monobloc premium heat pumps

Technical Document

OPTIM’ (Heating)
& OPTIM’ DUO
(Heating and DHW production)

Monobloc indoor air source heat pump

OPTIM’ and OPTIM’DUO 4kW mono
OPTIM’ and OPTIM’DUO 6kW mono
OPTIM’ and OPTIM’DUO 9kW mono

06th July 2018 version

Permanently up to date on www.amzair.eu

100% CONÇU ET FABRIQUÉ EN FRANCE À BREST

Réseau PRODUIT EN BRETAGNE

GARANTIE 5 ANS

PAR EUROVENT CERTITA CERTIFICATION NF POMPE À CHALEUR www.marque-nf.com

HEATING, COOLING AND DOMESTIC HOT WATER

Table of Contents

1 CERTIFICATION CONFORMITY

The AMZAIR OPTIM 'DUO air source heat pumps (ASHP) are fully designed and manufactured in France, in our Plabennec factory (located 5 minutes from Brest airport in Brittany region in France).
They are manufactured according to the regulations of the current CE standard.
They are certified NF Heat Pumps by EUROVENT CERTITA CERTIFICATION (certification body mandated by AFNOR Certification), according to the NF 414.

OPTIM' NF 414-1080

CERTIFICAT

Pompe à chaleur
Heat Pumps

Délivré à / *Granted to*

AMZAIR INDUSTRIE

521, rue Gustave EIFFEL
29860 PLABENNEC
FRANCE

Pour les produits suivants / *For the following products*

Marque Commerciale / *Trade Name*

AMZAIR

Nom de Gamme / *Range Name*

OPTIM'DUO

Numéro de Gamme / *Range number*

1560E / 1465E

...nces et caractéristiques données en annexe / *references and caracteristics given in attached appendix)*

...riqués dans la ou les usine(s) suivante(s) / *Manufactured in the production plant(s):*
Liste des unités de fabrication en annexe / *Liste of production sites on appendix*

Ce certificat est délivré par EUROVENT CERTITA CERTIFICATION dans les conditions fixées par le référentiel de certification NF 414 - Pompe à chaleur en vigueur.
...résente décision notifiée par EUROVENT CERTITA CERTIFICATION, AFNOR Certification accorde le droit ...a marque NF à la société qui en est bénéficiaire pour les produits visés ci-dessus, dans les conditions ...ar les règles générales de la marque NF et par le référentiel de certification NF mentionné ci-dessus.

This certificate is issued by EUROVENT CERTITA CERTIFICATION according to the certification rules NF 414 - Heat Pumps in force.
...resent decision notified by EUROVENT CERTITA CERTIFICATION, AFNOR Certification grants the right to use ...e beneficiary for the aforementioned products, within the frame of the general conditions applying to the NF Mark and to the aforementioned NF certification.

...e de début de validité : 28 février 2018 — Etabli à Paris, le 28 février 2018
...ective date : *28 February 2018* — Pour EUROVENT CERTITA CERTIFICATION

...e de fin de validité : 30 juin 2019 — Le Directeur Général
...iry date : *30 June 2019*

Certificat n° 414 - 1560 rkt1 — Sylvain COURTEY

...OVENT CERTITA CERTIFICATION SAS au capital de 100 000 € - 48-50 rue de la Victoire 75009 Paris - France
Tel. : 33 (0)1 75 44 71 71 - 513 133 637 RCS Paris - SIRET 513 133 637 000 35 – TVA FR 59513133637
www.eurovent-certification.com / www.certita.fr

S03 D03 Certificat NF 414 07/06/2017

OPTIM' DUO NF 414-1081

CERTIFICAT

Pompe à chaleur
Heat Pumps

Délivré à / *Granted to*

AMZAIR INDUSTRIE

521, rue Gustave EIFFEL
29860 PLABENNEC
FRANCE

Pour les produits suivants / *For the following products*

Marque Commerciale / *Trade Name*

AMZAIR

Nom de Gamme / *Range Name*

OPTIM'

Numéro de Gamme / *Range number*

1465E / 1080

(Références et caractéristiques données en annexe / *references and caracteristics given in attached appendix)*

Fabriqués dans la ou les usine(s) suivante(s) / *Manufactured in the production plant(s):*
Liste des unités de fabrication en annexe / *Liste of production sites on appendix*

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En vertu de la présente décision notifiée par EUROVENT CERTITA CERTIFICATION, AFNOR Certification accorde le droit d'usage de la marque NF à la société qui en est bénéficiaire pour les produits visés ci-dessus, dans les conditions définies par les règles générales de la marque NF et par le référentiel de certification NF mentionné ci-dessus.

This certificate is issued by EUROVENT CERTITA CERTIFICATION according to the certification rules NF 414 - Heat Pumps in force.
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Date de début de validité : 28 février 2018 — Etabli à Paris, le 28 février 2018
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Expiry date : 30 June 2019

Certificat n° 414 - 1465 rkt1 — Sylvain COURTEY

EUROVENT CERTITA CERTIFICATION SAS au capital de 100 000 € - 48-50 rue de la Victoire 75009 Paris - France
Tel. : 33 (0)1 75 44 71 71 - 513 133 637 RCS Paris - SIRET 513 133 637 000 35 – TVA FR 59513133637
www.eurovent-certification.com / www.certita.fr

S03 D03 Certificat NF 414 07/06/2017

All of our certification documents are available :

- On our web site, professionnal menu « espace pro » www.amzair.eu
- On the web site of Certita www.certita.org/marque-certita/nf-pompe-chaleur

The performances are validated in a certified private laboratory and tests according to standard NF EN 14511 (heating), and standard NF EN 16147 (domestic hot water). AMZAIR Industrie has a private validation climate chamber to optimize and refine the performance of its products.

2 WARRANTY

- The AMZAIR Heat Pumps benefit from control/quality follow-up during all phases of their production process: Tests of circuit tightness under pressure, test of vacuum for dehydratation, dielectric test, and operation test for each unit
- The control/quality commissionning document allow the unit acceptance before unit final packaging.

- The parts benefit from a contractual two (2) years of guarantee out of labour or any man hours, at the on site commissionning date of the unit on its environment. The commissionning procedure must be followed by an approved Amzair Industrie Technical Engineer. In any case the warranty will expire after 26 months of the delivery date. The warranty is extended to five (5) years for all units delivered after September first 2013 to the following components : All components of the refrigerant circuit (including the compressor), the electronic control board, the radio thermostat, the water pump and the fan.

- AMZAIR Industrie offers warranty extension of 3 years or 5 years parts, which the customer can contract as soon as the unit is commisionned on site by an approved Amzair Technican Engineer.

- These warranty is limited to the replacement of parts which that the defective parts would be returned to AMZAIR Industrie for technical analysis during the warranty period. The wear parts are not covered by the warranty, the refrigerant is also excluded from the warranty.

- The customer can benefit of this warranty or extended warranty only if all the following conditions are fullfiled:

- The equipment and all of its ancillary has been paid in full.

- The customer has sent within 8 days after the hardware installation, the commissionning report,

- The equipement has been corretly installed(including connection) by a qualified installer, in accordance with the installation instructions provided by AMZAIR Industrie,

- The equipment is covered by a maintenance contract that is consistent with the AMZAIR Industrie manual and this unit has been properly maintained during its life time operation.

- We remind you that our equipment must be followed by a regular maintenance contract in accordance with the local regulation. This aspect is under the sole responsability of the customer.

- Any sort of equipment modification made by the customer or under its responsability and without the formal written agreement of AMZAIR Industrie, will simply cancel the waranty contract between the parties.

- In any case, the customer is solely responsible for any damage that the equipment may cause or any damage that the equipement may suffer. Amzair Industrie deny any form of waranty for direct or indirect damages caused to the customer or its underwriters acquirers.

- The control board software password communication to a final customer, by the Installer can lead to a warranty cancellation by AMZAIR Industrie. The Amzair Industrie must be coverred by a maintenance contract in accordance with the local regulation, in order to control refrigeration tightness every year.

3 EQUIPMENT RECEPTION

3.1 RECEPTION PROCEDURE

- At the reception, verify all parcels delivered in accordance with the order, and delivery form.
- Verify in front of the freight forwarder, that all goods are not damaged.

3.2 LOGISTIC CLAIM PROCEDURE

- If at the reception process phase, you discover a defective or a damaged good, you must imperativelly:
    - Notify the damage reserves accurately (date and name of the person who find the damage) on the freight forwarder document.
    - Confirm your reserve within the 2 days (48h) by register letter to the freight forwarder.
    - Informe AMZAIR Industrie of the reserve made.
- **Caution: No claim will be accepted if you do not follow these rules and this procedure.**
  The goods are transported on our behalf and under your responsibility.

4 SAFETY CONSIDERATIONS

The users must follow the safety rules below in order to avoid any human risk or materiel damage.

Safety Rules

- To allow the equipement to operate in a good condition, and to facilitate a rapid access to them, it is highly recommended to let ASHP free for a quick access.
- Do not put or let any external object inside the ASHP grid.
- Do not use or let any hydrocarbure (paint, solvant,…) close to the ASHP.
- Try to avoid heavy dirty work and dust close to the ASHP.
- The children, or inexperiented person must not have access to the inside of the ASHP operating or not.
- Avoid to be in contact with equipment metal body with wet feet, wet body.
- To open the ASHP body to access to system, is only allowed to Professionnal.
- It is forbidden to modify, or to connect on the ASHP electric terminal block, or to connect to the hydraulic circuit of the installation without a Professionnal advice.
- Do not pull the electric cables.
- The equipments contain R410A refrigerant gaz. In case of gaz leakage, call the Installer or Technical Engineer. The gaz leakage repair must be made by a certified Technical Engineer.
- All of the maintenance or repair acivities requiring modification of the default set-up program, or default security values must made under the manufacturer management and approvement.

5 PRODUCT PRESENTATION

5.1 GENERALITIES

The **OPTIM'DUO** product range belong to the air/water **heat pumps** family (the Air Source Heat Pump (ASHP) use the external renewable ambient air calories to heat the water), with a **monobloc design** (no refrigerant piping to install between the outside and inside of the building).
The OPTIM'DUO are design and build to provide:

- Houses or buildings **heating,**
- **Domestic hot water production**,
- And eventually houses or buildings **cooling** (under some conditions).

The OPTIM'DUO is design to be installed **inside the house**, (no external equipment, just a simple and discreet ventilation grid to collect the outside ambient air, and to reject it after being processed by the Air Source Heat Pump (ASHP)).

5.2 PRODUCT TECHNICAL DESCRIPTION (CAN BE USE FOR SCOPE OF WORK WITHIN A Request For Proposal)

INDOOR MONOBLOC ASHP (AIR SOURCE HEAT PUMP) FOR HEATING AND DHW DOMESTIC HOT WATER PRODUCTION WITH AN INTEGRATED OR A SEPARATED HOT WATER TANK, 100% DESIGNED AND MANUFACTURED IN FRANCE.

- DC Inverter Twin rotary compressor.
- Centrifugal fan Low noise.
- R410A refrigerant.
- Body :
    - External body AG3 aluminium.
    - Internal Chassis in galvanized steel.
- Evaporator: Standard fins coated with hydrophilic in option full cooper evaporator including fins.
- Acoustic insulation reinforced, and muffler: synthetic agglomerated and alveola foam.
- Exterior grid, burglar-proof, with a rain protection, birds protection, and painted, made in galvanized steel
    - integrated water drop deflector to prevent any dripping and staining on house wall.
    - Paint: baked polyester powder in white base (RAL 9010) or glossy pearl off white (RAL 1013) color. In Option, color of your choice (please give us your RAL ref. choice).
- Complete hydraulic kit:
    - Water pump: Low power consumption electric engine, « class A ».
    - hot water expansion tank 1,5 bar.
    - 3 Bar pressure relief valve, with manometer.
    - Differential pressure valve.
    - Option: Integrated electrical heating (see. chap. 8.3.3).

CONTROL PANEL AND CONTROL BOARD

- The control board manages the main temperature regulation from the basics requirement to the most complex (PID). The water temperature is calculated according to the external temperature (integrated at the ASHP – dynamic set point),
- Operating modes: Domestic Hot Water only, heating and DHW, cooling and DHW, heating only, cooling only.
- Consummation records following the RT 2012 norm: Compatible with the DELTA DORE brand, and other on demand.
- Smartphone remote control via an optional interface.

OPERATION RANGE

- Heating water temperature from ASHP: from 20 to 60°C (see. Chap. 6)
- Domestic Hot Water Temperature: 55°C (above -10°C external T°)
- Lowest external temperature: -21°C (see Chap. 6)

DOMESTIC HOT WATER TANK

- Integrated version: 2 DHW tanks available capacity of 170 L or 200 L (170L and 200L for the 4kW ASHP; 170 or 200L for the 6kW ASHP) with an internal heat exchanger (exchanger surface 2.1m² or 2.5m²) and in option a back-up electric heating resistance (3kW).
- Separated version: 3 DHW tanks with an available capacity of 170 and 200 L or 300 L (170 et 200L for the 4 kW ASHP; 170, 200 and 300L for the 6kW ASHP; 200 and 300L for the 9 kW ASHP Cf. see Chap. 5.4) with an internal heat exchanger (of 2,1m², 2.4m² and 3.1m² depending of the tank capacity) and in option a back-up electric heating resistance (3kW).

Option 2 or 3 HEATING ZONES

- Integrated complementary hydraulic kit of the ASHP (maximum of 2 zones for the OPTIM' 4 and 6 KW), partially integrated of the ASHP hydraulic kit or separated of the ASHP hydraulic kit (maximum of 3 zones for the OPTIM' 4, 6 and 9 kW), including of 1 heated mixing zone possibility (2 managed dynamic set points).

5.3 VARIETY OF SITES DEPLOYMENT

ASHP solutions answer to a large variety of construction or renovation building projects, for the residential (individual or collective) and the small business office or plant.

Individual house

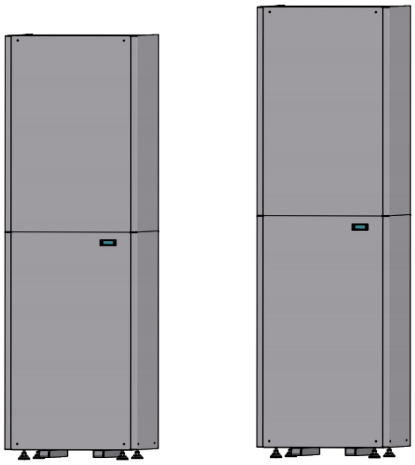
Collective housing building

For specific requirements, The AMZAIR Industrie Design Department has the competencies and capability to help you to initialize your project.

5.4 POSSIBLE CONFIGURATIONS

5.4.1 Basic configurations

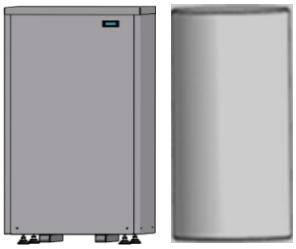
OPTIM' 4 kW with integrated domestic hot water tank (standard) or separated (in option)



170L integrated

200L integrated

170L separated

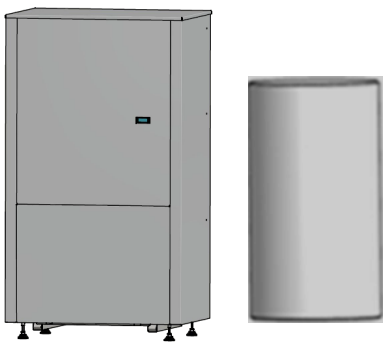


200L separated

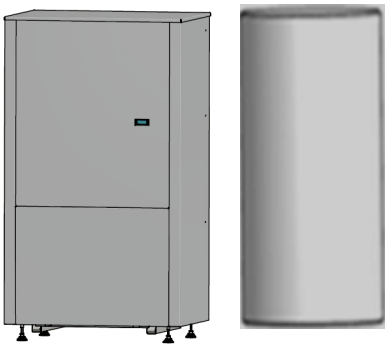
OPTIM' 6 kW with integrated domestic hot water DHW tank (standard) or separated (in option)

170L integrated | **200L integrated** | **170L separated** | **200L separated** | **300L separated**

OPTIM' 9 kW with Domestic hot water DHW separated tank



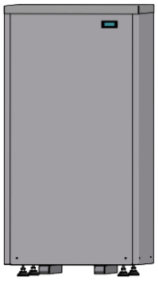
200L separated



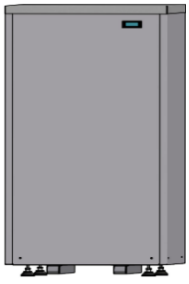
300L separated

5.4.2 Other possible configurations

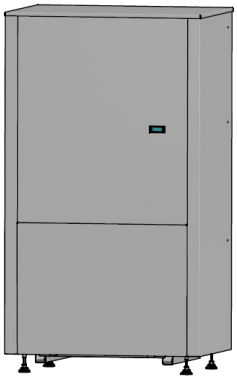
ASHP for heating purpose only – HO configuration



4 kW



6 kW



9 kW

ASHP For DHW only: *please contact us for details*

ASHP combined with solar installation: *please contact us for details*

Other applications /specific requirements: *the AMZAIR Industrie Design Department has the competencies and capability to help you to set-up your project.*

5.4.3 Summary of the water distribution kits solutions

Parts kit symbols:

Motorized 3 ways valve: 

Differential pressure valve: 

Water pump: 

Motorized 2 ways valve: 

Water Distribution for OPTIM' 4 and 6kW

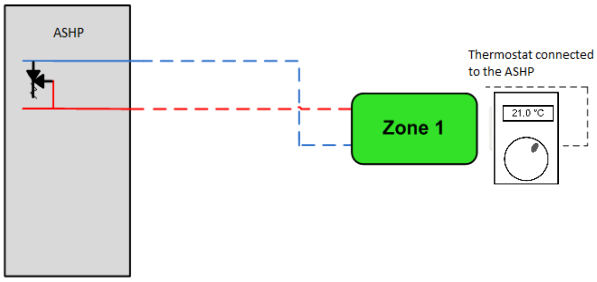
Water distribution solutions 100 % integrated in the ASHP

1 zone

1 zone direct not mixed + differential pressure valve (DSZ1)

Design for:
1 zone / Only 1 T°C out of the ASHP
+ ASHP double service (with DHW)
Or ASHP HO with electric heater and low volume of water for heating [2]

+ to be verified : ASHP water pump specs . [1]



Included hardware

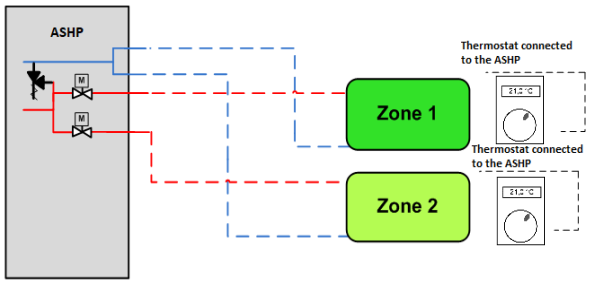
This is the basic version fully pre-mounted and connected inside the ASHP (the water distribution is performed by the main ASHP water pump).

2 zones with same type of heat emitters (same heating T°C for each zone)

2 zones direct not mixed + differential pressure valve (DSZ1Z2) EU.BAC

Design for:
2 zones with the same heating T°C from the ASHP double service (with DHW)
or ASHP HO with electric heater and low volume of water for heating [2

+ to be verified : ASHP water pump specs . [1]



Included hardware
(In addition to the basic version above DSZ1)

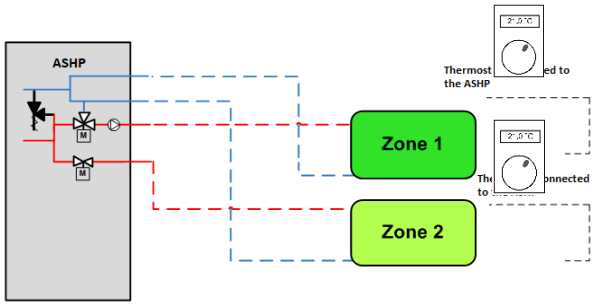
Pre-mounted and connected inside the ASHP
- 2 x 2 ways motorized valves
+ accessories

2 zones with different types of heat emitters (2 different T°C for each zone)

2 zones direct, one of two is mixed + differential pressure valve (DSZ1mZ2) EU.BAC

Design for:
2 zones
+ ASHP double service (with DHW)
Or ASHP HO electric heater and low volume of water for heating [2]

+ to be verified: ASHP water pump specs . [1] *+ Zone 1 water pump specs* [1]



Included hardware
(In addition to the basic version DSZ1)

Pre-mounted and connected inside the ASHP
- Zone 1 mixed heating water (lowest T°C): 1 mixing 3 ways valve + sensor + 1 water pump class A
- Zone 2 unmixed heating water (highest T°C): 1 motorized 2 ways valve (Out Z2)
+ accessories

Water distribution solutions partially integrated in the ASHP

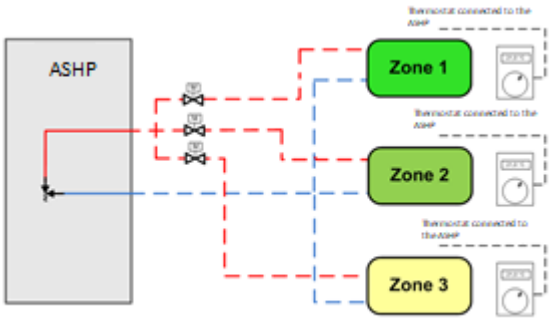
3 zones with the same type of emitters (same heating T°C for each zone)

Config. DSZ1 + 2 or 3 kits for each extra zone

Sample with 3 zones

Design for:

1 zone / Only 1 T°C out of the ASHP
+ PAC double service (with DHW)
or ASHP HO with electric heater and low volume of water for heating (2)
+ to be verified: ASHP water pump specs. (1)



Included hardware
(In addition to the basic version DSZ1)
- 2 or 3 additional kits (not mounted, neither connected)

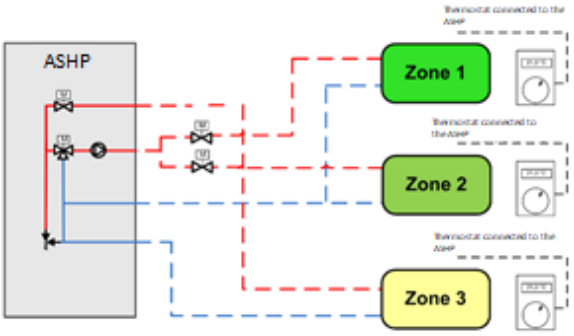
3 zones with different types of emitters (2 different T°C for each zone)

Config. DSZ1mZ2
+ 2 kits additional zones

Example with 2 mixed zones and 1 zone not mixed

Design for :

3 zones
+ PAC double service (with DHW)
or ASHP HO with electric heater and low volume of water for heating (2)
+ to be verified: ASHP water pump specs . (1)



Included hardware
(in addition to the basic version DSZ1MZ2)
- 2 additional zone (not mounted, neither connected)

(1) To be verified the pressure drop of the installation hydraulic network (see water pump specifications page 65), if the specification is not adapted, a stronger water pump can be defined.

(2) Lowest Volume of the hydraulic installation driven by the ASHP is about 25L on OPTIM-04, 40L on OPTIM-06 (=emitters without thermostatic head, motorized valve, actuator, and every other part of water distribution not driven by the ASHP). Otherwise the buffer tank installation is mandatory.

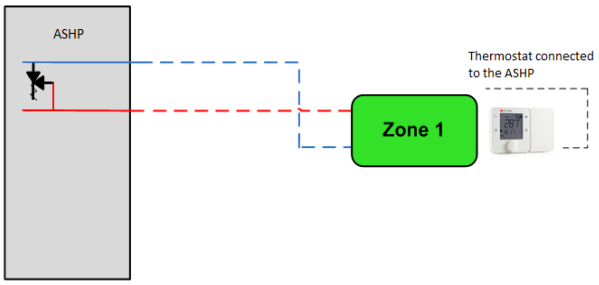
Water distribution for OPTIM' 9kW

Water distribution solutions 100 % integrated in the ASHP

1 zone

1 zone direct not mixed + differential pressure valve (DSZ1)

Design for:
1 zone / Only 1 T°C out of the ASHP
+ ASHP double service (with DHW)
Or ASHP HO with electric heater and low volume of water for heating (2)
+ to be verified: ASHP water pump specs. (1)



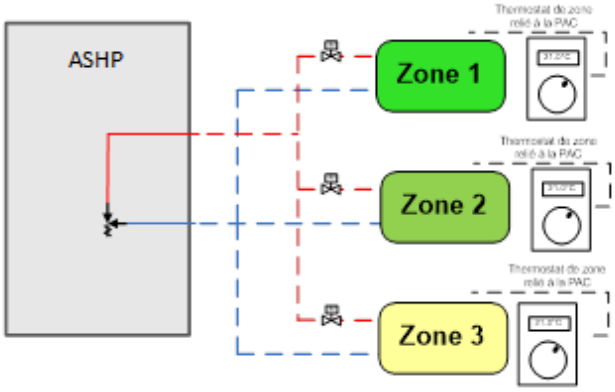
Included hardware

This is the basic version fully pre-assembled and connected inside the ASHP (the water distribution is performed by the main ASHP water pump).

Water distribution solutions partially integrated in the ASHP

3 zones with the same type of emitters (same heating T°C for each zone)

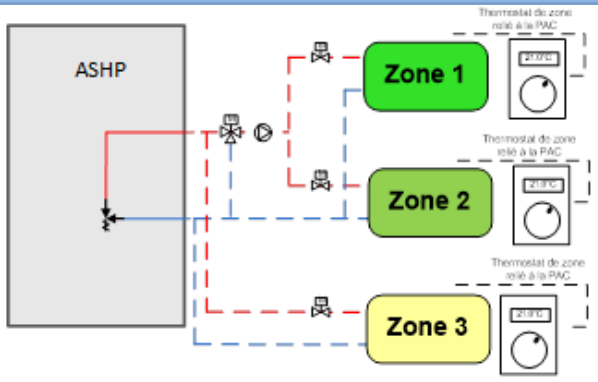
Config. DSZ1 + 2 to 3 kits for the additional zone
Example with 3 zones
Design for:
Compatible 4, 6 et 9kW
1 zone / Only 1 T°C out of the ASHP
+ ASHP double service (DHW)
Or ASHP HO with electric heater and low volume of water for heating (2)
+ to be verified: ASHP water pump specs . (1)



Included hardware
(In addition to the basic version DSZ1)
- 2 or 3 additional kits (not mounted, neither connected)

3 zones with different types of emitters (2 different T°C for each zone)

Config. DSZ1 + 1 kit mixed zone + 1 to 3 kits for the additional zone
Example with 2 mixed zones and 1 zone not mixed / 1 mixed zone and 2 not mixed zones
Design for:
3 zones with 2 different T°C out of the ASHP
+ ASHP double service (with DHW)
Or ASHP HO with electric heater and low volume of water for heating (2)
+ to be verified: ASHP water pump specs +. (1)
mixed zone water pump (1)



Included hardware
((In addition to the basic version DSZ1)
To be installed close to the ASHP and to connect to the control board.
- 1 kit ASHP out mixed zone
- 1 kit zone additional (not mixed zone)
If 3 zones :
- 2 kits additional zone

(1) To be verified the pressure drop of the installation hydraulic network (see water pump specifications page 65), if the specification is not adapted, a stronger water pump can be defined.

(2) Lowest Volume of the hydraulic installation driven by the ASHP is about 60L for an OPTIM-09 (=emitters without thermostatic head, motorized valve, actuator, and every other part of water distribution not driven by the ASHP).

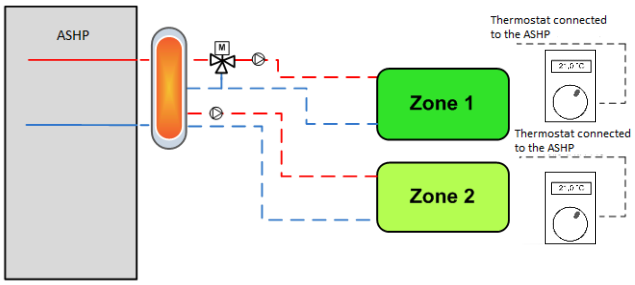
Water distribution for OPTIM' 4, 6 et 9kW

The solutions with mixing bottle

Volume bottle / mixing bottle or mixing tank: 25L mini on 4KW, 40L mini on 6KW, 60L mini on 9kW

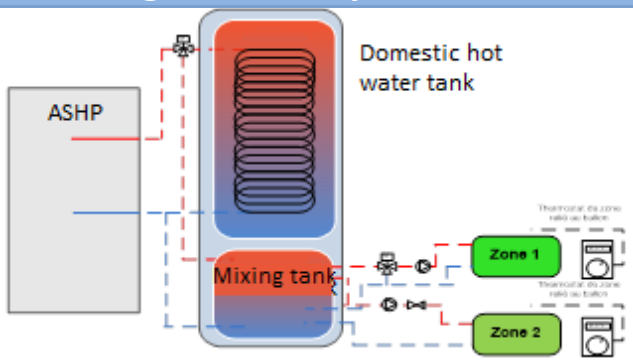
ASHP Heating only

Example with a mixing bottle + 1 standard zone std + 1 mixed zone



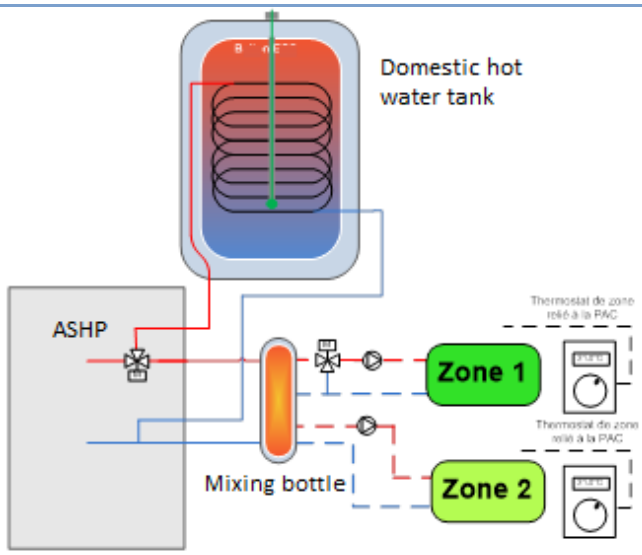
ASHP Heating and DHW production

Example with DUO V2.1



See details pages 60 to 61

Example with mixing bottle + Domestic hot water DHW + 1 standard zone + 1 mixed zone



The distribution solution for more than 3 zones

Possibility to split one or the 3 zone(s) in sub-zones = be careful, it is mandatory to install mixing bottle/tank)

C- The distribution solutions for more than 3 zones (= 1 to 3 zone(s) with sub-zones)

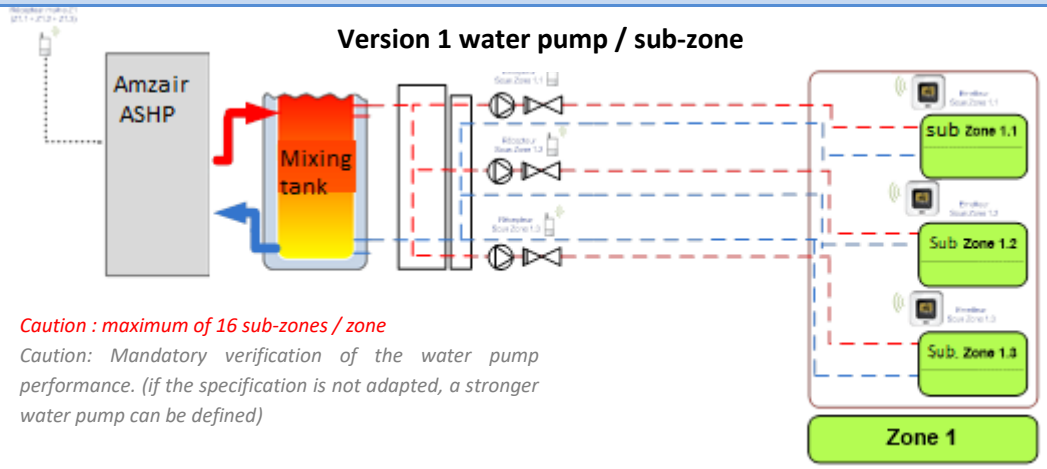
DESIGN PREREQUISITES TO INSTALL SOLUTIONS BELLOW

Split zone via mixing bottle is mandatory except if [ASHP double service + differential pressure valve] or [PAC HO + electric heater + differential pressure valve]

Example of x (sub) zones distribution with the same heated water temperature by the ASHP

The ASHP manage only one zone (Z1) via the master receptor RF6420 who communicate with the x sub zones (Z1.1, Z1.2 …)

Version 1 water pump / sub-zone



Caution : maximum of 16 sub-zones / zone

Caution: Mandatory verification of the water pump performance. (if the specification is not adapted, a stronger water pump can be defined)

WITHIN THIS EXAMPLE

PAC compatibles:

- OPTIM' DUO + DSZ1
- OPTIM' HO + electric heater + DSZ1
- OPTIM'HO without electric heater + BZ1

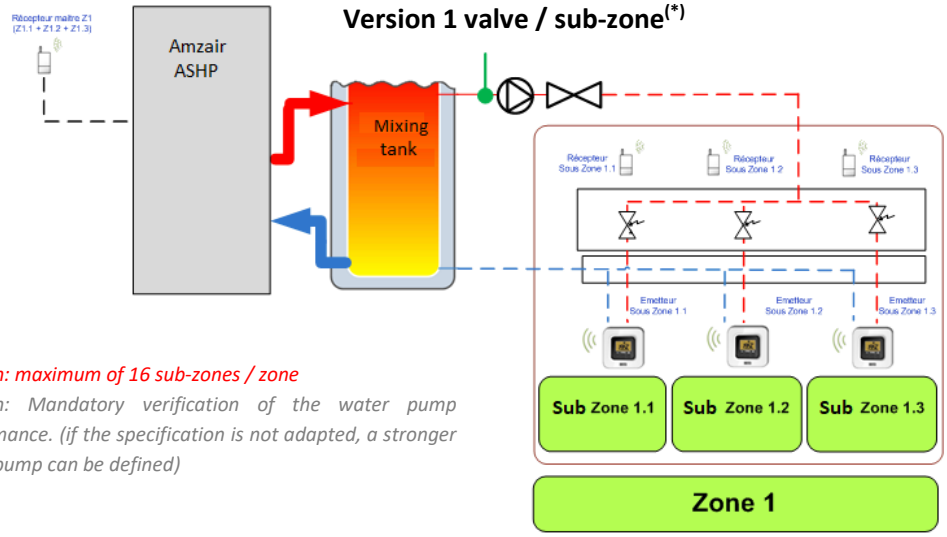
Hardware to order:

- x THETYBOX5100 (to manage the sub- zone)
- 1 THERF6420 (Master radio receptor)
- ASHP without the standard thermostat

Other procurement:

- x water pump to feed or not every sub-zone heating area
- Power cabling + connection for the x receptor (s) TYBOX on the heating for each subzone
- Power cabling + RF6420 connection in the ASHP

Version 1 valve / sub-zone(*)



Caution: maximum of 16 sub-zones / zone

Caution: Mandatory verification of the water pump performance. (if the specification is not adapted, a stronger water pump can be defined)

WITHIN THIS EXAMPLE

PAC compatibles:

- OPTIM' DUO + DSZ1
- OPTIM' HO + electric heater + DSZ1
- OPTIM'HO without electric heater + BZ1

Hardware to order:

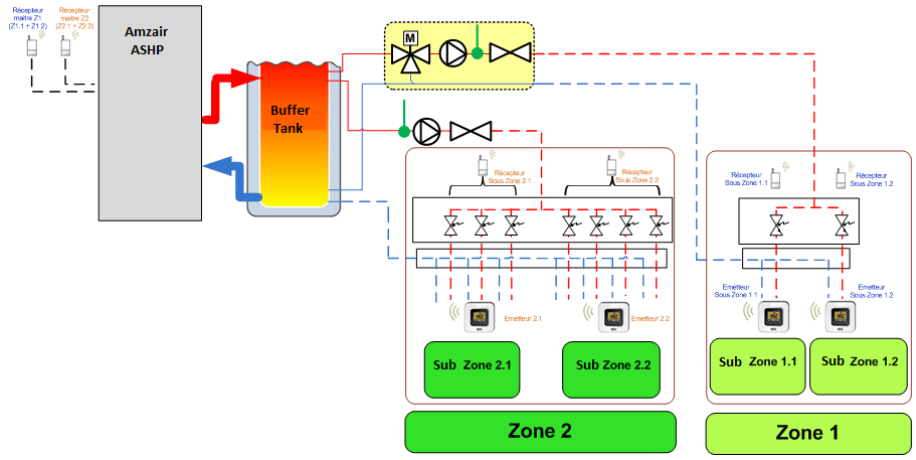
- x THETYBOX5100 (to manage the sub- zone)
- 1 THERF6420 (Master radio receptor)
- ASHP without the standard thermostat

Other procurement:

- x motorized two ways valves to feed or not every sub-zone area
- Power cabling + connection for the x receptor (s) TYBOX on the heating for each subzone
- Power cabling + RF6420 connection in the ASHP

Example for water distribution of x (sub) zones with 2 different temperatures of heating

The ASHP controller manage 2 zones (Z1+Z2) via master radio receptors RF6420 who communicate with x + y sub-zones (Z1.1, Z1.2, …. + Z2.1 …)



Caution: maximum of 16 sub-zones / zone

Caution: Mandatory verification of the water pump performance. (if the specification is not adapted, a stronger water pump can be defined)

Caution: One thermostat THETYBOX5100 per sub-zone and one receptor THERF6420 par zone

WITHIN THIS EXAMPLE

PAC compatibles:

- OPTIM' DUO + DSZ1mZ2
- OPTIM' HO + appoint + DSZ1mZ2
- OPTIM'HO sans appoint + BZ1mZ2

Hardware to order:

- x + y THETYBOX5100 (for each heating sub- zone)
- 2 THERF6420 (master receptor)
- ASHP without its standard thermostat

Other procurement:

- x motorized two ways valves to feed or not every sub-zone area
- Power cabling + connection for the x receptor (s) TYBOX on the heating for each subzone
- Power cabling + RF6420 connection in the ASHP

5.5 Thermostats help selection sheet

						Non reverse cycle (heating only)		Reverse cycle (heating + cooling)	
						1 zone	2 zones	1 zone	2 zones
Basic or option	**Item picture**	**Connect**	**Remotly connected**	**Type of comm[1]**	**Time Prog on the thermostat**	**AMZAIR ref**	**AMZAIR ref**	**AMZAIR ref**	**AMZAIR ref**
BASIC		Cabling	None	Elec. contact	yes	1 X PPACNTHFI	2 X PPACNTHFI	1 X PPACNTHFI	2 X PPACNTHFI
OPTION		Radio	None	Elec. contact	yes	1 x PPACNTHRA	2 x PPACNTHRA	1 x PPACNTHRA	2 x PPACNTHRA
		Radio	Yes (via box + TYDOM 1.0 ou +)	Elec. contact	none (available via TYBOX2000 screen or internet via BOX + TYDOM 1.0)	1 x THETYBOX5100	2 x THETYBOX5100	1 x THETYBOX5150	1x THETYBOX5150 + 1x THETYBOX5100
		Radio	Yes (via box + TYDOM 1.0 ou +)	Elec. contact	none (available via TYBOX2000 screen or internet via BOX + TYDOM 1.0)	1 x THETYBOX5200	2 x THETYBOX500	1 x THETYBOX5200	1x THETYBOX5200

[1] Control made by electrical contact between thermostat / control board = The thermostat act as a regular switch off / on, who control the ASHP if the zone require heating or not.

Certified Eubac with V2V cf p.13

6 SIZING ASHP / TECHNICAL HEAT OUTPUT DATA

6.1 INTRO

It is mandatory to start the project by an **accurate heat need assessment** of the building either it is a new construction or renovation project, in order to properly define the right ASHP power.

For the Design bureau, files are available for assistance to determine the right power of ASHP (Excel sheet on the “espace pro “ of our www.amzair.eu +web site base EDIBATEC + …)

In a Request For Information project phase, business case phase: **Pre-sizing ASHP file available** (on our the web site www.amzair.eu , menu “espace pro”).

6.2 PERFORMANCES

For each ASHP, you will find in the following below pages:

a) 3 charts of performances in relation with the external ambient air temperature and the ASHP heated water at (25, 35, 45 or 55°C):

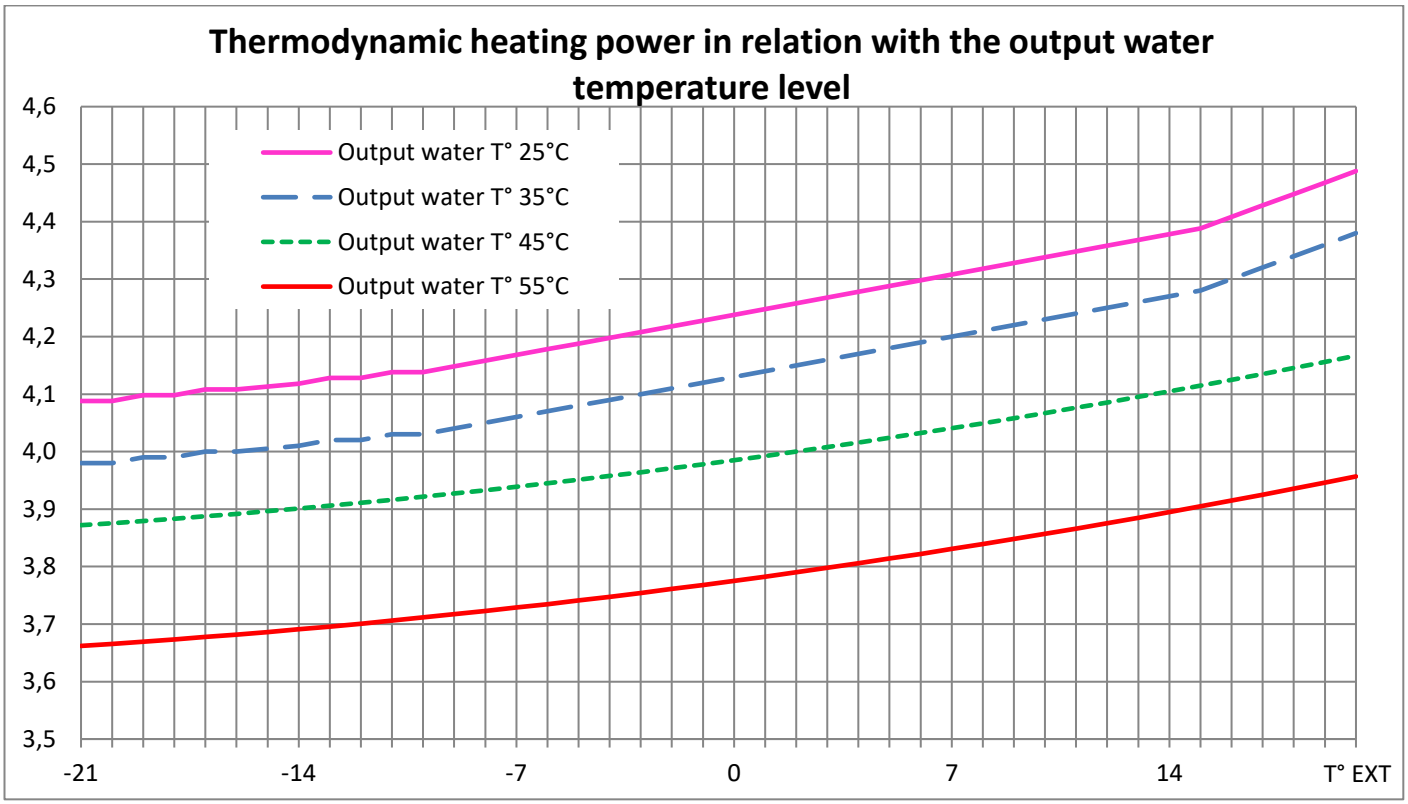
- The **heating power** thermodynamic = heat energy produced by the ASHP
- The **COP** (coefficient of performance) = heat energy / consumed energy
- The **consumed energy**

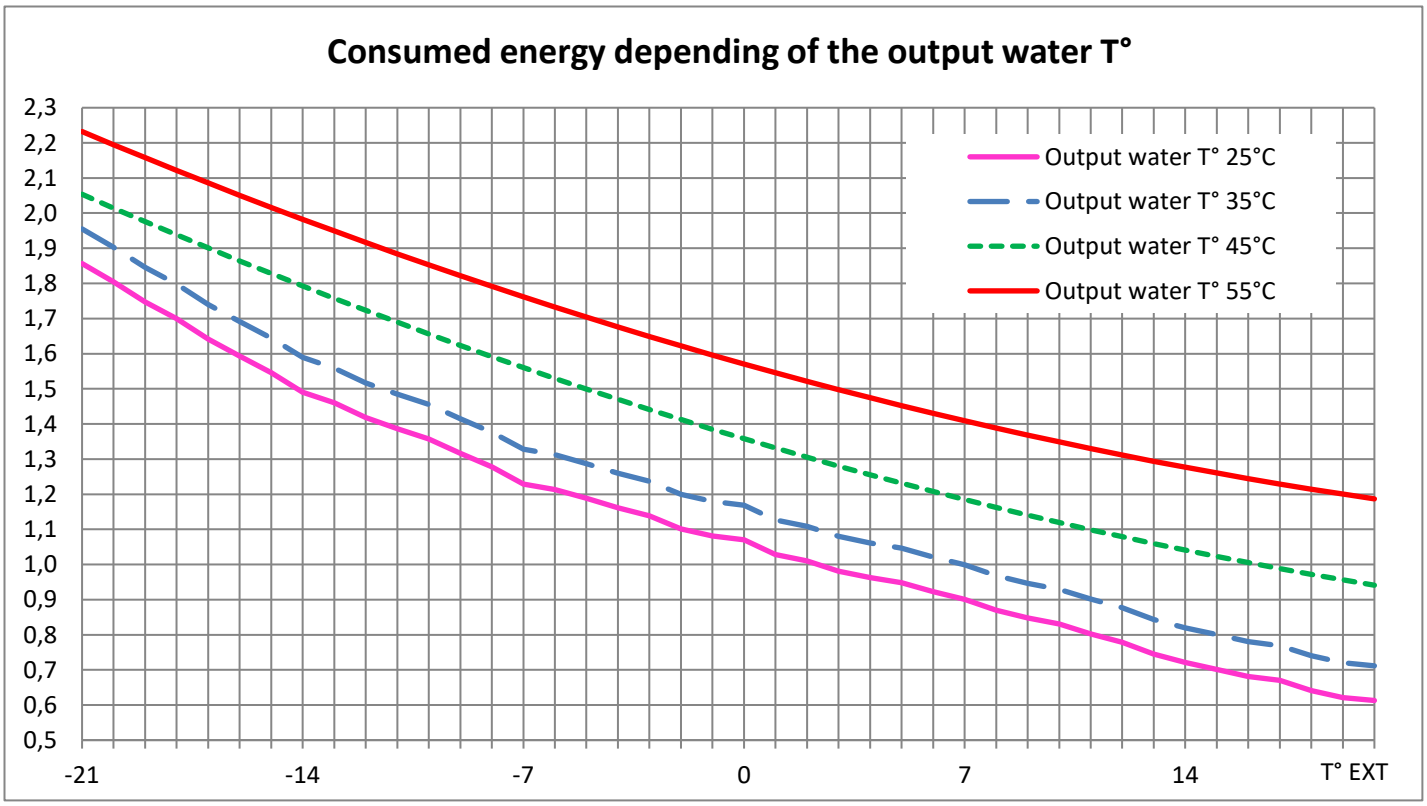
b) The **minimum external ambient air temperatures** in relation with ASHP heated temperature requirement (25, 35, 45 or 55°C).

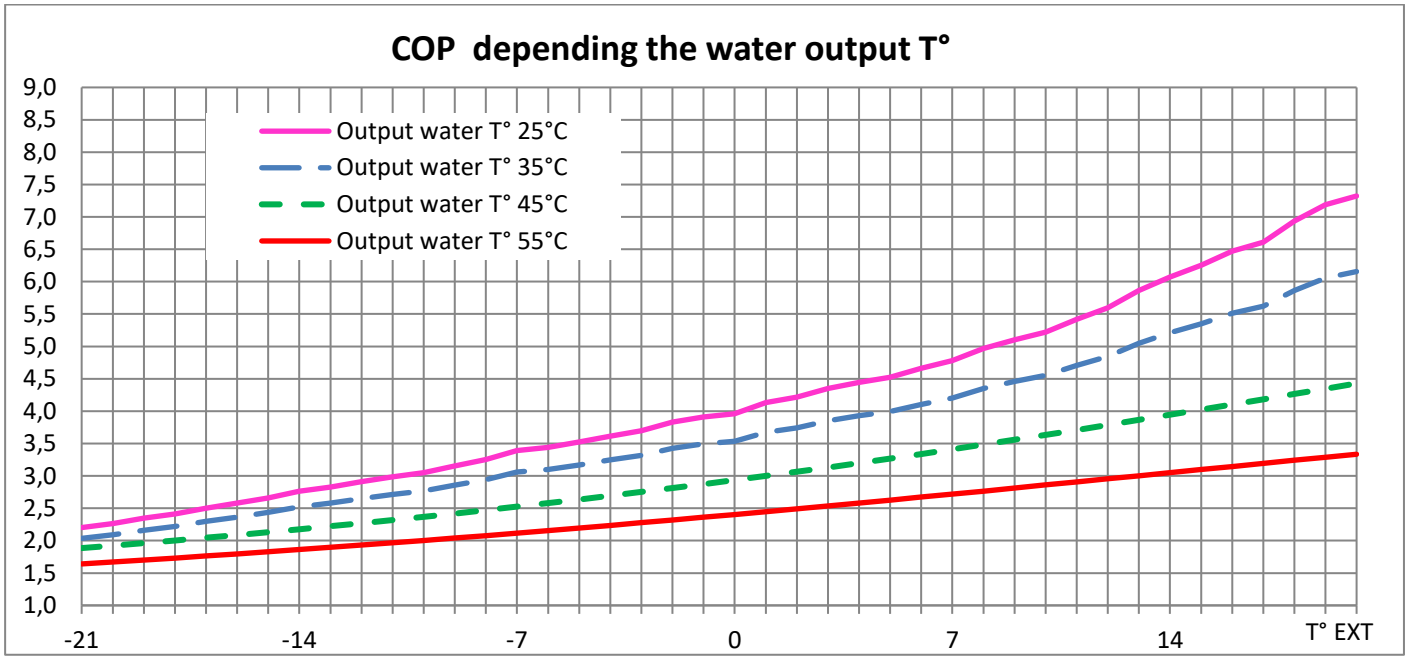
c) The ASHP **performances for domestic water production**.

6.2.1 OPTIM' 04M (single phase)

IMPORTANT: All of the performances are made without any electric heater help. The performances of the ASHP in operation are only thermodynamic data.
For info: The 3 kW electric heaters are optional for this model.







Minimum external ambient air temperature in operation

ASHP output water temperature	Minimum external ambient air temperature
25°C	-21°C
35°C	-21°C
45°C	-21°C
55°C	-21°C

Heating Performance

External air temperature	Output water temperature	Heating power	Consumed Energy	COP	Standby consumed energy	Class of energy	
7°C	30-35°C	4.20 kW	1.00 kW	4.20	9 W	A++	144.0%

External air temperature	Output water temperature	Heating power	Consumed Energy	COP	Standby consumed energy	Class of energy	
7°C	50-55°C	3.83 kW	1.38 kW	2.77	9 W	A+	112.0%

Cooling Performance

External air temperature	Output water temperature	Heating power	Consumed Energy	EER	Stanby consumed energy
35°C	23-18°C	5.40 kW	1.03 kW	5.26	9 W
35°C	12-7°C	3.10 kW	1.01 kW	3.06	9 W

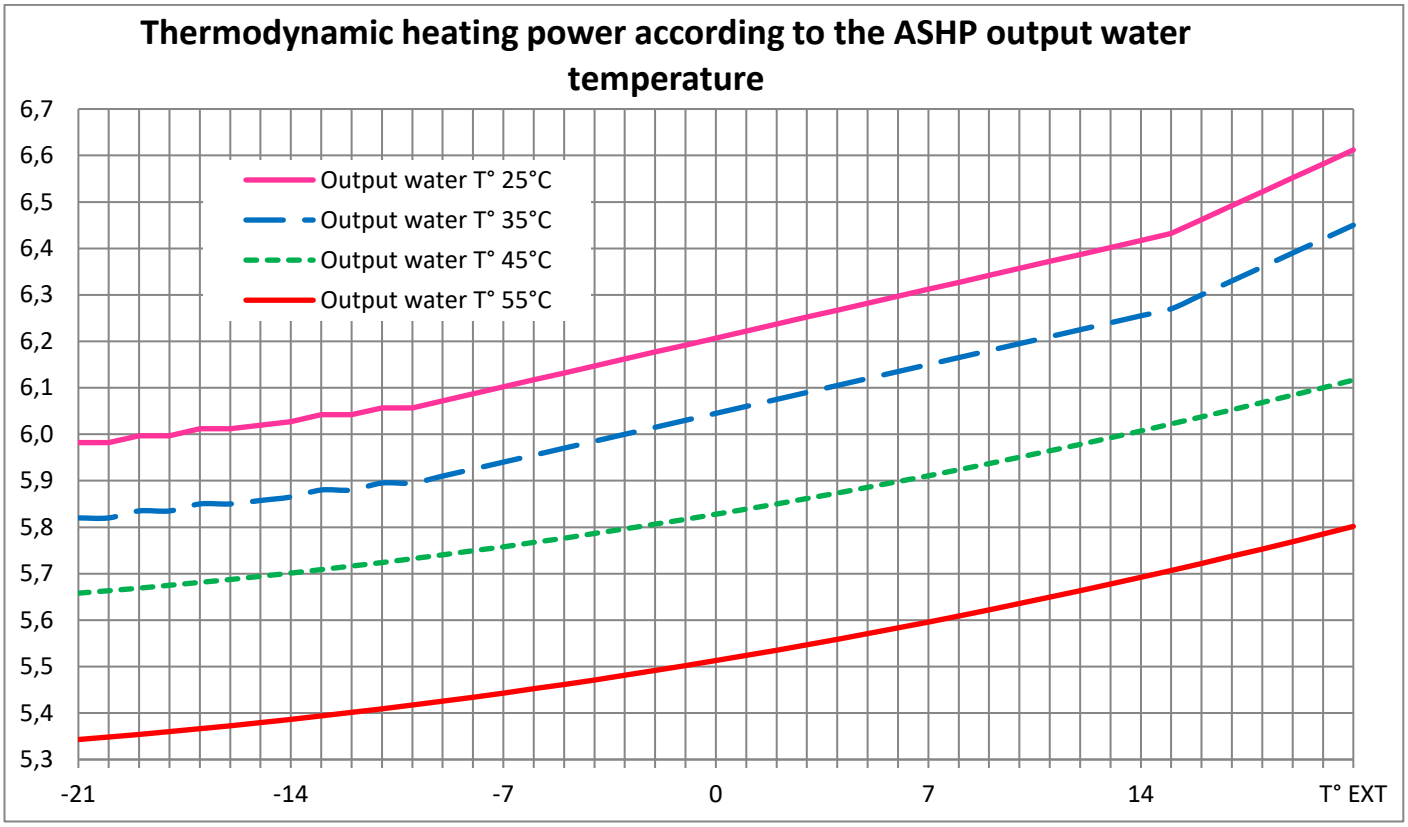
ASHP PERFORMANCE IN DOMESTIC HOT WATER PRODUCTION FOR AN EXTERNAL AMBIENT AIR OF 7°C

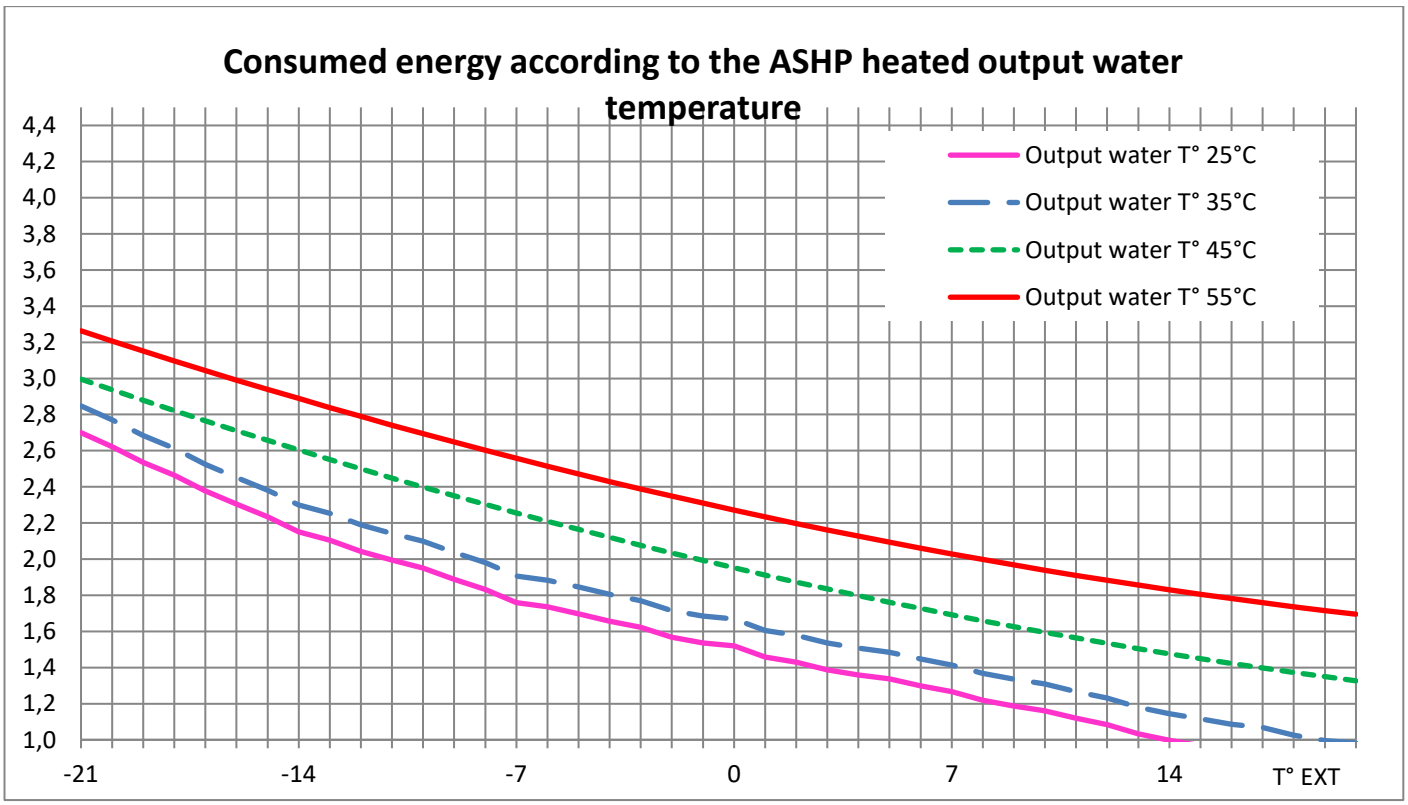
PAC OPTIM'DUO 04M	Dom. Water tank 170L	Dom. Water tank 200L
Cycle of emptying following the norm NF EN 16147 (S, M, L, XL, XXL)	M	M
Set point temperature (°C)	55	55
Type ASHP operating mode (alternate or simultaneous)	Alternate	Alternate
Tank capacity (Liter)	170	195
Certified performance domestic hot water with or without electric resistance	Without	Without
Set point temperature duration (Th) (h min) from 10°C to 55°C	2h 20min	2h 50min
Reserve of power (Pes) (W)	45.0	45.0
Coefficient of performance (COP dhw)	2.20	2.23
Domestic hot water temperature reference (Twh) (°C)	50.0	50.0
Maximum volume of domestic hot water at 40°C used (V max) (liter) for a 10l/min water flow	215.0	250.0
Energy efficiency for domestic hot water heat (η_{wh}) (%)	106	107
DHW Class of energy	A+	A+

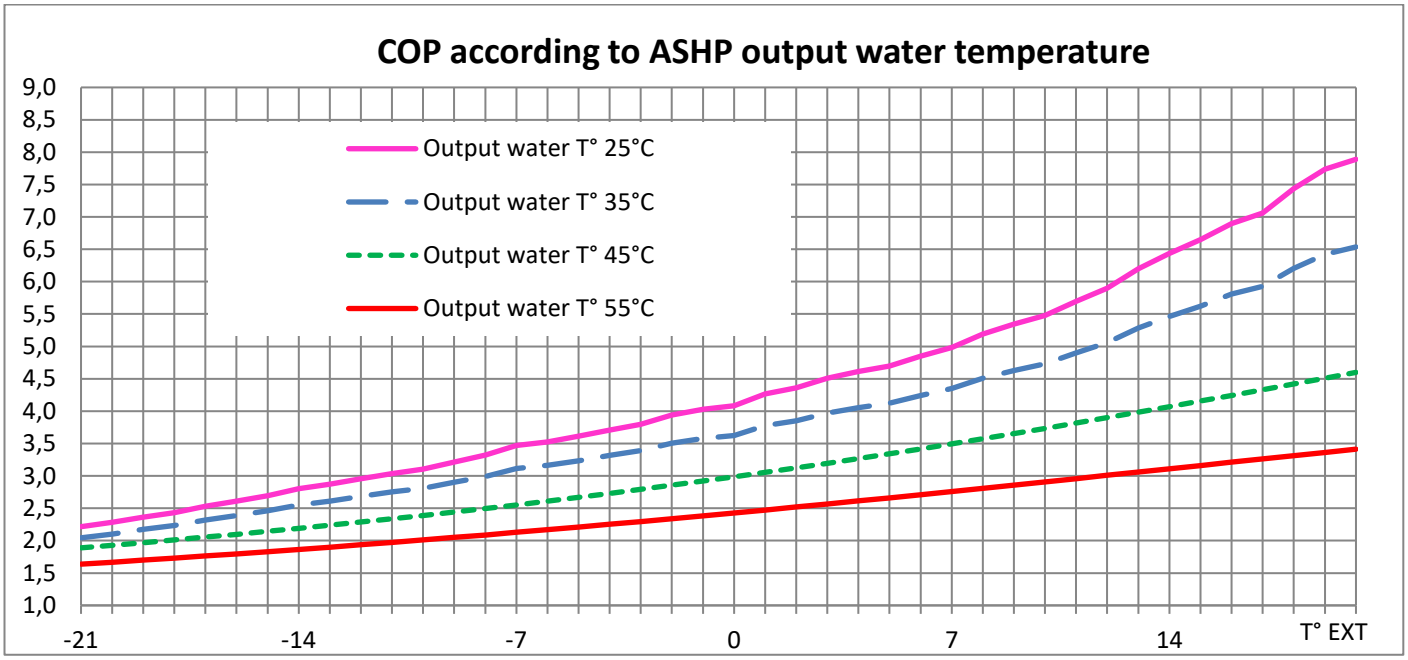
6.2.2 OPTIM' 06M (single phase)

IMPORTANT : All of the performances are made without any electric heater help. The performances of the ASHP in operation are only thermodynamic data.

For info : The 3 kW electric heaters are optional for this model.







Minimum external ambient air temperature in operation

ASHP output water temperature	Minimum external ambient air temperature
25°C	-21°C
35°C	-21°C
45°C	-21°C
55°C	-21°C

Heating Performance

External air temperature	Output water temperature	Heating power	Consumed Energy	COP	Standby consume energy	Class of energy	
7°C	30-35°C	6.15 kW	1.41 kW	4.35	9 W	A++	146%

External air temperature	Output water temperature	Heating power	Consumed Energy	COP	Standby consume energy	Class of energy	
7°C	50-55°C	5.60 kW	1.99 kW	2.81	9 W	A+	113%

Cooling Performance

External air temperature	Output water temperature	Heating power	Consumed Energy	EER	Standby consume energy
35°C	23-18°C	8.10 kW	1.45 kW	5.60	9 W
35°C	12-7°C	4.60 kW	1.5 kW	3.07	9 W

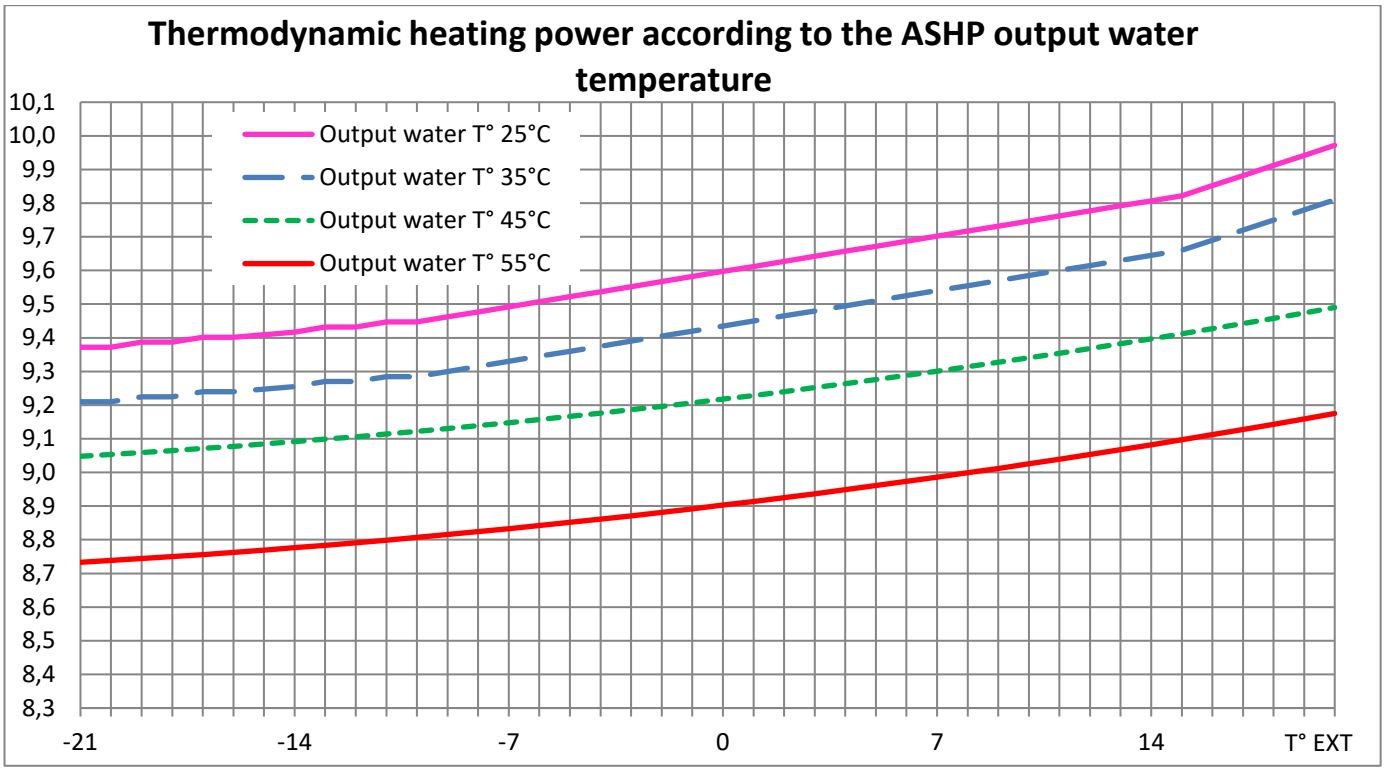
ASHP PERFORMANCE IN DOMESTIC HOT WATER PRODUCTION FOR AN EXTERNAL AMBIENT AIR OF 7°C

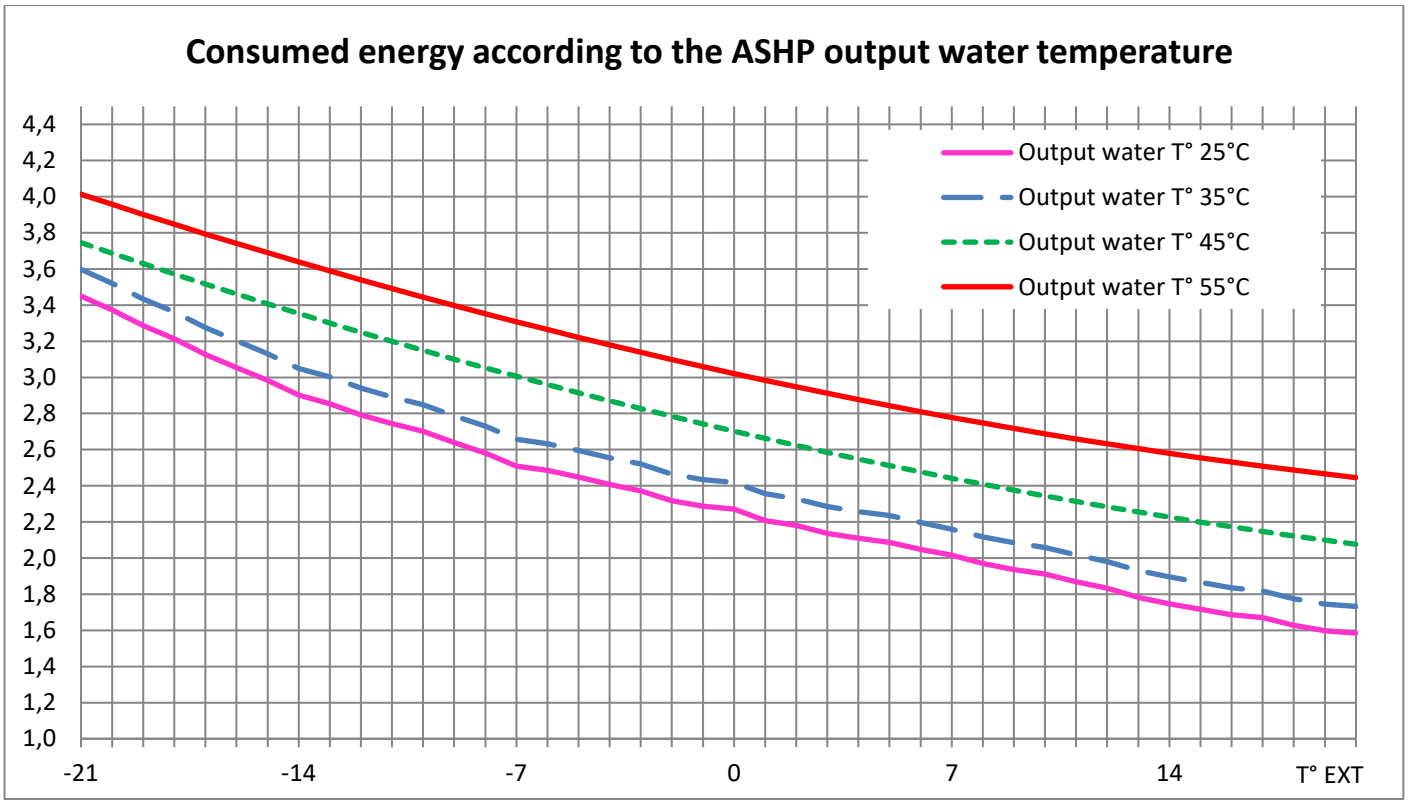
PAC OPTIM'DUO 06M	Water Tank 170L	Water Tank 200L	Water Tank 300L
Cycle of emptying following the norm NF EN 16147 (S, M, L, XL, XXL)	M	M	M
Set point temperature (°C)	55	55	55
Type ASHP operating mode (alternate or simultaneouse)	Alternate	Alternate	Alternate
Tank capacity (Liter)	170	195	300
Certified performance hot water with or without electric resistance	Without	Without	Without
Set point temperature duration (Th) (h min) from 10°C to 55°C	2h 02min	2h 20min	3h 15min
Reserve of power (Pes) (W)	45.0	45.0	45.0
Coefficient of performance (COP dhw)	2.49	2.60	2.55
Domestic hot water temperature reference (Twh) (°C)	50.0	50.0	50.0
Maximum volume of domestic hot water at 40°C used (V max) (liter) for a 10l/min water flow	215.0	250.0	385.0
Energy efficiency for domestic hot water heat (η_{wh}) (%)	120	126	123
DHW Class of energy	A+	A+	A+

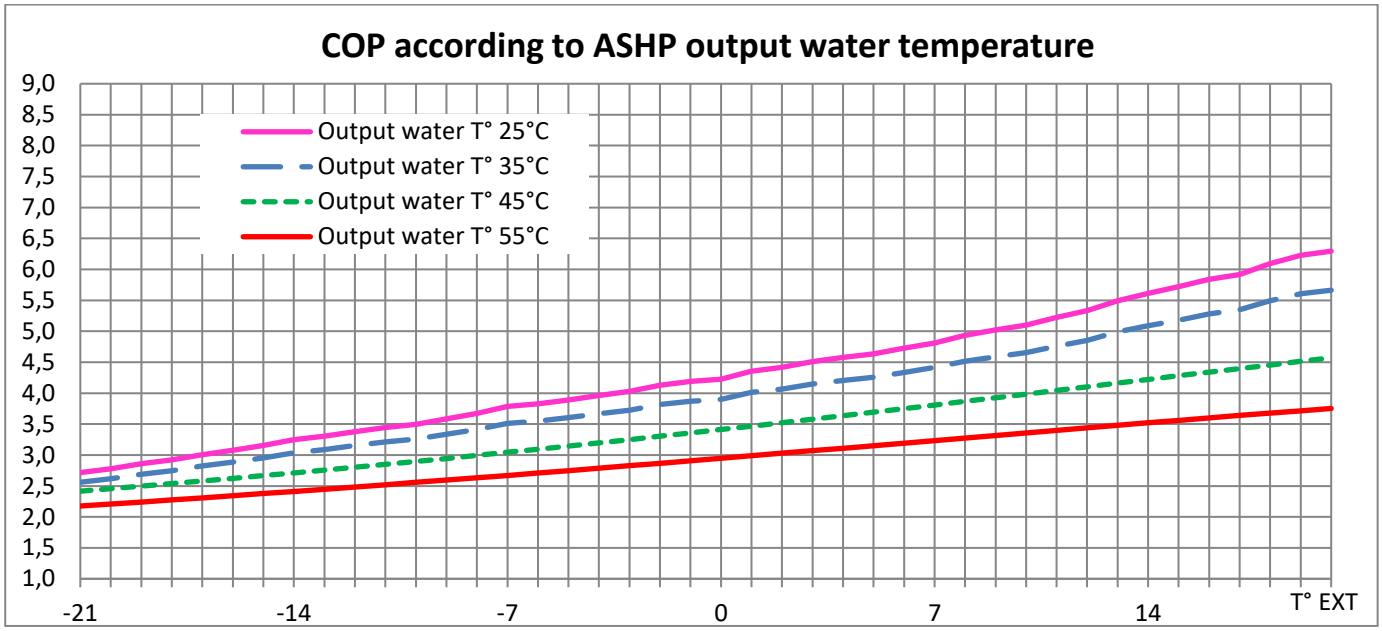
6.2.3 OPTIM' 09M (single phase)

IMPORTANT: All of the performances are made without any electric heater help. The performances of the ASHP in operation are only thermodynamic data.

For information: The 3 kW electric heaters are optional for this model.







Minimum external ambient air temperature in operation

ASHP water temperature	Minimum external ambient air temperature
25 °C	-21 °C
35 °C	-21 °C
45 °C	-21 °C
55 °C	-21 °C

Heating Performance

External air temperature	Output water temperature	Heating power	Consumed Energy	COP	Standby consume energy	Class of energy	
7 °C	30-35 °C	9.54 kW	2.16 kW	4.41	9 W	A++	149.0%

External air temperature	Output water temperature	Heating power	Consumed Energy	COP	Standby consume energy	Class of energy	
7°C	50-55°C	8.99 kW	2.72 kW	3.30	9 W	A+	115.0%

Cooling Performance

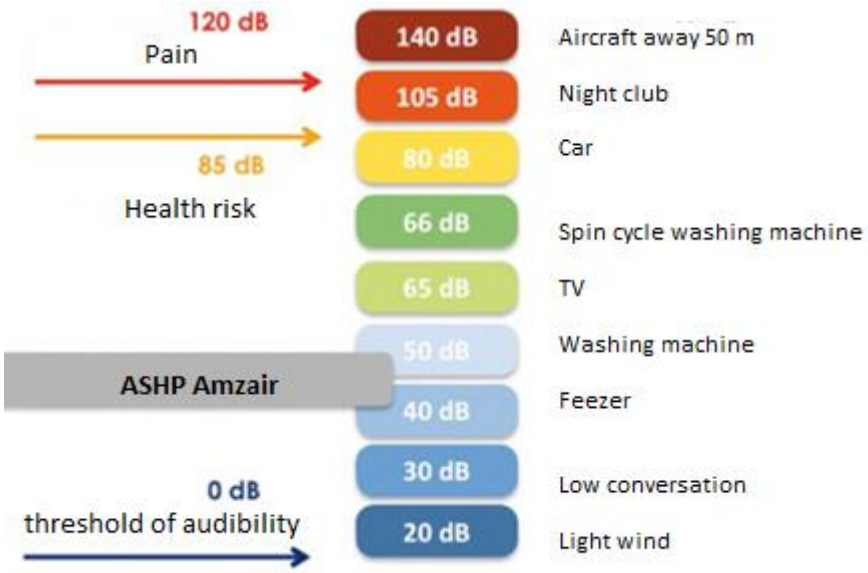
External air temperature	Output water temperature	Heating power	Consumed Energy	EER	Stanby consumed energy
35°C	23-18°C	9.63 kW	2.55 kW	3.78	9 W
35°C	12-7°C	6.76 kW	2.52 kW	2.68	9 W

ASHP PERFORMANCE IN DOMESTIC HOT WATER PRODUCTION FOR AN EXTERNAL AMBIENT AIR OF 7°C

PAC OPTIM'DUO 09M	Tank 200L	Tank 300L
Cycle of emptying following the norm NF EN 16147 (S, M, L, XL, XXL)	M	M
Set point temperature (°C)	55	55
Type ASHP operating mode (alternate or simultaneouse)	Alternate	Alternate
Tank capacity (Liter)	195	300
Certified performance hot water with or without electric resistance	Without	Without
Set point temperature duration (Th) (h min) from 10°C to 55°C	1h 30min	2h 30min
Reserve of power (Pes) (W)	45.0	45.0
Coefficient of performance (COP dhw)	2.53	2.50
Domestic hot water temperature reference (Twh) (°C)	50.0	50.0
Maximum volume of domestic hot water at 40°C used (V max) (liter) for a 10l/min water flow	250.0	385.0
Energy efficiency for domestic hot water heat (η_{wh}) (%)	122	121
DHW Class of energy	A+	A+

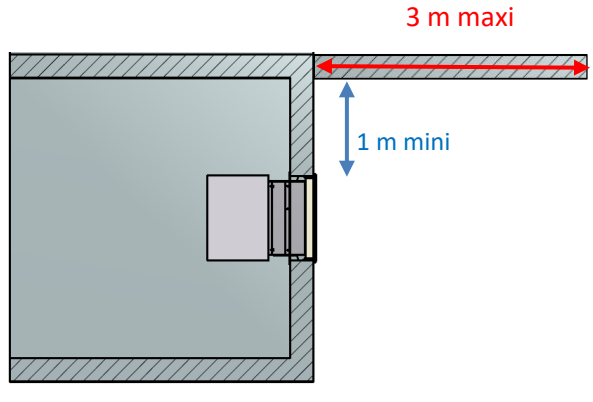
7 ACOUSTIC PERFORMANCES

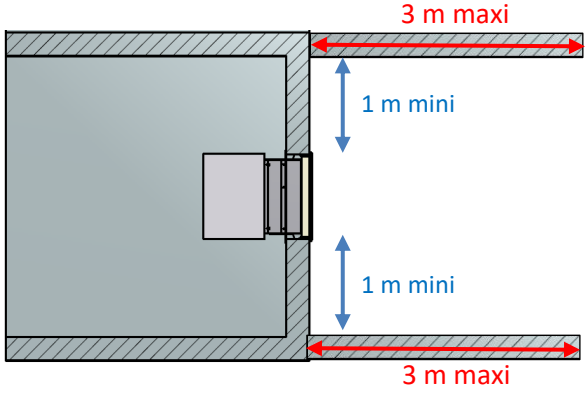
Acoustic Performances	OPTIM' 04M	OPTIM' 06M	OPTIM'09M
Indoor noise level at 1 m (dB(A))	48.0	46.1	46.5
Indoor noise level at 4 m (dB(A))	36.0	34.1	34.5
Indoor sound power level in accordance to EN12102 : 2008	59.0	57.1	57.5
Outdoor noise level at 4 m (dB(A))	44.5	42.8	43.0
Outdoor noise level at 10 m (dB(A))	36.5	34.8	35.0
Outdoor sound power level in accordance to EN12102 : 2008	67.5	65.8	66.0



Reminder:
An increase of 3 dB increase the noise perception by 2.

Installation guidelines: Minimum of ASHP side distance from one or several walls



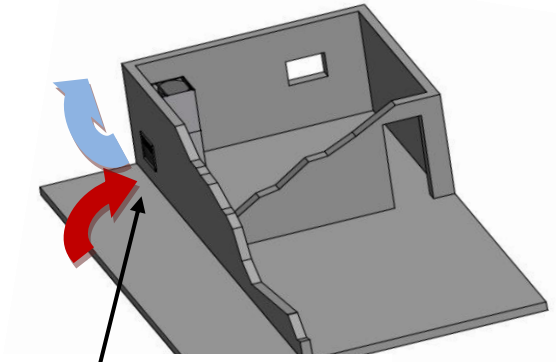


8 INSTALLATION – DIMENSIONS

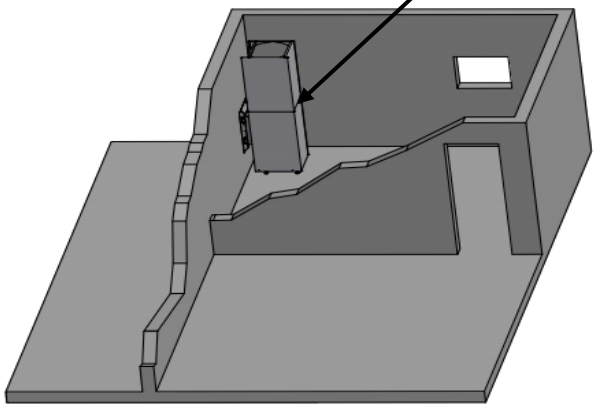
8.1 OPTIM'DUO

8.1.1 Installation sketch

Configuration with integrated tank

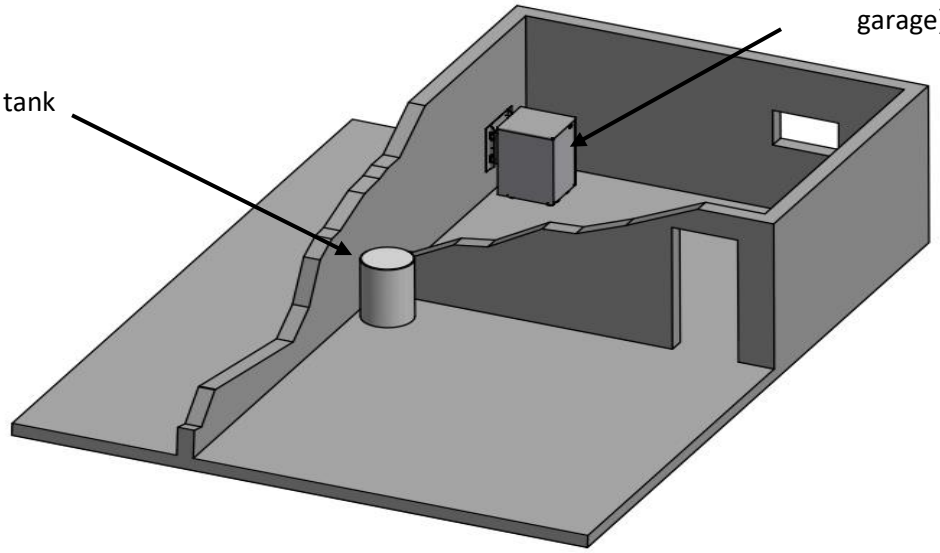


Extraction air and aspiration air source grid on the external wall



ASHP with integrated tank into the cellar (or inside the garage)

Configuration with separated tank



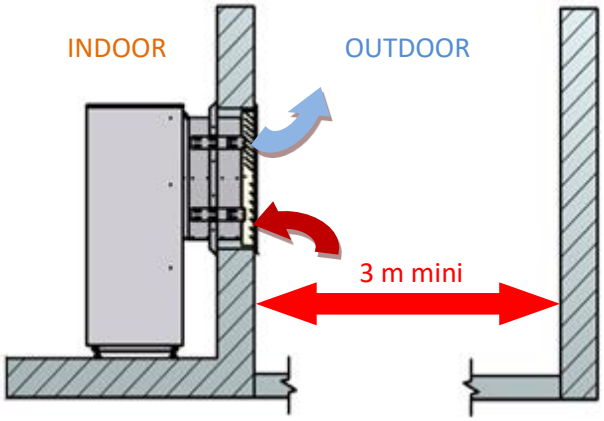
Separated tank

ASHP in the cellar (or in the garage)

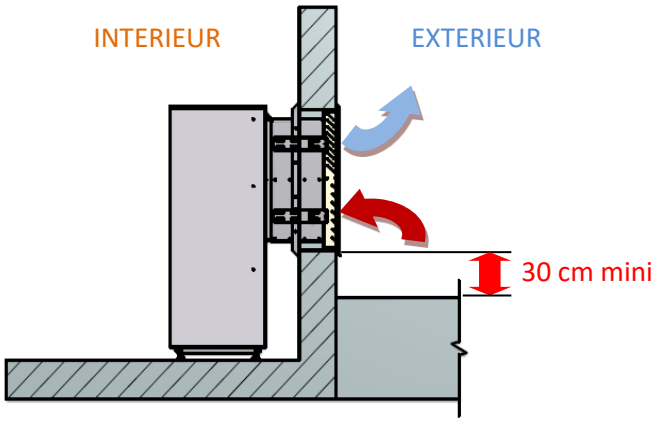
Dimensions (See Chapter 8.1.4)

8.1.2 Outdoor installation restrictions

Minimum distance from a wall in front of the grid

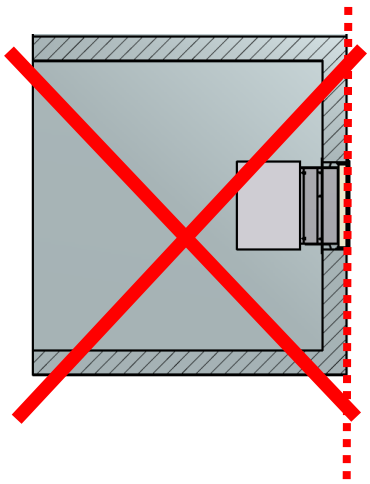


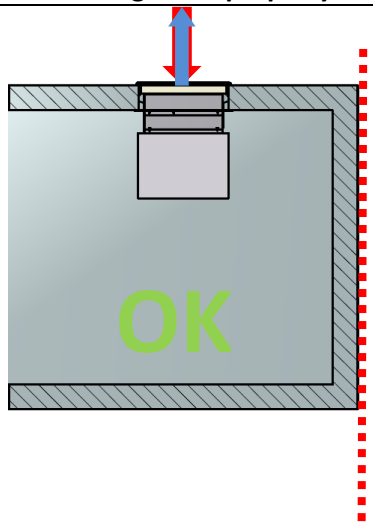
Semi-buried building

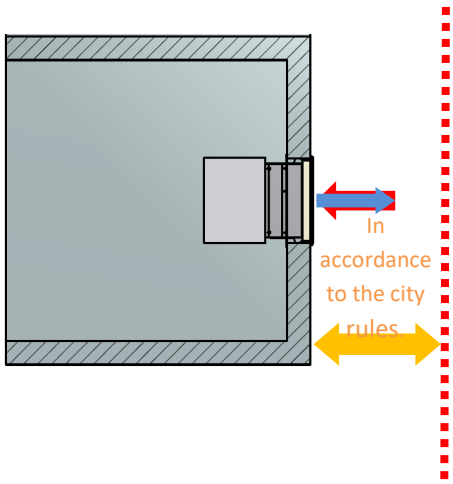


Particular case : Please ask for an adaptation

Neighbour property limit

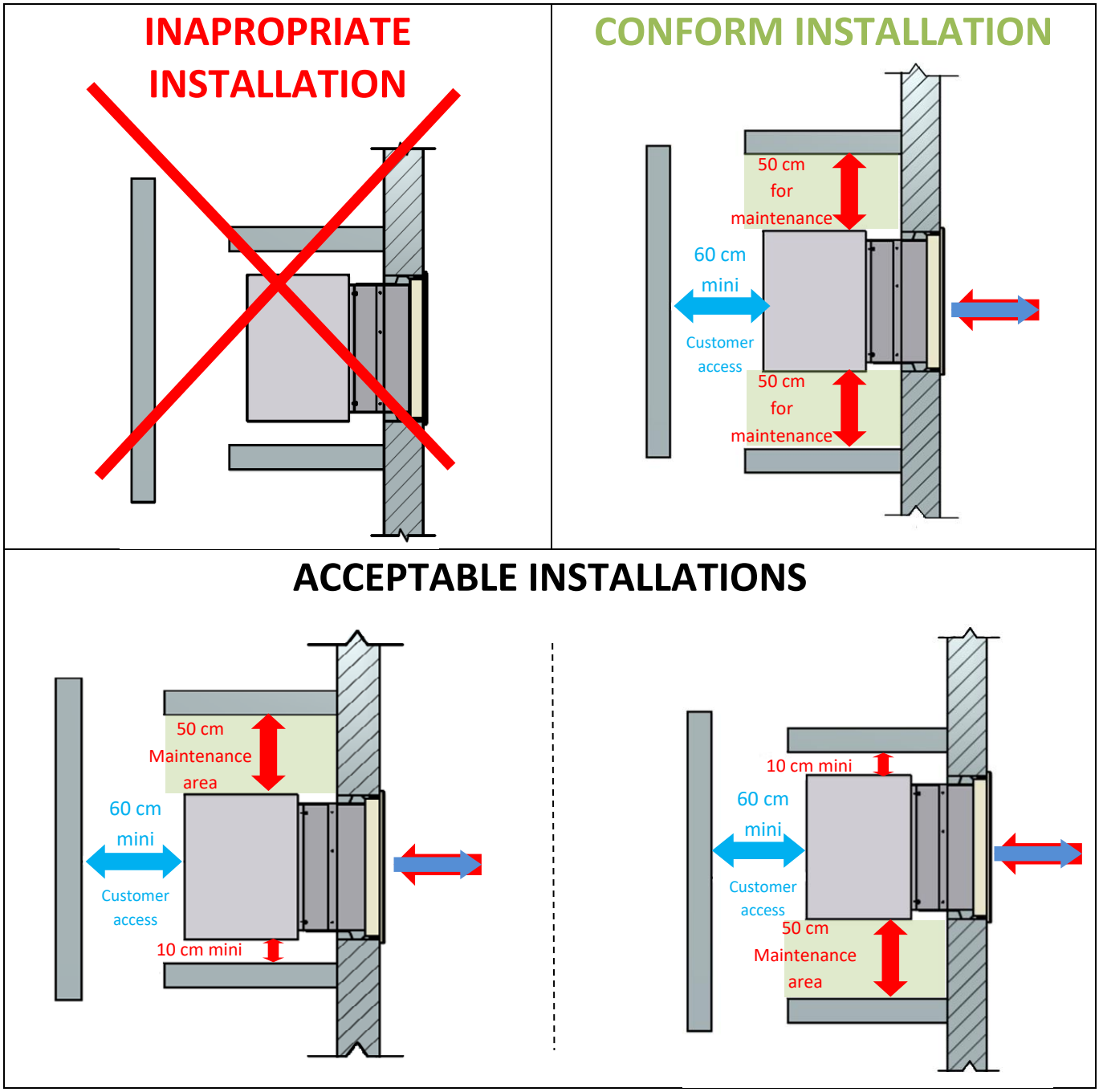






8.1.3 Indoor installation restrictions

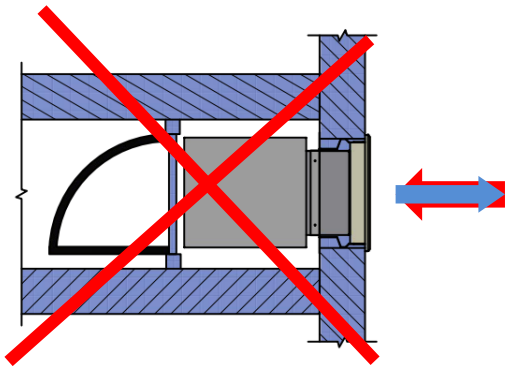
a. Installation inside the machine room



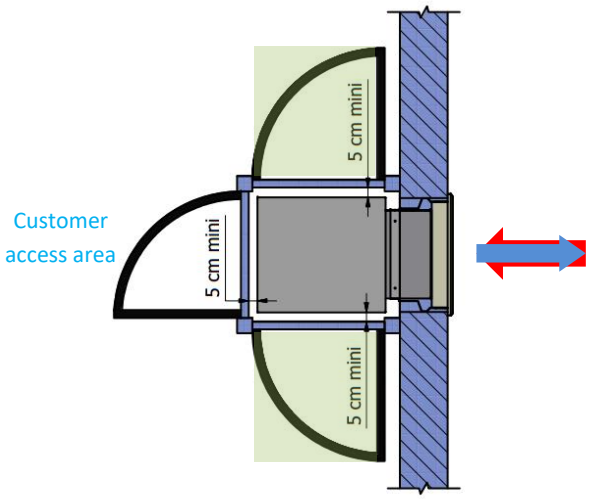
The maintenance area is free to install only movable equipment (dryer, washing machine, …)

b. Installation in a living room (acoustic closet highly recommended)

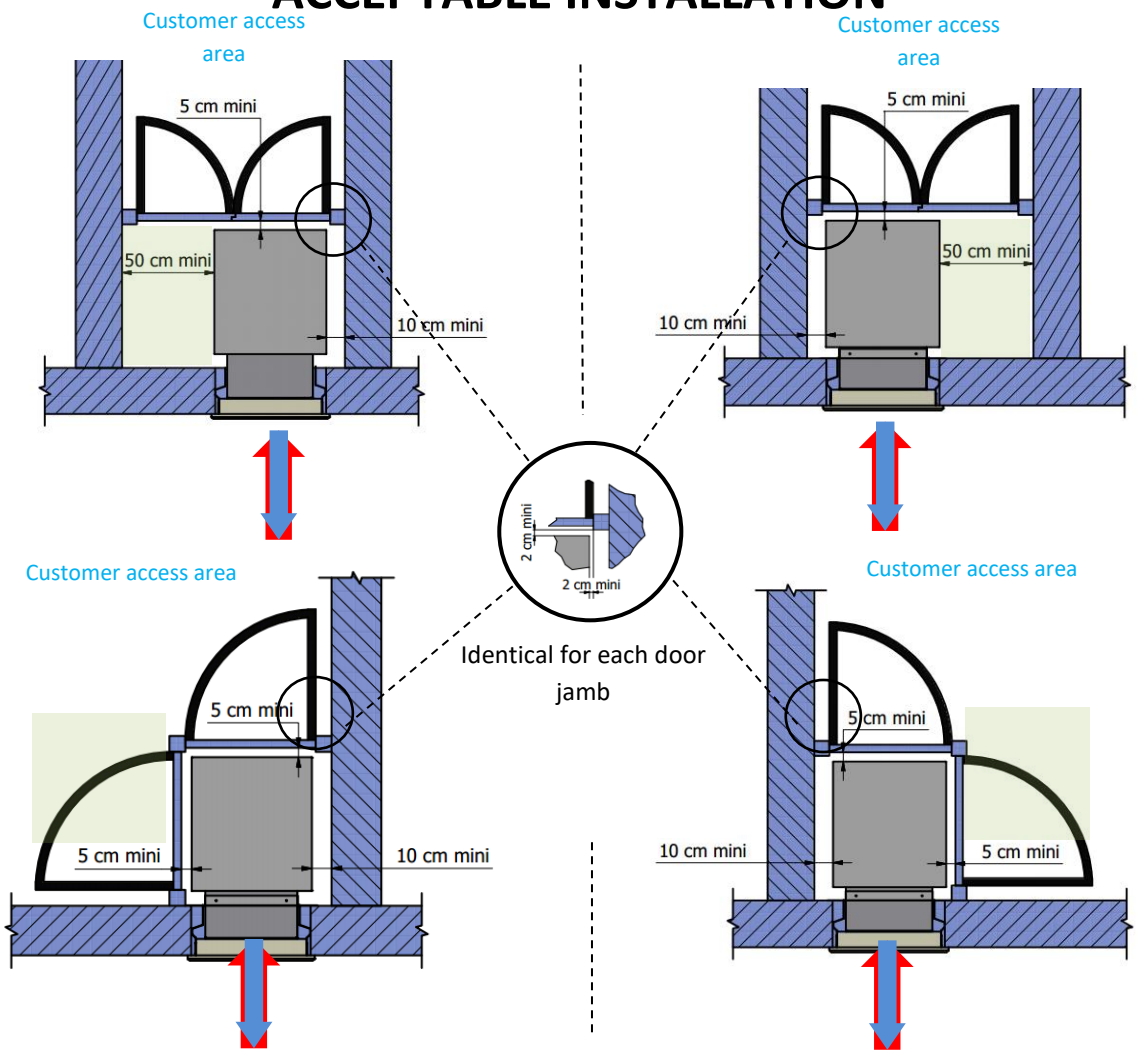
INAPROPRIATE INSTALLATION



CONFORM INSTALLATION



ACCEPTABLE INSTALLATION

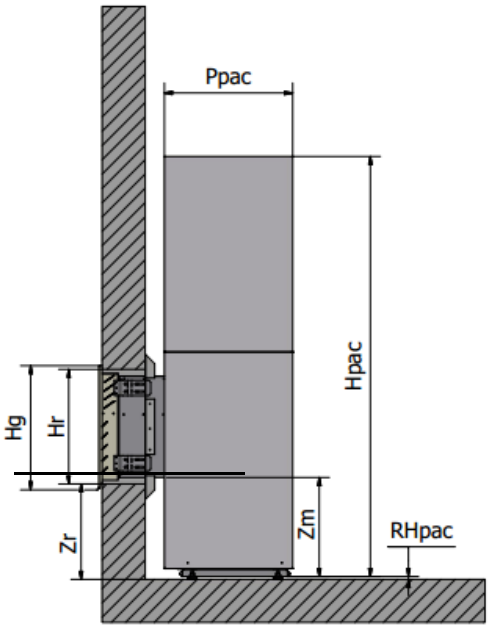


The maintenance area is free to install only movable equipment (dryer, washing machine, …)

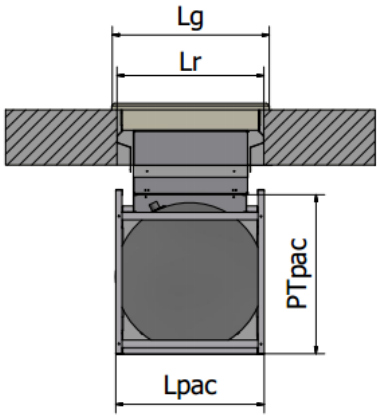
8.1.4 Dimension + weight

Version with integrated DHW tank

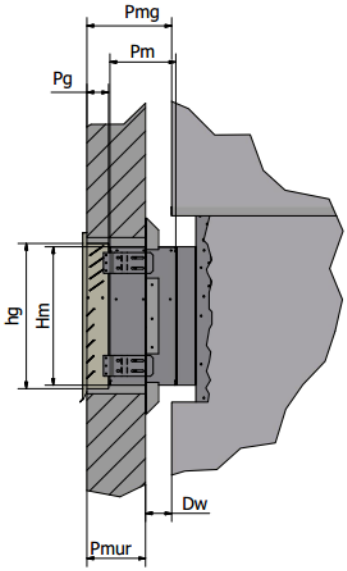
Side view



View from the top

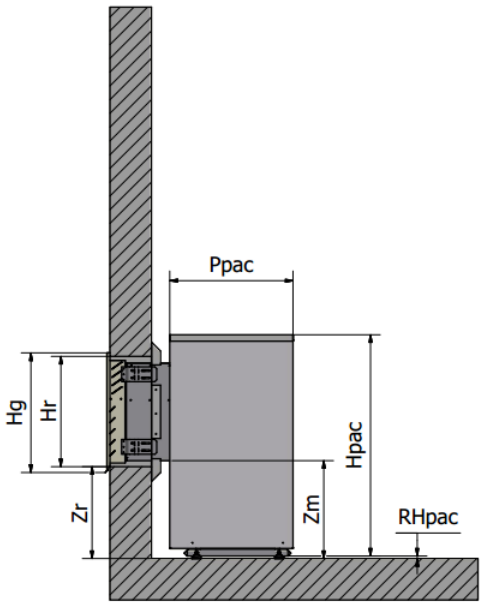


Detailed view of the grid/air duct

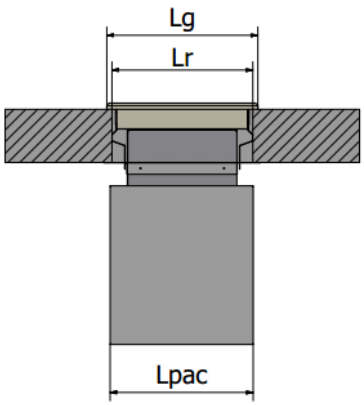


Version with separated DHW tank

Vue de côté

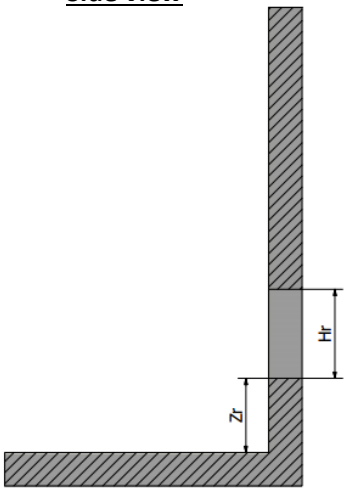


View from the top

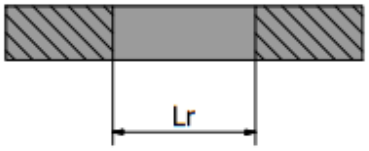


Inside wall opening dimension to allow the grid installation

Side view



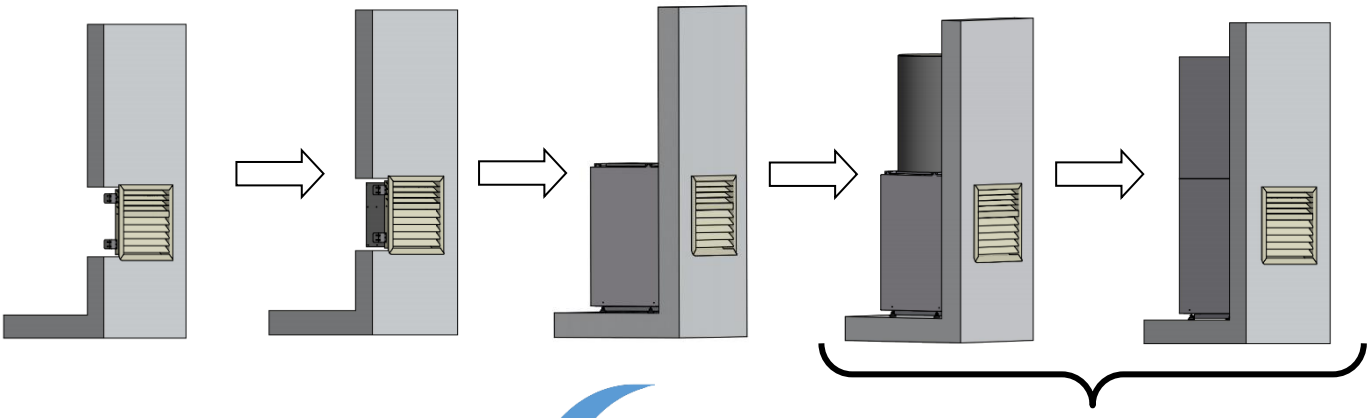
View from the top



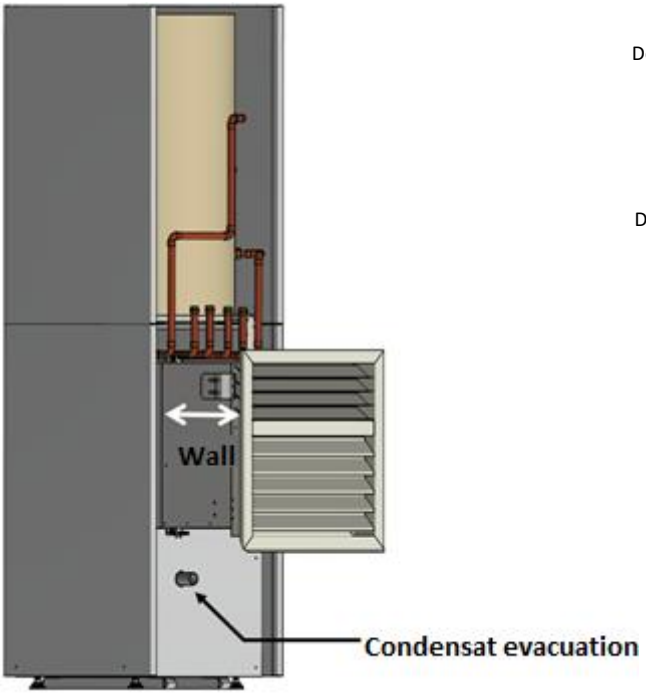
		4 kW 170L Integrated	4 kW 200L Integrated	4 kW 170L Separated	4 kW 200L Separated	6 kW 170L Integrated	6 kW 200L Integrated	6 kW 170L Separated	6 kW 200L Separated	6 kW 300L Separated	9 kW 200L Separated	9 kW 300L Separated
ASHP	Hpac	2 200 mm	2 300 mm	1 200 mm		2 200mm	2 300 mm	1 200 mm			1580 mm	
	RHpac	50 mm Maxi (Adjustable feet for height and horizontality)										
	Ppac	670 mm				745,5 mm					655 mm	
	PTpac	645 mm				695 mm					690 mm	
	Lpac	603mm				760 mm					904 mm	
	Weight	190 kg	200 kg	110+75 kg	110+85 kg	240 kg	250 kg	160+75 kg	160+85 kg	160+95 kg	250+85 kg	250+95 kg
Air duct	Hm	530 mm				630 mm					780 mm	
	Pm	362.5mm	Standard for wall until 375mm and optimised for wall of 350mm width			392.5mm	Standard for wall until 375mm width and optimized for wall off 350mm				354.5 mm	Standard for wall until 375mm width and optimized for wall off 350mm
	Pm	262.5mm	Optimized for width wall 250mm (+/-25mm)			292.5mm	Optimized for width wall 250mm (+/-25mm)				254.5 mm	Optimized for width wall 250mm (+/-25mm)
		312.5mm	Optimized for width wall 300mm (+/-25mm)			342.5mm	Optimized for width wall 300mm (+/-25mm)				304.5 mm	Optimized for width wall 300mm (+/-25mm)
		412.5mm	Optimized for width wall 400mm (+/-25mm			442.5mm	Optimized for width wall 400mm (+/-25mm)				404.5 mm	Optimized for width wall 400mm (+/-25mm)
		462.5mm	Optimized for width wall 450mm (+/-25mm)			492.5mm	Optimized for width wall 450mm (+/-25mm)				454.5 m	Optimized for width wall 450mm (+/-25mm)
	ZM	520 mm				420 mm					715 mm	
Grid	Hg	650 mm				775 mm					955 mm	
	Pg	83 mm				83 mm					95 mm	
	Lg	639 mm				790 mm					945 mm	
Grid + air duct	Weight	50 g				60 kg					75 kg	
Wall opening for grid	Hr	600 mm				700 mm					900 mm	
	Lr					750 mm					905 mm	
	Zr	500 mm (from the finished coated floor indoor)				400 mm (from the finished coated floor indoor)					700 mm (from the finished coated floor indoor)	
Interface wall / ASHP	Dw	To be calculate = Pm - Pmur + 62.5				To be calculate = Pm – Pmur + 32.5					To be calculate = Pm – Pmur + 130.5	
	Pmg	To be calculate = Pmur + Dw				To be calculate = Pmur + Dw					To be calculate = Pmur + Dw	

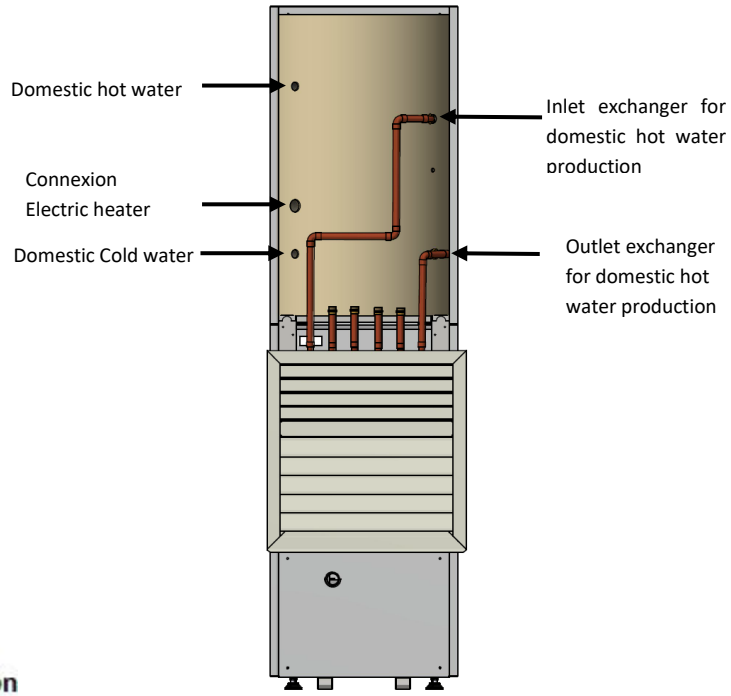
8.1.5 Installation steps of the ASHP OPTIM'

OPTIM' 4 et 6KW

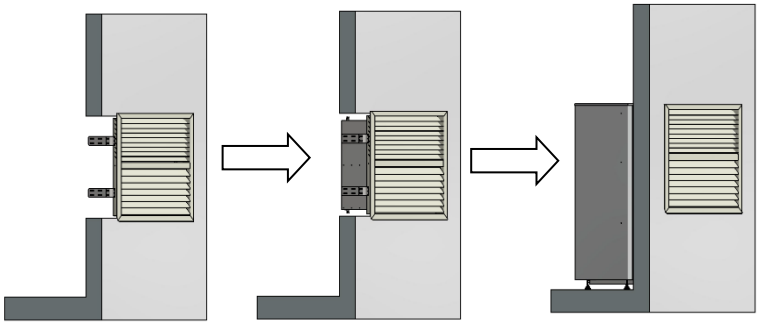


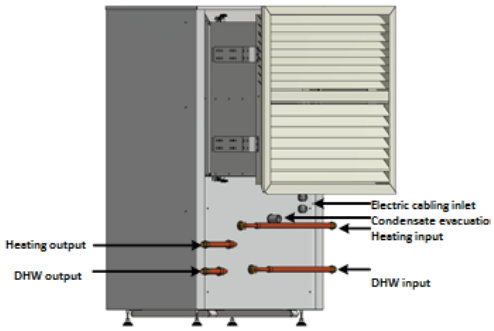
Only OPTIM' DUO 4 and 6KW with domestic water integrated tank (170L and 200L tank)





OPTIM' 9KW





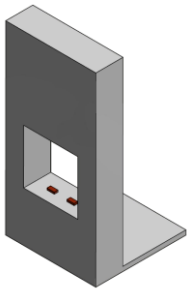
8.2 EXTERNAL GRID INSTALLATION

The grid package is delivered on a palette:

- The grid (aspiration air source + air extraction) paint color RAL 1013 or 9010 (color on demand in option : please provide the RAL reference requested)
- The mounting brackets + the acoustic air duct and its gaskets + the fixing angles (indoor) finishes

Pre-mounting and tracing the marks

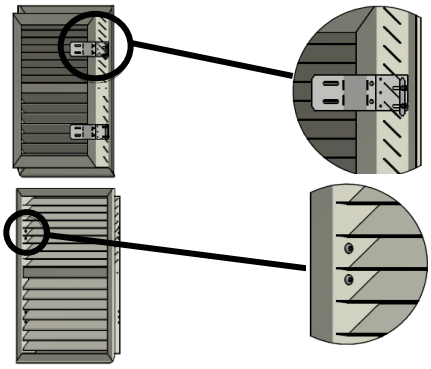
1



External building view

Lay the two wooden blocks before assembly (provided)

2a

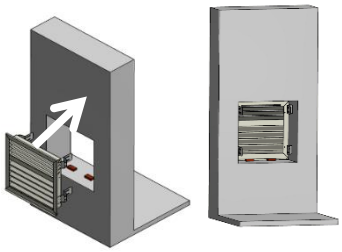


Back view

Front view

The mounting brackets are installed by the factory on the grid, ready to be mounted.

2b



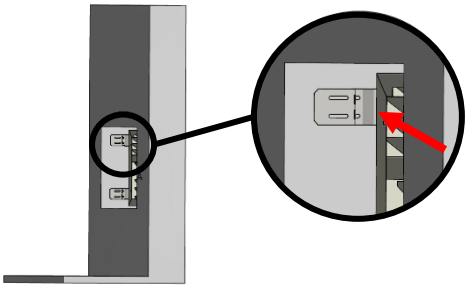
Put the grid on the two wooden blocks

2c

Building exterior view

Make sure that the grid is horizontaly installed in the wall

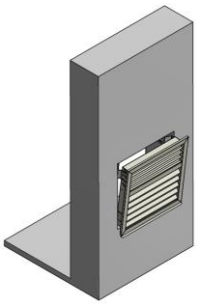
3



Building internal viewi

Mark the place where the 8 holes must be made (2 per mounting brackets)

4



External building view

Remove the grid after the mark are made

Drill / wall fixing

Install the air duct

Install the isolation panels

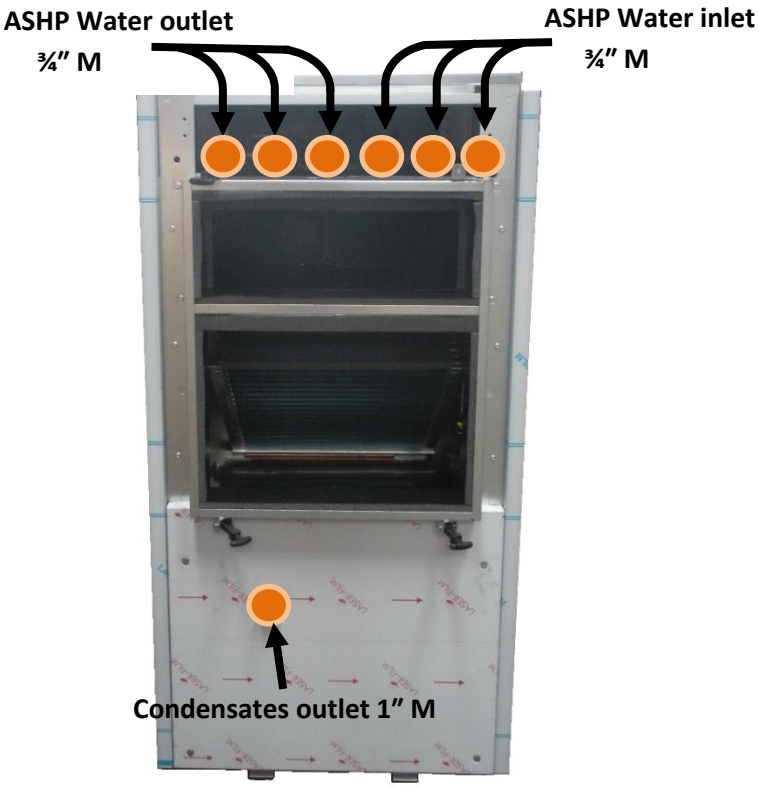
Or Insulation + airtightness

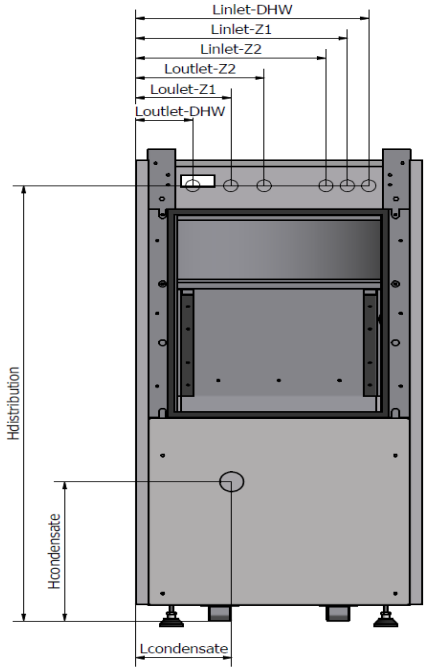
8.3 CONNECTIONS TO THE ASHP OPTIM'

8.3.1 Distribution

Water distribution OPTIM'04M and OPTIM'06M

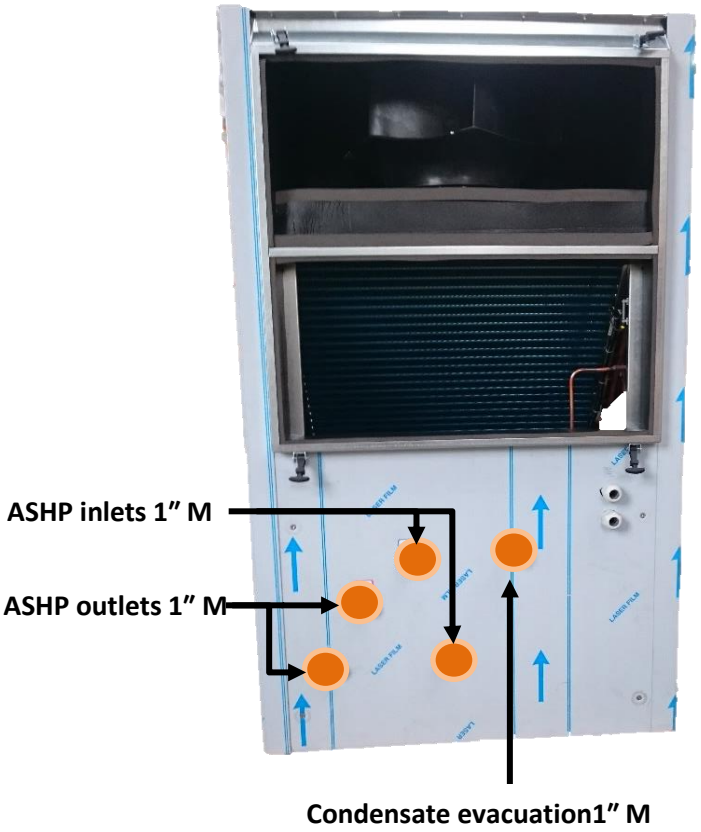
Example 2 zones ASHP:

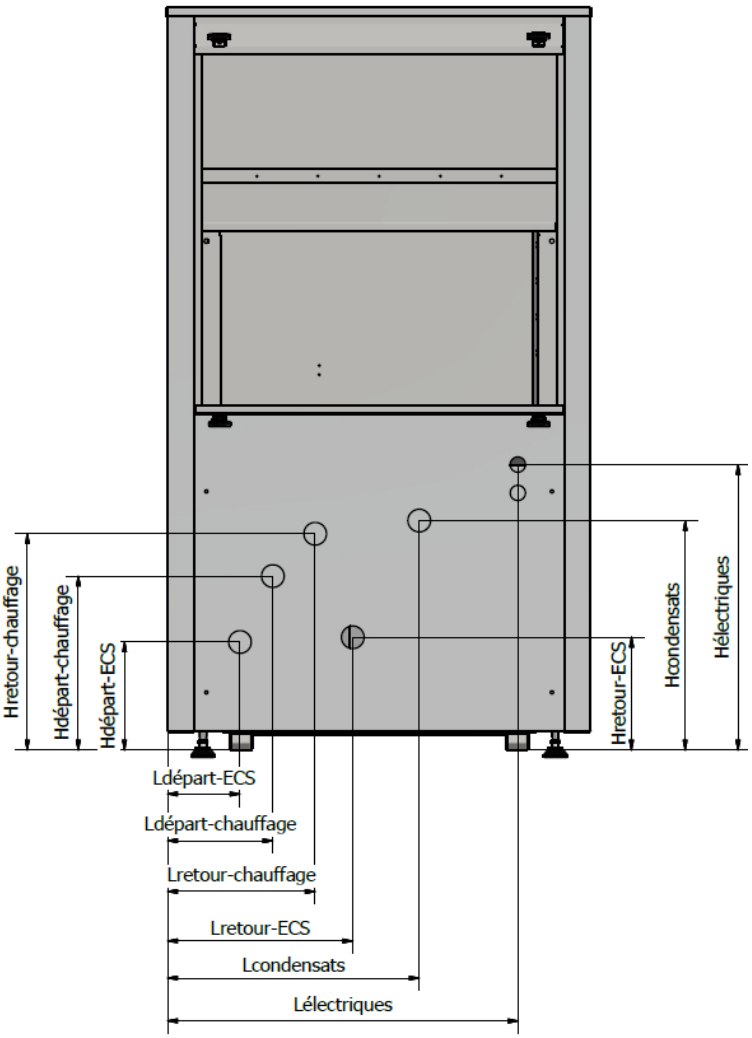




	Distribution	Lcondensates	Hcondensates	LOutlet-DHW	LOutlet-Z1	LOutlet-Z2	LInlet-Z2	LInlet-Z1	LInlet-DHW	Hdistribution
OPTIM'4	1 heating zone	210 mm	356 mm	120 mm	250 mm	/	/	400 mm	460 mm	1110 mm
	2 similar heating zones	210 mm	356 mm	160 mm	220 mm	320 mm	370 mm	420 mm	480 mm	1110 mm
	2 different heating zones	210 mm	356 mm	120 mm	340 mm	260 mm	440 mm	400 mm	490 mm	1110 mm
OPTIM'6	1 heating zone	255 mm	360 mm	130 mm	225 mm	/	/	590 mm	630 mm	1110 mm
	2 similar heating zones	255 mm	360 mm	145 mm	220 mm	320 mm	465 mm	530 mm	595 mm	1110 mm
	2 different heating zones	255 mm	360 mm	160 mm	400 mm	270 mm	530 mm	475 mm	585 mm	1110 mm

Water distribution OPTIM'09M

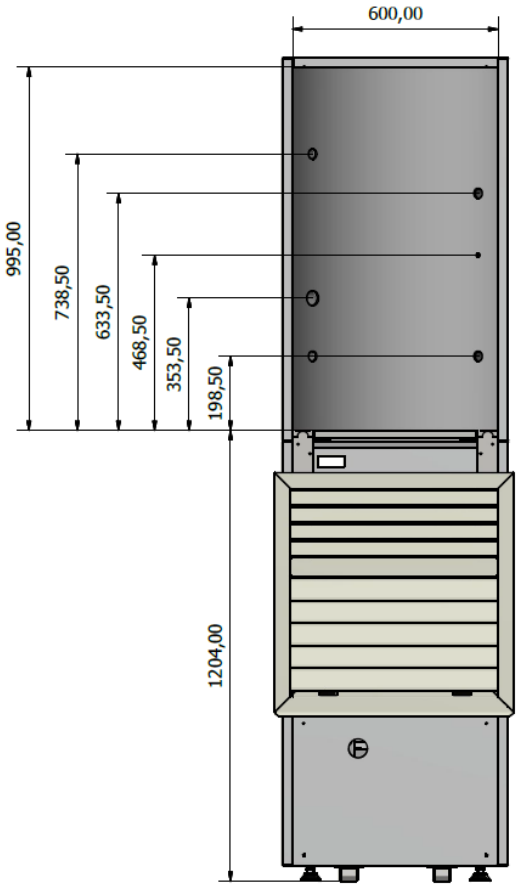




	Lcondensate	Hcondensate	Loutlet-DHW	Houtlet-DHW	Loutlet-heating	Houtlet-heating	Linlet-heating	Hinlet-heating	Linlet-DHW	Hinlet-DHW	Lelectric	Helectric
OPTIM'9	534.5 mm	488 mm	153.5 mm	230 mm	223.5 mm	370 mm	313.5 mm	460 mm	393.5 mm	240 mm	744.5 mm	607 mm

8.3.2 Tank

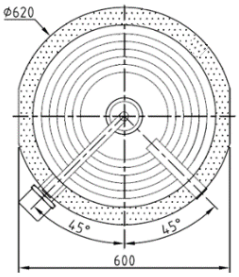
Integrated DHW tank 170L (OPTIM' 4 and 6 kW)

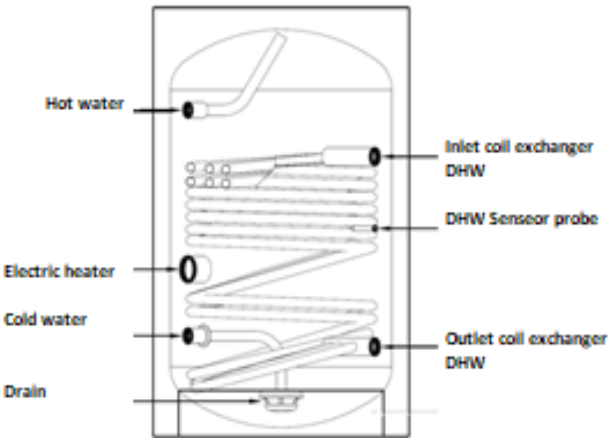


TANK DESCRIPTION		170L DHW
DHW Capacity	l.	170
External Diameter	mm.	600/620
Total Height	mm.	975
Cold water inlet	" F	3/4
DHW outlet	" F	3/4
Primary inlet	" F	1
Primary outlet	" F	1
Option electric back-up heater	" F	1 ½
Coil exchanger surface	m²	2.1
Weight empty approx.	Kg	50
C : Sensor probe for DHW		1

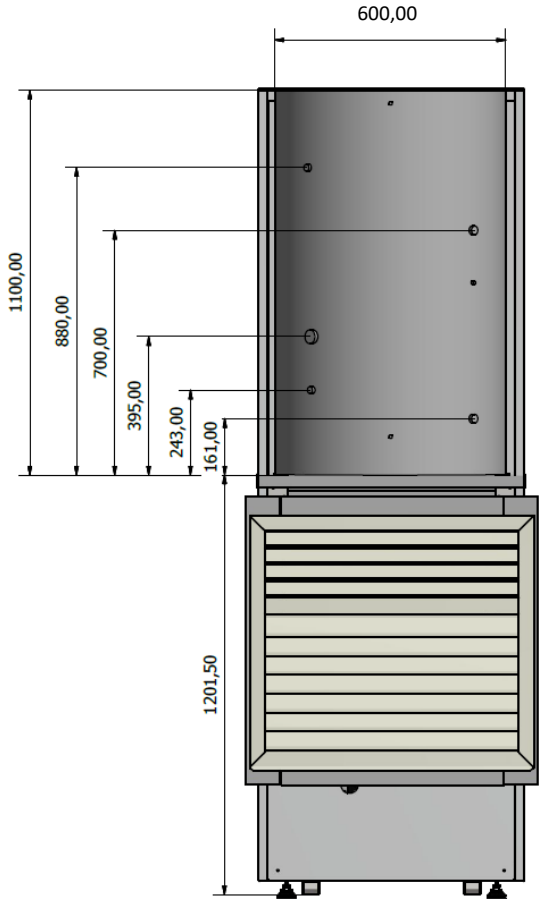
Note :

- Connection position : See below
- Tank without jacket





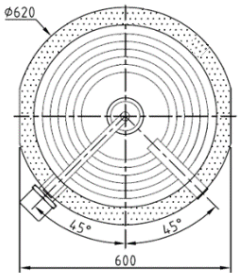
Integrated DHW tank 200L (OPTIM' 4 and 6 kW)

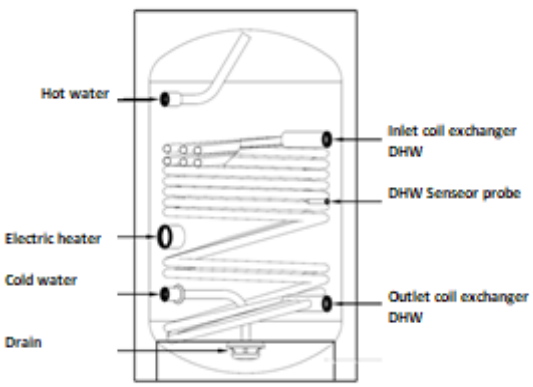


TANK DESCRIPTION		200L DHW
DHW Capacity	l.	200
External Diameter	mm.	620
Total Height	mm.	1 100
Cold water inlet	" F	3/4
DHW outlet	" F	3/4
Primary inlet	" F	1
Primary outlet	" F	1
Option electric back-up heater	" F	1 ½
Coil exchanger surface	m²	2.1
Weight empty approx.	Kg	85
C: Sensor probe for DHW		1

Note :

- Connection position : See below
- Tank without jacket





Separated DHW tanks 170L, 200L et 300L

TANK DESCRIPTION		170L	200L	300L
DHW Capacity	l.	170	200	300
External Diameter	mm.	620	620	620
Total Height	mm.	975	1100	1615
Cold water inlet	″ F	3/4	3/4	3/4
DHW outlet	″ F	3/4	3/4	3/4
Primary inlet	″ F	1	1	1
Primary outlet	″ F	1	1	1
Option electric back-up heater	″ F	1 ½	1 ½	1 ½
Coil exchanger surface	m^2	2.1	2.5	3.1
Weight empty approx.	Kg	75	85	95
C : Sensor probe for DHW		1	1	1

Example of a 200L tank with an integrated distribution water kit:

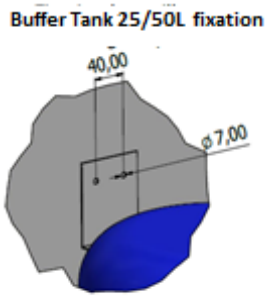
Mixing bottle

Model 25/50 L

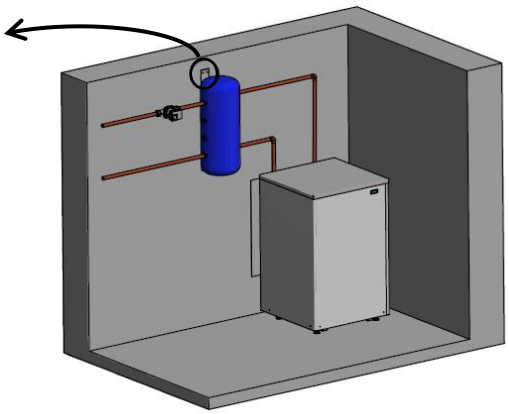
Buffer tank

Model 80 L

Mixing bottle		Wall model 25L	Wall model 50 L	Wall model 80 L
Capacity	l.	25	50	80
Total Height	mm.	788	1000	750
External diameter total	mm.	290	343	480
Inlet spacing	mm.	150	200	145
Number of inlet per side		4	4	4
Diameter inlet	" GAS/F	1 " 1/4	1 " 1/4	1 " 1/4



Installation example:
OPTIM'6 with mixing bottle



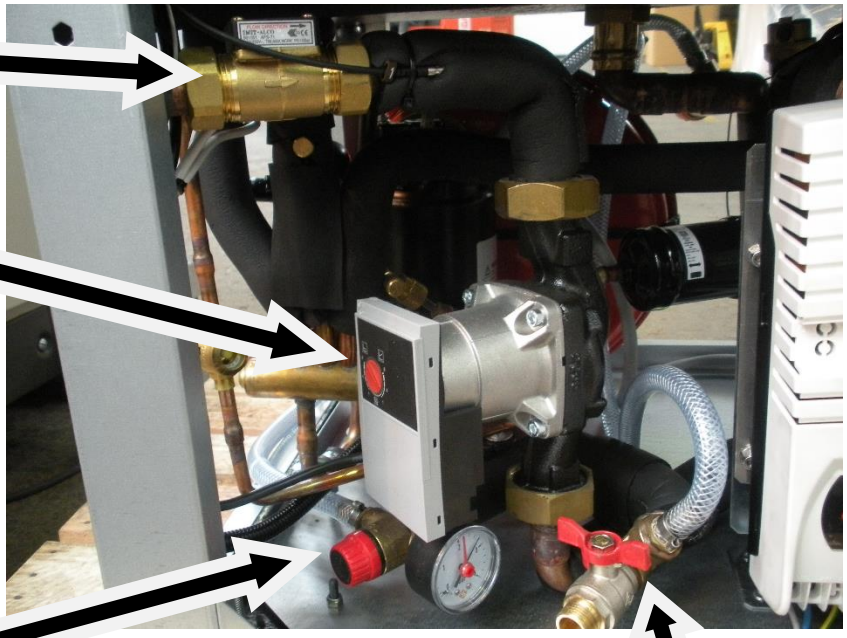
The mixing bottles are installed on the wall by mounting brackets

8.3.3 Hydraulic Connections

Hydraulic connections to the OPTIM' 4 and 6kW

Flow controler

Class A water pump (Maxi pressure available 35 kPa mini at the nominal water flow > see pump curves on page 56)

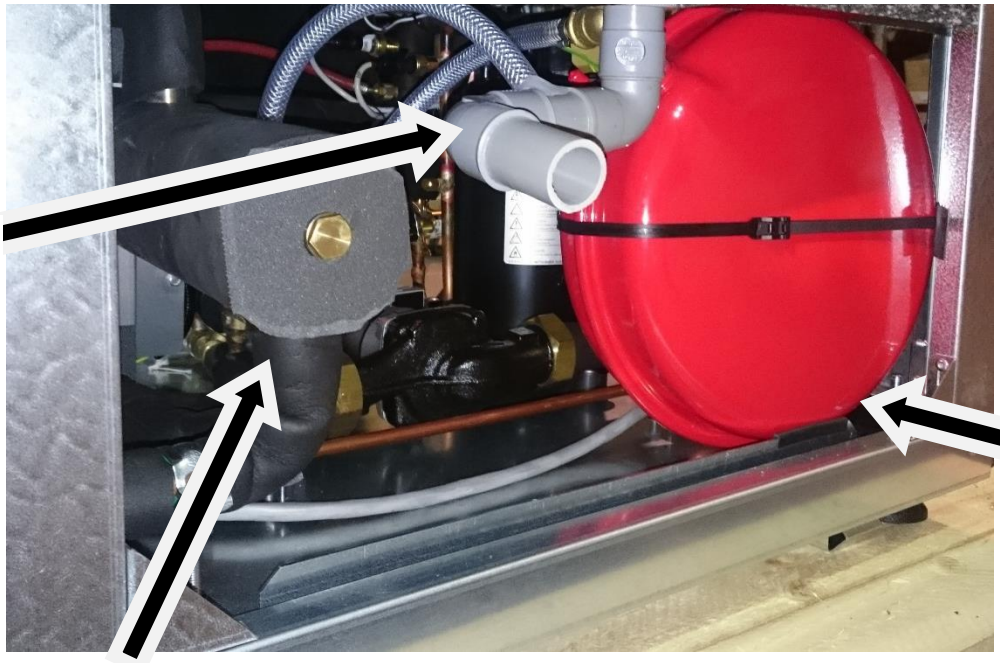


Manometer + safety valve 3 bars connected to the condensates evacuation

Drain or filling cock (3/4''M)

Caution: Mandatory, to verify that the ASHP water pump power is enough for the whole installation (especially if it is a renovation project or a heated ceiling). On demand, we can replace the water pump by a most powerful one (in option).

Condensate outlet
+
Safety 3 bars valve
(Diameter 32 mm PVC)



Heating expansion vessel 6 liters

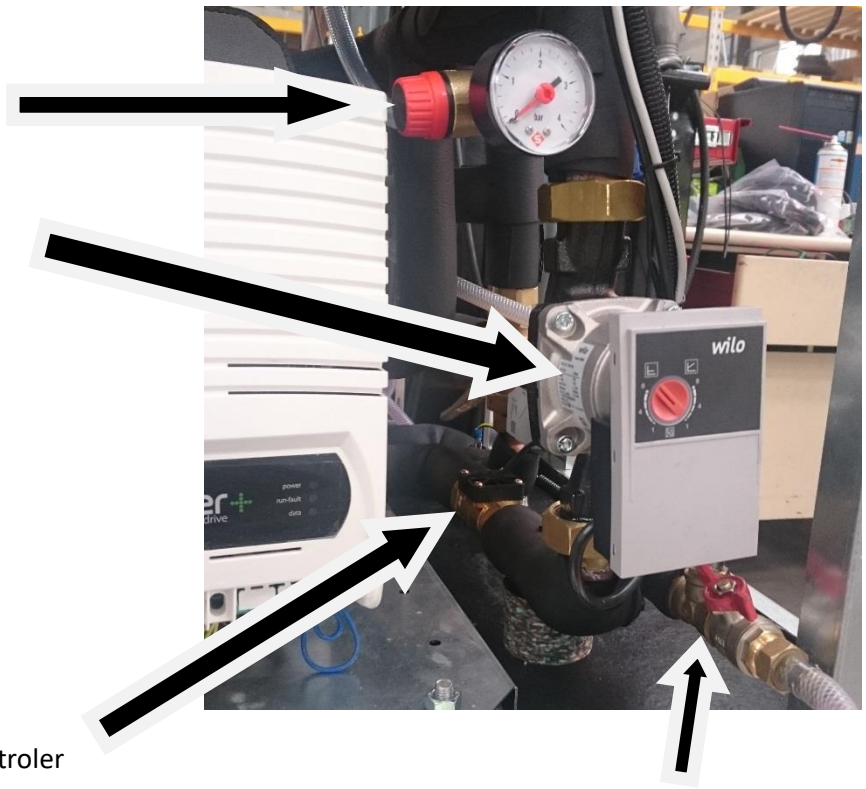
Electric back-up heater 3 kW. Can be by-passed (Mandatory except if other back-up energy)

Caution: Please verify that the expansion vessel capacity is on accordance with the installation (especially if for renovation project)

Hydraulic connections OPTIM 9kW

Manometer + Safety 3 bars valve connected to the condensates evacuation

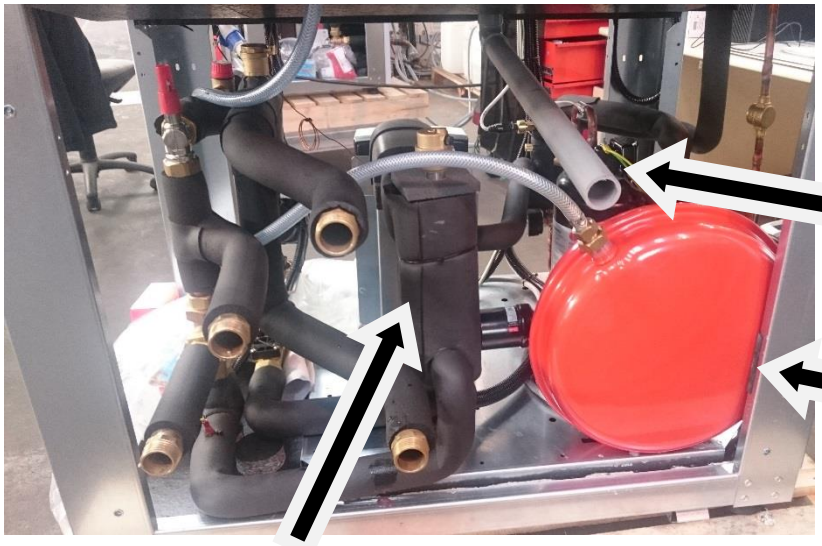
Classe A water pump Maxi pressure available 35 kPa mini at the nominal water flow > see pump curves on page 56)



Flow controler

Drain or filling cock (3/4''M)

Caution: Please verify that the expansion vessel capacity is on accordance with the installation (especially for renovation project)



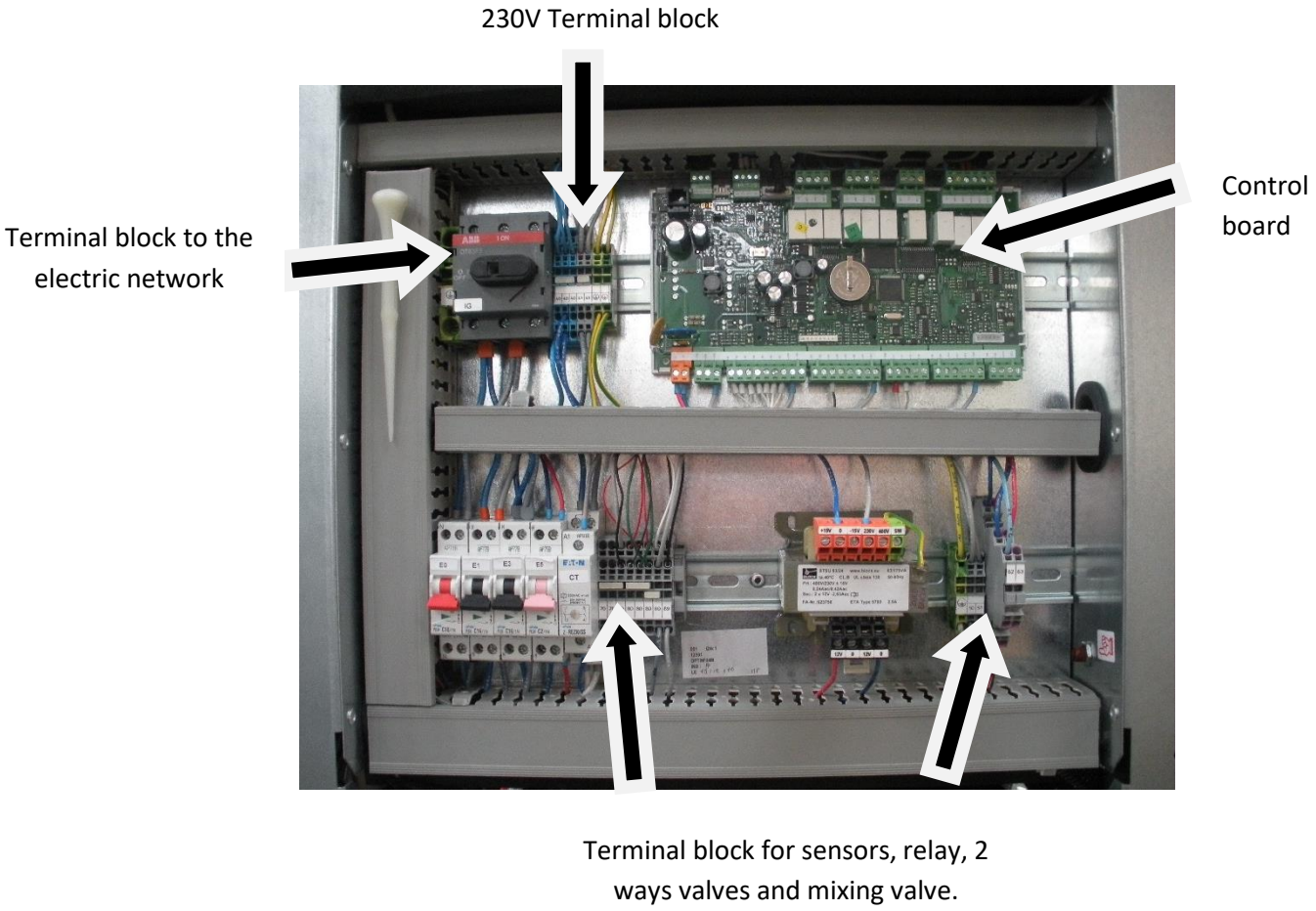
Condensates outlet + Safety 3 bars valve (Diamètre 32 mm PVC)

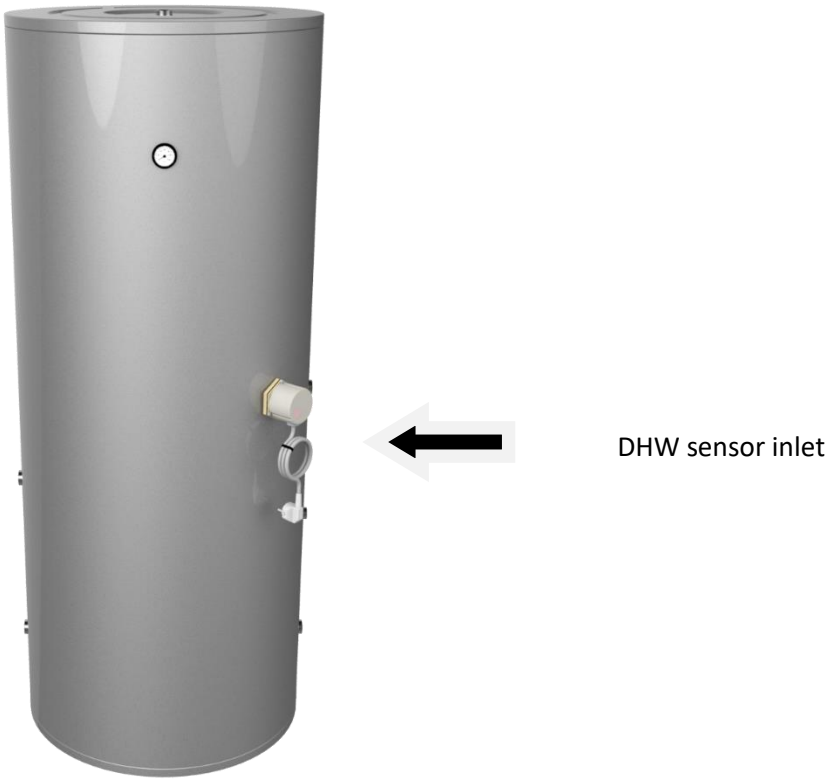
Expansion vessel 6 liters

Electric back-up heater 3 kW can be by-passed (Mandatory except if other back-up energy)

Caution : Please verify that the expansion vessel capacity is on accordance with the installation (especially for renovation project).

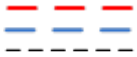
8.3.4 Electrical connections





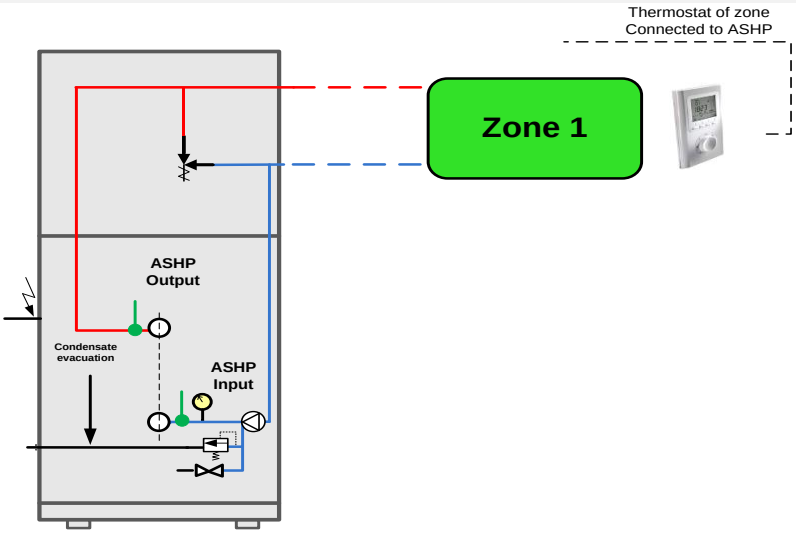
9 HYDRAULIC SKETCHS OPTIM'

Symbols :

Motorized 3 ways valve		**Security Unit**	
Manometer		**Temperature sensor**	
Water pump		**Safety valve**	
Drain cock		**Vanne 2 voies motorisée**	
Differential pressure valve		**Under customer responsibility**	

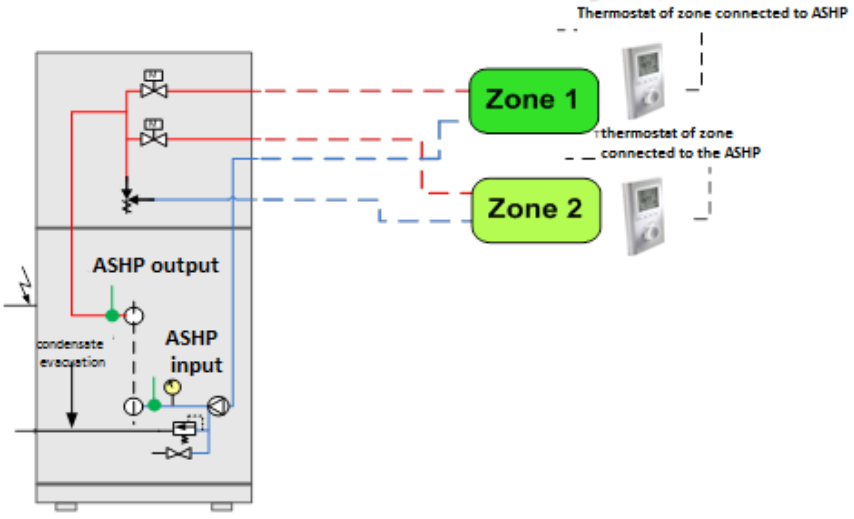
9.1 HYDRAULIC SKETCHS OPTIM' 4 et 6kW

9.1.1 OPTIM' heating only with 1 zone direct, not mixed with safety valve (C-DSZ1)



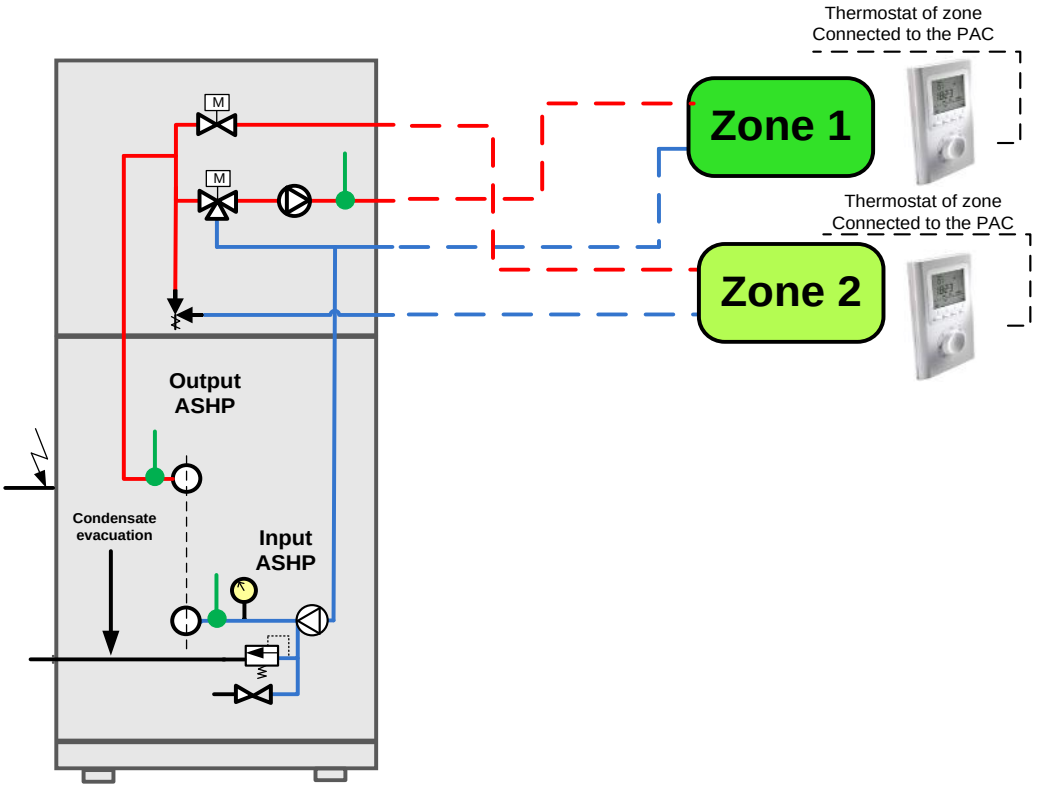
Technical conditions: 1 zone + electric heater mandatory.

9.1.2 OPTIM' heating only with 2 zones similar direct not mixed with valve (C-DSZ1Z2)



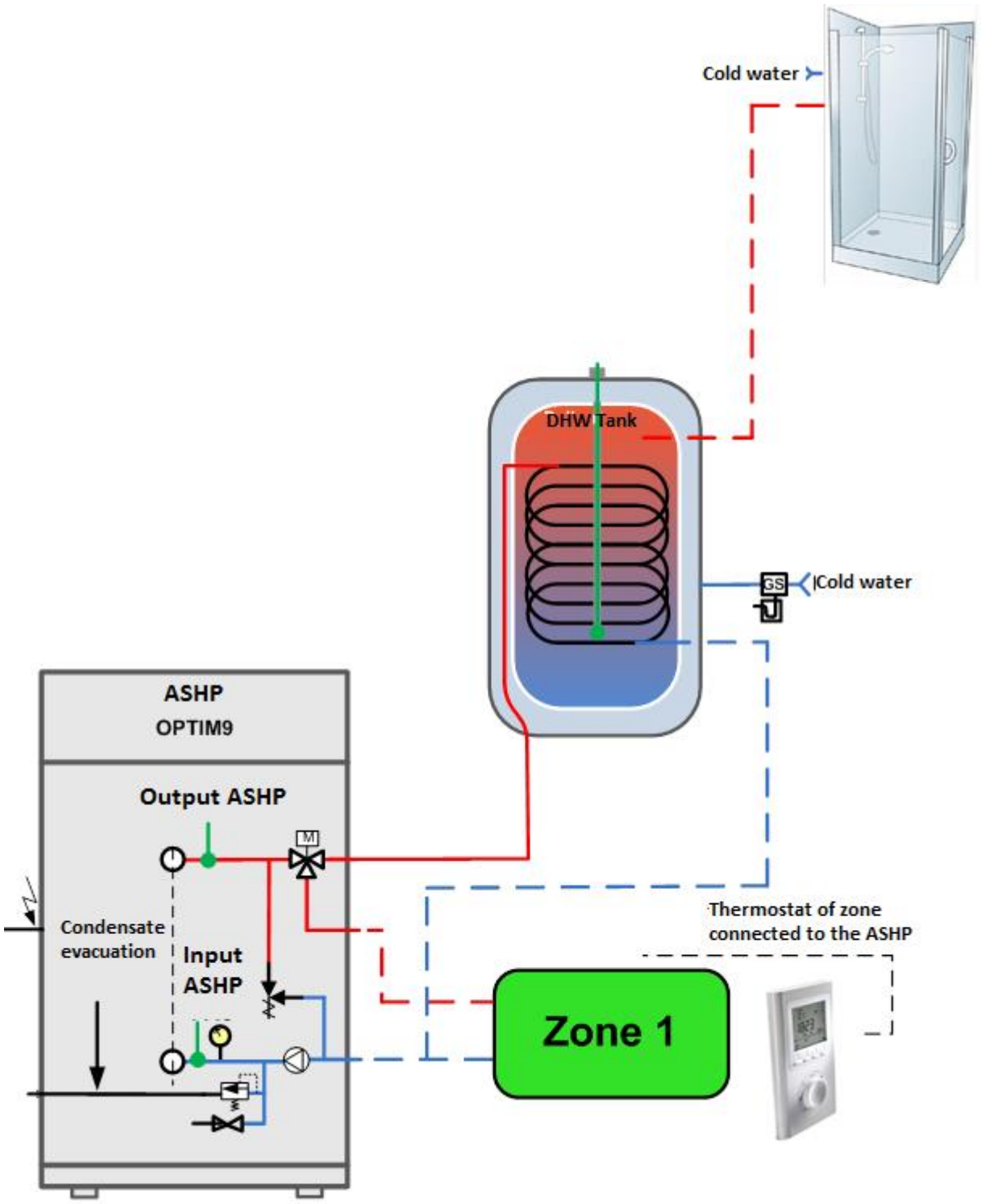
Technical conditions: 2 zones, same output temperature + electric back-up heater mandatory.

9.1.3 OPTIM' heating only with 2 zones direct of which one mixed with valve (C-DSZ1MZ2)



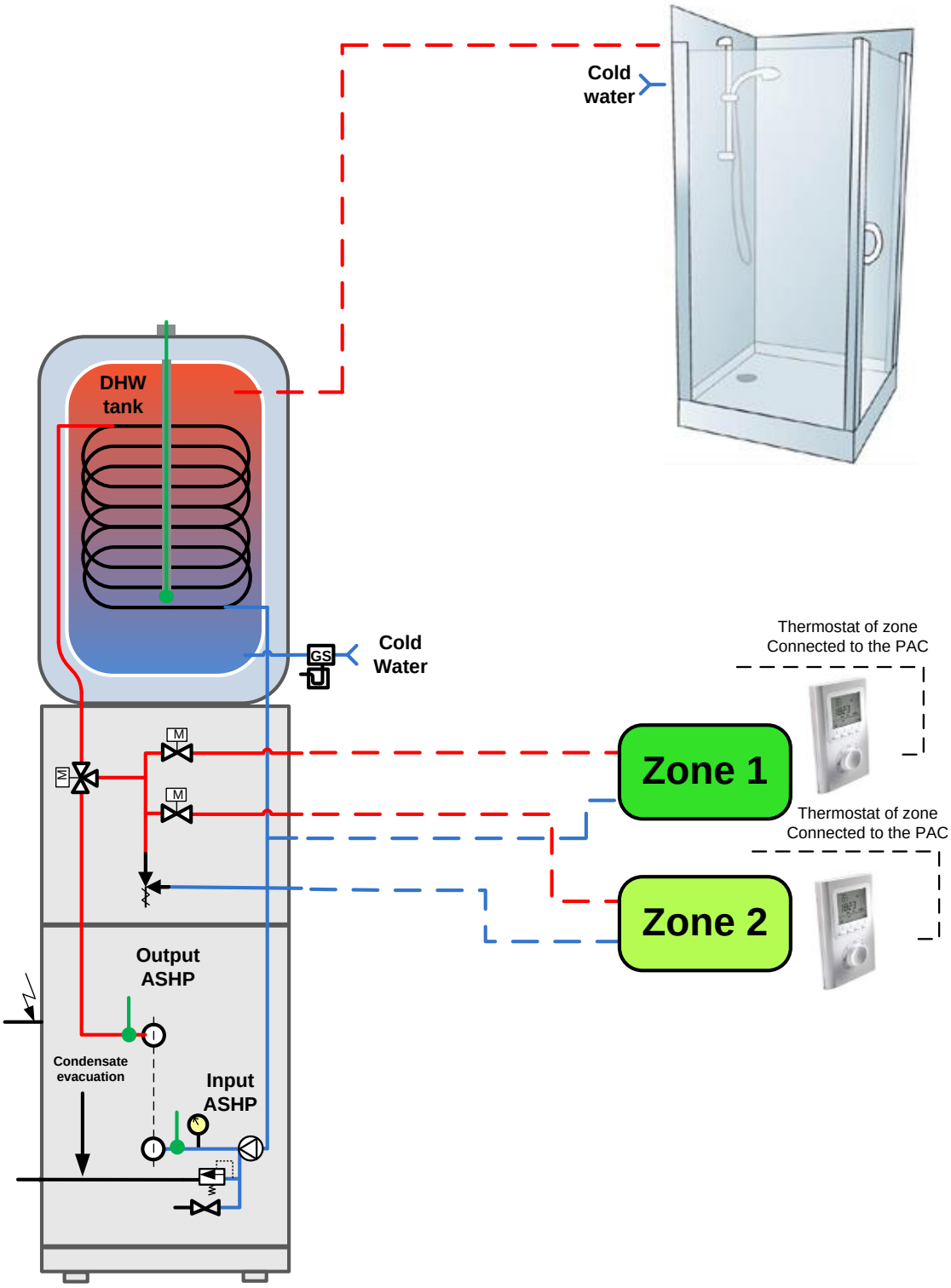
Technical condition: 2 zones with different output temperature + electric back-up heater mandatory.

9.1.4 OPTIM'DUO tank intégré avec 1 zone direct avec soupape (D-DSZ1)



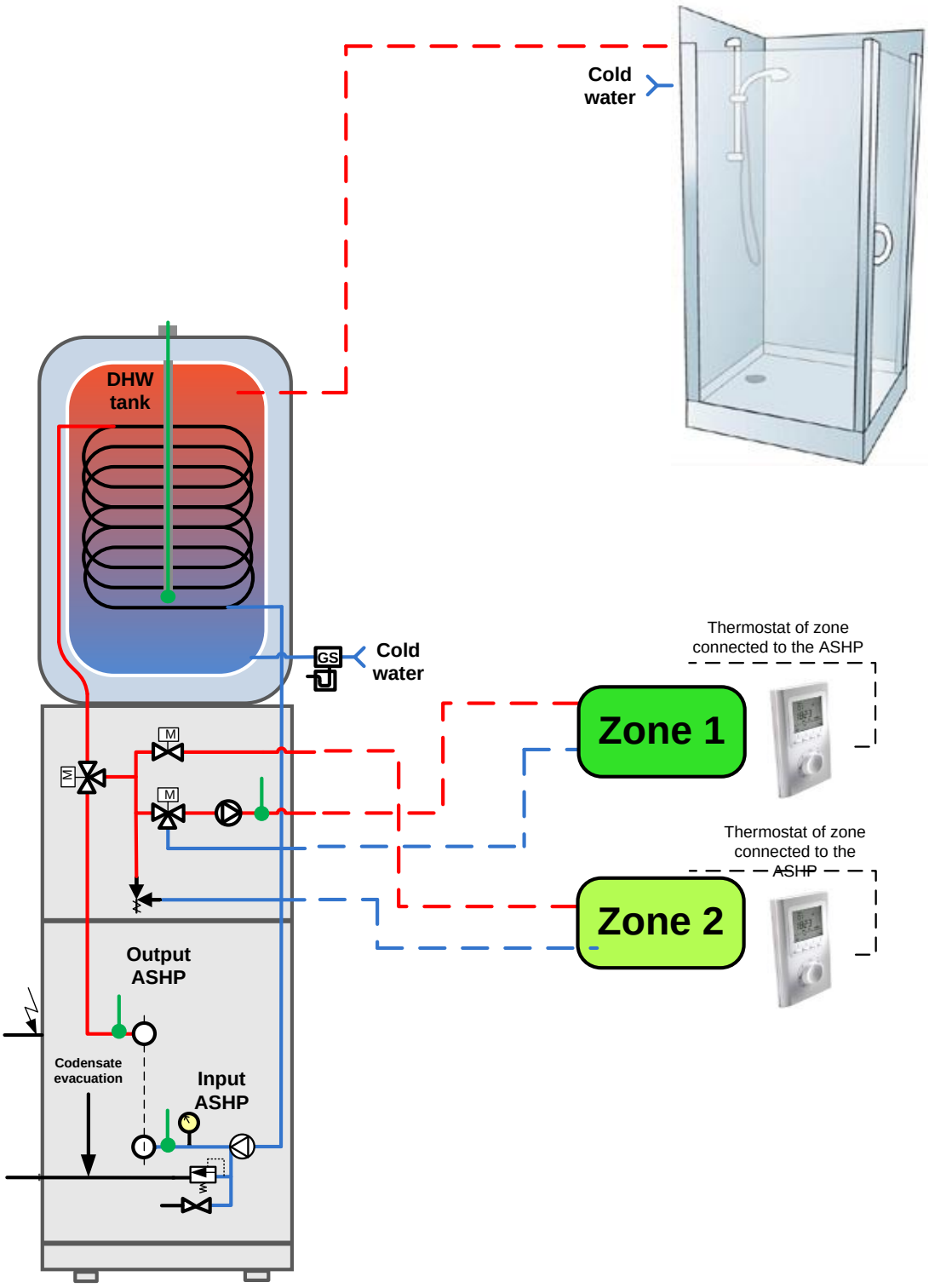
Technical condition: 1 zone.

9.1.5 OPTIM'DUO integrated tank with 2 zones direct with valve (D-DSZ1Z2)



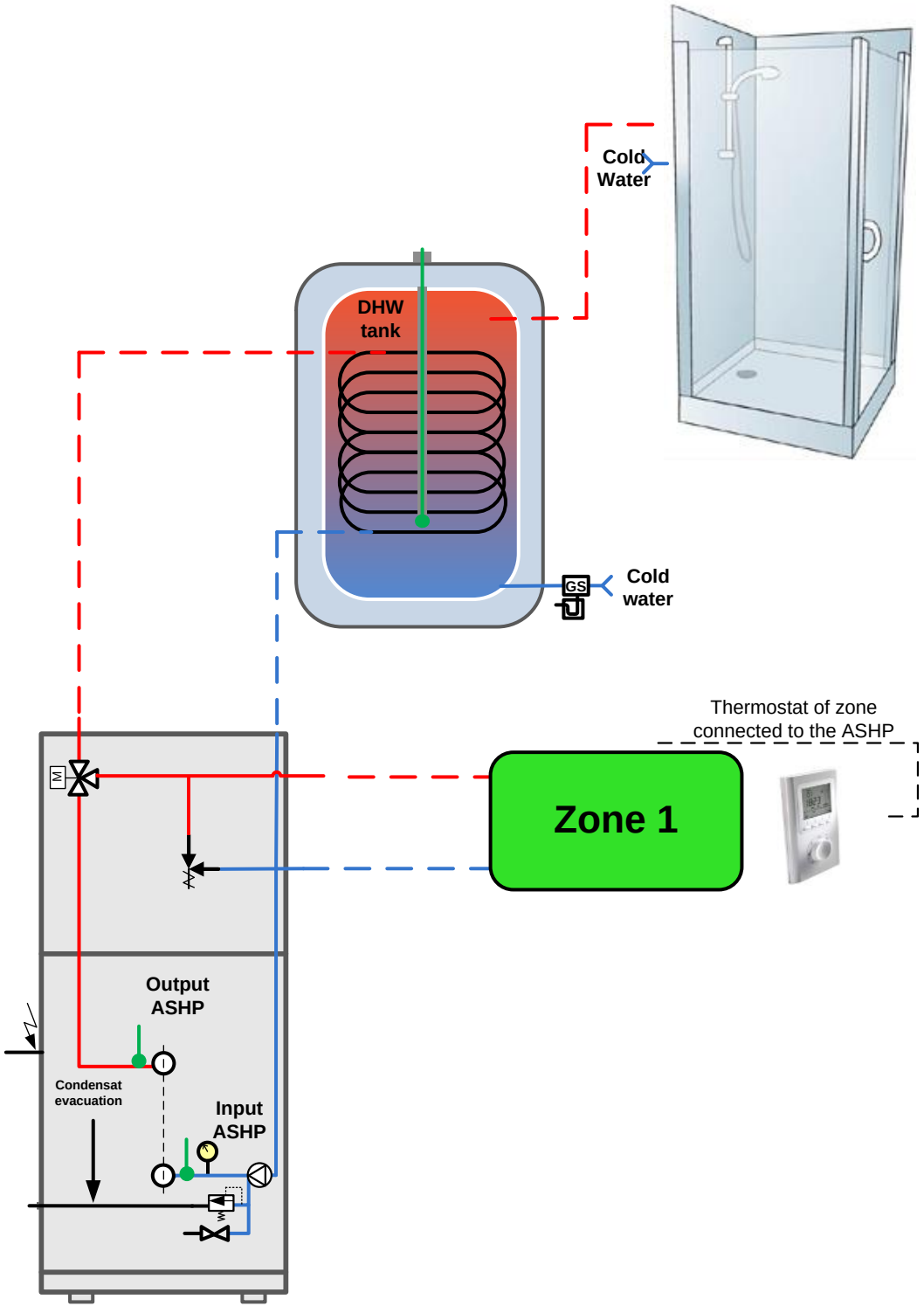
Technical condition: 2 zones same output temperature.

9.1.6 OPTIM'DUO integrated tank with 2 zones direct which one mixed with valve (D-DSZ1MZ2)



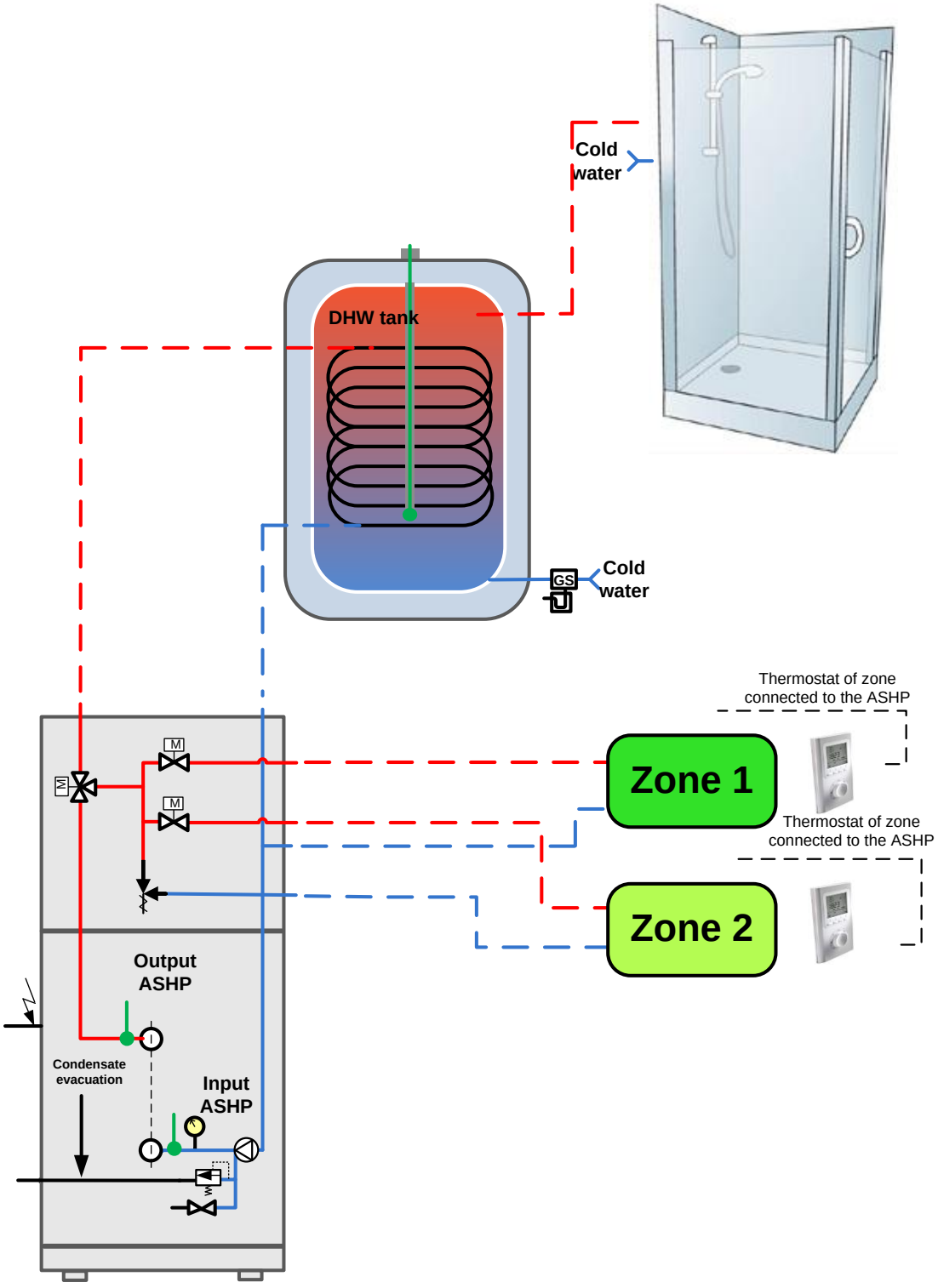
Technical condition: 2 zones different output temperatures (Z1 = mixed zone = lowest zone for heating temperature).

9.1.7 OPTIM'DUO separated tank with 1 zone direct with valve (D-DSZ1)



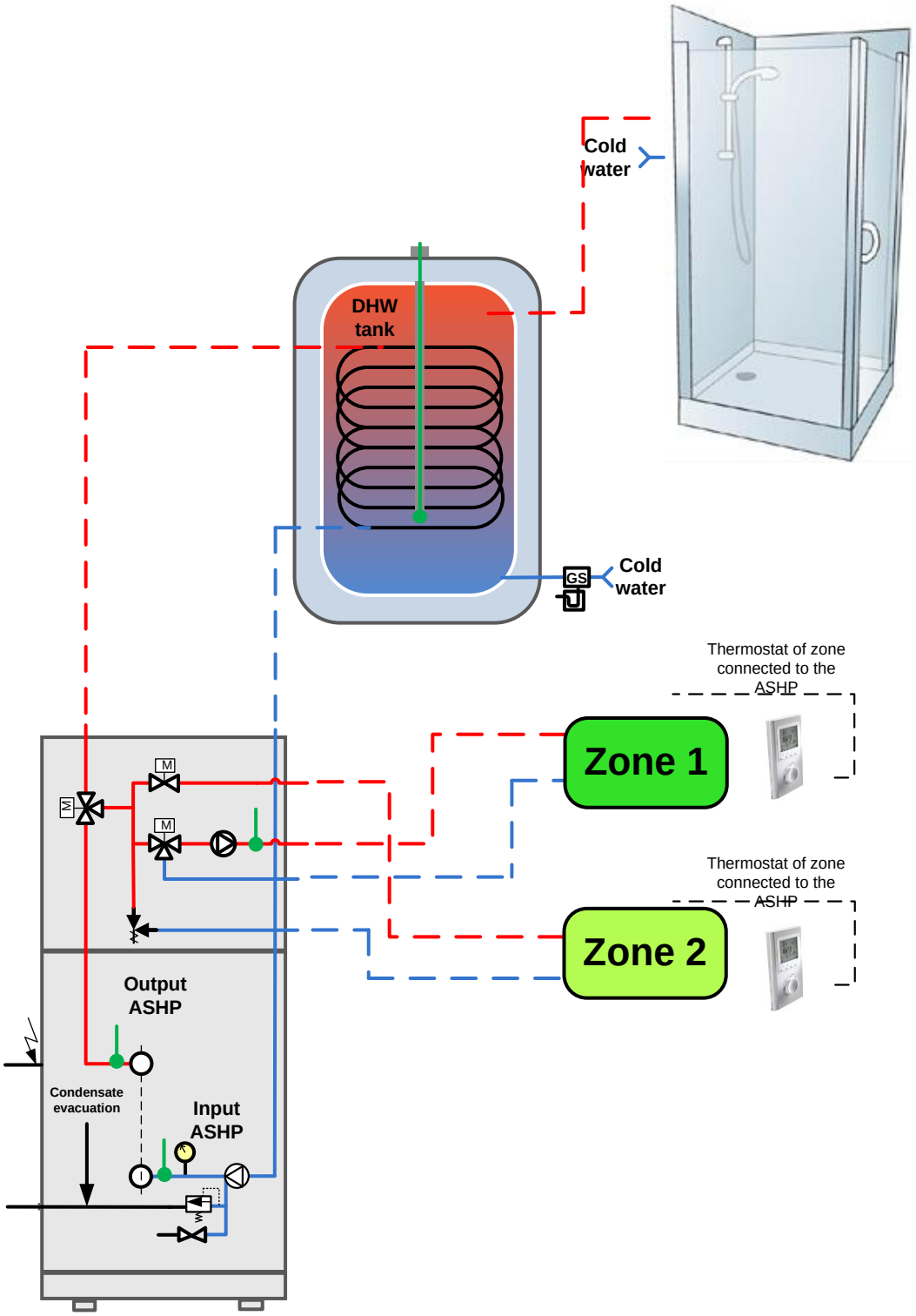
Technical condition: 1 zone.

9.1.8 OPTIM'DUO separated tank with 2 zones direct with valve (D-DSZ1Z2)



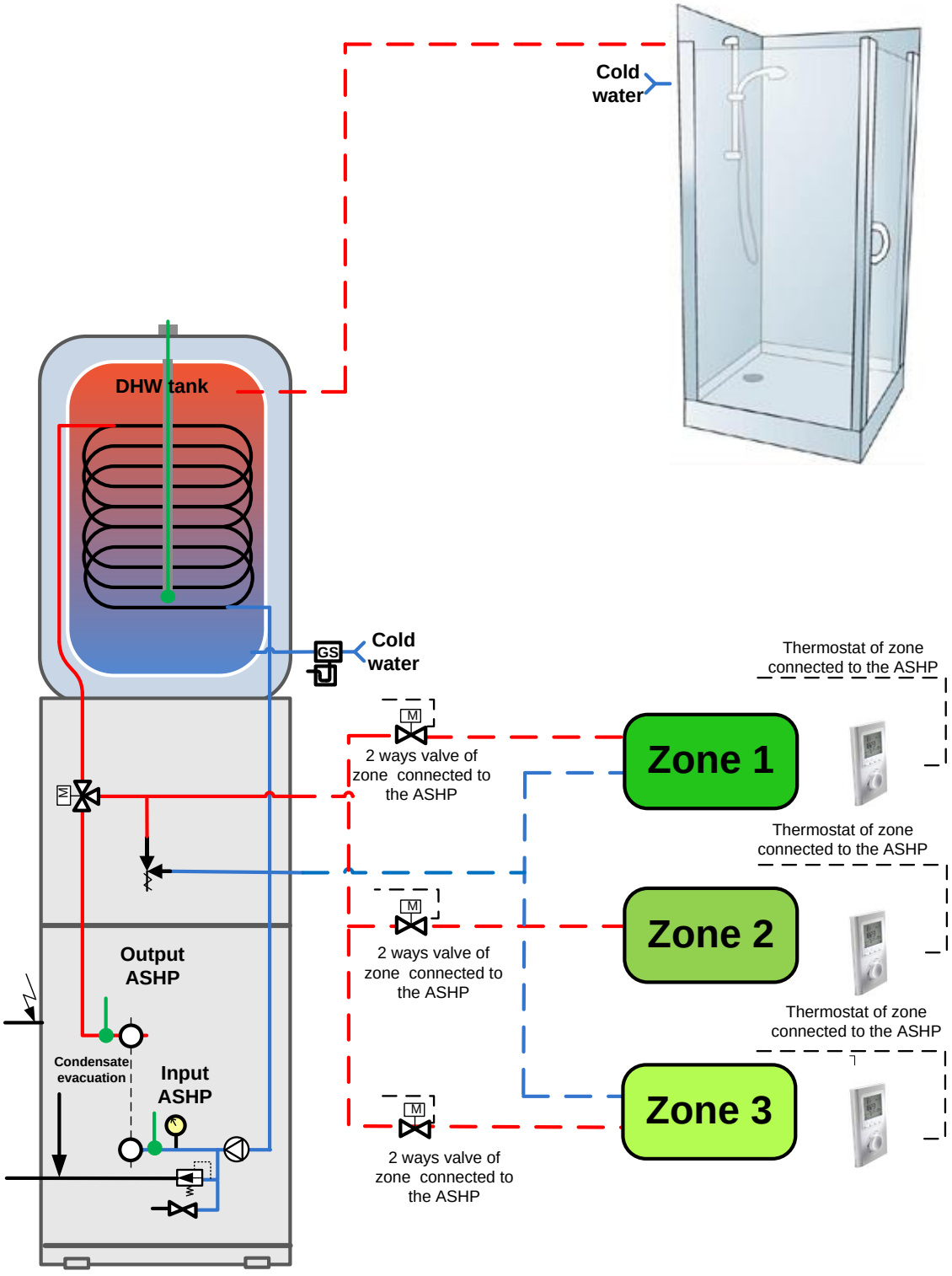
Technical condition: 2 zones with same output temperature

9.1.9 OPTIM'DUO separated tank with 2 zones directs which one mixed with valve (D-DSZ1MZ2)



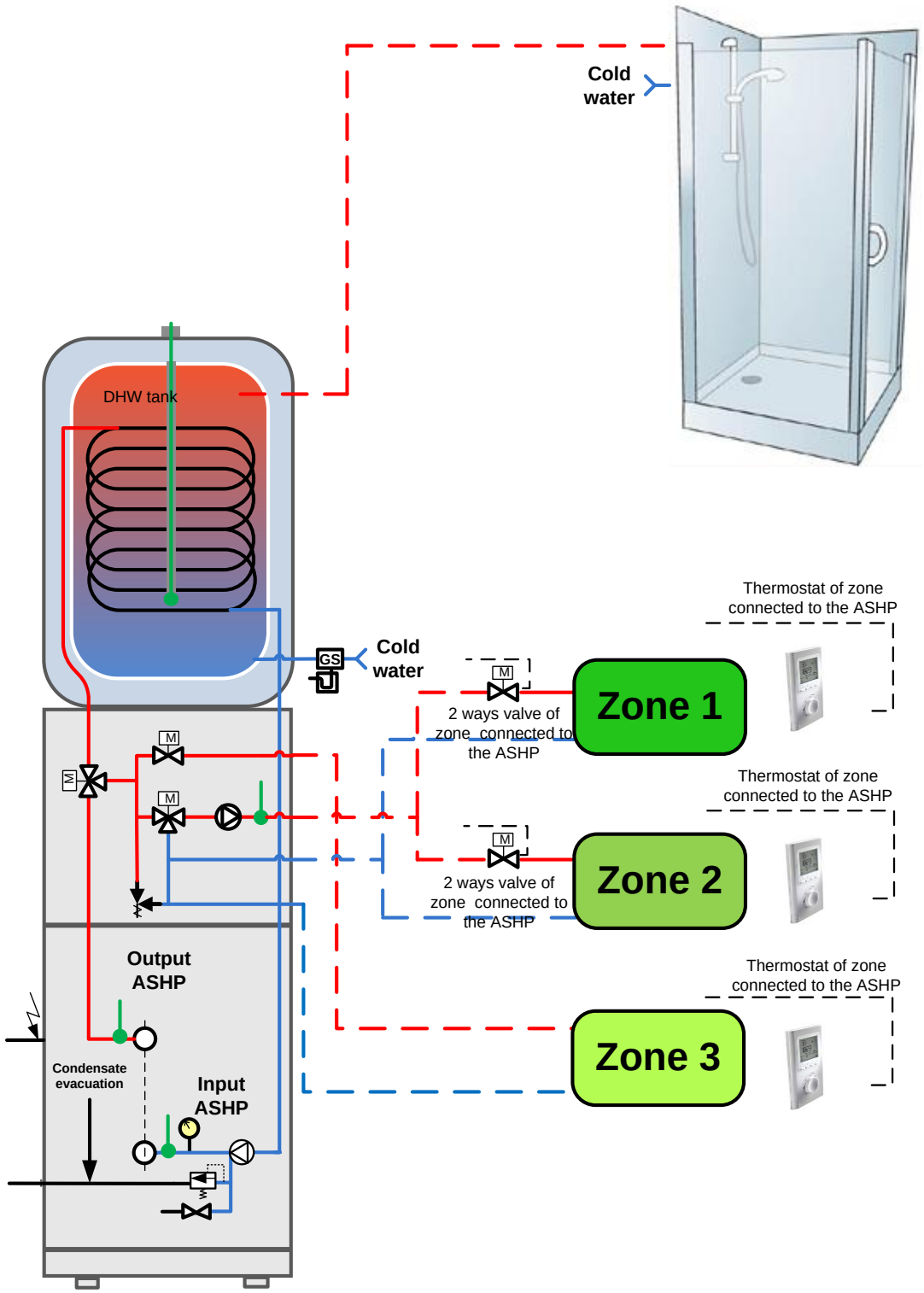
Technical condition: 2 zones with different output temperatures (Z1 = mixed zone = zone with the lowest heating temperature).

9.1.10 OPTIM'DUO Intergrated tank with 3 zones and similar emitters(D-DSZ1 + 3 additionnal kits)



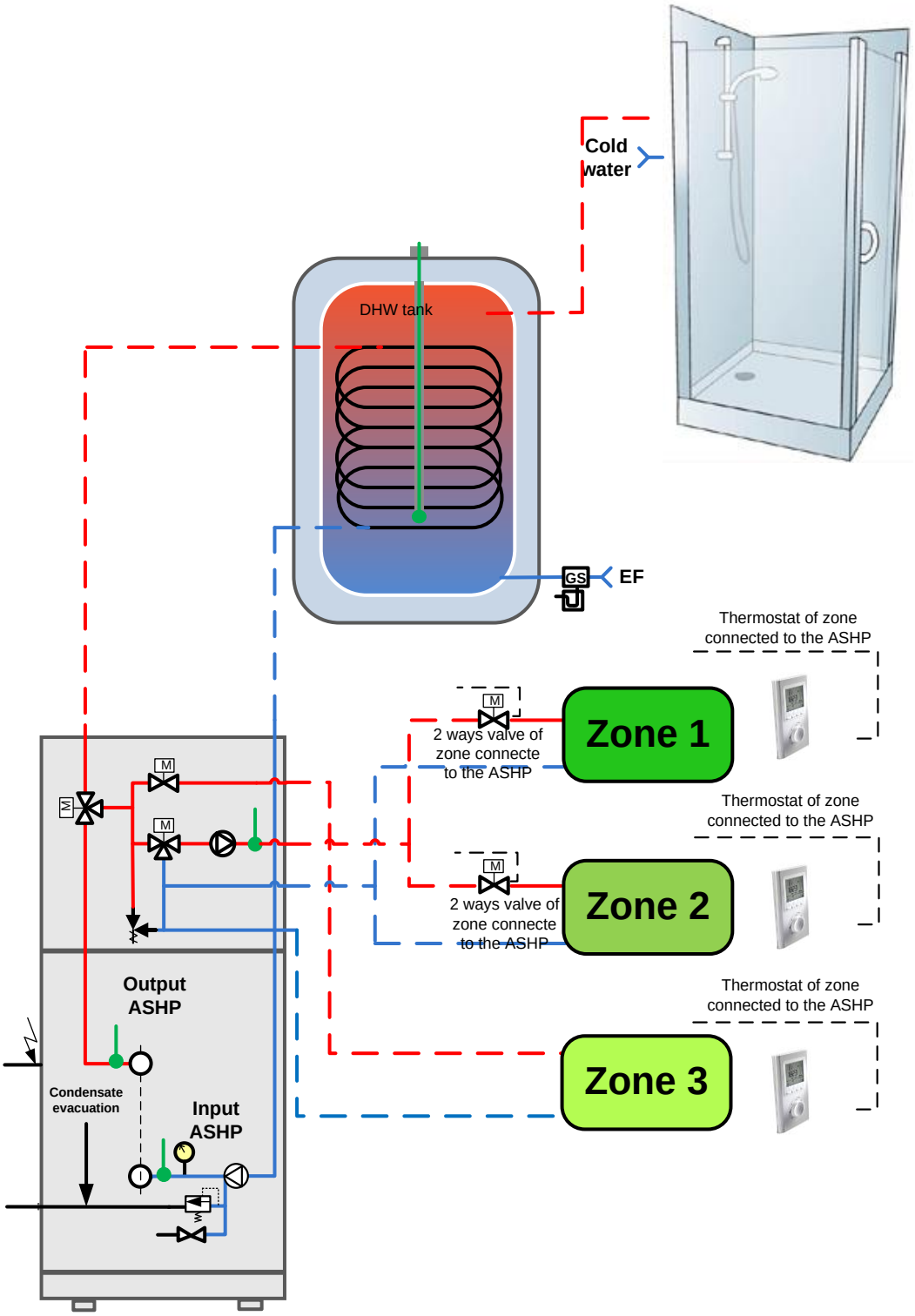
Technical condition: 3 zones with same output temperature.

9.1.11 OPTIM'DUO Integrated tank with 3 zones and 2 different types of emitters (D-DSZ1MZ2 + 2 kits complémentaires)

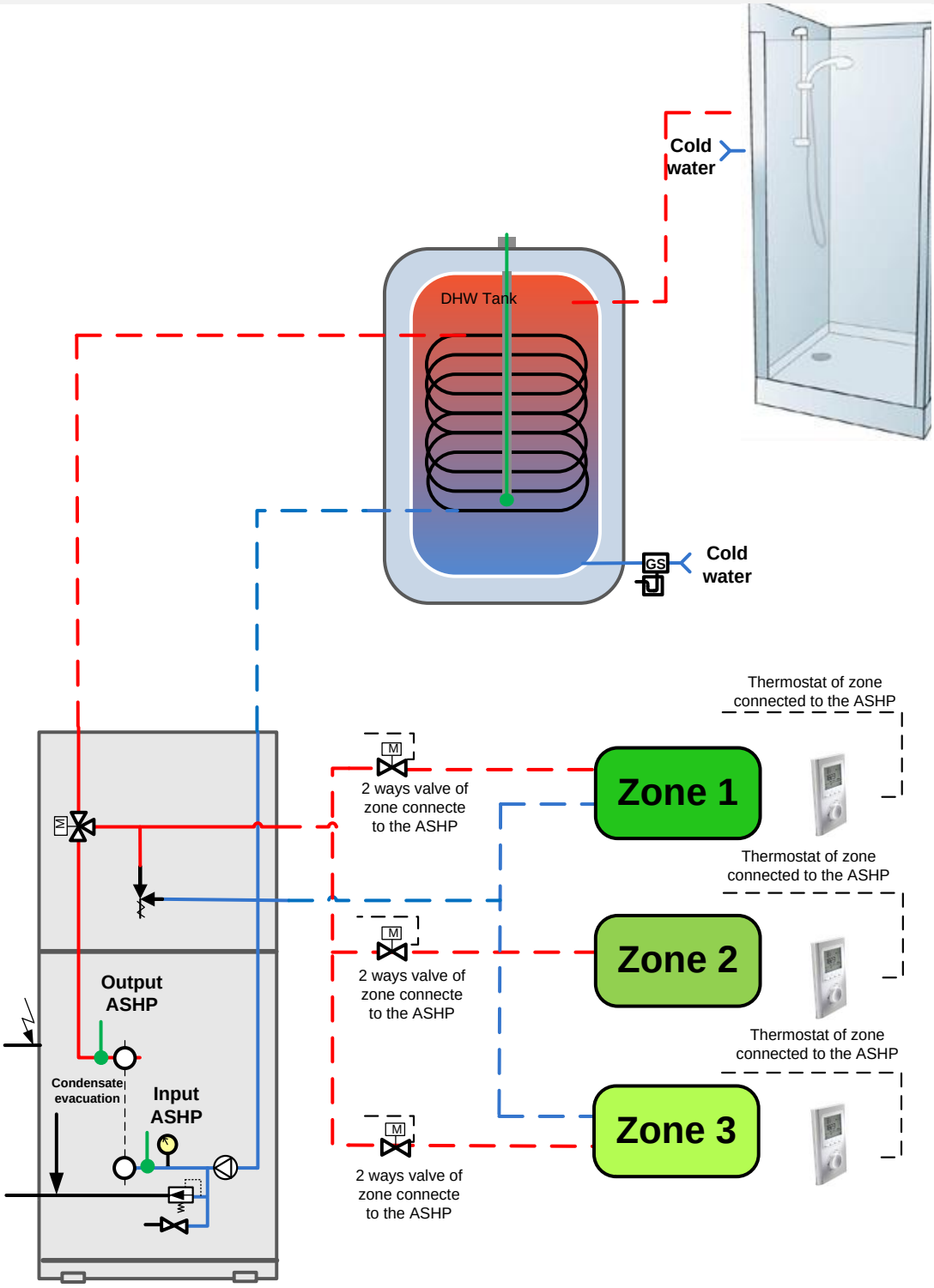


Technical condition: 3 zones with the same temperature.

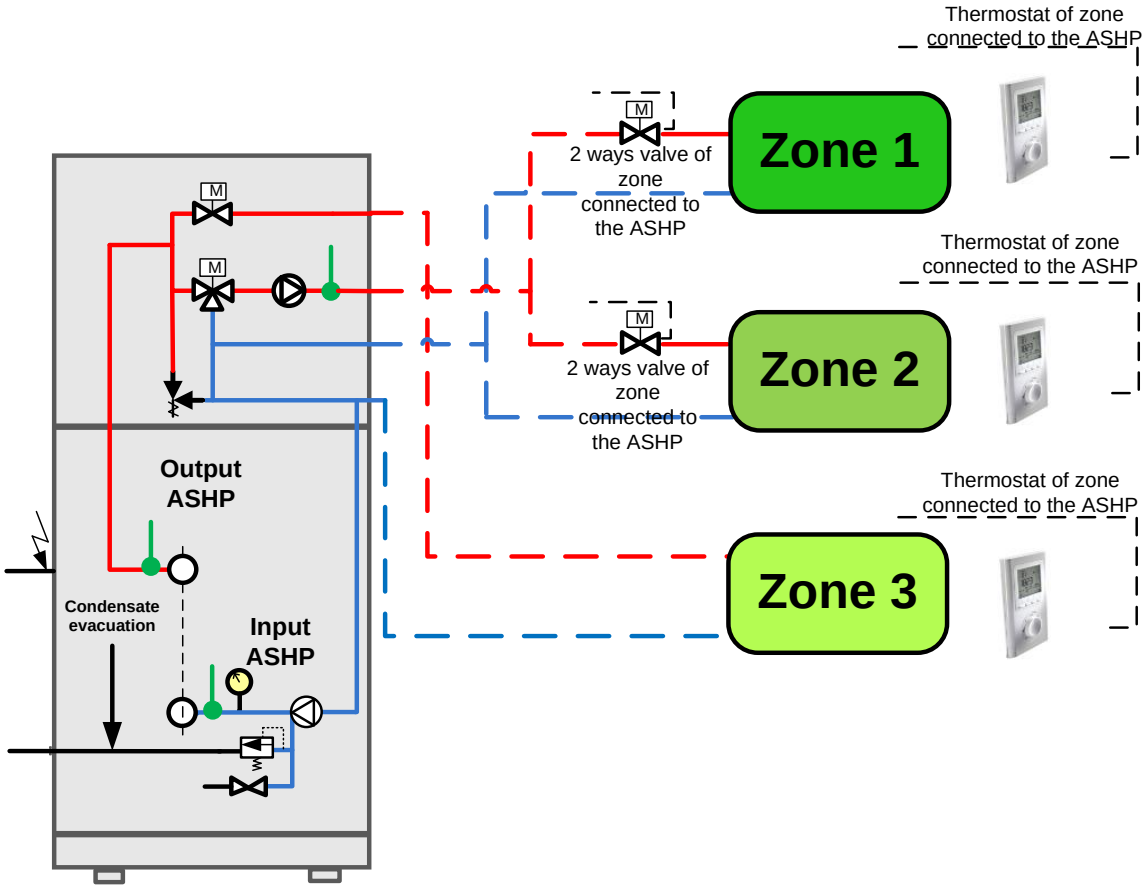
9.1.12 OPTIM'DUO separated tank divided in 3 zones and 2 different types of emitters (D-DSZ1MZ2 + 2 additionnal kits)



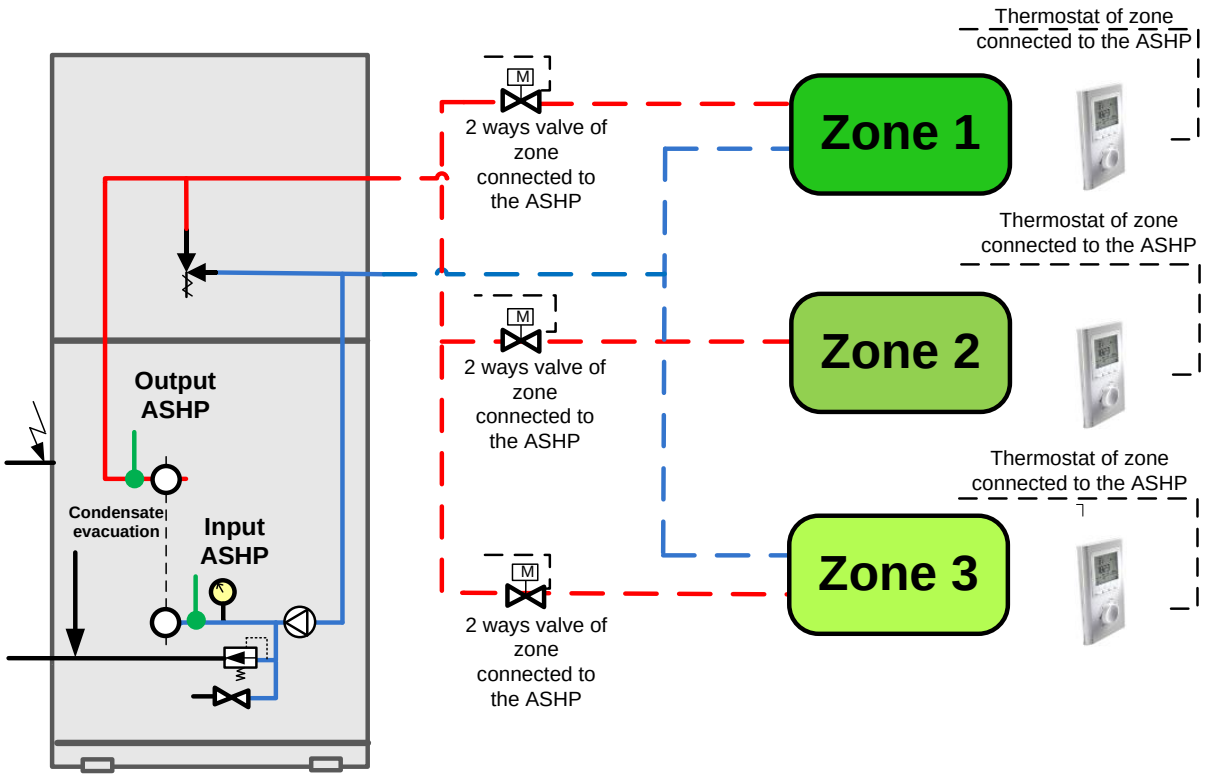
9.1.13 OPTIM'DUO separated tank 3 zones and 2 similar emitters (D-DSZ1 + 3 additionnal kits)



9.1.14 OPTIM' with 3 zones and 2 different types of emitters(C-DSZ1MZ2 + 2 kits complémentaires)

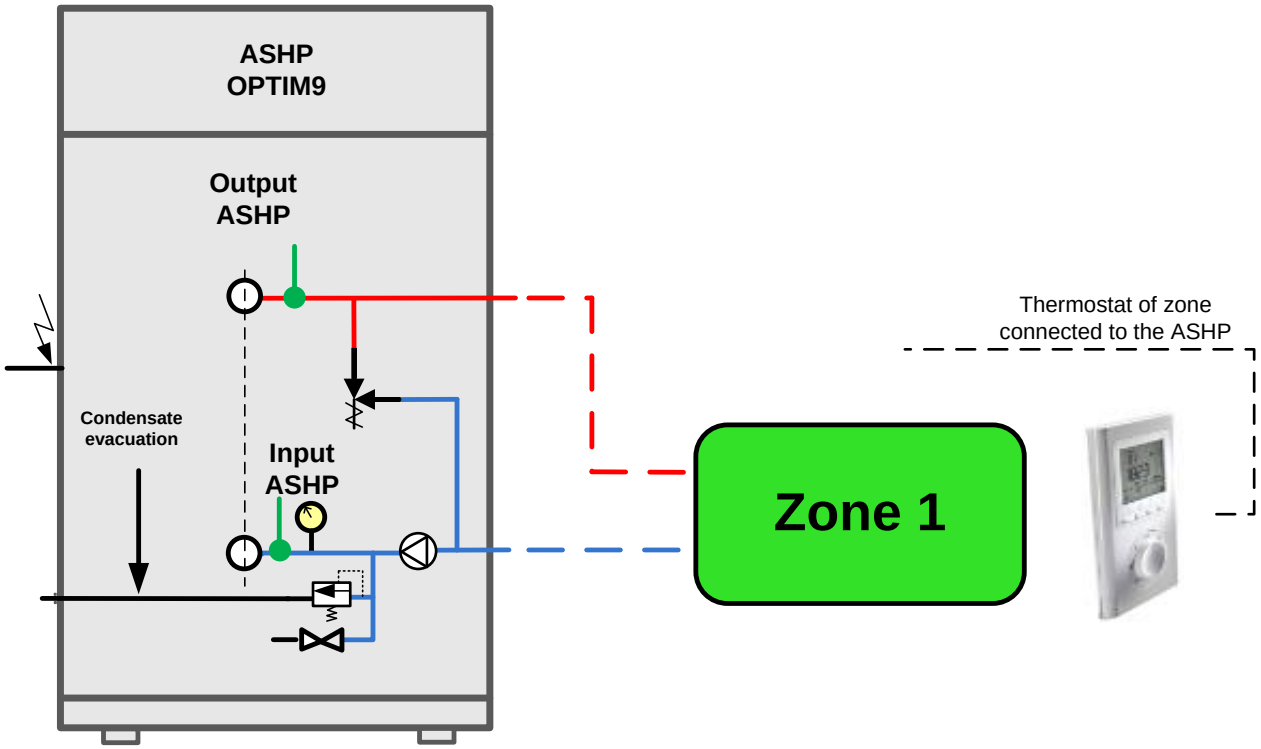


9.1.15 OPTIM' with 3 zones and similar emitters (C-DSZ1 + 3 additionnal kits)

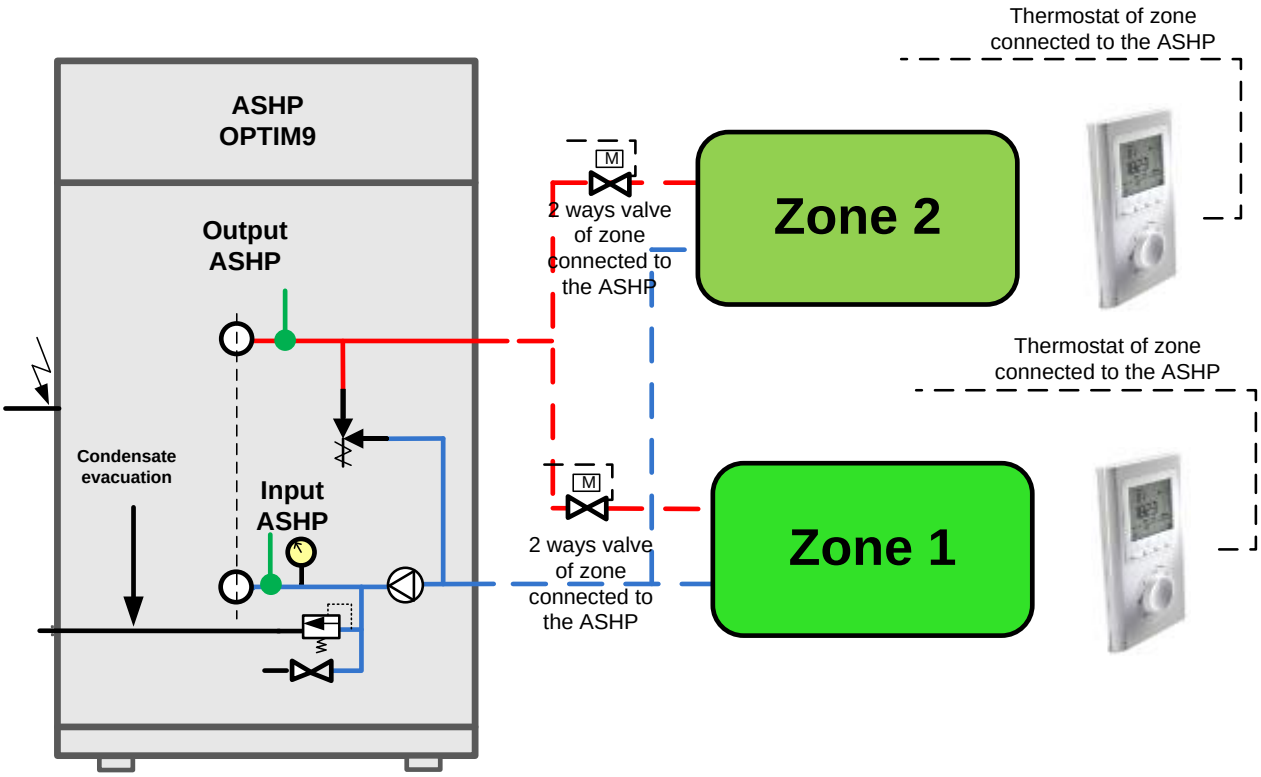


9.2 HYDRAULIC SKETCHS OPTIM' 9kW

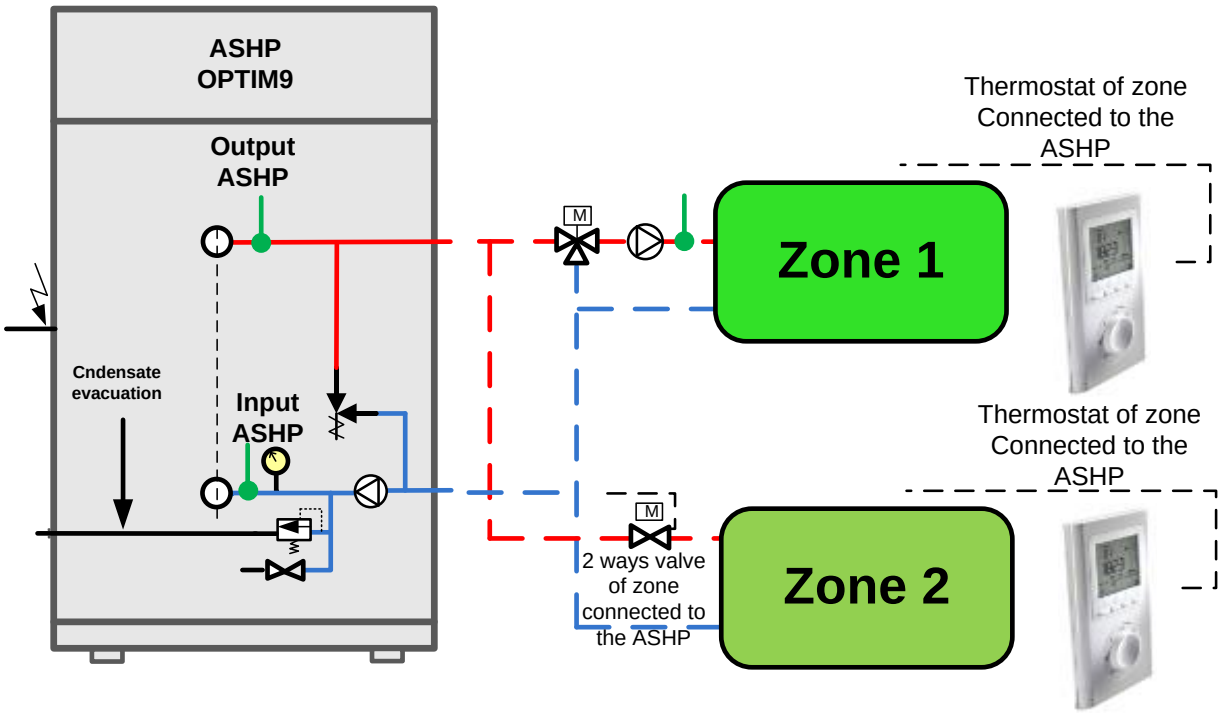
9.2.1 OPTIM' Heating only 1 zone direct not mixed with valve(DSZ1)



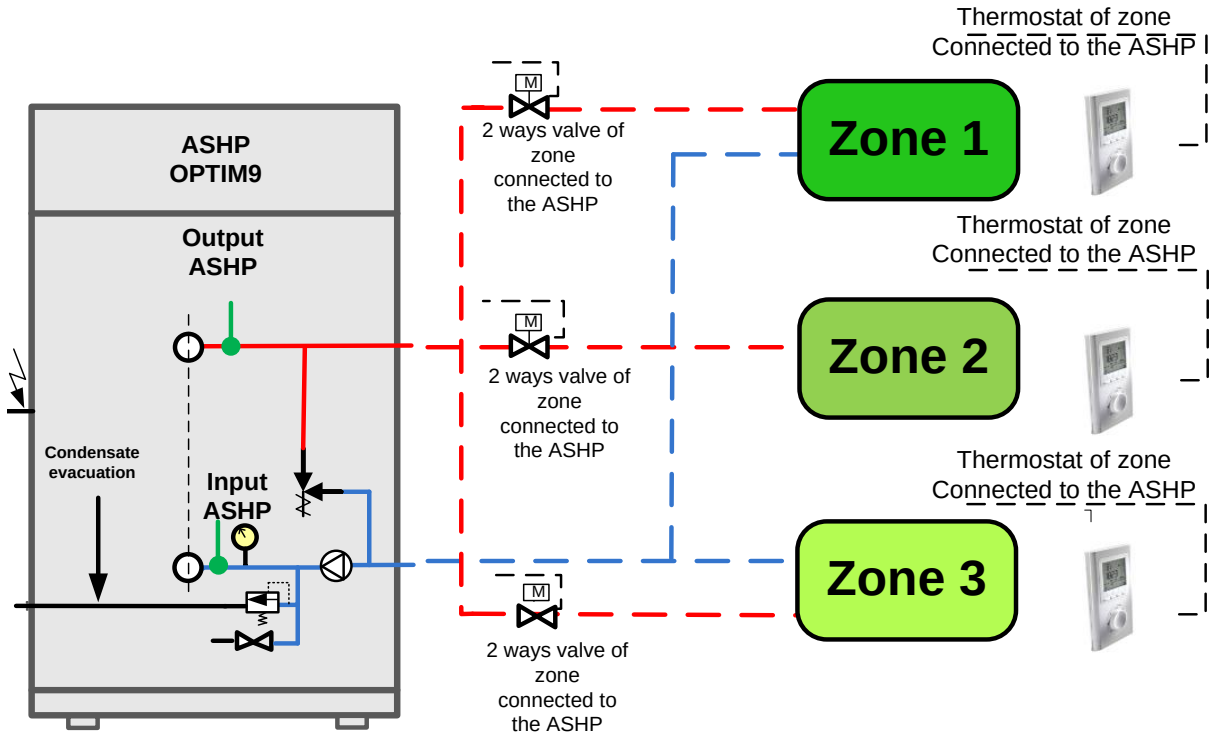
9.2.2 OPTIM' heating only 2 zones direct not mixed with valve (DSZ1 + 2 qadditionnal kits)



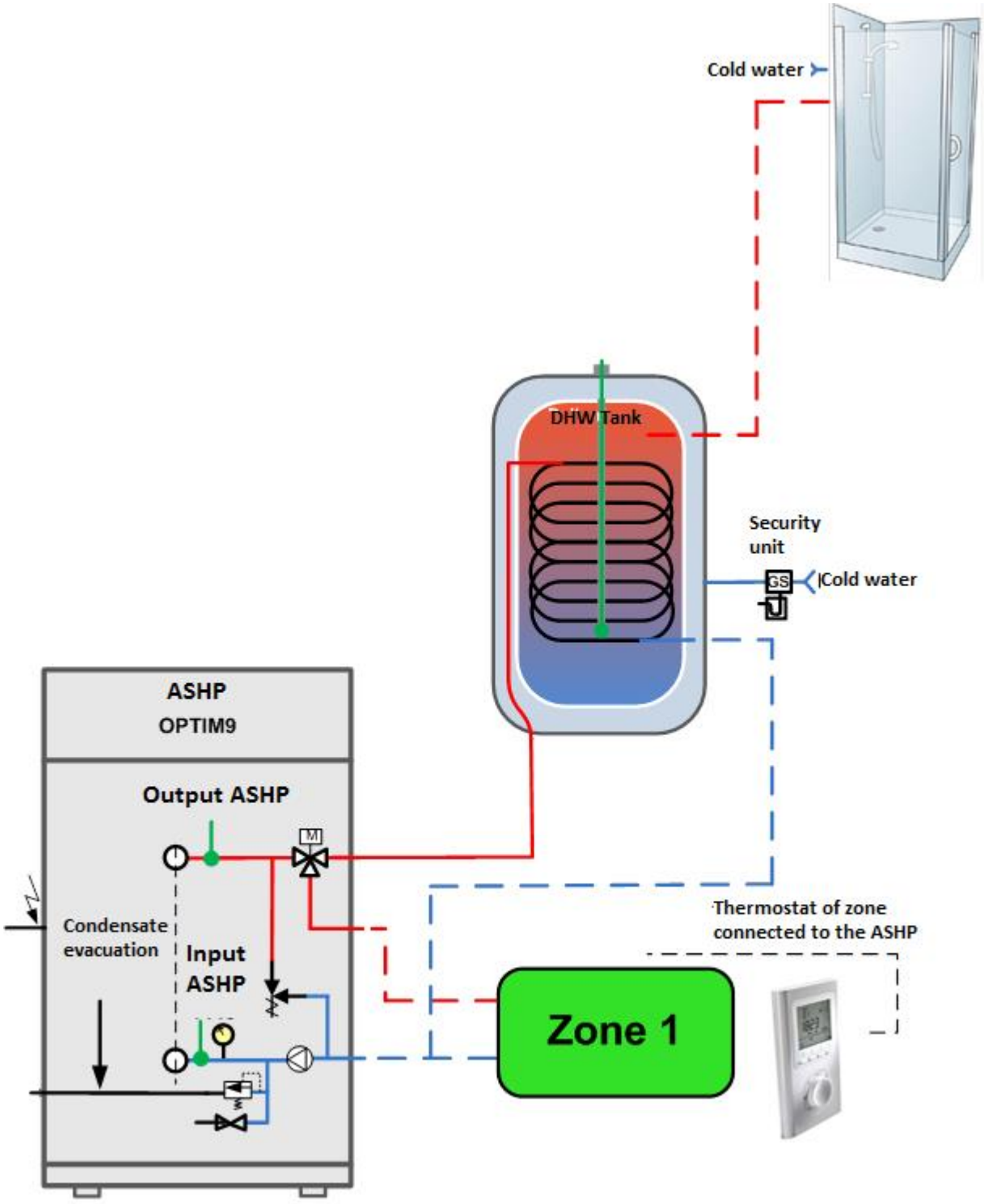
9.2.3 OPTIM‘ heating only 2 zone direct not mixed with valve(DSZ1 + 1 kit output confort)



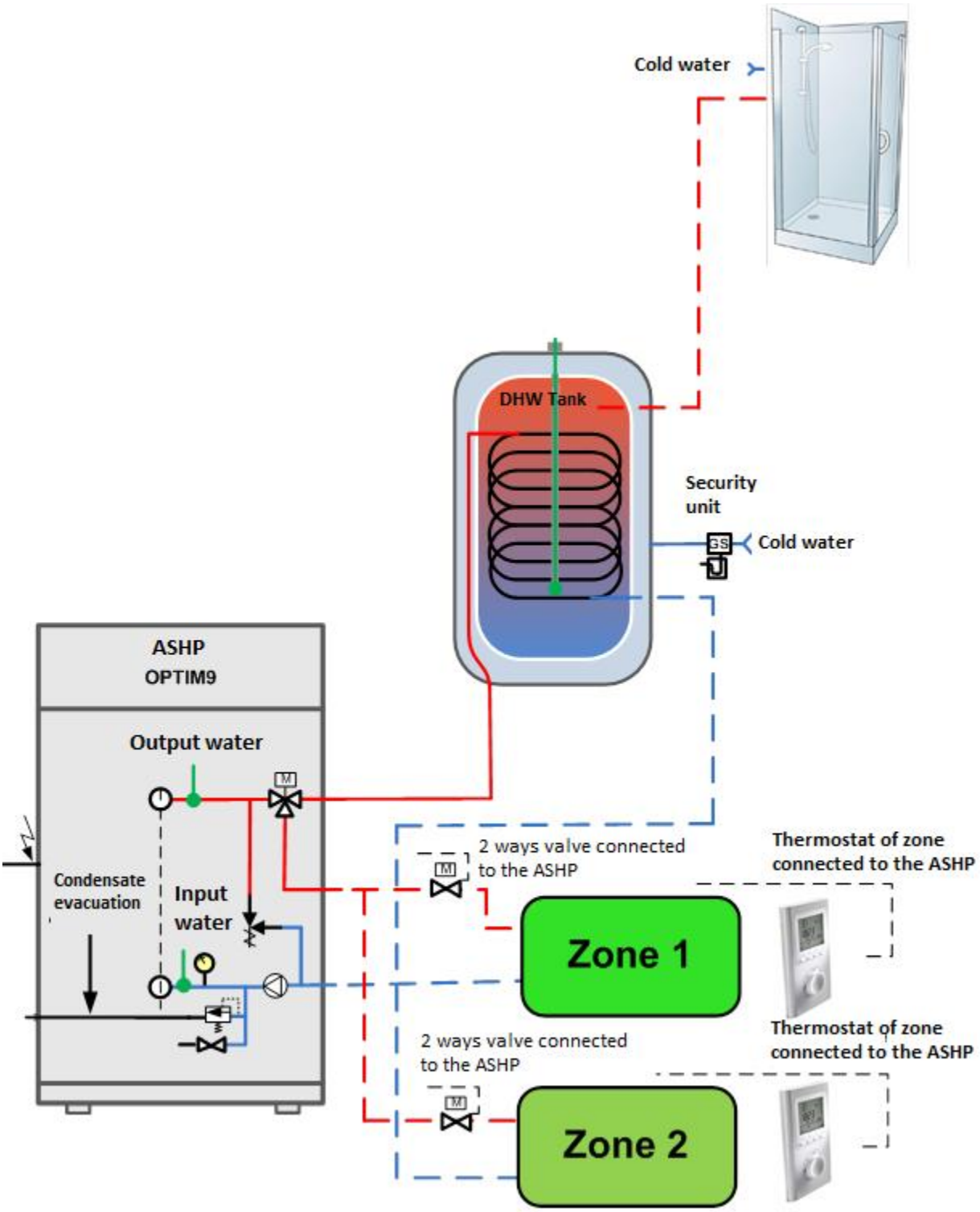
9.2.4 OPTIM’ 3 zones and similar emitters (DSZ1 + 3 additionnal kits)



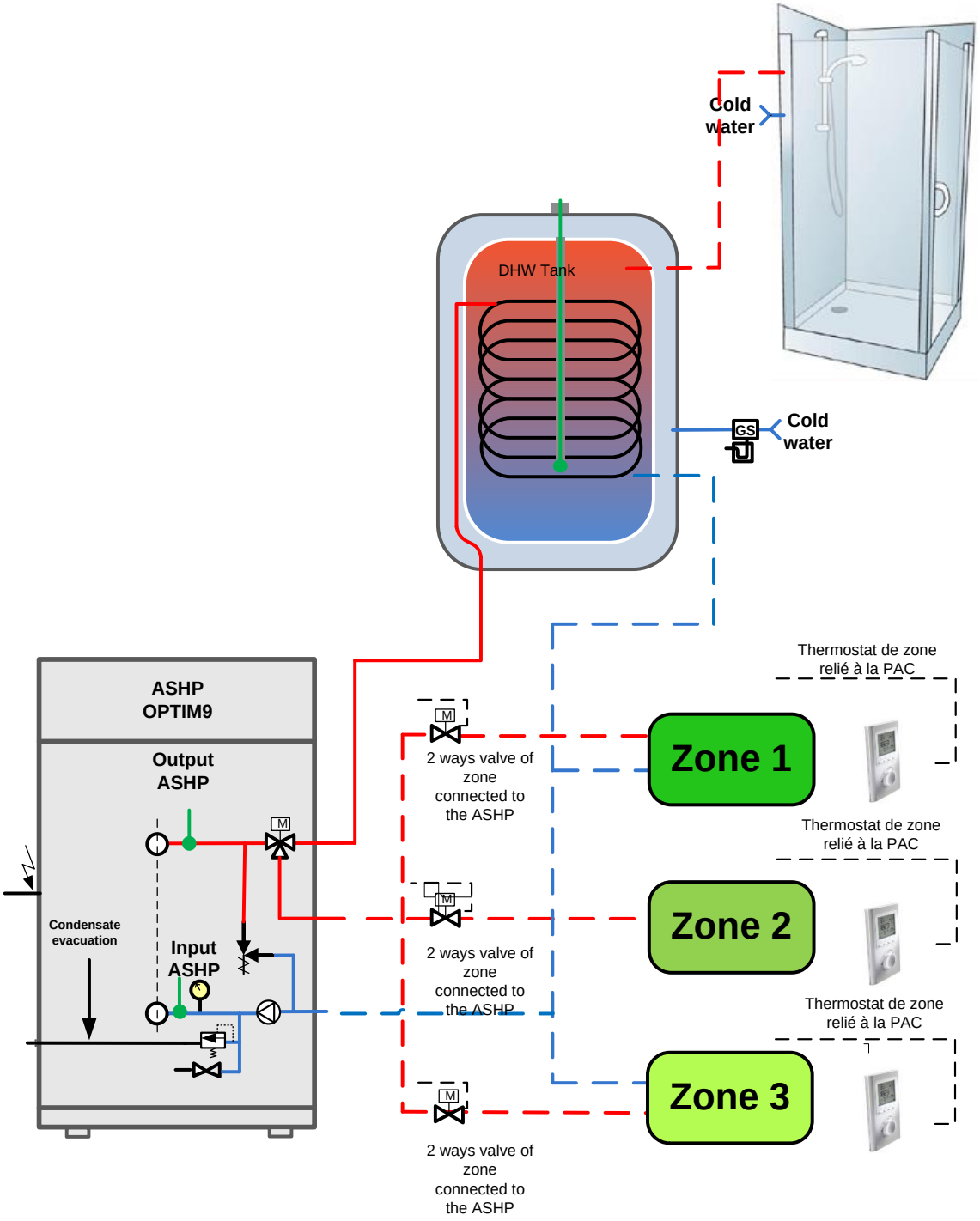
9.2.5 OPTIM'DUO 1 zone direct with valve (D-DSZ1)



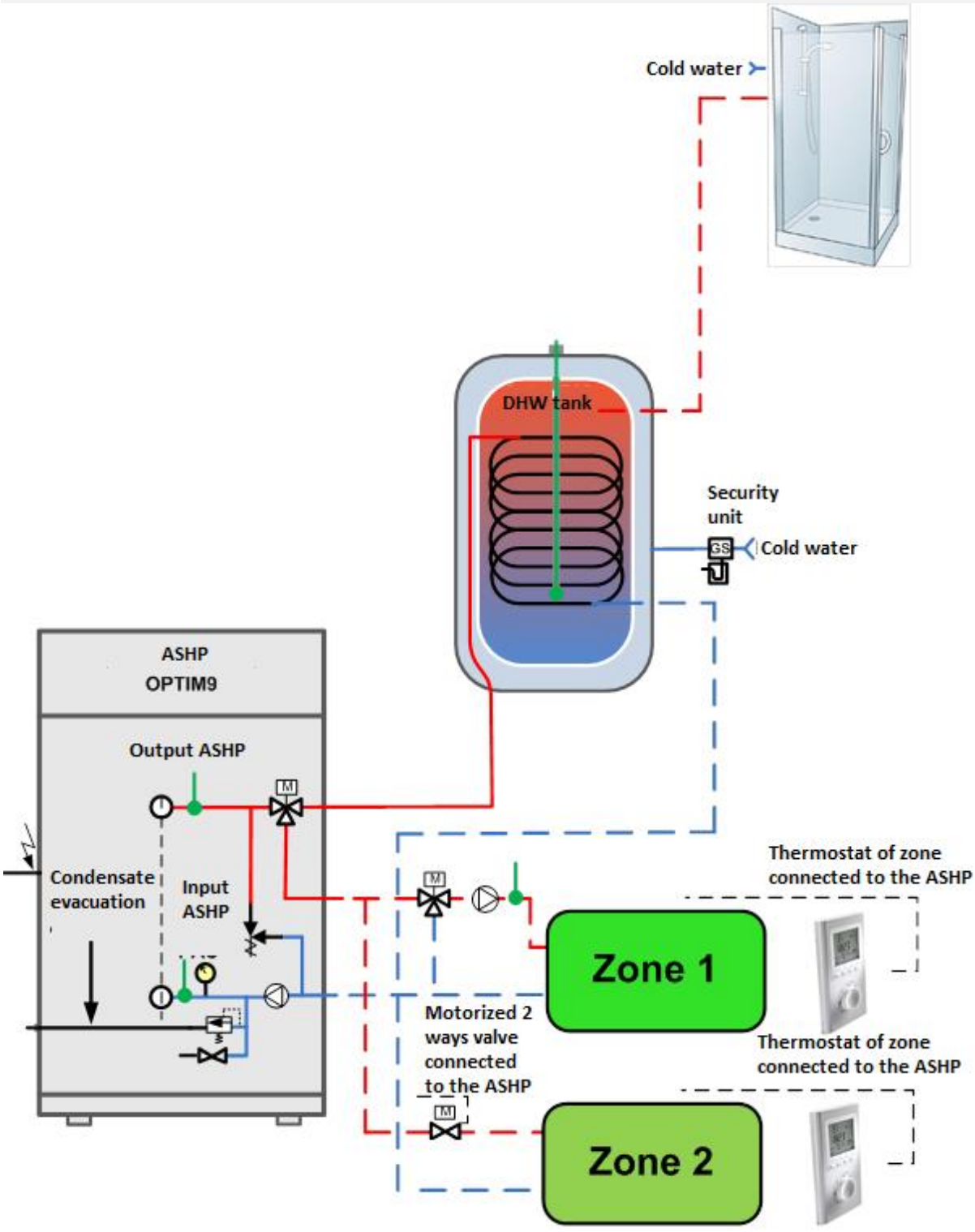
9.2.6 OPTIM'DUO 2 zones direct with valve (D-DSZ1 + 2 additionnal kits)



9.2.7 OPTIM'DUO separated tank 3 zones and similar emitters(D-DSZ1 + 3 additionnal kits)

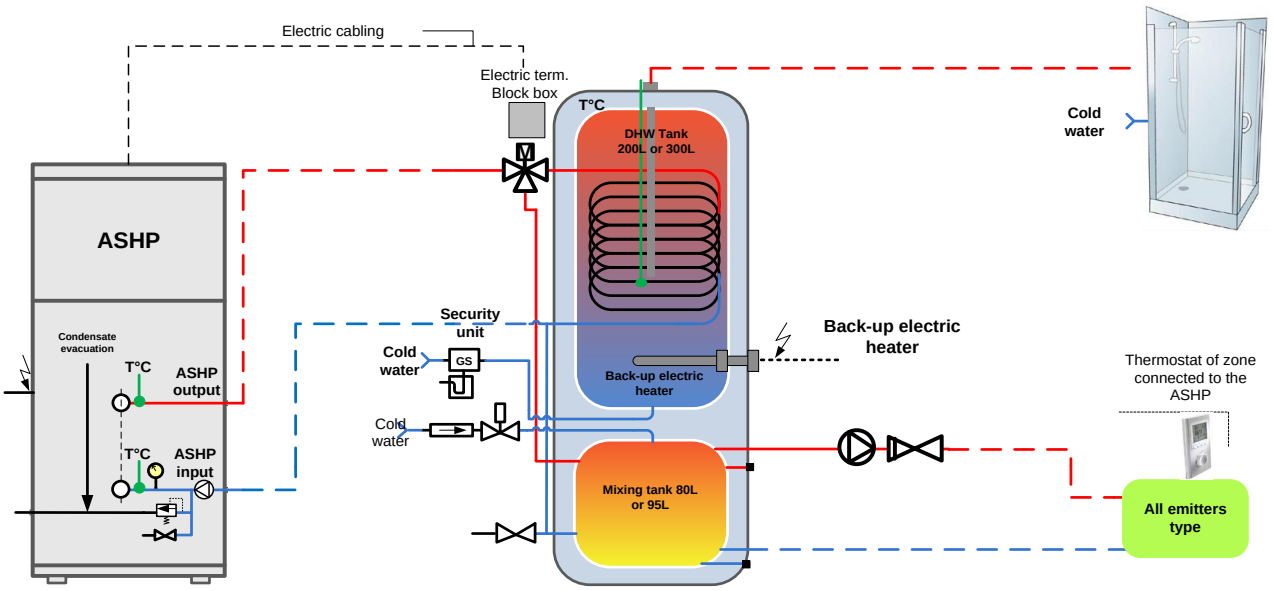


9.2.8 OPTIM'DUO 2 zones direct which one 1 mixed with vavle(D-DSZ1 + 1 kit output confort + 1 additionnal kit)

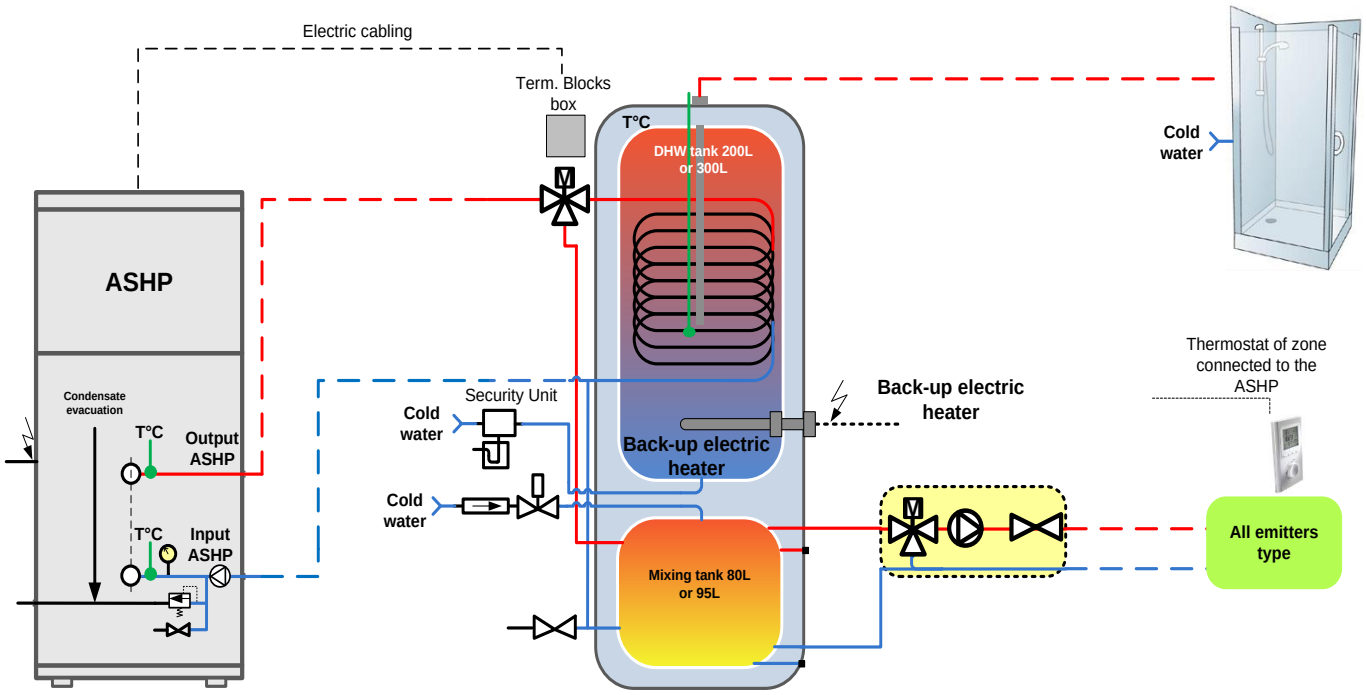


9.3 HYDRAULIC SKETCHS DUO TANK

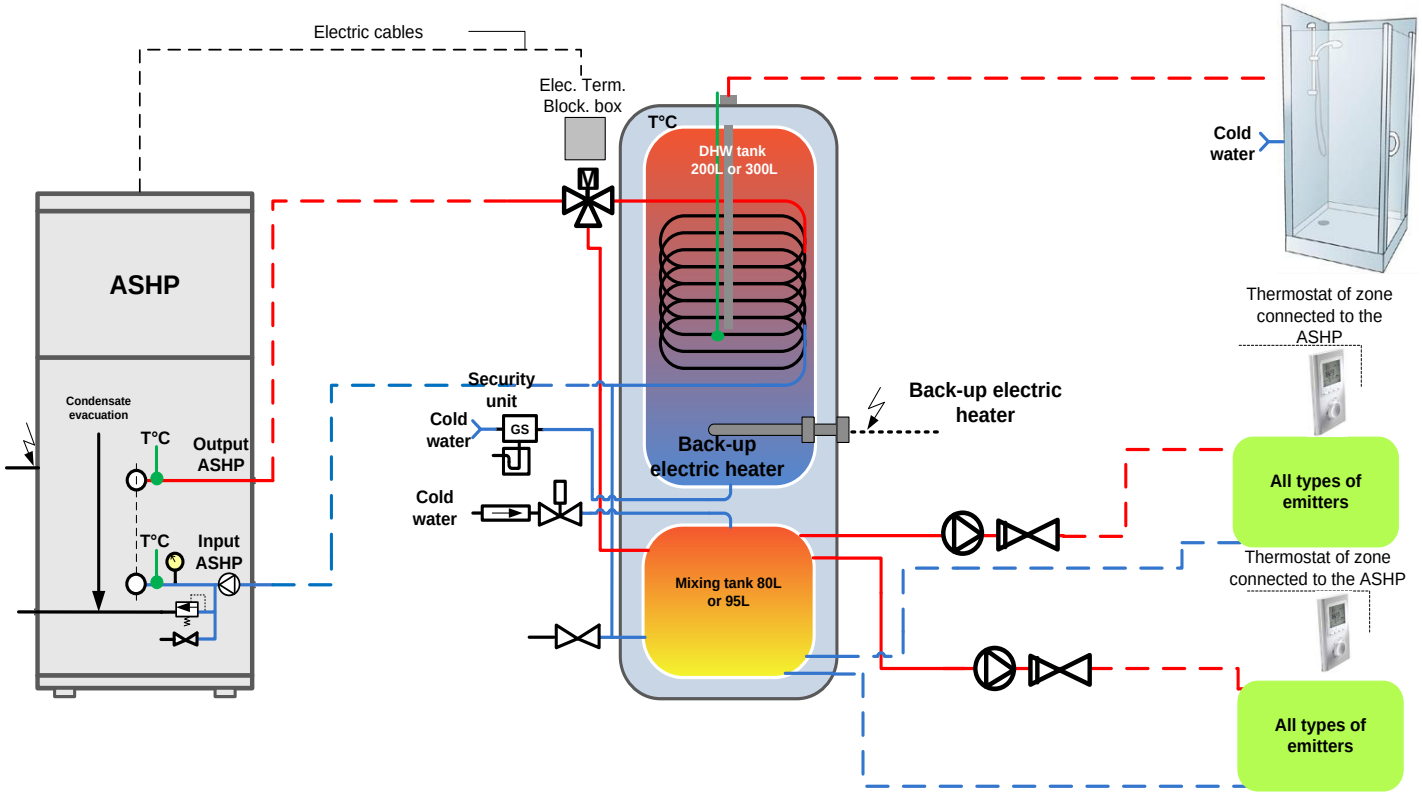
9.3.1 OPTIM' tank DUO V1.0 (1 zone)



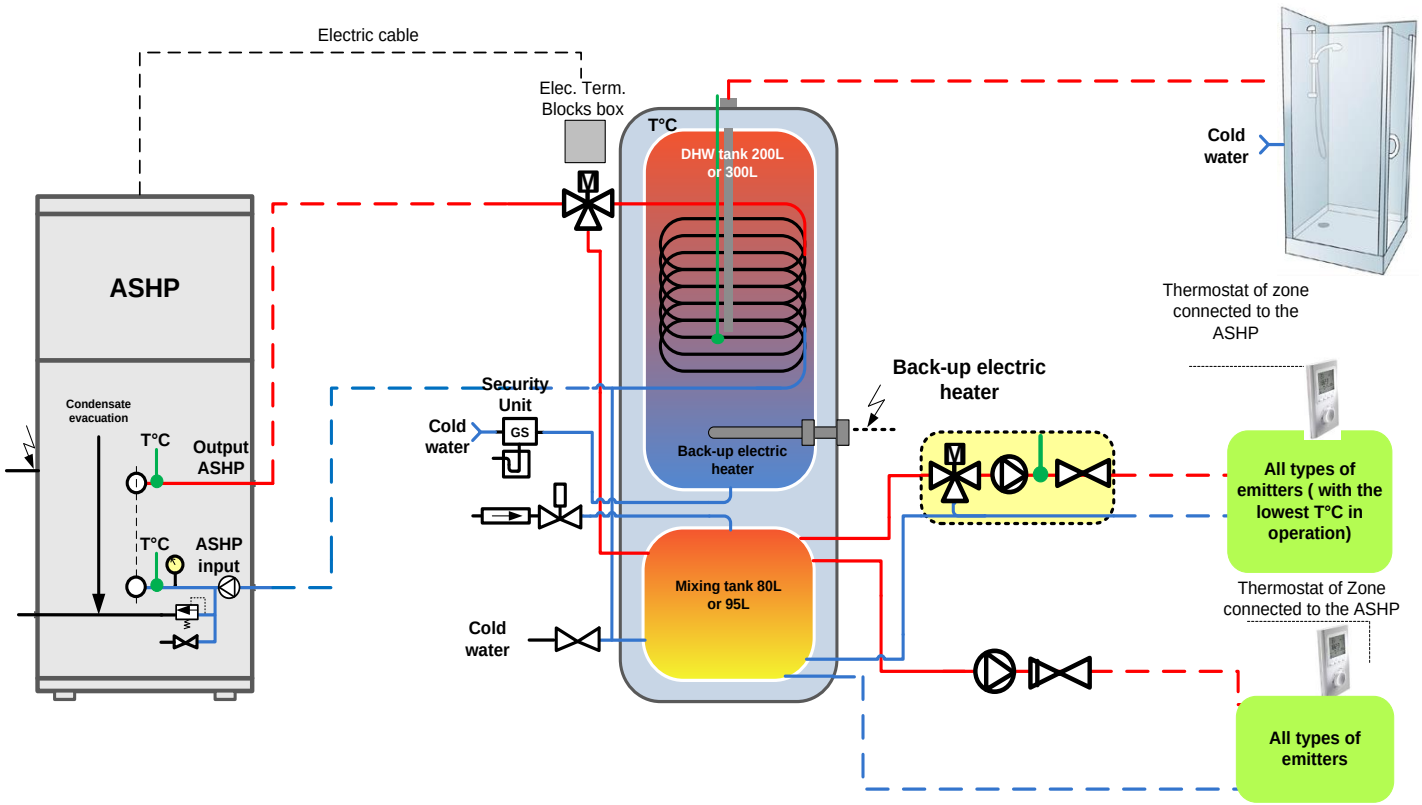
9.3.2 OPTIM' tank DUO V1.1 (1 zone confort/mixed)



9.3.3 OPTIM' tank DUO V2.0 (2 identical zones standard)



9.3.4 OPTIM' tank DUO V2.1 (2 different zones)



9.4 INCLUDED ASHP HARDWARE OR HARDWARE TO BE INCLUDED TO THE ASHP INSTALLATION PROJECT

Reminder: the installation assembly must be done in compliance with the rules of art and accordingly to the DTU or the up to date local code of practice.

OPTIM 4 et 6kW			
Version	**1 zone direct DSZ1**	**2 zones direct**	**3 zones direct**
Included hydraulic hardware for heating only (HO)	**Pre-mounted – pre-connected inside the ASHP** - Flow controller - Soupape de sécurité 3 bars - Manometer - Filling/drain cock - Expansion vessel - Class A Water pump (See below curves) (1) - Differential pressure valve(DSZX) Mandatory (mounting, and tuning) for the ASHP operation in a good condition (except if buffer tank or mixing tank installed) **Option :** - Electric backup heater - can be by passed(3kW) : Mandatory (except if ASHP with DHW + Installation with antifreeze treatment at -25°C)	**In addition to the HO 1 zone direct:** **Pre-mounted – pre-connected inside the ASHP** **2 similar zones (DSZ1Z2)** - 1 motorized 2 ways valve driven by the ASHP for each zone. **2 different zones (DSZ1mZ2)** - 1 motorized 3 ways valve for mixing, driven by the ASHP + 1 Class A water pump driven by the ASHP. (See water pump curves below) (1) for the mixed zone. - 1 motorized 2 ways valve for the standard zone.	**In addition to the HO 1 zone direct :** **Pré-monté – pré-câblé dans la PAC** **3 similar zones (DSZ1+3 additional)** - 1 motorized 2 ways valve driven by the ASHP for each zone. **3 zones with 2 different set points (DSZ1mZ2+2 additionnal kits)** - 1 motorized 3 ways valve for mixing purpose, driven by the ASHP + 1 Class A water pump driven by the ASHP. (see water pump curves below) (1) for the mixing zone. - 1 motorized 2 ways valve driven by the ASHP for each zone.
Included hardware in double service (DUO)	**In addition to the Heating Only versions :** - 1 DHW tank (4kW : 170 or 200L ; 6kW 170, 200 or 300L) + 1 security unit DHW with shut-off valve + 1 motorized 3 ways valve DHW/heating + 1 DHW sensor(6m). **For the versions with integrated tank to the ASHP, complete hydraulic kit between ASHP/Tank.**		
Hydraulic hardware parts procurement and recommendations for the project	- ASHP and DHW tank shut off valves + flexible pipe between ASHP output and input and the heating installation (to improve installation acoustic) - Isolated heating pipework 3/4'' diameter (internal diameter of 20 mm minimum, including elbow pipe, flexible pipes, valves…) for OPTIM'4 et 6kW - **Mandatory for appropriate operation: At the minimum 1 emitter valve fully open in the room with the thermostat (1 radiator without thermostatic head, 1 loop of the heating floor, etc…) + Thermostat installed in the coldest room (without sun exposure).** If it is not the case : Mixing bottle water (25L mini for 4kW / 40L mini for 6kW) in parallel (or eventually in serial with a differential pressure valve located near to the buffer tank (on the collector) - Shut-off valve + installation filling valve + automatic air vent shut-off cock (on every high point of the circuit including the mixing bottle in the separated version) - Mandatory system filter on each circuit of the installation. (in option : integrated system filter) - Drain siphon for the condensate evacuation - **Mandatory water cleaning before installation filling (following DTU or the local code of practice guidelines)** - Heating water chemical treatment (to prevent scale, oxygen corrosion, rust, condensate corrosion, mineral deposit, bacteria) - Highly recommended in every case and mandatory for the ASHP used in cooling mode : antifreeze treatment at -25°C - **Optional:** Manometer for the end-user(in addition with the inside ASHP manometer) **For the separated DHW tank : ¾" Isolated heating pipework between ASHP (OPTIM' DUO 4 or 6kW) and DHW tank**		
Included electric hardware	- Complete electric consumer unit and control board - Compressor DC inverter unit - Control panel screen installed in front of the ASHP	**In addition of 1 zone version :** - Accordingly to the water distribution : Temperature sensor for zone output	
Electrical hardware Procurement and recommendations for the project	- Installation must be protected by a 30mA differential circuit breaker - Installation of power cable 3G6 for 4 and 6kW 3G6 + 32 A breaker(curve D) - Thermostat: End-user interface to install inside the house(wire) (2 batteries LR6 1,5V are provided) - Cabling between each thermostat and ASHP: 2 wire 9/10 - **For the separated DHW tank version, installation of DHW temperature sensor: 1 pair of 9/10 wires (if DHW away more than 3 meters)** - **For the mixing bottle installation, water pump installation: 3G1.5 power cabling, temperature sensor(s): 1 pair 9/10 wires and 3 ways valve: 3G0.5**		

(1) Verify the installation drop loss, if not enough = in option a stronger water pump can be defined.

(2) At minimum 30% of the water flow, through the zone emitters = without head thermostatic radiator valves, motorized electro valve, actuator or other.

OPTIM 9kW

Version	1 zone direct DSZ1	2 à 3 zones directs not integrated
Hydraulic hardware included in heating only (HO)	**Pre-mounted – pre-connected in the ASHP** - Flow controler - 3 bars safety valve - Manometer - Drain/filling cock - Expansion vessel - Water pump Class A. (See curves below) (1) - Differential pressure valve (DSZ1) Mandatory (mounting, and tuning) for the ASHP operation in a good condition (except if buffer tank or mixing tank installed) **In option :** - Integrated electric heater – can be by-passed (3kW). Mandatory (except if ASHP with DHW + Installation with antifreeze treatment at -25°C)	**In addition to the version CS 1 zone direct :** **Pre-mounted– pre-connected inside the ASHP** **3 similar zones (DSZ1+3 kits complémentaires)** - 1 motorized 2 ways valve driven by the ASHP for each zones **3 zones with 2 different set-point (DSZ1+1 kit Output confort + 2 to 3 additionnal kits)** - 1 motorized 3 ways valve for mixing driven by the ASHP + 1 water pump Class A. (See curves below) (1) for the mixed zone. - 1 motorized 2 ways valves driven by the ASHP for each zone
Included hardware in double service (DUO)	**In addition of the heating only version :** - 1 DHW separated tank (200 or 300L) + 1 security unit with shut-off valve + 1 motorized 3 ways valve DHW/heating + 1 Temperature sensor DHW (6m).	
Hydraulic hardware parts procurement and recommendations for the proje **XXXXXXX ct**	- ASHP and DHW tank shut off valves + flexible pipe between ASHP output and input and the heating installation (to improve installation acoustic) - Isolated heating pipework 1'' diameter (internal diameter of 26 mm minimum, including elbow pipe, flexible pipes, valves…) for OPTIM'9kW - **Mandatory for appropriate operation: At the minimum 1 emitter valve fully open in the room with the thermostat (1 radiator without thermostatic head, 1 loop of the heating floor, etc…) + Thermostat installed in the coldest room (without sun exposure).** If it is not the case: Mixing bottle water (60L for 9kW) in parallel (or eventually in serial with a differential pressure valve located near to the buffer tank (on the collector) - Shut-off valve + installation filling valve + automatic air vent shut-off cock (on every high point of the circuit including the mixing bottle of the separated version) - Mandatory system filter on each circuit of the installation. (in option : integrated system filter) - Drain siphon for the condensate evacuation - **Mandatory water cleaning before installation filling (following the DTU or the local code of practice guidelines)** - Heating water chemical treatment (to prevent scale, oxygen corrosion, rust, condensate corrosion, mineral deposit, bacteria) - Highly recommended in every case and mandatory for the ASHP used in cooling mode: antifreeze treatment at -25°C - **Optional:** Manometer for the end-user(in addition with the inside ASHP manometer) **For the separated DHW tank : 1" Isolated heating pipework between ASHP and DHW tank**	
Included electric hardware	- Complete electric consumer unit and control board - Compressor DC inverter unit - Control panel screen installed in front of the ASHP	**In addition of 1 zone version :** - Accordingly to the water distribution : Temperature sensor for zone output
Electrical hardware Procurement and recommendations for the project	- Installation must be protected by 30mA differential circuit breaker - Installation of power cable 3G6 for 4 and 6kW 3G6 + 32 A breaker(curve D) - Thermostat: End-user interface to install inside the house(wire) (2 batteries LR6 1,5V are provided) - Cabling between each thermostat and ASHP: 2 wires 9/10 - **For the separated DHW tank version, installation of DHW temperature sensor: 1 pair of 9/10 wires (if DHW away more than 3 meters)** - **For the mixing bottle, water pump installation: 3G1.5 power cabling, temperature sensor(s): 1 pair 9/10 wires and 3 ways valve: 3G0.5**	

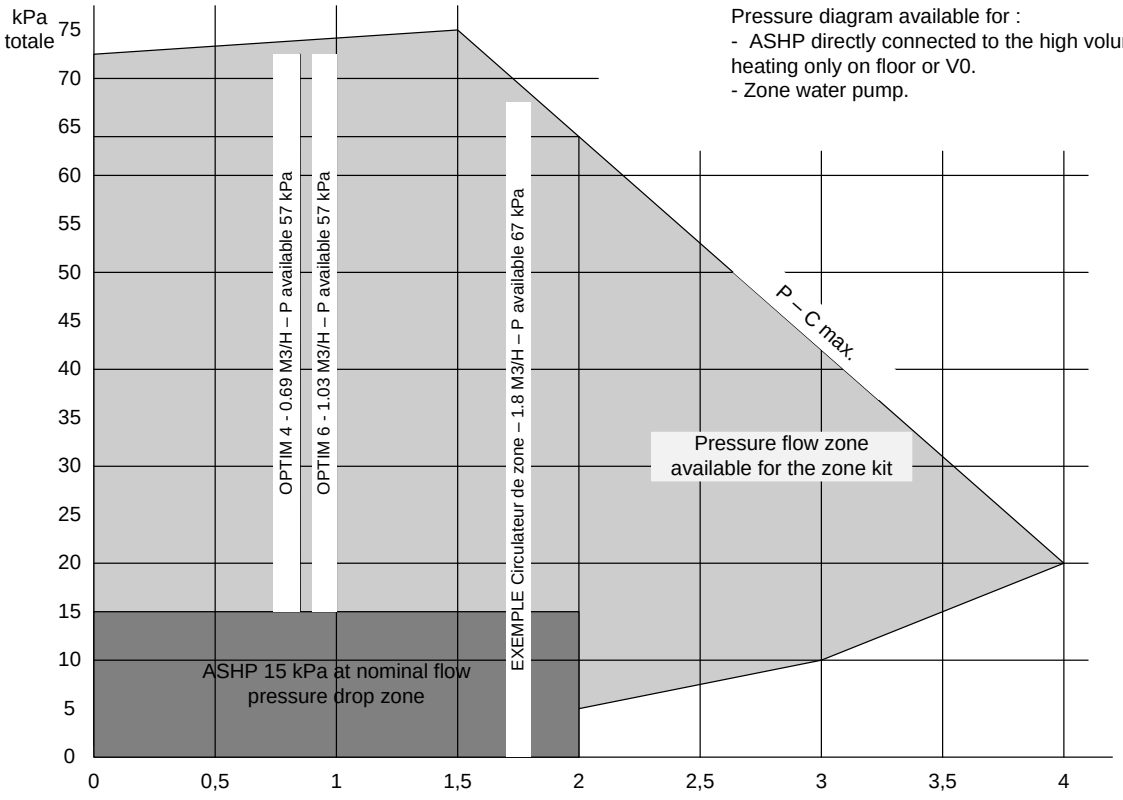
<table>
<tr><th colspan="3">OPTIM 4, 6 and 9kW – Duo TANK</th></tr>
<tr><th>Version</th><th>1 zone</th><th>2 zones</th></tr>
<tr><td>Included hardware included in double service (DUO)</td><td><u>Pré-mounted – pre-connected inside the ASHP</u>
- Flow controller
- 3 bars safety valve
- Manometer
- Drain/filling cock
- Expansion vessel
- Water pump Class A. (See curves below) (1)
- Differential pressure valve (DSZ1)
In option :
- Integrated electric heater – can be by-passed (3kW).

<u>Pre-mounted – pre-connected on the DUO Tank</u>
- 1 Standard output kit</td><td>In addition to the double service version 1 zone :
<u>Pre-mounted et pre-connected on the DUO tank</u>

<u>2 similar zones</u>
-1 standard output kit for the second zone

<u>2 different zones</u>
-1 output confort kit for the second zone (1 motorized 3 ways valves for mixing driven by the ASHP + 1 Class A water pump driven by the ASHP. (See curve below)(1) for the mixed zone)</td></tr>
<tr><td>Hydraulic hardware parts procurement and recommendations for the project</td><td colspan="2">- ASHP and DHW tank shut off valves + flexible pipe between ASHP output and input and the heating installation (to improve installation acoustic)
- Isolated heating pipework 3/4’’ diameter (internal diameter of 20 mm minimum, including elbow pipe, flexible pipes, valves…) for OPTIM’4 et 6kW and 1’’ diameter (internal diameter of 26 mm minimum, including elbow pipe, flexible pipes, valves…) for OPTIM’9kW
- Shut-off valve + installation filling valve + automatic air vent shut-off cock (on every high point of the circuit including the mixing bottle of the separated version)
- Mandatory system filter on each circuit of the installation. (in option : integrated system filter)
- Drain siphon for the condensate evacuation
- Mandatory water cleaning before installation filling (following the DTU or the local code of practice guidelines)
- Heating water chemical treatment (to prevent scale, oxygen corrosion, rust, condensate corrosion, mineral deposit, bacteria)
- Highly recommended in every case and mandatory for the ASHP used in cooling mode : antifreeze treatment at -25°C
- Optional: Manometer for the end-user(in addition with the inside ASHP manometer)</td></tr>
<tr><td>Included electric hardware</td><td colspan="2">- Complete electric consumer unit and control board
- Compressor DC inverter unit
- Control panel screen installed in front of the ASHP
- Coffret + câble pour raccordement PAC-ballon Duo
- Connection cabling package and terminal bloc box protection</td></tr>
<tr><td>Electrical hardware Procurement and recommendations for the project</td><td colspan="2">- Installation must be protected by 30mA differential circuit breaker
- Installation of power cable 3G6 for 4,6 and 9kW 3G6 + 32 A breaker(curve D)
- Thermostat: End-user interface to install inside the house(wire) (2 batteries LR6 1,5V are provided)
- Cabling between each thermostat and ASHP: 2 wires 9/10</td></tr>
</table>

Water pump curves ref 10459-A (basic OPTIM' 4, 6 et 9 kW water pump)

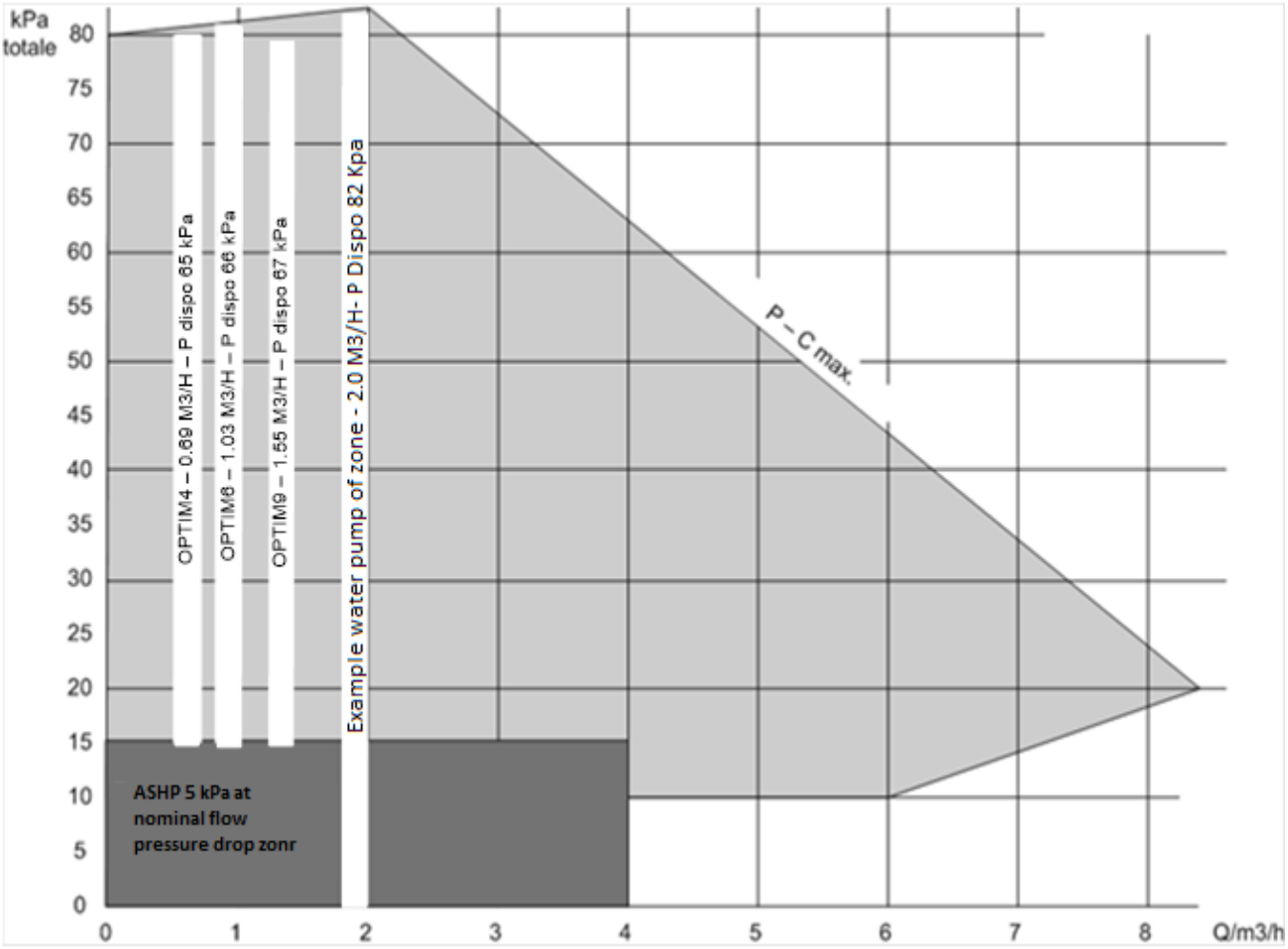


Pressure diagram available for :
- ASHP directly connected to the high volume emitters (15L/kW) heating only on floor or V0.
- Zone water pump.

Red button setting : Δ (constant)

Wtaer pump ref : 10459-A

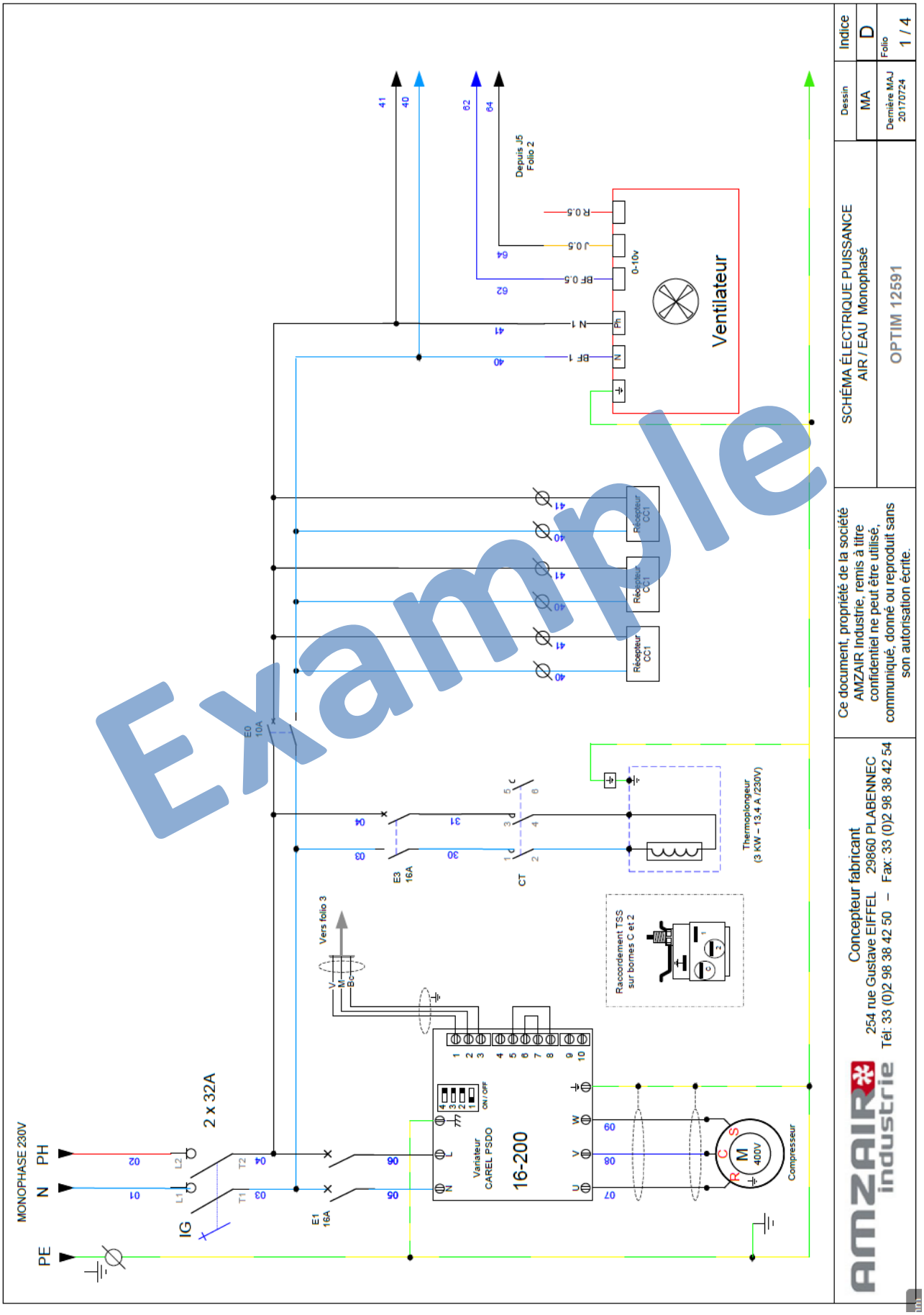
Water pump curve ref 10600-A with stronger power performance (= option boosted water pump)



10 ELECTRIC DIAGRAMS

Examples of electric diagrams below

10.1 ASHP electrical power diagrams



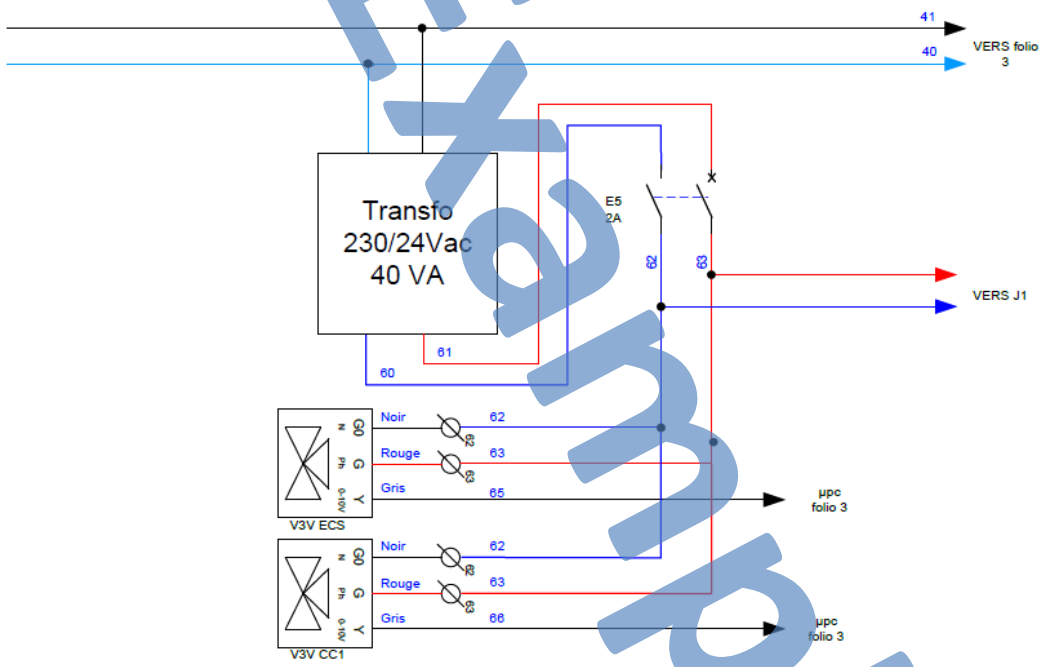


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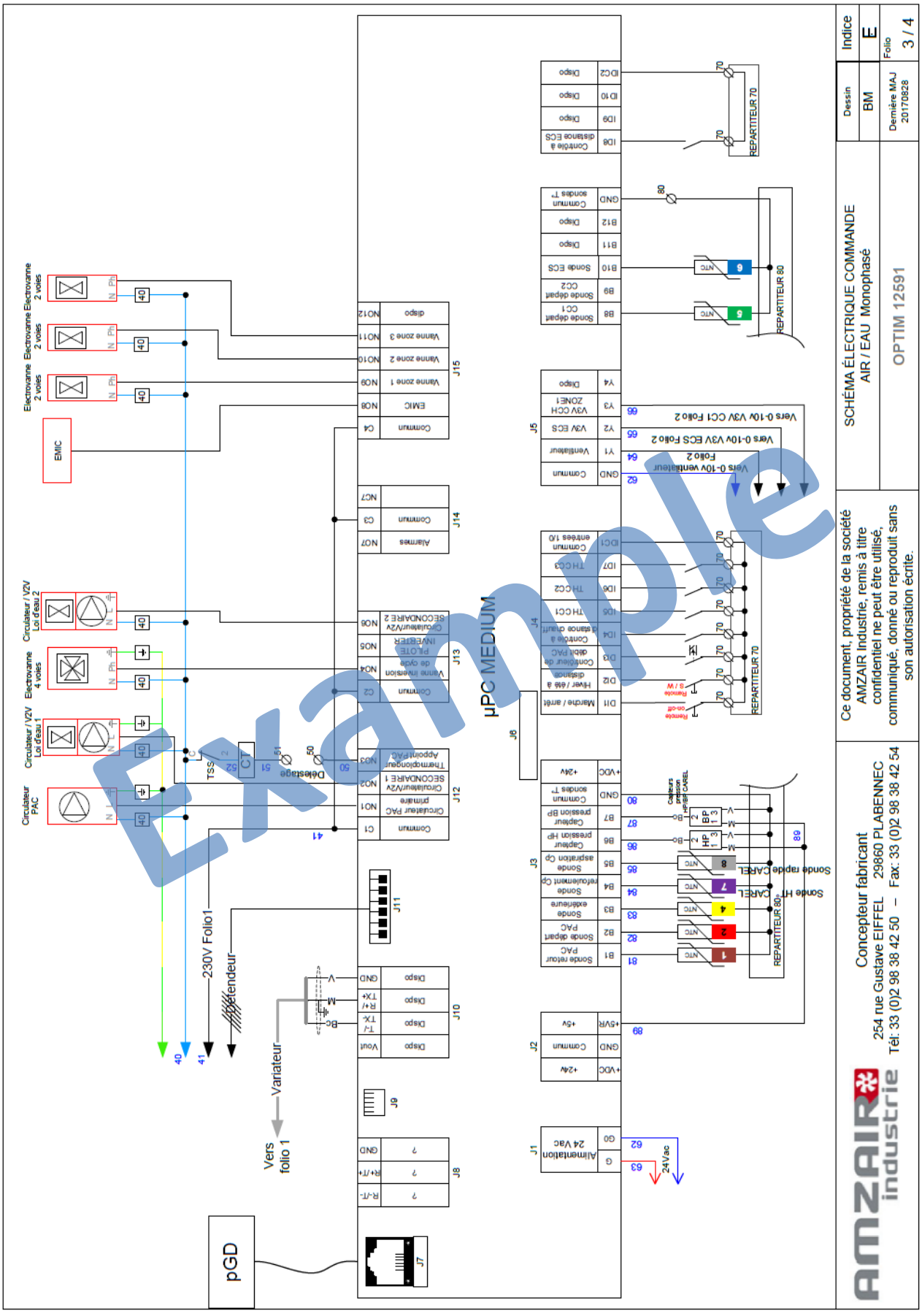
SCHÉMA ÉLECTRIQUE T B T
AIR / EAU Monophasé

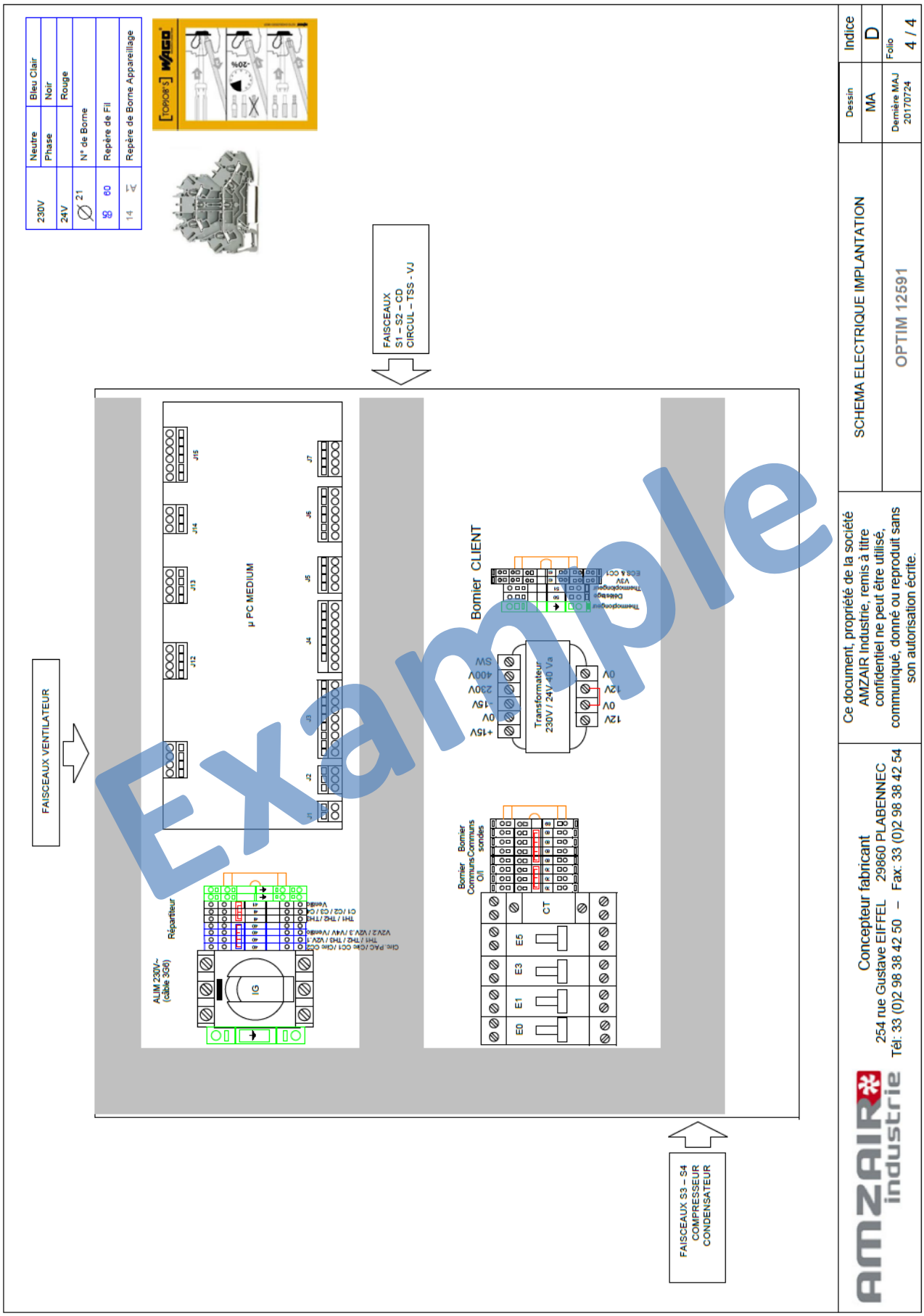
OPTIM 12591

Dessin	Indice
MA	D
Dernière MAJ 20170724	Folio 2 / 4

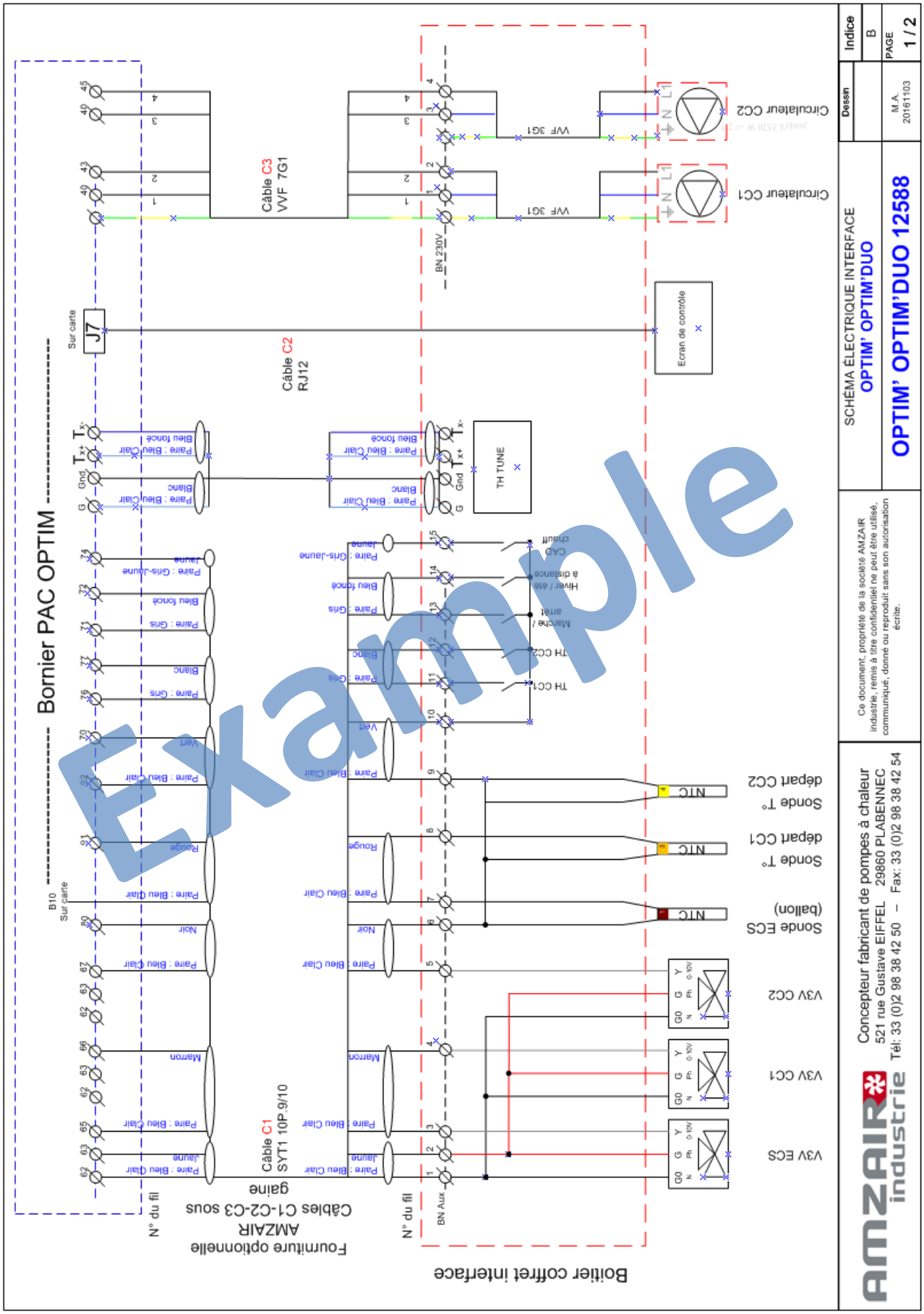
10.2 ASHP control board electric diagram



10.3 ASHP control board, terminal blocks, breakers, consumer unit implementation sketch



10.4 ASHP to DHW tank DUO electrical interface diagram



11 SUMMARY TABLE

ASHP OPTIM' indoor

Heat Pump Air /PAC monobloc indoor design for heating only or heating + DHW

AMZAIR industrie

TECHNICAL SPECIFICATIONS

		OPTIM-04M HO	OPTIM-04M integrated	OPTIM-04M separated	OPTIM-06M HO	OPTIM-06M integrated	OPTIM-06M separated	OPTIM'-09M HO	OPTIM'-09M separated
		Single phase	Single phase	Single phase	Single phase	Single phase	Single phase	Single phase	Single phase
		NF	NF	NF	NF	NF	NF	NF	NF
DC Inverter Twin rotary compressor R410A refrigerant									
Heating performances									
ASHP T°C max output		60°C	60°C	60°C	60°C	60°C	60°C	60°C	60°C
Heating power (kW)	Output T° 25°C Ext T°+7°C	4.31	4.31	4.31	6.31	6.31	6.31	9.70	9.70
Consumed Power (kW)		0.90	0.90	0.90	1.27	1.27	1.27	2.02	2.02
COP (Heat P / consu. P)		4.78	4.78	4.78	4.97	4.97	4.97	4.80	4.80
Heating power (kW))	Output T° 25°C Ext T° -7°C	4.17	4.17	4.17	6.10	6.10	6.10	9.49	9.49
Consumed Power (kW)		1.23	1.23	1.23	1.76	1.76	1.76	2.51	2.51
COP (Heat P / consu. P)		3.39	3.39	3.39	3.47	3.47	3.47	3.78	3.78
Heating power (kW)	Output T° 25°C Ext T° +7°C	4.20	4.20	4.20	6.15	6.15	6.15	9.54	9.54
Consumed Power (kW)		1.00	1.00	1.00	1.41	1.41	1.41	2.16	2.16
COP (Heat P / consu. P)		4.20	4.20	4.20	4.35	4.35	4.35	4.41	4.41
Heating power (kW))	Output T° 35°C Ext T° -7°C	4.06	4.06	4.06	5.94	5.94	5.94	9.33	9.33
Consumed Power (kW)		1.33	1.33	1.33	1.91	1.91	1.91	2.66	2.66
COP (Heat P / consu. P)		3.05	3.05	3.05	3.11	3.11	3.11	3.51	3.51
Heating power (kW)	Output T° 45°C Ext T° +7°C	4.04	4.04	4.04	5.90	5.90	5.90	9.30	9.30
Consumed Power (kW)		1.18	1.14	1.14	1.69	1.69	1.69	2.44	2.44
COP (Heat P / consu. P)		3.42	3.54	3.54	3.49	3.49	3.49	3.81	3.81
Heating power (kW))	Output T° 45°C Ext T°-7°C	3.94	3.94	3.94	5.76	5.76	5.76	9.15	9.15
Consumed Power (kW)		1.56	1.56	1.56	2.26	2.26	2.26	3.01	3.01
COP (Heat P / consu. P)		2.53	2.53	2.53	2.55	2.55	2.55	3.04	3.04
Heating power (kW)	Output T° 55°C Ext T°+7°C	3.83	3.83	3.83	5.60	5.60	5.60	8.98	8.98
Consumed Power (kW)		1.41	1.37	1.37	2.03	2.03	2.03	2.78	2.78
COP (Heat P / consu. P)		2.72	2.80	2.80	2.76	2.76	2.76	3.23	3.23
Heating power (kW))	Output T° 55°C Ext T°-7°C	3.73	3.73	3.73	5.44	5.44	5.44	8.83	8.83
Consumed Power (kW)		1.76	1.76	1.76	2.56	2.56	2.56	3.31	3.31
COP (Heat P / consu. P)		2.12	2.12	2.12	2.13	2.13	2.13	2.67	2.67
		Other temperature point : see curves of each ASHP in the Thenical document. Chap. Performance							
Minimum external ambient air temperature in operation 25°C		-21	-21	-21	-21	-21	-21	-21	-21
Minimum external ambient air temperature in operation 35°C		-21	-21	-21	-21	-21	-21	-21	-21
Minimum external ambient air temperature in operation 45°C		-21	-21	-21	-21	-21	-21	-21	-21
Minimum external ambient air temperature in operation 55°C		-21	-21	-21	-21	-21	-21	-21	-21
Electric back-up heater (kW) (in option but can be by-passed)		3	3	3	3	3	3	3	3
Refrigerant (R410A)			0.90			1.6		1.9	
DHW Performances 170									
DHW tank volume (L)		/	170	170	/	170	170	/	/
V_{MAX} maximum volume of usable DHW (L)		/	215	215	/	215	215	/	/
Duration time to reach the set point T°C (de 10°C à 55°C)		/	2h20	2h20	/	2h02	2h02	/	/
Electric back-up heater (kW) (in option but can be by-passed)		/	3	3	/	3	3	/	/
DHW Performances 200									
DHW tank volume (L)		/	/	195	/	195	195	/	195
V_{MAX} maximum volume of usable DHW (L)		/	/	250	/	250	250	/	250
Duration time to reach the set point T°C (de 10°C à 55°C)		/	/	2h50	/	2h20	2h20	/	1h30
Electric back-up heater (kW) (in option but can be by-passed)		/	/	3	/	3	3	/	3
DHW Performances 300									
DHW tank volume (L)		/	/	/	/	/	300	/	300
V_{MAX} maximum volume of usable DHW (L)		/	/	/	/	/	385	/	385
Duration time to reach the set point T°C (de 10°C à 55°C)		/	/	/	/	/	3h15	/	2h30
Electric back-up heater (kW) (in option but can be by-passed)		/	/	/	/	/	3	/	3
Acoustic Performances									
Indoor noise level at 1 m* (dB(A))		48.0	48.0	48.0	46.1	46.1	46.1	46.5	46.5
Indoor noise level at 4 m* (dB(A))		36.0	36.0	36.0	34.1	34.1	34.1	34.5	34.5
Indoor sound power level in accordance to EN12102		59.0	59.0	59.0	57.1	57.1	57.1	57.5	57.5
Outdoor noise level at 4 m* (dB(A))		44.5	44.5	44.5	42.8	42.8	42.8	43.0	43.0
Outdoor noise level at 10 m* (dB(A))		36.5	36.5	36.5	34.8	34.8	34.8	35.0	35.0
Outdoor sound power level in accordance to EN12102		67.5	67.5	67.5	65.8	65.8	65.8	66.0	66.0
* acoustic noise level at 1,5 m from the floor, free of anything, directivity 1									
Dimensions / Weight									
ASHP witdth (mm)			603			760		904	
ASHP dpth (mm)			603			650		655	
ASHP height (mm)		1200	2200	1200	1200	2200/2300	1200	1580	
Wall opening width dimension for grid (mm)			600			750		905	
Wall opening height dimension for grid (mm)			600			700		900	
ASHP weight empty		110	190	110	160	240/250	160	250	
Grid + air duct weight			50			60		75	
Electrical connection									
Power		230V - 50Hz	230V - 50Hz	230V - 50Hz	230V - 50Hz	230V - 50Hz	230V - 50Hz	230V - 50Hz	230V - 50Hz
Maximum consumed power in thermodynamics mode (kW)		1.80	1.80	1.80	2.60	2.60	2.60	3.40	3.40
Maximum consumed power by the back-up electric heater (kW)		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Overall maximum electric power consumed (thermodynamics + electric heater) (kW)		4.80	4.80	4.80	5.60	5.60	5.60	6.40	6.40
Maximum current in thermodynamics mode (A)		7.8	7.8	7.8	11.3	11.3	11.3	14.8	14.8
Maximum current in electric heater back-up mode only (A)		13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Maximum current in thermodynamics and back-up electric heater together (A)		20.9	20.9	20.9	24.3	24.3	24.3	27.8	27.8
Breaker spec. (curve D mandatory) (A)		32	32	32	32	32	32	32	32
Power cable section (mm^2) for a length of 15m		3G6	3G6	3G6	3G6	3G6	3G6	3G6	3G6
		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Hydraulic									
Diameter hydraulic pipe work		3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	1"	1"
Hydraulic connection diameter		DN20	DN20	DN20	DN20	DN20	DN20	DN25	DN25
Expansion vessel included in the ASHP (L)		6	6	6	6	6	6	6	6

Notes :

monobloc premium heat pumps

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