

# MECHANICAL EXTRACT VENTILATION (MEV & dMEV)



IMPROVING  
INDOOR AIR  
QUALITY IN  
NEW HOMES

NUAIRE'S PEDIGREE

# Proud to Build British

Nuaire is a world leader in the design and manufacture of fans and ventilation systems. We put our energy into efficient ventilation so you don't waste yours.

Nuaire is a British company that designs and manufactures innovative ventilation products for the residential and commercial sectors. We are proud to be recognised for our expertise, commitment to innovation and the outstanding quality of our products and customer service.

Our people are at the heart of Nuaire, we have more than 400 experienced staff based at our headquarters, with a further 65 technical sales engineers throughout the UK and Ireland.



MADE IN GREAT BRITAIN



Based in South Wales, our factory covers 18,000m<sup>2</sup>, allowing us to manufacture almost all of our products on site; from small bathroom fans to large air handling units.

In recent years Nuaire has invested millions of pounds into a new manufacturing plant to support its plans for growth.

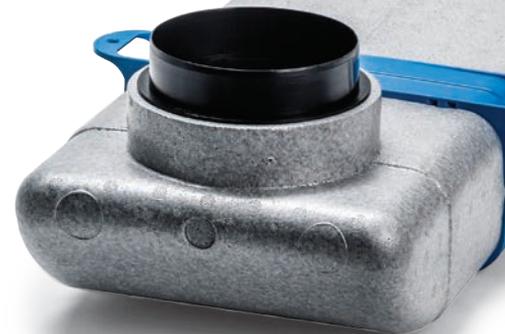


"Our manufacturing facility is approximately 4 x the size of the Wembley pitch"



Nuaire's technical application team can offer expert advice and support to help you make the right choice in your ventilation strategy. Providing a simple, quick selection or offering advice on compliance with the very latest building regulations and environmental issues, we are here for you every step of the way.

GETTING IT  
RIGHT FROM  
THE START





### Advice On Compliance and SAP Q

Stay ahead of the latest building regulations and make the best product and fabric choices.



### Over 65 Sales Staff

Field and office based staff to support you at every stage.



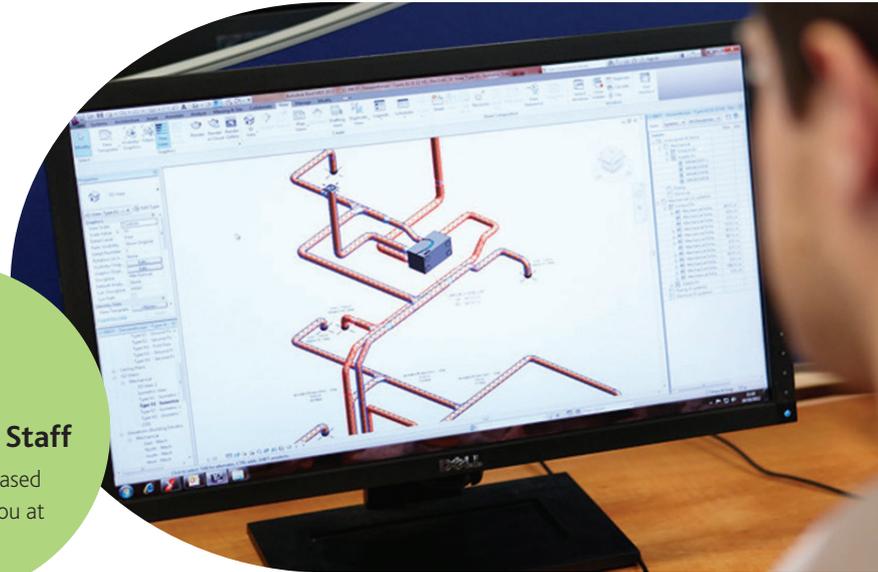
### Gold Star Aftercare

Our comprehensive product warranty and dedicated after sales support gives you peace of mind.



### The Full Service

Help with product selection, detailed parts lists and fast delivery ensure you meet your deadline and budget.

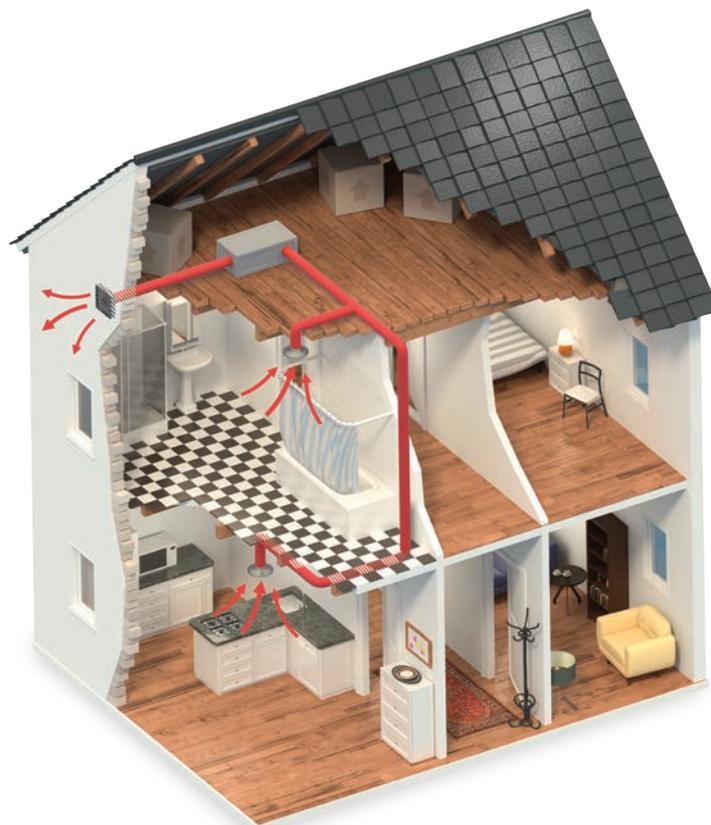


# CONTINUOUS MECHANICAL EXTRACT SYSTEMS (MEV – System 3)

MEV is a centralised extract system that can ventilate your entire property without the need for individual extract fans.

The low profile MEV unit can be mounted in any orientation, offering flexible and hassle-free installation, whilst low watt motors provide high performance extract ventilation.

MEV How does it work?



MEV falls under System 3 (Mechanical Extract Ventilation) and is sometimes known as 'Multi-Point Extract'.

The units can be installed at either first or second fix stages and at only 190mm deep, the low profile MEVDC is designed to save space, whilst providing high performance, low running costs and low noise levels.



## Design Services

Nuaire's Technical Application Team can offer expert advice and support on design.

Services include supporting 3D CAD illustrations to illustrate choice of product, ducting and ancillaries. This bespoke package enables correct selection and aids project management and site control.

As well as a simple, clean system layout in 3D showing ventilation, Nuaire provides a complete parts list with installation visuals.



# Building Regulations 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	

	Number of bedrooms in dwelling				
	1	2	3	4	5
Whole dwelling ventilation rate <sup>a,b</sup> (l/s)	13	17	21	25	29

Notes:  
 a. In addition, the minimum ventilation rates should be no less than 0.3 l/s per m<sup>2</sup> of internal floor area (this includes all floors, e.g. for 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.

### Design of continuous mechanical extract systems

System 3 (Continuous Mechanical Extract) has been sized for the winter period. Additional ventilation may be required during warmer months and it has been assumed that the provisions for purge ventilation (e.g. openable windows) could be used.

**Step 1:** Determine the whole dwelling ventilation rate from Table 5.1b.

(Note: no allowance is made for infiltration as the extract system lowers the pressure in the dwelling and all air flow through infiltration paths does not increase the overall ventilation rate.)

**Step 2:** Calculate the whole dwelling extract ventilation rate by summing the individual room rates for 'minimum high rate' from Table 5.1a.

(For sanitary accommodation only, as an alternative, the purge ventilation provisions can be used where security is not an issue. In this case the 'minimum high extract rate' for the sanitary accommodation should be omitted from the Step 2 calculation.)

**Step 3:** The required extract rates are as follows:

The maximum whole dwelling extract ventilation rate (i.e. the boost rate) should be at least the greater of Step 1 and Step 2. Note that the maximum individual room extract rates should be at least those given in Table 5.1a for minimum high rate.

The minimum whole dwelling extract ventilation rate should be at least the whole dwelling ventilation rate found in Step 1.

### Location of Ventilation Devices

- Extract should be from each wet room.
- Mechanical extract terminals and fans should be installed as high as is practicable and preferably less than 400mm below the ceiling.
- Where ducts etc are provided in a dwelling with a protected stairway, precautions may be necessary to avoid the possibility of the system allowing smoke or fire to spread into the stairway.

### Air Transfer

- To ensure good transfer of air throughout the dwelling, there should be an undercut of minimum area 7600mm<sup>2</sup> in all internal doors above the floor finish. This is equivalent to an undercut of 10mm for a standard 760mm width door. This should be achieved by making an undercut of 10mm above the floor finish if the floor finish is fitted, or by a 20mm undercut above the floorboards, or other surface, if the finish has not been fitted.

### Controls

- Should be set up to operate without occupant intervention, but may have manual or automatic controls to select the boost rate. Any manual boost controls should be provided locally to spaces being served, e.g. bathrooms and kitchen, as provision of a single centrally located switch may result in fans being left in an inappropriate mode of operation. Automatic controls could include sensors for humidity, occupancy/usage and pollutant release. Humidity controls should not be used for sanitary accommodation as odour is the main pollutant.
- In kitchens, any automatic control must provide sufficient flow during cooking with fossil fuel (e.g. gas) to avoid build up of combustion products.
- Ensure that the system always provides the minimum whole dwelling ventilation rate specified in table 5.1b.

Where manual controls are provided, they should be within reasonable reach of the occupants. It is recommended that they are located in accordance with the guidance of Requirement N3 Safe Opening And Closing of Windows etc., which is given in Approved Document N. Where reasonable, pull cords, operating rods or similar devices should be provided.

### Noise

Any continuously running fans should be quiet so as not to discourage their use by occupants.

# MEV Product Selector

Page No.	8	11	14
Feature	MEVDC	MEVDC2	dMEV
Meets Building Regulations			
Latest DC motors to provide high performance with low SFP			
Advanced motor and impeller technology			
Acoustic lined lid (optional case lining available)			
Unique locating bracket to allow the unit to be fixed in any location, quickly and efficiently at either 1st fix or 2nd fix stage			
Remote failure indicator			
Ecosmart controls compatible			
Integral Filter			
Can be fixed either horizontally or vertically			
ABS moulded case and lid for longer life and a more robust unit			
Compact unit - only 190mm deep			

## Ancillaries Available

			
Easy fan adjustment	Simple fixing bracket	Acoustic lined lid (Optional case lining available)	Simple filter change

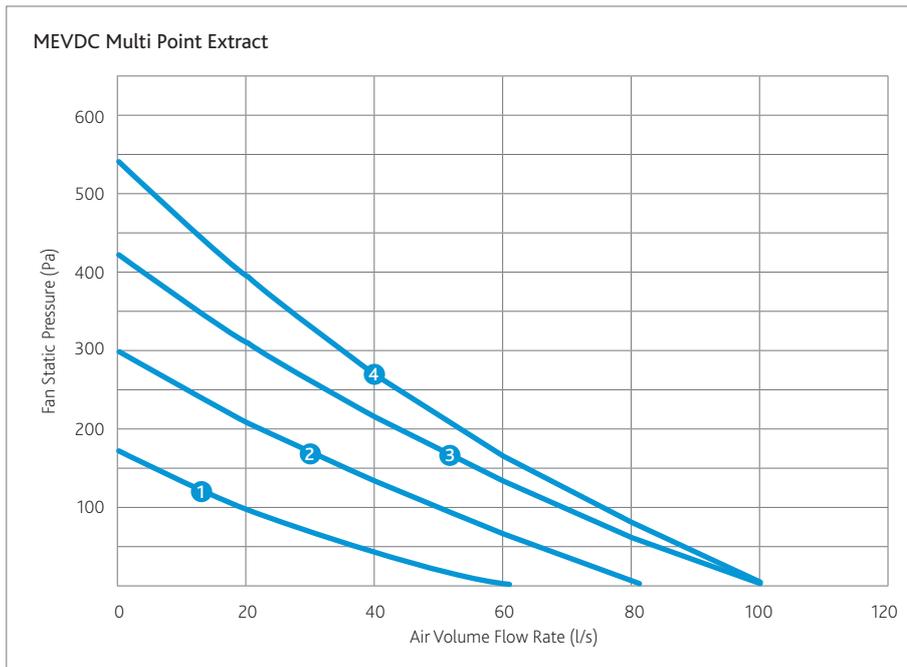


# MEVDC

A quiet, energy-efficient, low depth central extract system, which has been independently tested by the Building Research Establishment (BRE) for inclusion within the Product Characteristics Database (previously SAP Appendix Q).



## Performance



## SAP Test Results

Application	MEVDC		MEVDC-ES	
	Specific Fan Power (W/l/s)	Energy Saving Trust Best Practice Compliant	Specific Fan Power (W/l/s)	Energy Saving Trust Best Practice Compliant
Kitchen + 1 Wet Room	0.35	Yes	0.34	Yes
Kitchen + 2 Wet Room	0.30	Yes	0.31	Yes
Kitchen + 3 Wet Room	0.31	Yes	0.33	Yes
Kitchen + 4 Wet Room	0.33	Yes	N/A	Yes
Kitchen + 5 Wet Room	0.38	Yes	N/A	Yes

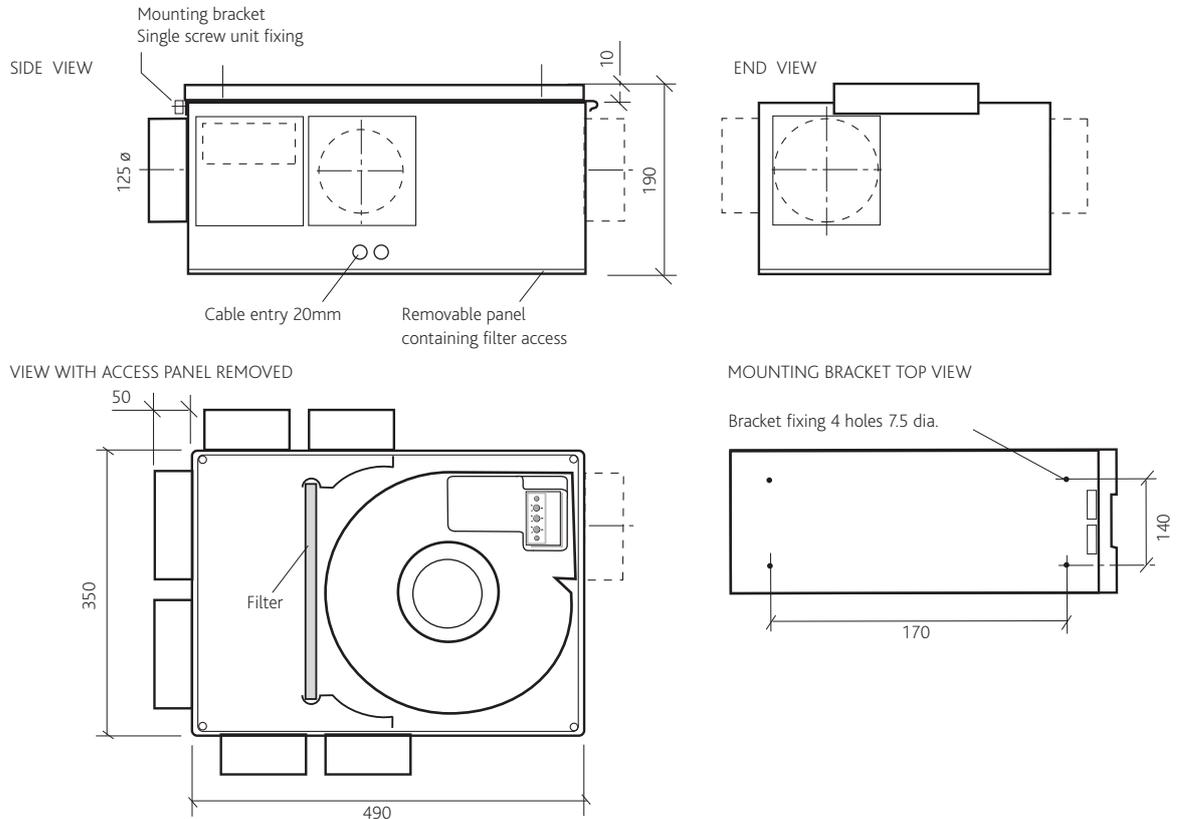
## Electrical & Sound

Curve	Maximum power consumption (Watts)	FLC Amps	Sound Power Levels dB re 1pW								dBA @3m Curve
			63	125	250	500	1K	2K	4K	8K	
1	11	0.14	39	39	44	36	31	22	21	18	19
2	21	0.19	40	42	46	41	37	28	24	18	27
3	35	0.25	43	43	50	46	41	31	28	27	31
4	52	0.37	45	44	54	52	44	35	31	27	34

Note: above sound level figures are for lined lid unit. Unit has a soft start feature as standard therefore the starting current is the same as the full load current. Step curves are for information purposes only and are not individual units. The electrical and sound information in the table is nominal. Note: dBA figures are calculated based on hemispherical propagation.

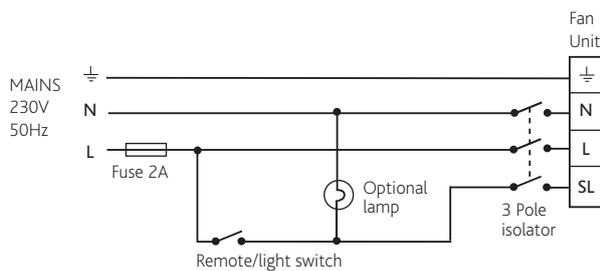
# General Arrangement

## DIMENSIONS (MM)

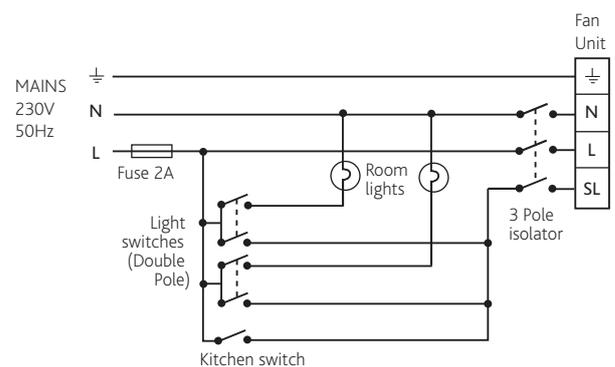


# Wiring

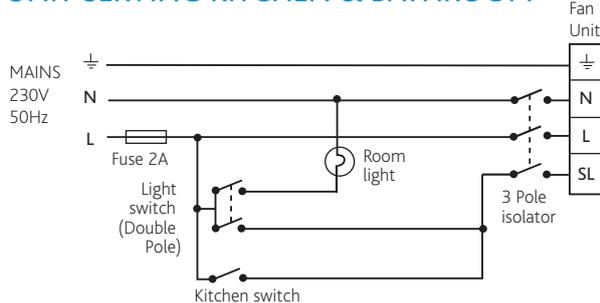
## UNIT SERVING BATHROOM ONLY



## UNIT SERVING KITCHEN & TWO BATHROOMS



## UNIT SERVING KITCHEN & BATHROOM



OPTIONAL EXTRAS

	Code
Ecosmart compatible	ES
Run on timer	R
G2 filter	G2
G4 filter	G4
Acoustic lining (full case)	L
Humidistat	H
<b>Spigot/damper kits (Choose from S1-D4)</b>	
Kit 1 - 4 x 100 circular & 2 x 125 circular spigots	S1
Kit 2 - 6 x rectangular spigots 110 x 54mm	S2
Kit 3 - 6 x rectangular dampers 110 x 54mm	D3
Kit 4 - 4 x 100 & 2 x 125 circular damper	D4

CODE DESCRIPTION

MEVDC-ES G2 L H D4



1. Mechanical Extract Ventilation
2. DC motor type
3. Ecosmart compatible (optional)
4. G2 filter (optional)
5. Lined case (optional)
6. Humidistat (optional)
7. D4 damper kit (optional)

# Consultants Specification

## MEVDC UNIT

The unit shall be designed specifically for incorporation within a system designed to comply with the requirements of Part F Building Regs. Ducting and grilles forming part of the system are specified elsewhere.

The unit shall be manufactured by a BSI Registered Firm with ISO 9000 certification. The unit's casing shall be of ABS, Moulded plastic.

The unit shall incorporate a low profile single point mounting bracket for horizontal or vertical mounting of the unit. When installed the unit shall not project any more than 190mm from the surface onto which it installed.

Air discharge from the unit shall be via a tapered spigot for easy connection to ducting. The unit shall be capable of multiple air inlets formatting. The unit casing shall have the facility to allow the connection, via tapered air inlet spigots supplied with one off 125mm diameter spigot.

The unit shall be constructed with one removable panel allowing full maintenance access. The unit shall incorporate a fully speed adjustable (note: stepped speed control shall not be acceptable) low energy, high efficiency DC fan/motor assembly with sealed for life bearings designed to operate continuously at a pre-set "background" design airflow rate with the ability to increase to a pre-set "boost" design airflow rate as and when required. It shall operate up to an ambient temperature of 40°C and be fitted with a locked rotor protection device.

The impeller should be a centrifugal backward curved type, dynamically balanced mounted directly onto the motor.

The unit shall incorporate electrical connections to allow for the unit's "boost" airflow to be triggered by:

A switched live signal, 230V.

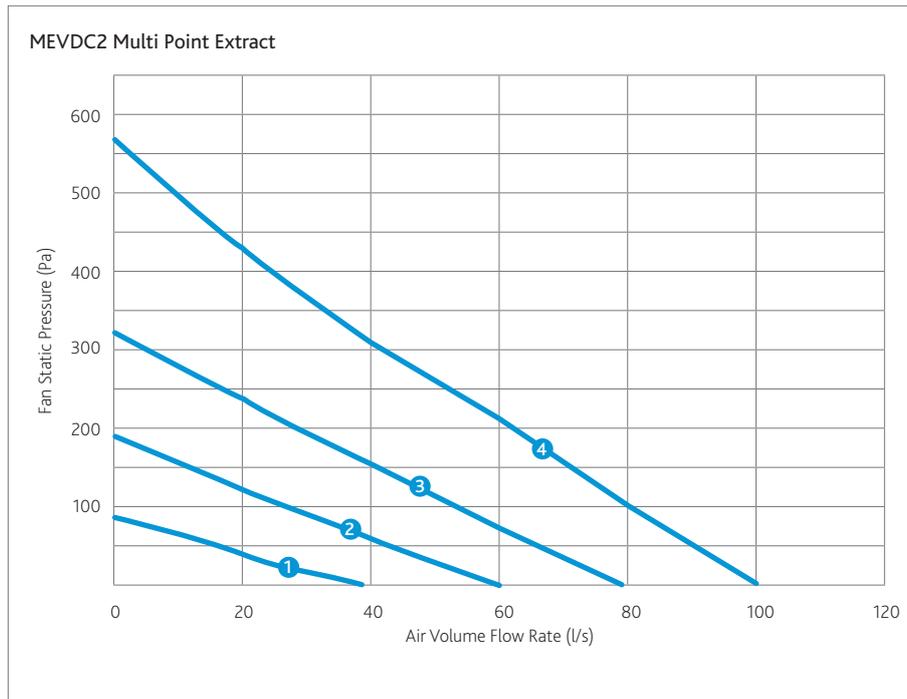
The MEVDC unit shall be offered with a 5 year warranty; 1 year parts and labour, remaining years parts only.

# MEVDC2

A quiet, energy-efficient, low depth central extract system, which has been independently tested by the Building Research Establishment (BRE) for inclusion within the Product Characteristics Database (previously SAP Appendix Q).



## Performance



### CODE DESCRIPTION

#### MEVDC2



1. Mechanical Extract Ventilation
2. DC motor type
3. 2 spigots

## SAP Test Results

	MEVDC2	
Application	Specific Fan Power (W/l/s)	Energy Saving Trust Best Practice Compliant
Kitchen + 1 Wet Room	0.35	Yes
Kitchen + 2 Wet Room	0.30	Yes
Kitchen + 3 Wet Room	0.31	Yes
Kitchen + 4 Wet Room	0.33	Yes
Kitchen + 5 Wet Room	0.38	Yes

## Electrical & Sound

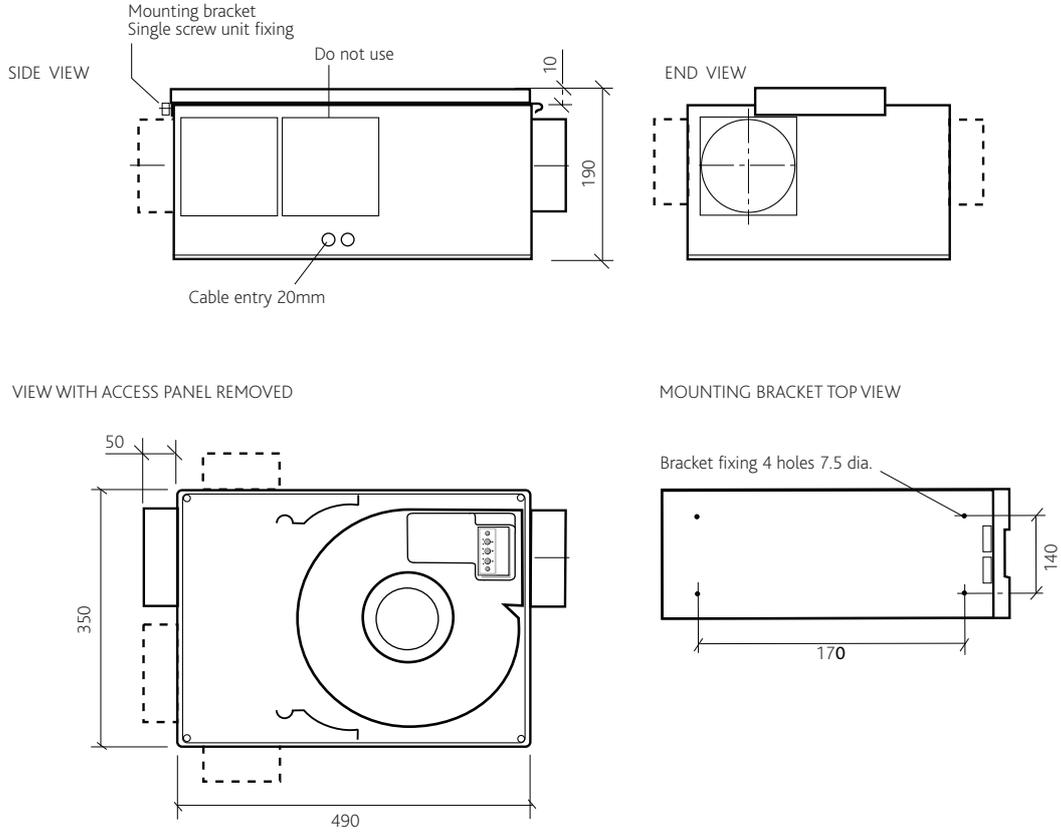
Curve	Maximum power consumption (Watts)	FLC Amps	Sound Power Levels dB re 1pW								dBA @3m Curve
			63	125	250	500	1K	2K	4K	8K	
1	8	0.16	44	44	48	29	22	22	17	13	25
2	16	0.19	46	47	52	35	31	31	26	22	30
3	29	0.25	48	49	56	39	37	37	32	28	34
4	56	0.37	49	51	58	42	42	42	37	33	38

Note: above sound level figures are for unlined unit. See MEVDC for lined options. Unit has a soft start feature as standard therefore the starting current is the same as the full load current. Step curves are for information purposes only and are not individual units. The electrical and sound information in the table is nominal.

Note: dBA figures are calculated based on hemispherical propagation.

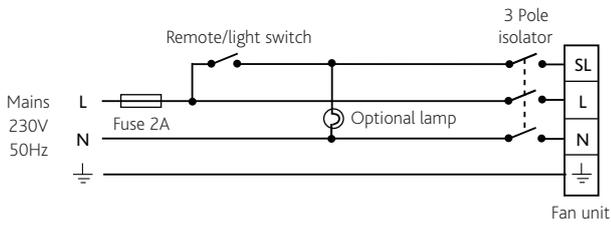
# General Arrangement

## DIMENSIONS (MM)

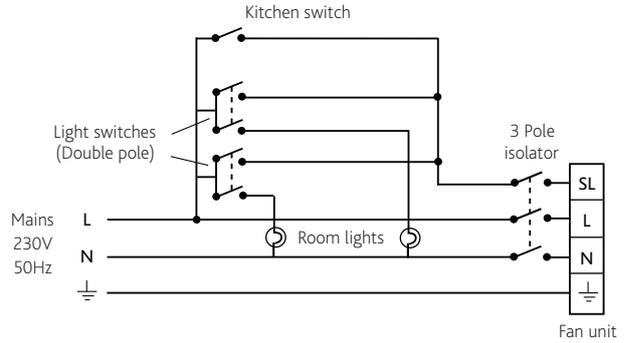


# Wiring

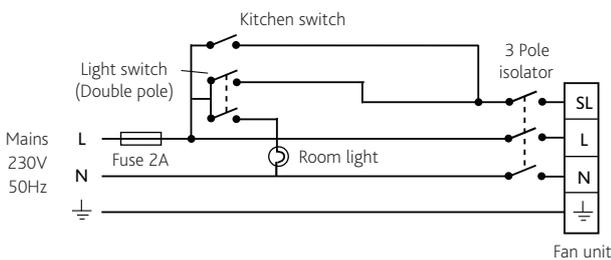
## UNIT SERVING BATHROOM ONLY



## UNIT SERVING KITCHEN & TWO BATHROOMS



## UNIT SERVING KITCHEN & BATHROOM



All field wiring and switches by others.

# Consultants Specification

## MEVDC2 UNIT

The unit shall be designed specifically for incorporation within a system designed to comply with the requirements of Part F Building Regs. Ducting and grilles forming part of the system are specified elsewhere.

The unit shall be manufactured by a BSI Registered Firm with ISO 9000 certification. The unit's casing shall be of ABS, Moulded plastic.

The unit shall incorporate a low profile single point mounting bracket for horizontal or vertical mounting of the unit. When installed the unit shall not project any more than 190mm from the surface onto which it is installed.

Air discharge from the unit shall be via a tapered spigot for easy connection to ducting. The unit shall be capable of multiple air inlets formatting. The unit casing shall have the facility to allow the connection, via tapered air inlet spigots supplied with one off 125mm diameter spigot.

The unit shall be constructed with one removable panel allowing full maintenance access. The unit shall incorporate a fully speed adjustable (note: stepped speed control shall not be acceptable) low energy, high efficiency DC fan/motor assembly with sealed for life bearings designed to operate continuously at a pre-set "background" design airflow rate with the ability to increase to a pre-set "boost" design airflow rate as and when required. It shall operate up to an ambient temperature of 40°C and be fitted with a locked rotor protection device.

The impeller should be a centrifugal backward curved type, dynamically balanced mounted directly onto the motor.

The unit shall incorporate electrical connections to allow for the unit's "boost" airflow to be triggered by:

A switched live signal, 230V.

The MEVDC2 unit shall be offered with a 3 year warranty; 1 year parts and labour, remaining years parts only.

# DECENTRALISED MECHANICAL EXTRACT VENTILATION (dMEV - System 3)

Decentralised Mechanical Extract Ventilation (dMEV) provides continuous background extract ventilation to a property.

The dMEV system works under the same principle as whole house mechanical extract ventilation (MEV) but with individual fans installed directly in the kitchen and every wet room in the property.

dMEV complies with current building regulations, is listed on the Product Characteristics Database and will help you achieve Code Level 3 in the Code for Sustainable Homes.

dMEV How does it work?



# Decentralised MEV (dMEV) (whole home mechanical extract ventilation)

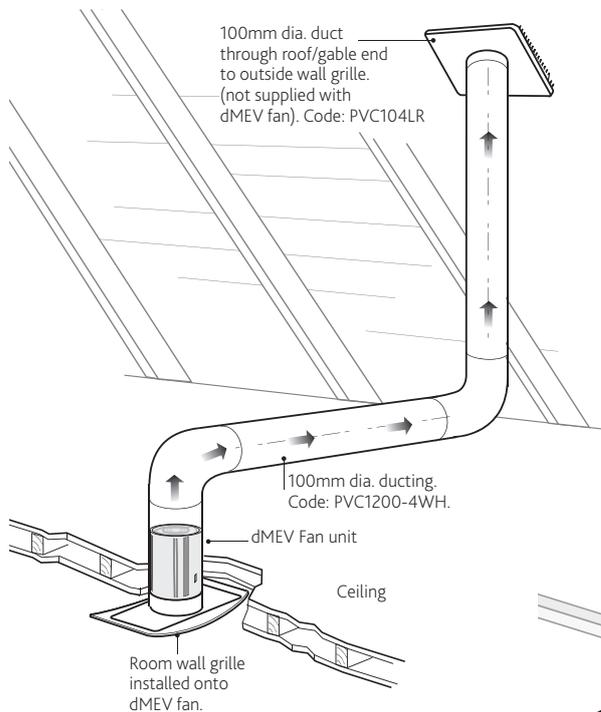
dMEV is a flexible solution offering three installation options; through the wall, wall/ceiling mounted with ducting to outside, as well as allowing the fan to be mounted inline and ducted to both the room and outside wall. dMEV is SAPQ listed for all three options.

A quiet, energy efficient 2 speed continuous ventilation system designed for wet room applications, the compact dMEV range of fans measure no more than a mini tablet device.

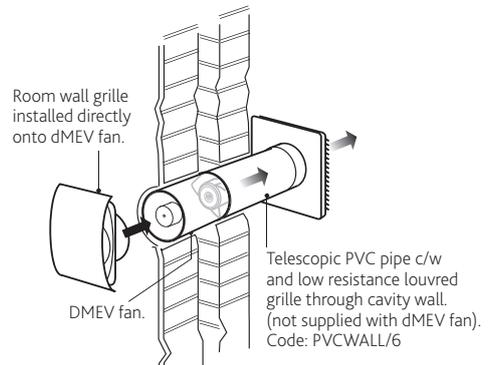


## Technical

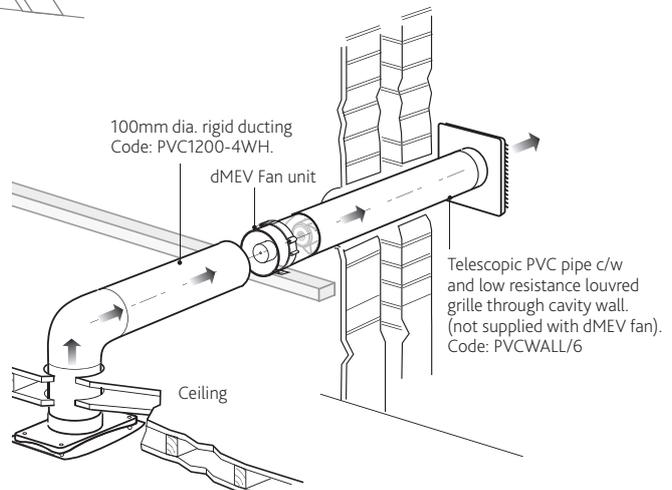
Typical dMEV installation with fan mounted through ceiling.



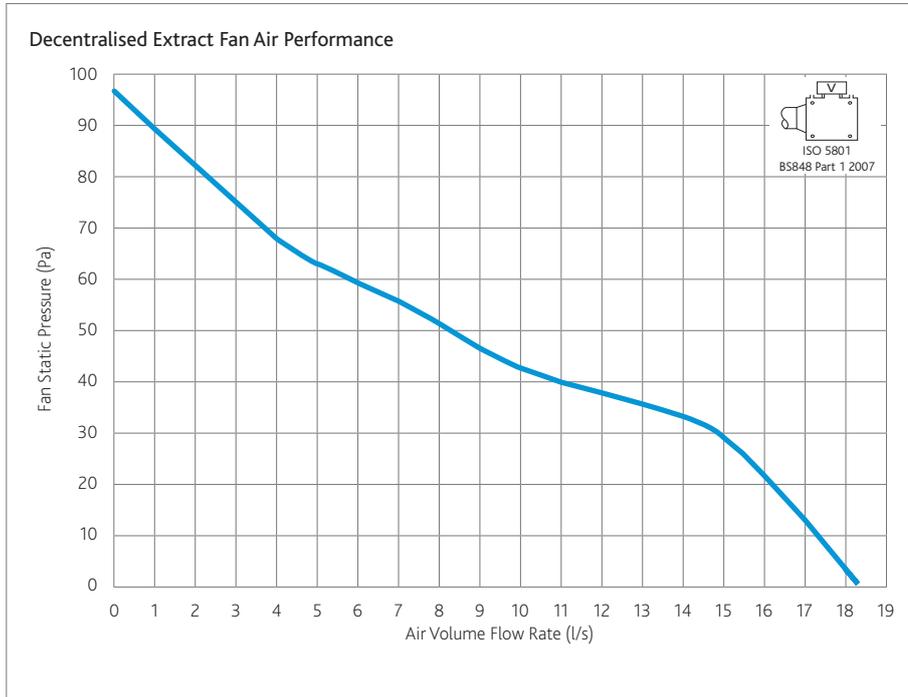
Typical dMEV installation with fan mounted through wall.



Typical dMEV induct/inline installation.



# Performance



## CODE DESCRIPTION

dMEV+ H

1 2 3

1. Decentralised Mechanical Extract Ventilation
2. Decentralised Mechanical Extract Ventilation with higher duty set points
3. Integral Humidistat (wall and ceiling mounted only)



# SAP Test Results

	dMEV
Application	Specific Fan Power (W/l/s)
In-room fan - kitchen	0.20
In-room fan - other wet room	0.24
In-duct fan - kitchen	0.19
In-duct fan - other wet room	0.24
Through wall fan - kitchen	0.19
Through wall fan - other wet room	0.25

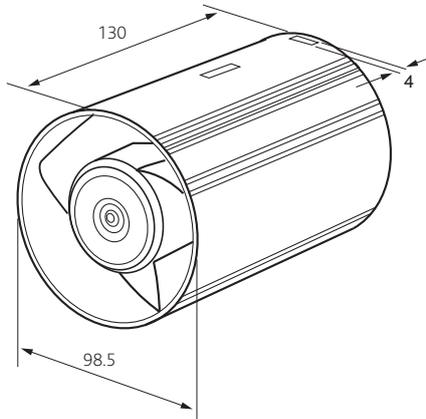
# Performance, Electrical & Sound

	Extract setting (l/s)				Power consumption (Watts)				dBA @3m			
	Wet Room		Kitchen		Wet Room		Kitchen		Wet Room		Kitchen	
	Normal	Boost	Normal	Boost	Normal	Boost	Normal	Boost	Normal	Boost	Normal	Boost
dMEV	4	8	6	13	1	2.5	1.1	3	10	21	14	26
dMEV+	6	13	8	18	1.1	3	2.5	3.8	14	26	21	35
dMEVH	4	8	6	13	1	2.5	1.1	3	10	21	14	26
dMEV+H	6	13	8	18	1.1	3	2.5	3.8	14	26	21	35

## General Arrangement

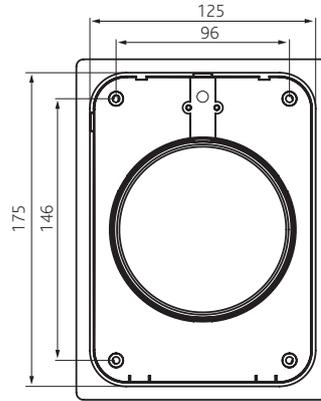
### DIMENSIONS (MM) - FAN UNIT AND GRILLE

View of fan unit without grille

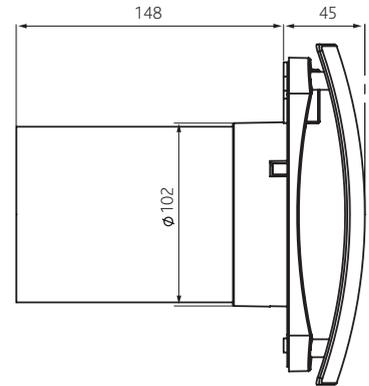


Unit weight: 0.5kg

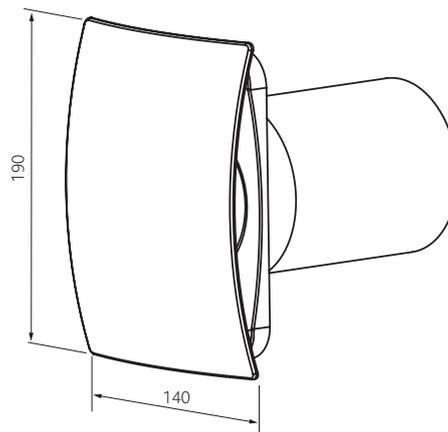
Back view of fan unit and grille



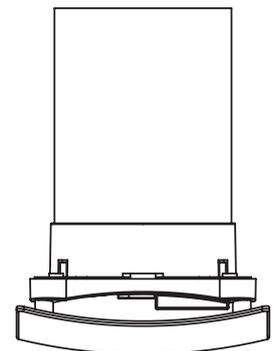
Side view of fan unit and grille



View of grille and fan unit



Top view of fan unit and grille



## Ancillaries Available



### Wall Kit

Code: (dMEV-WALLKIT)



### Inline Installation Kit

Code: (dMEV-INLINE-KIT)



### In-room Installation Kit

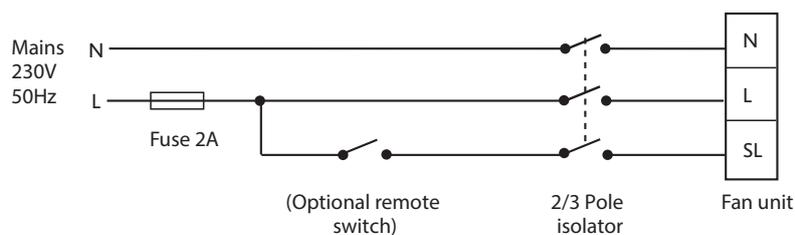
Code: (dMEV-INROOM-KIT)

## Electrical Details

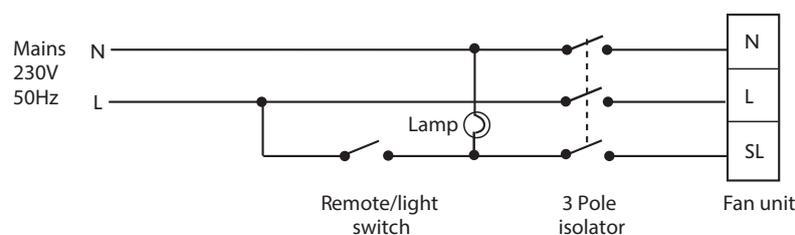
Voltage	230V	
Frequency	50Hz	
Operating Temperature	50°C	
Speed	Low (l/s)	Boost (l/s)
dMEV/H (Low)	4	8
dMEV/H (High)	6	13
dMEV+/H (Low)	6	13
dMEV+/H (High)	8	18

## Wiring

### UNIT SERVING BATHROOM OR KITCHEN (OPTIONAL BOOST)



### UNIT SERVING BATHROOM (VIA LIGHT SWITCH)



# Consultants Specification

## dMEV(H) / dMEV+(H) KITCHEN AND WET ROOM FAN

The unit shall be manufactured by Nuaire.

The National Calculation Method (SAP) identifier for this product is Decentralised Mechanical Ventilation Equipment (dMEV).

The unit shall be surface mountable or duct mounted using optional fixing kit. For duct mounting the fan section shall be removable and the fascia used as the inlet cowl.

### The unit shall have 2 speed settings - low or high.

- The dMEV(H) unit set at low speed shall achieve 4 l/s and 8 l/s (Boost).
- The dMEV(H) unit set at high speed shall achieve 6 l/s and 13 l/s (Boost).
- The dMEV+(H) unit set at low speed shall achieve 6 l/s and 13 l/s (Boost).
- The dMEV+(H) unit set at high speed shall achieve 8 l/s and 18 l/s (Boost).

Unit noise level shall not exceed 21dBA @3m for kitchens and 14dBA for wet rooms (normal running).

The unit shall incorporate an injection moulded, 3 blade axial impeller.

The impeller shall be directly driven by a low energy, high efficiency EC motor, fitted with sealed, self-lubricating ball bearings.

IPX4 rated.

Suitable for bathroom zone 1 applications.

Motors shall have locked rotor protection to prevent overheating in the event of fan failure.

Each unit is capable of being set to comply with new edition (2010).

Part F – ventilation building regulations for (System 3) continuous mechanical extract (MEV) and new edition (2010) Part L - conservation of fuel and power.

### The unit will meet the requirements of Part F for the following installations:

- Fan mounted within room with a maximum of 2.5m of rigid PVC ducting (Nuaire part number PVC1200-4WH),  
2 off 90 Deg bends (Nuaire part number PVC490WH),  
1 off low resistance extract grille (Nuaire part number PVC104LR).
- Fan mounted through a wall with 300mm rigid PVC ducting,  
1 off low resistance extract grille. (Nuaire part number PVCWALL/6).
- Fan mounted in-duct with a maximum of 2.5m of rigid PVC ducting (Nuaire part number PVC1200-4WH),  
2 off 90 Deg bends (Nuaire part number PVC490WH),  
1 off low resistance extract grille (Nuaire part number PVC104LR).

Unit can comply with BRE digest 398 under continuous mechanical extract ventilation.

Meets the minimum fan power requirement of 0.5w/l/s in the 'Domestic Building Services Compliance Guide' (2010 edition).

The unit shall be designed for quietest operation to ensure occupant satisfaction.

The unit shall incorporate electrical connections to allow for the unit's "boost" airflow to be triggered by switched live.

The unit shall be supplied with a 5 year warranty; 1 year parts and labour, remaining years parts only.

### dMEVH mounting options

Humidistat option available through wall and through ceiling mounted. Fully adjustable humidistat from 50-100RH.

# FLEXIBLE INSTALLATION IS ON "POINTE" FOR CARDIFF BAY DEVELOPMENT

Flexible installation and low noise made Nuaire's MEVDC the ideal choice for Cardiff Pointe

## The Project

Kier Living, part of the Kier Group, has made its first foray into residential construction in Wales with a major new build project in Cardiff Bay on behalf of Figurehead Homes. 'Cardiff Pointe' is a luxury waterfront development in the Capital's prime Bay area and forms part of the wider multi-million pound International Sports Village development.



Kier Living has reached a construction milestone in their management of Cardiff Pointe with the first street scenes completed and first sales confirmed. Future phases will commence in 2015, with the residential development due to continue for several years.

Rhys Thomas of Kier Living said: "There have been several challenges that the ventilation design has had to overcome; fortunately the design service from Nuaire has been excellent. I've had a much greater level of involvement in the ventilation design than on previous projects as we had to consider noise, limited space and minimal use of ducting. Nuaire and Aaron especially have gone above and beyond in assisting us with the ventilation design and tackling any issues on site to ensure optimum system performance."



670 luxury apartments and houses will be part of a high profile Sports Village to be developed which will include an Olympic-standard ice rink, indoor ski slope and Wales' tallest mixed use tower alongside a hotel, gallery, retail outlets, and office accommodation.



## The Challenge

As with all urban housing developments, internal space comes at a premium at Cardiff Point and the challenge facing Kier Living was how to maximise the available floor, wall and storage space within each property whilst still providing effective ventilation. Multi Point Extract (MEV) was the chief ventilation strategy selected for the majority of the apartments and houses due to its high performance and simple, unobtrusive installation, with MVHR used on plots requiring code level 3 in the Code for Sustainable Homes.

In March 2013, work began on the construction of apartments and houses in phases 1 and 2. Chosen to design and supply the ventilation strategies for the new properties, Nuaire has provided a range of low-energy products to assist Kier Living in meeting building regulations, to help them maximise the internal space of the new properties, and enable them to meet strict noise guidelines.



To ensure the MVHR units perform to their optimum efficiency, Nuaire used its latest innovation in ducting through un-heated spaces: the Ductmaster Thermal range, which, unlike other thermal systems that wrap around the PVC pipe, is an all-in-one system where the material used for insulation is the duct itself and is fully compliant with building regulations.



Nuaire's James Mullane explained: "The MEVDC multi-point extract fan was powerful enough to ventilate the apartments and three-story townhouses. The challenge was designing the ventilation system and ductwork to achieve the correct performance and to minimise noise whilst also accommodating the multi-level layout of the larger homes. We were able to meet the strict noise guidelines set by the consultant."







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