

What is a Balanced System?

A Balanced System refers to a ventilation strategy where the supply and extract airflows are precisely matched to maintain optimal indoor air quality and thermal comfort. This equilibrium ensures that the pressure inside the building remains neutral, preventing issues such as draughts, moisture build-up, or excessive heat loss.

In the UK house building, residential retrofit, and home renovation sectors, Balanced Systems are commonly implemented through Mechanical Ventilation with Heat Recovery (MVHR) systems. These systems are designed to comply with Part F (Ventilation) of the Building Regulations 2022, which mandates adequate ventilation for health and safety.

Synonyms:

- Neutral Pressure System
- Equilibrium Ventilation

Related Terms:

1. **Mechanical Ventilation with Heat Recovery (MVHR):** A system that extracts stale air from wet rooms (e.g., kitchens, bathrooms) and supplies fresh air to living spaces while recovering heat from the extracted air.
2. **Air Permeability:** The measure of how leaky a building is, expressed in $\text{m}^3/(\text{h}\cdot\text{m}^2)$ at 50 Pa. Lower values indicate better airtightness, which is crucial for the efficiency of Balanced Systems.
3. **Part L (Conservation of Fuel and Power):** Building Regulations that emphasise energy efficiency, influencing the design and implementation of Balanced Systems.
4. **Approved Document F:** Provides guidance on ventilation requirements, including the use of Balanced Systems in new builds and retrofits.
5. **Passive Ventilation:** A natural ventilation method that relies on wind and thermal buoyancy, often contrasted with Balanced Systems.
6. **Heat Recovery Efficiency:** The percentage of heat recovered from extracted air, a key performance metric for MVHR systems.
7. **Indoor Air Quality (IAQ):** The quality of air within a building, directly impacted by the effectiveness of Balanced Systems.

Practical Example:

In a UK residential retrofit project, a homeowner installs an MVHR system to improve ventilation in a newly insulated and airtight home. The Balanced System ensures that fresh air is supplied to bedrooms and living rooms while stale air is extracted from kitchens and bathrooms. This maintains neutral pressure, prevents condensation, and reduces heating costs by recovering up to 90% of the heat from extracted air.