

AIR HANDLERS LTD

PVU Quiet

Packaged Void Unit



1262

University of
Salford
MANCHESTER
Acoustic Testing Laboratory
College of Science & Technology

Engineering Solutions

air
HANDLERS



The Company...

Air Handlers have been trading since May 1989, and have just celebrated 25 years in business in 2014. The Company operates from its 60,000 Sq Ft Factory in Salford Quays which was purpose built in the year 2000.

Product Development...

The Company is continually updating its products to changing energy saving technologies, so the introduction of the PVU Range of Packaged Void Units is based on changes in Fan technology, with the introduction of EC backward curved direct driven plug fans, with 0<10V speed control. Multi fan wall arrangements have been adopted to give higher performance with lower energy consumption.

Compliance...

The Packaged Void range has been developed to meet the specific fan power requirements of Building Regulations, and additionally to meet the low noise levels imposed on office, school, commercial buildings projects.

Acoustic Performance...

Extensive acoustic testing of casework construction has been carried out at both the companies testing facilities, and Salford University Acoustic Testing Laboratory.

Acoustic tests were carried out on eleven double skin composite panel/frame systems, eight different triple and quadruple skin composite panel/frame systems, to BS. EN ISO 10140-2 (2010) which have all been certified as UKAS accredited.



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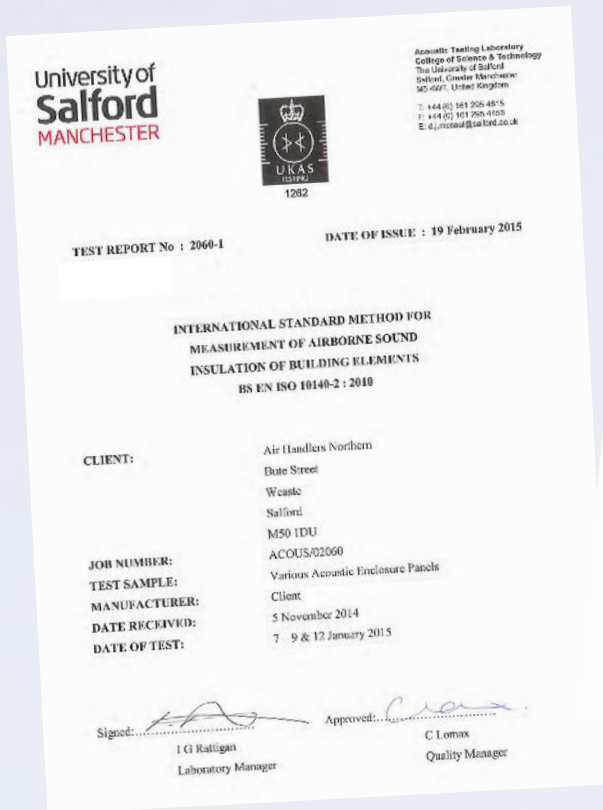
Contents...

Certification...	4
Location...	4
Construction...	4
Fan Inlet Flow grids...	6
Attenuation...	6
Attenuator Performance...	6
Attenuators Dimensions and Weights...	7
Casework Class...	7
Accreditation...	8
Type...	9
Performance Charts...	9
Selection Charts...	9 - 19
PVU Quiet Sections...	20 - 21
Dimensions and Weights...	22 - 24
Mounting Arrangements...	25 - 28
Controls and Wiring...	28



Certification...

All acoustic SRI tests are certified by Salford University Test Laboratories to BS EN ISO 10140-2(2010) – Report No's 1429 & 2060.



Location...

PVU Quiet Package Void Air Handling Units are normally located within the ceiling void or on the roof, providing full fresh air, RECIRC air or both by introducing a mixing box.

Construction...

Frame

Insulated extruded anodised aluminium pentapost sections with solid die cast mechanical fit corners are used to build each frame. The frame is acoustically insulated to prevent noise leakage.

Panels

Panels are flush fitted into the frame and air sealed with neoprene gaskets. A range of acoustically insulated panels are available to meet the sound reduction required in the classroom space.

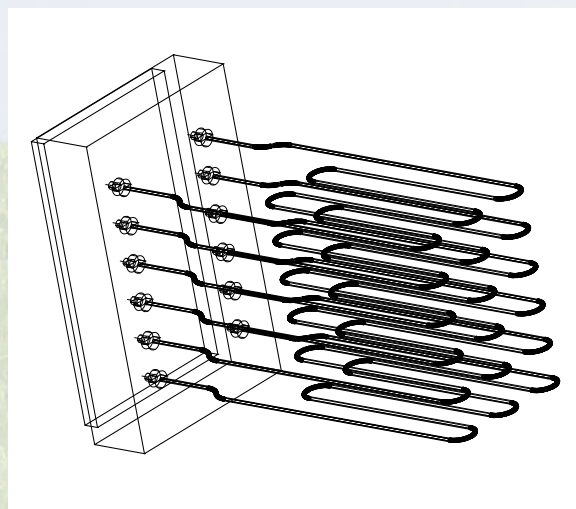
Access Panels

All access panels will be flush mounted in the frame, and constructed as the fixed panels. Fan and control panel access panels will be lockable.

Quick release fasteners will be used on other access panels, access can be from either side of from the bottom (additional length required for bottom access).

Mixing Box

A mixing box is available to give a mixed condition of recirculated and fresh air. Dampers suitable for motorised actuator operation are situated to suite the ductwork layout.



Filters

Filtration options available on Packaged Void Units is as follows

Panel Filters

Disposable panel filters grade G3 or G4.

Bag Filters

Disposable bag filters grade F5, F6, F7. Filters can be side or bottom withdrawal and arranged as pre and secondary. Manometers or PD switches factory fitted are available as an option.



Heating Coil

Low temperature hot water coils are designed to be side or bottom withdrawal. Coils are constructed from copper tubes and headers with aluminium fins as standard. For coastal environment the following fin material is available.

- Polyester coated aluminium
- Blygold coating
- Copper fin material

Electric Heaters

Manufactured with sheathed elements, and fitted with a high temperature cut out. Balanced phase elements are arranged for thyristor or step control.

Cooling Coil Options

Cooling coil options are available to offer mechanical cooling, direct expansion or chilled water coils constructed from copper tubes and headers with aluminium fins as standard for coastal environment the following fin material is available

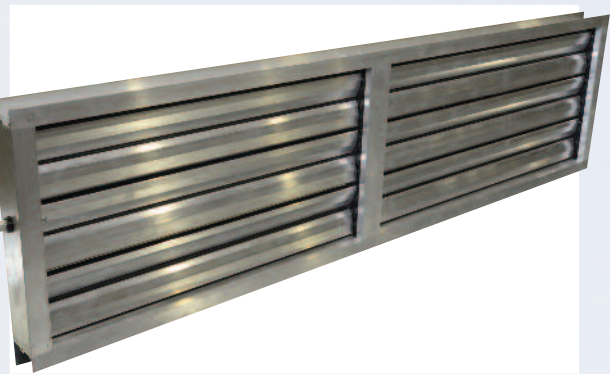
- Polyester coated aluminium
- Blygold coating
- Copper fin material

Drain trays are fitted to cooling coils with an option of natural drain connection requiring an external trapping arrangement or a condensate pump system.

Dampers

All dampers are constructed from an aerofoil section double skin aluminium blade profile with edge, blade and side seals to offer low leakage.

The blade rotation is performed by rigid nylon cogs which operate out of Air Stream. The damper operating mechanism is a brass shaft which can have q quadrant or be suitable for motorised actuator operation.



Fans

Package Void Units have supply air backward curved centrifugal plug type fans, direct driven by high efficiency EC motors.

This method of scroll free fan produces an optimal low loss flow of air through the impeller so there are no longer any drastic cross sectional changes.

Motors operate via a 0-10V DC output from the motor, this provides infinitely variable speed control.

Backward curved scroll free fans are quiet running with optimised airflow through the impeller, giving significantly reduced tonal noise.



Fan Inlet Flow grids...

By fitting an inlet flow grid to the supply fans it is possible to achieve significant noise reduction from the fan.

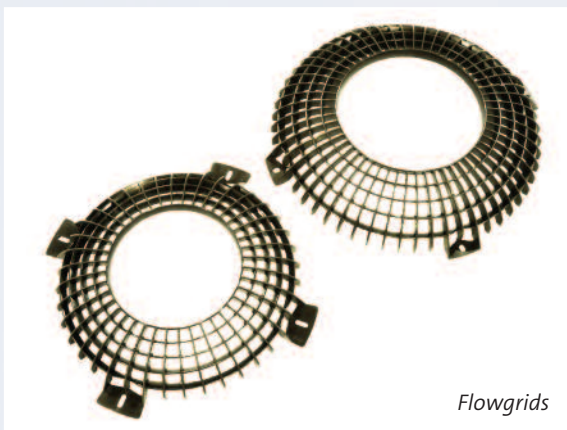
The noise reduction is predominantly low frequency decay (ie 63Hz, 125Hz, 250Hz), which can help offer significant sound power loss. This sound power loss is created by the reduction in turbulence hitting the rotating blades, with tonal frequency components, known as impeller noise or tonal noise.

Tonal noise consists of the blade-passing noise and its harmonics. The frequency of the blade-passing noise can be calculated as the sum of the fan speed and the number of blades.

A flow-grid fitted to the inlet of the fans will significantly reduce the low frequency noise generated disturbance. The vortex is split when impacting the grille as it is considerably weakened when it flows through the flowgrid.

Sound pressure is reduced, particularly the low frequency. The chart below indicates the power loss on octave bands.

Freq Hz	63	125	250	500	1K
Power loss db	-6	-10	-7.5	-8	-1



Attenuation...

All attenuators provided to match the Packaged Void Unit are supplied as an integral or bolt on arrangement. This is recommended to prevent noise flanking the attenuators.

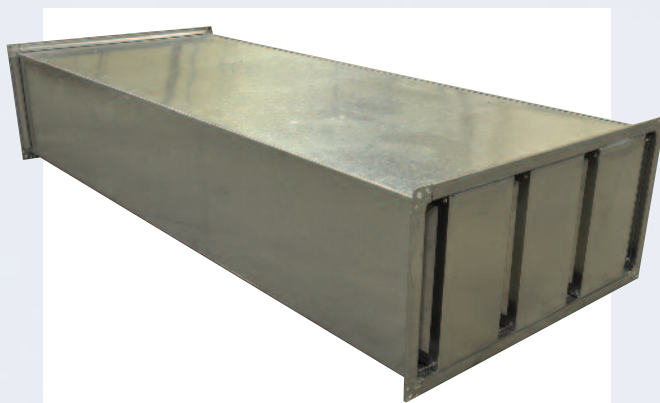
If the attenuators are positioned away from the noise source (i.e. Packaged Void Unit), then duct noise breakout will occur, unless the duct is acoustically lagged to the same high standard.

Option 1

Splitter absorbers inbuilt into the Package Void Unit Casework which provides an uniform casework appearance, particularly for Packaged Void Units on view in the room with no ceiling.

Option 2

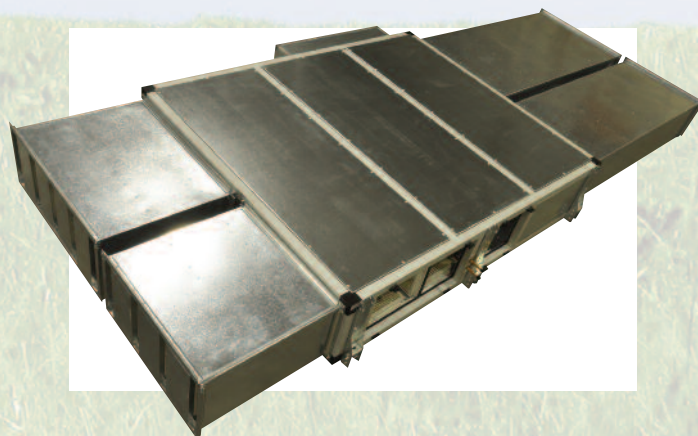
Duct style attenuators with bolt on arrangement as shown below. The splitter absorbers are contained are contained within a galvanized sheet steel duct.



Attenuator Performance...

Insertion losses for different attenuator lengths serving atmospheric and system side.

Freq Hz	63	125	250	500	1K	2K	4K	8K
600mm long	-6	-11	-20	-30	-38	-38	-38	-30
900mm long	-8	-16	-26	-42	-48	-48	-48	-42
1200mm long	-10	-20	-33	-48	-51	-51	-51	-46
1500mm long	-13	-25	-40	-53	-55	-55	-55	-50
1800mm long	-15	-30	-50	-55	-55	-55	-55	-54



Attenuators Dimensions and Weights...

PVU 300/220/163

	600 LONG			900 LONG			1200 LONG			1500 LONG			1800 LONG		
MODEL	WT	W	H	WT	W	H	WT	W	H	WT	W	H	WT	W	H
PVU300/1F	13.7	610	260	20.3	610	260	27.1	610	260	33.9	610	260	40.6	610	260
PVU300/2F	21.5	1000	260	32.2	100	260	43	1000	260	53.7	1000	260	64.5	1000	260
PVU300/3F	30	1460	260	45	1460	260	60.1	1460	260	75.1	1460	260	85.1	1460	260

PVU 300/220/163

	600 LONG			900 LONG			1200 LONG			1500 LONG			1800 LONG		
MODEL	WT	W	H	WT	W	H	WT	W	H	WT	W	H	WT	W	H
PVU400/1F	26.5	1000	360	39.8	1000	360	48.7	1000	360	66.3	1000	360	79.5	1000	360
PVU400/2F	38.1	1610	360	56.4	1610	360	71.2	1610	360	95.1	1610	360	114.4	1610	360

PVU 400/310/680

	600 LONG			900 LONG			1200 LONG			1500 LONG			1800 LONG		
MODEL	WT	W	H	WT	W	H	WT	W	H	WT	W	H	WT	W	H
PVU450/1F	39.4	1360	410	59.2	1360	410	78.9	1360	410	98.6	1360	410	118.4	1360	410
PVU450/2F	47.5	1760	410	71	1760	410	95.4	1760	410	119.3	1760	410	143.1	1760	410

All duct style bolt-on attenuators (option 2) have mezz flanges.

Casework Class...

Packaged Void Units have various types of casework available as detailed below.

Standard Casework

Standard casework is constructed from a 20mm anodised aluminium framework with 18mm double skin insulated panels.

Standard Casework Panel Options

Option 1

0.9mm Inner Skin galvanized sheet metal
1.2mm Outer Skin galvanized sheet metal

Option 2

1.2mm Inner Skin galvanized sheet metal
0.7mm Outer Skin plastisol plastic coated steel

Sound Reduction Index

Frequency Hz	63	125	250	500	1K	2K	4K	8K
Power Loss db	21	25.9	28.2	29.3	33.1	34.5	33.7	39.8

Acoustic Enhanced Casework

Various acoustically enhanced panels are available with different thickness's and acoustic insulation composites, frames are constructed from anodised aluminium acoustically insulated to prevent sound leakage. All acoustic panel options are listed below with there sound reduction index.

Standard Casework Panel Options

Option 1

25mm anodised aluminium acoustic insulated frame with 25mm double skin sound barrier insulated panels.

Inner Skin

0.9mm galvanised sheet metal

Outer Skin

1.2mm galvanised sheet metal

Sound Reduction Index

Frequency Hz	63	125	250	500	1K	2K	4K	8K
Power Loss db	20	23.5	29.4	36	39.1	34.1	34.5	40.8

Option 2

50mm anodised aluminium acoustic insulated frame with 50mm triple skin acoustic composite insulated panels.

Inner Skin

0.9mm galvanised sheet metal

Mid Skin

0.9mm galvanised sheet metal

Outer Skin

1.2mm galvanised sheet metal

Sound Reduction Index

Frequency Hz	63	125	250	500	1K	2K	4K	8K
Power Loss db	21.7	24.2	36.4	37.3	37.6	33.4	35.7	41.5

Option 3

50mm anodised aluminium acoustic insulated frame with 50mm quadruple skin acoustic composite insulated panels.

Inner Skin

0.9mm galvanised sheet metal

Mid Skin

2 off 0.9mm galvanised sheet metal

Outer Skin

1.2mm galvanised sheet metal

Sound Reduction Index

Frequency Hz	63	125	250	500	1K	2K	4K	8K
Power Loss db	24.1	26.6	34.7	39.8	40.7	37.8	39.7	43.7

Accreditation...

In partnership with Salford University acoustic testing laboratory a range of composite acoustic panels have been designed and tested.

To obtain the true casework noise breakout, the frame and panel assembly has to be tested with a large enough area sample to give a true representation of Packaged Void Unit casework.

In practice the framework can leak sound which will flank the panels. Therefore the frame must be acoustically insulated to the same standard as the panels.



Test set up during testing programme



Assembling test frame and panels

Type...

Standard Package Void Units have two depths, 300mm and 400mm with various component selections available for each type.

Type 1

Components available for selection with type 1 Packaged Void Units.

- Inlet attenuator.
- Inlet damper.
- Mixing box with fresh air & return air dampers.
- Panel filters G3/G4 grade.
- Electric heater battery.
- LPHW heating coil.
- Fan selection containing E.C. backward curved plug fan(s).

Type 2

Components available for selection with type 2 Packaged Void Units.

- Inlet attenuator.
- Inlet damper.
- Mixing box with fresh air & return air dampers.
- Panel filters G3/G4 grades.
- Bag filters F5/F6/F7 grades.
- Electric heater battery.
- LPHW heating coil.
- Fan selection containing E.C. backward curved plug fan(s).

Type 3

Components available for selection with type 3 Packaged Void Units.

- Inlet attenuator.
- Inlet damper.
- Mixing box with fresh air & return air dampers.
- Panel filters G3/G4 grades.
- Bag filters F5/F6/F7 grades.
- Electric heater battery.
- LPHW heating coil.
- Cooling coil chilled water or direct expansion.
- Fan selection containing E.C. backward curved plug fan(s).

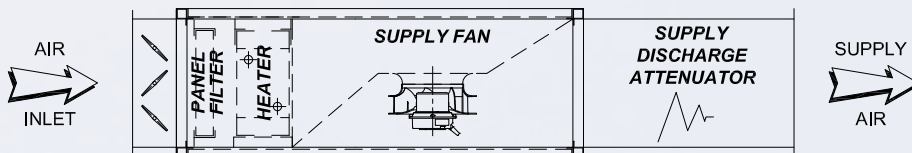
Performance Charts...

Performance charts relate to each type and size of Package Void Unit and offer airflow performance, sound and component outputs.

The casework class does not affect the performance values in the selection charts, but will affect the dimensions and weights of the Package Void Unit and its acoustic breakout performance.

Selection Chart PVU300/220/163T1/1F

Type 1 Performance Typical Type 1 Component Configuration



Fan Data

Motor output 0.163Kw Electric supply 240V/1/50
Maximum current rating 1.0Amps
Maximum Speed @10Volts 3200 RPM
Control Voltage 0<10 Volts

Filter Data

G3 or G4 disposable panel filters.

Electric Heater Data

Based on maximum airflow 9Kw single or three phase electric supply.

LPHW Coil Data

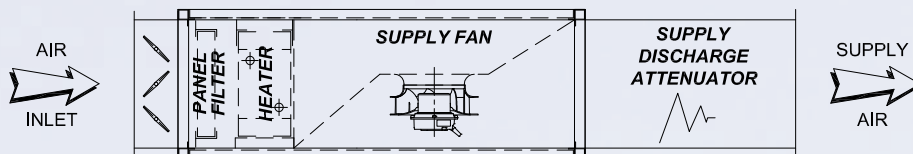
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 9Kw

Air Flow Performance PVU300/220/163/1F

External Pressure Pascals	50	100	150	200	250	300	350
Airflow m³/sec.	0.23	0.21	0.2	0.195	0.18	0.16	0.14
Inlet SWL db	61	62	63	64	64	65	65
Outlet SWL db	65	66	67	68	68	69	69

Selection Chart PVU300/220/163T1/2F

Type 1 Performance Typical Type 1 Component Configuration



Fan Data

Motor output 0.326Kw Electric supply 240V/1/50
Maximum current rating 2.0Amps
Maximum Speed @10Volts 3200 RPM
Control Voltage 0<10 Volts

Electric Heater Data

Based on maximum airflow 18Kw single or three phase electric supply.

LPHW Coil Data

Based on maximum airflow and LPHW @82/71°C
Maximum heating output 16.5Kw

Filter Data

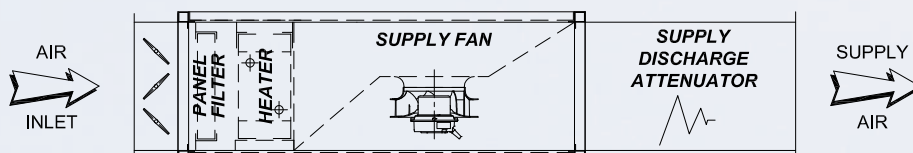
G3 or G4 disposable panel filters.

Air Flow Performance PVU300/220/163/2F

External Pressure Pascals	50	100	150	200	250	300	350
Airflow m³/sec.	0.46	0.42	0.4	0.39	0.36	0.33	0.28
Inlet SWL db	64	65	66	67	68	68	68
Outlet SWL db	68	69	70	71	71	72	72

Selection Chart PVU300/220/163T1/3F

Type 1 Performance Typical Type 1 Component Configuration



Fan Data

Motor output 0.489Kw Electric supply 240V/1/50
Maximum current rating 3.0Amps
Maximum Speed @10Volts 3200 RPM
Control Voltage 0<10 Volts

Electric Heater Data

Based on maximum airflow 21Kw single or three phase electric supply.

LPHW Coil Data

Based on maximum airflow and LPHW @82/71°C
Maximum heating output 24Kw

Filter Data

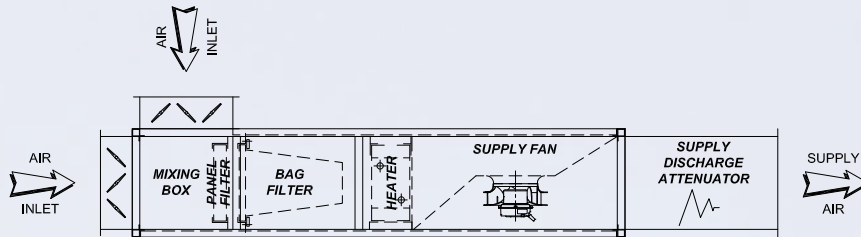
G3 or G4 disposable panel filters.

Airflow Performance PVU300/220/163/3F

External Pressure Pascals	50	100	150	200	250	300	350
Airflow m³/sec.	0.69	0.63	0.6	0.58	0.54	0.49	0.42
Inlet SWL db	64	65	66	67	67	68	68
Outlet SWL db	68	69	70	71	71	72	72

Selection Chart PVU300/220/163T2/1F

Type 2 Performance Typical Type 2 Component Configuration



Fan Data

Motor output 0.163Kw Electric supply 240V/1/50
Maximum current rating 1.0Amps
Maximum Speed @10Volts 3200 RPM
Control Voltage 0<10 Volts

Filter Data

G3 or G4 disposable panel filters.
F5, F6 OR F7 disposable bag filters.

Electric Heater Data

Based on maximum airflow 9Kw single or three phase electric supply.

LPHW Coil Data

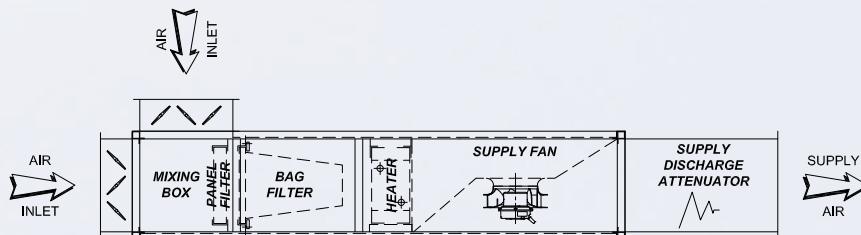
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 8.5Kw

Airflow Performance PVU300/220/163/1F

External Pressure Pascals	50	100	150	200	250	300	350
Airflow m³/sec.	0.21	0.2	0.18	0.17	0.15	0.13	0.1
Inlet SWL db	62	62	63	63	64	65	66
Outlet SWL db	65	66	67	67	67	68	70

Selection Chart PVU300/220/163T2/2F

Type 2 Performance Typical Type 2 Component Configuration



Fan Data

Motor output 0.326Kw Electric supply 240V/1/50
Maximum current rating 2.0Amps
Maximum Speed @10Volts 3200 RPM
Control Voltage 0<10 Volts

Filter Data

G3 or G4 disposable panel filters.
F5, F6 OR F7 disposable bag filters.

Electric Heater Data

Based on maximum airflow 18Kw single or three phase electric supply.

LPHW Coil Data

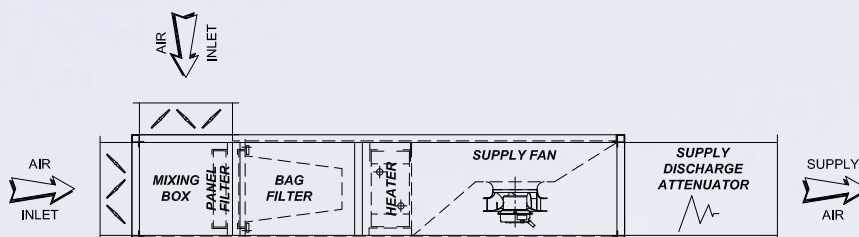
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 16Kw

Airflow Performance PVU300/220/163/2F

External Pressure Pascals	50	100	150	200	250	300	350
Airflow m³/sec.	0.42	0.4	0.36	0.34	0.3	0.26	0.2
Inlet SWL db	65	65	66	66	67	68	69
Outlet SWL db	68	69	70	70	70	71	73

Selection Chart PVU300/220/163T2/3F

Type 2 Performance Typical Type 2 Component Configuration



Fan Data

Motor output 0.489Kw Electric supply 240V/1/50
Maximum current rating 3.0Amps
Maximum Speed @10Volts 3200 RPM
Control Voltage 0<10 Volts

Filter Data

G3 or G4 disposable panel filters.
F5, F6 OR F7 disposable bag filters.

Electric Heater Data

Based on maximum airflow 21Kw single or three phase electric supply.

LPHW Coil Data

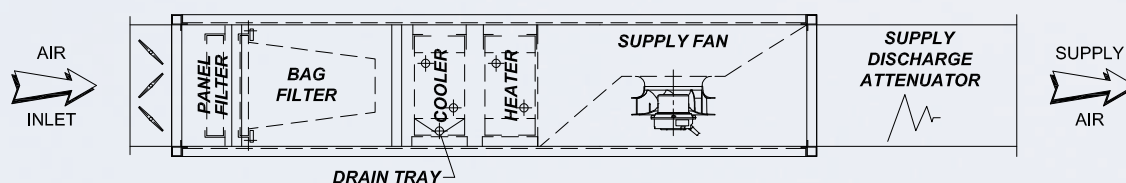
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 23Kw

Airflow Performance PVU300/220/163/3F

External Pressure Pascals	50	100	150	200	250	300	350
Airflow m ³ /sec.	0.63	0.6	0.59	0.51	0.45	0.39	0.3
Inlet SWL db	65	65	66	66	67	68	69
Outlet SWL db	68	69	70	70	70	71	73

Selection Chart PVU300/220/163T3/1F

Type 3 Performance Typical Type 3 Component Configuration



Fan Data

Motor output 0.163Kw Electric supply 240V/1/50
Maximum current rating 1.0Amps
Maximum Speed @10Volts 3200 RPM
Control Voltage 0<10 Volts

Filter Data

G3 or G4 disposable panel filters.
F5, F6 OR F7 disposable bag filters.

Airflow Performance PVU300/220/163/1F

External Pressure Pascals	50	100	150	200	250
Airflow m ³ /sec.	0.2	0.18	0.16	0.14	0.11
Inlet SWL db	75	72	73	75	74
Outlet SWL db	79	76	77	77	76

Electric Heater Data

Based on maximum airflow 9Kw single or three phase electric supply.

LPHW Coil Data

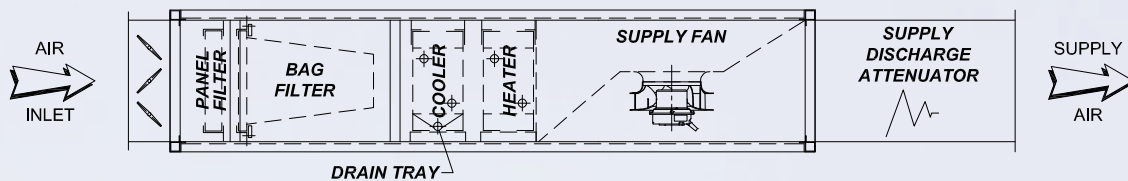
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 8Kw

Cooling Coil Data

Based on maximum airflow
Chilled water coil based on flow @ 6°C Return @ 12°C
Direct expansion coil based on R410A evaporating @ 6°C maximum cooling output.
Chilled water 2.5Kw
Direct expansion 2.5Kw

Selection Chart PVU300/220/163T3/2F

Type 3 Performance Typical Type 3 Component Configuration



Fan Data

Motor output 0.326Kw Electric supply 240V/1/50
Maximum current rating 2.0Amps
Maximum Speed @10Volts 3200 RPM
Control Voltage 0<10 Volts

Filter Data

G3 or G4 disposable panel filters.
F5, F6 OR F7 disposable bag filters.

Airflow Performance PVU300/220/163/2F

External Pressure Pascals	50	100	150	200	250
Airflow m³/sec.	0.4	0.36	0.32	0.28	0.22
Inlet SWL db	78	75	76	78	77
Outlet SWL db	82	79	80	80	79

Electric Heater Data

Based on maximum airflow 15Kw single or three phase electric supply.

LPHW Coil Data

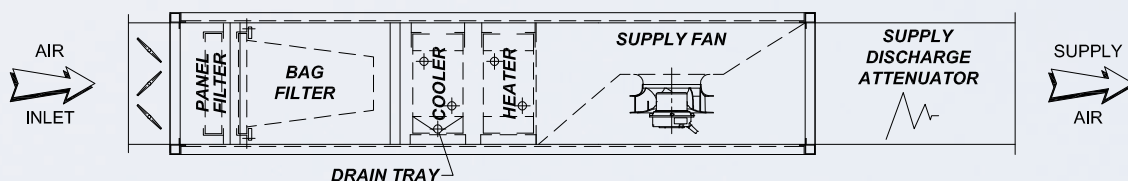
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 15Kw

Cooling Coil Data

Based on maximum airflow
Chilled water coil based on flow @ 6°C Return @ 12°C
Direct expansion coil based on R410A evaporating @ 6°C maximum cooling output.
Chilled water 5.0Kw
Direct expansion 5.0Kw

Selection Chart PVU300/220/163T3/3F

Type 3 Performance Typical Type 3 Component Configuration



Fan Data

Motor output 0.489Kw Electric supply 240V/1/50
Maximum current rating 3.0Amps
Maximum Speed @10Volts 3200 RPM
Control Voltage 0<10 Volts

Filter Data

G3 or G4 disposable panel filters.
F5, F6 OR F7 disposable bag filters.

Airflow Performance PVU300/220/163/3F

External Pressure Pascals	50	100	150	200	250
Airflow m³/sec.	0.6	0.54	0.48	0.42	0.33
Inlet SWL db	78	75	76	78	77
Outlet SWL db	82	79	80	80	79

Electric Heater Data

Based on maximum airflow 21Kw single or three phase electric supply.

LPHW Coil Data

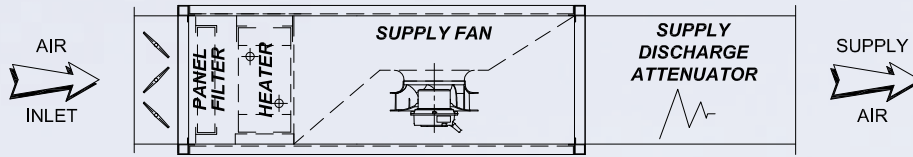
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 22Kw

Cooling Coil Data

Based on maximum airflow
Chilled water coil based on flow @ 6°C Return @ 12°C
Direct expansion coil based on R410A evaporating @ 6°C maximum cooling output.
Chilled water 8.0Kw
Direct expansion 8.0Kw

Selection Chart PVU400/310/390T1/1F

Type 1 Performance Typical Type 1 Component Configuration



Fan Data

Motor output 0.39 Electric supply 240V/1/50
Maximum current rating 2.6Amps
Maximum Speed @10Volts 2350 RPM
Control Voltage 0<10 Volts

Electric Heater Data

Based on maximum airflow 24Kw single or three phase electric supply.

LPHW Coil Data

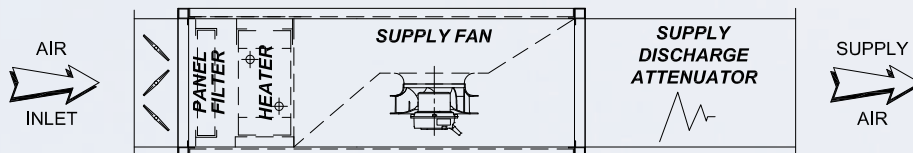
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 24Kw

Airflow Performance PVU400/310/390/1F

External Pressure Pascals	50	100	150	200	250	300	350	400
Airflow m³/sec.	0.69	0.64	0.6	0.56	0.5	0.46	0.4	0.33
Inlet SWL db	76	72	73	71	70	71	71	71
Outlet SWL db	79	77	79	76	76	76	76	77

Selection Chart PVU400/310/390T1/2F

Type 1 Performance Typical Type 1 Component Configuration



Fan Data

Motor output 0.78 Electric supply 240V/1/50
Maximum current rating 5.2Amps
Maximum Speed @10Volts 2350 RPM
Control Voltage 0<10 Volts

Electric Heater Data

Based on maximum airflow 45Kw single or three phase electric supply.

LPHW Coil Data

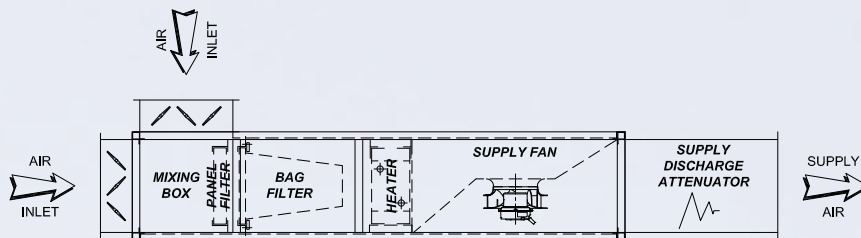
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 48Kw

Airflow Performance PVU400/310/390/2F

External Pressure Pascals	50	100	150	200	250	300	350	400
Airflow m³/sec.	1.38	1.28	1.2	1.12	1.0	0.92	0.8	0.66
Inlet SWL db	79	75	76	74	73	74	74	74
Outlet SWL db	82	80	82	79	79	79	79	80

Selection Chart PVU400/310/390T2/1F

Type 2 Performance Typical Type 2 Component Configuration



Fan Data

Motor output 0.39 Electric supply 240V/1/50
Maximum current rating 2.6Amps
Maximum Speed @10Volts 2350 RPM
Control Voltage 0<10 Volts

Filter Data

G3 or G4 disposable panel filters.
F5, F6 OR F7 disposable bag filters.

Electric Heater Data

Based on maximum airflow 24Kw single or three phase electric supply.

LPHW Coil Data

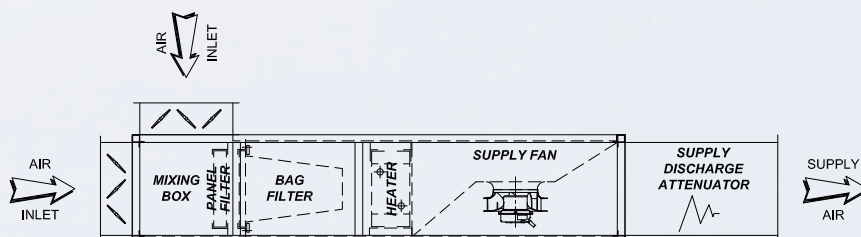
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 23Kw

Airflow Performance PVU400/310/390/1F

External Pressure Pascals	50	100	150	200	250	300	350	400
Airflow m³/sec.	0.62	0.56	0.5	0.45	0.39	0.32	0.27	0.2
Inlet SWL db	71	70	71	71	71	72	72	72
Outlet SWL db	76	76	76	76	77	78	78	78

Selection Chart PVU400/310/390T2/2F

Type 2 Performance Typical Type 2 Component Configuration



Fan Data

Motor output 0.68 Electric supply 240V/1/50
Maximum current rating 5.2Amps
Maximum Speed @10Volts 2350 RPM
Control Voltage 0<10 Volts

Filter Data

G3 or G4 disposable panel filters.
F5, F6 OR F7 disposable bag filters.

Electric Heater Data

Based on maximum airflow 45Kw single or three phase electric supply.

LPHW Coil Data

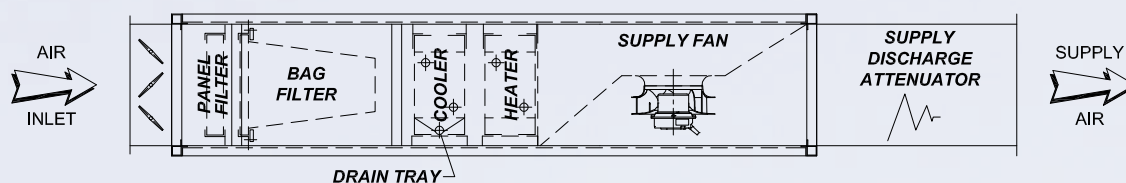
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 46Kw

Airflow Performance PVU400/310/390/2F

External Pressure Pascals	50	100	150	200	250	300	350	400
Airflow m³/sec.	1.24	1.12	1.0	0.9	0.78	0.64	0.54	0.4
Inlet SWL db	74	73	74	74	74	75	75	75
Outlet SWL db	79	79	79	79	80	81	81	81

Selection Chart PVU400/310/390T3/1F

Type 3 Performance Typical Type 3 Component Configuration



Fan Data

Motor output 0.39 Electric supply 240V/1/50
Maximum current rating 2.6Amps
Maximum Speed @10Volts 2350 RPM
Control Voltage 0<10 Volts

Filter Data

G3 or G4 disposable panel filters.
F5, F6 OR F7 disposable bag filters.

Airflow Performance PVU400/310/390/1F

External Pressure Pascals	50	100	150	200	250	300
Airflow m ³ /sec.	0.52	0.47	0.41	0.34	0.29	0.22
Inlet SWL db	70	71	71	71	72	72
Outlet SWL db	76	76	76	77	78	78

Electric Heater Data

Based on maximum airflow 18Kw single or three phase electric supply.

LPHW Coil Data

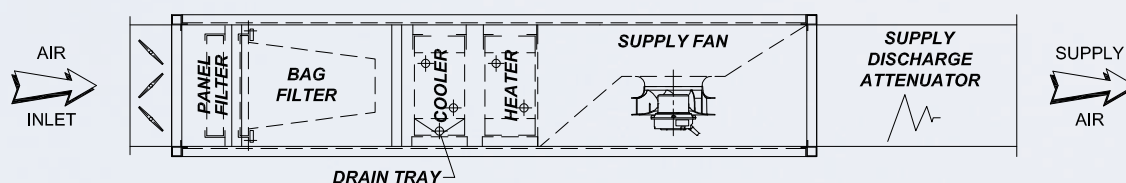
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 21Kw

Cooling Coil Data

Based on maximum airflow
Chilled water coil based on flow @ 6°C Return @ 12°C
Direct expansion coil based on R410A evaporating @ 6°C maximum cooling output.
Chilled water 8.0Kw
Direct expansion 8.0Kw

Selection Chart PVU400/310/390T3/2F

Type 3 Performance Typical Type 3 Component Configuration



Fan Data

Motor output 0.78 Electric supply 240V/1/50
Maximum current rating 5.2Amps
Maximum Speed @10Volts 2350 RPM
Control Voltage 0<10 Volts

Filter Data

G3 or G4 disposable panel filters.
F5, F6 OR F7 disposable bag filters.

Airflow Performance PVU400/310/390/2F

External Pressure Pascals	50	100	150	200	250	300
Airflow m ³ /sec.	1.03	0.92	0.81	0.68	0.52	0.43
Inlet SWL db	73	74	74	74	75	75
Outlet SWL db	79	79	79	80	81	81

Electric Heater Data

Based on maximum airflow 36Kw single or three phase electric supply.

LPHW Coil Data

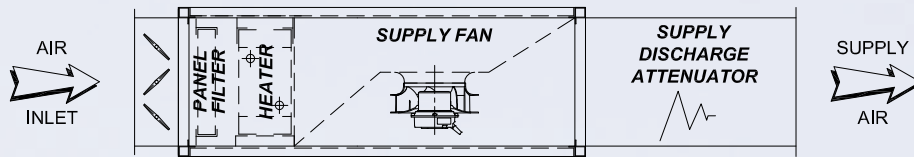
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 44Kw

Cooling Coil Data

Based on maximum airflow
Chilled water coil based on flow @ 6°C Return @ 12°C
Direct expansion coil based on R410A evaporating @ 6°C maximum cooling output.
Chilled water 12.0Kw
Direct expansion 12.0Kw

Selection Chart PVU450/310/680T1/1F

Type 1 Performance Typical Type 1 Component Configuration



Fan Data

Motor output 0.68Kw Electric supply 240V/1/50
Maximum current rating 4.3Amps
Maximum Speed @10Volts 3000 RPM
Control Voltage 0<10 Volts

Filter Data

G3 or G4 disposable panel filters.

Electric Heater Data

Based on maximum airflow 30Kw single or three phase electric supply.

LPHW Coil Data

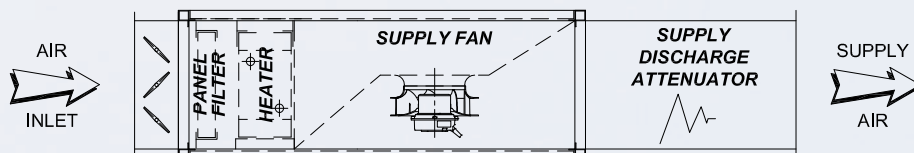
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 29Kw

Airflow Performance PVU450/310/680/1F

External Pressure Pascals	50	100	150	200	250	300	350	400
Airflow m ³ /sec.	0.83	0.81	0.78	0.75	0.71	0.66	0.64	0.61
Inlet SWL db	82	81	80	83	83	78	79	77
Outlet SWL db	85	82	84	84	86	81	81	80

Selection Chart PVU450/310/680T1/2F

Type 1 Performance Typical Type 1 Component Configuration



Fan Data

Motor output 1.36Kw Electric supply 240V/1/50
Maximum current rating 8.6Amps
Maximum Speed @10Volts 3000RPM
Control Voltage 0<10 Volts

Filter Data

G3 or G4 disposable panel filters.

Electric Heater Data

Based on maximum airflow 60Kw single or three phase electric supply.

LPHW Coil Data

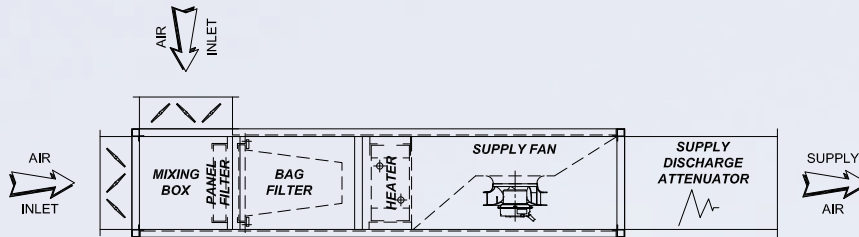
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 60Kw

Airflow Performance PVU450/310/680/2F

External Pressure Pascals	50	100	150	200	250	300	350	400
Airflow m ³ /sec.	1.66	1.62	1.56	1.5	1.42	1.32	1.28	1.22
Inlet SWL db	85	84	83	86	86	81	82	80
Outlet SWL db	88	85	87	87	89	84	84	83

Selection Chart PVU450/310/680T2/1F

Type 2 Performance Typical Type 2 Component Configuration



Fan Data

Motor output 0.68Kw Electric supply 240V/1/50
Maximum current rating 4.3Amps
Maximum Speed @10Volts 3200RPM
Control Voltage 0<10 Volts

Filter Data

G3 or G4 disposable panel filters.
F5, F6 OR F7 disposable bag filters.

Electric Heater Data

Based on maximum airflow 27Kw single or three phase electric supply.

LPHW Coil Data

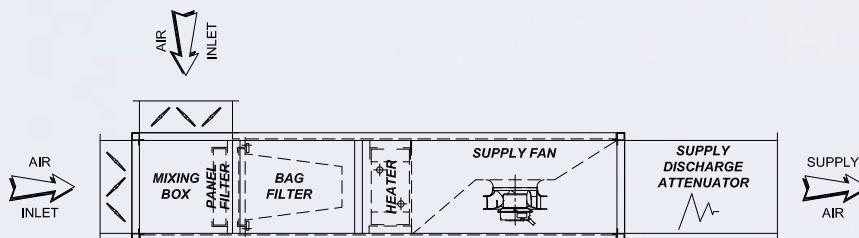
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 28Kw

Airflow Performance PVU450/310/680/1F

External Pressure Pascals	50	100	150	200	250	300	350	400	450	500
Airflow m³/sec.	0.8	0.76	0.71	0.65	0.63	0.6	0.57	0.54	0.5	0.46
Inlet SWL db	80	79	77	78	76	78	79	79	79	78
Outlet SWL db	83	81	80	81	80	82	83	83	83	83

Selection Chart PVU450/310/680T2/2F

Type 2 Performance Typical Type 2 Component Configuration



Fan Data

Motor output 1.36Kw Electric supply 240V/1/50
Maximum current rating 8.6Amps
Maximum Speed @10Volts 3200RPM
Control Voltage 0<10 Volts

Filter Data

G3 or G4 disposable panel filters.
F5, F6 OR F7 disposable bag filters.

Electric Heater Data

Based on maximum airflow 60Kw single or three phase electric supply.

LPHW Coil Data

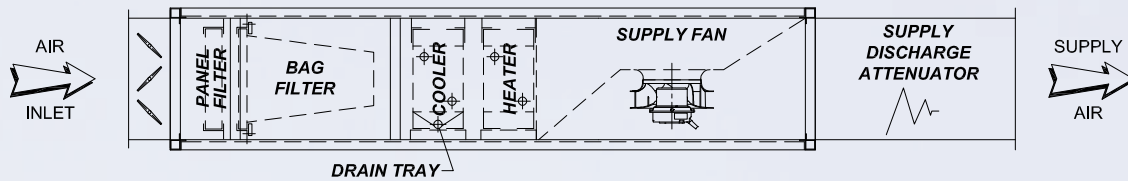
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 59Kw

Airflow Performance PVU450/310/680/2F

External Pressure Pascals	50	100	150	200	250	300	350	400	450	500
Airflow m³/sec.	1.6	1.52	1.42	1.30	1.26	1.20	1.14	1.08	1.00	0.92
Inlet SWL db	83	82	80	81	79	81	82	82	82	81
Outlet SWL db	86	84	84	84	83	85	86	86	86	86

Selection Chart PVU450/310/680T3/1F

Type 3 Performance Typical Type 3 Component Configuration



Fan Data

Motor output 0.68Kw Electric supply 240V/1/50
Maximum current rating 4.3Amps
Maximum Speed @10Volts 3200RPM
Control Voltage 0<10 Volts

Filter Data

G3 or G4 disposable panel filters.
F5, F6 OR F7 disposable bag filters.

Airflow Performance PVU450/310/680/1F

External Pressure Pascals	50	100	150	200	250	300	350	400
Airflow m ³ /sec.	0.77	0.72	0.63	0.61	0.57	0.55	0.51	0.47
Inlet SWL db	79	77	78	76	78	79	79	78
Outlet SWL db	81	80	81	80	82	83	83	83

Electric Heater Data

Based on maximum airflow 27Kw single or three phase electric supply.

LPHW Coil Data

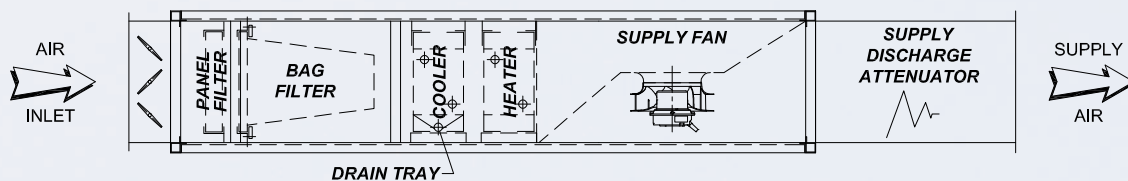
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 27Kw

Cooling Coil Data

Based on maximum airflow
Chilled water coil based on flow @ 6°C
Return @ 12°C
Direct expansion coil based on R410A
evaporating @ 6°C maximum cooling output.
Chilled water 11.0Kw
Direct expansion 11.0Kw

Selection Chart PVU450/310/680T3/2F

Type 3 Performance Typical Type 3 Component Configuration



Fan Data

Motor output 1.36Kw Electric supply 240V/1/50
Maximum current rating 8.6Amps
Maximum Speed @10Volts 3200RPM
Control Voltage 0<10 Volts

Filter Data

G3 or G4 disposable panel filters.
F5, F6 OR F7 disposable bag filters.

Airflow Performance PVU450/310/680/2F

External Pressure Pascals	50	100	150	200	250	300	350	400
Airflow m ³ /sec.	1.44	1.33	1.27	1.21	1.15	1.09	1.02	0.97
Inlet SWL db	82	80	81	79	81	82	82	81
Outlet SWL db	84	83	84	83	85	86	86	86

Electric Heater Data

Based on maximum airflow 48Kw single or three phase electric supply.

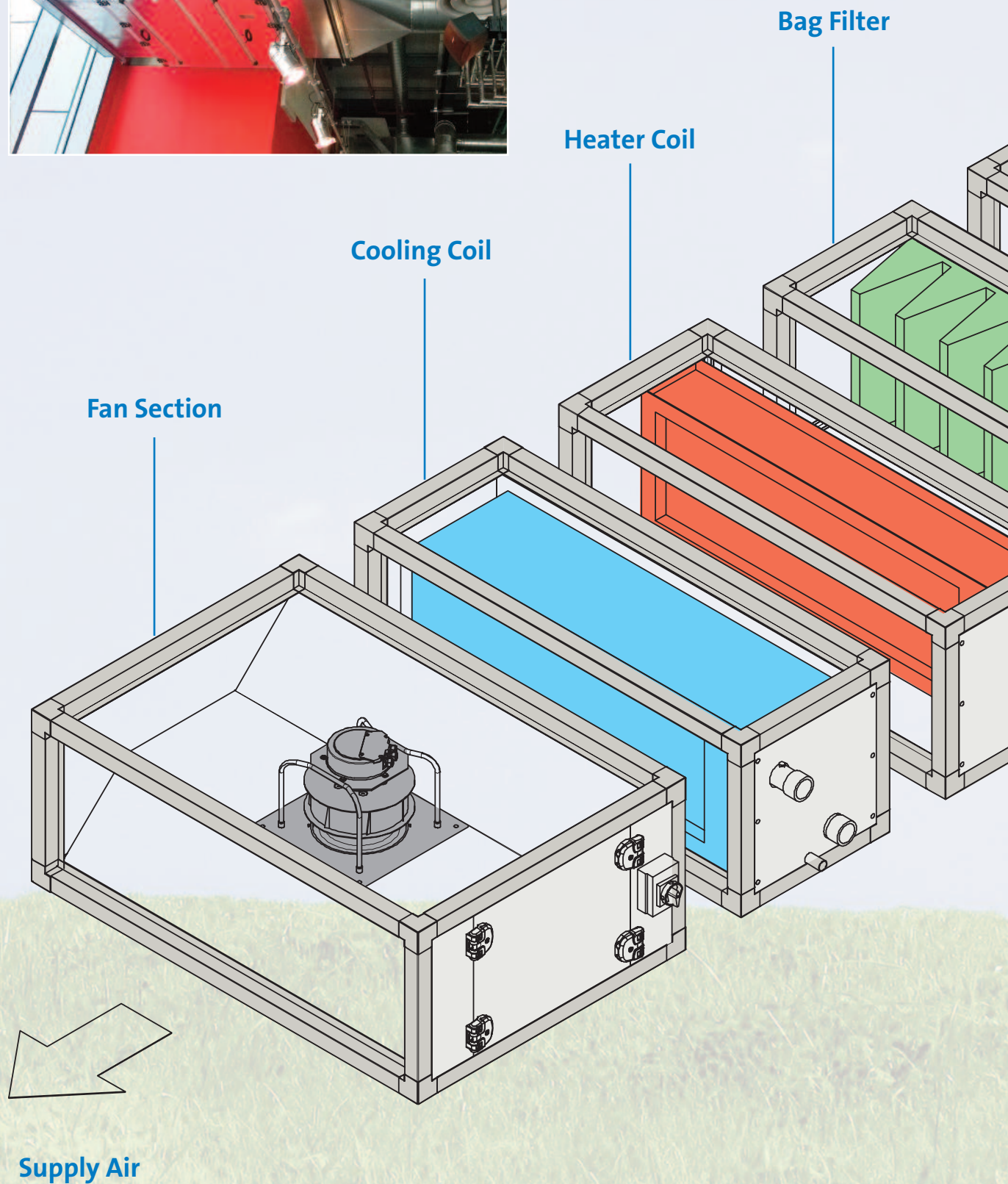
LPHW Coil Data

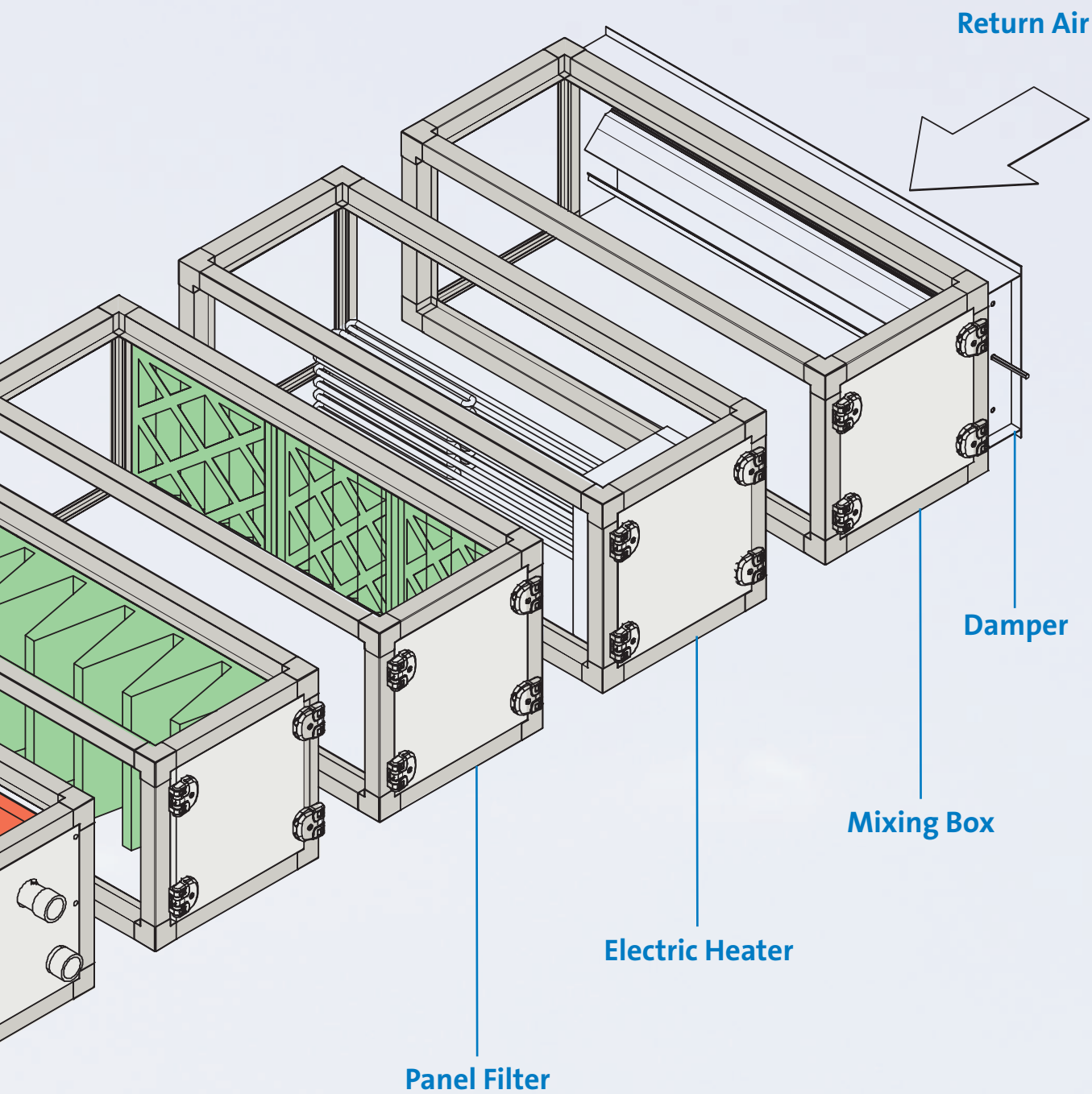
Based on maximum airflow and LPHW @82/71°C
Maximum heating output 58Kw

Cooling Coil Data

Based on maximum airflow
Chilled water coil based on flow @ 6°C
Return @ 12°C
Direct expansion coil based on R410A
evaporating @ 6°C maximum cooling output.
Chilled water 15.0Kw
Direct expansion 15.0Kw

PVU Quiet Sections...





University of
Salford
MANCHESTER
Acoustic Testing Laboratory
College of Science & Technology



Dimensions and Weights...

Dimensions and weights of all component options for both standard and acoustic casework. Individual dimensions and weights of the selected components provide the overall weight and length of the unit required.

STANDARD CASEWORK 18MM PANELS

MODEL PVU 300/220/163/1F

Component	Weight Kg	Width	Height	Length
DAMPER	4.1	650mm	300mm	125mm
MIXING BOX	25.2	650mm	300mm	400mm
ELECTRIC HEATER	38.7	650mm	300mm	500mm
PANEL FILTER	7.65	650mm	300mm	100mm
BAG FILTER	33.1	650mm	300mm	470mm
LPHW	22.6	650mm	300mm	230mm
COOLING COIL	34.4	650mm	300mm	340mm
FAN SECTION	36.3	650mm	300mm	500mm

STANDARD CASEWORK 18MM PANELS

MODEL PVU 400/310/390/2F

Component	Weight Kg	Width	Height	Length
DAMPER	9.0	1650mm	400mm	125mm
MIXING BOX	50.1	1650mm	400mm	500mm
ELECTRIC HEATER	78.2	1650mm	400mm	500mm
PANEL FILTER	15.3	1650mm	400mm	100mm
BAG FILTER	64.2	1650mm	400mm	470mm
LPHW	46.2	1650mm	400mm	230mm
COOLING COIL	71.0	1650mm	400mm	340mm
FAN SECTION	90.2	1650mm	400mm	600mm

STANDARD CASEWORK 18MM PANELS

MODEL PVU 300/220/163/2F

Component	Weight Kg	Width	Height	Length
DAMPER	6.8	1050mm	300mm	125mm
MIXING BOX	36.8	1050mm	300mm	400mm
ELECTRIC HEATER	58.1	1050mm	300mm	500mm
PANEL FILTER	10.9	1050mm	300mm	100mm
BAG FILTER	47.1	1050mm	300mm	470mm
LPHW	32.1	1050mm	300mm	230mm
COOLING COIL	45.0	1050mm	300mm	340mm
FAN SECTION	52.2	1050mm	300mm	500mm

STANDARD CASEWORK 18MM PANELS

MODEL PVU 450/310/680/1F

Component	Weight Kg	Width	Height	Length
DAMPER	8.1	1400mm	450mm	125mm
MIXING BOX	56.8	1400mm	450mm	500mm
ELECTRIC HEATER	76.9	1400mm	450mm	500mm
PANEL FILTER	13.8	1400mm	450mm	100mm
BAG FILTER	58.3	1400mm	450mm	470mm
LPHW	39.8	1400mm	450mm	230mm
COOLING COIL	72.9	1400mm	450mm	340mm
FAN SECTION	64.8	1400mm	450mm	600mm

STANDARD CASEWORK 18MM PANELS

MODEL PVU 300/220/163/3F

Component	Weight Kg	Width	Height	Length
DAMPER	8.7	1500mm	300mm	125mm
MIXING BOX	49.4	1500mm	300mm	400mm
ELECTRIC HEATER	73.8	1500mm	300mm	500mm
PANEL FILTER	14.6	1500mm	300mm	100mm
BAG FILTER	63.1	1500mm	300mm	470mm
LPHW	55.8	1500mm	300mm	230mm
COOLING COIL	62.7	1500mm	300mm	340mm
FAN SECTION	70.0	1500mm	300mm	500mm

STANDARD CASEWORK 18MM PANELS

MODEL PVU 450/310/680/2F

Component	Weight Kg	Width	Height	Length
DAMPER	10.4	1800mm	450mm	125mm
MIXING BOX	44.3	1800mm	450mm	500mm
ELECTRIC HEATER	90.7	1800mm	450mm	500mm
PANEL FILTER	16.9	1800mm	450mm	100mm
BAG FILTER	71.0	1800mm	450mm	470mm
LPHW	49.2	1800mm	450mm	230mm
COOLING COIL	87.8	1800mm	450mm	340mm
FAN SECTION	83.9	1800mm	450mm	600mm

STANDARD CASEWORK 18MM PANELS

MODEL PVU 400/310/390/1F

Component	Weight Kg	Width	Height	Length
DAMPER	5.4	1050mm	400mm	125mm
MIXING BOX	35.2	1050mm	400mm	400mm
ELECTRIC HEATER	46.0	1050mm	400mm	500mm
PANEL FILTER	10.9	1050mm	400mm	100mm
BAG FILTER	45.1	1050mm	400mm	470mm
LPHW	32.5	1050mm	400mm	230mm
COOLING COIL	52.4	1050mm	400mm	340mm
FAN SECTION	61.7	1050mm	400mm	600mm

ACOUSTIC CASEWORK 25MM PANELS**MODEL PVU 320/220/163/1F**

Component	Weight Kg	Width	Height	Length
DAMPER	4.5	670mm	320mm	125mm
MIXING BOX	24.7	670mm	320mm	420mm
ELECTRIC HEATER	37.7	670mm	320mm	520mm
PANEL FILTER	8.1	670mm	320mm	120mm
BAG FILTER	29.9	670mm	320mm	490mm
LPHW	21.4	670mm	320mm	250mm
COOLING COIL	34.0	670mm	320mm	360mm
FAN SECTION	34.9	670mm	320mm	520mm

ACOUSTIC CASEWORK 25MM PANELS**MODEL PVU 320/220/163/2F**

Component	Weight Kg	Width	Height	Length
DAMPER	7.4	1070mm	320mm	125mm
MIXING BOX	35.2	1070mm	320mm	420mm
ELECTRIC HEATER	48.0	1070mm	320mm	520mm
PANEL FILTER	11.7	1070mm	320mm	120mm
BAG FILTER	45.2	1070mm	320mm	490mm
LPHW	30.6	1070mm	320mm	250mm
COOLING COIL	47.0	1070mm	320mm	360mm
FAN SECTION	49.6	1070mm	320mm	520mm

ACOUSTIC CASEWORK 25MM PANELS**MODEL PVU 320/220/163/3F**

Component	Weight Kg	Width	Height	Length
DAMPER	9.4	1520mm	320mm	125mm
MIXING BOX	47.3	1520mm	320mm	420mm
ELECTRIC HEATER	73.3	1520mm	320mm	520mm
PANEL FILTER	15.6	1520mm	320mm	120mm
BAG FILTER	55.8	1520mm	320mm	490mm
LPHW	42.0	1520mm	320mm	250mm
COOLING COIL	60.9	1520mm	320mm	360mm
FAN SECTION	66.2	1520mm	320mm	520mm

ACOUSTIC CASEWORK 25MM PANELS**MODEL PVU 420/310/390/1F**

Component	Weight Kg	Width	Height	Length
DAMPER	5.7	1070mm	420mm	125mm
MIXING BOX	37.4	1070mm	420mm	420mm
ELECTRIC HEATER	55.5	1070mm	420mm	520mm
PANEL FILTER	13.0	1070mm	420mm	120mm
BAG FILTER	46.1	1070mm	420mm	470mm
LPHW	34.9	1070mm	420mm	250mm
COOLING COIL	55.1	1070mm	420mm	360mm
FAN SECTION	64.8	1070mm	420mm	620mm

ACOUSTIC CASEWORK 25MM PANELS**MODEL PVU 420/310/390/2F**

Component	Weight Kg	Width	Height	Length
DAMPER	9.5	1670mm	420mm	125mm
MIXING BOX	52.9	1670mm	420mm	420mm
ELECTRIC HEATER	81.3	1670mm	420mm	520mm
PANEL FILTER	18.1	1670mm	420mm	120mm
BAG FILTER	64.7	1670mm	420mm	470mm
LPHW	49.2	1670mm	420mm	250mm
COOLING COIL	74.5	1670mm	420mm	360mm
FAN SECTION	94.2	1670mm	420mm	620mm

ACOUSTIC CASEWORK 25MM PANELS**MODEL PVU 470/310/680/1F**

Component	Weight Kg	Width	Height	Length
DAMPER	8.5	1420mm	470mm	125mm
MIXING BOX	47.6	1420mm	470mm	420mm
ELECTRIC HEATER	67.3	1420mm	470mm	520mm
PANEL FILTER	15.9	1420mm	470mm	120mm
BAG FILTER	57.8	1420mm	470mm	470mm
LPHW	41.1	1420mm	470mm	250mm
COOLING COIL	64.1	1420mm	470mm	360mm
FAN SECTION	80.3	1420mm	470mm	620mm

ACOUSTIC CASEWORK 25MM PANELS**MODEL PVU 470/310/680/2F**

Component	Weight Kg	Width	Height	Length
DAMPER	8.9	1820mm	470mm	125mm
MIXING BOX	57.8	1820mm	470mm	420mm
ELECTRIC HEATER	86.9	1820mm	470mm	520mm
PANEL FILTER	19.3	1820mm	470mm	120mm
BAG FILTER	70.7	1820mm	470mm	470mm
LPHW	52.3	1820mm	470mm	250mm
COOLING COIL	79.1	1820mm	470mm	360mm
FAN SECTION	100.9	1820mm	470mm	620mm

Dimensions and Weights...

ACOUSTIC CASEWORK 50MM PANELS

MODEL PVU 360/220/163/1F

Component	Weight Kg	Width	Height	Length
DAMPER	5.3	710mm	360mm	125mm
MIXING BOX	35.3	710mm	360mm	460mm
ELECTRIC HEATER	44.3	710mm	360mm	560mm
PANEL FILTER	14.2	710mm	360mm	160mm
BAG FILTER	47.2	710mm	360mm	530mm
LPHW	30.4	710mm	360mm	290mm
COOLING COIL	47.6	710mm	360mm	400mm
FAN SECTION	50.6	710mm	360mm	560mm

ACOUSTIC CASEWORK 50MM PANELS

MODEL PVU 360/220/163/2F

Component	Weight Kg	Width	Height	Length
DAMPER	8.6	1110mm	360mm	125mm
MIXING BOX	50.4	1110mm	360mm	460mm
ELECTRIC HEATER	81.7	1110mm	360mm	560mm
PANEL FILTER	19.9	1110mm	360mm	160mm
BAG FILTER	65.0	1110mm	360mm	530mm
LPHW	41.0	1110mm	360mm	290mm
COOLING COIL	59.2	1110mm	360mm	400mm
FAN SECTION	52.6	1110mm	360mm	560mm

ACOUSTIC CASEWORK 50MM PANELS

MODEL PVU 360/220/163/3F

Component	Weight Kg	Width	Height	Length
DAMPER	10.8	1560mm	360mm	125mm
MIXING BOX	66.8	1560mm	360mm	460mm
ELECTRIC HEATER	96.6	1560mm	360mm	560mm
PANEL FILTER	26.4	1560mm	360mm	160mm
BAG FILTER	85.2	1560mm	360mm	530mm
LPHW	57.5	1560mm	360mm	290mm
COOLING COIL	81.6	1560mm	360mm	400mm
FAN SECTION	92.6	1560mm	360mm	560mm

ACOUSTIC CASEWORK 50MM PANELS

MODEL PVU 460/310/390/1F

Component	Weight Kg	Width	Height	Length
DAMPER	6.5	1010mm	460mm	125mm
MIXING BOX	54.4	1010mm	460mm	460mm
ELECTRIC HEATER	73.9	1010mm	460mm	560mm
PANEL FILTER	21.5	1010mm	460mm	160mm
BAG FILTER	69.0	1010mm	460mm	530mm
LPHW	48.0	1010mm	460mm	290mm
COOLING COIL	72.4	1010mm	460mm	400mm
FAN SECTION	90.2	1010mm	460mm	660mm

ACOUSTIC CASEWORK 50MM PANELS

MODEL PVU 460/310/390/2F

Component	Weight Kg	Width	Height	Length
DAMPER	10.6	1710mm	460mm	125mm
MIXING BOX	75.4	1710mm	460mm	460mm
ELECTRIC HEATER	107.3	1710mm	460mm	560mm
PANEL FILTER	29.8	1710mm	460mm	160mm
BAG FILTER	73.5	1710mm	460mm	530mm
LPHW	67.0	1710mm	460mm	290mm
COOLING COIL	97.6	1710mm	460mm	300mm
FAN SECTION	119.9	1710mm	460mm	660mm

ACOUSTIC CASEWORK 50MM PANELS

MODEL PVU 510/310/680/1F

Component	Weight Kg	Width	Height	Length
DAMPER	9.5	1460mm	510mm	125mm
MIXING BOX	82.7	1460mm	510mm	560mm
ELECTRIC HEATER	96.2	1460mm	510mm	560mm
PANEL FILTER	68.6	1460mm	510mm	160mm
BAG FILTER	88.8	1460mm	510mm	530mm
LPHW	52.7	1460mm	510mm	290mm
COOLING COIL	91.4	1460mm	510mm	400mm
FAN SECTION	112.6	1460mm	510mm	660mm

ACOUSTIC CASEWORK 50MM PANELS

MODEL PVU 510/310/680/2F

Component	Weight Kg	Width	Height	Length
DAMPER	12.1	1860mm	510mm	125mm
MIXING BOX	102.4	1860mm	510mm	560mm
ELECTRIC HEATER	122.2	1860mm	510mm	560mm
PANEL FILTER	85.3	1860mm	510mm	160mm
BAG FILTER	107.2	1860mm	510mm	530mm
LPHW	65.4	1860mm	510mm	290mm
COOLING COIL	109.6	1860mm	510mm	400mm
FAN SECTION	142.0	1860mm	510mm	660mm

Mounting Arrangements...

PVU Quiet units have a variety of mounting arrangements, which are outlined below.

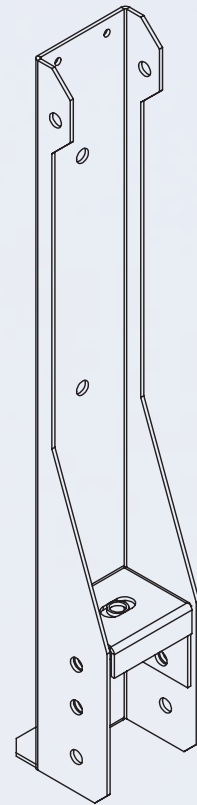
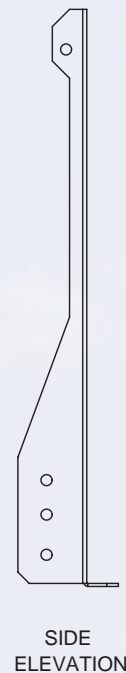
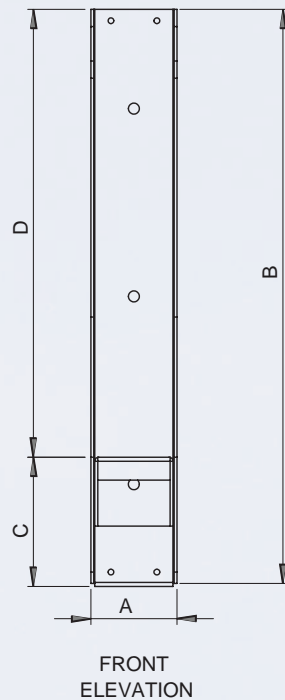
Suspension Brackets

Designed for use on internal ceiling mounted units, the brackets are contained within the depth of the extract unit casework for drop rod suspension.

The quantity of suspension brackets will depend on the size and weight of the PVU Quiet Units including any attenuators attached. The minimum number of suspension brackets is given in the loading chart.

Suspension Bracket Loading Chart

Model	Qty Brackets/Unit			No of Additional Brackets per Attenuator					
	1F	2F	3F	600L	750L	900L	1200L	1500L	1800L
PVU 300/320/360	4	4	6	2	2	2	4	4	4
PVU 400/420/460	4	6	-	2	2	4	4	4	6
PVU 300/320/360	6	8	-	2	4	4	6	6	8

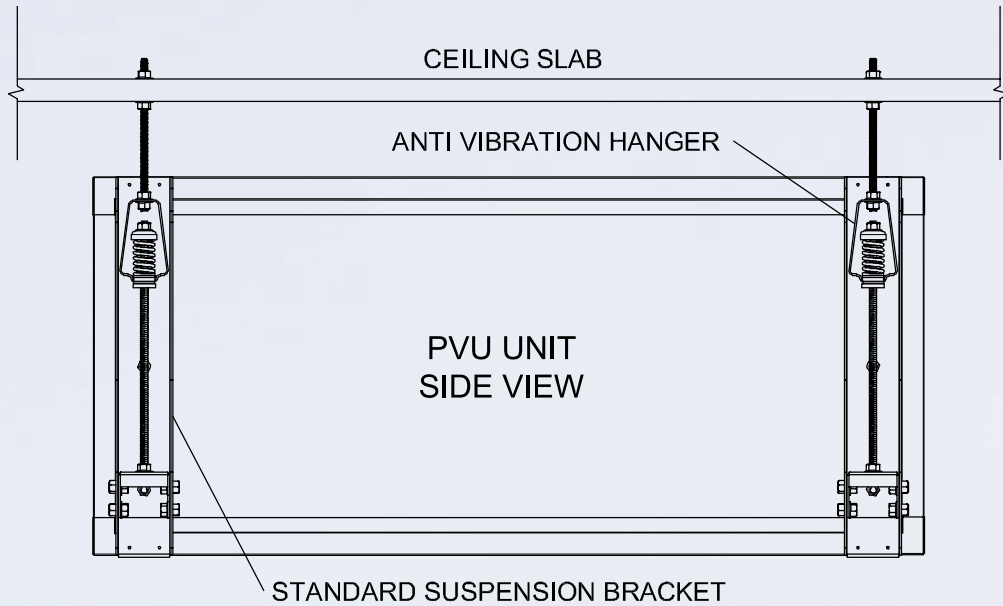


Constructed from galvanised sheet steel.

DIMENSIONS MM	A	B	C	D	E	F	G	H	Hole Size Slotted	Weight Each Kg
PVU300/1,2,3F	60	290	110	180	37.5	37.5	30	30	12.7 x 24	1.2
PVU320/1,2,3F	60	320	110	200	37.5	37.5	30	30	12.7 x 24	1.7
PVU360/1,2,3F	60	350	110	240	37.5	37.5	30	30	12.7 x 24	1.9
PVU400/1,2F	60	390	110	280	37.5	37.5	30	30	12.7 x 24	1.9
PVU420/1,2F	60	410	110	300	37.5	37.5	30	30	12.7 x 24	4.6
PVU460/1,2F	60	450	110	340	37.5	37.5	30	30	12.7 x 24	5.9
PVU450/1,2F	60	440	110	330	37.5	37.5	30	30	12.7 x 24	7.3
PVU470/1,2F	60	460	110	350	37.5	37.5	30	30	12.7 x 24	7.3
PVU510/1,2F	60	500	110	390	37.5	37.5	30	30	12.7 x 24	7.6

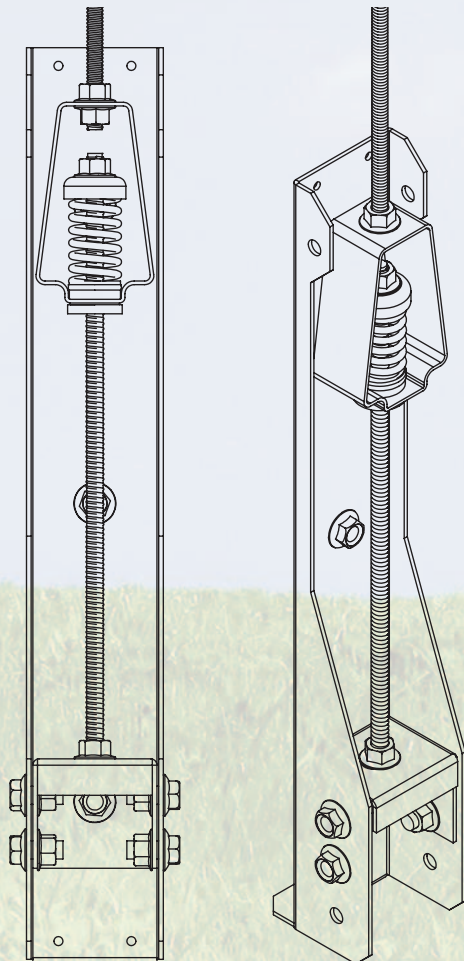
Vibration Control for Suspended PVU Units

Where packaged void extract units are suspended from the ceiling slab etc, then we can provide a range of neoprene or spring anti vibration control hangers as detailed below.



Vibration Hangers with Suspension Brackets

The application for this type of vibration isolation is where the cased extract unit is suspended from the ceiling via drop rods.



Type of Isolator

Both neoprene and spring isolators can be selected with this application, depending on the degree of vibration isolation required.

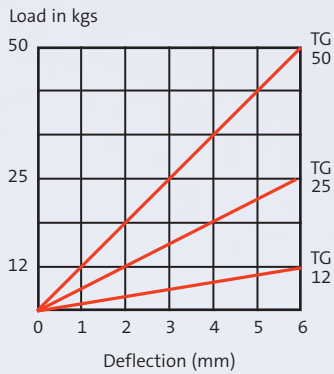
Open Rubber Hanger - Series TG

The TG series has different modules, each of which is indicated for a specific application, depending on the weight to be supported and the disturbance frequency it generates. The TG series is made from rubber. We recommend studying their physical analysis to check which is the most appropriate size, depending on the application.



The most important benefits of this product are its toughness, easy assembly and economy, which make them a favourite product of acoustic and air conditioning installation technicians.

Performance Curves



Physical Analysis

TG Vibration Absorbers

MODEL	Max load Kgs	Deflection mm	Frequency Hz
TG-12	12	6	7
TG-25	25	6	7
TG-50	50	6	7

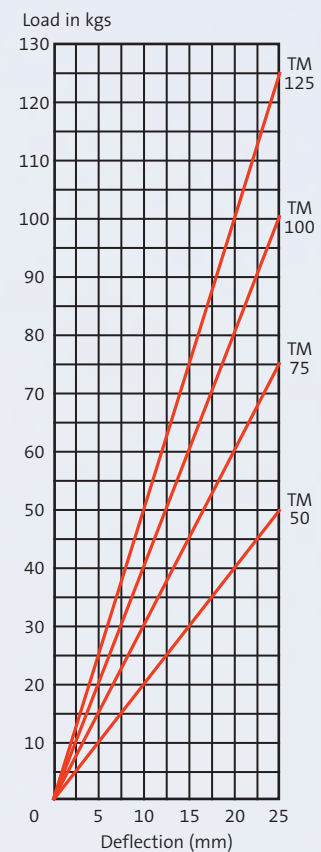
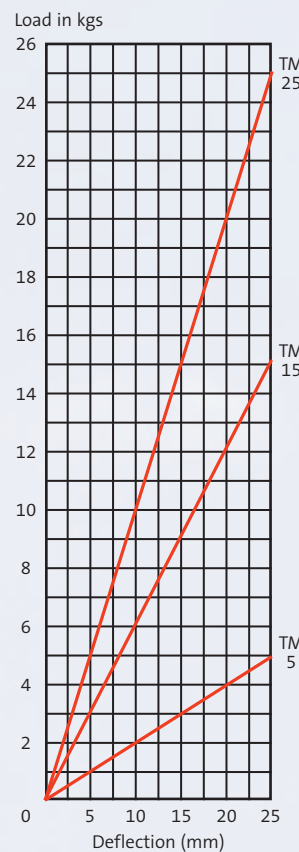
Open Spring Hanger - Series TM 5/25

The TM 5/125 Series are Metal Spring Isolators, ideal for suspending machinery from the ceiling or a metal structure. Highly suitable for very lightweight equipment situated in critical areas with a low cycle operating system (over 600 rpm).



4. Extremely secure Metal Casing, superior to other similar products, formed via a process of bending with one single connection point made with a bead of welding.

Performance Curves



Performance Curves Information

Components Description

1. Standardised, high resistance steel spring.
2. Cylindrical metal bushes, which protect the outside of the spring at its upper end. Because of its particular geometry, the attachment nut is connected the opposite way to the traditional system of similar products, providing maximum security.
3. Cylindrical rubber bushes for connecting the spring to the metal case preventing contact.
4. Extremely secure metal casing, superior to other similar products, formed via a process of bending and welding.

Physical Analysis

TM Spring Absorbers

Standardised Load at Minimum and Maximum Compression

MODEL	Min Load Kgs	Deflection mm	Max Load Kgs	Deflection mm	Stiffness Kgs/mm	Admissable Temporary Overload as a %
TM 5	2	10	5	25	0.2	10%
TM 15	6	10	15	25	0.6	10%
TM 25	10	10	25	25	1	10%
TM 50	20	10	50	25	2	10%
TM 75	30	10	75	25	3	10%
TM 100	40	10	100	25	4	10%
TM 125	50	10	125	25	5	10%

1. Working temperature range: -90°C to 200°C
2. Lateral to Axial Stiffness Ratio: 1
3. For studies requiring a maximum adjustment of the compression deflection and load: please consult our technical department.

Open Spring Hanger - Series TM 150/450

The TM150/450 comprises Metal Spring Isolators especially designed for suspending machinery and ductwork from the ceiling or from a metal structure. Highly suitable for all kinds of machinery with a low cycle operating system (above 600 rpm).



Performance Curves Information

Components Description

1. Standardised, high resistance steel spring.
2. Cylindrical metal bushes, which protect the outside of the spring at its upper end. Because of its particular geometry, the attachment nut is connected the opposite way to the traditional system of similar products, providing maximum security.
3. Cylindrical rubber bushes for connecting the spring to the metal case preventing contact.
4. Extremely secure metal casing, superior to other similar products, formed via a process of bending and welding.

Physical Analysis

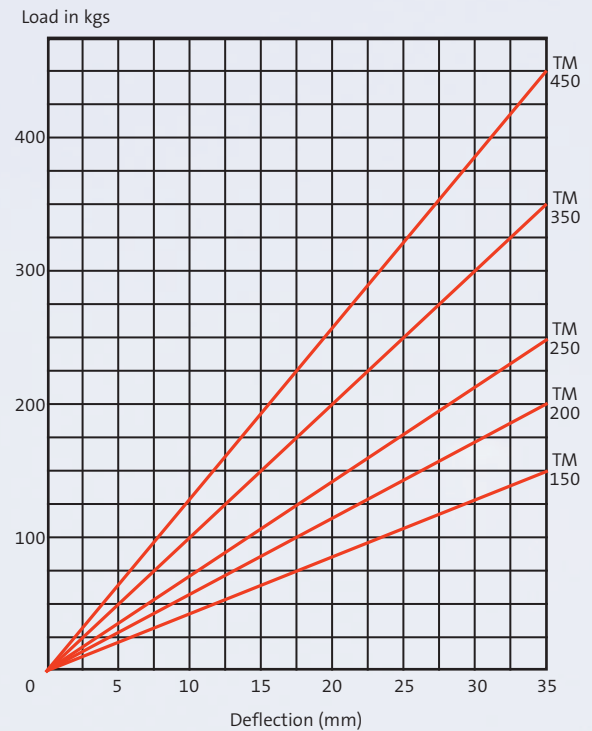
TM Spring Absorbers

Standardised Load at Minimum and Maximum Compression

MODEL	Min Load Kgs	Deflection mm	Max Load Kgs	Deflection mm	Stiffness Kgs/mms	Admissable Temporary Overload as a %
TM 150	64	15	150	35	4285	30%
TM 200	86	15	200	35	5714	25%
TM 250	107	15	250	35	7142	20%
TM 350	105	15	350	35	10000	14%
TM 450	193	15	450	35	12875	11%

1. Working temperature range: -90°C to 200°C
2. Lateral to Axial Stiffness Ratio: 1
3. For studies requiring a maximum adjustment of the compression deflection and load: please consult our technical department.

Performance Curves



Controls and Wiring...

The following Controls

All PVU Units incorporate a factory pre-wired fan motor isolator.

Speed regulators 0<10V can be provided as a loose item for remote locating and wiring by others, or factory fitted and prewired onto the casework of the PVU Unit.

Series VSI/VTI

Single & Twin Low Profile **Quiet** Extract Fan Units

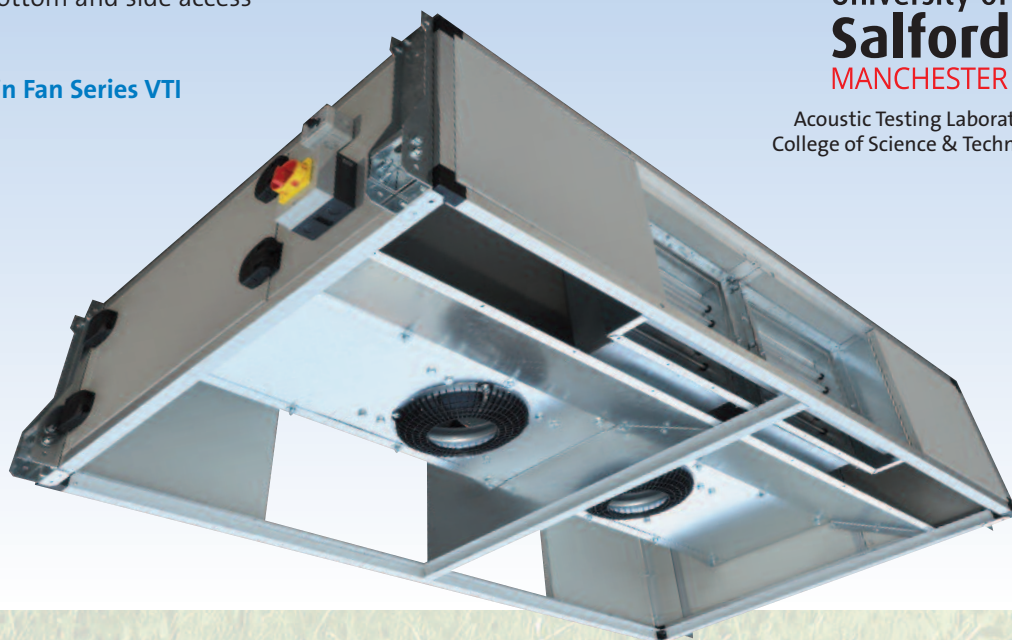
Single Fan Series VSI



Benefits

- Low SFP
- Tonal noise control
- Matching attenuators
- Weatherproof options
- Low noise breakout
- High sound reduction casework tested to BS EN ISO 10140-2 (2010)
- Backward curved, low speed, EC fans • Attenuators/cowls and acoustic louvre options
- Meets BB 93 Feb 2015
- Fan motor isolators fitted as standard
- Suspension brackets with vibration control available
- Auto change over control system for duty and stand by operation on VTI units
- Speed regulation 0>10 Volts
- Variable volume control system - Vari Vol
- Bottom and side access

Twin Fan Series VTI



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Acoustic Testing Laboratory
College of Science & Technology

Classvent Quiet

Low Noise Breakout with Optional Cooling to meet BB93 Feb 2015 and TM52 Specifications

Benefits

- TM 52 Compliant
- BB93 Feb 2015 Compliant
- Low Noise Boost for CO2 Control
- Trend Controllers Fitted
- Fully Integrated with BMS Time Scheduling and Fault Indication
- Reduced Volume with No Room Occupancy
- Manual Boost Override
- Room Minimum Setback Temperature
- Frost Protection
- Acoustic Internal Sound Absorbers
- High Sound Reduction Casework Tested to BS EN ISO 10140.2 (2010)
- PIR Sensoring
- CO2 Sensoring
- Low Speed Fans
- Tonal Noise Control
- Summer By Pass
- Cooling Coil Options
- High Efficiency Recuperators
- Attenuators Matched to Classvent
- Integral Multi Port Valve Unit with Balancing Terminal, Flushing By Pass, Fixed Orifice Commissioning Valve

NO NEED FOR AN ADDITIONAL ACOUSTIC ENCLOSURE



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Envirofresh 70 Quiet

Low Energy, Air Source Heat Pump System, Silenced with Acoustic Treatment as used in Hundreds of Projects



Benefits

- Meets TM52 for Schools
- Meets BB93 Feb 2015
- Renewable Energy Source
- BMS Controls Installed in Unit
- Factory Pre-Commissioned
- Heating and Cooling from One Source
- 50% Less CO₂ Production than a Gas Boiler
- Low Energy Consumption
- Reduced Site Installation Cost
- No External Condensing Units, Pipework or wiring
- Low Noise Emissions with Silenced Compressors
- High Specification UKAS Certified Low Breakout Casework
- No Loss of Heating Capacity at Low Temperatures
- Room Heating and Cooling available at Reduced Air Volumes
- Tempered Air Supply without Defrosting
- No Increase in Footprint over Standard AHUs
- More Pleasant External Appearance than Condensing Unit or Chiller Installations



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BSRIA

Ecodesign Directive

The Facts...



REASONS

Ecodesign directive is integral to the European Union's commitment to reaching a 20% reduction in greenhouse gas emissions and energy consumption by 2020.

DIRECTIVES

Energy related products (ErP) Directive 2009/125/EC offers guidance on the use of energy related products and continued efficiency improvement to them.

The Erp Directive comes into force by law (2015 No469) on 1st January 2016.

ECODESIGN DIRECTIVE LOT6

Relates to the minimum performance requirements for ventilation products and is included in part L building regulations.

CHANGES

The changes apply to both residential and non-residential ventilation units.

Residential ventilation units with a maximum airflow of more than 250 m³/H and in the case of residential ventilation units exclusively intended for residential use only ventilation 250-1000m³/H maximum airflow.

Non-residential ventilation units with bidirectional airflow having supply and exhaust air fans, more than 250m³/H.

PLATE EXCHANGERS

Minimum efficiency 67% from 01/01/2016

Minimum efficiency 73% from 01/01/2018

NOTE 1 The efficiency is based on balanced air flows.

NOTE 2 Plate exchanger heat recovery devices must have a thermal bypass facility.

ROTARY THERMAL RECOVERY WHEEL

Minimum efficiency 67% from 01/01/2016

Minimum efficiency 73% from 01/01/2018

NOTE 1 Thermal rotary wheels can have variable speed control or stop wheel control.

NOTE 2 The efficiency is based on balanced airflows.

RUN AROUND COIL SYSTEM

Minimum efficiency 63% from 01/01/2016

Minimum efficiency 68% from 01/01/2018

EXEMPTIONS

- Agricultural applications.
- Professional kitchens.

- Machine exhaust.
- Paper production, foundries, heat dissipation applications.
- Air Handling Units exclusively working with recirculating air.
- Unit which include a heat exchanger and a heat pump for heat recovery (EU No 1253/2014 article 1.1(g)).
This does not constitute Air Handling Units with a direct expansion heating/cooling heat pump coil with external heat pump condensing unit.
- Bidirectional unit with a total electric power input less than 30W.
- Atex see directive 94/9/EC.
- Unit specifically for operating for emergency use and for short periods of time (i.e. fire or smoke evacuation units) see regulation (EU No 305/201).
- Motors out of Airstream with operating temperatures in excess of 65°C or lower than -40°C.
- Toxic, highly corrosive or flammable environments or if in contact with abrasive substances.
- Process ventilation applications as below:
 - Swimming pools
 - Data centres/server rooms
 - Machine exhaust systems
 - Only a fan with housing (regulation 327/2011)
 - Units working with moved air temperature 100°C or -40°C
- Air Handling Units Supplied to Non European Union Member Countries.

NOTES

- Mixing boxes on their own do not constitute heat recovery.
- Air Handling Units containing a heat pump heating/cooling connected to a remote heat pump condensing unit are not exempt and are to be included.

DECLARATION OF PERFORMANCE

For all residential ventilation units it is mandatory to carry a Declaration Of Performance (DOP) energy label (1253/2014).

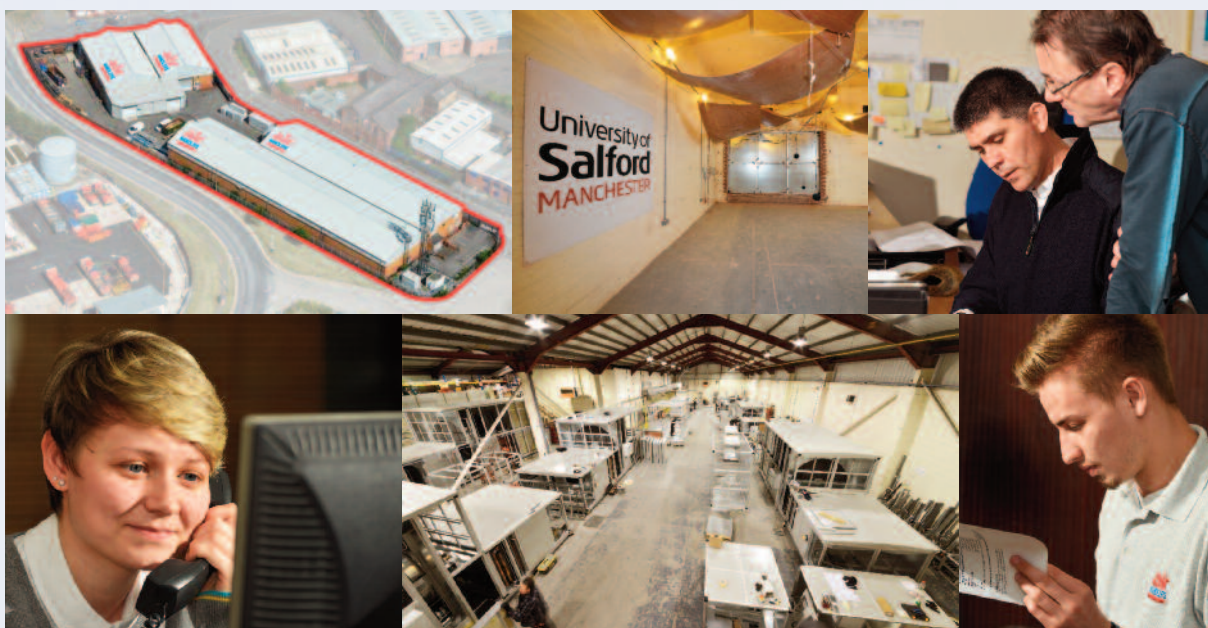
It is however not mandatory for non-residential ventilation units, as the manufacturer furnishes the mechanical services designer with information on ErP compliance.

Product Range...

- Single Cased Extract Unit VSI
- Twin Fan Extract Units VTI and ITU
- Classvent Units
- Flat Series Void Units FPVU
- Packaged Void Units PVU
- Vertical Air Handling Units
- AH Series Modular AHU's
- IDG Series Indirect Gas Fired AHU's
- DG Series Direct Gas Fired AHU's
- HOSP Health Care Specification Hygiene AHU's
- AHW Welded Frame and Stainless Units
- TWHR Heat Reclaim AHU's containing Thermal Wheels
- AHR Heat Recovery AHU's containing Recuperators
- Freshcool Cooling only Packaged Units
- Envirofresh Packaged Heat Pump Units
- Attenuators and Anti-vibration Mounts
- Acoustic Enclosures and Screens
- Flat Pack Build and Refurbishment
- Planned Maintenance and Site Repairs
- Airflow/Acoustic/Leakage Performance Testing Facility

Other Associated Literature...

- Sound Advice for Ventilation Plant in Schools.
By David Pinchbeck
- Air Handling Units Acoustic Insulation Performance test Report
- BSRIA Envirofresh Performance Test Report
- EcoDesign Directive 2016/18



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