



# PLATE HEAT EXCHANGER KITS

**IMAX XTRA 2**  
**80 120 160 200 240 280**  
**80P 120P 160P 200P 240P**

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](http://idealheating.com) where you can download the relevant information in PDF format.



This kit is suitable for the following boilers:

**Imax Xtra 2**      **80, 120, 160, 200, 240 & 280**  
**80P, 120P, 160P, 200P & 240P**

## CONTENTS

1 Introduction.....	3
2 General Description of Cascade Systems .....	4
3 Multiple Boiler System Components.....	7
4 Plate Heat Exchanger Kit Installation Procedure .....	10
5 Installation Drawings for Multiple Boiler Systems....	11
Frame Kit Configuration .....	14
6 Electrical Connections & Wiring Diagram.....	19
7 Pump Options .....	20
8 Commissioning and Testing.....	20

## IMPORTANT

**PLEASE READ THIS MANUAL ALONGSIDE THE IMAX XTRA 2 INSTALLATION MANUAL  
THESE KITS CAN BE USED IN CONJUNCTION WITH CASCADE HEADERS SUPPLIED AS  
PART OF THE IMAX XTRA 2 OPTIONS RANGE**

# 1 INTRODUCTION

This technical data contains information for dimensioning & assembly of a cascade system kit for the IMAX XTRA 2 range.

Header kits are available 'in line' (4 boilers long).

## GENERAL DESCRIPTION OF HEADER KITS

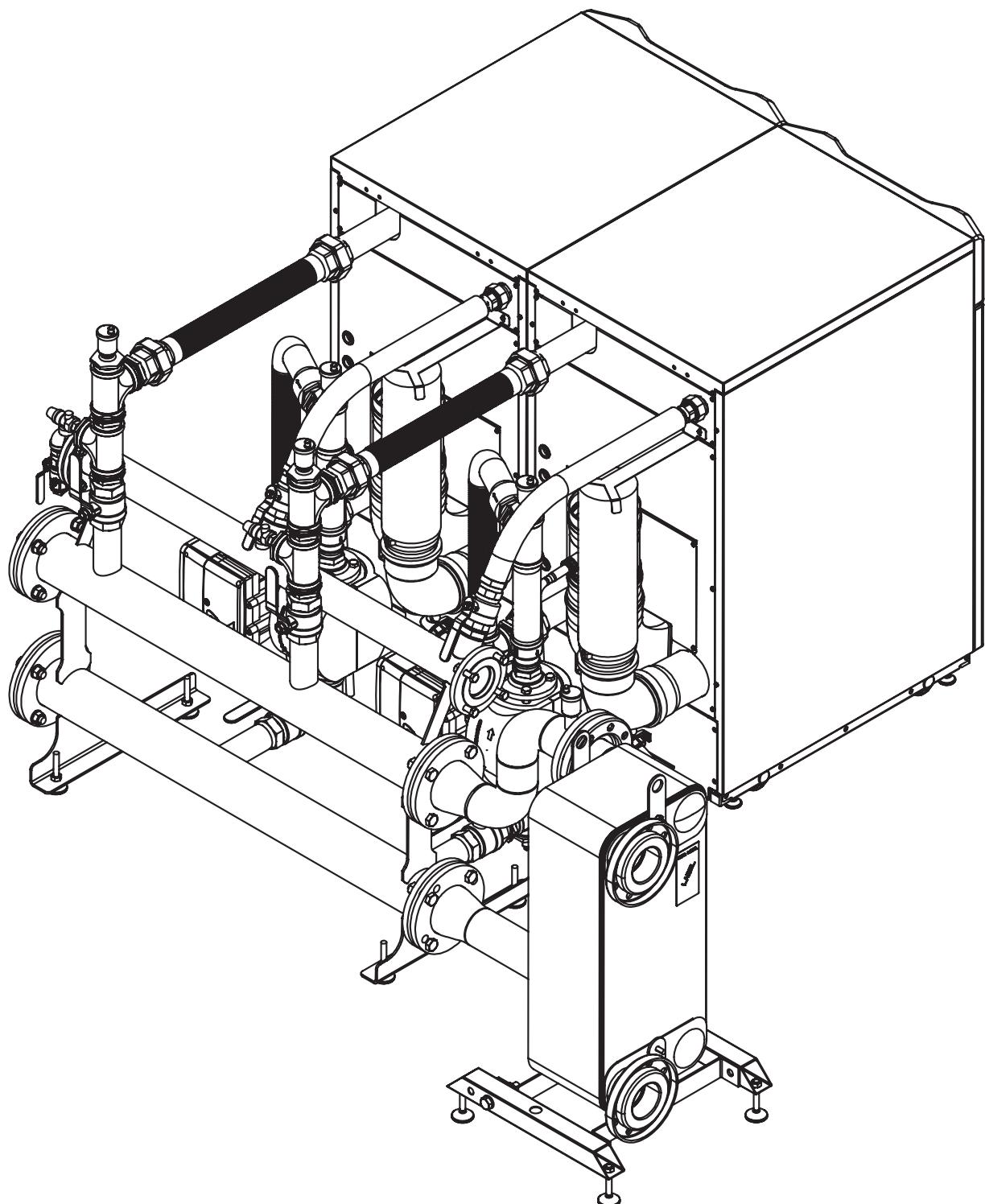
A requirement to spread the total required heat output over more than one boiler can be accommodated by the use of the Imax Xtra 2 multiple boiler header kit options.

The OCI345 can be installed (1 per boiler) for cascade control, see Imax Xtra 2 cascade kit instructions for further information.

The flue configurations for the range of appliances using these system kits are B23, C53 & C63 (See appliance manual).

**Note.** Particular care should be taken in the case of large outout boiler installations, complying with the requirements of the Clean Air Act.

All headers and pipe work should be insulated in accordance with the Non Domestic Building Services Compliance Guide. To ensure compliance with the maximum heat loss criteria, insulation thickness should be calculated according to BS EN ISO 12241 using standardised assumptions.



## 2 GENERAL DESCRIPTION OF CASCADE SYSTEMS

### 2.1 FRAME AND HEADER KIT DESIGN OPTIONS

The Imax Xtra 2 boilers are suitable for use in a multiple boiler configuration. The Imax Xtra 2 multiple boiler system is available in side 1 and 2 kit options giving the opportunity to choose the optimum footprint size for a given output. Frame 2, Table1 states available and gives the minimum number of appliances required, the appropriate floor space & the kit product number (N.B. The kits do not include the boilers).

**Note.**

All boilers need to be sized in accordance to the total required heat load and the modulation capabilities of the appliances.

Boilers operating with Propane must have the dedicated conversation kit installed.

Available Imax Xtra 2 Appliances	
kW (NG)	Product No.
Ideal Imax Xtra 2 80	225464
Ideal Imax Xtra 2 120	225465
Ideal Imax Xtra 2 160	225466
Ideal Imax Xtra 2 200	225467
Ideal Imax Xtra 2 240	225468
Ideal Imax Xtra 2 280	225469
kW (Propane)	Product No.
Ideal Imax Xtra 2 80P	225464 + 226434
Ideal Imax Xtra 2 120P	225465 + 226435
Ideal Imax Xtra 2 160P	225466 + 226436
Ideal Imax Xtra 2 200P	225467 + 226437
Ideal Imax Xtra 2 240P	225468 + 226438

**Table 1**

Boiler Model	Number of Boilers	Total kW	Water Header Size	Gas Header Size	Pump PHEX	PHEX Nominal Output kW	PHEX Product Number
Imax Xtra 2 80	1	80	DN80	DN65	UPML 25-105	150	222222
Imax Xtra 2 120	1	120	DN80	DN65	UPML 25-105	150	222222
Imax Xtra 2 160	1	160	DN80	DN65	UPMXXL 25-120	150	222222
Imax Xtra 2 200	1	200	DN80	DN65	Magna3 40-100F	300	222225
Imax Xtra 2 240	1	240	DN80	DN65	Magna3 40-100F	300	222225
Imax Xtra 2 280	1	280	DN80	DN65	Magna3 40-100F	300	222225
Imax Xtra 2 80	2	160	DN80	DN65	UPML 25-105	150	222222
Imax Xtra 2 120	2	240	DN80	DN65	UPML 25-105	300	222225
Imax Xtra 2 160	2	320	DN80	DN65	UPMXXL 25-120	300	222225
Imax Xtra 2 200	2	400	DN100	DN65	Magna3 40-100F	450	222996
Imax Xtra 2 240	2	480	DN150	DN80	Magna3 40-100F	450	222996
Imax Xtra 2 280	2	560	DN100	DN65	Magna3 40-100F	600	222227
Imax Xtra 2 80	3	240	DN80	DN65	UPML 25-105	300	222225
Imax Xtra 2 120	3	360	DN80	DN65	UPML 25-105	450	222226
Imax Xtra 2 160	3	480	DN100	DN65	UPMXXL 25-120	450	222996
Imax Xtra 2 200	3	600	DN100	DN65	Magna3 40-100F	600	222227
Imax Xtra 2 240	3	720	DN100	DN65	Magna3 40-100F	750	242218
Imax Xtra 2 280	3	840	DN150	DN80	Magna3 40-100F	900	242219
Imax Xtra 2 80	4	320	DN80	DN65	UPML 25-105	450	222226
Imax Xtra 2 120	4	480	DN100	DN65	UPML 25-105	450	222996
Imax Xtra 2 160	4	640	DN100	DN65	UPMXXL 25-120	750	242216
Imax Xtra 2 200	4	800	DN150	DN80	Magna3 40-100F	900	242219
Imax Xtra 2 240	4	960	DN150	DN80	Magna3 40-100F	900	242219
Imax Xtra 2 280	4	1120	DN150	DN80	Magna3 40-100F	1200	242220

**Table 2**

**Note:** The following table shows the PHE Kit outlet connection sizes.

PHE Kits (kW)	Outlet Connection Size
60	DN25 PN6 FLANGE
150	
300	
450	DN50 PN6 FLANGE
600	
750	
900	DN100 PN16 FLANGE
1200	

## 2.5 GAS SUPPLY

For Imax Xtra 2 the 80, 120, 160, 200, 240, 280 boilers are configured for use with natural gas. The 80P, 120P, 160P, 200P, 240P boilers are configured for use with LPG.

Connection to the gas supply must be in accordance to with all the applicable regulations.

GAS HEADERS	
Water Header Size	NG / LPG Header
DN150	DN80 (3")
DN80 / DN100	DN65 (2 1/2")

## 2.2 MULTIPLE BOILER INSTALLATIONS

For installing 1 to 4 boilers, the product range includes water and gas headers capable of assembly using threaded socket and PN6 flange connections.

## 2.3 HYDRONIC ISOLATION: PLATE HEAT EXCHANGER

A plate heat exchanger allows flow separation within a hydronic system.

This allows two flow circuits to operate with their own flow and pressure environments whilst effectively transferring heat to its adjoined water circuit.

This enables the modern high resistant, high efficiency boilers to operate under their optimum conditions, while the main heating circuit operates to its own controlled optimum requirements.

## 2.4 OUTPUT CONTROL

All pumps are designed to be wired to the appliance to allow a controlled pump over run.

If using an external pump control system the capability of a timed pump over run signal provided by the appliance must be maintained at all times.

The optional OCI 345 accessory control can be installed (1 per boiler) to enable cascade control.

**Note:** Option Kit DN65 flange 2" threaded comes as standard with the DN80 water header.

**Note.** Boilers operating with Propane must have the dedicated conversation kit installed.

Test and purge point is provided in the header blanking flange and is intended to check the total installation pressure drop.

## 2.6 ASSEMBLY

The header kits must be located in a suitable place that affords a flat and level floor-area of suitable load bearing capacity. Care must be taken when locating the kits that space is available for the servicing, installation and maintenance of the appliance and all of the associated connections and equipment. (See appliance manuals and drawing with this manual).

## 2.7 SAFE HANDLING

Installation may require 2 or more operatives to move it to its installation site, remove it from its packaging base and during movement into its installation location. Manoeuvring may include the use of a sack truck and involve lifting, pushing and pulling.

Caution should be exercised during these operations.

Operatives should be knowledgeable in handling techniques when performing these tasks and the following precautions should be considered:

- Be physically capable
- Use personal protective equipment as appropriate, e.g. gloves, safety footwear

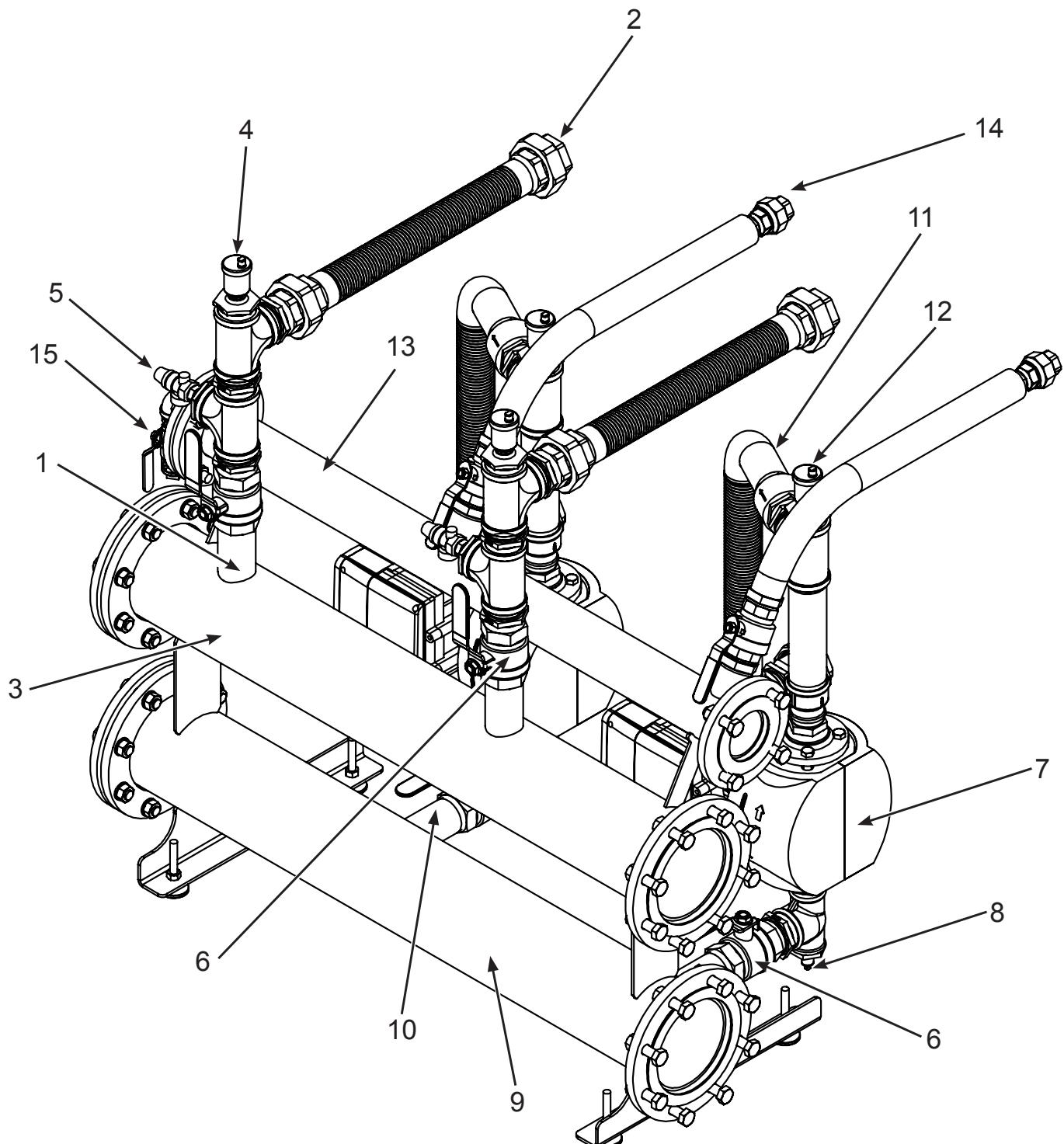
During all manoeuvres and handling actions, every attempt should be made to ensure the following unless unavoidable and/or the weight is light.

- Keep back straight
- Avoid twisting at the waist
- Avoid upper body/top heavy bending
- Always grip with the palm of the hand
- Use designated hand holds
- Keep load as close to the body as possible
- Always use assistance if required

Full stability is achieved when complete, ensure support where necessary during assembly.

## 2.8 HEADER ASSEMBLY

1. Flow Pipework	9. Return Header
2. Flow Connection	10. Return Pipework
3. Flow Header	11. Return to Boiler
4. Auto Air Vent	12. Auto Air Vent
5. Pressure Relief Valve	13. Gas Header
6. Isolation Valve	14. Gas Connection
7. Pump	15. Gas Header Test & Purge Point
8. Drain Cock	



### 3 MULTIPLE BOILER SYSTEM COMPONENTS

#### 3.1 GENERAL

The boiler kit system consist of the following components:

- Gas header
- Boiler flow and return headers supported on mounting skid
- Low loss mixing header (optional)
- Hardware pack (includes essential connection and valve components)
- Plate Heat exchanger kit (optional)
- Boiler Shunt pump (MUST be used, sold separately to match boiler)

#### 3.2 MAIN WATER HEADERS

The main water headers consist of: water flow, water return headers custom sized for all boilers. It is possible to extend the system to a maximum of 4 boilers in a linear configuration.

Each header kit provides water flow and return headers sized either DN80, DN100 or DN150 dependent on total maximum combined heating output required.

Water Header Size	Max Combined Output (kW)
DN150	1120
DN100	640
DN80	360

#### 3.3 GAS HEADER

The Gas header consists of a custom manufactured manifold. This is located in a cradle incorporated within the header mounting skid.

Up to 640kW DN65, 720kW to 1120kW DN80.

#### 3.4 PLATE HEAT EXCHANGERS (MIXING HEADER) OPTION

The mixing headers are supplied with an auto air vent and drain point as standard.

#### 3.5 BOILER SHUNT PUMP

Pump kits and External pump controls (**sold separately**) are designed to provide the optimum flow around the appliance water circuit ensuring the maximum flow rates are contained within the design constraints of the appliance.

It is not recommended to fit additional pumps directly to the appliance circuit unless they have been designed to ensure the maximum permissible appliance flow rate is not exceeded.

#### 3.6 HEADER SPACER

When installing more than 2 boilers, an optional header spacer 450mm long can be supplied to allow further access for maintenance.

Water Header size	Header Spacer Product No.
DN80	226418
DN100	226419
DN150	226420

#### 3.7 INSTALLATION AREA AND DIMENSIONS

Care must be taken to ensure adequate access for boiler / cascade system installation and servicing.

A minimum of 600mm and a maximum of 1000mm clearance must be provided from the front of the installed boilers in cascade to facilitate boiler servicing. Additional clearance must also be considered in the event of boiler replacement.

Consideration to connecting heating flow and return pipework, gas supply and condensate drainage must be given. Routing of the condensate drain must be made to allow a minimum fall of 1 in 20 away from the installed boilers in cascade, throughout its length. Adequate room above the boilers must be provided to install and service the boiler flue system. Further information with respect to flue and condensate drain connection is provided in the installation and servicing instructions provided within the boilers packaging carton.

### 3.8 BOILER CONNECTION KITS

The connection kit contains the following components:

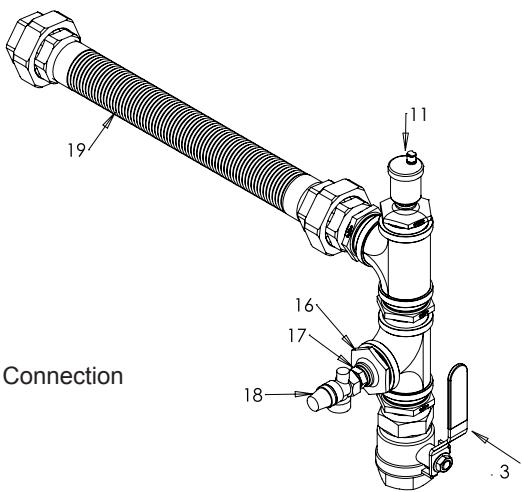
- Boiler return leg complete with isolating valve, pump, non return valve, drain cock and fibre seals
- Boiler flow leg complete with isolating valve, pressure relief valve and fibre seals
- Header blanking flanges, fasteners and gaskets
- Mixing header fasteners and gasket

#### LEGEND

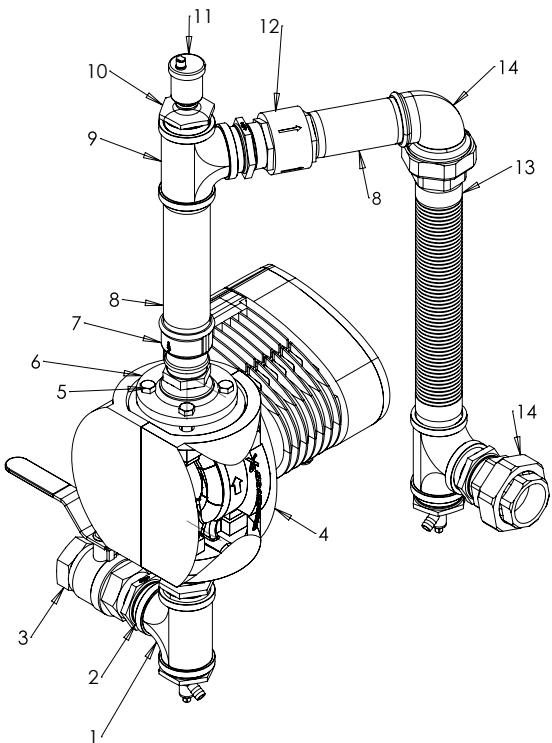
1. 2" x 1 $\frac{1}{4}$  x 1 $\frac{1}{4}$ " Tee
2. Nipple
3. Isolation Valve
4. Pump inc. Gaskets
5. Pump Fastener Kit
6. Threaded Flange
7. 2" - 1 $\frac{1}{4}$ " Reducing Socket
8. 2" Hard Pipe
9. 2" Equal Tee
10. Reducer

11. Auto Air Vent
12. Non Return Valve
13. Boiler Return Flexible Connection from Header
14. 2" Union
15. Pump Union
16. Reducer
17. Nipple
18. Safety Relief Valve 6 Bar
19. Boiler Flexible Connection from Header

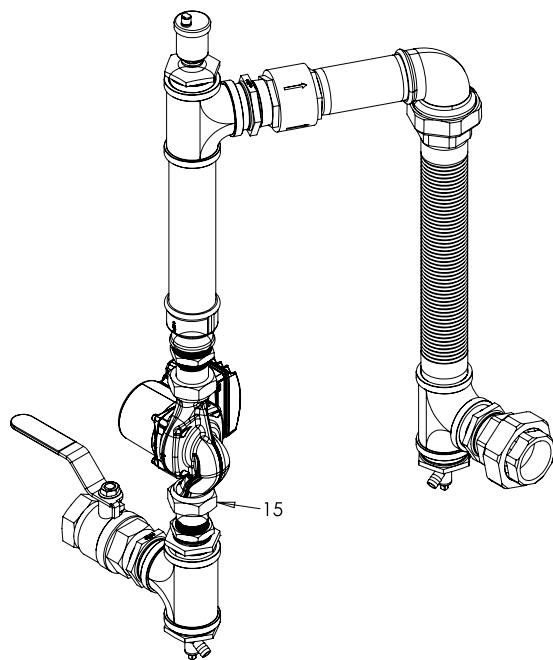
**Gas Connection:** Flexi-hose from header



**RETURN - Flanged Pump Variant**



**RETURN - Threaded Pump Variant**



## IMPORTANT POINT

### Assembly:

Header kits must stand on a flat and level floor of suitable load bearing capacity.  
Minimal adjustment/leveling is achieved with adjustable feet.

## 3.9 SYSTEM REQUIREMENTS

### Notes.

- Ancillary components can be connected to the system via the G ¾" tapping's on the header blanking flanges. See diagram below for guidance (diagram for illustration purposes only).
- The method of filling, refilling, topping up or flushing sealed primary circuits from the mains via a temporary hose connection is only allowed if acceptable to the local water authority
- When installing the filling device, it must be connected as shown to fully comply with the water regulations. This may involve the fitting of an approved WRAS approved isolator valve to the mains supply, and appropriate back flow prevention device

### Safety valve (Supplied with kit)

1. A spring loaded non-adjustable 6 bar safety valve complying with the relevant standards of BS6759 Pt1 is fitted close to the boiler with no intervening valve or restriction.
2. A manual testing device.
3. The safety valve outlet should be piped to ensure water or steam discharge cannot create a hazard to personal or damage electrical components or wiring.

### Pressure gauge (Not supplied)

A pressure gauge covering at least 0-6 bar must be fitted to the system visible from the filling point.

### Expansion vessel (Not supplied)

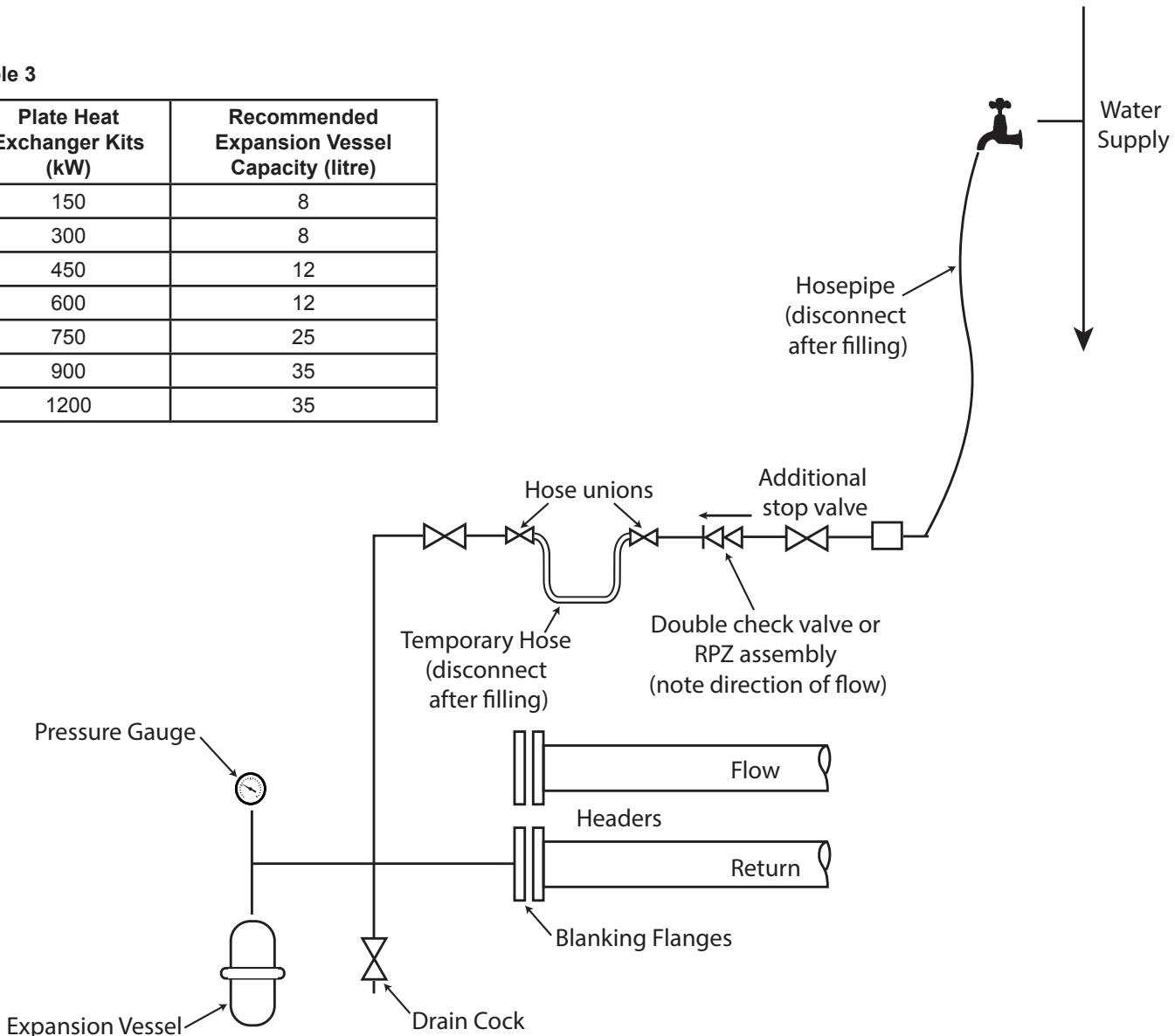
1. A diaphragm type expansion vessel complying with BS. EN 13831 must be fitted without incorporating isolation valves of any sort.
2. The vessel capacity must be adequate to accept the expansion of system water when heated to 110°C.
3. The charge pressure must not be less than the static water head above the vessel. The pressure attained in the system when heated to 110°C should be at least 0.35bar less than the lift pressure of the safety valve. For guidance on vessel sizing refer to the Table 3.

### System drain cock (Not supplied)

A drain cock should be fitted to the lower blanking flange on the lowest header.

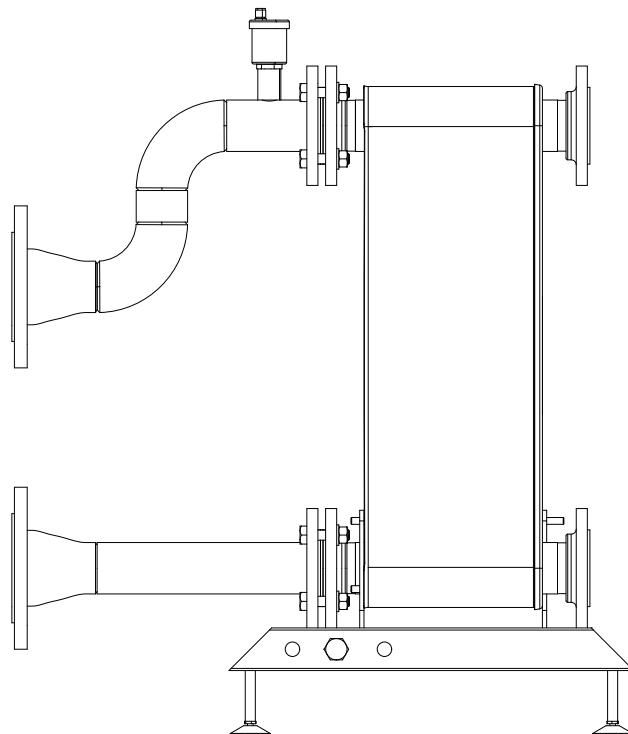
Table 3

Plate Heat Exchanger Kits (kW)	Recommended Expansion Vessel Capacity (litre)
150	8
300	8
450	12
600	12
750	25
900	35
1200	35



## 4 PLATE HEAT EXCHANGER KIT (OPTIONAL ACCESSORY)

### 4.1 PLATE HEAT EXCHANGER FEET



STANDARD HEIGHT CONFIGURATION (FEET INSTALLED)

### 4.2 FITTING PLATE HEAT EXCHANGER AND BLANKING FLANGES

1. Fit the Plate Heat Exchanger and blanking flanges in the chosen positions.

*Note: Plate Heat Exchanger can be located either LHS or RHS of the headers.*

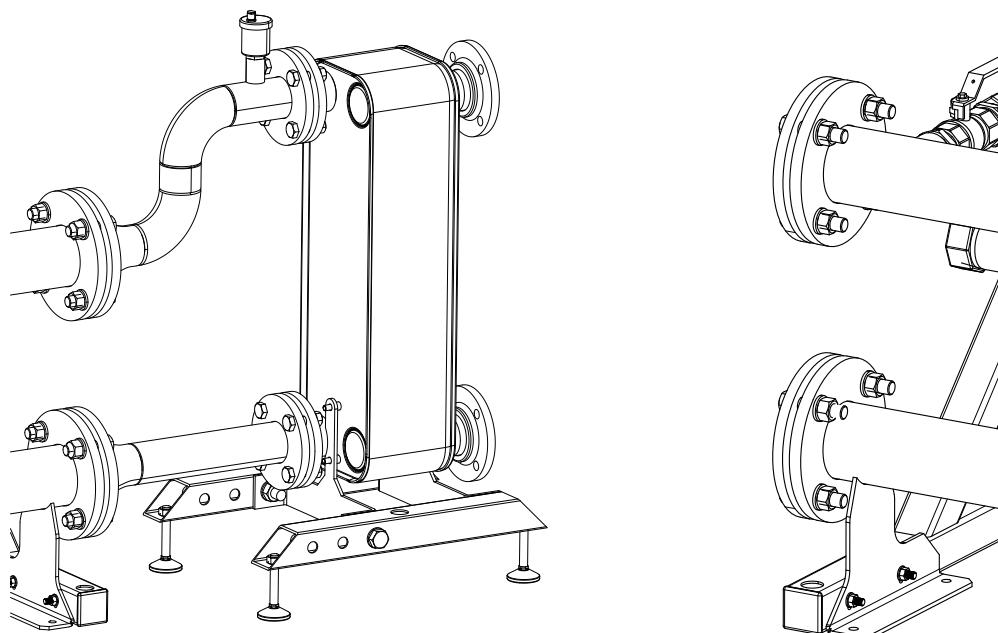


Plate Heat Exchanger

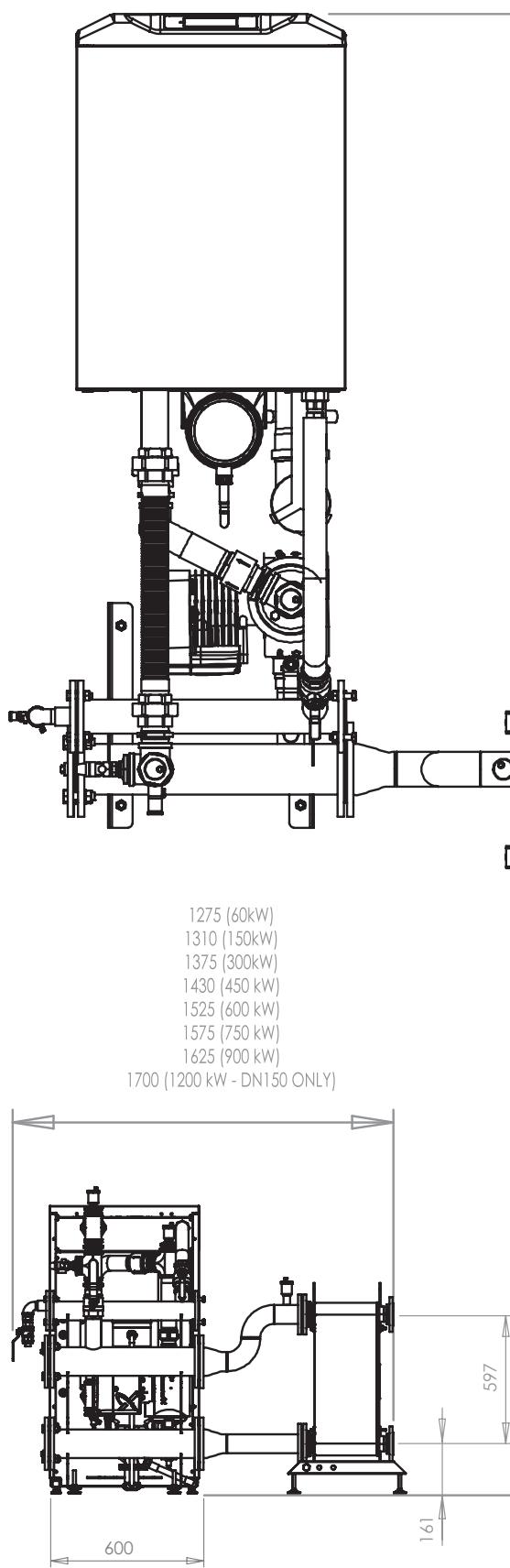
Blanking Flange

## 5 PLATE HEAT EXCHANGER KIT CONFIGURATION

### General Data

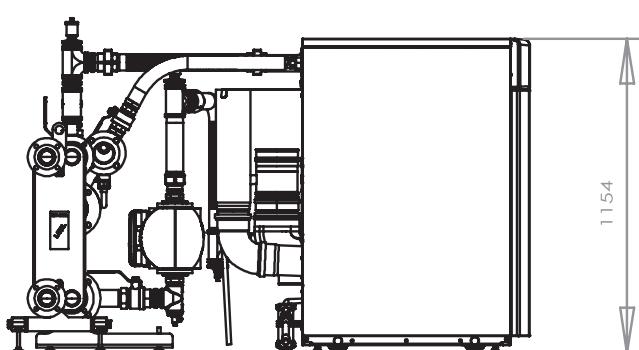
The boiler side of the cascade systems is sized to water flow and return temperature differential  $20\Delta T$ .

### 5.1 1 WIDE WITH SMALL BOILER : DN80, DN100 AND DN150 KITS

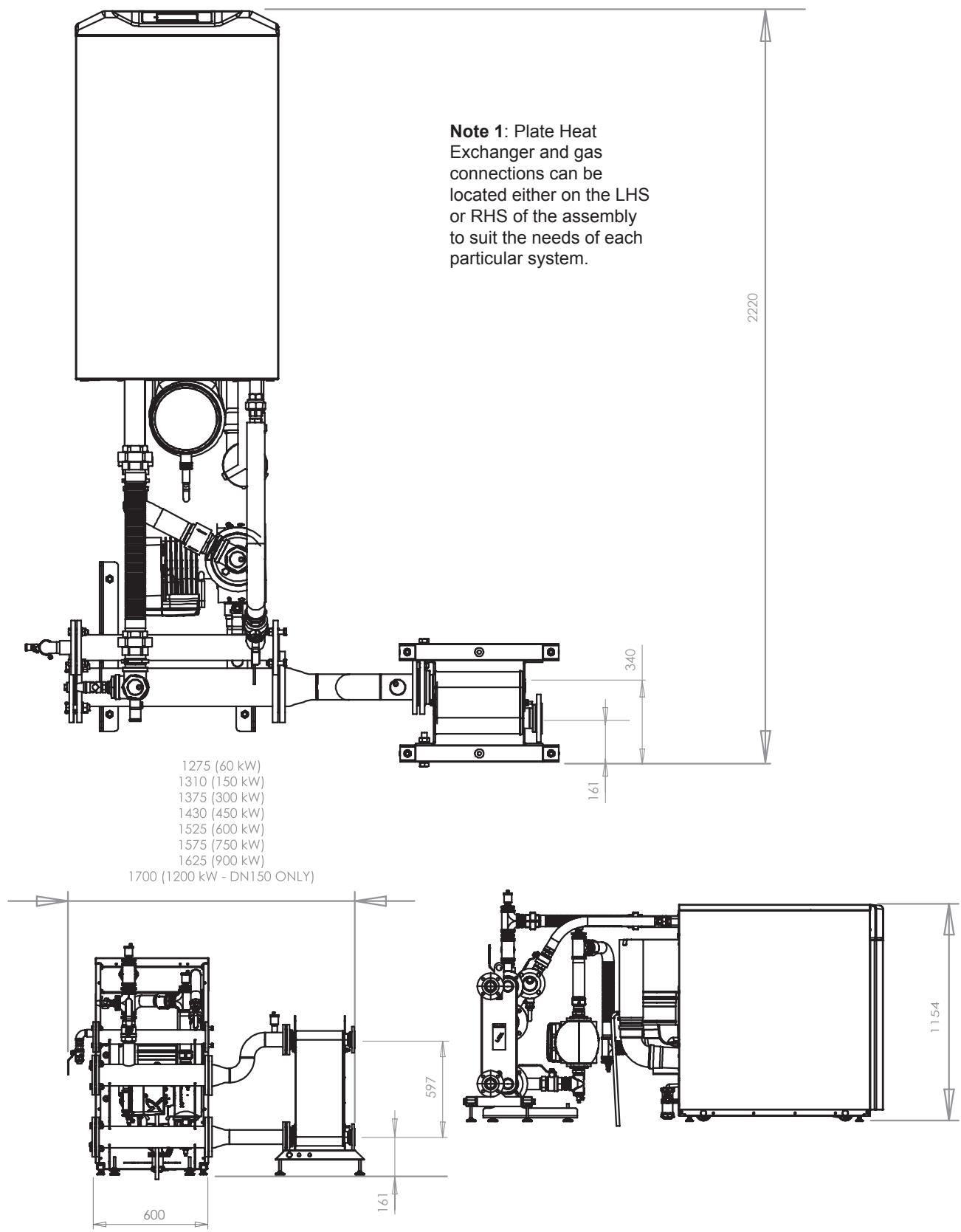


**Note 1:** Plate Heat Exchanger and gas connections can be located either on the LHS or RHS of the assembly to suit the needs of each particular system.

Boiler Output (kW)	Chassis Size
80-160	Small
200-280	Large

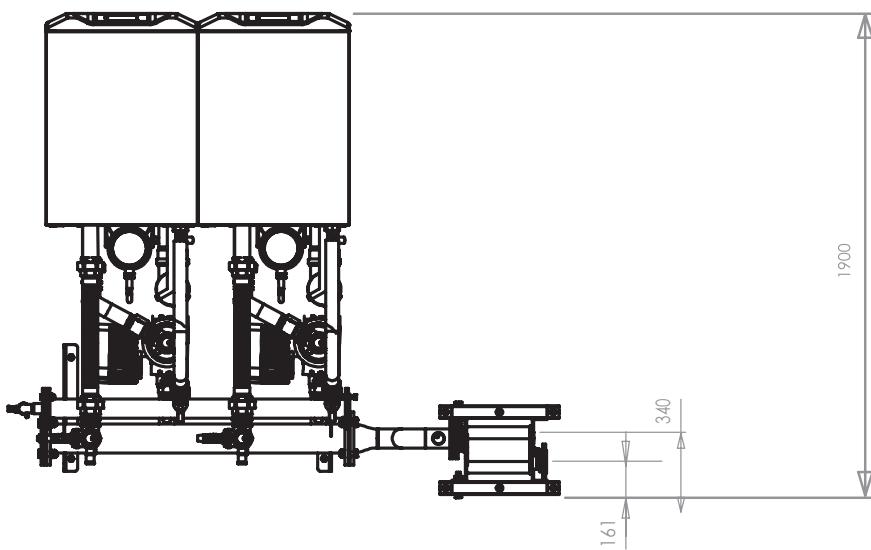


## 5.2 1 WIDE WITH LARGE BOILER : DN80, DN100 AND DN150 KITS



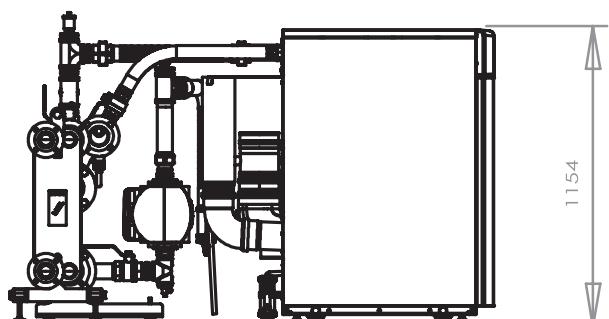
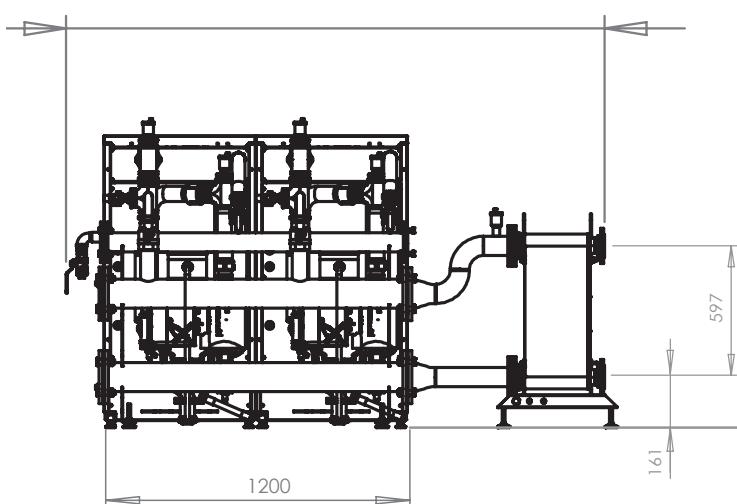
Boiler Output (kW)	Chassis Size
80-160	Small
200-280	Large

### 5.3 2 WIDE WITH SMALL BOILER : DN80, DN100 AND DN150 KITS



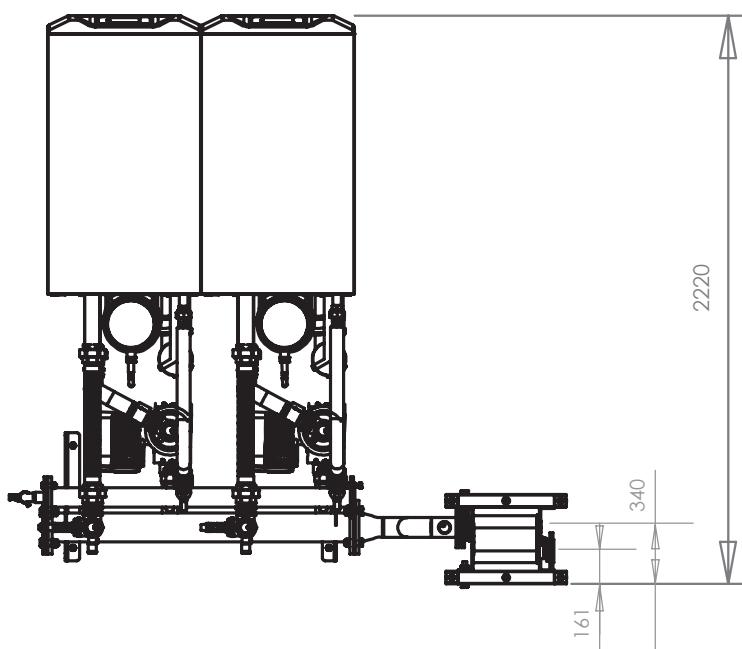
**Note 1:** Plate Heat Exchanger and gas connections can be located either on the LHS or RHS of the assembly to suit the needs of each particular system.

1875 (60 kW)  
 1910 (150 kW)  
 1975 (300 kW)  
 2030 (450 kW)  
 2125 (600 kW)  
 2175 (750 kW)  
 2225 (900 kW)  
 2300 (1200 kW - DN150 ONLY)

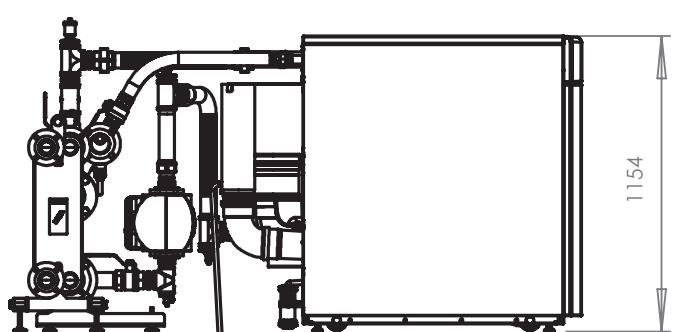
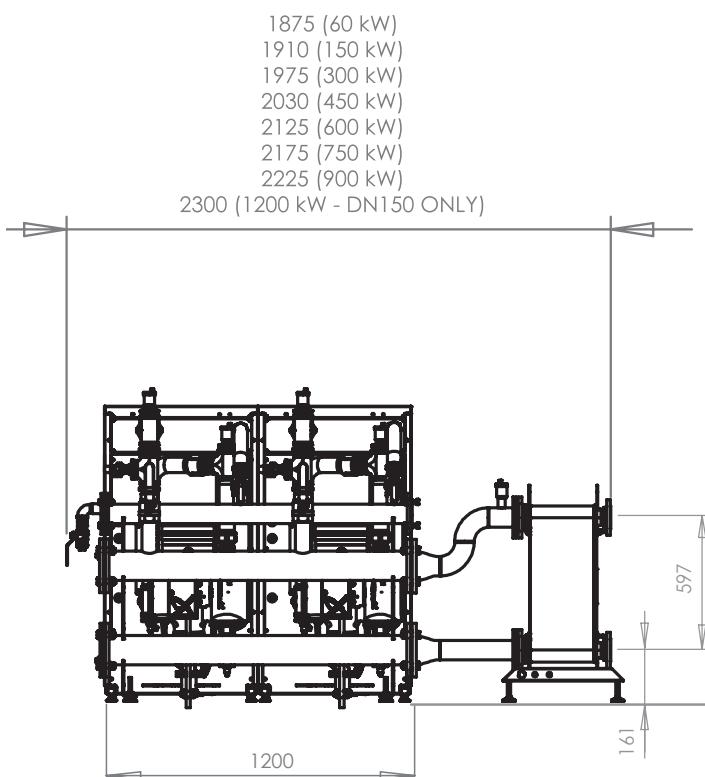


Boiler Output (kW)	Chassis Size
80-160	Small
200-280	Large

## 5.4 2-WIDE WITH LARGE BOILER : DN80, DN100 AND DN150 KITS

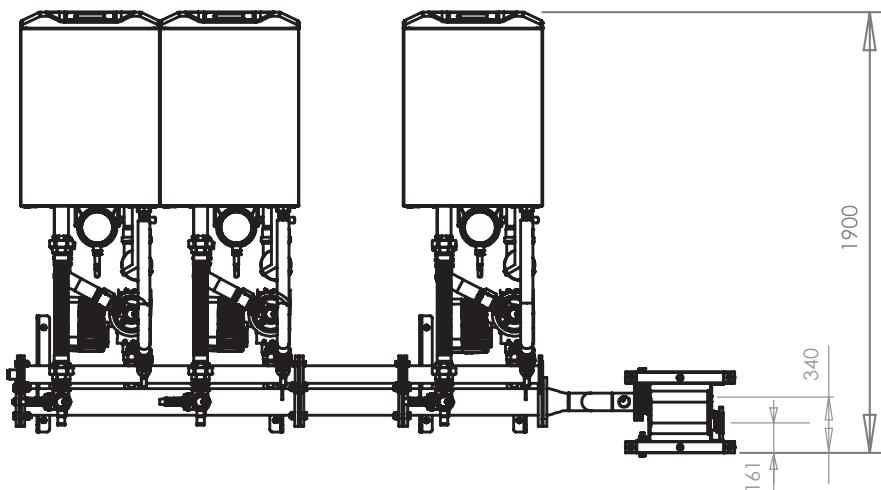


**Note 1:** Plate Heat Exchanger and gas connections can be located either on the LHS or RHS of the assembly to suit the needs of each particular system.



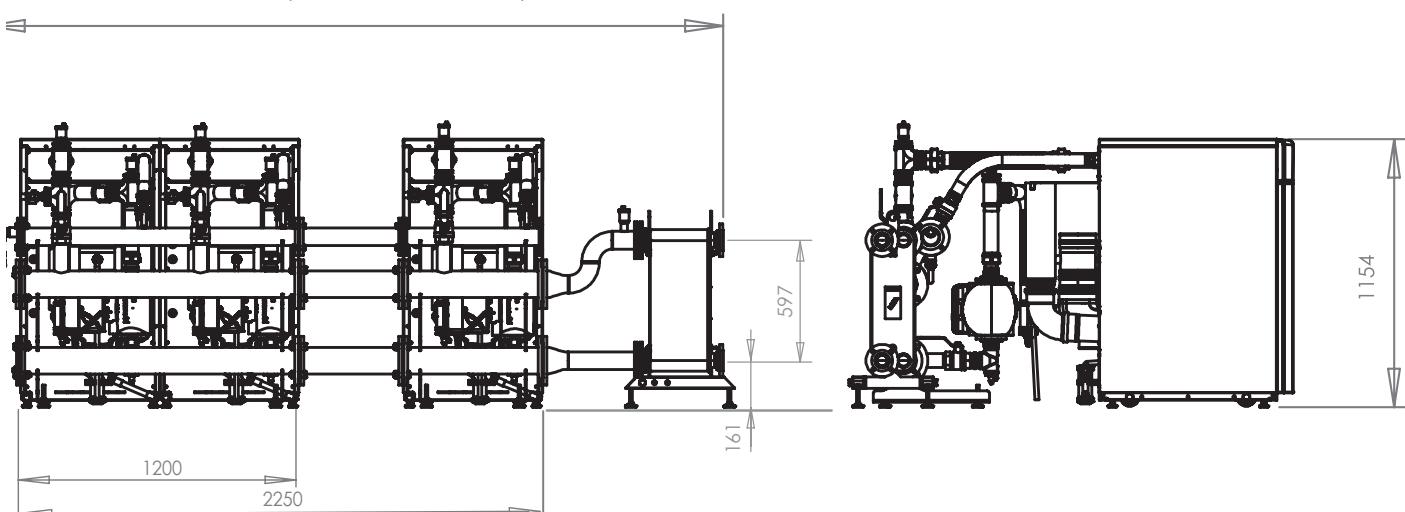
Boiler Output (kW)	Chassis Size
80-160	Small
200-280	Large

## 5.5 3-WIDE WITH SMALL BOILER : DN80, DN100 AND DN150 KITS



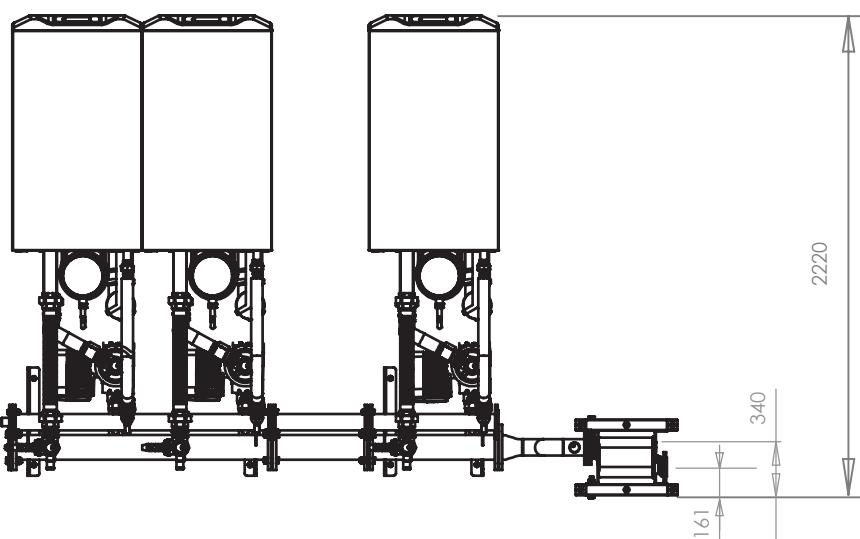
**Note 1:** Plate Heat Exchanger and gas connections can be located either on the LHS or RHS of the assembly to suit the needs of each particular system.

2925 (60kW)  
 2960 (150kW)  
 3025 (300kW)  
 3080 (450kW)  
 3175 (600kW)  
 3225 (750kW)  
 3275 (900kW)  
 3350 (1200kW - DN150 ONLY)

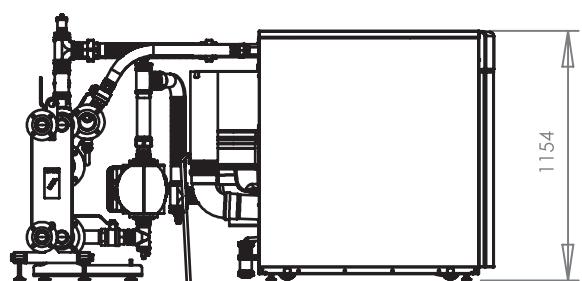
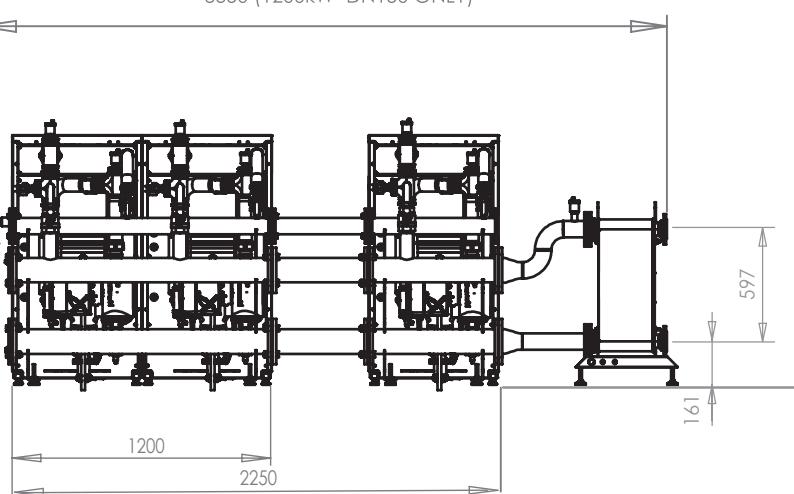


Boiler Output (kW)	Chassis Size
80-160	Small
200-280	Large

## 5.6 3-WIDE WITH LARGE BOILER : DN80, DN100 AND DN150 KITS

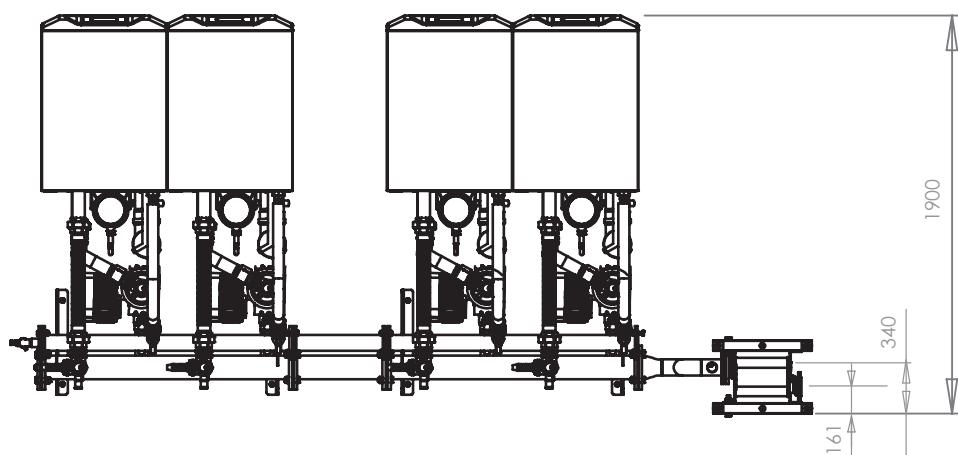


2925 (60kW)  
 2960 (150kW)  
 3025 (300kW)  
 3080 (450kW)  
 3175 (600kW)  
 3225 (750kW)  
 3275 (900kW)  
 3350 (1200kW -DN150 ONLY)



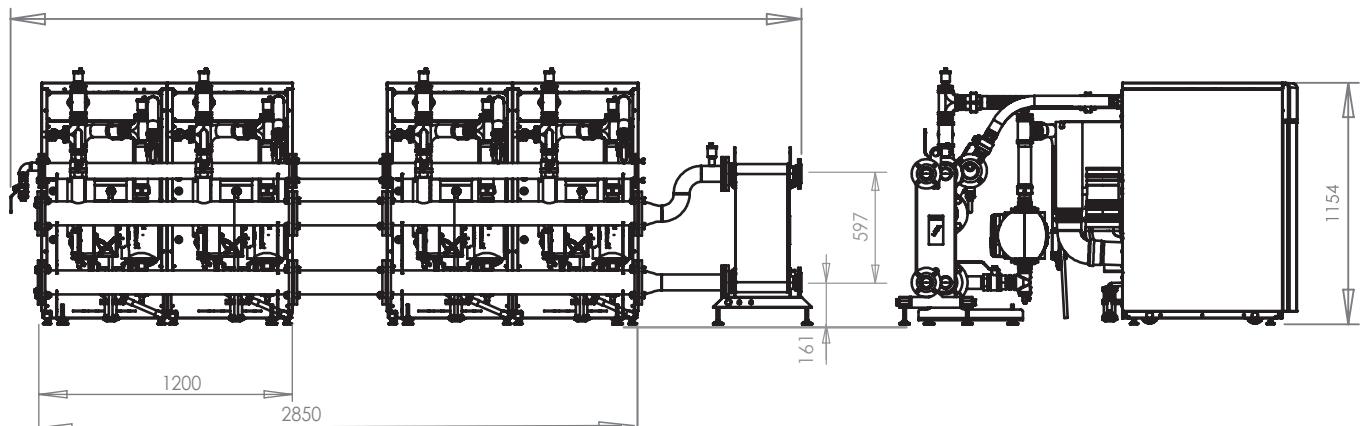
Boiler Output (kW)	Chassis Size
80-160	Small
200-280	Large

## 5.7 4-WIDE WITH SMALL BOILER : DN80, DN100 AND DN150 KITS



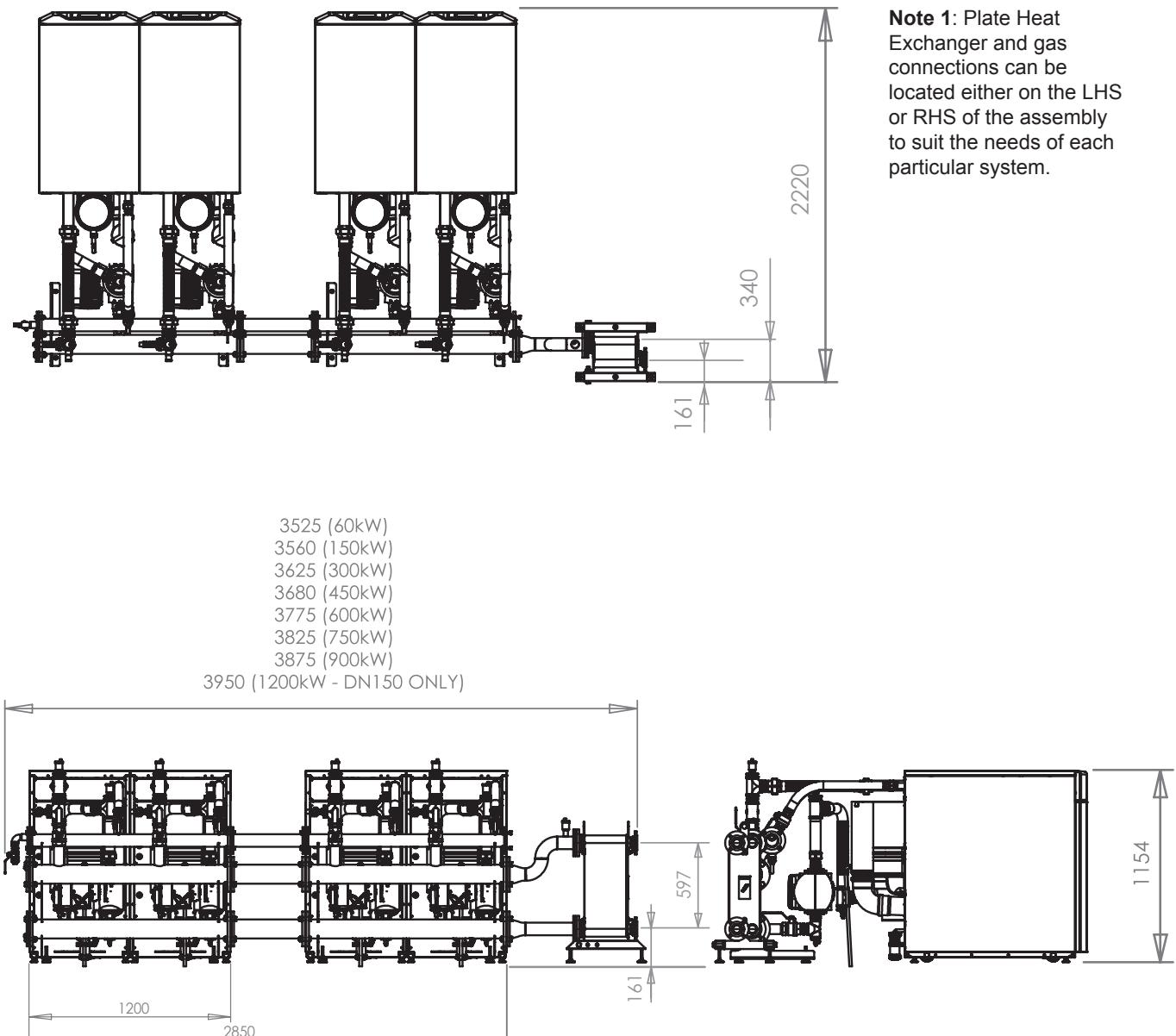
**Note 1:** Plate Heat Exchanger and gas connections can be located either on the LHS or RHS of the assembly to suit the needs of each particular system.

3525 (60kW)  
 3560 (150kW)  
 3625 (300kW)  
 3680 (450kW)  
 3775 (600kW)  
 3825 (750kW)  
 3875 (900kW)  
 3950 (1200kW - DN150 ONLY)



Boiler Output (kW)	Chassis Size
80-160	Small
200-280	Large

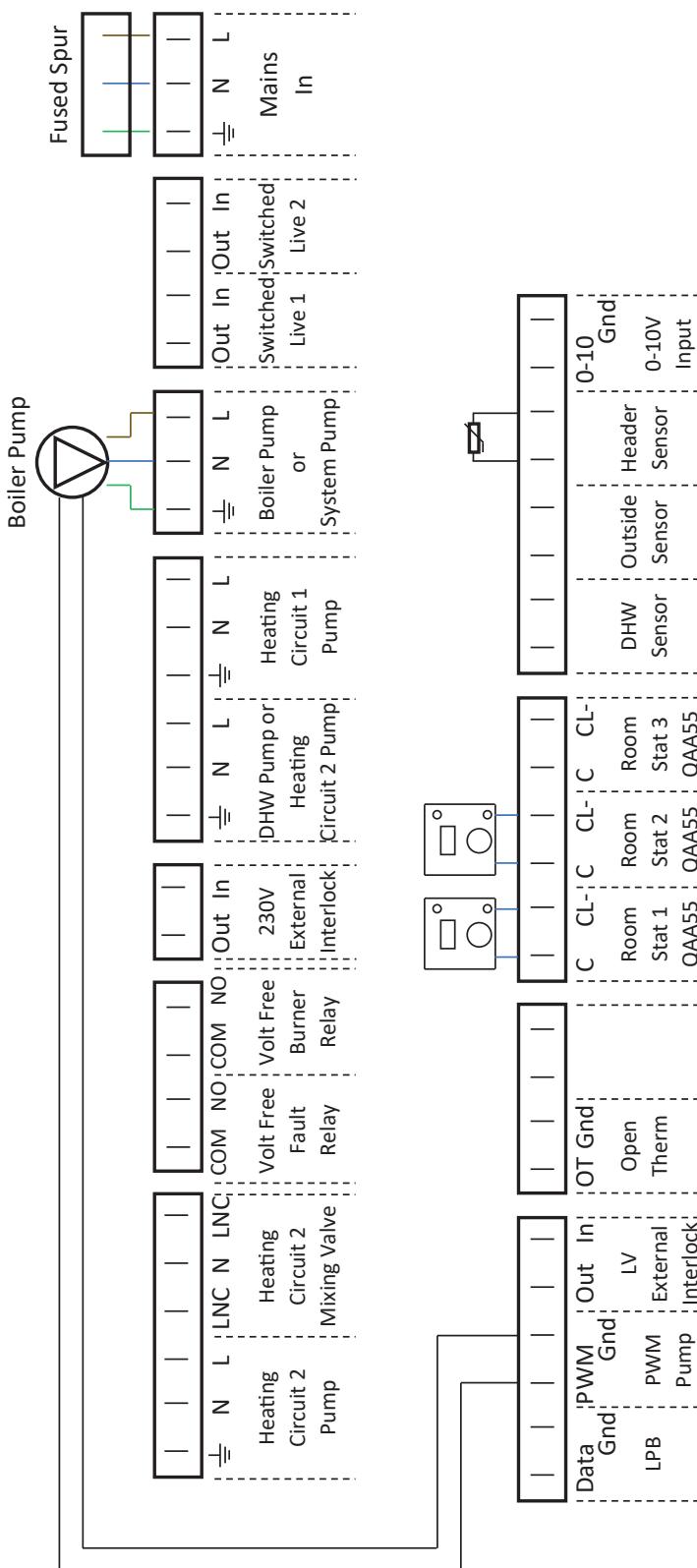
## 5.8 4-WIDE WITH LARGE BOILER : DN80, DN100 AND DN150 KITS



Boiler Output (kW)	Chassis Size
80-160	Small
200-280	Large

## 6 ELECTRICAL CONNECTIONS & WIRING DIAGRAM

## Boiler Pump Speed Control via PWM Output



Refer to the **Wiring Connection** section in the **boiler Installation Instructions** for wiring details.

**IMPORTANT:** Ensure the boiler numbers are wired to the boiler in order to ensure the boiler number overrun facility is provided

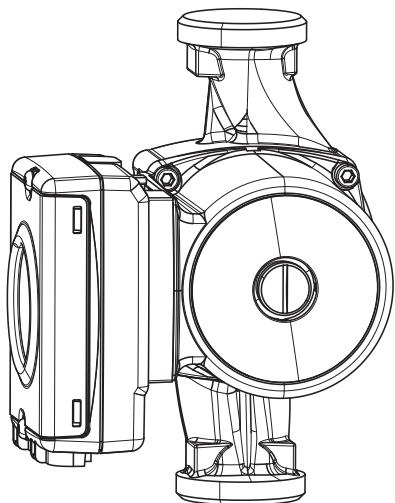
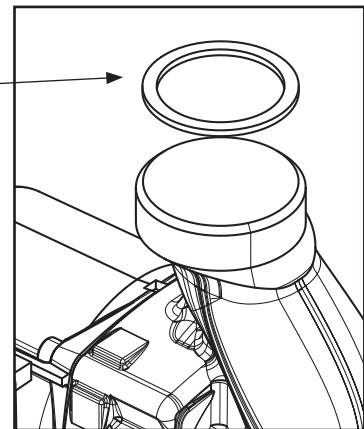
For the Imax Xtra 2 80kW and 120kW, it is recommended to use the Grundfos UPML Pump as the boiler pump. This needs to either be controlled by the Boiler/System Pump Connection, for On/Off Control direct from the boiler, or supplied with a permanent live supply on the same phase as the boiler and controlled by the PWM Pump Connection, for

For the **lmax Xtra 2 160kW**, it is recommended to use the **Grundfos UPMMXXL** Pump as the boiler pump. This needs to either be operated by an external relay, controlled by the Modulation Control.

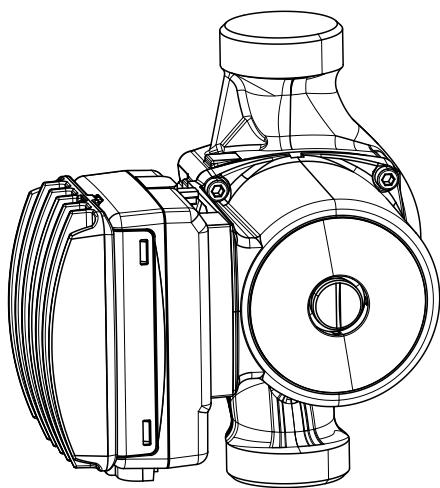
For the Imax Xtra 2 200kW, 240kW and 280kW, it is recommended to use the Grundfos Magna 3 Pump as the boiler pump. This needs to either be operated by an external relay, controlled by the Boiler/System Pump Connection, or supplied with a permanent live supply on the same phase as the boiler and controlled by the 0-10V Pump Connection (which requires the optional extra 0-10V Pump Kit), for Modulation Control.

## 7 PUMP OPTIONS

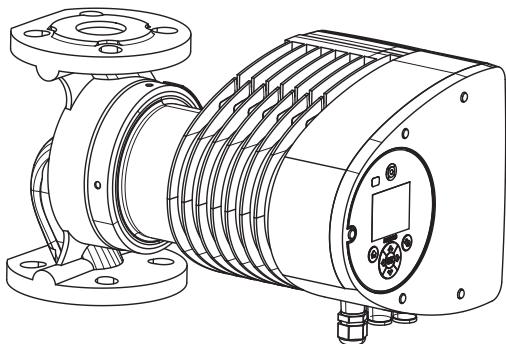
1. On the threaded pumps ensure that the sealing washers are used when connecting either side.
2. Ensure sealing washers/ gaskets are in place on all pumps.



'UPML' for use with Low Loss Headers  
and on 80 and 120 with plates



'UPMXXL' for use with  
Plate Heat Exchangers and low loss headers



MAGNA3 40-100 F

**IMPORTANT:** PWM Control to be wired directly to the boiler PCB.  
For pump and external pump control wiring refer to this instruction & the boiler Installation Manual.

## 8 COMMISSIONING AND TESTING

1. Electrical and gas safety checks must be carried out on completion of installation as with individual boiler commissioning.
2. Ensure sealing washers/ gaskets are in place on all pumps.

Refer to the boiler Installation Manual.

## NOTES



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](http://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.

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