

AMICUS BOOST

INSTALLATION PLANNING GUIDE



## Document Control

Article	Language	Version	Modified by
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## Introduction

This document includes all the basic information required for the Design team from stage 2 to stage 5 of the project.

The Lochinvar Amicus High temperature water source heat pump range has been designed to provide heating and DHW and can work at temperatures up to 78°. There are 10 models in the range with outputs ranging from 62 to 495kW at standard rating conditions Source water 30/35°C and user water 65/60°C. The individual technical product submittal for each heat pump supplies detailed data on outputs ranging from 10°C source to 78°C user flow.

Each heat pump has the following standard features:

The compressors used are a high-performance scroll type that incorporates a special scroll design which enhances the efficiency of the refrigerant cycle when the source temperature is low. The compressors are all supplied with a crankcase heater and thermal overload protection by a klixon embedded in the motor winding. They are mounted in a separate enclosure thus enabling them to be maintained even if the unit is operating. Access to this enclosure is via the front panel of the unit. The crankcase heater is always powered when the compressor is in stand-by.

On models 302-1402 the compressors are mounted in a special floating frame arrangement, isolating the compressors from the main casing further reducing noise and vibration. The floating frame arrangement typically reduces noise by up to 10dBa.

Source heat exchanger is made from brazed 316 stainless steel.

User heat exchanger made from brazed 316 stainless steel.

Control panel.

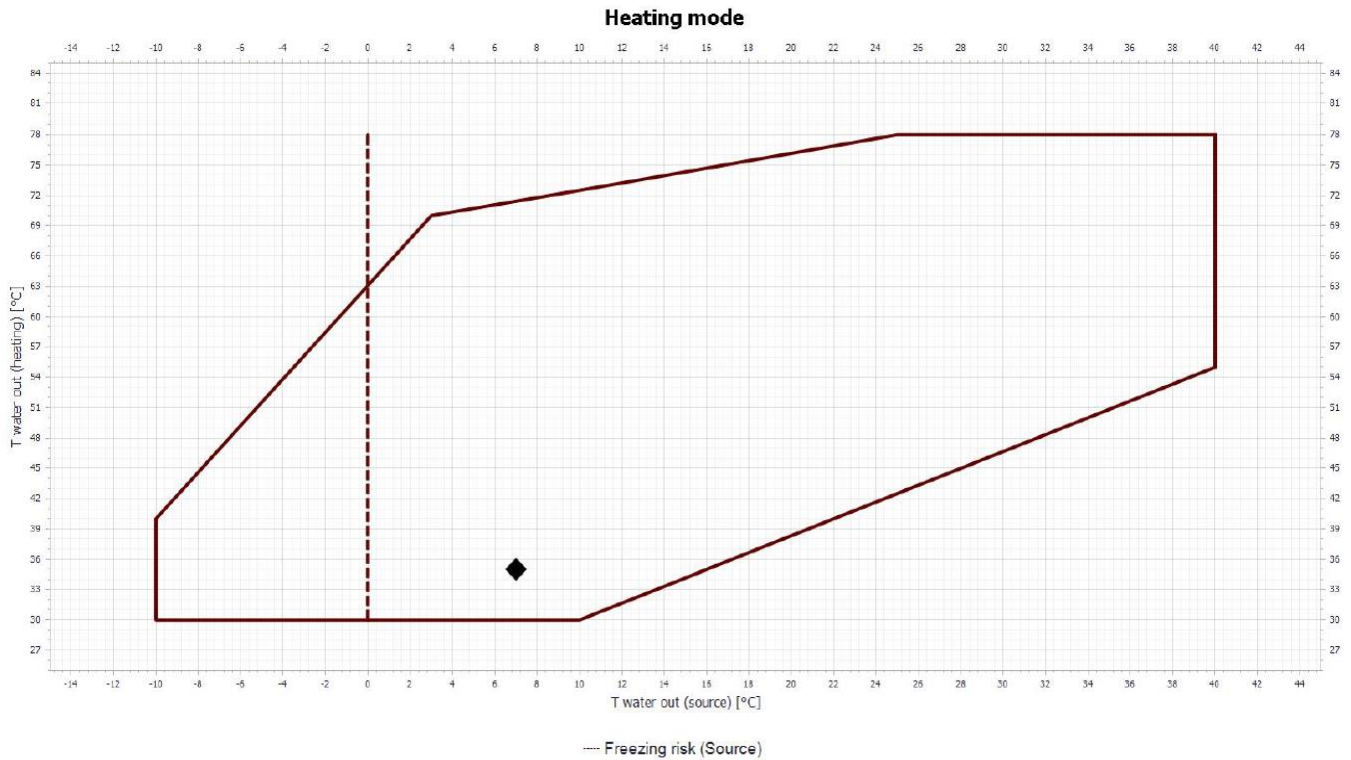
## General

The Amicus boost heat pump should be sited in an area which:

- Can bear the weight of the unit.
- Has enough space around the unit to allow maintenance, see table 2.
- Does not present a noise nuisance to users of the building and neighbours.

### Operational limits

Amicus high temperature heat pumps can provide heating and/or domestic hot water at temperatures up to 78°C. The diagram below shows the general working limits and should be cross reference with the data shown in the individual model Technical Product Submittal as each is slightly different.



Drawing 1 operational limits

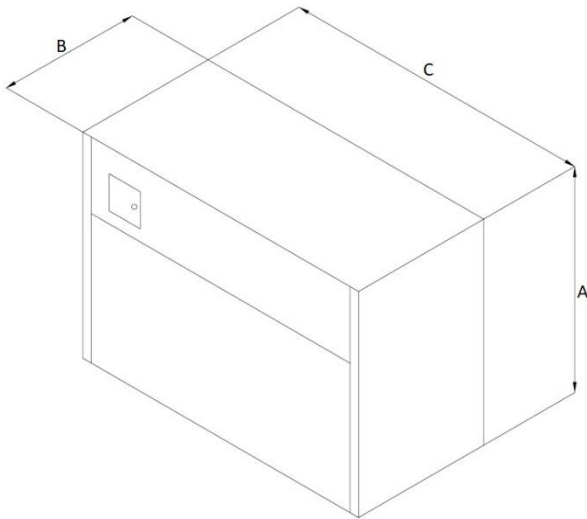
### Sizing

When sizing the boost heat pump careful consideration needs to be taken of the source water temperature and what is supplying the source water. Lochinvar can help with sizing your project, contact your local area sales manager or email [info@lochinvar.ltd.uk](mailto:info@lochinvar.ltd.uk)

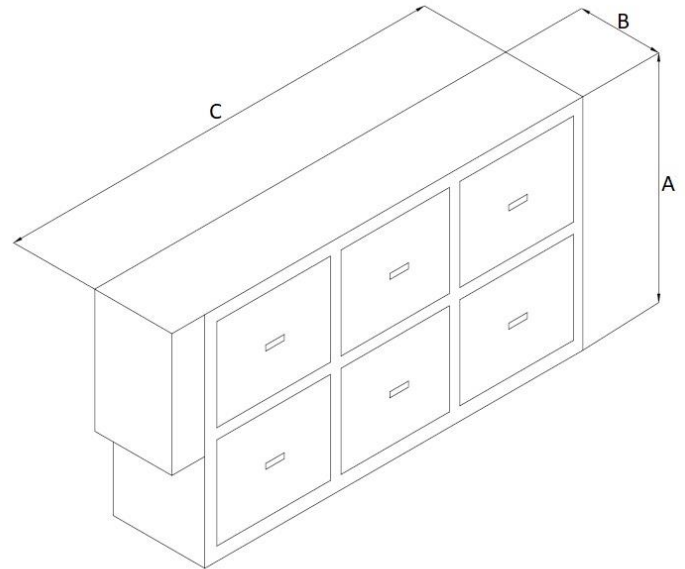
## Technical details

Table 1.1 Dimensions and weights models 302-1402

Legend	Data	Unit	Model (LAHP WW)						
			LAHP302WWXL	LAHP402WWXL	LAHP602WWXL	LAHP702WWXL	LAHP902WWXL	LAHP1202WWXL	LAHP1402WWXL
A	Height	mm	1631	1631	1631	1631	1631	1631	1631
B	Width	mm	790	790	790	790	790	790	790
C	Depth	mm	1154	1154	1154	1154	1154	1154	1154
Weight		Kg	660	680	700	730	740	760	790



Drawing 2 Dimensions models 302-1402



Drawing 3 Dimensions models 1804-2604

Table 1.2 Dimensions and weights models 1804-2604

Legend	Data	Unit	Model (LAHP WW)		
			LAHP1804WWS	LAHP2304WWS	LAHP2604WWS
A	Height	mm	1900	1900	1900
B	Width	mm	794	794	794
C	Depth	mm	2844	2844	2844
Weight		Kg	1320	1390	1430

Full technical details including detailed performance data for each model can be found on the technical product submittal at: <https://lochivar.ltd.uk/amicus-boost-water-source-heat-pumps/>

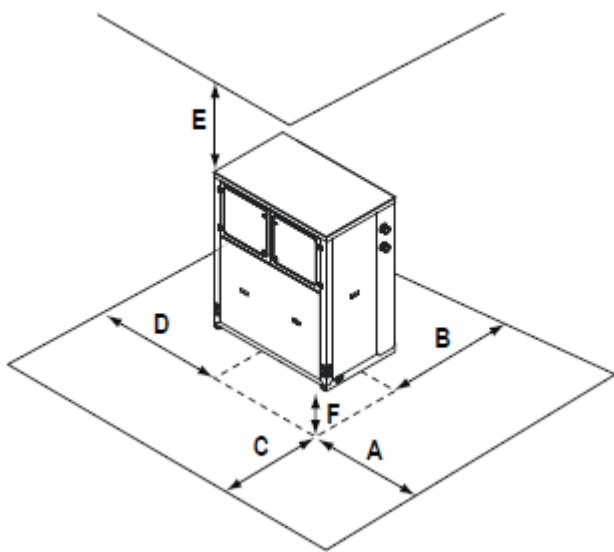
## Position on site

Amicus boost heat pumps require minimum clearances around them to enable maintenance of the unit.

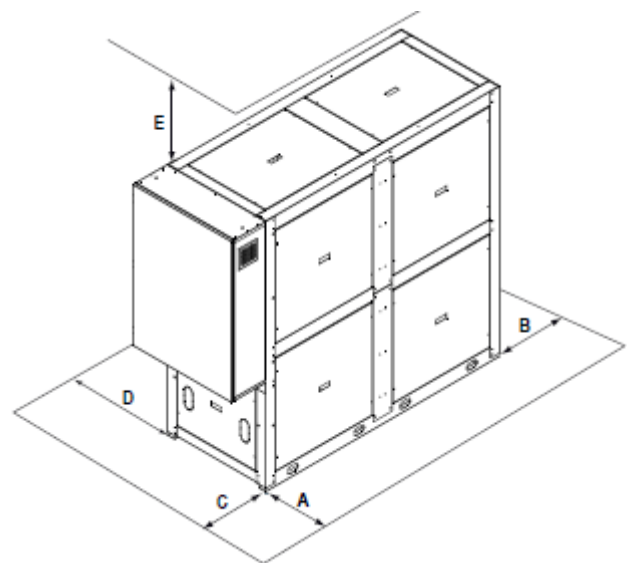
The type of model used will impact the required clearances and how multiple units can be laid out.

Table 2 clearances required models 302-1402

Legend	Unit	Model						
		302	402	602	702	902	1202	1402
A	mm	1000	1000	1000	1000	1000	1000	1000
B	mm	500	500	500	500	500	500	500
C	mm	600	600	600	600	600	600	600
D*	mm	0	0	0	0	0	0	0
E	mm	500	500	500	500	500	500	500



Drawing 4 Service clearances required models 302-1402



Drawing 5 Service clearances required models 1804-2604

Table 3 clearances required models 302-1402

Legend	Unit	Model		
		1804	2304	2604
A	mm	1000	1000	1000
B	mm	500	500	500
C	mm	800	800	800
D	mm	1000	1000	1000
E	mm	500	500	500

## Positioning multiple units

When positioning multiple Amicus units' minimum distances must be observed according to model size to ensure uninterrupted service access, as per table 1 and 2. If plantroom space is tight, please contact Lochinvar technical support for further help and guidance.

## Sound power data

Table 4 Sound power levels for standard units

model	octave bands (hz)								lw		lp
	63	125	250	500	1k	2k	4k	8k	db	db	db
	db	db	db	db	db	db	db	db	db	db	db
<b>LAHP302WW</b>	78.1	69.3	63.2	61.7	60.6	55.2	51.8	42.7	78.9	65	49
<b>LAHP402WW</b>	78.1	69.3	63.2	61.7	60.6	55.2	51.8	42.7	78.9	65	49
<b>LAHP602WW</b>	83.1	74.3	68.2	66.7	65.6	60.2	56.8	47.7	83.9	70	54
<b>LAHP702WW</b>	86.1	77.3	71.2	68.7	68.6	63.2	59.8	50.7	86.9	73	57
<b>LAHP902WW</b>	87.1	78.3	72.2	70.7	69.6	64.2	60.8	51.7	87.9	74	58
<b>LAHP1202WW</b>	89.1	80.3	74.2	72.7	71.6	66.2	62.8	53.7	89.9	76	60
<b>LAHP1402WW</b>	91.1	82.3	76.2	74.7	73.6	68.2	64.8	55.7	91.9	78	62
<b>LAHP1804WW</b>	101.1	92.3	86.2	84.7	83.6	78.2	74.8	65.7	101.9	88	72
<b>LAHP2304WW</b>	102.1	93.3	87.2	85.7	84.6	79.2	75.8	66.7	102.9	89	73
<b>LAHP2604WW</b>	104.1	95.3	89.2	87.7	86.6	81.2	77.8	68.7	104.9	91	75

Lw: Sound power level according to ISO 9614

Lp: Sound pressure level measured at 10 metres from the unit in free field conditions direction factor Q=2 to ISO 9614



## Pipework sizing and flow rates

Pipework should always be sized to match the flow rates below and maintaining a 5k delta T, this will result in larger pipework compared to a traditional 20k system design. The boost heat pump will require two pumps per unit, a source primary pump and a user primary pump, Lochinvar can supply a suitably sized single head pump for each side of the unit, or an alternative can be specified by the installer.



**A suitable flow setter must be fitted to every Amicus unit installed to set the correct flow rate at commissioning.**

### Design flow rates

Design flow rates can be found on the heat pump individual Technical Product Submittal available from <https://lochinvar.ltd.uk/amicus-boost-water-source-heat-pumps/>

## Buffer vessel sizing

Amicus boost heat pumps require a certain amount of both source volume and system volume to ensure problem free running and to reduce the number of starts and hence wear and tear on the compressor. In practise in most installations a buffer vessel will be required. The minimum system volume will:

1. Prevent the unit from running out of source water
2. Prevent the unit cycling during low demand.

### Minimum water content required.

Minimum water content can be found on the heat pump individual Technical Product Submittal available from <https://lochinvar.ltd.uk/amicus-boost-water-source-heat-pumps/>

Lochinvar will offer two suitably sized buffer vessels with every Boost heat pump quoted, a source buffer sized on the heat requirements of the Boost unit and the source heat, and a user buffer based on the heat output of the Boost.

## DHW Supply

Amicus boost heat pumps can supply low temperature hot water at up to 78°C so are suitable for supplying domestic hot water, even if a pasteurisation of 70°C is required. Domestic hot water can be supplied via a plate and buffer arrangement or with a more traditional indirect vessel. This will depend on the system being supplied and whether the Boost unit is also supplying heating.

## Electrical Connections

All models require a 3-phase supply with standard electrical requirements as per table 5.1 and 5.2

Table 5.1 electrical requirements models 302-1402

ELECTRICAL DATA	Unit	Model						
		LAHP302WW	LAHP402WW	LAHP602WW	LAHP702WW	LAHP902WW	LAHP1202WW	LAHP1402WW
Nominal voltage supply	Ph/V/Hz	3/400/50	3/400/50	3/400/50	3/400/50	3/400/50	3/400/50	3/400/50
Maximum voltage supply	V	430	430	430	430	430	430	430
Minimum voltage supply	V	380	380	380	380	380	380	380
Maximum input power	kW	18.3	19.4	29.9	36.6	47.8	59.6	71.6
Maximum input current	A	32.8	35.4	54.2	68.6	85.8	106	126
Maximum peak current	A	111	129	167	208	268	325	373
Maximum peak current (with soft start fitted)	A	73	73	119	136	178	216	249
Input power in stand-by mode	kW	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Power factor		0.78	0.82	0.81	0.75	0.9	0.83	0.88

Table 5.2 electrical requirements models 1804-2604

ELECTRICAL DATA	Unit	Model		
		LAHP1804WW	LAHP2304WW	LAHP2604WW
Nominal voltage supply	Ph/V/Hz	3/400/50	3/400/50	3/400/50
Maximum voltage supply	V	430	430	430
Minimum voltage supply	V	380	380	380
Maximum input power	kW	95.6	119	143
Maximum input current	A	172	211	252
Maximum peak current	A	354	430	499
Maximum peak current (with soft start fitted)	A	264	322	375
Input power in stand-by mode	kW	0.02	0.02	0.02
Power factor		0.89	0.83	0.88

Provision should be made for local isolation with a lockable isolator fitted on or very close to the heat pump. A single 230v plug socket should also be fitted close to the unit to aid commissioning and future maintenance.

Standard electrical connections available

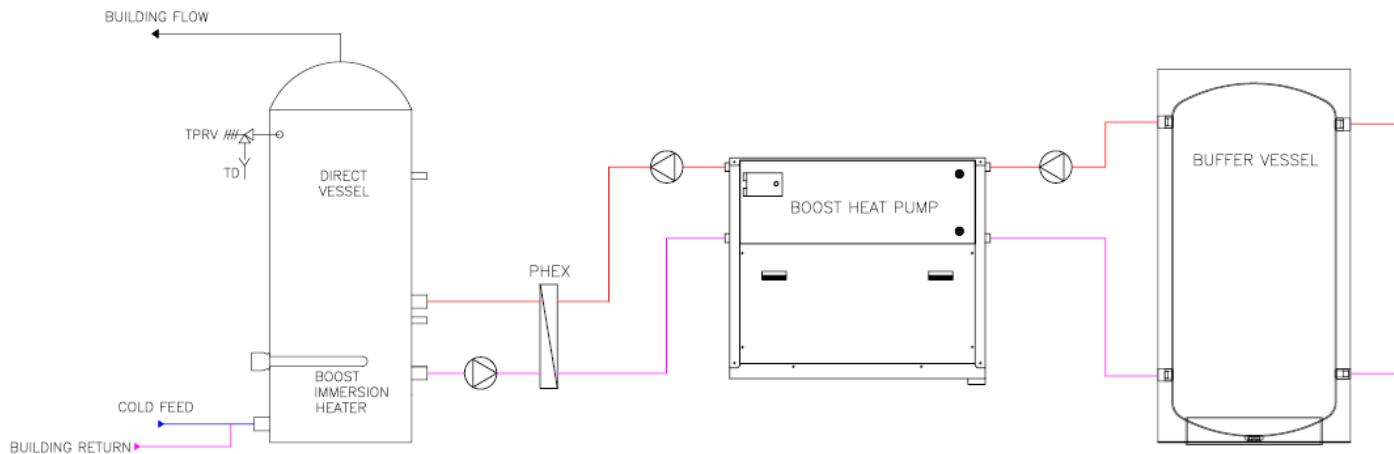
Standard electrical connections	
Connection	Note
BTI sensor	Monitor's temperature in the buffer vessel
BTs sensor	Monitor's temperature in the DHW vessel
Source Primary pump	Fitted within the plantroom
User Primary pump	Fitted within the plantroom
DHW Primary pump	Fitted between the heat pump plate and DHW storage vessel
Remote on/off	
Summer/winter mode	Switches to DHW only in summer
Hot water priority	
General alarm	
3-way valve	Switches between heating and DHW

Electrical ancillaries available

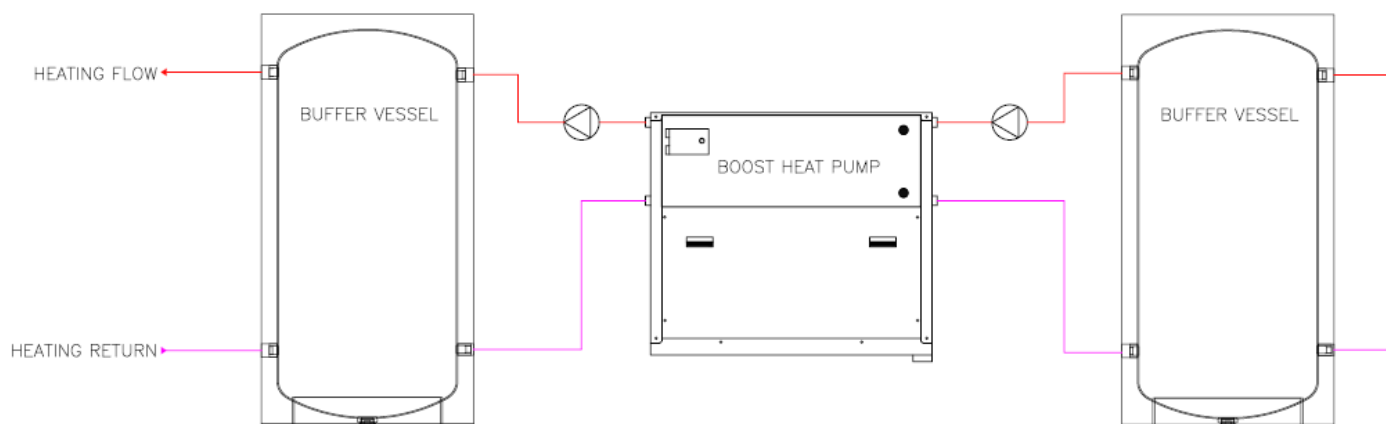
1. Cascade control, this will be supplied as standard on projects with more than one heat pump.
2. Soft start, this reduces the peak Amps at start-up as shown in table 5.1 and 5.2.

## Standard installation schematics

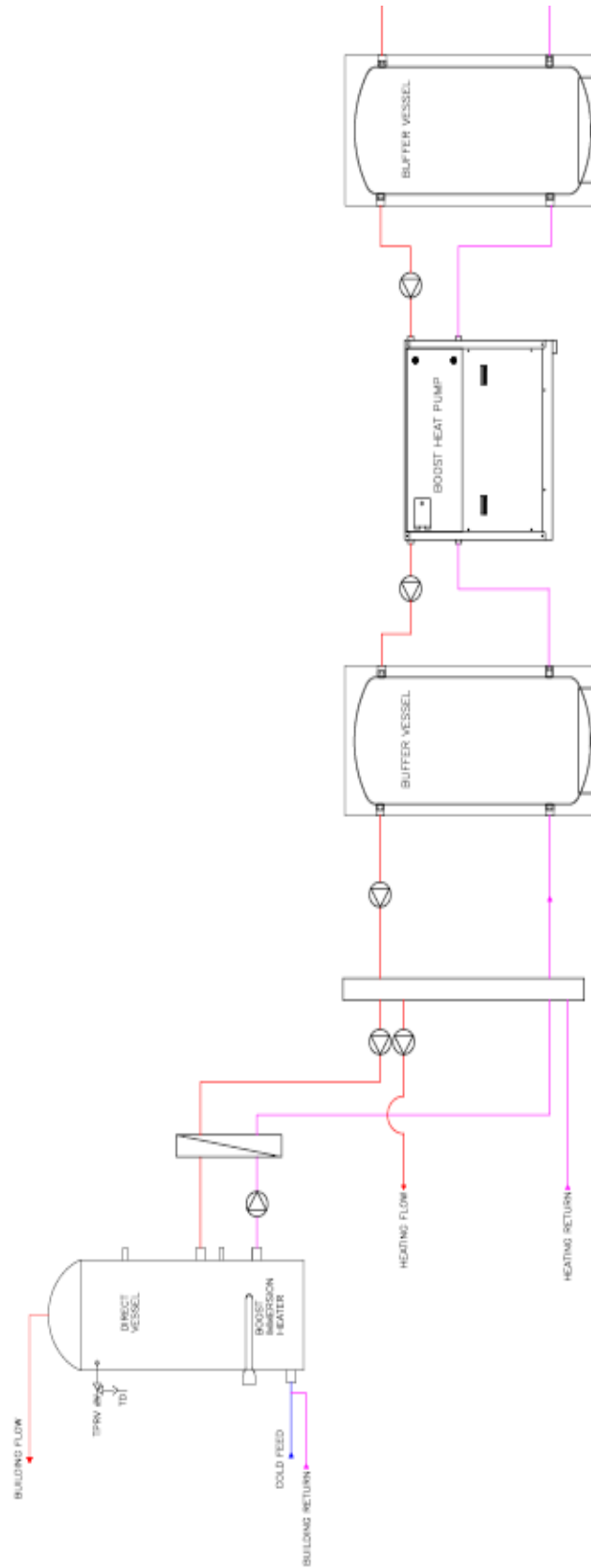
This section contains various standard schematics showing the concept installation options for the Amicus range. These drawings must not be used for detailed design but can be built upon by the design team to produce their own installations drawings. Lochinvar does not provide detailed installation drawings but can review any produced by the design team.



Drawing 6, Amicus Boost unit supplying domestic hot water only



Drawing 7, Amicus Boost supplying heating only



Drawing 8, Amicus Boost supplying heating and domestic hot water

## Installation assistance

Included in the cost of every Amicus unit is the use of the Lochinvar Project Engineer and commissioning. This helps ensure the units are installed correctly and the end user has the assurance the unit has been commissioned by the manufacturer. After orders are placed a Project Engineer will contact the installer and offer:

1. Initial pre-start visit to ensure the installer has all the required information to install the units and has the Project Engineer contact details for telephone and email support during the construction phase.
  - a. This visit covers flow rates, Location of equipment, wiring/controls, integration with other equipment and any other questions the installers may have.
2. A second visit during installation to make sure everything is OK.
  - a. This visit will review the progress and check everything is going ok, answer any further questions relating to the install – at this stage it is also good to meet the controls/BMS team.
3. A pre-commissioning visit to ensure all installation work is complete prior to the Lochinvar commissioning engineer visit.
  - a. On this visit we will complete the pre-com sheet ensure all works are complete and plan in a commissioning date.
4. Commissioning visit

On completion of the commissioning the installer will receive a detailed report.







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