

## VELUX Modular Skylights

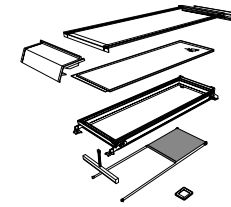
---

VELUX modular skylights are sash-frame constructed single skylights with a high-insulating glazing unit. The modules are available as fixed and venting skylights. All individual skylights are delivered as prefabricated modules with dedicated factory finished flashings to ensure superior water tightness in every available solution.

VELUX modular skylights are CE-marked in accordance with the harmonized standard EN 14351-1:2006+A1:2010 – Windows and doors.

In addition the skylight modules have been tested and approved in accordance to EN 12101-2:2003 - Smoke and heat control systems - Part 2: Specification for natural smoke and heat exhaust ventilators. This means that VELUX modular skylights with ventilation capabilities may also be used as Natural Smoke and Heat Exhaust Ventilators (NSHEV).

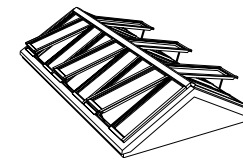
This technical handbook for VELUX modular skylights describes the product characteristics and performance of the skylight module together with sunscreening and control system. For real life case studies and inspiration, please refer to [velux.co.uk/modularskylights](http://velux.co.uk/modularskylights)



**Modular System**

6

Skylight Module	8
Functions & Sizes	8
Solutions	10
Main Components	12
Frame & Sash	13
Cladding & Flashing	15
Glazing Unit	16
Brackets & Hinges	17
Chain Actuator	18
Control System	19
Roller Blind	20
Beam for Ridgelight at 5°	21
Type Sign	21



**Solutions**

22

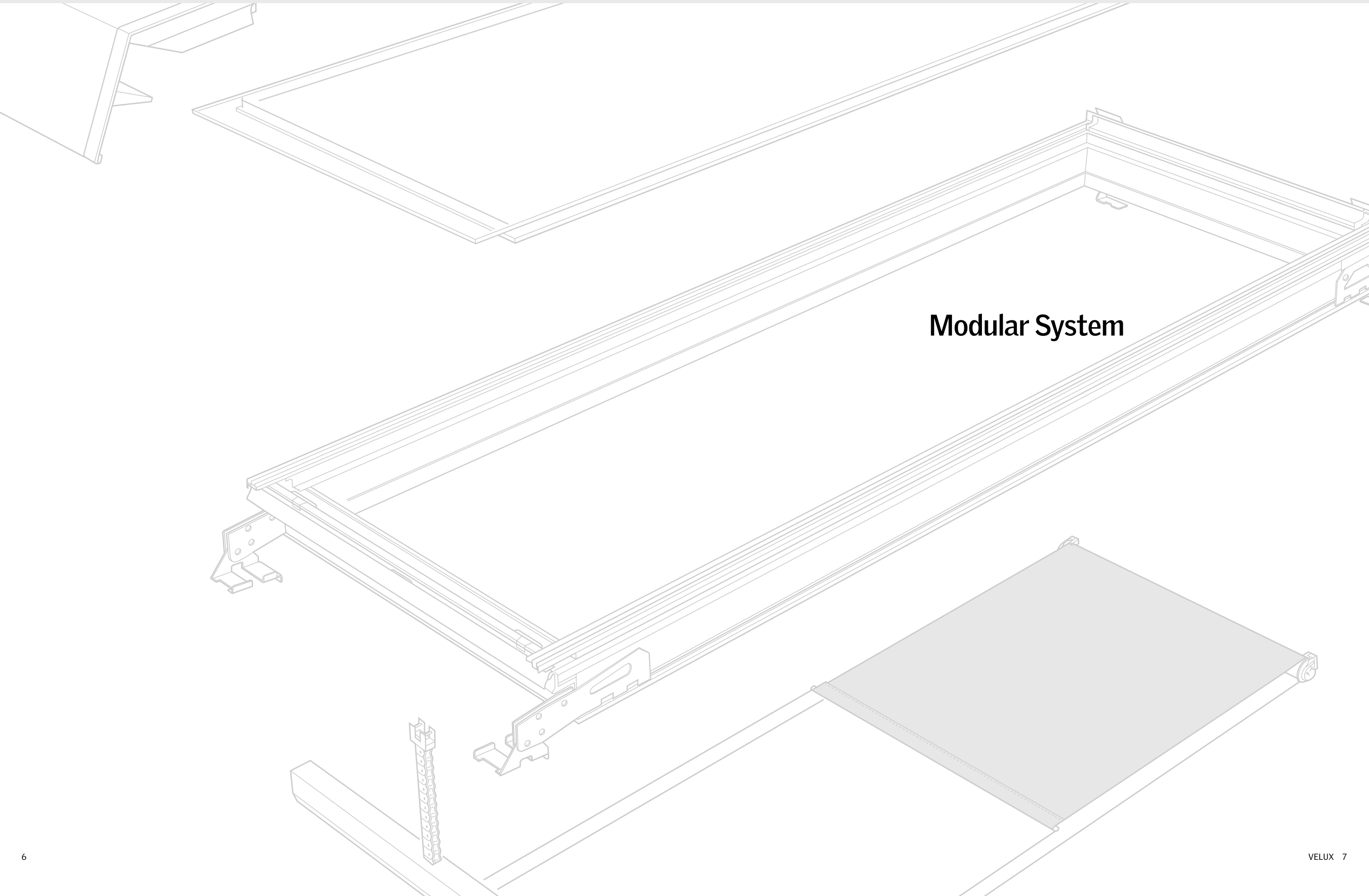
Longlight 5 - 25°	24
Wall-mounted Longlight 5 - 40°	26
Northlight 40 - 90°	28
Ridgelight 25 - 40°	30
Ridgelight at 5° with Beam	32
Atrium Longlight / Ridgelight	34

Product	Accessories	Control System	Roller Blind	Chain Actuator	Beam for Ridgelight at 5°
Skylight Module	Yes	Yes	Yes	Yes	Yes
Longlight 5 - 25°	Yes	Yes	Yes	Yes	Yes
Wall-mounted Longlight 5 - 40°	Yes	Yes	Yes	Yes	Yes
Northlight 40 - 90°	Yes	Yes	Yes	Yes	Yes
Ridgelight 25 - 40°	Yes	Yes	Yes	Yes	Yes
Ridgelight at 5° with Beam	Yes	Yes	Yes	Yes	Yes
Atrium Longlight / Ridgelight	Yes	Yes	Yes	Yes	Yes

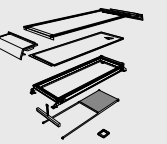
**Product Data**

36

Skylight Module	38
Frame & Sash	43
Cladding & Flashing	44
Beam for Ridgelight at 5°	45
Glazing Unit	46
Chain Actuator	48
Control System	50
Roller Blind	51
Resistance to Wind Load	56
Reaction to Fire	58
Water tightness	60
Air Permeability	62



**Modular System**



## Skylight Module

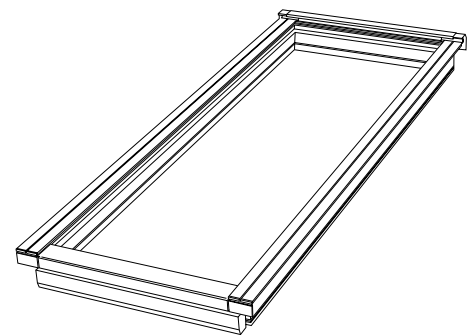
CE marked VELUX modular skylights can be used in any building where the national, local and individual building requirements allow the use of skylight modules. Given the aesthetics and advanced performance of the products, VELUX modular skylights are commonly used in heated buildings and primarily in

projects that support light commercial interests, e.g. hospitals, schools, shopping centres, offices, museums etc. However all buildings that have a suitable structure, and which are large enough to host an installation, will support VELUX modular skylights.

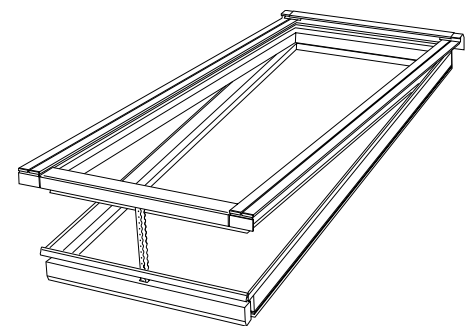
## Functions & Sizes

VELUX modular skylights are available as fixed and venting modules. By using the same frame and sash profile for both fixed and venting skylight modules they appear to be identical.

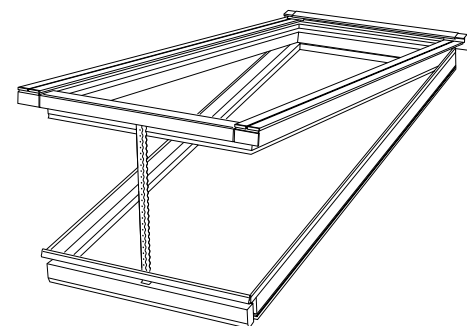
Venting skylights are top-hung and can be used for comfort ventilation, and in addition, a number of sizes are also approved for smoke ventilation according to NSHEV – EN 12101-2:2003.



**HFC**  
Fixed skylight module

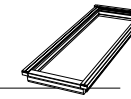


**HVC**  
Motorized comfort venting skylight module  
Opening up to 410 mm



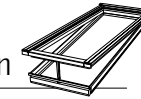
**HVC**  
Motorized smoke venting skylight module  
Opening up to 700 mm in 60 seconds

### Fixed modules



mm	Size grid				
	675	750	800	900	1000
1200					
1400					
1600					
1800					
2000					
2200					
2400					
2600				*	*
2800				*	*
3000					*

### Comfort ventilation



mm	Size grid				
	675	750	800	900	1000
1200					
1400					
1600					
1800					
2000					
2200					
2400					

### Smoke ventilation

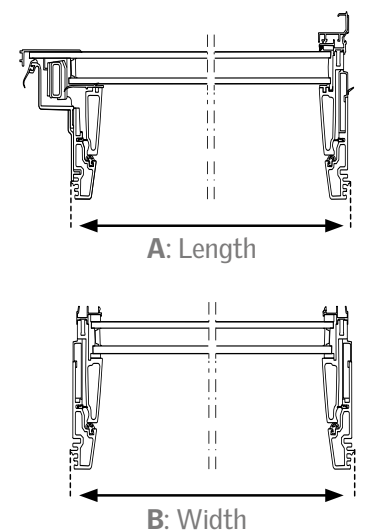
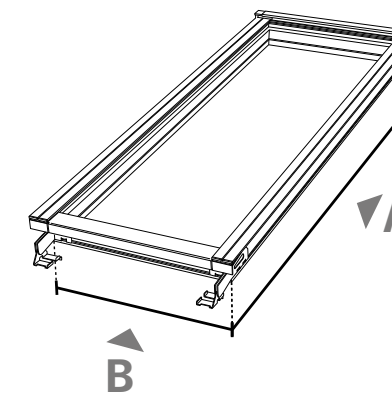


mm	Size grid				
	675	750	800	900	1000
1200					
1400					
1600					
1800					
2000				*	*
2200				*	
2400			*		

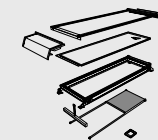
\* Not available with triple glazing

### How to measure the modules

Width and height of the modules is determined by the exterior measures of the frame. Not the measures of cladding, flashing or brackets.



\* Extra long modules for longlight, wall-mounted longlight and northlight. Constructed with an extra strong glazing unit

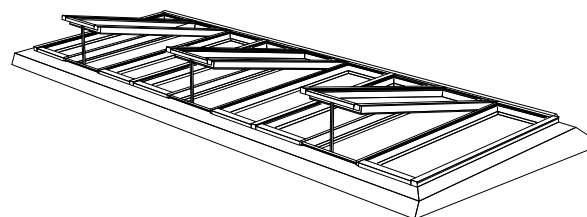


## Solutions

---

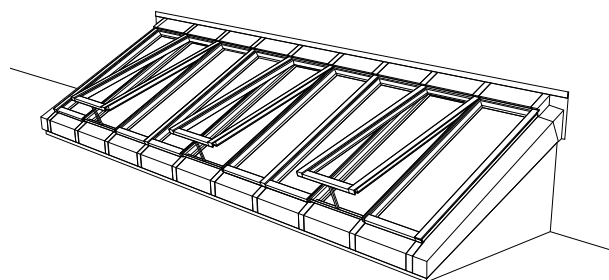
Longlight 5 - 25°

---



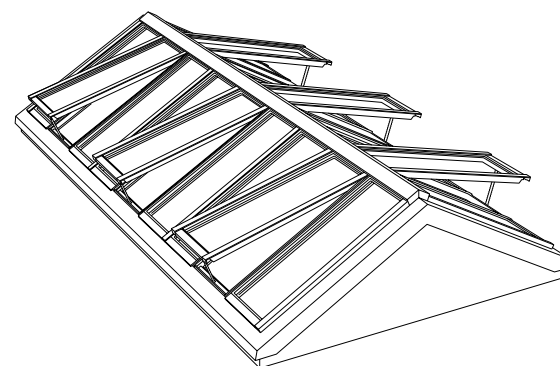
Wall-mounted Longlight 5 - 40°

---



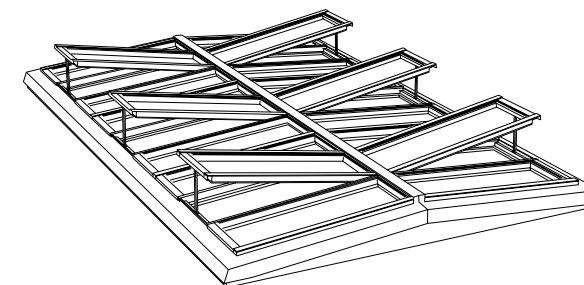
Ridgelight 25 - 40°

---



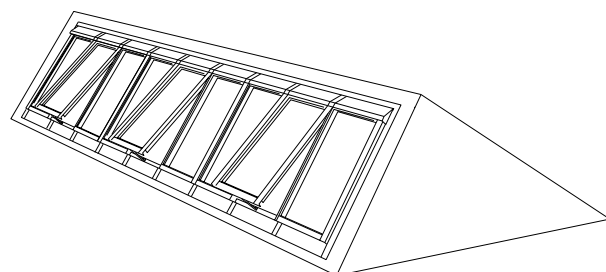
Ridgelight at 5° with Beam

---



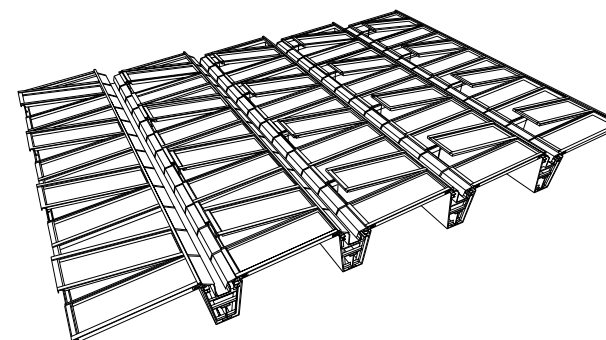
Northlight 40 - 90°

---



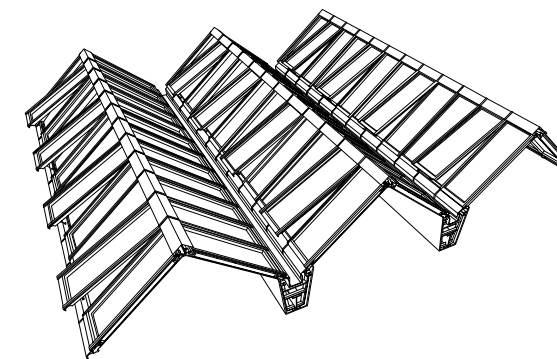
Atrium Longlight 5 - 25°

---



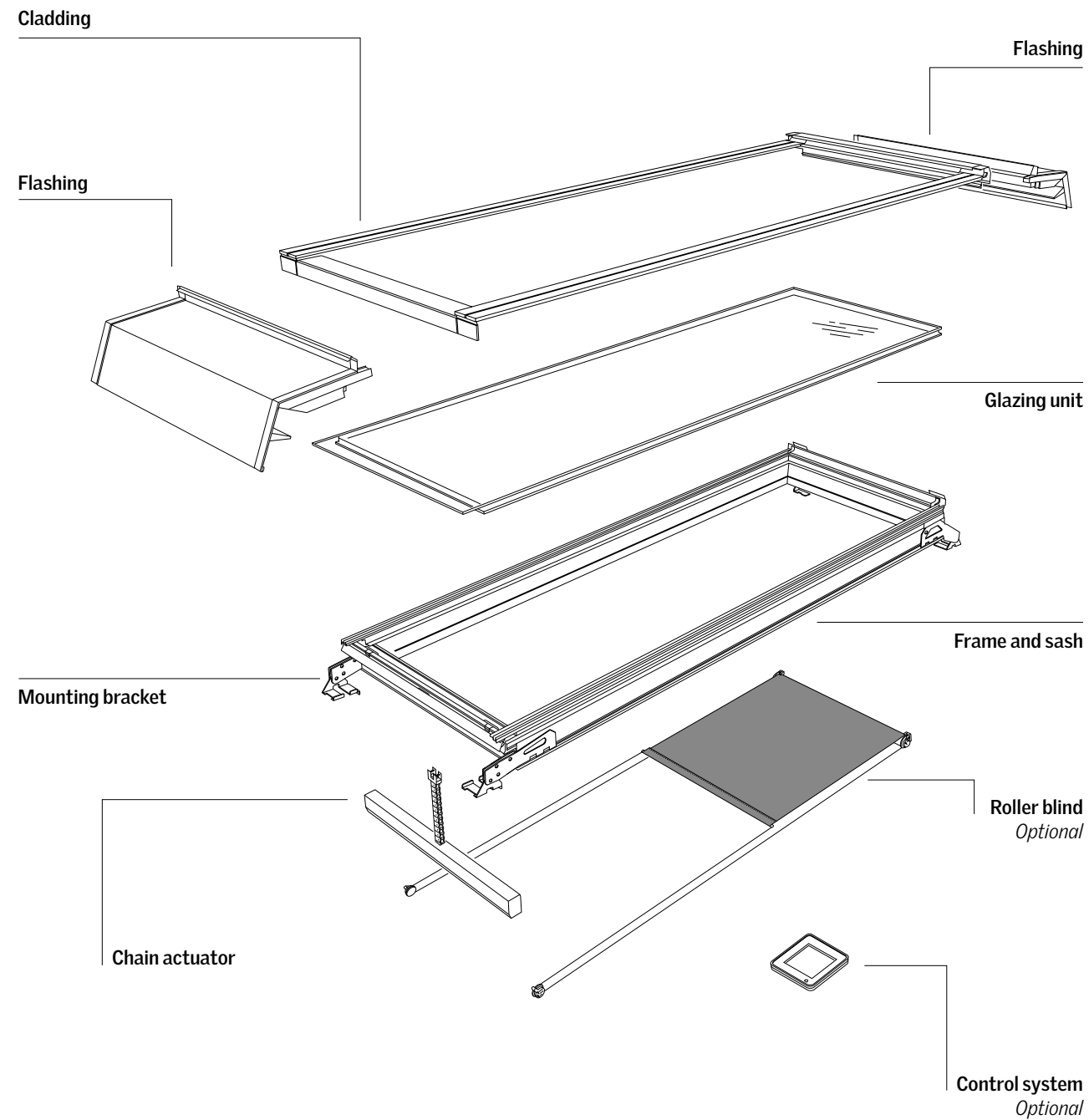
Atrium Ridgelight 25 - 40°

---





## Main Components



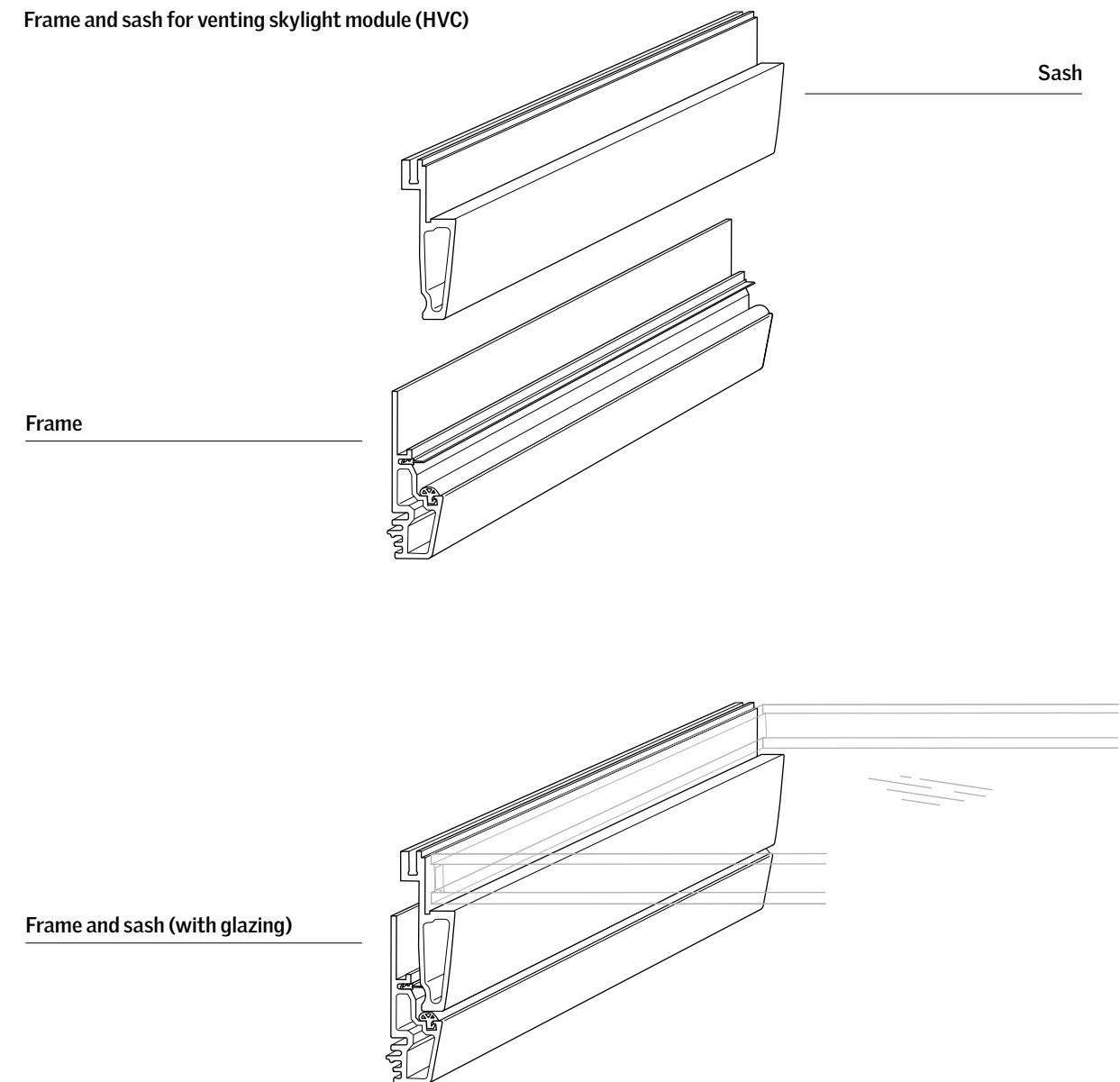
## Frame & Sash

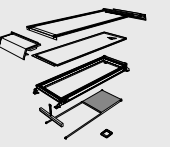
The main structural profiles of VELUX modular skylights consist of a low-conductive, pultruded composite, containing approximately 80% continuous fibreglass and 20% two-component polyurethane resin. The composite guarantees great profile strength as well as very high insulating performance.

In combination with low-energy glazing units the VELUX modular skylights are able to achieve one of the lowest

overall U-values for frame and glazing assembly within the skylight market. The inner surface is treated with white paint (RAL 9010, gloss 30) as standard. Other colours are available at premium price.

### Frame and sash for venting skylight module (HVC)

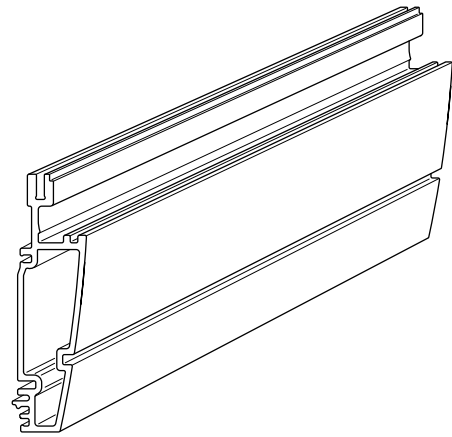




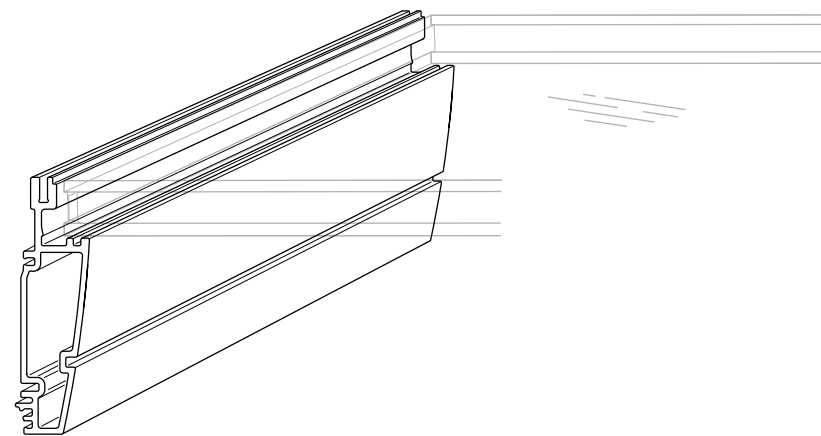
## Frame & Sash

Frame for fixed skylight module (HFC)

Frame



Frame (with glazing)

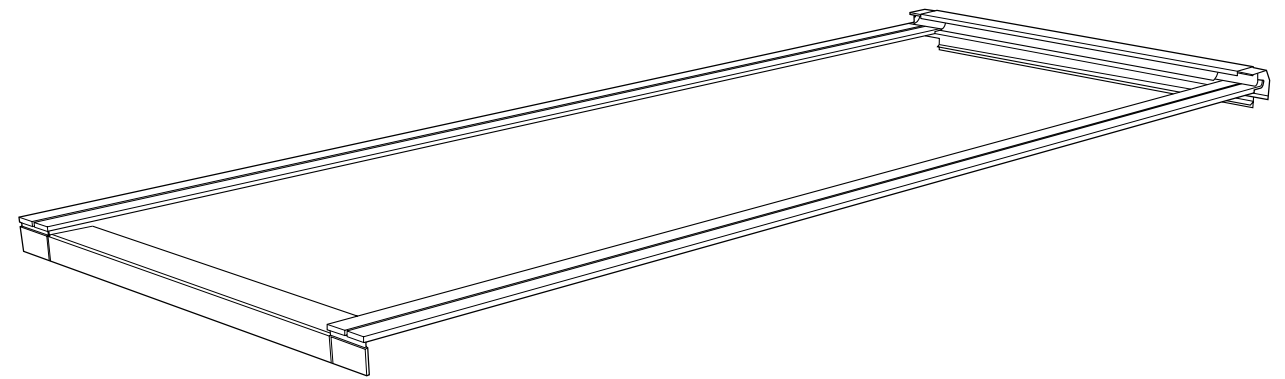


## Cladding & Flashing

### Cladding

Each single module has an assigned set of claddings. Cladding components are attached on four sides of the skylight, creating a watertight connection between sash and frame for both fixed

and venting skylight modules. The cladding is made of extruded aluminium, which is covered with a scratch resistant powder coating for added weather protection and aesthetics.



### Flashing

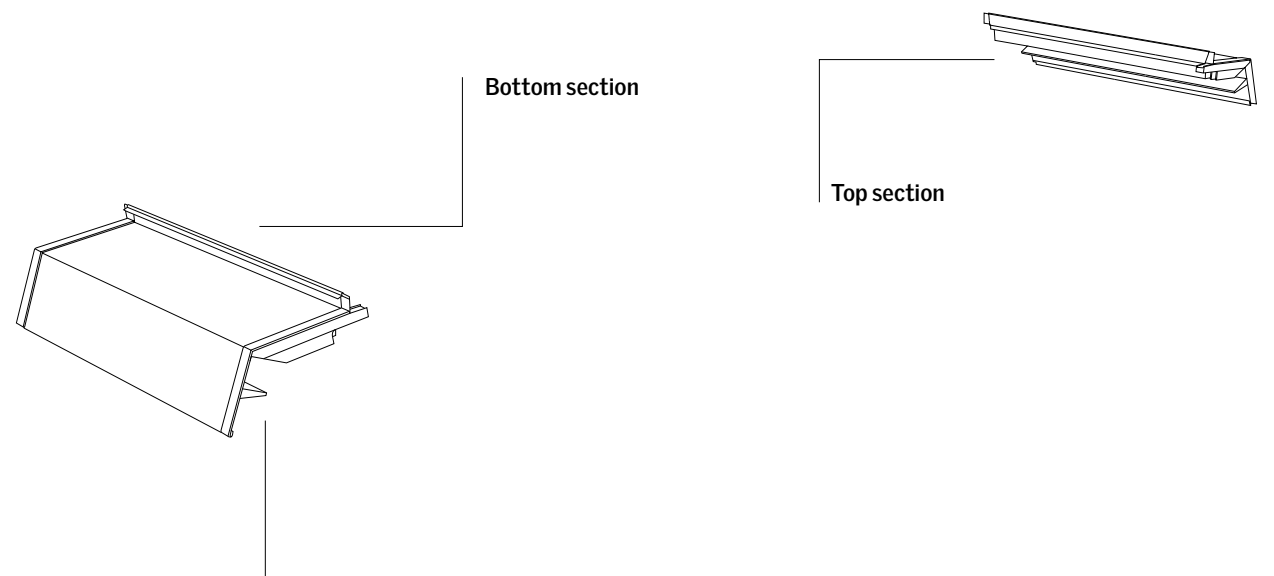
VELUX modular skylights come with factory-finished flashings. The pre-fabrication of flashings ensures a high quality together with safe and fast installation process. The flashing has a top, side and bottom section made from aluminium coil with a grey paint finish.

Prior to installation insulation must be added by others around the sub-construction. A wind and snow stop made from polyurethane foam is applied on the bottom edge of the flashing.

Bottom section

Top section

Wind and snow stop





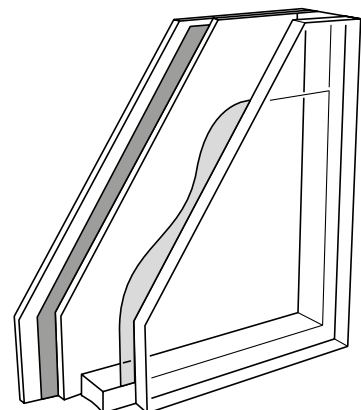
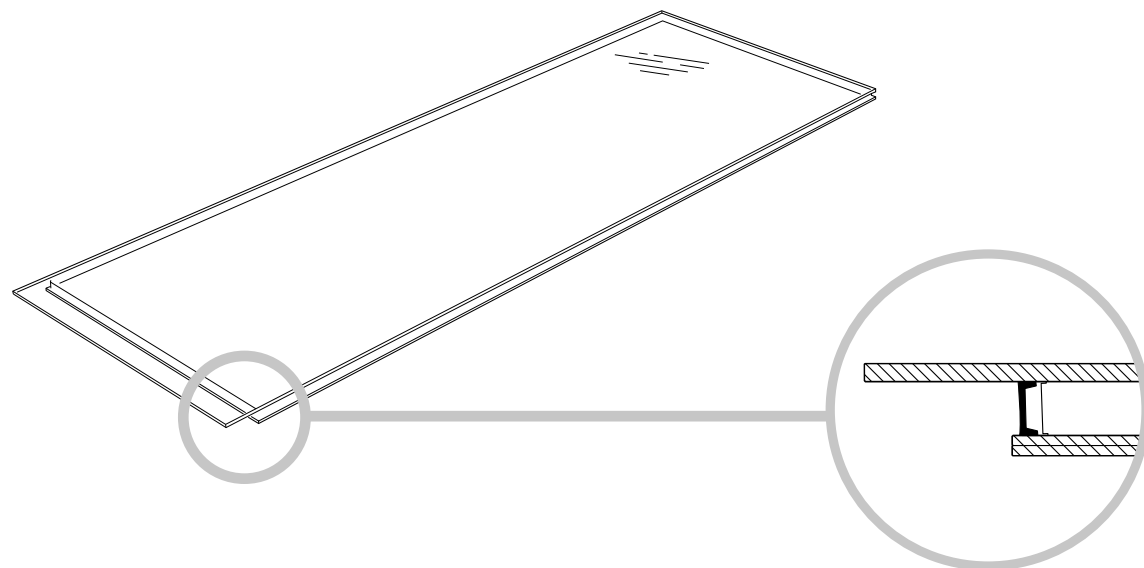


## Glazing Unit

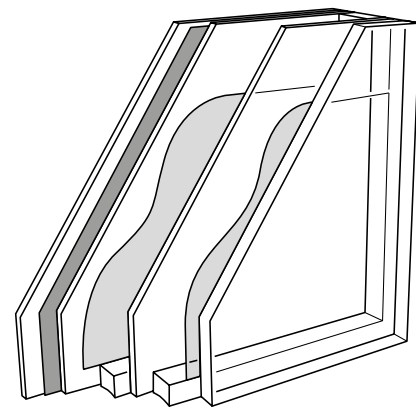
VELUX Modular Skylights come with a standard low-energy double-glazing unit. Alternatively the skylight modules can be supplied with improved solar protection or a triple-glazing unit for extra-low U-value. All glazing units include a toughened outer glass layer and a 3+3 or 5+5 mm safety inner glass layer with two layers of 0.38 mm interlayer PVB foil. For technical values on glazing units, please refer to the chapter about Technical Data.

The triple-glazing units have a heat-strengthened middle glass layer. On units with a 5+5 mm inner glass, the inner layer is likewise made of heat-strengthened glass. The cavity between the panes of the glazing units is filled with argon gas as a default.

All glazing units consist of a warm edge spacer and they are produced with warm edge technology to minimise the risk of condensation at the pane edges to provide the glazing units with the most durable insulation capabilities.



Double-glazing unit



Triple-glazing unit

## Brackets & Hinges

### Material and treatment

Metal components in VELUX modular skylights are made of galvanized low carbon steel for cold forming, galvanized structural steel, high-strength low-alloy steel, galvanized free-cutting steel and sealed passivated cast zinc.

The majority of the steel components are regarded to be critical and as such are electroplated according to European norm EN ISO 2081:2008 table A1 – C: iridescent.

Components fulfill corrosion resistance grade 4 in accordance with EN ISO 1670:2007.

Based on these properties, VELUX modular skylights can be used where external weather conditions and indoor climate conditions remain within the normal spectre of corrosiveness.

Note: VELUX modular skylights must NOT be used in indoor environments, where the risk of condensation on metal components can lead to extreme corrosive attack. Environments include buildings with swimming pools and other similar facilities that use highly corrosive substances, e.g. salt and/or chlo-

ride. Evaporation can lead to corrosive attack on components, weaken the functionality and in the end compromise the structural integrity of the installation.

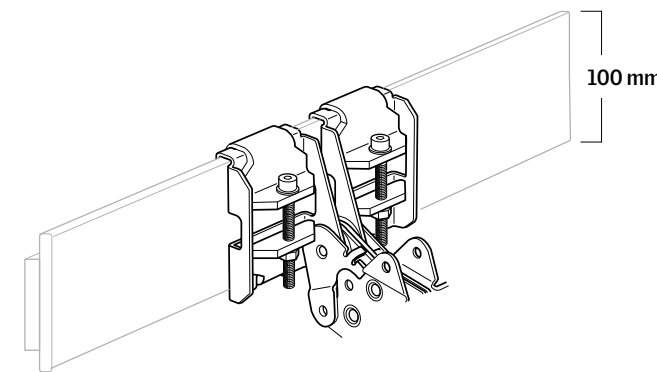
### Brackets

VELUX modular skylights come with pre-installed mounting brackets and are ready to be installed on any preferred sub-construction made of wood, steel or concrete finished with a steel profile at the top.

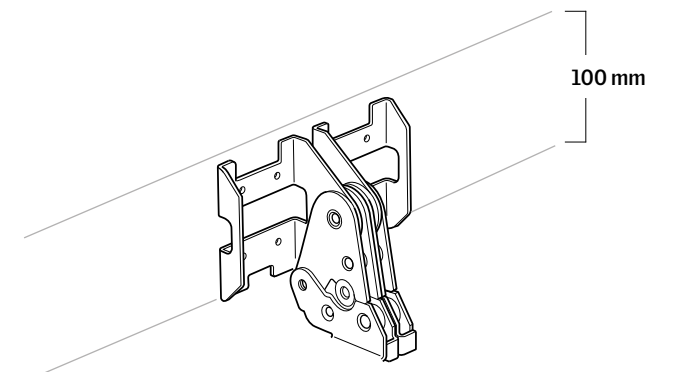
Using a steel profile in the sub-construction provides benefits, since the clamps at any time during installation can be released to allow minor positional adjustment of the modules.

### Hinges

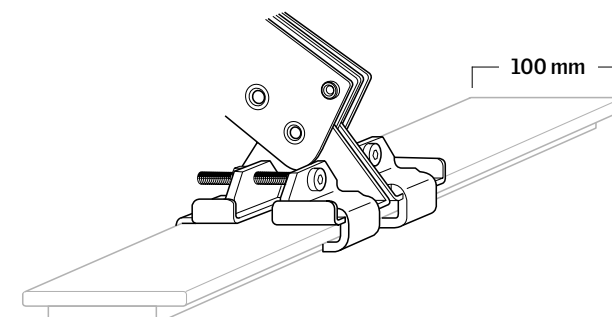
The pre-fitted hinges of the venting modules are tested under the most severe conditions, using the largest and heaviest modules to open and close continuously under various forms of stress. These tests document that VELUX modular skylights should remain entirely functional well beyond 30 years of normal operation.



Bracket for wall-mounted longlight



Bracket for northlight



Bracket for longlight and ridgetlight



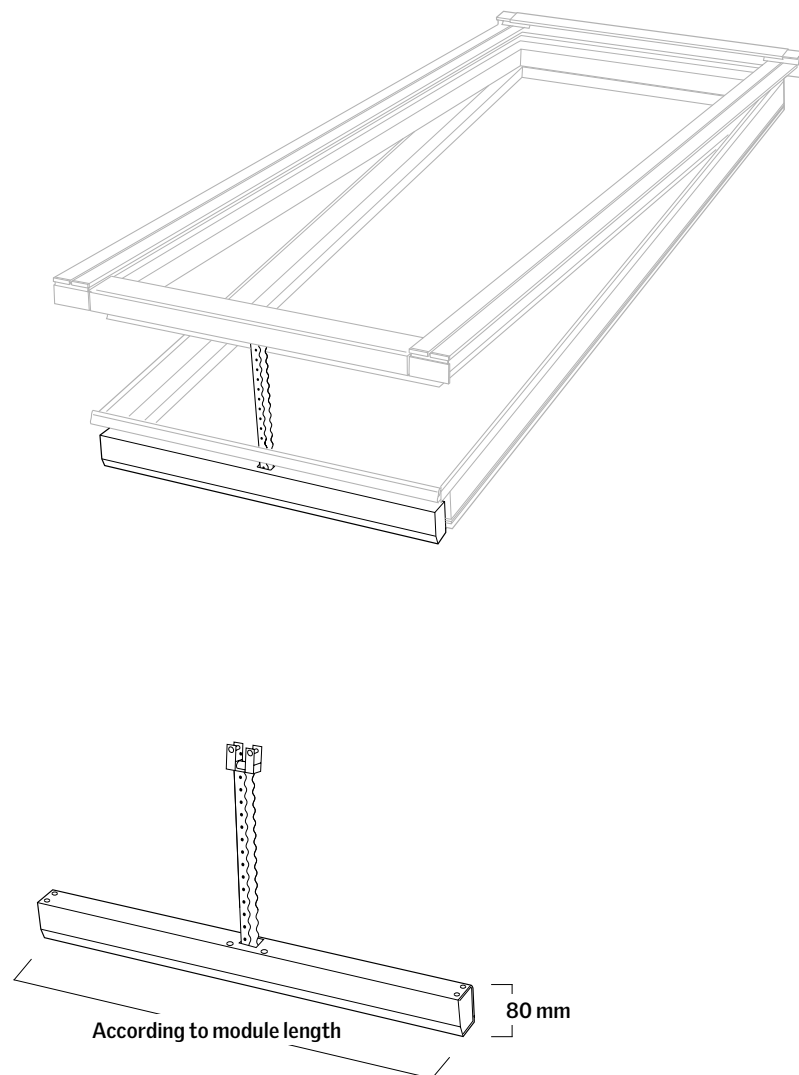
## Chain Actuator

Venting VELUX modular skylights are top-hung and use a hidden chain actuator integrated at the bottom profile. There are two variants of the chain actuator. You can either choose the VELUX INTEGRA® system based on the io-homecontrol® technology and use the VELUX INTEGRA® control pad, KLR 200, for user-friendly control. Alternatively you can choose the open system variant and connect the installation to your preferred building management system. The open system chain actuator can be programmed even after installation to suit specific needs, e.g. speed, tensile, compressive force, noise level and power con-

sumption. These parameters and functions can be changed via the green communication wire when connecting to WindowMaster MotorLink™ control.

The chain actuator for VELUX modular skylights has a built-in reversing function that prolongs the lifetime of the gaskets in the skylight sash.

The chain actuator is accessible from the roof. Therefore maintenance requires no access from the inside of the building.

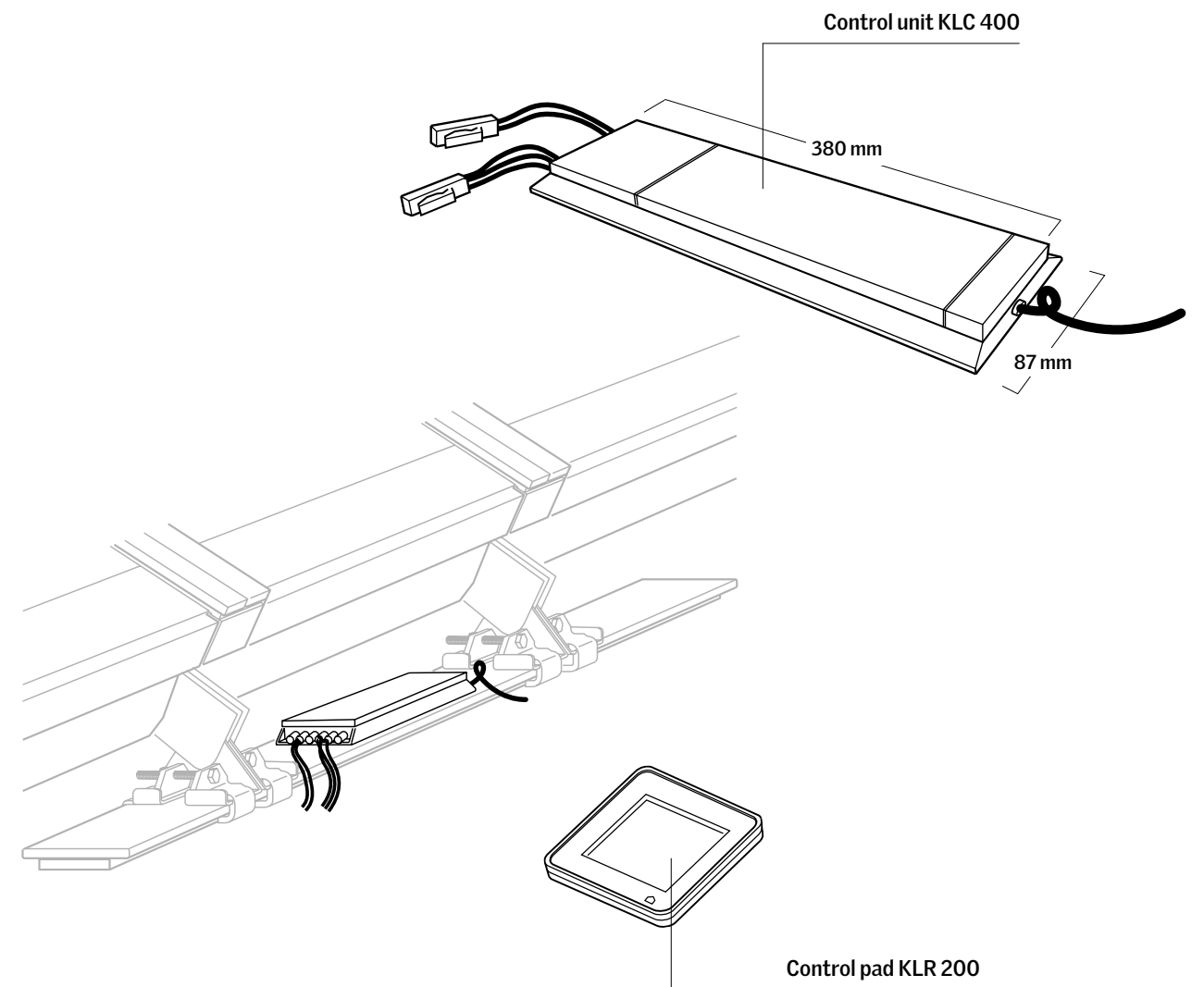


## Control System

### VELUX INTEGRA®

Venting modular skylights and blinds controlled with the VELUX INTEGRA® system will be powered and controlled from the control unit KLC 400. Each KLC 400 can operate one venting skylight module and up to four roller blinds individually, in groups or simultaneously.

Skylight systems installed with the VELUX INTEGRA® system are controlled with the VELUX INTEGRA® control pad, KLR 200, which allows the skylight modules and blinds to be set in any position and offers a range of programming features.



### Open system

Venting modular skylights and blinds controlled with the open system solution are connected to ± 24 V DC. In addition to ± 24 V DC the open system skylights and blinds can be connected to, and integrated in, common building automation fieldbus

systems, i.e. KNX, BACnet, LON and Modbus. The connection is made through the integrated WindowMaster MotorLink™ technology that among other things enables exact position control, feedback and speed control.



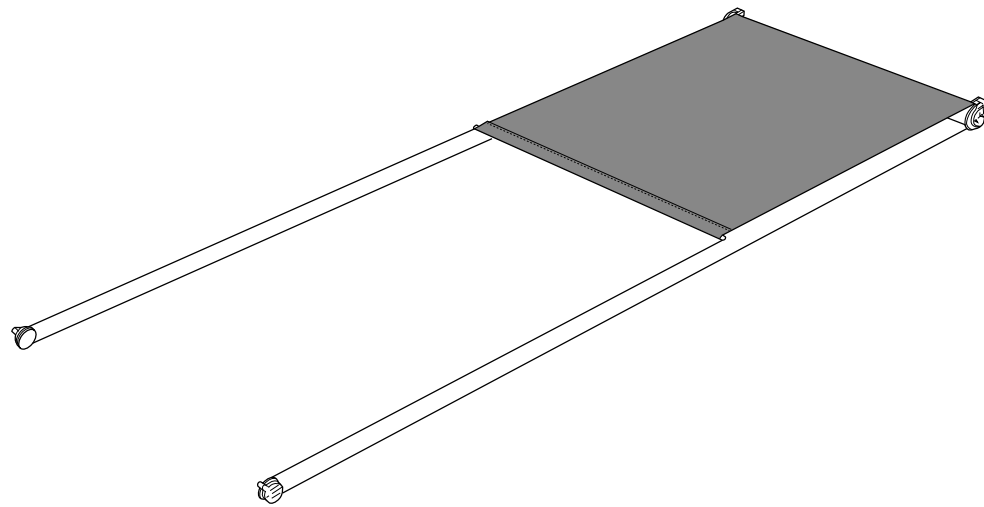
## Roller Blind

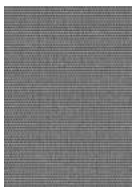
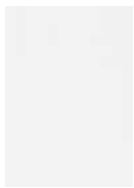


The internal roller blind, RMM, is designed for installation with VELUX modular skylights, and is available in all standard module sizes. The blind protects against heat and glare and helps to control the amount of light in the room.

The blind consists of four wheels located in each corner of the skylight module and two steel wires, running along the module

side frame. The two wires pull a lightweight polyester fabric available in three commonly used colours.

Since all VELUX modular skylights have cables for internal blinds pre-installed, the task of connecting the blind to the terminal block at the top of the module and to the power supply remains fast and easy.



	Sunscreening			Fire resistant
				
Colour	Grey	White	Black	White
Variant code	RMM 4083	RMM 4084	RMM 4085	RMM 4094

## Beam for Ridgelight at 5°

When installing VELUX modular skylights in a 5° ridgelight solution, the modules will be supported by a steel beam. The beam is included in the VELUX delivery and is ready for fast and easy installation with no further preparation.

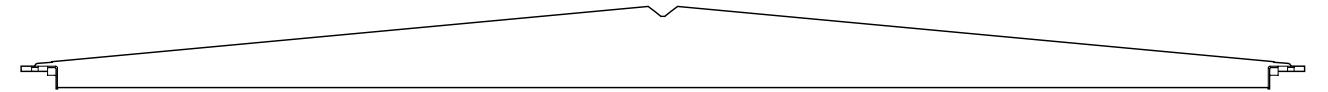
Beams are available for modules from 1200 to 3000 mm in height.

VELUX beams do not come with a fire rating as a standard. If such demands occur, please be advised: If there are specific demands for up to 30 minutes of fire resistance, clients will need to purchase a) modules with fire resistant glazing units and intumescent strip (HVS/HFS) and b) ask the local fire authorities to assess the fire properties of the beam.

If the beam is required to meet these increased demands for fire resistance, the beams must be treated with fire paint. Clients are advised to inform the local VELUX sales company of such demands prior to delivery, as standard beams have not been primed for fire paint. Please note that fire paint will change the visual expression of the beams slightly.

If there are no specific fire rating demands for the modules, but specific demands for the beams, only point b) is relevant. Always take into consideration that it is only possible to make beams fire rated for up to 30 minutes.

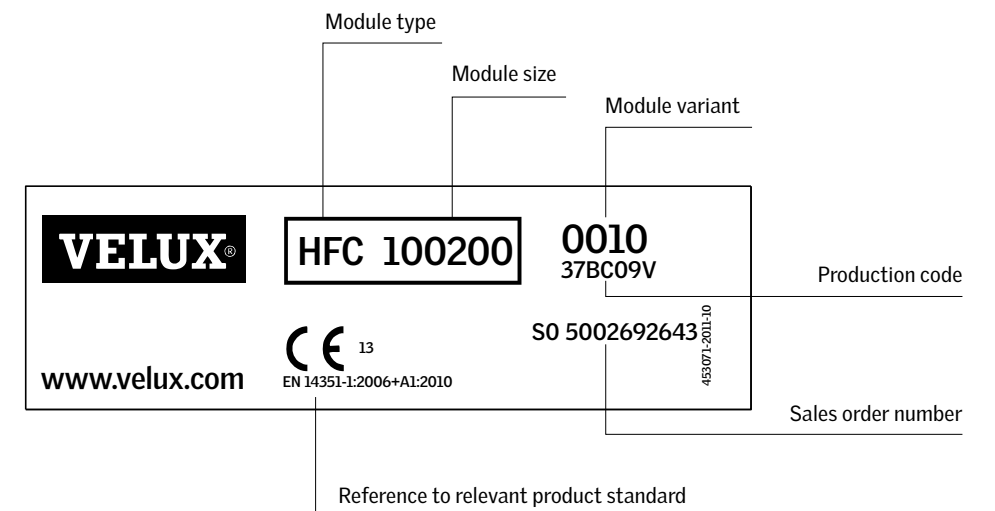
If fire rating demands exceed 30 minutes, 5° ridgelight configurations are not suited for this installation.

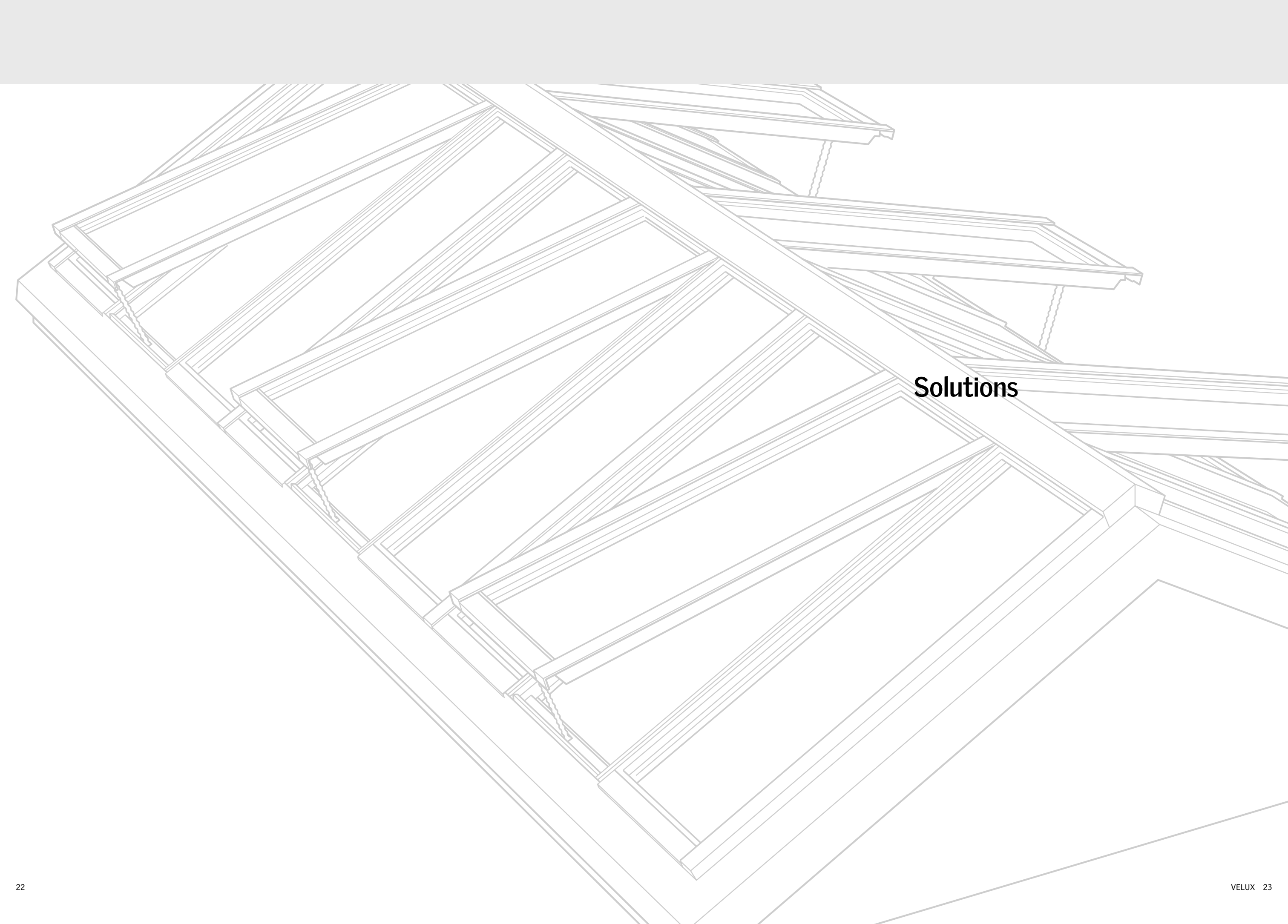


## Type Sign

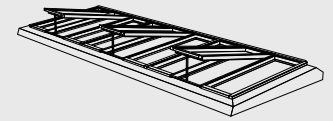
All VELUX modular skylights and internal blinds have a type sign sticker. The type sign helps to identify the product and must NOT be removed. If a product is damaged or malfunctioning,

the VELUX sales company must be informed about the information on the type sign.





**Solutions**



## Longlight 5 - 25°

Longlights are bands of VELUX modular skylights, pre-fitted with installation brackets and clamps that guarantee a fast and secure installation. The flashing allows for configurations with a pitch of 5 to 25°.

### A Mounting bracket

VELUX modular skylights are mounted on a standard steel profile of 100 mm width (not a VELUX component).

The brackets are fixed with a clamping system holding the skylights in place. It is also possible to install the mounting bracket directly onto a wooden batten without using the clamp system.

### B Glazing unit

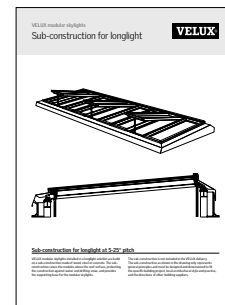
VELUX modular skylights are available with double or triple glazed units treated with a low energy and optionally, a sun protection coating.

### C Flashing

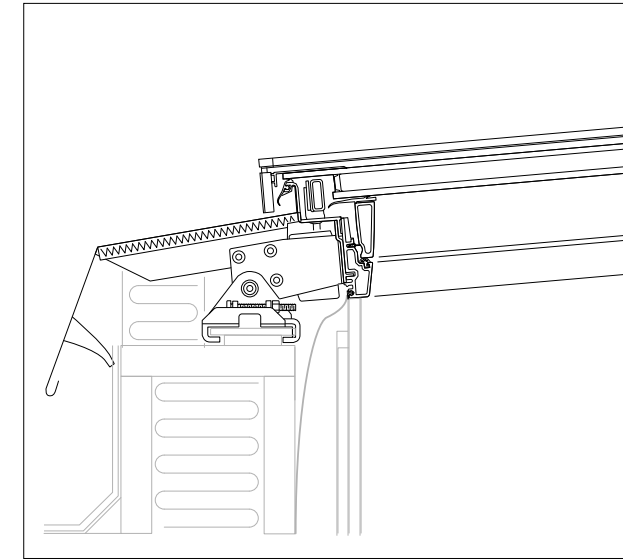
The prefabricated modular flashing is made from aluminium and includes a pre-mounted wind and snow stop.

Longlight		HFC*		HVC*	
Pitch		5-25°		5-25°	
		Internal lining	Internal sub-construction**	Internal lining	Internal sub-construction**
Opening width	Min:	1057 mm	1196 mm	1057 mm	1196 mm
	Max:	2955 mm	3099 mm	2357 mm	2501 mm
Opening length	Min:	641 mm	731 mm	641 mm	731 mm
	Max:	∞ mm	∞ mm	∞ mm	∞ mm
Module height	Min:	1200 mm		1200 mm	
	Max:	3000 mm		2400 mm	

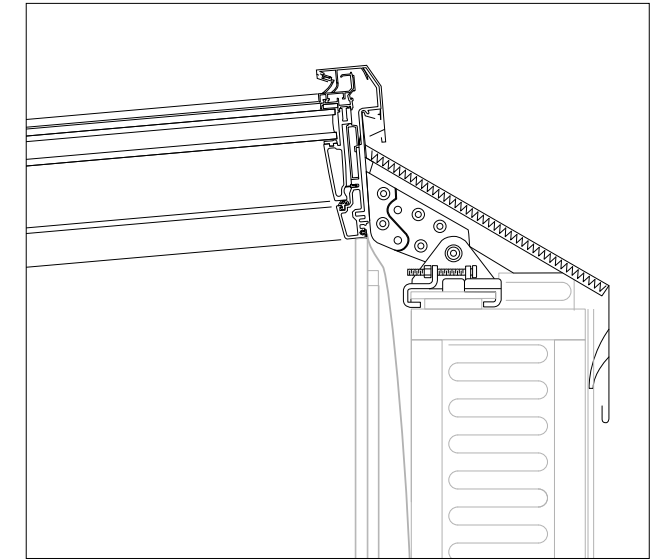
\* HFC = fixed modules, HVC = venting modules  
 \*\* The dimensions in the table refer to a sub-construction made of steel or wood. It is possible to cast a sub-construction in concrete, in which case other dimensions apply.



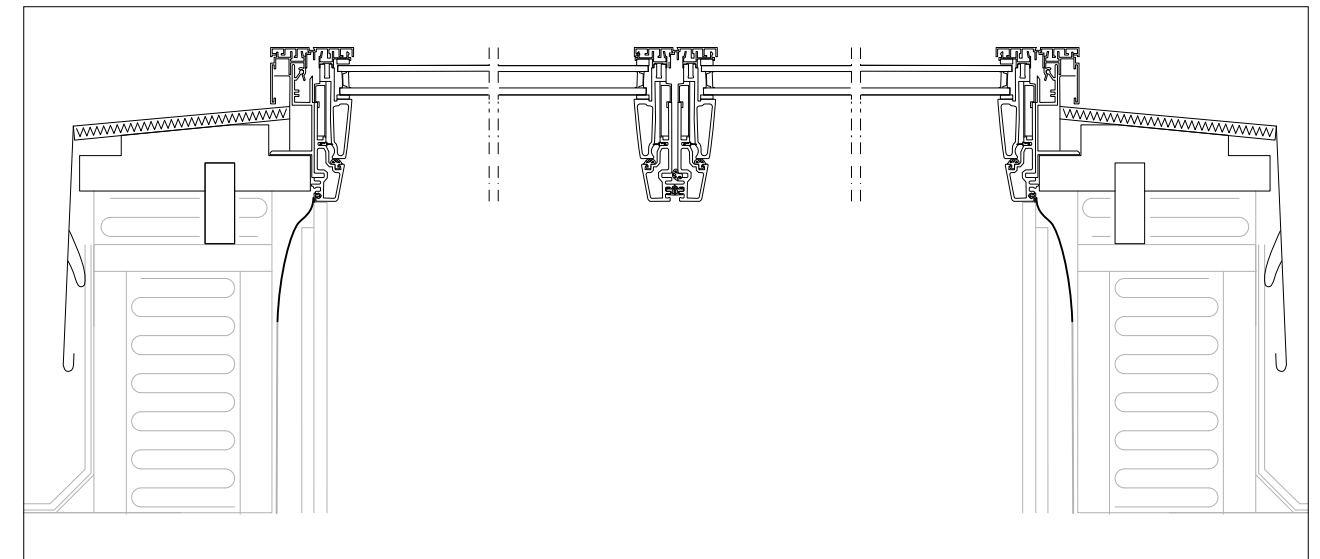
Read more about sub-construction for longlight at [velux.co.uk/modularskylights](http://velux.co.uk/modularskylights)



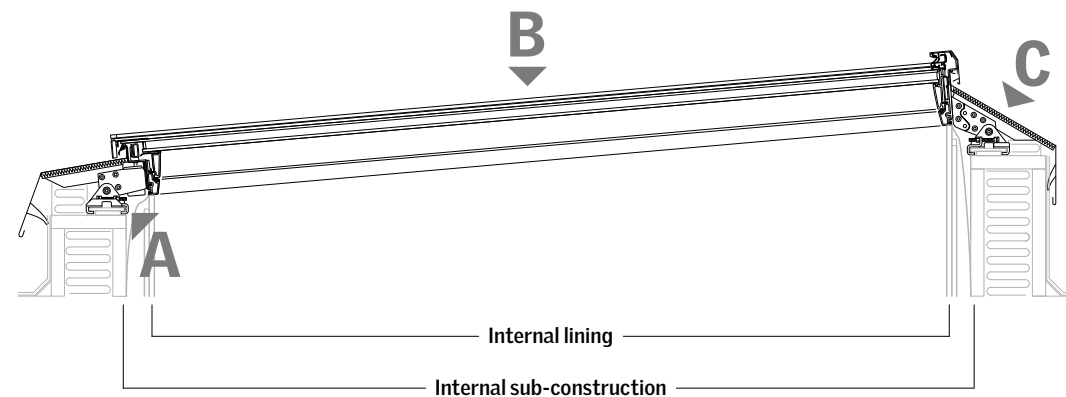
Cross section - bottom

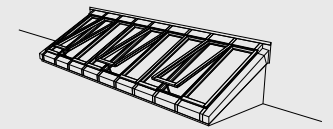


Cross section - top



Longitudinal section





## Wall-mounted Longlight 5 - 40°

Wall-mounted longlights are bands of VELUX modular skylights mounted against a vertical wall. Factory-fitted installation brackets and clamps guarantees a fast and secure installation. The flashing allows for configurations with a pitch of 5° to 40°.

### A Mounting bracket

Wall-mounted longlights are mounted on a standard steel profile of 100 mm width both at the wall and at the bottom. The steel profile is not a VELUX component.

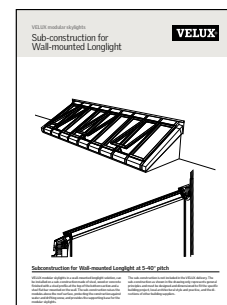
The brackets are fixed with a clamping system holding the skylights in place. In the bottom, it is also possible to install the mounting bracket directly onto a wooden batten without using the clamp system.

### B Flashing

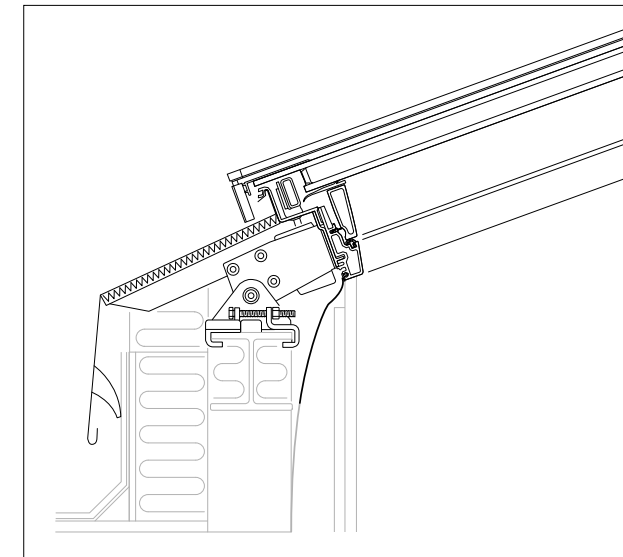
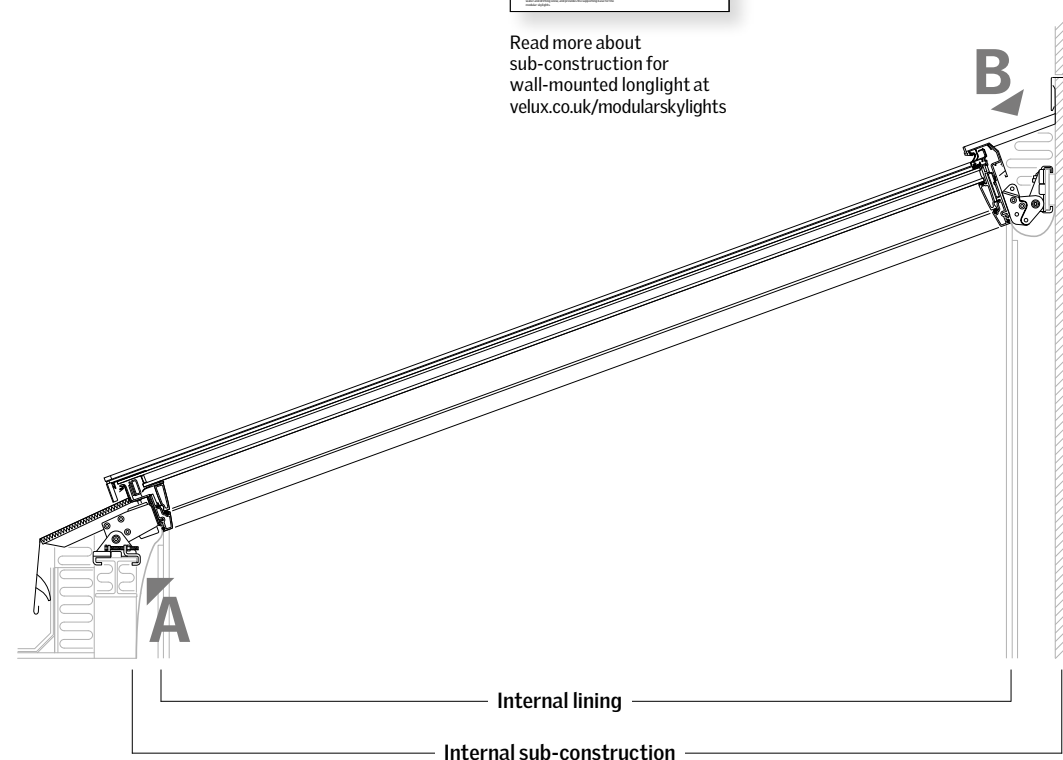
The modular flashing is prefabricated to fit the exact pitch of the modules. Therefore no adjustments on site is needed.

Wall mounted longlight		HFC*		HVC*	
Pitch		5-40°			
		Internal lining	Internal sub-construction**	Internal lining	Internal sub-construction**
Opening width	Min:	1162 mm	1371 mm	1162 mm	1371 mm
	Max:	2955 mm	3164 mm	2357 mm	2567 mm
Opening length	Min:	641 mm	731 mm	641 mm	731 mm
	Max:	∞ mm	∞ mm	∞ mm	∞ mm
Module height	Min:	1200 mm		1200 mm	
	Max:	3000 mm		2400 mm	

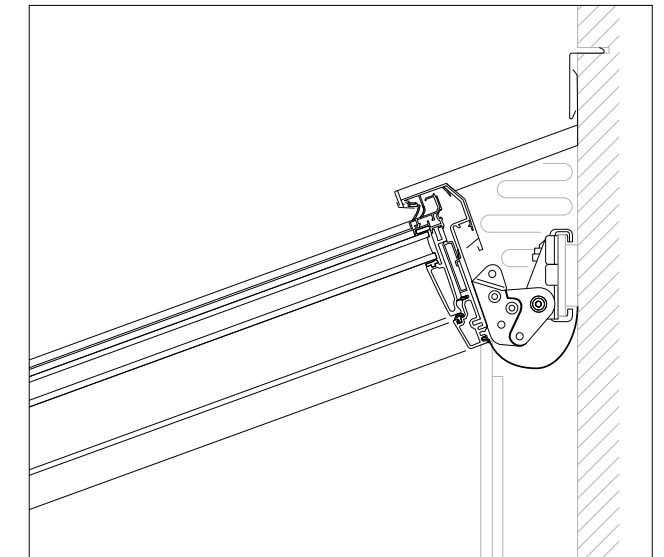
\* HFC = fixed modules, HVC = venting modules  
 \*\* The dimensions in the table refer to a sub-construction made of steel or wood. It is possible to cast a sub-construction in concrete, in which case other dimensions apply.



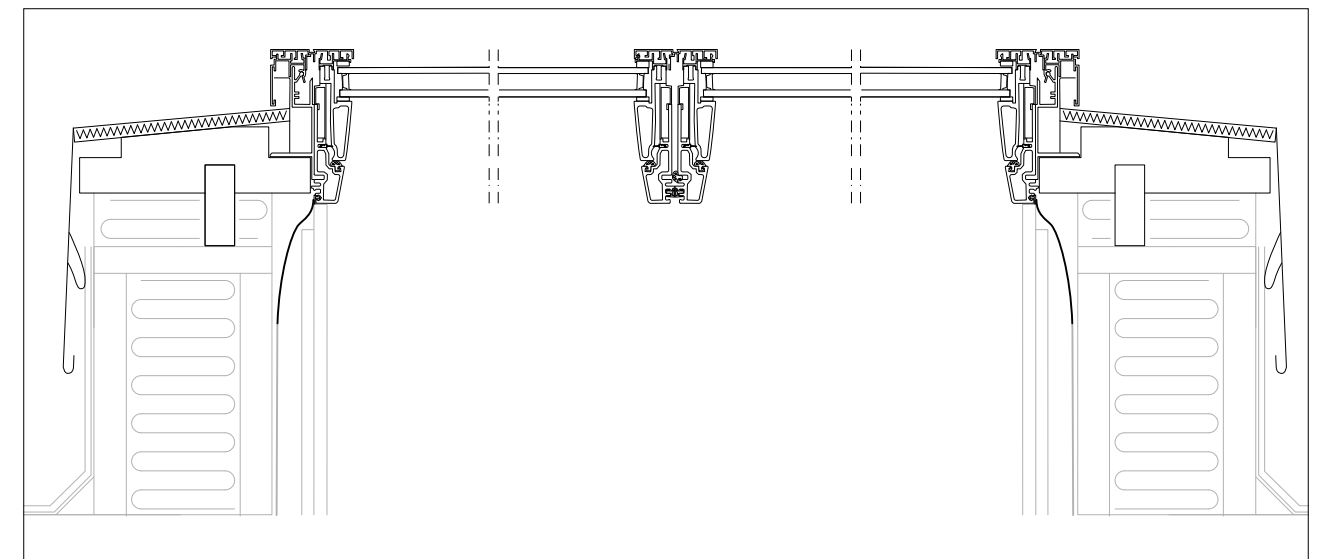
Read more about sub-construction for wall-mounted longlight at [velux.co.uk/modularskylights](http://velux.co.uk/modularskylights)



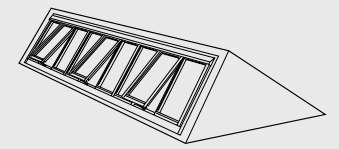
Cross section - bottom



Cross section - top



Longitudinal section



## Northlight 40 - 90°

Similar to longlights, northlights are bands of VELUX modular skylights. The characteristic upright design is primarily for installations that are directed towards the northern hemisphere for soft and reflected lighting. Northlight installations are applicable for pitch of 40 to 90°.

### A Flashing

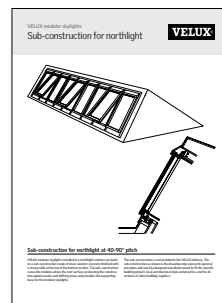
The prefabricated modular flashing ensures easy integration in the roof surface. All flashings are easily installed externally, eliminating the need for any interior work. The roof surface underneath the flashing must be appropriate for screw fixation.

### B 40°-90° pitch

A high-pitched installation facing north will produce a soft and appealing light with no glare. Once installed the northlight installation will ensure a very low U-value.

### C Mounting bracket

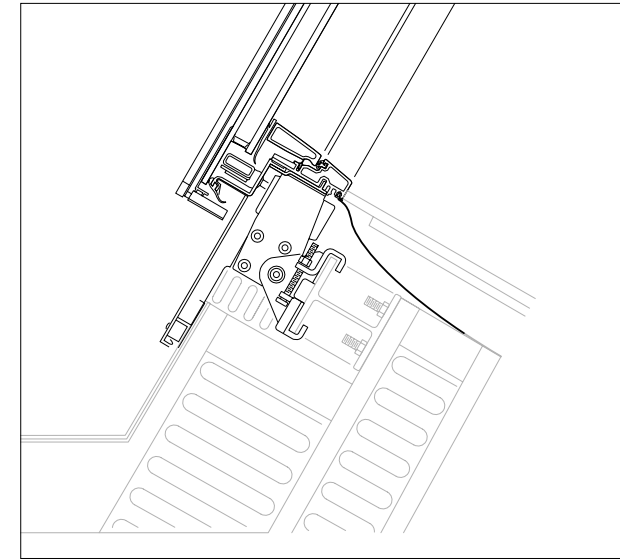
Velux modular skylight are in the bottom mounted on a standard steel profile of 100 mm and fixed with clamp system holding the skylight in place. At the top the bracket is fixed to the sub construction with screws meant for wood.



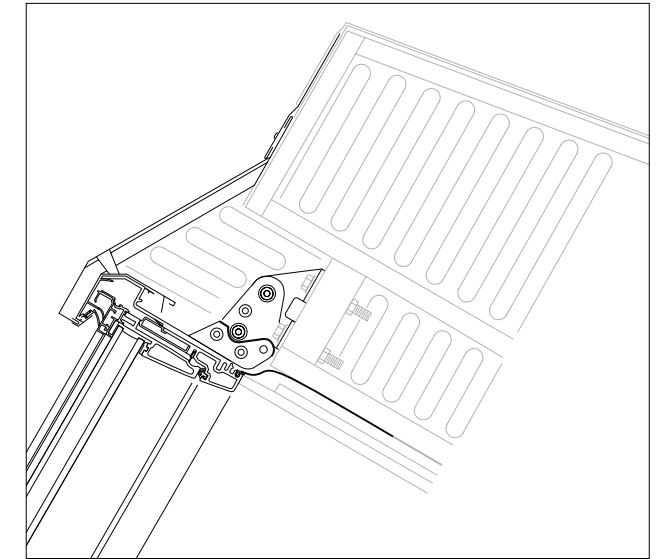
Read more about sub-construction for northlight at [velux.co.uk/modularskylights](http://velux.co.uk/modularskylights)

Northlight		HFC*		HVC*	
Pitch		40-90°		40-90°	
		Internal lining	Internal sub-construction	Internal lining	Internal sub-construction
Opening height	Min:	1166 mm	1279 mm	1166 mm	1279 mm
	Max:	2966 mm	3079 mm	2366 mm	2479 mm
Opening length	Min:	641 mm	805 mm	641 mm	805 mm
	Max:	∞ mm	∞ mm	∞ mm	∞ mm
Module height	Min:	1200 mm		1200 mm	
	Max:	3000 mm		2400 mm	

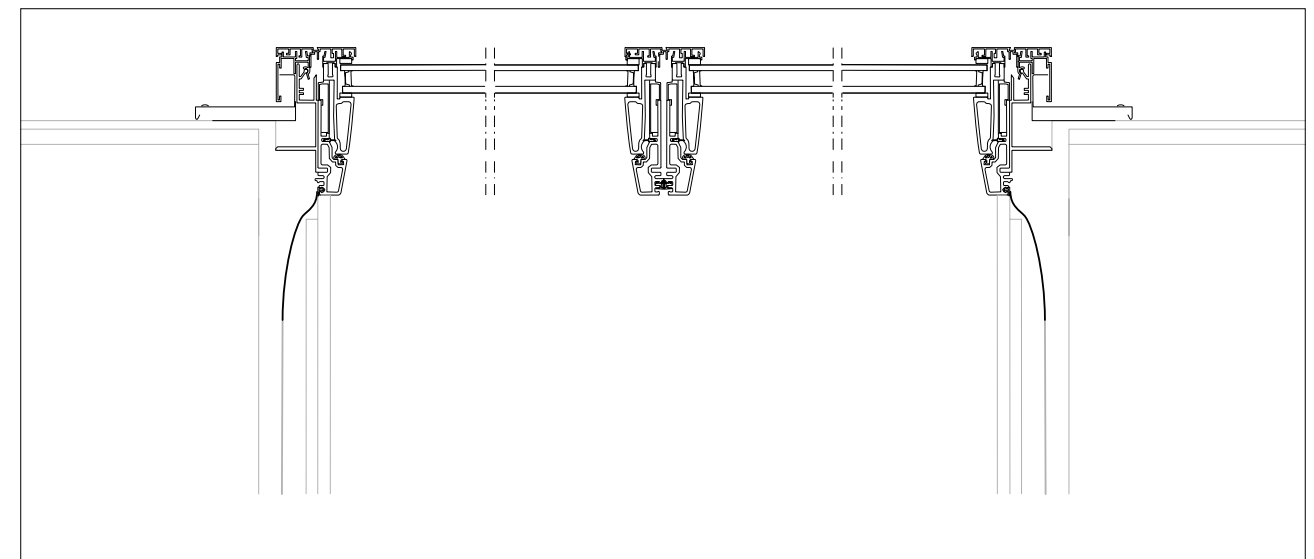
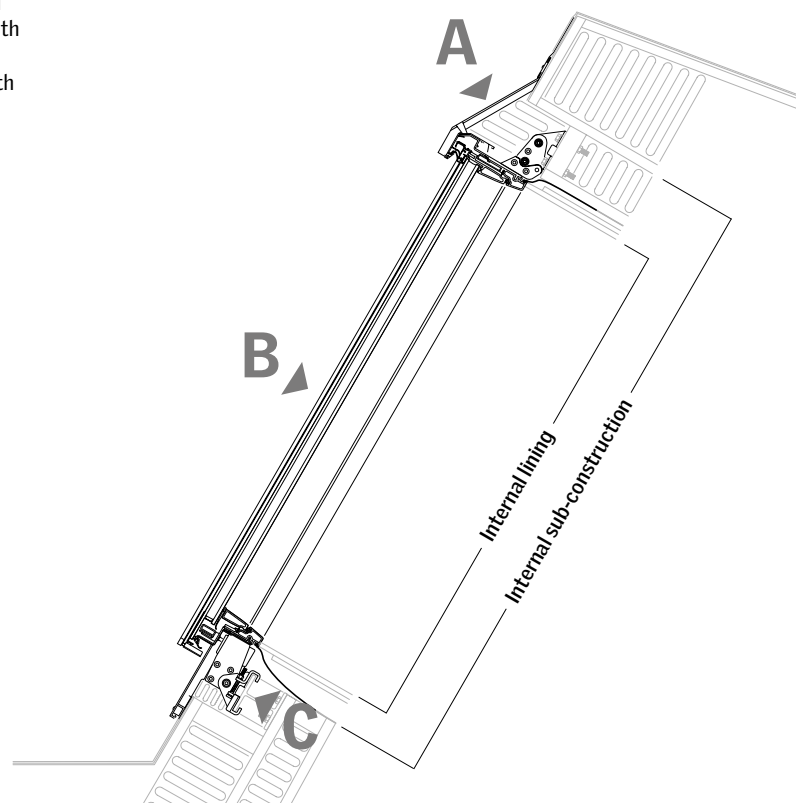
\* HFC = fixed modules, HVC = venting modules



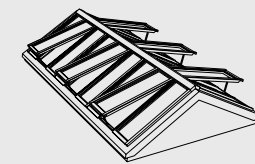
Cross section - bottom



Cross section - top



Longitudinal section



## Ridgelight 25 - 40°

Ridgelight is a classic looking solution, consisting of two rows of skylights that support each other in the ridge. The flashing allows for installations with a pitch of 25 to 40°.

### A Ridge

Mounted as a ridgelight in 25-40°, VELUX modular skylights link together at the ridge, creating a self-supporting structure.

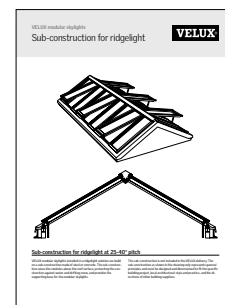
The ridge must be packed with insulating material and completed with a pre-fabricated aluminium cover.

### B Sub-construction

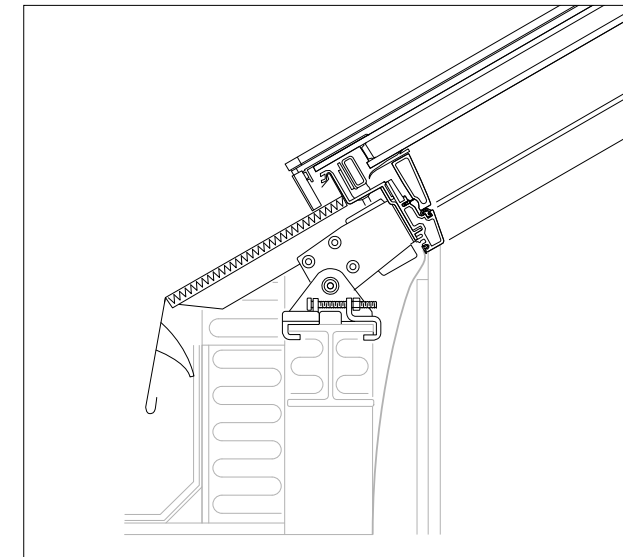
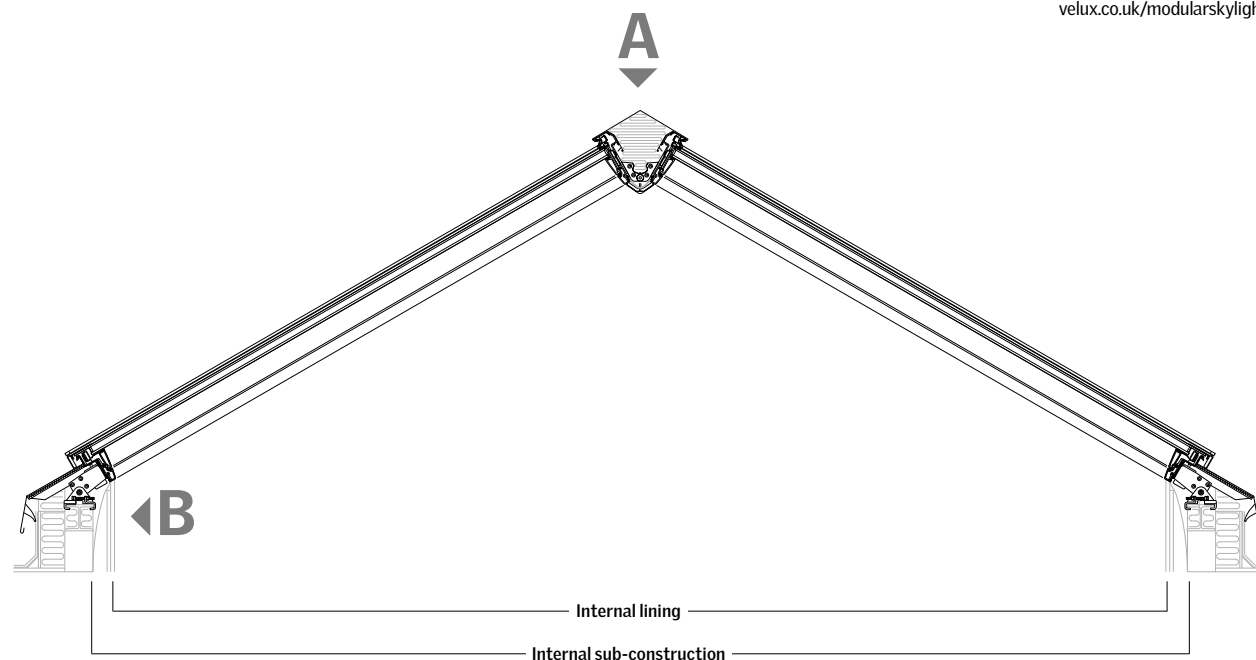
Due to horizontal forces, it is recommended to use a sub-construction of steel or concrete when mounting a ridgelight.

Ridgelight			
Pitch		25-40°	
		Internal lining	Internal sub-construction*
Opening width	Min:	1872 mm	1995 mm
	Max:	4385 mm	4534 mm
Opening length	Min:	641 mm	731 mm
	Max:	∞ mm	∞ mm
Module height	Min:	1200 mm	
	Max:	2400 mm	

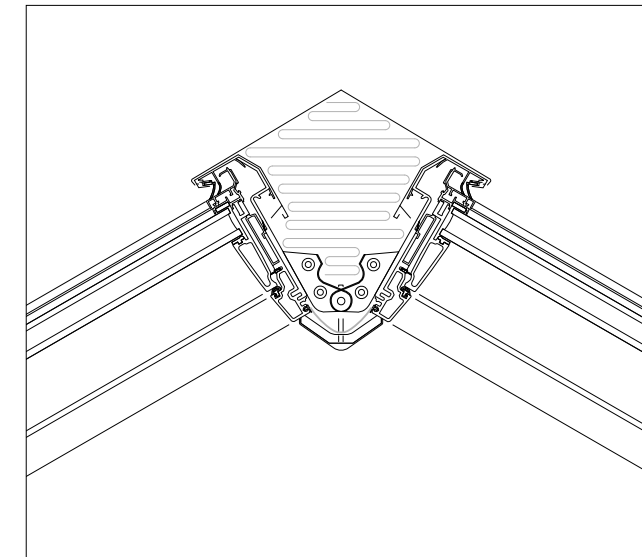
\* The dimensions in the table refer to a sub-construction made of steel. It is possible to cast a sub-construction in concrete, in which case other dimensions apply.



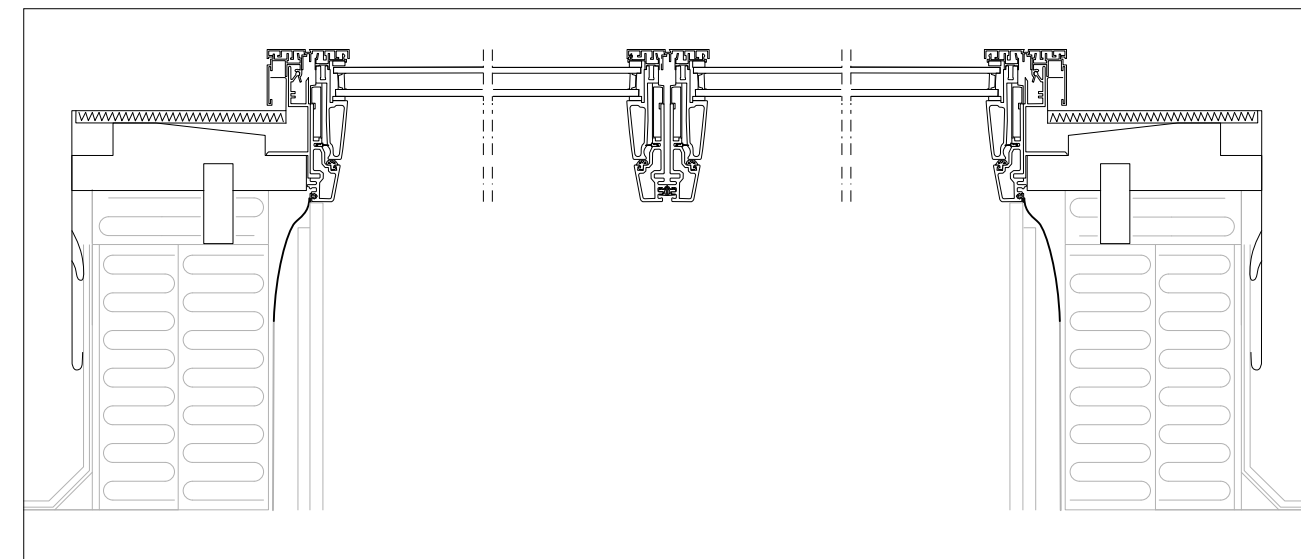
Read more about sub-construction for ridgelight at [velux.co.uk/modularskylights](http://velux.co.uk/modularskylights)



Cross section - bottom

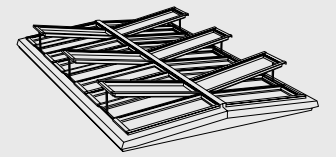


Cross section - top



Longitudinal section





## Ridgelight at 5° with Beam

Ridgelight at 5° pitch generates the illusion of a small glass roof with discreet transverse horizontal supporting beams. Ridgelight is mounted on a rail system that guarantees fast and secure installation.

### A Ridge

The modular skylights are attached to each other in the ridge with pre-fitted brackets.

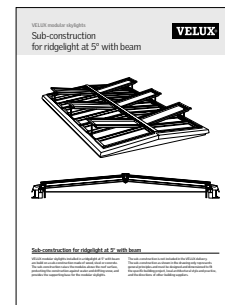
The ridge must be packed with insulating material and completed with a pre-fabricated aluminium cover.

### B Beam

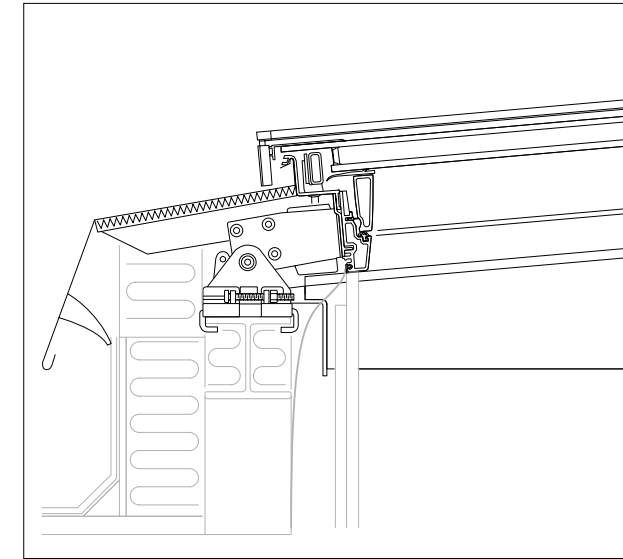
A prefabricated VELUX beam supports the skylights and creates the pitch of 5°. The beams are mounted on the sub-construction.

Ridgelight with 5° Beam			
Pitch		5°	
		Internal lining	Internal sub-construction*
Opening width	Min:	2424 mm	2581 mm
	Max:	6010 mm	6167 mm
Opening length	Min:	645 mm	811 mm
	Max:	∞ mm	∞ mm
Module height	Min:	1200 mm	
	Max:	3000 mm**	

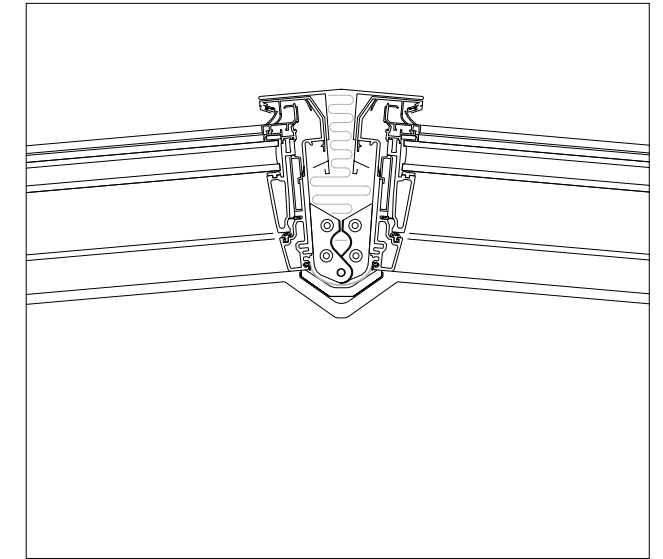
\* The dimensions in the table refer to a sub-construction made of steel or wood. It is possible to cast a sub-construction in concrete, in which case other dimensions apply.  
\*\* Up to 2400 mm when using HVC.



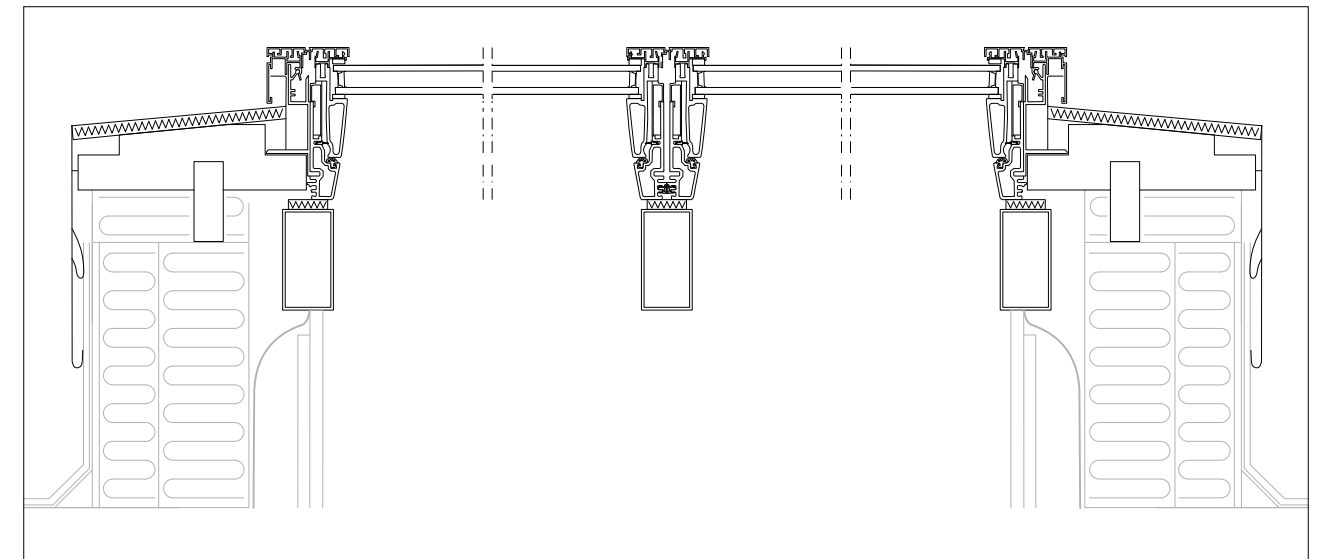
Read more about sub-construction for ridgelight at 5° with beam at [velux.co.uk/modularskylights](http://velux.co.uk/modularskylights)



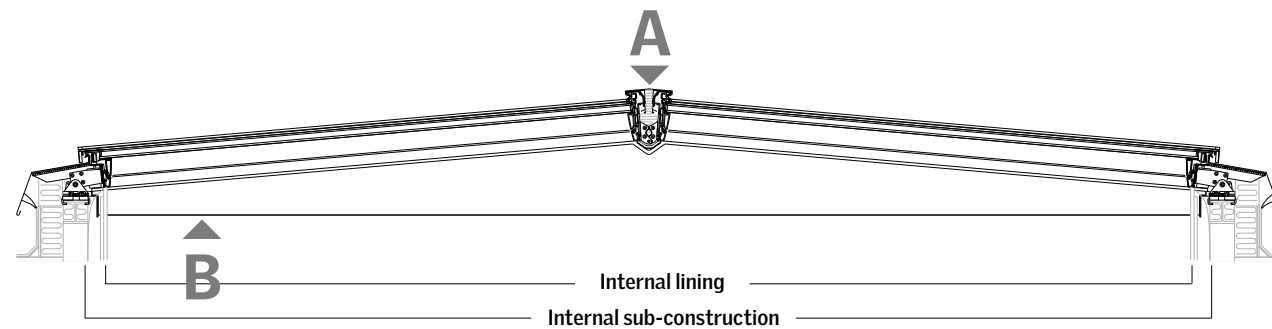
Cross section - bottom

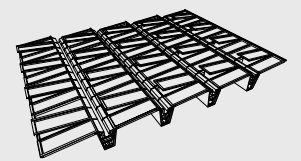


Cross section - top



Longitudinal section





## Atrium Longlight / Ridgelight

An atrium solution consists of several longlights or ridgelights attached to each other in the sub-construction. A drainage gutter separates each strip.

The supporting steel beams are not included in the VELUX delivery. The support structure is part of the primary structure of a building and will have to be designed by a structural engineer.

Atrium longlight		HFC*	HVC*
Pitch		5-25°	5-25°
Min distance between steel profiles		820 mm	820 mm
Min width of drainage gutter		400 mm	400 mm
Module height	Min:	1200 mm	1200 mm
	Max:	3000 mm	2400 mm

\* HFC = fixed modules, HVC = venting modules

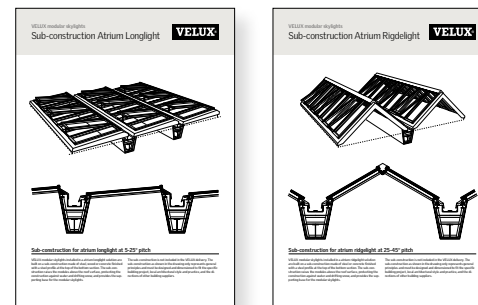
Atrium ridgelight		
Pitch		25-40°
Min distance between steel profiles		820 mm
Min width of drainage gutter		400 mm
Module height	Min:	1200 mm
	Max:	2400 mm

### A Atrium

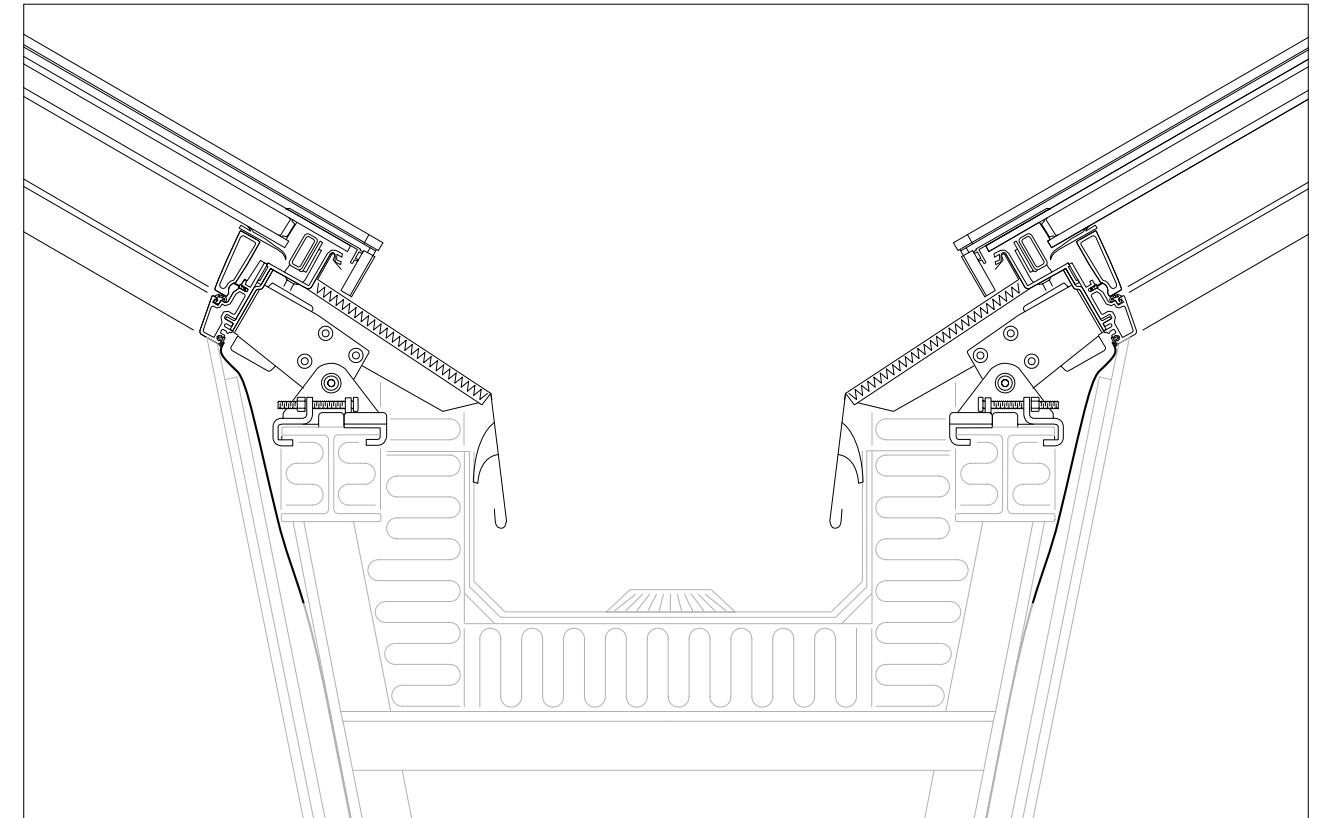
The distance between the skylights depends on thickness of insulation, width of drainage gutter and pitch of skylights. This example of an atrium is designed with 10 mm insulation and a 400 mm wide drainage gutter in a 5° pitch, resulting in a distance between skylights of 820 mm.

### B Supporting beams and gutter

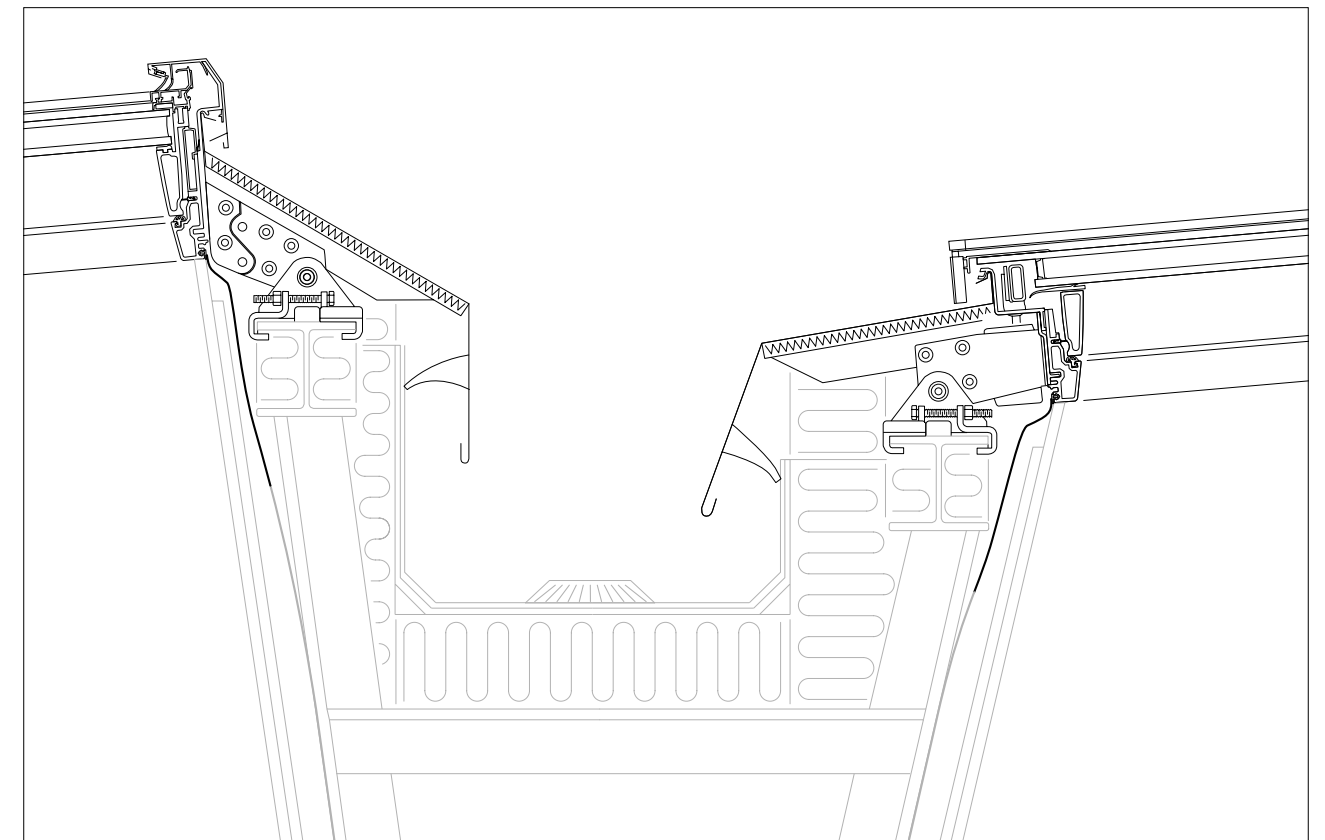
The material and design of the supporting beam and gutter are subject to constructional considerations and therefore not a VELUX component.



Read more about sub-construction for Atrium at [velux.co.uk/modularskylights](http://velux.co.uk/modularskylights)



Atrium Ridgelight



Atrium Longlight

50  
40  
30  
27  
20  
10  
9  
8  
7  
6  
5

12.5  
10  
6,75  
5.0  
2.5  
2.2  
2.0

**Class 1**

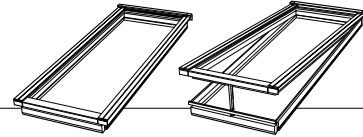
**Class 2**

**Class 3**

**Product Data**

Product	VELUX Skylight	Model	SKL 1000
Material	Aluminum	Color	White
Weight	15 kg	Dimensions	1000 x 1000 mm
Installation	Roof	Mounting	Flush
Warranty	10 years	Manufacturer	VELUX

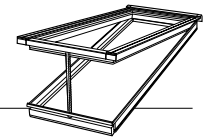
## Skylight Module



Essential characteristic performances for fixed and comfort venting skylight modules			
H-C -----		Harmonised technical specification EN 14351-1:2006+A1:2010	
Essential characteristics	Performance	§	NB #
Resistance to wind load*	class C5 <sup>1)</sup>	4.2	1235
Resistance to snow load	See your pane variant	4.3	-
Reaction to Fire**	ClassB	4.4.1	0845
External fire performance***	BROOF(t1) ; BROOF(t4)	4.4.2	-
Watertightness****	E900	4.5	1235
Impact resistance	NPD	4.7	-
Load-bearing capacity of safety devices	NPD <sup>2)</sup>	4.8	-
Acoustic performance	35 (-1; 6-) db	4.11	1004
Thermal transmittance	Double 1.4 W/m <sup>2</sup> K   Triple 1.0 W/m <sup>2</sup> K	4.12	1235
Solar factor	See your pane variant	4.13	0757
Light transmittance	See your pane variant	4.13	0757
Air permeability*****	class 4	4.14	1235

<sup>1)</sup> For skylight height > 2400 mm: class B5  
 For skylight width > 1000 mm and/or skylight height > 3000 mm: NPD  
<sup>2)</sup> No safety device on VELUX Modular Skylights

\* For explanation of test method and results, please refer to section of Wind Load  
 \*\* For explanation of test method and results, please refer to section of Reaction to Fire  
 \*\*\* For explanation of test method and results, please refer to section of External fire performance  
 \*\*\*\* For explanation of test method and results, please refer to section of Watertightness  
 \*\*\*\*\* For explanation of test method and results, please refer to section of Air Permeability

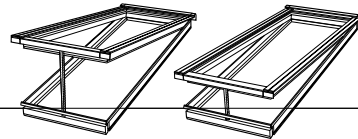


Essential characteristic performances for smoke venting skylight modules			
HVC -----A-		Harmonised technical specification EN 12101-2:2003	
Essential characteristics	Performance	§	NB #
Nominal activation system/sensitivity	passed	4.1 + 4.2	0402
Response delay (response time)	< 60 s	7.1.2	0402
Operational reliability	Re1000	7.1	0402
Aerodynamic free area A <sub>a</sub> [m <sup>2</sup> ]	Size	6	0402
	See ventilation tables		
Resistance to heat	B300	7.5	0402
Mechanical stability	Passed	7.5	0402
Opening under load	SL 750	7.2	0402
Low ambient temperature	T(-15)	7.3	0402
Stability under wind load	WL 3000	7.4	0402
Resistance to wind-induced vibration (where included)	-	7.4	-
Reaction to fire*	class B**	7.5.2.1	0845

\* For explanation of test method and results, please refer to section of Reaction to Fire  
 \*\* Variants with inner pane of 55.2 lamination have a sub-class s1-d0  
 Variants with inner pane of 33.2 and 44.2 lamination have a sub-class s1-d2

Product name	Product code	Product description
Product type	Product category	Product subcategory
Product version	Product status	Product date
Product manufacturer	Product distributor	Product contact

## Skylight Module

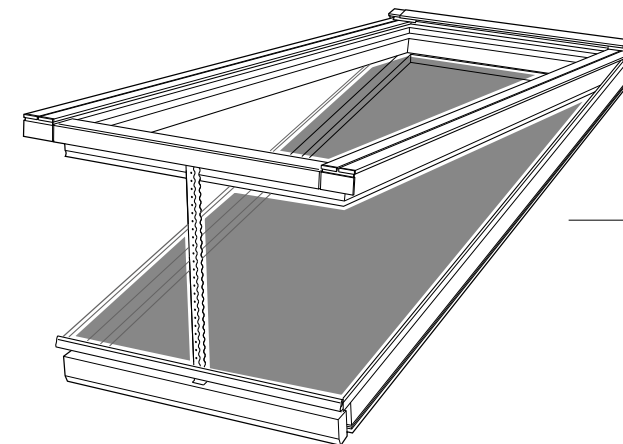
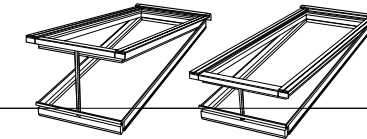


Ventilation characteristics for longlight and ridgelight modules								
Ventilation characteristics								
Size of skylight	Comfort ventilation (EN13141-1:2004) HVC-----C			Smoke ventilation NSHEV (EN12101-2:2003) HVC-----A				
	Chain stroke [mm]	Opening angle	Geometric free area: $A_c$ [m <sup>2</sup> ]	Chain stroke [mm]	Opening angle	$A_v \cdot C_{v0} = A_a$		
						Geometric area: $A_v$ [m <sup>2</sup> ]	Flow factor $C_{v0}$	Aerodynamic area: $A_a$ Roof [m <sup>2</sup> ]*
675 x 1200	317	14.9°	0.29	410	19.3°	0.74	0.24	0.18
675 x 1400	369	14.9°	0.41	410	16.5°	0.87	0.31	0.27
675 x 1600	410	14.5°	0.53	410	14.5°	1.00	0.36	0.36
675 x 1800	410	12.9°	0.57	410	12.9°	1.12	0.33	0.37
675 x 2000	410	11.6°	0.61	410	11.6°	1.25	0.31	0.39
675 x 2200	410	10.6°	0.65	410	10.6°	1.38	0.30	0.41
675 x 2400	410	9.7°	0.69	410	9.7°	1.51	0.32	0.48
750 x 1200	317	14.9°	0.31	460	21.6°	0.83	0.27	0.22
750 x 1400	369	14.9°	0.43	460	18.6°	0.97	0.32	0.31
750 x 1600	410	14.5°	0.55	460	16.3°	1.11	0.37	0.41
750 x 1800	410	12.9°	0.59	460	14.5°	1.25	0.37	0.46
750 x 2000	410	11.6°	0.64	460	13.0°	1.40	0.34	0.48
750 x 2200	410	10.6°	0.68	460	11.9°	1.54	0.32	0.49
750 x 2400	410	9.7°	0.72	460	10.9°	1.68	0.33	0.56
800 x 1200	317	14.9°	0.32	477	22.5°	0.88	0.23	0.20
800 x 1400	369	14.9°	0.44	530	20.6°	1.04	0.35	0.36
800 x 1600	410	14.5°	0.57	530	18.8°	1.19	0.42	0.50
800 x 1800	410	12.9°	0.61	530	16.7°	1.34	0.41	0.55
800 x 2000	410	11.6°	0.65	530	15.0°	1.50	0.39	0.58
800 x 2200	410	10.6°	0.69	530	13.7°	1.65	0.36	0.59
800 x 2400	410	9.7°	0.73	530	12.6°	1.80	0.37	0.67
900 x 1200	317	14.9°	0.34	477	22.5°	1.00	0.21	0.21
900 x 1400	369	14.9°	0.47	554	22.5°	1.17	0.34	0.40
900 x 1600	410	14.5°	0.60	610	21.6°	1.35	0.46	0.62
900 x 1800	410	12.9°	0.64	610	19.2°	1.52	0.47	0.71
900 x 2000	410	11.6°	0.68	610	17.3°	1.69	0.42	0.71
900 x 2200	410	10.6°	0.72	610	15.8°	1.86	0.40	0.75
900 x 2400	410	9.7°	0.76	N/A	N/A	N/A	N/A	N/A
1000 x 1200	317	14.9°	0.37	477	22.5°	1.11	0.18	0.20
1000 x 1400	369	14.9°	0.50	554	22.5°	1.31	0.31	0.41
1000 x 1600	410	14.5°	0.63	632	22.5°	1.50	0.44	0.66
1000 x 1800	410	12.9°	0.67	700	22.1°	1.69	0.52	0.88
1000 x 2000	410	11.6°	0.71	700	19.9°	1.89	0.47	0.89
1000 x 2200	410	10.6°	0.75	N/A	N/A	N/A	N/A	N/A
1000 x 2400	410	9.7°	0.79	N/A	N/A	N/A	N/A	N/A

Modules subject to snow load of SL 750

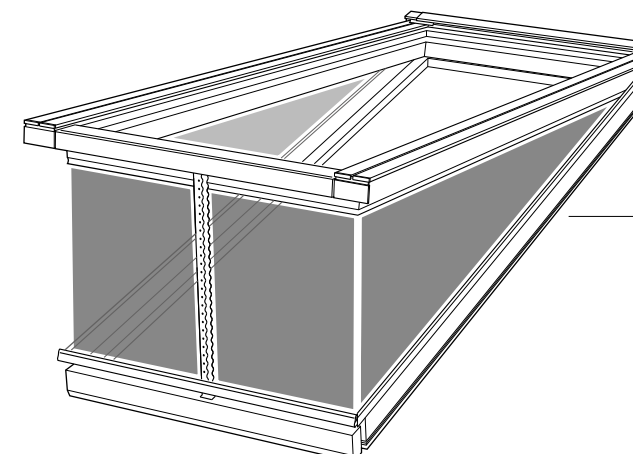
\* Wind direction dependent opening control required

## Skylight Module



Geometric free area:  $A_c$  [m<sup>2</sup>]

In accordance with EN 12101-2 : 2003

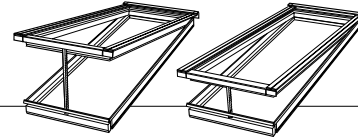


Geometric area:  $A_v$  [m<sup>2</sup>]

In accordance with EN 13141-1 : 2004

Product name	VELUX skylight modules
Product code	1000 x 2400
Product description	VELUX skylight modules
Product category	Skylight modules
Product weight	1000 x 2400
Product dimensions	1000 x 2400
Product material	VELUX skylight modules
Product color	VELUX skylight modules
Product finish	VELUX skylight modules
Product warranty	VELUX skylight modules
Product availability	VELUX skylight modules
Product website	VELUX skylight modules

## Skylight Module

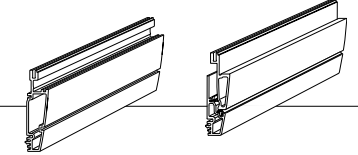


Ventilation characteristics for northlight modules								
Ventilation characteristics								
Size of skylight	Comfort ventilation (EN13141-1:2004) HVC -----CN			Smoke ventilation NSHEV (EN12101-2:2003) HVC-----AN				
	Chain stroke [mm]	Opening angle	Geometric free area: A <sub>c</sub> [m <sup>2</sup> ]	Chain stroke [mm]	Opening angle	A <sub>v</sub> · C <sub>v0</sub> = A <sub>a</sub>		
						Geometric area: A <sub>v</sub> [m <sup>2</sup> ]	Flow factor C <sub>v0</sub>	Aerodynamic area: A <sub>a</sub> Roof [m <sup>2</sup> ]*
675 x 1200	317	14.9°	0.29	317	15.0°	0.74	0.18	0.13
675 x 1400	369	14.9°	0.41	369	15.0°	0.87	0.28	0.24
675 x 1600	410	14.5°	0.53	410	14.6°	1.00	0.36	0.36
675 x 1800	410	12.9°	0.57	410	13.0°	1.12	0.34	0.38
675 x 2000	410	11.6°	0.61	410	11.7°	1.25	0.31	0.39
675 x 2200	410	10.6°	0.65	410	10.6°	1.38	0.30	0.41
675 x 2400	410	9.7°	0.69	410	9.8°	1.51	0.32	0.48
750 x 1200	317	14.9°	0.31	317	15.0°	0.83	0.16	0.13
750 x 1400	369	14.9°	0.43	369	15.0°	0.97	0.26	0.25
750 x 1600	410	14.5°	0.55	421	15.0°	1.11	0.36	0.40
750 x 1800	410	12.9°	0.59	460	14.5°	1.25	0.37	0.46
750 x 2000	410	11.6°	0.64	460	13.1°	1.40	0.34	0.48
750 x 2200	410	10.6°	0.68	460	11.9°	1.54	0.32	0.49
750 x 2400	410	9.7°	0.72	460	10.9°	1.68	0.33	0.56
800 x 1200	317	14.9°	0.32	317	15.0°	0.88	0.15	0.13
800 x 1400	369	14.9°	0.44	369	15.0°	1.04	0.25	0.26
800 x 1600	410	14.5°	0.57	421	15.0°	1.19	0.35	0.42
800 x 1800	410	12.9°	0.61	460	15.0°	1.34	0.38	0.51
800 x 2000	410	11.6°	0.65	525	15.0°	1.50	0.39	0.58
800 x 2200	410	10.6°	0.69	530	13.7°	1.65	0.36	0.59
800 x 2400	410	9.7°	0.73	530	12.6°	1.80	0.37	0.67
900 x 1200	317	14.9°	0.34	317	15.0°	1.00	0.13	0.13
900 x 1400	369	14.9°	0.47	369	15.0°	1.17	0.22	0.26
900 x 1600	410	14.5°	0.60	421	15.0°	1.35	0.32	0.43
900 x 1800	410	12.9°	0.64	460	15.0°	1.52	0.38	0.58
900 x 2000	410	11.6°	0.68	525	15.0°	1.69	0.38	0.64
900 x 2200	410	10.6°	0.72	578	15.0°	1.86	0.39	0.73
900 x 2400	410	9.7°	0.76	N/A	N/A	N/A	N/A	N/A
1000 x 1200	317	14.9°	0.37	317	15.0°	1.11	0.11	0.12
1000 x 1400	369	14.9°	0.50	369	15.0°	1.31	0.20	0.26
1000 x 1600	410	14.5°	0.63	421	15.0°	1.50	0.30	0.45
1000 x 1800	410	12.9°	0.67	460	15.0°	1.69	0.38	0.64
1000 x 2000	410	11.6°	0.71	525	15.0°	1.89	0.38	0.72
1000 x 2200	410	10.6°	0.75	N/A	N/A	N/A	N/A	N/A
1000 x 2400	410	9.7°	0.79	N/A	N/A	N/A	N/A	N/A

Modules subject to snow load of SL 750

\* Wind direction dependent opening control required

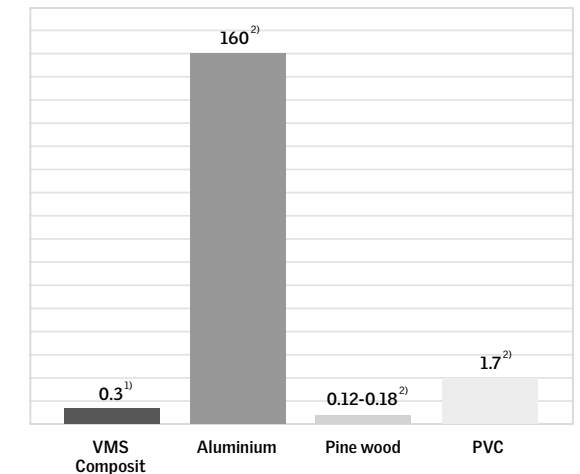
## Frame & Sash



### Pultruded composit performance

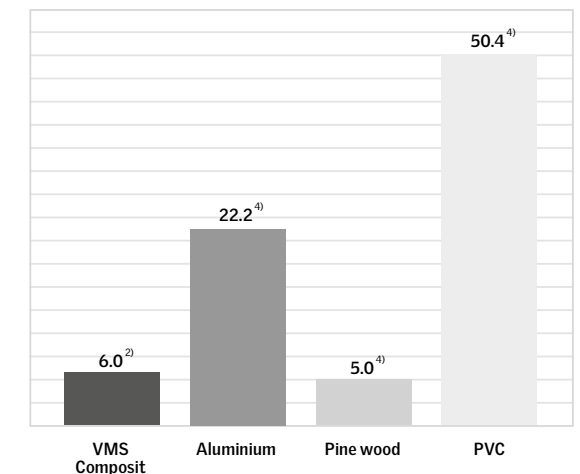
#### 1 Thermal conductivity (W/mk) – A low score means high insulation performance

Profiles used for VELUX modular skylights consist of an extremely low-conductive pultruded fibreglass and polyurethane composite.



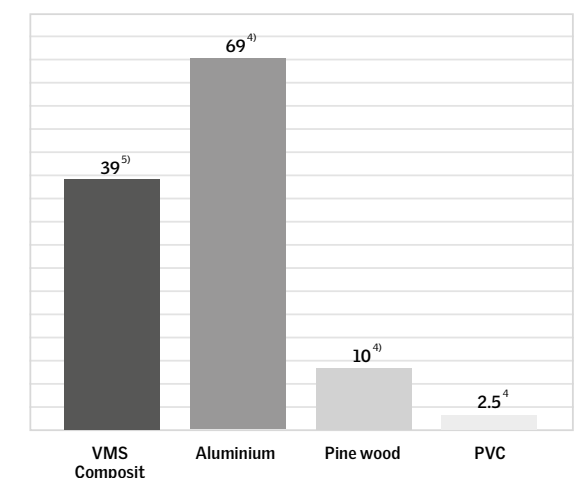
#### 2 Linear expansion coefficient (10<sup>-6</sup> m/m K) – A low score means high thermal stability

Whereas traditional skylight materials are bound to fluctuations in form due to thermal changes, the composite of VELUX modular skylights will maintain its dimensional properties, prolonging the expected lifetime of the application.



#### 3 E-Modulus (GPa) Modulus of elasticity – A high score means high strength

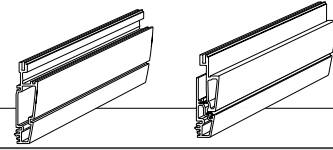
Material that combines low-conductive properties with high strength is normally hard to achieve. Thanks to the nature of the VELUX composite, we are able to unite the two characteristics, giving the slim profiles self-supporting strength and an ability to support installations of considerable size.



Source: <sup>1)</sup> Approved external test institute <sup>2)</sup> According to EN ISO 10077-2 <sup>3)</sup> Value identical to fibreglass <sup>4)</sup> www.engineeringtoolbox.com <sup>5)</sup> Internal VELUX test

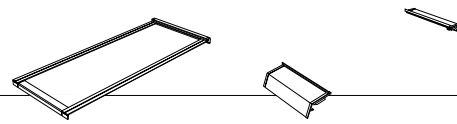
VELUX® Rooflights			
Product Name	Rooflight	Rooflight	Rooflight
Material	Aluminium	Aluminium	Aluminium
Material thickness	0.67 cm	0.67 cm	0.67 cm
Surface	Scratch resistant powder lacquer (60-120 my)	Scratch resistant powder lacquer (60-120 my)	Scratch resistant powder lacquer (60-120 my)
Colour	"Noir 2100 Sable YW" Akzo Nobel	"Noir 2100 Sable YW" Akzo Nobel	"Noir 2100 Sable YW" Akzo Nobel
Insulation material	EPS	EPS	EPS
Material thickness	10 mm	10 mm	10 mm
Wind and snow stop	Polyurethane foam	Polyurethane foam	Polyurethane foam

## Frame & Sash



Frame and Sash	
Material	Pultruded, composite (approx. 80% fibreglass and 20% polyurethane)
Material thickness	3-4 mm
Surface coating	Waterbased white coating
Colour	RAL colour 9010, gloss 30

## Cladding & Flashing



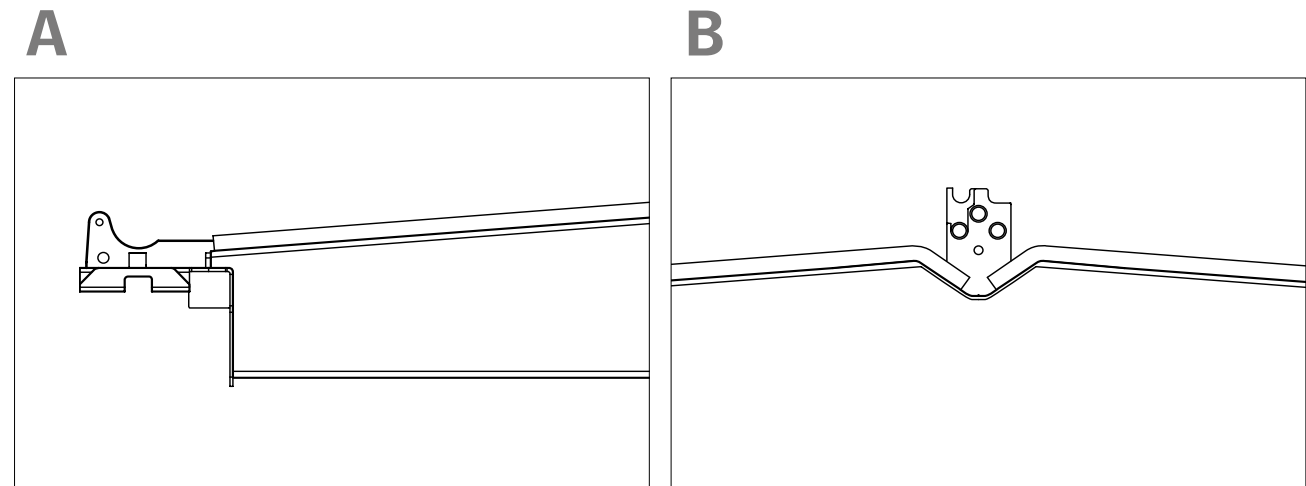
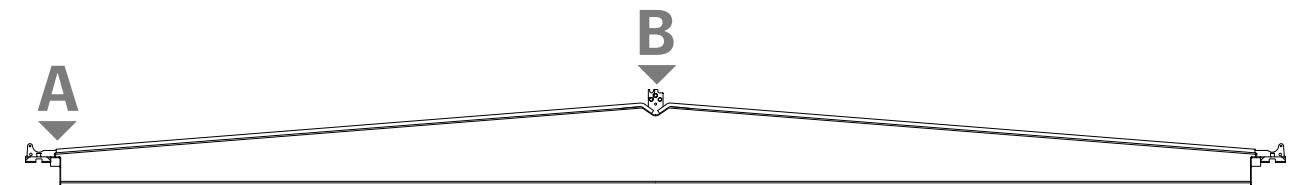
Cladding	
Material	Aluminium
Material thickness	0.67 cm
Surface	Scratch resistant powder lacquer (60-120 my)
Colour	"Noir 2100 Sable YW" Akzo Nobel

Flashing		
Flashing material	Aluminium	
Material thickness	0.8-1.2 mm	
Surface	Front: PVdt lacquer	Back: polyamid polyester lacquer
Colour	Front: NCS standard colour: S 7500-N (RAL 7043)	
Insulation material	EPS	
Material thickness	10 mm	
Wind and snow stop	Polyurethane foam	

## Beam for Ridgelight at 5°

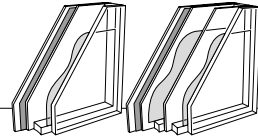


Material	Steel
Material thickness	3 mm
Construction	Hollow beam
Surface	Painted with white primer RAL 9003
Foam gasket on beam	15 mm



Product name	VELUX	Product code	VELUX
Product description	VELUX	Product description	VELUX
Product type	VELUX	Product type	VELUX
Product category	VELUX	Product category	VELUX
Product version	VELUX	Product version	VELUX
Product status	VELUX	Product status	VELUX
Product date	VELUX	Product date	VELUX
Product location	VELUX	Product location	VELUX
Product manufacturer	VELUX	Product manufacturer	VELUX
Product distributor	VELUX	Product distributor	VELUX
Product contact	VELUX	Product contact	VELUX

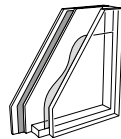
## Glazing Unit



Double/ Triple glazing	Coating	IGU	IGU	U <sub>g</sub>	τ <sub>v</sub>	g	IGU R <sub>w</sub> (C, Ctr)	Total solar energy direct absorption
		Construction (outside - inside)	code	W/m <sup>2</sup> K	%	%	dB	%
Double glazing	LowE	8H-20Argon-33.2F LowE	10	1.1	77	58	37 (-2;-5)	29
	Sun1	8H Sun1-20Argon-33.2F	11	1.1	49	27	37 (-2;-5)	31
	Sun2	8H Sun2-20Argon-33.2F	12	1.1	19	16	37 (-2;-5)	42
Triple glazing	LowE	8H LowE-12 Argon-8HS-12Argon-33.2F LowE	16	0.7	66	45	39 (-3;-6)	43
	Sun1	8H Sun1-12 Argon-8HS-12Argon-33.2F LowE	17	0.7	43	25	39 (-3;-6)	57
	Sun2	8H Sun2-12 Argon-8HS-12Argon-33.2F LowE	18	0.7	16	13	39 (-3;-6)	57
Double glazing	LowE	8H-16Argon-55.2F LowE	10T	1.1	77	58	41 (-1;-4)	35
	Sun1	8H Sun1-16Argon-55.2F	11T	1.1	48	27	41 (-1;-4)	35
	Sun2	8H Sun2-16Argon-55.2F	12T	1.1	18	16	41 (-1;-4)	45
Triple glazing	LowE	8H LowE-12 Argon-4HS-12Argon-55.2HS LowE	16T	0.7	64	44	42 (-2;-6)	45
	Sun1	8H Sun1-12 Argon-4HS-12Argon-55.2HS LowE	17T	0.7	42	24	42 (-2;-6)	59
	Sun2	8H Sun2-12 Argon-4HS-12Argon-55.2HS LowE	18T	0.7	15	13	42 (-2;-6)	60

<sup>1)</sup> Production height for calculation of climatic load is from 0 to 300 meter above sea level.

<sup>2)</sup> C and Ctr are spectrum adaptations considering when noise level measured as single value it is done according to a definite spectrum. When certain type traffic noises also present then the normal spectrum of values are not representative enough and correction of values has to be used (C; Ctr)



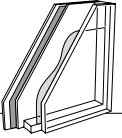
Fire resistant glazing units						
Double	Coating	IGU	IGU	U <sub>g</sub>	τ <sub>v</sub>	g
		Construction (outside - inside)	code	W/m <sup>2</sup> K	%	%
Double glazing	LowE	6H LowE-9Krypton - 5H - Int.6 - 44.2F	10U	1.0	74	56
	Sun1	6H Sun1-9Krypton - 5H - Int.6 - 44.2F	11U	1.0	64	40
	Sun2	6H Sun2-9Krypton - 5H - Int.6 - 44.2F	12U	1.0	57	32

Pane coatings	
LowE	Low energy pane
Sun1	Light sun protection
Sun2	Advanced sun protection

<sup>3)</sup> It is up to the customer to verify the chosen glazing unit against the project specific conditions following the national requirement.

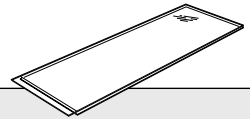
Production height for calculation of climatic load is from 0 to 300 m above sea level.

## Glazing Unit



Description	Explanation	Characteristic bending strength
H	Toughened	120,0 N/mm <sup>2</sup>
HS	Heat strengthened	70,0 N/mm <sup>2</sup>
F	Float	45,0 N/mm <sup>2</sup>
Int	Inter layer (Fire Gel)	-

Figures is according to DIN 18008



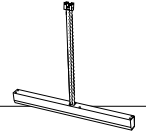
Example of glazing unit construction	
From inside - outside	
IGU 16	8H LowE-12 Argon-8HS-12Argon-33.2F LowE
8H	8 mm pane with toughened glass
LowE	Low energy coating
12 Argon	12 mm argon filled cavity
8HS	8 mm pane with heat strengthened glass
12 Argon	12 mm argon filled cavity
33.2F	Laminated float glass pane, 3 + 3 mm, 2 x 0,38 mm PVB
LowE	Low energy coating

It is up to the customer to verify the chosen glazing unit against the project specific conditions following the national requirement.



Model	Accessories	Dimensions	Weight
...	...	...	...

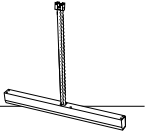
## Chain Actuator



VELUX INTEGRA®	
Material	Anodised aluminium housing with zinc cromate passivated steel chain
Weight	Max 5.5 kg
Control system	VELUX INTEGRA®
Supply cable*	0.3 m silicone cable, 4 cord, 0,75 mm <sup>2</sup> (white, brown, black, red)
Chain stroke	Up to 410 mm (depending on module size)
Opening speed	4 mm/s
Sound level	TBD
Holding force (tractive)	5000 N (burglary strength) min.
Pressure force	1000 Newton
Tractive force	500 Newton
Operation conditions	-5°C - +75°C, max. 90% relative humidity (not condensing)
Nominal voltage**	24 V DC
Power consumption	Max. 200 W (peak)
Service	It is recommended to carry out a function test of the actuator at least once a year and to make sure that the skylight opens correctly
CE marking	The product is tested with the VELUX KLC 400 control units and complies with the EMC directive's requirements for use in residential, commercial and light commercial buildings
Reservation	The VELUX Group reserve the right to technical changes

\* The supply cable is only for connection with VELUX control unit KLC 400.  
 \*\* Supplied by VELUX control unit KLC 400

## Chain Actuator



Open system	
Material	Anodised aluminium housing with zinc cromate passivated steel chain
Weight	Max 5.5 kg
Control system	MotorLink™ or ±24 V DC*
Supply cable**	5 m grey silicone cable, 3 cord, 0.75 mm <sup>2</sup> (white brown green***)
Chain stroke	Up to 700 mm (depending on module size)*
Opening speed	13 mm/s (full load)*
Sound level	32 dB (min speed)****
Holding force (tractive)	5000 N (burglary strength) min
Pressure force	1000 Newton*
Tractive force	300-1000 Newton*
IP rating	IPX4
Operation conditions	-5°C - +75°C, max. 90% relative humidity (not condensing)
Nominal voltage	24 V DC (max 10% ripple)
Voltage	19-32 V DC
Max Voltage	32 V DC
Switch-on-duration	ED max 20% (2 minutes per 10 minutes)
Current consumption	Max. 5A for smoke ventilation, nominal max. 4A for comfort ventilation
Service	It is recommended to carry out a function test of the actuator at least once a year and to make sure that the skylight opens correctly
CE marking	The product is tested with the original WindowMaster control units and complies with the EMC directive's requirements for use in residential, commercial and light commercial buildings
Reservation	The VELUX Group reserve the right to technical changes

\* Can be altered by a trained technician via MotorLink™  
 \*\*At standard ± 24 V DC connection maximum distances from venting skylight to power supply in accordance to calculation:

$$\text{Max cable length} = \frac{(\text{admissible voltage drop (UL)} \times \text{conductivity of copper (56)} \times \text{cable cross section (a)})}{(\text{total max.actuator current (I)} \text{ in amps} \times 2)}$$

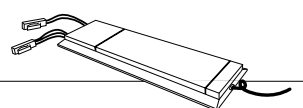
At MotorLink™ (3 cord) connection maximum distances from roller blind to motor controller (power supply) is 50 m.  
 \*\*\*Green = communication wire  
 \*\*\*\* The sound level can vary depending on the opening speed and building conditions

Maximum drive time for comfort ventilation		
Module length	Chain length [mm]	Drive time [sec]
1000	264	20
1200	317	24
1400	369	28
1600	410	32
1800	410	32
2000	410	32
2200	410	32
2400	410	32

When using a smoke venting skylight module (HVC- A) for comfort ventilation also, the chain stroke must be limited by the drive time in order to prolong lifetime expectancy of the module. The drive time must be limited according to this table.

Product	VELUX INTEGRA®	VELUX INTEGRA®	VELUX INTEGRA®
Material	Polyester	Polyester	Polyester
Wire	Stainless steel	Stainless steel	Stainless steel
Control bar	Anodized aluminium	Anodized aluminium	Anodized aluminium
Top pulley wheels	Stainless steel	Stainless steel	Stainless steel
Colours (cloth)	Grey, black and white	Grey, black and white	Grey, black and white
Weight	Max 3.4 kg	Max 3.4 kg	Max 3.4 kg
Installation	Please see installation instructions	Please see installation instructions	Please see installation instructions
Compability	All VELUX modular skylights with VELUX INTEGRA® control system	All VELUX modular skylights with VELUX INTEGRA® control system	All VELUX modular skylights with VELUX INTEGRA® control system
Control system	VELUX INTEGRA®	VELUX INTEGRA®	VELUX INTEGRA®
Supply cable	0.3 m silicone cable, 4 cord, 0,75 mm² (white, brown, black, red)	0.3 m silicone cable, 4 cord, 0,75 mm² (white, brown, black, red)	0.3 m silicone cable, 4 cord, 0,75 mm² (white, brown, black, red)
Running speed	70 mm/sec	70 mm/sec	70 mm/sec
Sound level	TBD	TBD	TBD
Operating conditions	-5°C - +75°C, max. 90% relative humidity (not condensing)	-5°C - +75°C, max. 90% relative humidity (not condensing)	-5°C - +75°C, max. 90% relative humidity (not condensing)
Nominal voltage	24 V DC	24 V DC	24 V DC
Power consumption			
Service	It is recommended to carry out a function test of the actuator at least once a year and to make sure that the skylight opens correctly	It is recommended to carry out a function test of the actuator at least once a year and to make sure that the skylight opens correctly	It is recommended to carry out a function test of the actuator at least once a year and to make sure that the skylight opens correctly
CE marking	The product is tested with the VELUX KLC 400 control units and complies with the EMC directive's requirements for use in residential, commercial and light commercial buildings	The product is tested with the VELUX KLC 400 control units and complies with the EMC directive's requirements for use in residential, commercial and light commercial buildings	The product is tested with the VELUX KLC 400 control units and complies with the EMC directive's requirements for use in residential, commercial and light commercial buildings
Reservation	The VELUX Group reserve the right to technical changes	The VELUX Group reserve the right to technical changes	The VELUX Group reserve the right to technical changes
Light values*	Grey: Reflection 20 % Transmission 10% Absorption 70 %	Black: Reflection 20 % Transmission 10% Absorption 70 %	White: Reflection 50 % Transmission 45% Absorption 5 %
	White, fire resistant: Reflection 60% Transmission 40% Absorption 0%	White, fire resistant: Reflection 60% Transmission 40% Absorption 0%	White, fire resistant: Reflection 60% Transmission 40% Absorption 0%

## Control System



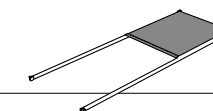
KLC 400	
Material and colour	Black fire resistant polycarbonate
Size and weight	Product including packaging: 587 mm x 80 mm x 166 mm (W x H x D) 2.0 kg Control unit: 380 mm x 36 mm x 87 mm (W x H x D) 1.5 kg
Installation	24 V DC SELV class III construction output. The control unit is for use in small/medium installations with VELUX modular skylights. The control unit is installed under the front flashing of VELUX modular skylights and functions at temperatures between -15°C and +50°C. ta = 40°C It is equipped with a 10 m 2-core cable (2 x 1,5mm <sup>2</sup> H05VV-F) and plug for connection to the mains supply. Radio frequency range: 300 m range open field. Depending on the building construction, the indoor range is approximately 30 m.
IP rating	IPX4
Power consumption	Primary side: 230/240 V AC - 50 Hz / 200W Secondary side: 24 V DC - 5 A class III construction output.
Connection	The control unit is only to be used with VELUX modular skylights and VELUX roller blinds RMM. The control unit can supply power to one venting skylight module and/or up to four roller blinds RMM. The connection wires are prefitted with wire-to-wire connectors.
Compatibility	KLC 400 is based on radio frequency (RF) technology and signals are transmitted in the 868 MHz range. It is compatible with products with the io-homecontrol® logo and can be used with VELUX modular skylights chain actuator and roller blinds RMM. VELUX electrical products connected to KLC 400 can be operated by io-homecontrol® compatible activation controls.
CE marking	CE marked to indicate that it is in accordance with the following EU directives: CPR, LVD, MD, RoHS, WEEE, R&TTE, Packaging waste directive and EMC for household, trade and light industry. Combinations of VELUX electrical products meet the requirements of above-mentioned directives.
Note	VELUX reserve the right to make technical changes.



KLR 200	
Material and colour	ABS, white (NCS S 1000-N), black (RAL 9005) and metallic grey
Size and weight	Product including packaging: 235 x 153 x 48 mm (W x H x D), 250 g Control pad: 95 x 95 x 23 mm (W x H x D), 180 g
Use	For indoor use, maximum ambient temperature 50 °C Radio frequency range: 200 m range open field. Depending on the building construction, the indoor range is approximately 20 m
Power consumption	3 x Alkaline AA (1.5 V) batteries Expected battery lifetime: Approximately 1 year
Compatibility	Based on radio frequency (RF) technology, transmitted in 868 MHz range. Compatible with products with the io-homecontrol® logo. Can be used with all VELUX INTEGRA® and VELUX INTEGRA® Solar products.
CE marking	This product has been CE-marked to indicate that it is in accordance with relevant EU directives. The product has been tested with other genuine VELUX INTEGRA® products and together with these it meets the requirements of the LVD and EMC directive for household, trade and light industry.
Note	This product has been designed for use with genuine VELUX products. The connection to other products may cause damage or malfunction. VELUX Group reserve the right to make technical changes.
CE marking	CE marked to indicate that it is in accordance with the following EU directives: CPR, LVD, MD, RoHS, WEEE, R&TTE, Packaging waste directive and EMC for household, trade and light industry. Combinations of VELUX electrical products meet the requirements of above-mentioned directives.
Note	VELUX reserve the right to make technical changes.

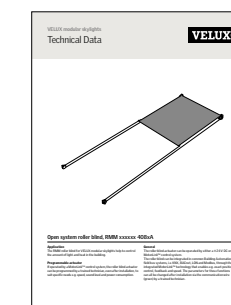
<sup>1)</sup> Modules can be operated by any kind of sensor e.g thermostat, CO<sub>2</sub>, lux that can give a potential free signal by connecting it to a KLF 100 interface.

## Roller Blind



VELUX INTEGRA®		
Materials (visible parts)	Fabric	Polyester
	Wire	Stainless steel
	Control bar	Anodized aluminium
	Top pulley wheels	Stainless steel
Colours (cloth)	Grey, black and white	
Weight	Max 3.4 kg	
Installation	Please see installation instructions	
Compability	All VELUX modular skylights with VELUX INTEGRA® control system	
Control system	VELUX INTEGRA®	
Supply cable	0.3 m silicone cable, 4 cord, 0,75 mm <sup>2</sup> (white, brown, black, red)	
Running speed	70 mm/sec	
Sound level	TBD	
Operating conditions	-5°C - +75°C, max. 90% relative humidity (not condensing)	
Nominal voltage	24 V DC	
Power consumption		
Service	It is recommended to carry out a function test of the actuator at least once a year and to make sure that the skylight opens correctly	
CE marking	The product is tested with the VELUX KLC 400 control units and complies with the EMC directive's requirements for use in residential, commercial and light commercial buildings	
Reservation	The VELUX Group reserve the right to technical changes	
Light values*	Grey:	Reflection 20 % Transmission 10% Absorption 70 %
	Black:	Reflection 20 % Transmission 10% Absorption 70 %
	White:	Reflection 50 % Transmission 45% Absorption 5 %
	White, fire resistant:	Reflection 60% Transmission 40% Absorption 0%

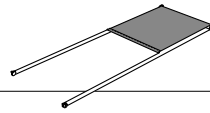
\* Tolerance +/-5



For separate datasheet on roller blind please refer to [velux.co.uk/modularskylights](http://velux.co.uk/modularskylights)

Product name	VELUX	Model	1000
Product code	1000	Accessories	1000
Product description	VELUX 1000		
Product dimensions	1000	1000	1000
Product weight	1000	1000	1000
Product material	1000	1000	1000
Product finish	1000	1000	1000
Product color	1000	1000	1000
Product warranty	1000	1000	1000
Product safety	1000	1000	1000
Product compliance	1000	1000	1000
Product certification	1000	1000	1000
Product testing	1000	1000	1000
Product installation	1000	1000	1000
Product maintenance	1000	1000	1000
Product disposal	1000	1000	1000

## Roller Blind



Open system		
Materials (visible parts)	Fabric	Polyester
	Wire	Stainless steel
	Control bar	Anodized aluminium
	Top pulley wheels	Stainless steel
Colours (cloth)	Grey, black and white	
Weight	Max 3.4 kg	
Installation	See installation instruction	
Compability	All VELUX modular skylights with open system control	
Control system	MotorLink™ or ±24 V DC	
Supply cable*	50 cm grey silicone cable, 3 cord, 0.75 mm <sup>2</sup> (white, brown, green**)	
Running speed	30-70 mm/sec***	
Sound level	TBD	
IP rating	IPX0	
Operating conditions	-5°C - +75°C, max 90 % relative humidity (not condensing)	
Nominal voltage	24 V DC (max 10 % ripple)	
Voltage	19-32 V DC	
Max. voltage	32 V DC	
Switch-on-duration	ED max 20 % (2 minutes per 10 minutes)	
Current consumption	Max 1A	
Service	It is recommended to carry out a function test of the roller blind at least once a year and to make sure that the roller blind runs correctly	
CE marking	The product is tested with the original WindowMaster control units and complies with the EMC directive's requirements for use in residential, commercial and light commercial buildings	
Reservation	The VELUX Group reserve the right to technical changes	

\* At standard ± 24 V DC connection maximum distances from roller blind to power supply in accordance to calculation:

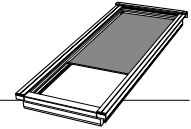
$$\text{Max.cable length} = \frac{\text{admissible voltage drop (UL)} \times \text{conductivity of copper (56)} \times \text{cable cross section (a)}}{\text{total max.actuator current (I)} \text{ in amps} \times 2}$$

At MotorLink™ (3 cord) connection maximum distances from roller blind to motor controller (power supply) is 50 m.

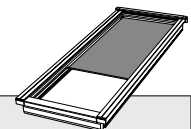
\*\*Green = communication wire for MotorLink™

\*\*\* Can be altered by a trained technician via MotorLink™

## Roller Blind



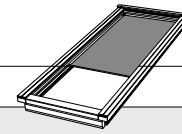
Roller blind effects on double-glazing unit									
Pane variant	10			11			12		
	g-value	T-value	Fc-value	g-value	T-value	Fc-value	g-value	T-value	Fc-value
Without RMM	0.58	0.77	1.0	0.27	0.49	1.0	0.16	0.19	1.0
With RMM									
White (4083)	0.39	0.35	0.67	0.19	0.24	0.70	0.13	0.09	0.81
Grey (4084)	0.47	0.08	0.81	0.24	0.05	0.89	0.15	0.02	0.94
Black (4085)	0.50	0.04	0.86	0.26	0.02	0.96	0.16	0.01	1.00
White, fire resistant (4094)	0.38	0.33	0.66	0.19	0.23	0.70	0.13	0.08	0.81



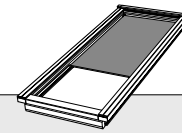
Roller blind effects on double-glazing unit									
Pane variant	10T			11T			12T		
	g-value	T-value	Fc-value	g-value	T-value	Fc-value	g-value	T-value	Fc-value
Without RMM	0.58	0.77	1.0	0.27	0.48	1.0	0.16	0.18	1.0
With RMM									
White (4083)	0.39	0.34	0.67	0.19	0.24	0.70	0.13	0.09	0.81
Grey (4084)	0.47	0.08	0.81	0.24	0.05	0.89	0.15	0.02	0.94
Black (4085)	0.50	0.04	0.86	0.26	0.02	0.96	0.16	0.01	1.00
White, fire resistant (4094)	0.38	0.32	0.66	0.19	0.22	0.70	0.13	0.08	0.81

Product name	VELUX	Product code	12000000000000000000
Product description	VELUX	Product description	VELUX
Product group	VELUX	Product group	VELUX
Product category	VELUX	Product category	VELUX
Product subcategory	VELUX	Product subcategory	VELUX
Product type	VELUX	Product type	VELUX
Product version	VELUX	Product version	VELUX
Product status	VELUX	Product status	VELUX
Product date	VELUX	Product date	VELUX

## Roller Blind



Roller blind effects on triple-glazing unit									
Pane variant	16			17			18		
	g-value	T-value	Fc-value	g-value	T-value	Fc-value	g-value	T-value	Fc-value
Without RMM	0.45	0.66	1.0	0.25	0.43	1.0	0.13	0.16	1.0
With RMM									
White (4083)	0.35	0.31	0.78	0.19	0.21	0.76	0.11	0,08	0.85
Grey (4084)	0.42	0.07	0.93	0.22	0.04	0.88	0.13	0.02	1,00
Black (4085)	0.44	0.03	0.98	0.24	0.02	0.96	0.13	0.01	1.00
White, fire resistant (4094)	0.34	0.29	0.76	0.18	0.19	0.72	0.11	0.07	0.85



Roller blind effects on triple-glazing unit									
Pane variant	16T			17T			18T		
	g-value	T-value	Fc-value	g-value	T-value	Fc-value	g-value	T-value	Fc-value
Without RMM	0.44	0.66	1.0	0.24	0.42	1.0	0.13	0.15	1.0
With RMM									
White (4083)	0,33	0.31	0.75	0.19	0.21	0.79	0.11	0.08	0.85
Grey (4084)	0.41	0.07	0.93	0.23	0.05	0.96	0.13	0.02	1.00
Black (4085)	0.43	0.03	0.98	0.24	0.02	1.00	0.13	0.01	1.00
White, fire resistant (4094)	0.33	0.29	0.75	0.19	0.20	0.79	0.11	0.07	0.85

### g-value:

"The total transmitted fraction of the incident solar radiation consisting of direct transmitted solar radiation and the part of the absorbed solar radiation transferred by convection and thermal radiation to the internal environment." (EN 13363-2:2005)

"The fraction of the incident solar radiation that is totally transmitted by the glass." (EN 410:2011)

The g-value (total solar energy transmittance) is a measure of how much solar energy that is transmitted through the construction in the cooling period.

The g-value is defined as the ratio between the solar energy transmitted through the glazing and the incident solar gain on the glazing.

### T-value:

"The transmitted fraction of the incident solar radiation in the visible part of the solar spectrum, see EN 410:2011." (EN 13363-2:2005)

"The fraction of incident light that is transmitted by the glass." (EN 410:2011)

### Fc-value:

"The shading factor, F<sub>c</sub>-value, is the ratio of the solar factor of the combined glazing and solar protection device, g<sub>tot</sub>, to that of the glazing alone, g. F<sub>c</sub>=g<sub>tot</sub>/g

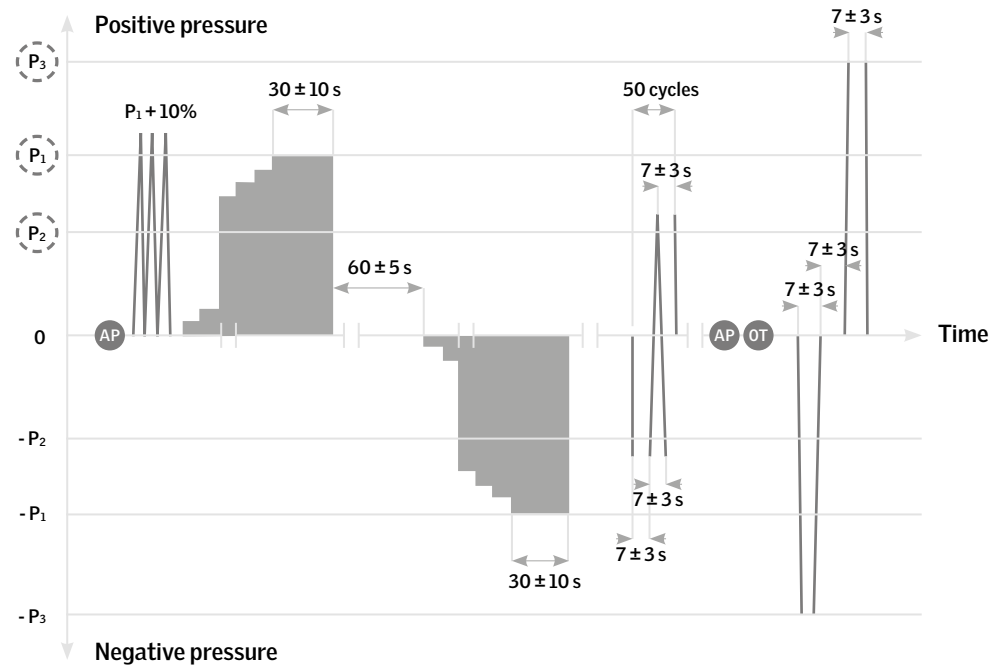
Note: in some countries, F<sub>c</sub> is known as z." (EN 14501:2005)

Product	VELUX modular skylights	Accessories	VELUX modular skylights
Accessories	VELUX modular skylights	Accessories	VELUX modular skylights
Accessories	VELUX modular skylights	Accessories	VELUX modular skylights
Accessories	VELUX modular skylights	Accessories	VELUX modular skylights
Accessories	VELUX modular skylights	Accessories	VELUX modular skylights
Accessories	VELUX modular skylights	Accessories	VELUX modular skylights
Accessories	VELUX modular skylights	Accessories	VELUX modular skylights
Accessories	VELUX modular skylights	Accessories	VELUX modular skylights
Accessories	VELUX modular skylights	Accessories	VELUX modular skylights
Accessories	VELUX modular skylights	Accessories	VELUX modular skylights

## Resistance to Wind Load

Load EN 1027 : 2000

### Test method

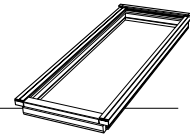


EN 12211 : 2000 - 06

- AP Air permeability test
- OT Operating test (if relevant)
- █ Increments or continuous rate not exceeding 100 Pa/s

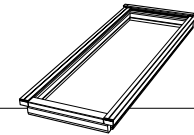
### VELUX modular skylights: Class C5

P<sub>1</sub>: 2000 Pa  
P<sub>2</sub>: 1000 Pa  
P<sub>3</sub>: 3000 Pa



## Resistance to Wind Load

Classification method EN 1028 : 2000



Classification of wind load			
Class	P1	P2 <sup>1)</sup>	P3
0		not tested	
1	400	200	600
2	800	400	1200
3	1200	600	1800
4	1600	800	2400
5	2000	1000	3000
Exxxx <sup>2)</sup>	xxxx		

<sup>1)</sup> This pressure having been repeated 50 times.  
<sup>2)</sup> Specimen tested with wind loading above class 5, classified Exxxx – where xxxx is the actual test pressure P1 (e.g. 2350 etc.)

Classification of relative frontal deflection	
Class	Relative frontal deflection
A	< 1/150
B	< 1/200
C	< 1/300

<sup>1)</sup> This pressure having been repeated 50 times.  
<sup>2)</sup> Specimen tested with wind loading above class 5, classified Exxxx – where xxxx is the actual test pressure P1 (e.g. 2350 etc.)

Resistance to wind load – classification			
Wind load class	A	B	C
1	A1	B1	C1
2	A2	B2	C2
3	A3	B3	C3
4	A4	B4	C4
5	A5	B5	C5
Exxxx	Axxxx	Bxxxx	Cxxxx

Note: In resistance to wind load classification the number refers to the wind load class, see table 1 and the letter to the relative frontal deflection, see table 2

### VELUX modular skylights: Class C5

- Frontal deflection measured at P1: 2000 Pa is less than L/300.
  - 50 cycle pressure test P2: 1000 Pa
  - After that repeated Air permeability test passed
- Safety test done at P3: 3000 Pa passed with no released part

Product	VELUX modular skylights
Material	Aluminum
Color	White
Weight	1.2 kg
Dimensions	1000 x 1000 mm
Installation	Standard
Warranty	10 years
Manufacturer	VELUX

## Reaction to Fire

EN ISO 11925-2, EN 13823 : 2010

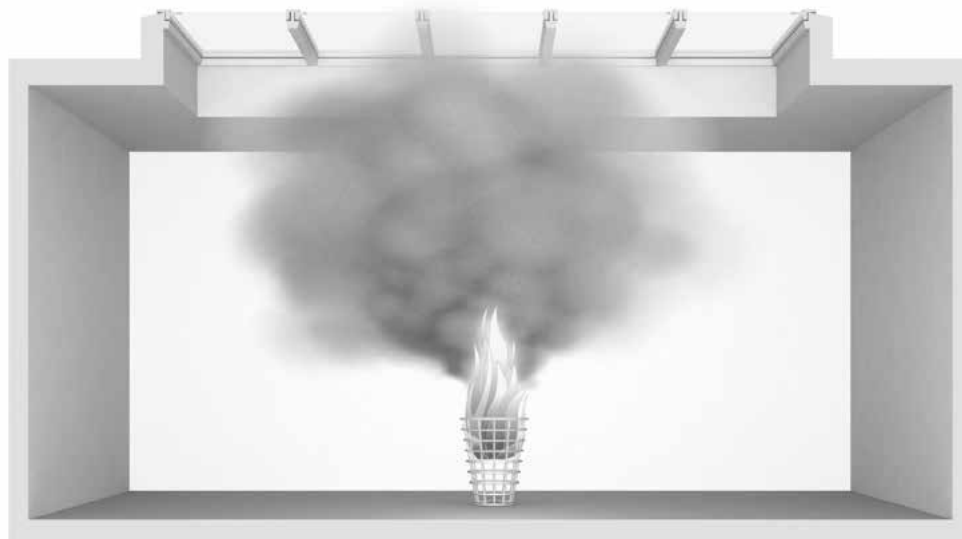
### Test method

Reaction to fire classes for building products (excl. floorings)							
Main class	Smoke class	Burning droplets class	Requirements according to			FIGRA	
			Non comb	SBI	Small flame	W/s	
A1	-	-	x	-	-	-	Non combustible
A2	s1 - s3	d0 - d2	x	x	-	≤ 120	
<b>B</b>	s1 - s3	d0 - d2	-	x	x	≤ 120	
C	s1 - s3	d0 - d2	-	x	x	≤ 250	
D	s1 - s3	d0 - d2	-	x	x	≤ 750	
E	-	- or d2	-	-	x	-	
F	-	-	-	-	-	-	No performance determined

<sup>1)</sup> The test is a corner basket test, which show how much the product contribute to the development of fire.

### Resistance to fire

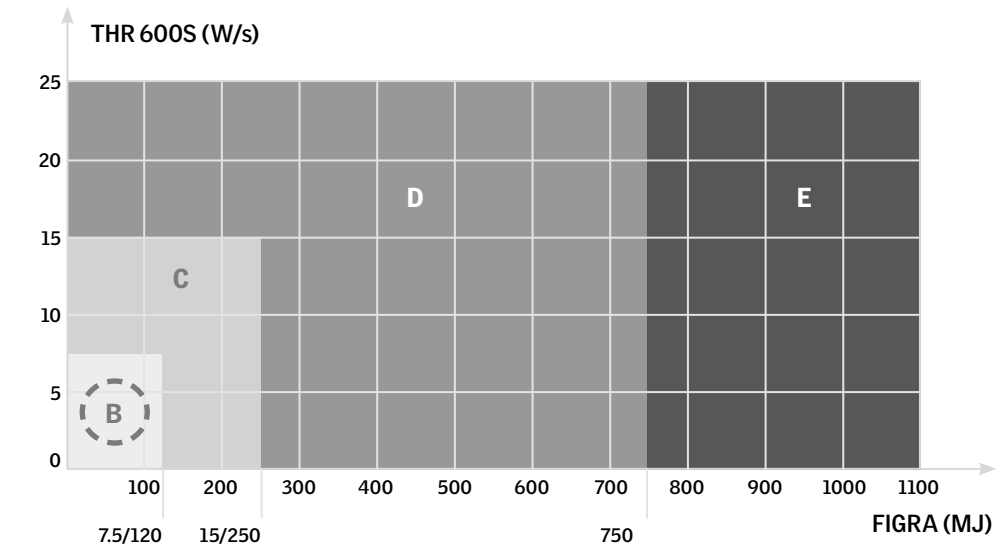
Infernal fire spread and smoke contribution.



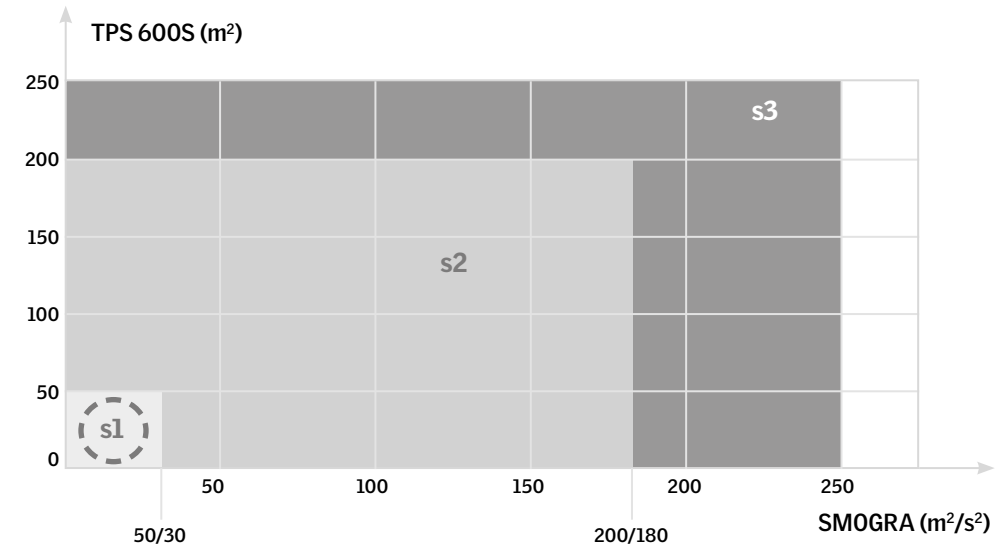
## Reaction to Fire

EN 13001-1 : 2007 and A1 : 2009

### EUROCLASS



### Smoke subclass



#### CLASSIFICATION

- A1, A2, B: Non-combustable and not very combustable product. Over 20 minutes to flashover.
- C: Moderate combustable products. Between 10 and 20 minutes to flashover.
- D: Moderate combustable products. Between 2 and 10 minutes to flashover.
- E: Moderate combustable products.
- F: Highly combustable products (or products whose reaction to fire has not been assessed).

#### SUB-CLASS

- s1: Low smoke production.
- s2: Medium smoke production.
- s3: High smoke production.

#### FLAMING DROPLETS SUB-CLASSIFICATION

- d0: No flaming droplets.
- d1: Flaming droplets that persist for less than 10 s.
- d2: Flaming droplets.

### VELUX modular skylights:

#### Clas B, s1-d0 or d2

B: Very low combustibility

(A: Incumbustable eg steel and concrete)

s1: Lowest smoke volume

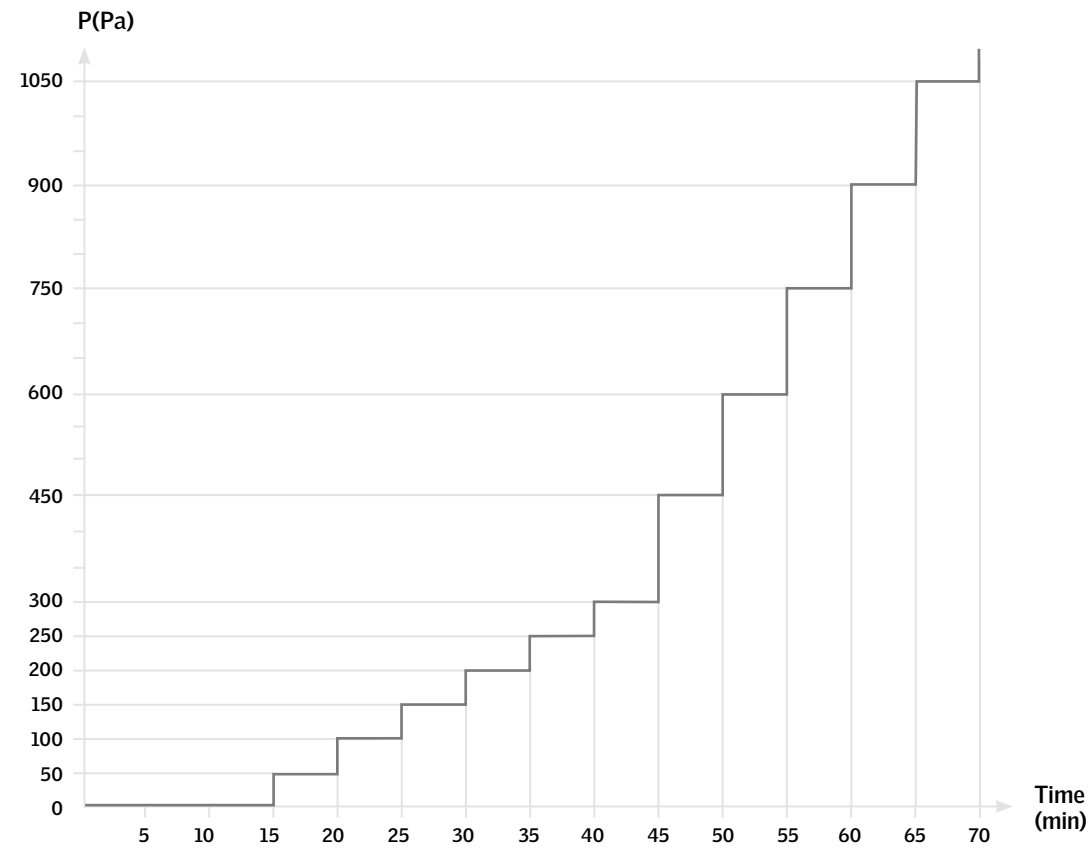
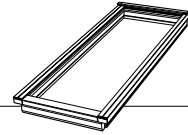
d0: No droplets in T pane variants

d2: Droplets in standard pane variant

Product name	VELUX modular skylights	Product code	06000000000000000000
Product description	VELUX modular skylights	Product code	06000000000000000000
Product description	VELUX modular skylights	Product code	06000000000000000000
Product description	VELUX modular skylights	Product code	06000000000000000000
Product description	VELUX modular skylights	Product code	06000000000000000000
Product description	VELUX modular skylights	Product code	06000000000000000000
Product description	VELUX modular skylights	Product code	06000000000000000000
Product description	VELUX modular skylights	Product code	06000000000000000000
Product description	VELUX modular skylights	Product code	06000000000000000000
Product description	VELUX modular skylights	Product code	06000000000000000000

## Watertightness

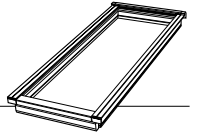
### Test method



EN 1027 : 2000 - 06

## Watertightness

### Classification EN 12208 : 2000



Water tightness		
Classification EN 12208 (11/1999)	Test method EN 1027 (06/2000) Ap in Pa	Wind (Km/h)
1 A	0	0
2 A	50	32
3 A	100	45
4 A	150	55*
5 A	200	63
6 A	250	71
7 A	300	78
8 A	450	95
9 A	600	110
E 750	750	123*
<b>E 900</b>	<b>900</b>	<b>134</b>

1 A to 9 A = Product fully exposed  
 1 B to 9 B = Product partially shielded  
 0 Pa = 15 min  
 After 15 min at 0 pressure and 5 min at subsequent steps

\* Equal to depression  
 \*\* Equal to tropical storm

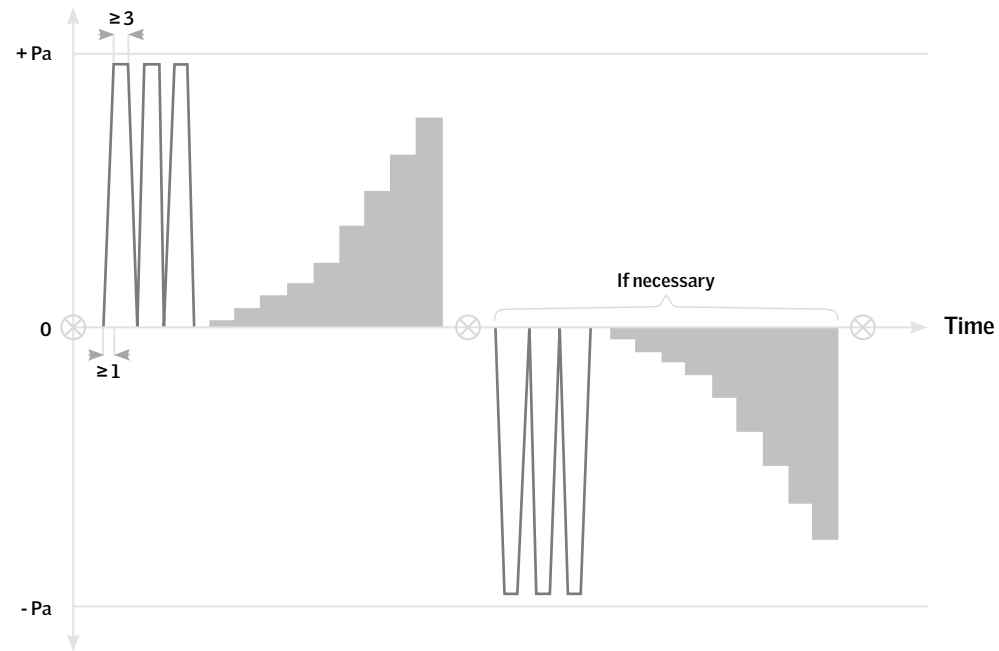
**VELUX modular skylights: E900**  
 No water penetration up to 900 Pa 900 Pa equals to 134 Km/h Wind

Technical specifications		Performance characteristics	
Item	Value	Item	Value
Weight	1.2 kg	Wind resistance	Class 4
Height	1.2 m	Water resistance	Class 4
Width	1.2 m	Air permeability	Class 4
Area	1.44 m²	Sound insulation	Class 4
Volume	1.728 m³	Thermal insulation	Class 4
Material	Aluminum	Light transmission	Class 4
Finish	White	UV protection	Class 4
Installation	Standard	Fire resistance	Class 4
Maintenance	Low	Acoustic insulation	Class 4
Warranty	5 years	Energy efficiency	Class 4

## Air Permeability

EN 1026 : 2000

Test method

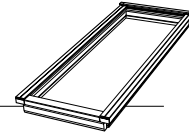


EN 1026 : 2000 - 06

⊗ Opening and closing

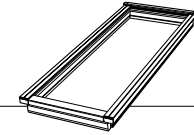
Test Pressure

- 150 Pa - Class 1
- 300 Pa - Class 2
- 600 Pa - Class 3, 4



## Air Permeability

Classification EN 12207 : 2000



### Class 1

- Poor air permeability
- Draught
- Major heat loss

### Class 2

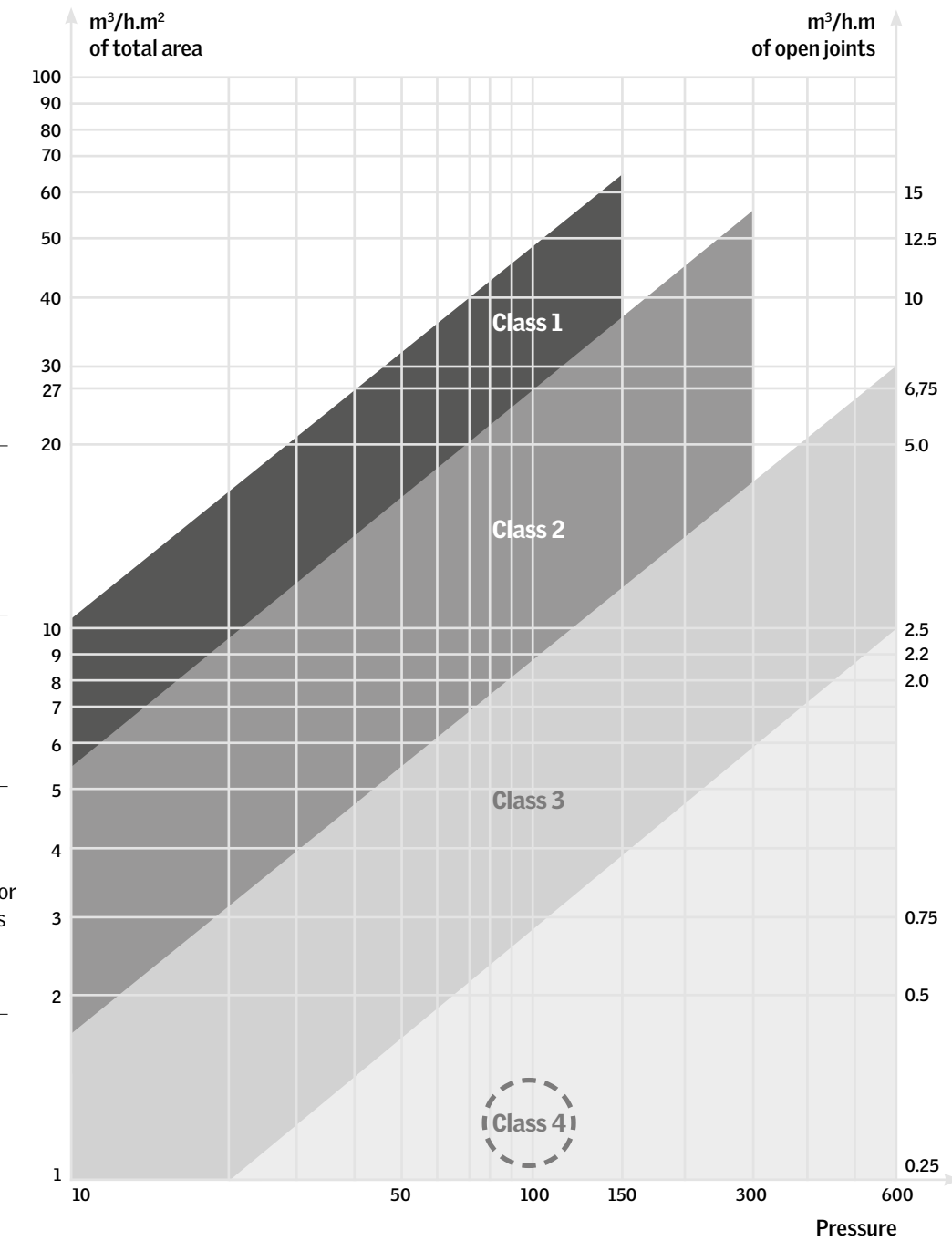
- Modest air permeability
- Draught in wind
- Large Heat loss

### Class 3

- Good air permeability
- Low heat loss
- Minimum requirement in most EU member states for heated inhabited buildings

### Class 4

- Highest air permeability
- Draught < 2.6 m³/hm through joint
- Tight in most conditions
- Small draught at peak storm pressure



⊗ VELUX moduler skylights: Class 4



VELUX Company Ltd  
Woodside Way  
Glenrothes  
Fife  
KY7 4ND  
Tel: 01592 778 916  
Email: [vms@velux.co.uk](mailto:vms@velux.co.uk)

*Bringing light to life™*

**VELUX®**