Let It Flow: Unvented Hot Water System

JON COBBURN, HEAD OF MARKETING AT HEATRAE SADIA, EXPLORES THE BENEFITS OF FITTING AN UNVENTED HOT WATER SYSTEM, AND OUTLINES WHAT PLUMBERS AND HEATING ENGINEERS SHOULD CONSIDER AS PART OF THE SPECIFICATION PROCESS.

Until the mid-1980s, the majority of UK water heating installations involved cistern-fed open vented low-pressure systems. While a large number of these systems remain in use, the fact that they are gravity fed means that they are often ill equipped to cater for modern lifestyles, leaving the end user frustrated as a result.

More recently, combination boilers have become a ‘go to’; fitted on the assumption that they will provide instant hot water. However, for properties with two or more bathrooms, it’s an assumption that can be misplaced, with demand from two or more outlets at the same time potentially outstripping the system’s capabilities.

Constant supply

Thankfully, there is a solution – in the form of an unvented hot water system. Designed to provide a consistent supply of powerful, mains pressure, high-flow hot water, they offer a viable alternative to lacklustre or miss-specified systems. End users get the satisfaction of being able to draw equally balanced mains pressure water from every outlet, and the everyday luxury of invigorating high-performance showers and fast filling baths.

In traditional open vented systems, mains water is delivered direct to the cistern and then on to outlets at a low pressure, which is determined by gravity. Flow rates are reliant on the static head – the fixed vertical distance between the water level in the cistern and the appliance outlet. As a rule of thumb, 10 metres equates to roughly one bar of pressure, meaning that a shower one metre below the cistern will deliver just 0.1 bar of pressure.

Stored under high pressure

However, in unvented systems, mains water is delivered direct to a cylinder and stored there under high-pressure until it’s required. When weighing up the pros and cons, remember that unvented systems do not require a cistern tank and therefore are not susceptible to issues such as float valve jams, blockages in the pipework and cistern water freezing.

They also eliminate frozen pipes and are modern and hygienic, guarding against the threat of winter flooding and removing the potential hazard of contaminated cisterns. There is also plenty of flexibility in where to site a cylinder – garages, airing cupboards and lofts are all popular locations.

Safety measures

The term ‘unvented’ actually refers to a water heating system that doesn’t include an open vent pipe. As a result, cylinders are designed with a series of safety control devices which, among other things, prevent stored water exceeding 100°C. Large unvented cylinders can only be installed or serviced by engineers with Building Regulations Approved Document G (G3) training. Qualified engineers receive a numbered, photographic identification card, which is valid for five years, making it a worthwhile investment.

It is a criminal offence to contravene Building Regulations. This includes the notification of the installation and commissioning of a new unvented system, or plans to alter existing systems. This notification can be made by the installer, or by a Competent Persons Scheme if the installer belongs to one.

It is important to note that Water Regulations require any approved contractor to provide a certificate of competence, and any electrical wiring or testing should be carried out in accordance with the relevant British Standard. Other relevant standards are BS EN60335-2-21 for electrically heated storage water heaters, and BS EN60335-2-73 for immersion heaters.
ErP Directive
From September, hot water systems, including unvented systems, will have to be appropriately labelled to comply with the Ecodesign and Energy Labelling Directives – commonly referred to as the ErP Directive. For help in understanding the directives, installers can look to guidance from manufacturers.

Before installing an unvented system, the property should be properly assessed. For the cylinder to work properly, the mains supply must be at least 1.5 bars and capable of delivering 20 litres of water per minute or more. The statutory minimum supply pressure is only one bar, so it’s worth checking, particularly in rural areas, or in older properties where small supply pipes can also mean lower flow rates. If either the water pressure or flow rate is low – or both – options such as a boosted supply or an accumulator can be explored. Homeowners could discuss the issue with their water company, but it’s worth warning them that improvements can be costly.

Hot water demand
Old pipework may be able to cope with a low-pressure system – but its weaknesses could be exposed by an unvented high-pressure system. So guard against leaks by checking the quality of pipework first, especially the connections, and repair or replace as necessary.

When it comes to specifying a system, assess the hot water requirements of the property. It’s vital to determine the demand for hot water at peak times of use, and how often hot water is required. When it comes to deciding whether an unvented system is appropriate, a good indication is the number of bathrooms in the property; if there are two or more, an unvented system could make a real difference.

Energy source
Next, establish the energy source for the property, be it gas, oil, LPG, or even solar or biomass. This will influence which sort of system you choose – indirect or direct.

Indirect systems offer a rapid heat recovery rate but require an external heat source, normally gas, although they do allow for alternative energy sources including LPG, oil boilers and renewables. Recovery times for indirect cylinders assume that the heat source has a sufficient output.

However, where gas is not available, a direct cylinder is a popular choice as it comes complete with an integral electrical heat source. It’s worth bearing in mind that direct cylinders take longer to recover because they are limited by the output of the immersion heater. As heat recovery will be dependent on the loading of immersion heaters, and most users in these areas will often belong to an economy tariff, it’s also worth checking that they understand how to use their system effectively. Renewable energy models such as the Megaflo Eco Solar are available for both direct and indirect systems.

Specification
Sizing charts detailing cylinder recovery times will help with specification, as will the manufacturer’s technical literature, especially when you want to check how the product is expected to perform. However, given the complexities, it’s worth seeking out specialist seminars on the subject, like that offered by Heatrae Sadia. Look too for tools to help in your selection, such as Spec Pro, available to download free from the Heatrae Sadia website.

Unvented hot water systems provide end users with a reliable source of high-pressure hot water, which can make a significant difference to their quality of life. There is a wide range of unvented hot water cylinders available for a variety of applications, and care should be taken in ensuring systems are specified correctly and sized in line with hot water demands. While installers may need to upskill to work with unvented systems, the lasting impact of training will mean they are perfectly positioned to take advantage of market trends, such as second bathrooms and high-performance, modern appliances.
QUESTIONS

1. Why can cistern-fed open vented low-pressure systems often be ill equipped to cater for modern lifestyles?

2. In traditional open vented systems, how is mains water delivered to outlets?

3. In traditional open vented systems, flow rates are reliant on the static head – the fixed vertical distance between the water level in the cistern and the appliance outlet. How many metres equate to roughly one bar of pressure?

4. In unvented systems, where is mains water stored?

5. Unvented cylinders are designed to prevent stored water exceeding what temperature?

6. What qualification do you need to install or service a large unvented cylinder?

7. When will hot water systems (including unvented systems) have to be labelled to comply with the ErP Directive?

8. If a property’s water pressure or flow rate is low, what improvement options could be considered?

9. For the cylinder to work properly in an unvented system, the mains supply must be capable of delivering how many litres of water per minute?

10. Why do direct cylinders take longer to recover than indirect cylinders?

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