Incorporating

Louvre systems

Series HPL80

Ultra high performance weather louvres

- **Extremely high performance weather louvre**
- **Class A2 performance up to 4.0 m/s**
- **No compromise between high airflow and high levels of rain rejection**
- ***'Air-Bypass'* twin blade system**
- **Available in standard louvre or penthouse (turret) louvre formats**
- **Natural ventilation systems and integrated louvre and volume control damper 'combination units' also available**
- **UK patent application pending**

HPL80: September 2020

Index

Quality assurance

HVC Supplies (Stourbridge) Ltd is an ISO 9001 certified company.

Assessed to ISO 9001
Cert/Ref No. 1186

Series HPL80

The new Series HPL80 louvre is an extremely high performance weather louvre, intended for installations demanding unimpeded ventilation, without the risk of water ingress.

Through its use of the new *'Air-Bypass'* blade design (UK patent application pending), never-before-seen levels of performance for a horizontally bladed weather louvre are achieved when tested against BS EN 13030:2001, the most widely used weather louvre test standard in Europe:

HPL80 with insect mesh: Class A2 up to 4.0 m/s

HPL80 with bird mesh: Class A2 up to 2.5 m/s

Aside from this unprecedented performance, other features include:

- A large 80mm blade pitch, resulting in improved aesthetics on larger units where rival products with smaller pitches can look cramped.
- Anti-cascade channels positioned on the leading edge of each front blade catch and channel away water, eliminating the problem of water cascading down from blade to blade.
- Concealed side drainage channels quickly and effectively channel water down from the blade pack, onto the bottom frame where it is ejected through the face of the louvre.

The HPL80 can be used as a standalone product, or as part of a larger assembly, for example as part of a bespoke natural ventilation system comprising other products from the wider HVC range.

Design features

Material	Main frame and blade members: Extruded aluminium Mechanical fixings: Stainless steel screws and pop rivets Additional parts: Vulcanised fibre sealing washers
Blade	Twin part *'Air-Bypass'* blade, 80mm pitch
Frame	Standard: Flanged (55mm flange) Optional: Recessed
Sizes	Minimum: 200mm wide x 280mm high (nominal) Units can be made with a height down to 200mm high (nominal) however will only have a single visible blade Maximum: Unlimited (when manufactured in sections, see page 11 for more information)
Fixings	Standard: Integrated rear fixing flange Optional: See page 12
Finish	Standard: Mill aluminium Optional: See page 18
Mass/m² face area	30kg (based on 1m x 1m nominal size unit, smaller units will be proportionally heavier relative to their size)
Free area	Approx. 50% Calculated as the sum of distances between one set of blades in the plane of maximum restriction, divided by blade pitch.
Important note:	Free area should not be considered to be a guide to performance. It is possible to have two louvres with identical free areas but different airflow characteristics. Wherever possible refer to tested airflow coefficients, as stated on pages 6 and 7 of this brochure or available in the test certificate for HPL80 louvres which is available on request.

Overview of BS EN 13030:2001

Within Europe the generally applicable standard for the testing of weather louvres is:

BS EN 13030:2001
Ventilation for buildings - Terminals
Performance testing of louvres subject to simulated rain

This test evaluates weather louvre designs based on two criteria:

- Resistance to the ingress of simulated rain
- Resistance to airflow in terms of pressure loss through the louvre

Louvre classifications are given as in the example below (or in a format to the same effect):

- A2 up to 2 m/s

Guide to classification

The grading system is as follows:

Resistance to ingress of simulated rain

- **Class A** Excellent
  99% effective and above
  Up to 0.750 l/hr/m^2
- **Class B** Good
  Between 95% and 98.9% effective
  Between 3.750 l/hr/m^2 and 0.751 l/hr/m^2
- **Class C** Fair
  Between 80% and 94.9% effective
  Between 15.000 l/hr/m^2 and 3.751 l/hr/m^2
- **Class D** Poor
  Less than 80% effective
  Greater than 15.000 l/hr/m^2

l/hr/m^2 - Litres of water per hour per square metre of louvre

Resistance to airflow in terms of pressure loss

- **Class 1** Excellent
  C_e of between 0.4 and 1.0
- **Class 2** Good
  C_e of between 0.3 and 0.399
- **Class 3** Fair
  C_e of between 0.2 and 0.299
- **Class 4** Poor
  C_e of 0.199 and below

C_e - Coefficient of entry

Important footnote

The way in which BS EN 13030:2001 grades weather louvres is very much open to misinterpretation and misuse:

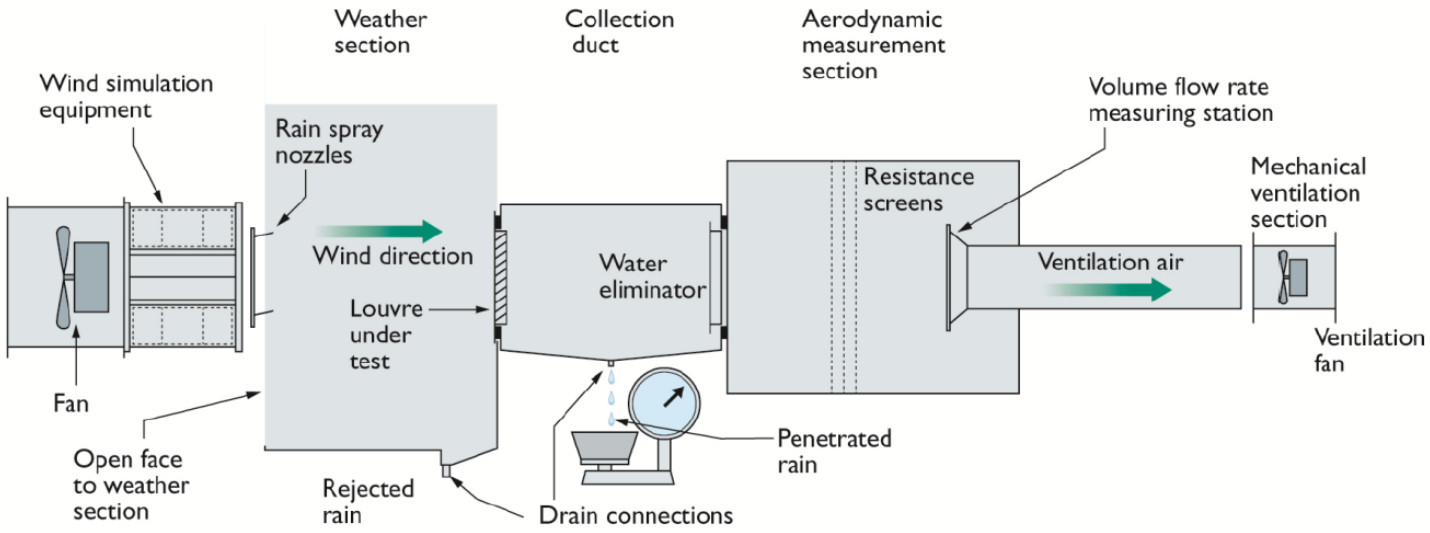
Many louvres are advertised as simply ‘Class A’; this is not giving the full picture and can mean that a louvre only gives ‘Class A’ performance at 0 m/s draw velocity.

Once air actually begins to be drawn through the louvre this rain rejection performance can rapidly drop, allowing a large quantity of water to enter the building.

The ‘Class A’ classification should always be accompanied by the draw velocity at which it was achieved.

Test method

A schematic representation of the rig used during testing.



The test comprises of two parts:

Water penetration

The weather louvre is subjected to fan driven wind at a speed of 13 m/s and water sprayed as rainfall at a rate of 75 l/h. In addition to the simulated wind and rain, air is drawn through the louvre at various set velocities (0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0 and 3.5 m/s).

Each test is preceded by a suitable ‘pre-test’ soak which is typically around 30 minutes. Each test is run until the results become stable, and in any case, for a minimum of 30 minutes.

The penetrated water is collected in the collection duct and is measured and recorded against time elapsed.

A range of measurements are taken to give the characteristic curve for the test louvre.

Pressure drop

For this test, the Aerodynamic Measuring Section (AMS) is separated from the main rig. The louvre is then mounted in the upstream opening of the AMS.

Pressure tappings in the plenum walls of the AMS allow measurement of the static pressure within the plenum during testing. The airflow volume is calculated from the differential pressure at the measuring cones. The plenum has a set of settling screens within to produce even flow through the cones and therefore gives an accurate reading of the total volume.

By adjusting the fan speed, the total airflow through the system varies and therefore changes the pressure on the louvre under test. A range of measurements are taken to give the characteristic curve for the test louvre.

Certification

HPL80 ultra high performance weather louvres fitted with both insect mesh and bird mesh have been tested against:

BS EN 13030:2001

The testing was carried out in August 2016 by BSRIA in Bracknell, Berkshire, England.

Copies of the test report are available on request.

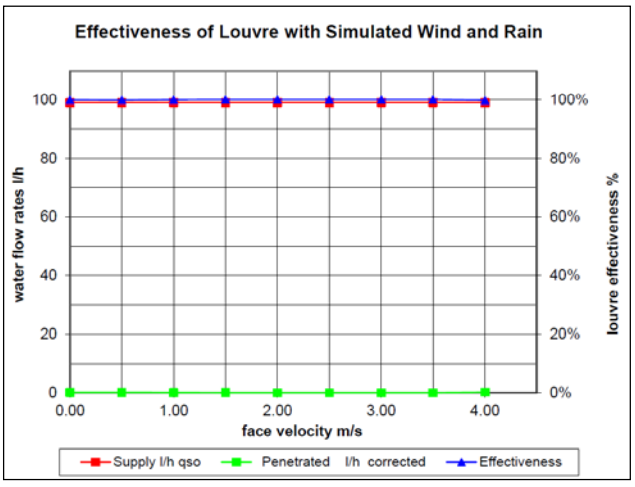
Test results - HPL80 c/w insect mesh

HPL80-IM
Ultra high performance weather louvre complete with insect-mesh

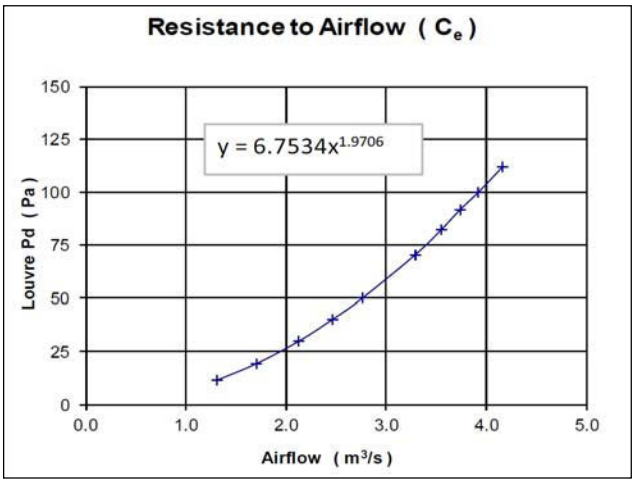
Classification: Class A2 up to 4.0 m/s draw velocity

Mean coefficient of entry: 0.329

Rain rejection test results					
Ventilation rate		Water flow rates			
Volume (m^3/s)	Velocity (m/s)	Supply (l/h)	Penetrated (l/h)	Effectiveness	Class
0.00	0.00	99.0	0.1	99.9%	A
0.46	0.50	99.0	0.1	99.8%	A
0.92	1.00	99.0	0.1	99.9%	A
1.37	1.50	99.0	0.0	100.0%	A
1.83	2.00	99.0	0.0	100.0%	A
2.29	2.50	99.0	0.0	100.0%	A
2.75	3.00	99.0	0.0	100.0%	A
3.20	3.50	99.0	0.0	100.0%	A
3.66	4.00	99.0	0.2	99.8%	A



Airflow test results				
		Air flow rate		
Pressure drop (Pa)	Louvre face velocity (m/s)	Test (m^3/s)	Theoretical (m^3/s)	Coefficient C_e
11.50	1.43	1.310	4.031	0.325
19.30	1.86	1.750	5.222	0.327
30.00	2.33	2.132	6.510	0.328
40.00	2.69	2.462	7.517	0.327
50.00	3.02	2.764	8.405	0.329
70.50	3.60	3.295	9.980	0.330
82.00	3.88	3.548	10.763	0.330
91.50	4.08	3.738	11.370	0.329
100.00	4.29	3.926	11.886	0.330
112.00	4.55	4.169	12.579	0.331
			Mean c_e	**0.329**
			Class	**2**



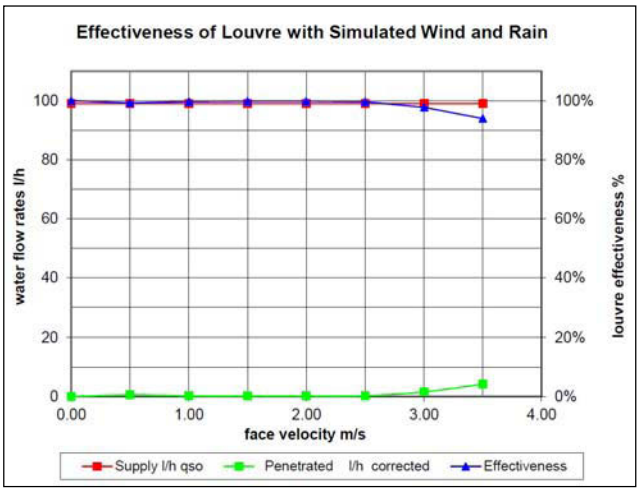
Test results - HPL80 c/w bird mesh

HPL80-BM
Ultra high performance weather louvre complete with bird-mesh

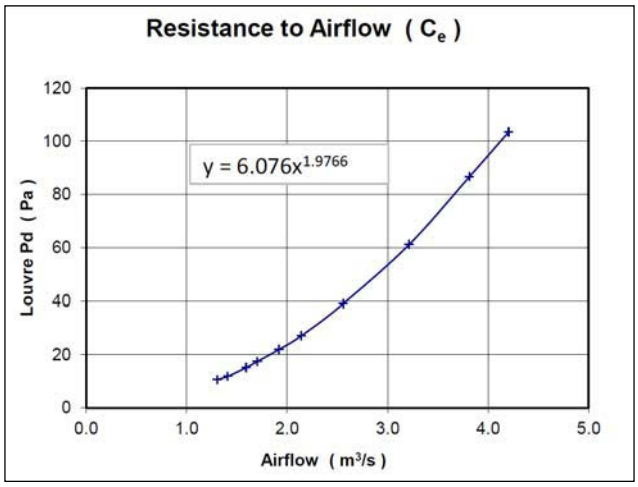
Classification: Class A2 up to 2.5 m/s draw velocity

Mean coefficient of entry: 0.345

Rain rejection test results					
Ventilation rate		Water flow rates			
Volume (m^3/s)	Velocity (m/s)	Supply (l/h)	Penetrated (l/h)	Effectiveness	Class
0.00	0.00	99.0	0.0	100.0%	A
0.46	0.50	99.0	0.5	99.2%	A
0.92	1.00	99.0	0.2	99.7%	A
1.37	1.50	99.0	0.1	99.8%	A
1.83	2.00	99.0	0.1	99.8%	A
2.29	2.50	99.0	0.2	99.6%	A
2.75	3.00	99.0	1.6	97.7%	B
3.21	3.20	99.0	4.2	93.9%	C



Airflow test results				
		Air flow rate		
Pressure drop (Pa)	Louvre face velocity (m/s)	Test (m^3/s)	Theoretical (m^3/s)	Coefficient C_e
10.60	1.43	1.305	3.865	0.338
11.80	1.54	1.409	4.078	0.346
15.10	1.74	1.592	4.613	0.345
17.40	1.86	1.703	4.952	0.344
21.90	2.10	1.920	5.555	0.346
27.10	2.34	2.143	6.180	0.347
39.00	2.79	2.558	7.413	0.345
61.20	3.51	3.215	9.286	0.346
86.70	4.17	3.815	11.053	0.345
103.50	4.59	4.205	12.076	0.348
			Mean c_e	**0.345**
			Class	**2**



Notes:

- BS EN 13030:2001 requires rain ingress figures to be measured up to a draw velocity of 3.5 m/s.

  The HPL80-IM test sample was tested up to 4.0 m/s on HVC's request. This goes beyond the velocity range specified by the test standard.

- A very small amount of water may still penetrate the louvre even at velocities tested to have 100% rain rejection due to limitations of the testing equipment.

HPL80 development

Series HPL80 louvres have been developed using a combination of computational flow dynamics software and real world testing.

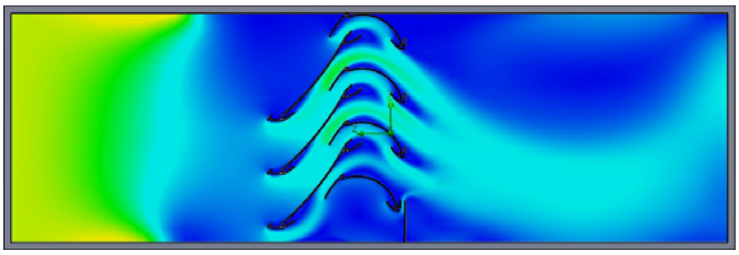
By examining different concepts within flow dynamics software, dozens of design iterations could be evaluated, and those which appeared promising honed to a point where real world testing was required.

This process of going from concept, to design involving virtual simulation, and finally real world evaluation has given us a better understanding of how air and water behave in a louvre system than ever before, which has been employed to aid us in designing the HPL80, what we believe to be the best performing louvre system available.

Airflow velocity plot through the HPL80

Bright green areas indicate regions of faster airflow.

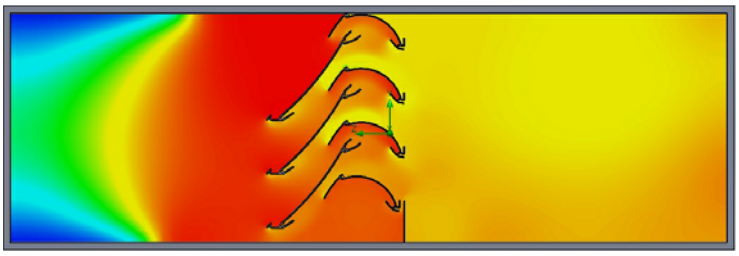
Notice how airflow velocities over the top of each rear blade are much higher than those beneath it; this is the now moisture free air being allowed to take the faster, less tortuous path through the louvre, keeping pressure drops as low as possible.



Pressure plot through the HPL80

Yellow areas indicate regions of lower pressure.

The pressure plot reveals the substantial difference in pressures when comparing the faster path above each rear blade, to the slower path beneath it.



Design: Water collection and ejection

While the louvre blades are responsible for separating water from the airstream, once caught that water must be removed quickly and effectively.

Barely noticable when assembled, the HPL80 makes use of concealed channels positioned at either end of the blade pack.

These serve both to hold the blades within the outer frame, and also to channel any caught water down onto the bottom of the outer frame, from where it can be ejected through the front of the louvre below the bottom blade.

Design: *'Air-Bypass'* blade system

The '*Air-Bypass'* louvre blade used within the HPL80 is the result of years of intensive research and development, conducted with the sole objective of producing an exceptionally high performance weather louvre.

During this research it became clear that there are distinct limitations to designs which make use of a single blade design, and systems which seek to improve performance using multiple sets of the same blade profile are often inefficient.

This conclusion has led to the first ever louvre design to make use of two distinct blade profiles which work in conjunction with each other, resulting in a louvre system where the traditional necessary compromise between high rain rejection and high airflow no longer applies; both are delivered in the same louvre.

Airflow

In terms of airflow performance, Series HPL80 louvres actually produce less resistance to airflow than our WL75 series of standard single bank weather louvres.

The flowing, aerodynamic shapes of the blades are designed to work with airflow; shaping and guiding it in order to achieve maximum performance.

- For powered ventilation systems, this means energy consumption is reduced as fans can be run at lower speeds with the same effect.
- For natural ventilation applications, it means greater levels of airflow moving in and out of a building, bringing increased comfort to occupants and reduced necessity for expensive powered 'boost' functions.

Rain rejection

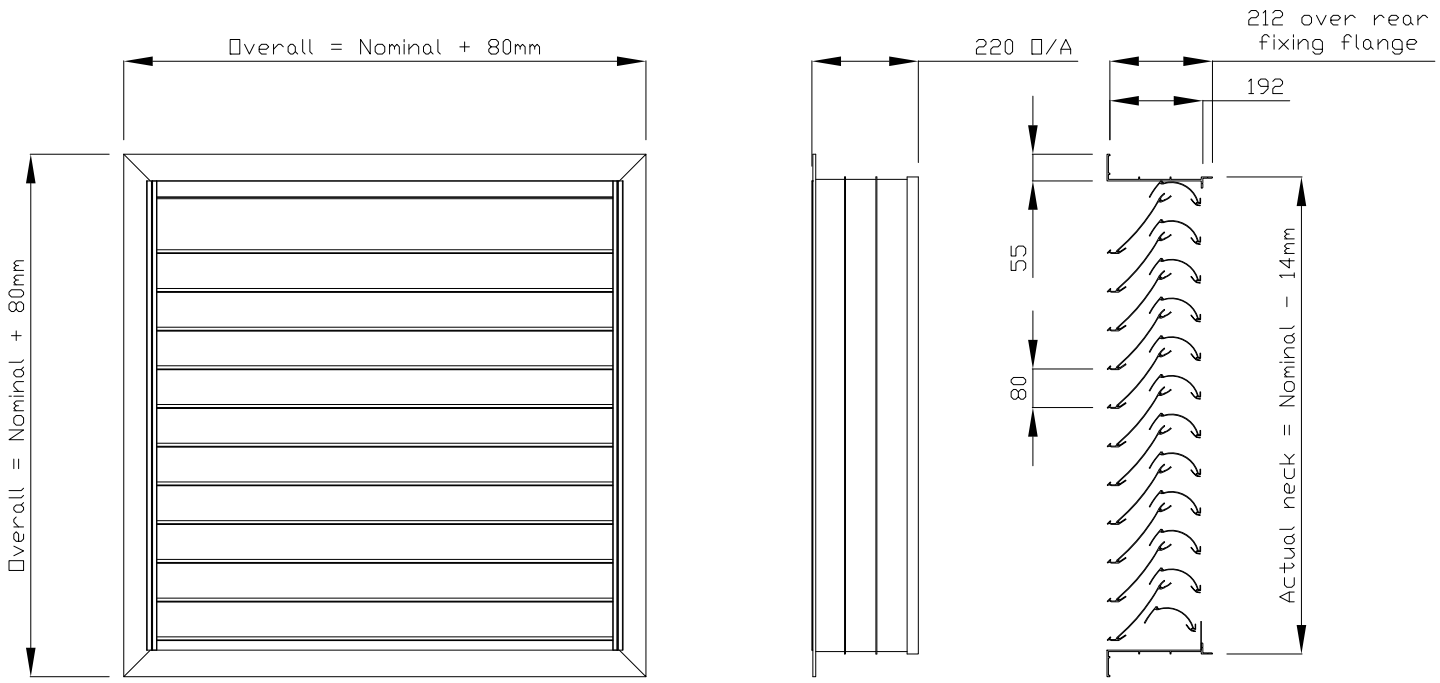
The aerodynamic shape does not just bring benefits for airflow; by ensuring airflow through the louvre is kept stable with minimal turbulence, it is possible to guide airborne water towards catches where it can be caught and effectively removed from the airstream.

This means:

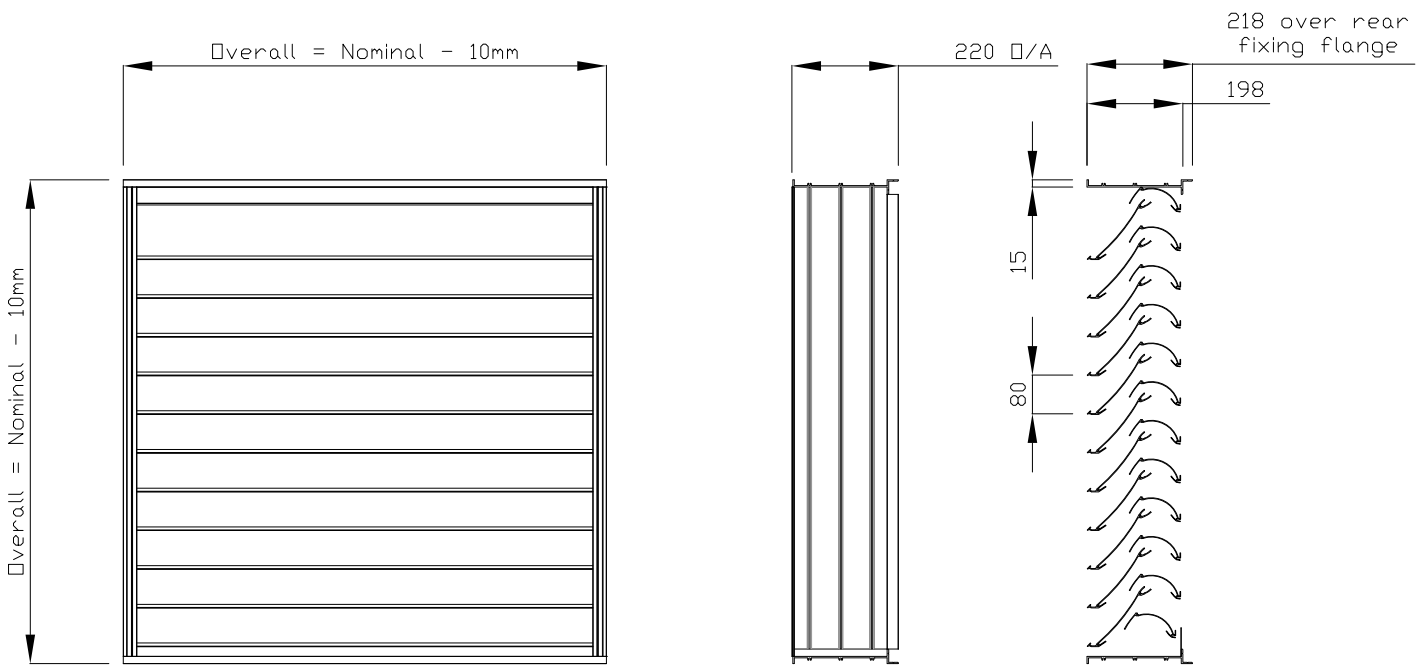
- In powered systems, air handling equipment can continue to draw in large quantities of air from outside even in heavy rain conditions, without the risk of drawing in potentially damaging quantities of water.
- In natural ventilation systems where louvres are often mounted adjacent to finished walls and floors, it means the risk of internal damage through water ingress is hugely reduced.

Technical drawings

HPL80: Flanged unit (standard)



HPL80 - REC: Recessed unit (optional)



Note: Please see page 12 for notes on recommended louvre heights and stop gaps.

Technical drawings

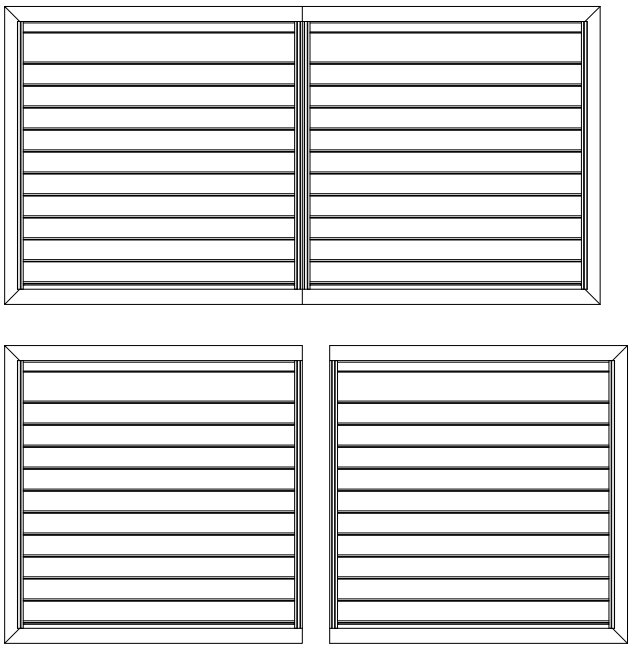
Multi-section units

Large louvres may need to be produced in multiple sections, in this way louvres banks of unlimited size can be manufactured.

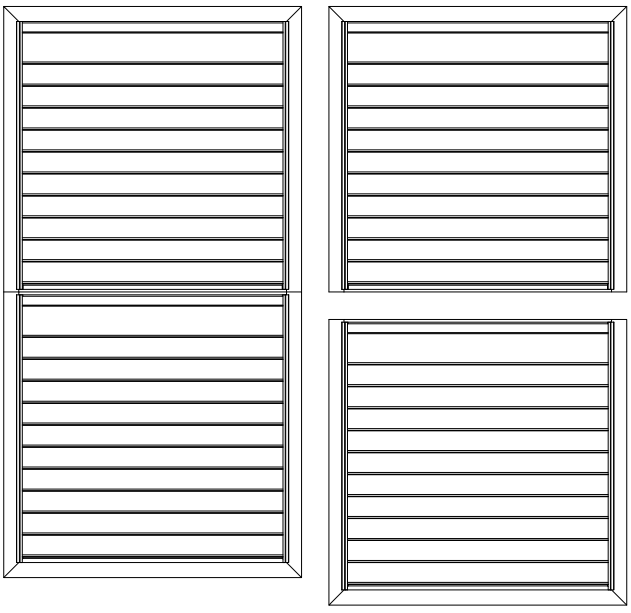
Adjacent sections will have a non-continuous appearance as drainage from both ends of each blade must be retained.

The number of sections can be stated in your ordering code, or will be decided by HVC and stated on your order acknowledgement.

Side-by-side sections



Stacked sections



Joining procedure

Joining adjacent sections is quick and simple.

Fixing holes are factory punched into the 20mm rear flanges of adjacent louvre sections. To join the sections, simply line them up and bolt them together using the supplied fixings.

This is the case with both side-by-side sections (shown) and with stacked sections.

Technical notes

Stop gaps

HPL80 louvres are constructed with the bottom blade always in a set position, and must finish at the top with a rear blade.

Should a whole number of blade pairs not be possible to fit into the required height, a top stop gap will be required. These are visible as flat aluminium sections positioned between the top frame member and the top-most blade, and are fitted prior to powder coating (if required).

To avoid having a stop gap, take the minimum recommended nominal height of 280mm (200mm with a single front blade), and simply add any multiple of 80mm, e.g. 280mm, 360mm, 440mm etc. In this way a full blade pair can be fitted (flanged louvres only).

Fixings

Integrated rear fixing flange

Part of both the flanged and recessed frames for the HPL80, the rear fixing flange serves to provide a bolting position for joining adjacent sections, and also as a concealed location for rear fixing.

This 20mm long, 2.5mm thick aluminium flange is supplied undrilled to accept whatever fixings are required on site.

A ‘v’ groove running down the centre of the flange aids drilling.

Factory punched face fixing holes - FH (optional)

5mm countersunk fixing holes will be punched into the louvre frame before powder coating, allowing quick and easy fitting on site.

The quantity and layout of fixing holes will be appropriate to louvre size. Arrangements can be specified, additional costs may be applicable.

Supplied with pozidrive self tapping screws in the same finish as the louvre.

Further options

Security bars

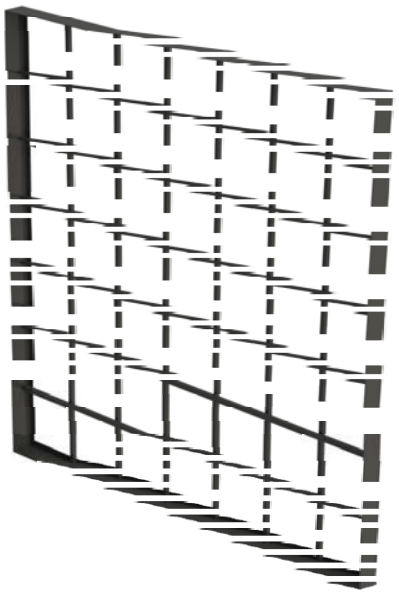
A wall mounted aluminium weather louvre can be a security risk, potentially providing an un-alarmed entry point to a building for any determined would be intruder.

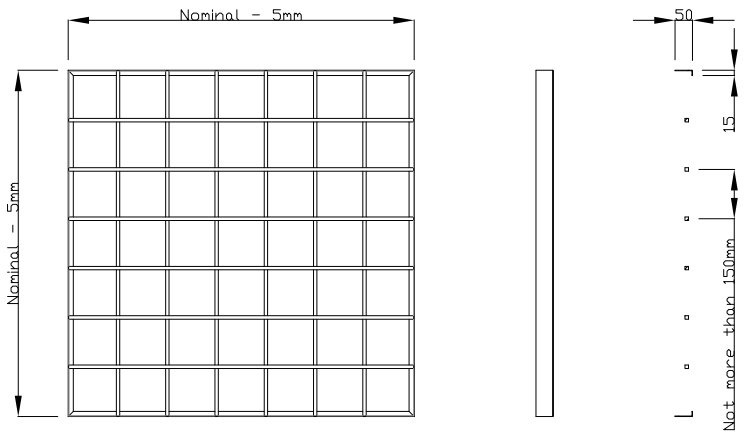
Proving an extremely robust barrier to entry, security bars can be fitted to mitigate this risk.

Designed to be fitted directly behind a louvre, security bars are constructed with a 1.2mm thick galvanised steel outer frame and a grid of 10mm fully welded steel bars, leaving spaces of not more than 150mm square.

Frames are supplied undrilled to accept whatever fixings are required on site.

Supplied in a powder coated black finish as standard.

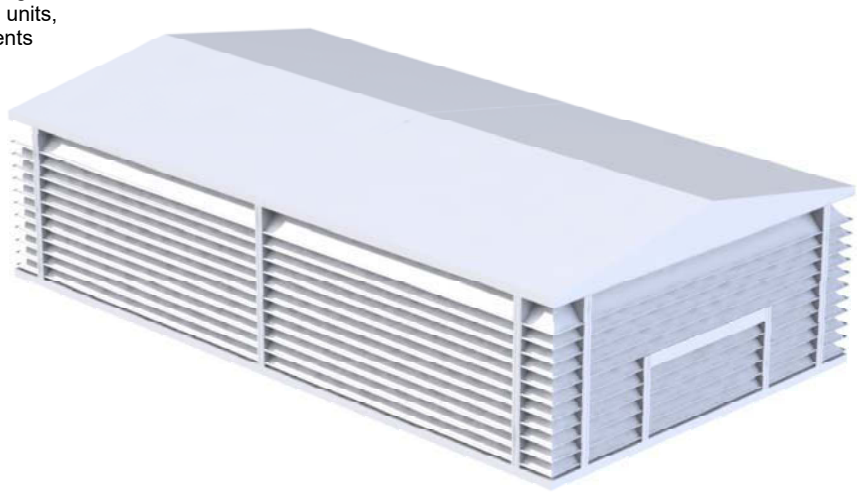




Ultra high performance penthouse (turret) louvres

Series HPHL80 ultra high performance penthouse louvres bring the extremely high performance of the HPL80 weather louvre but in a penthouse or turret louvre format designed for roof mounting.

Increasingly popular in natural ventilation applications, ultra high performance penthouse louvres are available as standalone units, or as part of a larger assembly comprising multiple components from the wider range of HVC products.



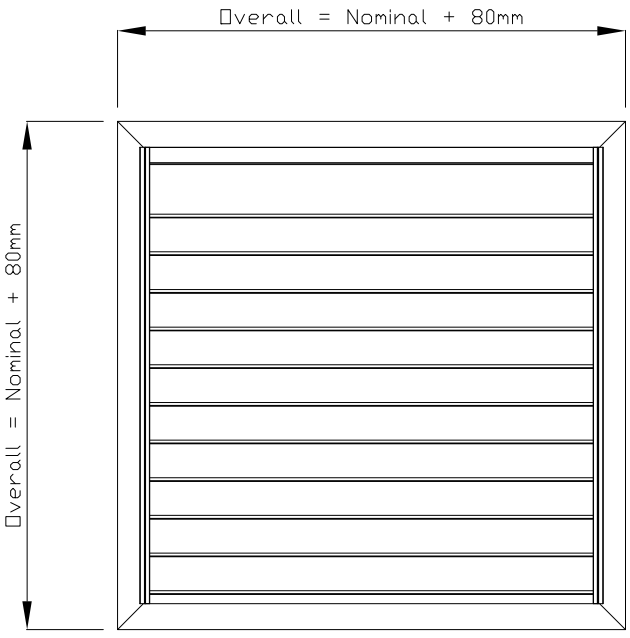
Combination units

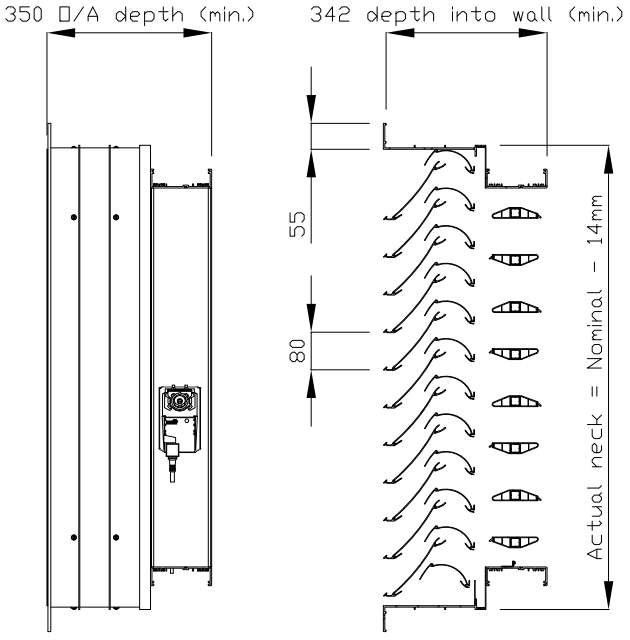
Combining two essential components in any ventilation system, combination units integrate an ultra high performance weather louvre with a volume control damper (Series LF uPVC-VCD high performance plastic or Series HVC-VCD aluminium).

A fully welded, black powder coated galvanised steel backbox joins the two components.

This ready made solution means installation time and costs are reduced, and ordering is made simple as you only need supply us with one size; we do the rest.

Volume control dampers can be supplied with a plastic handle or locking quadrant for manual operation, or with a factory fitted electric or pneumatic actuator.





Example system comprising:

Louvre:	Series HPL80 ultra high performance
Damper:	Series LF uPVC-VCD high performance plastic (shown complete with Belimo electronic actuator) Also available: Series HVC-VCD aluminium (would reduce depth by 30mm)
Case:	Fully welded galvanised steel

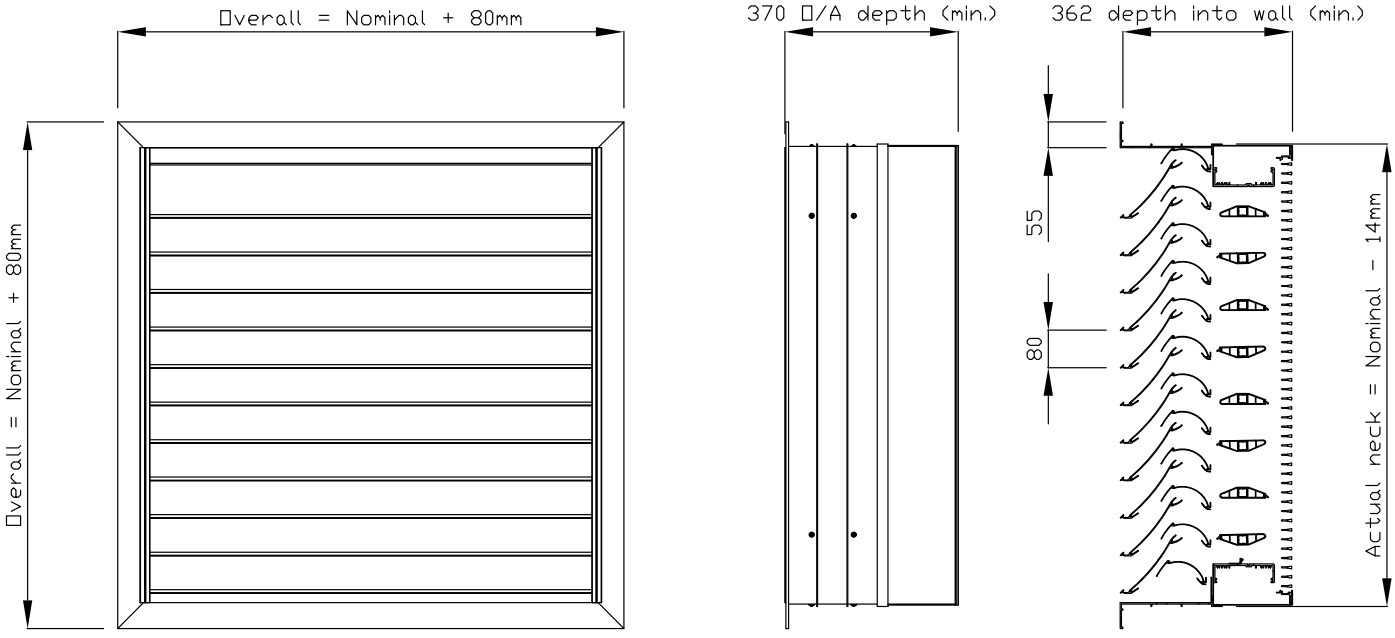
Louvres and cases can be polyester powder coated to any RAL or BS colour.

Natural ventilation systems: Wall mounted

Natural ventilation systems are bespoke assemblies usually comprising an external louvre, volume control damper, internal grille and case.

The advantages of taking this approach over bringing together multiple standalone products are obvious:

- **Reduced installation time**
  With components either factory fitted into the case, or fixing directly to it on site, installation time is reduced.
- **Guaranteed product compatibility**
  HVC's dedicated design team will work with you to ensure that your selected products will fit together perfectly, eliminating the risk of different components not being compatible.
- **Better performance**
  When bringing multiple products from different manufacturers together, it can be necessary to build in large tolerances which may adversely affect performance. With a bespoke system designed to suit your requirements from HVC, this requirement is eliminated.



Example system comprising:

Louvre:	Series HPL80 ultra high performance
Damper:	Series LF uPVC-VCD high performance plastic (shown complete with Belimo electronic actuator)
Internal grille:	Series LG linear bar
Case:	Fully welded galvanised steel

Louvres, grilles and cases can be polyester powder coated to any RAL or BS colour.

Natural ventilation systems: Roof mounted

Roof mounted natural ventilation systems are bespoke assemblies usually comprised of the following components:

- Penthouse (turret) louvre
- Galvanised steel drop duct
- Volume control damper/s
  Mounted within the drop duct or to the rear of one or more louvre panels
- Internal grille or diffuser

Since every installation is different, there is no standard roof mounted natural ventilation system, that shown here is an example only.

Please discuss any requirements for roof mounted natural ventilation systems directly with HVC.

Maintenance

We recommend all weather louvres are inspected and cleaned if necessary to ensure good operation at least annually.

This may need to be performed more frequently should local conditions dictate it.

An operation and maintenance manual (O & M) for HPL80 weather louvres is available via:

www.h-v-c.com

Finish

Mill aluminium (standard)

Polyester powder coating to any RAL or BS colour

Ordering codes

Example

1 - 1000 x 1000 - HPL80 - IM - FH - RAL9010 - 1S - SB

Codes

1)	**Quantity**		
2)	**Size (mm)**	(Width x height)	
3)	**Series**	HPL80	Ultra high performance weather louvre
4)	**Frame design**	*(nothing)* REC	Flanged Recessed
5)	**Debris screens**	BM IM	Bird mesh (12mm x 12mm mesh) - Required for Class A2 performance to 2.5 m/s Insect mesh - Required for Class A2 performance to 4.0 m/s
6)	**Fixings**	FH	Factory punched face fixing holes
7)	**Finish**	Mill RAL... BS...	Mill aluminium (standard) Polyester powder coated to RAL... Polyester powder coated to BS...
8)	**Sections**	_S	Number of sections required. If left blank this will be confirmed on order acknowledgement
9)	**Security bars**	SB	Security bars required

Important: Size will be taken to be nominal (hole internal) unless stated otherwise.
A debris screen must be specified for certified performance.

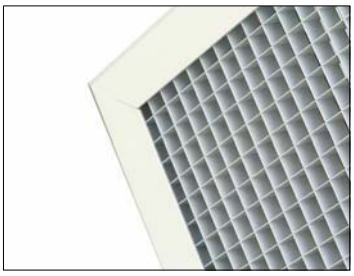
Leave code section blank if no option is required.

HVC & NCA products

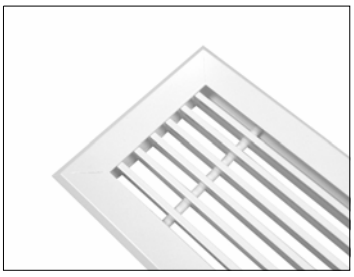
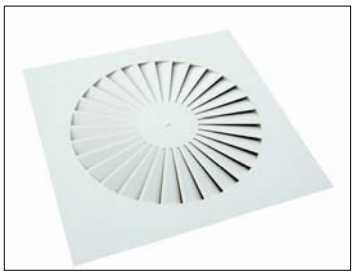
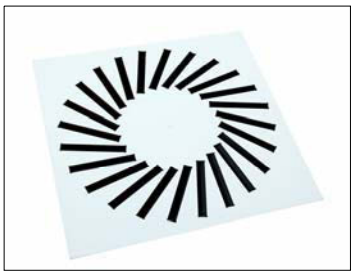
HVC offer the significant advantage of manufacturing both in duct and duct terminal equipment, making us a one stop shop for all your HVAC needs.

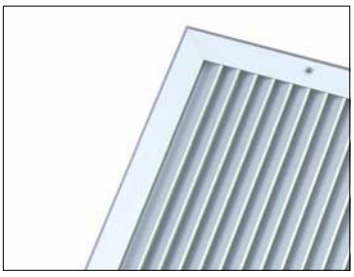
The products shown below are a selection, not an exhaustive list. Go to **www.h-v-c.com** for details on all HVC and NCA products.

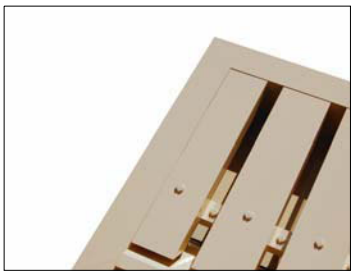
HVC: Grilles, Diffusers, Louvres and Volume Control Dampers










NCA: Fire and Volume Control Dampers



Assessed to ISO 9001
Cert/Ref No. 1186

HVC Supplies (Stourbridge) Ltd
Jason House
Amblecote
West Midlands
DY8 4EY
United Kingdom

Tel: +44 (0)1384 376555
Fax: +44 (0)1384 392555

sales@h-v-c.com

www.h-v-c.com