How to implement thermostatic radiator valves

Simple and effective, thermostatic radiator valves help you keep room temperatures just right – and can cut around 10% from your heating bills.

Thermostatic valves can be used on virtually all conventional radiators running from low temperature, hot water heating systems. They can also be part of the control system used to meet the latest building regulations.

The business case

Lowering room temperatures by just 1˚C can save you 8% on your annual heating costs.

Take an office using 300,000kWh of gas a year. At a gas price of 2.5p/kWh, you'd save about £600.

Thermostatic valves cost about £25 each. Let's say you need 20 for the office. This would cost £1,500, including £1,000 for installation – and the work would pay for itself in about 2½ years.

The technology

All thermostatic radiator valves have a temperature-sensitive component, usually wax. This expands as the room temperature increases, closes the valve and restricts the flow of hot water to the radiator.

As the room temperature cools, the wax contracts and the spring-loaded valve opens again to allow the flow of hot water to increase.

In a capillary valve, the temperature sensor is at the end of a capillary tube. This means the room temperature can be measured away from the radiator and gives more accurate control. This is particularly important if radiators are housed in low surface temperature or decorative enclosures.

If people change the valve setting, of course, you lose the energy saving advantage. Most thermostatic valves can be locked with internal pins to limit their maximum setting. For extra security, you can use valves that can only be adjusted with specialist tools.

A typical thermostatic radiator valve

Applications

Virtually all radiators can be controlled with thermostatic valves. Areas with a variety of heating needs and without existing temperature control are most likely to benefit, though.

You shouldn't use thermostatic valves in areas where a temperature sensor already controls the heating system, as the two controllers may compete with one another.

The following table outlines the typical applications, temperature settings and precautions.

Table 1 Applications

Considerations	Temperature sensor	Security
Frequently used area, such as an office	Set for an appropriate maximum temperature, such as 20˚C.	Use lockable valves or preset flow limit
Rarely used area, such as a storeroom	Use a frost protection or low temperature setting.	Use lockable valves or preset flow limit
Public area	Set for an appropriate maximum temperature, such as 18˚C for waiting rooms	Use lockable valves and, for extra security, consider theftproof heads

Specification checklist

The following table outlines the main points to discuss with your supplier.

Table 2 Specification checklist

Considerations	Comments
Number and location of radiators needing valves	
Pipe diameter	In mm.
One or two pipe system	Low pressure-drop valves are available for one pipe systems.
Limiting or locking features	To prevent unnecessary adjusting and overheating.
Sensor on radiator or a capillary lead	
Angled or straight connection	For mounting on pipework.
Radiator draining and filling	

Commissioning procedure

Installation and commissioning is fairly simple, providing you use a good heating contractor. They should check:

- the heating system is thoroughly flushed to avoid the new valves being blocked.
- that excessive pipe corrosion won't complicate installation.
- the valves are fitted in the best location
- that valves aren't fitted above the radiator, as this will lead to incorrect temperature measurement and underheating.
- that valves fitted at the bottom of radiators aren't likely to be affected by any large hot water pipes underneath.
- the pins controlling the flow rate are adjusted to a maximum temperature. This should be checked by measuring the temperature in the room.

Common problems

- If the radiator is turned off for a long period, the valves sometimes stick and the radiator stays cold. Your contractor can sort this out.
- Water hammer can occur when the water flows in the wrong direction through the valve. The valve needs to be refitted in the correct orientation. An alternative is to use bi-directional valves. It's really something to get right in the initial installation.
- Radiators that are covered or blocked by furniture don't work effectively. Valves shouldn't be covered or blocked either.
- If a valve is used at a low temperature in one room, keep the door closed, or the valve will try to control radiators in adjacent areas too.

Finding a supplier

There are many different makes of thermostatic radiator valves. A good heating contractor will be able to advise you on which is best for your needs. Ask for references so that you can check the product has performed well in similar situations.

You may already know of a good contractor; if not, contact a trade association.

The Heating and Ventilating Contractors' Association (HVCA)
020 7313 4900
www.hvca.org.uk