

MAXXflo

High Efficiency Condensing Stainless Steel Storage Water heaters

CWH30/200, CWH30/300, CWH60/200, CWH60/300,
CWH90/200, CWH90/300, CWH120/200, CWH120/300



Please read and understand these instructions before commencing installation and leave this manual with the customer for future reference

Andrews. Built to perform.





Reproduction of any information in this publication by any method is not permitted unless prior written approval has been obtained from Andrews Water Heaters.

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 UK users is drawn to their responsibilities under the Health and Safety Regulations.

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

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.

Further information and assistance can be obtained from:

Andrews Water Heaters
3, Innovation House
Oaklands Business Centre
Oaklands Park
Wokingham
Berkshire, RG41 2FD

Sales: 0345 070 1055
Technical: 0345 070 1057
Website: www.andrewswaterheaters.co.uk
Twitter: @AndrewsWH

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

Copyright Andrews Water Heaters

MAXXflo Water Heater

	PAGE	
SECTION 1	GENERAL AND SAFETY INFORMATION	
	Safety Information	4
	British Standards and Codes of Practice	4
	Health and Safety Regulations 1993	4
SECTION 2	TECHNICAL DETAILS	
	Technical Details – CWH30/60/90/120	5
	Technical Parameters	6
	Product Fiche	7
	Heater Dimensions – 200 litre model	7
	Heater Dimensions – 300 litre model	8
SECTION 3	INSTALLATION	
	Description	10
	Location	10
	Water Quality and Treatment	11
	Water Connections	11
	Condense Drain	12
	Typical Installations – CWH30/60 & CWH90/120	13
	Gas Supply – Natural Gas	14
	Gas Supply – Propane	14
	Typical Bulk Storage Vessel Installation	15
	Typical Cylinder Installation	15
	Electrical Supply	16
	Electrical Connection	16
	Wiring Diagram	17
	Temporary Water Heater Temperature Change	18
	Circulation Pump and Storage Tanks	18
	HWST Tank Dimensions and Wiring Diagram	19
	Flue Systems	20
	Flue Systems – CWH 30 & 60	21
	Alternative Flue Systems – CWH 30 & 60	22
	Standard Flue System Dimensions – CWH 30 & 60	23
	Flue Systems – CWH 90 & 120	24
	Alternative Flue Systems – CWH 90 & 120	25
	Standard Flue System Dimensions – CWH 90 & 120	26
	Flue System Positions and Distances	27
	Flue System – Horizontal and Vertical Terminations	28
	Air supply and ventilation – Concentric Flue Systems	28
	Air supply and ventilation – concentric and conventional flue systems	30
	Air supply and ventilation – conventional flue systems	31
	Heat exchanger configuration	32
	Control panel	32
SECTION 4	WATER TEMPERATURE SETTINGS	
	Temperature setting	33
	Adjusting temporary temperature change	33
SECTION 5	INSTRUCTIONS FOR COMMISSIONING	
	Filling the water heater	34
	Commissioning – natural gas and propane	34
	CO ₂ adjustment	34
	Control and adjustment at full load	35
	Control and adjustment at low load	35
	Decommissioning	35
SECTION 6	FAULT CODES	
	Fault codes	36
	Blocking faults	36
	Lockout faults	36
SECTION 7	MAINTENANCE	
	Annual maintenance checks	37
SECTION 8	PARTS LIST	
	External, Internal & cylinder spares	38
	Flue and old issue spares	40
SECTION 9	DISMANTLING DISPOSAL AND RECYCLING	43

SAFETY INFORMATION



IMPROPER USE

This Andrews Water Heaters product has been designed and manufactured to comply with current European standards of safety. However, following an improper use, dangers could arise concerning the safety and life of the user or of other people, or damage could be caused to the appliance or other objects. This appliance is designed to be used in a potable domestic hot water supply and storage system. Any other use of this appliance will be considered improper. Andrews Water Heaters declines any responsibility for any damage or injuries caused by an improper use. In order to use the appliance according to its designed scope, it is essential to carefully follow the instructions given in this guide.



USER COMPETENCY

This appliance is not intended for use by persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they are given supervision or instruction concerning the use of it by a person responsible for their safety. Children under the age of 12 years should not be permitted to use the appliance.



ENGINEER COMPETENCY

The installation, adjustment & servicing of this appliance must be carried out by a competent person (In the UK by a Gas Safe Registered Engineer and in IE by a (RGII) Registered Gas Installer) and installed in accordance with current standards and regulations. Failure to correctly install or maintain this appliance could cause injury to persons or damage to property. The manufacturer shall not be held liable for any such injury and/or damage.



SMELL OF GAS

If you smell gas - follow these safety instructions:

- **Do NOT** turn off or on any electrical switches (including light switches)
- **Do NOT** smoke
- **Do NOT** use the telephone
- **DO** evacuate persons away from the source of the gas smell
- **DO** close the main gas shutoff valve
- **DO** open all the windows and doors where the gas leakage has occurred
- **DO** inform the gas authority or a competent specialist as soon as possible



This heater must be installed in accordance with the following essential requirements:

- The current GAS SAFETY (INSTALLATION AND USE) REGULATIONS
- The current BUILDING REGULATIONS
- The WATER SUPPLY (WATER FITTINGS) REGULATIONS

Local Authority and recommendations of the British Standards and Codes of Practice which should include the following:

- BS EN 806 (Parts 1 - 5) Specifications for installations inside buildings conveying water for human consumption. General design, pipe sizing, installation, operation and maintenance.
- BS 5440-1 Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net. Specification for installation of gas appliances to chimneys and for maintenance of chimneys.
- BS 5440-2 Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net. Specification for the installation and maintenance of ventilation provision of gas appliances.
- BS 5546 Specification for installation of gas hot water supplies for domestic purposes. Using gas-rated appliances of rated input not exceeding 70 kW net.
- BS 6891 Installation of low pressure gas pipework of up to 35mm in domestic premises.
- BS 6644 Installation of gas fired water boilers of rated inputs between 70kW and 1.8MW
- BS EN 12897 Water supply. Specification for indirectly heated unvented (closed) storage water heaters
- IGE/UP/1A,1B Strength/tightness testing and direct purging
- IGE/UP/2 Installation pipework on industrial and commercial premises
- IGE/UP/10 - 1 (Edition 4): Installation of gas appliances in industrial and commercial premises.

Model Reference CWH	30/200 30/300	60/200 60/300	90/200 90/300	120/200 120/300
Input gross Hs min/max	6.7–31.1 kW	13.4–62.2 kW	20.1–93.3 kW	26.8–124.4 kW
Input nett Hi min/max	6.0–28.0 kW	12.0–56.0 kW	18.0–84.0 kW	24.0–112.0 kW
Output (tank set point : 60°C)	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	2.96 m ³ /h	5.93 m ³ /h	8.89 m ³ /h	11.85 m ³ /h
Minimum Gas Supply Pressure	18 mbar	18 mbar	18 mbar	18 mbar
Propane, G31				
Gas Consumption	2.18 Kg/h	4.35 Kg/h	6.53 Kg/h	8.71 Kg/h
Minimum Gas Supply Pressure	37 mbar	37 mbar	37 mbar	37 mbar
Efficiency (gross)	98%	98%	98%	98%
Efficiency (nett)	109%	109%	109%	109%
Standby Heat Loss	780 MJ per month			
NO _x level @ 0% O ₂	25ppm	25ppm	25ppm	25ppm
NO _x level @ 0% O ₂	44mg/kWh	44mg/kWh	44mg/kWh	44mg/kWh
Noise level L _{WA}	49dB	49dB	49dB	49dB
Ionisation current – max	6.0 A	6.0 A	6.0 A	6.0 A
Ionisation current – min	4.0 A	4.0 A	4.0 A	4.0 A
HSI resistance	1.0 – 1.4 kΩ	1.0 – 1.4 kΩ	1.0 – 1.4 kΩ	1.0 – 1.4 kΩ
Max recovery thru 50°C	480 l/h	960 l/h	1440 l/h	1920 l/h
Max recovery thru 56°C	429 l/h	856 l/h	1284 l/h	1712 l/h
Time to recover tank thru 50°C rise				
200 litre capacity	25 mins	13 mins	9 mins	7 mins
300 litre capacity	38 mins	19 mins	13 mins	10 mins
Flue size (concentric) Int/External	80/125	80/125	130/200	130/200
Flue Size (conventional)	80	80	130	130
Max flue run – concentric *	14	12	14	14
Max flue run – conventional **	50	20	50	40
Max flue static pressure	140 Pa	140 Pa	140 Pa	140 Pa
Inlet/Outlet connections	1½" BSP	1½" BSP	1½" BSP	1½" BSP
Return connection	1" BSP	1" BSP	1" BSP	1" BSP
Nominal operating water pressure	3.5 bar	3.5 bar	3.5 bar	3.5 bar
Maximum water pressure (vented)	6.0 bar	6.0 bar	6.0 bar	6.0 bar
Maximum water pressure (unvented)	5.5 bar	5.5 bar	5.5 bar	5.5 bar
Minimum water pressure	1.0 bar	1.0 bar	1.0 bar	1.0 bar
Gas connection (gas cock supplied)	3/4"	3/4"	3/4"	3/4"
Electrical supply	All models: 230/50V/Hz			
Power consumption	170 W	340 W	510 W	680 W
Weight – empty (200 litre)	155 kg	170 kg	185 kg	200 kg
Weight – empty (300 litre)	165 kg	180 kg	195 kg	210 kg
Weight – full (200 litre)	355 kg	370 kg	385 kg	400 kg
Weight – full (300 litre)	465 kg	480 kg	495 kg	513 kg
Shipping weight (200 litre)	178 kg	193 kg	208 kg	213 kg
Shipping weight (300 litre)	188 kg	203 kg	218 kg	233 kg
Shipping depth	1040 mm	1040 mm	1040 mm	1040 mm
Shipping width	880 mm	880 mm	880 mm	880 mm
Shipping height (200 litre)	1653 mm	1653 mm	1653 mm	1653 mm
Shipping height (300 litre)	2077 mm	2077 mm	2077 mm	2077 mm

* Reduce flue length by 1.2m for 90° bend, 0.7m for 45° bend and 1.5m for condensate trap

** Reduce flue length by 4m for 90° bend, 2m for 45° bend and 4m for condensate 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 20 and 25.

Conventional flue, suitable for condensing applications can be used if the plantroom is ventilated.

Technical parameters

MAXXflo										
Product name		MAXXflo CWH 30/200	MAXXflo CWH 30/300	MAXXflo CWH 60/200	MAXXflo CWH 60/300	MAXXflo CWH 90/200	MAXXflo CWH 90/300	MAXXflo CWH 120/200	MAXXflo CWH 120/300	
Daily electricity consumption	Q_{elec}	0.289	0.318	0.291	0.320	0.292	0.321	0.563	0.682	
Declared load profile		XXL	XXL	XXL	XXL	XXL	XXL	XXL	XXXL	
Sound power level, indoors	L_{WA}	49	49	49	49	49	49	49	49	
Daily fuel consumption	Q_{fuel}	27.945	28.201	28.222	28.189	29.529	29.660	30.979	56.402	
Emissions of nitrogen oxides	NO_x	44	44	44	44	44	44	44	44	
Weekly fuel consumption with smart controls	$Q_{fuel, week, smart}$	-	-	-	-	-	-	-	-	
Weekly electricity consumption with smart controls	$Q_{elec, week, smart}$	-	-	-	-	-	-	-	-	
Weekly fuel consumption without smart controls	$Q_{fuel, week}$	-	-	-	-	-	-	-	-	
Weekly electricity consumption without smart controls	$Q_{elec, week}$	-	-	-	-	-	-	-	-	
Storage volume	V	-	-	-	-	-	-	-	-	
Mixed water at 40 °C	V40	448	718	∞	∞	∞	∞	∞	686	
Harmonised standards applied										
EN: 13203-2										
Specific precautions that shall be taken when the water heater is assembled, installed or maintained:										
Before any assembly, installation or maintenance the installation and operation manual has to be read attentively and to be followed										



Product Fiche

MAXXflo				
Product name	MAXXflo CWH 30/200	MAXXflo CWH 30/300	MAXXflo CWH 60/200	MAXXflo CWH 60/300
Declared load profile	XXL	XXL	XXL	XXL
Water heating energy efficiency class	A	A	A	A
Water heating energy efficiency	86	85	85	85
Annual energy consumption	63 25	70 25	63 25	70 25
Other load profiles for which the water heater is suitable to use and the corresponding water heating energy efficiency and annual electricity consumption ⁽³⁾	-	-	-	-
Thermostat temperature setting	60	60	60	60
Sound power level L _{WA} indoors	49	49	49	49
Ability to off-peak hours functioning ⁽³⁾	-	-	-	-
Enables smart control settings ⁽⁴⁾	-	-	-	-

(1) Electricity

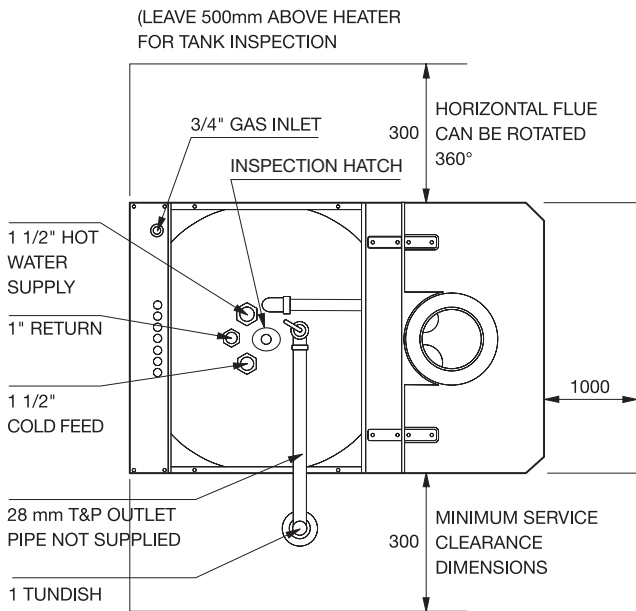
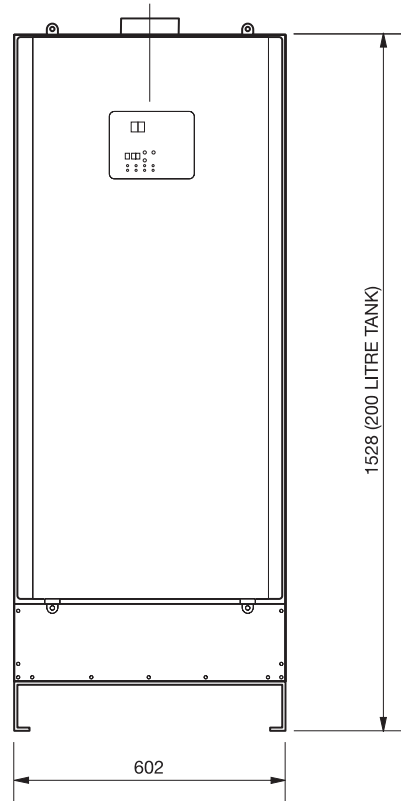
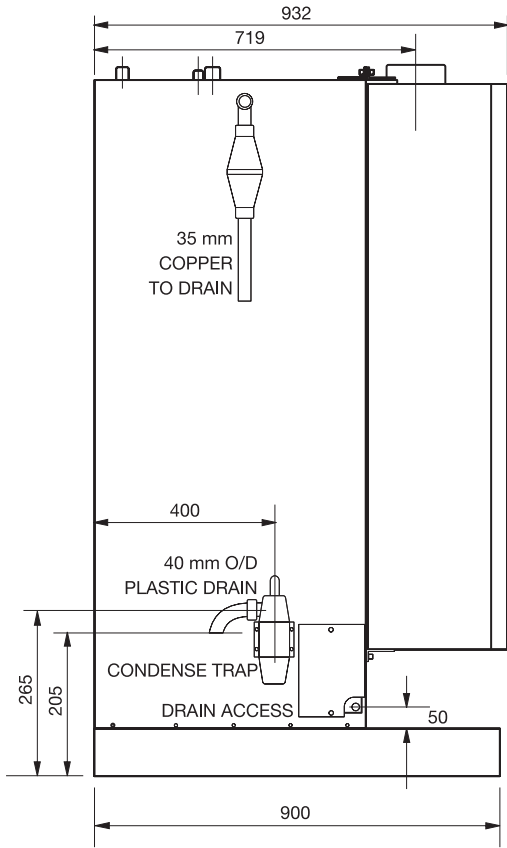
(2) Fuel

(3) If applicable.

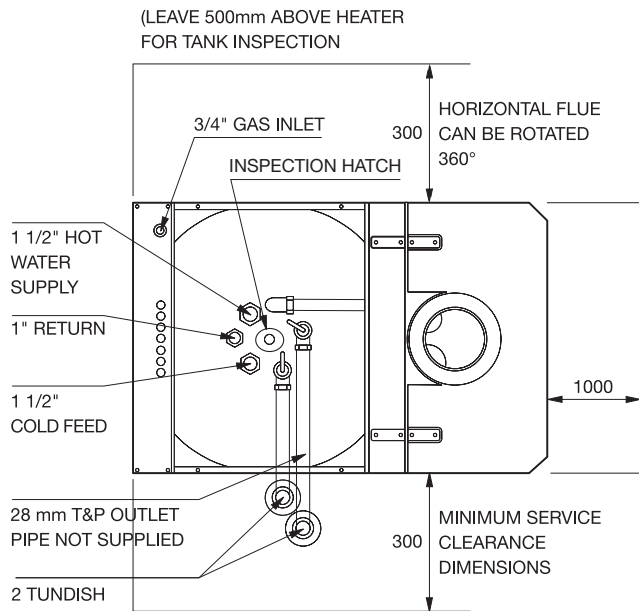
(4) If smart control settings value is "1", the water heating energy efficiency and annual electricity and fuel consumption only relate to enabled smart control settings.



Maxxflo CWH30/200, CWH60/200, CWH90/200 & CWH120/200

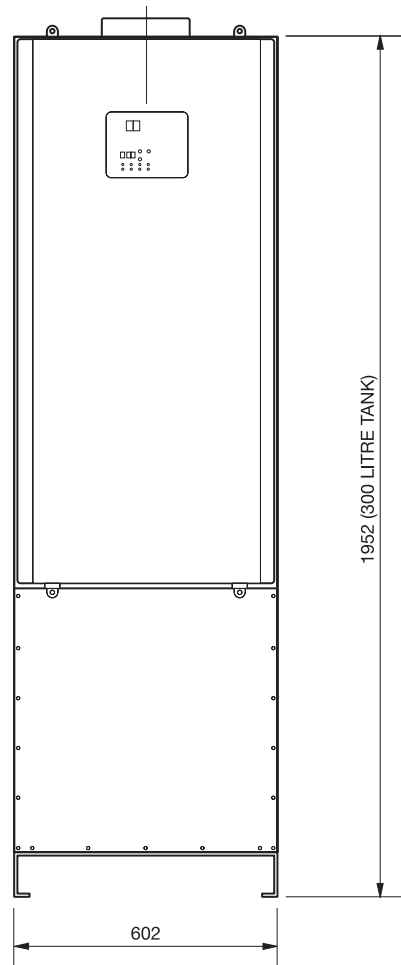
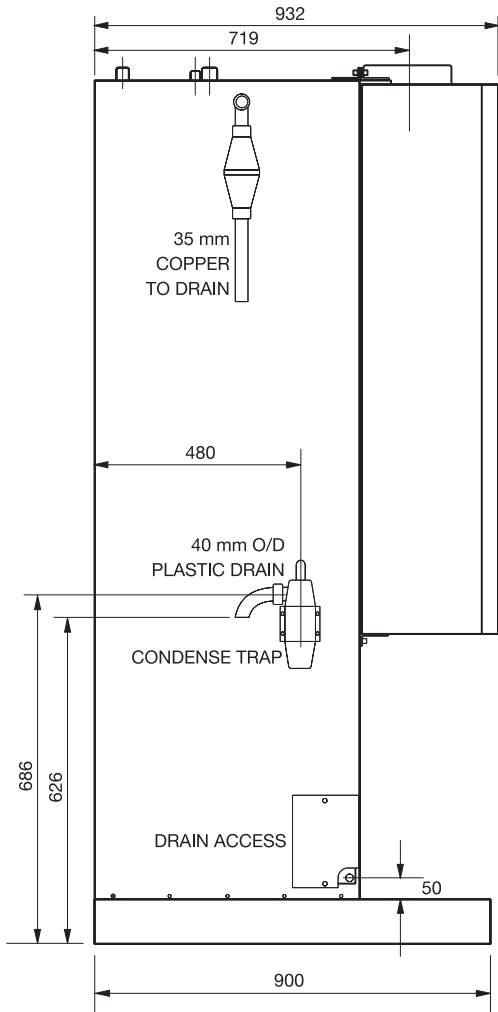


PLAN VIEW MODELS CWH30/200 & 60/200



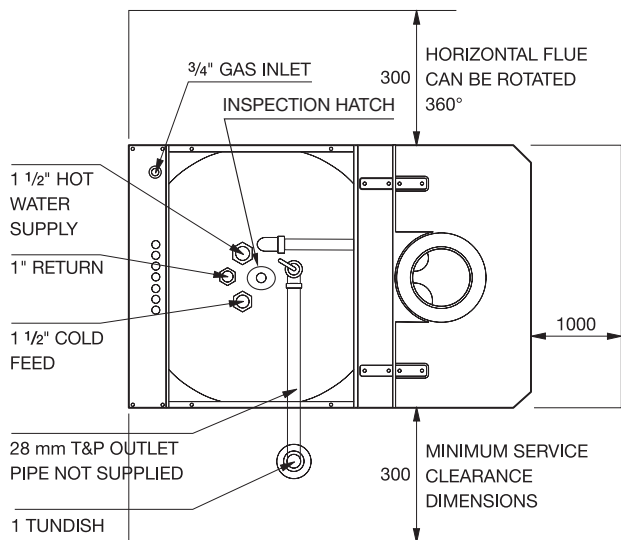
PLAN VIEW MODEL CWH90/200 & 120/200

Maxxflo CWH30/300, CWH60/300, CWH90/300 & CWH120/300

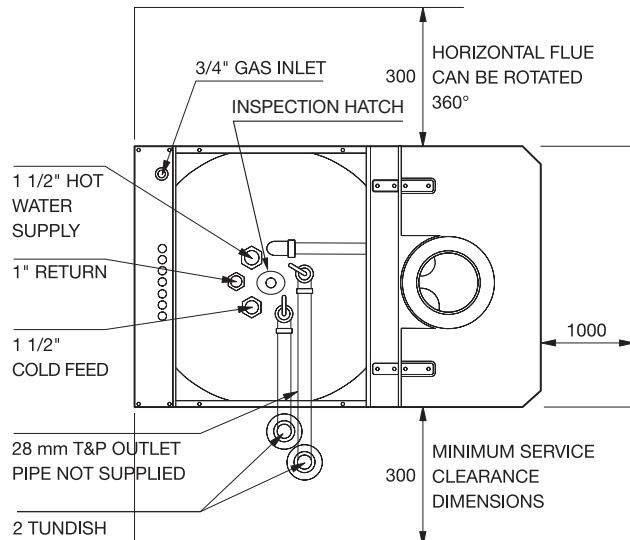


(LEAVE 500mm ABOVE HEATER FOR TANK INSPECTION)

(LEAVE 500mm ABOVE HEATER FOR TANK INSPECTION)



PLAN VIEW MODEL CWH30/300 & 60/300



PLAN VIEW MODEL CWH90/300 & 120/300

INSTALLATION

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 tanks 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.



Minimum water pressure = 1 bar

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

Installations must be carried out in accordance with Gas Safety (Installation and Use) Regulations, Building Regulations, The Water Supply (Water Fittings) Regulations 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.

LOCATION

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 BS6644 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 its 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 its temperature does not exceed 66°C (150°F).

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 we would recommend the inclusion of water treatment and that a water treatment specialist is consulted to ensure the selection of the most appropriate system for each particular installation.

In hard water areas in particular, scale formation can occur in all hot water systems and various factors can influence this such as water temperature, amount of water used and the quality of the local water supply. B.S. 7953 states that provision should be made for water treatment where the local water hardness exceeds 200 parts per million (14 degree Clark).

For further information please refer to our Technical Data Sheet - T/DO27 Water Quality and Treatment Data Sheet (available from www.andrewswaterheaters.co.uk).

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 6 bar. The expansion vessel C3 supplied is suitable for the stored volume of the heater and a comparative pipe work system.



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.

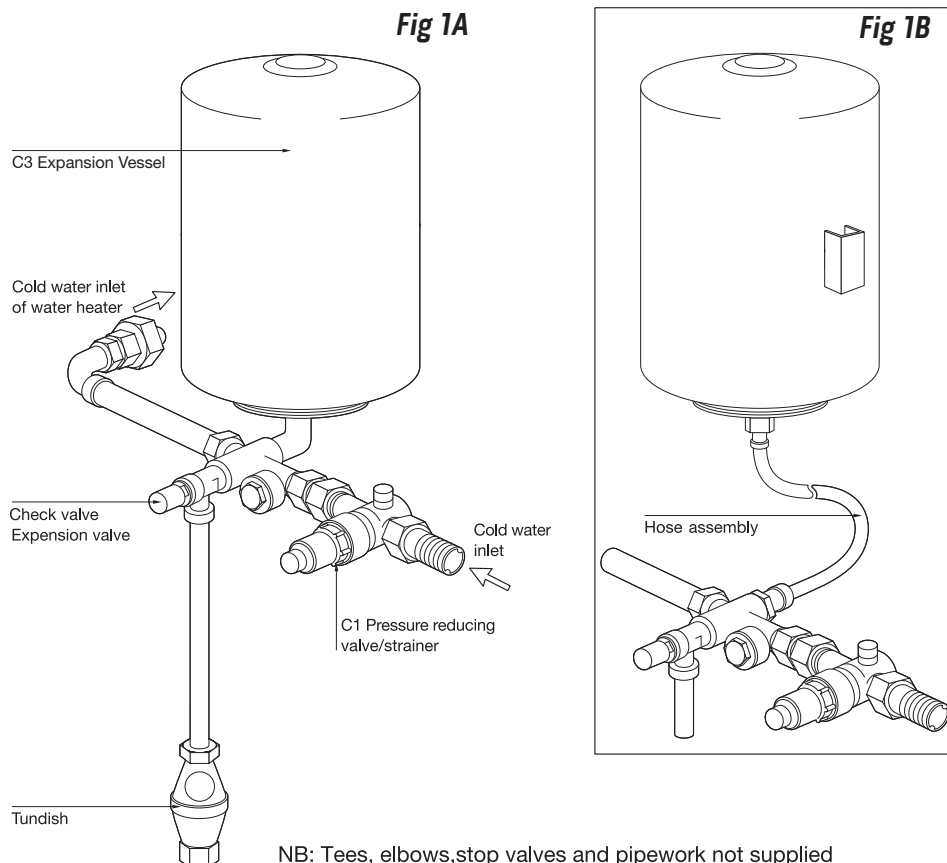
The cold water connection and the hot water connection can be found on the top of the appliance (see pages 8 & 9). An extra connection is available for the benefit of a circulation line. Please note that a stop valve should be fitted in the circulation line.



Caution : When connecting pipe work to the top of the appliance, avoid using excessive force when tightening the fitting. Use another set of grips to apply an opposite force during final tightening.

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 per Fig 1a and 1b plus drawings on pages 8 & 9.

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. The condense flow must not be allowed to block otherwise the heater will fail to work correctly.



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 condensate per hour while at full load.

SECONDARY RETURN CIRCULATION PUMP

An additional connection for a secondary circulation is available in the top of the heater that is located between the hot flow and cold feed ports. We would recommend that a non-return valve is fitted in the return line.

If a secondary return circuit is fitted with a secondary pump, please ensure that the flow-rate or heat loss does not exceed the heater maximum flow-rate or minimum load. An excessive flow in the secondary circuit could result in a temperature mixing effect in the heater storage vessel resulting in a stored water temperature less than the set temperature (see table below).

Model Type	CWH30	CWH60	CWH90	CWH120
Maximum flow rate m ³ /h	0.9	1.8	2.7	3.6
Minimum load kW	6	12	18	24

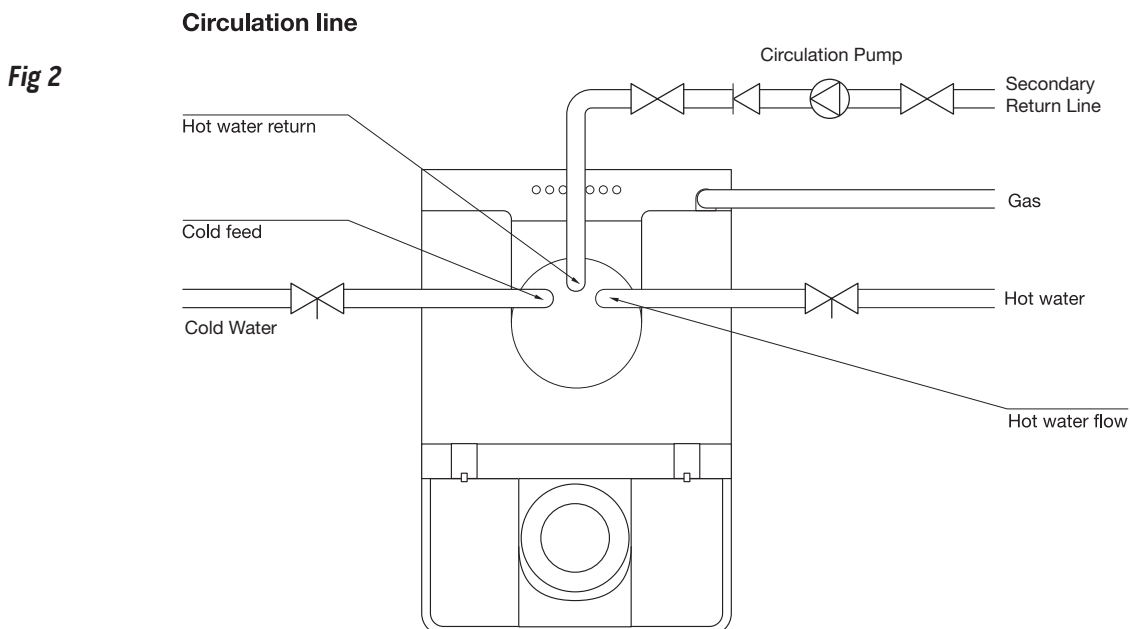


Fig 3A – Typical installation

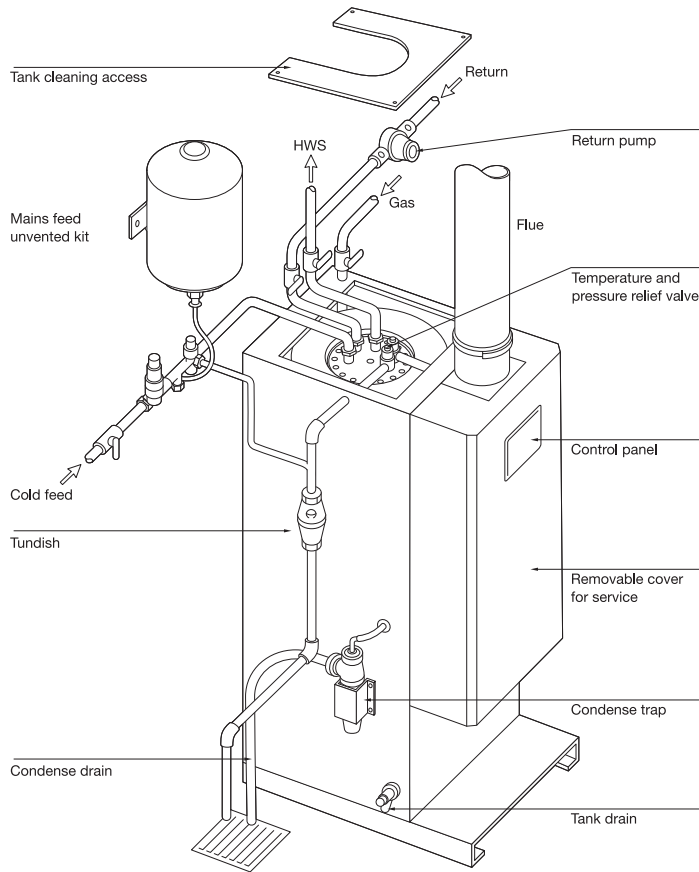
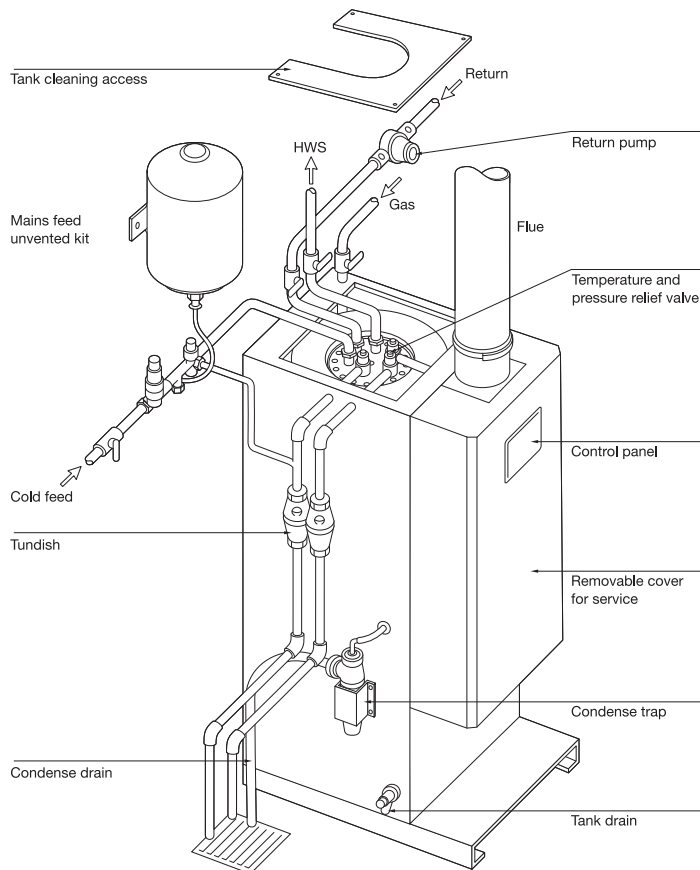


Fig 3B – Typical installation



GAS SUPPLY – NATURAL GAS

The installation of the gas supply must conform, depending on its 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 its authorised contractor.

The meter and service pipe should be checked by British Gas or its 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 plant room or purpose built compartments, a manually operated valve for the water heater house must be fitted in accordance with the Gas Safety (Installation and Use) Regulations. The valve must be easily identified and readily accessible.

After installation, the system should be pressure tested for soundness and purged in accordance with BS6891 or IGE/UP/1A or 1B 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 its safe location and installation.

The installation of the gas supply must conform to UKIpg Code of Practice 22 - Design, Installation and Testing of LPG piping systems, plus the requirements of British Standards and Codes of Practice listed in Section 1 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 of 47kg cylinders as listed below, together with a manifold before connecting to the union.

Use a minimum pipe size of ¾" bore.

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



Propane cylinders must be used and stored in accordance with "The highly flammable liquids and liquified petroleum gases regulations" and should comply with UKIpg code of practice 7 "Storage of full and empty LPG cylinders and Cartridges".



Please note that for Propane the minimum dynamic gas pressure to the unit must not fall below 35 mbar.

Fig 4: Typical Bulk Storage Vessel Installation

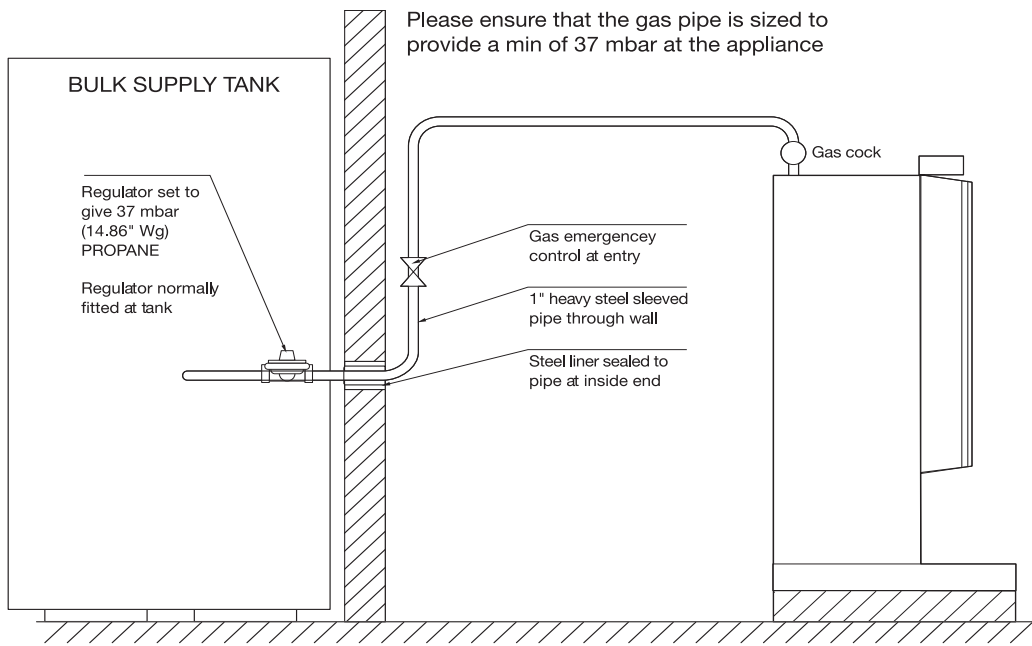
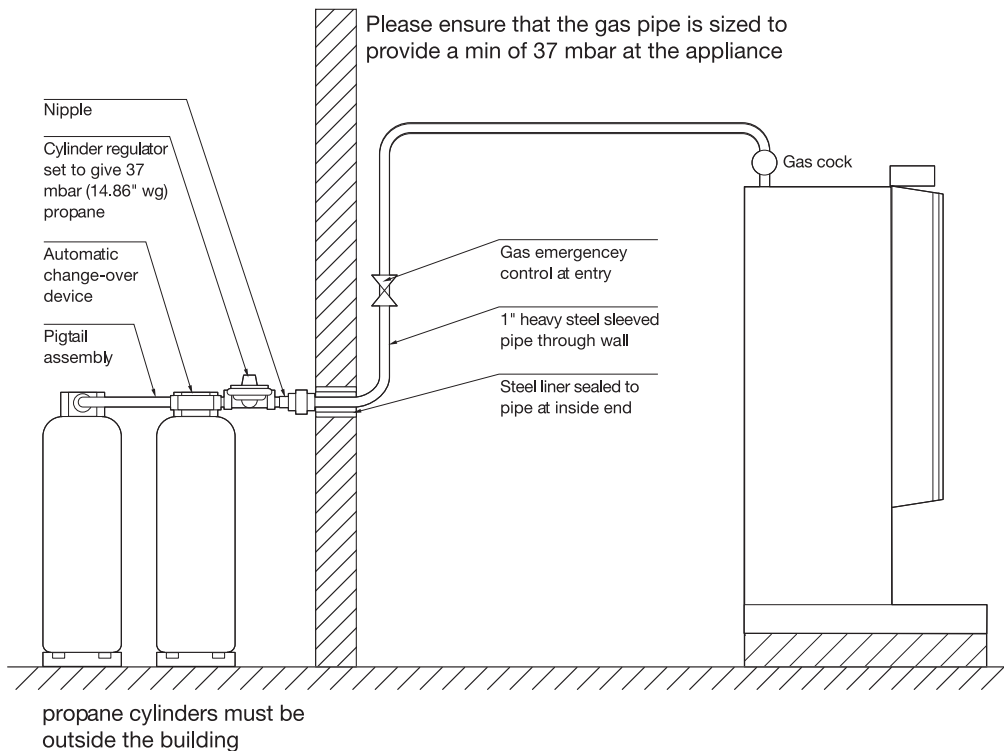


Fig 5: Typical Cylinder Installation



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 IET Wiring Regulations (BS 7671) 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 phases supply. The fuse rating is 5 amps.

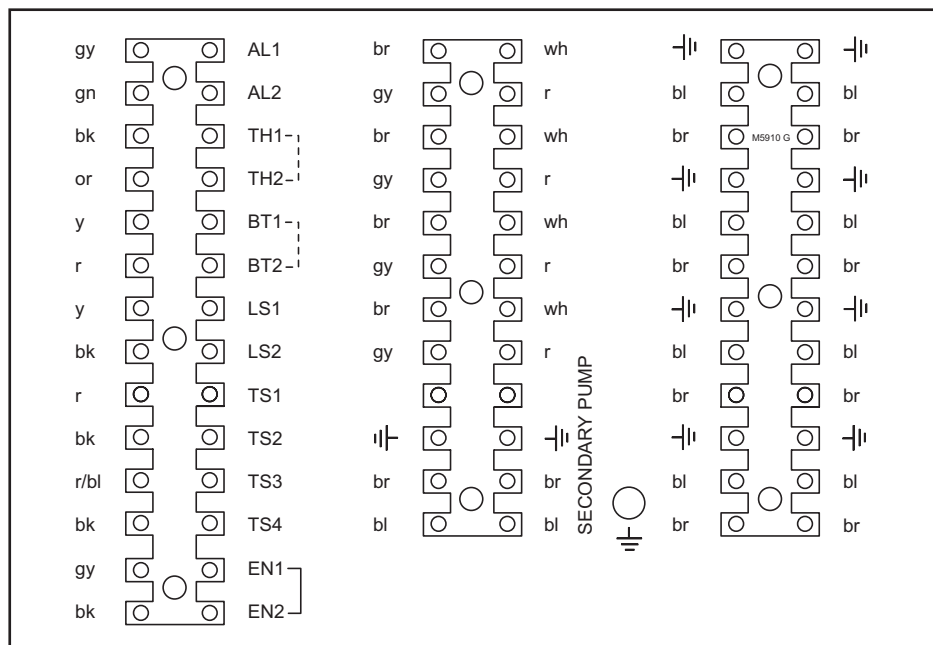
Maximum Electrical Loading

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.

Fig 6 – Terminal block connections



ELECTRICAL CONNECTION

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

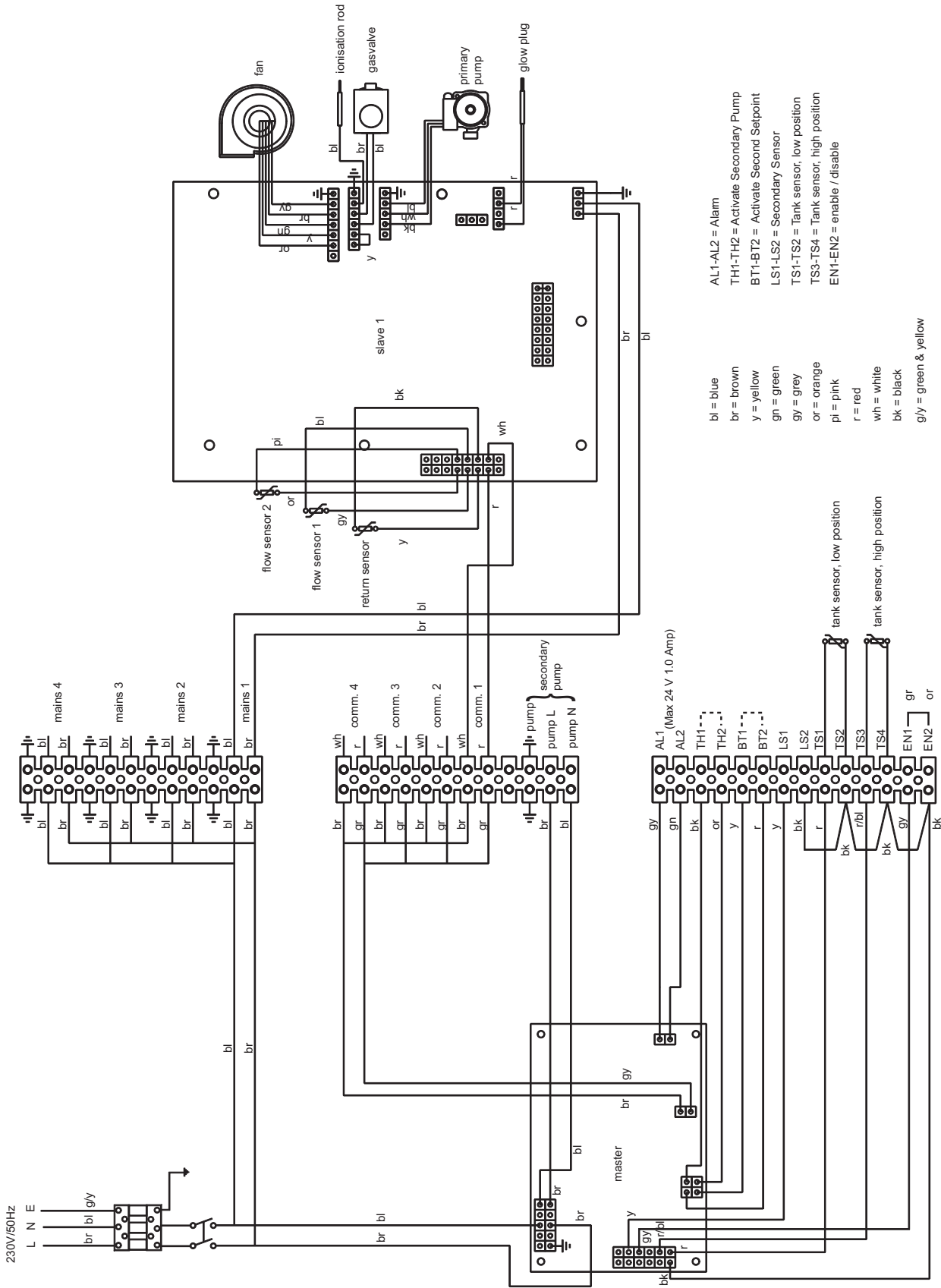
The following connections can be made on the terminal block (see Fig. 5 – Wiring diagram, on next page)

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 – 75°C)*
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. 7 – 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 therefore swapping the phase and neutral will lead to a fault in the appliance.



- AL1-AL2 = Alarm
 - TH1-TH2 = Activate Secondary Pump
 - BT1-BT2 = Activate Second Setpoint
 - LS1-LS2 = Secondary Sensor
 - TS1-TS2 = Tank sensor, low position
 - TS3-TS4 = Tank sensor, high position
 - EN1-EN2 = enable / disable
-
- bl = blue
 - br = brown
 - y = yellow
 - gn = green
 - gy = grey
 - or = orange
 - pi = pink
 - r = red
 - wh = white
 - bk = black
 - gy/y = green & yellow

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 32).

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 pages 16 & 18 for tank dimensions and wiring diagram.

FIG 8 – SCHEMATIC SYSTEM DESIGN

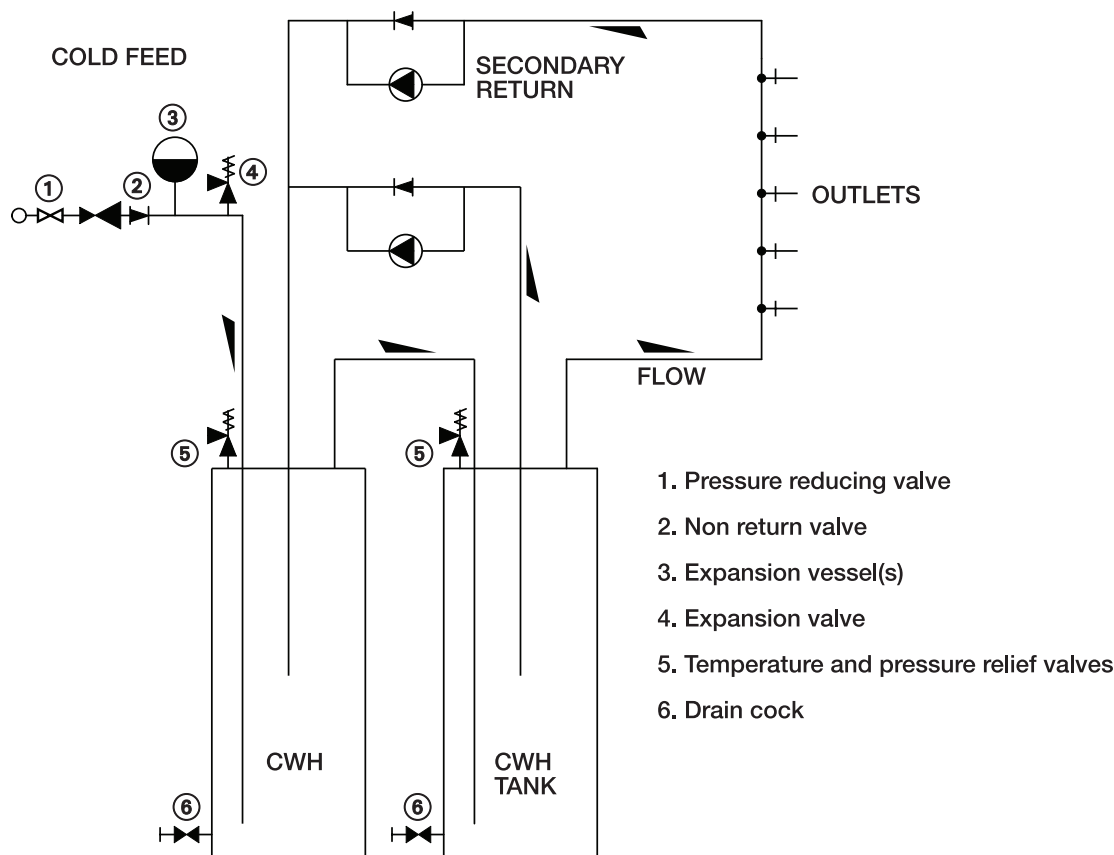


Fig 9 – HWST Tank Dimensions

HWST 200 HWST 300 STORAGE TANKS

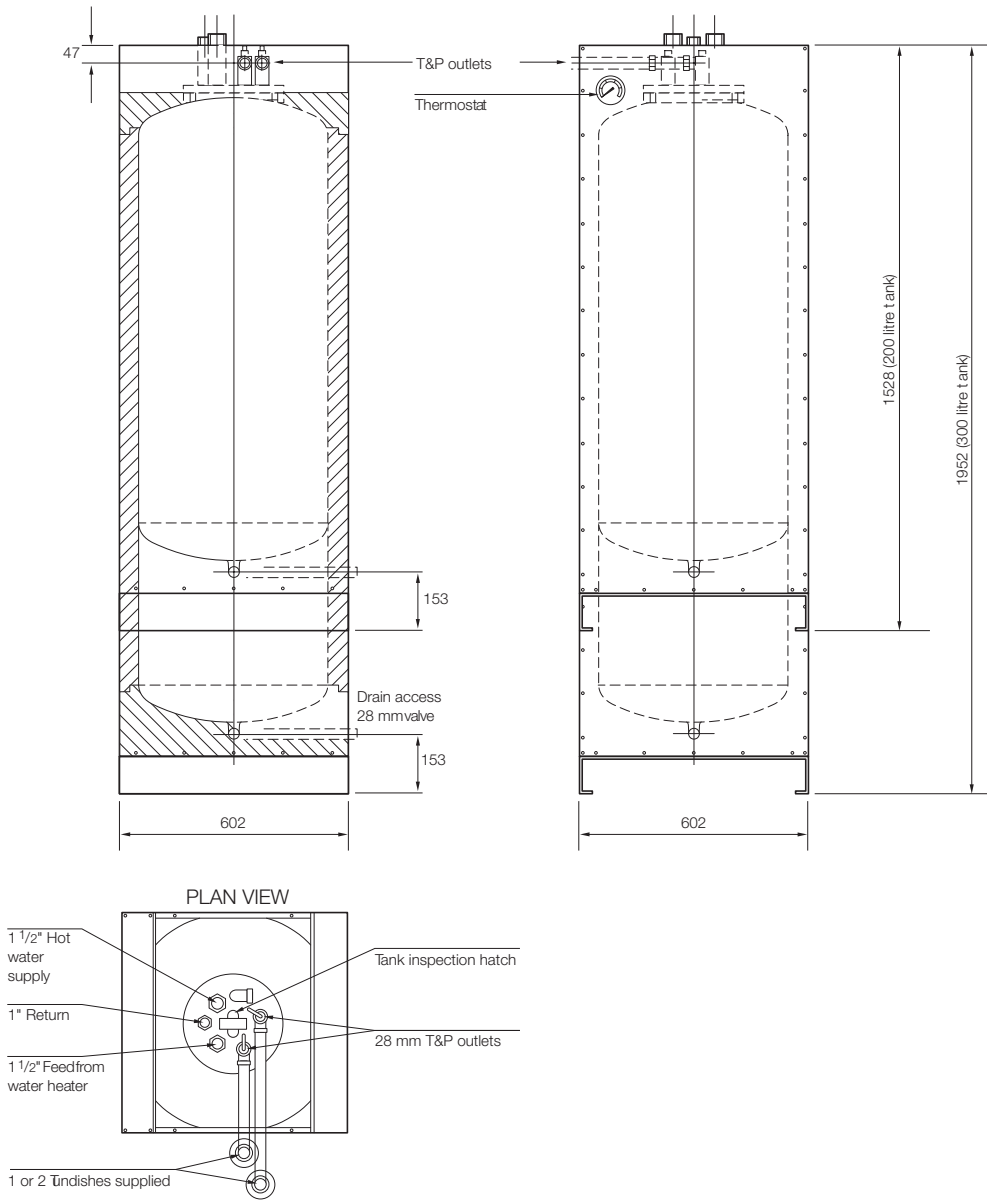
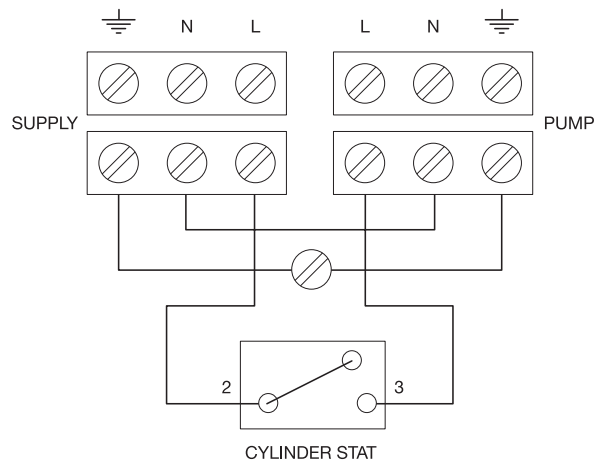


Fig 10 – Wiring Diagram



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.

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



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.

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 4 m for condense trap.

The different ventilation requirements for room sealed or conventional flue systems are given on pages 28 – 30.

GENERAL

Flue terminals must be installed in accordance with BS 5440 and IGE/UP/10 to ensure the products of combustion are properly dispersed. The drawing on page 27 shows minimum clearances for the flue terminals. The flue terminal should be positioned where it will not cause a nuisance from noise or from the combustion products accumulating. Please contact Andrews technical department if advice is needed for a particular installation. See drawings on page 26.

We recommend that a condensate trap be fitted when the secondary flue length is over 1.5m.

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 20 and 23.

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.

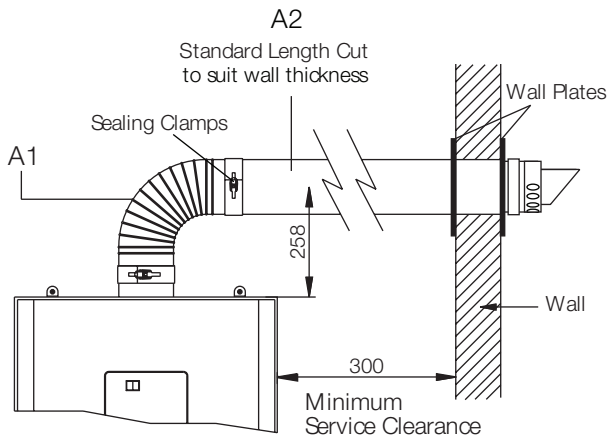
B260 – Horizontal flue kits include the following:

A1 – 90° 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)

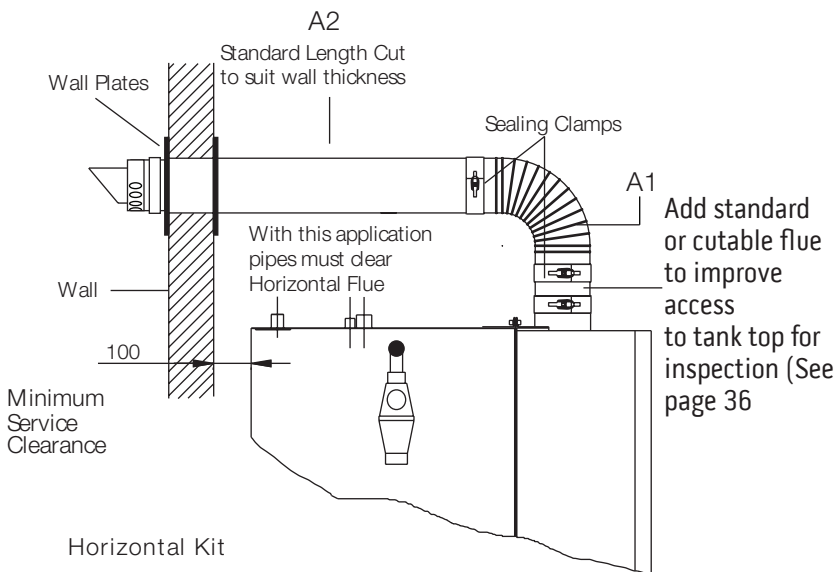
B261 – Vertical flue kits include the following:

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

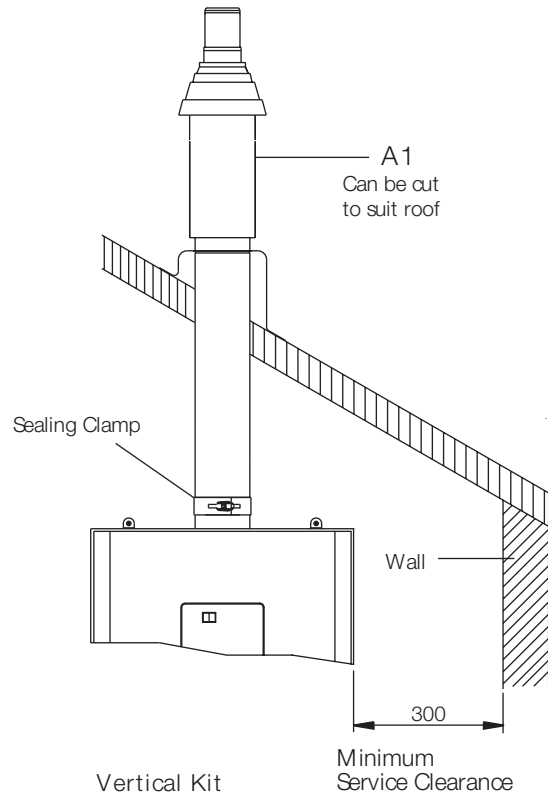


Horizontal Kit

Alternative Flue Systems



Horizontal Kit

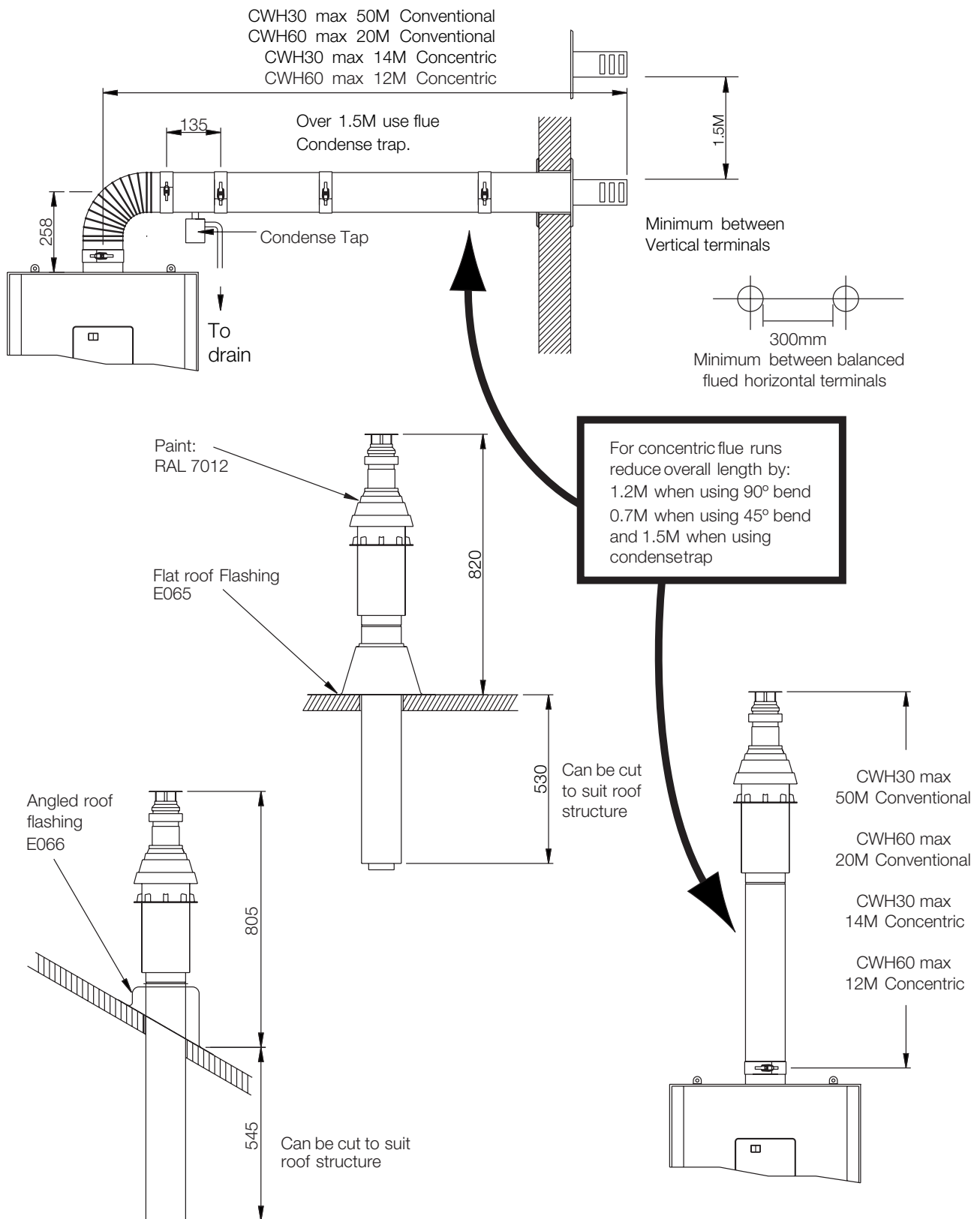


Vertical Kit

Optional flue components available

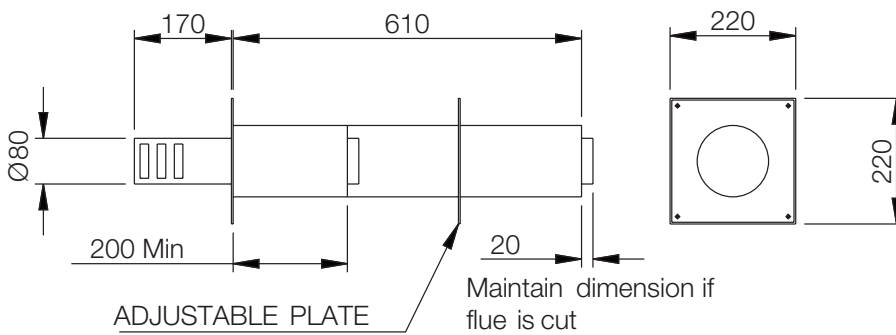
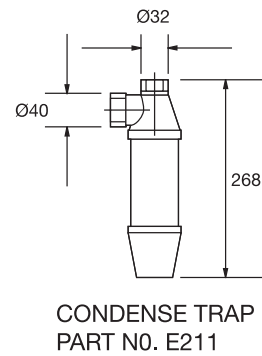
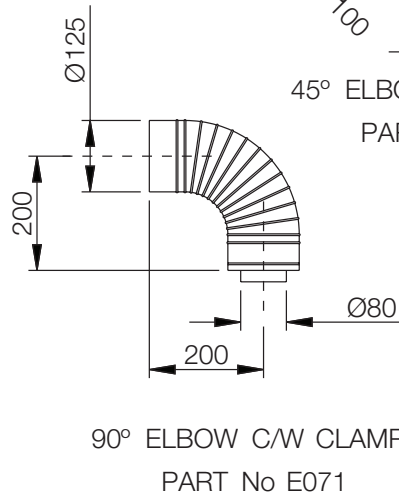
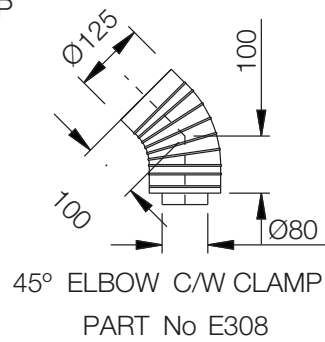
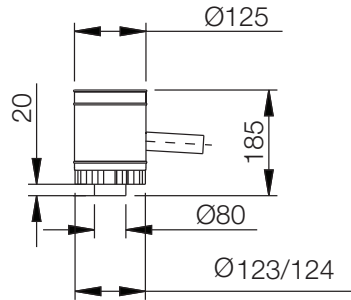
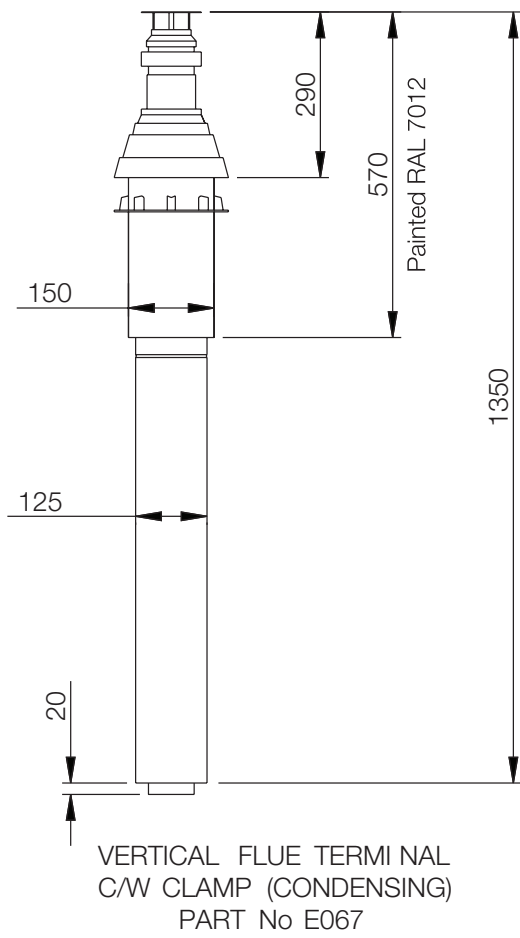
Part No	Description
E071	90° elbow c/w clamp
E308	45° elbow c/w clamp
E064	1m length of flue c/w clamp
E070	1m length cutable flue c/w clamp
E069	0.5m flue c/w clamp
E065	Flat roof plate (125mm)
E066	Angled roof plate (125mm)
E068	Wall clamp (125mm)
E105	Guard for horizontal flue terminal
E310	Flue condense trap
B260	Horizontal flue terminal
B261	Vertical flue terminal
E211	Condensate trap bottle
E075	Flue clamp 125mm
E261	Condense trap pipe kit

CWH30 & CWH60 ALTERNATIVE FLUE SYSTEMS



CWH30 & CWH60 STANDARD FLUE SYSTEM DIMENSIONS

ALL 80/125mm Ø CONCENTRIC FLUE



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.**

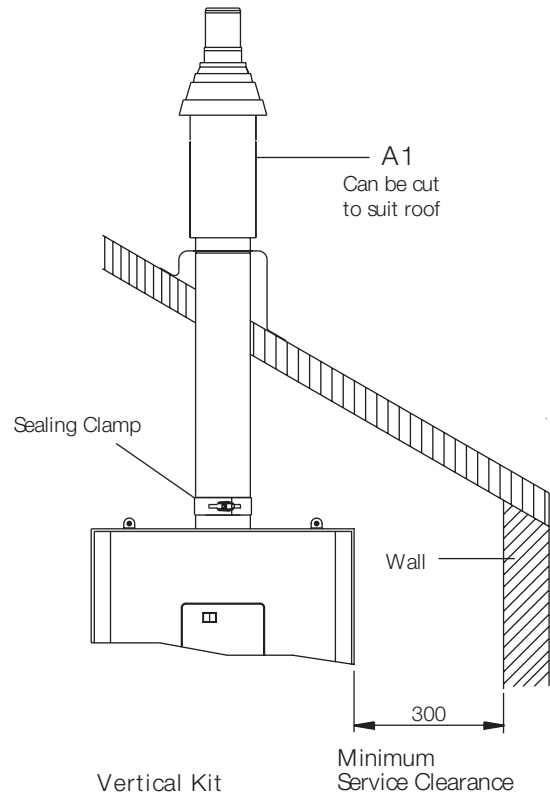
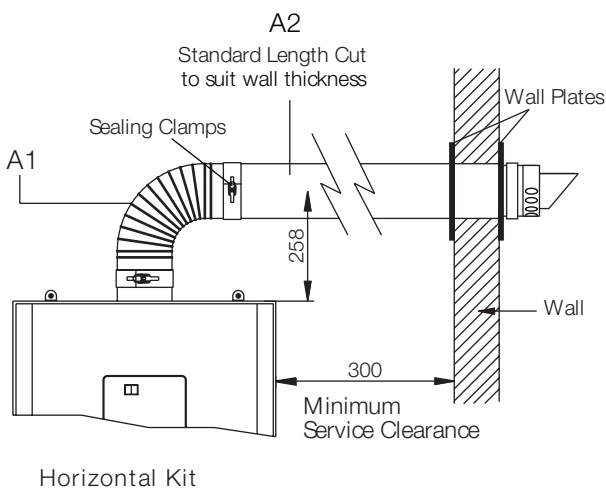
Flue components fit together with silicon sealing rings and the flues are retained with sealing clamps. Each heater can be ordered with either a horizontal or vertical flue kit. Flue assembly instructions are also included.

B262 – Horizontal flue kits include the following:

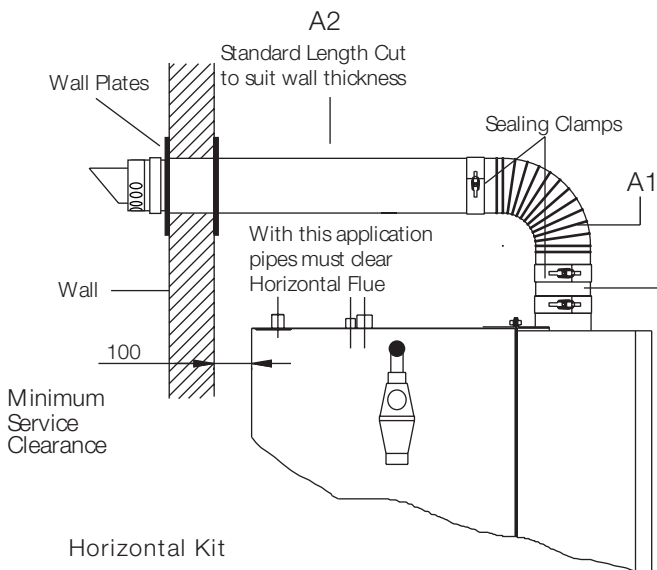
- A1 – 90° bend with sealing clamp (Part No. E215)
- A2 – Wall outlet terminal with sealing clamp complete with inner and outer wall plates fixing screws and plugs. (Part No. E240)

B263 – Vertical flue kits include the following:

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



Alternative Flue Systems

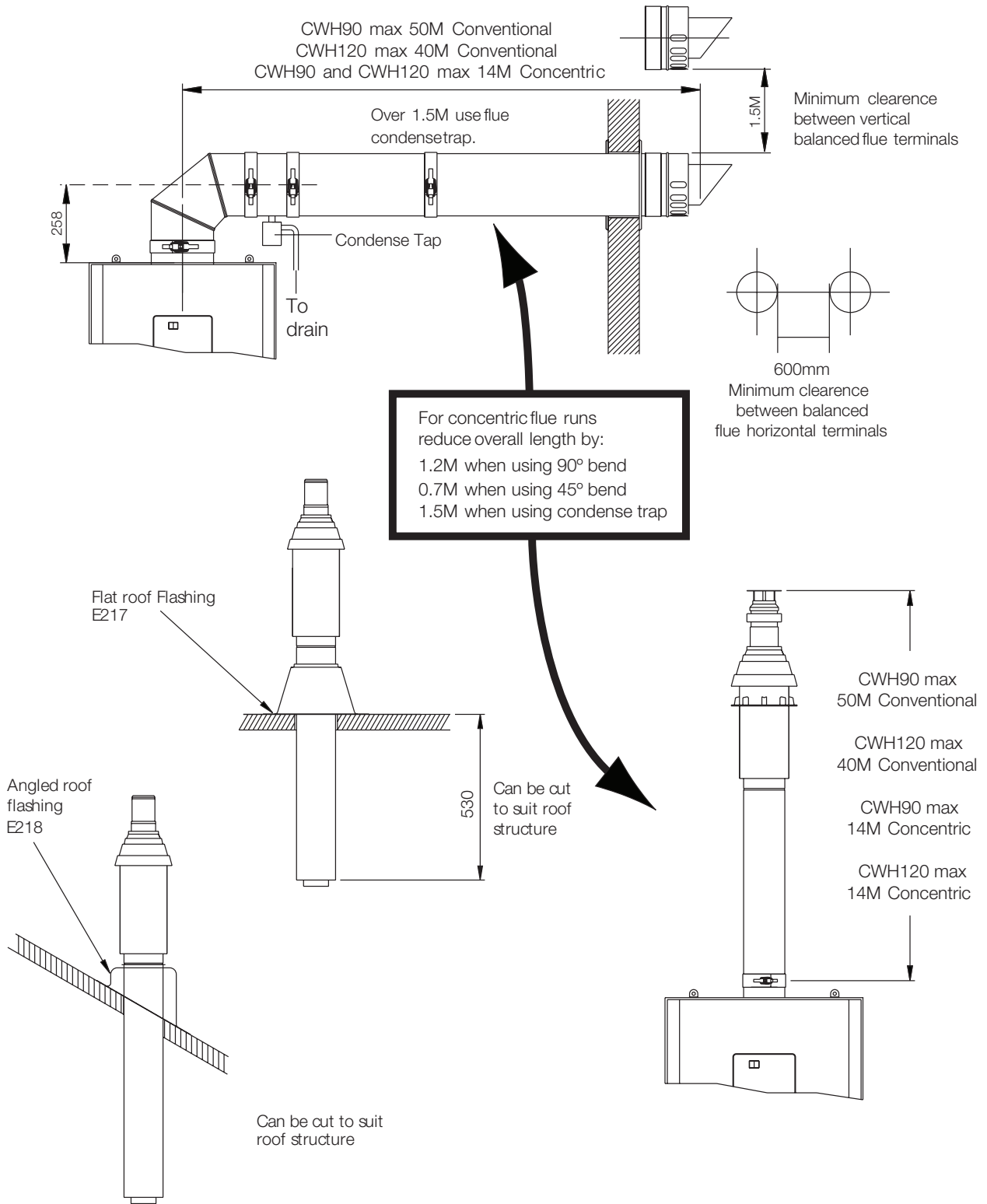


Add standard or cutable flue to improve access to tank top for inspection (See page 36)

Optional flue components available

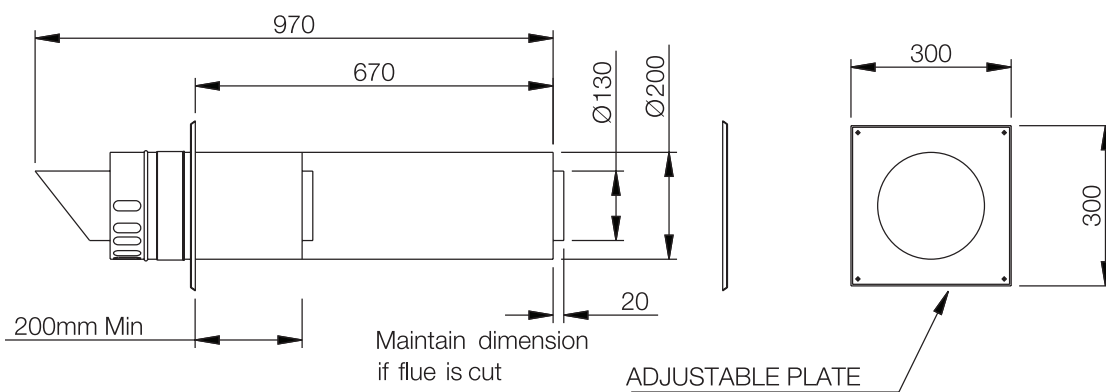
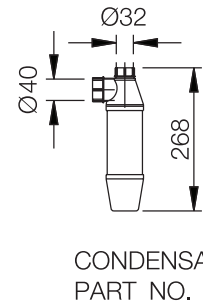
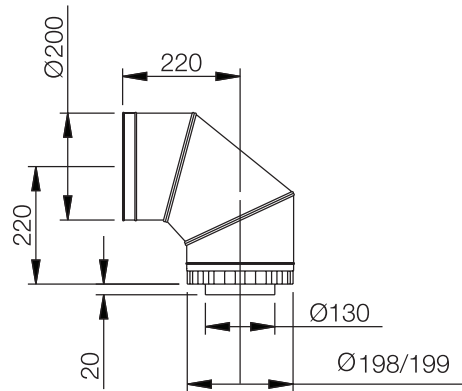
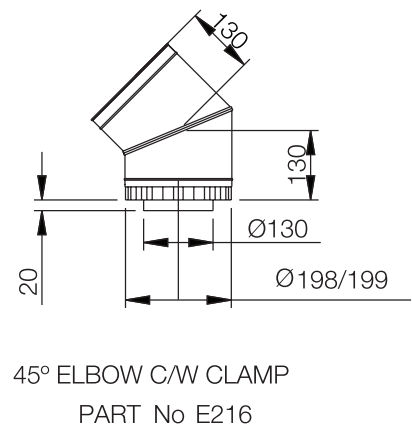
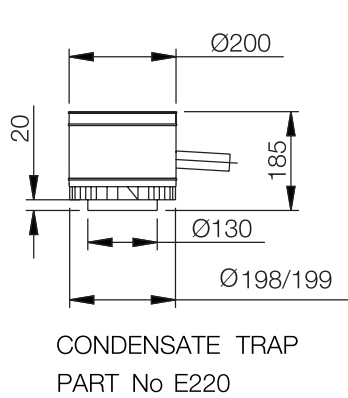
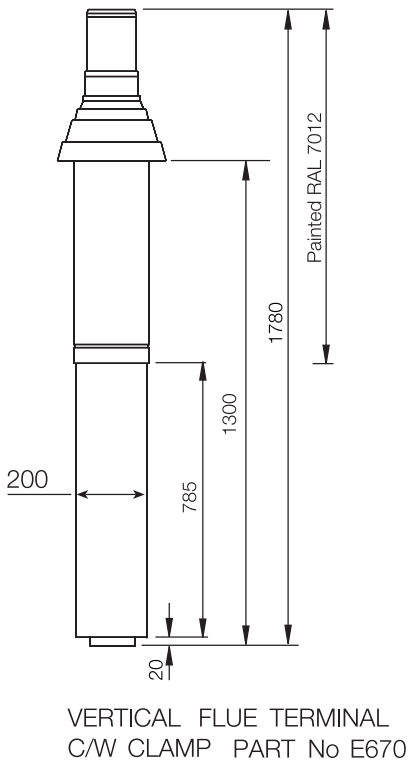
Part No	Description
E215	90° elbow c/w clamp
E216AWH	45° elbow c/w clamp
E212	1m length of flue c/w clamp
E213	1m length cutable flue c/w clamp
E214	0.5m flue c/w clamp
E217	Flat roof plate (200mm)
E218	Angled roof plate (200mm)
E219	Wall clamp (200mm)
E630	Guard for horizontal flue terminal
E220	Flue condense trap
B263	Vertical flue terminal
B262	Horizontal flue terminal
E211	Condensate trap bottle
E385	Flue clamp 200mm
E261	Condense trap pipe kit

CWH90 & CWH120 ALTERNATIVE FLUE SYSTEMS



CWH90 & CWH120 STANDARD FLUE SYSTEM DIMENSIONS

ALL 130/200MM Ø CONCENTRIC FLUE



FLUE SYSTEMS

TYPICAL INSTALLATION

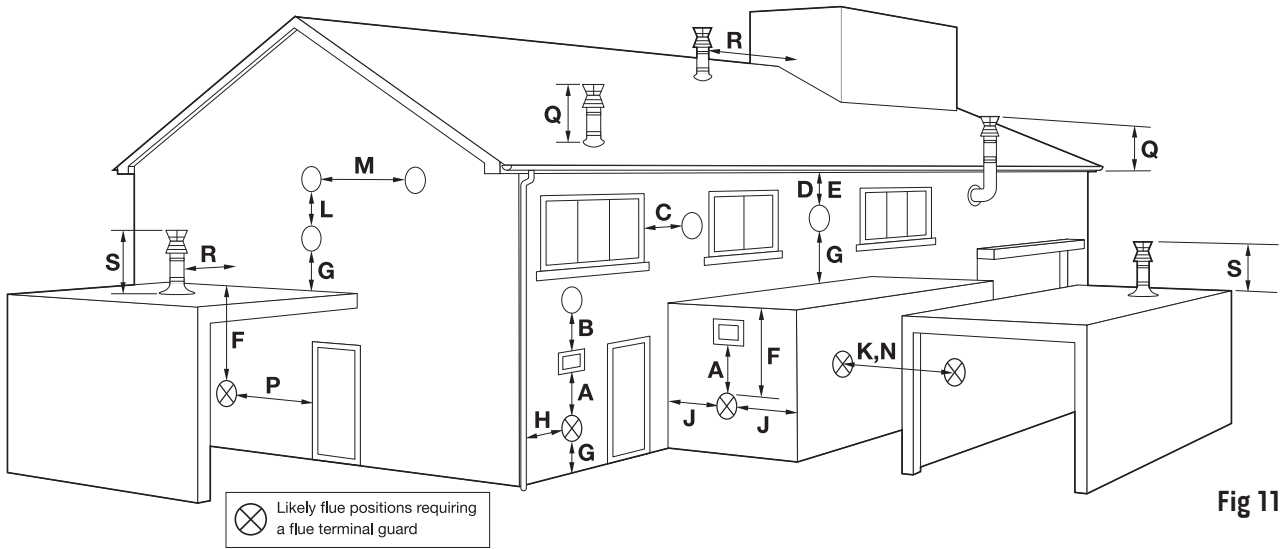


Fig 11

	Terminal position description	Minimum distance (mm) Type Cxx flue systems		
		CWH30, CWH60	CWH90	CWH120
A	Directly below an opening, air brick, opening window etc	300	2,500	2,500
B	Above an opening, air brick, opening window etc	300	700	900
C	Horizontal to an opening, air brick, opening window etc	300	700	900
D	Below a gutter or sanitary pipework etc	75	200	200
E	Below the eaves	200	200	200
F	Below a balcony or carport roof	200	Not recommended+	
G	Above ground, roof or balcony level	300	300++	300++
H	From vertical drain/soil pipework	150	150	150
J	From an internal or external corner	300	300++	300++
K	From a surface or boundary facing a terminal	1,200	2,300	2,800
L	Vertically from a terminal on the same wall	1,500	2,500	2,500
M	Horizontally from a terminal on the same wall	300	700	900
N	From a surface or boundary facing a terminal	600	2,600	3,200
P	From an opening in a carport (e.g. door, windows) into the building	1,200	Not recommended+	
Q	Above a pitched roof	300	400	500
R	From a vertical structure on a roof	2,500	2,500	2,500
S	Above a flat roof	300	400	500
	From any other roof flue terminal	300	700	900

+ Not recommended - Risk assessment required

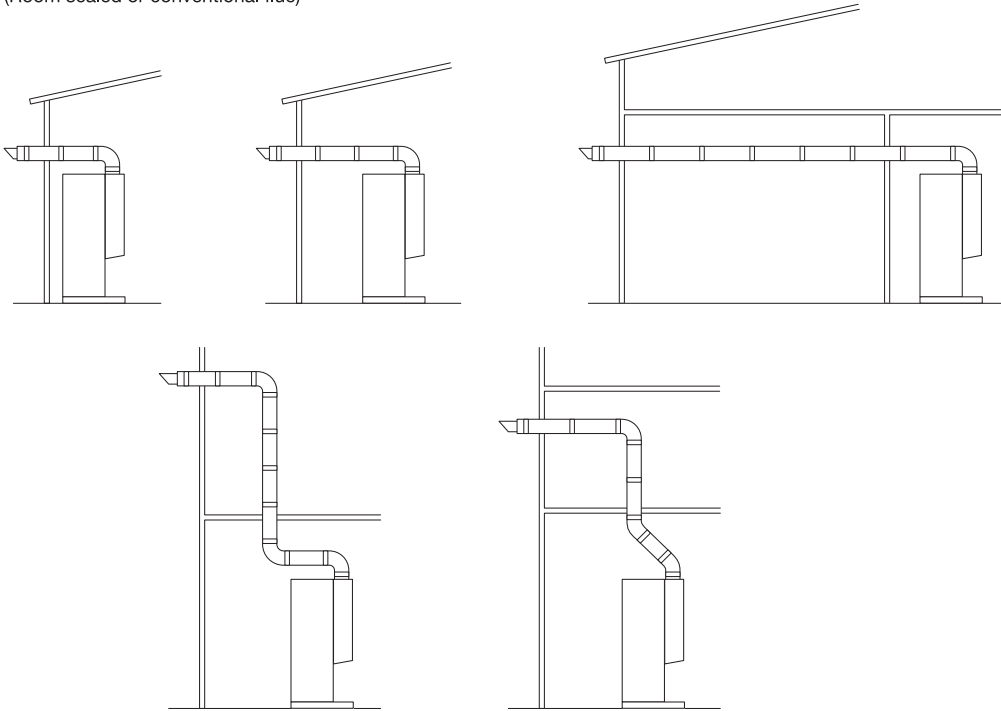
++ Plume management recommended

FLUE SYSTEMS

Fig 12

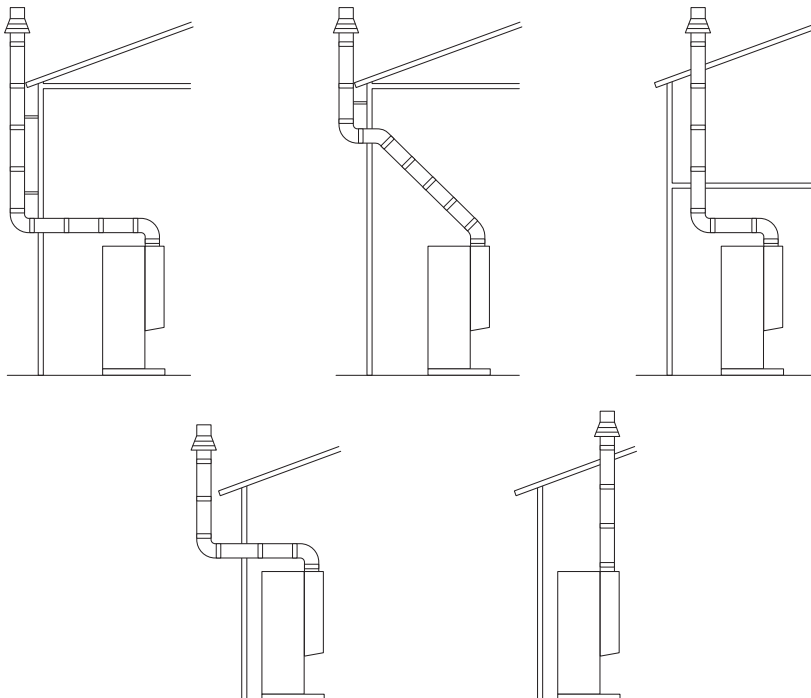
Horizontal termination

(Room sealed or conventional flue)



Vertical termination

(Room sealed or conventional flue)



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 should have negligible resistance and must not be sited in any apposition 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 Vents Areas

Position of Air Vents	Air from Room or Internal Space	Air Direct from Outside
High Level	10cm ² per kW Net input	5cm ² per kW Net input
Low Level	10cm ² per kW Net input	5cm ² 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 both must be on the same wall to outside air.

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 the heater(s) and are equivalent to those specified in BS 6644.
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.



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 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.



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

For all installations, please refer to the table below for calculating requirements. Detailed recommendations for the air supply are given in BS5440, Part 2, and BS6644 and in IGE/UP/10, Pt 1.

The following notes are provided for general guidance only.



Ventilation shall prevent the heater environment from exceeding 32°C (90°).

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)	540cm ² plus 5cm ² per kilowatt in excess of 54kW total net input
High Level (outlet)	270cm ² plus 2.5cm ² per kilowatt in excess of 54kW total net input

AIR SUPPLY AND VENTILATION CONVENTIONAL FLUE SYSTEMS

The minimum effective areas of the permanent air vents require 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	10cm ² per kW Net input	5cm ² per kW Net input
Low Level	20cm ² per kW Net input	10cm ² 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 BS6644 and IGE/UP/10, Pt 1.
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



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 and IGE/UP/10 Pt 1.

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 BS5440.

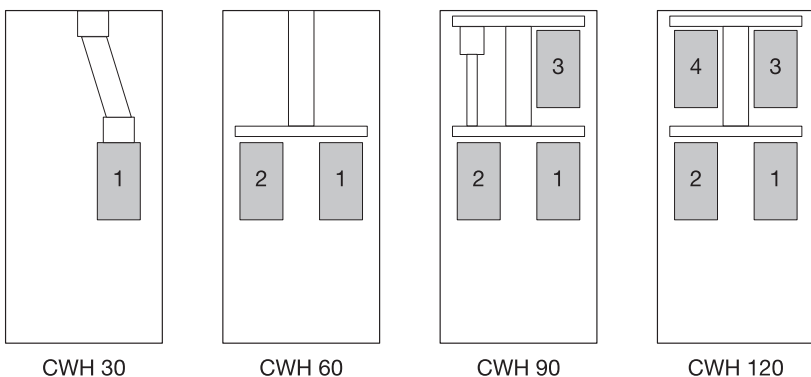
It may be necessary to increase the ventilation area to compensate for the extract fan.

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



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 13, right)

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:

- No heat demand
- Flashing, water not enabled
- Heat demand
- Programme changed, water temperature activated
- Permanent, circulation pump connected to terminals pump L – pump N activated
- Flashing, circulation pump stand by
- Actual water heater temperature

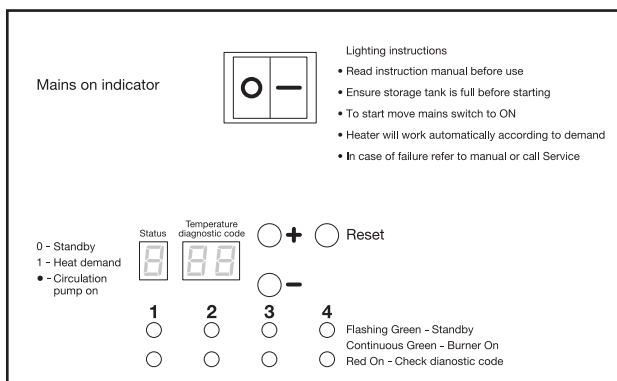


Fig 13

WATER TEMPERATURE SETTING

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.

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; C 00 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



To commission using 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.

CO₂ ADJUSTMENT

The correct proportion of gas and air can be controlled based on the CO₂ percentage in the flue gasses. This control needs to be done at full load and low load. Every burner module has CO₂ measuring point for the measurement, see Fig 9. Table 1 shows the value of the CO₂ percentage at full load and low load.

Fig 14 – Measuring Point










Table 1: CO₂ 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, C 00 appears in the display. Press the + button to select the burner module to be run at full load

-  01 Burner module 1
-  02 Burner module 2
-  03 Burner module 3
-  04 Burner module 4
-  04 All burner modules simultaneously
-  0A Burner module 2 not present
-  n2

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:

-  1- Burner module 1 full load
-  1- Burner module 1 low load

Select full load with the + button, when the actual burner capacity is above 90%, the CO₂ percentage can be measured and set.

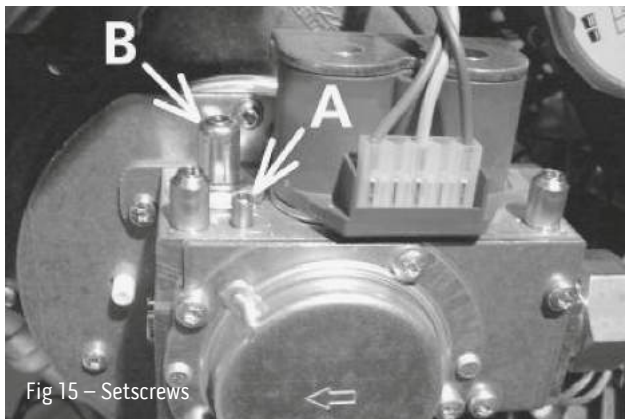


Fig 15 – Setscrews

4. Measure the CO₂ percentage and compare it with table 1 (page 33). The CO₂ percentage can be adjusted using the “Full Load” Setscrew (A) on the gas regulation unit (see Fig 15). The CO₂ percentage can be increased by turning the setscrew to the left.
5. Now check the CO₂ 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 CO₂ percentage can be measured and set.
2. Measure the CO₂ percentage and check it against table 1 (page 33). The CO₂ percentage can be adjusted using the “Low Load” Setscrew (b) (2mm Alan Key) on the gas regulation unit (see Fig 15). The CO₂ percentage can be increased by turning the setscrew to the right.
3. Check the CO₂ 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 C 00 appears in the display. Press the reset button again and the display switches back to normal.



If the appliance is left in commissioning mode by mistake, after 10 minutes the controls will automatically revert 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 meaning 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.

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 neutral 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

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 fault) 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.

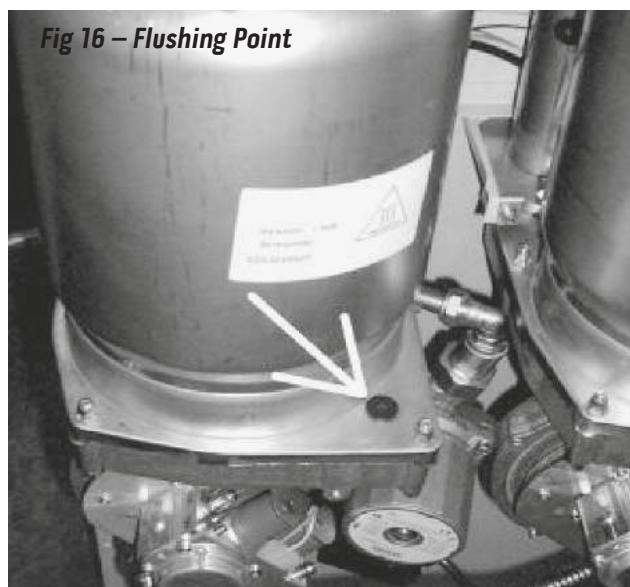
SLAVE BOARD LOCKOUT CODES

A01	Three Failed Ignitions: After three ignitions, 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 switching 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 is 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 fails three times within on burn cycle

MAINTENANCE

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

1. Check the CO₂ percentage at Minimum and Maximum load. Adjust if necessary, (see page 33)
2. Check the output at full load by measuring the gas usage. If this deviates more than 10% from the nominal value (see Section 2, Technical Details) then this is an indication of dirt or blockages in the flue gas exhaust channel, the air supply channel or the condensation drain.
3. Check the condensation drain and rinse the condensation tray and condensation drain with clean water. An opening has been provided for this on the top of the condensation tray, see Fig 16 (below). Rinse with fresh water until the condensation drain is running clear. It is recommended that the condensate hose and 90° drain elbow is removed from each heat engine to remove all debris from the sump.



It is important to make sure the sump is clear and the condense can flow freely

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. Test the operation of the TRV and expansion valves by opening and letting an adequate amount of water flow and then shutting them, until water flow stops. Whilst doing this, make sure the discharge pipe does not back up.

7. If the water heater is to be drained for any reason, first take the water heater out of operation and then proceed as follows:
 - (i) Turn off the water tap in the cold water supply.
 - (ii) 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.
 - (iii) Open the drainage tap of the water heater so the appliance runs empty. Be careful, the water flowing out can be very hot!
8. The storage tank should be inspected annually and cleaned if required. To gain access, first drain the tank as above. Remove the inspection hatch clamp securing the hatch and lift out the hatch plate. Please check the hatch seal as a new one may be required.
9. Unscrew and remove the head of the pressure reducing valve, clean and reassemble.

Burner and exchanger

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.

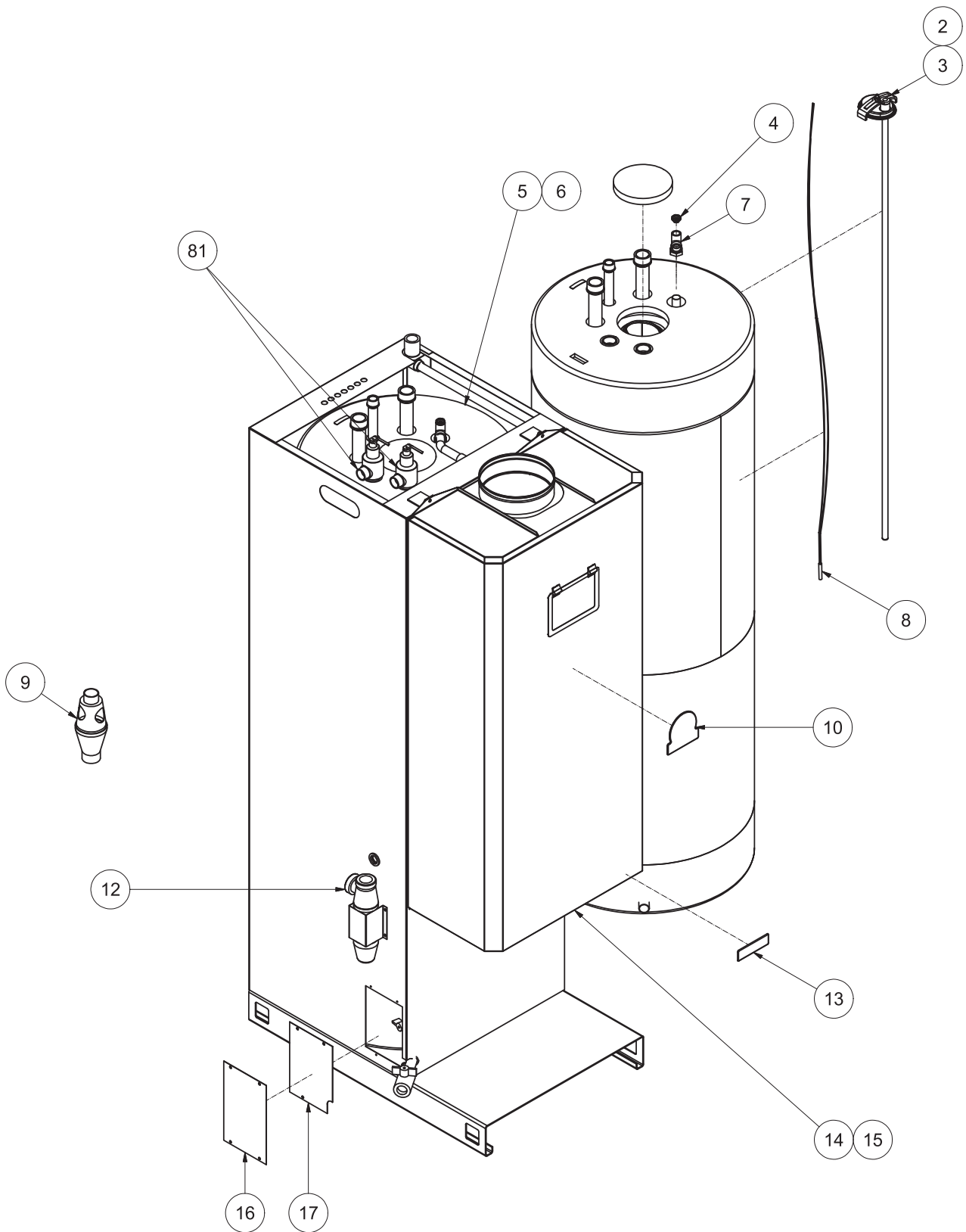
The hot surface igniter is a vulnerable part that should only be removed if it has to be replaced.



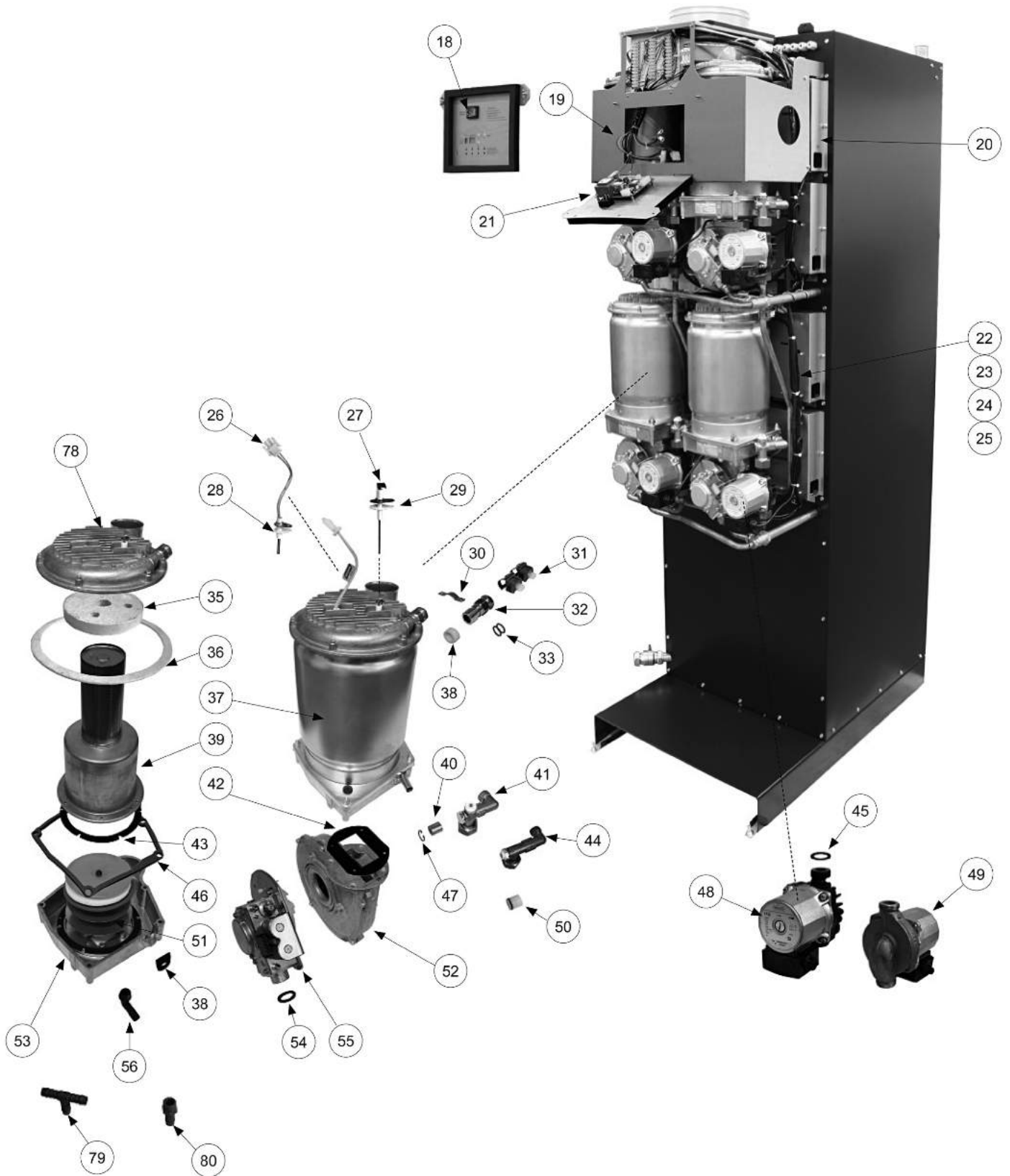
Only original parts recommended by the manufacturer can be used as replacement parts. Components that are sealed may not be altered or dismantled.

SPARE LIST FOR CWH RANGE

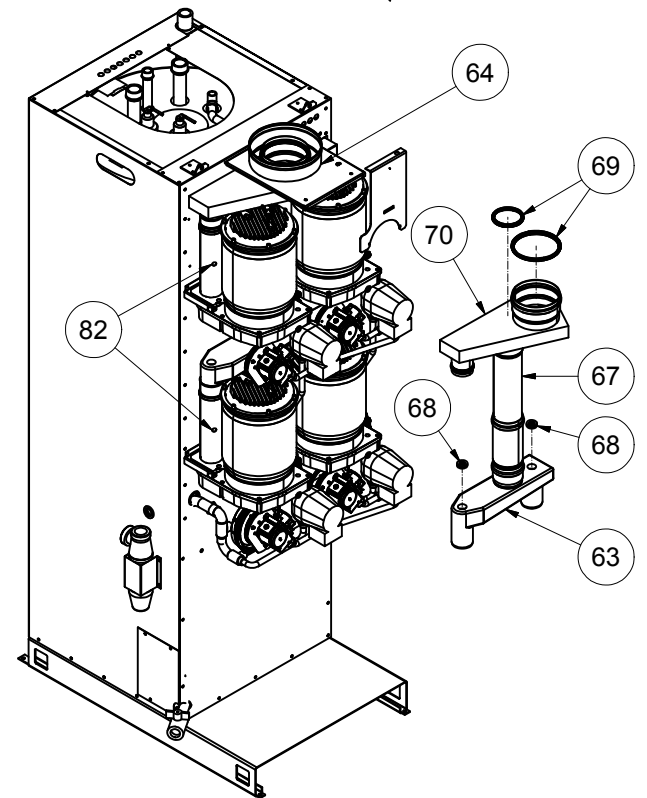
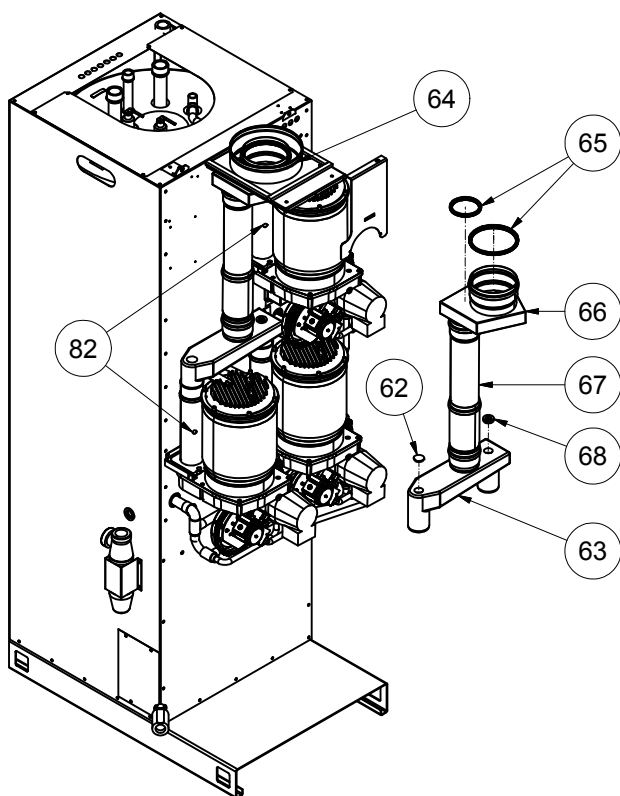
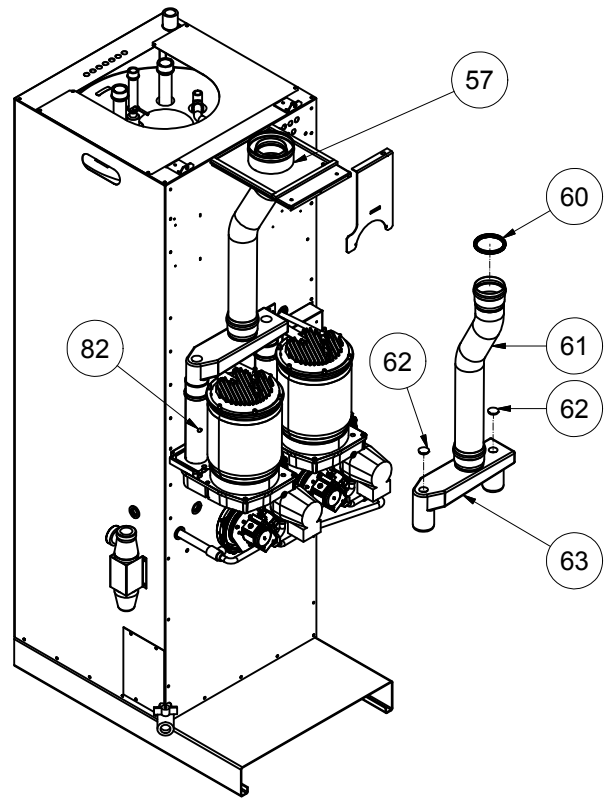
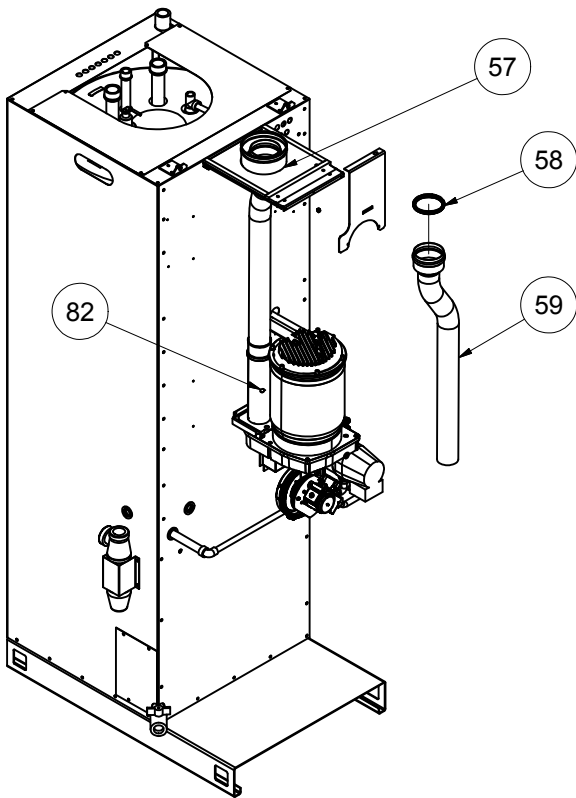
MAXXflo EXTERNAL & CYLINDER SPARES ITEMS



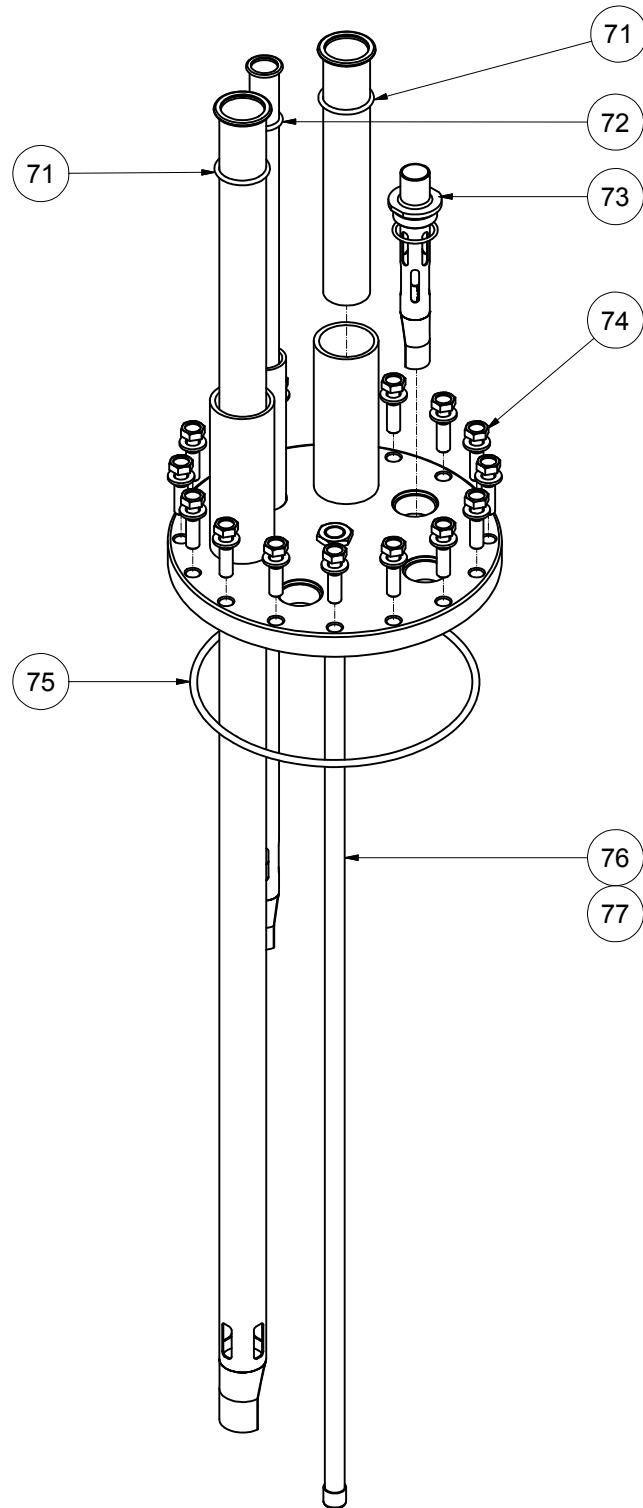
MAXXflo INTERNAL SPARES ITEMS



MAXXflo FLUE SPARES ITEMS



MAXXflo OLD ISSUE SPARES ITEMS



MAXXflo Water Heater

MAXXFLO SPARES LIST

ITEM	DESCRIPTION	Part No.
2	Sensor Dip Tube 200 Litre c/w Hatch	5140790
3	Sensor Dip Tube 300 Litre c/w Hatch	5140791
4	Air Vent ½" SMC 15	5141513
5	Storage Vessel – 200 Litre	E651
6	Storage Vessel – 300 Litre	E652
7	Brass Tee 22 x 22 x ½"	5141514
8	Tank Temperature Sensor & Lead	E664
9	Tundish	C384
10	Andrews Dome Label	E856
12	Condensate Trap	E211
13	MAXXflo Dome Label	E927
14	Front Cover (pump facing rear) pre-serial no. 071201	E918
15	Front Cover (pump facing front) from serial no. 071201	E919
16	Drain Cover Plate (200 Litre vessel) from serial no. 071906	E935
17	Drain Cover Plate (300 Litre vessel) from serial no. 071906	E936
18	Switch On/Off	E665
19	Master & Terminal Panel Wiring Loom	E858
20	Slave Board	E661
21	Master Control Board	E853
22	Wiring Loom 30/200 & 30/300 models	E849
23	Wiring Loom 60kW models	E850
24	Wiring Loom 90kW models	E851
25	Wiring Loom 120kW models	E852
26	Hot surface Ignitor Service Set c/w gasket	E657
27	Ionisation Electrode Service Set c/w gasket	E655
28	Hot surface Ignitor Gasket	5141517
29	Gasket for Ionisation Electrode	5141518
30	Heat Exchanger Brass Outlet Bracket	E937
31	Temperature Flow Surface Sensor	E663
32	Heat Exchanger Outlet Fitting & Seals	E917
33	Heat Exchanger 15mm Outlet O-ring Seals	E654
35	Heat Exchanger Top Lid Insulation	G025
36	Heat Exchanger Top Lid Body Seal	G024
37	Heat Exchanger	E656
38	Heat Exchanger Inlet/Outlet Pipe Seals x 2	5141515
39	Burner	5141516
40	Brass Flow Restrictor (after & inc serial no. 1105004468)	5141512
41	Pump Elbow & Vent Union (used with composite pump after & inc. serial no.071201)	E921
42	Fan Gasket	E846
43	Burner Gasket	E932
44	Pump Elbow & Vent Union (used with bronze pump after & inc. serial no.071201)	E847
45	Pump Gasket	E964
46	Vapour Tray Gasket	E931
47	Circlip – Stainless Steel 15mm	E963
48	Composite Body Primary Pump (after and inc. serial no.071201)	E920
49	Bronze Body Primary Pump (pre-serial no.071201)	E660
50	Non Return Valve (pre-serial no.1105004468)	E930
51	Burner Baffles Service Set	E933
52	Fan Assembly c/w Gasket	E658
53	Heat Exchanger Condensing Tray	G179
54	Gas Valve Seal	E845
55	Gas Valve Assembly	E659
56	Plastic Black 16mm x ½" BSP Male Elbow	E968
57	Air Inlet 125mm CWH30/CWH60	5141520
58	Flue/Air Seal Set CWH30	5141632
59	Flue Pipe 60mm CWH30	5140795
60	Flue/Air Seal Set CWH60	5141633
61	Flue Pipe 80mm CWH60	5140796
62	Blanking Plug for Flue Connector	5141522
63	Flue Gas Collector (Lower) CWH30/CWH60/CWH90	E967
64	Air Inlet 200mm CWH90/CWH120	5141523
65	Flue/Air Seal Set CWH90	5141634
66	Flue Gas Collector (Upper) CWH90	E965
67	Flue Pipe CWH90/CWH120	5140794
68	Condensate Tube Grommet 15mm	E857
69	Flue/Air Seal Set CWH120	5141635
70	Flue Gas Collector (Upper) CWH120	E966
71	O-ring for Cold Feed dip Tube	E928
72	O-ring for Return dip Tube	E929
73	Flow Dip Tube Assembly	5141519
74	Set of 16 no. M10 Stainless Steel Bolts & Washers	E859
75	Top Plate Seal	E653
76	Sensor Pocket Dip Tube – 200 Litre	5140792
77	Sensor Pocket Dip Tube – 300 Litre	5140793
78	Heat Exchanger Top Plate c/w Ceramic Board, Gasket & Fixings	7212717
79	Blue Tee 14mm x 14mm x 14mm	E969
80	Blue Straight Connector ½" x 14mm	5141636
81	Temperature & Pressure Relief Valve	C380AWH
82	Combustion Plug	5142574
83	Hatch Seal	5142675

DISMANTLING, DISPOSAL AND RECYCLING



Only competent qualified persons should remove or dismantle the appliance.

Before removing and dismantling please ensure you safely remove the power supply and isolate the appliance from the water and gas connections.

Dispose of the appliance correctly according to the laws in force. The appliance and accessories cannot be discarded along with normal household waste and should be recycled where appropriate.

More than 90% of the materials that make up the appliance are recyclable.

All the technical information you need is easy to find on our website, using your smart phone, tablet or PC:

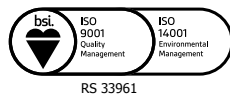
- BIM files
- CAD files
- Brochures
- Technical specification sheets
- Case studies
- Installation manuals
- User guides
- Size-It Tool

Sales
0345 070 1055

Technical
0345 070 1057

Website
andrewswaterheaters.co.uk

Twitter
@AndrewsWH



Andrews. Built to perform.