



# Glow-worm

## Instructions for use Installation and Servicing

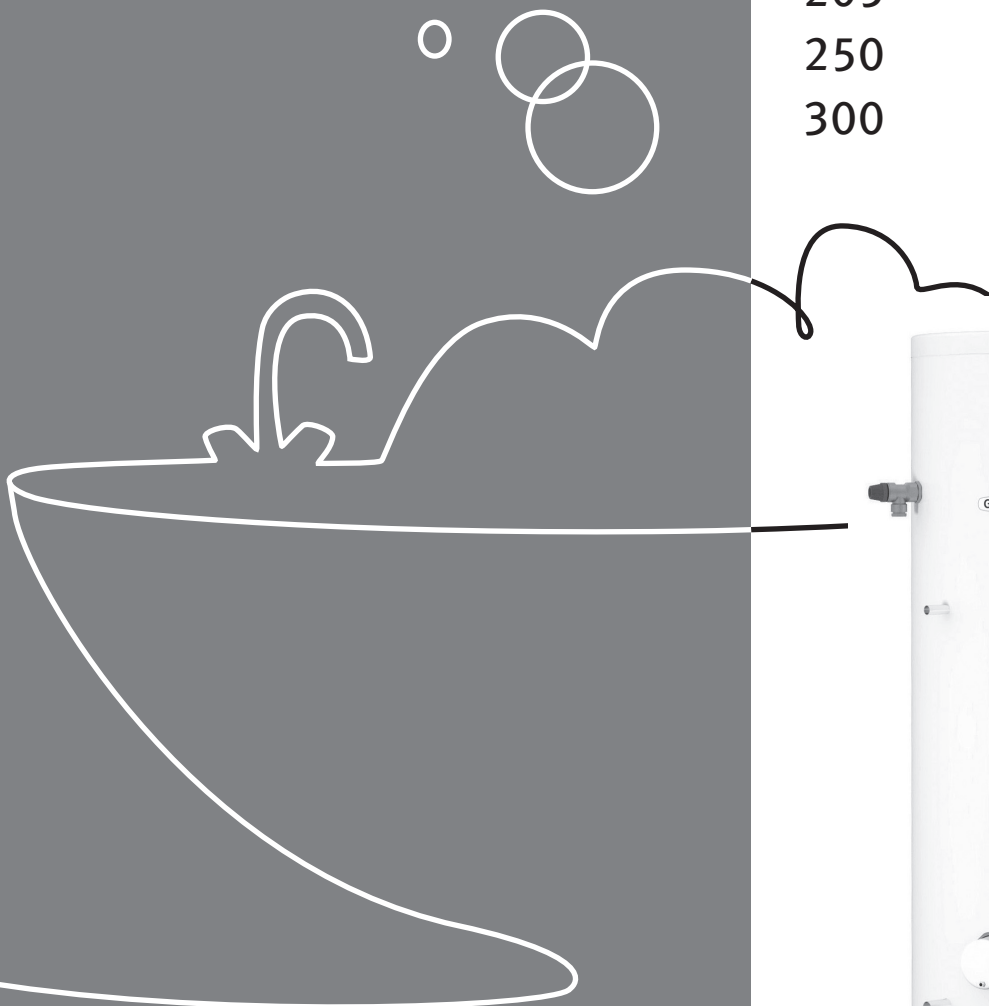
Unvented Hot Water Cylinders/  
Hydracyl

150

205

250

300





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## INTRODUCTION

### 1 Instructions guidance

#### 1.1 Product documentation

The instructions are an integral part of the appliance and must be handed to the user on completion of the installation in order to comply with the current regulation.

- Carefully read the manual, to understand all the information to enable safe installation, use and servicing. No liability can be accepted in the event of damage for not complying with the guidance in this instruction manual.

#### 1.2 Associated documents

When installing the cylinder, you must pay attention to the installation instructions for parts and components of the system.

These installation instructions are enclosed with the various system parts and supplementary components. You must also observe all operating instructions included with the system components.

#### 1.3 Storage of documents

Pass this installation manual and all other applicable documents and, if necessary, any required aids to the system operator.

The system operator will be responsible for storing them so that the instructions and aids are available when required.

#### 1.4 Explanation of symbols



**DANGER:** Risk of injuries.



**DANGER:** Risk of electric shock.



**ATTENTION:** Risk of damage to the appliance or to its vicinity.



**IMPORTANT:** Useful information.

#### 1.5 Benchmark



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 manufacturer's instructions by competent persons and that it meets the requirements of the appropriate Building Regulations. The Benchmark Checklist must be used to demonstrate compliance with Building Regulations and must 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 Hotwater Industry Council who manage and promote the Scheme.

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

### 2 Safety instructions and regulations

#### 2.1 Intended use

Glow-worm cylinders are constructed using state-of-the-art technology in accordance with recognised safety regulations. Nevertheless, there is still a risk of injury or death to the user or others or of damage to the unit and other property in the event of improper use or use for which the unit is not intended.

Glow-worm cylinders are not intended for use by persons who have inadequate experience and/or knowledge, unless they are supervised by a person responsible for their safety or have been given instructions by this person regarding the operation of the unit. Children must be supervised to ensure that they do not play with the unit.

Glow-worm Hydracyl domestic hot water cylinders are unvented, indirectly heated domestic hot water cylinders designed for use with gas-fired boilers as per GB standards for hot water supply systems. The cylinders work with the pressure of the water supply line and do not need a cold water tank for their supply.

They are used only to supply potable water heated up to 80 °C. They may only be used for this purpose. The cylinders can be used in combination with a downstream gas-fired boiler for hot water generation in accordance with GB standards.

Any other use or extended use is considered to be improper. Improper use of any kind is prohibited.

The manufacturer/supplier is not liable for any damage resulting from improper use. The user alone bears the risk. Intended use also includes observing the operating and installation manuals and all other applicable documents, as well as complying with the inspection and servicing conditions.

At the end of this manual there is a commissioning report which you must fill in and hand over to the operator. All installers should have a current ID card and registration number. The cylinder must be installed by a competent person approved at the time by the Health and safety Executive to the prevailing standards, installation book and building regulations at the time of installation.

## 2.2 General safety information

Installation and adjustment as well as service, maintenance and repair must be carried out by a competent person approved at the time by the Health and Safety Executive and be in accordance with the relevant requirements of the Local Authority, Building Regulations, Building Regulations (Scotland), Building Regulations (Northern Ireland), and the bye-laws of the local Water Undertaking.

All electrical wiring must be carried out by a competent electrician and be in accordance with the current I.E.E. Wiring Regulations.

## 2.3 Cylinder safety information

This product has been assessed and found to comply with the requirements of the Building Regulations for unvented hot water storage systems and must not be altered or modified in any way. In the event of parts replacement, use only genuine spare parts supplied by Glow-worm.

The installation is subject to Building Regulation approval.

Notify the Local Authority of intention to install.



*As stipulated in the manual "Handling Operations Regulations 1992", the weight of the unit exceeds that which should be lifted by one person.*

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Without potential equalisation, life-threatening voltage from the electric immersion heater can reach the piping and water taps. Earth the electric immersion heater. If the solar cylinder is connected with pipes made of non-metallic materials and is not earthed, corrosion damage can occur.

Earth the solar cylinder for potential equalisation and to protect against overvoltage.

If using non-metallic pipes on the water route, make sure that they are designed by the manufacturer for continuous operation at 70°C and operation by the hour at temperatures of up to 95°C

Always use a suitable open-end spanner to tighten or undo threaded connections. Do not use pipe wrenches, extensions, etc. If the water does not meet the requirements of the UK water quality standards with a maximum chloride level of 250 mg/l, corrosion damage may occur to the cylinder.

Only use the cylinder to heat potable water.

### 2.3.1 Electric potential equalisation

If you use an electric immersion heater in the cylinder, the external voltage may build up electrical potential in the water which can result in the electrochemical corrosion of the electric immersion heater. Make sure that both the hot water and cold water pipes are connected to the earth line by means of earth cable directly on the cylinder. You must also make sure that the electric immersion heater is connected to the earth line via the earthing terminal.

### 2.3.2 Preventing frost damage

You should not turn the gas-fired boiler off completely so that you can still use all of the safety functions for your heating installation. If you want to take the unit out of operation for a relatively long period of time in an unheated room at risk from frost, you must completely drain the Hydracyl.

### 2.3.3 Avoiding damage caused by leaks

If there are leaks in the pipe network, close off the cold water stop valve on the safety assembly and notify an engineer qualified to work on unvented systems to rectify the leaks.

### 2.3.4 Avoiding burns and scalds

For scald protection, install a hot water thermostat mixer in the system.

Should excessively hot water reach your hot taps contact your installer immediately.

### 2.3.5 Preventing damage due to unauthorised changes to the unit

Changes to the supply lines, relief valve termination, and expansion relief valve may only be carried out by an engineer qualified to work on unvented systems.



***Never shut off the expansion relief valve or relief valve termination.***

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***Never bypass any of the security devices.***

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## 2.4 Cylinder identification plate

The identification plate is attached to the middle of the cylinder at the factory.

## 2.5 Regulation and statutory requirements

### 2.5.1 Cylinder and cylinder assembly

Pressure equipment directive 97/23/EC

Directive of the European Parliament and Council from 29th May, 1997 for the approximation of the laws on pressure equipment of the Member States

EN 12897: 2006

Water supply - specification for indirectly heated unvented (closed) domestic hot water cylinders

EN 806-1

Specifications for installations inside buildings conveying water for human consumption - Part 1: General

EN 1717

Protection against pollution of potable water installations and general requirements of devices to prevent pollution by backflow

**EN 60335-1**

Safety of household and similar electrical appliances; Part 1: General principles (IEC 60335-1: 2001, modified)

**EN 60335-2-21**

Safety of household and similar electrical appliances; Part 2: Particular requirements for storage water heaters (domestic hot water cylinders and hot water boilers) (IEC 335-2-21: 1989 and supplements 1; 1990 and 2; 1990, modified)

**EN 60335-2-73**

Safety of household and similar electrical appliances; Part 2: Particular requirements for fixed immersion heaters (IEC 335-2-73: 1994, modified)

**EN 60529**

Degrees of protection provided by enclosures (IP code) - (IEC 60529: 1989 + A1: 1999)

**EN 60529-1**

Degrees of protection provided by enclosures (IP code) - (IEC 60529: 1989 + A1: 1999)

**EN 60730-1**

Automatic Electrical Controls for Household and Similar Use - Part 1: General requirements (IEC 60730-1: 1999, modified)

**EN 60730-2-9**

Automatic Electrical Controls for Household and Similar Use - Part 2-9: Particular requirements for temperature sensing controls (IEC 60730-2-9: 2000, modified)

**Directive 2004/108/EC**

Directive 2004/108/EC of the European Parliament and Council of 15th December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC

**EC low voltage directive 2006/95/EC**

Directive 2006/95/EC of the European Parliament and Council of 12th December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits

**Lightning protection****ENV 61024-1**

Protection of structures against lightning – Part 1: General principles (IEC 1024-1: 1990; modified) BS 6651: Code of practice for protection of structures against lightning.

**2.6 Regulations for Great Britain****2.6.1 Technical Guidance**

This appliance must only be installed and commissioned by a suitably competent person. Please check with your installer that he is able to carry-out all the necessary works including official notification of the works to the relevant body upon completion.

Observe all national regulations, including: Working at Heights Regulations 2005, Health and Safety at Work Act 1974, Electricity at Work Regulations 1989, IEE Wiring Regulations BS 7671, Lightning protection requirements, Equipotential bonding of electrical installations.

**2.7 General requirements****2.7.1 Preliminary remarks**

This appliance must only be installed and commissioned by an engineer qualified to work on unvented systems. Please check with your installer that he is able to carry-out all the necessary works including official notification of the works to the relevant body upon completion.

**2.7.2 Related documents**

The installation of the appliance and any associated hot water system must be in accordance with (but not limited to) the following; COSHH regulations, Gas Safety (Installation and Use) Regulations 1998, Health and Safety Document No. 635 (The Electricity at Work Regulations 1989), BS7671 (IEE Wiring Regulations) and the Water Supply (Water Fitting) Regulations 1999, or The Water Bylaws 2000 (Scotland). It should also be in accordance with the relevant requirements of the Local Authority, Building Regulations, The Building Regulations (Scotland), The Building Regulations (Northern Ireland) and the relevant recommendations of the following British Standards:

**BS. 6700** Services supplying water for domestic use within buildings and their curtilages.

**BS. 6798** Specification for installation of gas fired boilers not exceeding 60 kW input.

**BS. 6891** Specification for installation of low pressure gas pipework up to 28 mm (R1) in domestic premises (2nd family gas).

**BS. 7593** Treatment of water in domestic hot water central heating systems. Institute of Gas Engineers Publication IGE/UP/7/1998: "Guide for gas installations in timber framed housing"

**BS. 5482 Pt. 1** Domestic butane and propane gas burning installations.

**IGE/UP1** Soundness testing and purging of industrial and commercial gas installation.

**IGE/UP2** Gas installation pipework, boosters and compressors on industrial and commercial premises.

**IGE/UP10** Installation of gas appliances in industrial and commercial premises.

**BS. 6644** Installation of gas fired hot water boilers of rated inputs between 60 kW and 2 MW (2nd and 3rd family gases).

**BS. 5449** Forced circulation hot water central heating systems for domestic premises. Note: only up to 45 kW.

**BS. 6880** Low temperature hot water heating systems of output greater than 45 kW.

Part 1 Fundamental and design considerations.

Part 2 Selection of equipment.

Part 3 Installation, commissioning and maintenance.

BS. 4814 Specification for: Expansion vessels using an internal diaphragm, for sealed hot water heating systems.

BS. 5440 Installation and maintenance of flues and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases).

Part 1 Specification for installation of flues.

Part 2 Specification for installation and maintenance of ventilation for gas appliances.

### 2.7.3 CE Mark

CE labelling shows that the appliance according to the model overview comply with the basic requirements of the applicable directives. The CE declarations of conformity can be viewed at the manufacturer's premises and can be supplied if necessary.

## 3 Introducing your appliance

### 3.1 Appliance description

The Glow-worm Hydracyl domestic hot water cylinder is available in four sizes: 150, 205, 250, and 300 litres. The cylinders are made from stainless steel with EPS insulation.

The unvented domestic hot water cylinder works with the pressure of the water supply line and does not need a cold water tank for its supply. To enable the cylinder to work as well as possible, a cold water supply with an appropriate pressure and flow rate is required.

#### 3.1.1 Safety devices

The cylinder is delivered with all safety and control devices for the operation of the unvented domestic hot water supply:

- Temperature/pressure relief valve (90 °C, 7 bar)
- Pressure limiting valve (3.5 bar) with line strainer
- Expansion relief valve (one-way valve, 6.0 bar)
- Safety thermostat for electric immersion heater (85 °C)
- Reheating circuit safety thermostat (80 °C)

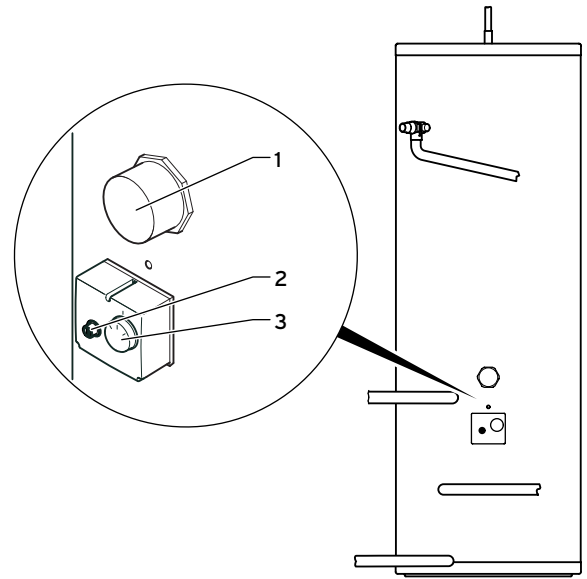
#### 3.1.2 Hot water temperature regulation

You can set the hot water temperature and reheating times on the controller. One of the following controllers may be used depending on the design of your system: Glow-worm dual-channel eBUS controller Cylinder thermostat in conjunction with a timer. Refer to the operating manual for the installed controller or timer.

#### Electric immersion heater

The cylinder is equipped with an additional electric immersion heater with a heating output of 3 kW. The electric immersion heater is designed for use in unvented cylinders and has a thermostat with a temperature controller and a safety thermostat (TCO) with a reset button.

### 3.1.3 Functional elements of cylinder



Key

- 1 Electric immersion heater
- 2 Safety thermostat
- 3 Cylinder thermostat

The following are premounted at the factory for the Hydracyl domestic hot water cylinder:

- Cylinder thermostat (3) and reheating circuit safety thermostat (2).
- Electric immersion heater (1) with safety thermostat and cylinder thermostat.

## 4 Operation



**Risk of scalding and bursts due to inappropriate alterations!**

There is a risk of escaping steam, bursting, and damage to the system if you make any changes to the cylinder, control system, supply lines for water and power (if present), relief valve termination, or expansion relief valve for the cylinder water.

Do not make any improper changes.



**Risk of scalding!**

The output temperature of the draw-off points can reach 85 °C if the mixing valve is set incorrectly.

- Do not adjust the mixing valve.
- If the output temperature at a draw-off point is too high or low, Contact an engineer qualified to work on unvented systems to adjust the temperature.



**Risk of damage from leaks!**

Leaks on the water pipes between the cylinder and tap can result in water damage.

- If a leak occurs, close the cold water stop valve on the cylinder.
- Contact an engineer qualified to work on unvented systems, to eliminate the leak.

The cold water stop valve is located in the pipe connection of your domestic water connection for the cylinder (cold water connection) which should have been fitted by your installer in an accessible position close to the cylinder.

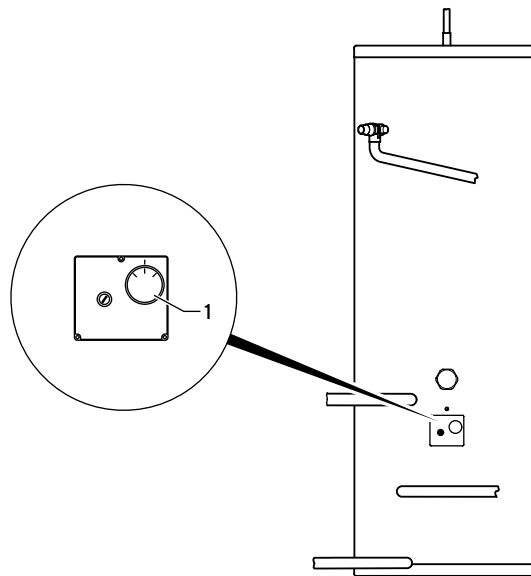
### 4.1 Adjusting the hot water temperature

The hot water temperature is set to the required value by the engineer qualified to work on unvented systems during the cylinder start-up process.

If an external controller is installed for hot water temperature control, you can adjust the hot water temperature and reheating times using this controller.

For information on making settings, see the operating manual for the controller.

#### 4.1.1 Adjusting the cylinder thermostat



Key  
1 Cylinder thermostat

If no controller for hot water temperature control is installed, you can set the required hot water temperature on the cylinder thermostat (1). You can set the reheating times on the installed timer. Refer to the operating manual for the timer.

- Set the desired cylinder hot water temperature on the cylinder thermostat (1).
- For optimum efficiency, choose a setting of 45 °C.
- Use the operating manual for the gas-fired boiler to make sure that the unit is ready for operation.



We recommend the cylinder is set to 60 °C periodically, to provide protection against the proliferation of harmful bacteria.



If you are heating up water for the first time or after a long switch-off period, the full cylinder performance is only available following a waiting period.

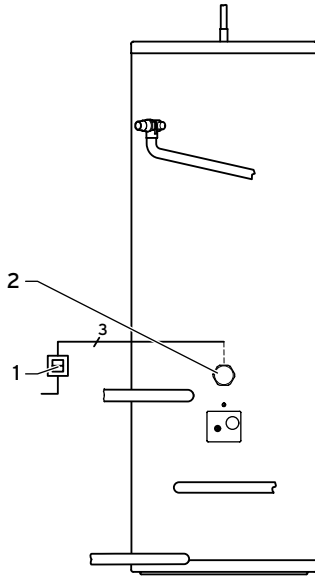


If the Hydracyl is installed in a cupboard, make sure that clothing and other objects are not placed on the cylinder, control devices, pipes, or other system components.



Always make sure that there is clear access to the cylinder to enable the use of the hot water thermostat controller and the thermostat mixer.

4.1.2 Using the electric immersion heater



- Key  
 1 Switch  
 2 Electric immersion heater

The electric immersion heater (2) should only heat the water if the gas-fired boiler fails. The electric immersion heater may not be operated at the same time as the gas-fired boiler.

- If the gas-fired boiler fails, switch the electric immersion on using the switch (1).
- Once the gas-fired boiler is in service again, use the switch to switch the electric immersion heater off.

4.2 Switching off hot water

- Switch off the immersion heater and the gas-fired boiler (see the operating manual for the gas-fired boiler) to temporarily switch off the heating and hot water system.

4.3 Frost protection



**Risk of damage due to frost!**

*If the cylinder is placed out of operation for a relatively long period of time in an unheated room (e.g. during a winter holiday), the cylinder must be completely drained.*

*- Contact an engineer qualified to work on unvented systems to drain the cylinder.*

If you are absent during a relatively long period when there is a risk of frost, make sure that you leave the central heating on and that the temperature in the cylinder room and in all other rooms are kept above freezing.

4.4 Cleaning the cylinder

- Clean the outside of the cylinder only with a damp cloth, using soapy water if it is especially dirty.

Do not use abrasive cleaning agents or solvents (any type of scouring agent, petroleum etc.) since they can damage the cladding and the cylinder fixtures.

4.5 Temporarily taking the cylinder out of service



**Risk of damage as a result of the cylinder freezing!**

*Frost protection and monitoring devices are only active while the boiler is connected up to the power supply.*

*- Make sure that the cylinder cannot be damaged if there is a frost.*

- Temporarily take the cylinder out of service by switching the boiler off.

4.6 Energy-saving tips

Appropriate hot water temperature

The warm water should only be heated up to the extent that is necessary for use. Any further heating results in unnecessary power consumption and hot water temperatures of more than 60°C also lead to increased lime scale production.

Run circulation pumps only if needed

Circulation pumps do indeed increase convenience when it comes to hot water generation. However, they require power. Moreover, circulating hot water which is not used cools down as it moves through the pipes and must then be reheated. Therefore, circulation pumps are to be operated only when hot water is actually needed for the household. Individual timer programs can be defined using autotimers which are already installed or can be retrofitted in most circulation pumps. Weather compensators often have ancillary functions for controlling circulation pump timings. Contact an engineer qualified to work on unvented systems.

## 4.7 Fault finding

Fault	Remedy
Fluid is dripping from the system?	If possible, collect the fluid in a bucket and contact an engineer qualified to work on unvented systems.
The controller issues a message telling me the sensor is faulty or there is a cable break?	Contact an engineer qualified to work on unvented systems.
The cylinder is not providing sufficient hot water?	Check that the hot water temperature is set correctly on the controller (recommended value of approx. 45 °C, however, set periodically to 60 °C to provide protection against the proliferation of harmful bacteria) and that the gas-fired boiler is working. If the settings are correct, the cylinder may be calcified. Then: contact an engineer qualified to work on unvented systems.
A safety thermostat trips?	Contact an engineer qualified to work on unvented systems.
Water escapes from the expansion relief valve?	Contact an engineer qualified to work on unvented systems.

## 5 Inspection and maintenance

An annual inspection/maintenance run by an engineer qualified to work on unvented systems is a prerequisite for ensuring that the cylinder is permanently ready for operation, reliable, and has a long service life.

It is important that your hot water cylinder is serviced annually.

We recommend entering into a maintenance agreement.

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



*Risk of death from electric shock.*

*Improperly executed work on the cylinder can result in a risk to life and limb.*

*- Never try to rectify cylinder malfunctions yourself.*

*- Contact an engineer qualified to work on unvented systems to rectify all malfunctions.*



*Risk of injury resulting from improper maintenance or repair.*

*Failure to arrange for the system to be maintained and repaired and improper maintenance and repair can impair the operational safety of the unit, leading to injuries and damage to property*

*- Never attempt to perform maintenance work or repairs on the cylinder yourself.*

*- Always employ an engineer qualified to work on unvented systems.*

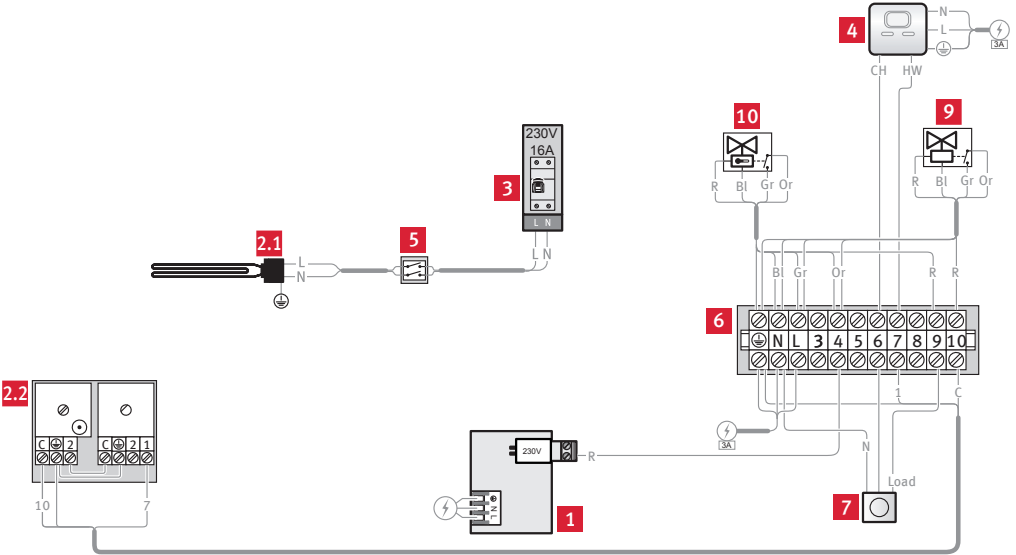
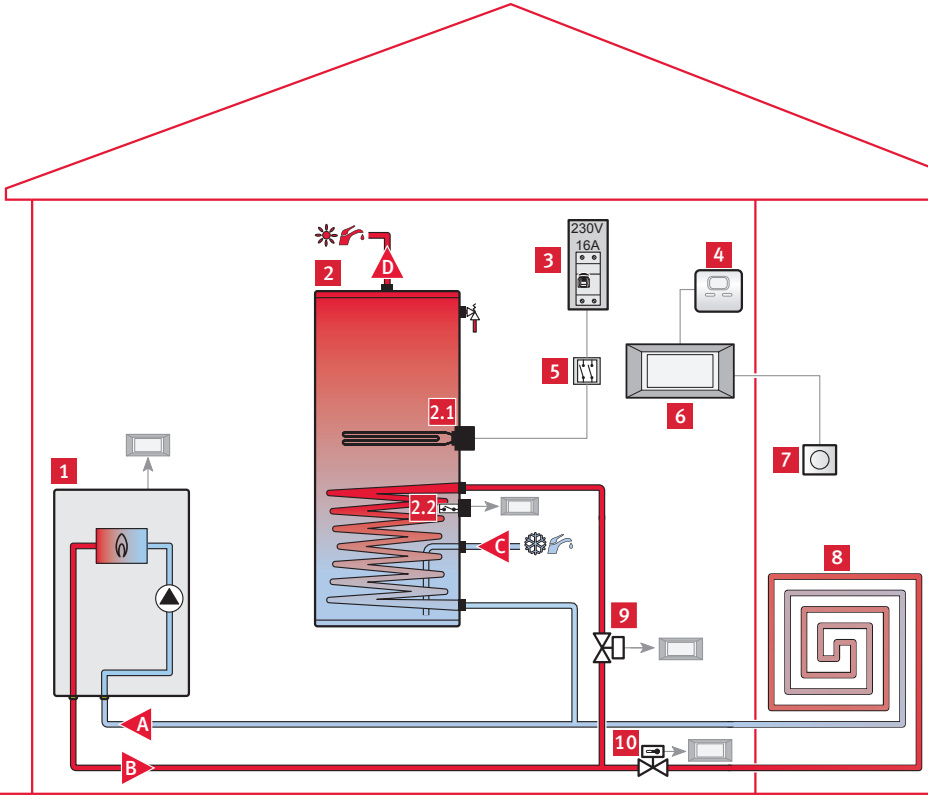
**TECHNICAL DATA**

**6 Technical data**

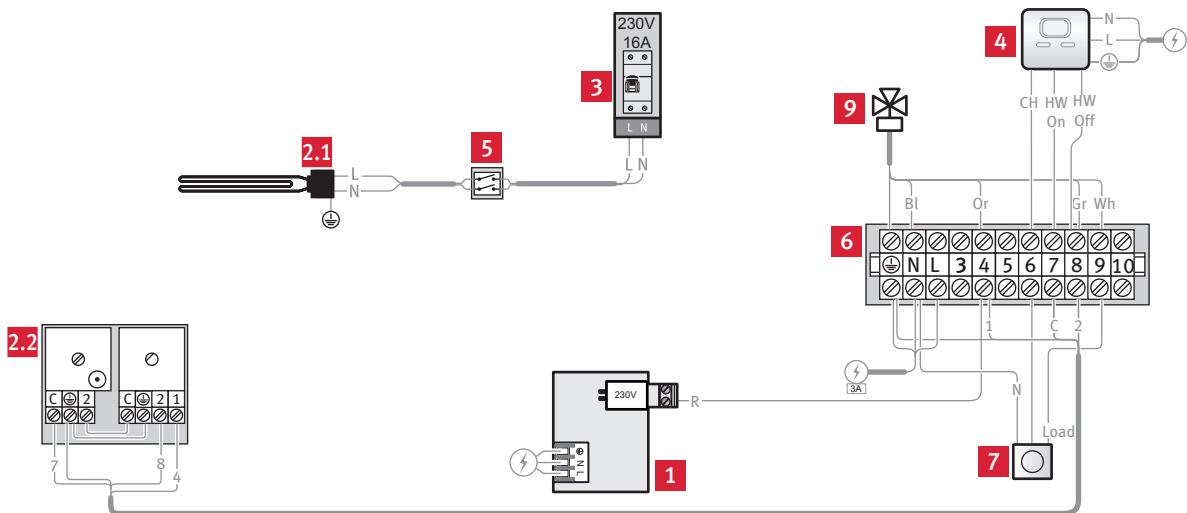
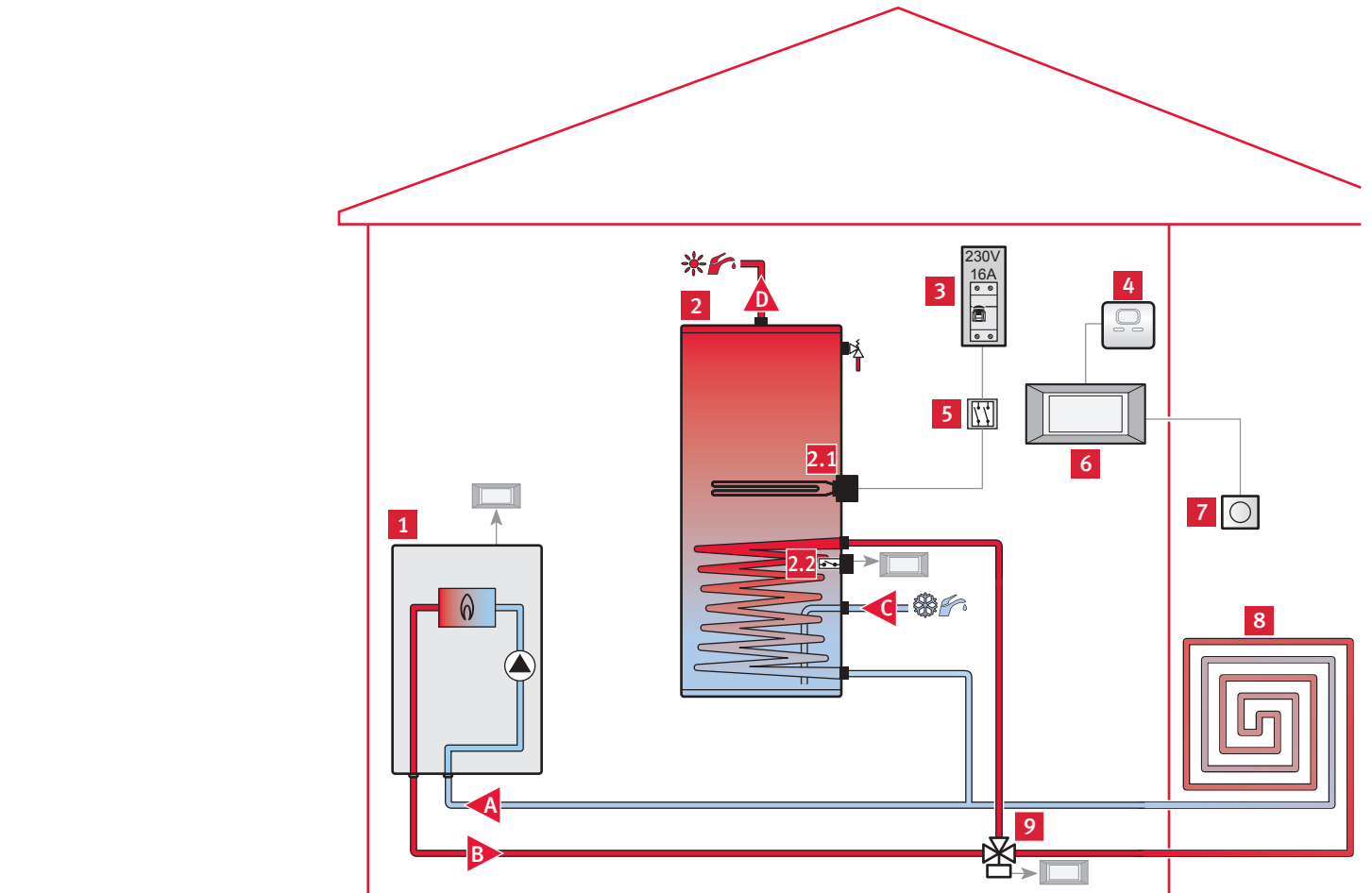
	Unit	Hydracyl 150	Hydracyl 205	Hydracyl 250	Hydracyl 300
Total capacity	l	150	205	250	300
Actual capacity	l	149.1	211.2	250.3	299.1
Hot water capacity	l	136.7	203.9	247.5	270.5
Maximum supply pressure to pressure reducing valve	bar	12			
Maximum operating pressure of cylinder	bar	7			
Maximum operating pressure of heating coil	bar	3.5			
Operating pressure	bar	3.5			
Pressure limiting valve	bar	3.5			
Expansion relief valve	bar	6.0			
Temperature and pressure relief valve	°C/bar	90/7.0			
Charge pressure of hot water expansion vessel	bar	4.0			
Maximum temperature of heating circuit	°C	85			
Maximum temperature of potable hot water	°C	85			
Standing heat loss	kW/24 h	1.61	1.98	2.17	2.37
Heating up time according to EN 12897	mins	24	30	37	42
Recovery time (70% capacity)	mins	19	21	26	31
Primary heat exchanger performance	kW	18.0	21.4	21.0	20.0
Flow rate for primary heat exchanger performance	l/min	23.3	23.3	23.3	23.3
Primary heat exchanger pressure drop	mbar	97	116	116	115
Primary heat exchanger volume	l	2.94	3.56	3.56	3.56
Primary heat exchanger surface area	m <sup>2</sup>	0.62	0.75	0.75	0.75
<b>Dimensions</b>					
Height	mm	1191	1593	1843	2153
Height with hot water draw off	mm	1223	1625	1875	2185
Topple measure	mm	1308	1680	1918	2217
Diameter	mm	554.5			
Depth	mm	624			
Net weight	kg	29	36	41	46
Weight (full)	kg	177.8	248	291	345
<b>Connections</b>					
Cold water inlet		22mm unprofiled pipe (compression joints)			
Hot water draw off		22mm unprofiled pipe (compression joints)			
Balanced pressure cold water outlet		22mm unprofiled pipe (compression joints)			
Secondary return		15mm unprofiled pipe (compression joints)			
Primary heater flow		22mm unprofiled pipe (compression joints)			
Primary heater return		22mm unprofiled pipe (compression joints)			
Primary heating circuit immersion sleeve size	mm	8			
<b>Electrical data</b>					
Immersion heater (according to BS EN 60335)		2.7kW, 230 V, 50 Hz			
Length of electric immersion heater	inch	14			
Two port motorised valve		230/240 V, 50 Hz			
Cylinder thermostat		230/240 V, 50 Hz			
<b>Material data</b>					
Cylinder body material		Stainless Steel (1.4521)			
Cylinder jacket material		Polypropylene			
Insulation material		EPS with infrared absorber			
Insulation thickness	mm	50			
Corrosion protection		Stainless steel			
Blowing agent for insulation material		Pentane (GWP < 5)			
ODP		0			

INSTALLATION

7 Hydraulic and electrical schematics

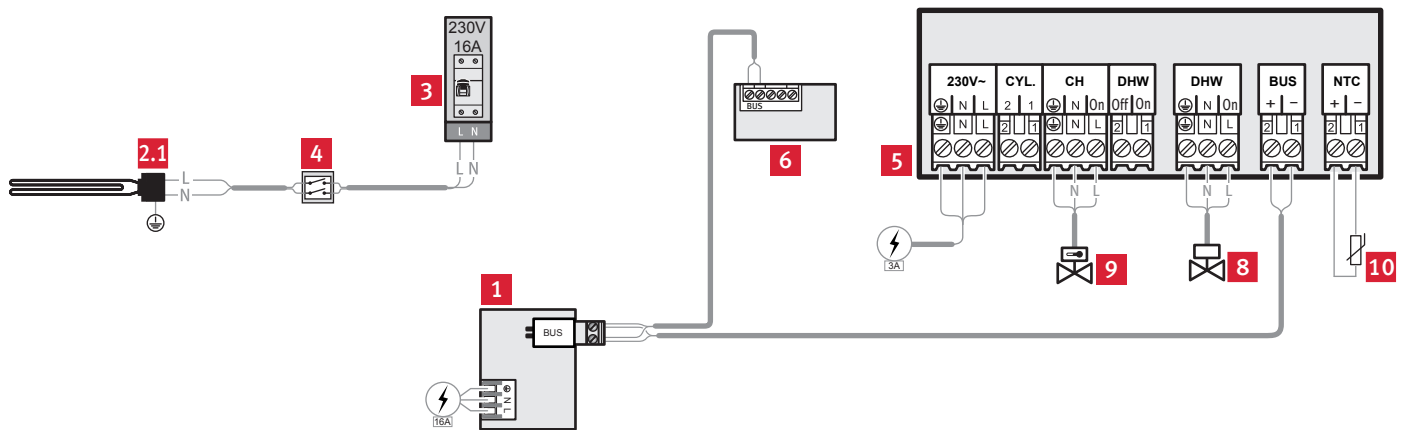
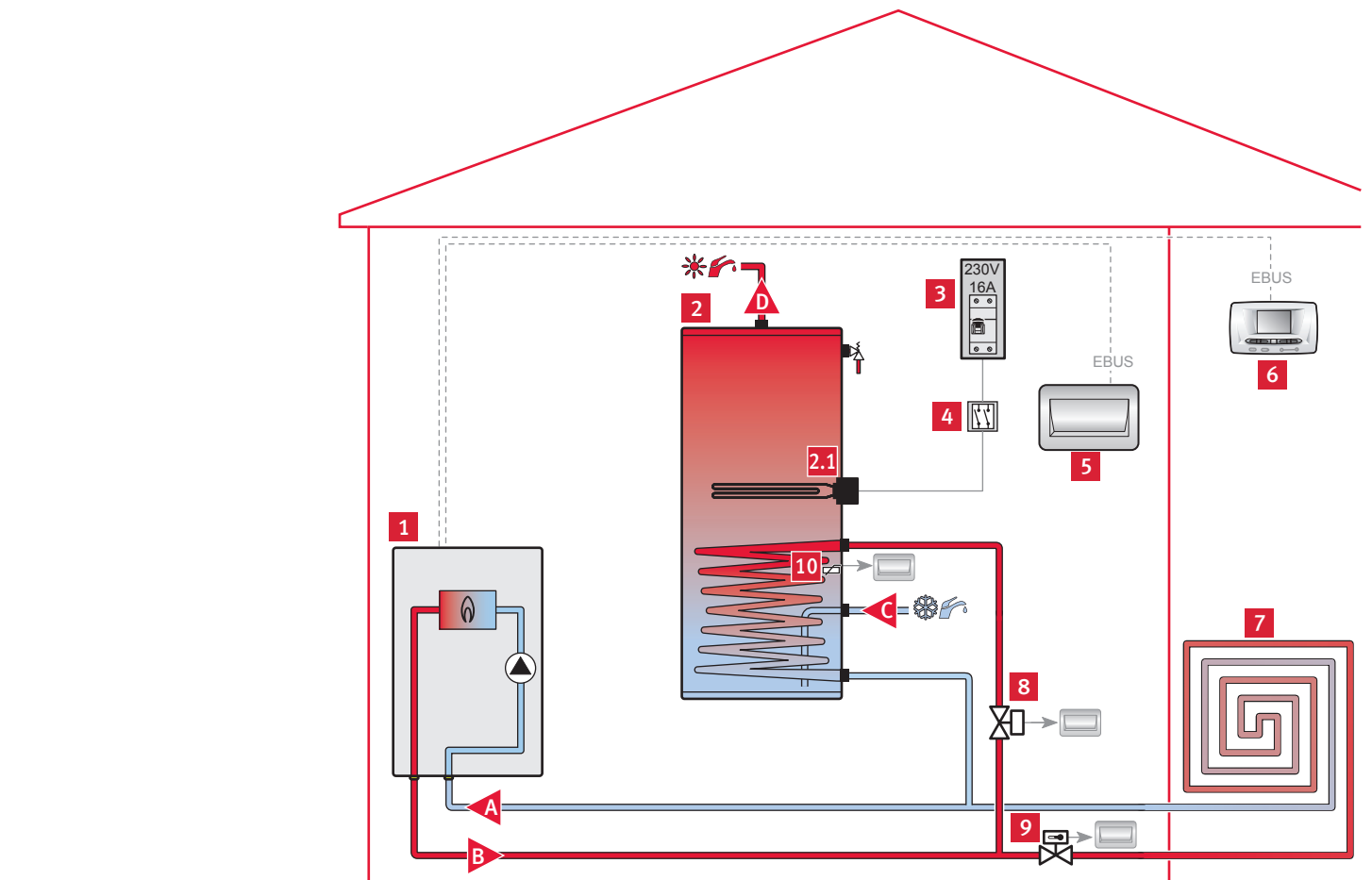


- Key:
- 1 Boiler
  - 2 Domestic hot water cylinder
  - 2.1 Immersion heater with thermal safety
  - 2.2 Cylinder dual thermostat
  - 3 Electrical supply + protection (This must have it's own single isolation)
  - 4 CH & DHW time controller
  - 5 Electrical switch
  - 6 Terminal block
  - 7 Room thermostat
  - 8 Heating circuit
  - 9 DHW 2 port valve
  - 10 CH 2 port valve
  - A Heating circuit return
  - B Heating circuit flow
  - C Cold water supply
  - D Domestic hot water outlet



**Key:**

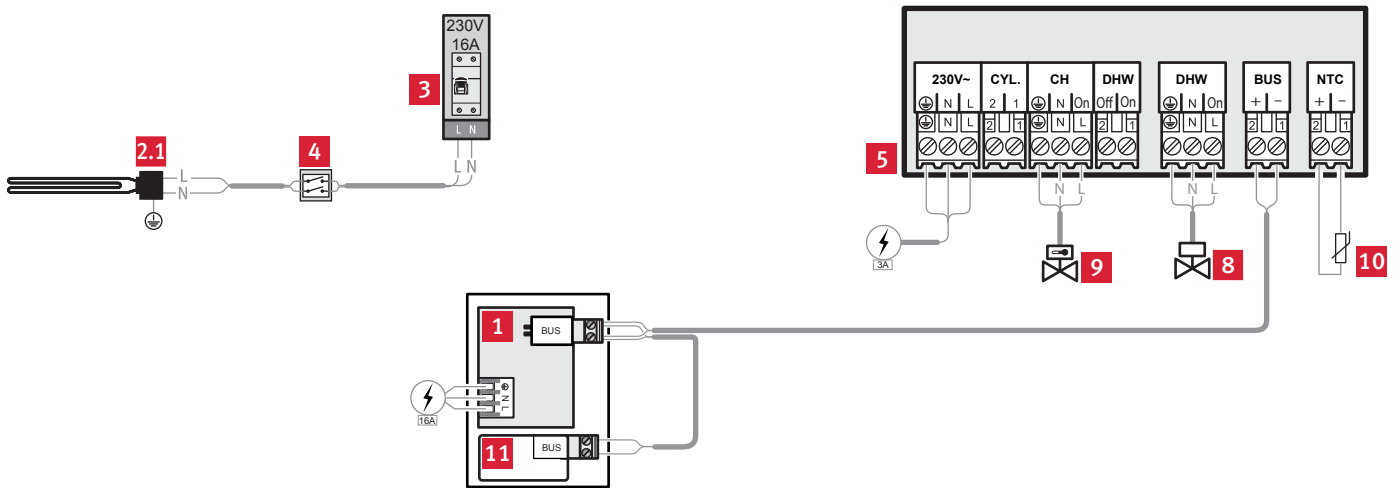
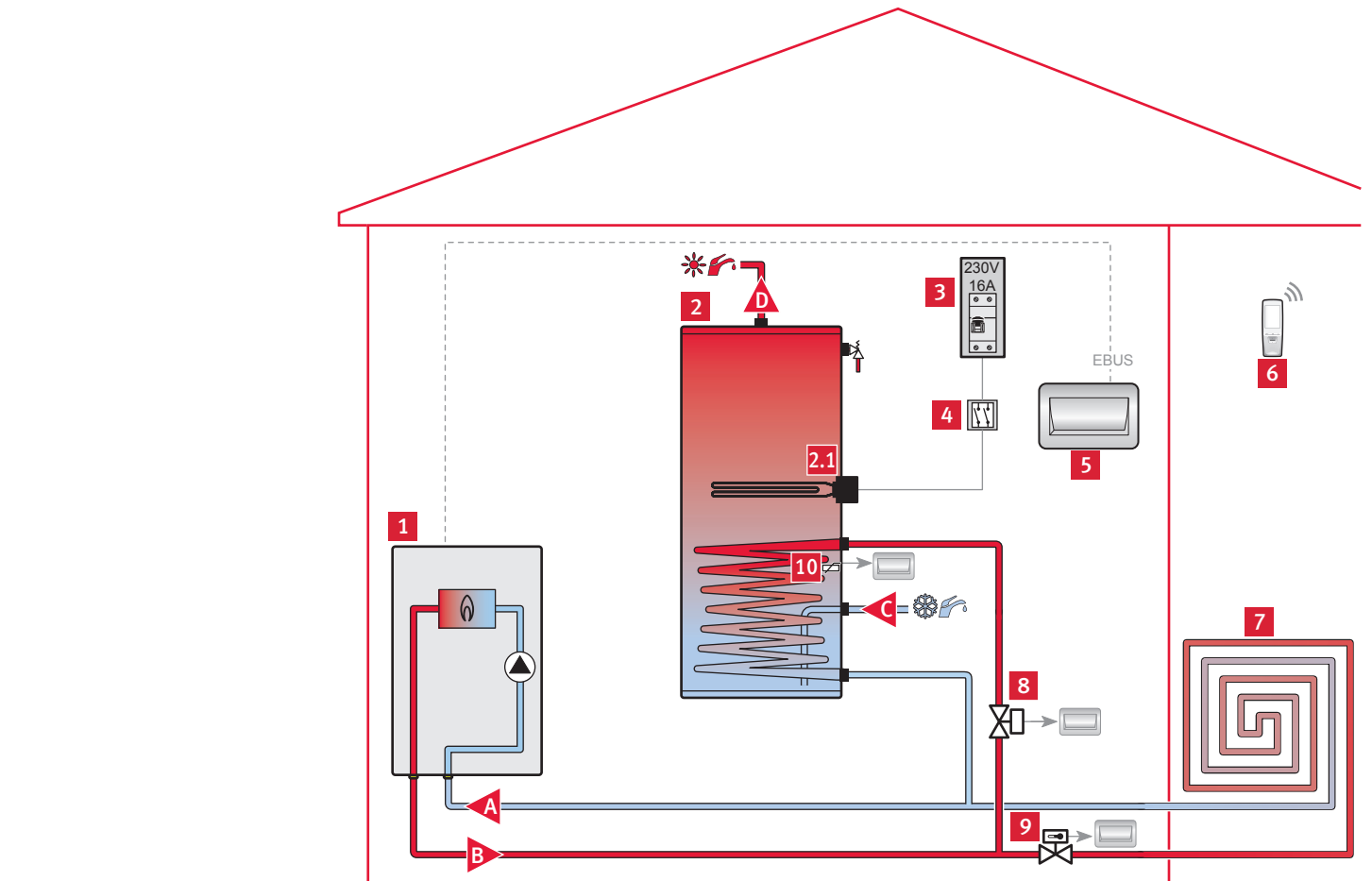
- |     |   |   |                           |
|-----|---|---|---------------------------|
| 1   | Boiler  | 8 | Heating circuit           |
| 2   | Domestic hot water cylinder   | 9 | 3 port mid position valve |
| 2.1 | Immersion heater with thermal safety                                      | A | Heating circuit return    |
| 2.2 | Cylinder dual thermostat  | B | Heating circuit flow      |
| 3   | Electrical supply + protection (This must have it's own single isolation) | C | Cold water supply         |
| 4   | CH & DHW time controller  | D | Domestic hot water outlet |
| 5   | Electrical switch   |   |                           |
| 6   | Terminal block  |   |                           |
| 7   | Room thermostat   |   |                           |



Key:

- 1 Ebus Boiler
- 2 Domestic hot water cylinder
- 2.1 Immersion heater with thermal safety
- 3 Electrical supply + protection (This must have it's own single isolation)
- 4 Electrical switch
- 5 Smart Wiring Centre
- 6 Climapro
- 7 Heating circuit
- 8 DHW 2 port valve
- 9 CH 2 port valve
- 10 NTC sensor

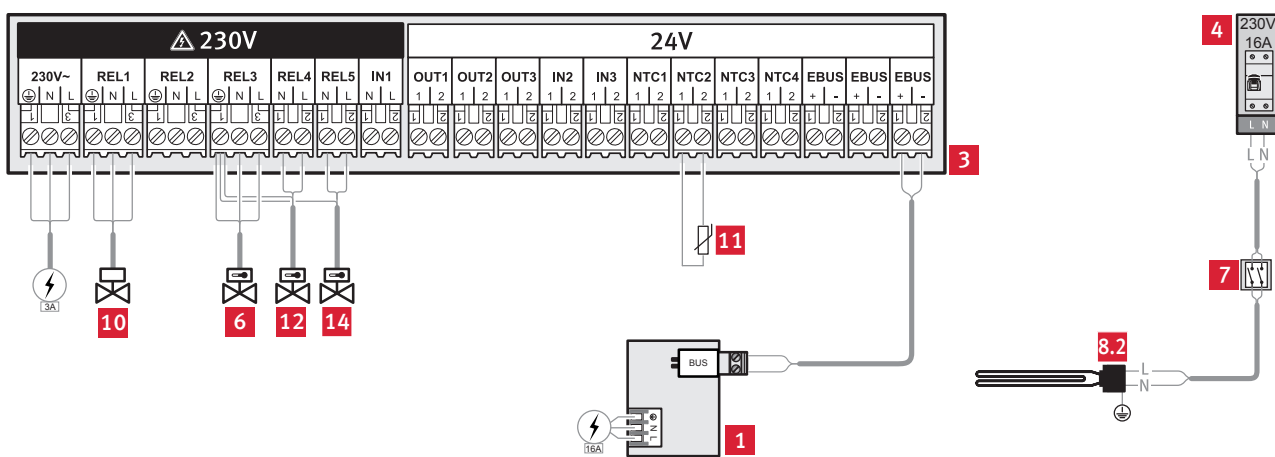
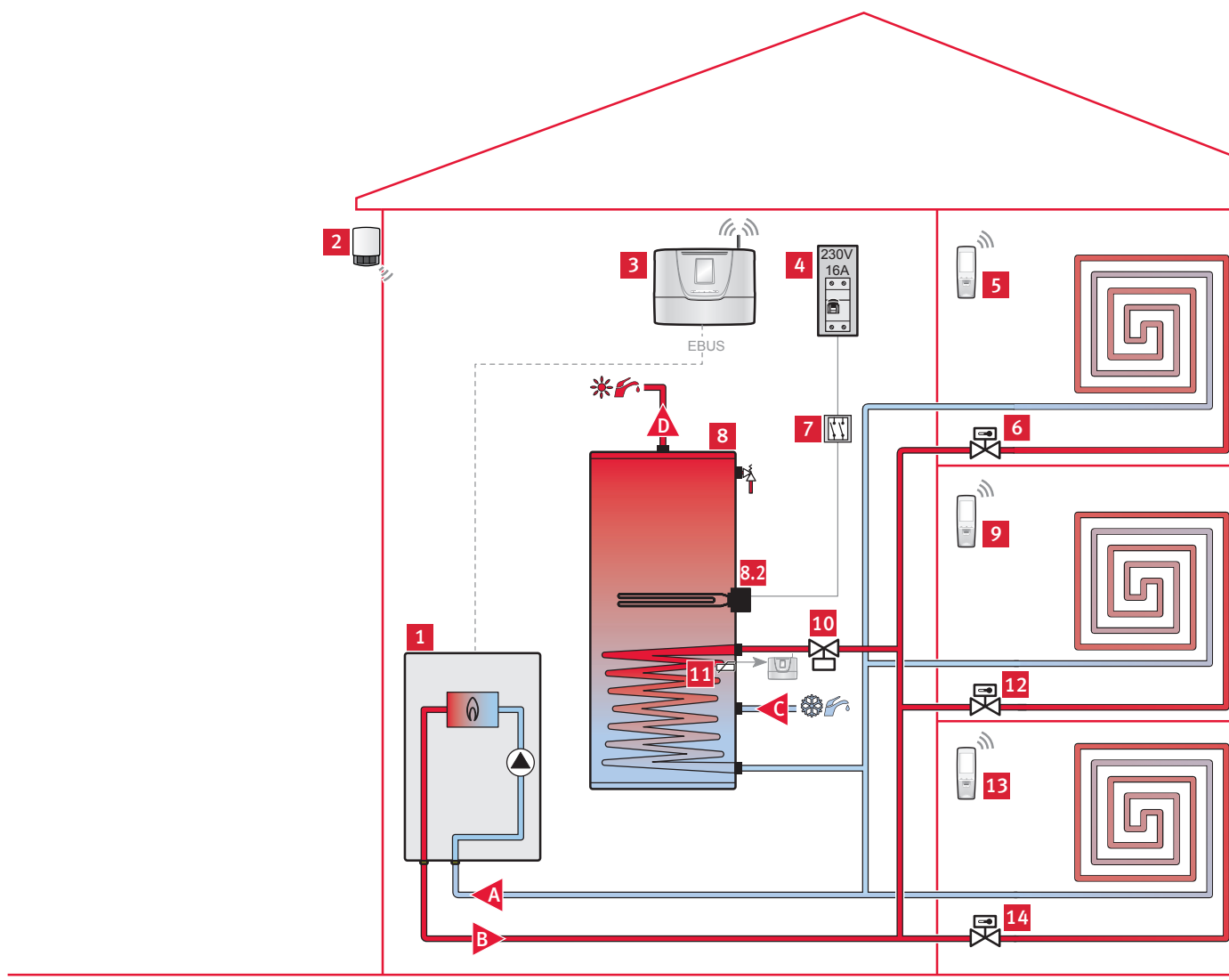
- A Heating circuit return
- B Heating circuit flow
- C Cold water supply
- D Domestic hot water outlet



**Key:**

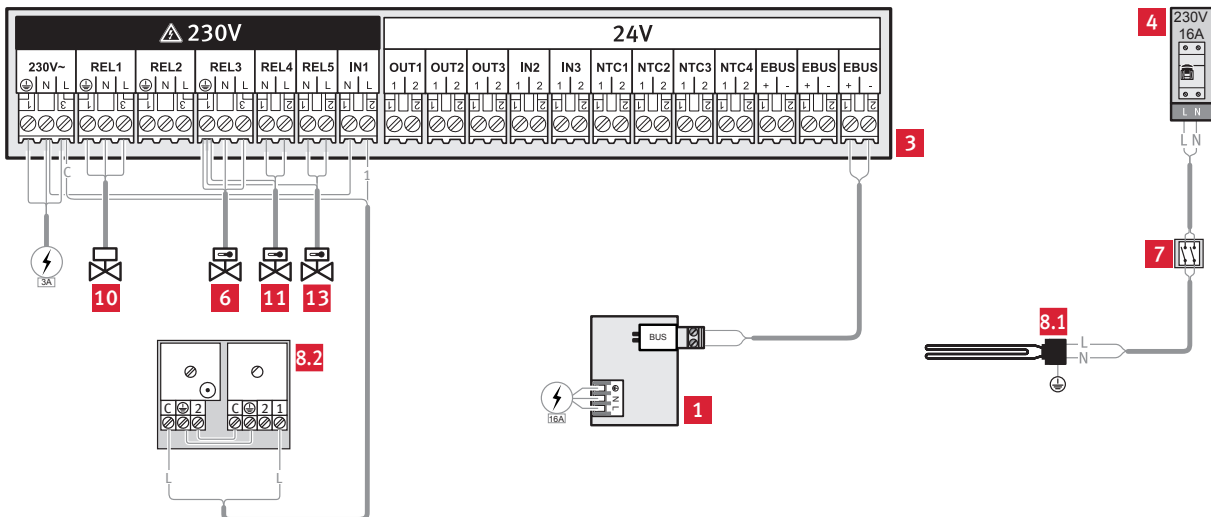
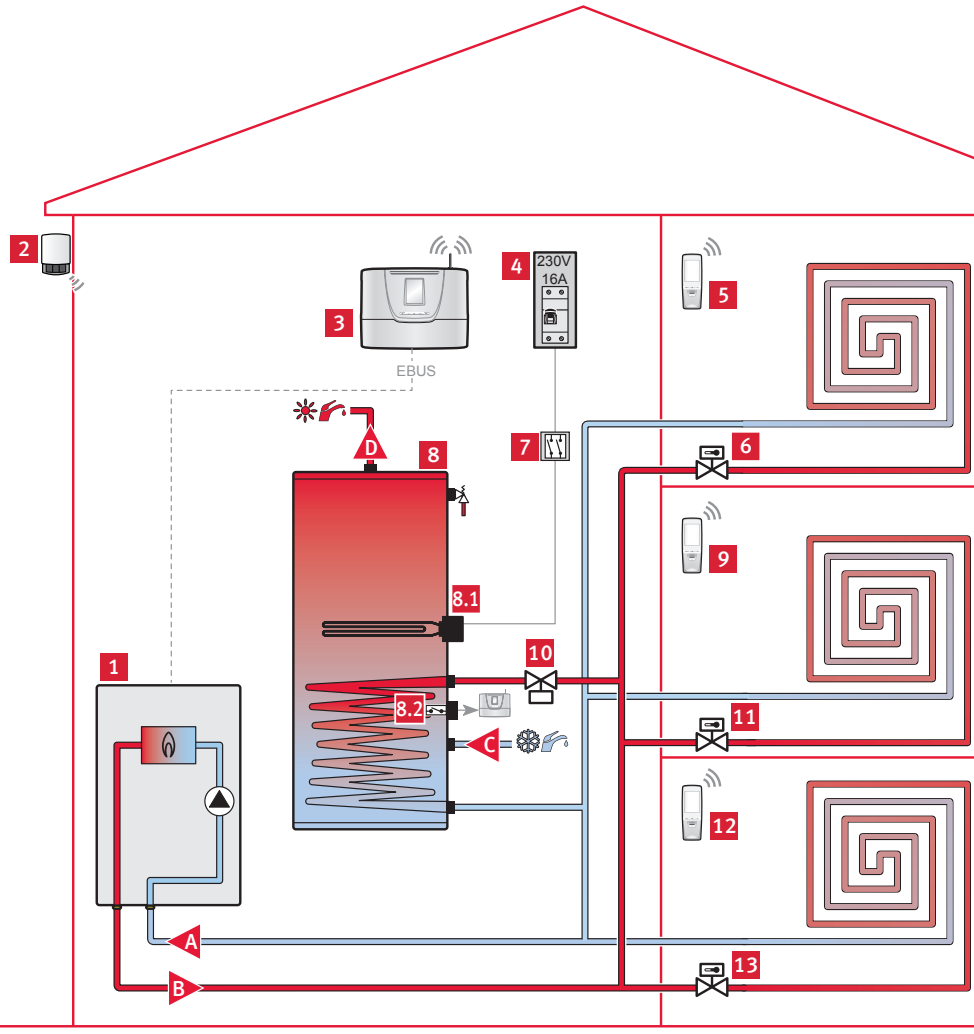
- 1 Ebus Boiler
- 2 Domestic hot water cylinder
- 2.1 Immersion heater with thermal safety
- 3 Electrical supply + protection (This must have it's own single isolation)
- 4 Electrical switch
- 5 Smart Wiring Centre
- 6 Climapro<sub>2</sub> RF room thermostat
- 7 Heating circuit
- 8 DHW 2 port valve
- 9 CH 2 port valve
- 10 NTC sensor
- 11 RF receiver

- A Heating circuit return
- B Heating circuit flow
- C Cold water supply
- D Domestic hot water outlet



Key:

- |   |                                  |
|---|----------------------------------|
| 1 Ebus Boiler   | 11 NTC sensor                    |
| 2 Wireless outside sensor   | 12 Motorized 2 port valve zone 2 |
| 3 Systempro solar controller  | 13 Room thermostat zone 1        |
| 4 Electrical supply + protection (This must have it's own single isolation) | 14 Motorized 2 port valve zone 1 |
| 5 Room thermostat RF zone 3   | A Heating circuit return         |
| 6 Motorized 2 port valve zone 3   | B Heating circuit flow           |
| 7 Electrical switch   | C Cold water supply              |
| 8 Domestic hot water cylinder   | D Domestic hot water outlet      |
| 8.2 Immersion heater with thermal safety                                    |                                  |
| 9 Room thermostat RF zone 2   |                                  |
| 10 DHW 2 port valve   |                                  |



## Key:

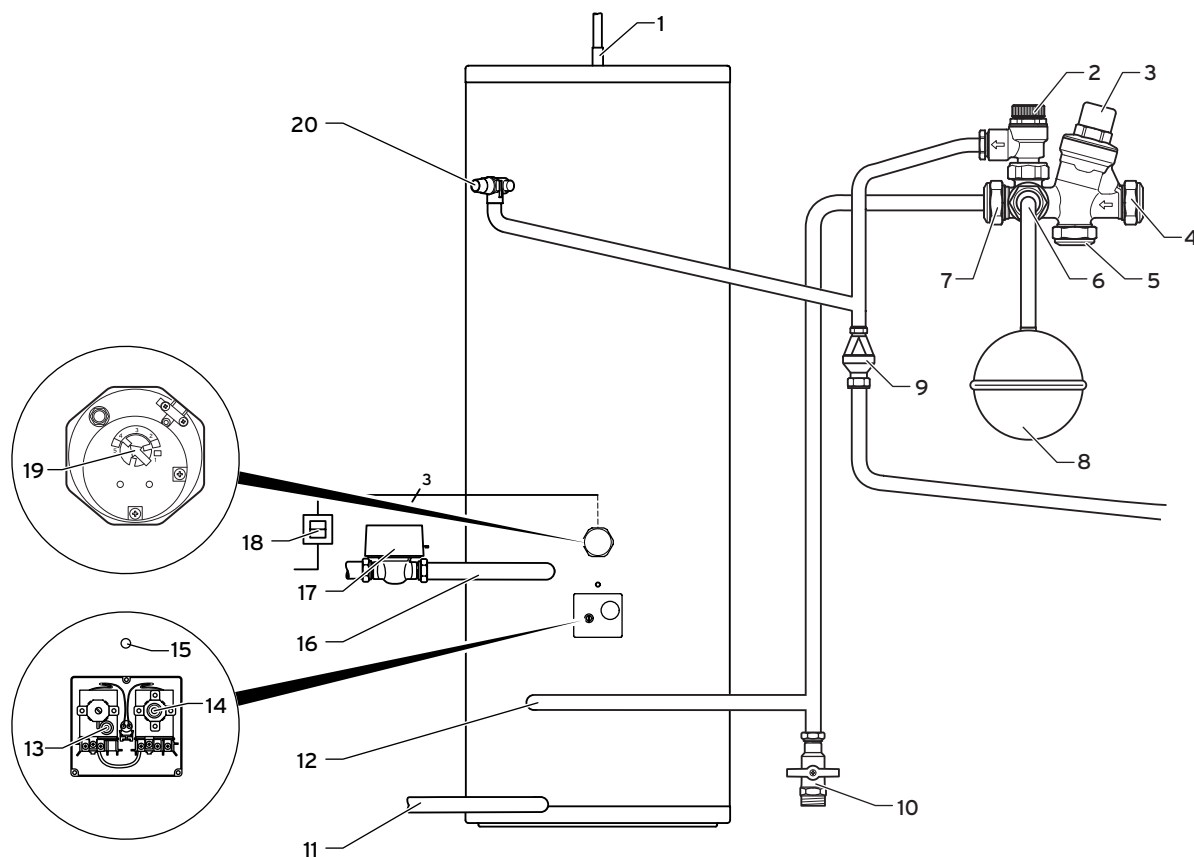
- |   |                                  |
|---|----------------------------------|
| 1 Ebus Boiler   | 10 DHW 2 port zone valve         |
| 2 Wireless outside sensor   | 11 Motorized 2 port valve zone 2 |
| 3 Systempro solar controller  | 12 Room thermostat zone 1        |
| 4 Electrical supply + protection (This must have it's own single isolation) | 13 Motorized 2 port valve zone 1 |
| 5 Room thermostat RF zone 3   |                                  |
| 6 Motorized 2 port valve zone 3   | A Heating circuit return         |
| 7 Electrical switch   | B Heating circuit flow           |
| 8 Domestic hot water cylinder   | C Cold water supply              |
| 8.1 Immersion heater with thermal safety                                    | D Domestic hot water outlet      |
| 8.2 Cylinder dual thermostat  |                                  |
| 9 Room thermostat RF zone 2   |                                  |

## 8 Description of the components

### 8.1 Cylinder unit description

Section 4.1 of this manual describes the Hydracyl solar cylinder in detail.

### 8.2 Functional elements of Hydracyl DHW cylinder



**Key:**

- 1 Hot water connection
- 2 Expansion relief valve (one way valve, 6.0 bar)
- 3 Pressure limiting valve (3.5 bar) with line strainer
- 4 Cold mains inlet
- 5 Balanced pressure cold water outlet
- 6 Connection for hot water expansion vessel
- 7 Cylinder connection
- 8 Hot water expansion vessel
- 9 Tundish
- 10 Cylinder drain valve (not supplied)
- 11 Primary heater return
- 12 Cold water inlet
- 13 Primary heating circuit safety thermostat, set to 80 °C, to be connected to the 2-way motorised valve in order to isolate the primary heating circuit if a malfunction occurs.
- 14 Cylinder thermostat (25 °C to 65 °C)
- 15 Reheating circuit immersion sleeve (NTC) (length 70mm, dia. 8mm)
- 16 Primary heater flow
- 17 2 port motorised valve
- 18 2-pole circuit breaker for electric immersion heater
- 19 Electric immersion heater (20 °C to 65 °C) with thermostat and safety thermostat
- 20 Temperature and pressure relief valve (90 °C, 7 bar)

The Hydracyl domestic hot water cylinder is available in four sizes: 150, 205, 250, and 300 litres. The containers are made from stainless steel with EPS insulation.

The cylinder is supplied along with all required cold and hot water control devices and a 2-way motorised valve.

The cylinder works with the pressure of the water supply line and does not need a cold water tank for its supply.

The cylinder has hot and cold water connections with a diameter of 22 mm. To enable the cylinder to work as well as possible, a cold water supply with an appropriately high pressure and flow rate is required.

#### Typical applications:

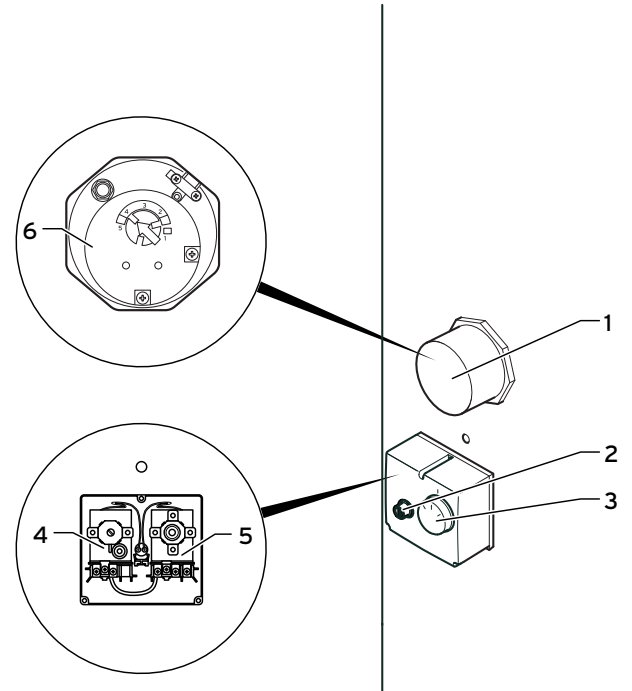
- Single bathroom property: Hydracyl 150 litre
- Single bathroom property with an en-suite shower room: Hydracyl 150 litre
- Two bathroom property: Hydracyl 150 or 205 litre
- Two bathroom property with an en-suite shower room: Hydracyl 205 litre
- Larger properties: Hydracyl 250 or 300 litre

### 8.2.1 Safety devices

The cylinder is delivered with all safety and control devices for the operation of the unvented domestic hot water supply system:

- Temperature/pressure relief valve (90 °C, 7 bar)
- Pressure limiting valve (3.5 bar) with line strainer
- Expansion relief valve (one-way valve, 6.0 bar)
- Safety thermostat for electric immersion heater (set to 85 °C)
- Reheating circuit safety thermostat, set to 80 °C, to be connected to the 2-way motorised valve in order to isolate the primary heat source if a cylinder thermostat malfunction occurs.

### 8.2.2 Cylinder operating elements



#### Key:

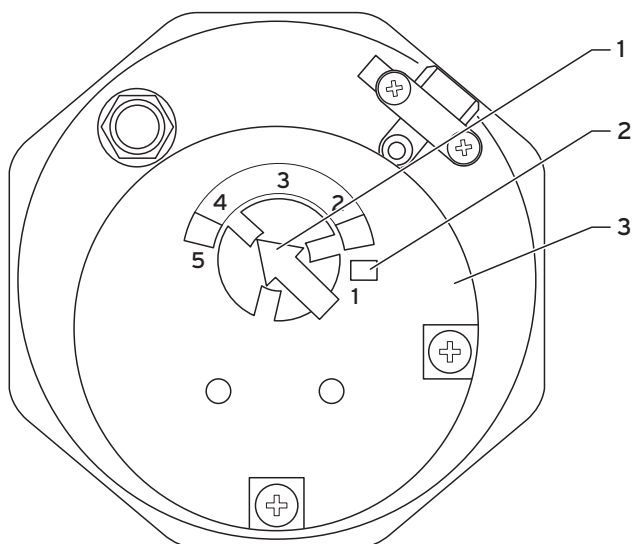
- 1 Electric immersion heater cover
- 2 Cover cap for reset button for reheating circuit TCO
- 3 Reheating circuit temperature controller
- 4 Reheating circuit safety thermostat
- 5 Cylinder thermostat
- 6 Electric immersion heater

The following are premounted at the factory for the unvented Hydracyl domestic hot water cylinder:

- Cylinder thermostat (5) and reheating circuit safety thermostat (4)
- Electric immersion heater (6) with safety thermostat and cylinder thermostat

The cylinder must be properly wired in order to comply with G3 building regulations.

### 8.2.3 Electric immersion heater



- Key:
- 1 Electric immersion heater temperature controller
  - 2 Electric immersion heater TCO reset button
  - 3 Electric immersion heater

The cylinder is equipped with an additional electric immersion heater (3) with a heating output of 3 kW. The electric immersion heater is designed for use in unvented cylinders and has a thermostat with a temperature controller (1) and a safety thermostat (TCO) with a reset button (2).



*If you need to make a replacement, you must use the correct electric immersion heater with a safety thermostat for overheating protection. Always replace the immersion heater gasket when parts are replaced. Only use original replacement parts from Glow-worm.*



*Inspection access to the cylinder is available through the immersion heater boss.*

### 8.2.4 Hot water temperature regulation

You can control the hot water temperature using a Glow-worm dual-channel eBUS controller or a separate hot water controller.



**Water at a temperature of more than 60 °C can escape from the water draw-off point.**

**- Install a hot water thermostat mixer in the hot water pipe to provide effective scald protection.**

**- Set the hot water thermostat mixer to less than 60°C and check the temperature on a hot water draw-off point.**

### 8.2.5 Wiring

If you are using an eBUS-capable Glow-worm gas-fired boiler, you can use the Glow-worm Smart Wiring Centre or the Systempro for the system cabling.

If you are using a non-eBUS-capable Glow-worm gas-fired boiler or a third-party boiler, you can use a standard cabling box.

### 8.2.6 Combination of Hydracyl hot water cylinder and controllers

The following controllers can be used to regulate hot water generation:

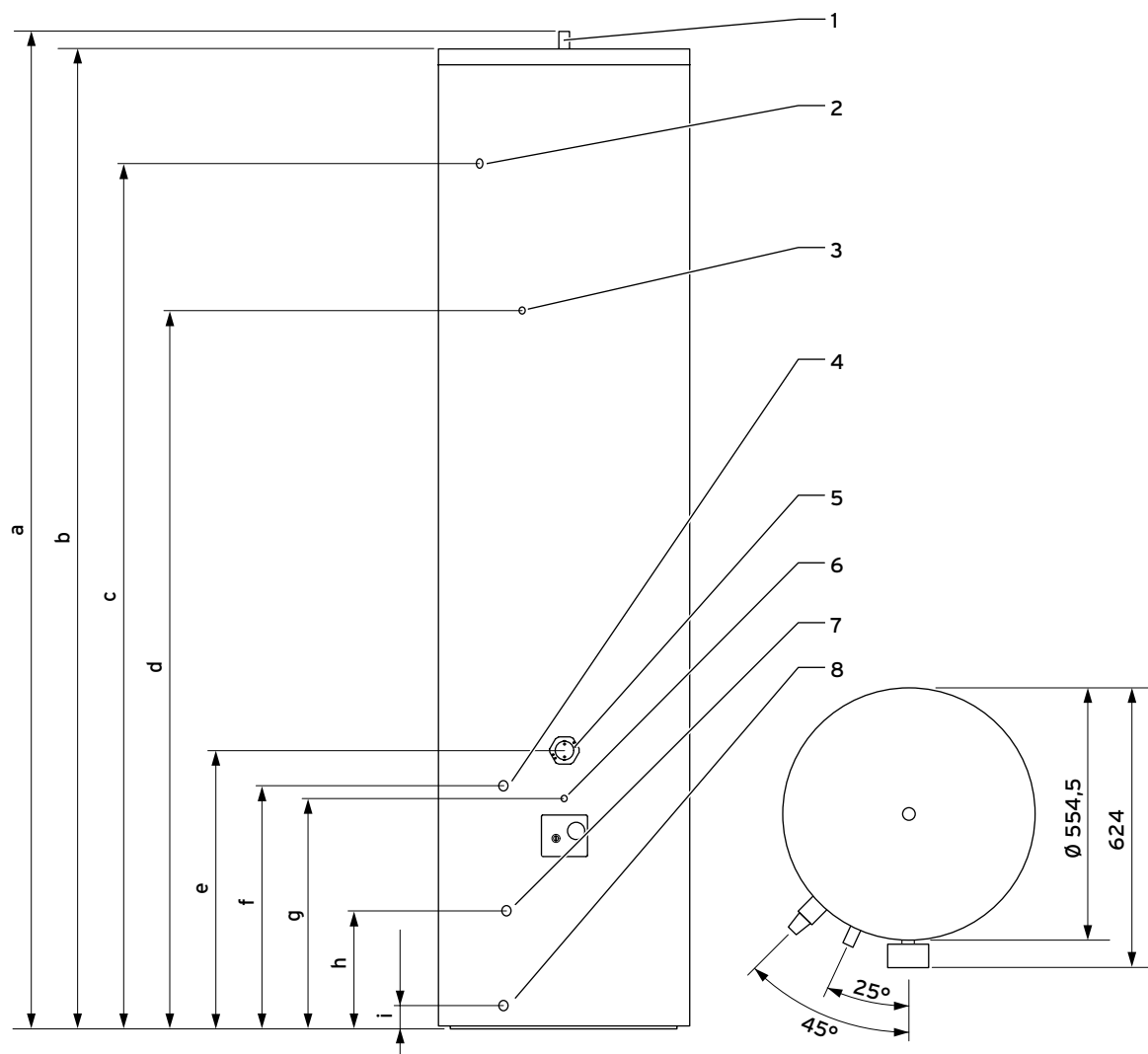
Glow-worm dual-channel eBUS controller, or a timer (from a third-party manufacturer).

If you are using an eBUS-capable Glow-worm gas-fired boiler, you can control the heating using a programmable Glow-worm Climapro or Climapro RF.

If weather compensation is required, the Climapro or Climapro RF can be used with a Glow-worm outdoor sensor.

If you are using a non-eBUS-capable Glow-worm gas-fired boiler or a third-party boiler, you can use room thermostats commonly available on the market.

## 8.2.7 Dimensions



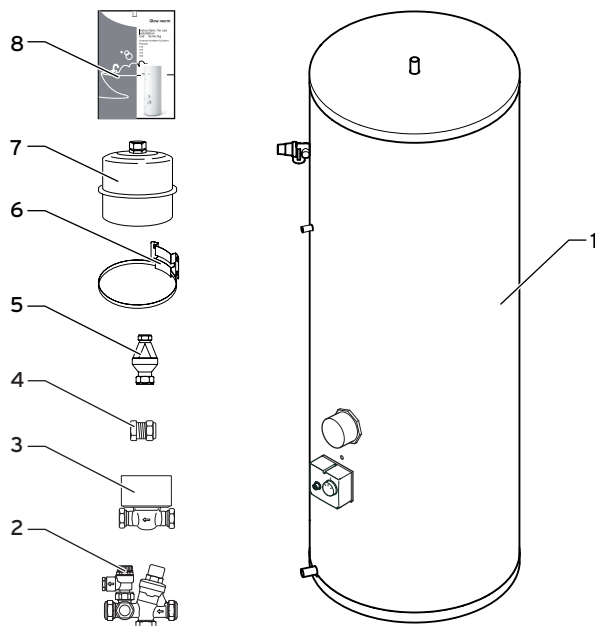
### Key:

- 1 Hot water connection
- 2 Temperature and pressure relief valve
- 3 Circulation line connection
- 4 Gas-fired boiler supply line
- 5 Electric immersion heater
- 6 Primary heater immersion sleeve
- 7 Cold water inlet
- 8 Primary heater return

Hydracyl	a	b	c	d	e	f	g	h	i
150	1229	1197	939	857	616	534	506	259	51
205	1631	1599	1341	1158	616	534	506	259	51
250	1881	1849	1591	1346	616	534	506	259	51
300	2191	2159	1901	1578	616	534	506	259	51

## 9 Assembly

### 9.1 Pack contents



Item	Quantity	Component
1	1	Domestic hot water cylinder with insulation in separate packaging
2	1	Safety assembly (pressure limiting valve, expansion relief valve, connections for pressure-controlled cold water connection and hot water expansion vessel)
3	1	2-way motorised valve
4	1	15mm compression cap for secondary return
5	1	Tundish
6	1	Assembly set for hot water expansion vessel
7	1	Hot water expansion vessel: 12 l for Hydracyl 150 18 l for Hydracyl 205 25 l for Hydracyl 250 and 300
8	1	Installation and maintenance instructions, operating manual

- Check the pack contents for completeness.

### 9.2 Cylinder transportation



- At least two people should lift the cylinder to prevent injuries.

- Use a suitable transportation aid (sack truck or similar).

- Transport the packaged cylinder to the installation site.
- Only remove the cylinder from its packaging once it reaches the installation site.

### 9.3 Installation site

Position the domestic hot water cylinder as near as possible to the heater to prevent unnecessary heat loss.

Place the cylinder in a suitable location in the building, paying attention to the following:

- The tundish discharge pipe must be installed with a minimum downward slope of 1:200 and must end in a safe and visible place.
- The installation surface must be flat and capable of bearing the weight of the full cylinder.
- The installation site must not be at risk of frost. If necessary, install a frost protection thermostat.
- The control system for the installed cylinder thermostat must be easily accessible to the operator.
- There must be sufficient space for installation, maintenance and replacement of the expansion vessel.
- Choose a cylinder installation site that allows the potable water and heating lines to be laid in an appropriate manner.
- To prevent energy losses in accordance with the current building regulations, provide all system pipes with thermal insulation.



*Where cylinders are fitted high up in the building there are some situations where a vacuum could be created in the cylinder. The installer must consider in these circumstances the necessity of fitting an anti vacuum valve to prevent cylinder damage. This valve allows air to enter the cylinder if the pressure becomes too low due to draining or thermal contraction.*

9.4 Installation of discharge pipe

9.4.1 Design of discharge pipe

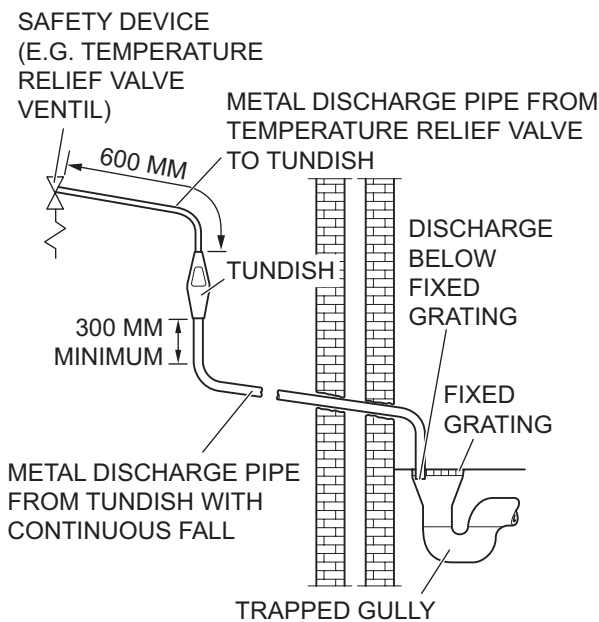


*Risk of burns and scalds resulting from escaping hot water.*

*If there is a malfunction, hot water will discharge from the TPRV via the tundish.*

*- Lay the discharge pipe so that it ends at an easily visible point inside or outside the building where escaping hot water does not pose a risk to persons.*

9.4.2 Discharge requirements (G3 building regulations)



The discharge connections of the temperature/pressure relief valve and the expansion relief valve must be connected with the supplied tundish via 15 mm copper piping. The tundish should be attached so that it is vertical, as near to the cylinder as possible, and not more than 600 mm from the connection of the temperature/ pressure relief valve. It must be mounted in the same room as the cylinder at a sufficient distance from the electrical components. The discharge pipes from the temperature/pressure relief valve and expansion relief valve can be joined above the tundish using a T-piece.

The discharge pipe from the 22 mm connection of the drain funnel must be laid using copper piping with a diameter of at least 22 mm to a safe and visible discharge point.

There must be a vertical section of pipe at least 300 mm long beneath the tundish before any bends or elbows in the pipework. If the total resistance of the discharge pipe exceeds the values specified in table below, you must increase the diameter of the piping. When installing the discharge piping, you must observe Directive G3 (section 2.5).

9.4.3 Sizing of copper discharge pipe for G1/2 temperature and pressure relief valve outlet size

Minimum diameter of discharge pipe from tundish	Maximum permissible total resistance, expressed as straight pipe length (without elbows or bends)	Resistance due to each elbow or bend
22 mm	Up to 9 m	0.8 m
28 mm	Up to 18 m	1.0 m
35 mm	Up to 27 m	1.4 m

Worked example

The example below is for a G1/2 temperature relief valve with a discharge pipe having 4 No. 22 mm elbows and length of 7 m from the tundish to the point of discharge.

From Sizing Table:

Maximum resistance allowed for a straight length of 22 mm copper discharge pipe from a G1/2 temperature relief valve is: 9.0 m.

Subtract the resistance for 4 No. 22 mm elbows at 0.8 m each = 3.2 m.

Therefore the maximum permitted length equates to: 5.8 m, which is less than the actual length of 7 m therefore calculate the next largest size.

Maximum resistance allowed for a straight length of 28 mm pipe from a G1/2 temperature relief valve is: 18 m.

Subtract the resistance of 4 No. 28 mm elbows at 1.0 m each = 4.0 m.

Therefore the maximum permitted length equates to: 14 m.

As the actual length is 7 m, a 28 mm (D2) copper pipe will be satisfactory.

A suitable place for the end of the discharge pipe is, for example, beneath a fixed grille above the odour seal in a gully with a siphon. Low discharge pipes, for example up to 100 mm above external surfaces such as car and other parking spaces, grasslands etc. can be used provided that they are secured by a wire fence or something similar to prevent children from coming into contact with the waste water and as long as the system is not visible. You must not install any valves or stop cocks in the discharge pipe.

- Make sure that the discharge pipe from the tundish to the drain has a constant downward incline of at least 1:200. The discharge pipe from the pressure relief valve of the Glow-worm gas-fired boiler can be connected to the horizontal discharge pipe of the cylinder behind the tundish using a T-piece.

## 10 Cylinder installation



*Improper installation can impede the operational safety of the unit.*

*- Only an engineer qualified to work on unvented systems may install and start up the unit. This person takes responsibility for making sure that the unit is installed and commissioned for the first time correctly and in accordance with regulations.*



*There is a risk of burns from system pipes without thermal insulation. Energy losses also occur in such cases.*

*- Provide all system pipes with thermal insulation.  
- Use screw connections to close all connection lines.*



*Improper use and/or unsuitable tools may result in damage to property (e.g. gas or water leaks).*

*- Always use a suitable open-ended spanner to tighten or undo threaded connections.  
- Do not use pipe wrenches, extensions, etc.*



*Mechanical stress on supply lines can result in leaks and thus damage to the heat pump.*

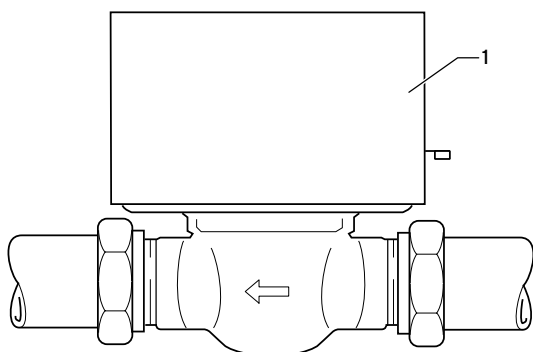
*- Avoid mechanical stress on supply lines!*

### 10.1 Installing pipes for the reheating circuit

- Make sure that the pipes in the reheating circuit between the gas-fired boiler and cylinder are as short as possible. Use copper piping with a minimum diameter of 22 mm.

If you are using the cylinder as per GB standards with a gas-fired boiler without a heating pump, you may have to install a suitable heating pump in the reheating circuit.

#### 10.1.1 2-way motorised valve



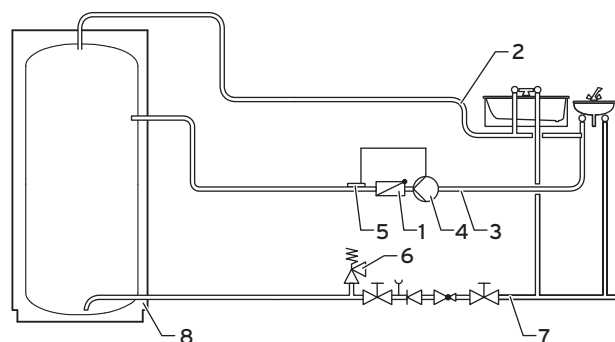
The 2-way motorised valve prevents the cylinder from overheating.

- Install the 2-way motorised valve (1) supplied with the cylinder in the supply line of the gas-fired boiler. Do not install the valve with the head upside down

### 10.2 Installing hot water pipes

- Connect the hot water piping to the 22 mm hot water connection of the cylinder.
- Lay the 22 mm piping up to the first T-piece. The required diameter of subsequent pipes depends on the system design.

#### 10.2.1 Installing the secondary circulation line



Key:

- 1 Non-return valve
- 2 Hot water pipe
- 3 Circulation line
- 4 Circulation pump
- 5 Contact thermostat
- 6 Expansion relief valve
- 7 Cold water pipe
- 8 Domestic hot water cylinder

Where possible, avoid installing a circulation line, since a circulation line results in higher energy consumption.



*If you are not using the circulation connection, you must ensure that it is properly closed off. Where secondary return circuits are used, an additional expansion vessel may be required.*

If the installation of a secondary circulation line is required, keep circulation operations to a minimum by only using circulation mode when required for demand and temperature reasons.

The cylinder has a connection with a 15 mm diameter for a secondary circulation line.

- Connect a WRAS-approved circulation pump (4) with a non-return valve to the circulation connection.
- Connect the circulation line (3) to the hot water pipe (2).

## 10.3 Installation of cold water pipe

### 10.3.1 Pressure in cold water pipe

The efficiency of an unvented cylinder depends on the available pressure in the cold water pipe and the flow rate. To obtain maximum cylinder efficiency, there must be a suitable cold water pipe, i.e. the measured static line pressure must be at least 2.0 bar. A corresponding flow rate of at least 20 - 25 l/min must be available.



*The pressure in the cold water pipe will be reduced at times of high consumption. Thus, measurements should be taken at such times.*

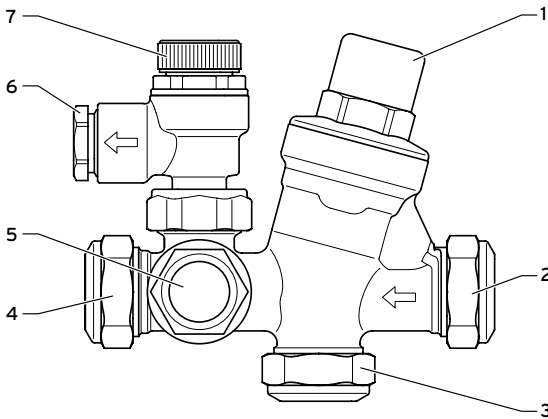
### 10.3.2 Mounting the safety assembly



**Excess pressure can cause the cylinder to burst.**

**- Make sure that there is no stop valve installed between the safety assembly and the cylinder.**

### 10.3.3 Safety assembly



Key:

- 1 Pressure limiting valve with line strainer
- 2 Cold water connection
- 3 Pressure-controlled cold water connection
- 4 Cylinder connection
- 5 Hot water expansion vessel connection
- 6 15 mm expansion relief valve connection
- 7 Expansion relief valve

- During the installation process, position the valves so that you are able to connect the 15 mm connection (6) of the expansion relief valve (7) with the tundish. Note the direction of flow, which is marked on the safety assembly with arrows. Do not install the valve with the relieve valve opening upside down



**Excess pressure can cause the cylinder to burst.**

**- Make sure that the expansion relief valve outlet is not covered or closed.**

- Mount the discharge pipe of the expansion relief valve with a constant downward slope to the outside. The discharge pipe must finish at a safe and visible point where there is no danger of it freezing up and where it poses no risk of injury to persons.
- Actuate the expansion relief valve regularly to prevent calcification.

- Connect the cylinder to connection (4).
- For the pipe from the main stop valve of the building to the cylinder, use copper piping with a diameter of at least 22 mm to ensure that the cylinder is as efficient as possible. This is particularly important for installations with a balanced cold water supply (3).
- Mount a drain valve in the cold water pipe at the lowest point between the cylinder and the safety assembly.
- Mount the safety assembly in the cold water pipe on the cylinder.



*If you mount the safety assembly above the cylinder, you do not need to drain the cylinder in order to maintain the safety assembly. Make sure there is sufficient space for maintenance and the connection of the discharge pipe of the expansion relief valve.*

When the discharge pipes are connected, the expansion relief valve may not be more than 600 mm away from the temperature/pressure relief valve.

### 10.3.4 Mounting the expansion vessel

The Glow-worm domestic hot water cylinder is delivered with an external expansion vessel. Connect this expansion vessel to the installed safety assembly as follows:

- Connect the expansion vessel with the safety assembly via a copper pipe or suitable hose line. Make sure the expansion vessel is supported sufficiently.
- Use the supplied wall bracket if you want to mount the expansion vessel to a wall.
- If necessary, establish the connection to the cold water connection (3) with pressure compensation of the safety assembly.
- Depending on the fittings used and the type of the draw-off points, it may be necessary to install a backflow preventer in the balanced cold water connection.



*In regions with high water pressure (4 bar or more), you can also connect the mixer tap for a bath or shower to the cold water connection with pressure compensation (3) of the safety assembly. This ensures that the hot and cold water supply to the mixer tap have the same pressure. You should install the cold water supply for all other connections using a T-piece before the safety assembly in the cold water pipe to the cylinder.*

### 10.3.5 Mounting the drain valve

- Mount a drain valve as low as possible between the cylinder and the safety assembly in the cold water pipe.

The drain valve must be provided by the customer. We recommend mounting a hose which reaches about 1 m under the base of the cylinder to the outlet of the drain valve.

## 10.4 Electrical installation



*Improperly executed electrical connections can impair the operational safety of the unit.*

*- Only a competent person approved at the time by the Health and Safety Executive may carry out the electrical installation.*



*Without earthing, life-threatening voltage can reach the piping and water draw-off points.*

*- Earth the cylinder.*

Wiring should be installed by a competent person in accordance with the building regulations, Part P of the current IEE regulations, and all other applicable regulations and directives.

You can use standard commercial cables (H05RR-F 3G1.5 or H05VV-F 3G1.5) for the wiring:

- Cross-section of conductors: 1.5 mm<sup>2</sup>
- Torque for strain relief: 1,5 Nm.
- Maximum length of bus cables: 300m.

230 V supply lines and bus cables must be laid separately above lengths of 10 m.

The discharge pipes of the tundish, drain valves, and motorised valves etc. must be laid at a distance from electrical components.

### 10.4.1 Wiring

Wiring can be accommodated via the Glow-worm Smart Wiring Centre or Systempro as a system solution. This enables Glow-worm dual-channel eBUS controllers (low-voltage) to be used along with 230 V valves to give control of Hot Water and Heating systems. Alternatively, a standard 230 V cabling box and controls can be used.



*Smart Wiring Centre will accommodate 1 CH plus 1 DHW zone. Systempro will accommodate up to 3 CH zones plus 1 DHW zone.*



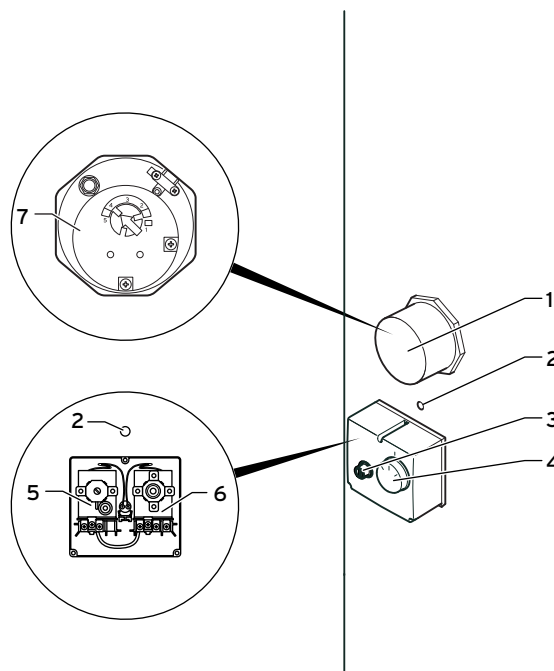
*All wiring must be carried out in accordance with BS 7671: "Requirements for electrical installations" (IEE wiring regulations, current edition).*

### 10.4.2 Regulation of cylinder reheating

The regulation of the reheating of the cylinder takes place via a Glow-worm Smart Wiring Centre, Systempro or a timer (third-party manufacturer).

## 10.5 Electrical connection of control components

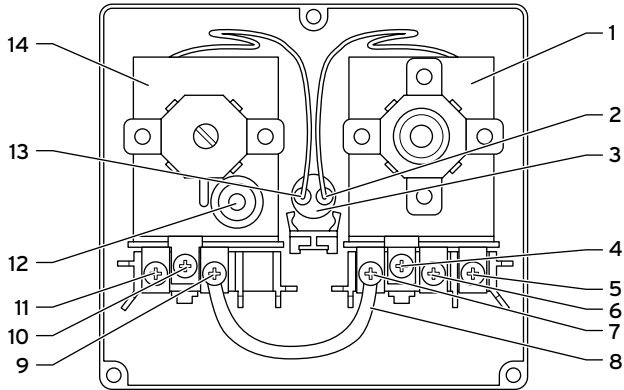
### 10.5.1 Cylinder temperature control



Key:

- 1 Electric immersion heater cover
- 2 Reheating circuit immersion sleeve (NTC)
- 3 Cover cap for reset button for reheating circuit TCO
- 4 Reheating circuit temperature controller
- 5 Reheating circuit safety thermostat
- 6 Cylinder thermostat
- 7 Electric immersion heater

## 10.5.2 Cylinder thermostat and safety thermostat (TCO) for reheating circuit

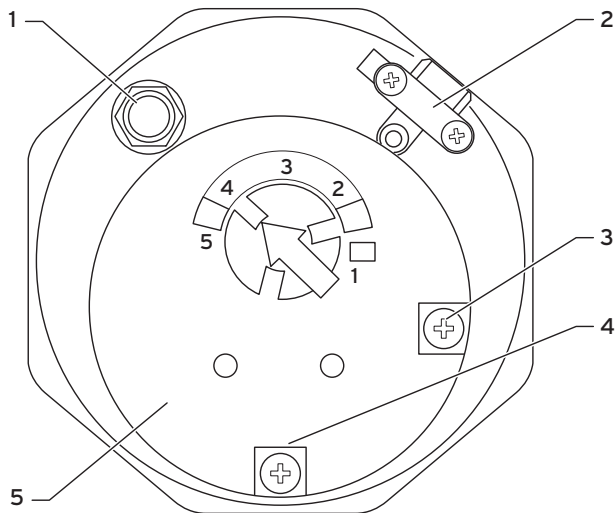


**Key:**

- 1 Cylinder thermostat
- 2 Cylinder thermostat temperature sensor
- 3 Lower immersion sleeve
- 4 Terminal for cylinder thermostat protective earth
- 5 Cylinder thermostat terminal 1
- 6 Cylinder thermostat terminal 2
- 7 Cylinder thermostat terminal C
- 8 Bridge
- 9 Reheating circuit TCO terminal 2
- 10 Reheating circuit TCO protective earth terminal
- 11 Reheating circuit TCO C terminal
- 12 Reheating circuit TCO reset button
- 13 Reheating circuit TCO temperature sensor
- 14 Reheating circuit safety thermostat (TCO)

Disconnect from the mains supply before you remove any of the underlying component covers.

## 10.5.3 Connection of electric immersion heater



**Key:**

- 1 Protective earth terminal (PE)
- 2 Cable grip
- 3 Neutral conductor terminal (N)
- 4 Outer conductor terminal (L)
- 5 Electric immersion heater



**Without earthing, life-threatening voltage can reach the piping and water draw-off points.**

**- Earth the cylinder.**



**If you use a immersion heater in the cylinder, the external voltage may build up electrical potential in the water which can result in the electrochemical corrosion of the immersion heater.**

**- Make sure that both the hot water and cold water pipes are connected to the earth line by means of an earth cable directly on the cylinder.**

**- You must also make sure that the immersion heater is connected to the earth line via the earthing terminal.**

- Dismantle the electric immersion heater cover.
- Install a separate electrical power supply for the electric immersion heater in accordance with current IEE regulations (BS 7671).
- Use heat-resistant cables (H05BN4-F 1.5 mm<sup>2</sup> 3 core HOFR sheathed flexible cable) for the cabling of the electric immersion heater.
- Use the cable grip (2) to firmly secure the supply cable of the immersion heater.
- Connect the electric immersion heater to the power mains via a 2-pole circuit breaker with a minimum contact gap of 3 mm in both poles.
- Protect the circuit using a 13 A fuse.
- Mount the cover for the electric immersion heater.



**Only switch the immersion heater on once the cylinder is completely full.**

With the circuit breaker, the electric immersion heater can be switched on if the reheating device has malfunctioned.

## 11 Commissioning

### 11.1 Filling the cylinder

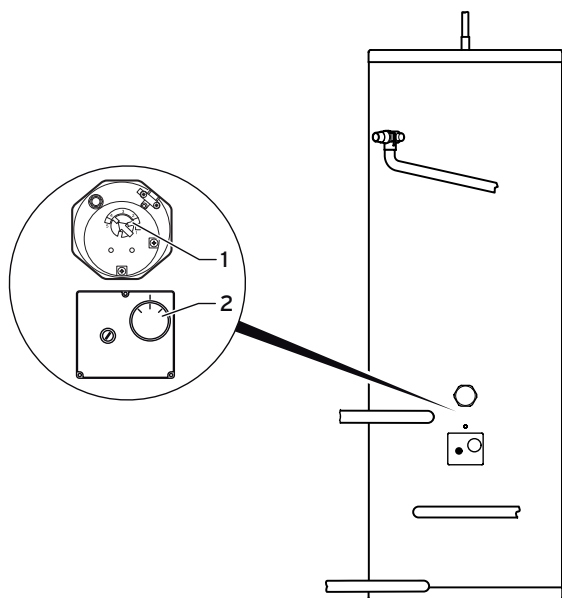


**Use the draw-off points to bleed the cylinder and water pipes. Do not use the combined temperature/pressure relief valve of the cylinder or the pressure relief valve of the coldwater safety assembly for bleeding, since foreign bodies can contaminate or damage the valves.**

- Make sure that the drain valve is closed.
- Open all of the draw-off points in the cold and hot water pipes.
- Open the water supply inlet to the cylinder and allow the water to run until bubble-free water runs from all of the draw-off points and the air is removed from the system.
- Close all of the draw-off points.
- Check the system for leaks. In particular, check the installed electric immersion heater for leaks.
- Open two hot water draw-off points, one at the lowest point and one at the highest point of the pipe system, and allow water to run for at least 5 minutes.

- Close both of the hot water draw-off points.

### 11.1.1 Setting thermostat



- Dismantle the electric immersion heater cover.

You can set the hot water temperature by turning the knob with the arrow pointing at the numbers 1 to 5. The following table gives in indication of approximate hot water temperature for each setting:

Setting	hot water temperature
- 1	20 °C
- 2	35 °C
- 3	45 °C
- 4	60 °C
- 5	68 °C

- Place the cylinder thermostat (1) and the electric immersion heater thermostat (2) for start-up into the central position (around 45°C) to achieve maximum energy efficiency.



*We recommend the cylinder is set to 60 °C periodically, to provide protection against the proliferation of harmful bacteria.*

- Place the gas-fired boiler into operation until the cylinder reaches the operating temperature and all radiators in the system are hot.
- Then drain the entire central heating system again to remove any residue from the pipes.
- Fill and bleed the central heating system again as described in the installation manual of the gas-fired boiler.

### 11.2 Filling out the cylinder commissioning checklist

- Fill in the benchmark cylinder commissioning checklist located on the last few pages of this manual.

### 11.3 Handover to the operator

You must brief the operator of the unit on the handling and function of the cylinder.

- Provide the operator with all relevant manuals and unit documentation.
- Go through the operating manual with the owner and answer any questions.
- Draw special attention to the safety instructions which the operator must follow.
- Inform the operator of the necessity of ensuring the regular inspection/maintenance of the system (inspection and maintenance contract).
- Make the operator aware that the manuals must be kept near to the cylinder.
- Inform the operator of the correct (efficient) settings for temperatures, controllers, and thermostatic radiator valves.
- Explain to the operator how to safely use the cylinder and control devices.
- Inform the operator of the required precautionary measures to prevent damage to the system and building if the system is not kept in operation during frost.
- In addition, inform the operator that the electric immersion heater is intended as a reserve appliance for water heating and must not be used to heat water in the cylinder at the same time as the gas-fired boiler.

## MAINTENANCE

### 12 Inspection and maintenance

To ensure lasting operational safety, reliability, and a long life, the cylinder must be regularly inspected/maintained by an engineer qualified to work on unvented systems.

The operational reliability of the cylinder may be impaired and material damage and personal injuries may result if the inspection and maintenance work is not carried out.

The essential maintenance work on the cylinder and the corresponding maintenance intervals are specified in the table below.

Inspection access to the cylinder is available through the immersion heater boss.

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



*When replacing parts, only use original replacement parts from Glow-worm.*

## 12.1 Maintenance checklist

Nature of maintenance work	Maintenance interval
Cylinder	
Check all connections to ensure no leaks	Annually
Check the temperature and pressure relief valve	Annually
Checking the expansion relief valve	Annually
Check the charge pressure of the hot water expansion vessel, re-pressurise as necessary	Annually
Check water flow rates are correct (Check and clean filters as necessary)	Annually
Ensure set temperatures are correct	Annually
Check the hot water thermostat mixer function	Annually
Fill in the service section of the benchmark cylinder commissioning checklist	Annually

## 12.2 Draining the cylinder

- Close the cold water feed line
- Secure a hose to the drain valve.
- Place the free end of the hose in a suitable discharge position. The opening should be around 1m beneath the cylinder.
- Open the highest hot water draw-off point to reduce the pressure and bleed the water pipes, thus draining them completely.
- Open the cylinder drain valve and leave open until no more water escapes and the cylinder is completely empty.
- Once the water has drained out, close the hot water draw-off point and the drain valve.
- Remove the hose from the drain valve.

## 13 Fault finding

The table below provides information on possible malfunctions which can occur when the cylinder is being operated along with information on their causes and how to rectify them.

All work on the Glow-worm cylinder (installation, maintenance, repairs etc.) may only be carried out by an engineer qualified to work on unvented systems.



*Improperly executed work on the cylinder can result in a danger to life and limb.*

*- Malfunctions may only be rectified by an engineer qualified to work on unvented systems.*



*Not all electric immersion heaters have a safety thermostat.*

*- Only use Glow-worm electric immersion heaters with a safety thermostat as replacement parts.*



When replacing parts, only use original replacement parts from Glow-worm.

We recommend that the operator enter into a maintenance agreement.

Malfunction	Cause	Solution
<b>Cylinder</b>		
The cylinder cools down at night.	One-pipe circulation in the case of short tube networks with low pressure loss.	Install an anti-siphon valve (as close as possible to the cylinder).
Reheating is not working. The Gas-fired boiler runs for a short time, goes off and then back on again. This is repeated until the cylinder is at its target temperature.	1. Air in the reheating heat exchanger	Vent the reheating heat exchanger.
	2. The cold and hot water connections on the cylinder have been mixed up.	Compare the data provided by the boiler manufacturer with the data for the cylinder. It may be possible to solve the problem by setting a higher flow temperature on the gas-fired boiler.
	2. Hot water thermostat mixer set too low.	Increase the setting.
	3. Heating insufficient; gas-fired boiler does not reheat. External control device is faulty.  Air in the reheating heat exchanger.  Cylinder sensor is faulty.	Check whether the gas-fired boiler is working. Check whether the external control device is working. Check that the 2-way valve is in the DHW position. Replace the 2-way valve. Vent the reheating heat exchanger.  Check the safety thermostat and suppress the fault. Replace the cylinder thermostat.
Water flows out of the expansion relief valve.	Dirt on the valve seat of the expansion relief valve.	Check the seat of the expansion relief valve and repair the fault.
	Pressure limiting valve is faulty.	Check whether the pressure behind the pressure limiting valve is lower than 3.0 bar. If so, replace the pressure limiting valve.
	Expansion vessel is faulty.	Check the pressure in the expansion vessel. If the pressure is insufficient, reestablish the pressure and check whether the expansion vessel maintains it.
	Expansion relief valve is faulty.	If the pressure is normal, replace the expansion relief valve.
Water flows out of the temperature/pressure relief valve.	There is dirt on the valve seat of the temperature/pressure relief valve.	Check the seat of the temperature/pressure relief valve and suppress the fault.
	The temperature control system for the gas-fired boiler is faulty.	If water is only escaping when being heated up by the gas-fired boiler, check the temperature control system of the gas-fired boiler. Check whether the 2-way valve switches to the heating position when the cylinder temperature is reached.
	Cylinder sensor is faulty.	Check the cylinder sensor and corresponding safety thermostat, replace the cylinder sensor if necessary, and repair the safety thermostat fault.
	Temperature and pressure relief valve is faulty.	If water is only escaping when being heated up by the electric immersion heater, replace the temperature/pressure relief valve.
	Electric immersion heater is faulty.	Check the temperature sensor of the electric immersion heater and the corresponding safety thermostat and replace the electric immersion heater if necessary.

## 13.1 Taking the cylinder out of service

### 13.2 Temporarily taking the cylinder out of service



*Risk of damage as a result of the cylinder freezing!  
Frost protection and monitoring devices are only active while the boiler is connected up to the power supply.*

*- Make sure that the cylinder cannot be damaged if there is a frost.*

- Temporarily take the cylinder out of service by switching the boiler off.

### 13.3 Permanently taking the cylinder out of service



*Risk of fatal electric shock from live connections!  
Voltage is continuously present on the mains connection terminals of the boiler.*

*- Interrupt the power supply.*

*- Prevent the power supply from being switched on again.*

*- Ensure that any electrical work is carried out by a competent person approved at the time by the Health and safety Executive.*

- Switch the boiler off.
- Empty the cylinder.
- Dismantle the hydraulic connections.
- Dismantle the temperature sensor.
- Remove the wiring for the temperature sensor from the boiler or external controller.

## 14 Recycling and disposal

Both the cylinder and its transport packaging are made primarily of recyclable raw materials.

### 14.1 Cylinder disposal

You must not dispose of the cylinder or any of its accessories in normal domestic rubbish.

- Dispose of the old unit and any accessories properly and in accordance with national regulations.

### 14.2 Disposal of packaging

Arrange for the recognised heating engineer who installed the unit to dispose of the transport packaging.

## 15 Customer service and manufacturer's warranty

### 15.1 Glow-worm service

To ensure regular servicing, it is strongly recommended that arrangements are made for a Maintenance Agreement. Please contact Glow-worm Service (Tel. No. 01773 828100) for further details.

### 15.2 Glow-worm warranty

Glow-worm provide a full parts and labour warranty for this appliance - please see warranty card for details. The appliances must be installed in accordance with The Water Regulations of: England and Wales

Water (supply and fittings) Regulations 1999 within England and Wales or Scotland

The Water Byelaws

Eire

Compliance with IS standards and Local Council regulations

Compliance with the Building regulations:

England and Wales Scotland

Northern Ireland

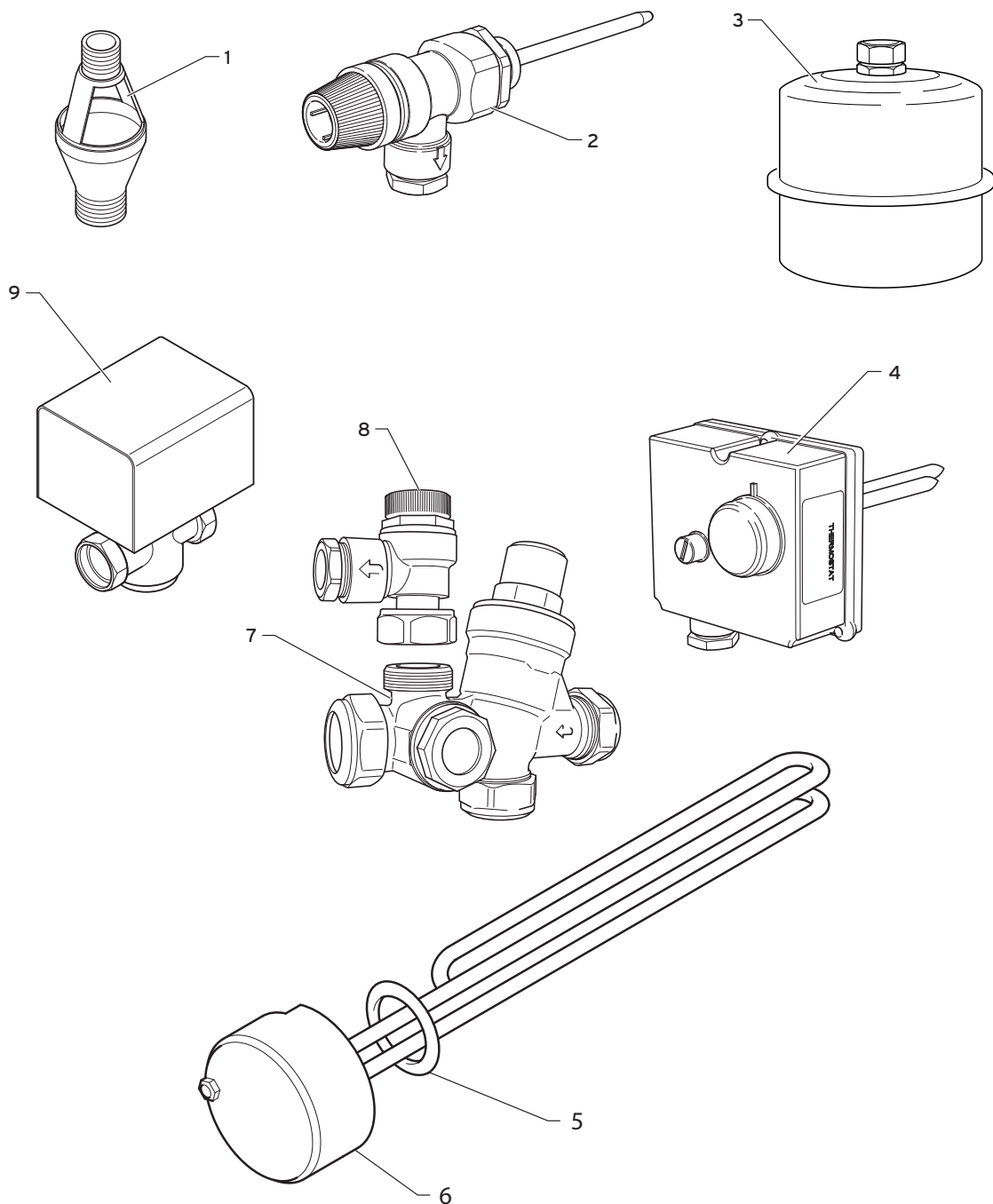
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Terms and conditions apply to the warranty, details of which can be found on the warranty registration card included with this appliance.

Failure to install and commission this appliance in compliance with the manufacturer's instructions will invalidate the warranty (this does not affect the customer's statutory rights).

16 Spare parts

Key No.	Part No.	Description
1	0020010155	Tundish
2	0020010154	Temperature and pressure relief valve
3	0020012035	Hot water expansion vessel assembly 12ltr
3	0020012036	Hot water expansion vessel assembly 18ltr
3	0020012037	Hot water expansion vessel assembly 25ltr
4	0020127614	Cylinder thermostat
5	0020127613	Immersion heater seal
6	0020127611	Immersion heater
7	0020127609	Safety assembly
8	0020127610	Pressure relief valve
9	0020127608	2-way motorised valve





# 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 1        Date

Engineer Name \_\_\_\_\_

Company Name \_\_\_\_\_

Telephone Number \_\_\_\_\_

Comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Signature \_\_\_\_\_

### SERVICE 2        Date

Engineer Name \_\_\_\_\_

Company Name \_\_\_\_\_

Telephone Number \_\_\_\_\_

Comments \_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

Signature \_\_\_\_\_

### SERVICE 3        Date

Engineer Name \_\_\_\_\_

Company Name \_\_\_\_\_

Telephone Number \_\_\_\_\_

Comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Signature \_\_\_\_\_

### SERVICE 4        Date

Engineer Name \_\_\_\_\_

Company Name \_\_\_\_\_

Telephone Number \_\_\_\_\_

Comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Signature \_\_\_\_\_

### SERVICE 5        Date

Engineer Name \_\_\_\_\_

Company Name \_\_\_\_\_

Telephone Number \_\_\_\_\_

Comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Signature \_\_\_\_\_

### SERVICE 6        Date

Engineer Name \_\_\_\_\_

Company Name \_\_\_\_\_

Telephone Number \_\_\_\_\_

Comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Signature \_\_\_\_\_

### SERVICE 7        Date

Engineer Name \_\_\_\_\_

Company Name \_\_\_\_\_

Telephone Number \_\_\_\_\_

Comments \_\_\_\_\_

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\_\_\_\_\_

Signature \_\_\_\_\_

### SERVICE 8        Date

Engineer Name \_\_\_\_\_

Company Name \_\_\_\_\_

Telephone Number \_\_\_\_\_

Comments \_\_\_\_\_

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Signature \_\_\_\_\_

### SERVICE 9        Date

Engineer Name \_\_\_\_\_

Company Name \_\_\_\_\_

Telephone Number \_\_\_\_\_

Comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Signature \_\_\_\_\_

### SERVICE 10        Date

Engineer Name \_\_\_\_\_

Company Name \_\_\_\_\_

Telephone Number \_\_\_\_\_

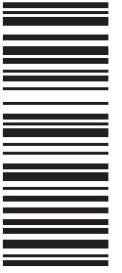
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Signature \_\_\_\_\_



Subject to engineering changes

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## GLOW-WORM

Nottingham Road,  
Belper, Derbyshire.  
DE56 1JT

Because of our constant endeavour for  
improvement, details may vary slightly  
from those shown in these instructions.

# Glow•worm

[www.glow-worm.co.uk](http://www.glow-worm.co.uk)