

Why is Professional Design of MVHR Systems Critical?

Professional design of a Mechanical Ventilation with Heat Recovery (MVHR) system is absolutely critical because it ensures the system is precisely tailored to your building's unique requirements, guaranteeing optimal performance, energy efficiency, and a quiet, healthy indoor environment. It prevents common issues like insufficient airflow, excessive noise, or mould growth that arise from a poorly planned or undersized system.

The design and installation of an MVHR system are not merely an afterthought; they are a fundamental engineering process. A successful MVHR system relies on a seamless, three-stage approach: a bespoke design, a meticulous installation, and a final, professional commissioning. The pitfalls of a 'supply-only' contract model highlight exactly why this integrated process is essential, as it fragments responsibility and leads to predictable failures.

The Core of an Effective MVHR System

A mechanically ventilated home is a sophisticated, interconnected environment. Its performance is intrinsically linked to the building it serves, particularly in modern, airtight properties. Therefore, the design process is paramount, beginning with detailed airflow calculations to determine each space's ventilation needs. These calculations must be precise, considering the number of inhabitants and the room layout to ensure that both supply and exhaust air flows are balanced and equal.

- **Airflow Rates:** If the air flow rate is too low, it can lead to high humidity and a concentration of pollutants. Conversely, an excessively high flow rate can cause rooms to dry out during the heating season and needlessly increase electricity consumption from the fans. A professional design strikes the perfect balance, ensuring adequate air exchange without waste or discomfort.
- **Ductwork Routing:** A well-prepared design meticulously plans the routing of ventilation ducts. This is crucial to avoid clashes with other building systems, especially when ducts are concealed within ceilings or flooring. Proper routing also minimises pressure drops, which can compromise the system's efficiency and increase fan noise. Flexible ducts, for instance, are prone to crushing and generating significant pressure resistance, making them unsuitable for long sections. A good design will specify robust, rigid ducting for optimal performance and hygiene.
- **Heat Recovery Unit Selection:** The MVHR unit must be carefully selected to match the calculated air flow rate and the system's static pressure. Choosing an undersized unit means it will not be able to perform its function adequately, leading to insufficient airflow in rooms furthest from the unit. A professional design will ensure the unit's capacity has a reserve, allowing for a 'boost mode' for quick ventilation when required, all while keeping noise levels to a minimum.

The Dangers of a Fragmented Approach

The most significant risk in MVHR implementation is the fragmentation of responsibility, which is the hallmark of the supply-only model. In this scenario, one company supplies the components, and a separate contractor installs them. When problems inevitably arise—such as a noisy system, lingering odours, or persistent condensation—there is a predictable cycle of blame. The supplier claims the product is fine, the installer says they just followed a flawed plan, and the client is left with a

dysfunctional system and no one to hold accountable.

General building contractors, while skilled in their trade, often lack the specialised knowledge required for a complex MVHR system. This can lead to a host of common, and costly, mistakes:

- **Improper Material Selection:** A general contractor may use cheaper, flexible ducting, which is prone to damage and leaks, instead of the rigid semi-rigid or galvanised steel specified in a professional design.
- **Installation Errors:** Unsealed ducting, incorrect mounting of the unit, and improper condensate drainage are frequent issues that can lead to system failure, water leaks, and mould growth.
- **Lack of Commissioning Expertise:** The final and most critical stage, commissioning, is often overlooked or performed incorrectly. It requires specialised, calibrated equipment that general contractors rarely own or know how to use. Commissioning ensures the system is balanced, and the airflow rates are adjusted to meet design specifications, guaranteeing the unit operates efficiently and quietly.

These failures are not isolated incidents but rather the predictable outcome of a systemic problem rooted in the fragmented approach of a supply-only contract. Ultimately, the perceived initial saving is a false economy, as the cost of remediation—which may include unit replacement or extensive ductwork repairs—far outweighs the savings.

By investing in a single, integrated provider who manages the entire process from design to commissioning, you safeguard your home and ensure your MVHR system delivers on its promise of a healthy, efficient, and comfortable living environment.