

Installation, Maintenance and User Instructions



AquaFlo II



Issue 3 – December 2011

Please read these instructions carefully before commencing installation of the AquaFlo unvented water heater

Please leave these instructions with the end user

INTRODUCTION

The corrosion resistant AquaFlo Unvented cylinder is made from Duplex Stainless Steel. It is highly insulated with environmentally friendly foam enclosed in a rust resistant white steel case.

It is available in Direct and Indirect versions in a family of 7 sizes from 90 – 300 litres. Twin Coil and Solar Direct units are available in 5 sizes from 150 - 300 litres.

To help ensure compliance with the relevant Water and Building Regulations all AquaFlo units are supplied complete with the necessary safety and control devices needed to connect to the cold water mains. In order to ensure high flow-rate performance with minimum pressure drop even in lower pressure areas, pre-adjusted, high quality controls have been selected.

AquaFlo is approved to demonstrate compliance with Water Regulations and Building Regulations G3 & Part L.

INSTALLATION PREREQUISITES

This Cylinder should only be installed by a competent installer holding their G3 unvented qualification. The installation of this product is also notifiable under the national building regulations.

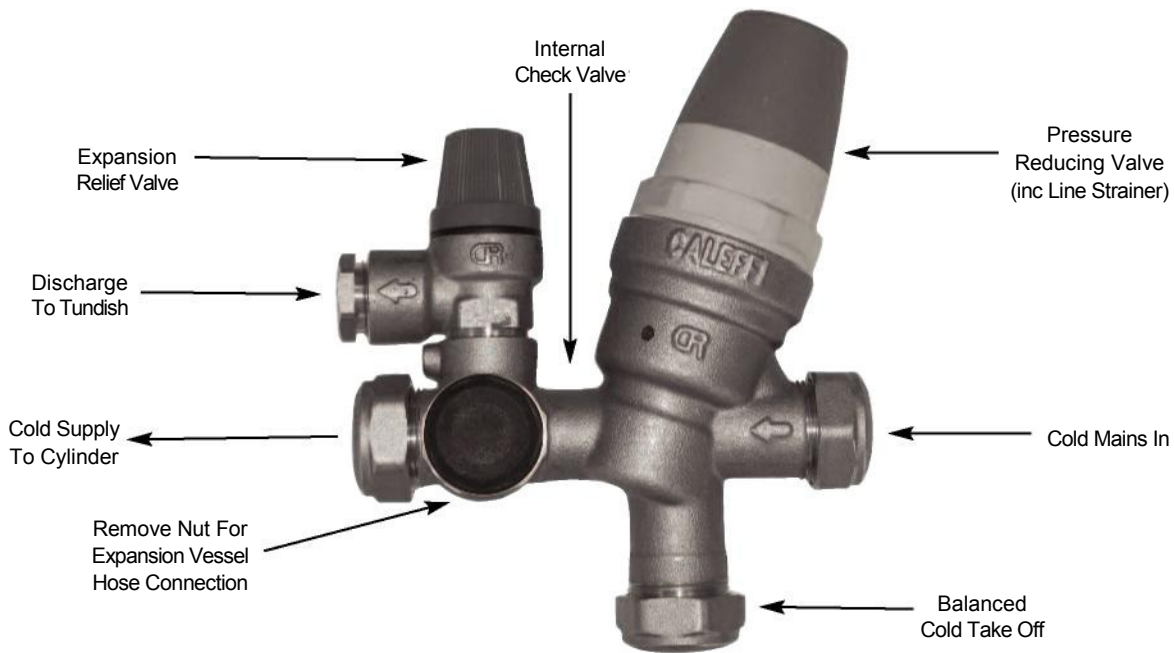
The electrical installation including earthing and cross bonding must comply with the current IEE regulations and any Local Authority requirements.

ONCE COMPLETED THIS INSTRUCTION MANUAL IN ITS ENTIRETY SHOULD BE LEFT WITH THE END USER.

STORAGE PRIOR TO INSTALLATION

AquaFlo should be stored upright in a dry area and kept in its original packaging until immediately prior to installation.

COLD INLET SET - WHAT ARE THE CONNECTIONS?



EQUIPMENT SUPPLIED WITH CYLINDER

Control & High Limit Cutout Thermostat (Indirect Models Only)	✓
Two Port Zone Valve (Indirect Models Only)	✓
Cold Water Inlet Set	✓
15 x 22mm Tundish	✓
Temperature & Pressure Relief Valve	✓
Expansion Vessel	✓
Expansion Vessel Bracket	✓
500mm Expansion Hose	✓
Immersion Heater(s) - Dependant on size and configuration	✓
Instruction Manual	✓

WATER SUPPLY

AquaFlo is capable of delivering over 50 litres per minute when connected to a suitable mains supply. The high quality inlet control set with its 3 bar operating pressure has been designed to make the most of what is available, however the performance of any unvented system is only as good as the water supply.

In unvented systems both hot and cold services are supplied simultaneously from the mains so the maximum possible on-site water demand must be assessed and the water supply should be tested to ensure it can meet these requirements. If necessary consult the local water supplier regarding the likely pressure and flow rate availability.

It is important that site pressure readings are taken under dynamic flow conditions, high pressures under zero flow conditions are not necessarily indicative of satisfactory performance. A minimum of 1.5 bar at 20 l/m flow should be available. Where mains inlet pressures are likely to exceed 12 bar then an additional upstream pressure reducing device should be fitted.

A minimum of 22mm supply pipe-work should ideally be provided and existing ½" (15mm) cold mains pipe-work may need to be upgraded. Hard water treatment should be considered in areas where the calcium carbonate content is greater than 200ppm, if required adjust cylinder temperature to below 60 degrees.

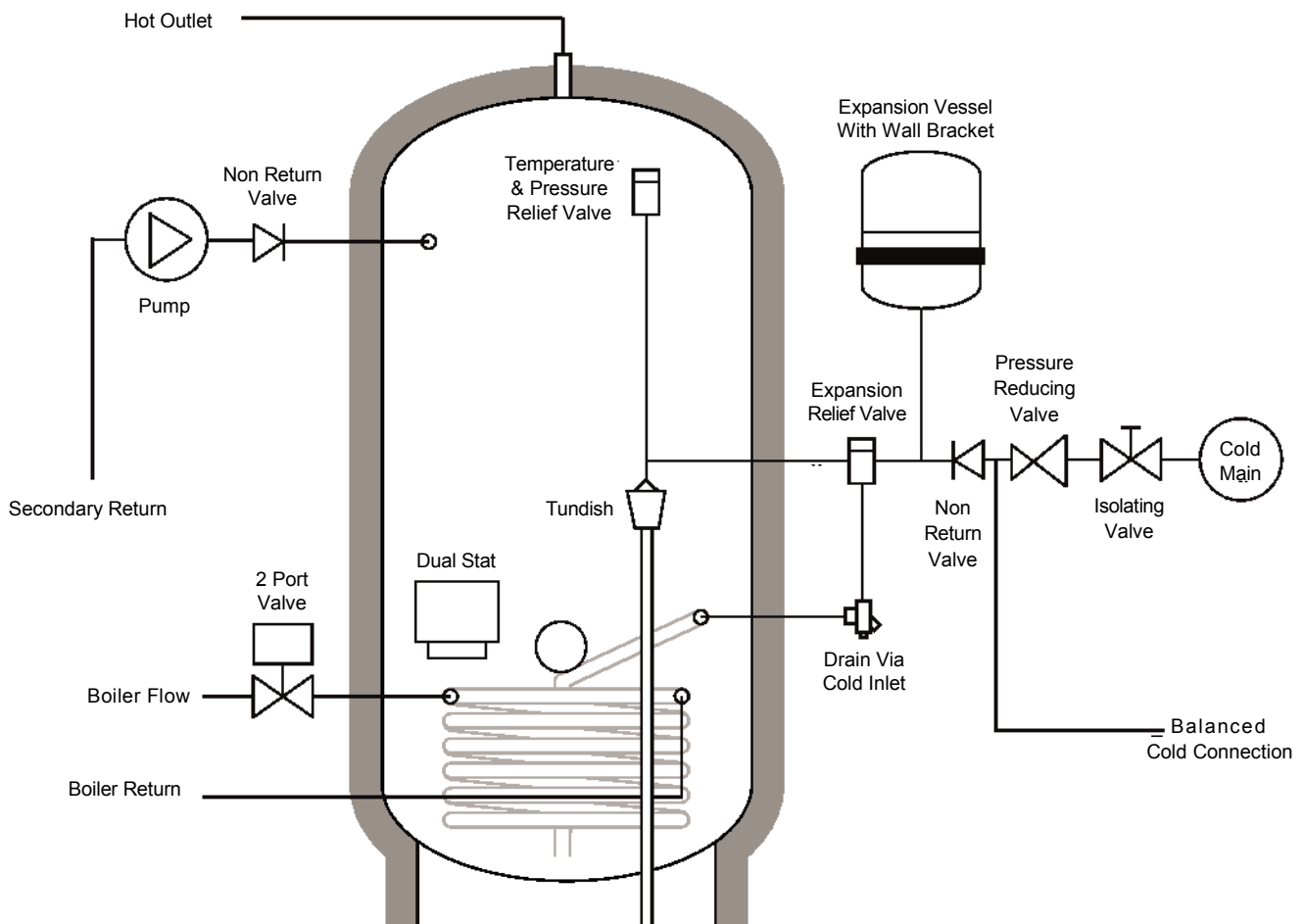
SITING THE UNIT

AquaFlo can be positioned more or less anywhere in the building but it should be remembered that for every 1 meter that an outlet is above the AquaFlo, the pressure will be reduced by 0.1 bar. If siting outside the heated envelope of the dwelling such as in a garage or outbuilding then frost protection should be provided and exposed pipework should be insulated.

AquaFlo must be supported on a flat base capable of supporting the weight of the cylinder when full. The minimum recommended cupboard size is 650mm square.

It's important that consideration is given to access for maintenance of the valves. The immersion heaters are 375mm long and access space should be provided for possible future replacement.

SCHEMATIC



* Do not fit shut off valve between Cylinder and Expansion Valve

GENERAL INSTALLATION

CYLINDER CONNECTIONS

All plumbing connections should be made to the Zip AquaFlo and its safety devices using the 15mm or 22mm compression fittings, nuts and olives supplied.

CYLINDER RELIEF VALVE CONNECTIONS

Safety relief valve connections should not be used for any other purpose and no valve should be fitted between the expansion relief valve and the storage cylinder.

COLD MAINS PIPEWORK

Run the cold main through the building to the place where the AquaFlo is to be installed. Take care not to run the cold pipe near hot water or heating pipe work so that the heat pick up is minimized. Identify the cold water supply pipe and fit an isolating valve (not supplied).

A 22mm BS1010 stopcock can typically be used but a 22mm quarter turn full bore valve would be better as it does not restrict the flow as much. Do not use "screwdriver slot" or similar valves.

Make the connection to the cold feed of the cylinder and incorporate a drain valve. Position the inlet control just ABOVE the Temperature & Pressure Relief Valve (TPRV) mounted on the side of the cylinder. This ensures that the cylinder does not have to be drained down in order to service the inlet control set. Ensure that the arrow points in the direction of the water flow. Select a suitable position for the expansion vessel. Mount it to the wall using the bracket provided. Use the hose to connect to the inlet control group.

BALANCED COLD CONNECTION

If there are to be showers, bidets or monobloc taps in the installation then a balanced cold supply is a requirement. There is a 22mm balanced connection on the inlet control set that must be used for this purpose.

HOT WATER PIPEWORK

Run the first part of the hot water distribution pipework in 22mm. This can be reduced to 15mm and 10mm as appropriate for the type of tap etc. Your aim should be to reduce the volume of the hot draw off pipework to a practical minimum so that the time taken for the hot water is as quick as possible.

Do not use monobloc mixer tap or showers if the balanced cold connection is not provided. This arrangement will back pressurise the unit and result in discharge. Ensure that the top of the vessel is accessible for servicing.

PRIMARY COIL CONNECTIONS (Indirect Only) Compression connections are provided for the primary circuit which must be positively pumped. Primary flow and return connections are interchangeable to suit site conditions without affecting reheat times.

Sealed or vented primary circuits can be used, to comply with normal installation practice the primary pressure should not exceed 3 bar although the coil in AquaFlo is suitable for up to 7 bar if required. The boiler may be Gas, Electric, Oil etc but must be under effective thermostatic control. AquaFlo is not intended for use with uncontrolled heat sources such as some AGA's, back boilers, solid fuel stoves etc. The two port zone valve should be installed into the primary flow pipework leading to the coil flow inlet. The direction of flow arrow should be towards the primary flow connection.

SECONDARY CIRCULATION

Where secondary circulation is required a circulator suitable for potable water should be used in conjunction with a non return valve to prevent backflow.

It may be necessary to incorporate an extra expansion vessel into the circuit to accommodate the increased system water volume in larger secondary circulation systems. Where off peak electrical tariffs are being used then secondary circulation should be avoided. A secondary return boss is fitted as standard on 210, 250 & 300L. On smaller sizes tee into the cold feed pipe above the drain.

IMMERSION HEATERS

As a requirement of Building regulations the AquaFlo immersion heaters are fitted with thermal cut-out in addition to the normal control thermostat. To help ensure correct replacement the immersion heaters have a special 1³/₄" thread. They are of a low noise Incoloy construction and rated at 3 kW at 240 V. Replacement immersion heaters should be purchased from Zip Heaters otherwise the product warranty may be affected.

Under no circumstances should immersion heaters without thermal cut-outs be fitted to the Zip AquaFlo.

The O'ring on the head of the immersion heater should be correctly positioned and lubricated before fitting. Screw in until hand-tight then gently tighten as the O' ring will seal easily. The electrical supply to each immersion heater must be fused at 13A via a double pole isolating switch to BS 3456. The cable must be 2.5mm² heat resistant (85°C HOFR) sheathed flex complying to BS 6141:1981 Table 8. Do not operate the immersion heater/s until the unit is full of water. If any sterilisation liquid is in the cylinder do not operate the immersion heater/s as this will cause premature failure. The electrical supply must be from a fused supply compliant with local regulations and fitted by a suitably qualified Electrician.

ENERGY CUT OUT AND CYLINDER THERMOSTAT (Indirect Only)

As a requirement of Building regulations the AquaFlo units are fitted with a thermal cut-out in addition to the normal control thermostat. This unit should be fitted to the dedicated boss on the cylinder and wired to the two port valve controlling the primary flow (see wiring diagram).

AQUAFLO UNVENTED INDIRECT

Twin Coil Solar

Indirect twin coil units can be installed in two separate formats:

- In a solar powered system with a fossil fuel boiler.
- In a system with two independent fossil fuel boilers.

With either format it is essential the overall installation meets all current legislation including, in particular, the high limit isolation requirements of Building Regulation G3. This document is designed to assist in achieving this aim.

Upper Coil

The upper coil is connected to the fossil fuel boiler as per the instructions for the AquaFlo single coil model with the control and high limit thermostat inserted into the middle stat pocket. The wiring requirements are as depicted in this guide.

Lower Coil: Solar Installation

In a solar powered system the lower coil is connected to the solar heat source. Either primary coil connection may be utilised as the flow or return. The solar cylinder sensor, supplied as part of the solar controls, inserts into the lower stat pocket. It is necessary to mount the solar pump in the return pipework with the two port valve (supplied with the cylinder) installed between the cylinder and the pump.

This valve is of the powered open, sprung closed design and is wired through the high limit stat which inserts into the upper stat pocket. Two wiring options for high limit isolation are provided in this guide. The control thermostat is not required in a solar installation.

Lower Coil: Two Boiler Installation

Where the lower coil is to be used with a fossil fuel boiler, the pipework requirements are as per that of a Stainless Indirect single coil cylinder described earlier in this book. However the electrical requirements mean the control thermostat inserts into the lower tank stat pocket to control the boiler input and the limit stat into the upper tank stat pocket. The two port valve may be installed into either the flow or return pipework. Wiring of the controls are as per the wiring diagram in this guide.

DISCHARGE ARRANGEMENT

General guidance is provided by the diagram below, extracted from the G3 Building Regulation Guidance. This guidance is available as a free of charge download of the G3 Approved Document from www.planningportal.gov.uk. The discharge from both the Temperature relief and expansion relief valves can be joined together via a 15mm end feed Tee.

It is important that any discharge water does not collect in this pipe-work and can run freely to the tundish. The tundish should be mounted in a vertical and visible position located in the same space as the unvented hot water storage system and be fitted as close as possible and within 500mm of the safety device e.g. the temperature relief valve. The discharge pipe-work from the tundish must be routed in accordance with Part G3 of the Building Regulations.

The discharge pipes and tundish should be installed in a visible location away from any electrical devices, should terminate in a safe place where there is no risk to persons in the vicinity of the discharge, be of metal and:

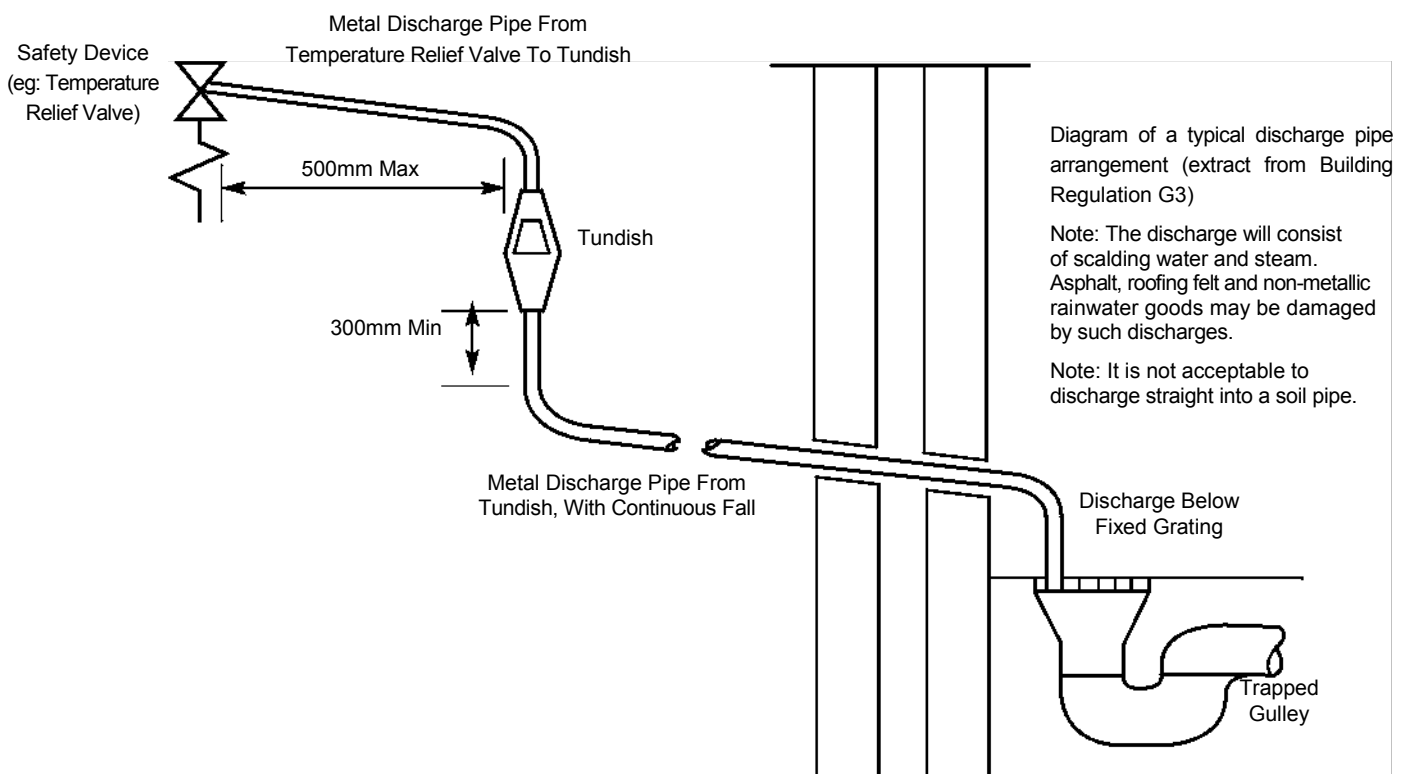
- a) Be at least one pipe size larger than the nominal outlet size of the safety device unless its total equivalent hydraulic resistance exceeds that of a straight pipe 9m long i.e. discharge pipes between 9m and 18m equivalent resistance length should be at least two sizes larger than the nominal outlet size of the safety device, between 18 and 27m at least 3 sizes larger, and so on. Bends must be taken into account in calculating the flow resistance. An alternative approach for sizing discharge pipes would be to follow BS6700

Specification for design installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages.

- b) Have a vertical section of pipe at least 300mm long, below the tundish before any elbows or bends in the pipework.
- c) Be installed with a continuous fall.
- d) It is preferable for the discharge to be visible at both the tundish and the final point of discharge but where this is not possible or practically difficult there should be clear visibility at one or other of these locations.

Examples of acceptable discharge arrangements are:

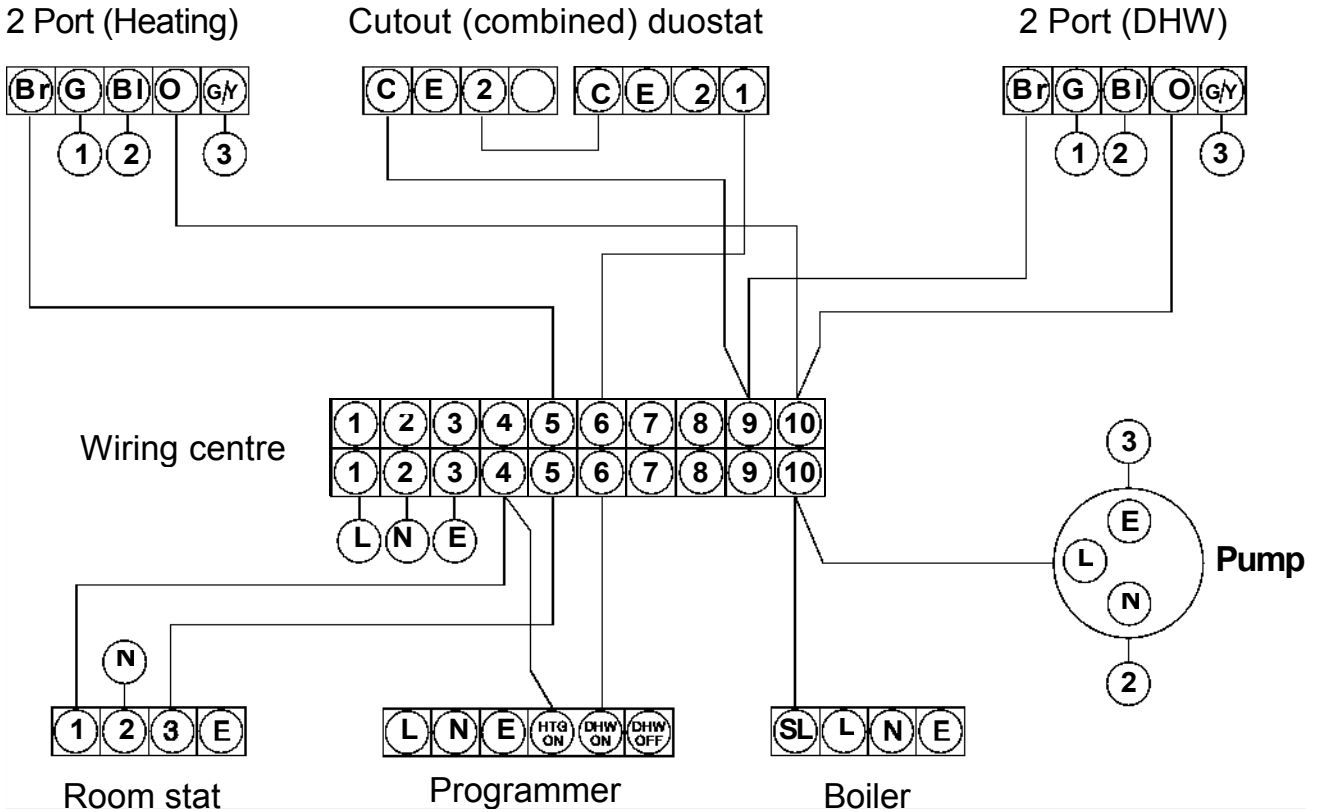
1. Ideally below the fixed grating and above the water seal in a trapped gulley.
2. Downward discharges at a low level; i.e. up to 100mm above external surfaces such as car parks, hard standings, grassed areas etc. are acceptable providing that where children play or otherwise come into contact with discharges, a wire cage or similar guard is positioned to prevent contact whilst maintaining visibility.
3. Discharges at a high level; e.g. in to metal hopper and metal down pipe with the end of the discharge pipe clearly visible (tundish visible or not) or onto a roof capable of withstanding high temperature discharges of water and 3m from any plastic guttering systems that would collect such discharges (tundish available).
4. Where a single pipe serves a number of discharges, such as in blocks of flats, the number served should be limited to not more than 6 systems so that any installation can be traced reasonably easily. The single common discharge pipe should be at least one pipe size larger than the largest individual discharge pipe to be connected. If unvented hot water storage systems are installed where discharges from safety devices may not be apparent i.e. in dwellings occupied by blind, infirm or disabled people, consideration should be given to the installation of an electronically operated device to warn when discharge takes place.



WIRING DIAGRAM 2 x 2 Port zone valves (Typically Honeywell 'S' Plan)

W = White G = Grey BI = Black O = Orange G/Y = Green/Yellow Br = Brown

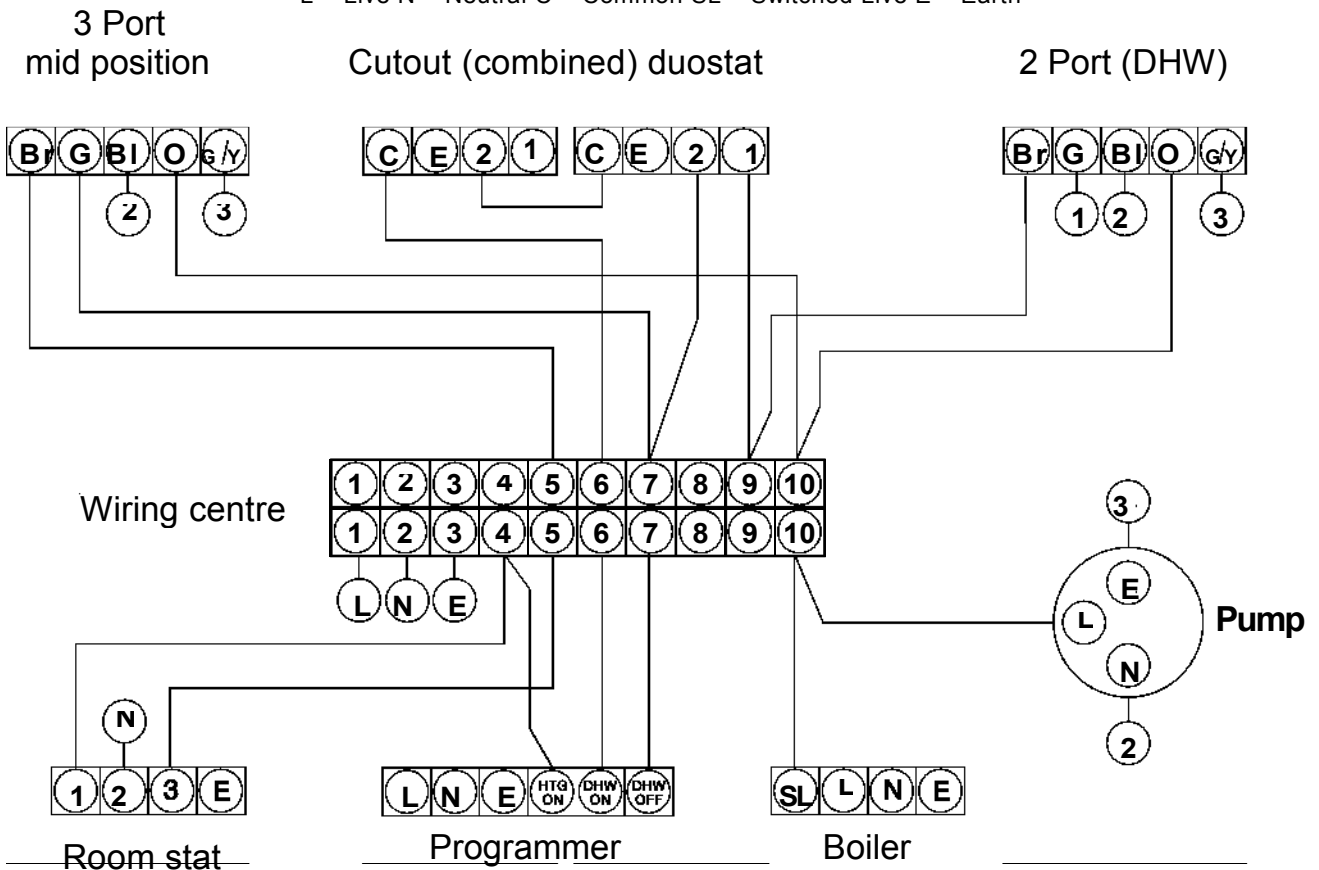
L = Live N = Neutral C = Common SL = Switched Live E = Earth



WIRING DIAGRAM 3 Port + 2 Port (Typically Honeywell 'Y' Plan)

W = White G = Grey BI = Black O = Orange G/Y = Green/Yellow Br = Brown

L = Live N = Neutral C = Common SL = Switched Live E = Earth



COMMISSIONING SERVICING

FILLING

Check all connections for water tightness including any factory made connections such as the immersion heater and the temperature and pressure relief valve. The pressure in the expansion vessel should be checked to ensure it is 3 bar (45PSI). The valve is of the car tyre (Schrader) type.

The hot tap furthest away from the AquaFlo should be opened before filling the system to let air out. The system should be flushed before use. The remaining taps should be opened in turn to expel air.

DIRECT UNITS

The system must be fully filled and flushed before switching on the power to the immersion heaters and allowing the unit to heat up. The immersion heater is supplied preset at 55°C. Turning fully to + sets to approx 65°C.

INDIRECT UNITS

Ensure the lever on the two port valve is set to the filling position and use the boiler manufacturers commissioning instructions to fill the primary circuit. When full release the lever. Switch the programmer to Domestic Hot water (DHW) and allow the unit to start to heat. Adjust the dial of the dual thermostat to between 55°C and 65°C as required.

STORAGE TEMPERATURE

A storage temperature of 60-65°C is normal for both direct and indirect AquaFlos. In hard water areas consideration should be given to reducing this to 55-60°C. In many healthcare applications the guidance on Legionella control and safe water delivery temperatures will require storing the water at 60-65°C, distributing at 50-55°C and using thermostatic mixing valves to control the final temperature. For details consult the NHS estates guidance on safe hot water temperatures.

SAFETY VALVE CHECKS

Any water coming from either the expansion relief valve or the temperature/pressure relief valve during heat up is indicative of a problem which needs to be identified and rectified. The temperature relief and expansion relief valves should be fully opened, one at a time then both together allowing as much water as possible to flow through the tundish. Check that your discharge pipework is free from debris and is carrying the water away without spillage over the tundish and release the valves and check that they reseat properly.

GENERAL

Servicing should only be carried out by competent installers and any spare parts used must be purchased from Zip Heaters. NEVER bypass any safety devices or operate the unit without them fully operational.

DRAINING

Isolate from the electrical supply to prevent the immersion heaters burning out. Isolate the unit from the cold mains. Attach a hose to the draining tap ensuring it reaches to a level below the unit. (This will ensure an efficient syphon is set up and the maximum amount of water is drained from the unit). Open the hot tap closest to the unit and open the draining tap.

WARNING: WATER DRAINED OFF MAY BE VERY HOT!

ANNUAL SERVICING

A competent installer should carry out the following checks on an annual basis, ideally at the same time as the annual boiler service.

- 1) The expansion relief valve on the inlet control set should be eased open allowing water to flow for 5 seconds. The valve should then be closed making sure it re-seats correctly. Repeat this procedure with the pressure/temperature relief valve. Always ensure that the discharge pipework is allowing the water to drain away adequately. If not check for blockages etc. and clear.

WARNING: THE WATER DISCHARGED MAY BE VERY HOT!

- 2) Ensure that any immersion heaters that are fitted are working correctly and that they are controlling the water at a temperature of between 55°C and 65°C.
- 3) Make sure the pressure in the expansion vessel is charged to 3 bar. Turn off the water supply to the unit and open a hot tap first. The valve on the expansion vessel is a Schrader (standard car tyre) type. Air or CO2 can be used to repressurise the expansion vessel.
- 4) Remove the head on the inlet control set by unscrewing, and clean the mesh filter within.

YOUR WARRANTY MAY BE VOID WITHOUT PROOF OF ANNUAL SERVICING.

WARRANTY

The AquaFlo stainless steel vessel carries a transferable 25 year warranty against faulty materials or manufacture provided that:

- It has been correctly installed by a competent installer as per this document and all the relevant standards, regulations and codes of practice in force at the time.
- It has not been modified in any way, other than by Zip Heaters (UK) Ltd.
- No components supplied with the AquaFlo have been removed for unauthorized repair or replacement.
- It has not been misused, tampered with or subjected to neglect.
- It has only been used for the storage of potable water.
- It has not been subjected to frost damage.
- The unit has been serviced annually.
- The system is fed from a public water supply.
- The warranty period commences from the date of purchase subject to registration of the product within 60 days of installation.

Please note that invoices for servicing may be requested to prove that the unit has been serviced annually. All the components fitted to/or supplied with the AquaFlo carry a 2 year warranty.

EXCLUSIONS –THE WARRANTY DOES NOT COVER

The effects of scale build up. Any labour charges associated with replacing the unit or its parts. Any consequential losses caused by the failure or malfunction of the unit.

IN THE EVENT OF A PROBLEM CONTACT ZIP HEATERS ON 0845 602 4533 FOR ADVICE

USER INSTRUCTIONS

Your stainless system is automatic in normal use and requires only annual servicing. You should employ a competent installer to perform the annual servicing.

Zip Heaters service department can be contacted on 0845 602 4533 to arrange servicing or repair.

IF WATER IS FLOWING FROM THE SAFETY VALVES THROUGH THE TUNDISH THIS INDICATES A FAULT CONDITION AND ACTION IS NEEDED.

If this water is hot turn the boiler and/or the immersion heater off. Do not turn off the water until the discharge runs cool. The discharge may also stop.

CONTACT ZIP HEATERS ON 0845 602 4533 OR CALL A COMPETENT PLUMBER OUT TO SERVICE THE UNIT.

Tell them you have a fault on an unvented cylinder. Zip Heaters stock all the spare parts that may be required

ESSENTIAL CYLINDER INFORMATION

Maximum water supply pressure	12 Bar	Set opening pressure of combined T&P valve.....	7 Bar
Operating pressure	3 Bar	Immersed electric element rating.....	3kW
Maximum primary pressure (indirects only).....	3 Bar	Immersion heater length	14"
Expansion vessel charge pressure	3 Bar	Gross Weight.....	(See cylinder data table below)
Expansion valve setting.....	6 Bar	Storage capacity	(See cylinder data table below)

AquaFlo Direct

Model	Storage Capacity (L)	Height (mm) x 545 Dia	Weight Empty (kg)	Weight Full (kg)	Vol within 10°C of Set Temp. (L)	Heat up 3kW (mins)	Heat up 6kW (mins)	Heat up 9kW (mins)	Boost re-heat (mins)	Low level Immersion Elements	High level Immersion Elements	Standing Loss (kWh/day)
AF3090	90	727	21	111	73	76.0	-	-	-	1	0	1.07
AF3120	120	915	26	146	102	103.0	-	-	58.0	1	1	1.23
AF3150	150	1102	33	183	133	134.0	-	-	72.0	1	1	1.41
AF3180	180	1290	38	218	163	164.0	-	-	82.0	1	1	1.53
AF3210	210	1478	41	251	194	203.0	-	-	96.0	1	1	1.80
AF3250	250	1728	46	296	236	248.0	-	-	117.0	1	1	2.15
AF3300	300	2041	55	355	288	323.0	-	-	145.0	1	1	2.28

AquaFlo Indirect

Model	Storage Capacity (L)	Height (mm) x 545 Dia	Weight Empty (kg)	Weight Full (kg)	Vol Within 10°C of Set Temp. (L)	Indirect Heat Exchanger (kW)	Recovery Indirect (mins)	Boost re-heat (mins)	Low level Immersion Elements	High level Immersion Elements	Standing Loss (kWh/day)
AF4090	88	727	23	111	74	16.46	12.0	-	1	0	1.07
AF4120	118	915	30	148	105	16.46	16.0	-	1	0	1.23
AF4150	148	1102	38	186	132	18.55	17.2	-	1	0	1.41
AF4180	178	1290	42	220	160	18.55	20.4	-	1	0	1.53
AF4210	208	1478	45	253	188	18.55	22.0	-	1	0	1.80
AF4250	248	1728	51	299	232	22.00	25.0	117.0	1	1	2.15
AF4300	297	2041	60	357	285	22.00	34.0	145.0	1	1	2.28

AquaFlo Solar Compatible

Model	Storage Capacity (L)	Height (mm) x 545 Dia	Weight Empty (kg)	Weight Full (kg)	Vol within 10°C of Set Temp. (L)	Indirect Heat Exchanger (kW)	Solar Heat Exchanger (kW)	Dedicated Solar Capacity (L)	Recovery solar (mins)	Boost re-heat (mins)	Low level Immersion Elements	High level Immersion Elements	Standing Loss (kWh/day)
Solar Twin Coil													
AF5150	147	1102	40	187	132	18.55	16.46	77	25.0*	12.0#	0	1	1.41
AF5180	177	1290	45	222	160	18.55	18.55	95	26.3*	14.8#	0	1	1.53
AF5210	207	1478	48	255	188	22	18.55	101	31.2*	15.5#	0	1	1.80
AF5250	247	1728	53	300	232	22	22.00	107	33.0*	20.0#	0	1	2.15
AF5300	297	2041	63	359	285	22	22.00	121	41.0*	25.0#	0	1	2.28
Solar Direct													
AF6150	148	1102	38	186	102	-	16.46	80	25.0*	72.0	1	1	1.41
AF6180	178	1290	42	220	123	-	18.55	100	26.3*	82.0	1	1	1.53
AF6210	207	1478	45	253	143	-	18.55	116	31.2*	96.0	1	1	1.80
AF6250	248	1728	51	299	175	-	22.00	137	33.0*	117.0	1	1	2.15
AF6300	298	2041	60	358	210	-	22.00	160	41.0*	145.0	1	1	2.28

* Re-heat times based on BS12897 parameters with an 80°C primary flow at 15 l/min.

Using Indirect heat exchanger.

Actual performance when installed will vary considerably dependant on the rate of solar or other renewable input, number of panels etc.

NOTE: It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice.

IMPORTANT: No liability is accepted for incorrect use or installation of this product.



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