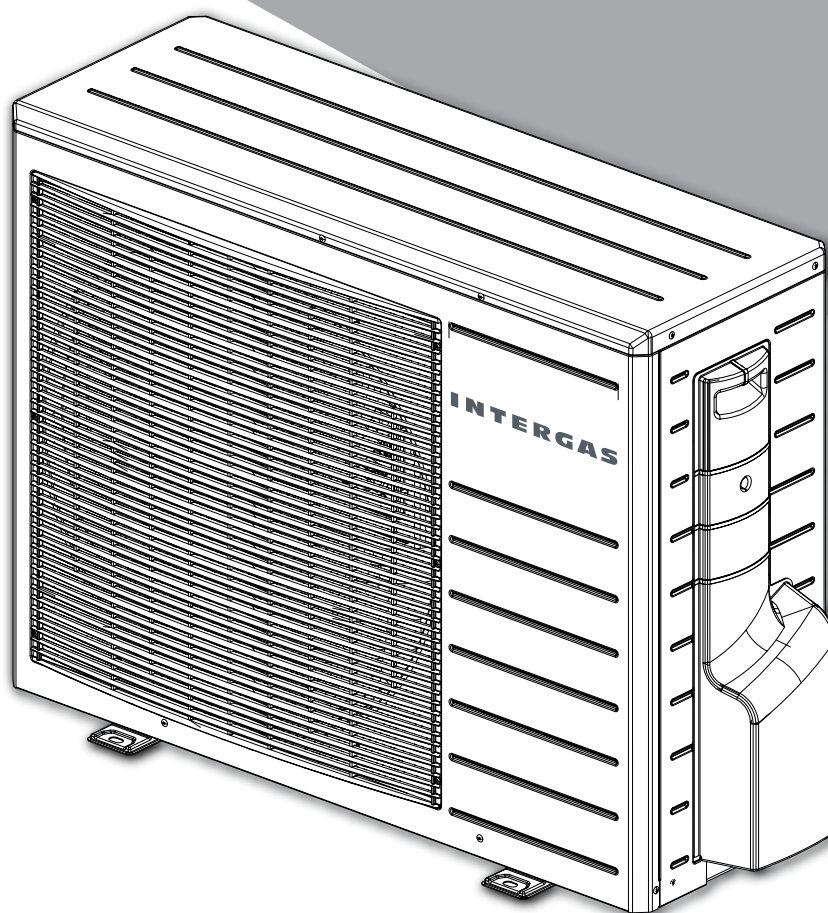
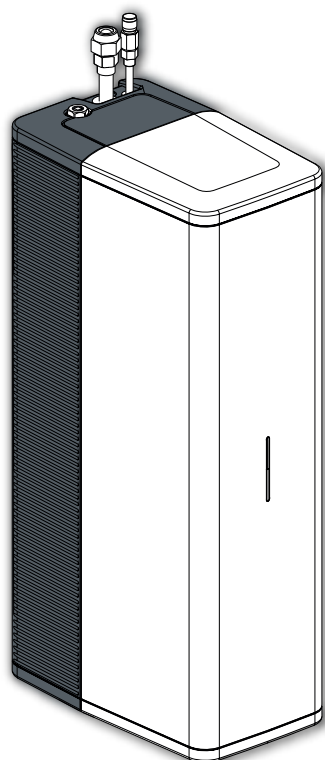


XTEND



INSTALLATION INSTRUCTIONS

Hybrid air-water heat pump system

Please read these installation instructions carefully before installing and using the system. Keep these installation instructions in a safe place. Always act in accordance with the indicated instructions.

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1 EXPLANATORY NOTES AND SAFETY INSTRUCTIONS

Intergas Heating Ltd accepts no liability whatsoever for damage or injury caused by failure to (strictly) observe the safety regulations and instructions, or by negligence during the installation of the Intergas appliance and any accessories.

This appliance should only be operated by persons who are competent to do so and have read and fully understand the the user instructions.

Cleaning of the indoor unit casing can be achieved using a damp cloth only and no solvent based products.

Cleaning of the outdoor unit must only be undertaken by an F-Gas / REFCOM registered and Intergas trained engineer.

Maintenance of both indoor and outdoor units must only be performed by an F-Gas / REFCOM registered and Intergas trained engineer.

Intergas Heating Ltd is constantly looking for ways to guarantee the quality of its products and to improve them where necessary. As a result, it reserves the right to modify the features mentioned within this document at any time.

Read and observe all safety instructions within this manual to prevent unsafe situations, fire, explosion, property damage or personal injury. When in doubt or if you have questions, contact Intergas Heating Ltd.

1.1 General explanation

1.1.1 Icons within the installation instructions



CAUTION / IMPORTANT

Procedures which, if not carried out with care, may damage the product, its surroundings or the environment, or may result in personal injury.



NOTE

Procedures and/or instructions which, if not followed, could negatively affect the operation of the system.



WARNING

Dangerous voltage or electric shock hazard

1.1.2 Symbols on the rating plate



INSTRUCTIONS

Read the included manual.



INSTRUCTIONS

See the operating instructions.



INSTRUCTIONS

Read the technical manual.



CE DECLARATION

Legal requirements for consumer products marketed within the EU relating to safety, health and the environment.



FLAMMABLE REFRIGERANT

The device contains flammable refrigerant.



RECYCLING

Take discarded products to a designated collection and recycling location.

1.1.3 Symbols on the packaging



INSTRUCTIONS (THIS SIDE UP)

The arrow is pointing up to indicate that the contents must be transported and stored upright.



INSTRUCTIONS (FRAGILE)

This symbol indicates that the contents of the box are fragile. Handle the contents carefully.



INSTRUCTIONS (KEEP DRY)

This symbol indicates that the contents of the box must be kept dry.



INSTRUCTIONS (MAXIMUM STACKING HEIGHT)

This symbol indicates how many of these boxes can be stacked.



INSTRUCTIONS (NO STANDING)

This symbol indicates that you cannot stand on the contents of the box.



INSTRUCTIONS (DO NOT USE HOOKS)

This symbol indicates that a hook cannot be used to hoist the product.



INSTRUCTIONS (NO TILTING)

This symbol indicates that the contents of the box cannot be tilted.



INSTRUCTIONS (DO NOT STACK ON SIDE)

This symbol indicates that the product cannot be stacked on its side.



REFRIGERANT TYPE (R32)

R32 is an A2L refrigerant, which has low flammability and low toxicity.

1.1.4 Abbreviations

- ▶ **CH:** Central heating
- ▶ **DHW:** Domestic hot water
- ▶ **IDU:** Indoor unit
- ▶ **ODU:** Outdoor unit
- ▶ **WDC:** Weather-dependent control

1.1.5 Information about the text

- ▶ The dimensions within the installation instructions are in millimetres unless otherwise specified.



IMPORTANT

- ▶ **Read the installation and operating instructions before installation.**
- ▶ **Installing the system incorrectly can result in serious or life-threatening injuries.**
- ▶ **A qualified installer must install the Intergas hybrid heat pump system, as incorrect installation can lead to leakage, electric shock or fire.**
- ▶ **Ensure that the system and the electrical connections are connected and earthed correctly to prevent parts and housing from becoming live. Electrical work may only be carried out by a qualified electrician; see §8.2.**
- ▶ **Do not insert fingers or objects into the outdoor unit's fan or the ribs of its evaporator. This can lead to serious injuries.**
- ▶ **To prevent short circuiting or fire, shut down the system immediately if it is not functioning correctly or if 'unusual' air is detected.**
- ▶ **If parts of the heat pump system need to be replaced or removed, this must be carried out by a qualified engineer.****
- ▶ **Repairs and restoration work may only be carried out by a qualified or Intergas engineer. Improper repair or restoration work may result in water damage, short circuiting, personal injury or fire.**
- ▶ **This product contains fluorinated greenhouse gases. Do not allow these gases to escape into the atmosphere.**
- ▶ **The refrigerant (R32) is flammable. If this refrigerant comes into contact with a heat source, it can lead to fire or the formation of hazardous gas.**

**City and Guilds
1 Giltspur Street
London EC1A 9DD
Telephone 0844 543 0033**

**Building Engineering Services Association (BESA)
Lincoln House
137-143 Hammersmith Road
London
W14 0QL
Telephone 020 7313 4900**

**LCL Awards
Unit 1 Belvue Business Park
Belvue Road
Northolt
Middlesex
UB5 5QQ
Telephone 020 8839 2439**



IMPORTANT

- ▶ **During the installation, the main Regulations that apply:**
 - Health and Safety at Work Act (HSWA)
 - Workplace (Health, Safety and Welfare) Regulations
 - Manual Handling Operations Regulations
 - Regulatory Reform (Fire Safety) Order
 - Electricity At Work Regulations
 - Control of Substances Hazardous to Health (COSHH) Regulations

- ▶ **The system must not be positioned near flammable substances. This can lead to a fire hazard.**

- ▶ **The indoor unit must always be positioned upright.**

- ▶ **Ensure that the wall on which the indoor unit is mounted is strong enough to support the system. Additional reinforcement is required if the system is installed on plasterboard stud walls.**

- ▶ **The CH system must be filled and ventilated. The water pressure in the CH system must be at least 1.0 to 1.5 bar when cold. Do not use the CH system if it is not full and vented.**

- ▶ **Ensure that the outdoor unit is placed on a foundation that is stable and level enough to prevent it from tipping over. Ensure that condensed water can be drained.**

- ▶ **Check whether the correct circuit breaker (B16) has been fitted to the electrical consumer unit. If the circuit breaker is too high, unsuitable or missing it can lead to short-circuiting or fire.**

- ▶ **Check whether the electrical supply circuit(s) to which the installation will be connected is/are suitable for the required capacity.**

- ▶ **Ensure that a three-pole isolator switch (see §8.7.3 and §8.8.1) is placed near the outdoor unit, it must be IPX rated and designed to carry the required electrical loading.**

- ▶ **The extra fittings specified within these installation instructions (filter, non-return valve and wiring etc.) must be supplied and fitted by the installer. Damages and consequences resulting from not applying the specified fittings are not covered by the Intergas warranty and will be the responsibility of the installer/user.**

- ▶ **Before installing any type of low temperature heating system it is essential a full room by room heat loss calculation is completed of the property, this should be fully explained to the home owner, especially regarding the different operational aspects, temperature of the emitters, duration of operation, electricity usage etc. It is recommended that the level of thermal insulation for the property walls, floor and roof are increased (where possible) to the maximum to help lower the U-values (The lower the U-value, the slower the heat escapes from the property).**

1.4 Points of attention for maintenance



IMPORTANT

- ▶ **The indoor unit and outdoor unit can be cleaned with a damp cloth. Do not use aggressive or abrasive cleaning agents or solvents.**
- ▶ **During maintenance, check that the base/foundation of the outdoor unit is strong and stable. Damage to or abnormalities in the base/foundation may lead to the outdoor unit tipping, possibly resulting in injury and/or material damage.**
- ▶ **When performing maintenance, ensure that the entire system is not live. The isolator switch must be able to cut off all electric current to the outdoor unit. The isolator switch will be located near the outdoor unit. (see §8.2 and §8.8.1).**
- ▶ **Disabling/overriding any safety devices in the system (mechanical or electrical) for any reason is prohibited.**
- ▶ **Dry nitrogen is the only substance permitted for tracking leaks and pressure testing.**
- ▶ **Cleaning the outdoor unit with flammable or combustible substances is not permitted as it can pose a possible fire hazard.**



IMPORTANT

- ▶ **Incorrect installation, commissioning or maintenance work may cause damage or injury to humans, animals, the environment or objects for which the manufacturer is not responsible.**

1.5 Regulations, standards and safety requirements

- ▶ The Intergas hybrid heat pump device meets the requirements of the following European regulations and standards:

Regulations:

- ▶ Low Voltage Directive 2014/35/EU, with regard to offering electrical equipment on the market that is intended for use within specific voltage limits.
- ▶ EMC directive 2014/30/EU, with regard to electromagnetic compatibility.
- ▶ RE Directive 2014/53/EU, with regard to offering radio equipment on the market.
- ▶ Ecodesign Directive 2009/125/EC, with regard to ecological design for energyrelated products.
- ▶ Energy labelling (EU) 2017/1369, with regard to establishing a framework for energy labelling.
- ▶ F-gases regulation (EU) 517/2014, with regard to fluorinated greenhouse gases and ozone-depleting substances.
- ▶ Pressure Equipment Directive 2014/68/EU, with regard to offering pressure equipment on the market.

Relevant standards:

- ▶ NEN-EN-IEC 60335: Household and similar electrical appliances - safety, Part 2 - 40.
- ▶ NEN 1010: Low-voltage electrical installations.
- ▶ NEN-EN 378: Refrigeration systems and heat pumps – safety and environmental requirements.
- ▶ NEN-EN 14511: Air conditioner equipment, liquid cooling units and heat pumps with electrically driven compressors for heating and cooling a room.

The installation:

The installation of the Xtend Hybrid must comply with the following British standards and codes of practice.

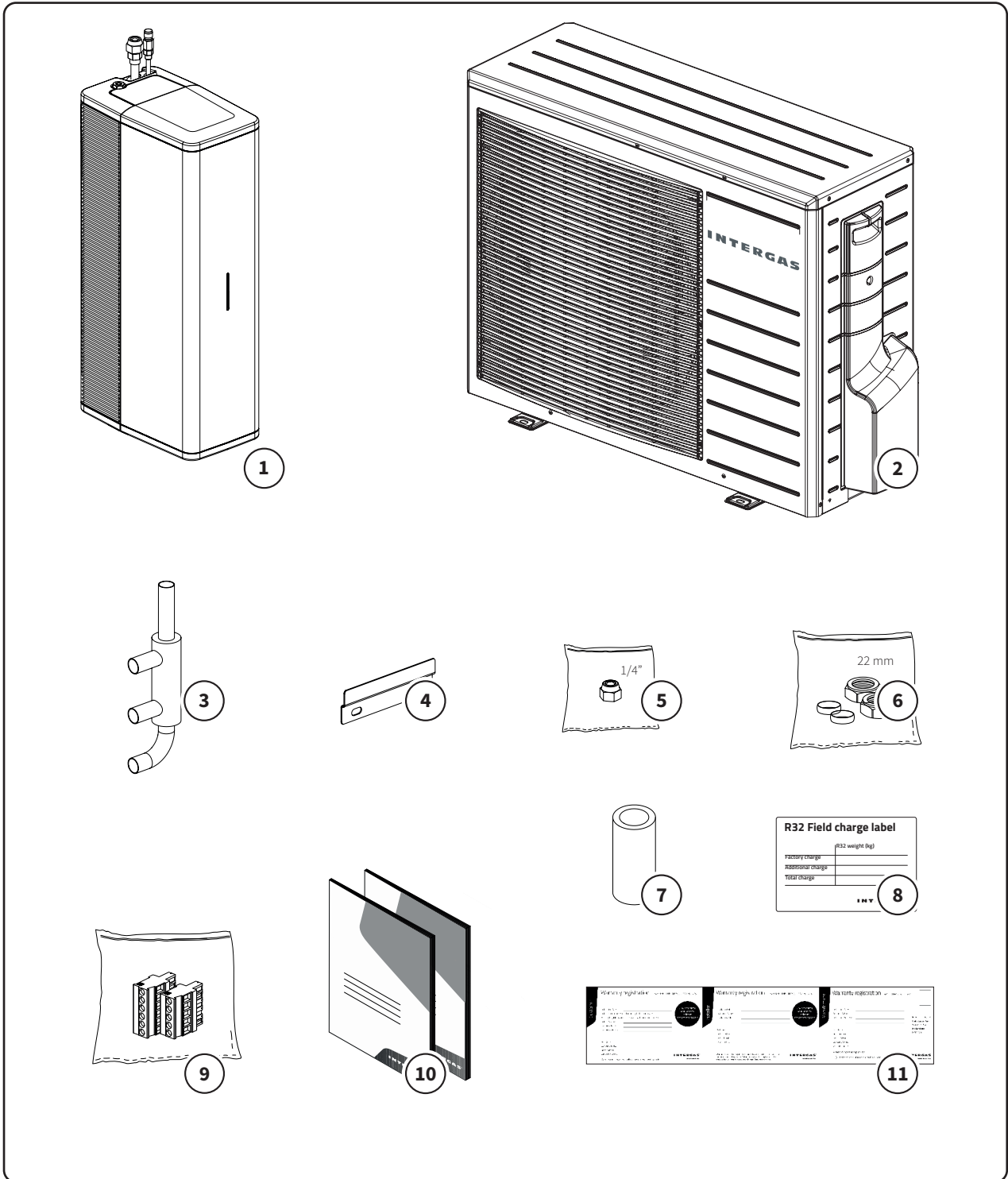
For the installation of the gas boiler that will be used in conjunction with the Xtend Hybrid system please adhere to the installation instructions supplied with that appliance where you will find the relevant British standards and current regulations that must be adhered to.

- ▶ European regulations and standards.
- ▶ BS EN 378 Safety and environmental requirements for heat pumps.
- ▶ BS EN 14511 requirements for heat pumps, space heating and cooling.
- ▶ BS EN 14276-2:2007 Pressure equipment for refrigerating systems & heat pumps.
- ▶ BS EN 14324:2004 Brazing, Guidance on the application of brazed joints.
- ▶ BS EN 12735-1:2010 Copper and copper alloys, copper tubes used for air conditioning & refrigeration.
- ▶ European Parliament Regulation (EC) 842/2006 on Certain Fluorinated Greenhouse Gases.
- ▶ Building Regulations
- ▶ Building Regulations (Scotland) (Consolidation).
- ▶ Local power supply regulations for the relevant utility company.
- ▶ BS 7593:2019 Treatment of water in domestic hot water central heating systems.

Further requirements:

- ▶ The Health and Safety at Work Act 1974.
- ▶ The Management of Health and Safety at Work Regulations 1999.
- ▶ The Construction (Health, Safety and Welfare) Regulations 1996.
- ▶ The Construction (Design and Management) Regulations 1994.
- ▶ The Lifting Operations and Lifting Equipment Regulations 1998.

2 SCOPE OF DELIVERY



①	Indoor unit	⑦	Insulation material (for refrigerant lines indoor unit)
②	Outdoor unit	⑧	Field charge sticker
③	Low loss header	⑨	Plug-in connectors (5 pole for X13 and 6 pole X2)
④	Indoor unit wall hanging bracket	⑩	Installation- and user manuals
⑤	Flare nut 1/4" (refrigerant liquid line)	⑪	Warranty card
⑥	Compression nut and 22mm olive (2x)		

3 REQUIRED COMPONENTS AND ACCESSORIES

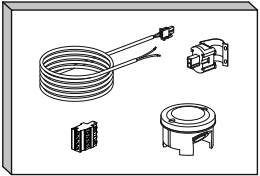
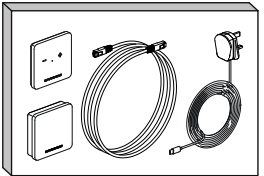
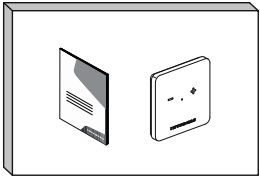
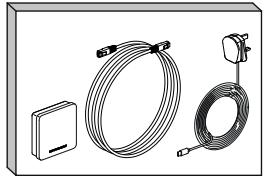
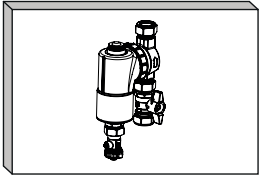
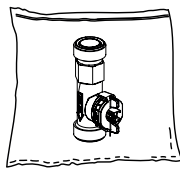
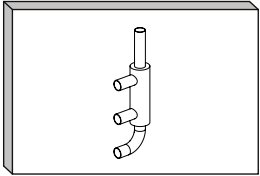
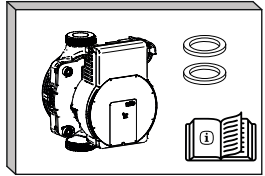
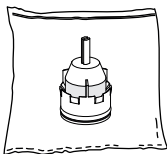
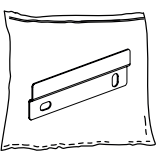
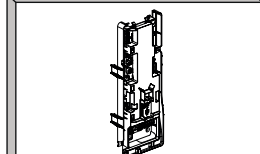
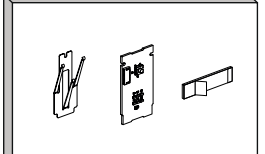
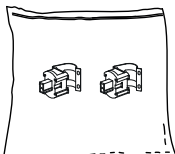
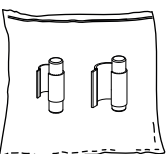
3.1 Required components

The number of components required for installing the hybrid heat pump system depends on the installation situation. In addition to the standard items included, an overview of the general required components is provided below:

Hydronic		
Intergas magnetic system filter	Ø22 mm	In the return system water pipework to the indoor unit (<i>required</i>)
Spring loaded non-return valve (full bore)	Ø22 mm	In the heating return pipework to the boiler (<i>required</i>)
Electrical		
Three-pole isolator switch		For isolating the 230V AC power to the outdoor unit. The three-pole isolator switch to be used must have the following: <ul style="list-style-type: none"> ▶ Contactor opening distances of at least 3 mm.
4-wire cable (N, L, 3, ⊕)	4 x 1.5 mm²	Power and switched live cable from the indoor unit to the outdoor unit. The cable to be used must have the following properties: <ul style="list-style-type: none"> ▶ Cannot be smaller in diameter than those specified adjacent (in accordance the electrical regulations BS7671). ▶ Must be suitable for outdoor use with a core thickness of at least 1.5 mm and a maximum diameter of 14.5 mm.
2-wire low-current signal cable	2 x 0.8 mm²	For the connection of the indoor unit to the room thermostat
2-wire low-current signal cable	2 x 0.8 mm²	For the connection between the indoor unit and the existing boiler

3.2 Accessories

Original Intergas accessories can be ordered separately at your local stockist. Instruction about the correct way to assemble and use these accessories are provided with the product ordered and therefore have not been included within this installation manual.

			
<p>Art. no. 090064 Outdoor sensor set</p>	<p>Art. no. 032034 (white) Art. no. 032044 (black) Comfort Touch thermostat + Gateway</p>	<p>Art. no. 030104 (white) Art. no. 030114 (black) Comfort Touch thermostat</p>	<p>Art. no. 032114 Gateway</p>
			
<p>Art. no. 090897 System Filter incl. spigot isolation valve</p>	<p>Art. no. 066034 Flow sensor type 200 service set</p>	<p>Art. no. 066074 Copper low loss header manifold 22mm</p>	<p>Art. no. 066024 Wilco pump replacement set</p>
			
<p>Art. no. 090024 Non return valve set X-serie</p>	<p>Art. no. 066084 Wall hanging bracket</p>	<p>Art. no. 066004 PCB Controller replacement set</p>	<p>Art. no. 066014 HMI-PCB replacement set</p>
			
<p>Art. no. 066044 NTC Temperature sensor clip on 22 mm (x2)</p>	<p>Art. no. 066054 NTC Refrigeration sensor set clip on 6mm/12mm including wiring loom to X6 connector</p>		

4 GENERAL

This manual contains the necessary information for the installation, troubleshooting and maintenance of the Intergas hybrid heat pump system. Read this manual carefully before installing, opening or performing maintenance work on the unit.

Intergas shall not be held liable for any consequences resulting from the following, if not performed in accordance with this manual: incorrect installation, improper troubleshooting, changes without permission from Intergas, incorrect operation or unnecessary maintenance work.

To prevent unsafe situations and to avoid possible claims, all instructions within this manual must be followed at all times.

Maintenance must be carried out at the time and frequency specified in **§13**. Use original parts only for replacement.

The Intergas hybrid heat pump system is an energy-saving and environmentally friendly system, intended for the heating and supply of hot water for the CH system. The system generates energy from the outside air and consists of:

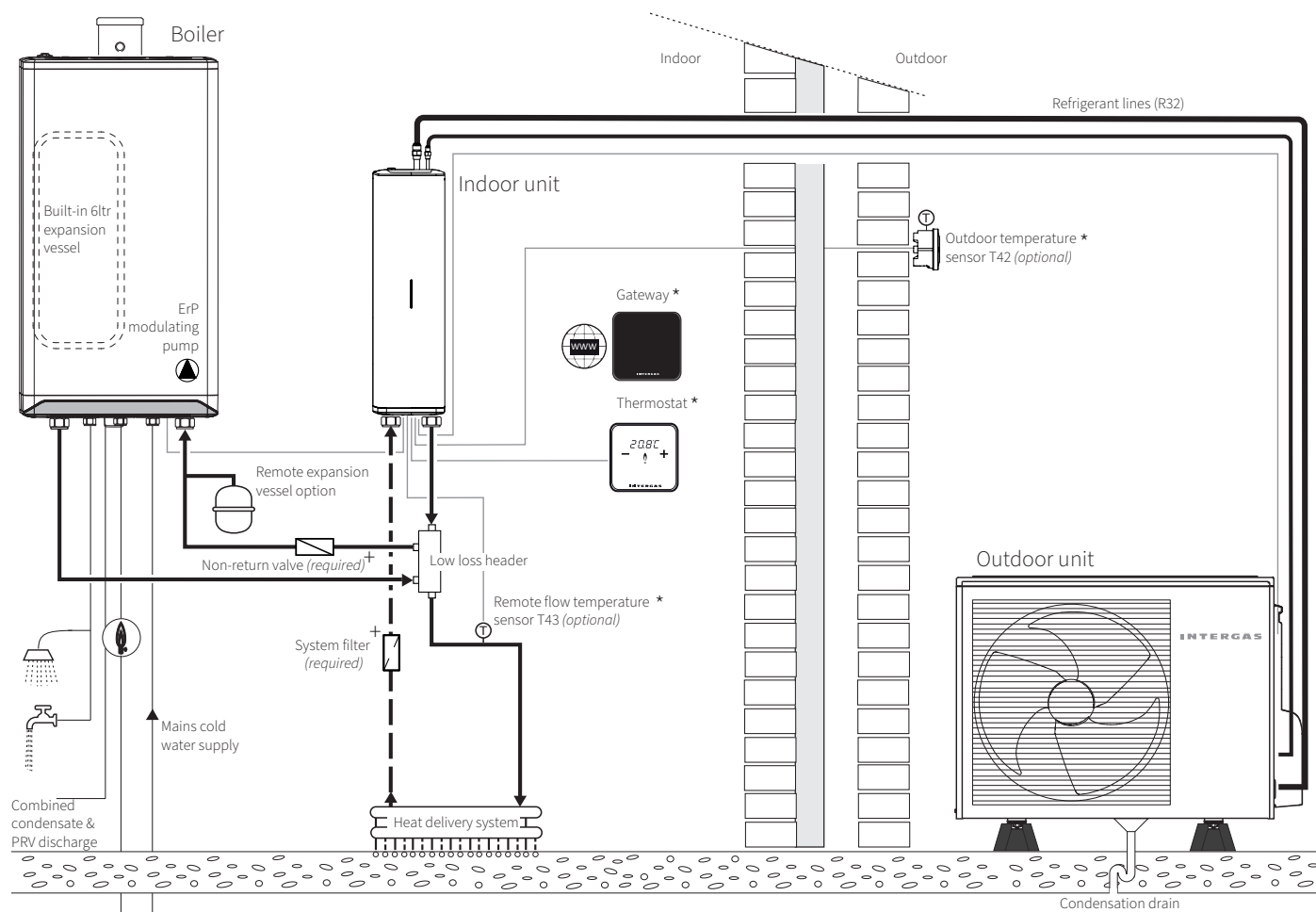
- ▶ the indoor unit
- ▶ the outdoor unit

The Intergas hybrid heat pump system complies with the European directives and additional national regulations as indicated by the CE markings. The corresponding declaration of conformity can be requested from Intergas Heating Ltd.

The system includes the following features:

1. Advanced control: this control is built into the indoor unit it controls and communicates with the outdoor unit as well as the boiler. It controls and monitors the system using various settings for heating of the CH system. The settings are configured by the installer and the user via the Wi-Fi control panel or the Intergas app.
2. High-quality, efficient compressor.
3. Working range of -15°C to +25°C.

4.1 General principle



1. Components marked with an (*) are offered as optional accessories; see **§3.2**.
2. Components marked with an (+) are mandatory items which can be found in accessories; see **§3.2**.
3. The indoor unit can be installed to either the right or left of the boiler.

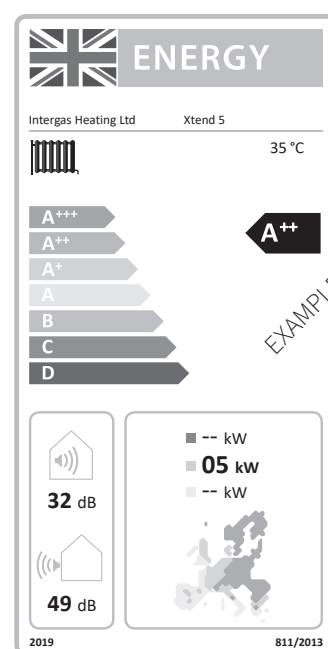
4.2 Energy label Xtend hybrid heat pump system

In accordance with European ErP Directive (Energy-related Products), all new hybrid heat pump room heaters must meet minimum energy performance requirements.

There is an European energy label on the Xtend hybrid heat pump system that contains specific information about the energy efficiency class (of the CH), its noise level and capacity.

The Xtend hybrid heat pump system has an A⁺⁺ label for low temperature (35°C).

The comprehensive product sheet can be found in **§14**.



5 SPECIFICATIONS

5.1 Indoor unit

Technical information	Unit	Xtend-HB-CUSP05
Operating temperature range	°C	+7 °C to +40 °C
Water in heating mode	°C	+7 °C to +70 °C
Maximum flow volume	l/min	30
Dimensions (H x W x D)	mm	557 x 163.5 x 275
Weight	kg	10 (empty weight)
Protection category		IPX1

5.2 Outdoor unit

Technical information	Unit	Xtend-HB-AWHPSP05
Operating temperature range (heating)	°C	-15 °C to +25 °C
Dimensions (H x W x D)	mm	689 x 968 x 367
Weight (net)	kg	43
Protection category		IPX4

5.3 Common specifications

Technical information	Unit	Value
Connection voltage/Frequency	VAC/Hz	230/50
Maximum electrical power consumption	kW	1.8
Maximum amperage	A	7.8
Refrigerant type		R32
Refrigerant GWP/CO ₂ equivalent		675/0.574
Refrigerant fill level weight	kg	0.85

5.3.1 Heating mode: L7/W35 measured in accordance with EN 14511-2

Technical information	Unit	Value
Nominal heat output	kW	5.04
Coefficient of Performance (COP)		4.68
Electrical power consumption	kWe	1.08
Nominal water flow rate ($\Delta T = 5K$)	m ³ /h	0.89

5.3.2 Heating mode: L2/W35 measured in accordance with EN 14511-2

Technical information	Unit	Value
Nominal heat output	kW	3.31
Coefficient of Performance (COP)		3.00
Electrical power consumption	kWe	1.10

5.3.3 Heating mode: L7/W45 measured in accordance with EN 14511-2

Technical information	Unit	Value
Nominal heat output	kW	5.01
Coefficient of Performance (COP)		3.56
Electrical power consumption	kWe	1.41

5.3.4 Technical parameters in accordance with EN 14825

Technical information	Symbol	Unit	Value
Supplier			Intergas Heating Ltd Unit 2 Easter Park Worcester Road Kidderminster DY11 7AR
Model			Xtend 5
Air-water heat pump			Yes
Water-water heat pump			No
Brine-water heat pump			No
Low-temperature heat pump			Yes
Equipped with an additional heating unit			Yes
Heat pump combination			No
Nominal heat output (*)	<i>Prated</i>	kW	5
Declared heating capacity for part load, at an indoor temperature of 20 °C and outdoor temperature T_j			
$T_j = -7\text{ °C}$	<i>Pdh</i>	kW	3.1
$T_j = +2\text{ °C}$	<i>Pdh</i>	kW	2.6
$T_j = +7\text{ °C}$	<i>Pdh</i>	kW	2.0

$T_j = +12\text{ °C}$	P_{dh}	kW	2.4
$T_j = \text{bivalent temperature}$	P_{dh}	kW	3.3
$T_j = \text{extreme operating temperature}$	P_{dh}	kW	3.0
Bivalent temperature	T_{biv}	°C	-2

Technical information	Symbol	Unit	Value
Cycling interval capacity for heating	P_{cyc}	kW	n/a
Loss coefficient (**)	C_{dh}	°C	0.9
Seasonally dependent energy efficiency for space heating	η_s	%	160
Declared Coefficient of Performance (COP) for part load, at an indoor temperature of 20 °C and outdoor temperature T_j			
$T_j = -7\text{ °C}$	COP_d	-	2.69
$T_j = +2\text{ °C}$	COP_d	-	3.45
$T_j = +7\text{ °C}$	COP_d	-	6.66
$T_j = +12\text{ °C}$	COP_d	-	8.96
$T_j = \text{bivalent temperature}$	COP_d	-	3.09
$T_j = \text{extreme outdoor temperature}$	COP_d	-	2.53
Cycling interval efficiency	COP_{cyc}	-	n/a
Extreme operating temperature for air-water heat pumps	TOL	°C	-10
Extreme operating temperature of water for heating	$WTOL$	°C	45
Energy consumption in statuses other than active mode			
Off mode	P_{OFF}	kW	0.011
Thermostat off mode	P_{TO}	kW	0.011
Stand-by mode	P_{SB}	kW	0.011
Crankcase heater mode	P_{CK}	kW	0.000
Other items			
Output control			Variable
Sound output level (indoor/outdoor)	LWA	dB(A)	32/49
Annual energy consumption	Q_{HE}	kWh	2438
Nominal airflow (outdoor)		m ³ /h	1783

(*) For space heating devices with a heat pump and combination heating devices with a heat pump, the nominal P_{rated} heat output is equal to the design load for heating $P_{designh}$, and the nominal heat output of an additional heating device P_{sup} is equal to the additional heating capacity $sup(T_j)$.

(**) If C_{dh} is not determined via measurement, the standard loss coefficient $C_{dh} = 0.9$

6 INDOOR UNIT

The indoor unit is designed for installation within the property and must not be subjected to external elements, it must be connected to an ErP classified combination boiler, also situated internally.

The indoor unit is the heart of the hybrid heat pump system. It acts as a distribution station, connecting and controlling the outdoor unit and the combination boiler during a heating demand.

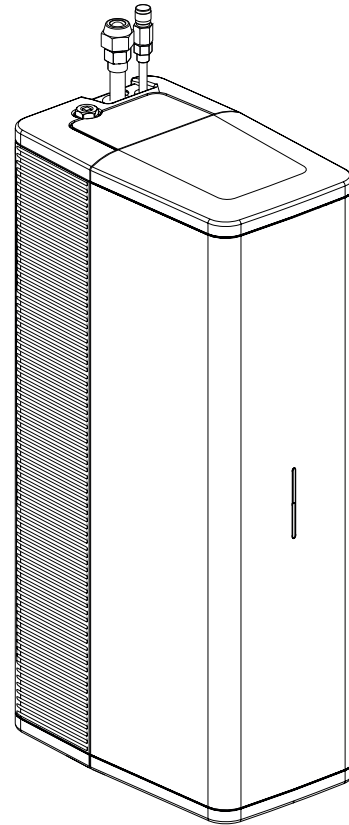
The indoor unit complies with electrical protection class IPX1.

6.1 Function

The indoor unit is the distribution and control station for the entire hybrid heat pump system. This means that all of the controls in the system run through this device. The indoor unit is equipped with an electronically modulating circulation pump, a plate heat exchanger and the control unit.

In conjunction with the outdoor unit (and if necessary the combination boiler, the indoor unit ensures that the desired heating water temperature can be achieved.

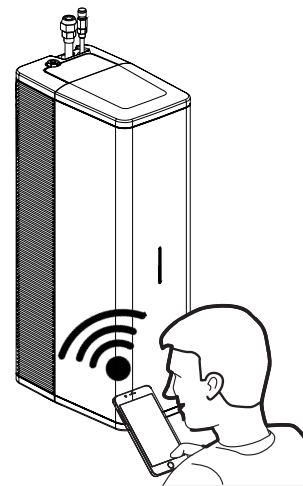
During extremely low outdoor temperatures if the indoor unit cannot achieve sufficient output to satisfy the heating demand, the combination boiler will receive a signal from the indoor unit and start generating additional heat to reach the desired water temperature.



6.2 Operation

The indoor unit is equipped with a multicolour LED strip and a control button. The LED lighting indicates the status of the system using different colours; see **§10.1**.

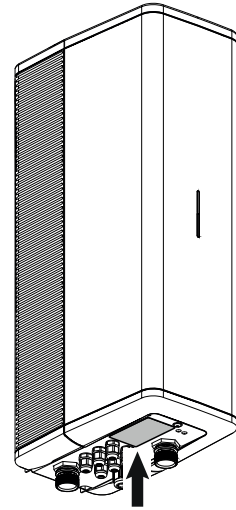
One of the control button functions is to establish a Wi-Fi connection, to link a smartphone or tablet to the device. This allows you to track the behaviour of the hybrid heat pump system. This control screen also provides access to various functions, malfunction information and user history; see **§10.2** and **§10.3**.









6.3 Rating plate indoor unit

The rating plate is located on the underside of the appliance and includes the following information:

- ▶ Product type
- ▶ Serial number
- ▶ QR-code
- ▶ Electrical mains supply
- ▶ Electrical power
- ▶ Electrical current
- ▶ IP Rating
- ▶ Operating pressure
- ▶ Weight



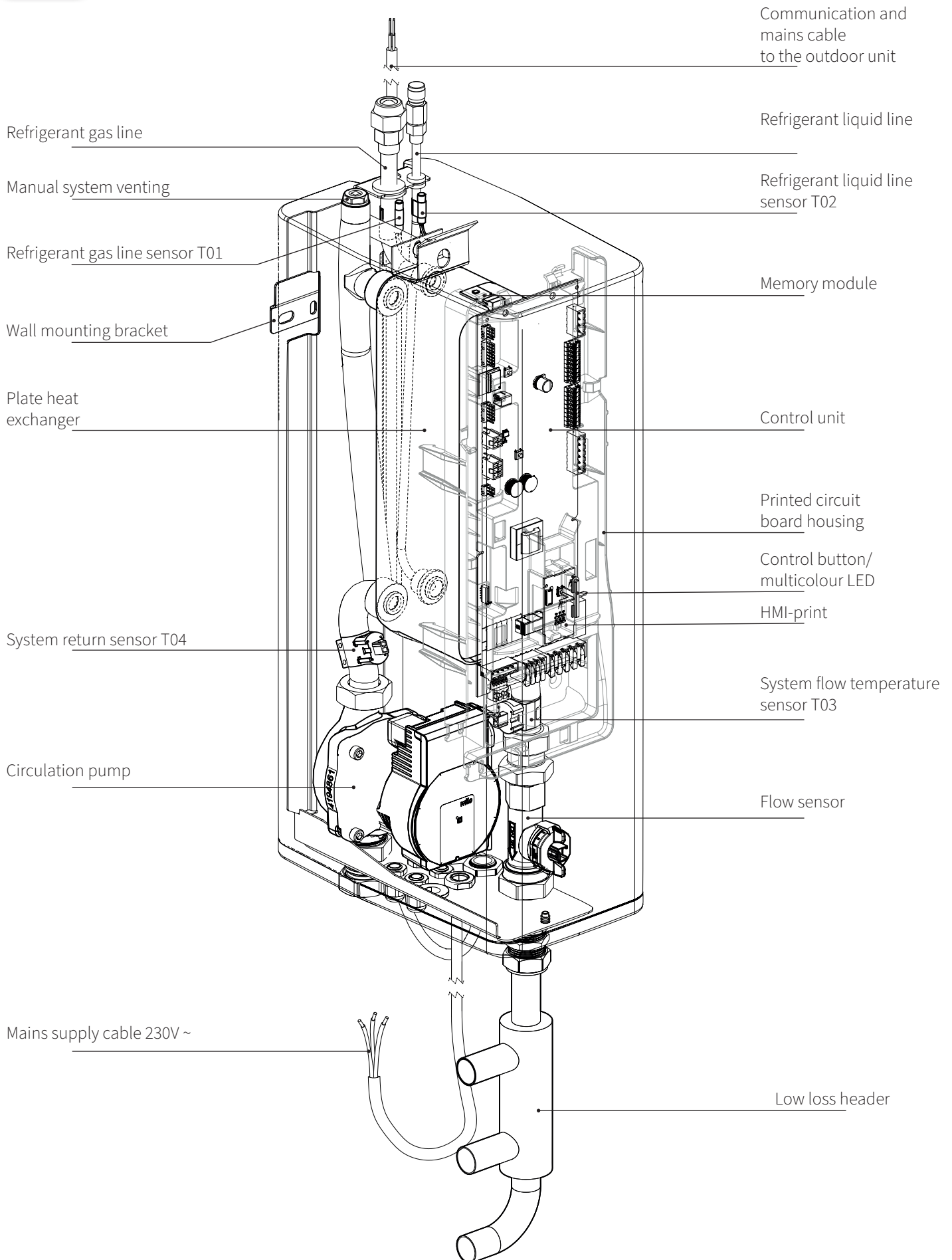
The serial number will be displayed in 2 sections separated by (-).
The first part is the country code or part number, made up of 6 digits.
The second part is the unique serial number, made up of 10 digits.

Air-to-water heat pump	XXXXXXXX-XXXXXXXXXX	20xx	
Xtend-HB-CUSP05			EXAMPLE
Power supply / frequency		230V~ / 50Hz	
Maximum input power		1,8 kW	
Maximum input current		7,8 A	
Protection rating		IPX1	
Maximum allowable water pressure		3 bar	
Netto weight		10 kg	
Intergas Heating Ltd. Unit 2, Easter Park Worcester Road Kidderminster, DY11 7AR	  	 	Made in the Netherlands

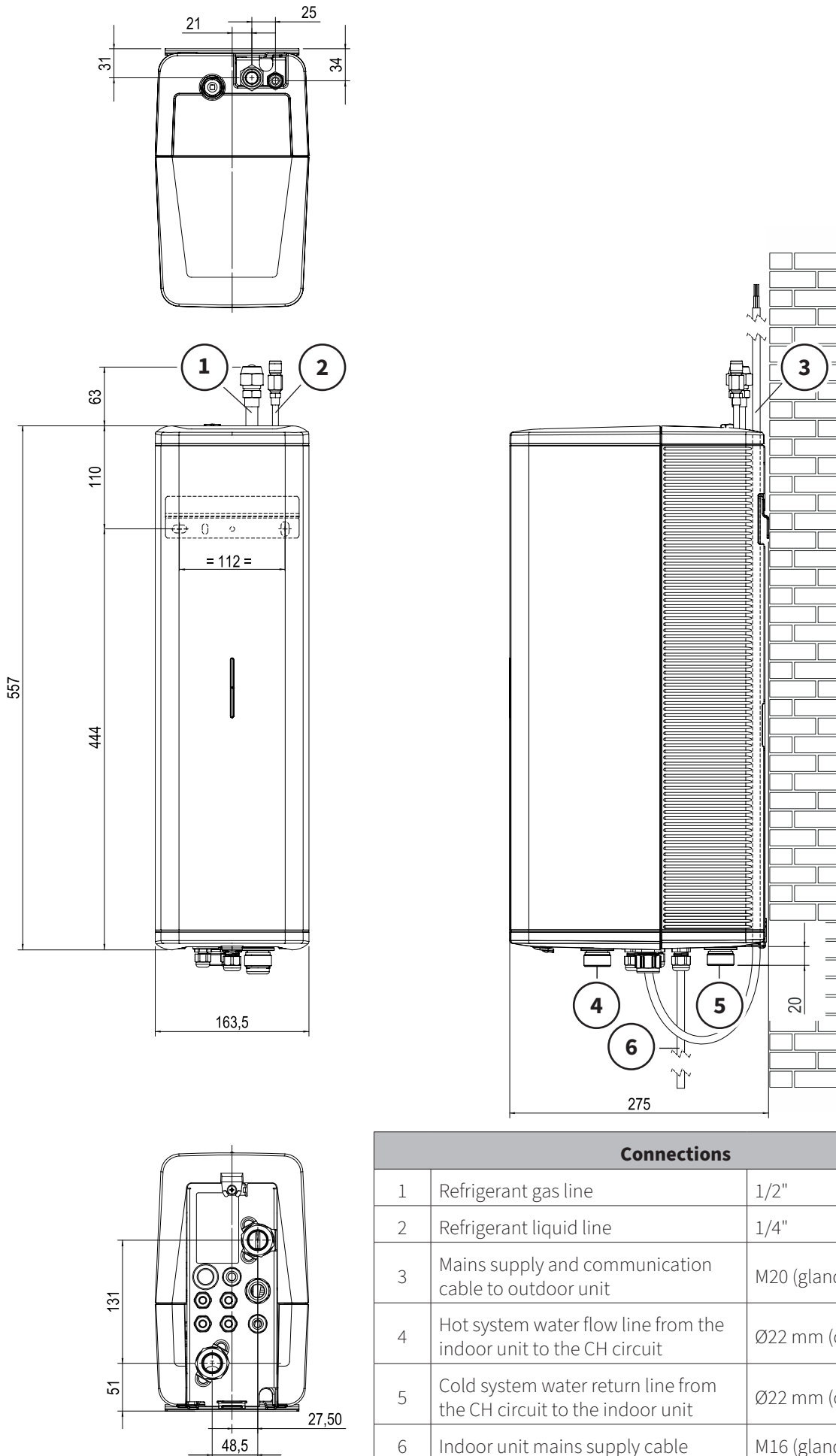
6.4 Main components indoor unit



► The view below shows the interior of the indoor unit without its usual insulation.



6.5 Dimensions and connections of the indoor unit



Connections		
1	Refrigerant gas line	1/2"
2	Refrigerant liquid line	1/4"
3	Mains supply and communication cable to outdoor unit	M20 (gland)
4	Hot system water flow line from the indoor unit to the CH circuit	Ø22 mm (compression)
5	Cold system water return line from the CH circuit to the indoor unit	Ø22 mm (compression)
6	Indoor unit mains supply cable	M16 (gland)

7 OUTDOOR UNIT

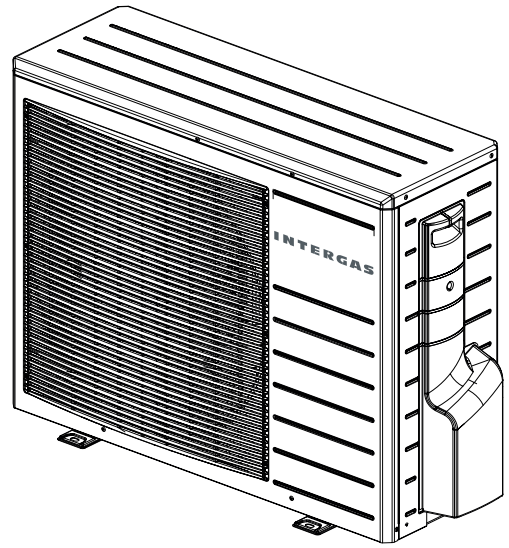
7.1 Function

The outdoor unit is designed for installation outside of the property and must be connected to and used in conjunction with the indoor unit detailed in **§6.0**

The outdoor unit complies with electrical protection class IPX4.

The outdoor unit extracts energy from the external air and transfers it to the indoor unit.

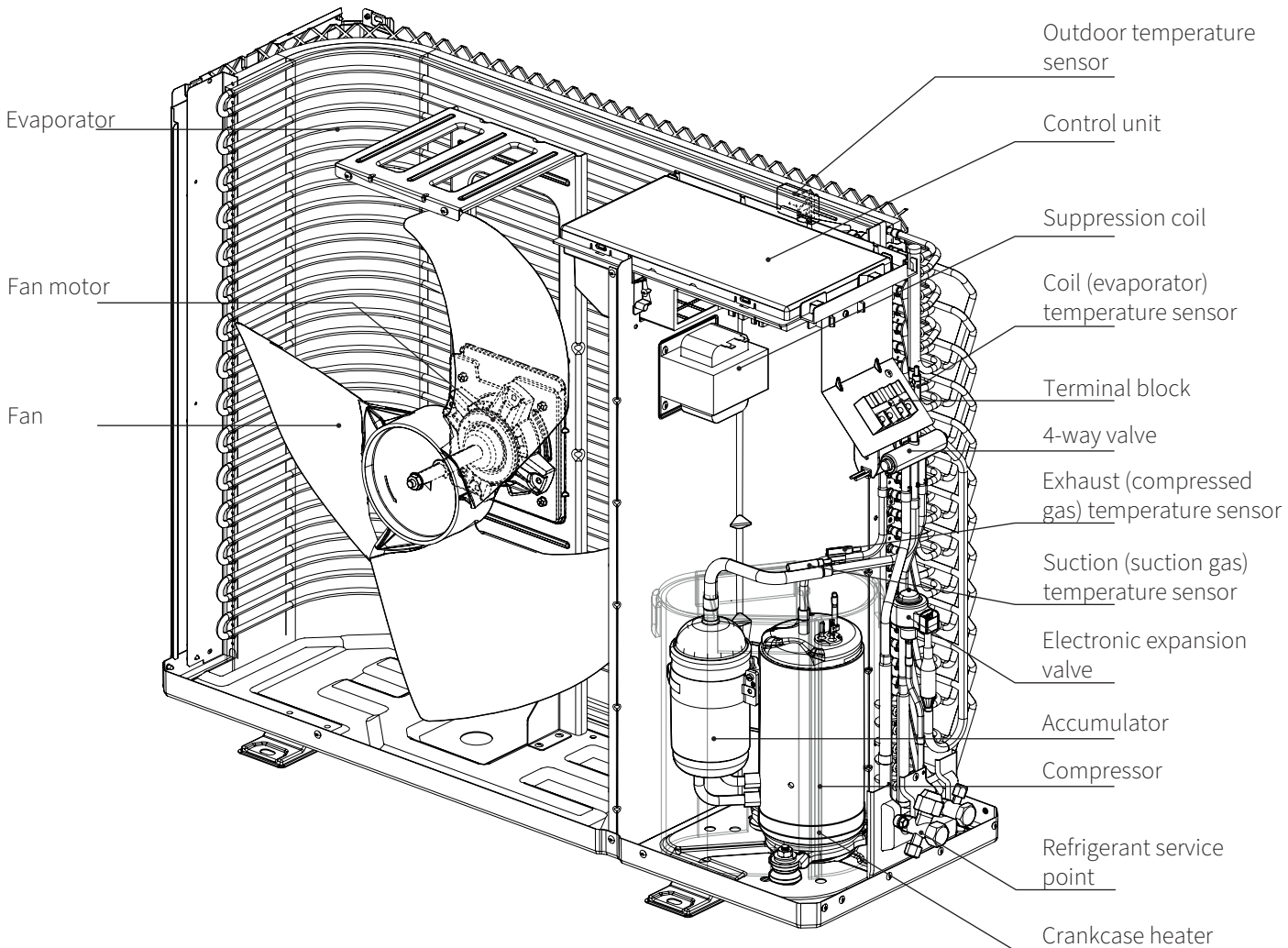
The compressor speed varies to ensure that the correct amount of energy is delivered. The fan is also speed controlled, modulating its speed to meet the heating demand. This ensures the energy consumption is as low as possible for maximum efficiency.



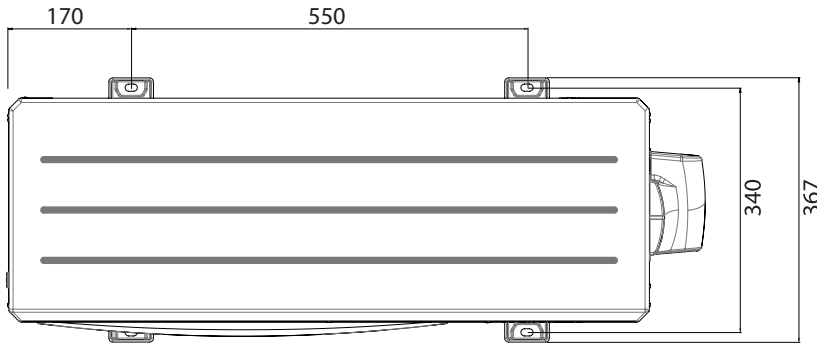
7.2 Main components outdoor unit



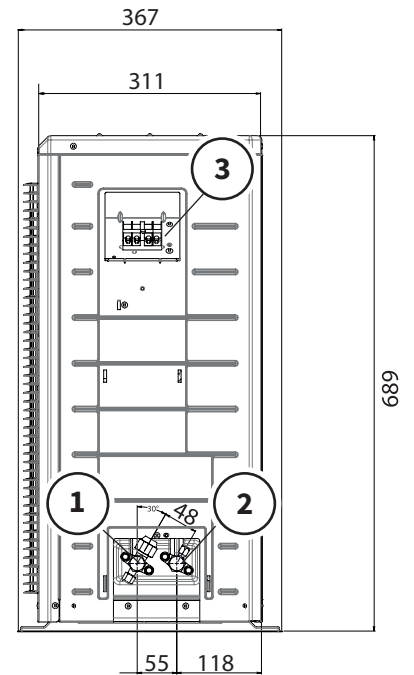
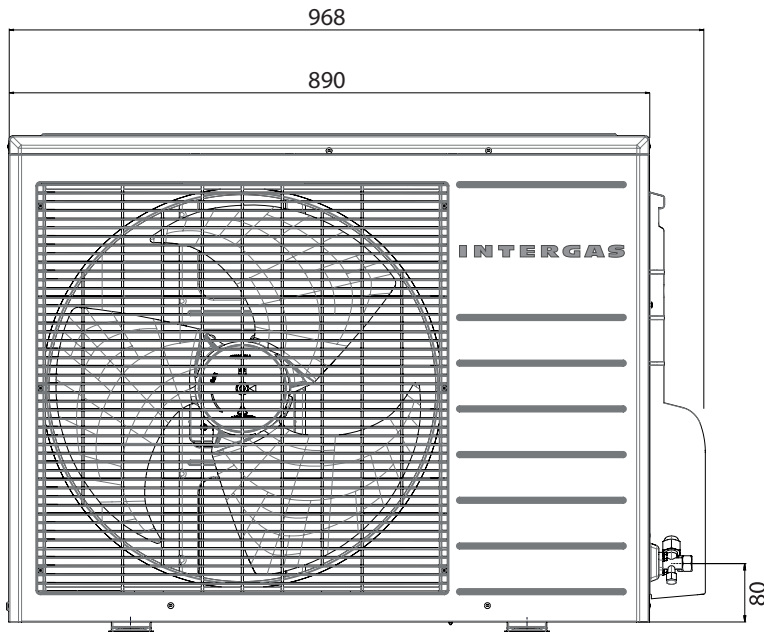
► The view below shows the interior of the outdoor unit without the casing.



7.3 Dimensions and connections outdoor unit



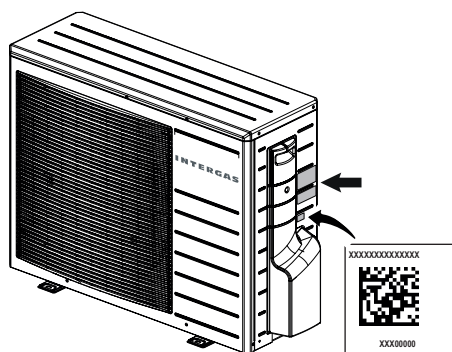
Connections		
1	Refrigerant gas line	1/2"
2	Refrigerant liquid line	1/4"
3	Mains supply and switched line connection (from the indoor unit)	N, L, 3, ⊕



7.4 Rating plate outdoor unit

The rating plate is located on the right side of the unit and includes the following information:

- ▶ Product type
- ▶ Operating pressure
- ▶ Refrigerant type
- ▶ Refrigerant quantity
- ▶ Electrical mains supply
- ▶ Electrical power
- ▶ IP Rating
- ▶ Weight



Air-to-water heat pump
Xtend-HB-AWHPSP05 xxxxxxx-xxxxxxxxx 20xx

Power supply/frequency **230V~ / 50Hz**
 Maximum input power **1,8 kW**
 Maximum input current **7,8 A**
 Protection rating **IPX4**
 Refrigerant type **R32**
 Refrigerant GWP / CO2 equivalent **675 / 0,574**
 Refrigerant charge **0,85 kg**
 Maximum allowable pressure (H/L) **4,2 MPa**
 Net weight **43 kg**

EXAMPLE

Icons: Manual, Information, Wrench, CE, No Flame

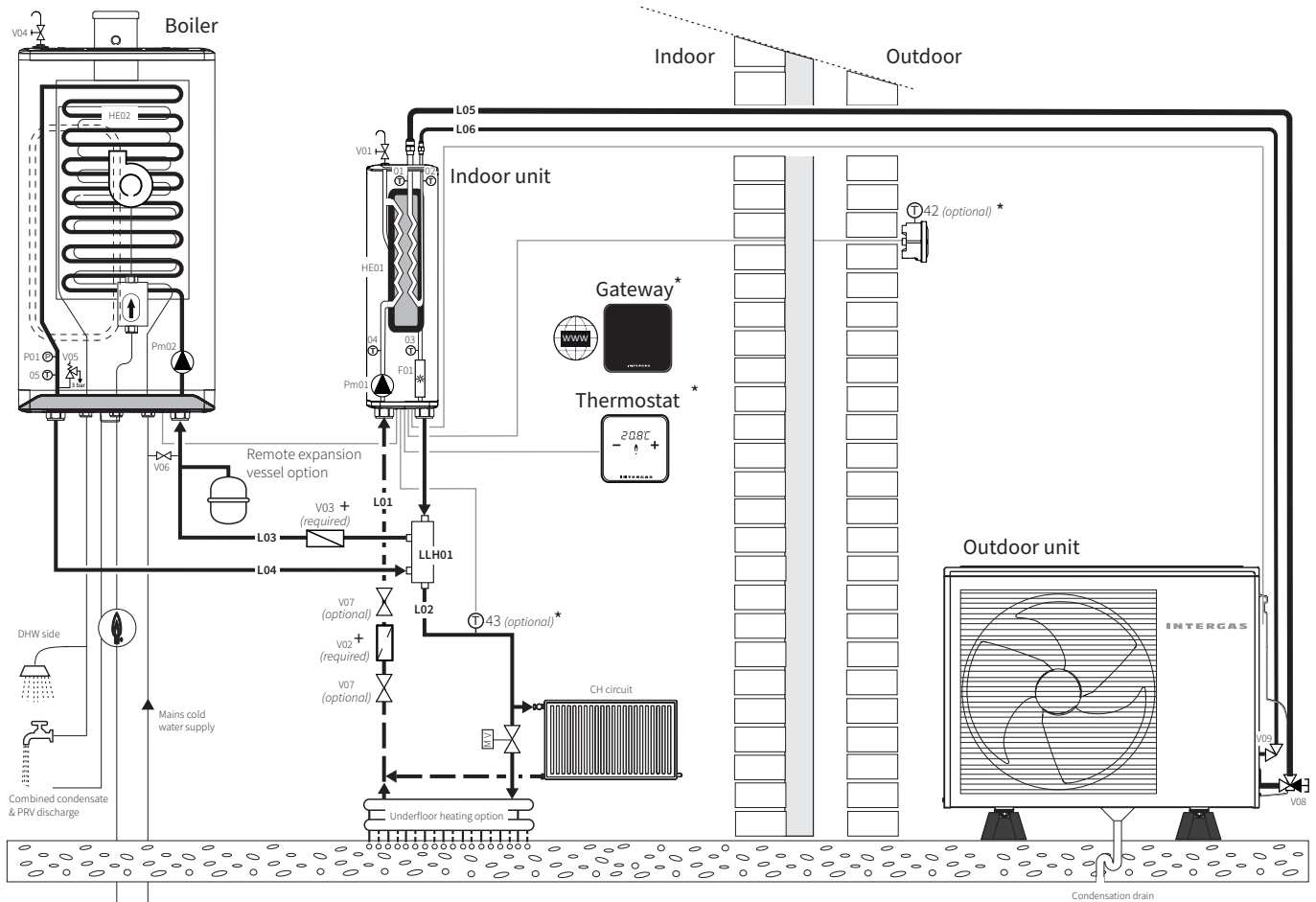
	A7/W35	A7/W45	A2/W35
Capacity [kW]	5,04	5,01	3,31
Current [A]	4,7	6,1	4,8
Power input [kW]	1,08	1,41	1,10
COP	4,68	3,56	3,00

Test conditions according to EN 14511-2:2018

Made in India
 Contains Fluorinated greenhouse gases covered by the Kyoto protocol.
 Hermetically sealed refrigerant System.

8 SYSTEM INSTALLATION

8.1 Installation overview



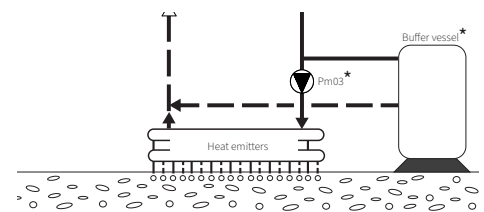
1. Components marked with an (*) are offered as optional accessories; see **§3.2**.
2. Components marked with an (+) are mandatory items which can be found in accessories; see **§3.2**.

The system must have a minimum volume of heating water. The standard flow is 15 l/min. It is advisable to install a central heating buffer tank to comply with the minimum flow, to prevent the outdoor unit from switching on and off too often and to ensure that there is sufficient energy to complete the defrost cycle of the outdoor unit when required. Below are two possible installation options:

Buffer tank (install parallel)

When using a buffer tank:

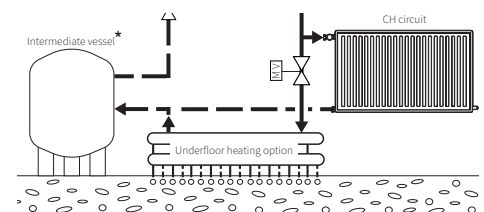
- ▶ Has a minimum capacity of 40 litres.
- ▶ Install a CH-pump after the separation from the buffer tank, see option A. (Connect the wiring to connector **X13** (contacts 4 and 5) on the indoor unit and set parameter **P068** to "10". Also see **§8.8.10**)



Option A

Intermediate vessel (install in series)

It is advisable to install an insulated intermediate vessel with a minimum volume of 20 litres, see option B.



Option B

Lines		
Tag	Description	Notes (minimum diameters)
L01	Cold system water return line from the CH circuit to the indoor unit	Ø22 mm (compression)
L02	Hot system water flow line from the indoor unit to the CH circuit	Ø22 mm (compression)
L03	Low loss header return line to the boiler	Ø22 mm (compression)
L04	Boiler flow line to the low loss header	Ø22 mm (compression)
L05	Refrigerant line (gas)	1/2 inch, flared joint union (must be insulated)
L06	Refrigerant line (liquid)	1/4 inch, flared joint union (must be insulated)

Fittings - Instrumentation		
Tag	Description	Signal
T01	NTC (clip-on 1/2")	T (°C) Refrigerant line (gas)
T02	NTC (clip-on 1/4")	T (°C) Refrigerant line (liquid)
T03	NTC (clip-on 22mm)	T (°C) Indoor unit flow
T04	NTC (clip-on 22mm)	T (°C) Indoor unit return
T05	NTC (clip-on 22mm S1 flow integral to boiler)	T (°C) Boiler heating flow to low loss header
T42	Outdoor sensor and housing (<i>optional</i>)	T (°C) outdoor
T43	Remote flow temperature sensor (<i>optional</i>)	T (°C) Heating system flow
P01	System pressure sensor (integral to boiler)	

Fittings - Process		
Tag	Description	Notes
LLH01	Open distributor (Low loss header)	
V01	Venting	Manual air vent top left of the indoor unit
V02	System filter (<i>required</i>)	Positioned in the CH system return line to the indoor unit
V03	Non return valve (<i>required</i>)	Positioned in the boiler return line (L03) from the low loss header to the boiler. Ensure no non-return valve has already been installed (i.e. to prevent thermo-syphoning).
V04	Venting	Manual venting top left of the boiler
V05	Pressure relief valve	Built into the boiler, the discharge pipework must be routed and terminated as stated within the installation manual or BS 6798
V06	Filling valve connection	For filling the system / CH water
V07	Full-flow ball type isolation valve (<i>optional</i>)	To assist when cleaning or flushing the system filter
V08	Gas line isolation valve 1/2" flared joint union (service connection point)	Service point for refrigerant actions
V09	Liquid line isolation valve 1/4" flared joint union	
Pm01	Indoor unit CH pump ErP modulating	Primary pump for the CH system installation
Pm02	Boiler CH pump ErP modulating	Secondary pump for the CH system installation
Pm03	External pump for a buffer vessel (<i>optional</i>)	
HE01	Indoor unit plate heat exchanger	
HE02	Boiler heat exchanger	

8.2 Distance between the indoor and outdoor units



NOTES

- ▶ **Observe the recommended connection lengths between the indoor and outdoor units in order to ensure the system functions correctly.**

A Minimum/maximum length of refrigerant lines

B Maximum height difference between horizontal lines.

C Maximum number of 90° bends, this applies to the entire pipework (including oil syphon) and not per pipe.

A	B	C
3 to 25 m	10 m	x 10

Oil return measures

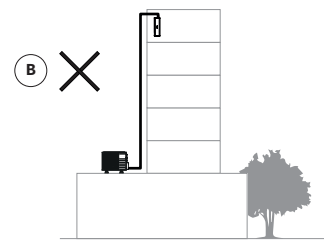
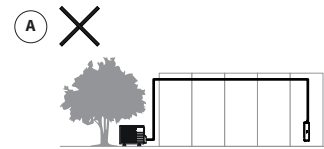
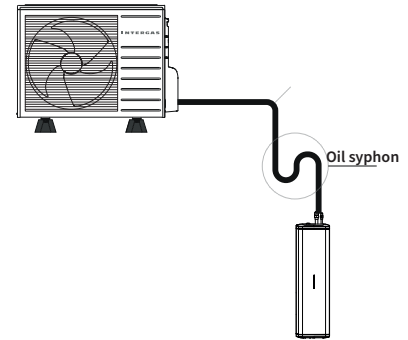
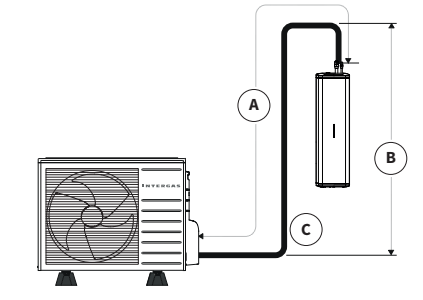
Use an S-shaped oil syphon in the gas pipe to the outdoor unit if it is more than 5 meters higher than the indoor unit, see the adjacent illustration.

Avoid long, complicated routes between the indoor unit and outdoor unit, see the adjacent illustration.

A Too long

B Too high

C Too many bends



8.3 Installing the indoor unit

8.3.1 Installation location

The indoor unit must be mounted level on a wall with sufficient load-bearing capacity to support the appliance when it is filled with water.

If the wall construction is not solid i.e. brick or block, the sound of the unit may resonate.

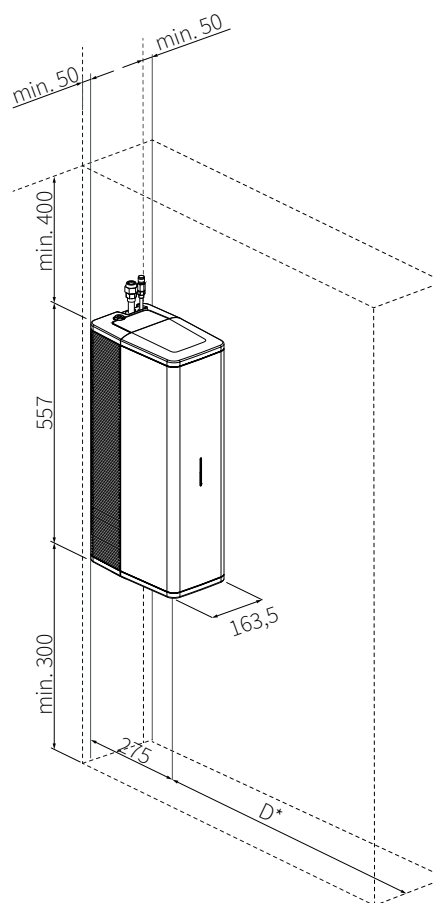
A switched fused spur must be located within 2 metres of the device.

The indoor unit should be placed near the boiler. Take this into account when planning the installation and pipework.

To prevent the indoor unit from freezing, it must be installed in a frost-free environment this would include any loft spaces etc.

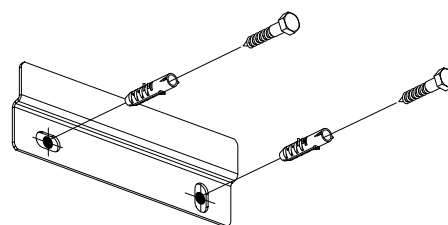
Ensure that the indoor unit is easily accessible by maintaining the adjacent minimum clearances.

Further dimensions	
D*	600 mm
	*5mm clearance from a closing door 600mm for servicing clearances

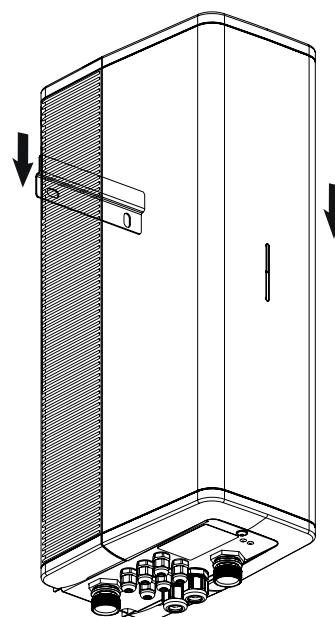


8.3.2 Mounting the indoor unit

1. Secure the mounting bracket to the wall horizontally using appropriate fastening equipment (not included). Please ensure it is level.
2. Lift the indoor unit over the mounting bracket and slide it down, ensuring it is correctly located.



1. Mount the wall bracket

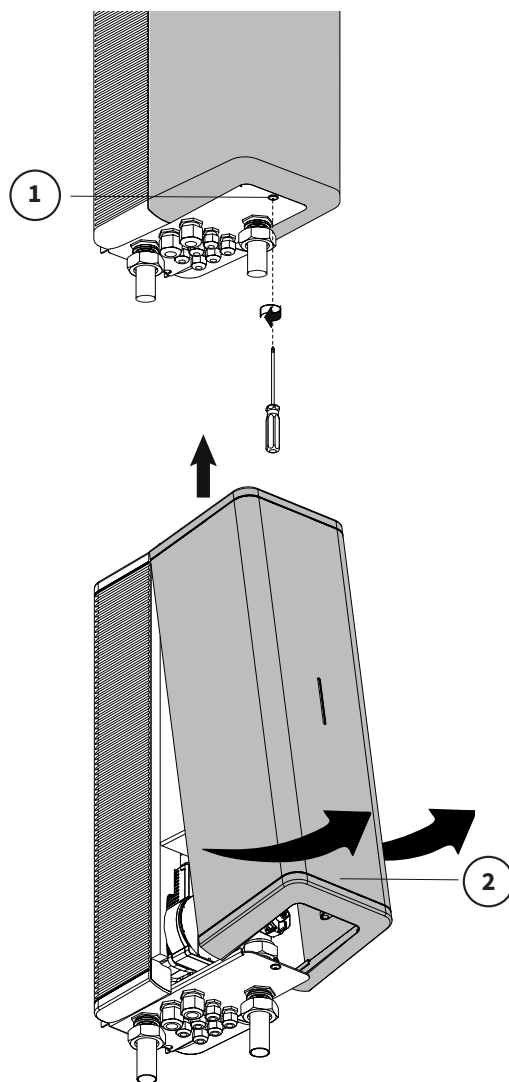


2. Installing the indoor unit

8.3.3 Removing and replacing the front cover

Before carrying out various types of work on the appliance, the front cover must be removed. The front cover is removed as follows:

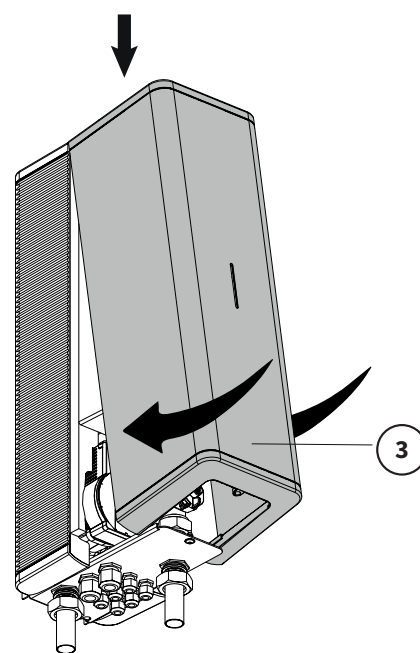
- ▶ Loosen the screw (1) under the device using a Pozi screwdriver.
- ▶ Gently pull the front cover (2) forwards at the bottom, and then slide upwards.



Replacing the front cover

The front cover is replaced as follows:

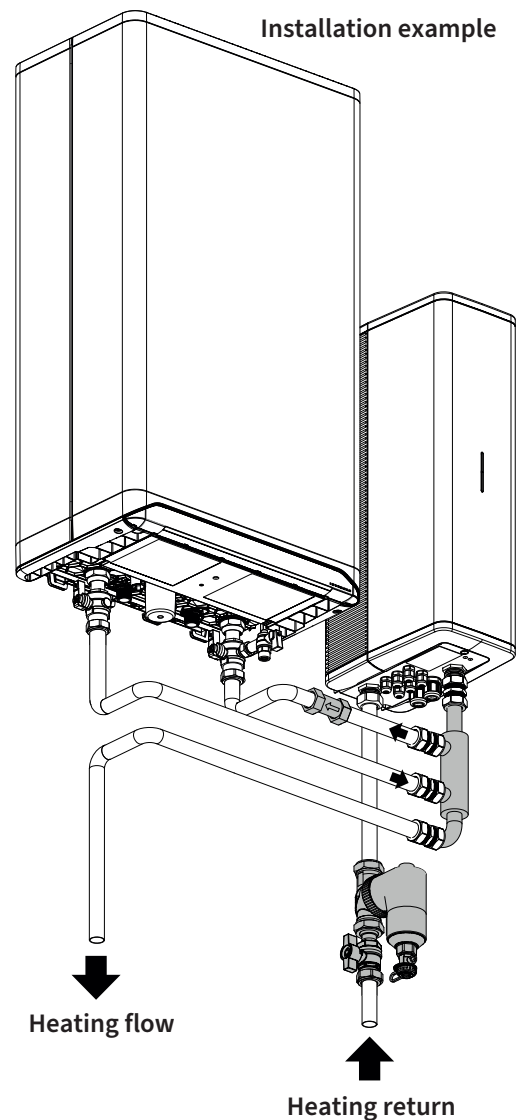
- ▶ Return the front cover (3) to its original position by lowering onto the top of the indoor unit and then gently pushing the bottom backwards until it locates correctly.
- ▶ Tighten the screw under the device using a Pozi type screwdriver.





NOTES

- ▶ For a complete overview of the system, see §8.1.
- ▶ Connect the indoor unit to an ErP compliant boiler.
- ▶ Open vent conversions are not suitable for connecting to the Xtend.
- ▶ The indoor unit, outdoor unit and existing boiler must be positioned as close together as possible.
- ▶ The pipework distance between the indoor unit and the boiler must be kept as short as possible.
- ▶ The pipework must be drained down before installation to prevent spillages and damage to the surroundings.
- ▶ There must be a 400 µm filter installed in the return heating line to the indoor unit, the Intergas system filter is preferred.
- ▶ Install shut-off valves between the indoor unit and the heating circuit in order to allow for maintenance work and other interventions.
- ▶ Install a full flow non-return valve in the return pipe to the boiler.
- ▶ The entire system must be equipped with an expansion vessel. (Some boiler models incorporate a vessel, however the capacity should be checked against the system volume)
- ▶ The boiler incorporates a suitable 3bar PRV.

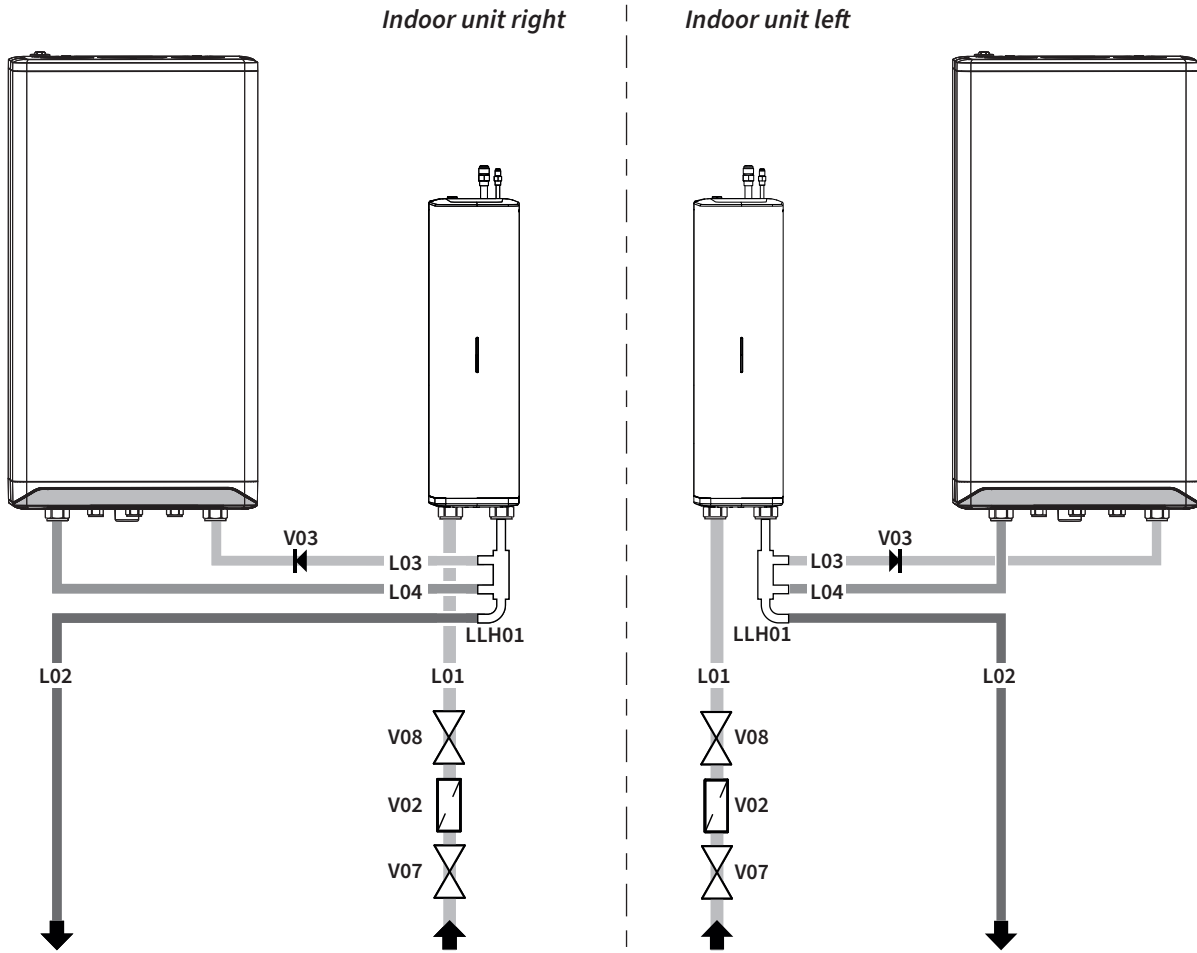


8.4.1 Connecting the indoor unit and the boiler using the low loss header



NOTES

- The indoor unit should be installed as close as possible to the boiler. Below are two installation examples.



1. Drain the heating system to eliminate spillages and damages.
2. Determine the position of the pipework and connections.
3. Connect the return pipe CH-water (L01) to the indoor unit using the supplied Ø22mm compression connection and install the Intergas system filter (V02) incl. spigot isolation valve (V07).
4. If required, install an additional isolation valve (V08) in the pipework above the filter to enable maintenance work (optional).
5. Install the low loss header (LLH01) vertically under the indoor unit using the supplied compression connector.
6. Install the return pipework (L03) from the upper side connection of the low loss header to the boiler, which must include a full flow non-return valve (V03).



IMPORTANT

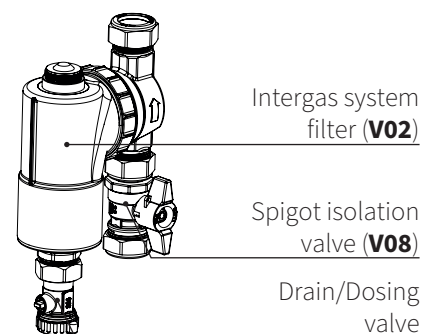
- Ensure the full flow non-return valve (V03) is in the correct directional flow.

7. Install the flow pipework (L04) from the lower side connection of the low loss header to the boiler.
8. Connect the central heating pipework (L02) from the bottom connection of the low loss header to the heating system flow.
9. Fill the system, check the pipework and the connections for leaks.

The following set is available:

- Filter set; art. no. **090897**

Key	Description
L01	Return pipe CH-water
L02	Flow pipe CH-water
L03	Return pipe Boiler
L04	Flow pipe Boiler
V02	System filter (required)
V03	Full flow non-return valve (required)
V07	Isolation valve (required)
V08	Isolation valve (optional)
LLH01	Low loss header



8.5 Setting up the outdoor unit

8.5.1 Points of attention for location

- ▶ The outdoor unit must be installed outdoors and on a permanent load bearing surface that is suitable for the weight of the unit.
- ▶ The unit must be mounted on anti-vibration feet (sold separately).
- ▶ The unit location must be away from any external sources of heat radiation or open flames.
- ▶ If possible place the outdoor unit in a shady location away from direct sunlight.
- ▶ There must not be any obstacles/barriers in front of or near the inlet and outlet side of the unit.
- ▶ Adverse weather conditions such as high wind, rain, snow or even fallen leaves can effect the efficiency or operation of the outdoor unit, so care should be taken when siting it, open areas should be avoided if at all possible.
- ▶ During defrost mode it must be possible to drain condensate water away from the unit base without it freezing, the water should be piped to a suitable drain or soakaway where it will not present a slip hazard from freezing.
- ▶ When choosing a suitable location for the outdoor unit please ensure that there is sufficient clearance around the unit housing; see **§8.5.3**. When doing so please ensure that there is clear access to complete the installation and also any further maintenance work ⁽¹⁾.
- ▶ The side panel and any removed covers must be correctly reinstalled after the work has been completed. Incorrect replacement can result in ingress from rain, spray water, vermin etc. which can lead to faults or irreparable damage to the outdoor unit.

8.5.2 Transport



IMPORTANT

- ▶ **Do not touch the outdoor evaporator fins with fingers, hands or objects. This may damage the exchanger and/or cause injury.**

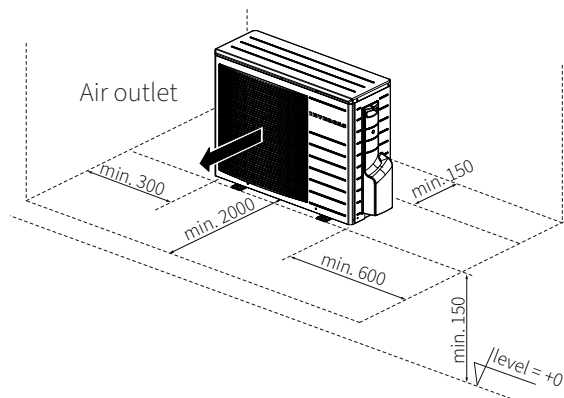
Leave the transportation packaging around the outdoor unit in place for as long as possible to prevent external damage. If it is necessary to hoist the unit, this must be done before the transportation packaging is removed. An approved hoisting strap suitable for the weight to be lifted is required for hoisting. To prevent damage, soft protective material must be placed between the straps and the corners of the outdoor unit. A hook cannot be used for hoisting the indoor unit.

Please note: the gross weight of the outdoor unit is 46 kg.

¹ Intergas Heating Ltd are not responsible for damage caused by non-compliance with the safety requirements and may decline to perform any maintenance or warranty work if there is a Health & Safety risk.

8.5.3 Installing the outdoor unit

- ▶ Provide sufficient space around the outdoor unit for maintenance and repair work to be carried out safely.
- ▶ Ensure that the distance between ground level and the underside of the outdoor unit is at least 150 mm, to prevent the unit from sucking in splash water, snow drifts or street dirt.
- ▶ There should be no less than 150 mm of free space from the back of the outdoor unit.

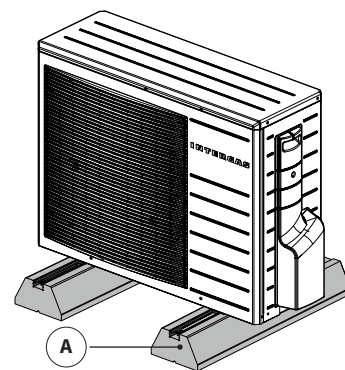


- ▶ For noise reduction purposes, the outdoor unit must be level and placed on suitable anti vibration footrests (A).
- ▶ Preferably place the outdoor unit on a gravel bed, equipped with an soakaway pit for draining off condensation water. The condensation drain hose or pipework must be insulated with a UV tolerant pipe lagging to prevent freezing.



IMPORTANT

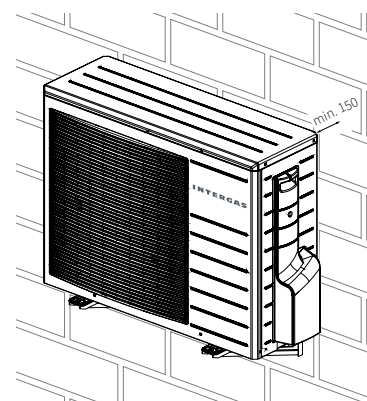
- ▶ **Placing the outdoor unit on a solid base or flat roof can lead to its underside or the outlet side of the fan freezing, especially during the winter months.**
- ▶ **If the outdoor unit is mounted on a flat roof, we recommend using longer anti vibration footrests to prevent it from blowing over.**



On a wall

If the outdoor unit is being secured to the facade, do the following:

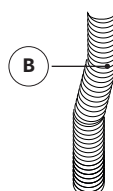
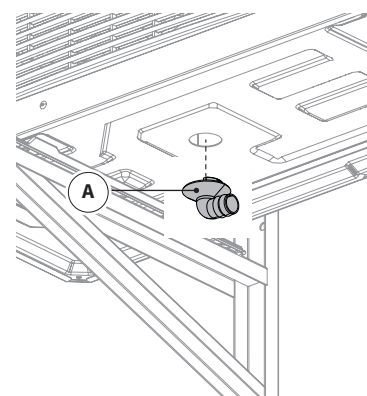
- ▶ Make sure that the wall is sturdy enough to bear the weight of the outdoor unit.
- ▶ Choose a wall with enough mass to dampen any vibrations.
- ▶ Ensure that the outdoor unit is easily and safely accessible for maintenance work, if base is above 1000 mm then a purpose made permanent platform must be present.
- ▶ Make sure that there is enough space around the outdoor unit, so that it can move air without any restrictions. There should be no less than 150 mm of free space from the back of the outdoor unit.
- ▶ Condensation water must drain correctly, use the supplied drain connection elbow (A) and flexible hose (B) to help facilitate the connection to a soakaway or drain.



Connecting the drain plug:

1. Clip the drain plug into the opening at the bottom of the outdoor unit.
2. Connect the flexible drain hose onto the drain plug.

NOTE: If the outdoor unit is placed directly over a gravel bed type soakaway then the drain connection (A) can be omitted allowing the condensate water to drip directly out the housing onto the gravel.



8.6 Refrigerant connections

8.6.1 Points of attention for refrigerant lines



IMPORTANT

- ▶ Refrigerant work can only be performed by a registered F-gas or REFCOM installer.
- ▶ All F-gas actions must be performed according to the F-gases regulation (EU) 517/2014.
- ▶ The outdoor unit is charged with 0.85 kg of R32 refrigerant before leaving the production facility.



IMPORTANT

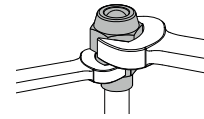
- ▶ Make sure that the refrigerant lines have minimal hydraulic resistance.
- ▶ The distances of the liquid and gas lines running between the outdoor unit and indoor unit must be kept as short as possible (between 3 metres and 25 metres), the external section of the pipework must be kept to a minimum.
- ▶ The inside of the refrigerant lines must not be contaminated. Ensure that the lines have been cleaned before the final connection.
- ▶ The lines must be protected from physical damage using a proprietary pipe cover.
- ▶ Use rubber lined support clamps or spacers to keep the lines from coming into contact with any surfaces.
- ▶ All of the lines must be well insulated with Class 0 rubber or similar quality insulation (pre-insulated coils available).
- ▶ The lines must be accessible for maintenance work.
- ▶ If work using heat sources must be performed, then suitable a hot works permit must be completed and issued prior to commencing. A suitable fire-extinguishing must be on site during these works.
- ▶ No ignition sources are permitted for use near exposed refrigerant gas lines. This poses a risk of fire or explosion.
- ▶ Use the correct tools for cooling connections: connections made incorrectly will have to be remade.
- ▶ Check the cooling connections for leaks with a leak detector whilst pressure testing with Oxygen free Nitrogen. Conduct a second leak test after the system has been filled with refrigerant using a suitable leak detection fluid or calibrated electronic sniffer (R32).

8.6.2 Making refrigerant connections to the indoor unit



IMPORTANT

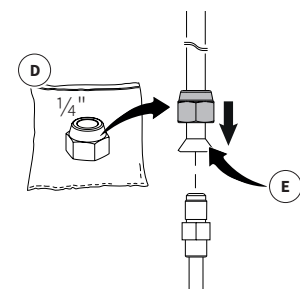
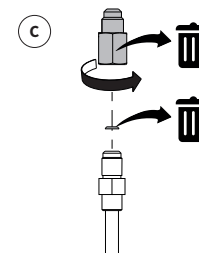
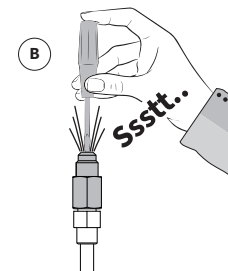
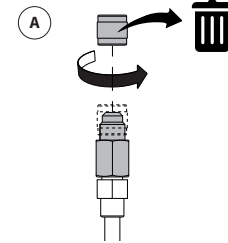
- ▶ Prevent internal connection lines from twisting by using a suitable spanner to secure the refrigerant coupler.



1. Cut the refrigerant lines to the correct length using a pipe cutter (not a hacksaw) then fully deburr the edges.

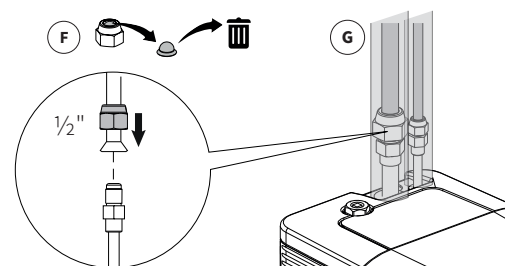
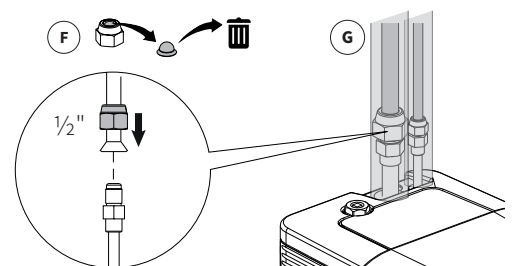
Liquid line (see example):

2. Unscrew and remove the cap from the schrader valve to the 1/4" liquid line 1/4" (A).
3. Check to ensure that the indoor unit is leak tight. Carefully insert a screwdriver or pointed tool into the schrader valve. You should hear a hissing sound when you do this which indicates that the unit is leak tight; see (B). (The unit is pre-charged with Oxygen free Nitrogen which is inert and not a greenhouse gas).
4. Remove the schrader valve and the copper seal ring, then dispose of them responsibly (C).
5. Remove the flare nut for the liquid line from the accessory bag supplied with the unit (D).
6. Place the nut onto the 1/4" liquid line and then flare the end using a proprietary flaring tool (E).
 - ▶ Instead of flaring the line yourself, a flare press-fit or flare solder adapter can be used.
7. Apply a smear of compressor oil or sealing fluid to the surface of the flare adapter to be sealed as this will improve the seal.
8. Connect the liquid line to the indoor unit via the flare connection.
9. Secure the connections by tightening them to the required torque setting.
 - ▶ - 1/4" nut: 14-18 Nm



Gas line:

10. Remove the flare nut from the 1/2" gas line. Save the nut and dispose of the copper sealing ring.
11. Place the nut onto the 1/2" gas line and then flare the end using a proprietary flaring tool (F).
 - ▶ Instead of flaring the line yourself, a flare press-fit or flare solder adapter can be used.
12. Apply a smear of compressor oil or sealing fluid to the surface of the flare adapter to be sealed as this will improve the seal.
13. Connect the gas line to the indoor unit via the flare connection.
14. Secure the connections by tightening them to the required torque setting.
 - ▶ - 1/2" nut: 49-61 Nm

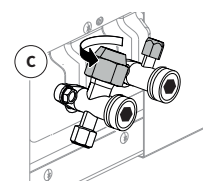
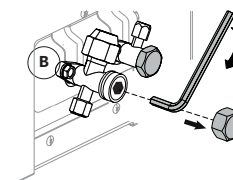
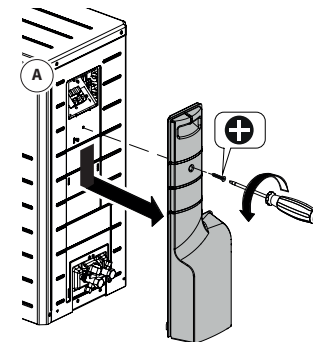


IMPORTANT

- ▶ Place the included insulation material around the lines beforehand so that it can later be pushed down over the refrigerant connectors; see (G) but also §8.6.7.

8.6.3 Making refrigerant connections to the outdoor unit

1. Remove the side panel from the outdoor unit (A).
2. Remove the 19 mm lockshield caps from the service valves and check that they are closed using a 5 mm Allen key (B).
3. Unscrew the ½" and ¼" flare nuts from both service valves (C).
4. Cut the now installed refrigerant lines running from the indoor unit to the desired length using a pipe cutter and deburr them.
5. Place the nuts onto the refrigerant lines and then flare the lines.
 - ▶ Instead of flaring the line yourself, a flare press-fit or flare solder adapter can be used.
6. Apply a smear of compressor oil or sealing fluid to the surface of the flare adapter to be sealed as this will improve the seal.
7. Connect both of the refrigerant lines via the flare connections.
8. Secure the connections by tightening them to the required torque setting.
 - ▶ - ¼" nut: 14-18 Nm
 - ▶ - ½" nut: 49-61 Nm

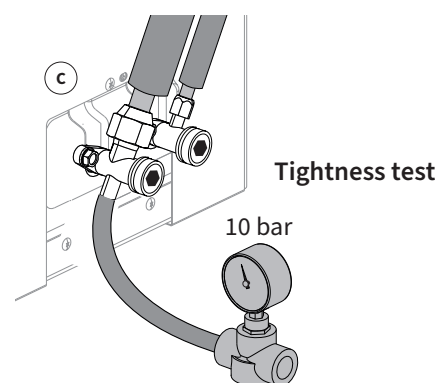
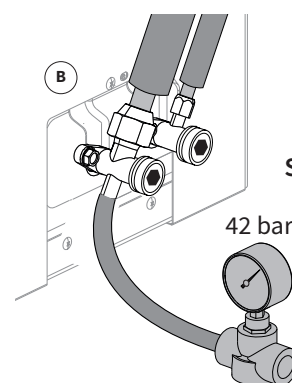
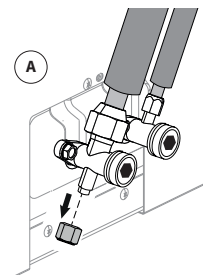


IMPORTANT

- ▶ Prevent internal connection lines from twisting.

8.6.4 Strength test and Tightness testing

1. Using a 5 mm Allen key check that the service valves are fully closed, then remove the 14 mm sealing cap from the Schrader valve on the ½" gas line service valve (A)
2. **Appropriate PPE must be worn at this stage.**
3. Using a certified removal tool remove the schrader valve and keep safe in a dust free environment, then using OFN (Oxygen free Nitrogen) connected via a pressure regulator slowly raise the pressure to 42 bar in increments of 5 bar (B) checking for leaks (listen for hissing sound) or use leak detection fluid that is suitable for use on refrigeration, (repair if required). Hold the pressure for 2 minutes then gently lower the pressure to 10 bar by slowly venting the Nitrogen to a well ventilated area (C).
4. Check that the connections on the indoor and outdoor unit are leak tight.
 - ▶ Check that the pressure on the meter set is not going down
 - ▶ Use leak-detecting spray that is suitable for hydrocarbon gases.
 - ▶ Any leaks must be repaired and re-tested before continuing.
5. Once complete and tightness proved slowly release the nitrogen to a well ventilated area.

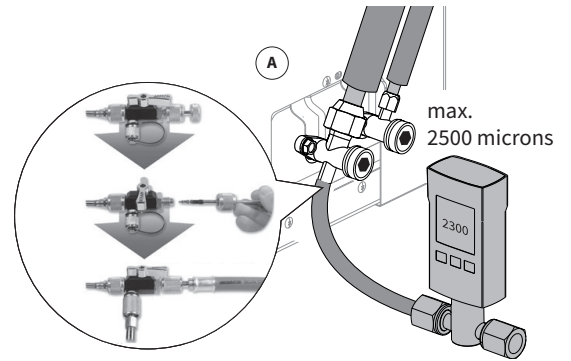


IMPORTANT

- ▶ For safety reasons when carrying out the strength and tightness tests to BS EN 378 appropriate PPE must be worn. Venting of Nitrogen must be done in a well ventilated place, away from any area where the vented gas could produce flying dust or objects. In poorly ventilated areas Nitrogen can displace the air, leading to an Oxygen deficient atmosphere where asphyxiation could occur.

8.6.5 Creating a vacuum in the refrigerant lines

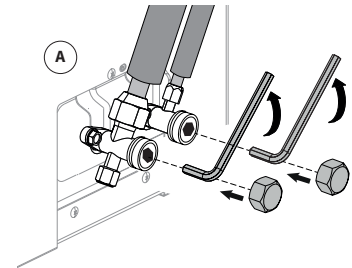
1. Connect the vacuum pump to the vacuum gauge on the service valve using the certified puller as a connection set, ensure that both service valves are still closed (A).
2. Create a vacuum in the refrigerant lines below 500 microns.
3. Close the valve to the vacuum pump, and switch the pump off read the pressure on the vacuum gauge.
4. The vacuum gauge must not rise above 2500 microns (2.5 Torr) within 30 minutes.
5. Repeat steps 2 and 3 if the pressure rises above 2500 microns.
6. If the test fails again break the vacuum with nitrogen then complete a further tightness test at 10 bar to find the leak and repair, then repeat steps 1 to 4.
7. Using a certified removal tool replace the schrader core as removed in **§8.6.4** (3).



Using the certified core removal tool connect it to the service valve outlet, this allows connection of the vacuum gauge and service.

8.6.6 Refrigerant actions

1. Open the service valve on the liquid line using a 5mm Allen key turning it anti-clockwise until you encounter firm resistance (A) (the system will start to fill with refrigerant).
2. Replace the 19mm lockshield cap, tighten to 14-18 Nm torque.
3. Open the service valve on the gas line using a 5mm Allen key by turning it anti-clockwise until you encounter firm resistance (A).
4. Replace the 19mm lockshield cap, tighten to 14-18 Nm torque.
5. Depending on the length of the refrigerant lines, it may be necessary to add more refrigerant. The minimum pipe length is 3 metres. The pre-filled refrigerant quantity in the outdoor unit is 850 grams. Follow the table below for longer refrigerant lines of 7 metres or more:



Ensure the service valves are back stopped before replacing the lockshield caps.

Meters of pipe ½" x ¼"	Additional filling (grams)	Total filling (grams)	Tons of CO2 equivalent
3	0	850	0,574
4	0	850	0,574
5	0	850	0,574
6	0	850	0,574
7	25	875	0,591
8	50	900	0,608
9	75	925	0,624
10	90	940	0,635
11	105	955	0,645
12	120	970	0,655
13	135	985	0,665
14	150	1000	0,675
15	165	1015	0,685
16	180	1030	0,695
17	195	1045	0,705
18	210	1060	0,716
19	225	1075	0,726
20	240	1090	0,736
21	255	1105	0,746
22	270	1120	0,756
23	285	1135	0,766
24	300	1150	0,776
25	315	1165	0,786

Example adding refrigerant:

For pipes of 12 meters, 120 grams of refrigerant must be added. The total filling is then 970 grams. Pipe length is measured from the outdoor unit to the indoor unit as a pair and not individually

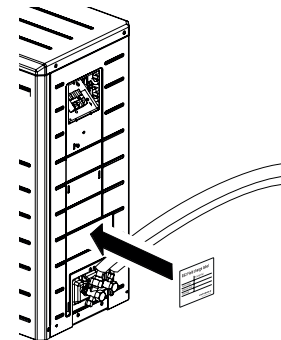
- Using a ball point pen complete the included field charge label.
- Attach the field charge label to the side panel of the outdoor unit as shown in the figure. This ensures the label is accessible for any attending engineers as per the F-Gas regulations.

R32 Field charge label	
	R32 weight (kg)
Factory charge	
Additional charge	
Total charge	
INTERGAS HEATING SOLUTIONS	



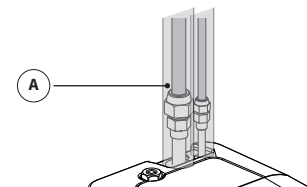
NOTES

- ▶ **The field charge label should only be completed and attached if refrigerant has been added.**



8.6.7 Insulating the refrigerant lines

- Fold or push the included insulation material (A) around each refrigerant line above the indoor unit. The lines must be insulated separately.
- Secure the insulation material using insulation tape.



8.6.8 Emptying the meter set

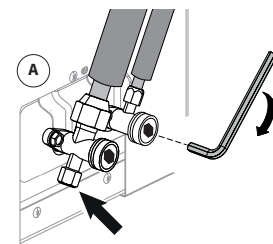
The pump draining function (pumping out refrigerant, see **§11.2.3**.) can be used to empty the meter set. The following steps describe how the pump draining function works with regard to emptying the meter set within the outdoor unit, assuming that the liquid and gas lines have been connected from the outdoor to indoor unit and commissioned correctly.

When doing this, ensure that you are connected to the Wi-Fi control screen, **§10.2.1**.

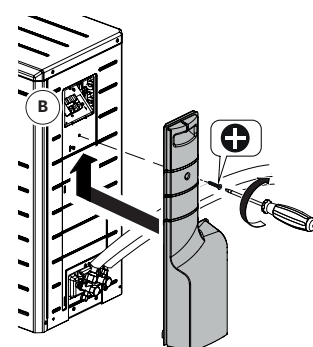
- Close the service valve on the liquid line using a 5mm Allen key by turning it clockwise (A).
Please note: the gas line service valve must remain open to carry out the draining function task.
- Connect a meter set to the gas line service valve using a Schrader core removal tool, having removed the core prior.
- Turn on the pump draining function using the control screen within the app.
 - ▶ Via the service menu:
 - ▶ Click on 'Tools'
 - ▶ Click on 'Pump out refrigerant'
 - ▶ Select 'Start'

The system will now create a vacuum and move the refrigerant back into the outdoor unit.

- Check the meter set to ensure the pressure is dropping at a pressure of 0 bar, all the refrigerant will have moved back into the outdoor unit.
- Select 'Stop' on the Wi-Fi control screen.
- Close the service valve on the gas line using a 5mm Allen key by turning it clockwise.
- Replace the 19mm lockshield cap, tighten to 14-18 Nm torque.
- Replace the Schrader core using the core removal tool and remove the meter set replacing the 14mm sealing cap (A).
- When completed replace the 19mm lockshield caps and the side panel on the outdoor unit (B).



Connect the meter set to the gas line service valve connection having removed the Schrader core prior.



8.6.9 Checking the refrigerant actions



IMPORTANT

- ▶ **Keep the refrigerant lines as short as possible (min. 3 metres and max. 25 metres), §8.6.6.**
- ▶ **Correct system operation may be affected if too much refrigerant has been added.**
- ▶ **Excessive refrigerant must be recovered and recorded correctly.**
- ▶ **The field charge label must be completed and attached to the outdoor unit when refrigerant has been added (for refrigerant lines of 7 metres or more), see §8.6.6.**
- ▶ **Conduct a second tightness test before leaving the location.**
- ▶ **Replace the side panel on the outdoor unit.**

8.7 Making electrical connections

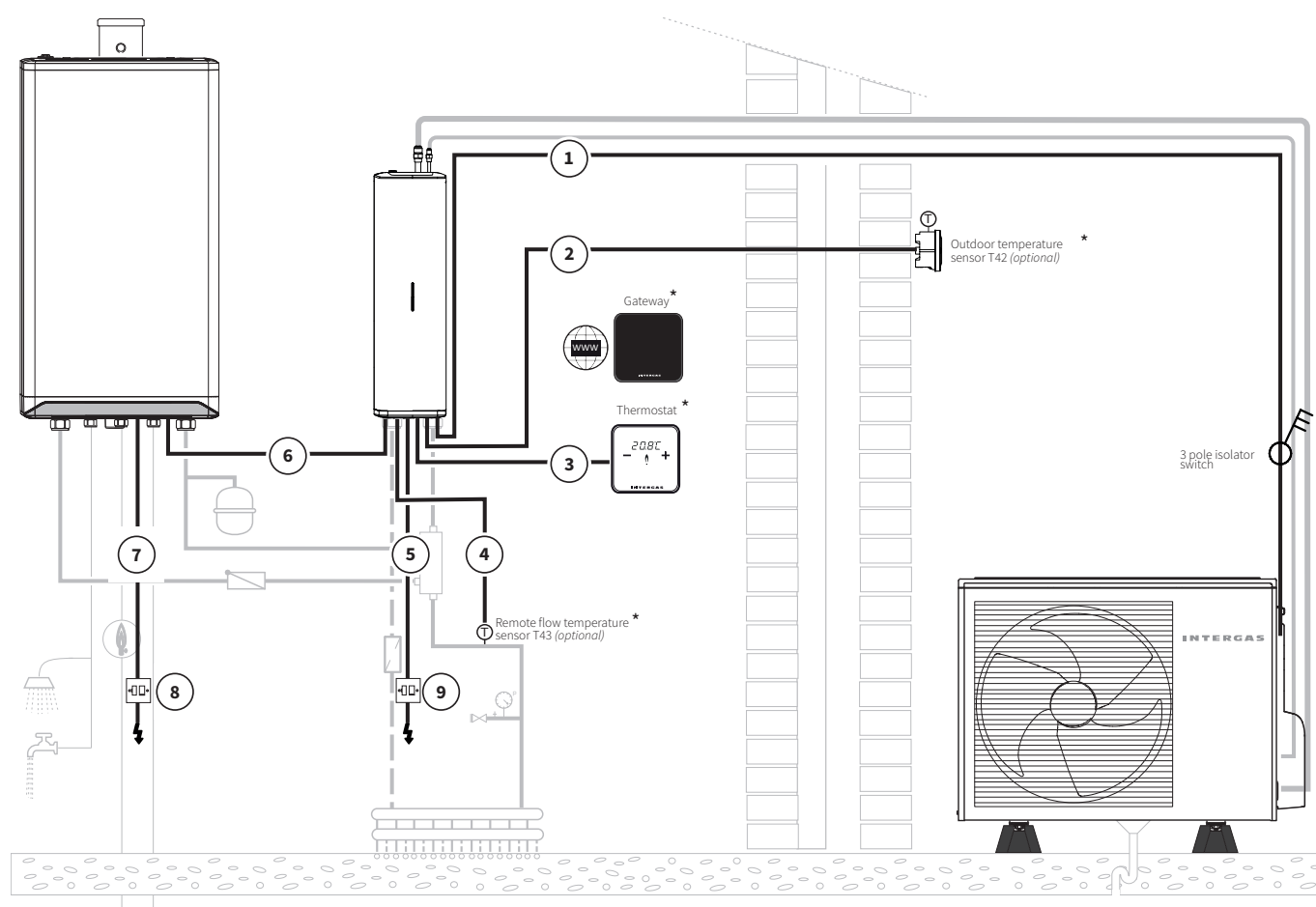
8.7.1 Points of attention for electrical installation



IMPORTANT

- ▶ **Work on electrical connections must never be performed when the system is live and the safe isolation procedure must be completed.**
- ▶ **For a complete overview of the electrical system, see §8.7.2.**
- ▶ **Always observe BS 7671 when carrying out any electrical work.**
- ▶ **Electrical work may only be carried out by a qualified and registered electrician.**
- ▶ **After completing the safe isolation checks and before working on the appliance, please check the electrical cables for any wear, strain UV or rodent damage etc.**
- ▶ **Correct polarities must be observed when making 230v~ electrical connections.**
- ▶ **Electrical work on the outdoor unit must not be attempted whenever there is a possibility of precipitation, or water ingress of any kind.**

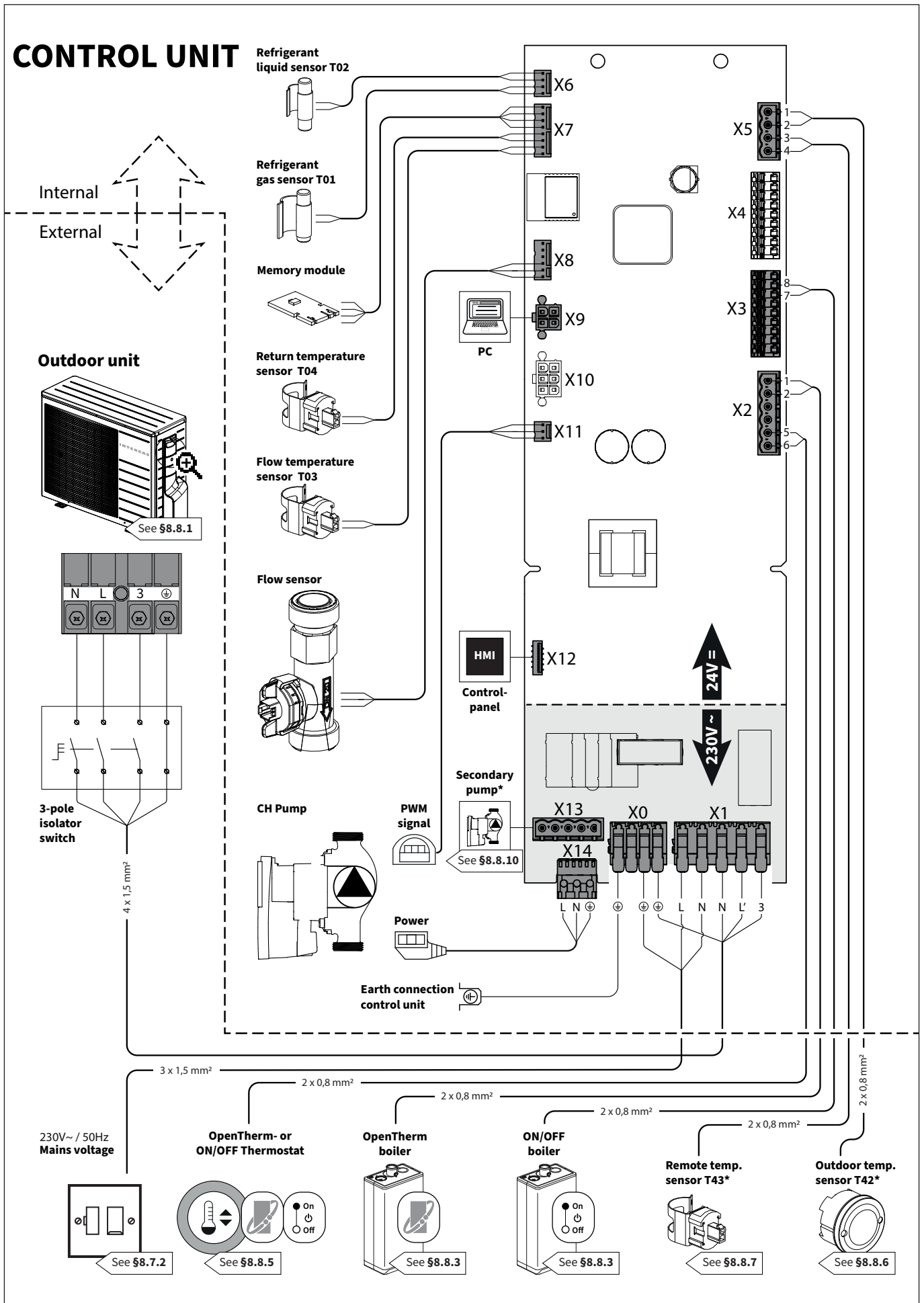
8.7.2 Electrical installation overview




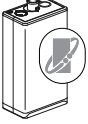

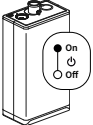

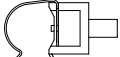
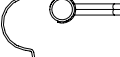

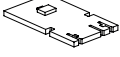
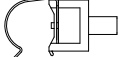
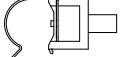
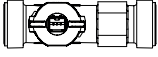




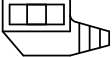


Components marked with an (*) are offered as optional accessories; see **§3.2**.

Wiring			
No.	Type	Function	Notes
001	4 x 1.5 mm ² - Mains and switch live cable	Mains power and switched live to the outdoor unit	Must be a 3 pole safe isolation switch near to the outdoor unit. See specification §3.1
002	2 x 0.8 mm ² - Signal cable	External outdoor sensor T42	Optional for use with a weather-dependent control setting. See §8.8.6 and §11.5
003	2 x 0.8 mm ² - Signal cable	Indoor temperature setpoint	Polarity not important when using OpenTherm connectivity
004	2 x 0.8 mm ² - Signal cable	Remote flow temperature sensor T43	Optional for use with a weather-dependent control setting. See §8.8.7 and §11.5
005	3 x 1.5 mm ² - Mains cable	Indoor unit power supply	10 amp rated fuse 230V~ / 50Hz
006	2 x 0.8 mm ² - Signal cable	Communication with boiler	OpenTherm connectivity
007	3 x 0.75 mm ² - Mains cable	Boiler power	3 amp rated fuse 230V~ / 50Hz
008	3 amp switched fused spur	Power supply to boiler	230V~ / 50Hz
009	10 amp switched fused spur	Power supply to Indoor and outdoor units	230V~ / 50Hz

8.7.3 Electrical schematic (indoor unit)



Connector	Connections	Designation	Description
X0			Earth connections.
X1	L, N, N, L', 3		Power connections. To indoor unit + indoor to outdoor unit supply + S/L.
X2	1 – 2		OpenTherm boiler.
	3 – 4	-	<i>Optional for second thermostat.</i>
	5 – 6		OpenTherm or ON/OFF thermostat.
X3	7 – 8		ON/OFF boiler.
X4	1 – 9	-	<i>Not applicable.</i>
X5	1 – 2		T42 (°C) Outdoor temperature sensor (12k Ω / 25°C) <i>(optional)</i> .
	3 – 4		T43 (°C) Remote temperature sensor <i>(optional)</i> .
X6	1 – 2		T02 Refrigerant liquid sensor.
	3 – 4		T01 Refrigerant gas sensor.
X7	1 – 2 – 3		Memory module
	4 – 5		T04 (°C) Return temperature sensor.
	6 – 7		T03 (°C) Flow temperature sensor.
X8	4 – 5 – 6		Flow sensor.
X9			PC - Intergas Diagnostic Software (IDS) <i>(optional)</i> .
X10		RS-485	<i>Not applicable.</i>
X11	1 – 2 – 3		CH pump, PWM signal
X12			Control panel power/multicolour LED signal.
X13	1 - 2	-	AUX2 relais (230V~, max. 1A / 100W), see §8.8.10
	3	-	Permanent mains voltage (230V~, max. 1A / 100W), see §8.8.10
	4 - 5		AUX1 relais (230V~, max. 1A / 100W), see §8.8.10
X14	L, N, \oplus		CH pump, power.

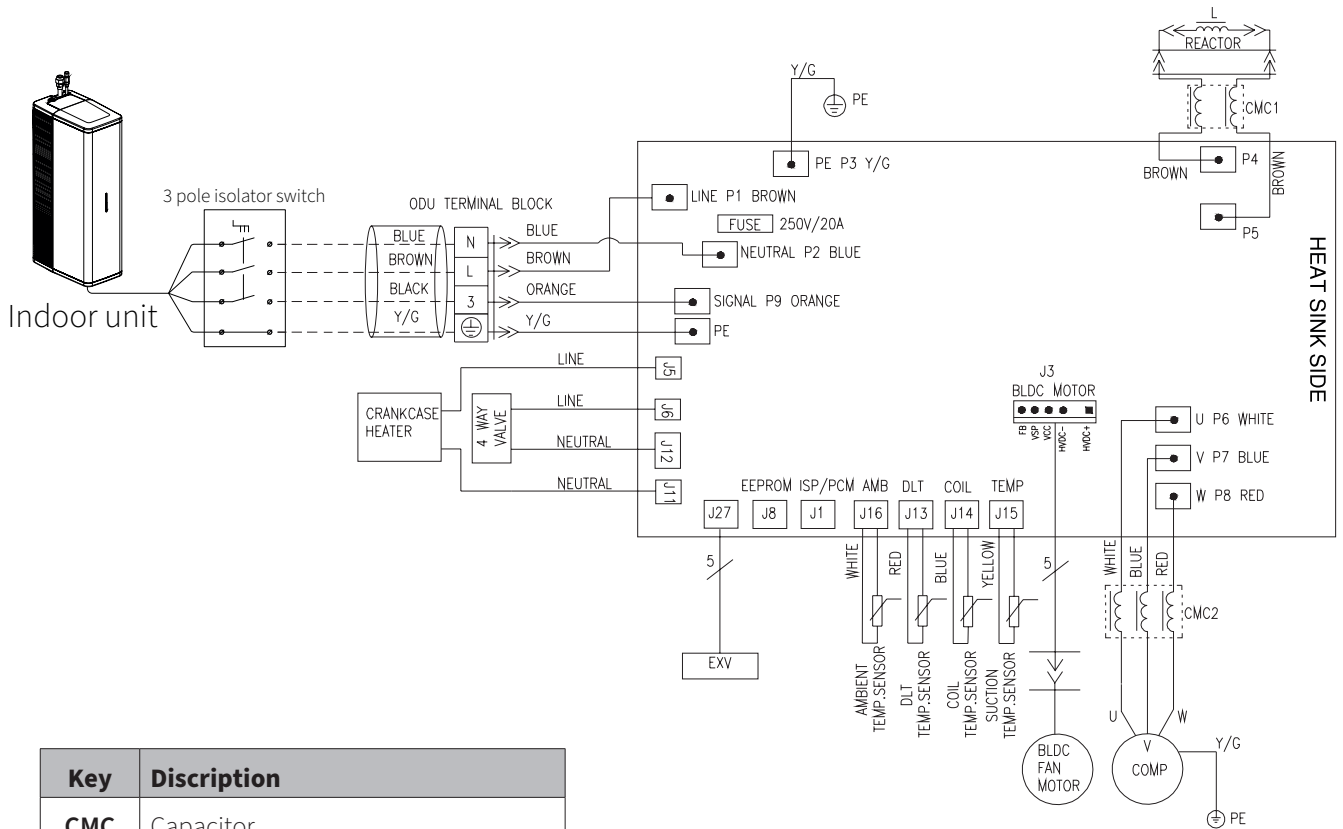
8.7.4 Electrical diagram outdoor unit



NOTES

- ▶ The wiring diagram below is for clarification only. The actual shape of the components may differ.

Control unit



Key	Discription
CMC	Capacitor
COMP	Compressor
—	Factory wiring
- - -	Field wiring
●	Wire terminals
⚡⚡⚡	Engaged conductors connectors (male - female contacts)

8.8 Routing and connecting cables

8.8.1 Wiring the outdoor unit to the indoor unit



IMPORTANT

- ▶ Ensure you use the correct cable, type and specification, see §3.1.
- ▶ Electrical work should never be performed when the system is supplied with power.

The outdoor unit's power and switched supply must be taken from the indoor unit via connection block X1, see §8.7.3.

Connecting the outdoor unit

1. Install a three-pole isolator switch between the indoor and outdoor units, to allow safe isolation when completing service work or in the event of an emergency.

This must be external to the property and placed within 1 meter of the outdoor unit.

Ensure correct separation of the (L) Live, (N) Neutral and (S3) Switched wire. The (⊕) Earth connection must have the correct continuity at all times.

Please note:

- ▶ Do not place the isolator switch anywhere on the outdoor unit casing.
2. Remove the side panel from the outdoor unit.
 3. Attach the strain relief around 4 core cable to the outdoor unit.
 4. Connect the wires to the terminal strip as shown in the adjacent diagram.
 5. Connect the cable from the outdoor unit to the 3 pole isolator switch.

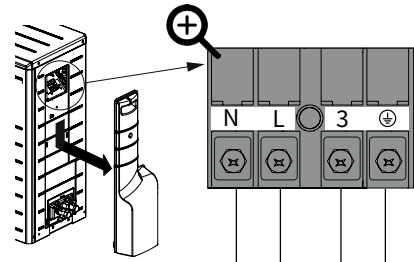
Connecting the indoor unit

1. Route the cable from the isolator switch to the indoor unit.
2. Feed the cable through the cable tray at the back of the indoor unit (from top to bottom); see illustration.
3. The cable must be pulled through to 60 cm below the indoor unit.
4. Remove up to 30 cm of the outer insulation on the cable.
5. Feed the cable through the M20 cable gland.

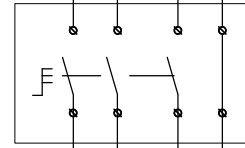
Please note:

- ▶ Depending on the thickness of the cable used, it may be preferable to feed the cable through a different gland.

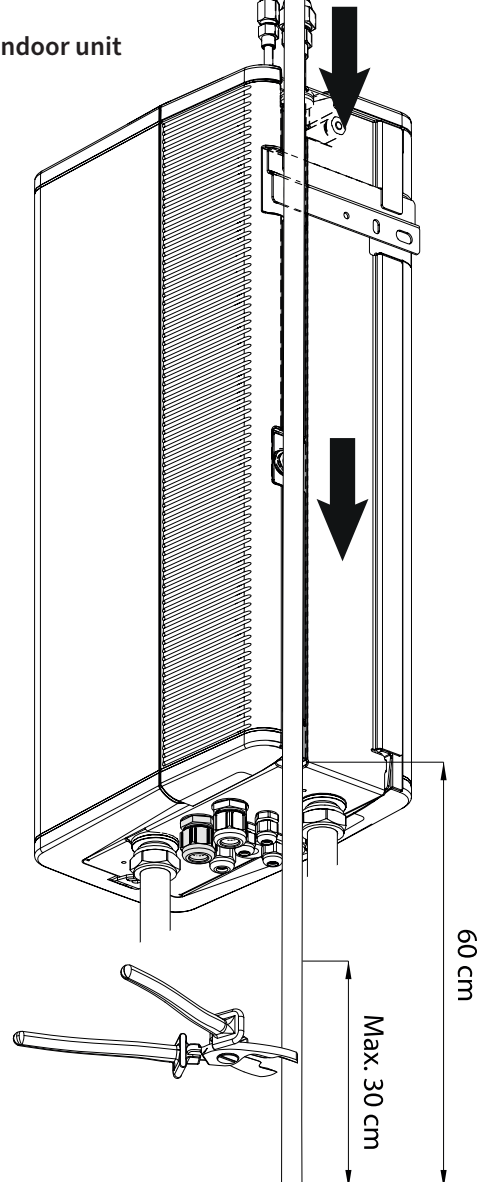
Outdoor unit terminal strip



3 pole isolator switch

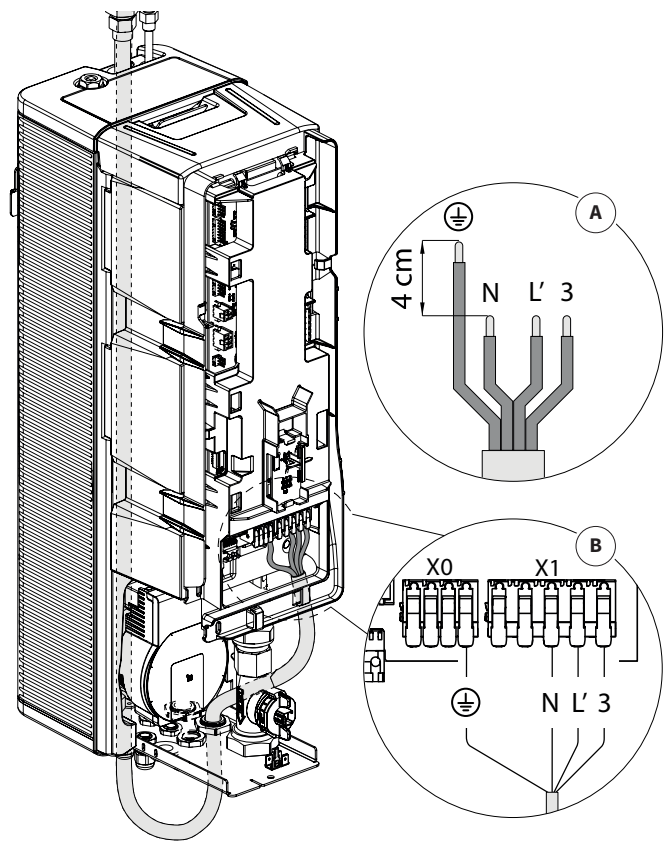


Indoor unit



6. Cut the (N), (L) and (3*) wires to length noting that the (⊕) wire must be 4 cm longer; see diagram (A).
7. Remove 1 cm of insulation from all the wires.
8. Connect the wires to the terminal strip X1 and Earth to X0 on the indoor unit; see diagram (B).

(3*) = Switched live supply from the indoor to outdoor unit.



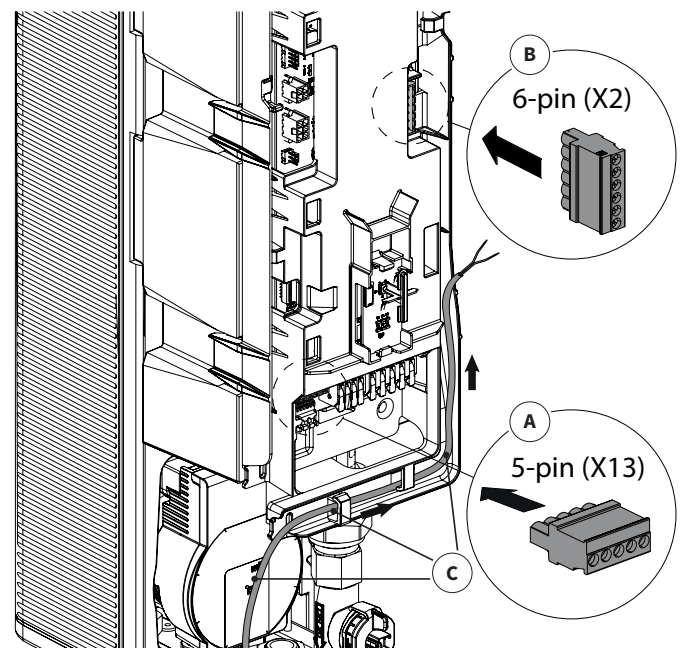
8.8.2 Connector plug information



IMPORTANT

► For electrical safety please ensure the supplied green connector plugs are fitted correctly to X13 and X2 **even if they are not to be used.**

1. Isolate the power to the indoor unit by switching off the fused spur and removing the 10amp fuse.
2. The included 5- and 6-pole plug-in connectors must be attached to the power connectors; see (A) and (B) in the adjacent illustration.
3. Use the cable tray on the housing of the printed circuit board to guide the external wiring to the relevant connector(s), see (C).



8.8.3 Wiring the boiler to the indoor unit

For the most efficient operation, the indoor unit should be connected to a boiler that supports OpenTherm communication. Standard on/off potential free switching is also possible.

1. Connecting an OpenTherm boiler.

Using the included 6-pole green connector, wire the boiler OpenTherm connections to screw terminals 1 and 2 and then push this into position **X2** of the indoor unit, as shown in the adjacent illustration (1).

(The OpenTherm connections are not polarity specific)

Additional info for boiler settings via OpenTherm:

- ▶ Set the maximum target temperature of the boiler to 80°C.
- ▶ If underfloor heating is used, with no mixing valve then set the maximum target temperature of the boiler 20°C higher than the maximum target temperature of the Xtend (see **§11.6 (P120 and P194)**).
- ▶ Set the boiler maximum output to calculated heat loss required (for example: 10kW)
- ▶ Set both the minimum and maximum pump capacity of the boiler to 50%.

2. Connecting an ON/OFF boiler.

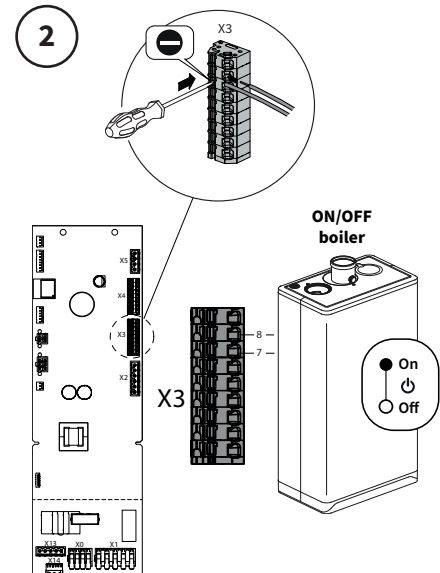
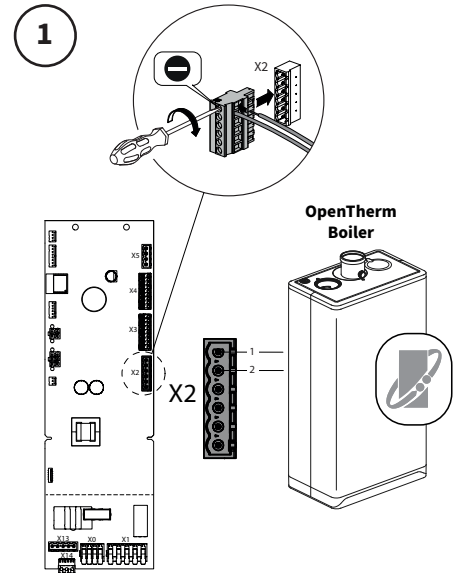
Using the 9-pole green connector **X3** wire the boiler ON/OFF connections to the push tabs 7 and 8 of the indoor unit, as shown in the adjacent illustration (2).

The connection must be potential-free failure to comply will result in irreparable damage being caused.

When doing this set **P066** to '4' (ON/OFF control) and **P121** to '3' (Relay output). See **§11.6**.

Additional info for boiler settings via ON/OFF:

- ▶ Set the maximum target temperature of the boiler 10°C higher than the maximum target temperature of the Xtend see **§11.6. (P194)**.
- ▶ Set the boiler maximum output to calculated heat loss required (for example: 10kW)
- ▶ Set both the minimum and maximum pump capacity of the boiler to 50%.



8.8.4 Wiring the indoor unit to an existing boiler

Connecting the wires to the correct boiler terminals depends on the make and model of the boiler that the hybrid system is being combined with.

1. Remove the original thermostat wiring from the existing combination boiler.
2. Now connect the indoor unit wiring to the resulting connection within the boiler. (previously the thermostat; see point 1 or point 2)
3. If necessary, consult the installation instructions for the boiler in question.



NOTES

- ▶ **When removing the wiring from the OpenTherm or ON/OFF thermostat terminals within the boiler you then create a pathway for the indoor unit connections. (ON/OFF boiler connections must be potential-free)**

8.8.5 Connecting the room thermostat to the indoor unit

Using the indoor units OpenTherm connection **X2** allows any modulating OpenTherm thermostat to communicate in accordance with the OpenTherm communication protocol.

The key function of the OpenTherm thermostat is to calculate the output and flow temperature required for the desired room temperature in order to achieve maximum efficiency.

The OpenTherm room thermostat becomes master and the indoor unit becomes the slave.

With the OpenTherm thermostat:

- ▶ the current room temperature is displayed.
- ▶ the required room temperature can be adjusted and set.

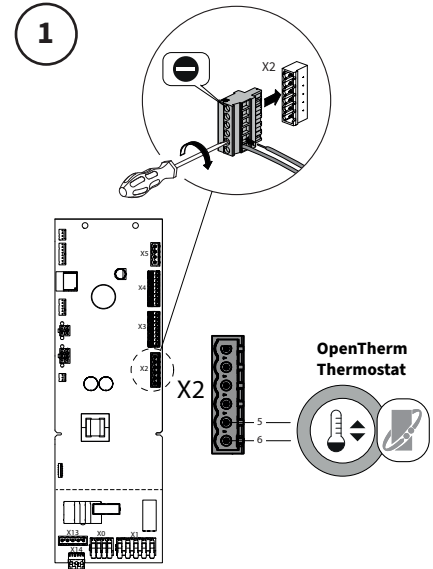
If the existing system is equipped with an OpenTherm or ON/OFF thermostat, this must be removed from the boiler connector; see **§8.8.3** and **§8.8.4**.

Option 1 (preferred)

1. Connecting an OpenTherm room thermostat.

Using the included 6-pole green connector, wire the boiler OpenTherm connections to screw terminals 5 and 6 and then push this into position **X2** of the indoor unit, as shown in the adjacent illustration (1).

(The OpenTherm connections are not polarity specific)



Option 2

2. Connecting an ON/OFF room thermostat.

Using the included 6-pole green connector, wire the boiler ON/OFF connections to screw terminals 5 and 6 and then push this into position **X2** of the indoor unit, as shown in the adjacent illustration (2).

The connection must be potential-free failure to comply will result in irreparable damage being caused.

Choose option "ON/OFF thermostat (with hysteresis)" or "ON/OFF thermostat (proportional)" via the installation web-ui wizard or set parameter **P064** to "1".

Set parameter **P107** to the desired value and make sure it is not set to "0".

For thermostats with hysteresis:

Set parameter **P187** to "0".

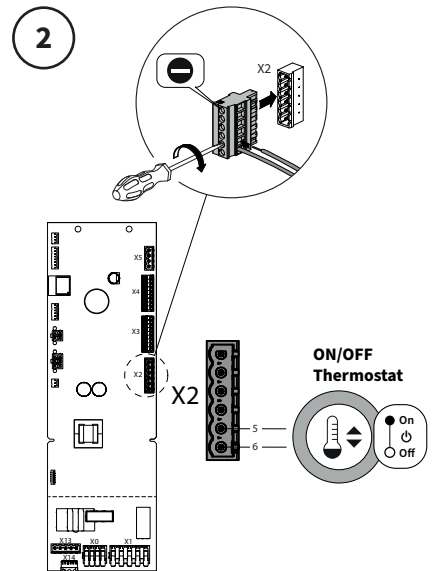
For proportional band thermostats:

Set parameter **P187** to the number of operations per hour. (e.g. 6x per hour, depending on the type of thermostat)

In order to ensure optimal performance and efficiency, only use Intergas Comfort Touch thermostats that were manufactured after September 2022.

These are available under article numbers:

- White; art. no. **030104**
- Black; art. no. **030114**



8.8.6 Wiring the outdoor sensor to the indoor unit (optional)



NOTES

- ▶ If the hybrid system is controlled based on a heating curve, it is important for the external sensor T42 to be connected.
- ▶ Please note: The external sensor is not part of the standard package and is available as a set. Article number: 090064
- ▶ The 2 x 0.8 mm² cable for the external sensor is not part of the standard package.

1. Connecting the outdoor sensor T42

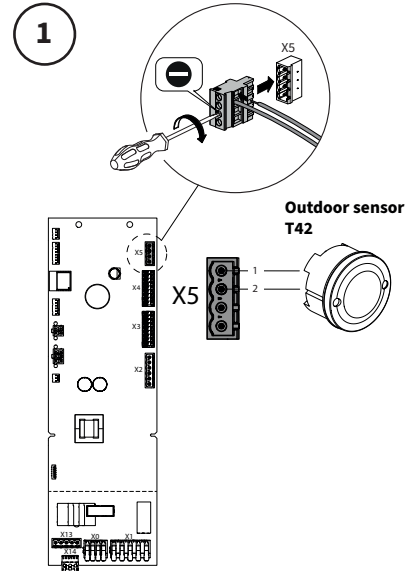
Using the 4-pole green connector, included with the kit, wire the connections to screw terminals 1 and 2 and then push this into position **X5** of the indoor unit, as shown in the adjacent illustration (1).

Set Parameter **P006** to '1'.

For optimal function of the external sensor:

- ▶ Do not place it in the sun (preferably it should face North or North-West);
- ▶ Do not place it where it may be influenced by other heat sources, for example near an external extraction vent or boiler flue terminal.

When it is not possible to install the external sensor, the system can function without it, by setting parameter **P006** to '0'.



8.8.7 Wiring a T43 NTC temperature sensor to the indoor unit (optional)



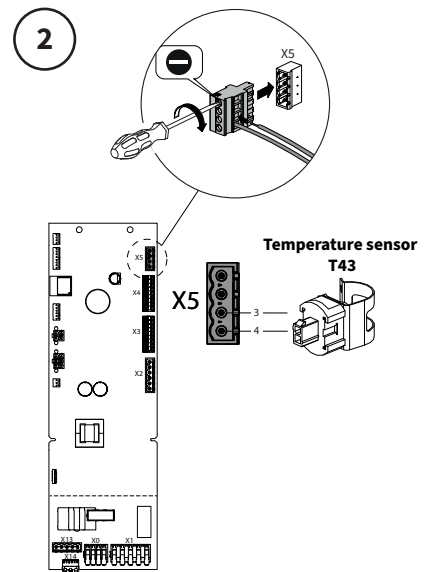
NOTES

- ▶ If the hybrid system is controlled based on a heating curve or is connected to an ON/OFF boiler (see §11.5, it is important for the external temperature sensor T43 to be connected.
- ▶ Please note: The temperature sensor is not part of the standard package and is available as a set. Article number: 090064
- ▶ Always use the included NTC sensor and cable to ensure correct operation of the system.

2. Connecting the external temperature sensor T43.

Using the 4-pole green connector, included with the kit, wire the connections to screw terminals 3 and 4 and then push this into position **X5** of the indoor unit, as shown in the adjacent illustration (2).

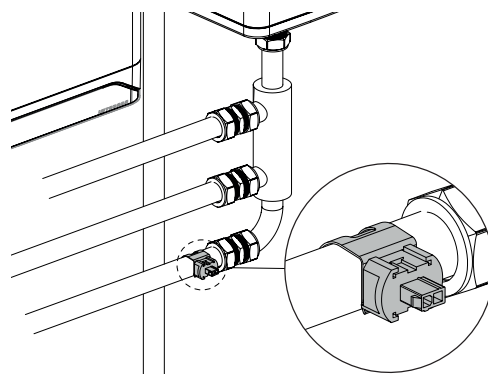
Set Parameter **P123** to '1'.



The temperature sensor T43 must be clipped to the heating flow under the low loss header.

Ensure that the sensor is firmly attached, so that it is in good contact with the pipework at all times.

To ensure the correct operation of the system, the original supplied cables and temperature sensors supplied by Intergas must be used. Place the cables in a suitable duct or conduit to prevent damage.



8.8.8 Installing and using the Comfort Touch room thermostat

Installation

- ▶ Isolate the indoor unit from the mains power and remove the fuse.
- ▶ Determine the best internal location ensuring:
 1. it is not mounted on an exterior wall
 2. it is not subject to any draughts
 3. it is not in direct sunlight
 4. it is not above any type of heat source
- ▶ Please read the supplied installation manual supplied with the room thermostat, it should be mounted at a height of approximately 1.5 metres from the floor surface. The back plate can be directly attached to a single wall pattres / back box if required using the supplied M3 bolts.
- ▶ Connect the wires to the terminal block within the thermostat. The wires push 'click' into place.
- ▶ Place the thermostat body over the top of the back panel and then hinge it down.
- ▶ Click the housing into place at the bottom.
- ▶ Replace the fuse and reestablish the power to the indoor unit..
- ▶ The thermostat will start up automatically.



NOTES

- ▶ **Please read the user instructions to operate the Intergas Comfort Touch.** 

8.8.9 Comfort Touch app

To enable remote management, the indoor unit must be paired with the Intergas Gateway.

This consists of a LAN2RF gateway and connection equipment. The Intergas Gateway connects the appliance to an internet router, after which an installer can monitor and manage the appliance remotely (via a web server) using the Service Dashboard. The end user must first give permission to the installer to do so, after the installer has invited the end user to the Service Dashboard.

When the Intergas Gateway is used, the end user can also use the Comfort Touch app, which is a thermostat app. The Comfort Touch app can be downloaded from both the Google Play Store and the Apple Appstore.

For setting up the Comfort Touch app and a more detailed description of the app, visit this link:

<https://www.intergasheating.co.uk/homeowner/products/comfort-touch-app/>



8.8.10 Connecting a secondary pump



WARNING

- ▶ **A permanent mains voltage is present at pin 3 of connector X13**

Connector **X13** is an additional 230V~ normally open (NO)-contact and can be used for connecting a secondary pump, valve etc.

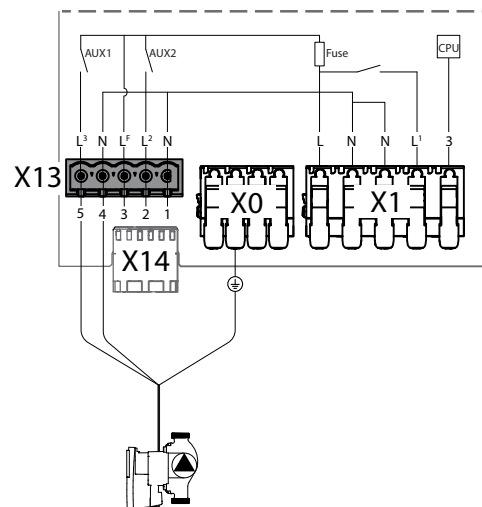
Use AUX1 to connect a secondary pump:

- ▶ Using the included 5-pole green connector, wire the pump connections to screw terminals 4 and 5 and then push this into position **X13** of the indoor unit, as shown in the adjacent illustration.
- ▶ Earth to terminal **X0**.
- ▶ Set Parameter **P068** to "10".

Use AUX2 as an additional (NO)-contact:

- ▶ Using the included 5-pole green connector, wire the pump connections to screw terminals 1 and 2 and then push this into position **X13**
- ▶ Earth to terminal **X0**.
- ▶ Set Parameter **P069** to the desired value.

See **§11.6 Parameters** for a full value list for P068 and P069.



9 COMMISSIONING THE SYSTEM

9.1 Preparatory work

- ▶ Using the diagram "Installation overview" **§8.1** ensure the pipework is connected and phased correctly.
- ▶ Using the diagram "Electrical diagram indoor unit" **§8.7.3** Ensure the wiring is connected correctly to each unit or component.

9.2 Filling, cleaning and venting the central heating system

9.2.1 Cleaning and flushing the central heating system

When filling new systems, it is important to remove all residue such as oil, flux solder etc:

- ▶ Chemically clean the system thoroughly as per **BS 7593:2019** Intergas Heating recommend Fernox F3 cleaner is used.
- ▶ Thoroughly flush the system and treat with the recommended dose levels of Inhibitor:
Intergas Heating recommend Fernox F1 combined with Fernox F7 Biocide for low temperature or underfloor systems.
- ▶ A magnetic system filter must be installed as per **BS 7593:2019** positioned in the return pipework to the indoor unit **§8.4.1**

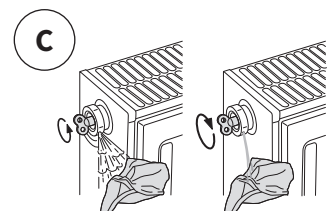
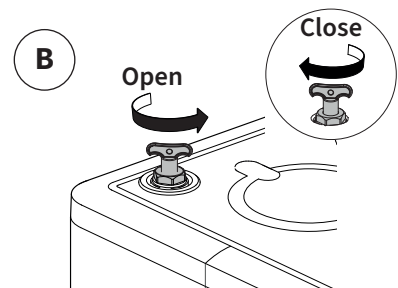
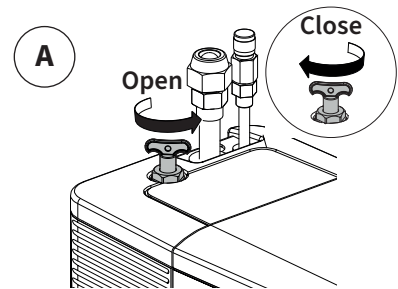
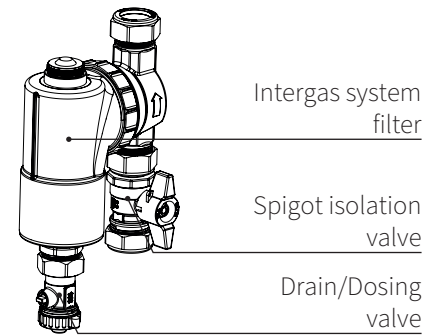
When filling existing systems, it is important to remove magnetite and corrosion debris:

- ▶ Chemically clean the system thoroughly as per **BS 7593:2019** Intergas Heating recommend Fernox F3 cleaner is used or F8 where heavily contaminated.
- ▶ Thoroughly flush the system and treat with the recommended dose levels of Inhibitor:
Intergas Heating recommend Fernox F1 combined with Fernox F7 Biocide for low temperature or underfloor systems.
- ▶ A magnetic system filter must be installed as per **BS 7593:2019** positioned in the return pipework to the indoor unit **§8.4.1**

9.2.2 Filling and venting the central heating system

Using the filling valve under or near the boiler, fill the system to a pressure of 1.5bar, then purge the air out via all vent points within the system. Check the system pressure and top-up where required.

1. Ensure that the heating system pressure can be read, this will only be possible, in most cases, when the power is switched on to the boiler but it is left in standby (small (-) on the display).
2. All isolation valves including radiator lockshields must be open.
3. Open the fill valve on the heating return side.
4. Slowly open the fill valve on the cold water inlet side until the system pressure is approximately 1.5bar when cold.
5. Vent the system using the manual vent on top of the indoor unit (dry any water spills); see (A).
6. Vent the boiler using the manual vent on top of the boiler casing (dry any water spills); see (B).
7. Vent all the radiators or underfloor manifolds within the heating system; see (C).



8. Check the system for any leaks, rectify where required.
9. Top-up the system pressure when required due to venting.
10. Close off both filling valves after check the correct pressure has been established.
11. Power up the indoor unit and boiler.
12. Switch the isolator for the outdoor unit to on.

9.2.3 Checking the heating circuit



NOTES

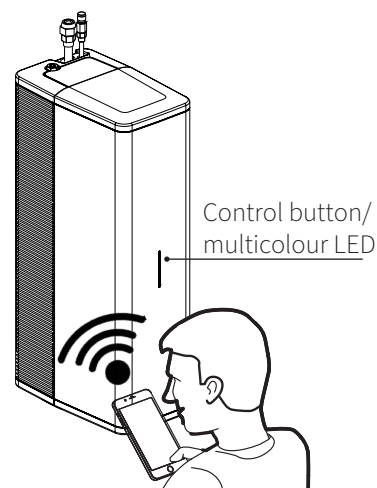
- ▶ **Check the pressure (1.5 to 2 bar)**
- ▶ **Check the inhibitor levels within the heating system**
- ▶ **Check the water-side connections to ensure they are leak-tight.**
- ▶ **Check if the system has been correctly vented.**
- ▶ **Check the system filter for debris and clean if required.**
- ▶ **Check all system valves, including the boiler isolation valves, radiator lockshield & TRV's etc. are open.**

9.3 Configuration procedure



NOTES

- ▶ **The hybrid heating system must be commissioned by a qualified installer.**
- ▶ **To configure and commission the system correctly it is best to use the Web-Ui facility to connect with the Xtend indoor unit control screen (via Wi-Fi), this will walk you through the configuration. process see §10.2.**



After the preparatory work has been carried out and completed, the hybrid heat pump system can be configured by following the below procedure:

	Commissioning procedure	Notes
1	Insert the fuse into the spur and switch on the power.	<i>The multicolour LED will turn white and flash on & off.</i>
2	Press the control button on the indoor unit for 2 seconds to initiate the venting program.	<i>The multicolour LED will turn green and flash on & off indicating that an internal action is being performed. The pump will start running. During this process, make sure that the manual air vents on top of the indoor unit, the boiler and the radiators are correctly vented.</i> 1. <i>If the system detects a stable flow, the venting program will end. The multicolour LED will turn white and remain continuously lit.</i> 2. <i>If the flow is too low, the LED will turn red. (Notification n023 will appear, see §12.2.) Reset the and repeat step 2.</i>
3	Repeat the venting/filling steps if necessary.	<i>It is important for the venting program to run its entire course.</i>
4	Connect to the Xtend Wi-Fi control screen.	See the connectivity procedure §10.2 .
5	Enter service code 15 and go through the installation wizard to complete the configuration.	If the wizard is not completed, it will reappear when a new connection is made to the operating screen. The installation wizard can also be accessed via the service menu.
6	Test the system operation by turning up the room thermostat to create a heating demand.	<i>Use the statistics page to check if the system is functioning well. Menu > Service > View statistics > Live data. §11.2.5.</i>
7	Check if there are any notifications or faults present and resolve them as required.	<i>Notification or fault codes are displayed on the main page of the control screen. See chapter 12 for all fault/notification codes.</i>
8	Instruct the end user on how to fill, vent and operate the complete system.	
9	Give the operating instructions and warranty card "for the customer" to the end user. The completed warranty card must be received by Intergas Heating Ltd within 30 days of the installation being finished. Any Intergas system filter being used must also be registered with Intergas at the same time as the Xtend indoor and outdoor units, (for enhanced warranty package).	

10 OPERATION AND READOUT

10.1 Multicolour LED description

The following colours will apply:

Primary colors:

- ▶ White (short flash) = Device is turned off
- ▶ White (continuous) = Device is in stand-by mode (*Device on, but with no external demand*).
- ▶ Green (continuous) = Device is heating (*A heating demand is present*).
- ▶ Green (flashing) = Internal action in progress.
- ▶ Red (continuous) = Notification active (*Device requires attention, but is still functioning*). **§12.2**
- ▶ Red (fast flashing) = Internal . (*Contact Intergas Heating Ltd*).
- ▶ Red (flashing) = Critical/blocking error (*Device running emergency program using the boiler*) **§12**

Secondary color:

- ▶ Purple (fast flashing) = Searching for an Intergas Gateway for up to 5 seconds.
- ▶ Purple (flashing) = Wi-Fi access point active or a connection to a smartphone or tablet has been established.

The purple colour can be alternated with one of the primary colours above.
(for example: purple/green = answers a heat demand and the WiFi module is active)

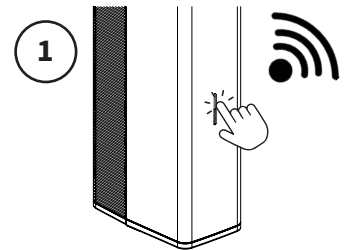
10.2 Connectivity procedure WiFi control screen

Follow one of the procedures below to connect to the WiFi control screen:

- ▶ Quick guide (quick connection via QR-codes), see **§10.2.1**
- ▶ Manual connection, see **§10.2.2**

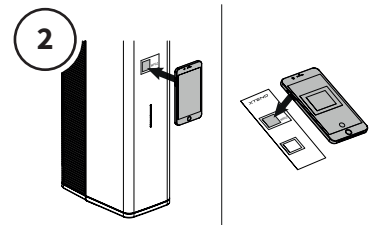
10.2.1 Quick guide (quick connection via QR-codes)

- 1. Activate the WiFi access point** on the Xtend by briefly pressing the LED button on the front of the device. *The LED will flash purple.*

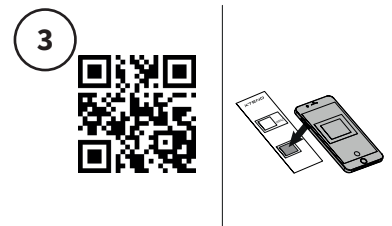


- 2. Scan the 1st QR-code** A sticker on the front of the device or in point (2) of the WiFi instruction card supplied with the unit. *A WiFi connection is now established with the Xtend.*

▶ **NOTE: this 1st QR-code is unique and must not be destroyed!**



- 3. Scan the 2nd QR-code** as shown on the right or on the Wifi activation card (point 3). (*This makes it easy to open the web browser, with direct access to the WiFi control screen.*)



10.2.2 Manual connection

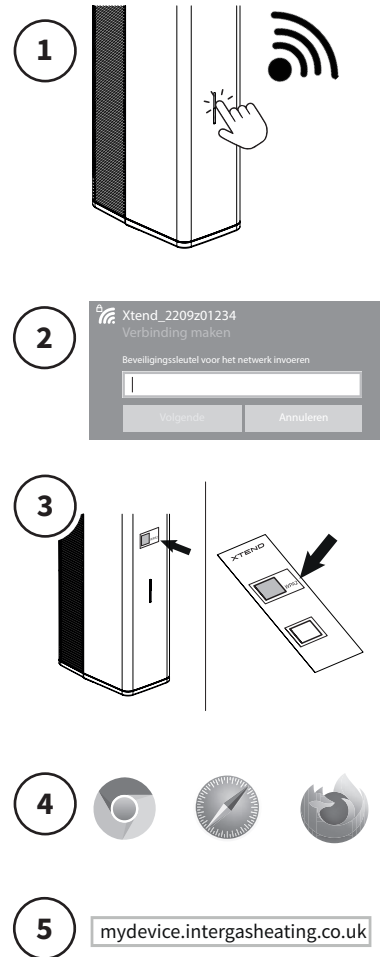
- 1. Activate the WiFi access point** on the Xtend by briefly pressing the LED button on the front of the device. *The LED will flash purple.*
- 2. Go to the WiFi settings on the smartphone, tablet or laptop** and search for the network "Xtend_<serial number>", for example *Xtend_2209z01234*.
- 3. Select network Xtend and enter the password** which can be read on the QR code sticker under WPA2 (on the front of the device or in point (2) of the WiFi activation card)

- 4. Open a web browser** on the smartphone, tablet or laptop.

- 5. Enter "mydevice.intergasheating.co.uk"** as URL in the search bar of the web browser and press "go/enter". *If the page of "mydevice.intergasheating.co.uk" is not available, type "10.20.30.1" and press "go/enter".*

You can now access the WiFi control screen.

The LED will flash for 15 minutes. As soon as the LED stops flashing, the WiFi connection will no longer be active.



10.3 Wi-Fi control screen description

The Wi-Fi control screen has been designed for both the end user (resident) and the installer. Using a local web server, the current data from the hybrid heat pump system, such as the energy consumption, notifications and malfunctions, can be exported and viewed. Settings (parameters) can be controlled and managed via the control screen. The following menus are available:

- ▶ **Overview**
- ▶ **Connections**
- ▶ **Settings**
- ▶ **Service**



10.3.1 Overview (main page)

1. Malfunctions are presented via fault codes. These are displayed at the top of the page. The 'reset' button provides the option to reset* a fault code.
2. Notifications and fault codes are shown at the top of the page as well. The system will attempt to resolve notifications on its own. If a notification persists, other options will have to be considered.
3. The most important statuses and statistics regarding the hybrid heat pump system are shown here.

* A fault code indicates an issue that may not always be resolved without a qualified engineers intervention.

10.3.2 Connections

1. This menu provides an overview of all the related devices that are connected. You can also connect to the Intergas Gateway here (if available). *The LED will flash fast for 5 seconds.*

10.3.3 Settings (for the end user as well as the installer)

1. For setting and adjusting daily programs.
2. For setting and adjusting the desired Hybrid mode.
3. For setting and adjusting the time and date.

10.3.4 Service (specifically for installer)

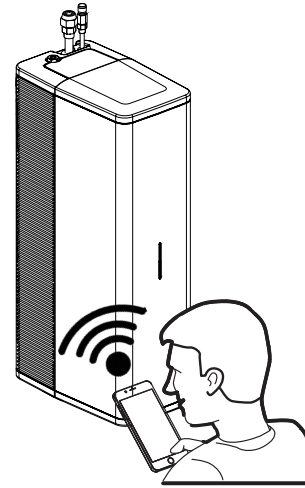
1. Installation wizard for system configuration.
2. Tools for use during work or maintenance
3. Parameters for making system adjustments.
4. Statistics for consulting live data.
5. Firmware (update), *if available.*

11 SETTINGS AND ADJUSTMENTS

Various (parameter) settings on the Wi-Fi control screen are used to influence how the system functions. Some of these settings can be changed by the end user as well as the installer. Other settings can only be changed within the service menu using the service code **15**; see **§11.2.1**.

The following menus on the Wi-Fi control screen are important for this:

- ▶ Settings
- ▶ Service (specifically for the installer)



11.1 Settings (Wi-Fi control screen)

11.1.1 Discription day programs

- ▶ Silent Mode
- ▶ Heat pump blockage

Silent Mode



- ▶ **Use this function only when there is a noise issue (i.e. night time operation).**
- ▶ **Observe local noise level regulations.**
- ▶ **The Silent Mode can lead to less comfort and/or higher energy costs.**


The system is equipped with an option to operate in Silent mode (e.g. during the night). This mode can be activated/deactivated using the parameter **P172**. When this mode is activated, the speed (rpm) of both the compressor and the fan is adjusted to reduce the noise level of the outdoor unit. Set the parameter **P167** to the desired capacity reduction (compressor reduction percentage).

By following the steps below, 2 time periods (1 to 2 and 3 to 4) can be programmed on the control screen for when Silent mode is active.

This mode is automatically deactivated when the outdoor temperature is too low. This is done to ensure that the system will still operate at the capacity required to heat the residence or avoid an excessive drop in temperature as a result of Silent mode operation. The minimum external temperature before Silent mode is deactivated can be set using the parameter **P171**.

Setting Silent mode:

In this example, Silent mode is set by using a time period
From 23:00 to 07:00. During this time period, the noise level of the outdoor unit will be reduced. Silent mode always requires an 'On' and 'Off' time period.

1. Go to 'Settings' on the Wi-Fi control screen.
2. Select 'edit programs'.
3. Select 'Silent mode'.
4. Edit a time period by clicking on the 'edit' icon , or add a time.
5. Select a time. Use the arrows to set the desired time (e.g. 23:00).
6. Select an action ('On').
7. Click on 'change'.
8. Select a second time period.
9. Select a time. Use the arrows to set the desired time (e.g. 07:00).
10. Select an action ('Off').
11. Click on 'Close' to leave the program.
12. The settings have been saved.

Heat pump blockage Mode

Using a separate day program (independent of Silent mode), the heat pump can be blocked for a period of time. Using **P128**, this timed program can be activated or deactivated:


'0' = Timed program off; heat pump not blocked

'1' = Timed program on; heat pump blocked

Setting the heat pump blockage:

In this example, the heat pump blocker time program is set by using a time period (00:00 to 06:00). During this time period, the heat pump will be deactivated. All demands for heat will then be forwarded to the boiler.

The heat pump blocker program always requires an 'On' and 'Off' time period.

1. Go to 'Settings' on the Wi-Fi control screen.
2. Select 'edit programs'.
3. Select 'Heat pump blocker'.
4. Edit a time period by clicking on the 'edit' icon , or add a time.
5. Select a time. Use the arrows to set the desired time (e.g. 00:00).
6. Select an action ('On').
7. Click on 'change'.
8. Select a second time period.
9. Select a time. Use the arrows to set the desired time (e.g. 06:00).
10. Select an action ('Off').
11. Click on 'Close' to leave the program.
12. The settings have been saved.

11.1.2 Time settings

1. Use the arrows to set the desired time and day, or select 'current time' to import the time and day from your smartphone or tablet.
2. Click 'Save the time'.

11.1.3 Hybrid mode



► **Please note: The hybrid mode can be further adjusted by changing the parameters in the service menu; see §11.2.4. and §11.6**

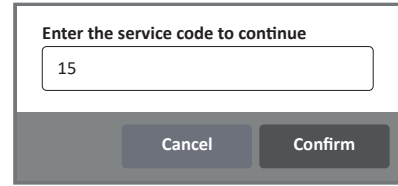
For setting the desired Hybrid mode. The front panel is removed as follows:

1. Select one of the desired modes.
 - **Standard COP setting**
 - **Ecological (based on CO₂ emission)**
 - **Economical (based on rates)**
2. Use the arrows to set the desired value.
3. Press 'Save'.

11.2 Service menu (specifically for the installer)

11.2.1 Access to the service menu

1. Select the service menu.
2. Enter service code **15**.
3. Click on 'confirm'.
4. The menu will now be available.



Enter the service code to continue

Cancel Confirm

11.2.2 Installation wizard



NOTES

- ▶ **The installation wizard takes several minutes and can be accessed at any time via the service menu.**

The installation wizard has been specifically designed to assist in commissioning and configuring the parameters.

The wizard will start on its own when you connect to the Wi-Fi control screen for the first time.

1. Connect to the Wi-Fi control screen.
2. Enter the service code.
3. Follow the installation wizard instructions.

11.2.3 Tools

The following tool functions can be used to commission other system elements or if work or maintenance is required on the system.

There is a 'start' and 'stop' button for all programs.

▶ **Pump venting**

During this program, the pump will operate slowly and stop at brief intervals, so that any air within the system can easily be vented.

This process will repeat itself until the system detects a stable flow.

During this process, please ensure that the manual air vents on top of the indoor unit, the boiler and the radiators are correctly vented, (**§9.3** - point 2)

▶ **Activating the system pump**

During this program, the pump will operate continuously. Use the arrows to set the desired flow rate (l/min).

▶ **Manual defrosting**

During this program, the heat pump evaporator will be defrosted.

▶ **Heat pump service mode (minimum)**

During this program, the pump will operate at minimum output.

▶ **Heat pump service mode (maximum)**

During this program, the pump will operate at maximum output.

▶ **Boiler service mode**

During this program, the boiler will be activated.

▶ **Pumping out refrigerant**

The pump draining function can be used to commission the system, such as by emptying the meter set, for maintenance work or decommissioning the system. During this process, the refrigerant will be moved back into the outdoor unit, **§8.6.8**

11.2.4 Parameters (adjustment)

The search function on the WiFi control screen can be used to find a parameter. Parameter settings must always be saved using the **'Save'** button.

The complete parameter list is explained in **§11.6**.

11.2.5 Statistics

The statistics page provides a complete overview of the system's energy consumption. This page can also be used to monitor the system.

Select 'Live data' to review the current system data.

11.2.6 Firmware (update)

Consult Intergas Heating Ltd.

11.3 Adjusting the hybrid work mode

The hybrid system consists of heat pump (ODU = outdoor unit), the boiler (B) and the indoor unit (IDU). The 3 units work together to optimise efficiency based upon the categories that are input and the average COP (coefficient of performance), using the lowest possible cost price and/or CO₂ emission.

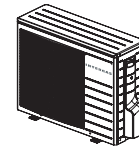
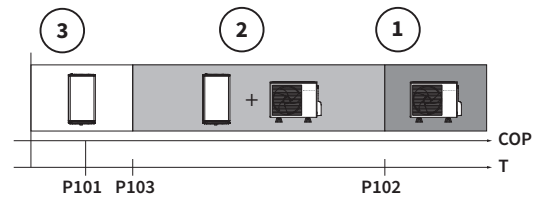
There are three categories for space heating:

1. Heat pump only
2. Heat pump + boiler assistance
3. Boiler only

Using **P102**, the external temperature can be set to a value above which the boiler is prevented from being activated. By lowering this value, the system is forced to operate the heat pump for longer without involving the boiler.

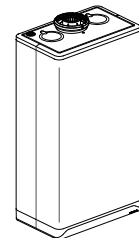
Using **P103**, the system can be forced to switch over to the boiler, even if the heat pump COP is still above the COP threshold value.

1. Typically, the heat pump is used for as long as possible.
2. If the heat pump cannot achieve the desired heat level (within the set time frame), the boiler will assist the heat recovery process.
3. Switching to the boiler will only occur if:
 - There is a heat pump malfunction.
 - The heat pump is unable to achieve the requested target temperature.
 - The average COP is lower than the current COP threshold value **P101**.
 - The external temperature is below the value set for **P103**.
 - The current return temperature is higher than the value set for **P104**.



ODU (Outdoor unit)

+



B (Combination boiler)

+



IDU (Indoor unit)

11.3.1 Setting the hybrid mode

The **P100** parameter can be used to influence how the boiler and heat pump interact. This is also called bivalent mode. The following settings are possible: **P100**:

0 = Entirely electric (boiler not activated).

In this mode, the boiler is not activated, not even when defrosting.

1 = Standard COP setting

If the heat pump is set below a specific COP, this mode switches over to the boiler. The lower the COP set, the longer the heat pump will run. The COP threshold value can be set using **P101**. The standard value is 2.0. Operation is not affected by the rate settings (as in point 3).

2 = Ecological (based on CO₂ emission)

Using **P143**, the CO₂ emission for kWh of electricity is set (grams of CO₂ per kWh). This value is weighted against the CO₂ emission from natural gas. This emission value can be found in your energy bill or from your energy supplier.

3 = Economical (based on rates)

In this mode, the COP threshold is determined based on the gas and electricity rates. A low and high rate can be provided for electricity:

- ▶ **P140**: High electricity rate (£ sterling per kWh)
- ▶ **P142**: Low electricity rate (£ sterling per kWh)
- ▶ **P144**: Natural gas rate (£ sterling per m³)

4 = Maximum heat pump use

In this mode, the heat pump is used as much as possible, however the boiler can be activated as well but only if the heat pump cannot achieve the required target temperature.

5 = Only the boiler

If there are issues with the heat pump, the system can be forced to use the boiler.

11.4 Settings for activating the boiler

Activating the boiler is determined based on the water temperature and room temperature (using OpenTherm if available). Generally, this setting works using degree minutes. This means that a significant deviation in water temperature leads to the involvement of the boiler sooner than a minor deviation.

Using **P107**, the activation threshold can be set. At a lower value, the boiler will be involved more quickly.

Heat pump malfunction

If the heat pump is unavailable due to a malfunction, the boiler will be activated directly to meet the heating demand. The delay time can be set using **P108**.

Delay time before the involvement of the boiler after initiating heating

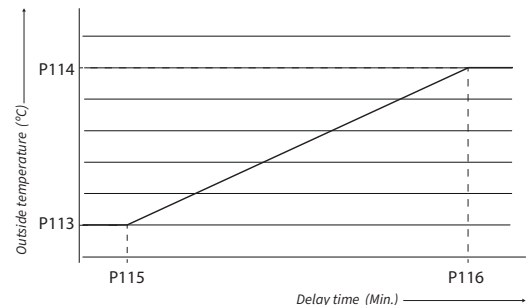
When the heating phase is initiated, the involvement of the boiler can be postponed in order to allow the heat pump time to achieve the desired heat on its own. A wait time that depends on the external temperature can be set for this. In relatively warm weather, the wait time can be extended.

Using **P113**, a minimum external temperature can be set (the default is 0 °C).

Using **P114**, a maximum external temperature can be set (the default is 20 °C).

Using **P115**, the wait time can be set for a low external temperature (the default is 5 min).

Using **P116**, the wait time can be set for a high external temperature (the default is 50 min).



11.4.1 Setting a reduced temperature

During a period in the daytime, boiler involvement can be postponed, which will result in a lower room temperature. This 'reduced temperature' can be based on a 'reduced room temperature setpoint' or a timed program.

Reduced temperature setpoint.

Using **P218**, a temperature setpoint can be set. If the room temperature setpoint is actually set to be equal to or lower than this value, the reduced temperature function will activate. When the reduced temperature function is active, the boiler is prevented from being involved. This allows the room temperature to drop below the setpoint. A maximum drop in temperature can be set using **P219**. If the current room temperature drops below the thermostat value (— negative) **P219** — then the boiler becomes free to activate.

The reduced temperature function via a room temperature setpoint can be deactivated by setting **P218** to '10°C' **§11.4.1**

- ▶ This function is intended for situations when the night-time reduction is being used (**P180** = 0).
- ▶ In situations where the same room temperature has been set 24/7, the CH timed program can be used to indicate when the boiler should be blocked. For the period of the 'CH mode OFF' timed program, the reduced temperature function will be active.

At lower external temperatures, this function may have the opposite effect: the room temperature will drop too much, even though it is no longer possible to compensate for it. Using **P216**, a 'reduced temperature off' temperature can be set.

11.5 Room heating settings (CH mode)

The hybrid system is controlled using the Intergas Comfort Touch thermostat or any OpenTherm thermostat. Parameter **P202** is set to '4', the default value for this type of thermostat.

There are several other control modes available in addition to the factory settings, which can even be combined with each other. These are divided into internal and external control modes.

Internal control modes are based on the supply temperature. The system uses a weather-dependent control (WDC) setting that adjusts based on the external temperature and the set heating curve. Optional accessories, such as the external sensor T42 (outdoor) and remote temperature sensor T43 (system flow), are important for optimal system performance.

External control modes use an external thermostat to determine the supply temperature. There are also ON/OFF CH modes. These fall under the external control modes.

If these are being used for a different application (different from the default value), further information can be requested from Intergas Heating Ltd.

11.6 Parameter list

The parameters are set at the factory in accordance with the table below. These parameters can only be changed using the service code. **Please note:** Installers must be fully versant with the below parameters, incorrect adjustment or setting can damage the equipment.

Parameter	Category	Setting	Default value	Description/Setting range
P000	General	Device in use.	1	0 = no 1 = yes
P004	Connections	Room heating connected to the system	1	0 = no 1 = yes
P006	Connections	External outdoor sensor connected.	0	0 = no 1 = yes
P007	Connections	Source of the external temperature.	0	0 = automatic. (external sensor, internet, outdoor unit sensor) 1 = external outdoor sensor T42 (P006 = 1) 2 = internet 3 = outdoor unit sensor 4 = CH-Boiler (via OpenTherm)
P009	Connections	<i>not applicable</i>	-	<i>deactivated</i>
P010	Connections	<i>not applicable</i>	-	<i>deactivated</i>
P011	Connections	<i>not applicable</i>	-	<i>deactivated</i>
P015	Calibration	External outdoor sensor T42 .	0.0	-12.7 °C to 12.7 °C (increments of 0.1)
P016	Calibration	Return sensor T04 .	0.0	-12.7 °C to 12.7 °C (increments of 0.1)
P017	Calibration	Flow sensor T03 .	auto	-12.7 °C to 12.7 °C, auto
P018	Calibration	External temperature flow sensor T43 .	auto	-12.7 °C to 12.7 °C, auto
P020	Connections	Setting minimum CH pressure threshold value	0.5	0.0 to 4.0 bar (increments of 0.1 bar).
P021	Connections	Use of the OpenTherm pressure sensor in the existing boiler.	1	0 = Does NOT use the OpenTherm pressure sensor 1 = DOES use the OpenTherm pressure sensor
P064	Connections	Heating demand input type through Connector X2 (contacts 5 and 6)	1	0 = deactivated (OpenTherm default) 1 = ON/OFF based on heating demand
P065	Connections	Heating demand input type through Connector X2 (contacts 3 and 4)	-	<i>deactivated</i>
P066	Connections	Function of digital output 1 relay (Connector X3 , contacts 7, 8 and 9)	0	0 = not in use 1 = signal, cooling active 2 = signal, heating active 3 = control of the secondary CH pump 4 = Hybrid boiler ON/OFF 5 = indoor unit on (P000 = 1) 6 = secondary pump (even during defrosting) 7 = locked status 8 = locked/notification status 9 = heat pump malfunction 10 = Sec. pump (active during heat pump and boiler)

Parameter	Category	Setting	Default value	Description/Setting range
P067	Connections	Function of digital output 2 relay (Connector X4 , contacts 1, 2 and 3)	0	0 = not in use 1 = signal, cooling active 2 = signal, heating active 3 = control of the secondary CH pump 4 = Hybrid boiler ON/OFF 5 = indoor unit on (P000 = 1) 6 = secondary pump (even during defrosting) 7 = locked status 8 = locked/notification status 9 = heat pump malfunction 10 = Sec. pump (active during heat pump and boiler)
P068	Connections	Function of AUX 1 relay (Connector X13 , contacts 4 and 5)	0	0 = not in use 1 = signal, cooling active 2 = signal, heating active 3 = control of the secondary CH pump 4 = Hybrid boiler ON/OFF 5 = indoor unit on (P000 = 1) 6 = secondary pump (even during defrosting) 7 = locked status 8 = locked/notification status 9 = heat pump malfunction 10 = Sec. pump (active during heat pump and boiler)
P069	Connections	Function of AUX 2 relay (Connector X13 , contacts 1 and 2)	0	0 = not in use 1 = signal, cooling active 2 = signal, heating active 3 = control of the secondary CH pump 4 = Hybrid boiler ON/OFF 5 = indoor unit on (P000 = 1) 6 = secondary pump (even during defrosting) 7 = locked status 8 = locked/notification status 9 = heat pump malfunction 10 = Sec. pump (active during heat pump and boiler)
P081	System	Setting IDU pump output (maximum pump control).	100	20 to 100%
P086	System	Minimum ΔT for heating. Reduces flow rate when ΔT falls below set value.	0	0 = off (always uses the set flow rate) 1 to 15
P088	System	(IDU) Pump mode	0	0 = standard pump control 1 = pump is operating continuously while in stand-by 2 = pump is always operating (emergency program)
P100	Bivalent	Setting hybrid/bivalent operation mode	1	0 = entirely electric 1 = minimum COP (P101) 2 = ecological (based on CO ₂ emission) 3 = economical (based on rates) 4 = maximum heat pump use 5 = only the boiler (no heat pump)
P101	Bivalent	Setting minimum COP for heat pump operation	2.0	1.0 to 10.0 (increments of 0.1)
P102	Bivalent	Setting the external temperature value (Boiler will not be involved in heating above this value).	15 °C	-20 °C to 20 °C (increments of 1 °C).

Parameter	Category	Setting	Default value	Description/Setting range
P103	Bivalent	Setting the external temperature value. (No heat pump operation below this external temperature value).	-5 °C	-20 °C to 20 °C (increments of 1 °C).
P104	Bivalent	Setting return sensor value. (No heat pump operation above this CH value).	50 °C	25 °C to 55 °C (increments of 1 °C).
P107	Bivalent	Delay in involvement of the boiler (at a lower value, the boiler will be involved more quickly).	0	0 = adaptive mode (adjusts itself) 1> = 40 to 8000 degree minutes.
P108	Bivalent	Setting the delay for the involvement of the boiler if the heat pump is experiencing a malfunction.	0	0 to 250 min.
P109	Bivalent	Setting the minimum boiler off-time	1	1 to 60 min.
P113	Bivalent	Setting the minimum external temperature (for the involvement of the boiler). See §11.4	0 °C	-20 °C to 30 °C.
P114	Bivalent	Setting the maximum external temperature (for the involvement of the boiler). See §11.4	20 °C	-20 °C to 30 °C.
P115	Bivalent	Setting the wait time for the boiler at a low external temperature. See §11.4	5	0 to 250 min.
P116	Bivalent	Setting the wait time for the boiler at a high external temperature. See §11.4	50	0 to 250 min.
P120	Bivalent	Setting the maximum requested boiler supply temperature.	80 °C	30 °C to 90 °C.
P121	Bivalent	Setting a back-up type.	2	0 = none 1 = OpenTherm connector X2 (contacts 5 and 6, only ON/OFF control) 2 = OpenTherm boiler 3 = freely adjustable relay outlet
P123	Connections	External supply temperature sensor T43 connected.	0	0 = no 1 = yes
P124	Bivalent	Setting the threshold value. (Boiler will become involved in heating if the difference in the flow temperature and the requested temperature is too high).	25 °C	5 °C to 50 °C (increments of 1 °C).
P125	Bivalent	Setting the time delay of the pump after only the boiler has been operating.	1	0 to 30 sec.
P126	Bivalent	Setting the minimum requested boiler flow temperature.	20 °C	20 °C to 50 °C.
P127	Bivalent	Setting the time frame if the boiler is set to low-capacity operation.	10	5 to 60 min.

Parameter	Category	Setting	Default value	Description/Setting range
P128	Bivalent	Activation/deactivation of the heat pump blockage program; see §11.1.1	0	0 = no, heat pump not blocked 1 = yes, heat pump can be blocked
P129	Bivalent	Minimum control percentage of the boiler during on/off operation. (relates to P127)	10	5% to 100%
P130	Defrosting	Activating the boiler during defrosting.	1	0 = always activate the boiler when defrosting. 1 = only activate the boiler below a certain minimum temperature (P131). 2 = never activate the boiler.
P131	Defrosting	Setting minimum supply temperature when defrosting (see P130=1).	15 °C	5 °C to 30 °C.
P140	Bivalent	Setting electricity rate per kWh (high rate).	0	0 to 9999 £/KWh.
P142	Bivalent	Setting electricity rate per kWh (low or off-peak rate).	0	0 to 9999 £/KWh.
P144	Bivalent	Setting rate per m ³ gas	0	0 to 9999 £/m ³ .
P146	Bivalent	Setting CO ₂ emissions in grams per KWh.	0	0 to 9999 g/KWh.
P165	Heat pump	Setting degree minutes for heating. This affects when the heat pump starts and stops (a higher value means fewer activation changes).	0	0 = adaptive mode (adjusts itself) 1 to 42 degree minutes (increments of 10 degree min.)
P167	Heat pump	Setting compressor reduction percentage during Silent mode (if P172=2)	50	20 to 100%
P171	Heat pump	Setting the external temperature value (Silent mode deactivated below this external temperature).	-20 °C	-20 °C to 20 °C.
P172	Heat pump	Activation/deactivation of Silent mode.	0	0 = off 1 = on (fixed, non-adjustable reduction of 5 dB) 2 = a maximum percentage set by the user (adjustable using P167)
P175	Heat pump	Setting whether the crankcase heater remains hot.	1	0 = never (only when compressor starts) 1 = maximum of 24 hours 2 = always
P176	Heat pump	This setting determines if or when the boiler will become involved in heating for the crankcase heater.	1	0 = never 1 = automatic (delay time determined based on P113 , P114 , P115 and P116) 2 = always
P180	CH comfort	Setting the CH timed program.	0	0 = Comfort mode 1 = Eco mode
P181	CH comfort	Setting the difference in room temperature and heating threshold.	3	0 °C to 15 °C.

Parameter	Category	Setting	Default value	Description/Setting range
P182	CH comfort	Setting the maximum that the average room temperature and the set room temperature can be exceeded by.	2	1 °C to 5 °C.
P183	CH comfort	Setting the pump flow rate if the heating pump is activated (l/min).	15.0	3 to 25 l/min.
P184	CH comfort	Setting the pump flow rate if the heating pump is NOT activated (l/min).	6.5	3 to 25 l/min.
P186	CH comfort	Setting the threshold value for immediate involvement of the boiler at a timed program setpoint (from 2.2 °C)	2.2	0.0 to 5.0 °C
P187	CH comfort	Setting ON/OFF thermostat switches per hour	0	0 = off (no pulsing) 1 to 12 = (number of switches per hour)
P188	CH comfort	Setting a base point for a timed program 'ON period' (if there is no setpoint) (see §11.5).	20 °C	15 °C to 30 °C.
P189	CH comfort	Setting a base point for a timed program 'OFF period' (if there is no setpoint) (see §11.5).	20 °C	15 °C to 30 °C.
P190	CH comfort	Setting a pump flow rate if only the boiler is active (l/min).	15.0	3.0 to 25.0 l/min.
P191	CH comfort	Activating/deactivating CH clock program.	0	0 = off 1 = on
P192	CH comfort	Setting heating curve slope	1.10	0.00 to 2.50 (increments of 0.01)
P194	CH comfort	Setting maximum supply temperature.	70	20 °C to 85 °C.
P195	CH comfort	Setting proportional constant.	160	0 to 255
P196	CH comfort	Setting integrating factor (a lower value yields a quicker response).	1	0 to 255
P197	CH comfort	Setting a differentiating constant (a higher value yields a quicker response in alternating circumstances).	0	0 to 255
P198	CH comfort	Setting maximum positive displacement of the heating curve as a result of room heating compensation.	10 °C	0 °C to 50 °C.
P199	CH comfort	Setting maximum negative displacement of the heating curve as a result of room heating compensation.	10 °C	0 °C to 50 °C.
P200	CH comfort	Setting heating system	0	0 = underfloor heating 1 = radiators 2 = convectors

Parameter	Category	Setting	Default value	Description/Setting range
P202	CH comfort	Setting thermostat control	4	0 = Full control by WDC. None thermostat connected. 1 = WDC + room temp. compensation control. 2 = WDC + room temp. compensation control. + ON/OFF thermostat. 3 = WDC + ON/OFF thermostat. 4 = Standard OpenTherm thermostat. 5 = WDC + ON/OFF thermostat (via OpenTherm or ON/OFF shortcut). 6 = Fixed water temperature + ON/OFF thermostat. 7 = Internal WDC + external OpenTherm thermostat. 8 = WDC + ON/OFF thermostat (proportional band).
P203	CH comfort	Setting thermostat hysteresis.	0.50	0.00 to 2.50 (increments of 0.01)
P206	CH comfort	Setting nightly reduction and/or daily increase (ΔT); see §11.5	1.0	0.0 to 5.0°C (increments of 0.1)
P207	CH comfort	Activating/deactivating room heating modes.	1	0 = off 1 = on
P209	CH comfort	Influencing the thermostat based on the heating curve (if P202 = 7) (0% = no influence).	50	0 to 100%.
P210	CH comfort	Raising/lowering the heating curve.	0	-5 °C to 40 °C.
P211	CH comfort	Slow-start setting (0 = off).	60	0 to 240 min.
P214	CH comfort	Setting the hour of the day that the maximum temperature is reached (if P180=1 Eco mode = ON).	16	0 to 23 hours.
P216	CH comfort	Setting external temperature. (Deactivates nightly reduction and daily increase at this value).	-10 °C	-20 °C to 20 °C.
P217	CH comfort	Setting a value for immediately switchen the CH-boiler when the room thermostat temperature is set manually (0 = off)	0,7	0,0 t/m 5,0°C
P218	CH comfort	Defines a "lower temperature". It blocks the CH-boiler if the room temperature deviation is smaller than P219 . See §11.4.1 (10 = off)	10	10 to 20 °C
P219	CH comfort	Setting maximum drop (regarding P218).	0.5	0.0 to 5.0 °C
P220	CH comfort	Setting the desired compressor 'ON' time (if P202=5).	90	15 to 240 min.
P221	CH comfort	Setting maximum deviation as a result of the adaptive ON/OFF control based on the heating curve (if P202=5 or 8).	3.0	0.0 to 10.0 °C
P255	General	Reset the device to factory settings	0	0 = off 9 = reset to factory settings

12 FAULTS/NOTIFICATIONS

12.1 Fault codes

If a fault occurs that blocks the heat pump operation, then any heating demand will automatically be forwarded to the boiler. Go to the WiFi control screen to read the fault code generated. Use the reset button in the WiFi control screen or press and hold the button on the indoor unit for 8 seconds to reset the device.

The fault codes are as follows:

Fault code	Description	Possible cause/solution
F001	No flow in the CH circuit for at least 30 minutes.	<ul style="list-style-type: none"> ▶ Check the CH pump. ▶ Check the system for leaks. ▶ Check the system water pressure.
F003	Value of external flow sensor T43 too high (>67°C) or Value of flow sensor T03 over 1 minute too high. (> 90 °C)	<ul style="list-style-type: none"> ▶ Check the flow in the system.
F009	Memory fault codes.	<ul style="list-style-type: none"> ▶ Reset the control unit. ▶ Replace the control unit.
F010	Water temperature too low during defrost function.	<ul style="list-style-type: none"> ▶ CH flow too low. Check system flow.
F018	Heat pump type not correctly configured.	<ul style="list-style-type: none"> ▶ <i>Consult Intergas Heating Ltd.</i>
F019	Incorrect serial number in memory module.	<ul style="list-style-type: none"> ▶ <i>Consult Intergas Heating Ltd.</i>
F020	Incorrect firmware.	<ul style="list-style-type: none"> ▶ <i>Consult Intergas Heating Ltd.</i>
F022	Firmware version not compatible	<ul style="list-style-type: none"> ▶ Firmware needs an updating. ▶ <i>Consult Intergas Heating Ltd.</i>
F023	XTP controller internal	<ul style="list-style-type: none"> ▶ <i>Consult Intergas Heating Ltd.</i>
F024	XTP controller configuration	<ul style="list-style-type: none"> ▶ <i>Consult Intergas Heating Ltd.</i>
F025	XTP controller communication	<ul style="list-style-type: none"> ▶ <i>Consult Intergas Heating Ltd.</i>
F026	Startup	<ul style="list-style-type: none"> ▶ Switch off the power at the fused spur for 1 minute, then re-establish. ▶ Replace the control unit.
F037	Return sensor T04 .	<ul style="list-style-type: none"> ▶ Check for any breakages/short circuits in the wiring for the sensor T04. ▶ Check whether the sensor T04 is connected correctly. ▶ Replace the sensor T04.
F038	Flow sensor T03 .	<ul style="list-style-type: none"> ▶ Check for any breakages/short circuits in the wiring for the sensor T03. ▶ Check whether the sensor T03 is connected correctly. ▶ Replace the sensor T03.
F039	External flow sensor T43 .	<ul style="list-style-type: none"> ▶ Check for any breakages/short circuits in the wiring for the sensor T43. ▶ Check whether the sensor T43 is correctly connected. ▶ Replace the sensor T43.
F040	External outdoor sensor T42 .	<ul style="list-style-type: none"> ▶ Check for any breakages/short circuits in the wiring for the sensor T42. ▶ Check whether the sensor T42 is correctly connected. ▶ Replace the sensor T42.
F050	Fault within the outdoor unit	<ul style="list-style-type: none"> ▶ Access the control screen for additional information
F051	Fault within the indoor unit	<ul style="list-style-type: none"> ▶ Access the control screen for additional information
F254	Bypass mode active	<ul style="list-style-type: none"> ▶ Not a fault code as such, but a forced way to forward the heat request to the boiler. ▶ Switch off the power at the fused spur then, press and hold the control button whilst re-establishing the power supply to clear the by-pass mode.

12.2 Notification codes

In addition to fault codes, the control unit can also display notifications. Notifications are displayed if an anomaly occurs somewhere in the system that does not affect the vital functioning of the system. Notifications disappear if the system can fix the anomaly. Intergas Heating must be consulted if a notification returns repeatedly.

When using a digital type OpenTherm room thermostat notification codes from either the heat pump or the boiler can be displayed on its display screen, otherwise they can be viewed via the WiFi control screen.

Non compatible OpenTherm room stats will display F050 = heat pump error or F051 = CH-boiler error

The following notifications are used:

Notification	Description	Possible cause/solution
n000	Parameter settings outside range	▶ Check the settings.
n001	System pressure too low, parameter P020	▶ Check for leaks ▶ The system water requires refilling or topping up.
n008	XTP error heat pump (ODU)	▶ <i>Consult Intergas Heating Ltd.</i>
n011	Communication with the outdoor unit has been lost or the outdoor unit has an internal .	▶ Access the WiFi control screen for additional information ▶ Check the wiring between the indoor unit and outdoor unit for breakages/short circuit. ▶ Check the connections in the outdoor unit.
n013	Condenser temperature too high: heating pump disengaged.	▶ Potentially insufficient flow.
n014	Thermostat not connected.	▶ Connect the Comfort Touch thermostat; see §8.8.5 .
n015	Crankcase heater function	▶ Possible loose connection to the outdoor unit ▶ Faulty resistance element.
n016	Abnormal Delta-T between the flow and return temperature values	▶ Sensors T03 and T04 connected or mounted incorrectly. ▶ Check the system flow.
n018	Problem with memory.	▶ <i>Consult Intergas Heating Ltd.</i>
n019	Fault memory module	▶ Check the wiring. ▶ Replace the memory module.
n021	No flow in the CH circuit for at least 30 seconds.	▶ Venting program (max. 15 minutes) is started. Other system functions are blocked and resumed after the program has completed. ▶ Pump turns off for 60 seconds. ▶ Pump runs at maximum capacity. ▶ If sufficient flow is regained again for 30 seconds, the program will stop and the notification code will clear.
n022	Problem with automatic flow rate control	▶ Probably air in the system, vent.
n023	System flow too low during commissioning	▶ Check the CH-circuit for restrictions, debris, air or isolation valves closed.
n039	Problem with external flow temperature sensor T43	▶ Check the position and connection of the sensor on the flow pipework. ▶ Check wiring. Replace if necessary.
n040	Problem with external outdoor sensor T42	▶ Check wiring. Replace if necessary.
n041	Problem with refrigerant liquid sensor.	▶ Check wiring. Replace if necessary.
n042	Problem with refrigerant gas sensor.	▶ Check wiring. Replace if necessary.
n051	Boiler locked out of system	▶ Check for boiler malfunction.

Notification	Description	Possible cause/solution
n052	Error with OpenTherm connection to boiler.	▶ Check wiring. Replace if necessary.
N053	Flow temperature from boiler is too low	▶ Set the flow target temperature of the boiler to the same as the maximum flow target temperature of the Xtend or higher (P194).
N054	Boiler not responding to heating request from Xtend.	▶ Check whether the boiler or CH function is turned off.
N055	Boiler has a notification	▶ Resolve the boiler malfunction.
N060	Thermostat firmware version is not up to date if using the Intergas Comfort Touch.	▶ Install the latest version of Intergas Comfort Touch.

12.3 Other malfunctions

12.3.1 Malfunction within the indoor unit

Possible causes	Solution
The power LED is not displayed.	▶ Check the supply voltage, 230V AC 50Hz, see §5.3
Thermostat not connected or faulty.	▶ Check the wiring. ▶ Check the connection between the indoor unit and the thermostat, see §8.8.5 ▶ Replace the thermostat.
No power (24V).	▶ Check the fuse. ▶ Replace faulty parts. ▶ Check the wiring according to the diagram; see §8.7.3 .

12.3.2 CH does not get up to temperature

Possible causes	Solution
Water pressure in system is too low.	▶ Check system for leaks; top the system up if necessary.
Thermostat is not working.	▶ Check the settings and adjust if necessary.
Temperature is set too low.	▶ Increase the room thermostat target temperature. ▶ Flow temperature from boiler is too low, increase the boiler target temperature. ▶ Check the external temperature sensor for for a short-circuit, check the parameter settings where necessary, P102, P113, P114 , see §11.4 .
No heat transfer due to dirt or debris in the installation.	▶ Flush the system to BS 7593:2019 , clean the filter add inhibitor, see §9.2.1 .

12.3.3 CH installation stays too hot

Possible causes	Solution
Faulty thermostat.	▶ Check thermostat for issues; short circuit, batteries where applicable etc, replace thermostat if necessary.
Faulty temperature sensor(s).	▶ Check all temperature sensors; replace faulty sensor

12.3.4 Malfunction of the outdoor unit

Possible causes	Solution
Outdoor unit does not start up.	<ul style="list-style-type: none"> ▶ Check the supply voltage, 230V AC 50Hz, see §5.3 ▶ Check the isolator switch is turned on. ▶ Check the switched line powered between the indoor unit and outdoor unit. ▶ Check the fuses in the outdoor unit; replace if necessary.
Heat output capacity of the outdoor unit is too low.	<ul style="list-style-type: none"> ▶ Possible ice formation/debris accumulation restricting the evaporator: carefully clean the evaporator or remove the ice/snow see §13.3 ▶ Check the settings; adjust settings if necessary. ▶ Check operation of air intake NTC; replace if necessary. ▶ Too little refrigerant in the system: check for leaks and top up the system if necessary (should only be performed by an F-gases certified installer).
Low pressure problems at start-up.	<ul style="list-style-type: none"> ▶ Filter blockage. Replace filter. ▶ Check EEV (Electronic expansion valve) cables. ▶ Check whether the solenoid on the EEV is faulty. ▶ No airflow in heat exchanger; check fan operation; check whether the heat evaporator is clean. ▶ Shortage of refrigerant in the system: check for leaks and top up (should only be performed by an F-gas certified installer).
Compressor won't start.	<ul style="list-style-type: none"> ▶ No compressor voltage; check power supply/fuses ▶ Check electrical connections. ▶ Compressor protection triggered; compressor temperature too high. ▶ Check refrigerant fill level.
Compressor makes a high-pitched sound	<ul style="list-style-type: none"> ▶ Fluid refrigerant enters compressor; poor evaporation in system. Find cause and try to resolve it. ▶ Faulty compressor; repair compressor.
Fan is not operating	<ul style="list-style-type: none"> ▶ Faulty fan fuse; replace fuse. ▶ Faulty fan motor; replace motor. ▶ Fan printer circuit board is faulty or internal cables are damaged.
The compressor works, but there is no heat output from the heat pump.	<ul style="list-style-type: none"> ▶ Shortage of refrigerant in the system: check for leaks and top up (should only be performed by an F-gas certified installer). ▶ Evaporator faulty; locate and replace if required. ▶ Compressor faulty; replace compressor.



IMPORTANT

- ▶ **If a fault/notification causes the boiler to operate and take over from the hybrid heat pump system, it can have an adverse effect on the end user's energy consumption.**
- ▶ **Replace defective parts with original Intergas parts only.**
- ▶ **Failure to install the sensors or installing them incorrectly may result in serious damage.**

13 MAINTENANCE

The entire hybrid heat pump system must be serviced and cleaned on an annual basis by an authorised installer.



CAUTION

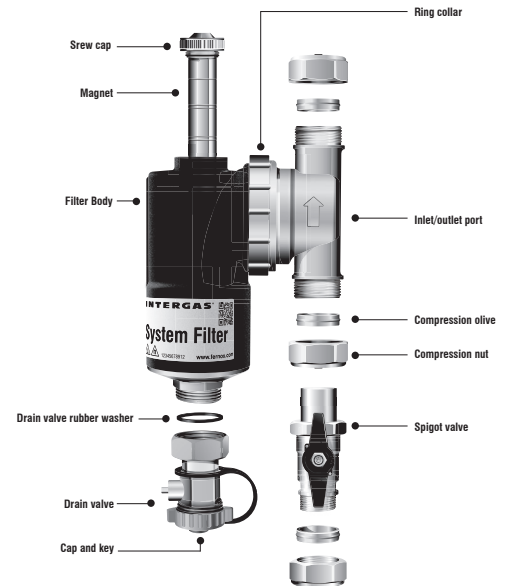
- ▶ **When the system has just been operating, certain components may be hot to touch.**

13.1 Cleaning the filter

- ▶ Clean the filter. Proceed as follows:
 1. Isolate the power to both the CH-boiler and the indoor units.
 2. Close the boiler isolation valves and filter spigot valve.
 3. Unscrew the system filter drain valve cap.
 4. Use the drain valve cap to open the drain valve.
 5. Unscrew and remove the magnet from the filter.
 6. Drain the dirty water from the filter into a bucket or hosepipe by slowly opening the spigot valve at the bottom of the filter.
 7. Close the drain valve again.
 8. Replace the magnet back into the filter.
 9. Open the boiler and spigot isolation valves.
 10. Check the system pressure and if necessary increase to 1.5 to bar.
 11. Re-establish the power to both the CH-boiler and the indoor units.



- ▶ **Intergas recommend using our own system filter as illustrated. When using a different manufacturers magnetic and hydronic separation filter please refer to their instructions for maintenance and cleaning.**



13.2 Indoor unit maintenance work

- ▶ Check the water pressure in the system through the WiFi control screen, or the boiler display where applicable. Fill and vent the system if necessary.
 - The recommended water pressure is 1.5 to 2 bar.
 - If the system requires a top up twice a year or more, check for leaks.
- ▶ Isolate the indoor unit from the mains power by switching off the fused spur and removing the fuse.
- ▶ Loosen the screw below the indoor unit and remove the front cover; see **§8.3.3**.
- ▶ Ensure all pipework and refrigerant lines have cooled down.
- ▶ Ensure that all sensors are correctly located and that the wiring is not damaged or disconnected. Repair/replace if necessary.
- ▶ Ensure there are no water leaks, repair where required.
- ▶ Replace the front cover and tighten the screw under the device; see **§8.3.3**.
- ▶ Clean the outside of the unit with a damp cloth. Do not use aggressive or abrasive cleaning agents or solvents.
- ▶ Re-establish the power supply by replacing the fuse and switching on the fused spur.
- ▶ Acquire a readout from the device using the Wi-Fi control screen.

13.3 Outdoor unit maintenance work



CAUTION

- ▶ **If the outdoor unit is not cleaned regularly, this may lead to poor output, freezing, leaks or problems with the compressor.**
- ▶ **The evaporator fins are very delicate and have sharp edges. Use safety gloves as a precaution to prevent any injuries.**

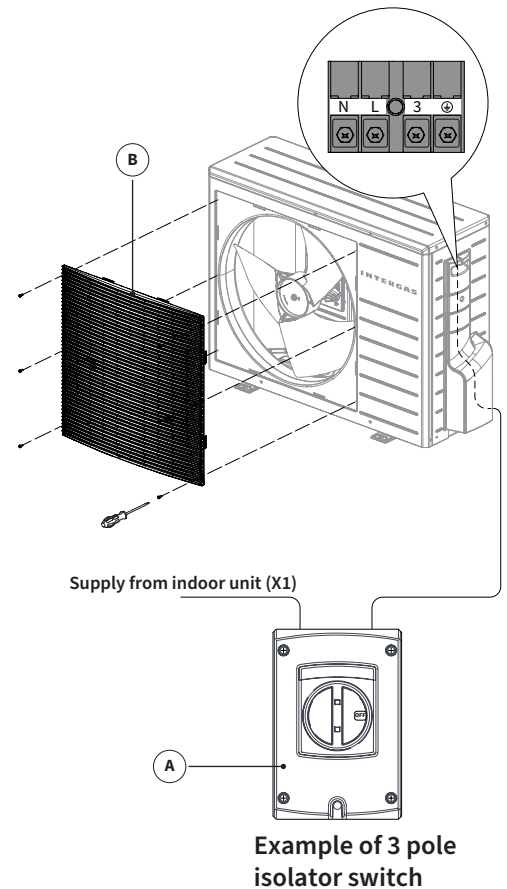


WARNING

- ▶ **If the outdoor unit is disconnected from power, the electrical circuitry in the outdoor unit will still be live for another 8 to 10 seconds.**

For environmental and technical reasons, regular cleaning and maintenance of the outdoor unit is recommended to ensure maximum efficiency and correct operation of the outdoor unit.

- ▶ Note to see if there is any excess noise or vibration from the outdoor unit due to debris build-up on the fan blades etc.
- ▶ Isolate the outdoor unit from the power supply by turning the 3 pole isolator switch to off (A).
- ▶ Remove any dirt, leaves and debris from around the unit.
- ▶ Check for any damage to the outdoor unit, repair or replace any damaged components.
- ▶ Check for any damage to the refrigerant pipework insulation, replace any damaged areas and ensure it is sealed from the elements.
- ▶ Remove the front grill (B) so that the fan and evaporator can be accessed easily. Clean the fan by hand with a damp soft microfibre type cloth (Do not use any solvent type cleaners).
- ▶ Check the rotation and balance of the fan. If either of these is noticeably poor, the fan blade or motor must be replaced.
- ▶ Clean the aluminium fins of the evaporator by carefully spraying water onto the back of them. Check the fins for damage as well and repair them if necessary by using a fin alignment comb.
- ▶ Check for signs of rust or scratching on the coating of the outdoor unit, and repair faulty components or apply rust-resistant paint if required.
- ▶ Refit the front grill (B) to the outdoor unit and to prevent vibration or noise, ensure it is located correctly and secured with all 6 screws.
- ▶ Clean the outside of the unit with a damp cloth. Do not use aggressive or abrasive cleaning agents or solvents.
- ▶ Turn the isolator switch (A) back to on.



13.4 Decommissioning the system

Decommissioning can only be completed by an F-Gas qualified and registered engineer.

13.4.1 Removing and recycling

- ▶ Isolate the heat pump from power by switching the 3 pole isolator switch to off.
- ▶ Isolate the indoor unit from the mains by switching off and removing the fuse, then remove the power cable from the fused spur.
- ▶ Recover the refrigerant into a cylinder specifically for this purpose weighing and recording this using the appropriate documentation.
- ▶ Drain the heating circuit and remove all redundant pipework.
- ▶ Disconnect and remove the refrigerant lines.
- ▶ Disconnect the hydraulic connections.
- ▶ Destroy or recycle the components in accordance with local or national legislation.



13.4.2 Collecting refrigerant



IMPORTANT

Prior to recovering refrigerant:

- ▶ **Wear the correct PPE safety equipment.**
- ▶ **Ensure there is 230V supply to the unit.**
- ▶ **Have the correct tools at hand.**
- ▶ **The devices or cylinders used to collect the refrigerant must meet all applicable standards and be completed to ISO 11650.**

Procedure:

1. Check the quantity of refrigerant present in the system. If extra refrigerant has been added, this should be stated on the field charge label on the outdoor unit. See **§8.6.6 (point 7)**.
2. Ensure that no refrigerant is able to escape into the atmosphere.
3. Perform an analysis beforehand to see if the refrigerant can be reused.
4. Isolate the power supply.
5. Weigh and record the weight of the recovery cylinder before starting.
6. Connect manifold, gauges and recovery pump etc.
7. Keep the recycling cylinder on a scale.
 - Recovery cylinders should never be overfilled.
 - Keep an eye on the temperature as well as the operating pressure: these cannot be exceeded.
8. Begin the recovery procedure.
9. Close the isolation / service valves on the device.
10. The cylinders should be removed from the location as soon as possible.

13.4.3 Label

Decommissioning the system can only be performed by an F-gas certified installer. After the system has been decommissioned, the installer must apply a signed and dated label.

This label states that the system has been decommissioned and the refrigerant has been removed, see GOV.UK for further guidance.

14 PRODUCT FICHE (COMMISSION DELEGATED REGULATION (EU) 811/2013)

Supplier		Intergas Heating Limited Unit 2 Easter Park Worcester Road Kidderminster DY11 7AR
Type designation	Unit	Hybrid heat pump system Xtend 5
Seasonal energy efficiency class for space heating (average climate conditions - low temperature)		A++
Nominal heat output (average climate conditions - low temperature)	kW	5
Seasonal energy efficiency class for space heating (average climate conditions - low temperature)	%	160
Annual energy consumption (average climate conditions - low temperature)	kWh	2438
Annual energy consumption - GCV (average climate conditions - low temperature)	GJ	-
Sound output level (indoor)	dB	32
Precautions for assembly, installation and maintenance		See installation instructions
Nominal heat output (colder climate conditions - low temperature)	kW	-
Nominal heat output (warmer climate conditions - low temperature)	kW	-
Seasonal energy efficiency class for space heating (colder climate conditions - low temperature)	%	-
Seasonal energy efficiency class for space heating (warmer climate conditions - low temperature)	%	-
Annual energy consumption (colder climate conditions - low temperature)	kWh	-
Annual energy consumption - GCV (colder climate conditions - low temperature)	GJ	-
Annual energy consumption (warmer climate conditions - low temperature)	kWh	-
Annual energy consumption - GCV (warmer climate conditions - low temperature)	GJ	-
Sound output level (outdoor)	dB	49

16 SPARES SHORT LIST (OUTDOOR UNIT)

Description	Part number
Replacement fan guard grill & front housing panel 5kW unit	812007
Replacement compressor unit 5kW	812017
Replacement compressor heater 5 kW (23W)	812027
Replacement service valve (1/2" Gas line) including Schrader valve test point	812037
Replacement service valve (1/4" Liquid line)	812047
Replacement electronic expansion valve	812057
Replacement reversible 4 way valve	812067
Replacement PCB controller	812077
Replacement transformer 16amp	812087
Replacement fan motor 85W	812097
Replacement fan blade 20" x 3	812107
Replacement evaporator sensor	812117
Replacement sensor (discharge line)	812127
Replacement sensor (suction line)	812137
Replacement sensor (ambient rear housing)	812147
Replacement fan motor mounting bracket	812157
Replacement housing panel (left & right sides)	812167
Replacement housing panel (top)	812177
Replacement housing panel (plastic service cover)	812187
Replacement screw fixing set (x 10)	812197

17 WARRANTY PROVISIONS

1. The installer must be registered with F-Gas or REFCOM and complete the Intergas Commissioning Checklist in full at the time the Hybrid is installed. The checklist must be made available and can be found at the back of the installation instructions. The Intergas Commissioning Checklist must be retained on site by the owner/occupier for inspection during an engineer's visit.
2. The Hybrid and Intergas system filter* must both be registered for warranty with Intergas by either the installer or you the householder, within 30 days of the Hybrid being installed. For the new build properties, this must be done within 30 days of the sale being completed. If these conditions are not met, the warranty will not be valid.
(*Intergas system filter must be installed on the same date as the Hybrid and registered for warranty at the same time).

The product must be registered via the internet at www.intergasheating.co.uk or on the Intergas MiREG website www.myintergasregistration.co.uk or by returning the warranty card.

3. The Hybrid must be serviced annually by an F-Gas or REFCOM registered Engineer in accordance with manufacturer's instructions.
4. Service details must be recorded in the service work record or provide proof of service which must be available for inspection.
5. The cost of the annual service is not included in the warranty.

If the above conditions are not met this warranty will be limited to 12 months from the date of installation or date of Manufacture, as recorded on the Intergas commissioning checklist.



IMPORTANT

Warranty terms mentioned above are based on domestic use only. Any non-domestic applications will be covered by a 12 months warranty. Service intervals may need to be increased depending on commercial usage. For additional information please contact Intergas Heating Ltd.

6. Only Hybrid component failures are covered by the warranty. The warranty does not cover any connected system or accessories such as time switches, thermostats, motorised valves, external pumps and so on.
7. Any repair carried out under the terms of this warranty does not extend the warranty beyond its original period
8. If the Hybrid breaks down, Intergas may ask you* (Homeowner or Installer) to pay a deposit before we visit to complete the repair. We will return the deposit in full if we find a fault that is covered by the warranty. We may keep the deposit if we cannot access the property at the time we have arranged with you to visit or we find other conditions of this warranty have not been met.
9. The system must be flushed and cleansed in accordance with BS7593:2019.
10. If any failure is caused by contaminated water in the system the engineer visit and failed parts becomes chargeable.
11. All installation, non Hybrid or external system faults calls will be charged to the home owner/occupier.
12. Roof space installation to BS6798:2014 Require a permanently fixed loft ladder to access installations in lofts or attics. Adequate lighting and permanently fixed flooring must also be present.
13. Engineers will not carry out repairs if they think accessing any part of the Hybrid would be a risk to Health and Safety. A responsible adult must be at the property to give our engineer access to the Hybrid indoor and outdoor units.
14. If the indoor unit is in a cupboard, there must be enough room for the engineer to work (the minimum area as set out in the installation instructions). We are not responsible for removing cupboards, kitchen units, trims etc to gain access for repairs.

15. When connected to a 3rd party boiler, Intergas heating Ltd will not be held responsible for any issues of operation or electrical communication that prevents the correct functionality of the Hybrid system whether via OpenTherm protocol or on/off control. Engineer call outs may be chargeable and not covered under the terms of this warranty if the fault is diagnosed to the 3rd party Natural gas, LPG or oil fired appliance.
16. The central heating system must be maintained in accordance with the Benchmark Guidance on water Treatment in Central Heating Systems & BS7593:2019, we recommend the use of Fernox, Sentinel or Adey products, Inhibitors & filters. It is important that the correct concentration of water treatment is maintained for the life of the Hybrid unit, should we attend a warranty call Intergas reserve the right to take system water samples and should they fail the aforementioned requirements then the warranty will be void and the call will become chargeable. (Intergas system filter must be installed & registered at the same time as the Xtend Indoor and outdoor units for the enhanced warranty period).
17. If the unit suffers a breakdown you should contact Intergas Heating on 01527 888000 selecting option 2. Our normal working hours, excluding Bank Holidays are:
8.00am – 5.00pm Monday to Friday
8.00am – 5.00pm Monday to Friday

Website: www.intergas.co.uk

Technical & Service: service@intergas-heating.co.uk

Installers are required to carry out installation, commissioning and servicing work in accordance with the manufacturers instructions and any current regulations in force at that time.

18 HYBRID SYSTEM COMMISSIONING CHECKLIST AND WARRANTY VALIDATION RECORD

Customer name and address:											
Customer phone number:				Customer email address:				Post code:			
Indoor unit serial number:											
Outdoor serial number:											
Intergas system filter serial number:											
Commissioned by (PRINT NAME):						F-Gas / REFCOM registration number:					
Company name:						Telephone number:					
Company address:						Company email:					
						Post code:			Commissioning date:		
Does the outdoor unit location comply with current planning regulations?											Yes
Has the installation been approved with local Building Control?				N/A	Yes		Approved planning certification number:				
Have you completed the ENA application form (EVCP & HP Connections) with your local DNO (Distribution Network Operator)?										Approval number	
CONTROLS USED											
Heating controls connected to the indoor unit										Flue gas heat recovery (Boiler)	
										Load compensation	
OpenTherm room thermostat		OpenTherm Make & model						Weather compensation			
On/Off room thermostat		Intergas gateway fitted						Outdoor sensor fitted			
App controlled thermostat		PDHW						Outdoor sensor located on North facing wall			
Zone controls		Cylinder NTC						External flow sensor fitted			
Smart TRV's		Water pressure reducing valve						Full flow L/P non return fitted to boiler return			
WATER QUALITY											
The system has been flushed, cleaned and a suitable inhibitor added upon final fill, in accordance with BS7593 and our manufacturr's instructions.											
What system cleaner was used?				Brand:		Product:			Qty Ltrs		
What inhibitor has been added to the system?				Brand:		Product:			Qty Ltrs		
What additional inhibitor has been used for low temperature protection?				Brand:		Product:			Qty Ltrs		
System filter fitted to indoor unit return pipework				Yes	Make and model of system filter						
CENTRAL HEATING											
Buffer tank installed		Yes	System water capacity		Ltrs						
Buffer tank installed parallel			Underfloor heating		Zones						
Buffer tank in series			Underfloor heatloss		kW						
Buffer tank capacity		Ltrs	Radiators fitted		Qty						
Central heating flow temperature		°C	Radiators heatloss		kW						
Central heating return temperature		°C	Total heatloss		kW						
System correctly balanced?		Yes	Running cost per hour = heater size (kW) x unit cost of electricity (kWh)								
OUTDOOR UNIT											
Has the OD unit been installed with a 3 pole isolation switch near to the housing				Minimum distance in front of the unit				mm			
Has the OD unit been installed on a level surface				Minimum distance from rear of unit				mm			
Has the OD unit been installed away from other heat sources				Minimum distance from right side of unit				mm			
Has the OD unit been installed over gravel to facilitate drainage				Minimum distance from left side of unit				mm			
Has the OD unit been installed where it is protected from falling debris				Minimum distance below the unit				mm			
Has the OD unit been installed where it will not be subject to adverse weather conditions				Dimensions of the OD the unit				mm			
INDOOR UNIT											
Minimum distance in front of the unit				mm		Insulation to refrigerant connections above the unit					
Minimum distance above the unit				mm		Low loss header connected to the unit 22mm flow					
Minimum distance below the unit				mm							
Minimum distance either side of the unit				mm							
REFRIGERANT											
Have the refrigerant lines been insulated correctly (inside and outside of property)				Recorded pressure of strength test for refrigerant lines				bar			
Have the refrigerant lines been protected with a proprietary cladding and secured correctly				Recorded Vac pressure for refrigerant lines				Micron			
Total length of refrigerant lines				mtrs		Recorded additional refrigerant (where applicable)*				grams	
INSTALLATION WIZARD											
Record Wizard settings	Room thermostat:		(Type)		Boiler boost activation when manually adjusting the thermostat:		<input type="radio"/> Yes (Comfort) <input type="radio"/> No (Ecologic)				
	Main heating system:		(Rads/underfloor)		Enable silent mode schedule:		<input type="radio"/> Yes <input type="radio"/> No				
	Maximum flow temperature of the whole system (heat pump & boiler):		°C		Activat heat pump blockage schedule:		<input type="radio"/> Yes <input type="radio"/> No				
	Boiler activation during heat pump defrost cycle:		<input type="radio"/> Always (comfort) <input type="radio"/> Only at low water temperature		Bivalent mode & COP setting:		<input type="radio"/> Standard · COP setting		Minimum 1.0 COP Maximum 10.0 COP		
	Connection of Xtend to boiler:		<input type="radio"/> OpenTherm <input type="radio"/> On / Off		Boiler blocked above (°C):		°C				
	CH water flow temp sensor installed:		<input type="radio"/> Yes <input type="radio"/> No		Heat pump is blocked under (°C):		°C				
CH water flow temp sensor installed:		<input type="radio"/> Yes <input type="radio"/> No		Current time format set:		<input type="radio"/> Yes					
The operation of the Hybrid and system controls have been explained and demonstrated and understood by the customer											Yes
The manufacturers' literature, including warranty checklist, has been explained and left with the customer											Yes
Commissioning Engineer's signature						Signature			Print		
Customer's signature (To confirm satisfactory demonstration and receipt of manufacturers literature)						Signature			Print		

*Complete the field charge sticker and place it on outdoor unit, additional refrigerant must be recorded as per Article 6 of Regulation (EC) No 517/2014 commonly referred to as the F-Gas regulations.

19 SERVICE & INTERIM HEAT PUMP WORK RECORD

It is essential for reliability and efficiency that your heat Hybrid heat pump and heating system are regularly serviced and maintained in line with our manufacturer's instructions and that the appropriate service / interim work record is completed below.

Service provider

When completing a service record (as below), please ensure you have carried out the service as described in the manufacturers' instructions. Always use the Intergas specified spare parts.

SERVICE / INTERIM WORK ON HEAT PUMP <small>delete as appropriate</small>		Date:	
Engineer name:	Company name:		
Telephone N°:	F-Gas/REFCOM reg N°:		
Indoor unit checks			
System pressure correct	Yes		bar
NTC sensors connected / located correctly	Yes		Yes
Outdoor unit checks			
Debris from around unit cleaned (leaves and dirt etc).	Yes		
Fan blades and grill cleaned (check for noise).	Yes		
Evaporator fins cleaned with water (do not touch).	Yes		
Any parts fitted / replaced:			
System inhibitor concentration has been checked and appropriate action taken in accordance with BS 7593 and the magnetic filter cleaned correctly*.			Yes
Comments:			
Signature:			

*A system inhibitor efficacy test is required at every annual service in accordance with our manufacturers instructions and BS 7593. The system filter must be cleaned as per the filter manufacturers instructions.

SERVICE / INTERIM WORK ON HEAT PUMP <small>delete as appropriate</small>		Date:	
Engineer name:	Company name:		
Telephone N°:	F-Gas/REFCOM reg N°:		
Indoor unit checks			
System pressure correct	Yes		bar
NTC sensors connected / located correctly	Yes		Yes
Outdoor unit checks			
Debris from around unit cleaned (leaves and dirt etc).	Yes		
Fan blades and grill cleaned (check for noise).	Yes		
Evaporator fins cleaned with water (do not touch).	Yes		
Any parts fitted / replaced:			
System inhibitor concentration has been checked and appropriate action taken in accordance with BS 7593 and the magnetic filter cleaned correctly*.			Yes
Comments:			
Signature:			

*A system inhibitor efficacy test is required at every annual service in accordance with our manufacturers instructions and BS 7593. The system filter must be cleaned as per the filter manufacturers instructions.

SERVICE / INTERIM WORK ON HEAT PUMP <small>delete as appropriate</small>		Date:	
Engineer name:	Company name:		
Telephone N°:	F-Gas/REFCOM reg N°:		
Indoor unit checks			
System pressure correct	Yes		bar
NTC sensors connected / located correctly	Yes		Yes
Outdoor unit checks			
Debris from around unit cleaned (leaves and dirt etc).	Yes		
Fan blades and grill cleaned (check for noise).	Yes		
Evaporator fins cleaned with water (do not touch).	Yes		
Any parts fitted / replaced:			
System inhibitor concentration has been checked and appropriate action taken in accordance with BS 7593 and the magnetic filter cleaned correctly*.			Yes
Comments:			
Signature:			

*A system inhibitor efficacy test is required at every annual service in accordance with our manufacturers instructions and BS 7593. The system filter must be cleaned as per the filter manufacturers instructions.

SERVICE / INTERIM WORK ON HEAT PUMP <small>delete as appropriate</small>		Date:	
Engineer name:	Company name:		
Telephone N°:	F-Gas/REFCOM reg N°:		
Indoor unit checks			
System pressure correct	Yes		bar
NTC sensors connected / located correctly	Yes		Yes
Outdoor unit checks			
Debris from around unit cleaned (leaves and dirt etc).	Yes		
Fan blades and grill cleaned (check for noise).	Yes		
Evaporator fins cleaned with water (do not touch).	Yes		
Any parts fitted / replaced:			
System inhibitor concentration has been checked and appropriate action taken in accordance with BS 7593 and the magnetic filter cleaned correctly*.			Yes
Comments:			
Signature:			

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SERVICE & INTERIM HEAT PUMP WORK RECORD

It is essential for reliability and efficiency that your Hybrid heat pump and heating system are regularly serviced and maintained, in line with our manufacturer's instructions and that the appropriate service / interim work record is completed below.

Service provider

When completing a service record (as below), please ensure you have carried out the service as described in the manufacturers' instructions. Always use the Intergas specified spare parts.

SERVICE / INTERIM WORK ON HEAT PUMP <small>delete as appropriate</small>		Date:	
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Telephone N°:	F-Gas/REFCOM reg N°:		
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Intergas Heating Ltd

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