

A detailed black and white photograph showing the mechanical components of an external venetian blind. The image focuses on the top rail, which is a complex extruded metal profile. A vertical support post is attached to the side of the rail. Below the rail, the top edge of a slat is visible, showing its attachment points and the internal structure. A control cord is partially visible on the left side. The background is dark, with faint, repeating patterns of the blind's slats and rail structure, suggesting a larger installation.

# External Venetian Blinds

For many years European architects have been specifying HunterDouglas® External Venetian Blinds as experience has shown to be the most efficient and most flexible form of solar and light control.

**HunterDouglas**

WINDOW COVERINGS



# External Venetian Blinds

## Complete Flexibility

### DESIGN

The design, measurements, operation and motors of the new generation External Venetian Blinds are identical to the existing blinds. However, this new generation requires no special conditions like deeper stacking, complicated installation or special electronic components. The External Venetian Blinds are available in a new project colour collection and in several dimensions of slats, up to 100 mm width.

### EASY INSTALLATION

HunterDouglas® External Venetian Blinds can be mounted very easily. Depending on the local situation of the building, several mounting solutions are available to install the blinds to the façade.

### FUNCTIONALITY & COMFORT

Tilting and raising/lowering mechanism is made of durable maintenance free PVC. The positive tilting mechanism prevents movement of the slats by wind load. The stainless steel tilting spring enclosed in two different slat suspension rings for user friendly, smooth and exact operation.



## ENERGY & LIGHT

HunterDouglas® External Venetian Blinds are designed to improve indoor environmental quality and conserve energy. These systems help create built environments that are comfortable, healthy, productive, and sustainable. Our engineering and production processes minimize embodied environmental impact while meeting the highest standards for commercial, hospitality, industrial, institutional, and commercial applications. In order to obtain the optimal shading performance for a building and its occupants we developed compute simulation and calculation tools. Our project support team can analyze, visualize and optimize Window Covering Solutions with the HunterDouglas® Energy and Light Tool.

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**Innovative Products Make Innovative Projects**



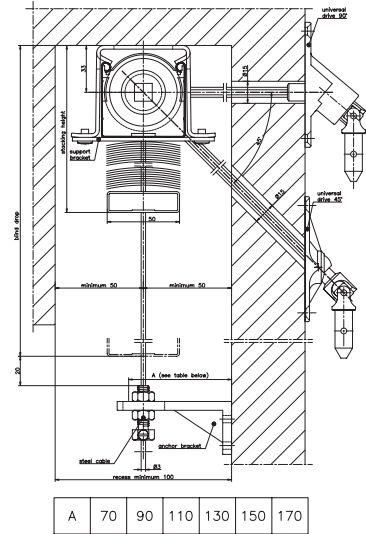
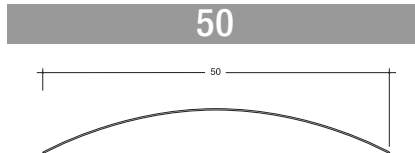
**HunterDouglas**

# Systems

## 50 MM FLEXIBLE SLAT: 50F

The hardware system for tilting, lowering and raising is incorporated in the head-rail.

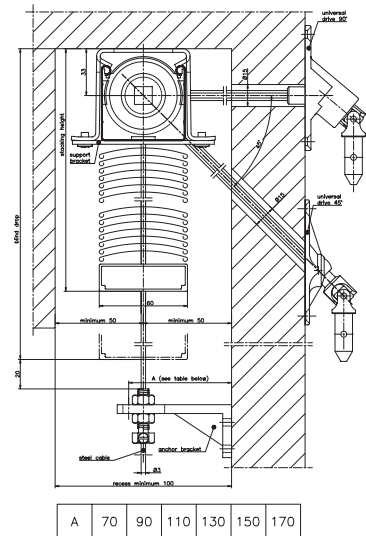
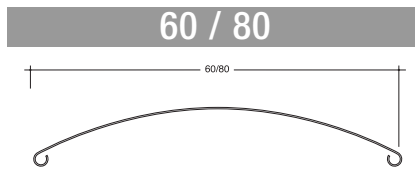
- Operation by:
  - (K) crank with 45° or 90° feed through with cardan joint
  - (EL) motor
- Side guiding:
  - (A) stainless steel cable



## 60 MM / 80 MM, WITH BEADED EDGES

The hardware system for tilting, lowering and raising is incorporated in the head-rail.

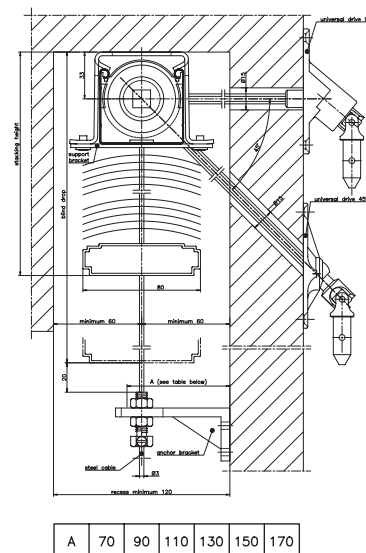
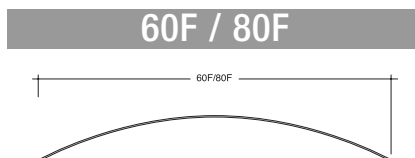
- Operation by:
  - (K) crank with 45° or 90° feed through with cardan joint
  - (EL) motor
- Side guiding:
  - (A) stainless steel cable
  - (AS) standard side guiding channels
  - (ASS) push-on guiding channels
  - (ASK) guiding mounted with clamping brackets
- Optional:
  - 40° tilting angle
  - round side guiding channels with ASK
  - mounting systems on or between the side track



## 60 MM / 80 MM, FLEXIBLE SLATS: 60F & 80F

The hardware system for tilting, lowering and raising is incorporated in the head-rail.

- Operation by:
  - (K) crank with 45° or 90° feed through with cardan joint
  - (EL) motor
- Side guiding:
  - (A) stainless steel cable
- Optional:
  - 40° tilting angle

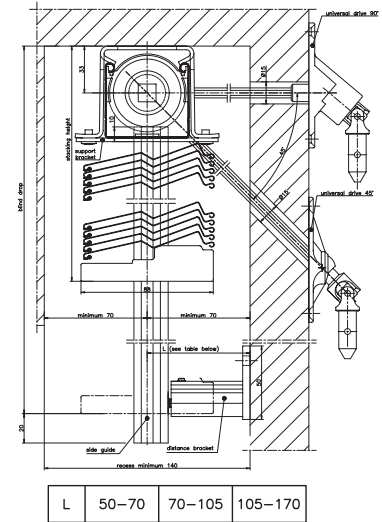
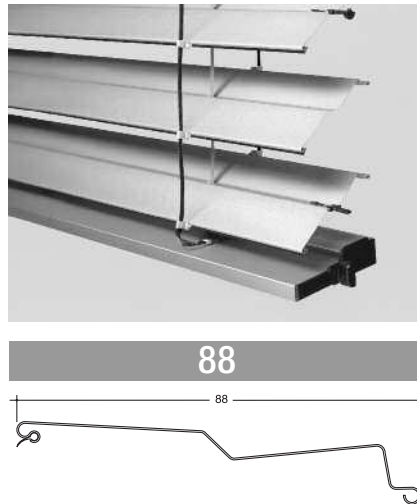


# Systems

## 88 MM, WITH BEADED EDGES

The hardware system for tilting, lowering and raising is incorporated in the head-rail. Rolled-in insert made with LDPE (plastic) for sound absorption.

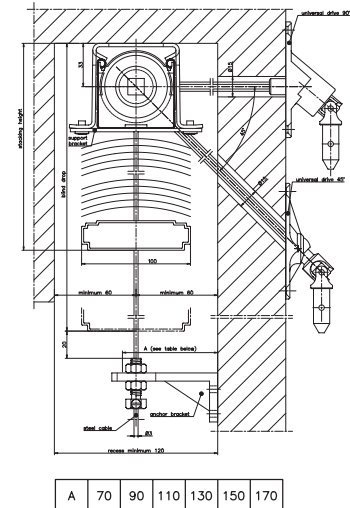
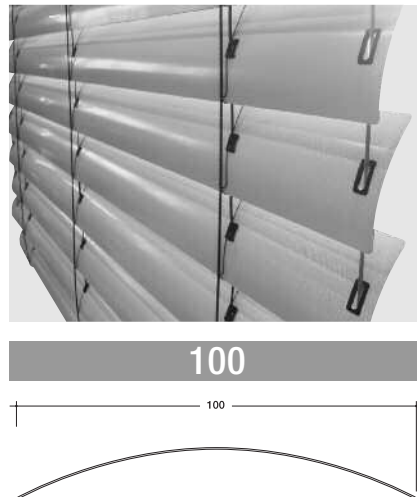
- Operation by:
  - (K) crank with 45° or 90° feed through with cardan joint
  - (EL) motor
- Side guiding:
  - (AS) standard side guiding channels
  - (ASS) push-on guiding channels
  - (ASK) guiding mounted with clamping brackets
- Optional:
  - 40° tilting angle



## 100 MM, FLEXIBLE SLATS: 100F

The hardware system for tilting, lowering and raising is incorporated in the head-rail.

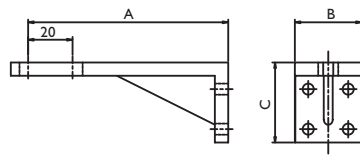
- Operation by:
  - (K) crank with 45° or 90° feed through with cardan joint
  - (EL) motor
- Side guiding:
  - (A) stainless steel cable
- Optional:
  - 40° tilting angle



Project : The Bond  
 Architect : Bovis Lend Lease  
 Product : Exterior Venetian Blinds

# Side Guiding

## TYPE A: CABLE GUIDING

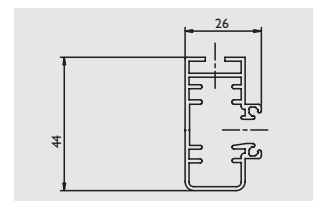
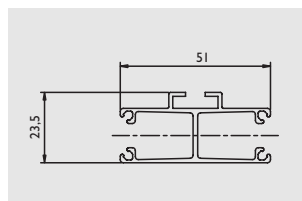
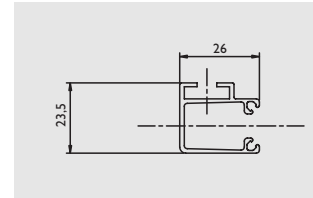
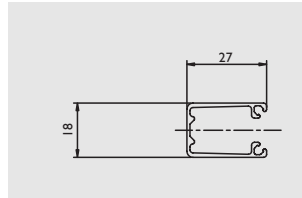
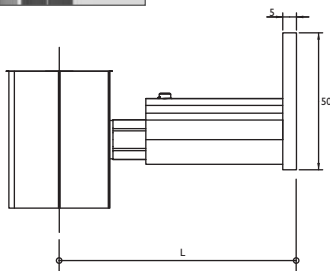


A	53.5	73.5	93.5	113.5	133.5	153.5	173.5
B	30	30	30	30	30	35	35
C	25	35	35	40	40	50	50

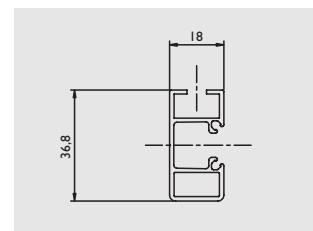
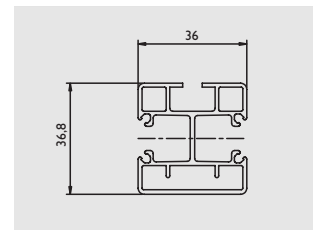
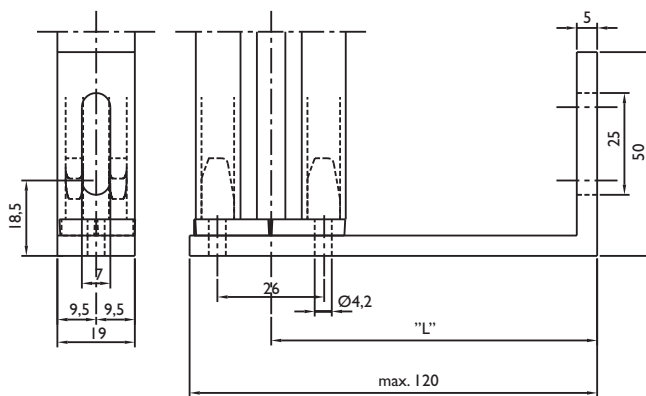
## TYPE AS: STANDARD SIDE CHANNEL GUIDING



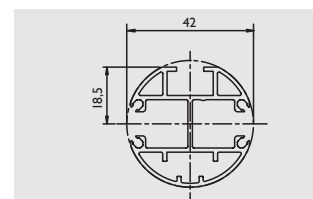
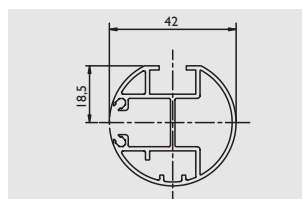
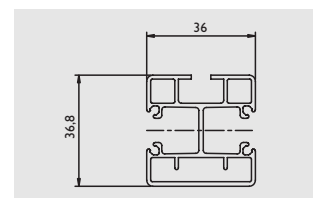
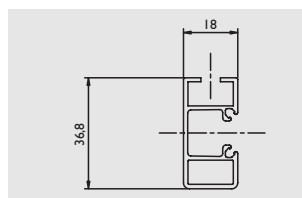
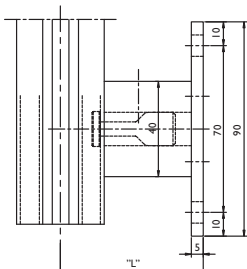
L1 = 50 - 70 mm  
L2 = 70 - 105 mm  
L3 = 105 - 170 mm



## TYPE ASS: PUSH-ON GUIDING SYSTEM



## TYPE ASK: SIDE CHANNEL GUIDING WITH CLAMPING PIECE



All sizes in mm

# System Properties

## TYPE OF SLATS

- 50F mm
- 60(F) mm
- 80(F) mm
- 88 mm
- 100F mm

## HEADRAIL

Rollformed zinc-plated steel U-shaped channel 57 x 51 mm.

Optional: Extruded aluminium profile, natural anodized with cover and end caps.

## BOTTOM RAIL

Extruded aluminium profile, natural anodized or powder coated, adapted to the shape of the slats, with plastic end caps provided with guiding pins or cable guiding rivets.

## SLATS

- All slats are pre-coated with Anorcoat® conversion coating system. Colour coated with stove enameled polyester paint.
- 50 / 50F mm rollformed aluminium slats, thickness 0.2 mm. Alloy AW5182, with painted edges in the length of the slats.
- 60 / 60F mm rollformed aluminium slats, thickness 0.4 mm / 0.45 mm. Alloy HD5050, with painted edges in the length of the slats.
- 80 / 80F mm rollformed aluminium slats, thickness 0.4 mm. Alloy HD5050, with painted edges in the length of the slats.
- 88 and 100F mm rollformed aluminium slats, thickness 0.45 mm / 0.4 mm. Alloy HD5050, with painted edges in the length of the slats.

## SLAT SUSPENSION

- 50F, 60(F), 80(F) and 100F mm types: UV and weather resistant woven polyester ladder braid. Slats inserted between ladders.
- 88 mm types: UV and weather resistant woven polyester ball tapes. Slats individually connected to the tape by special clips in the bead of the slat (available colour grey).

## TILTING AND RAISING/ LOWERING MECHANISM

Made of durable maintenance free plastics. Positive tilting mechanism prevents movement of the slats by wind load. Stainless steel tilting spring enclosed in two different slat suspension rings for smooth and exact operation. During lowering slats are fully closed, during raising slats are fully open. The optional automatic tilting device pre-sets the slats at a 40° angle. The system is re-set automatically during lifting of the slats.

## SIDE GUIDING

- 50F, 60F, 80F and 100F mm types: Stainless steel cable, Ø 3 mm with nylon jacket, tensioned between headrail and guide cable bracket.
- 60, 80 and 88 mm types: Extruded aluminium profile with plastic insert for noise reduction, natural anodized or powder coated. Slats supplied with guiding pins at the extreme ends.

## STRING TAPE

String tape consists of high tenacity polyester material (colour: black).

## LIFT TAPE

Made of durable UV and weather resistant pre-shrunk polyester (6 x 0.33 mm). Alternative: 88 KV-ELV types, made of durable UV and weather resistant plastic (dymetrol), 15.2 x 1.27 mm (colour: black).

## CONNECTION CORD

UV and weather resistant woven polyester cord connects slat suspension to the mechanism. Provides quick release and adjustment of the slat stack.

## OPERATION

- Crank operation: With crank rod via universal joint to a self braking gearbox incorporated in the headrail or located at the extreme end of the headrail.
- Electrical operation: With electric motor ( 220/240V - 50 Hz) enclosed within the headrail. The motor is thermally protected against over heating and splash proof (IP54).

Blinds can be operated individually and/or linked together. By group controls, solar sensors, anemometers, time switches and relays to provide a fully automated central control. *Check the 'Hunter Douglas® Control' brochure.*

# Size Limitations

## EXTERNAL VENETIAN BLINDS

Type	Width of the slats (mm)	Type of operation (lift/tilt)	Sideguarding	Construction limits							
				Single installation				Group installation			
				Width		Height	Surface	Width	Height	Surface	
				Min. (cm)	Max. (cm)	Max. (cm)	Max. (m²)	Max. (cm)	Max. (cm)	Max. (cm)	
K 50 A	50	crank	cable	80	400	400	12	800	400	16	
EL 50 A	50	motor	cable	80	400	400	12	800	400	20	
K 60 A	60	crank	cable	80	500	450	12	1000	450	12	
K 60 AF	60 flexible	crank	cable	80	400	400	12	800	400	12	
K 60 AS	60	crank	standard sideguarding channels	80	400	400	12	1000	400	12	
K 60 ASS	60	crank	push-on side guiding channels	80	300	250	7	1000	250	12	
K 60 ASK	60	crank	channels with clamping brackets	80	400	400	12	1000	400	12	
EL 60 A	60	motor	cable	80	500	450	12	1000	450	20	
EL 60 AF	60 flexible	motor	cable	80	400	400	12	800	400	20	
EL 60 AS	60	motor	standard sideguarding channels	80	400	400	12	1000	400	20	
EL 60 ASS	60	motor	push-on side guiding channels	80	300	250	7	1000	250	20	
EL 60 ASK	60	motor	channels with clamping brackets	80	400	400	12	1000	400	20	
K 80 A*	80	crank	cable	80	500	450	12	1000	450	12	
K 80 AF*	80 flexible	crank	cable	80	400	400	12	1000	400	12	
K 80 AS*	80	crank	standard sideguarding channels	80	400	400	12	1000	400	12	
K 80 ASS*	80	crank	push-on side guiding channels	80	300	250	7	1000	250	12	
K 80 ASK*	80	crank	channels with clamping brackets	80	400	400	12	1000	400	12	
EL 80 A*	80	motor	cable	80	500	450	12	1000	450	20	
EL 80 AF*	80 flexible	motor	cable	80	400	400	12	1000	400	20	
EL 80 AS*	80	motor	standard sideguarding channels	80	400	400	12	1000	400	20	
EL 80 ASS*	80	motor	push-on side guiding channels	80	300	250	7	1000	250	20	
EL 80 ASK*	80	motor	channels with clamping brackets	80	400	400	12	1000	400	20	
K 88 AS*	88	crank	standard sideguarding channels	80	400	400	10	1000	400	10	
K 88 ASS*	88	crank	push-on side guiding channels	80	300	250	7	1000	250	10	
K 88 ASK*	88	crank	channels with clamping brackets	80	400	400	10	1000	400	10	
EL 88 AS*	88	motor	standard sideguarding channels	80	400	400	12	1000	400	16	
EL 88 ASS*	88	motor	push-on side guiding channels	80	300	250	7	1000	250	16	
EL 88 ASK*	88	motor	channels with clamping brackets	80	400	400	12	1000	400	16	
KV 88 A-S	88	crank	lifftape inside guiding channels	80	300	350	10	700	350	16	
ELV 88 A-S	88	motor	lifftape inside guiding channels	80	300	350	10	700	350	16	
K 100 A	100 flexible	crank	cable	80	300	350	10	700	350	16	
EL 100 A	100 flexible	motor	cable	80	400	400	12	1000	400	20	
*) External Venetian Blinds with light control option						100	300	300	9	600	

## WIND FORCES ON THE BEAUFORT SCALE OR IN M/SEC.

Beaufort Scale	Description	Average wind strength		Effects on land
		m/s	km/h	
0	Calm	0 - 2	<1	Smoke rises vertically
1	Light air	0.3 - 1.4	1 - 5	Smoke drifts in the wind
2	Light breeze	1.5 - 3.4	6 - 12	Leaves rustle. Wind felt on face
3	Gentle breeze	3.5 - 5.4	13 - 19	Small twigs in constant motion. Light flags extended.
4	Moderate wind	5.5 - 7.4	20 - 27	Dust, leaves and loose papier raised. Small branches move
5	Fresh wind	7.5 - 10.4	28 - 37	Small trees sway
6	Strong wind	10.5 - 13.4	38 - 48	Large branches move. Whistling in phone wires. Difficult to use umbrellas
7	Very strong wind	13.5 - 17.4	49 - 62	Whole trees in motion
8	Gale	17.5 - 20.4	63 - 73	Twigs break off trees. Difficult to walk.
9	Sever gale	20.5 - 24.4	74 - 87	Chimney pots and slates removed.
10	Storm	24.5 - 28.4	88 - 102	Trees uprooted. Structural damage.
11	Severe storm	28.5 - 32.4	103 - 117	Widespread damage.
12	Hurricane force	>32.5	>118	Widespread damage. Very rarely experienced on land.

The standards by external products are specified in the European Standards EN 13659



# Size Limitations

## WIND LOAD LIMITS EXTERNAL VENETIAN BLINDS

Width (cm)	Rollformed with side guides		Rollformed with cable guides		Flexible with cable guides	
	(bft)	(m/s)	(bft)	(m/s)	(bft)	(m/s)
150	7	13.5 - 17.4	7	13.5 - 17.4	7	13.5 - 17.4
200	7	13.5 - 17.4	7	13.5 - 17.4	6	10.5 - 13.4
250	7	13.5 - 17.4	6	10.5 - 13.4	6	10.5 - 13.4
300	7	13.5 - 17.4	6	10.5 - 13.4	6	10.5 - 13.4
400	6	10.5 - 13.4	6	10.5 - 13.4	5	7.5 - 10.4
500	6	10.5 - 13.4	6	10.5 - 13.4	5	7.5 - 10.4

### Legend:

For External Venetian Blinds the wind load limits to be used are dependent on the type of product. Once the wind load limit has been reached the blind has to be retracted.

The values listed in the table apply to a distance of  $\leq 10$  cm between the slats and the façade, a slat gage of  $\leq 0.4$  mm and a blind height of less than 240 cm.

Depending on the manufacturer's recommendation, larger blinds (>200 cm) may be supplied with additional side cables. For the following cases, the values in the table are to be decreased or increased as follows:

1. For a distance between façade and slats of >10 cm to 30 cm the value of the table has to be reduced by one Beaufort. With a distance of >30 cm to 50 cm reduce the value by 2 Beaufort. For larger distances the table is not applicable.
2. For a slat gage of less than 0.4 mm reduce the value by 1 Beaufort.
3. For slats with strong profiles the value may be increased by 1 Beaufort.
4. For heights between 240 cm and 400 cm and cable guides, the value should be reduced by 1 Beaufort; for heights over 400 cm reduce the value by 2 Beauforts.



# Specials

## TYPE STANDARD

The Standard light control blind is available in 60 and 80 mm crowned version as well as in 88 mm Z-shaped slats. These blinds offer excellent features as traditional exterior sun protection and improved light conditions at the work place.

The blind is automatically lowered in a 40° pre-set tilt angle position for the optimal sun protection. According to individual requirements the blind can be further closed in order to optimize light conditions. The blind is divided in two different parts.

The slats of the standard light control blind drive off in 40° tilting angle above the TLT point and offers in this position optimal sun protection. As required the slats can be individually adjusted for optimal light conditions.

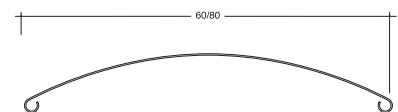
Because of this feature daylight is reflected further into the room without causing reflection on display screens. In order to maintain contact to the exterior view the slats in the bottom part of the blind can be perforated as an option.

### Type Standard

- 80 or 88 mm
- 40° pre-set tilt angle
- Optional: lower part micro-perforated



Standard



## TYPE DUOLUX™

The Duolux™ light control blind offers the optimal solution for rooms with screen work places. Besides the excellent benefit of sun protection, this type of blind also offers high flexibility in setting the required slat angles due to the almost independent tilting of the top and lower part of the blind. This feature enables optimal light conditions throughout the room.

The Duolux™ blind is automatically lowered in a 40° pre-set tilt angle offering optimal sun protection, without causing darkening and distraction in the room. Pre-set tilt angle can be deactivated or activated again. Full closure of the slats is possible at any time. The blind is divided into two sections, at approx. 1.50 m. from the floor level, which can be tilted open with a maximum difference in angle of approx. 60°.

The top part of the slats can be adjusted to a wider angle. This allows daylight to enter the room when the bottom part of the blind is closed. Light is reflected by the ceiling deep into the room.

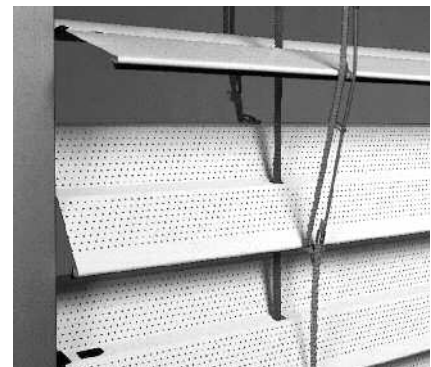
This allows the artificial lighting to be reduced. The lower part of the blind slats can be closed completely in order to prevent reflection on display screens and to improve working conditions at work places close to the window.

A new slow motion drive enables a micro adjustment of the slats. This allows a very accurate amount of day light reflection according the user's wishes.

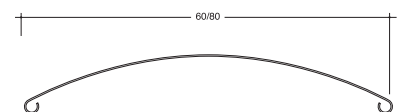
In order to maintain eye contact with the outside world the slats in the lower part of the blind can be micro-perforated.

### Type Duolux™

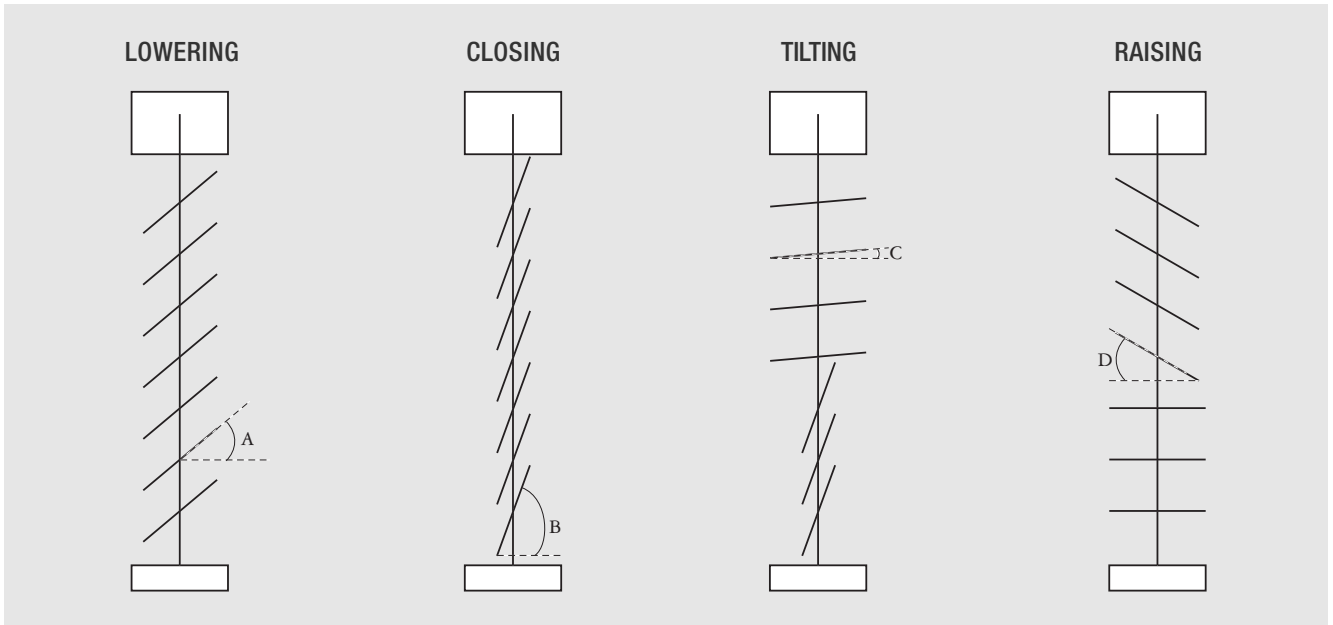
- 80 or 88 mm
- 40° pre-set tilt angle
- High flexibility in slat angle
- Slow motion tilting
- Optional: lower part micro-perforated



Duolux™



## DUOLUX™ LIGHT CONTROL BLIND TYPES



Slat angles Duolux™ (approximate)	A	B	C	D
80 mm	40°	70°	5°	40°
88 mm	40°	90°	25°	30°

Dimensions		Bundle heights			
		Blind height	80 flex.	80 mm	88 mm
Max. height (mm)	3000	1000 mm	158	162	170
Max. width	3000	1500 mm	185	192	190
Min. width	1000	2000 mm	203	222	230
Max. width		2500 mm	223	252	265
coupled blinds (mm)	10,000	3000 mm	241	282	300
Max. surface	9 m <sup>2</sup>				
Max. surface					
coupled blinds	16 m <sup>2</sup>				

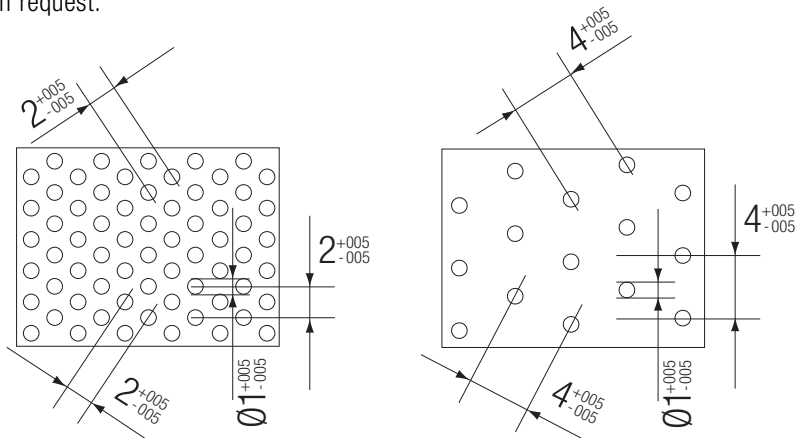
For variances of the construction limits which are outside the specification, please contact us. For standard colours please check our valid colour selector.

### PERFORATION

In order to maintain eye contact with the exterior, the slats can be perforated on request.

Different perforation patterns are available on request.

**Applying perforated slats for exterior use will effect the warranty conditions.**



Perforation patterns

# Indoor Environmental Quality & Productivity

## PRODUCTIVITY

Energy saving strategies and natural resources like daylight, can create a comfortable and productive environment for occupants. Smart, sustainable design that provides good indoor environmental quality is a proven and profitable investment.

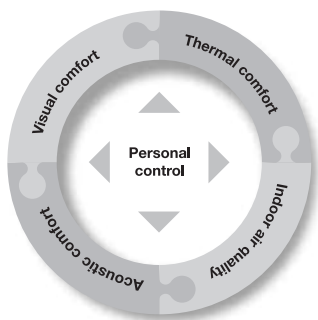
Seemingly small increases of as little as 1% in productivity could result in a much higher payback than the reduced cost of energy.

## COMFORT

Comfort can be described as 'the state of mind that expresses satisfaction with the surrounding environment'.

Indoor environmental quality has essentially four dimensions:

1. Thermal comfort;
2. Visual comfort;
3. Acoustic comfort;
4. Indoor air quality.



It is an accepted fact that people prefer to experience daylight through visual contact with the outside world. This is therefore, generally recognized as an important factor in influencing people's positive emotional state.

Situations that cause visual discomfort can frequently arise. The light, glare or reflection levels are just too bright and contrasts too large for optimal working conditions.

Workspaces which are comfortable, naturally lit and allow occupants to connect with outdoor space can improve productivity and reduce absenteeism. Research on the relationship between day lighting and productivity shows that the use of daylight without glare resulted in productivity gains in the order of 4%. To fully optimise the benefits of daylight, control systems can be integrated in the sun control solution.

## SUSTAINABILITY & INDOOR ENVIRONMENTAL QUALITY

The environmental footprint of a building includes such factors as the use of energy, water, materials and resources. HunterDouglas® Sun Control Systems and Window Covering products can play an excellent role in reducing the environmental footprint, whilst at the same time enhancing the thermal and visual dimensions of indoor environmental quality.



# Energy and Light Tool

The function of Window Coverings is to provide visual comfort and heat control. The primary function of interior window coverings is to reduce glare levels and diffusing daylight. The primary function of External Window Coverings is heat control.

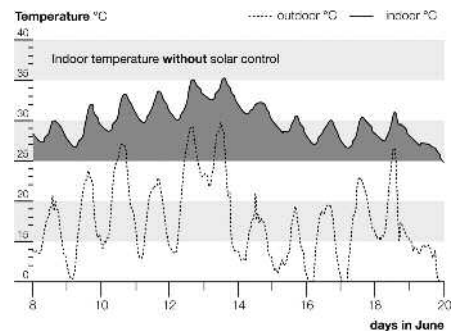
## THERMAL COMFORT

External Window Coverings will prevent excessive solar heat gain and reduce the need for cooling in the summer. Moreover, it will also reduce - if not eliminate - the high capacity of cooling equipment needed, resulting in a reduction in the initial investment cost.

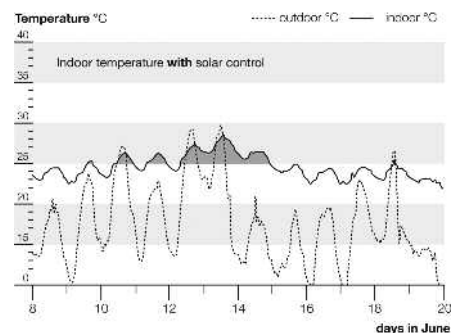
In colder climates, External Window Coverings will enable the use of solar energy to help heat the building in winter. This is often overlooked when solar control glass is selected for heat control.

Thermal comfort at a minimal environmental impact calls for a careful matching of glazing, Sun Control and HVAC equipment.

The Hunter Douglas Energy Tool helps finding an optimum solution by quantifying the effects of various External Window Coverings. The pay-off will be reduced energy costs and often reduced investment cost, and on top of that: reduced greenhouse gas emission during the operation phase of the building.



Indoor and outdoor temperature without External Window Covering



Indoor and outdoor temperature with External Window Covering

## VISUAL COMFORT

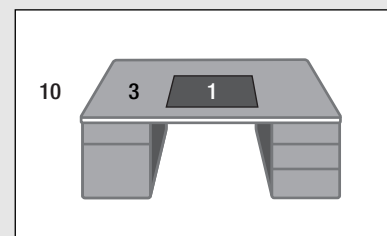
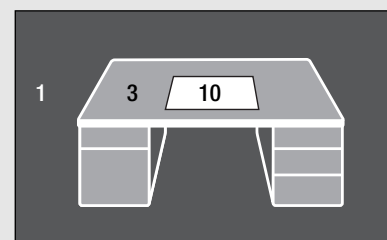
Interior Window Coverings enable the use of free renewable daylight to the maximum extent, so significantly reducing the need for artificial lighting and avoiding the associated cooling loads.

The accepted factor in creating visual comfort states that the contrast within the field of view should not exceed a factor of 10. The contrast between the central visual task and its direct surroundings should not exceed a factor of 3.

When designing an office space, questions often arise around what measures should be considered to guarantee the right level of visual comfort?

The Hunter Douglas Light Tool makes the assessment of visual comfort tangible by calculating luminance levels for a model office with and without window coverings. The amount and type of glass, the orientation of the façade, the geographical location, weather, season and time of day are all taken into account before recommendations are made.

The Light Tool helps client's assess which window covering provides the aesthetic and performance levels needed to create visual comfort for their particular project.



Contrast factor 1:3:10

Light Tool calculations are based on Radiance (Lawrence Berkeley Laboratories). The scene model consists of approximately 20,000 polygons. Colours and reflection values were measured in an actual model office.



### HUNTER DOUGLAS ARCHITECTURAL PRODUCTS

Over 40 years, Hunter Douglas has been dedicated to innovation. As the field of Sun Control grows, we pride ourselves on leading the way as pioneers in the area.

We're working alongside architects and designers throughout the globe, developing new, innovative methods of managing heat, light and energy. We've committed ourselves to crafting products that meet the highest standards of materials, construction and performance because we believe that you need the right tools to create projects that inspire.

## Innovative Products Make Innovative Projects



Promoting sustainable  
forest management  
[www.pefc.org](http://www.pefc.org)

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## ARCHITECTURAL SERVICES

We support our business partners with a wide range of technical consulting and support services for architects, developers and installers. We assist architects and developers with recommendations regarding materials, shapes and dimensions, colours and finishes. We also help creating design proposals, visualisations and mounting drawings. Our services to installers range from providing detailed installation drawings and instructions to training installers and advising on the building site.

**HunterDouglas**

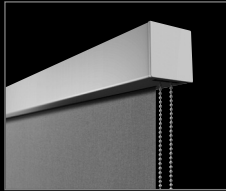
WINDOW COVERINGS



# Learn More

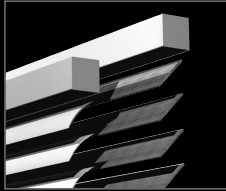
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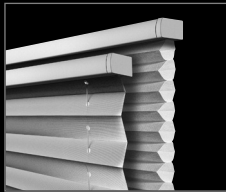
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Bulgaria  
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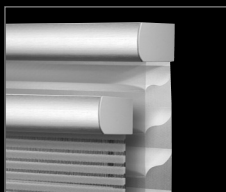
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