the HAMWORTHY

DORCHESTER DR-SG WATER HEATER

SCAN ME

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Hamworthy

Contents

Hamworthy

A solution for every plant room.

- **Trusted expertise since 1914.**

Hamworthy Heating is a British commercial heating manufacturer.

Our energy efficient commercial heating, hot water, and renewable energy products are used in buildings across the UK.

Trusted expertise since 1914.

Introducing the Dorchester DR-SG

The Dorchester DR-SG is available in 10 power outputs over 3 storage capacities. The range features a full stainless steel tank, heat exchanger and coil offering a durable solution while maximising product life.

The DR-SG is operated via the popular Siemens LMS mini controls platform. With easy access for service and maintenance, the range also features a lightweight and slim design to ease transportation on-site. An integrated flue non-return valve makes for a simple connection to existing flue systems (providing the flue system is suitable for a condensing appliance).

Being fully part L compliant, the DR-SG water heater meets all the seasonal efficiency requirements of the latest Building Regulations and offers significantly improved efficiency and performance when replacing a non-condensing water heater.

kiwa approved
UK WATER REGULATION 4

CE

Key features

Water Reg 4 — Water Regulations Reg 4 Approved (KUKReg4)

A ErP rating — ErP Class A

Part L — Fully Part L compliant

5 Yr Warranty — 5 year warranty *

Suitable for commercial properties

BIM Objects — BIM objects available to download

** 5 year warranty on the tank, 2 year warranty on components. Terms and conditions apply.*

Enhanced durability with anode protection

The combination of stainless steel tank with an anode within means that the water heater can maintain performance under challenging water conditions.

Get in touch

Contact your local Hamworthy sales team for more information:
hamworthy-heating.com/Contact-us

Features and benefits

- Storage tank, heat exchanger and coil all manufactured from stainless steel
- Enhanced durability under challenging water conditions
- NOx under 40 mg/kWh across the range (Class 6)
- Quick and easy burner access
- Operated via the popular Siemens LMS Mini controls platform
- Integrated flue non-return valve
- Can deliver flow rates to satisfy high demand environments
- Suitable for natural gas and LPG systems (conversion kit available).

Why use a stainless steel tank over alternative materials?

- More resistant to corrosion so maximises service life
- Able to tolerate low pH water which can be a cause of aggressive corrosion
- Significantly lighter than other commonly used materials for water heaters* so aid transportation and handling

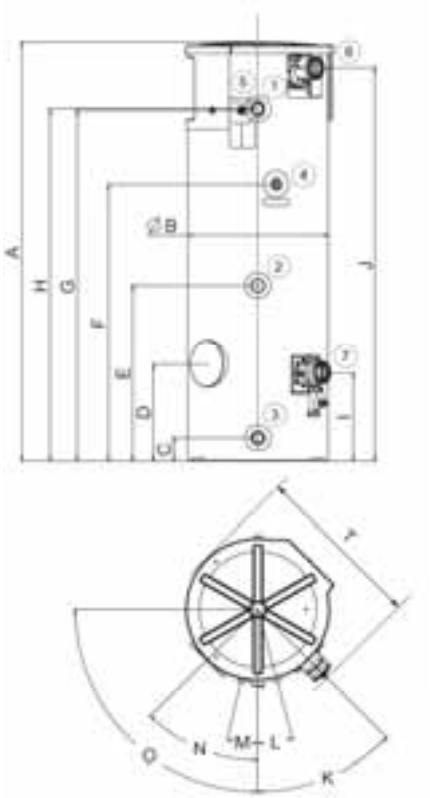
** 200kg lighter than nearest equivalent enamelled steel product*

Technical information

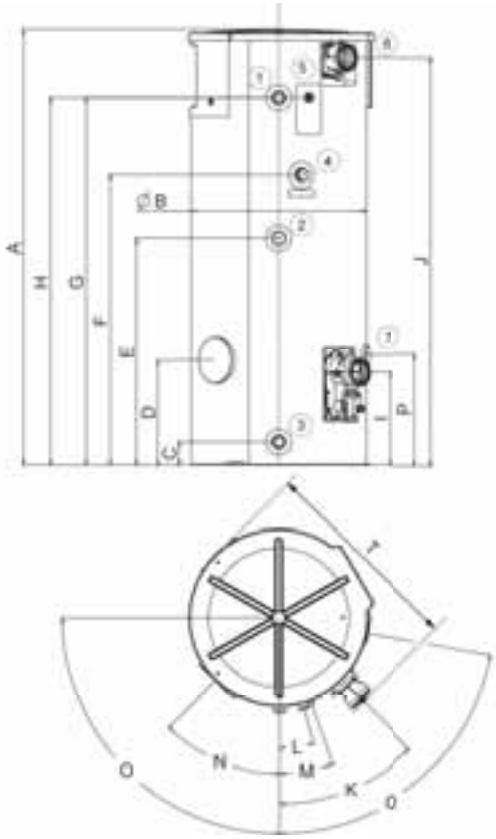
	Model:		DR-SG 20-210	DR-SG 25-210	DR-SG 30-210	DR-SG 35-356	DR-SG 50-356	DR-SG 60-356	DR-SG 70-538	DR-SG 80-538	DR-SG 100-538	DR-SG 120-538
Energy	Max Heat Input (Gross)	kW	20	25	30	35	50	56.6	69.9	80	100	120
	Max Power Output (Net)	kW	21	26.3	31.5	37	53	60	73.4	84	105	126
	Building regulations Part L, EN89 100% efficiency (NCV)	%	105	105	105	106	106	106	106	106	106	106
	Building regulations Part L, EN89 100% efficiency (GCV)	%	94.6	94.6	94.6	95.5	95.5	95.5	95.5	95.5	95.5	95.5
	Standby Loss	kWh/day	1.6	1.6	1.6	1.9	1.9	1.9	3.2	3.2	3.2	3.2
	Building regulations Part L, Maintenance Consumption (EN89)	kWh/day	2.7	2.7	2.7	3.4	3.4	3.4	5.6	5.6	5.6	5.6
	ErP efficiency rating		A	A	A	A	A	A	A	n/a	n/a	n/a
	Water Heater Efficiency (ErP)	%	95.9	91.7	93.5	90.3	92.5	91.4	92.7	91.3	90.8	90
	ErP Load Profile		XXL	XXL	XXL	XXL	XXL	XXL	3XL	3XL	3XL	3XL
Water	Storage Capacity	L	210	210	210	356	356	356	538	538	538	538
	1st 10 mins at ΔT 50°C	l/10'	175	205	220	330	400	435	475	500	550	600
	1st hour at ΔT 50°C	l/60'	450	570	580	630	1100	1210	1500	1700	2000	2300
	Continuous Flow at ΔT 50°C	l/hr	360	450	540	640	910	1090	1280	1460	1820	2190
	Max DHW temperature setpoint	°C	80	80	80	80	80	80	80	80	80	80
	Max operating pressure (open vented)	bar	7	7	7	7	7	7	7	7	7	7
	Max operating pressure (unvented)	bar	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
	Heat-up time (mins) 50°C rise		36	29	24	35	24	20	26	23	18	15
	Heat-up time (mins) 55°C rise		40	32	26	39	27	22	29	25	20	17
Gas	Gas Inlet Pressure (Nominal nat gas)	mbar	20	20	20	20	20	20	20	20	20	20
	Gas flow rate (Nominal nat gas)	m³/hr	2.1	2.6	3.2	3.7	5.3	6	7.4	8.5	11	12.7
	Gas Inlet Pressure (Nominal, LPG)	mbar	37	37	37	37	37	37	37	37	37	37
	Gas flow rate (LPG)	m³/hr	0.8	1	1.2	1.4	2	2.4	2.7	3.1	4	4.7
	Gas connection		R ¾"	R ¾"	R ¾"	R ¾"	R ¾"	R ¾"	R 1"	R 1"	R 1"	R 1"
Flues	Max flue gas temperature	°C	100	100	100	100	100	100	100	100	100	100
	Nominal flue gas operating temp	°C	39	55	60	40.3	50.9	51.6	56.8	58.8	59.8	59.3
	Flue Gas Volume @15°C	kg/h	33.1	41.4	49.7	53.3	79.9	95	104.4	118.8	158.4	187.2
	NOx emissions	mg/kWh	29	29	29	32	32	32	39.5	39.5	39.5	39.5
	Pressure at flue outlet	Pa	110	170	200	130	200	200	65	95	155	200
	Air inlet/Flue outlet diameter	mm	80	80	80	100	100	100	130	130	130	130
	Max system length – C type flues	m	20	20	20	20	20	20	20	20	20	20
Electrical	Electrical Supply	V	230 V AC (+10%, -15%) 50Hz									
	Fuse rating	amp	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
	Power consumption (maximum)	W	12.7	12.7	12.7	18	18	18	22.5	22.5	22.5	22.5
	Power consumption (standby)	W	3.6	3.6	3.6	3.7	3.7	3.7	4.5	4.5	4.5	4.5
	Sounds Power Level (Noise emissions)	dBA	64	64	64	75	75	75	67	69	74	78
Misc	Number of Anodes		1	1	1	2	2	2	3	3	3	3
	Dry weight	kg	96	96	96	142	142	142	240	240	240	240
	Filled Weight	kg	306	306	306	498	498	498	778	778	778	778
	Height	mm	1802	1802	1802	1874	1874	1874	2028	2028	2028	2028
	Diameter (inc insulation)	mm	600	600	600	750	750	750	890	890	890	890

Technical dimensions

Dorchester DR-SG XX-210

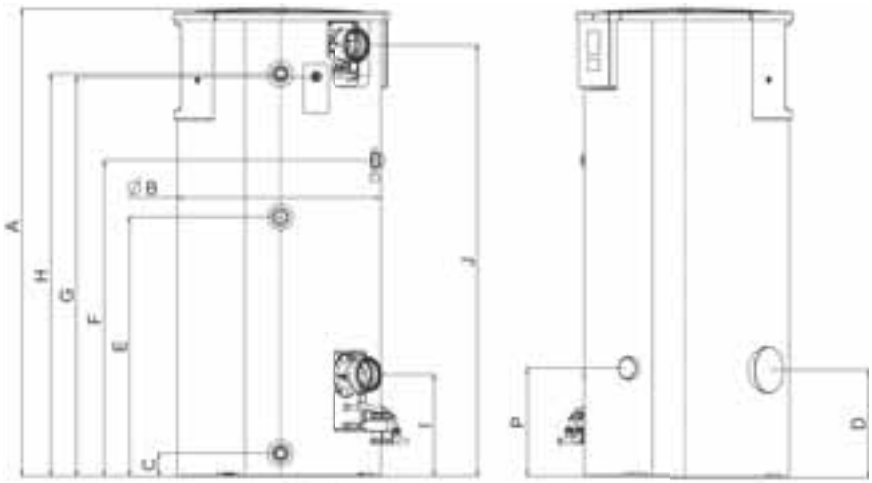


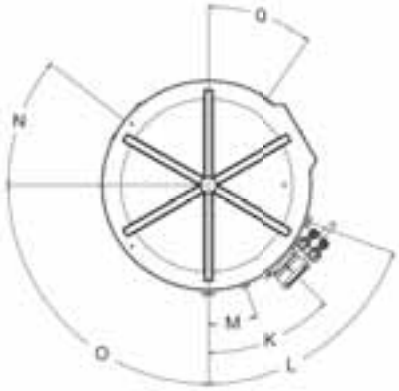
Dorchester DR-SG XX-356

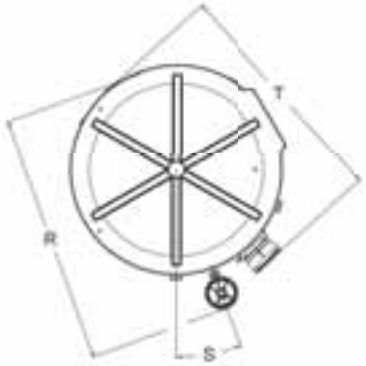


	MODELS									
	Dorchester DR-SG XX-210			Dorchester DR-SG XX-356			Dorchester DR-SG XX-538			
	20	25	30	35	50	60	70	80	100	120
1 Hot water outlet	Rp 1"½			Rp 1"½			Rp 1"½			
2 Loop return	Rp 1"½			Rp 1"½			Rp 1"½			
3 Cold water inlet	Rp 1"½			Rp 1"½			Rp 1"½			
4 T&P valve	Rp 1"			Rp 1"¼			Rp 1"½			
5 Gas inlet	R ¾"			R ¾"			R 1"			
6 Air inlet	Ø 80			Ø 100			Ø 130			
7 Flue outlet	Ø 80			Ø 100			Ø 130			

Dorchester DR-SG XX-538







ref		DR-SG XX-210	DR-SG XX-356	DR-SG XX-538
A	Overall height	1802	1874	2028
B	Diameter	Ø 600	Ø 750	Ø 890
C	Height to cold water inlet	100	100	100
D	Height to inspection hatch	419	454	467
E	Height to secondary return	759	980	1129
F	Height to T&P valve connection	1193	1248	1373
G	Height to gas connection	1508	1580	1735
H	Height to hot water outlet	1514	1579	1748
I	Height to flue outlet	380	402	442
J	Height to air inlet	1691	1752	1871
K	Angle position of flue outlet	45°	45°	45°
L	Angle position of T&P valve fitting	13°	15°	70°
M	Angle position of gas connection	12.9°	20°	20°
N	Angle position of inspection hatch	45°	45°	38°
O	Angle position of HMI	90°	90°	90°
P	Height of lower anode fitting	NA	478	470
Q	Angle position of lower anode fitting	NA	80°	35°
R	Overall width with LPG conversion kit	NA	NA	639
S	Angle position of gas connection with LPG conversion kit	NA	NA	20°
T	Max installed width	699	884	1020
U	Height to condensate trap outlet	233	230	151

Clearances

ALL MODELS		DR-SG
Clearance – front (service)	mm	Min 500
Clearance – sides	mm	500
Clearance – rear	mm	500
Clearance – top	mm	175

Product specification

Construction

The storage tank, heat exchanger and combustion chamber are all manufactured from high quality grades of Stainless Steel.

Particular attention is paid to the welding process with as much welding as possible being done on the inside 'water side' of the tank. Where 'water side' welding has not been possible, a full penetration welding process is used. The opposite sides of the weld are then filled using an inerting process to ensure a high quality complete weld is achieved.

The completed storage tank assembly is then 100% pickled in order to remove potential contaminants and provide additional protection for welded areas.

The storage tank comes with a removable foam insulation jacket and insulation upper disk to ensure that standing losses are minimised.

Burner

The modulating pre-mix burner is mounted on top of the heater in a downward-firing arrangement. The controlled supply of gas and air achieves the optimum gas/air mixture for efficient performance and clean combustion. The burner can modulate down to 20% on full power (model dependent).

Heat Exchanger

The hot combustion gases are directed down through the combustion chamber which extends to near the base of the tank, then rises up the heat exchanger to a point where it forms a coiled spiral and descends again. The flue gas discharge outlet is towards the base of the water heater. This construction maximises heat transfer as gases cooled by the colder water towards the bottom of the tank are able to condense. Latent heat is recovered as a result of this process which increases the operating efficiency of the water heater.

This type of heat exchanger also reduces the problems traditionally associated with scale. Any build-up will fall to the base of the unit and avoid any issues with performance and hot spots.

Anode protection

All DR-SG models are fitted with bespoke titanium electrical anodes as standard.

These anodes do not required any routine maintenance or replacement, and have an estimated service life of more than 10 years.

Anodes protect against corrosion which can develop on all types of metal, and corrosion can occur in both hard and soft water conditions.

It is essential for the electrical anode protection system that the power supply is uninterruptible to ensure proper protection of the unit is maintained. Any external time controls must use the remote enable connections and not interrupt the mains supply to the water heater..

Construction

Down firing burner

LPG Compatible

All DR-SG water heater models are suitable for LPG fuel. All models can be converted from natural gas to LPG by a qualified installer. It is strongly recommended that on LPG installations gas detection equipment is fitted and that this equipment is positioned near the heater and at low level. It is also imperative that the plant room ventilated at high and low level.

Any DR-SG models operating on LPG must not be installed in basement plant rooms.

Flue Connection

The air inlet connection is at the top of the water heater, and the flue gas outlet connection is sited at the bottom. The Dorchester DR-SG water heaters are suitable to operate on traditional open flue systems (B23) and also room sealed flue configurations with horizontal and vertical terminations (C13, C33). All Hamworthy flue components have been specified and tested specifically for use with the DR-SG to ensure safe and optimum performance from the installation.

It is possible to install multiple Dorchester DR-SG water heaters onto a common flue header. The flue outlet on a DR-SG incorporates a non-return valve so no additional back flow prevention devices for flue gases are required.

Bespoke flue starter kits are available for open flue and room sealed flue systems. The components within these starter kits have been designed to provide an easy, compact installation of the flue system closest to the water heater. The open flue kits contain an air inlet basket with air filter to prevent dust and debris from entering the air inlet, and the concentric kits contain an adaptor to combine the air inlet pipework with the flue outlet pipework into a concentric flue system.

Condensate Management

The DR-SG is a condensing water heater, where the cooler flue gases condense as they pass through the coil within the water heater. Latent heat is recovered as a result of this process which increases the operating efficiency of the water heater.

The condensate of the flue gases is discharged through the flue outlet into an external trap on the XX-210 and XX-356 models, and through a dedicated condensate evacuation tube into an external trap on the XX-538 models. The XX-538 models have a double condensate trap.

Open vented or unvented systems

The Dorchester DR-SG range is suitable for both open vented and unvented hot water systems. An optional unvented accessory kit is available from Hamworthy to enable the DR-SG to be installed on an unvented hot water system. A temperature and pressure relief valve is included with the water heater as standard.

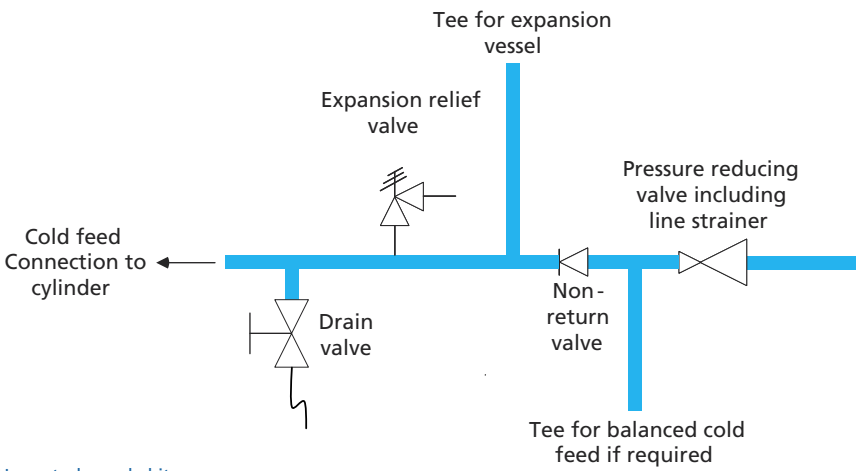
Safety

The DR-SG water heaters conform to the recommendations offered within industry best practices such as HSG 274 Part 2 and ACOP L8 as follows:

- Dedicated access for routine inspection and cleaning
- Dedicated pasteurisation cycle within the control software
- Unique Triplex sensor for accurate temperature control

Water Quality Statement

Due to the variable composition of distributed water supplies it is necessary to identify the properties of the cold water feed to the water heater. As is common seen within water heating devices, scale formation will develop during normal operation, and it is therefore an essential requirement that appropriate action is undertaken to ensure reliable and continuous operation. For regions with very calcareous water (over 350 ppm CaCO3), it is best to use a softener to prevent scaling problems in the heating element. Excessive scaling reduces device performance and can lead to corrosion of the heating element. Routine monitoring, inspection and cleaning is therefore important. The water heater warranty requires that the conductivity of the water in the heater must be no less than 100 µS/cm. This is necessary to ensure effective operation of the electrical anodic protection system. As hardness and conductivity are related, and water softening that is applied must check that the water maintains a conductivity level above 100 µS/cm.



Unvented supply kit

Safety

Unvented systems and accessories

Unvented kit

Each unvented supply kit is sized 1½" and comprises the following items:

- 3.5 bar pressure reducing valve
- Non return valve
- 6 bar expansion relief valve
- Tundish
- Drain valve (including tee and reducing fitting)

The unvented supply kit is essential for any unvented application.

Expansion factor for different water temperatures						
Temperature	°C	50	55	60	65	70
Expansion Factor	Σ	0.0118	0.0142	0.0168	0.0196	0.0225

A Temperature and Pressure relief valve is supplied with the water heater. Each unvented supply kit is designed to be used with a single water heater.

Multiple water heater installations should order one unvented kit per water heater.

The expansion vessel is not supplied as part of the unvented kit and must be ordered separately from the Burstock range of expansion vessels..

Burstock expansion vessel

Expansion vessels can be purchased from the existing Burstock range, which offers a wide range of vessel sizes for many types of hot water system.

- All models are WRAS approved
- Maximum working pressure 10 bar
- Factory pre-charged with nitrogen to 3.5 bar for DHW system use
- Available from 25l to 1000l

Flow-through type expansion vessels are also available up to 200l and can provide increased protection against the formation of bacterial growth.

Top-to-bottom recirculation pump

This gives enhanced temperature control and can be used in the control of legionellosis – for compliance with the Heath and Safety Commission (HSC) requirements for safe production of hot water.

LPG conversion kit

An LPG conversion kit is supplied as standardfor 20-60kW models (XX-210 and XX-356).
For 70-120kW models (XX-538), the LPG conversion kit must be ordered separately and is not included as standard with the water heater.

Controls

The Dorchester DR-SG uses a Siemens controls platform which has been specially adapted for use on DHW systems.

Controlled by the H3100 Navistem controller, a HMI familiar across the Hamworthy heating product range.

Easy to use digital control panel with backlit LCD display and utilising a scroll wheel to navigate between the different settings screens. LEDs are also incorporated into the user interface to enable quick and easy identification of faults, should they occur.

Primary operating features include:

- DHW production in comfort (primary temperature setpoint) and reduced (secondary temperature setpoint) modes
- Full 7 day / 24 hour time and date settings to control comfort/reduced mode activation
- Standby mode which will operate a frost protection programme if required
- Anti-legionella programme which is fully customisable to system requirements
- Holiday mode programming for periods of shutdown
- Programmable pump control function

Setpoints:

- The DHW setpoints can be adjusted between 45°C and 80°C
- 3 'ON/OFF' cycles can be programmed to run within a single 24 hour period
- The anti-legionella programme can have it's cycle temperature, cycle duration and cycle frequency adjusted
- Adjustable frost protection setpoint between -20°C and 20°C

In addition to the standard controls built into the water heater a selected range of optional controls accessories will also be available. These include:

- AVS75 extension module to enable 0-10V communication with additional system pumps (secondary return, loading pumps for additional cylinder)
- Cable (sensor QAZ36 for thermowell) water temperature sensor to monitor stored water temps of additional cylinders connected to the DR-SG

Flue data

	Open Flue		Concentric / Room Sealed Flue (C13/C33)			
Model	Air Inlet/Flue Outlet Diameter	Pressure at Outlet (Pa)	Flue System Diameter	Max Flue System Length (m)	Equivalent Length 90° Elbow	Equivalent length 45° Elbow
20-210	80mm	110	80/125	20	1	0.5
25-210	80mm	170	80/125	20	1	0.5
30-210	80mm	200	80/125	20	1	0.5
35-356	100mm	130	100/150	20	1	0.5
50-356	100mm	200	100/150	20	1	0.5
60-356	100mm	200	100/150	20	1	0.5
70-538	130mm	65	130/200	20	1	0.5
80-538	130mm	95	130/200	20	1	0.5
100-538	130mm	155	130/200	20	1	0.5
120-538	130mm	200	130/200	20	1	0.5

Flues

DR-SG is approved for open flue or room sealed flue systems.

The water heaters are offered with a range components suitable for B23, C13 and C33 flue systems.

Flue starter kits are available for open and concentric systems.

Typical flue installation

Note: Flue terminals are not included within flue starter kits and must be ordered separately.

B23 flue system

C13 flue system

C33 flue system

Kit components

B type kits for open flue systems (Optional installation)
B23 Air inlet basket
Flue outlet straight extension
Flue outlet support elbow
Adjustable support foot
Water heater bracket kit
1m straight extension
0.5m straight extension

C type kits for room sealed flue systems (Mandatory installation)
Air inlet straight extension
Flue outlet straight extension
Flue outlet support elbow
Adjustable support foot
Water heater bracket kit
Concentric T-adaptor
1m straight extension
0.5m straight extension

With any alternative flue system used, the installer must ensure that the flue system is sufficiently supported, and the air inlet and flue outlet connections are not under any weight stress.

Service and warranty

Commissioning

We strongly recommend that all water heaters are commissioned by our service department. As well as ensuring your product is set up correctly for maximum efficiencies you will receive extra benefits on warranty (see below). On completion, you will get a report with details of the initial operating settings.

Service

Installed water heaters will experience a wide variation in operating conditions that can occur due to differing patterns of usage and the variable chemical nature of distributed water supplies. It is therefore strongly recommended that water heaters be drained and inspected within 3 months of the initial commissioning. Once the levels of calcium deposition are established a suitable maintenance schedule can be implemented, however as a minimum all water heaters should be serviced annually.

To maintain your water heaters, we have a range of servicing options that can be tailored to your requirements. For more information on commissioning and service please contact Hamworthy Heating Service Department.

Warranty

The Dorchester DR-SG comes with a 5-year warranty on the tank and 2 year warranty on the components.

We offer tailored packages to suit the individual customer requirements, many of which include extended warranty benefits. Full details of warranty terms and conditions are available on request.

Speak to our service team today to find out more about commissioning and service offering or ask us to add it to your project quote.

Telephone:
01202 662555

Email:
service@hamworthy-heating.com

Website:
hamworthy-heating.com/commissioning

Spares

Essential to any maintenance and service regime is the availability of quality spare parts.

By coming to us you can be assured of genuine spare parts and may also benefit from technological improvements. We have a long-term commitment to spare parts for our products.

The Hamworthy difference

Delivery

Dorchester water heaters are delivered factory assembled and mounted within frames, shrinkwrapped and on a wooden pallet. Standard delivery for all Hamworthy products is free of charge. Deliveries are closely co-ordinated with the customer, to suit the site construction programme. Products are delivered to ground level and it is the responsibility of the customer to arrange movement of products from here to the required location on site.

To enquire about special delivery services including FORS and time critical deliveries (additional charges apply) please contact our customer services team.

British engineering excellence

Here in the UK, we design, test, manufacture and source market-leading products. We know our products inside out, back to front and from start to finish. You can trust that we know what we're talking about.

Everyone's got history, we've got heritage

Our roots date back to 1914 when two brothers in Poole set up Hamworthy Engineering. Decades of experience go in to every nut, screw and bolt, and every phone call, text and email.

Since 2008, we've been part of Groupe Atlantic, a company with a similar ethos to us. Groupe Atlantic was founded in 1968 by two engineers and is now one of the market leaders in the European heating and hot water industry. We're part of their growing UK, ROI and North America Divisions.

Lifetime support

From design and specification, through to commissioning, training and maintenance, as well as commitment to spares availability. We support businesses through their lifetime of commercial heating and hot water needs.

Aftersales support

Got a question?

Don't hesitate to get in touch. Your local contact is listed on the back cover, or speak to one of the team in head office:

Sales team: 01202 662552

Service team: 01202 662555

Spares team: 01202 662525

Technical support: 01202 662505

You can speak to us online via our web chat service or visit our technical library to download full product information including CAD files, BIM objects and data tables.

hamworthy-heating.com

sales@hamworthy-heating.com

Request a free site survey

Our free site survey brings our experts directly to you.

hamworthy-heating.com

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Product training

Get hands-on training on Dorchester water heaters

Training can be provided onsite, online or at one of our training centres.

Delivered by Groupe Atlantic engineers with years of product knowledge and industry experience, the training session will provide hands-on product training and guide you through the servicing of products to ensure they are operating at their maximum efficiencies.

We recommend you encourage your customer to attend too so they are confident understanding fault codes and associated control operation.

We're also accredited with CIBSE to deliver approved Continuing Professional Development (CPD) courses.

To enquire about hands-on training or a CPD module with us, please contact your local area sales manager or email **sales@hamworthy-heating.com**

Notes

Notes

British engineering excellence from Hamworthy Heating; the commercial heating and hot water specialists.

SUPPORT BRITISH MANUFACTURING

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Hamworthy Heating Accreditations
ISO 9001 Quality Management System
ISO 14001 Environmental Management System
ISO 45001 Health & Safety Management System