

PLUS NEW
CONDENSING RANGE

Hamworthy Water Heaters



Hot Water Systems

Guide to Direct Fired
Water Heaters from
Hamworthy



Heating *at work.*

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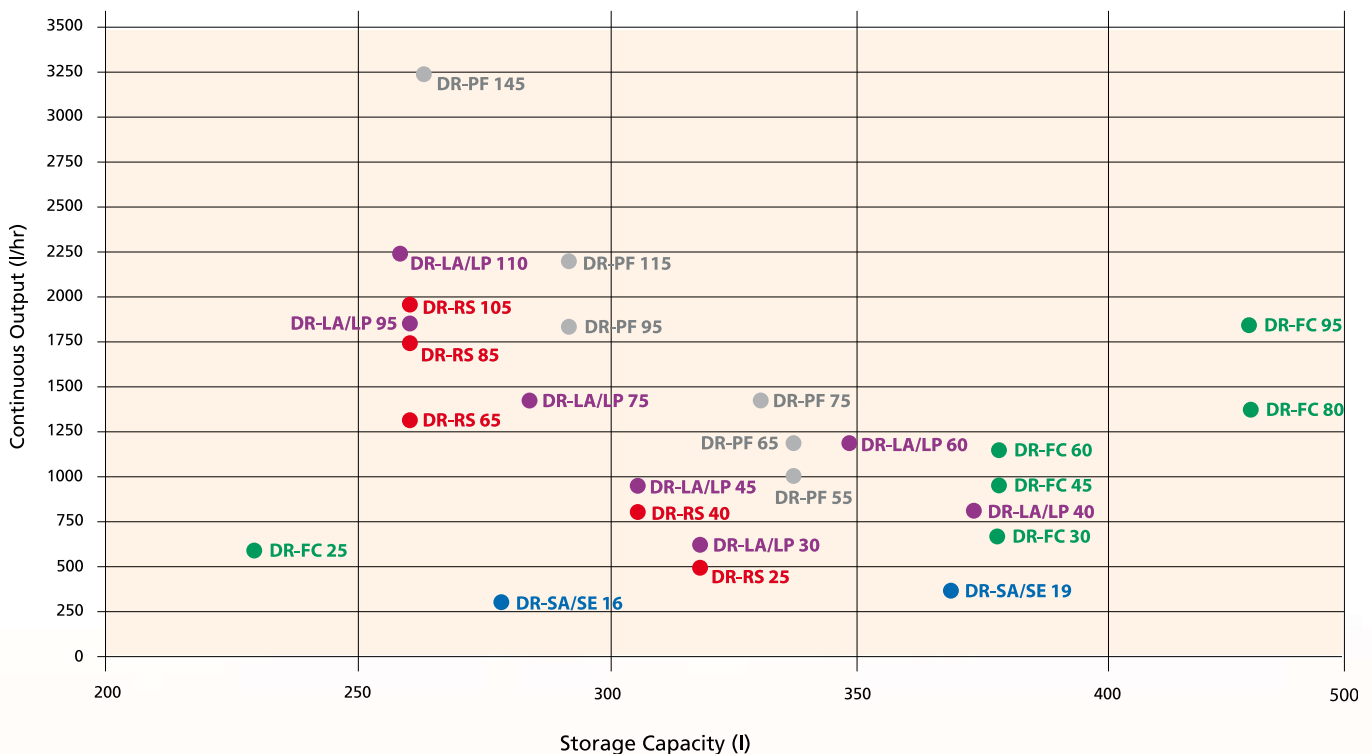
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Dorchester Range of Direct Fired Water Heaters

Specification

Dorchester Direct Fired Water Heaters

The Dorchester 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 Directives for CE marking, and all models are Water Regulations Advisory Scheme (WRAS) approved.

Construction

The water heater cylinders are constructed from high grade steel and coated with a high quality vitreous enamel lining. The fabrication of the cylinder and welding is completed fully before the glass lining is applied, ensuring that the integrity of the lining is not affected during manufacture. On completion of the fabrication, the cylinder undergoes a precise glass coating process where the unit is rotated in every direction to ensure an even coating is applied throughout. Surplus material is drained before the unit is baked at 840°C to complete the adhesion of the lining to all internal surfaces of the cylinder, providing a long lasting finish.

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

Heat Exchanger

Multiple vertical fire tubes are arranged through the centre of the cylinder in the DR-RS, DR-L and DR-PF ranges. Each fire tube is fitted with a steel baffle in order to maximise heat transfer. The DR-S range of water heaters use a single vertical fire tube in the centre of the cylinder.

Designed for Safety

The HSC approved code of practice and guidance document L8 makes it clear that, if the risk of Legionella is to be minimised, then the departments recommendations must be observed in so far as they relate to hot & cold water systems.

Dorchester water heaters conform to these requirements as follows:

- Good access for cleaning
- Generous flow and return connections
- Adequately sized drain
- Base designed to avoid sludge traps
- Anodes to reduce metal corrosion
- Number of tappings correctly positioned to facilitate recirculation, destratification and to obviate stagnation areas
- Designed to meet unvented supply requirements

Anode Protection

All cylinders are fitted with removable magnesium sacrificial anodes ensuring excellent protection against corrosion. For areas of the country that have particularly soft water, which has conductivity of less than 200 micro-seimens, magnesium anodes may not be fully effective in providing protection against corrosion. The optional electrical anode protection system replaces the magnesium anodes and is effective in providing protection in any water conditions. A further benefit of this system is that it can remove the need for the full clearance required for maintenance above the heater, dependent on the model. It is essential that if the electrical anode protection system is fitted to a heater, then an uninterrupted 24-hour power supply must be maintained to ensure proper protection of the unit.

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 all units with draught diverters, and comprises a thermostat that is fitted to the rim of the diverter. In the event of spillage of combustion products occurring, the thermostat will shut down the heater.

Frost Protection System

On DR-FC, DR-RS and DR-LA models, when the on/off switch on the control panel is in the off position, the frost protection system will initiate firing of the burner when the stored water temperature falls below 5°C. This provides protection against freezing in the cylinder.

LPG Fuels

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.

Controlling Legionella

All Dorchester models are designed to meet the Health & Safety Commission (HSC) requirements for safe production of hot water, and in particular the control of Legionellosis.

Legionella bacteria are common in natural water sources and therefore low concentrations may be present in many water systems. It is important that hot water services are designed and operated in such a way that these organisms are prevented from multiplying.

Water temperature is a significant factor in controlling the risk, with optimum conditions for bacterial growth occurring between 20°C and 45°C. Regular cleaning of the system will help to avoid the build up of sediments, which may harbour or provide nutrients for the bacteria. Water stagnation may encourage the growth of biofilm, which can provide local conditions that may promote the proliferation of Legionella bacteria.

Options

The Dorchester range of direct fired water heaters offers a wide choice in models, and to supplement that choice, each range has a number of specific options available. Please refer to range pages to check availability.

Fuel

All models in the Dorchester range are suitable for firing natural gas (G20), LPG propane or butane*. On the DR-PF range, oil (35 Sec Redwood No.1) is an alternative option. Fuel type must be specified at the time of ordering.

*Butane not available on DR-RS 105.



Unvented Supply Kit

All Dorchester water heaters are suitable for installation in direct unvented systems. The expansion vessel is sized for the water heater and local pipework 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 the essential components to comply with the Water Supply (water fittings) Regulations 1999, including a suitably sized pressure and temperature relief valve, which locates directly into the water heater.



Flexible Magnesium Sacrificial Anodes

All cylinders are fitted with removable magnesium sacrificial anodes ensuring excellent protection against corrosion. In plant rooms with insufficient headroom clearance for fixed anodes, flexible magnesium sacrificial anodes may be specified as a replacement option. The fixed anodes can be used from installation, and when in need of replacement then the flexible anodes can be used.

Electrical Anode Protection

In areas of the country that have particularly soft water, which has conductivity of less than 200 micro-siemens per cm, such as Scotland, Devon and Cornwall, magnesium sacrificial anodes may not be fully effective in providing protection against corrosion. The optional electrical anode protection system is effective in providing protection in any water conditions. It is essential that if the electrical anode protection system is fitted to a heater, then an uninterrupted 24-hour power supply must be maintained to ensure proper protection of the unit.

Close Temperature Control Kit



For applications requiring above average temperature control, an optional electronic thermostat kit can be fitted. This will provide close control of the flow temperature within $\pm 2.5^{\circ}\text{C}$, dependant on the operating conditions.

Top to Bottom Recirculation Kit



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, an optional top to bottom re-circulation kit should be specified. By constantly returning water from the flow back into the base of the heater, a uniform temperature is maintained. The kit includes a pump, isolation valves, non return valve and pipework for fitting on site.

General Information

Time Clock Control (DR-SE only)



Where there is a requirement for the heater to be controlled by an external signal, such as 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. This kit will require a 230 volt, 50Hz single phase power supply.

Delivery

Dorchester water heaters are delivered factory assembled and mounted within frames, shrink-wrapped and on a timber pallet base. DR-FC and DR-RS models are equipped with a steel pallet base which is fitted permanently to the unit.

Draught diverters on DR-LA and DR-LP models are supplied packaged separately for fitting on site. All Hamworthy products are delivered to site on a tail-lift vehicle, and deliveries are closely co-ordinated with the customer, to suit the site construction programme. Standard delivery is to ground level from the tail-lift vehicle. To enquire about special delivery services, please contact our customer services team.

Commissioning

Hamworthy Heating Ltd strongly recommend that all water heaters are commissioned by their service department, who will issue an appliance log-book that details the initial operating settings, and which can be used to record all future maintenance work.

For more information on commissioning contact Hamworthy Heating Service Department.
Telephone **0845 450 2866** or email **service@hamworthy-heating.com**

Maintenance

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 level of calcium deposition and rate of anode decay are established a suitable maintenance schedule can be implemented, however as a minimum all water heaters should be serviced annually.

Water Treatment

Due to the variable chemical composition of distributed water supplies it is necessary to identify the properties of the cold water feed to the water heater.

In common with all types of water heating equipment, scale will develop during normal use and it is therefore essential that the appropriate steps are taken to ensure reliable and continuous operation of the plant. Contact should be made with the local water provider to determine the quality of the feed water and reference should be made to water treatment specialists for appropriate advice.

Installation

The installation of all heaters MUST be in accordance with the relevant requirements of Gas Safety Regulations, I.E.E. Regulations and the bye-laws of the local water undertaking. It should also be in accordance with any relevant requirements of the local gas region, local authority and relevant recommendations of the following documents:

British Standards

- BS 6891:** Installation of low pressure gas pipework of up to 28mm in domestic premises.
- BS 6644:** Installation of gas fired hot water boilers - 60 kW to 2 MW.
- BS 6700:** Design, installation, testing and maintenance of services supplying water for domestic use.
- BS 6880:** Part 1, 2 & 3: Code of practice for low temperature hot water heating systems of output greater than 45 kW.
- CP 342:** Centralised hot water supply. Part 2: Buildings other than individual dwellings.

I. Gas. E. Publications

- IGE/UP/1** Soundness testing and purging of industrial and commercial gas installations.
- IGE/UP/1A** Soundness testing and direct purging of small low pressure industrial and commercial natural gas installations.
- IGE/UP/2** Gas installation pipework, boosters and compressors in industrial and commercial premises.
- IGE/UP/10** Installation of gas appliances in industrial and commercial premises.

Dorchester DR-FC Range

Condensing, Room Sealed Direct Gas Fired Water Heaters



The control functionality on the Dorchester DR-FC is comprehensive with electronic temperature control to manage accurate flow and storage temperatures. Temperature sensors are fitted towards the top and bottom of the unit to monitor temperatures in the unit and control heating closely for optimum performance. Programming the settings is achieved via the neat easy to use control panel and features instant override for convenience, which resets automatically at the end of the next programmed period. The backlit display can show operating history, service diagnostics and alert to service due based on operating hours.

The control incorporates a useful safety function which can be set to perform a weekly anti-legionella purge cycle, running for a period at a higher temperature to prevent the risk of legionella bacteria forming in the vessel. This can be set to run automatically during periods when hot water will not be used, to minimise the risk of scalding.

The water heaters are suitable for open vented or unvented systems using an optional unvented supply kit, and are complete with a frost protection thermostat supplied as standard. For further details of flue systems for the Dorchester DR-FC, please refer to pages 20 and 23.

The Dorchester DR-FC range of condensing water heaters from Hamworthy provide a high efficiency solution for provision of hot water, and because of the versatile flue capability, can be sited almost anywhere in the building.

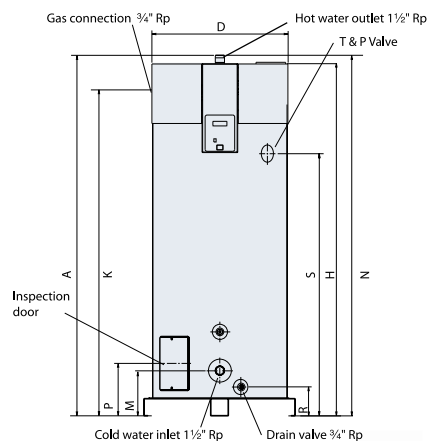
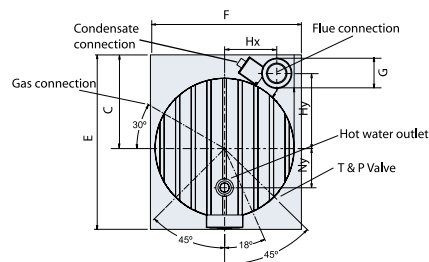
Designed to operate as open flue or room sealed, the Dorchester DR-FC is particularly suited to installations where the heater needs to be located closer to point of use. Twin duct flue systems can extend to a massive 115m overall length, whilst concentric flues can run up to an impressive 40m in length.

The DR-FC range consists of 6 models with continuous outputs from 585 to 1836 litres/hour, based on a 44°C temperature rise. Storage capacities range from 227 to 483 litres. Two or more water heaters can be installed where there is demand for larger loads.

Fitted with a down firing forced draught burner, the hot gases are directed down into the spiralling coil, maintaining contact with the heat exchanger surface to effect maximum heat transfer. This design of the heat exchanger eliminates problems with scale as any build-up will fall away to the base of the unit and not affect heat transfer or create hot spots.

Options

- Natural gas or LPG
- Unvented supply kit
- Horizontal or vertical flue terminal kit
- Top to bottom pump recirculation kit
- Electrical anode protection (optional on models DR-FC25 to 60)



Clearances: The DR-FC heaters can be positioned very close to a wall or adjacent units, but access must be given to the flue area for checking the condensate trap, and to the inspection door for internal cleaning. The anodes and burner components are on top of the unit, where clearance must be provided for servicing. Flexible replacement anodes are available where headroom is restricted.

Model		DR-FC 25	DR-FC 30	DR-FC 45	DR-FC 60	DR-FC 80	DR-FC 95
Continuous output with 44°C Δt (80°F) l/h		585	626	936	1142	1570	1911
	UK gal/h	129	138	206	251	345	420
Storage capacity	litres	227	386	386	386	483	483
	UK gal	50	85	85	85	106	106
Time to recover storage 44°C Δt (80°F) mins		21	27	23	18	19	15
Heater output	kW	29.8	32.0	47.9	58.6	80.3	97.8
Maximum water pressure (open vented)	bar	8					
	Psig	116					
Gas input rate natural gas (G20)	m ³ /h	3.1	3.3	5.0	6.0	8.3	10.1
	ft ³ /h	109.5	116.5	176.6	211.9	293.1	356.7
Propane input gas rate at 37m bar (14.85 In wg) standard inlet pressure	m ³ /h	1.2	1.3	2.0	2.5	3.4	4.2
	ft ³ /h	42.3	45.9	70.6	88.3	120.0	148.3
Water flow and inlet connection	in	1 1/2" Rc					
Gas connections	in	3/4" Rc					
Drain connection (hose connection)	in	3/4" Rc					
T & P valve connection	in	3/4" Rp	1" NPT	1" NPT	1" NPT	1" NPT	1" NPT
Electrical supply		230V 50Hz 1Ph					

Dimensions in mm		DR-FC 25	DR-FC 30	DR-FC 45	DR-FC 60	DR-FC 80	DR-FC 95
Overall Height	A	1470	2000	2000	2000	2100	2100
Heater centre line to pallet edge	C	492	492	492	492	530	530
Cylinder diameter	D	705	705	705	705	845	845
Pallet depth	E	925	925	925	925	1000	1000
Pallet width	F	755	755	755	755	900	900
Concentric flue diameter	G	80/125	100 /150	100 /150	100 /150	130 /200	130 /200
Flue height	H	1465	2005	2005	2005	2105	2105
Gas connection	K	1370	1910	1910	1910	1845	1845
Cold water inlet	M	260	260	260	260	225	225
Hot water outlet	N	1505	2020	2020	2020	2050	2050
Inspection door	P	300	300	300	300	290	290
Drain	R	175	175	175	175	225	225
T&P valve	S	990	1515	1515	1515	1415	1415
Condensate height	W	210	210	210	210	260	260
Flue position	Hx	265	265	265	265	310	310
Flue position	Hy	375	375	375	375	440	440
Flow position	Ny	205	205	205	205	205	205

Standard Features

- Condensing high efficiency performance
- Room sealed or open flue
- Fully automatic ignition
- Control thermostat range 40°C - 80°C
- Magnesium sacrificial anodes (standard on models DR-FC 25 to 60)
- Powered fault output for remote alarm indication
- 7 day time clock, up to 3 operating periods per day
- Frost protection thermostat
- Electrical anode protection (standard on models DR-FC 80 & 95)

Flue Options
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Dorchester DR-RS Range

Room Sealed, Fully Automatic Direct Gas Fired Water Heaters



The Dorchester DR-RS range is designed to operate as a room sealed system, making it particularly suited to applications where a conventional flue is impractical, or where the heater is to be located closer to point of use. Units are available with either vertical or horizontal flue arrangements using twin duct or concentric flue systems.

The DR-RS range consists of 5 models with continuous outputs from 517 to 1965 litres/hour, based on a 44°C temperature rise. Storage capacities range from 265 to 324 litres. Two or more water heaters can be installed where there is demand for larger loads.

Options

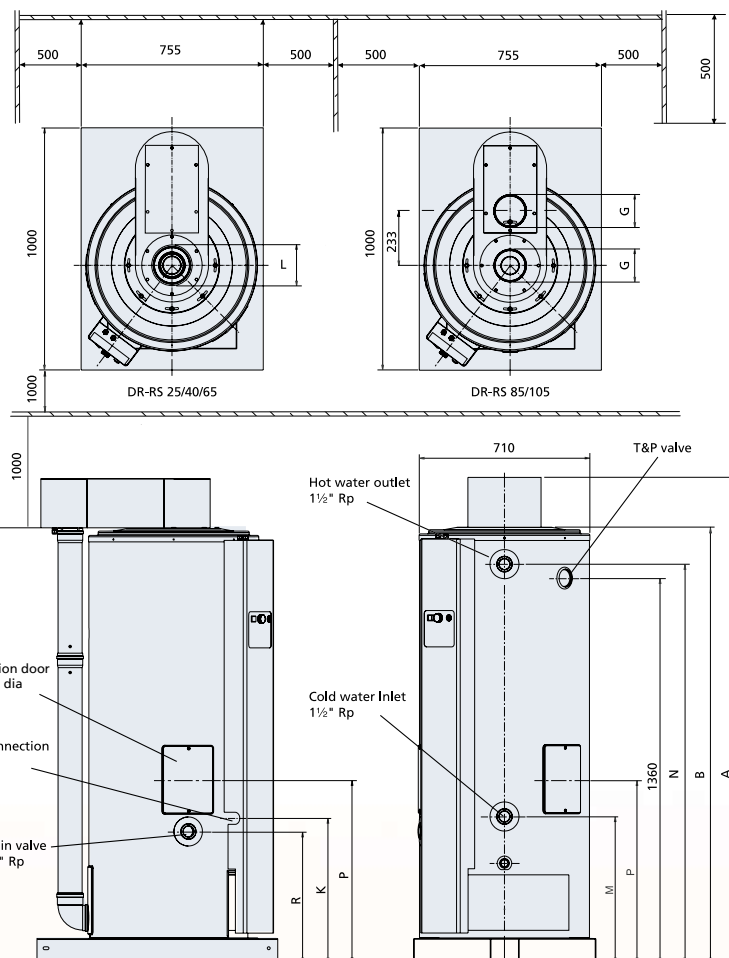
- Natural gas or LPG
- Unvented supply kit
- Electrical anode protection
- Close temperature control kit
- Top to bottom recirculation kit
- Flexible magnesium sacrificial anodes
- Horizontal or vertical flue terminal kit

The DR-RS is fitted with an atmospheric burner with fully automatic ignition, and is suitable for firing natural gas or LPG. Volt free contacts are fitted as standard, and are compatible with building management systems (BMS) for monitoring the operation and status of the unit.

At less than 60 dBA, the Dorchester DR-RS is quiet in operation and enables the unit to be installed close to point of use in a wide variety of locations. With a pallet based design, handling of the unit is made easier and this also reduces the risk of damage to the tank during transit and installation.

The DR-RS range is designed to meet the latest HSC requirements for the control of Legionellosis. Two large inspection doors provide access for servicing and suitable tappings are included to facilitate top to bottom recirculation.

The water heaters are suitable for open vented or unvented systems using an optional unvented supply kit, and are complete with a frost protection thermostat supplied as standard. In plant rooms with insufficient headroom clearance for fixed anodes, flexible magnesium sacrificial anodes may be specified as an option. For further details on room sealed flue systems, please refer to pages 20 & 21.



Model		DR-RS 25	DR-RS 40	DR-RS 65	DR-RS 85	DR-RS 105
Continuous output with 44°C Δt (80°F)	l/h	517	812	1295	1750	1965
	UK gal/h	114	179	285	385	432
Storage capacity	litres	324	312	265	265	265
	UK gal	71	69	58	58	58
Time to recover storage 44°C Δt (80°F)	mins	35	25	12	9	8
Heater output	kW	26.4	41.5	66.2	89.4	100.4
Maximum water pressure (open vented)	bar	8	8	8	8	8
	Psig	116	116	116	116	116
Gas input rate natural gas (G20)	m ³ /h	3.1	5.0	7.9	10.8	12.2
	ft ³ /h	109.5	176.6	278.9	381.4	430.8
Propane input gas rate at 37m bar (14.85 In wg) standard inlet pressure	m ³ /h	1.2	2.0	3.2	4.4	4.9
	ft ³ /h	42.3	70.6	112.4	153.7	173.6
Water outlet and inlet connection	in	1 1/2" Rp				
Gas connections	in	3/4" Rp				1" RP
Drain connection (hose connection) & Recirculation connection	in	1 1/2" Rp				
T & P valve connection	in	1"		1 1/2"		
Electrical supply		230V 50Hz 1Ph				

Dimensions in mm		DR-RS 25	DR-RS 40	DR-RS 65	DR-RS 85	DR-RS 105
Overall Height	A	1995	1995	2020	2020	2020
Cylinder height	B	1795	1795	1820	1820	1820
Twin duct air/flue	G	N/A			2 x 130	2 x 130
Concentric air flue	L	80/125	100/150	130/200	N/A	
Gas connection	K	600				750
Cold water inlet	M	600		590		
Hot water outlet	N	1640		1655		
Inspection door	P	630		625		
Drain	R	520		525		

Standard Features

- Room sealed
- Fully automatic ignition
- Control thermostat range 40°C to 70°C
- Multi-tube heat exchanger
- Magnesium sacrificial anodes
- Volt free contacts - for lockout & normal run
- Two inspection doors
- Frost protection thermostat

Flue Options
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Dorchester DR-LA Range

Fully Automatic, Multi-tube Direct Gas Fired Water Heaters



There are 7 models in the DR-LA range with continuous outputs from 621 to 2105 litres/hour, based on a 44°C temperature rise. Storage capacities range from 264 to 374 litres. Two or more water heaters can be installed in a modular configuration where there is demand for larger loads.

The DR-LA is fitted with an atmospheric burner with fully automatic controls utilising hot surface ignition. The water heaters are suitable for firing natural gas or LPG, and have volt free contacts fitted as standard. The pre-wired control panel includes on/off switch, control thermostat, power indicator, lockout indicator and reset button.

Options

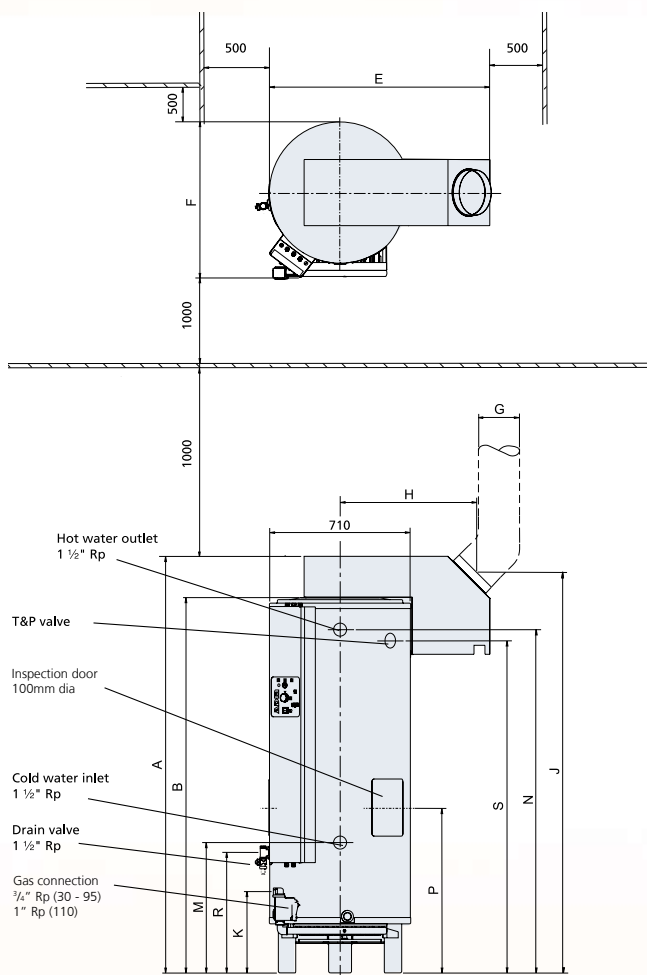
- Natural gas or LPG
- Unvented supply kit
- Electrical anode protection
- Close temperature control kit
- Top to bottom recirculation kit
- Flexible magnesium sacrificial anodes
- Draught diverter with horizontal take off

Two large inspection doors provide access for servicing and maintenance, and the DR-LA range is designed to meet the latest HSC requirements for the control of Legionellosis. Connections are provided to facilitate top to bottom recirculation which ensures an even temperature is maintained throughout the vessel, preventing stratification.

A fully electronic soft start gas valve and hot surface ignition ensures reliable burner operation and minimal electro magnetic interference. The water heaters are suitable for open vented or unvented systems using an optional unvented supply kit, and are complete with a frost protection thermostat supplied as standard.

In plant rooms with insufficient headroom clearance for fixed anodes, flexible magnesium sacrificial anodes may be specified as an option.

All models are available with an optional draught diverter to provide a horizontal flue take-off. This must be specified at the time of ordering.



Model		DR-LA 30	DR-LA 40	DR-LA 45	DR-LA 60	DR-LA 75	DR-LA 95	DR-LA 110
Continuous output with 44°C Δt (80°F)	l/h	621	822	965	1199	1427	1838	2105
	UK gal/h	137	181	212	264	314	405	463
Storage capacity	litres	324	374	312	351	291	265	264
	UK gal	71	82	69	77	64	58	58
Time to recover storage 44°C Δt (80°F)	mins	32	28	20	16	13	9	7
Heater output	kW	31.7	42.0	49.3	61.2	72.9	93.9	107.5
Maximum water pressure (open vented)	bar	8						
	Psig	116						
Gas input rate natural gas (G20)	m ³ /h	4.0	5.4	6.3	7.8	9.4	12.1	13.7
	ft ³ /h	142.0	190.0	223.5	275.4	330.9	425.9	483.8
Propane input gas rate at 37m bar (14.85 l/wg) standard inlet pressure	m ³ /h	1.6	2.2	2.5	3.1	3.8	4.9	5.5
	ft ³ /h	57.2	76.6	90.1	110.9	133.4	171.6	195.0
Water flow and inlet connection	in	1 1/2" Rp						
Gas connections	in	3/4" Rp						1" Rp
Drain connection (hose connection) & Recirculation connection	in	1 1/2" Rp						
T&P Valve Connection	in	1"					1 1/2"	
Draught diverter spigot ID	mm	150	150	180	180	225	225	225
	in	6	6	7	7	9	9	9
Electrical supply		230V 50Hz 1Ph						

Dimensions in mm		DR-LA 30	DR-LA 40	DR-LA 45	DR-LA 60	DR-LA 75	DR-LA 95	DR-LA 110
Overall height	A	1900	2100	1900	2040	2000	2025	2085
Cylinder height	B	1760	1960	1760	1900	1795	1810	1870
Width including draught diverter	E	1100				1105		
Width including control column	F	800						
Flue spigot diameter	G	150		180		225		
Flue spigot centre line	H	640				675		
Flue spigot centre line	J	1840	2040	1840	1980	1935	1950	2010
Gas connection	K	400			340	400	340	205
Cold water inlet	M	565			505	575	590	650
Hot water outlet	N	1605	1810	1605	1750	1640	1655	1715
Inspection door	P	730			670	740	765	855
Drain	R	500	515	500	455	525	540	595
T & P Valve	S	1550	1760	1550	1700	1595	1600	1660

Standard Features

- Fully automatic ignition
- Multi tube heat exchanger
- Control thermostat range 40°C to 70°C
- Magnesium sacrificial anodes
- Volt free contacts - for lockout and normal run
- Two inspection doors
- Combustion products discharge safety device
- Draught diverter with 45 degree take-off
- Frost protection thermostat

Dorchester DR-LP Range

Permanent Pilot, Multi-tube Direct Gas Fired Water Heaters



The Dorchester DR-LP range is the permanent pilot version, based on the DR-LA, and consists of 6 models with continuous outputs ranging from 621 - 1838 litres/hour, based on a 44°C temperature rise. Storage capacities range from 265 to 374 litres. Two or more water heaters can be installed in a modular configuration where there is demand for larger loads.

Options

- Natural gas or LPG
- Unvented supply kit
- Electrical anode protection
- Top to bottom recirculation kit
- Flexible magnesium sacrificial anodes
- Draught diverter with horizontal take-off

The DR-LP is fitted with an atmospheric burner with permanent pilot ignition. The water heaters are suitable for firing natural gas or LPG.

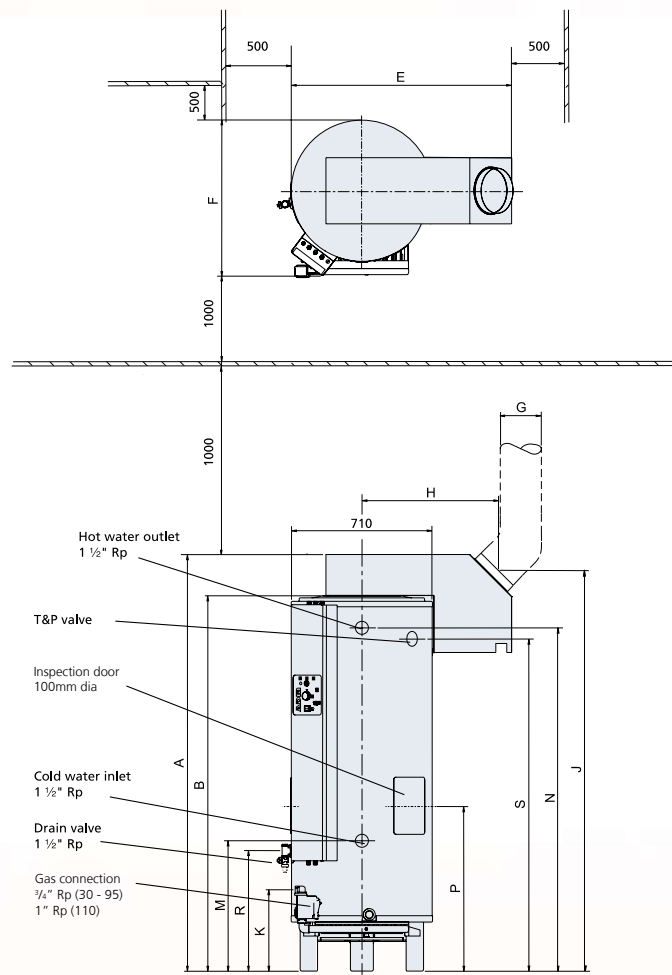
All Dorchester water heaters are constructed with high-grade carbon steel and utilise a vitreous enamel lining. Additional tank protection is provided by magnesium sacrificial anodes. In plant rooms with insufficient headroom clearance for fixed anodes, flexible magnesium sacrificial anodes may be specified as an option. The cylinder is covered with a 50mm layer of CFC free foam insulation to ensure that standing losses are kept to a minimum.

The DR-LP is suitable for open vented or unvented systems using an optional unvented supply kit.

The DR-LP range is designed to meet the latest HSC requirements for the control of Legionellosis. Two large inspection doors provide access for servicing and suitable tapings are included to facilitate top to bottom recirculation.

Where optional electrical anode protection is fitted, a permanent 230 volt 50Hz single phase power supply will be required, to ensure the water heater has 24 hour protection.

All models are available with an optional draught diverter to provide a horizontal flue take-off. This must be specified at the time of ordering.



Model		DR-LP 30	DR-LP 40	DR-LP 45	DR-LP 60	DR-LP 75	DR-LP 95
Continuous output with 44°C Δt (80°F)	l/h	621	822	965	1199	1427	1838
	UK gal/h	137	181	212	264	314	405
Storage capacity	litres	324	374	312	351	291	265
	UK gal	71	82	69	77	64	58
Time to recover storage 44°C Δt (80°F)	mins	32	28	20	16	13	9
Heater output	kW	31.7	42.0	49.3	61.2	72.9	93.9
Maximum water pressure (open vented)	bar	8					
	Psig	116					
Gas input rate natural gas (G20)	m ³ /h	4.0	5.4	6.3	7.8	9.4	12.1
	ft ³ /h	142.0	190.0	223.5	275.4	330.9	425.9
Propane input gas rate at 37m bar (14.85 l/wg) standard inlet pressure	m ³ /h	1.6	2.2	2.5	3.1	3.8	4.9
	ft ³ /h	57.2	76.6	90.1	110.9	133.4	171.6
Water flow and inlet connection	in	1 1/2" Rp					
Gas connections	in	3/4" Rp					
Drain connection (hose connection) & Recirculation Connection	in	3/4" NPT					
T&P Valve Connection	in	1"				1 1/2"	
Draught diverter spigot ID	mm	150	150	180	180	225	225
	in	6	6	7	7	9	9
Electrical supply		230V 50Hz 1Ph					

Dimensions in mm		DR-LP 30	DR-LP 40	DR-LP 45	DR-LP 60	DR-LP 75	DR-LP 95
Overall height	A	1900	2100	1900	2040	2025	2085
Cylinder height	B	1760	1960	1760	1900	1795	1810
Width including draught diverter	E	1100				1105	
Width including control column	F	800					
Flue spigot diameter	G	150		180		225	
Flue spigot centre line	H	640				675	
Flue spigot centre line	J	1840	2040	1840	2040	1935	2010
Gas connection	K	205			145	205	145
Cold water inlet	M	565			505	575	590
Hot water outlet	N	1605	1810	1605	1750	1640	1655
Inspection door	P	730			670	740	765
Drain	R	500	515	500	455	525	540
T&P valve	S	1550	1760	1550	1700	1595	1600

Standard Features

- Permanent pilot ignition
- Multi tube heat exchanger
- Control thermostat range 40°C to 70°C
- Magnesium sacrificial anodes
- Two inspection doors
- Combustion products discharge safety device
- Draught diverter with 45 degree take-off

Dorchester DR-SA Range

Fully Automatic, Single-tube Direct Gas Fired Water Heaters



The DR-SA range consists of two models with continuous outputs of 309 litres/hour and 352 litres/hour, based on a 44°C temperature rise. Storage capacities are 278 litres and 372 litres respectively. Two or more water heaters can be installed in a modular configuration where there is demand for larger loads.

The DR-SA is fitted with an atmospheric burner with fully automatic ignition suitable for firing natural gas or LPG. The water heaters incorporate a fully electronic gas valve, spark ignition system, control and high limit thermostats, safety thermostat, a 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.

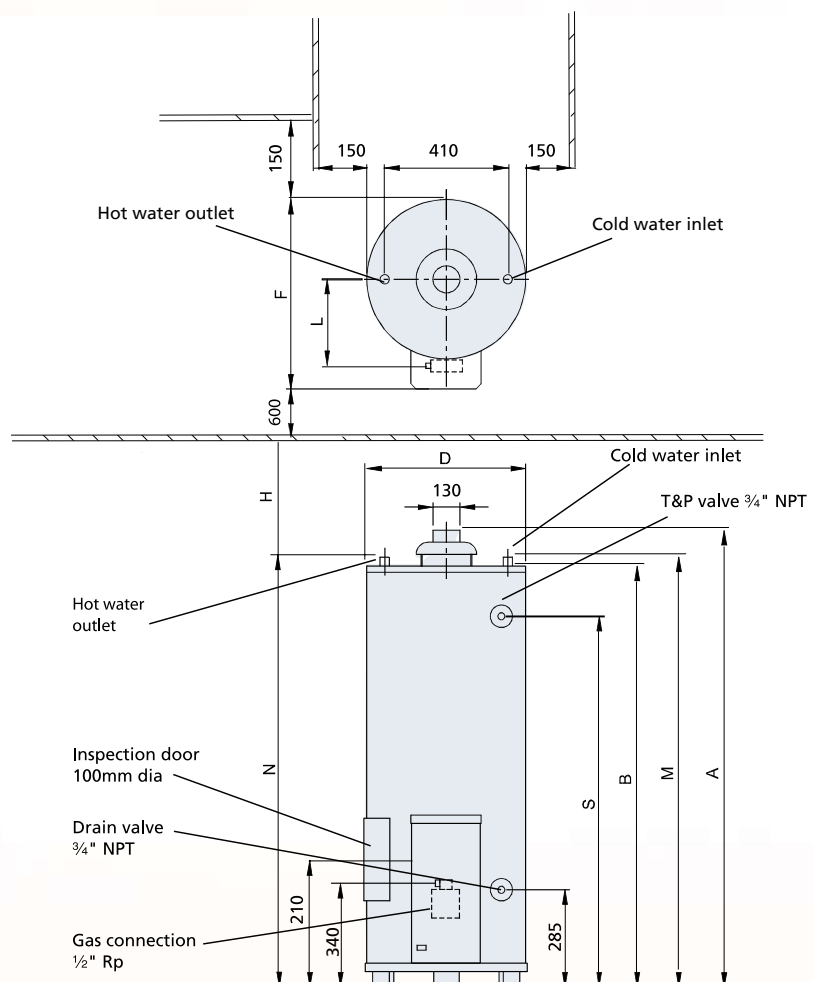
Options

- Natural gas or LPG
- Unvented supply kit
- Electrical anode protection
- Top to bottom recirculation kit
- Flexible magnesium sacrificial anode

The DR-SA range is designed to meet the latest HSC requirements for the control of Legionellosis. A large inspection door provides access for servicing and suitable tappings are included to facilitate top to bottom recirculation.

Suitable for open vented or unvented systems, the DR-SA range has an optional unvented supply kit which contains all the additional parts required to satisfy the Water Supply (water fittings) Regulations 1999.

All Dorchester water heaters are constructed with high grade carbon steel and utilise a vitreous enamel lining. Additional tank protection is provided by a magnesium sacrificial anode. In plant rooms with insufficient headroom clearance for fixed anodes, flexible magnesium sacrificial anodes may be specified as an option.



Model		DR-SA 16	DR-SA 19
Continuous output with 44°C Δt (80°F)	l/h	370	393
	UK gal/h	81	86
Storage capacity	litres	278	372
	UK gal	61	82
Time to recover storage 44°C Δt (80°F)	mins	55	60
Heater output	kW	18.9	20.1
Maximum water pressure (open vented)	bar	8	
	Psig	116	
Gas input rate natural gas (G20)	m ³ /h	2.4	2.5
	ft ³ /h	84.7	88.3
Propane input gas rate at 37m bar (14.85 In wg) standard inlet pressure	m ³ /h	1.0	1.1
	ft ³ /h	35.3	38.8
Water flow and inlet connection	in	1" NPT	1 1/4" NPT
Gas connections	in	1/2" Rp	
Drain connection (hose connection) & Recirculation connection	in	3/4" NPT	
Draught diverter spigot ID	mm	130	
	in	5	
Electrical supply		230V 50Hz 1Ph	

Dimensions in mm		DR-SA 16	DR-SA 19
Overall height	A	1585	1780
Cylinder height	B	1450	1640
Cylinder diameter	D	645	675
Width including control housing	F	770	775
Gas connection	L	355	370
Cold water inlet	M	1505	1685
Hot water outlet	N	1505	1685
T&P valve	S	1280	1460
Anode clearance	H	1000	1300

Standard Features

- Fully automatic ignition
- Single tube heat exchanger
- Control thermostat range 40°C to 80°C
- Magnesium sacrificial anodes
- Inspection door
- Combustion products discharge safety device
- Draught diverter

Dorchester DR-SE Range

Permanent Pilot, Single-tube Direct Gas Fired Water Heaters



The Dorchester DR-SE range is the permanent pilot version, based on the DR-SA, and consists of two models with continuous outputs of 309 litres/hour and 352 litres/hour, based on a 44°C temperature rise. Storage capacities are 278 litres and 372 litres respectively. Two or more water heaters can be installed in a modular configuration where there is demand for larger loads.

The DR-SE is fitted with an atmospheric burner with permanent pilot ignition suitable for firing natural gas or LPG. DR-SE water heaters do not require a power supply when supplied as a basic unit, however, a power supply will be required for electrical anode protection, recirculation kit and time clock control options.

Options

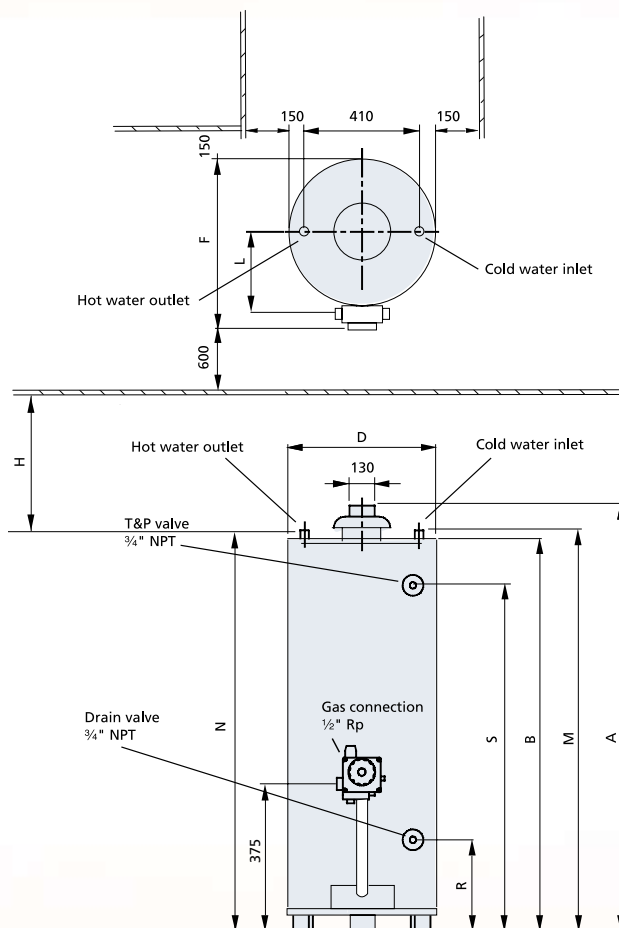
- Natural gas or LPG
- Time clock control kit
- Unvented supply kit
- Electrical anode protection
- Top to bottom recirculation kit
- Flexible magnesium sacrificial anodes

All Dorchester water heaters are constructed with high grade carbon steel and utilise a vitreous enamel lining. Additional tank protection is provided by a magnesium sacrificial anode. In plant rooms with insufficient headroom clearance for fixed anodes, flexible magnesium sacrificial anodes may be specified as an option. The cylinder is covered with a 50mm layer of CFC free foam insulation to ensure that standing losses are kept to a minimum.

The Dorchester range is designed to meet the latest HSC requirements for the control of Legionellosis. A large inspection door provides access for servicing and suitable tappings are included to facilitate top to bottom recirculation.

The DR-SE is suitable for open vented or unvented systems. An optional unvented supply kit contains all of the additional parts required to satisfy the Water Supply (water fittings) Regulations 1999.

Where optional electrical anode protection is fitted, a permanent 230 volt 50Hz single phase power supply will be required, to ensure the water heater has 24 hour protection.



Model		DR-SE 16	DR-SE 19
Continuous output with 44°C Δt (80°F)	l/h	370	393
	UK gal/h	81	86
Storage capacity	litres	278	372
	UK gal	61	82
Time to recover storage 44°C Δt (80°F)	mins	55	60
Heater output	kW	18.9	20.1
Maximum water pressure (open vented)	bar	8	
	Psig	116	
Gas input rate natural gas (G20)	m ³ /h	2.4	2.5
	ft ³ /h	84.7	88.3
Propane input gas rate at 37m bar (14.85 In wg) standard inlet pressure	m ³ /h	1.0	1.1
	ft ³ /h	35.3	38.8
Water flow and inlet connection	in	1" NPT	1 1/4" NPT
Gas connections	in	1/2" Rp	
Drain connection (hose connection) & Recirculation connection	in	3/4" - NPT	
Draught diverter spigot ID	mm	130	
	in	5	

Dimensions in mm		DR-SE 16	DR-SE 19
Overall height	A	1585	1780
Cylinder height	B	1450	1640
Cylinder diameter	D	645	675
Width including gas train	F	730	765
Gas connection	L	375	385
Cold water inlet	M	1505	1685
Hot water outlet	N	1505	1685
Drain connection	R	285	285
T&P valve	S	1280	1460
Anode clearance	H	1000	1300

Standard Features

- Permanent pilot ignition
- Single tube heat exchanger
- Control thermostat range 40°C to 81°C
- Magnesium sacrificial anodes
- Inspection door
- Combustion products discharge safety device
- Draught diverter

Dorchester DR-PF Range

Power Flame, Gas or Oil Direct Fired Water Heaters



The Dorchester DR-PF range of power flame water heaters is suitable for the larger load requirements for hot water and consists of 6 models with continuous outputs ranging from 969 to 3241 litres/hour, based on a 44°C temperature rise. Storage capacities range from 271 to 338 litres. Two or more water heaters can be installed in a modular configuration where there is demand for even larger loads.

The DR-PF is fitted with a power flame burner with fully automatic ignition. The water heaters are suitable for firing natural gas, LPG or oil and a Riello gas or oil burner is supplied as standard. The range is particularly suited to installations where a shared flue with other power flame plant is preferred, or in installations where oil fired water heating is required.

Options

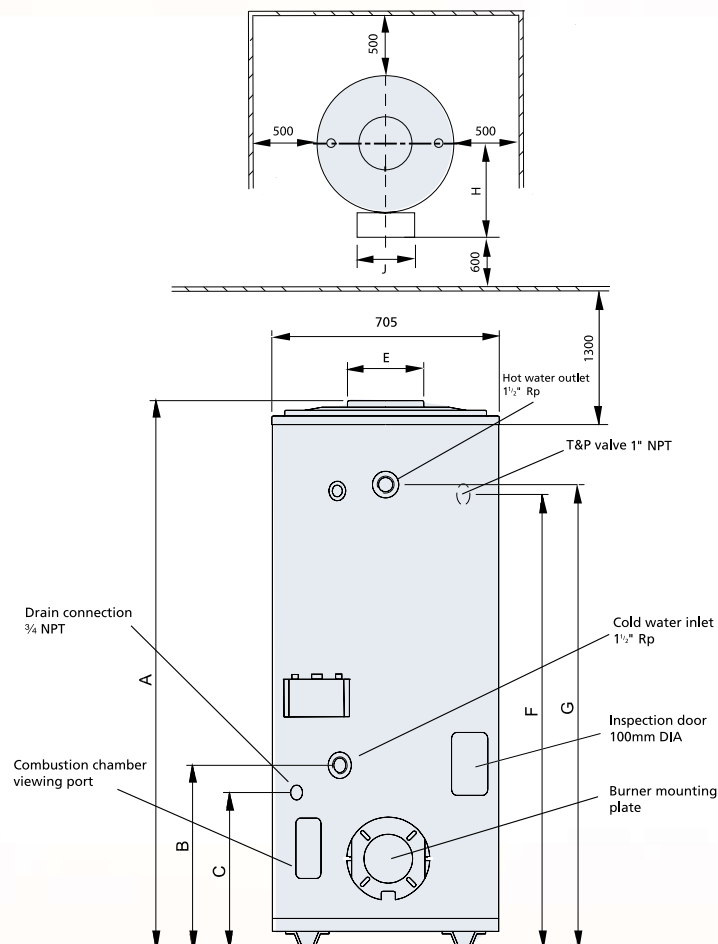
- Natural gas, LPG or Oil fired burner
- Unvented supply kit
- Electrical anode protection
- Top to bottom recirculation kit
- Flexible magnesium sacrificial anodes

The DR-PF range is designed to meet the latest HSC requirements for the control of Legionellosis. The large inspection door provides access for servicing and suitable tappings are included to facilitate top to bottom recirculation.

The water heater is supplied complete with a matched Riello burner and pre-wired control panel with on/off switch, temperature thermostat, power indicator, reset button, powered lockout and run indication connection.

The DR-PF is suitable for use on open vented or unvented systems. An optional unvented supply kit contains all of the additional parts required to satisfy the Water Supply (water fittings) Regulations 1999.

In plant rooms with insufficient headroom clearance for fixed anodes, flexible magnesium sacrificial anodes may be specified as an option.



Model - Oil fired water heaters		DR-PF 55	DR-PF 65	DR-PF 75	DR-PF 95	DR-PF 115	DR-PF 145
Continuous output with 44°C Δt (80°F)	l/h	1012	1214	1417	1823	2225	3241
	UK gal/h	222	267	312	401	489	713
Storage capacity	litres	338	338	333	296	296	271
	UK gal	74	74	73	65	65	60
Time to recover storage 44°C Δt (80°F)	mins	20	16	13	9	8	5
Heater output	kW	51.7	62.1	72.4	93.2	113.7	165.6
Oil input rate	l/h	6.4	7.6	8.9	11.4	14.0	20.4
	UK gal/h	1.4	1.7	1.9	2.5	3.1	4.5

Common data	Model	DR-PF 55	DR-PF 65	DR-PF 75	DR-PF 95	DR-PF 115	DR-PF 145
Maximum water pressure (open vented)	bar	8					
	psig	116					
Water outlet & inlet connection	in	1½" Rp					
Drain & recirculation connection	in	¾" NPT					
Flue Connection	mm	150	200				250
	in	6	8				10
Electrical supply		230v 50Hz 1Ph					

Model - Natural gas fired water heaters		DR-PF 55	DR-PF 65	DR-PF 75	DR-PF 95	DR-PF 115	DR-PF 145	
Continuous output with 44°C Δt (80°F)	l/h	969	1210	1452	1855	2177	2821	
	UK gal/h	213	266	319	408	479	621	
Storage capacity	litres	338	338	333	296	296	271	
	UK gal	74	74	73	65	65	60	
Time to recover storage 44°C Δt (80°F)	mins	19	15	12	8	7	5	
Heater output	kW	49.5	61.8	74.2	94.8	111.2	144.1	
Gas input rate	m³/h	6.4	7.9	9.5	12.2	14.3	18.5	
	ft³/h	226	279	335	431	505	653	
Gas connections	in	¾" Rp						1¼ Rp

Dimensions in mm		DR-PF 55	DR-PF 65	DR-PF 75	DR-PF 95	DR-PF 115	DR-PF 145
Overall height	A	1900					2025
Cold water inlet	B	685			640	765	
Drain connection	C	585			605	746	
Flue spigot	E	150*	200				250*
T&P valve	F	1700			1630	1770	
Hot water outlet	G	1720			1650	1785	
Burner width	H	Oil	575		601		
		Gas	625		653		
Width including burner	J	Oil	255		300		
		Gas	255		300		

* After fitting flue reducer

Standard Features

- Riello burner
- Fully automatic ignition
- Multi-tube heat exchanger
- Control thermostat range 40°C to 80°C
- Magnesium sacrificial anodes
- Powered lockout & run indication connection
- Inspection door

Dorchester DR-RS & DR-FC Ranges

Room Sealed & Open Flue Systems

The Dorchester DR-RS and DR-FC water heaters are designed to operate as room sealed appliances and are available with a choice of fluing options using a range of matched components.

Alternatively the Dorchester DR-FC water heaters can be used with open flue systems.

The matched range comprises balanced flue type components that can be used in a variety of balanced flue, room sealed or open flue configurations.

Available in concentric, twin duct arrangements, or single pipe arrangements the flue components provide versatility in where the main appliance can be located. Balanced flue arrangements can reduce the cost of installation and simplify flue runs. The room sealed configurations reduce the volume of ventilation air

required, resulting in tighter, and more energy efficient buildings. Open flue applications using DR-FC water heaters provide solutions where balanced flue terminals are unsuitable, or where existing flue routes are to be retained.

A simple push fit connection with a silicone seal ensures water and pressure tight joints every time and clamp bands complete the installation. The flue is constructed from aluminium for twin duct and open flue arrangements (single wall) and this forms the inner wall of concentric flue components. The outer wall of concentric flue components is constructed from galvanised steel, with the concentric ring carrying the combustion air to the appliance, which also acts as the insulation to the inner duct, which carries the exhaust flue gases.

The flue range can be selected for Dorchester DR-RS and DR-FC water heaters in the following configurations, in accordance with the European scheme for the classification of gas appliances, according to the method of evacuation of the products of combustion (types) - published document (BSI) PD CR 1749:2001

DR-RS & DR-FC Models

- Type C13 Concentric duct, horizontal discharge
- Type C33 Concentric duct, vertical discharge

DR-FC Models

- Type C53 Twin duct, horizontal air supply, vertical discharge
- Type B23 Single pipe open flue, vertical discharge

It is possible to arrange flues in other configurations. Please consult our technical team for further details.

Telephone: 01202 662379

PD CR 1749:2001

This document provides guidance on the classification of appliances, depending on the product characteristics.

Extracts for guidance:

Room Sealed

Type C - An appliance in which the combustion circuit (air supply, combustion chamber, heat exchanger and evacuation of the products of combustion) is sealed with respect to the room in which the appliance is installed.

Type C1 - A type C appliance that is designed for connection via its ducts to a horizontal terminal, which at the same time admits fresh air to the burner and discharges the products of combustion to the outside through orifices that are either concentric or close enough to come under similar wind conditions.

Type C3 - A type C appliance that is designed for connection via its ducts to a vertical terminal, which at the same time admits fresh air to the burner and discharges the products of combustion to the outside through orifices that are either concentric or close enough to come under similar wind conditions.

Type C5 - A type C appliance connected to separate ducts for the supply of combustion air and the evacuation of the products of combustion. These ducts may terminate in zones of different pressure.

Type C13 - A type C1 appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

Type C33 - A type C3 appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

Type C53 - A type C5 appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

Open Flue

Type B - An appliance intended to be connected to a flue that evacuates the products of combustion to the outside of the room containing the appliance. The combustion air is drawn directly from the room.

Type B2 - A type B appliance without a draught diverter.

Type B23 - A type B2 appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

For details of the full range of classifications refer to BSI publication PD CR 1749:2001.



Dorchester DR-RS Range

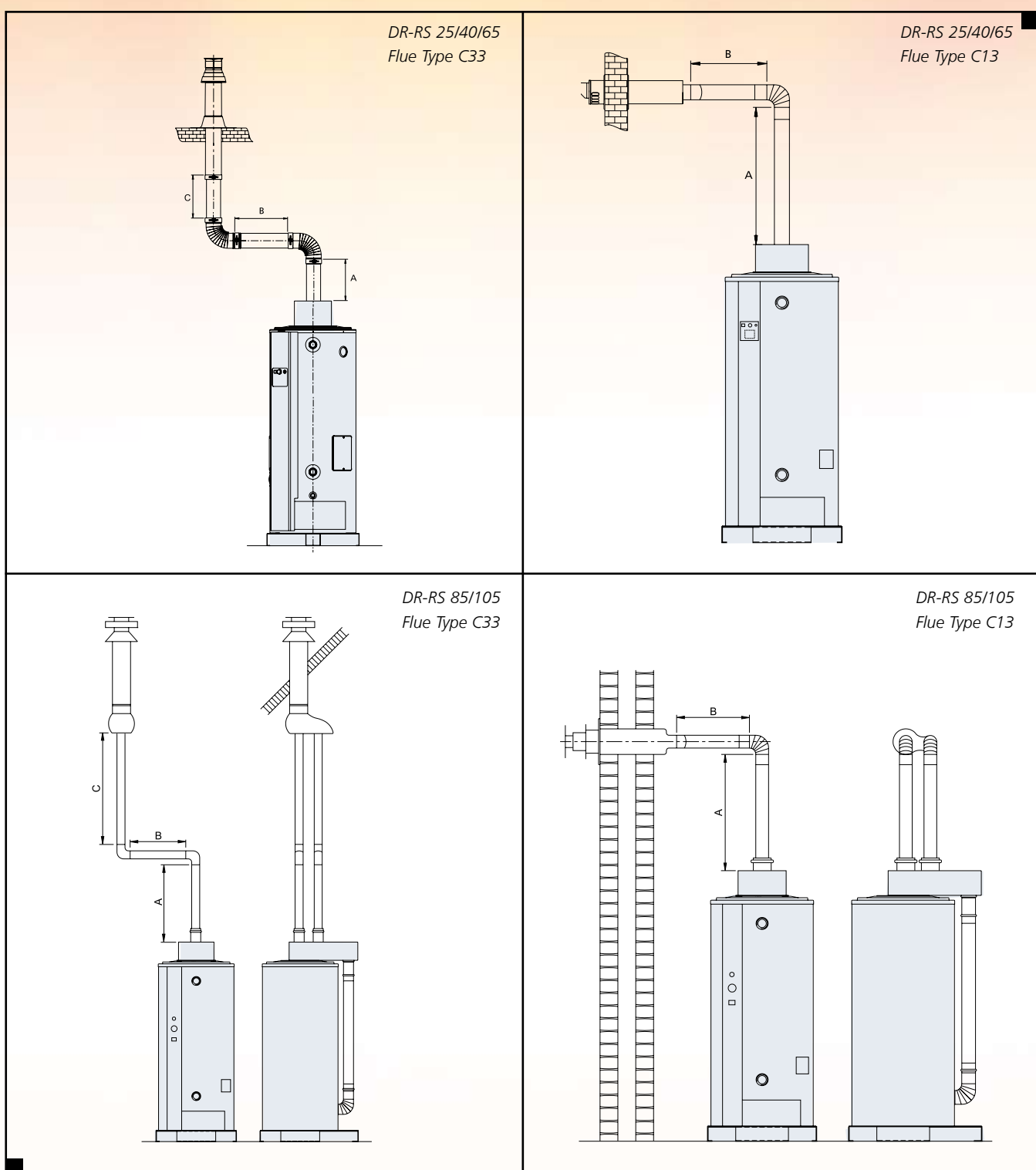
Room Sealed Flue Systems

Flues can be arranged for horizontal or vertical discharge through concentric terminals. The maximum flue run is 7m, using a maximum of two 90 degree or 45 degree bends.

Horizontal flue runs must be installed to allow for condensate drainage from the flue.

The DR-RS 25, DR-RS 40 and DR-RS 65 models use concentric flue components throughout.

The DR-RS 85 and DR-RS 105 use concentric terminals, but twin duct components are used from the appliance to the terminal.



Dorchester DR-FC Range

Room Sealed & Open Flue Systems

Concentric, room sealed flue systems type C13 & C33

The Dorchester DR-FC can be flued with horizontal or vertical discharge through concentric terminals.

Ducting from heater to terminal can be made using concentric tubes. Table 1 provides details of the maximum length of flue and the permitted number of bends within an individual flue system.

Where longer flue routes are required it is possible to use individual air supply and flue ducts from the heater converging at the concentric terminal, reducing the flue system resistance permitting the extended length. Table 2 provides details of the maximum flue length and equivalent bend lengths.

If still longer flue lengths are required then it is possible to increase the size for the air supply and flue ducts between the heater and the terminal. The final connection sizes at the heater and concentric terminal remain the same, so expansion and reduction pieces are used to facilitate the size change at each end of both the air supply and flue pipe. Table 3 provides details of the maximum flue length and equivalent bend lengths.

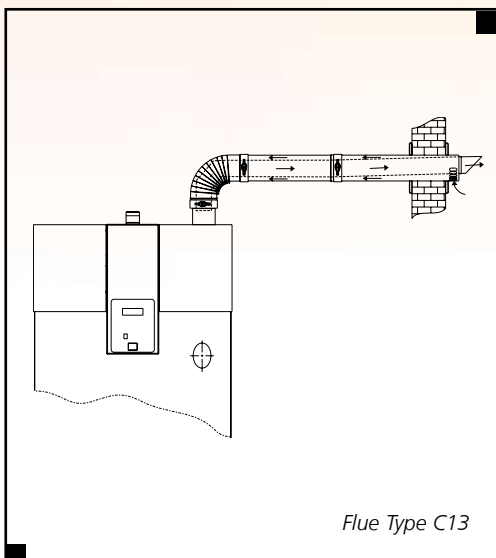


Table 1 - Concentric flue systems - room sealed application only
C13 & C33 Type flues

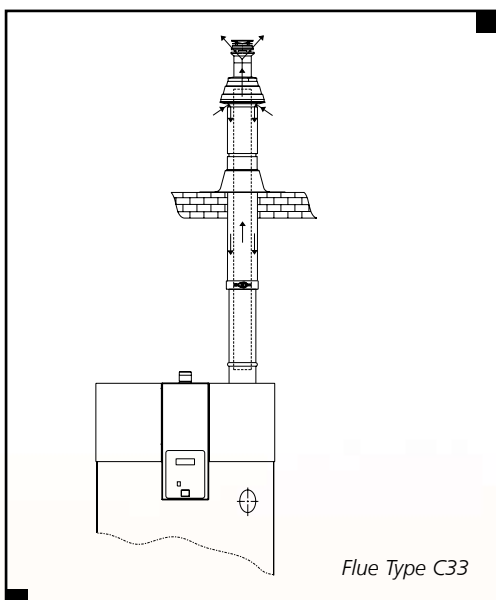
Model	Diameter - mm	Max length - m	Max no 45° or 90° bends
DR-FC 25	80/125	40	7
DR-FC 30	100/150	40	7
DR-FC 45	100/150	40	7
DR-FC 60	100/150	15	4
DR-FC 80	130/200	15	3
DR-FC 95	130/200	15	3

Table 2 - Twin pipe flue systems converging into concentric terminal
C13 & C33 Type flues. Concentric terminal diameter as Table 1

Model	Diameter - mm	Max length - m	Equivalent length 90° bend	Equivalent length 45° bend
DR-FC 25	80	25	3.9	1.1
DR-FC 30	100	80	4.6	1.2
DR-FC 45	100	45	4.6	1.2
DR-FC 60	100	25	4.6	1.2
DR-FC 80	130	115	2.4	1.4
DR-FC 95	130	60	2.4	1.4

Table 3 - Enlarged twin pipe flue systems converging into concentric terminal - C13 & C33 Type flues. Concentric terminal diameter as Table 1

Model	Diameter - mm	Max length - m	Equivalent length 90° bend	Equivalent length 45° bend
DR-FC 25	100	100	4.6	1.2
DR-FC 30	130	100	2.4	1.4
DR-FC 45	130	100	2.4	1.4
DR-FC 60	130	100	2.4	1.4
DR-FC 80	150	100	2.6	1.6
DR-FC 95	150	100	2.6	1.6



Dorchester DR-FC Range

Room Sealed & Open Flue Systems

Twin pipe, room sealed flue systems type C53

Dorchester DR-FC room sealed flues can be arranged for horizontal air supply and vertical flue discharge

Ducting between the heater and air/flue terminals is made using single tubes. Table 1 provides details of the maximum flue length and equivalent bend lengths.

Where longer flue routes are required then it is possible to increase the size for the air supply and flue ducts between the heater and the air/flue terminals. The final connection sizes at the heater and terminals remain the same, so expansion and reduction pieces are used to facilitate the size change at each end of both the air supply and flue pipe. Table 2 provides details of the maximum flue length and equivalent bend lengths.

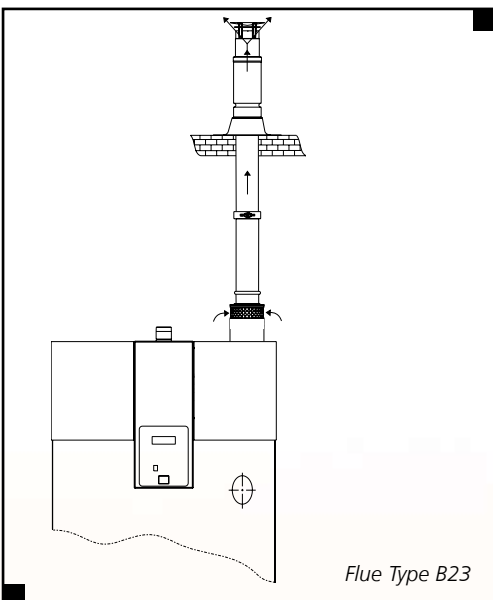
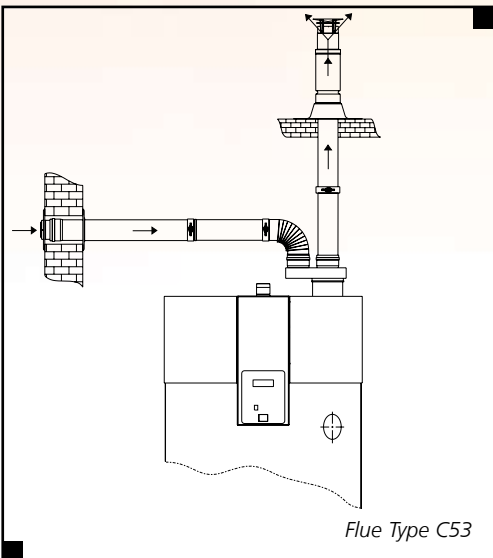


Table 1 - Twin pipe flue systems and open flue systems
C53 & B23 Type flues

Model	Diameter - mm	Max length - m	Equivalent length 90° bend	Equivalent length 45° bend
DR-FC 25	80	25	3.9	1.1
DR-FC 30	100	80	4.6	1.2
DR-FC 45	100	45	4.6	1.2
DR-FC 60	100	25	4.6	1.2
DR-FC 80	130	115	2.4	1.4
DR-FC 95	130	60	2.4	1.4

Table 2 - Enlarged twin pipe flue systems and open flue systems
C53 & B23 Type flues

Model	Diameter - mm	Max length - m	Equivalent length 90° bend	Equivalent length 45° bend
DR-FC 25	100	100	4.6	1.2
DR-FC 30	130	100	2.4	1.4
DR-FC 45	130	100	2.4	1.4
DR-FC 60	130	100	2.4	1.4
DR-FC 80	150	100	2.6	1.6
DR-FC 95	150	100	2.6	1.6

Open Flue Systems Type B23

An Open flue system can be installed with vertical flue discharge.

Ducting between the heater and flue terminal is made using single tubes. Table 1 provides details of the maximum flue lengths and equivalent bend lengths.

Where longer flue routes are required then it is possible to increase the size for the flue duct between the heater and the flue terminal. The final connection sizes at the heater and terminal remain the same, so expansion and reduction pieces are used to facilitate the size change at each end of the flue pipe. Table 2 provides details of the maximum flue length and equivalent bend lengths.



Customer Service Centre

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Hamworthy reserves the right to make changes and improvements which may necessitate alteration to the specification without prior notice.

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