



## **FRAME & HEADER KIT INSTRUCTIONS**

**Keston Heat 45  
Keston Heat 55**

Keston Heating  
PO Box 103, National Avenue, Kingston Upon Hull, HU5 4JN  
Tel. +44 (0) 1482 443005 Fax. +44 (0) 1482 467133  
email : [info@keston.co.uk](mailto:info@keston.co.uk) web : [www.keston.co.uk](http://www.keston.co.uk)

This kit is suitable for the following boilers:

**Keston Heat 45 & 55**

**CONTENTS**

1 Introduction and General Description .....3

2 General Description of Cascade System .....4

3 Multiple Boiler System Components .....5

4 Installation Drawings for Multiple Boiler Systems .....8

5 Wall Mounted Installation Procedure ..... 11

6 Frame Kit Installation Procedure ..... 13

7 Header Kit Assembly ..... 14

8 Electrical Connections ..... 17

9 Commissioning and Testing ..... 17

# 1 INTRODUCTION

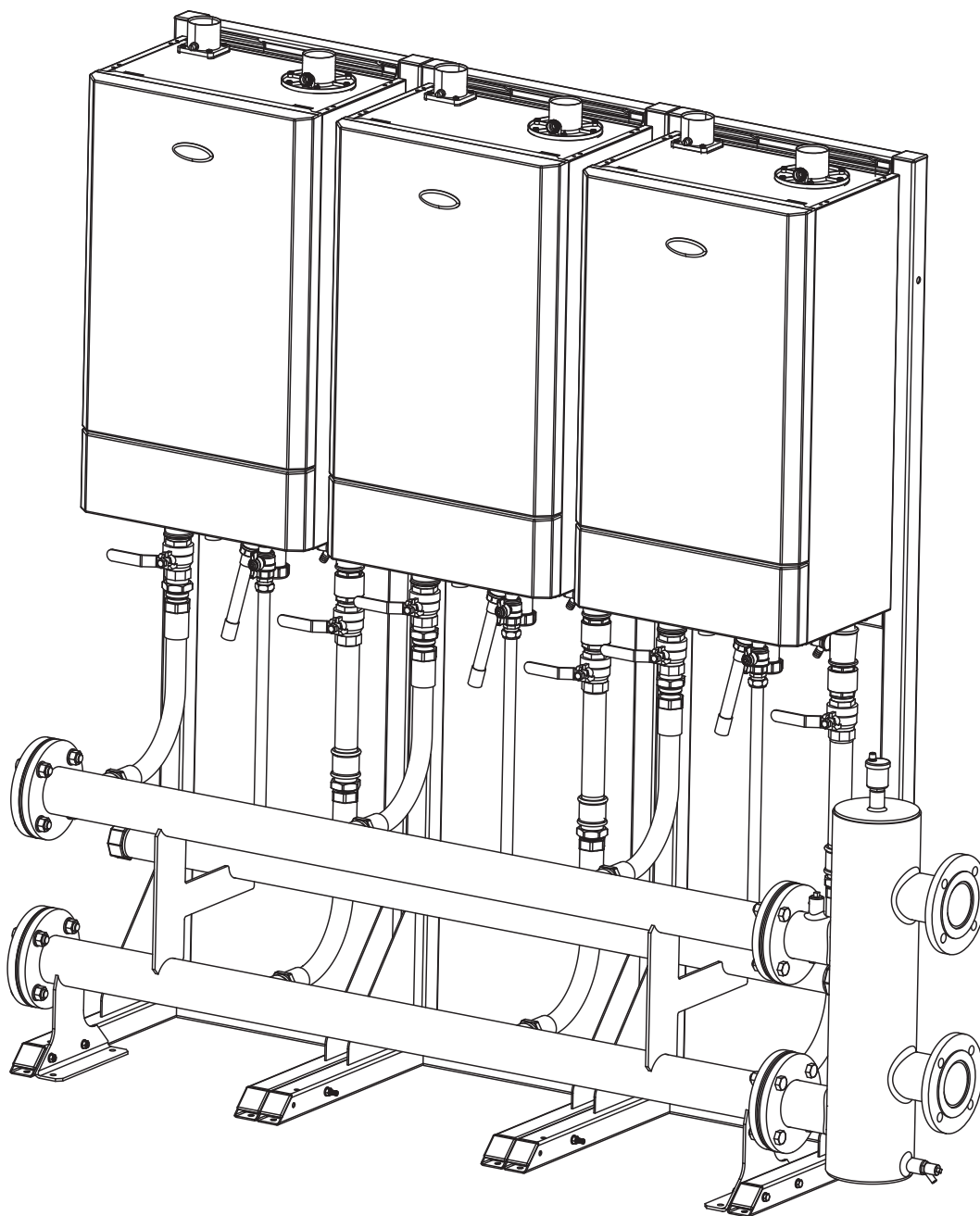
This technical data contains information for dimensioning & assembly of a cascade system kit for the Keston Heat range of products.

Header and Frame kits are available in line (from 2 to 6 boilers long).

## GENERAL DESCRIPTION OF FRAME & HEADER KITS

A requirement to spread the total required heat output over several boilers can be accommodated by the use of the Keston Heat multiple boiler frame & header kit options.

An optional sequencer kit can be specified to switch boilers in cascade on or off dependent on total heat demand.



## 2 GENERAL DESCRIPTION OF CASCADE SYSTEMS

### 2.1 FRAME AND HEADER KIT DESIGN OPTIONS

The Keston Heat boilers are suitable for use in a multiple boiler configuration. The multiple boiler system is available as a wall or frame mounted side by side configuration with the use of the relevant frame / header kits. This gives opportunity to choose the optimum footprint size or wall space for a given output. The table below states options 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).

Side by side kits do not include the support frame as the boilers can be wall mounted but a frame kit is available if wall space etc. does not facilitate boiler/header wall mounting.

Flue configuration for the appliance is C53 and C13 only (see appliance manual).

#### FRAME AND HEADER KIT SYSTEM DESIGN OPTIONS

Total Output Required Kw	Side By Side Option – Number Of Boilers/Output Required	Side by Side Footprint Size W x D (mm)	Header Kit Product No. Side By Side
90	2 x 45	1500x560	355014
100	1 x 45 - 1 x 55	1500x560	355014
110	2 x 55	1500x560	355014
135	3 x 45	2055x560	355015
145	1 x 55 - 2 x 45	2055x560	355015
155	2 x 55 - 1 x 45	2055x560	355015
165	3 x 55	2055x560	355015
180	4 x 45	2600x560	355016
190	1 x 55 - 3 x 45	2600x560	355016
200	2 x 55 - 2 x 45	2600x560	355016
210	3 x 55 - 1 x 45	2600x560	355016
220	4 x 55	2600x560	355016
225	5 x 45	3150x560	355017
235	1 x 55 - 4 x 45	3150x560	355017
245	2 x 55 - 3 x 45	3150x560	355017
255	3 x 55 - 2 x 45	3150x560	355017
265	4 x 55 - 1 x 45	3150x560	355017
275	5 x 55	3150x560	355017
280	1 x 55 - 5 x 45	3700x560	355018
290	2 x 55 - 4 x 45	3700x560	355018
300	3 x 55 - 3 x 45	3700x560	355018
310	4 x 55 - 2 x 45	3700x560	355018
320	5 x 55 - 1 x 45	3700x560	355018
330	6 x 55	3700x560	355018
	In line frame kit		355013
	Header Low Loss DN80 Kit		355019

## 2.2 MULTIPLE BOILER INSTALLATIONS

For installing 2 to 6 boilers, the product range includes water and gas headers capable of assembly using threaded socket, compression and flange connections.

## 2.3 HYDRAULIC ISOLATION: MIXING HEADER (HEADER KITS INCLUDE A LOW LOSS MIXING HEADER)

A low loss header allows flow separation within a hydronic system.

This essentially creates linked stand alone flow circuits with their own flow rates and pressure drops. Allowing for 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

An optional sequencer kit is available to maximise the efficiency of a multiple boiler installation. Instructions for installation and use are contained in the sequencer kit. The sequencer kit facilitates control of up to five boilers in cascade.

## 2.5 GAS SUPPLY

The 45-55kW boilers are suitable for use with natural gas. Connect the boilers to the gas mains in accordance with the applicable regulations. The gas header connection is a 2" female thread with test points at each end. It is the test point nearest the inlet of the group of appliances that becomes the appliance inlet pressure point. Refer to the boiler Installation & Servicing Instructions for general GAS SUPPLY details.

## 2.6 ASSEMBLY

The frames and headers must stand on a flat and level floor of suitable load bearing capacity.

## 2.7 SAFE HANDLING

This boiler 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 the boiler 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:

- Grip the boiler at the base.
- 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.

## 3 MULTIPLE BOILER SYSTEM COMPONENTS

### 3.1 GENERAL

The multiple boiler systems consist of the following components:

- Frame kit. (Optional only with In-line kits)
- Boiler gas header.
- Boiler flow and return headers supported on mounting skid
- Low loss mixing header
- Hardware packs (includes essential connection and valve components)

### 3.2 MAIN WATER HEADERS

The main water headers consist of: insulated water flow, insulated water return headers custom sized for all boilers. It is possible to extend the system to a maximum of 6 boilers in a linear configuration. Each header kit provides water flow and return headers sized either DN80 or DN100 dependent on total maximum combined heating output required.

### 3.3 GAS HEADER

The Gas header consists of a custom manufactured 2" manifold. This is located in a cradle incorporated within the header mounting skid.

### 3.4 MIXING HEADER

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

### 3.5 BOILER CONNECTION KITS

#### Legend

1. 1 1/4" x 3/4" x 1 1/4" Tee
2. Close Taper Nipple
3. Safety Relief Valve 6 bar
4. Isolation Valve
5. 1 1/4" x 1/2" x 1 1/4" Tee
6. Drain Off Cock
7. Connection Pipe Assembly
8. Non Return Valve
9. 1 1/4" Taper Male to 1 1/4" Parallel Hex Adapter
10. Boiler Flow Flexible Connection from Header
11. Boiler Return Flexible Connection from Header

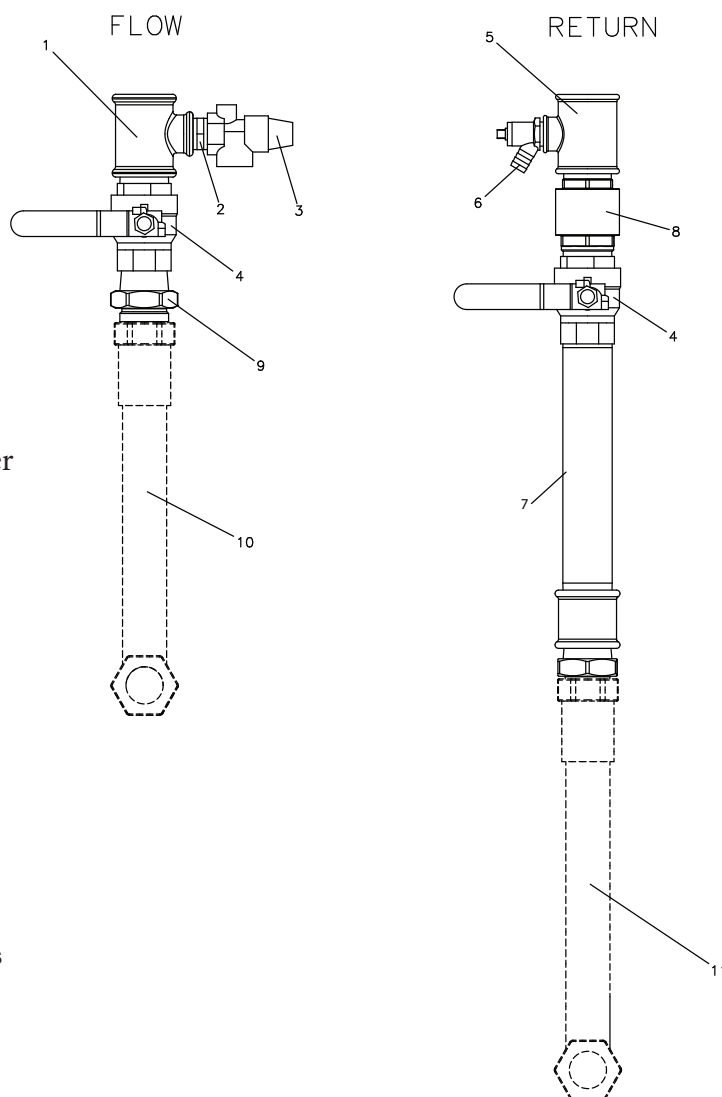
Items 1,2,3,4,5 & 6 are supplied with the boiler. (AL-208973 Isolation Valve Kit)

Items 7, 8 & 9 are supplied with the Header Kit

Items 10 & 11 are pre-assembled to the water header.

Assemble fittings together as shown using appropriate sealing material. Do not fit the safety relief valve (item 3) at this stage. When assemblies are complete fit to boiler flow and return stubs with suitable sealing material. The safety valve (item 3) can now be fitted using suitable sealing material.

Ensure all isolation valves, pressure relief valves and drain valves are fitted to allow unrestricted operation.



### 3.6 FREE-STANDING FRAMES

If boilers in cascade are positioned in-line the installer has the option to either wall mount the boilers or mount boilers on optional frame kits available. If mounting in-line product on frames, optional frame kit UIN 355013 must be specified in the correct quantity, one frame kit for each boiler installed in cascade.

### 3.7 INSTALLATION AREA AND DIMENSIONS

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

A minimum of 450mm must be provided from the front of the installed boilers in cascade to facilitate boiler servicing.

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.

# IMPORTANT POINTS

## **Before commencing installation:**

### **If Wall mounting;**

- Ensure wall is capable of supporting the weight of boilers to be mounted
- Mark drill points of header using floor mounting template
- Mark height on to the wall from the floor to the top of the boiler
- Ensure floor is flat and level and is of suitable load bearing capacity

### **If Frame mounting;**

- The frames must stand on a flat and level floor of suitable load bearing capacity.
- If using a frame kit (UIN 355013) the header must be bolted to the frame before the hoses are connected to the boiler.

These Installations refer to perpendicular wall and floor. If walls are not perpendicular, it is recommended that a frame kit be used (UIN 355013). The correct number of frames should be ordered (1 per boiler).

Allowances must be made for installation where skirting boards or other features are in place that may affect the nominal installation conditions.

## 4 INSTALLATION DRAWINGS FOR MULTIPLE BOILER SYSTEMS

### 4.1 GENERAL

The multiple boiler systems are available in two formats:

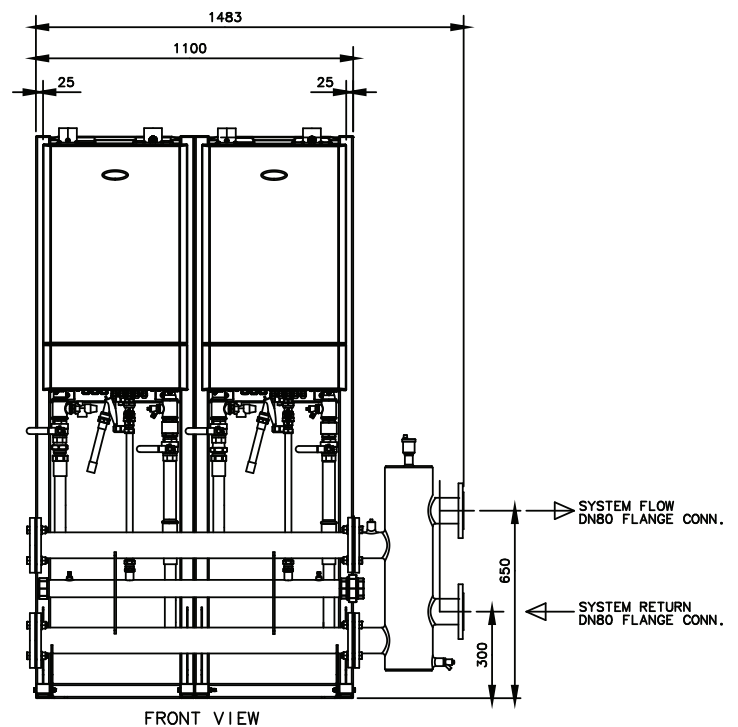
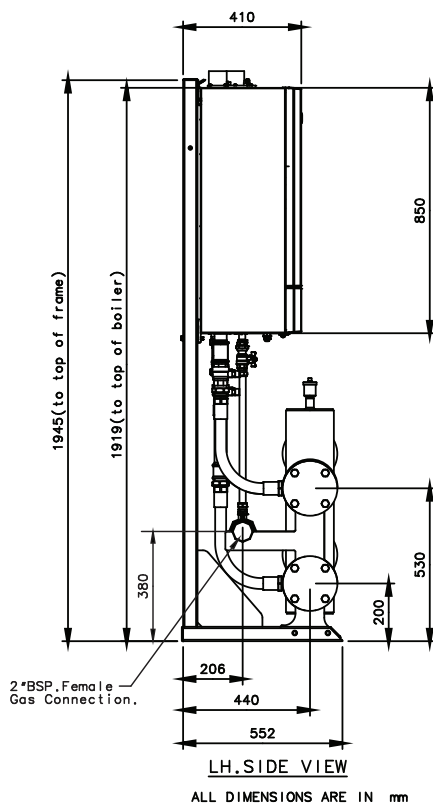
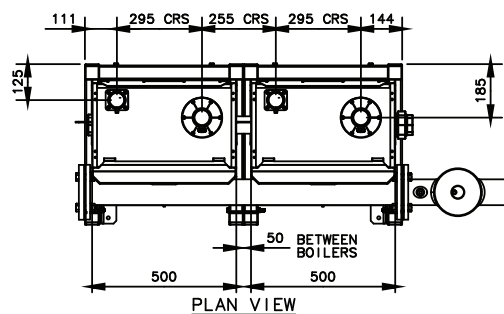
- 2 to 6 boilers in a linear configuration, mounted on a wall.
- 2 to 6 boilers in a linear configuration, mounted on free-standing frames.

The boiler side of the cascade systems is sized to give a water flow and return differential 20°C.

## 4.2 SIDE BY SIDE FRAME KIT CONFIGURATION

### 4.2.1 INSTALLATION DRAWING WITH 2 - 45 or 55 BOILERS (SIDE BY SIDE)

Side by side wall or  
frame mounting dimensions

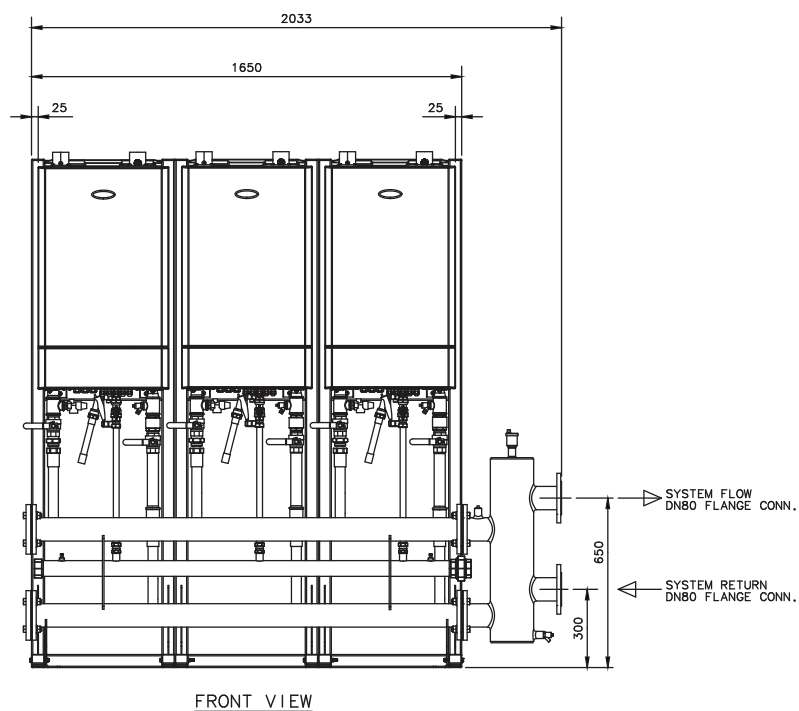


Note 1: Mixing header and gas connections can be located either on the LHS. or RHS. of the assembly to suit needs of each particular system.

Note 2: Optional frame(UIN355013)one req'd per boiler.

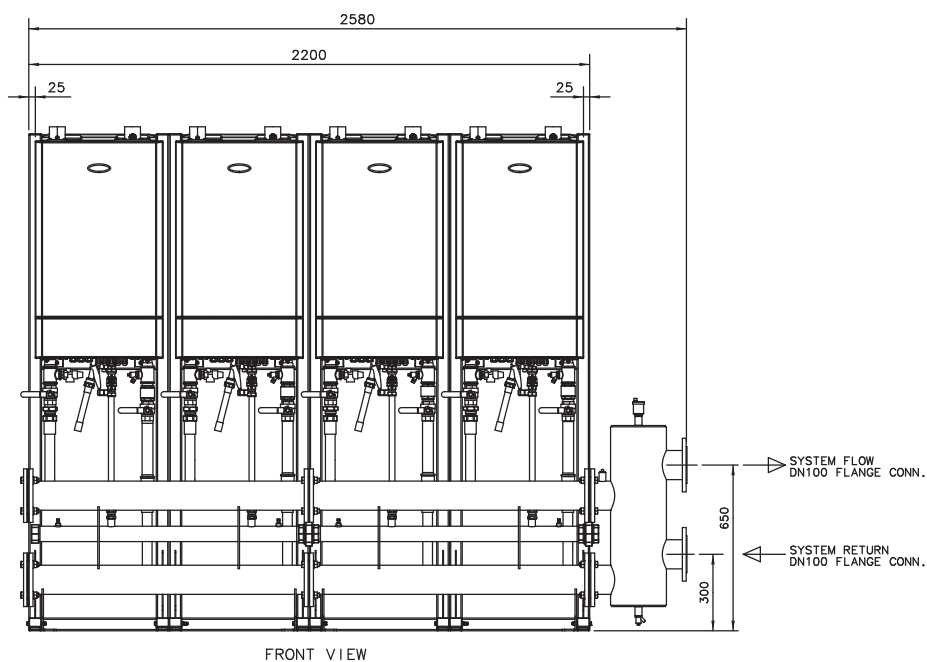
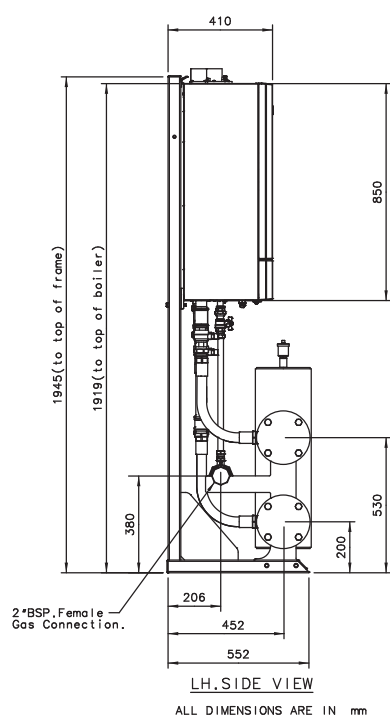
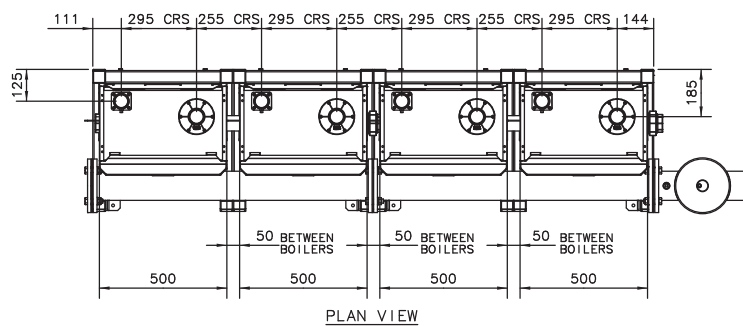
Header Inline DN80 KIT 45-55kW UIN355014  
with two Keston 45-55 boilers mounted onto  
optional Single frame inline Kit UIN355013



Side by side wall or  
frame mounting dimensions

Header Inline DN80 KIT 45-55kW UIN355015  
with three Keston 45-55 boilers mounted onto  
optional Single frame inline Kit UIN355013

#### 4.2.3 INSTALLATION DRAWING WITH 4 - 45 or 55 BOILERS (SIDE BY SIDE)

Side by side wall or  
frame mounting dimensions

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

Note 2: Optional frame(UIN355013)one req'd per boiler.

Header Inline DN100 KIT 45-55kW UIN355016  
with four Keston 45-55 boilers mounted onto  
optional Single frame inline Kit UIN355013

Side by side wall or  
frame mounting dimensions

ALL DIMENSIONS ARE IN mm



Note 2: Optional frame(UIN355013)one req'd per boiler.

11

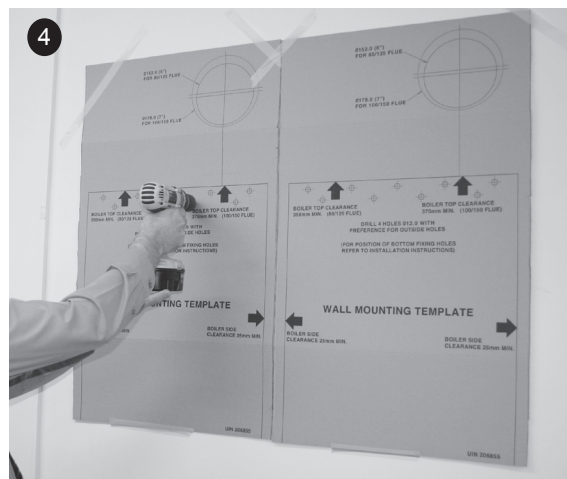
Side by side wall or  
frame mounting dimensions

## 5 WALL MOUNTED INSTALLATION PROCEDURE

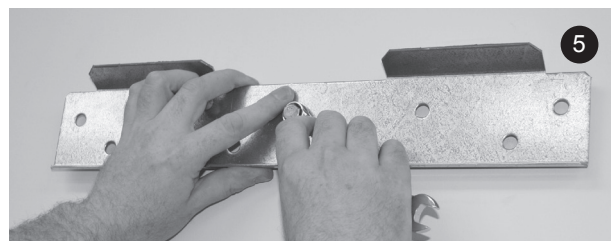
### 5.1 WALL MOUNTED SIDE BY SIDE OPTION

Ensure wall is capable of supporting the weight of boilers to be mounted. Note. boiler weights can found in the boiler Installation Instructions.

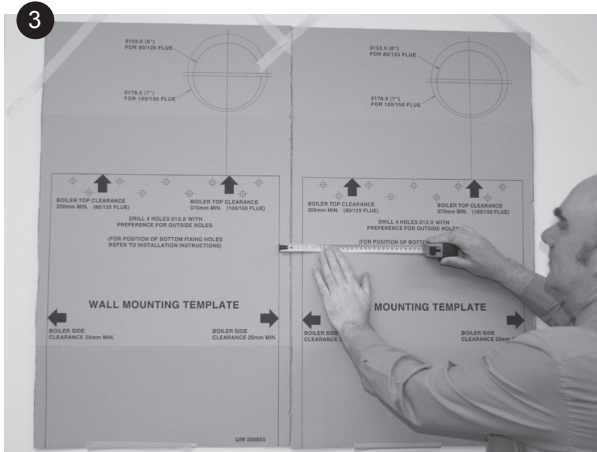
1. Cut the sides off the cardboard wall mounting template/s (found in the boiler packaging) to create the 50mm side clearance required.
2. Mark the height on to the wall from the floor to the top of the boiler 1919mm.
4. Drill the required holes in the wall to fit the wall mounting plate plugs. (See boiler Installation Instructions for details)



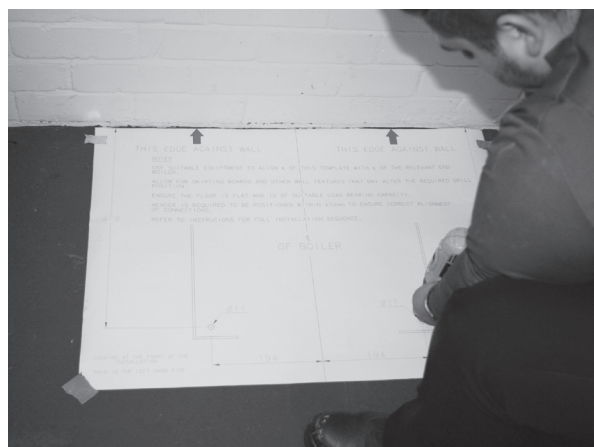
5. Screw the wall mounting plate(s) to the wall.



3. Tape the template/s to the wall ensuring the 50mm side clearance per boiler requirement is adhered to.

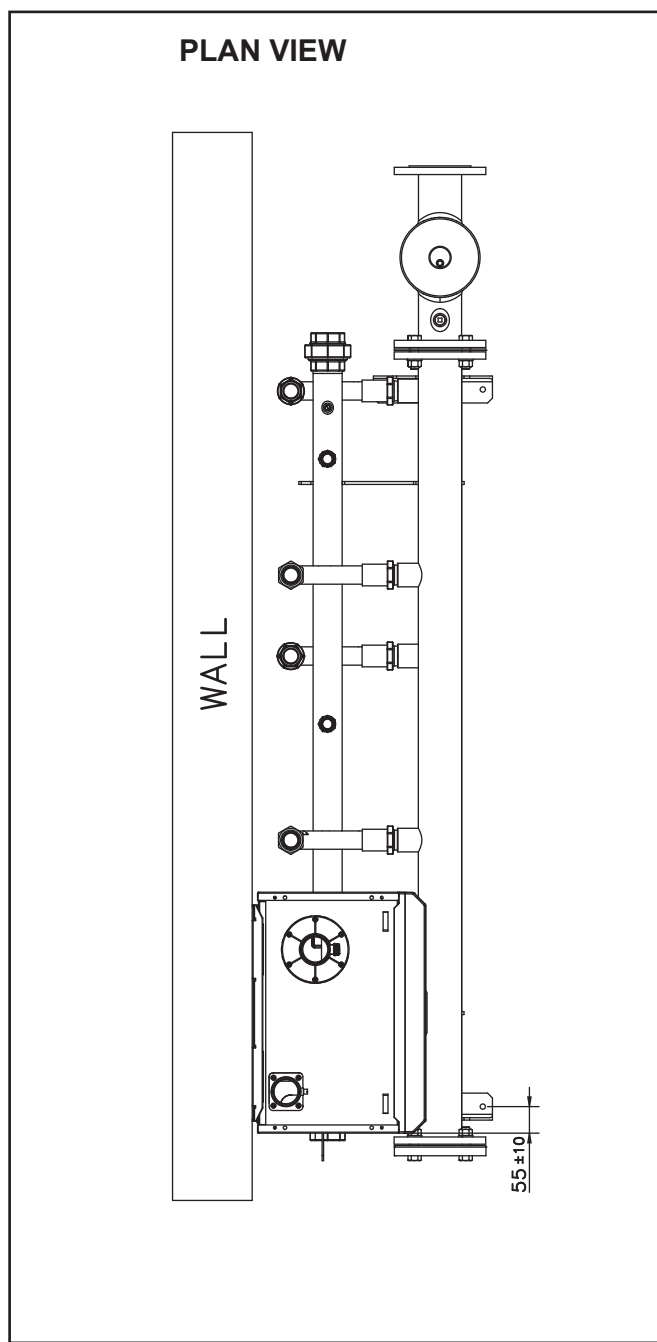
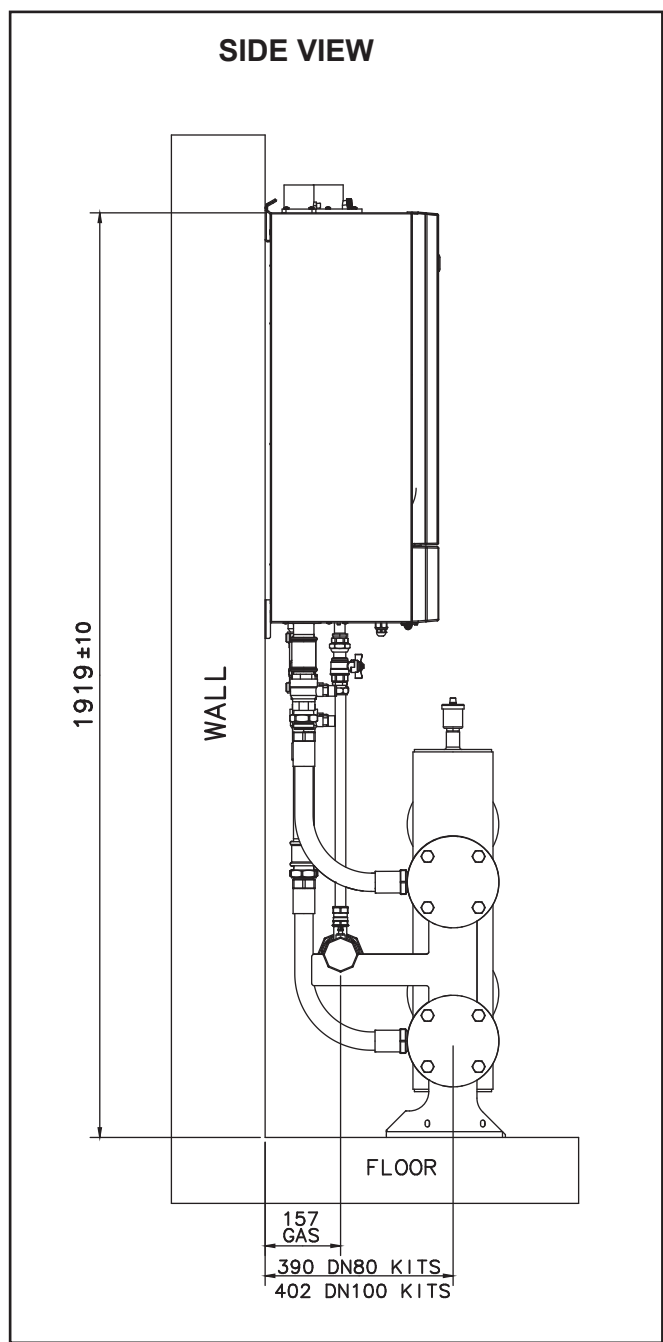


**Floor Mounting:** Align centre line of template to centre line of boiler and drill holes for headers.



continued . . . . .

## 5.1 WALL MOUNTED SIDE BY SIDE OPTION CONT'D.....



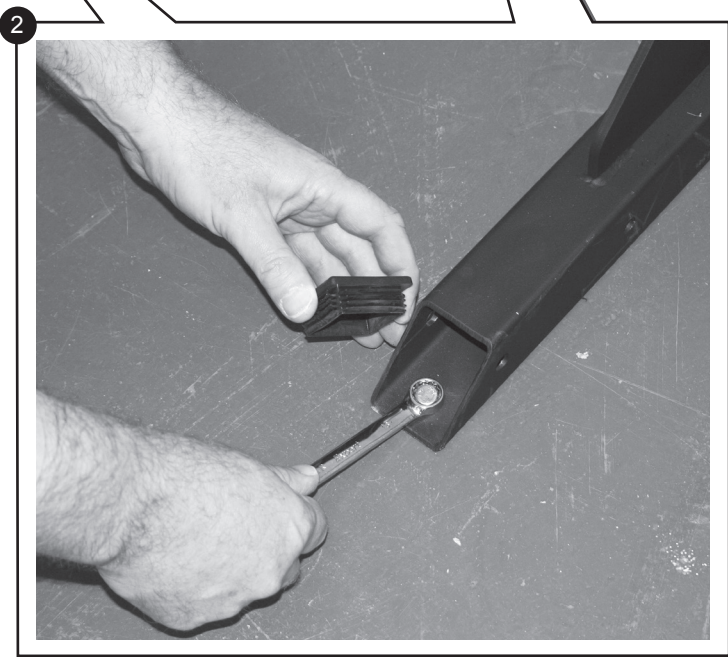
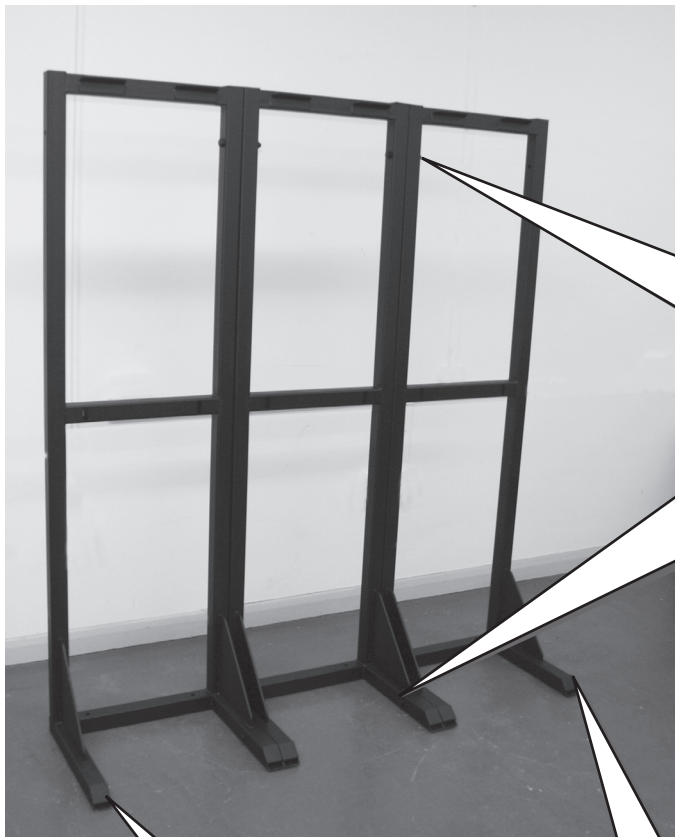
Careful consideration **MUST** be given to the installation tolerances. If these are not adhered to, hoses may become kinked or connections may not fit.

Bolt header to floor using template provided (front fixings only). Connect up hoses (see page 15)

## 6 FRAME KIT INSTALLATION PROCEDURE

### 6.1 SIDE BY SIDE FRAME KIT MOUNTING PROCEDURE

1. Place the frame kit sections in the required position and bolt them together at the top and bottom with the bolts, nuts and washers provided.

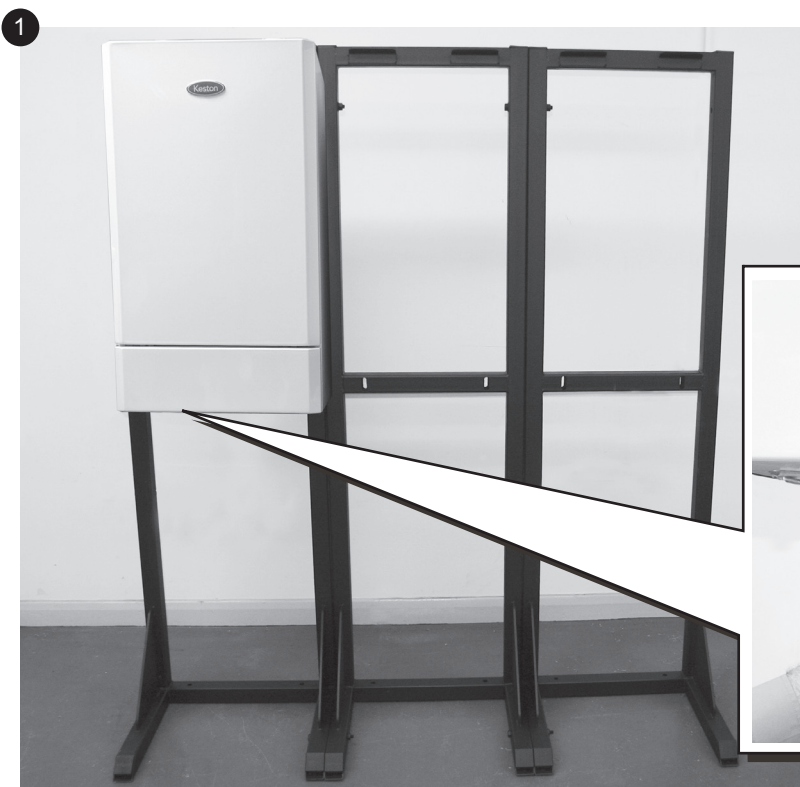


2. If additional stability is required remove the plastic foot covers and drill the floor. Then bolt the frame to the floor using suitable bolts and fixings (bolts not supplied).

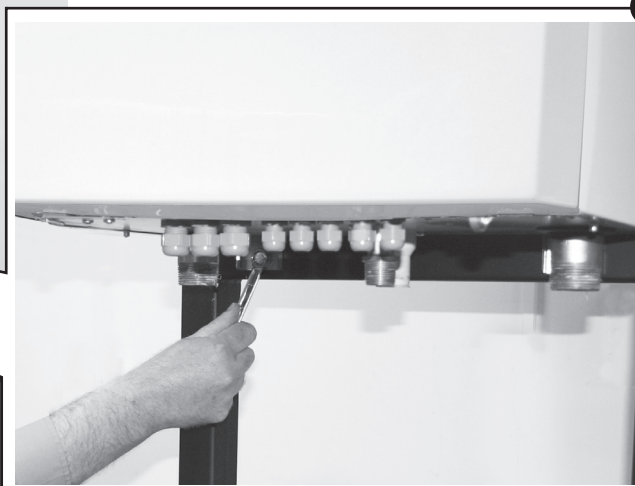


## 6.2 BOILER MOUNTING

1. As appropriate mount the boilers onto either the wall plates or the side by side frame kit.



2. Ensure the two boiler bottom fixing brackets are screwed to the frame or wall.



## 7 HEADER KIT ASSEMBLY

### 7.1 FITTING MIXING HEADER AND BLANKING FLANGES

1. Fit the mixing header and blanking flanges in the chosen positions, with the bolts, washers and seals supplied.

*Note. Mixing header can be located either LHS or RHS of the headers.*



Mixing Header

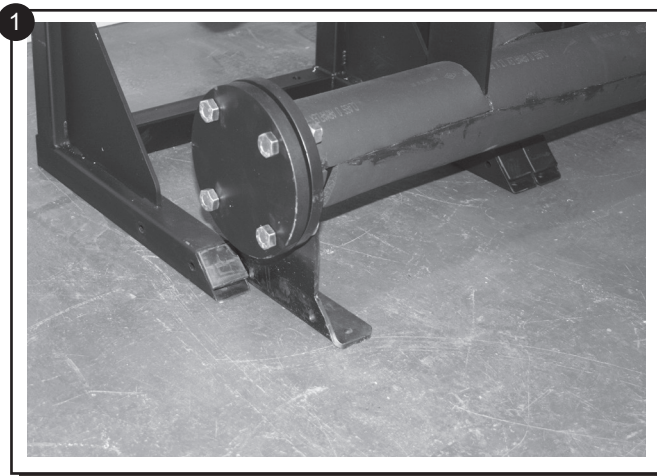


Blanking Flange

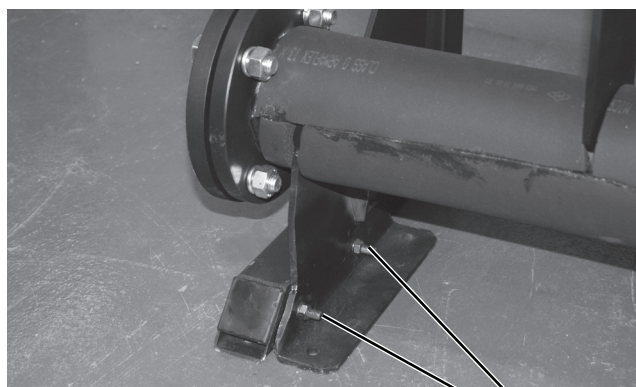


## 7.2 FITTING HEADER KIT ASSEMBLY

1. Slide the header kit assembly between the frame legs but do not screw the header kit to the frame at this stage.



2. Screw the header legs to the frame feet with the bolts, nuts & washers provided. Tighten nuts after the flexible hoses have been fitted to the boiler.

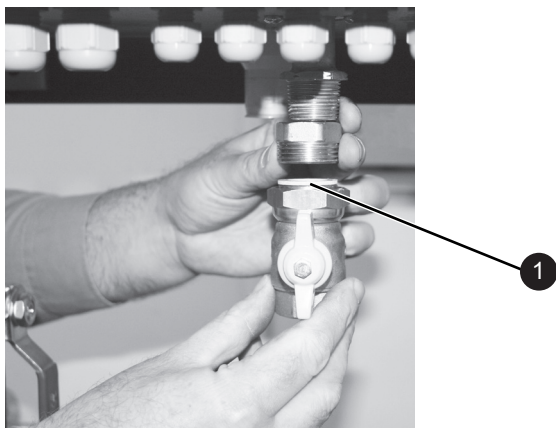


3. Fit the two flexible header connections to the boiler flow and return connections ensuring the sealing washers are fitted.

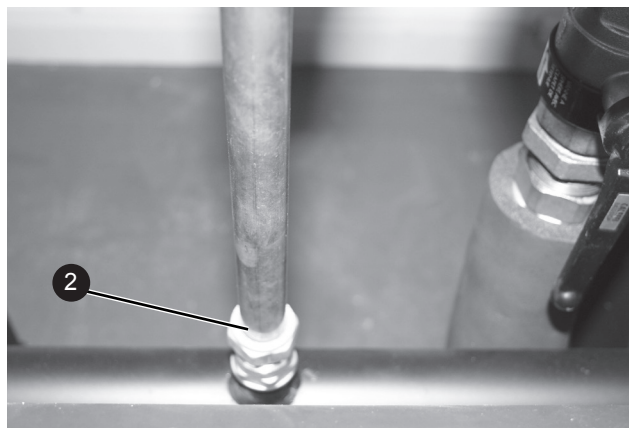
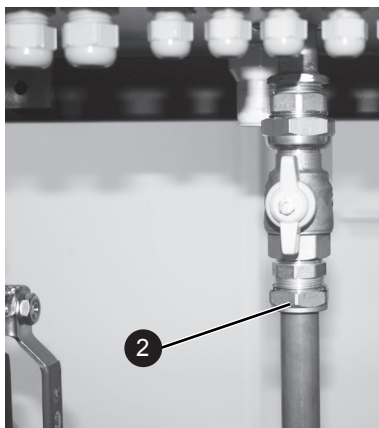


### 7.3 FITTING GAS CONNECTION

1. Fit the gas isolation valve assembly supplied with the boiler to the boiler gas connection ensuring the sealing washer is fitted.

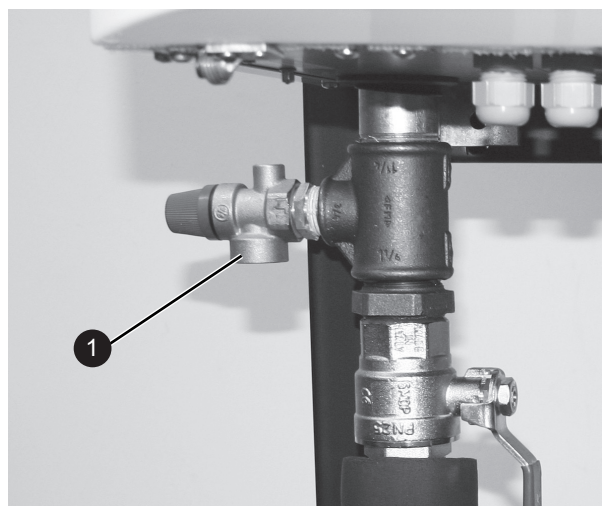


2. Fit the copper gas pipe provided in the header kit to the isolating valve and the header gas connection using 22mm compression fittings provided.



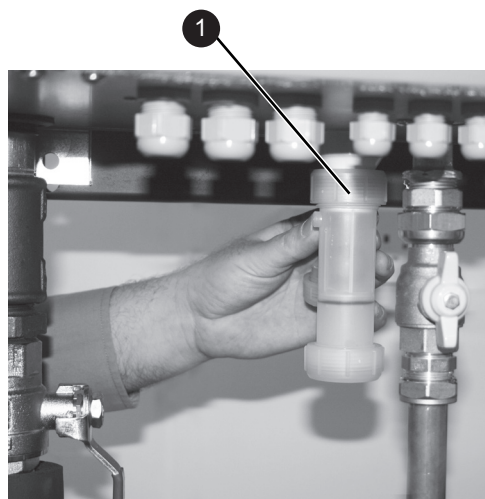
### 7.4 PRESSURE RELIEF VALVE CONNECTION

1. Ensure each boiler pressure relief connection is piped to a safe discharge point.



### 7.5 CONDENSATE TRAP FITTING

1. Fit the condensate trap to the boiler and pipe to drain following the recommendations contained in the boiler Installation instructions.



## **8 ELECTRICAL CONNECTIONS**

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

## **9 COMMISSIONING AND TESTING**

Electrical and gas safety checks must be carried out on completion of installation as with individual boiler commissioning.

