

KEEP CONTROL

When properly selected and installed, TRVs can provide accurate temperature control in individual rooms, helping to reduce heating costs and enhance comfort, says Bjorn Sejr Nielsen. Here, he explains the key issue that separates one model from another

First brought to the UK market in 1943, radiator thermostats (TRVs) remain essential to achieving optimum efficiency for most 'wet' domestic central heating systems.

For example, heating control tests carried out at the Energy House at Salford University highlighted the importance of TRVs in ensuring satisfactory heat distribution around a dwelling. Indeed, the university's research showed that this is not possible without TRVs, even if the system is balanced.

Although the TRV has become one of the most widely-used heating controls, the range of products now available – all offering different features, functions and sensors – can be confusing for even the most experienced heating installer.

Making the right choice for the end-user's needs, rather than simply sticking with what you know or picking the cheapest option, can be key to keeping customers happy and securing new and repeat business.

PROS AND CONS

If you take a look through any of the online plumbing forums you are likely to come across discussions about which TRV to install, and the perceived pros and cons of different brands and types. To assist selection, I believe installers need to be aware of what is, arguably, the most critical difference between the various

TRVs on the market – the material used in the sensor.

BASIC CONCEPT

Inside each TRV head is a sensor containing a material, usually a wax or liquid, which expands as the room temperature warms up and contracts when it cools down. The sensor is connected to a valve seat inside the body, which opens as the sensor contracts and closes as the sensor expands to allow more or less water through.

While this concept is in itself effective, the material used inside the sensor can affect the TRV's overall performance and accuracy. This is because different materials have different thermal properties, both initially and over time.

RESPONSE TIME

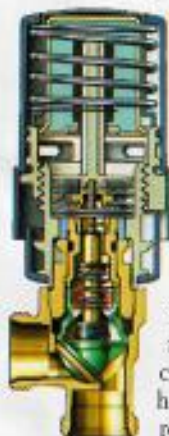
According to the basic laws of physics, the lighter the material

used in the sensor, the quicker it will respond to changes in the ambient temperature. With this scientific principle in mind, it is fair to say that liquid models have the advantage of a faster response time compared with a wax-filled sensor.

Wax is a heavier, denser material therefore it is relatively slow to expand or contract. When it comes to heating a home, the TRV's response time will have a direct impact – not only on comfort, but also on energy consumption and overall heating costs.

WAX-FILLED TRVS

Aside from a slower reaction time to changes in room temperature, the wax in a TRV sensor has, in



TRVs can help households save energy; below-left, a cross-section of a Danfoss TRV

many cases, a tendency to change consistency over time. This is primarily due to the crystalline composition of wax, with the crystals tending to become bigger as they repeatedly expand and contract.

This can make the wax harder and heavier, resulting in it needing a higher temperature to react. While this process may take up to a year to have a significant impact on the home, during this time the end-user will likely find they are having to increase their temperature settings in order to achieve the same level of comfort.

Making this incremental adjustment over time can increase heating costs and may, ultimately, negate the potential energy savings of installing TRVs in the first place. In addition, the installer could be faced with a costly call-back from a dissatisfied

customer, something that every reputable business tries hard to avoid.

INFORMED CHOICE

TRVs are proven to help households save energy and improve comfort, but in order to maximise these benefits over the longer term it is important to know what's inside the sensor. When you know the differences, you can make a more informed choice for your customer and help maintain the TRV's rightful reputation as a cost-effective, energy saving heating control. If you are in any doubt, you can always check out the various options on manufacturers' websites or just ask your supplier's advice before you buy.

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