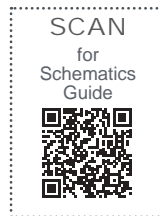




INSTALLATION & MAINTENANCE

HP290 MONOBLOC HEAT PUMP SYSTEM



When replacing any part on this appliance, use only spare parts that you can be assured conform to the safety and performance specification that we require. Do not use reconditioned or copy parts that have not been clearly authorised by Ideal Heating.

For the very latest copy of literature for specification and maintenance practices visit our website idealheating.com where you can download the relevant information in PDF format.



NOTES FOR THE INSTALLER

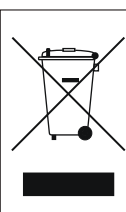
For any technical queries please contact the Ideal installer helpline : 01482 498663

SAFETY DEFINITIONS

 **WARNING: Risk of injury or death.**

 **CAUTION: Risk of damage to objects.**

 **IMPORTANT: notes to make you aware.**



WEEE DIRECTIVE 2012/19/EU
Waste Electrical and Electronic Equipment Directive

- At the end of the product life, dispose of the packaging and product in a corresponding recycle centre.
- Do not dispose of the unit with the usual domestic refuse.
- Do not burn the product.
- Remove the batteries.
- Dispose of the batteries according to the local statutory requirements and not with the usual domestic refuse.



The code of practice for the installation, commissioning and servicing of central heating systems



NOTE TO INSTALLER: COMPLETE THE BENCHMARK COMMISSIONING CHECKLIST AT THE REAR OF THIS BOOK AND LEAVE THESE INSTRUCTIONS WITH THE APPLIANCE

Ideal Heating reserve the right to vary specification without notice

CONTENTS

Section 1 - General	6
1.1 Documentation.....	6
1.2 General Safety Instructions.....	6
1.3 Regulations.....	7
1.4 System Configurations.....	8
Section 2 - Product Information	9
2.1 ERP Data.....	9
2.2 Heat Pump Outdoor Unit.....	9
2.3 DHW Cylinders.....	12
2.4 Control Box.....	20
2.5 Contents Provided with Appliance.....	21
2.6 Location of Data Plates.....	22
2.7 Heat Pump Operating Principles.....	23
Section 3 - Pre-Installation Checks	24
3.1 System Combinations.....	24
3.2 Primary Heating System Requirements.....	24
3.3 Heat Pump - Installation Area.....	25
3.4 Cylinder - Installation Area.....	28
3.5 Control Box - Installation Area.....	29
Section 4 - Installation	30
4.1 Installation of Heat Pump.....	30
4.2 Installation of Indoor DHW Cylinder.....	40
4.3 Installation of Control Box.....	44
4.4 Installation of System.....	49
Section 5 - Commissioning	50
5.1 Pre-Commissioning Checklist.....	50
5.2 Commissioning of Hydronic Circuit.....	50
5.3 Filling the System.....	52
5.4 System Air Venting.....	52
5.5 Activation of System.....	53
5.6 Heat Pump Indoor Control Box Homepage.....	58
5.7 Operating Status.....	59
5.8 Menu.....	59
5.9 Default System Parameters.....	78
Section 6 - Inspection and Maintenance	85
6.1 Normal Operation Features.....	85
6.2 Overall Maintenance Plan Table.....	85
6.3 Heat Pump Service and Maintenance Procedure.....	86
Section 7 - De-Commissioning	89
7.1 De-Commissioning.....	89
Section 8 - Recycle and Disposal	90
8.1 Packaging.....	90
8.2 End of Product Life.....	90
Section 9 - Fault Finding	91
9.1 Fault Help.....	91
Appendix	121
1.1 System Schematics.....	121
1.2 Pump Pressure Curves.....	130
1.3 R290 Outdoor Unit Wiring without Indoor Unit.....	133
1.4 HP290 Cascade wiring.....	139

TABLES

Table 1	Data - Heat Pump Outdoor Unit.....	9
Table 3	Minimum Installation Clearances.....	10
Table 2	Product Dimensions.....	10
Table 4	Clearances between multiple units.....	11
Table 5	Single Zone Pre-plumbed Cylinders.....	12
Table 6	Two Zone Pre-plumbed Cylinders with Integrated Low Loss Header.....	14
Table 7	Single Zone Pre-plumbed Cylinder with Integrated Buffer.....	16
Table 8	Two Zone Pre-plumbed Cylinder with Integrated Buffer.....	18
Table 9	Control Box.....	20
Table 10	Content provided with DHW Cylinders.....	21
Table 11	System Specification.....	24
Table 12	Weights of Unpackaged Units.....	31
Table 13	Connection Sizes.....	34
Table 14	Sizing of Copper Discharge Pipe.....	42

Table 15	Pre-Commissioning Checklist	50
Table 16	Glycol Concentration vs Expected Min. Outdoor Temp	51
Table 17	Glycol Concentration vs Performance	51
Table 18	USB changed parameters	53
Table 19	Table of Limitation	75
Table 20	System User Parameters	78
Table 21	System Installer Parameters	82
Table 22	Maintenance Tasks	85
Table 23	Discharge pressure (P1) for heating/DHW mode	107
Table 24	Main Circuit Board (Outdoor)	117

FIGURES

Figure 1.	System Configurations	8
Figure 2.	Heat Pump - Dimensions	10
Figure 3.	Heat Pump - Clearances	10
Figure 4.	Clearances between multiple units	11
Figure 5.	Plan View - PP Single Zone - 475 mm	12
Figure 6.	Plan View - PP Single Zone - 550 mm	12
Figure 7.	HP290 DHW pre-plumbed slimline cylinder	13
Figure 8.	HP290 DHW pre-plumbed cylinder	13
Figure 9.	Plan View - PP Two Zone LL - 475 mm	14
Figure 10.	Plan View - PP Two Zone LL - 550 mm	14
Figure 11.	HP290 DHW pre-plumbed slimline cylinder	15
Figure 12.	HP290 DHW pre-plumbed cylinder	15
Figure 13.	Plan View - PP Single Zone Buff - 550 mm	16
Figure 14.	Plan View - PP Single Zone Buff - 630 mm	16
Figure 15.	HP290 DHW pre-plumbed cylinder	17
Figure 16.	HP290 DHW pre-plumbed cylinder	17
Figure 17.	Plan View - PP Two Zone Buff - 550 mm	18
Figure 18.	Plan View - PP Two Zone Buff - 630 mm	18
Figure 19.	HP290 DHW pre-plumbed cylinder	19
Figure 20.	HP290 DHW pre-plumbed cylinder	19
Figure 21.	Control Box - Dimensions	20
Figure 22.	Control Box - Clearances	20
Figure 23.	Heat Pump - Location of Data Plate and Serial Number	22
Figure 24.	DHW Cylinder - Location of Data Plates	22
Figure 25.	Control Box - Location of Data Plates	22
Figure 26.	Closed Refrigerant Circuit	23
Figure 27.	Heat Pump PRV Outlet (4.5-6 kW model shown)	26
Figure 30.	Installation in corner	27
Figure 28.	Freestanding installation	27
Figure 29.	Installation in front of wall	27
Figure 31.	Dimensions of Mounting Fixtures (8 - 14 kW)	30
Figure 32.	Dimensions of Mounting Fixtures (4.5 - 6 kW)	30
Figure 33.	Heat Pump Base Panel (4.5 - 6 kW)	33
Figure 34.	Heat Pump Base Panel (8 - 14 kW)	33
Figure 35.	Condensate Spigot installation	33
Figure 36.	Primary Heating Connections	34
Figure 37.	Heat Pump - Panel Removal	35
Figure 38.	Transport Bracket Installation	36
Figure 39.	Routing the Cables	38
Figure 40.	Mains Supply Connections to Outdoor Unit	39
Figure 41.	Communications Connections between Outdoor Unit and Control Box	39
Figure 42.	Typical Discharge Pipe Arrangement	42
Figure 43.	Immersion Heater Wiring	43
Figure 44.	Front Panel Removal	44
Figure 45.	Front Panel Mounting	45
Figure 46.	Control Box - Internal Wiring	46
Figure 48.	Installer Wiring Connections	47
Figure 47.	Contactors Diagram	47
Figure 49.	Typical Antifreeze Valve	51
Figure 50.	Antifreeze Installation Recommendations	51
Figure 51.	Auto Air Vent Dust Cap	52
Figure 52.	Types of HP290 Control Box which require DIP Switch S2 Position 1 to be set to ON	53
Figure 53.	HP290 Monobloc (Access to Outdoor Control PCB)	54
Figure 54.	HP290 Heat Pump Controller	54
Figure 55.	Outdoor PCB	55
Figure 56.	Control Box display	55
Figure 57.	Control Box Homepage display	58
Figure 58.	Operating status display	59
Figure 59.	Menu display	59
Figure 60.	HP290 Standard curve graph	61
Figure 61.	Heat Pump - Top and side panel installation	86
Figure 62.	Heat Pump - Electrical panel installation	86

Figure 63. Front Panel Removal	87
Figure 64. XT1 Connector	96
Figure 65. Indoor PCB (Section view)	99
Figure 66. XT1 Connector	101
Figure 67. Main Control Circuit Board (Outdoor)	116
Figure 68. Refrigerant Circuit Diagram	132
Figure 69. R290 Outdoor unit wiring diagram	133
Figure 70. Single zone room thermostat wiring	134
Figure 71. Two zone room thermostat wiring	134
Figure 73. Control Box (Indoor)	139
Figure 72. HP290 Cascade wiring diagram	139

1.1 DOCUMENTATION

This is an original manual and must not be modified or translated without the expressed permission of Ideal Heating.

This document applies to the installation and maintenance of the following individual and combined products when installed in the United Kingdom and Republic of Ireland:

- HP290 Monobloc Heat Pump
- HP290 Control Box
- HP290 Controller
- HP290 Single Zone Preplumbed Cylinder
- HP290 Two Zone Preplumbed Cylinder
- HP290 Preplumbed Cylinder with Integrated Buffer

The document is to be used for reference on installation and maintenance of these systems by heating system installers, refrigeration engineers, and electricians.

This information is provided to assist in the selection of equipment. Responsibility for selection and specification of our equipment is that of the customer, expert or consultant concerned with the installation.

All instructions must be left with the user. It must be communicated to the user that these documents are to be safely stored for future service records.

This document is to be used in combination with the below documents:



1.2 GENERAL SAFETY INSTRUCTIONS

Prior to installation and maintenance of the product, make sure that:

- General safety instructions are read and understood.
- When working on the outdoor unit with the casing panels removed, a gas detector must be present which is set to $\leq 25\%$ of the lower explosive limit of R290.

If the gas detector indicates that R290 is present, work must be stopped and a Cat I or Cat II F-gas certified engineer with a City and Guilds 6187-21 certificate or equivalent must be contacted.

- There is an awareness of relevant regulations and guidelines, and that they are obeyed.
- Sections specific to the work to be undertaken are read.
- Work performed is correctly documented.

1.2.1 Risks and Warning

⚠ WARNING: Failure to obey the warnings can result in death or severe injury. Detailed hazardous events and how to prevent them are presented in their relevant sections throughout the document.

Flammable Refrigerant

- The heat pump is charged with R290 which is a flammable, odourless, and colourless refrigerant. A leak from the refrigerant circuit can create a hazardous environment. To reduce the risk of a hazardous event, the installation instructions must be followed. The installation area must be kept clear of ignition sources, including but not limited to; electrical switches, electrical plug sockets, and lamps.

Transport and Storage of Boxed Unit

- The heat pump must be transported and stored in an upright position. When still in the packaging, the product and surrounding area should be kept clear of ignition sources and should be handled with caution.

Installation and Safety Devices

- If the installation requirements of this document are not upheld there is increased risk of a hazardous event occurring. All pre-installation checks and the specific installation requirements of each individual product and the system must be implemented and obeyed.

Modification of the Products and Installation Environment.

- The product is not to be modified or tampered with in any way that is not defined and approved by this document. Make sure that the requirements for both the products and installation environments are always followed. The end user should be properly informed of the installation area and product requirements during the handover process.

Improper Maintenance

- The product is to be regularly maintained and serviced by an appropriately qualified service engineer. The end user should be properly informed of maintenance and care requirements during the handover process.

Inappropriate Operation

- The product is to be operated as outlined in both this document and the user manuals. The end user must be properly informed of intended and acceptable operation methods during the handover process.

Electrical Risk

- Work on electrical components must only be done by a competent electrician. Electrical supplies must be locked in the off position when any work is done near electrical components. Failure to comply with this requirement can result in severe injury or death.

If any of the supply cables are damaged, they must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

Correct Disposal of Waste

- Waste from the products, such as cardboard, plastics, and refrigerant must be disposed of appropriately and recycled where applicable. Refrigerant must not be released into the atmosphere.

Presence of Frozen Condensate in Walkways

- There is condensate produced by the Heat Pump which can potentially build up around the heat pump and freeze if not properly disposed of. Appropriate disposal methods of the condensate should be implemented and maintained to prevent slipping hazard.

Safe Handling

- The installer is responsible for their own health and safety. In the United Kingdom the manufacturer recommends that the installer refers to the newest revision of the guidance given in HSE document L23, Manual Handling Operations Regulations 1992 (Fourth Edition). The installer must do their own risk assessment to identify the correct and safest method of handling the heat pump (HSE Guide L23 - <https://www.hse.gov.uk/pubns/priced/l23.pdf>). In Ireland, the manual handling must comply with the Safety, Health and Welfare at Work, (General Applications) Regulations 2007.

1.2.2 Installer Qualification






⚠ WARNING: The product contains the hydrocarbon refrigerant R290 which is very flammable. The refrigerant may mix with air to form a flammable atmosphere increasing the risk of fire and/or explosion. Work that requires the removal of the exterior casing of the Heat Pump must only be done by competent persons who are familiar with the risks of R290 refrigerant. Work on the refrigeration circuit must only be done by a Cat I or Cat II F-gas certified engineer with a City and Guilds 6187-21 certificate or equivalent. Work done on the heat pump should be done in accordance with industry standard safety procedures and practices for working with hydrocarbons

⚠ WARNING: Work on electrical systems must only be done by competent persons.

⚠ WARNING: The DHW Cylinder must be installed by a competent person as defined by the relevant regulations. Manufacturers notes DO NOT overrule statutory obligations.

1.2.3 Appliance Symbols

Warning labels are affixed to several points on these products. These warning labels also include rules of conduct for the R290 refrigerant. Warning labels must not be removed.

Symbol	Meaning
	Flammable refrigerant
	At the end of the product life, dispose of the packaging and product in a corresponding recycle centre.
	Read the operating manual.
	Read the installation manual.
	Read the installation and operating manual.

1.2.4 Intended Use

The correct usage of products is specified within this document and must be obeyed.

⚠ WARNING: Failure to comply with the requirements stipulated within this documentation may result in increased risk of death, serious injury and/or damage to equipment and property.

The Heat Pump is an air-to-water monobloc heat pump to be installed in a domestic household with a sealed heating system. The Ideal HP290 setup parameters do not provide a cooling function.

The Heat Pump takes heat from ambient outdoor air for transfer into domestic hot water or a space heating system. This air is not to be ducted or re utilised and must be allowed to flow freely back into the natural environment.

The DHW cylinder is used to heat a store of domestic hot water. The DHW cylinder is to be installed within a domestic household.

The control box / heat pump controller is to be installed as this contains the control system and installer interfaces

needed for the initial setup and commissioning of the overall heating system. A limited interface is provided for the end user however it is envisaged that day to day interface will be via a Programmable Room Thermostat (PRT) i.e., Halo Lite RF.

If the Halo Lite RF is not installed as the Programmable Room Thermostat (PRT) and an alternative PRT is used it must have a maximum cycle rate of 1 per hour.

The following basic functionality is recommended:

- Setback Temperature with a maximum 3 °C below comfort temperature.
- Heating Schedule with a minimum 2.5-hour optimisation.

System schematic diagrams in this document are meant for reference only. It is the responsibility of the installer to make sure that all appropriate measures are implemented.

The installation must comply with all accompanying documentation and applicable local regulations and guidelines.

1.3 REGULATIONS

All installations must comply with the applicable local and national regulations such as:

- The Building Regulations (England and Wales).
- The Building Regulations (Scotland).
- Building Regulations (Northern Ireland). Building Control Acts 1990 to 2014 (Ireland).
- Local regulations and provisions of local electricity suppliers.
- BS 7671:2018 (IET Wiring regulations).
- The Electricity at Work Regulations 1989.
- Water Supply (Water Fittings) Regulations 1999 England and Wales.
- Water Supply (Water Fittings) (Scotland) Byelaws 2014.
- Water Supply (Water Fittings) Regulations (Northern Ireland) 2009.
- The Water Services Act 2007 (Ireland).

Detailed recommendations are contained in the following British Standards Codes of Practice. Listed below are the editions of the standards at the time of publication, it should be made sure that the current editions at the time of installation are used for reference.

BS EN 378:2016	Refrigerating systems and heat pumps. Safety and environmental requirements.
BS EN 1717:2000	Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by back flow
BS 7593:2019	Code of practice for the preparation, commissioning and maintenance of domestic central heating and cooling water systems
BS 7671:2018 +A2:2022	Requirements for Electrical Installations. IET Wiring Regulations
BS EN 14336:2004	Heating systems in buildings. Installation and commissioning of water-based heating systems.
BS EN 15450:2007	Heating systems in buildings. Design of heat pump heating systems.
BS EN 50160:2010 +A3:2019	Voltage characteristics of electricity supplied by public electricity networks View details
BS EN 12828:2012 +A1:2014	Heating systems in buildings. Design for water-based heating systems.
BS EN 12831-1:2017	Energy performance of buildings. Method for calculation of the design heat load. Space heating load, Module M3-3
BS 8558:2015	Guide to the design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages. Complementary guidance to BS EN 806
BS EN 806-1:2000	Specifications for installations inside buildings conveying water for human consumption. General
BS EN 12897:2016 (+A1:2020)	Water supply - specification for indirectly heated unvented (closed) storage water heaters
I.S. 10101 NSAI	National Rules for Electrical Installations
S.I. No. 497/1997	Building Regulations, Ireland.

1.4 SYSTEM CONFIGURATIONS

The basic HP290 Heat Pump configurations are illustrated in Figure 1.

For further information on available HP290 accessories, refer to Section 3.1 System Combinations on page 24.

For further information on HP290 Cylinder and associated component options, refer to Table 10 in Section 2.5.2 DHW Cylinders on page 21.

For further information on HP290 Cascade refer to APPENDIX 1.4 HP290 Cascade wiring.

For further information on appliance package contents, please refer to Section 4.1.3 Reveal and Unpacking on page 31.

Option 1:

- HP290 Monobloc Air Source Heat Pump**
- +**
- HP290 Pre-Plumbed Cylinder**
- +**
- Halo Lite RF**

Option 2:

- HP290 Monobloc Air Source Heat Pump**
- +**
- HP290 Control Box**
- +**
- Heat Pump DHW Cylinder**
- +**
- Buffer Tank (if required to meet minimum system volume/ Flow Rates)**
- +**
- Halo Lite RF**

Option 3:

- HP290 Monobloc Air Source Heat Pump**
- +**
- Heat Pump Controller**
- +**
- Heat Pump DHW Cylinder**
- +**
- Buffer Tank (if required to meet minimum system volume/ Flow Rates)**
- +**
- Halo Lite RF**

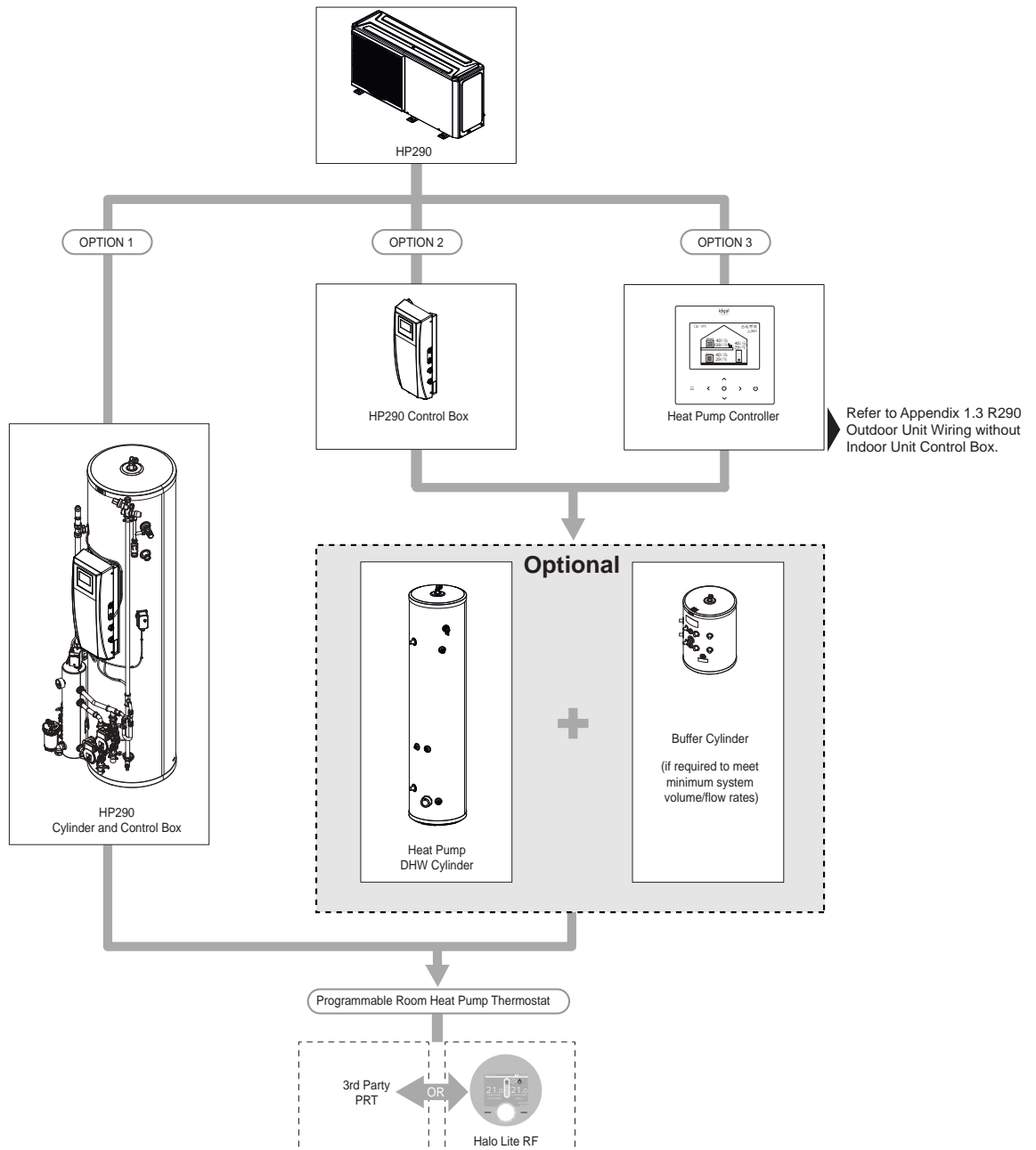


Figure 1. System Configurations

Section 2 - Product Information

2.1 ERP DATA

IMPORTANT: The following performance data is only applicable to brand new products.

Applicable ErP energy efficiency labels are supplied with each of the products. A separate ErP product fiche is provided with the HP290 Heat Pump. If a HP290 Cylinder product is installed, refer to *Table 5* to *Table 7* within this document for the cylinder product fiche.

2.2 HEAT PUMP OUTDOOR UNIT

Description	Unit	HP290 4.5 kW	HP290 6 kW	HP290 8 kW	HP290 10 kW	HP290 12 kW	HP290 14 kW
Physical Properties							
Packaged Weight - Gross (Unpackaged Weight (Net))	kg	110 (90)	110 (90)	139 (117)	157 (135)	157 (135)	157 (135)
Height (Unpackaged)	mm	717	717	865	865	865	865
Width (Unpackaged)	mm	1299	1299	1385	1385	1385	1385
Depth (Unpackaged)	mm	351	351	413	413	413	413
Volume (Unpackaged)	m ³	0.327	0.327	0.495	0.495	0.495	0.495
Performance Data							
Coefficient of Performance (A+7 / W35)	COP	5.15	4.90	4.70	4.80	4.50	4.40
Coefficient of Performance (A+7 / W55)	COP	3.20	3.10	3.05	3.10	3.00	2.85
Coefficient of Performance (A-7 / W35)	COP	3.10	2.95	2.85	2.80	2.70	2.50
Coefficient of Performance (A-7 / W55)	COP	2.20	2.15	2.10	2.15	2.10	2.05
Seasonal Coefficient of Performance (W35 / W55)	SCOP	(5.07 / 3.79)	(4.89 / 3.82)	(5.07 / 3.82)	(4.67 / 3.62)	(4.63 / 3.61)	(4.59 / 3.57)
Sound Power Level (Max) *	dB (A)	56	58	61	65	65	69
Sound Power Level (ErP) *	dB (A)	50	50	53	56	56	56
Sound Pressure Level @ 1m	dB (A)	44	46	49	51	52	56
Maximum Outdoor Temperature	°C	46	46	46	46	46	46
Minimum Outdoor Temperature	°C	-25	-25	-25	-25	-25	-25
Heat Output							
A+2°C/W+35°C	kW	4.60	6.20			4.68	4.68
A+7°C/W+55°C	kW	4.60	6.20	9.50	12.00	14.00	15.00
A-7°C/W+35°C	kW	4.50	5.90	8.00	10.00	11.50	12.70
A-7°C/W+55°C	kW	4.70	5.20	7.40	10.40	11.30	12.40
Electrical Properties							
Electrical Supply Requirements							
Rated Supply Voltage	V	220 ~ 240	220 ~ 240	220 ~ 240	220 ~ 240	220 ~ 240	220 ~ 240
Frequency	Hz	50	50	50	50	50	50
No. of Supply Phases	-	1	1	1	1	1	1
Maximum Current	A	12	13.5	17.5	25	26.5	28
Fuse Rating	A	20	20	25	32	32	32
Outdoor Unit Properties							
IP Rating	-	IP24	IP24	IP24	IP24	IP24	IP24
Compressor Control Type	-	Inverter	Inverter	Inverter	Inverter	Inverter	Inverter
Electrical Power Consumption							
A+2°C/W+35°C	kW	1.438	2			1.04	1.04
A+7°C/W+55°C	kW	1.438	2	3.115	3.871	4.667	5.263
A-7°C/W+35°C	kW	1.452	2.419	2.807	3.571	4.259	5.08
A-7°C/W+55°C	kW	2.136	3.524	3.524	4.837	5.38	6.049
Heating Circuit Requirements							
Hydronic Connections	"	G 1" BSP	G 1" BSP	G 1 1/4" BSP	G 1 1/4" BSP	G 1 1/4" BSP	G 1 1/4" BSP
Maximum Operating Pressure	bar	3	3	3	3	3	3
Minimum Flow Rate of the Hydronic Circuit	l/min	6.67	6.67	6.67	11.67	11.67	11.67
Maximum Flow Temperature	°C	75	75	75	75	75	75
Minimum Operating Water Temperature (without pre-heating)	°C	12	12	12	12	12	12
Hydraulic Resistance	-	Refer to Pump Curve	Refer to Pump Curve	Refer to Pump Curve	Refer to Pump Curve	Refer to Pump Curve	Refer to Pump Curve
Refrigerant Data							
Refrigerant	-	R290	R290	R290	R290	R290	R290
Factory Refrigerant Charge	grams	700	700	1100	1250	1,250	1,250
GWP Rating	-	3	3	3	3	3	3
ODL Rating	-	0	0	0	0	0	0
Flammability Rating	-	A3	A3	A3	A3	A3	A3
Maximum Circuit Pressure	bar	35	35	35	35	35	35
Compressor Type	-	Twin Rotary	Twin Rotary	Twin Rotary	Twin Rotary	Twin Rotary	Twin Rotary
Compressor Oil	-	XS-601C1	XS-601C1	XS-601C1	XS-601C1	XS-601C1	XS-601C1

* Tested in accordance with EN 12102-1 Annex A

Section 2 - Product Information

2.2.1 Dimensions and Clearances

⚠ CAUTION: The product is not to be obstructed by any surrounding objects or surfaces as this can limit access and adversely affect performance. The minimum clearances that are shown in Figure 2 should be always maintained.

Table 2 Product Dimensions

Model	Units	A	B	C	D	E	F	G	H	I	J	K
4.5 - 6 kW	mm	717	1299	426	375	121	644	379	71	161	91	91
8 - 14 kW	mm	865	1385	523	456	192	656	363	68	145	100	129

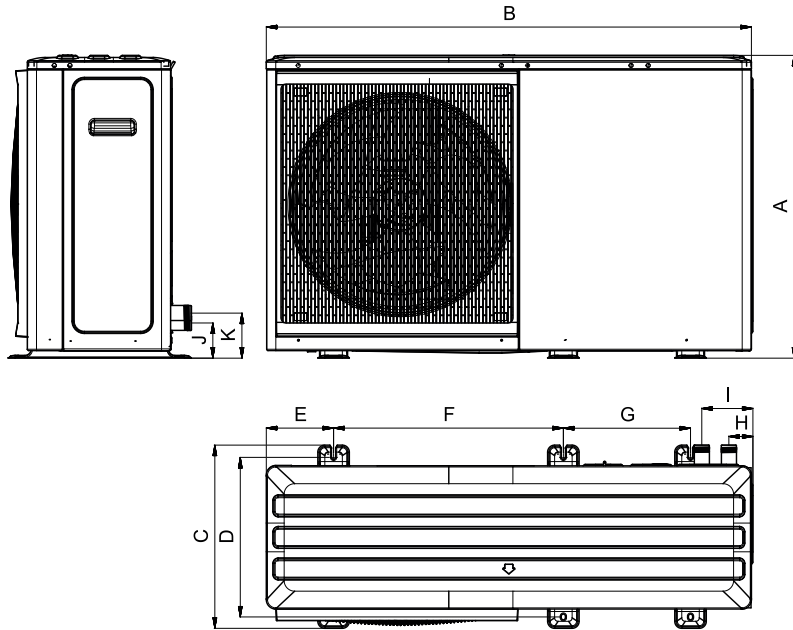


Figure 2. Heat Pump - Dimensions

ⓘ IMPORTANT: Dimensions shown below are the minimum required to satisfy the Heat Pump air flow. The requirements of the Protective Safety Zone - 3.3.6 on page 27 must also be complied with. Consideration must be given to installation, service and maintenance access requirements.

Table 3 Minimum Installation Clearances

Model	Units	A	B	C	D	E	F	G	H	I
4.5 - 8 kW	mm	Height + B	≥100*	≥1000	≥500	≥500	≥300	≥500	≥500	≥500
10 - 14 kW	mm	Height + B	≥100*	≥1500	≥500	≥500	≥300	≥500	≥500	≥500

* When the product is installed in areas that are prone to snow build up, this height should be increased to avoid the product being blocked by the build-up of snow. This dimension must not exceed 1000 mm.

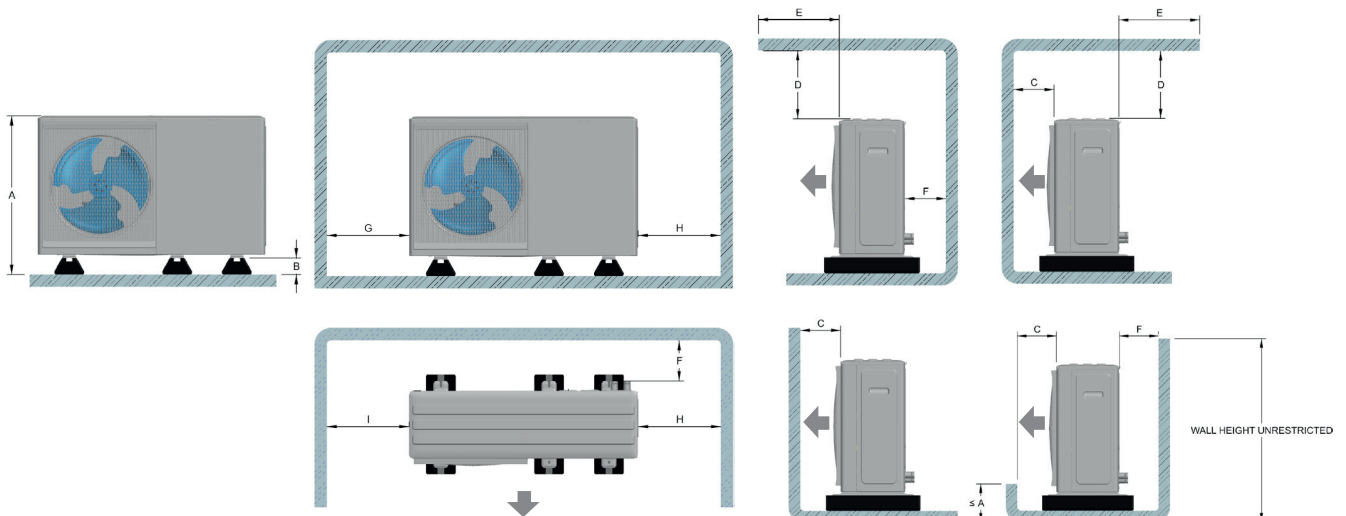


Figure 3. Heat Pump - Clearances

2.2.2 Clearances between multiple units

Table 4 Clearances between multiple units

Model	Units	V	W	Y
4.5 - 6 kW	mm	≥ 600	≥ 2500	≥ 500
8 - 14 kW	mm	≥ 600	≥ 3000	≥ 500

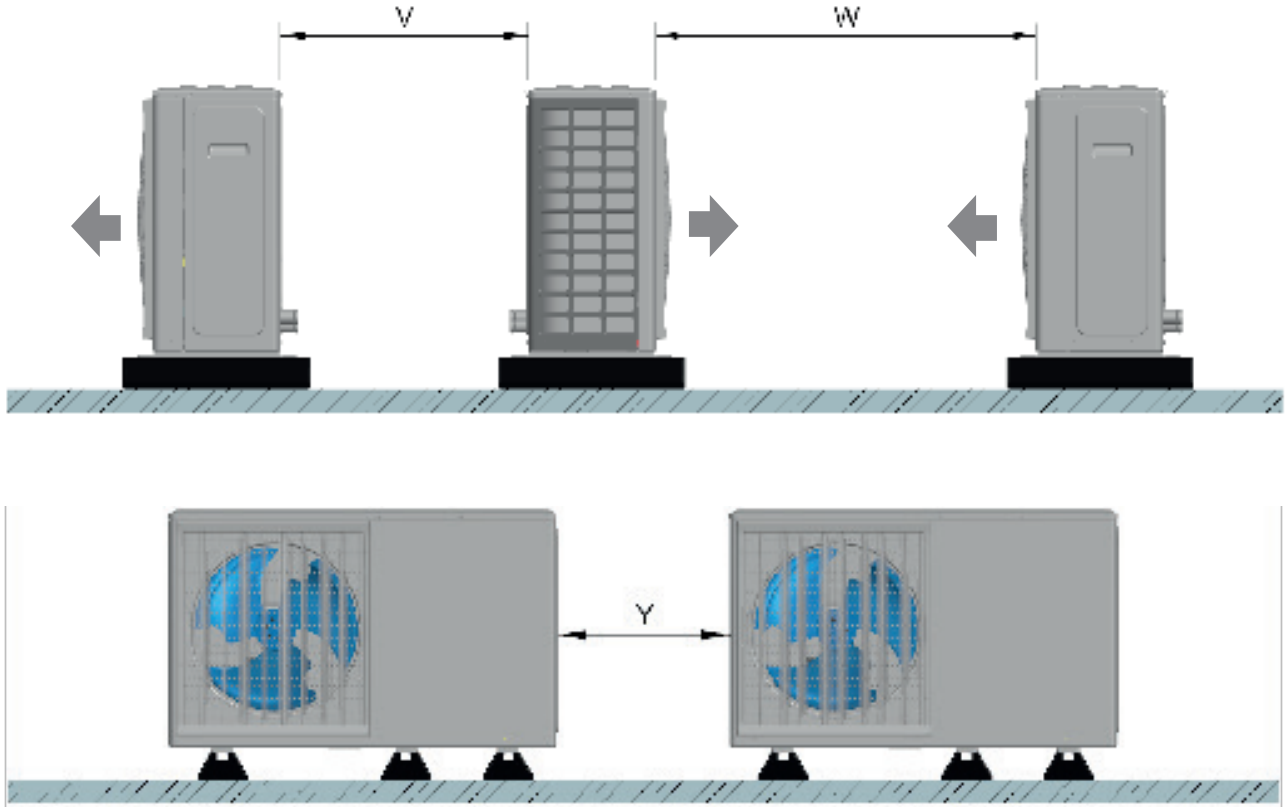


Figure 4. Clearances between multiple units

Section 2 - Product Information

2.3 DHW CYLINDERS

Table 5 Single Zone Pre-plumbed Cylinders

		HP290 Single zone Pre-plumbed cylinders			
General Description		150 L and 180 L; 475 mm and 550 mm diameter, single coil cylinders intended for coupling with a range of heat pumps 5 kW to 14 kW; Pre-plumbed and pre-wired including control box. Intended for a single zone heating system installation where hydronic separation is not required or is being installed externally to the cylinder.			
Assembly Model code/number		HP290 DHW pre-plumbed slimline cylinder 150 L and control box 1-zone	HP290 DHW pre-plumbed slimline cylinder 180 L and control box 1-zone	HP290 DHW pre-plumbed cylinder 150 L and control box 1-zone	HP290 DHW pre-plumbed cylinder 180 L and control box 1-zone
Product Code		239596	239597	239591	239592
Cylinder model code/number		IDEPLUHP150PPSZSL	IDEPLUHP180PPSZSL	IDEPLUHP150PPSZ	IDEPLUHP180PPSZ
Energy Efficiency Class		B	C	B	B
Heat Loss	Watts	50	58	44	49
	kWh/24h	1.21	1.40	1.07	1.18
Capacity (DHW content)	Litres	145	169	148	170
Volume heated by immersion heater	Litres	134	165	127	157
Weight Empty	kg	46	53	44	48
Weight Full	kg	192	222	192	219
Pressure Reducing valve setting	bar	3	3	3	3
Expansion relief valve setting	bar	4.5	4.5	4.5	4.5
Temperature setting of TPRV	°C	95	95	95	95
Pressure setting of TPRV	bar	6	6	6	6
Potable Expansion Vessel size	Litres	18	18	18	18
Expansion Vessel charge	bar	3	3	3	3
Overall Width	mm	581	581	636	636
Overall Height	mm	1598	1870	1196	1384
Overall Depth	mm	606	606	683	683
Cylinder Diameter	mm	A 475	A 475	A 550	A 550
DHW outlet	mm	B 1579	B 1851	B 1177	B 1365
Cylinder Height	mm	C 1519	C 1791	C 1118	C 1306
TPRV port	mm	D 1292	D 1564	D 875	D 1063
Manual reset overheat thermostat pocket	mm	E 1051	E 1151	E 673	E 673
Primary flow	mm	F 535	F 535	F 535	F 535
Secondary return port	mm	G -	G -	G -	G -
Thermistor pocket	mm	H 668	H 759	H 532	H 584
Primary return	mm	J 100	J 100	J 100	J 100
Immersion heater pocket	mm	K 230	K 230	K 230	K 230
Cold water inlet	mm	L 1516	L 1788	L 1099	L 1287
Cylinder Drain	mm	M 220	M 220	M 220	M 220
CH1 Flow	mm	N 414	N 414	N 414	N 414
CH2 Flow (n/a to SZ version)	mm	P -	P -	P -	P -
CH Return	mm	Q 100	Q 100	Q 100	Q 100
Buffer Connections	mm	R -	R -	R -	R -
Buffer Inspection	mm	S -	S -	S -	S -
Buffer Drain	mm	T -	T -	T -	T -
Primary heat exchanger surface area	m ²	1.8	3.0	1.6	2.5
Primary heat exchanger capacity	Litres	6.4	10.6	5.6	8.5
HWA Heat pump Test					
Primary heat exchanger thermal rating	kW	15.2	20.7	13.1	17.8
Heat up time from 10 °C to 50 °C	min	22.3	21.8	22.6	22.6
V40	Litres	158.9	205.0	139.8	186.0
BS EN 12897 Test					
Primary heat exchanger thermal rating	kW	33.2	39.3	25.7	32.8
Primary heat exchanger pressure loss	bar	0.08	0.05	0.06	0.10
Heat up time from 10 °C to 60 °C	min	13.9	15.8	16.4	17.6
V40	Litres	215.7	291.0	198.2	270.0
Revision Level		D8.2	D8.2	D8.2	D8.2

Heat Up Time, HWA Heat Pump Test 002:2020 (flow rate 0.42 L/s and flow temperature of 55 °C)

Heat Up Time, BS EN 12897, G3 Performance Test (flow rate of 0.25 L/s / 80 °C).

The relative heat up times stated are based on the tests referenced above and done on all cylinders within the range. The stated test value may not reflect real life performance within a residential environment.

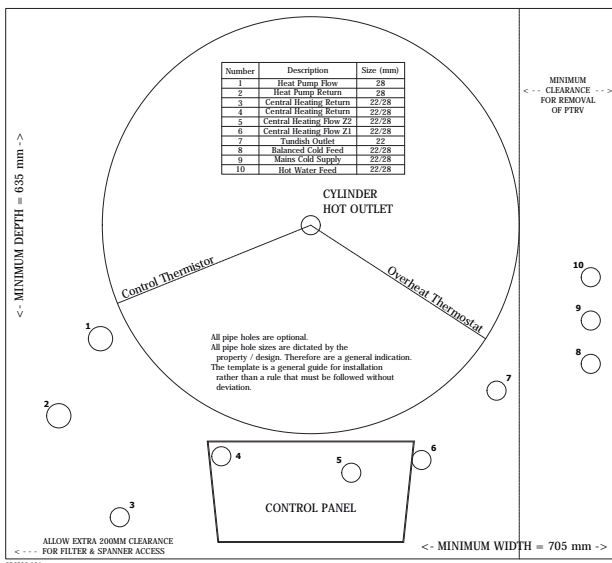


Figure 5. Plan View - PP Single Zone - 475 mm

Applies to HP290 DHW pre-plumbed slimline cylinder 150 L and Control Box (1-zone), and HP290 DHW pre-plumbed slimline cylinder 180L, and Control Box (1-zone).

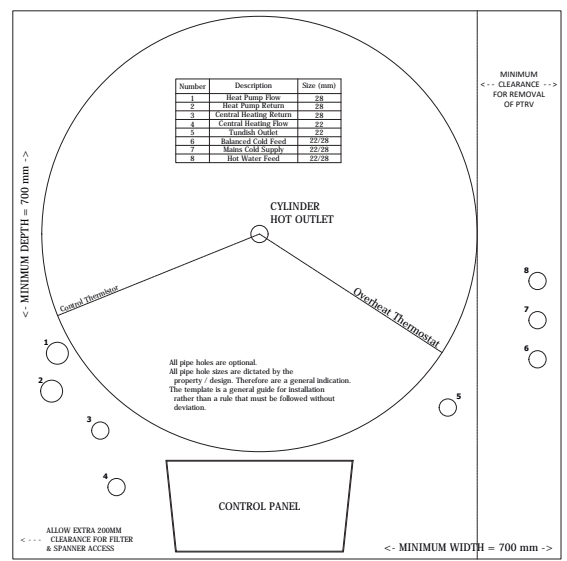


Figure 6. Plan View - PP Single Zone - 550 mm

Applies to HP290 DHW pre-plumbed cylinder 150 L and Control Box (1-zone), and HP290 DHW pre-plumbed cylinder 180 L and Control Box (1-zone).

2.3.1 Single Zone Pre-plumbed Cylinders Dimensions and Clearances

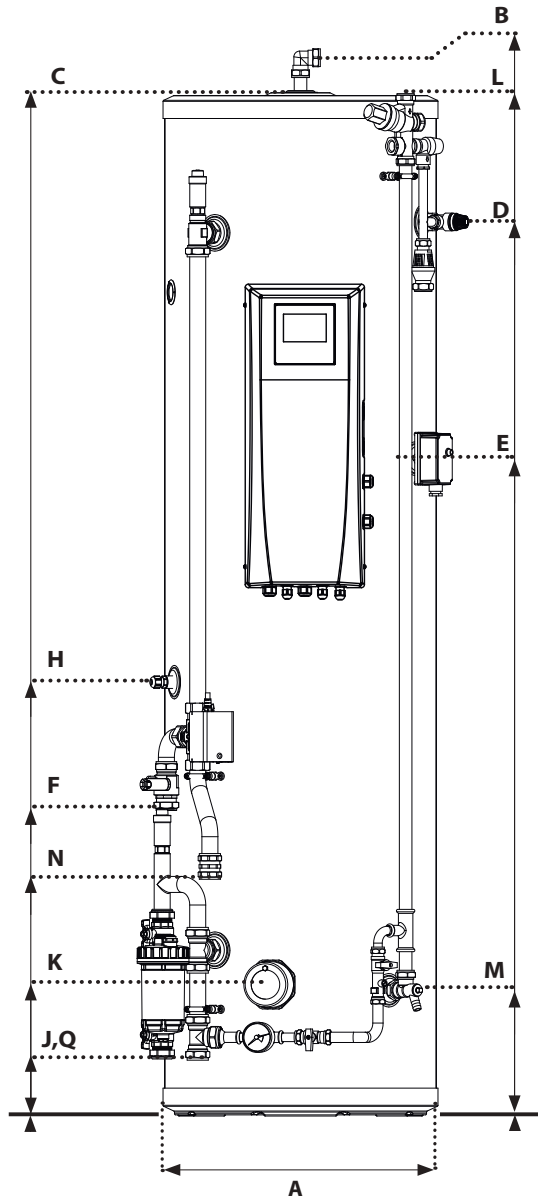


Figure 7. HP290 DHW pre-plumbed slimline cylinder

Applies to HP290 DHW pre-plumbed slimline cylinder 150 L and Control Box (1-zone), and HP290 DHW pre-plumbed slimline cylinder 180L, and Control Box (1-zone).

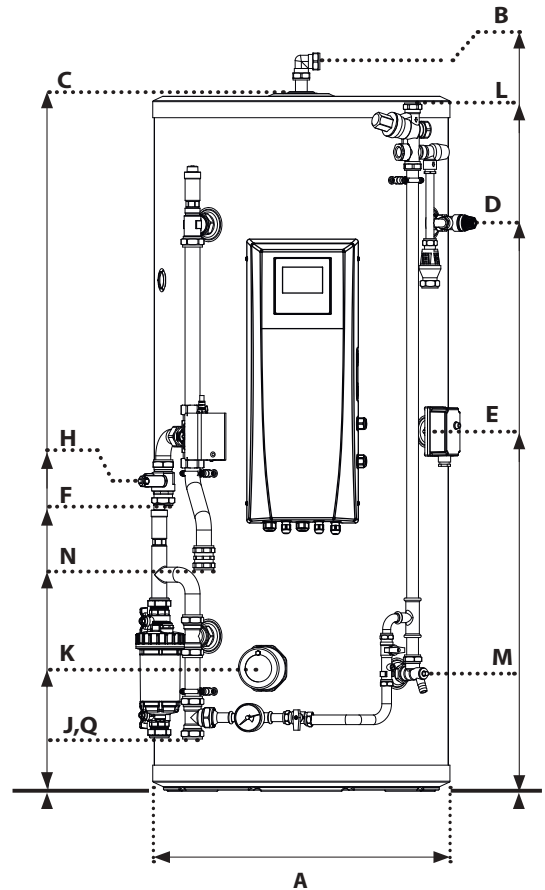


Figure 8. HP290 DHW pre-plumbed cylinder

Applicable to HP290 DHW pre-plumbed cylinder 180 L and Control Box (1-zone).

Section 2 - Product Information

Table 6 Two Zone Pre-plumbed Cylinders with Integrated Low Loss Header

		HP290 Two zone Pre-plumbed Cylinders with integrated low loss header			
General Description		210 L, 250 L 300 L; 475 mm and 550 mm diameter; single coil cylinders intended for coupling with a range of heat pumps 5 kW to 14 kW; Pre-plumbed and pre-wired including control box. Intended for a dual zone heating system installation. A low loss header is supplied fitted to decouple the heat pump from the heating zones.			
Assembly Model code/number		HP290 DHW pre-plumbed slimline cylinder 210 L, control box and low loss header 2-zone	HP290 DHW pre-plumbed cylinder 210 L, control box and low loss header 2-zone	HP290 DHW pre-plumbed cylinder 250 L, control box and low loss header 2-zone	HP290 DHW pre-plumbed cylinder 300 L, control box and low loss header 2-zone
Product Code		239598	239593	239594	239595
Cylinder model code/number		IDEPLUHP210PPDZSL	IDEPLUHP210PPDZ	IDEPLUHP250PPDZ	IDEPLUHP300PPDZ
Energy Efficiency Class		C	B	C	C
Heat Loss	Watts	65	55	63	72
	kWh/24h	1.55	1.33	1.52	1.74
Capacity (DHW content)	Litres	188	199	237	279
Volume heated by immersion heater	Litres	184	177	227	267
Weight Empty	kg	60.6	64	69.8	73.4
Weight Full	kg	248.9	262.8	307	352.4
Pressure Reducing valve setting	bar	3	3	3	3
Expansion relief valve setting	bar	4.5	4.5	4.5	4.5
Temperature setting of TPRV	°C	95	95	95	95
Pressure setting of TPRV	bar	6	6	6	6
Potable Expansion Vessel size.	Litres	24	24	24	35
Expansion Vessel charge	bar	3	3	3	3
Overall Width	mm	647	704	704	704
Overall Height	mm	2042	1572	1822	2068
Overall Depth	mm	620	686	686	686
Cylinder Diameter	mm	A 475	A 550	A 550	A 550
DHW outlet	mm	B 2023	B 1553	B 1803	B 2049
Cylinder Height	mm	C 1963	C 1494	C 1744	C 1990
TPRV port	mm	D 1737	D 1252	D 1502	D 1748
Manual reset overheat thermostat pocket	mm	E 1151	E 1051	E 1150	E 1150
Primary flow	mm	F 647	F 647	F 647	F 647
Secondary return port	mm	G 1551	G 1141	G 1353	G 1562
Thermistor pocket	mm	H 816	H 687	H 769	H 823
Primary return	mm	J 61	J 61	J 61	J 61
Immersion heater pocket	mm	K 230	K 230	K 230	K 230
Cold water inlet	mm	L 1961	L 1475	L 1726	L 1971
Cylinder Drain	mm	M 220	M 220	M 220	M 220
CH1 Flow	mm	N 266	N 266	N 266	N 266
CH2 Flow (n/a to SZ version)	mm	P 156	P 156	P 156	P 156
CH Return	mm	Q 132	Q 132	Q 132	Q 132
Buffer Connections	mm	R -	R -	R -	R -
Buffer Inspection	mm	S -	S -	S -	S -
Buffer Drain	mm	T -	T -	T -	T -
Primary heat exchanger surface area	m ²	2.5	2.5	3.0	3.0
Primary heat exchanger capacity	Litres	10.6	10.6	10.6	10.6
Low Loss Header Capacity	Litres	1.95	1.95	1.95	1.95
HWA Heat pump Test					
Primary heat exchanger thermal rating	kW	19.9	16.1	18	19
Heat up time from 10 °C to 50 °C	min	23.7	30.6	27.3	35.1
V40	Litres	222	227	276	317
BS EN 12897 Test					
Primary heat exchanger thermal rating	kW	35.2	34.5	36	37.4
Primary heat exchanger pressure loss	bar	0.05	0.05	0.04	0.05
Heat up time from 10 °C to 60 °C	min	18.8	18.7	22.0	23.0
V40	Litres	306	303	373	406
Revision Level		D8.2	D8.2	D8.2	D8.2

Heat Up Time, HWA Heat Pump Test 002:2020 (flow rate 0.42 L/s and flow temperature of 55 °C)

Heat Up Time, BS EN 12897, G3 Performance Test (flow rate of 0.25 L/s / 80 °C).

The relative heat up times stated are based on the tests referenced above and done on all cylinders within the range. The stated test value may not reflect real life performance within a residential environment.

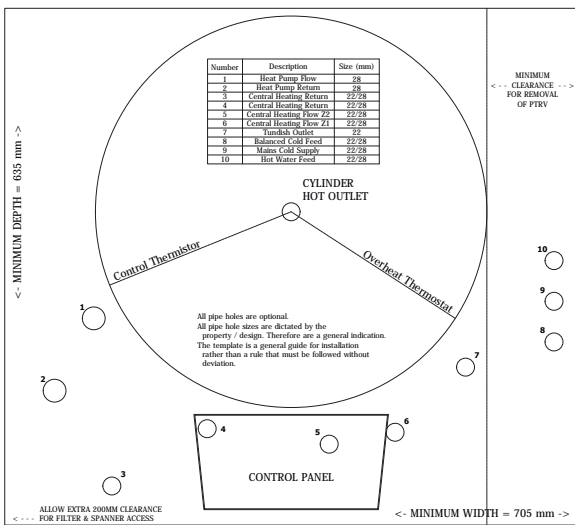


Figure 9. Plan View - PP Two Zone LL - 475 mm

Applicable to HP290 DHW pre-plumbed slimline cylinder 210 L, Control Box and Low Loss Header (2-zone).

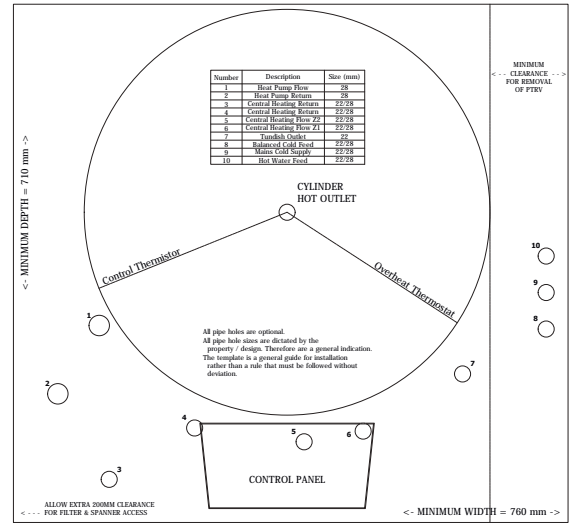


Figure 10. Plan View - PP Two Zone LL - 550 mm

Applicable to:

- HP290 DHW pre-plumbed cylinder 210 L, Control Box and Low Loss Header (2-zone),
- HP290 DHW pre-plumbed cylinder 250 L, Control Box and Low Loss Header (2-zone).
- HP290 DHW pre-plumbed cylinder 300 L, Control Box and Low Loss Header (2-zone).

PRODUCT INFO

2.3.2 Two Zone Pre-Plumbed Cylinders with Integrated Low Loss Header Dimensions and Clearances

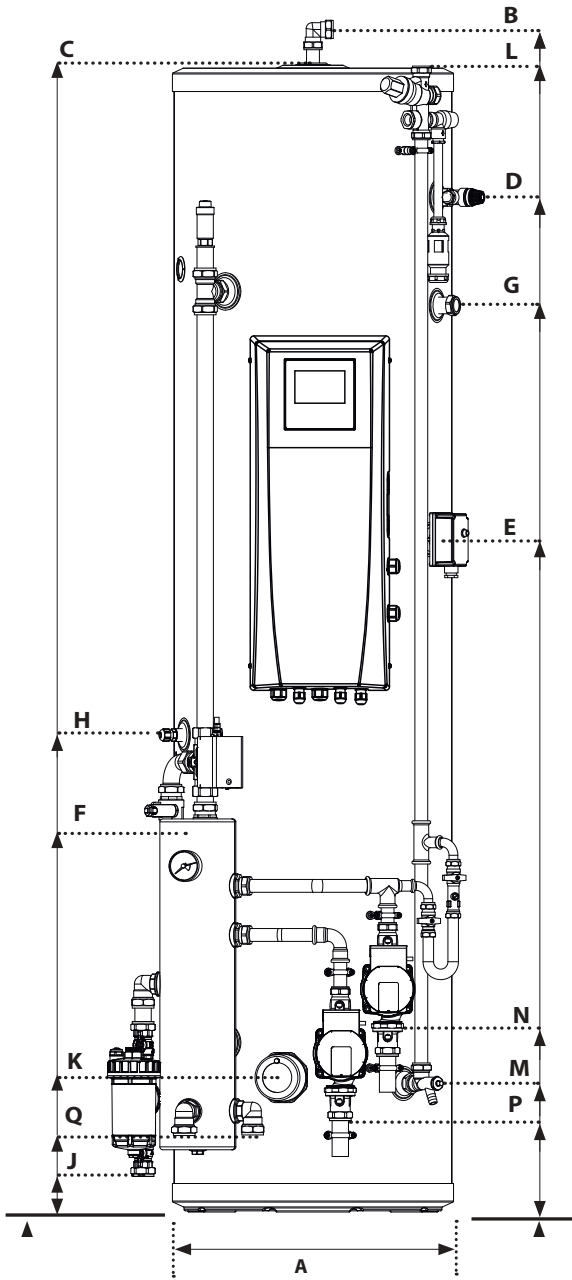


Figure 11. HP290 DHW pre-plumbed slimline cylinder
HP290 DHW pre-plumbed slimline cylinder 210 L, Control Box and Low Loss Header (2-zone).

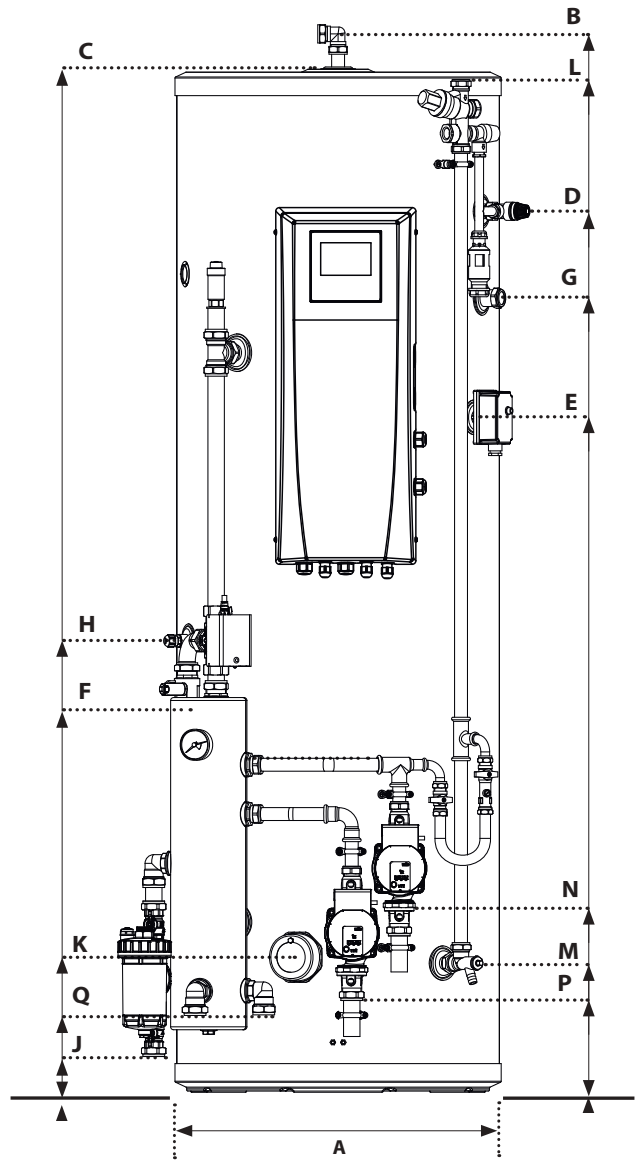


Figure 12. HP290 DHW pre-plumbed cylinder
HP290 DHW pre-plumbed cylinder 250 L, Control Box and Low Loss Header (2-zone).

Section 2 - Product Information

Table 7 Single Zone Pre-plumbed Cylinder with Integrated Buffer

		HP290 Single Zone Pre-plumbed Cylinder with Integrated Buffer			
General Description		180 L, 210 L, 250 L 300 L; 550 mm and 630 mm diameter; single coil cylinders intended for coupling with a range of heat pumps, 5 kW to 14 kW; Pre-plumbed and pre-wired including control box. Intended for a single zone heating system installation. These products incorporate a buffer which increases system volume and decouples the heat pump from the central heating zone. It is possible to upgrade this product to a dual zone at a later date.			
Assembly Model code/number		HP290 DHW pre-plumbed cylinder 180 L, control box and buffer 1-zone	HP290 DHW pre-plumbed cylinder 210 L, control box and buffer 1-zone	HP290 DHW pre-plumbed cylinder 250 L, control box and buffer 1-zone	HP290 DHW pre-plumbed cylinder 300 L, control box and buffer 1-zone
Product Code		239599	239601	239603	239605
Cylinder model code/number		IDEPLUHP180DUOPPSZ	IDEPLUHP210DUOPPSZ	IDEPLUHP250DUOPPSZ	IDEPLUHP300DUOPPSZ
Energy Efficiency Class		B	B	B	B
Heat Loss	Watts	49	55	62	68
	kWh/24h	1.18	1.33	1.49	1.63
Capacity (DHW content)	Litres	171	199	239	287
Volume heated by immersion heater	Litres	158	189	218	267
Weight Empty	kg	64.6	68.6	77	87
Weight Full	kg	305.6	337.4	379	437.5
Pressure Reducing valve setting	bar	3	3	3	3
Expansion relief valve setting	bar	4.5	4.5	4.5	4.5
Temperature setting of TPRV	°C	95	95	95	95
Pressure setting of TPRV	bar	6	6	6	6
Potable Expansion Vessel size.	Litres	18	24	24	35
Expansion Vessel charge	bar	3	3	3	3
Overall Width	mm	644	644	705	705
Overall Height	mm	1907	2095	1908	2128
Overall Depth	mm	702	702	780	780
Cylinder Diameter	mm	A 550	A 550	A 630	A 630
DHW outlet	mm	B 1888	B 2076	B 1889	B 2109
Cylinder Height	mm	C 1829	C 2017	C 1829	C 2049
TPRV port	mm	D 1586	D 1774	D 1572	D 1792
Manual reset overheat thermostat pocket	mm	E 1151	E 1151	E 1151	E 1151
Primary flow	mm	F 742	F 742	F 742	F 742
Secondary return port	mm	G -	G 1664	G 1491	G 1678
Thermistor pocket	mm	H 1109	H 1172	H 1101	H 1174
Primary return	mm	J 117	J 117	J 82	J 82
Immersion heater pocket	mm	K 744	K 744	K 736	K 736
Cold Water Inlet	mm	L 1810	L 2000	L 1796	L 2016
Cylinder Drain	mm	M 744	M 744	M 736	M 736
CH1 Flow (n/a to SZ version)	mm	N 118	N 118	N 83	N 83
CH2 Flow (n/a to SZ version)	mm	P 118	P 118	P 83	P 83
CH Return	mm	Q 118	Q 118	Q 83	Q 83
Buffer Connections	mm	R 375	R 375	R 340	R 340
Buffer Inspection	mm	S 360	S 360	S 325	S 325
Buffer Drain	mm	T 221	T 221	T 219	T 219
Primary heat exchanger surface area	m ²	2.5	2.5	2.5	3.0
Primary heat exchanger capacity	Litres	8.5	10.6	8.5	10.6
Buffer Capacity	Litres	70	70	63.5	63.5
HWA Heat pump Test					
Primary heat exchanger thermal rating	kW	17.8	14.5	23.6	14.3
Heat up time from 10 °C to 50 °C	min	22.2	32.7	26.6	44.1
V40	Litres	185.5	224.3	260.2	295.8
BS EN 12897 Test					
Primary heat exchanger thermal rating	kW	35.1	37.2	37	39.2
Primary heat exchanger pressure loss	bar	0.08	0.05	0.05	0.04
Heat up time from 10 °C to 60 °C	min	14.5	16.4	20.3	21.8
V40	Litres	241.5	288.4	354.5	402.2
Revision Level		D8.2	D8.2	D8.2	D8.2

Heat Up Time, HWA Heat Pump Test 002:2020 (flow rate 0.42 L/s and flow temperature of 55 °C)

Heat Up Time, BS EN 12897, G3 Performance Test (flow rate of 0.25 L/s / 80 °C).

The relative heat up times stated are based on the tests referenced above and done on all cylinders within the range. The stated test value may not reflect real life performance within a residential environment

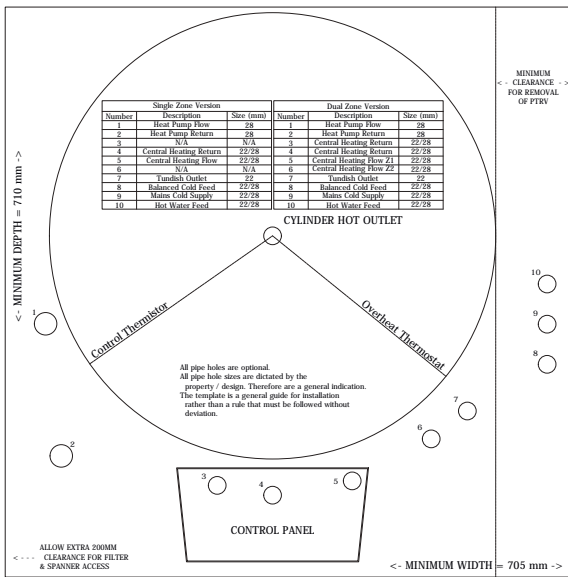


Figure 13. Plan View - PP Single Zone Buff - 550 mm

Applicable to HP290 DHW pre-plumbed cylinder 180 L and Control Box and Buffer (1-zone) and HP290 DHW pre-plumbed cylinder 210 L, Control Box and Buffer (1-zone).

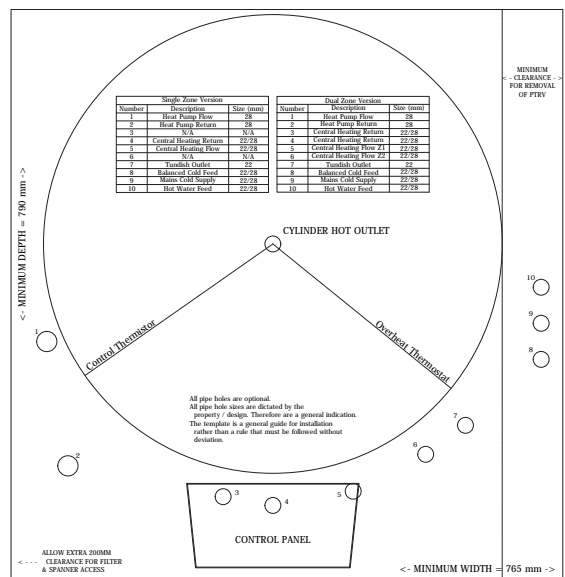


Figure 14. Plan View - PP Single Zone Buff - 630 mm

Applicable to HP290 DHW pre-plumbed cylinder 250 L, Control Box and Buffer (1-zone) and HP290 DHW pre-plumbed cylinder 300 L, Control Box and Buffer (1-zone).

2.3.3 Single Zone Pre-Plumbed Cylinder with Integrated Buffer Dimensions and Clearances

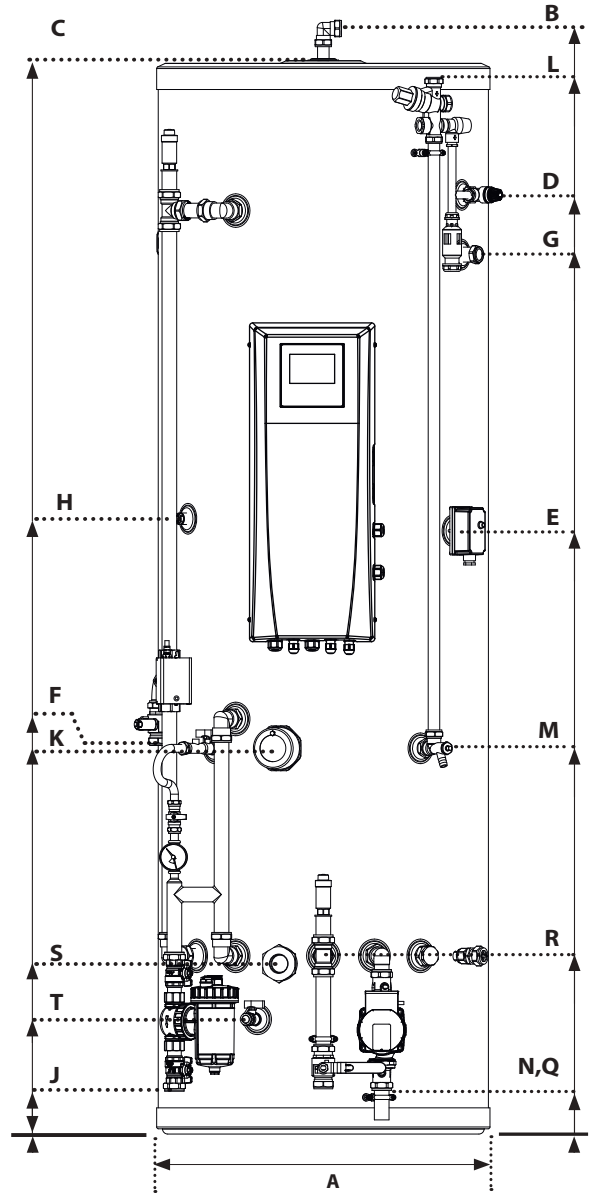
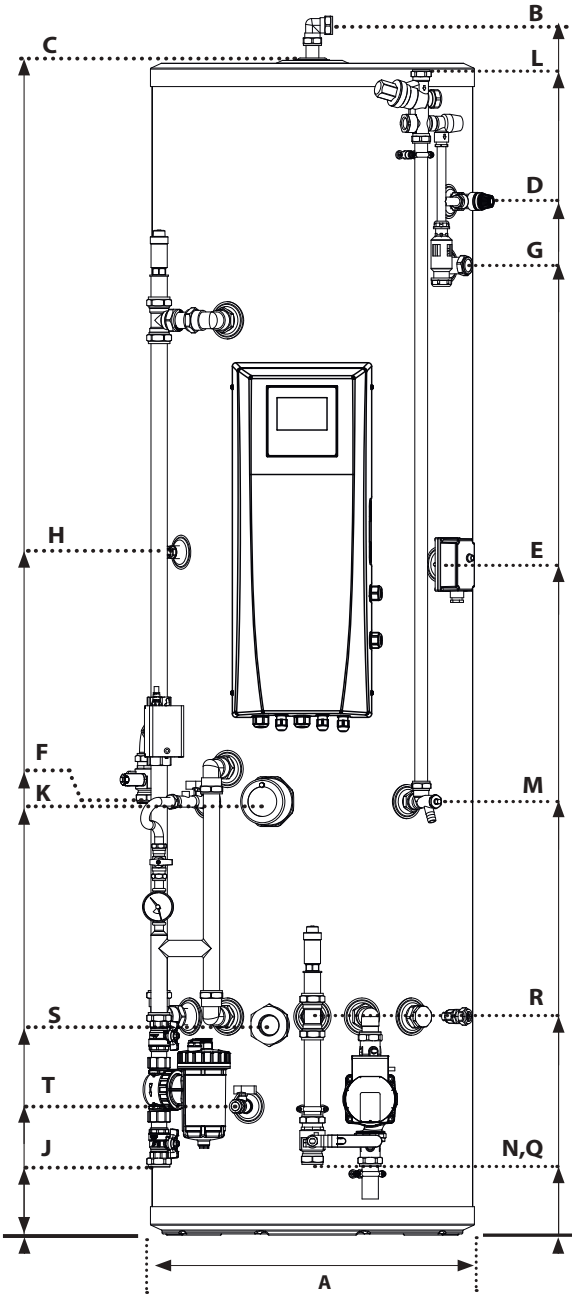


Figure 15. HP290 DHW pre-plumbed cylinder

HP290 DHW pre-plumbed cylinder 210 L, Control Box and Buffer (1-zone).

Figure 16. HP290 DHW pre-plumbed cylinder

HP290 DHW pre-plumbed cylinder 300 L, Control Box and Buffer (1-zone).

Section 2 - Product Information

Table 8 Two Zone Pre-plumbed Cylinder with Integrated Buffer

		HP290 Two Zone Pre-plumbed Cylinder with Integrated Buffer			
General Description		180 L, 210 L, 250 L 300 L; 550 mm and 630 mm diameter; single coil cylinders intended for coupling with a range of heat pumps, 5 kW to 14 kW; Pre-plumbed and pre-wired including control box. Intended for a dual zone heating system installation. These products incorporate a buffer which increases system volume and decouples the heat pump from the central heating zones.			
Assembly Model code/number		HP290 DHW pre-plumbed cylinder 180 L, control box and buffer 2-zone	HP290 DHW pre-plumbed cylinder 210 L, control box and buffer 2-zone	HP290 DHW pre-plumbed cylinder 250 L, control box and buffer 2-zone	HP290 DHW pre-plumbed cylinder 300 L, control box and buffer 2-zone
Product Code		239600	239602	239604	239606
Cylinder model code/number		IDEPLUHP180DUOPPDZ	IDEPLUHP210DUOPPDZ	IDEPLUHP250DUOPPDZ	IDEPLUHP300DUOPPDZ
Energy Efficiency Class		B	B	B	B
Heat Loss	Watts	49	55	62	68
	kWh/24h	1.18	1.33	1.49	1.63
Capacity (DHW content)		171	199	239	286
Volume heated by immersion heater		158	189	218	267
Weight Empty		68	71.8	80	90.2
Weight Full		309	340.6	382	439.7
Pressure Reducing valve setting		3	3	3	3
Expansion relief valve setting		4.5	4.5	4.5	4.5
Temperature setting of TPRV		95	95	95	95
Pressure setting of TPRV		6	6	6	6
Potable Expansion Vessel size.		18	24	24	35
Expansion Vessel charge		3	3	3	3
Overall Width		644	644	705	705
Overall Height		1907	2095	1908	2128
Overall Depth		702	702	780	780
Cylinder Diameter		mm A 550	mm A 550	mm A 630	mm A 630
DHW outlet		mm B 1888	mm B 2076	mm B 1889	mm B 2109
Cylinder Height		mm C 1829	mm C 2017	mm C 1829	mm C 2049
TPRV port		mm D 1586	mm D 1774	mm D 1572	mm D 1792
Manual reset overheat thermostat pocket		mm E 1151	mm E 1151	mm E 1151	mm E 1151
Primary flow		mm F 742	mm F 742	mm F 742	mm F 742
Secondary return port		mm G -	mm G 1664	mm G 1491	mm G 1678
Thermistor pocket		mm H 1109	mm H 1172	mm H 1101	mm H 1174
Primary return		mm J 117	mm J 117	mm J 82	mm J 82
Immersion heater pocket		mm K 744	mm K 744	mm K 736	mm K 736
Cold Water Inlet		mm L 1810	mm L 2000	mm L 1796	mm L 2016
Cylinder Drain		mm M 744	mm M 744	mm M 736	mm M 736
CH1 Flow		mm N 118	mm N 118	mm N 83	mm N 83
CH2 Flow (n/a to S2 version)		mm P 118	mm P 118	mm P 83	mm P 83
CH Return		mm Q 118	mm Q 118	mm Q 83	mm Q 83
Buffer Connections		mm R 375	mm R 375	mm R 340	mm R 340
Buffer Inspection		mm S 360	mm S 360	mm S 325	mm S 325
Buffer Drain		mm T 221	mm T 221	mm T 219	mm T 219
Primary heat exchanger surface area		m ² 2.5	m ² 2.5	m ² 2.5	m ² 3.0
Primary heat exchanger capacity		Litres 8.5	Litres 10.6	Litres 8.5	Litres 10.6
Buffer Capacity		Litres 70	Litres 70	Litres 63.5	Litres 63.5
HWA Heat pump Test					
Primary heat exchanger thermal rating		kW 17.8	kW 14.5	kW 23.6	kW 14.3
Heat up time from 10 °C to 50 °C		min 22.2	min 32.7	min 26.6	min 44.1
V40		Litres 185.5	Litres 224.3	Litres 260.2	Litres 295.8
BS EN 12897 Test					
Primary heat exchanger thermal rating		kW 35.1	kW 37.2	kW 37	kW 39.2
Primary heat exchanger pressure loss		bar 0.08	bar 0.05	bar 0.05	bar 0.04
Heat up time from 10 °C to 60 °C		min 14.5	min 16.4	min 20.3	min 21.8
V40		Litres 241.5	Litres 288.4	Litres 354.5	Litres 402.2
Revision Level		D8.2	D8.2	D8.2	D8.2

Heat Up Time, HWA Heat Pump Test 002:2020 (flow rate 0.42 L/s and flow temperature of 55 °C)

Heat Up Time, BS EN 12897, G3 Performance Test (flow rate of 0.25 L/s / 80 °C).

The relative heat up times stated are based on the tests referenced above and done on all cylinders within the range. The stated test value may not reflect real life performance within a residential environment.

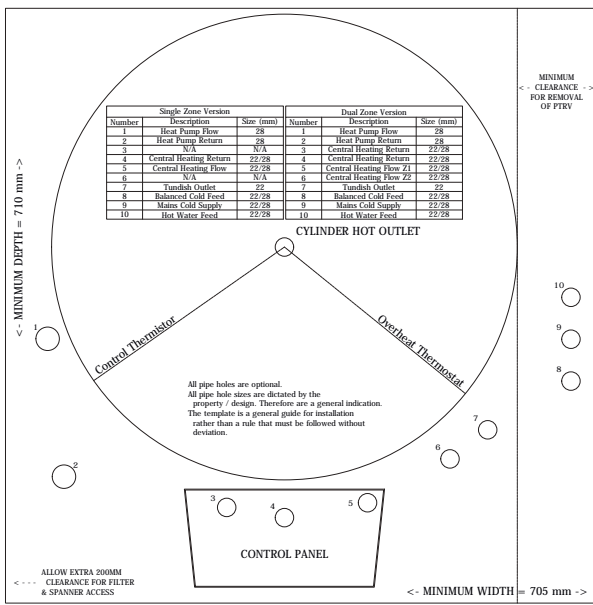


Figure 17. Plan View - PP Two Zone Buff - 550 mm

Applicable to:

- HP290 DHW pre-plumbed cylinder 180 L, Control Box and Buffer (2-zone)
- HP290 DHW pre-plumbed cylinder 210 L, Control Box and Buffer (2-zone)

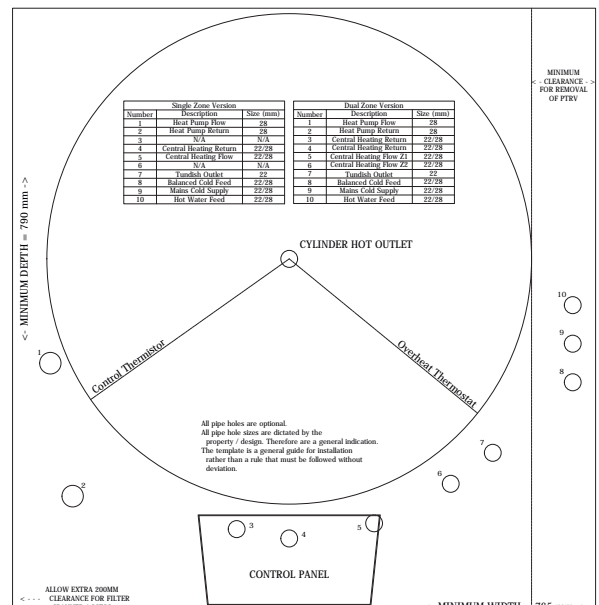


Figure 18. Plan View - PP Two Zone Buff - 630 mm

Applicable to:

- HP290 DHW pre-plumbed cylinder 250 L, Control Box and Buffer (2-zone)
- HP290 DHW pre-plumbed cylinder 300 L, Control Box and Buffer (2-zone).

PRODUCT INFO

2.3.4 Two Zone Pre-Plumbed Cylinder with Integrated Buffer Dimensions and Clearances

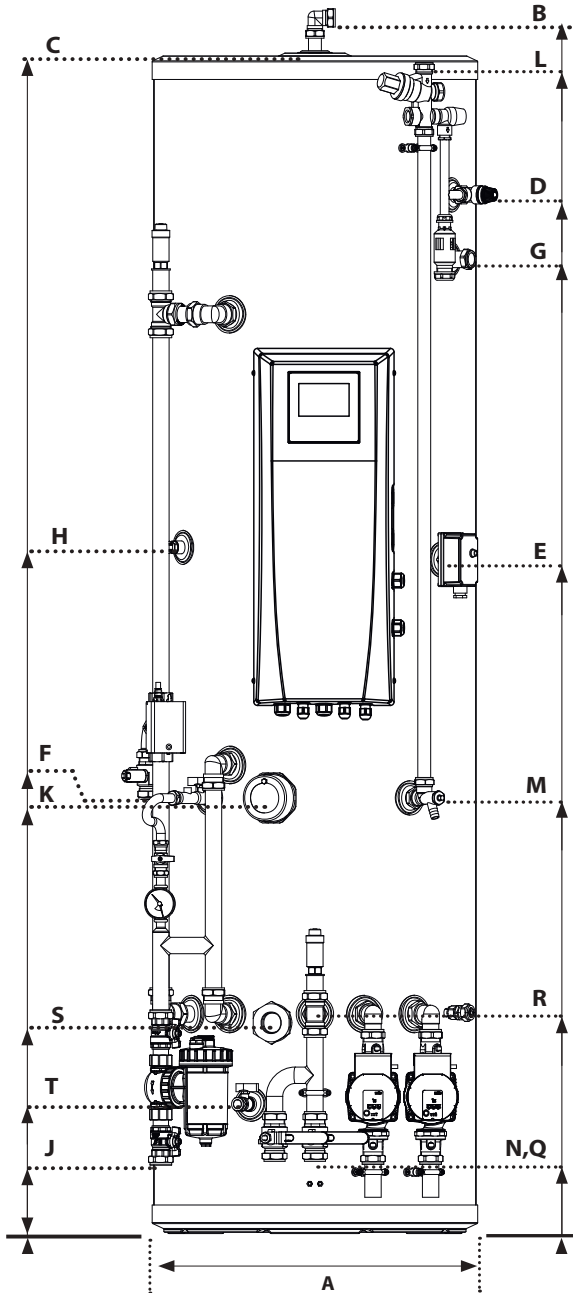


Figure 19. HP290 DHW pre-plumbed cylinder
HP290 DHW pre-plumbed cylinder 210 L, Control Box and Buffer (2-zone).

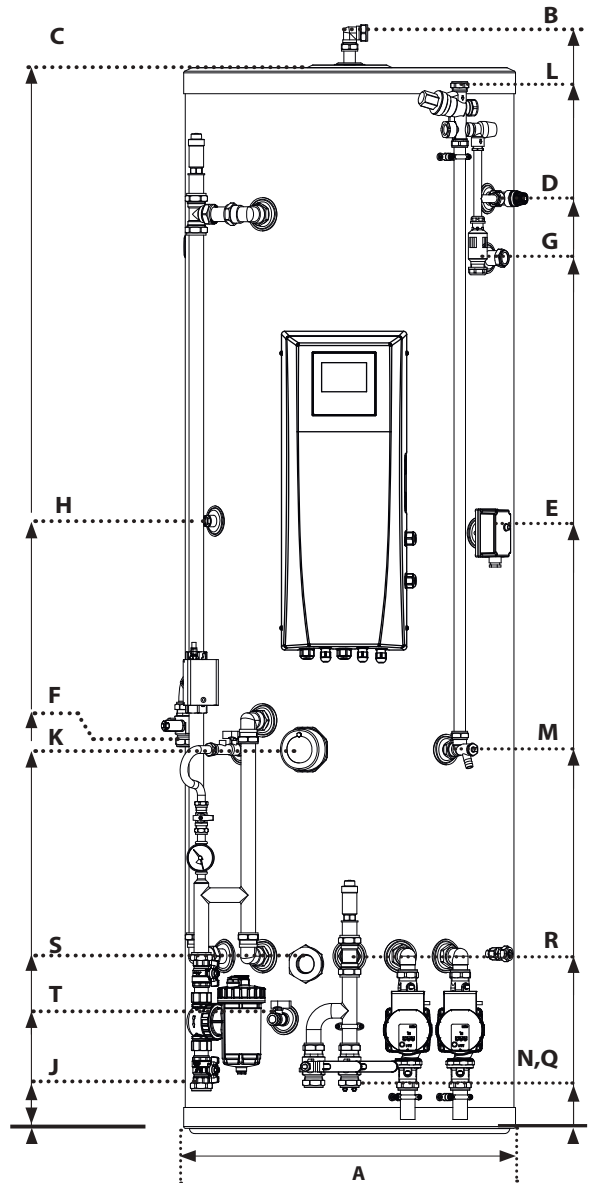


Figure 20. HP290 DHW pre-plumbed cylinder
HP290 DHW pre-plumbed cylinder 300 L, Control Box and Buffer (2-zone).

2.4 CONTROL BOX

PRODUCT INFO

Table 9 Control Box

Physical Properties		
Packaged Weight - Gross (unpackaged Weight)	kg	8.5 (5)
Height (unpackaged)	mm	796 (627)
Width (unpackaged)	mm	320 (254)
Depth (unpackaged)	mm	176 (147)
Maximum Ambient Temp	° C	60
Electrical Properties		
IP Rating.	IP	20
Rated Voltage.	VAC	220-240
Maximum Rated Current	A	16
Rated Power Input	W	3000
Frequency	Hz	50
Fuse Rating		
External fuse without Immersion Heater	A	5
External fuse with Immersion Heater	A	20

2.4.1 Control Box Dimensions and Clearances

⚠ CAUTION: Do not obstruct the product by any surrounding objects or surfaces as this can limit access and adversely affect performance. The minimum clearances that are shown in Figure 22 should be always maintained.

ⓘ IMPORTANT: Front clearance can be reduced to 5mm (e.g. cupboard installation) but must maintain 900 mm serviceable access.

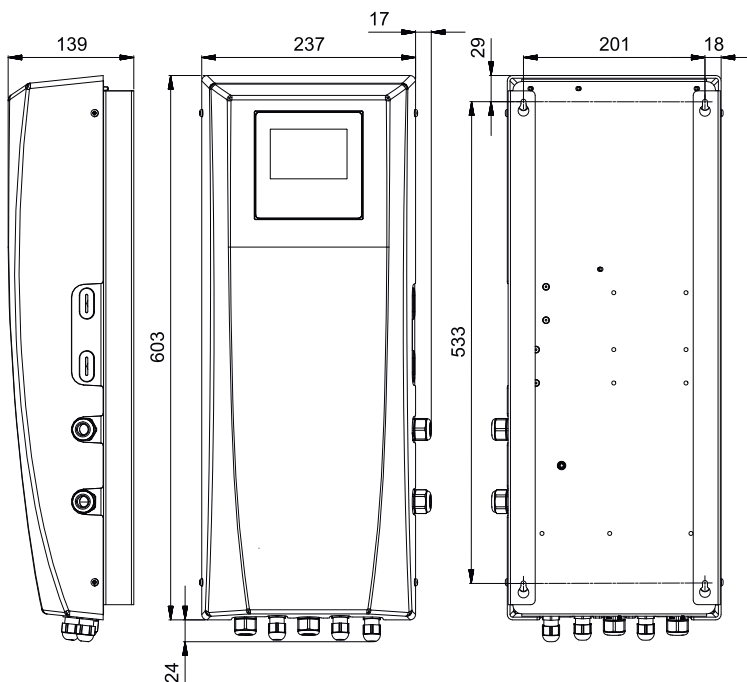


Figure 21. Control Box - Dimensions

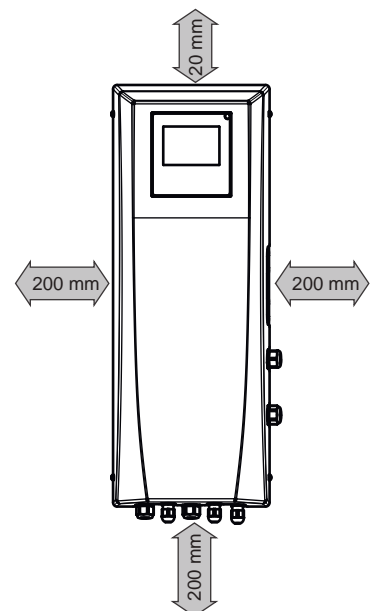


Figure 22. Control Box - Clearances

2.5 CONTENTS PROVIDED WITH APPLIANCE

2.5.1 Monobloc Heat Pump

Refer to Section 4.1.3 on page 31.

2.5.2 DHW Cylinders

Refer to Table 10 for components supplied with the DHW Cylinders and Section 4.2.1 on page 40.

2.5.3 Control Box

Refer to Section 4.3.1 on page 44.

Table 10 Content provided with DHW Cylinders

Brand reference code	IDEPLUHP															
	150	180	150	180	210	210	250	300	180	180	210	210	250	250	300	300
Pre-plumbed (PP)	PP															
Single zone, Two Zone (SZ,DZ)	SZ				DZ				SZ	DZ	SZ	DZ	SZ	DZ	SZ	DZ
Slimline-475 mm/ Standard-550 mm / Wide-630 mm (SL/S/W)	SL		S		SL	S						W				
No circulation pump, Low Loss Header / Buffer (NP/LLH/BUFFER/)	NP	NP	NP	NP	LLH	LLH	LLH	LLH	BUFFER							
Pre-Plumbed unvented cylinder components																
Inlet control group, inc. PRV, BCF, CV, ERV	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Temperature and pressure relief valve	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Tundish	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Cylinder drain valve, on cold inlet elbow, (22mm elbow with MT cock)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Correctly sized expansion vessel (supplied not fitted)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Pre-wired controls																
DHW thermistor	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
DHW cylinder overheat thermostat	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Pre-Plumbed Primary system components																
Full divert, spring close, 3-port valve, motor open for DHW heating	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Low loss header with drain point	N	N	N	N	Y	Y	Y	Y	N	N	N	N	N	N	N	N
System filter fitted to the HP return, Inc. isolation valves	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Auto air valve on central heating returns	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y
Central heating zone pump with isolation valves	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
System filling loop	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Isolation valves on HP flow	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Isolation valves on CH returns	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y
DHW Back up heat source																
Immersion heater	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Expansion vessel (supplied in a separate box)																
Expansion vessel size	18	18	18	18	24	24	24	35	18	18	24	24	24	24	35	35

PRV = Pressure Reducing Valve, BCF = Balanced Cold Feed, CV = Check Valve, ERV = Expansion Relief Valve

2.6 LOCATION OF DATA PLATES

2.6.1 Heat Pump

The data plate can be found on the side of the Heat Pump as shown in *Figure 23*.

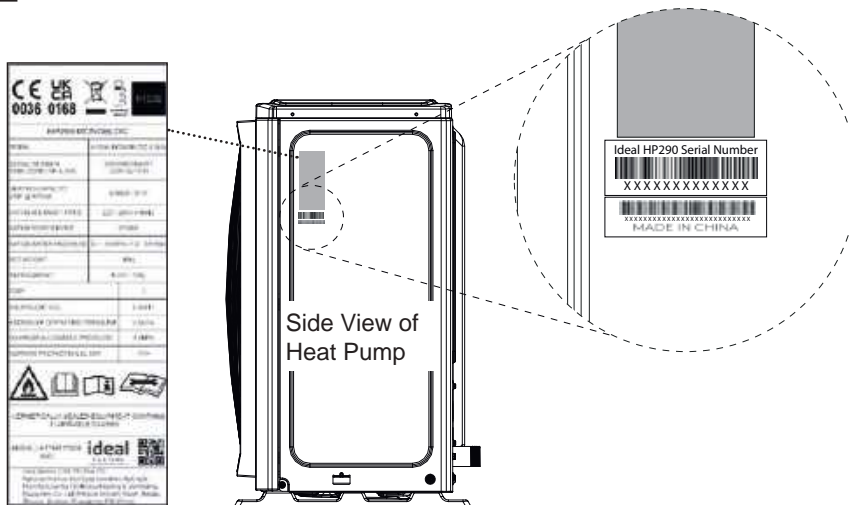


Figure 23. Heat Pump - Location of Data Plate and Serial Number

2.6.2 DHW Cylinder

The location of the main data plate and warning label, shown in *Figure 24*, can be different depending upon the model of the DHW Cylinder.

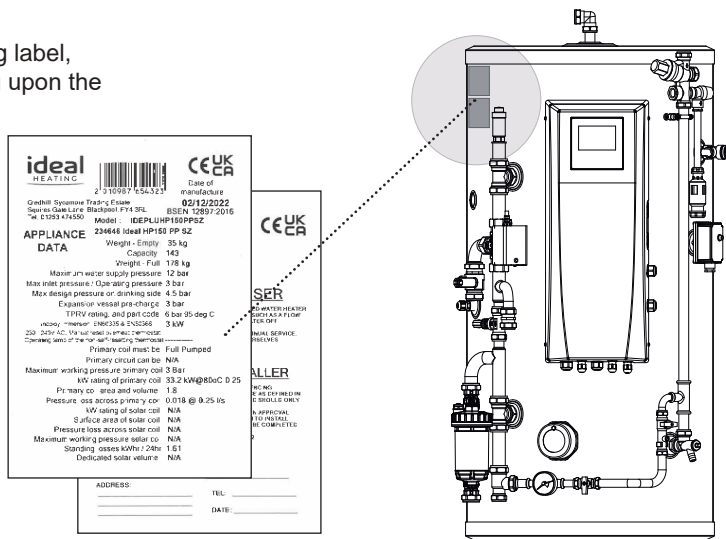


Figure 24. DHW Cylinder - Location of Data Plates

2.6.3 Control Box

The main data plate can be found on the inside of the control box door as shown in *Figure 25*.

The tear off strips of the data plate can be found on the side of the control box, *Figure 25* and on the front of the literature pack envelope.

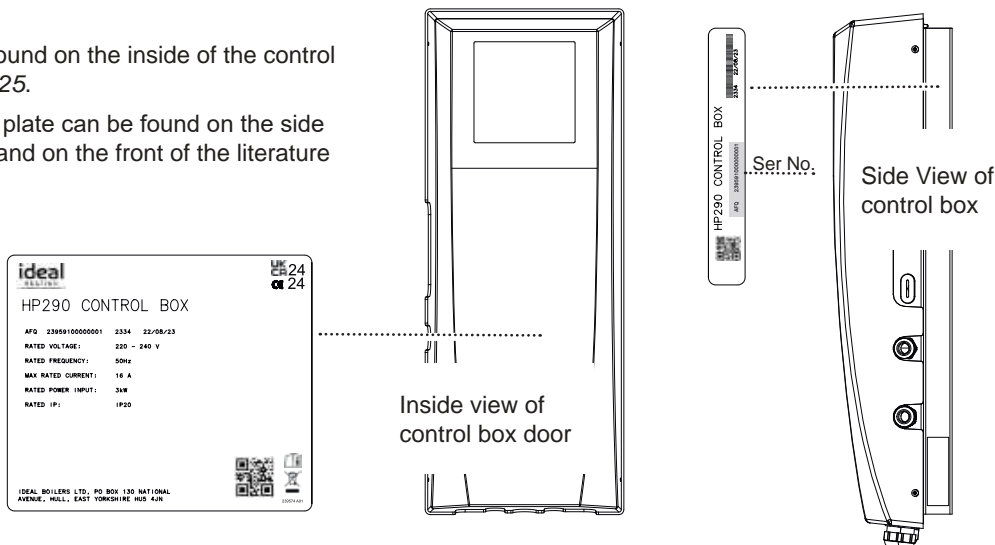


Figure 25. Control Box - Location of Data Plates

2.7 HEAT PUMP OPERATING PRINCIPLES

2.7.1 Operating Principle

The Heat Pump contains a closed refrigerant circuit. When operating, refrigerant is circulated around the circuit absorbing heat energy from the ambient air, increasing its temperature and transferring it to the heating and hot water systems through a heat exchanger.

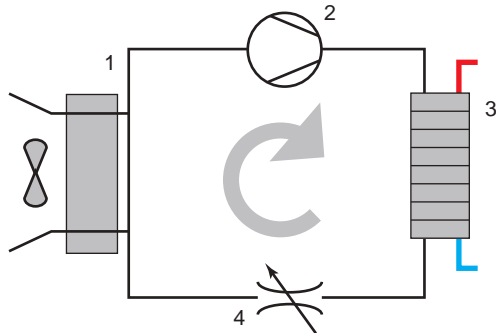


Figure 26. Closed Refrigerant Circuit

The circuit consists of four main components/functions.

1. Refrigerant absorbs heat energy during vaporisation when flowing through the evaporator (heat exchanger).
2. The compressor increases the pressure and temperature of the vapour refrigerant.
3. As refrigerant changes state to liquid in the condenser (heat exchanger) it transfers heat energy into the primary system water.
4. The expansion valve reduces the pressure and temperature of the liquid refrigerant to begin the vaporisation process and repeat the cycle.

For an in-depth refrigerant circuit schematic see *Appendix 1.2.4*.

2.7.2 Defrost Method

During operation, the Heat Pump will periodically be required to go through an automatic defrosting process dependant on the outdoor conditions. Over time the evaporator will begin to collect frost from the water vapour in the air.

The defrost process causes the refrigerant to be directed to the evaporator and uses the hot vapour to thaw the frost into liquid water. This liquid water then collects in the base panel and flows through into the drain openings in the centre of the base panel.

2.7.3 Domestic Hot Water

If there is a domestic hot water (DHW) cylinder installed and the temperature of the DHW cylinder is less than the Hot Water Set point minus the hysteresis then the heat pump circuit is activated and directed (via the divertor valve) to heat the DHW cylinder. The Heat Pump and primary circuit circulation pump will be active until the DHW cylinder has reached its setpoint.

This function will always take priority over the heating of the space heating system within the programmed time period. The two functions cannot operate simultaneously.

2.7.4 Space Heating

If there is a heating demand and the temperature of any thermostat is less than its setpoint, the primary circuit is activated and directed (via the divertor valve) to heat the space heating circuits. The Heat Pump and circulator will modulate and be active until the space heating has reached its setpoint.

2.7.5 Anti-Legionella Function

If there is a DHW cylinder installed, Anti-Legionella measures should be utilised in accordance with HSE guidance HSG274 Part 2.

The control system is provided with an Anti-Legionella function for the DHW cylinder, the default parameter, which is adjustable according to installation / user requirements, initiates this function once per week and heats the DHW cylinder to hold at 60 °C for a period of 15 minutes using both the heat pump and DHW immersion heater..

2.7.6 Frost Protection

Frost protection is controlled in accordance with the outdoor temperature, and water temperature sensors on the outdoor unit. When the frost protection occurs, the outdoor unit displays the error code Pb and the unit will stop operating.

Frost protection will activate under either of the following conditions:

- Outdoor temperature < 3 °C and minimum water temperature < 5 °C
- Minimum water temperature < 2 °C.

Once either of these conditions are met, the primary circulator will first operate for five minutes at maximum output.

At the end of this period if the water temperature is ≥ 8 °C, then the compressor will run for a 10 minutes until the minimum water temperature is > 15 °C.

If the water temperature is < 8 °C and there is normal water flow, then either the compressor or auxiliary heat source (if applicable) will operate until the minimum water temperature is met.

The compressor will operate for a minimum period of 10 minutes until the minimum water temperature is > 15 °C.

An auxiliary heat source will be active for a minimum period of five minutes until the minimum water temperature is > 10 °C.

ⓘ **IMPORTANT:** Make sure prior to the installation that permissions have been granted for the installation.

3.1 SYSTEM COMBINATIONS

⚠ WARNING: Failure to comply with this documentation will lead to increased risk of injury or death to persons, or damage to the product or property.

⚠ WARNING: Installations must conform to the schematics in Appendix 1.1. It is the responsibility of the installer to make sure that all appropriate measures are implemented including appropriate safety devices.

ⓘ **IMPORTANT:** Any combinations of the products that are not listed below are outside of the scope of this document and are not covered under warranty and are excluded from liability.

Refer to *Appendix 1.1 System Schematics on page 118 for the system schematic and more information of the system arrangement.*

The available product combinations are:

- HP290 Monobloc Heat Pump+ HP290 Pre-plumbed Cylinder (HP290 Control Box Included)
- HP290 Monobloc Heat Pump + HP290 Control Box (wall mounted) + Heat Pump DHW Cylinder (if DHW is required)
- HP290 Monobloc Heat Pump + HP290 Controller + Heat Pump DHW Cylinder (if DHW is required).

3.2 PRIMARY HEATING SYSTEM REQUIREMENTS

To safeguard correct function of the system it must be made sure that the system operates within the specification outlined in *Table 11*.

Table 11 System Specification

Specification/Requirement	Units	4.5 kW	6 kW	8 kW	10 kW	12 kW	14 kW
Maximum System Operating Pressure	bar	3.0					
Minimum System Pressure	bar	1.0					
Maximum Flow Rate	(L/min)	15.0	20.8	35.0	41.7	45.8	50.0
Design Flow Rate	(L/min)	12.8	15.2	23.0	30.7	33.4	35.3
Minimum Flow Rate	(L/min)	6.7			11.7		
Maximum Water Temperature	°C	75					
Minimum Water Temperature	°C	12					
Primary Circuit Minimum Copper Pipe (ø)*	mm	22	28			35	
Minimum System Filter Mesh Size	μ	800					
Minimum Water Volume	(L/min)	≥ 25			≥ 40		

* Consideration of the internal diameter of selected pipework must be taken into account when calculating the system resistance and water velocities at the specified design flow rates.

⚠ WARNING: It is the responsibility of the installer to make sure that the correct safety devices are installed to the heating system.

⚠ CAUTION: The system pipework must be designed and installed to achieve the correct Design Flow Rate. Failure to achieve the correct design rate will lead to poor performance and efficiency.

⚠ CAUTION: The system flow rate must be guaranteed to be above the minimum flow rate requirement in all operating modes, taking care when the installation includes thermostatic / electronic control valves. If the minimum flow rate of the system is not maintained at all times, the Heat Pump will not operate. The water velocity in the pipe should be kept within limits of material to avoid erosion, corrosion, and excessive noise generation.

ⓘ **IMPORTANT:** Added resistance in the hydronic circuit will result in the reduction of the overall system efficiency. To reduce resistance, as few bends must be used as possible and swept bends are to be used where practical. The cross-sectional area of the pipework must be maintained and meet the minimum size.

3.2.1 Minimum System Volume of the Heating Circuit

⚠ CAUTION: The primary circuit of the heat pump must always have a minimum free system volume of 25 L for 4.5 kW to 8 kW and 40 L for 10 kW to 14 kW. This makes sure that the Heat Pump does not cycle excessively and is able to defrost completely. Failure to adhere to this requirement will result in inefficient operation of the Heat Pump and the potential for nuisance faults.

Free volume must be considered as any part of the system (including the Zone 1 space heating circuit) with sections of pipework and radiators without Thermostatic Radiator valves (TRV).

If the minimum free volume cannot be met this will need to be increased. This can be done with the addition of a volumiser or buffer vessel.

3.2.2 System Expansion

⚠ WARNING: Failure to appropriately protect against system expansion may lead to catastrophic failure of the system circuit, major property damage and serious harm to dwelling inhabitants. It must be made sure that it is impossible to isolate the expansion vessel from the system.

Refer to BS EN 12828 - Heating systems in buildings - Design for water-based heating systems; when determining the accurate size of the Expansion Vessel. It must be made sure that the installed expansion vessel is large enough to accommodate the system volume.

If glycol is used a correction factor should be applied to account for higher coefficients of expansion.

3.2.3 Maximum Pipe Length

Primary pipework must be correctly designed and installed to enable the correct design flow rate to be achieved.

3.2.4 Water Quality Requirements

⚠ WARNING: Make sure that water intended for human consumption complies with EU Directive 98/83/EC.

⚠ CAUTION: Due to the lower operating temperatures, it is recommended that heat pump systems have additional protection against oxidation and aggressive chemicals.

⚠ CAUTION: Failure to adequately dose the heating systems corrosion inhibitor will lead to the gradual deterioration of the system performance over time and reduce both the lifespan and efficiency of the product.

System water is to be cleaned, treated, tested, and maintained in accordance with BS 7593:2019 - Code of practice for the

preparation, commissioning, and maintenance of domestic central heating. Record water quality test results in the Benchmark Section at the rear of the book.

The HP290 pre-plumbed cylinder range is fitted with a primary circuit system filter as standard. If the installation does not include a HP290 pre-plumbed cylinder an appropriately sized and positioned system filter and strainer with a minimum mesh size of 800 microns must be installed on the primary return to the Heat Pump to prolong the life expectancy of the system.

3.2.5 System Water Antifreeze Protection

⚠ WARNING: Do not use mono ethylene glycol. Use Propylene glycol only.

⚠ CAUTION: Where any circuit pipework is exposed to ambient temperatures of less than 5 °C, antifreeze protection must be installed. Failure to install adequate antifreeze protection methods may lead to damage to the system. Damage to systems which do not have adequate antifreeze protection methods is not covered by warranty.

When the Heat Pump is exposed to freezing temperatures, the primary heating circuit must either be:

- Charged with a glycol water mixture, refer to Section 5.2.2.4.
- Installed with antifreeze protection valves on both the inlet and outlet of the Heat Pump refer to Section 5.2.2.3.

⚠ WARNING: Do not install antifreeze valves if the system has been charged with glycol or vice versa.

All exterior pipework must be insulated with UV resistant and water proof pipe lagging.

A fill and flush valve must be installed when the system is charged with Glycol.

3.3 HEAT PUMP - INSTALLATION AREA

⚠ CAUTION: The product is not to be obstructed by any surrounding objects or surfaces as this can limit access and adversely affect performance. The minimum clearances that are shown in *Figure 3* should be always maintained.

⚠ WARNING: The installation area should always be kept clear of ignition sources, including but not limited to; electrical switches, electrical plug sockets, and lamps.

⚠ WARNING: Mounting structures and fixtures must be capable of supporting the weight of the product and its accessories. Product weights without accessories are as follows 4.5 kW to 6 kW; 90 kg, 8 kW; 117 kg, 10 kW to 14 kW; 135 kg.

The proposed installation site should be explained, discussed, and agreed with the client prior to the start of installation, making them aware of blowing cold air, potential condensate build up, noise emissions, and vibration.

The heat pump must be installed outdoors, preferably in a sunny location. It is acceptable to install the product underneath a protective roof and/or surrounded by some walls and surfaces, providing that the installation requirements and

clearances are maintained. The product must be accessible for maintenance activities.

National regulations regarding noise emissions should be obeyed. When selecting a site, reverberation of noise against surfaces should be considered, especially in areas where the heat pump is adjacent to multiple walls.

It should also be made sure that the cold air does not cause any disturbance of neighbours or negatively influence the installation site.

Routing of pipework, electrical cables and condensate disposal method should be considered and accounted for when selecting the installation site.

Section 3 - Pre-Installation Checks

3.3.1 Installation Environment

⚠ WARNING: The air drawn into the air intake of the product must be free from methane gas, ammonia, and any other flammable/explosive substances. The heat pump must not be placed in locations likely to produce such vapours such as near stables or near large open fertilizer stores.

⚠ CAUTION: The heat pump installation environment must be free from corrodents, specifically: mineral oil, sulphur, arsenic acids, and environments of high salt content, such as coastal areas. These will cause corrosion of metal components.

Do not install the heat pump within 2000 meters of the sea.

The heat pump must only be installed at altitudes less than 2000 metres above sea level.

The installation site of the heat pump must not be placed in areas that are subjected to significant dirt or water flow such as near defective guttering. The air intake must not be placed in an area prone to build up of any medium that could cause significant blockage.

The installation site must not obstruct or restrict the airways or be subjected to strong winds.

The heat pump must be raised sufficiently above ground level to prevent blockage by settling snow. Make sure that there is protection from falling snow or water, including build ups from roofs that may fall in large quantities.

3.3.2 Orientation

The heat pump must have an unrestricted air flow in order to work at its most efficient. It is recommended to install in locations protected from direct or oncoming wind if possible. Strong winds may adversely affect evaporator fan operation and, when combined with precipitation, can cause ice to form.

The evaporator air intake is fitted with an air temperature sensor as standard and is used by the heat pump for ambient air temperature measurement. Installation in direct sunlight must be avoided.

3.3.3 Mounting

The heat pump should be installed on a level mounting foundation which must be structurally sound and designed to not structurally degrade over time. It should be mounted at least 100 mm above ground level and not exceeding 1000 mm.

The heat pump must not be directly installed to fixtures without sufficient means of vibration absorption to prevent vibration from being conducted through the fixtures.

The area underneath the product must be capable of absorbing condensate and be structurally unaffected by freezing condensate or long-term exposure to moisture. It is recommended that gravel is used underneath the heat pump.

3.3.4 Condensate Disposal

⚠ WARNING: The installation should not cause any risk or danger to the surrounding area. It should be made sure that there are no roads or pathways that are significantly influenced by the condensate disposal of the heat pump. Make sure that suitable condensate disposal methods are installed.

The heat pump discharges condensate during normal operation and the defrosting function. Condensate can be disposed of using the following methods and must be considered when determining the installation site, refer to Section 4.1.5.:

- Ground disposal into a soak away or gravel bed.
- Piped into a rainwater drain/gully.

3.3.5 Pressure Relief Valve Discharge Outlet

⚠ WARNING: Make sure the location of the PRV discharge outlet pipe from the heat pump does not cause any hazards to the occupants of the premises or damage to the property from discharge, such as, above walkways.

If necessary, the discharge outlet must be piped away in a safe manner or collected by a condensate drain tray with a suitable drain connection. Make sure that selected materials can withstand the pressures and temperatures of the discharge medium. Refer to *Figure 27* for location of the PRV outlet.

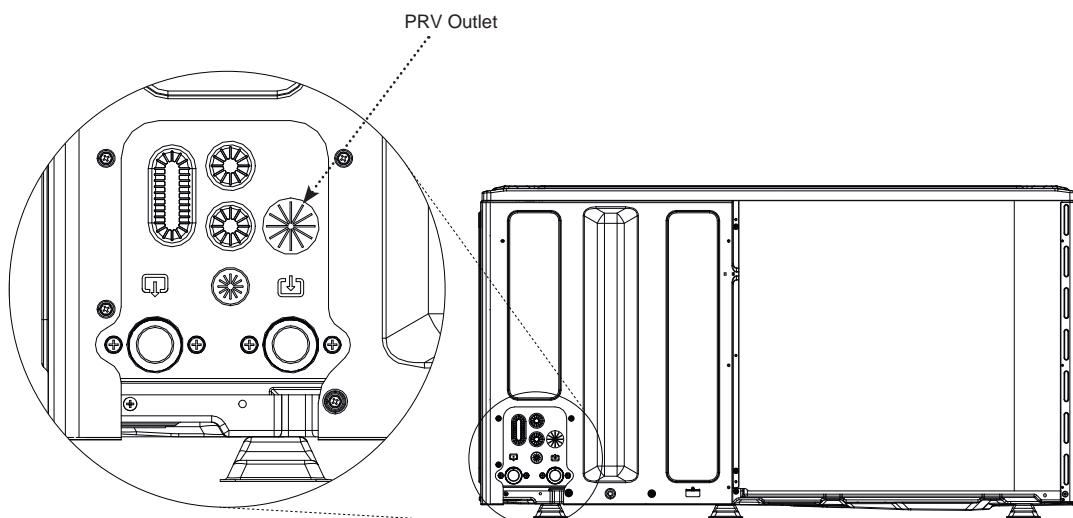


Figure 27. Heat Pump PRV Outlet (4.5-6 kW model shown)

3.3.6 Protective Safety Zone

⚠ WARNING: The product contains the hydrocarbon refrigerant R290 which is very flammable. The refrigerant may mix with air to form a flammable atmosphere increasing the risk of fire and/or explosion.

Work that requires the removal of the exterior casing of the Heat Pump must only be done by competent persons who are familiar with the risks of R290 refrigerant.

Work on the refrigeration circuit must only be done by a Cat I or Cat II F-gas certified engineer with a City and Guilds 6187-21 certificate or equivalent. Work done on the heat pump should be done in accordance with industry standard safety procedures and practices for working with hydrocarbons.

The refrigerant circuit of the outdoor heat pump is charged with R290 refrigerant, which is an odourless, colourless, and flammable refrigerant and classified in the safety group A3 in accordance with ISO 817 and ANSI/ASHRAE standard 34.

When selecting an installation area, it should be considered that R290 has a higher density than air and therefore in the event of leakage from the heat pump, will displace air and pool in low-lying areas. A protective safety zone is defined around the area to prevent explosive and asphyxiating atmospheres, by avoiding the following within this area:

1. Building openings, e.g., doors, windows, air intakes, exhausts, cellar entrances, etc.
2. Ignition sources, e.g., electrical switches, plugs sockets, drills, heaters, etc.
3. Areas outside of the property lines e.g., public areas, adjacent buildings.
4. Ditches, troughs, un-trapped drains, or depressions in the ground.
5. Surfaces exceeding 400 °C in temperature.

The protective safety zone is dependent on the installation areas and adjacent structural installations. See *Figure 28*, *Figure 29* and *Figure 30* to determine the extent of the protective safety zone.

In this area no further works should be done which would affect the stated rules and measures for the protective safety zone.

For all shown types of installations, the top of the protective safety zone is in line with the top face of the heat pump.

ⓘ IMPORTANT: Dimensions shown in *Figure 28*, *Figure 29* and *Figure 30* below are the minimum dimensions for the extent of the protective safety zone.

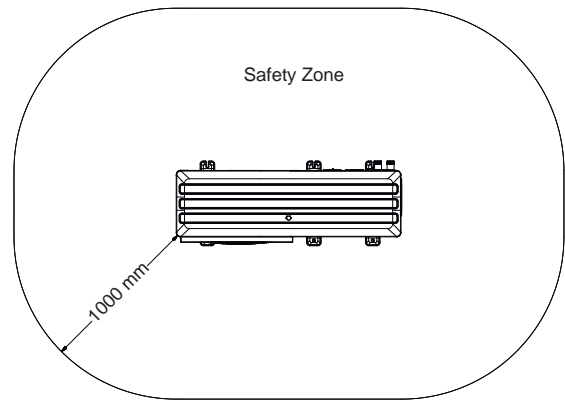


Figure 28. Freestanding installation

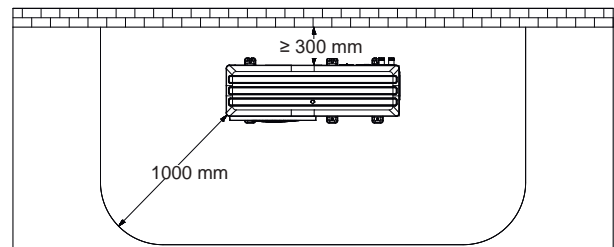
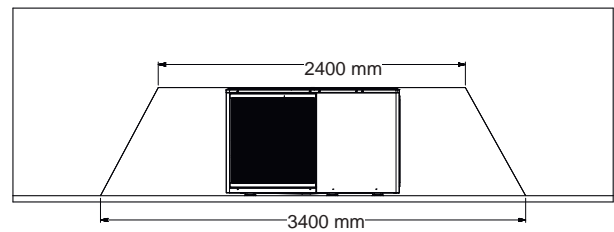


Figure 29. Installation in front of wall

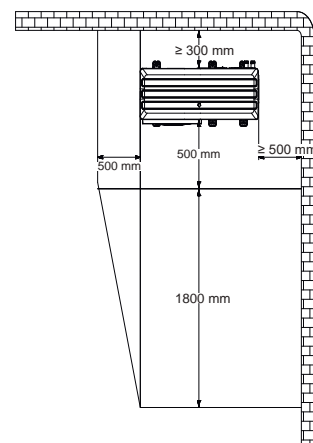
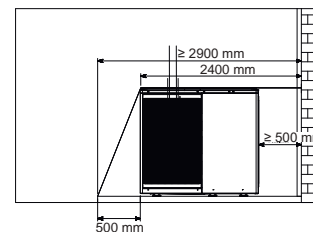


Figure 30. Installation in corner

3.4 CYLINDER - INSTALLATION AREA

Make sure your selected product will fit in your selected location.

Examine the product dimensions "Overall width, depth and height" shown in *Table 5, Table 6 and Table 7* for your selected product.

Think through the clearances needed to move the product through the property to its final location and those needed in its final location. For example 100 mm either side of these dimensions may be required for manoeuvring the product but less may be required in its final location.

3.4.1 Product Location Considerations

Examine the product "Weight Full" *Table 5, Table 6, Table 7 and Table 8* for your selected product.

Make sure that the floor of the chosen location can support at least more than this weight.

Make sure that the Mains water supply is Sufficient. Please review the guidance below and do a check on the water pressure and dynamic flow rate.

Guidance: Existing properties with a 15 mm supply will be satisfactory provided the local mains pressure is good, but should be confined to single bathroom properties. For new properties where simultaneous demand is required to more than one bathroom or a bathroom and one or more en-suites, the communication and service pipe into the dwelling should be a minimum of 22 mm (usually in the form of a 25 mm MDPE supply).

The optimum performance is achieved if the inlet pressure is 3 bar dynamic.

However, the HP290 DHW Cylinder will function with lower inlet pressures, but this will reduce the performance. There should be a flow of at least 30 litres per minute or above available into the property. Normally the HP290 cylinder provides well in excess of 40 litres/min in most conditions. Flow rates for ALL mains pressure systems are subject to district pressures and system dynamic loss. Particularly on larger properties with more than one bathroom, the pipe sizes should be calculated in accordance with BS EN 806-3:2006 and BS 8558:2011.

Make sure that the selected location allows the following:

1. The discharge pipework for the safety valves must have a minimum fall of 1:200 from the unit to a safe discharge point.
2. All exposed pipework and fittings on the cylinder must be insulated, and the unit should NOT be fixed in a location where the contents could freeze. In new systems, pipes must be insulated to comply with building regs. The maximum permissible heat loss is indicated in the table below.
 - i. Primary circulation pipes for domestic hot water circuits must be insulated through their length, subject only to practical constraints imposed by the need to penetrate joists and other structural elements.
 - ii. All pipes connected to hot water storage vessels, must be insulated for at least 1 metre from their points of connection to the cylinder (or they must be insulated up to the point where they become concealed).

- iii. In replacement systems, whenever a boiler or hot water storage vessel is replaced in an existing system, any pipes that are exposed as part of the work or are otherwise accessible should be insulated as recommended for new systems, or to some lesser standard where practical constraints dictate.

Insulation of pipework	
Pipe outside diameter	Maximum heat loss
15 mm	7.89 W/m
22 mm	9.12 W/m
28 mm	10.07 W/m
35 mm	11.08 W/m

① **FURTHER GUIDANCE ON CONVERTING HEAT LOSS LIMITS TO INSULATION THICKNESS FOR SPECIFIC THERMAL CONDUCTIVITIES IS AVAILABLE IN TIMSA "HVAC GUIDANCE FOR ACHIEVING COMPLIANCE WITH PART L OF THE BUILDING REGULATIONS".**

① **OUR CYLINDERS HAVE BEEN DESIGNED WITH 28 MM PIPEWORK IN MIND. THIS IS BASED UPON THE EXPECTATION THAT HIGHER FLOW RATES ARE REQUIRED ON HEAT PUMP SYSTEMS.**

3.4.2 Water Supply Requirements

The hot water cylinder must only be used for the storage of potable water supplied from the public mains. The water quality shall be in accordance with European Council Directive 98/83 EC, or revised version of the date of installation, and must not be fed with water from a private supply.

Water supply particular requirements;

- Chloride content: Max 200 mg/l
- Sulphate content: Max 200 mg/l
- Combination chloride/sulphate. Max. 300 mg/l (in total)

If the newly fitted hot water cylinder is not in regular use, then it must be flushed through with fresh water for at least 15 minutes. Open at least one hot water taps once per week, during a period of at least four weeks.

3.5 CONTROL BOX - INSTALLATION AREA

3.5.1 Product Dimensions and Installation Clearances

⚠ CAUTION: The product is not to be obstructed by any surrounding objects or surfaces as this can limit access and adversely affect performance. The minimum clearances that are shown in *Figure 22* should be always maintained.

3.5.2 Determining Installation Area

The proposed installation site should be explained, discussed, and agreed with the client prior to the start of installation. It should be accessible for the specific end user for control of the heating system.

Both power cables and communication cable routing should be considered when selecting an installation site.

3.5.3 Requirements of Installation Area

If installing the HP290 Pre-Plumbed (PP) cylinder with mounted control box, refer to Section 2.3 and 2.4 for dimensions, access, and clearance requirements.

If installing a third-party cylinder and separate control box, refer to Section 2.4.1 for control box dimensions, access, and clearance requirements.

Precautions must be put in place to protect the control box from damage e.g. impact, splashing, etc.

The installation site is to be free from water, high levels of humidity, or debris as this can cause malfunction or damage in the control box. The installation site must not exceed the operating temperature or humidity tolerances given in *Table 1*.

The installation site must be free from the influence of electromagnetic, electrostatic, or magnetic fields, and not be mounted in direct sunlight.

The proposed installation site must be explained, discussed, and agreed with the client prior to the start of installation. The site must be accessible for the end user.

The installation site must consider the routing of power supply electrical cables and interconnecting cables for sensors. Make sure adequate segregation is achieved.

4.1 INSTALLATION OF HEAT PUMP

4.1.1 Preparation of Installation Area

The installation site is to follow the requirements and be determined using the conditions outlined in Section 3.3.

Figure 31 and Figure 32 shows the dimensions of the mounting fixtures of the Heat Pump.

Ideal Heating offer anti-vibration mounting feet for the HP290 Heat Pump which will provide both vibration protection and the necessary minimum ground clearance requirements.

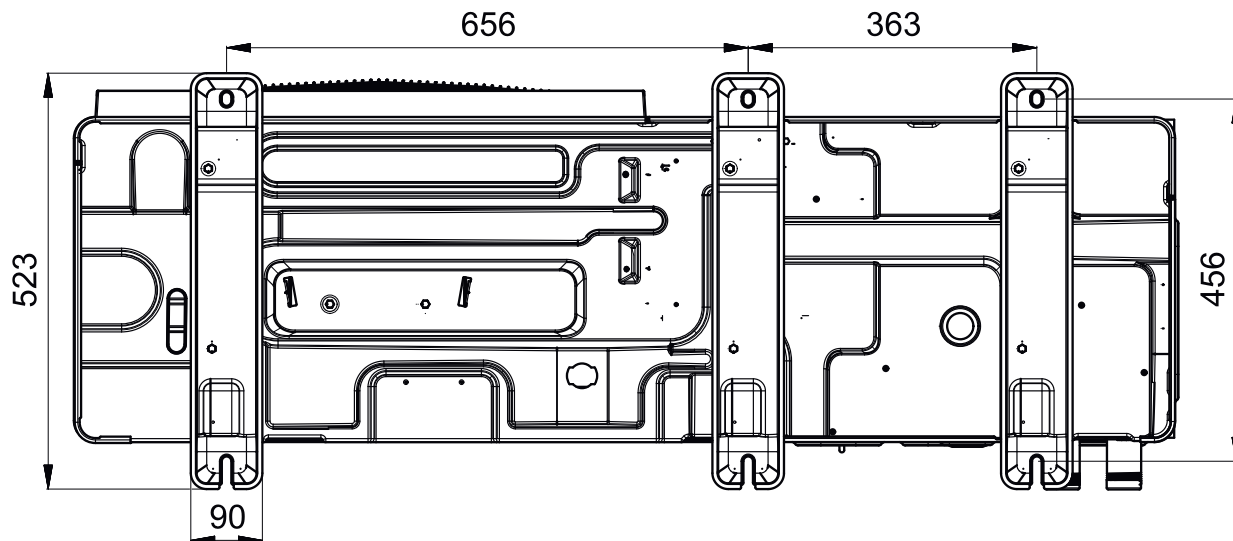


Figure 31. Dimensions of Mounting Fixtures (8 - 14 kW)

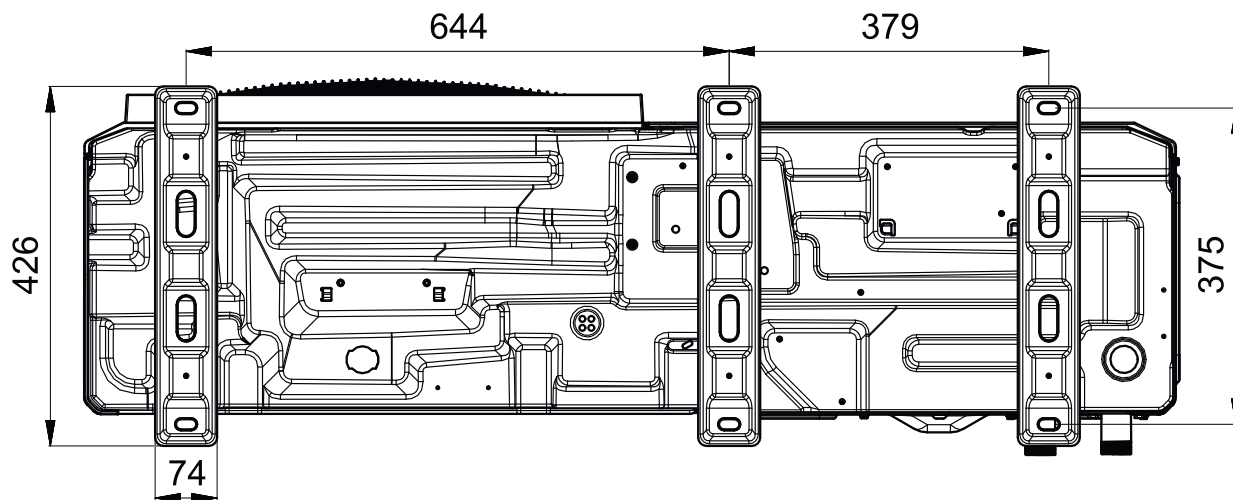


Figure 32. Dimensions of Mounting Fixtures (4.5 - 6 kW)

4.1.2 Floor Mounting

4.1.2.1 Mounting Foundation

A level mounting foundation must be prepared, and it is to be structurally sound and designed to not structurally degrade over time. It is to be of stable and solid construction following structural engineering principles and it must easily support the weight of the heat pump.

The heat pump must be raised to at least 100 mm above the ground level. In areas prone to snow, this height should be increased but should not exceed 1000 mm from ground level.

⚠ CAUTION: To not impede the performance of the heat pump it must be made sure that the foundation is level. Failure to meet this requirement may compromise the unit's ability to correctly drain condensate and negatively affect the operation of the refrigerant circuit.









4.1.3 Receival and Unpacking

⚠ CAUTION: Use a suitable means of transporting the Heat Pump. The appliance **MUST** remain upright and not be tilted more than 45 degrees to prevent damage to the internal sealed circuit of the Heat Pump.

⚠ CAUTION: The product is not to be manoeuvred via the packaging straps. The packaging straps are not designed to carry the weight of the packaged unit and will may break potentially causing injury to handlers or damage to the product.

Packaging Symbols

The below symbols and conditions must always be followed for the packaged product.

	Do not clamp from these sides when handling.
	Vertical stacking limit x 2
	Do not tilt the package
	This package is to be kept upright
	Product must be treated as fragile
	Flammable contents
	Keep package away from water and rain
	Product should not be discarded as unsorted waste but must be sent to separate collection facilities for recovery and recycling

⚠ WARNING: Packaging straps are tightly secured and can release a lot of kinetic energy when cut. Hold straps firmly and apply caution when cutting and keep body away during cutting to avoid injury.

The packaging is to be removed by following the below sequence:

1. Remove packaging straps by cutting them away from the body.
2. Lift lid from packaging and evenly lift cardboard surround sleeve.
3. Remove polystyrene top plate and accessories pack.

⚠ WARNING: The protective plastic bag can accumulate a lot of static charge. Appropriate measures should be taken in hazardous areas.

4. Remove protective plastic bag from the Heat Pump and secure with the rest of the packaging.
5. Once the Heat Pump is ready to be mounted, remove the fixings and lift it from the base.
6. It is the responsibility of the system installer to correctly dispose and recycle the product packaging.

After the product is unpacked, make sure that all the contents are present.

Quantity	Item Description
1	HP290 Monobloc Heat Pump
1	Documentation Package
1	ErP Label
1	Hardware Pack
1	Flow and Return adaptors (2 pack)

ⓘ IMPORTANT: If there are any missing items, contact Ideal Heating.

4.1.4 Lifting and Handling

⚠ WARNING: The surface of the evaporator is sharp. Care should be taken when handling the product and appropriate protective equipment used.

⚠ CAUTION: Use a suitable means of transporting the Heat Pump. The appliance **MUST** remain upright and not be tilted more than 45° to prevent damage to the internal sealed circuit of the Heat Pump.

Handlers must be aware and capable of good manual handling techniques and practise them during the lifting and handling of the heat pump. Weight of the products can be found in *Table 12*.

Table 12 Weights of Unpackaged Units

HP290	Unit	4.5	6	8	10	12	14
Unpackaged Weight	kg	90	117	135			

Prior to transporting and handling the product, the movement route must be planned, and the mounting foundation be prepared. It must be made sure that the movement route can handle the weight of the product and lifting equipment.

Once moved onto the foundation, the heat pump is to be fixed with vibration resistant fastenings to prevent gradually loosening over time. There must be some method of vibration absorption to prevent vibration from damaging the mounting foundation.

4.1.5 Condensate Disposal

⚠ WARNING: The HP290 generates a large volume of condensate water. The condensate water MUST be disposed of in a safe manner avoiding freezing on walkways and surfaces.

INSTALLATION OPTION 1

HP290 installed on a permeable base such as a gravel or sand soakaway etc. which will allow the condensate to drain freely.

YES

No additional condensate drain requirements.

INSTALLATION OPTION 2

HP290 installed on a non-permeable base such as concrete, patio or paving blocks etc. which may restrict condensate drainage and increase the potential for the condensate freezing.

YES

SOLUTION A

Install the condensate spigot into the drain connection point in the Heat Pump base panel, refer to *Figure 33* and *Figure 34*.

Install condensate drain pipework to a suitable drainage point. Insulate all condensate drain pipework.

SOLUTION B

Install a condensate drain tray underneath the HP290 Heat Pump.

Install condensate drain pipework to a suitable drainage point. Insulate all condensate drain pipework.

No additional condensate drain requirements.

⚠ WARNING: The product contains the hydrocarbon refrigerant R290, in the unlikely event of a leak, the refrigerant may collect in the condensate drain. For installation option 2: Make sure that any drainage system that the heat pump's condensate drain pipework is connected to, includes a frost-free siphon i.such as a P-trap.

⚠ CAUTION: To avoid condensate freezing, any condensate that is piped away from the heat pump must be sloped to prevent collection of condensates in the pipework.

Section 4 - Installation

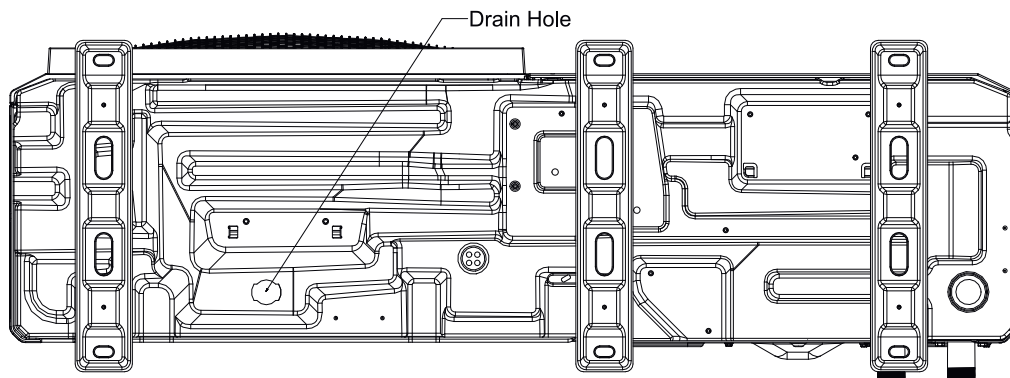
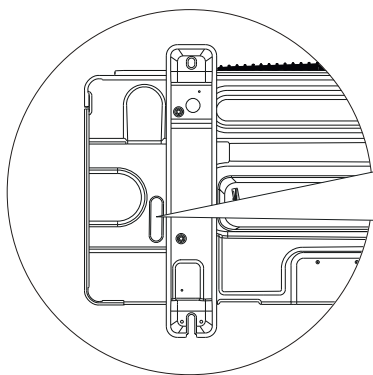


Figure 33. Heat Pump Base Panel (4.5 - 6 kW)



This drain hole is covered by a rubber plug. If the small drain hole cannot meet the drainage requirements, the large drain hole can be used instead.

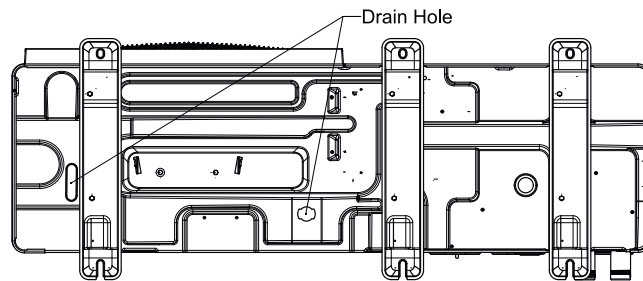
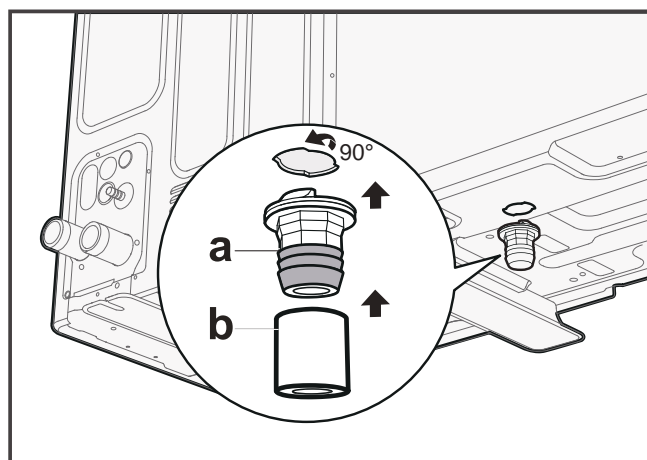


Figure 34. Heat Pump Base Panel (8 - 14 kW)

4.1.5.1 Installation of the Condensate Spigot

Install the condensate spigot as follows:

1. Take the condensate spigot from the installer pack and apply a silicone-based grease to the seal.
2. Insert the spigot into base panel opening and using a wrench turn the condensate spigot by 90 degrees making sure of full contact of the retaining face with the base of the panel.
3. The condensate spigot must then be fitted with a drain hose. The outer diameter of the condensate spigot is 32 mm and must be connected to an appropriately fitting hose. Caution must be taken not to loosen the condensate spigot from the base panel when connecting the drain hose.



- a. - Condensate Spigot (Pagoda connection, provided in installer pack).
 b. - Drain Hose (Not provided).

Figure 35. Condensate Spigot installation

4.1.6 Hydronic Connections

⚠ CAUTION: To prevent blockage, care must be taken to prevent solids, metal fillings, sealing tape, and any other contaminant from entering the heating circuit. Before connection to the heating system, the pipework must be thoroughly cleaned in accordance with BS7593:2019 to remove any contaminant.

The installation of the hydronic pipework must comply with local directives and guidelines.

To optimise performance, the length of pipes between the heat pump and the indoor system must be kept as short as possible and the resistance of the circuit should be minimised by using the fewest number of elbows and pipe fittings.

Suitable seals (fibre gasket, O-rings) are to be used in appropriate applications. Where thread sealant is required use PTFE tape, or sealing pastes (synthetic, dependant on application). Face seal connections are to be tightened with 15 Nm to 35 Nm.

Hydronic connections must be made by ≥ 22 mm diameter copper pipe for the 4.5 kW model, ≥ 28 mm for 6 kW to 10 kW, and ≥ 35 mm for the models 12 kW to 14 kW models. The diameter of the pipe is to be calculated based on the flow rate and length requirements of the hydronic system. Consideration of the internal diameter of selected pipework

must be taken into account when calculating the system resistance and water velocities at the specified design flow rates.

The water velocity in the pipe should be kept within the design limits of the material used to avoid erosion, corrosion, and excessive noise generation.

A heat pump flow balancing valve capable of displaying flow rates between 10 L/min to 50 L/min is required to be installed on the primary return pipework

⚠ CAUTION: When connecting metal pipes of different materials, be sure to insulate the connections to prevent galvanic corrosion.

It must be made sure that there is no transfer of vibration to the dwelling or heating system. To protect the heating system from vibration, braided hoses must be installed between the heat pump and rigid pipework to prevent vibration from being transferred to the system.

Local to the heat pump there must be means of isolation and drainage to allow for temporary decommissioning. External pipework must be insulated with UV/moisture resistant insulation and have a wall thickness of ≥ 19 mm.

Table 13 Connection Sizes

Connection	Size	Size	Material	Type
	4.5 kW to 6 kW	8 kW - 14 kW		
Heat Pump Flow	1 in BSP	1 1/4 in BSP	Brass	BSP Male
Heat Pump Return	1 in BSP	1 1/4 in BSP	Brass	BSP Male
Pressure Relief Valve Connection (PRV)	9 mm ID		PVC	Hose
Condensate Disposal Spigot (Base Panel)	32 mm OD		Plastic	Barbed Spigot
Flow Adaptor (Provided)	1 in M – 1 in F	1 1/4 in M – 1 1/4 in F	Brass	BSP Parallel Male to Female
Return Adaptor (Provided)	1 in M – 1 in F	1 1/4 in M – 1 1/4 in F	Brass	BSP Parallel Male to Female

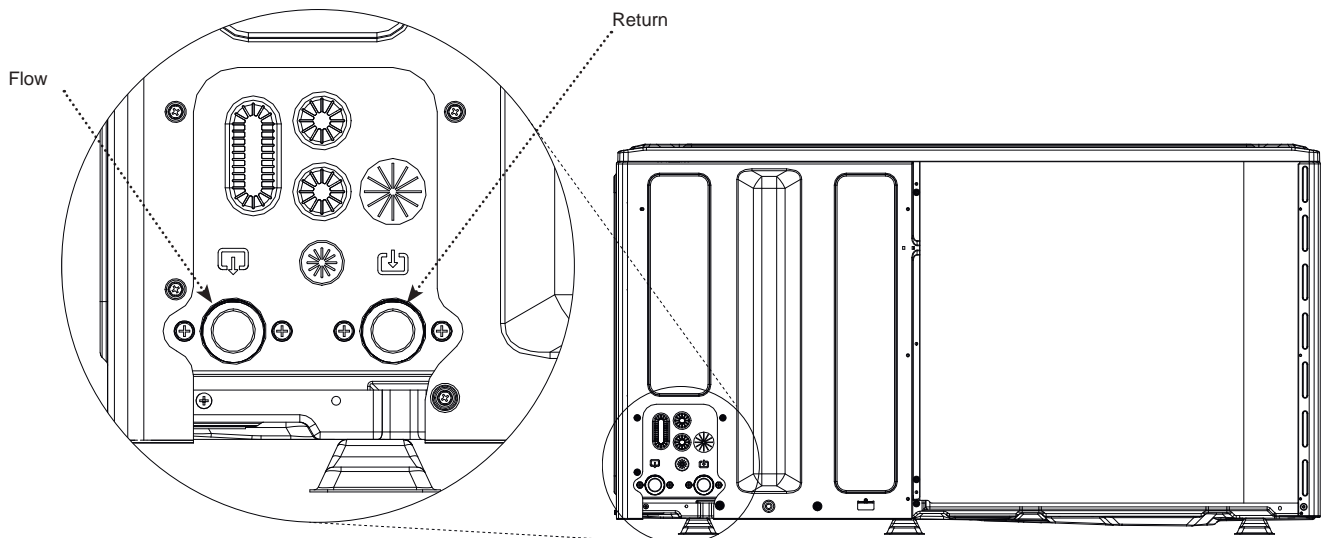


Figure 36. Primary Heating Connections

Section 4 - Installation

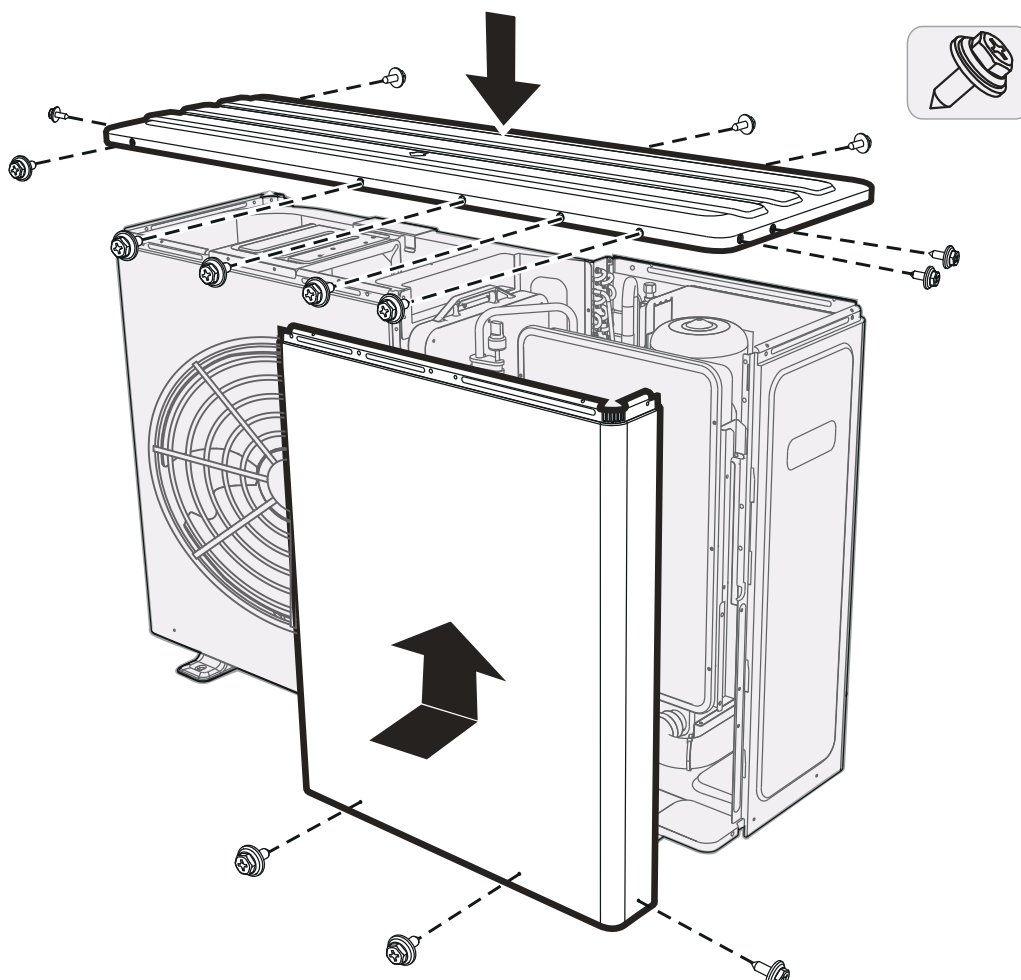
4.1.7 Accessing the Casing

The side panel is removable for the access to the internals of the product by following steps 1 to 4:

⚠ WARNING: When removing the casing panels you must wear protective gloves. Sharp edges can cause injury to hands and fingers.

⚠ WARNING: The product contains the hydrocarbon refrigerant R290 which is highly flammable. The refrigerant may mix with air to form a flammable atmosphere increasing the risk of fire and/or explosion. Work that requires the removal of the exterior casing of the Heat Pump must only be done by competent persons who are familiar with the risks of R290 refrigerant. Work on the refrigeration circuit must only be done by a Cat I or Cat II F-gas certified engineer with a City and Guilds 6187-21 certificate or equivalent. Work done on the heat pump should be done in accordance with industry standard safety procedures and practices for working with hydrocarbons.

1. To first remove the top panel, the 11 upper screws shown in *Figure 37* are removed using an appropriate tool.
2. The top panel may then be lifted vertically and removed from the heat pump.
3. The side panel can then be removed by undoing the three lower screws shown in *Figure 37*.
4. To refit the panels, follow steps 1 – 3 in reverse order.



Note: This drawing is representative only, actual units may differ.

Figure 37. Heat Pump - Panel Removal

4.1.8 Removal of Transport Bracket

⚠ CAUTION: The compressor transportation support bracket must be removed before the compressor is operated. If it is not removed the bracket will damage the compressor.

For 10 kW, 12 kW and 14 kW models as delivered, the compressor is supplied with a transportation support bracket to prevent damage during transport. After the product has been installed, this bracket must be removed before operating

the product by following the steps below

1. Remove the four screws that attach the transportation support bracket.
2. Remove the transportation support bracket.
3. Dispose of the bracket and screws. Refer to local authority regulations for correct waste disposal.

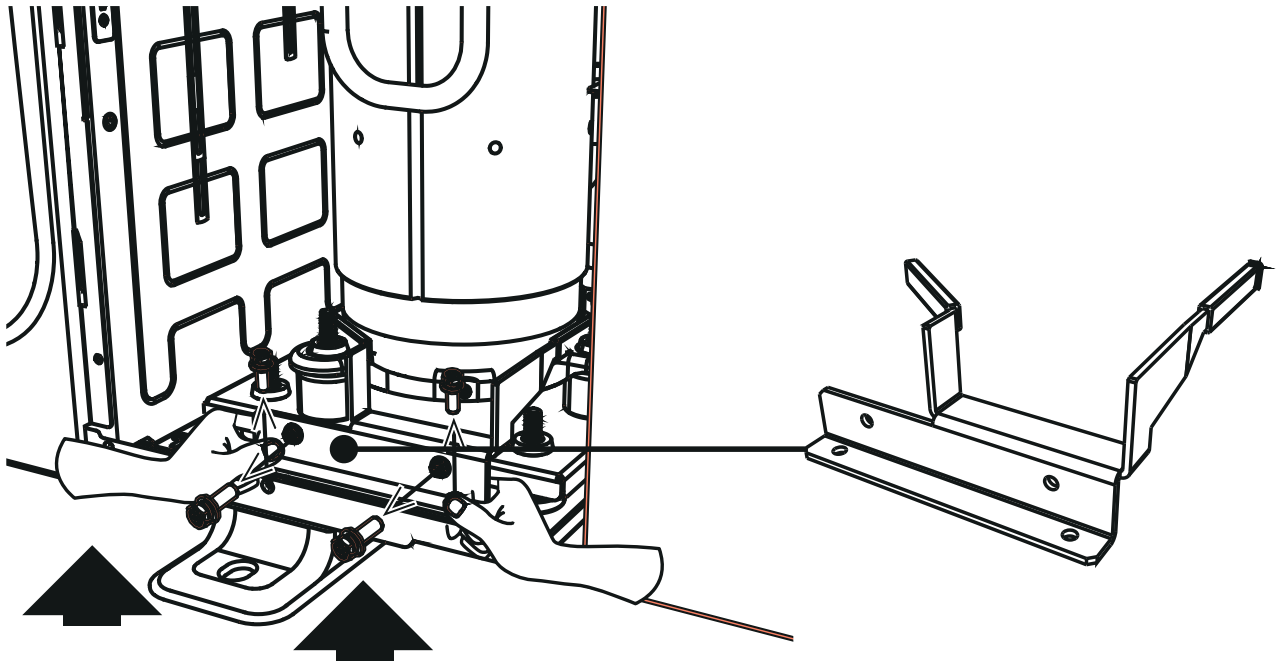


Figure 38. Transport Bracket Installation

4.1.9 Electrical Installation

⚠ WARNING: The product contains the hydrocarbon refrigerant R290 which is very flammable. The refrigerant may mix with air to form a flammable atmosphere increasing the risk of fire and/or explosion. Work that requires the removal of the exterior casing of the Heat Pump must only be done by competent persons who are familiar with the risks of R290 refrigerant. Work done on the heat pump should be done in accordance with industry standard safety procedures and practices for working with hydrocarbons.

⚠ WARNING: All electrical work is to be undertaken by a competent electrician. The electrical supply is to be switched off with appropriate safety measures in place to prevent accidental activation. The electrical installation must be done on the Heat Pump first and connection to the supply must be the last connection made to reduce risk of electric shock.

The electrical installation is only to be undertaken once all other installation operations prior to this section have been completed.

Electrical installations must comply with the requirements of guidance of BS 7671:2018 (IET Wiring Regulations), and must be used to determine the cross-sectional area of the electrical cable.

Electrical installations in the Republic of Ireland must also comply with - I.S. 10101 NSAI National Rules for Electrical Installation.

The electrical installation must be installed in accordance with the specification in Table 1 on page 9.

⚠ CAUTION: Incorrect installation of the electrical supply can lead to the destruction of the electrical components in the heat pump and any other unit that it is connected to.

The heat pump is to be supplied directly from the consumer unit using protected cable via a dedicated rotary isolator. The heat pump supply line must not contain a plug-type connection.

The electrical supply for the outdoor unit is to be taken from a type B or a type F RCD (residual current device) protected circuit and must have a Type-C curve cut-out device (circuit-breaker) compliant with the local installations rules in force.

There is to be an isolation switch, that when operated will switch off all poles, installed local to the Heat Pump.

⚠ WARNING: This product must be earthed, and it must not be possible to disconnect the protective conductor through any isolator switches.

The system requires dedicated 230 Vac power supplies for the outdoor unit and indoor unit with RCD type as specified above.

4.1.10 Routing the Electrical Cables

Cables that are connecting to the heat pump are to be routed through the cable glands to the circuit board as shown in *Figure 39*.

⚠ CAUTION: When routing cables, care should be taken to make sure that water is not able to run down the cables and enter the product by making sure that the cable is routed downwards after leaving the product and that the cable glands are tightly fitted.

When making connections to the electrical terminals make sure that there is no exposed copper wire and connections are made in accordance with BS 7671:2018 IET Regulations, as amended.

Supply and communication lines are to be installed as shown in *Figure 39*, and *Figure 40*. Make sure that the communication lines are attached by the securing clip below the terminal, and that the control box grommets are secured using the tie-wraps supplied in the installers pack.

Multi core cables should be stripped back by at least 60mm to allow for easy connection and to reduce strain on the terminals. Once all connections have been made, the cables are to be secured using the cable securing clamps at the base of the control board, to prevent stress on the terminals.

It is important to maintain the neutral-phase polarity of the heat pump. The earth continuity must be maintained, and the earthing wire is to be longer than the other wires.

⚠ WARNING: Failure to do electrical safety tests to verify the circuit has a higher risk of damage to the products and electric shock.

Upon completion of the electrical connections, electrical safety tests are to be done to verify the integrity of the circuit. These tests are to be done by a competent electrician and comply with BS 7671:2018 IET Regulations, as amended.

6x ⊕

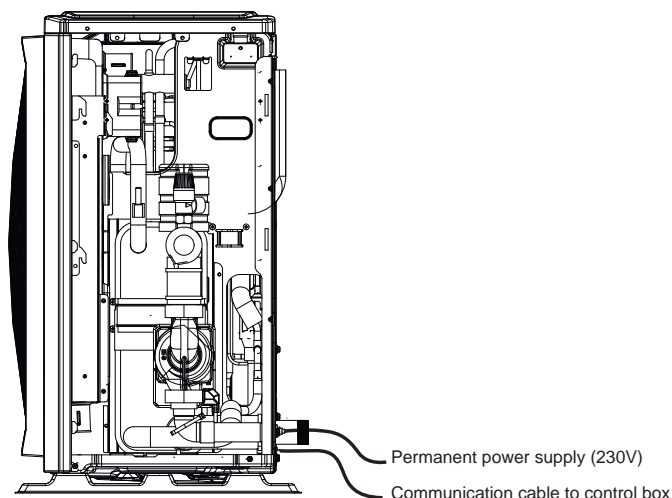
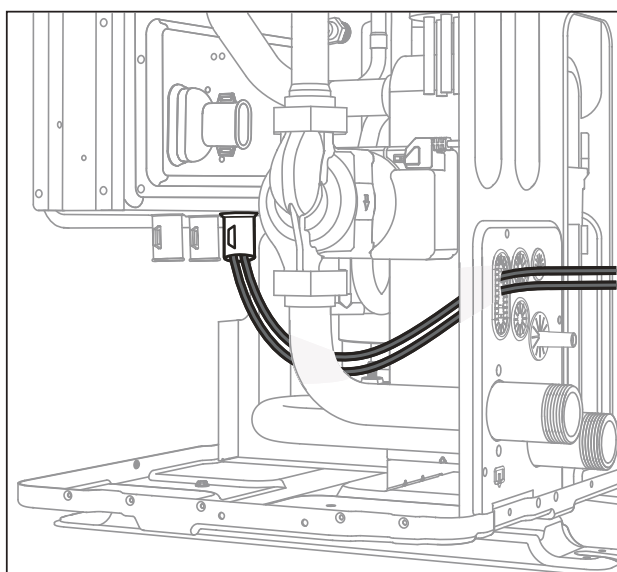
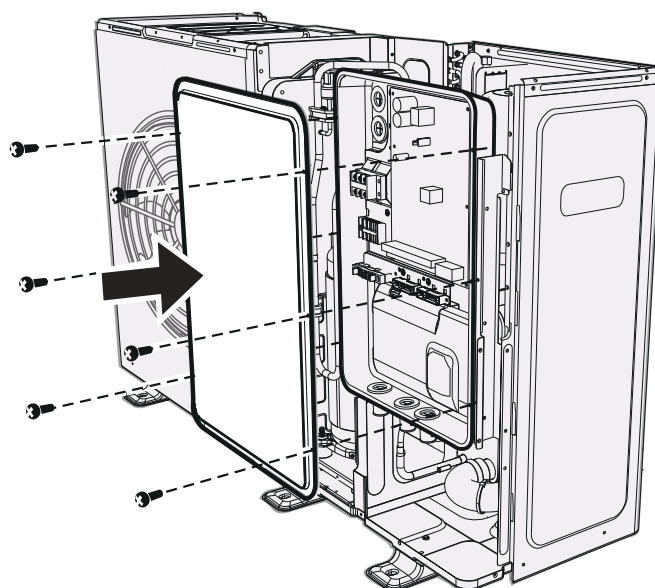


Figure 39. Routing the Cables

Section 4 - Installation

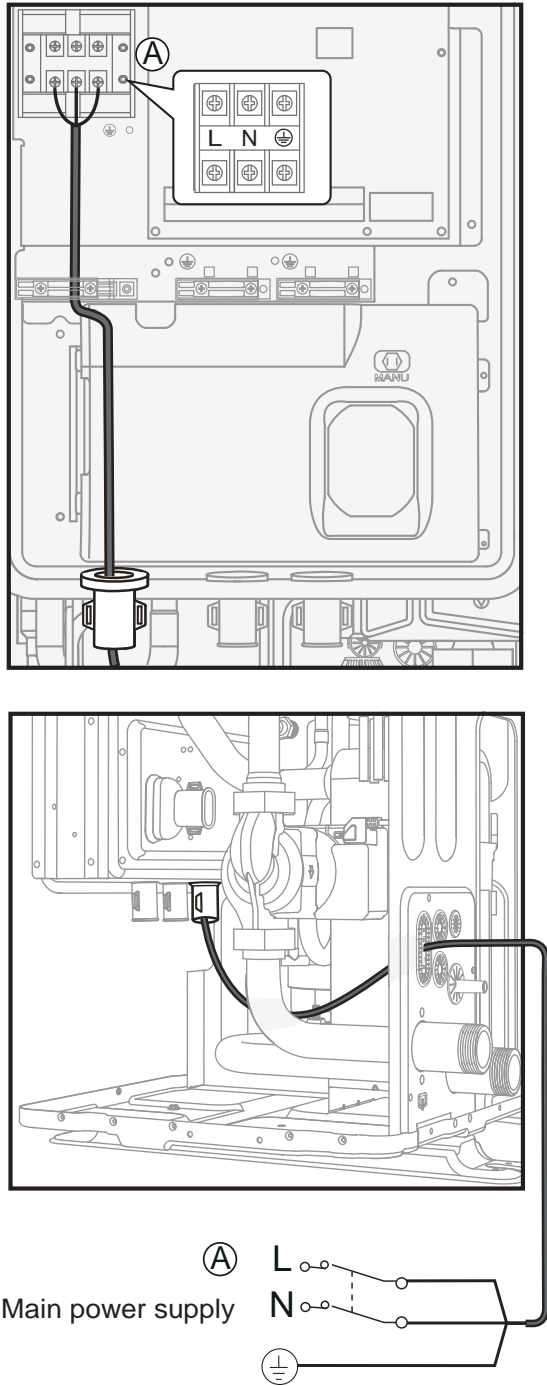


Figure 40. Mains Supply Connections to Outdoor Unit

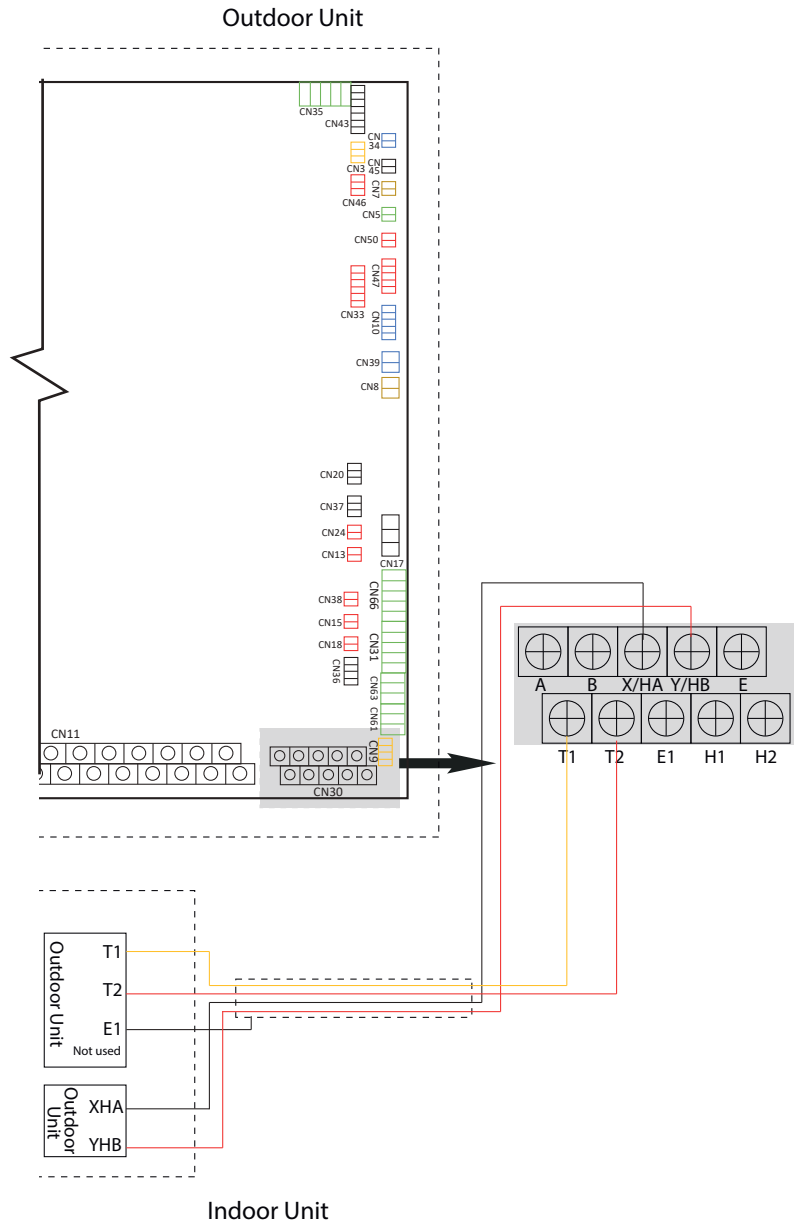







Figure 41. Communications Connections between Outdoor Unit and Control Box

4.2 INSTALLATION OF INDOOR DHW CYLINDER

4.2.1 Receival and Unpacking

Packaging Symbols

The below symbols and conditions must always be followed for the packaged product.

	Do not clamp from these sides when handling
	Do not tilt the package
	Product must be treated as fragile
	Keep package away from water and rain
	Product should not be discarded as unsorted waste but must be sent to separate collection facilities for recovery and recycling

ⓘ IMPORTANT: The DHW Cylinder MUST be kept upright at ALL times.

⚠ WARNING: Packaging straps are tightly secured and can release a lot of kinetic energy when cut. Hold straps firmly and apply caution when cutting and keep body away during cutting to avoid injury.

The cylinder is supplied fixed to a wooden pallet with a cardboard sleeving / packaging and is to be removed in following the below sequence:

1. Remove the packaging straps by cutting them away from the body.
2. Lift the cardboard outer lid from the packaging.
3. Remove the inner cardboard cylinder cover.
4. Remove the inner cardboard corner supports.
5. Remove the outer cardboard sleeves.
6. Remove the mechanical fixings securing the cylinder to the pallet. The Cylinder can now be removed from the pallet.

It is the responsibility of the system installer to correctly dispose and recycle the product packaging.

After the product is unpacked, make sure that all the contents listed below are present.

Quantity	Item Description
1	HP290 Cylinder**
1	Documentation Package

**Contents will depend on the cylinder type and options selected (refer to Table 10 on page 21)

4.2.2 Lifting and Handling

The HP290 DHW Cylinder must be handled with care and stored the correct way up in a dry place. Any manual handling/lifting operations will need to comply with the requirements of the Manual Handling Operations Regulations 1992 issued by the HSE. The appliance is supplied attached to a small pallet, and can be move around on smooth level surfaces using a pallet truck. In more confined spaces the

appliance can be moved using a sack truck on the rear face although care must be taken and the route must be flat and level. In apartment buildings containing a number of storeys we would recommend that the appliances are moved vertically in a mechanical lift. If it is proposed to use a crane, expert advice should be obtained regarding the need for slings, lifting beams etc.

4.2.3 Hydronic Connections

4.2.3.1 Performance Recommendations

The highest hot or cold water draw off point should not exceed 10 metres above the Pressure Reducing Valve.

In larger properties with a number of bathrooms/en-suites and long pipe runs we would recommend that the balanced cold supply is provided with its own pressure reducing valve and is not taken from the balanced cold connection on the combination valve. In this case it will also be necessary to fit a small expansion vessel on the balanced cold water system to accommodate the pressure rise caused by the increase in temperature of the balanced cold water. Check the performance requirements of the terminal fittings with regard to flow/pressure are suitable. Aerated taps are recommended to prevent splashing.

4.2.3.2 Shower Fitting Guidance

All types of shower mixing valve can be used as long as both the hot and cold supplies are mains fed. However, all mains pressure systems are subject to dynamic changes particularly when other hot and cold taps/showers are opened and closed, which will cause changes in the water temperature at mixed water outlets such as showers.

For this reason and because these are now no more expensive than a manual shower we strongly recommend the use of thermostatic showers with this appliance. These must be used in three storey properties where the impact on pressure/temperature of opening another tap in the system is greater than normal. The shower head provided must also be suitable for mains pressure supplies.

4.2.3.3 Pipe Layout

In all mains pressure installations it is important to remember that the incoming cold supply must be shared between all terminal fittings. It is important that a 22 mm supply is brought to the appliance and a 22 mm take-off is continued at least to the bath. If there are two baths, 28 mm pipework must be considered. One metre of smaller diameter pipework, or flow restrictors, must be provided on the final connection to all outlets so as to balance the water available. In any event the distribution pipework should generally be in accordance with BS EN 806, parts 1 to 5.

4.2.3.4 Plastic Pipework

This appliance is suitable for use with plastic pipework as long as the material is recommended for the purpose by the manufacturer and is installed fully in accordance with their recommendations.

4.2.3.5 Secondary Hot Water Circulation

All models 210 and above are fitted with a secondary return tapping as standard. If fitted, an extra expansion vessel may be necessary. A non-return valve **MUST** be **FITTED** near the return connection. No valve or terminal fitting should be installed between the non return valve and the cylinder.

All pipes kept hot by the secondary circulation **MUST** be insulated.

Any secondary circulation pump must be installed with effective time and temperature controls.

4.2.4 Pressure and Temperature/Expansion Relief Valve Pipework

The relief valve should be installed to discharge in accordance with G3 of the Approved Document of the Building Regulations and should be piped to where it is visible, but will not cause danger to persons or damage to materials.

The following information is taken from Approved Document G3 of the Building Regulations and is provided to assist with the design and installation of the discharge pipework. However, the information is not exhaustive and reference should always be made to Approved Document G3 of the Building Regulations. The final decision regarding any arrangements rests with Building Control and it is recommended that their advice is sought if you have any concerns regarding this aspect of the installation.

The two safety valves will only discharge water under fault conditions. When operating normally water will not be discharged.

The tundish should be vertical, located in the same space as the unvented hot water storage system and be fitted as close as possible and within 600mm of the safety device e.g. the temperature relief valve.

The discharge pipe (D2) from the tundish should terminate in a safe place where there is no risk to persons in the vicinity of the discharge, or other material that has been demonstrated to be capable of safely withstanding temperatures of the water discharged and is clearly and permanently marked to identify the product and performance standard and:

- A. Be at least one pipe size larger than the nominal outlet size of the safety device unless its total equivalent hydraulic resistance exceeds that of a straight pipe 9m long i.e. discharge pipes between 9m and 18m equivalent resistance length should be at least two sizes larger than the nominal outlet size of the safety device, between 18 and 27m at least 3 sizes larger, and so on. Bends must be taken into account in calculating the flow resistance. Refer to the *Table 14* and the worked example.

An alternative approach for sizing discharge pipes would be to follow BS EN 806-2:2005 Specification for design installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages.
- B. Have a vertical section of pipe at least 300mm long, below the tundish before any elbows or bends in the pipe work.
- C. Be installed with a continuous fall.
- D. It is preferable for the discharge to be visible at both the tundish and the final point of discharge but where this is not possible or practically difficult there should be clear visibility at one or other of these locations. Examples of acceptable discharge arrangements are:
 1. Ideally below the fixed grating and above the water seal in a trapped gully.
 2. Downward discharges at a low level; i.e. up to 100 mm above external surfaces such as car parks, hard standings, grassed areas etc are acceptable providing that where children play or otherwise come into contact with discharges, a wire cage or similar guard is positioned to prevent contact when maintaining visibility.
 3. Discharges at a high level; e.g. into metal hopper and metal down pipe with the end of the discharge pipe clearly visible (tundish visible or not) or onto a roof capable of withstanding high temperature discharges of water and 3 m from any plastic guttering systems that would collect such discharges.
 4. Where a single common discharge pipe serves more than one system, it should be at least one pipe size larger than the largest individual discharge pipe (D2) to be connected.

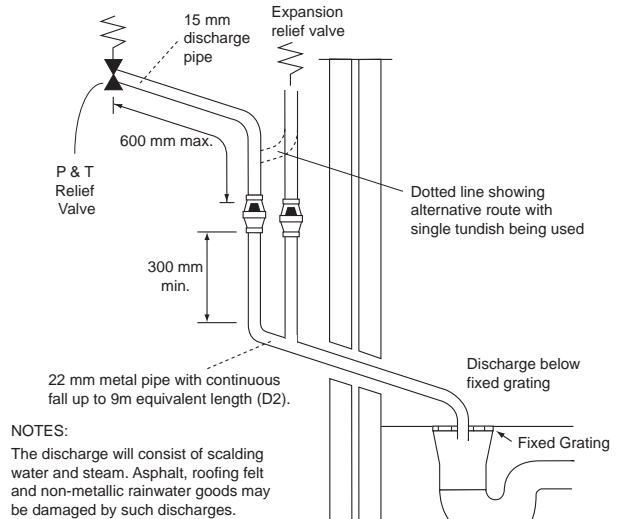


Figure 42. Typical Discharge Pipe Arrangement

Worked Example

The example below is for G1/2 temperature relief valve with a discharge pipe (D2) having 4 elbows and length of 7m from the tundish to the point of discharge.

From *Table 14*:

Maximum resistance allowed for a straight length of 22mm copper discharge pipe (D2) from a G1/2 temperature relief valve is: 9m subtract the resistance for 4 x 22mm elbows at 0.8m each = 3.2m.

Therefore the maximum permitted length equates to: 5.8m.

5.8m is less than the actual length of 7m therefore calculate the next largest size.

Maximum resistance allowed for a straight length of 28mm pipe (D2) from a G1/2 temperature relief valve equates to: 14m.

As the actual length is 7m, a 28mm (D2) copper pipe will be satisfactory.

Table 14 Sizing of Copper Discharge Pipe

Sizing of copper discharge pipe 'D2' for a temperature relief valve with a G1/2 outlet size (as supplied)		
Size of discharge pipework	Maximum length of straight pipe (no bends or elbows)	Deduct the figure below from the maximum length for each bend or elbow in the discharge pipe
22mm	Up to 9m	0.8m
28mm	Up to 18m	1m
35mm	Up to 27m	1.4m

5. If unvented hot water storage systems are installed where discharges from safety devices may not be apparent i.e. in dwellings occupied by blind, infirm or disabled people, consideration should be given to the installation of an electronically operated device to warn when discharge takes place.

Safety

The safety devices supplied or fitted on an HP290 are selected for their suitability for the temperatures and pressures involved. They must not be changed, removed or by-passed and it is essential that only genuine replacement parts supplied or approved by Ideal heating Ltd are used. All parts are available to approved installers from Ideal heating spares department (Telephone 01482 498663).

Combination Inlet Group

Combines elements 1, 2 and 3 below.

1. Pressure Reducing Valve - The cold water supply to any mixer taps/showers must be taken from the cold water tapping of this valve make sure that the hot and cold water pressures are balanced. This valve is factory set to the correct operating pressure for the StainlessLite Plus.
2. Non Return Valve - This is integral with the pressure reducing valve to prevent backflow of hot water towards cold water draw off points.
3. Cold Water Expansion Relief Valve - This safety device is preset at the factory and will relieve excess cold water pressure resulting from a fault condition.

Line Strainer

This is integral within the combination inlet group to reduce the likelihood of contaminants fouling the valve seat. Following installation; Isolate the cold supply to the cylinder. Remove the inlet control group valve. Inspect the gauze filter on the inlet side of the valve and remove the debris.

Tundish

This is to allow the discharge from any Relief Valve to be seen. It must be fitted away from any electrical devices. See page 36 for discharge pipework details.

Expansion Vessels Installation

To prevent water stagnation and particulate accumulation affecting water quality, it is recommended that the expansion vessel be installed in the vertical orientation so that the fitting accommodating thermal expansion or a pressure surge is:-

1. bottom fed and upright; and
2. that the connecting pipework to the fitting:-
 - rises continuously; and
 - is kept to a minimum;

There must be no valve on the pipe work between the expansion vessels and the unvented cylinder which could prevent the expansion of the water contained in the unvented cylinder reaching the expansion vessels.

Temperature/Pressure Relief Valve

This safety device is also pre-set at the factory and relieves before the temperature reaches 100°C. It is also a Pressure Relief Valve, and is pre-set to 6 bar.

4.2.5 Immersion Heater Wiring

⚠ WARNING: Danger of electrocution: before making any adjustments to the thermostat isolate the immersion heater from the mains electricity supply at the fuse spur unit.

The immersion heater supplied with Heat pump products is set to max; so will operate in the range 68 °C ± 3 °C.

The immersion heater thermostat should be left on set to max; If the immersion heater thermostat is set too low the Legionella Cycle will fail to complete correctly.

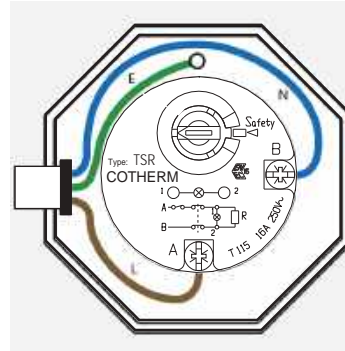


Figure 43. Immersion Heater Wiring

Immersion Heater

The immersion heaters fitted to our units are 3kW 240V ~AC. Check that the mains supply conforms to this, and all external wiring conforms to the most recent revision of the IEE wiring regulations. An Incoloy element is used on this product for standard domestic use and water conditions.

The immersion heater is fitted into the hot water cylinder using an O-ring. After the unit is filled with water check for leaks to determine if the O-ring has sealed and tighten carefully using the appropriate tool. To prevent damage to the O ring do not use excessive force to tighten the immersion heater.

The immersion heater is supplied with a thermostat which has been tested for operation in the cylinder and complies with the European directives for Electromagnetic compatibility and radio interference. It is Rated at 16 Amp 250V ~AC.

The immersion thermostat has two terminals A and B. The Live (brown) wire should be connected to terminal A and the Neutral (blue) wire should be connected to terminal B. It has been our experience that Crimp terminals make better connections. The immersion heater must be fully earthed (earth post) and connected via a double pole isolator switch having a contact separation at least 3mm, see diagram above.

The immersion heater thermostats incorporate a manual reset safety/overheat cut out thermostat. Should this operate, investigate the cause for the operation cut out before pressing the red reset button labelled safety. If there is no apparent fault adjust the control setting down slightly to prevent nuisance tripping.

If another heat source is used to heat the cylinder and this is allowed to raise the water temperature excessively then the overheat thermostat will trip. This is likely on solar thermal products when the solar thermostats are set at high temperatures. All HP290 cylinders are fitted with a 3 kW immersion heater so that the store temperature can be raised above that which the heat pump provides, to boost the hot water performance if necessary and to protect against legionella eg. following the time parameters set on the Heat Pump remote control.

Control/Overheat Dual Thermostats

Make sure that the probe is fully inserted into the pocket Provided taking care not to damage the probe during insertion.





4.3 INSTALLATION OF CONTROL BOX

4.3.1 Receival and Unpacking and Handling

Note: Section 4.3.1 is only applicable if using a non pre-plumbed cylinder, as the control box will be packaged and supplied separately.

Packaging Symbols

Below are the symbols on the packaging of the control box when supplied as an individual unit. The below symbols and conditions must always be followed for the packaged product.

	Stackable height x 2
	This package is recyclable
	Product must be treated as fragile
	Product should not be discarded as unsorted waste but must be sent to separate collection facilities for recovery and recycling

Contents of Package. Checklist.

After the product is unpacked, make sure that all the contents are present.

Quantity	Item Description
1	HP290 Control Box
1	Literature Pack
1	Wall Mounted Fixing Kit
1	Connector Kit
1	Domestic Hot Water Thermistor
1	Wall Template

ⓘ **IMPORTANT:** If there are any missing items, contact Ideal Heating.

4.3.2 Removal of the Front Panel

⚠ WARNING: The control box may have dual electrical supplies (a power supply for the control box and a power supply from a hybrid boiler). Both must be isolated before removing the control box front panel.

To allow for the controller to be mounted first the front panel must be removed, by removing the fixings displayed in *Figure 44*.

To refit the front panel, rest the top of the panel on the top of the control box and make sure that the sides of the front panel are external to the control box. Then reinsert and tighten the fixings, starting with the top fixings. Do not over tighten to avoid damage to the front panel.

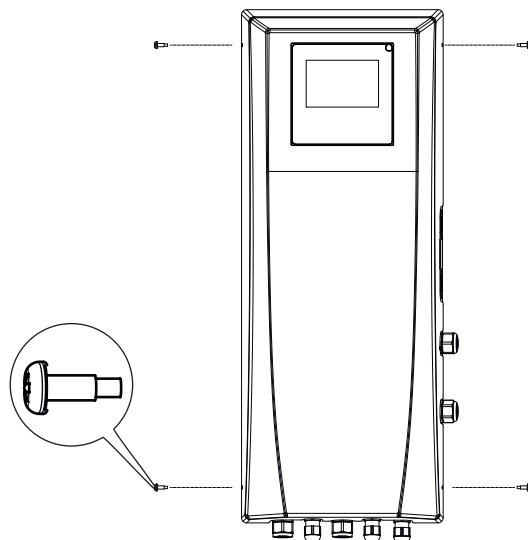


Figure 44. Front Panel Removal

4.3.3 Mounting

Note: Section 4.3.1 to 4.3.3 is only applicable if using a non pre-plumbed cylinder, as the control box will be packaged and supplied separately.

Hang the wall mounting template supplied on the wall, using a spirit level.

The control box is to be mounted using fixing holes which are indicated in *Figure 45* onto the wall mounting template.

It is the responsibility of the installer to determine appropriate fixings for fitting the control box and being held by the wall material. Once fixed, the control box should be rigid and sturdy.

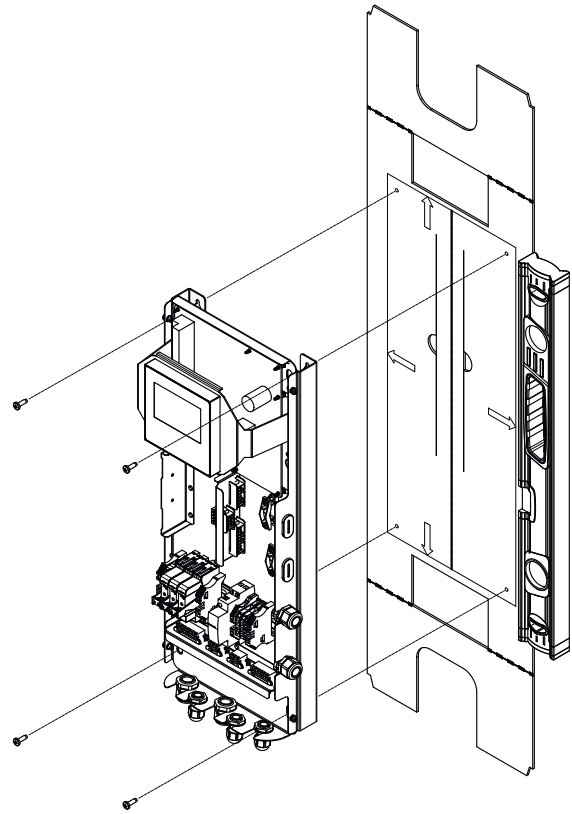


Figure 45. Front Panel Mounting

4.3.4 Electrical Installation

⚠ WARNING: All electrical work is to be done by a competent electrician. The electrical supply is to be switched off with appropriate safety measures in place to prevent accidental activation. The electrical installation must be done on the heat pump first and connection to the supply must be the last connection made to reduce risk of electric shock.

⚠ WARNING: This product must be earthed, and it must not be possible to disconnect the protective conductor through any isolator switches.

Electrical installations must comply with the requirements and guidance of the IET Wiring Regulations BS 7671, and these guidelines are to be used to determine the cross-sectional area of the electrical cable.

The electrical installation must be installed in accordance with the specification in *Table 9*.

⚠ CAUTION: Incorrect installation of the electrical supply can lead to the destruction of the electrical components in the heat pump and any other unit that it is connected to.

Cables that are connecting to the heat pump are to be routed through the cable glands and through to the circuit board as shown in *Figure 39*. Power cables and communication/signal cables must be separated by a minimum distance of 100mm and routed through separate glands to prevent electrical interference.

⚠ CAUTION: When routing cables, care should be taken to make sure that water is not able to run down the cables and enter the product by making sure that the cable is routed downwards after leaving the product and that the cable glands are tightly fitted.

Connections are to be made using the plastic terminal connectors supplied within the control box. When making connections to the electrical terminals make sure that there is no exposed copper wire.

Multi core cables should be stripped back by at least 60mm to allow for easy connection and to reduce strain on the terminals. Once all connections have been made, the cables are to be secured using the cable securing clamps at the base of the control board, to prevent stress on the terminals.

Section 4 - Installation

4.3.5 Control Box Internal Wiring

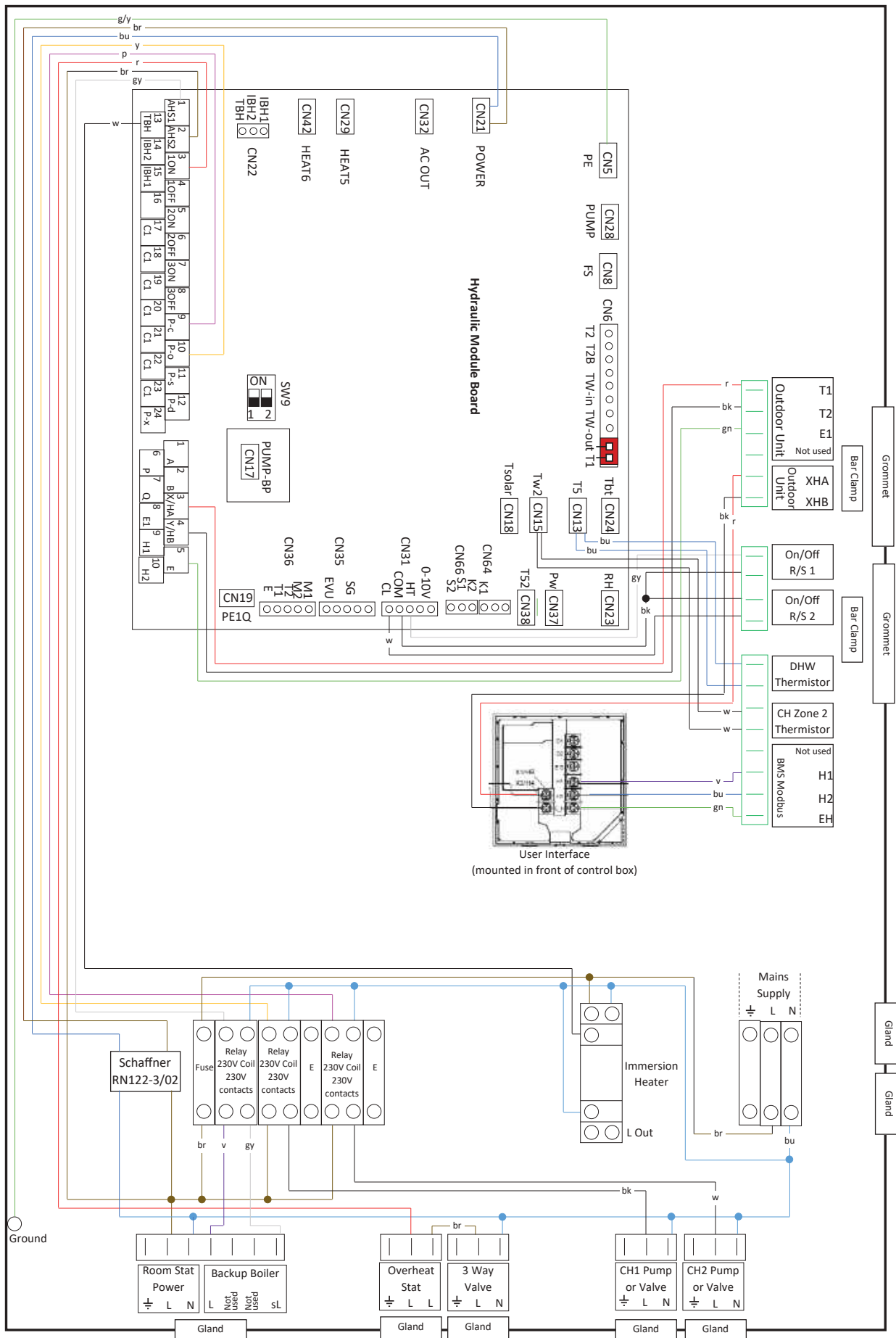


Figure 46. Control Box - Internal Wiring

Section 4 - Installation

4.3.6 Immersion Contactor Diagram

Remove pre-fitted blue wire from connection A2, before wiring immersion heater to connection 2.
Then reconnect pre-fitted wire to A2.

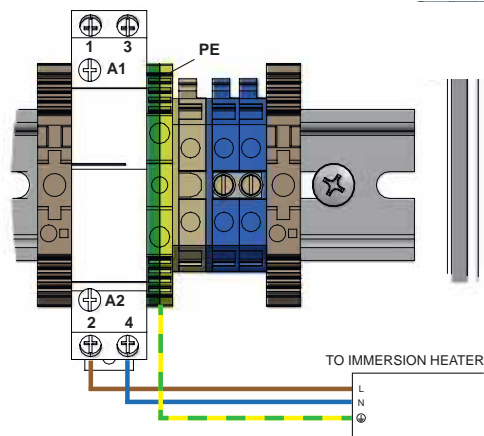


Figure 47. Contactor Diagram

4.3.7 Installer Wiring Connections

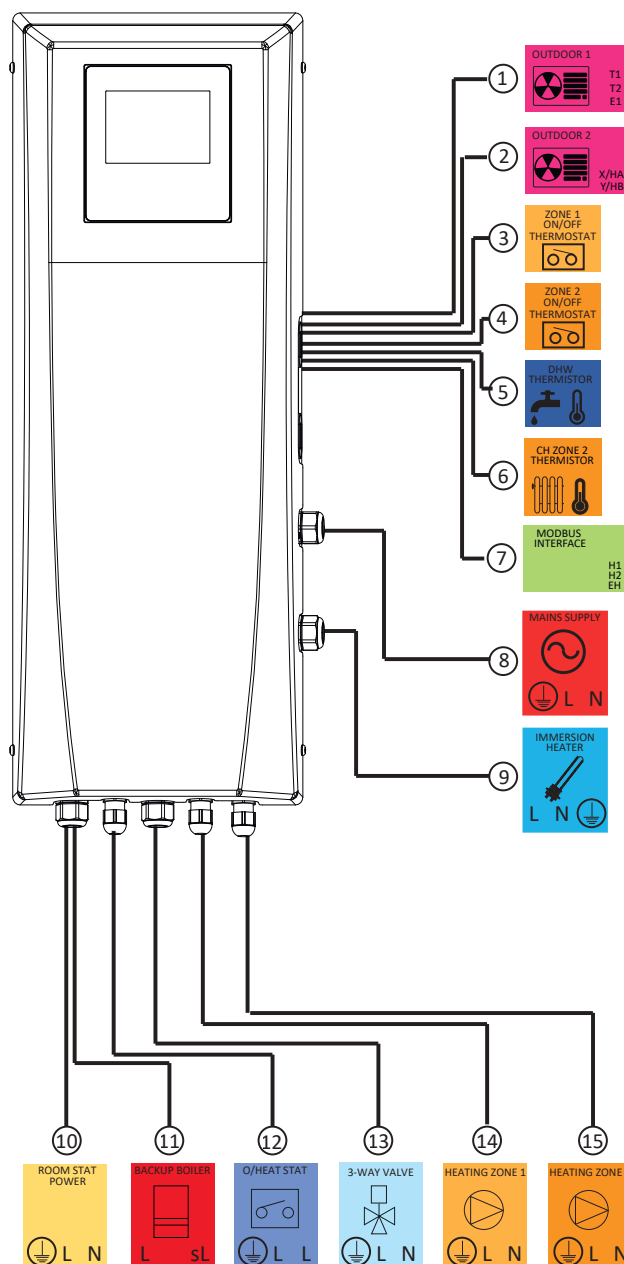


Figure 48. Installer Wiring Connections (refer to Section 4.3.7.1 for description of connections)

4.3.7.1 Installer Connections Key

1. Outdoor Unit 1

An earth shielded cable must be used for these connections. T1 and T2 must be connected to the corresponding connections in the outdoor unit. E1 must be used as the earth screen but must only be connected at the indoor unit end. These connections can be combined with those of (2) Outdoor Unit 2 in a Shielded CAT5 cable (5V, 10mA).

2. Outdoor Unit 2

These 2 connections (YHB/XHA) must be connected to the corresponding connections (YHB/XHA) in the Outdoor Unit. They can be run in the same earth shielded cable as those of (3) Outdoor Unit 1 (18V, 10mA).

3. Zone 1 Thermostat:

The programmable thermostat for either the single space heating circuit or space heating Zone 1 is to be wired into the 'Zone 1 ON/OFF Thermostat' connection (18V, 10mA).

4. Zone 2 Thermostat:

For Two Zone space heating systems, the programmable thermostat for Zone 2 is to be wired into the 'Zone 2 ON/OFF Thermostat' connection (18V, 10mA).

5. DHW Thermistor

When using a HP290 Pre-Plumbed cylinder, the Domestic Hot Water Thermistor will be pre-installed as part of the package. If using a Non-Pre-Plumbed cylinder, the DHW thermistor will need to be inserted into the sensor pocket and secured to avoid it being disturbed. It is recommended to install insulation to reduce ambient temperature influence (5V, 10mA).

If using a third party DHW cylinder, refer to the manufacturer's installation guidelines for thermistor installation requirements. Use the cables provided which can be extended if necessary.

6. CH Zone 2 Thermistor

This connection is not required for single zone systems, or if multiple zones are to be managed separately from the HP290 Control system (5V, 10mA).

When using a 2 Zone HP290 Pre-Plumbed cylinder, the CH Zone 2 Thermistor will be pre-installed as part of the package.

For installations without the HP290 pre-plumbed cylinder, a two zone kit is required (Product code: 241520). For installations with the HP290 Control Box, see section 4.3.5. For HP290 Controller installations, see Appendix 1.3.

7. MODBUS:

Connect MODBUS device here.

8. Mains supply

230 Vac mains power for the Indoor Control Box and the 3 kW immersion heater (if used). This cable should be routed through the upper gland located to the right of the immersion heater contactor.

The electrical supply is to be taken from an Residual Current Device protected circuit and must be compliant with the local installation rules in force (230Vac/Maximum 15A)

9. Immersion Heater

Output connection for a 230Vac immersion heater (as per Section 4.2.5 Immersion Heater Wiring on page 43), (230Vac/13A).

10. Programmable Room Thermostat 240v Power Supply

If a Programmable Room Thermostat RF transceiver/receiver is to be used then its power supply (240v) can come from this connection (230Vac/current depends room thermostat).

11. Backup Boiler

⚠ WARNING: Always comply with the boiler manufacturers instructions.

If using a boiler backup application then a permanent live from the boiler supply must be wired into the "L" connection and the switched live to the boiler must be wired into the "sL" connection (230Vac/current depends on boiler).

12. Overheat Stat

When using a HP290 Pre-Plumbed cylinder, the DHW Overheat Thermostat will be pre-installed as part of the package. If using a Non-Pre-Plumbed Cylinder, the DHW Overheat Thermostat will need to be installed in the sensor pocket and secured to avoid it being disturbed.

If using a third party DHW cylinder then refer to the manufacturer's installation guidelines for overheat thermostat installation requirements (230Vac/30mA).

13. 3-Way Diverter Valve

When using a HP290 Pre-Plumbed cylinder, the 3-way diverter valve will be pre-installed as part of the package. If using a Non-Pre-Plumbed cylinder the 3-way diverter valve will need to be installed and connected to the control box via the '3-Way Diverter Valve' connection and must spring return to the CH position (230Vac/30mA).

14. CH 1 Pump or Valve

The pump for either the single space heating circuit or space heating Zone 1 is to be wired into the 'CH1 Pump or Valve' connection (230Vac/0.5A).

15. CH 2 Pump or Valve

For Two Zone space heating systems, the second zone pump/valve is to be wired into the 'CH2 Pump or Valve' connection (230Vac/0.5A).

4.3.8 Electrical Safety Test

⚠ WARNING: As a minimum, the below electrical safety tests should be performed. Failure to do so, may result in damage to the product and/or personal injury.

Upon completion of the electrical connections, electrical safety tests are to be done to verify the integrity of the circuit.

These tests are to be done by a competent electrician in accordance with IET guidelines:

- Earth Continuity.
- Polarity.
- Resistance to Earth.
- Short Circuit.

4.4 INSTALLATION OF SYSTEM

⚠ CAUTION: The installation manuals and guides of all individual system components must be obeyed to make sure of correct operation and optimised life expectancy.

The system is to be installed in accordance with the standards and legislation outlined in Section 1.3, and the requirements of section 3.1.

Pipework is to be kept as simple as is practicable. Minimal bends are to be used and swept bends are preferred to increase efficiency and lifespan of system.

Where possible solder joints are to be made with temperature sensitive components disconnected.

⚠ WARNING: Failure to appropriately protect against system expansion will lead to catastrophic failure of the system circuit, major property damage, and serious harm to dwelling inhabitants. It must be sized in accordance with BS EN 12828.

Installations must conform to the schematics in Appendix 1.1. It is the responsibility of the installer to make sure that all appropriate measures are implemented including appropriate safety devices etc.

Make sure a suitably sized expansion vessel is installed in the primary circuit return pipe. Refer to *Table 5*, *Table 6*, *Table 7* and *Table 8*. for further details. The expansion vessel must be pre-charged to the correct pre-charge setting before heating the circuit is filled. The plumbed water connection should be upward facing to aid de-aeration.

⚠ CAUTION: System water is to be cleaned, treated, tested, and maintained in accordance with BS 7593:2019 - Code of practice for the preparation, commissioning, and maintenance of domestic central heating.

All safety relief valves (including antifreeze) are to be mounted in an orientation that avoids sediment build up on the sealing face.

Air vents should be placed at every high point within the circuit.

5.1 PRE-COMMISSIONING CHECKLIST

⚠ WARNING: The checklist must be completed prior to any further action. Further actions are not permitted, and the safety of the system is not verified unless each check has been done and positively confirmed.

Table 15 Pre-Commissioning Checklist

Does the circuit comply with the appropriate building regulations, and legislation?	
Does the circuit have the necessary safety devices installed?	
Do electrical components of the circuit and surrounding areas have their electrical supply switched off or are reasonably protected from potential water leaks/sprays?	
Are all drainage valves (and any other valve that open the circuit) closed?	
Are automatic-air-vent dust caps open?	
Have adequate antifreeze measures been installed in the system (not including dosing)?	

5.2 COMMISSIONING OF HYDRONIC CIRCUIT

5.2.1 Flushing Out the Hydronic Circuit

⚠ CAUTION: Pipework is to be cleaned in accordance with BS 7593:2019 to remove any particles that may negatively affect the performance of any of the components. If the system is not rinsed, the system efficiency will be negatively affected, and it will negatively affect the life expectancy of the system components. Requirements stipulated in BS 7593:2019 should be followed when purging and treating the system water circuit.

⚠ CAUTION: Solvents and aromatic hydrocarbons (such as petrol, or paraffins etc.) are not to be used to clean the system pipework.

ⓘ IMPORTANT: The application of any treatment to this product that is not outlined in this document may render the guarantee invalid.

It is recommended to use any of the following solutions for cleaning the system. Please follow the instructions and guidance supplied with the solution.

- Fernox F3
- ADEY MC3 or MC5
- Sentinel X300 (New Systems)
- Sentinel X400 (Existing Systems)

5.2.2 System Water Treatment

5.2.2.1 Water Quality

ⓘ IMPORTANT: Requirements stipulated in BS 7593:2019 should be followed when purging and treating the system water circuit.

The following steps should be taken to check any sealed heating circuit. A heating circuit water quality test kit will be required (instructions on test kit to be followed over the following for taking a sample).

Make sure that the heating system has been circulating and operating at temperature for a minimum of 15min.

1. Use a drainage point (preferably low in the system) to take a water sample sufficient for test.
2. The sample will then need to be checked for the following (instructions on test kit to be followed):
 - pH Level.
 - Water Hardness.
 - Turbidity.
 - Propylene Glycol Concentration (if applicable)

Record results on the Benchmark records at the rear of this book.

ⓘ INFORMATION: Ideal Heating accepts no liability for the compatibility, effectiveness, and suitability of any inhibitors used in part or in the whole of the heating system. It is the responsibility of the applicator of the inhibitor to assess the system and its components for compatibility with the inhibitor.

Ideal Heating recommend dosing the system with a suitable inhibitor as a minimum. If propylene glycol is used for frost protection, a combined propylene glycol, biocide and inhibitor MUST be used.

5.2.2.2 Dosing Method

⚠ CAUTION: Prior to dosing, check the compatibility of any chemicals or solutions to be added with the system components and materials to prevent damage or reduced lifespan.

The system is to be dosed following the guidance stipulated in BS 7593:2019 and the instructions provided by the inhibitor manufacturer.

ⓘ IMPORTANT: When dosing the system with any product, the use of fill and flush valves in conjunction with a fill and flush station is recommended to make sure the concentration and mixing is thorough and avoid the potential for hydrostatic locking of the system.

Section 5 - Commissioning

5.2.2.3 Antifreeze Valves

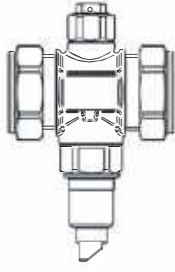


Figure 49. Typical Antifreeze Valve

Installation

Refer to Antifreeze valve manufacturers installation instructions. Below is general guidance on the installation requirements. It must be made sure that the antifreeze valves are suitable for both the ambient-air, and water temperature range.

To achieve correct flow through the device, the valve must be installed in the vertical position as depicted. It must be free from obstructions to enable servicing.

The antifreeze valves must be installed outside, in the coldest part of the system that is at risk of freezing.

We recommend installing the antifreeze valves on both pipes (flow and return). Refer to Figure 50.

They must not be placed close to heat sources which could interfere with proper function.

Leave at least 15 cm clearance from the ground so the block of ice that may form below will not prevent the safe operation of the valve. Keep a distance of at least 10 cm between the antifreeze valves.

When installed outdoors, the anti-freeze valve must be protected from rain, snow and direct sunlight.

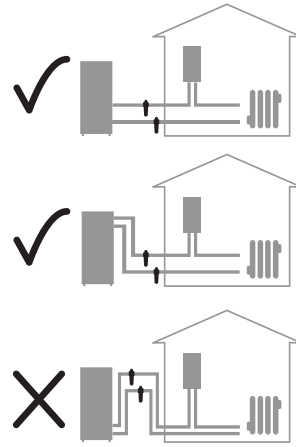


Figure 50. Antifreeze Installation Recommendations

5.2.2.4 Glycol Antifreeze Treatment

Ideal Heating recommend dosing the system with a suitable inhibitor as a minimum. If propylene glycol is used for frost protection, a combined propylene glycol, biocide and inhibitor MUST be used.

ⓘ IMPORTANT: When dosing the system with any product, the use of fill and flush valves in conjunction with a fill and flush station is recommended to make sure the concentration and mixing is thorough and avoid the potential for hydrostatic locking of the system.

⚠ CAUTION: Table 17 is to be used for guidance only. Consult the glycol providers instruction for exact dosage and recommendations for use.

The values in Table 16 illustrates the freezing point of the water when dosed with propylene glycol mixtures.

Table 16 Glycol Concentration vs Expected Min. Outdoor Temp.

Propylene Glycol Solution (%)	Freezing Point					
	0	10	20	30	40	50
Temperature (°C)	0	-3	-8	-14	-22	-34

The below values in Table 17 illustrates the heating capacity reduction when dosed with propylene glycol and when maintaining nominal flow rates.

Table 17 Glycol Concentration vs Performance

Propylene Glycol Volume in Water		%	0	10	15	20	25	30	35	40	45	50
Capacity Reduction Factor		-	1	0.98	0.973	0.96	0.95	0.935	0.919	0.895	0.88	0.85
Heating Capacity	4.5 kW	4.5	4.41	4.38	4.32	4.28	4.21	4.14	4.03	3.96	3.83	
	6 kW	6	5.88	5.84	5.76	5.7	5.61	5.51	5.37	5.28	5.1	
	8 kW	8	7.84	7.78	7.68	7.6	7.48	7.35	7.16	7.04	6.8	
	10 kW	10	9.8	9.73	9.6	9.5	9.35	9.19	8.95	8.8	8.5	
	12 kW	12	11.76	11.68	11.52	11.4	11.22	11.03	10.74	10.56	10.2	
	14 kW	14	13.72	13.62	13.44	13.3	13.09	12.87	12.53	12.32	11.9	

5.3 FILLING THE SYSTEM

⚠ WARNING: The product contains the hydrocarbon refrigerant R290 which is very flammable. The refrigerant may mix with air to form a flammable atmosphere increasing the risk of fire and/or explosion. Work that requires the removal of the exterior casing of the Heat Pump must only be done by competent persons who are familiar with the risks of R290 refrigerant. Work on the refrigeration circuit must only be done by a Cat I or Cat II F-gas certified engineer with a City and Guilds 6187-21 certificate or equivalent. Work done on the heat pump should be done in accordance with industry standard safety procedures and practices for working with hydrocarbons.

⚠ WARNING: During charging operations, it must be made sure that the electrical components of the circuit and surrounding area have their electrical supply switched off or protected from potential water leaks/sprays. Failure to comply with this requirement increases the risk of electric shock, damage to the products.

Make sure that all circuits connections have been made and drainage valves are closed before charging the system. A system circulator is not to be operated when initially charging the system.

Refer to 5.2.2 for dosing requirements.

Filling the System

The primary heating circuit is charged using the following method:

1. Review the circuit and confirm that installation has been completed.
2. Open automatic air vent dust cap. Refer to *Figure 51*.
3. The filling loop is to be gradually opened when looking at the pressure gauge.
4. Fill the system to between 1 – 1.5 Bar.

⚠ CAUTION: Care should be taken when filling the system. If pressure is difficult to achieve, or if a pressure drop is observed after the pressure is settled, circuit components and routes should be reviewed and checked for water leaks.

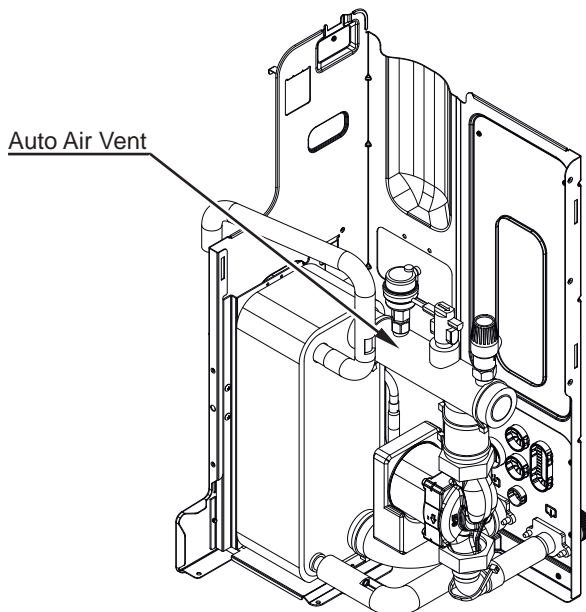


Figure 51. Auto Air Vent Dust Cap

COMMISSIONING

5.4 SYSTEM AIR VENTING

⚠ WARNING: The outdoor unit is supplied with the automatic air vent closed. To allow for proper air venting the dust cap must be opened as shown in *Figure 51*.

1. Charge the circuit with water through the filling valve, making sure that the system air vents have been purged.
2. Once all the air is purged, charge the circuit pressure to 1 – 1.5 bar. Refer to Tables 5, 6, 7, & 8.
3. Periodically operate the system circulator and repeat steps 1 – 2 until all the air is removed from the system.
4. Make sure that the pressure is set correctly and that any auto air vents are left open upon completion.

Air Lock

All automatic air vents should be opened, and the system should be filled with water until the pressure reaches 1 - 1.5 bar. Circulator pumps should then be activated and the system checked for flow to determine whether any airlocks are present.

If airlocks are detected, a pipe should be connected to bleed valve of the buffer tank, and routed to a suitable drainage location. Open the bleed valve to allow trapped air to escape from the top of the buffer tank. Then reopen the filling loop and fill system until a flow of water is observed at the drain through bleed valve. This indicates that air has been successfully expelled from the system. The circulator pumps should be activated again to verify that flow is now present.

5.5 ACTIVATION OF SYSTEM

⚠ WARNING: Prior to activating the control box, make sure that all requirements and checks from sections 5.1 and 5.3 have been completed. Electrical circuits require verification of safety to reduce risk of electric shock or damage to the system.

⚠ WARNING: The Heat Pump must have the power active for a minimum of 6 hours prior to activation of the heating function to protect the compressor.



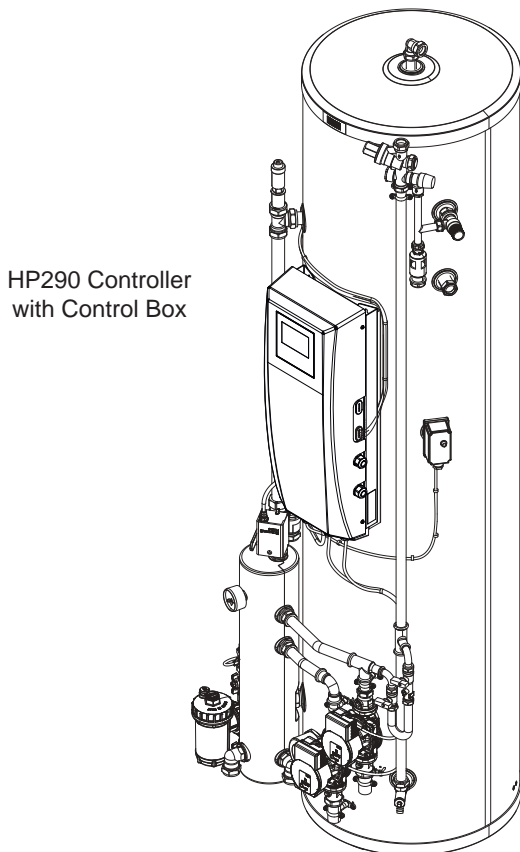
5.5.1 HP290 Cylinder or HP290 Control Box

Configure the HP290 Monobloc as follows:

1. Remove the HP290 Monobloc top and side panels. Refer to Sect 4.1.7 Accessing the Casing.
2. Gain access to the HP290 Monobloc Outdoor Control PCB (see Figure 53). Remove and keep the Control Box cover retaining screws and remove the cover.
3. **Make sure that DIP switch S2 (switch 1) is set to the ON position, see Figure 55.**
4. Update the system parameters using the supplied USB. Refer to Sect 5.5.3. For system parameters see Table 18.
5. Put the Control Box cover in position and install the cover retaining screws.
6. Install the HP290 monobloc top and side panels. Refer to Sect 4.1.7 Accessing the Casing.

Table 18 USB changed parameters

Item	Parameter	Default	USB value
1	dT5_ON	10°C	7°C
2	T4DHWMIN	-10°C	-25°C
3	T5S_DISINFECT	65°C	60°C
4	T_DHWHP_MAX	90 mins	60 mins
5	Cooling Mode	0 (ON)	1 (OFF)
6	T4HMAX	25°C	21°C
7	T4HMIN	-15°C	-20°C
8	Zone 2 H-emission	2 (Underfloor)	1 (Radiators)
9	Room thermostat	0 (None)	2 (One zone)
10	T4_AHS_ON	-5°C	7°C
11	Preheating for floor T1S	2 kW	3 kW



or

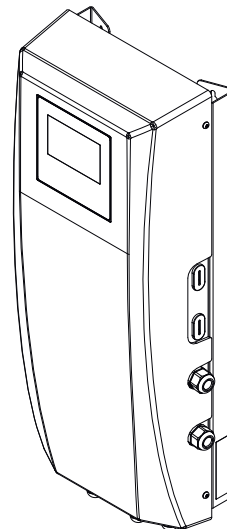


Figure 52. Types of HP290 Control Box which require DIP Switch S2 Position 1 to be set to ON

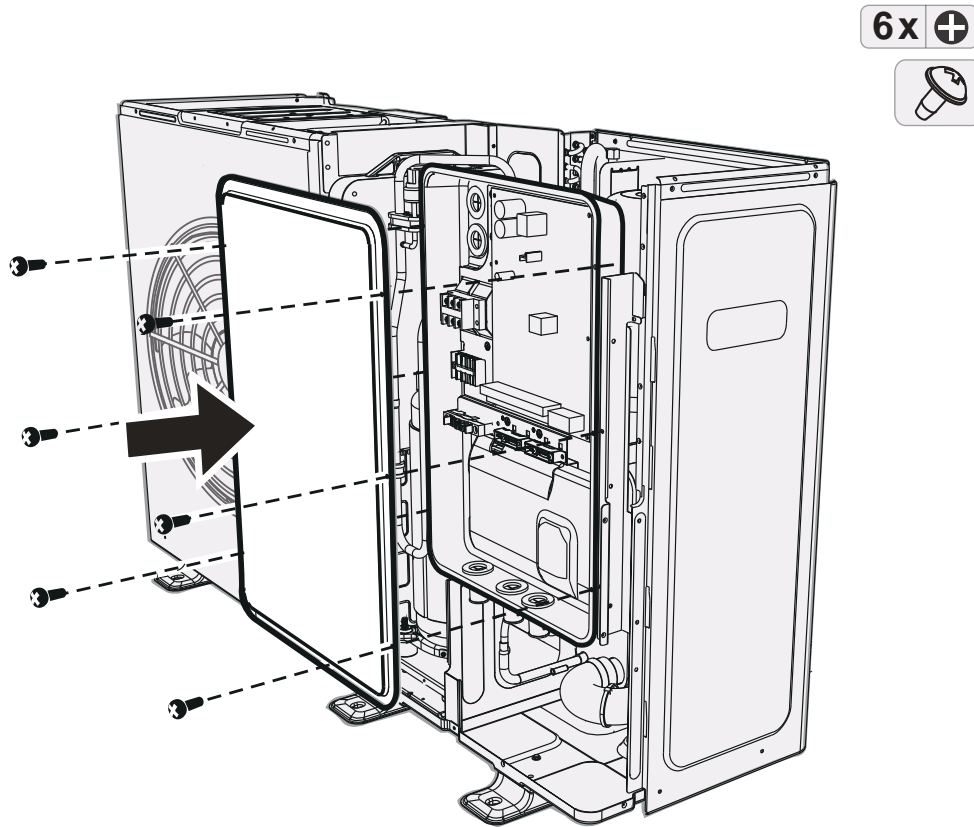


Figure 53. HP290 Monobloc (Access to Outdoor Control PCB)

5.5.2 HP290 Controller

Set the HP290 Monobloc DIP switch as follows:

1. Remove the HP290 Monobloc top panels. Refer to Sect 4.1.7 Accessing the Casing.
2. Gain access to the HP290 Monobloc Outdoor Control PCB. Remove and keep the Control Box cover retaining screws and remove the cover.
3. **Make sure that DIP switch S2 (switch 1) is set to the OFF position, see Figure 55.**
4. Update the system parameters using the supplied USB. Refer to Sect 5.5.3. For system parameters see Table 18.
5. Put the Control Box cover in position and install the cover retaining screws.
6. Install the HP290 monobloc top and side panels. Refer to Sect 4.1.7 Accessing the Casing.

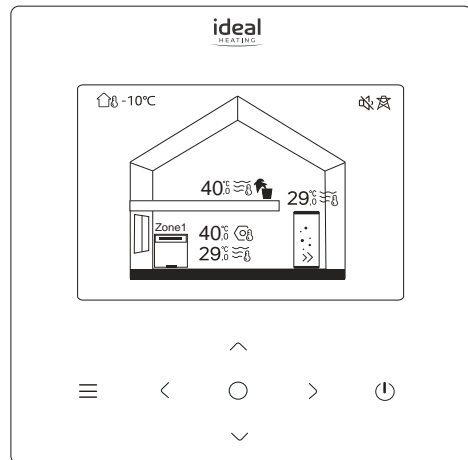


Figure 54. HP290 Heat Pump Controller

5.5.3 HP290 System Parameter Update using USB

⚠ WARNING: All electrical work is to be undertaken by a competent electrician. The electrical supply is to be switched off with appropriate safety measures in place to prevent accidental activation. The electrical installation must be done on the Heat Pump first and connection to the supply must be the last connection made to reduce risk of electric shock.

Commission the Heat Pump USB as follows:

1. Make Make sure that the appliance power is set to OFF.
2. On the Outdoor PCB (Figure 55) insert the USB stick (provided) into the slot marked CN4 USB.

3. Power up the indoor unit and then power up the outdoor unit. Wait until the Control display shows the USB FUNCTION window (Figure 56).

Note 1. This may take up to 30 seconds.

Note 2. Do not touch the display during this time. If the display is touched, the system will return to the Home screen and you will have to do Step 1 again.

4. On the Control Box, press \checkmark to scroll through the options. When WRITE SET PARAMETER is illuminated on the display (Figure 56), press O (to select the option).
5. When a pop-up window shows SUCCESS, set the power on the indoor and outdoor units to OFF.
6. Remove the USB stick.
7. Set the power on the indoor and outdoor units to ON.

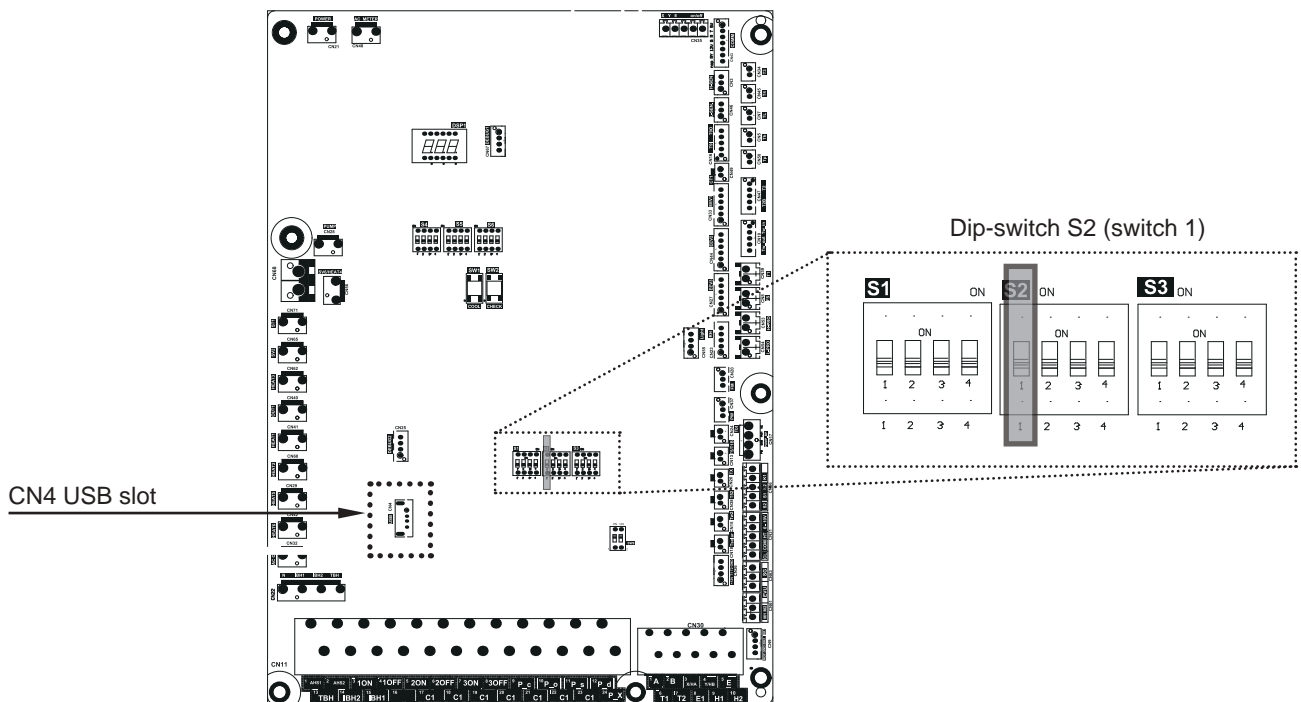


Figure 55. Outdoor PCB

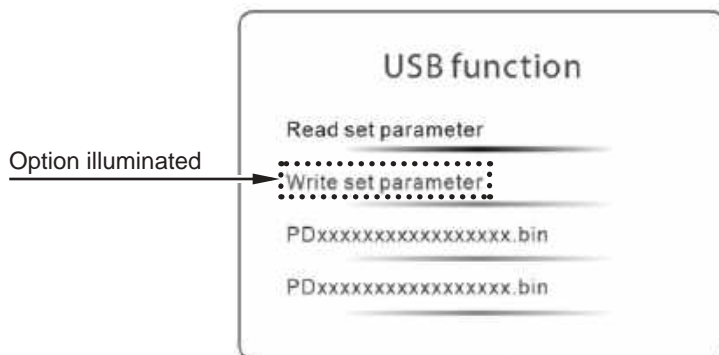
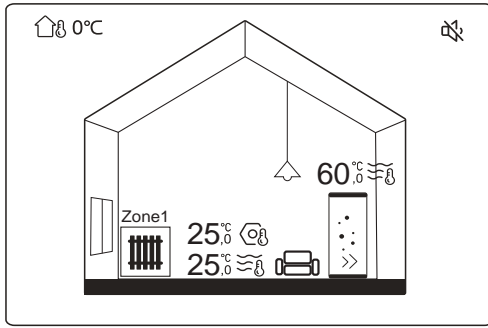


Figure 56. Control Box display

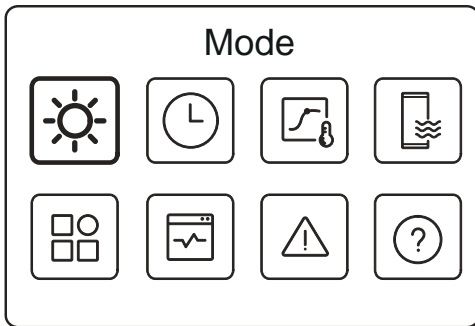
Section 5 - Commissioning

5.5.4 Enabling CH operation

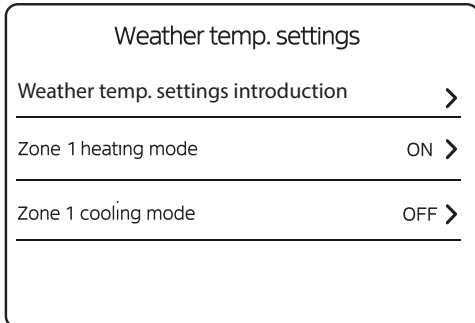
Enable CH operation as follows:



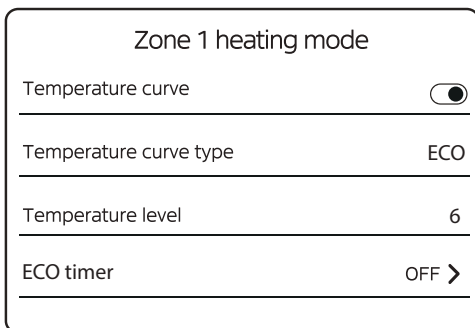
From the Home Screen (above), press \equiv to move to the Menu page (below).



Press \triangleright twice to highlight the Weather temp. settings option, then press O and the below will be shown.



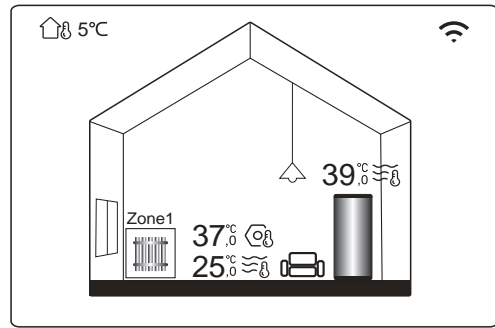
Press \surd to highlight **Zone 1 heating mode** then press O and the following screen will be shown.



Press O so that Temperature curve is enabled, then press \surd twice so that **Temperature level** is highlighted, press \surd until either 6 (radiators) or 4 (underfloor heating) is shown and press O to store.

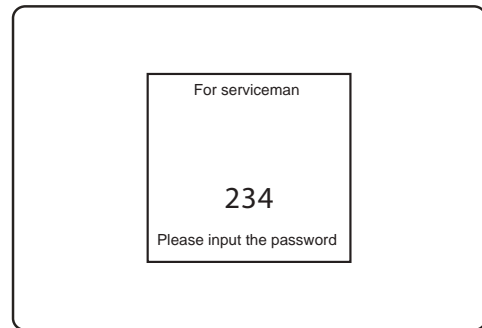
5.5.5 Enabling CH Zone 2 (if applicable)

Enable CH zones as follows:

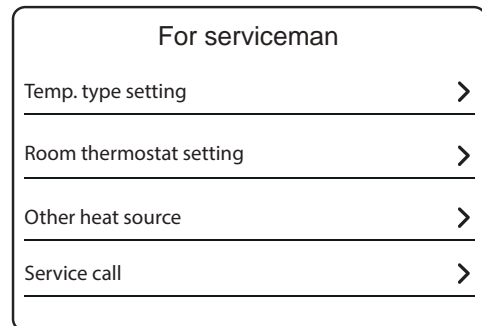


Press and hold \equiv and \triangleright together.

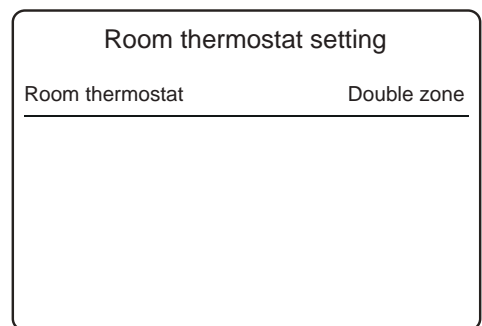
Note: TW2 zone 2 thermistor must be clipped to the zone 2 flow pipe for 2 zone operation



Enter 234



Select **Room thermostat setting**

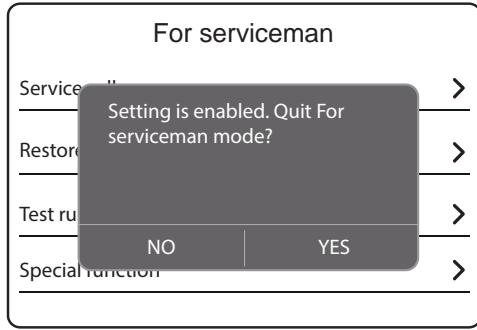


Select **Double zone**

Section 5 - Commissioning

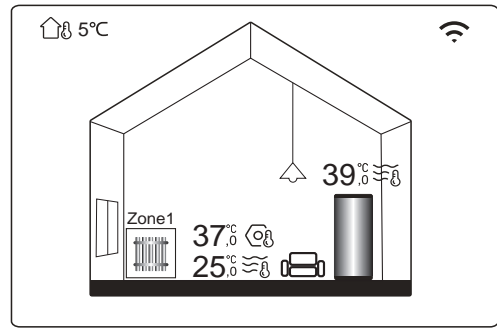
5.5.6 Setting Emitter Type

Set the Emitter Type as follows:



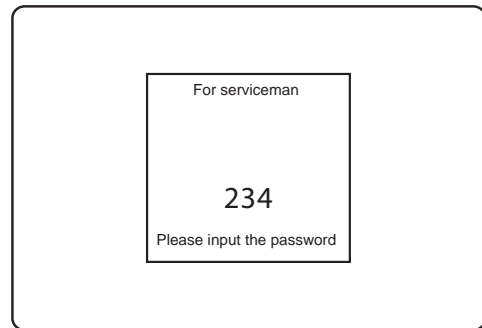
Repeatedly press \equiv to exit the For serviceman menu. Select **YES** to save.

Set zone 2 for weather compensation as per the previous page.

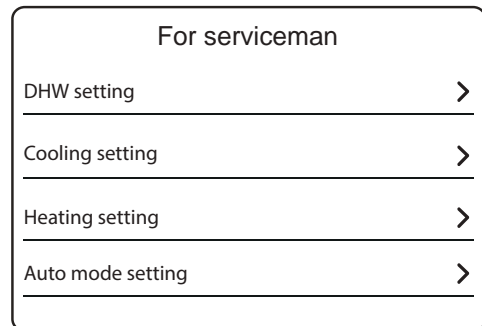


Press and hold \equiv and \triangleright together.

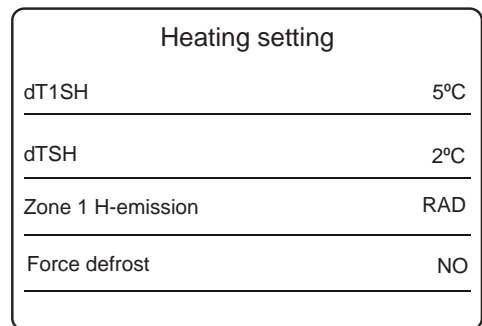
Note: TW2 zone 2 thermistor must be clipped to the zone 2 flow pipe for 2 zone operation



Enter 234



Press \surd twice and select **Heating setting**



Press \surd until **Zone 1 H-emission** is highlighted then press O.

Press up or down buttons until **RAD** is shown and press O to confirm.

Repeatedly press Select YES to save.

Repeat the above to set Zone 2 H-emission as required.

5.6 HEAT PUMP INDOOR CONTROL BOX HOMEPAGE

The Heat Pump controls are located on the front of the control box. This is the centralised control for the full heating system.

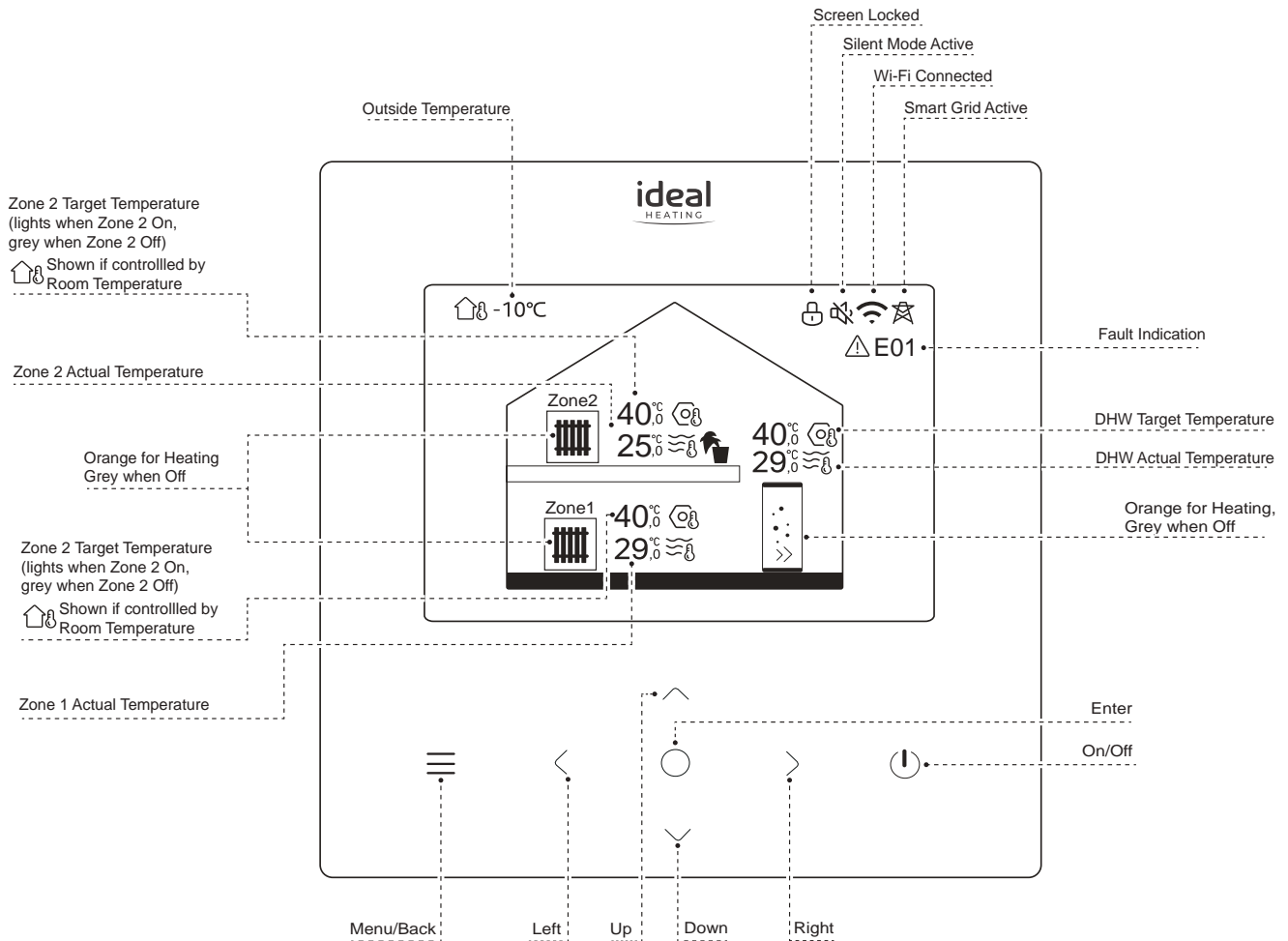


Figure 57. Control Box Homepage display

For Operating Status press O.

For Menu press ≡ (refer to 5.8).

If no touch-buttons are pressed for 30 seconds the screen dims, switching off after a further 10 seconds.

Press any touch-button to re-activate the screen.

To enable/disable DHW press ↓, ↑, > and < until the DHW tank symbol is illuminated. Then press O.

To enable/disable central heating Zone 1 press ↓, ↑, > and < until central heating Zone 1 symbol is illuminated. Then press O.

To enable/disable central heating Zone 2 press ↓, ↑, > and < until central heating Zone 2 symbol is illuminated. Then press O.

To change the DHW target temperature press ↓, ↑, > and < until the DHW tank symbol is illuminated. Then press O, then press ↓ and ↑.

5.7 OPERATING STATUS

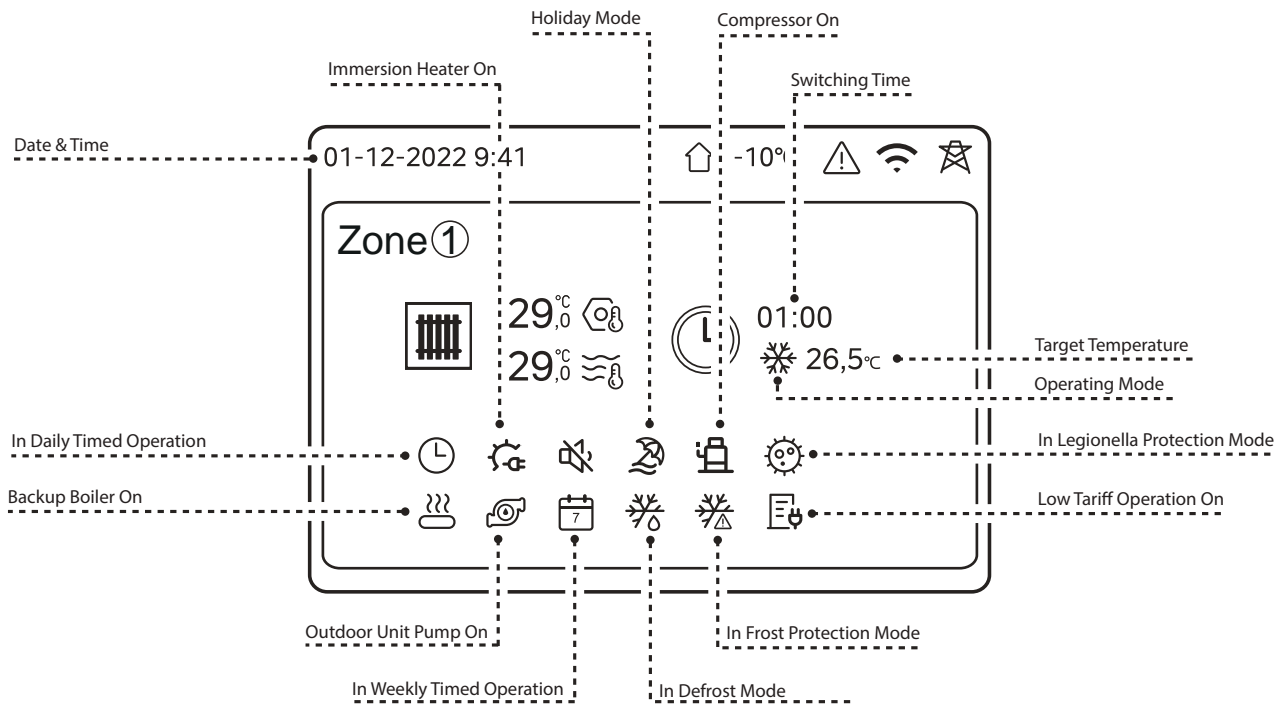


Figure 58. Operating status display

5.8 MENU

To select a menu press \vee , \wedge , \rangle and \langle until the required menu option is illuminated. Then press O.

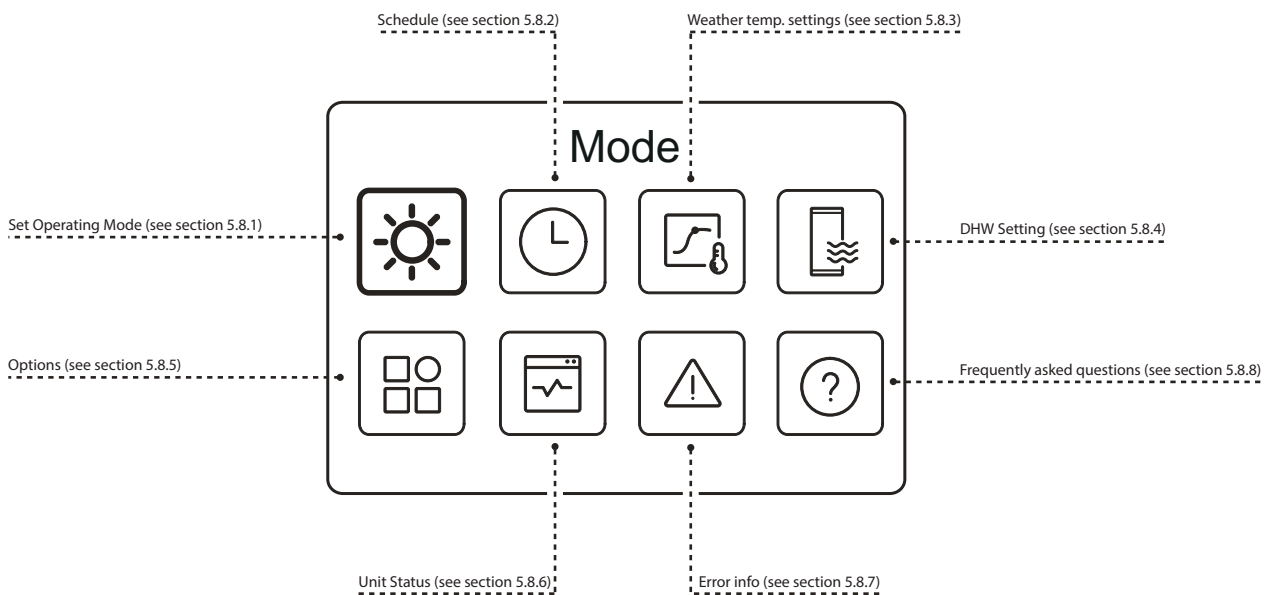
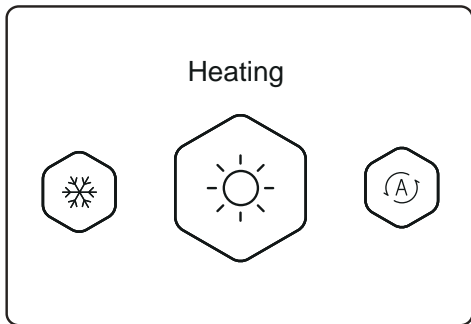


Figure 59. Menu display

5.8.1 Set Operating Mode



DO NOT change the settings for Heating. Heating (☀️) is the ONLY option available on the Heat Pump at this time.

If the ☀️ is not illuminated then select > and < until the Heating ☀️ is illuminated.

5.8.2 Schedule, DHW daily timer

To change the setting:

To set the option to OFF, press O.

To set the option to ON, press O.

🕒 DHW daily timer				
No.	Time	Mode	Temp.	
01	01:00	ON	55°C	<input checked="" type="checkbox"/>
02	20:00	OFF	55°C	<input type="checkbox"/>
03	00:30	ON	55°C	<input checked="" type="checkbox"/>
04	00:30	ON	60°C	<input checked="" type="checkbox"/>

The first column shows the order in which the events will happen.

The second column is the time at which the events will happen.

The third column shows if the hot water demand is ON, or OFF, it should only be ON for this application (☀️).

The fourth column is the target hot water temperature.

The fifth column shows if the event is ON or OFF.

To scroll through the options, press ∨, ∧, >, and <.

To select an option, press O.

To change a setting, press ∨ or ∧.

5.8.3 Weather temp. settings

Weather temp. settings	
Zone 1 heating mode	ON >
Zone 1 cooling mode	OFF >
Zone 2 heating mode	OFF >
Zone 2 cooling mode	OFF >

To scroll through the options press ∨, ∧, > and <.

ⓘ **NOTE: The cooling modes are not available.**

To select Zone 1 heating mode, press O when **Zone 1 heating mode** is illuminated (refer to 5.8.3.1).

To select Zone 2 heating mode, press O when **Zone 2 heating mode** is illuminated (refer to 5.8.3.1).

5.8.3.1 Weather temp. settings, Zone 1 / Zone 2 heating mode

Zone 1 heating mode	
Temperature curve	<input checked="" type="checkbox"/>
Temperature curve type	Standard
Temperature level	4
Temperature offset	0°C

To scroll through the options press ∨, ∧, > and <.

To enable/disable Weather Compensation, press O when **Temperature curve** is illuminated.

To change the Temperature curve type between Standard, Custom and Eco, press O when **Temperature curve type** is illuminated.

ⓘ **IMPORTANT: Do not change this setting from Standard for optimum appliance operation.**

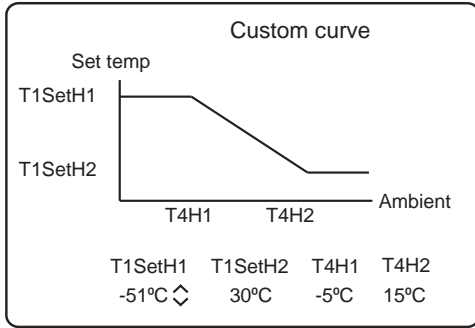
To change the Temperature level, press O when **Temperature level** is illuminated, the screen shown below can be viewed.

To change Temperature offset, press O when **Temperature offset** illuminated. Then use ∨ and ∧ to change the value.

For the standard radiator curve (1.5) use Temperature level 6, for the standard underfloor heating curve (0.8) use Temperature level 4. These settings can be customised using the Custom Curve function (see next page).

Weather compensation settings should always be checked and set against the system design flow temperature requirements.

Section 5 - Commissioning



To set an option Press O. To scroll through settings, use \swarrow or \searrow . To change the settings use \rightarrow and \leftarrow .

For radiators (outdoor sensor curve 1.4) the settings listed below should not be used:-

- T1SetH1 (maximum flow temperature) +65 °C
- T1SetH2 (minimum flow temperature) +30 °C
- T4H1 (minimum outside temperature) -15 °C
- T4H2 (maximum outside temperature) +15 °C

For underfloor heating (outdoor sensor curve 0.9) the settings listed below should not be used:-

- T1SetH1 (maximum flow temperature) +50 °C
- T1SetH2 (minimum flow temperature) +26 °C
- T4H1 (minimum outside temperature) -20 °C
- T4H2 (maximum outside temperature) +15 °C

If both zones are active then the higher flow temperature required will be delivered, with the room thermostat ensuring that the desired room temperature is achieved.

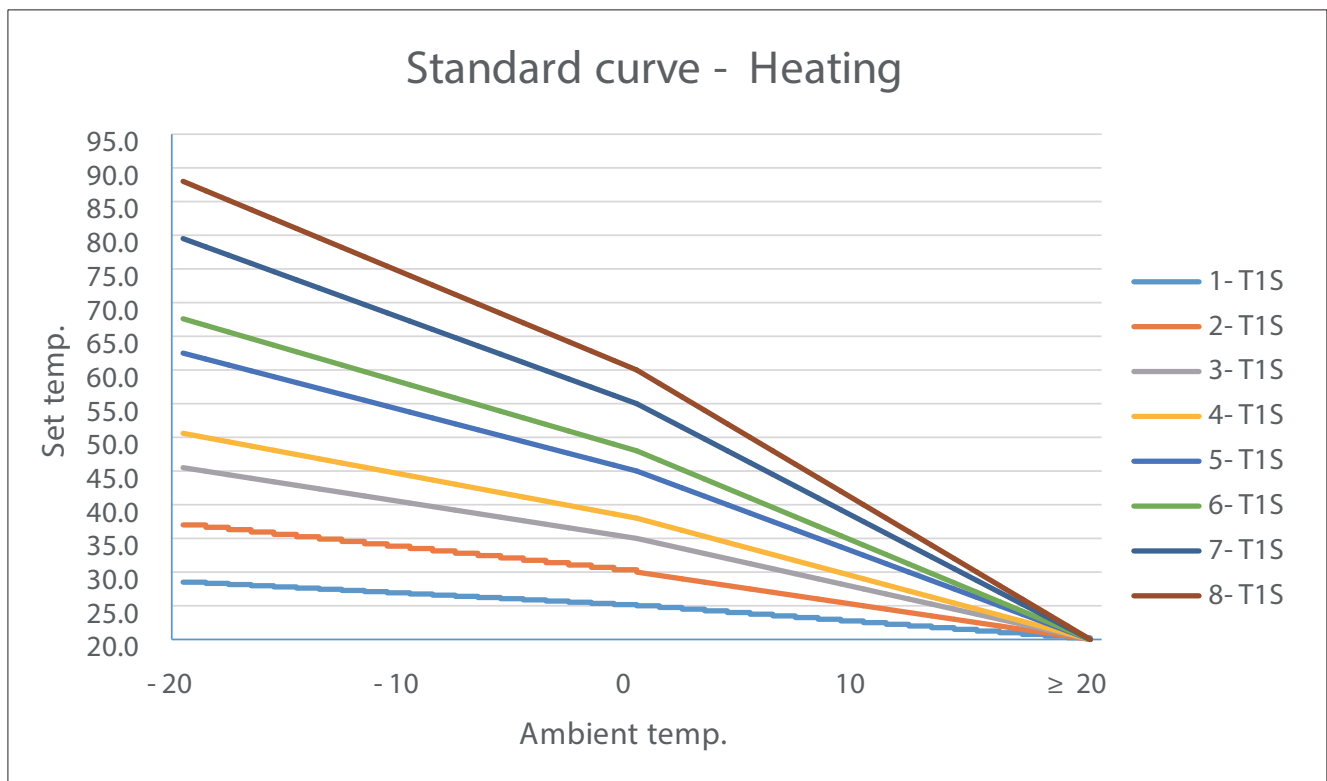
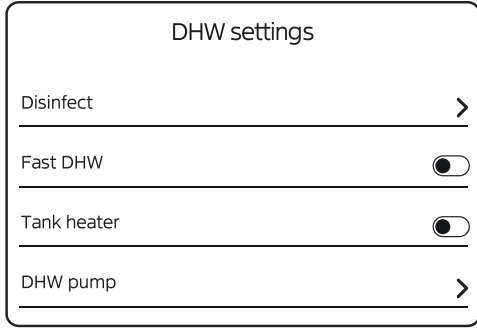


Figure 60. HP290 Standard curve graph

5.8.4 DHW setting



To scroll through the options press \downarrow , \uparrow , \rightarrow and \leftarrow .
 To select Disinfect (Anto-Legionella protection), press O when **Disinfect** is illuminated (refer to 5.8.4.1).
 To enable/disable Fast DHW, press O when **Fast DHW** is high-lighted.

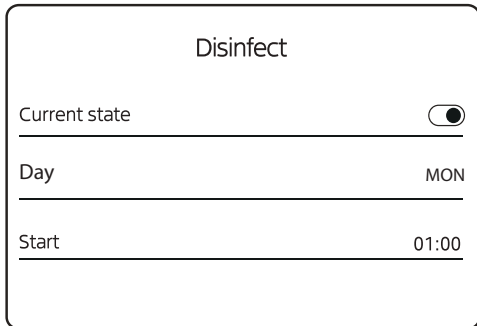
ⓘ IMPORTANT: Fast DHW will immediately switch ON the hot water immersion heater or the backup boiler so it should be disabled.

To enable/disable Tank heater, press O when **Tank heater** is illuminated.

To select DHW pump, press O when **DHW pump** is illuminated (refer to 5.8.4.2).

ⓘ IMPORTANT: DHW pump configures operating times for a DHW re-circulation pump, which is not required, so it should be disabled.

5.8.4.1 DHW setting, Disinfect



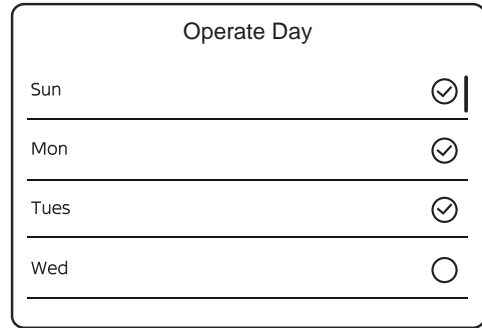
To scroll through the options press \downarrow , \uparrow , \rightarrow and \leftarrow .
 To enable/disable Disinfect (Anti-Legionella protection), press O when **Current state** is illuminated.

ⓘ IMPORTANT: Disinfect (Anti-Legionella) must not be disabled when a hot water cylinder is installed.

To select the day Disinfect (Anti-legionella) takes place, press O when **Day** is illuminated (refer to 5.8.4.1.1).

To change the time Disinfect (Anti-legionella) takes place, press \downarrow and \uparrow when **Start** is illuminated.

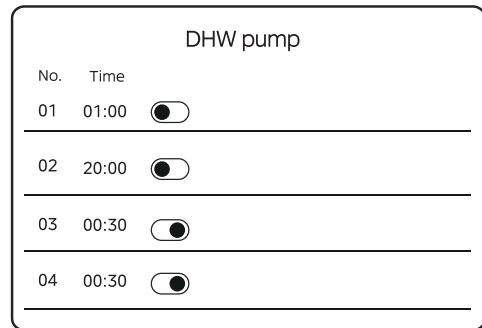
5.8.4.1.1 DHW setting, Disinfect, Day



To scroll through the options press \downarrow , \uparrow , \rightarrow and \leftarrow .
 To select a day. Press O when the correct day is illuminated.

ⓘ IMPORTANT: At least 1 day must be selected or the Disinfect (Anti-legionella) function will not be active.

5.8.4.2 DHW setting, DHW pump



These are the timings for operation of a DHW recirculation pump, which is not required for this appliance, so all times should be disabled.

The first column shows the order in which the events will happen.

The second column is the time at which the events will happen.

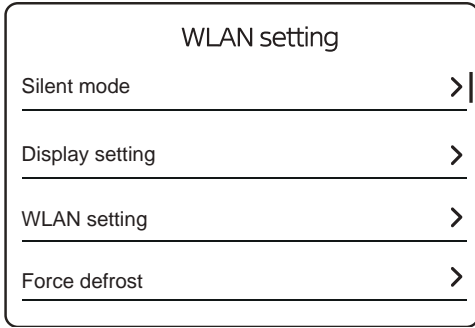
The third column shows if the event is ON or OFF.

To scroll though the options use \downarrow , \uparrow , \rightarrow and \leftarrow .

To select a time press O. Then use \downarrow or \uparrow to change the time.

To enable/disable a time press O when the appropriate time is illuminated.

5.8.5 Options



To scroll through the options use \downarrow , \uparrow , \rightarrow and \leftarrow .

ⓘ IMPORTANT: Silent Mode should be switched OFF, otherwise central heating and hot water operation is likely to be compromised.

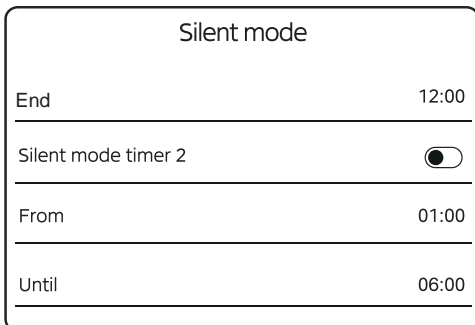
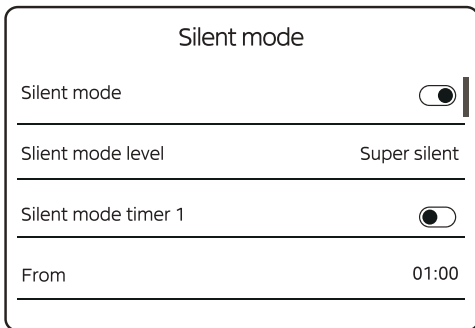
If Silent Mode is switched ON, then press \downarrow and \uparrow until **Silent mode** is illuminated. Then press O twice to switch Silent mode OFF (refer to 5.8.5.1).

To select Display setting, press \downarrow and \uparrow until **Display setting** is illuminated. Then press O (refer to 5.8.5.2).

To select WLAN setting, press \downarrow and \uparrow until **WLAN setting** is illuminated. Then press O (refer to 5.8.5.3).

To enable/disable Force defrost ON, press \downarrow and \uparrow until **Force defrost** is illuminated. Then press O.

5.8.5.1 Silent Mode



ⓘ IMPORTANT: Silent Mode should be switched OFF, otherwise central heating and hot water operation is likely to be compromised.

If Silent Mode is switched ON, then press \downarrow and \uparrow until Silent mode is illuminated. Then press O to switch Silent mode OFF.

To change Silent mode level between Silent and Super Silent,

press \downarrow and \uparrow until **Silent Mode level** is illuminated. Then press O and then press \downarrow or \uparrow .

To enable/disable Silent Mode Timer 1, press \downarrow and \uparrow until **Silent Mode Timer 1** is illuminated. Then press O.

To change Silent Mode Timer 1 start time, press \downarrow and \uparrow until **From** is illuminated. Then press O and then press \downarrow and \uparrow .

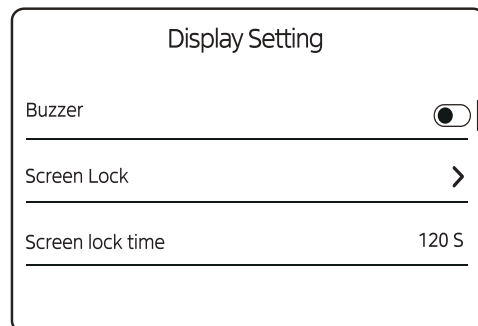
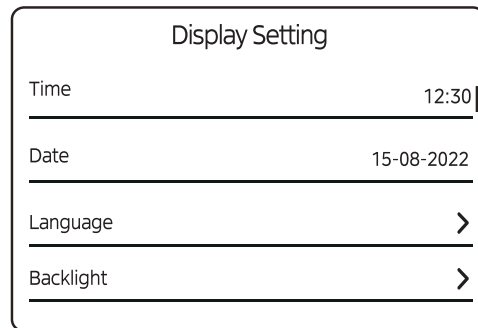
To change Silent Mode Timer 1 end time, press \downarrow and \uparrow until **End** is illuminated. Then press O and then press \downarrow and \uparrow .

To enable/disable Silent Mode Timer 2, press \downarrow and \uparrow until **Silent Mode Timer 2** is illuminated. Then press O.

To change Silent Mode Timer 2 start time, press \downarrow and \uparrow until **From** is illuminated. Then press O and then press \downarrow and \uparrow .

To change Silent Mode Timer 2 end time, press \downarrow and \uparrow until **End** is illuminated. Then press O and then press \downarrow and \uparrow .

5.8.5.2 Display setting



To change the time, press \downarrow and \uparrow until **Time** is illuminated. Then press O and then press \downarrow or \uparrow .

To change the date, press \downarrow and \uparrow until **Date** is illuminated. Then press O.

To change the Language, press \downarrow and \uparrow until **Language** is illuminated. Then press O (refer to 5.8.5.2.1).

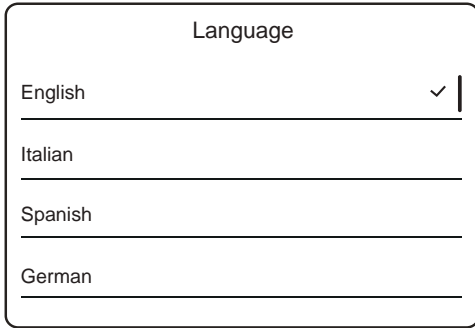
To change Backlight setting, press \downarrow and \uparrow until **Backlight** is illuminated. Then press O (refer to 5.8.5.2.2).

To enable/disable the buzzer for the buttons, press \downarrow and \uparrow until **Buzzer** is illuminated. Then press O.

To change the screen lock setting, press \downarrow and \uparrow until **Screen Lock** is illuminated. Then press O (refer to 5.8.5.2.3).

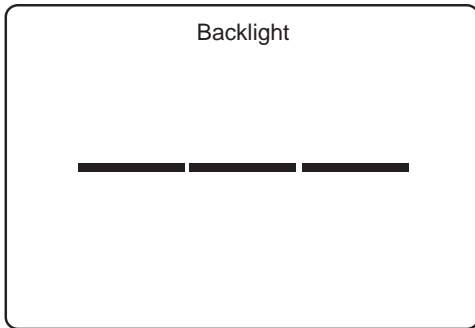
To change the screen lock time, press \downarrow and \uparrow until **Screen Lock** is illuminated. Then press O and then press \downarrow and \uparrow .

5.8.5.2.1 Language



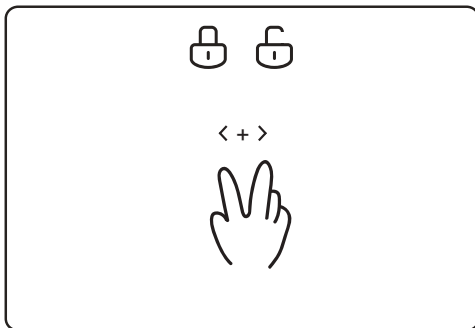
To scroll through the languages use \vee and \wedge until the correct menu option is illuminated. Then press O.

5.8.5.2.2 Backlight



To change the Backlight setting press \vee and \wedge until the correct setting is illuminated.

5.8.5.2.3 Screen Lock



To enable/disable screen press \vee and \wedge together.

5.8.5.3 WLAN Settings

① **IMPORANT: Transmission frequency 2.4000 GHz to 2.4835 GHz, EIRP (equivalent isotropic radiated power) < 20 dBm.**

To select smart link, press \vee and \wedge until **Smart link** is illuminated. Then press O (refer to 5.8.5.3.1).

To disconnect Wi-Fi, press \vee and \wedge until **Restore WLAN setting** is illuminated. Then press O, press \triangleright so **Yes** is illuminated. Then press O.

① **IMPORTANT: This will disconnect the appliance from the Wi-Fi connection.**

5.8.5.3.1 WLAN Settings, Smart link

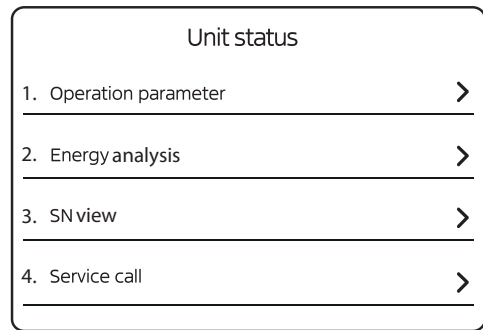


The serial number of the user interface is shown.

The Wi-Fi connection is activated for 5 minutes when this page is entered.

Scan the code on the HP290 control display to download the App, and use the App to create the connection.

5.8.6 Unit Status



To select the correct menu option, press \vee and \wedge until the correct menu option is illuminated. Then press O.

To view the operation parameters, press \vee and \wedge until **Operation parameter** is shown. Then press O (refer to 5.8.6.1).

To view the energy analysis, press \vee and \wedge until **Energy analysis** is shown. Then press O (refer to 5.8.6.2).

To view SN view, press \vee and \wedge until **SN view** is shown. Then press O (refer to 5.8.6.3).

To view Service call, press \vee and \wedge until **Service call** is shown. Then press O (refer to 5.8.6.4).

5.8.6.1 Unit Status, Operation Parameter

The operation parameters can be read from the user interface, press \vee and \wedge to move through the list.

Section 5 - Commissioning

Operation parameter			
Unit	NO.		
#00	1	Online unit number	1
#00	2	ODU unit	5KW *
#00	3	Operating	Heating
#00	4	Operation status	ON

* Nominal output at A+7 / W35.

Operation parameter			
Unit	NO.		
#00	5	Frequency limited type	--
#00	6	Comp. run time	0min
#00	7	Comp. frequency	0Hz
#00	8	Fan speed	0RPM

Operation parameter			
Unit	NO.		
#00	9	Expansion valve	0P
#00	10	Tp Comp. discharge temp.	0°C
#00	11	Th Comp. suction temp.	0°C
#00	12	T3 outdoor exchanger temp.	0°C

Operation parameter			
Unit	NO.		
#00	13	T4 outdoor air temp.	0°C
#00	14	Tf module temp.	0°C
#00	15	P1 comp. pressure	0kPa
#00	16	P2 comp. pressure	0kPa

Operation parameter			
Unit	NO.		
#00	17	T2b plate F-in temp.	0°C
#00	18	T2 plate F-out temp.	0°C
#00	19	Tw_in plate water outlet temp.	0°C
#00	20	Tw_out plate water outlet temp.	0°C

Operation parameter			
Unit	NO.		
#00	21	T1 leaving water temp.	0°C
#00	22	Tw2 circuit2 water temp.	0°C
#00	23	Ta room temp.	0°C
#00	24	RH room humidity	0%

Operation parameter			
Unit	NO.		
#00	25	T5 water tank temp.	0°C
#00	26	T5_2 water tank temp.	0°C
#00	27	TBt buffer tank temp.	0°C
#00	28	Tsolar	0°C

Operation parameter			
Unit	NO.		
#00	29	T1S_C1 CLI. curve temp.	0°C
#00	30	T1S2_C2 CLI. curve temp.	0°C
#00	31	Water pressure	0.00bar
#00	32	Water flow	0.00m³/h

Operation parameter			
Unit	NO.		
#00	33	Heat pump capacity	--
#00	34	ODU current	0A
#00	35	ODU voltage	0V
#00	36	DC generatrix voltage	0V

Operation parameter			
Unit	NO.		
#00	37	DC generatrix current	0A
#00	38	Power consump.	0kWh
#00	39	SV1 state	OFF
#00	40	SV2 state	OFF

Operation parameter			
Unit	NO.		
#00	45	SV3 state	OFF
#00	46	Pump_I	OFF
#00	47	Pump_O	OFF
#00	48	Pump_C	OFF



Operation parameter			
Unit	NO.		
#00	45	SV3 state	OFF
#00	46	Pump_I	OFF
#00	47	Pump_O	OFF
#00	48	Pump_C	OFF



Operation parameter			
Unit	NO.		
#00	49	TBH	OFF
#00	50	AHS	OFF
#00	51	Comp. total run time	0Hrs
#00	52	Fan total run time	0Hrs



Operation parameter			
Unit	NO.		
#00	53	Pump_I total run time	0Hrs
#00	54	IBH total run time	0Hrs
#00	55	IBH2 total run time	0Hrs
#00	56	TBH total run time	0Hrs



Operation parameter			
Unit	NO.		
#00	57	AHS total run time	0Hrs
#00	58	IDU software	0-0-0V0
#00	59	ODU software	0-0-0V0
#00	60	HMI software	V1.0.26

5.8.6.2 Unit Status, Energy analysis

Energy analysis	
Heating energy data	>
Cooling energy data	>
DHW energy data	>

To select the correct menu option, press ∇ and \wedge until the correct menu option is illuminated. Then press O.

ⓘ IMPORTANT: Cooling is not available on this product, so no Cool energy data will be available.

5.8.6.2.1 Unit Status, Energy analysis: Heat Energy Data

Heat energy data	
Energy data	>
Historical data	>

Press ∇ and \wedge until the correct menu option is illuminated. Then press O.

5.8.6.2.1.1 Unit Status, Energy analysis: Heat Energy Data

Heat energy: Hour	
Energy produced	8,5 kW
RE Energy produced	6,5 kW
Consumption	2,5 kW
COP	3,40



Heat energy: Total	
Energy produced	8,5 kWh
RE Energy produced	6,5 kWh
Consumption	2,5 kWh
COP	3,40



Section 5 - Commissioning

Heat energy: Day	
Energy produced	8,5 kWh
RE Energy produced	6,5 kWh
Consumption	2,5 kWh
COP	3,40



Heat energy:Week	
Energy produced	8,5 kWh
RE Energy produced	6,5 kWh
Consumption	2,5 kWh
COP	3,40



Heat energy: Year	
Energy produced	8,5 kWh
RE Energy produced	6,5 kWh
Consumption	2,5 kWh
COP	3,40



Heat energy: Month	
Energy produced	8,5 kWh
RE Energy produced	6,5 kWh
Consumption	2,5 kWh
COP	3,40

5.8.6.2.2 Unit Status, Energy analysis: Heat Energy Data: Energy data annals, Heating Energy

Heating energy	
Jan ◊ 2022 < >	
Production	6000 kWh
RE production	3455 kWh
Consumption	1456 kWh
COP	

Use ∨ and ∩ to select the correct month. Then use < and > to select the correct year.

5.8.6.2.3 Unit Status, Energy analysis: DHW Energy Data

DHWenergy data	
Energy data	>
Historical data	>

Press ∨ and ∩ until the correct menu option is illuminated. Then press O.

Section 5 - Commissioning

5.8.6.2.3.1 Unit Status, Energy analysis: DHW Energy Data

DHW energy: Hour	
Energy produced	8,5 kW
RE Energy produced	6,5 kW
Power consumed	2,5 kW
COP	3,40



DHW energy: Total	
Energy produced	8,5 kWh
RE Energy produced	6,5 kWh
Consumption	2,5 kWh
COP	3,40



DHW energy: Day	
Energy produced	8,5 kWh
RE Energy produced	6,5 kWh
Consumption	2,5 kWh
COP	3,40



DHW energy: Week	
Energy produced	8,5 kWh
RE Energy produced	6,5 kWh
Consumption	2,5 kWh
COP	3,40



DHW energy: Year	
Energy produced	8,5 kWh
RE Energy produced	6,5 kWh
Consumption	2,5 kWh
COP	3,40



DHW energy: Month	
Energy produced	8,5 kWh
RE Energy produced	6,5 kWh
Consumption	2,5 kWh
COP	3,40

5.8.6.2.3.2 Unit Status, Energy analysis: Heat Energy Data: Energy data annals, DHW Energy

DHW energy	
Jan 2022 <>	
Production	6000 kWh
RE production	3455 kWh
Consumption	1456 kWh
COP	

To scroll through the months use or . To scroll through the years use and .

5.8.6.3 Unit Status, SN view

To set a parameter scroll through settings, use or . Press O to select the parameter, and then press and to change the parameter.

SN view	
Unit SN	
HMI	-----
IDU	-----
ODU	-----

5.8.6.4 Unit Status, Service call

Service call	
Phone number	0000000000000
Mobile number	0000000000000

Phone number is the landline to call if there is a problem with the heat pump. Mobile number is the mobile number to call.

5.8.7 Error information

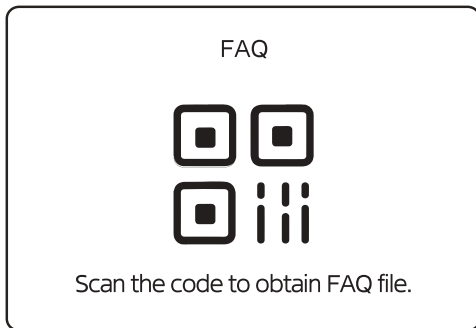
Error info.			
Unit	Code	Time	Date
#01	E8 (70%)	11:27	19-12-2022
#02	E8 (70%)	15:30	19-12-2022
#03	E12	10:30	19-05-2022
#04	E8 (70%)	00:30	20-12-2022

To set a parameter scroll through the fault codes use ∇ or \blacktriangle . Press O to scroll through the pages for more information.

Error info.			
Unit	Code	Time	Date
#01	E1	11:27	19-12-2022
E8 water flow fault			

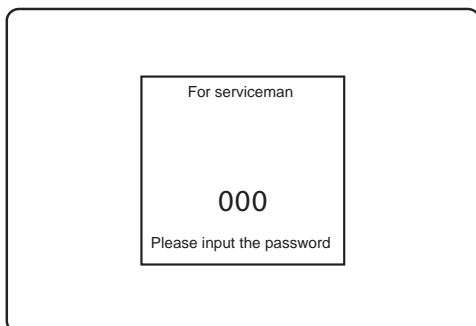
5.8.8 Frequently Asked Questions (FAQ's)

To set a parameter scroll through settings, use ∇ or \blacktriangle . Press O to select the parameter, and then press ∇ and \blacktriangle to change the parameter.



5.8.9 For serviceman

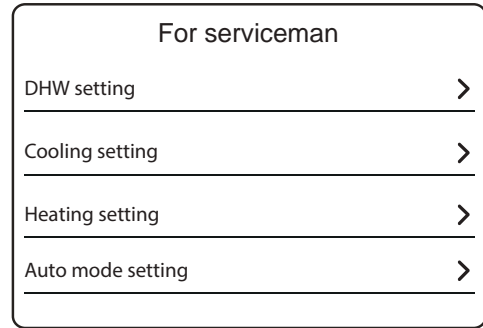
To access the Point check function, press \equiv and \blacktriangleright together for 3S. Then the next screen will be shown.



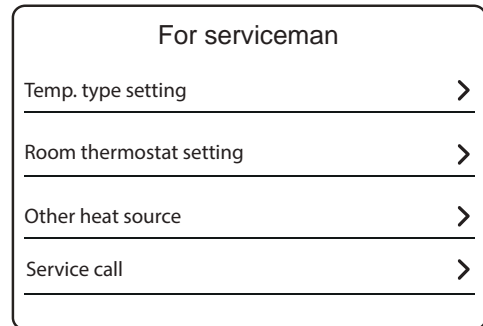
Press \blacktriangle until 2 is shown for the left-hand digit then press \blacktriangleright .

Press \blacktriangle until 3 is shown for the middle digit then press \blacktriangleright .

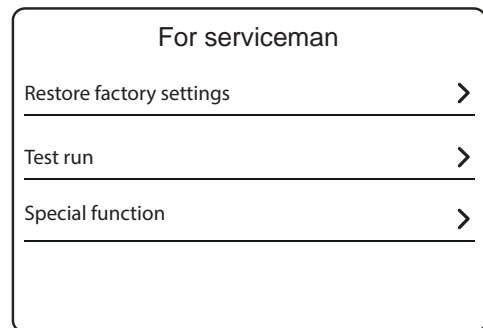
Press \blacktriangle until 4 is shown for the right-hand digit. Then press O and the next screen will be shown.



- For DHW settings, refer to 5.8.9.1.
- Cooling setting is not applicable for this product.
- For Heating settings, refer to 5.8.9.2.
- For Auto mode settings, refer to 5.8.9.3



- For Temp. type settings, refer to 5.8.9.4
- For Room thermostat settings, refer to 5.8.9.5
- For Other heat source settings, refer to 5.8.9.6



- For Service call settings, refer to 5.8.9.7
- For Restore factory settings, refer to 5.8.9.8
- For Test run settings, refer to 5.8.9.9
- For Special function settings, refer to 5.8.9.10



Section 5 - Commissioning

For serviceman	
Auto restart	>
Power input limitation	>
Input definition	>
Cascade setting	>

- For Auto restart settings, refer to 5.8.9.11.
- For Power input limitation settings, refer to 5.8.9.12.
- For input definition settings, refer to 5.8.9.13.
- For Cascade settings, refer to 5.8.9.14.



For serviceman	
Input definition	>
Cascade setting	>
HMI address setting	>
Common setting	>

- For HMI address setting refer to 5.8.9.15.
- For Power input limitation refer to 5.8.9.16.

5.8.9.1 For serviceman, DHW setting

To scroll through the parameters, use ∨ or ^. Press O to select the parameter. Then press ∨ and ^ to change the parameter.

DHW setting	
DHW mode	ON
Disinfect	ON
DHW priority	YES
Pump_D	OFF

DEFAULTS

- DHW Mode: YES (enable/Disable DHW mode)
- Disinfect (Anti-legionella): YES (enable/disable) (must be enabled)
- DHW priority: YES or NO
- Pump_D: 0 (not applicable to this product)



DHW setting	
DHW priority time set	OFF
dT5_ON	10°C
dT1S5	10°C
T4DHWMAX	46°C

DEFAULTS

- DHW priority time set: NO (if not NO, time DHW runs before CH)
- dT5_ON (DHW hysteresis temperature): will be changed to 7°C by USB update to outdoor PCB
- dT1S5: 10 (DHW flow temperature = DHW target temp + dT1S5)
- T4DHWMAX: 43 (not applicable to this appliance)



DHW setting	
T4DHWMIN	-10°C
t_INTERVAL_DHW	5minutes
T5S_DISINFECT	65°C
t_DI_HIGHTEMP.	15minutes

DEFAULTS

- T4DHWMIN: -10 (no DHW if outdoor temperature < -10 °C)
- T_INTERVAL_DHW: 5 (compressor DHW anti-cycle time)
- T5S_DISINFECT: will be changed to 60°C by USB update to outdoor PCB
- T_DI_HIGHTEMP.: 15 (time to maintain anti-legionella temperature)



DHW setting	
t_DI_MAX	210minutes

DEFAULTS

- T_DI_MAX: 210 (maximum anti-legionella time)

Section 5 - Commissioning

5.8.9.2 For serviceman, Heating setting

To set a parameter scroll through settings, use \vee or \wedge . Press O to select the parameter. Then press \rangle and \langle to change the parameter.

Heating setting	
Heating mode	ON
t_T4_FRESH_H	0.5hours
T4HMAX	25°C
T4HMIN	-15°C

DEFAULTS

- Heating Mode: ON (ON = CH enabled, OFF = CH disabled)
- T_T4_FRESH_H: 0.5 (refresh time of outdoor curve target temp')
- T4HMAX: change to 21 °C (minimum CH output above 21 °C)
- T4HMIN: should be changed to -20 °C (no CH below -20 °C)



Heating setting	
dT1SH	5°C
dTSH	2°C
Zone 1 H-emission	RAD
Zone 1 H-emission	RAD

DEFAULTS

- dT1SH: 5 °C (CH ON/OFF hysteresis temperature)
- dTSH: 2 °C (CH Room temperature hysteresis)
- Zone 1 H-emission: RAD (Zone 1 emitter type) (RAD = Radiators, FLH = Underfloor Heating)



Heating setting	
Zone 2 H-emission	RAD
Force defrost	OFF

DEFAULTS

- Zone 2 H_emission: (Zone 2 emitter type) should be changed to RAD (for Radiators) or FLH (for Underfloor heating)
- Force defrost: (NO = disabled, YES = defrosts if the heat exchanger outlet temperature is less than 6 °C for more than 10 minutes.

5.8.9.3 For serviceman, AUTO mode setting

To set a parameter scroll through settings, use \vee or \wedge . Press O to select the parameter, and then press \vee and \wedge to change the parameter.

Auto mode setting	
T4AUTOCMIN	25°C
T4AUTOHMAX	21°C

DEFAULTS

- T4AUTOCMIN: 25 (not applicable to this product)
- T4AUTOHMAX: 21 °C (CH is disabled if the outdoor temperature is more than 21 °C)

5.8.9.4 For serviceman, Temp. type setting

To set a parameter scroll through settings, use \vee or \wedge . Press O to select the parameter, and then press \vee and \wedge to change the parameter.

Temp. type setting	
Water flow temp.	YES
Room temp.	NO
Double zone	NO

DEFAULTS

- Water flow temp: YES (YES = flow temp set by outdoor temp, NO = flow temp not set by outdoor temp)
- Room temp.: NO (NO = flow temp not set by room temp, YES = flow temp set by room temp)
- Double zone: NO (one zone), change to YES (for two zones)

5.8.9.5 For serviceman, Room thermostat setting

To set a parameter scroll through settings, use \vee or \wedge . Press O to select the parameter, and then press \vee and \wedge to change the parameter.

Room thermostat setting	
Room thermostat	NO

DEFAULTS

- Room thermostat: usually this should be left as One Zone, but should be changed to NO if the heat pump user interface is to be used as the room thermostat, or Double zone for 2 zones.

Section 5 - Commissioning

5.8.9.6 For serviceman, Other heat source

To set a parameter scroll through settings, use ∇ or \blacktriangle . Press O to select the parameter, and then press ∇ and \blacktriangle to change the parameter.

ⓘ IMPORTANT: IBH = Internal Backup Heater (not used in this product)

∇ \blacktriangle

Other heat source	
AHS function	OFF
TBH FUNCTION	ON
dT5_TBH_OFF	5°C
t_TBH_DELAY	30minutes

AHS function:

- NO (stand-alone heat pump)
- HEATING (heat pump and boiler hybrid, with hot water from the boiler)
- HEATING and HOT WATER (heat pump and boiler hybrid, with hot water from heat pump and boiler)

ⓘ IMPORTANT: TBH = Tank Booster Heater

∇ \blacktriangle

Other heat source	
T4_TBH_ON	5°C
P_TBH	2.0kW
P_TBH	2.0kW
Solar function	NO

DEFAULTS

- TBH FUNCTION: will be changed to OFF by USB update to outdoor PCB
- dT5_TBH_OFF: 5 (not applicable to this product)
- t_TBH_DELAY: 30 (not applicable to this product)
- T4_TBH_ON: 5 (not applicable to this product)
- P_TBH: is changed to 3 kW during the USB update (DHW immersion heater rating)
- Solar function: NO (not applicable to this product)

5.8.9.7 For serviceman, Service Call

To set a parameter scroll through settings, use ∇ or \blacktriangle . Press O to select the parameter, and then press ∇ and \blacktriangle to change the parameter.

Service call	
Phone number	0000000000000000
Mobile number	0000000000000000

Phone number is for the landline of the service engineer.

Mobile number is for the mobile of the service engineer.

(the defaults are disabled – all 0s).

5.8.9.8 For serviceman, Restore factory settings

To scroll through the **NO** and **YES** options use ∇ and \blacktriangle . Press O to select.

For serviceman	
Service #	>
Restore	>
Test run	>
Special function	>

All the settings will come back to factory default. Do you want to restore factory settings?

NO YES

ⓘ IMPORTANT: All parameters that were set during initial

Section 5 - Commissioning

commissioning will be lost if **YES** is selected.

5.8.9.9 For serviceman, Test run

To set a parameter scroll through settings, use \downarrow or \uparrow . Press O to select the parameter, and then press \downarrow and \uparrow to change the parameter.

Test run	
Point check	>
Air purge	>
Circulated pump running	>
Cooling running	>

- For Point check settings, refer to 5.8.9.9.1
- For Air purge settings, refer to 5.8.9.9.2
- For Circulated pump running settings, refer to 5.8.9.9.3
- Cooling running is not available on this product. DO NOT select COOLING RUNNING.

\downarrow \uparrow

Test run	
Circulated pump running	>
Cooling running	>
Heating running	>
DHW running	>

- For Heating running settings, refer to 5.8.9.9.4
- For DHW running settings, refer to 5.8.9.9.5

5.8.9.9.1 For serviceman, Test run, Point check

To scroll through the options use \downarrow , \uparrow , \leftarrow and \rightarrow . Select O to set the applicable setting to ON or OFF.

Point check	
SV2	<input type="checkbox"/>
SV3	<input type="checkbox"/>
Pump_1	<input checked="" type="checkbox"/>
Pump_0	<input checked="" type="checkbox"/>

- SV2 = not applicable to this product
- SV3 = not applicable to this product
- Pump_I = Primary Circulation Pump

- Pump_O = CH Zone 1 Pump
(the defaults are all OFF)

5.8.9.9.2 For serviceman, Test run, Air purge

Press O to switch Air purge ON or OFF.

Air purge	
Air purge	<input checked="" type="checkbox"/>
Air purge Pump_I output	70%
Air purge running time	20min
Air purge water flow	1.70m ³ /h

The Air Purge function runs the pump to extract air from the system.

Air purge Pump_I output default: 70 %

Air purge running time default: 20min

5.8.9.9.3 For serviceman, Test run, Circulated pump running

Press O to return to the menu.

Circulated pump running	
Circulated pump running is on. Water flow X.XXm ³ /h	
<input type="button" value="OK"/>	

This shows whether the primary circulation pump in the outdoor unit is ON or OFF and what the water flow rate through it is.

5.8.9.9.4 For serviceman, Test run, Heating running

Press O to return to the menu.

Heating running	
Circulated pump running is on. Water flow X.XXm ³ /h	
<input type="button" value="OK"/>	

Section 5 - Commissioning

This shows whether CH is operating and whether the primary circulation pump in the outdoor unit is ON or OFF and what the water flow rate through it is.

5.8.9.9.5 For serviceman, Test, DHW running

Press O to return to the menu.

DHW running	
DHW running is on.	
Tw_out 15°C	
T5 15°C	
OK	

This shows whether DHW is operating, Tw_out (flow) temperature and T5 (Cylinder) temperature..

5.8.9.10 For serviceman, Special function

To set a parameter scroll through the settings, use \downarrow and \uparrow . Press O to select the parameter.

Special function	
Preheating for floor	>
Floor drying up	>

- For Preheating for floor settings, refer to 5.8.9.10.1
- For Floor drying up settings, refer to 5.8.9.10.2

5.8.9.10.1 For serviceman, Special function, Preheating for floor

Preheating for floor	
Preheating for floor	<input checked="" type="checkbox"/>
T1S	30°C
t_ARSTH	72hours
Elapsed time	--

T1S is underfloor heating drying flow temperature. (default 15° C)

t_ARSTH is the underfloor heating drying time. (default 72 hours)

Elapsed time is the amount of time that the underfloor heating function has been in operation.

Tw-out temp. is the current flow temperature.

Preheating for floor	
T1S	15°C
t_ARSTH	72hours
Elapsed time	--
Tw_out temp.	0°C

To enable/disable Preheating for floor, press \downarrow and \uparrow until **Preheating for floor** is illuminated. Then press O.

To change floor Preheating temperature, press \downarrow and \uparrow until **T1S** illuminated. Then press O to access the parameter. Then use \downarrow and \uparrow to change.

To change floor Preheating time, press \downarrow and \uparrow until **t_ARSTH** illuminated. Then press O to access the parameter. Then use \downarrow and \uparrow to change.

Elapsed time is the time-period that the floor preheating function has been running for.

Tw-out temp. is the current flow temperature.

5.8.9.10.2 For serviceman, Special function, Floor drying up

Floor drying up	
FLoor drying up	<input checked="" type="checkbox"/>
t_Dryup	8days
t_Highpeak	5days
t_Drydown	5days

t-Dryup is the time taken to increase the flow temperature to the maximum underfloor heating drying temperature. (default 8 days)

t-Highpeak is the time period that the maximum underfloor heating drying temperature is maintained for. (default 5 days)

t-Drydown is the time taken to decrease the flow temperature from the maximum underfloor heating drying temperature back to OFF.

Section 5 - Commissioning

(default 5 days)

Floor drying up	
t_Drypeak	45°C
Start time	15:00
Start day	01-01-2023

t-Drypeak is the maximum underfloor heating temperature. (default 45 °C)

Start time is the time at which the underfloor heating drying function begins.

Start day is the day the underfloor heating drying function begins.

To enable/disable Floor drying up, select \vee and \wedge until **Floor drying up** is illuminated. Then press O.

To change t_Dryup time, press \vee and \wedge until **t_Dryup** is illuminated. Then press O, then press \vee and \wedge .

To change t_Highpeak time, press \vee and \wedge until **t_Dryup** is illuminated. Then press O, then press \vee and \wedge .

To change t_Drydown time, press \vee and \wedge until **t_Dryup** is illuminated. Then press O, then press \vee and \wedge .

To change Floor drying up Start time, press \vee and \wedge until **t_Dryup** is illuminated. Then press O, then press \vee and \wedge .

To change Floor drying up Start day. Then press \vee and \wedge until **t_Dryup** is illuminated. Then press O, then press \vee and \wedge .

5.8.9.11 For serviceman, Auto restart

To change a parameter press \vee and \wedge until the parameter is illuminated. Then press O. Then use \vee and \wedge .

If Auto restart cooling/heating mode is set to YES when the appliance automatically restarts after a mains electricity interruption, then hot water will be enabled. If it is set to NO cooling / heating mode water will be disabled.

When the appliance automatically restarts after a mains electricity interruption:

If DHW mode is set to YES, then hot water will be enabled.

If DHW mode is set to NO. Then hot water will be disabled.

Auto restart	
Auto restart cooling/heating mode	YES
Auto restart DHW mode	YES

- Auto restart cooling/heating mode default: YES
- Auto restart DHW mode default: YES

5.8.9.12 For serviceman, Power input limitation

To change the power input limitation setting, press O and then press \vee and \wedge .

Power input limitation	
Power input limitation	1

If the supply has less capability than the appliance. power input limitation limits the current drawn by the appliance to match the maximum available current from the mains electricity supply.

This function should not be required.

Default setting is 1 (no limitation).

Table 19 Table of Limitation

Setting	Model		
	4.5kW, 6kW	8kW	10kW, 12kW, 14kW
1	13.5A	17.5A	28A
2	12A	16A	26A
3	11A	15A	24A
4	10A	14A	22A
5	9A	13A	20A
6	8A	12A	18A
7	8A	12A	18A
8	8A	12A	18A

5.8.9.13 For serviceman, Input definition

To change a parameter:

Scroll through the settings with the \vee and \wedge touch-buttons until the correct parameter is illuminated.

Press O. Then use the \vee and \wedge touch-buttons.

Input definition	
M1 M2	Remote ON/OFF
Smart grid	NO
Tbt	NO
P_X port	NO

None of the Input definition parameters are applicable to this product (all defaults are NO).

\vee \wedge

Section 5 - Commissioning

Input definition	
Tbt	NO
P_X PORT	Defrost

HMI address setting	
HMI address for BMS	1
Stop BIT	1

5.8.9.14 For serviceman, cascade setting

Scroll through the settings with the \vee and \wedge touch-buttons until the correct parameter is illuminated.

Press O. Then use the \vee and \wedge touch-buttons.

Cascade setting	
PER_START	10%
TIME_ADJUST	5minutes

PER_START sets the maximum output of the appliances, as a % of maximum output, at start up for cascade operation. (default: 10 %)

TIME_ADJUST sets the time period at which additional appliances are added to, or removed from, the cascade. (default 5 minutes)

5.8.9.15 For serviceman, HMI address setting

Scroll through the settings with the \vee and \wedge touch-buttons until the correct parameter is illuminated.

Press O. Then use the \vee and \wedge touch-buttons.

5.8.9.16 For serviceman, Common setting

Scroll through the settings with the \vee and \wedge buttons until the correct parameter is illuminated.

Push O. Then use the \vee and \wedge buttons.

Common setting	
t_DELAY PUMP	2.0minutes
t1_ANTILOCK PUMP	24hours
t2_ANTILOCK PUMP RUN	60seconds
t1-ANTILOCK SV	24hours

t_DELAY PUMP is the outdoor unit primary circulation pump overrun time after the compressor switches OFF. (default 2.0 minutes).

t1_ANTILOCK PUMP is the minimum time period necessary until the pumps operate prevent seizing. (default 24 hours)

t2_ANTILOCK PUMP RUN is the time period that the pumps will operate for if they have not been operated for 24 hours (to prevent seizing) (default 60s)

t1-ANTILOCK SV is the minimum time period necessary before the 3-way valve will operate if it has not been cycled in the previous 24 hour to prevent seizing. (default 24 hours)



Common setting	
t2-ANTILOCK SV RUN	30seconds
Ta-adj.	-2°C
PUMP_I SILENT OUTPUT	100%
Pump_O	Auto

t2-ANTILOCK SV RUN is the time period the 3-way valve will operate for if it has been cycled in the previous 24 hours. (default 30s)

Ta-adj. is not applicable for this appliance.

PUMP_I SILENT OUTPUT: should not be changed (default 100 %)

Notes

Energy metering is not applicable to this product

If **Pump_O** is set to ON then CH Zone 1 Pump operates continuously.

If **Pump_O** is set to Auto then CH Zone 1 Pump operates when there is a demand in CH Zone 1.
(default 0)

Glycol - Set to Without Glycol (no function on this unit).

Section 5 - Commissioning

5.9 DEFAULT SYSTEM PARAMETERS

5.9.1 User Parameters

Table 20 System User Parameters

Menu Location			Parameter	Default	
Home Screen			DHW mode	Enabled	
			Heating mode	Enabled	
Menu, Heating			Heating mode	Enabled	
Menu, Schedule	Zone 1 daily timer		Event 1 ... Event 6	Time	00:00
			Mode	OFF	
			Temp.	0.0°C	
			Enabled	Disabled	
	Zone 2 daily timer		Event 1 ... Event 6	Time	00:00
			Mode	OFF	
			Temp.	0.0°C	
			Enabled	Disabled	
	DHW daily timer		Event 1 ... Event 6	Time	00:00
			Mode	OFF	
			Temp.	0.0°C	
			Enabled	Disabled	
	Zone 1 weekly schedule	Schedule 1 ... Schedule 4	Event 1 ... Event 6	Enabled	Enabled
				Day	Every day
				Time	00:00
				Mode	OFF
	Zone 2 weekly schedule	Schedule 1 ... Schedule 4	Event 1 ... Event 6	Temp.	0.0°C
				Enabled	Disabled
				Day	Every day
				Time	00:00
	DHW weekly schedule	Schedule 1 ... Schedule 4	Event 1 ... Event 6	Mode	OFF
				Temp.	0.0°C
				Enabled	Disabled
				Day	Every day
Holiday away			Current state	Disabled	
			From	10-01-2023	
			Until	10-01-2023	
			Heating Mode	Enabled	
			Heating temp.	25°C	
			DHW mode	Enabled	
			DHW temp.	25°C	
Holiday home			Disinfect	Enabled	
			Current state	Disabled	
			From	10-01-2023	
			Until	10-01-2023	
			Zone 1 holiday timer	OFF	
			Zone 2 holiday timer	OFF	
			DHW holiday timer	OFF	

Section 5 - Commissioning

Weather temp. settings introduction		Text	
Menu, Weather temp. settings	Zone 1 heating mode	Temperature curve	Enabled
		Temperature curve type	Standard
		Temperature level	6
		Temperature offset	0°C
	Zone 1 heating mode	Temperature curve	Enabled
		Temperature curve type	Standard
		Temperature level	6
		Temperature offset	0°C
Menu, DHW settings	Disinfect	Disinfect timer	Enabled
		Operation day	Thu
		Start	23:00
		Fast DHW	Disabled
Menu, Settings	Silent mode	Tank heater	Disabled
		Enabled	Disabled
		Silent mode level	Silent
		Silent mode timer 1	Disabled
		From	12:00
		Until	15:00
		Silent mode timer 2	Disabled
		From	22:00
	Until	07:00	
	Display	Time	00:00
		Date	09-01-2023
		Language	English
		Backlight	3 Bars
		Buzzer	Enabled
		Screen lock	Disabled
	WLAN setting	Screen lock time	0seconds
		Smart link	Disabled
		Reset WLAN setting	Disabled
Online unit number		n/a	
ODU model		n/a	
Operation mode		n/a	
Operation status		n/a	
Frequency limited type		n/a	
Comp. run time		n/a	
Comp. frequency		n/a	
Fan speed		n/a	
Expansion valve		n/a	
Tp comp. discharge temp.		n/a	
Th comp. suction temp.		n/a	
T3 outdoor exchanger temp.		n/a	
T4 outdoor air temp.		n/a	
TF module temp.		n/a	
P1 comp. pressure		n/a	
P2 comp. pressure		n/a	
T2B plate F-in temp.		n/a	
T2 plate F-out temp.		n/a	
Tw_in plate water inlet temp.		n/a	
Tw_out plate water outlet temp.		n/a	
T1 leaving water temp.		n/a	
Tw2 ircuit2 water temp.		n/a	
Ta room temp.		n/a	
T5 water tank temp.	n/a		
T5_2 water tank temp.	n/a		

Section 5 - Commissioning

COMMISSIONING

Unit status	Operation parameter			TBT buffer tank temp.	n/a			
				Tsolar	n/a			
				T1S_C1 CL1 curve temp.	n/a			
				T1S2_C2 CL1 curve temp.	n/a			
				Water pressure	n/a			
				Water flow	n/a			
				Heat pump capacity	n/a			
				ODU current	n/a			
				ODU voltage	n/a			
				DC voltage	n/a			
				DC current	n/a			
				Power consump.	n/a			
				SV1	n/a			
				SV2	n/a			
				SV3	n/a			
				Pump_I	n/a			
				Pump_O	n/a			
				Pump_C	n/a			
				Pump_S	n/a			
				Pump_O	n/a			
				IBH1	n/a			
				IBH2	n/a			
				TBH	n/a			
				AHS	n/a			
				Comp. total run time	n/a			
				Fan total run time	n/a			
				Pump_I total run time	n/a			
				IBH total run time	n/a			
				IBH2 total run time	n/a			
				TBH total run time	n/a			
				AHS total run time	n/a			
				IDU software	n/a			
				ODU software	n/a			
				HMI software	n/a			
				Pump_I PWM	n/a			
				Heating energy data	Energy data	Heating energy: Week	Production	n/a
							RE production	n/a
							Consumption	n/a
							COP	n/a
						Heating energy: Month	Production	n/a
							RE production	n/a
							Consumption	n/a
							COP	n/a
						Heating energy: Year	Production	n/a
							RE production	n/a
Consumption	n/a							
COP	n/a							
Heating energy: Hour	Production	n/a						
	RE production	n/a						
	Consumption	n/a						
	COP	n/a						
Heating energy: Total	Production	n/a						
	RE production	n/a						
	Consumption	n/a						
	COP	n/a						

Section 5 - Commissioning

	Energy metering			Heating energy: Day	Production	n/a			
					RE production	n/a			
					Consumption	n/a			
					COP	n/a			
				Historical data	Month, Year	Production	n/a		
						RE production	n/a		
						Consumption	n/a		
						COP	n/a		
		Cooling energy data	not relevant to this appliance						
		DHW energy data	Energy data	Heating energy: Week	Production	n/a			
					RE production	n/a			
					Consumption	n/a			
	COP				n/a				
	Heating energy: Month			Production	n/a				
				RE production	n/a				
				Consumption	n/a				
				COP	n/a				
	Heating energy: Year			Production	n/a				
				RE production	n/a				
				Consumption	n/a				
				COP	n/a				
	Heating energy: Hour			Production	n/a				
				RE production	n/a				
				Consumption	n/a				
				COP	n/a				
	Heating energy: Total			Production	n/a				
				RE production	n/a				
				Consumption	n/a				
				COP	n/a				
	Heating energy: Day	Production	n/a						
		RE production	n/a						
		Consumption	n/a						
COP		n/a							
Historical data	Month, Year	Production	n/a						
		RE production	n/a						
		Consumption	n/a						
		COP	n/a						
SN check					Unit	n/a			
Service call					HMI	n/a			
					IDU	n/a			
					ODU	n/a			
					Phone number	n/a			
Errr info.					Mobile number	n/a			
					No of Occurances	Error Code	Time of Occurance	Date of Occurance	Error Descriptor
					No of Occurances	Error Code	Time of Occurance	Date of Occurance	Error Descriptor
					No of Occurances	Error Code	Time of Occurance	Date of Occurance	Error Descriptor
FAQ					QR Code				

Section 5 - Commissioning

5.9.2 Installer Parameters

Table 21 System Installer Parameters

Title	Parameter	Default
DHW setting	DHW mode (Enable/disable)	YES (Enabled)
	Disinfect (Anti-Legionella)	YES (Enabled)
	DHW priority	YES (DHW Priority)
	Pump_D (DHW Recirculation Pump) (not applicable to this appliance)	NO (Disabled)
	DHW priority time set	NO (Disabled)
	dT5_ON (DHW hysteresis temperature)	7°C
	dT1S5 (DHW Flow temperature Target = DHW cylinder temperature target + dT1S5)	10°C
	T4DHWMAX (not applicable in the UK)	43°C
	T4DHWMIN (no DHW if outdoor temperature < -10°C)	-10°C
	t_INTERVAL_DHW (compressor DHW anti-cycle time)	5 minutes
	T5S_DISINFECT (Anti-legionella temperature)	60°C
	t_DL_HIGHTEMP (time anti-legionella temperature is maintained)	15 minutes
	t_DI_MAX (Maximum duration of Anti-legionella)	210 minutes
	t_DHWHP_RESTRICT (Maximum CH time before DHW occurs)	30 minutes
	t_DHWHP_MAX (Maximum DHW time before CH occurs)	60 minutes
	PUMP_D TIMER (not applicable to this appliance)	YES (Enabled)
	PUMP_D RUNNING TIME (not applicable to this appliance)	5 minutes
	PUMP_D DISINFECT (not applicable to this appliance)	YES (Enabled)
	ACS function (not applicable to this appliance)	NO (Disabled)
Cooling setting	Cooling mode (not applicable to this appliance)	YES (Disabled)
	t_T4_FRESH_C (not applicable to this appliance)	0.5 hours
	T4CMAX (not applicable to this appliance)	52°C
	T4CMIN (not applicable to this appliance)	10°C
	dT1SC (not applicable to this appliance)	5°C
	dTSC (not applicable to this appliance)	2°C
	t_INTERVAL_C (not applicable to this appliance)	5 minutes
	Zone 1 C-emission (not applicable to this appliance)	0 (fan coil unit)
	Zone 2 C-emission (not applicable to this appliance)	0 (fan coil unit)
Heating setting	Heating mode (Enabled/disabled)	1 (Enabled)
	t_T4_FRESH_H (refresh time of outdoor curve target temperature)	0.5 hours
	T4HMAX (output limited to minimum if outdoor > 21°C)	21°C
	T4HMIN (no CH operation if outdoor < -20°C)	-20°C
	dT1SH (CH on/off flow temperature hysteresis)	5°C
	dTSH (CH on/off room temperature hysteresis)	2°C
	t_INTERVAL_H (CH compressor anti-cycle time)	5 minutes
	Zone 1 H-emission (CH Zone 1, RAD / FCU / FLH)	RAD (radiators)
	Zone 2 H-emission (CH Zone 2, RAD / FCU / FLH)	RAD (Radiators)
Force defrost (if enabled, defrosts if heat exchanger outlet temperature less than 6°C for more than 10 minutes)	NO (Disabled)	
AUTO mode setting	T4AUTOCMIN (not applicable to this appliance - cooling function)	25°C
	T4AUTOHMAX (CH disabled if outdoor temperature > 17°C)	17°C
Temp. type setting	Water flow temp. (YES = flow temperature set from outdoor temperature) (NO = flow temperature not set from outdoor temperature)	YES (Enabled)
	Room temp. (YES = flow temperature set from room temperature) (NO = flow temperature not set from room temperature)	NO (Disabled)
	Double zone (NO = 1 zone) (YES = 2 zone)	NO (1 Zone)
Room thermostat setting	Room thermostat (NO / ONE ZONE / MODE SET)	ONE ZONE
	IBH FUNCTION (IBH = Internal Backup Heater,) (not applicable to this appliance)	0 (not connected)
	IBH locate (not applicable to thi9s appliance)	0
	dT1_IBH_ON (not applicable to this appliance)	5°C

COMMISSIONING

Section 5 - Commissioning

	t_IBH_DELAY (not applicable to this appliance)	30 minutes
	T4_IBH_ON (not applicable to this appliance)	-5°C
	P_IBH1 (not applicable to this appliance)	0.0kW
	P_IBH2 (not applicable to this appliance)	0.0kW
	AHS FUNCTION (AHS = Additional Heat Source, ie Boiler) NO / HEATING and DHW / HEATING	NO (Disabled)
	AHS_PUMPCONTROL RUN / NOT RUN	RUN
	dT1_AHS_ON (If flow temperature < target flow temperature - 5°C then boiler on)	5°C
	t-AHS_DELAY (delay between heat pump on and boiler on)	30 minutes
Other heat source	T4_AHS_ON (change to +2°C for hybrid) (>2°C heat pump on, <2°C boiler on)	-5°C
	EnSwitchPDC (YES / NO)	NO (Disabled)
	GAS-COST	£0.85/m3
	ELE-COST	£0.20/kWh
	MAX-SETHEATER (Not applicable)	80°C
	MIN-SETHEATER (Not applicable)	30°C
	MAX-SIGHEATER (not applicable to this appliance)	10V
	MIN-SIGHEATER (not applicable to this appliance)	3V
	TBH FUNCTION (TBH = Tank Booster Function) (YES / NO)	NO (Disabled)
	dT5_TBH_OFF (not applicable to this appliance)	5°C
	t_TBH_DELAY (not applicable to this appliance)	30 minutes
	T4_TBH_ON (not applicable to this appliance)	5°C
	P_TBH (not applicable to this appliance)	3kW
	Solar function (not applicable to this appliance)	NO (Disabled)
	Solar control (not applicable to this appliance)	NO (Tsolar)
	Deltatsol (not applicable to this appliance)	10°C
Holiday away setting	T1S_H_A_H (Holiday mode CH flow temperature target)	25°C
	T5S_H_A_DHW (Holiday mode DHW flow temperature target)	25°C
Serviceman, Service Call	Phone number	0000000000000000
	Mobile number	0000000000000000
Serviceman, Restore factory settings	Restore factory settings	No
Serviceman, Test Run, Point Check	SV2 (not applicable to this appliance)	Auto
	SV3 (not applicable to this appliance)	Auto
	Pump_I (Primary circulation pump)	Auto
	Pump_O (CH Zone 1 pump)	Auto
Serviceman, Test run, Air purge	Air Purge (runs pump to extract air from system)	Off
	Air purge Pump_I output	70%
	Air purge running time	20min
	Air purge water flow	1.70m3/h
Serviceman, Test run	Circulated pump running (Primary circulation pump)	Auto
	Heating running	Auto
	DHW running	Auto
Special function	Preheating for floor (Underfloor heating floor drying with fixed profile)	OFF (disabled)
	T1S (Preheating for floor, drying temperature)	15°C
	t_ARSTH (Preheating for floor, drying time)	72 hours
	Floor drying up (Underfloor heating floor drying with variable profile)	OFF (disabled)
	T_Dryup (Floor drying up, time to increase temperature to maximum)	8 days
	T_Highpeak (Floor drying up, time at maximum temperature)	5 days
	T_Drydown (Floor drying up, time to decrease temperature to ambient)	5 days
	t-Drypeak (Floor drying up, maximum temperature)	45°C
	Start time (Floor drying up, start time)	00:00
Start date (Floor drying up, start date)	Current date+1	

Section 5 - Commissioning

Auto restart	Auto restart cooling/heating mode (enable/disable heating after mains interruption)	1 (Enabled)
	Auto restart DHW mode (enable/disable DHW after mains interruption)	1 (Enabled)
Power input limitation	Power input limitation (limits power drawn by appliance, not applicable)	1
Input definition	M1 M2 (not applicable to this appliance)	NO (Remote on/off)
	Smart grid (not applicable to this appliance)	NO (Disabled)
	T1T2 (not applicable to this appliance)	NO (Disabled)
	Tbt (not applicable to this appliance)	NO (Disabled)
	P_X PORT (not applicable to this appliance)	NO (Defrost)
Cascade setting	PER_START (Maximum output of appliance at cascade start up)	10%
	TIME_ADJUST (Time at which additional units added/removed from cascade)	5 minutes
HMI address setting	HMI setting (0 allows all parameters to be changed) (1 limits changes to Room Stat functions) (should be left at 0)	0 (Master)
	HMI address for BMS (not applicable to this appliance)	1
	Stop BIT (not applicable to this appliance)	1 (Stop bit 1)
Common setting	t_DELAY PUMP (Primary circulation pump overrun time)	2.0 minutes
	t1_ANTILOCK PUMP (pump non operation time before anti-sieze occurs)	24 hours
	t2_ANTILOCK PUMP RUN (Pump anti-sieze run time)	60 seconds
	t1-ANTILOCK SV (3-way valve non operation time before anti-sieze occurs)	24 hours
	t2-ANTILOCK SV RUN (3-way valve anti-sieze run time)	30 seconds
	Ta-adj. (not applicable for this appliance)	-2°C
	PUMP_I SILENT OUTPUT (not applicable fo this appliance)	100%
	Energy metering (not applicable to this appliance)	NO (Enabled)
	Pump_0 (ON and AUTO)	AUTO (controlled by demand)

⚠ WARNING: All maintenance and servicing tasks must be done by a competent and sufficiently qualified engineer.

The product contains the hydrocarbon refrigerant R290 which is very flammable. The refrigerant may mix with air to form a flammable atmosphere increasing the risk of fire and/or explosion. Work that requires the removal of the exterior casing of the Heat Pump must only be done by competent persons who are familiar with the risks of R290 refrigerant. Work on the refrigeration circuit must only be done by a Cat I or Cat II F-gas certified engineer

with a City and Guilds 6187-21 certificate or equivalent. Work done on the heat pump should be done in accordance with industry standard safety procedures and practices for working with hydrocarbons.

Work on electrical systems must only be done by competent persons.

Refrigerant should never be released into the atmosphere. Refrigerant is to always be collected and recycled using a suitable recycling unit.

6.1 NORMAL OPERATION FEATURES

6.1.1 Crankcase Heater

If the outdoor temperature is less than 8°C and the compressor has been off for more than 3 hours then the crankcase heater is switched on.

6.1.2 Primary Circulation Pump

If the outdoor unit is in standby, the primary circulation pump will activate as part of the antifreeze protection system.

6.1.3 Compressor Anti-cycle

When the compressor switches off the anti-cycle function prevents it switching back on for a minimum of 5 minutes.

6.1.4 Flow Temperature Control

The flow temperature is regulated to match the target temperature, which is calculated based on the outside temperature, by adjusting the compressor and the fan.

6.2 OVERALL MAINTENANCE PLAN TABLE

ⓘ IMPORTANT: Ideally, maintenance activities should be scheduled during times where there is little heating demand to avoid disruption to the end user.

To keep the appliance operating as efficiently as possible the maintenance listed in *Table 22* should be conducted annually. Failure to do so could affect the appliance warranty.

Table 22 Maintenance Tasks

Maintenance Task	Frequency
Heat Pump Inspection and Maintenance	1 year
DHW Cylinder Inspection and Maintenance	1 year
Control Box Inspection and Maintenance	1 year
System Inspection and Maintenance	1 year
Water Quality Treatment	1 year

6.3 HEAT PUMP SERVICE AND MAINTENANCE PROCEDURE

⚠ WARNING: Before removing any covers or casing, make sure that the electrical power supply is isolated.

⚠ CAUTION: Any damage to paint is to be repaired using a suitable paint to prevent corrosion of the casing and compromising the assembly.

⚠ CAUTION: Compressed air and high pressure water jets i.e. pressure washers must not be used on the heat pump. The use of high pressure water jets will damage the unit.

6.3.1 HP290 Monobloc Heat Pump Checks

1. Do a check of the installation to make sure that it conforms to the installation instructions and correct any non-conformities.
2. Check that the installation is electrically supplied by correctly rated circuit breakers (check values against *Table 1 on page 9* and *Table 9 on page 20*).
3. Isolate and securely lock-off the electrical supply to the heat pump.
4. Remove the top and side panels by removing the screws shown in *Figure 61*. To gain access to the electrical panel, remove the 6 screws indicated in *Figure 62*. (See section 4.1.7 for thorough instructions).
5. Do the following internal checks:
 - a. Check electrical connections, cables, and terminals
 - b. Check the refrigerant circuit for signs of leakages, such as oil deposits.
 - c. Release air from the auto air vent and the auto air vent must remain open at all times. (Check system pressure afterwards and repressurised if necessary).
6. Refit the electrical panel cover, checking the quality of the inside casing seal, and then refit the casing side panel.
7. Remove the fan grill by first removing the 4 screw caps in each corner with a terminal screwdriver and then remove the 4 screws underneath. Slide the fan grille upwards to remove from casing.
8. Check that the fan assembly is unobstructed, and spins evenly. Clean the fan impeller assembly using a proprietary cleaner.
9. Check the condition of the evaporator for corrosion, damage, blockage, and repair where necessary.
10. Rinse off the evaporator using a low-pressure water spray and a proprietary cleaner. Make sure to remove all dirt and debris.
11. Refit and refix the fan grille and casing panels.
12. Clean the outer casing panels.
13. Check the condition of the pipework insulation and repair where necessary.
14. Clean any installed filter ball strainer where required.
15. Check and record the levels of glycol and inhibitor in the system.

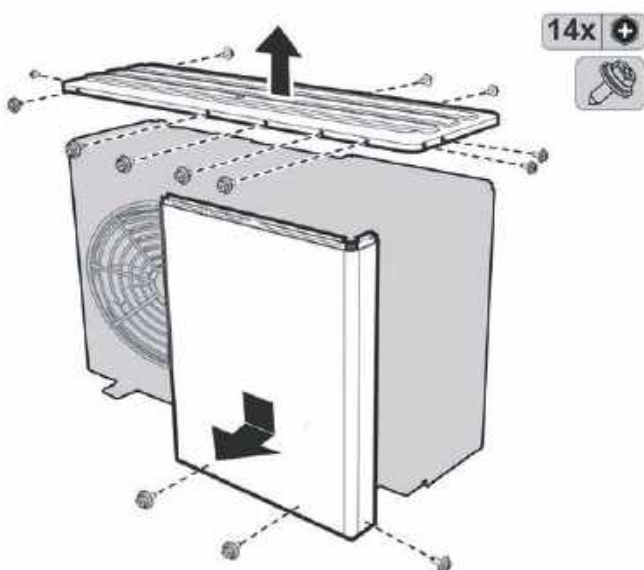


Figure 61. Heat Pump - Top and side panel installation

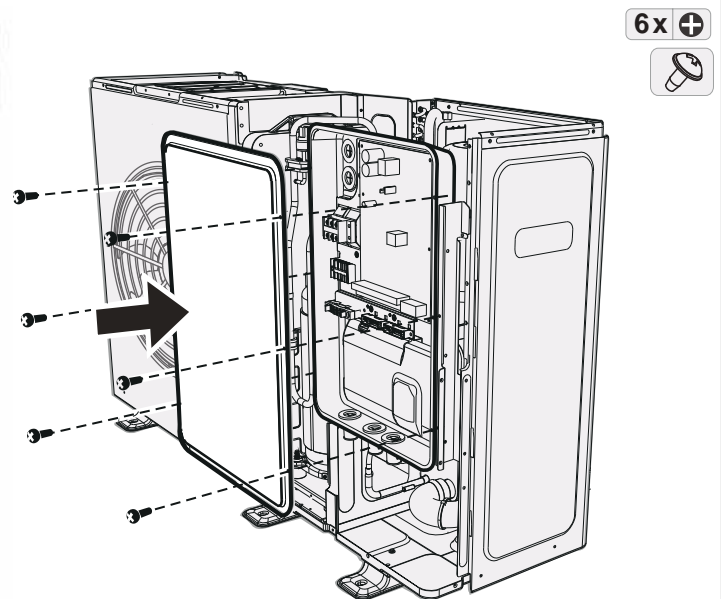


Figure 62. Heat Pump - Electrical panel installation

6.3.2 Control Box Checks

Check the ****Controls Sections**** for further instructions on how to access settings covered in the below instructions:

1. Gain access to the control box (either wall mounted or pre-plumbed cylinder).
2. Do a check of the installation to make sure that it conforms to the installation instructions and correct any non-conformities.
3. Isolate and securely lock-off the electrical supply to the control box.

⚠ CAUTION: The control box may have dual electrical supplies (a power supply from the outdoor unit and a power supply for the DHW Cylinder immersion Heater). Both must be isolated before removing the control box front panel.

4. Remove the front panel of the control box by removing the screws indicated in *Figure 63*.
5. Inspect the electrical connections, cables, and terminals for signs of damage, loose connections etc.
6. Refit the front panel and the fixings as indicated in *Figure 63*.
7. Remove the lock-off means of safe electrical isolation and reactivate the mains power supply.
8. Check and record the following in the maintenance record:
 - a. Legionella Function.
 - b. Weather Compensation.
 - c. Hot Water Set Temperature.
 - d. Fault History.
9. Check that both the time and date settings are correct on the main menu.
10. Put the product into DHW operation. Check and record the flow rate.

11. Put the product in CH operation. Check and record the flow rate.
12. If present in the system check and confirm the operation of the following:
 - a. 3 – diverter way valve.
 - b. Secondary circulator.
13. Check that when a heat demand is initiated, that the system warms correctly.
14. Ask the system owner about the heating performance and review the settings of the controller to make improvements.
15. Record the any generation and consumption meters for the system if fitted.

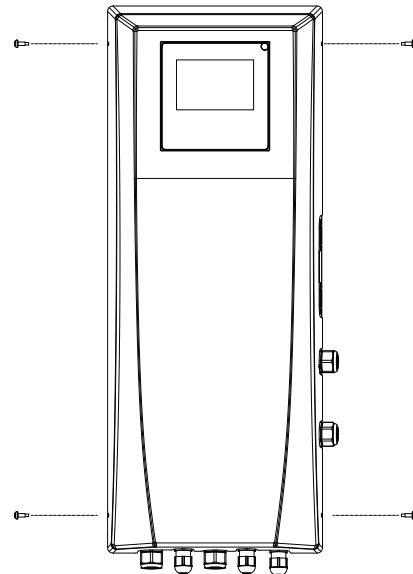


Figure 63. Front Panel Removal

6.3.3 Domestic Hot Water Cylinder and System Checks

1. Gain access to the domestic hot water cylinder and assess the installation to make sure that it conforms to the installation instructions and correct any non-conformities.
2. On the control box, make sure that the demand for domestic hot water and central heating demand are turned off.
3. Isolate the cold-water supply mains lines to the cylinder and any other water supplies.
4. Make sure to loosen any auto air vent dust caps and then drain the domestic hot water cylinder from a suitable drain point.
5. Remove the inlet water filter valves and inspect and clean the gauze filter on the inlet side, removing any debris. Refit the valves.
6. Check the pre-charge of any expansion vessels against the specified value on their data plates. Re-pressurise with air as required.
7. Make sure that the system has been reassembled and that the drain valve is closed. Re-pressurise the system to 1.5 – 3 bar by re-opening the cold-water supply mains line.

8. Manually check the operation of any temperature, pressure, and expansion relief valves installed on the system. Check that the discharge lines from these valves are free from obstruction and blockage and correctly discharge into an appropriate drainage point without spillage.
9. Check that the water downstream of the pressure reducing valve is within the manufacturer's limits.
10. Carry out the following maintenance activities on the immersion heater:
 - i. Isolate and securely lock-off the electrical supply to the immersion heater.
 - ii. Remove the electrical cover to the immersion heater and check that the system is electrically dead.
 - iii. Check that the position of the immersion heater thermostat is set to the maximum position.
 - iv. Replace the electrical cover to the immersion heater and re-energise the electrical supply.
11. Check the placement of the DHW sensor and that it is placed securely within its pocket.
12. Make the owner aware of any works taken place and advise them to not place any clothing or combustible materials on/against the cylinder or adjacent components.

Section 6 - Inspection and Maintenance

6.3.5 System Checks

1. Assess the installation to make sure that it conforms to the installation instructions and correct any non-conformities.
2. Check that the means of filling to the system are isolated.
3. Make sure to loosen any auto air vent dust caps and then drain the system from a suitable drain point.
4. Remove the inlet water filter valves and inspect and clean the gauze filter on the inlet side, removing any debris. Refit the valves.
5. Isolate the magnetic system filter. Clean the magnet and mesh filter and then refit and deisolate.
6. Check the pre-charge of any expansion vessels against the specified value on their data plates. Re-pressurise with air as required.
7. Make sure that the system has been reassembled and that the drain valve is closed. Re-pressurise the system to 1.5 bar via the filling loop.
8. Manually check the operation of any temperature, pressure, and expansion relief valves installed on the system. Check that the discharge lines from these valves are free from obstruction and blockage and correctly discharge into an appropriate drainage point without spillage.
9. If required, do a rinse and clean of the system with an appropriate system cleaner.
10. If required, dose the system with appropriate antifreeze or system water additives.
11. Check that the water pressure is within the pressure limits of the system.
12. Close the filling loop and circulate the water around the system to remove air from the system. Bleed air from manual and auto air vents until no further air is released.
13. Check the system pressure and repressurise if necessary.

6.3.4 Update the Settings

The end user is to be surveyed on their heating performance comfort levels. Any issues are to be addressed and settings to be updated accordingly to improve the end users. For setting instructions refer to 5.6.

7.1 DE-COMMISSIONING

⚠ WARNING: The product contains the hydrocarbon refrigerant R290 which is highly flammable. The refrigerant may mix with air to form a flammable atmosphere increasing the risk of fire and/or explosion. Work that requires the removal of the exterior casing of the Heat Pump must only be done by competent persons who are familiar with the risks of R290.

Work on the refrigeration circuit must only be done by a Cat I or Cat II F-gas certified engineer with a City and Guilds 6187-21 certificate or equivalent. Work done on the heat pump should be done in accordance with industry standard safety procedures and practices for working with hydrocarbons.

Work on electrical systems must only be done by competent persons.

Refrigerant should never be released into the atmosphere. Refrigerant is to always be collected and recycled using a suitable recycling unit.

⚠ WARNING: Only use tools, electrical power tools and equipment that are suitable for the intended work scope.

⚠ WARNING: Wear suitable protective personal equipment (PPE) as necessary.

⚠ WARNING: Do not use the appliance compressor to pump the refrigerant out of the product.

⚠ WARNING: Do not attempt to recover the refrigerant when the appliance is switched on.

CAUTION: If the heat pump is required to be in-active for an extended period of time it must not be switched off.

1. Perform safe isolation of all power supplies.
2. Disconnect the appliance from the power supply but make sure the appliance is still earthed.
3. Drain the heating water from the appliance.

4. Remove service access covers, refer to 4.1.7.
5. Remove the refrigerant from the appliance.
6. Re-install the right-hand side casing, the front casing, and the top casing.
7. Clearly label that the appliance so that it is visible from the outside and explicitly states that it has been decommissioned and that the refrigerant has been completely removed.
8. Return the recovered refrigerant in accordance with F-Gas and local regulations.
9. Dispose of or recycle the appliance and/or its components in accordance with local laws and regulations.

8.1 PACKAGING

It is the responsibility of the system installer to correctly dispose and recycle of the products packaging.

8.2 END OF PRODUCT LIFE

8.2.1 Environmental Protection

⚠ WARNING: Under no circumstance should the refrigerant fluid be released into the atmosphere. Any action to remove the refrigerant from the Heat Pump is to be done by an F-gas certified engineer with a City and Guilds 6187-21 certificate or equivalent. Work done on the heat pump should be done in accordance with industry standard safety procedures and practices for working with hydrocarbons.

8.2.2 WEEE

WEEE DIRECTIVE 2012/19/EU

Waste Electrical and Electronic Equipment Directive

- At the end of the product life, dispose of the packaging and product in a corresponding recycle centre.
- Do not dispose of the unit with the usual domestic refuse.
- Do not burn the product.
- Remove the batteries.
- Dispose of the batteries according to the local statutory requirements and not with the usual domestic refuse.



BS EN 378-3 establishes procedures for the operation, maintenance, and repair of refrigerating systems and the recovery of refrigerants.

8.2.3 Environmental Disposal

Used products contain valuable material that can be harvested and recycled.

Heat Pump Disposal

The Heat Pump must be dismantled and recycled by a specialised service. The appliances must not under any circumstances, be thrown out with household waste, or at a general waste centre. At the end of its service life, please contact an installer or local representative to proceed with its dismantling and recycling.

When removing refrigerant from a system, either for servicing or decommissioning, it is a legal requirement that all refrigerants are removed safely.

The recovery equipment must be in good working order with a full set of instructions applicable to the equipment that is at hand and must be suitable for the recovery of flammable refrigerants. In addition, a set of calibrated weighing scales must be available and in good working order. Hoses must be complete with leak free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant must be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note completed. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, make sure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process must be completed before the compressor is returned to the supplier.

9.1 FAULT HELP

⚠ WARNING: All maintenance and servicing tasks must be done by a competent and sufficiently qualified engineer.

The product contains the hydrocarbon refrigerant R290 which is highly flammable. The refrigerant may mix with air to form a flammable atmosphere increasing the risk of fire and/or explosion. Work that requires the removal of the exterior casing of the Heat Pump must only be done by competent persons who are familiar with the risks of R290 refrigerant. Work on the refrigeration circuit must only be done by a Cat I or Cat

⚠ If F-gas certified engineer with a City and Guilds 6187-21 certificate or equivalent. Work done on the heat pump should be done in accordance with industry standard safety procedures and practices for working with hydrocarbons.

Work on electrical systems must only be done by competent persons.

Refrigerant should never be released into the atmosphere. Refrigerant is to always be collected and recycled using a suitable recycling unit.

Code ID	Description	Reference
C7	Inverter Error	9.1.1 on page 94
E0	No Water Flow, through Outdoor Unit, 10 times in succession	9.1.2 on page 95
E1	Live and Neutral reversed	9.1.3 on page 96
E2	No connection Outdoor PCB to User Interface	9.1.4 on page 96
E3	Header Thermistor (T1) Error (for Hybrid/Cascade)	9.1.5 on page 96
E4	DHW Cylinder Thermistor (T5) Error	9.1.6 on page 97
E5	Outdoor Unit, Air to Refrigerant Heat Exchanger Outlet Thermistor (T3) Error	9.1.8 on page 98
E6	Outdoor Sensor within Outdoor Unit (T4) Error	9.1.9 on page 98
E8	No Water Flow, through Outdoor Unit	9.1.9 on page 98
E9	Compressor Refrigerant Return Thermistor (Th) Error (E9)	9.1.10 on page 98
EA	Discharge Thermistor (Tp) Error	9.1.11 on page 98
Ed	Outdoor Unit, Return Thermistor (Tw_in) Error	9.1.12 on page 99
F1	Inverter Error	9.1.1 on page 94
H0	No connection Outdoor PCB to Indoor PCB	9.1.13 on page 99
H1	No connection Outdoor PCB to Inverter PCB	9.1.14 on page 100
H2	Plate Heat Exchanger Outlet Refrigerant Thermistor (T2) Error	9.1.15 on page 100
H3	Plate Heat Exchanger Inlet Refrigerant Thermistor (T2B) Error	9.1.16 on page 100
H4	Inverter High Current (L1E/L11/L12) 3 times within 60mins	9.1.17 on page 101
H6	Fan Error	9.1.18 on page 101
H7	Mains High Voltage or Low Voltage Error	9.1.19 on page 101
H8	High Pressure Sensor Error	9.1.20 on page 102
H9	Central Heating Zone 2 Thermistor Fault	9.1.7 on page 97
HA	Outdoor Unit, Flow Thermistor (Tw_out) Error	9.1.21 on page 102
Hb	High Flow/Return Differential, 3 times in succession and Flow Temperature <7°C	9.1.22 on page 103
Hd	No connection Master Heat Pump to Slave Heat Pump	9.1.23 on page 103
HF	Inverter not matched to Outdoor PCB dip switch setting	9.1.24 on page 104
HH	10 Fan Errors in 2 hours	9.1.18 on page 101
P0	Low Pressure Error	9.1.25 on page 104
P1	High Pressure Switch Operated	9.1.26 on page 105
P3	Overcurrent Protection Error	9.1.27 on page 106
P4	Compressor Discharge Temperature High	9.1.28 on page 107
P5	High Flow/Return Differential	9.1.22 on page 103
P21	Low Pressure Sensor Error	9.1.29 on page 107
P27	High Pressure Sensor and Low Pressure Sensor Wiring Reversed	9.1.30 on page 107
Pd	Condensing Temperature High	9.1.31 on page 108
PP	High Flow/Return Differential	9.1.22 on page 103
FC1	Outdoor Unit, Air to Refrigerant Heat Exchanger Outlet Thermistor Error	9.1.8 on page 98

Section 9 - Fault Finding

-	3-way Valve does not operate	9.1.35 on page 111
-	Anti-Legionella does not operate	9.1.36 on page 112
-	CH1 Pump does not operate	9.1.37 on page 113
-	CH2 Pump does not operate	9.1.38 on page 114
-	No CH	9.1.37 on page 113
-	No DHW	9.1.35 on page 111
-	No Display	9.1.39 on page 115
L11	Inverter High Current	9.1.17 on page 101
L12	Inverter High Current	9.1.17 on page 101
L1E	Inverter High Current	9.1.17 on page 101
L2E	Inverter High Temperature	9.1.32 on page 109
L31	Inverter Error	9.1.1 on page 94
L32	Inverter Error	9.1.1 on page 94
L34	Inverter Error	9.1.1 on page 94
L3E	Inverter Error	9.1.1 on page 94
L43	Inverter Error	9.1.1 on page 94
L45	Wrong Fan Fitted	9.1.33 on page 109
L46	Inverter Error	9.1.1 on page 94
L47	Inverter Error	9.1.1 on page 94
L52	Compressor Stall Error	9.1.34 on page 110
L5E	Compressor Start Error	9.1.34 on page 110
L61	Short Circuit to Compressor Terminals	9.1.34 on page 110
L65	Inverter Error	9.1.1 on page 94
L6E	Inverter Error	9.1.1 on page 94
LB7	Inverter Error	9.1.1 on page 94
LBE	High Pressure Switch Operated	9.1.26 on page 105
LC1	Inverter Error	9.1.1 on page 94
LC2	Inverter Error	9.1.1 on page 94
LC3	Inverter Error	9.1.1 on page 94
LC4	Inverter Error	9.1.1 on page 94
LC5	Inverter Error	9.1.1 on page 94
LC6	Inverter Error	9.1.1 on page 94
LC7	Inverter Error	9.1.1 on page 94
LC8	Inverter Error	9.1.1 on page 94
LC9	Inverter High Temperature	9.1.32 on page 109
LCA	Inverter High Current	9.1.17 on page 101
LCB	Inverter Error	9.1.1 on page 94
LBC	Inverter Error	9.1.1 on page 94
LCD	Inverter Error	9.1.1 on page 94
LCE	Inverter High Current	9.1.17 on page 101
J11	Inverter High Current	9.1.17 on page 101
J12	Inverter High Current	9.1.17 on page 101
J2E	Inverter High Temperature	9.1.32 on page 109
J31	Inverter Error	9.1.1 on page 94
J32	Inverter Error	9.1.1 on page 94
J3E	Inverter Error	9.1.1 on page 94
J43	Inverter Error	9.1.1 on page 94
J45	Wrong Fan Motor Fitted	9.1.33 on page 109
J46	Inverter Error	9.1.1 on page 94
J47	Inverter Error	9.1.1 on page 94
J52	Compressor Stall Error	9.1.34 on page 110

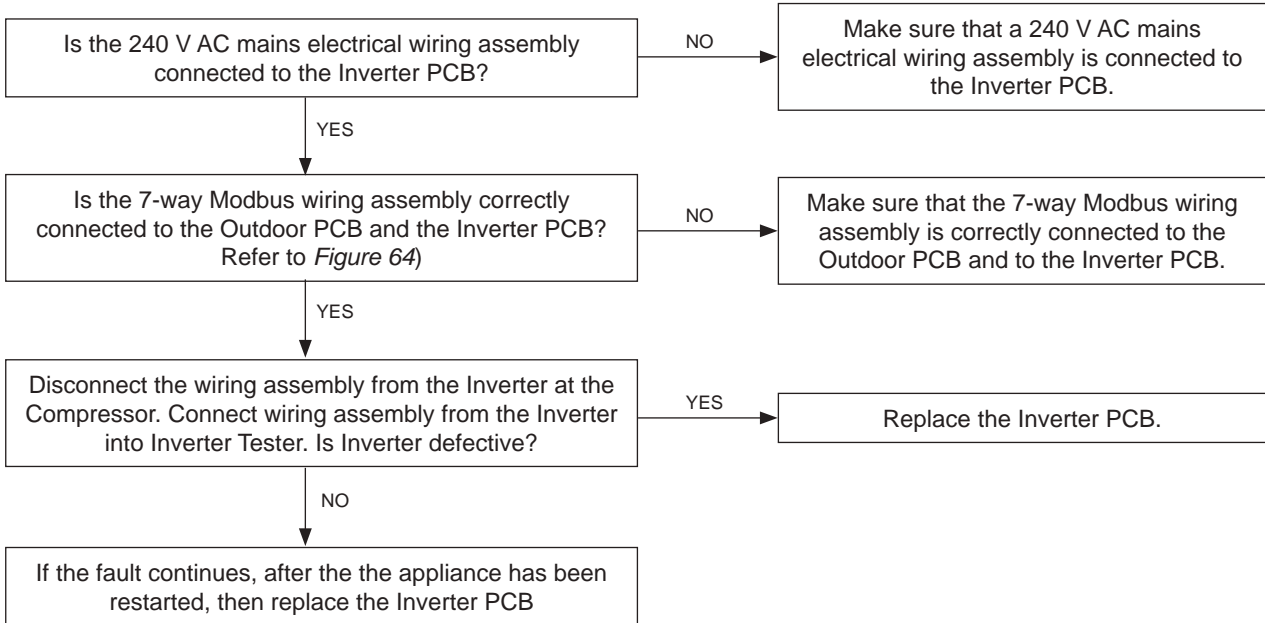
Section 9 - Fault Finding

J5E	Compressor Error	9.1.34 on page 110
J61	Fan Connections Short Circuit	9.1.33 on page 109
J65	Inverter Error	9.1.1 on page 94
J6E	Inverter Error	9.1.1 on page 94

Note: DHW thermistor fault and CH zone 2 thermistor fault: check outdoor PCB, dipswitch 2, switch 1, is in the On position

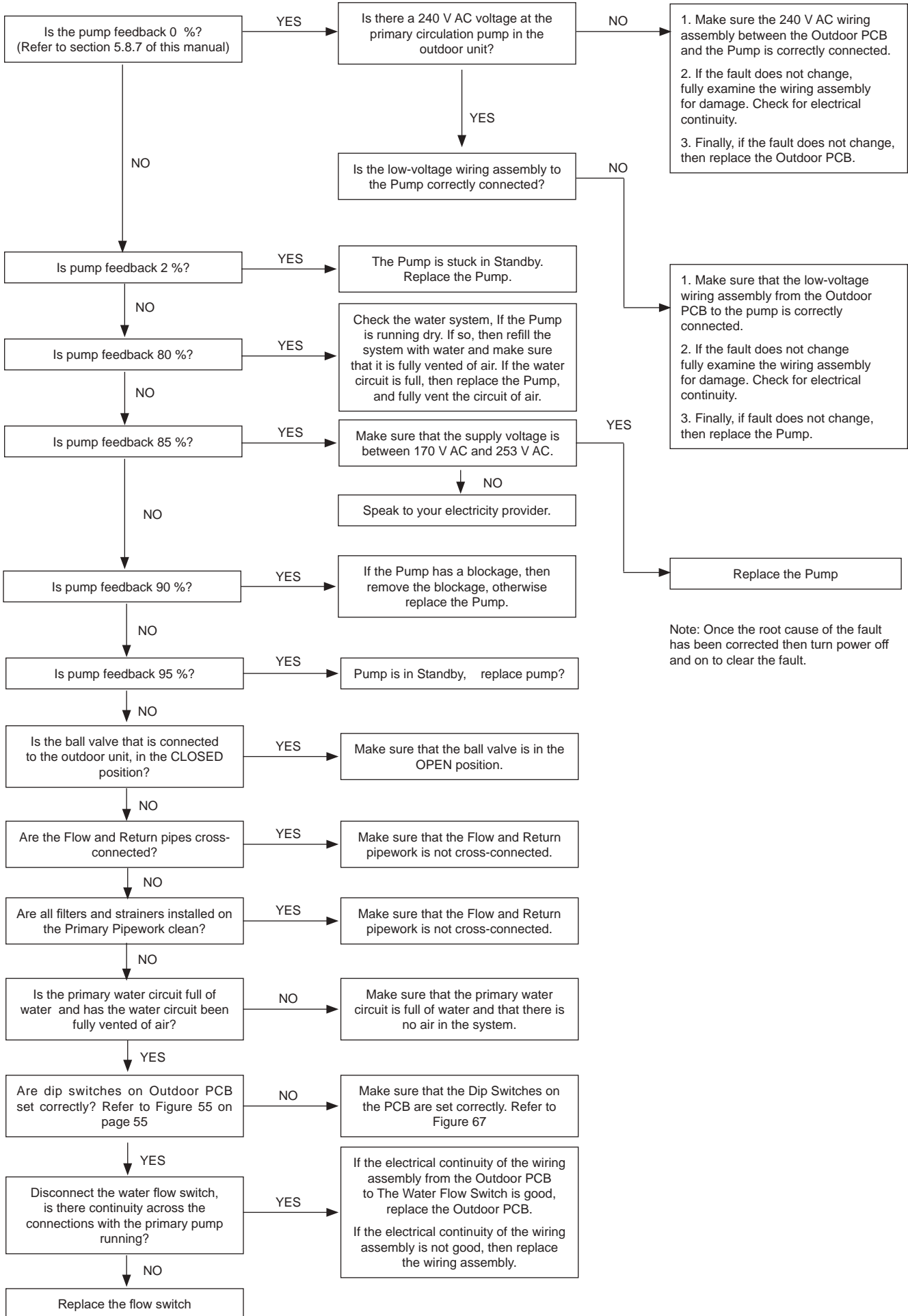
9.1.1 Inverter Error

⚠ WARNING: Set the power supply to OFF. Wait for a minimum of 10 minutes before you work on the appliance. This is to let harmful electrical charges decrease to below a safe limit.



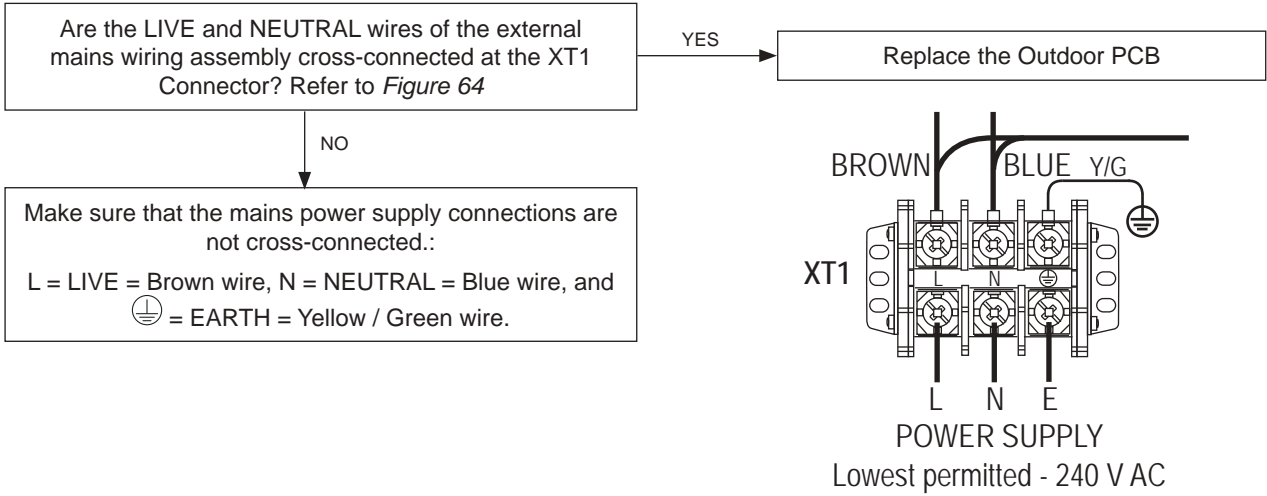
Section 9 - Fault Finding

9.1.2 No Water Flow, through Outdoor Unit, 10 times in succession

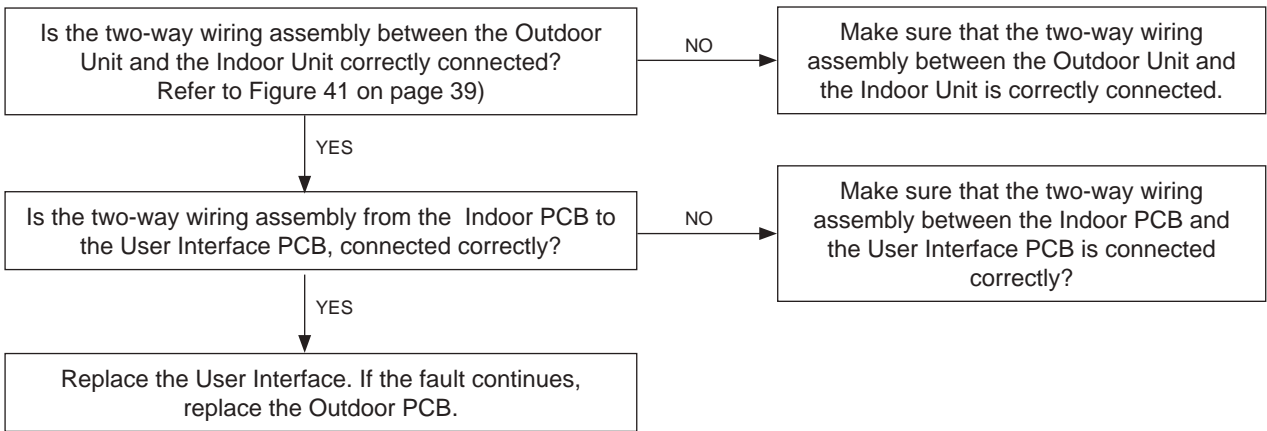


Note: Once the root cause of the fault has been corrected then turn power off and on to clear the fault.

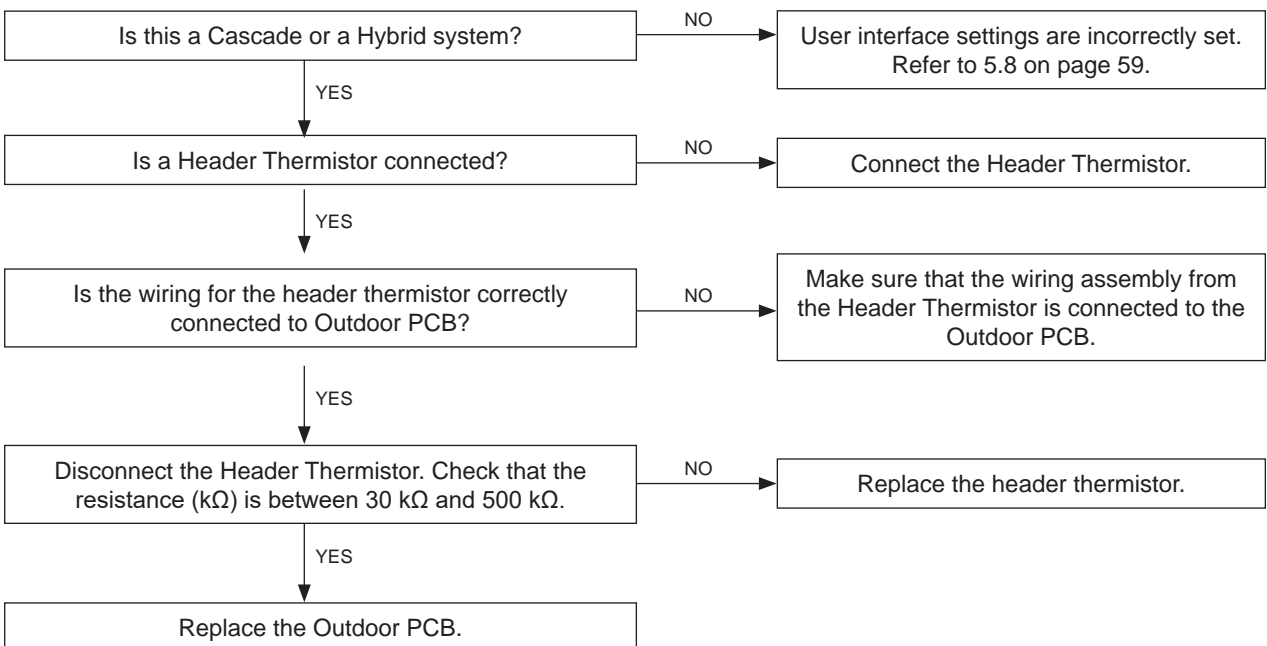
9.1.3 Live and Neutral reversed



9.1.4 No connection Outdoor PCB to User Interface



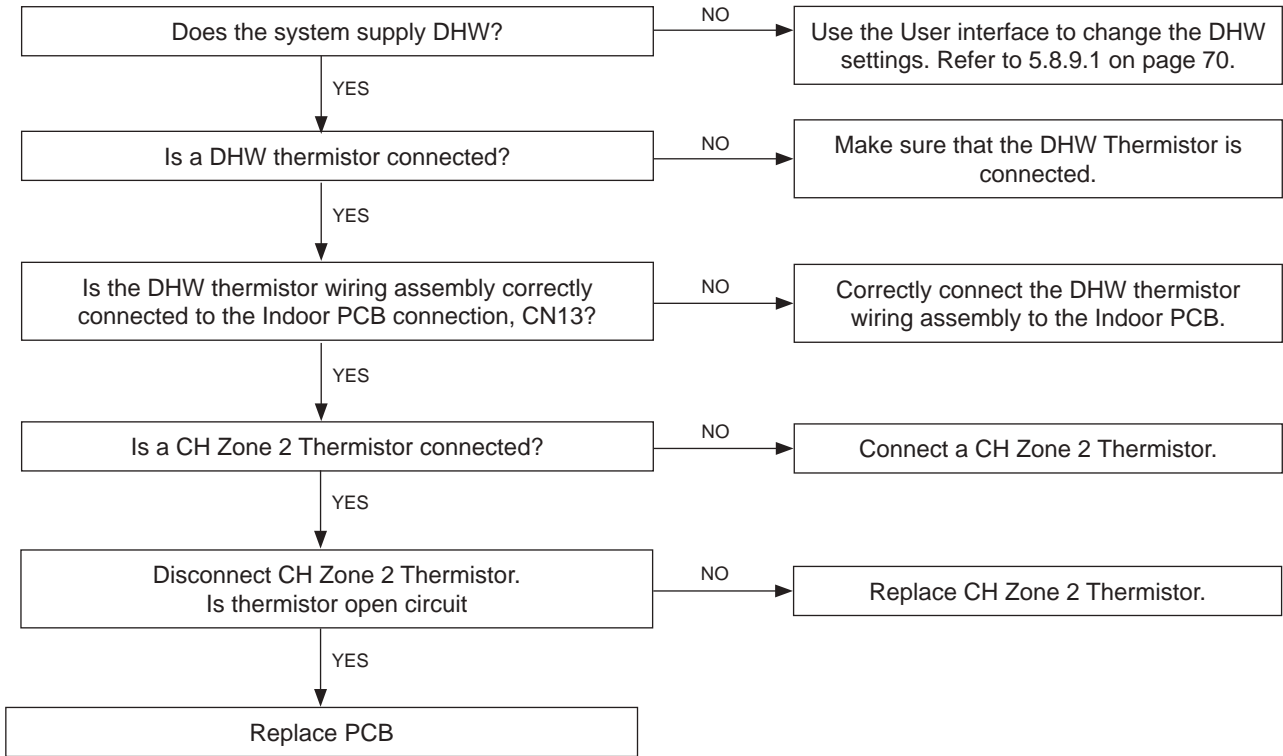
9.1.5 Header Thermistor (T1) Error – for cascade and hybrid



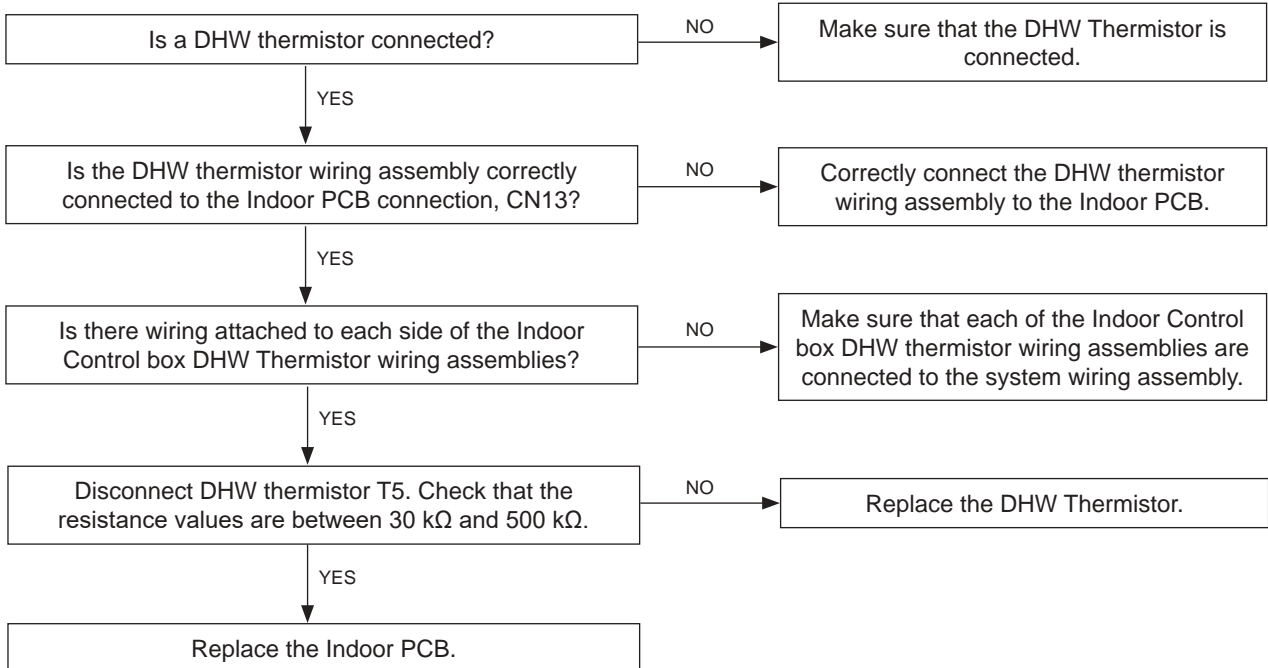
FAULT FINDING

Section 9 - Fault Finding

9.1.6 DHW Thermistor (T5) Error

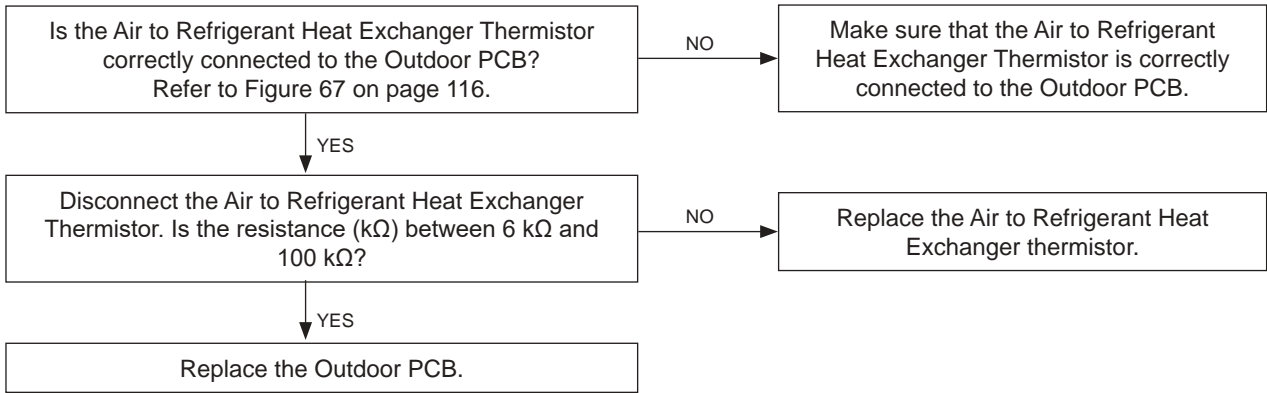


9.1.7 Central Heating Zone 2 Thermistor Fault.

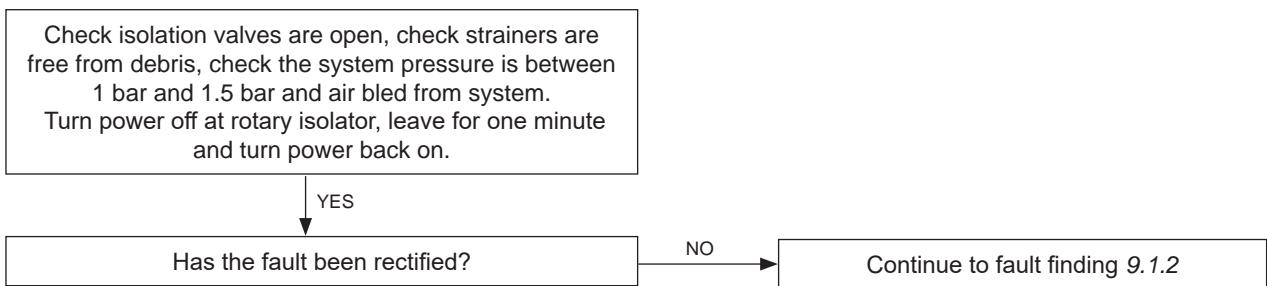


Section 9 - Fault Finding

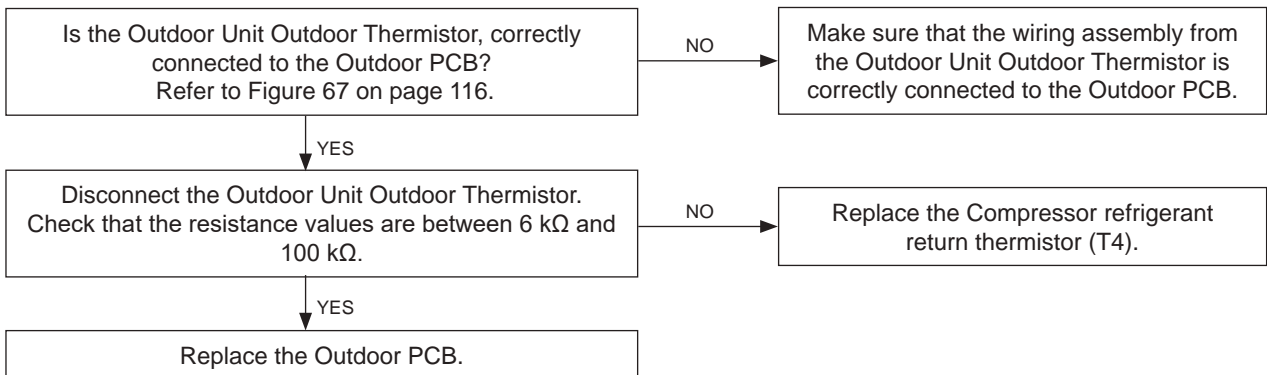
9.1.8 Outdoor Unit, Air to Refrigerant Heat Exchanger Outlet Thermistor (T3) Error



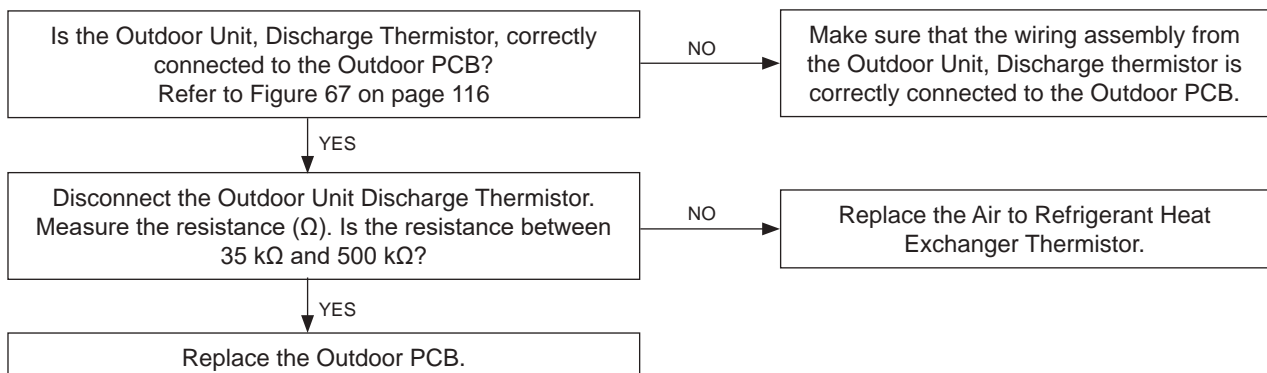
9.1.9 Outdoor Unit, No Water Flow, Error



9.1.10 Outdoor Unit, Compressor Refrigerant Return Thermistor (Th) Error

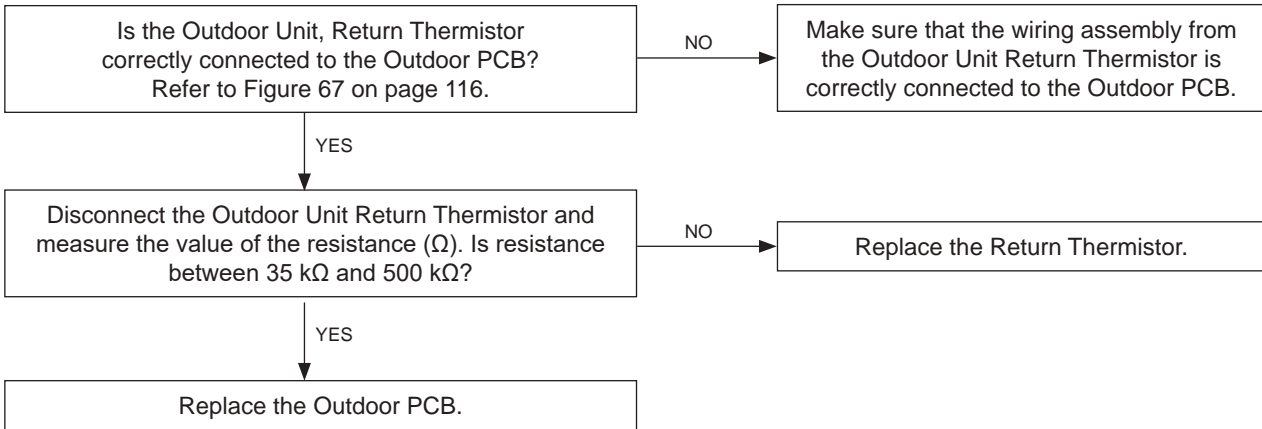


9.1.11 Outdoor Unit, Discharge Thermistor (Tp) Error



Section 9 - Fault Finding

9.1.12 Outdoor Unit, Return Thermistor (Tw_In)



9.1.13 No connection Outdoor PCB to Indoor PCB (H0)

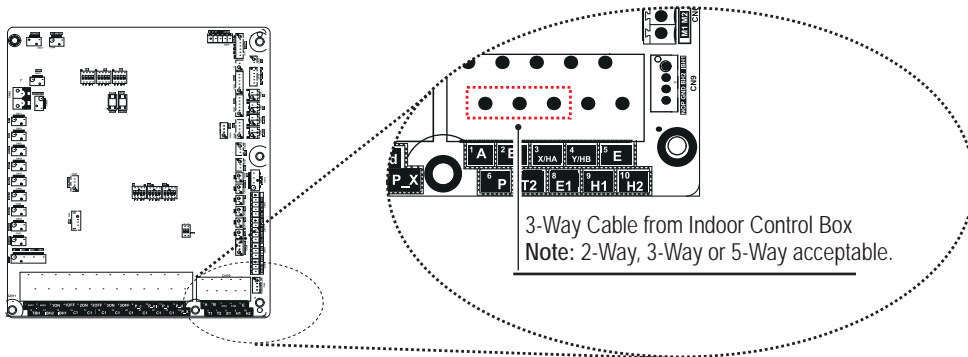
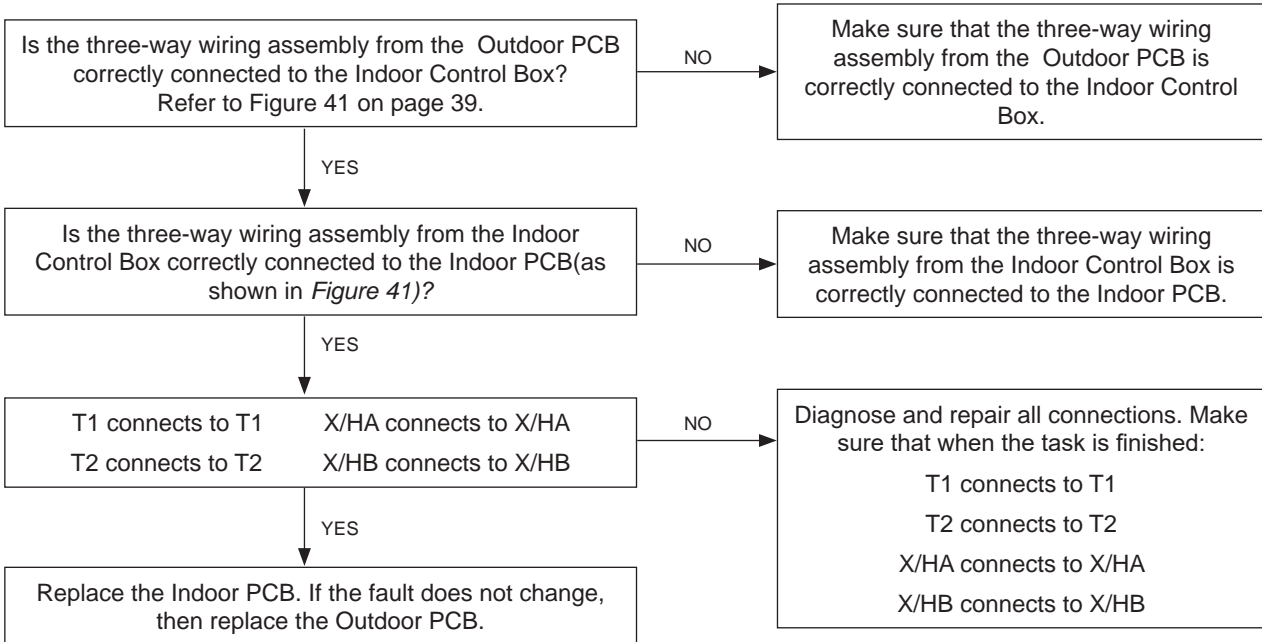
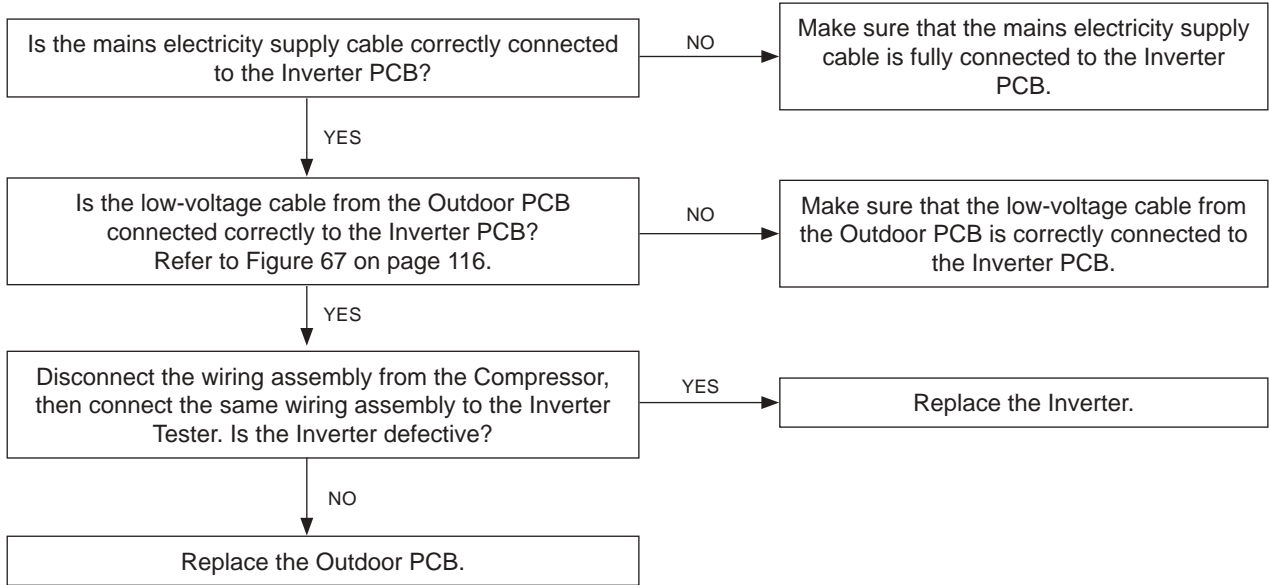


Figure 65. Indoor PCB (Section view)

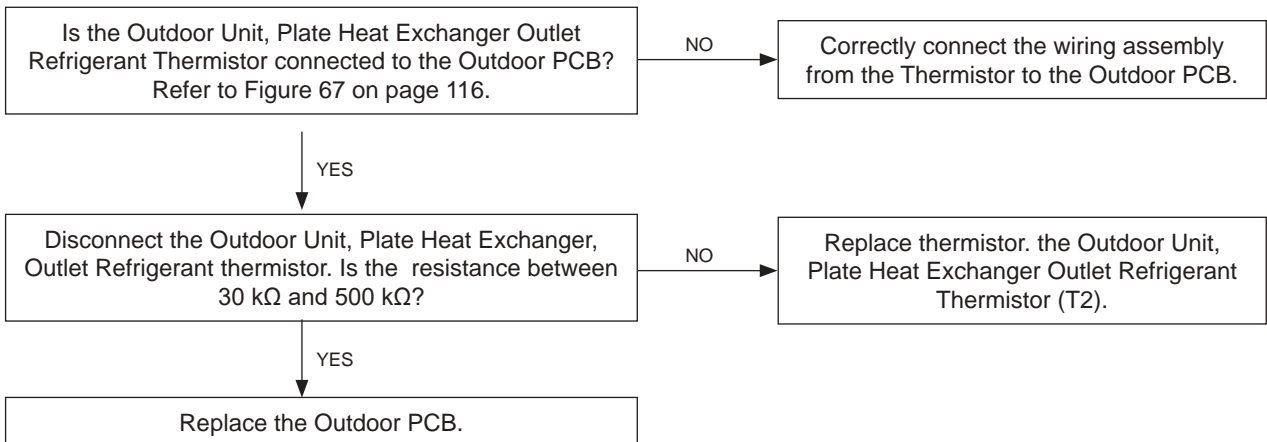
Section 9 - Fault Finding

9.1.14 No connection Outdoor PCB to Inverter PCB (H1)

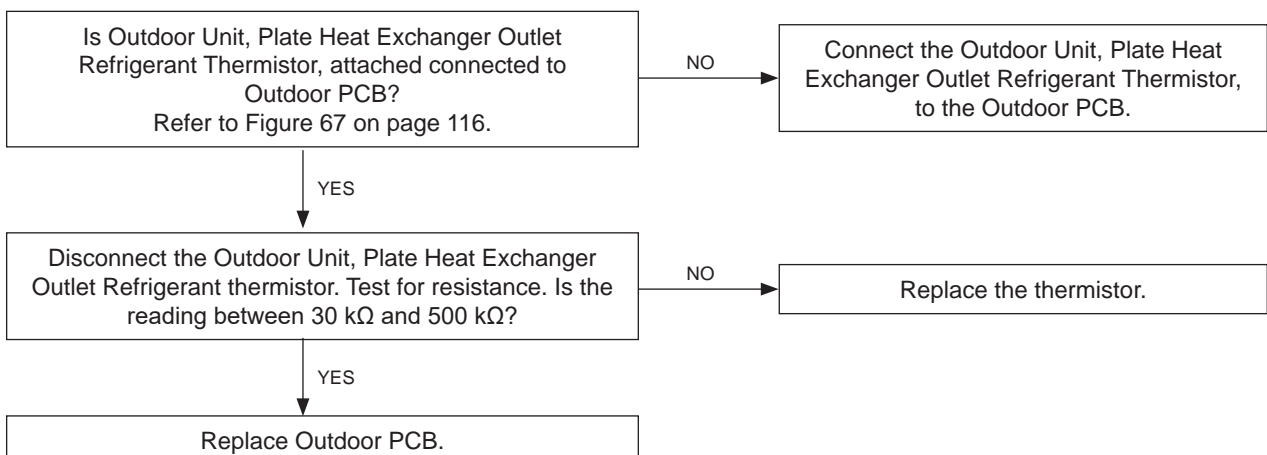
⚠ WARNING: Set the power supply to OFF. Wait for a minimum of 10 minutes before you work on the appliance. This is to let harmful electrical charges decrease to below a safe limit.



9.1.15 Outdoor Unit, Plate Heat Exchanger Outlet Refrigerant Thermistor (T2) Error



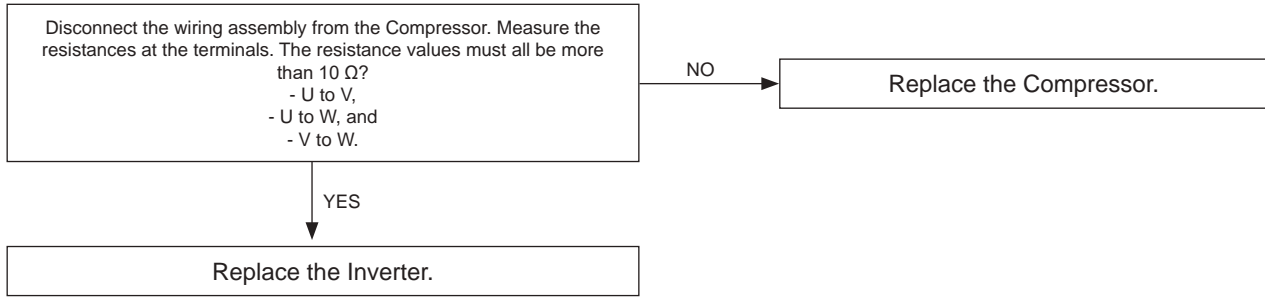
9.1.16 Plate Heat Exchanger Inlet Refrigerant Thermistor Error



Section 9 - Fault Finding

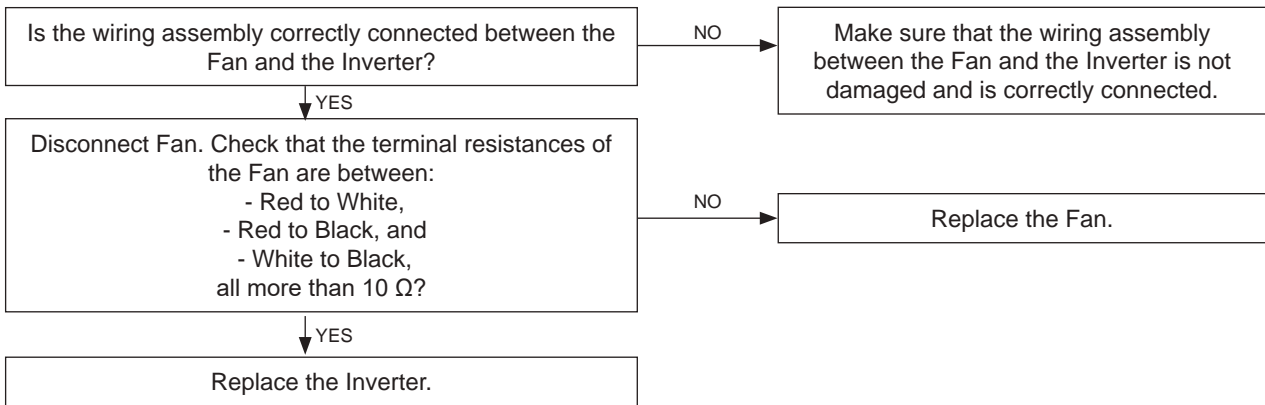
9.1.17 Inverter High Current

⚠ WARNING: Set the power supply to OFF. Wait for a minimum of 10 minutes before you work on the appliance. This is to let harmful electrical charges decrease to below a safe limit.

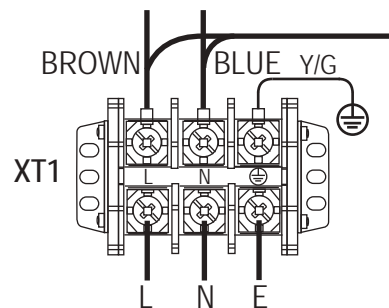
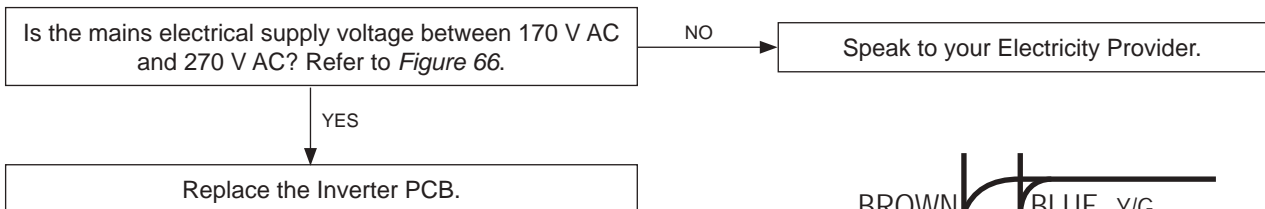


9.1.18 Fan Error

⚠ WARNING: Set the power supply to OFF. Wait for a minimum of 10 minutes before you work on the appliance. This is to let harmful electrical charges decrease to below a safe limit.



9.1.19 High Voltage or Low Voltage Error

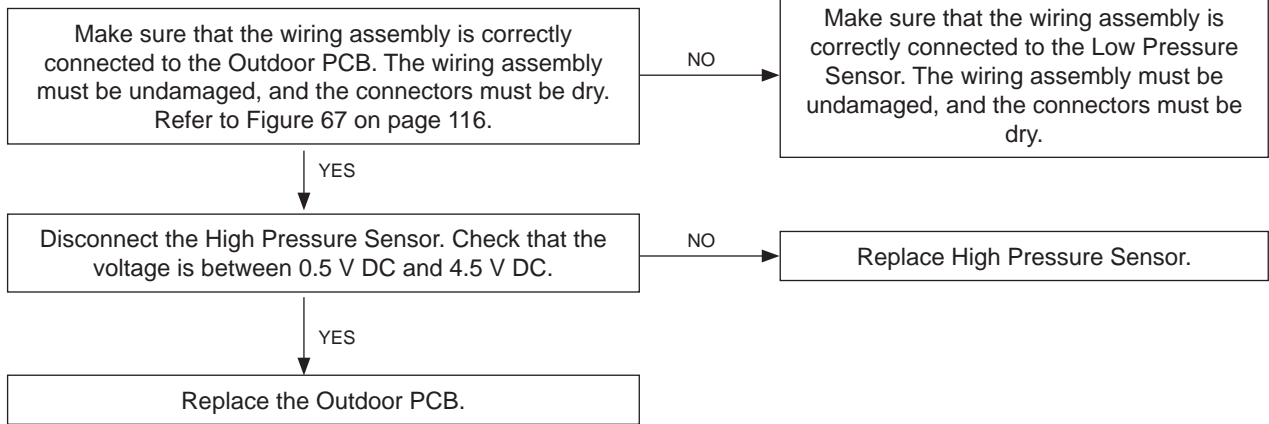


Lowest permitted - 240 V AC

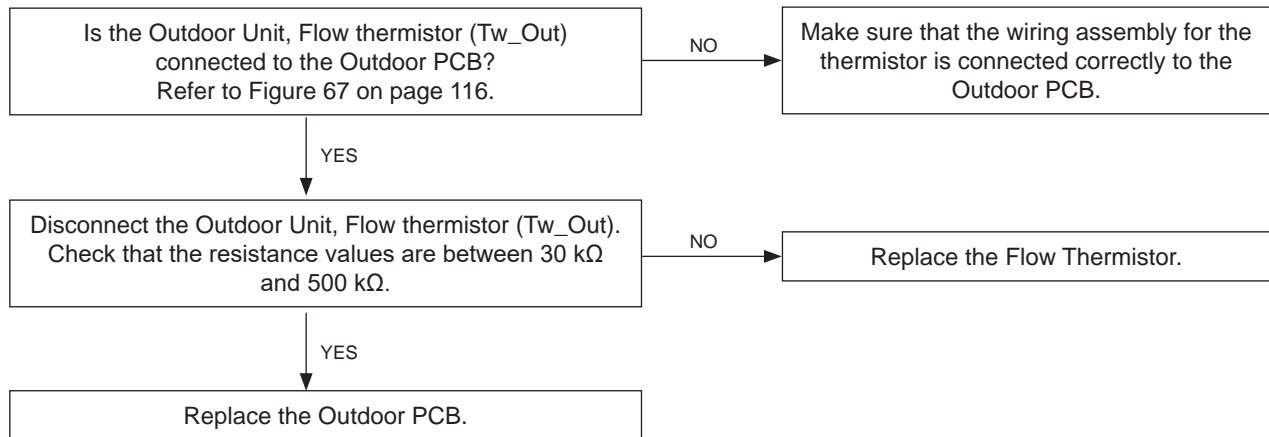
Figure 66. XT1 Connector

Section 9 - Fault Finding

9.1.20 High Pressure Sensor Error

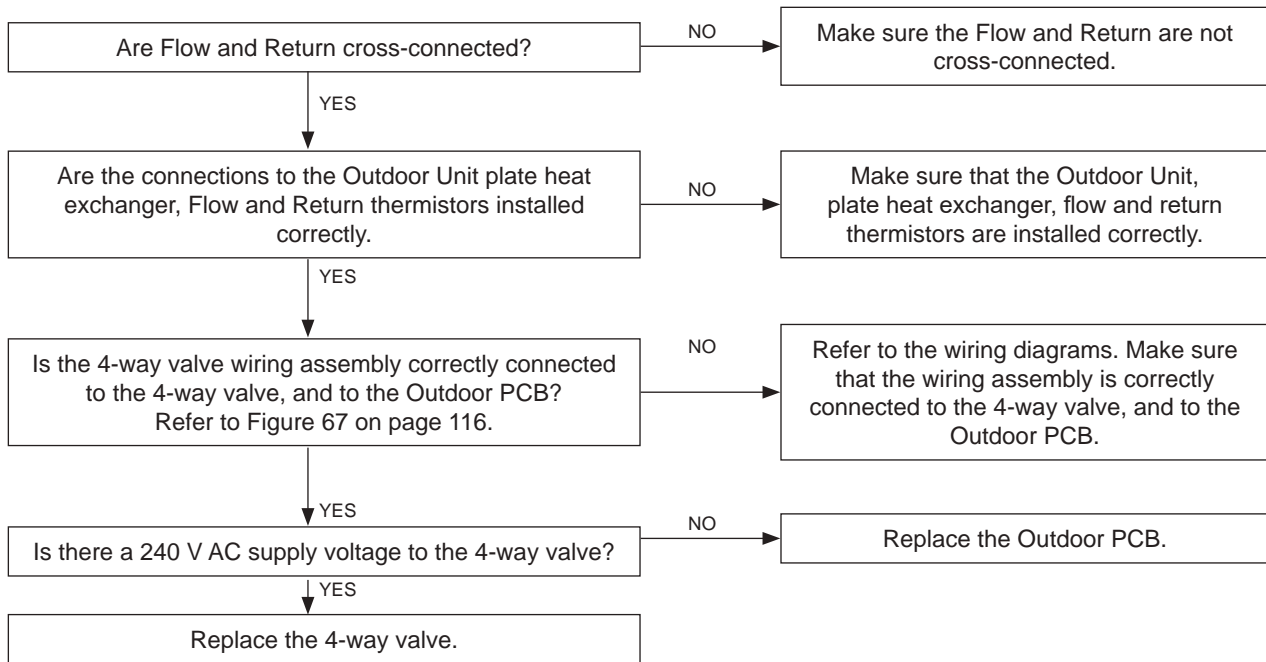


9.1.21 Outdoor Unit, Flow Thermistor (Tw_Out) Error

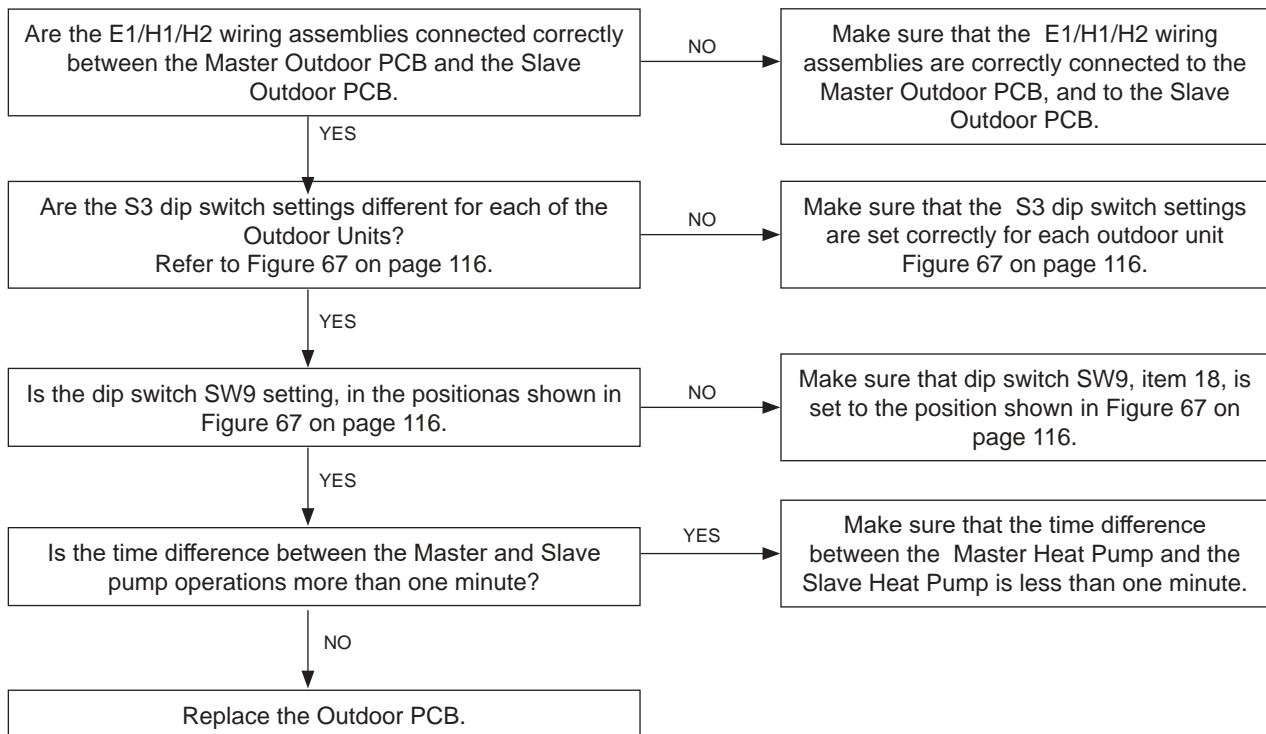


Section 9 - Fault Finding

9.1.22 High Flow/Return Differential 3 times in succession and Flow Temperature <math><7^{\circ}\text{C}</math> Error

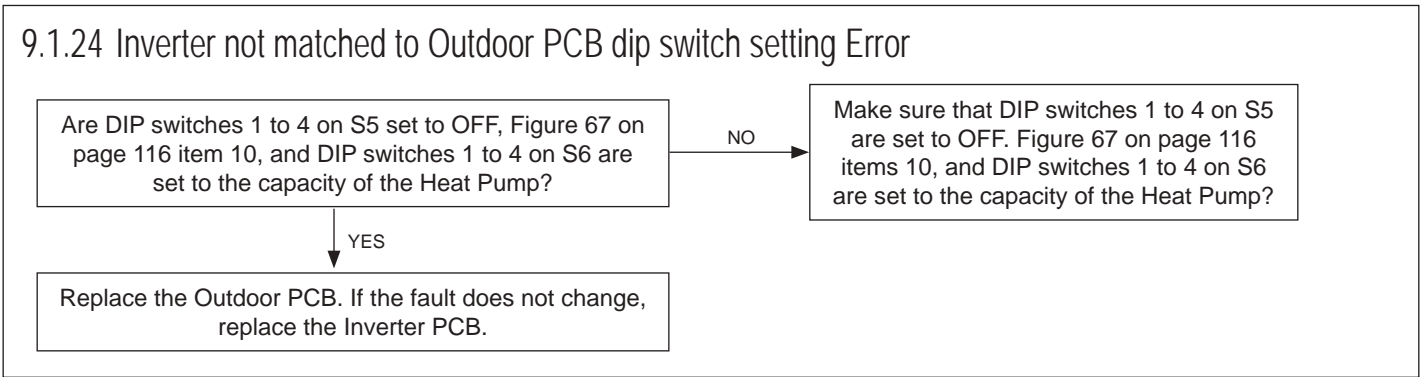


9.1.23 No connection Master Heat Pump to Slave Heat Pump Error

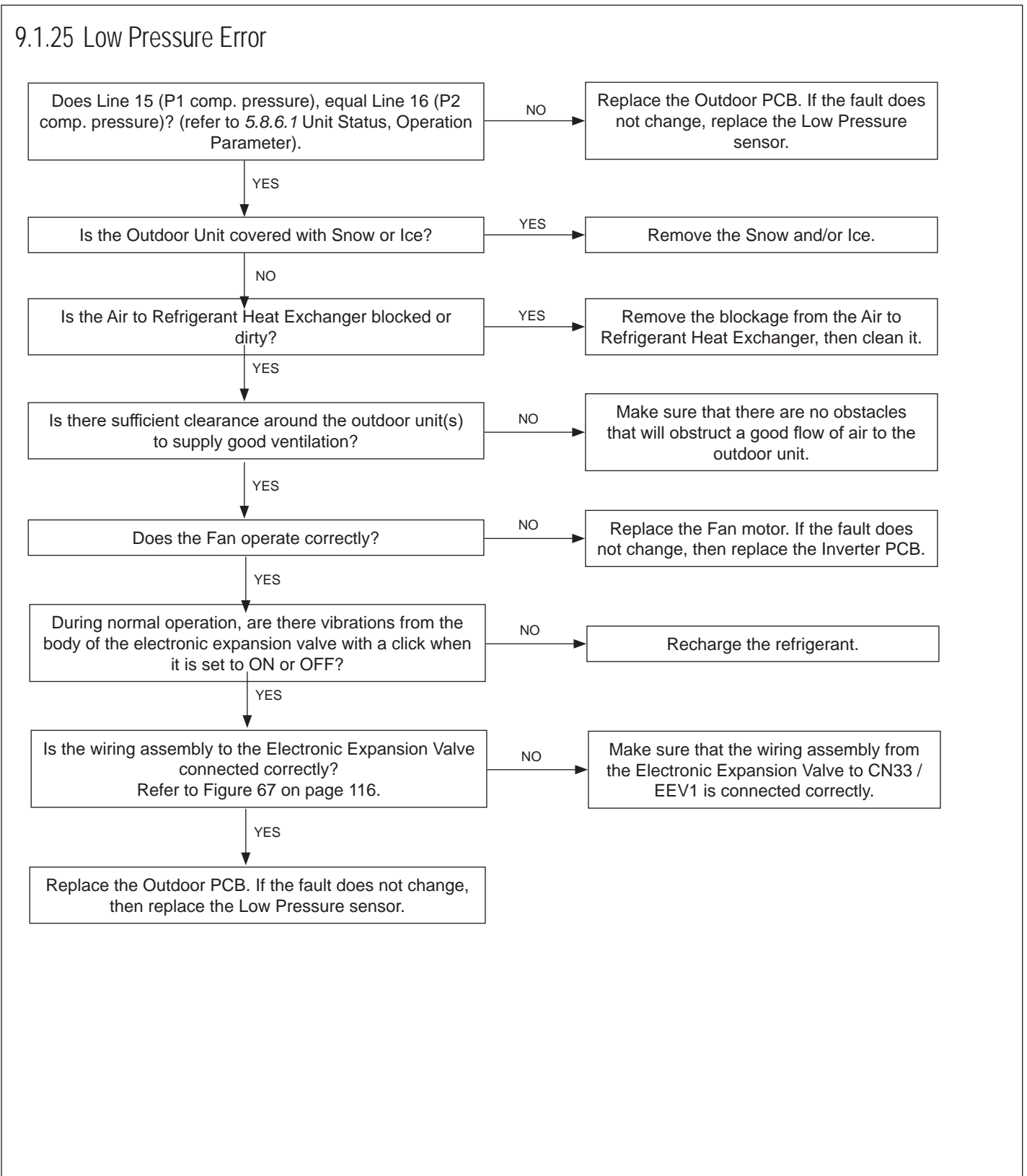


Section 9 - Fault Finding

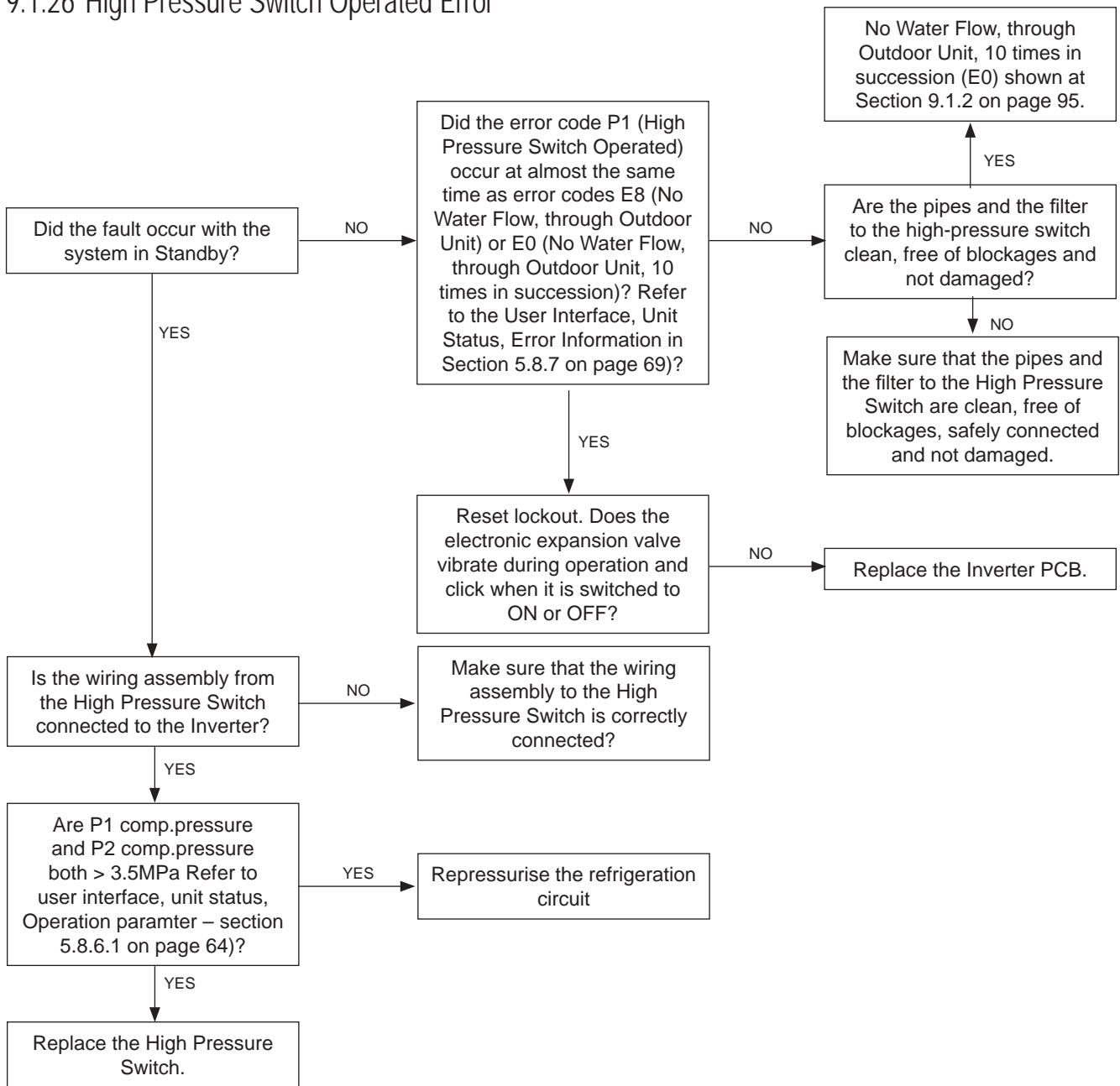
9.1.24 Inverter not matched to Outdoor PCB dip switch setting Error



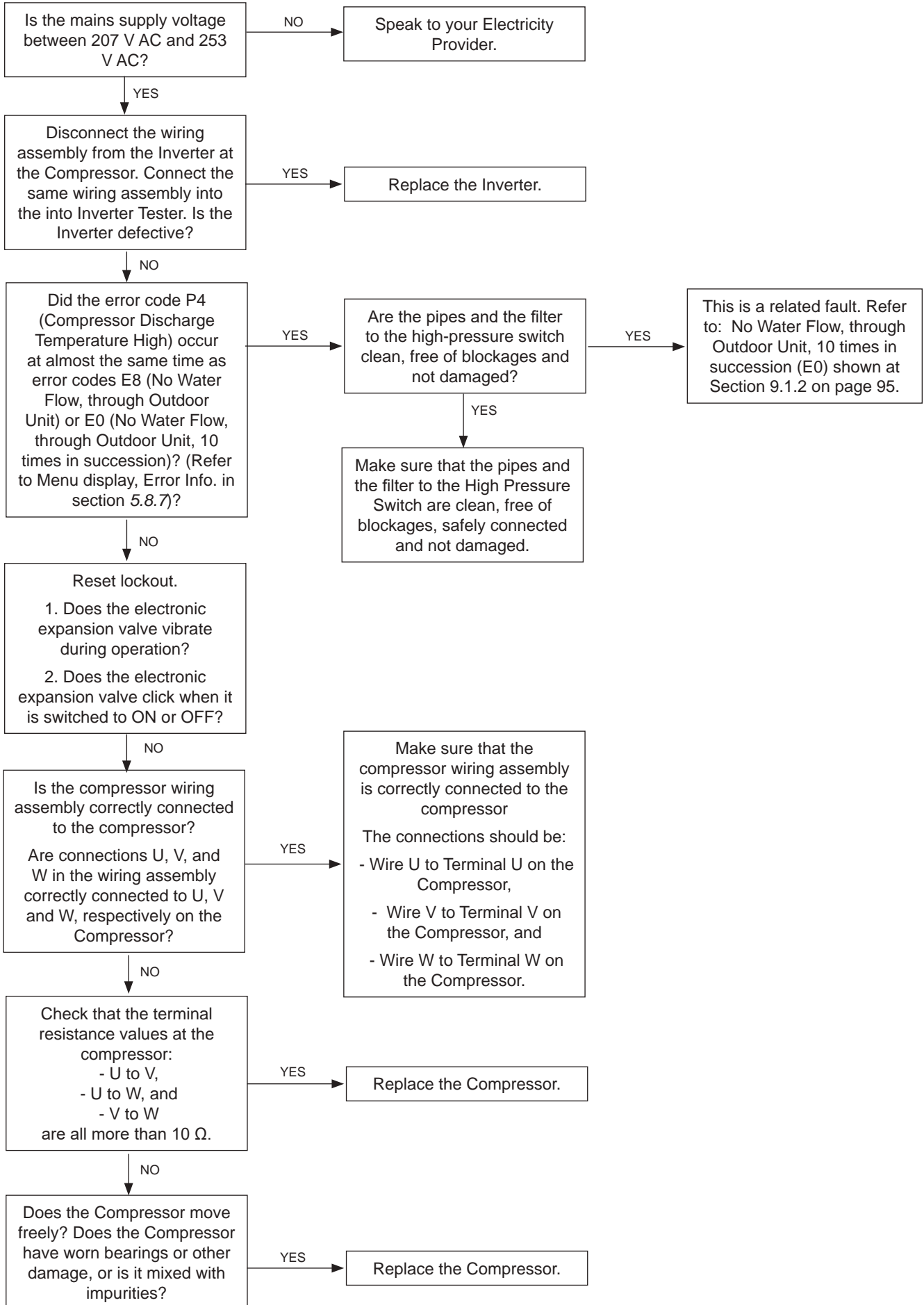
9.1.25 Low Pressure Error



9.1.26 High Pressure Switch Operated Error



9.1.27 Overcurrent Protection Error



FAULT FINDING

Section 9 - Fault Finding

9.1.28 Compressor Discharge Temperature High Error

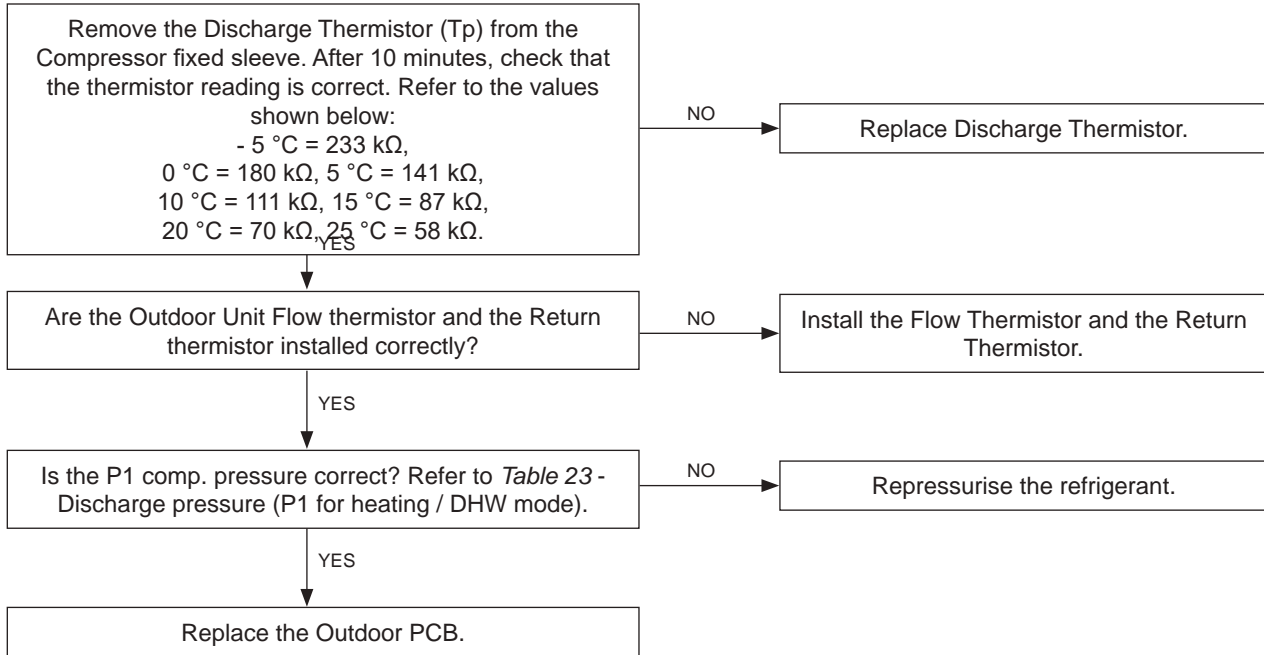
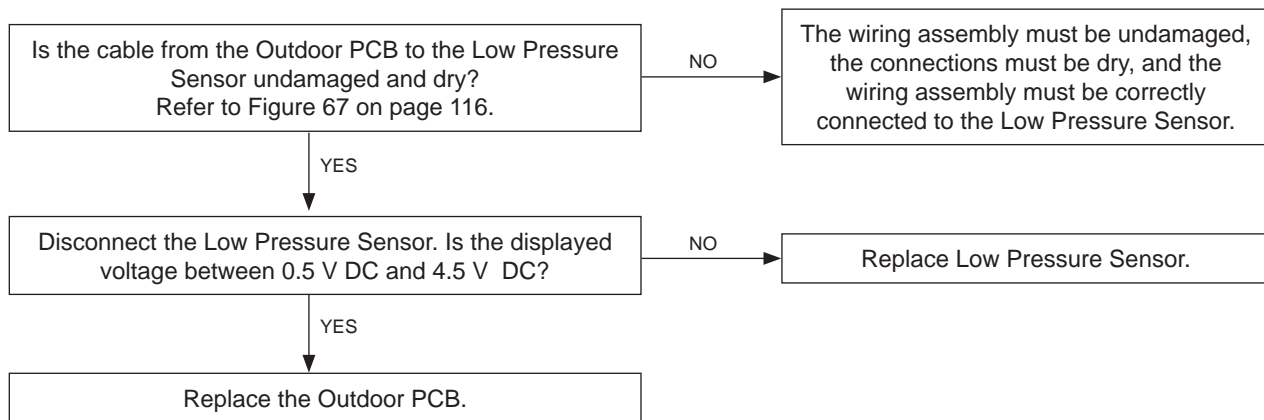


Table 23 Discharge pressure (P1) for heating/DHW mode

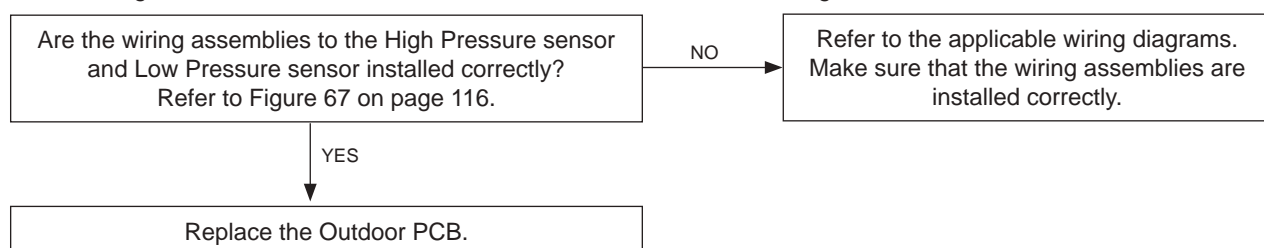
Unit	Value					
Tw_out (°C)	25	30	35	40	45	50
P1 (kPa)	1000 ±100	1150 ±100	1300 ±100	1450 ±100	1600 ±100	1800 ±100
w_out (°C)	55	60	65	70	75	
P1 (kPa)	2000 ±150	2200 ±150	2450 ±150	2700 ±150	3000 ±150	

Note: P1 is absolute pressure.

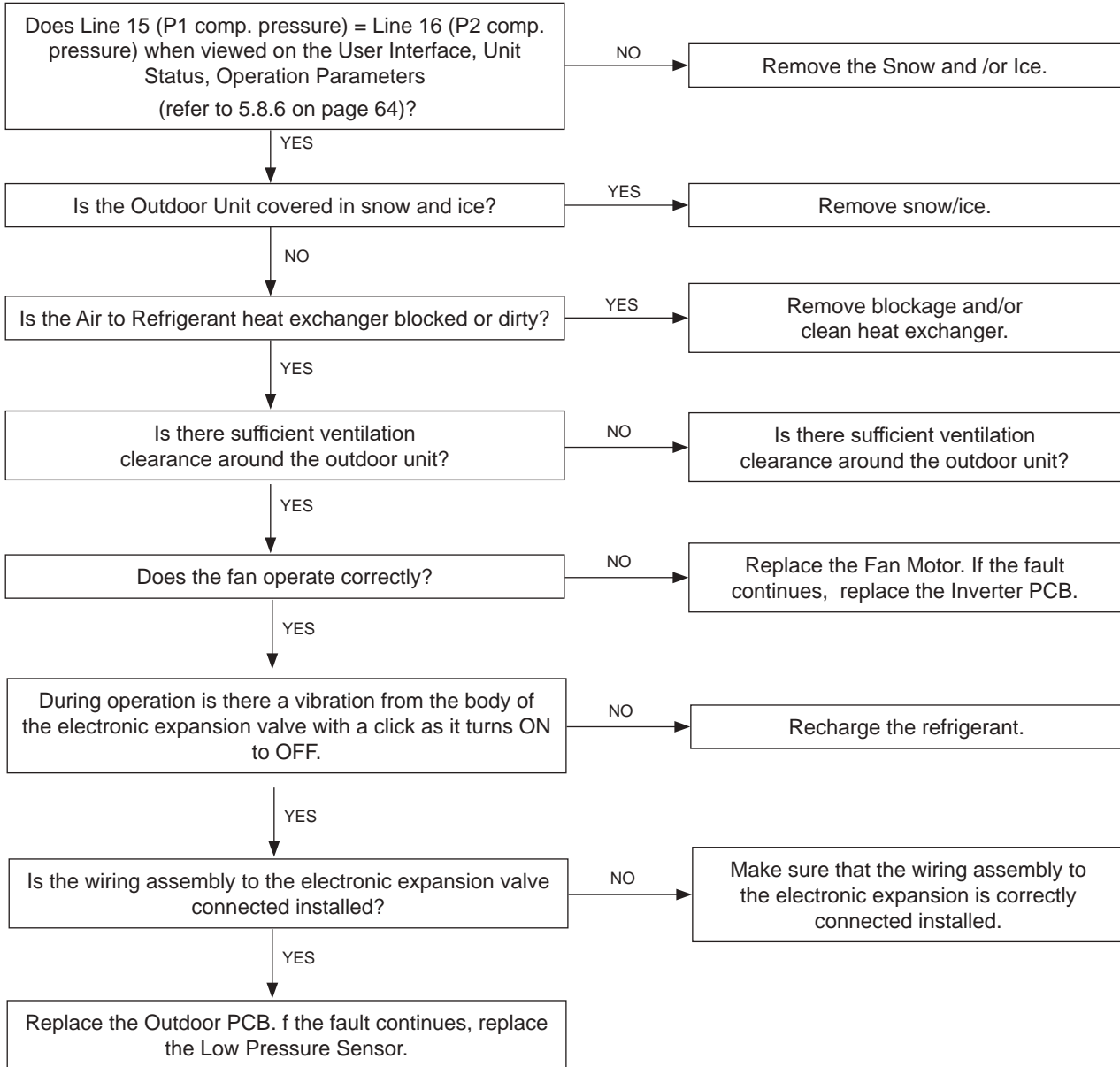
9.1.29 Low Pressure Sensor Error



9.1.30 High Pressure Sensor and Low Pressure Sensor Wiring-Cross-Connection



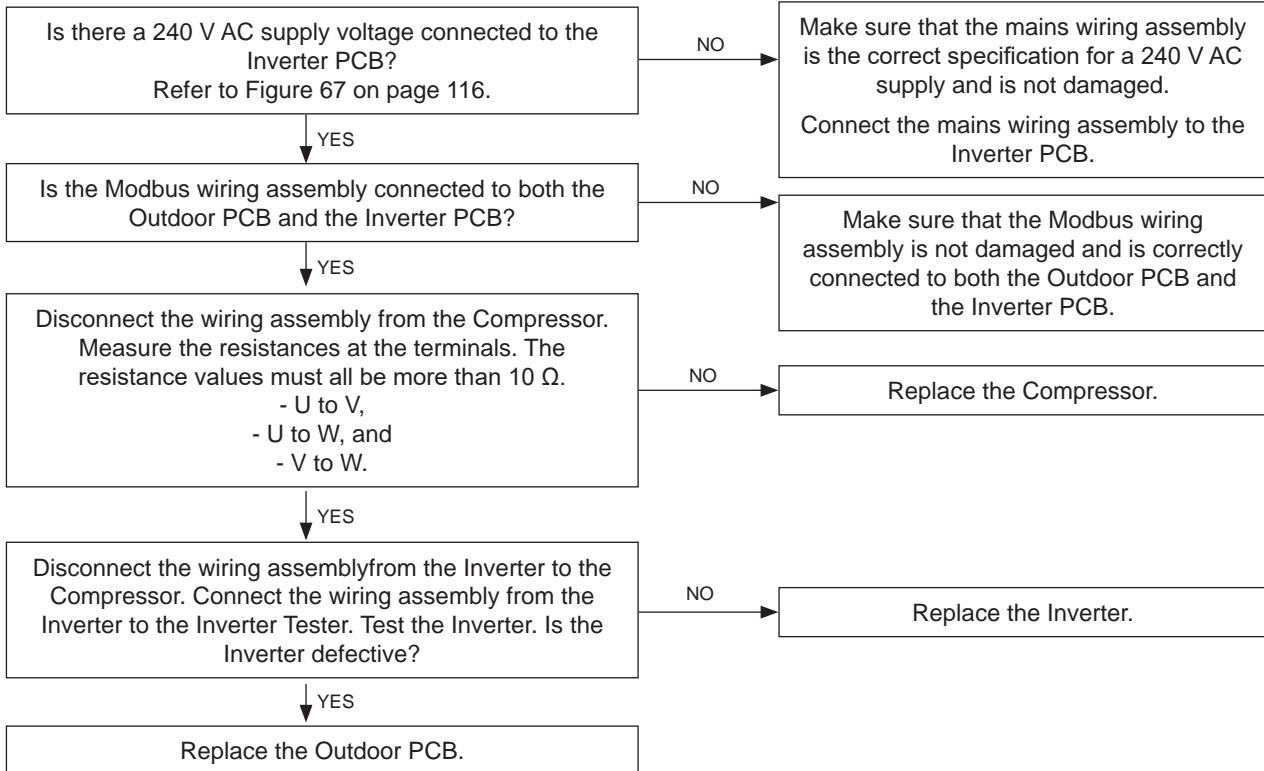
9.1.31 Condensing Temperature High Error



Section 9 - Fault Finding

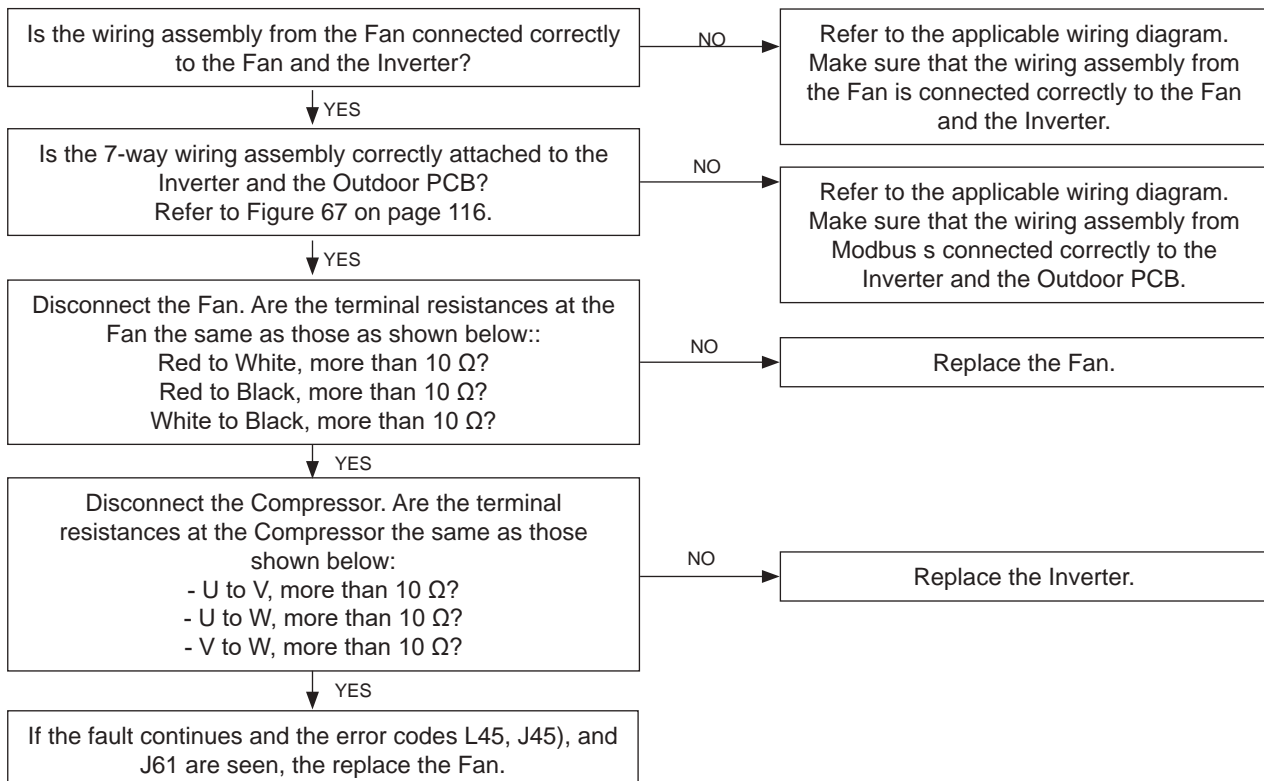
9.1.32 Inverter High Temperature (L2E and LC9)

⚠ WARNING: Set the power supply to OFF. Wait for a minimum of 10 minutes before you work on the appliance. This is to let harmful electrical charges decrease to below a safe limit.



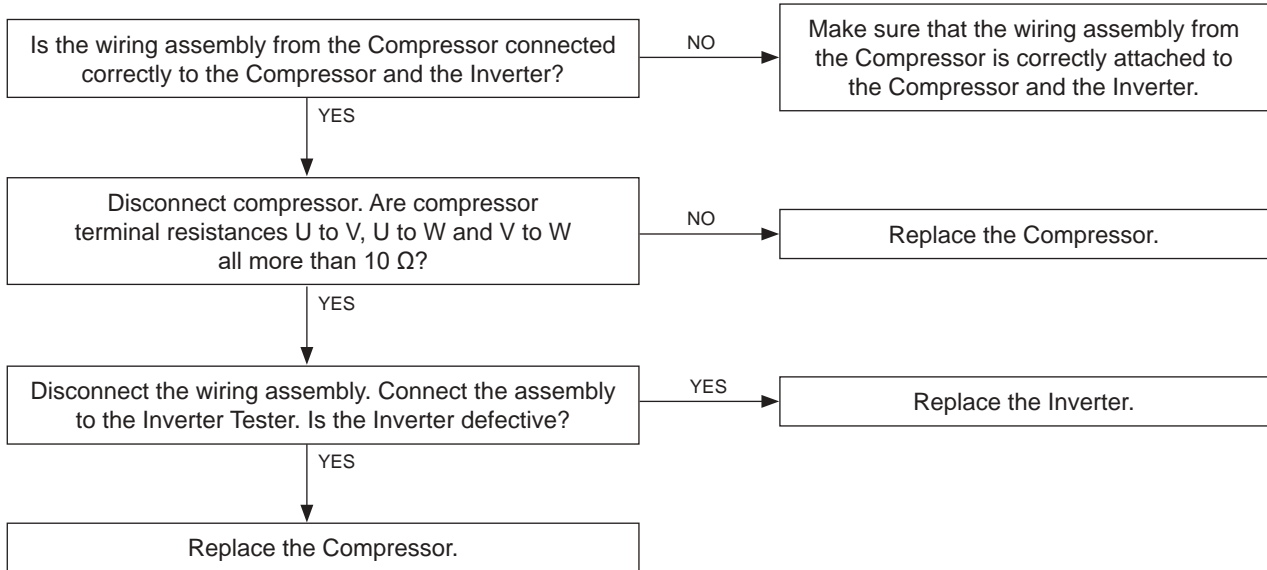
9.1.33 Wrong Fan Fitted (L45) and Wrong Fan Motor Fitted (J45) and Fan Connections Short Circuit (J61)

⚠ WARNING: Set the power supply to OFF. Wait for a minimum of 10 minutes before you work on the appliance. This is to let harmful electrical charges decrease to below a safe limit.



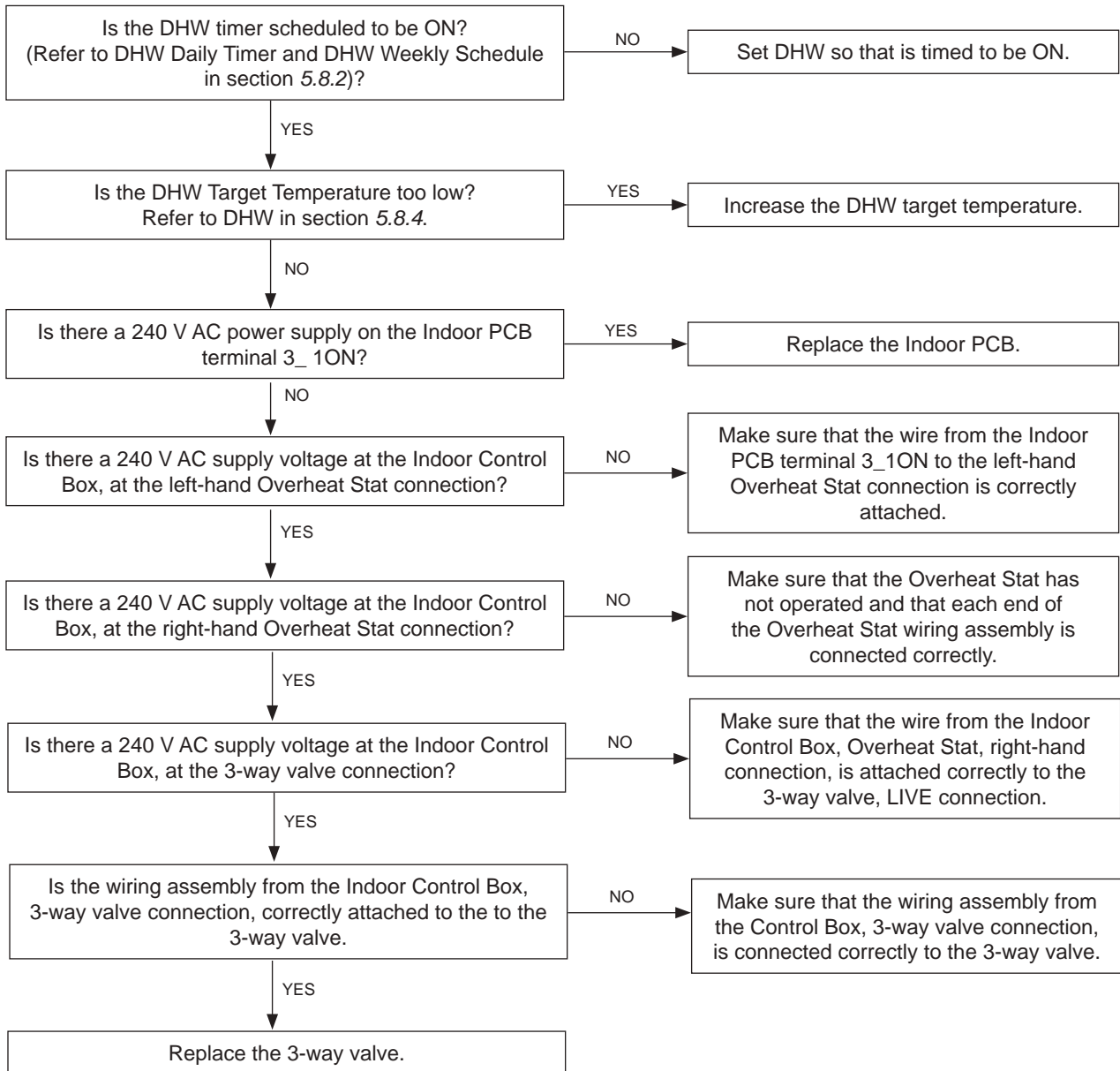
9.1.34 Compressor Stall Error and Compressor Start Error and Compressor Terminals Short Circuit (L61) and Compressor Error

⚠ WARNING: Set the power supply to OFF. Wait for a minimum of 10 minutes before you work on the appliance. This is to let harmful electrical charges decrease to below a safe limit.

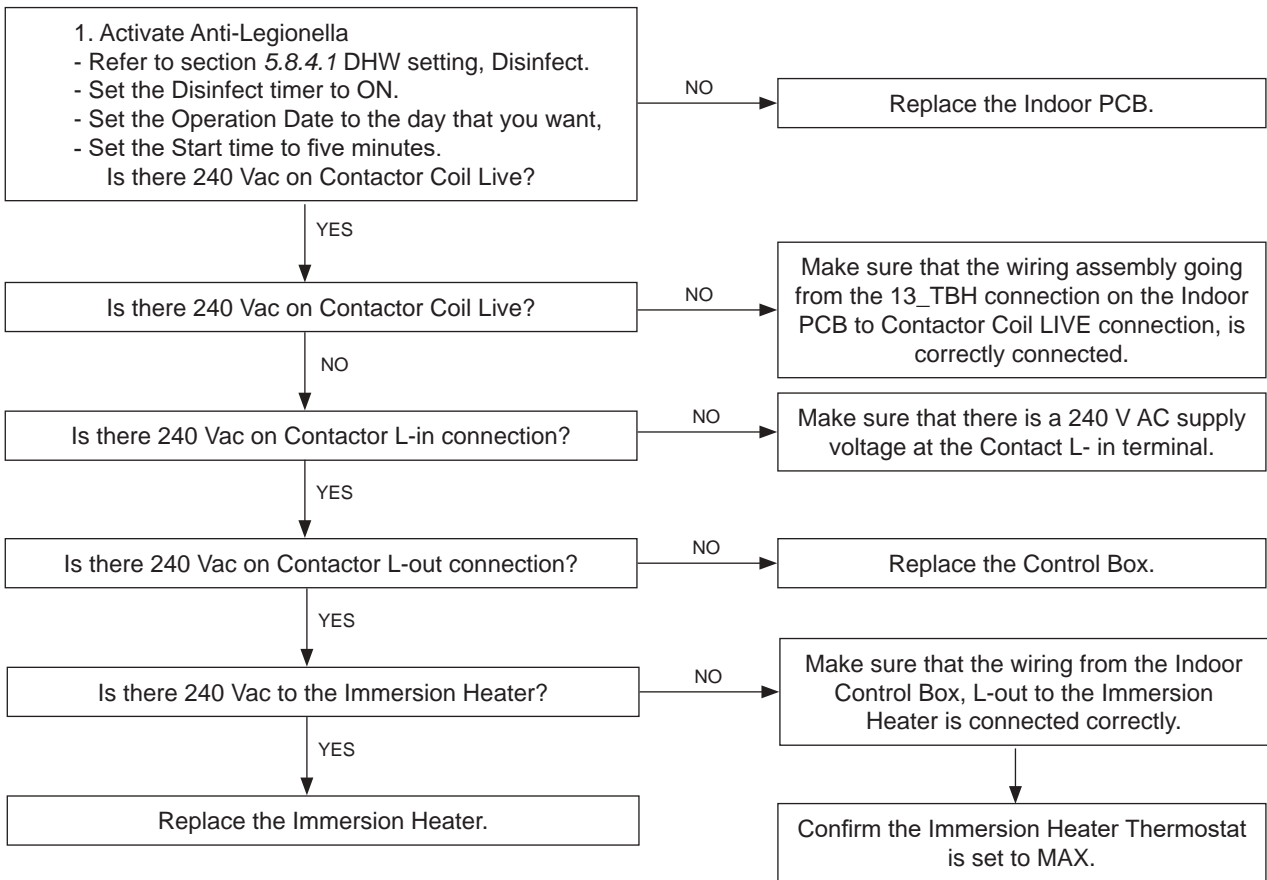


Section 9 - Fault Finding

9.1.35 3-Way Valve does not Operate and No DHW

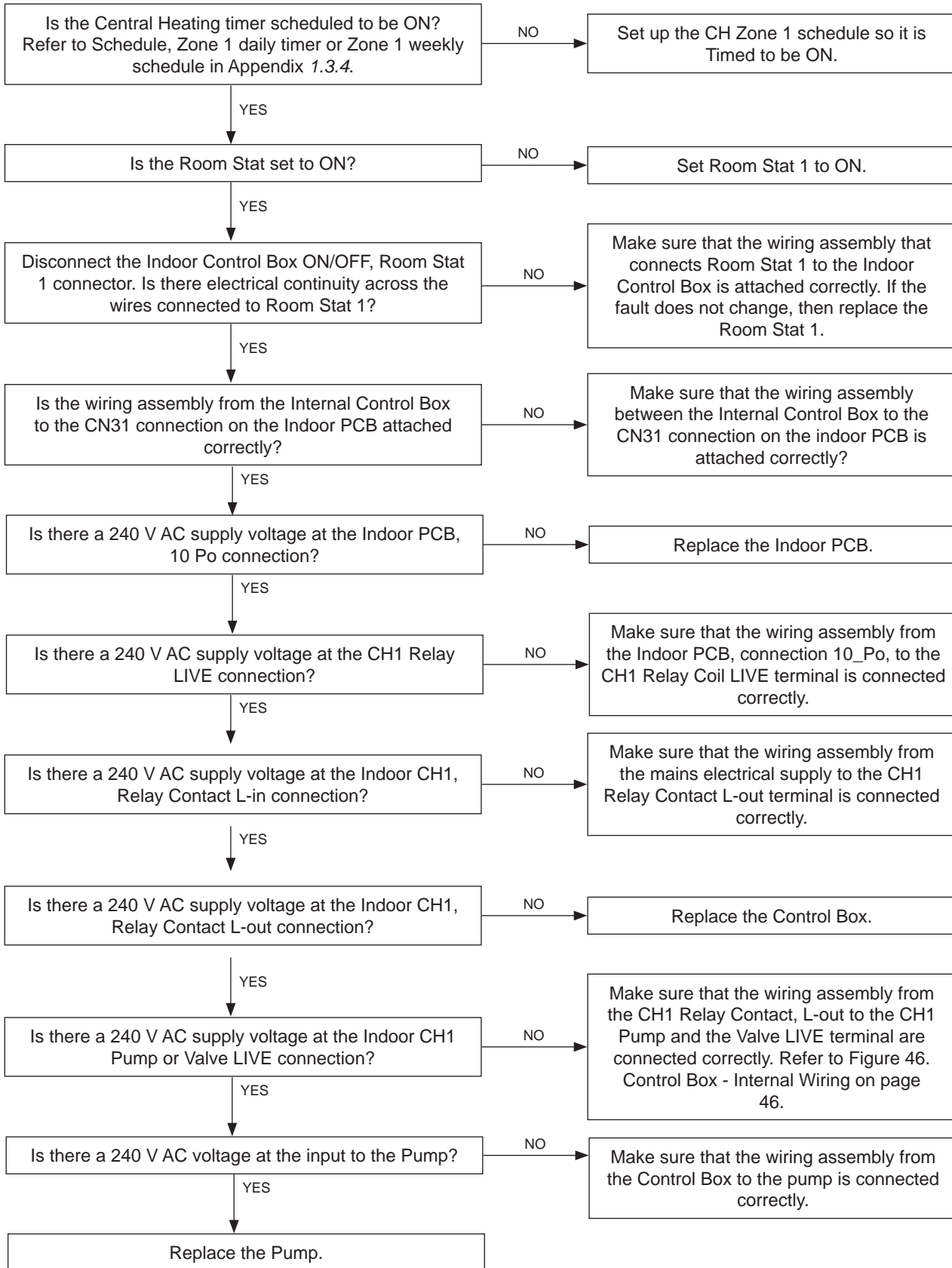


9.1.36 Anti-Legionella does not Operate

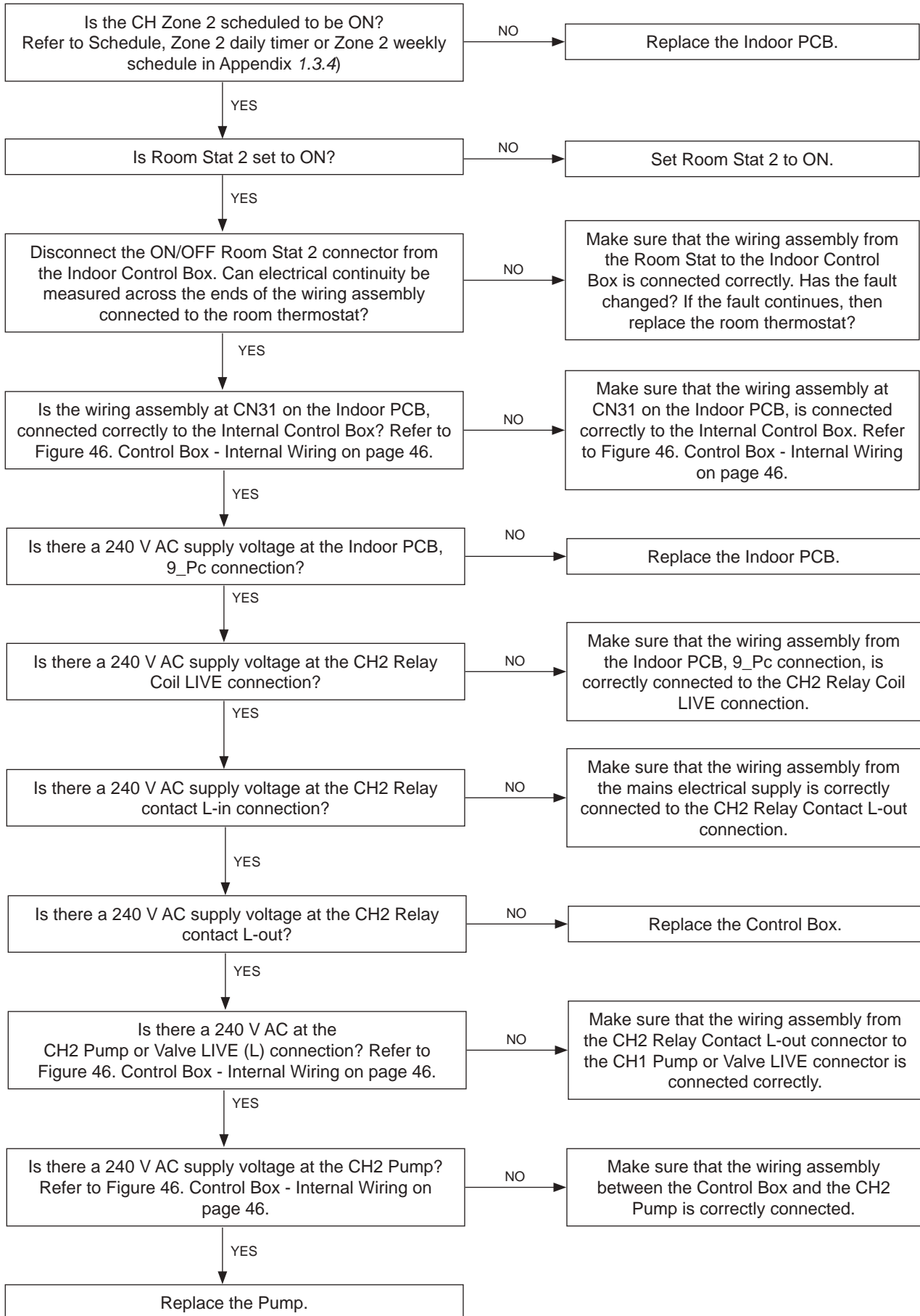


Section 9 - Fault Finding

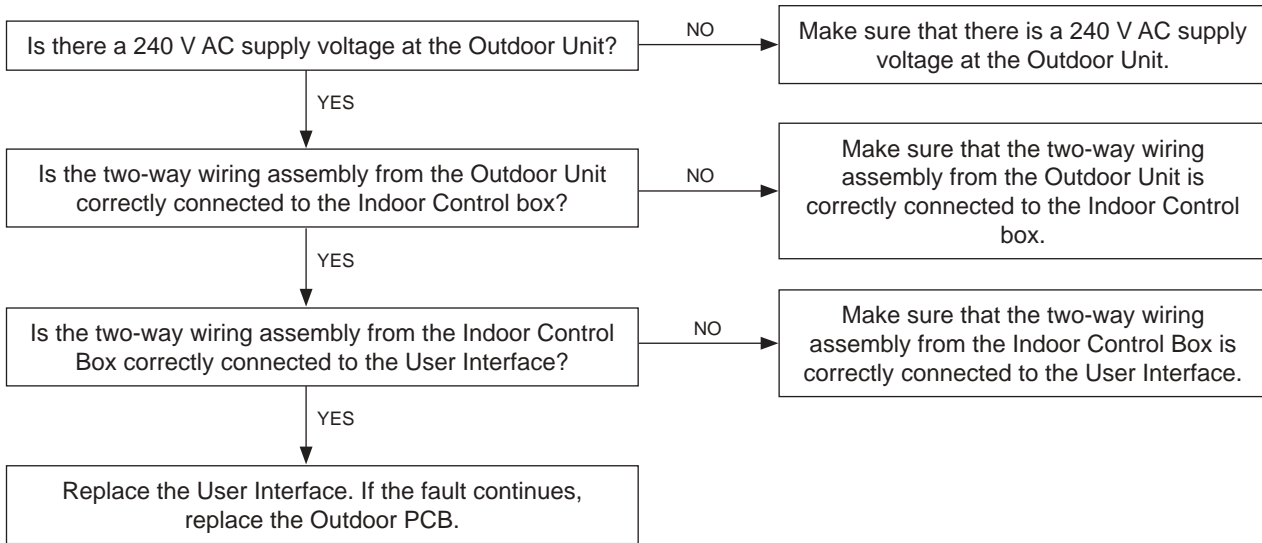
9.1.37 No CH or No CH1 Pump



9.1.38 No CH2 Pump



9.1.39 No Display



Section 9 - Fault Finding

9.1.40 Main Control Circuit Board (Outdoor)

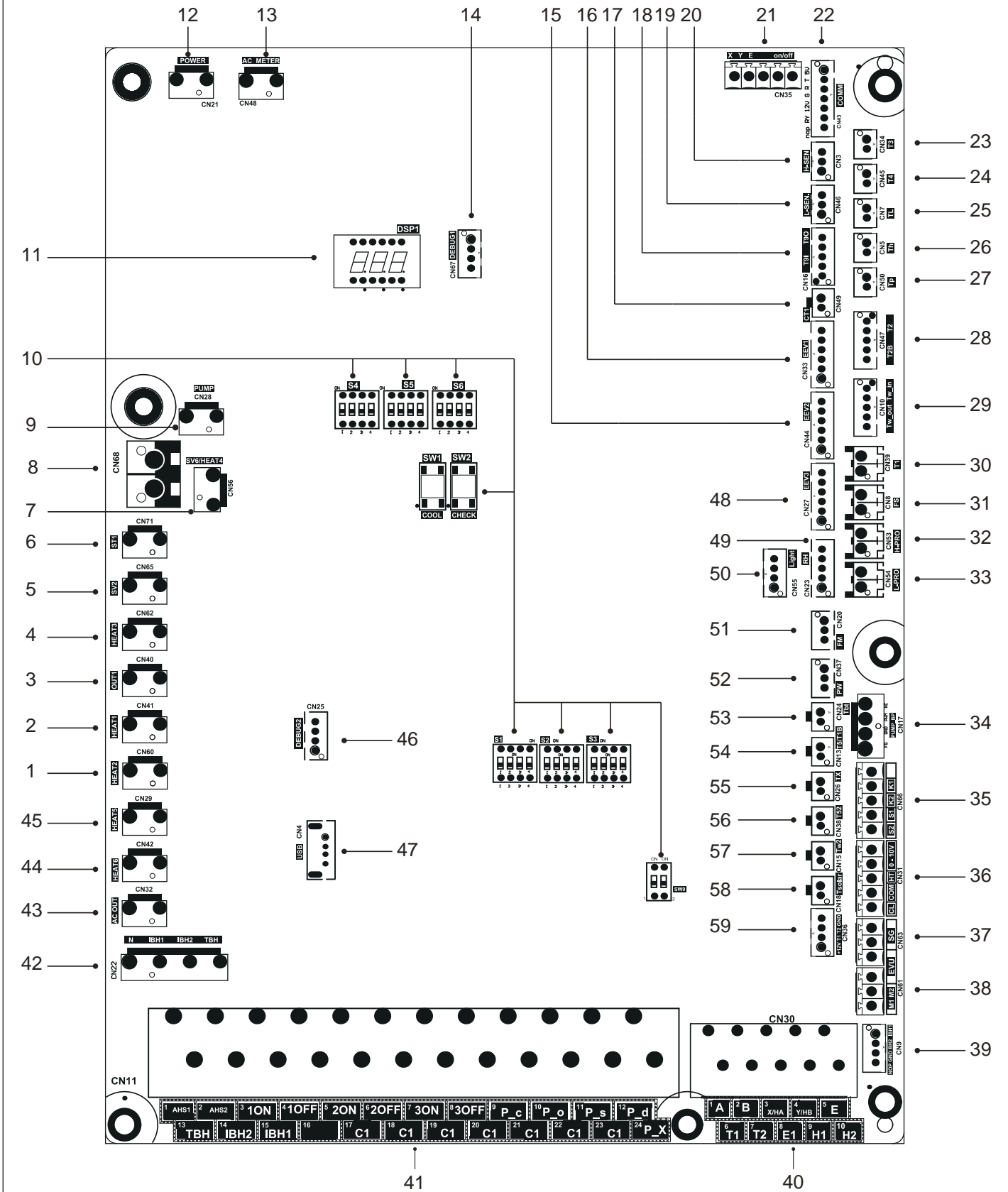


Figure 67. Main Control Circuit Board (Outdoor)

Section 9 - Fault Finding

Table 24 Main Circuit Board (Outdoor)

Order	Port	Code	Assembly unit		Order	Port	Code	Assembly unit	
1	CN60	HEAT2	Reserved				0-10V	Output port for 0-10V	0-5VDC
2	CN41	HEAT1	Reserved	230VAC	36	CN31	HT	Control port for room thermostat (heating mode)	0-5VDC
3	CN40	OUT1	OUT1	230VAC			COM	Power port for room thermostat	0-5VDC
4	CN62	HEAT3	Port for crankcase heating tape	230VAC			CL	Control port for room thermostat (cooling mode)	0-5VDC
5	CN65	SV2	Reserved		37	CN63	SG	Port for smart grid (grid signal)	0-12VDC
6	CN71	ST1	Port for 4-way valve	230VAC			EVU	Port for smart grid (photovoltaic signal)	0-12VDC
7	CN56	/	Port for the heating tape of drainage outlet	230VAC	38	CN61	M1 M2	Port for remote switch	0-12VDC
8	CN68	/	Port for the heating tape of drainage outlet	230VAC	39	CN9	/	Control port for internal backup heater	0-5VDC
9	CN28	PUMP	Port for variable speed pump power input				1,2	Port for additional heat source	
10	/	/	Dip switch		40	CN30	3,4	Port for communication with the wired controller	
11	DSP1	/	Digital display				6,7	Port for thermostat transfer board	
12	CN21	POWER	Port for power supply	230VAC			9,10	Port for machine Cascade	
13	CN48	AC METER	Reserved				1 2	Port for additional heat source	230VAC
14	CN67	DEBUG1	Port for IC programming				3 4 17	Port for SV1(3-way valve)	230VAC
15	CN44	EEV2	Port for electrical expansion valve2				5 6 18	Port for SV2(3-way valve)	230VAC
16	CN33	EEV1	Port for electrical expansion valve1(Reserved)	0-12VDC			7 8 19	Port for SV3(3-way valve)	230VAC
17	CN49	CT1	Port for current transformer(Reserved)		41	CN11	9 20	Port for zone 2 pump	230VAC
18	CN16	T9O/T9I	Reserved				10 21	Port for outside circulation pump	230VAC
19	CN46	L-SEN	Port for low pressure sensor	0-5VDC			11 22	Port for solar energy pump	230VAC
20	CN3	H-SEN	Port for high pressure sensor	0-5VDC			12 23	Port for DHW pipe pump	230VAC
							13 16	Control port for tank booster heater	230VAC
21	CN35	RS485 on/off	Reserved	0-5VDC			14 16	Control port for internal backup heater 1	230VAC
							15 17	Control port for internal backup heater 2	230VAC
							24 23	Reserved	230VAC
22	CN43	COMM	Port for communication with Inverter module	0-5VDC			IBH1	Control port for internal backup heater 1	230VAC
23	CN34	T3	Port for T3 temp.sensor	0-3.3VDC	42	CN22	IBH2	Control port for internal backup heater 2	230VAC
24	CN45	T4	Port for T4 temp.sensor	0-3.3VDC			TBH	Control port for tank booster heater	230VAC
25	CN7	TL	Port for TL temp.sensor	0-3.3VDC	43	CN32	AC OUT	Port for transformer power input	230VAC
26	CN5	Th	Port for Th temp.sensor	0-3.3VDC	44	CN42	HEAT6	Port for anti-freeze electric heating tape(internal)	230VAC
27	CN50	Tp	Port for Tp temp.sensor	0-3.3VDC	45	CN29	HEAT5	Port for anti-freeze electric heating tape(internal)	230VAC
					46	CN25	DEBUG2	Port for IC programming	
28	CN47	T2	Port for refrigerant liquid side temperature (heating mode)	0-5VDC	47	CN4	USB	Port for USB programming	
		T2B	Port for temperature sensors of refrigerant gas side temperature (cooling mode)	0-5VDC	48	CN27	EEV3	Port for electrical expansion valve3(Reserved)	
					49	CN23	RH	Port for humidity sensor	
29	CN10	TW_in	Port for temperature sensors of inlet water temperature of plate heat exchanger	0-5VDC	50	CN55	Light	Port for breathing light	
		TW_out	Port for temperature sensors of outlet water temperature of plate heat exchanger	0-5VDC	51	CN20	FM	Reserved	0-5VDC
30	CN39	T1	Port for temperature sensors of final outlet water temperature	0-5VDC	52	CN37	PW	Port for temperature sensor of water pressure	0-5VDC
31	CN8	FS	Port for flow switch	0-12VDC	53	CN24	Tbt	Port for temperature sensor of balance tank	0-5VDC
32	CN53	H-PRO	Port for high pressure switch(Reserved)		54	CN13	T5/T1B	Port for domestic hot water tank temp. sensor	0-5VDC
33	CN54	L-PRO	Port for low pressure switch(Reserved)		55	CN26	TX	Reserved	
34	CN17	PUMP_BP	Port for variable speed pump communication	0-5VDC	56	CN38	T52	Port for temperature sensor of balance tank 2	0-5VDC
35	CN66	K1,K2	Port for high pressure switch	0-5VDC	57	CN15	Tw2	Port for outlet water for zone 2 temp. sensor	0-5VDC
		S1,S2	Port for high pressure switch	0-5VDC	58	CN18	Tsolar	Port for solar panel temp sensor	0-5VDC
					59	CN36	/	Port for thermostat transfer board	0-12VDC

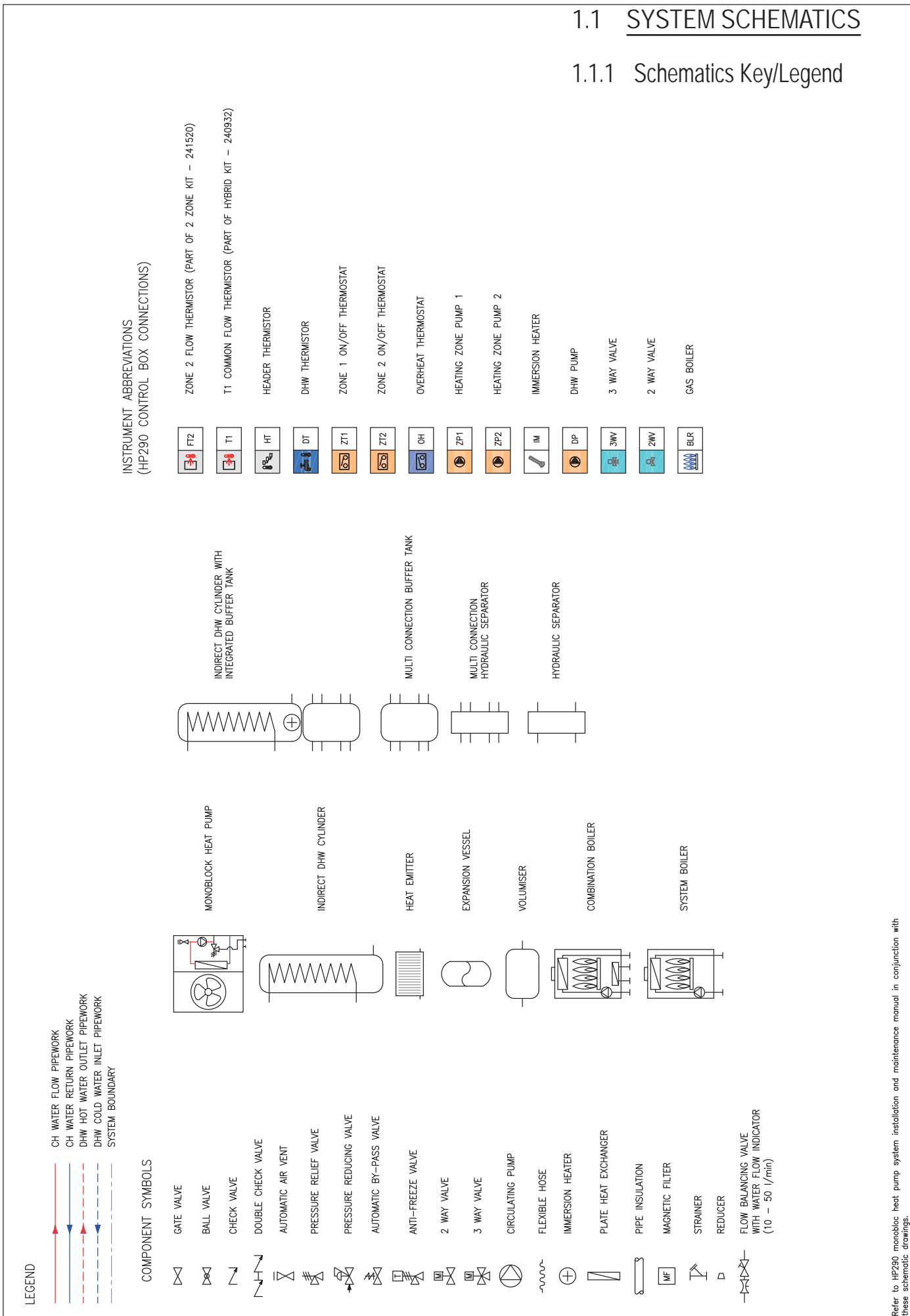
Notes

Notes

Notes

1.1 SYSTEM SCHEMATICS

1.1.1 Schematics Key/Legend



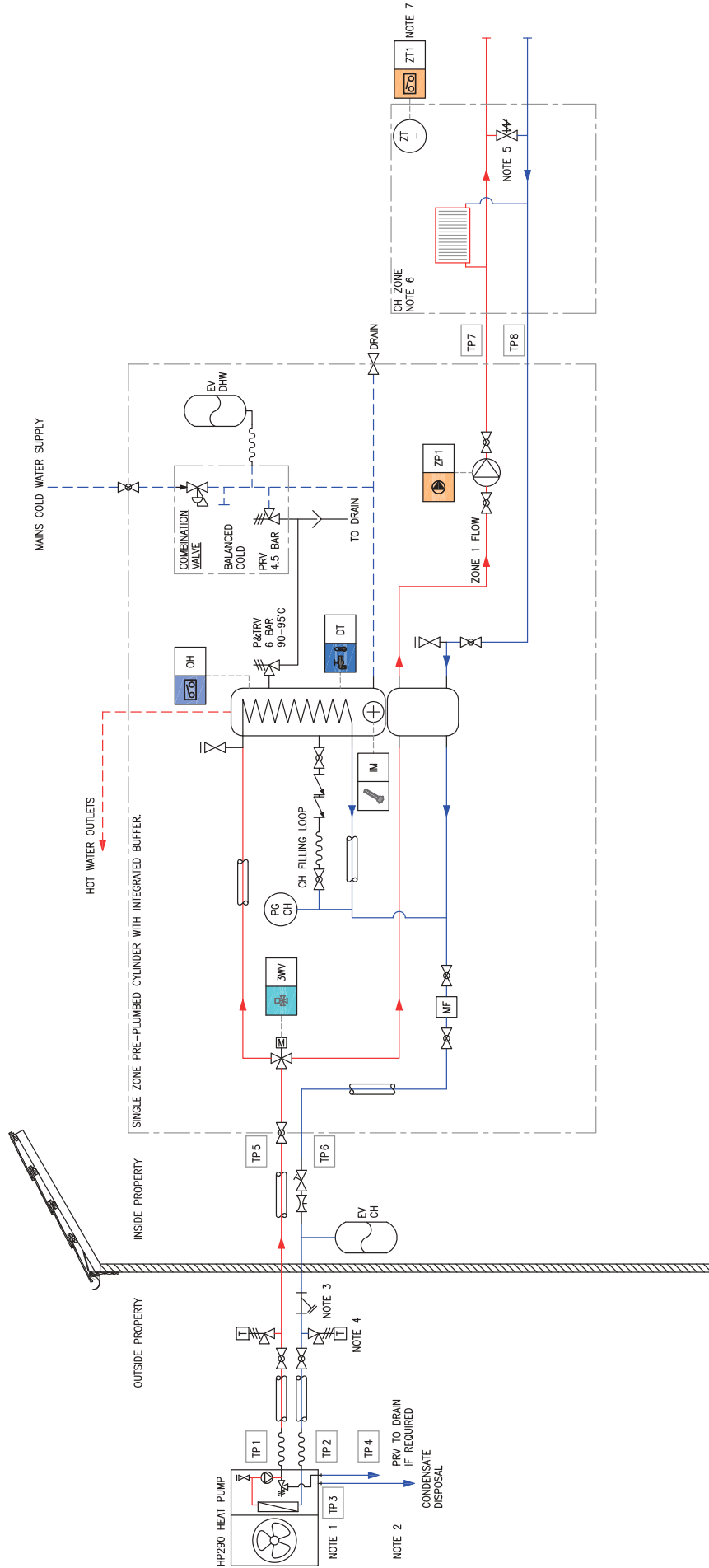
Refer to HP290 monobloc heat pump system installation and maintenance manual in conjunction with these schematic drawings.

HP290 + Single Zone Pre-plumbed Cylinder with Integrated Buffer.

1.1.2 HP290 + Single Zone Pre-plumbed Cylinder with Integrated Buffer

CONNECTION POINT LIST

TP No	DESCRIPTION	SIZE	4.5-6kW	MATERIAL	TYPE
1	HEAT PUMP FLOW	1"	1/4" BSP	BRASS	BSP MALE
2	HEAT PUMP RETURN	1"	1/4" BSP	BRASS	BSP MALE
3	HEAT PUMP CONDENSATE DISPOSAL	32MM OD	PLASTIC	BARBED SPIGOT	
4	PRESSURE RELIEF VALVE (PRV)	9MM ID	PVC	HOSE	
5	CYLINDER HEAT PUMP FLOW	28MM	BRASS	COMPRESSION	
6	CYLINDER HEAT PUMP RETURN	28MM	BRASS	COMPRESSION	
7	ZONE 1 FLOW	28MM	BRASS	COMPRESSION	
8	ZONE 1 RETURN	28MM	BRASS	COMPRESSION	

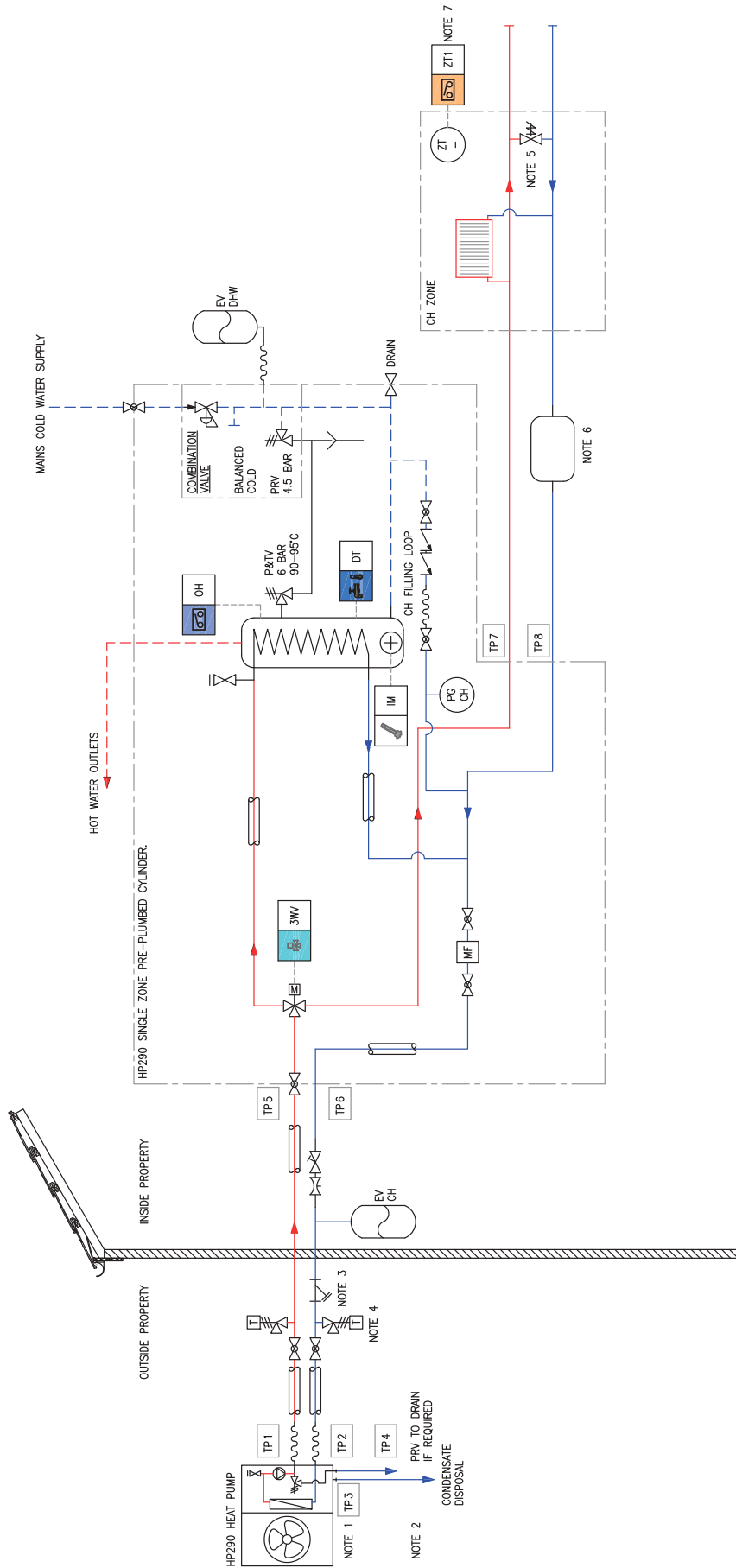


- Notes.**
- Note 1. The heat pump must be installed on a secure level base capable of supporting its weight.
 - Note 2. Refer to the installation manual for condensate and pressure relief discharge requirements.
 - Note 3. A particle filter can be supplied as an option and it's recommended that a magnetic filter is installed. Pre-plumbed cylinders are supplied complete with a combined magnetic and particle filter.
 - Note 4. Pre-plumbed cylinders are supplied complete with a combined magnetic and particle filter.
 - Note 5. Anti-freeze valves are required if glycol is not used in the system.
 - Note 6. The zone pump is not pre-plumbed.
 - Note 7. Refer to the installation manual for thermostat connection.
 - Note 8. Flow, return and outdoor sensors are integrated within the outdoor unit.
- This drawing is for information and guidance only. It is the heating designer/ installers responsibility to adhere to the latest relevant standards.
- Refer to HP290 heat pump system installation and maintenance manual in conjunction with these schematic drawings.

HP290 + Single Zone Pre-plumbed Cylinder.

1.1.3 HP290 + Single Zone Pre-plumbed Cylinder

CONNECTION POINT LIST			
TP No	DESCRIPTION	SIZE	TYPE
1	HEAT PUMP FLOW	4.5-6kW	BSP MALE
2	HEAT PUMP RETURN	8-14kW	BSP MALE
3	HEAT PUMP CONDENSATE DISPOSAL	1" BSP	BARBED SPIGOT
4	PRESSURE RELIEF VALVE (PRV)	1" BSP	HOSE COMPRESSION
5	CYLINDER HEAT PUMP FLOW	32MM OD	COMPRESSION
6	CYLINDER HEAT PUMP RETURN	9MM ID	COMPRESSION
7	ZONE 1 FLOW	28MM	COMPRESSION
8	ZONE 1 RETURN	28MM	COMPRESSION



Notes:

- Note 1. The heat pump must be installed on a secure level base capable of supporting its weight.
- Note 2. Refer to the installation manual for condensate and pressure relief discharge requirements.
- Note 3. A particle filter can be supplied as an option and it's recommended that a magnetic filter is installed. Pre-plumbed cylinders are supplied complete with a combined magnetic and particle filter.
- Note 4. Anti-freeze valves are required if glycol is not used in the system.
- Note 5. Install an auto-bypass if no permanent open circuit is available to allow pump overrun and normal operation. Ensuring the pump is not running when the system is not required.
- Note 6. If minimum flow system water volume cannot be met, a volumiser or buffer vessel is required.
- Note 7. Refer to the installation manual for thermostat connection.
- Note 8. Flow, return and outdoor sensors are integrated within the outdoor unit.

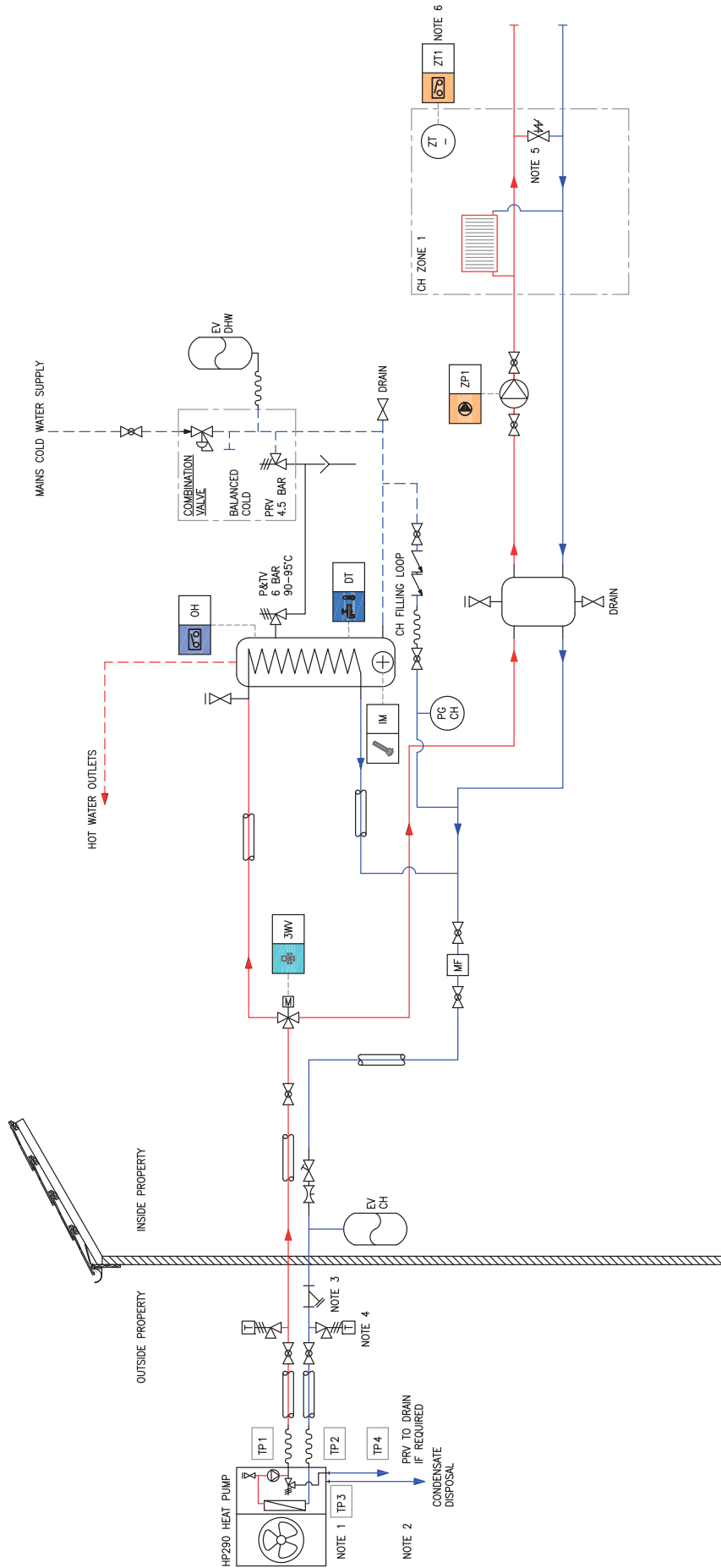
This drawing is for information and guidance only, it is the heating designer/installers responsibility to adhere to the latest relevant standards.

Refer to HP290 heat pump system installation and maintenance manual in conjunction with these schematic drawings.

1.1.4 HP290 + Standard Non Pre-plumbed Heat Pump Cylinder + Buffer with Single Zone

HP290 + Standard Non Pre-plumbed Heat Pump Cylinder + Buffer with Single Zone.

CONNECTION POINT LIST				
TP No	DESCRIPTION	SIZE	4.5-6kW	8-14kW
1	HEAT PUMP FLOW	1" BSP	1/4" BSP	BRASS
2	HEAT PUMP RETURN	1" BSP	1/4" BSP	BRASS
3	HEAT PUMP CONDENSATE DISPOSAL	32MM OD	32MM OD	PLASTIC
4	PRESSURE RELIEF VALVE (PRV)	9MM ID	9MM ID	PVC

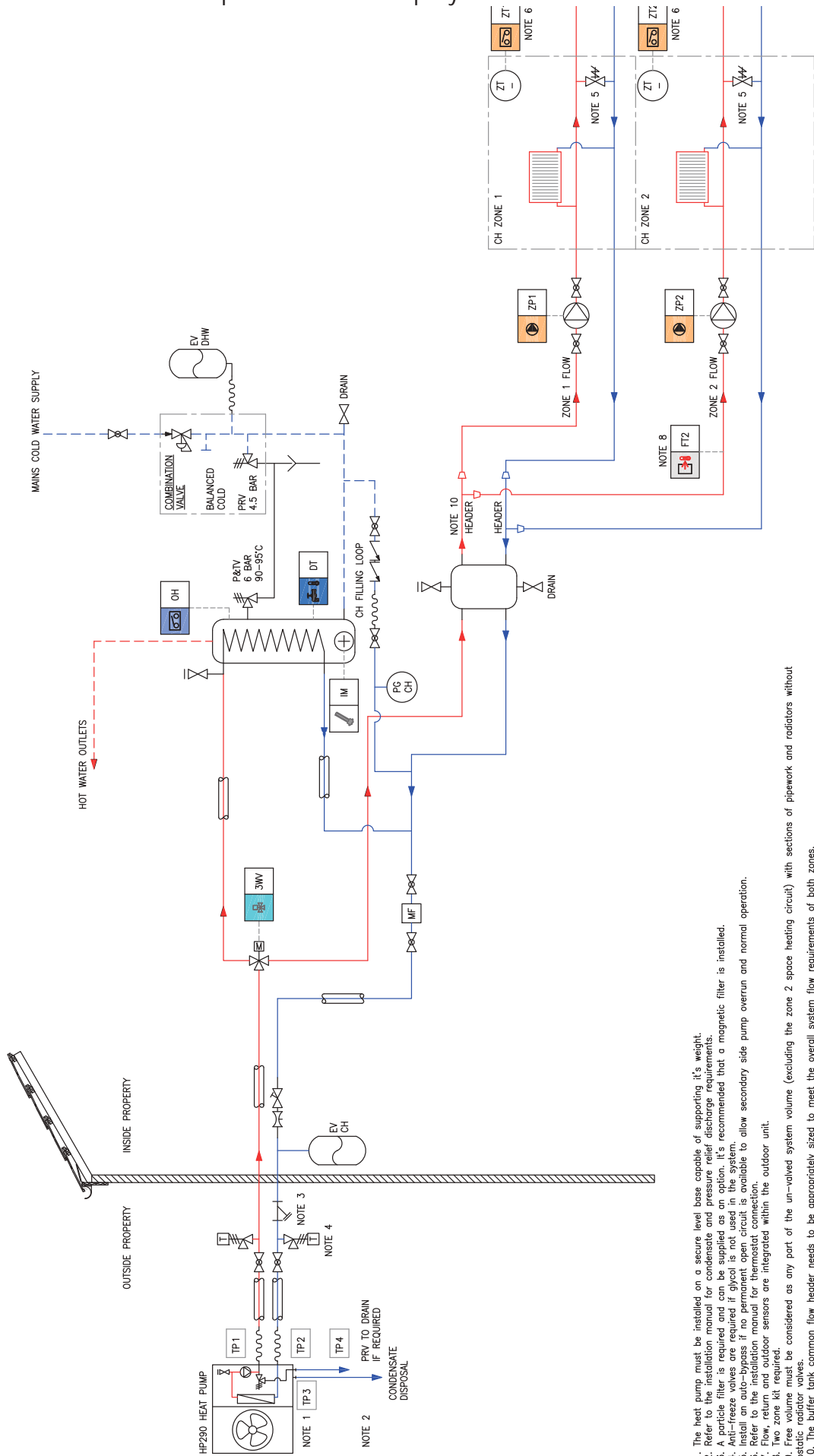


- Notes:**
- Note 1. The heat pump must be installed on a secure level base capable of supporting it's weight.
 - Note 2. Refer to the installation manual for condensate and pressure relief discharge requirements.
 - Note 3. A particle filter is required on the supply as an installation is recommended that a magnetic filter is installed.
 - Note 4. An air flow valve is required on the supply as an installation is recommended that a magnetic filter is installed.
 - Note 5. Install an auto-bypass if no permanent open circuit is available to allow secondary side pump overrun and normal operation.
 - Note 6. Refer to the installation manual for thermostat connection.
 - Note 7. Flow, return and outdoor sensors are integrated within the outdoor unit.
- This drawing is for information and guidance only, it is the heating designer/installers responsibility to adhere to the latest relevant standards.
- Refer to HP290 heat pump system installation and maintenance manual in conjunction with these schematic drawings.

1.1.5 HP290 + Standard Non Pre-plumbed Heat Pump Cylinder + Buffer with Two Zones

HP290 + Standard Non Pre-plumbed Heat Pump Cylinder + Buffer with Two Zones.

CONNECTION POINT LIST			
TP No	DESCRIPTION	SIZE	TYPE
1	HEAT PUMP FLOW	8-14kW	BSP MALE
2	HEAT PUMP RETURN	1" BSP	BSP MALE
3	HEAT PUMP CONDENSATE DISPOSAL	32MM OD	BARBED SPIGOT
4	PRESSURE RELIEF VALVE (PRV)	9MM ID	HOSE



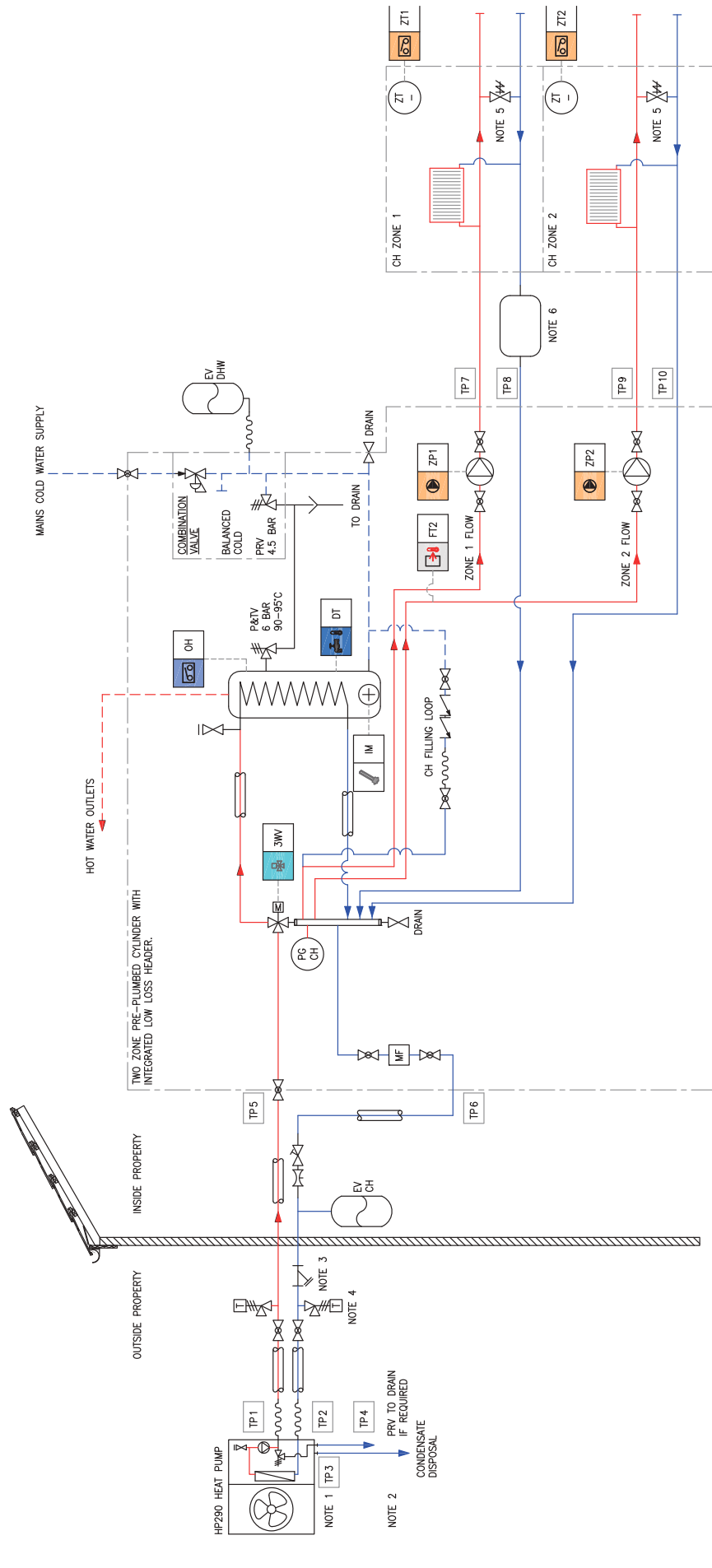
NOTES:

- Note 1. The heat pump must be installed on a secure level base capable of supporting its weight.
 - Note 2. Refer to the installation manual for condensate and pressure relief discharge requirements.
 - Note 3. A particle filter is required and can be supplied as an option. It is recommended that a magnetic filter is installed.
 - Note 4. Anti-freeze valves are required if glycol is not used in the system.
 - Note 5. Install an auto-bypass if no permanent open circuit is available to allow secondary side pump overrun and normal operation.
 - Note 6. Refer to the installation manual for thermostat connection.
 - Note 7. Two zone kit required.
 - Note 8. Free volume must be considered as any part of the un-valved system volume (excluding the zone 2 space heating circuit) with sections of pipework and radiators without thermostatic radiator valves.
 - Note 9. The buffer tank common flow header needs to be appropriately sized to meet the overall system flow requirements of both zones.
 - Note 10. Make sure both zones are balanced.
- This drawing is for information and guidance only. It is the heating designer/installer's responsibility to adhere to the latest relevant standards. Refer to HP290 heat pump system installation and maintenance manual in conjunction with these schematic drawings.

1.1.7 HP290 + Two Zone Pre-plumbed Cylinder with Integrated Low Loss Header.

HP290 + Two Zone Pre-plumbed Cylinder with Integrated Low Loss Header.

CONNECTION POINT LIST			
TP No	DESCRIPTION	SIZE	TYPE
1	HEAT PUMP FLOW	8-14kW	BSP MALE
2	HEAT PUMP RETURN	1.1/4" BSP	BSP MALE
3	HEAT PUMP CONDENSATE DISPOSAL	1.1/4" BSP	BARBED SPIGOT
4	PRESSURE RELIEF VALVE (PRV)	32MM OD	HOSE
5	CYLINDER HEAT PUMP FLOW	9MM ID	COMPRESSION
6	CYLINDER HEAT PUMP RETURN	28MM	COMPRESSION
7	ZONE 1 FLOW	28MM	COMPRESSION
8	ZONE 1 RETURN	28MM	COMPRESSION
9	ZONE 2 FLOW	28MM	COMPRESSION
10	ZONE 2 RETURN	28MM	COMPRESSION

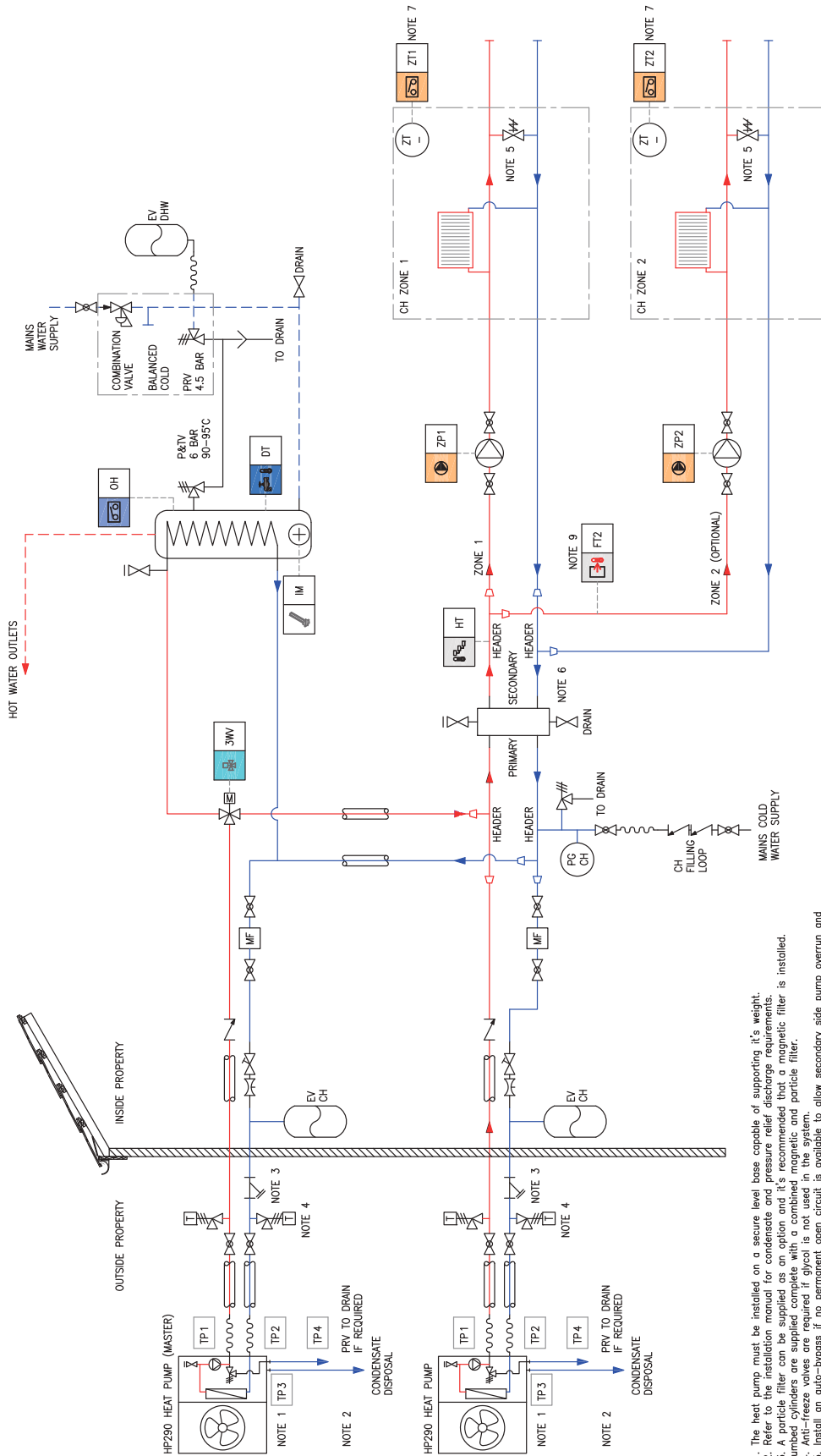


- Notes.**
- The heat pump must be installed on a secure level base capable of supporting its weight.
 - Refer the installation manual for condensate disposal requirements.
 - A particle filter can be supplied as an option and it is recommended that a magnetic filter is installed. Pre-plumbed cylinders are supplied complete with a combined magnetic and particle filter.
 - Anti-freeze valves are required if glycol is not used in the system.
 - Install an auto-bypass if no permanent open circuit is available to allow secondary side pump overrun and normal operation.
 - If minimum free system water volume cannot be met, a volumiser or buffer vessel is required.
 - Refer to the installation manual for thermostat connection.
 - Flow, return and outdoor sensors are integrated within the outdoor unit.
 - Free volume must be considered as any part of the un-valved system volume (excluding the zone 2 space heating circuit) with sections of pipework and radiators without thermostatic radiator valves.
- This drawing is for information and guidance only. It is the heating designer/installers responsibility to adhere to the latest relevant standards.
Refer to HP290 heat pump system installation and maintenance manual in conjunction with these schematic drawings.

HP290 Cascade + 3rd Party DHW Cylinder + Decoupler with 2 Zones.

1.1.8 HP290 Cascade + 3rd Party DHW Cylinder + Decoupler with 2 Zones

CONNECTION POINT LIST			
TP No	DESCRIPTION	SIZE	TYPE
1	HEAT PUMP FLOW	8-14MM	BSP MALE
2	HEAT PUMP RETURN	1.1/4" BSP	BSP MALE
3	HEAT PUMP CONDENSATE DISPOSAL	1.1/4" BSP	BSP MALE
4	PRESSURE RELIEF VALVE (PRV)	32MM OD	BARBED SPRIGOT

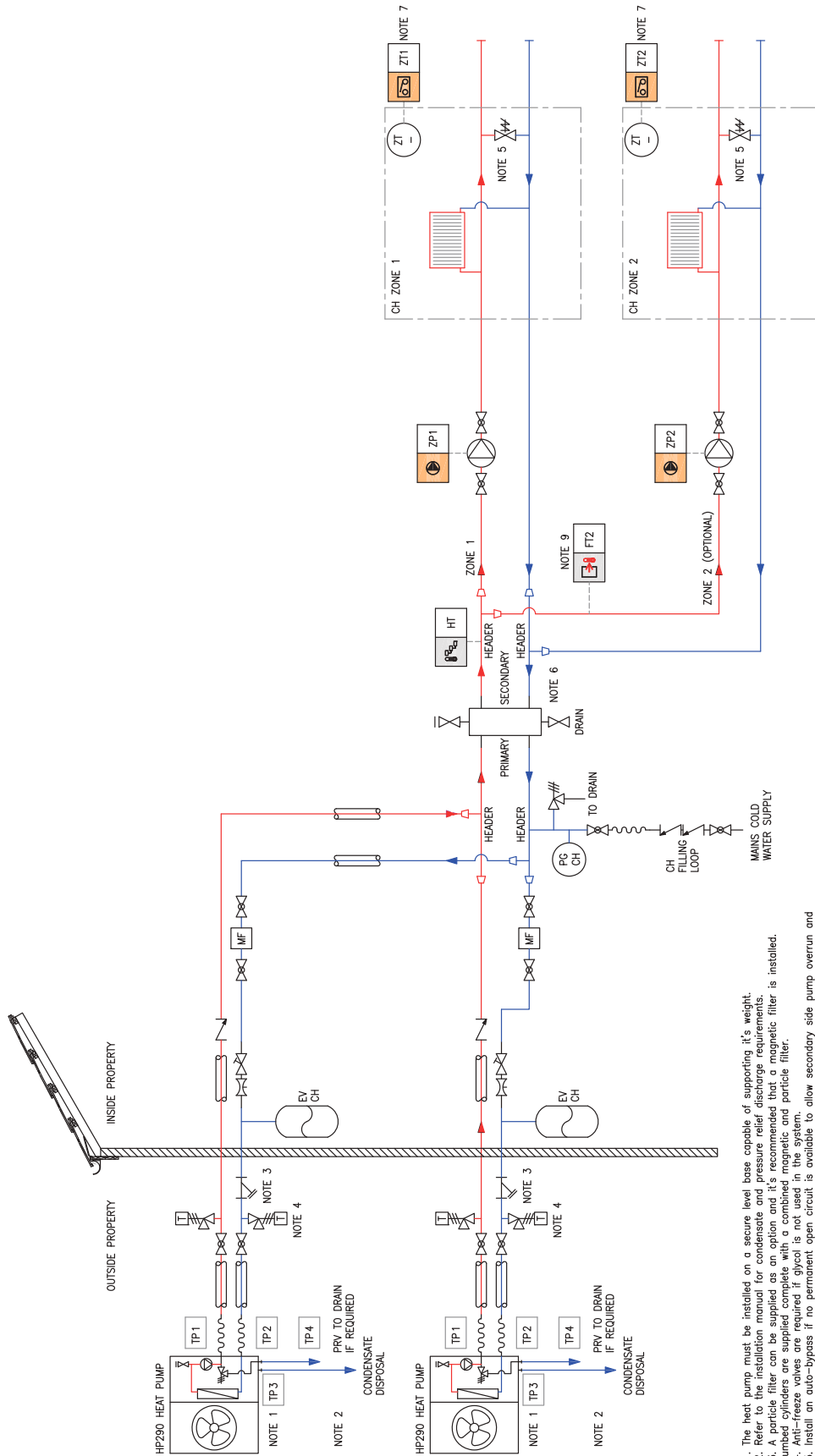


- Notes:**
- Note 1. The heat pump must be installed on a secure level base capable of supporting its weight.
 - Note 2. Refer to installation manual for condensate and pressure relief discharge requirements.
 - Note 3. A certified filter (see appropriate section) is recommended for all mains water supply. A magnetic filter is installed. Plumbed cylinders are supplied with combined magnetic and particle filter.
 - Note 4. Anti-freeze valves are required if glycol is not used in the system.
 - Note 5. Install an auto-bypass if no permanent open circuit is available to allow secondary side pump overrun and normal operation.
 - Note 6. Low loss separator (Hydraulic decoupler).
 - Note 7. Refer to the installation manual for thermostat connection.
 - Note 8. Flow, return and outdoor sensors are integrated within the outdoor unit.
 - Note 9. Two zone kit required.
 - Note 10. Free volume must be considered as any part of the un-valved system volume (excluding the zone 2 space heating circuit) with sections of pipework and radiators without thermostatic radiator valves.
- This drawing is for information and guidance only. It is the heating designer/ installers responsibility to adhere to the latest relevant standards.
- Refer to HP290 heat pump system installation and maintenance manual in conjunction with these schematic drawings.

1.1.9 HP290 Heat Only Cascade + Decoupler with Two Zones

HP290 Heat Only Cascade + Decoupler with 2 Zones.

CONNECTION POINT LIST			
TP No	DESCRIPTION	SIZE	TYPE
1	HEAT PUMP FLOW	8-14kW	TYPE
2	HEAT PUMP RETURN	1. 1/4" BSP	BSP MALE
3	HEAT PUMP CONDENSATE DISPOSAL	1. 1/4" BSP	BSP MALE
4	PRESSURE RELIEF VALVE (PRV)	32MM OD	BARBED SPIGOT
		9MM ID	HOSE



- Notes:**
- Note 1. The heat pump must be installed on a secure level base capable of supporting its weight.
 - Note 2. Refer to the installation manual for condensate and pressure relief discharge requirements.
 - Note 3. A particle filter can be supplied as an option and it's recommended that a magnetic filter is installed. Pre-plumbed cylinders are supplied complete with a combined magnetic and particle filter.
 - Note 4. Anti-freeze valves are required if glycol is not used in the system.
 - Note 5. Install an auto-bypass if no permanent open circuit is available to allow secondary side pump overrun and normal operation.
 - Note 6. Low loss separator (Hydraulic decoupler).
 - Note 7. Refer to the installation manual for thermostat connection.
 - Note 8. Flow, return and outdoor sensors are integrated within the outdoor unit.
 - Note 9. Two zone kit required.
 - Note 10. Free volume must be considered as any part of the un-valved system volume (excluding the zone 2 space heating circuit) with sections of pipework and radiators without thermostatic radiator valves.
- This drawing is for information and guidance only. It is the heating designer/ installers responsibility to adhere to the latest relevant standards.
- Refer to HP290 heat pump system installation and maintenance manual in conjunction with these schematic drawings.

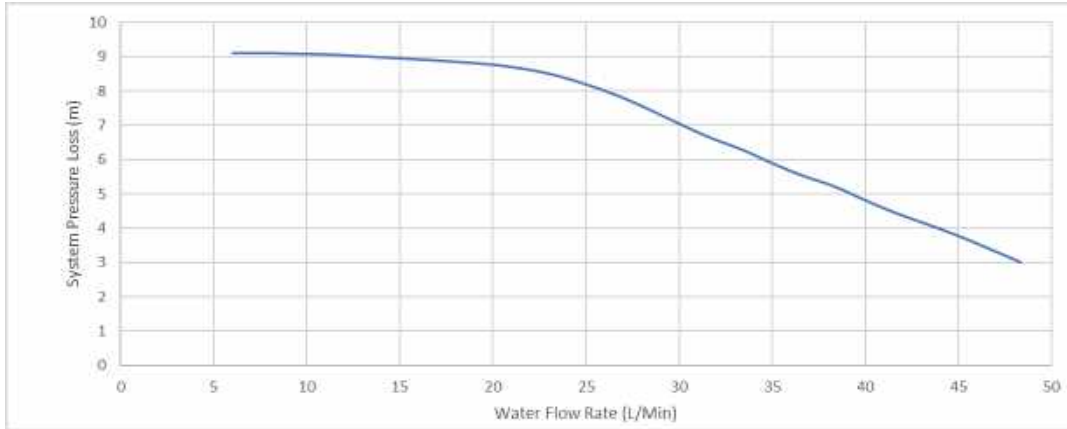
1.2 PUMP PRESSURE CURVES

Glycol has a higher viscosity than water. If admixtures of glycol are used, the pumping data of the circulation pump must be corrected to match the mixing ratio.

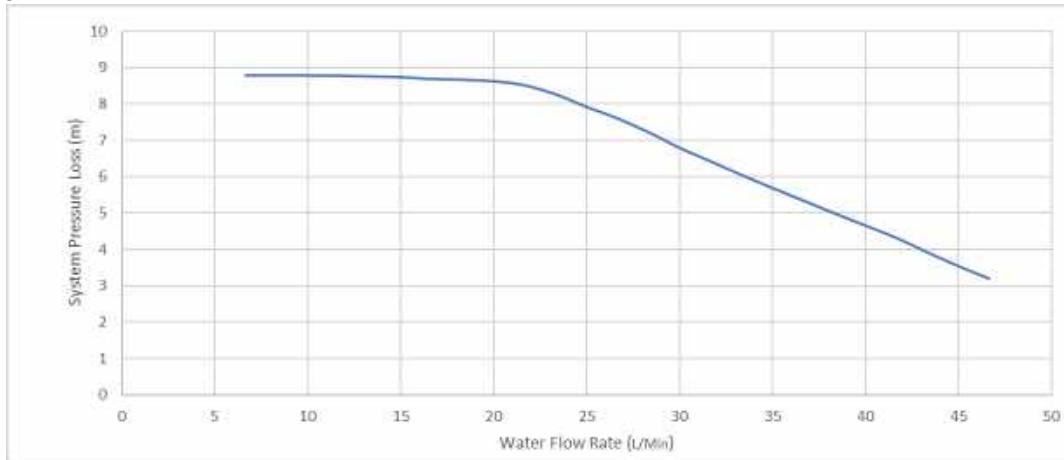
1.2.1 Heat Pump Remaining Pump Head (after appliance losses)

Heat Pump Model	kW	4.5	6	8	10	12	14
Design flow rate	L/min	12.8	15.2	23.0	30.7	33.4	35.3
Remaining Pump Head	m	9.0	9.0	8.2	6.9	6.4	6.1

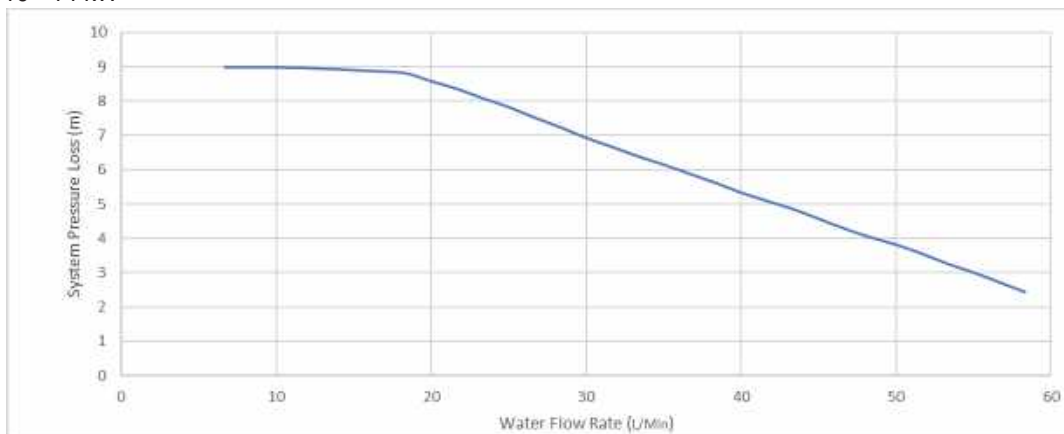
4.5 - 6 kW



8 kW



10 - 14 kW

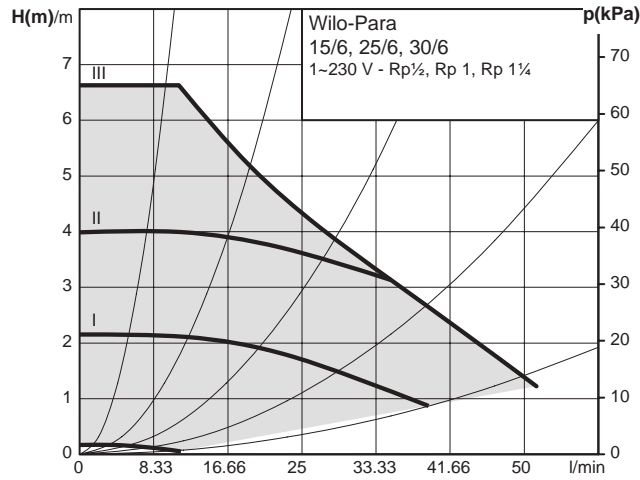


Appendix

1.2.2 Ideal Heat Pump Magnetic Filter and Strainer Losses (HP290 Pre-Plumbed Cylinders)

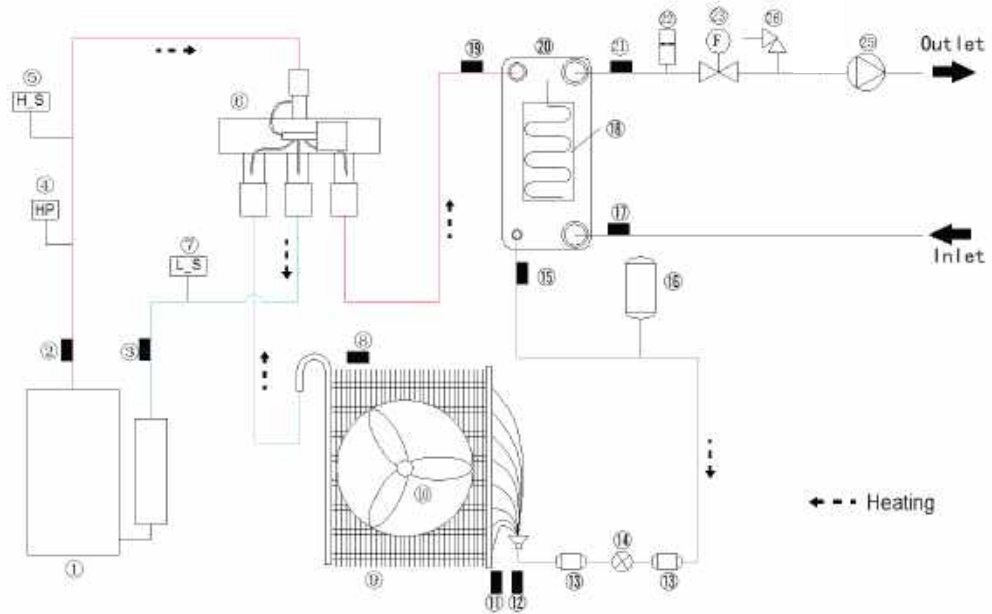
Heat Pump Model	kW	4.5	6	8	10	12	14
Design flow rate	L/min	12.8	15.2	23.0	30.7	33.4	35.3
Ideal Heat Pump Magnetic Filter and Strainer Losses	m	0.09	0.13	0.30	0.53	0.63	0.70

1.2.3 Central Heating Zone Pump Curves (HP290 Pre-Plumbed Cylinders)

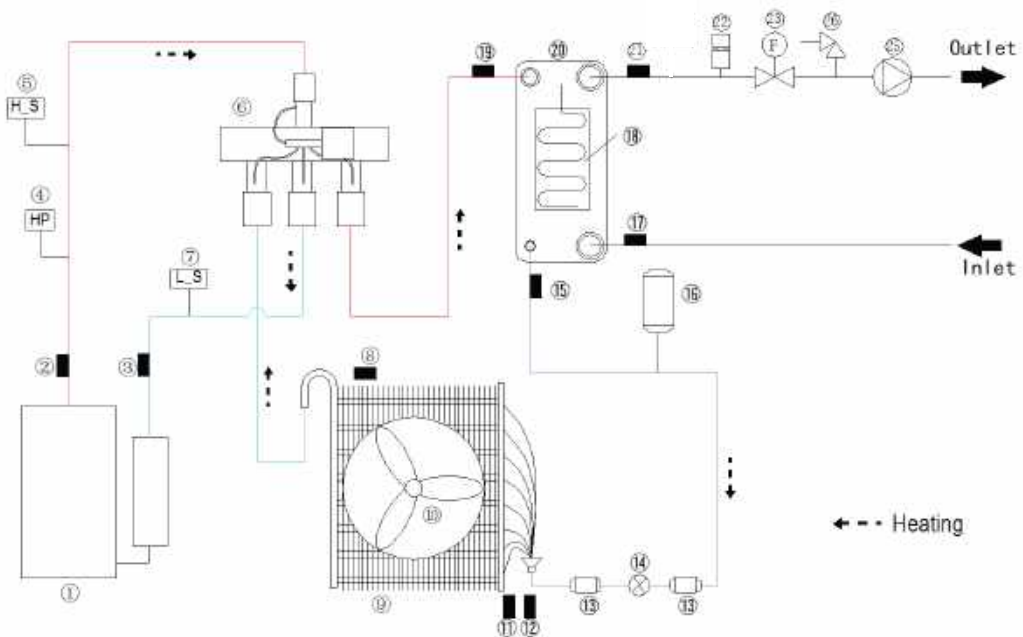


1.2.4 Refrigerant Circuit

4.5 kw - 6 kw



8 kw - 14 kw



- | | |
|--|--|
| 1. Compressor | 14. Electronic expansion valve (EEV) |
| 2. Temperature sensor (Compressor discharge) | 15. Temperature sensor (Plate heat exchanger refrigerant inlet) |
| 3. Temperature sensor (Compressor suction) | 16. Liquid receiver |
| 4. High pressure switch | 17. Temperature sensor (Inlet water) |
| 5. High pressure sensor | 18. Heating tape of Plate heat exchanger |
| 6. 4-way valve | 19. Temperature sensor (Plate heat exchanger refrigerant outlet) |
| 7. Low pressure sensor | 20. Plate heat exchanger |
| 8. Temperature sensor (Outdoor air) | 21. Temperature sensor (Outlet water) |
| 9. Finned tube Heat exchanger | 22. Automatic air vent |
| 10. Fan | 23. Water flow switch |
| 11. Temperature sensor (Heat exchanger) | 24. <i>Item removed</i> |
| 12. Temperature sensor (Heat exchanger outlet refrigerant) | 25. Water pump |
| 13. Filter | 26. Pressure relief valve |

1.3 R290 OUTDOOR UNIT WIRING WITHOUT INDOOR UNIT

If the outdoor unit is to be installed without using the associated Ideal R290 DHW Cylinder or the Ideal R290 Control box, then the system should be wired as follows.

Note 1: The DHW Immersion Heater must be powered via a contactor, as otherwise the PCB contacts will become welded shut.

Note 2: CH1 and CH2 Pumps must be powered via separate relays, as otherwise the PCB contacts will become welded shut.

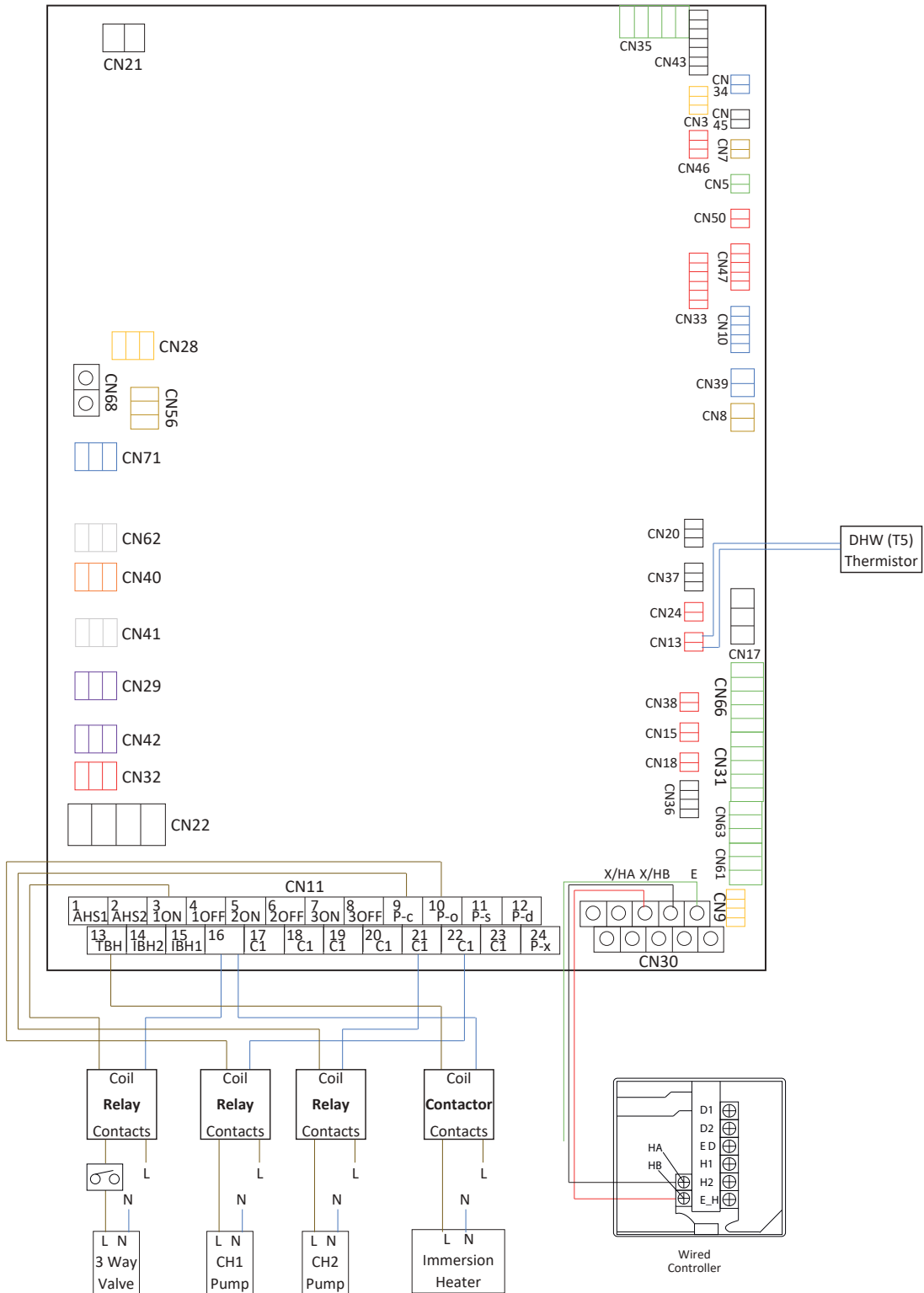


Figure 69. R290 Outdoor unit wiring diagram

1.3.1 R290 Outdoor Unit Thermostat Wiring

Single Zone Room Thermostat Wiring

For a single zone connection, wire Com to Com, and HT on the HP290 ODU to NO on the room stat. Once wiring is complete, commission the heat pump following the steps in section 5.5.2 onwards.

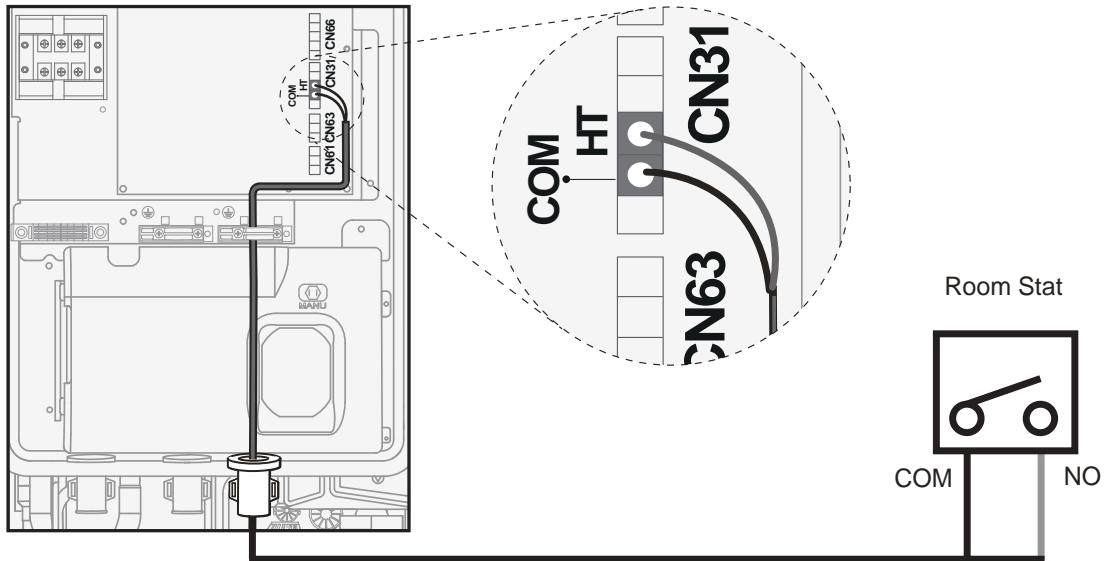


Figure 70. Single zone room thermostat wiring

Two Zone Room Thermostat Wiring

For a two-zone connection, wire Com to Com, HT on the HP290 ODU to NO on the room stat (Zone 1), and CL on the HP290 ODU to NO on the room stat (Zone 2). Once wiring is complete, commission the heat pump following the steps in section 5.5.2 onwards.

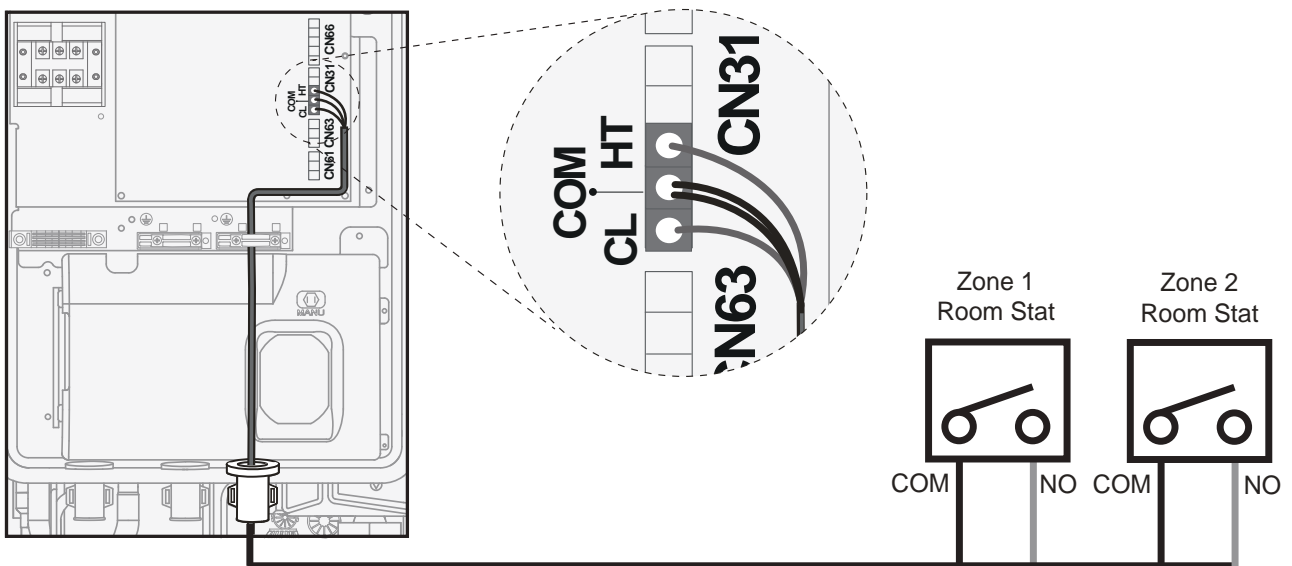


Figure 71. Two zone room thermostat wiring

1.3.2 Schedule

Schedule	
Zone1 daily timer	ON >
Zone2 daily timer	ON >
DHW daily timer	OFF >
Zone1 weekly schedule	ON >



Schedule	
Zone 2 weekly schedule	ON
DHW weekly schedule	ON >
Holiday away	OFF >
Holiday home	ON >

To set a schedule for central heating Zone 1 where the operating times and temperatures are **the same for each day of the week** then select **Zone 1 daily timer** (refer to Appendix 1.3.3).

To set a schedule for central heating Zone 2 where the operating times and temperature are **the same for each day of the week** then select **Zone 2 daily timer** (refer to Appendix 1.3.3).

To set a schedule for DHW where the operating times and temperatures are the same for each day of the week then select **DHW daily timer** (refer to section 5.8.2).

To set a schedule for central heating Zone 1 where the operating times and temperatures are **different across the week** then select **Zone 1 weekly schedule** (refer to Appendix 1.3.4).

To set a schedule for central heating Zone 2 where the operating times and temperatures are **different across the week** then select **Zone 2 weekly schedule** (refer to Appendix 1.3.4).

To set a schedule for DHW where the operating times and temperatures are different across the week select **DHW weekly schedule**.

To set the day the householder is going away on holiday select **Holiday away** (refer to Appendix 1.3.5).

To select the day the householder is returning from holiday select **Holiday home** (refer to Appendix 1.3.6).

1.3.3 Schedule, Zone 1 / Zone 2 daily timer

To change the setting:

To set the option to OFF, press O.

To set the option to ON, press O.

⌚ Zone 1 daily timer				
No.	Time	Mode	Temp.	
01	01:00	☀	26,5°C	<input type="checkbox"/>
02	20:00	☀	26,5°C	<input type="checkbox"/>
03	00:30	☀	26,5°C	<input checked="" type="checkbox"/>
04	00:30	☀	26,5°C	<input checked="" type="checkbox"/>

ⓘ **IMPORTANT: For ON periods heat will be provided using a flow temperature calculated from measured outside temperature.**

ⓘ **IMPORTANT: For OFF periods no heat will be provided, therefore ON periods should be set allowing sufficient time (multiple hours) for the correct room.**

The first column shows the order of events.

The second column is the times that the events will occur.

The third column shows if the heat demand is ON or OFF. The Heat demand should only be ON for this application.

The temperature in the fourth column cannot be changed.

The fifth column shows if the event is ON or OFF.

The temperature in the fourth column cannot be changed (it is set automatically based on the outdoor temperature).

The fifth column shows if the event is ON or OFF.

To scroll through the options select ∨, ∩, > and <.

To select an option select O.

To change a setting select ∨ or ∩.

1.3.4 Schedule, Zone 1/ Zone 2 weekly schedule

Zone 1 weekly schedule	
Schedule 1	ON >
Schedule 2	ON >
Schedule 3	OFF >
Schedule 4	ON >

To scroll through the options, press \downarrow , \uparrow , \rightarrow and \leftarrow .
To select an option, press O. (refer to Appendix).

1.3.4.1 Schedule, Zone 1/Zone 2 weekly schedule

To change the setting:
To set the option to OFF, press O.
To set the option to ON, press O.

📅 Zone 1 weekly schedule	
Weekly schedule	<input checked="" type="checkbox"/>
Day	Sun, Mon, Tue, Wed, Thu, Fri, Sat >
Command	>

To scroll through the options, press \downarrow , \uparrow , \rightarrow and \leftarrow .

To enable/disable the schedule, press O when **Weekly schedule** is illuminated.

To select **Day** (refer to Appendix 1.3.4.2) or **Command** (refer to 1.3.4.3) press O, when they are illuminated.

1.3.4.2 Schedule, Zone 1/Zone 2 weekly schedule

📅 Zone 1 weekly schedule	
Sunday	<input checked="" type="checkbox"/>
Monday	<input type="checkbox"/>
Tuesday	<input type="checkbox"/>
Wednesday	<input type="checkbox"/>

To scroll through the options, press \downarrow and \uparrow .
To enable or disable a day, press O.

1.3.4.3 Schedule, Zone 1/Zone 2 weekly schedule

Zone 1 weekly schedule	
Schedule 1	ON >
Schedule 2	ON >
Schedule 3	OFF >
Schedule 4	ON >

① **NOTE:** For ON periods heat will be provided using a flow temperature calculated from measured outside temperature.

① **IMPORTANT:** For OFF periods no heat will be provided, therefore ON periods should be set allowing sufficient time (multiple hours) for the correct room temperature .

The first column shows the order in which the events will happen.

The second column is the time at which the events will happen.

The third column shows if the heat demand is ON, or OFF, it should only be ON for this application (☀️).

The temperature in the fourth column cannot be changed (it is set automatically based on the outdoor temperature).

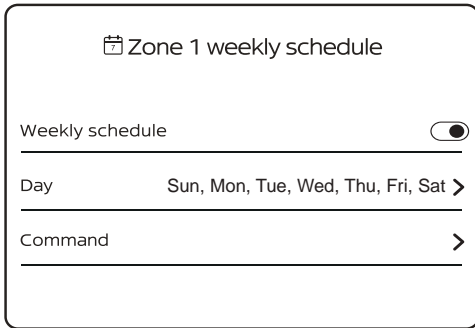
The fifth column shows if the event is ON or OFF.

To scroll through the options press \downarrow , \uparrow , \rightarrow and \leftarrow .

To select an option, press O.

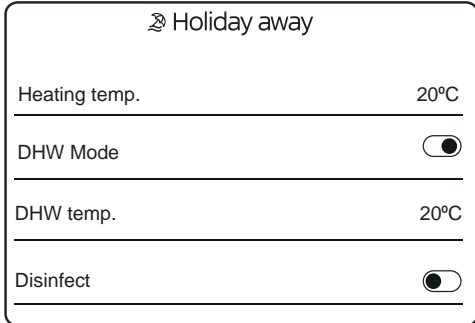
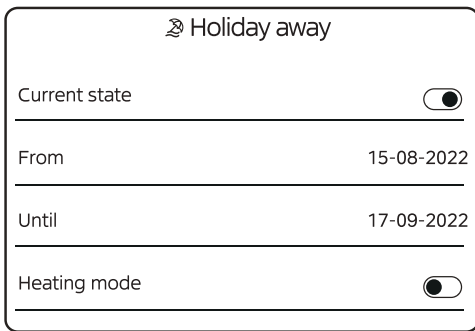
To change a setting, press \downarrow or \uparrow .

1.3.5 Schedule, Holiday away



Press O to view the Holiday away screens (refer to Appendix 1.3.5.1).

1.3.5.1 Schedule, Holiday away



To scroll through the the options, press \vee and \wedge .

To enable/disable the holiday function, press O when **Current state** is illuminated.

To set the holiday start date, press O when **From** is illuminated. Then use \vee and \wedge to change the date.

To set the holiday end date, press O when **Until** is illuminated. Then use \vee and \wedge to change the date.

To enable/disable central heating during the holiday period, press O when **Heating mode** is illuminated.

To set the central heating temperature during the holiday period, press \vee and \wedge when **Heating temp.** is illuminated.

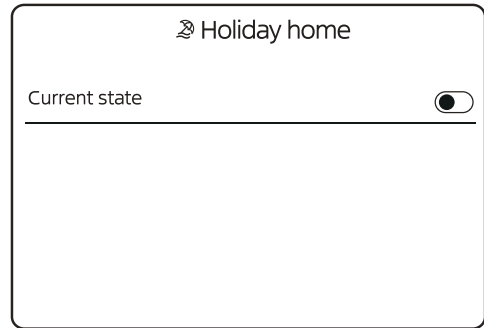
To enable/disable hot water during the holiday period, press O when **DHW Mode** is illuminated.

To set the DHW temperature during the holiday period, press and when **DHW temp.** is illuminated.

To enable/disable the anti-legionella function during the holiday period, press O when **Disinfect** is illuminated.

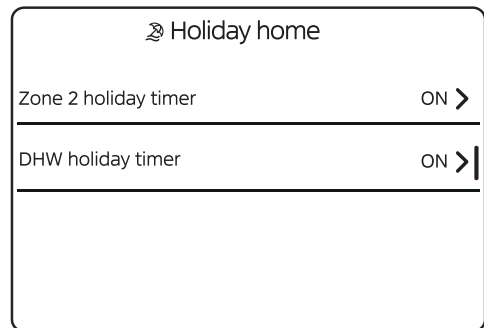
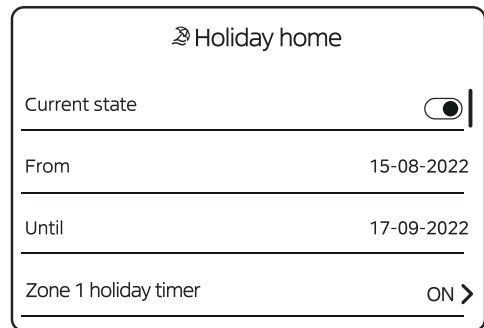
The next screen is shown when the holiday function is enabled/disabled.

1.3.6 Schedule, Holiday home



The intention of the Holiday home function is that is someone has a holiday where they do not go to work, but stay at home instead then they can set different operating conditions for their central heating and hot water for this period.

Press O to view the Holiday home screens (refer to Appendix 1.3.6.1.1).



To scroll through the the options, press \vee and \wedge .

To enable/disable the Holiday home function, press O when **Current state** is illuminated.

To set the Holiday home start date, press O when **From** is illuminated. Then use \vee and \wedge to change the date.

To set the Holiday home end date, press O when **Until** is illuminated. Then use \vee and \wedge to change the date.

To set central heating Zone 1 timer during Holiday home period press, O when **Zone 1 holiday timer** is illuminated (refer to Appendix 1.3.6.1.1).

To set central heating Zone 2 timer during Holiday home period, press O when **Zone 2 holiday timer** is illuminated (refer to Appendix 1.3.6.1.1).

To set hot water timer during Holiday home period, press O when **DHW holiday timer** is illuminated (refer to Appendix 1.3.6.1.1).

☰ Zone 1 holiday timer				
No.	Time	Mode	Temp.	
01	01:00	☀	26,5°C	<input type="checkbox"/>
02	20:00	☀	26,5°C	<input type="checkbox"/>
03	00:30	☀	26,5°C	<input checked="" type="checkbox"/>
04	00:30	☀	26,5°C	<input checked="" type="checkbox"/>

ⓘ **NOTE: For ON periods heat will be provided using a flow temperature calculated from measured outside temperature.**

ⓘ **NOTE: For OFF periods no heat will be provided, therefore ON periods should be set allowing sufficient time (multiple hours) for the correct room temperature.**

The first column shows the order in which the events will happen.

The second column is the time at which the events will happen.

The third column shows if the heat demand is ON, or OFF, it should only be ON for this application (☀).

The temperature in the fourth column cannot be changed (it is set automatically based on the outdoor temperature)

The fifth column shows if the event is ON or OFF.

To scroll through the options press \vee , \wedge , \rangle and \langle .

To select an option, press O.

To change a setting, press \vee or \wedge .

1.3.6.1.1 Schedule, Holiday home: DHW holiday timer

☰ DHW holiday timer				
No.	Time	Mode	Temp.	
01	01:00	ON	55°C	<input type="checkbox"/>
02	20:00	OFF	55°C	<input type="checkbox"/>
03	00:30	ON	55°C	<input checked="" type="checkbox"/>
04	00:30	ON	60°C	<input checked="" type="checkbox"/>

ⓘ **NOTE: For ON periods heat will be provided using a flow temperature calculated from measured outside temperature.**

ⓘ **NOTE: For OFF periods no heat will be provided, therefore ON periods should be set allowing sufficient time (multiple hours) for the correct hot water temperature.**

The first column shows the order in which the events will happen.

The second column is the time at which the events will happen.

The third column shows if the heat demand is ON, or OFF, it should only be ON for this application (☀).

The fourth column is the target hot water temperature.

The fifth column shows if the event is ON or OFF.

To scroll through the options press \vee , \wedge , \rangle and \langle .

To select an option press O.

To change a setting press \vee or \wedge .

1.4 HP290 CASCADE WIRING

Make sure that all heat pump outdoor units that are in cascade are the same kW output.

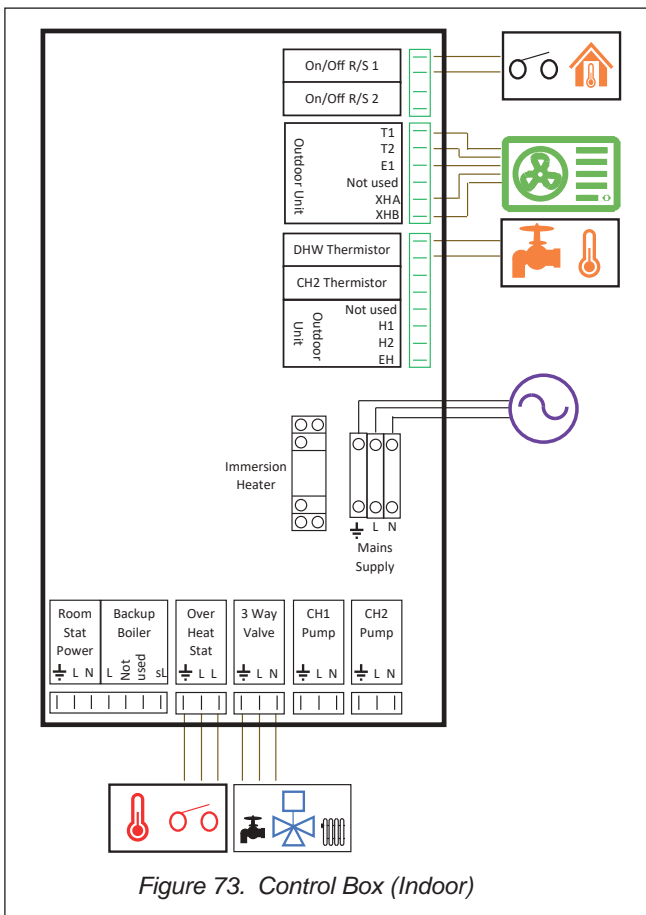


Figure 73. Control Box (Indoor)

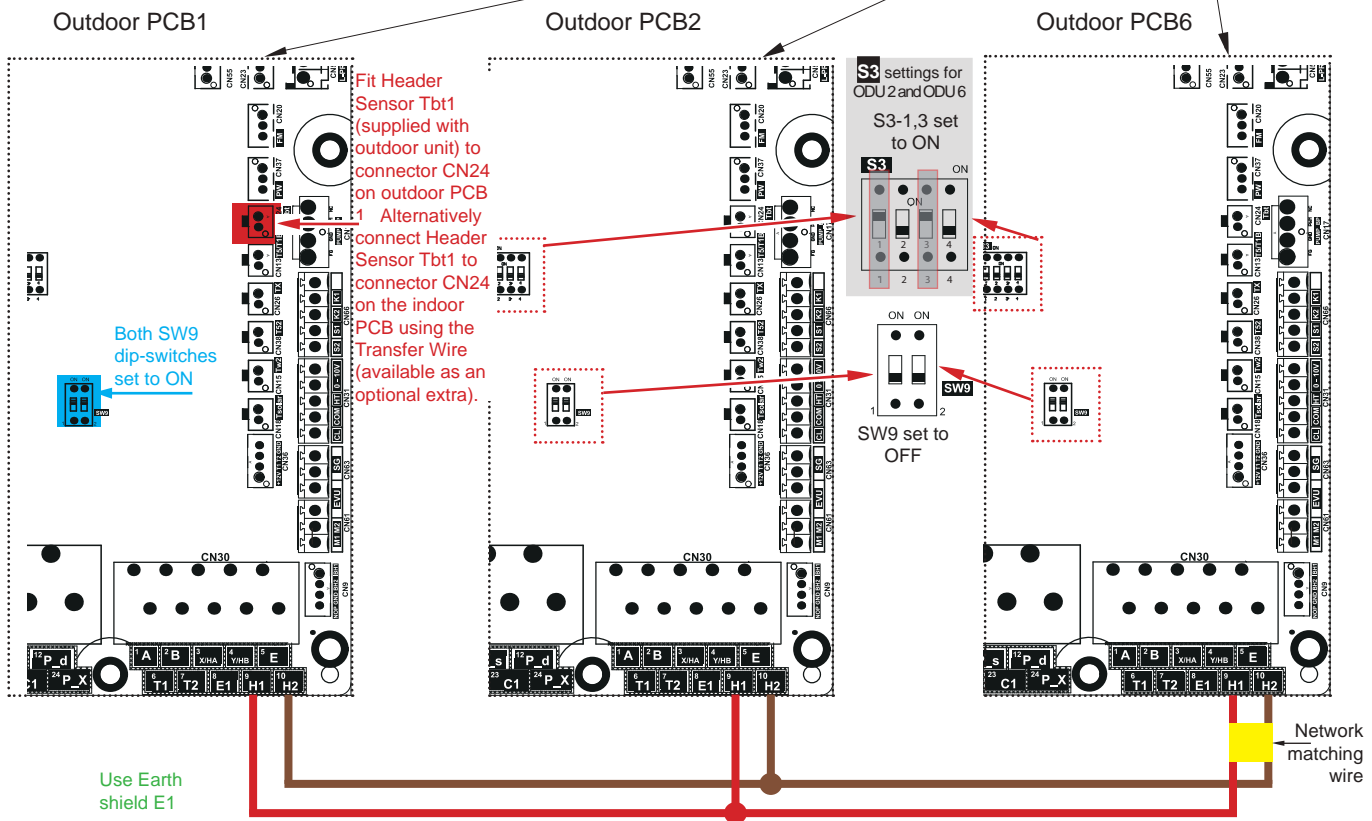
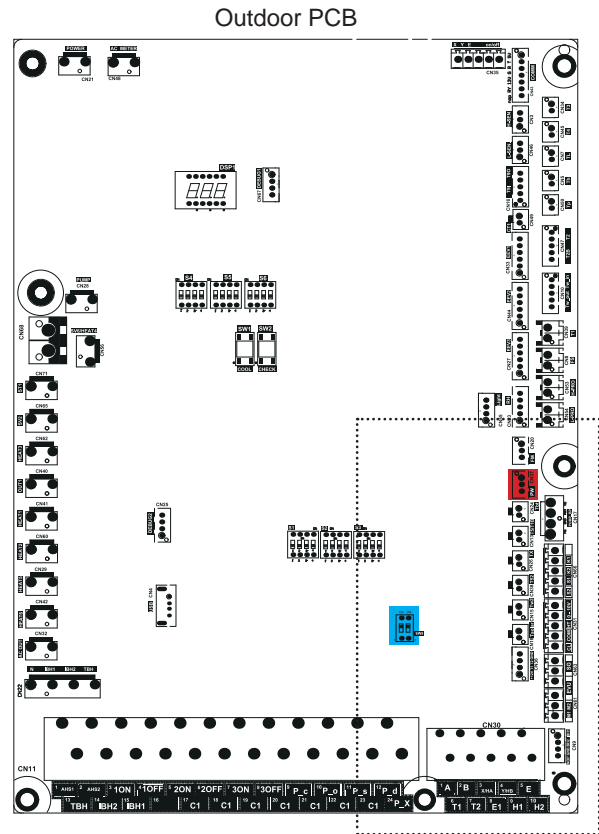
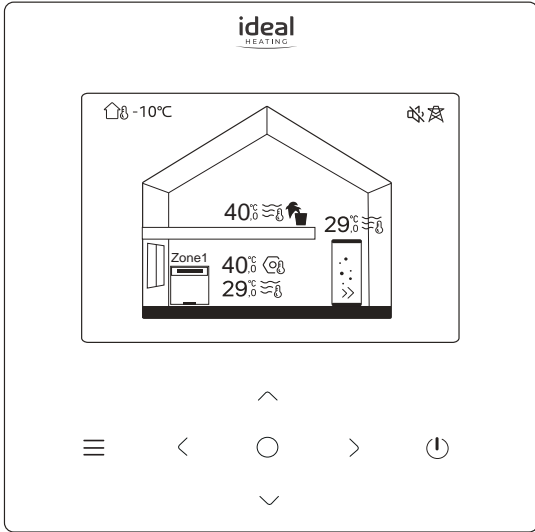


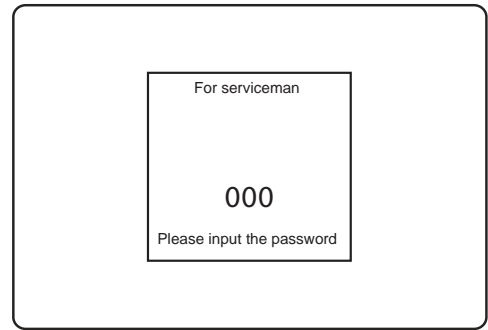
Figure 72. HP290 Cascade wiring diagram

Appendix

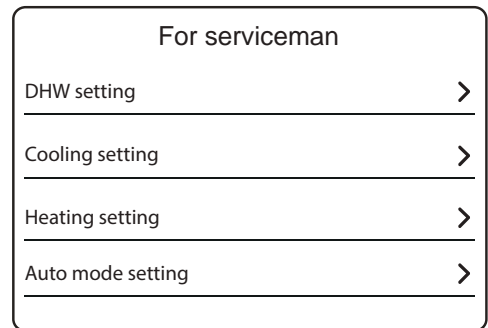
Enable Cascade Header Thermistor (Tbt), using the indoor control box user interface from the homescreen as follows:-



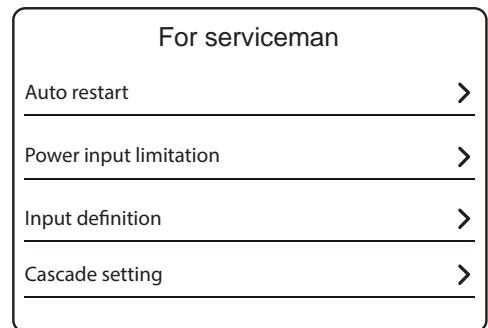
Press > and ≡ together for 3 seconds.



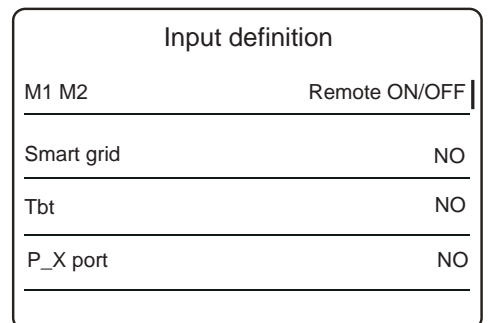
Enter the password (234)



Scroll down to **Input definition**



Press O.



Change setting to YES.



The Benchmark for installers app is available to download from the App Store or Google Play Store or can be completed online



SCAN
for link



Benchmark Commissioning & Warranty Validation Service Record

It is a requirement that the heat pump is installed and commissioned to the manufacturers' instructions and the data fields on the commissioning checklist completed in full.

To instigate the warranty the heat pump needs to be registered with the manufacturer within one month of the installation. The warranty rests with the end-user (consumer), and they should be made aware it is ultimately their responsibility to register with the manufacturer, within the allotted time period.

It is essential that the heat pump is serviced in line with the manufacturers' recommendations, at least annually. This must be carried out by a competent, certified operative. The service details should be recorded on the Benchmark Service and Interim Heat Pump Work Record and left with the householder. Failure to comply with the manufacturers' servicing instructions and requirements will invalidate the warranty.



www.hhic.co.uk

This Commissioning Checklist is to be completed in full by the competent person who commissioned the heat pump and associated equipment as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission according to the manufacturers' instructions and complete this Benchmark Commissioning Checklist will invalidate the warranty. This does not affect the customer's statutory rights.

* All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.

© Heating and Hotwater Industry Council (HHIC)



www.hhic.org.uk
Issue date: 20.08.2020

Benchmark Checklist and Service Records

AIR TO WATER HEAT PUMP COMMISSIONING CHECKLIST

Address:											
Heat Pump make and model:											
Heat Pump serial number:											
Commissioned by (PRINT NAME):						Certified Operative Reg number (1):					
Company name:						Telephone number:					
Company email:						Company address:					
										Commissioning date:	
Heating and hot water system complies with the appropriate Building Regulations?										Yes	
DNO notification?										Yes	
Building Regulations Notification Number (if applicable) (2)											
MCS installer registration Number (if applicable)						MCS product certification number (if applicable)					
F-gas certification number (split heat pump only)											
G3 certification number (if applicable)											
Heat Pump Type (Tick)		Split		Monoblock		Peak heat loss of building kW					
Is Heat Pump Installed as part of a cascade?		Yes				Cascade Heat Pump Series				() of ()	
Heat Pump Refrigerant Type				Refrigerant weight (total)				kg			
Electrical and Hydronic Controls – SYSTEM AND HEAT PUMP (Tick the appropriate boxes)											
Time and temperature control to heating		Room thermostat and programmer/timer				Programmable Roomstat					
		Load/weather compensation				Optimum start control					
Time and temperature control to hot water		Cylinder thermostat and programmer/timer				Combined with Heat pump main controls					
Hybrid system – synchronised control of boiler and heat pump fitted										Yes	
If Yes – boiler model switching point – (Quote Tariff or Temperature Level)											
Heating zone valves (including underfloor loops)		pre-existing				Fitted				Not required	
Hot water zone valves		pre-existing				Fitted				Not required	
Thermostatic radiator valves		pre-existing				Fitted				Not required	
Outdoor Sensor		pre-existing				Fitted				Not required	
Heat Pump Safety Interlock (3)		pre-existing				Fitted				Not required	
Automatic bypass to system		pre-existing				Fitted				Not required	
Buffer Vessel Fitted		Yes		No		If yes		volume:		Litres	
Plate Heat Exchanger fitted to give hydronic separation of the heat pump circuit to the heating circuit										Yes	
Expansion vessel for heating is sized, fitted & charged in accordance with manufacturer's instructions										Yes	
Legionella protection for stored hot water provided by timed temperature control?										Yes	
Water Treatment – SYSTEM AND HEAT PUMP (Tick the appropriate boxes/Measure and Record)											
System has been cleaned and treated in accordance with BS 7593:2019 and heat pump manufacturers' instructions?										Yes	
What system cleaner was used?		Brand:				Product:					
What heating system inhibitor was used?		Brand:				Product:					
What heat pump system anti-freeze/inhibitor was used? (monoblock only)		Brand:				Product:		%		concentration	
System filter fitted in accordance with BS7593 : 2019?										Yes	
Heat Pump outdoor unit (Tick the appropriate boxes/Measure and Record)											
Is the heating system adequately frost protected and pipes insulated to prevent heat loss?										Yes	
Split only: The refrigerant circuit has been evacuated and charged in accordance with manufacturer's instructions										Yes	
The heat pump is fitted on a solid/stable surface capable of taking its weight										Yes	
The necessary heat pump defrost provision been put in place										Yes	
The heat pump fan free from obstacles and operational										Yes	
Condensate drain installed to manufacturer's instructions										Yes	
CENTRAL HEATING MODE (Tick the appropriate boxes/Measure and Record)											
The heating system has been filled and pressure tested										Yes	
Heating Flow Temperature		°C		Heating Return Temperature		°C					
System correctly balance/rebalanced										Yes	
DOMESTIC HOT WATER MODE (Tick the appropriate boxes)											
Is the heat pump connected to a hot water cylinder?		Unvented		Vented		Thermal Store		Not connected			
Hot water cylinder size		Litres		Stored hot water temperature		°C					
Hot water has been checked at all outlets		Yes		Have Thermostatic Blending Valves been fitted?		Yes		Not required			

* All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.

© Heating and Hotwater Industry Council (HHIC)



www.hhic.org.uk
Issue date: 20.08.2020

Benchmark Checklist and Service Records

ADDITIONAL SYSTEM INFORMATION (Tick the appropriate boxes/Measure and Record)											
Water flow rate setting of the heat pump at commissioning (l/min):											
Additional heat sources connected:	<input type="checkbox"/>	Gas Boiler	<input type="checkbox"/>	Oil Boiler	<input type="checkbox"/>	Electric Heater	<input type="checkbox"/>	Solar Thermal	<input type="checkbox"/>	Other:	
ALL INSTALLATIONS											
All electrical work complies with the appropriate Regulations										Yes	<input type="checkbox"/>
The heat pump and associated products have been installed and commissioned in accordance with the manufacturer's instructions										Yes	<input type="checkbox"/>
The operation of the heat pump and system controls have been demonstrated to and understood by the customer										Yes	<input type="checkbox"/>
The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer										Yes	<input type="checkbox"/>
Commissioning Engineer's signature:											
Customer's signature											
(To confirm satisfactory demonstration and receipt of manufacturers' literature)											

* All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.

© Heating and Hotwater Industry Council (HHIC)



www.hhic.org.uk
Issue date: 20.08.2020

Benchmark Checklist and Service Records

MAINS PRESSURE HOT WATER STORAGE SYSTEM COMMISSIONING CHECKLIST

This Commissioning Checklist is to be completed in full by the competent person who commissioned the storage system as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission this equipment to the manufacturer's instructions may invalidate the warranty but does not affect statutory rights.

Customer name:										Telephone number:														
Address:																								
Cylinder Make and Model																								
Cylinder Serial Number																								
Commissioned by (PRINT NAME):										Registered Operative ID Number														
Company name:										Telephone number:														
Company address:																								
										Commissioning date:														
To be completed by the customer on receipt of a Building Regulations Compliance Certificate*:																								
Building Regulations Notification Number (if applicable)																								
ALL SYSTEMS PRIMARY SETTINGS (indirect heating only)																								
Is the primary circuit a sealed or open vented system?										Sealed					Open									
What is the maximum primary flow temperature?															°C									
ALL SYSTEMS																								
What is the incoming static cold water pressure at the inlet to the system?															bar									
Has a strainer been cleaned of installation debris (if fitted)?															Yes					No				
Is the installation in a hard water area (above 200ppm)?															Yes					No				
If yes, has a water scale reducer been fitted?															Yes					No				
What type of scale reducer has been fitted?																								
What is the hot water thermostat set temperature?															°C									
What is the maximum hot water flow rate at set thermostat temperature (measured at high flow outlet)?															l/min									
Time and temperature controls have been fitted in compliance with Part L of the Building Regulations?															Yes									
Type of control system (if applicable)										Y Plan			S Plan			Other								
Is the cylinder solar (or other renewable) compatible?															Yes					No				
What is the hot water temperature at the nearest outlet?															°C									
All appropriate pipes have been insulated up to 1 metre or the point where they become concealed															Yes									
UNVENTED SYSTEMS ONLY																								
Where is the pressure reducing valve situated (if fitted)?																								
What is the pressure reducing valve setting?															bar									
Has a combined temperature and pressure relief valve and expansion valve been fitted and discharge tested?															Yes					No				
The tundish and discharge pipework have been connected and terminated to Part G of the Building Regulations															Yes									
Are all energy sources fitted with a cut out device?															Yes					No				
Has the expansion vessel or internal air space been checked?															Yes					No				
THERMAL STORES ONLY																								
What store temperature is achievable?															°C									
What is the maximum hot water temperature?															°C									
ALL INSTALLATIONS																								
The hot water system complies with the appropriate Building Regulations															Yes									
The system has been installed and commissioned in accordance with the manufacturer's instructions															Yes									
The system controls have been demonstrated to and understood by the customer															Yes									
The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer															Yes									
Commissioning Engineer's Signature																								
Customer's Signature																								
(To confirm satisfactory demonstration and receipt of manufacturer's literature)																								

*All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.



www.centralheating.co.uk

Benchmark Checklist and Service Records

SERVICE RECORD

It is recommended that your heating system is serviced regularly and that the appropriate Service Interval Record is completed.

Service provider

Before completing the appropriate Service Record below, please ensure you have carried out the service as described in the manufacturer's instructions.

Always use the manufacturer's specified spare part when replacing controls.

*A System inhibitor efficacy test is required on every annual service in accordance with the manufacturers' instructions and BS 7593. It is only acceptable to not have undertaken this if the service engineers attendance visit was in between annual services to attend a non-water facing component.

SERVICE 01		Date:	
Engineer name:			
Company name:			
Telephone No:			
Operative ID No:			
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *		Yes	N/a
Comments:			
.....			
.....			
.....			
.....			
.....			
.....			
Signature:			

SERVICE 01		Date:	
Engineer name:			
Company name:			
Telephone No:			
Operative ID No:			
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *		Yes	N/a
Comments:			
.....			
.....			
.....			
.....			
.....			
.....			
Signature:			

SERVICE 01		Date:	
Engineer name:			
Company name:			
Telephone No:			
Operative ID No:			
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *		Yes	N/a
Comments:			
.....			
.....			
.....			
.....			
.....			
.....			
Signature:			

SERVICE 01		Date:	
Engineer name:			
Company name:			
Telephone No:			
Operative ID No:			
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *		Yes	N/a
Comments:			
.....			
.....			
.....			
.....			
.....			
.....			
Signature:			

SERVICE 01		Date:	
Engineer name:			
Company name:			
Telephone No:			
Operative ID No:			
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *		Yes	N/a
Comments:			
.....			
.....			
.....			
.....			
.....			
.....			
Signature:			

SERVICE 01		Date:	
Engineer name:			
Company name:			
Telephone No:			
Operative ID No:			
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *		Yes	N/a
Comments:			
.....			
.....			
.....			
.....			
.....			
.....			
Signature:			

* All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.



Benchmark Checklist and Service Records

SERVICE RECORD

It is recommended that your heating system is serviced regularly and that the appropriate Service Interval Record is completed.

Service provider

Before completing the appropriate Service Record below, please ensure you have carried out the service as described in the manufacturer's instructions.

Always use the manufacturer's specified spare part when replacing controls.

*A System inhibitor efficacy test is required on every annual service in accordance with the manufacturers' instructions and BS 7593. It is only acceptable to not have undertaken this if the service engineers attendance visit was in between annual services to attend a non-water facing component.

SERVICE 01		Date:	
Engineer name:			
Company name:			
Telephone No:			
Operative ID No:			
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *		Yes	N/a
Comments:			
.....			
.....			
.....			
.....			
.....			
Signature:			

SERVICE 01		Date:	
Engineer name:			
Company name:			
Telephone No:			
Operative ID No:			
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *		Yes	N/a
Comments:			
.....			
.....			
.....			
.....			
.....			
Signature:			

SERVICE 01		Date:	
Engineer name:			
Company name:			
Telephone No:			
Operative ID No:			
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *		Yes	N/a
Comments:			
.....			
.....			
.....			
.....			
.....			
Signature:			

SERVICE 01		Date:	
Engineer name:			
Company name:			
Telephone No:			
Operative ID No:			
System inhibitor concentration has been checked and appropriate action taken, in accordance with BS 7593 and heat pump manufacturers' instructions. *		Yes	N/a
Comments:			
.....			
.....			
.....			
.....			
.....			
Signature:			

* All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.



HANDOVER TO END USER

It must be made sure that the following information has been explained and understood by the end user to prevent unnecessary call outs and customer dissatisfaction.

	Communicated?
<p>Operating Principle of the System.</p> <p>The heat pump contains a closed refrigerant circuit. When operating, refrigerants circulated around the circuit absorbing heat from the ambient air and depositing it into the system water.</p> <p>The air intake and out-take are to be explained to the end user and the importance of not obstructing either side should be expressed.</p> <p>Explain the location and function of the safety devices installed in the system.</p>	
<p>User Controls.</p> <p>The operation principle of the specific installation is to be explained to the user, in particular the operation of the heating thermostat and how to operate the user interface.</p> <p>If a heated floor circuit is installed, it is to be explained that these circuit have significant resistance to change and that any adjustments must be made in smaller steps to be effective.</p> <p>It should be demonstrated how to both check and maintain the water pressure of the heating circuits.</p>	
<p>Defrost.</p> <p>The heat pump will begin to collect frost across the air intake at lower outdoor temperatures. Periodically the heat pump will be required to do a defrost function which will produce steam. This is normal in operation and is not cause for concern.</p> <p>If there are any areas at risk of collecting frozen condensate, these should be pointed out to the end user.</p>	
<p>Antifreeze Function.</p> <p>The heat pump has an antifreeze function to protect itself from damage. It is important that the heat pump electrical supply is not switched off unless done by a qualified service engineer.</p>	
<p>Clearances.</p> <p>The heat pump must not be obstructed at any time. The minimum installation clearances must be upheld. Do not rest objects on the surface of the heat pump.</p>	
<p>Storage and Usage of Manual.</p> <p>It is important that the manuals are kept in a safe and secure place for personal reference and future use.</p> <p>The user manual is to be read by the end user and all hazards and warnings understood.</p> <p>The setting instructions in the user manual are to be read through and explained with the end user. Key differences from their previous system are to be explained such as setting of flow temperature.</p> <p>The end user should then be given the opportunity to ask any questions regarding the new system.</p>	
<p>Servicing and Maintenance.</p> <p>It is important that the system is regularly serviced and inspected as required by the SERVICING AND MAINTENANCE section (Section 6 - Inspection and Maintenance) to make sure that the system continues to operate optimally and extend the lifespan of the system.</p> <p>Servicing and maintenance of the heat pump must only be done by a competent authorised person.</p>	
<p>Disposal and Decommissioning.</p> <p>The heat pump contains R290 refrigerant. It is a legal requirement that disposal and decommissioning of the heat pump must only be done by a competent authorised person.</p>	
<p>Legal Responsibilities.</p> <p>End user must be made aware that it is a legal requirement from the F-Gas Directive that operators (or owners) are responsible for:</p> <ul style="list-style-type: none"> • Organising regular maintenance on the Heat Pump. • Checking the soundness of the refrigerant circuit. • Repair any leaks immediately. <p>All maintenance and repair activities on the refrigerant circuit must be documented in the USER/ MAINTENANCE MANUAL.</p>	
<p>Warranty</p> <p>Inform the householder of the warranty / registration found within the envelope pack and then the requirement to register it to receive the full benefit of the warranty</p>	



At Ideal Heating we take our environmental impact seriously, therefore when installing any Ideal Heating product please make sure to dispose of any previous appliance in an environmentally conscious manner. Households can contact their local authority to find out how. See <https://www.gov.uk/managing-your-waste-an-overview> for guidance on how to efficiently recycle your business waste.

Technical Training

Our Expert Academy offer a range of training options designed and delivered by our experts in heating. For details please visit: expert-academy.co.uk

Ideal Boilers Ltd., pursues a policy of continuing improvement in the design and performance of its products. The right is therefore reserved to vary specification without notice.

Hereby, Ideal Boilers Ltd declares that the radio equipment type (model HP290 Heat Pump System) is in compliance with: Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address

idealheating.com/declaration-of-conformity

RF frequency is 2.4000GHz to 2.4835Ghz

Max RF output power is less than or equal to 20dBm

Ideal is a trademark of Ideal Boilers.

Registered Office

Ideal Boilers Ltd., National Avenue, Hull, East Yorkshire, HU5 4JB

Tel 01482 492251 Fax 01482 448858

Registration No. London 322 137

EU Authorised Representative:

Atlantic SFDT

44 Boulevard des Etats-Unis, 85 000 La Roche-Sur-Yon, France

+33 (0)2 51 44 34 34

Ideal Technical Helpline: 01482 498663

Ideal Consumer Helpline: 01482 498660

Ideal Parts: 01482 498665

idealheating.com

ideal
HEATING



USER GUIDE

HP290 MONOBLOC HEAT PUMP SYSTEM

When replacing any part on this appliance, use only spare parts that you can be assured conform to the safety and performance specification that we require. Do not use reconditioned or copy parts that have not been clearly authorised by Ideal Heating.

For the very latest copy of literature for specification and maintenance practices visit our website [idealheating.com](https://www.idealheating.com) where you can download the relevant information in PDF format.



CONTENTS

1. Introduction	3
2. Safety	3
3. Protective Safety Zone	4
4. General Information	5
5. Basic Heat Pump operating Principle	5
6. Basic Functions	6
7. Controller and Display Functions	6
8. Trouble Shooting	11
9. HP290 Alarms	12
10. Fault Codes	13
11. Warranty	15



FIGURES

Figure 1. Freestanding installation	4
Figure 2. Installation in front of wall	4
Figure 3. Installation in corner	4
Figure 4. Control Box Homepage display	7
Figure 5. Operating status display	8
Figure 6. Menu display	8
Figure 7. Halo Lite display	10

WEEE DIRECTIVE 2012/19/EU
Waste Electrical and Electronic Equipment Directive

- At the end of the product life, dispose of the packaging and product in a corresponding recycle centre.
- Do not dispose of the unit with the usual domestic refuse.
- Do not burn the product.
- Remove the batteries.
- Dispose of the batteries according to the local statutory requirements and not with the usual domestic refuse.



Ideal Heating is a member of the Benchmark scheme and fully supports the aims of the programme. Benchmark has been introduced to improve the standards of installation and commissioning of central heating systems in the UK and to encourage the regular servicing of all central heating systems to ensure safety and efficiency.



THE BENCHMARK SERVICE INTERVAL RECORD MUST BE COMPLETED AFTER EACH SERVICE

1. INTRODUCTION

The HP290 Heat Pump System. This document applies to the installation and maintenance of the following individual and combined products when installed in the United Kingdom and Republic of Ireland.

- HP290 Heat Pump
- DHW Cylinder
- HP290 controls:
 - HP290 Control Box (included on HP290 preplumbed cylinders)
 - HP290 Controller

The HP290 Monobloc Heat Pump is an Air to Water type system and suitable to be installed in a domestic household within a sealed heating system. The Monobloc heat pump does not provide a cooling function. The appliance will produce condensate water. Thus, the necessary disposal system and drainage points must be installed

The heat pump takes heat from the ambient outdoor air for transfer into domestic hot water or space heating system. This air is not to be ducted or re utilised and must be allowed to flow freely back into the natural environment.

The HP290 Domestic Hot Water cylinder is to be used to store heat from the heat pump. The DHW cylinder is to be installed within a domestic household.

Overall control of the heating system is provided by the HP290 Control Box or the HP290 Controller. Day-to-day control will be provided by the HP290 Controller or a programmable room thermostat.

2. SAFETY

Flammable Refrigerant:

The Heat Pump is charged with R290 which is a flammable, odourless, and colourless refrigerant. In the event of a leak from the refrigerant circuit this can create a hazardous environment. To reduce the risk of a hazardous event, the installation instructions should be followed, and the installation area should be kept clear of ignition sources, including but not limited to; electrical switches, electrical plug sockets, and lamps.

Modification of the Products and Installation Environment:

The product is not to be modified or tampered with in any way that is not defined and approved by this document. Make sure that the requirements for both the products and installation environments are always followed. The end user should be properly informed of the installation area and product requirements during the handover process.

Improper Maintenance:

The product is to be regularly maintained and serviced by an appropriately qualified service engineer. The end user should be properly informed of maintenance and care requirements during the handover process.

Inappropriate Operation:

The product is to be operated as outlined in both this document and the user manuals. The end user must be properly informed of intended and acceptable operation methods during the handover process.

Electrical Risk:

Work on electrical components must only be done by a competent electrician. Electrical supplies must be locked in the off position

when any work is done near electrical components. Failure to comply with this requirement can result in severe injury or death. If any of the supply cables are damaged, they must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

Correct Disposal of Waste:

Waste from the products, such as cardboard, plastics, and refrigerant must be disposed of appropriately and recycled where applicable. Refrigerant must not be released into the atmosphere.

Presence of Frozen Condensate in Walkways:

There is condensate produced by the heat pump which can potentially build up around the heat pump and freeze if not properly disposed of. Appropriate disposal methods of the condensate should be implemented and maintained to prevent slipping hazard.

ⓘ IMPORTANT: This appliance must not be operated without all the covers and casing(s) correctly fitted.

If it is known or suspected that a fault exists on the system, then it MUST NOT BE USED until the fault has been investigated and corrected by a suitably trained and competent person.

Under NO circumstances should this appliance be used incorrectly or tampered with.

This appliance can be used by children 8 years and above. Also, persons with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, provided they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children must not play with the appliance. Cleaning and user maintenance must not be made by children without supervision.

⚠ WARNING: The product contains the hydrocarbon refrigerant R290 which is very flammable. The refrigerant may mix with air to form a flammable atmosphere increasing the risk of fire and/or explosion. Work that requires the removal of the exterior casing of the Heat Pump must only be done by competent persons who are familiar with the risks of R290 refrigerant. Work on the refrigeration circuit must only be done by a Cat I or Cat II F-gas certified engineer with a City and Guilds 6187-21 certificate or equivalent. Work done on the heat pump should be done in accordance with industry standard safety procedures and practices for working with hydrocarbons.

3. PROTECTIVE SAFETY ZONE

⚠ WARNING: The product contains the hydrocarbon refrigerant R290 which is very flammable. The refrigerant may mix with air to form a flammable atmosphere increasing the risk of fire and/or explosion.

Work that requires the removal of the exterior casing of the Heat Pump must only be done by competent persons who are familiar with the risks of R290 refrigerant.

Work on the refrigeration circuit must only be done by a Cat I or Cat II F-gas certified engineer with a City and Guilds 6187-21 certificate or equivalent. Work done on the heat pump should be done in accordance with industry standard safety procedures and practices for working with hydrocarbons.

The refrigerant circuit of the outdoor heat pump is charged with R290 refrigerant, which is an odourless, colourless, and flammable refrigerant and classified in the safety group A3 in accordance with ISO 817 and ANSI/ASHRAE standard 34.

When selecting an installation area, it should be considered that R290 has a higher density than air and therefore in the event of leakage from the heat pump, will displace air and pool in low-lying areas. A protective safety zone is defined around the area to prevent explosive and asphyxiating atmospheres, by avoiding the following within this area:

1. Building openings, e.g., doors, windows, air intakes, exhausts, cellar entrances, etc.
2. Ignition sources, e.g., electrical switches, plugs sockets, drills, heaters, etc.
3. Areas outside of the property lines e.g., public areas, adjacent buildings.
4. Ditches, troughs, or depressions in the ground.
5. Surfaces exceeding 400°C in temperature.

The protective safety zone is dependent on the installation areas and adjacent structural installations. See *Figure 1*, *Figure 2* and *Figure 3* to determine the extent of the protective safety zone.

In this area no further works should be done which would affect the stated rules and measures for the protective safety zone.

For all shown types of installations, the top of the protective safety zone is in line with the top face of the heat pump.

ⓘ IMPORTANT: Dimensions shown in See *Figure 1*, *Figure 2* and *Figure 3* below are the minimum dimensions for the extent of the protective safety zone.

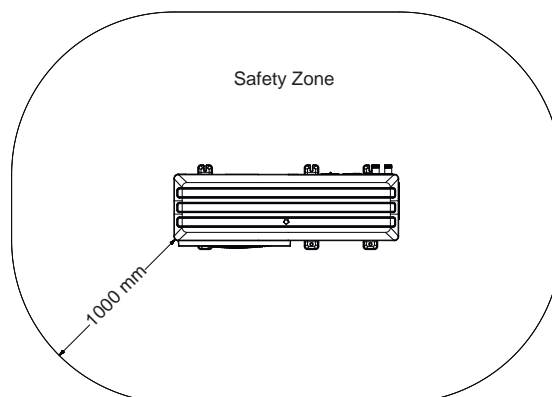


Figure 1. Freestanding installation

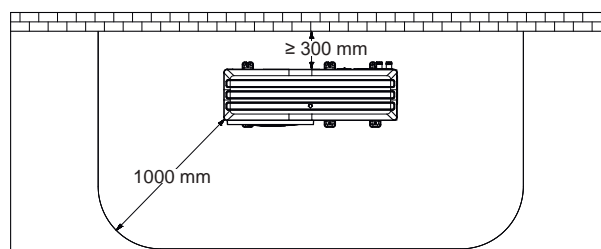
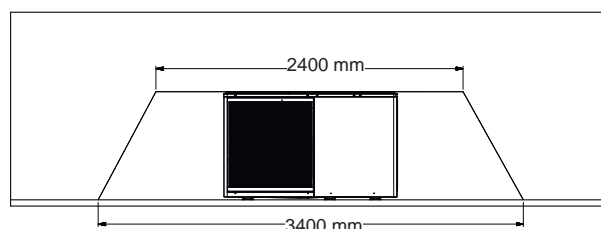


Figure 2. Installation in front of wall

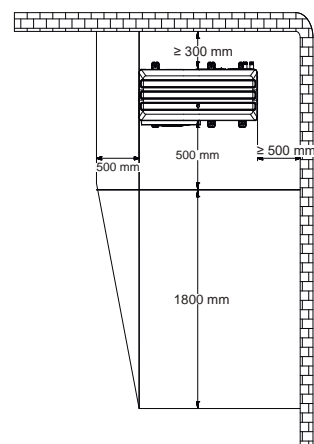
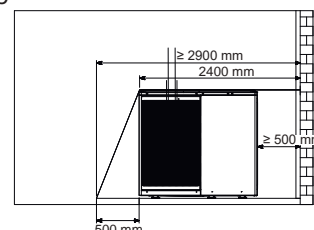


Figure 3. Installation in corner

4. GENERAL INFORMATION

- During periods of heat pump operation, notably during defrost cycles, a plume of steam may be visible. This is normal and due to moisture and/or ice formation evaporating.
- During periods of heat pump operation, the appliance will produce condensate water.
- During periods of heat pump operation, both the evaporator fan and compressor speed will change, dependent upon the prevailing conditions and heat output level required. Due to this there may be a noticeable change in the appliance noise levels and tone which is normal.
- The area directly around the heat pump should be kept clear at all times. Any items that may restrict the airflow to the heat pump such as leaves, litter etc. should be removed immediately as these may negatively affect the operational efficiency.
- The area directly around the control box should be kept clear at all times. Items such as wet laundry should not be placed upon the control box and general clearances illustrated within the Installation Manual must be respected.

CLEANING

⚠ CAUTION: The heat pump contains sensitive components that may be damaged by the use of hose pipes or high-pressure washers.

DO NOT use abrasive cleaning agents when cleaning the heat pump.

HP290 Monobloc Heat Pump Casing:

For normal cleaning of the heat pump casing use a weak soap spray solution only. Rinse off soap spray solution with a low-pressure hose or low-pressure spray bottle only.

HP290 Control Box/HP290 Controller:

For normal cleaning simply dust with a dry cloth. For stubborn marks and stains, wipe with a damp cloth and finish with a dry cloth.

Domestic Hot Water Cylinder:

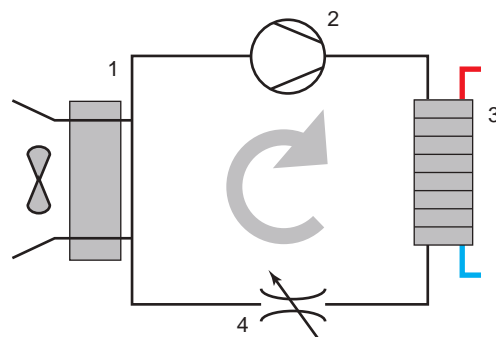
For normal cleaning simply dust with a dry cloth. For stubborn marks and stains, wipe with a damp cloth and finish with a dry cloth.

MAINTENANCE

The frequency of servicing will depend upon the installation condition and usage, but it should be done at least annually by a competent heat pump engineer.

5. BASIC HEAT PUMP OPERATING PRINCIPLE

The heat pump contains a sealed and closed loop refrigerant circuit which contains a flammable refrigerant R290. When operating, refrigerant is continuously circulated by a compressor where it absorbs heat from the outdoor air which is passed through a heat exchanger and transferring that heat to water which is used in heating and hot water systems.



The circuit consists of four main components/functions.

1. Evaporator Heat Exchanger - Refrigerant absorbs heat energy from the outdoor ambient air.
2. Compressor – Refrigerant is compressed and circulated around the closed loop circuit.
3. Condenser Heat Exchanger – Refrigerant transfers heat energy to the heating or hot water systems.
4. Expansion Device – Refrigerant pressure and temperature is reduced.

6. BASIC FUNCTIONS

Domestic Hot Water:

If there is a domestic hot water (DHW) cylinder installed and the temperature of the DHW cylinder is less than the hot water setpoint, the primary heat pump circuit is activated and directed (via the divertor valve) to heat the hot DHW cylinder.

The heat pump will operate until the DHW cylinder has reached its setpoint. This function will always take priority over the space heating system within the programmed time.

Note: Domestic hot water heating and space heating functions cannot operate simultaneously.

Space Heating:

If there is a heating demand and the temperature of any thermostat is less than its setpoint, the primary circuit is activated and directed (via the divertor valve) to heat the space heating circuits. The heat pump and primary heating circuit circulator will be active until the space heating has reached its setpoint.

Note: Domestic hot water heating and space heating functions cannot operate simultaneously.

Anti-Legionella:

If there is a DHW cylinder installed, anti-legionella measures should be utilised in accordance with HSE guidance HSG274 Part 2. The control system is provided with an anti-legionella function for the DHW cylinder, the default parameter, which is adjustable according to the installation and user requirements, initiates this function once per week and heats the DHW cylinder to 60°C for a period of 1 hour.

Monobloc ASHP Defrost Method:

During operation, the heat pump will periodically be required to go through an automatic defrosting process dependent on the outdoor air temperature and humidity levels. Over time the evaporator will begin to collect water which will then frost. The defrost process causes the accumulated frost to thaw and change to liquid. This liquid water then collects in the base panel and flows through into the condensate drain openings located on the base panel of the heat pump. Dependent upon the installation type, the water will drain to ground or a dedicated drainage point.

Frost Protection (Dwelling):

Frost protection is controlled in accordance with the outdoor temperature, and water temperature sensors on the outdoor unit. When the frost protection occurs, the outdoor unit displays the error code Pb and the unit will stop operating.

Frost protection will activate under either of the following conditions:

- Outdoor temperature < 3°C and minimum water temperature < 5°C
- Minimum water temperature < 2°C.

Once either of these conditions are met, the primary circulator will first operate for 5mins at maximum output.

At the end of this period if the water temperature is $\geq 8^{\circ}\text{C}$, then the compressor will run for a 10 minutes until the minimum water temperature is $> 15^{\circ}\text{C}$.

If the water temperature is $< 8^{\circ}\text{C}$ and there is normal water flow, then either the compressor or auxiliary heat source (if applicable) will operate until the minimum water temperature is met.

The compressor will operate for a minimum period of 10 minutes until the minimum water temperature is $> 15^{\circ}\text{C}$.

An auxiliary heat source will be active for a minimum period of 5 minutes until the minimum water temperature is $> 10^{\circ}\text{C}$.

Weather Compensation:

Weather compensation regulates and maintains optimum flow temperatures which allows the heat pump to run more efficiently. This function will modulate the water flow temperature relative to the external ambient temperatures. The lower the outdoor air temperature, the higher the flow temperature and vice versa.

7. CONTROLLER AND DISPLAY FUNCTIONS

The Heat Pump controls are a centralised controller for all systems settings including domestic hot water schedule and temperature control.

For space heating schedule and temperature controls please refer to the instructions supplied with your Programmable Room Thermostat (PRT).

Should there not be a programmable room thermostat control fitted, the Ideal Controller display can function as a room thermostat and the heating schedule must be configured on this device.

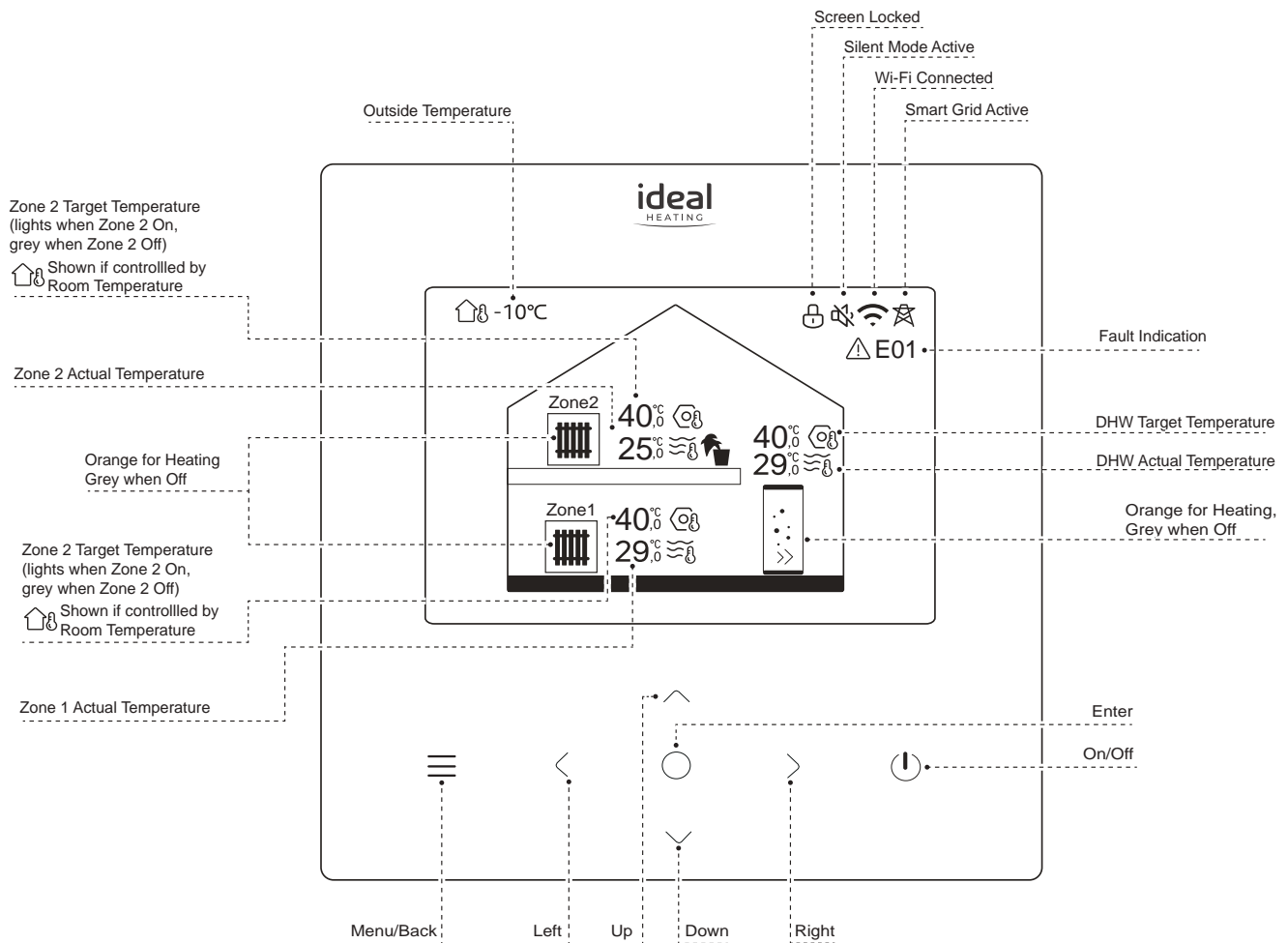


Figure 4. Control Box Homepage display

For Operating Status press O.

For Menu press ≡ (refer to Figure 4).

If no touch-buttons are pressed for 30 seconds the screen dims, switching off after a further 10 seconds.

Press any touch-button to re-activate the screen.

To enable/disable DHW press ∨, ∧, > and < until the DHW tank symbol is illuminated. Then press ⏻.

To change the DHW target temperature press ∨, ∧, > and < until the DHW tank symbol is illuminated. Then press O, then press ∨ and ∧.

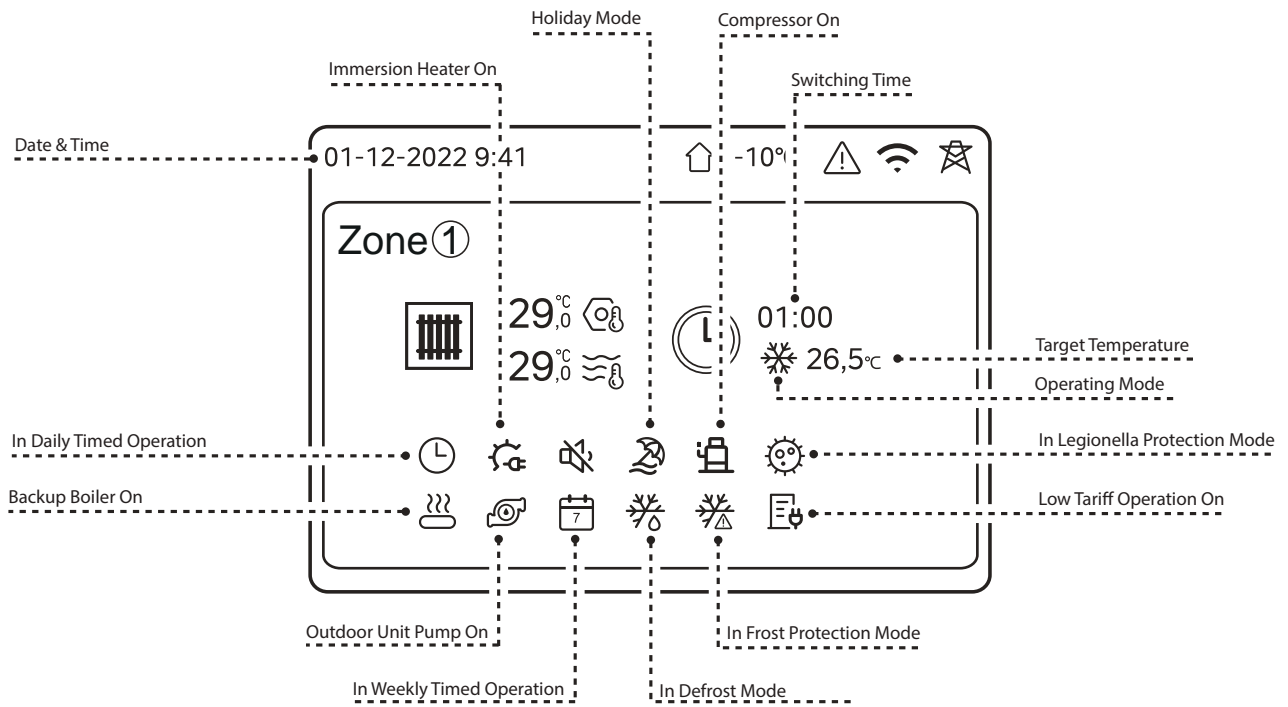


Figure 5. Operating status display

To select a menu press \vee , \wedge , \rangle and \langle until the required menu option is illuminated. Then press O.

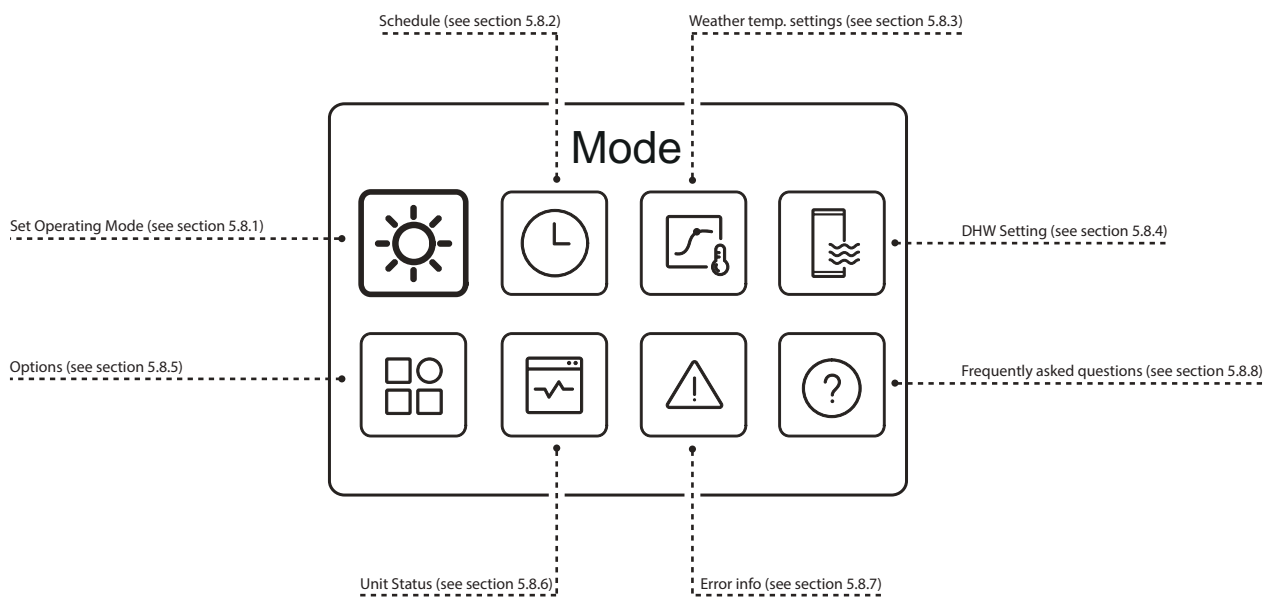


Figure 6. Menu display

Display setting

Display Setting

Time 12:30

Date 15-08-2022

Language >

Backlight >



Display Setting

Buzzer

Screen Lock >

Screen lock time 120 S

To change the time, press ∨ and ∨ until **Time** is illuminated. Then press O and then press ∨ or ∨.

To change the date, press ∨ and ∨ until **Date** is illuminated. Then press O.

To change the Language, press ∨ and ∨ until **Language** is illuminated. Then press O (refer to 5.8.5.2.1).

To change Backlight setting, press ∨ and ∨ until **Backlight** is illuminated. Then press O (refer to 5.8.5.2.2).

To enable/disable the buzzer for the buttons, press ∨ and ∨ until **Buzzer** is illuminated. Then press O.

To change the screen lock setting, press ∨ and ∨ until **Screen Lock** is illuminated. Then press O (refer to 5.8.6.1).

To change the screen lock time, press ∨ and ∨ until **Screen Lock** is illuminated. Then press O and then press ∨ and ∨.

Schedule, DHW

Schedule

Zone1 daily timer ON >

Zone2 daily timer ON >

DHW daily timer OFF >

Zone1 weekly schedule ON >



Schedule

Zone 2 weekly schedule ON

DHW weekly schedule ON >

Holiday away OFF >

Holiday home ON >

To set a schedule for DHW where the operating times and temperatures are the same for each day of the week then select **DHW daily timer**

Schedule, DHW daily timer

To change the setting:

To set the option to OFF, press O.

To set the option to ON, press O.

⌚ DHW daily timer

No.	Time	Mode	Temp.	
01	01:00	ON	55°C	<input checked="" type="checkbox"/>
02	20:00	OFF	55°C	<input type="checkbox"/>
03	00:30	ON	55°C	<input checked="" type="checkbox"/>
04	00:30	ON	60°C	<input checked="" type="checkbox"/>

The first column shows the order in which the events will happen.

The second column is the time at which the events will happen.

The third column shows if the heat demand is ON, or OFF, it should only be ON for this application (☀️).

The fourth column is the target hot water temperature.

The fifth column shows if the event is ON or OFF.

To scroll through the options, press ∨, ∨, >, and <.

To select an option, press O.

To change a setting, press ∨ or ∨.

To set a schedule for DHW where the operating times and temperatures are different across the week select **DHW weekly schedule.**

Creating a space heating demand with PRT [Halo Lite or Third-Party Thermostat]

The space heating function will be controlled via the use of a Halo Lite RF or equivalent PRT. Please refer to the instructions supplied with the PRT to set the schedule. Non-Programmable Room Thermostats cannot be used in conjunction with this appliance.

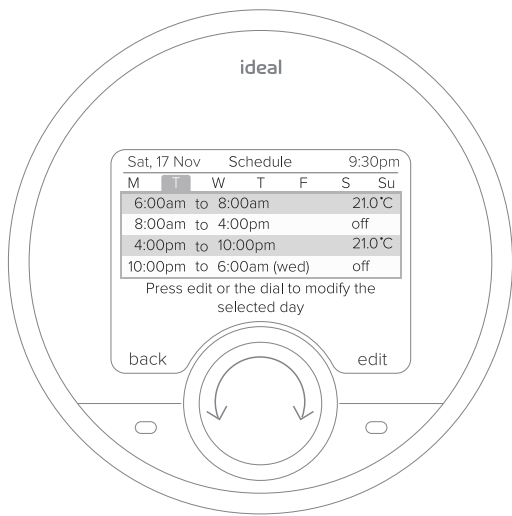


Figure 7. Halo Lite display

Creating a space heating demand with Ideal Controller

This section shows how to set the heating schedule using the Ideal Controller where no programmable room thermostat is present.

To change the setting:

To set the option to OFF, press O.

To set the option to ON, press O.

🕒 Zone 1 daily timer				
No.	Time	Mode	Temp.	
01	01:00	☀️	26,5°C	🔘
02	20:00	☀️	26,5°C	🔘
03	00:30	☀️	26,5°C	🔘
04	00:30	☀️	26,5°C	🔘

① **IMPORTANT: For ON periods heat will be provided using a flow temperature calculated from measured outside temperature.**

① **IMPORTANT: For OFF periods no heat will be provided, therefore ON periods should be set allowing sufficient time (multiple hours) for the correct room.**

The first column shows the order of events.

The second column is the times that the events will occur.

The third column shows if the heat demand is ON or OFF. The Heat demand should only be ON for this application.

The temperature in the fourth column cannot be changed.

The fifth column shows if the event is ON or OFF.

The temperature in the fourth column cannot be changed (it is set automatically based on the outdoor temperature).

The fifth column shows if the event is ON or OFF.

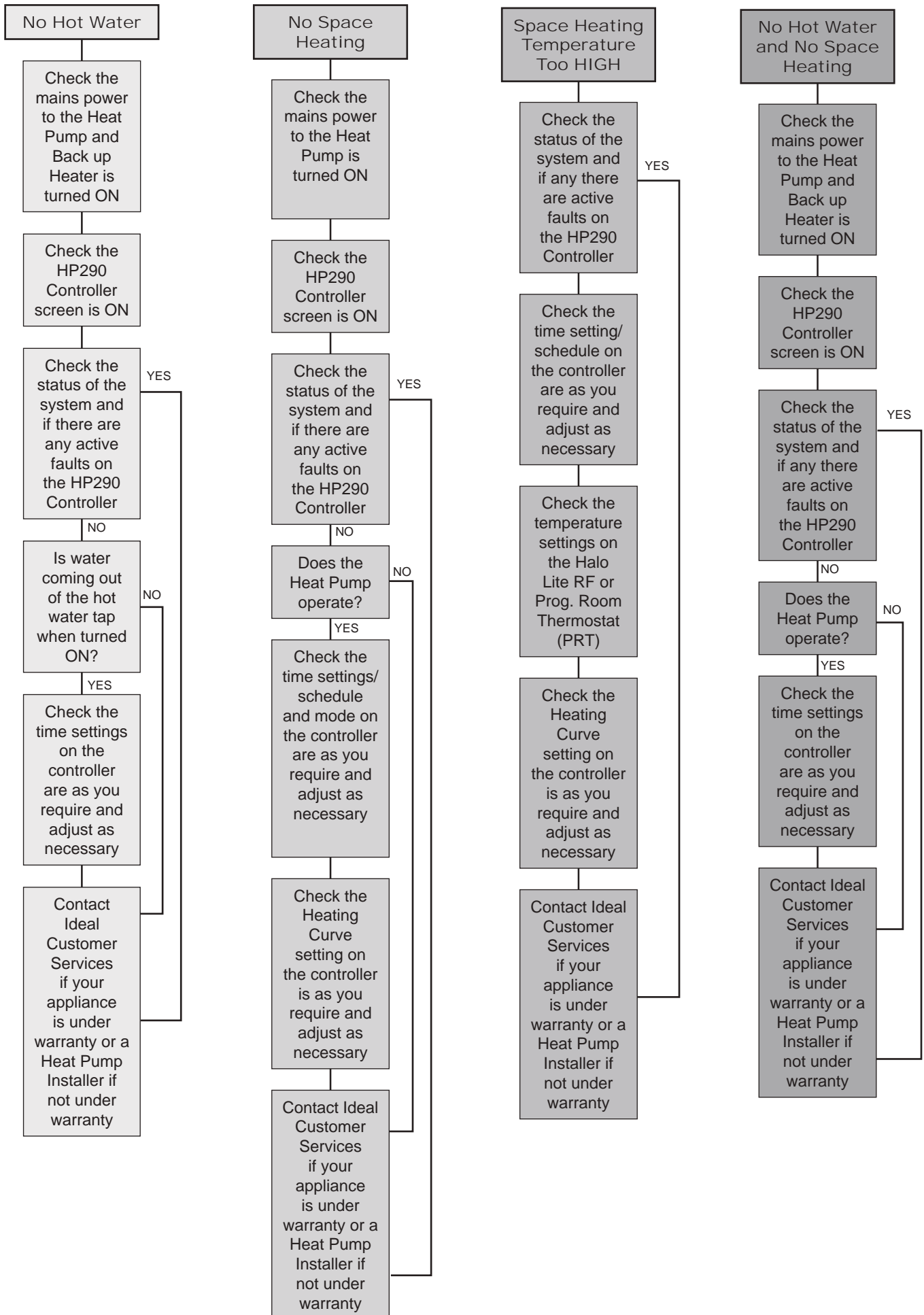
To scroll through the options select \vee , \wedge , \rangle and \langle .

To select an option select O.

To change a setting select \vee or \wedge .

For weekly schedule configuration and holiday mode please refer to Appendix 1.3 to 1.3.4.3 and 1.3.5 of the Installation Instructions.

8. TROUBLE SHOOTING



9. HP290 ALARMS

Any active faults will be displayed on the home screen.

To see error information, from the Home Screen, press the menu button \equiv , then use the up and down arrows \vee or \wedge to move the display so that the error symbol \triangle is displayed (Error info.), then press enter (O).

Error info.			
Unit	Code	Time	Date
#01	E8 (70%)	11:27	19-12-2022
#02	E8 (70%)	15:30	19-12-2022
#03	E12	10:30	19-05-2022
#04	E8 (70%)	00:30	20-12-2022

To set a parameter scroll through the fault codes use \vee or \wedge . Press O to scroll through the pages for more information.

Error info.			
Unit	Code	Time	Date
#01	E 1	11:27	19-12-2022
E8 water flow fault			

10. FAULT CODES

Code ID	Description	Reference
C7	Inverter Error	9.1.1 on page 94
E0	No Water Flow, through Outdoor Unit, 10 times in succession	9.1.2 on page 95
E1	Live and Neutral reversed	9.1.3 on page 96
E2	No connection Outdoor PCB to User Interface	9.1.4 on page 96
E3	Header Thermistor (T1) Error (for Hybrid/Cascade)	9.1.5 on page 96
E4	DHW Cylinder Thermistor (T5) Error	9.1.6 on page 97
E5	Outdoor Unit, Air to Refrigerant Heat Exchanger Outlet Thermistor (T3) Error	9.1.8 on page 98
E6	Outdoor Sensor within Outdoor Unit (T4) Error	9.1.9 on page 98
E8	No Water Flow, through Outdoor Unit	9.1.9 on page 98
E9	Compressor Refrigerant Return Thermistor (Th) Error (E9)	9.1.10 on page 98
EA	Discharge Thermistor (Tp) Error	9.1.11 on page 98
Ed	Outdoor Unit, Return Thermistor (Tw_in) Error	9.1.12 on page 99
F1	Inverter Error	9.1.1 on page 94
H0	No connection Outdoor PCB to Indoor PCB	9.1.13 on page 99
H1	No connection Outdoor PCB to Inverter PCB	9.1.14 on page 100
H2	Plate Heat Exchanger Outlet Refrigerant Thermistor (T2) Error	9.1.15 on page 100
H3	Plate Heat Exchanger Inlet Refrigerant Thermistor (T2B) Error	9.1.16 on page 100
H4	Inverter High Current (L1E/L11/L12) 3 times within 60mins	9.1.17 on page 101
H6	Fan Error	9.1.18 on page 101
H7	Mains High Voltage or Low Voltage Error	9.1.19 on page 101
H8	High Pressure Sensor Error	9.1.20 on page 102
H9	Central Heating Zone 2 Thermistor Fault	9.1.7 on page 97
HA	Outdoor Unit, Flow Thermistor (Tw_out) Error	9.1.21 on page 102
Hb	High Flow/Return Differential, 3 times in succession and Flow Temperature <7°C	9.1.22 on page 103
Hd	No connection Master Heat Pump to Slave Heat Pump	9.1.23 on page 103
HF	Inverter not matched to Outdoor PCB dip switch setting	9.1.24 on page 104
HH	10 Fan Errors in 2 hours	9.1.18 on page 101
P0	Low Pressure Error	9.1.25 on page 104
P1	High Pressure Switch Operated	9.1.26 on page 105
P3	Overcurrent Protection Error	9.1.27 on page 106
P4	Compressor Discharge Temperature High	9.1.28 on page 107
P5	High Flow/Return Differential	9.1.22 on page 103
P21	Low Pressure Sensor Error	9.1.29 on page 107
P27	High Pressure Sensor and Low Pressure Sensor Wiring Reversed	9.1.30 on page 107
Pd	Condensing Temperature High	9.1.31 on page 108
PP	High Flow/Return Differential	9.1.22 on page 103
FC1	Outdoor Unit, Air to Refrigerant Heat Exchanger Outlet Thermistor Error	9.1.8 on page 98
-	3-way Valve does not operate	9.1.35 on page 111
-	Anti-Legionella does not operate	9.1.36 on page 112
-	CH1 Pump does not operate	9.1.37 on page 113
-	CH2 Pump does not operate	9.1.38 on page 114
-	No CH	9.1.37 on page 113
-	No DHW	9.1.35 on page 111
-	No Display	9.1.39 on page 115
L11	Inverter High Current	9.1.17 on page 101
L12	Inverter High Current	9.1.17 on page 101
L1E	Inverter High Current	9.1.17 on page 101
L2E	Inverter High Temperature	9.1.32 on page 109

L31	Inverter Error	9.1.1 on page 94
L32	Inverter Error	9.1.1 on page 94
L34	Inverter Error	9.1.1 on page 94
L3E	Inverter Error	9.1.1 on page 94
L43	Inverter Error	9.1.1 on page 94
L45	Wrong Fan Fitted	9.1.33 on page 109
L46	Inverter Error	9.1.1 on page 94
L47	Inverter Error	9.1.1 on page 94
L52	Compressor Stall Error	9.1.34 on page 110
L5E	Compressor Start Error	9.1.34 on page 110
L61	Short Circuit to Compressor Terminals	9.1.34 on page 110
L65	Inverter Error	9.1.1 on page 94
L6E	Inverter Error	9.1.1 on page 94
LB7	Inverter Error	9.1.1 on page 94
LBE	High Pressure Switch Operated	9.1.26 on page 105
LC1	Inverter Error	9.1.1 on page 94
LC2	Inverter Error	9.1.1 on page 94
LC3	Inverter Error	9.1.1 on page 94
LC4	Inverter Error	9.1.1 on page 94
LC5	Inverter Error	9.1.1 on page 94
LC6	Inverter Error	9.1.1 on page 94
LC7	Inverter Error	9.1.1 on page 94
LC8	Inverter Error	9.1.1 on page 94
LC9	Inverter High Temperature	9.1.32 on page 109
LCA	Inverter High Current	9.1.17 on page 101
LCB	Inverter Error	9.1.1 on page 94
LBC	Inverter Error	9.1.1 on page 94
LCD	Inverter Error	9.1.1 on page 94
LCE	Inverter High Current	9.1.17 on page 101
J11	Inverter High Current	9.1.17 on page 101
J12	Inverter High Current	9.1.17 on page 101
J2E	Inverter High Temperature	9.1.32 on page 109
J31	Inverter Error	9.1.1 on page 94
J32	Inverter Error	9.1.1 on page 94
J3E	Inverter Error	9.1.1 on page 94
J43	Inverter Error	9.1.1 on page 94
J45	Wrong Fan Motor Fitted	9.1.33 on page 109
J46	Inverter Error	9.1.1 on page 94
J47	Inverter Error	9.1.1 on page 94
J52	Compressor Stall Error	9.1.34 on page 110
J5E	Compressor Error	9.1.34 on page 110
J61	Fan Connections Short Circuit	9.1.33 on page 109
J65	Inverter Error	9.1.1 on page 94
J6E	Inverter Error	9.1.1 on page 94

Note: DHW thermistor fault and CH zone 2 thermistor fault: check outdoor PCB, dipswitch 2, switch 1, is in the On position

11. WARRANTY

At the end of each 12-month period after commissioning, the Heat Pump must be serviced by a suitable competent heat pump engineer in accordance with the process in the manufacturer's instructions. Should this condition not be met the Heat Pump warranty will lapse.



At Ideal Heating we take our environmental impact seriously, therefore when installing any Ideal Heating product please make sure to dispose of any previous appliance in an environmentally conscious manner. Households can contact their local authority to find out how. See <https://www.gov.uk/managing-your-waste-an-overview> for guidance on how to efficiently recycle your business waste.

Technical Training

Our Expert Academy offer a range of training options designed and delivered by our experts in heating. For details please visit: expert-academy.co.uk

Ideal Boilers Ltd., pursues a policy of continuing improvement in the design and performance of its products. The right is therefore reserved to vary specification without notice.

Ideal is a trademark of Ideal Boilers.

Registered Office

Ideal Boilers Ltd., National Avenue, Hull, East Yorkshire, HU5 4JB

Tel 01482 492251 Fax 01482 448858

Registration No. London 322 137

EU Authorised Representative:

Atlantic SFDT

44 Boulevard des Etats-Unis, 85 000 La Roche-Sur-Yon, France

+33 (0)2 51 44 34 34

Ideal Technical Helpline: 01482 498663

Ideal Consumer Helpline: 01482 498660

Ideal Parts: 01482 498665

idealheating.com

ROI Installer Helpline: 00353 (0)1 961 7700

service@idealenergy.ie