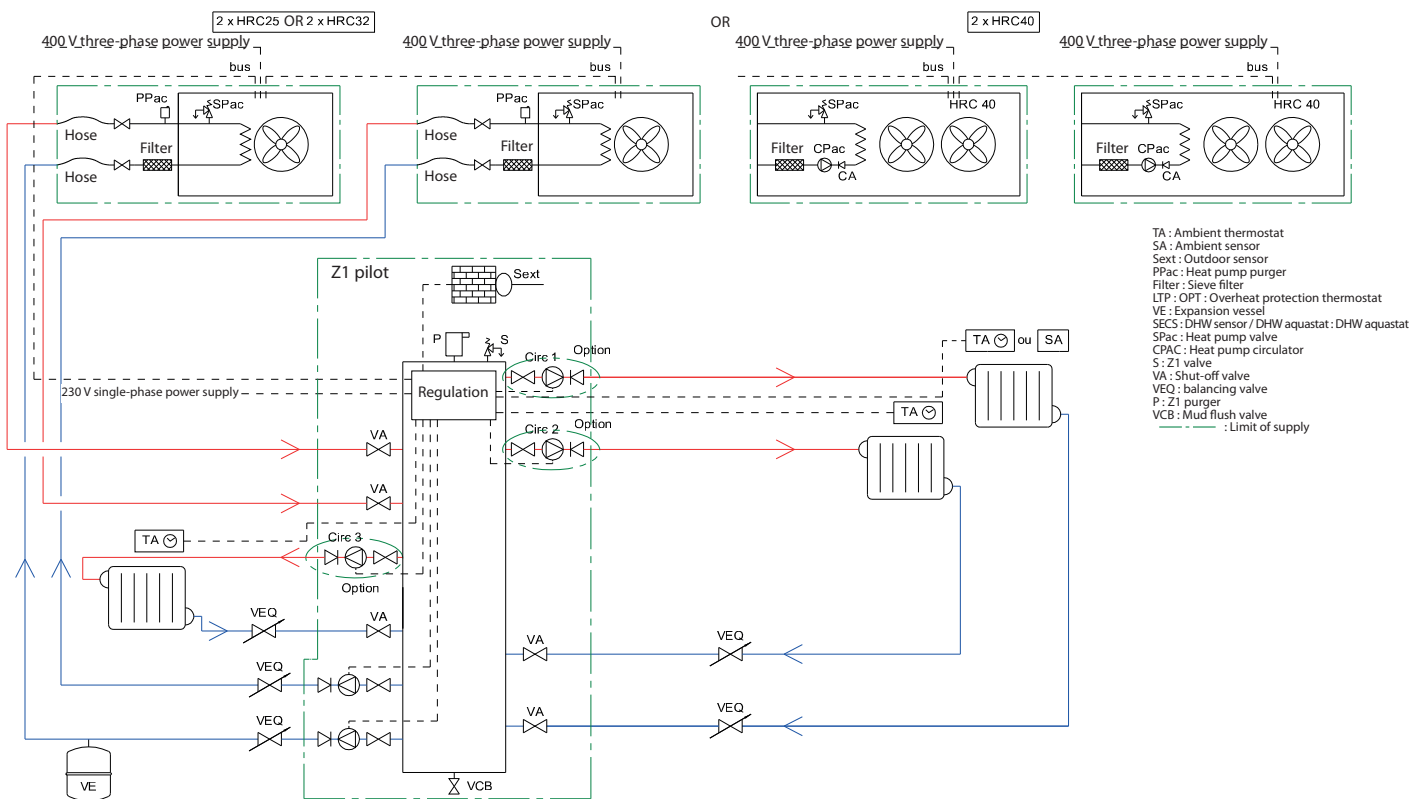
A3.14 - CASE n°14 - 2 HRC⁷⁰ heat pumps + 2 DHW tanks



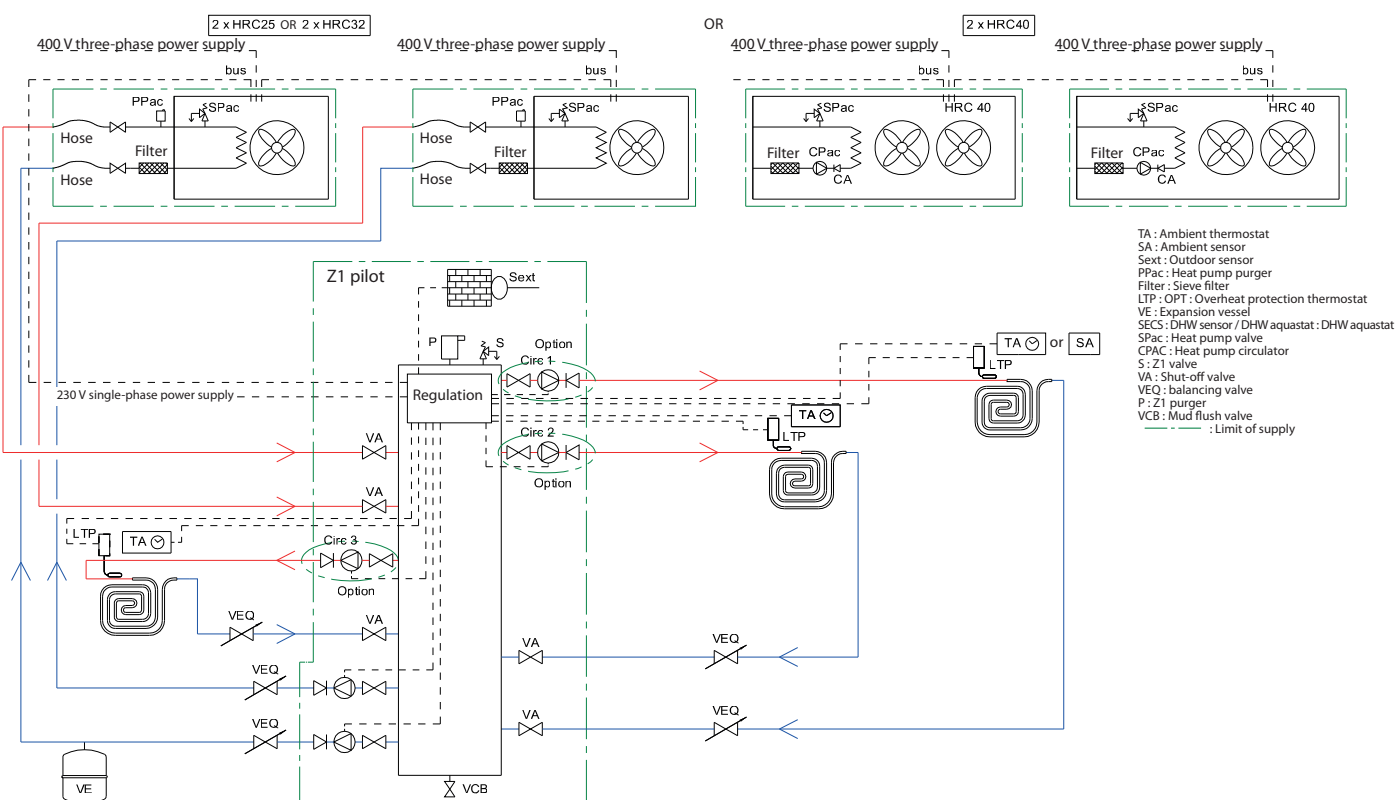
A3.15 - CASE n°15 - 2 HRC70 heat pumps + 3 DHW tanks



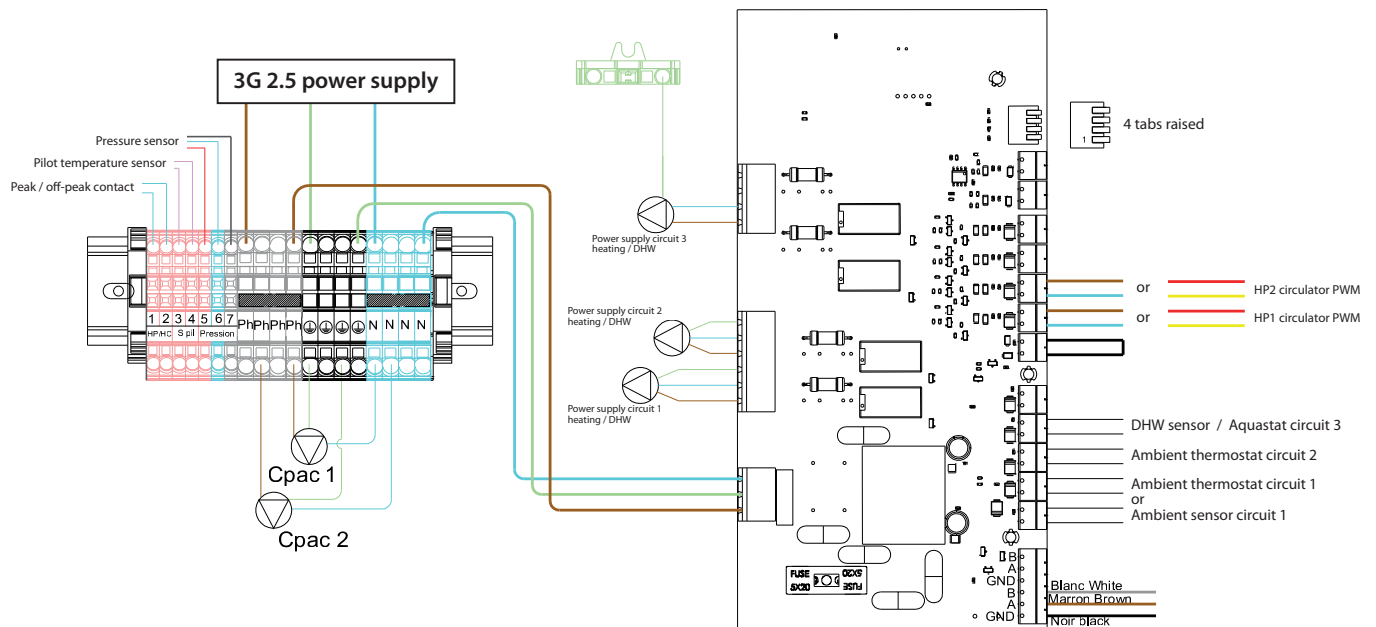
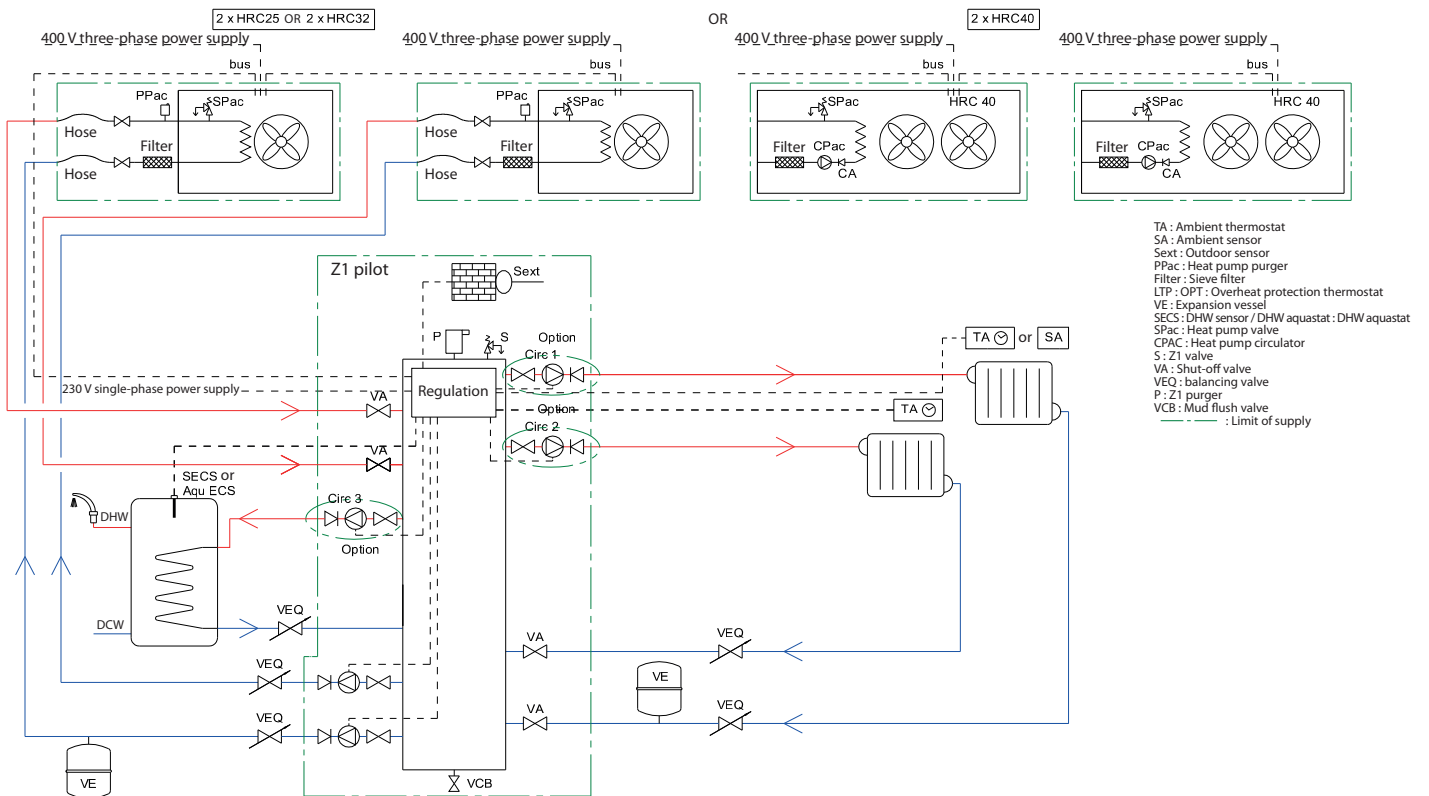
A3.15.1 - Heating circuit - Radiator



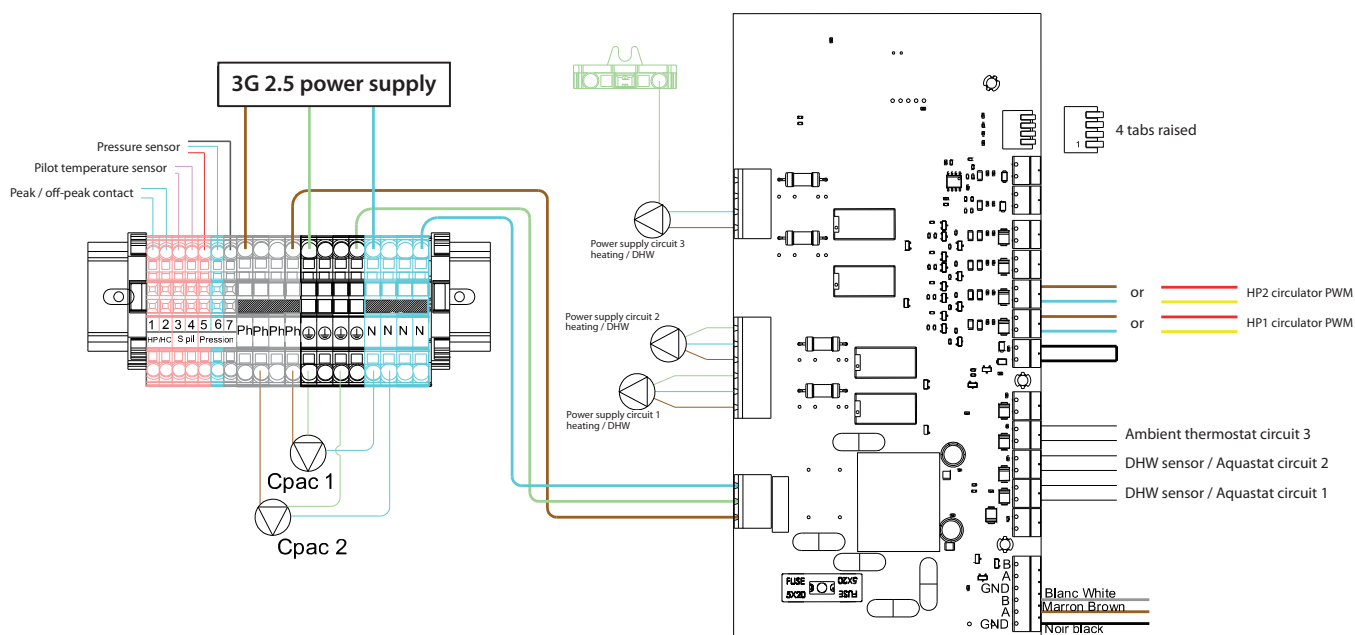
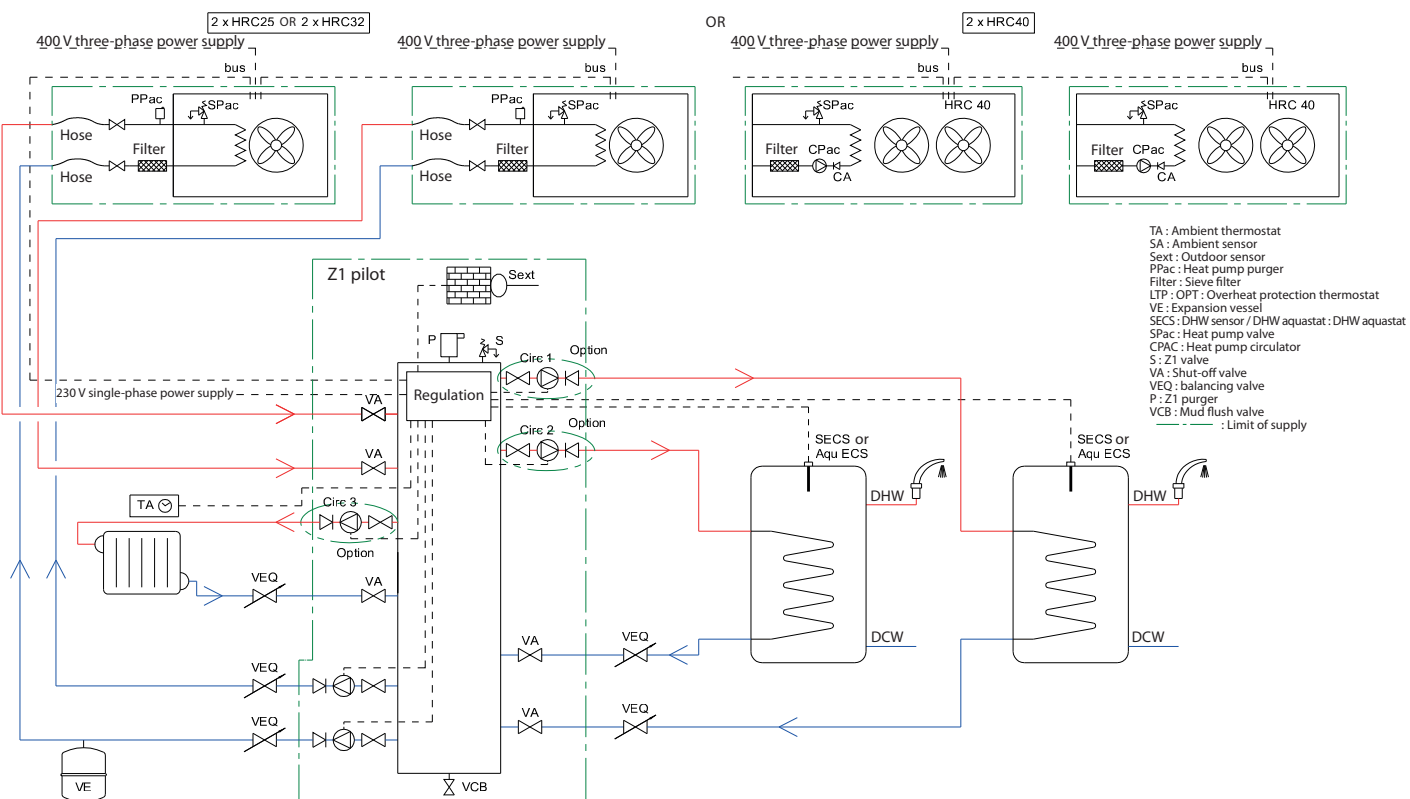
A3.15.2 - Heating circuit - Underfloor heating



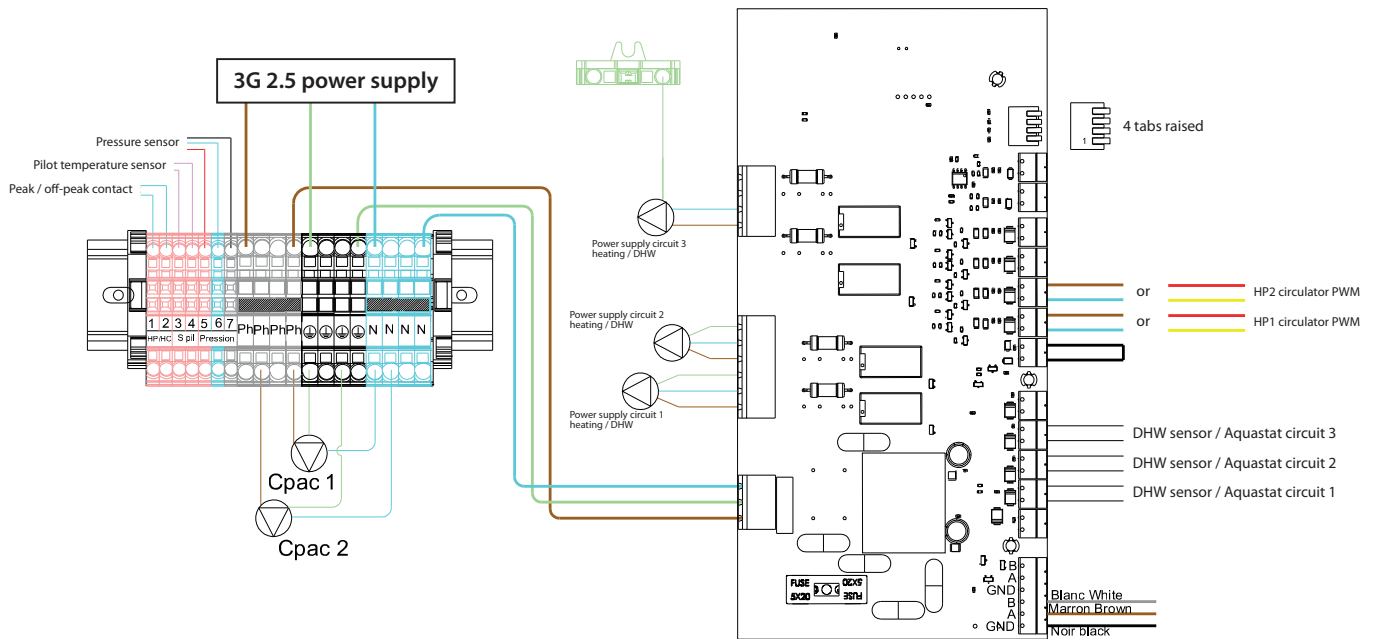
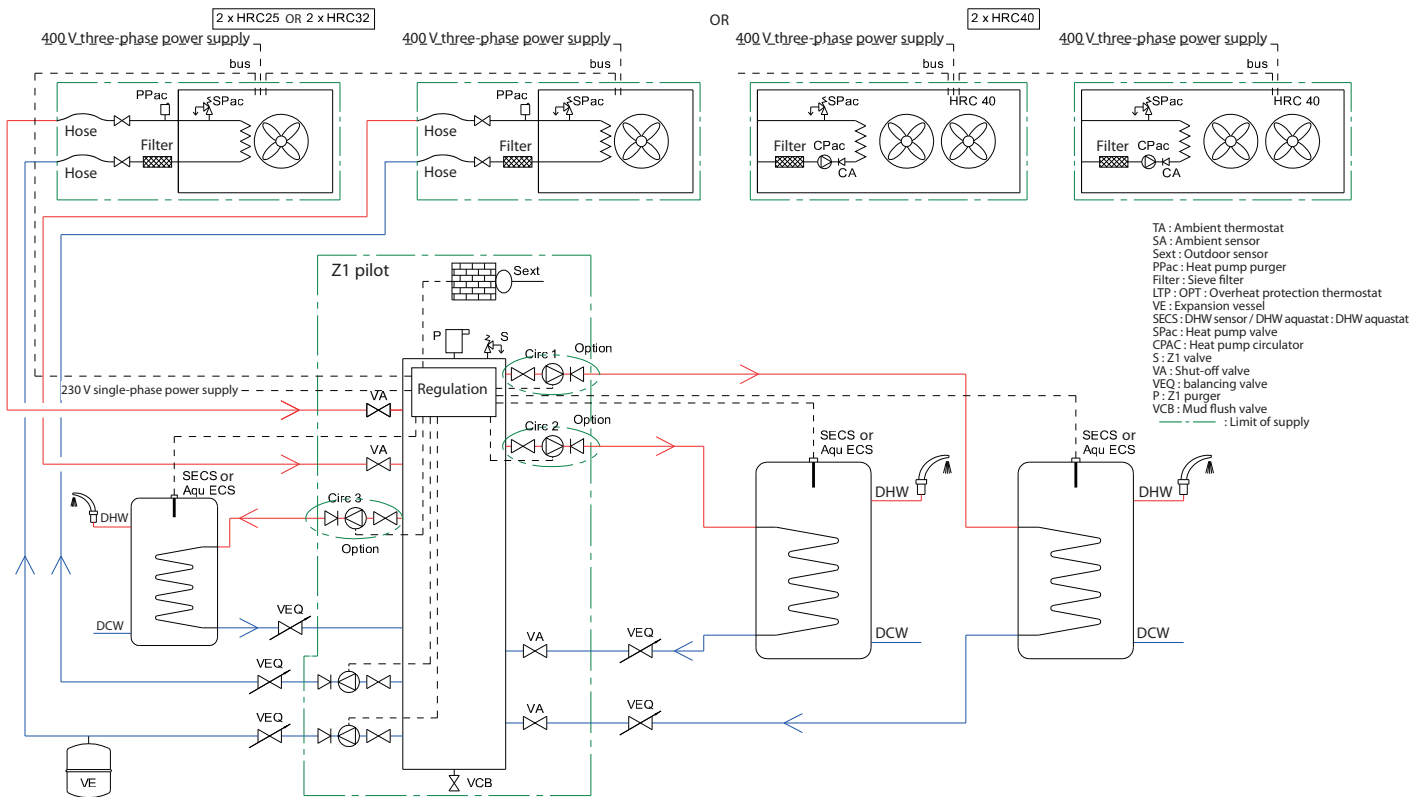
A3.16 - CASE n°16 - 2 HRC⁷⁰ heat pumps + 2 heating circuits + 1 DHW tank



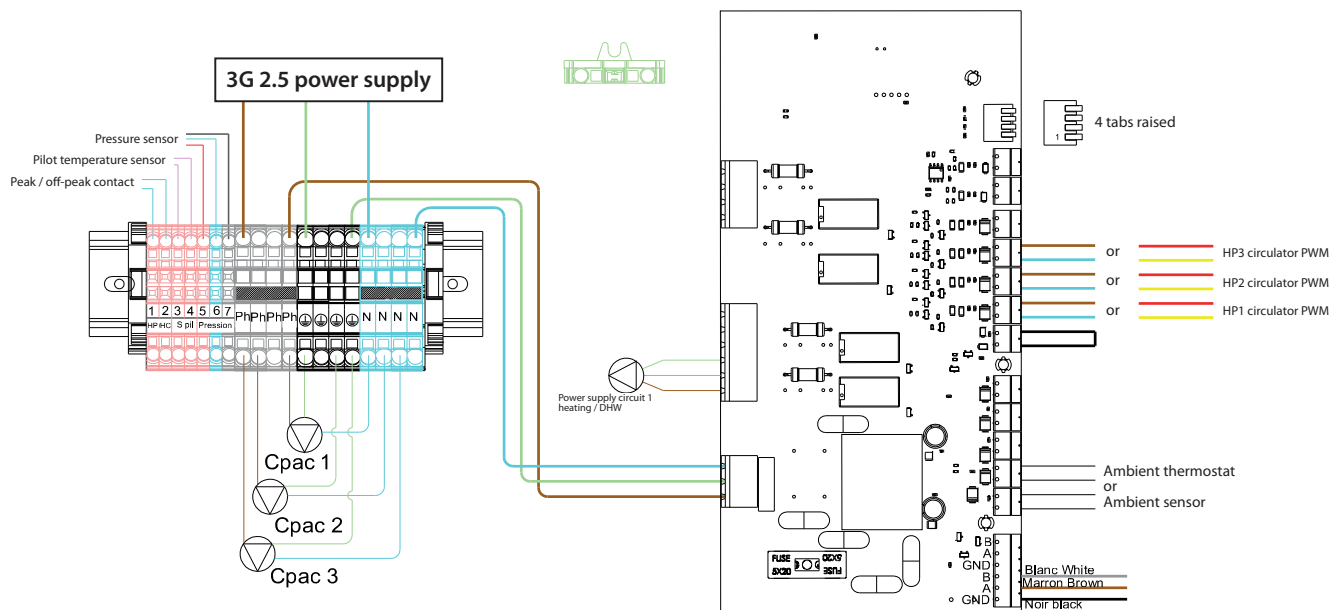
A3.17 - CASE n°17 - 2 HRC⁷⁰ heat pumps + 1 heating circuit + 2 DHW tanks



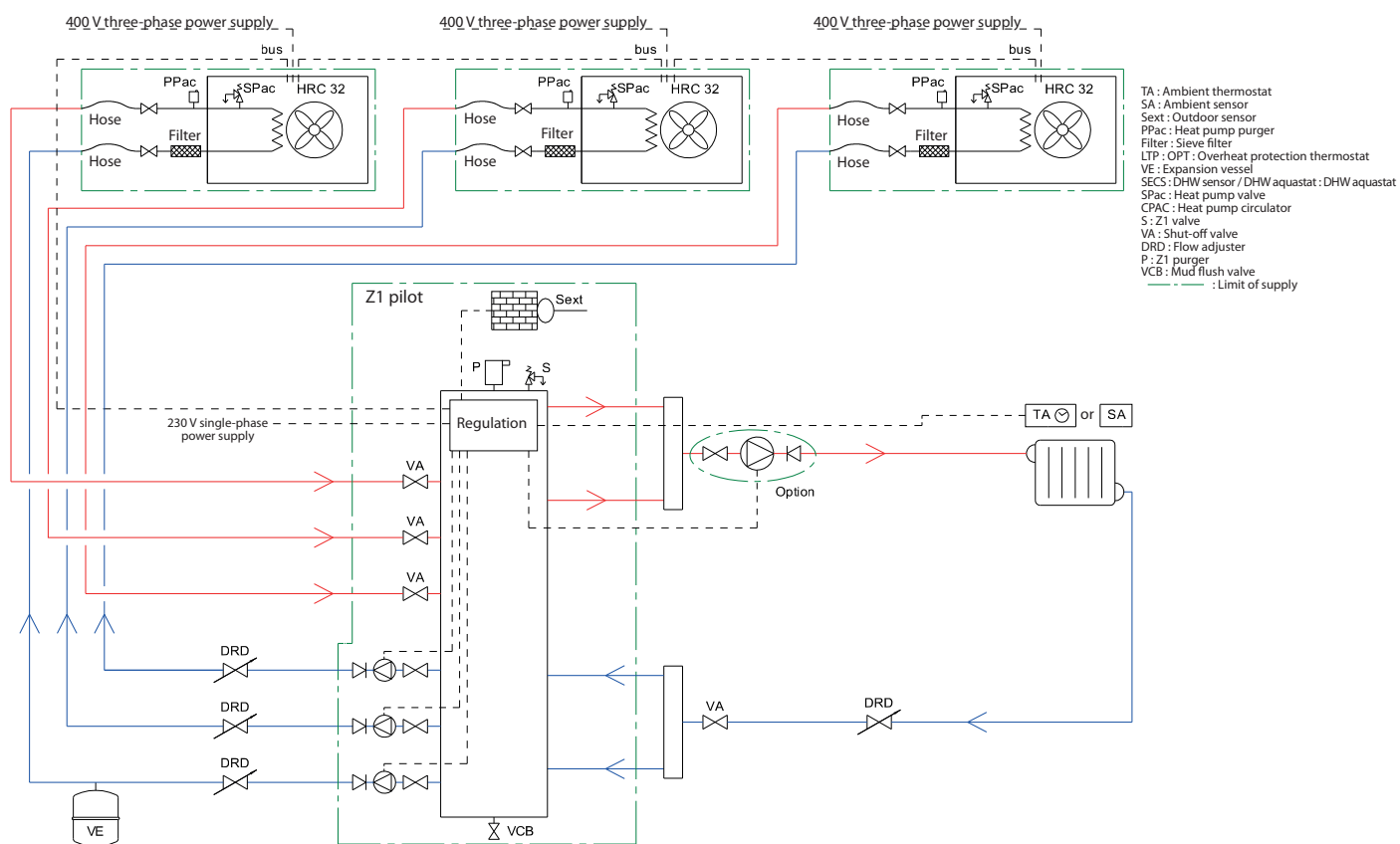
A3.18 - CASE n°18 - 2 HRC70 heat pumps + 3 DHW tanks



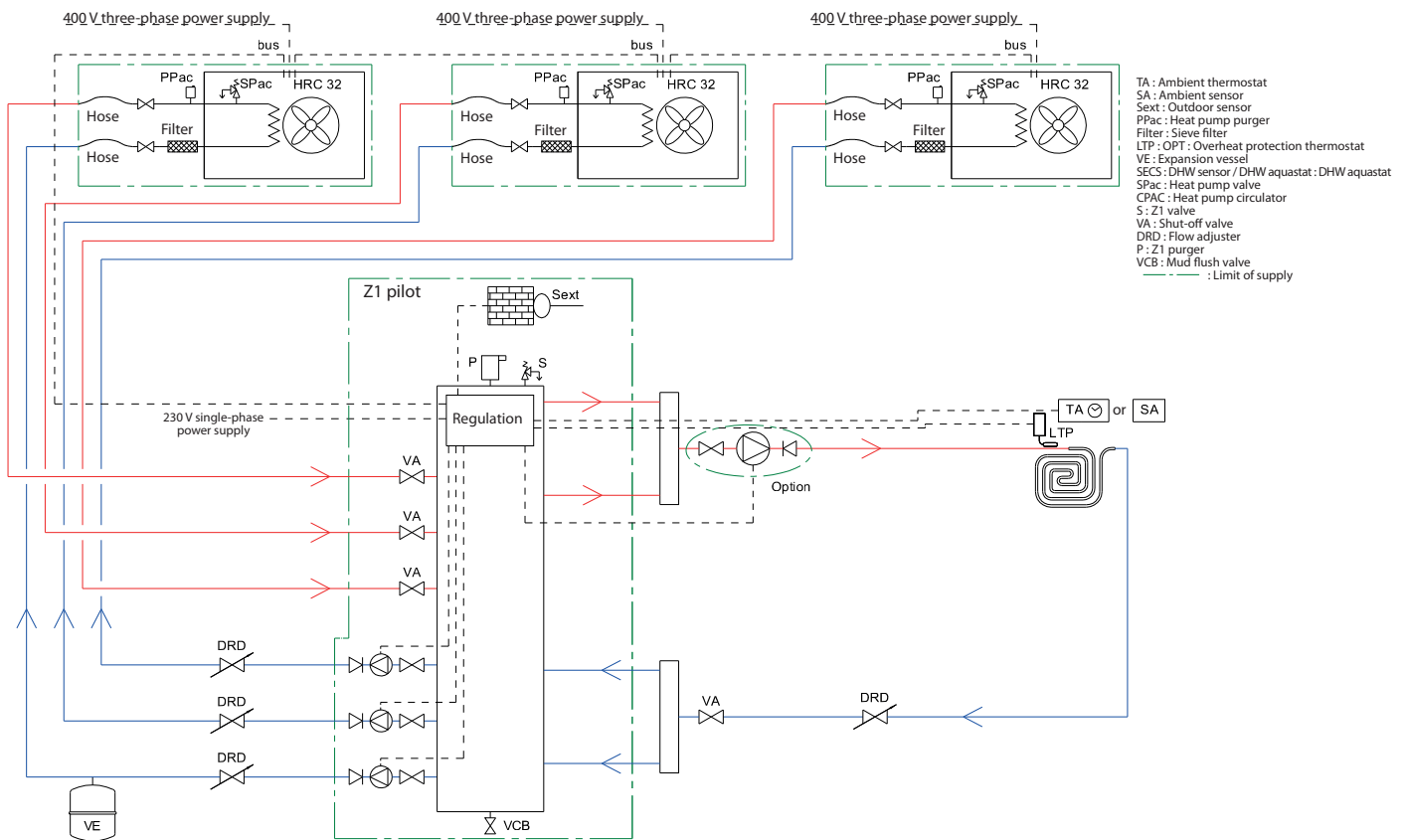
A3.19 - CASE n°19 - 3 HRC⁷⁰ heat pumps + 1 heating circuit



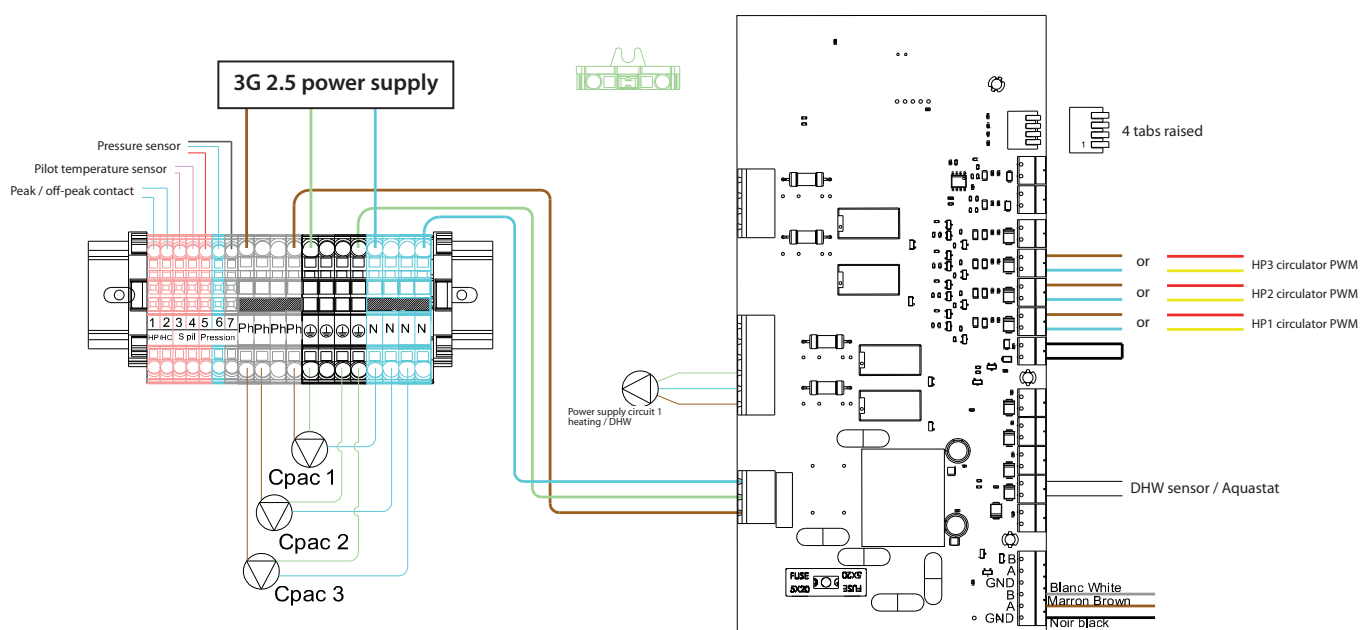
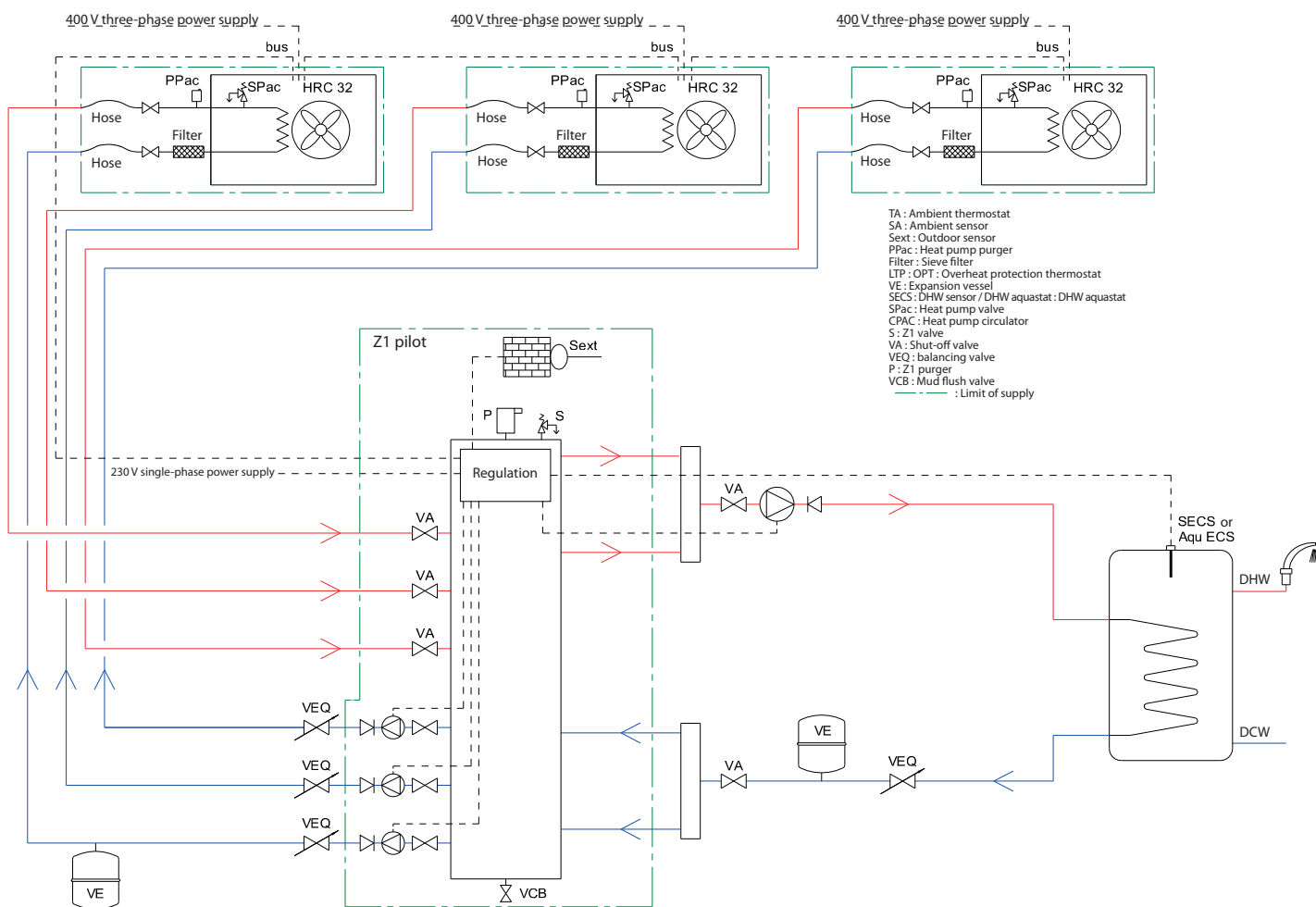
A3.19.1 - Heating circuit - Radiator



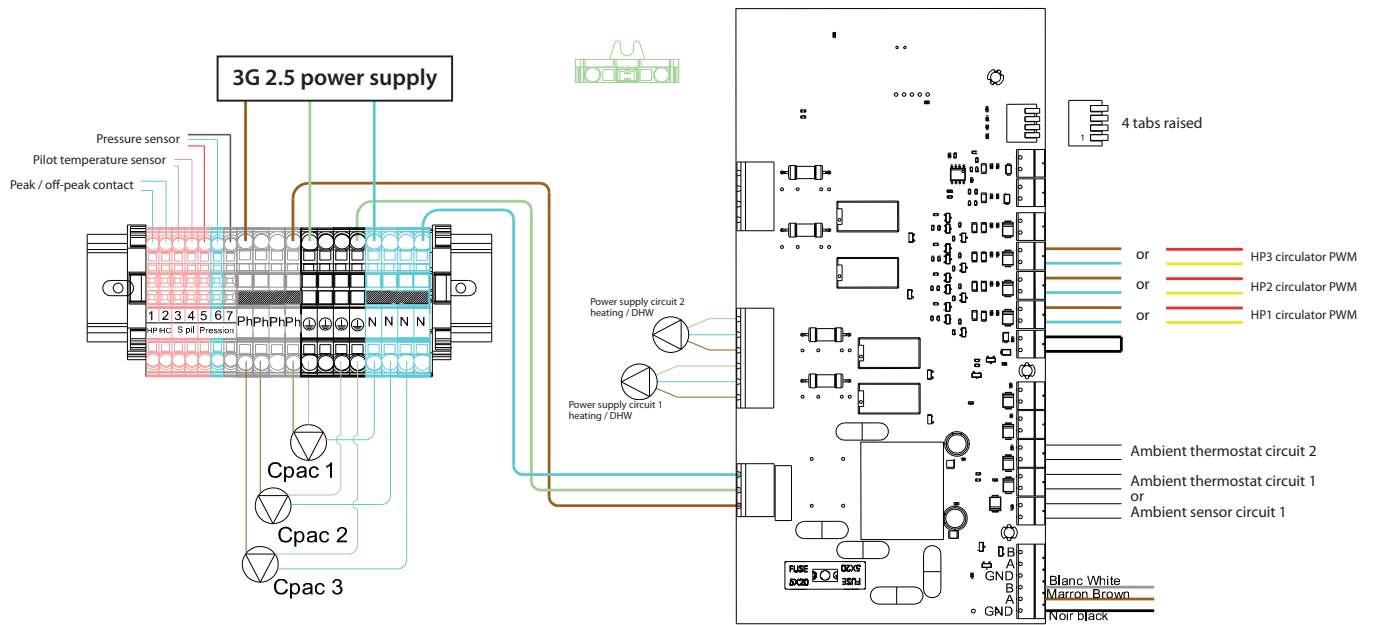
A3.19.2 - Heating circuit - Underfloor heating



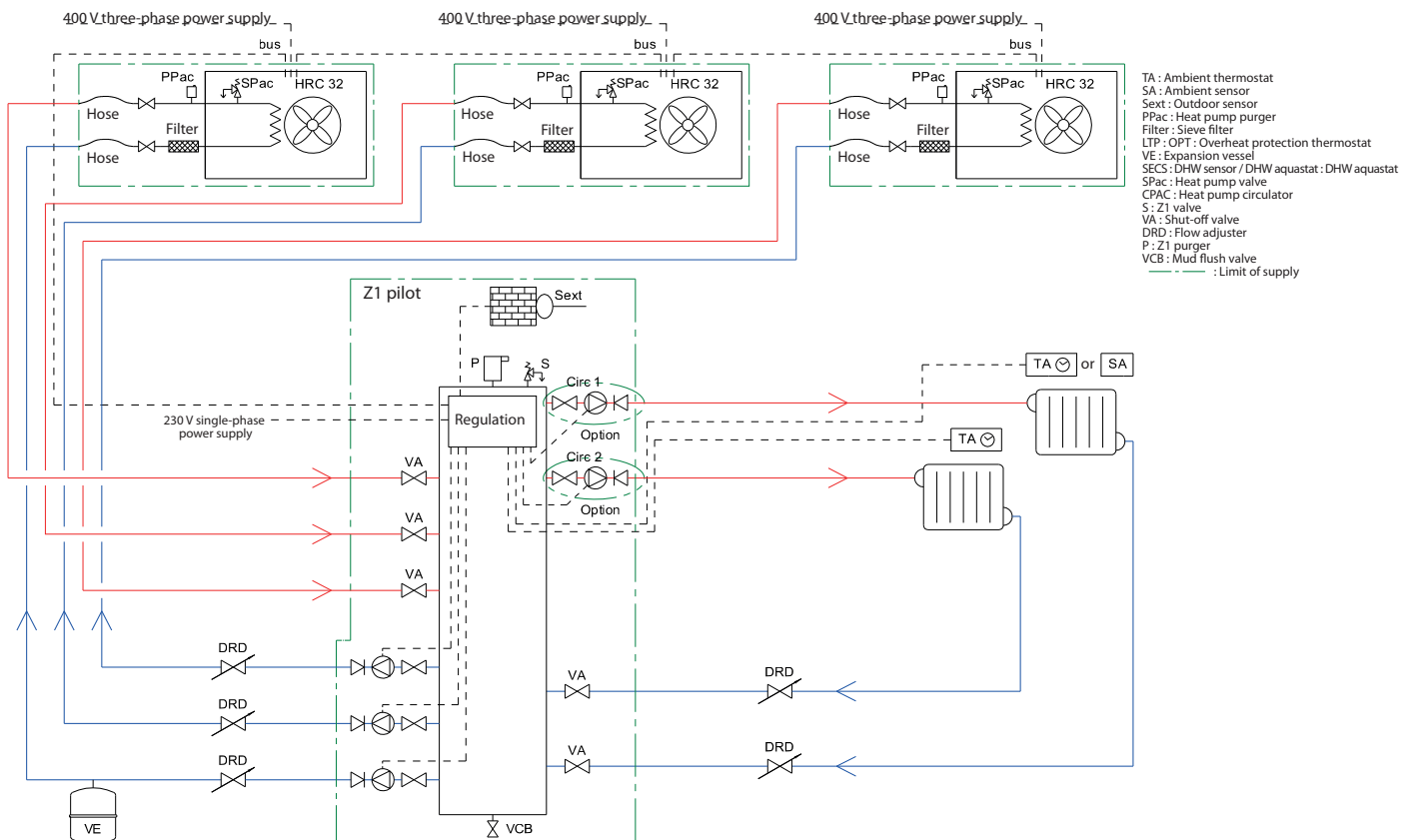
A3.20 - CASE n°20 - 3 HRC⁷⁰ heat pumps + 1 DHW tank



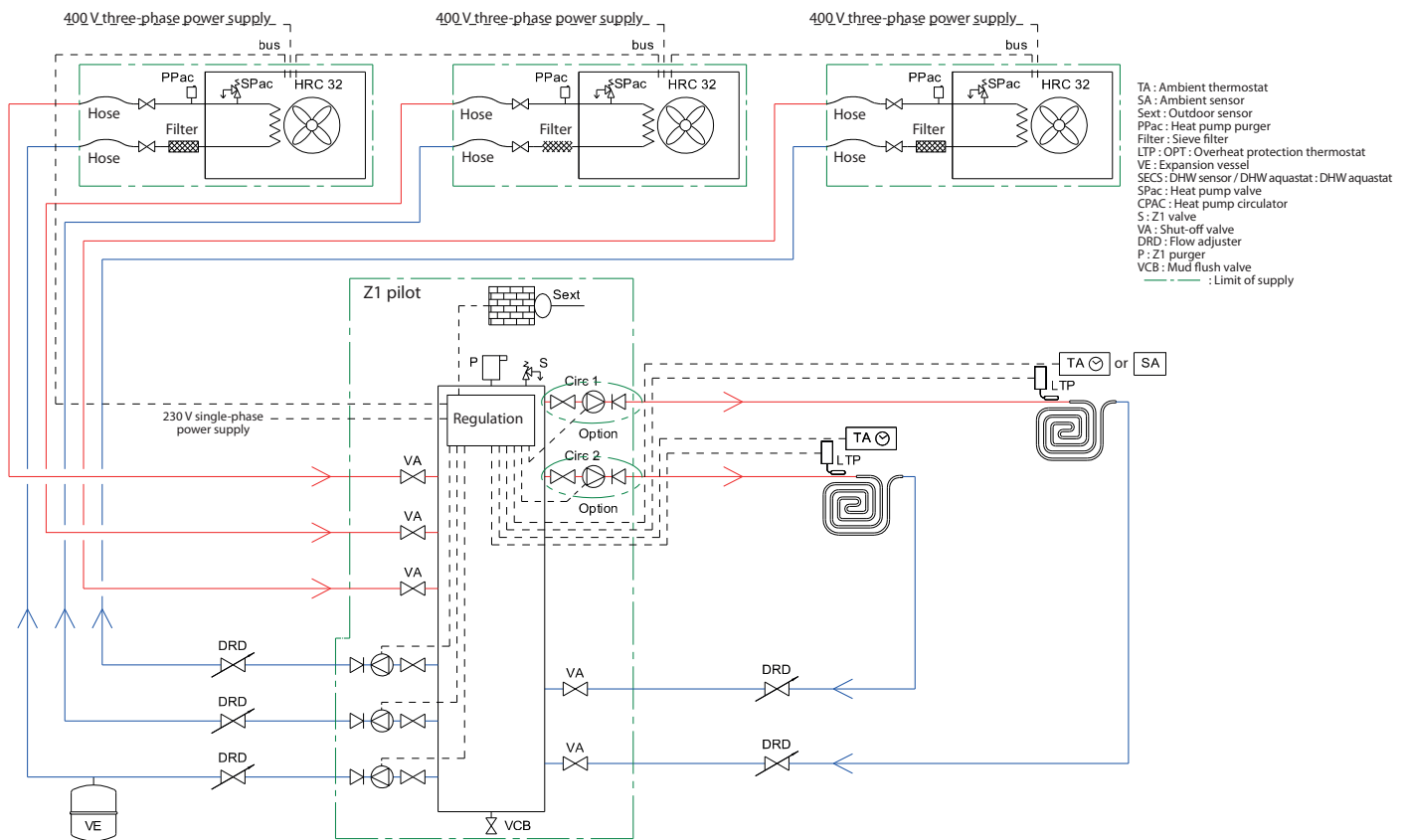
A3.21 - CASE n°21 - 3 HRC⁷⁰ heat pumps + 2 heating circuits



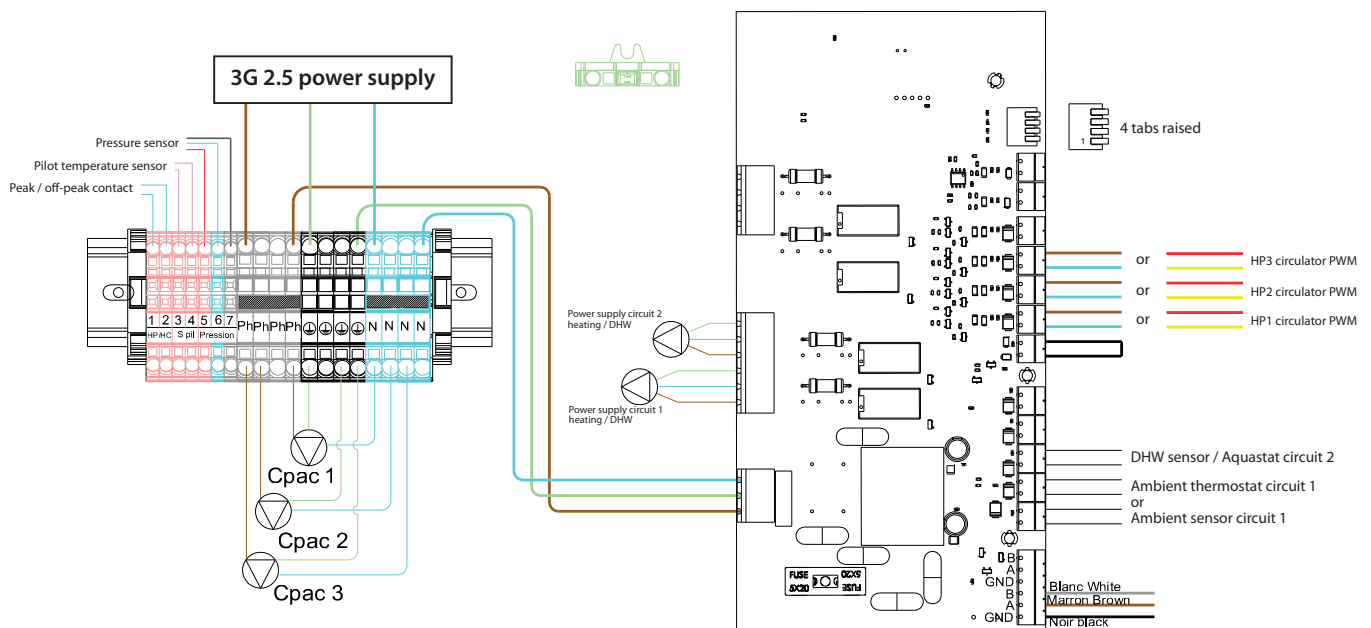
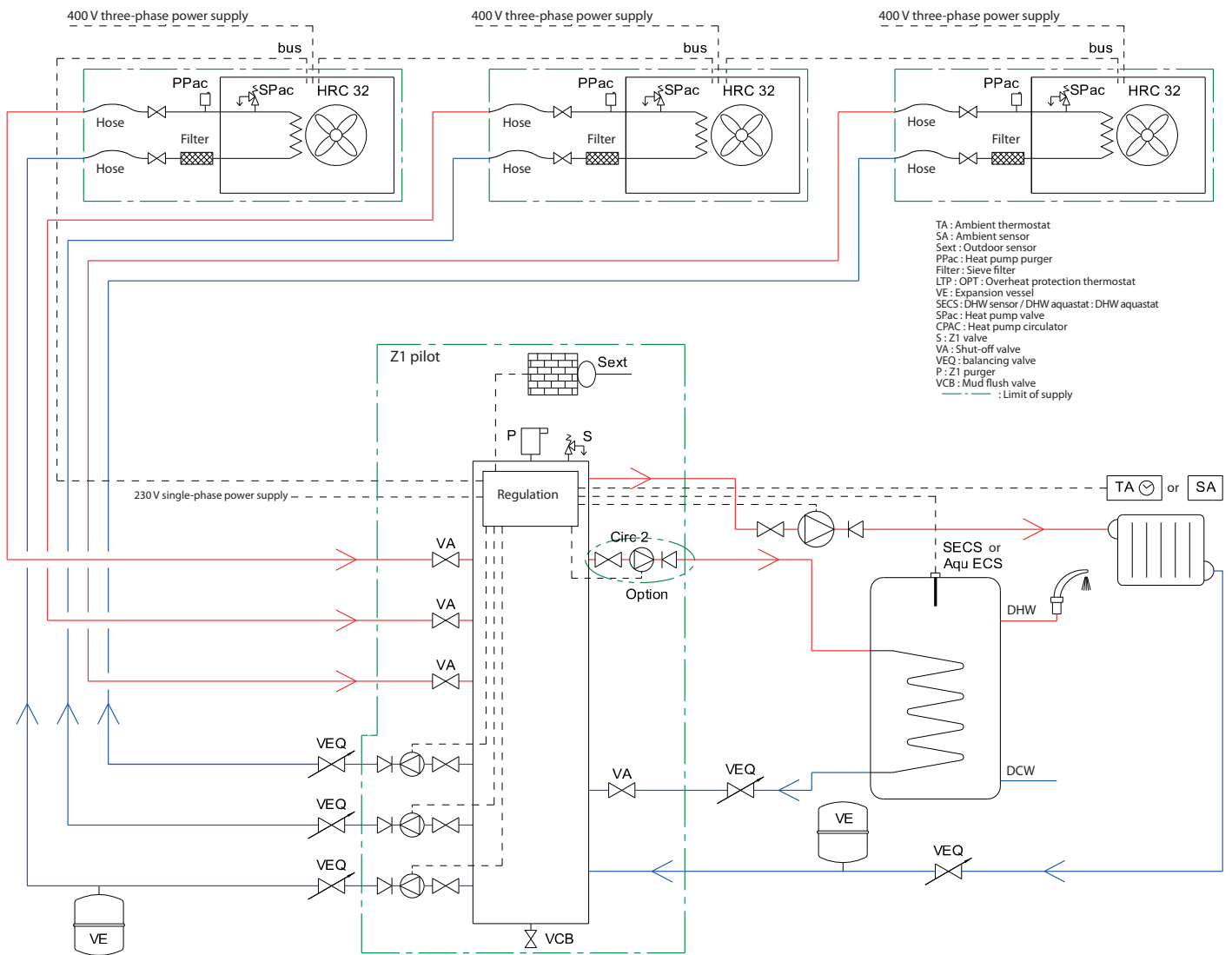
A3.21.1 - Heating circuit - Radiator



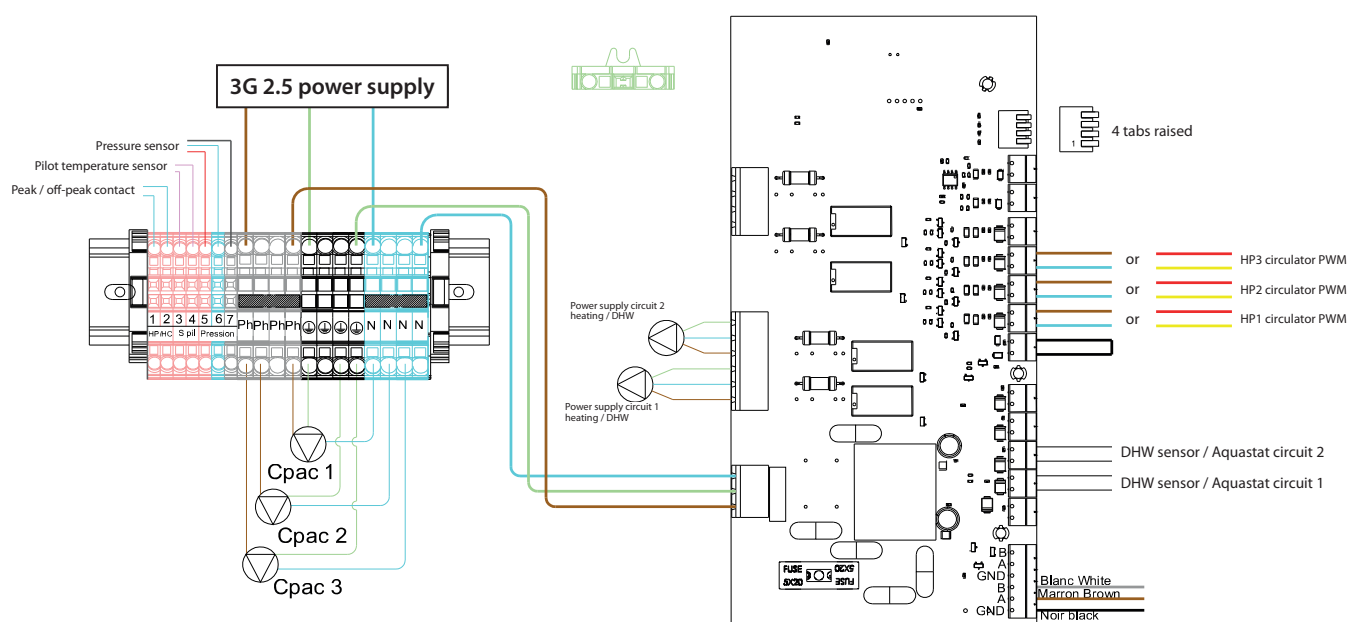
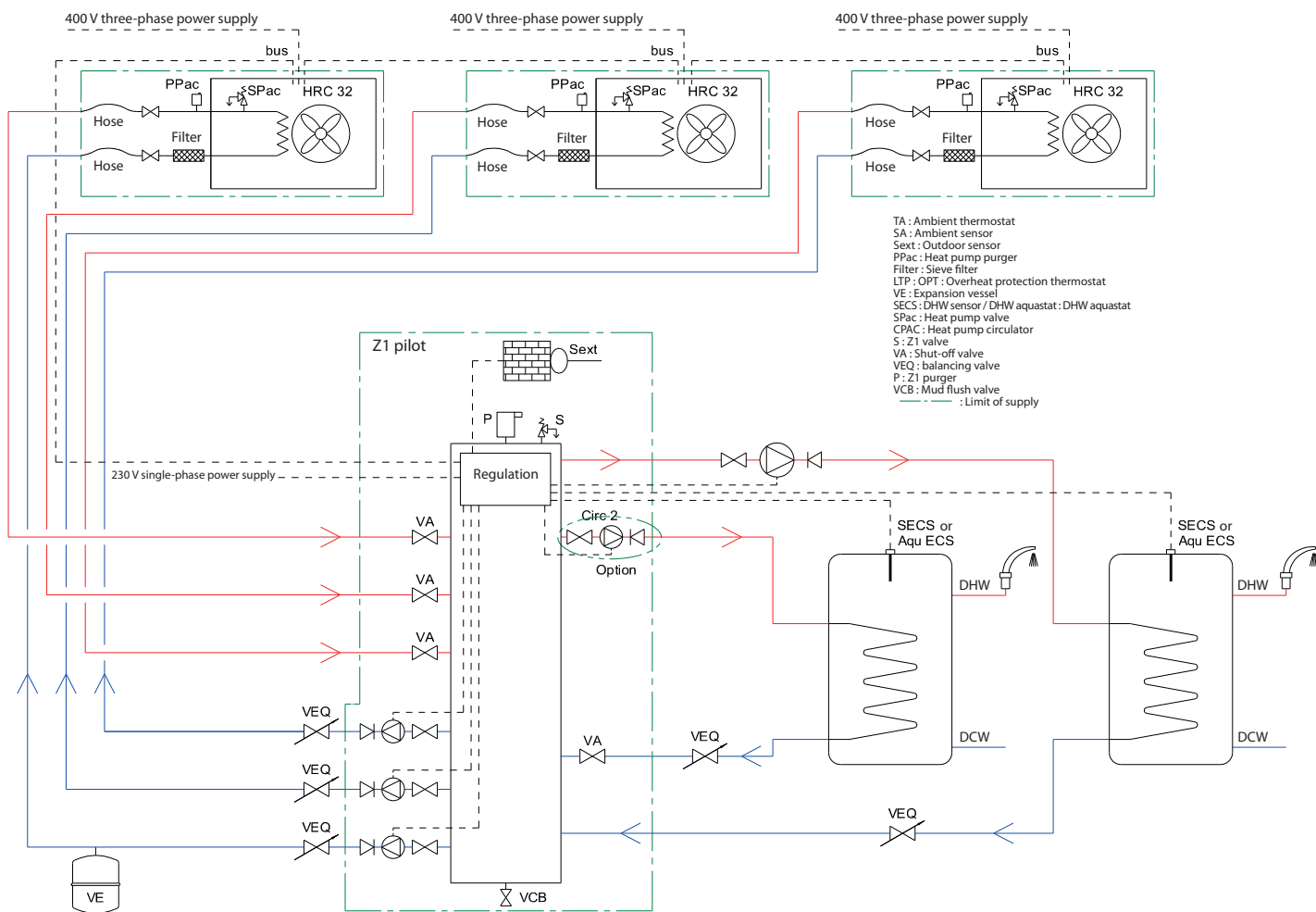
A3.21.2 - Heating circuit - Underfloor heating



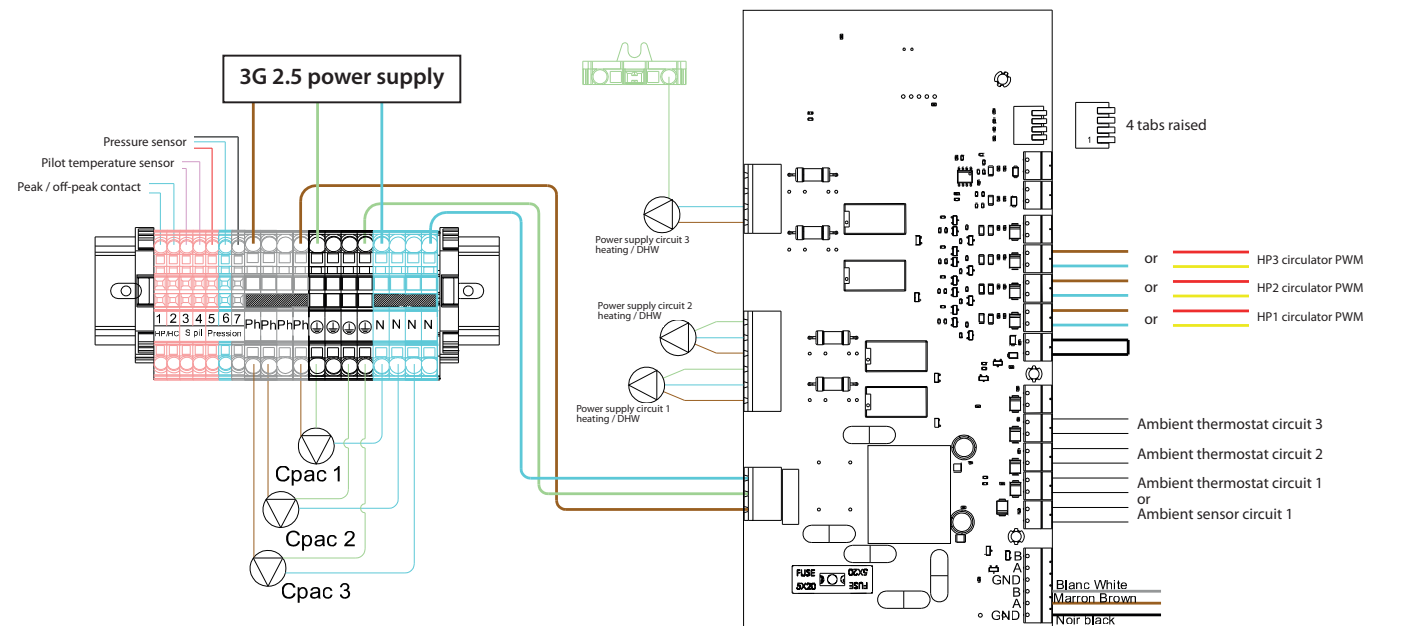
A3.22 - CASE n°22 - 3 HRC⁷⁰ heat pumps + 1 heating circuit + 1 DHW tank



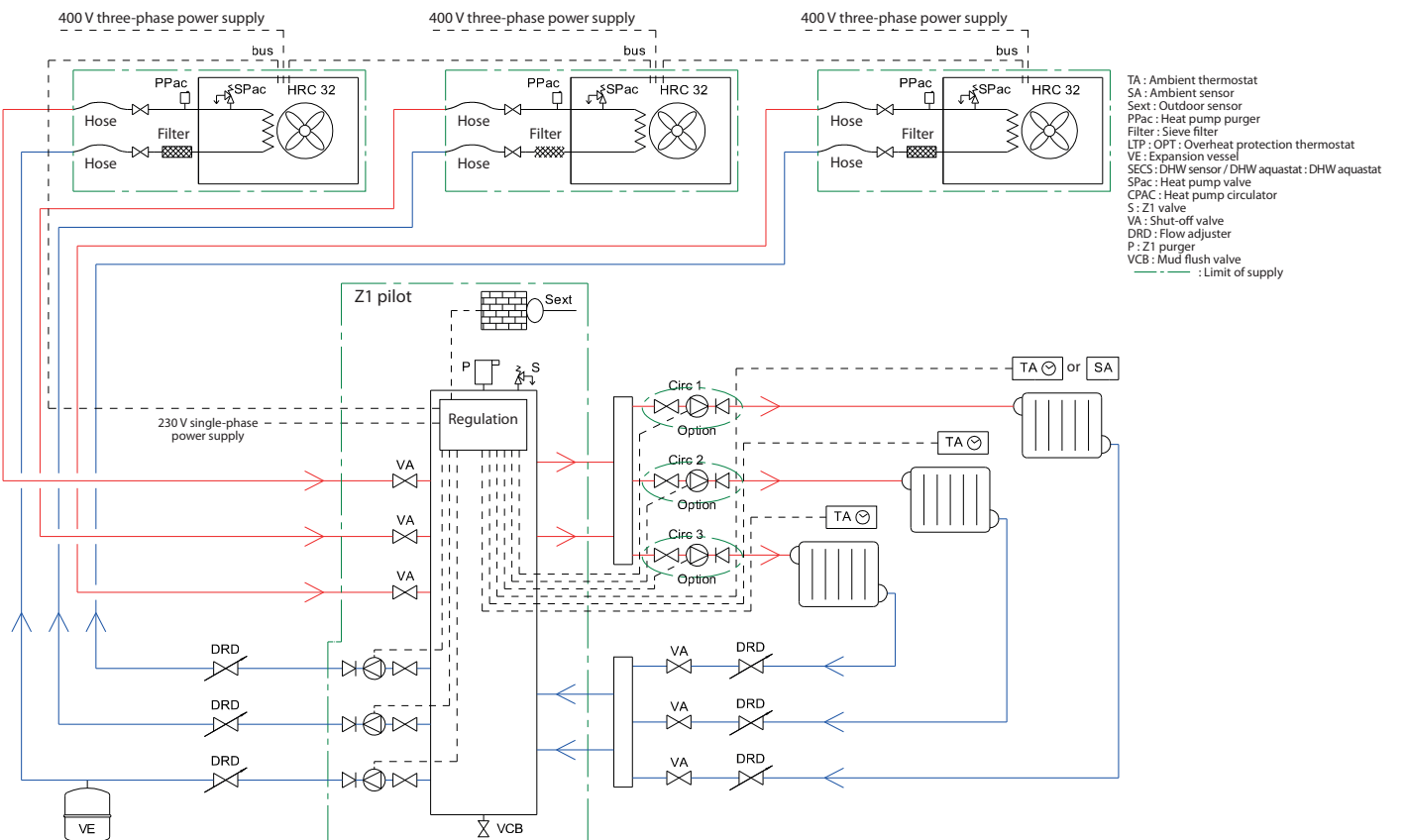
A3.23 - CASE n°23 - 3 HRC⁷⁰ heat pumps + 2 DHW tanks



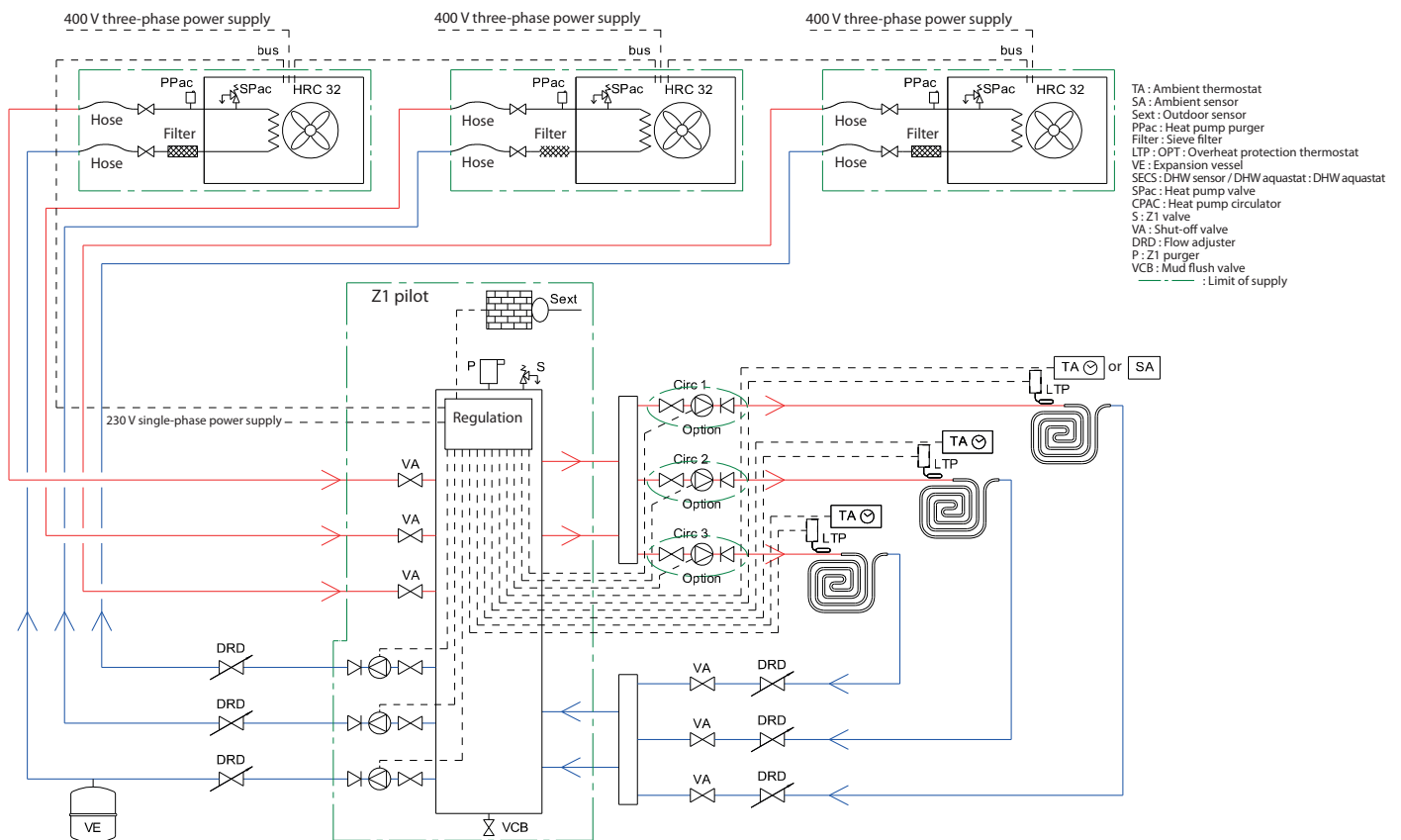
A3.24 - CASE n°24 - 3 HRC⁷⁰ heat pumps + 3 heating circuits



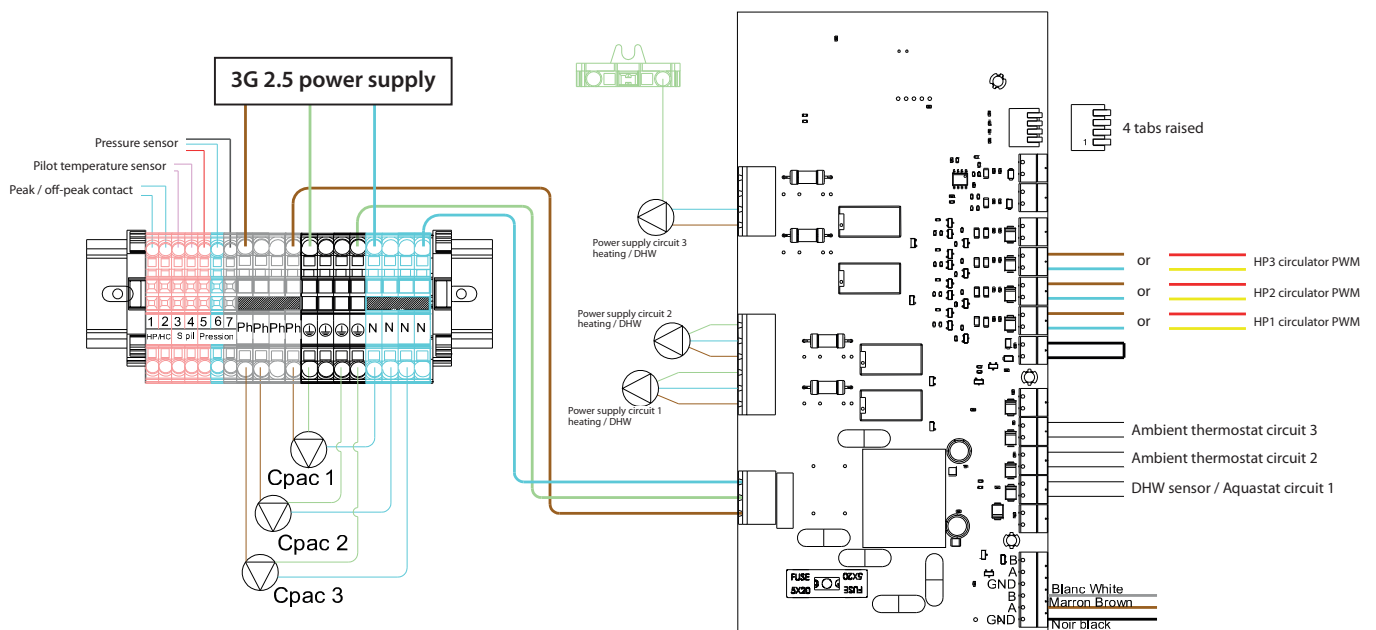
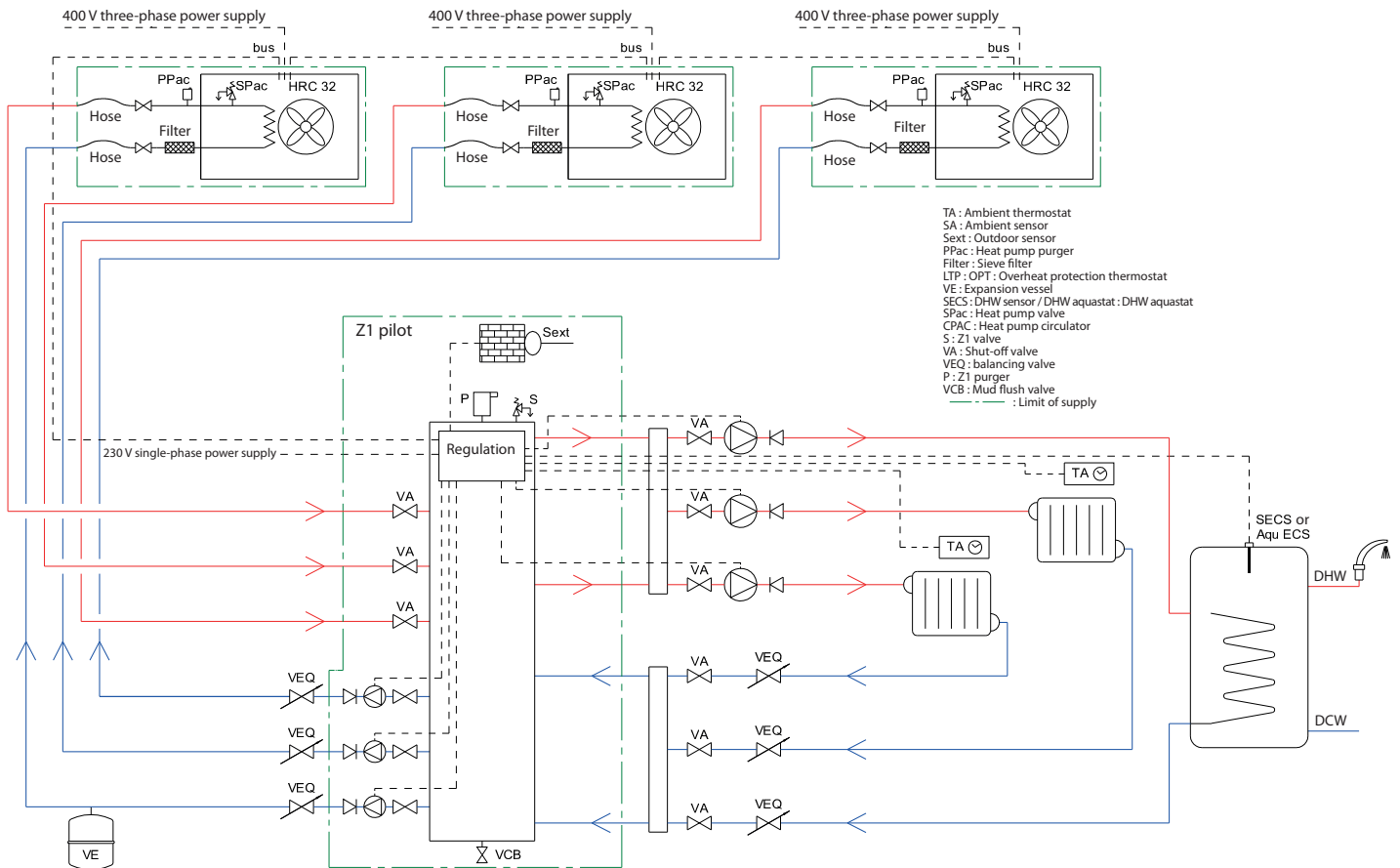
A3.24.1 - Heating circuit - Radiator



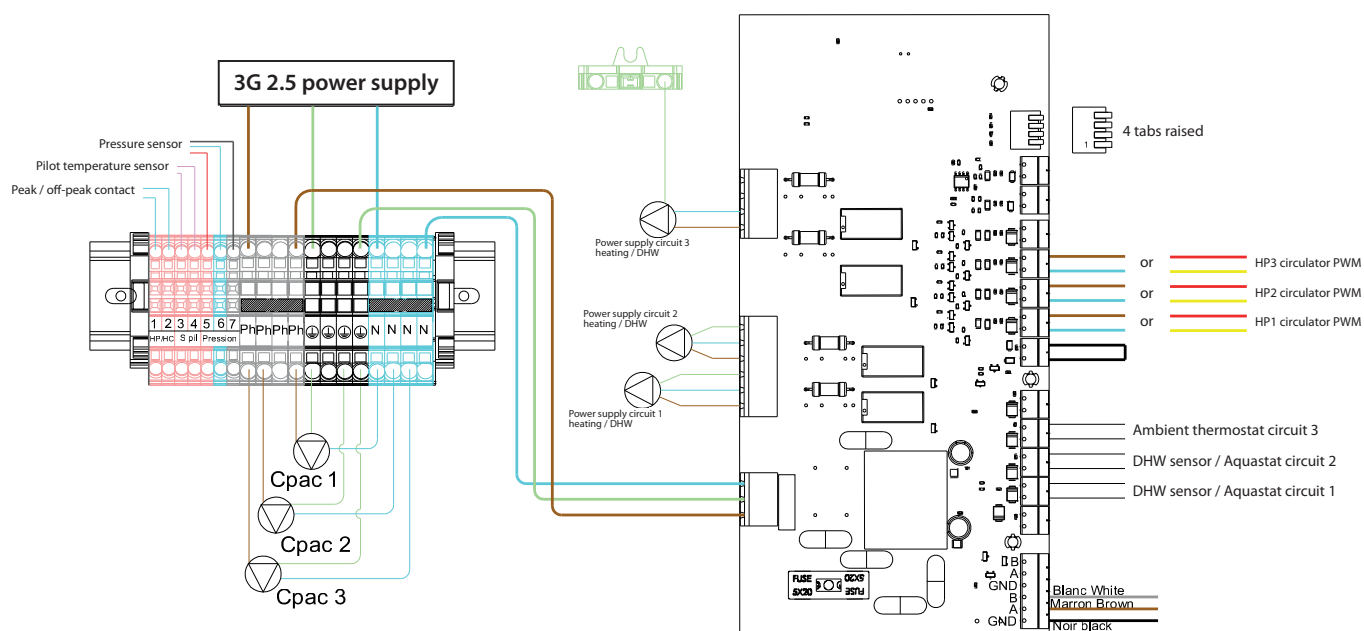
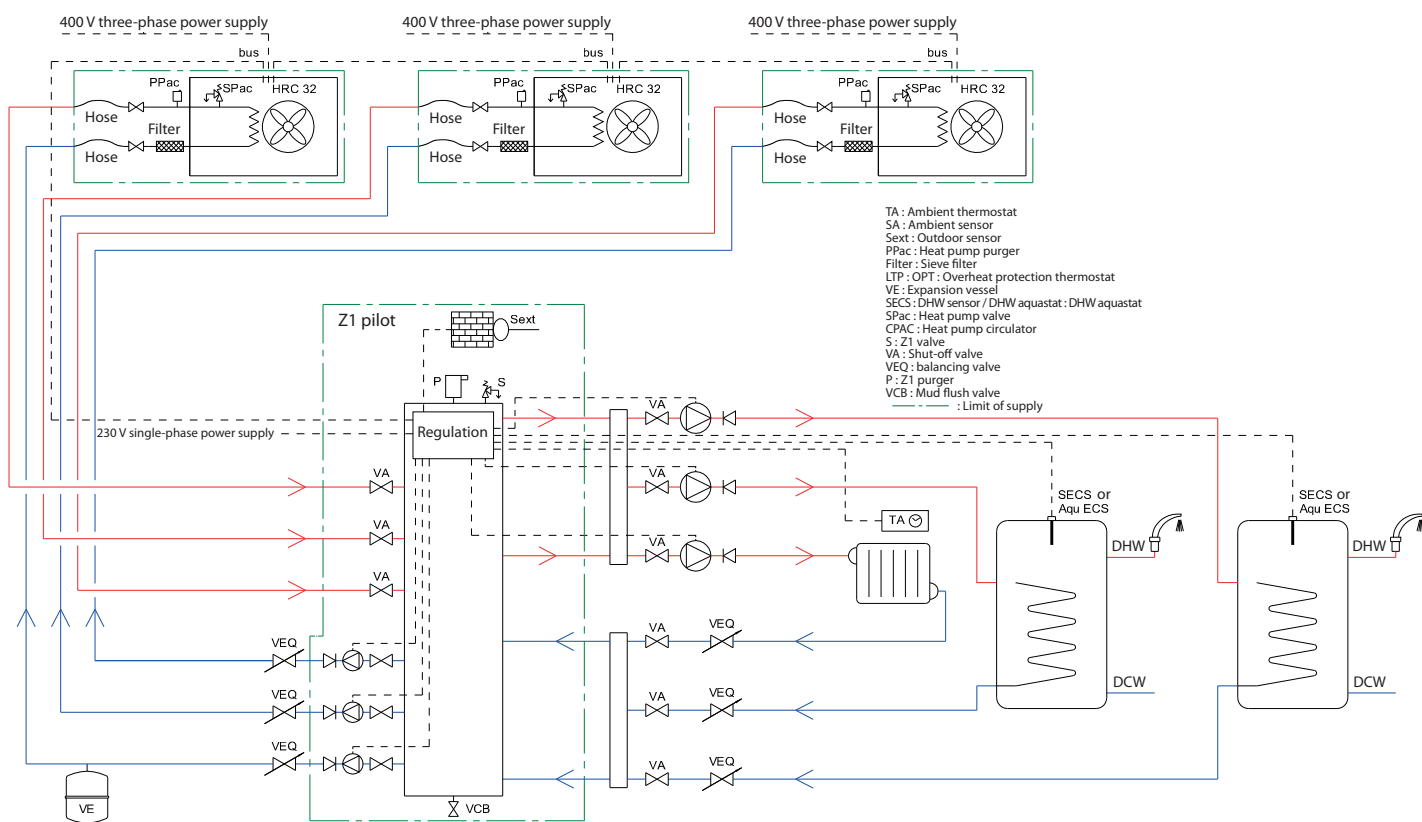
A3.24.2 - Heating circuit - Underfloor heating



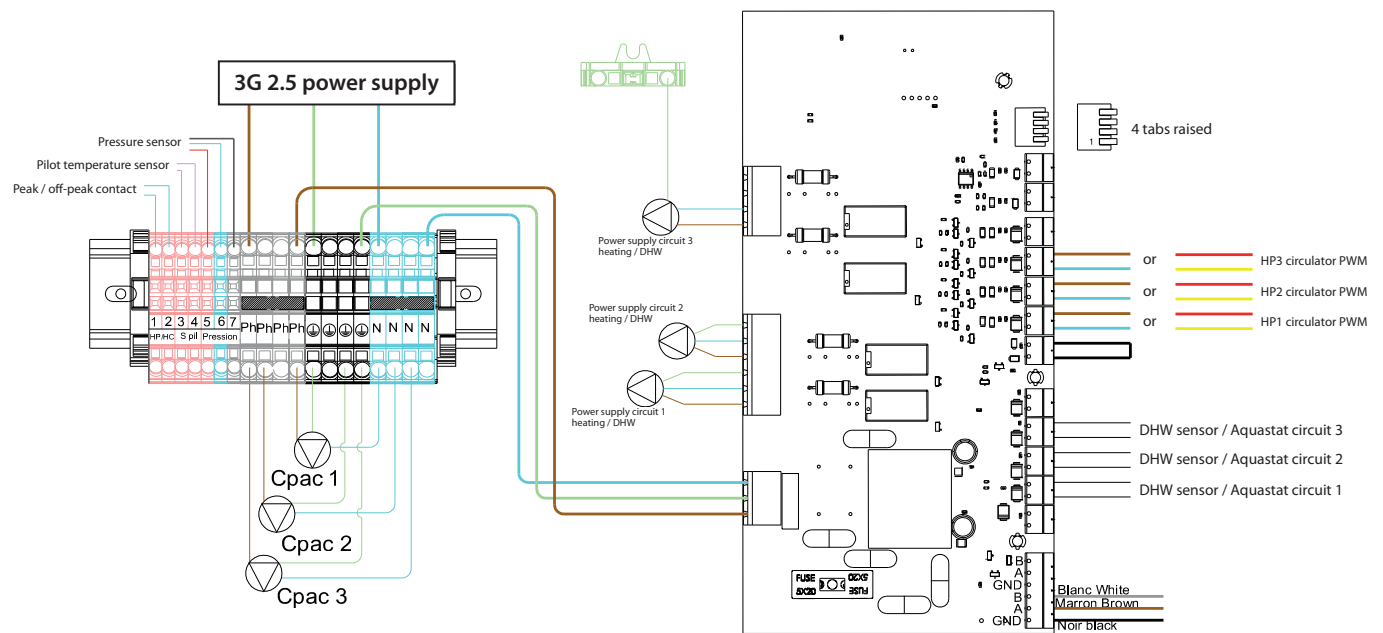
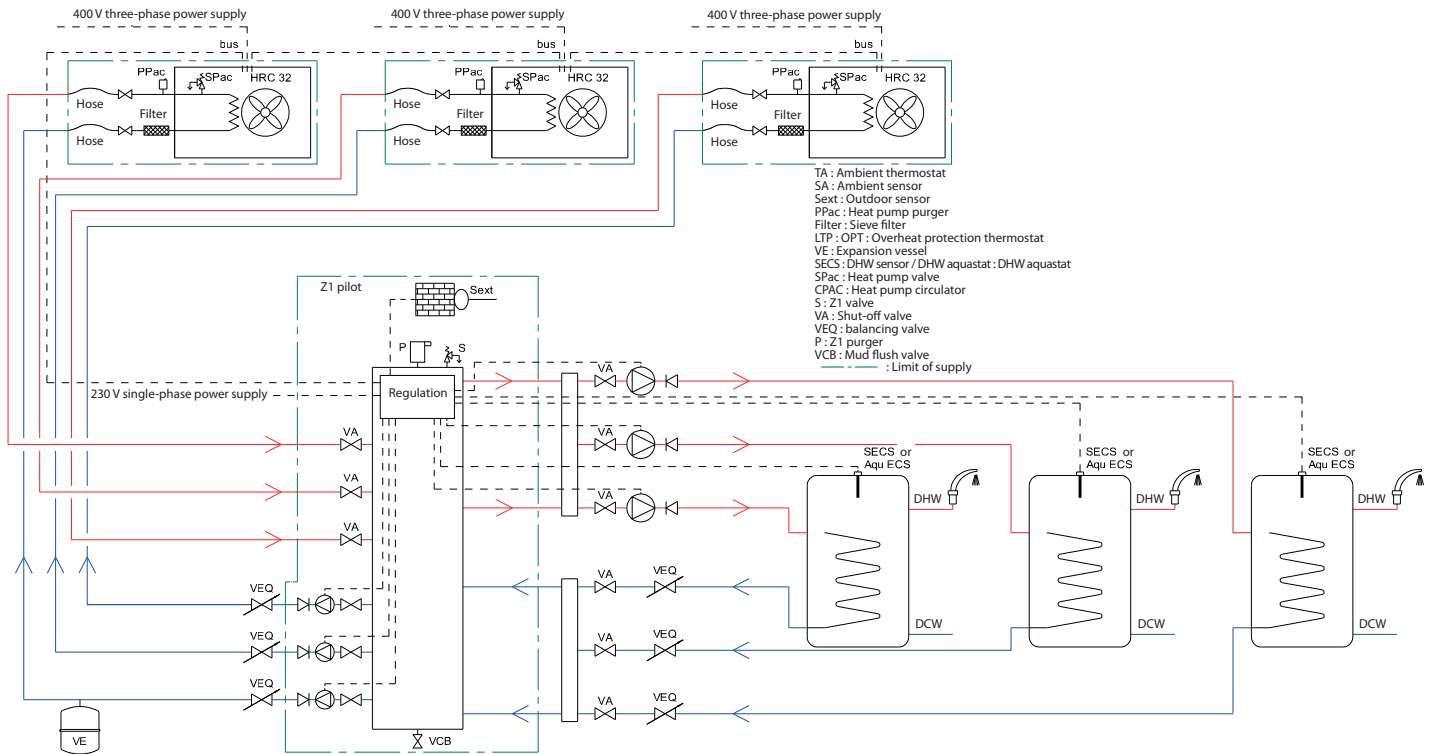
A3.25 - CASE n°25 - 3 HRC70 heat pumps + 1 DHW tank + 2 heating circuits



A3.26 - CASE n°26 - 3 HRC⁷⁰ heat pumps + 2 DHW tank + 1 heating circuit

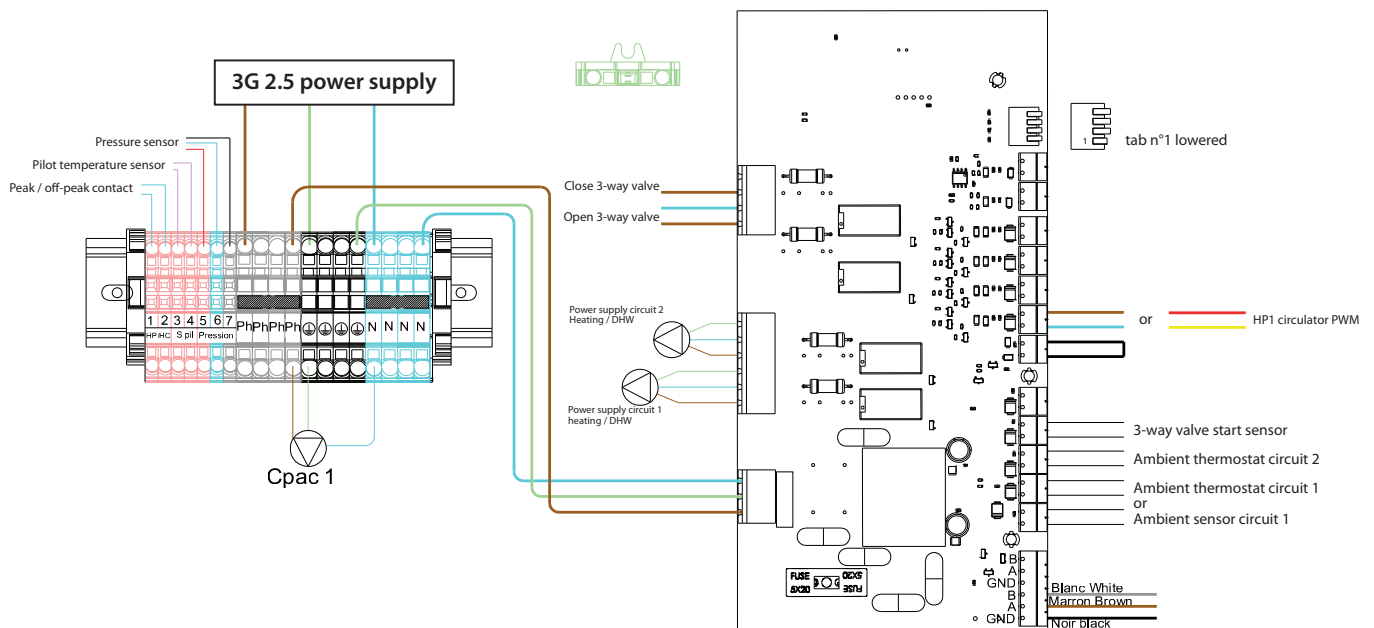
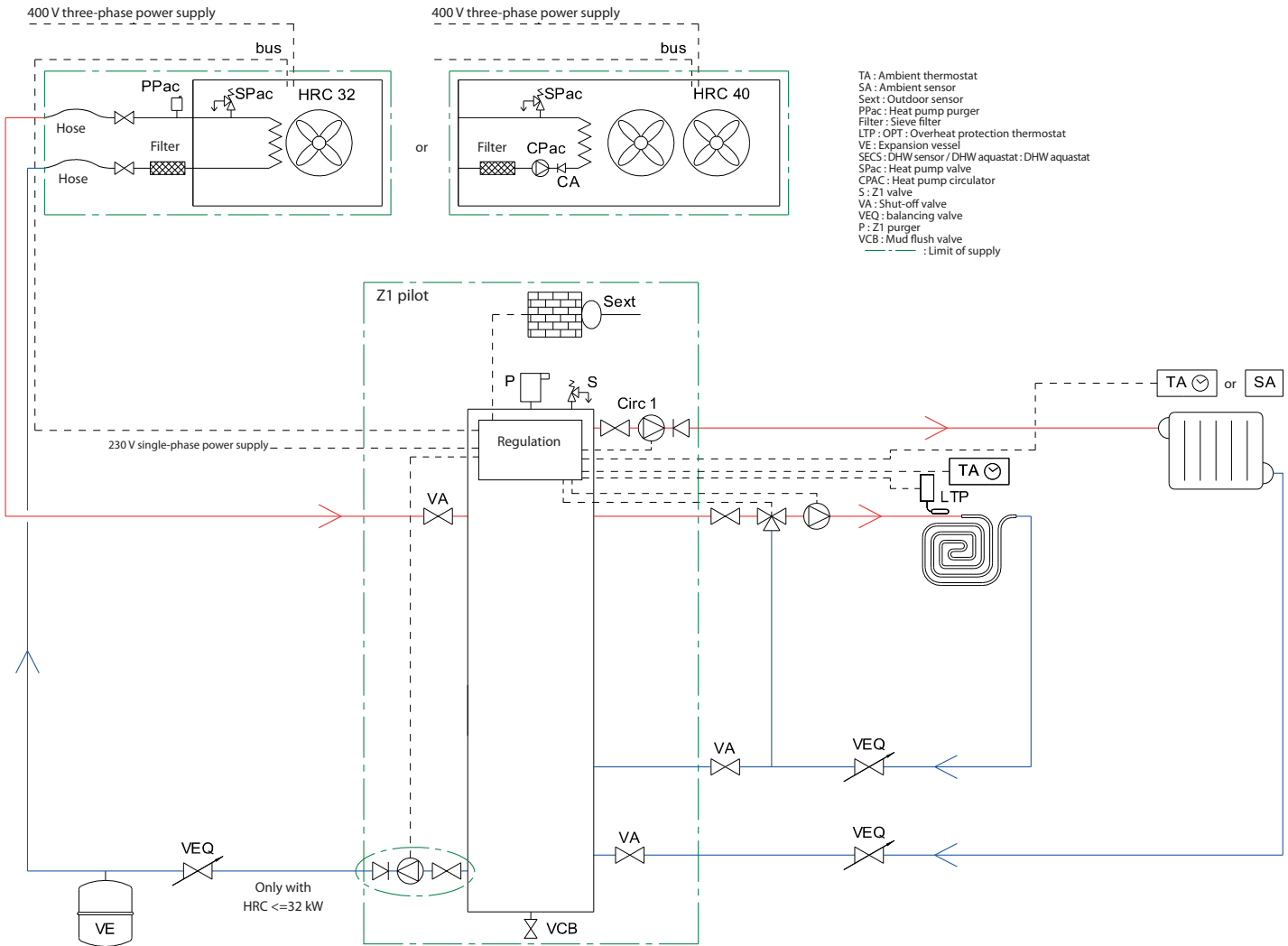


A3.27 - CASE n°27 - 3 HRC⁷⁰ heat pumps + 3 DHW tanks

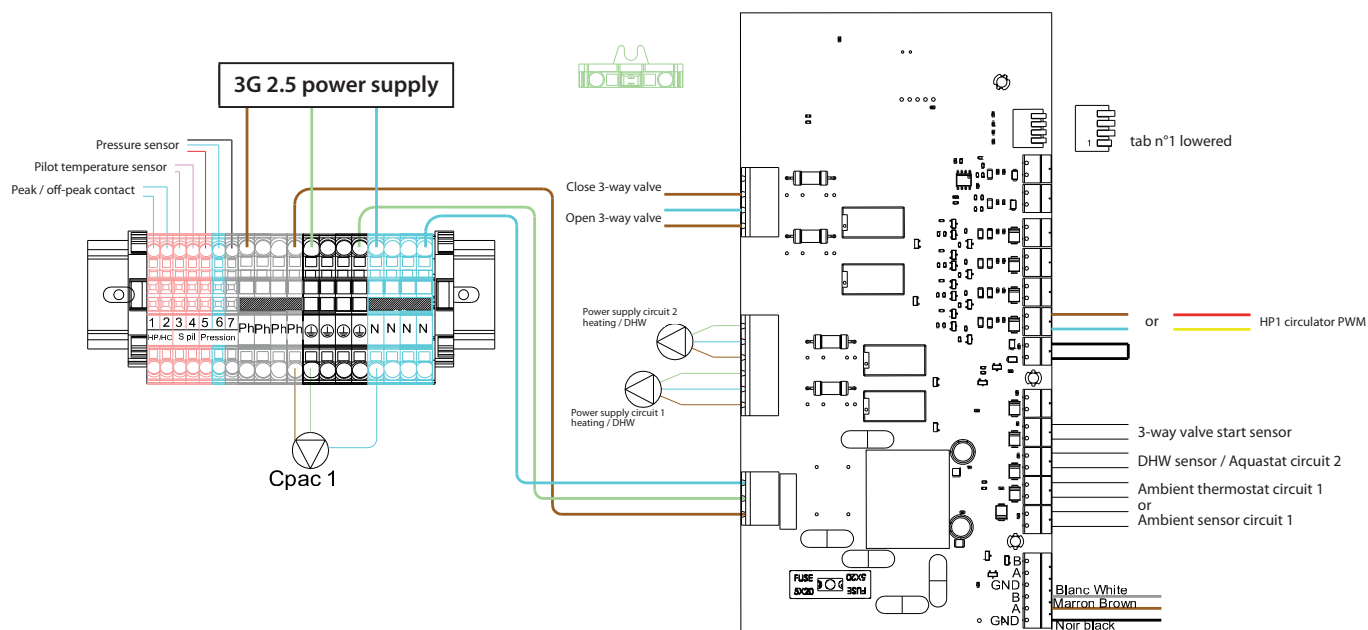
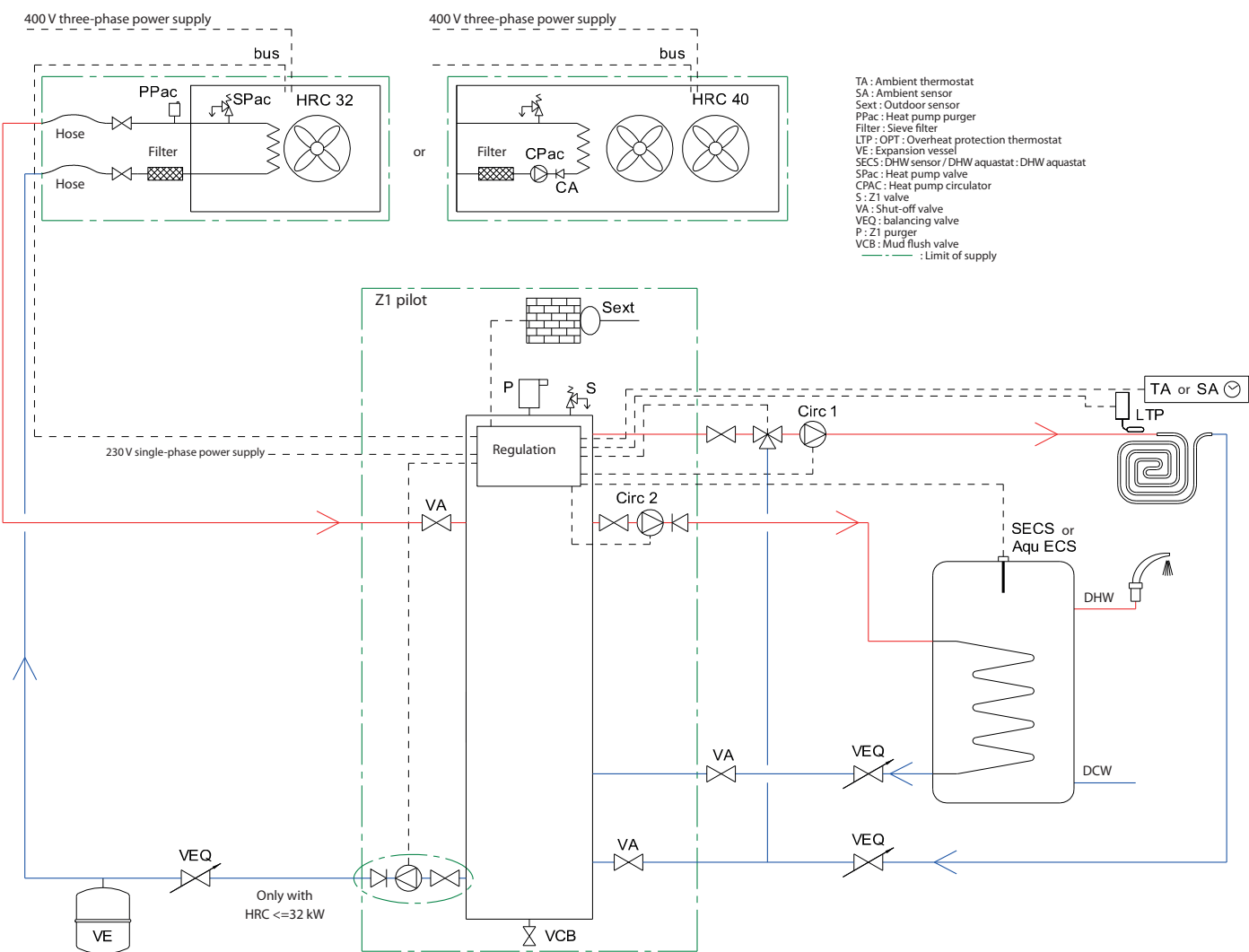


A3.28 - Direct and mixed circuit configurations

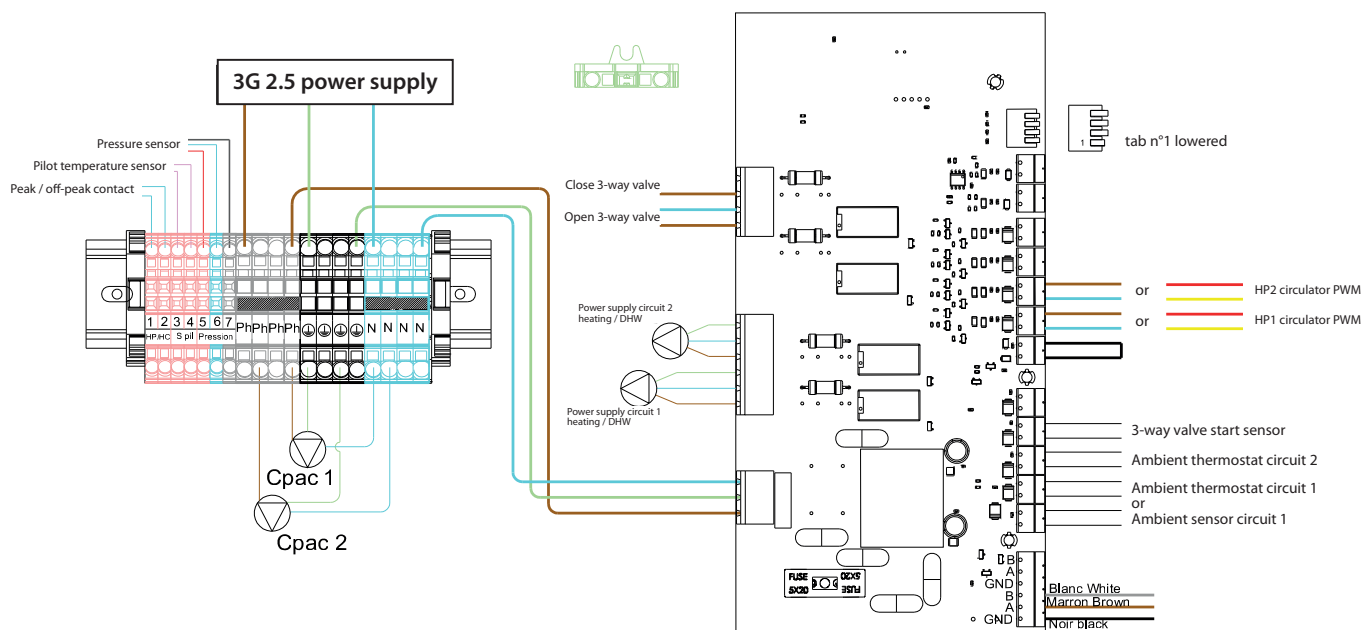
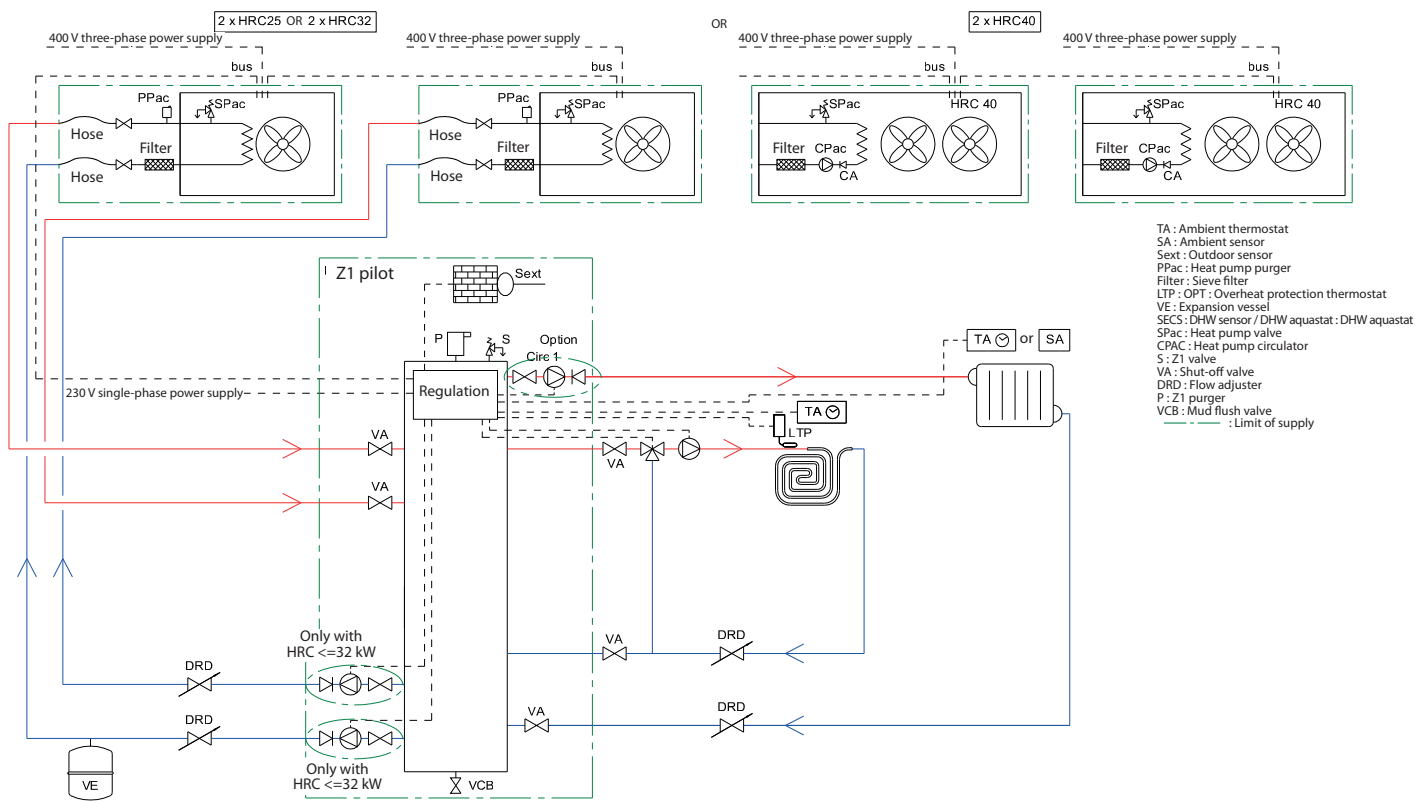
A3.28.1 - Case n°28 - 1 heat pump + 1 radiator circuit + 1 underfloor heating circuit



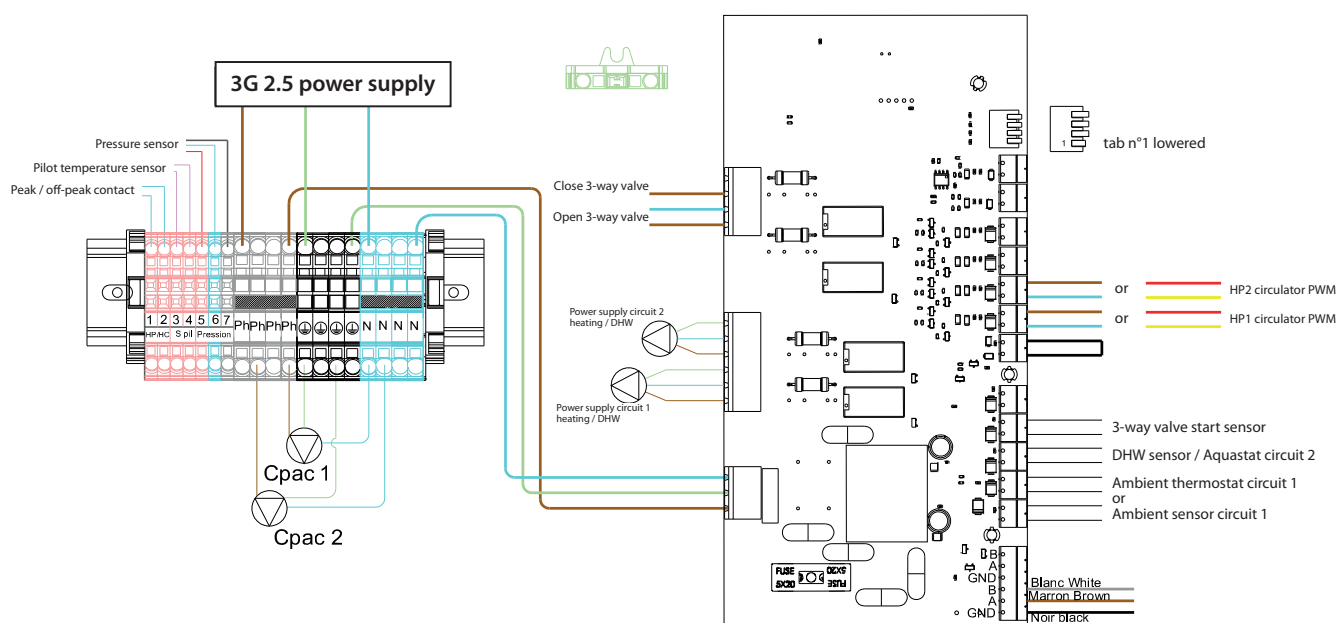
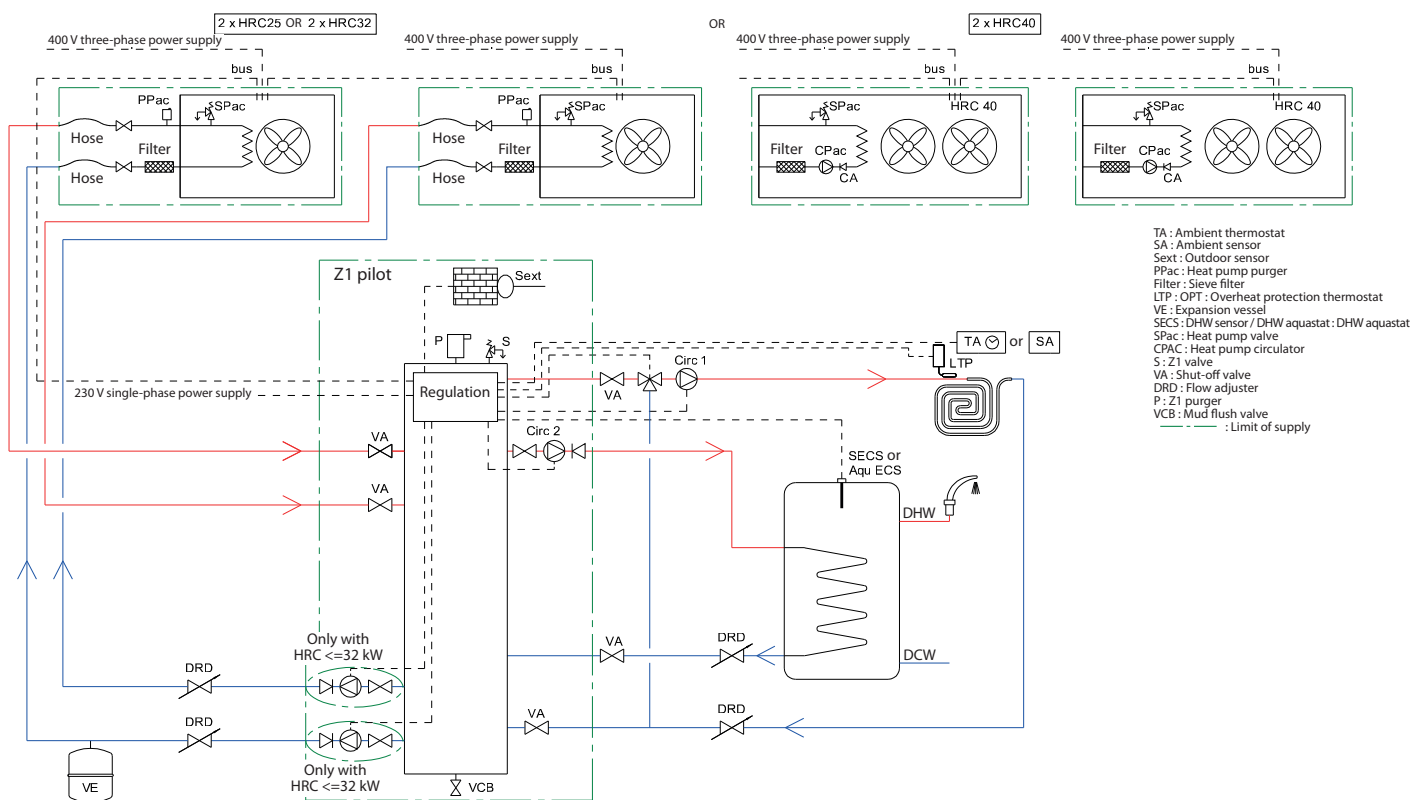
A3.28.2 - Case n°29 - 1 heat pump + 1 DHW tank + 1 underfloor heating circuit



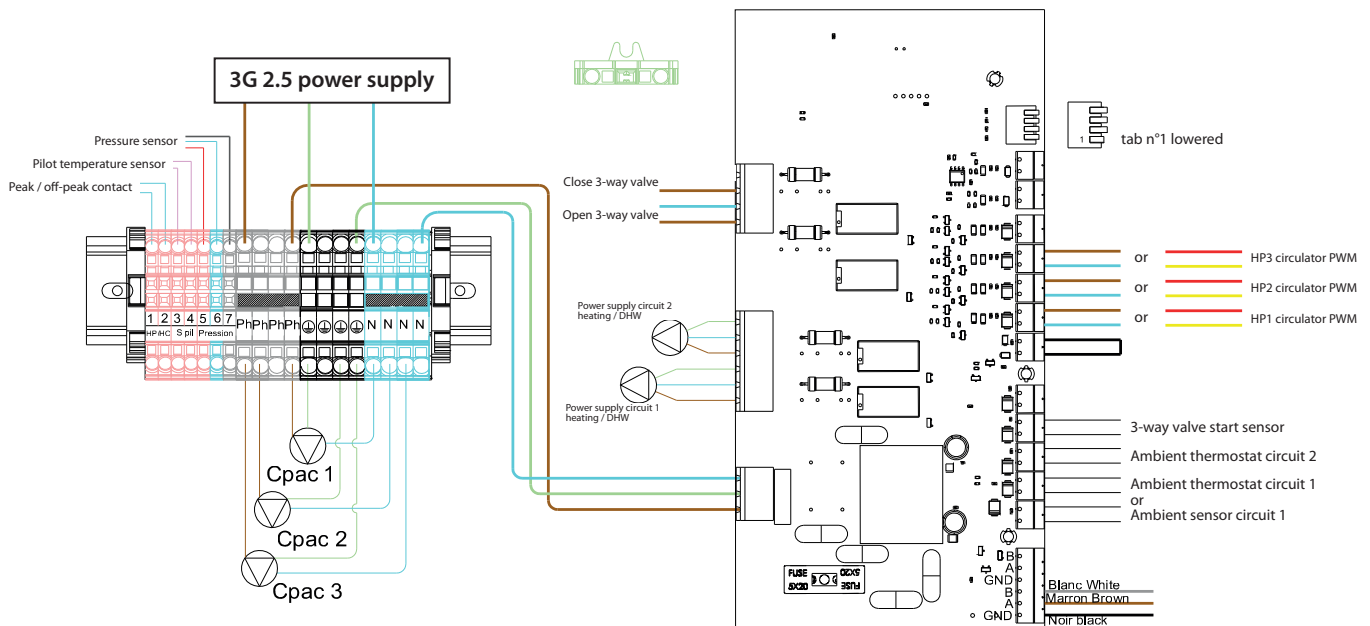
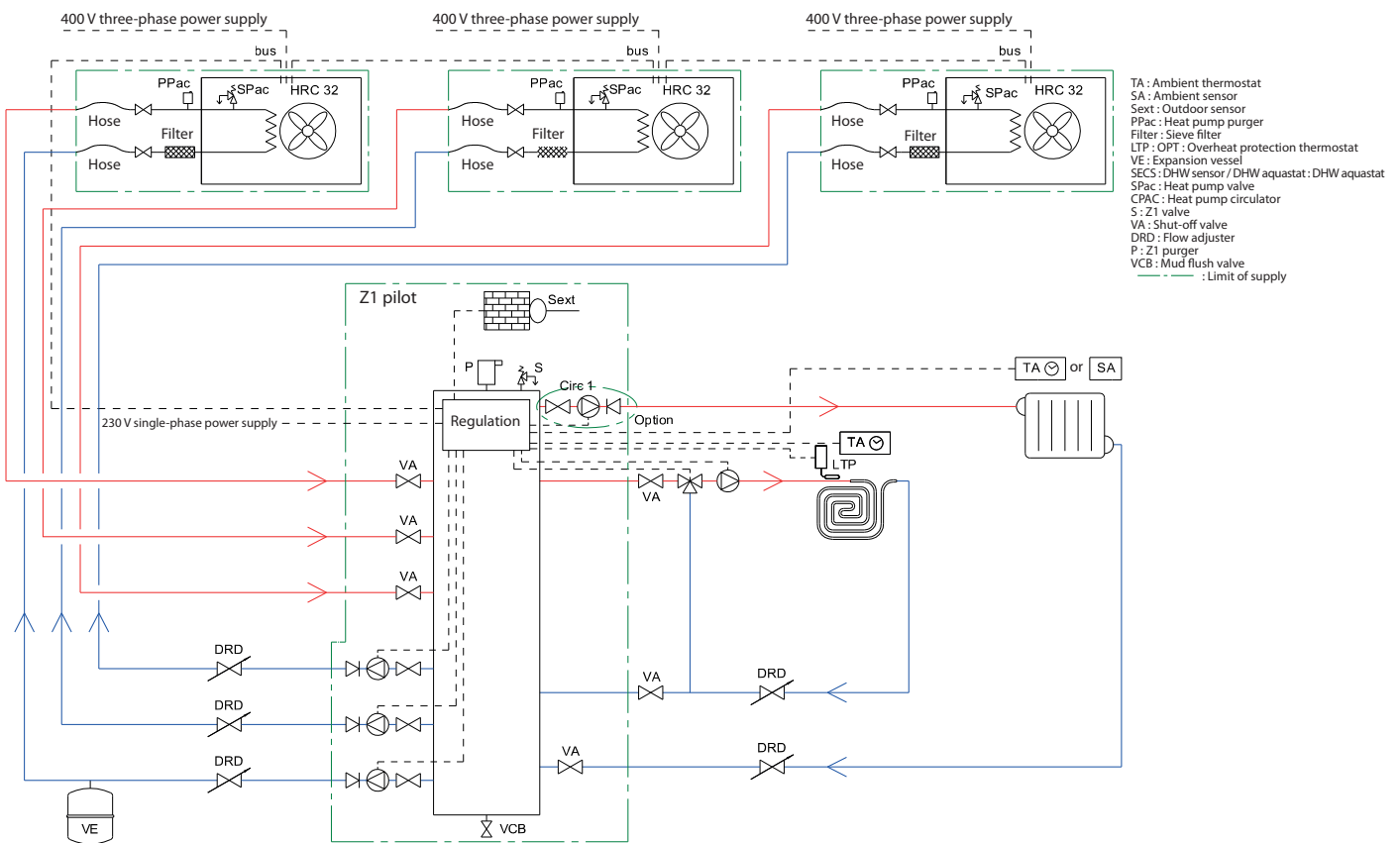
A3.28.3 - Case n°30 - 2 heat pumps + 1 radiator circuit + 1 underfloor heating circuit



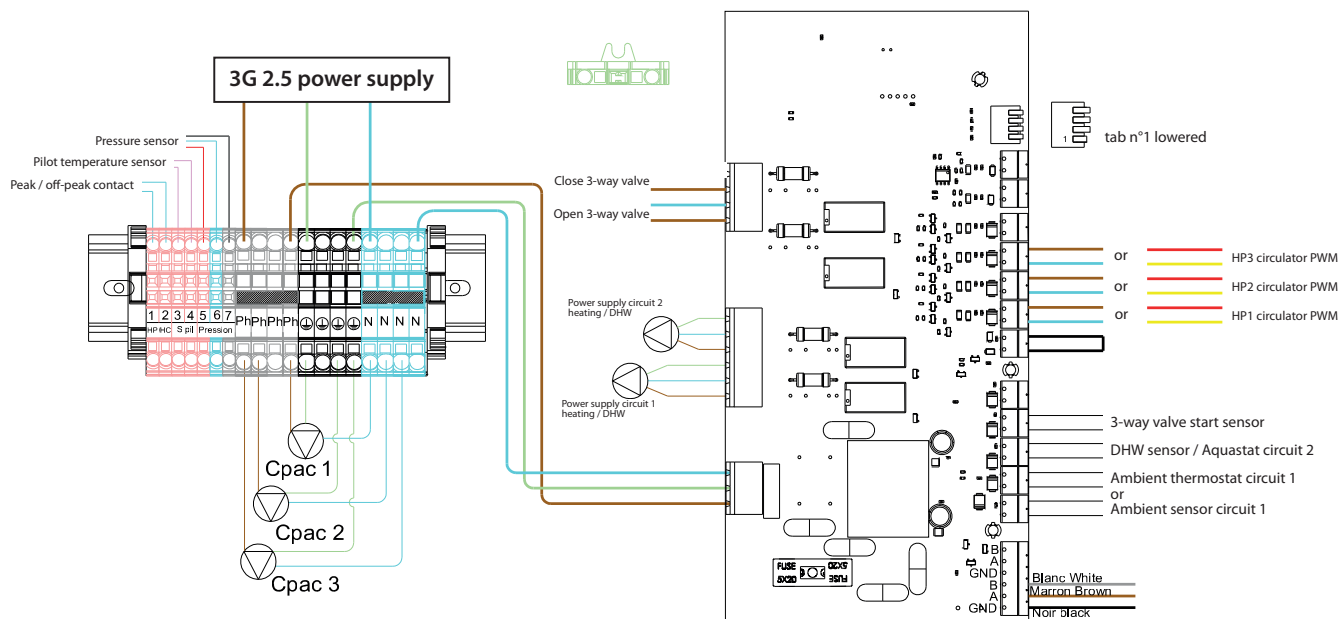
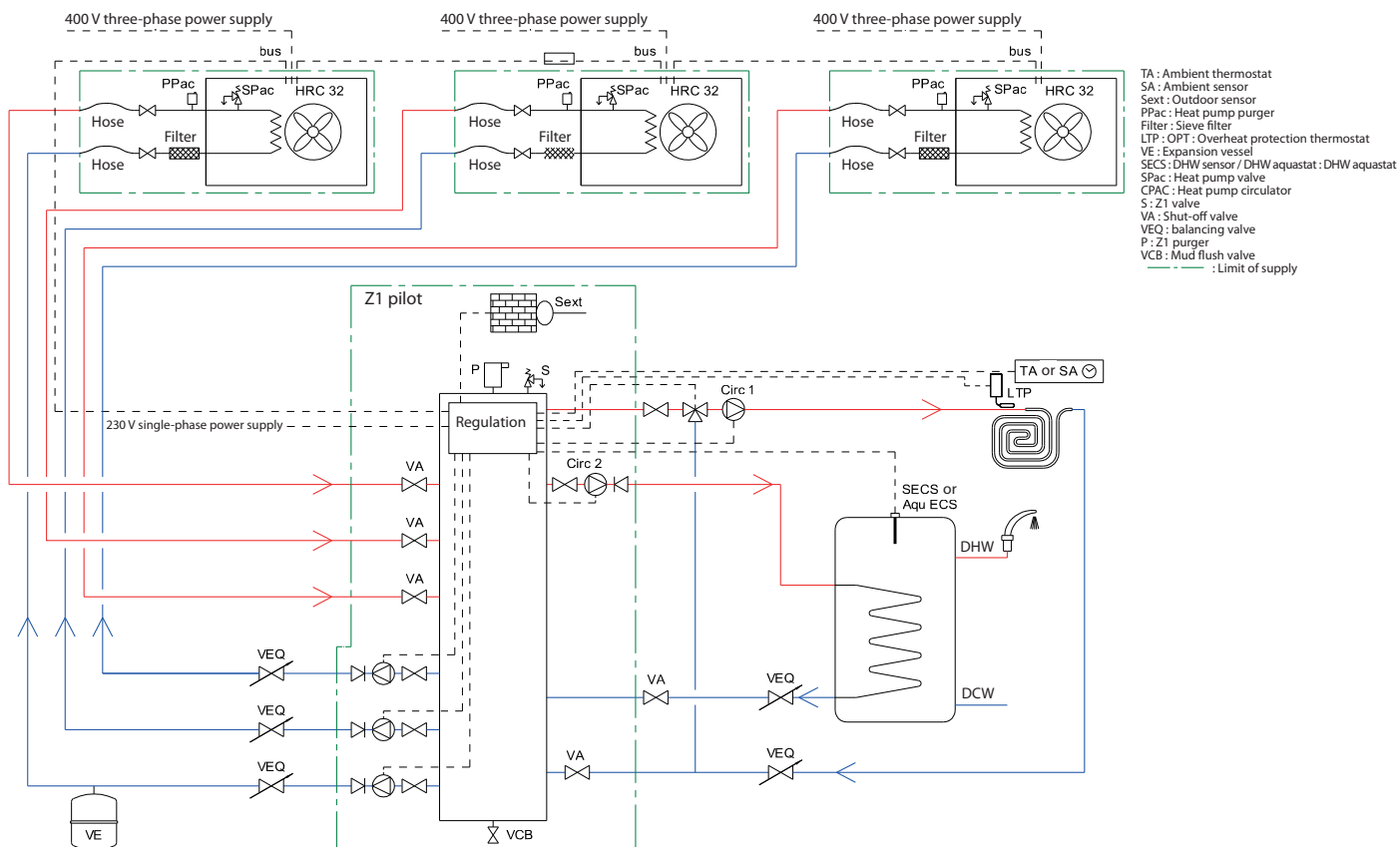
A3.28.4 - Case n°31 - 2 heat pumps + 1 DHW tank + 1 underfloor heating circuit



A3.28.5 - Case n°32 - 3 heat pumps + 1 radiator circuit + 1 underfloor heating circuit

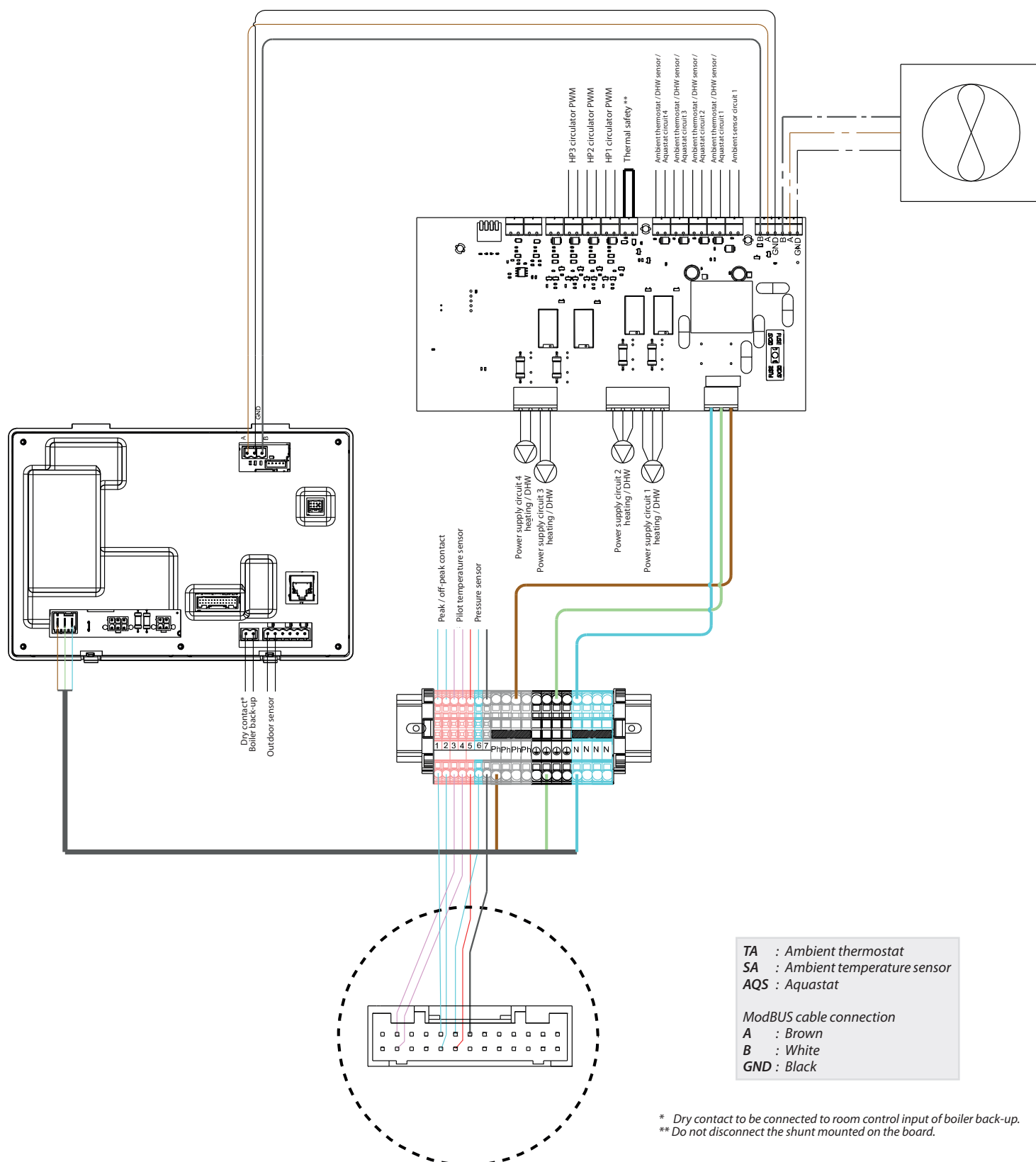


A3.28.6 - Case n°33 - 3 heat pumps + 1 DHW tank + 1 underfloor heating circuit

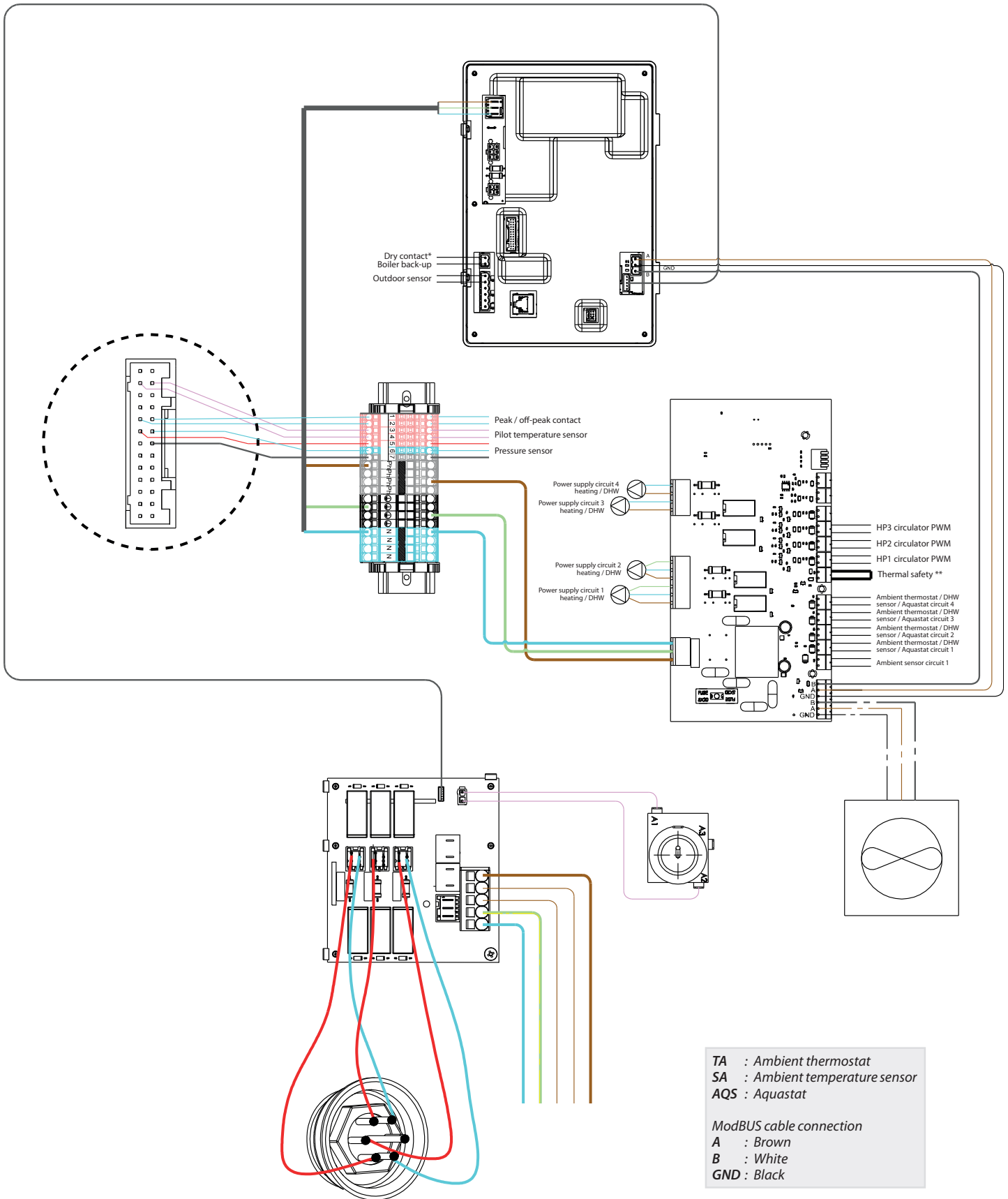


A4 - Wiring diagram

A4.1 - Wiring diagram without electrical back-up



A4.2 - Wiring diagram with electrical back-up



* Dry contact to be connected to room control input of boiler back-up.
** Do not disconnect the shunt mounted on the board.

A5 -Settings and functions

A5.1 - Control panel

A5.1.1 - Keypad

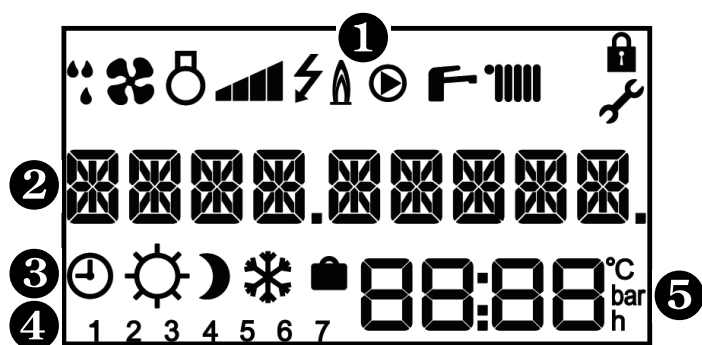


Button Primary function
ex.: Decrease / scroll down

Secondary function
ex.: Holiday mode

Primary function (short press)	Secondary function (long press)
- menu access - return / cancel	locking / unlocking of the keypad
- switch on	standby mode
- setting the temperatures	program scheduled comfort modes
- increase the setting - scroll up	activate temporary comfort mode
- confirm / remove error - display pressure or T°	information on temperatures and current operating state
- decrease the setting - scroll down	activation of holiday mode

A5.1.2 - Display



① Symbols of current operating state

	Defrosting in progress		Circulating pump working
	Ventilator working		Domestic hot water activated
	Compressor working		Heating activated
	Power level		Keypad locked
	Electrical back-up		Installer menu
	Back-up boiler		

② 9 character message

③ Current comfort mode

	Programming active		Comfort mode		Eco mode
	Frost protection mode		Holiday mode		

④ Day of the week: (1= Monday; 2= Tuesday...)

⑤ Display zone: temperatures, pressure, settings, time...

A5.2 - Menus

Menus (and sub-menus)	Access buttons
menu USER	
menu INSTALLER <i>(Display here under will be shown or hidden according to product configuration)</i>	
- HP CIRC : Setting the speed of HP circulating pump	
- OUTS.TMAX : Outside temperature on the warmest day	
- OUTS.TMIN : Outside temperature on the coldest day	
- MODE : Choice of Z1 pilot operation	
HP : HP only operation	
HP+B BACKUP : Operation with the heat pump and authorised back-up	
BACK UP : Operation with back-up only	
- HEAT CURV : Setting the heat curve - Radiator circuit	
- HEAT TMAX : Radiator circuit heat curve set-point on the coldest day	+
- HEAT TMIN : Radiator circuit heat curve set-point on the warmest day	
- HEAT CURV : Setting the heat curve - Underfloor heating	
- TMAX HEAT : Underfloor heating heat curve set-point on the coldest day	
- TMIN HEAT : Underfloor heating heat curve set-point on the warmest day	
- SHARING : Activation of priority sharing	
- ANTI-BACT. : Activation of anti-bacteria function	
menu EXPERT	
- SETTINGS : Access to all parameters	
- DISPLAY : State of operation of the pilot	
- DATA CALC : Temperatures and time delays in progress	
- COUNTERS : Operation counters	
- CONFIGURA. : Choice of circuits and their controls	+
- AIR BLEED : Activation of a special air purge cycle	
- MANUAL : Manual operation of component for diagnostics	
- COMMISSIO : Access to the set-up	
- MODBUS : Remote control setting up	
- SOFTWARE : Manage software version	

Press  to exit the menus and sub-menus.

A5.3 - Actions to be activated using a combination of buttons

Action	Combination of buttons
<u>Reset counters to zero</u> Certain counters cannot be reset to zero. Only the counters which can be reset are affected by this action.	in the «counters» menu  +  press for 5s
<u>Reset to default settings</u> (return to factory settings)	in the «settings» menu  +  press for 5s

A6 - Product technical information sheet

A6.1 - Z1 pilot with HRC⁷⁰ 17 kW mono /3 heat pump

Fiche d'information technique produit (conformément au règlement UE n°811/2013, 813/2013)

Product data sheet (in accordance with EU regulation n°. 811/2013, 813/2013)

Marque / Brand name		intuis			
Modèle / Model		HRC ⁷⁰ 17 kW mono /3 Z1			
Pompe à chaleur air-eau <i>Air-to-water heat pump</i>	oui yes	Pompe à chaleur basse température <i>Low-temperature heat pump</i>		non no	
Pompe à chaleur eau-eau <i>Water-to-water heat pump</i>	non no	Equippée d'un dispositif d'appoint <i>Equipped with a supplementary heater</i>		non no	
Pompe à chaleur eau glycolée-eau <i>Brine-to-water heat pump</i>	non no	Dispositif de chauffage mixte par pompe à chaleur <i>Heat pump combination heater</i>		non no	
Caractéristique Item		Symbole Symbol	Unité Unit	35°C	55°C
Classe d'efficacité énergétique chauffage / <i>Heating seasonal energy efficiency class</i>				A++	A++
Puissance de chauffage nominale / <i>Nominal heat output (*1)</i>		Prated	kW	14	15
Puissance de chauffage nominale / <i>Nominal heat output (*2)</i>		Prated	kW	15	14
Puissance de chauffage nominale / <i>Nominal heat output (*3)</i>		Prated	kW	10	9
Puissance calorifique déclarée à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes. <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		Pdh	kW	10,7	11,5
Tj = +2°C		Pdh	kW	8,0	7,9
Tj = +7°C		Pdh	kW	7,3	7,1
Tj = +12°C		Pdh	kW	8,3	8,4
Tj = température bivalente / <i>Tj = Bivalence temperature</i>		Pdh	kW	10,9	12,3
Tj = température limite fonctionnement / <i>Tj = Operating limit temperature</i>		Pdh	kW	11,0	10,6
Tj = -15°C		Pdh	kW	9,5	8,8
Température bivalente / <i>Bivalence temperature</i>		Tbiv	°C	-5	
Puissance calorifique sur intervalle cyclique / <i>Output for cyclical interval heating mode</i>		Pcych	kW	-	
Coefficient de dégradation / <i>Degradation coefficient</i>		Cdh	-	0,9	
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*1)</i>		ηs	%	150	125
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*2)</i>		ηs	%	121	100
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*3)</i>		ηs	%	196	167
Coefficient de performance déclaré à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		COPd	-	2,84	2,28
Tj = +2°C		COPd	-	3,77	3,06
Tj = +7°C		COPd	-	5,22	4,35
Tj = +12°C		COPd	-	5,81	5,31
Tj = température bivalente / <i>Tj = Bivalence temperature</i>		COPd	-	3,03	2,55
Tj = température limite fonctionnement / <i>Tj = Operating limit value temperature</i>		COPd	-	2,82	2,15
Tj = -15°C		COPd	-	2,60	1,95
Température limite de fonctionnement / <i>Operating limit temperature</i>		TOL	°C	-10	
Efficacité sur intervalle cyclique / <i>Cycling interval efficiency</i>		COPcyc	-	-	
Température maximale eau de chauffage / <i>Max. temperature for the heating water</i>		WTOL	°C	70	
Puissance électrique consommée dans les autres modes que le mode actif / <i>Power consumption in modes other than active mode</i>					
Mode arrêt / <i>OFF mode</i>		P _{OFF}	kW	0,007	
Mode arrêt thermostat / <i>Thermostat-off mode</i>		P _{TO}	kW	0,009	
Mode veille / <i>Standby mode</i>		P _{SB}	kW	0,007	
Mode résistance de carter / <i>Crankcase heater mode</i>		P _{CK}	kW	0,009	
Dispositif de chauffage d'appoint / <i>Supplementary heater</i>					
Puissance thermique nominale d'appoint / <i>Nominal heat output of supplementary heater</i>		Psup	kW	2,5	4,5
Type d'énergie chauffage d'appoint / <i>Type of energy input of supplementary heater</i>		-	-	électrique / electric	
Autres caractéristiques / <i>Other items</i>					
Régulation de la puissance thermique / <i>Heating capacity control</i>		-	-	variable	
Consommation annuelle d'énergie / <i>Annual energy consumption (*1)</i>		Q _{HE}	kWh	7329	9779
Consommation annuelle d'énergie / <i>Annual energy consumption (*2)</i>		Q _{HE}	kWh	11590	13239
Consommation annuelle d'énergie / <i>Annual energy consumption (*3)</i>		Q _{HE}	kWh	2552	2967
Puissance sonore intérieure - extérieure / <i>Sound power level - indoor - outdoor</i>		L _{WA}	dB	- / 60	- / 66
Débit d'air nominal à l'extérieur / <i>Rated Air flow outdoor</i>		-	m ³ /h	3500	
Coordonnées de contact / <i>Contact details</i>		intuis, rue de la République 80210 Feuquières-en-Vimeu			
Les précautions particulières qui doivent être prises lors du montage, l'installation et l'entretien, sont décrites dans la notice d'installation et d'utilisation. <i>All specific precautions for assembly, installation and maintenance are described in the operating and installation instructions. Read and follow the operating and installation instructions.</i>					

(*1) Conditions climatiques moyennes / Average climatic conditions

(*2) Conditions climatiques plus froides / Colder climatic conditions

(*3) Conditions climatiques plus chaudes / Warmer climatic conditions

A6.2 - Z1 pilot with HRC⁷⁰ 17 kW /3 tri heat pump

Fiche d'information technique produit (conformément au règlement UE n°811/2013, 813/2013)

Product data sheet (in accordance with EU regulation n°. 811/2013, 813/2013)

Marque / Brand name		intuis			
Modèle / Model		HRC ⁷⁰ 17 kW tri /3 Z1			
Pompe à chaleur air-eau <i>Air-to-water heat pump</i>	oui yes	Pompe à chaleur basse température <i>Low-temperature heat pump</i>	non no		
Pompe à chaleur eau-eau <i>Water-to-water heat pump</i>	non no	Equipée d'un dispositif d'appoint <i>Equipped with a supplementary heater</i>	non no		
Pompe à chaleur eau glycolée-eau <i>Brine-to-water heat pump</i>	non no	Dispositif de chauffage mixte par pompe à chaleur <i>Heat pump combination heater</i>	non no		
Caractéristique <i>Item</i>		Symbole <i>Symbol</i>	Unité <i>Unit</i>	35°C	55°C
Classe d'efficacité énergétique chauffage / <i>Heating seasonal energy efficiency class</i>				A++	A++
Puissance de chauffage nominale / <i>Nominal heat output (*1)</i>		Prated	kW	14	15
Puissance de chauffage nominale / <i>Nominal heat output (*2)</i>		Prated	kW	15	14
Puissance de chauffage nominale / <i>Nominal heat output (*3)</i>		Prated	kW	10	9
Puissance calorifique déclarée à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes. <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		Pdh	kW	10,7	11,5
Tj = +2°C		Pdh	kW	8,0	7,9
Tj = +7°C		Pdh	kW	7,3	7,1
Tj = +12°C		Pdh	kW	8,3	8,4
Tj = température bivalente / <i>Tj = Bivalence temperature</i>		Pdh	kW	10,9	12,3
Tj = température limite fonctionnement / <i>Tj = Operating limit temperature</i>		Pdh	kW	11,0	10,6
Tj = -15°C		Pdh	kW	9,5	8,8
Température bivalente / <i>Bivalence temperature</i>		Tbiv	°C	-5	
Puissance calorifique sur intervalle cyclique / <i>Output for cyclical interval heating mode</i>		Pcych	kW	-	
Coefficient de dégradation / <i>Degradation coefficient</i>		Cdh	-	0,9	
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*1)</i>		ηs	%	150	125
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*2)</i>		ηs	%	133	99
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*3)</i>		ηs	%	217	176
Coefficient de performance déclaré à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		COPd	-	2,84	2,28
Tj = +2°C		COPd	-	3,77	3,06
Tj = +7°C		COPd	-	5,22	4,35
Tj = +12°C		COPd	-	5,81	5,31
Tj = température bivalente / <i>Tj = Bivalence temperature</i>		COPd	-	3,03	2,55
Tj = température limite fonctionnement / <i>Tj = Operating limit value temperature</i>		COPd	-	2,82	2,15
Tj = -15°C		COPd	-	2,60	1,95
Température limite de fonctionnement / <i>Operating limit temperature</i>		TOL	°C	-10	
Efficacité sur intervalle cyclique / <i>Cycling interval efficiency</i>		COPcyc	-	-	
Température maximale eau de chauffage / <i>Max. temperature for the heating water</i>		WTOL	°C	70	
Puissance électrique consommée dans les autres modes que le mode actif / <i>Power consumption in modes other than active mode</i>					
Mode arrêt / <i>OFF mode</i>		P _{OFF}	kW	0,007	
Mode arrêt thermostat / <i>Thermostat-off mode</i>		P _{TO}	kW	0,009	
Mode veille / <i>Standby mode</i>		P _{SB}	kW	0,007	
Mode résistance de carter / <i>Crankcase heater mode</i>		P _{CK}	kW	0,009	
Dispositif de chauffage d'appoint / <i>Supplementary heater</i>					
Puissance thermique nominale d'appoint / <i>Nominal heat output of supplementary heater</i>		P _{sup}	kW	2,5	4,5
Type d'énergie chauffage d'appoint / <i>Type of energy input of supplementary heater</i>		-	-	électrique / electric	
Autres caractéristiques / <i>Other items</i>					
Régulation de la puissance thermique / <i>Heating capacity control</i>		-	-	variable	
Consommation annuelle d'énergie / <i>Annual energy consumption (*1)</i>		Q _{HE}	kWh	7329	9779
Consommation annuelle d'énergie / <i>Annual energy consumption (*2)</i>		Q _{HE}	kWh	11590	13239
Consommation annuelle d'énergie / <i>Annual energy consumption (*3)</i>		Q _{HE}	kWh	2552	2967
Puissance sonore intérieure - extérieure / <i>Sound power level - indoor - outdoor</i>		L _{WA}	dB	- / 60	- / 66
Débit d'air nominal à l'extérieur / <i>Rated Air flow outdoor</i>		-	m ³ /h	3500	
Coordonnées de contact / <i>Contact details</i>		intuis, rue de la République 80210 Feuquières-en-Vimeu			
Les précautions particulières qui doivent être prises lors du montage, l'installation et l'entretien, sont décrites dans la notice d'installation et d'utilisation. <i>All specific precautions for assembly, installation and maintenance are described in the operating and installation instructions. Read and follow the operating and installation instructions.</i>					

(*1) Conditions climatiques moyennes / Average climatic conditions

(*2) Conditions climatiques plus froides / Colder climatic conditions

(*3) Conditions climatiques plus chaudes / Warmer climatic conditions

A6.3 - Z1 pilot with HRC⁷⁰ 20 kW tri /3 heat pump

Fiche d'information technique produit (conformement au règlement UE n°811/2013, 813/2013)

Product data sheet (in accordance with EU regulation n°. 811/2013, 813/2013)

Marque / Brand name		intuis			
Modèle / Model		HRC ⁷⁰ 20 kW tri /3 Z1			
Pompe à chaleur air-eau <i>Air-to-water heat pump</i>	oui yes	Pompe à chaleur basse température <i>Low-temperature heat pump</i>	non no		
Pompe à chaleur eau-eau <i>Water-to-water heat pump</i>	non no	Equipée d'un dispositif d'appoint <i>Equipped with a supplementary heater</i>	non no		
Pompe à chaleur eau glycolée-eau <i>Brine-to-water heat pump</i>	non no	Dispositif de chauffage mixte par pompe à chaleur <i>Heat pump combination heater</i>	non no		
Caractéristique Item		Symbole Symbol	Unité Unit	35°C	55°C
Classe d'efficacité énergétique chauffage / Heating seasonal energy efficiency class				A++	A++
Puissance de chauffage nominale / Nominal heat output (*1)		Prated	kW	17	17
Puissance de chauffage nominale / Nominal heat output (*2)		Prated	kW	19	19
Puissance de chauffage nominale / Nominal heat output (*3)		Prated	kW	11	11
Puissance calorifique déclarée à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes. <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		Pdh	kW	13,9	13,5
Tj = +2°C		Pdh	kW	8,8	8,5
Tj = +7°C		Pdh	kW	11,1	10,9
Tj = +12°C		Pdh	kW	12,5	12,2
Tj = température bivalente / Tj = Bivalence temperature		Pdh	kW	14,1	13,7
Tj = température limite fonctionnement / Tj = Operating limit temperature		Pdh	kW	13,2	12,8
Tj = -15°C		Pdh	kW	12,6	12,1
Température bivalente / Bivalence temperature		Tbiv	°C	-6	
Puissance calorifique sur intervalle cyclique / Output for cyclical interval heating mode		Pcych	kW	-	
Coefficient de dégradation / Degradation coefficient		Cdh	-	0,9	
Efficacité énergétique saisonnière / Seasonal energy efficiency (*1)		ηs	%	164	129
Efficacité énergétique saisonnière / Seasonal energy efficiency (*2)		ηs	%	133	102
Efficacité énergétique saisonnière / Seasonal energy efficiency (*3)		ηs	%	199	169
Coefficient de performance déclaré à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		COPd	-	2,93	2,09
Tj = +2°C		COPd	-	4,27	3,38
Tj = +7°C		COPd	-	5,88	4,68
Tj = +12°C		COPd	-	6,56	5,91
Tj = température bivalente / Tj = Bivalence temperature		COPd	-	3,00	2,17
Tj = température limite fonctionnement / Tj = Operating limit value temperature		COPd	-	2,72	1,93
Tj = -15°C		COPd	-	2,60	1,90
Température limite de fonctionnement / Operating limit temperature		TOL	°C	-10	
Efficacité sur intervalle cyclique / Cycling interval efficiency		COPcyc	-	-	
Température maximale eau de chauffage / Max. temperature for the heating water		WTOL	°C	70	
Puissance électrique consommée dans les autres modes que le mode actif / Power consumption in modes other than active mode					
Mode arrêt / OFF mode		P _{OFF}	kW	0,007	
Mode arrêt thermostat / Thermostat-off mode		P _{TO}	kW	0,010	
Mode veille / Standby mode		P _{SB}	kW	0,007	
Mode résistance de carter / Crankcase heater mode		P _{CK}	kW	0,010	
Dispositif de chauffage d'appoint / Supplementary heater					
Puissance thermique nominale d'appoint / Nominal heat output of supplementary heater		Psup	kW	3,8	4,2
Type d'énergie chauffage d'appoint / Type of energy input of supplementary heater		-	-	électrique / electric	
Autres caractéristiques / Other items					
Régulation de la puissance thermique / Heating capacity control		-	-	variable	
Consommation annuelle d'énergie / Annual energy consumption (*1)		Q _{HE}	kWh	8409	10652
Consommation annuelle d'énergie / Annual energy consumption (*2)		Q _{HE}	kWh	13999	17617
Consommation annuelle d'énergie / Annual energy consumption (*3)		Q _{HE}	kWh	3003	3421
Puissance sonore intérieure - extérieure / Sound power level - indoor - outdoor		L _{WA}	dB	- / 61	- / 67
Débit d'air nominal à l'extérieur / Rated Air flow outdoor		-	m ³ /h	4500	
Coordonnées de contact / Contact details		intuis, rue de la République 80210 Feuquières-en-Vimeu			
Les précautions particulières qui doivent être prises lors du montage, l'installation et l'entretien, sont décrites dans la notice d'installation et d'utilisation. All specific precautions for assembly, installation and maintenance are described in the operating and installation instructions. Read and follow the operating and installation instructions					

(*1) Conditions climatiques moyennes / Average climatic conditions

(*2) Conditions climatiques plus froides / Colder climatic conditions

(*3) Conditions climatiques plus chaudes / Warmer climatic conditions

A6.4 - Z1 pilot with HRC⁷⁰ 25 kW tri /3 heat pump

Fiche d'information technique produit (conformément au règlement UE n°811/2013, 813/2013)

Product data sheet (in accordance with EU regulation n°. 811/2013, 813/2013)

Marque / Brand name		intuis			
Modèle / Model		HRC ^{7°} 25 kW tri /3 Z1			
Pompe à chaleur air-eau <i>Air-to-water heat pump</i>	oui yes	Pompe à chaleur basse température <i>Low-temperature heat pump</i>	non no		
Pompe à chaleur eau-eau <i>Water-to-water heat pump</i>	non no	Equipée d'un dispositif d'appoint <i>Equipped with a supplementary heater</i>	non no		
Pompe à chaleur eau glycolée-eau <i>Brine-to-water heat pump</i>	non no	Dispositif de chauffage mixte par pompe à chaleur <i>Heat pump combination heater</i>	non no		
Caractéristique <i>Item</i>		Symbole <i>Symbol</i>	Unité <i>Unit</i>	35°C	55°C
Classe d'efficacité énergétique chauffage / <i>Heating seasonnal energy efficiency class</i>				A++	A+
Puissance de chauffage nominale / <i>Nominal heat output (*1)</i>		Prated	kW	21	18
Puissance de chauffage nominale / <i>Nominal heat output (*2)</i>		Prated	kW	24	21
Puissance de chauffage nominale / <i>Nominal heat output (*3)</i>		Prated	kW	13	13
Puissance calorifique déclarée à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes. <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		Pdh	kW	17,1	14,7
Tj = +2°C		Pdh	kW	11,1	11,2
Tj = +7°C		Pdh	kW	11,1	10,9
Tj = +12°C		Pdh	kW	12,5	12,2
Tj = température bivalente / <i>Tj = Bivalence temperature</i>		Pdh	kW	17,4	14,9
Tj = température limite fonctionnement / <i>Tj = Operating limit temperature</i>		Pdh	kW	16,3	14,0
Tj = -15°C		Pdh	kW	15,5	12,7
Température bivalente / <i>Bivalence temperature</i>		Tbiv	°C	-6	
Puissance calorifique sur intervalle cyclique / <i>Output for cyclical interval heating mode</i>		Pcyh	kW	-	
Coefficient de dégradation / <i>Degradation coefficient</i>		Cdh	-	0,9	
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*1)</i>		ηs	%	150	116
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*2)</i>		ηs	%	123	95
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*3)</i>		ηs	%	206	154
Coefficient de performance déclaré à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		COPd	-	2,58	1,97
Tj = +2°C		COPd	-	3,79	2,99
Tj = +7°C		COPd	-	5,61	4,51
Tj = +12°C		COPd	-	5,84	4,81
Tj = température bivalente / <i>Tj = Bivalence temperature</i>		COPd	-	2,66	1,95
Tj = température limite fonctionnement / <i>Tj = Operating limit value temperature</i>		COPd	-	2,40	1,92
Tj = -15°C		COPd	-	2,29	1,90
Température limite de fonctionnement / <i>Operating limit temperature</i>		TOL	°C	-10	
Efficacité sur intervalle cyclique / <i>Cycling interval efficiency</i>		COPcyc	-	-	
Température maximale eau de chauffage / <i>Max. temperature for the heating water</i>		WTOL	°C	70	
Puissance électrique consommée dans les autres modes que le mode actif / <i>Power consumption in modes other than active mode</i>					
Mode arrêt / <i>OFF mode</i>		P _{OFF}	kW	0,007	
Mode arrêt thermostat / <i>Thermostat-off mode</i>		P _{TO}	kW	0,010	
Mode veille / <i>Standby mode</i>		P _{SB}	kW	0,007	
Mode résistance de carter / <i>Crankcase heater mode</i>		P _{CK}	kW	0,010	
Dispositif de chauffage d'appoint / <i>Supplementary heater</i>					
Puissance thermique nominale d'appoint / <i>Nominal heat output of supplementary heater</i>		Psup	kW	4,8	4,0
Type d'énergie chauffage d'appoint / <i>Type of energy input of supplementary heater</i>		-	-	électrique / electric	
Autres caractéristiques / <i>Other items</i>					
Régulation de la puissance thermique / <i>Heating capacity control</i>		-	-	variable	
Consommation annuelle d'énergie / <i>Annual energy consumption (*1)</i>		Q _{HE}	kWh	11314	12525
Consommation annuelle d'énergie / <i>Annual energy consumption (*2)</i>		Q _{HE}	kWh	18551	20431
Consommation annuelle d'énergie / <i>Annual energy consumption (*3)</i>		Q _{HE}	kWh	3311	4401
Puissance sonore intérieure - extérieure / <i>Sound power level - indoor - outdoor</i>		L _{WA}	dB	- / 61	- / 72
Débit d'air nominal à l'extérieur / <i>Rated Air flow outdoor</i>		-	m ³ /h	4500	
Coordonnées de contact / <i>Contact details</i>		intuis, rue de la République 80210 Feuquières-en-Vimeu			
Les précautions particulières qui doivent être prises lors du montage, l'installation et l'entretien, sont décrites dans la notice d'installation et d'utilisation. <i>All specific precautions for assembly, installation and maintenance are described in the operating and installation instructions. Read and follow the operating and installation instructions</i>					

(*1) Conditions climatiques moyennes / Average climatic conditions

(*2) Conditions climatiques plus froides / Colder climatic conditions

(*3) Conditions climatiques plus chaudes / Warmer climatic conditions

A6.5 - Z1 pilot with HRC⁷⁰ 32 kW /3 tri heat pump

Fiche d'information technique produit (conformément au règlement UE n°811/2013, 813/2013)

Product data sheet (in accordance with EU regulation n°. 811/2013, 813/2013)

Marque / Brand name		intuis			
Modèle / Model		HRC ⁷⁰ 32 kW tri /3 Z1			
Pompe à chaleur air-eau <i>Air-to-water heat pump</i>	oui yes	Pompe à chaleur basse température <i>Low-temperature heat pump</i>	non no		
Pompe à chaleur eau-eau <i>Water-to-water heat pump</i>	non no	Equipée d'un dispositif d'appoint <i>Equipped with a supplementary heater</i>	oui yes		
Pompe à chaleur eau glycolée-eau <i>Brine-to-water heat pump</i>	non no	Dispositif de chauffage mixte par pompe à chaleur <i>Heat pump combination heater</i>	non no		
Caractéristique Item		Symbole Symbol	Unité Unit	35°C	55°C
Classe d'efficacité énergétique chauffage / <i>Heating seasonal energy efficiency class</i>				A++	A+
Puissance de chauffage nominale / <i>Nominal heat output (*1)</i>		Prated	kW	23	22
Puissance de chauffage nominale / <i>Nominal heat output (*2)</i>		Prated	kW	27	25
Puissance de chauffage nominale / <i>Nominal heat output (*3)</i>		Prated	kW	16	16
Puissance calorifique déclarée à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes. <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		Pdh	kW	18,8	17,8
Tj = +2°C		Pdh	kW	13,9	13,7
Tj = +7°C		Pdh	kW	13,5	13,5
Tj = +12°C		Pdh	kW	15,9	15,9
Tj = température bivalente / <i>Tj = Bivalence temperature</i>		Pdh	kW	18,8	17,8
Tj = température limite fonctionnement / <i>Tj = Operating limit temperature</i>		Pdh	kW	18,6	17,4
Tj = -15°C		Pdh	kW	16,3	15,6
Température bivalente / <i>Bivalence temperature</i>		Tbiv	°C	-7	
Puissance calorifique sur intervalle cyclique / <i>Output for cyclical interval heating mode</i>		Pcyc	kW	-	
Coefficient de dégradation / <i>Degradation coefficient</i>		Cdh	-	0,9	
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*1)</i>		ηs	%	152	121
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*2)</i>		ηs	%	121	94
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*3)</i>		ηs	%	187	168
Coefficient de performance déclaré à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		COPd	-	2,92	2,13
Tj = +2°C		COPd	-	3,79	2,97
Tj = +7°C		COPd	-	5,34	4,54
Tj = +12°C		COPd	-	6,31	5,78
Tj = température bivalente / <i>Tj = Bivalence temperature</i>		COPd	-	2,92	2,13
Tj = température limite fonctionnement / <i>Tj = Operating limit value temperature</i>		COPd	-	2,67	1,86
Tj = -15°C		COPd	-	2,22	1,75
Température limite de fonctionnement / <i>Operating limit temperature</i>		TOL	°C	-10	
Efficacité sur intervalle cyclique / <i>Cycling interval efficiency</i>		COPcyc	-	-	
Température maximale eau de chauffage / <i>Max. temperature for the heating water</i>		WTOL	°C	70	
Puissance électrique consommée dans les autres modes que le mode actif / <i>Power consumption in modes other than active mode</i>					
Mode arrêt / <i>OFF mode</i>		P _{OFF}	kW	0,007	
Mode arrêt thermostat / <i>Thermostat-off mode</i>		P _{TO}	kW	0,010	
Mode veille / <i>Standby mode</i>		P _{SB}	kW	0,007	
Mode résistance de carter / <i>Crankcase heater mode</i>		P _{CK}	kW	0,010	
Dispositif de chauffage d'appoint / <i>Supplementary heater</i>					
Puissance thermique nominale d'appoint / <i>Nominal heat output of supplementary heater</i>		Psup	kW	4,4	4,6
Type d'énergie chauffage d'appoint / <i>Type of energy input of supplementary heater</i>		-	-	électrique / electric	
Autres caractéristiques / <i>Other items</i>					
Régulation de la puissance thermique / <i>Heating capacity control</i>		-	-	variable	
Consommation annuelle d'énergie / <i>Annual energy consumption (*1)</i>		Q _{HE}	kWh	12194	14720
Consommation annuelle d'énergie / <i>Annual energy consumption (*2)</i>		Q _{HE}	kWh	20679	25796
Consommation annuelle d'énergie / <i>Annual energy consumption (*3)</i>		Q _{HE}	kWh	4429	4974
Puissance sonore intérieure - extérieure / <i>Sound power level - indoor - outdoor</i>		L _{WA}	dB	- / 63	- / 70
Débit d'air nominal à l'extérieur / <i>Rated Air flow outdoor</i>		-	m ³ /h	5000	
Coordonnées de contact / <i>Contact details</i>		intuis, rue de la République 80210 Feuquières-en-Vimeu			
Les précautions particulières qui doivent être prises lors du montage, l'installation et l'entretien, sont décrites dans la notice d'installation et d'utilisation. <i>All specific precautions for assembly, installation and maintenance are described in the operating and installation instructions. Read and follow the operating and installation instructions.</i>					

(*1) Conditions climatiques moyennes / Average climatic conditions

(*2) Conditions climatiques plus froides / Colder climatic conditions

(*3) Conditions climatiques plus chaudes / Warmer climatic conditions

A6.6 - Z1 pilot with HRC⁷⁰ 40 kW /3 tri heat pump

Fiche d'information technique produit (conformément au règlement UE n°811/2013, 813/2013)

Product data sheet (in accordance with EU regulation n°. 811/2013, 813/2013)

Marque / Brand name		intuis			
Modèle / Model		HRC ⁷⁰ 40 kW /3 tri Z1			
Pompe à chaleur air-eau <i>Air-to-water heat pump</i>	oui yes	Pompe à chaleur basse température <i>Low-temperature heat pump</i>	non no		
Pompe à chaleur eau-eau <i>Water-to-water heat pump</i>	non no	Equipée d'un dispositif d'appoint <i>Equipped with a supplementary heater</i>	oui yes		
Pompe à chaleur eau glycolée-eau <i>Brine-to-water heat pump</i>	non no	Dispositif de chauffage mixte par pompe à chaleur <i>Heat pump combination heater</i>	non no		
Caractéristique <i>Item</i>		Symbole <i>Symbol</i>	Unité <i>Unit</i>	35°C	55°C
Classe d'efficacité énergétique chauffage / <i>Heating seasonal energy efficiency class</i>			A++	A++	
Puissance de chauffage nominale / <i>Nominal heat output (*1)</i>		Prated	kW	27	27
Puissance de chauffage nominale / <i>Nominal heat output (*2)</i>		Prated	kW	31	30
Puissance de chauffage nominale / <i>Nominal heat output (*3)</i>		Prated	kW	19	19
Puissance calorifique déclarée à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes. <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		Pdh	kW	21,9	21,6
Tj = +2°C		Pdh	kW	15,0	14,7
Tj = +7°C		Pdh	kW	19,1	18,8
Tj = +12°C		Pdh	kW	21,8	21,4
Tj = température bivalente / <i>Tj = Bivalence temperature</i>		Pdh	kW	22,0	21,8
Tj = température limite fonctionnement / <i>Tj = Operating limit temperature</i>		Pdh	kW	18,6	17,2
Tj = -15°C		Pdh	kW	19,9	18,5
Température bivalente / <i>Bivalence temperature</i>		Tbiv	°C	-5	
Puissance calorifique sur intervalle cyclique / <i>Output for cyclical interval heating mode</i>		Pcych	kW	-	
Coefficient de dégradation / <i>Degradation coefficient</i>		Cdh	-	0,9	
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*1)</i>		ηs	%	153	127
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*2)</i>		ηs	%	125	101
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*3)</i>		ηs	%	197	169
Coefficient de performance déclaré à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		COPd	-	2,76	2,17
Tj = +2°C		COPd	-	4,03	3,17
Tj = +7°C		COPd	-	5,83	4,83
Tj = +12°C		COPd	-	6,59	5,83
Tj = température bivalente / <i>Tj = Bivalence temperature</i>		COPd	-	2,90	2,33
Tj = température limite fonctionnement / <i>Tj = Operating limit value temperature</i>		COPd	-	2,32	1,90
Tj = -15°C		COPd	-	2,52	2,04
Température limite de fonctionnement / <i>Operating limit temperature</i>		TOL	°C	-20	
Efficacité sur intervalle cyclique / <i>Cycling interval efficiency</i>		COPcyc	-	-	
Température maximale eau de chauffage / <i>Max. temperature for the heating water</i>		WTOL	°C	70	
Puissance électrique consommée dans les autres modes que le mode actif / <i>Power consumption in modes other than active mode</i>					
Mode arrêt / <i>OFF mode</i>		P _{OFF}	kW	0,008	
Mode arrêt thermostat / <i>Thermostat-off mode</i>		P _{TO}	kW	0,008	
Mode veille / <i>Standby mode</i>		P _{SB}	kW	0,008	
Mode résistance de carter / <i>Crankcase heater mode</i>		P _{CK}	kW	0,013	
Dispositif de chauffage d'appoint / <i>Supplementary heater</i>					
Puissance thermique nominale d'appoint / <i>Nominal heat output of supplementary heater</i>		Psup	kW	5,9	6,7
Type d'énergie chauffage d'appoint / <i>Type of energy input of supplementary heater</i>		-	-	électrique / electric	
Autres caractéristiques / <i>Other items</i>					
Régulation de la puissance thermique / <i>Heating capacity control</i>		-	-	variable	
Consommation annuelle d'énergie / <i>Annual energy consumption (*1)</i>		Q _{HE}	kWh	15908	19088
Consommation annuelle d'énergie / <i>Annual energy consumption (*2)</i>		Q _{HE}	kWh	24073	28335
Consommation annuelle d'énergie / <i>Annual energy consumption (*3)</i>		Q _{HE}	kWh	5174	5914
Puissance sonore intérieure - extérieure / <i>Sound power level - indoor - outdoor</i>		L _{WA}	dB	- /	- / 71
Débit d'air nominal à l'extérieur / <i>Rated Air flow outdoor</i>		-	m ³ /h	6000	
Coordonnées de contact / <i>Contact details</i>		intuis, rue de la République 80210 Feuquières-en-Vimeu			
Les précautions particulières qui doivent être prises lors du montage, l'installation et l'entretien, sont décrites dans la notice d'installation et d'utilisation. <i>All specific precautions for assembly, installation and maintenance are described in the operating and installation instructions. Read and follow the operating and installation instructions.</i>					

(*1) Conditions climatiques moyennes / Average climatic conditions

(*2) Conditions climatiques plus froides / Colder climatic conditions

(*3) Conditions climatiques plus chaudes / Warmer climatic conditions

A6.7 - Z1 pilot with HRC⁷⁰ 40 kW tri V heat pump

Fiche d'information technique produit (conformément au règlement UE n°811/2013, 813/2013)

Product data sheet (in accordance with EU regulation n°. 811/2013, 813/2013)

Marque / Brand name		intuis			
Modèle / Model		HRC ⁷⁰ 40 kW tri V Z1			
Pompe à chaleur air-eau <i>Air-to-water heat pump</i>	oui yes	Pompe à chaleur basse température <i>Low-temperature heat pump</i>	non no		
Pompe à chaleur eau-eau <i>Water-to-water heat pump</i>	non no	Equipée d'un dispositif d'appoint <i>Equipped with a supplementary heater</i>	oui yes		
Pompe à chaleur eau glycolée-eau <i>Brine-to-water heat pump</i>	non no	Dispositif de chauffage mixte par pompe à chaleur <i>Heat pump combination heater</i>	non no		
Caractéristique Item		Symbole Symbol	Unité Unit	35°C	55°C
Classe d'efficacité énergétique chauffage / <i>Heating seasonal energy efficiency class</i>				A++	A++
Puissance de chauffage nominale / <i>Nominal heat output (*1)</i>		Prated	kW	30	30
Puissance de chauffage nominale / <i>Nominal heat output (*2)</i>		Prated	kW	30	26
Puissance de chauffage nominale / <i>Nominal heat output (*3)</i>		Prated	kW	30	28
Puissance calorifique déclarée à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes. <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		Pdh	kW	24,1	25,9
Tj = +2°C		Pdh	kW	16,5	16,0
Tj = +7°C		Pdh	kW	21,3	20,4
Tj = +12°C		Pdh	kW	24,8	23,9
Tj = température bivalente / <i>Tj = Bivalence temperature</i>		Pdh	kW	24,5	24,0
Tj = température limite fonctionnement / <i>Tj = Operating limit temperature</i>		Pdh	kW	24,6	24,4
Tj = -15°C		Pdh	kW	19,9	18,5
Température bivalente / <i>Bivalence temperature</i>		Tbiv	°C	-5	
Puissance calorifique sur intervalle cyclique / <i>Output for cyclical interval heating mode</i>		Pcych	kW	-	
Coefficient de dégradation / <i>Degradation coefficient</i>		Cdh	-	0,9	
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*1)</i>		ηs	%	153	127
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*2)</i>		ηs	%	126	102
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*3)</i>		ηs	%	208	177
Coefficient de performance déclaré à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		COPd	-	2,86	2,29
Tj = +2°C		COPd	-	3,89	3,23
Tj = +7°C		COPd	-	5,61	4,68
Tj = +12°C		COPd	-	6,42	5,76
Tj = température bivalente / <i>Tj = Bivalence temperature</i>		COPd	-	2,99	2,33
Tj = température limite fonctionnement / <i>Tj = Operating limit value temperature</i>		COPd	-	2,57	2,13
Tj = -15°C		COPd	-	2,52	2,04
Température limite de fonctionnement / <i>Operating limit temperature</i>		TOL	°C	-10	
Efficacité sur intervalle cyclique / <i>Cycling interval efficiency</i>		COPcyc	-	-	
Température maximale eau de chauffage / <i>Max. temperature for the heating water</i>		WTOL	°C	70	
Puissance électrique consommée dans les autres modes que le mode actif / <i>Power consumption in modes other than active mode</i>					
Mode arrêt / <i>OFF mode</i>		P _{OFF}	kW	0,008	
Mode arrêt thermostat / <i>Thermostat-off mode</i>		P _{TO}	kW	0,012	
Mode veille / <i>Standby mode</i>		P _{SB}	kW	0,008	
Mode résistance de carter / <i>Crankcase heater mode</i>		P _{CK}	kW	0,012	
Dispositif de chauffage d'appoint / <i>Supplementary heater</i>					
Puissance thermique nominale d'appoint / <i>Nominal heat output of supplementary heater</i>		Psup	kW	5,4	5,6
Type d'énergie chauffage d'appoint / <i>Type of energy input of supplementary heater</i>		-	-	électrique / electric	
Autres caractéristiques / <i>Other items</i>					
Régulation de la puissance thermique / <i>Heating capacity control</i>		-	-	variable	
Consommation annuelle d'énergie / <i>Annual energy consumption (*1)</i>		Q _{HE}	kWh	15908	19088
Consommation annuelle d'énergie / <i>Annual energy consumption (*2)</i>		Q _{HE}	kWh	23018	24398
Consommation annuelle d'énergie / <i>Annual energy consumption (*3)</i>		Q _{HE}	kWh	7584	8310
Puissance sonore intérieure - extérieure / <i>Sound power level - indoor - outdoor</i>		L _{WA}	dB	- / 62	- / 60
Débit d'air nominal à l'extérieur / <i>Rated Air flow outdoor</i>		-	m ³ /h	6000	
Coordonnées de contact / <i>Contact details</i>		intuis, rue de la République 80210 Feuquières-en-Vimeu			
Les précautions particulières qui doivent être prises lors du montage, l'installation et l'entretien, sont décrites dans la notice d'installation et d'utilisation. <i>All specific precautions for assembly, installation and maintenance are described in the operating and installation instructions. Read and follow the operating and installation instructions.</i>					

(*1) Conditions climatiques moyennes / Average climatic conditions

(*2) Conditions climatiques plus froides / Colder climatic conditions

(*3) Conditions climatiques plus chaudes / Warmer climatic conditions

A6.8 - Z1 pilot with HRC⁷⁰ 40 kW tri Cascade heat pump

Fiche d'information technique produit (conformement au règlement UE n°811/2013, 813/2013)

Product data sheet (in accordance with EU regulation n°. 811/2013, 813/2013)

Marque / Brand name		intuis			
Modèle / Model		HRC ⁷⁰ 40 kW tri Z1 Cascade			
Pompe à chaleur air-eau <i>Air-to-water heat pump</i>	oui yes	Pompe à chaleur basse température <i>Low-temperature heat pump</i>		non no	
Pompe à chaleur eau-eau <i>Water-to-water heat pump</i>	non no	Equipée d'un dispositif d'appoint <i>Equipped with a supplementary heater</i>		oui yes	
Pompe à chaleur eau glycolée-eau <i>Brine-to-water heat pump</i>	non no	Dispositif de chauffage mixte par pompe à chaleur <i>Heat pump combination heater</i>		non no	
Caractéristique Item		Symbole Symbol	Unité Unit	35°C	55°C
Classe d'efficacité énergétique chauffage / <i>Heating seasonal energy efficiency class</i>				A++	A++
Puissance de chauffage nominale / <i>Nominal heat output (*1)</i>		Prated	kW	17	17
Puissance de chauffage nominale / <i>Nominal heat output (*2)</i>		Prated	kW	19	19
Puissance de chauffage nominale / <i>Nominal heat output (*3)</i>		Prated	kW	11	11
Puissance calorifique déclarée à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes. <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		Pdh	kW	13,9	13,5
Tj = +2°C		Pdh	kW	8,8	8,5
Tj = +7°C		Pdh	kW	11,1	10,9
Tj = +12°C		Pdh	kW	12,5	12,2
Tj = température bivalente / <i>Tj = Bivalence temperature</i>		Pdh	kW	14,1	13,7
Tj = température limite fonctionnement / <i>Tj = Operating limit temperature</i>		Pdh	kW	13,2	12,8
Tj = -15°C		Pdh	kW	12,6	12,1
Température bivalente / <i>Bivalence temperature</i>		Tbiv	°C	-6	
Puissance calorifique sur intervalle cyclique / <i>Output for cyclical interval heating mode</i>		Pcych	kW	-	
Coefficient de dégradation / <i>Degradation coefficient</i>		Cdh	-	0,9	
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*1)</i>		ηs	%	164	129
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*2)</i>		ηs	%	133	102
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*3)</i>		ηs	%	199	169
Coefficient de performance déclaré à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		COPd	-	2,93	2,09
Tj = +2°C		COPd	-	4,27	3,38
Tj = +7°C		COPd	-	5,88	4,68
Tj = +12°C		COPd	-	6,56	5,91
Tj = température bivalente / <i>Tj = Bivalence temperature</i>		COPd	-	3,00	2,17
Tj = température limite fonctionnement / <i>Tj = Operating limit value temperature</i>		COPd	-	2,72	1,93
Tj = -15°C		COPd	-	2,60	1,90
Température limite de fonctionnement / <i>Operating limit temperature</i>		TOL	°C	-10	
Efficacité sur intervalle cyclique / <i>Cycling interval efficiency</i>		COPcyc	-	-	
Température maximale eau de chauffage / <i>Max. temperature for the heating water</i>		WTOL	°C	70	
Puissance électrique consommée dans les autres modes que le mode actif / <i>Power consumption in modes other than active mode</i>					
Mode arrêt / <i>OFF mode</i>		P _{OFF}	kW	0,007	
Mode arrêt thermostat / <i>Thermostat-off mode</i>		P _{TO}	kW	0,010	
Mode veille / <i>Standby mode</i>		P _{SB}	kW	0,007	
Mode résistance de carter / <i>Crankcase heater mode</i>		P _{CK}	kW	0,010	
Dispositif de chauffage d'appoint / <i>Supplementary heater</i>					
Puissance thermique nominale d'appoint / <i>Nominal heat output of supplementary heater</i>		Psup	kW	3,8	4,2
Type d'énergie chauffage d'appoint / <i>Type of energy input of supplementary heater</i>		-	-	électrique / electric	
Autres caractéristiques / <i>Other items</i>					
Régulation de la puissance thermique / <i>Heating capacity control</i>		-	-	variable	
Consommation annuelle d'énergie / <i>Annual energy consumption (*1)</i>		Q _{HE}	kWh	8409	10652
Consommation annuelle d'énergie / <i>Annual energy consumption (*2)</i>		Q _{HE}	kWh	13999	17617
Consommation annuelle d'énergie / <i>Annual energy consumption (*3)</i>		Q _{HE}	kWh	3003	3421
Puissance sonore intérieure - extérieure / <i>Sound power level - indoor - outdoor</i>		L _{WA}	dB	- / 61	- / 67
Débit d'air nominal à l'extérieur / <i>Rated Air flow outdoor</i>		-	m ³ /h	4500	
Coordonnées de contact / <i>Contact details</i>		intuis, rue de la République 80210 Feuquières-en-Vimeu			
Les précautions particulières qui doivent être prises lors du montage, l'installation et l'entretien, sont décrites dans la notice d'installation et d'utilisation. <i>All specific precautions for assembly, installation and maintenance are described in the operating and installation instructions. Read and follow the operating and installation instructions.</i>					

(*1) Conditions climatiques moyennes / Average climatic conditions

(*2) Conditions climatiques plus froides / Colder climatic conditions

(*3) Conditions climatiques plus chaudes / Warmer climatic conditions

A6.9 - Z1 pilot with HRC⁷⁰ 50 kW tri Cascade heat pump

Fiche d'information technique produit (conformément au règlement UE n°811/2013, 813/2013)

Product data sheet (in accordance with EU regulation n°. 811/2013, 813/2013)

Marque / Brand name		intuis			
Modèle / Model		HRC ⁷⁰ 50 kW tri Z1 Cascade			
Pompe à chaleur air-eau <i>Air-to-water heat pump</i>	oui yes	Pompe à chaleur basse température <i>Low-temperature heat pump</i>	non no		
Pompe à chaleur eau-eau <i>Water-to-water heat pump</i>	non no	Equippée d'un dispositif d'appoint <i>Equipped with a supplementary heater</i>	oui yes		
Pompe à chaleur eau glycolée-eau <i>Brine-to-water heat pump</i>	non no	Dispositif de chauffage mixte par pompe à chaleur <i>Heat pump combination heater</i>	non no		
Caractéristique Item		Symbole Symbol	Unité Unit	35°C	55°C
Classe d'efficacité énergétique chauffage / Heating seasonal energy efficiency class				A++	A+
Puissance de chauffage nominale / Nominal heat output (*1)		Prated	kW	21	18
Puissance de chauffage nominale / Nominal heat output (*2)		Prated	kW	24	21
Puissance de chauffage nominale / Nominal heat output (*3)		Prated	kW	13	13
Puissance calorifique déclarée à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes. <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		Pdh	kW	17,1	14,7
Tj = +2°C		Pdh	kW	11,1	11,2
Tj = +7°C		Pdh	kW	11,1	10,9
Tj = +12°C		Pdh	kW	12,5	12,2
Tj = température bivalente / Tj = Bivalence temperature		Pdh	kW	17,4	14,9
Tj = température limite fonctionnement / Tj = Operating limit temperature		Pdh	kW	16,3	14,0
Tj = -15°C		Pdh	kW	15,5	12,7
Température bivalente / Bivalence temperature		Tbiv	°C	-6	
Puissance calorifique sur intervalle cyclique / Output for cyclical interval heating mode		Pcych	kW	-	
Coefficient de dégradation / Degradation coefficient		Cdh	-	0,9	
Efficacité énergétique saisonnière / Seasonal energy efficiency (*1)		ηs	%	150	116
Efficacité énergétique saisonnière / Seasonal energy efficiency (*2)		ηs	%	123	95
Efficacité énergétique saisonnière / Seasonal energy efficiency (*3)		ηs	%	206	154
Coefficient de performance déclaré à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		COPd	-	2,58	1,97
Tj = +2°C		COPd	-	3,79	2,99
Tj = +7°C		COPd	-	5,61	4,51
Tj = +12°C		COPd	-	5,84	4,81
Tj = température bivalente / Tj = Bivalence temperature		COPd	-	2,66	1,95
Tj = température limite fonctionnement / Tj = Operating limit value temperature		COPd	-	2,40	1,92
Tj = -15°C		COPd	-	2,29	1,90
Température limite de fonctionnement / Operating limit temperature		TOL	°C	-10	
Efficacité sur intervalle cyclique / Cycling interval efficiency		COPcyc	-	-	
Température maximale eau de chauffage / Max. temperature for the heating water		WTOL	°C	70	
Puissance électrique consommée dans les autres modes que le mode actif / Power consumption in modes other than active mode					
Mode arrêt / OFF mode		P _{OFF}	kW	0,007	
Mode arrêt thermostat / Thermostat-off mode		P _{TO}	kW	0,010	
Mode veille / Standby mode		P _{SB}	kW	0,007	
Mode résistance de carter / Crankcase heater mode		P _{CK}	kW	0,010	
Dispositif de chauffage d'appoint / Supplementary heater					
Puissance thermique nominale d'appoint / Nominal heat output of supplementary heater		Psup	kW	4,8	4,0
Type d'énergie chauffage d'appoint / Type of energy input of supplementary heater		-	-	électrique / electric	
Autres caractéristiques / Other items					
Régulation de la puissance thermique / Heating capacity control		-	-	variable	
Consommation annuelle d'énergie / Annual energy consumption (*1)		Q _{HE}	kWh	11314	12525
Consommation annuelle d'énergie / Annual energy consumption (*2)		Q _{HE}	kWh	18551	20431
Consommation annuelle d'énergie / Annual energy consumption (*3)		Q _{HE}	kWh	3311	4401
Puissance sonore intérieure - extérieure / Sound power level - indoor - outdoor		L _{WA}	dB	- / 61	- / 72
Débit d'air nominal à l'extérieur / Rated Air flow outdoor		-	m ³ /h	4500	
Coordonnées de contact / Contact details		intuis, rue de la République 80210 Feuquières-en-Vimeu			
Les précautions particulières qui doivent être prises lors du montage, l'installation et l'entretien, sont décrites dans la notice d'installation et d'utilisation. All specific precautions for assembly, installation and maintenance are described in the operating and installation instructions. Read and follow the operating and installation instructions.					

(*1) Conditions climatiques moyennes / Average climatic conditions

(*2) Conditions climatiques plus froides / Colder climatic conditions

(*3) Conditions climatiques plus chaudes / Warmer climatic conditions

A6.10 - Z1 pilot with HRC⁷⁰ 64 kW tri Cascade heat pump

Fiche d'information technique produit (conformément au règlement UE n°811/2013, 813/2013)

Product data sheet (in accordance with EU regulation n°. 811/2013, 813/2013)

Marque / Brand name		intuis			
Modèle / Model		HRC ⁷⁰ 64 kW tri Z1 Cascade			
Pompe à chaleur air-eau <i>Air-to-water heat pump</i>	oui yes	Pompe à chaleur basse température <i>Low-temperature heat pump</i>	non no		
Pompe à chaleur eau-eau <i>Water-to-water heat pump</i>	non no	Equipée d'un dispositif d'appoint <i>Equipped with a supplementary heater</i>	oui yes		
Pompe à chaleur eau glycolée-eau <i>Brine-to-water heat pump</i>	non no	Dispositif de chauffage mixte par pompe à chaleur <i>Heat pump combination heater</i>	non no		
Caractéristique Item		Symbole Symbol	Unité Unit	35°C	55°C
Classe d'efficacité énergétique chauffage / <i>Heating seasonal energy efficiency class</i>				A++	A+
Puissance de chauffage nominale / <i>Nominal heat output (*1)</i>		Prated	kW	23	22
Puissance de chauffage nominale / <i>Nominal heat output (*2)</i>		Prated	kW	27	25
Puissance de chauffage nominale / <i>Nominal heat output (*3)</i>		Prated	kW	16	16
Puissance calorifique déclarée à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes. <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		Pdh	kW	18,8	17,8
Tj = +2°C		Pdh	kW	13,9	13,7
Tj = +7°C		Pdh	kW	13,5	13,5
Tj = +12°C		Pdh	kW	15,9	15,9
Tj = température bivalente / <i>Tj = Bivalence temperature</i>		Pdh	kW	18,8	17,8
Tj = température limite fonctionnement / <i>Tj = Operating limit temperature</i>		Pdh	kW	18,6	17,4
Tj = -15°C		Pdh	kW	16,3	15,6
Température bivalente / <i>Bivalence temperature</i>		Tbiv	°C	-7	
Puissance calorifique sur intervalle cyclique / <i>Output for cyclical interval heating mode</i>		Pcyc	kW	-	
Coefficient de dégradation / <i>Degradation coefficient</i>		Cdh	-	0,9	
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*1)</i>		ηs	%	152	121
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*2)</i>		ηs	%	121	94
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*3)</i>		ηs	%	187	168
Coefficient de performance déclaré à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		COPd	-	2,92	2,13
Tj = +2°C		COPd	-	3,79	2,97
Tj = +7°C		COPd	-	5,34	4,54
Tj = +12°C		COPd	-	6,31	5,78
Tj = température bivalente / <i>Tj = Bivalence temperature</i>		COPd	-	2,92	2,13
Tj = température limite fonctionnement / <i>Tj = Operating limit value temperature</i>		COPd	-	2,67	1,86
Tj = -15°C		COPd	-	2,22	1,75
Température limite de fonctionnement / <i>Operating limit temperature</i>		TOL	°C	-10	
Efficacité sur intervalle cyclique / <i>Cycling interval efficiency</i>		COPcyc	-	-	
Température maximale eau de chauffage / <i>Max. temperature for the heating water</i>		WTOL	°C	70	
Puissance électrique consommée dans les autres modes que le mode actif / <i>Power consumption in modes other than active mode</i>					
Mode arrêt / <i>OFF mode</i>		P _{OFF}	kW	0,007	
Mode arrêt thermostat / <i>Thermostat-off mode</i>		P _{TO}	kW	0,010	
Mode veille / <i>Standby mode</i>		P _{SB}	kW	0,007	
Mode résistance de carter / <i>Crankcase heater mode</i>		P _{CK}	kW	0,010	
Dispositif de chauffage d'appoint / <i>Supplementary heater</i>					
Puissance thermique nominale d'appoint / <i>Nominal heat output of supplementary heater</i>		Psup	kW	4,4	4,6
Type d'énergie chauffage d'appoint / <i>Type of energy input of supplementary heater</i>		-	-	électrique / electric	
Autres caractéristiques / <i>Other items</i>					
Régulation de la puissance thermique / <i>Heating capacity control</i>		-	-	variable	
Consommation annuelle d'énergie / <i>Annual energy consumption (*1)</i>		Q _{HE}	kWh	12194	14720
Consommation annuelle d'énergie / <i>Annual energy consumption (*2)</i>		Q _{HE}	kWh	20679	25796
Consommation annuelle d'énergie / <i>Annual energy consumption (*3)</i>		Q _{HE}	kWh	4429	4974
Puissance sonore intérieure - extérieure / <i>Sound power level - indoor - outdoor</i>		L _{WA}	dB	- / 63	- / 70
Débit d'air nominal à l'extérieur / <i>Rated Air flow outdoor</i>		-	m ³ /h	5000	
Coordonnées de contact / <i>Contact details</i>		intuis, rue de la République 80210 Feuquières-en-Vimeu			
Les précautions particulières qui doivent être prises lors du montage, l'installation et l'entretien, sont décrites dans la notice d'installation et d'utilisation. <i>All specific precautions for assembly, installation and maintenance are described in the operating and installation instructions. Read and follow the operating and installation instructions</i>					

(*1) Conditions climatiques moyennes / Average climatic conditions

(*2) Conditions climatiques plus froides / Colder climatic conditions

(*3) Conditions climatiques plus chaudes / Warmer climatic conditions

A6.11 - Z1 pilot with HRC⁷⁰ 75 kW tri Cascade heat pump

Fiche d'information technique produit (conformément au règlement UE n°811/2013, 813/2013)

Product data sheet (in accordance with EU regulation n°. 811/2013, 813/2013)

Marque / Brand name		intuis			
Modèle / Model		HRC ⁷⁰ 75 kW tri Z1 Cascade			
Pompe à chaleur air-eau <i>Air-to-water heat pump</i>	oui yes	Pompe à chaleur basse température <i>Low-temperature heat pump</i>	non no		
Pompe à chaleur eau-eau <i>Water-to-water heat pump</i>	non no	Equippée d'un dispositif d'appoint <i>Equipped with a supplementary heater</i>	oui yes		
Pompe à chaleur eau glycolée-eau <i>Brine-to-water heat pump</i>	non no	Dispositif de chauffage mixte par pompe à chaleur <i>Heat pump combination heater</i>	non no		
Caractéristique Item		Symbole Symbol	Unité Unit	35°C	55°C
Classe d'efficacité énergétique chauffage / Heating seasonal energy efficiency class				A++	A+
Puissance de chauffage nominale / Nominal heat output (*1)		Prated	kW	21	18
Puissance de chauffage nominale / Nominal heat output (*2)		Prated	kW	24	21
Puissance de chauffage nominale / Nominal heat output (*3)		Prated	kW	13	13
Puissance calorifique déclarée à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes. <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		Pdh	kW	17,1	14,7
Tj = +2°C		Pdh	kW	11,1	11,2
Tj = +7°C		Pdh	kW	11,1	10,9
Tj = +12°C		Pdh	kW	12,5	12,2
Tj = température bivalente / Tj = Bivalence temperature		Pdh	kW	17,4	14,9
Tj = température limite fonctionnement / Tj = Operating limit temperature		Pdh	kW	16,3	14,0
Tj = -15°C		Pdh	kW	15,5	12,7
Température bivalente / Bivalence temperature		Tbiv	°C	-6	
Puissance calorifique sur intervalle cyclique / Output for cyclical interval heating mode		Pcych	kW	-	
Coefficient de dégradation / Degradation coefficient		Cdh	-	0,9	
Efficacité énergétique saisonnière / Seasonal energy efficiency (*1)		ηs	%	150	116
Efficacité énergétique saisonnière / Seasonal energy efficiency (*2)		ηs	%	123	95
Efficacité énergétique saisonnière / Seasonal energy efficiency (*3)		ηs	%	206	154
Coefficient de performance déclaré à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		COPd	-	2,58	1,97
Tj = +2°C		COPd	-	3,79	2,99
Tj = +7°C		COPd	-	5,61	4,51
Tj = +12°C		COPd	-	5,84	4,81
Tj = température bivalente / Tj = Bivalence temperature		COPd	-	2,66	1,95
Tj = température limite fonctionnement / Tj = Operating limit value temperature		COPd	-	2,40	1,92
Tj = -15°C		COPd	-	2,29	1,90
Température limite de fonctionnement / Operating limit temperature		TOL	°C	-10	
Efficacité sur intervalle cyclique / Cycling interval efficiency		COPcyc	-	-	
Température maximale eau de chauffage / Max. temperature for the heating water		WTOL	°C	70	
Puissance électrique consommée dans les autres modes que le mode actif / Power consumption in modes other than active mode					
Mode arrêt / OFF mode		P _{OFF}	kW	0,007	
Mode arrêt thermostat / Thermostat-off mode		P _{TO}	kW	0,010	
Mode veille / Standby mode		P _{SB}	kW	0,007	
Mode résistance de carter / Crankcase heater mode		P _{CK}	kW	0,010	
Dispositif de chauffage d'appoint / Supplementary heater					
Puissance thermique nominale d'appoint / Nominal heat output of supplementary heater		Psup	kW	4,8	4,0
Type d'énergie chauffage d'appoint / Type of energy input of supplementary heater		-	-	électrique / electric	
Autres caractéristiques / Other items					
Régulation de la puissance thermique / Heating capacity control		-	-	variable	
Consommation annuelle d'énergie / Annual energy consumption (*1)		Q _{HE}	kWh	11314	12525
Consommation annuelle d'énergie / Annual energy consumption (*2)		Q _{HE}	kWh	18551	20431
Consommation annuelle d'énergie / Annual energy consumption (*3)		Q _{HE}	kWh	3311	4401
Puissance sonore intérieure - extérieure / Sound power level - indoor - outdoor		L _{WA}	dB	- / 61	- / 72
Débit d'air nominal à l'extérieur / Rated Air flow outdoor		-	m ³ /h	4500	
Coordonnées de contact / Contact details		intuis, rue de la République 80210 Feuquières-en-Vimeu			
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(*1) Conditions climatiques moyennes / Average climatic conditions

(*2) Conditions climatiques plus froides / Colder climatic conditions

(*3) Conditions climatiques plus chaudes / Warmer climatic conditions

A6.12 - Z1 pilot with HRC⁷⁰ 96 kW tri Cascade heat pump

Fiche d'information technique produit (conformément au règlement UE n°811/2013, 813/2013)

Product data sheet (in accordance with EU regulation n°. 811/2013, 813/2013)

Marque / Brand name		intuis			
Modèle / Model		HRC ⁷⁰ 96 kW tri Z1 Cascade			
Pompe à chaleur air-eau <i>Air-to-water heat pump</i>	oui yes	Pompe à chaleur basse température <i>Low-temperature heat pump</i>	non no		
Pompe à chaleur eau-eau <i>Water-to-water heat pump</i>	non no	Equipée d'un dispositif d'appoint <i>Equipped with a supplementary heater</i>	oui yes		
Pompe à chaleur eau glycolée-eau <i>Brine-to-water heat pump</i>	non no	Dispositif de chauffage mixte par pompe à chaleur <i>Heat pump combination heater</i>	non no		
Caractéristique Item		Symbole Symbol	Unité Unit	35°C	55°C
Classe d'efficacité énergétique chauffage / <i>Heating seasonal energy efficiency class</i>				A++	A+
Puissance de chauffage nominale / <i>Nominal heat output (*1)</i>		Prated	kW	23	22
Puissance de chauffage nominale / <i>Nominal heat output (*2)</i>		Prated	kW	27	25
Puissance de chauffage nominale / <i>Nominal heat output (*3)</i>		Prated	kW	16	16
Puissance calorifique déclarée à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes. <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		Pdh	kW	18,8	17,8
Tj = +2°C		Pdh	kW	13,9	13,7
Tj = +7°C		Pdh	kW	13,5	13,5
Tj = +12°C		Pdh	kW	15,9	15,9
Tj = température bivalente / <i>Tj = Bivalence temperature</i>		Pdh	kW	18,8	17,8
Tj = température limite fonctionnement / <i>Tj = Operating limit temperature</i>		Pdh	kW	18,6	17,4
Tj = -15°C		Pdh	kW	16,3	15,6
Température bivalente / <i>Bivalence temperature</i>		Tbiv	°C	-7	
Puissance calorifique sur intervalle cyclique / <i>Output for cyclical interval heating mode</i>		Pcych	kW	-	
Coefficient de dégradation / <i>Degradation coefficient</i>		Cdh	-	0,9	
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*1)</i>		ηs	%	152	121
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*2)</i>		ηs	%	121	94
Efficacité énergétique saisonnière / <i>Seasonal energy efficiency (*3)</i>		ηs	%	187	168
Coefficient de performance déclaré à charge partielle pour une température intérieure de 20°C , une température extérieure Tj avec application basse et moyenne température (35°C / 55°C) et les conditions climatiques moyennes <i>Declared capacity for part load at indoor temperature 20°C, outdoor temperature Tj, low and medium temperature application (35°C / 55°C) and average climate condition.</i>					
Tj = -7°C		COPd	-	2,92	2,13
Tj = +2°C		COPd	-	3,79	2,97
Tj = +7°C		COPd	-	5,34	4,54
Tj = +12°C		COPd	-	6,31	5,78
Tj = température bivalente / <i>Tj = Bivalence temperature</i>		COPd	-	2,92	2,13
Tj = température limite fonctionnement / <i>Tj = Operating limit value temperature</i>		COPd	-	2,67	1,86
Tj = -15°C		COPd	-	2,22	1,75
Température limite de fonctionnement / <i>Operating limit temperature</i>		TOL	°C	-10	
Efficacité sur intervalle cyclique / <i>Cycling interval efficiency</i>		COPcyc	-	-	
Température maximale eau de chauffage / <i>Max. temperature for the heating water</i>		WTOL	°C	70	
Puissance électrique consommée dans les autres modes que le mode actif / <i>Power consumption in modes other than active mode</i>					
Mode arrêt / <i>OFF mode</i>		P _{OFF}	kW	0,007	
Mode arrêt thermostat / <i>Thermostat-off mode</i>		P _{TO}	kW	0,010	
Mode veille / <i>Standby mode</i>		P _{SB}	kW	0,007	
Mode résistance de carter / <i>Crankcase heater mode</i>		P _{CK}	kW	0,010	
Dispositif de chauffage d'appoint / <i>Supplementary heater</i>					
Puissance thermique nominale d'appoint / <i>Nominal heat output of supplementary heater</i>		Psup	kW	4,4	4,6
Type d'énergie chauffage d'appoint / <i>Type of energy input of supplementary heater</i>		-	-	électrique / electric	
Autres caractéristiques / <i>Other items</i>					
Régulation de la puissance thermique / <i>Heating capacity control</i>		-	-	variable	
Consommation annuelle d'énergie / <i>Annual energy consumption (*1)</i>		Q _{HE}	kWh	12194	14720
Consommation annuelle d'énergie / <i>Annual energy consumption (*2)</i>		Q _{HE}	kWh	20679	25796
Consommation annuelle d'énergie / <i>Annual energy consumption (*3)</i>		Q _{HE}	kWh	4429	4974
Puissance sonore intérieure - extérieure / <i>Sound power level - indoor - outdoor</i>		L _{WA}	dB	- / 63	- / 70
Débit d'air nominal à l'extérieur / <i>Rated Air flow outdoor</i>		-	m ³ /h	5000	
Coordonnées de contact / <i>Contact details</i>		intuis, rue de la République 80210 Feuquières-en-Vimeu			
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(*1) Conditions climatiques moyennes / Average climatic conditions

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(*3) Conditions climatiques plus chaudes / Warmer climatic conditions



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