

AIR HANDLERS LTD

PVHRU **Max Quiet**

Packaged Void Heat Reclaim Unit



1262

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



Engineering Solutions



The Company...

Air Handlers has been trading since May 1989, and has 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 year 2000.

Product Development...

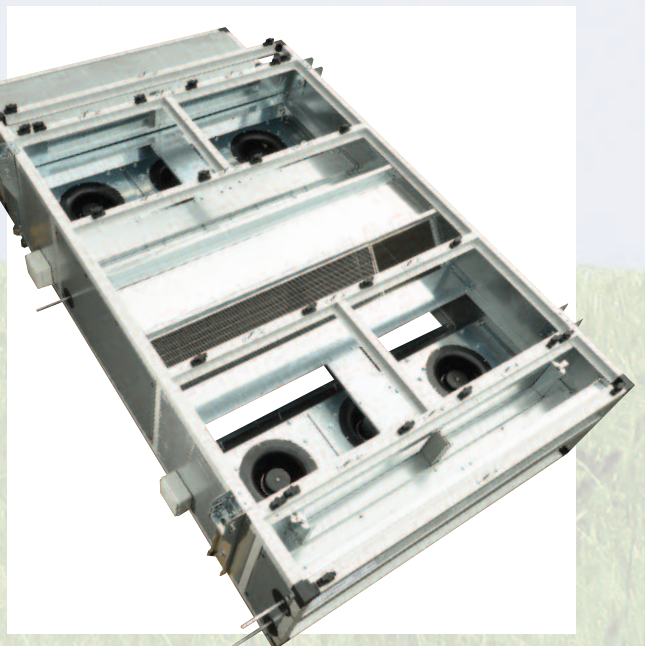
The Company is continually updating its products to comply with changing energy saving technologies, so the introduction of the PVHRU Range of low profile heat reclaim air handling units is based on changes in Fan technology, with the introduction of EC backward curved direct driven plug fans, with 0<10V speed control. Multi fan wall arrangements have been adopted to give higher performance with lower energy consumption. Our team of research professionals are committed to developing products with sustainable energy solutions to meet today's demands for reducing ventilation energy consumption.

Compliance...

The Packaged Void Heat Reclaim Unit range has been developed to meet the specific fan power requirements of Building Regulations, BS EN 1886 Class B Construction Standards and Ecodirective ErP 2018.

Acoustic Performance...

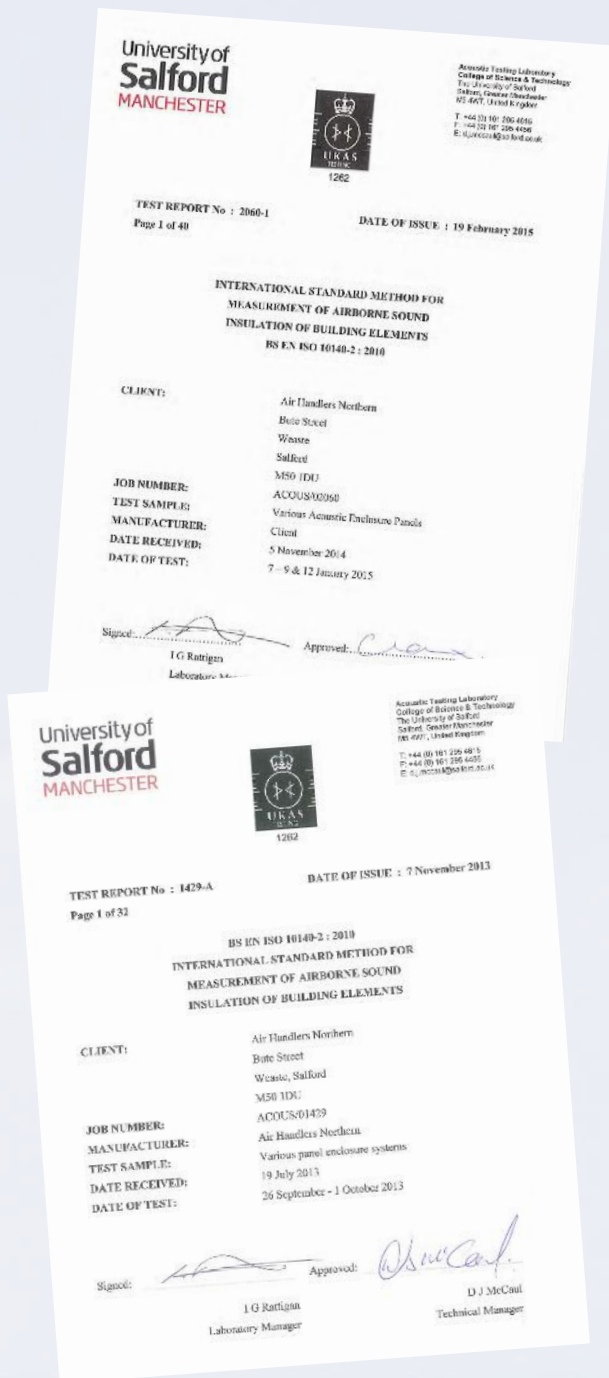
Extensive acoustic testing of casework construction has been carried out at both the companies testing facilities, and Salford University Acoustic Testing Laboratory. Acoustic tests were carried out on eleven double skin composite panel/frame systems, eight different triple and quadruple skin composite panel/frame systems, to BS. EN ISO10140-2 (2010) which have all been certified as UKAS accredited.



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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...

PVHRU Quiet Package Void Heat Reclaim Air Handling Units are normally located within the ceiling void or space below the ceiling slab, providing full fresh air with heat recovery from the exhaust air.

Packaged Void Heat Reclaim Units can be provided with a on board or remote mounted control panel with integral controls, sensors, actuators to offer a fully packaged unit.

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.

Side and Bottom Access

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. bottom access).

Energy Recovery

PVHRU Packaged Void Heat Recovery Units utilise counterflow plate heat exchangers. Having sealed shaped plates, with energy recovery performance to European Directives (ErP) 2018.

Offering efficiencies up to 90%, all plate exchangers are Eurovent certified, with 100% air tightness tested to EN 308.

A drain tray is provided with an in built condensate pump operated via a float switch. Face and bypass dampers, actuator operated, offer a summer by pass facility.



Counterflow Exchanger

Filters

Filtration is fitted to both the fresh air and return air inlets disposable G4 grade panel filters are used as standard.

Disposable cartridge panel filters can be offered as an alternative or secondary filter with grades F5, F6, F7.

Filters can be side or bottom withdrawal and arranged as pre and secondary filters.

Manometers or pressure differential switches factory fitted are available as an option.

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.

Heating Coil

Low temperature hot water heating coils are designed to be side or bottom withdrawal. Coils are constructed from copper tubes and headers with aluminium fins as standard. Other fin block constructions are available offering higher corrosion protection.

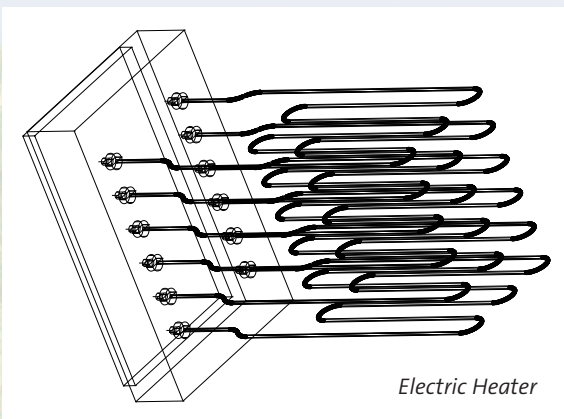
- Polyester coated aluminium
- Blygold coating
- Copper fin material



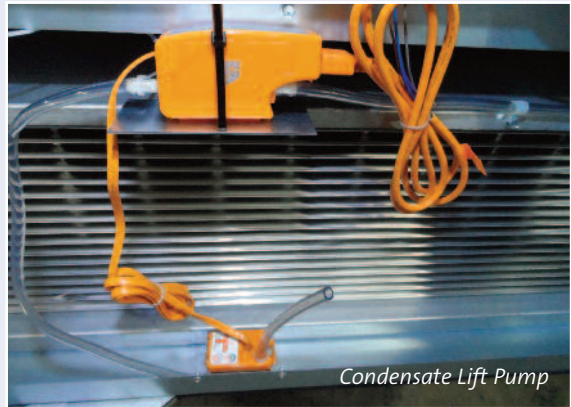
Heating Coil

Electric Heaters

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



Electric Heater

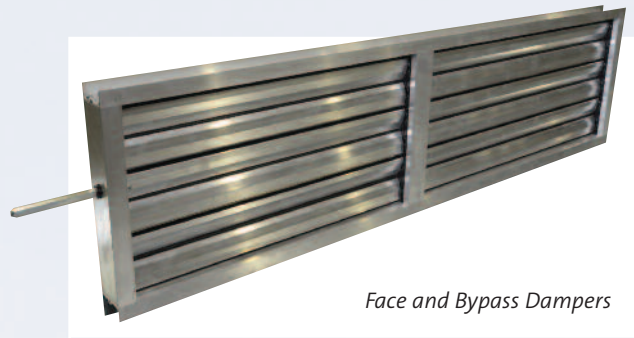


Condensate Lift Pump

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 connected to an optional factory fitted and pre-wired actuator via a square brass drive shaft.



Face and Bypass Dampers

Fans

Package Void Heat Reclaim Units have supply and return 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, it 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 and extract fans, it is possible to achieve significant noise reduction from the fan.

The noise reduction is predominantly low frequency decay (i.e. 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.



Flowgrids

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

Controls...

PVHRU Quiet Packaged Void Heat Reclaim Air Handling Units can be supplied with an optional in built control system.

Standard Control Package

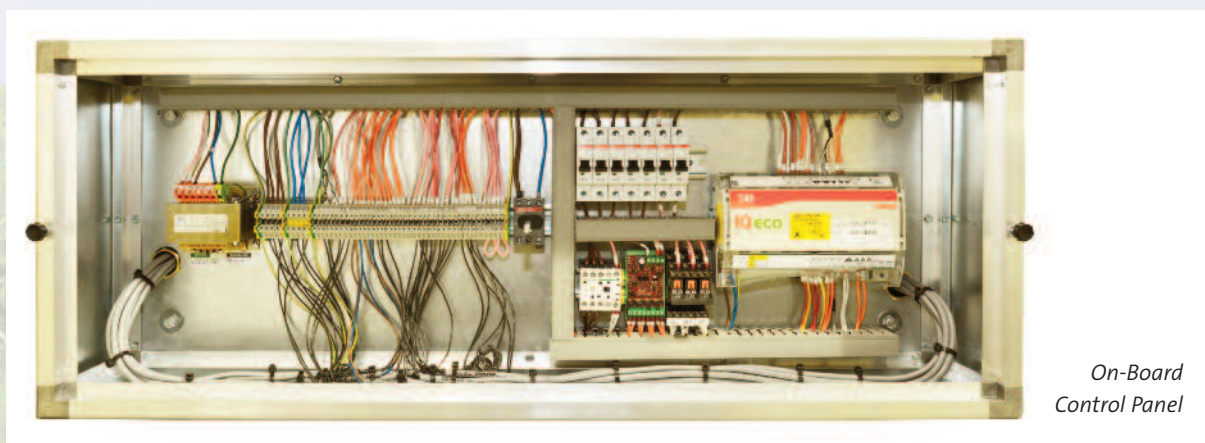
This option includes for the control panel to be built into or directly mounted on the PVHRU Quiet Unit. All internal components will be pre-wired with isolators, actuators, sensors, thermostats, pressure switches factory fitted.

The control package will incorporate a controller which contains features to act independent or with a BMS, Modbus and Bacnet facility is installed in the controller which has display features.

The control package includes speed controllers built into the control panel to speed regulate the EC fans.

Control system options:

- Control panel suitable for remote mounting and interconnecting wiring by others.
- Trend or similar controller.
- Output facility to operate remote condensing unit(s) or heat pump unit(s).
- Output to operate a thyristor controller (additional) for electric heater 0<10 Volt temperature regulation.



On-Board Control Panel

Casework Class...

Packaged Void Heat Reclaim 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 Double Skin

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

Option 2 Double Skin

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

Sound Reduction Index 20/18 PB Double Skin

Frequency Hz	63	125	250	500	1K	2K	4K	8K
Power Loss db	21.0	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 and acoustic insulation composites, frames are constructed from anodised aluminium and acoustically insulated to prevent sound leakage.

All acoustic panel options are listed below with their sound reduction index.

Option 1 Double Skin

30mm anodised aluminium acoustic insulated frame with 25mm double skin sound barrier insulated panels.

Inner Skin

0.9mm inner skin galvanized sheet metal

Outer Skin

1.2 mm outer skin galvanized sheet metal

Sound Reduction Index 30/25 PB Double Skin

Frequency Hz	63	125	250	500	1K	2K	4K	8K
Power Loss db	20.0	23.5	29.4	36.0	39.1	34.1	34.5	40.8

Sound Reduction Index 30/25 AS Double Skin

Frequency Hz	63	125	250	500	1K	2K	4K	8K
Power Loss db	19.9	23.5	29.4	36.0	39.1	34.1	34.5	40.8

Option 2 Triple Skin

30mm anodised aluminium acoustic insulated frame with 25mm triple skin sound barrier insulated panels.

Inner Skin

0.9mm inner skin galvanized sheet metal

Intermediate Skin

0.9 mm intermediate skin galvanized sheet metal

Outer Skin

1.2mm outer skin galvanized sheet metal

Sound Reduction Index 30/25 PB TS PB

Frequency Hz	63	125	250	500	1K	2K	4K	8K
Power Loss db	23.8	26.6	29.0	30.6	36.7	35.6	33.3	40.1

Option 3 Double Skin

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

Inner Skin

0.9mm inner skin galvanized sheet metal

Outer Skin

1.2mm outer skin galvanized sheet metal

Sound Reduction Index 50/50 PB Double Skin

Frequency Hz	63	125	250	500	1K	2K	4K	8K
Power Loss db	21.8	23.8	32.1	26	35.6	35.2	32	40.1

Option 4 Triple Skin

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

Inner Skin

0.9mm inner skin galvanized sheet metal

Intermediate Skin

0.9mm intermediate skin galvanized sheet metal

Outer Skin

1.2mm outer skin galvanized sheet metal

Sound Reduction Index 50/50 PB TS PB Triple Skin

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 5 Triple Skin

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

Inner Skin

0.9mm inner skin galvanized sheet metal

Intermediate Skin

0.9 mm intermediate skin galvanized sheet metal

Outer Skin

1.2mm outer skin galvanized sheet metal

Sound Reduction Index 50/50 AS TS PB Triple Skin

Frequency Hz	63	125	250	500	1K	2K	4K	8K
Power Loss db	23.4	23.5	34.3	39.8	38.9	36.0	39.8	46.9

Option 6 Quadruple Skin

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

Inner Skin

0.9mm inner skin galvanized sheet metal

Two Intermediate Skins

0.9 mm intermediate skin galvanized sheet metal

Outer Skin

1.2mm outer skin galvanized sheet metal

Sound Reduction Index 50/50 AS QS PB

Frequency Hz	63	125	250	500	1K	2K	4K	8K
Power Loss db	24.1	36.6	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 Heat Reclaim 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.

Standard PVHRU Package Heat Reclaim Units are supplied as standard with galvanised sheet metal outer casework skins for ceiling void mounting, should the air handling units require mounting without a ceiling then plastisol plastic coated sheet steel is available in an approved colour.

It must be noted additional acoustic treatment will normally be applied to the PVHRU air handling unit internal casework to improve the casework sound reduction index and give additional internal absorption.



Test set up during testing programme



Assembling test frame and panels

Type...

Standard Package Void Heat Reclaim Units have six depths 300mm, 400mm, 450mm, 550mm, 600mm, 750mm which will increase in depth with acoustic enhanced casework class for 30mm and 50mm post frames. Various components within the PVHRU can be selected. The type of component configuration is shown for each type and can be any or all of the components listed. Refer to the selection charts for performance details.

Type 1

Components available for selection with type 1 Packaged Void Heat Reclaim Units

- Inlet attenuators.
- Inlet/ exhaust air dampers.
- Plate exchanger heat recovery device with face and bypass dampers.
- Panel filters G3/G4 grade on supply and extract.
- Fan selection containing E.C. backward curved plug fan(s).
- Discharge attenuators.

Type 2

Components available for selection with type 2 Packaged Void Heat Reclaim Units.

- Inlet attenuators.
- Inlet/exhaust dampers.
- Plate exchanger heat recovery device with face and bypass dampers.
- Panel filters G3/G4 grade on supply and extract.
- Electric heater battery.
- LPHW heating coil.
- Fan section containing EC backward curved plug fan(s).
- Discharge attenuators.

Selection Charts and Graphs...

Selection charts relate to counterflow plate exchangers and their different configuration.

Counterflow plate exchangers have higher energy recovery efficiencies which are reflected in the Performance Charts.

Type 3

Components available for selection with type 3 Packaged Void Heat Reclaim Units

- Inlet attenuators.
- inlet air/exhaust air dampers.
- Plate exchanger heat recovery device with face and bypass dampers.
- Panel filters G3/G4 grades.
- Cooling coil - chilled water/direct expansion.
- Electric heater battery.
- LPHW heating coil.
- Fan selection containing E.C. backward curved plug fan(s).
- Discharge attenuators.

Type 4

Components available for selection with type 4 Packaged Void Heat Reclaim Units.

- Inlet attenuators.
- Fresh air/exhaust air dampers.
- Plate exchanger heat recovery device with face and bypass dampers.
- Panel filters G3/G4 grades.
- Cartridge panel filters grades F5/6/7.
- Electric Heater battery.
- LPHW heating coil.
- Cooling coil- chilled water/direct expansion.
- Fan section containing E.C. backward curved fan(s).
- Discharge attenuators.

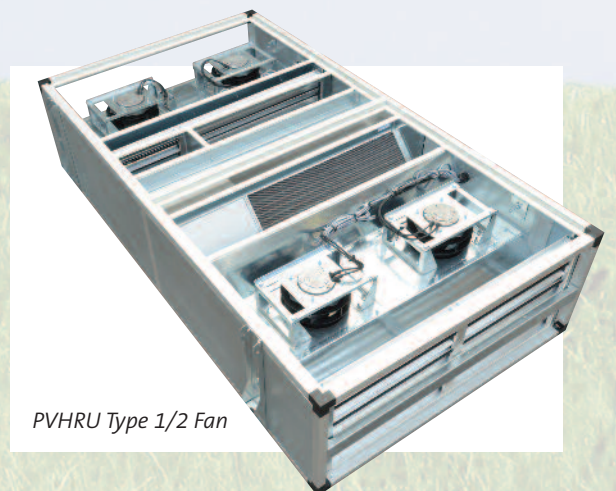
Performance Charts...

Performance charts relate to each type and size of Package Void Heat Reclaim Units 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 also the acoustic breakout performance.

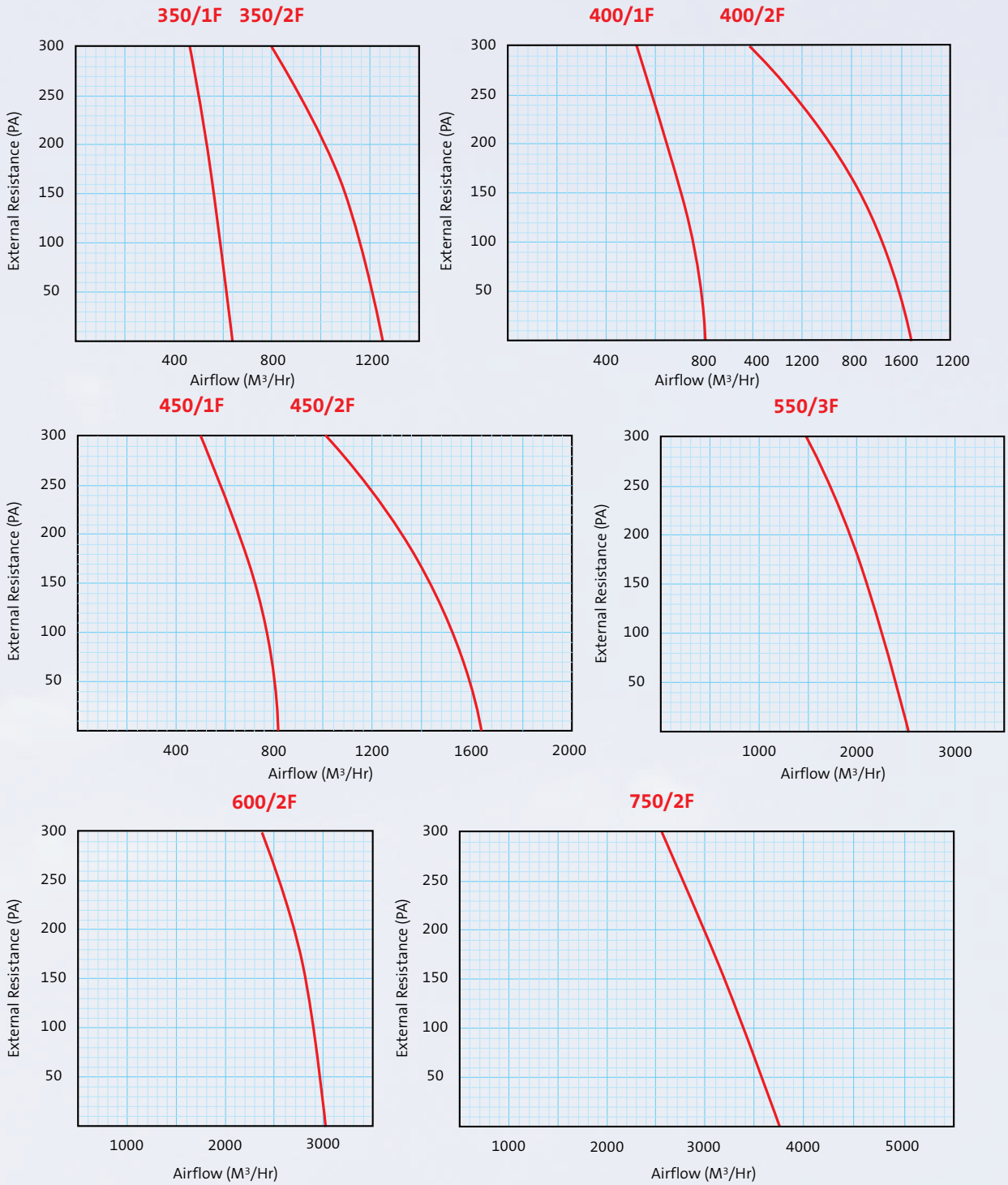


PVHRU Type 1/2 Fan



PVHRU Type 1/2 Fan

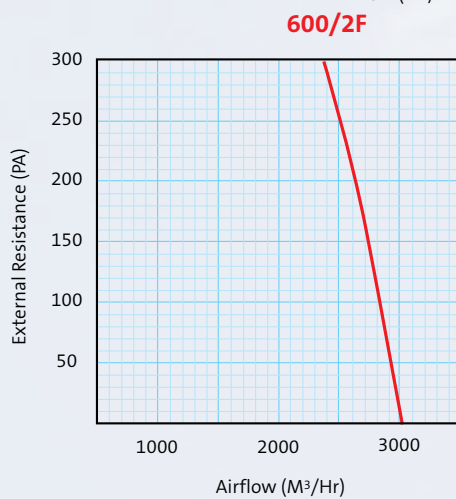
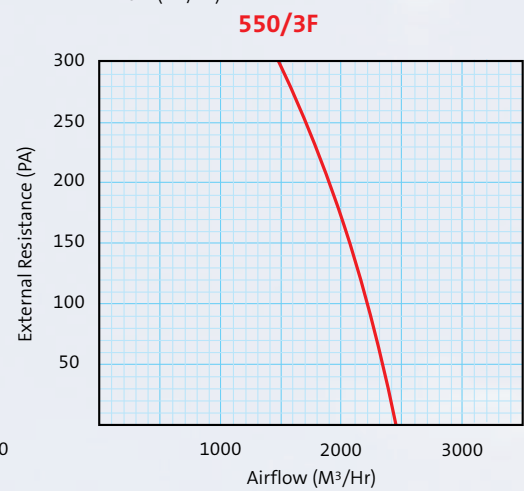
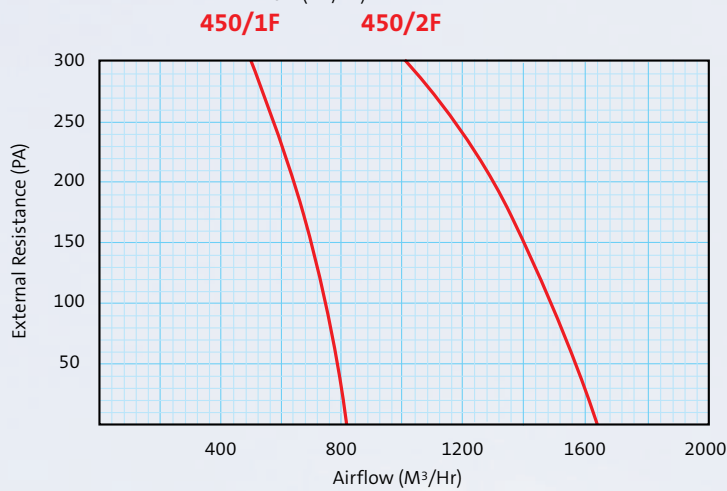
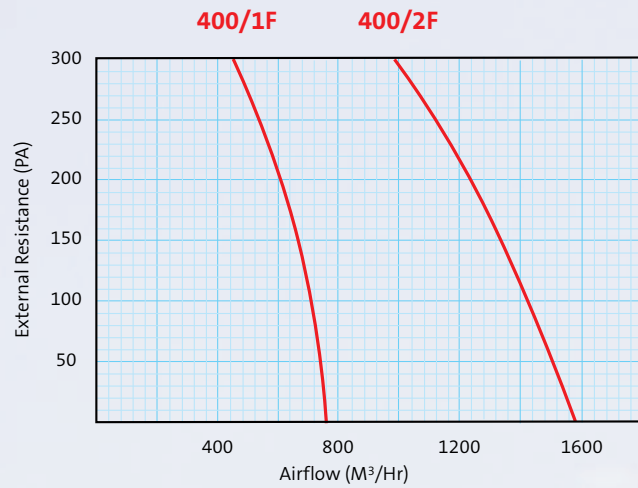
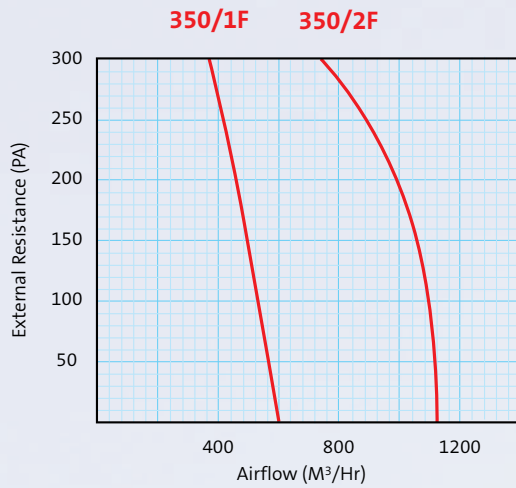
Performance Graphs... Type 1 Curves



Combined Heating and Cooling Coil



Type 2 Curves

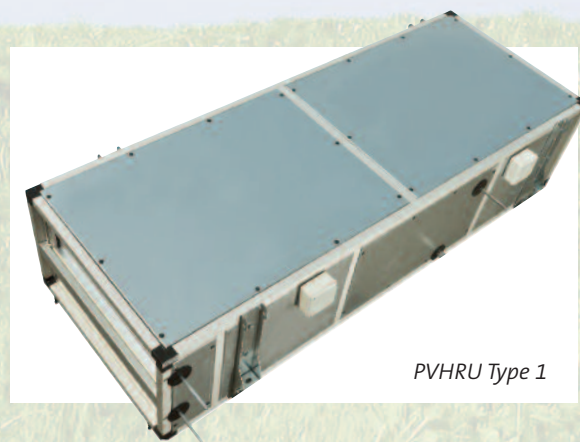
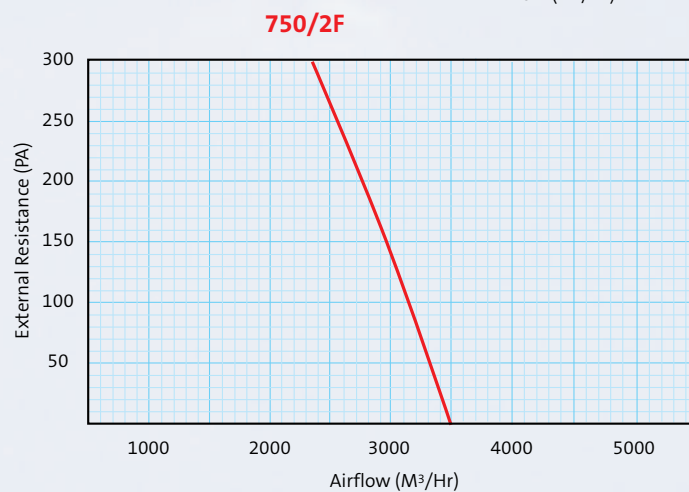
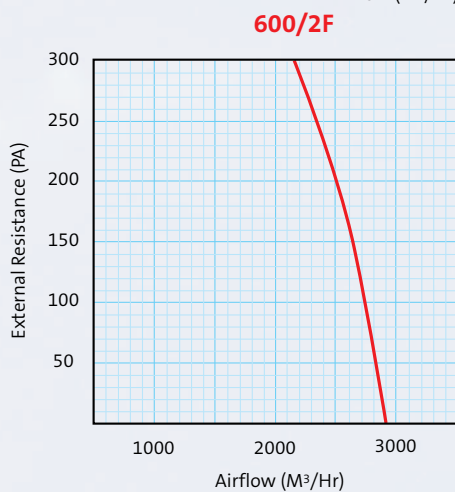
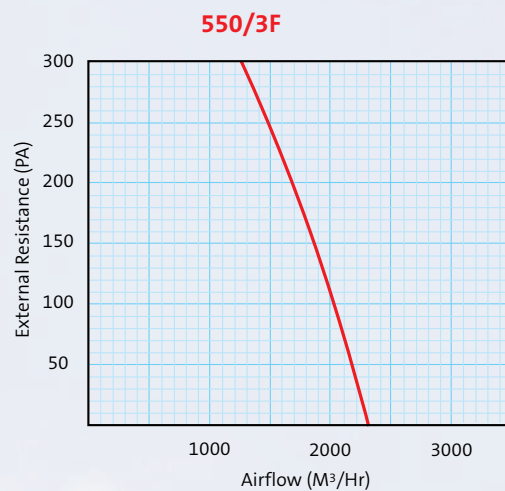
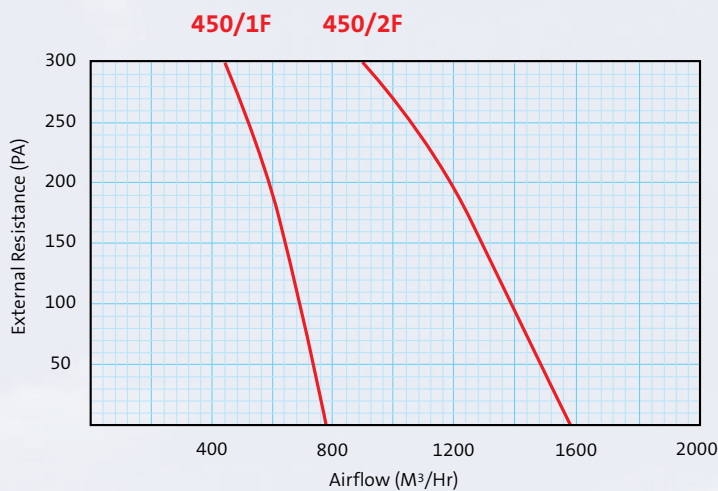
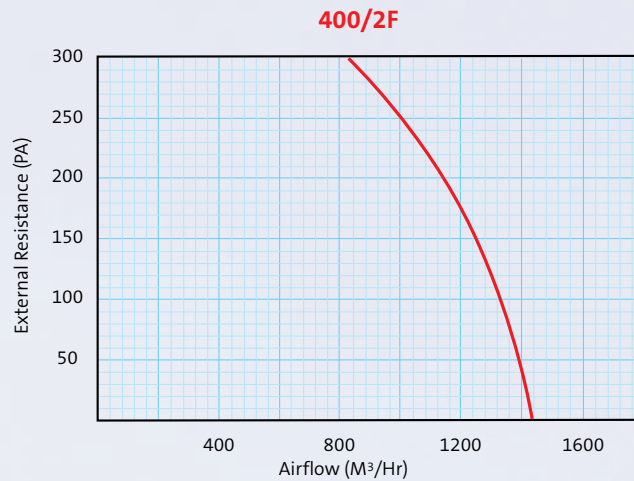
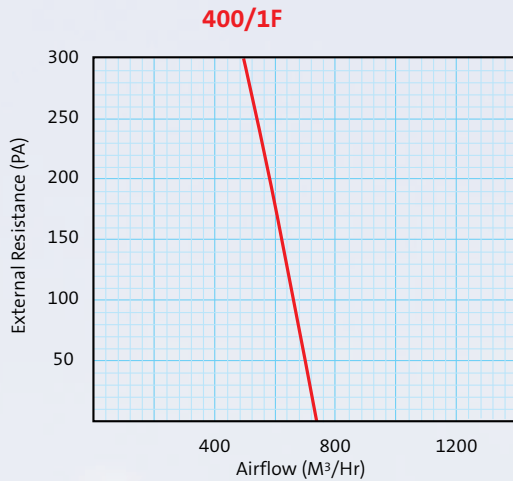


PVHRU Type 1/1 Fan

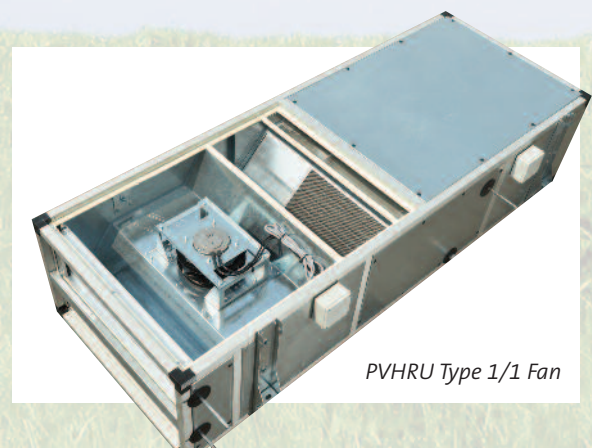
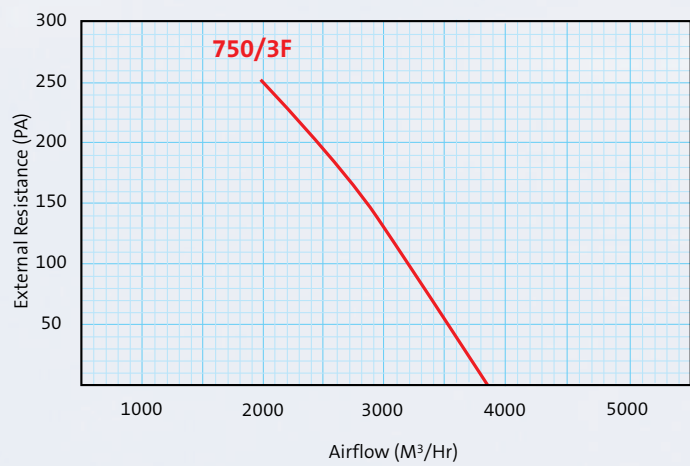
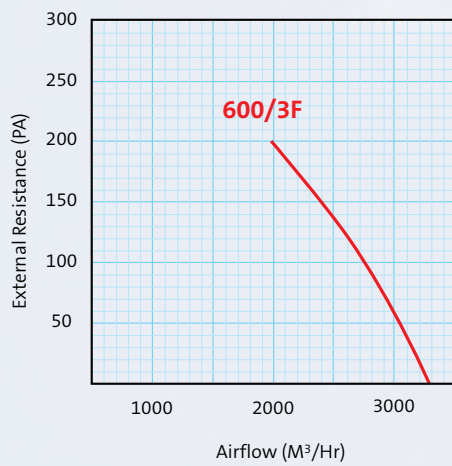
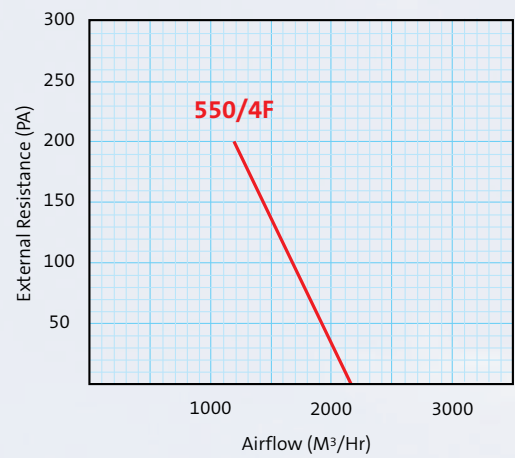
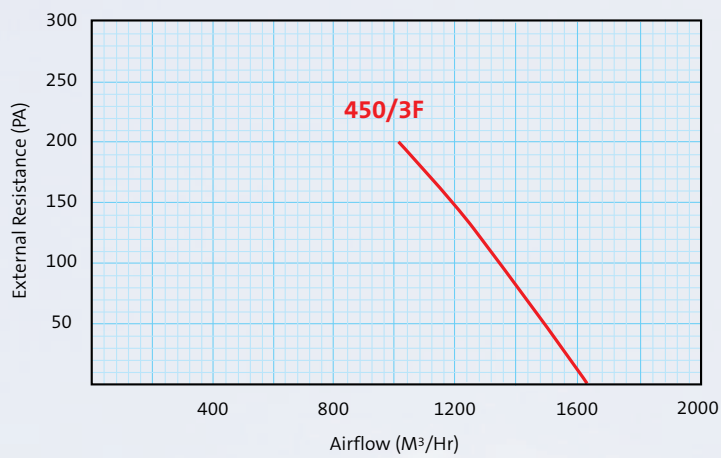
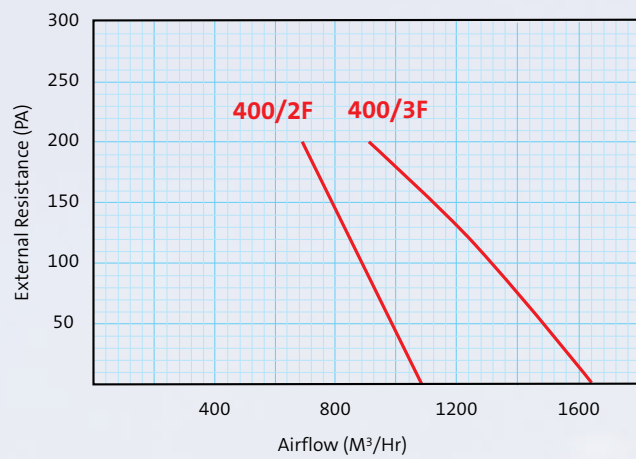
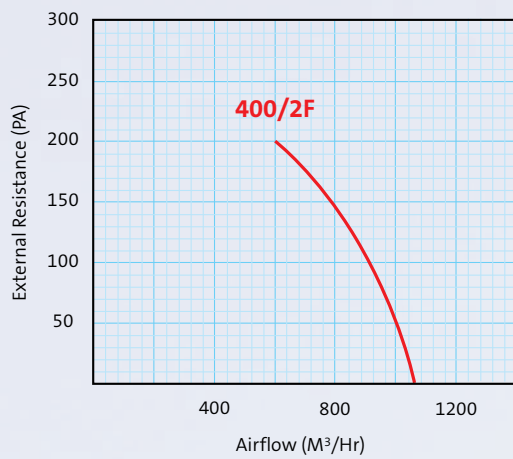


PVHRU Combined Heating and Cooling Coil Section

Type 3 Curves

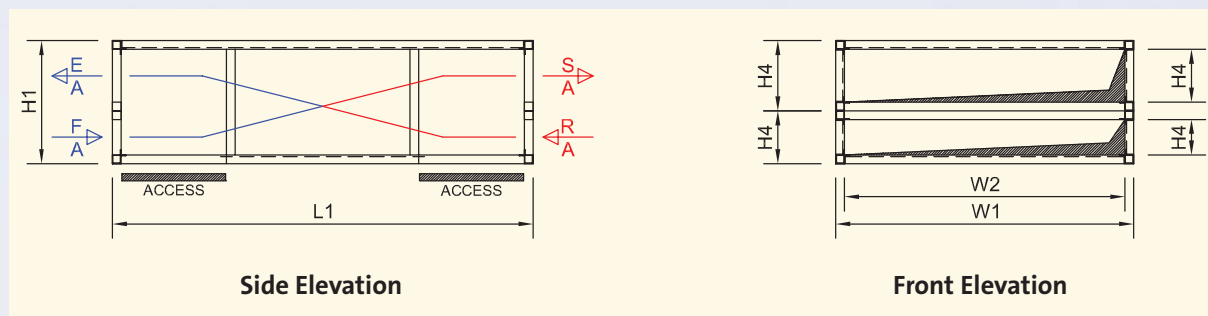


Type 4 Curves



Selection Chart **MODEL PVHRU 350/EC 190-137/IF/COF 30-600/200 20-18**

TYPE 1 PERFORMANCE TYPICAL TYPE 1 COMPONENT CONFIGURATION



Fan Data

Motor output	137 WATTS
Electric supply	240V/1/50
Maximum current rating	0.9Amps
Maximum Speed	@10Volts 3800 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 30-600/200

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	600	575	540	500	450	400
Inlet SWL db	77	75	74	75	75	76
Outlet SWL db	80	80	77	77	77	78
Absorbed power watts	120	128	126	125	127	130

Airflow performance based on maximum speed @ 10 Volts.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	600	575	540	500	450	400
Dry Efficiency	80.2	80.4	80.7	81.9	81.6	82.2
Wet Efficiency	87.0	87.1	87.4	87.7	88.1	88.5
Supply Air Lat °C	17.6	17.7	17.7	17.8	17.9	18.0
Exhaust Air Lat °C	5.9	5.9	5.6	5.6	5.6	5.6
Energy Recovered (Kw)	4.5	4.3	4.1	3.8	3.4	3.1

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

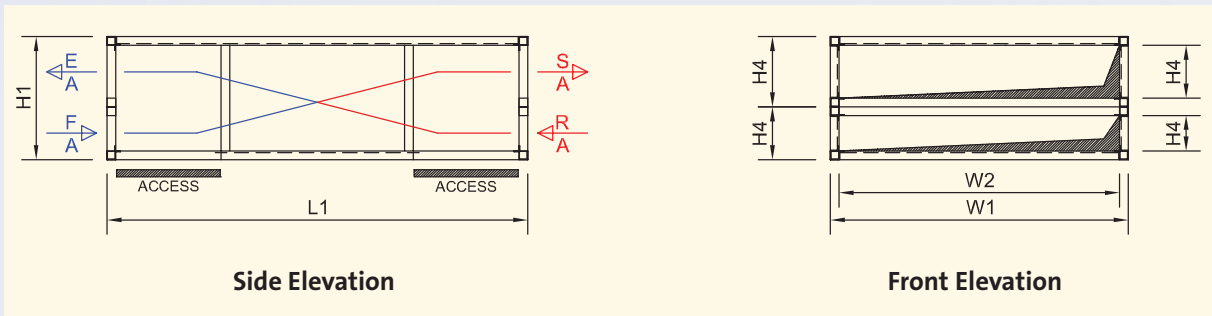
Supply air entering at -5°db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	W1	W2
20/18 PB	156	350	220	130	180	90	1750	800	760
30/25 PB	174	370	230	140	170	80	1770	820	760
30/25 AS	186	370	230	140	170	80	1770	820	760
30/25 PB TS PB	197	370	230	140	170	80	1770	820	760
50/50 PB	190	450	270	180	80	170	1810	860	760
50/50 PB TS PB	218	450	270	180	80	170	1810	860	760
50/50 AS TS PB	254	450	270	180	80	170	1810	860	760
50/50 AS QS PB	272	450	270	180	80	170	1810	860	760

Selection Chart **MODEL PVHRU 350/EC 190-137/2F/COF 30-1200/300 PB 20-18**

TYPE 1 PERFORMANCE TYPICAL TYPE 1 COMPONENT CONFIGURATION



Fan Data

Motor output	274 WATTS
Electric supply	240V/1/50
Maximum current rating	1.8Amps
Maximum Speed	@10Volts 3800 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 30-1200/300

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m ³ /Hr)	1200	1150	1080	1000	950	800
Inlet SWL db	80	78	77	78	78	79
Outlet SWL db	83	83	80	80	80	81
Absorbed power watts	240	256	252	250	254	260

Airflow performance based on maximum speed @ 10 Volts.

Plate Exchanger Efficiency %

Airflow (m ³ /Hr)	1200	1150	1080	1000	950	800
Dry Efficiency	80.2	80.4	80.7	81.1	81.3	82.2
Wet Efficiency	87.0	87.1	87.4	87.7	87.9	88.5
Supply Air Lat °C	17.6	17.6	17.7	17.8	17.9	18.0
Exhaust Air Lat °C	5.9	5.9	5.6	5.6	5.6	5.6
Energy Recovered (Kw)	9.1	8.7	8.2	7.6	7.3	6.2

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

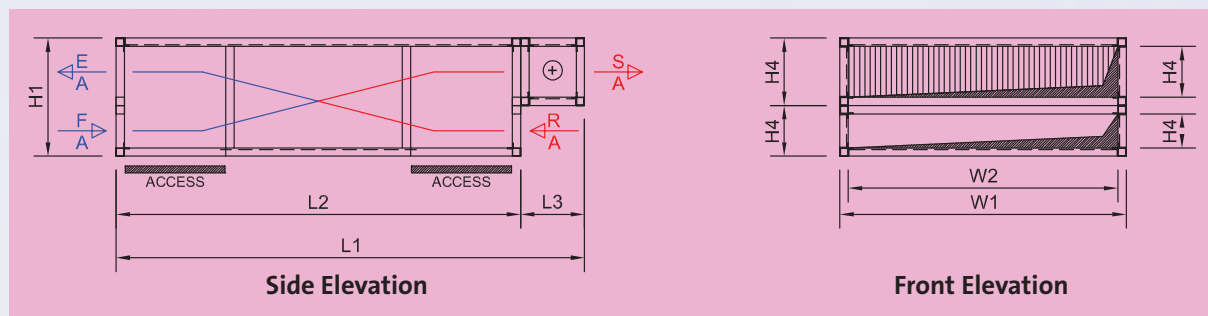
Supply air entering at -5%db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	W1	W2
20/18 PB	231	350	220	130	180	90	1750	1500	1460
30/25 PB	266	390	240	150	180	90	1770	1520	760
30/25 AS	274	390	240	150	180	90	1770	1520	760
30/25 PB TS PB	333	390	240	150	180	90	1770	1520	760
50/50 PB	313	470	280	190	180	90	1810	1560	1460
50/50 PB TS PB	348	470	280	190	180	90	1810	1560	1460
50/50 AS TS PB	417	470	280	190	180	90	1810	1560	1460
50/50 AS QS PB	475	470	280	190	180	90	1810	1560	1460

Selection Chart **MODEL PVHRU 350/EC 190-137/1F/COF 30-600/200 PB 20-18**

TYPE 2 PERFORMANCE TYPICAL TYPE 2 COMPONENT CONFIGURATION



Fan Data

Motor output	190 WATTS
Electric supply	240V/1/50
Maximum current rating	0.9 Amps
Maximum Speed	@10Volts 3800 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 30-1200/300

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m ³ /Hr)	580	560	520	480	420	380
Inlet SWL db	76	74	73	74	74	75
Outlet SWL db	79	79	76	76	76	77
Absorbed power watts	120	128	126	125	127	130

Airflow performance based on maximum speed @ 10 Volts.

Electric Heater Data

Based on maximum airflow 3.0Kw single or three phase electric supply.

LPHW Coil Data

Based on maximum airflow and LPHW @ 82/71°C.

Maximum heating output 3.0Kw.

Plate Exchanger Efficiency %

Airflow (m ³ /Hr)	580	560	520	480	420	380
Dry Efficiency	80.3	80.5	80.9	81.3	82.0	82.4
Wet Efficiency	87.1	87.2	87.5	87.8	88.4	88.7
Supply Air Lat °C	17.6	17.7	17.7	17.8	18.0	18.1
Exhaust Air Lat °C	5.9	5.6	5.6	5.6	5.6	5.4
Energy Recovered (Kw)	4.4	4.2	4.0	3.7	3.2	3.0

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

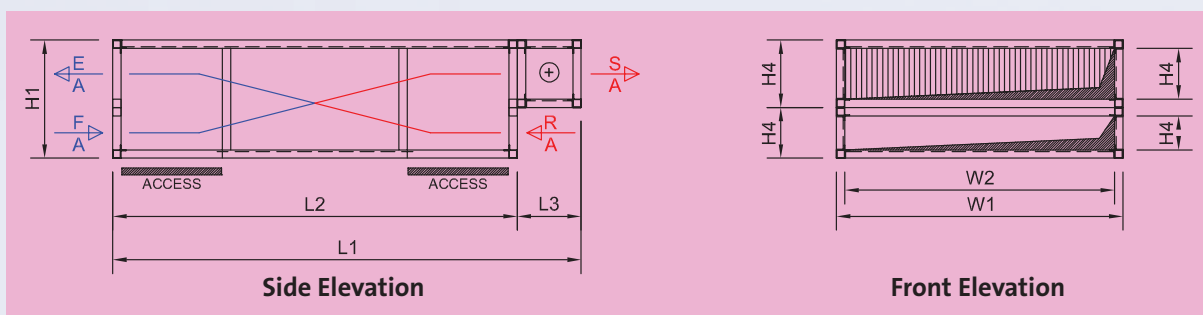
Supply air entering at -5%db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	175	350	220	130	180	90	1930	1750	180	800	760
30/25 PB	196	390	240	150	180	90	1970	1770	200	820	760
30/25 AS	204	390	240	150	180	90	1970	1770	200	820	760
30/25 PB TS PB	228	390	240	150	180	90	1970	1770	200	820	760
50/50 PB	337	470	280	190	180	90	2050	1810	240	860	760
50/50 PB TS PB	389	470	280	190	180	90	2050	1810	240	860	760
50/50 AS TS PB	448	470	280	190	180	90	2050	1810	240	860	760
50/50 AS QS PB	510	470	280	190	180	90	2050	1810	240	860	760

Selection Chart **MODEL PVHRU 350/EC 190-137/2F/COF 30-1200/300 PB 20-18**

TYPE 2 PERFORMANCE TYPICAL TYPE 2 COMPONENT CONFIGURATION



Fan Data

Motor output	274 WATTS
Electric supply	240V/1/50
Maximum current rating	1.8 Amps
Maximum Speed	@10Volts 3800 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 disposable panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 30-1200/300

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m ³ /Hr)	1140	1100	1020	940	900	740
Inlet SWL db	79	77	76	77	77	78
Outlet SWL db	82	82	79	79	79	80
Absorbed power watts	240	256	250	250	250	260

Airflow performance based on maximum speed @ 10 Volts.

Electric Heater Data

Based on maximum airflow 6Kw single or three phase electric supply.

LPHW Coil Data

Based on maximum airflow and LPHW @ 82/71°C.

Maximum heating output 6Kw.

Plate Exchanger Efficiency %

Airflow (m ³ /Hr)	1140	1100	1020	940	900	740
Dry Efficiency	80.4	80.6	81.0	81.4	81.6	82.5
Wet Efficiency	87.1	87.3	87.6	88.0	88.1	88.8
Supply Air Lat °C	17.6	17.7	17.8	17.8	17.9	18.1
Exhaust Air Lat °C	5.9	5.6	5.6	5.6	5.6	5.4
Energy Recovered (Kw)	8.6	8.4	7.8	7.2	6.9	5.7

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

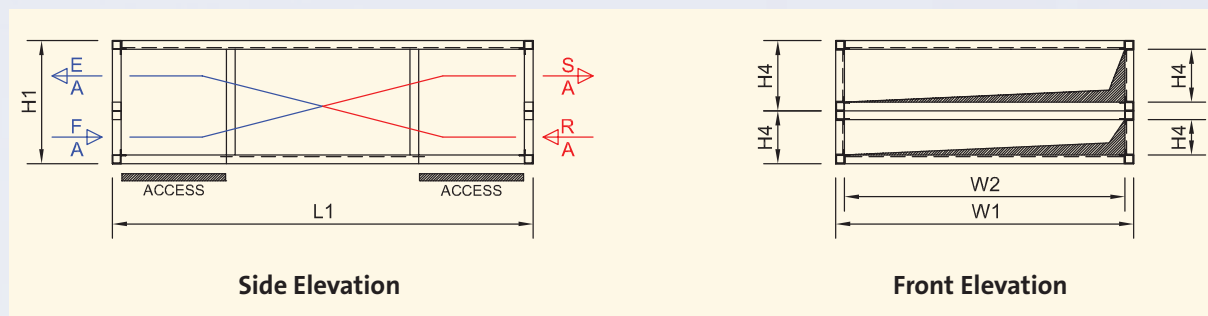
Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.
Supply air entering at -5%db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	260	350	220	130	180	90	1930	1750	180	1500	1460
30/25 PB	301	390	240	150	180	90	1970	1770	200	1520	1460
30/25 AS	318	390	240	150	180	90	1970	1770	200	1520	1460
30/25 PB TS PB	360	390	240	150	180	90	1970	1770	200	1520	1460
50/50 PB	337	470	280	190	180	90	2050	1810	240	1560	1460
50/50 PB TS PB	380	470	280	190	180	90	2050	1810	240	1560	1460
50/50 AS TS PB	448	470	280	190	180	90	2050	1810	240	1560	1460
50/50 AS QS PB	510	470	280	190	180	90	2050	1810	240	1560	1460

Selection Chart **MODEL PVHRU 400/EC 220-167/1F/COF 35-900/300 PB 20-18**

TYPE 1 PERFORMANCE TYPICAL TYPE 1 COMPONENT CONFIGURATION



Fan Data

Motor output	167 WATTS
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 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 35-900/300

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	800	760	710	660	600	500
Inlet SWL db	76	74	75	72	73	75
Outlet SWL db	80	78	79	76	77	77
Absorbed power (Watts)	130	140	145	151	154	159

Airflow performance based on maximum speed @ 10 Volts.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	800	760	710	660	600	500
Dry Efficiency	80.4	81.7	82.0	82.4	84.0	83.8
Wet Efficiency	88.0	88.2	88.4	88.7	90.0	89.8
Supply Air Lat °C	17.9	17.9	18.0	18.1	18.4	18.3
Exhaust Air Lat °C	5.6	5.6	5.6	5.4	5.4	5.4
Energy Recovered (Kw)	6.1	5.8	5.5	5.1	4.7	4.0

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

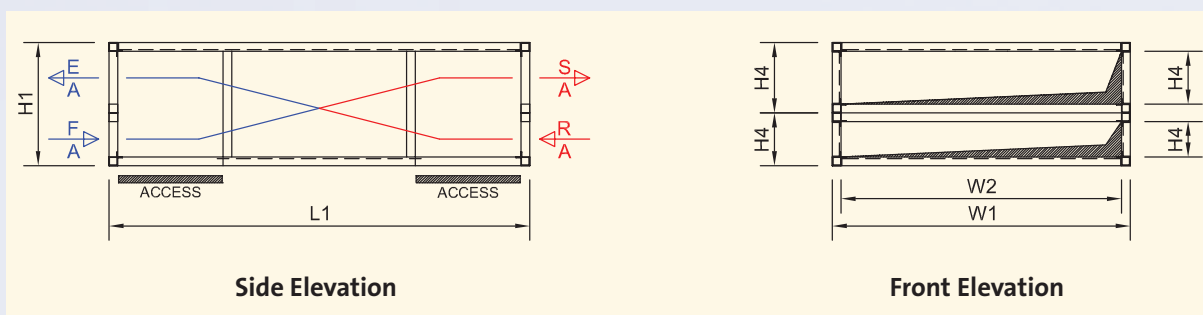
Supply air entering at -5%db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	W1	W2
20/18 PB	240	400	250	150	210	110	1900	1300	1260
30/25 PB	379	440	270	170	210	110	1920	1320	1260
30/25 AS	291	440	270	170	210	110	1920	1320	1260
30/25 PB TS PB	324	440	270	170	210	110	1920	1320	1260
50/50 PB	305	520	310	210	210	110	1960	1360	1260
50/50 PB TS PB	368	520	310	210	210	110	1960	1360	1260
50/50 AS TS PB	408	520	310	210	210	110	1960	1360	1260
50/50 AS QS PB	466	520	310	210	210	110	1960	1360	1260

Selection Chart **MODEL PVHRU 400/EC 220-167/2F/COF 35-1300/400 PB 20-18**

TYPE 1 PERFORMANCE TYPICAL TYPE 1 COMPONENT CONFIGURATION



Fan Data

Motor output	334 WATTS
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 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 35-1300/400

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m ³ /Hr)	1600	1520	1420	1320	1200	1000
Inlet SWL db	79	77	78	75	76	78
Outlet SWL db	83	81	82	79	80	80
Absorbed power watts	260	280	290	302	308	318

Airflow performance based on maximum speed @ 10 Volts.

Plate Exchanger Efficiency %

Airflow (m ³ /Hr)	1600	1520	1420	1320	1200	1000
Dry Efficiency	79.9	80.1	80.4	80.8	81.2	82.1
Wet Efficiency	86.7	86.9	87.2	87.4	87.8	88.5
Supply Air Lat °C	17.5	17.6	17.6	17.7	17.8	18.0
Exhaust Air Lat °C	5.9	5.9	5.9	5.6	5.6	5.6
Energy Recovered (Kw)	12.1	11.5	10.8	10.0	9.2	7.7

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

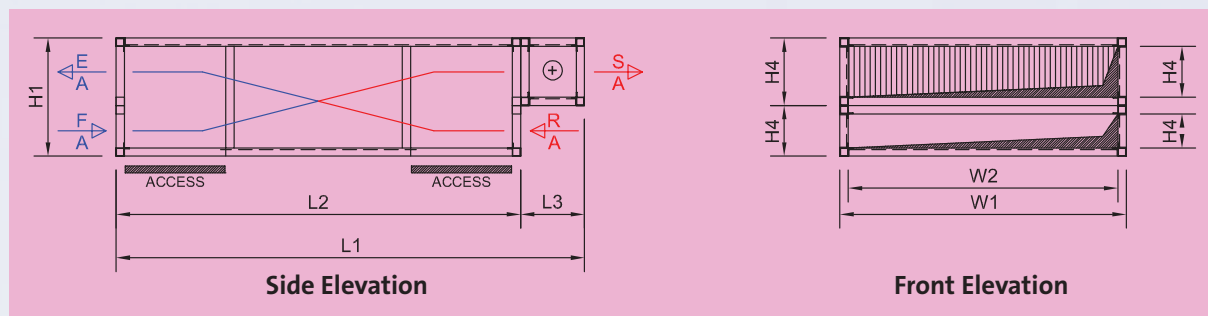
Supply air entering at -5°db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	W1	W2
20/18 PB	332	400	250	150	210	110	1900	1800	1760
30/25 PB	382	440	270	170	210	110	1920	1820	1760
30/25 AS	401	440	270	170	210	110	1920	1820	1760
30/25 PB TS PB	440	440	270	170	210	110	1920	1820	1760
50/50 PB	415	520	310	210	210	110	1960	1860	1760
50/50 PB TS PB	477	520	310	210	210	110	1960	1860	1760
50/50 AS TS PB	549	520	310	210	210	110	1960	1860	1760
50/50 AS QS PB	614	520	310	210	210	110	1960	1860	1760

Selection Chart **MODEL PVHRU 400/EC 220-167/1F/COF 35-700/300 PB 20-18**

TYPE 2 PERFORMANCE TYPICAL TYPE 2 COMPONENT CONFIGURATION



Fan Data

Motor output	167 WATTS
Electric supply	240V/1/50
Maximum current rating	1.0 Amps
Maximum Speed	@10Volts 3200 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 35-700/300

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	770	730	680	630	570	470
Inlet SWL db	76	74	75	72	73	75
Outlet SWL db	80	78	79	76	77	77
Absorbed power (Watts)	130	140	145	151	154	159

Airflow performance based on maximum speed @ 10 Volts.

Electric Heater Data

Based on maximum airflow 6Kw single or three phase electric supply.

LPHW Coil Data

Based on maximum airflow and LPHW @ 82/71°C.

Maximum heating output 6Kw.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	800	760	710	660	600	500
Dry Efficiency	80.4	80.7	81.0	81.4	81.9	82.8
Wet Efficiency	87.1	87.6	87.6	87.9	88.3	89.0
Supply Air Lat °C	17.6	17.7	17.8	17.9	18.0	18.1
Exhaust Air Lat °C	5.9	5.6	5.6	5.6	5.6	5.4
Energy Recovered (Kw)	5.8	5.6	5.2	4.8	4.4	3.7

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

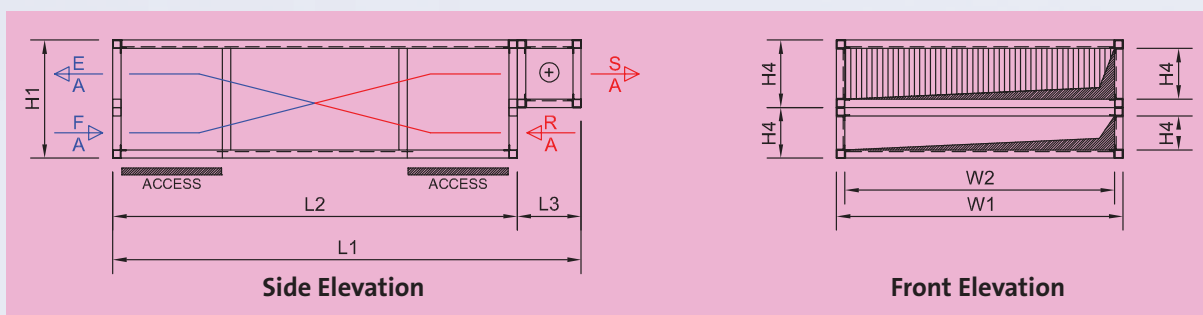
Supply air entering at -5%db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	267	400	250	150	210	110	2080	1900	180	1300	1260
30/25 PB	313	440	270	170	210	110	2120	1920	200	1320	1260
30/25 AS	329	440	270	170	210	110	2120	1920	200	1320	1260
30/25 PB TS PB	362	440	270	170	210	110	2120	1920	200	1320	1260
50/50 PB	339	520	310	210	210	110	2200	1960	240	1360	1260
50/50 PB TS PB	378	520	310	210	210	110	2200	1960	240	1360	1260
50/50 AS TS PB	455	520	310	210	210	110	2200	1960	240	1360	1260
50/50 AS QS PB	519	520	310	210	210	110	2200	1960	240	1360	1260

Selection Chart **MODEL PVHRU 400/EC 220-167/2 F/COF 35-1300/400 PB 20-18**

TYPE 2 PERFORMANCE TYPICAL TYPE 2 COMPONENT CONFIGURATION



Fan Data

Motor output	334 WATTS
Electric supply	240V/1/50
Maximum current rating	2.0 Amps
Maximum Speed	@10Volts 3200 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 3 35-1300/400

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m ³ /Hr)	1540	1460	1360	1260	1140	940
Inlet SWL db	79	77	78	75	76	78
Outlet SWL db	83	81	82	79	80	80
Absorbed power (Watts)	260	280	290	302	308	318

Airflow performance based on maximum speed @ 10 Volts.

Electric Heater Data

Based on maximum airflow 12Kw single or three phase electric supply.

LPHW Coil Data

Based on maximum airflow and LPHW @ 82/71°C.

Maximum heating output 12Kw.

Plate Exchanger Efficiency %

Airflow (m ³ /Hr)	1540	1460	1360	1260	1140	940
Dry Efficiency	80.0	80.3	80.6	81.4	81.5	82.5
Wet Efficiency	86.8	87.1	87.3	87.6	88.0	88.8
Supply Air Lat °C	17.6	17.6	17.6	17.8	17.9	18.1
Exhaust Air Lat °C	5.9	5.9	5.7	5.6	5.6	5.4
Energy Recovered (Kw)	11.7	11.1	10.4	9.6	8.7	7.3

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

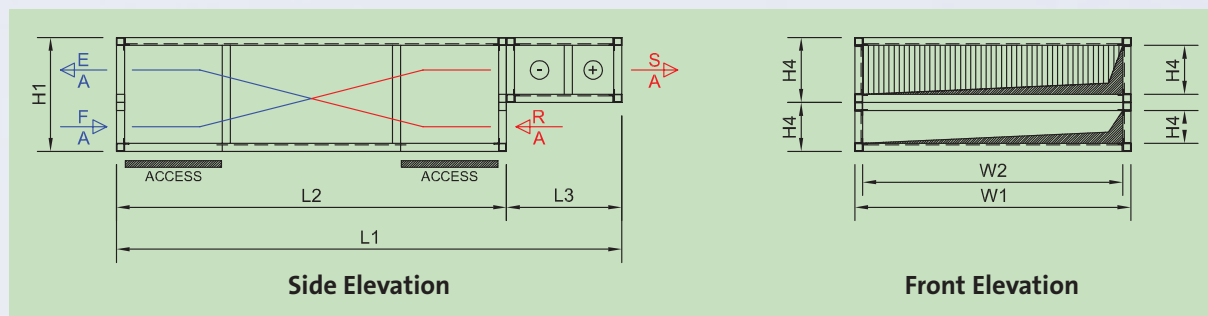
Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.
Supply air entering at -5°db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	371	400	250	150	210	110	2080	1900	180	1800	1760
30/25 PB	429	440	270	170	210	110	2120	1920	200	1820	1760
30/25 AS	448	440	270	170	210	110	2120	1920	200	1820	1760
30/25 PB TS PB	493	440	270	170	210	110	2120	1920	200	1820	1760
50/50 PB	466	520	310	210	210	110	2200	1960	240	1860	1760
50/50 PB TS PB	539	520	310	210	210	110	2200	1960	240	1860	1760
50/50 AS TS PB	614	520	310	210	210	110	2200	1960	240	1860	1760
50/50 AS QS PB	687	520	310	210	210	110	2200	1960	240	1860	1760

Selection Chart **MODEL PVHRU 400/EC 220-163/1 F/COF 35-800/250 PB 20-18**

TYPE 3 PERFORMANCE TYPICAL TYPE 3 COMPONENT CONFIGURATION



Fan Data

Motor output	167 WATTS
Electric supply	240V/1/50
Maximum current rating	1.0 Amps
Maximum Speed	@10Volts 3200 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 35 -800/250

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	720	680	630	580	520	420
Inlet SWL db	75	73	74	71	71	74
Outlet SWL db	79	77	78	75	75	76
Absorbed power (Watts)	130	140	145	151	154	159

Airflow performance based on maximum speed @ 10 Volts.

Electric Heater Data

Based on maximum airflow 6Kw single or three phase electric supply.

LPHW Coil Data

Based on maximum airflow and LPHW @ 82/71°C.

Maximum heating output 6Kw.

Chilled water/direct expansion coil data based on maximum airflow & chilled water @ 6/12°C or DX evaporating @ 6°C.

Max cooling output 5Kw.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	720	680	630	580	520	420
Dry Efficiency	81.4	81.7	82.0	82.1	83.0	84.1
Wet Efficiency	88.0	88.1	88.4	88.8	89.2	90.0
Supply Air Lat °C	17.8	17.9	18.0	18.1	18.2	18.4
Exhaust Air Lat °C	5.6	5.6	5.6	5.4	5.4	5.4
Energy Recovered (Kw)	5.5	5.2	4.8	4.5	4.0	3.3

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

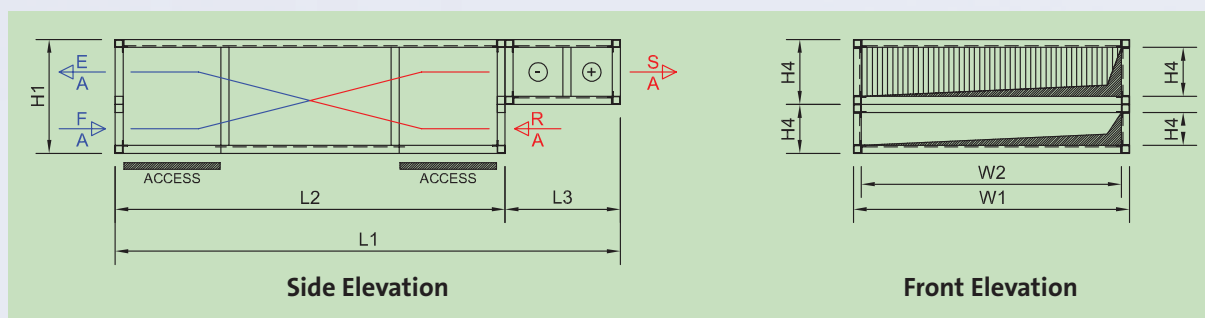
Supply air entering at -5%db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	279	400	250	150	210	110	2300	1900	400	1300	1260
30/25 PB	357	440	270	170	210	110	2340	1920	420	1320	1260
30/25 AS	371	440	270	170	210	110	2340	1920	420	1320	1260
30/25 PB TS PB	410	440	270	170	210	110	2340	1920	420	1320	1260
50/50 PB	386	520	310	210	210	110	2420	1960	460	1360	1260
50/50 PB TS PB	429	520	310	210	210	110	2420	1960	460	1360	1260
50/50 AS TS PB	512	520	310	210	210	110	2420	1960	460	1360	1260
50/50 AS QS PB	582	520	310	210	210	110	2420	1960	460	1360	1260

Selection Chart **MODEL PVHRU 400/EC 220-163/2 F/COF 35-1300/400 PB 20-18**

TYPE 3 PERFORMANCE TYPICAL TYPE 3 COMPONENT CONFIGURATION



Fan Data

Motor output	334 WATTS
Electric supply	240V/1/50
Maximum current rating	2.0 Amps
Maximum Speed	@10Volts 3200 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 35 -1300/400

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	1440	1360	1260	1160	1040	840
Inlet SWL db	78	75	77	74	75	77
Outlet SWL db	82	80	81	78	77	78
Absorbed power (Watts)	260	280	290	302	308	318

Airflow performance based on maximum speed @ 10 Volts.

Electric Heater Data

Based on maximum airflow 12Kw single or three phase electric supply.

LPHW Coil Data

Based on maximum airflow and LPHW @ 82/71°C.

Maximum heating output 12Kw.

Chilled water/direct expansion coil data based on maximum airflow & chilled water @ 6/12°C or DX evaporating @ 6°C.

Max cooling output 10Kw.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	1440	1360	1260	1160	1040	840
Dry Efficiency	80.4	80.6	81.0	81.4	82.0	83.0
Wet Efficiency	87.1	87.3	87.6	88.0	88.4	89.2
Supply Air Lat °C	17.6	17.7	17.8	17.9	18.0	18.2
Exhaust Air Lat °C	5.9	5.6	5.6	5.6	5.6	5.4
Energy Recovered (Kw)	11.0	10.4	9.6	9.0	8.0	6.5

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

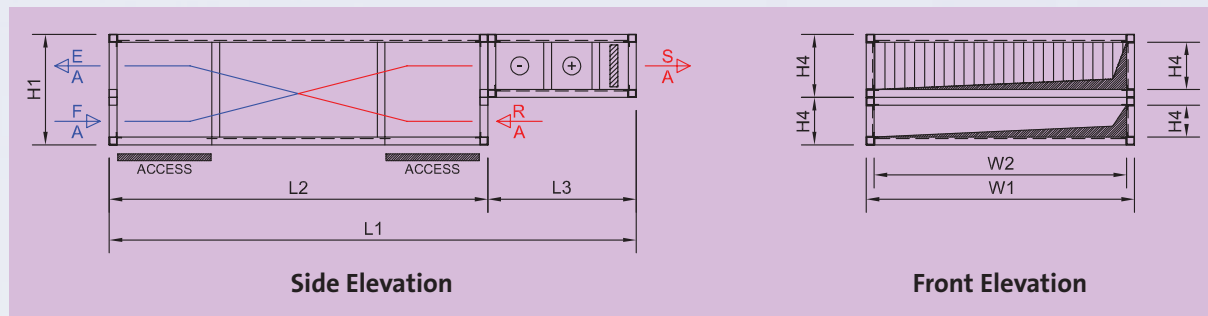
Supply air entering at -5%db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	426	400	250	150	210	110	2300	1900	400	1800	1760
30/25 PB	489	440	270	170	210	110	2340	1920	420	1820	1760
30/25 AS	517	440	270	170	210	110	2340	1920	420	1820	1760
30/25 PB TS PB	559	440	270	170	210	110	2340	1920	420	1820	1760
50/50 PB	530	520	310	210	210	110	2420	1960	460	1860	1760
50/50 PB TS PB	613	520	310	210	210	110	2420	1960	460	1860	1760
50/50 AS TS PB	692	520	310	210	210	110	2420	1960	460	1860	1760
50/50 AS QS PB	773	520	310	210	210	110	2420	1960	460	1860	1760

Selection Chart **MODEL PVHRU 400/EC 220-163/2 F/COF 35-800/250 PB 20-18**

TYPE 4 PERFORMANCE TYPICAL TYPE 4 COMPONENT CONFIGURATION



Fan Data

Motor output	334 WATTS
Electric supply	240V/1/50
Maximum current rating	2.0 Amps
Maximum Speed	@10Volts 3200 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 35 -800/250

Air Flow Performance

External Pressure Pascals	50	100	150	200
Airflow (m³/Hr)	1000	880	780	600
Inlet SWL db	71	72	74	74
Outlet SWL db	75	76	76	77
Absorbed power (Watts)	308	318	320	324

Airflow performance based on maximum speed @ 10 Volts.

Electric Heater Data

Based on maximum airflow 7Kw single or three phase electric supply.

LPHW Coil Data

Based on maximum airflow and LPHW @ 82/71°C.

Maximum heating output 7Kw.

Chilled water/direct expansion coil data based on maximum airflow & chilled water @ 6/12°C or DX evaporating @ 6°C.

Max cooling output 9Kw.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	1000	880	780	600
Dry Efficiency	79.8	80.4	81.0	82.3
Wet Efficiency	86.6	87.1	87.6	88.6
Supply Air Lat °C	17.5	17.6	17.7	18.0
Exhaust Air Lat °C	5.9	5.9	5.6	5.6
Energy Recovered (Kw)	7.5	6.7	5.9	4.6

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

Supply air entering at -5%db/100% relative humidity.

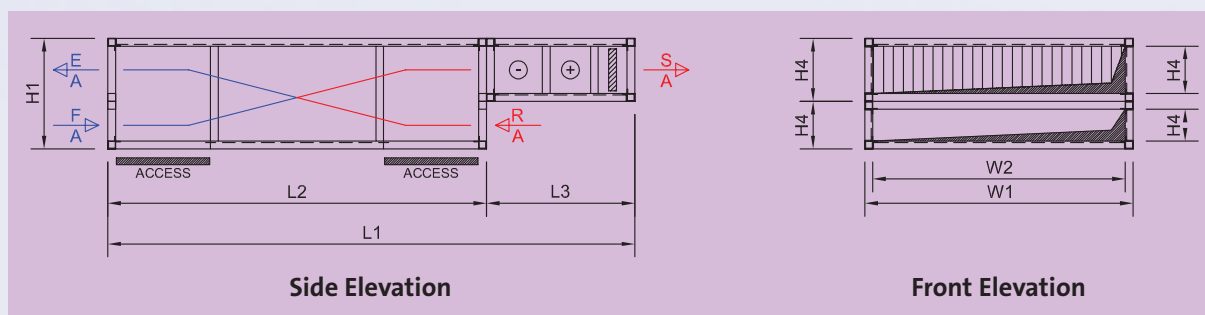
Filter 95mm pleated panel filter pressure drop allowance 200Pa.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	315	400	250	150	210	110	2500	1900	600	1300	1260
30/25 PB	375	440	270	170	210	110	2540	1920	620	1320	1260
30/25 AS	401	440	270	170	210	110	2540	1920	620	1320	1260
30/25 PB TS PB	454	440	270	170	210	110	2540	1920	620	1320	1260
50/50 PB	448	520	310	210	210	110	2620	1960	660	1360	1260
50/50 PB TS PB	573	520	310	210	210	110	2620	1960	660	1360	1260
50/50 AS TS PB	723	520	310	210	210	110	2620	1960	660	1360	1260
50/50 AS QS PB	798	520	310	210	210	110	2620	1960	660	1360	1260

Selection Chart **MODEL PVHRU 400/EC 220-163/3 F/COF 35-1300/400 PB 20-18**

TYPE 4 PERFORMANCE TYPICAL TYPE 4 COMPONENT CONFIGURATION



Fan Data

Motor output	501 WATTS
Electric supply	240V/1/50
Maximum current rating	3.0 Amps
Maximum Speed	@10Volts 3200 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 35 -1300/400

Air Flow Performance

External Pressure Pascals	50	100	150	200
Airflow (m³/Hr)	1500	1320	1170	900
Inlet SWL db	74	75	77	77
Outlet SWL db	78	79	79	80
Absorbed power (Watts)	462	477	540	486

Airflow performance based on maximum speed @ 10 Volts.

Electric Heater Data

Based on maximum airflow 10Kw
single or three phase electric supply.

LPHW Coil Data

Based on maximum airflow and
LPHW @ 82/71°C.

Maximum heating output 10Kw.

Chilled water/direct expansion coil
data based on maximum airflow &
chilled water @ 6/12°C or DX
evaporating @ 6°C.

Max cooling output 8Kw.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	1500	1320	1170	900
Dry Efficiency	80.2	80.8	81.4	82.7
Wet Efficiency	87.0	87.4	88.0	89.0
Supply Air Lat °C	17.6	17.7	17.8	18.1
Exhaust Air Lat °C	5.9	5.6	5.6	5.4
Energy Recovered (Kw)	11.4	10.1	9.0	7.0

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

Supply air entering at -5%db/100% relative humidity.

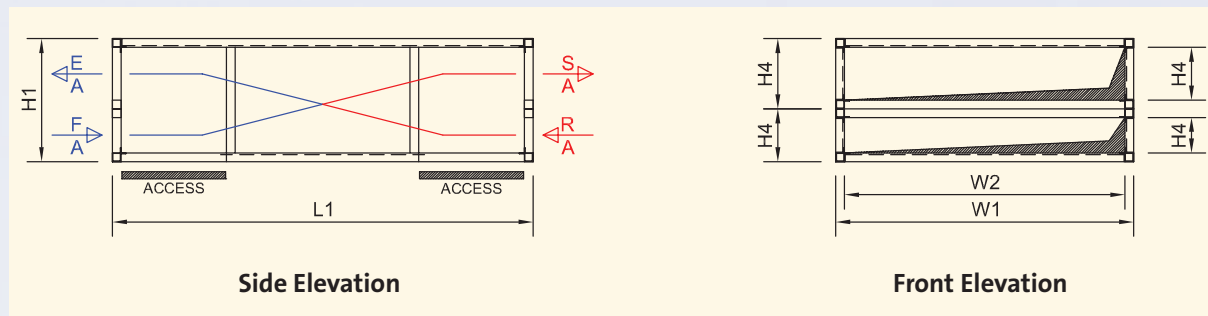
Filter 95mm pleated panel filter pressure drop allowance 200Pa.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	471	400	250	150	210	110	2500	1900	600	1800	1760
30/25 PB	539	440	270	170	210	110	2540	1920	620	1820	1760
30/25 AS	558	440	270	170	210	110	2540	1920	620	1820	1760
30/25 PB TS PB	597	440	270	170	210	110	2540	1920	620	1820	1760
50/50 PB	580	520	310	210	210	110	2620	1960	660	1860	1760
50/50 PB TS PB	666	520	310	210	210	110	2620	1960	660	1860	1760
50/50 AS TS PB	798	520	310	210	210	110	2620	1960	660	1860	1760
50/50 AS QS PB	821	520	310	210	210	110	2620	1960	660	1860	1760

Selection Chart **MODEL PVHRU 450/EC 220-163/1 F/COF 45-700/250 PB 20-18**

TYPE 1 PERFORMANCE TYPICAL TYPE 1 COMPONENT CONFIGURATION



Fan Data

Motor output	167 WATTS
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 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 45 -700/250

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	800	750	700	650	600	500
Inlet SWL db	79	77	78	75	76	78
Outlet SWL db	83	81	82	79	80	80
Absorbed power (Watts)	130	140	145	151	154	159

Airflow performance based on maximum speed @ 10 Volts.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	800	750	700	650	600	500
Dry Efficiency	81.4	81.7	82.0	82.4	82.8	83.7
Wet Efficiency	88.0	88.1	88.4	88.7	89.0	89.7
Supply Air Lat °C	17.9	17.9	18.0	18.1	18.1	18.3
Exhaust Air Lat °C	5.6	5.6	5.6	5.4	5.4	5.4
Energy Recovered (Kw)	6.1	5.8	5.4	5.0	4.7	3.9

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

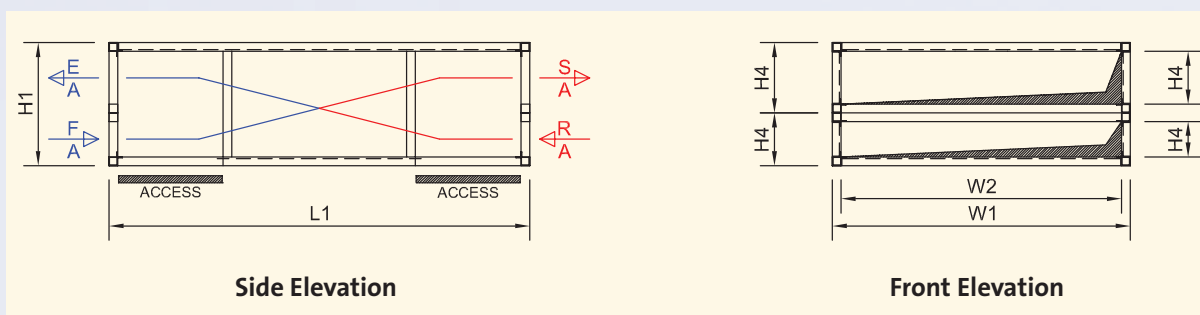
Supply air entering at -5%db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	W1	W2
20/18 PB	234	450	270	180	230	140	2000	1050	1010
30/25 PB	270	490	290	200	230	140	2020	1070	1010
30/25 AS	283	490	290	200	230	140	2020	1070	1010
30/25 PB TS PB	312	490	290	200	230	140	2020	1070	1010
50/50 PB	294	570	330	240	230	140	2060	1110	1010
50/50 PB TS PB	341	570	330	240	230	140	2060	1110	1010
50/50 AS TS PB	390	570	330	240	230	140	2060	1110	1010
50/50 AS QS PB	444	570	330	240	230	140	2060	1110	1010

Selection Chart **MODEL PVHRU 450/EC 220-163/2 F/COF 45-1200/400 PB 20-18**

TYPE 1 PERFORMANCE TYPICAL TYPE 1 COMPONENT CONFIGURATION



Fan Data

Motor output	334 WATTS
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 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 45 -1200/400

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	1600	1500	1400	1300	1200	1000
Inlet SWL db	79	77	78	75	76	78
Outlet SWL db	83	81	82	79	80	80
Absorbed power (Watts)	260	280	290	302	308	318

Airflow performance based on maximum speed @ 10 Volts.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	1600	1500	1400	1300	1200	1000
Dry Efficiency	80.6	81.0	81.3	81.6	82.0	83.0
Wet Efficiency	87.3	87.6	87.8	88.1	88.4	89.7
Supply Air Lat °C	17.7	17.8	17.8	17.9	17.9	18.1
Exhaust Air Lat °C	5.6	5.6	5.6	5.6	5.6	5.4
Energy Recovered (Kw)	12.2	11.5	10.7	10.0	9.3	7.8

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

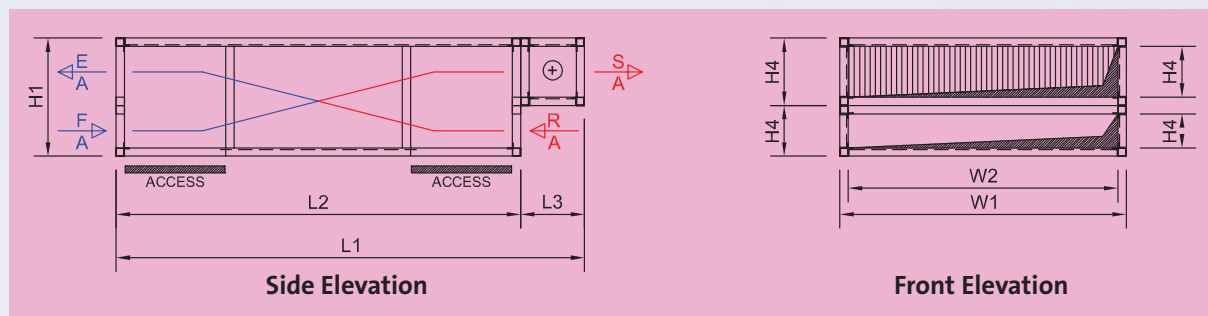
Supply air entering at -5°db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	W1	W2
20/18 PB	350	450	270	180	230	140	2000	1700	1660
30/25 PB	401	490	290	200	230	140	2020	1720	1660
30/25 AS	417	490	290	200	230	140	2020	1720	1660
30/25 PB TS PB	449	490	290	200	230	140	2020	1720	1660
50/50 PB	436	570	330	240	230	140	2060	1760	1660
50/50 PB TS PB	498	570	330	240	230	140	2060	1760	1660
50/50 AS TS PB	574	570	330	240	230	140	2060	1760	1660
50/50 AS QS PB	651	570	330	240	230	140	2060	1760	1660

Selection Chart **MODEL PVHRU 450/EC 220-163/1 F/COF 45-700/250 PB 20-18**

TYPE 2 PERFORMANCE TYPICAL TYPE 2 COMPONENT CONFIGURATION



Fan Data

Motor output	167 WATTS
Electric supply	240V/1/50
Maximum current rating	1.0 Amps
Maximum Speed	@10Volts 3200 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 45 -700/250

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m ³ /Hr)	800	750	700	650	600	500
Inlet SWL db	76	74	75	72	73	75
Outlet SWL db	80	78	79	76	77	77
Absorbed power (Watts)	130	140	145	151	154	159

Airflow performance based on maximum speed @ 10 Volts.

Electric Heater Data

Based on maximum airflow 5Kw single or three phase electric supply.

LPHW Coil Data

Based on maximum airflow and LPHW @ 82/71°C.

Maximum heating output 5Kw.

Plate Exchanger Efficiency %

Airflow (m ³ /Hr)	800	750	700	650	600	500
Dry Efficiency	81.4	81.7	82.0	82.4	82.8	83.7
Wet Efficiency	88.0	88.1	88.4	88.7	89.0	89.7
Supply Air Lat °C	17.9	17.9	18.0	18.1	18.1	18.3
Exhaust Air Lat °C	5.6	5.6	5.6	5.4	5.4	5.4
Energy Recovered (Kw)	6.1	5.8	5.4	5.0	4.7	3.9

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

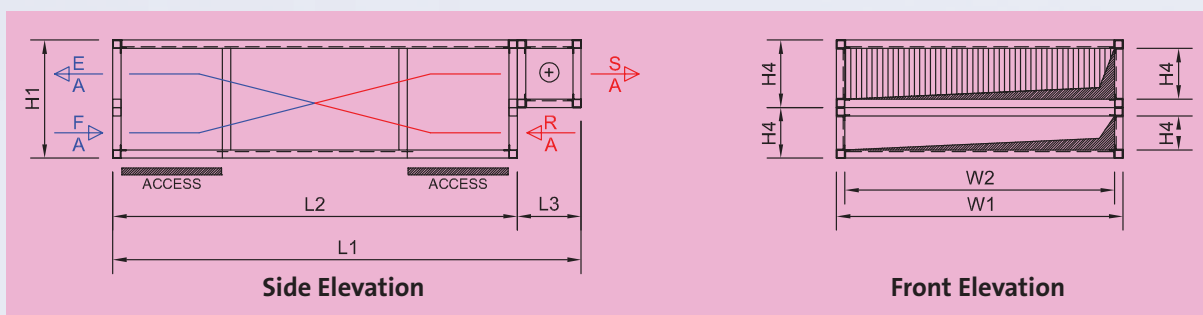
Supply air entering at -5%db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	260	450	270	180	230	140	2180	2000	180	1050	1010
30/25 PB	300	490	290	200	230	140	2220	2020	200	1070	1010
30/25 AS	314	490	290	200	230	140	2220	2020	200	1070	1010
30/25 PB TS PB	346	490	290	200	230	140	2220	2020	200	1070	1010
50/50 PB	327	570	330	240	230	140	2300	2060	240	1110	1010
50/50 PB TS PB	382	570	330	240	230	140	2300	2060	240	1110	1010
50/50 AS TS PB	431	570	330	240	230	140	2300	2060	240	1110	1010
50/50 AS QS PB	491	570	330	240	230	140	2300	2060	240	1110	1010

Selection Chart **MODEL PVHRU 450/EC 220-163/2 F/COF 45-1200/400 PB 20-18**

TYPE 2 PERFORMANCE TYPICAL TYPE 2 COMPONENT CONFIGURATION



Fan Data

Motor output	334 WATTS
Electric supply	240V/1/50
Maximum current rating	2.0 Amps
Maximum Speed	@10Volts 3200 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 45 -1200/400

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	1600	1500	1400	1300	1200	1000
Inlet SWL db	79	77	78	75	76	78
Outlet SWL db	83	81	82	79	80	80
Absorbed power (Watts)	260	280	290	309	308	318

Airflow performance based on maximum speed @ 10 Volts.

Electric Heater Data

Based on maximum airflow 12Kw single or three phase electric supply.

LPHW Coil Data

Based on maximum airflow and LPHW @ 82/71°C.

Maximum heating output 12Kw.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	800	750	700	650	600	500
Dry Efficiency	80.6	81.0	81.3	81.6	82.0	83.0
Wet Efficiency	87.3	87.6	87.8	88.1	88.4	89.1
Supply Air Lat °C	17.7	17.8	17.8	17.9	18.0	18.1
Exhaust Air Lat °C	5.6	5.6	5.6	5.6	5.6	5.4
Energy Recovered (Kw)	12.2	11.5	10.7	10.0	9.3	7.8

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

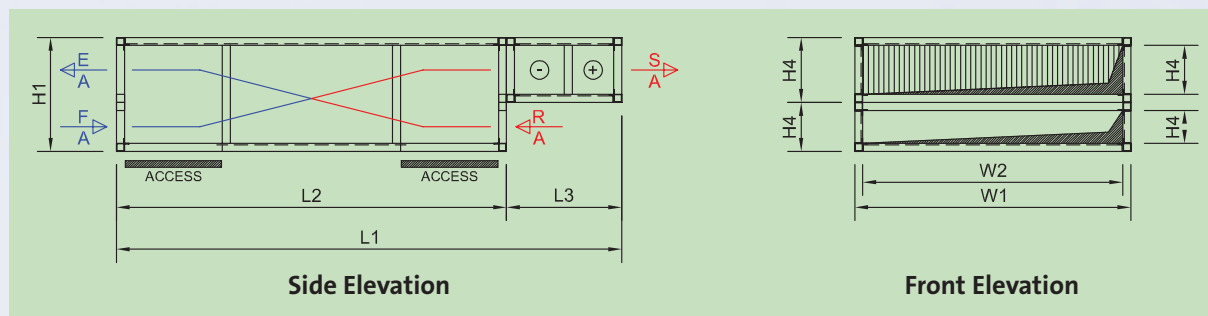
Supply air entering at -5%db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	395	450	270	180	230	140	2180	2000	180	1700	1660
30/25 PB	449	490	290	200	230	140	2200	2020	200	1720	1660
30/25 AS	462	490	290	200	230	140	2200	2020	200	1720	1660
30/25 PB TS PB	501	490	290	200	230	140	2200	2020	200	1720	1660
50/50 PB	479	570	330	240	230	140	2300	2060	240	1760	1660
50/50 PB TS PB	556	570	330	240	230	140	2300	2060	240	1760	1660
50/50 AS TS PB	639	570	330	240	230	140	2300	2060	240	1760	1660
50/50 AS QS PB	723	570	330	240	230	140	2300	2060	240	1760	1660

Selection Chart **MODEL PVHRU 450/EC 220-163/1 F/COF 45-700/250 PB 20-18**

TYPE 3 PERFORMANCE TYPICAL TYPE 3 COMPONENT CONFIGURATION



Fan Data

Motor output	167 WATTS
Electric supply	240V/1/50
Maximum current rating	1.0 Amps
Maximum Speed	@10Volts 3200 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 45 -700/250

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	750	700	650	600	550	450
Inlet SWL db	75	73	74	71	72	71
Outlet SWL db	79	77	78	75	76	76
Absorbed power (Watts)	130	140	145	151	154	159

Airflow performance based on maximum speed @ 10 Volts.

Electric Heater Data

Based on maximum airflow 6Kw single or three phase electric supply.

LPHW Coil Data

Based on maximum airflow and LPHW @ 82/71°C.

Maximum heating output 6Kw.

Chilled water/direct expansion coil data based on maximum airflow & chilled water @ 6/12°C or DX evaporating @ 6°C.

Max cooling output 5Kw.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	750	700	650	600	550	450
Dry Efficiency	81.7	82.0	82.4	82.8	83.2	84.2
Wet Efficiency	88.1	88.4	88.7	89.0	89.4	90.1
Supply Air Lat °C	18.0	18.0	18.0	18.1	18.2	18.4
Exhaust Air Lat °C	5.6	5.6	5.4	5.4	5.4	5.4
Energy Recovered (Kw)	5.7	5.4	5.0	4.6	4.3	3.5

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

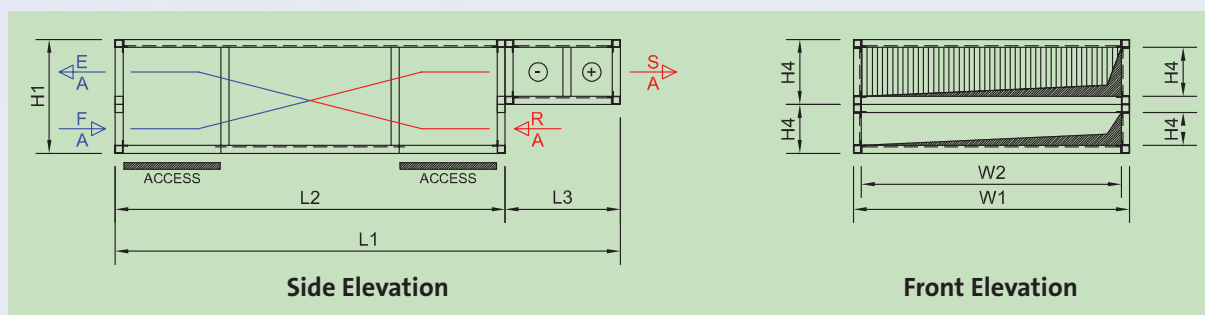
Supply air entering at -5%db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	302	450	270	180	230	140	2400	2000	400	1050	1010
30/25 PB	348	490	290	200	230	140	2440	2020	420	1070	1010
30/25 AS	359	490	290	200	230	140	2440	2020	420	1070	1010
30/25 PB TS PB	398	490	290	200	230	140	2440	2020	420	1070	1010
50/50 PB	378	570	330	240	230	140	2500	2060	460	1110	1010
50/50 PB TS PB	436	570	330	240	230	140	2500	2060	460	1110	1010
50/50 AS TS PB	490	570	330	240	230	140	2500	2060	460	1110	1010
50/50 AS QS PB	556	570	330	240	230	140	2500	2060	460	1110	1010

Selection Chart **MODEL PVHRU 450/EC 220-163/2 F/COF 45-1200/400 PB 20-18**

TYPE 3 PERFORMANCE TYPICAL TYPE 3 COMPONENT CONFIGURATION



Fan Data

Motor output	334 WATTS
Electric supply	240V/1/50
Maximum current rating	2.0 Amps
Maximum Speed	@10Volts 3200 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 45 -1200/400

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	1500	1400	1300	1200	1100	900
Inlet SWL db	78	76	77	74	75	77
Outlet SWL db	82	80	81	78	79	79
Absorbed power (Watts)	260	280	290	302	308	318

Airflow performance based on maximum speed @ 10 Volts.

Electric Heater Data

Based on maximum airflow 12Kw single or three phase electric supply.

LPHW Coil Data

Based on maximum airflow and LPHW @ 82/71°C.

Maximum heating output 12Kw.

Chilled water/direct expansion coil data based on maximum airflow & chilled water @ 6/12°C or DX evaporating @ 6°C.

Max cooling output 10Kw.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	1500	1400	1300	1200	1100	900
Dry Efficiency	81.0	81.3	81.6	82.0	82.4	83.4
Wet Efficiency	87.5	87.8	88.1	88.4	88.7	89.5
Supply Air Lat °C	17.7	17.8	17.9	18.0	18.1	18.3
Exhaust Air Lat °C	5.6	5.6	5.6	5.6	5.4	5.4
Energy Recovered (Kw)	11.5	10.7	10.0	9.3	8.5	7.0

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

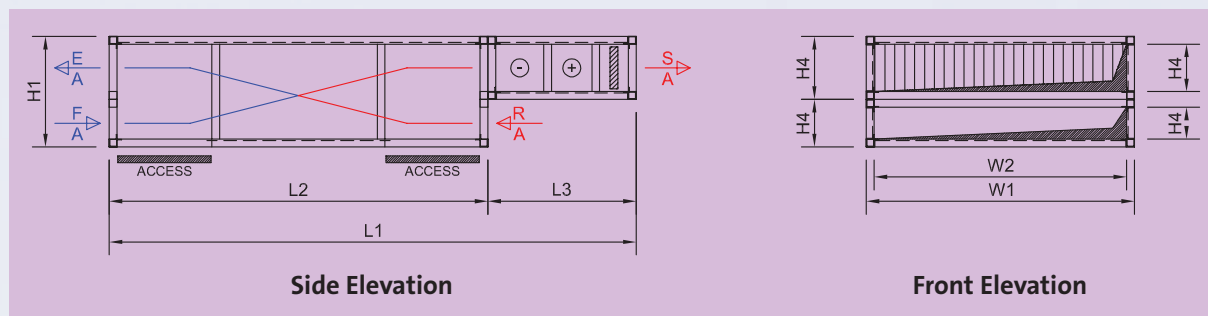
Supply air entering at -5°db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	458	450	270	180	230	140	2400	2000	400	1700	1660
30/25 PB	515	490	290	200	230	140	2440	2020	420	1720	1660
30/25 AS	530	490	290	200	230	140	2440	2020	420	1720	1660
30/25 PB TS PB	571	490	290	200	230	140	2440	2020	420	1720	1660
50/50 PB	559	570	330	240	230	140	2500	2060	460	1760	1660
50/50 PB TS PB	622	570	330	240	230	140	2500	2060	460	1760	1660
50/50 AS TS PB	682	570	330	240	230	140	2500	2060	460	1760	1660
50/50 AS QS PB	813	570	330	240	230	140	2500	2060	460	1760	1660

Selection Chart **MODEL PVHRU 450/EC 220-163/2 F/COF 45-700/250 PB 20-18**

TYPE 4 PERFORMANCE TYPICAL TYPE 4 COMPONENT CONFIGURATION



Fan Data

Motor output	334 WATTS
Electric supply	240V/1/50
Maximum current rating	2.0 Amps
Maximum Speed	@10Volts 3200 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 45 -700/250

Air Flow Performance

External Pressure Pascals	50	100	150	200
Airflow (m³/Hr)	1000	900	800	700
Inlet SWL db	75	77	76	75
Outlet SWL db	79	79	78	77
Absorbed power (Watts)	260	280	290	302

Airflow performance based on maximum speed @ 10 Volts.

Electric Heater Data

Based on maximum airflow 7Kw single or three phase electric supply.

LPHW Coil Data

Based on maximum airflow and LPHW @ 82/71°C.

Maximum heating output 7Kw.

Chilled water/direct expansion coil data based on maximum airflow & chilled water @ 6/12°C or DX evaporating @ 6°C.

Max cooling output 5Kw.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	1000	900	800	700
Dry Efficiency	80.3	80.8	81.3	82.0
Wet Efficiency	87.0	87.4	87.9	88.4
Supply Air Lat °C	17.6	17.7	17.8	18.0
Exhaust Air Lat °C	5.9	5.6	5.6	5.6
Energy Recovered (Kw)	7.6	6.9	6.1	5.4

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

Supply air entering at -5°db/100% relative humidity.

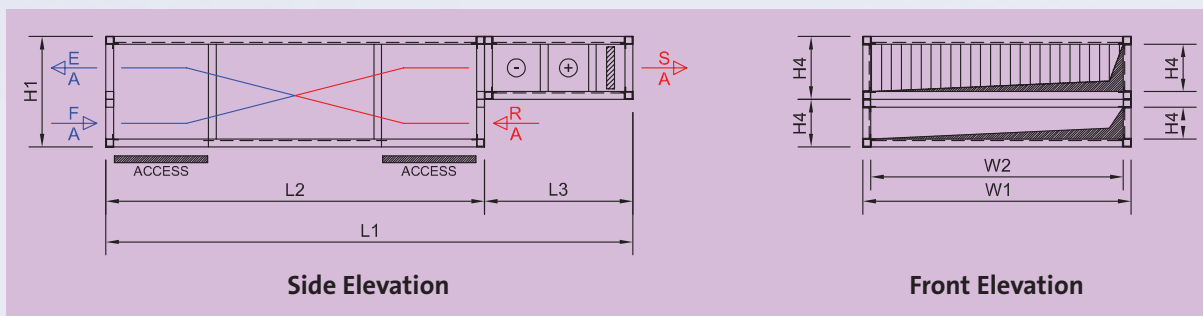
Secondary filter 95mm pleated panel filter pressure drop allowance 200PA.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	333	450	270	180	230	140	2600	2000	600	1050	1010
30/25 PB	390	490	290	200	230	140	2640	2020	620	1070	1010
30/25 AS	406	490	290	200	230	140	2640	2020	620	1070	1010
30/25 PB TS PB	448	490	290	200	230	140	2640	2020	620	1070	1010
50/50 PB	429	570	330	240	230	140	2720	2060	660	1110	1010
50/50 PB TS PB	487	570	330	240	230	140	2720	2060	660	1110	1010
50/50 AS TS PB	554	570	330	240	230	140	2720	2060	660	1110	1010
50/50 AS QS PB	621	570	330	240	230	140	2720	2060	660	1110	1010

Selection Chart **MODEL PVHRU 450/EC 220-163/3 F/COF 45-1200/400 PB 20-18**

TYPE 4 PERFORMANCE TYPICAL TYPE 4 COMPONENT CONFIGURATION



Fan Data

Motor output	501 WATTS
Electric supply	240V/1/50
Maximum current rating	3.0 Amps
Maximum Speed	@10Volts 3200 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 45 -1200/400

Air Flow Performance

External Pressure Pascals	50	100	150	200
Airflow (m³/Hr)	1500	1350	1200	1050
Inlet SWL db	76	78	77	76
Outlet SWL db	80	80	79	78
Absorbed power (Watts)	390	420	435	453

Airflow performance based on maximum speed @ 10 Volts.

Electric Heater Data

Based on maximum airflow 12Kw single or three phase electric supply.

LPHW Coil Data

Based on maximum airflow and LPHW @ 82/71°C.

Maximum heating output 12Kw.

Chilled water/direct expansion coil data based on maximum airflow & chilled water @ 6/12°C or DX evaporating @ 6°C.

Max cooling output 9Kw.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	1000	900	800	700
Dry Efficiency	80.9	81.4	82.0	82.7
Wet Efficiency	87.5	88.0	88.4	89.0
Supply Air Lat °C	17.7	17.8	18.0	18.1
Exhaust Air Lat °C	5.6	5.6	5.6	5.4
Energy Recovered (Kw)	11.5	10.3	9.2	8.1

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

Supply air entering at -5%db/100% relative humidity.

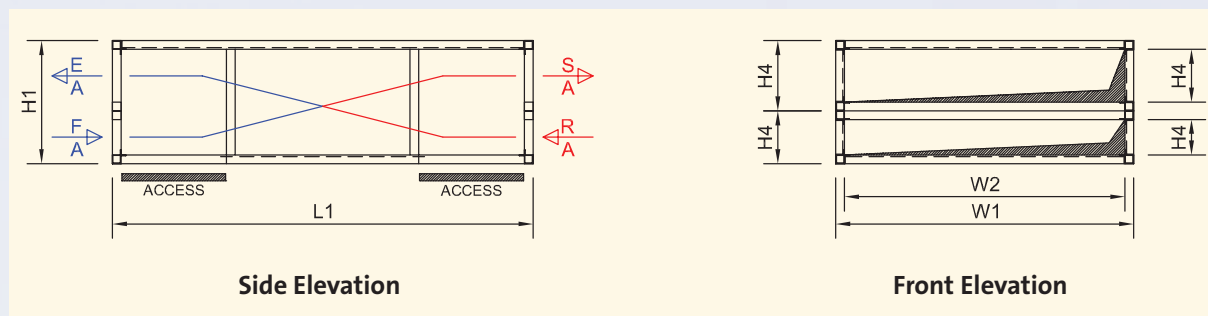
Secondary filter 95mm pleated panel filter pressure drop allowance 200PA.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	506	450	270	180	230	140	2600	2000	600	1700	1660
30/25 PB	575	490	290	200	230	140	2640	2020	620	1720	1660
30/25 AS	589	490	290	200	230	140	2640	2020	620	1720	1660
30/25 PB TS PB	636	490	290	200	230	140	2640	2020	620	1720	1660
50/50 PB	465	570	330	240	230	140	2720	2060	660	1760	1660
50/50 PB TS PB	591	570	330	240	230	140	2720	2060	660	1760	1660
50/50 AS TS PB	646	570	330	240	230	140	2720	2060	660	1760	1660
50/50 AS QS PB	799	570	330	240	230	140	2720	2060	660	1760	1660

Selection Chart **MODEL PVHRU 550/EC 220-163/3 F/COF 55-400/400 PB 20-18**

TYPE 1 PERFORMANCE TYPICAL TYPE 1 COMPONENT CONFIGURATION



Fan Data

Motor output	501 WATTS
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 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 55 -1400/400

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	2400	2250	2100	1900	1800	1500
Inlet SWL db	76	74	75	72	73	75
Outlet SWL db	80	78	79	76	77	77
Absorbed power (Watts)	390	420	435	453	462	477

Airflow performance based on maximum speed @ 10 Volts.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	2400	2250	2100	1900	1800	1500
Dry Efficiency	80.1	80.6	81.0	81.1	81.7	82.6
Wet Efficiency	87.0	87.3	87.6	88.0	88.2	89.0
Supply Air Lat °C	17.6	17.7	17.8	17.9	17.9	18.1
Exhaust Air Lat °C	5.9	5.6	5.6	5.6	5.6	5.4
Energy Recovered (Kw)	19.0	17.1	16.0	14.6	13.8	11.6

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

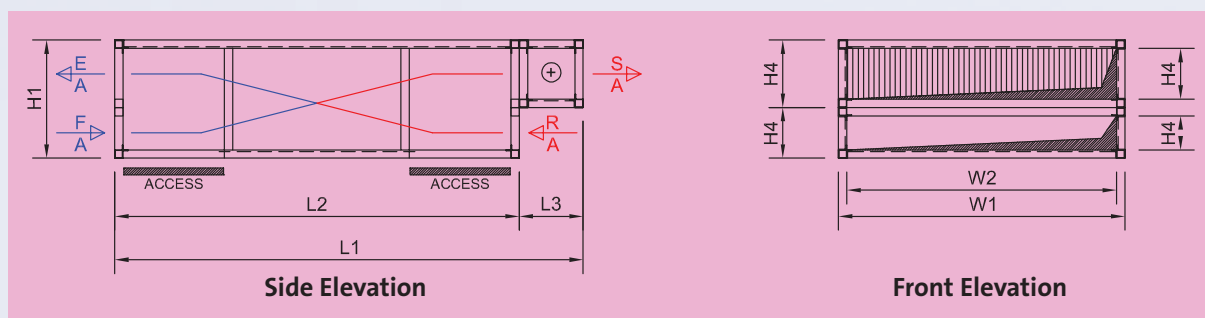
Supply air entering at -5%db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	W1	W2
20/18 PB	410	550	350	200	310	160	2100	1900	1860
30/25 PB	471	590	370	220	310	160	2120	1920	1860
30/25 AS	501	590	370	220	310	160	2120	1920	1860
30/25 PB TS PB	543	590	370	220	310	160	2120	1920	1860
50/50 PB	558	670	410	260	310	160	2160	1960	1860
50/50 PB TS PB	609	670	410	260	310	160	2160	1960	1860
50/50 AS TS PB	677	670	410	260	310	160	2160	1960	1860
50/50 AS QS PB	767	670	410	260	310	160	2160	1960	1860

Selection Chart **MODEL PVHRU 550/EC 220-167/3 F/COF 55-1400/400 PB 20-18**

TYPE 2 PERFORMANCE TYPICAL TYPE 2 COMPONENT CONFIGURATION



Fan Data

Motor output	501 WATTS
Electric supply	240V/1/50
Maximum current rating	3.0 Amps
Maximum Speed	@10Volts 3200 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 55 -1400/400

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	2400	2250	2100	1900	1800	1500
Inlet SWL db	76	74	75	72	73	75
Outlet SWL db	80	78	79	76	77	77
Absorbed power (Watts)	390	420	435	453	462	472

Airflow performance based on maximum speed @ 10 Volts.

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.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	2400	2250	2100	1900	1800	1500
Dry Efficiency	80.1	80.6	81.0	81.1	81.7	82.6
Wet Efficiency	87.0	87.3	87.6	88.0	88.2	89.0
Supply Air Lat °C	17.6	17.7	17.8	17.9	17.9	18.1
Exhaust Air Lat °C	5.9	5.6	5.6	5.6	5.6	5.4
Energy Recovered (Kw)	19.0	17.1	16.0	14.6	13.8	11.6

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

Supply air entering at -5%db/100% relative humidity.

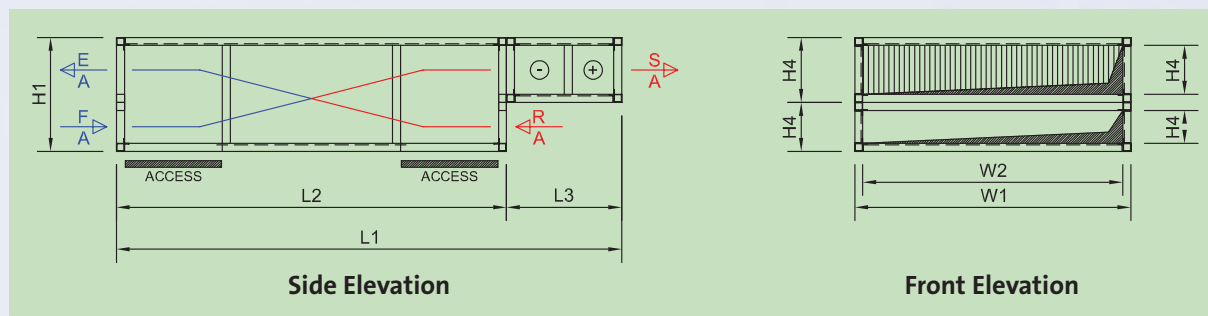
Secondary filter 95mm pleated panel filter pressure drop allowance 200PA.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	461	505	350	200	310	160	2280	2100	180	1900	1860
30/25 PB	527	590	370	220	310	160	2320	2120	200	1920	1860
30/25 AS	542	590	370	220	310	160	2320	2120	200	1920	1860
30/25 PB TS PB	606	590	370	220	310	160	2320	2120	200	1920	1860
50/50 PB	618	670	410	260	310	160	2400	2160	240	1960	1860
50/50 PB TS PB	692	670	410	260	310	160	2400	2160	240	1960	1860
50/50 AS TS PB	753	670	410	260	310	160	2400	2160	240	1960	1860
50/50 AS QS PB	852	670	410	260	310	160	2400	2160	240	1960	1860

Selection Chart **MODEL PVHRU 550/EC 220-167/3 F/COF 55-1400/400 PB 20-18**

TYPE 3 PERFORMANCE TYPICAL TYPE 3 COMPONENT CONFIGURATION



Fan Data

Motor output	501 WATTS
Electric supply	240V/1/50
Maximum current rating	3.0 Amps
Maximum Speed	@10Volts 3200 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 55 -1400/400

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	2250	2100	1900	1800	1500	1300
Inlet SWL db	74	75	72	73	74	73
Outlet SWL db	78	79	76	77	77	77
Absorbed power (Watts)	420	435	453	462	477	481

Airflow performance based on maximum speed @ 10 Volts.

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.

Chilled water/direct expansion coil data based on maximum airflow & chilled water @ 6/11°C or DX evaporating @ 6°C.

Max cooling output 15Kw.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	2250	2100	1900	1800	1500	1300
Dry Efficiency	80.6	81.0	81.1	81.7	82.6	83.3
Wet Efficiency	87.3	87.6	88.0	88.2	89.0	89.5
Supply Air Lat °C	17.7	17.8	17.9	17.9	18.1	18.2
Exhaust Air Lat °C	5.6	5.6	5.6	5.6	5.4	5.4
Energy Recovered (Kw)	17.1	16.0	14.6	13.8	11.6	10.1

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

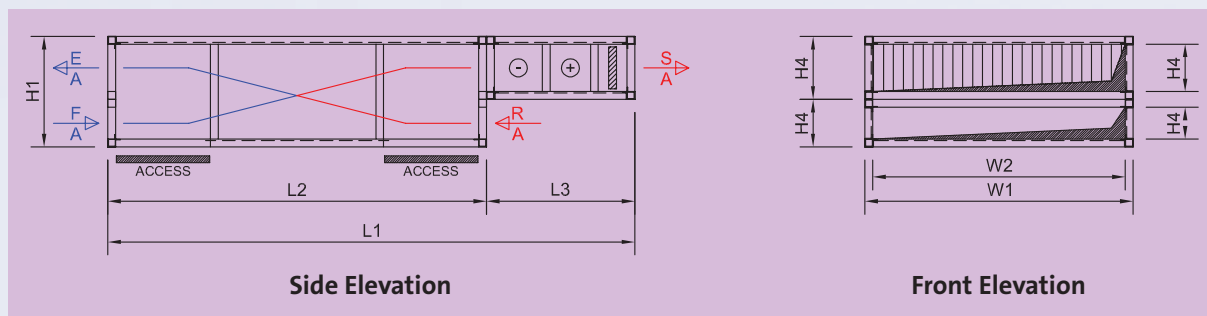
Supply air entering at -5%db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	523	550	350	200	310	160	2500	2100	400	1900	1860
30/25 PB	594	590	370	220	310	160	2540	2120	420	1920	1860
30/25 AS	616	590	370	220	310	160	2540	2120	420	1920	1860
30/25 PB TS PB	680	590	370	220	310	160	2540	2120	420	1920	1860
50/50 PB	689	670	410	260	310	160	2620	2160	460	1960	1860
50/50 PB TS PB	770	670	410	260	310	160	2620	2160	460	1960	1860
50/50 AS TS PB	840	670	410	260	310	160	2620	2160	460	1960	1860
50/50 AS QS PB	948	670	410	260	310	160	2620	2160	460	1960	1860

Selection Chart **MODEL PVHRU 550/EC 220-167/4 F/COF 55-1400/400 PB 20-18**

TYPE 4 PERFORMANCE TYPICAL TYPE 4 COMPONENT CONFIGURATION



Fan Data

Motor output	668 WATTS
Electric supply	240V/1/50
Maximum current rating	4.0 Amps
Maximum Speed	@10Volts 3200 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 55 -1400/400

Air Flow Performance

External Pressure Pascals	50	100	150	200
Airflow (m³/Hr)	2000	1700	1400	1100
Inlet SWL db	74	75	72	73
Outlet SWL db	78	79	76	77
Absorbed power (Watts)	624	628	635	640

Airflow performance based on maximum speed @ 10 Volts.

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.

Chilled water/direct expansion coil data based on maximum airflow & chilled water @ 6/11°C or DX evaporating @ 6°C.

Max cooling output 15Kw.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	2000	1700	1400	1100
Dry Efficiency	81.2	82.0	83.0	84.2
Wet Efficiency	87.8	88.4	89.1	90.1
Supply Air Lat °C	17.8	18.0	18.2	18.4
Exhaust Air Lat °C	5.6	5.6	5.4	5.4
Energy Recovered (Kw)	15.3	13.1	10.9	8.7

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

Supply air entering at -5%db/100% relative humidity.

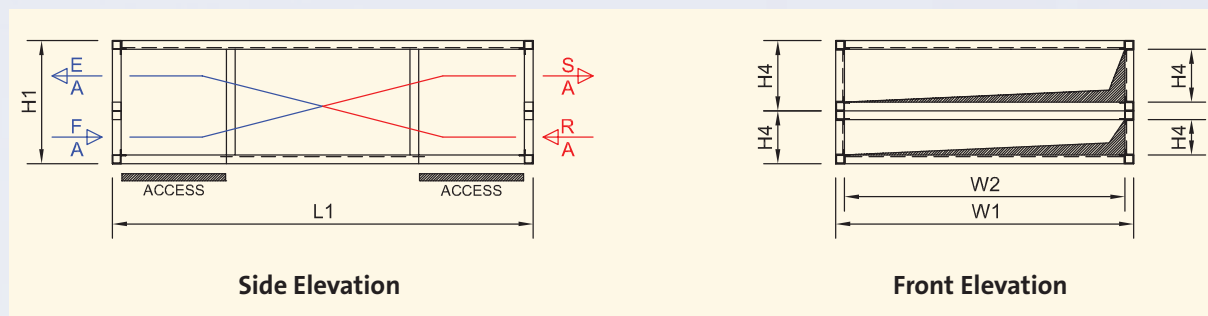
Secondary filter 95mm pleated panel filter pressure drop allowance 200PA.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	576	550	350	200	310	160	2700	2100	600	1900	1860
30/25 PB	652	590	370	220	310	160	2740	2120	620	1920	1860
30/25 AS	678	590	370	220	310	160	2740	2120	620	1920	1860
30/25 PB TS PB	745	590	370	220	310	160	2740	2120	620	1920	1860
50/50 PB	751	670	410	260	310	160	2820	2160	660	1960	1860
50/50 PB TS PB	832	670	410	260	310	160	2820	2160	660	1960	1860
50/50 AS TS PB	918	670	410	260	310	160	2820	2160	660	1960	1860
50/50 AS QS PB	1035	670	410	260	310	160	2820	2160	660	1960	1860

Selection Chart **MODEL PVHRU 600/EC 310-390/2 F/COF 62-1600/400 PB 20-18**

TYPE 1 PERFORMANCE TYPICAL TYPE 1 COMPONENT CONFIGURATION



Fan Data

Motor output	780 WATTS
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 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 62 -1600/400

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	3000	2900	2800	2700	2600	2400
Inlet SWL db	78	77	77	76	75	74
Outlet SWL db	80	79	78	78	77	76
Absorbed power (Watts)	680	685	690	700	705	710

Airflow performance based on maximum speed @ 10 Volts.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	3000	2900	2800	2700	2600	2400
Dry Efficiency	82.0	82.1	82.3	82.5	82.7	83.1
Wet Efficiency	88.8	89.0	89.1	89.2	89.4	89.7
Supply Air Lat °C	18.1	18.1	18.2	18.2	18.2	18.3
Exhaust Air Lat °C	5.6	5.3	5.3	5.3	5.3	5.3
Energy Recovered (Kw)	22.8	22.1	21.4	20.7	19.9	18.4

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

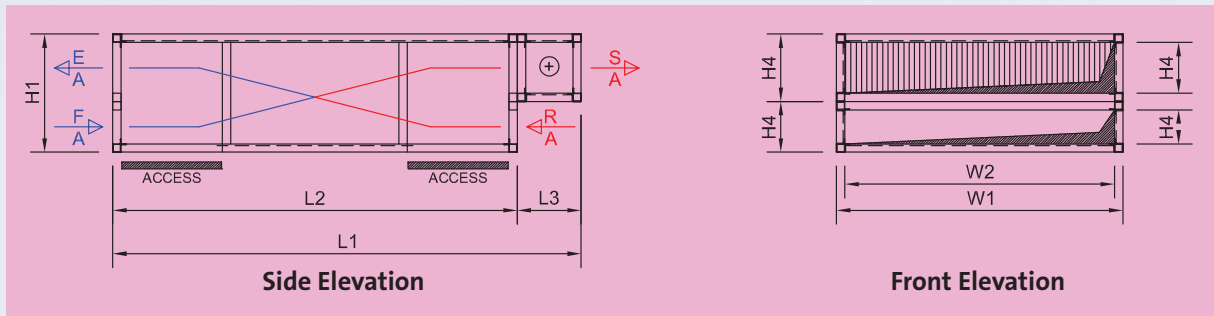
Supply air entering at -5%db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	W1	W2
20/18 PB	516	600	360	240	320	200	2300	2100	2060
30/25 PB	591	640	380	260	320	200	2320	2120	2060
30/25 AS	620	640	380	260	320	200	2320	2120	2060
30/25 PB TS PB	677	640	380	260	320	200	2320	2120	2060
50/50 PB	651	720	420	300	320	200	2360	2160	2060
50/50 PB TS PB	756	720	420	300	320	200	2360	2160	2060
50/50 AS TS PB	839	720	420	300	320	200	2360	2160	2060
50/50 AS QS PB	951	720	420	300	320	200	2360	2160	2060

Selection Chart **MODEL PVHRU 600/EC 310-390/2 F/COF 62-1600/400 PB 20-18**

TYPE 2 PERFORMANCE TYPICAL TYPE 2 COMPONENT CONFIGURATION



Fan Data

Motor output	780 WATTS
Electric supply	240V/1/50
Maximum current rating	5.2 Amps
Maximum Speed	@10Volts 2350 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 62 -1600/400

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	3000	2900	2800	2700	2600	2400
Inlet SWL db	78	77	77	76	75	74
Outlet SWL db	80	79	78	78	77	76
Absorbed power (Watts)	680	685	690	700	705	710

Airflow performance based on maximum speed @ 10 Volts.

Electric Heater Data

Based on maximum airflow 20Kw single or three phase electric supply.

LPHW Coil Data

Based on maximum airflow and LPHW @ 82/71°C.

Maximum heating output 20Kw.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	3000	2900	2800	2700	2600	2400
Dry Efficiency	82.0	82.1	82.3	82.5	82.7	83.1
Wet Efficiency	88.8	89.0	89.1	89.2	89.4	89.7
Supply Air Lat °C	18.1	18.1	18.2	18.2	18.2	18.3
Exhaust Air Lat °C	5.6	5.3	5.3	5.3	5.3	5.3
Energy Recovered (Kw)	22.8	22.1	22.4	20.7	19.9	18.4

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

Supply air entering at -5%db/100% relative humidity.

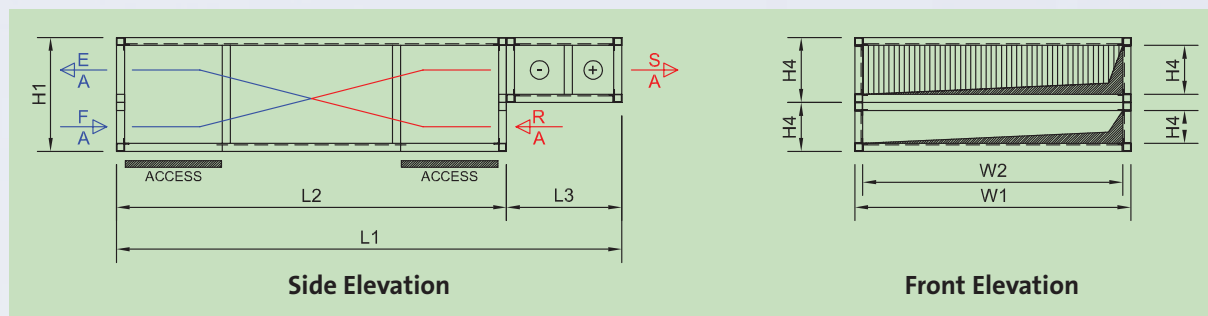
Secondary filter 95mm pleated panel filter pressure drop allowance 200PA.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	574	600	360	240	320	200	2480	2300	180	2100	2060
30/25 PB	655	640	380	260	320	200	2520	2320	200	2120	2060
30/25 AS	688	640	380	260	320	200	2520	2320	200	2120	2060
30/25 PB TS PB	748	640	380	260	320	200	2520	2320	200	2120	2060
50/50 PB	715	720	420	300	320	200	2600	2360	240	2160	2060
50/50 PB TS PB	824	720	420	300	320	200	2600	2360	240	2160	2060
50/50 AS TS PB	925	720	420	300	320	200	2600	2360	240	2160	2060
50/50 AS QS PB	1046	720	420	300	320	200	2600	2360	240	2160	2060

Selection Chart 600/EC 310-390/2 F/COF 62-1600/400 PB 20-18

TYPE 3 PERFORMANCE TYPICAL TYPE 3 COMPONENT CONFIGURATION



Fan Data

Motor output	780 WATTS
Electric supply	240V/1/50
Maximum current rating	5.2 Amps
Maximum Speed	@10Volts 2350 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 62 -1600/400

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	2900	2800	2700	2600	2400	2200
Inlet SWL db	77	77	76	75	74	74
Outlet SWL db	79	78	78	77	76	75
Absorbed power (Watts)	685	690	700	705	710	714

Airflow performance based on maximum speed @ 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 18Kw.

Chilled water/direct expansion coil data based on maximum airflow & chilled water @ 6/11°C or DX evaporating @ 6°C.

Max cooling output 20Kw.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	2900	2800	2700	2600	2400	2200
Dry Efficiency	82.1	82.3	82.5	82.7	83.1	83.5
Wet Efficiency	89.0	89.1	89.2	89.4	89.7	90.0
Supply Air Lat °C	18.1	18.2	18.2	18.2	18.3	18.4
Exhaust Air Lat °C	5.3	5.3	5.3	5.3	5.3	5.3
Energy Recovered (Kw)	22.1	21.4	20.7	19.9	18.4	17.0

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

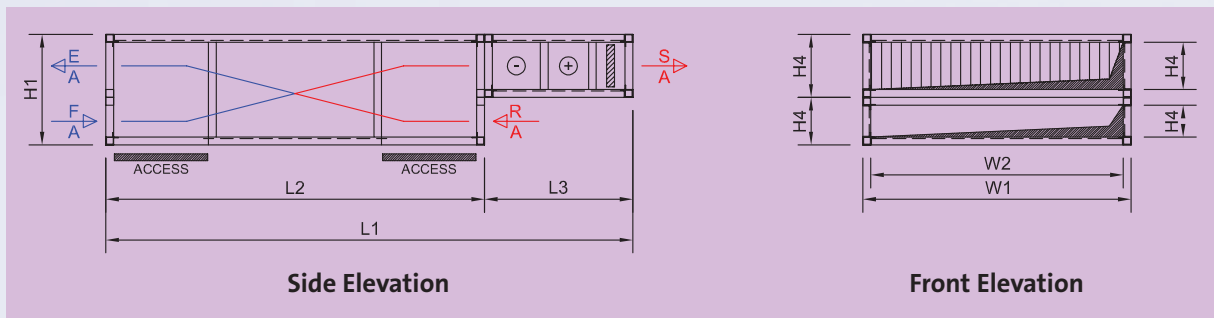
Supply air entering at -5%db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	653	600	360	240	320	200	2700	2300	400	2100	2060
30/25 PB	740	640	380	260	320	200	2740	2320	420	2120	2060
30/25 AS	750	640	380	260	320	200	2740	2320	420	2120	2060
30/25 PB TS PB	789	640	380	260	320	200	2740	2320	420	2120	2060
50/50 PB	800	720	420	300	320	200	2820	2360	460	2160	2060
50/50 PB TS PB	909	720	420	300	320	200	2820	2360	460	2160	2060
50/50 AS TS PB	1032	720	420	300	320	200	2820	2360	460	2160	2060
50/50 AS QS PB	1162	720	420	300	320	200	2820	2360	460	2160	2060

Selection Chart **MODEL PVHRU 600/EC 310-390/3 F/COF 62-1600/400 PB 20-18**

TYPE 4 PERFORMANCE TYPICAL TYPE 4 COMPONENT CONFIGURATION



Fan Data

Motor output	1170 WATTS
Electric supply	240V/1/50
Maximum current rating	7.8 Amps
Maximum Speed	@10Volts 2350 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 62 -1600/400

Air Flow Performance

External Pressure Pascals	50	100	150	200
Airflow (m³/Hr)	3600	3300	3000	2500
Inlet SWL db	77	77	76	75
Outlet SWL db	79	78	78	77
Absorbed power (Watts)	1065	1071	1077	1085

Airflow performance based on maximum speed @ 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 18Kw.

Chilled water/direct expansion coil data based on maximum airflow & chilled water @ 6/11°C or DX evaporating @ 6°C.

Max cooling output 20Kw.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	3600	3300	3000	2500
Dry Efficiency	81.0	81.5	82.0	82.8
Wet Efficiency	88.1	88.4	88.8	89.5
Supply Air Lat °C	17.9	18.0	18.1	18.3
Exhaust Air Lat °C	5.6	5.6	5.6	5.3
Energy Recovered (Kw)	27.2	25.0	22.8	19.2

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

Supply air entering at -5%db/100% relative humidity.

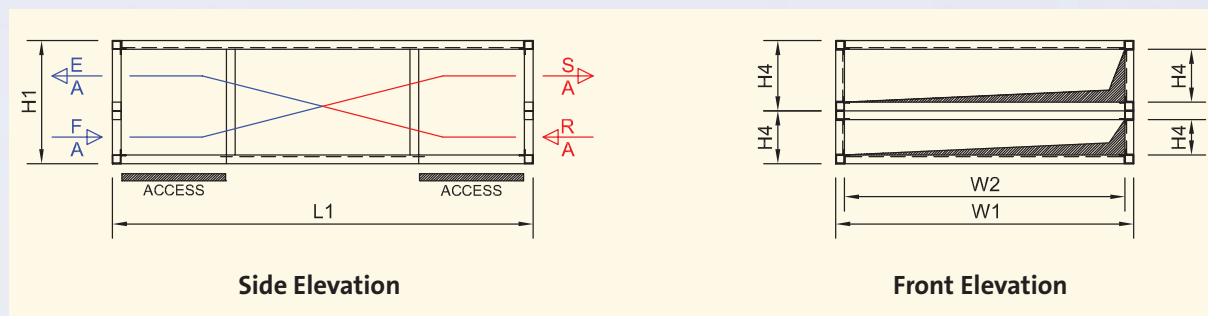
Secondary filter 95mm pleated panel filter pressure drop allowance 200PA.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	716	600	360	240	320	200	2900	2300	600	2100	2060
30/25 PB	809	640	380	260	320	200	2940	2320	620	2120	2060
30/25 AS	822	640	380	260	320	200	2940	2320	620	2120	2060
30/25 PB TS PB	845	640	380	260	320	200	2940	2320	620	2120	2060
50/50 PB	869	720	420	300	320	200	3020	2360	660	2160	2060
50/50 PB TS PB	988	720	420	300	320	200	3020	2360	660	2160	2060
50/50 AS TS PB	1123	720	420	300	320	200	3020	2360	660	2160	2060
50/50 AS QS PB	1262	720	420	300	320	200	3020	2360	660	2160	2060

Selection Chart **MODEL PVHRU 750/EC 310-680/2 F/COF 80-1600/400 PB 20-18**

TYPE 1 PERFORMANCE TYPICAL TYPE 1 COMPONENT CONFIGURATION



Fan Data

Motor output	1360 WATTS
Electric supply	240V/1/50
Maximum current rating	8.6Amps
Maximum Speed	@10Volts 3000 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 80 -1600/400

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	3600	3400	3200	3000	2800	2600
Inlet SWL db	80	73	74	73	74	74
Outlet SWL db	83	77	78	77	78	77
Absorbed power (Watts)	900	910	920	930	940	945

Airflow performance based on maximum speed @ 10 Volts.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	3600	3400	3200	3000	2800	2600
Dry Efficiency	84.2	84.5	84.8	85.2	85.5	85.9
Wet Efficiency	91.2	91.5	91.7	92.0	92.3	92.6
Supply Air Lat °C	18.7	18.8	18.8	18.9	19.0	19.1
Exhaust Air Lat °C	4.9	4.9	4.9	4.9	4.9	4.9
Energy Recovered (Kw)	27.4	26.0	24.5	23.0	21.6	20.3

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

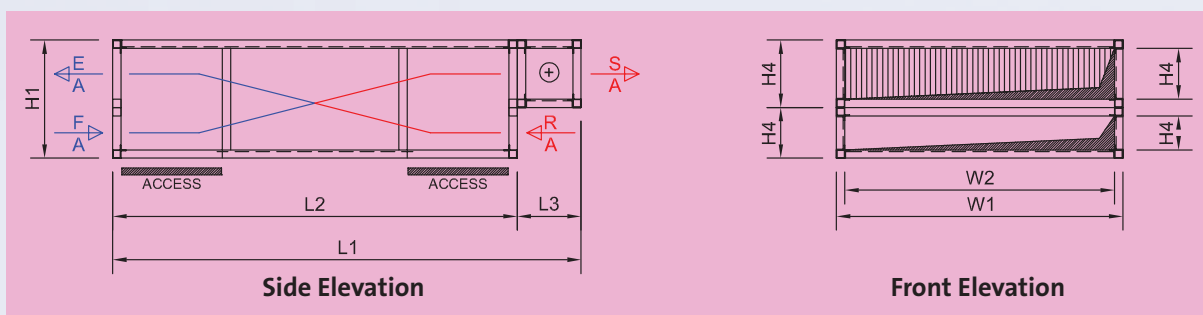
Supply air entering at -5%db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	W1	W2
20/18 PB	624	750	420	330	380	290	2500	2100	2060
30/25 PB	709	790	440	350	380	290	2520	2120	2060
30/25 AS	732	790	440	350	380	290	2520	2120	2060
30/25 PB TS PB	808	790	440	350	380	290	2520	2120	2060
50/50 PB	766	870	480	390	380	290	2560	2160	2060
50/50 PB TS PB	852	870	480	390	380	290	2560	2160	2060
50/50 AS TS PB	993	870	480	390	380	290	2560	2160	2060
50/50 AS QS PB	1103	870	480	390	380	290	2560	2160	2060

Selection Chart **MODEL PVHRU 750/EC 310-680/2 F/COF 80-1600/400 PB 20-18**

TYPE 2 PERFORMANCE TYPICAL TYPE 2 COMPONENT CONFIGURATION



Fan Data

Motor output	1360 WATTS
Electric supply	240V/1/50
Maximum current rating	8.6 Amps
Maximum Speed	@10Volts 2350 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 80 -1600/400

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	3600	3400	3200	3000	2800	2600
Inlet SWL db	80	73	74	73	74	74
Outlet SWL db	83	77	78	77	78	77
Absorbed power (Watts)	900	910	920	930	940	945

Airflow performance based on maximum speed @ 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.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	3600	3400	3200	3000	2800	2600
Dry Efficiency	84.2	84.5	84.8	85.2	85.5	85.9
Wet Efficiency	91.2	91.5	91.7	92.0	92.3	92.6
Supply Air Lat °C	18.7	18.8	18.8	18.9	19.0	19.1
Exhaust Air Lat °C	4.9	4.9	4.9	4.9	4.9	4.9
Energy Recovered (Kw)	27.4	26.0	24.5	23.0	21.6	20.3

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

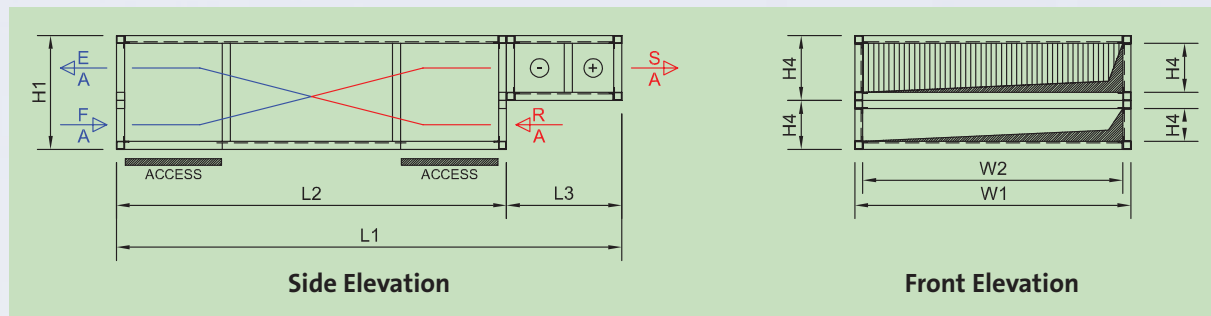
Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.
Supply air entering at -5%db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	686	750	420	330	380	290	2680	2500	180	2100	2060
30/25 PB	778	790	440	350	380	290	2720	2520	200	2120	2060
30/25 AS	798	790	440	350	380	290	2720	2520	200	2120	2060
30/25 PB TS PB	885	790	440	350	380	290	2720	2520	200	2120	2060
50/50 PB	840	870	480	390	380	290	2800	2560	240	2160	2060
50/50 PB TS PB	955	870	480	390	380	290	2800	2560	240	2160	2060
50/50 AS TS PB	1085	870	480	390	380	290	2800	2560	240	2160	2060
50/50 AS QS PB	1205	870	480	390	380	290	2800	2560	240	2160	2060

Selection Chart **MODEL PVHRU 750/EC 310-680/2 F/COF 80-1600/400 PB 20-18**

TYPE 3 PERFORMANCE TYPICAL TYPE 3 COMPONENT CONFIGURATION



Fan Data

Motor output	1360 WATTS
Electric supply	240V/1/50
Maximum current rating	8.6 Amps
Maximum Speed	@10Volts 3000 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 80 -1600/400

Air Flow Performance

External Pressure Pascals	50	100	150	200	250	300
Airflow (m³/Hr)	3400	3200	3000	2800	2600	2400
Inlet SWL db	73	74	73	74	74	73
Outlet SWL db	77	78	77	78	77	76
Absorbed power (Watts)	910	920	930	940	945	952

Airflow performance based on maximum speed @ 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 18Kw.

Chilled water/direct expansion coil data based on maximum airflow & chilled water @ 6/11°C or DX evaporating @ 6°C.

Max cooling output 24Kw.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	3400	3200	3000	2800	3600	2400
Dry Efficiency	84.5	84.8	85.2	85.5	85.9	86.3
Wet Efficiency	91.5	91.7	92.0	92.3	92.6	92.9
Supply Air Lat °C	18.8	18.8	18.9	19.0	19.1	19.1
Exhaust Air Lat °C	4.9	4.9	4.9	4.9	4.9	4.7
Energy Recovered (Kw)	26.0	24.5	23.0	21.6	20.3	18.6

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

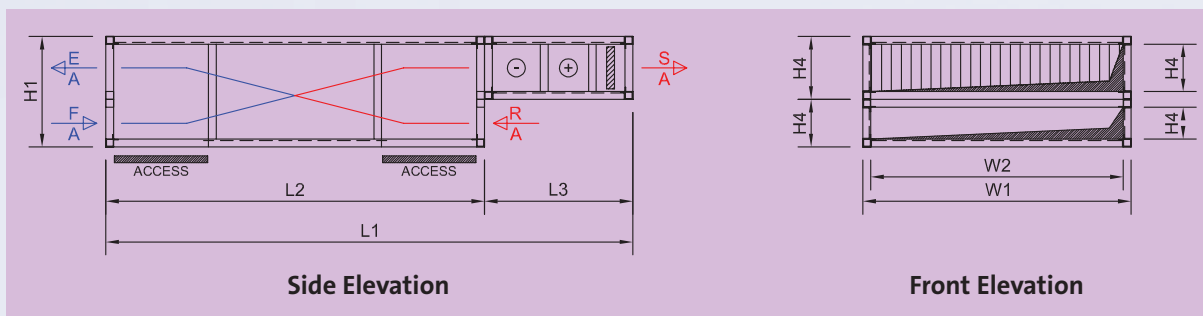
Supply air entering at -5%db/100% relative humidity.

Dimensions and Weight

Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	763	750	420	330	380	290	2900	2500	400	2100	2060
30/25 PB	862	790	440	350	380	290	2940	2520	420	2120	2060
30/25 AS	869	790	440	350	380	290	2940	2520	420	2120	2060
30/25 PB TS PB	977	790	440	350	380	290	2940	2520	420	2120	2060
50/50 PB	929	870	480	390	380	290	3020	2560	460	2160	2060
50/50 PB TS PB	1074	870	480	390	380	290	3020	2560	460	2160	2060
50/50 AS TS PB	1192	870	480	390	380	290	3020	2560	460	2160	2060
50/50 AS QS PB	1322	870	480	390	380	290	3020	2560	460	2160	2060

Selection Chart **MODEL PVHRU 750/EC 310-680/3 F/COF 80-1600/400 PB 20-18**

TYPE 4 PERFORMANCE TYPICAL TYPE 4 COMPONENT CONFIGURATION



Fan Data

Motor output	2040 WATTS
Electric supply	240V/1/50
Maximum current rating	12.9 Amps
Maximum Speed	@10Volts 3000 RPM
Control Voltage	0<10 Volts

Filter Data

G3 or G4 grade panel filters.

Plate Exchanger

Type	Counterflow
Model	COF 80 -1600/400

Air Flow Performance

External Pressure Pascals	50	100	150	200	250
Airflow (m³/Hr)	3600	3200	2800	2500	2000
Inlet SWL db	74	74	73	72	71
Outlet SWL db	77	76	75	74	73
Absorbed power (Watts)	1410	1460	1500	1545	1590

Airflow performance based on maximum speed @ 10 Volts.

Electric Heater Data

Based on maximum airflow 20Kw single or three phase electric supply.

LPHW Coil Data

Based on maximum airflow and LPHW @ 82/71°C.

Maximum heating output 20Kw.

Chilled water/direct expansion coil data based on maximum airflow & chilled water @ 6/12°C or DX evaporating @ 6°C.

Max cooling output 24Kw.

Plate Exchanger Efficiency %

Airflow (m³/Hr)	3600	3200	2800	2500	2000
Dry Efficiency	84.2	84.8	85.5	86.1	87.3
Wet Efficiency	91.7	91.7	92.2	92.7	93.6
Supply Air Lat °C	18.7	18.8	19.0	19.1	19.3
Exhaust Air Lat °C	4.9	4.9	4.9	4.7	4.7
Energy Recovered (Kw)	27.4	24.5	21.6	19.4	15.6

EQUAL AIRFLOWS

ECO DIRECTIVE ErP 2016/2018 COMPLIANT

Counterflow plate exchanger efficiency based on return air entering at 21°C db/50% relative humidity.

Supply air entering at -5%db/100% relative humidity.

Secondary filter 95mm pleated panel filter pressure drop allowance 200PA.

Dimensions and Weight

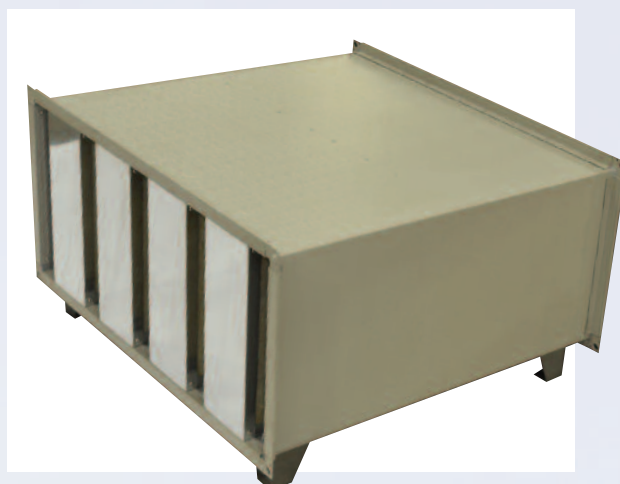
Casework Class	Weight (kg)	H1	H2	H3	H4	H5	L1	L2	L3	W1	W2
20/18 PB	827	750	420	330	380	290	3100	2500	600	2100	2060
30/25 PB	933	790	440	350	380	290	3140	2520	620	2120	2060
30/25 AS	979	790	440	350	380	290	3140	2520	620	2120	2060
30/25 PB TS PB	1056	790	440	350	380	290	3140	2520	620	2120	2060
50/50 PB	1005	870	480	390	380	290	3220	2560	660	2160	2060
50/50 PB TS PB	1137	870	480	390	380	290	3220	2560	660	2160	2060
50/50 AS TS PB	1286	870	480	390	380	290	3220	2560	660	2160	2060
50/50 AS QS PB	1426	870	480	390	380	290	3220	2560	660	2160	2060

Attenuation...

Attenuators provided with the PVHRU Packaged Void Reclaim Unit are duct mounted attenuators for remote mounting, the attenuators shown are standard sizes, but bespoke attenuators can be specifically designed for projects particularly with space restrictions and limitations in noise emission.

As the attenuators are designed for remote location away from the PVHRU unit duct breakout may occur prior to the attenuator, requiring the ducts to be acoustically lagged to prevent breakout noise (this is called noise flanking).

Should you require specific advice on a project with potential noise issues then please contact our sales office on 0161 745 8888.



Attenuator Performance...

Attenuator Performance PVHRU 350/EC 190-137/1F

Length (mm)	63	125	250	500	1K	2K	4K	8K	Pressure Drop (PA)
600	-7	-13	-24	-33	-42	-42	-42	-32	19
900	-9	-18	-29	-47	-55	-55	-55	-53	19
1200	-11	-22	-38	-55	-55	-55	-55	-55	20
1500	-14	-26	-44	-55	-55	-55	-55	-55	21
1800	-16	-32	-53	-55	-55	-55	-55	-55	22

Note: The pressure drop value is at maximum airflow for lower airflow rates the pressure drop will be less.

Attenuators Dimensions and Weights PVHRU 350/1F

Casework Class	Width (mm)	Height (mm)	Length (mm)	Weight (kg)
All Classes	450	200	600	12.3
	450	200	900	18.5
	450	200	1200	24.4
	450	200	1500	30.5
	450	200	1800	36.5

Attenuator Performance PVHRU 350/EC/ 190-137/2F

Length (mm)	63	125	250	500	1K	2K	4K	8K	Pressure Drop (PA)
600	-7	-12	-21	-31	-40	-40	-40	-30	17
900	-8	-17	-28	-42	-49	-49	-49	-43	17
1200	-10	-22	-37	-53	-54	-55	-55	-47	18
1500	-12	-24	-42	-55	-55	-55	-55	-49	19
1800	-14	-30	-52	-54	-55	-55	-55	-52	20

Note: The pressure drop value is at maximum airflow for lower airflow rates the pressure drop will be less.

Attenuator Performance...

Attenuators Dimensions and Weights PVHRU 350/2F

Casework Class	Width (mm)	Height (mm)	Length (mm)	Weight (kg)
All Classes	850	200	600	22.1
	850	200	900	29.9
	850	200	1200	42.0
	850	200	1500	55.0
	850	200	1800	65.9

Attenuator Performance PVHRU 400/EC/ 190-137/1F

Length (mm)	Insertion Loss db							Pressure Drop (PA)	
	63	125	250	500	1K	2K	4K	8K	
600	-8	-15	-26	-35	-44	-44	-44	-35	20
900	-10	-20	-31	-50	-55	-55	-55	-55	20
1200	-12	-24	-40	-55	-55	-55	-55	-55	20
1500	-16	-28	-46	-55	-55	-55	-55	-55	21
1800	-18	-34	-55	-55	-55	-55	-55	-55	22

Note: The pressure drop value is at maximum airflow for lower airflow rates the pressure drop will be less.

Attenuators Dimensions and Weights PVHRU 400/1F

Casework Class	Width (mm)	Height (mm)	Length (mm)	Weight (kg)
All Classes	550	250	600	15.9
	550	250	900	23.6
	550	250	1200	31.6
	550	250	1500	39.4
	550	250	1800	47.7

Attenuator Performance PVHRU 400/EC/ 190-137/2F

Length (mm)	Insertion Loss db							Pressure Drop (PA)	
	63	125	250	500	1K	2K	4K	8K	
600	-7	-12	-21	-31	-40	-40	-40	-30	19
900	-8	-17	-28	-42	-49	-49	-49	-43	19
1200	-10	-22	-37	-53	-55	-55	-55	-47	20
1500	-12	-24	-42	-55	-55	-55	-55	-49	21
1800	-14	-30	-52	-54	-55	-55	-55	-55	22

Note: The pressure drop value is at maximum airflow for lower airflow rates the pressure drop will be less.

Attenuators Dimensions and Weights PVHRU 400/2F

Casework Class	Width (mm)	Height (mm)	Length (mm)	Weight (kg)
All Classes	1250	250	600	34.6
	1250	250	900	51.4
	1250	250	1200	68.8
	1250	250	1500	85.9
	1250	250	1800	103.1

Attenuator Performance PVHRU 450/EC/ 190-137/1F

Length (mm)	Insertion Loss db							Pressure Drop (PA)	
	63	125	250	500	1K	2K	4K	8K	
600	-7	-13	-24	-33	-42	-42	-42	-32	14
900	-9	-18	-29	-47	-55	-55	-55	-53	14
1200	-11	-22	-38	-55	-55	-55	-55	-55	15
1500	-14	-26	-44	-55	-55	-55	-55	-55	15
1800	-16	-32	-50	-55	-55	-55	-55	-55	16

Note: The pressure drop value is at maximum airflow for lower airflow rates the pressure drop will be less.

Attenuators Dimensions and Weights PVHRU 450/1F

Casework Class	Width (mm)	Height (mm)	Length (mm)	Weight (kg)
All Classes	650	300	600	18.8
	650	300	900	28.1
	650	300	1200	37.4
	650	300	1500	47
	650	300	1800	56.3

Attenuator Performance PVHRU 450/EC/ 190-137/2F & 3F

Length (mm)	Insertion Loss db							Pressure Drop (PA)	
	63	125	250	500	1K	2K	4K	8K	
600	-7	-13	-24	-33	-42	-42	-42	-32	15
900	-9	-18	-29	-47	-55	-55	-55	-53	15
1200	-11	-22	-38	-55	-55	-55	-55	-55	16
1500	-14	-26	-44	-55	-55	-55	-55	-55	16
1800	-16	-32	-53	-55	-55	-55	-55	-55	17

Note: The pressure drop value is at maximum airflow for lower airflow rates the pressure drop will be less.

Attenuators Dimensions and Weights PVHRU 450/2F & PVHRU 450/3F

Casework Class	Width (mm)	Height (mm)	Length (mm)	Weight (kg)
All Classes	1250	300	600	35.7
	1250	300	900	54.0
	1250	300	1200	71.8
	1250	300	1500	90.2
	1250	300	1800	108.1

Attenuator Performance PVHRU 550/EC/ 190-137/3F & 4F

Length (mm)	Insertion Loss db							Pressure Drop (PA)	
	63	125	250	500	1K	2K	4K	8K	
600	-7	-13	-24	-33	-42	-42	-42	-32	15
900	-9	-18	-29	-47	-55	-55	-55	-53	16
1200	-11	-22	-38	-55	-55	-55	-55	-55	16
1500	-14	-26	-44	-55	-55	-55	-55	-55	17
1800	-16	-32	-53	-55	-55	-55	-55	-55	17

Note: The pressure drop value is at maximum airflow for lower airflow rates the pressure drop will be less.

Attenuator Performance...

Attenuators Dimensions and Weights PVHRU 550/3F & PVHRU 550/4F

Casework Class	Width (mm)	Height (mm)	Length (mm)	Weight (kg)
All Classes	1250	400	600	46.4
	1250	400	900	70.2
	1250	400	1200	93.3
	1250	400	1500	117.2
	1250	400	1800	140.5

Attenuator Performance PVHRU 600/EC/ 190-137/2F & 3F

Length (mm)	Insertion Loss db							Pressure Drop	
	63	125	250	500	1K	2K	4K	8K	(PA)
600	-7	-13	-24	-33	-42	-42	-42	-32	19
900	-9	-18	-29	-47	-55	-55	-55	-53	19
1200	-11	-22	-38	-55	-55	-55	-55	-53	20
1500	-14	-26	-44	-55	-55	-55	-55	-55	21
1800	-16	-32	-53	-55	-55	-55	-55	-55	22

Note: The pressure drop value is at maximum airflow for lower airflow rates the pressure drop will be less.

Attenuators Dimensions and Weights PVHRU 600/2F & PVHRU 600/3F

Casework Class	Width (mm)	Height (mm)	Length (mm)	Weight (kg)
All Classes	1450	450	600	56.2
	1450	450	900	83.9
	1450	450	1200	112.1
	1450	450	1500	140
	1450	450	1800	167

Attenuator Performance PVHRU 750/EC/ 190-137/2F & 3F

Length (mm)	Insertion Loss db							Pressure Drop	
	63	125	250	500	1K	2K	4K	8K	(PA)
600	-7	-13	-24	-33	-42	-42	-42	-32	19
900	-9	-18	-29	-47	-55	-55	-55	-53	19
1200	-11	-22	-38	-55	-55	-55	-55	-55	20
1500	-14	-26	-44	-55	-55	-55	-55	-55	21
1800	-16	-32	-53	-55	-55	-55	-55	-55	22

Note: The pressure drop value is at maximum airflow for lower airflow rates the pressure drop will be less.

Attenuators Dimensions and Weights PVHRU 750/2F & PVHRU 750/3F

Casework Class	Width (mm)	Height (mm)	Length (mm)	Weight (kg)
All Classes	1650	450	600	62.2
	1650	450	900	91.4
	1650	450	1200	123.1
	1650	450	1500	155.1
	1650	450	1800	185

Controls and Wiring...

PVHRU Units can incorporate a factory fitted and prewired controls package with an on board control panel offering the following features:

- 240/1/50 circuit protection.
- Control panel door isolation.
- Trend/Carel or similar controller.
- Temperature sensors, supply/return, frost.
- Pressure switches for filter condition.
- Remote or time clock enable.
- LPHW or chilled water control valves.
- Shut off and face/bypass damper actuators.

Controls options:

- CO2 sensing.
- PIR activation.
- Electric heater battery/thyristor controller.
- Fan run on timer and airflow proving circuit (both are statutory requirements for electric heater protection).
- Remote access.

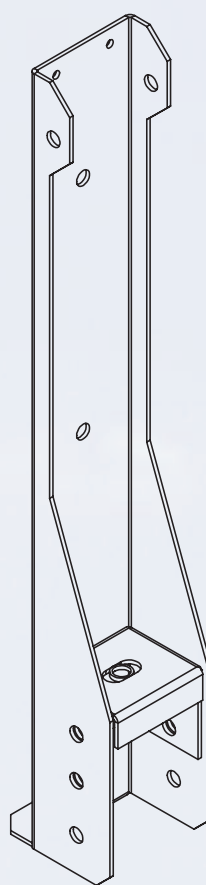
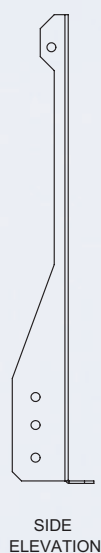
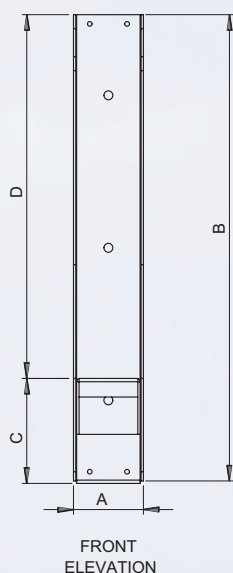
Mounting Arrangements...

PVHRU 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 unit casework for drop rod suspension.

The quality of suspension brackets will depend on the size and weight of the PVHRU Quiet Units including any attenuators attached.

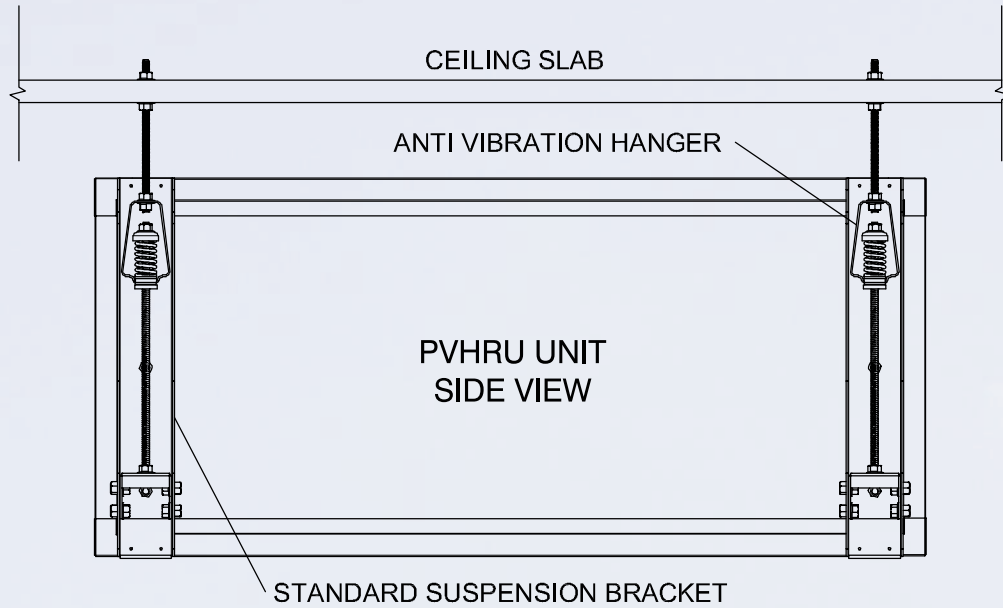


Constructed from galvanised sheet steel

DIMENSIONS MM	A	B	C	D	E	F	G	H	Hole Size Slotted	Weight Each Kg
PVHRU 350	60	350	110	240	37.5	37.5	30	30	12.7 x 24	1.9
PVHRU 400	60	400	110	300	37.5	37.5	30	30	12.7 x 24	4.6
PVHRU 450	60	450	110	340	37.5	37.5	30	30	12.7 x 24	5.9
PVHRU 500	60	500	110	390	37.5	37.5	30	30	12.7 x 24	7.6
PVHRU 550	60	550	110	440	37.5	37.5	30	30	12.7 x 24	8.4
PVHRU 600	60	600	110	490	37.5	37.5	30	30	12.7 x 24	9.1
PVHRU 750	60	750	110	640	37.5	37.5	30	30	12.7 x 24	11.3

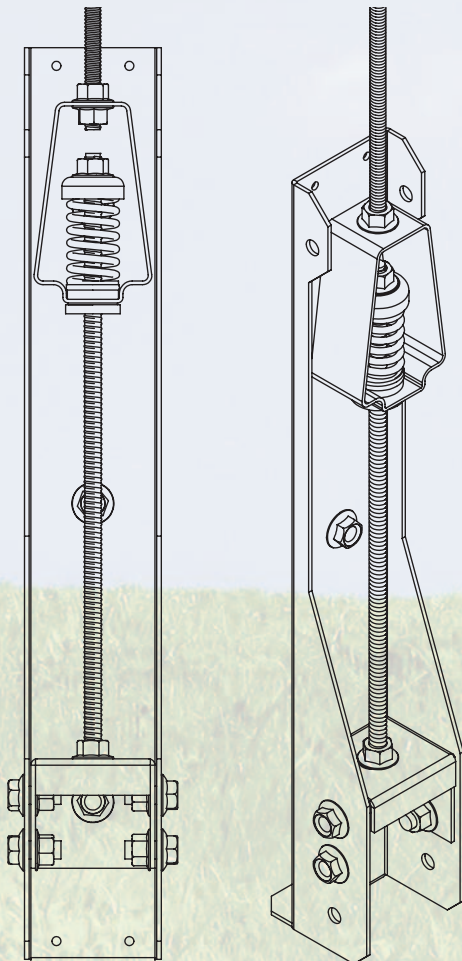
Vibration Control for Suspended PVHRU Units

Where packaged void heat reclaim 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 PVHRU 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.

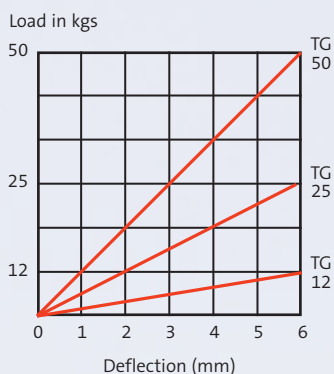
Open Rubber Hanger - Series TG

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

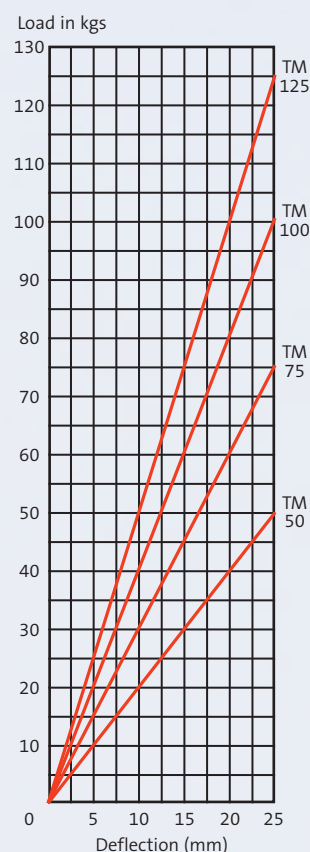
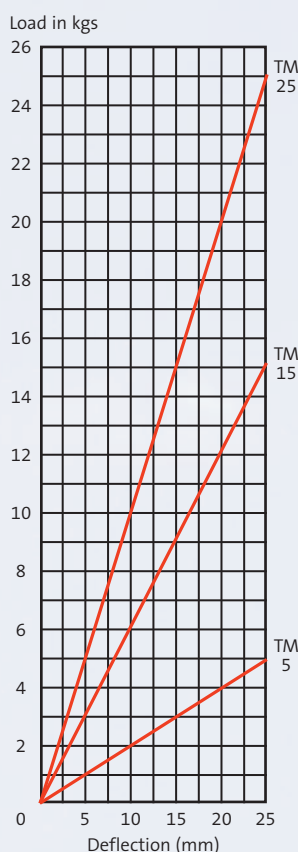
Open Spring Hanger - Series TM 5/25

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).



5. 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/mms	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

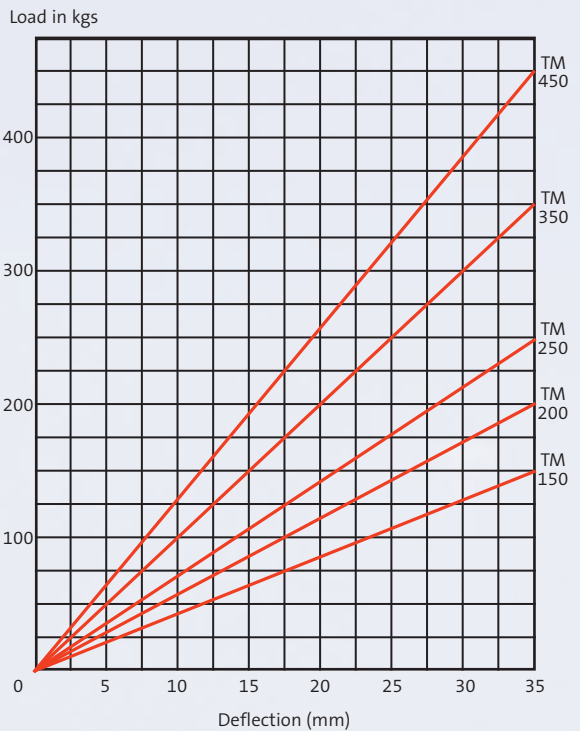
TM Spring Absorbers

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



PVU **Quiet** Packaged Void Unit

PVU Ceiling Void Units

Benefits

- A range of units for ceiling void application.
- Available with volumes up to 1.4m³/s.
- Includes a complete range of plate heat exchangers, cooling, heating, direct driven fans and air-handling functions.
- Low breakout casework available.
- Low profile units of 300mm high up to 0.8m³/s.



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



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Acoustic Testing Laboratory
College of Science & Technology

Twin Fan Series VTI



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



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NO NEED FOR AN ADDITIONAL ACOUSTIC ENCLOSURE

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 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.

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 305/2011).
- 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
- 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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