



Building Regulations 2010:
What it means to you.



Where are we going?

Ongoing changes to the ADF (Approved Document F) will bring about several differences to the way in which we use Ventilation in both new builds and renovation projects.

This guide will help you to judge how those changes affect you.



In 2006 the Government announced a 10 year timetable towards a target of Zero carbon homes by 2016.

The Department for Communities and Local Government launched the Code for Sustainable Homes in 2007, this is based on 9 categories, these include Energy and CO₂ Emissions and Health and Wellbeing. Points are awarded for each of the 9 categories resulting in an overall Code Level being awarded. Whilst the requirement to give buyers of new houses a sustainability certificate has recently been suspended, the Code for Sustainable Homes is the Government's national sustainable standard for new homes.

2010

25% Reduction in
Carbon Emissions

2013

44% reduction in
Carbon Emissions

2016

100% reduction in
Carbon Emissions

**Zero Carbon
Homes**

Revised Building Regulations 2010

1st October 2010 saw a number of changes to Building Regulations as energy efficiency requirements of **Part L1** are raised, **Part F1 ventilation** is included in these changes to ensure energy efficiency is matched with good indoor air quality:

The relevant documents are:

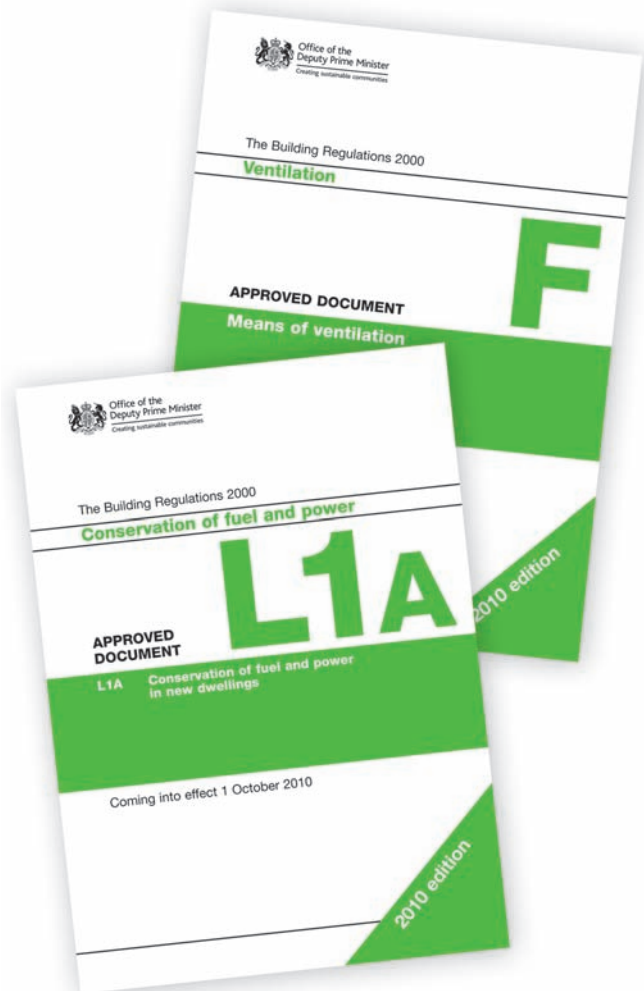
- **F1 Means of ventilation 2010**
- **L1A Conservation of fuel and power in new dwellings 2010**
- **L1B Conservation of fuel and power in existing dwellings 2010**

There are also two new second tier documents that must be complied to:-

- **Domestic Building Services Compliance Guide 2010**
- **Domestic Ventilation Compliance Guide 2010**

The addition of the Domestic Building Services Compliance Guide provides detailed guidance of the persons responsible for both installing and designing fixed building services.

Within this document mechanical ventilation specification is referred to in relation to its energy efficiency, the document stipulates a minimum standard of efficiency for all Mechanical ventilation systems.



Domestic Building Services Guide Recommended standards for mechanical ventilation	
Fan Power SFP levels	<p>Specific Fan Power levels should not exceed:</p> <ul style="list-style-type: none"> • 0.5 W/l/s for intermittent extract ventilation systems • 0.7 W/l/s for continuous extract ventilation systems • 0.5 W/l/s for continuous supply ventilation systems • 1.5 W/l/s for continuous supply and extract heat recovery systems
Controls	<p>Domestic Ventilation Compliance Guide</p> <p>Continuously running mechanical ventilation units require manual controls capable of switching fan speeds, local to the area being served i.e. Kitchen, bathroom.</p> <p>This document dictates that heat recovery continuous ventilation be no less than 70% efficient.</p>

Why we need to Ventilate
<ul style="list-style-type: none"> • To control excess humidity • To provide adequate outside air for breathing • To remove pollutants including odours from the premises • To remove moisture from the air created by washing and cooking • Dilute Allergens found in the home • To remove CO₂ in the atmosphere created by humans and pets • During a buildings design, consideration is taken to both intended ventilation as well as natural infiltration • Infiltration will occur through leakage points throughout the building's structure, however with the increase in tighter build dwellings the need for purpose built ventilation is increasing

Ventilation Rates

Within the regulation changes ventilation is referred to under four standard systems.

- System 1:** Background Ventilators and Intermittent Extract Fans
- System 2:** Passive Stack Ventilation
- System 3:** Continuous Mechanical Extract Ventilation
- System 4:** Continuous Supply and Extract Mechanical Ventilation with Heat Recovery

Each system is impacted by the ever increasing target of tighter sealed homes reducing air permeability. These properties are designed to minimise the uncontrolled infiltration element of air movement resulting from unintended leaks which result in waste energy.

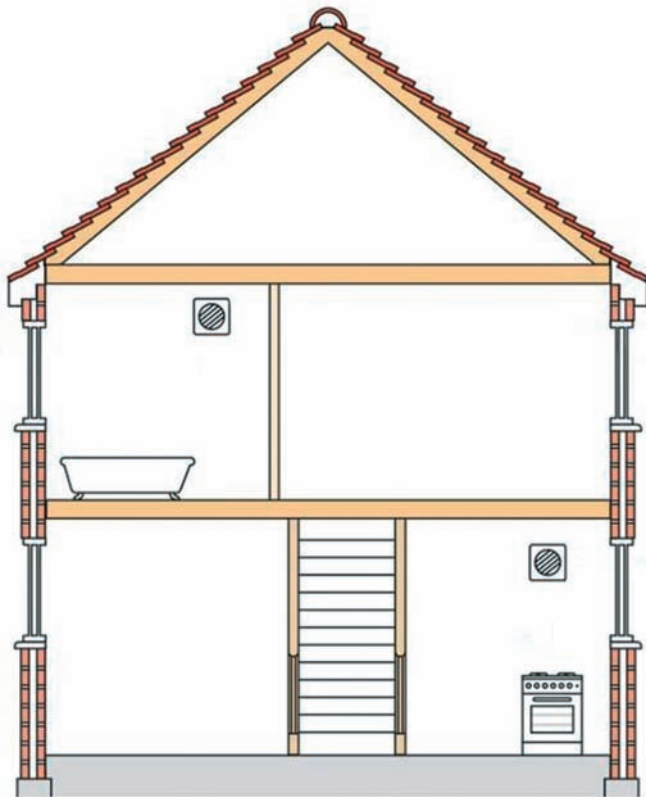
Part L1A has increased the number of properties which should be pressure tested within a new development to 3 units of each dwelling type or 50% of all instances, whichever is the less.

Since the resulting values obtained by testing and proving the tightness of the dwelling can save the need for other costly measures being taken, this is becoming a favoured practice. Homes are commonly achieving air tightness of 3m³/(h.m²) @ 50Pa whereas a default value of 15m³/(h.m²) is attributed to homes where the builder opts not to test.

The essential thing is that tightly sealed homes MUST be ventilated in a controlled manner to ensure wellbeing of the occupants and protect the fabric of the building.

System 1, Intermittent Fans and Background Ventilators:

If the designed permeability is tighter than $\leq 5\text{m}^3/(\text{h.m}^2)$ @ 50Pa, the equivalent area of background ventilators is increased e.g. A 3 bed house 71-80m² increase from 35,000mm² to 50,000mm² (Average 40%).



Example:

A 4 bedroom property = 95m²

There are 9 windows

So we have 65.000mm² equivalent area resulting in 7222mm² per window

For **New Build**, intermittent extract fans including extraction cooker hoods must be **commissioned and airflows measured** within 5 days of completion where full plans or a building notice has been submitted or 30 days in other cases.

For new build under "System efficiencies" it requires that the service should be at least as effective as the worst acceptable value listed.

Ensuring that energy efficiency is addressed whichever system of ventilation is used, the new Domestic Building Services Guide accompanying Part L, states for the first time the maximum specific fan power (SFP) for intermittent extract fans, this relates to new and existing domestic buildings where building control approval is required.

This states a maximum specific fan power of 0.5 W/l/s for intermittent fans.

What can **Xpelair** offer to make this easy



**Premier Ultra
CF20/40 CV; SFP
0.45 W/I/s**

Premier CF20/40T CV - MAX SFP 0.45 W/I/s (Suitable for kitchen extract and utility rooms)

The Premier CF20/40T CV constant volume model to guarantee controlled air movement, features UltraEC technology offering reduced energy use, a choice of installed performances and a longer life than a conventional AC motor.

The fan is designed to comply with the requirements of Part F1 to provide Intermittent Ventilation in Kitchens, Utility rooms, Bathrooms and Sanitary Rooms, Humidity Controlled Intermittent Ventilation. These units can also be used as part of a continuous decentralised extract system.

Premier DC2/DC3 - MAX SFP 0.37 W/I/s (Suitable for intermittent extract for WC's and bathrooms)

The new Premier Ultra DC2/DC3 has been specially designed for through the wall and ducted applications, suitable for internal bathrooms, toilets and other small rooms.

Finished in white, the DC2/DC3 can be flush or surface mounted. A simple to remove front cover and clip-off impeller and easy fit motor cassette feature allows for easy maintenance and also assists in a quick and simple installation. The DC2/DC3 incorporates a constant trickle feature, which means when the unit is installed in every wet area of the property it can be classed as a wholehouse system, allowing it to comply with current Building Regulations for either intermittent or continuous extract.



**Premier Ultra DC2 and
DC3; SFP 0.37 W/I/s**

Minor Works

When a project is classed as "Minor Works" it is not necessary to notify building control providing that testing and adjustment is not possible i.e. Factory set or an existing extract fan is being replaced. This means **WE CAN OFFER LIKE FOR LIKE REPLACEMENTS!!**

If it's a replacement and classified as Minor works why not use



WX range
For kitchen installations



DX100B range
Bathrooms



Slimline
For kitchen and bathroom



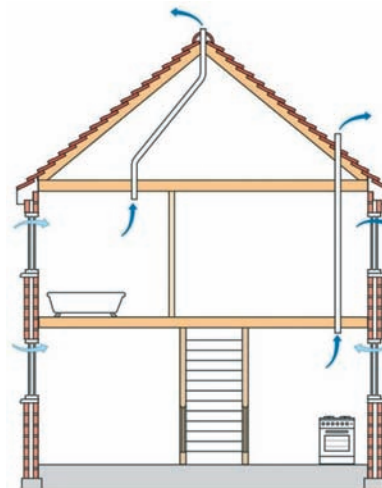
GX range
For kitchen installations

System 2, Passive Stack Ventilation:

Similarly to intermittent extract units, if the designed air permeability is tighter than $\leq 5\text{m}^3/(\text{h.m}^2)$ @ 50Pa then the same increase in background ventilation is required (Roughly 40%).

You can **NO** longer use 100mm dia in the utility rooms and bathrooms **NOR** can you use 80mm duct in sanitary accommodation. **ALL DUCTING MUST NOW BE 125MM.**

New builds using Passive Stack are required to **commission** the unit and notify building control.

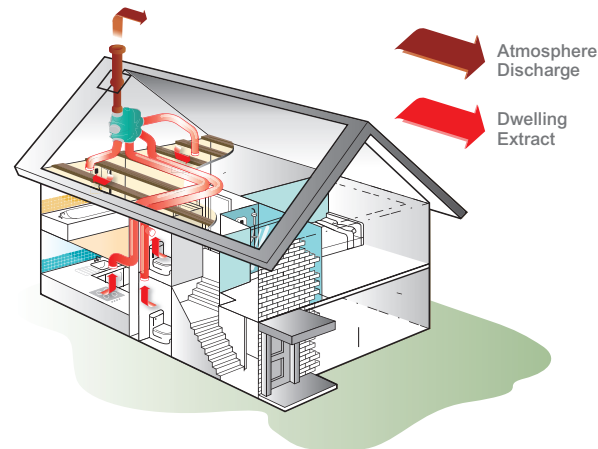


System 3, Continuous Mechanical Extract:

Continuous mechanical ventilation can be formed in one of two ways. A **Centralised** system where one unit is situated in either the loft/wall or floor space and then ducted throughout the property to all necessary wet rooms.

Alternatively a **Decentralised** system can be used. This is where continuously running extract fans are located in all wet rooms and background ventilators are fitted in all habitable rooms throughout the property.

Continuous mechanical extract systems where build permeability is tighter than $\leq 5\text{m}^3/(\text{h.m}^2)$ @ 50Pa there is **NO INCREASE** in the requirement for background ventilators, however, where the building design permeability is leakier than $5\text{m}^3/(\text{h.m}^2)$ @ 50Pa the need for background ventilators is removed altogether, relying on infiltration to provide the make up air.



IF design = $\leq 5\text{m}^3/(\text{h.m}^2)$ @ 50Pa then 2500mm² background ventilator is required in every habitable room



BUT if design = $> 5\text{m}^3/(\text{h.m}^2)$ @ 50Pa then background ventilators are no longer required

Within the new changes to Part F the regulations now require the end user to be provided with full information on the function and usage of the unit as well as all essential contact information. In Section 4.48 on page 18 of Approved Document F it stipulates that in new and existing dwellings the information pack should also include a checklist with airflow measurements and commissioning data.

The Domestic Ventilation Compliance Guide requires that manual controls which enable the boost setting to be selected should be local to the room being ventilated and not have an off function which may lead to then being used intermittently.

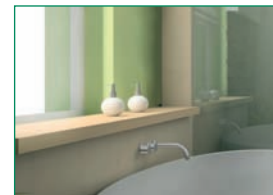
Xpelair have a range of controllers and sensors to suit both MEV and MVHR systems along with tamper proof RegulAir individual room ventilation valves.



Kitchen



En-suite



Bathroom

A key change in the development of the building regulations for 2010 is the focus on onsite installation and commissioning. This development is to confirm ventilation as a **controlled service**.

When installing centralised continuous mechanical ventilation systems for new builds including extensions, the unit will require **commissioning with airflow rates being tested in each room**.

All System 3 ventilation installations require commissioning and notification to building control. MEV must not exceed the new recommended Domestic Building Services Guide standard for mechanical ventilation of ≤ 0.7 W/l/s.



Noise from continuously running systems has moved up the agenda and the document discusses the need for careful design and specification of quieter products whilst minimising the disturbances to people outside the building as well.

The document suggests the following sound power levels where normally continuously running systems should not exceed these levels:

Bedrooms/Living Rooms

An upper limit of 30dB(A) weighted sound power level

Kitchens/Bathrooms

An upper limit of 35dB(A) weighted sound power level

Key features when using MEV ventilation systems

All ventilation systems are required to be commissioned

Airflow testing on systems where notice is required is in new builds only

All homeowners should be supplied with full information on both maintenance and use

Xpelair makes it simple

Xpelair's Xplus 2 (AC) has an SFP of 0.31-0.44 W/l/s & 3 Speeds



The Xplus 2 is a high performing central extract system designed to continuously extract stale, moist air from all wet areas, such as kitchens and bathrooms.

The unit is primarily used in domestic applications but can also be used for commercial applications, where continuous extract is required.

The multi-spigot design offers the installer greater flexibility when choosing where to site the unit and also due to the spigot configuration, allows any ducting to be connected from any direction, therefore reducing airflow restriction and noise.

The Xplus 2 EC Low energy has an SFP of 0.2 W/l/s



Don't forget this unit is SAP Appendix Q Listed



Technical Data

Exhaust Terminal Configuration	Fan Speed Setting	Specific fan power (W/l/s)	EST Best Practice Performance Compliant
Kitchen + 1 additional wet room	100% variable	0.21	Yes
Kitchen + 2 additional wet rooms	100% variable	0.19	Yes
Kitchen + 3 additional wet rooms	100% variable	0.19	Yes
Kitchen + 4 additional wet rooms	100% variable	0.21	Yes
Kitchen + 5 additional wet rooms	100% variable	0.24	Yes
Kitchen + 6 additional wet rooms	100% variable	0.27	Yes

Plus we also offer... The Xplus 250DC with an SFP 0.3 W/l/s



Xplus offers constant volume centrifugal performance with a long life UltraDC motor.

The installer selects the performance required - Xplus selects the speed necessary to meet the performance based on the system resistance.

This ensures a constant extract performance and lower energy use than AC equivalents.



Another SAP Appendix Q
Registered Unit

Technical Data

Exhaust Terminal Configuration	Fan Speed Setting	Specific fan power (W/l/s)	EST Best Practice Performance Compliant
Kitchen + 1 additional wet room	2	0.52	Yes
Kitchen + 2 additional wet rooms	2	0.27	Yes
Kitchen + 3 additional wet rooms	3	0.34	Yes
Kitchen + 4 additional wet rooms	5	0.50	Yes

MEV is shown here as a centralised system with a single fan ducted to the wet rooms however as stated above the requirements can also be met with a **DECENTRALISED** system using separate fans, providing the required rates are achieved and the fans operated continuously.

The Premier Ultra DC range of fans can be used in this way, inbuilt speed settings provide a range of performances suited to this application.



System 4, Mechanical Supply and Extract with Heat Recovery

Whole house heat recovery units recover heat from exhaust air and transfer to the supply air tempering the air entering the property.

Infiltration

When calculating ventilation rates for MVHR to Part F1 2006, an allowance was made to compensate for natural infiltration of air, in recognition of the move towards ever tighter built homes, the revised document removes the allowance for infiltration for buildings with a designed air tightness $\leq 5\text{m}^3/(\text{h.m}^2)$ @ 50Pa effectively increasing the ventilation rate, *this actually applies to buildings tighter than $3\text{m}^3/(\text{h.m}^2)$ since there is an arbitrary $+ 2\text{m}^3/(\text{h.m}^2)$ added to the average tested value for any untested buildings on a development.* A note of guidance is given for those properties with a designed tightness $\geq 5\text{m}^3/(\text{h.m}^2)$ where the infiltration allowance can still be deducted, this advises that care should be taken only to continue with the reduced rate if the builder has experience of building to designed standards of permeability.

System Booklet

As with other continuous mechanical ventilation systems, heat recovery units must be installed with a complete information pack provided for the occupier. This will need to include full instructions of use and maintenance along with all necessary contact details.

Commissioning

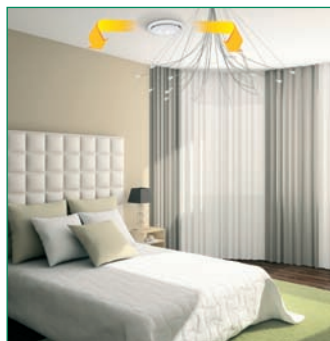
ALL MVHR installations **must** be commissioned, by qualified persons in compliance with the checklist provided in Part F with notification being sent to building control and a copy provided for end users.

Controls

With the change in The Domestic Ventilation Compliance Guide systems with supply and extract heat recovery now require that manual controls are localised to the rooms being served i.e. Kitchen/Hall

A new stipulation in the building regulations means that a control switch must **NOT** have an off option.

The maximum SFP for MVHR systems recommended in the Domestic Building Services Compliance Guide is 1.5 W/l/s.



Xpelair can help

Xpelair Xcell 150/200QV



SFP of 0.74 W/l/s (150QV)
SFP of 0.7 W/l/s (200QV)

Xpelair's Xcell 150QV range benefit from being SAP Appendix Q registered with an efficiency rating of 90%. The New Xpelair Xcell 200QV is one of a range of a new generation of CarbonLite energy efficient Mechanical Ventilation units with Heat Recovery (MVHR) designed for modern tight buildings.

It is ideal for apartments and houses, is suitable for handed installations and has a standard 600mm width. The Xcell 200QV has a lightweight EPP construction and can be wall or loft mounted.

The design combines a highly insulated EPP structural foam body with four 125mm Ø extract spigot connections with barbed connections and has a 90% energy efficient heat exchanger, EC ultra low energy multi-speed external rotor motors and long life G4 filters.

Inspection of the filters is easily achieved by removal of the rotating, easy fit access panel without switching the unit off.

Technical Data

	Exhaust Terminal Configuration	Fan Speed Setting	Specific fan power (W/l/s)	Heat exchange efficiency (%)	EST Best Practice Performance Compliant
Xcell 150QV	Kitchen + 1 additional wet room	100% variable	0.66	90	Yes
	Kitchen + 2 additional wet rooms	100% variable	0.68	89	Yes
	Kitchen + 3 additional wet rooms	100% variable	0.76	88	Yes
	Kitchen + 4 additional wet rooms	100% variable	0.87	87	Yes
Xcell 200QV	Kitchen + 1 additional wet room	100% variable	0.65	91	Yes
	Kitchen + 2 additional wet rooms	100% variable	0.60	91	Yes
	Kitchen + 3 additional wet rooms	100% variable	0.61	90	Yes
	Kitchen + 4 additional wet rooms	100% variable	0.68	89	Yes
	Kitchen + 5 additional wet rooms	100% variable	0.76	88	Yes
	Kitchen + 6 additional wet rooms	100% variable	0.84	87	Yes
	Kitchen + 7 additional wet rooms	100% variable	1.00	87	Yes

Xpelair Xcell 300QV



SFP of 0.6 W/l/s

Also Available

- The Xcell 350V EC BP is 93% efficient SAP Appendix Q registered and EST Best Practice compliant.

SFP of 0.8 W/l/s



- The Xcell 150U EC BP is 92% efficient with a SAP Appendix Q register.

SFP of 1.1 W/l/s



Technical Data

Exhaust Terminal Configuration	Fan Speed Setting	Specific fan power (W/l/s)	Heat exchange efficiency (%)	EST Best Practice Performance Compliant
Kitchen + 1 additional wet room	100% variable	0.66	91	Yes
Kitchen + 2 additional wet rooms	100% variable	0.65	91	Yes
Kitchen + 3 additional wet rooms	100% variable	0.68	90	Yes
Kitchen + 4 additional wet rooms	100% variable	0.81	89	Yes
Kitchen + 5 additional wet rooms	100% variable	0.89	88	Yes

Building Regulations Moving Forward

Installation and Testing - What happens next

2006 Units were installed by skilled craftsman but the performance data was never tested. Changes were made to Document L to include the SAP Appendix Q products within a properties SAP calculation.

2010 With increasing focus towards tighter building designs creating a requirement for specific ventilation flow rates, the 2010 regulation targets ventilation as a controlled service for the first time. Installation must be completed by a competent qualified individual with all results notified to building control. 2010 regulation changes require the supplier of ventilation units to provide the occupier with all relevant information including commissioning data, maintenance and guide of use.

2013 Will see even further changes as we move towards Zero Carbon homes and a 44% reduction in Carbon emissions. It is intended that by 2013 installers will be fully qualified to install domestic ventilation with the attention for these to be signed off and reported to BCB.

For future training on building regulations contact us on www.xpelair.co.uk



Let's make it easy!

2010. The main points to remember...

Air Flow Rates
Based on the permeability of the build
(Design: $\leq 5\text{m}^3/(\text{h.m}^2)$ @ 50Pa).

Localised Control Units
Localised controls must be supplied to areas subject to ventilating.

Building Commissioning and Installation
All units in major work new builds to be commissioned to ensure air volumes are achieved and building control notified.

Maintenance and Guide to Use Literature
The end user must receive a full guide to use and maintenance along with all necessary contact details.

Useful Breakdown

Extract ventilation rates (as Table 5.1a Approved Document Part F)

Room	Intermittent extract	Continuous extract	
	Minimum rate	Minimum high rate	Minimum low rate
Kitchen	30 l/s adjacent to hob; or 60 l/s elsewhere	13 l/s	Total extract rate should be at least the whole dwelling ventilation rate given in Table 5.1b
Utility room	30 l/s	8 l/s	
Bathroom	15 l/s	8 l/s	
Sanitary accommodation	6 l/s	6 l/s	

Whole dwelling ventilation rates (as Table 5.1b Approved Document Part F)

Number of bedrooms in dwelling	1	2	3	4	5
Whole dwelling ventilation rate a, b (l/s)	13	17	21	25	29
Notes: a. In addition, the minimum ventilation rate should not be less than 0.3 l/s per m ² of internal floor area (This includes all floors, eg, a two storey building add the ground and first floor areas). b. This is based on two occupants in the main bedroom and a single occupant in all other bedrooms. This should be used as the default value. If a greater level of occupancy is expected add 4 l/s per occupant.					



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