

# What is a Wall-Mounted PIV?

**A wall-mounted PIV unit is a mechanical ventilation system designed to improve indoor air quality and control condensation in residential properties, particularly those without a loft space. Unlike a traditional loft-based PIV system that draws air from the roof void, a wall-mounted unit draws fresh air directly from outside through a ducted connection in an external wall. This air is then filtered, slightly warmed if necessary, and gently introduced into the dwelling's main living space, typically a hallway or central landing. This positive pressure displaces stale, moisture-laden air, which is then expelled naturally through existing gaps and vents in the building fabric.**

Wall-mounted PIV units are a valuable solution for houses, flats, and bungalows that lack a suitable loft space or for areas like basements and cellars that suffer from poor ventilation. The unit is typically installed in a discreet, convenient location such as a kitchen cupboard, utility room, or airing cupboard. A duct is then run from the unit to a central, high-level diffuser, which is the point where the filtered air enters the property. This central location ensures the fresh air circulates effectively throughout the home.

A key benefit of this system is its ability to combat condensation and mould growth by continuously replacing moist indoor air with drier, fresh air. By maintaining a slight positive pressure, the system prevents the ingress of pollutants and radon gas from the ground, which is particularly relevant in areas with high radon levels.

In the context of the **UK residential retrofit sector**, wall-mounted PIV systems are a popular choice for improving ventilation in older properties where traditional ventilation methods may be insufficient or impractical. For example, in a mid-terrace Victorian home with damp issues in the hallway, a wall-mounted PIV unit could be installed in a cupboard under the stairs. The ducting would then be routed to a diffuser at the top of the stairwell, continuously supplying fresh air and addressing the underlying cause of the condensation.

It's important to consider the **Building Regulations** when installing these systems. Approved Document F (Ventilation) provides guidance on meeting the ventilation requirements for new and existing dwellings. While PIV is not explicitly referenced as a specific system type in the same way as extract fans or MVHR, it can contribute to meeting the overall ventilation strategy for a property, particularly for background ventilation and condensation control. Installers must also consider Part L (Conservation of Fuel and Power) and Part O (Overheating) to ensure the chosen system is energy-efficient and doesn't contribute to overheating.

Since the unit draws air directly from outside, the ducting run must be insulated to prevent condensation from forming on its exterior. This is especially crucial where the duct passes through a colder part of the house, like an unheated void or basement. Using thermal ducting or insulating the duct with appropriate materials ensures that the system operates efficiently and prevents secondary condensation problems.

## **Some Related Terms and Concepts:**

- **Continuous Mechanical Ventilation:** A ventilation strategy that involves a constant, low-level flow of air, rather than intermittent bursts. Wall-mounted PIV units are a form of this, providing a continuous supply of fresh air to the property. This contrasts with intermittent systems like kitchen or bathroom extractor fans.

- **Approved Document F (ADF):** A key part of the Building Regulations in England that provides guidance on ventilation for dwellings. It outlines the requirements for background ventilation, purge ventilation, and the installation of mechanical extract systems to ensure a healthy indoor environment. PIV systems can be used as part of a whole-house ventilation strategy to comply with the requirements of ADF.
- **Air Change Rate:** A measure of how many times the air in a space is completely replaced within a given period, usually one hour. A well-designed ventilation system, including a wall-mounted PIV unit, aims to achieve a healthy air change rate to remove pollutants and moisture effectively.
- **Psychrometrics:** The study of the thermodynamic properties of moist air. Understanding psychrometrics is fundamental to explaining how PIV units work to control condensation. The system introduces drier, warmer air, lowering the relative humidity within the property and preventing moisture from condensing on cold surfaces.
- **Air Permeability:** A measure of the airtightness of a building's fabric. PIV units are more effective in dwellings with a degree of natural air leakage, as this allows the positive pressure to push stale air out. In very airtight homes, PIV may need to be supplemented with other forms of extract ventilation to ensure adequate air exchange.
- **Condensation Control:** The primary function of PIV systems. By introducing a continuous supply of fresh, filtered air, these units help to lower the overall humidity of the indoor environment, preventing warm, moist air from condensing on cold surfaces like windows and walls.
- **Indoor Air Quality (IAQ):** The quality of the air inside a building as it relates to the health and comfort of its occupants. Wall-mounted PIV units significantly improve IAQ by filtering out pollutants, pollen, and other allergens from the incoming air while also diluting and removing airborne contaminants generated indoors, such as VOCs and odours.