BUILDING REGULATIONS
Exceeds Minimum Requirements
PART L COMPLIANT

Hamworthy Dorchester DR-SA & DR-SE

Fully Automatic and Permanent Pilot Direct Gas-Fired Storage Water Heaters

18.9 kW to 20.1 kW, Natural Gas or LPG
Continuous outputs 369 l/h to 392 l/h

CE

Hamworthy

Heating *at work.*

Dorchester DR-SA & DR-SE

Single Fire Tube, Direct Gas-Fired Storage Water Heaters

The Hamworthy Dorchester DR-S storage water heaters offer a practical and efficient means of producing domestic hot water and are suitable for smaller commercial applications requiring a maximum continuous output of up to 392 litres/hour.

These single fire tube gas-fired water heaters are available with a choice of fully automatic ignition in the DR-SA range or permanent pilot ignition in the DR-SE range.

Both ranges have the same atmospheric burners and very similar water storage tanks. Each range offers two equivalent models and these can provide maximum continuous outputs of 369 litres/hour and 392 litres/hour, based on a 44°C temperature rise.

For the Dorchester DR-SA and DR-SE respectively, storage capacities are 278 litres and 372 litres and maximum output powers are 18.9 kW and 20.1 kW using natural gas, or 17.6 kW and 19.1 kW using LPG.

The DR-SA and DR-SE water heaters are the smallest in the Hamworthy Dorchester range, with straight forward controls for ease and simplicity of operation; and yet built to the same exacting high standards as all other water heaters in the Hamworthy Dorchester family for the safe production of potable domestic hot water (DHW).

If no electrically-powered options are specified, the Dorchester DR-SE models can be operated without a power supply in their basic form, as they use a piezo ignition and thermocouple-type safety controls. This means they can be an ideal choice for use in applications such as campsites and temporary buildings, and wherever access to a mains power supply may be limited.

Options

- **Natural gas or LPG**
- **Unvented supply kit**
- **Top-to-bottom pump recirculation kit**
- **Flexible replacement magnesium anodes**
- **Electrical anode protection**
- **Time clock control kit (DR-SE only)**

BENEFITS

- **Exceeds Part L minimum requirements**
- **Magnesium sacrificial anode for corrosion protection**
- **Clean out door for easy maintenance**
- **Simple operation**
- **DR-SE can operate without power supply**

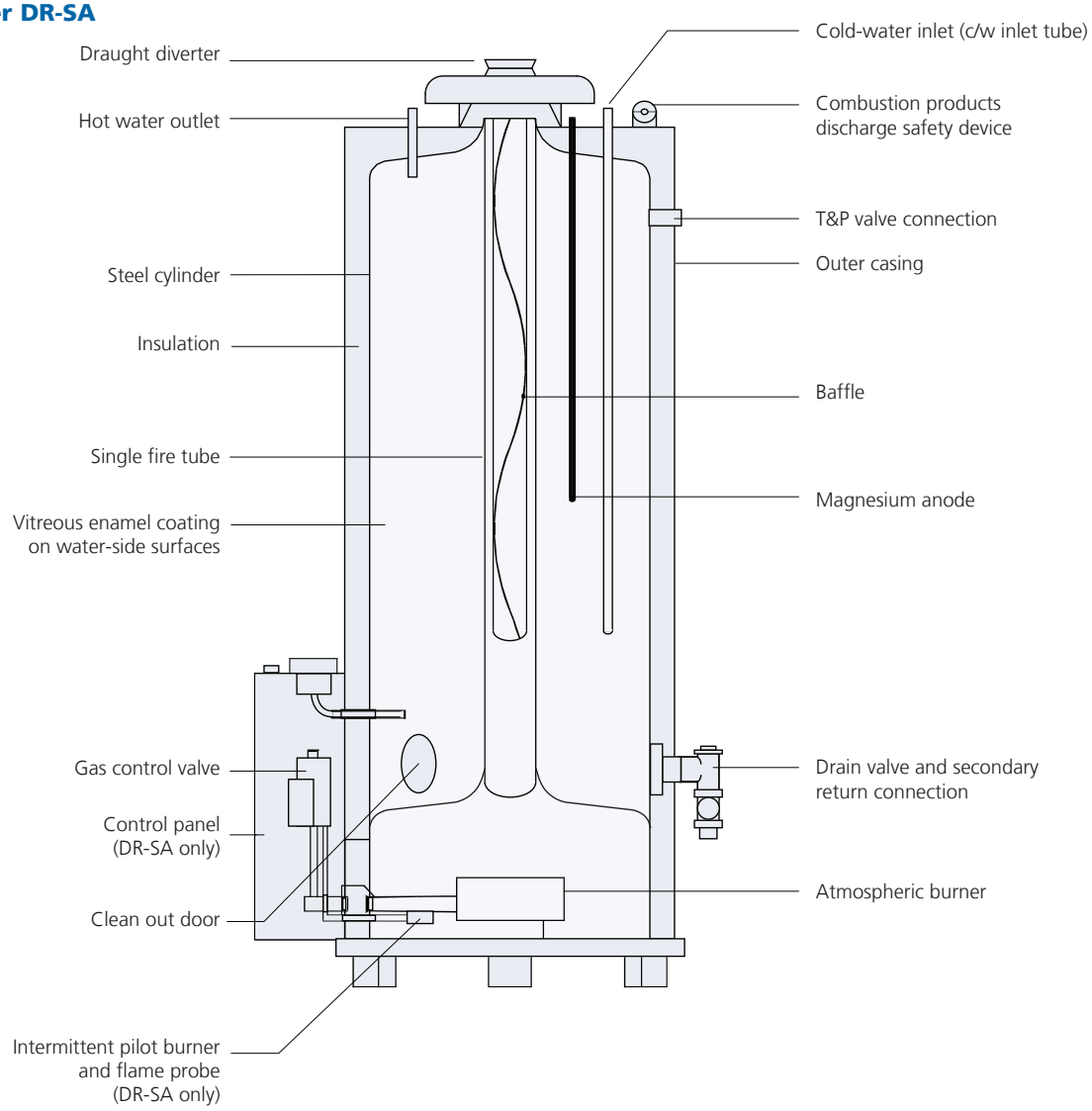
Ideal for close to point-of-use small commercial applications and, in the case of the Dorchester DR-SE, can be used without a mains power supply.

Dorchester DR-SA automatic ignition direct-fired water heater in a plant room

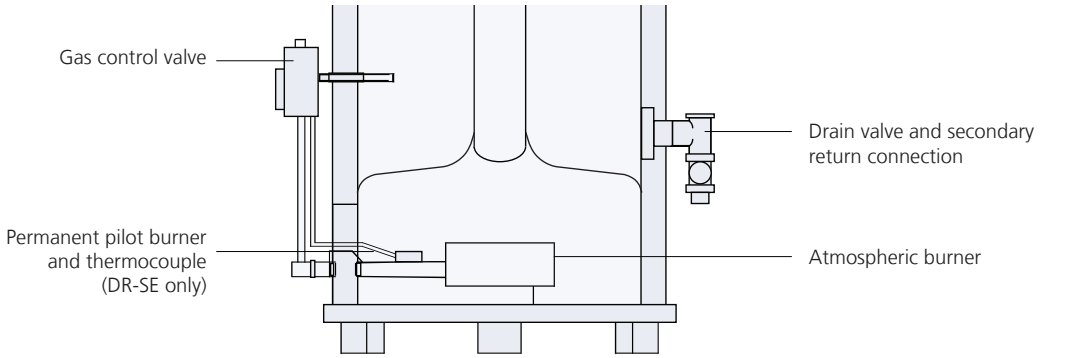
Typical Layout

Dorchester DR-SA & DR-SE

Dorchester DR-SA



Dorchester DR-SE
Lower cylinder and ignition system detail



Specification

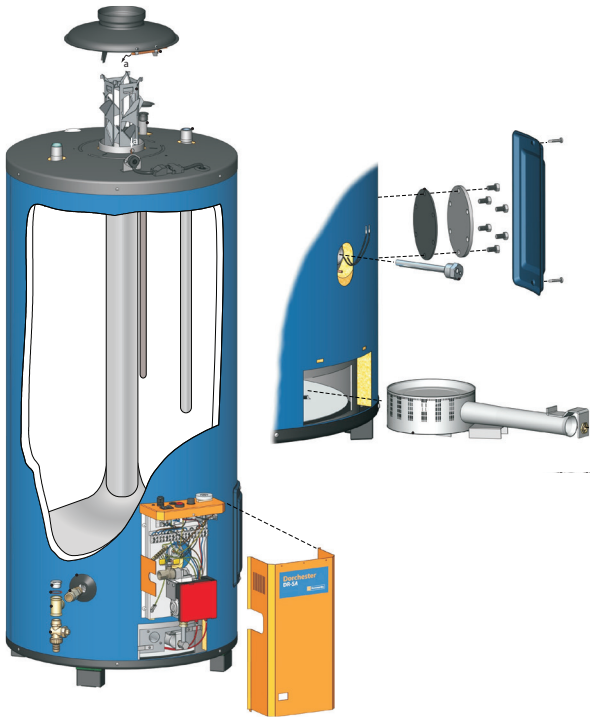
Dorchester DR-SA & DR-SE

The Dorchester DR-SA is the automatic ignition variant and includes a fully electronic gas valve, spark ignition system, control and high limit thermostats, safety thermostat and lockout indicator light and reset button. A further thermostat is located on the draught diverter as a combustion products discharge safety device, to detect flue gas spillage and to shut down the burner in the event of a down draught condition.

The Dorchester DR-SE is the permanent pilot variant based on the Dorchester DR-SA but with self-energised controls and a permanent pilot ignition system.

The Dorchester DR-S range of water heaters are manufactured to the highest standards using the latest production technology to ensure a high quality long lasting finish in every product configuration. Compliance is assured with stringent controls in accordance with the European Standards and each model carrying the CE mark for compliance with the European standard BS EN 89:2000.

All Dorchester DR-S models exceed the minimum efficiency requirements of the Building Regulations, Part L, and each is designed to meet the latest HSC requirements for the control of Legionellosis.



Dorchester DR-SA cutaway with covers removed, showing fire tube and baffles, anode, clean out door and annular burner

Water Heater Construction

The water heater cylinders are constructed from high grade steel and given a high quality vitreous enamel coating. The fabrication of the cylinder and welding is completed fully before the enamel is applied, ensuring that the integrity of the coating is not affected during manufacture.

During enamelling, the cylinder and associated heat exchanger fire tube undergo a precise glass coating process where the unit is rotated in every direction to ensure an even glaze is applied throughout. Surplus material is drained before the unit is then baked at 840ºC to complete the adhesion of the glaze to water-side surfaces of the cylinder and heat exchanger fire tube, providing a long lasting, hygienic and corrosion resistant finish.

The cylinder is covered with a 50 mm layer of CFC-free foam insulation to ensure that standing losses are kept to a minimum.

Burner

The atmospheric burner is a single, stainless steel, annular burner mounted at the base of the cylinder and draws air in naturally (no fan) in the space under the unit, which must be kept clear.

Heat Exchanger and Flue Connection

The heat exchanger has a single vertical fire tube which is fitted with steel baffles in order to maximise the heat transfer. The fire tube exits the cylinder through a draught diverter for connection to a flue system.

Fully Automatic Ignition (DR-SA)

Dorchester DR-SA models are equipped with a fully automatic ignition system. An electronic soft start gas valve and spark electrode ensures reliable burner operation. If the flame is not established within the safety period, the controller locks out and must be reset manually.

Permanent Pilot Ignition (DR-SE)

Dorchester DR-SE models are equipped with a permanent pilot ignition system with automatic gas valve and safety pilot which is monitored by means of a thermocouple device. A piezo spark device is fitted to provide ignition for the pilot flame.

Inspection and Clean Out Door

The Dorchester DR-S models have an easily accessible clean out door that allows for the inspection and cleaning of the tank's interior, as required by the recommendations of the HSC for the control of Legionellosis, including Legionnaires' disease, along with suitable tappings to facilitate an optional top-to-bottom recirculation kit.

Open Vented or Unvented Water Supplies

The water heaters are suitable for open vented water supplies but can also be used with unvented water supplies using an optional unvented supply kit.

Specification

Dorchester DR-SA & DR-SE

Unvented Supply Kit (Optional)

All Dorchester water heaters are suitable for installation in direct unvented water supply systems when installed with the optional unvented supply kit. The expansion vessel included in the kit is sized for the water heater and local pipe work only, and should be re-sized if used on larger systems.

The unvented supply kit allows the water heater to be fed directly from the mains water supply or from a booster pump set without the need for header tanks. The kit contains all of the additional parts required to satisfy the Water Supply (water fittings) Regulations 1999, including:

- Strainer
- Pressure reducing valve
- Isolating non-return valve
- Expansion relief valve
- Tundish
- 24 litre expansion vessel with wall bracket
- Pressure and temperature relief valve (which locates directly into the water heater).

Temperature Control

The outlet temperature of the heater is regulated by the control thermostat which is housed in the control panel. The operating temperature set point is adjustable from 40°C to 80°C (DR-SA) or 81°C (DR-SE). The high temperature limit setting is 90°C, at which point the unit will shut down and require manual reset.

Time Clock Control, DR-SE only (Optional)

Where there is a requirement for control by an external signal, such as from a time clock or safety interlocks, then an optional control kit can be fitted. The kit comprises a solenoid valve that fits between the control valve and the burner. The kit requires a 230V, 50Hz single phase power supply.

Corrosion Protection: Magnesium Sacrificial Anodes

DR-SE and DR-SA models are all fitted with removable magnesium sacrificial anodes as standard, ensuring excellent protection against corrosion. Clearance is required above the unit for maintenance and replacement of the magnesium sacrificial anodes.

Flexible Replacement Magnesium Sacrificial Anodes (Optional)

Flexible replacement magnesium anodes can be ordered as an option where clearance above the unit is restricted. The fixed anodes can be used from installation, and when in need of replacement, then the flexible anodes can be used. These sausage-shaped anodes comprise several small magnesium bars that are chain–linked together.

Electrical Anode Protection (Optional)

In areas of the country with particularly soft water supplies having electrical conductivity less than 200 microsiemens, such as Scotland, Devon and Cornwall, magnesium sacrificial anodes may not be fully effective in providing protection against internal corrosion. The optional electrical protection replaces the magnesium sacrificial anodes and is effective in providing internal corrosion protection with water supplies having electrical conductivity levels as low as 125 microsiemens.

It is essential for correct operation that an uninterrupted 24-hour power supply is maintained at all times to ensure proper protection of the unit. Electrical anode protection will be factory fitted where specified at the time of ordering.

Top-to-Bottom Pump Recirculation Kit (Optional)

In order to prevent stratification within the heater, thus creating a zone of lower temperature water that can possibly lead to the proliferation of Legionella bacteria, a top to bottom re-circulation kit should be specified. The top to bottom circulator should be controlled to run during the anti-Legionella purge cycle. Alternatively, by constantly returning water from the flow connection back into the base of the heater, a uniform temperature is maintained. The kit includes a pump, isolation valves, non-return valve and pipe work for fitting on site.

Combustion Products Discharge Safety Device

If a water heater is to be installed in a habitable area then it is a requirement of EN 89 that it be fitted with a device that detects the spillage of combustion products and shuts down the appliance. A habitable area includes kitchens, shower blocks, workshops or any other area that is occupied. A combustion products discharge safety device is fitted as standard on Dorchester DR-SA and DR-SE water heaters, and comprises a thermostat that is fitted to the rim of the draught diverter. In the event of flue gas spillage occurring due to down draught or lack of buoyancy in the flue system, the thermostat will shut down the heater.

Fuel Options

All Dorchester water heaters are suitable for both natural gas and LPG fuel. The fuel type must be specified at the time of ordering. 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 is ventilated at high and low level. The LPG variants of the Dorchester DR-SE and DR-SA must not be installed in basement plant rooms.

Flue System

The Dorchester DR-SA and DR-SE water heaters are suitable for B23 open flue applications. Although there are no dedicated flue terminals and flue components available for the Dorchester DR-SA and DR-SE water heater, we work in partnership with Midtherm Engineering to provide a comprehensive flue design and installation package for all of the Dorchester range of water heaters including the Dorchester DR-SA and DR-SE. Contact your Hamworthy Area Sales Manager about your bespoke flue requirements:

Tel 0845 450 2865

Email sales@hamworthy-heating.com

Technical Data

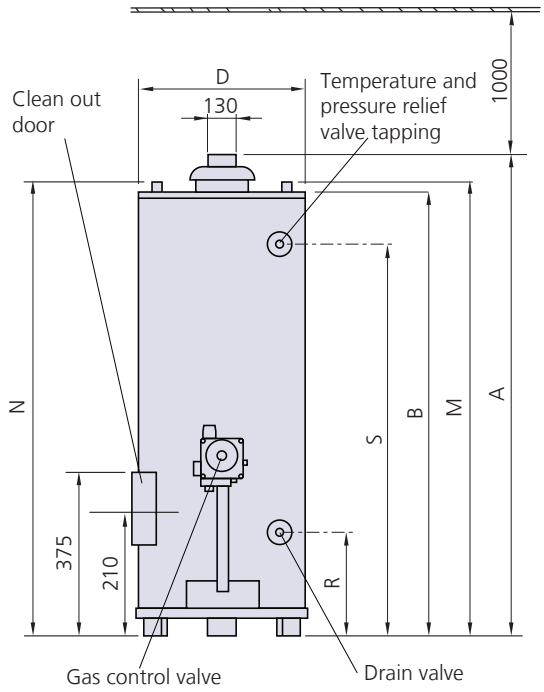
Dorchester DR-SA & DR-SE

		Specification	Units	Dorchester DR-SA/SE Model			
				DR-SA 16	DR-SE 16	DR-SA 19	DR-SE 19
Water		Continuous output with 44°C ΔT	l/h	369		392	
		Continuous output with 50°C ΔT	l/h	325		345	
		Continuous output with 55°C ΔT	l/h	295		314	
		Storage capacity	litres	278		372	
		Maximum operating water pressure (open vented)	bar	8			
		Maximum operating water pressure (unvented)	bar	3.5 (=cold feed pressure reducing valve preset in unvented kit option)			
		Expansion relief valve setting (open vented kit)	bar	5			
Energy		Building Regulations thermal efficiency gross	%	76.54			
		Heating-up time, ΔT = 44°C	min.	45		57	
		Heating-up time, ΔT = 50°C	min.	51		65	
		Heating-up time, ΔT = 55°C	min.	57		71	
		Standby losses	kW/24h	11.3		n/a	
Gas	Nat. Gas G20-20mbar	Input power, gross–maximum	kW	24.7		26.2	
		Output power–maximum	kW	18.9		20.1	
		Gas inlet pressure–nominal	mbar	20			
		Gas flow rate–maximum@1013.25 mbar and 15°C	m³/h	2.4		2.5	
	LPG G31-37mbar	Input power, gross/ (net)–maximum	kW	22.5		24.5	
		Output–maximum	kW	17.6		19.1	
		Gas inlet pressure–nominal	mbar	37			
		Gas flow rate–maximum@1013.25 mbar and 15°C	kg/h	1.6		1.8	
Flue		Approximate flue gas volume @15°C, 9.8% CO_2, N.T.P. (Nat. Gas-G20)	m³/h	30.4		31.7	
		Flue gas temperature–maximum	°C	275			
		Flue draught requirements	mbar	-0.125			
General		Power consumption-DR-SA (DR-SE)	W	30 (0*)			
		Electrical supply DR-SA (DR-SE)	V_{AC}	230 V 1 Ph 50 Hz (n/a*)			
		Weight when empty	kg	117	122	144	149
		Approximate shipping weight	kg	122	127	149	154
		Maximum floor load/ weight filled with water	kg	395	400	516	521

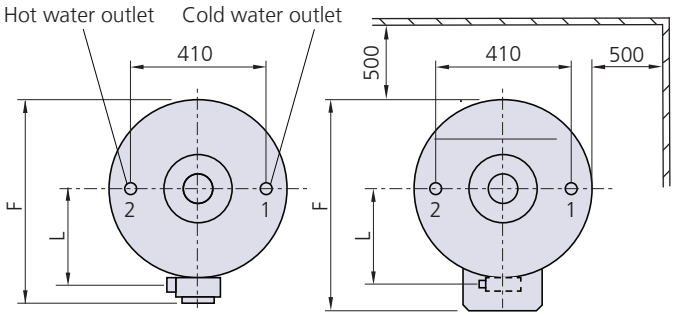
**Note: The basic DR-SE requires no power supply; 230 V supply only required if any electrical options are to be used.*

Dimensional Details

Dorchester DR-SA & DR-SE Dimensions and Clearances

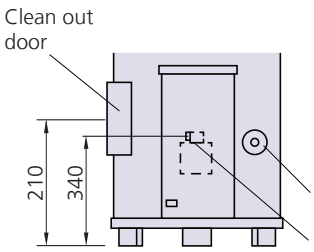


Front View DR-SE



Plan View DR-SA

Plan View DR-SE



Part-Front View DR-SA

Clearances:
Allow minimum 1000 mm above water heater, 1000 mm around the controls and clean out doors and 500 mm around all other sides.

All dimensions in mm

Ref	Dimensions	Units	Dorchester DR-SA/SE Model			
			DR-SA 16	DR-SE 16	DR-SA 19	DR-SE 19
A	Total height	mm	1585		1780	
B	Cylinder height	mm	1450		1640	
D	Water heater diameter	mm	645		675	
F	Depth	mm	770	735	775	765
L	Gas control valve position	mm	355		370	
M	Cold water inlet connection height/(size)	mm/(inch)	1505 (1□-11.5 NPT male)		1685 (1¼□-11.5 NPT male)	
N	Hot water outlet connection height/(size)	mm/(inch)	1505 (1□-11.5 NPT male)		1685 (1¼□-11.5 NPT male)	
R	Drain valve connection height/(size)	mm/(inch)	285 (¾□ -14 NPT female)			
S	T & P valve connection height/(size).	mm/(inch)	1280 (¾□ -14 NPT female)		1460 (¾□ -14 NPT female)	
	Gas inlet connection size	inch	Rp ½□ female			

Air Supply and Ventilation

An adequate supply of fresh air for combustion and ventilation must be provided in accordance with BS5440 (<70 kW Net) and BS6644 (>70 kW Net). Air supply and ventilation must be sized for the entire plant, with calculations based on the combined net heat input of all gas fired appliances within the plant room or compartment.

Compartment Ventilation – Open Flue	Plant Room Ventilation – Open Flue
Direct to outside air	Direct to outside air
High level–5 cm^2/kW net input	High level–2 cm^2/kW net input
Low level–10 cm^2/kW net input	Low level–4 cm^2/kW net input

Your local contact is:

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

Hamworthy Heating Limited
Wessex House,
New Fields Business Park,
Stinsford Road,
Poole, Dorset BH17 0NF

Tel: **01202 662500**
Email: sales@hamworthy-heating.com
www.hamworthy-heating.com

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