

STAINLESSLITE PLUS BUFFER STORE

HOT WATER STORAGE FOR USE WITH
HEAT PUMPS AND BOILERS



INSTRUCTION MANUAL DESIGN, INSTALLATION & SERVICING

ONE NAME. EVERY SOLUTION.

WWW.GLEDHILL.NET

ISSUE 2: SEPTEMBER 2017

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Benchmark places responsibilities on both manufacturers and installers. The purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturers instructions by competent persons and that it meets the requirements of the appropriate Building Regulations. The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

Installers are required to carry out installation, commissioning and servicing work in accordance with the Benchmark Code of Practice which is available from the Heating and Hot Water Industry Council who manage and promote the Scheme. Visit www.centralheating.co.uk for more information.

For further information on the HWA Charter Statement, please refer to the HWA website hotwater.org.uk.

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, Building Regulations, I.E.E. Wiring Regulations and the Water Fitting Regulations (England and Wales) or Water Byelaws (Scotland). It should be read in accordance with the relevant recommendations of the following:

BS 6798; BS EN 12828, BS EN 12831, BS EN 14336; BS 5546;

BS 5440:1; BS 5440:2; CP 331:3

BS EN 806-1 to 5, BS EN 8558:2011; BS EN 1458-1:2011 and BS 7593:2006

It must be installed by a competent person as defined by the relevant regulations. Manufacturers notes must NOT be taken as over-riding statutory obligations.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised at all times to ensure they do not play with the appliance.

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 SYSTEM CONTAINING ONE OF OUR PRODUCTS UNLESS SPECIFICALLY REQUESTED TO DO SO IN WRITING.

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 StainlessLite Plus range, Gledhill Building Products 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 will be made available for other appliances on request.

StainlessLite Plus Buffer Store is produced under an iso 9001:2008 quality management system approved by bsi.

Buffer vessels are simply a duplex stainless steel tank that contains a volume of water. Buffer vessels are used in heating systems to decouple the heat sources from the heat demands, in the same way a hot water cylinder decouples the hot water demands from the boiler.

Buffer stores are recommended by heat pump manufacturers to ensure trouble free operation of their appliances. They achieve this by presenting the heat pump with a larger volume of water to heat which reduces the amount of cycling. This in turn extends the life of the heat pump's compressor and by reducing cycling reduce running costs.

These buffer stores can be connected to air, water or ground source heat pumps.

Buffer stores can be connected to either open vented or sealed systems as they are designed to work at up to 3.5 bar. The systems that are connected to the buffer store dictate the selection of system and components required for safe operation, and this is the responsibility of the system designer.

Buffer stores are not suitable for potable water and should not be used to feed any hot water outlets.

Direct & Indirect buffer stores

Direct buffer stores are heated directly by the main heat source only, eg. heat pump, and do not incorporate electric heaters and therefore the heating circuit flow temperature connected to the buffer vessel depends upon the flow temperature of the heat source. This type of store is ideal for the combination of a heat pump with under floor heating. Underfloor heating operating at 30°C - 40°C.

Indirect stores enable connections to be made to the heat pump, heating system and an additional heat source. This could be an oil or gas boiler but not a solid fuel heat source because the heat exchanger is not of the correct type. The additional heat is supplied via a heat exchanger and therefore is hydraulically separate from the water in the buffer store.

An additional heat source is useful for extreme conditions when the heat pump may not be able to supply the heat required and when it can top up the store.

Flexible buffer stores

This type of buffer store has been designed with flexibility in mind. It enables multiple heat pumps and/or separate domestic hot water and central heating zones to be connected. For this reason the installation diagrams in the following pages do not relate to this model. The installer can choose how to install this product and blank off any unused connections.

Weather compensation

Some heat pumps can use the external temperature to control the temperature of the water supplied to the cylinder and therefore the temperature supplied to the under floor heating. This can produce further savings by eliminating the need for the thermostatic component of the under floor heating manifold. Also it enables the heating system to run at its optimum temperature, rather than running too hot for the conditions at that time.

Please Note:-

- i) Any heat source, heat pump, boiler or other source used in a sealed system must incorporate a certified overheat protection device and the heat source should be certified for use in a sealed heating system. All heat sources must have two independent temperature control devices, for example, a control and an overheat thermostat.
- ii) Any sealed heating system must have a means for accommodating the expansion of the whole system volume including the buffer vessel's volume.
- iii) Any heat source in a sealed heating system must be fitted with a pressure relief valve (PRV), and there should be no isolating valve between the PRV and the heat source.
- iv) Any sealed heating system should incorporate an approved filling method.
- v) Should it be deemed necessary by the designer or installer to incorporate a third level of protection against overheat, a manual reset overheat thermostat can be fitted in the top thermostat pocket. This coupled with the energy cut off valves for every heat source will stop the buffer store overheating if all other devices fail.

The Environment

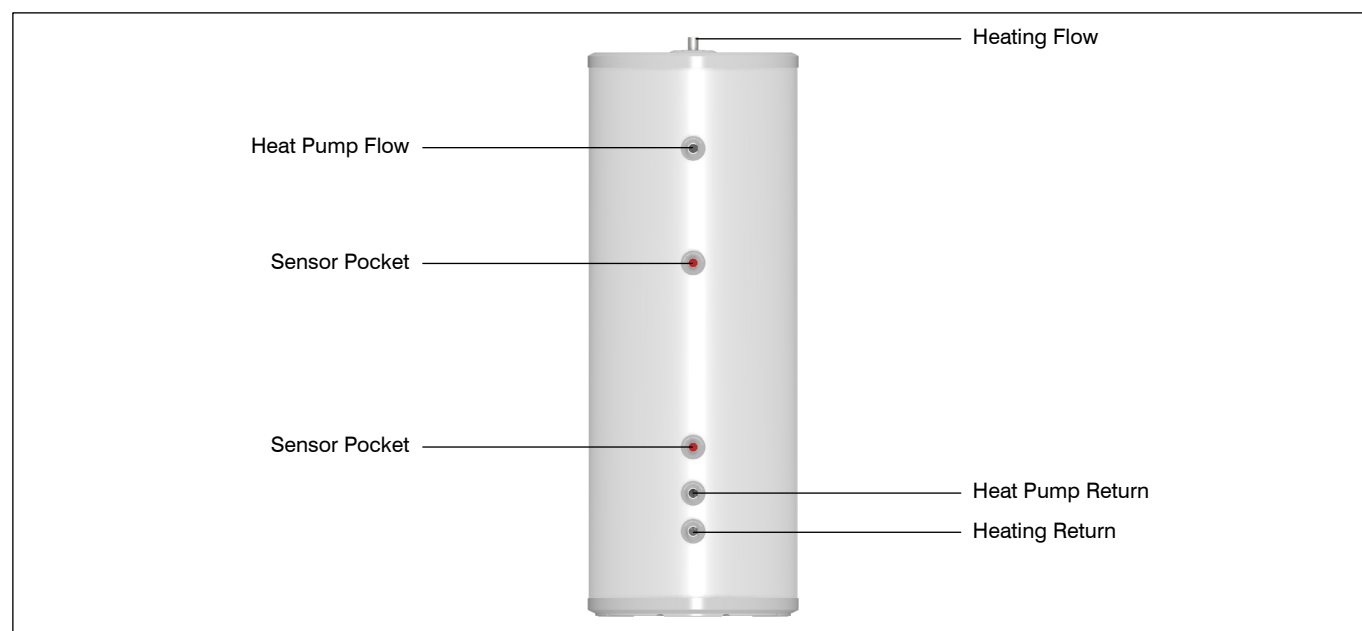
This product has been manufactured using many recyclable materials, including the approved HCFC/CFC free polyurethane foam insulation. At the end of its useful life, it should be disposed of at a Local Authority Recycling Centre, to maximise the products full environmental benefits.

DESIGN

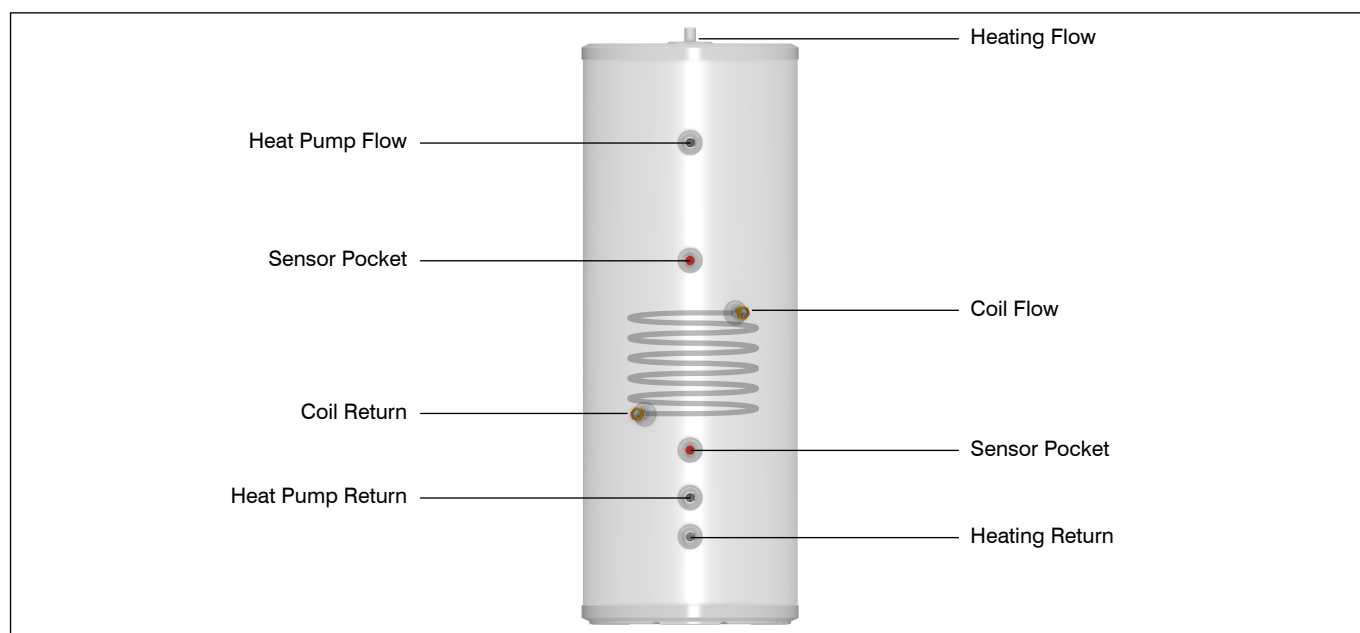
The Buffer store is insulated to a very high standard using high density HCFC free foam cased in a steel shell and has an ozone depletion potential (ODP) of zero and a global warming potential (GWP) of 2.

The specification of the models are shown in the following tables.

StainlessLite Plus Direct Buffer Store Technical Specification						
Description		90D	120D	210D	300D	400D
Product stock code		PLUDR090B	PLUDR120B	PLUDR210B	PLUDR300B	PLUDR400B
Energy efficiency class		A	B	B	C	C
Heat loss	watts	32	39	62	86	87
	kWh/24h	0.77	0.94	1.49	2.06	2.09
Capacity	litres	91	119	208	287	393
Height	mm	764	931	1494	1990	2030
Diameter	mm	550	550	550	550	630
Weight (empty)	kg	17	20	30	39	51
Weight (full)	kg	108	139	238	326	451
Maximum working pressure - cylinder	bar	3.5	3.5	3.5	3.5	3.5
Maximum working pressure - space heating	bar	3.5	3.5	3.5	3.5	3.5
Central heating flow connection	mm	28	28	28	28	28
Central heating return connection	mm	28	28	28	28	28
Heat pump flow connection	mm	28	28	28	28	28
Heat pump return connection	mm	28	28	28	28	28
Central heating flow tapping height	mm	798	966	1530	2025	2030
Central heating return tapping height	mm	225	225	225	225	214
Heat pump flow tapping height	mm	504	672	1235	1731	1805
Heat pump return tapping height	mm	325	325	325	325	314
Thermostatic pocket size - Bottom	mm	22	22	22	22	22
Thermostatic pocket size - Top	mm	22	22	22	22	22
Thermostatic pocket height - Bottom	mm	275	275	447	586	621
Thermostatic pocket height - Top	mm	458	567	933	1255	1201



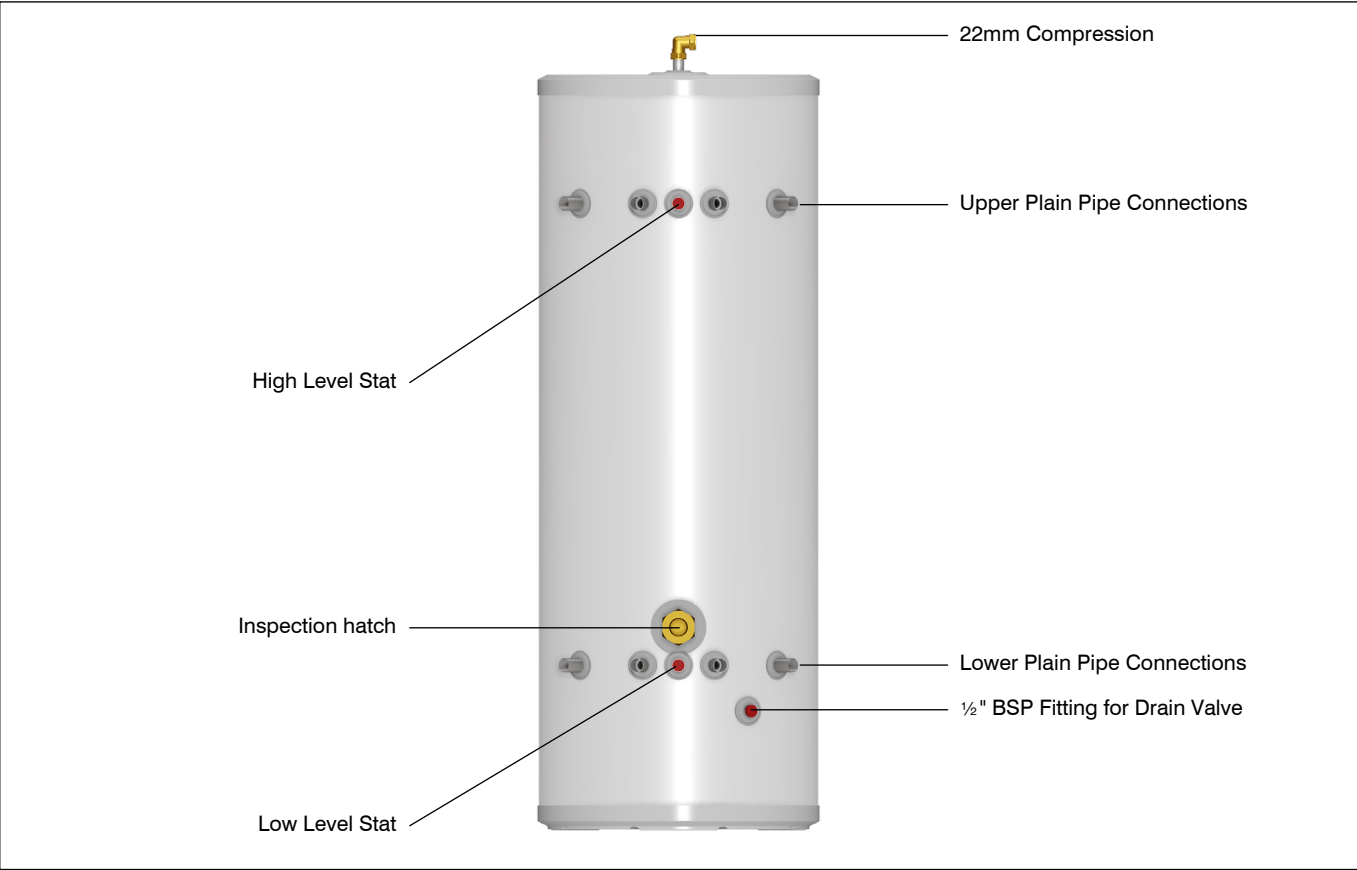
StainlessLite Plus Indirect Buffer Store Technical Specification					
Description		120IND	210IND	300IND	400IND
Product stock code		PLUIN120B	PLUIN210B	PLUIN300B	PLUIN400B
Energy efficiency class		B	B	C	C
Heat loss	watts	39	62	86	87
	kWh/24h	0.94	1.49	2.06	2.09
Capacity	litres	119	208	287	393
Height	mm	931	1494	1990	2030
Diameter	mm	550	550	550	630
Weight (empty)	kg	22	32	43	55
Weight (full)	kg	141	240	328	455
Maximum working pressure - cylinder	bar	3.5	3.5	3.5	3.5
Maximum working pressure - space heating	bar	3.5	3.5	3.5	3.5
Maximum working pressure - heat exchanger	bar	3	3	3	3
Central heating flow connection	mm	28	28	28	28
Central heating return connection	mm	28	28	28	28
Heat pump flow connection	mm	28	28	28	28
Heat pump return connection	mm	28	28	28	28
Coil flow connection	mm	22	22	22	22
Coil return connection	mm	22	22	22	22
Central heating flow tapping height	mm	966	1530	2025	2030
Central heating return tapping height	mm	225	225	225	214
Heat pump flow tapping height	mm	672	1234	1731	1805
Heat pump return tapping height	mm	325	325	325	314
Coil flow tapping height	mm	574	799	1003	1014
Coil return tapping height	mm	354	539	703	714
Thermostatic pocket size - Bottom	mm	22	22	22	22
Thermostatic pocket size - Top	mm	22	22	22	22
Thermostatic pocket height - Bottom	mm	275	447	586	621
Thermostatic pocket height - Top	mm	567	959	1255	1201
Coil - loops		6	7	8	8
Coil - surface area	m ²	0.59	0.68	0.78	0.78



DESIGN

StainlessLite Plus Flexible Buffer Store Technical Specification							
Description		90FLX	120FLX	210FLX	250FLX	300FLX	400FLX
Product stock code		PLU090MB	PLU120MB	PLU210MB	PLU250MB	PLU300MB	PLU400MB
Energy efficiency class		A	B	B	C	C	C
Heat loss	watts	32	39	62	74	86	87
	kWh/24h	0.77	0.94	1.49	1.78	2.06	2.09
Capacity	litres	91	119	208	248	287	393
Height	mm	764	931	1494	1744	1990	2030
Diameter	mm	550	550	550	550	550	630
Weight (empty)	kg	18	21	30	34	39	51
Weight (full)	kg	109	140	238	282	326	451
Maximum working pressure - cylinder	bar	3.5	3.5	3.5	3.5	3.5	3.5
Maximum working pressure - space heating	bar	3.5	3.5	3.5	3.5	3.5	3.5
Tappings	mm	28	28	28	28	28	28
Upper tapping height	mm	505	672	1235	1485	1731	1776
Lower tapping height	mm	325	325	325	325	325	310
Vent/relief boss (22mm compression)	mm	Top/Mid	Top/Mid	Top/Mid	Top/Mid	Top/Mid	Top/Mid
Drain (1/2" BSP) height	mm	235	235	235	235	235	235
Inspection hatch (1 3/4" BSP) height	mm	400	400	400	400	400	385
Thermostatic pocket size	mm	22	22	22	22	22	22
High level stat height	mm	505	672	1235	1485	1731	1776
Low level stat height	mm	325	325	325	325	325	310

The 22mm compression connection at the top of the cylinder can be used as a vent or possible pressure relief position.



Sizing the Buffer store to the Heat pump

Buffer stores should be sized as per the table below (source paragraph 4.5 BS EN 15450).

Heat Pump Sizing	
Cylinder capacity	Heat pump output
90 litres	2.6kW - 7.5kW
120 litres	3.4kW - 10kW
210 litres	6kW - 17.5kW
300 litres	8.5kW - 25kW
400 litres	11.4kW - 33.3kW

One heat pump manufacturer recommends that -

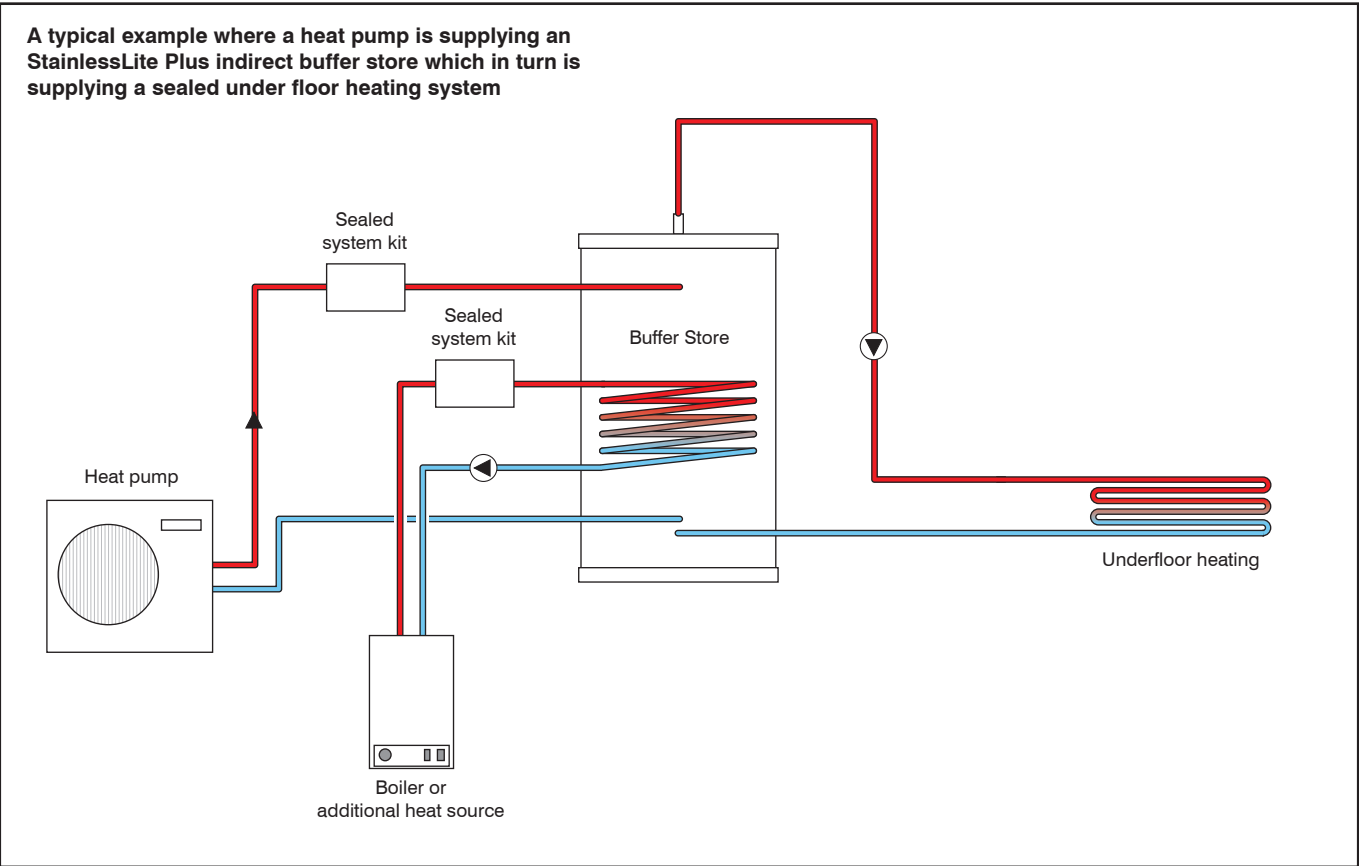
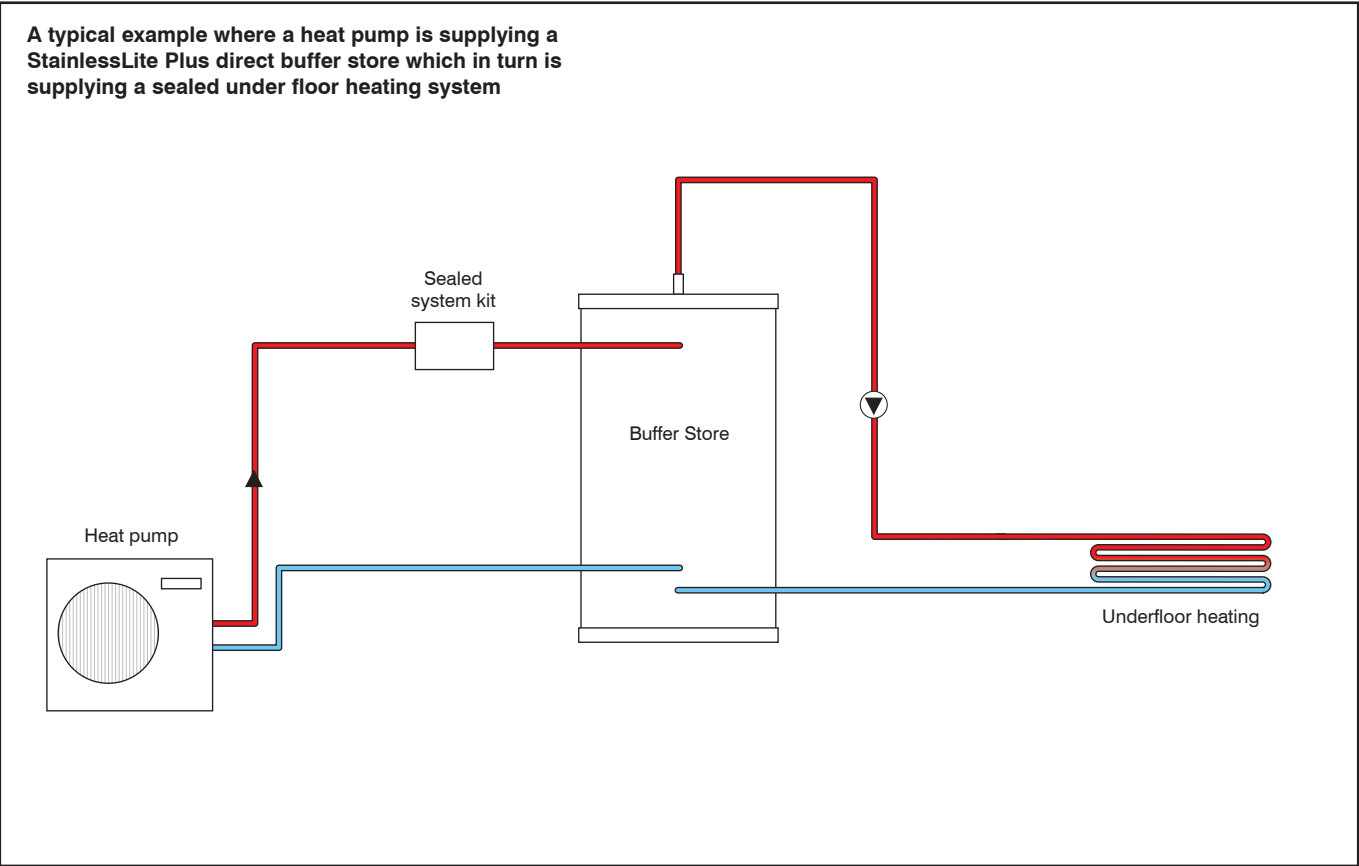
'... A prerequisite for energy-efficient operation is the proper design of the heat source system and the heat utilization system. One of the most important factors of heat pump efficiency is keeping the temperature difference between the heating water and the heat source as small as possible. It is therefore strongly recommended that the design of both the heat source system and the heat distribution system be carried out with great care.

A 1 Kelvin (1C) higher temperature difference corresponds to an increase in power consumption of approximately 2.5%. When designing the heating system care must be taken that special applications such as domestic water heating are taken into consideration and dimensioned for low temperature operation. Heat pumps are optimally suited for underfloor heating (surface/radiant heating) applications due to the low supply temperatures (30°C to 40°C). A considerable contribution to the economical operation is made by the heat pump controller provided it is set correctly...

Using the buffer store in conjunction with an additional heat source requires a more sophisticated control system. This is to stop the boiler dominating the heating of the cylinder and reducing the possible input of the heat pump.

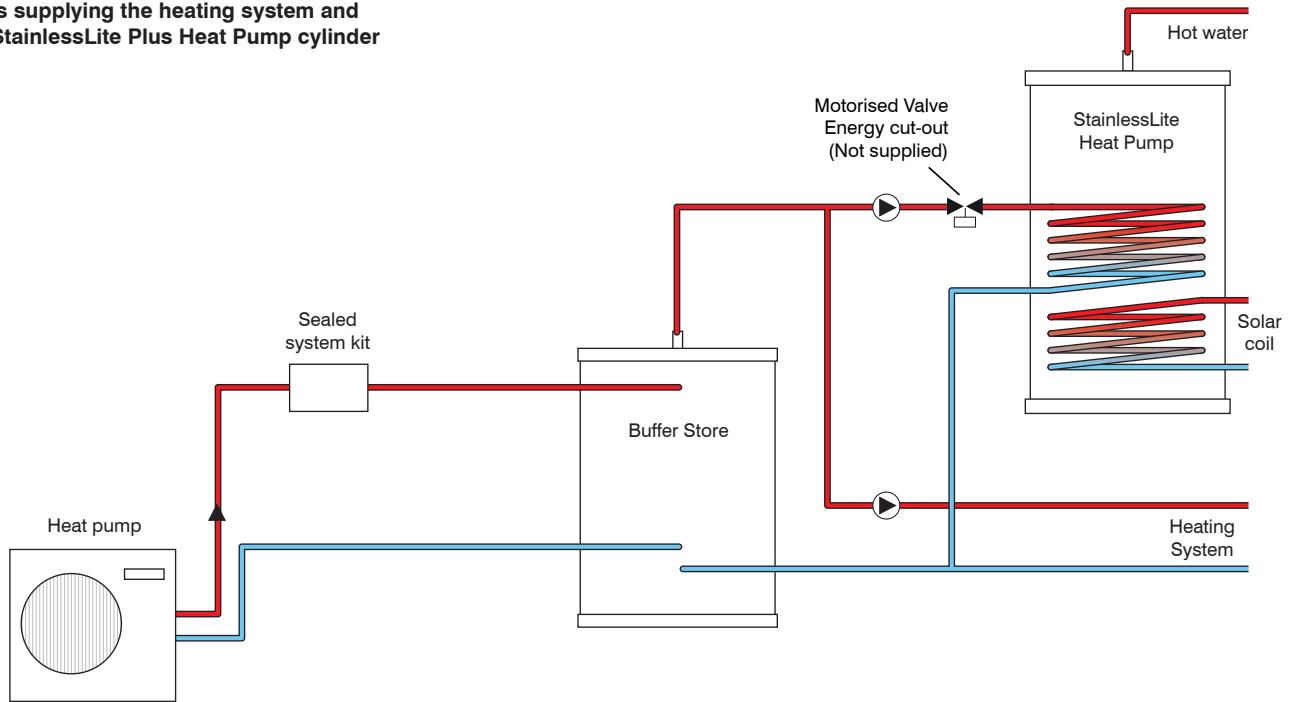
Several alternative arrangements are shown on page 7 & 8. It is also possible to use a buffer vessel in a serial arrangement, either in the return or flow from the heat pump.

INSTALLATION

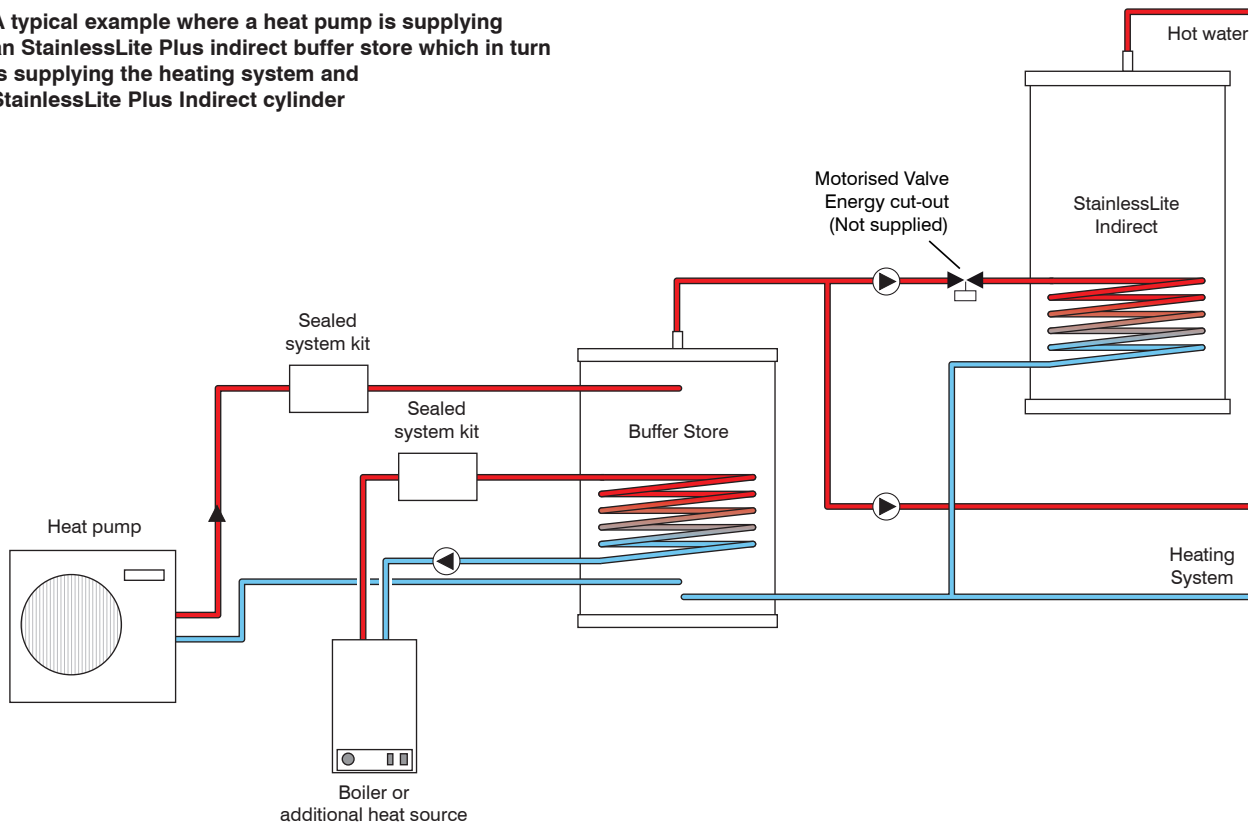


INSTALLATION

A typical example where a heat pump is supplying a StainlessLite Plus direct buffer store which in turn is supplying the heating system and StainlessLite Plus Heat Pump cylinder



A typical example where a heat pump is supplying an StainlessLite Plus indirect buffer store which in turn is supplying the heating system and StainlessLite Plus Indirect cylinder



INSTALLATION

System Controls

The system controls should be developed in conjunction with the heat pump manufacturer.

Using the buffer store in conjunction with an additional heat source requires a more sophisticated control system. This is to stop the boiler dominating the heating of the cylinder and reducing the possible input of the heat pump.

Soldering

In line with good plumbing practice, use with excessive flux should be avoided.

When soldering above the cylinder, ensure flux/solder does not contaminate the cylinder below, since this can cause corrosion.

Flushing the system

Before completing the heat pump connections, the heating installation must be flushed in order to remove any impurities that may be present, residues of sealing agents. Any accumulation of residues and other deposits in the heat pump condenser may result in reduced efficiency of the unit or a total failure of the heat pump.

Water Treatment And Frost Protection

Although the Buffer store has no special water treatment requirements, the radiators and other parts of the circuit will require the application of a scale and corrosion inhibitor. The heat pump and the external connecting pipe work will also require protection against freezing. For this reason, a combined antifreeze and inhibitor product such as Fernox Alpha 11 must be used (see Fernox Alpha 11 datasheet in Appendix A).

The volumes and concentration should be calculated in accordance with the manufacturer's instructions and when calculating the system volume i.e. the water content, the volume of the Buffer store should be taken into account (see technical specification tables).

NOTE

At the time of commissioning, complete all relevant sections of the Benchmark Checklist located on the inside back pages of this document.

This must be completed during commissioning and left with the product to meet the Warranty conditions offered by Gledhill.



ALPHI-11 PROTECTOR

- Protects against corrosion and limescale
- Combined antifreeze and protector
- Prevents limescale build-up
- Compatible with all metals and materials commonly used in heating systems
- Non-toxic, environmentally friendly
- Protects heating and chilled water



Product Uses

Fernox Alphi-11 Protector is a combined antifreeze and inhibitor, which gives long term protection against internal corrosion and limescale in commercial heating and chilled water systems. Fernox Alphi-11 Protector is compatible with all metals and materials commonly used in central heating systems, including aluminium.

For continued protection we recommend Protector levels are checked regularly (annually). The concentration of the product can be easily measured on site using a Fernox Protector Test Kit or by using a refractometer.

Physical Properties

Fernox Protector Alphi-11 contains mono-propylene glycol.

Colour:	Colourless
Odour:	Aromatic (slight)
Form:	Clear liquid
pH (conc)	6.9
pH (soln 25%):	6.4 – 7.4
SG:	1.04 at 20°C

Application and Dosage

The minimum recommended "in-use" concentration of the product is 25% in order to ensure adequate corrosion protection. This concentration will protect down to -11°C. A concentration of 40% will protect down to -22°C. Alphi-11 Protector can be introduced via the feed and expansion tank or injected directly into the system via a suitable point (e.g. dosing pot). Introduce into the system after having drained a quantity of water at least equal to the amount of Alphi-11 to be added. Engage the circulating pump and have the system online for a few hours in order to achieve an even distribution.

Concentration	25%	30%	35%	40%
Protection	-11°C	-15°C	-18°C	-22°C

In single feed indirect cylinders, e.g. "Primatic" or similar, potable water chemicals must be used.

We recommend untreated systems are thoroughly cleansed and flushed, in accordance with BS7593 and Benchmark, using Fernox Cleaner F3 before treating with Fernox Alphi-11 Protector as existing debris can damage the installation.

Packaging, Handling and Storage

Fernox Protector Alphi-11 is supplied in 5 and 25 litre containers.

Fernox Protector Alphi-11 is classified as non-hazardous and non-irritant, but as with all chemicals keep out of reach of children. Do not mix with other chemicals with the exception of Fernox products. Do not take internally. May cause an allergic reaction. Contains 1,2-benzisothiazol-3(2H)-one. In case of contact with eyes or skin, rinse immediately with plenty of water.

APPENDIX

MANUAL HANDLING OF APPLIANCE PRODUCTS

Description

Manual handling means any transporting or supporting of a load (including lifting, putting down, pushing, pulling, carrying or moving) by hand or bodily force.

Scope

This assessment will cover the largest unit within each product range.

For specific weights and dimensions please refer to technical data section.

Main Hazards

Vision may not be clear due to the size of the products.

Adopting an incorrect method of lifting may cause injury, attempting to lift these products will require help from others. (Team lifts)

Control Measures

Manual lifting procedure

The lift, key factors in safe lifting are:

- a. **Balance**
- b. **Position of back**
- c. **Positioning of the arms and body**
- d. **The hold**
- e. **Taking the lead for team lifts**

a. **Balance** - Since balance depends essentially upon the position of the feet, they should be apart about hip breadth with one foot advanced giving full balance sideways and forward without tension. In taking up this position, lifting is done by bending at the knees instead of the hips and the muscles that are brought into use are those of the thigh and not the back.

b. **Position of back** - Straight - not necessary vertical. The spine must be kept rigid, this coupled with a bent knee position, allows the centre line of gravity of the body to be over the weight so reducing strain.

c. **Positioning of arms and body** - The further arms are away from the side, the greater the strain on the shoulders, chest and back. Keep elbows close to the body arms should be straight.

d. **The hold** - Before lifting ensure you have a good hold.

e. **Taking the lead for team lifts**- As more than one person is required for these products ensure that one person is taking the lead. **This may be you** so ensure that each person that is helping is made aware of the weight and of the items listed within this assessment. Make sure you and any others helping know the route you intend to take that it is clear of any obstructions. Never jerk the load as this will add a little extra force and can cause severe strain to the arms, back and shoulders. If there are steps involved decide on where you will stop and take a rest period. Move smoothly and in unison taking care to look and listen to others helping with the lift. Where possible use a sack truck to move the product over long flat distances, only lift the products when necessary. If in doubt stop and get more help.

Individual capability

Individual capability plays an important part in handling these products. Persons above average build and strength will find it easier and should be in good health. Persons below average build and strength may require more rest periods during the handling process.

Pregnant women should not carry out this operation.

Persons who are not in good health should seek medical advice prior to commencing any lifting or manual handling operation.

Residual risk

Following the guidelines given above will reduce any risk to injury.

All persons carrying out this operation must be fully trained and copies of the specific risk assessment made available for inspection and use in their training process.

Further guidance on Manual Handling can be obtained from the Health and Safety Executive. Manual Handling Operations Regulations 1992 (amended by Health and Safety (Miscellaneous Amendments) Regulations 2002.

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Gledhill (Building Products) Ltd

AMD. APRIL 2018

CONDITIONS OF SALE & GUARANTEE TERMS

1. Gledhill (Building Products) Ltd ("We" or "Gledhills") 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

Once an order or call off has been accepted the price will be held for three months **but if delivery is extended beyond that period at the customer's request, then we reserve the right to amend the price when necessary.** The company reviews its pricing annually to adjust for changes in our cost base. We reserve the right to alter prices at any time for severe movements in raw materials (mainly copper and steel). If there is to be a change we will give customers at least four weeks notice but anything delivered after that date will be at the revised price. 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 buyer shall make payment in full within thirty days from the end of the month in which the invoice is dated. 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

Standard delivery is free of charge on normal lead times to mainland UK. 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 AND GUARANTEE

- 9.1. Subject to the terms of these Conditions of Sale and Guarantee Terms Gledhills provide Guarantees in respect of specific products as set out in this clause.
- 9.2. Each Guarantee is strictly conditional upon the following:-
 - 9.2.1. 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 approval.
 - 9.2.2. 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.
 - 9.2.3. All necessary inlet controls and safety valves have been fitted correctly.
 - 9.2.4. The unit has only been used for the storage of potable water supplied from the public mains. The water quality shall be in accordance with European Council Directive 98/83 EC, or revised version at the date of installation, and is not fed with water from a private supply. Particular:

Chloride content:	Max. 200 mg/l
Sulphate content:	Max. 200 mg/l
Combination chloride/sulphate:	Max. 300 mg/l (in total)
 - 9.2.5. Where appropriate the unit has been regularly maintained as detailed in the installation and service instructions.
 - 9.2.6. Defects caused by corrosion or scale deposits are not covered by any Guarantee.
 - 9.2.7. Where we agree to rectify any defect we reserve the right to undertake the work on our own premises.
 - 9.2.8. We will not accept any labour charges associated with replacing the unit or parts for any of the following products listed.
 - 9.2.9. If the newly fitted water heater is not in regular use then it must be flushed through with fresh water for at least 15 minutes. Open at least one hot water tap once per week, during a period of at least 4 weeks.
- 9.3. Guarantees are provided in respect of specified goods supplied by Gledhills as follows:-

(a) Domestic and Commercial Open Vented Cylinders and Tanks.

The storage vessel is guaranteed for ten years and if it proves to be defective either in materials or workmanship, we reserve the right to either repair or supply replacement at our option with the closest substitute in the case of any obsolete product to any address in England, Wales and Scotland (excluding all Scottish Islands).

(b) Domestic Mains Fed Products [Primary Stores]

The storage vessel is guaranteed for five years and if it 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 replacement at our option with the closest substitute in the case of any obsolete product to any address in England, Wales and Scotland (excluding all Scottish Islands).

(c) Unvented Cylinders

Gledhill guarantee the components including controls, valves and electrical parts for two years from the date of purchase. IT SHOULD BE NOTED THAT THE FACTORY FITTED TEMPERATURE AND PRESSURE RELIEF VALVE MUST NOT BE REMOVED OR ALTERED IN ANY WAY OR THE GUARANTEE WILL NOT BE VALID. GLEDHILL WILL NOT BE RESPONSIBLE FOR ANY CONSEQUENTIAL LOSS OR DAMAGE HOWEVER IT IS CAUSED.

The guarantee for the stainless steel vessel is for twenty five years against material defect or manufacturing faults if the original unit is returned to us **AND PROVIDED THAT:**

- (i) It has not been modified, other than by Gledhill.
- (ii) It has not been subjected to wrong or improper use or left uncared for.
- (iii) It has only been used for the storage of potable water supplied from the public mains, max 200mg/litre chloride.
- (iv) It has not been subjected to frost damage.
- (v) The benchmark service record is completed after each annual service.
- (vi) The unit has been serviced annually.
- (vii) Any disinfection has been carried out strictly in accordance with BS6700.

If the stainless steel vessel proves to be defective either in materials or workmanship we reserve the right to either repair or supply replacement at our option with the closest substitute in the case of any obsolete product to any address in England, Wales and Scotland (excluding all Scottish Islands).

ACTION IN THE EVENT OF FAILURE

We will require the return of a cylinder which develops a leak for inspection. If our examination confirms a failure then an appropriate level of credit against the cost of the original cylinder will be issued in line with the terms of our warranty.

Please note:

- Installation must have been carried out by a licensed specialized company (heating contractor or plumber) following the version of installation instructions in force.
- Gledhill or its representative was given the opportunity to check complaints on site immediately after any defect occurred.
- Confirmation exists that the system was commissioned properly and that the system was checked and maintenance was performed annually by a specialised company licensed for this purpose.

(d) 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 two years 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.

9.4.

9.4.1. In respect of goods supplied by us 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 the Guarantees) shall be as follows:-

- (a) We accept liability for death or personal injury to the extent that it results from our negligence or that of our employees
- (b) Subject to the other provisions of this clause 9 we accept liability for direct physical damage to tangible property to the extent that such damage is caused by our negligence or that of our employees, agents or subcontractors.
- (c) Our total liability to the purchaser over and above any liability to replace under the Guarantees (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 not withstanding 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) Without prejudice to any other term we shall not be liable for any water damage caused directly or indirectly as a result of any leak or other defect in the goods. We cannot control the conditions of use of the goods or the time or manner or location in which they will be installed and the purchaser agrees to be fully responsible for testing and checking all works which include the goods at all relevant times (up to, including and after commissioning) and for taking all necessary steps to identify any leaks and prevent any damage being caused thereby.
- (g) Nothing in these Conditions shall confer on the purchaser any rights or remedies to which the purchaser would not otherwise be legally entitled

10. LOSS OR INJURY

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 substandard 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.
- (d) any loss resulting from any failure by the purchaser to comply with its obligations under these terms as to install and/or check works correctly.

PROVIDED that this paragraph 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 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 in proper working order free from leaks and are not likely to cause any loss injury or damage to any person or property.

11. 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.

12. ADVICE

Any advice or assistance given by the Company is provided without charge and is in good faith without undertaking, representation or warranty, and we will not accept any liability, whether consequential or compensatory, for advice or assistance given.

13. 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 of 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 :-
 - (ii) the Purchaser shall forthwith inform us in writing of the fact and circumstances of such loss, theft, damage or destruction.
 - (iii) the Purchaser shall assign to us the benefit of any insurance claim in respect of the goods so lost, stolen, damaged or destroyed.

14. 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.

15. 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.

16. 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.

17. JURISDICTION

The agreement is subject to English law for products delivered in England and Scottish law for products delivered in Scotland and any dispute hereunder shall be settled in accordance therewith dependent upon the location.

18. PRODUCT DEVELOPMENT

Gledhill have a policy of continuous product development and may introduce product modifications from time to time.

MAINS PRESSURE HOT WATER STORAGE SYSTEM COMMISSIONING CHECKLIST

This Commissioning Checklist is to be completed in full by the competent person who commissioned the storage system as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission this equipment to the manufacturer's instructions may invalidate the warranty but does not affect statutory rights.

Customer name:										Telephone number:														
Address:																								
Cylinder Make and Model																								
Cylinder Serial Number																								
Commissioned by (PRINT NAME):										Registered Operative ID Number														
Company name:										Telephone number:														
Company address:																								
										Commissioning date:														
To be completed by the customer on receipt of a Building Regulations Compliance Certificate*:																								
Building Regulations Notification Number (if applicable)																								
ALL SYSTEMS PRIMARY SETTINGS (indirect heating only)																								
Is the primary circuit a sealed or open vented system?										Sealed					Open									
What is the maximum primary flow temperature?															°C									
ALL SYSTEMS																								
What is the incoming static cold water pressure at the inlet to the system?															bar									
Has a strainer been cleaned of installation debris (if fitted)?										Yes					No									
Is the installation in a hard water area (above 200ppm)?										Yes					No									
If yes, has a water scale reducer been fitted?										Yes					No									
What type of scale reducer has been fitted?																								
What is the hot water thermostat set temperature?															°C									
What is the maximum hot water flow rate at set thermostat temperature (measured at high flow outlet)?															l/min									
Time and temperature controls have been fitted in compliance with Part L of the Building Regulations?										Yes														
Type of control system (if applicable)										Y Plan					S Plan					Other				
Is the cylinder solar (or other renewable) compatible?										Yes					No									
What is the hot water temperature at the nearest outlet?															°C									
All appropriate pipes have been insulated up to 1 metre or the point where they become concealed										Yes														
UNVENTED SYSTEMS ONLY																								
Where is the pressure reducing valve situated (if fitted)?																								
What is the pressure reducing valve setting?															bar									
Has a combined temperature and pressure relief valve and expansion valve been fitted and discharge tested?										Yes					No									
The tundish and discharge pipework have been connected and terminated to Part G of the Building Regulations										Yes														
Are all energy sources fitted with a cut out device?										Yes					No									
Has the expansion vessel or internal air space been checked?										Yes					No									
THERMAL STORES ONLY																								
What store temperature is achievable?															°C									
What is the maximum hot water temperature?															°C									
ALL INSTALLATIONS																								
The hot water system complies with the appropriate Building Regulations										Yes														
The system has been installed and commissioned in accordance with the manufacturer's instructions										Yes														
The system controls have been demonstrated to and understood by the customer										Yes														
The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer										Yes														
Commissioning Engineer's Signature																								
Customer's Signature																								
(To confirm satisfactory demonstration and receipt of manufacturer's literature)																								

*All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.



While this Checklist can be used for any installation covered by its description, only appliances manufactured by Scheme Members will be covered by the rules and requirements of the Benchmark Scheme.

SERVICE RECORD

It is recommended that your hot water system is serviced regularly and that the appropriate Service Record is completed.

Service Provider

Before completing the appropriate Service Record below, please ensure you have carried out the service as described in the manufacturer's instructions.

SERVICE 01	Date:	SERVICE 02	Date:
Engineer name:		Engineer name:	
Company name:		Company name:	
Telephone No:		Telephone No:	
Comments:		Comments:	
Signature		Signature	
SERVICE 03	Date:	SERVICE 04	Date:
Engineer name:		Engineer name:	
Company name:		Company name:	
Telephone No:		Telephone No:	
Comments:		Comments:	
Signature		Signature	
SERVICE 05	Date:	SERVICE 06	Date:
Engineer name:		Engineer name:	
Company name:		Company name:	
Telephone No:		Telephone No:	
Comments:		Comments:	
Signature		Signature	
SERVICE 07	Date:	SERVICE 08	Date:
Engineer name:		Engineer name:	
Company name:		Company name:	
Telephone No:		Telephone No:	
Comments:		Comments:	
Signature		Signature	
SERVICE 09	Date:	SERVICE 10	Date:
Engineer name:		Engineer name:	
Company name:		Company name:	
Telephone No:		Telephone No:	
Comments:		Comments:	
Signature		Signature	

FOR TECHNICAL SUPPORT:
01253 474584

FOR ANNUAL SERVICE AND MAINTENANCE:
0800 3800 129

FOR SPARE PARTS:
01253 474412

OR
WWW.GLEDHILL-SPARES.NET



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