

# Handbook for the K18 range

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## K18 Simplygas/Hybrigas

Modulating, condensing gas absorption heat pump system,  
using aerothermal renewable energy and natural gas for  
heating and domestic hot water production



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# INDEX OF CONTENTS

|  |       |   |       |
|--|-------|---|-------|
| <b>1 Introduction</b> .....            | p. 4  | 5.4 Mounting base.....                                  | p. 21 |
| 1.1 Premise.....                       | p. 4  | <b>6 Standard equipment</b> .....                       | p. 21 |
| 1.2 Available range.....               | p. 4  | <b>7 Available optionals</b> .....                      | p. 21 |
| 1.3 Operating mode.....                | p. 5  | 7.1 Controls.....                                       | p. 22 |
| 1.4 Selection guide.....               | p. 5  | 7.2 DHW buffer tanks (OSRB012, OSRB004, OSRB013).....   | p. 23 |
| 1.5 DHW production.....                | p. 6  | 7.3 Diverter valve (OVLV007).....                       | p. 25 |
| <b>2 FAQ</b> .....                     | p. 6  | 7.4 Modulating water pumps (OPMP009, OPMP004).....      | p. 25 |
| <b>3 Specification sheets</b> .....    | p. 7  | 7.5 Outdoor temperature probe (OSND007).....            | p. 26 |
| 3.1 K18 Simplygas.....                 | p. 7  | 7.6 Immersion temperature probe (OSND004).....          | p. 26 |
| 3.2 K18 Hybrigas.....                  | p. 8  | 7.7 Kit of anti vibration rubber pads (ONTV014).....    | p. 26 |
| 3.3 K18 Hybrigas Easy.....             | p. 8  | 7.8 Unified flue (OTBO069).....                         | p. 27 |
| <b>4 Technical data</b> .....          | p. 9  | 7.9 Winter kit for K18 Hybrigas (OKBT013, OKBT014)..... | p. 27 |
| 4.1 K18 Simplygas.....                 | p. 9  | 7.10 Winter kit for K18 Simplygas (OKBT015).....        | p. 27 |
| 4.2 K18 Hybrigas.....                  | p. 12 | 7.11 Cover for K18 Simplygas (OMNT021).....             | p. 27 |
| 4.3 Armonia control system.....        | p. 17 | <b>8 System diagrams</b> .....                          | p. 28 |
| 4.4 DHW production control device..... | p. 18 | 8.1 Generation circuits.....                            | p. 28 |
| 4.5 Sound power.....                   | p. 18 | 8.2 Heating distribution.....                           | p. 39 |
| 4.6 Combustion products exhaust.....   | p. 19 | 8.3 System examples.....                                | p. 41 |
| <b>5 Appliance positioning</b> .....   | p. 20 | <b>9 Required connections</b> .....                     | p. 47 |
| 5.1 Warnings.....                      | p. 20 |   |       |
| 5.2 Appliance positioning.....         | p. 20 |   |       |
| 5.3 Minimum clearance distances.....   | p. 20 |   |       |

# 1 INTRODUCTION

## 1.1 PREMISE

This document provides instructions on the operating modes, system use, and application of the family of aerothermic gas absorption heat pump systems K18. The contents of this handbook are intended for those interested in the design and set up of a plant with a K18 system (designer, qualified installer) and complete that provided in the installation, use and maintenance manuals of each version of the K18 appliances and the related system controller, which this handbook refers to explicitly.

## 1.2 AVAILABLE RANGE

From the point of view of type of appliance, the K18 range of systems can be divided into two subsystems:

1. Systems based on K18 Simplygas appliances, i.e. units with just the gas absorption aerothermal heat pump.
2. Systems based on K18 Hybrigas appliances, i.e. hybrid units consisting of a gas absorption aerothermal heat pump and a condensing boiler.

A first distinction must be made from the application perspective based on the type of service provided:

- A. Systems for space heating only.
- B. Systems for space heating and DHW production, with basic DHW functionality.
- C. Systems for space heating and DHW production, with advanced DHW functionality and management of one or more heating circuits.

Systems for space heating, DHW production and heating circuit management require the use of the optional OQLT021 system controller.

Systems for space heating and DHW production can be further divided based on how the DHW is produced:

- DHW buffer tank produced with a gas absorption heat pump: K18 Simplygas and K18 Hybrigas.
- DHW buffer tank produced with the boiler: K18 Hybrigas Easy.

All K18 Simplygas and K18 Hybrigas appliances are available in the **outdoor installation** version.

**Figure 1.1** Available range for the family of K18 systems

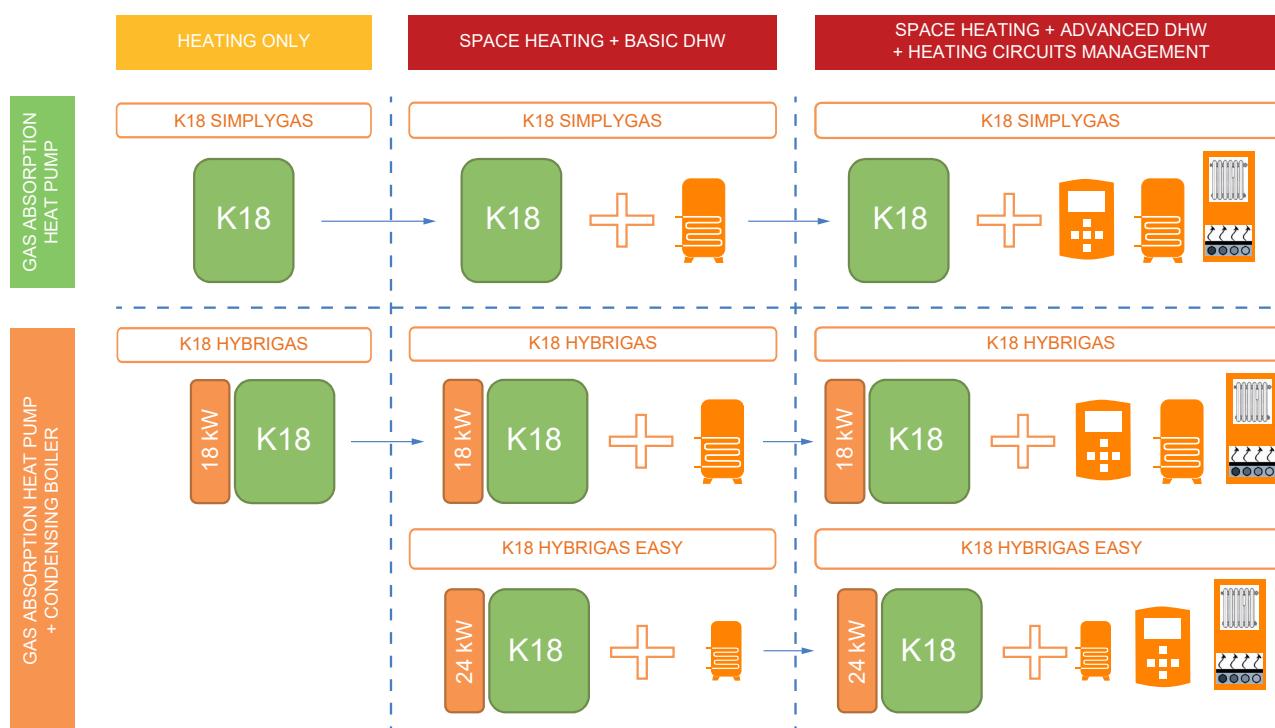


Table 1.1 Selection guide

| Heating only  | Space heating + basic DHW  | Space heating + advanced DHW + heating circuits management   |
|---|--|--|
| <b>K18 Simplygas</b><br>- aerothermal gas heat pump<br>- heating efficiency 169%<br>- use of aerothermal renewable energy for heating hot water production up to 65 °C<br>- heat input 11,2 kW<br>- delivered heat output 18,9 kW   | <b>K18 Simplygas</b><br>- aerothermal gas heat pump + 200/300 liter DHW buffer tank (optional)<br>- use of aerothermal renewable energy for heating hot water production up to 65 °C<br>- use of aerothermal renewable energy also for buffer tank DHW production up to 70 °C<br>- heat input 11,2 kW<br>- delivered heat output 18,9 kW   | <b>K18 Simplygas</b><br>- aerothermal gas heat pump + system controller (required) + 200/300 liter DHW buffer tank (optional)<br>- use of aerothermal renewable energy for heating hot water production up to 65 °C<br>- use of aerothermal renewable energy also for buffer tank DHW production up to 70 °C<br>- controlling secondary zone circuits (via the system controller)<br>- heat input 11,2 kW<br>- delivered heat output 18,9 kW   |
| <b>K18 Hybrigas</b><br>- aerothermal gas heat pump + condensing boiler<br>- built-in digital system, optimises the use of renewable energy; depending on outdoor temperature, it regulates the operation in the most cost-effective and ecological way possible<br>- use of aerothermal renewable energy for heating hot water production up to 65 °C<br>- monobloc, makes installation easier and reduces costs<br>- high peak heat output with wide modulation<br>- heat input 29,2 kW<br>- delivered heat output 37,9 kW | <b>K18 Hybrigas</b><br>- aerothermal gas heat pump + condensing boiler + 200/300 liter DHW buffer tank (optional)<br>- built-in digital system, optimises the use of renewable energy; depending on outdoor temperature, it regulates the operation in the most cost-effective and ecological way possible<br>- use of aerothermal renewable energy for heating hot water production up to 65 °C<br>- use of aerothermal renewable energy also for buffer tank DHW production up to 80 °C<br>- heat input 29,2 kW<br>- delivered heat output 37,9 kW | <b>K18 Hybrigas</b><br>- aerothermal gas heat pump + condensing boiler + system controller (required) + 200/300 liter DHW buffer tank (optional)<br>- built-in digital system, optimises the use of renewable energy; depending on outdoor temperature, it regulates the operation in the most cost-effective and ecological way possible<br>- use of aerothermal renewable energy for heating hot water production up to 65 °C<br>- use of aerothermal renewable energy also for buffer tank DHW production up to 80 °C<br>- controlling secondary zone circuits (via the system controller)<br>- heat input 29,2 kW<br>- delivered heat output 37,9 kW |
|   | <b>K18 Hybrigas Easy</b><br>- aerothermal gas heat pump + condensing boiler + 150-liter DHW buffer tank (optional)<br>- built-in digital system, optimises the use of renewable energy; depending on outdoor temperature, it regulates the operation in the most cost-effective and ecological way possible<br>- use of aerothermal renewable energy for heating hot water production up to 65 °C<br>- production of domestic hot water with a buffer tank up to 80 °C with the boiler<br>- heat input 29,2 kW<br>- delivered heat output 37,9 kW    | <b>K18 Hybrigas Easy</b><br>- aerothermal gas heat pump + condensing boiler + system controller (required) + 150-liter DHW buffer tank (optional)<br>- built-in digital system, optimises the use of renewable energy; depending on outdoor temperature, it regulates the operation in the most cost-effective and ecological way possible<br>- use of aerothermal renewable energy for heating hot water production up to 65 °C<br>- production of domestic hot water with a buffer tank up to 80 °C with the boiler<br>- controlling secondary zone circuits (via the system controller)<br>- heat input 29,2 kW<br>- delivered heat output 37,9 kW    |

### 1.3 OPERATING MODE

The operating mode of the appliance for space heating is set on modulating by default, that is the thermal power output is adapted to the thermal load.

For the DHW production function, if present, the ON/OFF mode is always used.

### 1.4 SELECTION GUIDE

#### Q.: which are the most typical types of buildings for the appliances of the K18 family?

In relation to the heat output, we can identify single-family residence and maisonette or small buildings, even already existing and with little thermal insulation, as being typical applications.

#### Q.: can the appliances of the K18 family be used in a home with existing radiators, sized for water at 70/80 °C?

Definitely. Not only this is obvious for K18 Hybrigas appliances (which may supply hot water up to 80 °C), but it remains true also for K18 Simplygas appliances, which can supply hot water up to 65 °C. This temperature is in fact, broadly sufficient to provide adequate heating even during the coldest periods, also in relation to the following considerations:

1. Radiators' surfaces are commonly oversized compared to the required power.
2. It is very common for old homes to have already undergone improvement works on the insulation and leakage reduction (e.g. replacing frames and windows), which reduce the thermal demand and therefore the maximum temperatures required.
3. The sizing on the peak load, calculated on the few night-time annual hours of minimum temperature, does not consider

the thermal inertia of the building, which offsets any temporary shortfall of power required.

#### Q.: which is the most suitable appliance of the K18 family?

You should choose the most suitable K18 appliance in relation to the thermal load and the intended use and not to the size of the building. For example, a 120 sqm building with poor insulation may require the same thermal load as a 300 sqm well-insulated building. If the production of domestic hot water is required, the choice of the most suitable K18 system depends on the number of bathrooms in the building, the usage habits of the users and the type of system (instantaneous/buffer tank/recirculation/solar integration).

#### Q.: in addition to the thermal load of the building, which are the other criteria to be considered when choosing the appliance of the K18 family?

The main factors that influence the choice are as follows:

1. If the K18 appliance must only meet the space heating requirements or (in addition to space heating) those of the production of domestic hot water too.
2. For existing buildings, if you intend to maintain an existing boiler as an integration appliance and/or for the production of domestic hot water (in which case we recommend a K18 Simplygas version) or if the existing boiler must in any case be replaced (in which case a K18 Hybrigas might be the preferred choice).
3. If the K18 system also involves the production of domestic hot water, regardless of the maximum consumption of DHW envisaged, according to the number of bathrooms in the building and the usage habits of its occupants. In more detail:
  - for one or two bathrooms with likely simultaneous use

(two showers): this requires at least one K18 Hybrigas Easy solution (production of DHW with a small buffer tank fed by the boiler); this solution allows for the use of an existing DHW buffer tank as well, if there is one.

- For more than two bathrooms with presumed simultaneous use (more than two showers): K18 Simplygas or K18 Hybrigas solution with a 300 litre DHW buffer tank is preferred. The K18 system can provide for the production of DHW also using a share of renewable energy for this service, without the use of additional optional controls.
- 4. If the K18 system is required to control the secondary distribution circuits directly (in which case the system controller is required, available as OQLT021 optional).

The following criteria are not particularly relevant in the choice:

1. The type of distribution terminals (radiators or floor/radiant systems): in fact, as explained above, also the K18 Simplygas versions can be perfectly coupled to existing radiators, thanks to flow temperatures which are high in any case (65 °C).
2. The fact that the appliance is a hybrid product or not: in fact, the sophisticated K18 system control algorithm will nonetheless maximise the use of the absorption heat pump module, limiting the use of the auxiliary boiler to very restricted operating conditions, in similar applications, which will not have a significant impact on the overall seasonal heating efficiency of the K18 system. In this regard, it must be noted that, even if the consumption of the DHW production were completely entrusted to the auxiliary boiler, it represents a small fraction of the total.

## 1.5 DHW PRODUCTION

All K18 appliances are able to produce domestic hot water without the use of additional control devices, with the exception of the temperature probe in the buffer tank (supplied for K18 Hybrigas Easy).

For the production of domestic hot water it is always essential to use a buffer tank with a suitably sized exchange coil.

### 1.5.1 K18 Simplygas and K18 Hybrigas

For K18 Simplygas and K18 Hybrigas versions the DHW is produced indirectly through the water supply to a coil embedded in a specific domestic hot water buffer tank. The volume of the DHW buffer tank should be chosen according to the domestic hot water demand by the users supplied (number of bathrooms, number of occupants in the building, usage habits, etc.): normally, a 200 to 300 litre DHW buffer tank is needed. It is particularly important to properly size the coil, which must have a suitable exchange surface, considering that the heat pump heats

the buffer tank (with the relevant limitations to the maximum flow temperature). This happens entirely for the K18 Simplygas version and at least in part also for the K18 Hybrigas version. Typically, the exchange surface should be at least 3 m<sup>2</sup> for 200 litre DHW buffer tanks and 4 m<sup>2</sup> for 300 litre DHW buffer tanks.

The K18 Simplygas and K18 Hybrigas appliances can autonomously manage the DHW buffer tank charging function if a temperature probe in the buffer tank (available as OSND004 optional) is properly connected and configured.

The DHW production modes available in this scenario are limited to basic functionality. For more comprehensive management of DHW production, the use of the system controller (available as OQLT021 optional) is recommended.

If the unit manages the production of DHW directly, any request contact for the DHW service has the function of switching between two different setpoints of the DHW buffer tank temperature, which can be set by means of appropriate parameters.



In the presence of the OQLT021 system controller, the management of DHW production, with the control of the relevant temperature probe, must be carried out by the controller itself, and not by the K18 appliance.

#### 1.5.1.1 DHW production operating modes

In case DHW production is managed directly by the K18 Simplygas or K18 Hybrigas appliance (i.e. in the absence of the OQLT021 system controller) the following operating modes are possible:

1. Fixed comfort setpoint 24 hours/day
2. Fixed comfort setpoint with the possibility to deactivate the DHW request via external request (comfort / OFF)
3. Fixed comfort setpoint or DHW buffer tank antifreeze protection via external request (comfort / antifreeze)
4. Variable setpoint (comfort and reduced) according to programming (with external timer)
5. Fixed setpoint with anti-legionella function (with external timer)

#### 1.5.2 K18 Hybrigas Easy

For the K18 Hybrigas Easy version once again the production of DHW occurs indirectly through a DHW buffer tank. However, unlike the previous case, the DHW buffer tank coil is only fed by the boiler of the K18 Hybrigas Easy appliance. Therefore, the size of both the DHW buffer tank volume and the coil exchange surface can be smaller, because on the one hand, you can have higher delivery temperatures and, on the other hand, the recharge can be faster.

The buffer tank temperature probe is supplied with the K18 Hybrigas Easy unit.

## 2 FAQ

### Q.: what are the benefits of the appliances of the K18 family compared to an electrical heat pump?

The main ones include:

- The K18 appliances have practically no electric power consumption: less than half kW compared to the 5+ kW required by the electrical solutions with the same heat output.
- The K18 appliances maintain good performance even at very low air temperatures so as not to require any additional electrical heating element with consequent savings in energy consumption.
- The K18 appliances are exempt from the F-Gas legislation as they use natural refrigerants not subject to restrictions and declaration obligations or special maintenance.

### Q.: are the K18 appliances simple, in terms of installation and maintenance?

Absolutely yes, just like a boiler. They do not require any other special precautions.

### Q.: where is it recommended to position a K18 appliance?

The unit is best placed as close as possible to the building to prevent thermal dispersion from the connecting pipes with the internal thermal system. It should also be installed at least 30 cm away from the wall, in a zone with adequate natural air circulation, to allow the air to flow and be extracted by the unit fan and to prevent sound reverberation, which is potentially annoying.

### Q.: what about the fumes outlet?

The fumes outlet of such appliances may be wall-mounted, but



it can also be easily conveyed over the ridge of the roof because the residual head allows the ducts to be extended by some tens meters, if the local regulations require this.

For hybrid versions, the two distinct flue gas exhaust ducts can be conveyed separately or via a unified flue.

**Q.: is the condensate outlet required for the K18 appliances?**  
Yes, like for a condensing boiler.

**Q.: which is the optimum design temperature for an aerothermic heat pump?**

The performance of heat pumps depends on the intended water flow temperature. It is therefore recommended to work with a relatively high design temperature only in the colder periods (e.g. 55-60 °C flow with -5 °C outdoor air), then reducing the flow temperature when the outdoor temperatures are milder (for example 45-55 °C with an outdoor temperature above zero). This function (defined as climatic curve mode) allows the seasonal efficiency to be significantly optimised, and can be activated directly on the electronics onboard without using other accessories or system components.

**Q.: how is the anti-legionella cycle in the DHW buffer tank managed, when present?**

The K18 heat pump can dispense hot water up to 70 °C (with a return temperature of not higher than 60 °C). With such temperatures, you can perform regular cycles of thermal disinfection in the DHW buffer tank, managed by the system controller (available as optional) or by a suitable external request, able to prevent the proliferation of legionella bacteria. In any case, other non-thermal disinfection systems can also be used (more efficient and less energy consuming), such as the treatment with UV rays, use of micro filters, treatment with chlorine dioxide or hydrogen peroxide.

In the K18 Hybrigas Easy model you can set the delivery temperature for the Legionella disinfection up to 80 °C.

**Q.: generally, what system accessories must I set up in the case of a space heating system? And if production of domestic hot water is required?**

The insertion of a K18 appliance in a system for space heating only requires only an operating request (for example via a room thermostat or a programmable thermostat, even if pre-existing), as is the case today for a traditional boiler.

If you want a more thorough control, extended also to the system, you can manage the zone circulating pumps and a mixing valve through the system controller (available as optional).

If the production of domestic hot water is to be provided through a buffer tank (non instantaneous), DHW buffer tanks are available with oversized coils and the 3-way valve dedicated to

space heating/DHW switching.

**Q.: are the K18 units fitted with their own circulating pumps?**

Yes, the K18 units are fitted with their own high efficiency modulating circulating pumps, which are generally sufficient to guarantee adequate water circulation in an ordinary installation; the optional booster circulating pump must still be assessed according to the type of distribution system.

**Q.: must a buffer tank be installed on the heating circuit?**

No. However, even a small buffer tank is recommended because it can help the average overall seasonal efficiency especially when running at a low thermal load. The buffer tank is particularly recommended in systems where the water flow in the system can be significantly reduced, and therefore, in the presence of:

- 2-way zone valves
- thermostatic valves on radiators
- heating circuits with several zones

**Q.: how does the system controller work and what does it do?**

The system controller (available as optional) is a controller that allows for advanced management of the system and not just of the K18 unit. It can:

- Manage the production of domestic hot water with advanced control functions, if this occurs by means of a DHW buffer tank and a dedicated 3-way valve (available as optional).
- Manage two secondary circuits (both direct or one direct and one mixed) to optimise system efficiency.
- Control circuits with different parameters and setpoints (for example you can control two circuits on different climatic curves).
- Use the user interface (advanced room unit) supplied as per standard as a room unit (with room adjustment performance greater than that of a normal programmable thermostat).

**Q.: can I continue to use the existing room thermostat to control the temperature of K18?**

Certainly, provided that using the system controller and the room unit included in it will allow for better overall efficiency.

**Q.: must the plumbing system be cleaned before installing a K18?**

Yes, it is always required, as new systems may contain residue of installation processing and existing systems may contain impurities and metallic residue, which could be transported to the exchanger of the heat pump, thereby reducing the effectiveness of the heat exchange with the system water. Refer to the information in the Installation Manual of the K18 unit to clean the piping.

## 3 SPECIFICATION SHEETS

### 3.1 K18 SIMPLYGAS

Water-ammonia absorption heat pump, energy efficiency class A++, fed with natural gas or LPG, air-water version, modulating and condensing, for hot water production up to a delivery temperature of 65 °C (70 °C for DHW production), for external installation, consisting of:

- Steel sealed circuit, externally treated with epoxy paint.
- Metal mesh radiant burner, equipped with ignition electrodes and flame detection, managed by an electronic flame control box.
- Titanium stainless steel shell-and-tube water heat exchanger, externally insulated.
- Stainless steel, shell-and-tube recovery exchanger of flue gas latent heat.
- Air exchanger with finned coil, with steel pipe and aluminium

fins.

- Automatic microprocessor-controlled finned coil defrosting valve.
- Low power consumption refrigerant fluid oil pump.
- High efficiency modulating fan.
- High efficiency modulating water pump.

Control and safety devices:

- Electronic board with microprocessor.
- Water flowmeter.
- Generator limit thermostat, with manual reset.
- Flue gas thermostat, with manual reset.
- Generator fins temperature probe.
- Sealed circuit safety relief valve.
- Bypass valve, between high and low-pressure circuits.
- Ionization flame control box.

- Double shutter electric gas valve.
- Antifreeze functions for hydraulic circuit.
- Condensate discharge sensor.
- Water temperature probes.

### 3.2 K18 HYBRIGAS

Hybrid group consisting of a water-ammonia absorption heat pump, energy efficiency class A++, fed with natural gas or LPG, air-water version, modulating and condensing, and of a condensing boiler, energy efficiency class A, for hot water production up to a delivery temperature of 65 °C (70 °C for DHW production), for external installation.

Heat pump module characteristics:

- Steel sealed circuit, externally treated with epoxy paint.
- Metal mesh radiant burner, equipped with ignition electrodes and flame detection, managed by an electronic flame control box.
- Titanium stainless steel shell-and-tube water heat exchanger, externally insulated.
- Stainless steel, shell-and-tube recovery exchanger of flue gas latent heat.
- Air exchanger with finned coil, with steel pipe and aluminium fins.
- Automatic microprocessor-controlled finned coil defrosting valve.
- Low power consumption refrigerant fluid oil pump.
- High efficiency modulating fan.
- High efficiency modulating water pump.

Boiler module characteristics:

- Integrated spiral single tube stainless steel heat exchanger.
- Premix modulating burner with 1:9 ratio.
- Automatic air vent valves.
- High efficiency modulating water pump.
- System drain tap.
- Water temperature probes.
- Condensate drain siphon.

Control and safety devices of the hybrid group:

- Electronic board with microprocessor.
- Water flowmeter.
- Generator limit thermostat, with manual reset.
- Flue gas thermostat, with manual reset.
- Generator fins temperature probe.
- Sealed circuit safety relief valve.
- Bypass valve, between high and low-pressure circuits.
- Ionization flame control box.
- Double shutter electric gas valve.
- Antifreeze functions for hydraulic circuit.
- Condensate discharge sensor.
- 3 bar safety valve.
- 8 l expansion tank.

### 3.3 K18 HYBRIGAS EASY

Hybrid group consisting of a water-ammonia absorption heat pump, energy efficiency class A++, fed with natural gas or LPG, air-water version, modulating and condensing, and of a condensing boiler, energy efficiency class A, for hot water production up to a delivery temperature of 65 °C (80 °C with the condensing boiler only), and for simultaneous DHW production up to a delivery temperature of 70 °C (80 °C with the condensing boiler only), for external installation.

Heat pump module characteristics:

- Steel sealed circuit, externally treated with epoxy paint.
- Metal mesh radiant burner, equipped with ignition electrodes and flame detection, managed by an electronic flame control box.
- Titanium stainless steel shell-and-tube water heat exchanger, externally insulated.
- Stainless steel, shell-and-tube recovery exchanger of flue gas latent heat.
- Air exchanger with finned coil, with steel pipe and aluminium fins.
- Automatic microprocessor-controlled finned coil defrosting valve.
- Low power consumption refrigerant fluid oil pump.
- High efficiency modulating fan.
- High efficiency modulating water pump.

Boiler module characteristics:

- Integrated spiral single tube stainless steel heat exchanger.
- 3-way diverter valve for heating/DHW switching.
- Premix modulating burner with 1:9 ratio.
- Automatic air vent valves.
- High efficiency modulating water pump.
- System drain tap.
- Water temperature probes.
- Condensate drain siphon.

Control and safety devices of the hybrid group:

- Electronic board with microprocessor.
- Water flowmeter.
- Generator limit thermostat, with manual reset.
- Flue gas thermostat, with manual reset.
- Generator fins temperature probe.
- Sealed circuit safety relief valve.
- Bypass valve, between high and low-pressure circuits.
- Ionization flame control box.
- Double shutter electric gas valve.
- Antifreeze functions for hydraulic circuit.
- Condensate discharge sensor.
- 3 bar safety valve.
- 8 l expansion tank.
- DHW buffer tank temperature probe.



## 4 TECHNICAL DATA

### 4.1 K18 SIMPLYGAS

Table 4.1 K18 Simplygas technical data

|  |   |       |        | k18 Simplygas C1 |
|--|---|-------|--------|------------------|
| Heating mode   |   |       |        |                  |
| Seasonal space heating energy efficiency class (ErP) | medium-temperature application (55 °C)      |       | -      | A++              |
|  | low-temperature application (35 °C)         |       | -      | A+               |
| Heat output  | Outdoor temperature/Delivery temperature    | A7W50 | kW     | 17,6             |
|  |   | A7W35 | kW     | 18,9             |
| GUE efficiency                                       | Outdoor temperature/Delivery temperature    | A7W50 | %      | 157              |
|  |   | A7W35 | %      | 169              |
| Heat input   | nominal (1013 mbar - 15 °C) (1)             |       | kW     | 11,4             |
|  | real  |       | kW     | 11,2             |
| Hot water delivery temperature                       | maximum for heating                         |       | °C     | 65               |
| Hot water return temperature                         | maximum for heating                         |       | °C     | 55               |
|  | minimum temperature in continuous operation |       | °C     | 25 (2)           |
| Heating water flow                                   | nominal                                     |       | l/h    | 1000             |
|  | maximum                                     |       | l/h    | 2000             |
|  | minimum                                     |       | l/h    | 400              |
| Ambient air temperature (dry bulb)                   | maximum                                     |       | °C     | 40               |
|  | minimum                                     |       | °C     | -25              |
| DHW mode   |   |       |        |                  |
| DHW delivery temperature                             | maximum for DHW                             |       | °C     | 70               |
| DHW inlet temperature                                | maximum for DHW                             |       | °C     | 60               |
| nominal heat output for DHW at 20 °C ambient         |   |       | kW     | 18,9             |
| specific capacity in continuous operation - Δt 30°C  |   |       | l/min  | 30,0 (3)         |
| Electrical specifications                            |   |       |        |                  |
| Power supply   | voltage                                     |       | V      | 230              |
|  | type  |       | -      | single-phase     |
|  | frequency                                   |       | Hz     | 50               |
| Electrical power absorption                          | nominal                                     |       | kW     | 0,35             |
| Degree of protection                                 | IP  |       | -      | 25               |
| Installation data                                    |   |       |        |                  |
| Gas consumption                                      | G20 natural gas (nominal)                   |       | m³/h   | 1,20 (4)         |
|  | LPG G30/G31 (nominal)                       |       | kg/h   | 0,87 (5)         |
| Water fitting  | type  |       | -      | M                |
|  | thread                                      |       | "      | 3/4              |
| Gas connection                                       | type  |       | -      | M                |
|  | thread                                      |       | "      | 1/2 (6)          |
| Flue gas exhaust                                     | diameter (Ø)                                |       | mm     | 80               |
|  | residual head                               |       | Pa     | 70               |
| type of installation                                 |   |       | -      | B23P, B53P       |
| NO <sub>x</sub> emission class                       |   |       | -      | 5                |
| Dimensions   | width                                       |       | mm     | 1145             |
|  | depth                                       |       | mm     | 721 (7)          |
|  | height                                      |       | mm     | 1333             |
| Weight   | in operation                                |       | kg     | 215              |
| sound pressure L <sub>p</sub> at 5 metres (max)      |   |       | dB(A)  | 43,0 (8)         |
| sound pressure L <sub>p</sub> at 5 metres (min)      |   |       | dB(A)  | 40,0 (8)         |
| maximum water pressure in operation                  |   |       | bar    | 4,0              |
| maximum condensation and defrosting water flow rate  |   |       | l/h    | 13,5             |
| Water content inside the apparatus                   |   |       | l      | 1                |
| required air flow                                    |   |       | m³/h   | 4000             |
| Circulating pump data                                | maximum head                                |       | m w.c. | 8,0              |
|  | residual pressure head at nominal flow rate |       | m w.c. | 4,0              |
|  | nominal flow at the maximum available head  |       | l/h    | 1500             |
|  | maximum electrical consumption              |       | W      | 75               |

(1) Relative to NCV (net calorific value).

(2) In transient operation, lower temperatures are allowed.

(3) 10 minute peak collection of domestic hot water. The exact value depends on the performance of the DHW buffer tank.

(4) PCI (G20) 34,02 MJ/m³ (15 °C - 1013 mbar).

(5) PCI (G30/G31) 46,34 MJ/kg (15 °C - 1013 mbar).

(6) It is possible to reduce gas pipe diameter to 3/8", ensuring enough gas pressure to the appliance, considering pressure losses of entire gas supply pipe.

(7) Dimensions including flue gas discharge.

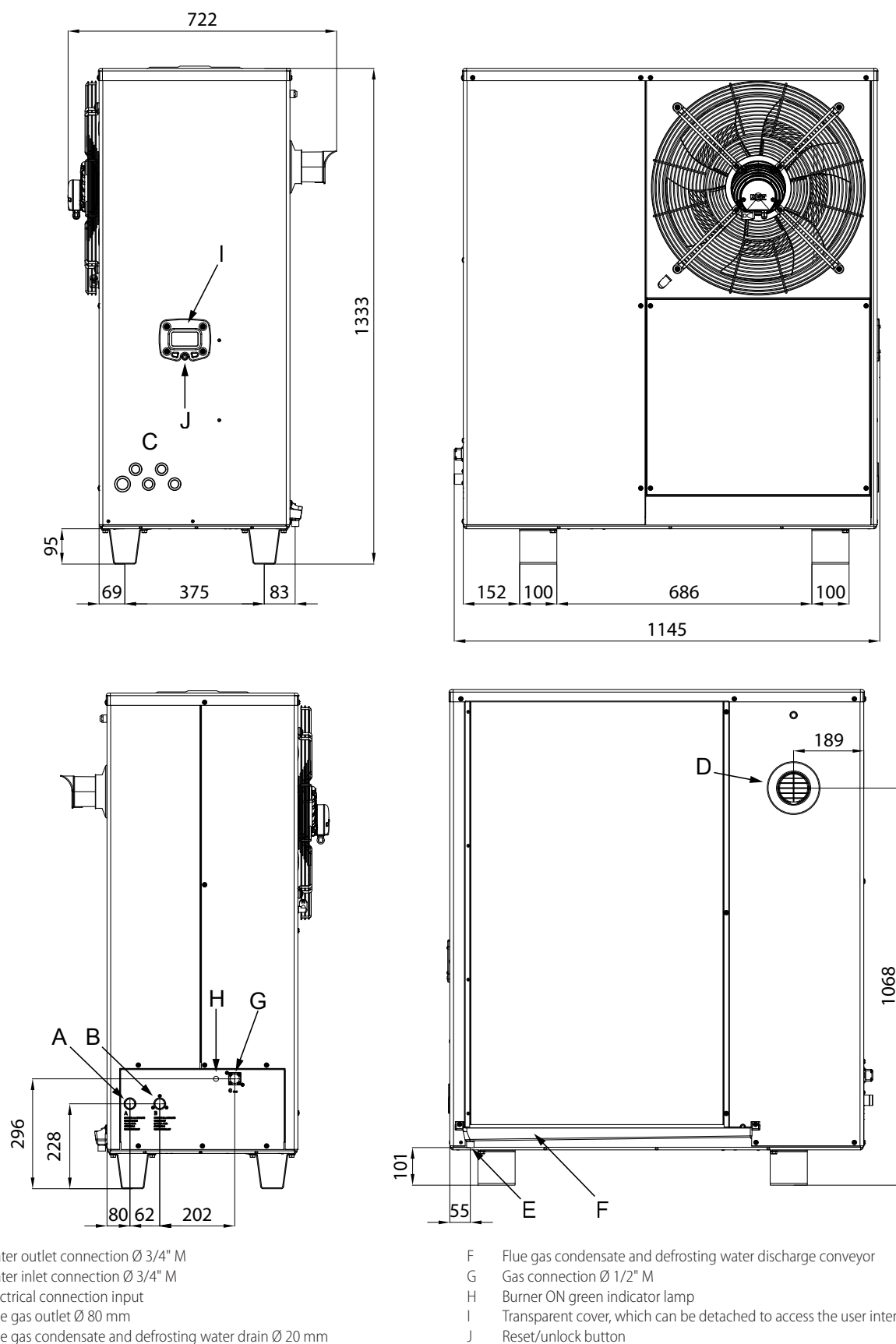
(8) Sound pressure values in free field, with directionality factor 2, obtained from the sound power value in compliance with standard EN ISO 9614. Sound power L<sub>w</sub> 65 dB(A) at maximum ventilation, 62 dB(A) at minimum ventilation; sound power values detected in compliance with the intensity measurement methodology set forth by standard EN ISO 9614.

|                     |                        |    | k18 Simplygas C1 |
|---------------------|------------------------|----|------------------|
| General information |                        |    |                  |
| Cooling fluid       | ammonia R717           | kg | 4,3              |
|                     | water H <sub>2</sub> O | kg | 4,4              |

- (1) Relative to NCV (net calorific value).  
 (2) In transient operation, lower temperatures are allowed.  
 (3) 10 minute peak collection of domestic hot water. The exact value depends on the performance of the DHW buffer tank.  
 (4) PCI (G20) 34,02 MJ/m<sup>3</sup> (15 °C - 1013 mbar).  
 (5) PCI (G30/G31) 46,34 MJ/kg (15 °C - 1013 mbar).  
 (6) It is possible to reduce gas pipe diameter to 3/8", ensuring enough gas pressure to the appliance, considering pressure losses of entire gas supply pipe.  
 (7) Dimensions including flue gas discharge.  
 (8) Sound pressure values in free field, with directionality factor 2, obtained from the sound power value in compliance with standard EN ISO 9614. Sound power L<sub>w</sub> 65 dB(A) at maximum ventilation, 62 dB(A) at minimum ventilation; sound power values detected in compliance with the intensity measurement methodology set forth by standard EN ISO 9614.

### 4.1.1 Dimensions

Figure 4.1 Dimensions K18 Simplygas



#### 4.1.2 Performances

The following table shows the thermal output in relation to the

outdoor air temperature and the water delivery temperature to the system.

**Table 4.2** K18 Simplygas heat output

| External air temperature | Water delivery temperature |       |       |       |       |       |       |
|--------------------------|----------------------------|-------|-------|-------|-------|-------|-------|
|                          | 35 °C                      | 40 °C | 45 °C | 50 °C | 55 °C | 60 °C | 65 °C |
|                          | kW                         | kW    | kW    | kW    | kW    | kW    | kW    |
| -25 °C                   | 13,0                       | 12,8  | 12,5  | 12,3  | 11,8  | 11,4  | 11,0  |
| -20 °C                   | 14,0                       | 13,5  | 13,0  | 12,8  | 12,0  | 11,6  | 11,2  |
| -15 °C                   | 15,0                       | 14,4  | 13,7  | 13,4  | 12,5  | 12,1  | 11,7  |
| -10 °C                   | 16,9                       | 15,9  | 14,8  | 14,4  | 13,0  | 12,6  | 12,1  |
| -7 °C                    | 17,5                       | 16,5  | 15,4  | 14,9  | 13,3  | 12,9  | 12,5  |
| -5 °C                    | 17,7                       | 16,8  | 15,8  | 15,4  | 14,0  | 13,5  | 12,9  |
| 0 °C                     | 18,0                       | 17,5  | 17,0  | 16,5  | 15,0  | 14,4  | 13,8  |
| 2 °C                     | 18,4                       | 17,9  | 17,4  | 16,9  | 15,3  | 14,8  | 14,3  |
| 5 °C                     | 18,5                       | 18,2  | 17,9  | 17,5  | 16,0  | 15,3  | 14,6  |
| 7 °C                     | 18,9                       | 18,5  | 18,0  | 17,6  | 16,3  | 15,7  | 15,1  |
| 10 °C                    | 19,0                       | 18,6  | 18,2  | 17,9  | 17,0  | 16,3  | 15,6  |
| 12 °C                    | 19,0                       | 18,7  | 18,3  | 18,0  | 17,0  | 16,5  | 16,0  |
| 15 °C                    | 19,2                       | 18,8  | 18,4  | 18,1  | 17,3  | 16,8  | 16,2  |
| 20 °C                    | 19,2                       | 18,9  | 18,5  | 18,2  | 17,4  | 16,9  | 16,4  |
| 25 °C                    | 19,2                       | 18,9  | 18,5  | 18,2  | 17,4  | 16,9  | 16,4  |
| 30 °C                    | 19,2                       | 18,9  | 18,5  | 18,2  | 17,4  | 16,9  | 16,4  |
| 35 °C                    | 19,2                       | 18,9  | 18,5  | 18,2  | 17,4  | 16,9  | 16,4  |

**Table 4.3** Other useful data

|   |         |
|---|---------|
| Operational limit temperature $\theta_{tol}$  | -25 °C  |
| Generator temperature $\theta_{gen,in}$       | 90 °C   |
| Electrical draw C1 version Wel                | 0,35 kW |
| Heat input (burner power) $\dot{Q}_{gahp,in}$ | 11,2 kW |
| Minimum modulation rate CR                    | 60 %    |

**Table 4.5** Useful heat output  $\dot{Q}_{gahp,out}$

| $\theta_f$ | $\theta_c$ |       |       |
|------------|------------|-------|-------|
|            | 35 °C      | 45 °C | 55 °C |
|            | kW         | kW    | kW    |
| -7 °C      | 17,5       | 15,4  | 13,3  |
| 2 °C       | 18,4       | 17,4  | 15,3  |
| 7 °C       | 18,9       | 18,0  | 16,3  |
| 12 °C      | 19,0       | 18,3  | 17,0  |

**Table 4.4** GUE K18

| $\theta_f$ | $\theta_c$ |       |       |
|------------|------------|-------|-------|
|            | 35 °C      | 45 °C | 55 °C |
|            | %          | %     | %     |
| -7 °C      | 149        | 131   | 113   |
| 2 °C       | 161        | 153   | 134   |
| 7 °C       | 169        | 161   | 146   |
| 12 °C      | 173        | 166   | 155   |

## 4.2 K18 HYBRIGAS

**Table 4.6** K18 Hybrigas technical data

|  |   |       |    | K18 Hybrigas 37/2 | K18 Hybrigas Easy 37/4 |
|--|---|-------|----|-------------------|------------------------|
| <b>Heating mode</b>                                  |   |       |    |                   |                        |
| Seasonal space heating energy efficiency class (ErP) | medium-temperature application (55 °C)      |       |    | -                 | A++                    |
|  | low-temperature application (35 °C)         |       |    | -                 | A+                     |
| Heat output  | Outdoor temperature/Delivery temperature    | A7W50 | kW | 36,6              |                        |
|  |   | A7W35 | kW | 37,9              |                        |
| Heat input   | nominal (1013 mbar - 15 °C) (1)             |       |    | kW                | 29,4 (2)               |
|  | real  |       |    | kW                | 29,2 (3)               |
|  | minimum (1)                                 |       |    | kW                | 2,9                    |
| Hot water delivery temperature                       | maximum for heating                         |       |    | °C                | 65 (4)                 |
| Hot water return temperature                         | minimum temperature in continuous operation |       |    | °C                | 25 (5)                 |

- (1) Relative to NCV (net calorific value).  
 (2) For operation in space heating mode only.  
 (3) For space heating mode and combined production of DHW.  
 (4) Value in combined operation. 80 °C for boiler only operation (half of the total available power).  
 (5) In transient operation, lower temperatures are allowed.  
 (6) Operation at -25 °C is possible with a special winter kit.  
 (7) 10 minute peak collection of domestic hot water. The exact value depends on the performance of the DHW buffer tank.  
 (8) PCI (G20) 34,02 MJ/m<sup>3</sup> (15 °C - 1013 mbar).  
 (9) PCI (G30/G31) 46,34 MJ/kg (15 °C - 1013 mbar).  
 (10) Dimensions including flue gas discharge.  
 (11) Sound pressure values in free field, with directionality factor 2, obtained from the sound power value in compliance with standard EN ISO 9614. Sound power Lw 65 dB(A) at maximum ventilation, 62 dB(A) at minimum ventilation; sound power values detected in compliance with the intensity measurement methodology set forth by standard EN ISO 9614.

|   |   |        | K18 Hybrigas<br>37/2 | K18 Hybrigas<br>Easy 37/4 |
|---|---|--------|----------------------|---------------------------|
| Heating water flow                                  | nominal                                     | l/h    | 2000                 |                           |
| Ambient air temperature (dry bulb)                  | maximum                                     | °C     | 40                   |                           |
|   | minimum                                     | °C     | -10 (6)              |                           |
| DHW mode  |   |        |                      |                           |
| nominal heat output for DHW at 20 °C ambient        |   | kW     | 37,9                 | 23,5                      |
| specific capacity in continuous operation - Δt 30°C |   | l/min  | 30,0 (7)             | 20,0 (7)                  |
| DHW delivery temperature                            | maximum for DHW                             | °C     | 70                   | 80                        |
| DHW inlet temperature                               | maximum for DHW                             | °C     | 60                   | 80                        |
| Electrical specifications                           |   |        |                      |                           |
| Power supply  | voltage                                     | V      | 230                  |                           |
|   | type  | -      | single-phase         |                           |
|   | frequency                                   | Hz     | 50                   |                           |
| Electrical power absorption                         | nominal                                     | kW     | 0,44                 |                           |
| Degree of protection                                | IP  | -      | 25                   |                           |
| Installation data                                   |   |        |                      |                           |
| Gas consumption                                     | G20 natural gas (nominal)                   | m³/h   | 3,10 (8)             |                           |
|   | G30 (nominal)                               | kg/h   | 2,29 (9)             |                           |
|   | G31 (nominal)                               | kg/h   | 2,27 (9)             |                           |
| Water fitting                                       | type  | -      | M                    |                           |
|   | thread                                      | "      | 3/4                  |                           |
| DHW connections                                     | type  | -      | -                    | M                         |
|   | thread                                      | "      | -                    | 3/4                       |
| Gas connection                                      | type  | -      | M                    |                           |
|   | thread                                      | "      | 3/4                  |                           |
| Flue gas exhaust                                    | diameter (Ø)                                | mm     | 80                   |                           |
|   | residual head                               | Pa     | 70                   |                           |
| Boiler flue gas exhaust                             | diameter (Ø)                                | mm     | 80                   |                           |
|   | residual head                               | Pa     | 100                  |                           |
| Type of installation (heat pump)                    | type of installation                        | -      | B23P, B53P           |                           |
| Type of installation (boiler)                       | type of installation                        | -      | B23P, B33            |                           |
| NO <sub>x</sub> emission class                      |   | -      | 5                    |                           |
| Dimensions  | width                                       | mm     | 1452                 |                           |
|   | depth                                       | mm     | 752 (10)             |                           |
|   | height                                      | mm     | 1348                 |                           |
| Weight  | in operation                                | kg     | 295                  |                           |
| sound pressure L <sub>p</sub> at 5 metres (max)     |   | dB(A)  | 43,0 (11)            |                           |
| sound pressure L <sub>p</sub> at 5 metres (min)     |   | dB(A)  | 40,0 (11)            |                           |
| maximum water pressure in operation                 |   | bar    | 4,0                  |                           |
| maximum condensation and defrosting water flow rate |   | l/h    | 17,5                 |                           |
| Water content inside the apparatus                  |   | l      | 9                    |                           |
| Circulating pump data                               | maximum head                                | m w.c. | 8,0                  |                           |
|   | residual pressure head at nominal flow rate | m w.c. | 2,0                  |                           |
| expansion tank volume                               |   | l      | 8                    |                           |
| General information                                 |   |        |                      |                           |
| Cooling fluid                                       | ammonia R717                                | kg     | 4,3                  |                           |
|   | water H <sub>2</sub> O                      | kg     | 4,4                  |                           |

- (1) Relative to NCV (net calorific value).  
 (2) For operation in space heating mode only.  
 (3) For space heating mode and combined production of DHW.  
 (4) Value in combined operation. 80 °C for boiler only operation (half of the total available power).  
 (5) In transient operation, lower temperatures are allowed.  
 (6) Operation at -25 °C is possible with a special winter kit.  
 (7) 10 minute peak collection of domestic hot water. The exact value depends on the performance of the DHW buffer tank.  
 (8) PCI (G20) 34,02 MJ/m<sup>3</sup> (15 °C - 1013 mbar).  
 (9) PCI (G30/G31) 46,34 MJ/kg (15 °C - 1013 mbar).  
 (10) Dimensions including flue gas discharge.  
 (11) Sound pressure values in free field, with directionality factor 2, obtained from the sound power value in compliance with standard EN ISO 9614. Sound power L<sub>w</sub> 65 dB(A) at maximum ventilation, 62 dB(A) at minimum ventilation; sound power values detected in compliance with the intensity measurement methodology set forth by standard EN ISO 9614.

Table 4.7 Onboard condensing boilers technical data (for K18 Hybrigas range)

|                       |                                 |                 | K18 Hybrigas Boiler | K18 Hybrigas Easy Boiler |
|-----------------------|---------------------------------|-----------------|---------------------|--------------------------|
| <b>Heating mode</b>   |                                 |                 |                     |                          |
| Heat input            | nominal (1013 mbar - 15 °C) (1) | kW              | 18,0                |                          |
|                       | minimum (1)                     | kW              | 2,9                 |                          |
| Operating point 80/60 | Nominal heat input              | effective power | kW                  | 17,6                     |
|                       |                                 | efficiency      | %                   | 98,0                     |
| Operating point 50/30 | Nominal heat input              | efficiency      | %                   | 105,5                    |

- (1) Relative to NCV (net calorific value).

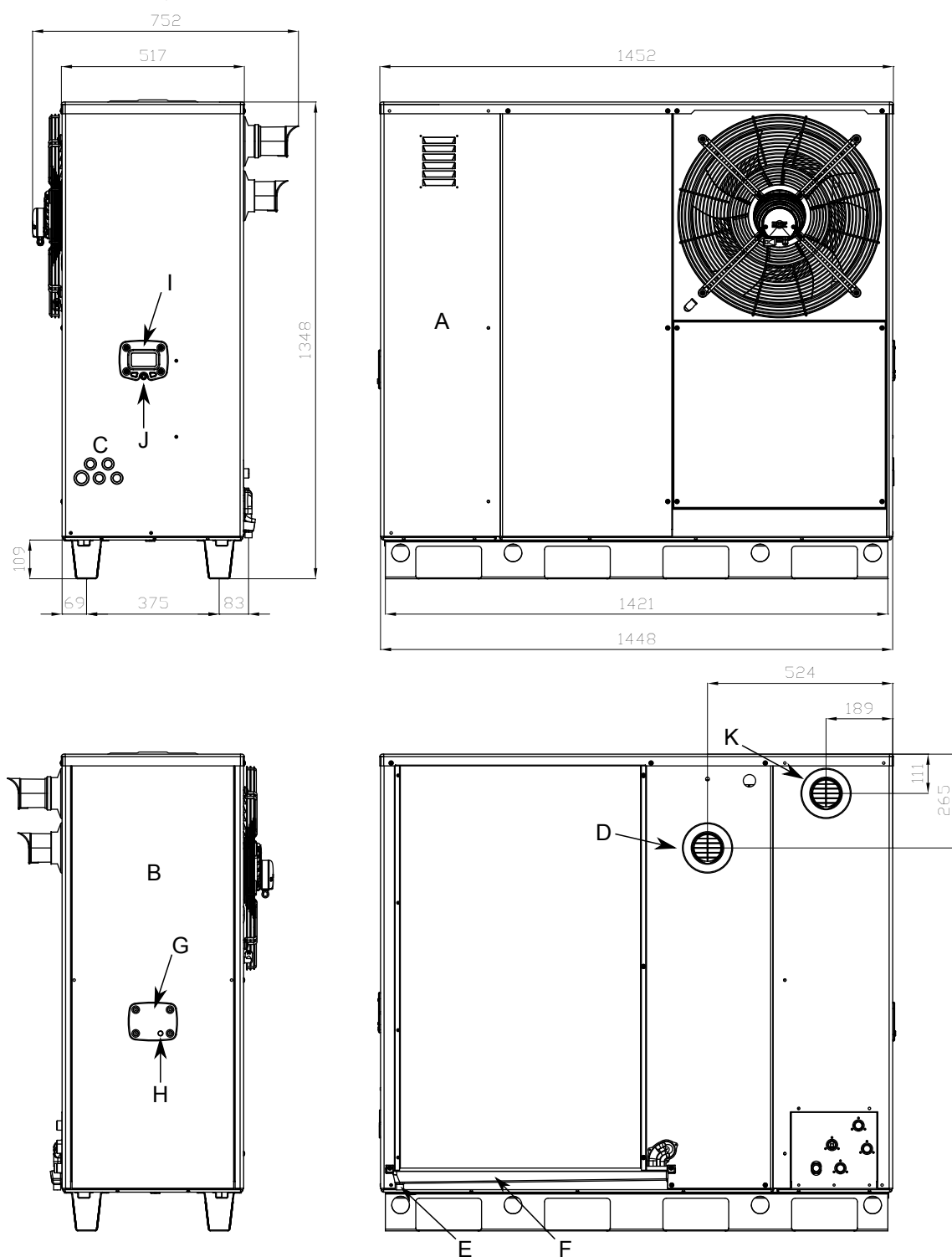
|                            |                             |            |      | K18 Hybrigas Boiler | K18 Hybrigas Easy Boiler |
|----------------------------|-----------------------------|------------|------|---------------------|--------------------------|
| Operating point Tr = 30 °C | Heat input 30%              | efficiency | %    | 107,5               |                          |
| Operating point Tr = 47 °C | Heat input 30%              | efficiency | %    | 101,2               |                          |
| Heat loss                  | to jacket in operation      |            | kW   | 0,02                |                          |
|                            | to jacket in operation      |            | %    | 0,10                |                          |
|                            | to flue in operation        |            | kW   | 0,38                |                          |
|                            | to flue in operation        |            | %    | 2,10                |                          |
|                            | with burner off             |            | kW   | 0,045               |                          |
|                            | with burner off             |            | %    | 0,25                |                          |
| efficiency class           |                             | ****       |      |                     |                          |
| DHW mode                   |                             |            |      |                     |                          |
| Heat input                 | nominal (1013 mbar - 15 °C) |            | kW   | -                   | 23,5                     |
|                            | minimum                     |            | kW   | -                   | 2,9                      |
| Installation data          |                             |            |      |                     |                          |
| Gas consumption            | G20 natural gas (nominal)   |            | m³/h | 1,90                |                          |
|                            | G30 (nominal)               |            | kg/h | 1,42                |                          |
|                            | G31 (nominal)               |            | kg/h | 1,40                |                          |
| CO emission                |                             |            | ppm  | 41,0                |                          |

(1) Relative to NCV (net calorific value).



### 4.2.1 Dimensions

**Figure 4.2** Dimensions K18 Hybrigas

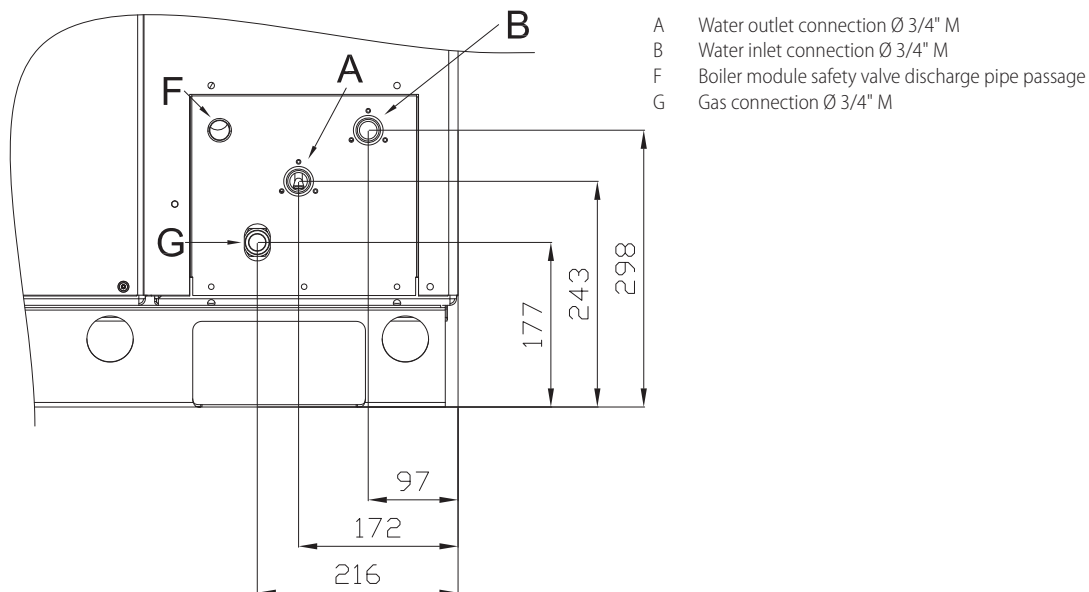


- |   |  |   |  |
|---|--|---|--|
| A | Front panel  |   | interface keys   |
| B | Left panel   | H | Boiler reset/unlock button   |
| C | Electrical connection input  | I | Heat pump display transparent cover, which can be detached to access the user interface keys |
| D | Heat pump flue gas exhaust outlet Ø 80 mm                                  | J | Heat pump reset/unlock button  |
| E | Flue gas condensate and defrosting water drain Ø 20 mm                     | K | Boiler flue gas exhaust outlet Ø 80 mm   |
| F | Flue gas condensate and defrosting water discharge conveyor                |   |  |
| G | Boiler display transparent cover, which can be detached to access the user |   |  |

#### 4.2.1.1 Connection plate detail

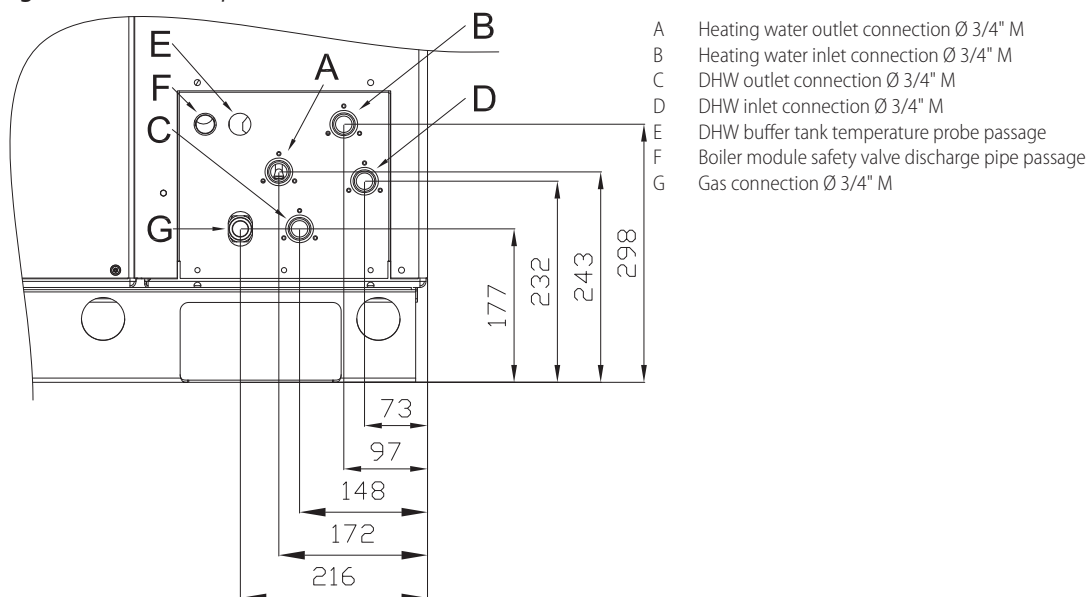
##### K18 Hybrigas

**Figure 4.3** Connection plate detail



##### K18 Hybrigas Easy

**Figure 4.4** Connection plate detail



#### 4.2.2 Performances

The following table shows the thermal output in relation to the outdoor air temperature and the water delivery temperature to

the system.

Data related to outdoor temperatures below -10 °C are applicable only when using the winter kit (optional OKBT013 or OKBT014).

Table 4.8 K18 Hybrigas heat output

| Water delivery temperature | Water delivery temperature |       |       |       |       |       |       |       |
|----------------------------|----------------------------|-------|-------|-------|-------|-------|-------|-------|
|                            | 35 °C                      | 40 °C | 45 °C | 50 °C | 55 °C | 60 °C | 65 °C | 80 °C |
|                            | kW                         | kW    | kW    | kW    | kW    | kW    | kW    | kW    |
| -25 °C                     | 32,0                       | 31,7  | 31,5  | 31,3  | 30,8  | 30,4  | 30,0  | 17,6  |
| -20 °C                     | 33,0                       | 32,5  | 32,0  | 31,8  | 31,0  | 30,6  | 30,2  | 17,6  |
| -15 °C                     | 34,0                       | 33,3  | 32,7  | 32,4  | 31,5  | 31,1  | 30,7  | 17,6  |
| -10 °C                     | 35,9                       | 34,8  | 33,8  | 33,4  | 32,0  | 31,5  | 31,1  | 17,6  |
| -7 °C                      | 36,5                       | 35,4  | 34,4  | 33,9  | 32,3  | 31,9  | 31,5  | 17,6  |
| -5 °C                      | 36,7                       | 35,7  | 34,8  | 34,4  | 33,0  | 32,4  | 31,9  | 17,6  |
| 0 °C                       | 37,0                       | 36,5  | 36,0  | 35,5  | 34,0  | 33,4  | 32,8  | 17,6  |
| 2 °C                       | 37,4                       | 36,9  | 36,4  | 35,9  | 34,3  | 33,8  | 33,2  | 17,6  |
| 5 °C                       | 37,5                       | 37,2  | 36,9  | 36,4  | 35,0  | 34,3  | 33,6  | 17,6  |
| 7 °C                       | 37,9                       | 37,5  | 37,0  | 36,6  | 35,3  | 34,7  | 34,1  | 17,6  |
| 10 °C                      | 38,0                       | 37,6  | 37,2  | 36,9  | 36,0  | 35,3  | 34,6  | 17,6  |
| 12 °C                      | 38,0                       | 37,6  | 37,3  | 37,0  | 36,0  | 35,5  | 34,9  | 17,6  |
| 15 °C                      | 38,2                       | 37,8  | 37,4  | 37,1  | 36,3  | 35,7  | 35,2  | 17,6  |
| 20 °C                      | 38,2                       | 37,8  | 37,5  | 37,2  | 36,4  | 35,9  | 35,4  | 17,6  |
| 25 °C                      | 38,2                       | 37,8  | 37,5  | 37,2  | 36,4  | 35,9  | 35,4  | 17,6  |
| 30 °C                      | 38,2                       | 37,8  | 37,5  | 37,2  | 36,4  | 35,9  | 35,4  | 17,6  |
| 35 °C                      | 38,2                       | 37,8  | 37,5  | 37,2  | 36,4  | 35,9  | 35,4  | 17,6  |

Other data for the heat pump module are the same than for the K18 Simplygas model (see Paragraph 4.1.2 p. 12).

### 4.3 ARMONIA CONTROL SYSTEM

A control system has been designed for the K18 range, called Armonia, which allows integration between the heat pump and an optional auxiliary boiler (for K18 Hybrigas units the auxiliary boiler is the integrated condensing boiler module) to be managed as optimally as possible in order to provide the best performance in terms of comfort and energy efficiency. Specifically, as shown in Figure 4.5 p. 18 below, various cases are possible:

- A.** Very low load: active auxiliary boiler in modulation and heat pump off (replacement at a particularly mild outdoor temperature).
- B.** Low load: active heat pump in modulation and auxiliary boiler off.
- C.** Average/high load: active heat pump at full power and active auxiliary boiler in modulation (integration).
- D.** High load: maximum power for the operating condition to be reached quicker (integration).
- E.** Very high load: heat pump out of the operating limits and auxiliary boiler that autonomously covers the design load (replacement at low ambient temperature).

In the presence of a minimal thermal demand (scenario A), the minimum power of the heat pump could still be excessive in comparison to the demand. In this case it may be advantageous

to use only the auxiliary boiler (replacement mode), if this has adequate modulation capacity.

In the presence of low thermal demand (scenario B), only the heat pump will be active in modulation mode, whereas the auxiliary boiler will be off.

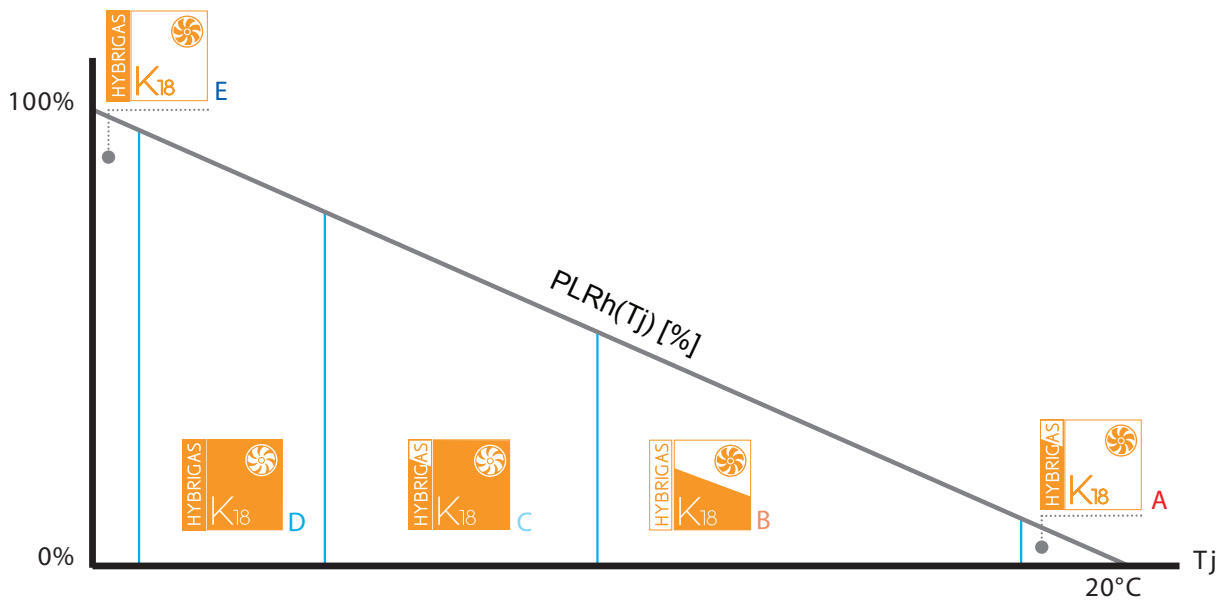
As the thermal demand increases (scenario C), the heat pump reaches full power and, if the thermal load still cannot be fulfilled, it will activate the auxiliary boiler, which (if the specific model used allows it) will run in modulation mode. The heat pump will still remain active and at full power, and therefore the power of the auxiliary boiler will be added to that of the heat pump (integration mode).

When the thermal demand is high (scenario D), for example while the system reaches operating conditions, the heat pump and auxiliary boiler will run at maximum power, reducing the necessary time for the operating conditions to be reached and ensuring the optimal comfort even in harsher environmental conditions.



If the heating system design require the water temperature to be higher than the maximum that can be dispensed by the heat pump, in high thermal demand conditions (scenario E), the auxiliary boiler can be activated as its replacement. In this type of application the maximum thermal load of the building must be at most equal to the power of the auxiliary boiler and not to the sum of the power of the two appliances (replacement mode).

**Figure 4.5** Armonia control system diagram



$T_j$  [°C] outdoor temperature

$PLRh(T_j)$  [%] plant partial load ratio at outdoor temperature  $T_j$

A Heat pump off. Active auxiliary boiler in modulation

B Active heat pump in modulation. Auxiliary boiler off

C Active heat pump at full power. Active auxiliary boiler in modulation

D Active heat pump at full power. Active auxiliary boiler at full power

E Heat pump off. Active auxiliary boiler at full power

## 4.4 DHW PRODUCTION CONTROL DEVICE

The appliance may only produce DHW if it is connected to a control device, selected from:

1. OQLT021 system controller (optional)
2. Direct control from K18 Simplygas or K18 Hybrigas appliance (with DHW buffer tank probe, optional OSND004), without use of external request
3. Direct control from K18 Simplygas or K18 Hybrigas appliance (with DHW buffer tank probe, optional OSND004) and use of external request

### 4.4.1 OQLT021 system controller (optional)

The OQLT021 system controller can manage the buffer tank DHW production with the K18 Simplygas or K18 Hybrigas appliances in the most comprehensive way.

The main functions for DHW production are:

- Selection of the type of DHW function required (continuous production or only in certain time slots).
- Programming of DHW request activation time slots.
- Programming of DHW buffer tank setpoints.
- Programmed antilegionella disinfection management.
- Management of the temperature probe in the DHW buffer tank.
- Diverter valve management.

### 4.4.2 Direct control from the appliance without use of external request

The production of DHW, without the help of the OQLT021

system controller, will be active 24 hours/day with fixed comfort setpoint. The actual activation of the service will depend on the temperature measured by the temperature probe in the DHW buffer tank. The comfort setpoint will be set to relevant K18 Simplygas or K18 Hybrigas appliance parameter.

### 4.4.3 Direct control from the appliance and use of external request

The DHW production management, also in this case carried out without the help of the OQLT021 system controller, can be made more flexible by connecting an external device (typically, and depending on the required function, a timer or a switch) that allows to activate or deactivate the DHW service request or, alternatively, to switch the required setpoint in the DHW buffer tank to two different values. The required setpoint values will be set to the relevant K18 Simplygas or K18 Hybrigas appliance parameters.

In the case of using a timer, it will be possible to schedule the DHW production on the timer itself using two different setpoints (comfort / reduced, comfort / antifreeze, or comfort / anti-legionella), or providing for the complete deactivation of the DHW service outside the set time slots.

Through the use of a simple switch, instead, it will not be possible to schedule the DHW service, but two different setpoints or alternatively the activation and deactivation of the DHW production service will be managed manually.

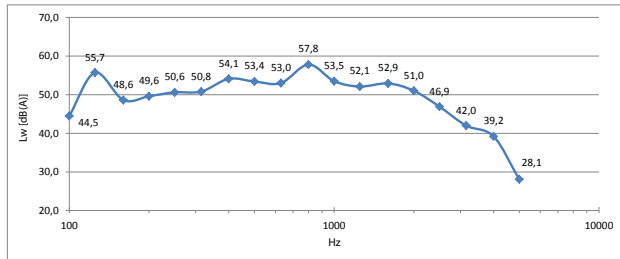
## 4.5 SOUND POWER

The following data are valid for all models in the K18 range.

**Table 4.9** Sound power

|                         | Full load | Full load - fan in low noise mode | Partial load |
|-------------------------|-----------|-----------------------------------|--------------|
| Sound power [dB(A)] (1) | 65        | 64                                | 62           |

(1) measures according to ISO EN 9614-2 and EN 12102 standards

**Figure 4.6** Frequency spectrum K18 at full load

## 4.6 COMBUSTION PRODUCTS EXHAUST



### Compliance with standards

The appliance is approved for connection to a combustion products exhaust duct for the types shown in Table 4.1 p. 9 for K18 Simplygas models and in Table 4.6 p. 12 for K18 Hybrigas models.

The fumes outlet of such appliances may be wall-mounted, but it can also be easily conveyed over the ridge of the roof because

**Table 4.11** Characteristics of K18 Hybrigas flue gas exhaust

|   |                      |    | K18 Hybrigas 37/2 | K18 Hybrigas Easy 37/4 |
|---|----------------------|----|-------------------|------------------------|
| <b>Installation data</b>                |                      |    |                   |                        |
| <b>Type of installation (heat pump)</b> | type of installation | -  | B23P, B53P        | B23P, B53P             |
|   | diameter (Ø)         | mm | 80                | 80                     |
|   | residual head        | Pa | 70                | 70                     |
| <b>Type of installation (boiler)</b>    | type of installation | -  | B23P, B33         | B23P, B33              |
|   | diameter (Ø)         | mm | 80                | 80                     |
|   | residual head        | Pa | 100               | 100                    |

**Table 4.12** K18 Hybrigas boilers flue gas exhaust characteristics

|   |                    |     |      | K18 Hybrigas Boiler | K18 Hybrigas Easy Boiler |
|---|--------------------|-----|------|---------------------|--------------------------|
| <b>Installation data</b>                  |                    |     |      |                     |                          |
| <b>CO<sub>2</sub> percentage in fumes</b> | Nominal heat input | G20 | %    | 9,4                 |                          |
|   |                    | G30 | %    | 11,1                |                          |
|   |                    | G31 | %    | 10,2                |                          |
|   | Minimal heat input | G20 | %    | 9,0                 |                          |
|   |                    | G30 | %    | 10,5                |                          |
|   |                    | G31 | %    | 10,0                |                          |
| <b>Flue temperature</b>                   | Nominal heat input | G20 | °C   | 73,7                |                          |
| <b>Fumes flow rate</b>                    | Nominal heat input | G20 | kg/h | 28                  |                          |
|   | Minimal heat input | G20 | kg/h | 5                   |                          |

For the design of any unified flue for hybrid versions, you must consider that:

- It is mandatory to install a check valve on the exhaust of each module (heat pump and boiler).
- In case the check valves are installed outside, an appropriate UV ray protection must be assured (if the valve is constructed

the residual head allows the ducts to be extended by some tens meters, if the local regulations require this.

For K18 Hybrigas versions, the two distinct flue gas exhaust ducts of the heat pump module and the boiler module can be conveyed separately or via a unified flue.

For K18 Hybrigas units, the optional OTBO069 is available (see Paragraph 7.8 p. 27), which simplifies the execution of a unified flue for the two modules that make up the unit.

Tables 4.10 p. 19, 4.11 p. 19, 4.12 p. 19 below show the characteristics of the combustion products, which are useful to size an optional flue.

**Table 4.10** K18 Simplygas flue gas exhaust characteristics

|                                     |                    |     |      | K18 Simp-<br>lygas |
|-------------------------------------|--------------------|-----|------|--------------------|
| Installation data                   |                    |     |      |                    |
| CO <sub>2</sub> percentage in fumes | Nominal heat input | G20 | %    | 9,0 (1)            |
|                                     |                    | G30 | %    | 10,5 (2)           |
|                                     |                    | G31 | %    | 10,0 (3)           |
| Flue temperature                    | Nominal heat input | G20 | °C   | 60,0               |
|                                     |                    | G30 | °C   | 60,0               |
|                                     |                    | G31 | °C   | 60,0               |
| Fumes flow rate                     | Nominal heat input | G20 | kg/h | 19                 |
|                                     |                    | G30 | kg/h | 19                 |
|                                     |                    | G31 | kg/h | 21                 |
| type of installation                |                    |     | -    | B23P, B53P         |
| Flue gas exhaust                    | diameter (Ø)       | mm  |      | 80                 |
|                                     | residual head      | Pa  |      | 70                 |

(1) 8,8 ÷ 9,2.

(2) 10,3 ÷ 10,7.

(3) 9,8 ÷ 10,2.

in plastic material) as well as protection from potential winter freezing of condensate backflow into the siphon.

- The optional OTBO069 (unified flue) greatly simplifies the execution of the unified flue. For more information on the OTBO069 optional, see Paragraph 7.8 p. 27.

## 5 APPLIANCE POSITIONING

### 5.1 WARNINGS



#### Aggressive substances in the air

Halogenated hydrocarbons containing chlorine and fluorine compounds cause corrosion. The air of the installation site must be free from aggressive substances.



#### Environmental or operational heavy conditions

In environmental or operational conditions particularly heavy (for example: heavy-duty use of the appliance, salty environment, etc.), maintenance and cleaning operations must be more frequent.

### 5.2 APPLIANCE POSITIONING



#### Do not install inside a room

The appliance is type-approved for external installation.

- Do not install inside a room, not even if it has openings.
- In no event start the appliance inside a room.



#### K18 unit ventilation

- The athermal appliance requires a large space, ventilated and free from obstacles, to enable smooth flow of air to the finned coil and free air extraction from the fan, with no air recirculation.
- Incorrect ventilation may affect efficiency and cause damage to the appliance.
- The manufacturer shall not be liable for any incorrect choices of the place and setting of installation.



#### Limiting heat loss

- It is advisable to place the unit near the inlet of the water pipes in the building, minimising the external sections (adequately insulated), in order to avoid unnecessary heat loss.

#### 5.2.1 Where to install the appliance

- The appliance may be installed at ground level, on a terrace or on a roof, compatibly with its dimensions and weight.
- It must be installed outside buildings, in an area of natural air circulation, outside the dripping path of drainpipes or similar. It does not require protection from weathering.
- No obstruction or overhanging structure (e.g. protruding roofs, canopies, balconies, ledges, trees, etc.) must interfere either with the air flow reaching the finned coil and leaving the front part of the appliance or with the fumes exhaust.
- The appliance's flue gas exhaust must not be immediately close to openings or air intakes of buildings, and must comply with safety and environmental regulations.
- Do not install near the exhaust of flues, chimneys or hot polluted air. In order to work correctly, the appliance needs clean air.

#### 5.2.2 Defrosting water drainage



In winter, it is normal for frost to form on the finned coil

and for the appliance to perform defrosting cycles.

- To prevent overflowing and damages provide for a drainage system connected to water discharge (reference E Figure 4.1 p. 11 and 4.2 p. 15).

#### 5.2.3 Acoustic issues

- Pre-emptively assess the appliance's sound effect in connection to the site, taking into account that building corners, enclosed courtyards, restricted spaces may amplify the acoustic impact due to the reverberation phenomenon.
- Paragraph 4.5 p. 18 provides additional information on noise testing.

### 5.3 MINIMUM CLEARANCE DISTANCES

#### 5.3.1 Distances from combustible or flammable materials

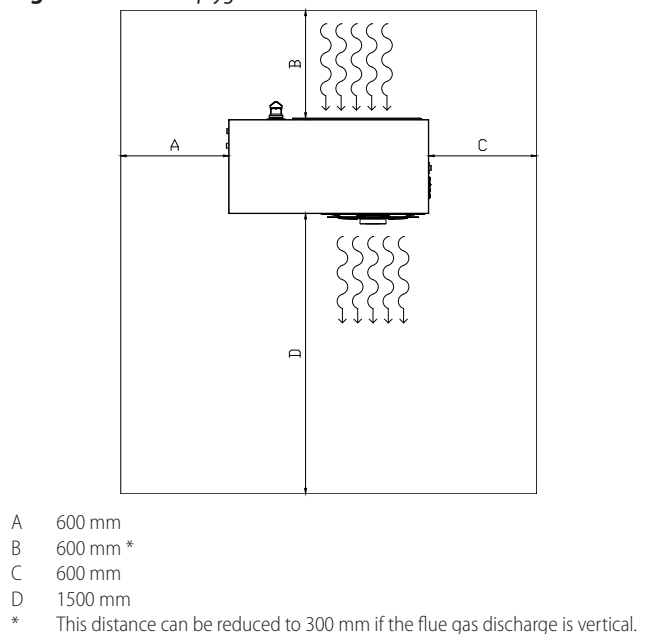
- Keep the appliance away from combustible or flammable materials or components, in compliance with applicable regulations.

#### 5.3.2 Clearances around the appliance

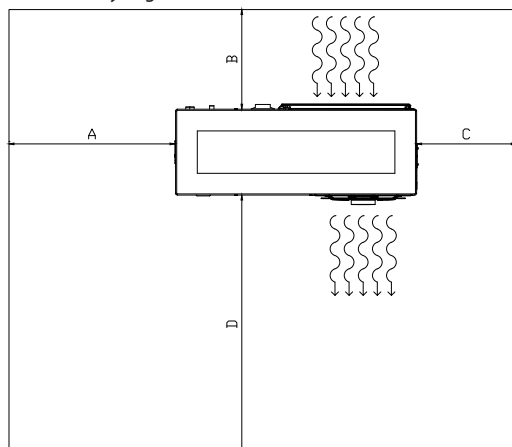
The minimum clearance distances shown in Figures 5.1 p. 20 and 5.2 p. 21 (bar any stricter regulations) are required for safety, operation and maintenance.

An open area of at least 2.5 m must be guaranteed above the appliance so as to allow free air circulation, as shown in Figure 5.3 p. 21.

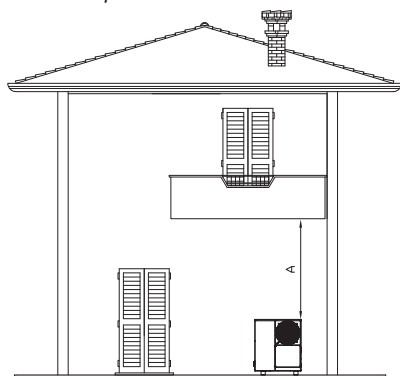
Figure 5.1 K18 Simplygas minimum clearance distances





**Figure 5.2** K18 Hybrigas minimum clearance distances

- A 1000 mm  
 B 600 mm \*  
 C 600 mm  
 D 1500 mm  
 \* This distance can be reduced to 400 mm if the flue gas exhaust is vertical.

**Figure 5.3** Minimum open area above the units

- A 2,5 m min

## 5.4 MOUNTING BASE

### 5.4.1 Mounting base constructive features

- Place the appliance on a level flat surface made of fireproof material and able to withstand its weight.

**i** In order to simplify maintenance operations even in case of adverse weather conditions (snow, heavy rain ...) it is suggested to install the unit at a height of about 300 mm from the ground.

### 5.4.2 Installation at ground level

- Failing a horizontal supporting base, make a flat and level concrete base, at least 100-150 mm larger than the appliance size per side.

### 5.4.3 Installation on a terrace or roof

- The structure of the building must support the total weight of the appliance and the supporting base.
- If necessary, provide a maintenance walkway around the appliance.

### 5.4.4 Anti vibration mountings

Although the appliance's vibrations are minimal, resonance phenomena might occur in roof or terrace installations.

- Use vibration damper supports (available as optional features).
- Also provide anti-vibration joints between the appliance and water and gas pipes.

## 6 STANDARD EQUIPMENT

All models include the following standard equipments:

- Outdoor temperature probe on the appliance.
- Remote system delivery water probe (to be installed on the system as shown in the hydraulic diagrams).
- "Climatic curve" function, which can be activated without

any other optional.

- High efficiency modulating fan.
- Active antifreeze system (without electric heaters).
- Modulating water pump/s.
- DHW temperature probe (only for K18 Hybrigas Easy model).

## 7 AVAILABLE OPTIONS

To completion of the offer of the units of the K18 family, specific accessories, control devices and system equipments are available (refer to Table 7.1 p. 21), which allow you to further optimise the overall system performance.

Other components that complete the systems can however be easily found on the market.

It should be noted that the system controller (OQLT021), as already shown in Paragraph 2 p. 6, should be provided when you want to control secondary circuits, even in the absence of DHW production, or when you want to manage DHW production in a more comprehensive way.

**Table 7.1** Available optionals

| Optional code                         | Description | K18 Simplygas | K18 Hybrigas | K18 Hybrigas Easy |
|---------------------------------------|-------------|---------------|--------------|-------------------|
| <b>Control and regulation devices</b> |             |               |              |                   |

- 1 Not applicable to primary circuit. Can be used on secondary circuits.  
 2 Temperature probe of the DHW buffer tank already included as standard with the K18 Hybrigas Easy unit.  
 NA Not applicable.

| Optional code      | Description   | K18 Simplygas | K18 Hybrigas | K18 Hybrigas Easy |
|--------------------|---|---------------|--------------|-------------------|
| OQLT021            | System controller for K18 Simplygas and K18 Hybrigas, which allows you to manage DHW production via the DHW buffer tank and one or more space heating circuits<br>It can also be optionally used with K18 Hybrigas Easy for the control of one or more space heating circuits.<br>It also includes an outdoor temperature probe and an advanced room control unit | Optional      |              |                   |
| ODSP050            | Advanced room unit, which can be used to adjust one of the zones (or heating circuits) managed by the system controller more precisely and to manage the settings of the heating system and the domestic hot water production system  | Optional      |              |                   |
| ODSP004            | Basic room unit, which can be used to adjust one of the zones (or heating circuits) managed by the system controller more precisely   | Optional      |              |                   |
| OCVO009            | Connection cable between the K18 unit and system controller (provided in metres)  | Optional      |              |                   |
| OCDS007            | Room programmable thermostat to control the 3 temperature levels and time programming on multiple time slots.<br>Can be used when the system controller is NOT used   | Optional      |              |                   |
| System components  |   |               |              |                   |
| OSRB012            | 200 l DHW buffer tank, with 3 sqm oversize coil   | Optional      |              | NA                |
| OSRB004            | 300 l DHW buffer tank, with 4 sqm oversize coil   | Optional      |              | NA                |
| OSRB013            | 150-litre DHW buffer tank   | NA            |              | Optional          |
| OVLV007            | 3-way diverter valve, including an actuator, for space heating/DHW operating mode switching   | Optional      |              | NA                |
| OPMP009            | High efficiency modulating water pump with total head of 80 kPa @ 1.500 l/h (WILO YONOS PARA 8.0 - PWM)   | Optional (1)  |              |                   |
| OPMP004            | High efficiency modulating water pump with total head of 105 kPa @ 1.500 l/h (WILO STRATOS PARA 25/1-11 – 0-10 V)   | Optional (1)  |              |                   |
| Temperature probes |   |               |              |                   |
| OSND007            | Remote outdoor temperature probe, to measure outdoor temperature<br>Can be used when the system controller is NOT used  | Optional      |              |                   |
| OSND004            | Immersion water temperature probe to detect the system water temperature or the temperature of the DHW buffer tank (a flow manifold probe is already included as standard with the K18 unit)  | Optional      |              | Optional (2)      |
| Other optionals    |   |               |              |                   |
| ONTV014            | Kit of anti vibration rubber pads, to be placed under K18 unit supports   | Optional      |              |                   |
| OTBO069            | Unified flue for K18 Hybrigas   | NA            | Optional     | Optional          |
| OKBT013            | Winter kit for K18 Hybrigas   | NA            | Optional     | Optional          |
| OKBT014            | Preassembled winter kit for K18 Hybrigas  | NA            | Optional     | Optional          |
| OKBT015            | Winter kit for K18 Simplygas (antifreeze protection of the condensate conveyor tray)  | Optional      | NA           | NA                |
| OMNT021            | Cover for K18 Simplygas   | Optional      | NA           | NA                |

1 Not applicable to primary circuit. Can be used on secondary circuits.

2 Temperature probe of the DHW buffer tank already included as standard with the K18 Hybrigas Easy unit.

NA Not applicable.

For information about optionals not described in following paragraphs refer to Robur technical service.

## 7.1 CONTROLS

The elements of the control devices available for the K18 systems are presented below together with the description of the main features.

### 7.1.1 OQLT021 system controller

The management and control system of an air conditioning system plays an important role for the intended energy savings and efficiency to be achieved.

In order to obtain maximum performance it is preferable to use a system that can integrate the control of the heat generators and that of the users (zones or heating circuits, DHW preparation system, etc.), by actuating the corresponding components directly (requests of the generators, circulating pumps, valves, etc.) and acquiring the temperature of the rooms directly through dedicated room units.

For this reason a system controller has been specifically devised for the units of the K18 family, which can be used on relatively simple installations as well as more complex systems.

The system controller:

- Manages the comfort of the rooms served by space heating.
- Manages up to two heating circuits, one of which is mixed.
- Manages the production of domestic hot water.

System controller is composed by following main elements:

- Electrical control panel containing the central control unit, which all connections converge to from other devices and

system components (on special terminal blocks that simplify the installation).

- Advanced room unit, Figure 7.1 p. 23, with detection of the room temperature and user interface. The direct detection of the room temperature allows the system controller to optimise comfort control and management, whereas the user interface allows you to access and change the settings of the heating system and the domestic hot water production system. Except in cases where it is not practically possible, the room unit must be installed in a representative room between the heated rooms, in place of any existing (programmable) thermostat. If not, it can be installed in the technical room (operating as a simple control unit).
- Outdoor temperature probe (for heating curve operating mode).

The system controller is pre-configured for certain basic system layouts described in the following chapters, thereby allowing for considerable simplification of the installation and use by the end user.

### 7.1.2 Advanced room unit (ODSP050)

Figure 7.1 Advanced room unit



The advanced room unit (Figure 7.1 p. 23) is an optional component which can only be used in conjunction with the system controller (OQLT021).

One advanced room unit can be used, in addition to that already provided with the system controller, in the presence of two zones or heating circuits.

Each room unit must be installed in a reference room served by one of the zones or circuits.

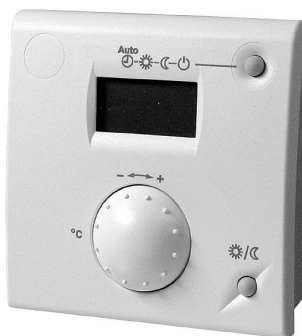
Each advanced room unit can be of reference for several zones or heating circuits.

If used, they allow to:

- Access and change the settings of the heating system and the domestic hot water production system from each advanced room unit.
- Further optimise comfort and efficiency thanks to more precise adjustment by the system controller (e.g. selectively varying the flow temperature of a mixed circuit according to the temperature in the rooms served by it).
- Be able to vary or exclude the space heating service of the zone in a simple and convenient manner.

### 7.1.3 Basic room unit (ODSP004)

Figure 7.2 Basic room unit ODSP004



The basic room unit (Figure 7.2 p. 23) is an optional component which can only be used in conjunction with the system controller (OQLT021).

One basic room units can be used, in addition to the advanced room unit already provided with the system controller, in the presence of two zones or heating circuits.

Each room unit must be installed in a reference room served by one of the zones or circuits.

Unlike the advanced room unit, which can serve as a reference for several zones or heating circuits, the basic room unit can be associated with only one zone or heating circuit.

If used, they allow to:

- Further optimise comfort and efficiency thanks to more precise adjustment by the system controller (e.g. selectively varying the flow temperature of a mixed circuit according to the temperature in the rooms served by it).
- Be able to vary or exclude the space heating service of the zone in a simple and convenient manner.

### 7.1.4 Connection cable (OCVO009)

The connection cable is used to connect the K18 unit with the system controller (OQLT021), while maintaining high signal quality and reducing interference.

You can alternatively use an LI-YcY type shielded 8x0,75 mm<sup>2</sup> multi-polar commercial cable.

### 7.1.5 Ambient chronothermostat (OCDS007)

The digital room programmable thermostat is an optional component that allows for:

- 3 temperature levels to be controlled (comfort, reduced, antifreeze).
- Programming in various time slots, with a calendar function to manage holidays and public holidays.

It requires no electrical connection as it is battery-powered.

Unlike the system controller (refer to Paragraph 7.1.1 p. 22), which offers more comprehensive control and therefore allows for greater efficiency, the room programmable thermostat:

- Offers more simple control which is suitable for environments characterised by homogeneous use and in which the temperature in the installation room of the programmable thermostat can be considered representative of the level of comfort of all heated rooms.
- Does not allow the settings of the K18 unit to be modified but merely send an ON/OFF signal of a space heating service request.
- It cannot be used for DHW management (which, if foreseen, must be managed directly by the K18 Simplygas or K18 Hybrigas appliance).

## 7.2 DHW BUFFER TANKS (OSRB012, OSRB004, OSRB013)

DHW buffer tanks available as optional have been chosen for optimum coupling with the units of the K18 family.

Namely, please note that the size of the DHW buffer tanks for the K18 Simplygas and K18 Hybrigas versions (OSRB012 and OSRB004) is specifically designed for coupling with a heat pump ("oversized coil"), while the DHW buffer tank for the K18 Hybrigas Easy version (OSRB013) is exclusively designed for coupling with a boiler.

If DHW buffer tanks provided by another commercially available supplier are used, the same selection criteria must be applied, verifying the actual sizing of the exchange surface.

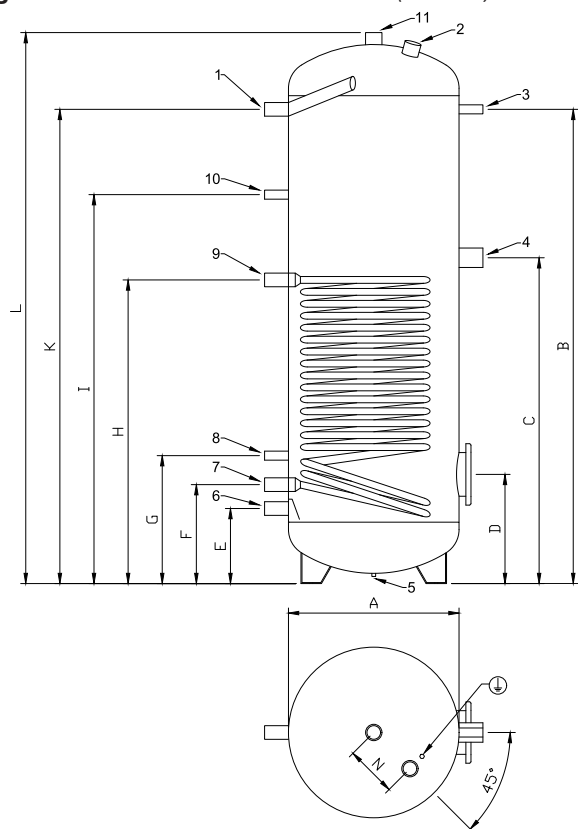
## 7.2.1 DHW buffer tanks technical data

**Table 7.2** DHW buffer tank technical data

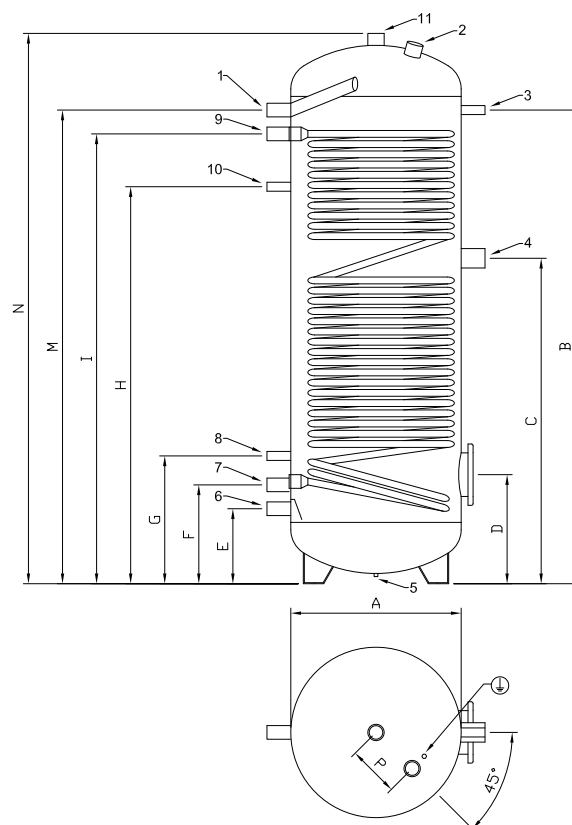
|   |                   | OSRB013              | OSRB012 | OSRB004 |
|---|-------------------|----------------------|---------|---------|
| Total capacity                          | l                 | 160                  | 190     | 263     |
| Insulation                              | mm                | 50 mm foamed hard PU |         |         |
| Energy efficiency class                 |                   | B                    | C       | C       |
| Standing losses                         | W                 | 55                   | 67      | 85      |
| Diagonal size                           | mm                | 1170                 | 1375    | 1735    |
| Coil surface                            | m <sup>2</sup>    | 1,0                  | 3,0     | 4,0     |
| Coil water capacity                     | l                 | 5,7                  | 17,2    | 23,0    |
| DHW output 80/60°C - 10/45°C (DIN 4708) | m <sup>3</sup> /h | 0,6                  | 1,8     | 2,4     |
| Nominal water flow                      | l/h               | 1000                 | 3100    | 4100    |
| Pressure drop at nominal water flow     | bar               | 0,012                | 0,055   | 0,112   |
| Power code DIN 4708                     | NL                | 3                    | 10      | 13      |
| Weight empty                            | kg                | 70                   | 120     | 160     |
| Max DHW working pressure                | bar               | 10                   |         |         |
| Max pipe coil working pressure          | bar               | 10                   |         |         |
| Max DHW tank working pressure           | °C                | 95                   |         |         |

### 7.2.1.1 Dimensions

**Figure 7.3** 150l DHW buffer tank dimensions (OSRB013)



**Figure 7.4** 200-300l DHW buffer tank dimensions (OSRB012 - OSRB004)



**Table 7.3** DHW buffer tank dimensions data

|   | OSRB013 | OSRB012 | OSRB004 |
|---|---------|---------|---------|
| A | 500     | 500     | 500     |
| B | 775     | 995     | 1390    |
| C | 655     | 735     | 945     |
| D | 330     | 320     | 340     |
| E | 220     | 140     | 140     |
| F | 300     | 220     | 220     |
| G | 385     | 370     | 395     |
| H | 620     | 835     | 1165    |
| I | 695     | 990     | 1310    |
| M | 765     | 1070    | 1390    |
| N | 990     | 1215    | 1615    |
| P | 150     | 150     | 150     |

Dimensions in mm referring to Figure 7.3 p. 24 for the 150 l DHW buffer tank and Figure 7.4 p. 24 for 200/300 l DHW buffer tanks.

**Table 7.4** DHW buffer tank connectors dimensions

|    |                              | OSRB013 | OSRB012 | OSRB004 |
|----|------------------------------|---------|---------|---------|
| 1  | DHW outlet                   | 1"      | 1"      | 1"      |
| 2  | Anode                        | 1" 1/4  | 1" 1/4  | 1" 1/4  |
| 3  | Thermostat/Probe             | 1/2"    | 1/2"    | 1/2"    |
| 4  | Thermostat/Probe             | 1" 1/2  | 1" 1/2  | 1" 1/2  |
| 5  | Blind connection for fasting | 1/2"    | 1/2"    | 1/2"    |
| 6  | Cold water inlet             | 1"      | 1"      | 1"      |
| 7  | Pipe coil inlet              | 1"      | 1"      | 1"      |
| 8  | Thermostat/Probe             | 1/2"    | 1/2"    | 1/2"    |
| 9  | Pipe coil outlet             | 1"      | 1"      | 1"      |
| 10 | Recirculation                | 1/2"    | 1/2"    | 1/2"    |
| 11 | DHW outlet                   | 1" 1/4  | 1" 1/4  | 1" 1/4  |

For the positioning of the temperature probe in the DHW buffer tank it is recommended to use the connection indicated with "4"

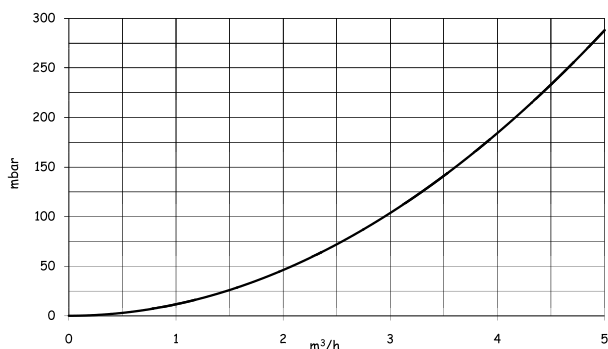
in the dimensional diagram of Figure 7.3 p. 24 and 7.4 p. 24.



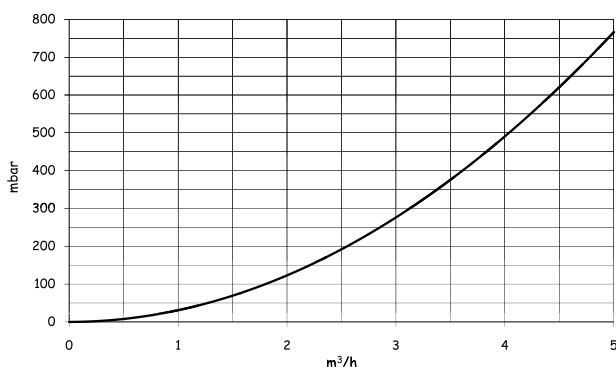
Pay particular attention to the choice of the temperature probe well, which should be long enough to make sure the thermal contact with the water in the DHW buffer tank is correct, and to its positioning.

### 7.2.1.2 Pressure drops

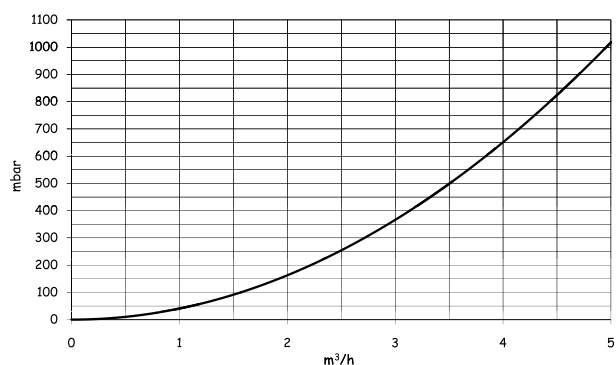
**Figure 7.5** 150 l DHW buffer tank pressure drop



**Figure 7.6** 200 l DHW buffer tank pressure drop



**Figure 7.7** 300 l DHW buffer tank pressure drop



## 7.3 DIVERTER VALVE (OVLV007)

Balanced 3-way diverter valve, including an actuator, for switching the space heating/DHW operating mode, actuated by an SPST contact.

The valve is provided together with 1 m long connecting cable.

The following are shown below:

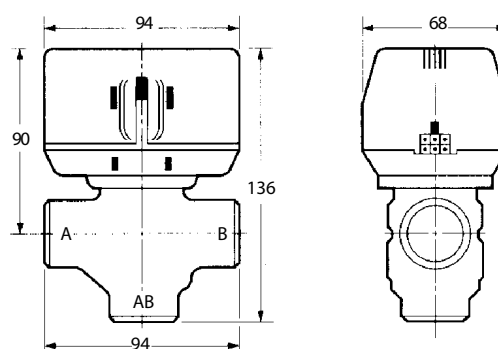
- technical data (7.5 p. 25)

- dimensions (7.8 p. 25)
- the graph of the pressure drop according to the water flow (7.9 p. 25)

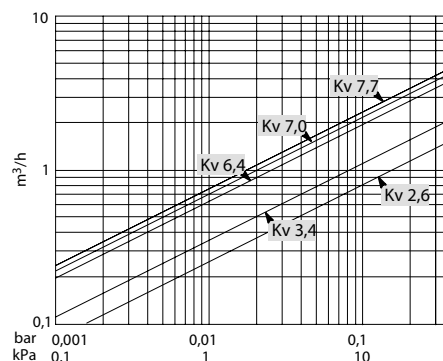
**Table 7.5** OVLV007 diverter valve technical data

|                             |                                      |
|-----------------------------|--------------------------------------|
| Voltage                     | 200/240 V<br>50/60 Hz                |
| Threaded body               | M/M/M 1" BSPP                        |
| Connection cable            | 3x0,75 mm <sup>2</sup><br>1 m lenght |
| kv                          | 7,7                                  |
| Control                     | SPST                                 |
| Fluid temperature           | 1÷95 °C                              |
| Ambient temperature         | 0÷65 °C                              |
| Electrical power absorption | 6 W                                  |

**Figure 7.8** OVLV007 diverter valve dimensions



**Figure 7.9** OVLV007 diverter valve pressure drop graph



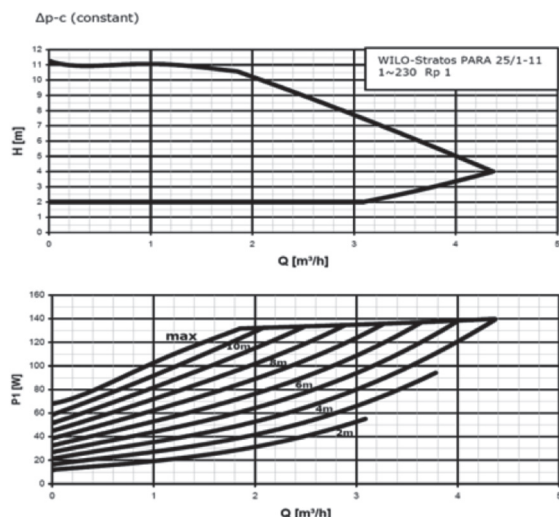
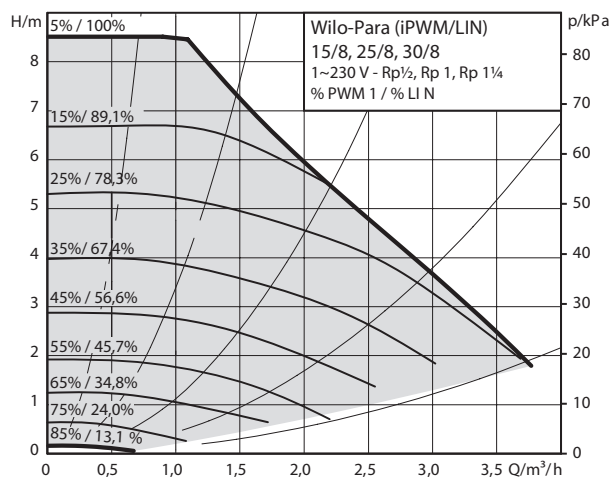
Consider the following for the hydraulic connection:

- AB = common
- A = DHW circuit
- B = space heating circuit

## 7.4 MODULATING WATER PUMPS (OPMP009, OPMP004)

All the units of the K18 range are fitted with circulating pumps. High-efficiency circulators available as an option can be used on secondary circuits.

Figures 7.10 p. 26 and 7.11 p. 26 show characteristic curves of available models.

**Figure 7.10** OPMP004 - Wilo-Stratos PARA 25/1-11**Figure 7.11** OPMP009 - Wilo-Yonos PARA PWM 8.0

Water pump OPMP009 can be used only with constant flow operation.

## 7.5 OUTDOOR TEMPERATURE PROBE (OSND007)

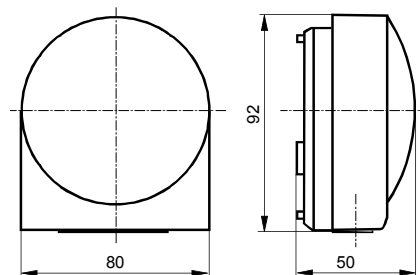
A passive type of remote outdoor temperature probe used as a reference to control the climatic compensation.

The following are shown below:

- technical data (7.6 p. 26)
- dimensions (7.12 p. 26)

**Table 7.6** OSND007 outdoor temperature probe technical data

|                   |                 |
|-------------------|-----------------|
| Sensing element   | NTC 10k @ 25 °C |
| Range of use      | -40 ÷ +70 °C    |
| Time constant     | Ca. 14 min      |
| Protection rating | IP 54           |

**Figure 7.12** OSND007 outdoor temperature probe dimensions

## 7.6 IMMERSION TEMPERATURE PROBE (OSND004)

Immersion temperature probe for acquiring the water temperature in cooling and heating thermal systems and DHW buffer tanks.

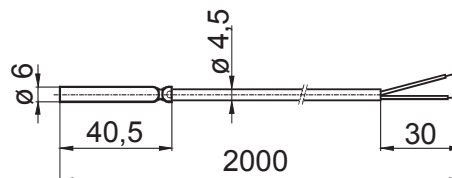
The probe is not designed to work in direct contact with the water, but to be inserted in an appropriate well (sufficiently long to make sure there is correct thermal contact with the water).

The following are shown below:

- technical data (7.7 p. 26)
- dimensions (7.13 p. 26)

**Table 7.7** OSND004 immersion temperature probe technical data

|                 |                 |
|-----------------|-----------------|
| Sensing element | NTC 10k @ 25 °C |
| Range of use    | 0 ÷ 95 °C       |
| Tolerance       | ± 0,5 K         |
| Time constant   | 30 s            |
| Cable length    | 2 m             |

**Figure 7.13** OSND004 immersion temperature probe dimensions

## 7.7 KIT OF ANTI VIBRATION RUBBER PADS (ONTV014)

Kit composed by 6 anti vibration rubber pads, to be placed under K18 unit supports.

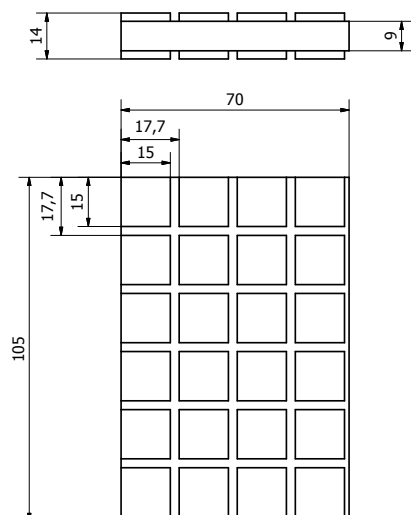
The following are shown below:

- technical data (7.8 p. 26)
- dimensions (7.14 p. 27)

**Table 7.8** ONTV014 anti vibration rubber pads technical data

|          |                    |
|----------|--------------------|
| Material | elastomeric rubber |
| Load     | 1000 ÷ 3000 daN    |
| Hardness | 45° Sh             |



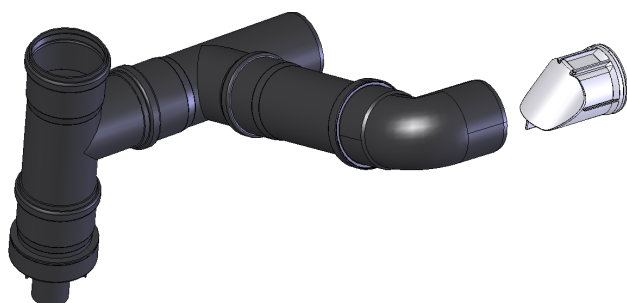
**Figure 7.14** ONTV014 anti vibration rubber pads dimensions

## 7.8 UNIFIED FLUE (OTBO069)

It can be used on all units of the K18 Hybrigas family, thus allowing to simplify the installation if there is the need to convey in a single flue, wall-mounted or roof-mounted, the separate flues of the two modules that make up the unit.

It consists of a series of 80 mm ducts and is already equipped with two check valves, one for each module, and gaskets.

The unified flue is provided with a Tee coupling with a fitting for condensate drain.

**Figure 7.15** Unified flue for K18 Hybrigas**Table 7.9** OTBO069 unified flue technical data

|                           |       |
|---------------------------|-------|
| Material                  | PP    |
| Color                     | black |
| Flue gas exhaust diameter | 80 mm |
| Condensate drain diameter | 40 mm |
| Residual head             | 50 Pa |

## 7.9 WINTER KIT FOR K18 HYBRIGAS (OKBT013, OKBT014)

It can be used on units of the K18 Hybrigas family realized since October 2017 and allows to extend the operation with outdoor temperatures down to -25 °C, together with:

- Glycol at 40% minimum in space heating circuit (and in DHW circuit too, if any).
- K18 antifreeze function activated.

It consists of a heating cable, a heating element for the

condensate siphon of the boiler module, an antifreeze thermostat, and the relative electrical wiring.

The two kits differ as follows:

- The OKBT013 kit is mounted on the K18 Hybrigas after it has already been placed on the system. It is then ordered after installation of the K18 Hybrigas unit.
- The OKBT014 kit is factory-mounted on the K18 Hybrigas and the unit is shipped with the kit. It must be then ordered at the same time as the K18 Hybrigas unit.

## 7.10 WINTER KIT FOR K18 SIMPLYGAS (OKBT015)

It can be used on units of the K18 Simplygas family realized since October 2017 and allows to protect the condensate drain tray from freezing.

It consists of a heating cable, an antifreeze thermostat, and the relative electrical wiring.

## 7.11 COVER FOR K18 SIMPLYGAS (OMNT021)

Cover for K18 Simplygas appliances, it allows the K18 Simplygas appliance to best harmonize with outdoor environments, safeguarding functionality and performance.

## 8 SYSTEM DIAGRAMS

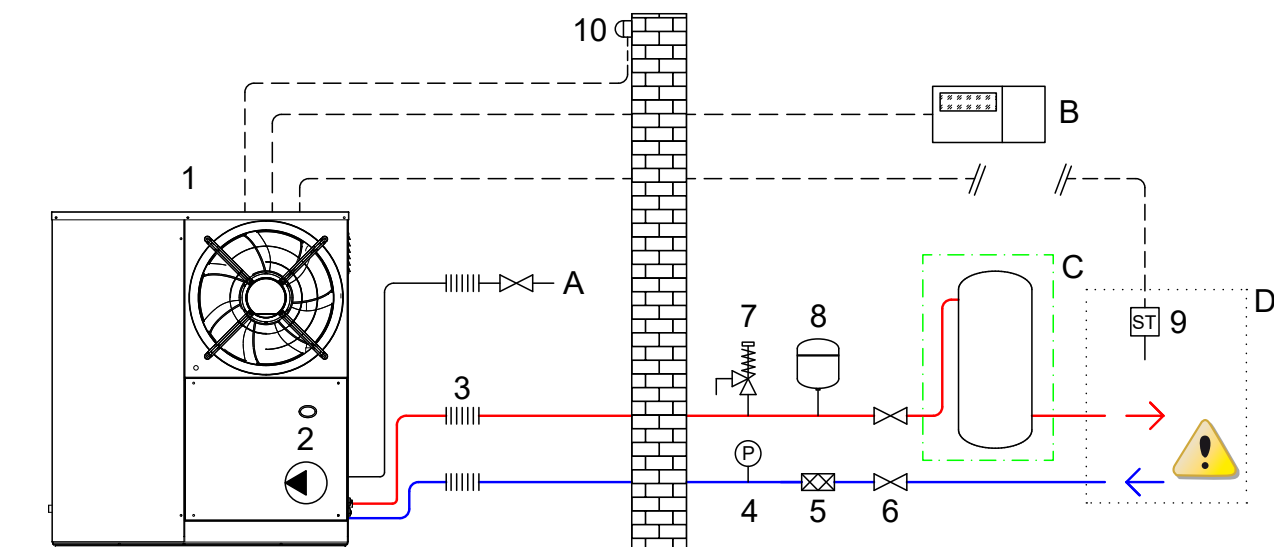
### 8.1 GENERATION CIRCUITS

#### 8.1.1 K18 Simplygas hydraulic diagram for space heating only

System for hot water production up to 65 °C for space heating only.

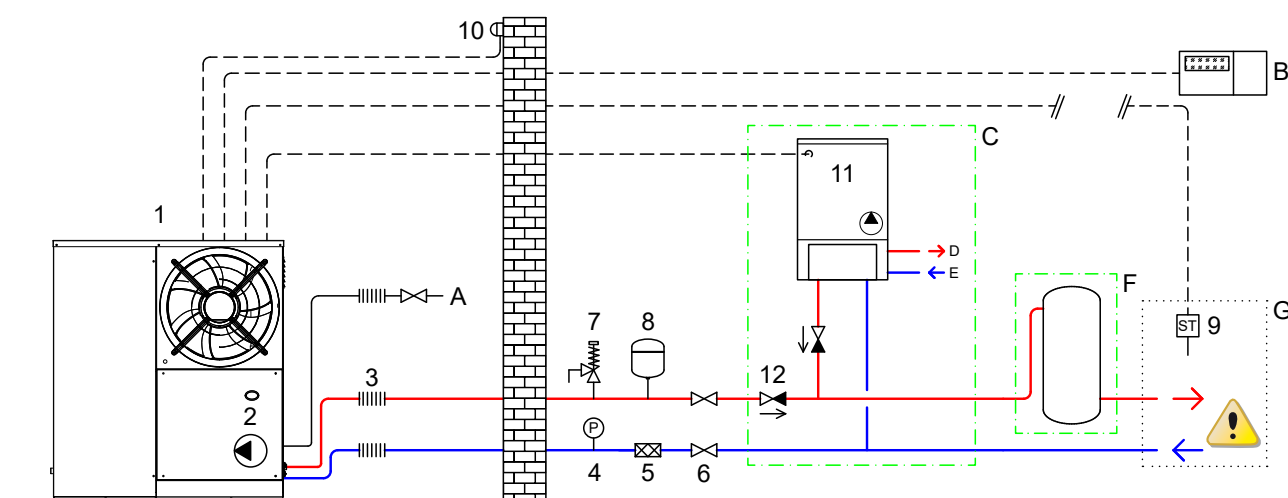
You can include an optional supplementary boiler (new or existing) managed directly by the K18 unit.

**Figure 8.1** K18 Simplygas C1 for space heating only, without auxiliary boiler



- 1 k18 Simplygas C1 heat pump
- 2 Enclosed modulating water pump, 4,0 m w.c. available head
- 3 Anti-vibration connection
- 4 Pressure gauge
- 5 Sludge filter
- 6 Shut-off valve
- 7 3 bar safety valve
- 8 Expansion tank
- 9 GHP immersion temperature probe (standard) to be installed on heating

- circuit (see Paragraph 8.2 p. 39)
  - 10 Outdoor temperature probe (available as OSND007 optional)
  - A Gas connection
  - B Ambient chronothermostat (available as OCDS007 optional)
  - C Buffer tank group min 100 l (optional)
  - D Heating distribution circuit, to be carried out as described in Paragraph 8.2 p. 39
- The components enclosed in dotted rectangles are optional.

**Figure 8.2** K18 Simplygas C1 for space heating only, with optional auxiliary boiler

- 1 k18 Simplygas C1 heat pump
- 2 Enclosed modulating water pump, 4,0 m w.c. available head
- 3 Anti-vibration connection
- 4 Pressure gauge
- 5 Sludge filter
- 6 Shut-off valve
- 7 3 bar safety valve
- 8 Expansion tank
- 9 GHP immersion temperature probe (standard) to be installed on heating circuit (see Paragraph 8.2 p. 39)
- 10 Outdoor temperature probe (available as OSND007 optional)

- 11 Auxiliary boiler (optional)
- 12 Check valve (to be installed only in the presence of an auxiliary boiler)
- A Gas connection
- B Ambient chronothermostat (available as OCDS007 optional)
- C Auxiliary boiler group (optional)
- D Optional domestic hot water connection
- E Optional domestic cold water connection
- F Buffer tank group min 100 l (optional)
- G Heating distribution circuit, to be carried out as described in Paragraph 8.2 p. 39

The components enclosed in dotted rectangles are optional.

**Table 8.1** Accessories to be used with K18 Simplygas C1 for space heating only

|                |                                   |
|----------------|-----------------------------------|
| <b>OCDS007</b> | Ambient chronothermostat          |
| <b>ONTV014</b> | Kit of anti vibration rubber pads |
| <b>OSND007</b> | Outdoor temperature probe         |

#### Notes

- The unit will be controlled by means of a request coming from a device (even existing) such as a room thermostat, a programmable thermostat, a series of parallel thermostats which close a request contact, etc.
- The auxiliary boiler will be controlled directly by the K18 unit, which will only activate when required, according to the thermal load of the building and the operating conditions of the system.
- The unit is provided with its own outdoor probe (onboard) with the optional climatic curve mode, to optimise performance during medium to low thermal load periods. Alternatively, the remote outdoor probe (OSND007) is available as an optional. You can modify the preset parameters of the climatic curve from the interface onboard the unit.
- The system temperature probe (GHP) is standard supplied and must be installed as show in Figure 8.1 p. 28 (detail ST). See also Section 8.2 p. 39.
- The expansion tank must be sized according to the system water content, also considering that of the unit and the connection piping to the system (approximately 4 litres of tank are required for every 100 litres of water content).
- The separator filter (preferably magnetic) is mandatory when the system already exists because of the possible impurities contained therein. It can be replaced by a simple Y filter in the case of new systems. It is recommended in any case to wash the system before starting up.
- The buffer tank is not strictly required but suggested in

systems with low water content in the primary circuit (with input on the top and output on the bottom, as shown in Figure 8.1 p. 28) to ensure minimum thermal load during the periods of medium to low thermal demand. It is always recommended in systems with zones managed with 2-way valves. A capacity of 80/100 litres is usually adequate.

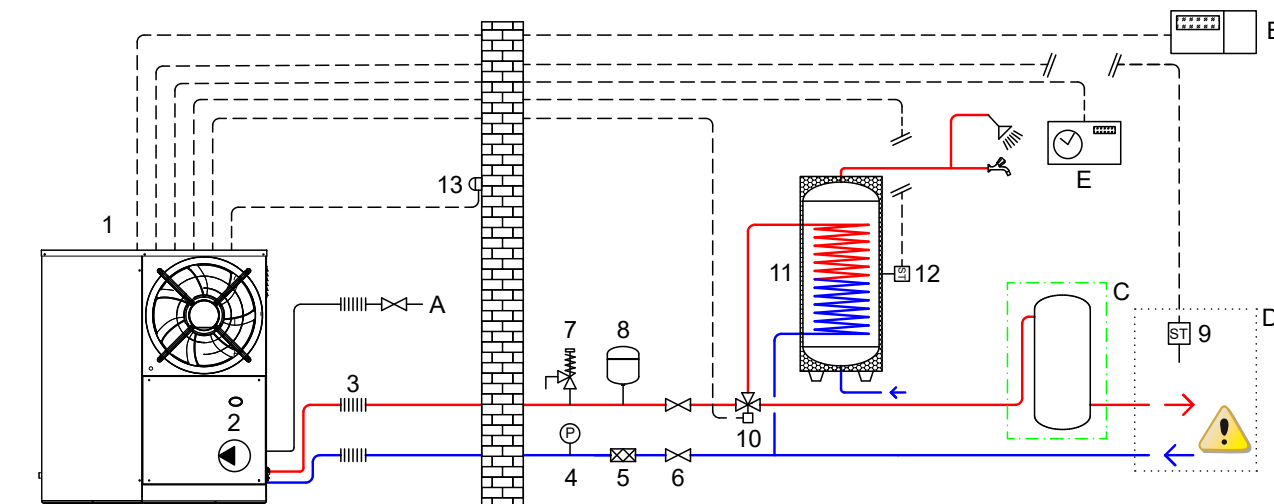
- The appliance is protected by an active antifreeze system. Refer to the Installation, use and maintenance manual for all the details about the antifreeze protection of the appliance.

### 8.1.2 K18 Simplygas hydraulic diagram for space heating and DHW production (basic functionality)

System for the production of hot water up to 65 °C for space heating and up to 70 °C for the production of domestic hot water through the DHW buffer tank.

You can include an optional supplementary boiler (new or existing) managed directly by the K18 unit.

**Figure 8.3** K18 Simplygas C1 for space heating and DHW production (basic functionality), without auxiliary boiler



- 1 K18 Simplygas C1 heat pump
- 2 Enclosed modulating water pump, 4,0 m w.c. available head
- 3 Anti-vibration connection
- 4 Pressure gauge
- 5 Sludge filter
- 6 Shut-off valve
- 7 3 bar safety valve
- 8 Expansion tank
- 9 GHP immersion temperature probe (standard) to be installed on heating circuit (see Paragraph 8.2 p. 39)
- 10 3-way diverting valve for heating/DHW management (available as OVLV007 optional)
- 11 DHW buffer tank, 200 or 300 liter, 3 or 4 sqm coil (available as optional OSRB012 or OSRB004)

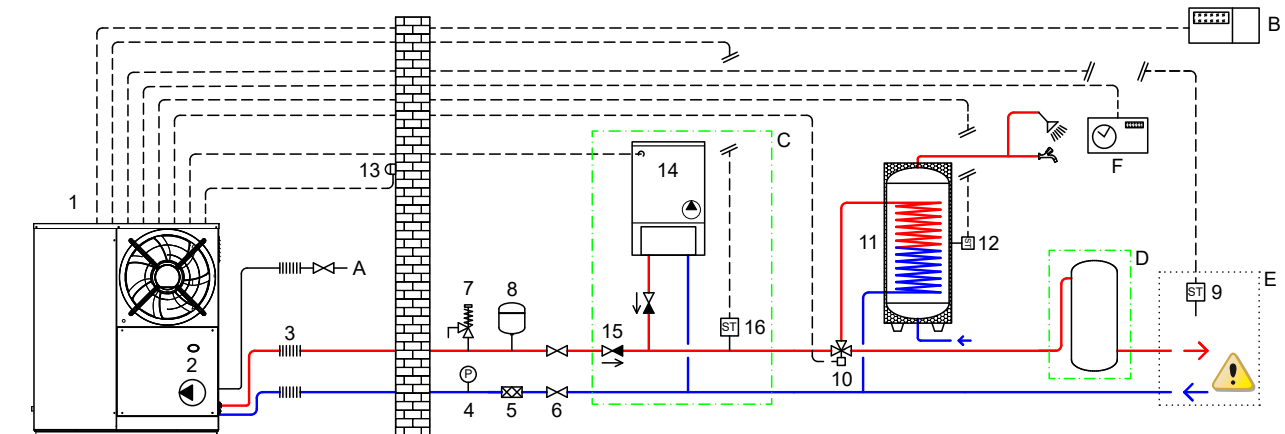
- 12 Immersion temperature probe GHP'' (available as OSND004 optional)
- 13 Outdoor temperature probe (available as OSND007 optional)
- A Gas connection
- B Ambient chronothermostat (available as OCDS007 optional)
- C Buffer tank group min 100 l (optional)
- D Heating distribution circuit, to be carried out as described in Paragraph 8.2 p. 39
- E Daily/weekly timer for DHW service

The components enclosed in dotted rectangles are optional.

In case the system requires all three GHP, GHP' and GHP'' probes, the outdoor temperature probe cannot be installed. In this case the regulation based on climate curve uses the value supplied by the outdoor temperature probe installed on board the appliance.

**Table 8.2** Accessories to be used with K18 Simplygas C1 for space heating and DHW production (basic functionality), without auxiliary boiler

|                |  |                |                             |                |   |
|----------------|--|----------------|-----------------------------|----------------|---|
| <b>OCDS007</b> | Ambient chronothermostat   | <b>OSND004</b> | Immersion temperature probe | <b>OVLV007</b> | 3-way diverter valve for heating/DHW management |
| <b>OSRB012</b> | 200 l DHW buffer tank, with 3 sqm coil (as alternative to 300 l OSRB004 DHW buffer tank with 4 sqm coil) | <b>OSND007</b> | Outdoor temperature probe   | <b>ONTV014</b> | Kit of anti vibration rubber pads               |

**Figure 8.4** K18 Simplygas C1 for space heating and DHW production (basic functionality), with optional auxiliary boiler

- |    |   |    |  |
|----|---|----|--|
| 1  | k18 Simplygas C1 heat pump  | 14 | Auxiliary boiler (optional)  |
| 2  | Enclosed modulating water pump, 4,0 m w.c. available head   | 15 | Check valve (to be installed only in the presence of an auxiliary boiler)  |
| 3  | Anti-vibration connection   | 16 | GHP' immersion temperature probe (only in the presence of an auxiliary boiler, available as OSND004 optional)  |
| 4  | Pressure gauge  | A  | Gas connection   |
| 5  | Sludge filter   | B  | Ambient chronothermostat (available as OCDS007 optional)   |
| 6  | Shut-off valve  | C  | Auxiliary boiler group (optional)  |
| 7  | 3 bar safety valve  | D  | Buffer tank group min 100 l (optional)   |
| 8  | Expansion tank  | E  | Heating distribution circuit, to be carried out as described in Paragraph 8.2 p. 39  |
| 9  | GHP immersion temperature probe (standard) to be installed on heating circuit (see Paragraph 8.2 p. 39) | F  | Daily/weekly timer for DHW service   |
| 10 | 3-way diverting valve for heating/DHW management (available as OVLV007 optional)                        |    | The components enclosed in dotted rectangles are optional.   |
| 11 | DHW buffer tank, 200 or 300 liter, 3 or 4 sqm coil (available as optional OSRB012 or OSRB004)           |    | In case the system requires all three GHP, GHP' and GHP'' probes, the outdoor temperature probe cannot be installed. In this case the regulation based on climate curve uses the value supplied by the outdoor temperature probe installed on board the appliance. |
| 12 | Immersion temperature probe GHP'' (available as OSND004 optional)                                       |    |  |
| 13 | Outdoor temperature probe (available as OSND007 optional)   |    |  |

**Table 8.3** Accessories to be used with K18 Simplygas C1 for space heating and DHW production (basic functionality), with optional auxiliary boiler

|                |  |                |  |                |   |
|----------------|--|----------------|--|----------------|---|
| <b>OCDS007</b> | Ambient chronothermostat   | <b>OSND004</b> | Immersion temperature probe (2 probes) | <b>OVLV007</b> | 3-way diverter valve for heating/DHW management |
| <b>OSRB012</b> | 200 l DHW buffer tank, with 3 sqm coil (as alternative to 300 l OSRB004 DHW buffer tank with 4 sqm coil) | <b>ONTV014</b> | Kit of anti vibration rubber pads      |                |   |

#### Notes

- The probe in the DHW buffer tank (available as OSND004 optional), connected to the K18 appliance, allows the control of DHW production, according to the parameters set on the K18 appliance.
- A request coming from a device (even an existing one) such as a daily/weekly timer or a switch will allow to manage the DHW production on different setpoints, or to deactivate it completely outside the desired time slots. See also Paragraph 4.4.3 p. 18.
- The 3-way valve for DHW production (available as OVLV007 optional) is controlled directly by the K18 appliance.
- Any auxiliary boiler (controlled by the K18) can intervene if necessary for both heating and DHW production.
- In case the system requires all three GHP, GHP' and GHP'' probes, the outdoor temperature probe cannot be installed. In this case the regulation based on climate curve uses the value supplied by the outdoor temperature probe installed on board the appliance.
- For other notes see Paragraph 8.1.1 p. 28.

### 8.1.3 K18 Simplygas hydraulic diagram for space heating and DHW production (basic functionality) with solar thermal integration

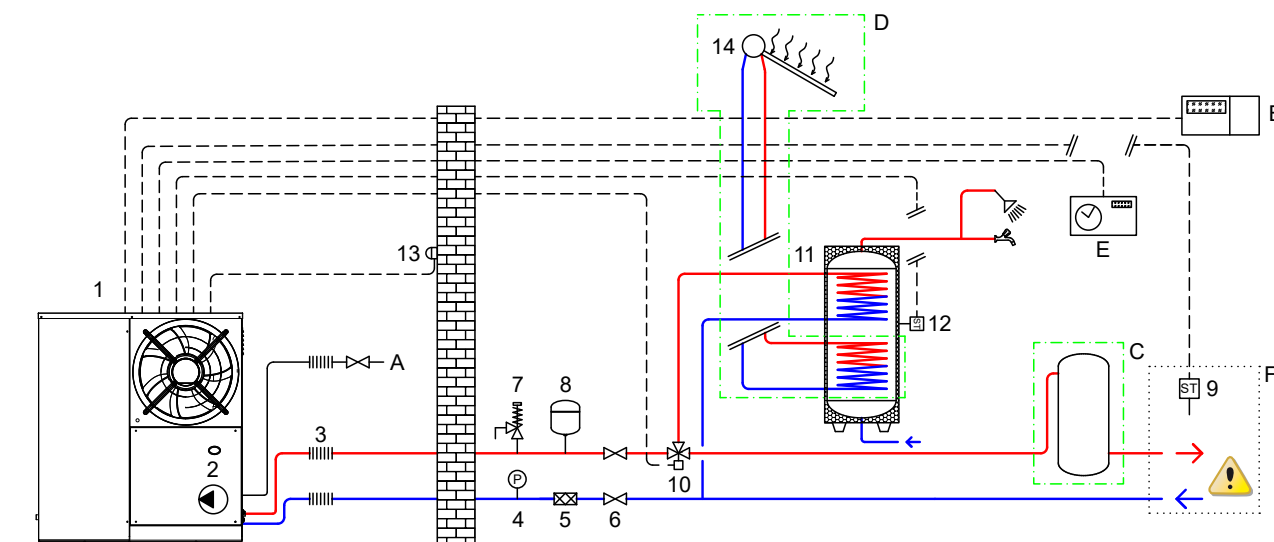
System for the production of hot water up to 65 °C for space heating and up to 70 °C for the production of domestic hot water through the DHW buffer tank.

You can include an optional supplementary boiler (new or

existing) managed directly by the K18 unit.

A solar thermal system for the production of DHW can also be integrated.

**Figure 8.5** K18 Simplygas C1 for space heating and DHW production (basic functionality), with solar thermal integration, without auxiliary boiler



- 1 K18 Simplygas C1 heat pump
- 2 Enclosed modulating water pump, 4,0 m w.c. available head
- 3 Anti-vibration connection
- 4 Pressure gauge
- 5 Sludge filter
- 6 Shut-off valve
- 7 3 bar safety valve
- 8 Expansion tank
- 9 GHP immersion temperature probe (standard) to be installed on heating circuit (see Paragraph 8.2 p. 39)
- 10 3-way diverting valve for heating/DHW management (available as OVLV007 optional)
- 11 DHW buffer tank with dual coil
- 12 Immersion temperature probe GHP" (available as OSND004 optional)

- 13 Outdoor temperature probe (available as OSND007 optional)
- 14 Solar thermal panel
- A Gas connection
- B Ambient chronothermostat (available as OCDS007 optional)
- C Buffer tank group min 100 l (optional)
- D Solar thermal group (not supplied)
- E Daily/weekly timer for DHW service
- F Heating distribution circuit, to be carried out as described in Paragraph 8.2 p. 39

The components enclosed in dotted rectangles are optional.

In case the system requires all three GHP, GHP' and GHP" probes, the outdoor temperature probe cannot be installed. In this case the regulation based on climate curve uses the value supplied by the outdoor temperature probe installed on board the appliance.

**Table 8.4** Accessories to be used with K18 Simplygas C1 for space heating and DHW production (basic functionality), with solar thermal integration, without auxiliary boiler

|                |                                   |                |                             |                |   |
|----------------|-----------------------------------|----------------|-----------------------------|----------------|---|
| <b>OCDS007</b> | Ambient chronothermostat          | <b>OSND004</b> | Immersion temperature probe | <b>OVLV007</b> | 3-way diverter valve for heating/DHW management |
| <b>ONTV014</b> | Kit of anti vibration rubber pads |                |                             |                |   |

#### Notes

- In this case, the DHW buffer tank with solar integration is not supplied and special attention must be paid to the correct sizing of the exchange surface of the coil connected to the heat pump. Refer to Paragraph 7.2 p. 23 for information on sizing.
- For other notes see Paragraph 8.1.2 p. 30.

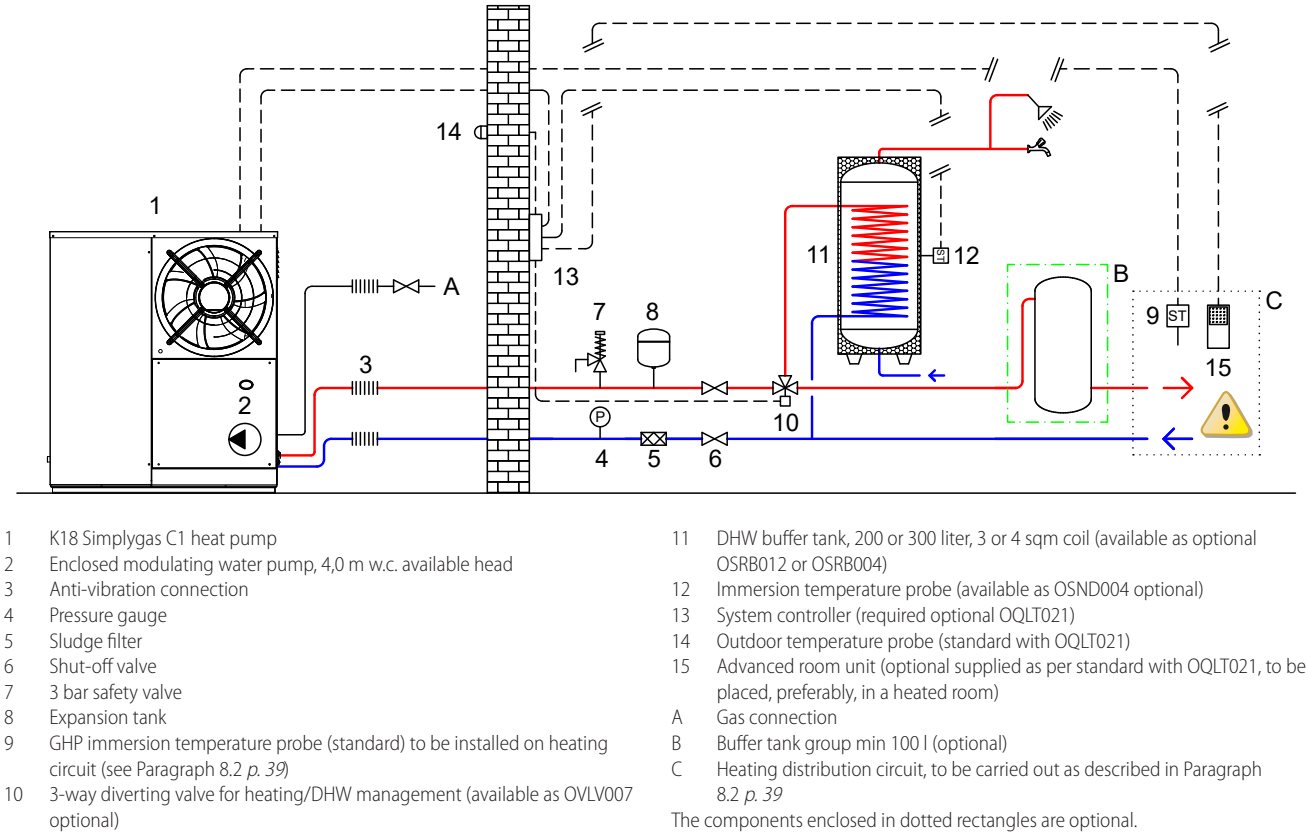


### 8.1.4 K18 Simplygas hydraulic diagram with OQLT021 system controller

System for the production of hot water up to 65 °C for space heating and up to 70 °C for the production of domestic hot water through the DHW buffer tank.

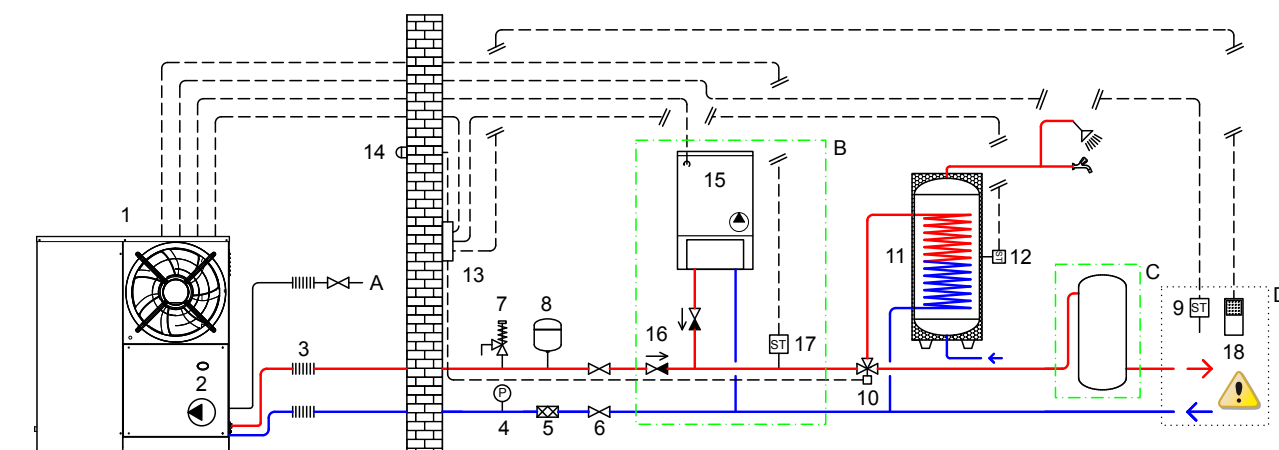
You can include an optional supplementary boiler (new or existing) managed directly by the K18 unit.

**Figure 8.6** K18 Simplygas C1 with OQLT021 system controller, without auxiliary boiler



**Table 8.5** Accessories to be used with K18 Simplygas C1 with OQLT021 system controller, without auxiliary boiler

|                |  |                |                                   |                |   |
|----------------|--|----------------|-----------------------------------|----------------|---|
| <b>OQLT021</b> | System controller  | <b>OSND004</b> | Immersion temperature probe       | <b>OVLV007</b> | 3-way diverter valve for heating/DHW management |
| <b>OSRB012</b> | 200 l DHW buffer tank, with 3 sqm coil (as alternative to 300 l OSRB004 DHW buffer tank with 4 sqm coil) | <b>ONTV014</b> | Kit of anti vibration rubber pads |                |   |

**Figure 8.7** K18 Simplygas C1 with OQLT021 system controller, with optional auxiliary boiler

- |    |   |    |   |
|----|---|----|---|
| 1  | K18 Simplygas C1 heat pump  | 13 | System controller (required optional OQLT021)   |
| 2  | Enclosed modulating water pump, 4,0 m w.c. available head   | 14 | Outdoor temperature probe (standard with OQLT021)   |
| 3  | Anti-vibration connection   | 15 | Auxiliary boiler (optional)   |
| 4  | Pressure gauge  | 16 | Check valve (to be installed only in the presence of an auxiliary boiler)                                       |
| 5  | Sludge filter   | 17 | GHP immersion temperature probe (only in the presence of an auxiliary boiler, available as OSND004 optional)    |
| 6  | Shut-off valve  | 18 | Advanced room unit (optional supplied as per standard with OQLT021, to be placed, preferably, in a heated room) |
| 7  | 3 bar safety valve  | A  | Gas connection  |
| 8  | Expansion tank  | B  | Auxiliary boiler group (optional)   |
| 9  | GHP immersion temperature probe (standard) to be installed on heating circuit (see Paragraph 8.2 p. 39) | C  | Buffer tank group min 100 l (optional)  |
| 10 | 3-way diverting valve for heating/DHW management (available as OVLV007 optional)                        | D  | Heating distribution circuit, to be carried out as described in Paragraph 8.2 p. 39                             |
| 11 | DHW buffer tank, 200 or 300 liter, 3 or 4 sqm coil (available as optional OSRB012 or OSRB004)           |    |   |
| 12 | Immersion temperature probe (available as OSND004 optional)   |    |   |
- The components enclosed in dotted rectangles are optional.

**Table 8.6** Accessories to be used with K18 Simplygas C1 with OQLT021 system controller, with optional auxiliary boiler

|                |  |                |  |                |   |
|----------------|--|----------------|--|----------------|---|
| <b>OQLT021</b> | System controller  | <b>OSND004</b> | Immersion temperature probe (2 probes) | <b>OVLV007</b> | 3-way diverter valve for heating/DHW management |
| <b>OSRB012</b> | 200 l DHW buffer tank, with 3 sqm coil (as alternative to 300 l OSRB004 DHW buffer tank with 4 sqm coil) | <b>ONTV014</b> | Kit of anti vibration rubber pads      |                |   |

#### Notes

- The unit will be controlled by means of the system controller which the zone room units can be connected to.
- The system controller manages the climatic curve mode (differentiable for each zone) to optimise performance during the medium to low thermal load periods. The operating parameters can be changed on the system controller.
- Connect the 3-way valve (optional) and the DHW buffer tank probe (optional) to the system controller to manage the production of DHW.
- If an auxiliary boiler is present, which will also be used for DHW production, another immersion temperature probe (optional) must be positioned as shown in Figure 8.7 p. 34 (detail 17).
- For other notes see Paragraph 8.1.1 p. 28.

### 8.1.5 K18 Hybrigas hydraulic diagram for space heating only

System for the production of hot water up to 65 °C for space heating-only purposes (you can reach 80 °C by using the condensing boiler alone, with respect to a supplied power equal to the power provided by the boiler alone).  
The heat pump unit contains a condensing boiler, the water

circulating pumps, the expansion tank and the water safety valve.  
The presence of the condensing boiler in K18 Hybrigas versions, combined with the advanced control system, means that the installation of the buffer tank is unnecessary.

Figure 8.8 K18 Hybrigas for space heating only

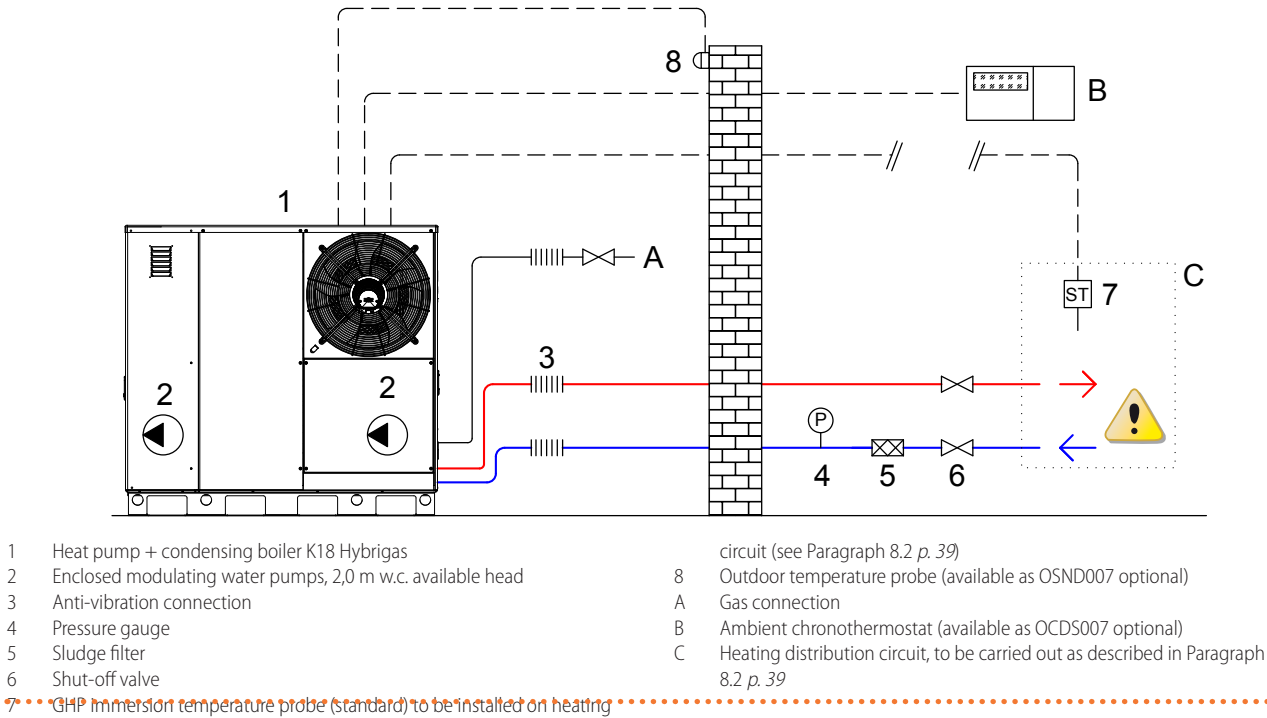


Table 8.7 Accessories to be used with K18 Hybrigas

|         |                                   |         |  |
|---------|-----------------------------------|---------|--|
| OCDS007 | Ambient chronothermostat          | OTB0069 | Unified flue for K18 Hybrigas            |
| ONTV014 | Kit of anti vibration rubber pads | OKBT013 | Winter kit for K18 Hybrigas              |
| OSND007 | Outdoor temperature probe         | OKBT014 | Preassembled winter kit for K18 Hybrigas |

#### Notes

- The unit will be controlled by means of a request coming from a device (even existing) such as a room thermostat, a programmable thermostat, a series of parallel thermostats which close a request contact, etc.
- The unit is provided with its own outdoor probe (onboard) with the optional climatic curve mode, to optimise performance during medium to low thermal load periods. Alternatively, the remote outdoor probe (OSND007) is available as an optional. You can modify the preset parameters of the climatic curve from the interface onboard the unit.
- The system temperature probe (GHP) is standard supplied and must be installed as show in Figure 8.8 p. 35 (detail ST). See also Section 8.2 p. 39.
- The K18 Hybrigas unit already contains an expansion tank with a 8 l capacity. In relation to the volume of water involved, consider adding an additional tank with an adequate capacity (you need approximately 4 litres of tank per 100 litres of water).
- The separator filter (preferably magnetic) is mandatory when the system already exists because of the possible impurities contained therein. It can be replaced by a simple Y filter in the case of new systems. It is recommended in any case to wash the system before starting up.
- The appliance is protected by an active antifreeze system.

Refer to the Installation, use and maintenance manual for all the details about the antifreeze protection of the appliance.

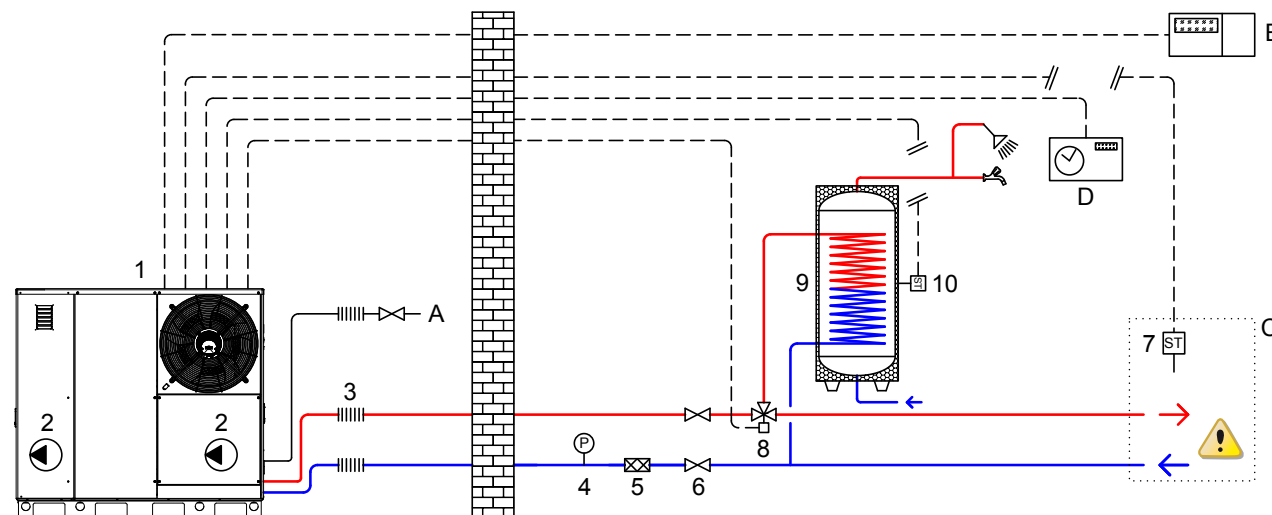
### 8.1.6 K18 Hybrigas hydraulic diagram for space heating and DHW production (basic functionality)

System for the production of hot water up to 65 °C for space heating purposes (you can reach 80 °C by using the condensing boiler only, with a power output equal to half the nominal power) and up to 70 °C for the production of domestic hot water by means of the DHW buffer tank (you can reach 80 °C by using the

condensing boiler only, with a power output equal to half the nominal power).

The heat pump unit contains a condensing boiler, the water circulating pumps, the expansion tank and the water safety valve.

**Figure 8.9** K18 Hybrigas for space heating and DHW production (basic functionality)



- 1 Heat pump + condensing boiler K18 Hybrigas
- 2 Enclosed modulating water pumps, 2,0 m w.c. available head
- 3 Anti-vibration connection
- 4 Pressure gauge
- 5 Sludge filter
- 6 Shut-off valve
- 7 GHP immersion temperature probe (standard) to be installed on heating circuit (see Paragraph 8.2 p. 39)
- 8 3-way diverting valve for heating/DHW management (available as OVLV007 optional)
- 9 DHW buffer tank, 200 or 300 liter, 3 or 4 sqm coil (available as optional

- OSRB012 or OSRB004)
  - 10 Immersion temperature probe (available as OSND004 optional)
  - A Gas connection
  - B Ambient chronothermostat (available as OCDS007 optional)
  - C Heating distribution circuit, to be carried out as described in Paragraph 8.2 p. 39
  - D Daily/weekly timer for DHW service
- In case the system requires all three GHP, GHP' and GHP'' probes, the outdoor temperature probe cannot be installed. In this case the regulation based on climate curve uses the value supplied by the outdoor temperature probe installed on board the appliance.

**Table 8.8** Accessories to be used with K18 Hybrigas for space heating and DHW production (basic functionality)

|                |  |                |  |                |   |
|----------------|--|----------------|--|----------------|---|
| <b>OCDS007</b> | Ambient chronothermostat   | <b>OSND004</b> | Immersion temperature probe              | <b>OVLV007</b> | 3-way diverter valve for heating/DHW management |
| <b>OSRB012</b> | 200 l DHW buffer tank, with 3 sqm coil (as alternative to 300 l OSRB004 DHW buffer tank with 4 sqm coil) | <b>ONTV014</b> | Kit of anti vibration rubber pads        | <b>OTB0069</b> | Unified flue for K18 Hybrigas                   |
| <b>OKBT013</b> | Winter kit for K18 Hybrigas  | <b>OKBT014</b> | Preassembled winter kit for K18 Hybrigas |                |   |

#### Notes

- The probe in the DHW buffer tank (available as OSND004 optional), connected to the K18 appliance, allows the control of DHW production, according to the parameters set on the K18 appliance.
- A request coming from a device (even an existing one) such as a daily/weekly timer or a switch will allow to manage the DHW production on different setpoints, or to deactivate it completely outside the desired time slots. See also Paragraph 4.4.3 p. 18.
- The 3-way valve for DHW production (available as OVLV007 optional) is controlled directly by the K18 appliance.
- The condensing boiler module of the K18 Hybrigas can intervene if necessary for both heating and DHW production.
- In case the system requires all three GHP, GHP' and GHP'' probes, the outdoor temperature probe cannot be installed. In this case the regulation based on climate curve uses the

value supplied by the outdoor temperature probe installed on board the appliance.

- For other notes see Paragraph 8.1.5 p. 35.

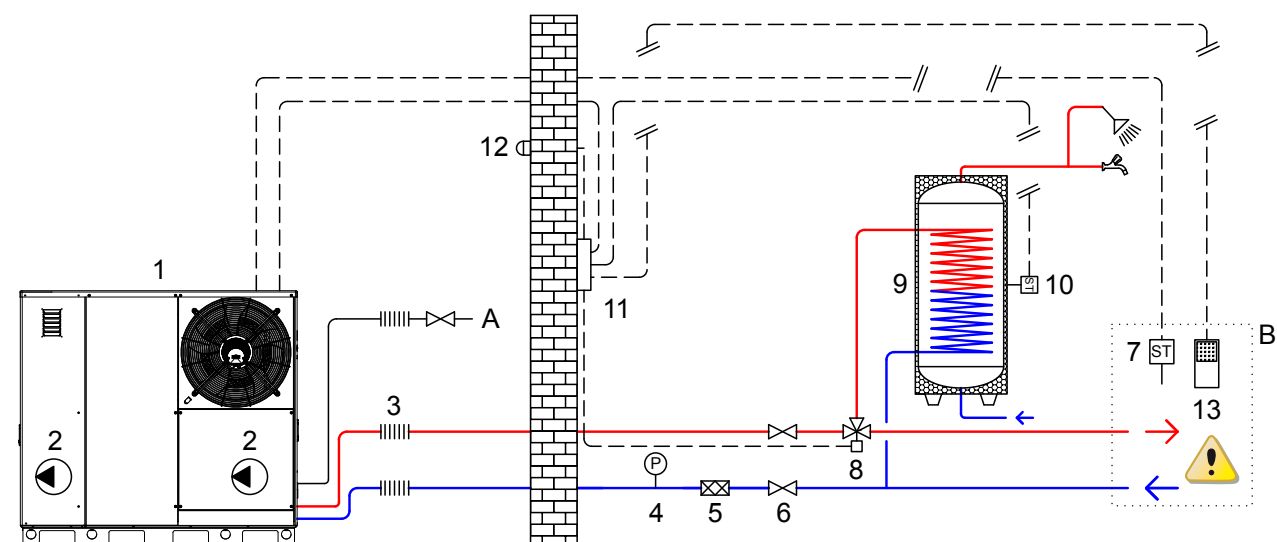
### 8.1.7 K18 Hybrigas hydraulic diagram with OQLT021 system controller

System for the production of hot water up to 65 °C for space heating purposes (you can reach 80 °C by using the condensing boiler only, with a power output equal to half the nominal power) and up to 70 °C for the production of domestic hot water by means of the DHW buffer tank (you can reach 80 °C by using the

condensing boiler only, with a power output equal to half the nominal power).

The heat pump unit contains a condensing boiler, the water circulating pumps, the expansion tank and the water safety valve.

**Figure 8.10** K18 Hybrigas with OQLT021 system controller



- |   |  |
|---|--|
| 1 Heat pump + condensing boiler K18 Hybrigas  | 9 DHW buffer tank, 200 or 300 liter, 3 or 4 sqm coil (available as optional OSRB012 or OSRB004)                    |
| 2 Modulating internal water pumps with available head of 2,0 m w.c.                                       | 10 Immersion temperature probe (available as OSND004 optional)   |
| 3 Anti-vibration connection   | 11 System controller (required optional OQLT021)   |
| 4 Pressure gauge  | 12 Outdoor temperature probe (standard with OQLT021)   |
| 5 Sludge filter   | 13 Advanced room unit (optional supplied as per standard with OQLT021, to be placed, preferably, in a heated room) |
| 6 Shut-off valve  | A Gas connection   |
| 7 GHP immersion temperature probe (standard) to be installed on heating circuit (see Paragraph 8.2 p. 39) | B Heating distribution circuit, to be carried out as described in Paragraph 8.2 p. 39                              |
| 8 3-way diverting valve for heating/DHW management (available as OVLV007 optional)                        |  |

**Table 8.9** Accessories to be used with K18 Hybrigas with OQLT021 system controller

|                |  |                |  |                |   |
|----------------|--|----------------|--|----------------|---|
| <b>OQLT021</b> | System controller  | <b>OSND004</b> | Immersion temperature probe              | <b>OVLV007</b> | 3-way diverter valve for heating/DHW management |
| <b>OSRB012</b> | 200 l DHW buffer tank, with 3 sqm coil (as alternative to 300 l OSRB004 DHW buffer tank with 4 sqm coil) | <b>ONTV014</b> | Kit of anti vibration rubber pads        | <b>OTB0069</b> | Unified flue for K18 Hybrigas                   |
| <b>OKBT013</b> | Winter kit for K18 Hybrigas  | <b>OKBT014</b> | Preassembled winter kit for K18 Hybrigas |                |   |

#### Notes

- The unit will be controlled by means of the system controller which the zone room units can be connected to.
- The system controller manages the climatic curve mode (differentiable for each zone) to optimise performance during the medium to low thermal load periods. The operating parameters can be changed on the system controller.
- Connect the 3-way valve (optional) and the DHW buffer tank probe (optional) to the system controller to manage the production of DHW.
- For other notes see Paragraph 8.1.5 p. 35.

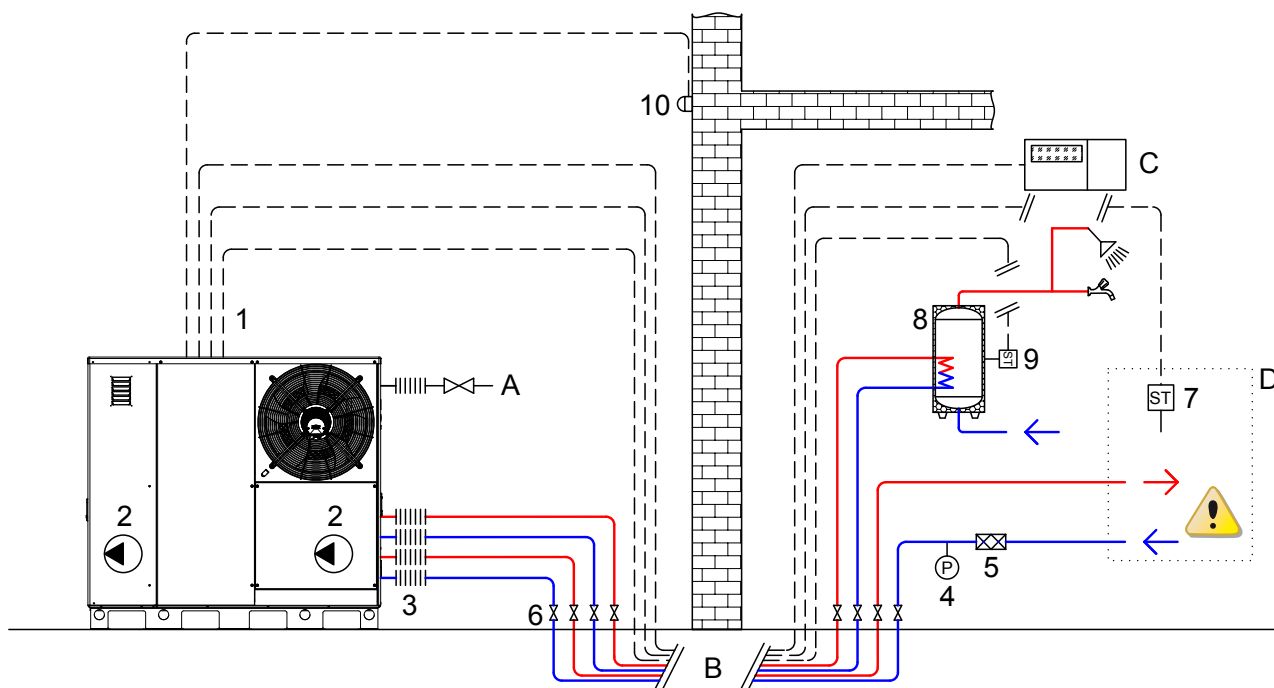
### 8.1.8 K18 Hybrigas Easy

System for the production of hot water up to 65 °C for space heating purposes (you can reach 80 °C by using the condensing boiler alone, with respect to a supplied power equal to the power provided by the boiler alone) and up to 80 °C for the production

of domestic hot water by means of the DHW buffer tank.

The heat pump unit contains a condensing boiler, the water circulating pumps, the expansion tank and the water safety valve.

**Figure 8.11** K18 Hybrigas Easy



- 1 Heat pump + condensing boiler K18 Hybrigas Easy
- 2 Enclosed modulating water pumps, 2,0 m w.c. available head
- 3 Anti-vibration connection
- 4 Pressure gauge
- 5 Sludge filter
- 6 Shut-off valve
- 7 GHP immersion temperature probe (standard) to be installed on heating circuit (see Paragraph 8.2 p. 39)

- 8 DHW buffer tank, 150 liter (available as optional OSRB013)
- 9 Immersion temperature probe (standard)
- 10 Outdoor temperature probe (available as OSND007 optional)
- A Gas connection
- B Skylight well
- C Ambient chronothermostat (available as OCDS007 optional)
- D Heating distribution circuit, to be carried out as described in Paragraph 8.2 p. 39

**Table 8.10** Accessories to be used with K18 Hybrigas EASY

|                |                                   |                |  |
|----------------|-----------------------------------|----------------|--|
| <b>OCDS007</b> | Ambient chronothermostat          | <b>OTB0069</b> | Unified flue for K18 Hybrigas            |
| <b>ONTV014</b> | Kit of anti vibration rubber pads | <b>OKBT013</b> | Winter kit for K18 Hybrigas              |
| <b>OSRB013</b> | 150-litre DHW buffer tank         | <b>OKBT014</b> | Preassembled winter kit for K18 Hybrigas |
| <b>OSND007</b> | Outdoor temperature probe         |                |  |

#### Notes

- To control the production of DHW, you need to connect the DHW buffer tank probe (included as standard and pre-wired inside the boiler, fixed cable length equal to 8 m) to the DHW buffer tank.
- For other notes see Paragraph 8.1.5 p. 35.

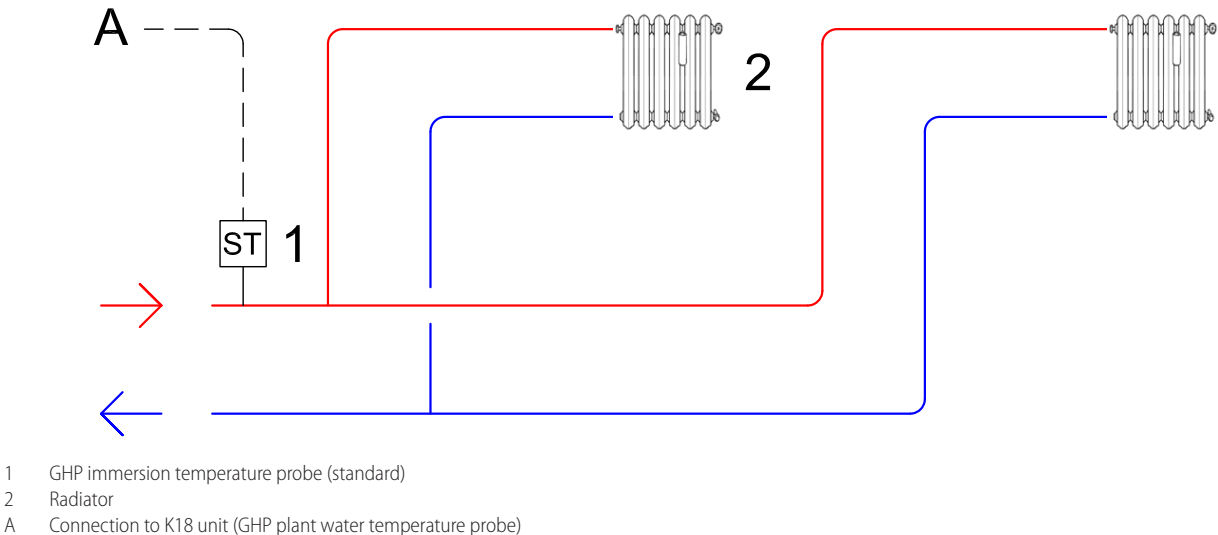
# 8.2 HEATING DISTRIBUTION

The following diagrams describe the possible solutions for the heating distribution circuits in conjunction with the diagrams for the production circuits described in the previous chapter.

## 8.2.1 Heating distribution 01 - direct

Direct heating distribution with single zone (system with primary water circuit only).

**Figure 8.12** Heating distribution 01 - direct



### Notes

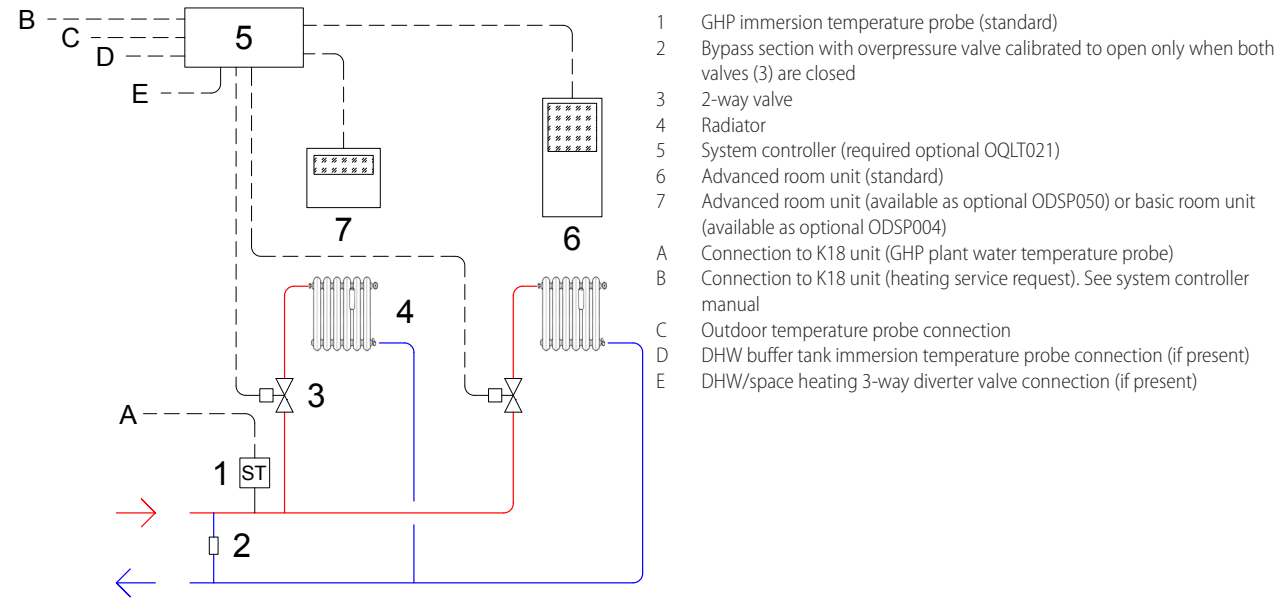
► You must make sure that water can always circulate in the system. If, for example, thermostatic valves are used on the

radiators, do not install on one or two radiators. Otherwise, do not install (or remove) the thermostatic valves in the room where the programmable thermostat is placed.

## 8.2.2 Heating distribution 02 - two zones managed by system controller

Heating distribution with two zones controlled by 2-way valves (system with primary water circuit only).

**Figure 8.13** Heating distribution 02 - system controller with two 2-way zone valves



**Table 8.11** Accessories to be used with heating distribution 02

|         |                   |         |  |
|---------|-------------------|---------|--|
| OQLT021 | System controller | ODSP004 | Basic room unit (as alternative to ODSP050 advanced room unit) |
|---------|-------------------|---------|--|

### Notes

► The unit will be controlled by means of the system controller

which the zone room units can be connected to.

► The system controller manages the climatic curve mode



(differentiable for each zone) to optimise performance during the medium to low thermal load periods. The operating parameters can be changed on the system controller.

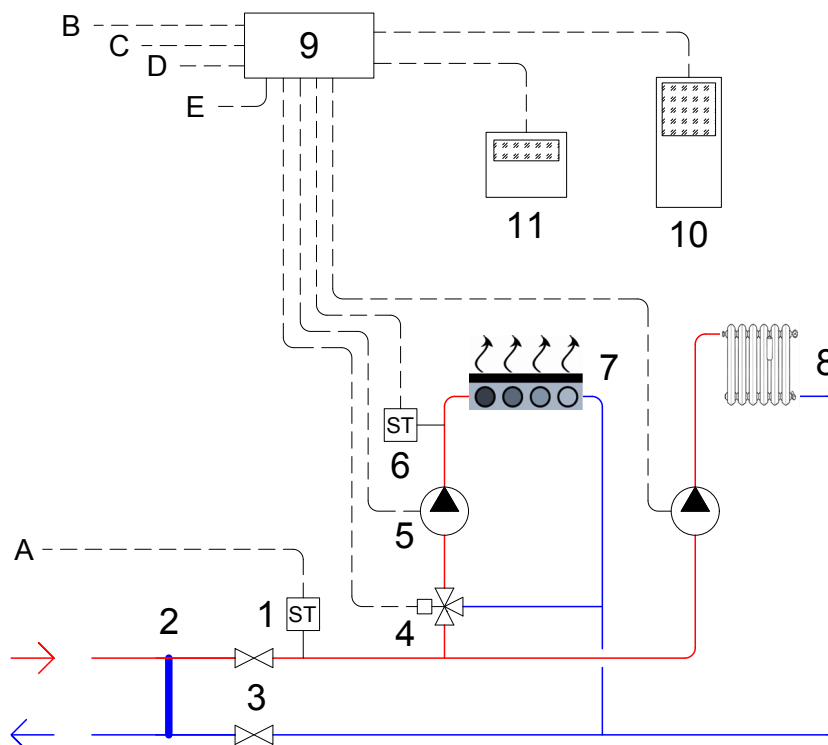
- The system controller can control the buffer tank DHW production with the relevant diverter valve and DHW buffer tank probe, if present.
- You must make sure that water can always circulate in the

system. Connect the zone room units and the switching of the 2-way valve to the system controller so that this turns off the unit in the absence of a request from both zones. Insert a pressure relief valve on the bypass section between the flow and return, so that this opens when the zone valves are closed and the K18 unit activates the antifreeze function (so as to guarantee water circulation).

### 8.2.3 Heating distribution 03 - up to two heating circuits managed by system controller

Heating distribution with up to two heating circuits, one of which is optionally mixed and one not mixed (system with primary and secondary water circuits).

**Figure 8.14** Heating distribution 03 - system controller with a mixed heating circuit and a direct one



- |   |   |    |   |
|---|---|----|---|
| 1 | GHP immersion temperature probe (standard)  | 10 | Advanced room unit (standard)   |
| 2 | Decoupling of primary/secondary circuits (large cross-section pipe with T-connections or a hydraulic separator) | 11 | Advanced room unit (available as optional ODSP050) or basic room unit (available as optional ODSP004) |
| 3 | Shut-off valve  | A  | Connection to K18 unit (GHP plant water temperature probe)  |
| 4 | Zone mixing valve   | B  | Connection to K18 unit (heating service request). See system controller manual                        |
| 5 | Zone circulating pump (available as OPMP009/OPMP004 optional)   | C  | Outdoor temperature probe connection  |
| 6 | Immersion temperature probe (available as OSND004 optional)   | D  | DHW buffer tank immersion temperature probe connection (if present)                                   |
| 7 | Underfloor heating panel  | E  | DHW/space heating 3-way diverter valve connection (if present)  |
| 8 | Radiator  |    |   |
| 9 | System controller (required optional QQLT021)   |    |   |

**Table 8.12** Accessories to be used with heating distribution 03

|                |                             |                |   |
|----------------|-----------------------------|----------------|---|
| <b>QQLT021</b> | System controller           | <b>ODSP004</b> | Basic room unit (as alternative to ODSP050 advanced room unit)  |
| <b>OSND004</b> | Immersion temperature probe | <b>OPMP009</b> | Water pump with 8,0 m total head (as alternative to OPMP004 water pump, with 10 m total head) (2 water pumps) |

#### Notes

- The system controller manages the unmixed and mixed circuits, including the mixing valve, circulating pump and water temperature probe. You can also manage two unmixed circuits.
- For other notes see Paragraph 8.2.2 p. 39.

### 8.3 SYSTEM EXAMPLES

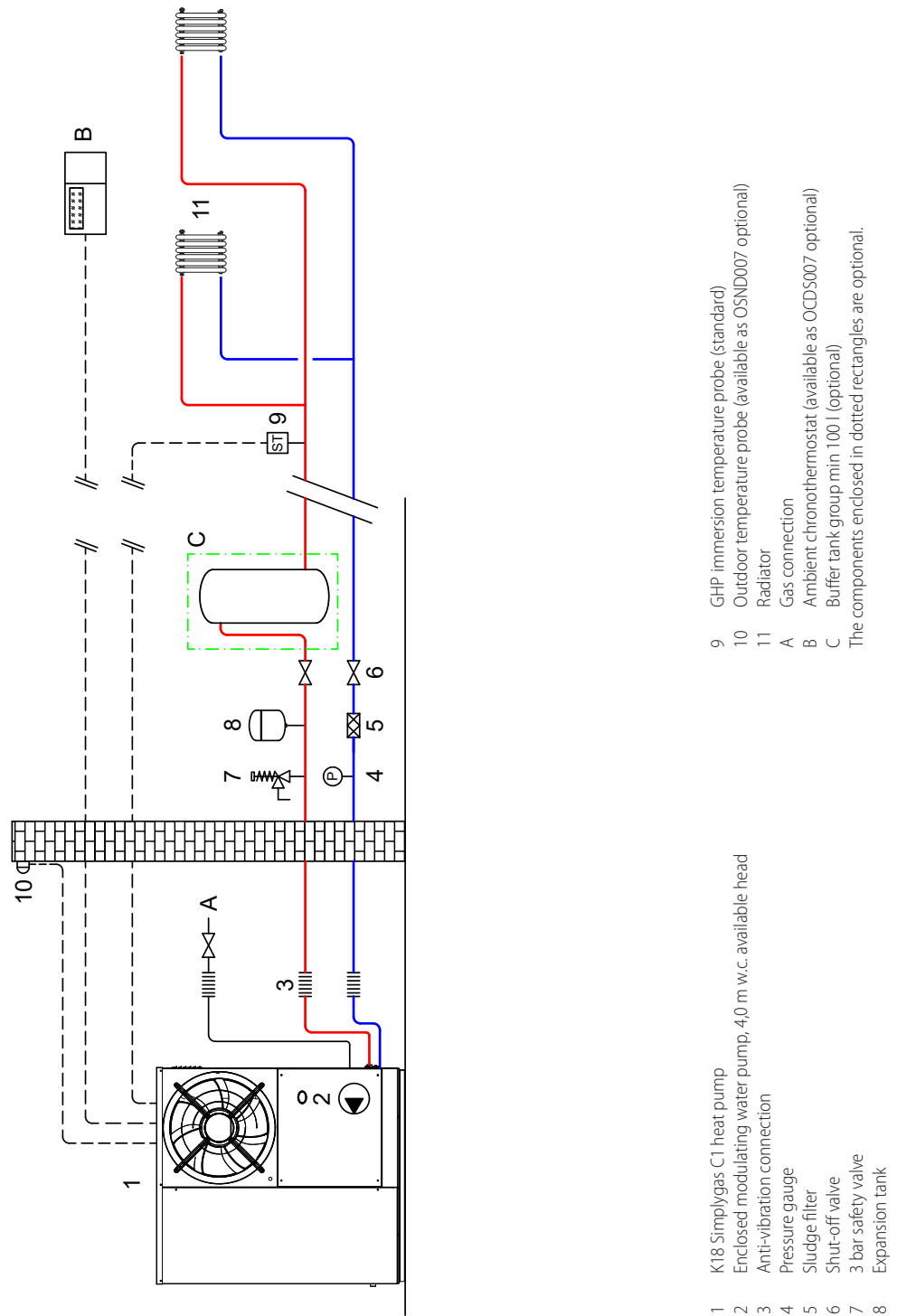
By way of example, below are a few complete system diagrams, resulting from the coupling of generation circuits (Paragraph 8.1 *p. 28*) with heating distribution circuits (Paragraph 8.2 *p. 39*).

The diagrams shown do not cover all the system possibilities with units of the K18 family.

In fact it is possible to couple each of the generation circuits (detailed in Paragraph 8.1 *p.* 28) with each of the heating distribution circuits (detailed in Paragraph 8.2 *p.* 39), providing the appropriate optionals, detailed in the relative circuits.

### 8.3.1 K18 Simplygas C1 for space heating only, without auxiliary boiler, with heating distribution 01

**Figure 8.15** K18 Simplygas C1 for space heating only, without auxiliary boiler, with heating distribution 01

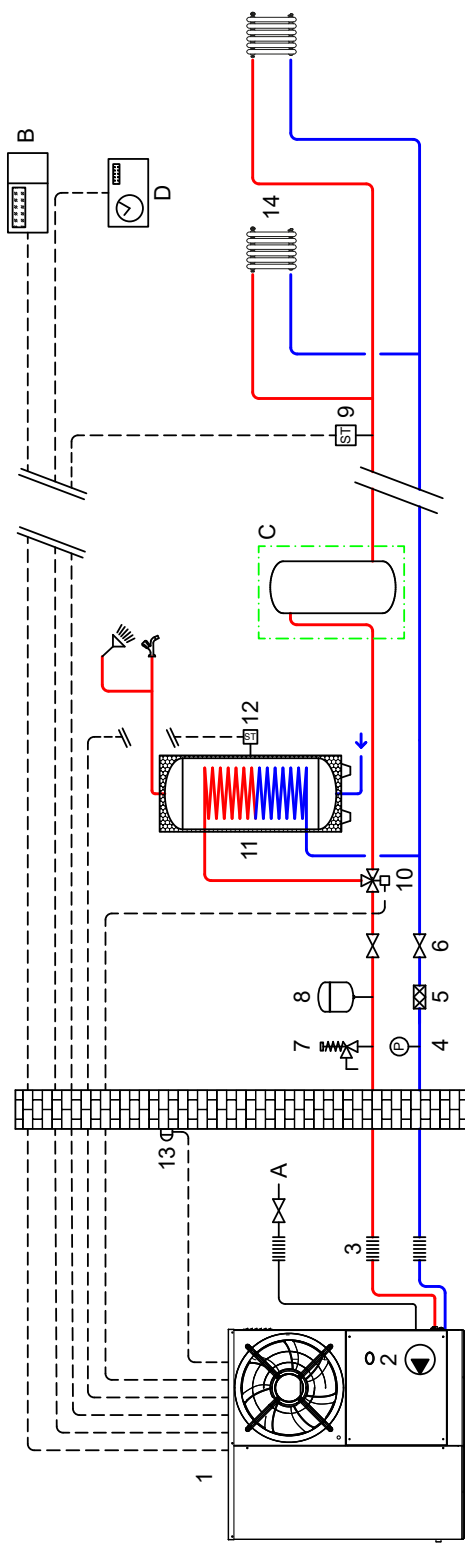


## Notes

- Notes**
- Refer to Paragraph 8.1.1 *p. 28* for the generation circuit.
- For space heating distribution circuit, see Paragraph 8.2.1 *p. 39*.

### 8.3.2 K18 Simplygas C1 for space heating and DHW production (basic functionality), without auxiliary boiler, with heating distribution 01

**Figure 8.16** K18 Simplygas C1 for space heating and DHW production (basic functionality), without auxiliary boiler, with heating distribution 01



- |    |   |    |  |
|----|---|----|--|
| 1  | K18 Simplygas C1 heat pump  | 12 | Immersion temperature probe GHP" (available as OSND004 optional) |
| 2  | Enclosed modulating water pump, 4,0 m w.c. available head                                     | 13 | Outdoor temperature probe (available as OSND007 optional)        |
| 3  | Anti-vibration connection   | 14 | Radiator   |
| 4  | Pressure gauge  | A  | Gas connection   |
| 5  | Sludge filter   | B  | Ambient thermostat (available as OCDS007 optional)               |
| 6  | Shut-off valve  | C  | Buffer tank group min 100 l (optional)                           |
| 7  | 3 bar safety valve  | D  | Daily/weekly timer for DHW service                               |
| 8  | Expansion tank  |    |  |
| 9  | GHP immersion temperature probe (standard)  |    |  |
| 10 | 3-way diverting valve for heating/DHW management (available as OVLV007 optional)              |    |  |
| 11 | DHW buffer tank, 200 or 300 liter, 3 or 4 sqm coil (available as optional OSRB012 or OSRB004) |    |  |

The components enclosed in dotted rectangles are optional.

In case the system requires all three GHP, GHP" and GHP" probes, the outdoor temperature probe cannot be installed. In this case the regulation based on climate curve uses the value supplied by the outdoor temperature probe installed on board the appliance.

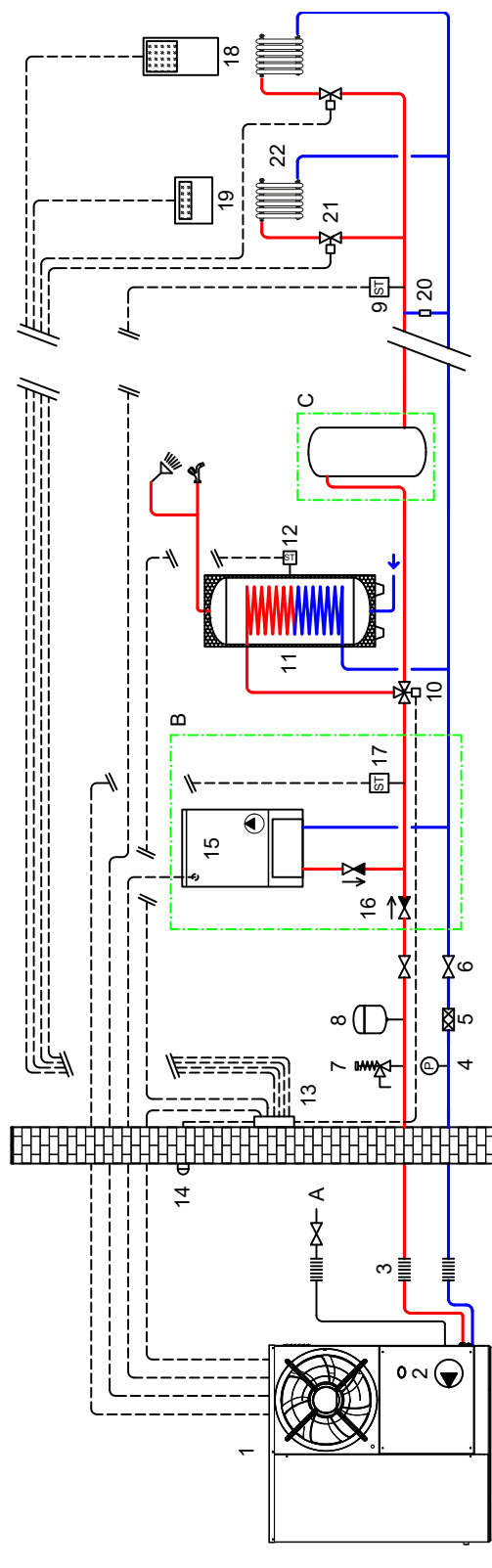
#### Notes

► Refer to Paragraph 8.1.2 p. 30 for the generation circuit.

► For space heating distribution circuit, see Paragraph 8.2.1 p. 39.

### 8.3.3 K18 Simplygas C1 with OQLT021 system controller, with optional auxiliary boiler, with heating distribution 02

**Figure 8.17** K18 Simplygas C1 with OQLT021 system controller, with optional auxiliary boiler, with heating distribution 02



- |    |   |    |   |
|----|---|----|---|
| 1  | K18 Simplygas C1 heat pump  | 15 | Auxiliary boiler (optional)   |
| 2  | Enclosed modulating water pump, 4,0 m w.c. available head                                     | 16 | Check valve (to be installed only in the presence of an auxiliary boiler)                                       |
| 3  | Anti-vibration connection   | 17 | Immersion temperature probe (available as OSND004 optional)   |
| 4  | Pressure gauge  | 18 | Advanced room unit (optional supplied as per standard with OQLT021, to be placed, preferably, in a heated room) |
| 5  | Sludge filter   | 19 | Basic room unit (available as ODS004 optional)  |
| 6  | Shut-off valve  | 20 | Bypass section with overpressure valve  |
| 7  | 3 bar safety valve  | 21 | 2-way/thermostatic valve  |
| 8  | Expansion tank  | 22 | Radiator  |
| 9  | GHP immersion temperature probe (standard)  | A  | Gas connection  |
| 10 | 3-way diverting valve for heating/DHW management (available as OVLV007 optional)              | B  | Auxiliary boiler group (optional)   |
| 11 | DHW buffer tank, 200 or 300 liter; 3 or 4 sqm coil (available as optional OSRB012 or OSRB004) | C  | Buffer tank group min 100 l (optional)  |
| 12 | Immersion temperature probe (available as OSND004 optional)                                   |    |   |
| 13 | System controller (required optional OQLT021)   |    |   |
| 14 | Outdoor temperature probe (standard with OQLT021)   |    |   |
- The components enclosed in dotted rectangles are optional.

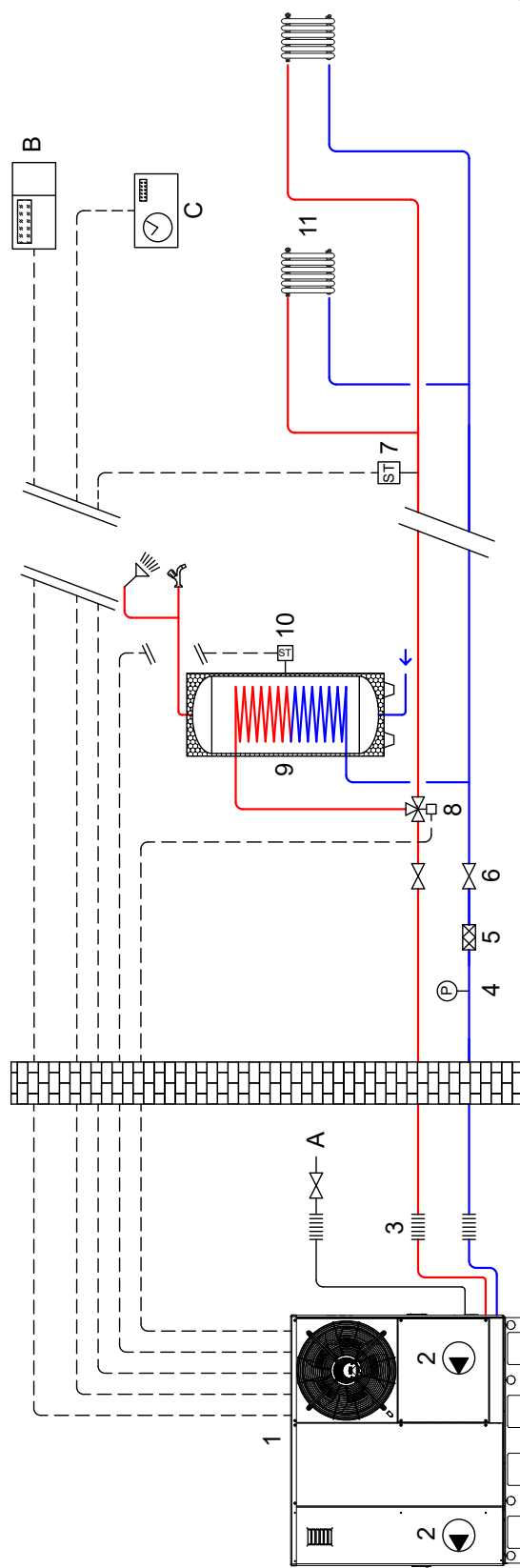
#### Notes

► Refer to Paragraph 8.1.4 p. 33 for the generation circuit.

► For space heating distribution circuit, see Paragraph 8.2.2 p. 39.

### 8.3.4 K18 Hybrigas for space heating and DHW production (basic functionality), with heating distribution 01

**Figure 8.18** K18 Hybrigas for space heating and DHW production (basic functionality), with heating distribution 01



- |   |  |    |   |
|---|--|----|---|
| 1 | Heat pump + condensing boiler K18 Hybrigas                 | 8  | 3-way diverting valve for heating/DHW management (available as OVLV007 optional)              |
| 2 | Enclosed modulating water pumps, 2.0 m w.c. available head | 9  | DHW buffer tank, 200 or 300 liter, 3 or 4 sqm coil (available as optional OSRB012 or OSRB004) |
| 3 | Anti-vibration connection                                  | 10 | Immersion temperature probe GHP* (available as OSND004 optional)                              |
| 4 | Pressure gauge   | 11 | Radiator  |
| 5 | Sludge filter  | A  | Gas connection  |
| 6 | Shut-off valve   | B  | Ambient chronothermostat (available as OCD5007 optional)                                      |
| 7 | GHP immersion temperature probe (standard)                 | C  | Daily/weekly timer for DHW service  |

#### NOTE

- 1 In case the system requires all three GHP, GHP\* and GHP\*\* probes, the outdoor temperature probe cannot be installed. In this case the regulation based on climate curve uses the value supplied by the outdoor temperature probe installed on board the appliance.
- 2 The K18 Hybrigas unit already contains an expansion tank with a 8 l capacity. In relation to the volume of water involved, consider adding an additional tank with adequate capacity.

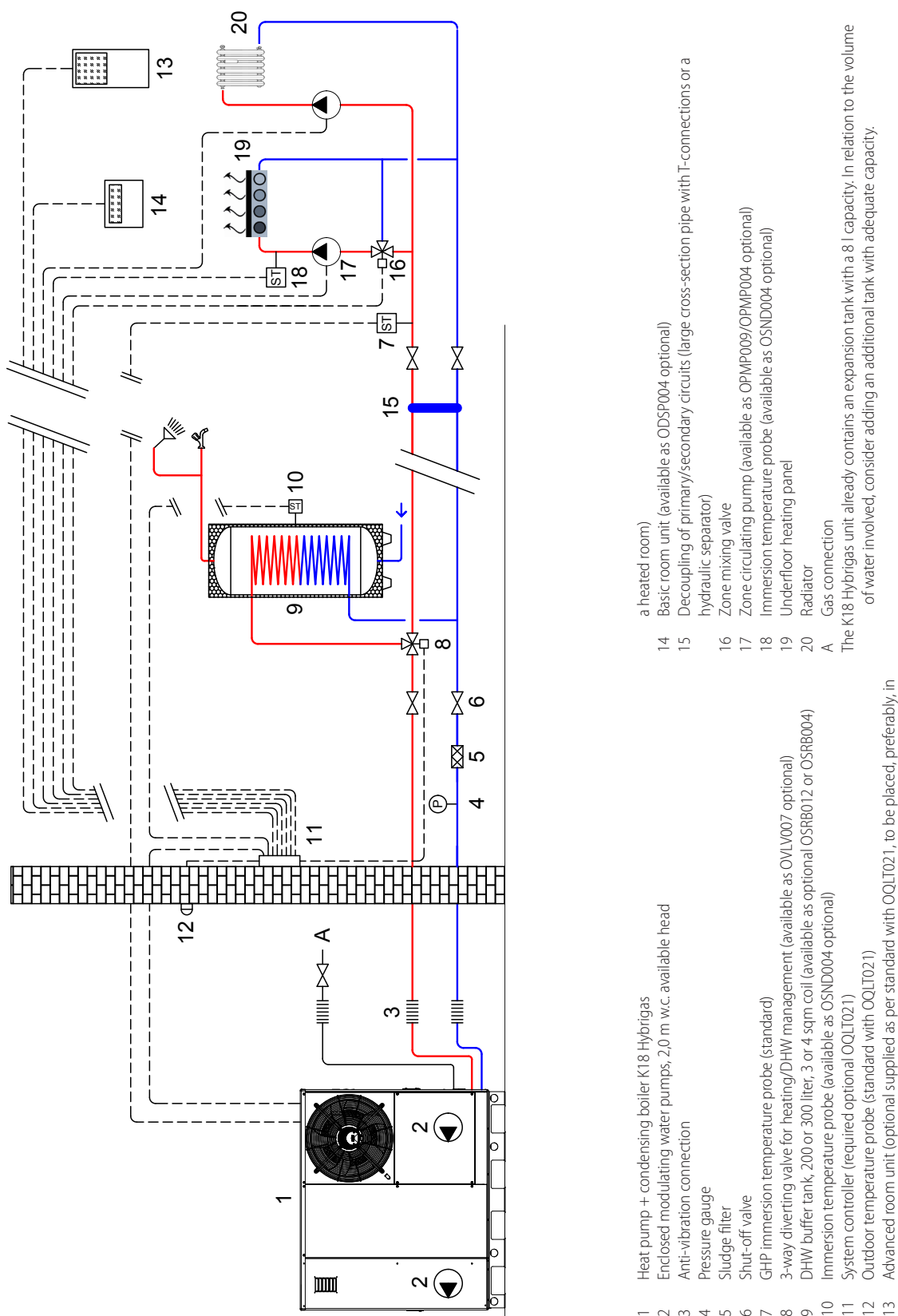
#### Notes

- Refer to Paragraph 8.1.6 p. 36 for the generation circuit.

- For space heating distribution circuit, see Paragraph 8.2.1 p. 39.

### 8.3.5 K18 Hybrigas with OQLT021 system controller, with heating distribution 03

**Figure 8.19** K18 Hybrigas with OQLT021 system controller, with heating distribution 03



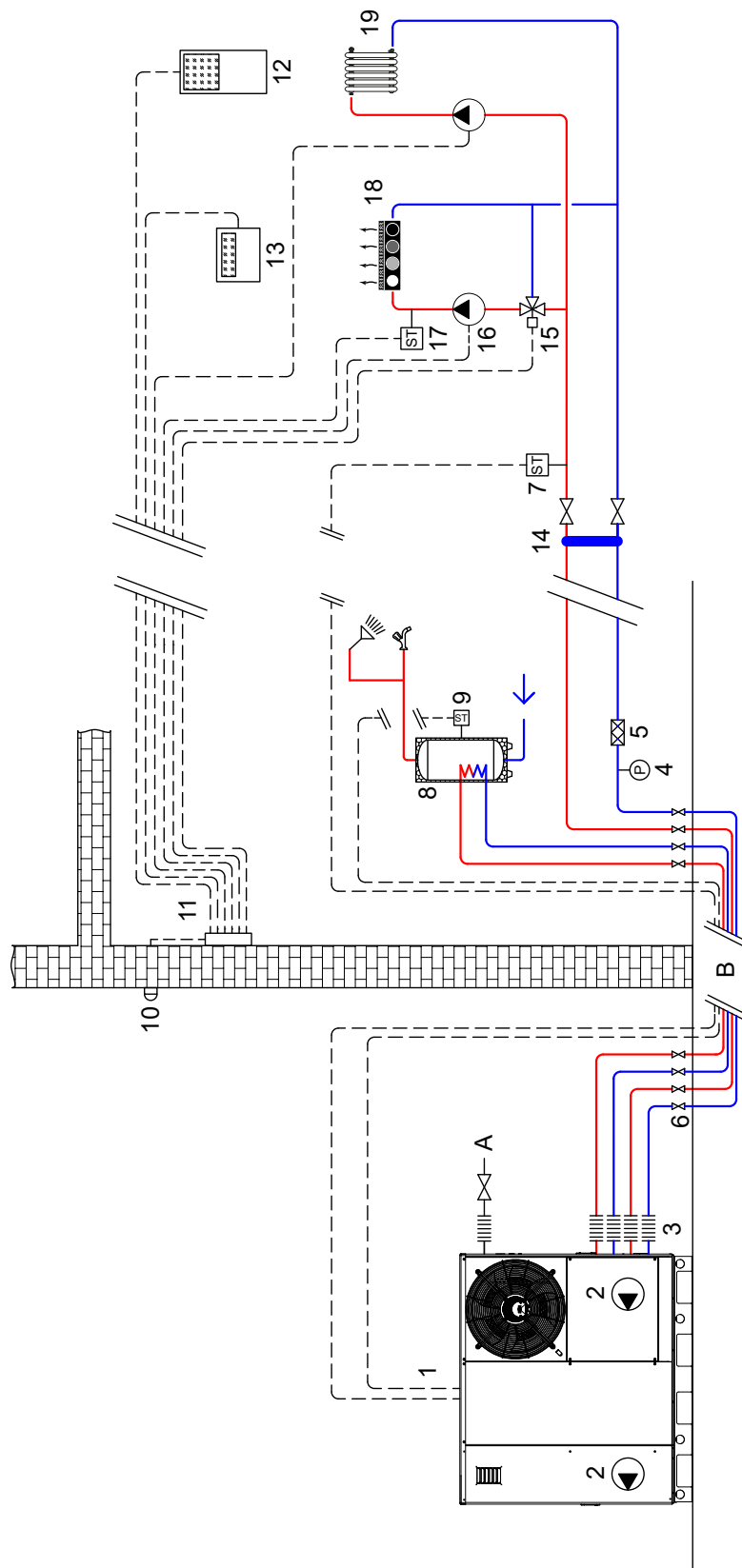
#### Notes

► Refer to Paragraph 8.1.7 p. 37 for the generation circuit.

► For space heating distribution circuit, see Paragraph 8.2.3 p. 40.

### 8.3.6 K18 Hybrigas Easy with heating distribution 03

**Figure 8.20** K18 Hybrigas Easy with heating distribution 03



- |    |   |    |   |
|----|---|----|---|
| 1  | Heat pump + condensing boiler K18 Hybrigas Easy   | 13 | Basic room unit (available as ODSP004 optional)   |
| 2  | Enclosed modulating water pumps, 2,0 m w.c. available head  | 14 | Decoupling of primary/secondary circuits (large cross-section pipe with T-connections or a hydraulic separator) |
| 3  | Anti-vibration connection   | 15 | Zone mixing valve   |
| 4  | Pressure gauge  | 16 | Zone circulating pump (available as OPMP009/OPMP004 optional)   |
| 5  | Sludge filter   | 17 | Immersion temperature probe (available as OSND004 optional)   |
| 6  | Shut-off valve  | 18 | Underfloor heating panel  |
| 7  | GHP immersion temperature probe (standard)  | 19 | Radiator  |
| 8  | DHW buffer tank, 150 liter (available as optional OSR8013)  | A  | Gas connection  |
| 9  | Immersion temperature probe (standard)  | B  | Skylight well   |
| 10 | Outdoor temperature probe (standard with OQLT021)   |    |   |
| 11 | System controller + expansion kit (required optional OQLT021 + ODSP030)   |    |   |
| 12 | Advanced room unit (optional supplied as per standard with OQLT021, to be placed, preferably, in a heated room) |    |   |
- The K18 Hybrigas Easy unit already contains an expansion tank with a 8 l capacity. In relation to the volume of water involved, consider adding an additional tank with adequate capacity.

#### Notes

► Refer to Paragraph 8.1.8 p. 38 for the generation circuit.

► For space heating distribution circuit, see Paragraph 8.2.3 p. 40.



## 9 REQUIRED CONNECTIONS

---

The unit needs the following supplies and connections:

- ▶ LPG or natural gas mains.
- ▶ 230 V power supply.
- ▶ Request and control connections to be connected to the foreseen devices inside the building.
- ▶ Connection to the delivery and return piping (the system water can be topped up in the system piping) and possible connection for the DHW circuit (K18 Hybrigas Easy).
- ▶ Evacuation of combustion fumes (for proper evacuation refer to the applicable regulations in force).
- ▶ Drainage of condensate water of flue gas and that of defrosting (coming from the finned coil).

The details about the positioning and characteristics of the connections listed above are provided in the installation manual of each unit of the K18 family and where applicable, in the installation manual of the system controller.

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