



DESIGN AND INSTALLATION INSTRUCTIONS

**A MAINS
PRESSURE HOT
WATER SUPPLY,
INCORPORATING A
THERMAL STORE**



**ALL MODELS COMPLY WITH THE WMA SPECIFICATION FOR
THERMAL STORES.**

**PLEASE LEAVE THESE INSTRUCTIONS ADJACENT TO THE
APPLIANCE.**

Issue 2 : 09-04

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These instructions should be read in conjunction with the installation/servicing instructions issued by the manufacturer of the heat source being used.

Any installation must be in accordance with the relevant requirements of the Gas Safety Regulations, Local Building Regulations, I.E.E. Wiring Regulations and Byelaws of the Local Water Undertaking. It should be read in accordance with the relevant recommendations of the following:

BS 6798; BS 5549; BS 5546;
BS 5440:1; BS 5440:2; CP 331:3
BS 6700; BS 5258 and BS 7593: 1992

It must be installed by a competent person as stated in the Gas Safety Regulations. Manufacturers notes must NOT be taken as over-riding statutory obligations.

Torrent is not covered by Section G3 of the 1985 Building Regulations and is therefore not notifiable to the Building Control Office.

Although the secondary supply (domestic) is at mains pressure, it is not necessary to fit an expansion chamber, pressure or temperature relief valve.

This information is provided to assist generally in the selection of equipment.

Responsibility for selection and specification of our equipment must however remain that of our customer and any experts or consultants concerned with the installation(s).

PLEASE NOTE: THAT WE DO NOT THEREFORE ACCEPT ANY RESPONSIBILITY FOR MATTERS OF DESIGN SELECTION OR SPECIFICATION, FOR THE EFFECTIVENESS OF AN INSTALLATION OR UNIT CONTAINING ONE OF OUR PRODUCTS.

All goods are sold subject to our Conditions of Sale which are set out at the rear of this specification. In the interest of continuously improving the Torrent range, Gledhill Water Storage Limited reserve the right to modify the product without notice, and in these circumstances this booklet, which is accurate at the time of printing, should be disregarded. An updated set of Instructions will be produced and supplied with new appliances and available on request.

A WRAS LISTED PRODUCT DEVELOPED BY GLEDHILL WATER STORAGE IN THE 1980'S IN CONJUNCTION WITH BRITISH GAS PLC.

BRITISH PATENT NOS. 1358166, 2136099
BRITISH PATENT APPLICATIONS PUBLISHED UNDER NOS. 2136099, 2153503, 2153504, 8516025

DESCRIPTION

INTRODUCTION

Torrent is a range of primary thermal stores designed to provide mains pressure hot water without the requirements of a pressure and temperature relief valve. Notification to Building Control to comply with Section G3 of the Building Regulations is not required. This is because the thermal store is vented in the normal way. Unlike unvented storage cylinders the Torrent range of mains pressure hot water supply units require no maintenance. This reduces running cost for the home-owner while offering high performance showers and higher flow rates to fill a bath in approximately 4 minutes.

Torrent is available in two basic variants :-

1. **Torrent Direct** - For providing hot water heated by electricity. (Figure 1)
2. **Torrent Indirect** - For use with gas or oil boilers. (Figure 2)

TORRENT DIRECT (Figure 1)

Torrent Direct is an electrically heated, fully packaged mains pressure hot water appliance. It is a combination unit which incorporates a feed and expansion tank, and eliminates the problems associated with a cold water cistern in the roof space.

It is supplied complete with two low watts density immersion heaters for extra quiet operation as recommended by the Electricity Council and BEAB approved for safety.

“Draw-off” for baths and “flow” for power showers are fed from this one compact unit which means there are more siting options, maximising building design flexibility.

Torrent direct models are listed in Table 1.

TORRENT INDIRECT (Figure 2)

Torrent indirect is a mains pressure vented hot water cylinder designed for use with gas or oil boiler and is suitable for both open vented and sealed heating systems.

Torrent indirect models are listed in Table 2.



F & E tank supplied separately with indirect models

Direct models have the F & E tank included within the case

TORRENT - DIRECT

This is a thermal store directly heated by electric immersion heater. The feed and expansion cistern is included in the finished case with the feed and vent pipe factory supplied and connected.

INSTALLATION

Ensure that the water level in the feed and expansion cistern is set correctly when filling manually or by adjusting the ball valve before switching on the electricity supply to the unit.

It is an important part of the commissioning procedure to ensure that the thermostat settings are accurate by allowing the tank sufficient time to heat up and switch off without reaching boiling point. Thermostats are pre-set to 77°C. The upper immersion heater need only be used for day time topping up if necessary.

NOTE: NEVER COMMISSION ELECTRICAL INSTALLATIONS TO THE APPLIANCE UNTIL THE WATER IN THE F & E TANK IS UP TO THE WATER LEVEL MARK. FAILURE TO DO SO WILL DRY FIRE THE IMMERSION HEATERS.

If it is necessary to replace the immersion heater these should be obtained complete with pre-set thermostat from your Local Gledhill Depot.

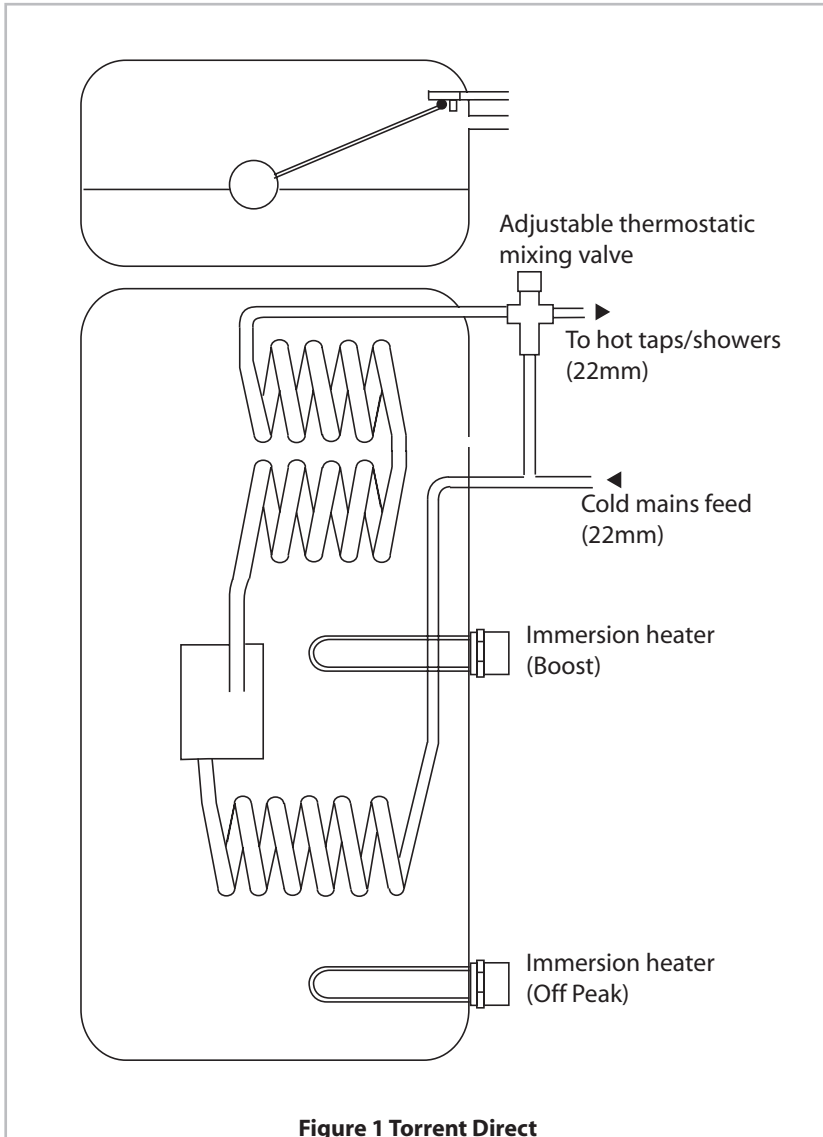


Figure 1 Torrent Direct

TABLE 1 TORRENT DIRECT MODELS (Figure 1)

Model	Capacity Store (litres)	Hot Flow Rate (litres)	Dimensions mm Includes F & E Tank	Min Cupboard Size	Suggested Dwelling Type
			Height x Diameter	Width x Depth x Height	
T144 DE	160	15	1650 x 520	700 x 600 x 1900	1 - 2 bedrooms 1 bathroom
T210 DE	230	15	1870 x 570	750 x 600 x 2120	2 -3 bedrooms 1 bathroom / 1 shower
All models	Off peak immersion heater : 3kW; 230V; 50Hz (Type 2) On peak immersion heater : 3kW; 230V; 50Hz (Type 2) Mains pressure working : 1.5 - 3.5 bar (All proprietary equipment must be suitable for a maximum working pressure of 10 bar).				

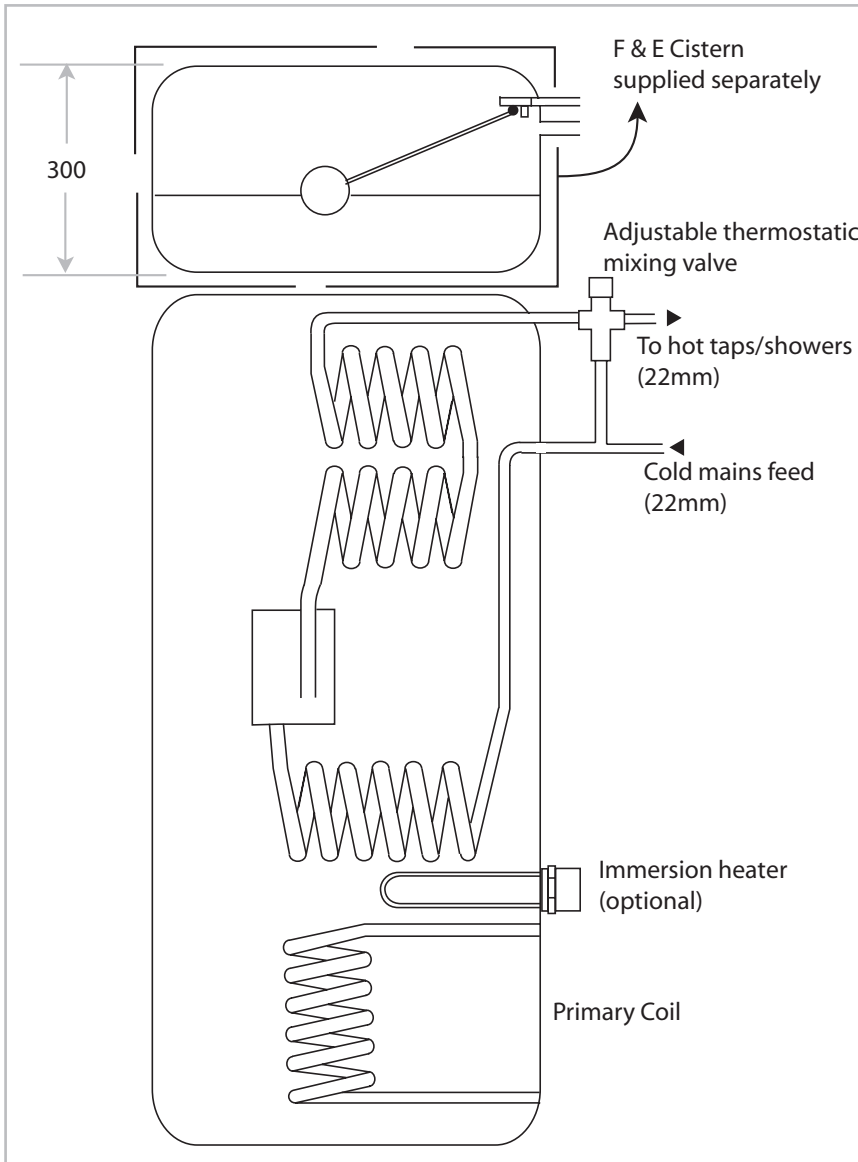


Figure 2 Torrent Indirect

TORRENT - INDIRECT

In an open-vented heating (Figure 5) the primary store and the heating circuit are filled from the same feed and expansion tank, supplied separately. Therefore the water treatment can be introduced through the feed and expansion tank. When calculating the quantity of water treatment, the volume of thermal store should be taken into account.

In a sealed heating system (Figure 6) the primary store water does not mix with sealed heating circuit. Therefore water treatment must be introduced via header tank for the primary store and via radiator for the heating circuit.

BOILER SIZING

It is only necessary to calculate the heating requirements in accordance with BS 5449. The allowance for domestic hot water (shown in the table below) depends upon the operating mode selected for the 3 port-valve. For example; if the system is designed to operate with priority to domestic hot water, i.e. full divert, then no additional allowance for hot water is required for sizing the boiler.

Allowance for Domestic Hot Water		
Model	Allowance for Domestic Hot Water (kW)	
	Full Divert Mode	Flow Share Mode
T130	0	2
T170	0	3
T200	0	3.5

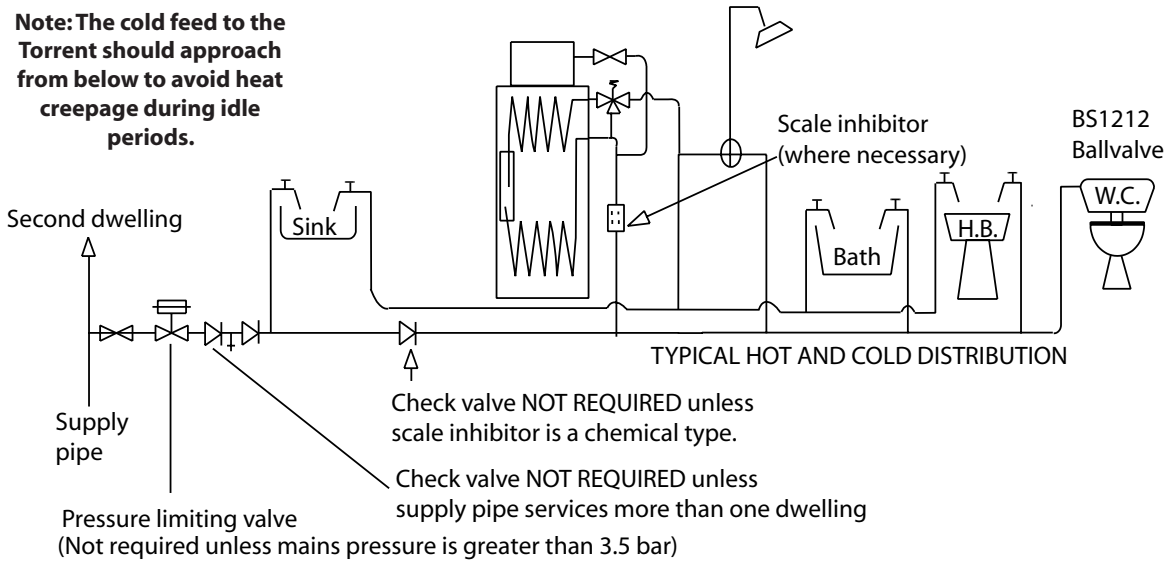
The primary pipework connecting the boiler and the thermal store should be sized to achieve a maximum of 11°C rise across the boiler or the maximum temperature rise specified by the boiler manufacturer. But in any instance it should not be less than 22mm copper tube.

TABLE 2 TORRENT INDIRECT (Figure 2)

Model	Nominal Store capacity	Hot water flow rate	Dimensions of thermal store over insulation (Not including F & E Tank)	Minimum cupboard size	Suggested dwelling type
	Litres	l/min	height x dia	width x depth x height	
T130	130	18	1250 x 525	700 x 600 x 1800	2/3 bedroom house with one bathroom and separate en-suite shower room
T170	170	18	1450 x 525	700 x 600 x 2000	2/4 bedroom house with one bathroom and one or two separate en-suite shower rooms
T200	190	25	1600 x 525	700 x 600 x 2150	3/4 bedroom house with one bathroom and up to 3 separate en-suite shower rooms or 2 bathrooms and 2 separate en-suite shower rooms

All Models * Maximum working pressure Primary thermal store = 6m Primary heating coil = 3.0 bar
 * Standard Components Control thermostat, DHW mixing valve.

Figure 3 Hot and Cold Distribution Pipe Arrangement - All Models



COLD AND HOT WATER DISTRIBUTION DESIGN - ALL MODELS

Torrent models are designed to be fed directly from mains. They fulfill the requirements of Water Byelaw 91, and therefore **do not require a check valve** to be fitted to the supply pipe. The performance of the Torrent is directly related to the adequacy of the cold supply to the dwelling. This must be capable of providing for those services which could be required simultaneously and the maximum demand should be calculated. Torrent will operate at dynamic pressures as low as 1.5 bar (at the appliance) which must be available when local demand is at its maximum, but the preferred range is between 2 and 3.5 bar.

As a general guideline, although a 15mm external service may be sufficient for the smaller dwelling with one bathroom, a 22mm service is preferred (25mm MDPE) and should be the minimum for larger dwellings.

If a water meter is fitted in the service pipe, it should have a nominal rating to match the anticipated maximum simultaneous hot and cold water demand, calculated in accordance with BS 6700. This could be 50 litres per minute in some properties.

If the incoming static mains water pressure exceeds 3.5 bar at any point in the 24 hour cycle then a pressure limiting valve set at 3.5 bar should be fitted downstream of the stop tap where the cold supply enters the property. Units must be fitted strictly in accordance with the requirements of the Local Water Undertaking who should be consulted prior to installation. In the event of any difficulty please contact us as the manufacturer. Equipment used in the system should be suitable for a working pressure of 10 bar.

A typical arrangement for the hot and cold water system is shown in Figure 3.

BALLVALVE/OVERFLOW - ALL MODELS

Because it supplies the whole of the primary/heating system a ballvalve and overflow must be installed in the feed and expansion cistern when the Torrent Indirect is used in an open vented heating system. A ballvalve and overflow can also be fitted with Torrent Direct models or Torrent Indirect models fitted in sealed primary heating systems.

However because it only supplies the thermal store the feed and expansion cistern on these two appliances/systems can be filled manually if required ie through a hose pipe fitted with a double check valve. In this situation an overflow can still be fitted if required to ensure that if a leak occurs on the internal coils it can be discharged safely to the outside of the building and not discharge internally from the feed and expansion cistern itself. **If a ballvalve is fitted a warning/overflow pipe must always be fitted.**

USE IN HARD WATER AREAS - ALL MODELS

The patented design of the heat exchange module is such that the turbulence through the coil slows down the formation of scale in even the hardest water conditions, at normal operating pressures. However, where the water can be considered hard, it is recommended that an effective proprietary in-line scale inhibitor is installed. It is important that where the supply to the Torrent is in 22mm the in-line descaler is also 22mm. In practice servicing is not normally required but in hard water areas requirements can be considered similar to those needed for instantaneous or 'combi' appliances. The installation of the scale inhibitor should be in accordance with the manufacturers instructions and with the Water Byelaws.

PLASTIC PIPEWORK - ALL MODELS

This appliance is suitable for use with plastic pipework as long as the material is recommended for the purpose by the manufacturer and is installed fully in accordance with their recommendations. We recommend the use of barrier pipe for heating systems, which will mean the system can have British Gas service cover in regions offering this service. A short 300mm length of copper pipe must be fitted at the hot outlet from the thermostatic mixing valve.

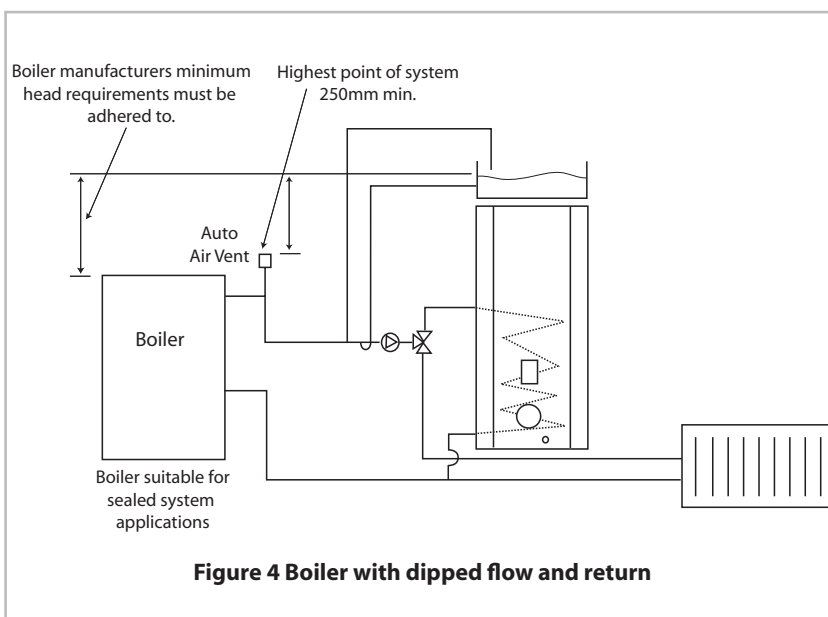
WATER TREATMENT

In all Torrent models treating the primary water will not contaminate domestic hot water supply.

TORRENT INDIRECT - OPEN VENTED HEATING SYSTEM (FIGURE 4)

The open vented primary system is filled via the feed and expansion cistern supplied. It is therefore important that the unit is positioned at the highest point in the system. Ensuring that the minimum head for the boiler and system pump is as required by the boiler manufacturers.

- 1) If the flow and return pipes between the boiler and Torrent - Indirect store are dipped then the boiler selected must be suitable for use in a sealed heating system i.e. it must be fitted with an overheat thermostat (Figure 4).
- 2) Any boiler can be used with Torrent- Indirect provided the flow pipe from the boiler to the Torrent is continuously rising. (Figure 5)
- 3) The flow pipe between the boiler and the Torrent thermal store is part of the open vent and therefore it must not be fitted with any isolating valve, non-return valve or any other component which can obstruct the flow.
- 4) The minimum size of flow and return pipes between the boiler and the Torrent should be 22mm copper or equivalent.
- 5) Where the radiators are to be fitted higher than the Torrent, then, the feed and expansion cistern can be sited at higher level but a maximum 6m from the base of the Torrent. The water level must be at least 250mm higher than the highest radiator in the system. (Figure 5)
- 6) The installer must fit the feed and vent pipes ensuring continuous rise on the open vent and no isolating valves in either open vent or cold feed pipes. A combined feed and vent pipe should not be used with Torrent.
- 7) The installer must fit the close coupled open vent and cold feed pipes for heating circuit as shown schematically in Figures 4 and 5.
- 8) The primary thermal store and the heating systems are filled from the same feed and expansion cistern.
- 9) It is important to ensure that both the primary store and the system are fitted and vented before switching on the boiler and the immersion heater if fitted.



10) The water level must be set correctly by adjusting the ball valve in the F & E cistern. A 22mm connection is provided for the overflow/warning pipe, which should be no less than 20mm internal diameter and have a continuous fall.

11) This should be fitted to discharge clear of the building and be situated so that any overflow can be easily observed. The warning pipe should be installed in either high temperature uPVC or copper and should not have any other connections to it. Alternatively the Torrent thermal store can be filled by a temporary connection without the use of a ball valve or requirement for an overflow/warning pipe.

IMPORTANT: Care must be taken to ensure the unit is filled to the correct water level when using a temporary connection. It is also important to ensure the unit does not overflow when filling.

TORRENT INDIRECT - SEALED HEATING SYSTEM (FIGURE 6)

1. Only boilers suitable for sealed system must be used in this configuration and a typical arrangement is shown in Figure 6.
2. The feed and expansion cistern may be sited above the Torrent in the same cupboard.
3. The F & E cistern on sealed heating system only fills the thermal store. Therefore the provision must be made for filling the primary radiator/boiler circuit by incorporating approved filling loop and method.
4. The water level must be set correctly in the F & E cistern when filling manually or by adjusting the ball valve. A 22mm connection is provided for the overflow/warning pipe, which should be no less than 20mm internal diameter and have a continuous fall.
5. This should be fitted to discharge clear of the building and be situated so that any overflow can be easily observed. The warning pipe should be installed in either high temperature uPVC or copper and should not have any other connections to it.
6. It is important to ensure that both primary store and the system are fitted and vented before switching on the boiler and the immersion heater if fitted.

INSTALLATION

Note : F & E tank can be positioned up to 6M above the base of the Torrent.

This needs to be done when radiators are fitted above the level of the unit. F & E tank water level must be 250mm min. above the highest point in the primary system.

The boiler manufacturers instructions with regard to minimum head must be followed.

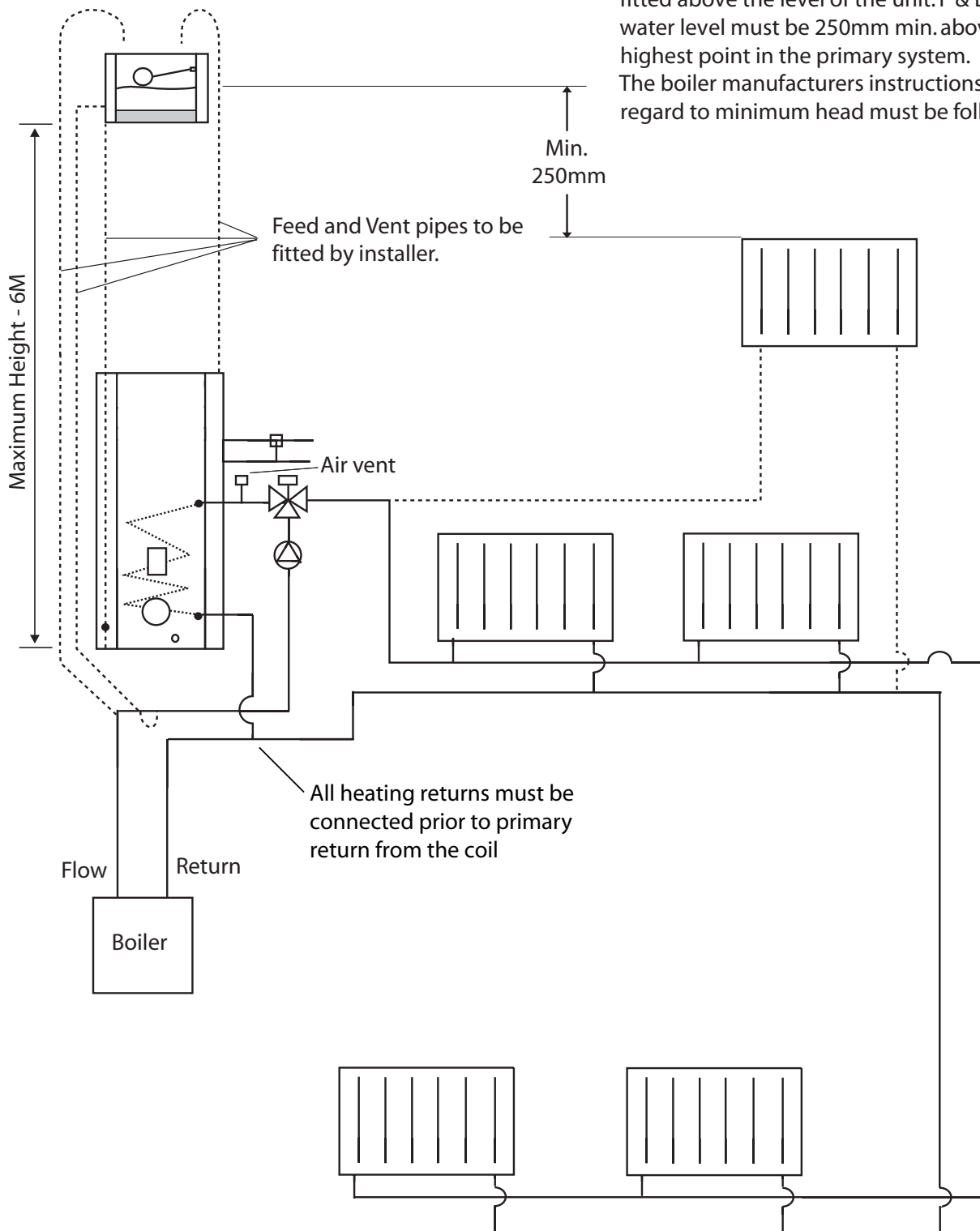


Figure 5

Note : F & E tank on sealed system only required to fill Thermal store.
 Primary radiator system filled from mains.

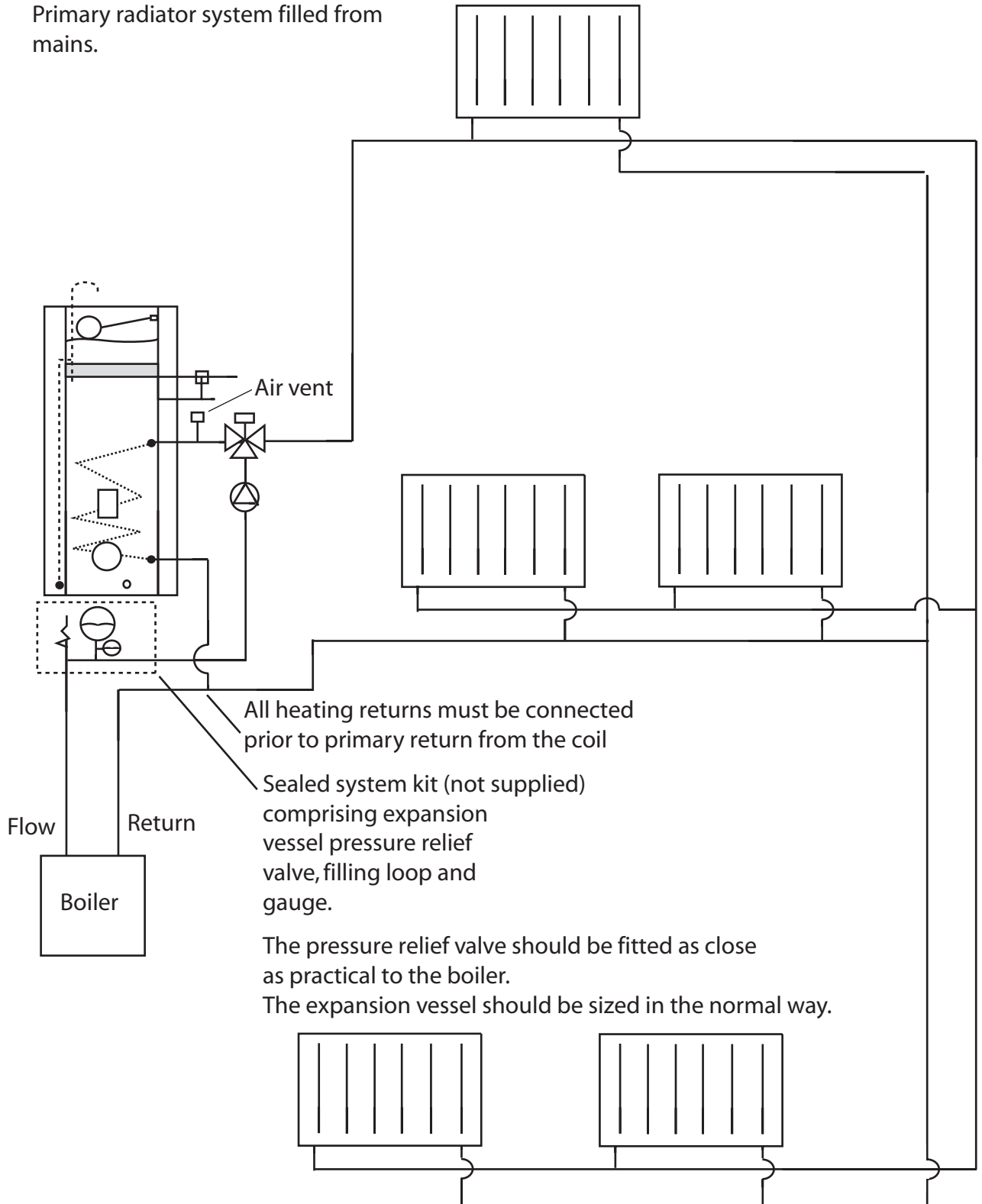


Figure 6

COMMISSIONING

TORRENT DIRECT

Direct Electric Model

Ensure that the thermal store cistern is filled with water to the water level mark inside the feed cistern and the ballvalve (if fitted) is set correctly.

Switch the immersions on and allow the store to heat up to its full temperature (around 77°C).

When the store has been fully charged open the nearest hot tap and check the mixing valve at the Torrent unit is delivering the desired temperature. (Note:- the mixing valve is factory set around 55°C ±5°). Adjust if necessary to suit individual requirements.

ELECTRICIAN/INSTALLER

PLEASE NOTE WATER AT THE HOT TAP DOES NOT INDICATE THAT THE CYLINDER IS FULL.

CHECK THAT THERE IS WATER IN THE FEED AND EXPANSION TANK BEFORE SWITCHING ELECTRICITY ON TO THE IMMERSION HEATERS. "DRY FIRING" THE ELEMENTS WILL CAUSE PREMATURE FAILURE WHICH IS NOT COVERED BY OUR NORMAL WARRANTY.

TORRENT INDIRECT

- Ensure that the thermal store cistern is filled with water to the water level mark inside the feed cistern and the ballvalve (if fitted) is set correctly.
- Ensure that the store thermostat is set at 70°C. Check the **boiler control thermostat is set at maximum. When the boiler switches off check that the store thermostat is not calling for heat and is satisfied. The boiler may cycle two or three times to achieve this.**
- When the store has been fully charged open the nearest hot tap and check the mixing valve at the Torrent unit is delivering the desired temperature. (Note:- the mixing valve is factory set around 55°C ±5°). Adjust if necessary to suit individual requirements.

It is essential that the system functions properly for optimum performance. To achieve this, the system should be commissioned in accordance with good practice and generally in accordance with the requirements of BS 6798, BS 5449 and BS 7593: 1992.

- Fill the system and flush cold.
- Refill the system.
- Add a cleanser such as Fernox Superfloc or Sentinel X300 to ensure that flux residues and installation debris are removed from the system. **When determining the quantity of cleanser required, on open vented systems, be sure to allow for the increased volume of water in the primary circuit due to the thermal store.**
- Commission the boiler.
- **If the boiler is range rated, then adjust to the specified design heat input.**
- Set the pump between boiler and Torrent to a temperature difference across the boiler between 8 - 11°C.

- To ensure full cleansing, circulation to all parts of the system should continue for a minimum of 1 hour.
- Flush the system hot having checked that there is no overflow when the system is up to temperature.
- Refill the system.

Although the standard Torrent has no special water treatment requirements, the radiators and other parts of the circuit will benefit from the application of a corrosion and scale inhibitor, such as Fernox MBI or Sentinel X100. **When determining the quantity of inhibitor required, on open vented systems, be sure to allow for the increased volume of water in the primary circuit due to the thermal store. Set the boiler to maximum.**

With the central heating system off, let the system heat up (1.5 hours - 2 hours approximately).

- Check that the space heating system controls are functioning correctly i.e. **CLOCK AND ROOM THERMOSTAT.**
- Switch off space heating system.
- Ensure that the store thermostat is set to 70°C.
- Ensure that the boiler thermostat is set to maximum.
- Establish that the temperature difference between the flow and return at the boiler is not more than 11°C. If it is more than 11°C, and the pipes are sized correctly, then check that in accordance with good practice, air air vents have been fitted at high points. Increase the pump setting if necessary. Check for obstructions in the pipework.

Final Setting of Store Thermostat

Ensure that the heating clock is set to "off". Refire the boiler by running a little water, wait for the boiler to switch off. Check that there is no live supply from the store thermostat and the stat has been satisfied.

Important Do's and Don'ts

- DO -** Check the incoming mains water pressure. If it exceeds 3.5 bar at any point in the 24 hour cycle then a pressure limiting valve set at 3.5 bar should be fitted where the cold supply enters the property.
- DO -** Check that all connections are in accordance with the labelling on the thermal store.
- DO -** Fill the cistern manually or adjust the ballvalve so that the water in the F & E cistern is set to the correct level.
- DO -** Restrict the ballvalve fill rate when full so that the overflow pipe can cope with the fill rate in the event of a ballvalve failure.
- DO -** Make sure there is adequate clearance above the F & E cistern to service the valve.
- DO -** Ensure that range-rated appliances are set **to the specified design heat input and the boiler thermostat is set to maximum for all boilers.**
- DO -** Ensure that the water level in the expansion cistern is at least 250mm above the highest point on the radiator circuit and satisfies the boiler head required.
- DO -** Insulate any exposed pipework in the Torrent cupboard.
- DO -** Plumb the overflow warning pipe in 20mm minimum internal diameter tubing to discharge in a conspicuous external position, using high temperature uPVC or copper.
- DO -** Check the pump setting. This should be set as high as possible (consistent with not creating noise) so as to give a small temperature difference across the boiler, i.e. not greater than 11°C.
- DON'T -** Use a combined feed and vent on Torrent indirect installations.
- DON'T -** Use tube smaller than 28mm between boiler and Torrent when the boiler exceeds 60,000 Btu (17kW) output.
- DON'T -** Use dipped flow and return pipes between boiler and Torrent unless the boiler is fitted with an overheat switch.
- DON'T -** place any clothing or other combustible materials against or on top of this appliance

SERVICING

In situations where scale inhibitors have not been fitted and the hot water service has deteriorated a Torrent can be descaled very easily with equipment available from Gledhill.

You can now do the whole job easily and efficiently on site - and do it under the hour.

The operation is carried by a VORTEX DECALOMAT-3 Descaling Unit which removes the scale chemically. By simply replacing the thermostatic mixing valve on the hot water outlet with the special adaptor valve supplied, descaling solution is pumped through the secondary coil (see figure 7). After approximately 45 minutes the job is done and the mixer valve is put back in place. The solution is made up of 2kg of either Sentinel ScaleClean or Fernox DS-3 descaling powder dissolved in 20 litres of water (preferably warm but not exceeding 70°C). The powders are manufactured with a colour indicator which changes as the active ingredients are used up.

TO DESCALE TORRENT USING DECALOMAT-3

1. Before descaling turn the boiler off and run the hot water tap until the thermal store is below 40°C.
2. Turn off the mains water supply at stop tap supplying the Torrent.
3. Open a hot tap on the hot water system.
4. Break the three unions securing the Oventrop mixing valve to the Torrent and remove the Oventrop mixing valve making sure a container is in place to collect spillage.
5. Attach the adaptor to the Torrent - two unions and washers.
6. Close all hot taps on the DHW system.

TO CHARGE DECALOMAT-3

7. Unscrew the large cap adjacent to the carrying handle.
8. Make sure that the hoses are connected together with the brass nipple.
9. Partly fill the Decalomat-3 with 20 litres of Sentinel ScaleClean solution or Fernox DS-3 solution (the solution should be 2kg of powder dissolved in water).

Note: This solution is ACIDIC and MUST be handled with CARE. It is a wise precaution to do the mixing, filling and emptying outside the premises.

Observe the manufacturers handling instructions.

10. Replace the filling cap on the Decalomat-3.
11. Break the joint between the hose (keeping both hoses above the level of the Decalomat-3) retaining the brass joining piece.
12. Attach the hoses to the adaptor (ensure that the unions are finger tight on the 3/4" BSP male connectors to the adaptor).
13. Loosen the filling cap on the Decalomat-3 to allow carbon dioxide formed in the descaling process to escape.
14. Plug the Decalomat-3 to a 240V 50Hz electric supply. The pump in the Decalomat will now circulate the coloured descaling solution through the heat exchanger coil of the Torrent. Depending on the degree of scale formation within the coil, the following may be observed:-

WITH SENTINEL SCALECLEEN

1. The red solution will be observed in one of the transparent plastic tubes, foam and an orange/yellow liquid may be seen in the other tube.
2. Flow of the red liquid may initially be intermittent due to:
 - a. Gas formation in the coil as the Sentinel ScaleClean attacks the scale.
 - b. Degree of blockage - this stage may exist for about half an hour.
3. Continuous flow will begin with the red Sentinel ScaleClean solution in one pipe and a foaming solution in the other.
4. If after some time, the colour in both pipes has turned to yellow (no gas bubbles are observed), the Sentinel ScaleClean is now exhausted and requires changing.
5. When the solution in both tubes remains red or orange and no gas bubbles are observed, the coil has been descaled.

WITH FERNOX DS-3

1. The yellow solution will be observed in one of the transparent plastic tubes, foam and a greenish blue liquid may be seen in the other tube.
2. Flow of the yellow liquid may initially be intermittent due to:
 - a. Gas formation in the coil as the Fernox DS-3 attacks the scale.
 - b. Degree of blockage - this stage may exist for about half an hour.
3. Continuous flow will begin with the yellow Fernox DS-3 solution in one pipe and a foaming solution in the other.
4. If after some time, the colour in both pipes has turned to green (no gas bubbles are observed), the Fernox DS-3 is now exhausted and requires changing.
5. When the solution in both tubes is still yellow and no gas bubbles are observed, the coil has been descaled.

TO REMOVE DECALOMAT-3

1. Unplug Decalomat-3 from electrical supply.
2. Tighten the filling cap on the Decalomat 3.
3. Remove the two hoses from the adaptor.
4. Join the hoses with brass connector piece.
5. Remove adaptor.
6. Replace Oventrop mixing valve - **ensuring that it is the correct way round.**
7. Open a hot tap - preferably to a porcelain sink.
8. Turn on the mains water supply to Torrent.
9. Allow the system to flush via the open hot tap for some minutes, then flush out system at each hot tap.

SERVICING

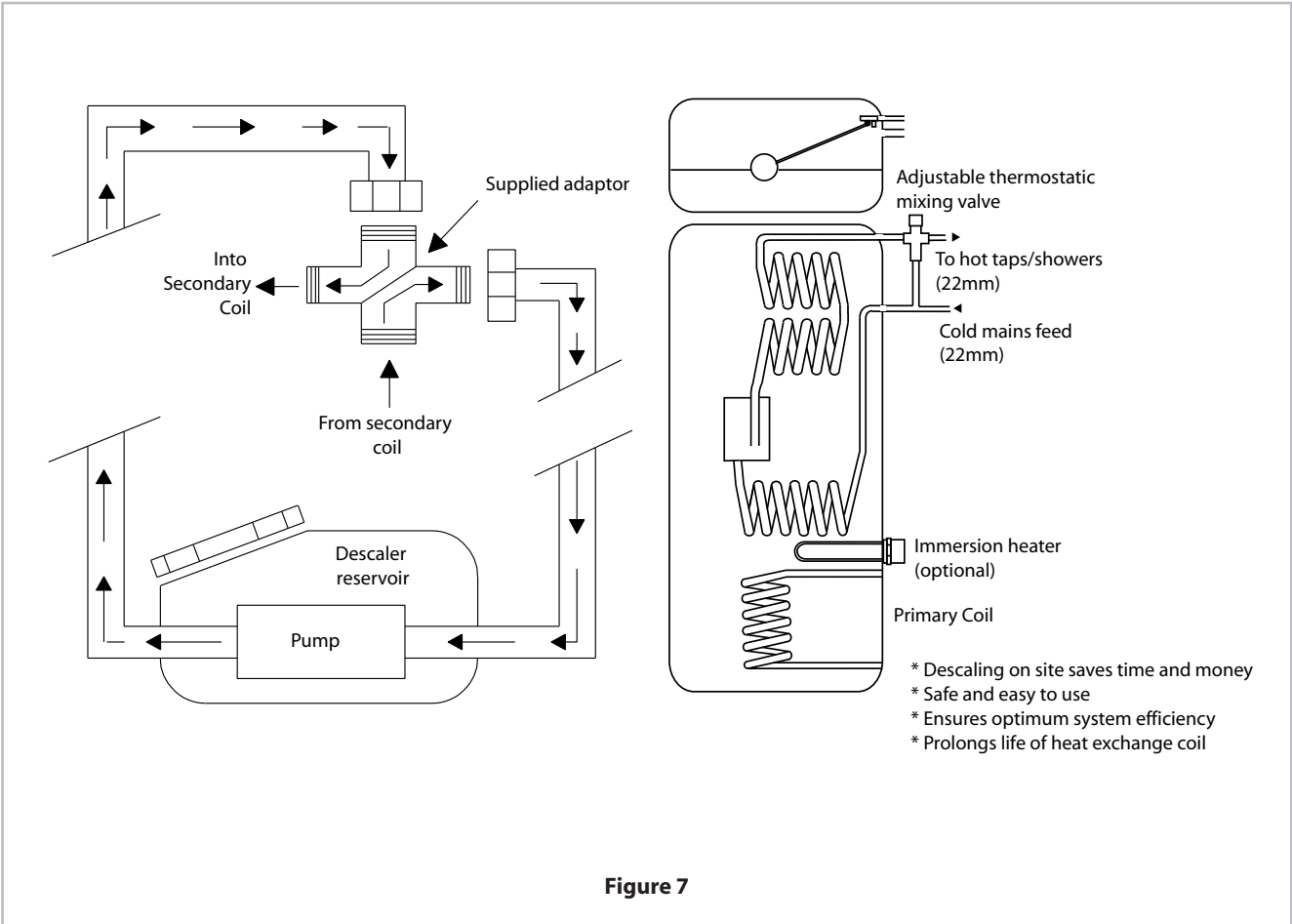


Figure 7

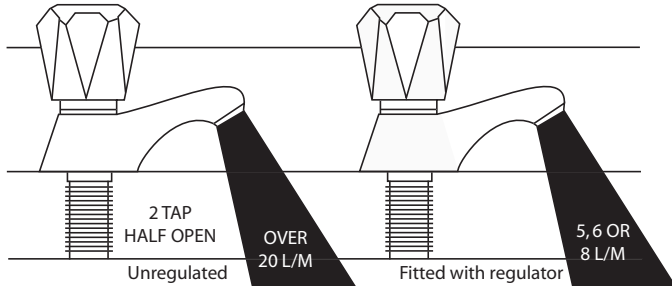
ANNUAL SERVICING

No annual servicing of the Torrent is necessary.

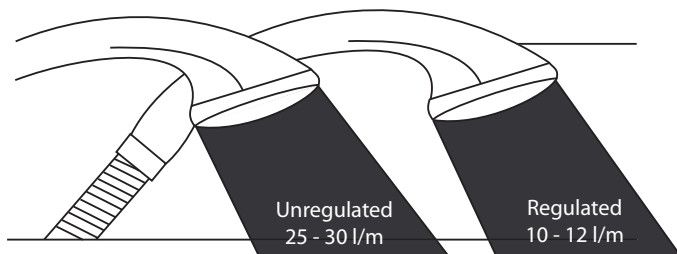
WATER SAVINGS

WATER RELATED COSTS CAN BE REDUCED BY GOOD PLUMBING PRACTICE.

TAPS & MIXERS



SHOWERS



Vast quantities of water are needlessly run off to waste due to Taps, Mixers and Showers discharging flow rates far in excess of the rates required for them to perform their duties.

The contrasting flow rates shown on this leaflet clearly illustrate the savings that can be made whilst still providing a good performance.

British made Aquaflow Regulators provide constant flow rates by automatically compensating for supply pressure changes between 1 bar & 10 bars.

To facilitate installation into the wide range of plumbing equipment which is encountered in the U.K, Four Fixing Options are available:-

OPTIONS FOR SHOWERS

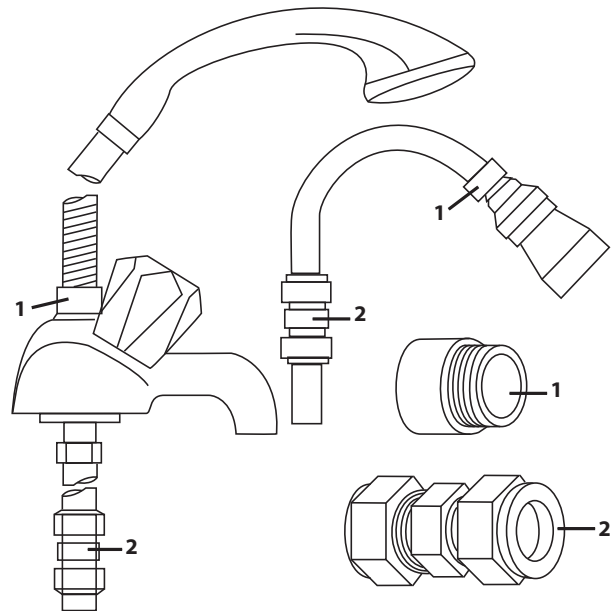
1. MXF "DW" Range - For fitting behind Fixed Shower Heads or onto Flexible Hoses for Handshowers (preferably onto the inlet end when lightweight hoses are used).
2. Compression Fitting Range. "In Line" regulators as in Option 4 for Taps & Mixers.

Information by courtesy of

AQUAFLOW REGULATORS LTD

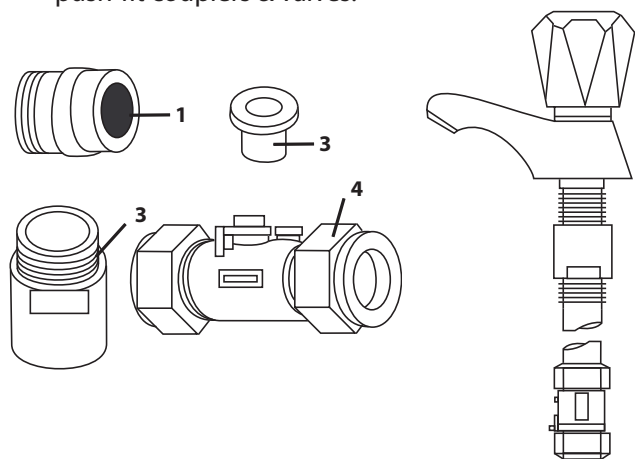
Haywood House, 40 New Road, Stourbridge, West Midlands DY8 1PA

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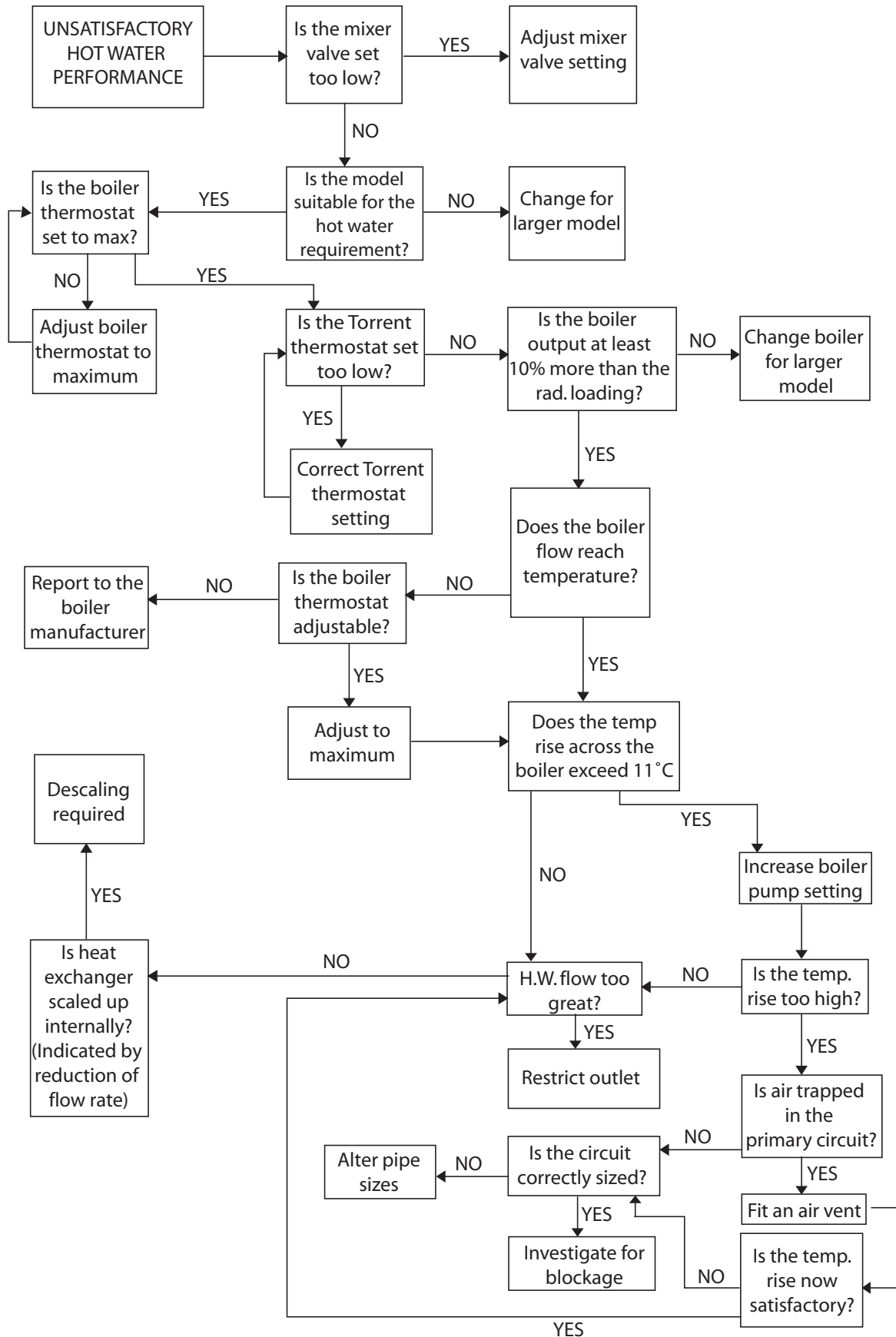


4 FIXING OPTIONS FOR TAPS & MIXERS

1. MK Range - Combined Regulators & Aerators for screwing onto Taps & Mixers with internal or external threads on their noses. Anti Vandal models also available.
2. MR05-T Range - Internal Regulators. Push-fit into Tap or Mixer seats. Produced in three sizes - 12.5mm (BS1010), 12mm & 10mm, Flangeless models also available for Taps with Low Lift washers.
3. MXF Standard Range - Screw on tail models for Taps & Mixers. Fix onto the tails before fitting the tap connectors. Available in 3/8", 1/2", 3/4" and 1" BSP.
4. Compression Fitting Range - "In Line" regulators housed in 15mm & 22mm CXC Couplers & Isolating Valves. "UK WFBS listed by the Water Research Centre. Isolation valves available for slotted screwdriver operation or with coloured plastic handles. Now available also in plastic bodied push-fit couplers & valves.



TORRENT INDIRECT FAULT FINDING



PARTS

Key No.	Description	Part No.	Gas Council Part No.
1	Ballvalve BS 1212 Part 2	FT207	370 505
2	Ballvalve Float	FT429	370 506
3	Mixing Valve - Brawa	XC007	385 872
4	Spare ring gasket for mixing valve	XC008	370 507
5	Immersion heater 3kW	XB078	E39 184
6	Control Thermostat	XC010	-
7			
8			
9			



Gledhill Building Products Ltd

AMD. MAY 2005

CONDITIONS OF SALE & WARRANTY TERMS

1. We only do business upon the Conditions which appear below and no other. Unless we so agree in writing these Conditions shall apply in full to any supply of goods by us to the exclusion of any Conditions or terms sought to be imposed by any purchaser. These Conditions of Sale and Warranty Terms override those which are contained on the Invoice Forms and all Sales are now subject to these Conditions of Sale and Warranty terms only.

2. PRICE

Orders are accepted at the price ruling at the date of receipt of order; this price is our last published list price plus a supplement to allow for any increase in the price of copper between the dates of publication of our price lists ("the copper price supplement"). An order may not be cancelled or varied after acceptance without the written consent of the company. Such cancellation or variation shall be subject to such reasonable charges as may be appropriate.

3. SPECIFICATION

The goods are supplied in accordance with the Specifications (if any) submitted to the Purchaser and any additions and alterations shall be the subject of an extra charge. Any goods not so specified shall be in accordance with our printed literature or the literature of any of our component suppliers (subject to any modifications made since publication). If we adopt any changes in construction or design of the goods, or in the specification printed in our literature, the Purchaser shall accept the goods so changed in fulfilment of the order.

4. PAYMENT

The invoice price of goods shall be payable within 30 days of despatch by us of our invoice for the goods or such longer time as may be stated by our quotation or invoice. If we receive payment in full on or before the due date we will allow an appropriate settlement discount except where we have quoted a special net price. If payment is not received in full on or before the due date we shall be entitled in addition to the invoice price to:

- (i) payment of a sum equal to any increase in the copper price supplement applicable to the particular goods sold between the date of receipt of order and the date of receipt of payment in full; and
- (ii) interest on any part of the invoice price unpaid after the due date at the rate of 3% per annum over the base rate for the time being of HSBC Bank plc.

5. TIME

We give estimates of delivery dates in good faith and time of delivery is not nor shall be made of the essence of any contract nor shall we be liable for any loss or damage occasioned by delay in delivery.

6. DELIVERY

We deliver free normally by our own vehicles within 25 miles of any of our manufacturing depots. Delivery to any place more than 25 miles from one of our manufacturing depots is subject to our quoted delivery charges. We reserve the right to make delivery of goods contained in one order by more than one consignment and at different times. Where a period is agreed for delivery and such period is not extended by our Agreement, the Purchaser shall take delivery within that period. If the Purchaser fails to take delivery, we shall be entitled at the Purchaser's risk and expense to store the goods at the Purchaser's premises or elsewhere and to demand payment as if they had been despatched. Off loading at point of delivery shall be the responsibility of and be undertaken by the Purchaser.

7. SHORTAGES OR DAMAGE

Goods must be inspected before signature of delivery note and any damage, shortage or discrepancy noted on the delivery note and the goods returned on the same vehicle. The buyer must also give us immediate written notice of the damage, shortage or discrepancy so that we may prompt investigation.

8. RETURN OF GOODS

Goods may not be returned to the Company except by prior written permission of an authorised officer of the Company and such return shall be subject to payment by the Purchaser of handling and re-stocking charges, transport and all other costs incurred by the Company.

9. COMPANY LIABILITY

All our goods are made of the best materials from reputable manufacturers and where stated are manufactured to the appropriate British Standard. Complaints must be given to us immediately, before any action is taken, as responsibility cannot be accepted if repairs or renewals are attempted on site without our written authority.

Defects caused by corrosion or scale deposits are not covered by this guarantee save as expressly provided in paragraph (4) of this Condition 9.

Where we agree to rectify any defect, we reserve the right to undertake the work on our own premises. The following guarantee covers faulty materials and manufacture for the stated period, **provided that**:

- The unit has been installed in accordance with our installation and service instructions and all relevant codes of practice and regulations in force at the time of installation.
- That all necessary inlet controls and safety valves have been fitted correctly.
- It has only been used for the storage of potable water supplied from the public mains.
- **Where appropriate the unit has been regularly maintained as detailed in the installation and service instructions.**

(1) **Domestic and Commercial Open Vented Cylinders and Tanks.**

If the copper cylinder or tank or any integral pipework proves to be defective either in materials or workmanship, we will either repair or supply replacement at our option with the closest substitute in the case of any obsolete product to any address in Great Britain.

- (a) free of all charge during the first year after delivery by us.
- (b) thereafter at a charge of one-tenth of the then current list price and any copper price supplement and delivery charge during the second year after delivery by us and increasing by a further one-tenth on the second and subsequent anniversary of delivery by us.

AND FURTHER we will meet the contractors/installers reasonable costs in removing and replacing any defective Open Vented Copper Cylinder or Tank with defective integral pipework as follows:

(i) in the case of vessels of less than 80 imperial gallons capacity up to a maximum of one-half of the extent of our liability in regard to the replacement product expressed in (1) (a) and (b) above

ii) in the case of vessels larger than 79 imperial gallons capacity up to a maximum of one-quarter of the extent of our liability in regard to the replacement product as expressed in paragraphs (1) (a) and (b) above.

(2) **Domestic Mains Fed Products**

If the copper storage vessel itself or any integral pipework as part of the storage vessel assembly proves to be defective either in materials or workmanship, we reserve the right to either repair or supply replacements or the closest possible substitute in the case of any obsolete product and will collect and deliver to any address in England, Wales and Scotland (excluding all Scottish Islands).

(a) free of all charge during the first year after delivery by us.

(b) thereafter at a charge of one-fifth of the then current list price or any copper price supplement and delivery charge during the second year after delivery by us increasing by a further one-fifth on the second and subsequent anniversary of delivery by us.

AND FURTHER we will meet the contractors/installers reasonable costs in removing and replacing any defective copper storage vessel or storage vessel with defective integral pipework from the Domestic Mains Pressure Range of products up to a maximum of one-third of the extent of our liability in regard to the replacement product expressed in (2) (a) and (b) above.

(3) **Gledhill Boiler/Combi**

Gledhill guarantees the heat exchanger (boiler) for material and construction faults for two years and FURTHER we will meet the installer/contractors reasonable costs in removing and replacing any DEFECTIVE heat exchanger up to a MAXIMUM of one third of the extent of our liability in regard to the replacement product.

THE RESPONSIBILITY FOR THE EXECUTION OF THIS GUARANTEE LIES WITH THE INSTALLER.

The guarantee becomes null and void if the appliance is used incorrectly, or in the event of proven negligence or incorrectly implemented repairs **OR FAILURE TO CARRY OUT THE RECOMMENDED INSPECTION/MAINTENANCE.** The guarantee also becomes null and void if changes are made to the appliance without our knowledge, or if the serial number on the appliance is removed or made illegible.

The annual service must be carried out by a competent installer in accordance with the advice given by Gledhill and using Gledhill approved parts.

(4) **Components of our products other than Storage Vessels and Integral Pipework.**

We will either extend to the purchaser the same terms of warranty as we are given by the manufacturer of the component or if the manufacturer does not give any warranty, replace free of charge any component which becomes defective within twelve months after the date of the delivery by us and is returned to us at the purchaser's expense but we shall not meet the cost of removal or shipping or return of the component or any other cost charges or damages incurred by the purchaser.

If the appliance manufactured by Gledhill incorporates a factory fitted scale inhibitor then during the period of three years from the date of delivery Gledhill will replace, free of charge, any plate heat exchanger fitted in the appliance as original equipment in which scale formation occurs that materially reduces the effectiveness of the plate heat exchanger. This guarantee does not extend to any other component installed within the Gledhill appliance or elsewhere in the Purchaser's domestic water system.

(5) **General**

In the case of goods manufactured solely in accordance with our specification and designs and in respect of any installation work carried out by or on our behalf, our entire liability and the purchaser's sole remedies (subject to (1-4) above) and shall be as follows:

(a) we accept liability for death or personal injury to the extent that it results from our negligence that of our employees agents or subcontractors.

(b) subject to paragraph (d) below, we accept liability for direct physical damage to tangible property to the extent that such damage is caused by our negligence that of our employees agents or subcontractors.

(c) our total liability to the purchaser over and above any liability to replace under (1 - 4) above (whether in contract or in tort including negligence) in respect of any one cause of loss or damage claimed to result from any breach of our obligations hereunder, shall be limited to actual money damages which shall not exceed £20,000 provided that such monetary limit shall not apply to any liability on the part of ourselves referred to in paragraph (a) above.

(d) except as provided in paragraph (a) above but otherwise notwithstanding any provision herein contained in no event shall we be liable for the following loss

or damage howsoever caused and even if foreseeable by us or in our contemplation :-

(i) economic loss which shall include loss of profits, business revenue, goodwill or anticipated savings.

(ii) damages in respect of special indirect or consequential loss or damage (other than death, personal injury and damage to tangible property).

(iii) any claim made against the purchaser by any other party (save as expressly provided in paragraph (b) above).

(e) except in respect of our liability referred to in paragraph (a) above no claim may be made or action brought (whether in contract or in tort including negligence) by the purchaser in respect of any goods supplied by us more than one year after the date of the invoice for the relevant goods.

(f) nothing in these Conditions shall confer on the purchaser any rights or remedies to which the purchaser would not otherwise be legally entitled.

(6) Notwithstanding any other provision contained herein the Purchaser's hereby agree to fully indemnify us against any damages losses costs claims or expenses incurred by us in respect of any claim brought against us by any third party for :-

(a) any loss injury or damage wholly or partly caused by any goods supplied by us or their use.

(b) any loss injury or damage wholly or partly caused by the defective installation or sub-standard workmanship or materials used in the installation of any goods supplied by us.

(c) any loss injury or damage in any way connected with the performance of this contract.

PROVIDED that this paragraph (6) will not require the Purchaser to indemnify us against any liability for our own acts of negligence or those of our employees agents or sub-contractors.

FURTHER in the case of goods supplied by us which are re-sold to and installed by a third party by the Purchaser it will be the sole responsibility of the Purchaser to test the goods immediately after their installation to ensure that inter alia they are correctly installed and are in proper working order, and are not likely to cause any loss injury or damage to any person or property.

10. VARIATION OF WARRANTY AND EXCLUSION

Should our warranty and exclusion be unacceptable we are prepared to negotiate for variation in their terms but only on the basis of an increase in the price to allow for any additional liability or risk which may result from the variation.

Purchasers are advised to insure against any risk or liability which they may incur and which is not covered by our warranty.

11. RISK AND RETENTION OF TITLE

(a) goods supplied by us shall be at the Purchaser's risk immediately upon delivery to the Purchaser or into custody on the Purchaser's behalf or to the Purchaser's Order. The Purchaser shall effect adequate insurance of the goods against all risks to the full invoice value of the goods, such insurance to be effective from the time of delivery until property in the goods shall pass to the Purchaser as hereinafter provided.

(b) property in the goods supplied hereunder will pass to the Purchaser when full payment has been made by the Purchaser to us for :-

(i) the goods of the subject of this contract.

(ii) all other goods the subject to of any other contract between the Purchaser and us which, at the time of payment of the full price of the goods sold under this contract, have been delivered to the Purchaser but not paid for in full.

(c) until property in the goods supplied hereunder passes to the Purchaser in accordance with paragraph (2) above.

(i) the Purchaser shall hold the goods in a fiduciary capacity for us and shall store the same separately from any other goods in the Purchaser's possession and in a manner which enables them to be identified as our goods.

(ii) the Purchaser shall immediately return the goods to us should our authorised representative so request. All the necessary incidents associated with a fiduciary relationship shall apply.

(d) the Purchaser's right to possess the goods shall cease forthwith upon the happening of any of the following events, namely :-

(i) if the Purchaser fails to make payment in full for the goods within the time stipulated in clause 4 hereof.

(ii) if the Purchaser, not being a company, commits any act of bankruptcy, makes a proposal to his or her creditors for a compromise or does anything which would entitle a petition for a Bankruptcy Order to be presented.

(iii) if the Purchaser, being a company, does anything or fails to do anything which would entitle an administrator or an administrative receiver or a receiver to take possession of any assets or which would entitle any person to present a petition for winding up or to apply for an administration order.

(e) the Purchaser hereby grants to us an irrevocable licence to enter at any time any vehicle or premises owned or occupied by the Purchaser or in the possession of the Purchaser for the purposes of repossessing and recovering any such goods the property in which has remained in us under paragraph (2) above. We shall not be responsible for and the Purchaser will indemnify us against liability in respect of damage caused to any vehicle or premises in such repossession and removal being damaged which it was not reasonably practicable to avoid.

(f) notwithstanding paragraph (3) hereof and subject to paragraph (7) hereof, the Purchaser shall be permitted to sell the goods to third parties in the normal course of business. In this respect the Purchaser shall act in the capacity of our commission agent and the proceeds of such sale :-

(i) shall be held in trust for us in a manner which enables such proceeds to be identified as such, and :

(ii) shall not be mixed with other monies nor paid into an overdrawn bank account.

We, as principal, shall remunerate the Purchaser as commission agent a commission depending upon the surplus which the Purchaser can obtain over and above the sum, stipulated in this contract of supply which will satisfy us.

(g) in the event that the Purchaser shall sell any of the goods pursuant to clause (6) hereof, the Purchaser shall forthwith inform us in writing of such sale and of the identity and address of the third party to whom the goods have been sold.

(h) if, before property in the goods passes to the Purchaser under paragraph (2) above the goods are or become affixed to any land or building owned by the Purchaser it is hereby agreed and declared that such affixation shall not have the effect of passing property in the goods to the Purchaser. Furthermore if, before property in the goods shall pass to the Purchaser under paragraph (2) hereof, the goods are or become affixed to any land or building (whether or not owned by the Purchaser), the Purchaser shall:-

(i) ensure that the goods are capable of being removed without material injury to such land or building.

(ii) take all necessary steps to prevent title to the goods from passing to the landlord of such land or building.

(iii) forthwith inform us in writing of such affixation and of the address of the land or building concerned.

The Purchaser warrants to repair and make good any damage caused by the affixation of the goods to or their removal from any land or building and to indemnify us against all loss damage or liability we may incur or sustain as a result of affixation or removal.

(i) in the event that, before property in the goods has passed to the Purchaser under paragraph (2) hereof, the goods or any of them are lost, stolen, damaged or destroyed :-

(i) the Purchaser shall forthwith inform us in writing of the fact and circumstances of such loss, theft, damage or destruction.

(ii) the Purchaser shall assign to us the benefit of any insurance claim in respect of the goods so lost, stolen, damaged or destroyed.

12. NON-PAYMENT

If the Purchaser shall fail to make full payment for the goods supplied hereunder within the time stipulated in clause 4 hereof or be in default of payment for any other reason then, without prejudice to any of our other rights hereunder, we shall be entitled to stop all deliveries of goods and materials to the Purchaser, including deliveries or further deliveries of goods under this contract. In addition we shall be entitled to terminate all outstanding orders.

13. RISK

All goods sold by us shall be at the sole risk of the Purchaser from the date of despatch by us of the invoice for their price.

14. VALUE ADDED TAX

All prices quoted are exclusive of Value Added Tax which will be charged at the rate ruling at the date of despatch of invoice.

15. TRADE SALES ONLY

We are only prepared to deal with those who are not consumers within the terms of the Unfair Contract Terms Act 1977, the Sale of Goods Act 1979 and the Supply of Goods and Services Act 1982. Accordingly any person who purchases from us shall be deemed to have represented that he is not a consumer by so purchasing.

16. JURISDICTION

The agreement is subject to English/Scottish law and any dispute arising hereunder shall be settled in accordance therewith dependent upon the location.

