



Practical approaches to controlling heat pumps

What installers can learn from the UK,
Germany and the Netherlands

Contents

Executive summary	Page 3
Europe's rising interest in heat pumps	Page 4
Heat pump adoption	Page 5
How homeowners influence heating choices	Page 8
How Dutch installers are managing heat pump systems	Page 12
Zone regulation or no zone regulation? Heat pump control strategies	Page 13
How industry best practices support heat pump performance	Page 17
How specialist comfort controls work with manufacturer heat pump controllers	Page 18
What can installers take forward from Europe's heat pump experiences?	Page 20
Heat pump-compatible thermostats and controllers from Resideo	Page 21
How Resideo's smart thermostats and controls align with best practice	Page 23
Heat Pump Optimised Control	Page 24
Heat Pump Optimised Control in Five Steps	Page 26
Contact us	Page 27

Executive summary

Heat pump installations are accelerating across the UK, Germany and the Netherlands, but the experience of working with them varies enormously between markets.

German and Dutch installers are well into their sustainable heating transition, yet many UK installers may still be completing their first installations after training.

This report outlines not only where each market stands, but what the more experienced markets can teach the less experienced ones — particularly around controls, where conflicting advice from colleagues, manufacturers and trade bodies can make it harder for installers to determine the best approach.

Across all three markets, many of the retrofit and multi-zone installations reviewed for this paper share some common ground: the heat pump's own controller stays in charge

of heat generation and modulation, while a separate comfort control layer manages room temperature, scheduling and zoning.

This paper draws on real installer perspectives and market data to explore the control strategies behind this approach, covering everything from single-zone versus multi-zone regulation to hydraulic design and homeowner expectations, to help installers decide what approach is right for each project.



Europe's rising interest in heat pumps

Across Europe, more households are looking at heat pump technology as energy costs rise, older boiler systems reach the end of their working life, and incentive schemes encourage uptake.

As heat pumps become more commonplace, controls are playing a larger part in how systems are managed. Unlike traditional boilers, low-temperature systems heat homes gradually, placing greater emphasis on how comfort is controlled in everyday use. But many installers are encountering mixed advice.

Some heat pump manufacturers recommend keeping it simple, with a control that manages the entire home as one zone. However, many homeowners expect room-by-room heating regulation — and they aren't always aware that heat pumps react differently from boilers.

Resideo has compared how the UK, Germany and the Netherlands approach heat pump control, and what installers can learn from each market.

Whether you're still gaining experience with heat pumps or installing them on a regular basis, the lessons we share will help you make control choices that meet customer needs while aligning with industry best practice.

Heat pump adoption: United Kingdom vs. Germany vs. Netherlands

United Kingdom: Ambitious targets but early-stage adoption

The UK heat pump market is still finding its footing, but uptake is gathering pace, with over 51,000 retrofit heat pump installations recorded by DESNZ¹ in 2025 and over 60,000 Microgeneration Certification Scheme (MCS)²-certified heat pump installations in 2025—the highest annual total ever recorded by the MCS.

Despite this growth, the market remains some distance from the UK government's target of 450,000 heat pump installations per year by 2030³ (revised down from 600,000 by 2028⁴).

What is being done to meet the target?

The Warm Homes announcement⁵ in early 2026 included increasing the Boiler Upgrade Scheme (offering up to £7,500 for qualifying heat pump installations) to £2.7 billion, introducing grants for air-to-air heat pumps, and an intention to work with industry to simplify heat pump installation. Together, these measures point to a growing installed base and signal a stronger role for controls within it.

In addition, domestic heat pump planning regulations in England were eased last year⁶. The one-metre boundary rule was relaxed in May 2025, making heat pump installation more feasible for terraced homeowners and simplifying delivery in urban projects.

Industry bodies are also supporting uptake by expanding heat pump training options. The Chartered Institute of Plumbing and Heating Engineering (CIPHE) and the Heat Pump Association have collaborated to develop an Ofqual-accredited Low Temperature Heating and Hot Water Systems qualification⁷. City Plumbing research⁸ in 2025 indicated strong uptake of training, with over 90% of the 500 UK installers surveyed either already trained or intending to upskill within the following 12 months.

58%

Are UK installers heat pump ready?

Out of 500 UK installers surveyed 58% were already trained and a further 34% planned to upskill in the following 12 months.

Source: *TAKING THE TEMPERATURE 2025 Industry insights for the plumbing and heating industry from City Plumbing.*

1 <https://www.gov.uk/government/statistics/heat-pump-deployment-statistics-december-2025>

2 <https://mcscertified.com/the-2026-low-carbon-landscape/>

3 <https://www.gov.uk/government/publications/warm-homes-plan/warm-homes-plan-technical-annex>

4 <https://www.gov.uk/government/publications/energy-security-bill-factsheets/energy-security-bill-factsheet-low-carbon-heat-scheme>

5 <https://www.gov.uk/government/publications/warm-homes-plan/warm-homes-plan.html#warm-homes-plan-at-a-glance>

6 UK Government, Town and Country Planning (General Permitted Development) (England) (Amendment) Order 2025: <https://www.legislation.gov.uk/uksi/2025/560>

7 <https://www.ciphe.org.uk/professional/careers--trainees/low-temperature-heating-and-hot-water-qualification/>

8 <https://professionalbuildersmerchant.co.uk/news/city-plumbing-customer-insight-shows-surging-uk-heat-pump-training-uptake/>

- TAKING THE TEMPERATURE 2025 Industry insights for the plumbing and heating industry from City Plumbing

Germany: The adoption of heat pumps has reached a tipping point

Germany's heat pump market has expanded rapidly and is now the third largest in Europe.⁹ EHPA data shows installations increased by 50% between 2024 and 2025, with 345,000 new heat pumps installed last year.¹⁰

In the first half of 2025, heat pump sales in Germany surpassed those of gas boilers for the first time, with 139,000 heat pumps sold compared with 132,500 gas boilers.¹¹

Installers are receiving more heat pump installation requests, particularly in major cities. E.ON data shows that heat pumps now supply more than 4% of Berlin households and 2% of homes in Hamburg, Munich and Cologne.¹²

Policy is a major driver of heat pump adoption. The Heat Planning Act requires municipalities to draw up local heat plans, while network companies must indicate how they will decarbonise their networks. This act is accompanied by significant national investment in district heating, estimated at €3.5 billion by 2030, according to research by the German Energy Efficiency Association for Heating, Cooling and CHP.¹³

The Building Energy Act, updated in 2025, has also driven the uptake of energy-saving and climate-friendly heating technologies. The legislation declared that newly installed heating systems must use at least 65% renewable energy, although the mandatory renewable share requirement was dropped following a change of government.¹⁴ While the regulatory obligation no longer stands, market incentives and funding structures continue to favour heat pumps as part of the broader direction of German heating policy.

Federal funding programmes also offer homeowners grants of up to 70% towards sustainable heating systems to accelerate energy-efficient retrofits.¹⁵

50%

Increase in heat pump installations between 2024 and 2025

Source: EHPA data

In the first half of 2025, sales of heat pumps in Germany surpassed gas boilers for the first time.

Source: Federation of the German Heating Industry

⁹ <https://www.ehpa.org/wp-content/uploads/2025/07/EHPA-Market-Report-2025-executive-summary.pdf>

¹⁰ <https://ehpa.org/news-and-resources/press-releases/heat-pump-sales-testify-to-government-action/>

¹¹ <https://www.warpnews.org/green-tech/heat-pumps-outsold-gas-boilers-in-germany-for-the-first-time/>

¹² <https://www.eon.com/en/about-us/media/press-release/2024/eon-presents-status-of-heat-transition-in-major-german-cities.html>

¹³ <https://www.cleanenergywire.org/news/germany-needs-eu435-bln-district-heating-investment-2030-meet-climate-goals-report>

¹⁴ <https://www.cleanenergywire.org/news/german-government-drops-mandatory-renewable-share-heating>

¹⁵ <https://energiewende.bundeswirtschaftsministerium.de/EWD/Redaktion/EN/Newsletter/2024/01/Meldung/topthema.html>

Netherlands: Rapid adoption driven by regulation and incentives

The Netherlands has experienced a strong heat pump uptake, with 143,000 systems installed in 2025.¹⁶

The Dutch government has committed to removing 1.5 million homes from the gas grid by 2030, on the path to making all homes gas-free by 2050.¹⁷ New-build homes stopped receiving gas connections back in 2018, and since 2025 all new homes must connect to a gas-free heating solution; typically an all-electric heat pump or a heat network connection.¹⁸

The coalition agreement of the new government, which took office in February 2026, includes plans to introduce new legislation on heat pumps from 2029 onwards. For example, the government wants to introduce a standard that will require owners of existing homes to install a more sustainable alternative when replacing their gas boiler. This will be at least a hybrid heat pump installation, but it could also be an all-electric heat pump system or connection to a collective heat supply.¹⁹

Currently, 3.7% of Dutch homes currently use hybrid heat pumps; more than double the level in 2022, according to the Centraal Bureau voor de Statistiek (CBS).²⁰

The installation costs in the Netherlands are supported by a generous financing structure. The ISDE scheme offers grants that cover around 30% of system costs²¹, and the National Heat Fund provides low- or no-interest loans to reduce upfront costs.²²

These incentives are only available when systems are installed by skilled and licensed professionals, keeping demand strong within the pool of trained installers.

2025

The Dutch government wants to make all homes gas-free by 2050.

Source: Dutch News

1.5M

Homes to be removed from the gas grid by 2030

Source: Dutch Government

The rapid growth of heat pumps and the increasing focus on smart control means that Home Energy Management Systems (HEMS) are more frequently being discussed as way to effectively manage energy demand.

Hybrid heat pumps are increasingly being promoted in the Netherlands as a means of managing grid congestion. The heat pump in a hybrid system can be temporarily switched off when the electricity grid is under pressure, with the gas boiler providing backup heating.

To deliver energy savings beyond load-shifting, the control system must be capable of managing the interplay between the heat pump, boiler and any solar PV integration. A buffer tank is one approach to achieve this, as it provides a thermal mass that helps smooth demand and supports the heat pump's operating cycles.

Control strategy and bivalence temperature settings matter as much as hydraulic configuration. Where a buffer is specified, the control system must manage the full interaction between components.



More about Smart Grid initiatives

¹⁶ <https://ehpa.org/news-and-resources/press-releases/heat-pump-sales-testify-to-government-action/>

¹⁷ <https://www.dutchnews.nl/2025/12/more-dutch-homes-switch-to-gas-free-heating-cbs-says/>

¹⁸ <https://www.cbs.nl/en-gb/news/2025/50/ever-more-gas-free-homes>

¹⁹ <https://eibi.co.uk/news/the-netherlands-to-ban-fossil-fuel-heating-from-2026/>

²⁰ <https://www.dutchnews.nl/2025/12/more-dutch-homes-switch-to-gas-free-heating-cbs-says/>

²¹ <https://www.bricknest.nl/en/blog/subsidies-en-kosten-energielabel-verbeteren-in-nederland>

²² <https://www.nesta.org.uk/report/future-subsidies-for-heat-pumps/statement-4/>

How homeowners influence heating choices

To understand how homeowner attitudes shape heating control decisions, Resideo interviewed a panel of 16 consumers across the UK, Netherlands, Germany and Italy during May–June 2025. This was a small qualitative panel — not a representative survey — but several consistent themes emerged.

Cost is the first thing homeowners raise. Not just the heat pump itself, but the installation, any electrical upgrades and the building work that comes with it. Most homeowners we interviewed expect to see that money back within approximately five years through lower running costs. However, this expectation does not reflect what retrofit economics typically deliver. Payback periods of approximately five years are rarely achievable in most retrofit scenarios, and installers should set accurate expectations early in the conversation.

The existing boiler is most people's reference point. Homeowners compare everything against what they've

got now: comfort, ease of use, running costs. Embracing heat pumps is as much about changing expectations as it is about changing technology.

Individual needs vary widely depending on living circumstances, property type and financial situation. However, across all markets, one challenge was consistent: there is a shortage of reliable, accessible information.

Perception is currently a key influencer in purchase decisions, and both consumers and installers need better education to support confident decision-making.

What our panel thinks about heat pumps:

- 01** Upfront and running cost savings from a new technology are key considerations
- 02** Individual homeowner wants and needs vary due to different living, financial and property situations
- 03** The heat pump comparison benchmark for many homeowners is their existing boiler
- 04** There is a need for reliable information sources as perception is currently a key influencer

UK installers: Upskilling for heat pumps but lacking real-world experience

Many UK installers are still building familiarity with heat pumps, as most domestic heating work still centres on gas boilers.

The Wolseley at Westminster report, released in 2025, highlights the scale of this learning curve: 74% of installers who completed Heat Training Grant (HTG) courses had not carried out a single heat pump installation within the first six months of qualifying.²³ There's a growing pool of trained installers who are yet to gain practical experience of low-temperature systems.

For now, most installers are focused on setting up heat pumps correctly and managing customer expectations regarding running patterns and comfort.

To keep commissioning predictable, many installers start with straightforward control arrangements that align with manufacturer systems.

In most cases, that means using manufacturer-provided controllers as the default setup, managing the home from a single thermostat or control point, and only adding extra control layers when needed. This usually only happens in response to customer preferences or for more complex building layouts.

But as installers work across a broader mix of properties, situations will arise where manufacturer controls cannot fully support comfort requirements, varied room-use patterns or customer expectations. This is where additional control layers will become more relevant, provided they maintain the heat pump's preferred operating conditions.



I've been working with heat pumps for 20 years. They are generally higher-end, higher-value and higher-quality installations compared to basic boiler work. Much more challenging, but also more rewarding.

There are still far too many gas boilers being installed. Both installers and end users are responsible for that; too many people in our industry only want to fit combi boilers because of their own lack of skills and knowledge. It frustrates me when I see new-build sites where gas boilers are still going in, and heating systems installed with 10mm pipe to radiators, which will undoubtedly cause problems for heat pump conversions in the future.

Stuart Edwards,
Director, Total Energy Solutions Scotland Ltd



I can't handle all the heat pump enquiries - it's taking time to allocate and train staff. The move is on and it's not going away. We're seeing very strong local interest in Greater Manchester, and with the Warm Home Plan and interest-free loans, I expect demand to keep growing.

Andy Baxter
Director, High Efficiency Heating (UK) Ltd

²³ <https://www.installeronline.co.uk/heating/nearly-three-quarters-havent-installed-a-heat-pump-since-completing-heat-training-grant-funded-training/>

German installers: Adapting to demands for multi-zone heating systems

Germany is moving closer to a structural shift in residential heating, but installer familiarity with heat pumps remains mixed.

Like the UK, many long-established installers still default to one-to-one gas boiler replacements as standard. However, newer or specialist companies are more comfortable working with heat pumps, particularly where remote system management is part of the offer.

Hybrid heating solutions combining a heat pump with a gas boiler are becoming more common in older buildings. With these systems, the heat pump can efficiently manage the base load, while peak load and domestic hot water are handled by the boiler. This reduces perceived installation and performance risks.

In most cases, installers rely on the manufacturer-supplied regulation or thermostat as the primary interface. However, many manufacturer control units are designed primarily for single-zone operation, though an increasing number now offer multi-zone or weather compensation options.

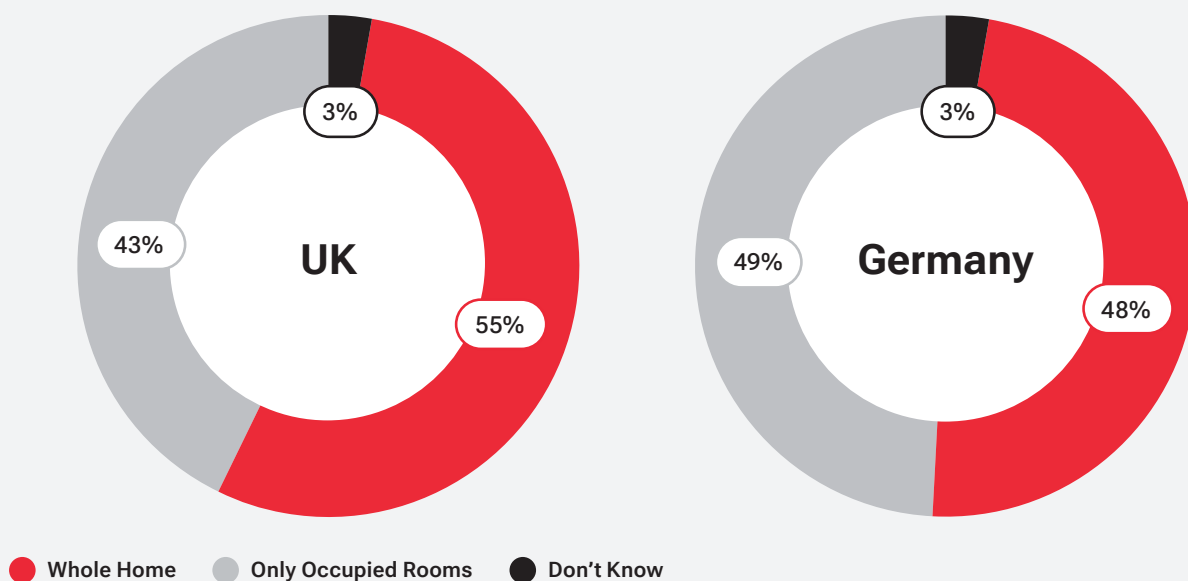
The more relevant issue is how zoning is implemented: where manufacturer controls do not natively support multi-zone arrangements, or where the implementation does not meet the homeowner's expectations, a specialist external comfort layer adds value without displacing the manufacturer's heat generation architecture.

If we compare Germany and the UK, there is a higher appetite in Germany for heating only the occupied rooms.

A zoned control for the heating is standard in new-build homes and is incorporated into system design from the outset. By contrast, older homes built before 1990 present a wider range of zoning layouts. Depending on building fabric and room-use patterns, additional control layers may be required to maintain comfort and support consistent heat pump operation.

Germany's high renovation rates, especially in major cities, are strengthening the case for multi-zone, low-temperature systems. More than half of the buildings in Berlin, Cologne and Hamburg have been partly or completely renovated, according to data from energy company E.ON.²⁴

This winter you will focus on heating your whole home or the individual rooms in your home which are occupied?



Resideo November 2025 Thermostat Survey - Results are based on the responses of 500+ UK and German and 1,000 Dutch adult homeowners, ages 18 and older, living in the UK, Germany and Netherlands respectively, who completed an online survey.

²⁴ <https://www.eon.com/en/about-us/media/press-release/2024/eon-presents-status-of-heat-transition-in-major-german-cities.html>

Dutch installers: Multi-zone heating control is a standard expectation

Dutch installers are, as a group, particularly experienced in zoned and room-level heat pump regulation: a product of the Netherlands’ long-established practice of heating to individual room level rather than whole-home setpoints. This does not necessarily mean greater total installation volume than Germany, but it does mean familiarity with the specific challenges that arise when combining zone control with heat pump operation.

Heat zoning has been standard practice in the Netherlands for many years, so room-level control is something households expect as standard. We can see this when we compare Dutch homeowner expectations versus the UK and Germany.

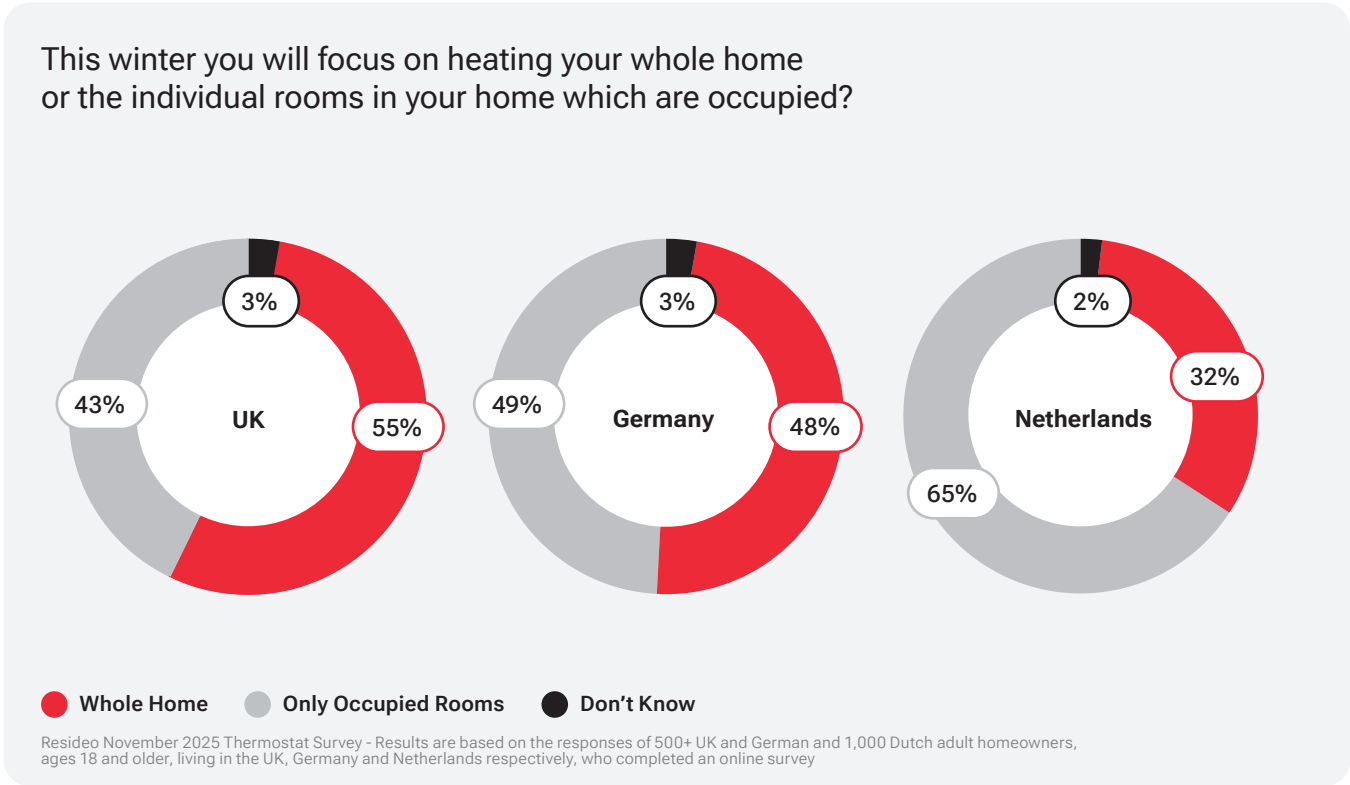
By the end of 2025, there were a total of 189,000 hybrid heat pumps in Dutch households, compared with 635,000 all-electric heat pump systems.²⁵ This means that quite a lot of heat pumps are installed in the Netherlands as part of a hybrid system. And in homes that already have zoned heating before the heat pump is installed, the resident wants to keep that regulation. This gives installers an advantage: instead of building zoned heating from scratch, installers can integrate

the existing zone or room layout within the heat pump system, using specialist controls to align the system’s output with heat distribution around the home.

In most projects, the heat pump’s manufacturer controller manages system behaviour and weather compensation, while existing room controls continue to handle comfort at zone level.

When building layout or heat-loss patterns are more complex, installers often add a specialist “layer” in the control; for example, adding a buffer tank. This should maintain the zone regulation without disrupting the operating conditions essential for the heat pump.

With a multi-level control system in place, coordination becomes important. Reliable performance depends on the installer, controls provider and heat pump manufacturer working together so that each part of the system functions effectively.



25 [National Heat Pump Trend Report 2026 by DNE Research](#)

How Dutch installers are managing heat pump systems

Real-world installations in the Netherlands show how intelligent control solutions enable installers to optimise heat pump performance while meeting diverse comfort and efficiency requirements.



All-electric heat pump with room-by-room control

In this Dutch residential project, the installer used Resideo thermostats to provide individual room control across an all-electric heat pump system. Each room or zone can be adjusted separately, giving occupants precise comfort control without interfering with the heat pump's operating logic.



[View Case Study](#)



Hybrid heat pump with smart control

A Dutch sports hall installation demonstrates how smart control can coordinate a hybrid heat pump. The control system manages the interplay between the heat pump and gas boiler, ensuring efficient operation across varying demand levels while maintaining stable comfort conditions throughout the facility.



[View Case Study](#)

Zone regulation or no zone regulation? Heat pump control strategies

Heat pumps depend on a consistent minimum water flow to protect internal components and avoid short, unprofitable heating cycles.

Maintaining that constant flow becomes especially important once zone regulation or additional control layers are introduced.

The degree of hydraulic complexity required to achieve this varies significantly by heat pump manufacturer, system volume, and modulation range. Many inverter-driven heat pumps with ECM pumps and wide compressor turn-down ratios can operate in zoned systems without a buffer tank, provided minimum flow is maintained by design. The guidance below reflects established practice rather than a universal rule, and installers should always check manufacturer specifications.

Installers generally work with one of two system approaches: open-loop or buffered.

Open-loop systems rely on continuous circulation through the primary circuit, with flow maintained at all times. Buffered systems introduce additional thermal mass to stabilise operation, particularly where zoning may cause flow to drop intermittently.

Neither approach is inherently superior; the right choice depends on the specific heat pump, system volume, and how zoning is configured.

In zoned or more complex layouts, installers may need to use hydraulic measures to preserve minimum flow. These may include adding buffer tanks to provide thermal mass where zones close independently, ensuring bypass paths or valves maintain circulation. Checking pipe sizing and pump head capacity also ensures flow is not restricted when zones open and close. Hydronic balancing is equally important, so no single room or delivery system dominates the demand signal.

These measures do not compete with the heat pump control strategy; they enable it. Creating a stable interface between the control and the heat pump prevents temperature overshoot, unwanted cycles and uneven temperatures.

Why installers get conflicting advice on zone regulation

Many installers are encountering mixed messages about whether heat pumps should be zoned, and if so, how. This can make it difficult to decide where zoning adds value versus where it could create problems.

Some heat pump manufacturers are cautious about zoning and advise against it in certain applications. Their reasoning is largely technical:

- Some manufacturers prefer a heat pump system that uses a single, central demand signal with minimal external intervention.
- They're concerned about the impact of excessive cycling when zones close and system flow drop too quickly.
- They want to safeguard against installations where incorrect zoning setups could shorten the lifespan or reliability of their equipment, impacting their reputation.

It is worth noting that cycling is not caused solely by zoning. Oversizing, aggressive setpoint strategies, limited compressor turn-down ratios and domestic hot water priority logic all contribute.

Homeowners add another layer of complexity. Many people, especially in the UK, still struggle to understand how heat pumps work. They don't realise that it is best to run these appliances for a long time at low temperatures, instead of the sharp on/off cycles they are used to with gas boilers.

When homeowners are unfamiliar with heat pump operation, installing separate comfort controls helps prevent unnecessary changes to the system's settings.

Industry guidance also shapes decisions. BEAMA, the UK trade association for manufacturers and providers of energy infrastructure technologies and systems, sets out the technical differences between single-zone and multi-zone systems:



Single-zone setups

Require an open circuit with sufficient system volume and minimal restriction; thermostatic radiator valves (TRVs) or underfloor heating actuators must not be used in a way that reduces primary flow.



Multi-zone setups

Must incorporate hydraulic separation — such as a buffer tank or low-loss header — so each zone can operate independently without depriving the heat pump of its minimum water volume.

Across both approaches, the fundamentals remain the same: installers must protect low flow temperatures, maintain stable flow and avoid short cycling, especially when adding a control layer that is not the manufacturer's own.

Single-zone vs multi-zone control:
Where each approach is most suitable

		
Consideration	Single-zone control	Multi-zone control
Property type	Small homes, even heat-loss, simple layouts	Large homes, varied heat-loss, extensions, attics, basements
Room-use patterns	Consistent use across all rooms	Irregular use (e.g. home office, spare rooms)
Homeowner expectations	Prefers simplicity, minimal interaction, lower upfront cost	Expects tailored comfort per room or has previous zoning experience
Typical installer goal	Predictable commissioning, simple setup	Meeting comfort needs without raising flow temperatures unnecessarily
System behaviour	Single demand point: heat pump runs long, steady cycles	Zonal demand changes; requires minimum flow and stable hydronics
Typical control hardware	Manufacturer controller only	Manufacturer controller + zoning/comfort layer
Where it performs well	New builds, well-insulated properties	Retrofits, hybrids, varied room use, mixed insulation levels
Risks if mis-applied	Overheating unused rooms, comfort complaints	Cycling risk if minimum flow is not maintained

Underfloor heating: A key use case for multi-zone regulation

Even in markets where zoning is less common, underfloor heating (UFH) is becoming a strong driver for room-level control. Many homeowners now expect UFH as part of a modern home upgrade, especially when installing a heat pump. 28% of UK homeowners view underfloor heating powered by renewables as a status symbol, according to research by Skipton Building Society, Leeds Beckett University and the University of Leeds.²⁶

Underfloor heating is almost inherently zoned, as it is seldom installed in every room, and each area usually runs on its own circuit. This makes underfloor heating well suited to heat pumps, which operate most efficiently at the low flow temperatures typical of UFH systems — often in the 30–40°C range. In addition, where the heat pump model and controls support it, and where dew-point monitoring is in place to manage condensation risk, a heat pump and underfloor heating system can also provide passive cooling of the living spaces in summer.

The high thermal mass of UFH also brings stability to system behaviour.²⁷ Because the floor holds and releases heat gradually, demand remains steady, supporting the long, continuous operating cycles that heat pumps prefer and reducing the risk of short run-cycles.

But even with underfloor heating, the installation must maintain a minimum flow. UFH actuators can close individually, and if several zones shut down at once, primary flow can fall below heat pump requirements. Installers may need to use hydraulic separation or bypass measures to keep flow stable and protect the system.

Mixed delivery systems with UFH and radiators add further design considerations. Each type of system has a different heat curve and response time, so the heat pump control must manage these differences while keeping the system within its preferred operating conditions. This makes zone design — and the interaction between the heat pump control and any additional control layer — extra important.



25%

A quarter of UK homeowners view underfloor heating powered by renewable energy as a status symbol.

Source: Skipton Building Society

²⁶ <https://www.thesun.co.uk/money/35329337/survey-status-symbols-home-solar-panels-underfloor-heating/>

²⁷ <https://www.sciencedirect.com/science/article/abs/pii/S0950061822009734>

How industry best practices support heat pump performance

The difference between a stable heat pump system and one with frequent failures or repairs often comes down to whether installers follow industry best practice.

BEAMA's guidance²⁸ sets out the following conditions for efficient heat pump performance:²⁹

- Low flow temperatures ($\leq 55^{\circ}\text{C}$) to maintain efficiency
- Sufficient system water volume to avoid cycling
- Weather compensation as the main way output is modulated
- A single primary control interface so homeowner interaction doesn't disrupt system behaviour

In most installations, and particularly where zoning is involved, the heat pump's own controller should remain in charge of how heat is generated and modulated, with any additional control layer working around those parameters. This is especially important in retrofit and hybrid scenarios; in single-zone systems, the interaction between layers is less complex.

Industry guidance from the HPA and BEAMA is prescriptive when zoning is introduced. Zone-controlled heating systems must protect minimum water volume at all times, which often requires hydraulic separation when zones or radiators with thermostatic radiator valves (TRVs) are present.

Buffer tanks or open distributors are one of the more common ways to guarantee stable primary-side volume, and zoning should not rely solely on TRVs, as each zone needs a defined control point. The appropriate hydraulic solution varies by heat pump specification, system volume and how zones are configured; installers should check manufacturer guidance before specifying a buffer.

When these requirements are met, zoning or specialist controls can be added without undermining heat pump performance. When they are not, it can lead to comfort issues, inefficiency and premature, unprofitable cycles.

²⁸ <https://essmag.co.uk/beama-and-the-heat-pump-association-launch-new-controls-guide/>

²⁹ References to BEAMA/HPA guidance are included for general industry context only and do not imply endorsement or approval of Resideo products

How specialist comfort controls work with manufacturer heat pump controllers

Specialist arrangements, such as zoning or multi-room systems, focus on how heat is distributed around the home to manage each room or zone for comfort. The heat pump's own control remains responsible for generating heat, modulating power and handling weather compensation.

In hybrid systems, additional regulation also helps coordinate when the heat pump or boiler should run, preventing unnecessary boiler use and avoiding clashes between schedules.

For the overall system to function properly, the heat pump manufacturer's control must stay in charge of flow temperature and its operating curve.

The specialist control layer should communicate demand in a steady, predictable manner rather than attempting to adjust the same parts of system behaviour.

When both layers work in their own defined roles — generation on one side, distribution and comfort on the other — the heat pump can run in a stable environment, and the homeowner can adjust room settings to their preference.

Specialist controls also improve the homeowner's user experience by giving them a simple interface for day-to-day adjustments, without the risk they will alter critical settings on the heat pump itself.



Heat pump system regulations: Questions to ask before choosing your approach

Before deciding on a control approach, it's worth considering a few things. How will the residents use their homes? What is their living/working pattern? How will the heat pump have to work to meet their requirements? What expectations does the homeowner have of their system?

The checklist below will help you decide your control strategy to ensure the heat pump operates effectively once commissioned.

Building and system characteristics:

- Q** How varied is the heat loss across the property?
- Q** Is the home small and uniform, or spread across extensions, lofts or mixed-use rooms?
- Q** Is the heat pump system hybrid or fully electric?
- Q** Will existing temperature controls remain in place?

Heat pump operation:

- Q** Has domestic hot water demand been matched to appropriate cylinder sizing?
- Q** Does the heat pump have the modulation range to handle low loads?
- Q** Are open-loop or buffered arrangements more appropriate for the building?
- Q** Will zoning reduce flow to a point where hydronic measures are needed?

Homeowner expectations:

- Q** Do customers expect a single temperature setting, or are they used to room-by-room control?
- Q** Are there rooms used intermittently where single-zone control would waste heat?
- Q** How much day-to-day interaction do homeowners want with their system?

Installer considerations:

- Q** Will the chosen control keep the commissioning process predictable?
- Q** Does the preferred zoning model avoid short cycling and prevent unnecessary switching between heat pump and boiler?
- Q** Does your approach minimise the chance of callbacks without compromising comfort?

What can installers take forward from Europe's heat pump experiences?

Across the UK, Germany and the Netherlands, heat pump adoption is developing at different speeds, and installer experience reflects that variation.

But while familiarity, experience and expectations differ between markets, one thing remains consistent: the conditions heat pumps need to operate efficiently.

Installations tend to perform most predictably when the heat pump control takes care of system behaviour — managing flow temperature, modulation and weather compensation — while comfort and day-to-day adjustment are handled by a dedicated comfort control layer. Clear separation between these roles supports stable operation and makes systems easier to commission and maintain.

Specialist comfort controls also shape how heat is used within the home. By targeting demand more precisely, installers can reduce unnecessary whole-home heating or cooling, support hybrid systems more effectively, and avoid running a boiler when the heat pump is capable of meeting the load.

Ultimately, homeowners will judge heat pumps like any heating system: by their comfort and usability. For installers, this puts control strategy at the heart of system design.



One thing remains consistent: the conditions heat pumps need to operate efficiently.

Heat pump-compatible thermostats and controllers from Resideo

Resideo's range of heat pump-compatible thermostats and controls is designed to support the control approach discussed in this paper — separating heat generation from comfort control — where supported by the connected system, configuration and manufacturer requirements.

Across the range, our design approach is consistent: the heat pump's controller remains responsible for system behaviour, while Resideo controls manage time schedules, room temperatures and zoning. This is intended to avoid competing control logic and may reduce the risk of short, unprofitable cycling where the system is correctly sized, designed and configured.



Simple programmable control: T3/T3R

For homeowners who want a straightforward, set-and-forget approach, the T3/T3R programmable thermostat can provide time and temperature control without adding complexity. Available in wired and wireless versions, it allows occupants to adjust comfort safely without having to adjust the manufacturer's heat pump settings.

The T3/T3R is compatible with selected heat pump models and interfaces.³⁰ Installer parameters have been updated specifically to support heat pump operation, including longer minimum run times can help reduce the risk of excessive cycling where the system is correctly sized and the hydraulic design maintains minimum flow.



Versatile room thermostat: DT4

For homeowners who want a simple, reliable room thermostat, the DT4 combines a slim, modern design with straightforward functionality. Available in wired and wireless versions, it is compatible with on/off and OpenTherm® heating and cooling appliances including heat pumps, hybrid systems, boilers and district heating.³¹

The DT4 can be installed as a standalone thermostat or as part of a wider home comfort solution, for example as a zone thermostat within an HCC100 underfloor heating system. Its eco state functionality allows occupants to reduce or boost temperature for a set period, supporting day-to-day energy savings without needing to access the heat pump's own settings.

³⁰ [Subject to the connected system, interface type, installer configuration and manufacturer requirements. Please refer to the current compatibility list before specification.](#)

³¹ [Subject to the connected system, interface type, installer configuration and manufacturer requirements. Please refer to the current compatibility list before specification.](#)



Advanced multi-zone control: evohome

Where room-by-room control is required, evohome offers multi-zone heating. The system supports up to 12 heating zones, allowing homeowners to heat occupied rooms while turning down areas not in use.

evohome is Wi-Fi enabled and can be controlled via smartphone or tablet, giving homeowners flexibility without interfering with the heat pump's operating logic. For installers, this makes it easier to meet comfort expectations in larger or more complex properties while maintaining stable system behaviour.

By managing demand across zones in a coordinated way, evohome can help reduce the risk of excessive cycling (and the associated wear on the heat pump compressor) when installed as part of a correctly designed hydraulic system. Equipment lifespan benefits are a function of overall system design.



Underfloor heating control: HCC100

For wet underfloor heating systems, the HCC100 provides a purpose-built multi-zone controller. It supports multiple wired and wireless thermostats and can operate either as a standalone solution or alongside evohome.

The HCC100 is designed to work with low-temperature systems and can be commissioned using the Resideo Pro app, helping installers configure zoning in systems designed to maintain minimum flow, potentially reducing the risk of short cycling in systems where the hydraulic design supports minimum flow requirements. It's well suited to heat pump installations where UFH is used across part or all of the property.



A consistent approach for installers

By separating heat generation from comfort control, Resideo's heat pump-compatible thermostats and controllers can support stable operation, predictable demand and intuitive day-to-day use.

And because the T3/T3R, evohome and HCC100 are compatible with multiple heat pump brands,³² installers can repeatedly recommend familiar controls rather than learning a new manufacturer interface for every project. This simplifies commissioning, reduces setup errors, and makes it easier to explain the system.

³² [Subject to the connected system, interface type, installer configuration and manufacturer requirements. Please refer to the current compatibility list before specification.](#)

How Resideo's smart thermostats and controls align with best practice

Resideo's approach to heat pump control clearly separates responsibilities within the heating system. Specialist comfort controls are not a replacement for the heat pump manufacturer's controller — they serve a different and complementary purpose.

Where manufacturer controllers manage how heat is generated and modulated, Resideo's controls manage how that heat is distributed, scheduled and experienced by the homeowner.

The heat pump itself remains responsible for heat generation, including flow temperature control and modulation, while the control layer focuses on comfort and distribution. This supports predictable system behaviour and avoids introducing competing logic that can disrupt how the heat pump operates.

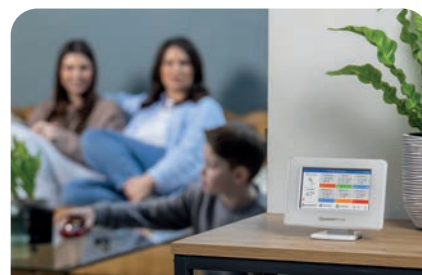
Resideo's controls are designed to work with a range of hydraulic configurations commonly found in heat pump installations, where supported by the connected system and configuration. Minimum flow still needs to be preserved as zones open and close through appropriate system design and configuration.

Compatibility with specific heat pump brands operates across on/off, OpenTherm and external demand interfaces; installers should confirm the appropriate interface for each project.

For the homeowner, system interaction is simple and intuitive. Users can adjust comfort settings through a dedicated interface, without accessing or altering the heat pump's internal controls. This reduces the likelihood of unintended changes to the system while still giving occupants control over how they heat and cool their homes.

By keeping system function and user interaction clearly separated, Resideo's smart thermostats and controls are designed to support predictable commissioning and stable heat pump operation, where the system is correctly sized and the hydraulic design supports it.

Installers can deliver systems that meet customer expectations and perform well over time without constant callbacks.



**For the homeowner,
system interaction is
simple and intuitive**

Heat Pump Optimised Control

Balancing responsive comfort with controlled heat pump operation

A heat-pump-specific approach

Resideo combines a heat-pump-specific control approach with heat pump-compatible thermostats that are easy to use and familiar to homeowners. These thermostats can be configured using operating parameters appropriate to the connected heat pump, allowing the heat pump manufacturer, system designer or installer to align its behaviour with the appliance requirements rather than applying a generic boiler control strategy.



Why control matters

Heat pumps operate differently from conventional boilers. Effective control must maintain a comfortable room temperature while avoiding unnecessarily short operating periods and rapid restarts.

01

Maximum cycles per hour

Sets the maximum number of times the thermostat can start the heat pump within an hour. The heat pump may cycle less often when demand is low. The thermostat will only initiate a heating cycle when demand is sufficient to meet the configured minimum on-time requirement.

02

Minimum on time

Defines how long the heat pump must remain operating after it starts, helping to avoid very short compressor run times. This should usually be at least 20 minutes.

03

Minimum off time

Defines how long the heat pump must remain off before another start is permitted, helping to prevent rapid restarts. This should match the heat pump manufacturer's recommendation, usually at least 5 minutes.

Beyond simple on/off control

The thermostat regularly compares room temperature with the target setpoint. As the room approaches that target, the algorithm adjusts when to call for heat while continuing to respect the configured maximum cycle rate and minimum on/off times. The maximum cycles-per-hour setting is a limit, not a target; when demand is low, the heat pump may run fewer cycles. A new heating cycle is initiated only when demand is sufficient to meet the configured minimum on-time requirement. This combines responsive temperature control with defined operating constraints for the heat pump.



Stable

Room temperature



Controlled

Start-stop behaviour



Flexible

Manufacturer settings



Practical

Installer configuration

Designed for manufacturer collaboration

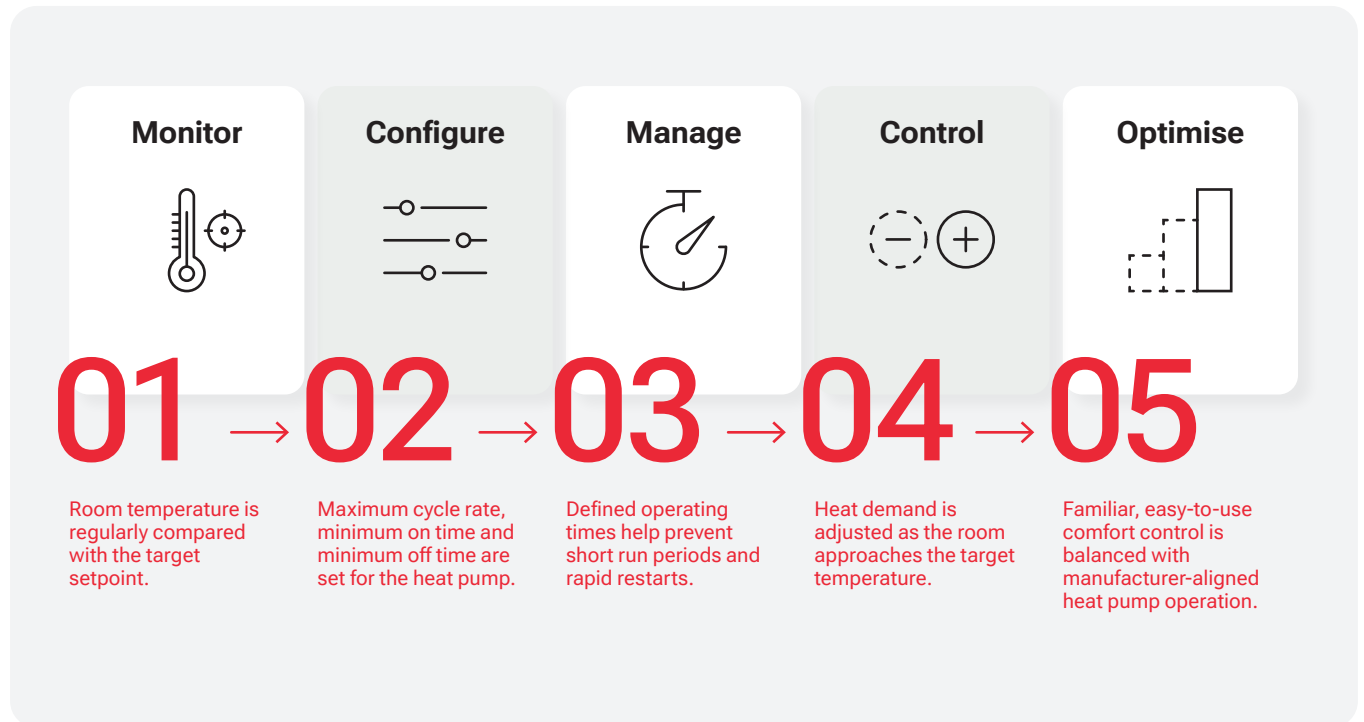
The configurable thermostat parameters allow preferred cycle rates and minimum operating times to be agreed with heat pump manufacturers. This supports a universal thermostat proposition that can be adapted to the requirements of different heat pump systems through a clear installation and commissioning process.

Resideo's heat-pump-optimised control approach combines responsive room-temperature control with configurable cycle limits and minimum on/off times, delivered through a thermostat that is easy to use and familiar to homeowners. This helps maintain comfort while supporting the operating requirements specified for the heat pump.



Heat Pump Optimised Control in Five Steps

Delivering stable comfort without unnecessary cycling.



The three settings that shape operation

Cycles per hour

Sets the maximum permitted starts within the control period; actual cycling may be lower when demand is low.

Minimum on time

Keeps the heat pump operating for a defined minimum period.

Minimum off time

Prevents another start until the defined off period has elapsed.

How the approach differs:

Responsive comfort

+

Controlled heat pump operation

=

- Familiar homeowner control
- Manufacturer-configurable cycle limits
- Minimum on/off times
- Supporting stable room temperature



Talk to an expert

Scan the QR code opposite to explore additional guidance, compatible Resideo controls, and installer resources.



For more information
resideo.com

Resideo Technologies, Inc.
Z. A. La Pièce 6,
1180 Rolle,
Switzerland

RES-EMEA-MKG-REP-0167-A1 | 10/26
© 2026 Resideo Technologies, Inc.
All rights reserved.