



# Mechanical Ventilation Systems Installers Guide



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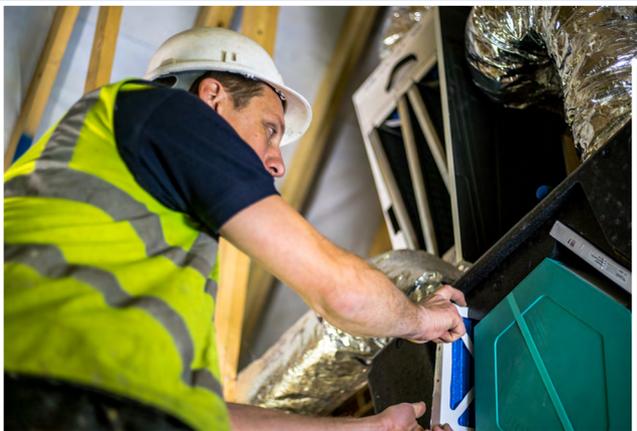
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## Introduction

Titon products are manufactured to meet demanding European Standards and are rigorously tested prior to sale so failures as a result of manufacturing defects are extremely rare. The great majority of complaints that Titon Engineers are called out to site to resolve are the result of installation or commissioning mistakes or the product being damaged by mishandling which are counter chargeable. Here we set out the most common mistakes that lead to complaints and a set of troubleshooting guides to help identify the cause of complaints.

Titon offer a comprehensive manufacturer's product guarantee but Titon are not responsible for installation or commissioning mistakes. Always follow the detailed guidance contained in the product manual supplied with all Mechanical Extract Ventilation and Heat Recovery Ventilation products.

Titon also strongly recommends reading the guidance set out in the Domestic Ventilation compliance Guide that accompanies Part F of the Building Regulations, and Chapter 8.3 of the NHBC Technical Standards 2016 which should be familiar to all professional domestic ventilation systems installers.

Titon product handbooks including links to further guidance can be found at [www.titon.co.uk](http://www.titon.co.uk).

## Online Searches

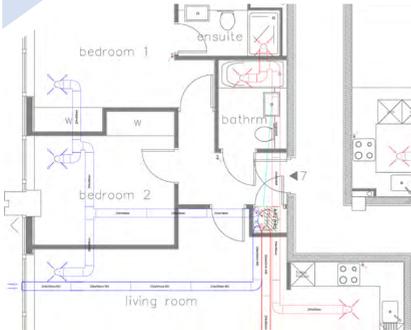
- Building Regulations Approved Document F (Ventilation)
- Domestic Ventilation Compliance Guide (accompanies the above)
- NHBC Technical Standard 8.3 (2016): Mechanical Ventilation with Heat Recovery



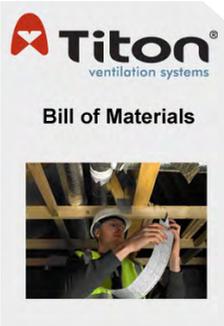
# The Top Ten Installation Mistakes

## 1. Not using or following a professional system design (poor performance, excessive noise)

Ventilation Systems must be professionally designed to ensure they meet the required performance standards and work quietly and efficiently. The System Designer should provide detailed drawings showing the layout, all product selections and the design performance characteristics. Any variation from the design provided must be approved by the System Designer to ensure performance is not adversely affected. If you choose to not to use a professional design or to vary from a design provided you may be held responsible for any subsequent performance issues.



Ventilation system design drawing



## 2. Excessive use of flexible ducting (poor performance, excessive noise)

Even when it is installed properly, flexible ducting has a much greater resistance to airflow than smooth bore rigid ducting and its use must be avoided where possible. Where it is used, for example, to connect the MVHR unit to the solid ducting to allow for slight differences in alignment. We recommend it should only be used in short straight lengths pulled taut to a maximum length of 300mm.



Excessive use of flexible ducting damaged, crushed, twisted and not pulled taut causing a blockage or excessive resistance to airflow

### 3. Not adequately sealing or supporting ducts (poor performance, excessive noise)

All duct joints must be made airtight and properly sealed by either using a proprietary fitting with an integral rubber seal or by applying a suitable non-hardening sealant. Duct tape alone is not suitable and will not provide a long term seal. Ducting should be supported to ensure it will remain intact and not cause joint stress.



Silicone sealed and bracketed



Titon Self Seal Connector

### 4. Using the wrong type of terminals (poor performance, excessive noise)

There are many products sold as ventilation terminals that are totally unsuitable for systems ventilation as they will strangle airflow or allow water ingress. Only use the terminals detailed by the System Designer that have been chosen because they meet specific performance standards for use with continuously running mechanical ventilation systems. Terminals fitted with an insect guard, ridge ventilation terminals, SVP or flue terminals are normally unsuitable.



Inappropriate wall terminals can increase resistance, causing excessive noise from the MVHR unit

## 5. Not insulating ducting (excess moisture, water leaks)

When warm air comes in to contact with a cold surface it produces moisture. Moisture may form on the inside or the outside of a duct and may collect in the ducting system and unit or damage surroundings. All ducting and duct accessories connected to the outside air, or running outside the heated space, must be continuously insulated and the insulation must have a vapour barrier to prevent it from absorbing the moisture. Any vertical ducting carrying the extracted air to the outside may also require an additional inline condensation trap. The smallest of gaps in the insulation can result in water damage.



Ductwork soaked and dripping



Ductwork with no insulation

## 6. Wiring a ventilation unit incorrectly (unit not running, not responding to controls)

Your product may use zero or low voltage switching circuits and accessories that can be easily damaged by the application of high (mains) voltage or can be affected by induced power when running cables together with higher voltages. Always ensure the product handbook instructions have been followed before making any connections.



Blown PCB controller



## 7. Not installing user controls or adjusting humidity or timer settings (excessive noise - unit not boosting or boosting automatically)

Most ventilation systems require electrical controls and accessories to be installed. All controls should be easily accessible and be clearly labelled. For example, ventilation systems boost and SUMMERboost® controls should be conveniently located and made obvious to the user. Some units also include automatic functions that may need adjustment such as timer or humidity settings. Always ensure the product handbook instructions have been followed.



Titon auralite® status indicator



Titon SUMMERboost® switch

## 8. Not commissioning the system correctly (excessive noise - unit not boosting)

All ventilation systems require on-site commissioning and performance checks to ensure Building Regulations compliance. Commissioning includes setting the unit speeds and using an airflow meter to set the individual room airflow rates to achieve the rates set out by the system designer. It may also include adjusting other settings such as overrun timers and humidity controls. The commissioning engineer should record the installed performance of the ventilation system (forms are provided in the Domestic Ventilation Compliance Guide that accompanies Part F of the Building Regulations).



Balancing MVHR settings



Using a cone anemometer

## 9. Not checking the MVHR unit filters (poor performance)

We recommend that MVHR filters are checked prior to commissioning and handover to the owner as building work produces high levels of contaminants that may enter the ventilation system and block filters. All MVHR units require servicing and filter replacement, the recommended service interval is one year, or less in where ambient pollution levels are higher such as in urban environments.



Titon G3 HRV filter



Titon G4 HRV filter

## 10. Boxing in the ventilation unit or locating out of normal reach

Ventilation units must remain safely accessible to allow commissioning adjustments, maintenance, repair and end of life replacement. Units must not be “boxed in” and the product handbook includes detailed guidance on access requirements. Any serviceable appliance located in a loft cavity must have safe floor boarding directly from the access hatch to the repair area and provision for adequate lighting to meet with health and safety at work regulations. There are also statutory access requirements where units are installed out of reach.



Cupboard with insufficient space in front of the unit to allow maintenance or repair



An accessible MVHR unit

## Troubleshooting Checklists

### FAQ's: Ventilation System Not Working

Check the Ventilation Unit is supplied with power. Check the mains circuit is live, check the fuse at local isolator and that each wire core is making contact with terminal at outlet point.	
Turn off the power to the Ventilation Unit at the local isolating. Carry out appropriate electrical safety checks and taking effective precautions ensure that the Ventilation Unit has been wired in accordance with the Product Handbook requirements. Ensure that no other power source has been connected to boost circuits as this will damage the electrical components within the unit and may cause the unit not to run, not to boost or to boost constantly.	
(MVHR Only) Ventilation Units are fitted with Automatic Frost Protection Systems that may automatically reduce the supply air rate during periods where temperatures drop below freezing especially for long periods and may activate particularly if home has been unheated for more than 24hrs.	
(MVHR Only) Some Ventilation Units include a Summer Mode facility that allows the supply air fan to be turned off by the occupant using an external switch, check if switch is installed at PCB connections and activated or that PCB terminals have been used in error to connect to a circuit intended for an alternative use.	
Correctly installed product may be running quietly and efficiently making it difficult to hear the fan(s), also the low airflow rates required in smaller dwellings may not always be obvious without close inspection of the room air valves. Also, in some circumstances there may not be a noticeable increase in sound levels between normal and boost speeds.	
Check the unit has been commissioned and set to operate at the appropriate speed settings in accordance with the Dwelling Commissioning Rates specified by the System Designer.	
Check the commissioning control is in the "run" position (MVHR – the sliding switch is in central position) (CME – the link is on one pin and not making the circuit and not still connected to both pins) and check no other cables normally attached to the PCB have been disconnected accidentally.	

### FAQ's: Excessive Noise From The Ventilation System

Turn off the power to the Ventilation Unit at the local isolating. Carry out appropriate electrical safety checks and taking effective precautions ensure that the Ventilation Unit has been wired in accordance with the Product Handbook requirements. Ensure that no other power source has been connected to boost circuits as this will damage the electrical components within the unit and may cause the unit not to run, not to boost or to boost constantly.	
Ensure boost control circuit opens/closes as required at PCB connections.	
Check the timer overrun setting (CME adjustable between 0 – 30 minutes, MVHR 0 - 60 mins).	
(MVHR Only) Some Ventilation Units are fitted with Constant Volume fans that automatically compensate for an increased backpressure to maintain airflows by increasing speed. These fan types will also react by increasing to maximum speed if ducting systems are blocked which can be determined by checking if the fans slow down as pressure is released by opening the Ventilation Unit front cover.	
Some Ventilation Units are fitted with integral humidity sensors to boost the system automatically, check humidity settings as adjustment may be required.	

## FAQ's: Excessive Noise From The Ventilation System (Continued)

(MVHR Only) Some Ventilation Units are fitted with an automatic SUMMERboost® facility that may activate as temperatures increase. Check link is present at terminals on PCB if unused or check to ensure that switch has not been closed and SUMMERboost is operational.	
(MVHR Only) Turn off the power supply, remove the front cover (refer to product manual) and check the fans for any obstructions caused by debris, they must rotate freely. In extreme cases where the fans have been subjected to mishandling or debris damage it may result in the fan assemblies running out of balance. Check all duct ports are free from debris, particularly those on the top of vertically mounted units.	
Check the unit has been commissioned and set to operate at the appropriate speed settings in accordance with the Dwelling Commissioning Rates specified by the System Designer.	
Check the commissioning control is in the "run" position (MVHR – the sliding switch is in central position) (CME – the link is on one pin and not making the circuit and not still connected to both pins) and check no other cables normally attached to the PCD have been disconnected accidentally.	
(MVHR Only) Turn off the power supply, remove the front (refer to product manual) and check the filters (if fitted) are clean and not blocked by debris. Make sure that there is no debris (such as plaster or masonry dust) within the unit's internal airways leading to the fans.	
Check the duct cross-sectional dimensions comply with the System Design specifications (usually a minimum of ø125mm or 204 mm x 60mm rectangular for MVHR systems and for the main exhaust duct to outside for CME systems).	
Check the ductwork for blockages. Any restriction in any part of the system will create a resistance to air flow and noise.	
Check ANY FLEXIBLE DUCTING used does not exceed the lengths specified by the System Design (normally 300mm maximum) and that it is pulled taut and straight. Flexible ducting is highly resistive to airflow and will easily crease or distort causing a blockage.	
Check all ducts, joints and accessories are leak free. All joints must be fully sealed using a proprietary product such as the Titon Self Seal Coupler or by using a flexible joint sealant. Duct tape alone is not sufficient and will not provide an effective long term seal.	
Check that no additional ducting, bends, tee pieces or other accessories have been used over and above that specified in the System Design. Any change to the specified design such as a change in duct size or layout may have a detrimental impact on system performance and increase the fan load resulting in the need to increase fan speed and the unintentional creation of excessive noise.	
Check the supply and extract diffusers are appropriately fitted in accordance with the air flow direction required, and they are not closed off. Extract and supply diffusers differ from each other and must be used appropriately.	
Check the air velocities at the terminals meets with the specified requirement System Design requirements. Check static pressure at fan inlets and outlets with a manometer (and Pitot tube if available).	
Check the Ventilation Unit installed has the capacity and performance specified by the System Designer and it is not undersized.	

## FAQ's: Insufficient Airflow

Check the Ventilation Unit is supplied with power. Check the mains circuit is live, check the fuse at local isolator and that each wire core is making contact with terminal at outlet point.	
Turn off the power to the Ventilation Unit at the local isolating. Carry out appropriate electrical safety checks and taking effective precautions ensure that the Ventilation Unit has been wired in accordance with the Product Handbook requirements. Ensure that no other power source has been connected to boost circuits as this will damage the electrical components within the unit and may cause the unit not to run, not to boost or to boost constantly.	
Ensure boost control circuit opens/closes as required at PCB connections.	
(MVHR Only) Ventilation Units are fitted with Automatic Frost Protection Systems that may automatically reduce the supply air rate during periods where temperatures drop below freezing especially for long periods and may activate particularly if home has been unheated for more than 24hrs.	
(MVHR Only) Some Ventilation Units include a Summer Mode facility that allows the supply air fan to be turned off by the occupant using an external switch, check if switch is installed at PCB connections and activated or that PCB terminals have been used in error to connect to a circuit intended for an alternative use.	
Correctly installed product may be running quietly and efficiently making it difficult to hear the fan(s), also the low airflow rates required in smaller dwellings may not always be obvious without close inspection of the room air valves. Also, in some circumstances there may not be a noticeable increase in sound levels between normal and boost speeds.	
Check the unit has been commissioned and set to operate at the appropriate speed settings in accordance with the Dwelling Commissioning Rates specified by the System Designer.	
Check the commissioning control is in the "run" position (MVHR – the sliding switch is in central position) (CME – the link is on one pin and not making the circuit and not still connected to both pins) and check no other cables normally attached to the PCB have been disconnected accidentally.	
(MVHR Only) Turn off the power supply, remove the front (refer to product manual) and check the filters (if fitted) are clean and not blocked by debris. Make sure that there is no debris (such as plaster or masonry dust) within the unit's internal airways leading to the fans.	
Check external terminals for fresh air intake and stale air extract, such as air bricks, grilles or roof mounted terminals, are free of debris and are of the correct size, adequately mounted so as not to impede air flow. Insect screens are not required and are highly resistive to airflow.	
Check the duct cross-sectional dimensions comply with the System Design specifications (usually a minimum of $\varnothing 125\text{mm}$ or $204\text{ mm} \times 60\text{mm}$ rectangular for MVHR systems and for the main exhaust duct to outside for CME systems).	
Check the ductwork for blockages. Any restriction in any part of the system will create a resistance to air flow and noise.	
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Check all ducts, joints and accessories are leak free. All joints must be fully sealed using a proprietary product such as the Titon Self Seal Coupler or by using a flexible joint sealant. Duct tape alone is not sufficient and will not provide an effective long term seal.	

## FAQ's: Insufficient Airflow (Continued)

Check that no additional ducting, bends, tee pieces or other accessories have been used over and above that specified in the System Design. Any change to the specified design such as a change in duct size or layout may have a detrimental impact on system performance and increase the fan load resulting in the need to increase fan speed and the unintentional creation of excessive noise.	
Check the air velocities at the terminals meets with the specified requirement System Design requirements. Check static pressure at fan inlets and outlets with a manometer (and Pitot tube if available).	
Check the Ventilation Unit installed has the capacity and performance specified by the System Designer and it is not undersized.	
Check the ducting connections to the Ventilation unit have been correctly fixed to the appropriate spigots. Do not recirculate stale extracted air by confusing the duct connections (MVHR Only).	
Ensure the room air valves are sited appropriately. Extraction should be close to the source of moisture but not directly over cooking appliances such as hobs. Supply air (MVHR Only) should be located so as to provide a flow of air across the room towards the door and not short circuit.	
Ensure all kitchens and wet rooms have extract air valves.	
(MVHR Only) Ensure all habitable rooms have supply air valves.	
Ensure all internal doors have undercuts (normally 10mm above the finished floor surface) to allow air to circulate.	

## FAQ's: Ventilation System Constantly Boosting

Turn off the power to the Ventilation Unit at the local isolating. Carry out appropriate electrical safety checks and taking effective precautions ensure that the Ventilation Unit has been wired in accordance with the Product Handbook requirements. Ensure that no other power source has been connected to boost circuits as this will damage the electrical components within the unit and may cause the unit not to run, not to boost or to boost constantly.	
Ensure boost control circuit opens/closes as required at PCB connections.	
Check the timer overrun setting (CME adjustable between 0 – 30 minutes, MVHR 0 - 60 mins).	
(MVHR Only) Some Ventilation Units are fitted with Constant Volume fans that automatically compensate for an increased backpressure to maintain airflows by increasing speed. These fan types will also react by increasing to maximum speed if ducting systems are blocked which can be determined by checking if the fans slow down as pressure is released by opening the Ventilation Unit front cover.	
Some Ventilation Units are fitted with integral humidity sensors to boost the system automatically, check humidity settings as adjustment may be required.	
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## FAQ's: Water Leaks From Ventilation Fan Unit

Ensure all ducting connected to the outside air and/or any ducting running through unheated space (including the inner parts of terminals or around other duct accessories) are continuously insulated and the insulation has a continuous vapour barrier and that it leaves no uninsulated surfaces visible.	
(MVHR Only) Check that vertical exhaust ducts connected to the outside air are fitted with an appropriate condensate trap to prevent moisture running back in to the Ventilation Unit.	
(MVHR Only) Check that all condensate drainage pipework running through unheated space is insulated against freezing and check that the drain pipework is sealed to a suitable waste water trap and there is a sufficient angle to allow run off.	
Check to ensure horizontal ducts fitted to wall terminals are angled to allow a slight fall for run off to the outside.	
(MVHR Only) Check that the Ventilation Unit is level in both directions.	

## FAQ's: The Ventilation System is Ineffective

Check the Ventilation Unit is supplied with power. Check the mains circuit is live, check the fuse at local isolator and that each wire core is making contact with terminal at outlet point.	
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Ensure boost control circuit opens/closes as required at PCB connections.	
Check the timer overrun setting is adjusted (as required to clear excesses of moist air) (CME adjustable between 0 – 30 minutes, MVHR 0 - 60 mins).	
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## FAQ's: The Ventilation System is Ineffective (Continued)

Check external terminals for fresh air intake and stale air extract, such as air bricks, grilles or roof mounted terminals, are free of debris and are of the correct size, adequately mounted so as not to impede air flow. Insect screens are not required and are highly resistive to airflow.	
Check the air velocities at the terminals meets with the specified requirement System Design requirements. Check static pressure at fan inlets and outlets with a manometer (and Pitot tube if available).	
Check the Ventilation Unit installed has the capacity and performance specified by the System Designer and it is not undersized.	
Check the ducting connections to the Ventilation unit have been correctly fixed to the appropriate spigots. Do not recirculate stale extracted air by confusing the duct connections (MVHR Only).	
Ensure the room air valves are sited appropriately. Extraction should be close to the source of moisture but not directly over cooking appliances such as hobs. Supply air (MVHR Only) should be located so as to provide a flow of air across the room towards the door and not short circuit.	
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