This manual must be kept with the appliance Jan 2009

MAXXflo

Installation guide, operation and maintenance manual

High Efficiency Condensing Stainless Steel Storage Water Heaters for Natural Gas and Propane

Natural Gas Models
CWH30/100, CWH30/200, CWH30/300
CWH60/200, CWH60/300
CWH90/200, CWH90/300
CWH120/200, CWH120/300

Propane Models
LCWH30/100, LCWH30/200, LCWH30/300
LCWH60/200, LCWH60/300
LCWH90/200, LCWH90/300
LCWH120/200, LCWH120/300

Working towards a cleaner future

ANDREWS WATER HEATERS

Part No. E281

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ANDREWS
WATER HEATERS

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Andrews Storage Water Heaters have been designed and manufactured to comply with current International standards of safety. In the interests of the health and safety of personnel and the continued safe, reliable operation of the equipment, safe working practices must be employed at all times. The attention of U.K. users is drawn to their responsibilities under the Health and Safety Regulations 1993.

All installation and service on the Andrews Water Heater must be carried out by properly qualified personnel, and therefore no liability can be accepted for any damage or malfunction caused as a result of intervention by unauthorised personnel.

The Andrews Water Heaters policy is one of continuous product improvement, and therefore the information in this manual, whilst completely up to date at the time of publication, may be subject to revision without prior notice.

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THE ANDREWS WATER HEATERS COVERED IN THIS MANUAL ARE FOR USE WITH NATURAL GAS OR LPG (PROPANE) GAS ONLY

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GENERAL INFORMATION

The Andrews Water Heater has been designed for use with NATURAL GAS or PROPANE and is manufactured to give an efficient, reliable and long service life.

To ensure the continued, trouble-free operation of your heater at maximum efficiency, it is essential that correct installation, commissioning, operation and service procedures are carried out strictly in accordance with the instructions given in this manual. By law, installation and commissioning of the heater must be carried out by properly qualified personnel.

The heater(s) must be installed in accordance with the following requirements;
The current GAS SAFETY (INSTALLATION AND USE) REGULATIONS
The current BUILDING REGULATIONS
The Water Supply (WATER FITTINGS) REGULATIONS 1999

Additionally, installation should be performed in accordance with all relevant requirements of the Gas Supplier, Local Authority and recommendations of the British Standards and Codes of Practice detailed below.

BRITISH STANDARDS AND CODES OF PRACTICE

BS 6700: 1997	Specification for design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages. This standard supersedes the following British Standards and Codes of Practice: CP99, CP310, CP324, 202, CP342 Part 2, Centralised Hot Water Supply.
BS 5440:1990	Installation of flues and ventilation for gas appliances of rated output not exceeding 60kW.
Part 1	Specification for installation of flues.
Part 2	Specification for installation of ventilation for gas appliances.
BS 5546:1990	Installation of gas hot water supplies for domestic purposes.
BS 6891	Installation of low pressure gas pipework of up to 28mm in domestic premises.
BS 6644	Installation of gas fired water boilers of rated inputs between 60kW and 2mW
BS 7206:1990	Specification for unvented hot water storage units and packages.
I/M2	Purging procedures for non-domestic gas installations.
I/M5	Soundness testing procedures for industrial and commercial gas installations.
I/M11	Flues for commercial and industrial gas fired boilers and air heaters.
I/M16	Notes on installation of gas pipework (excluding 25mm and below).

LPGA Code of practice 7:
Storage of full and empty LPG cylinders and cartridges. Highly Flammable Liquids and liquid Petroleum gases Regulations 1972.

IGE/UP/10 Part 1 Edition 2:
Installation of Gas Appliances in Industrial and Commercial premises.

Terms:

a. **Andrews Water Heaters accepts no liability for any damage resulting from failing to accurately follow the instructions.**

b. **When replacing parts during maintenance, only original parts from Andrews Water Heaters should be used; these can be recognised by the name of the manufacturer printed on them.**

HEALTH AND SAFETY REGULATIONS 1993

Health and Safety Regulations 1993
It is the duty of manufacturers and suppliers of products for use at work to ensure, so far as is practicable, that such products are safe and without risk to health when properly used and to make available to users, adequate information about their safe and proper operation.

Andrews Water Heaters should only be used in the manner and purpose for which they were intended and in accordance with the instructions in this manual. Although the heaters have been manufactured with paramount consideration to safety, certain basic precautions specified in this manual must be taken by the user.

It is imperative that all users of the heater must be provided with all the information and instruction necessary to ensure correct and safe operation.

EFFECTIVENESS IN COMBATING LEGIONELLAE

Water systems in buildings have been associated with outbreaks of Legionnaires' Disease, particularly in health care facilities where occupants are significantly more susceptible to infection.

In recognition of the risks in hospitals, a Code of Practice for the Control of Legionellae in Health Care premises has been issued by the Department of Health (1991). Codes of Practice applicable to other premises have been published by other organisations, principally the Health and Safety Executive (HS)(G70) and the Chartered Institute of Building Services Engineers (CIBSE, TM13).

All Codes of Practice draw attention to the design and operation of water systems with reference to avoidance of factors that favour colonisation by Legionellae bacteria. These factors include stagnation, lukewarm conditions (20°C to 45°C) and the accumulation of debris, scale and corrosion in the base of tanks and calorifiers.

The **MAXXflo** range has a legionellae flushing programme. See page 15.

Model reference	CWH30/100	CWH30/200	CWH60/200	CWH90/200	CWH120/200
Model reference		**CWH30/300**	**CWH60/300**	**CWH90/300**	**CWH120/300**
Input gross H_s	6.7 - 31.1 kW	6.7 - 31.1 kW	13.4 - 62.2 kW	20.1 - 93.3 kW	26.8 - 124.4 kW
Input nett H_i	6.0 - 28.0 kW	6.0 - 28.0 kW	12.0 - 56.0 kW	18.0 - 84.0 kW	24.0 - 112.0 kW
Output (tank set point = 60ºC)	6.5 - 30.5 kW	6.5 - 30.5 kW	13.0 - 61.0 kW	19.5 - 91.6 kW	26.0 - 122.1 kW
Natural Gas, G20					
Gas Consumption	2.96m³/h	2.96m³/h	5.93m³/h	8.89m³/h	11.85m³/h
Min. Dynamic Gas supply pressure	18 mbar	18 mbar	18 mbar	18 mbar	18 mbar
Propane, G31					
Gas Consumption	2.18 kg/h	2.18 kg/h	4.35 kg/h	6.53 kg/h	8.71 kg/h
Min. Dynamic Gas supply pressure	37 mbar	37 mbar	37 mbar	37 mbar	37 mbar
Efficiency (gross)	98%	98%	98%	98%	98%
Efficiency (nett)	109%	109%	109%	109%	109%
NOx level	25ppm	25ppm	25ppm	25ppm	25ppm
NOx level	44mg/kWh	44mg/kWh	44mg/kWh	44mg/kWh	44mg/kWh
Noise level ●	51dBA	51dBA	51dBA	51dBA	51dBA
Ionisation current - max	6.0µA	6.0µA	6.0µA	6.0µA	6.0µA
Ionisation current - min	4.0µA	4.0µA	4.0µA	4.0µA	4.0µA
HSI resistance	1.0 – 1.4 kΩ	1.0 – 1.4 kΩ	1.0 – 1.4 kΩ	1.0 – 1.4 kΩ	1.0 – 1.4 kΩ
Max recovery thru 50ºC	480 l/h	480 l/h	960 l/h	1440 l/h	1920 l/h
Time to recover tank through 50ºC rise					
100 litre capacity	13 mins	n/a	n/a	n/a	n/a
200 litre capacity	n/a	25mins	13mins	9mins	7mins
300 litre capacity	n/a	38mins	19mins	13mins	10mins
Flue size (concentric) Internal/External	80/125	80/125	80/125	130/200	130/200
Flue size (conventional)	80	80	80	130	130
Max flue run - room sealed ▲	14	14	12	14	14
Max flue run - conventional ■	50	50	20	50	40
Max flue static pressure	140 Pa	140 Pa	140 Pa	140 Pa	140 Pa
Inlet/outlet connections	1" BSP	1" BSP	1" BSP	1½" BSP	1½" BSP
Return connection	1½" BSP	1½" BSP	1½" BSP	1" BSP	1" BSP
Nominal operating water pressure	3.5 bar	3.5 bar	3.5 bar	3.5 bar	3.5 bar
Maximum water pressure	8.0 bar	8.0 bar	8.0 bar	8.0 bar	8.0 bar
Minimum water pressure	1.0 bar	1.0 bar	1.0 bar	1.0 bar	1.0 bar
Gas connection (gas cock supplied)	¾" BSP	¾" BSP	¾" BSP	¾" BSP	¾" BSP
Electrical supply	230/50V/Hz	230/50V/Hz	230/50V/Hz	230/50V/Hz	230/50V/Hz
Power consumption	170 W	170 W	340 W	510 W	680 W
Weight - empty (100 litre)	145kg	n/a	n/a	n/a	n/a
Weight - empty (200 litre)	n/a	155 kg	170 kg	185 kg	200 kg
Weight - empty (300 litre)	n/a	165 kg	180 kg	195 kg	210 kg
Weight - full (100 litre)	245kg	n/a	n/a	n/a	n/a
Weight - full (200 litre)	n/a	355 kg	370 kg	385 kg	400 kg
Weight - full (300 litre)	n/a	465 kg	480 kg	495 kg	513 kg
Shipping weight (100 litre)	168kg	n/a	n/a	n/a	n/a
Shipping weight (200 litre)	n/a	178 kg	193 kg	208 kg	213 kg
Shipping weight (300 litre)	n/a	188 kg	203 kg	218 kg	233 kg
Shipping depth	1040 mm	1040 mm	1040 mm	1040 mm	1040 mm
Shipping width	880 mm	880 mm	880 mm	880 mm	880 mm
Shipping height (100 litre)	1312 mm	n/a	n/a	n/a	n/a
Shipping height (200 litre)	n/a	1653 mm	1653 mm	1653 mm	1653 mm
Shipping height (300 litre)	n/a	2077 mm	2077 mm	2077 mm	2077 mm

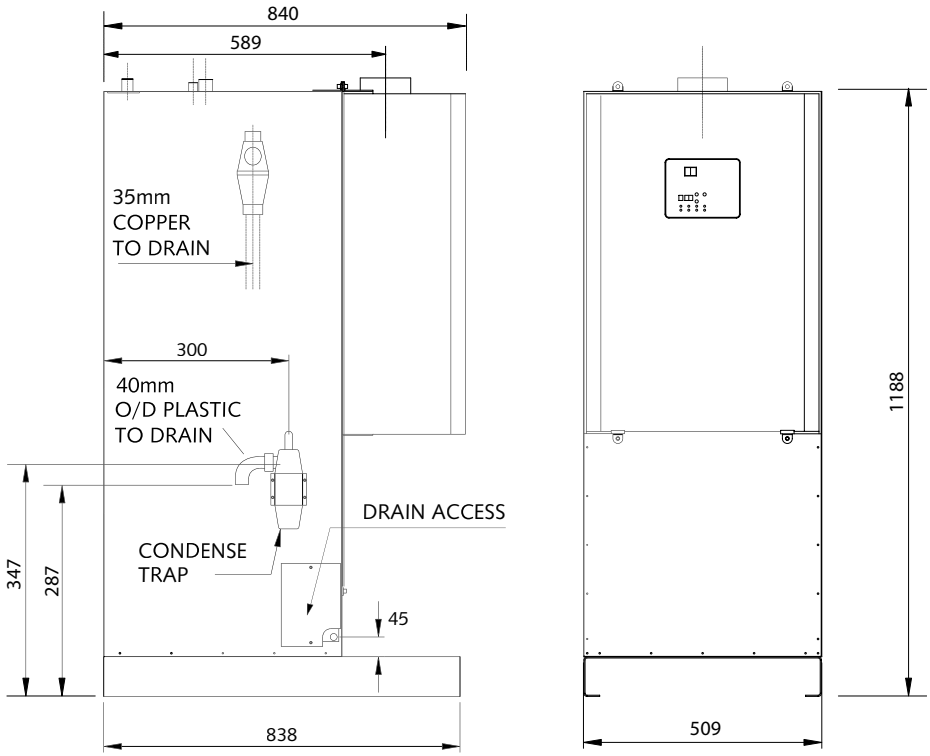
● Noise level measured at 2m from flue terminal.
▲ Reduce flue length by 1.2m for 90° bend, 0.7m for 45° bend and 1.5m for condense trap.
■ Reduce flue length by 4m for 90° bend, 2m for 45° bend and 4m for condense trap.

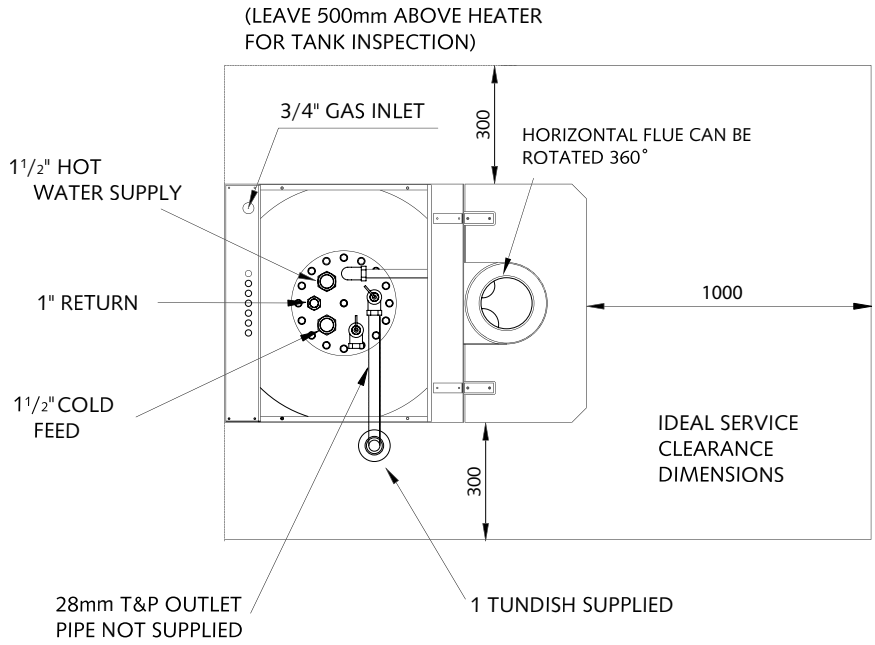
The **MAXXFLO** range features stainless steel tanks with external heat exchanger(s) and fully automatic electronic control with BEMS interface as standard. The heaters must be installed with a minimum water pressure of 1 bar. The heaters are factory fitted with temperature and pressure relief valve(s). A gas cock, water draw-off cock and comprehensive instruction manual are also included. The water heaters can be fitted with concentric flue for room sealed applications; ***horizontal or vertical flue kits must be ordered separately see pages 19 and 22.***
Conventional flue, suitable for condensing applications can be used if the plantroom is ventilated.

MAXXflo Heater Dimensions

Model CWH30/100

NOTE:- See pages 18 to 26 for flue details
Model CWH30/100 uses 80/125mm diameter concentric flue components



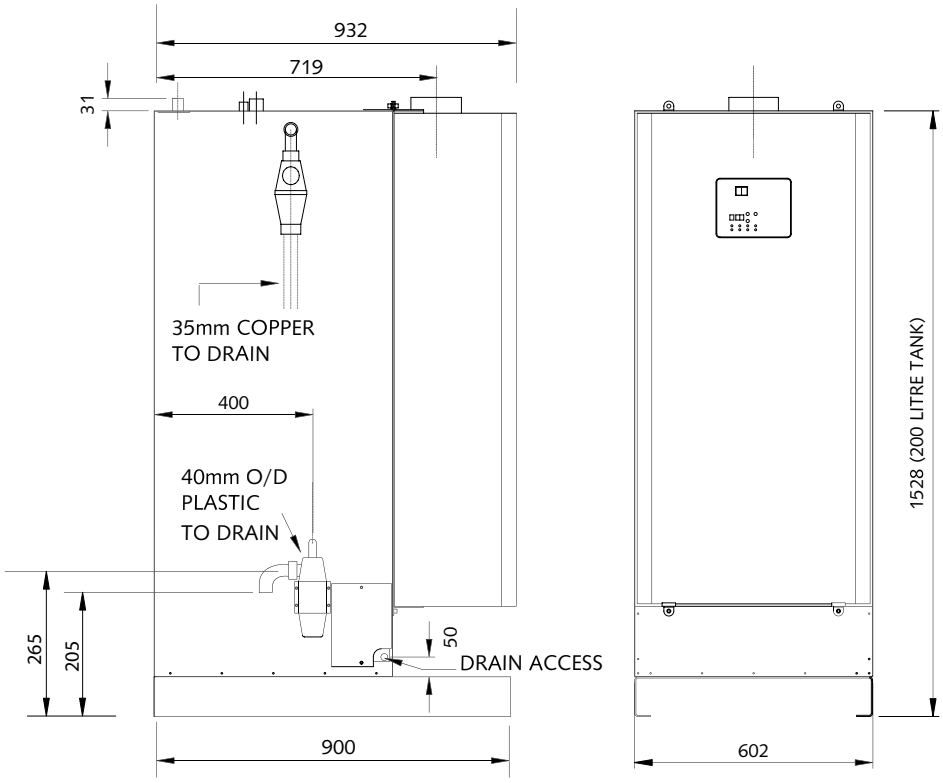


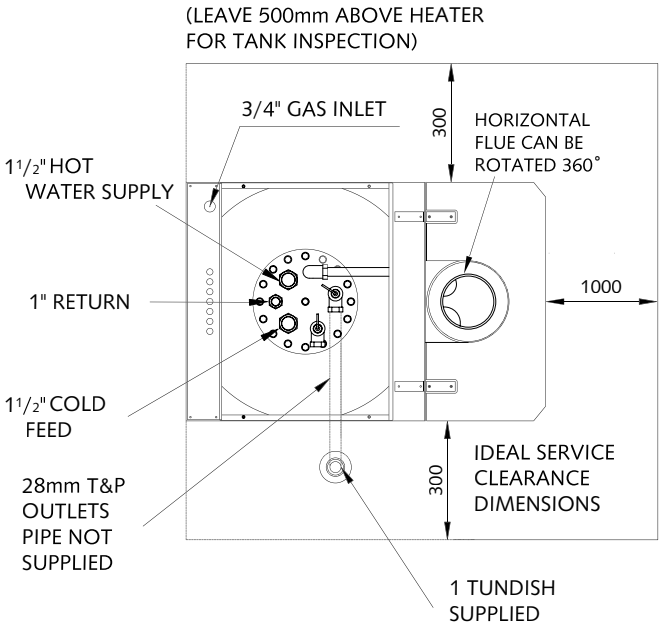
PLAN VIEW MODEL CWH30/100

MAXXflo Heater Dimensions

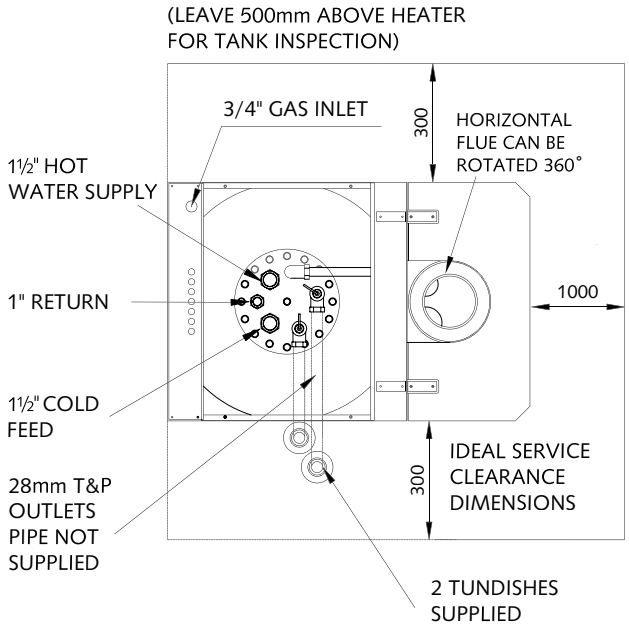
Models CWH30/200, CWH60/200, CWH90/200 and CWH120/200

NOTE:- See pages 18 to 26 for flue details
Models CWH30 and 60 use 80/125mm diameter concentric flue components
Models CWH90 and 120 use 130/200mm diameter concentric flue components





PLAN VIEW MODEL CWH30/200 & 60/200

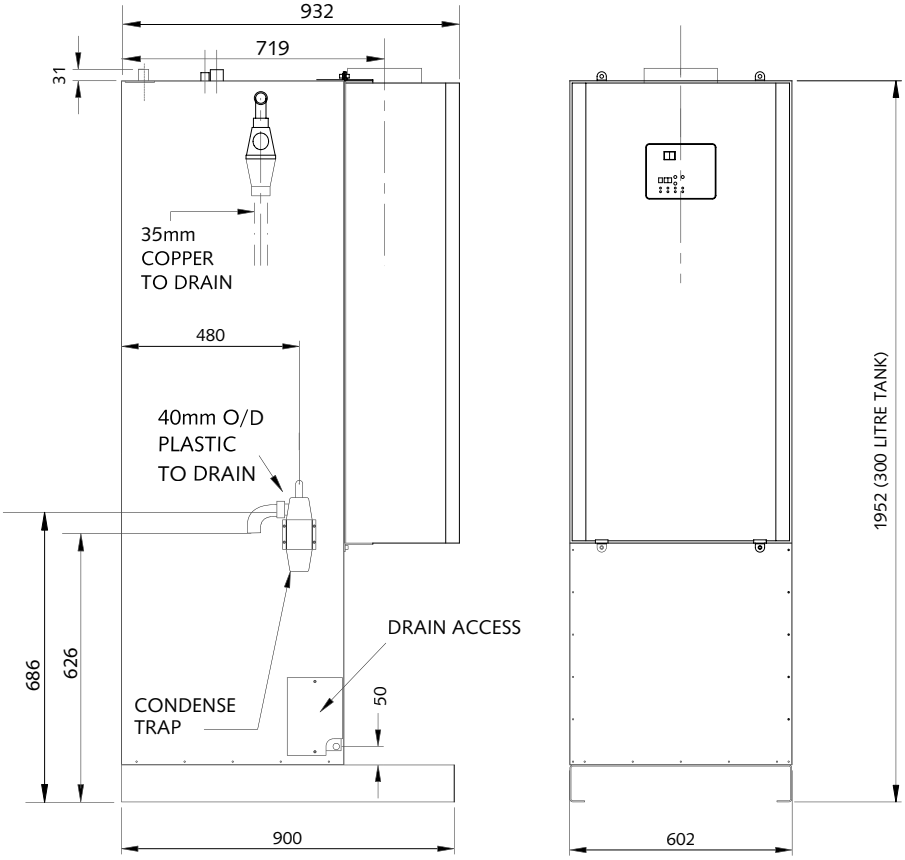


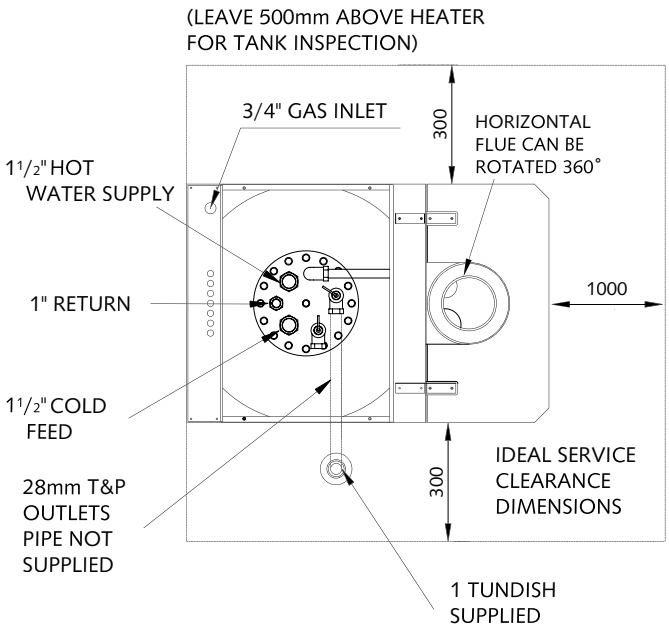
PLAN VIEW MODEL CWH90/200 & 120/200

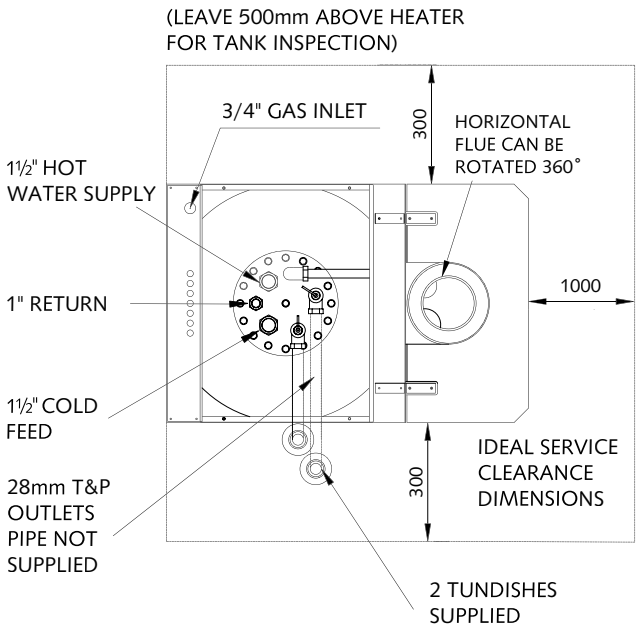
MAXXflo Heater Dimensions

Models CWH30/300, CWH60/300, CWH90/300 and CWH120/300

NOTE:- See pages 18 to 26 for flue details
Models CWH30 and 60 use 80/125mm diameter concentric flue components
Models CWH90 and 120 use 130/200mm diameter concentric flue components







DESCRIPTION

The **MAXXflo** series is a direct fired condensing storage water heater which has a stainless steel tank that is heated by up to four burner modules placed outside the tank. A burner module consists of a stainless steel heat exchanger in which the burner is placed.

The water heater works according to the loading principle: The water in the bottom of the tank is led directly through the heat exchanger, heated up and carried back to the top of the tank. The temperature of the water at the bottom of the tank (return temperature) is representative of the input heat; the burner modulates on the basis of this return temperature. The temperature at which the water is supplied to the tank from the heat exchanger (supply temperature) is kept at the set water heater temperature using pump modulation.

An important advantage of bringing the heat transfer from outside the tank is that the output is not influenced by the temperatures that prevail in the tank. As long as draw off occurs the water from the bottom of the tank to the heat exchanger is almost the same as the supply cold water temperature. This means the maximum output is maintained during the heating up period. On the final heating period, when the tank is almost completely heated up, the return temperature will increase and the burner modulates. Because the water is pumped round from the lowest point in the tank, the whole tank is heated up and there are no cool zones.

The water heater is equipped with a maximum of four burner modules dependent on the model. Each burner module produces a maximum of 30.5 kW output for a set water heater temperature of 60°C.

LOCATION

THE LAW REQUIRES THAT THE INSTALLATION IS CARRIED OUT BY A PROPERLY QUALIFIED PERSON

Installations must be carried out in accordance with Gas safety (Installation and Use) Regulations 1998, Building Regulations, The Water Supply (Water Fittings) Regulations 1999 and any requirements of the local Gas Authority, Local Authority, Water and Fire Authorities and the current British Standards and Codes of Practice listed in Section 1.

The location selected for installation of the heater must allow the provision of a satisfactory flue, adequate air supply, drain facilities and must be well illuminated.

A purpose built water heater room or compartment is strongly recommended.

A manual valve for isolation of the water heater room should be installed in the gas supply; it should be clearly identified and readily accessible for use at all times.

If a purpose built water heater room is not available, measures should be taken to protect the heater from damage and prevent any extraneous matter from being stored on or around the heater. See BS 6644 Clauses 4, 5 and 6 for details.

The heater must not be installed in any location which contains a bed, bath or shower. There must be easy access to the water heater room and heater at all times.

The water heater must be located in an area where leakage from the tank, water connections or the combination temperature and safety valve will not result in damage to the area adjacent to the water heater. When such locations cannot be avoided, a suitable drain tray must be installed under the water heater. The drain tray must be no deeper than 38mm and must be 100mm wider and longer than the heater.
The drain tray must be piped to an adequate drain using 20mm (0.75in) diameter pipe, angled for proper drainage.

Access must be provided to the front of the water heater and adequate clearance for it's servicing and operation.

The floor on which the heater is installed must be flat, level and of sufficient strength to withstand the weight of the heater when filled with water, and should satisfy the requirements of the Local Authority & Building Regulations.

Any Combustible material adjacent to the heater must be so placed and shielded as to ensure that it's temperature does not exceed 66ºC (150ºF).

Place the water heater on a flat floor in a frost-proof area. See pages 5,6 and 7 for recommended service clearances.

WATER QUALITY AND TREATMENT

When installing Andrews Water Heaters in hard water areas we would recommend that a water treatment specialist is consulted.

In hard water areas, scale formation can occur in all hot water systems and water heaters and the higher the temperature and volume of water used, the more problematic the scale build-up can be. Water treatment is normally recommended when the hardness reaches 100 – 150ppm (7 – 10 degrees Clark) and above. This problem can be minimised by reducing the water temperature in the heater and by fitting suitable water pre-treatment equipment. It is for this reason we strongly recommend water pre-treatment is fitted. A base-exchange type of softener is recommended for a reliable solution to hard water. Also the tank should be inspected annually.
See page 36.

WATER CONNECTIONS

An unvented system must be fitted by an approved installer.
The pressure-reducing valve C1 will regulate the mains water pressure at 3.5 bar (provided there is sufficient mains water pressure available). The maximum test pressure should be 8 bar. The expansion vessel C3 supplied is suitable for the stored volume of the heater and a comparative pipe work system. The temperature and pressure relief valve(s) are factory fitted. FOR SYSTEMS WITH LARGER PIPE VOLUMES OR ADDITIONAL STORAGE, EXPANSION VESSELS WITH MORE CAPACITY ARE AVAILABLE.
We do not recommend the use of Galvanised pipework due to issues such as galvanic attack (British Standard BS6644). The **MAXXflo** has a number of copper and brass components.

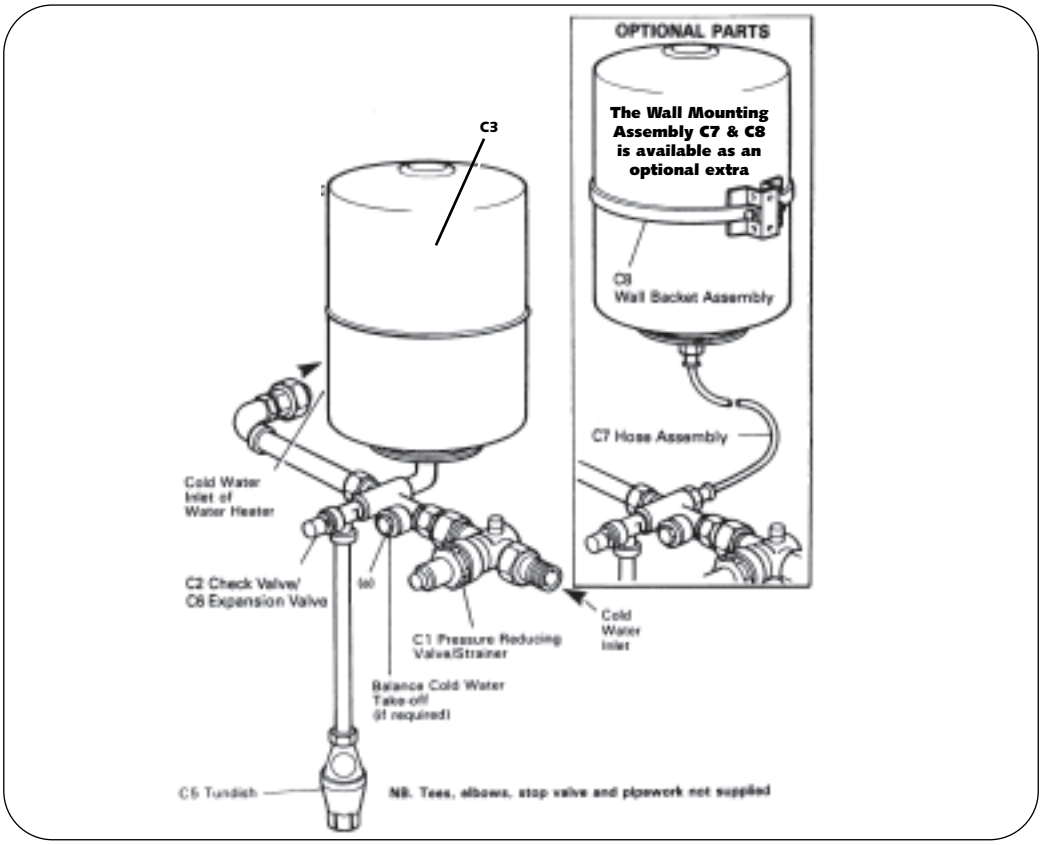


Fig. 1

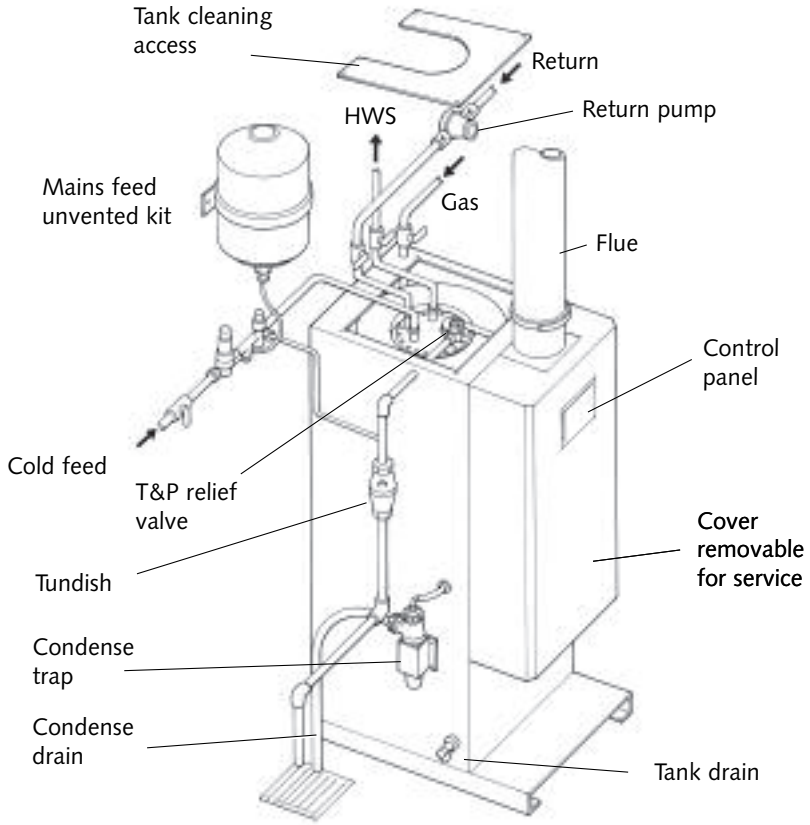
The cold water connection and the hot water connection can be found on the top of the appliance, see Fig.1a and 1b. An extra connection is available for the benefit of a circulation line. Please note that a stop valve should be fitted in the circulation line.

The **MAXXflo** range of storage water heaters are designed to work from a mains fed unvented system. An unvented kit to regulate the cold feed is supplied with each heater and should be installed as Fig.1, 1a and 1b plus drawings on pages 5, 6 and 7.
The temperature and pressure relief valves are supplied factory fitted for external connection to a tundish (supplied) and suitable drain. The **MAXXflo** can also operate on vented systems providing the minimum water pressure is one bar.

CONDENSE DRAIN

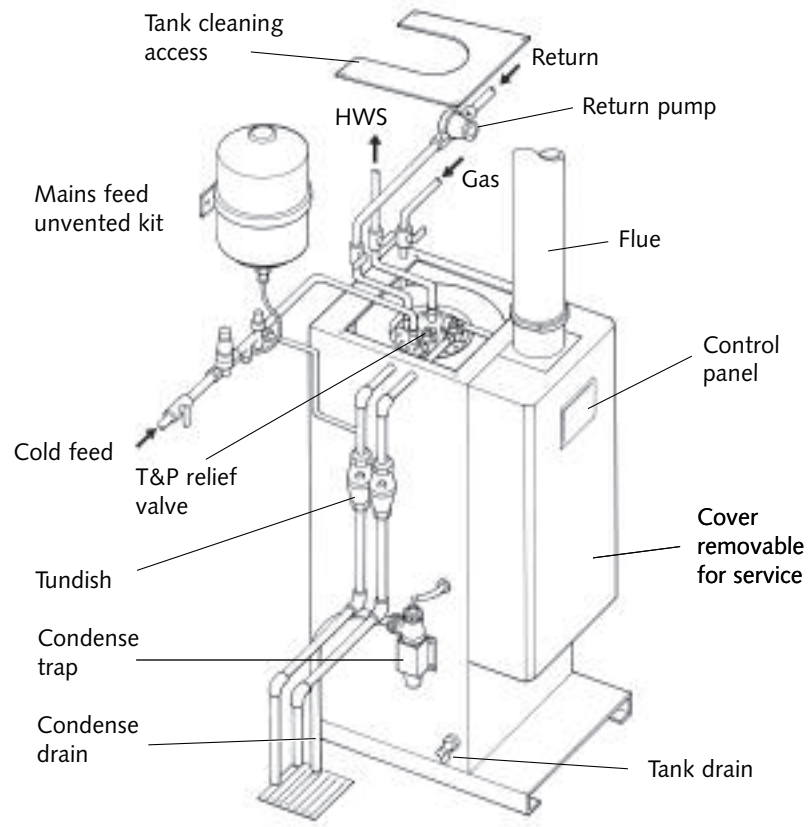
Condensation is formed in the heater and this must be continuously discharged into a drain. A trap is supplied which should be connected into a drain via a tundish or air break. (See Fig.1a and 1b). The condense flow must not be allowed to block otherwise the heater will fail to work correctly. NOTE: AN AIR BREAK IS REQUIRED DOWNSTREAM OF THE TRAP TO PROTECT THE WATER HEATER FROM BLOCKAGES AND SUBSEQUENT DAMAGE. Each 30kw module could produce up to 3 litres of condense per hour while at full load.

TYPICAL INSTALLATION Fig. 1a



CWH30
CWH60

Fig. 1b



CWH90
CWH120

GAS SUPPLY
NATURAL GAS

The installation of the gas supply must conform, depending on it's size, to the requirements of British Standards and Codes of Practice listed in Section 1 of this manual.

A gas meter will be connected to the service pipe by British Gas plc or it's authorised contractor.

The meter and service pipe should be checked by British Gas or it's authorised contractor to ensure that they are adequate to deal with the gas supply to the water heater(s) in addition to any existing or additional requirements.

Fit the service gas cock (supplied) to the gas connection on top of the water heater using a suitable jointing compound and connect to the gas supply.

Where the water heater(s) is(are) installed in a water heater house or purpose built compartment, a manually operated valve for the water heater house must be fitted in accordance with the Gas Safety (Installation and Use) Regulations 1998. The valve must be easily identified and readily accessible.

After installation, the system should be pressure tested for soundness and purged in accordance with BS 6891 or IM/2 and IM/5 as appropriate.

Please note that the minimum dynamic gas pressure for Natural Gas must not fall below 18 mbar.

GAS SUPPLY
PROPANE

Contact your provider or supplier who will provide the appropriate type and size of LPG supply vessel and ensure it's safe location and installation.

The installation of the gas supply must conform to LPGA Code of Practice, 22 LPG Piping Systems: Design and installation plus the requirements of British Standards and Codes of Practice listed in Section of this manual.

Andrews water heaters are unregulated and a second stage regulator must be installed to give an inlet pressure to the appliance as follows: (See fig. 2).

PROPANE:	37 mbar (14.86 in wg)

When using propane cylinders, connect a minimum number of 47kg cylinders as listed below, together with a manifold before connecting to the union.

Use a minimum pipe size of ¾in bore.

Two 47kg Cylinders	**LCWH30 and LCWH60**
Three 47kg Cylinders	**LCWH90**
Four 47kg Cylinders	**LCWH120**

WARNING!

PROPANE CYLINDERS MUST BE USED AND STORED IN ACCORDANCE WITH 'THE HIGHLY FLAMMABLE LIQUIDS AND LIQUIFIED PETROLEUM GASES REGULATIONS 1972', AND SHOULD COMPLY WITH LPGA CODE OF PRACTICE 7, 'STORAGE OF FULL AND EMPTY LPG CYLINDERS AND CARTRIDGES'.

Also please note that for Propane the minimum dynamic gas pressure to the unit must not fall below 37 mbar.

TYPICAL BULK STORAGE VESSEL INSTALLATION

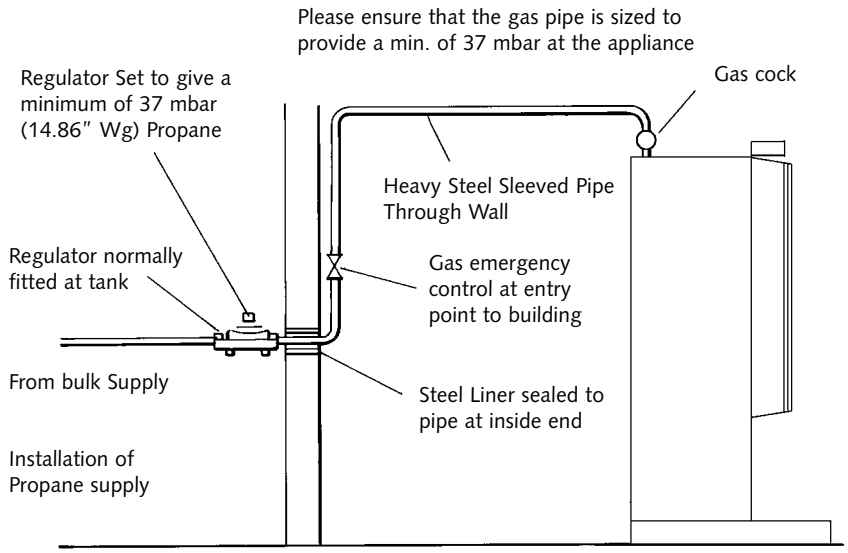


Fig 2

TYPICAL CYLINDER INSTALLATION

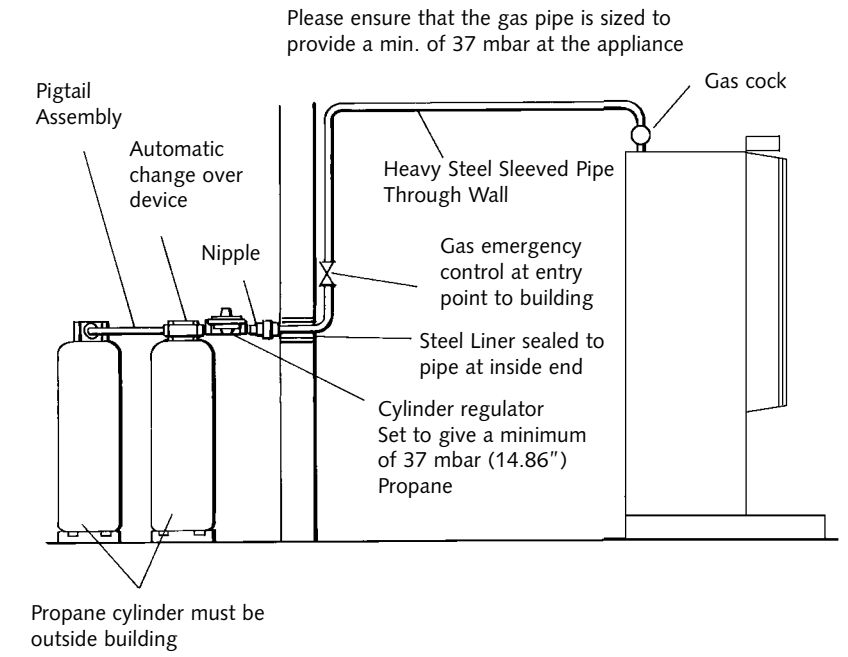


Fig 3

Important

These drawings show a schematic representation only and should not be used for installation purposes. Contact your gas supplier for authorised installation drawings.

ELECTRICAL SUPPLY

External wiring to the water heater(s) must be installed in accordance with current I.E.E. Regulations for the wiring of buildings and to any Local Regulations that may apply.

The **MAXXFLO** range is designed to operate from a permanent 230v/50Hz single phasesupply. The fuse rating is 5 amps.

Maximum Electrical Loading		
Model Type	**Watts**	**Amps**
30 kW	170	0.74
60 kW	340	1.48
90 kW	510	2.22
120 kW	680	2.96

The method of connection to the mains electricity supply should facilitate complete Electrical isolation of the appliance, preferably by use of a fused double pole switch or fused spur box serving only the heater. The disconnection of the supply shall have a contact separation of 3mm on all poles.

The point of connection to the mains electricity supply should be readily accessible and adjacent to the appliance.

ELECTRICAL CONNECTION

A terminal block can be found above the control panel (Fig. 4). This becomes accessible by first removing the front cover.

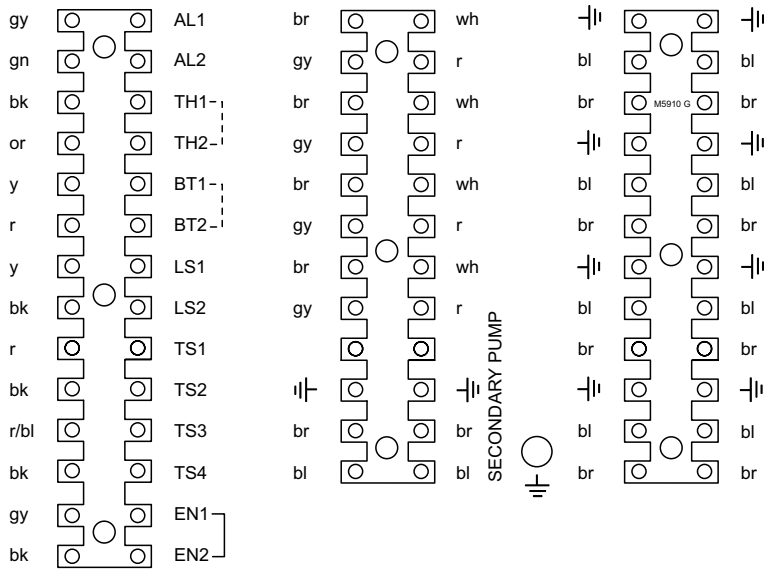


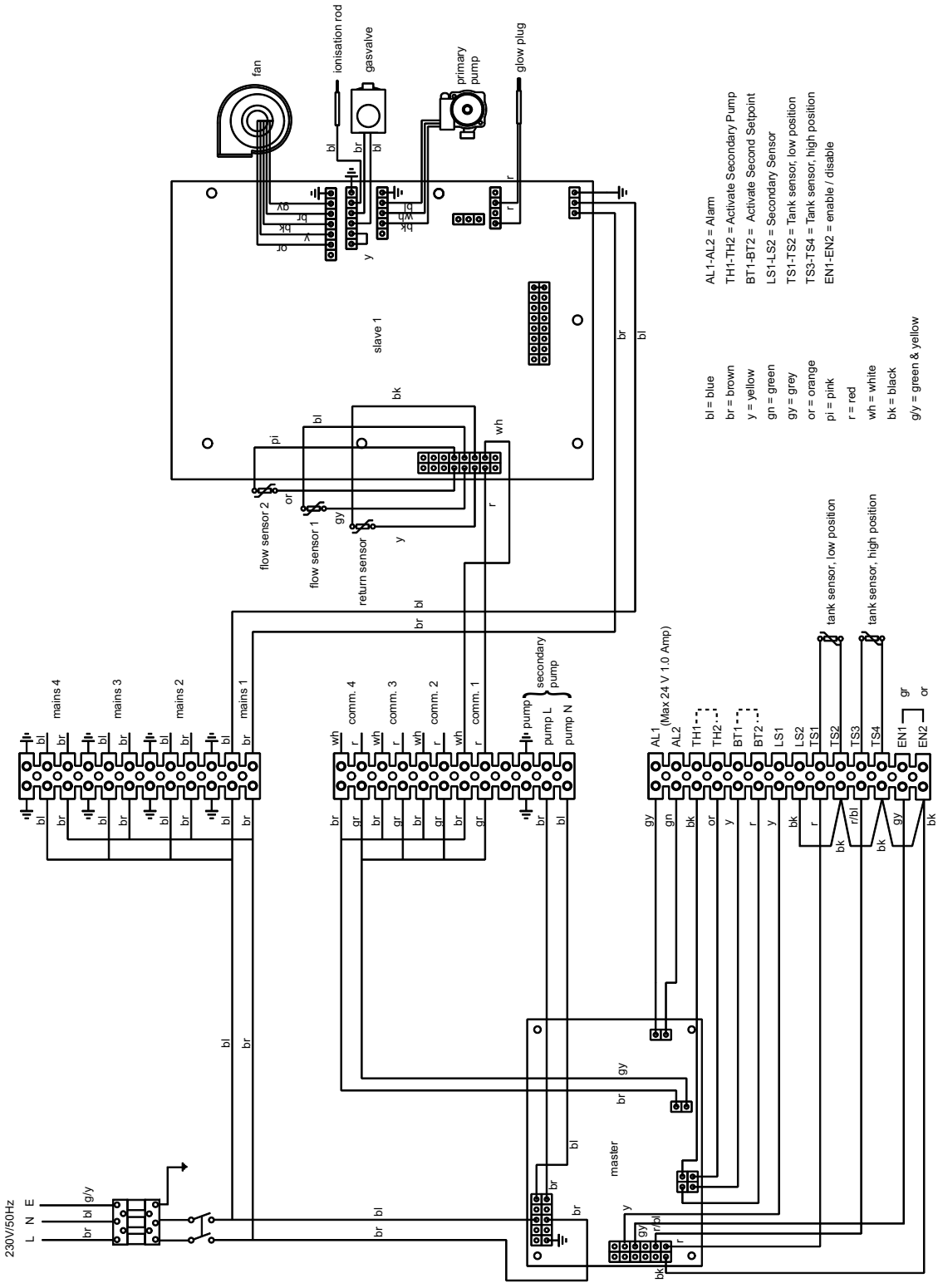
Fig. 4

The following connections can be made on the terminal block (see Fig. 5 wiring diagram):

Terminals	**Terminal Function**
AL1 - AL2:	Alarm volt-free contacts (24 volt 1 amp max.)
EN1 - EN2:	Enable or disable contacts volt-free (link fitted to enable).*
BT1 - BT2:	Secondary set point temp. enable (40 - 80ºC)*
LS1 - LS2:	Secondary return temp. sensor for pasteurisation function.
TH1 - TH2:	Secondary pump control enable.*
Pump L - Pump N:	Secondary pump power supply (0.7 amp max.)

*To activate place a contact across the terminals.

Fig. 5
Wiring diagram.



Make sure that the phase (L) and the neutral (N) are connected to the correct terminals on the connector.
The appliance is phase sensitive, swapping the phase and neutral will lead to a fault in the appliance.

TEMPORARY WATER HEATER TEMPERATURE CHANGE

It is possible to change the water heater temperature remotely via a timer programme. First of all the new, desired water heater temperature is set at a value higher or lower than the water heater temperature during normal operation. This makes it possible, for example, to carry out legionella flushing. See page 31.

The water heater temperature changes when the contacts connected to terminals BT1-BT2 are closed. The water heater temperature goes back to normal operation when these contacts are opened again.

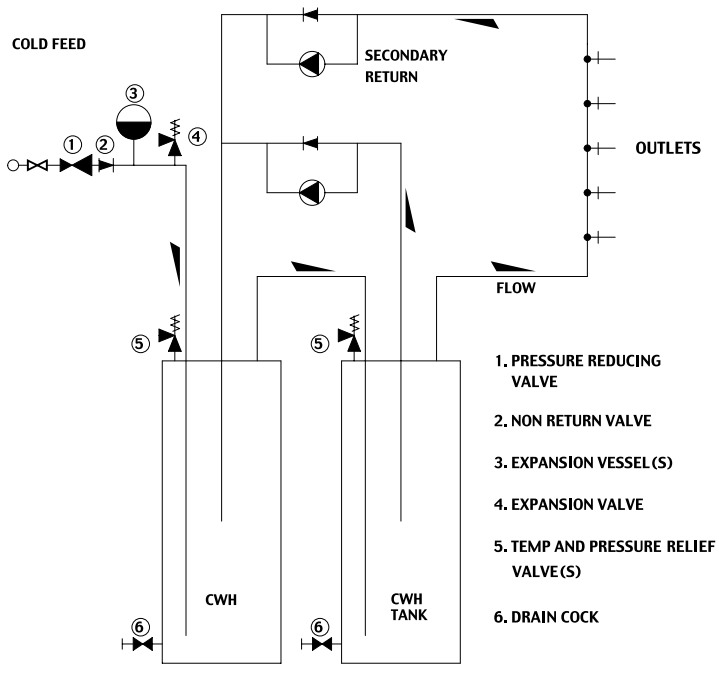
If the temperature change is used for legionella flushing, it is possible to return the water heater temperature to normal operation before the timer programme finishes. This happens on the basis of a temperature measurement, for example at the end of a circulation line (secondary return). For this purpose a 10K NTC temperature sensor (part number E674) must be connected to the terminals LS1-LS2. The water heater temperature now goes back to normal operation if the temperature is higher at the measuring point than the secondary pre-set water heater temperature minus 5°C for 20 minutes. If, for example, the secondary pre-set water heater temperature is set at 70°C, the water heater temperature returns back to normal operation as soon as the temperature at the secondary measuring point has been above 65°C for more than 20 minutes.

CIRCULATION PUMP AND STORAGE TANKS

A circulation pump (maximum 0.7 A) can be connected at the terminal pump L - pump N. The circulation pump can then be controlled by a thermostat connected to terminals TH1-TH2. Connecting the contacts of the thermostat then activates the circulation pump.

The application can be used when the water heater is combined with a separate storage tank.
As soon as the temperature in the tank gets too low the thermostat will activate the pump so the tank is heated up again. Matching **MAXXFLO** storage tanks are available in 200 and 300 litre sizes, models HWST200 and HWST300, these tanks are fitted with a thermostat for use as above. See below for schematic system design, and page 17 for tank dimensions and wiring diagram.

Fig. 6

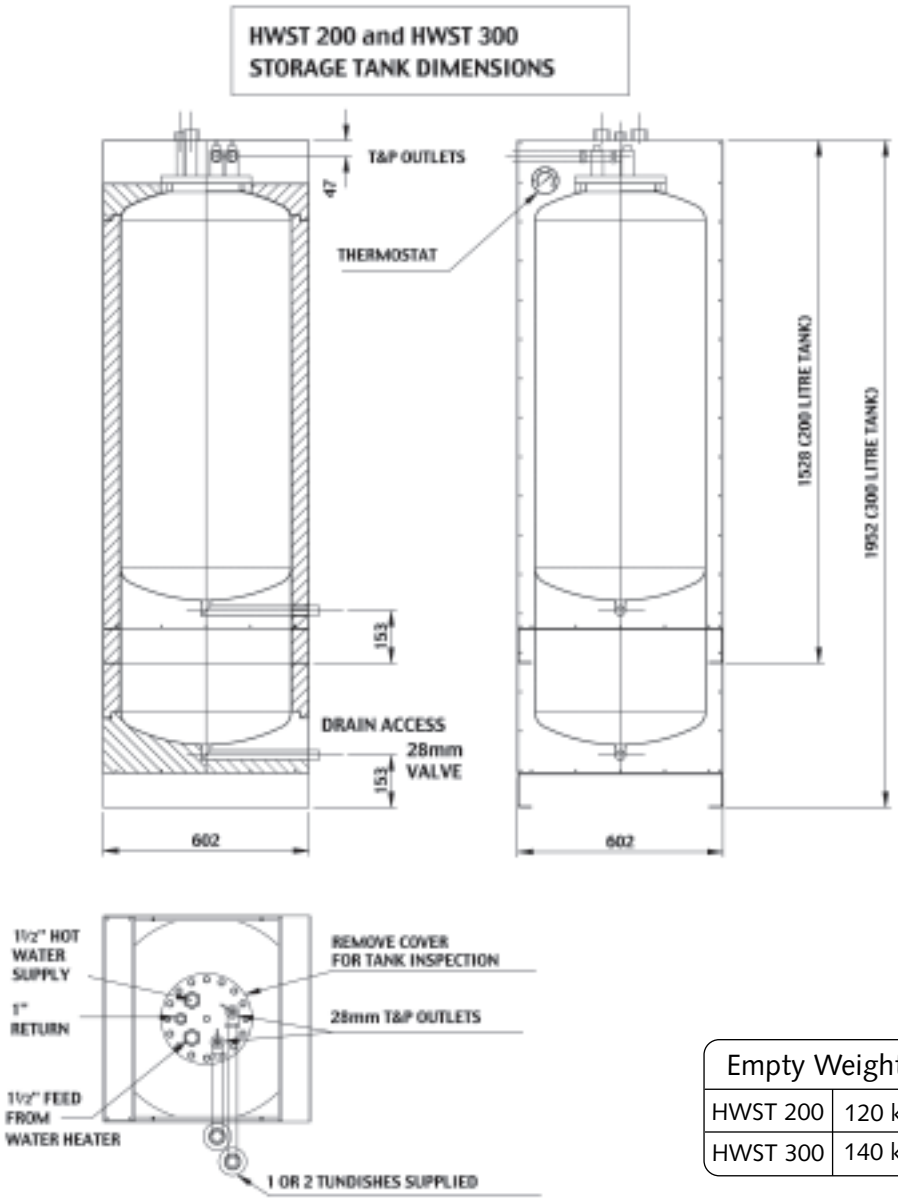


TYPICAL INSTALLATION OF AN ANDREWS CWH CONDENSING WATER HEATER AND A CWH BUFFER TANK

Schematic System Design

HWST TANK DIMENSIONS

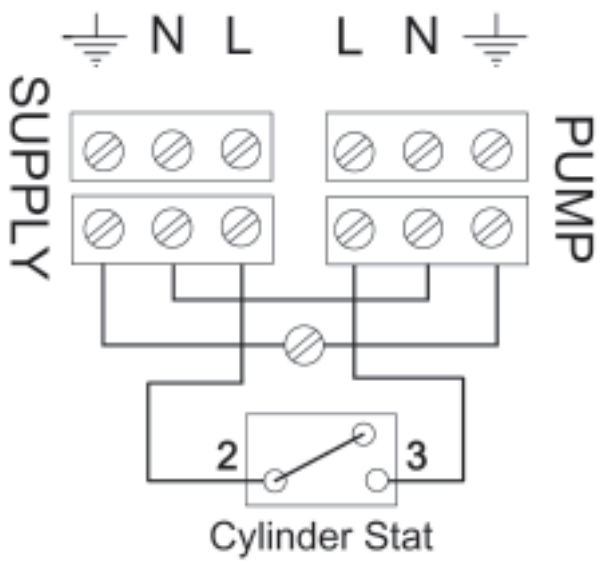
Fig. 7



Empty Weight	
HWST 200	120 kg
HWST 300	140 kg

WIRING DIAGRAM

Fig. 8



FLUE SYSTEMS

The versatile flueing options will provide a solution to most flushing requirements. The heater when fitted with a concentric flue system provides a room sealed application. The concentric flue, supplied by Andrews, is available for either horizontal or vertical installation and the table below shows the basic kit supplied plus optional extras. Alternatively the heater can be fitted with a conventional flue system, which can be obtained from a specialist flue stockist. A flue system suitable for a condensing pressurised system must be specified.

The table and the concentric flue component below show the maximum allowable length of flue for both systems.

Model		**CWH30**	**CWH60**	**CWH90**	**CWH120**
Flue size (concentric)	mm	80/125	80/125	130/200	130/200
Max. flue run - concentric (a)	m	14	12	14	14
Max. flue run - conventional (b)	m	50	20	50	40
Max. flue static pressure	Pa	140	140	140	140
Max. flue gas volume	M^3/h	41	82	123	164
Max. flue gas temperature	°C	52	52	52	52

(a) For a concentric flue/room sealed reduce flue length by 1.2m for 90° bend, 0.7m for 45° bend and 1.5m for condense trap.
(b) For a conventional flue reduce flue length by 4m for 90° bend, 2m for 45° bend and 4m for condense trap.

The different ventilation requirements for room sealed or conventional flue systems are given on pages 27-29.

The following pages show standard kits and additional items for concentric flue supplied by Andrews. Horizontal or Vertical flue kits must be ordered separately, flue kits are not included in the heater price.

GENERAL

Flue terminals must be installed in accordance with the Clean Air Act to ensure the products of combustion are properly dispersed. The drawing shows some minimum clearances for the flue terminal, in addition the flue terminal should be positioned where it will not cause a nuisance from noise or from the combustion products accumulating. Please contact Andrews's technical department if advice is needed for a particular installation. See drawings on page 25.

If installed in a roof valley the terminal should be at least 1m above the highest part of the roof structure and 2.5m from any adjacent structure.

The terminal must be fitted with a guard if less than 2m above ground level or in a position where it may cause injury to persons resulting from touching a hot surface. Guards can be ordered with flue components, see table on pages 19 and 22.

Warning!

The flue system must be properly installed. Ensure the inner flue is securely sealed at all the joints otherwise incomplete combustion may result.

Do not exceed maximum flue lengths including elbows.

.

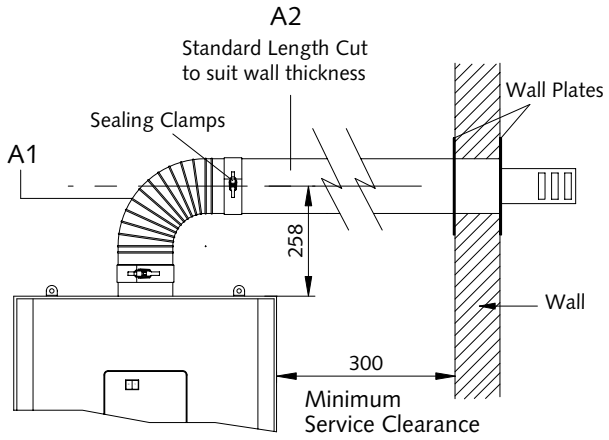
CWH30 & CWH60 Flue Systems

The CWH30 & CWH60 uses a concentric flue system, **125mm outside diameter with an inner flue of 80mm diameter.**
Flue components fit together with silicon sealing rings and the flues are retained with sealing clamps. Each heater can be ordered with either a horizontal or vertical flue kit. Flue assembly instructions are also included.

Horizontal flue kits include the following.

A1 - 90º bend with sealing clamp (Part No. E071)

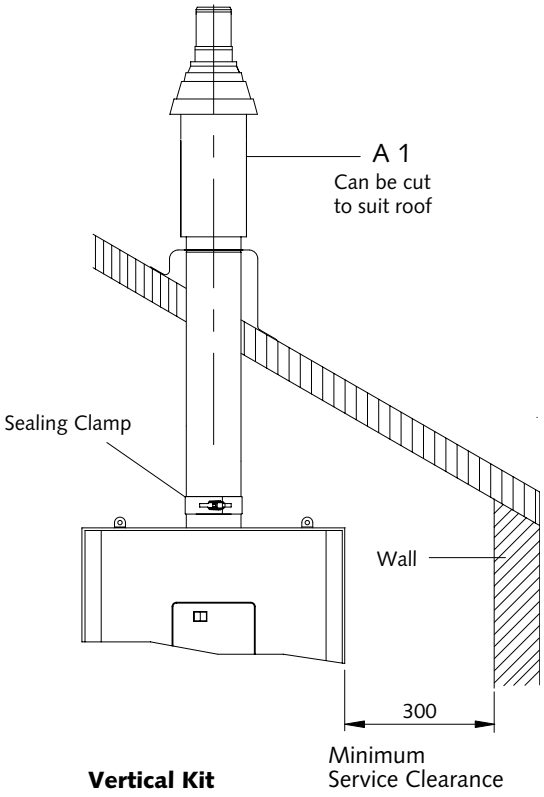
A2 - Wall outlet terminal with sealing clamp complete with inner and outer wall plates, fixing screws and plugs. (Part No.E073)



Horizontal Kit

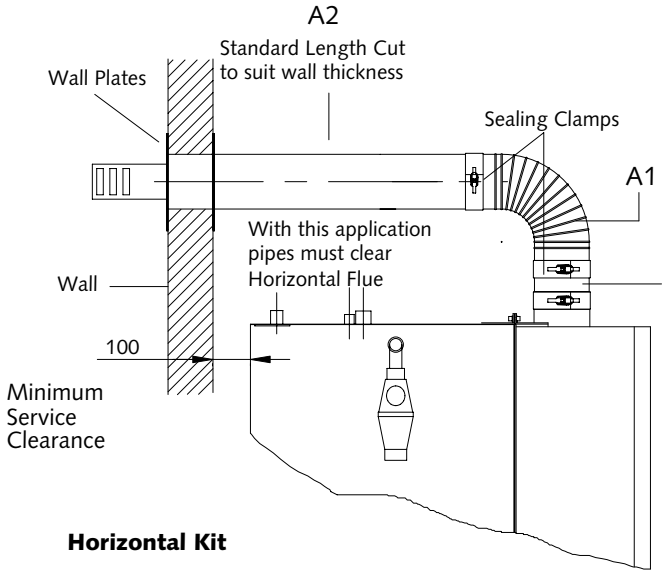
Vertical kits include the following.

A1 - Roof outlet terminal with sealing clamp. (Part No. E067) Roof flashing plates and additional flue components are available.



Vertical Kit

Alternative Flue Systems



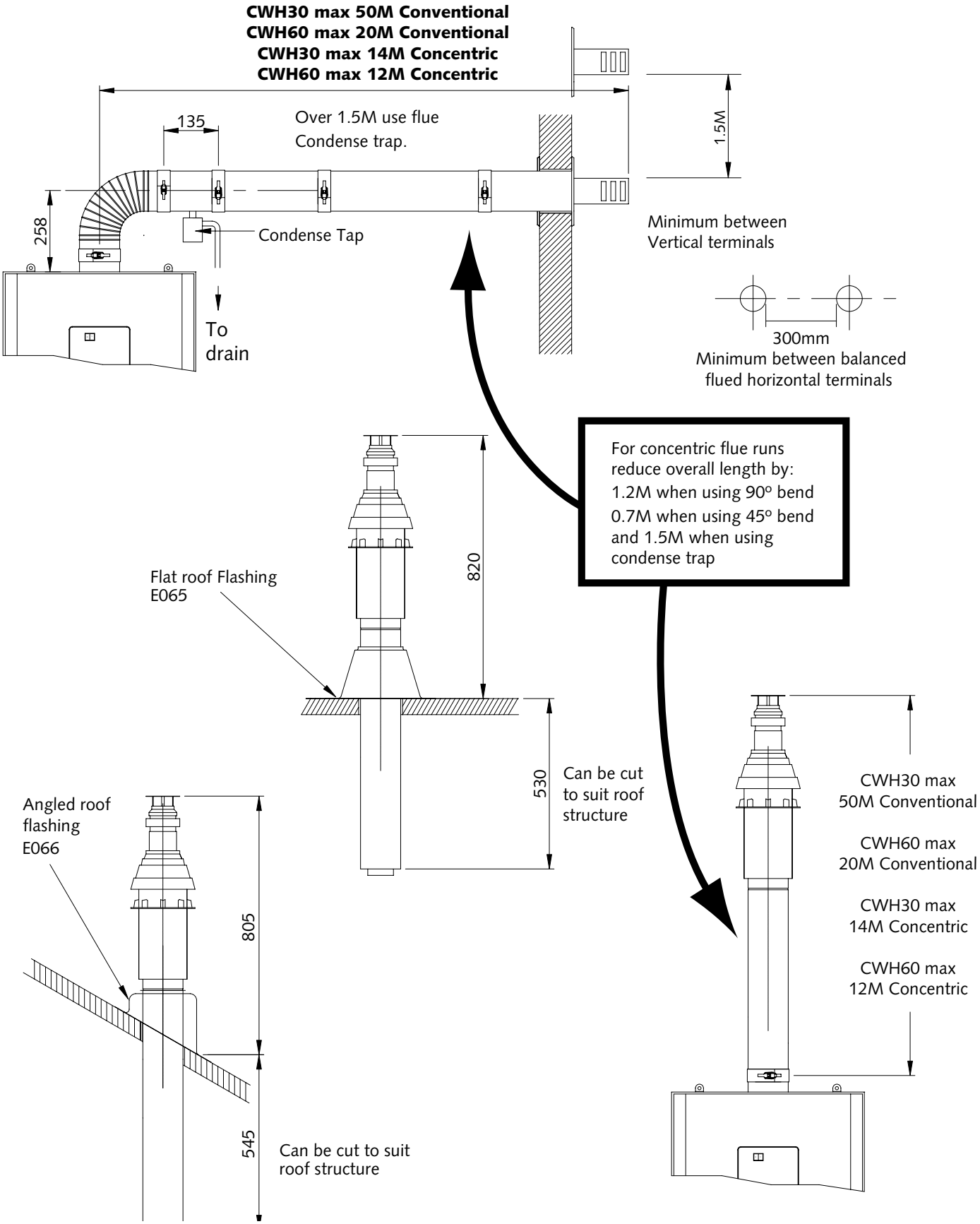
Add standard or cutable flue to improve access to tank top for inspection (see page 35)

Horizontal Kit

Optional flue components available

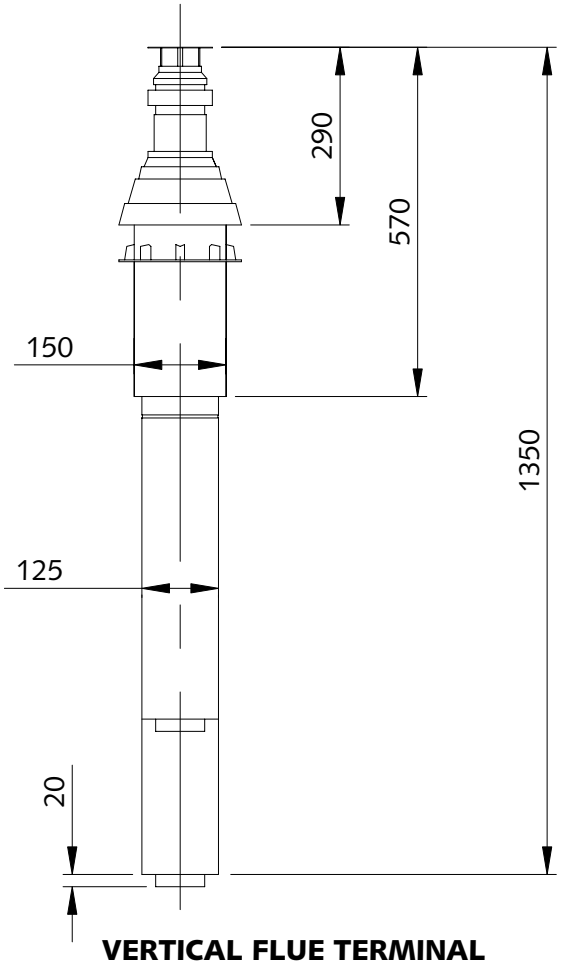
Part No.	Description
E071	90º elbow c/w clamp
E308	45º elbow c/w clamp
E064	1m length of flue c/w clamp
E070	1m length cutable flue c/w clamp
E069	0.5m flue c/w clamp
E065	Flat roof plate (125mm)
E066	Angled roof plate (125 mm)
E068	Wall clamp (125 mm)
E105	Guard for horizontal flue terminal
E310	Flue condense trap

CWH30 & CWH60 Alternative Flue Systems

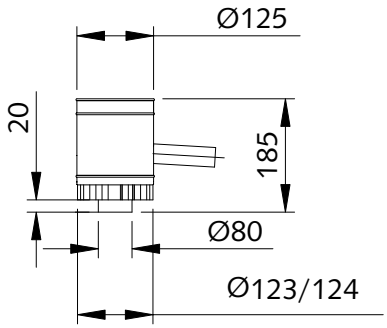


CWH30 & CWH60 Standard Flue System Dimensions

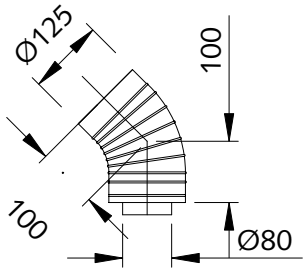
ALL 80/125mm Ø CONCENTRIC FLUE



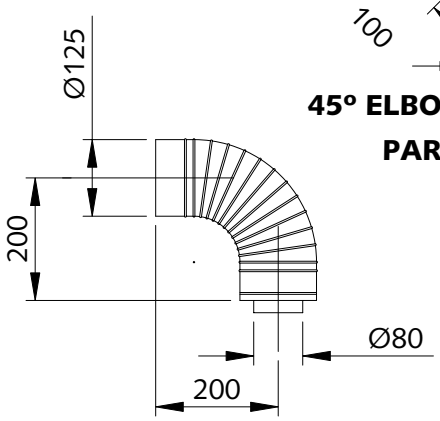
VERTICAL FLUE TERMINAL C/W CLAMP (CONDENSING) PART No E067



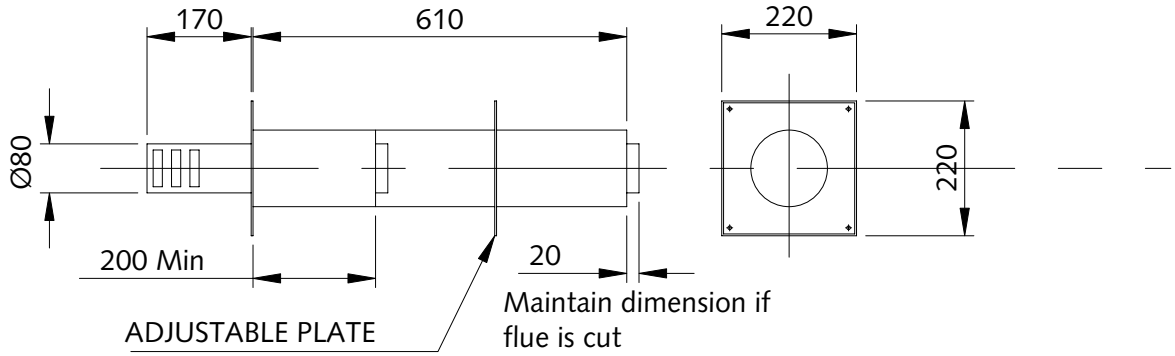
CONDENSATE TRAP PART No E310



45º ELBOW C/W CLAMP PART No E308



90º ELBOW C/W CLAMP PART No E071



HORIZONTAL TERMINAL C/W WALL PLATES PART No E073

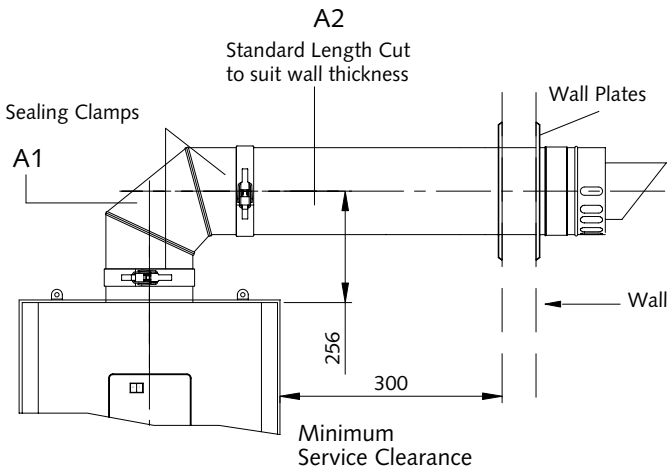
CWH90 & CWH120 Flue Systems

The CWH90 & CWH120 uses a concentric flue system, **200mm outside diameter with an inner flue of 130mm diameter.**
Flue components fit together with silicon sealing rings and the flues are retained with sealing clamps. Each heater can be ordered with either a horizontal or vertical flue kit. Flue assembly instructions are also included.

Horizontal flue kits include the following.

A1 - 90º bend with sealing clamp (Part No. E215)

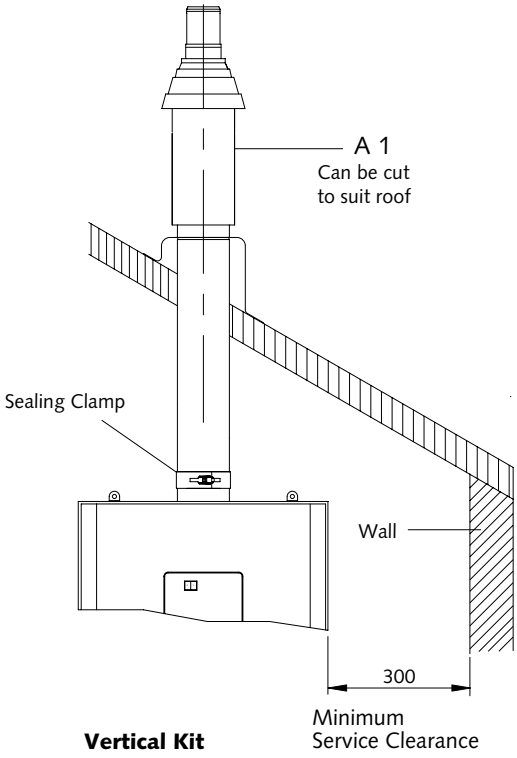
A2 - Wall outlet terminal with sealing clamp complete with inner and outer wall plates, fixing screws and plugs. (Part No.E240)



Horizontal Kit

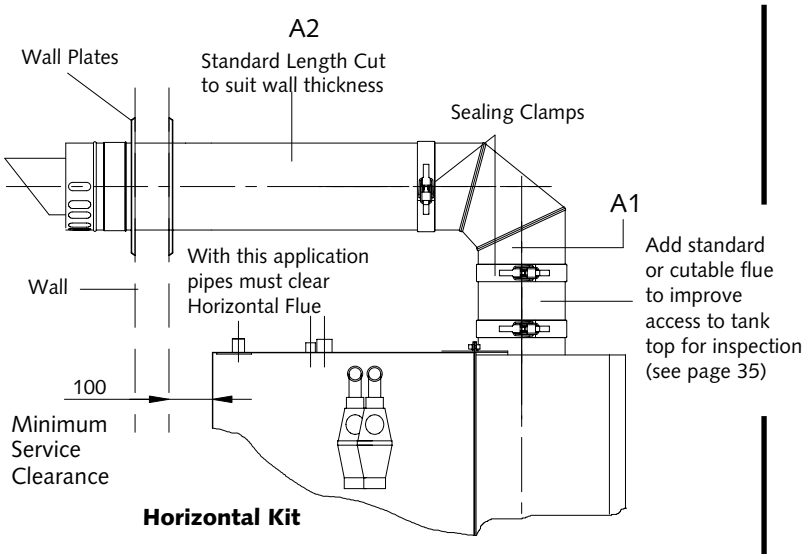
Vertical kits include the following.

A1 - Roof outlet terminal with sealing clamp. (Part No. E670) Roof flashing plates and additional flue components are available.



Vertical Kit

Alternative Systems



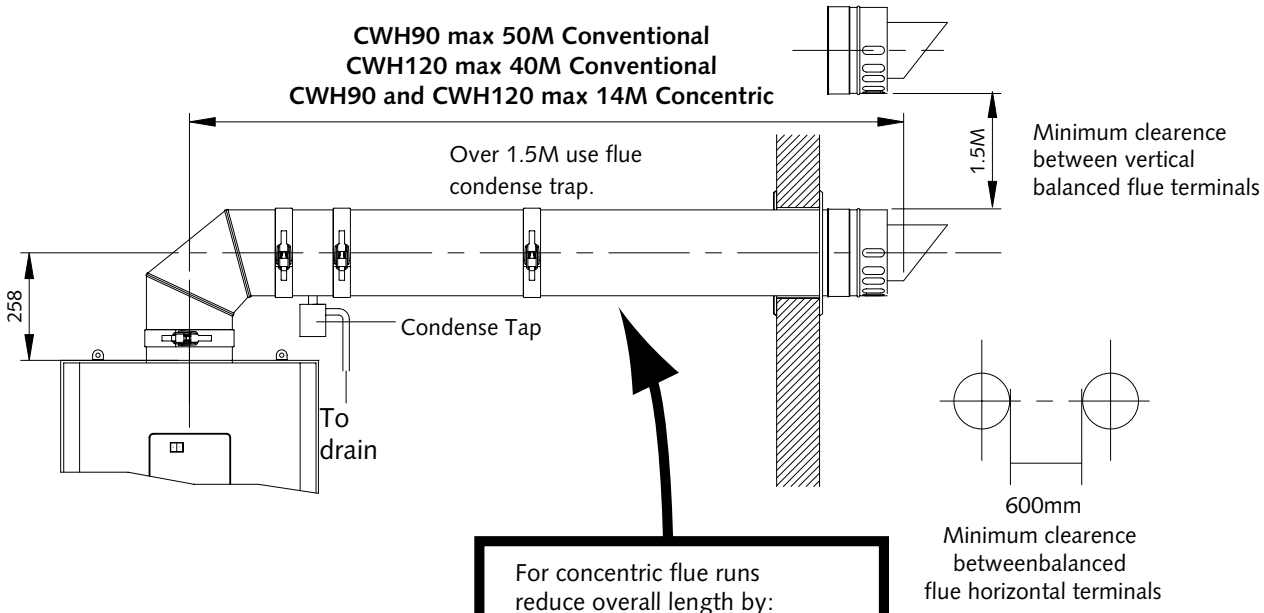
Horizontal Kit

Optional flue components available

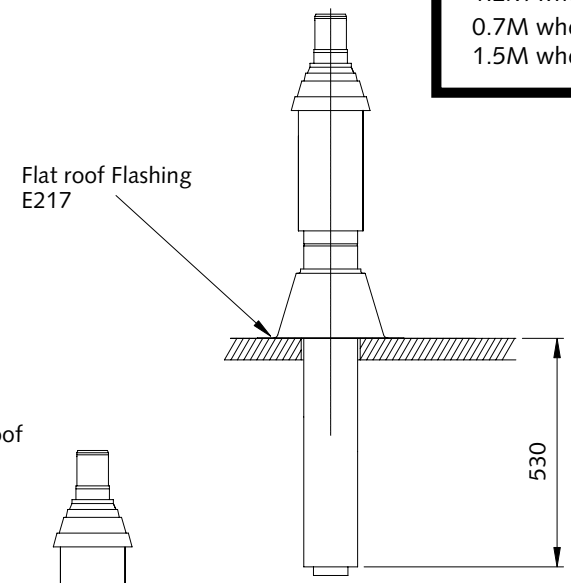
Part No.	Description
E215	90º elbow c/w clamp
E216	45º elbow c/w clamp
E212	1m length of flue c/w clamp
E213	1m length cutable flue c/w clamp
E214	0.5m flue c/w clamp
E217	Flat roof plate (200mm)
E218	Angled roof plate (200 mm)
E219	Wall clamp (200mm)
E630	Guard for horizontal flue terminal
E220	Flue condense trap

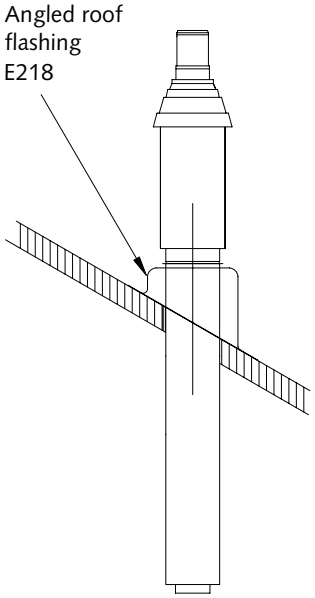
CWH90 & CWH120 Alternative Flue Systems

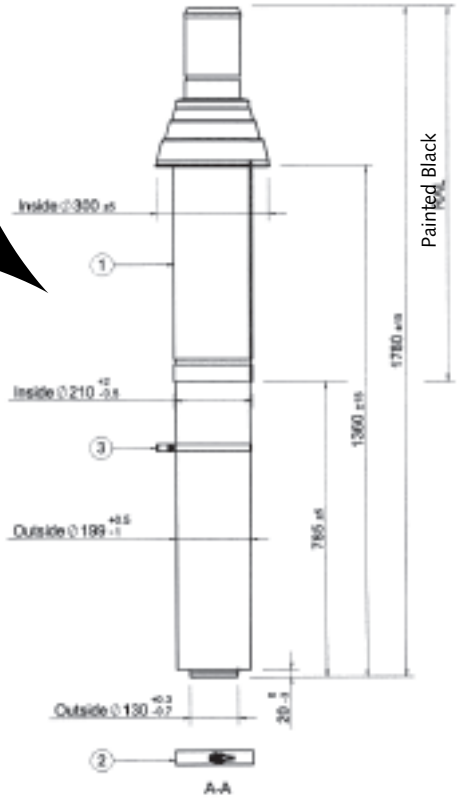
CWH90 max 50M Conventional
CWH120 max 40M Conventional
CWH90 and CWH120 max 14M Concentric



For concentric flue runs reduce overall length by:
1.2M when using 90° bend
0.7M when using 45° bend
1.5M when using condense trap

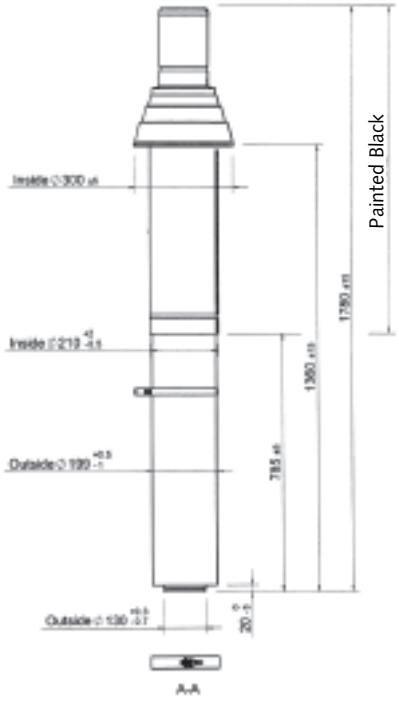




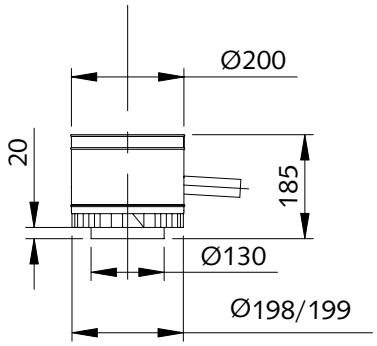


CWH90 & CWH120 Standard Flue System Dimensions

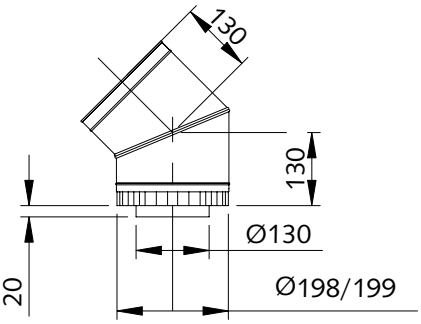
ALL 130/200MM Ø CONCENTRIC FLUE



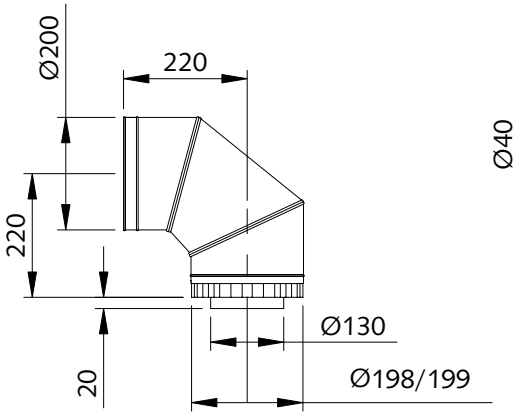
VERTICAL FLUE TERMINAL C/W CLAMP PART No E670



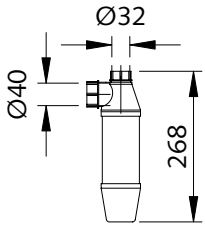
CONDENSATE TRAP PART No E220



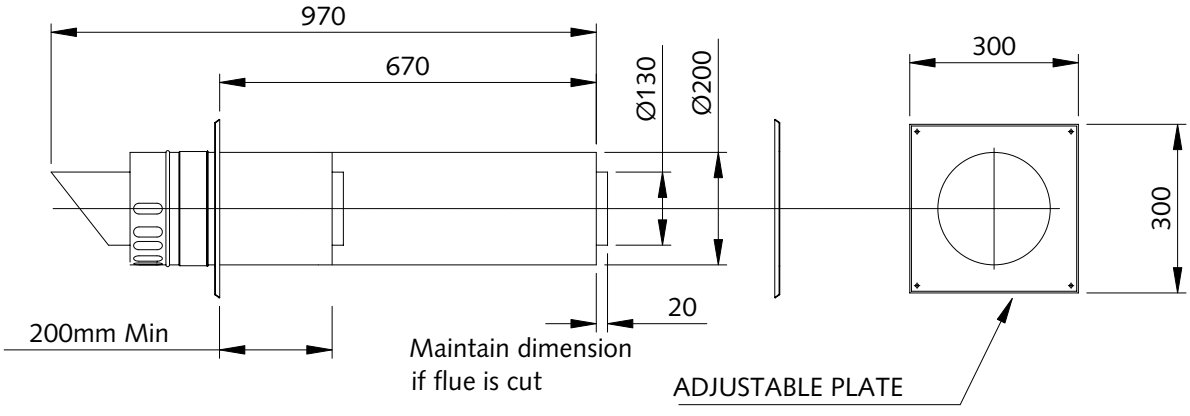
45º ELBOW C/W CLAMP PART No E216



90º ELBOW C/W CLAMP PART No E215



CONDENSE TRAP PART NO. E211



HORIZONTAL TERMINAL C/W WALL PLATES PART No E240

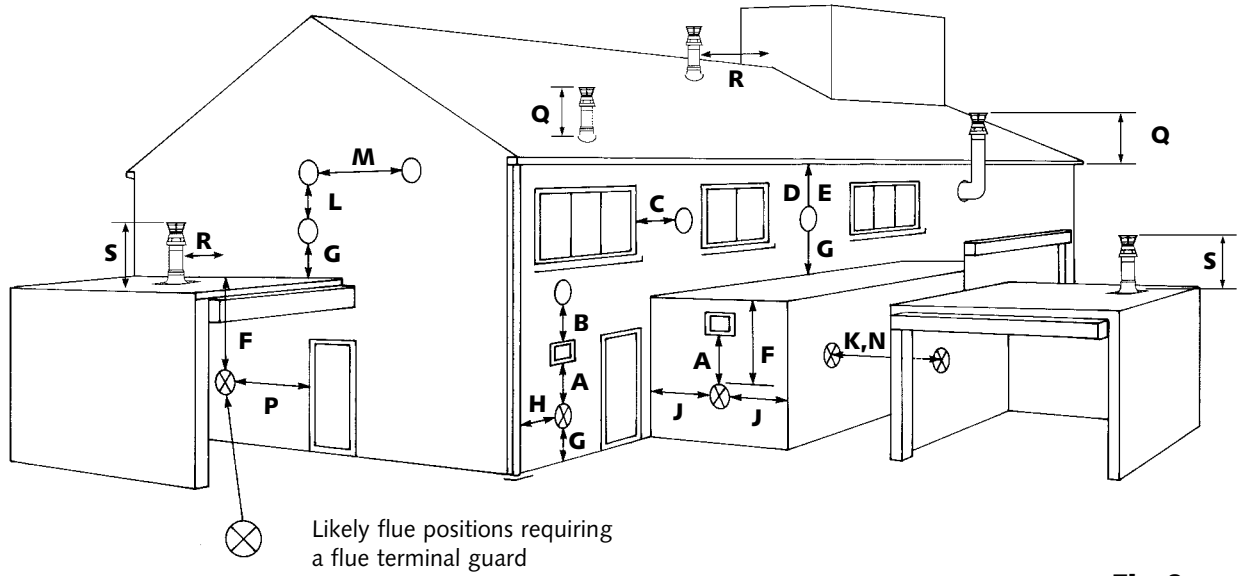


Fig. 9

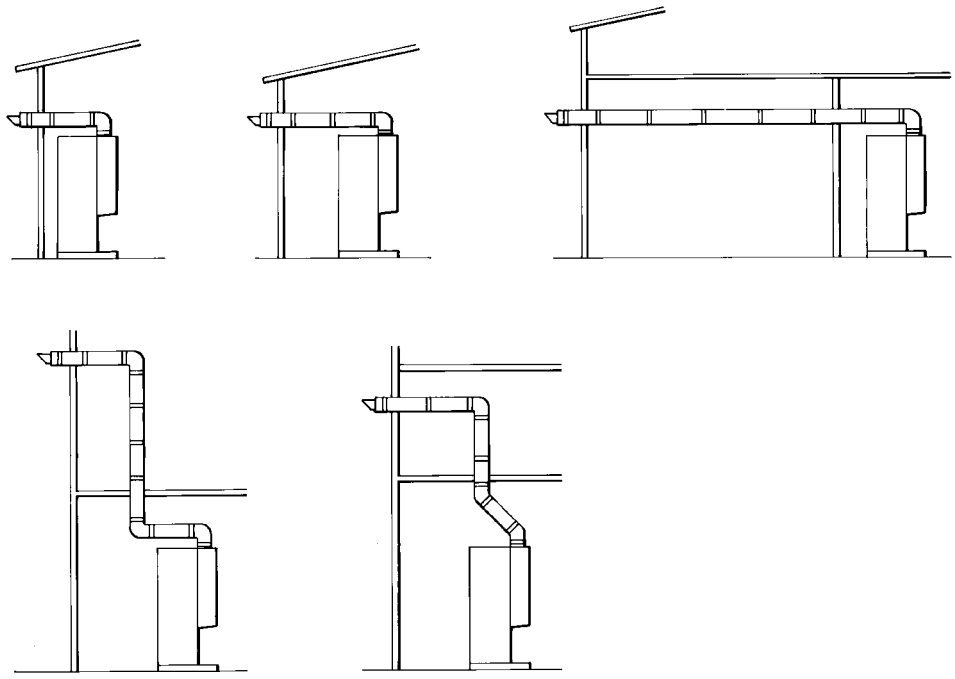
FLUE SYSTEMS

	Terminal Positions with Minimum Distance	**mm**
A	Directly below an opening, air brick, opening window etc.	300
B	Above an opening, air brick, opening window etc.	300
C	Horizontally to an opening, air brick, opening window etc.	300
D	Below a gutter or sanitary pipework	75
E	Below the eaves	200
F	Below a balcony or carport roof	200
G	Above ground, roof or balcony level	300
H	From vertical drain/soil pipework	150
J	From an internal or external corner	300
K	From a surface or *boundary* facing the terminal	600
L	Vertically from a terminal on the same wall	1500
M	Horizontally from a terminal on the same wall	(30 & 60 kW) 300 (90 & 120 kW) 600
N	From a terminal facing the terminal	1200
P	From a opening in a carport (e.g. door, windows) *into the building*	1200
Q	Above roof	500
R	From a vertical structure on a roof	500
S	Above flat roof	1000

FLUE SYSTEMS

NOTE:
See page 25 for positioning of flue terminals.

Horizontal termination
(Room sealed or conventional flue)



Vertical termination
(Room sealed or conventional flue)

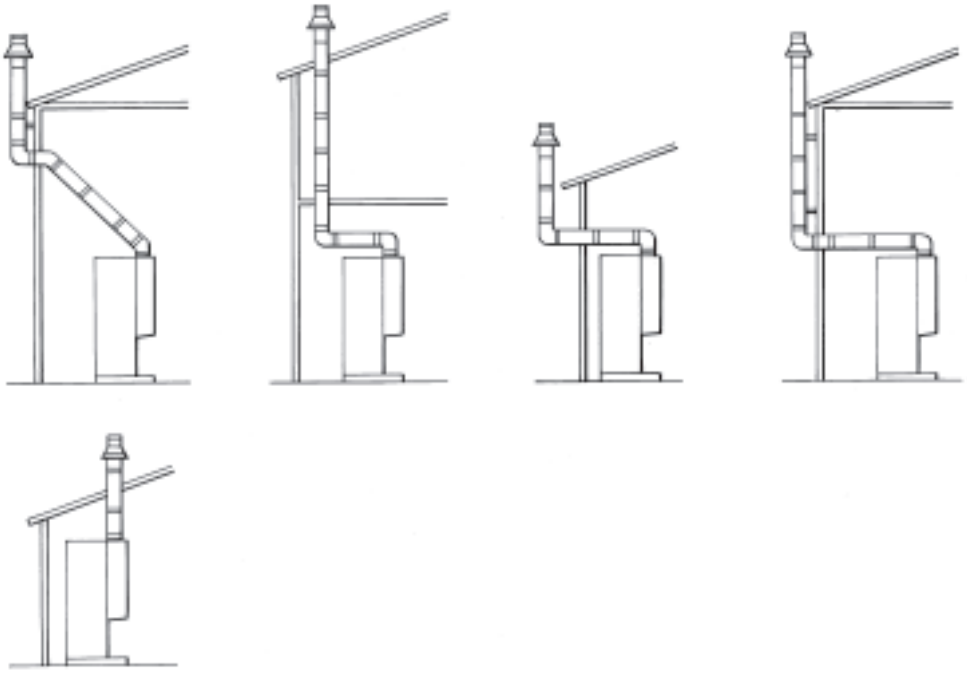


Fig. 10

AIR SUPPLY AND VENTILATION
CONCENTRIC FLUE SYSTEMS

The following notes are intended to give guidance:
Where the heater is to be installed in a room, NO VENTS ARE REQUIRED.

Where the heater is to be installed in a **COMPARTMENT**, permanent air vents are required in the **COMPARTMENT** at high and low level. These air vents must either communicate with a room or internal space or be direct to outside air.

The minimum effective areas of the permanent air vents required in the compartment are as follows:

Air Vents Areas

Position of Air Vents	Air from Room or Internal Space	Air Direct from Outside
High Level	10cm² per kW Net input	5cm² per kW Net input
Low Level	10cm² per kW Net input	5cm² per kW Net input
In a Room or Internal Space	No Requirement for Ventilation	

Note: - Both air vents must communicate with the same room or internal space or must both be on the same wall to outside air.

Air vents should have negligible resistance and must not be sited in any position where they are likely to be easily blocked or flooded or in any position adjacent to an extraction system which is carrying flammable vapour.

Consideration must be given to the position of the high level ventilation opening. A high level vent must not be sited within 300mm (1ft) measured vertically, of the flue terminal.

Grilles and louvres should be so designed that high velocity air streams do not occur within the space housing the heater(s).

AIR SUPPLY AND VENTILATION CONCENTRIC FLUE SYSTEMS

IMPORTANT:

1. The effective area requirements specified in the table are related to the maximum heat input of of the heater(s), and are equivalent to those specified in BS6644.
2. The free area of the grilles should not be less than the size of the recommended ventilation opening.
3. The supply of air to a space housing the heater(s) by mechanical means should be:-

   (a) Mechanical inlet with natural extraction.

   (b) Mechanical inlet with mechanical extraction.

NB!! Natural inlet with mechanical extraction must not be used.

Where a mechanical inlet and mechanical extraction system is used, the design extraction rate must not exceed one third of the design inlet rate.

All mechanical ventilation systems must be fitted with automatic gas shut off safety systems which cut off the supply of gas to the heater(s) in the event of failure of either the inlet or extract fans.

The requirements for air supply by mechanical ventilation are given in BS6644 Clause 19.3. and in IGE/UP/10 Pt.1.

The permanent air vents shall be sited away from the extract fans. It may be necessary to increase the ventilation area to compensate for the extractor fan.

AIR SUPPLY AND VENTILATION CONVENTIONAL FLUE SYSTEMS

For all installations, please refer to the table below for calculating requirements. Detailed recommendations for the air supply are given in BS 5440 Part 2 and BS 6644 Clause 19. **The following notes are provided for general guidance only.**

Ventilation shall prevent the heater environment from exceeding 32°C (90°F).
The purpose provided space in which the heater(s) are installed must have permanent air vents communicating directly with the outside air, at high and low level. Where communication with the outside air is possible only by means of high level air vents, ducting down to floor level for the lower vents must be used.
For an exposed building, air vents must be fitted on at least two sides, preferably on all four sides.

Air vents should have negligible resistance and must not be sited in any position where they are likely to- be easily blocked or flooded, or in any position adjacent to an extraction system which is carrying flammable vapour.

Grilles or louvres should be so designed that high velocity air streams do not occur within the space housing the heater(s).

The grilles should have a total minimum free area for the water heater(s) in addition to any other requirements as follows:-

Where the heater is to be installed in a room the following permanent ventilation is required:

5cm² per kW in excess of 7kW for installations up to 54kW net.

For installations exceeding 60kW the following permanent ventilation is required:

Low Level (inlet)	540cm² plus 5cm² per kilowatt in excess of 54kW total net input
High Level (outlet)	270cm² plus 2.5cm² per kilowatt in excess of 54kW total net input

Where the heater is to be installed in a compartment, permanent air vents are required in the compartment at high and low level. These air vents must either communicate with a room or internal space or be direct to outside air.

AIR SUPPLY AND VENTILATION
CONVENTIONAL FLUE SYSTEMS

The minimum effective areas of the permanent air vents required in the compartment are as follows;-

	Air Vent Areas	
Position of Air Vents	Air from room or internal space	Air direct from outside
High Level	10cm² per kW Net input	5cm² per kW Net input
Low Level	20cm² per kW Net input	10cm² per kW Net input

Note:- Both air vents must communicate with the same room or internal space or must both be on the same wall to outside air.

IMPORTANT!

1. The effective area requirements specified in the table are related to the maximum heat input of the heater(s) and are equivalent to those specified in BS 6644 & IGE/UP/10 Pt1.

2. The free area of the grilles should not be less than the size of the recommended ventilation opening.

3. The supply of air to a space housing the heater(s) by mechanical means should be:
   (a) Mechanical inlet with natural extraction.
   (b) Mechanical inlet with mechanical extraction.

NOTE! Natural inlet with mechanical extraction must not be used.

Where a mechanical inlet and mechanical extraction system is used, the design extraction rate must not exceed one third of the design inlet rate.

All mechanical ventilation systems must be fitted with automatic gas shut off safety systems which cut off the supply of gas to the heater(s) in the event of failure of either the inlet or extract fans.

The requirements for air supply by mechanical ventilation are given in BS 6644 Clause 19.3 & IGE/UP/10 Pt1.

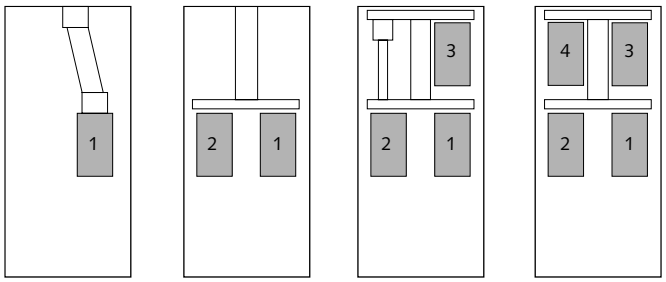
The permanent air vents shall be sited away from any extract fans. Where an extract fan is fitted, check for spillage at the draught diverter as detailed in BS 5440 Part 1 Appendix B.

It may be necessary to increase the ventilation area to compensate for the extract fan.

4. The vapours emitted by halogen based compounds can, if drawn into the combustion air, cause corrosion of the gas burner, thermocouple and storage vessel. Therefore, if heaters are to be installed in locations where halogens are likely to be present, they should be isolated from such compounds and ventilated from and to outside uncontaminated atmosphere.

Some of the vulnerable areas are:
(a) Hairdressing salons and adjoining rooms and basements
(b) Establishments where dry cleaning solutions are used or stored.
(c) Degreasing plants using hydrocarbon solvents.
(d) Premises where refrigerant gases are used or stored.

CWH HEAT EXCHANGER CONFIGURATION



CWH 30 CWH 60 CWH 90 CWH 120

The water heater is equipped with 1, 2, 3 or 4 burner modules depending on the model. Each burner module has its own automatic burner.

CONTROL PANEL

The operational status of the water heater can be seen and the desired temperature can be set on the control panel (Fig.11).

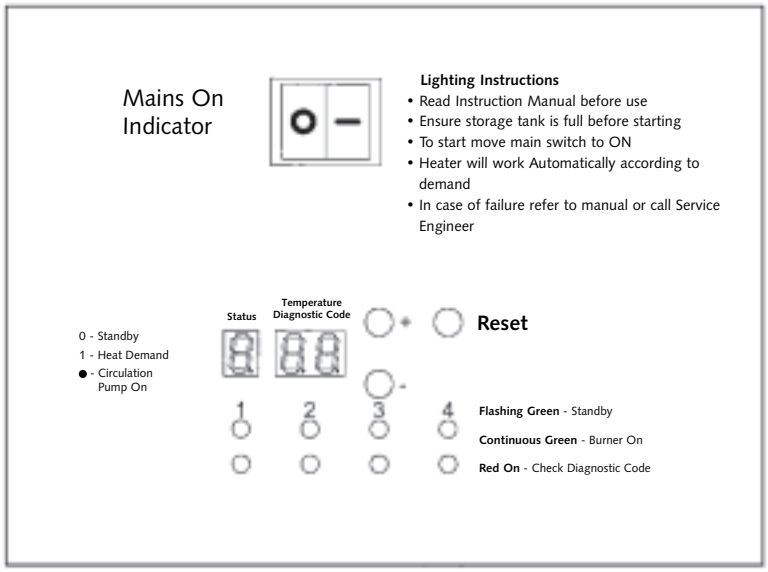


Fig . 11

A green and a red LED can be found on the control panel for each burner module. These indicate the status of the corresponding burner module.

The green LED:

- off	no automatic burner detected
- flashing	automatic burner detected, burner module not in use
- on	burner module in use

The red LED:

- off	no fault
- flashing	blocking fault
- on	locking fault

The display on the control panel consists of 3 segments, the following codes can appear:

Code	Meaning
0	No heat demand
0	Flashing, water heater not enabled
1	Heat demand
2	Programme changed water heater temperature activated
.	Permanent, circulation pump connected to terminals pump L - pump N activated
.	Flashing, circulation pump stand by
60	Actual water heater temperature

TEMPERATURE SETTING

The water heater temperature can be set between 40°C and 70°C using the + and - buttons on the control panel. The maximum temperature for the Legionella flushing programme is 75°C.

The lower the temperature the lower the chance of lime deposits (less maintenance). The risk of scalding is also less (think of children, those with special needs and the elderly). To avoid the formation of legionella bacteria the water heater temperature must be set to at least 60°C. Thermostatic mixing valves must be fitted at point of use in some applications. Health Guidance TM3 scheme refers.

ADJUSTING TEMPORARY TEMPERATURE CHANGE

If use is made of the programme for temporary temperature change (see page 16) the new temperature is set as follows:

Press the reset button down for longer than 5 seconds, L appears in the left segment of the display. The water heater temperature is shown in the 2 right segments, the new temperature can be entered using the + and - buttons. The new temperature is set by pressing the reset button once again, C00 appears in the display. Pressing the reset button again switches the display back to the normal menu. If the new temperature is not set within 1 minute the display switches back to the normal menu without recording the new value.

FILLING THE WATER HEATER

1. Check that the tank drain tap is closed.
2. Check that the return valve in the 28mm pipe (close to the drain tap) is open.
3. Open the main water tap and then all warm water drainage points, so that air present in the installation and water heater can escape.
4. Fill the water heater by turning on the cold water supply tap. The water heater is full once water is flowing out of all the warm water drainage points.

COMMISSIONING

WARNING: IMPORTANT LPG NOTICE

To commission on Propane turn the high setting screw completely clockwise on each burner before starting the heater. Then start up each heater and turn the high setting screw anti-clockwise until the burner ignites, then proceed as per the following instructions.

1. Before the water heater can be used it must be checked that:
   - the water heater is completely full of water
   - the gas pipes have been purged
   - the electricity supply to the appliance is switched on
   - the phase and neutral are correctly connected to the appliance
2. Open the appliance's gas tap.
3. Switch the electricity on with the power switch on the control panel.

   The water heater now searches for what burner modules are present. When these are detected the green LED for the corresponding burner module begins to flash. When all burner modules have been detected they are started up one by one. When the burner module is operational the green LED is lit permanently.

CO_2 ADJUSTMENT

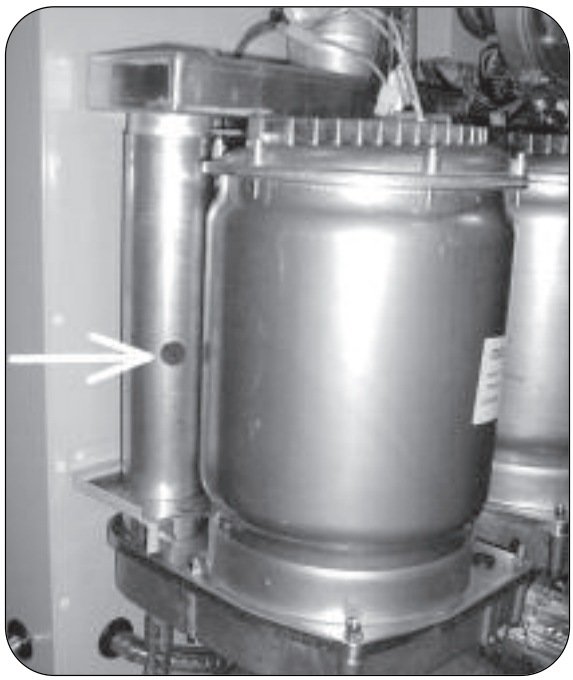


Fig. 12
Measuring point

The correct proportion of gas and air can be controlled based on the CO_2 percentage in the flue gasses. This control needs to be done at full load and low load. Every burner module has a CO_2 measuring point for the measurement, see Fig. 9. Table 1 shows the value of the CO_2 percentage at full load and low load.

Table 1. CO_2 percentage

Gas Type	Full load	Low load
Natural Gas	8.8%	8.3%
Propane	9.8%	9.2%

CONTROL AND ADJUSTMENT AT FULL LOAD

1. Switch the water heater off and flush system until the tank is completely cooled down.
2. Put the water heater in operation.
3. Press the reset button down for longer than 5 seconds, L appears in the display. Pressing the reset button again, C00 appears in the display. Press the + button to select the burner module to be run at full load:

C 01 burner module 1
C 02 burner module 2
C 03 burner module 3
C 04 burner module 4
C 0A all burner modules simultaneously
C n2 burner module 2 not present

Press the reset button to choose the desired burner module. The burner can now function at full load or low load using the + and - buttons respectively. The actual burner capacity appears in the display alternately with:

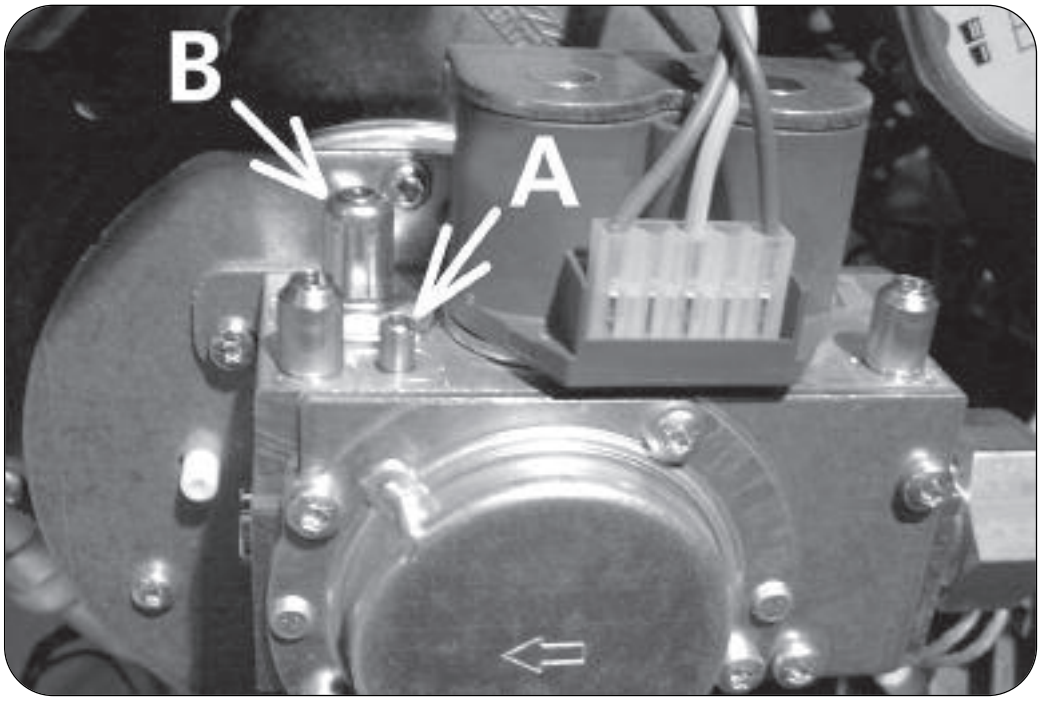


Fig. 13 Setscrews

C 1¯ burner module 1 full load
C 1_ burner module 1 low load

Select full load with the + button, when the actual burner capacity is above 90% the CO_2 percentage can be measured and set.

4. Measure the CO_2 percentage and compare it with table 1 (page 32). The CO_2 percentage can be adjusted using the "Full Load" Setscrew (A) on the gas regulation unit, see Fig. 13.
The CO_2 percentage can be increased by turning the setscrew to the left.

5. Now check the CO_2 percentage at low load.

CONTROL AND ADJUSTMENT AT LOW LOAD

1. Select low load with the - button. When the actual burner capacity is above 25% the CO_2 percentage can be measured and set.

2. Measure the CO_2 percentage and check it against table 1 (page 32). The CO_2 percentage can be adjusted using the "Low Load" Setscrew (B) (2mm Alan Key) on the gas regulation unit, see Fig. 13. The CO_2 percentage can be increased by turning the setscrew to the right.

3. Check the CO_2 percentage at full load again, if there is another adjustment at full load check it at low load again.

4. Press the reset button. A new burner module can now be selected using the + and - buttons. The heater is brought into operation again by repeatedly pressing on the - button until C00 appears in the display. Press the reset button again and the display switches back to normal.

NB: IF THE UNIT IS LEFT IN THE COMMISSIONING MODE BY MISTAKE, AFTER 10 MINUTES THE SOFTWARE WILL AUTOMATICALLY SWITCH THE APPLIANCE BACK TO NORMAL OPERATION.

DECOMMISSIONING

Turn the electricity supply off. Then turn off the gas tap in the supply pipe. The water heater must be empty when there is a risk of freezing. Please note: if the electricity supply remains switched off for a long period the self test of the control no longer works. This happens once every 24 hours and activates pumps momentarily to prevent the pumps from sticking, amongst other things.

FAULT CODES

A fault code will appear in the control panel display if there is a lockout failure. A letter and the number of the burner module appear alternately in the display. The letter A is for a lockout fault, and E is for a blocking fault. The two right segments show a fault code, table 2 gives the meanings of the different codes. If there is a fault in more than one burner module the display alternates every 5 seconds between burner modules and their associated fault codes.

Lockout faults can be reset using the reset button. Only the burner module for which the fault code appears in the display at that moment is reset. Any E code (or blocking faults) will require some form of rectification before it can be reset i.e. repair or replacement of a component or part. An E code could indicate a fault in connection with the Master or Slave boards.

Table 2. Fault Codes

MASTER BOARD BLOCKING CODES

E09	Control Error: Internal RAM location not correct
E12	Control Error: The incorrect parameters are programmed in the slave board
E13	Control Error: A references measurement indicated that the AD-circuit is defective, too low
E14	Control Error: A references measurement indicated that the AD-circuit is defective, too high
E15	Control Error: A references measurement indicated that the AD-circuit is defective, too low
E16	Control Error: A references measurement indicated that the AD-circuit is defective, too high
E18	Control Error: Internal RAM
E19	Control Error: Not able to read parameters
E20	No slave board present
E22	Power Fault: The 50Hz has too large deviation
E60	Tank sensor opened circuit
E65	Return sensor opened circuit
E70	Tank sensor shorted
E75	Return sensor shorted

SLAVE BOARD BLOCKING CODES

E0	Read Error: Not able to read stored parameters
E28, E29 E30, E31	Control Error: Reference measurements indicates that there is an error in the AD circuit
E33	Flame detected when gas valve was closed
E41	Phase Error: Live and netural reversed
E42	Phase Error: Too much deviation in the supply voltage frequency
E44	Control Error: Poor communication between the two processors
E47	Return sensor open circuit
E48	Flow sensor open circuit
E63	Return sensor short circuit
E64	Flow sensor short circuit
E78	Reset Error: Too many user resets

SLAVE BOARD LOCKOUT CODES

A01	Three Failed Ignitions: After three ignition, there was still no flame detected
A02	Overheat Stat Failure: No water flow conditions, the flow sensor is not detecting a temperature increase during operation
A03	The two flow sensors have too greater temperature differential between them, 10°C for more than 60 seconds
A05	Gas Valve Relay Error: The gas valve relay is not switch correctly
A06	Safety Relay Error: The safety relay is not switching correctly
A08	Fan Error: The fan is not reaching its target value or speed for more than 60 seconds
A09	Control Error: Internal storage location
A10	The contents of the stored parameters are not correct
A11	Flow Temperature: Flow temperature went above 95°C
A12	Control Error: The stored contents inside the control are not matching the software version
A14	Control Error: Internal storage location
A15	Control Error: Internal storage location
A16	Control Error: Internal storage location
A17	Control Error: Internal storage location
A19	Control Error: Internal storage location
A20	Flame detection after gas valve as closed. Flame still present 10 seconds after the gas valve is closed
A21	Flame detected before opening of the gas valve during the start up sequence
A24	Too many flame failures: When the flame failures three times within one burn cycle

At least once a year the following works must be carried out:

1. Check the CO_2 percentage and adjust if necessary, see page 32.

2. Check the output at full load by measuring the gas usage. If this deviates more than 15% from the nominal value (see Section 2, Technical Details) then this is an indication of dirt or blockages in the flue gas extraction channel, the air supply channel or the condensation extractor.

3. Switch off the electricity supply. Check the condensation extraction and rinse the condensation tray and condensation extraction with clean pipe water. An opening has been provided for this on the top of the condensation tray, see Fig.14. When no more impurities come out then the condensation extraction is clean.

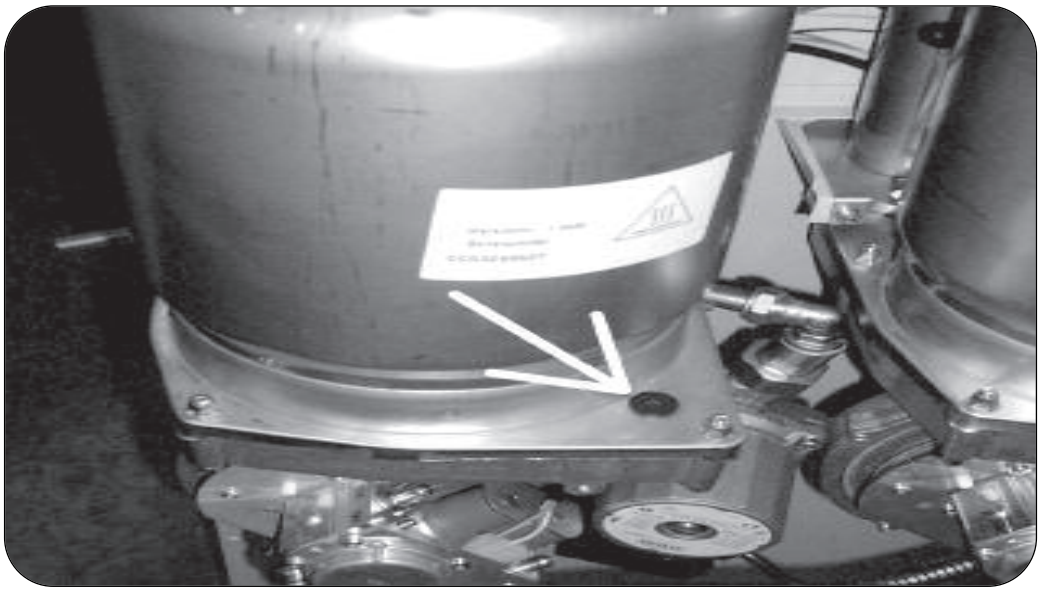


Fig. 14
Flushing Point

4. Check the ionisation electrode. This must be straight and clean (light residue is normal).

5. Flush the water heater tank by opening the drainage tap. Let water flow out of the water heater until no more chalk residue comes out with the water. In areas with hard water it is necessary to flush out the water heater more frequently.

6. If the water heater is to be drained for any reason, first take the water heater out of operation and then proceed as follows:
   a. Turn off the water tap in the cold water supply.
   b. Open one of the warm water taps that can be found at a point higher than the water heater in order to bleed the warm water pipe section. If the water heater is set up above the level of the drainage points it will be necessary to open the warm water connection to let the appliance run empty.
   c. Open the drainage tap of the water heater, so the appliance runs empty. Be careful, the water flowing out can be very hot!

7. The storage tank should be inspected annually and cleaned if required. To gain access, first drain the tank as above, disconnect any pipework connections to allow removal of the tank cover, including the pipes from the T&P valve (The valves should be left in position in the inspection cover), remove sixteen M10 bolts and washers securing the cover at the top. Lift off the cover, retain the O ring seal for refitting, alternatively a new seal may be required. When refitting the cover locate the O ring in the groove and fasten cover using the bolts and washers. Do not over tighten, the torque setting used should be 60Nm.

The burner and exchanger do not normally need to be cleaned. If there is a suspicion of dirt then the exchanger should be opened on the bottom. New gaskets must always be used when assembling. The top of the exchanger must never be opened.

The hot surface igniter is a vulnerable part that should only be removed if it has to be replaced.

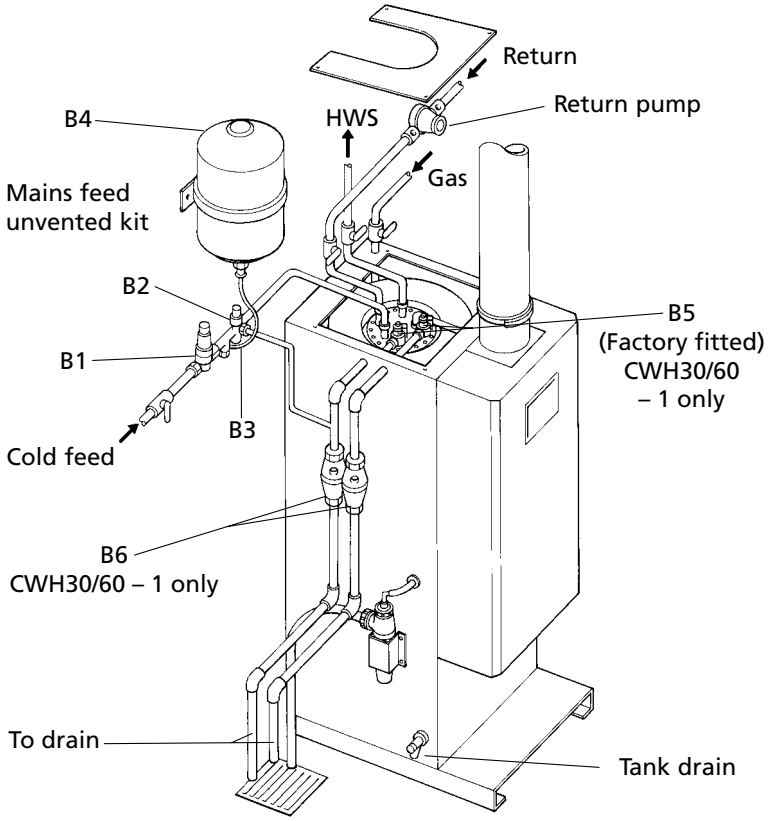
Only original parts recommended by the manufacturer can be used as replacement parts. Components that are sealed may not be changed or dismantled.

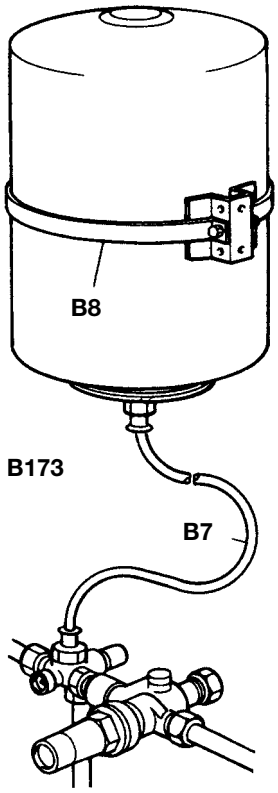
SPARES LIST FOR CWH RANGE

Parts Description	Part Number		Quantity
Main Dungs Gas Valve Assembly	E659	M1835	1 per module
Main Gas Valve O Ring	E845	M1842	1 per module
Fan Assembly & Gasket	E658	M1834	1 per module
Fan Gasket only	E846	M1843	1 per module
Wilo Primary Pump (Bronze)	E660	M1836	1 per module
Pre serial number 071401 Pump Elbow & Vent Union	E847	M1844	1 per module
Pre serial number 071401 Wilo Primary Pump (Plastic)	E920	M2266	1 per module
Plastic Pump Elbow & Vent Union	E921	M2272	1 per module
From serial number 071401 Non-return Valve	E930	M2296	1 per module
Heat Exchanger (Coopra 30 kW)	E656	M1832	1 per module
Heat Exchanger Baffle Service Kit	E933	M0760	1 per module
Heat Exchanger Burner Gasket	E932	M0766	1 per module
Heat Exchanger Vapour Tray Gasket	E931	M0755	1 per module
Heat Exchanger Top Lid Body Seal	G024	M2653	1 per module
Heat Exchanger Top Lid Insulation	G025	M2654	1 per module
Heat Exchanger 15mm Outlet Seal	E654	M1830	1 per module
Heat Exchanger Outlet Fitting & Seals	E917	M2250	1 per module
Exchanger Outlet Fitting top Bracket	E937	M2337	1 per module
Top Plate Seal	E653	M1829	1
Slave board	E661	M1837	1 per module
Master Control Board (E 5580)	E853	M1838	
Hot surface Ignitor	E657	M1833	1 per module
Flame Rod	E655	M1831	1 per module
Temperature Flow Surface Senor	E663	M1839	3 per module
Tank Temperature Sensor & Lead	E664	M1840	1
Wiring Looms			
30/100 Model Only	E848	M1765	1
30/200 & 300 models	E849	M1766	1
60 kW models	E850	M1767	1
90 kW models	E851	M1768	1
120 kW models	E852	M1769	1
Master & Terminal Panel Wiring Loom	E855	M0748	1
Condensate Trap	E211	M1828	1
Condensate Tube Grommet	E857	M1846	1 per module
Return Temp. Sensor & Lead Kit	E674		1
Switch no/off	E665	M1841	1
Stainless Steel Top Bolts	E859	M1826	1 Set
Cold feed Dip Tube O Seal (34.52 x 3.53 mm)	E928	M2294	1
Return Dip Tube O Seal (21.5 x 3 mm)	E929	M2295	1

Temperature/Pressure Relief Valve	C380		1 – *30 & 60 kW*
	C380		2 – *90 & 120 kW*
Andrews Dome Label	E856	M1845	1
Maxxflo Dome Label	E927	M2290	1
Front Cover (pump facing rear)	E918	M1717	1
Pre serial number 071201			
Front Cover (pump facing front)	E919	M2264	1
From serial number 071201			
Drain Cover Plate (200 L vessel)	E935	M1411	1
From serial number 071906			
Drain Cover Plate (300 L vessel)	E936	M5845	1
From serial number 071906			
Side Access Panel (200 L)	E935	M1411	1
Side Access Panel (300 L)	E936	M5845	1
Laptop Interface USB Lead	E870		1
Service Manual	E281		1
LPG Warning Label	E942		1

Unvented Systems Kit Installation Details
Maxxflo Water Heater CWH30/60/90/120





COMPLETE UNVENTED SYSTEMS KIT PART No. B265-CWH90/120

	Description	Andrews Pt No.	RWC Pt No.
B1	Combined Reducing Valve/Strainer	C784	PRED 300-127
B2	Check Valve	C785	CORE 225-002
B3	Expansion Valve	C786	PREL 102-027
B4	Expansion Vessel (25 Litre)	C782	XVES 603-041
B5	Temperature/Pressure Relief Valve	C380 x 2	PTEM 100-002
B6	Tundish from Expansion Valve and T/P Valve	C384 x 2	TUND 300-001

COMPLETE UNVENTED SYSTEMS KIT PART No. B264-CWH30/60

	Description	Andrews Pt No.	RWC Pt No.
B1	Combined Reducing Valve/Strainer	C784	PRED 300-127
B2	Check Valve	C785	CORE 225-002
B3	Expansion Valve	C786	PREL 102-027
B4	Expansion Vessel (25 Litre)	C782	XVES 603-041
B5	Temperature/Pressure Relief Valve	C380	PTEM 100-002
B6	Tundish from Expansion Valve and T/P Valve	C384	TUND 300-001

EXPANSION VESSEL WALL MOUNTING KIT PART No. B173

B7	Hose Assembly		HOSE 202-106
B8	Wall Bracket Assembly		BRKT 240-024

NB. Tees, elbows, stop valve and pipework not supplied

CE
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