

# Stainless ES

## Design, Installation & Servicing Instructions

This manual contains important information regarding the commissioning and servicing of the product to meet the warranty conditions, and **MUST** be left with the product.

## GLEDHILL STAINLESS ES

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

Gledhill Stainless ES is covered by Section G3 of the Building Regulations (England and Wales) Technical Standard P3 (Scotland) and Building Regulation P5 (Northern Ireland). Compliance can be achieved via a Competent Person Self Certification Scheme or notification of installation to the Local Authority Building Control Department.

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.

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.



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](http://www.centralheating.co.uk) for more information.

For further information on the HWA Charter Statement, please refer to the HWA website [hotwater.org.uk](http://hotwater.org.uk).

Manufacturer: Gledhill Building Products Ltd

|  |                            |
|--|----------------------------|
| Maximum inlet pressure to  |                            |
| Pressure reducing valve  | 16 bar, 22 mm compression  |
| Operating pressure (PRV setting)                                 | 3 bar                      |
| Expansion vessel charge pressure                                 | 3 bar                      |
| Expansion relief valve setting                                   | 4.5 bar, 15 mm compression |
| Opening pressure of P & T Relief Valve                           | 6 bar, 1/2" BSPM           |
| Opening temperature of P & T Relief Valve                        | 90 °C                      |
| Dual energy cut-out thermostat                                   | 82 °C                      |
| Max. working pressure - Primary heat exchanger (Indirect models) | 3 bar                      |
| Immersion overheat thermostat setting                            | 85°C (TSR) & 70°C (TSE)    |
| Immersion heater rating  | 3 kW, 240 V AC             |

All cylinders are manufactured in accordance with the requirements of BS EN 12897.

The tundish must be positioned so that it is visible to the occupant and is away from electrical devices.

**Components supplied with Stainless ES:**

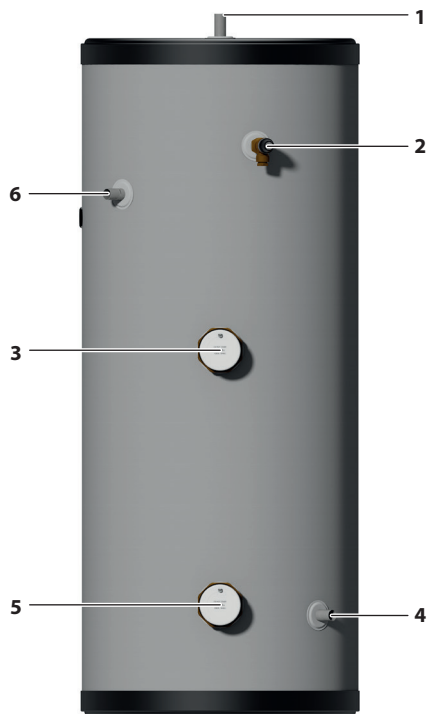
- **Cold water inlet PRV combination valve/expansion relief**
- **Pressure and temperature relief valve**
- **Dual thermostat (Control thermostat and Energy cut-out thermostat)**
- **Energy cut-out motorised valve (indirects only)**
- **Tundish**
- **3 kW Immersion heater including control and cut out thermostats**
- **Expansion vessel/mounting bracket**
- **Technical/user product literature**

In any situation where the volume of heated pipework (eg. secondary circulation pipes or manifold pipework for multiple units) exceeds 10 litres, then an additional expansion vessel must be fitted to accommodate the extra expansion volume.

**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.

| Table 1                                  |   |         | Gledhill ES 530 mm Diameter Direct Cylinders Data |                 |                 |                 |                 |                 |
|--|---|---------|---|-----------------|-----------------|-----------------|-----------------|-----------------|
| Model                                    |   |         | D090  | D120            | D150            | D170            | D200            | D250            |
| Product Stock Code                       | - |         | SESINP<br>DR090                                   | SESINP<br>DR120 | SESINP<br>DR150 | SESINP<br>DR170 | SESINP<br>DR200 | SESINP<br>DR250 |
| Load Profile                             |   |         | L   | L               | L               | L               | L               | L               |
| Energy efficiency class                  | - |         | C   | C               | C               | C               | C               | C               |
| Heat loss                                | - | watts   | 36  | 43              | 52              | 57              | 65              | 79              |
|  | - | kWh/24h | 0.87  | 1.03            | 1.24            | 1.37            | 1.56            | 1.89            |
| Energy efficiency                        |   | %       | 37.4%   | 37.2%           | 37.0%           | 37.1%           | 38.0%           | 37.1%           |
| Annual consumption                       |   | kWh     | 2736.87   | 2755.30         | 2767.42         | 2762.93         | 2693.00         | 2762.65         |
| Immersion heater setting                 |   |         | 55  | 55              | 55              | 55              | 55              | 55              |
| Sound power level                        | - | db      | 15  | 15              | 15              | 15              | 15              | 15              |
| Capacity - total volume                  | - | litres  | 93  | 113             | 142             | 161             | 190             | 237             |
| Volume heated by lower immersion heater  | - | litres  | 81.2  | 102.5           | 128.9           | 149.8           | 178.9           | 227.1           |
| Weight - empty/full                      | - | kg      | 15/108  | 19/137          | 22/171          | 24/193          | 27/225          | 33/281          |
| Pressure regulating valve setting        | - | bar     | 3   | 3               | 3               | 3               | 3               | 3               |
| Expansion relief valve setting           | - | bar     | 4.5   | 4.5             | 4.5             | 4.5             | 4.5             | 4.5             |
| Temperature setting (P&T valve)          | - | °C      | 90  | 90              | 90              | 90              | 90              | 90              |
| Pressure setting (P&T valve)             | - | bar     | 6   | 6               | 6               | 6               | 6               | 6               |
| Expansion vessel size (volume)           | - | litres  | 12  | 12              | 19              | 19              | 25              | 25              |
| Expansion vessel initial charge pressure | - | bar     | 3   | 3               | 3               | 3               | 3               | 3               |
| Height                                   | - | mm      | 705   | 832             | 1012            | 1130            | 1304            | 1602            |
| Diameter                                 | - | mm      | 530   | 530             | 530             | 530             | 530             | 530             |
| Hot Supply                               | 1 | mm      | 750   | 879             | 1059            | 1178            | 1352            | 1650            |
| P & T valve                              | 2 | mm      | 498   | 625             | 805             | 924             | 1098            | 1395            |
| 3 kW immersion heater upper (1 3/4")     | 3 | mm      | n/a   | 440             | 540             | 610             | 705             | 875             |
| 22 mm cold feed                          | 4 | mm      | 195   | 195             | 195             | 195             | 195             | 195             |
| 3 kW immersion heater lower (1 3/4")     | 5 | mm      | 215   | 215             | 215             | 215             | 215             | 215             |
| 22 mm secondary return                   | 6 | mm      | -   | -               | -               | -               | 1005            | 1225            |
| 22 mm primary flow                       | - | mm      | -   | -               | -               | -               | -               | -               |
| 22 mm primary return                     | - | mm      | -   | -               | -               | -               | -               | -               |
| Control thermostat                       | - | mm      | -   | -               | -               | -               | -               | -               |
| Primary heat exchanger surface area      | - | m2      | -   | -               | -               | -               | -               | -               |
| Primary heat exchanger capacity          | - | litres  | -   | -               | -               | -               | -               | -               |
| Primary heat exchanger thermal rating 1  | - | kW      | -   | -               | -               | -               | -               | -               |
| Primary heat exchanger pressure loss 1   | - | bar     | -   | -               | -               | -               | -               | -               |
| Heat up time from 15 °C to 60 °C 2       | - | min     | -   | -               | -               | -               | -               | -               |
| V40                                      | - | litres  | 132.3   | 153.6           | 193.3           | 235.5           | 295.6           | 395.1           |



## Stainless ES Direct

### Basic Appliance

1. Hot water draw off (22 mm)
2. Temperature & pressure relief valve 90°/6 bar
3. Immersion heater 1¾" BSP 3 kW (normally on-peak)
4. Cold feed (22 mm)
5. Immersion heater 1¾" BSP 3 kW (normally off-peak)
6. Secondary return (22mm) (200 and 250 litre models only)

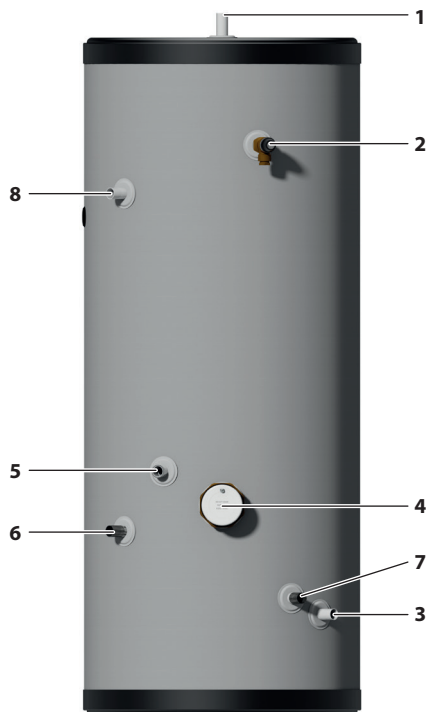
Part G3 loose components supplied in a separate box

- A. Combination inlet group incorporating:
  - pressure reducing valve
  - strainer
  - check valve
  - balance cold take off point (22 mm)
  - expansion relief valve (15 mm)
  - expansion vessel hose connection point
- B. Potable expansion vessel and wall bracket
- C. Tundish

**Cylinders are supplied with plain pipe connections suitable for use with compression fittings.**

**No drain valve is supplied with the product, however the draining of the unit can be achieved via the cold feed connection. For insitu cylinder draining, we would recommend a drain is fitted close to the cold feed inlet to enable maintenance work.**

| Table 2                                  |   |         | Gledhill ES 530 mm Diameter Indirect Cylinders Data |              |              |              |              |              |              |
|--|---|---------|---|--------------|--------------|--------------|--------------|--------------|--------------|
| Model                                    | - |         | IN090   | IN120        | IN150        | IN170        | IN200        | IN250        | IN300        |
| Product Stock Code                       | - |         | SESIN PIN090  | SESIN PIN120 | SESIN PIN150 | SESIN PIN170 | SESIN PIN200 | SESIN PIN250 | SESIN PIN300 |
| Load Profile                             | - |         | -   | -            | -            | -            | -            | -            | -            |
| Energy efficiency class                  | - |         | B   | B            | B            | B            | C            | C            | C            |
| Heat loss                                | - | watts   | 36  | 43           | 52           | 57           | 65           | 79           | 92           |
|  | - | kWh/24h | 0.87  | 1.03         | 1.24         | 1.37         | 1.56         | 1.89         | 2.20         |
| Energy efficiency                        | - | %       | -   | -            | -            | -            | -            | -            | -            |
| Annual consumption                       | - | kWh     | -   | -            | -            | -            | -            | -            | -            |
| Immersion heater setting                 | - | °C      | 60  | 60           | 60           | 60           | 60           | 60           | 60           |
| Sound power level                        | - | db      | -   | -            | -            | -            | -            | -            | -            |
| Capacity - total volume                  | - | litres  | 82.9  | 110.5        | 139.5        | 158          | 186          | 234.8        | 280.5        |
| Volume heated by IH                      | - | litres  | 50  | 70           | 100          | 115          | 143          | 188          | 230          |
| Weight - empty/full                      | - | kg      | 17/110  | 20/136       | 23/172       | 26/192       | 29/227       | 35/263       | 41/336       |
| Pressure regulating valve setting        | - | bar     | 3   | 3            | 3            | 3            | 3            | 3            | 3            |
| Expansion relief valve setting           | - | bar     | 4.5   | 4.5          | 4.5          | 4.5          | 4.5          | 4.5          | 4.5          |
| Temperature setting (P&T valve)          | - | °C      | 90  | 90           | 90           | 90           | 90           | 90           | 90           |
| Pressure setting (P&T valve)             | - | bar     | 6   | 6            | 6            | 6            | 6            | 6            | 6            |
| Expansion vessel size (volume)           | - | litres  | 12  | 12           | 19           | 19           | 25           | 25           | 35           |
| Expansion vessel initial charge pressure | - | bar     | 3   | 3            | 3            | 3            | 3            | 3            | 3            |
| Height                                   | - | mm      | 705   | 832          | 1012         | 1130         | 1304         | 1602         | 1894         |
| Diameter                                 | - | mm      | 530   | 530          | 530          | 530          | 530          | 530          | 530          |
| Hot Supply                               | 1 | mm      | 750   | 879          | 1059         | 1178         | 1352         | 1650         | 1942         |
| P & T valve                              | 2 | mm      | 498   | 625          | 805          | 923          | 1097         | 1395         | 1688         |
| 22 mm cold feed                          | 3 | mm      | 195   | 195          | 195          | 195          | 195          | 195          | 195          |
| 3 kW immersion heater upper (1 3/4")     | 4 | mm      | 365   | 365          | 365          | 405          | 405          | 445          | 445          |
| 3 kW immersion heater lower (1 3/4")     | - | mm      | -   | -            | -            | -            | -            | -            | -            |
| Control thermostat                       | 5 | mm      | 275   | 315          | 375          | 415          | 470          | 570          | 665          |
| 22 mm primary flow                       | 6 | mm      | 315   | 315          | 315          | 355          | 355          | 395          | 395          |
| 22 mm primary return                     | 7 | mm      | 226   | 226          | 226          | 226          | 266          | 226          | 226          |
| 22 mm secondary return                   | 8 | mm      | -   | -            | -            | -            | 1005         | 1225         | 1505         |
| Primary heat exchanger surface area      | - | m2      | 0.59  | 0.59         | 0.59         | 0.68         | 0.68         | 0.78         | 0.78         |
| Primary heat exchanger capacity          | - | litres  | 0.15  | 0.16         | 0.14         | 0.19         | 0.18         | 0.21         | 0.23         |
| Primary heat exchanger thermal rating 1  | - | kW      | 15.68   | 15.07        | 16.47        | 17.80        | 20.61        | 21.28        | 20.24        |
| Primary heat exchanger pressure loss 1   | - | bar     | 0.15  | 0.16         | 0.14         | 0.19         | 0.18         | 0.21         | 0.23         |
| Heat up time from 10 °C to 60 °C 2       | - | min     | 15.11   | 20.08        | 25.42        | 27.62        | 29.04        | 35.97        | 44.65        |
| V40                                      | - | litres  | 112.9   | 144.3        | 199.5        | 234          | 283.1        | 364.8        | 429.7        |



## Stainless ES Indirect

### Basic Appliance

1. Hot water draw off (22 mm)
2. Temperature & pressure relief valve 90°/6 bar
3. Cold feed (22 mm)
4. Immersion heater 1¾" BSP 3 kW
5. Control stat pocket (22 mm)
6. Primary flow (22 mm)
7. Primary return (22 mm)
8. Secondary return (22 mm) (200, 250 and 300 litre models only)

Part G3 loose components supplied in a separate box

- A. Combination inlet group incorporating:
  - pressure reducing valve
  - strainer
  - check valve
  - balance cold take off point (22 mm)
  - expansion relief valve (15 mm)
  - expansion vessel hose connection point
- B. Potable expansion vessel and wall bracket
- C. Tundish
- D. Cylinder control thermostat
- E. 2 Port valve (22 mm)

**Cylinders are supplied with plain pipe connections suitable for use with compression fittings.**

**No drain valve is supplied with the product, however the draining of the unit can be achieved via the cold feed connection. For insitu cylinder draining, we would recommend a drain is fitted close to the cold feed inlet to enable maintenance work.**

**General Design Considerations**

The cupboard footprint needs to be at least 650 mm square. The base chosen for the cylinder should be level and capable of supporting the weight of the unit when full of water as shown in General Data. The discharge pipework for the safety valves must have a minimum fall of 1 : 200 from the unit to a safe discharge point. All exposed pipework and fittings on the cylinder should be insulated, and the unit should NOT be installed in a location where the contents could freeze.

In new systems, pipes should be insulated to comply with building regs, the maximum permissible heat loss is indicated in the table below, and labelled accordingly as follows:

- i. Primary circulation pipes for domestic hot water circuits should be insulated through their length, subject only to practical constraints imposed by the need to penetrate joists and other structural elements.
- ii. All pipes connected to hot water storage vessels, including the vent pipe, should be insulated for at least 1 metre from their points of connection to the cylinder (or they should be insulated up to the point where they become concealed).

In replacement systems, whenever a boiler or hot water storage vessel is replaced in an existing system, any pipes that are exposed as part of the work or are otherwise accessible should be insulated as recommended for new systems, or to some lesser standard where practical constraints dictate.

The pipe connecting the boiler flow to the appliance must not be less than 22 mm copper or equivalent.

| Insulation of pipework |                   |
|------------------------|-------------------|
| Pipe outside diameter  | Maximum heat loss |
| 15 mm                  | 7.89 W/m          |
| 22 mm                  | 9.12 W/m          |
| 28 mm                  | 10.07 W/m         |
| 35 mm                  | 11.08 W/m         |

Further guidance on converting heat loss limits to insulation thickness for specific thermal conductivities is available in TIMSA “HVAC guidance for achieving compliance with Part L of the Building Regulations”.

## **Mains Water Supply**

Existing properties with a 15 mm supply will be satisfactory, provided the local mains pressure is good, but should be confined to single bathroom properties. For new properties where simultaneous demand is required to more than one bathroom or a bathroom and one or more en-suites, the communication and service pipe into the dwelling should be a minimum of 22 mm (usually in the form of a 25 mm MDPE supply).

The optimum performance is achieved if the inlet pressure is 3 bar dynamic. However, the Stainless ES will function with lower inlet pressures, but this will reduce the performance. For optimum performance, 30L per minute incoming mains flow should be present, however the Stainless ES will work at lower flow rates, although performance will be affected.

Normally the Stainless ES provides well in excess of 40 litres/min in most conditions. Flow rates for ALL mains pressure systems are subject to district pressures and system dynamic loss. Particularly on larger properties with more than one bathroom, the pipe sizes should be calculated in accordance with BS EN 806-3:2006 and BS 8558:2011.

## **Pipe Layout**

In all mains pressure installations it is important to remember that the incoming cold supply must be shared between all terminal fittings. It is important that a 22 mm supply is brought to the appliance and a 22 mm take-off is continued at least to the bath. If there are two baths, 28 mm pipework should be considered. One metre of smaller diameter pipework, or flow restrictors, should be provided on the final connection to all outlets so as to balance the water available. In any event the distribution pipework should generally be in accordance with BS EN806-1 to 5.

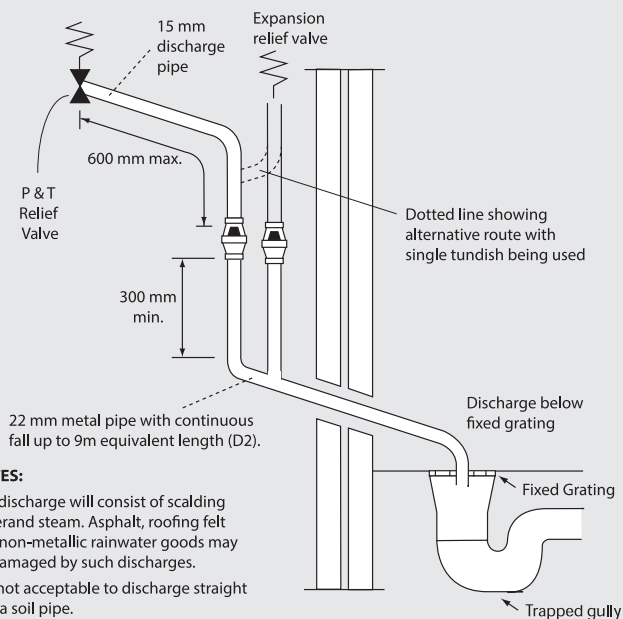
## **Plastic Pipework**

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.

## **Secondary Hot Water Circulation**

Some models are fitted with a secondary return tapping as standard. If fitted, an extra expansion vessel may be necessary. A non-return valve **MUST** be FITTED near the return connection. No valve or terminal fitting should be installed between the non return valve and the cylinder. (See schematic arrangement on page 13.) All pipes kept hot by the secondary circulation should be insulated.

### Typical Discharge Pipe Arrangement



#### NOTES:

The discharge will consist of scalding water and steam. Asphalt, roofing felt and non-metallic rainwater goods may be damaged by such discharges. It is not acceptable to discharge straight into a soil pipe.

### Pressure & Temperature/expansion Relief Valve Pipework

The relief valve should be installed to discharge in accordance with G3 of the Approved Document of the Building Regulations and should be piped to where it is visible, but will not cause danger to persons or damage to materials.

The following information is taken from Approved Document G3 of the Building Regulations and is provided to assist with the design and installation of the discharge pipework. However, the information is not exhaustive and reference should always be made to Approved Document G3 of the Building Regulations. The final decision regarding any arrangements rests with Building Control and it is recommended that their advice is sought if you have any concerns regarding this aspect of the installation.

The two safety valves will only discharge water under fault conditions. When operating normally water will not be discharged.

The tundish should be vertical, located in the same space as the unvented hot water storage system and be fitted as close as possible and within 600 mm of the safety device e.g. the temperature relief valve.

The discharge pipe (D2) from the tundish should terminate in a safe place where there is no risk to persons in the vicinity of the discharge, be of metal and:

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

An alternative approach for sizing discharge pipes would be to follow BS EN 806-2:2005 Specification for design installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages.

Worked Example

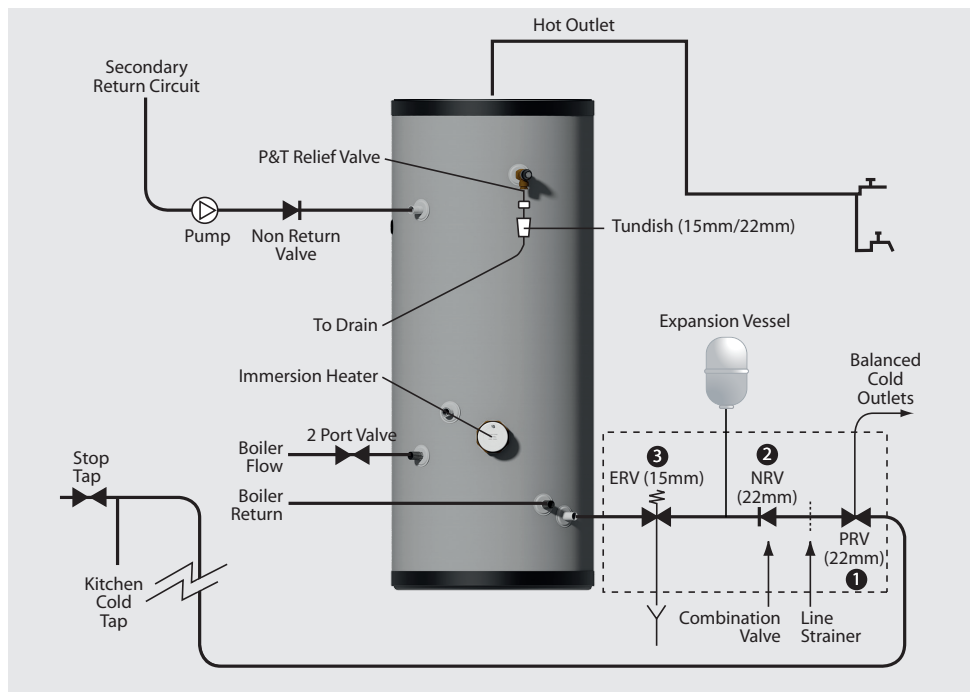
The example below is for G1/2 temperature relief valve with a discharge pipe (D2) having 4 elbows and length of 7 m from the tundish to the point of discharge.

From the table below:

- Maximum resistance allowed for a straight length of 22 mm copper discharge pipe (D2) from a G1/2 temperature relief valve is: 9 m subtract the resistance for 4 x 22 mm elbows at 0.8 m each = 3.2 m.
- Therefore the maximum permitted length equates to: 5.8 m.
- 5.8m is less than the actual length of 7m therefore calculate the next largest size.
- Maximum resistance allowed for a straight length of 28 mm pipe (D2) from a G1/2 temperature relief valve equates to: 14 m.
- As the actual length is 7 m, a 28 mm (D2) copper pipe will be satisfactory.

| Sizing of copper discharge pipe 'D2' for a temperature relief valve with a G1/2 outlet size (as supplied) |  |  |
|---|--|--|
| Size of discharge pipework  | Maximum length of straight pipe (no bends or elbows) | Deduct the figure below from the maximum length for each bend or elbow in the discharge pipe |
| 22 mm   | Up to 9 m  | 0.8 m  |
| 28 mm   | Up to 18 m   | 1 m  |
| 35 mm   | Up to 27 m   | 1.4 m  |

- b) Have a vertical section of pipe at least 300 mm long, below the tundish before any elbows or bends in the pipe work.
- c) Be installed with a continuous fall.
- d) It is preferable for the discharge to be visible at both the tundish and the final point of discharge but where this is not possible or practically difficult there should be clear visibility at one or other of these locations. Examples of acceptable discharge arrangements are:
  - 1. Ideally below the fixed grating and above the water seal in a trapped gulley.
  - 2. Downward discharges at a low level; i.e. up to 100 mm above external surfaces such as car parks, hard standings, grassed areas etc are acceptable providing that where children play or otherwise come into contact with discharges, a wire cage or similar guard is positioned to prevent contact whilst maintaining visibility.
  - 3. Discharges at a high level; e.g. into metal hopper and metal down pipe with the end of the discharge pipe clearly visible (tundish visible or not) or onto a roof capable of withstanding high temperature discharges of water and 3 m from any plastic guttering systems that would collect such discharges.
  - 4. Where a single pipe serves a number of discharges, such as in blocks of flats, the number served should be limited to not more than 6 systems so that any installation can be traced reasonably easily. The single common discharge pipe should be at least one pipe size larger than the largest individual discharge pipe to be connected. If unvented hot water storage systems are installed where discharges from safety devices may not be apparent i.e. in dwellings occupied by blind, infirm or disabled people, consideration should be given to the installation of an electronically operated device to warn when discharge takes place.



## Combination Inlet Group

Combines elements 1, 2 and 3 below.

1. **Pressure Reducing Valve** - This must be fixed near the cylinder. The cold water supply to any mixer taps/showers must be taken from the cold water tapping of this valve to ensure balanced hot and cold pressures. This valve is factory set to ensure the correct operating pressure for the Stainless ES.
2. **Non Return Valve** - This is integral with the pressure reducing valve to prevent backflow of hot water towards cold water draw off points.
3. **Cold Water Expansion Relief Valve** - This safety device is preset at the factory and will relieve excess cold water pressure resulting from a fault condition.

There must be no valve on the pipe work between the expansion cylinders and the unvented cylinder which could prevent the expansion of the water contained in the unvented cylinder reaching the expansion cylinders.

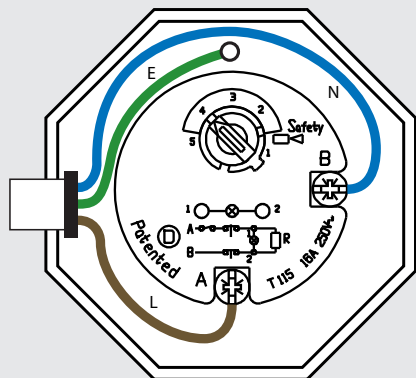
## Pressure & Temperature Relief Valve

This safety device is also pre-set at the factory and relieves before the temperature reaches 100 °C. It is also a Pressure Relief Valve, and is pre-set to 6 bar.

## Immersion Heaters

The immersion heaters fitted to our units are 3 kW 240V ~AC. Check that the mains supply conforms to this, and all external wiring conforms to the most recent revision of the IEE wiring regulations. An Incoloy element is used on this product for standard domestic use and water conditions, use our Titanium elements in all other circumstances, part number SH002.

The immersion heater is fitted into the hot water cylinder using an O-ring. After the unit is filled with water check for leaks to determine if the O-ring has sealed and tighten carefully using the appropriate tool. To prevent damage to the O-ring do not use excessive force to tighten the immersion heater.



## Immersion Heater Wiring

Thermostat Type TSE fitted in the indirect cylinders - is supplied set in position 5 at  $60\text{ }^{\circ}\text{C} \pm 4\text{ }^{\circ}\text{C}$ .

When ordering a replacement part the TSR thermostat type will be supplied with the immersion heater.

Thermostat Type TSR fitted in the Direct cylinders. Position 4 is  $55^{\circ}\text{C} \pm 3^{\circ}\text{C}$  and position 5 is  $68^{\circ}\text{C} \pm 3^{\circ}\text{C}$ .

The immersion heater is supplied with a thermostat which has been tested for operation in the cylinder and complies with the European directives for Electromagnetic compatibility and radio interference. It is Rated at 20 Amp 250 V ~AC.

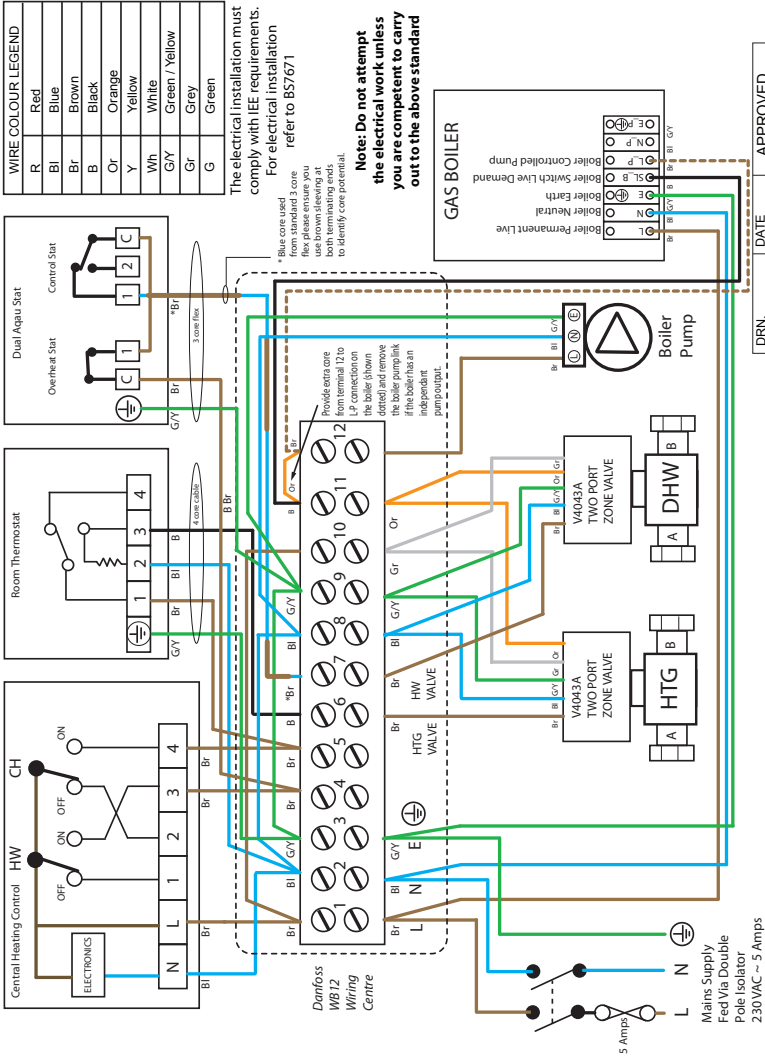
The immersion thermostat has two terminals A and B. The Live (brown) wire should be connected to terminal A and the Neutral (blue) wire should be connected to terminal B. It has been our experience that Crimp terminals make better connections. The immersion heater must be fully earthed (earth post) and connected via a double pole isolator switch having a contact separation at least 3 mm, see diagram opposite.

Danger of electrocution: before making any adjustments to the thermostat isolate the immersion heater from the mains electricity supply at the fuse spur unit.

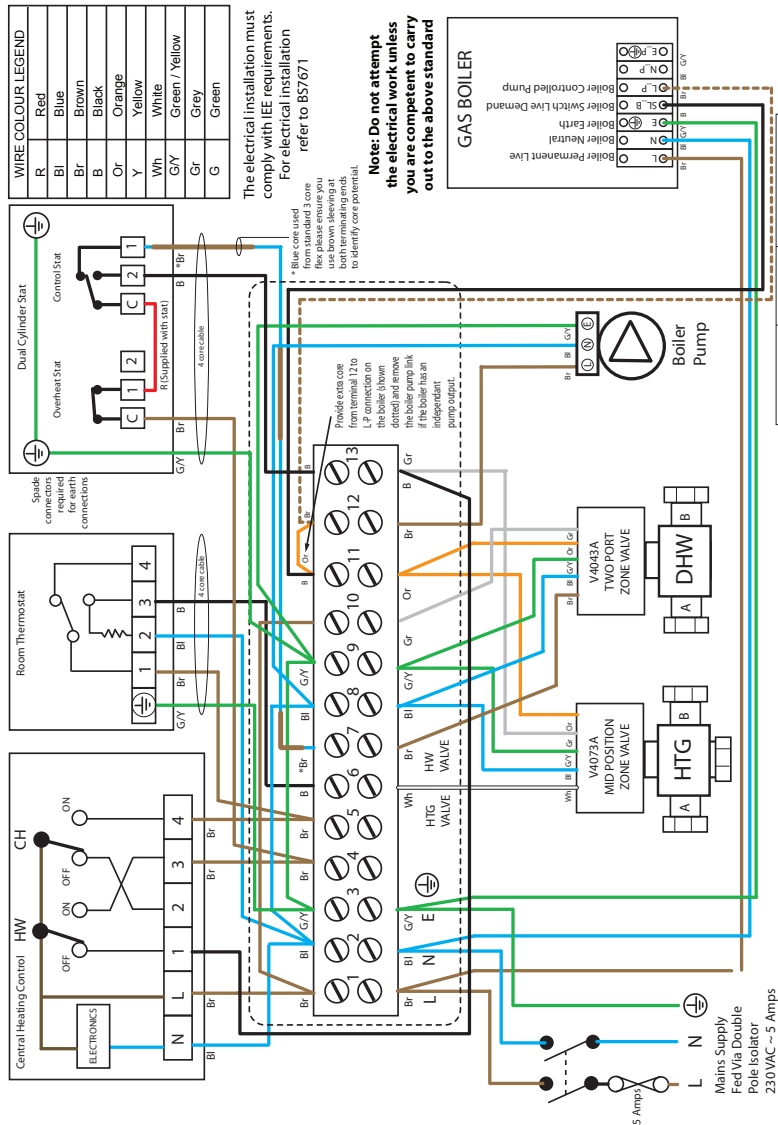
The immersion heater thermostats incorporate a manual reset safety/overheat cut out thermostat. Should this operate, investigate the cause for the operation cut out before pressing the red reset button labelled safety. If there is no apparent fault adjust the control setting down slightly to prevent nuisance tripping.

The direct cylinder is intended to be heated from an off peak supply using the lowest immersion heater(s) and boosted via the upper immersion heater from an on peak supply. Suitable controllers are available to control this operation effectively.

(S-PLAN) WIRING DIAGRAM WITH TWO 2 PORT VALVES AND BOILER CONTROLLED PUMP OVERRUN OPTION



## (Y-PLAN) WIRING DIAGRAM WITH 3 PORT VALVE/2 PORT SAFETY VALVE AND BOILER CONTROLLED PUMP OVERRUN OPTION



### Typical schematic wiring diagram for an unvented installation

| DRN.       | DATE     | APPROVED     |
|------------|----------|--------------|
| N. Fursman | 07-12-10 | ISSUE No : 4 |

Connections can come loose in transit, and all should be checked after first fill of the unit.

The control thermostat of the immersion heaters for direct heating of our cylinders are set at 62 °C. The control thermostat for indirect heat exchanger heat up of our cylinders are usually set at between 60 °C - 65 °C. During commissioning the actual temperature that the cylinder reaches when the thermostat(s) operate should be tested and adjusted so that it achieves a minimum of 60 °C. This temperature needs to be achieved on a regular basis in order to comply with the Legionella pasteurisation requirements.

Check the pressure on the air side of the expansion vessel = 3 bar. This must be done when the water in the cylinder is free to expand in atmospheric pressure or the cylinder and relevant pipe work is empty.

Check that all the drain cocks are closed, and open all the cold and hot water taps and other terminal fittings. Allow the system to fill with water, and to run until there is no air left in the system. Close the taps and inspect the system closely for leaks.

Manually open the Relief Valves one by one and check that water is discharged and run freely through the tundish and out at the discharge point. The pipework should accept full bore discharge without overflowing at the tundish, and the valve should seat satisfactorily.

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 should be performed as per BS EN 806:4 2010 section 6.2.

Allow the cylinder to heat to normal working temperature, then thoroughly flush the domestic hot and cold water pipework through each tap.

**NOTE:** If this appliance is to be installed in other than a single domestic dwelling ie. in an apartment block or student flats etc., the hot and cold water system will need to be disinfected in accordance with BS EN 806:4 2010 section 6.3 and the Water Regulations.

Because the Stainless ES appliance is stainless steel, the use of chlorine as the disinfection agent can cause damage unless the appliance is adequately flushed and refilled with the mains water immediately on completion of the disinfection procedure. Damage caused through a failure to do this adequately will not be covered by the warranty. For the reasons mentioned, we recommend the use of a non chlorine based disinfectant such as Fernox LP Sterox as manufactured by Cookson Electronics when carrying out disinfection of systems incorporating these appliances.

Remove the filter from the combination inlet group clean and replace. Refill the system and open all hot taps until there is no air in the pipe work. **ENSURE CYLINDER IS DRAINED PRIOR TO CHECKING OR REMOVING FILTER FROM THE COMBINATION INLET GROUP.**

Please note a drain valve is not supplied with the cylinder.

## **IMPORTANT - DRAIN DOWN PROCEDURE**

- 1 Switch off both the boiler and the immersion heater
- 2 Open the nearest hot tap and run all hot water until cold, then close it
- 3 Close the incoming cold main at the stop tap
- 4 **Hold open the pressure and temperature relief valve until water stops discharging into the tundish and keep it open**
- 5 Open the cold taps starting from the highest point and working down to the lowest tap, leaving them open
- 6 When the cold taps have stopped draining, open the hot taps starting from the highest and working down to the lowest tap
- 7 Open the drain cock and ensure the pressure and temperature relief valve is held open until the cylinder is empty

Allow the cylinder to heat to normal working temperature with whatever heat source is to be used, and check again for leaks. The pressure relief valve or the P&T valve should not operate during the heating cycle. If the P&T valve operates before the pressure relief valve due to high pressure, check that the inlet control group is fitted correctly, and that no valves are fitted between the cylinder and the expansion vessel

The boiler/heating systems should be filled and commissioned in accordance with good practice following the guidance in BS 7593:2006/the boiler manufacturers instructions. This includes adequately flushing the system to remove any debris that may have been introduced during installation/maintenance.

### **Scale**

In hard water areas it is recommended that an in-line scale inhibitor is fitted. Reducing the temperature of the stored water will reduce the rate at which scale forms. If the recovery rate is badly affected, this is an indication that scaling may have occurred. In this event, follow the procedures as recommended by a reputable Water Treatment Company.

### **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.

Your Stainless ES unvented cylinder is automatic in normal use, but requires routine maintenance which is normally carried out at least annually along with the boiler service. The maintenance must be carried out by a suitably competent tradesperson who is qualified to work on unvented cylinders. The checks/work needed are listed in the maintenance part of these Instructions.

The control thermostat of the immersion heaters for direct heating of our cylinders are set at 62 °C. The control thermostat for indirect heat exchanger heat up of our cylinders are usually set at between 60 °C - 65 °C. During commissioning the actual temperature that the cylinder reaches when the thermostat(s) operate should be tested and adjusted so that it achieves a minimum of 60 °C. This temperature needs to be achieved on a regular basis in order to comply with the Legionella pasteurisation requirements.

When initially opening the taps, a small surge in flow may be experienced, which disappears as the pressure in the system stabilises. This is quite normal with these types of systems and does not indicate a fault.

In some areas the water will initially appear cloudy, but will quickly clear when left to stand. This is nothing to be concerned about and is due to aeration of the water.

**WARNING** - If water is seen flowing through the tundish, this indicates a fault condition which needs action.

If the discharge is hot and continuous, turn the boiler and/or the immersion heaters off, but do not turn off the cold water to the appliance until the discharge is cold.

**Note:** The discharge may stop by itself as the discharge cools.

If the discharge is cold and intermittent, no immediate action is needed but this indicates a problem with the expansion vessel.

**However, in both cases you must call the registered installer / a suitably qualified, competent tradesperson, advise them that you have an unvented cylinder and request a maintenance visit.**

**DO NOT**, at any time, tamper in any way with the safety valves or overheat thermostats/wiring.

## **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.

The Registered Installer is responsible for the safe installation and operation of the system. The installer must also make his customer aware that periodic maintenance of the equipment is essential for safety.

Maintenance periods will vary for many reasons. Gledhill Building Products Ltd recommend a maximum of 12 months to coincide with boiler maintenance. Experience of local water conditions may indicate that more frequent maintenance is desirable, eg, when water is particularly hard, scale-forming or where the water supply contains a high proportion of solids, eg, sand. Maintenance must include, but not limited to, the following:

1. Turn the mains water off, remove and clean the strainer element in the Pressure Reducing Valve.
2. Manually check the operation of the temperature relief valve.
3. Manually check the operation of the expansion relief valve.
4. Check discharge pipes from temperature and expansion relief valves are free from obstruction and blockage and are not passing any water.
5. Check that water pressure downstream of combination valve is 3 bar in static condition.
6. Check operation of motorised valve.
7. Check the pressure on the air side of the expansion vessel. This must be done when the volume in the cylinders is cold.
8. Re-fill the system and ensure that all relief valves have re-seated.
9. Check and advise the householder not to place any clothing or other combustible materials against or on top of this appliance.
10. On completion of the work, fill in the Benchmark Service Record towards the back of this manual.

## IMPORTANT NOTE

**When draining down the appliance for any reason, the instructions provided in the Commissioning Section (Page 19) MUST be followed to prevent potential damage to the cylinder.**

After servicing, complete the relevant Service Interval Record section of the Benchmark Checklist located on the inside back pages of this document.

## General

No water at the tap. Check that the mains water supply is turned ON. Check the line strainer is not blocked. Check that the combination valve has been fitted so that water is flowing in the correct direction.

If the water at the tap is cold, ensure that the boiler has been switched ON and is working correctly. Check that there are no air locks in the primary system. ISOLATE THE UNIT AT THE MAINS ELECTRIC SUPPLY AND THEN CHECK THE FOLLOWING:

- i. The cylinder thermostat
- ii. The thermal cut-out, which can be re-set by pushing the red button
- iii. The motorised valve
- iv. The boiler thermostat
- v. The boiler thermostat cut-out (if fitted)

ANY ENERGY CUT-OUT MUST NEVER BE BY-PASSED UNDER ANY CIRCUMSTANCES.

If the units are not getting hot and the heat source is electrical, ensure that the immersion heaters are isolated from the mains before re-setting the energy cut-out. If the immersion heater(s) need replacing this should be done with the units supplied from Gledhill Building Products Limited. Same day despatch by Gledhill Spares to approved installers can be arranged by telephoning 01253 474412.

## Discharge From Relief Valves

If cold water is discharging from the expansion relief valve into the tundish check the pressure on the expansion vessel when cold and recharge if necessary.

If the fault continues and the problem cannot be stopped by operating the control a few times then either the Pressure Reducing Valve or the Relief Valve may be at fault. If the cold water pressure is too high, this would suggest that the Pressure Reducing Valve is at fault and the Gledhill approved replacement should be fitted. If the pressure is correct then the Relief Valve will require replacing with a Gledhill approved component.

## See Commissioning for drain down procedure.

If there is an overheat fault and very hot water is being discharged, turn off the heat source, **but not the water supply**.

When the supply is cool, check thermostats and energy cut-outs in the boiler and immersion heaters and replace the faulty component with a unit supplied by Gledhill and check that it works correctly before returning the system to full operation.

| SPARE PARTS LIST |  |          |                |
|------------------|--|----------|----------------|
|                  | Description  | Quantity | Stock Code No. |
| 1                | 3 kW immersion element   | 1        | SH010          |
| 2                | Pressure and temperature relief valve 6 bar 90° bar                | 1        | SG019          |
| 3                | Inlet group set at 3 bar c/w expansion relief valve set at 4.5 bar | 1        | SG034          |
| 4                | 12 litre expansion vessel  | 1        | XG224          |
| 5                | 19 litre expansion vessel  | 1        | XG225          |
| 6                | 24 litre expansion vessel  | 1        | XG226          |
| 7                | 35 litre expansion vessel  | 1        | XG227          |
| 8                | 22 mm 2 Port valve (Indirects only)                                | 1        | XG083          |
| 9                | Control and overheat limit thermostat                              | 1        | XG219          |
| 10               | 15 mm x 22 mm tundish  | 1        | XG247          |

**Gledhill Building Products guarantees the Stainless ES cylinder and components against material defect or manufacturing fault for a period of two years from the date of purchase. The two year warranty on the stainless steel inner cylinder will be extended to twenty five years in domestic properties on the registration of the cylinder.**

The above product guarantees are valid provided:

- It has been installed by a competent installer in accordance with the instructions detailed in our installation manual and all relevant Codes of Practice and Regulations in force at the time of installation.
- No factory fitted parts have been removed for unauthorised repair or replacement and the product has not been modified - other than by Gledhill.
- Any replacement parts used should be authorised, approved Gledhill spare parts.
- The cylinder has only been used for the storage of potable water supplied from the public mains (-max 200 mg/litre chloride).
- It has not been subject to wrong or improper use, left uncared for, or subjected to scale or frost damage.
- The unit has been serviced annually by a competent, licenced engineer in accordance with the requirement set out in the manual.
- The Benchmark TM Commissioning Checklist Service Record included in our manual has been completed and updated after each annual service.
- Any disinfection has been carried out strictly in accordance with BS6700.
- For heavy use installation where constant usage / reheat is required titanium immersion heaters should be fitted.
- **The registration for the unit is completed within 30 days of purchase by the owner. Evidence of purchase and date of supply must be submitted upon making a claim.**

### **Guidance in the event of a problem**

If you have a problem in the first year, please contact the plumber who fitted the unit. After the first year, you should contact the plumber who carries out the annual servicing for you.

### **Action in the event of component failure within warranty period**

Failed components should be returned via the local authorised supplier. A nominal charge of £30 will be made which is refunded in full by Gledhill on receipt of the original part and proof of purchase.

### **Action in the event of inner vessel cylinder failure within warranty period**

Since the full diagnosis of cause of failure is usually only possible with a laboratory test environment where a product can be fully assessed and tested, we will require the return of a cylinder which develops a leak for inspection. Providing our expert examination confirms a manufacturing fault or defect, credit will then be raised against the cost of the original cylinder.

Please note that a copy of the completed annual service record and commissioning checklist should be submitted with any claim.

**As a HWA Charter Member we endeavour to provide consumers quality assurance, product satisfaction, and confidence in Gledhill, that we will deliver a service beyond just supplying the product.**

# Gledhill (Building Products) Ltd

AMD. APRIL 2018

## CONDITIONS OF SALE & GUARANTEE TERMS

1. Gledhill (Building Products) Ltd ("Gledhill") only do business upon the Conditions which appear below and no other. Unless we 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 fulfillment 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:

- 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
- 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 vessels 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:**

- It has not been modified, other than by Gledhill.
- It has not been subjected to wrong or improper use or left uncared for.
- It has only been used for the storage of potable water supplied from the public mains, max 200mg/litre chloride.
- It has not been subjected to frost damage.
- The benchmark service record is completed after each annual service.
- The unit has been serviced annually.
- 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:-

- We accept liability for death or personal injury to the extent that it results from our negligence or that of our employees.
- 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.
- 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
- 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:-
  - 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 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 -
  - (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

Glehdil 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? |  |                                |  |  |  |  |  |  |  |        |     |        |     |
| Type of control system (if applicable)  |  |                                |  |  |  |  |  |  |  | Y Plan |     | S Plan | Yes |
| Is the cylinder solar (or other renewable) compatible?  |  |                                |  |  |  |  |  |  |  |        |     | Other  |     |
| What is the hot water temperature at the nearest outlet?  |  |                                |  |  |  |  |  |  |  |        | Yes |        | No  |
| All appropriate pipes have been insulated up to 1 metre or the point where they become concealed      |  |                                |  |  |  |  |  |  |  | °C     |     |        |     |
|   |  |                                |  |  |  |  |  |  |  | Yes    |     |        |     |

| UNVENTED SYSTEMS ONLY  |  |  |     |    |
|--|--|--|-----|----|
| Where is the pressure reducing valve situated (if fitted)?   |  |  |     |    |
|  |  |  | bar |    |
| What is the pressure reducing valve setting?   |  |  |     |    |
|  |  |  | Yes | No |
| Has a combined temperature and pressure relief valve and expansion valve been fitted and discharge tested?                     |  |  |     |    |
|  |  |  | Yes |    |
| The tundish and discharge pipework have been connected and terminated to Part G of the Building Regulations                    |  |  |     |    |
|  |  |  | Yes | No |
| 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.

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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      |  |       |

|                   |  |       |
|-------------------|--|-------|
| <b>SERVICE 05</b> |  | Date: |
| Engineer name:    |  |       |
| Company name:     |  |       |
| Telephone No:     |  |       |
| Comments:         |  |       |
|                   |  |       |
|                   |  |       |
|                   |  |       |
| Signature         |  |       |

|                   |  |       |
|-------------------|--|-------|
| <b>SERVICE 07</b> |  | Date: |
| Engineer name:    |  |       |
| Company name:     |  |       |
| Telephone No:     |  |       |
| Comments:         |  |       |
|                   |  |       |
|                   |  |       |
|                   |  |       |
| Signature         |  |       |

|                   |  |       |
|-------------------|--|-------|
| <b>SERVICE 09</b> |  | Date: |
| Engineer name:    |  |       |
| Company name:     |  |       |
| Telephone No:     |  |       |
| Comments:         |  |       |
|                   |  |       |
|                   |  |       |
|                   |  |       |
| Signature         |  |       |

|                   |  |       |
|-------------------|--|-------|
| <b>SERVICE 06</b> |  | Date: |
| Engineer name:    |  |       |
| Company name:     |  |       |
| Telephone No:     |  |       |
| Comments:         |  |       |
|                   |  |       |
|                   |  |       |
|                   |  |       |
| Signature         |  |       |

|                   |  |       |
|-------------------|--|-------|
| <b>SERVICE 08</b> |  | Date: |
| Engineer name:    |  |       |
| Company name:     |  |       |
| Telephone No:     |  |       |
| Comments:         |  |       |
|                   |  |       |
|                   |  |       |
|                   |  |       |
| Signature         |  |       |

|                   |  |       |
|-------------------|--|-------|
| <b>SERVICE 10</b> |  | Date: |
| Engineer name:    |  |       |
| Company name:     |  |       |
| Telephone No:     |  |       |
| Comments:         |  |       |
|                   |  |       |
|                   |  |       |
|                   |  |       |
| Signature         |  |       |

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