RISE | Retrofit information, support & expertise

MVHR practical guide for the supply chain

Supply chain advice pack

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www.riseretrofit.org.uk

Introduction

As homes undergo retrofit and energy efficiency improvements, they become significantly more airtight. While this reduces heat loss and improves performance, it also limits natural ventilation routes, increasing reliance on **controlled ventilation systems**.

Without adequate ventilation, this can result in:

- Poor indoor air quality (IAQ)
- Condensation and mould
- Occupant discomfort and health risks

Mechanical Ventilation with Heat Recovery (MVHR) provides a whole-house mechanical ventilation system that continuously extracts stale air and supplies filtered fresh air, while recovering heat from the outgoing air via a heat exchanger. This allows ventilation without significant heat loss, making MVHR particularly suitable for airight homes. This makes MVHR a key solution where improved airtightness would otherwise reduce natural ventilation.

- Extracting stale air from wet rooms (e.g., kitchens, bathrooms) and background air from other areas of the home
- Supplying fresh, filtered air to living spaces
- Recovering heat from outgoing air to reduce energy loss

Modern MVHR systems can recover
up to ~90% of heat from extracted air,
making them highly efficient in airtight homes.[1]

This advice pack focuses on **practical delivery of MVHR in retrofit**, including:

- When MVHR is appropriate
- What good delivery looks like
- Common pitfalls
- How the supply chain ensures performance outcomes

Why MVHR matters in retrofit

Airtightness = need for controlled ventilation

Retrofit measures such as insulation and air sealing reduce natural infiltration.

[1] Titon (2025), Breathing new life into old walls with MVHR retrofitting

In traditional homes, uncontrolled air leakage provided some background ventilation. In modern airtight homes, this is no longer the case - **ventilation must be designed and delivered deliberately**.

Without this:

- Moisture, CO_2 and pollutants are trapped indoors
- Ventilation becomes inconsistent, uncontrolled, and unreliable

Risks of poor ventilation

Poor ventilation can result in:

- Condensation and mould growth
- High humidity and pollutant build-up
- Reduced occupant wellbeing and health issues
- Compliance failures under Part F[2]

Research shows people spend **80-90% of their time indoors**, making indoor air quality critical.[3]

Retrofit context

Historically, retrofit focused heavily on insulation. However, as buildings are "wrapped tighter," this can unintentionally trap:

- Stale air
- Moisture
- Allergens and pollutants

This has led to increased damp, mould, and IAQ issues, making ventilation a **critical system in retrofit delivery**.

When MVHR is the right solution

Suitable scenarios

MVHR is most appropriate in:

- Deep retrofit projects
- Homes achieving high airtightness (< ~5 $m^3/h{\cdot}m^2$)
- Whole-house upgrades rather than isolated measures

The Future Homes Standard targets significantly tighter buildings (~3 $m^3/h{\cdot}m^2$), making **mechanical ventilation essential rather than optional**.

[2] Building regulation (2022), Ventilation: Approved Document F - GOV.UK
[3] Titon (2025), Mechanical ventilation systems 101: Benefits, types, and installation tips

Whole-house vs partial upgrades

Whole-house retrofit:
MVHR delivers consistent, balanced ventilation

Partial retrofit
Alternatives such as Mechanial Extract Ventilation (MEV) or decentralized Mechanial Extract Ventilation (dMEV) may be more appropriate

MEV: a continuous centralized extract system serving multiple rooms

dMEV: individual intermittent or continuous extract fans installed in specific rooms

When alternatives may be better

Consider alternatives where:

- Airtightness remains relatively low
- Duct installation is constrained
- Budget or disruption is limiting

Key qualities of a good ventilation partner

Delivering MVHR successfully requires a capable and experienced partner.

Capability	What good looks like
Design capability	Designs aligned with Approved Document F airflow requirements
End-to-end support	Design, install, commissioning, and aftercare included
Product quality & certification	High performance systems compliant with UK standards
Installation support	Clear ducting strategies and install guidance
Compliance support	Ensures Part F, PAS 2035, and funding compliance
Aftercare	Filter maintenance guidance and system support
Retrofit expertise	Experience working in constrained existing properties

A strong ventilation partner helps ensure systems are **designed, installed, and perform correctly in real buildings**.

What good MVHR delivery looks like

1. Assess dwelling suitability and system selection

Assess whether MVHR is appropriate based on:

- Airtightness level
- Ability to install ductwork
- Property layout and constraints
- Extent of retrofit (whole-house vs partial)

Then specify the system based on dwelling size, occupancy, and airflow requirements, ensuring compliance with Approved Document F.

2. System selection and specification

- System specification based on dwelling size, occupancy, and airflow requirements
- Ensure compliance with Approved Document F ventilation rates
- Account for building layout and constraints

3. Installation best practice

Duct routing

- Short, direct runs
- Minimise bends and resistance
- Avoid poor routing which can increase noise and inefficiency

Unit location

- Accessible for maintenance
- Positioned to reduce noise and vibration

Airtightness alignment

- System performance depends on airtightness being achieved

4. Commissioning and balancing

- Systems must be tested and balanced
- Supply and extract airflows must be precisely matched

Commissioning is mandatory under Part F, with airflow rates measured and documented.
Failure here is one of the **biggest causes of complaints and underperformance**.

5. Handover to residents

Residents must be provided with:

- Clear operating instructions
- Maintenance guidance (e.g., filters)
- Explanation of continuous operation

MVHR systems are designed to run continuously – switching them off leads to indoor air quality issues and moisture risk.

Common pitfalls in MVHR retrofit

Pitfall	Impact
Poor airtightness	System cannot perform effectively
Bad duct routing	Increased noise and energy use
Lack of commissioning	Poor airflow and imbalance
Incorrect sizing	Over/under ventilation
No user guidance	Misuse or system turned off

Why these issues matter

Without proper delivery:

- Heat recovery benefits are lost
- Energy demand increases
- IAQ deteriorates
- Costly remedial works may be required

With correct delivery:

- Systems maintain healthy airflow
- Improve comfort and IAQ
- Reduce heating demand through heat recovery

Working effectively with project managers

What the supply chain can do	What project managers can do
Provide accurate installation data	Set expectations early
Capture photo evidence	Maintain communication
Flag issues early	Coordinate sequencing
Follow QA processes	Enforce QA and validation

Using good practice to manage risk

MVHR systems rely on **design, installation, and commissioning working together seamlessly**.

Good practice:

- Embeds checks at each stage
- Aligns with PAS 2035 and Part F
- Reduces risk of:
  - Mould and moisture issues
  - Non-compliance
  - Resident complaints

Even with regulation and certification, **quality is not guaranteed without strong delivery processes**.

Summary

MVHR is a **key solution for modern retrofit**, particularly as homes become more airtight.

When delivered correctly, it:

- Maintains indoor air quality
- Reduces moisture and mould risk
- Recovers heat to improve energy efficiency
- Supports compliance with evolving regulations

For the supply chain, success depends on:

- Choosing the **right system for the property**
- Following **best practice design and installation**
- Ensuring **robust commissioning and handover**
- Working collaboratively across delivery teams

Embedding these principles ensures MVHR systems **perform as intended in real homes**, supporting high-quality retrofit outcomes and better resident experiences.

Resources

Podcast: All RISE podcasts are available here.

Podcast: "Mastering data management with Energy Saving Trust" available here.

Masterclass: All RISE masterclasses are available here.

Masterclass "Women in retrofit" available here.

Advice pack: All RISE advice packs available here.

Advice pack: "External Wall Insulation – Installation Phase" available here.