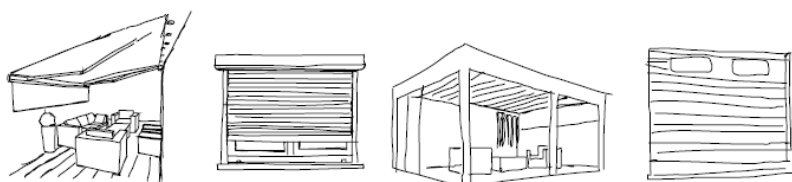


TECHNICAL DATA SHEET

Outside venetian blinds



HAROL®

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1. General

Exterior sun protection with exterior blinds are the perfect combination of design and function. Innovative technology leads to noticeable benefits in reducing light - and heat radiation - for a better quality of life.

For private homes or office buildings, they provide exactly the right lighting conditions at any time of day and, if you wish, complete privacy.

The large choice of slat types and numerous assembly variants made of high-quality aluminium accentuates what makes a building unique - its individual style.

Light control

Excessive light contrasts force the eye to constantly adapt to different light conditions and will lead to rapid fatigue, anxiety and poor concentration.

Therefore, even as the outdoor light changes, it should be possible to keep light fluctuations indoors to a minimum. At the same time, it is necessary to have some degree of changes in clarity for the psychological relationship with the outside world.

Moreover, in the event of inadequate outside light, it should be possible to clear the entire window surface to enable enjoyment of diffuse daylight.

If so desired, exterior blinds can also be set to guide the right amount of daylight into the room. The lighting control effect depends on the slat shape and the slat material used (colour and degree of gloss).

The systems can be fitted with automatic control so that the desired brightness is always achieved and the use of artificial light during the day is avoided.

Protection against glare from the sun

Protection from direct solar radiation is the principle function of a solar protection system and - in itself - can be achieved by relatively simple means.

However, a modern glare control system must provide an unobstructed full view of the outside and simultaneously illuminate the room with daylight rather than requiring the need for artificial light.

Climate control and performance

If humans can achieve 100% performance at 20°C, then this value drops to 70% at 28°C and to 50% at 33°C. In office workplaces, the temperature should not exceed 26°C, even in summer.

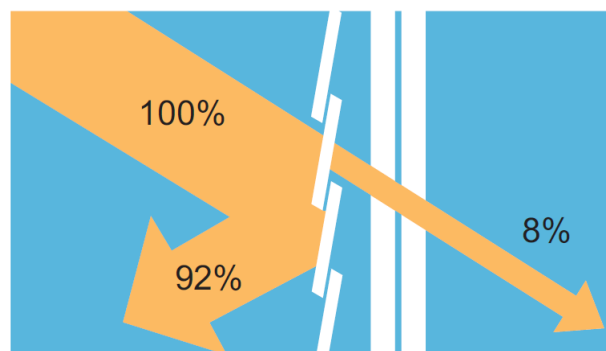
Temperatures above 23°C cause a noticeable reduction in vitality and productivity, especially during the warm seasons.

Controlling the room temperature is an important prerequisite for an optimal room climate. Effective sun protection measures can significantly reduce an uncomfortably heated room.

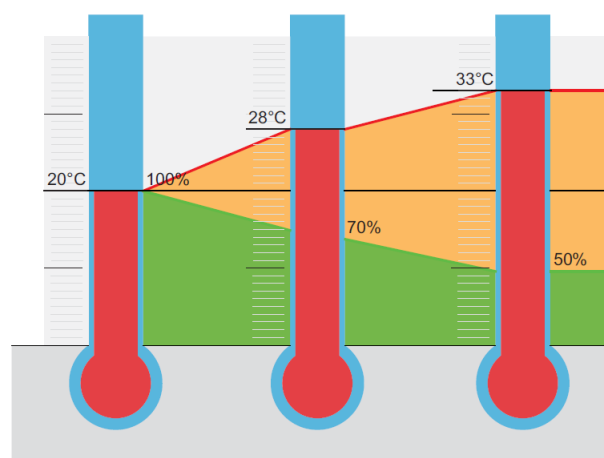
Cost-effective

From both an ecological and economic point of view, running heating and air-conditioning systems is a problematic factor.

Here, effective sun protection can significantly reduce energy requirements and costs, thus making an important contribution to environmental protection. Sun protection works differently in summer and winter.



Sun protection with exterior blinds



Performance depending on the temperature

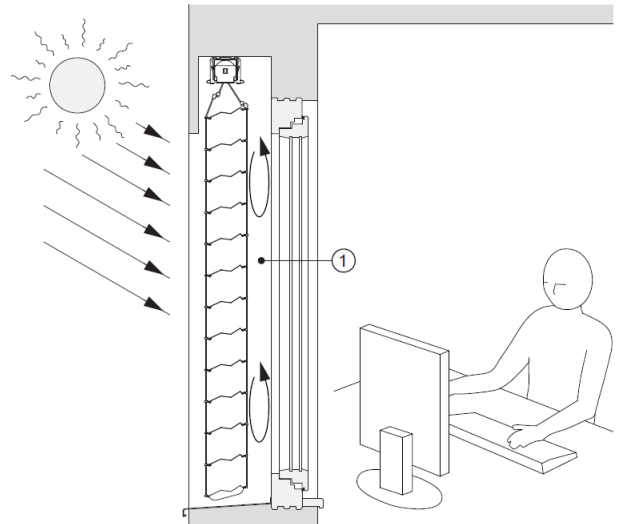
Optimal working conditions

Not only economic and ecological, but also psychological aspects play an equally important role when choosing the right sun protection system. However, despite this, sun protection is often neglected when planning workplaces, and incorrect planning has palpable effects on employees' well-being and hence performance.

The authorities have recognised this issue and have included relevant limit values regarding room temperatures in the health and safety regulations. As a result, the upper limit of 26°C should not be exceeded and major temperature fluctuations and direct sunlight should be avoided. These requirements can only be met with external sun protection systems.

This is because exterior venetian blinds shield up to 92% of the sun's thermal radiation, thus ensuring an acceptable working environment and stable lighting conditions.

Especially in the afternoon, when the slats are set almost horizontally, the exterior blinds provide an unobstructed outdoor view.

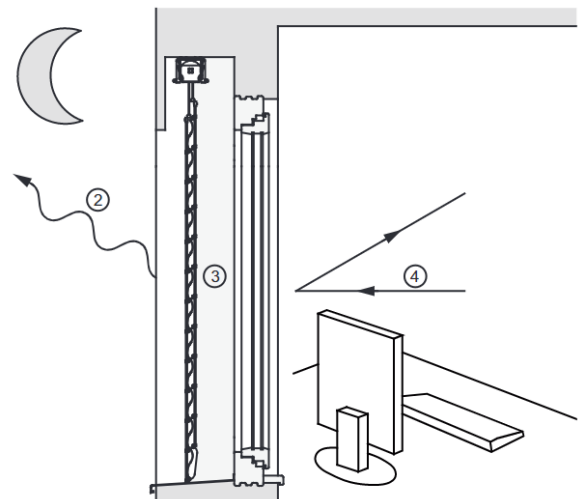


Heat protection in summer

Heat and cold protection

In summer, an optimal sun protection system protects against uncontrolled heat build-up; in winter, the layer of air between the system and window surfaces forms an insulating layer and as such reduces the level of cooling during the night, whereas during the day solar radiation is used for heat.

Modern sun protection combines economic and ecological benefits.



Heat protection in winter

Key

- ① Good rear ventilation
- ② Heat losses
- ③ Air cushion
- ④ Thermal radiation

Communication

The open view to the outside and the ability to communicate with the outside world prevent a feeling of suffocation and isolation.

With the right sun protection, both points are guaranteed at all times.

Height-to-width ratio

If the width-to-height ratios of 1:4 or slat widths < 800 mm are exceeded, the pull-up cords may suffer early wear. An oblique movement of the slats and a possible tilt in the guides cannot be avoided. For these reasons, we cannot offer a guarantee for these outside venetian blinds.

This means, for example, that with a total width of 700 mm, the outside venetian blind can only be supplied up to a height of 2800 mm without limiting the functions.



Light control technology - for workstation displays

Since 1 January 1997, the EU Display Directive 90/270/EWG has been in force, obliging every employer to implement employee display workstations according to EU legislation.

This includes the following requirements for exterior blinds:

- Full view of the outside
- Adjustable protection against direct sunlight
- Sufficient uniform light throughout the room
- Preservation of the natural daylight spectrum
- Prevention of reflections on the display
- Limited brightness contrasts in the field of vision

Functioning principle of exterior blinds with light control technology

Incoming sunlight is reflected by slats in the upper part of the suspended ceiling of the room. As a result, daylight illuminates the depth of the room and ensures a highly uniform level of illumination. This enables artificial lighting to be reduced or even eliminated altogether.

In the lower section, the suspension system can be fitted with perforated slats that let in sunlight in a controlled and low-reflection manner while providing visual contact to the outside.

Protection

- Sun protection
- Anti-glare
- Weather protection
- Heat protection as solar radiation in front of the façade is reflected back
- Privacy protection
- Noise insulation

Comfort

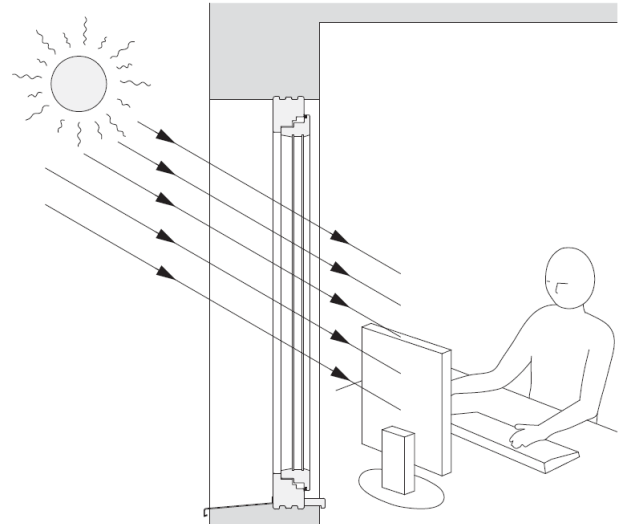
- Reduction of solar heat gains – passive reduction of temperature or passive cooling
- Air cushion reduces heat loss or cooling at night (higher surface temperatures)
- Variable colour finish
- Motor drive as required with remote control
- Separate adjustable slats for light regulation
- Regulation of the room climate
- Wind stability, weather resistance
- Output element
- Daylight management
- High durability / Long service life
- Easy to operate

Assessment of product features

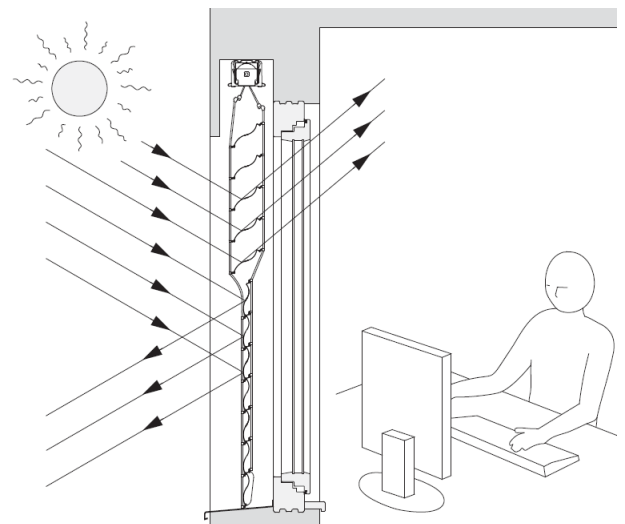
Blinds and exterior blinds are custom made. No returns, modifications or exchanges. If the dimensions fall between two standard dimensions, the price for the larger size will be used for calculations.

Subject to technical changes. Colour deviations between plastic elements and coated surfaces are due to material and production method and cannot be ruled out, similar to orders for spare parts in eloxal colours.

We recommend the ITRS (Industrieverband Technisch Textilien – Rolladen – Sonnenschutz e.v.) guidelines for assessing the product features of exterior blinds/blinds.



Workstation without light control technology



Workstation with exterior blinds using light control technology



2. Wind resistance and operating classes in accordance with NBN-EN 13659

2.1. Compulsory application since 1 April 2006

The new NBN EN 13659 standard has been in force since 1 April 2006. In accordance with this standard, from that date onwards blinds/venetian blinds must carry a CE mark that also shows the wind resistance class. There are standards and guidelines for different countries in order to define which wind resistance class is necessary for which application.

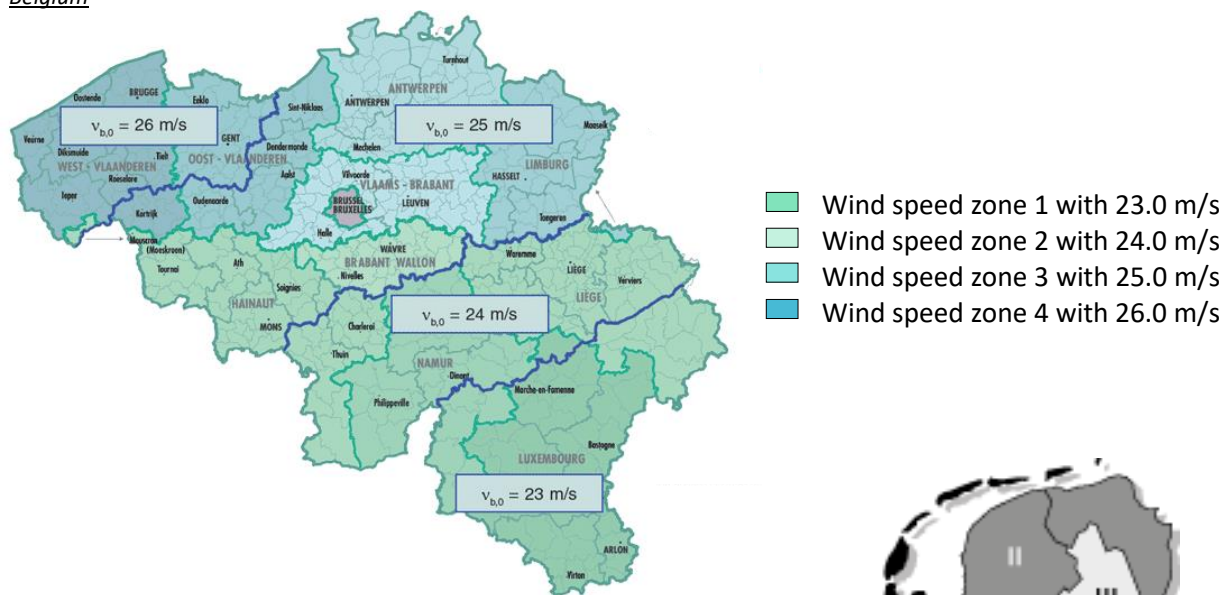
For Germany, the German "Bundesverband Rolladen und Sonnenschutz" commissioned the development of an IFT guideline entitled "Application advice for external closures". This guideline (DIN 1055-4:2005-3) divides the territory of Germany into wind speed or wind load zones and terrain categories. In this way, the applicable wind speed zone and terrain category can be derived from the location of the building. The installation height of the seals indicates the third necessary reference measurement.

For Belgium, everything is shown in standard NBN EN 1991-1-4 and the territory is divided into four wind speed zones. The Netherlands is divided into three wind speed zones in accordance with standard NEN-EN 1991-1-4:2005/NB:2007 and France has four wind speed zones in accordance with standard DTU 34.2.

For other countries, ask the local meteorological services for the values!

2.2. Definition of the wind speed zones or wind load zones

Belgium



The Netherlands

- Zone I with 30.0 m/s:** Markermeer, IJsselmeer, Waddenzee, the West Frisian Islands and the province of North Holland north of the municipalities of Heemskerk, Uitgeest, Wormerland, Purmerend and Edam-Volendam.
- Zone II with 27.5 m/s:** The rest of the province of North Holland, the mainland of the provinces of Groningen and Friesland and the provinces of Flevoland, South Holland and Zeeland.
- Zone III with 25.0 m/s:** The rest of the Netherlands.

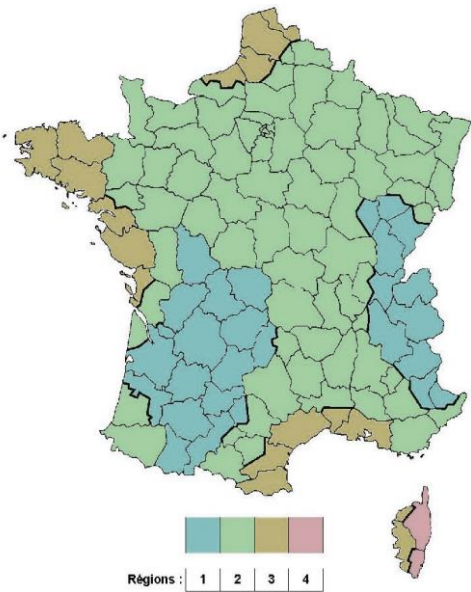


Germany



- Wind load zone 1 with 22.5 m/s
- Wind load zone 2 with 25.0 m/s
- Wind load zone 3 with 27.5 m/s
- Wind load zone 4 with 30.0 m/s

France



- Wind load zone 1 with 22.0 m/s
- Wind load zone 2 with 24.0 m/s
- Wind load zone 3 with 26.0 m/s
- Wind load zone 4 with 28.0 m/s

2.3. Definition of the terrain or roughness category

	Terrain category 0 (The most stringent) Sea or coastal area with wind flowing over the open sea.
	Terrain category I Lakes or flat and horizontal area with negligible vegetation and no obstacles.
	Terrain category II Area with low vegetation such as grass, with or without a few free-standing obstacles (trees, buildings) with a distance between them of at least 20 times their height (= gap of at least 20 obstacle heights).
	Terrain category III Area with regular overgrowth or buildings or isolated obstacles with a gap of no more than 20 obstacle heights (e.g. villages, peri-urban areas, sustainable forests, etc.)
	Terrain category IV (The least stringent) Urban areas where at least 15% of the surface area is covered with buildings with an average height of over 15 metres.

Source: NBN EN 1991-1-4

2.4. Installation height

In addition to the wind speed zone and the terrain category, the installation height also plays a role in defining the wind resistance classes. The table below shows the recommended wind resistance class depending on the installation height in accordance with the applicable standards in each country.

The minimum class in the application recommendations is wind resistance class 2. This does not mean that class 0 or class 1 products cannot be used. However, a product with the relevant wind resistance class is recommended to define a particular quality level.

BELGIUM	Terrain category	Installation heights 0 – 8 metres				Installation heights > 8 – 20 metres				Installation heights > 20 – 100 metres			
		Wind speed zone				Wind speed zone				Wind speed zone			
	▼	1 23 m/s	2 24 m/s	3 25 m/s	4 26 m/s	1 23 m/s	2 24 m/s	3 25 m/s	4 26 m/s	1 23 m/s	2 24 m/s	3 25 m/s	4 26 m/s
	0	3	4	4	4	4	4	4	5	4	5	5	5
	I	3	4	4	4	4	4	4	5	4	5	5	5
	II	3	3	3	4	3	4	4	4	4	5	5	5
	III	2	3	3	3	3	3	3	4	4	5	5	5
	IV	2	3	3	3	3	3	3	3	4	4	4	4

THE NETHERLANDS	Terrain category	Installation heights 0 – 8 metres			Installation heights > 8 – 20 metres			Installation heights > 20 – 100 metres		
		Wind speed zone			Wind speed zone			Wind speed zone		
	▼	1 30 m/s	2 27.5 m/s	3 25 m/s	1 30 m/s	2 27.5 m/s	3 25 m/s	1 30 m/s	2 27.5 m/s	3 25 m/s
	0	4	4	4	5	5	4	6	5	5
	I	4	4	4	5	5	4	6	5	5
	II	4	4	3	5	4	4	5	5	5
	III	4	3	3	4	4	3	5	5	5
	IV	3	3	3	4	3	3	5	4	4

FRANCE	Terrain category	Installation heights 0 – 8 metres				Installation heights > 8 – 20 metres				Installation heights > 20 – 100 metres			
		Wind speed zone				Wind speed zone				Wind speed zone			
	▼	1 22 m/s	2 24 m/s	3 26 m/s	4 28 m/s	1 22 m/s	2 24 m/s	3 26 m/s	4 28 m/s	1 22 m/s	2 24 m/s	3 26 m/s	4 28 m/s
	0	3	4	4	4	4	4	5	5	4	5	5	5
	I	3	4	4	4	4	4	5	5	4	5	5	5
	II	3	3	4	4	3	4	4	4	4	5	5	5
	III	2	3	3	3	3	3	4	4	4	5	5	5
	IV	2	3	3	3	3	3	3	3	4	4	4	4

GERMANY	Terrain category	Installation heights 0 – 8 metres				Installation heights > 8 – 20 metres				Installation heights > 20 – 100 metres			
		Wind speed zone				Wind speed zone				Wind speed zone			
	▼	1 22.5 m/s	2 25.0 m/s	3 27.5 m/s	4 30.0 m/s	1 22.5 m/s	2 25.0 m/s	3 27.5 m/s	4 30.0 m/s	1 22.5 m/s	2 25.0 m/s	3 27.5 m/s	4 30.0 m/s
	0	3	4	4	4	4	4	5	5	4	5	5	6
	I	3	4	4	4	4	4	5	5	4	5	5	6
	II	3	3	4	4	3	4	4	5	4	5	5	5
	III	2	3	3	4	3	3	4	4	4	5	5	5
	IV	2	3	3	3	3	3	3	4	4	4	4	5

2.5. Operation in frosty conditions

Blinds/external blinds must not be operated when ice forms. The installations must first be cleared of snow and ice so that they can move. Harol accepts no liability for damage to the sun protection system resulting from operation when ice forms.

Tip: If you use remote controls or wind/sun controls, disable automatic operation in winter and check that any snow and ice has been cleared from the sun protection before operating it manually.

2.6. Operating forces

Our products comply with the guidelines for maximum permitted operating forces in accordance with DIN EN 13659.

3. Wind forces and recommendations

3.1. Summary of wind forces, wind speeds and their effects

The Beaufort scale was devised in 1806 by the English admiral Sir Francis Beaufort (1774-1857). It allows the wind force to be estimated using observations of the effects of the wind. The scale ranges from 0 (calm) to 12 (hurricane).

Wind force (Beaufort)	Average wind speed*		Thrust [Pa]	Description	Features
	[m/s]	[km/h]			
0	0 – 0.2	<1	0	Calm	Smoke rises vertically.
1	0.3 – 1.5	1 – 5	0 – 1	Light air	Smoke drift indicates wind direction.
2	1.6 – 3.3	6 – 11	2 – 6	Light breeze	Wind felt on exposed skin. Leaves rustle. Wind vanes begin to move.
3	3.4 – 5.4	12 – 19	7 – 18	Gentle breeze	Leaves and small twigs constantly moving, light flags extended.
4	5.5 – 7.9	20 – 28	19 – 39	Moderate breeze	Dust and loose paper raised. Small branches begin to move.
5	8 – 10.7	29 – 38	40 – 72	Fresh breeze	Small trees in leaf begin to sway. White caps on the sea.
6	10.8 – 13.8	39 – 49	73 – 119	Strong breeze	Large branches in motion. Umbrella use becomes difficult. Whistling heard in overhead wires.
7	13.9 – 17.1	50 – 61	120–183	Near gale	Whole trees in motion. Effort needed to walk against the wind.
8	17.2 – 20.7	62 – 74	184–268	Gale	Some twigs break off trees. Progress on foot is seriously impeded.
9	20.8 – 24.4	75 – 88	269–373	Strong gale	Some branches break off trees, minor damage to houses (roof tiles or chimney caps are blown off).
10	24.5 – 28.4	89 – 102	374–505	Storm	Trees are broken off, structural damage likely.
11	28.5 – 32.6	103 – 117	506–665	Violent storm	Trees are uprooted, substantial storm damage.
12	≥ 32.7 m/s	≥ 118 km/h	666–853	Hurricane	Severe, widespread damage.

* Average wind speed is measured at 10 m altitude above undeveloped terrain

Wind resistance classes Complies with EN 13659:2004 + A1:2008	Thrust [Pa]
0	<50
1	50
2	70
3	100
4	170
5	270
6	400

3.2. Usage guidelines and wind limits.

Exterior blinds/outside venetian blinds must be retracted at higher wind speeds. Since the sun protection can only be retracted with a certain delay at particular wind forces, we recommend wind warning installations in conjunction with the relevant controls. The ITRS (Industrieverband Technische Textielien- Rolladen- Sonnenschutz e.V.) tables below show the wind limits in m/s for exterior blinds and outside venetian blinds. The installations must be retracted when the lower limit is reached.

ARB-80 met geleiders (BZ700/BZ1000)

H↓\B→	1000	1500	2000	2500	3000	3500	4000	4500	5000
1000	17	17	17	17	17	17	17	17	17
1500	17	17	17	17	17	13	13	13	13
2000	17	17	17	17	17	13	13	13	13
2500	17	17	17	17	17	13	13	13	13
3000	17	17	17	17	17	13	13	13	13
3500	17	17	17	13	13	13	13	13	10
4000	17	17	17	13	13	13	13	10	10
4500	17	17	17	13	13	13	10	10	10
5000	13	13	13	13	13	10	10	10	10

ARB-80 met kabelgeleiding (BZ1000)

H↓\B→	1000	1500	2000	2500	3000	3500	4000	4500	5000
1000	17	17	17	13	13	13	13	13	13
1500	17	17	17	13	13	13	13	13	10
2000	17	17	17	13	13	13	13	13	10
2500	17	17	13	13	10	10	10	10	10
3000	13	13	13	10	10	10	8	8	8
3500	13	13	10	10	10	8	8	8	8
4000	13	10	10	10	8	8	8	8	8

AR 63 ECN / AR 92 ECN (BZ700/BZ1000)

H↓\B→	1000	1500	2000	2500	3000	3500	4000	4500	5000
1000	17	17	17	17	17	17	17	17	17
1500	17	17	17	17	17	17	17	17	17
2000	17	17	17	17	17	17	17	17	17
2500	17	17	17	17	17	17	17	17	17
3000	17	17	17	17	17	17	17	17	17
3500	17	17	17	17	17	17	17	17	13
4000	17	17	17	17	17	17	17	13	13
4500	17*	17*	17*	17*	17*	17*	13*	13*	13*
5000	17*	17*	17*	17*	17*	13*	13*	13*	13*

* Hoogte niet mogelijk bij kabelgeleiding

AF-80 with geleiders (BZ700)

H↓\B→	1000	1500	2000	2500	3000	3500	4000	4500	5000
1000	17	17	13	13	13	10	10	10	10
1500	17	17	13	13	13	10	10	10	10
2000	17	17	13	13	13	10	10	10	10
2500	17	17	13	13	13	10	10	10	10
3000	17	17	13	13	13	10	10	10	8
3500	17	17	13	13	13	10	10	10	8
4000	17	13	13	13	10	10	10	8	8

The following factors must be taken into account:

- * Installation type: cable guide or guide via rails, beaded slats or flat slats, respectively.
- * For frame mounting, the value in the table can be increased to the next higher table values (e.g. from 10 to 13 m/s - maximum value is 17 m/s), up to a maximum width of 3000 mm.
- * Position and alignment of the building: in critical corner and end situations, we advise that the activation delay be reduced to 2 seconds and the limits to 8 m/s.
- * The values must be reduced at installation heights above the 7th floor or if the building is situated higher than 800 m above sea level.
- * Dimensions of the installation:
 - at heights of 2.4 to 4 metres: table value to next smaller table value,
For example from 13 to 10 m/s.
 - at heights greater than 4 metres: reduce the table value by two steps,
For example from 13 to 8 m/s.
- * Distance from fixing level:
 - at a façade distance of 100 to 300 mm: reduce table value by one step.
 - at a façade distance >300 to 500 mm: reduce table value by two steps.
(The table cannot be used over these values.)
- * The wind sensor must always be positioned at the point with the greatest exposure to the wind.

For venetian blinds/exterior blinds we advise wind speed data as shown in the tables above. Manual installations and electrical installations without a wind warning mechanism must be retracted manually at the aforementioned wind speeds. Damage caused by failure to comply with the conditions is not covered by the warranty.

3.3. Recommendations for better wind resistance.

It is advisable to follow the recommendations below to achieve better wind resistance of venetian blinds. If a system complies with these, the wind resistance can be increased by 1 Beaufort (except wind-stable outside venetian blinds).

- split wide systems into sections with maximum total widths of 3000 mm
- slat guide (wind protection) with guide rail
- cable guides in the top box with spring tensioner and tensioning elements with threaded fitting
- extra wind protection on the sides (tensioning consoles for guide rails)
- use 90° rotation (not 180° rotation)
- reinforce bottom lath
- secure the guide cord in each slat
- distance from securing wall as small as possible (less than 100 mm)
- use of wind warning systems in conjunction with the relevant controls

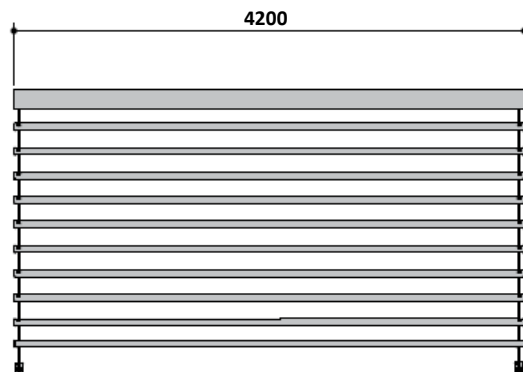
Additional wind protection (extra tensioning cables) is recommended for outside venetian blinds wider than 3 metres. This improves the wind resistance of the sun protection installation. The number of extra tensioning cables depends on the width of the blind (see table). When defining the wind resistance of a venetian blind with extra wind protection, the field with the greatest distance between two wind protection mechanisms is crucial (see example).

Recommended number of additional wind protection mechanisms

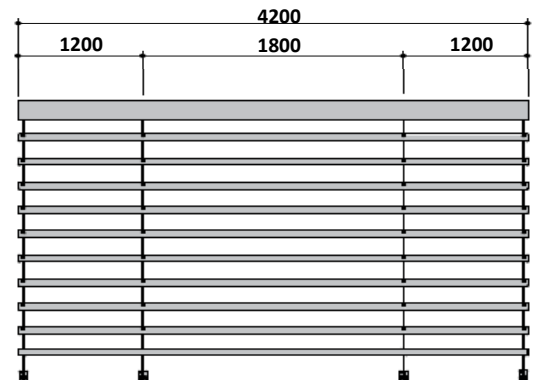
Blind width	< 3000 mm*	3001 – 4000 mm	4001 – 5000 mm
Number of extra tensioning cables	0	1	2

* < 2500 mm for flat slat AF-80

Example: ARB80 Outside venetian blind with and without additional wind protection (tensioning wire)



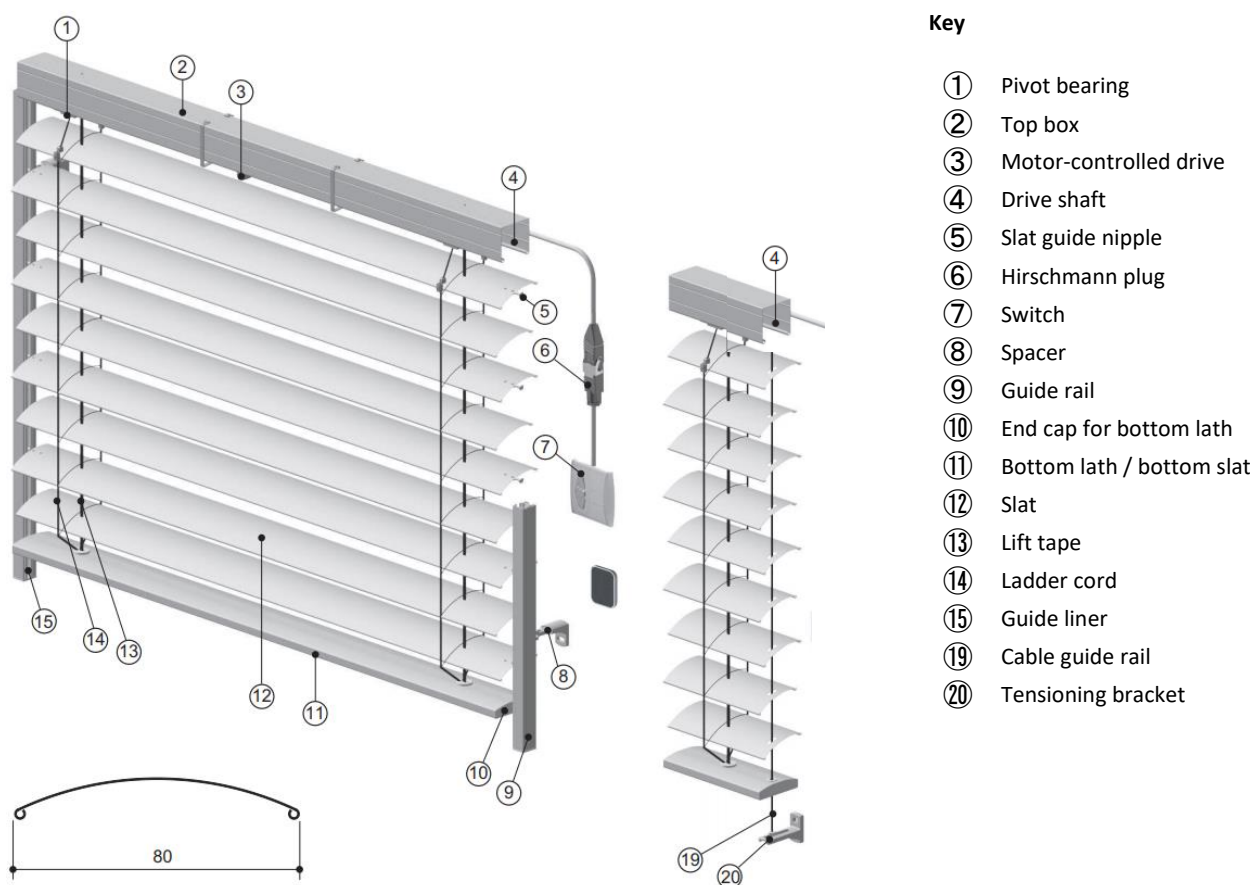
The wind resistance for ARB80 with cable guides and a total width of 4200 mm is force 6 (10.8 – 13.8 m/s). The field with the greatest distance between two wind protection mechanisms is 4200 mm.



The wind resistance for the same outside venetian blind with additional wind protection and a total width of 4200 mm is force 7 (13.5 – 17.1 m/s). The field with the greatest distance between two wind protection mechanisms is 1800 mm.

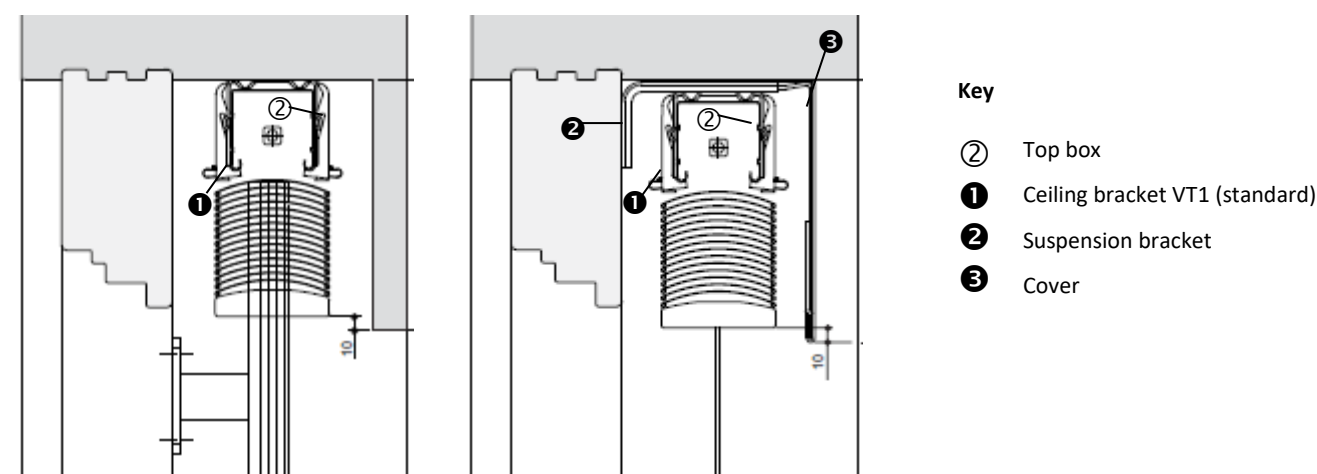
4. General structure of outside venetian blinds

4.1. Outside venetian blind



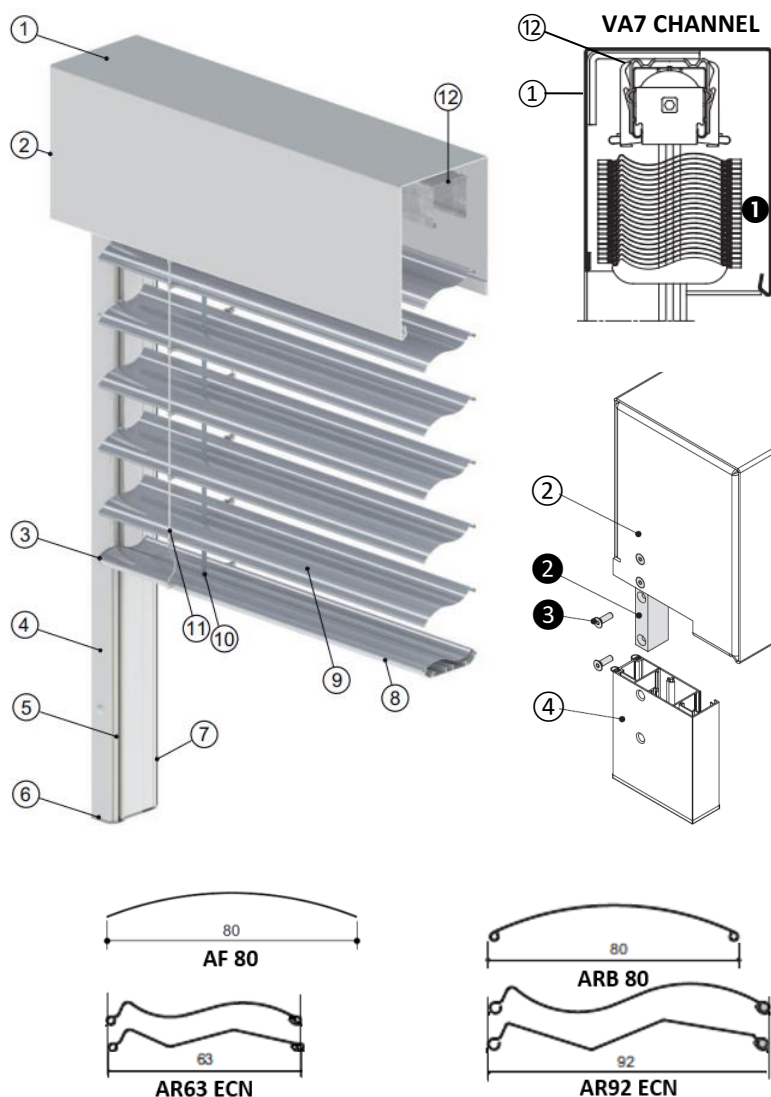
Assembly of an outside venetian blind with guide rail/cable guide with motor drive,

4.2. Suspension of the outside venetian blind



Examples of the suspension of an outside venetian blind

4.3. Flush-mounted system with outside venetian blind

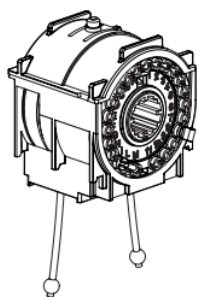


Key

- ① Flush-mounted channel, closed at the back
- ② Side console / head piece
- ③ End cap for bottom lath
- ④ FUP guide
- ⑤ Guide liner
- ⑥ End stop for guide rail
- ⑦ Sealing profile (rubber)
- ⑧ Bottom lath / bottom slat
- ⑨ Slat
- ⑩ Lift tape
- ⑪ Ladder cord
- ⑫ Top box
- ① Outside venetian blind (AR63 ECN/ARB 80/ AR92 ECN or AF-80)
- ② Pivot for console
- ③ Countersunk bolts M5 x 16

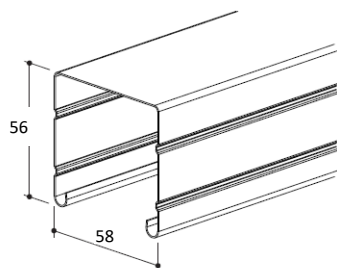
Assembly of a flush-mounted system with outside venetian blind and FUP guide rail (motor driven)

5. The components

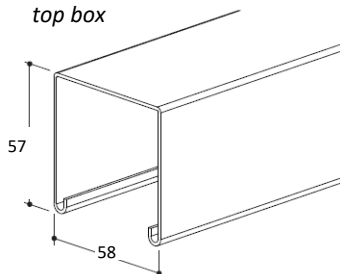


5.1. Pivot bearing

The pivot bearings are located in the upper rail, always at the height of the lift tapes. In addition to raising and lowering the slats, they also take care of the tilt and close the slats. In the factory, the pivot bearings (OS 58 x 56) are pre-set depending on the model selected and the lighting control required (see 13.1. Tilting functions). This means that no further adjustments should be made to this upon assembly or afterwards.



Galvanised (↑) and extruded (↓)
top box

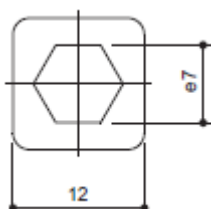


5.2. Top box

The top box is a U-shaped profile, folded inwards at both ends. It forms the backbone of the assembly. In addition to the pivot bearings, the upper box contains the (motor) controls and the drive shaft. The top box can be positioned with the opening facing downwards (standard) or with the opening facing upwards.

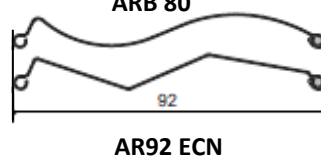
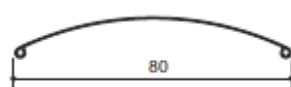
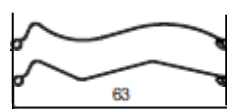
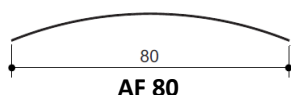
There are two versions:

- Galvanised top box 58 x 56 VZ (standard)
- Extruded top box 58 x 57 which can be painted at an additional cost



5.3. Drive shaft

The drive shaft consists of an aluminium extrusion profile with dimensions VK 12 x 12 mm. This shaft is used in both motor and crank handle operation. Internally, the drive shaft for attached elements does not have a hexagonal hole, but a round hole with a $\varnothing 9$ mm.



5.4. Slats

The slats are manufactured from a highly elastic special aluminium alloy. Different shapes and sizes are available.

The AF-80 slat is a flat slat, featuring an omega punch hole in each slat. For all AR types, the slats are folded inwards at the ends. The S and Z slats even have a plastic rubber seal embedded for maximum blackout.

The ARB-80 slats also feature an omega punch hole in each slat as standard. See also slat joints!

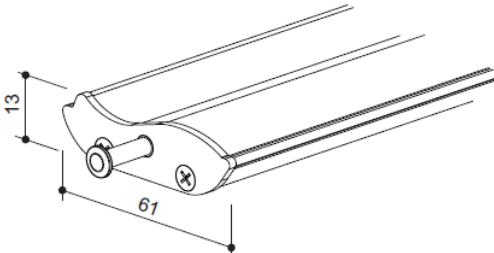
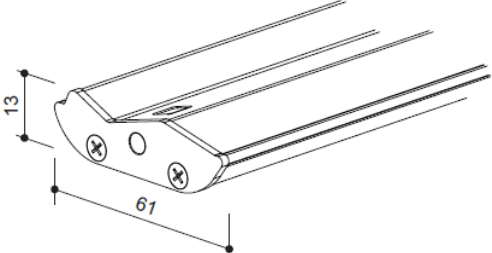
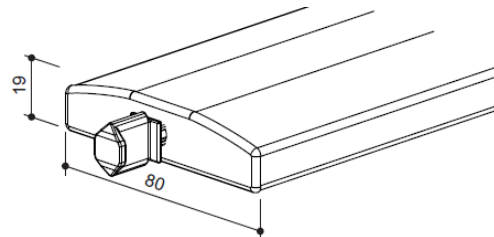
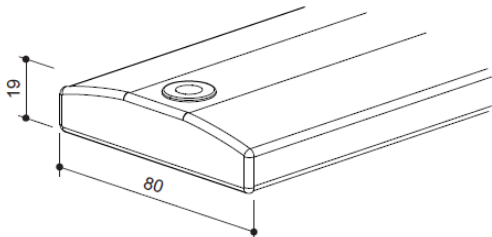
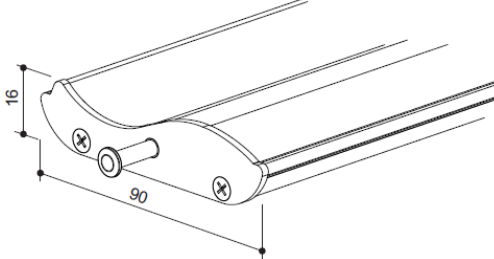
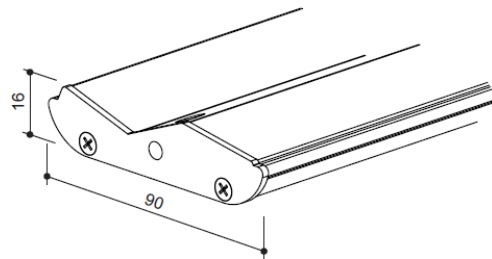
All slats have two enamelled layers and are bend, scratch and impact-resistant. They have a thickness of 0.45 mm.

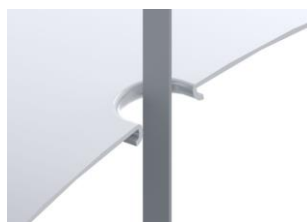
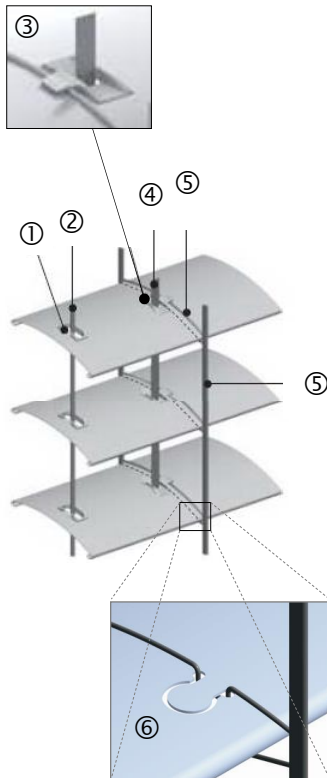
5.5. Bottom lath or bottom slat

The bottom lath or slat is extruded from an aluminium profile and powder-coated. It is closed on both sides with a plastic end cap.

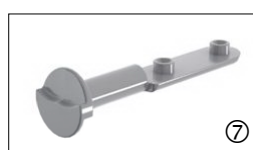
Depending on the guide system, the bottom lath differs slightly. With a cable guide, there is a finished hole 15 mm from the sides through which the tensioning cable passes. With the guide rail system, there are guide nipples on both sides. For the S and Z slat types, these guide nipples are metal, the other types are plastic. Optionally, the bottom lath can be reinforced with galvanised steel.

Below is an overview of the bottom laths.

	System with guide rails	Cable guide
AR 63 ECN (S and Z slats)		
AF 80 & ARB 80		
AR 92 ECN (S and Z slats)		



Punch hole with flange



- ① Cable guide rail clip
- ② Tensioning cable
- ③ Lift tape
- ④ Lift tape
- ⑤ Ladder cord
- ⑥ Omega punch holes
- ⑦ Rail nipple
- ⑧ ECN clip tape

5.6. Slat joints

Depending on the guide system and the type of outside venetian blind, the structure of the slat joints is different.

With the AF-80 and ARB-80, a ladder cord keeps the slats evenly spaced. This non-shrink and non-stretch ladder cord is made of high-quality terylene polyester. Furthermore, with these versions, an omega punch hole in each slat (standard) secures against sideways movement of the slats.

With the other types (AR-63 ECN and AR-92-ECN), it is the High-Grade Steel Clip Ridged Tape (ECN), or clip cord for short, that guarantees equal spacing between the slats. The woven clip cord is made of polyester, reinforced with aramid fibres and sprayed on are 2-part clip ridges of UV-resistant plastic (PA12).

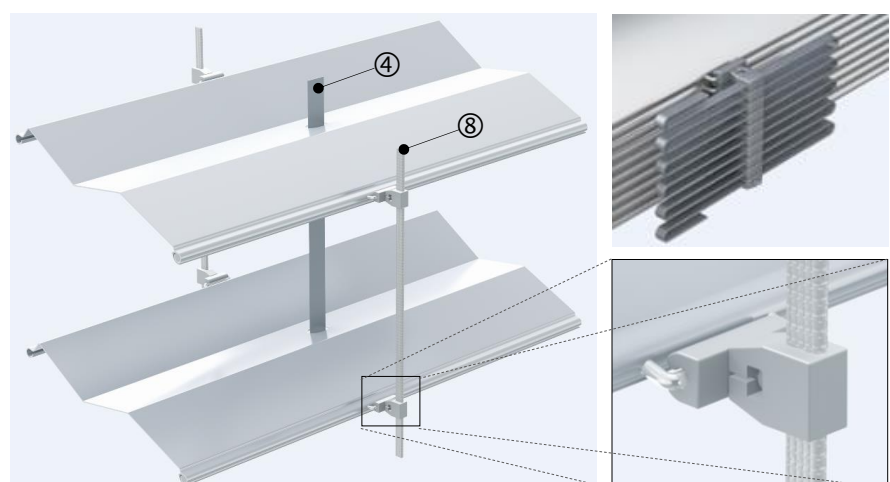
The major advantages of the ECN are the minimum package height as well as aesthetically a smoother slat package with accurate clip tape folds.

The punch holes for the tensioning cable in the cable guide and lift tape are made with flanges as standard for better wear protection.

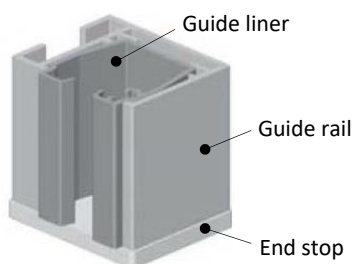
For the AF-80 and the ARB-80, instead of punch holes with flanges, lift clips and cable guide clips are an option at additional cost. For the AF-80, this will increase the package height.

When using guide rails, every 3rd slat on the AF-80 has a rail nipple on both sides. For all AR slats when guide rails are used, a zinc rail nipple is placed on each slat, alternately on the left and right.

The lift tape is fitted on all guide systems and types. It consists of a flat polyester tape, coated with a wear-resistant and UV-resistant layer that has high sliding properties. The breaking strength of a standard tape with dimensions of 6.0 x 0.28 mm is 700 N. With the 92 mm ECN slats, the tape dimensions are 8.0 x 0.34 mm and the breaking strength is 900 N. For the colour of the lift tape there is a choice of black and grey for all types.



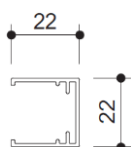
Z-slat with ECN-clip tape, folded and details



5.7. Guide rails

There is a whole range of guide rails to choose from. All guide rails are made of extruded aluminium. Inside each guide rail is a plastic guide liner for noise insulation, within which a guide nipple moves. At the bottom, an end stop made of PA6 seals the guide rail. The guide rails can be mounted with adjustable or fixed spacers (see 5.8.) on the window or wall or directly on the side in the wall.

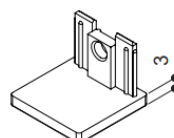
RECTANGULAR BASIC GUIDE RAILS WITH ACCOMPANYING END STOPS



FE22S

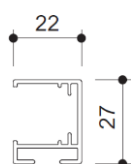
Lateral guide 22 x 22

Basic guide for inside the recess



00620960

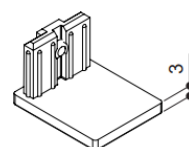
End stop lateral guide 22 x 22



FE22

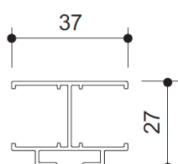
Lateral guide 22 x 27

Basic guide rail for fitting to window or wall



006209Y1

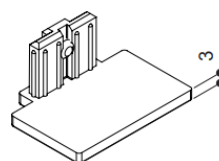
End stop lateral guide 22 x 27



FD27

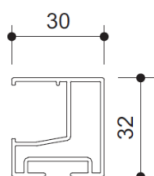
Central guide 37 x 27

Basic guide rail for fitting to window or wall



006209Y2

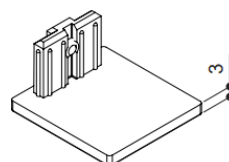
End stop central guide 37 x 27



FE30

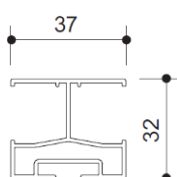
Lateral guide 30 x 32

Rectangular guides for self-supporting box



006209Y3

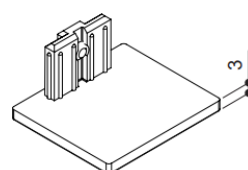
End stop lateral guide 30 x 32



FD32

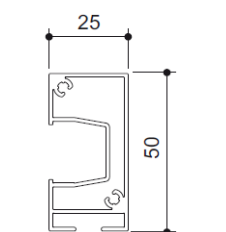
Central guide 37 x 32

Rectangular guides for self-supporting box



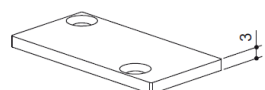
006209Y4

End stop Central guide 37 x 32



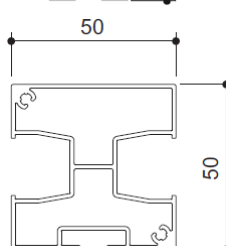
FE50

Lateral guide 25 x 50



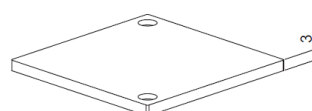
00620999

End plate lateral guide 25 x 50



FD50

Central guide 50 x 50



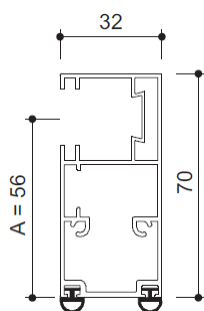
00620998

End plate central guide 50 x 50

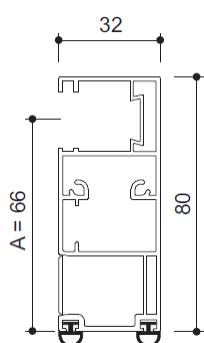


00620954

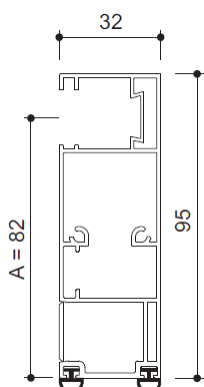
Guide liner (grey or black)

GUIDE RAILS FOR "VA7" FLUSH-MOUNTED SYSTEM WITH ASSOCIATED END STOPS

FUP 70
Lateral guide 32 x 70

Basic guide rail for the VA7 flush-mounted boxes


FUP 80
Lateral guide 32 x 80

Basic guide rail for the VA7 flush-mounted boxes


FUP 95
Lateral guide 32 x 95

Basic guide rail for the VA7 flush-mounted boxes

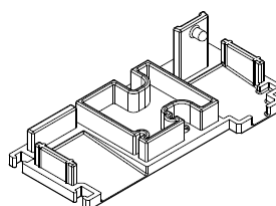


00630902

Guide liner FUP

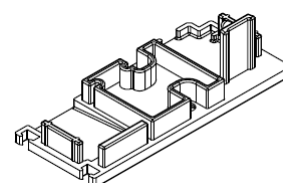

75000120

Dismantling assistance for guide rail-Liner for guide rails

End stops right


00630909

FUP-70 End stop straight L



00630910

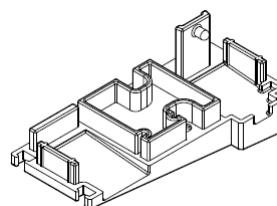
FUP-70 End stop straight R

00630915
FUP-80 End stop straight L

00630916
FUP-80 End stop straight R

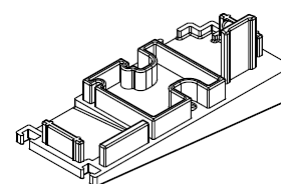
00630921
FUP-95 End stop straight L

00630922
FUP-95 End stop straight R

End stops 5°


00630911

FUP-70 End stop 5° L



00630912

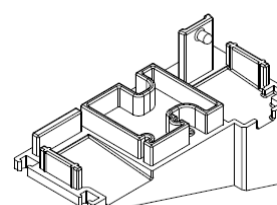
FUP-70 End stop 5° R

00630917
FUP-80 End stop 5° L

00630918
FUP-80 End stop 5° R

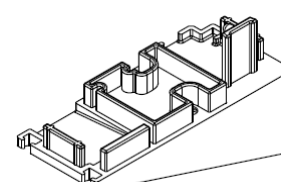
00630923
FUP-95 End stop 5° L

00630924
FUP-95 End stop 5° R

End stops 1° - 18° (order-related)


00630913

FUP-70 End stop X° L



00630914

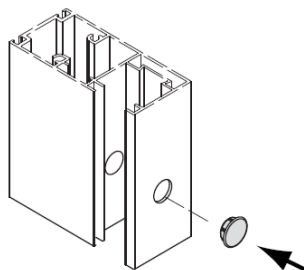
FUP-70 End stop X° R

00630919
FUP-80 End stop X° L

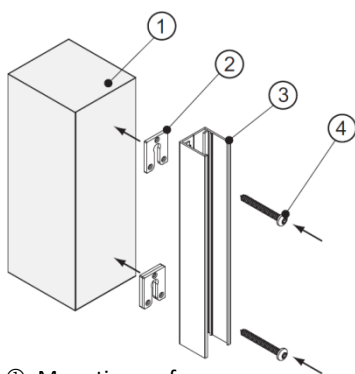
00630920
FUP-80 End stop X° R

00630925
FUP-95 End stop X° L

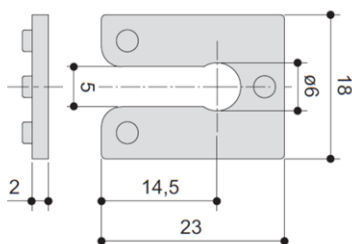
00630926
FUP-95 End stop X° R



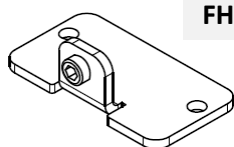
FUP secured in the back (standard)



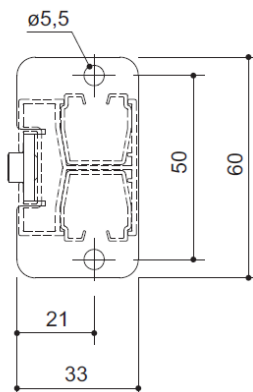
- ① Mounting surface
- ② Spacer plate
- ③ Guide rail FE22S
- ④ Fastening bolt



Spacer plate dimensions



FH10



Dimensions FH10 cover plate

5.8. Securing the guide rails

The FE22S lateral guide is mounted sideways. The FUP lateral guides can also be mounted laterally, but are usually secured in the back. The holes drilled for this purpose are covered with PVC plugs.

For all other basic guide rails, spacers are used, which then ensure the guide rail is connected to the window or wall.

5.8.1. Laterally securing the guide rails

To secure the FE22S lateral guides, a number of drill holes must be provided in the surface and in the guide rails. The number of drill holes depends on the length of the guide rail (see table). It is recommended to drill the bottom hole at 200 mm from the bottom and the top hole at 350 mm from the top. The remaining holes should then be evenly spaced between the top and bottom hole. The fastenings to use depend on the surface.

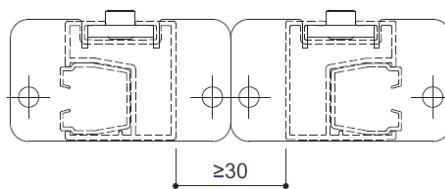
Ensure the mounting surface is level by using plastic spacers, article number 00620940, with a thickness of 2 mm. Available colours: RAL 9016 (traffic white), RAL 9006 (white aluminium), RAL 9005 (black) and RAL 7016 (anthracite grey).

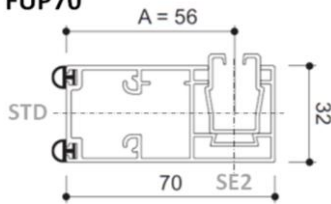
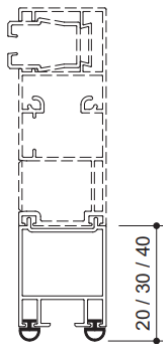
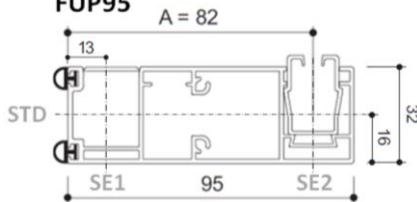
Number of fastening drill holes					
Length of guide rail:	<=1400	1401-2300	2301-3200	3201-4100	> 4101
Quantity	2	3	4	5	6

5.8.2. Fixing the guide rails to the floor

When fixing the FE30 and FD32 guide rails, there is a version for fixing them to the floor: the cover plate below (FH10).

When mounting two single FE30 guide rails side by side using these cover plates, there must always be a minimum distance of 30 mm between the guide rails (see drawing).



FUP70

FUP95


5.8.3. Securing FUP guide rails

There are a number of options when fixing FUP guide rails. As standard, these guide rails are fixed in the back (STD). Laterally, there is a choice of fastening drill holes SEZ1, SEZ2 or both.

Again, the number of drill holes depends on the length of the guide rail (see table). It is recommended to drill the lower and upper holes 140 mm from the ends and evenly distribute the remaining holes between them. Depending on the surface, different fastening materials are also used here.

Number of fastening drill holes				
Length of guide rail	<=1800	1801-3000	3001-4000	4001-5200
Quantity	2	3	4	5

5.8.4. Adjustment profiles for FUP guide rails

To mount the FUP guide rails at a further distance from a mounting surface, 20 mm, 30 mm and 40 mm adjustment profiles are available.

The rubber seals of the FUP guide rail then move to the adjustment profile.

These adjustment profiles are secured, together with the FUP guide rails, using longer screws.

5.8.5. Fixing guide rails with spacers

With the exception of the FE22S and FUP guide rails, a number of spacers are provided as standard for fixing the basic guide rails, depending on the length of the guide rails and the type of spacers chosen (see tables).

It is recommended that the outer spacers are fitted 150 mm from the bottom and top. For reinforced spacers, the distance is 250 mm. Distribute the remaining spacers evenly between these.

Number of variable/fixed spacers				
Length of guide rail	<=1800	1801-3000	3001-4000	4001-5200
Quantity	2	3	4	5

Number of reinforced spacers			
Length of guide rail	<=2900	2901-4500	4501-5200
Quantity	2	3	4

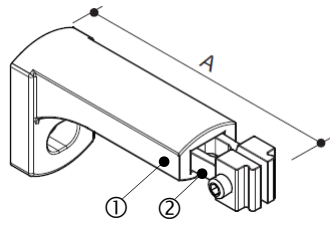
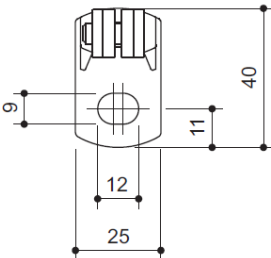
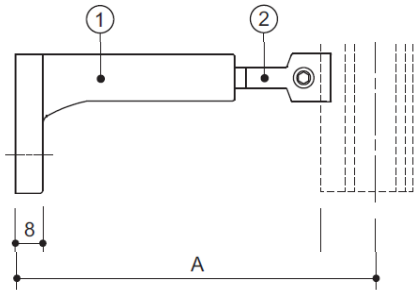
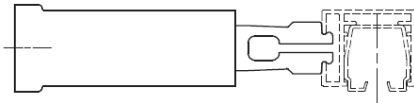
5.8.6. Overview of spacers for guide rails

Name:	F A 1 0
Sound-absorbing plate	0 Without sound-absorbing plate 1 With sound-absorbing plate
Mounting level	1 Base plate integrated 2 Base plate small 3 Base plate large 4 Base plate transverse 5 Base plate single-sided transverse
Type	A Variable spacer B Spacer FIX 32 (spacer profile 32x20) C Spacer FIX 57 (spacer profile 57x20) D Reinforced spacer (sword 45) F Inside corner G Outside corner H Bottom cover plate

5.8.7. Variable spacers (standard with guide rails)

The variable spacer consists of a pressure-cast aluminium and powder-coated spacer flange. A clamping strip made of pressure-cast zinc, Collinox coated, moves inside this. There are two adjusting screws on the clamping strip: one for clamping the guide rail, the other for fixing the guide rail at the desired distance.

Distance A is the measurement between the centre line of the slat and the vertical installation surface. The standard distance A for the AR63-ECN model is 56 mm, for the other models it is 66 mm.

VARIABLE SPACER				
FA10 / FA11				
				
				
				
Spacer size A [mm]			Spacer flange ①	Clamp ing strip ②
FE22/ FD27	FE30/ FD32	FE50/ FD50		
55-62	60-67	64-71	26	37
63-70	68-75	72-79	34	37
71-89	76-94	80-98	34	51
90-110	95-115	99-120	64	51
111-116	116-121	121-126	64	74
117-140	122-145	127-149	89	74

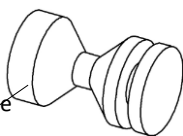
5.8.8. Fixed spacers (for non-cantilevered installations)

For the fixed spacers, a few different types are possible, with the difference only in terms of the base plate. The base plate always consists of pressure-cast aluminium. The spacer profile on it is made of extruded aluminium with a diameter of 32 x 20 mm. A zinc-plated steel clamping cone is inserted, which, after sliding it into the guide rail, is secured in the spacer profile with an adjusting screw.

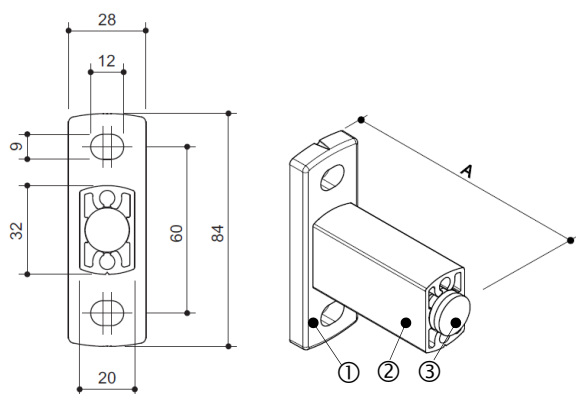
The minimum spacer length is 36 mm, the maximum spacer dimension A for non-cantilevered mounting is 400 mm.

Key

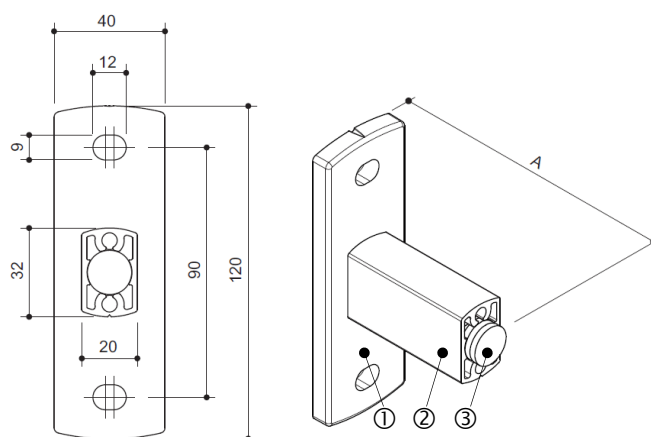
- ① Base plate
- ② Profile 32
- ③ Clamping cone


FIXED SPACER
FB20 / FB21 Fixed spacer & small base plate

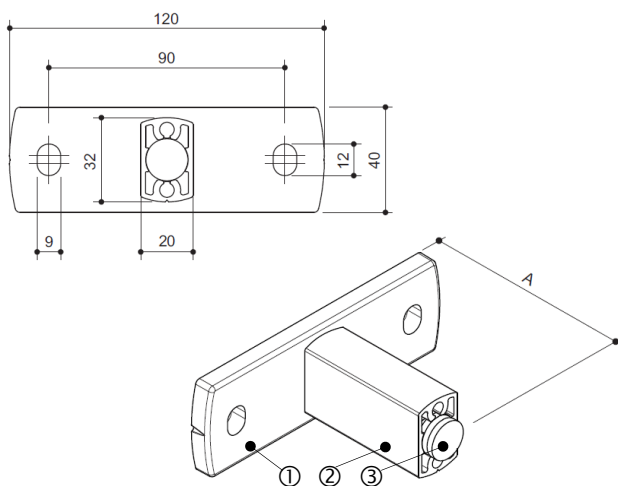
Base plate: 84 x 28 x 8 mm


FB30 / FB31 Fixed spacer & large base plate vertical

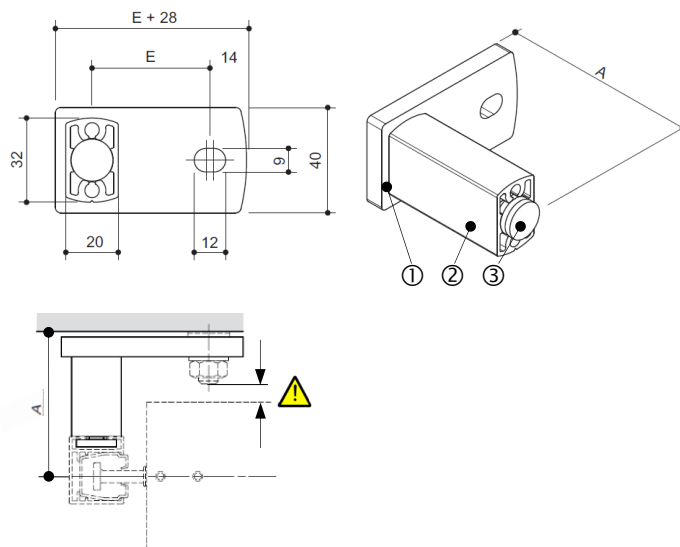
Base plate: 120 x 40 x 8 mm


FB40 / FB41 Fixed spacer & large base plate transverse

Base plate: 40 x 120 x 8 mm


FB50 Fixed spacer & single-sided base plate transverse

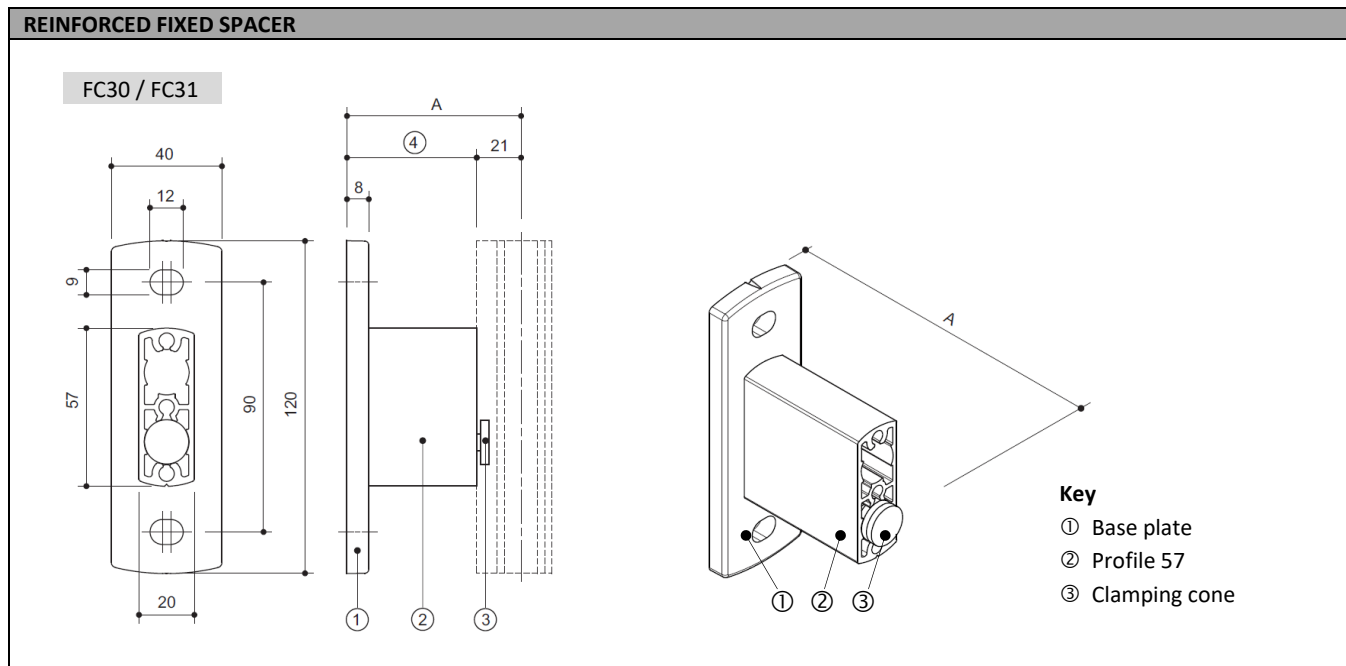
Base plate: 40 x B x 8 mm (B = E+28 = depending on the order)



For the size A of spacers with a transverse base plate, the slot width and fastening material must be taken into account to avoid a conflict between the two.

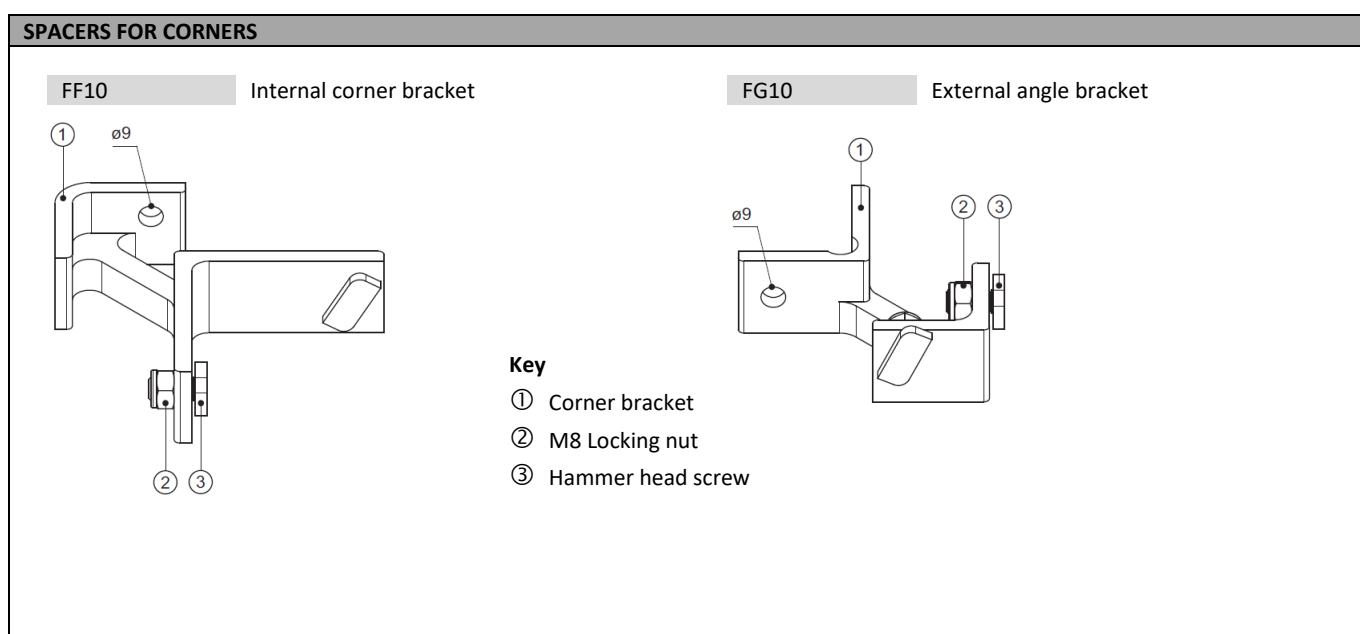
5.8.9. Reinforced fixed spacers (for cantilevered installations)

A reinforced fixed spacer consists of a pressure-cast aluminium base plate with dimensions of 120 x 40 x 8 mm. The spacer profile on it is made of extruded aluminium with a diameter of 57 x 20 mm. A zinc-plated steel clamping cone is inserted, which, after sliding it into the guide rail, is secured in the spacer profile with an adjusting screw. This clamping cone is the same as the one used with the fixed spacers. The minimum spacer length is 36 mm, the maximum spacer size A is 350 mm for cantilever mounting.



5.8.10. Spacers for corners

The corner brackets are made of aluminium, the locking nut and hammer head screw are made of stainless steel. Each corner bracket is made to order according to the sketch provided, where the type of guide rails, the angle and A dimension should also be indicated.



5.9. Tensioning cable



Assembly bracket

As a guide rail system, you can also choose to have cable guides along the sides. For blinds wider than 3 metres, it is desirable to use additional tensioning cables as wind protection, regardless of which guide rail system is used.

Tensioning cables are attached to the top rail via an assembly bracket, then run down through the punch holes in the slats and the bottom lath, where they are then fixed to the floor or wall with a tensioning element (see 5.10).

With regard to the tensioning cable, there is a choice of a bare or polyamide-coated stainless steel cable Ø 2.5 mm.

Optional tensioning cables



00620955 PSILB	Nylon-sheathed stainless steel cable Ø 2.5 mm – pearl silver
00620955 SCHW	Nylon-sheathed stainless steel cable Ø 2.5 mm – black
00620955 TRANS	Nylon-sheathed stainless steel cable Ø 2.5 mm – transparent
00620943	Clamping sleeve (always permanently crimped onto the cable)

5.10. Tensioning elements (bottom)

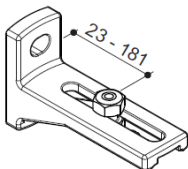
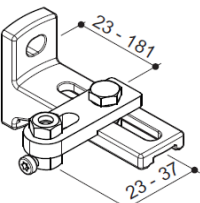
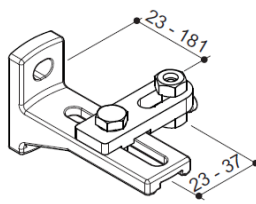
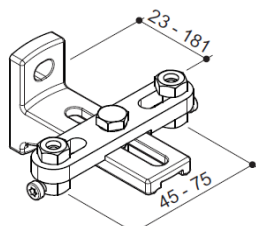
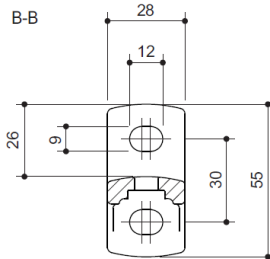
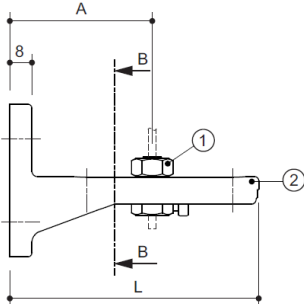
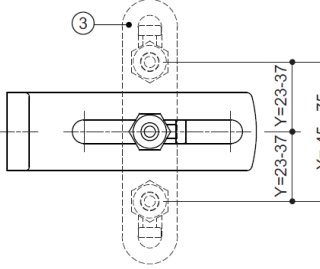
There are a number of options for securing the tensioning cables to the underside: rake angles, tensioning shoes and tension brackets.

5.10.1. Overview of tensioning elements for cable guides

Name:	S	A	1	0	M	3
Type of screw						1 2 3 4
Position					M L R D G	
Sound-absorbing plate					0 1	
Mounting level					0 1 2 3 4 5 6	
Type	A B C D E F G					

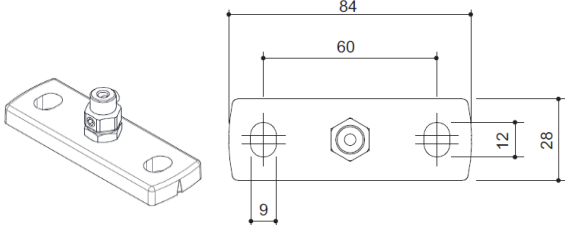
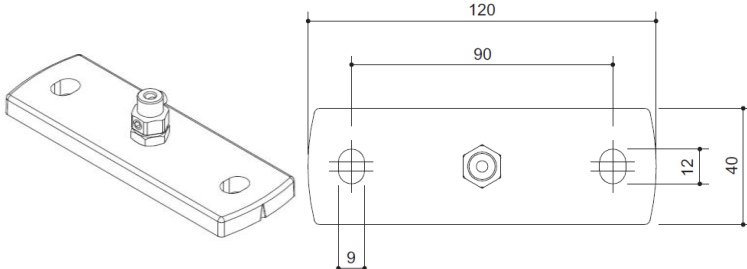
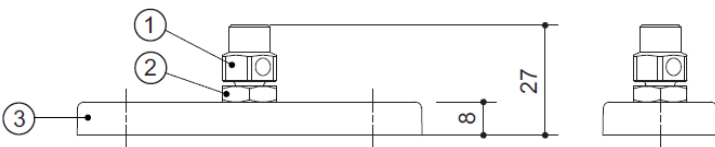
5.10.2. Tensioning brackets

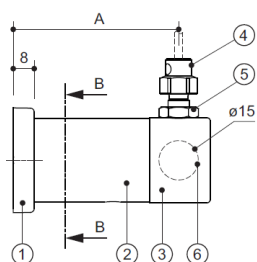
The tensioning bracket is always made of pressure-cast aluminium, with a length L depending on the distance dimension A. A tensioning screw is used to secure the stainless steel tensioning cables. Any transverse used is made of aluminium.

TENSIONING BRACKETS													
SA10M1 / SA11M1 Central tensioning bracket 	SA10L1 / SA11L1 Tensioning bracket, left 	SA10R1 / SA11R1 Tensioning bracket, right 	SA10D1 / SA11D1 Tensioning brackets left & right 										
   Adjustable tensioning bracket <table border="1"> <thead> <tr> <th>Size A</th> <th>Length L</th> </tr> </thead> <tbody> <tr> <td>23-40</td> <td>60</td> </tr> <tr> <td>41-77 (Stand.)</td> <td>90</td> </tr> <tr> <td>78-122</td> <td>135</td> </tr> <tr> <td>123-181</td> <td>190</td> </tr> </tbody> </table> ① Cable tension Tensioning cable ② Tensioning bracket ③ Transverse				Size A	Length L	23-40	60	41-77 (Stand.)	90	78-122	135	123-181	190
Size A	Length L												
23-40	60												
41-77 (Stand.)	90												
78-122	135												
123-181	190												

5.10.3. Tensioning shoes

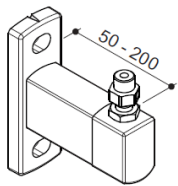
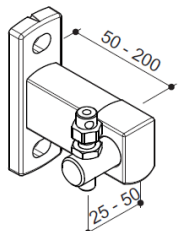
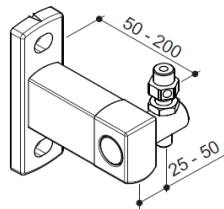
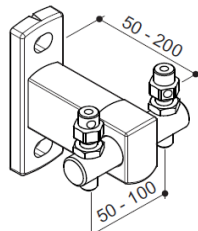
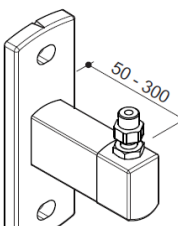
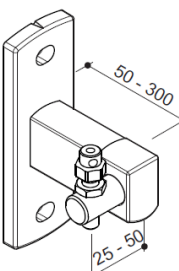
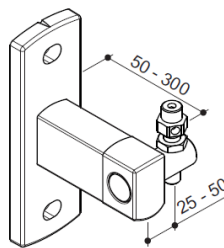
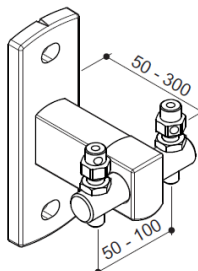
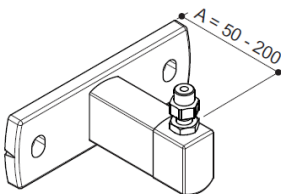
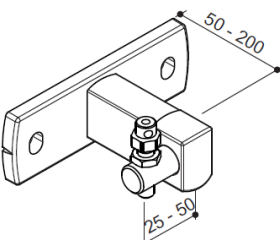
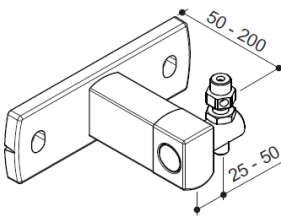
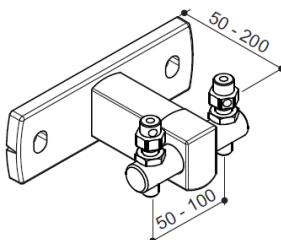
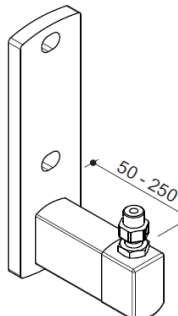
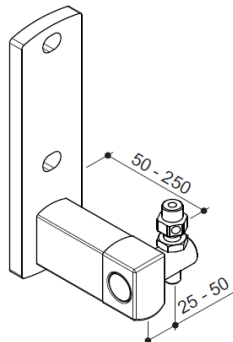
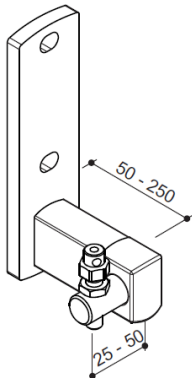
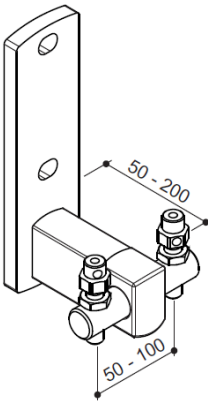
Tensioning cables are used to secure the tensioning shoes in the floor. An aluminium tensioning shoe with an M8 threaded fitting and hex nut for the stainless steel cables is fitted on a pressure-cast aluminium base plate.

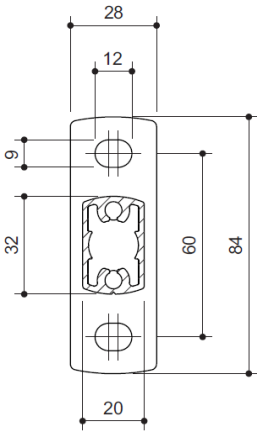
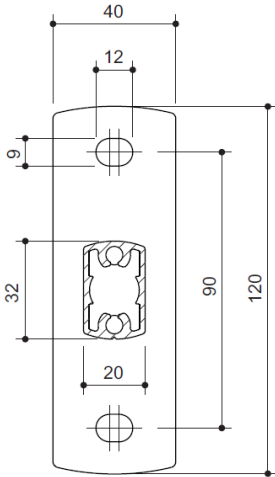
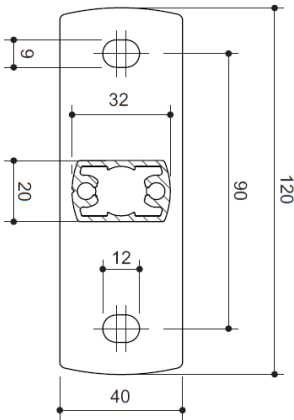
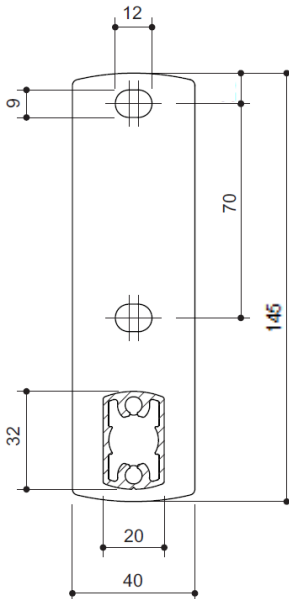
TENSIONING SHOES	
SC20M3 / SC21M3 Tensioning shoe with small base plate 	SC30M3 / SC31M3 Tensioning shoe with large base plate 
① M8 threaded fitting ② Hexagonal nut ③ Base plate small/large 	



5.10.4. Tensioning consoles

The tensioning consoles consist of a pressure-cast aluminium chuck with 1 or 2 threaded fittings M8 and hex nut, an extruded aluminium spacer profile (32 x 20 mm and length 50-300 mm) and a pressure-cast aluminium base plate. The different choices of base plate and location of threaded fitting then allow all the options below.

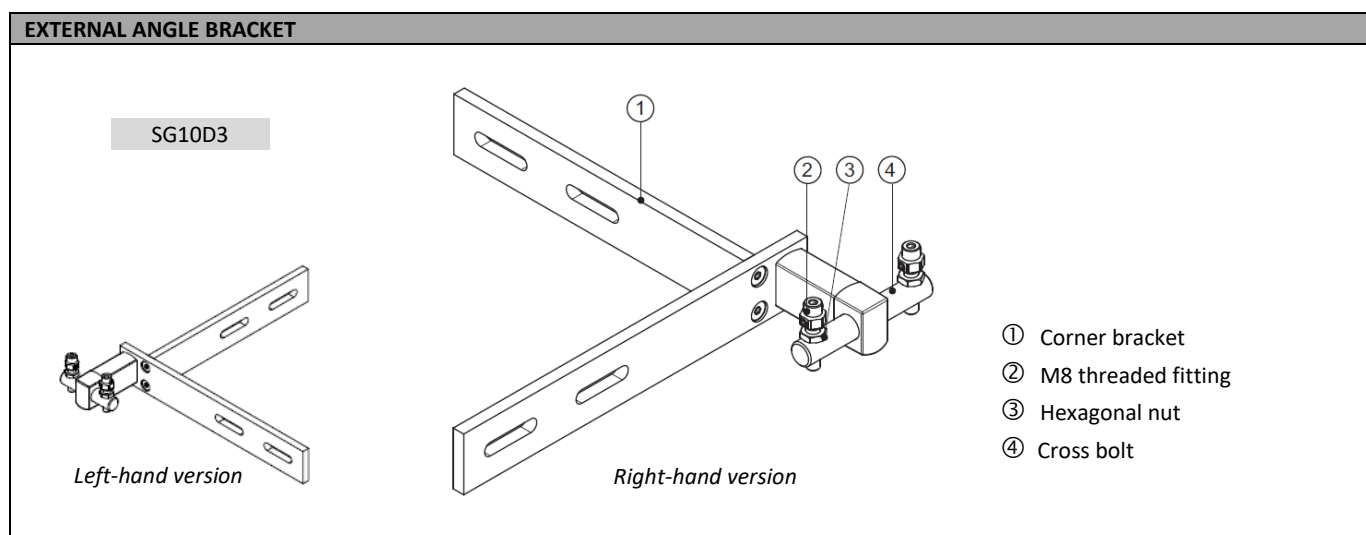
TENSIONING CONSOLES				
	Middle / Central	Left	Right	Double (Left & Right)
Small base plate	 SB20M3 / SB21M3	 SB20L3 / SB21L3	 SB20R3 / SB21R3	 SB20D3 / SB21D3
Large vertical base plate	 SB30M3 / SB31M3	 SB30L3 / SB31L3	 SB30R3 / SB31R3	 SB30D3 / SB31D3
Large base plate traverse	 SB40M3 / SB41M3	 SB40L3 / SB41L3	 SB40R3 / SB41R3	 SB40D3 / SB41D3
Tensioning consoles with base plate top	 SB50M3	 SB50L3	 SB50R3	 SB50D3

TENSIONING CONSOLES (continued)						
Base plate dimensions for drilling positions		Small base plate				
		Large base plate vertical				
		Large base plate traverse				
		Tensioning consoles with base plate top				
Base plate thickness	The base plate thickness depends on the type of tensioning console and size A (See table below).					
	Size A (mm) >>>	50 - 90	91 - 120	121 - 150	151 - 200	201 – 250
	Single tensioning console*	8 mm	8 mm	12 mm	12 mm	15 mm
	Double tensioning console	8 mm	12 mm	15 mm	20 mm	
	* Tensioning console with central chuck, left or right					

5.10.5. 90° outer corner bracket

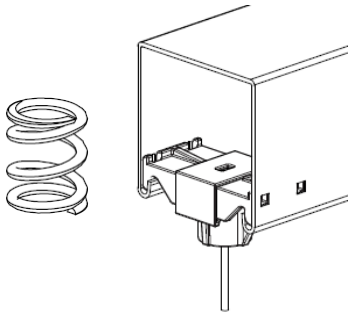
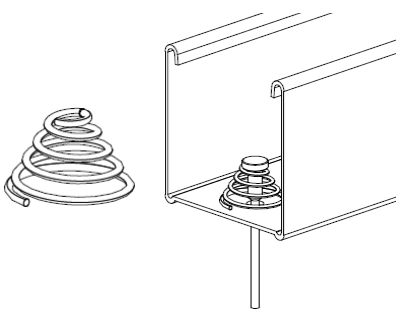
The outer corner console consists of an aluminium corner console with a tensioning console on top, composed of an aluminium spacer profile, a pressure-cast aluminium chuck, threaded fitting M8, hexagon nut and a cross bolt.

This corner bracket is made according to the orders as per the sketch provided.



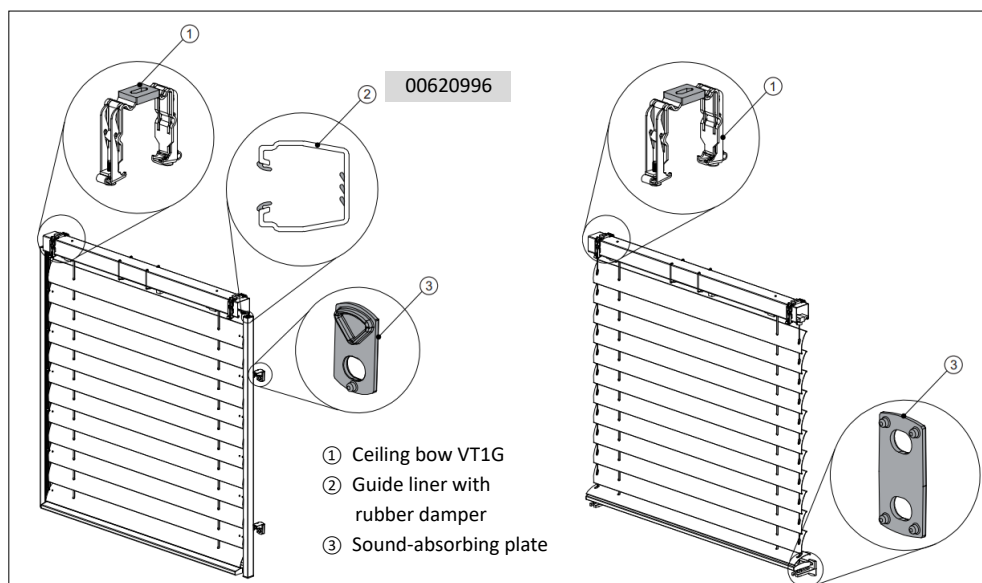
5.11. Tensioning elements top: spring tensioners for tensioning cables

To tension the stainless steel tensioning cables at the top, a compression spring or conical compression spring can be used, but only for motor-controlled drives.
The compression spring or conical compression spring can be used for galvanised and extruded top boxes, a compression spring when opening downwards, a conical compression spring when opening upwards.

SPRING TENSIONERS FOR TENSIONING CABLES		
00620989 Hercules compression spring 	Cable forces (per cable) ◀ Preload tension force 200 N Maximum force 300 N Maximum travel 10 mm Preload tension force 80 N Maximum force 100 N Maximum travel = 12 mm ▶	00620363 Conical compression spring 

5.12. Sound-absorbing elements

*Sound-absorbing elements for
guide rails and cable guides*



To reduce noise in outside venetian blinds, a number of sound-absorbing elements are available. Available options:

- Sound-absorbing ceiling bow VT1G
- Guide liner with rubber damper
- Sound absorbing plates

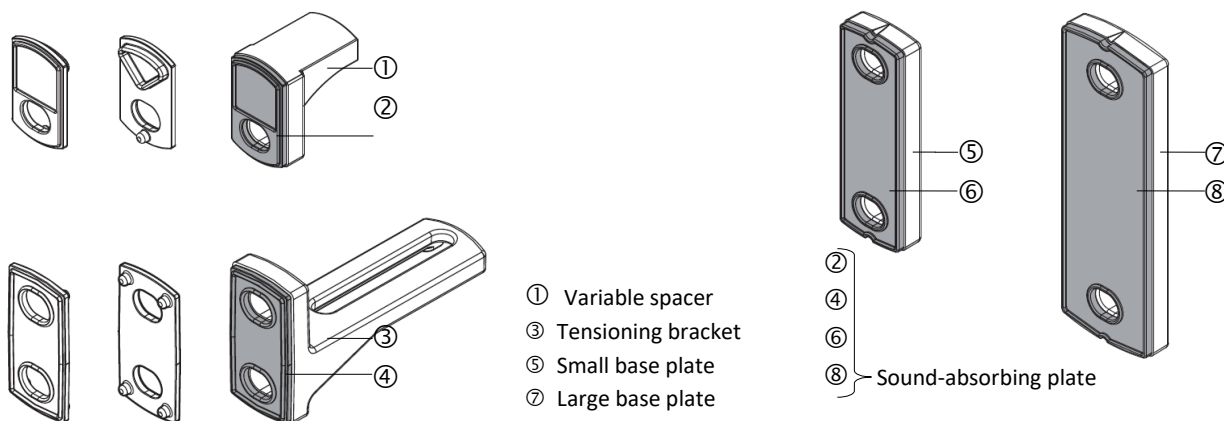
For the sound-absorbing ceiling bow, the standard VT1 ceiling bow is fitted with a sound-absorbing rubber damper, resulting in the VT1G.

The guide liner of the basic guide rails can optionally be fitted with rubber dampers. Here, too, there is a choice of grey or black guide liners (00620996). The maximum width that can be used with these guide liners is limited to 3000 mm.

Optionally, in certain cases, you may choose to attach a black sound-absorbing EPDM plate between the attachment elements for guide rails or tensioning cables and the mounting surface. If the previously described attachment elements have two article numbers, the second number is the version with a sound-absorbing plate. Positioning the sound-absorbing plate is facilitated by the studs on it and by corresponding notches in the attachment elements.

In addition to absorbing sound, this EPDM plate provides a seal against water ingress and a thermal separation between the outside venetian blind and the mounting surface.

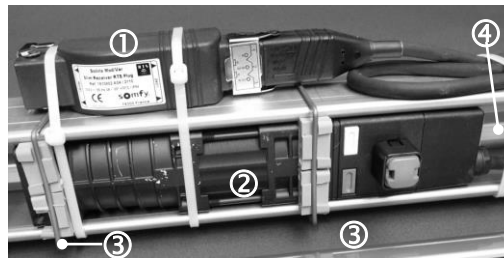
NOISE-DAMPENING PLATES



6. Controls



The outside venetian blinds are always viewed from inside, from left to right!



- ① IO-receiver
- ② Blind motor
- ③ Clips
- ④ Drive shaft

6.1. Motor-controlled drive



With a motor-controlled drive, the motor is located in the top box, attached with clips. The motor with the drive shafts controls the pivot bearings, which lift and lower the slats when the switch is actuated. To rotate the slats, give a light press on the button of the corresponding direction.

There is the option to position the motor either left, centre or right, always when seen from inside! A control panel is specified if more than one motor needs to be operated with a switch. Once the top or bottom end position is reached, the limit switches that are built into the motor ensure that the drive switches off automatically.

With electronic motors, there is the option to connect several motors in parallel to a switch. The number of motors depends on the used switches.

Our range of motors is shown below:

Model	Area FH x FB	Prod. no.	Motor	Power [Watt]	Power consumption [Amps]
ELERO	up to 10 m ²	05100205	E-motor SOFT JA 06	115 W	0.5 A
	up to 16 m ²	05100206	E-motor SOFT JA 09	170 W	0.75 A
	up to 25 m ²	05100207	E-motor DK JA 20	190 W	1.05 A
ELERO NHK (motor & emerg. man. operation.)	up to 18 m ²	05100141	E-motor NHK JA 10	120 W	0.53 A
	up to 18 m ²	05100142	E-motor NHK JA 10	120 W	0.53 A
SOMFY J4 IO (Standard motor)	up to 10 m ²	05100410	E-motor IO J4 06	95 W	0.4 A
	up to 18 m ²	05100411	E-motor IO J4 10	110 W	0.5 A
	up to 25 m ²	05100412	E-motor IO J4 18	155 W	0.7 A

General motor data:

Speed:	24 rev/min for Somfy motors, 26 rev/min for Elero
Voltage:	230 V
Frequency:	50 Hz
Protection class:	IP 54
Temperature range:	-20°C to +60°C

6.2. Connecting the motor

Motor connections may only be carried out by an authorised electrical engineering company at the expense of the end customer! The connection instructions or guidelines for connecting the motor are described in the assembly instructions, together with the guidelines for the electrical connection.

7. Suspension elements for outside venetian blinds

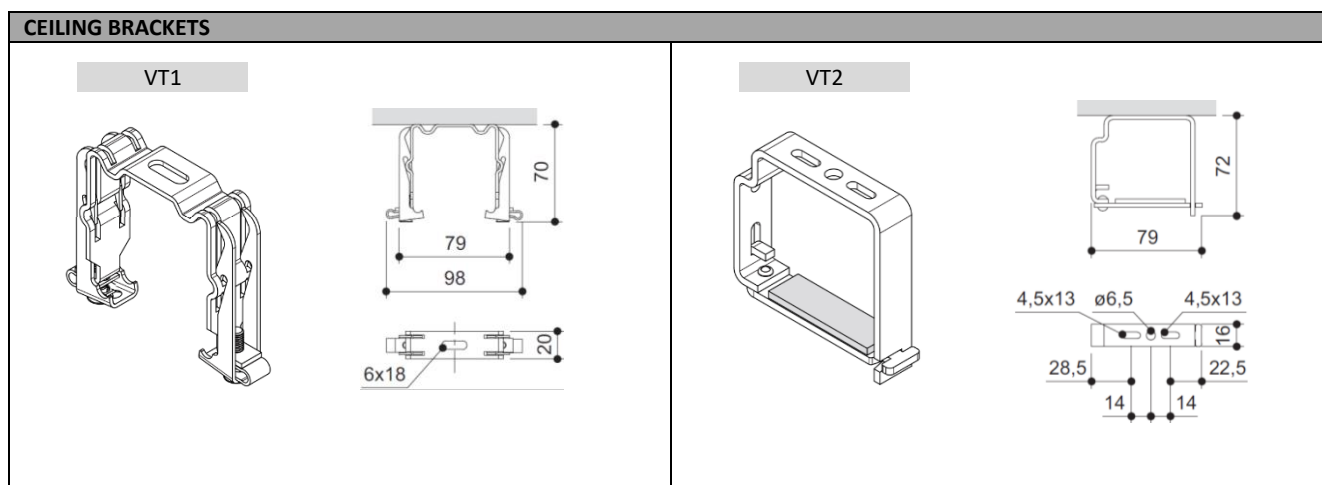
7.1. Ceiling brackets

Together with the top box, the outside venetian blind is suspended with ceiling bows. These brackets are either fixed directly into the ceiling or attached to basic support brackets (see 7.2.). If the opening near the top box points downwards, a galvanised VT1 ceiling bow is used as standard, or optionally its sound-absorbing variant VT1G. If the opening points upwards, a VT2 aluminium ceiling bow is used for suspending the outside venetian blind.

The number of ceiling bows depends on the total width (see table).

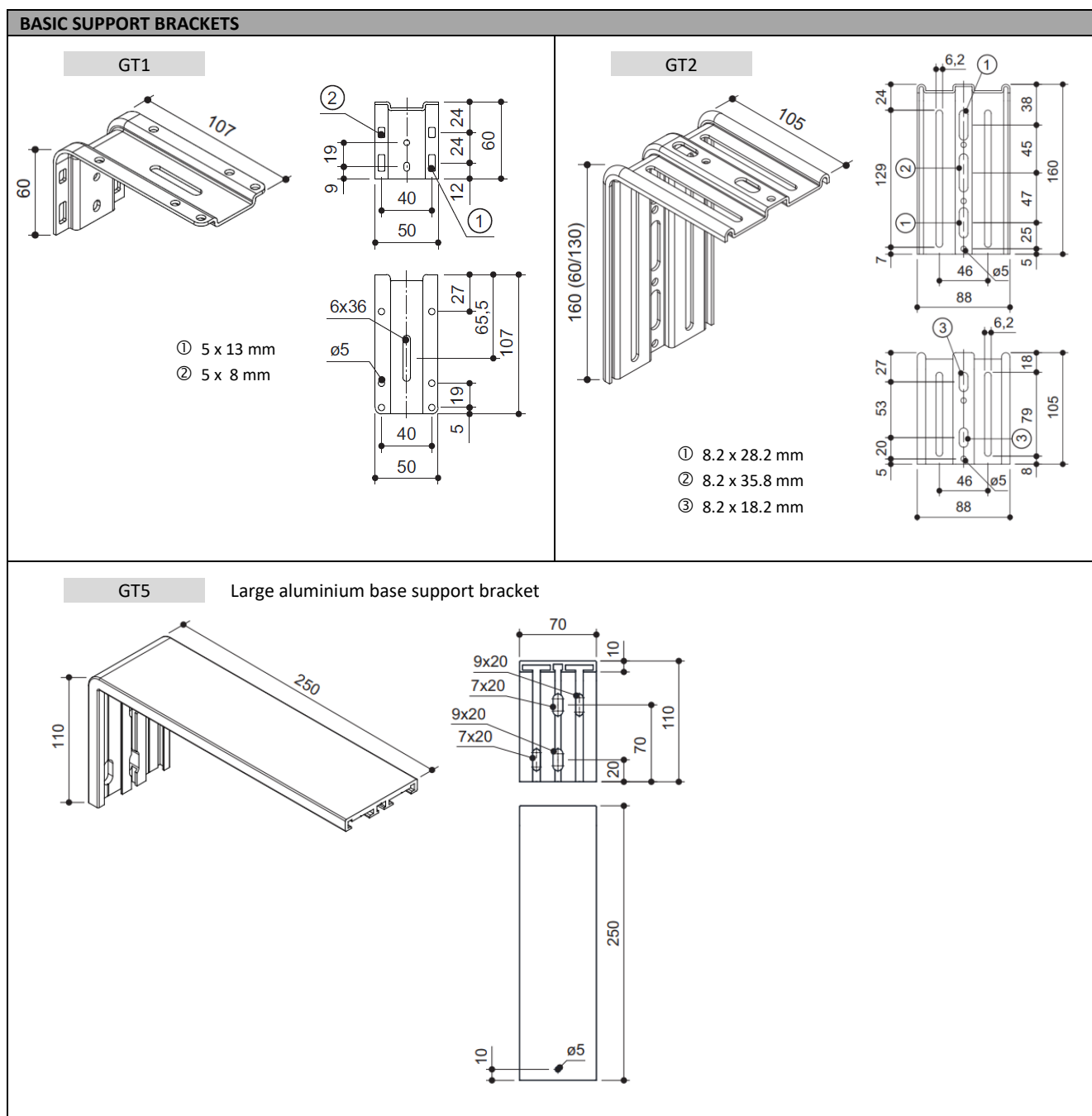
Number of ceiling bows/brackets per width

Total width (mm)	≤ 1500	1501-2700	2701-3800	3801-4900	4901-5000
Quantity	2	3	4	5	6



7.2. Basic support brackets

There is the choice of two different sizes of base support brackets made of galvanised steel and one made of aluminium. Apart from ceiling brackets, there is also the option to attach cover supports. See also combined supports (7.3.) and cover supports (7.4.).

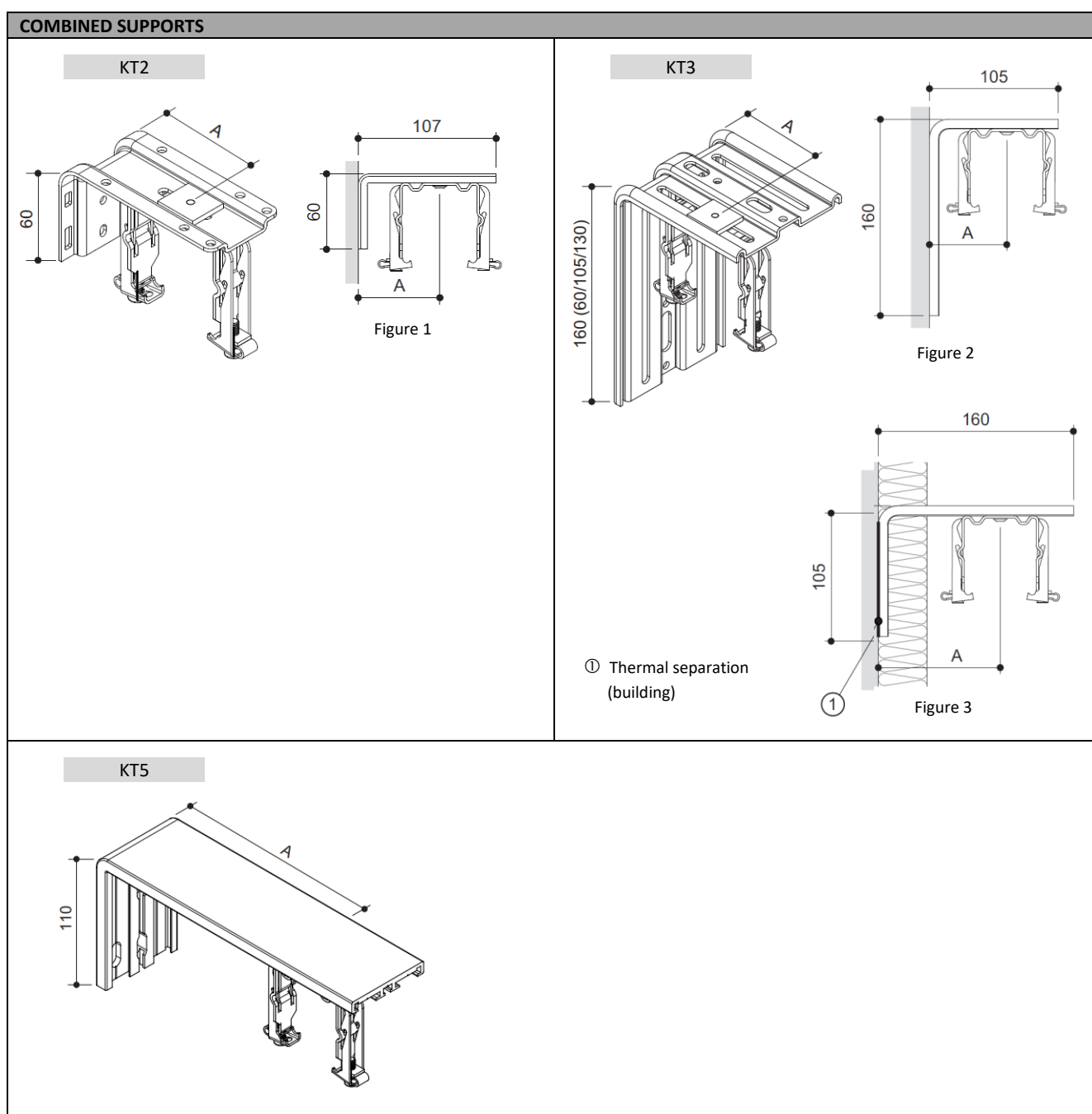


7.3. Combined supports

By attaching a ceiling bow (VT1 or VT2) to a base support bracket (GT1, GT2 or GT5), combined supports (KT2, KT3 or KT5) are obtained.

The A-size adjustment range per model for these supports is shown in the table below.

Model	Adjustment range A for vertical venetian blind supports [mm].			
	Standard	Length of adjoining side		
		60 (figure 1)	105 (figure 2)	160 (figure 3)
AR63 ECN	56	56-80	56-150	56-100
ARB80 / AR92 ECN	66	66-80	66-150	66-100

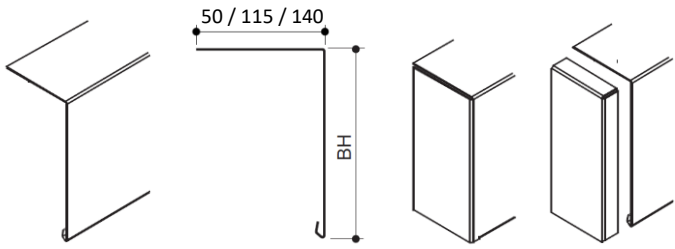
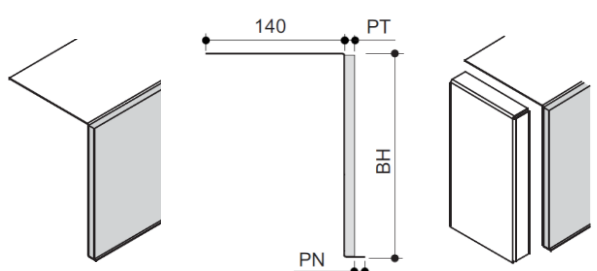
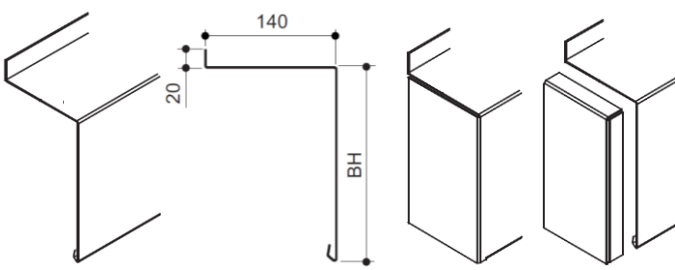
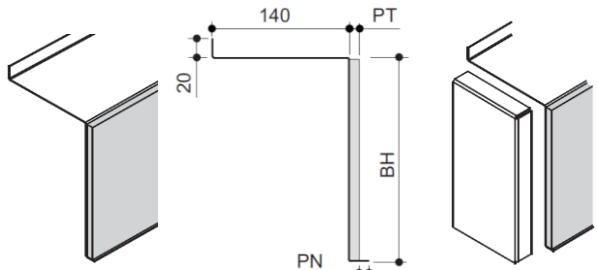
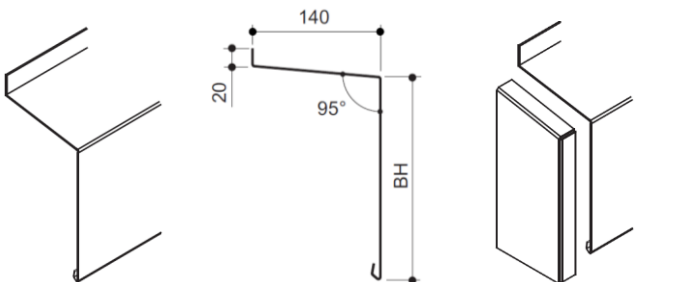


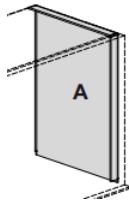
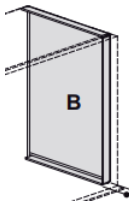
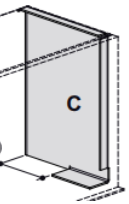
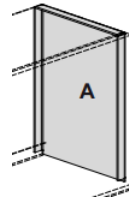
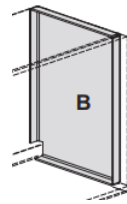
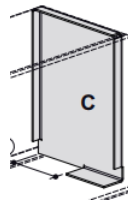
7.4. Cover supports

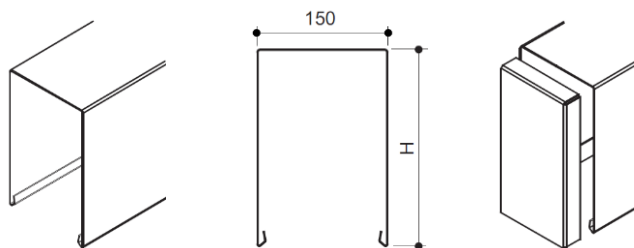
Cover supports are formed by adding additional bracket(s) to the combined supports. The brackets vary, depending on which cover is used.

COVER SUPPORTS	
KBT2 (Cover: shape 1 or 2)	KBT3 (Cover: shape 1 or 2)
KBT4 (Cover: shape 3)	KBT6 (Cover: Shape 1-PT or 2-PT)
KBT8 (Cover: shape 7)	KBT11 (Cover: shape 7-PT)

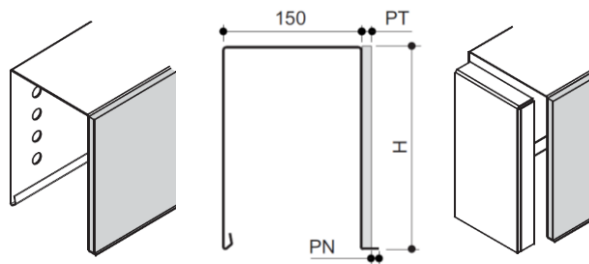
7.5. Covers / U-channels / Cover plate

COVERS	
 Cover: shape 1 (1-1, 1-2 and 1-3) Aluminium angled cover, 1.2 or 2 mm plate thickness, Powder-coated, depths: 50, 115 or 140 mm. End fitting folded over, loose or spot-welded. Supports: KBT2 or KBT3	 Cover: shape 1-3-PT Aluminium corner cover, 2 mm sheet thickness, unpainted, (10mm/20mm/without) plaster support, plaster lip PC variable, depth: 140 mm. End fitting loose or spot-welded. Supports: KBT6
 Cover: shape 2 Aluminium angled cover, 2 mm plate thickness, powder-coated, 20 mm raised edge, depth: 140 mm. End fitting folded over, loose or spot-welded. Supports: KBT2 or KBT3	 Cover: shape 2-PT Aluminium angled cover, 2 mm plate thickness, unpainted, 20 mm raised edge, (10mm/20mm/without) plaster support, plaster lip PC variable, depth: 140 mm. End fitting loose or spot-welded. Supports: KBT6
 Cover: shape 3 Aluminium angled cover, 2 mm plate thickness, powder-coated, 5° angle, 20 mm raised edge. 140 mm. End fitting loose or spot-welded. Supports: KBT4	

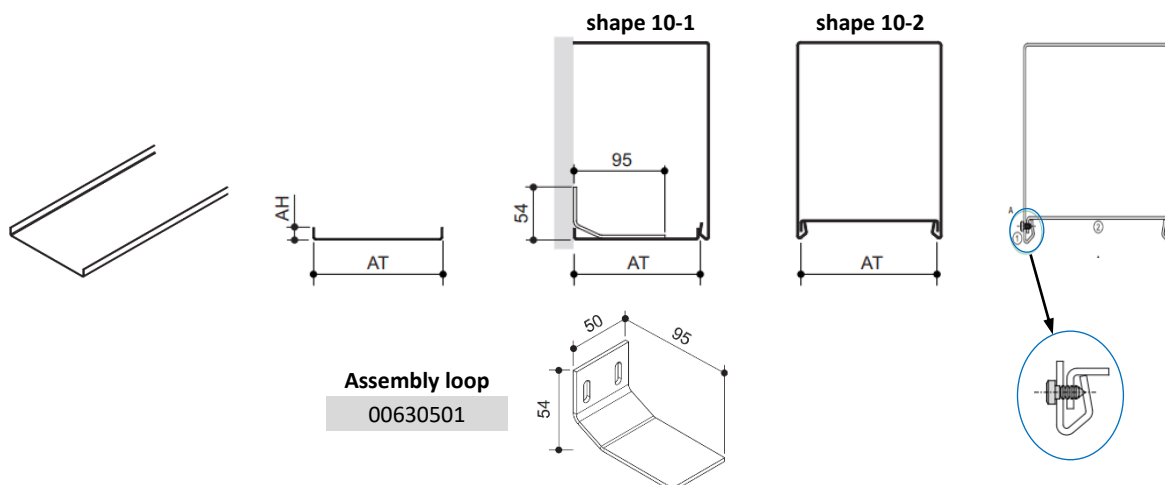
END FITTING FOR COVERS			END FITTING FOR CHANNELS		
 TYPE A (Standard)	 TYPE B	 TYPE C	 TYPE A (Standard)	 TYPE B	 TYPE C

U-CHANNELS

Cover: shape 7

Aluminium U-channel, 2 mm plate thickness, powder-coated
Depth: 150 mm. End fitting loose or spot-welded.
Supports: KBT8


Cover: shape 7-PT

Aluminium U-channel, 2 mm plate thickness, unpainted,
(10mm/20mm/without) plaster carrier, plaster lip PN
variable, depth: 150 mm. End fitting loose or spot-welded.
Drill holes on the back to prevent condensation.
Supports: KBT11

COVER PLATE

Cover: form 10-1 (for covers) / form 10-2 (for U-channels)

Aluminium cover, 1.2 or 2 mm sheet thickness, powder-coated,
Dimensions: cover height 12 mm (CH), cover depth (CD) and cover length (CL)

Attach using assembly loop for covers, for U-channel secure with screw (see drawing)

Number of assembly loops/width

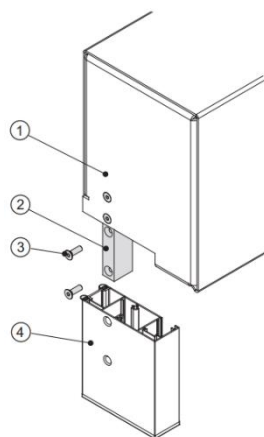
Total width (mm)	≤ 1000	1001-1800	1801-2600	2601-3400	3401-4200	4201-5000
Quantity	2	3	4	5	6	7

Dimension limits for covers / U-channels /cover / cover plate

- With a plate thickness of 1.2 mm: maximum cover height H = 300 mm, maximum length = 4000 mm
- With a plate thickness of 2 mm: maximum cover height H = 480 mm, maximum length = 5000 mm
- Maximum cover length with folded end fittings = 3000 mm
- Minimum height with U-channel is 170 mm
- Maximum height with U-channel of 120 mm = 350 mm, with larger channel width 480 mm.
- For a cover/U-channel with a mitre cut, 250 mm must be added to every cut as a tensioning aid.

8. Specific for flush-mounted system

8.1. Flush-mounted channel VA7



- ① Side console
- ② Side console pin
- ③ Sunk M5x16 bolt
- ④ FUP guide rail

The VA7 flush-mounted channel consists of an extruded aluminium profile. At the sides, the flush-mounted channel is closed using a left and right bracket, two aluminium castings. During the assembly, a console pivot on each of these castings is connected to the FUP guide rails using countersunk bolts M5x16. As a result, the box is self-supporting.

The box contains VT1 ceiling bows, so the actual blind and top box can click into place in the top box.

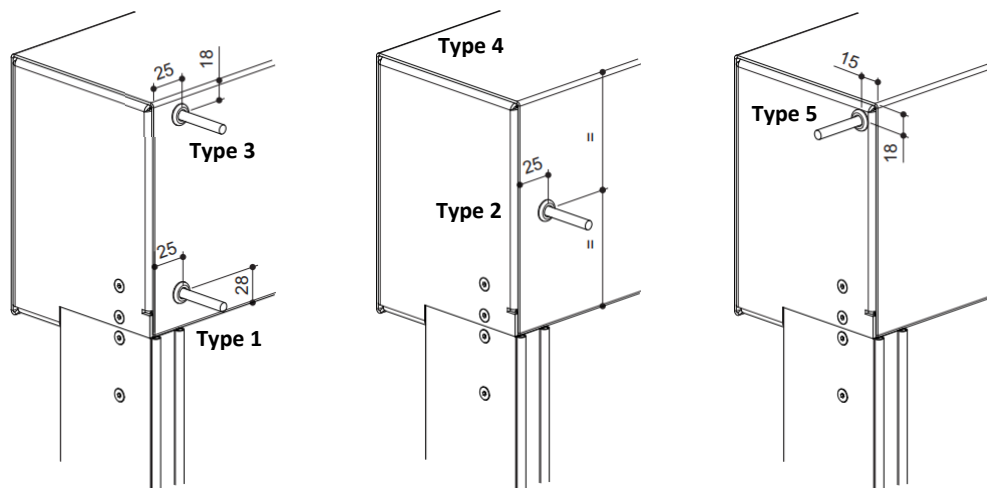
The table below shows the maximum overall heights (FH) for each channel height and channel depth for all slat types.

Slat	Guide rail >	FUP 70	FUP 80	FUP 95	
	Channel depth (CD)>	120	150	150	160
	Channel height (H)	Maximum heights (FH in mm)			
AF-80 ^[1]	200	2900			
	240	4000			
	280	4000			
	370 ^[2]	4400			
ARB-80	200	1700			
	240	2400			
	280	3200			
	370 ^[2]	4400			
AR63 ECN	200	1400			
	240	2000			
	280	2700			
	370 ^[2]	3700			
AR92 ECN	200	---	1700	---	1700
	240	---	2500	---	2500
	280	---	3100	---	3100
	370 ^[2]	---	4400	---	4400

^[1] Without slat clips ^[2] Maximum optional channel height

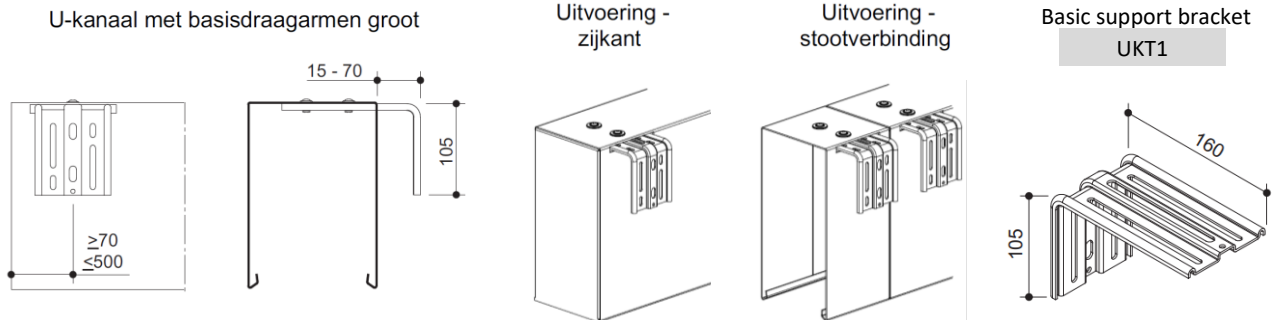
8.2. Cable exits VA7 box

There are 5 possible cable outlets with the VA7 flush-mounted box: three in the torque bar, one in the top plate and one in the side console.



9. Special suspensions for outside venetian blinds

9.1. U-channel fixing to façade with basic support bracket UKT1



Considerations:

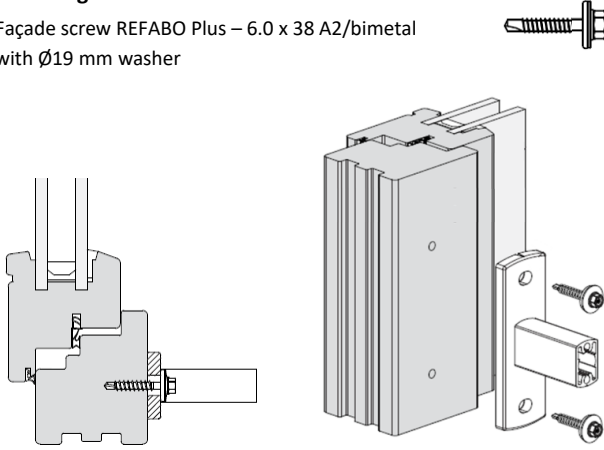
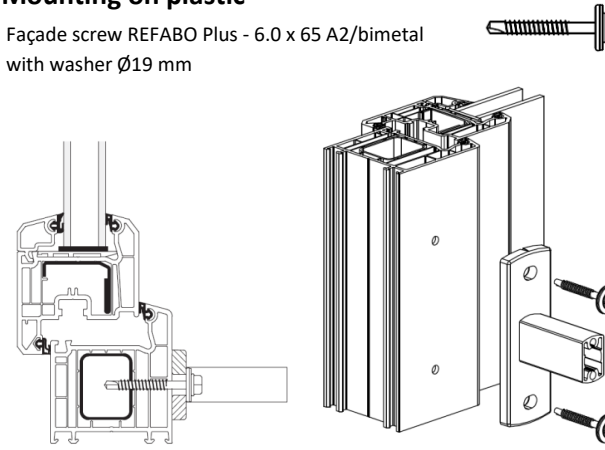
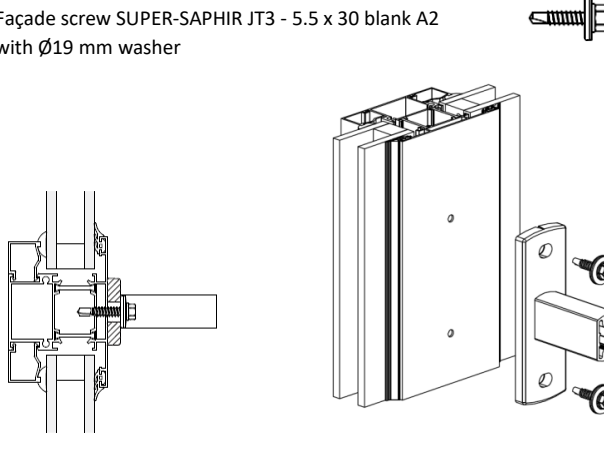
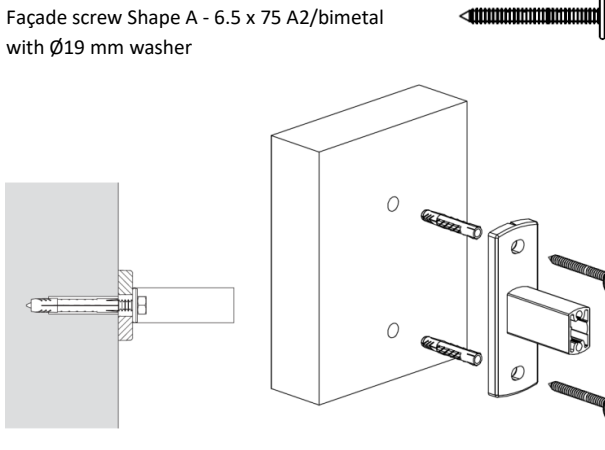
- Punch holes are needed on the back of the U-channel to secured the basic support brackets, which is why the positions and distance of these brackets must be specified at the time of order.
- The positions of the centre lines of the outermost basic support brackets are at least 70 mm and no more than 500 mm from the sides. The maximum distance between two brackets is 2000 mm.
- If the distance between the U-channel and fixing level is not specified, 40 mm will be assumed by default. The choice of distance between the two ranges from 15 mm up to a maximum of 70 mm.
- 2 basic support brackets are used for channel lengths up to 3000 mm, and 3 brackets for lengths between 3001 and 5000 mm. The maximum channel length in a single piece is 5000 mm. A butt joint is required in excess of this!

10. Fastening materials

10.1. Fastening materials for tensioning elements / spacers

The supports for the guide rails and/or cable guides must be secured with the appropriate fastening materials. Different fastening materials are required depending on the mounting surface. On the order form, be sure to indicate the mounting surface for each in order to obtain the correct fastening materials.

The screws look the same as galvanised screws but these should not be switched. The screws vary in shape and length, but all have an 8 mm SW head. An A2 sealing ring with weather-resistant, vulcanised EPDM sealant is always used for this.

FASTENING MATERIALS	
Mounting on wood Façade screw REFABO Plus – 6.0 x 38 A2/bimetal with Ø19 mm washer  Features: • Self-drilling façade screw made of stainless steel with hardened steel drill point. The surface treatment protects the steel tip against corrosion and at the same time lubricates the thread. • As a result, drilling and screwing can be done in one step. • Reduced drill point.	Mounting on plastic Façade screw REFABO Plus - 6.0 x 65 A2/bimetal with washer Ø19 mm  Features: • Self-drilling façade screw made of stainless steel with hardened steel drill point. The surface treatment protects the steel tip against corrosion and at the same time lubricates the thread. • As a result, drilling and screwing can be done in one step. • Reduced drill point.
Mounting on metal/aluminium Façade screw SUPER-SAPHIR JT3 - 5.5 x 30 blank A2 with Ø19 mm washer  Features: • Self-drilling façade screw made of stainless steel with hardened steel drill point. The surface treatment protects the steel tip against corrosion and at the same time lubricates the thread. • As a result, drilling and screwing can be done in one step. • Reduced drill point.	Mounting on concrete Façade screw Shape A - 6.5 x 75 A2/bimetal with Ø19 mm washer  Features: • Façade screw made of stainless steel A2. • Rawlplugs SX10

10.2. Fastening materials for FUP guide rails

Fastening materials also vary for mounting the FUP guide rails, depending on the surface.

If adaptor profiles are also used, longer screws should be used, depending on which adaptor profile is used.

Surfaces	Fastening material
Wood	Pan head screw ASSY - 4.5x35 AW20 VZ
Plastic	Pan Head Self-drilling Screw DIN 7504N - 4.2x38 AW20 VZ
Metal/aluminium	Pan Head Self-drilling Screw DIN 7504N - 4.2x22 AW20 VZ
Concrete/wall	Pan head screw ASSY - 4.5x50 AW20 VZ & PLUG SX 8
Wood/Aluminium Plastic/Aluminium	Pan head self-drilling screw DIN 7504N - 4.8x50 AW25 VZ

10.3. Fastening materials for support brackets

For mounting ceiling brackets (VT1/VT2), base support brackets (GT1/GT2), combined brackets (KT2/KT3) or cover supports (KBT..), the surface also determines what fastening materials are supplied.

Surfaces	Fastening material
Wood	Pan head screw ASSY - 5.0x35 AW20 VZ
Plastic	Pan head self-drilling screw DIN 7504N - 4.8x38 AW20 VZ
Metal/aluminium	Pan head self-drilling screw DIN 7504N - 4.8x22 AW20 VZ
Concrete/wall	Pan head screw ASSY - 5.0x50 AW20 VZ & PLUG SX 8
Wood/Aluminium Plastic/Aluminium	Pan head self-drilling screw DIN 7504N - 4.8x50 AW25 VZ

10.4. Fastening materials general

The fastening materials provided are a recommendation. However, due to all the varied window constructions, the specified fastening material may not be permitted. Always check the suitability of the specified fastening material for the relevant window before fitting it.

11. Standard colours

11.1. Standard colours for slats

Colour number	Colour name	venetian blind type			
		AR 63 ECN	ARB 80	AR 92 ECN	AF 80 (Flush-mounted)
Basic standard slat colours					
0003	Beige	●	●	●	●
0780 (=C33)	Bronze	●	●	●	●
7016	Anthracite grey	●	●	●	●
7016M	Anthracite grey matt		●	●	
7035	Light grey	●	●	●	●
7038	Agate grey	●	●	●	●
8014	Sepia brown	●	●	●	●
9002	Grey white	●	●	●	●
9005M	Black matt		●	●	●
9006	White aluminium	●	●	●	●
9006M	White aluminium matt		●	●	
9007	Grey aluminium	●	●	●	●
9007M	Grey aluminium matt		●	●	
9010	Pure white	●	●	●	●
9016	Traffic white	●	●	●	●
DB 703	Haematite dark	●	●	●	●
DB 703M	Haematite dark matt		●	●	
C31	Light bronze		●		●
C32	Medium bronze		●		●
C34	Dark bronze		●		●
C35	Black		●		●
Duplex slats (no additional charges)					
7016/9016	Anthracite grey / Traffic white	●		●	
DB 703/9016	Haematite dark / traffic white	●		●	
Slats in stucco colours (at additional cost)					
M99702V	Gold		●	●	
M99773V	Natural		●	●	
M99783V	Dark grey		●	●	

General slat information

- Colour:** Colour discrepancies between the RAL colour ordered and that supplied are possible!
(White and pastel shades $\Delta E \leq 1.0$, red/blue/green/yellow and metallic colours $\Delta E \leq 2.0$)
Special colours are available at extra cost, lead time on request.
- Tape material:** Aluminium 0.45 mm thick
- Coating:** Smooth coated with polyester paint (with no heavy metals), suitable for façades
- UV:** UV-resistance compliant with standard EN 1396, Index 2 – Table C.3.
- Corrosion:** Corrosion-resistant compliant with standard EN 1396, Index 2 – Table C.5.

11.2. Standard colours for powder-coated aluminium parts

The RAL colours for powder coating are available as standard for guide rails, spacers, tensioning elements, bottom laths and the covers/U-channels.

For anodised installations, the visible cast aluminium parts are powder-coated in the anodised shade. The lead time may be somewhat longer.

See also rates for current standard colours with or without additional cost!

Colour number	Colour name	Surface quality		
		Satin gloss	Matt	Matt fine-textured
Standard colours				
RAL 1013	Pearl white	●	●	●
RAL 6005	Moss green	●	●	●
RAL 7012	Basalt grey	●	●	●
RAL 7015	Slate grey	●	●	●
RAL 7016	Anthracite grey	●	●	●
RAL 7024	Graphite grey	●	●	●
RAL7035	Light grey	●	●	●
RAL 8003	Clay brown	●		
RAL 8014	Sepia brown	●	●	●
RAL 8019	Grey brown	●	●	●
RAL 8077	Dark brown	●	●	
RAL 9005	Jet black		●	●
RAL 9006	White aluminium	●	●	●
RAL 9007	Grey aluminium	●	●	●
RAL 9016	Traffic white	●	●	●
DB 703	Haematite dark		●	●
DM 1000	Chestnut brown 04 metallic			●
DM 1001	Sparkling iron effect			●
HELLA 0003	HELLA beige	●		
VSR 0110	Dark beige	●		
VSR 0330	Purple red	●		
VSR 0780	Bronze	●		
Colours with anodized look (powder coated!)				
COPB	Anodized natural-colour		●	
C33PB	Anodized medium bronze		●	
C34PB	Anodized dark bronze		●	

11.3. Standard colours for other parts

The lift tape, the ladder cord and the plastic parts (end caps, slat clips and guide rail lining) are available in grey and black. The colour is matched using the colour of the bottom slat. If the bottom slat is traffic white (RAL 9016) or white aluminium (RAL 9006), these are grey. For all other colours, these parts are black as standard. Any deviations from the standard must be specified separately at the time of order!

Exceptions: For outside venetian blinds AR 63 ECN and AR 92 ECN, the lift tape and clip tape are only available in grey.

11.4. Standard colours general

Special colours

Special colours such as fluorescent colours, colours in special collections (NCS, Sikkens, etc.) or particular powder specifications must be requested separately. Pricing for anodizing is available on request. However, powder coating with anodized shades is available at no extra cost and within the regular lead time.

Quality of the coating

The coating is carried out in accordance with the guidelines of the "Gütegemeinschaft für Stückgutbeschichtung (GSB-Premium)" in façade quality. The different production methods mean that colour differences between slats and powder-coated aluminium parts are inevitable. The colours may vary from the original colours in registers RAL 840-HR and RAL 841-GL in terms of shade and gloss due to the different production methods.

11.5. Comparison of RAL/VSR/NCS colours

Colour name	RAL number	VSR number	NCS number	Colour discrepancy
Green beige	1000	909	NCS-S 2020-G90Y	$\Delta E = 1.9$
Chrome yellow	1007	720	NCS-S 1080-Y20R	$\Delta E = 2.3$
Purple red	3011	330	NCS-S 3560-R	$\Delta E = 2.4$
Terracotta	3013	120	NCS-S 3560-Y80R	$\Delta E = 2.2$
Ultramarine blue	5002	906	NCS-S 4350-R74B	Exact
Azure blue	5009	440	NCS-S 5040-B	$\Delta E = 3.5$
Dove blue	5014	903	NCS-S 4030-R90B	$\Delta E = 3.1$
Turquoise blue	5018	908	NCS-S 3040-B40G	$\Delta E = 3.0$
Moss green	6005	220	NCS-S 7020-B90G	$\Delta E = 1.0$
Light grey	7035	904	NCS-S 1502-G	$\Delta E = 1.8$
Grey	7038	130	NCS-S 3000-N	$\Delta E = 3.7$
Brown	8014	071	NCS-S 8010-Y50R	$\Delta E = 2.7$
White	9003	010	NCS-S 0502-B	$\Delta E = 2.8$
Aluminium	9006	140	-	-
Pure white	9010	901	NCS-S 0502-Y	$\Delta E = 0.6$
Beige	-	110	NCS-S 4010-Y50R	-
Light beige	-	240	NCS-S 2010-Y30R	-
Bronze	-	780	IPG 5807E77084S30	-

RAL colours are not VSR standard colours. Colour discrepancies of $\Delta E > 0.5$ are visible.

11.6. Reflection and transmission values of slats

Colours		Material properties				EN14501			Outdoor ven. blind + glass	
Colour-number	Colour name	ρ_{sol}	ρ_{vis}	ρ_{UV}	α_{sol}	Glare protection	Privacy protection at night	Visual contact	$g_{to-80^\circ/1^\circ}$	$g_{to-45^\circ/30^\circ}$
0003	Beige	0497	0550	0082	0503	3	4	4	0.03	0.08
0780	Bronze	0220	0185	0123	0780	4	4	4	0.02	0.05
7016	Anthracite grey	0157	0079	0064	0843	4	4	4	0.02	0.05
7016M	Anthracite grey matt	0148	0079	0060	0852	4	4	4	0.02	0.04
7035	Light grey	0515	0566	0086	0485	3	4	4	0.03	0.09
7038	Agate grey	0390	0445	0080	0610	3	4	4	0.03	0.07
8014	Sepia brown	0159	0100	0064	0841	4	4	4	0.02	0.05
9002	Grey white	0629	0685	0083	0371	2	4	4	0.03	0.11
9005M	Black matt	0049	0049	0056	0951	4	4	4	0.05	0.04
9006	White aluminium	0648	0609	0585	0352	3	4	4	0.03	0.10
9006M	White aluminium matt	0493	0463	0306	0507	4	3	4	0.03	0.08
9007	Grey aluminium	0348	0326	0318	0652	4	4	4	0.02	0.06
9007M	Grey aluminium matt	0342	0301	0230	0658	4	4	4	0.02	0.06
9010	Pure white	0755	0833	0076	0245	2	3	4	0.04	0.13
9016	Traffic white	0769	0845	0081	0231	2	3	4	0.04	0.14
C31	Light bronze	0388	0363	0120	0612	4	4	4	0.03	0.06
C32	Medium bronze	0318	0295	0096	0682	4	4	4	0.03	0.06
C33	Bronze	0192	0215	0094	0808	4	4	4	0.02	0.05
C34	Dark bronze	0114	0083	0062	0886	4	4	4	0.02	0.04
C35	Black	0116	0075	0065	0884	4	4	4	0.02	0.04
DB703	Haematite dark	0207	0165	0147	0793	4	4	4	0.02	0.05
DB703M	Haematite dark matt	0215	0160	0137	0785	4	4	4	0.02	0.05
M99702V	Gold	0611	0592	0092	0389	3	4	4	0.03	0.10
M99773V	Natural	0629	0608	0109	0371	3	4	4	0.03	0.10
M99783V	Dark grey	0226	0181	0041	0774	4	4	4	0.02	0.05

Key

ρ_{sol}	Solar reflection 300...2500 nm
ρ_{vis}	Visual reflection 280...780 nm
ρ_{UV}	Reflection in UV
α_{sol}	Solar absorption
EN 14501	Seals - thermal and visual comfort
$g_{tot-80^\circ/1^\circ}$	Total energy transmission coefficient for 80° closed slat with 1° radiation ($=g_{tot}$)
$g_{tot-45^\circ/30^\circ}$	Total energy transmission coefficient for 45° closed slat with 30° radiation

Conditions / instructions:

- Slats placed at a distance of 50 mm relative to a reference pane C (= double glazing).
- The gap towards the glass is naturally ventilated.
- The values are guiding values.
- (Other colours on request).

Calculation compliant with EN 13363-2-A1, reference glazing C compliant with EN 14501, $g = 0.59$, $U = 1.20$ [W/m²].

12. Overview of outside venetian blinds

TYPE	AR 63 ECN	ARB 80	AR 92 ECN	AF 80
Slat shape				
Slat width	63 mm	80 mm	92 mm	80 mm
Type of slat	Beaded slat	Beaded slat	Beaded slat	Flat slat
Drive:				
- Motor	S	S	S	S
Guide method:				
- Cable guide	O	O	O	---
- Guide rails	S	S	S	S
Bottom slat:				
- non-rotating	O	S	O	S
- rotating	S	---	S	---
Rotation:				
- 90° rotation	S	O	S	S
- 180° rotation	---	S	---	O
- Working position	O	O	O	O
Venetian blind punch holes: (lift tape/cable guide)				
- with flanges	S	S	S	S
- clips in every slat	---	O	---	O
- punched without clips	---	---	---	O
Omega-shaped punch hole:				
- in every slat	---	S	---	S
Top box:				
- 58/56 roll-formed	S	S	S	S
- 58/57 extruded	O	O	O	---
Flush-mounted system:				
- No flush-mounted system (=BZ1000)	S	S	S	O
- VA7 (=BZ700)	O	O	O	S

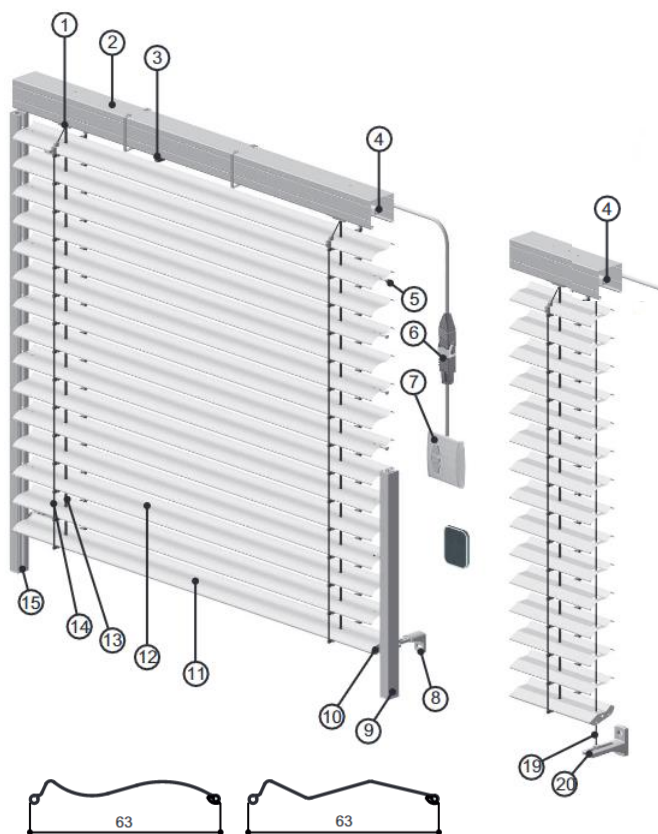
- S : as standard depending on the model and price list
 O : optional (additional cost)
 --- : not possible
 ECN : Edelstahl Clip Nokkenband (stainless steel clip ridged tape)

Outside venetian blind 63 mm – BZ1000 - AR 63 ECN	50-52
Outside venetian blind 80 mm – BZ1000 - ARB 80	53-55
Outside venetian blind 92 mm – BZ1000 - AR 92 ECN	56-58
VA7 Flush-mounted system:	
B700 - Outside venetian blind in flush-mounted channel	59-61

Outside venetian blind 63 mm – AR 63 ECN

Type: AR 63 ECN

Model: ARE63



Key

- ① Pivot bearing
- ② Top box
- ③ Motor-controlled drive
- ④ Drive shaft
- ⑤ Slat guide nipple
- ⑥ Hirschmann plug
- ⑦ Switch
- ⑧ Spacer
- ⑨ Guide rail
- ⑩ End cap for bottom lath
- ⑪ Bottom lath/bottom slat
- ⑫ Slat
- ⑬ Lift tape
- ⑭ ECN clip tape
- ⑮ Guide liner
- ⑯ Cable guide
- ⑰ Tensioning bracket

AR 63 ECN view: Outside venetian blind with guide rail/cable guide with motor drive

Application and use

Solid, low-noise outside venetian blind, simple to use. Suitable for glass façades, window areas and buildings with modern architectural elements with special requirements for sun protection, schools, office buildings and in residential rooms.

Product benefits

- Sun protection
- Privacy protection
- Weather protection
- Dimming element

- Heat protection whereby the heat radiation is reflected back in front of the façade
- Façade model
- Light control
- Regulation of the room climate
- Optimum pack heights by using ECN clip tape to connect the slats
- Slat shape designed to achieve optimum slat closure
- Slats with noise and light insulating profiles
- High-quality components for sustainability and simple operation

Motor-controlled drive

Lift and lower the blind and tilt the slats with a convenient electric drive.

The electric motor with integrated limit switches can also be operated with control panels, remote controls or automatic equipment if desired.

Assembly

Fitting depends on the external demands on the window or door frame, in a bay in the building or in front of the window niche.

AR 63 ECN dimension limits

Operation and model	Min. width [mm]	
	Somfy IO	Elero
Motor and guide rails	547	507
Motor and cable guide	490*	450*

* For cable guide, width is indicated by slat width (SW).

[1] The number of blinds that can be connected is specified inclusive of the drive element.

[2] The maximum height with cable guide is limited to 4000 mm.

Single / Connected	Max. width [mm]	Max. height [2] [mm]	Max. area [m²]
Single	5000	4200	18
Connected (2 units)	10000	4200	22.5
Connected (3 units)	15000	4200	22.5

Tender text – AR 63 ECN

Type: AR 63 ECN
Model: ARE63

Top box

U-shaped profiled cold-rolled profile, galvanised and with flange on both sides, dimensions 58 x 56 mm. Available at extra cost if desired: Top box of extruded aluminium, dimensions 58 x 57 mm. Top box closed or open underneath as preferred.

Bottom lath

Extruded aluminium profile: powder coated, dimensions 61 x 19 mm. Closed at the side with plastic caps (for venetian blinds with guide rails, guided in the rails with metal pins on both sides). Bottom lath is rotating as standard (minimum bay or cover height is 200 mm). Bottom lath optionally also available as non-rotating. Rotating bottom lath is not possible for installations with cable guides.

Slats

Aluminium slats designed with flanges on both sides, made of a highly elastic special alloy, bend-proof, scratch-proof and impact-proof, two-layer muffling with polyester paint, slat width 63 mm, slat thickness 0.45 mm. A sealing profile is rolled into the front flange for better dimming. In addition, an 'Edelstahl Clip Nockenband (ECN)' keeps the slats evenly spaced. Slat choice: Z-shape or S-shape.

Slat guides (wind protection)

Guide rails and slat guide nipples

Guide rail made of extruded aluminium, powder-coated, with plastic weather-resistant and clippable guide liner for sound insulation. The guide rails are fitted with plastic end caps and can be mounted on the side or in the wall using adjustable/fixed spacers.

Zinc slat guide nipples with Collinox coating, alternating in every slat on each side, connected to the slat in such a way that they are impact-proof.

Guide rail options:

- Lateral guide FE22S (22x22)
- Lateral guide FE18S (21.5x18)
- Single/double guide rail FE22 (22x27) / FD27 (37x27)
- Single/double guide rail FE30 (30x32) / FD32 (37x32)
- Single/double guide rail FE50 (25x50) / FD50 (50x50)
- FUP guide rails FUP70 / FUP80 / FUP95

Cable guide

A spring tensioner is fitted in the top box. From there, a tensioning cable runs through flanged punch holes in the slat, through the bottom lath and is then attached at the bottom with a tensioning element (tensioning bracket, tensioning console or tensioning shoe).

Cable guide options:

- Nylon-covered stainless steel cable Ø 2.5 mm, in pearl silver, black and transparent.

Pivot bearing

Pivot bearing without working position with 90° rotation. Venetian blind moves down closed outwards, smooth rotation when direction of movement changes. Venetian blind moves up in horizontal position.

At additional cost on request: working position bearing. Venetian blind moves down with slats in a position rotated approx 50° (until it reaches the stop at the bottom). To close the blind, it must be raised (approx. 2 s) and then lowered again.

The venetian blind can be closed fully in any position. Smooth rotation procedure when direction of movement changes, blind moves up in a horizontal position.

Clip tape (ECN)

Woven carrier band made of polyester reinforced with aramid fibres with sprayed 2-part clip ridges of UV-resistant plastic (PA12). Connected to the slat with chromium steel clamps. This system has many benefits: perfect closure of the blind, accurate folding of the carrier band (external), minimum pack height, little shrinkage, minimum expansion and precise division of the slats.

Lift tape

Lift tapes with sliding layer in black or grey for low-wear use and maximum UV protection, dimensions 6.0 x 0.28 mm, 700 N tear resistance, guaranteed thickness tolerance at approx. 1/100 mm and with high durability. Available in black and grey.

Drive

Motor drive

The venetian blind is lifted and lowered and the slats are adjusted with a 230 V/AC, 50HZ, IP54 electric motor. Motor is supplied with Hierschmann plug and connection cable. Drive with planet-gear transmission, limit switches top and bottom, thermal protection switch to prevent motor overload. Slats are rotated by means of a short pulse in the appropriate direction.

A control panel is specified if more than one motor needs to be operated with one switch.

Square drive shaft

Drive shaft is made of aluminium VK 12 x 12 mm with hexagon socket 7 mm for direct power from the motor.

On the attached element, the aluminium drive shaft is VK 12 x 12 mm with internal opening of Ø9 mm for the coupler power. This allows for sustainable inspection of the coupler.

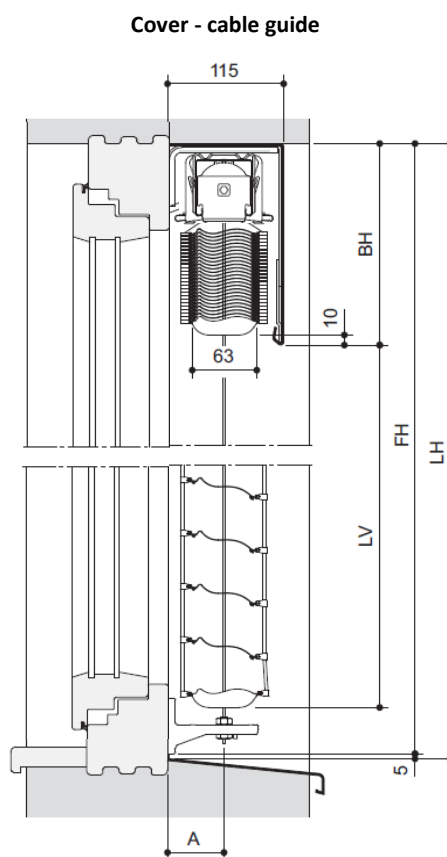
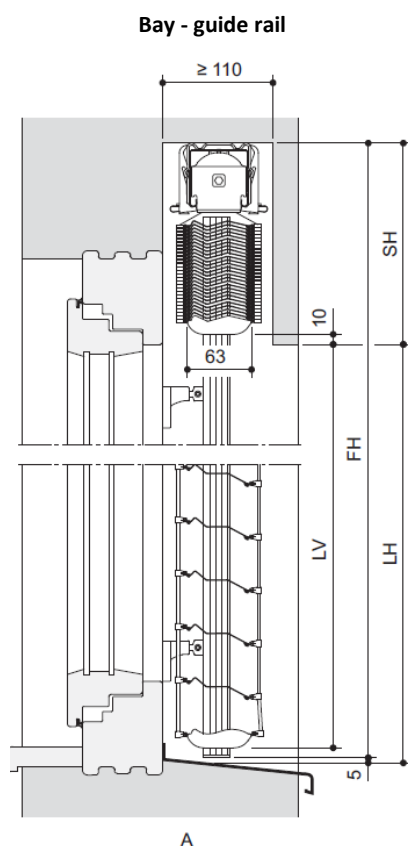
Recommendation for additional wind protection

Blind width	< 3000 mm	3001 – 4000 mm	4001 – 5000 mm
Number of extra tensioning cables	0	1	2

Instructions:

- The two outermost guides are present as standard and are not shown in the table.
- A maximum of 5 extra wind protection devices per blind is possible.
- See also section 3: Wind forces and recommendations.

Type AR 63 ECN – installation situation and dimensions

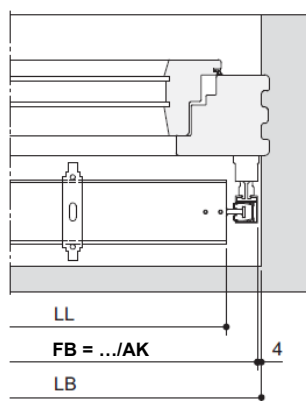


Key

A	Spacer size
BH	Cover height
BL	Cover length
FB	Total width
FH	Total height
LB	Clear width
LH	Clear height
LV	Free height shadow
LL	Slat length
SH	Bay height

Instructions:

- When measurements are taken, at least 3 points must be measured for each total dimension. The smallest clearance dimension is decisive.
- Use sketches to make special designs obvious.

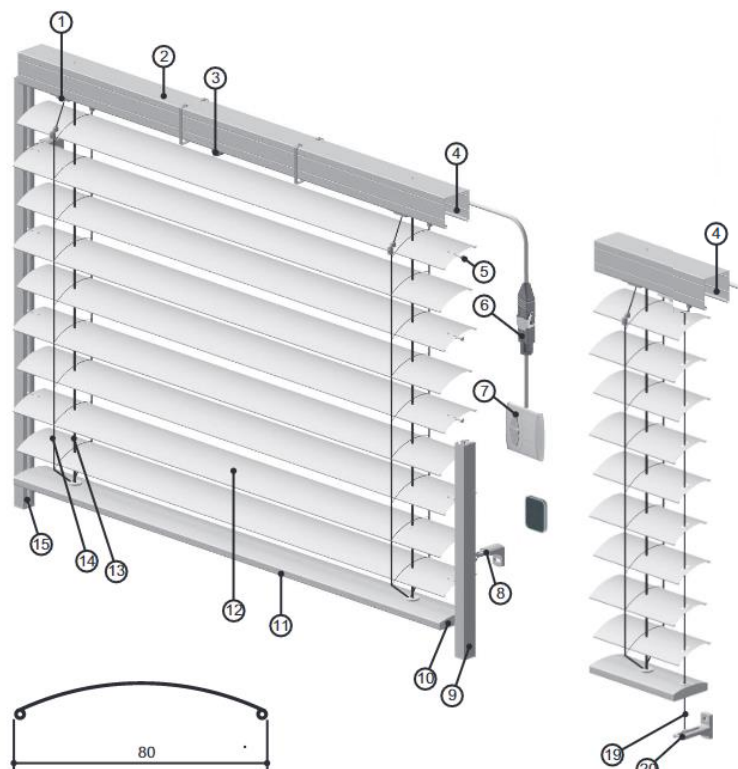


Definition of blind dimensions	Guide rails	Cable guides
Total width	FB = LB – 8 mm	FB = LB – 30 mm
Total height at niche	FH = LH – 5 mm	FH = LH – 5 mm
Total height at bay	FH = LH + SH – 5 mm	FH = LH + SH – 5 mm
Definition of cover dimensions	on façade	at niche
Cover length	BL = FB + 30 mm	BL = LB – 4 mm

Outside venetian blind 80 mm – ARB 80

Type: ARB 80

Model: ARB80



ARB80 view: Outside venetian blind with guide rail/cable guide with motor drive

Key

- ① Pivot bearing
- ② Top box
- ③ Motor-controlled drive
- ④ Drive shaft
- ⑤ Slat guide nipple
- ⑥ Hirschmann plug
- ⑦ Switch
- ⑧ Spacer
- ⑨ Guide rail
- ⑩ End cap for bottom lath
- ⑪ Bottom lath/bottom slat
- ⑫ Slat
- ⑬ Lift tape
- ⑭ Ladder cord
- ⑮ Guide liner
- ⑰ Cable guide
- ⑱ Tensioning bracket

Application and use

Solid, low-noise outside venetian blind, simple to use. Suitable for glass façades, window areas and buildings with modern architectural elements, especially with special requirements for sun protection, schools, office buildings and in residential rooms.

Installation with spacers directly on the window frame or at the side, optionally with cable tensioning and tensioning bracket.

Product benefits

- Sun protection
- Privacy protection
- Weather protection
- Heat protection whereby the heat radiation is reflected back in front of the façade
- Attractive design creates a decorative element for façades
- Adjustable slats for light regulation
- High-quality components for sustainability and simple operation
- Regulation of the room climate

Motor-controlled drive

Lift and lower the blind and tilt the slats with a convenient electric drive.

The electric motor with integrated limit switches can also be operated with control panels, remote controls or automatic equipment if desired (accessories at extra cost).

A control panel is specified if more than one motor needs to be operated with one switch.

Assembly

Fitting depends on the external demands on the window or door frame, in a bay in the building or in front of the window niche.

ARB 80 dimension limits

Operation and model	Min. width [mm]	
	Somfy IO	Elero
Motor and guide rails	532	492
Motor and cable guide	530*	490*

* For cable guide, width is indicated by slat width (SW).

[1] The number of blinds that can be connected is specified inclusive of the drive element.

[2] The maximum height with cable guide is limited to 4000 mm.

Single / Connected	Max. Width [mm]	Max. Height [2] [mm]	Max. area [m²]
Single	5000	5200	20
Connected (2 units)	10000	5200	22.5
Connected (3 units)	15000	5200	22.5

Tender text – ARB 80

Type: ARB 80
Model: ARB80

Top box

U-shaped profiled cold-rolled profile, galvanised and with flange on both sides, dimensions 58 x 56 mm. Available at extra cost if desired: Top box of extruded aluminium, dimensions 58 x 57 mm. Top box closed or open underneath as preferred.

Bottom lath

Extruded aluminium profile: powder coated, dimensions 80 x 19 mm. Closed at the side with plastic caps (for venetian blinds with guide rails, guided in the rails with plastic pins on both sides).

Slats

Aluminium slats designed with flanges on both sides, made of a highly elastic special alloy, bend-proof, scratch-proof and impact-proof, two-layer muffling with polyester paint, slat width 80 mm, slat thickness 0.45 mm. The slats are held at even distances with a ladder cord. Ladder cord fixed using omega-shaped punched holes in each slat as protection against lateral slat shift.

Lift tape punched holes with flange for better protection against wear of lift tape.

Slat guides (wind protection)Guide rails and slat guide nipples

Guide rail made of extruded aluminium, powder-coated, with plastic weather-resistant and clippable guide liner for sound insulation. The guide rails are fitted with plastic end caps and can be mounted on the side or in the wall using adjustable/fixed spacers.

Zinc slat guide nipples with Collinox coating, alternating in every slat on each side, impact-proof, connected to slat.

Guide rail options:

- Lateral guide FE22S (22x22)
- Lateral guide FE18S (21.5x18)
- Single/double guide rail FE22 (22x27)/FD27 (37x27)
- Single/double guide rail FE30 (30x32)/FD32 (37x32)
- Single/double guide rail FE50 (25x50)/FD50 (50x50)
- FUP guide rails FUP70 / FUP80 / FUP95

Cable guide

A spring tensioner is fitted in the top box. From there, a tensioning cable runs through flanged punch holes in the slat, through the bottom lath and is then attached at the bottom with a tensioning element (tensioning bracket, tensioning console or tensioning shoe).

Cable guide options:

- Nylon-covered stainless steel cable Ø 2.5 mm, in pearl silver, black and transparent.

Pivot bearing

Pivot bearing without working position with 180° (standard) or with 90° rotation. Venetian blind moves down closed outwards, smooth rotation when direction of movement changes. With 180° rotation, the venetian blind lifts closed inwards. With 90° rotation, the blind moves up in a horizontal position.

At additional cost on request: working position bearing. Venetian blind moves down with slats in a position rotated approx 50° (until it reaches the stop at the bottom). To close the blind, it must be raised (approx. 2 s) and then lowered again.

The venetian blind can be closed fully in any position. Smooth rotation procedure when direction of movement changes, blind moves up in a horizontal position.

Ladder cord

High-strength terylene polyester, shrink-proof and with high durability.

Colour options: black or grey.

Lift tape

Lift tapes with sliding layer for low-wear rotation and maximum UV protection, dimensions 6.0 x 0.28 mm, 700 N tear resistance, guaranteed thickness tolerance at approx. 1/100 mm and with high durability. Available in black and grey.

DriveMotor drive

The venetian blind is lifted and lowered and the slats are adjusted with a 230 V/AC, 50Hz, IP54 electric motor. Motor is supplied with Hierschmann plug and connection cable. Drive with planet-gear transmission, limit switches top and bottom, thermal protection switch to prevent motor overload. Slats are rotated by means of a short pulse in the appropriate direction.

A control panel is specified if more than one motor needs to be operated with one switch.

Square drive shaft

Drive shaft is made of aluminium VK 12 x 12 mm with hexagon socket 7 mm for direct power from the motor.

On the attached element, the aluminium drive shaft is VK 12 x 12 mm with internal opening of Ø9 mm for the coupler power. This allows for sustainable inspection of the coupler.

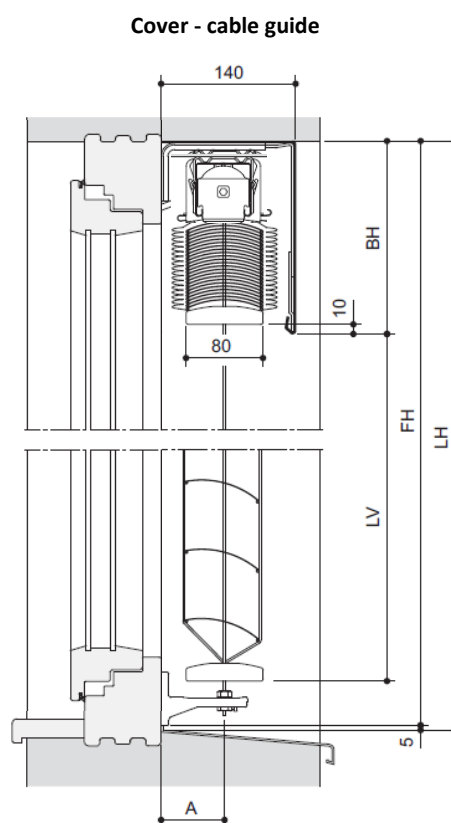
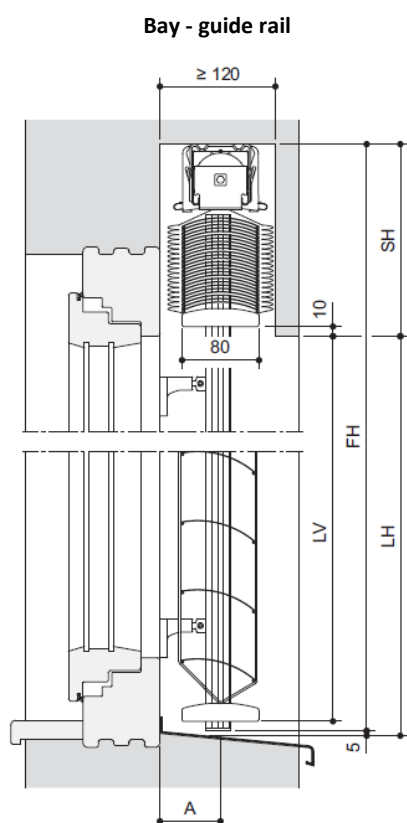
Recommendation for additional wind protection

Blind width	< 3000 mm	3001 – 4000 mm	4001 – 5000 mm
Number of extra tensioning cables	0	1	2

Instructions:

- The two outermost guides are present as standard and are not shown in the table.
- A maximum of 5 extra wind protection devices per blind is possible.
- See also section 3: Wind forces and recommendations.

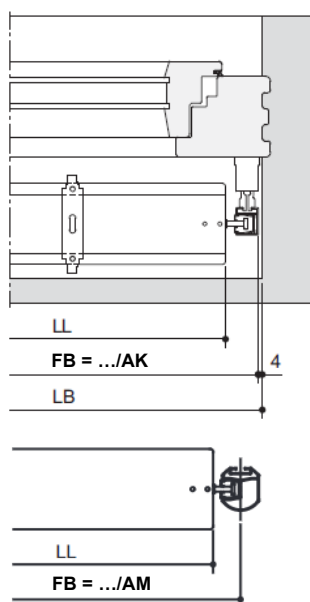
Type ARB 80 – installation situation and dimensions

**Key**

A	Spacer size
BH	Cover height
BL	Cover length
FB	Total width
FH	Total height
LB	Clear width
LH	Clear height
LV	Free height shadow
LL	Slat length
SH	Bay height

Instructions:

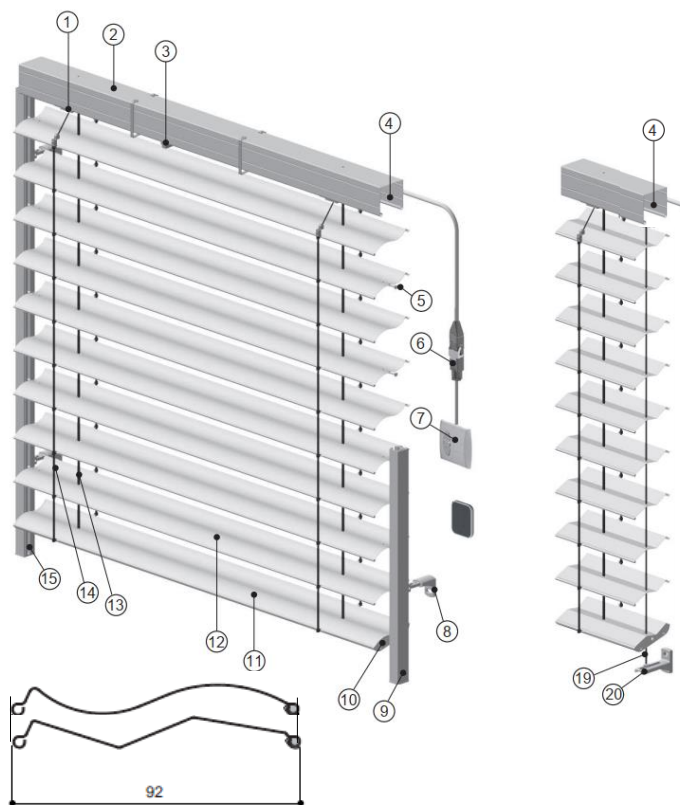
- When measurements are taken, at least 3 points must be measured for each total dimension. The smallest clearance dimension is decisive.
- Use sketches to make special designs obvious.



Definition of blind dimensions	Guide rails	Cable guides
Total width	$FB = LB - 8 \text{ mm}$	$FB = LB - 30 \text{ mm}$
Total height at niche	$FH = LH - 5 \text{ mm}$	$FH = LH - 5 \text{ mm}$
Total height at bay	$FH = LH + SH - 5 \text{ mm}$	$FH = LH + SH - 5 \text{ mm}$
Definition of cover dimensions	on façade	at niche
Cover length	$BL = FB + 30 \text{ mm}$	$BL = LB - 4 \text{ mm}$

Outside venetian blind 92 mm – AR 92

Type: AR 92 ECN
Model: ARE92



AR 92 ECN view: Outside venetian blind with guide rail/cable guide with motor drive

Key

- ① Pivot bearing
- ② Top box
- ③ Motor-controlled drive
- ④ Drive shaft
- ⑤ Slat guide nipple
- ⑥ Hirschmann plug
- ⑦ Switch
- ⑧ Spacer
- ⑨ Guide rail
- ⑩ End cap for bottom lath
- ⑪ Bottom lath/bottom slat
- ⑫ Slat
- ⑬ Lift tape
- ⑭ ECN clip tape
- ⑮ Guide liner
- ⑲ Cable guide
- ⑳ Tensioning bracket

Application and use

Solid, low-noise outside venetian blind, simple to use. Suitable for glass façades, window areas and buildings with modern architectural elements with special requirements for sun protection, schools, office buildings and in residential rooms.

Product benefits

- Sun protection
- Privacy protection
- Weather protection
- Dimming element

- Heat protection whereby the heat radiation is reflected back in front of the façade
- Façade model
- Light control
- Regulation of the room climate
- Slat shape designed to achieve optimum slat closure
- Slats with noise and light insulating profiles
- Patented slat carrier cord loop connection ensures optimum centring of the entire slat pack
- High-quality components for sustainability and simple operation

Motor-controlled drive

Lift and lower the blind and tilt the slats with a convenient electric drive.

The electric motor with integrated limit switches can also be operated with control panels, remote controls or automatic equipment if desired.

Assembly

Fitting depends on the external demands on the window or door frame, in a bay in the building or in front of the window niche.

AR 92 ECN dimension limits

Operation and model	Min. Width [mm]	
	Somfy IO	Elero
Motor and guide rails	547	507
Motor and cable guide	490*	450*

Single / Connected [1]	Max. width [mm]	Max. height [2] [mm]	Max. area [m²]
Single	5000	5200	18
Connected (2 units)	10000	5200	22.5
Connected (3 units)	15000	5200	22.5

* For cable guide, width is indicated by slat width (SW).

[1] The number of blinds that can be connected is specified inclusive of the drive element.

[2] The maximum height with cable guide is limited to 4000 mm.

Tender text – AR 92 (ECN)

Type: AR 92 ECN
Model: ARE92

Top box

U-shaped profiled cold-rolled profile, galvanised and with flange on both sides, dimensions 58 x 56 mm. Available at extra cost if desired: Top box of extruded aluminium, dimensions 58 x 57 mm. Top box closed or open underneath as preferred.

Bottom lath

Extruded aluminium profile: powder coated, dimensions 90 x 16 mm. Closed at the side with plastic caps (for venetian blinds with guide rails, guided in the rails with metal pins on both sides). Bottom lath is rotating as standard (minimum bay or cover height is 230 mm). Bottom lath optionally also available as non-rotating. Rotating bottom lath is not possible for installations with cable guides.

Slats

Aluminium slats designed with flanges on both sides, made of a highly elastic special alloy, bend-proof, scratch-proof and impact-proof, two-layer muffling with polyester paint, slat width 92 mm, slat thickness 0.45 mm. A sealing profile is rolled into the front flange for better dimming. In addition, an 'Edelstahl Clip Nockenband (ECN)' keeps the slats evenly spaced. Slat choice: Z-shape or S-shape.

Slat guides (wind protection)

Guide rails and slat guide nipples

Guide rail made of extruded aluminium, powder-coated, with plastic weather-resistant and clippable guide liner for sound insulation. The guide rails are fitted with plastic end caps and can be mounted on the side or in the wall using adjustable/fixed spacers.

Zinc slat guide nipples with Collinox coating, alternating in every slat on each side, impact-proof, connected to slat.

Guide rail options:

- Lateral guide FE22S (22x22)
- Lateral guide FE18S (21.5x18)
- Single/double guide rail 22 x 27 / 37 x 27
- Single/double guide rail 30 x 32 / 37 x 32
- Single/double guide rail 25 x 50 / 50 x 50
- FUP guide rails FUP70 / FUP80 / FUP95

Cable guide

A spring tensioner is fitted in the top box. From there, a tensioning cable runs through flanged punch holes in the slat, through the bottom lath and is then attached at the bottom with a tensioning element (tensioning bracket, tensioning console or tensioning shoe).

Cable guide options:

- Nylon-covered stainless steel cable Ø 2.5 mm, in pearl silver, black and transparent.

Pivot bearing

Pivot bearing without working position with 90° rotation. Venetian blind moves down closed outwards, smooth rotation when direction of movement changes. Venetian blind moves up in horizontal position.

At additional cost on request: working position bearing. Venetian blind moves down with slats in a position rotated approx 50° (until it reaches the stop at the bottom). To close the blind, it must be raised (approx. 2 s) and then lowered again.

The venetian blind can be closed fully in any position. Smooth rotation procedure when direction of movement changes, blind moves up in a horizontal position.

Clip tape (ECN)

Woven carrier band made of polyester reinforced with aramid fibres with sprayed 2-part clip ridges of UV-resistant plastic (PA12). Connected to the slat with chromium steel clamps. This system has many benefits: perfect closure of the blind, accurate folding of the carrier band (external), minimum pack height, little shrinkage, minimum expansion and precise division of the slats.

Lift tape

Lift tapes with sliding layer in black or grey for low-wear use and maximum UV protection, dimensions 8.0 x 0.34 mm, 900 N tear resistance, guaranteed thickness tolerance at approx. 1/100 mm and with high durability. Available in black and grey.

Drive

Motor drive

The venetian blind is lifted and lowered and the slats are adjusted with a 230 V/AC, 50Hz, IP54 electric motor. Motor is supplied with Hierschmann plug and connection cable. Drive with planet-gear transmission, limit switches top and bottom, thermal protection switch to prevent motor overload. Slats are rotated by means of a short pulse in the appropriate direction.

A control panel is specified if more than one motor needs to be operated with one switch.

Square drive shaft

Drive shaft is made of aluminium VK 12 x 12 mm with hexagon socket 7 mm for direct power from the motor.

On the attached element, the aluminium drive shaft is VK 12 x 12 mm with internal opening of Ø9 mm for the coupler power. This allows for sustainable inspection of the coupler.

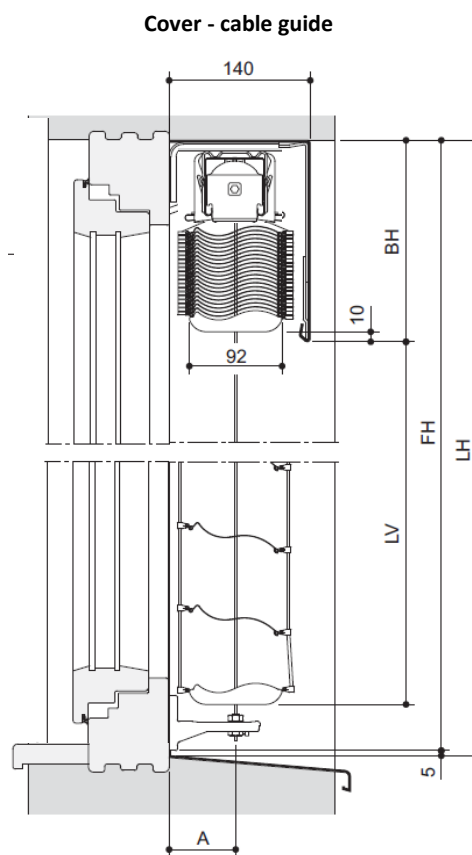
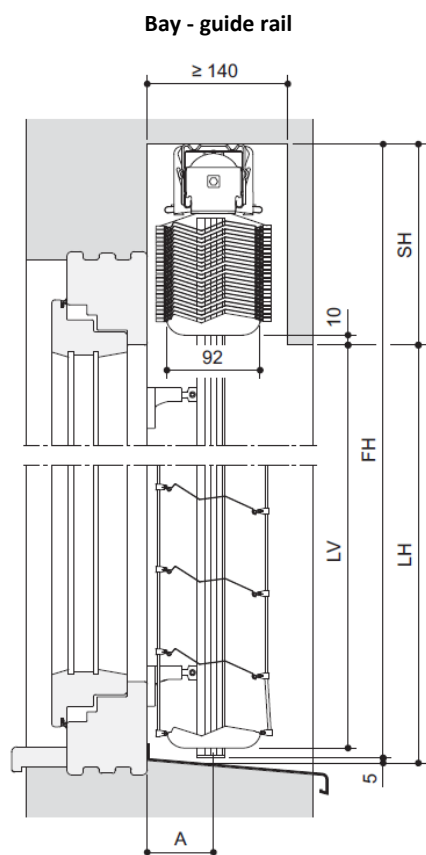
Recommendation for additional wind protection

Blind width	< 3000 mm	3001 – 4000 mm	4001 – 5000 mm
Number of extra tensioning cables	0	1	2

Instructions:

- The two outermost guides are present as standard and are not shown in the table.
- A maximum of 5 extra wind protection devices per blind is possible.
- See also section 3: Wind forces and recommendations.

Type AR 92 (ECN) – installation situation and dimensions

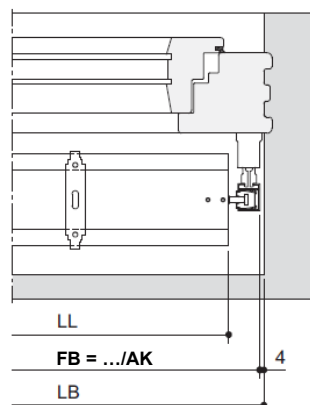


Key

A	Spacer size
BH	Cover height
BL	Cover length
FB	Total width
FH	Total height
LB	Clear width
LH	Clear height
LV	Free height shadow
LL	Slat length
SH	Bay height

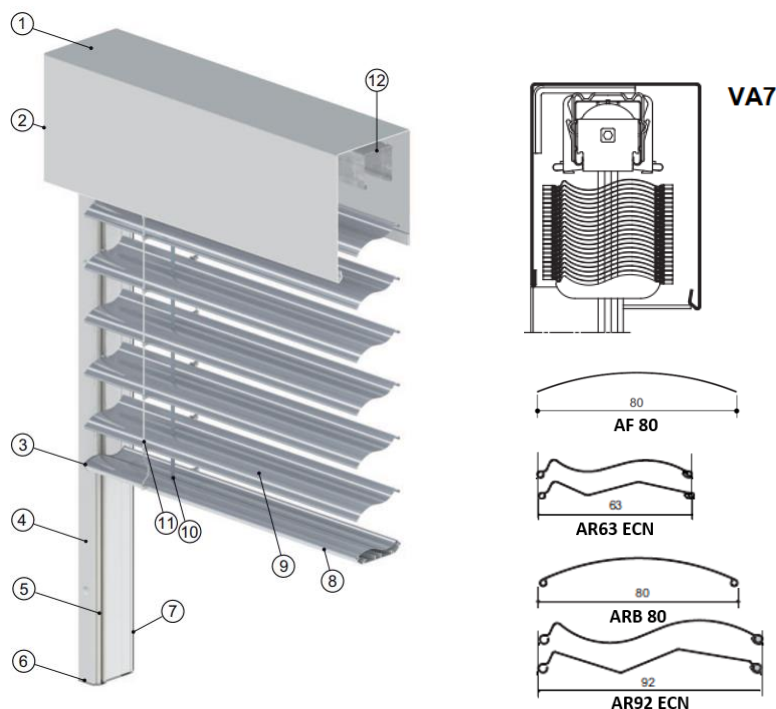
Instructions:

- When measurements are taken, at least 3 points must be measured for each total dimension. The smallest clearance dimension is decisive.
- Use sketches to make special designs obvious.



Definition of blind dimensions	Guide rails	Cable guides
Total width	$FB = LB - 8 \text{ mm}$	$FB = LB - 30 \text{ mm}$
Total height at niche	$FH = LH - 5 \text{ mm}$	$FH = LH - 5 \text{ mm}$
Total height at bay	$FH = LH + SH - 5 \text{ mm}$	$FH = LH + SH - 5 \text{ mm}$
Definition of cover dimensions	on façade	at niche
Cover length	$BL = FB + 30 \text{ mm}$	$BL = LB - 4 \text{ mm}$

VA7 Flush-mounted system - Outside venetian blinds in flush-mounted channel



Key

- ① Flush-mounted channel
- ② Side console (Head piece)
- ③ End cap for bottom lath
- ④ FUP guide
- ⑤ Guide liner
- ⑥ End stop guide rail FUP
- ⑦ Rubber seal
- ⑧ Bottom lath / bottom slat
- ⑨ Slat (AR63 ECN / ARB-80 / AR92 ECN / AF-80)
- ⑩ Lift tape
- ⑪ Ladder cord
- ⑫ Top box

Image : Outdoor venetian blind in VA7 Flush-mounted box (AR92 ECN slats with FUP guide rail with motor drive)

Application and use

Flush-mounted channel with slats, convenient outdoor venetian blind with low-noise wind protection. The outside venetian blinds are pre-assembled in the flush-mounted channel. This unit can be mounted cantilever on FUP guide rails.

Product benefits

- Assembly-friendly
- Sun protection
- Anti-glare
- Light control
- Privacy protection
- Façade model
- High durability due to high-quality materials
- Convenient to operate
- Environmentally friendly by using recycled materials

Motor-controlled drive

Lift and lower the blind and tilt the slats with a convenient electric drive.

The electric motor with integrated limit switches can also be operated with control panels, remote controls or automatic equipment if desired (accessories at extra cost).

A control panel is specified if more than one motor needs to be operated with one switch.

Assembly

Depending on requirements, assembly is externally on the window frame or on the façade. The box can be mounted cantilever on the FUP guide rails using the console pivots.

The FUP guide rails are first moved onto the console pivots of the box and then secured. Next, everything is fixed on the mounting surface, with cantilevered box (comp. install. instruct.).

Flush-mounted channel - VA7

Flush-mounted channel consists of an extruded aluminium profile of 2.0 mm and two aluminium castings, a left and a right side console.

The standard channel depths are 120/150/160 mm. Optionally, other depths are possible.

The standard channel heights are 200/240/280 mm. Optionally, other heights are possible between 150 and 370 mm.

Dimension limits VA7 flush-mounted channel with the various slats

Operation and model	Min. width [mm]		Single / Connected	Max. width [mm]	Max. Height* [mm]		Max. area [m²]
	Somfy IO	Elero			Standard	Optional	
Motor and FUP guide rail: AR63 ECN	591	551	Single	5000	2700	3700	18
Motor and FUP guide rail: AR92 ECN	591	551	Single	5000	3100	4400	18
Motor and FUP guide rail: ARB-80	576	540	Single	5000	3200	4400	20
Motor and FUP guide rail: AF-80	576	540	Single	5000	4000	4000	20

The VA7 flush-mounted channels cannot be linked as each box has two side consoles and there are no centre consoles.

* Maximum height for standard channel heights or for optional heights up to 370 mm and PTH up to 350 mm

Tender text - VA7 Flush-mounted channel with slats

Top box

U-shaped profiled cold-rolled profile, galvanised and with flange on both sides, dimensions 58 x 56 mm. Top box is open from below for easier assembly and adjustment.

Bottom lath

Powder-coated extruded aluminium profile, closed at the sides with plastic caps fitted with guide nipple for guidance in the guide liner of the FUP guide rails.

ARB-80 and AF-80: size 80 x 19 mm, plastic guide nipple and bottom lath not rotating.

AR63 ECN: size 61 x 19 mm, metal guide nipple.

AR92 ECN: size 90 x 16 mm, metal guide nipple.

For both ECN slats the bottom lath rotates as standard and optionally can be non-rotating.

Slats

Aluminium slats designed with flanges on both sides, made of a highly elastic special alloy, bend-proof, scratch-proof and impact-proof, two-layer muffling, slat thickness 0.45 mm.

AF-80: only slat without flanges, slightly curved slat.

AF-80 and ARB-80: slat width 80 mm, slats are at equal distance from each other using a ladder cord. Ladder cord fixed using omega punched holes in each slat as protection against lateral slat shift. Standard lift tape punched holes with flange for better protection against wear of lift tape.

AR63/92 ECN: slat width 63/92 mm, sealing profile embedded in front flange for better blackout, slats are kept at equal distance from each other with "Edelstahl Clip Nockenband (ECN)". Slat choice: Z-shape or S-shape.

Slat guides (wind protection)

Guide rails and slat guide nipples

FUP guide rail made from extruded aluminium, powder coated, with plastic end stops at the bottom and rubber seals at the back. These rubber seals provide the following benefits:

- Reduction of vibration noise on the façade and window
- Sealed against driving rain relative to the façade and window
- Thermal separation

These guide rails are mounted directly, in the back or sideways. A weather and UV-resistant, plastic guide liner in both guide rails guarantees better sound insulation. Optional adjustment profiles of 20/30/40 mm.

Zinc slat guide nipples with Collinox coating, alternating in every slat on each side, connected to the slat in such a way that they are impact-proof.

Square drive shaft

Drive shaft is made of aluminium VK 12 x 12 mm with hexagon socket 7 mm for direct power from the motor.

Pivot bearing

90° rotation: Venetian blind moves down closed outwards, smooth rotation when direction of movement changes. Venetian blind lifts in horizontal position.

Standard on AR63/92 ECN and AF-80. Optional with ARB-80 (additional charge).

180° rotation: blind moves down, is closed and facing outwards and is closed inwards when lifting.

Standard with ARB-80. Optional with AF-80.

Operating mode function: Venetian blind moves down with slats in a rotated position approx 50° (to the lowest stop). To close the blind, it must be raised a little (approx. 2 s) and then lowered again. The venetian blind can be closed fully in any position. Smooth rotation procedure when direction of movement changes, blind moves up in a horizontal position.

Optional for all slats

Ladder cord/clip tape ECN

ARB-80 and AF-80: High-strength terylene polyester in black or grey, shrink-proof and with high durability.

AR63/92 ECN: Woven carrier band made of polyester reinforced with aramid fibres with sprayed 2-part clip ridges of UV-resistant plastic (PA12). Connected to the slat with chromium steel clamps. This system has many benefits: perfect closure of the blind, accurate folding of the carrier band (external), minimum pack height, little shrinkage, minimum expansion and precise division of the slats.

Lift tape

Lift tapes in black or grey with sliding layer for low-wear use and maximum UV protection.

For AR92 ECN slats, the lift tape size 8.0 x 0.34 mm and tear resistance 900 N are used. For all other slats, the 6.0 x 0.28 mm lift tape with a tear resistance of 700 N is used.

Both lift tapes have a guaranteed thickness tolerance of approx. 1/100 mm and a long service life.

Drive

Motor drive

The venetian blind is lifted and lowered and the slats are adjusted with a low-noise 230 V/AC electric motor, 50 Hz and IP 54. Drive with planet-gear transmission, adjustable limit switches top and bottom, thermal protection switch to prevent motor overload. Motor is supplied with Hirschmann coupling and connection cable.

Slats are rotated by means of a short pulse in the appropriate direction. A control panel is specified if more than one motor needs to be operated with a switch.

Recommendation for additional wind protection

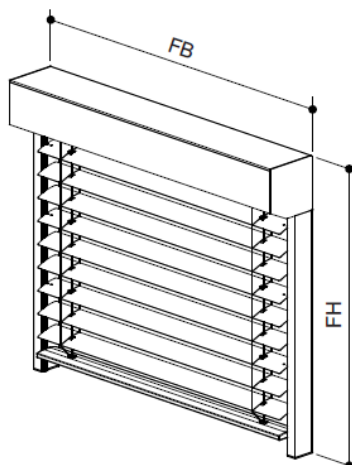
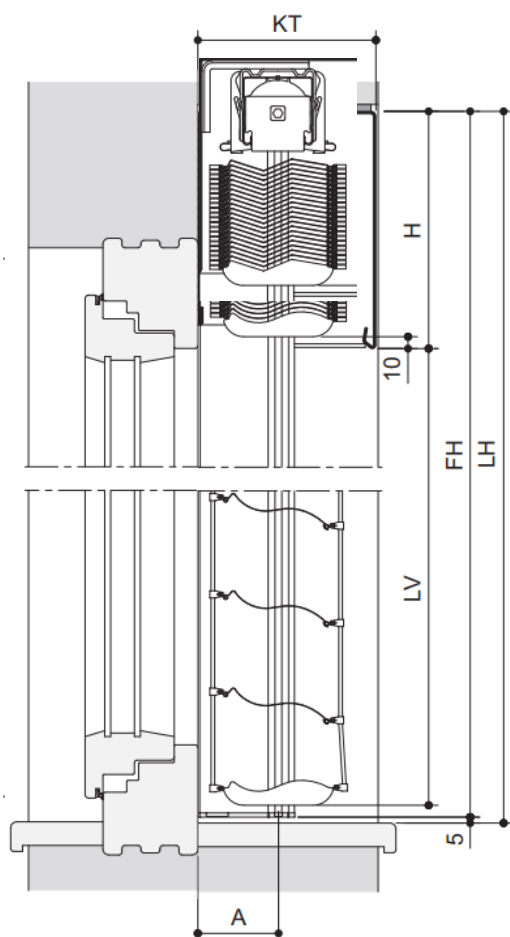
Blind width	< 3000 mm	3001 – 4000 mm	4001 – 5000 mm
Number of extra tensioning cables	0	1	2

Instructions:

- The two outermost guides are present as standard and are not shown in the table.
- A maximum of 5 extra wind protection devices per blind is possible.
- See also section 3: Wind forces and recommendations.

Installation situation and dimensions - VA7 Flush-mounted channel with AR92 ECN

Flush-mounted - Motor & FUP guide rail

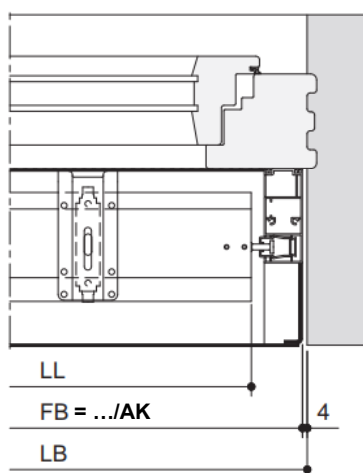


Key

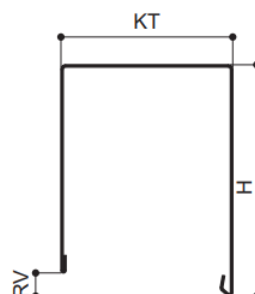
A	Spacer size
H	Box height or duct height
FB	Total width
FH	Total height
KT	Box depth
LB	Clear width
LH	Clear height
LL	Slat length
LV	Free height shadow

Instructions:

- When measurements are taken, at least 3 points must be measured for each total dimension. The smallest clearance dimension is decisive.
- Use sketches to make special designs obvious.



Dimensions of the flush-mounted channel



Standard dimensions

KT = 120 mm / 150 mm / 160 mm
H = 200 mm / 240 mm / 280 mm
RV = 20 mm

Optional

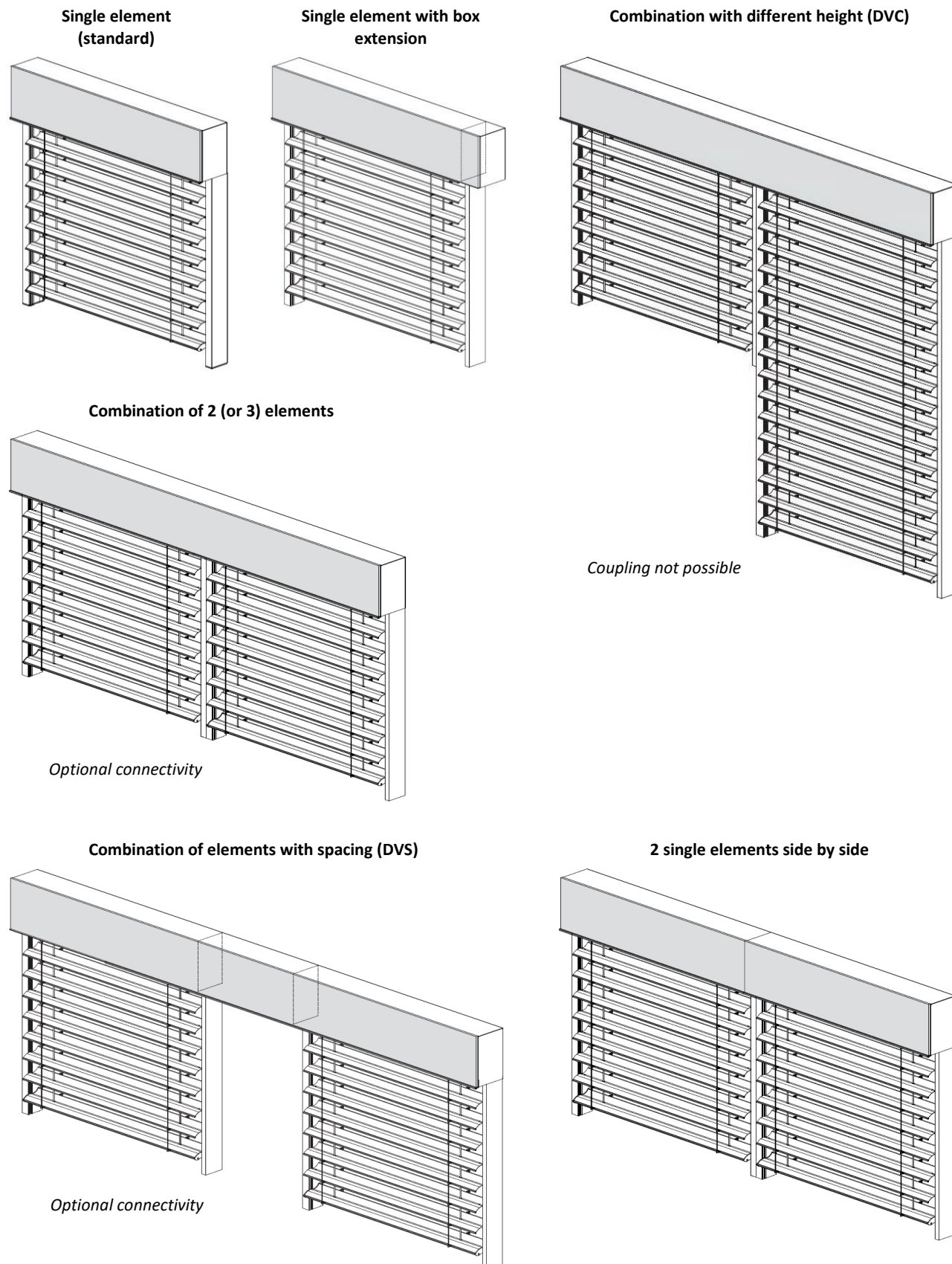
H between 150 mm and 370 mm
RV between 3 mm and 60 mm

Definition of blind dimensions	Guide rails
Total width	FB = LB - 8 mm
Total height	FH = LH - 5 mm

Guide rail	Distance A
FUP 70	56
FUP 80	66
FUB 95	82

13. Connected outside venetian blinds

13.1. Coupling options

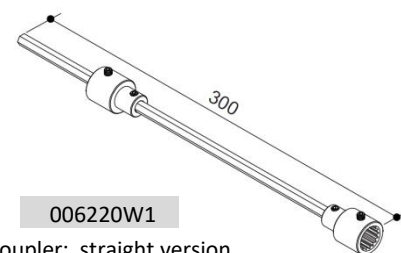


13.2. Can be coupled

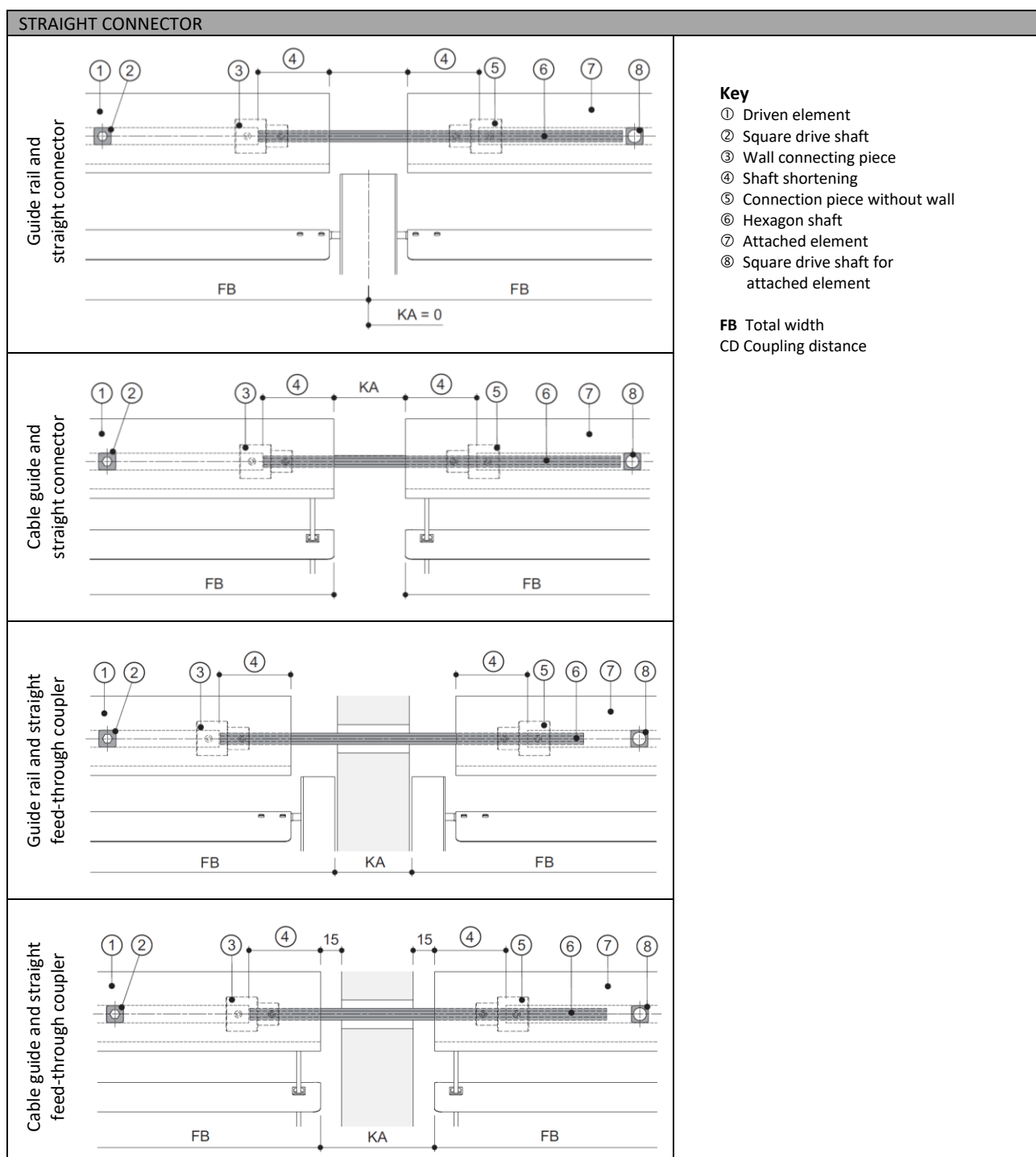
The maximum number of outside venetian blinds connected together is 3. With crank rod drive or when using cardan joints, a max. of 2 connected blinds are possible. The number of blinds that can be connected is specified inclusive of the drive element. The maximum connection distance is 500 mm.

13.2.1. Straight connector

With this coupling, the hexagonal shaft is pushed into the square drive shaft of the coupled element, the fine-toothed connectors are externally fitted to the square drive shafts. This coupling can be used with a split top box, and also for penetration through existing structural elements. Required penetration opening is $\varnothing 20$ mm.

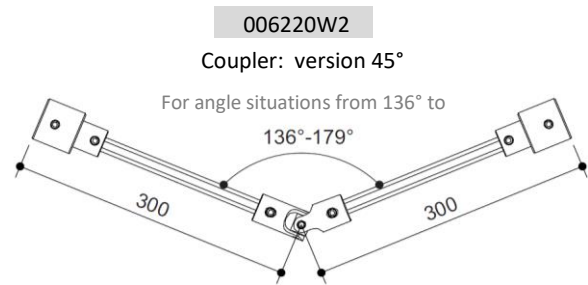


006220W1
Coupler: straight version



13.2.2. Angled couplers 45°

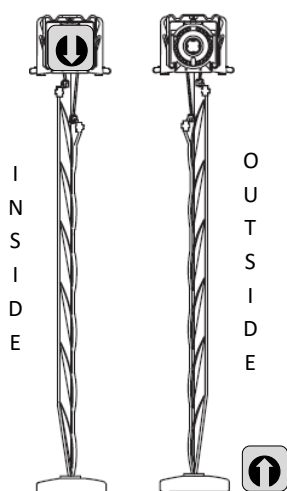
Angled couplers use one cross head connector. For the rest there is no difference from a straight coupler.



COUPLINGS UNDER CORNER		
Cross head connector (45°)		Key ① Driven element ② Square drive shaft ③ Wall connecting piece ④ Shaft shortening ⑤ Connection piece without wall ⑥ Hexagon shaft ⑦ Attached element ⑧ Square drive shaft for attached element FB Total width

14. Slat positions

14.1. Tilting functions

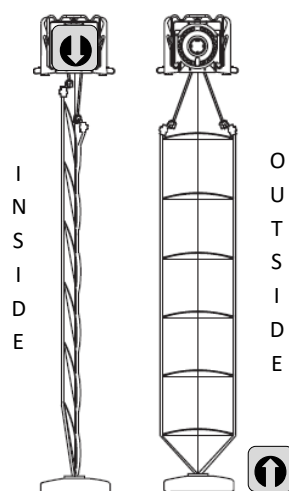


180° rotation

The venetian blind is closed outwards when it is lowered and inwards when it is raised. It can be infinitely adjusted between the two positions.

Standard on ARB80.

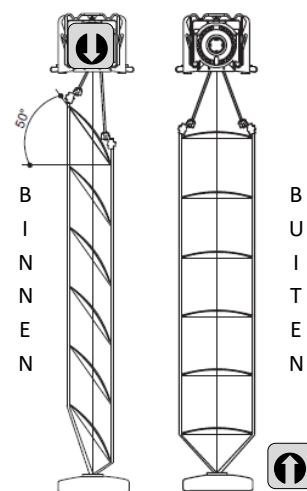
Optional with VNV box & AF80.



90° rotation

The venetian blind is closed outwards when it is lowered and horizontal when it is raised. It can be infinitely adjusted between the two positions.

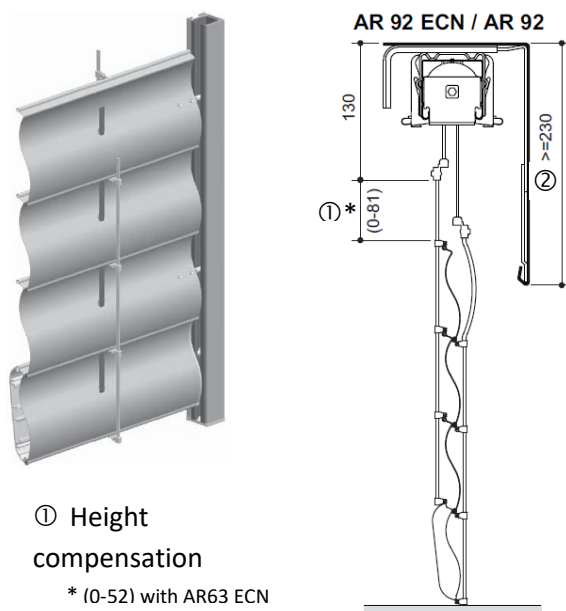
Standard with AR63 ECN, AR92 ECN and VNV box & AF80. Optional on ARB80.



Working position

The venetian blind is tilted approx. 50° outwards when it is lowered and horizontal when it is raised. It can be infinitely adjusted between the two positions. The venetian blind can be closed outwards. Available as an option for all venetian blinds at extra cost.

14.2. Rotating or non-rotating bottom lath

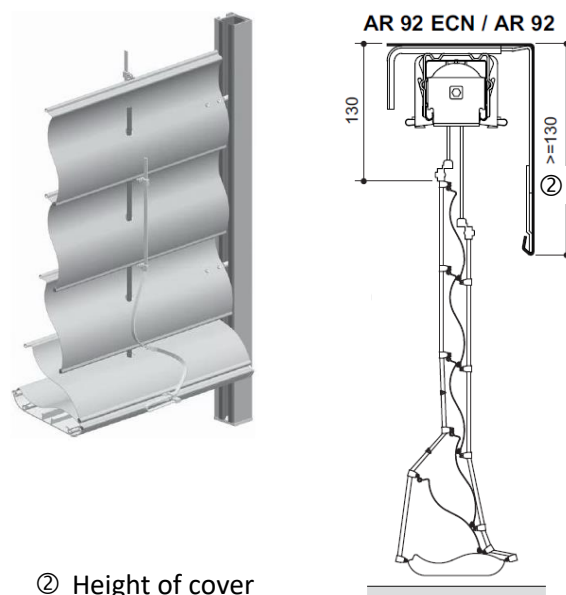


① Height compensation

* (0-52) with AR63 ECN

Rotating bottom lath

The rotating bottom lath is standard on AR63 ECN and AR92 ECN on the versions with guide rails! The advantages of this rotating bottom lath are that it closes perfectly in the bottom section and that the blind has an even appearance. Compensation is needed for the extra space ① required for the bottom lath to rotate. A minimum covering of 200 mm (AR63 ECN) or 230 mm (AR92 ECN) is needed to cover this gap.



② Height of cover

Non-rotating bottom lath

A non-rotating bottom lath is optional for the AR63 ECN and AR92 ECN venetian blinds with guide rails. It is standard for all other venetian blinds.

The minimum covering for the two aforementioned versions is 130 mm.

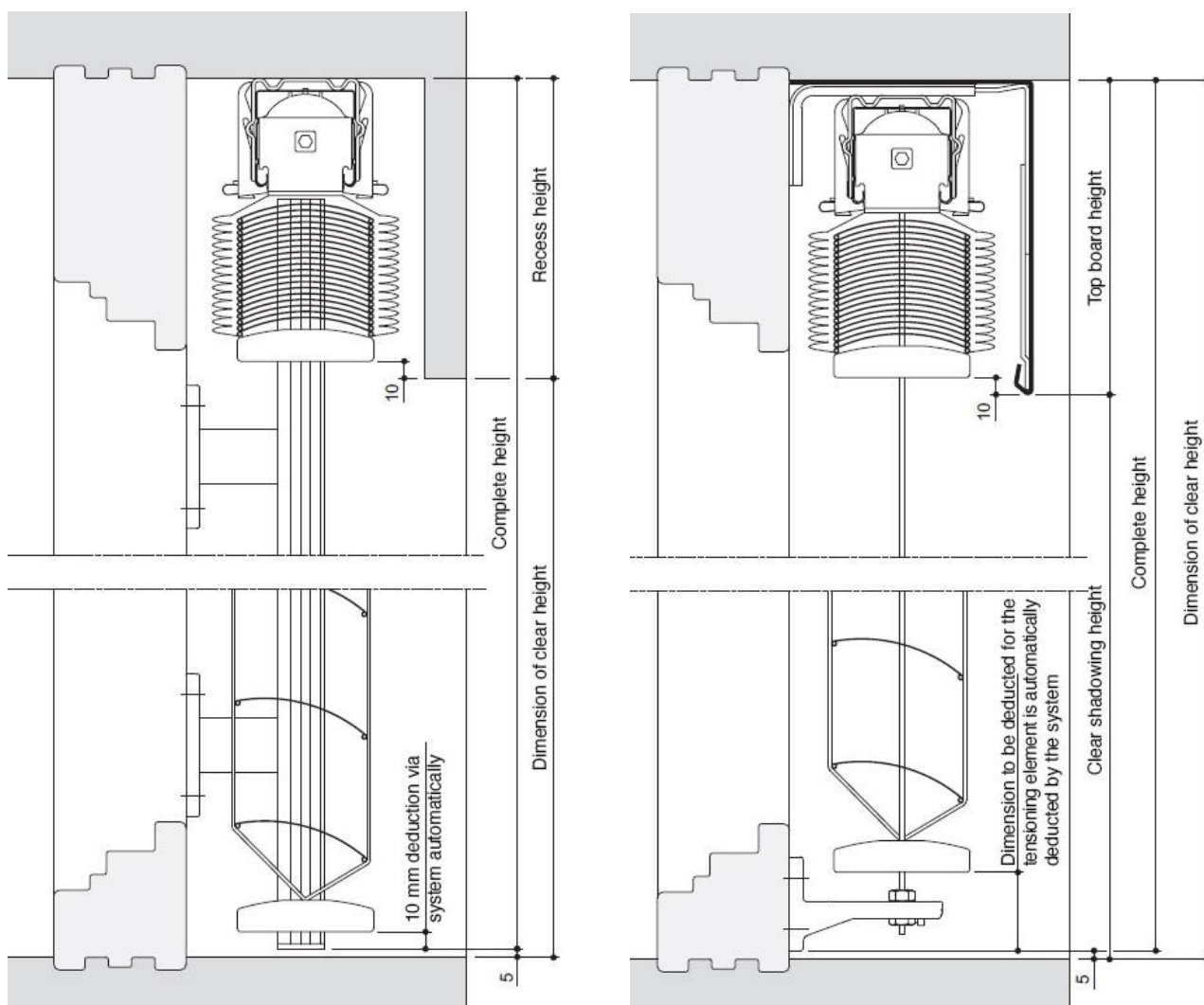
15. Taking measurements and finished dimensions

When measurements are taken, at least 3 points must be measured for each total dimension. The smallest clearance is decisive for determining the measurement.

15.1. Total height (FH)

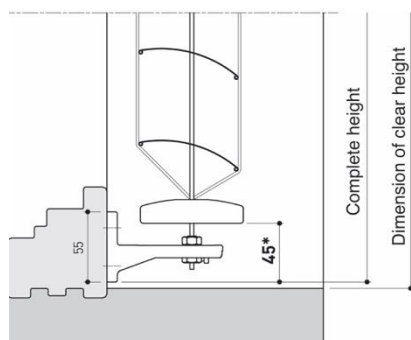
- Total height (FH) = distance from the top edge of the support to the bottom edge of the tensioning element (cable guide)
 or to the bottom edge of the guide rail
 = clear height (+ bay height) – clearance (Recommended clearance is 5 mm)

The distance between the bottom edge of the bottom lath and the top edge of the tensioning element or the bottom edge of the guide rail is 10 mm, which is automatically deducted via the system. The various allowance dimensions depending on the selected tensioning element (see 14.2) are also deducted automatically via the system.

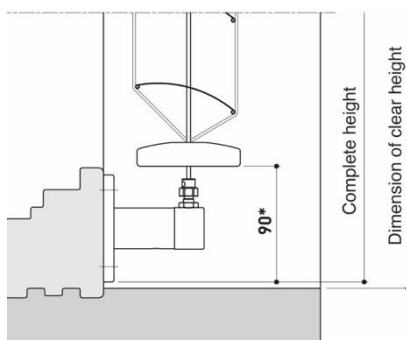


15.2. Allowance dimensions for tensioning elements (deducted automatically via the system)

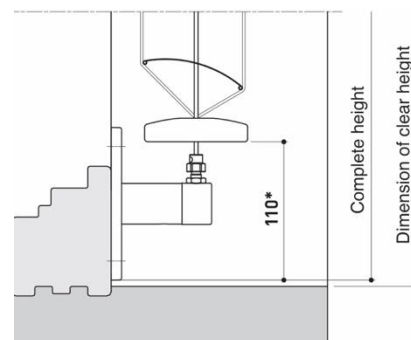
... with tensioning bracket



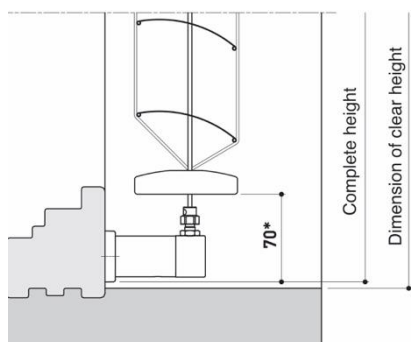
... with tensioning console and base plate small



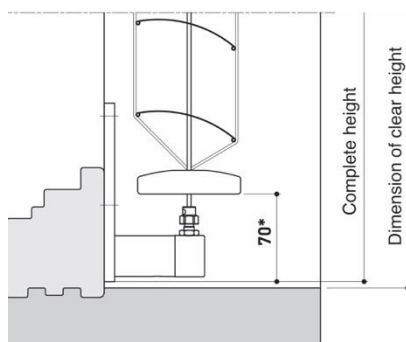
... with tensioning console and base plate large



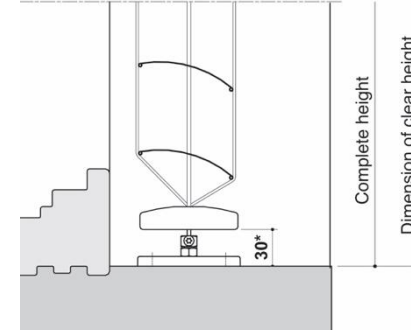
... with tensioning console and base plate transverse



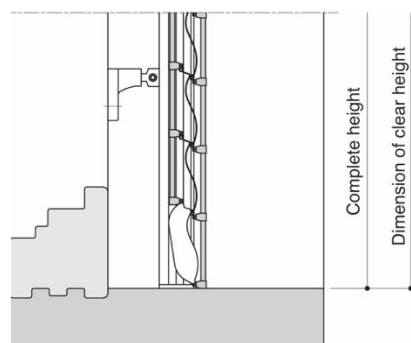
... with tensioning console and base plate top



... with tensioning shoe and stainless steel cable

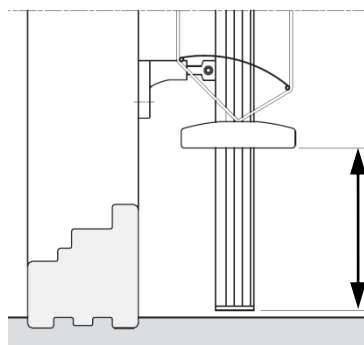


... with rotating bottom lath (AR63/AR92)



15.3. Height extensions

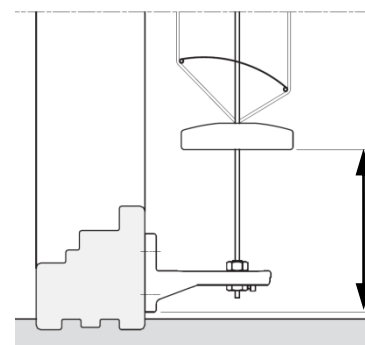
Extended guide rail



Extension to be specified is the distance between the bottom edge of the bottom lath and the bottom edge of the guide rail, including cover.

Extension to be specified is the distance between the bottom edge of the bottom lath and the bottom edge of the tensioning element.

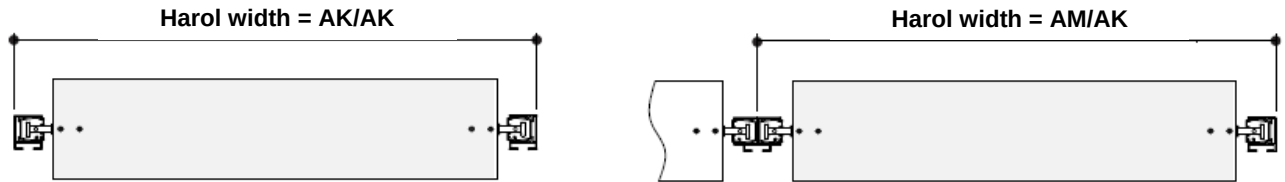
Extended cable guide



15.4. Total width (FB)

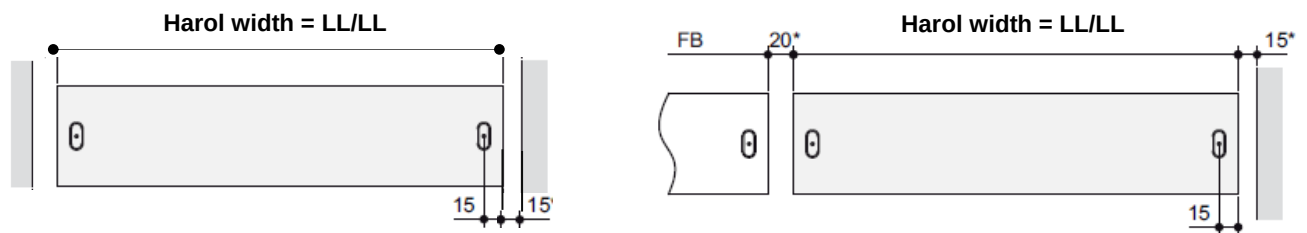
With guide rails, the total width can be indicated in three different ways depending on the situation: outer edge of guide rail (AK), shaft dimension of guide rail (AM) or inner edge of guide rail (IK). The measurement situation can also be different on the left and right.

Harol has chosen always to specify widths as "AK". "AM" is used on the relevant side only when a central guide is used.

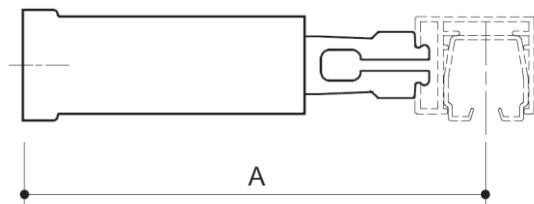


For outside venetian blinds with cable guides, the total width is specified by the slat width (LL). The distance from the outer edge of the slat to the axis of the cable guide is 155 mm by default, but can be increased as an option. At least 15 mm is always required for the distance between the side edge of the slat and the wall, and at least 20 mm between the side edges of two adjacent slats.

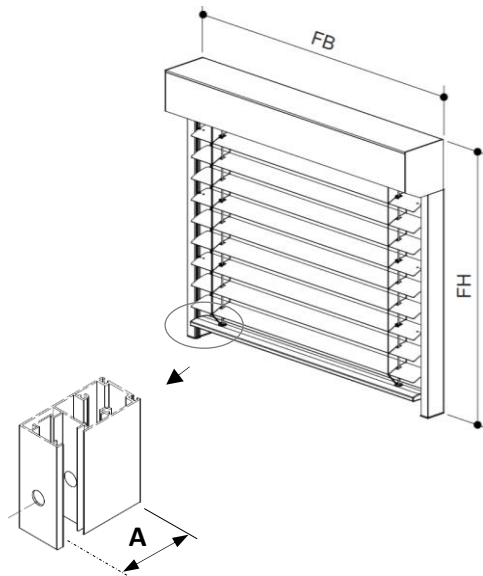
Here, too, Harol has chosen to specify the total width as the slat width at the cable guide.



Combinations of a guide rail on one side and a cable guide on the other are possible.

15.5. Distance A

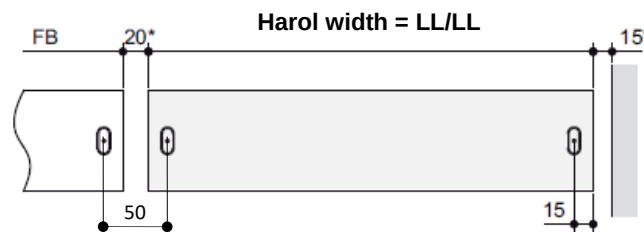
Distance A is the measurement between the centre line of the slat and the vertical installation surface. This measurement is very important, especially to get the right spacers for guide rails or the right tensioning consoles for tensioning cables.

15.6. Measurements for flush-mounted systems

- Total height (FH) = distance from the top of the flush-mounted box to the bottom of the guide rail, including the end stop.
- Total width (FB) = distance from the outside of the left guide rail to the outside of the right guide rail (AK/AK)
= distance between left and right side consoles (including the side consoles).
- Spacer size A = the measurement between the centre line of the slat and the vertical mounting surface.
(For FUP-70 this is 56 mm, for FUP-80 66 mm and for FUP-95 82 mm)

15.7. Connection distance

The maximum connection distance for connected outside venetian blinds is 500 mm. If a central guide is used, this connection distance is 0 mm. With a cable guide, the connection distance is at least 20 mm. The distance between two cable guides is consequently at least 50 mm.



15.8. Dimension limits

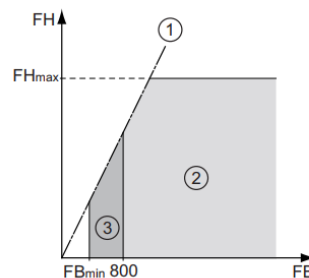
Type ¹		Single systems					Group systems ²		
		Width [mm]		Maximum	Max. height [mm]	Max. area [m²]	Max. width [mm]	Max. height [mm]	Max. area [m²]
		Minimum							
		Somfy IO	Elero						
BZ1000									
AR63-ECN M	Guide rail	547	507	5000	4200	18	15000	4200	22.5
	Cable	490*	450*		4000			4000	
ARB 80 M	Guide rail	532	492	5000	5200	20	15000	5200	22.5
	Cable	530*	490*		4000			4000	
AR92-ECN M	Guide rail	547	507	5000	5200	18	15000	5200	22.5
	Cable	490*	450*		4000			4000	
BZ700 ³ (flush-mounted boxes VA7 with slat)									
VA7 + AF80 ⁴		552	516	5000	4000	20	N/A		
VA7 + ARB80		552	516	5000	3200	16**	N/A		
VA7 + AR63-ECN		552	516	5000	2700	13.5**	N/A		
VA7 + AR92-ECN		552	516	5000	3100	15.5**	N/A		

¹ M: Motorised versions² Max. 3 venetian blinds can be connected. Max. 2 blinds can be connected if a cardan joint is used.³ Flush-mounted boxes VA7 always include guide rails and are only available as a single system.⁴ Maximum height for AF80 with slat clips is 3800 mm. Max. area is then 19 m².

* For cable guides, the width is indicated by the slat width (SW).

** The maximum area can be up to 20 m², but then part of the slats are outside the box.

The ratio of width to height is also an important dimension limit.
If the ratio FB/FH < 1.6,
an outside venetian blind cannot be



FB	Width
FH	Height
FBmin	Minimum width
FHmax	Maximum height
①	Limit ratio FB/FH = 1.6
②	Recommended area
③	Area of higher risk

BZ1000 : Outside venetian blind AR63 ECN

		Width [mm]															
		600	700	1000	1500	1600	2000	2700	2800	3000	3800	4000	4200	4400	4600	4800	5000
Height [mm]	1000																
	2000																
	3000																
	3500																
	3600																
	3700																
	3900																
	4000																
	4200																

*Cable guide not possible

Number of ceiling brackets for top rail suspension

2	3	4	5	6
---	---	---	---	---

BZ1000 : Outside venetian blind ARB-80

		Length [mm]																	
		600	700	800	900	1000	1500	1600	2000	2700	2800	3000	3800	4000	4200	4400	4600	4800	5000
Height [mm]	1000																		
	2000																		
	3000																		
	3500																		
	3600																		
	4000																		
	4100		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	4200		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	4300			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	4500			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	4700			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	4800			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
5000			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
5200			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
*Cable guide not possible																			
		Number of ceiling brackets for top rail suspension																	
		2					3			4			5				6		

BZ1000 : Outside venetian blind AR92 ECN

		Length [mm]																				
		600	700	800	900	1000	1500	1600	2000	2700	2800	3000	3400	3600	3800	4000	4200	4400	4600	4800	5000	
Height [mm]	1000																					
	2000																					
	3000																					
	3500																					
	3600																					
	3700																					
	3900																					
	4000																					
	4200		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	4500		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	4700		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
4800		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
5000		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
5200		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	

*Cable guide not possible

		Number of ceiling brackets for top rail suspension				
		2	3	4	5	6

Length [mm]

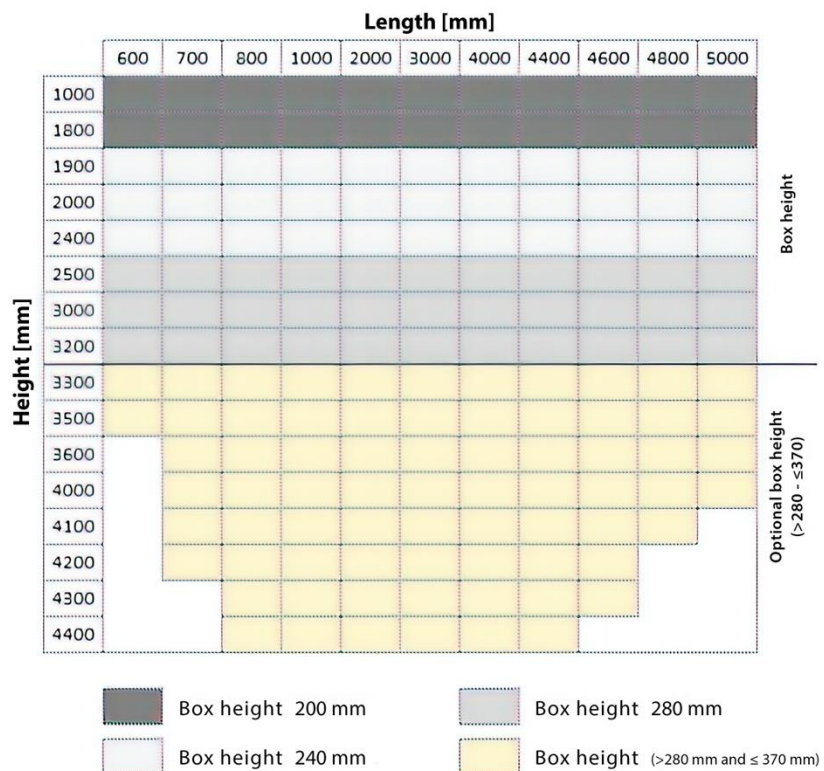
	600	700	1000	2000	3000	4000	4800	5000
1000	Dark Grey	Dark Grey	Dark Grey	Dark Grey	Dark Grey	Dark Grey	Dark Grey	Dark Grey
1400	Dark Grey	Dark Grey	Dark Grey	Dark Grey	Dark Grey	Dark Grey	Dark Grey	Dark Grey
1500	White	White	White	White	White	White	White	White
2000	White	White	White	White	White	White	White	White
2100	Light Grey	Light Grey	Light Grey	Light Grey	Light Grey	Light Grey	Light Grey	Light Grey
2700	Light Grey	Light Grey	Light Grey	Light Grey	Light Grey	Light Grey	Light Grey	Light Grey
2800	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
3000	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
3500	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
3600	White	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	White
3700	White	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	White

Height [mm]

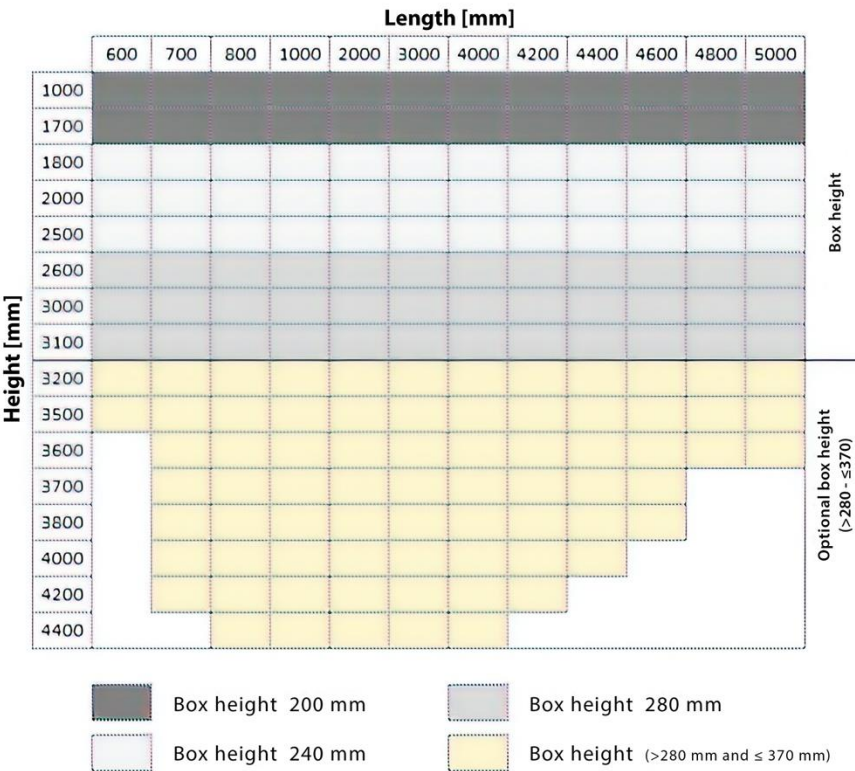
Box height

Optional box height (>280 - <=370)

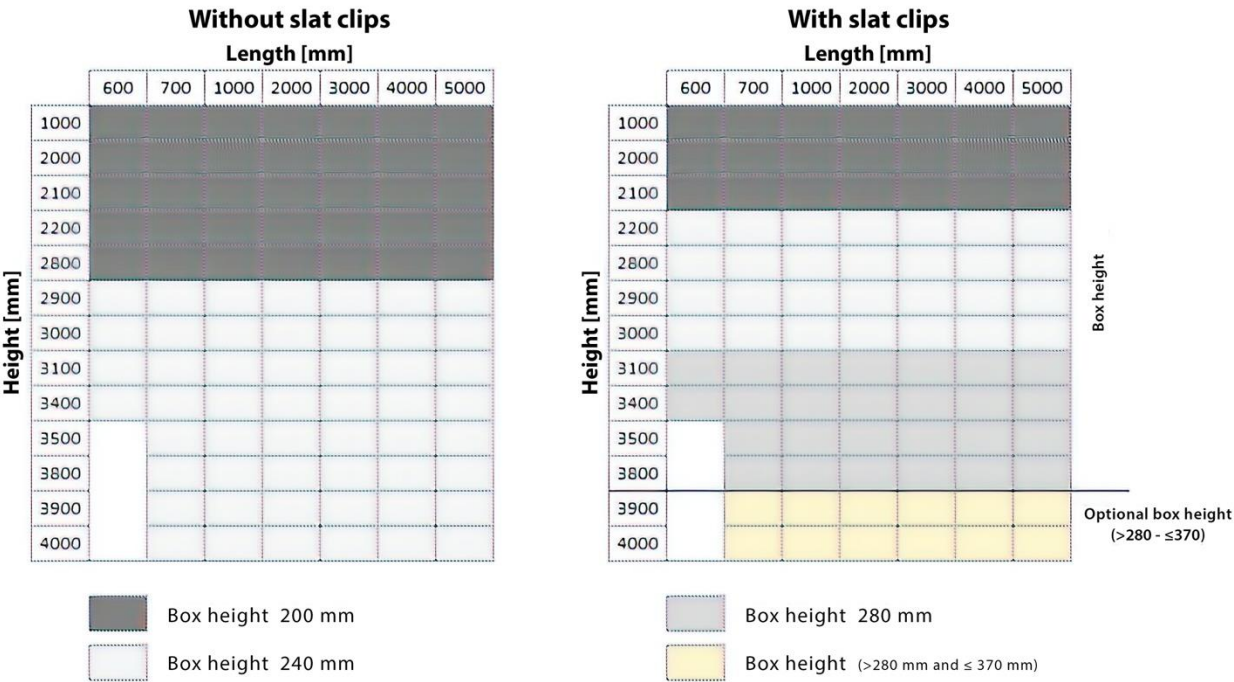
- Box height 200 mm
- Box height 280 mm
- Box height 240 mm
- Box height (>280 mm and <= 370 mm)



BZ700 : Surface-mounted channel VA7 with venetian blind AR92 ECN



BZ700 : Surface-mounted channel VA7 with venetian blind AF-80



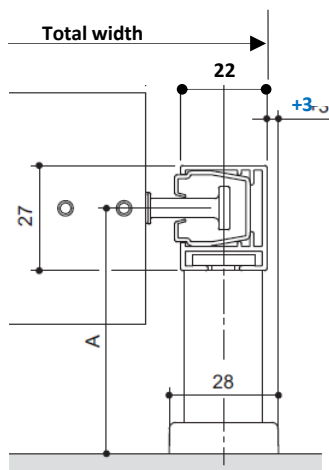
15.9. Minimum bay depths and channel depths

PTH = pack height
 ST = bay depth
 BT = cover depth
 KT = channel depth
 LKÖ = channel
 opening
 LKÖ = KT - 22 mm

Type	Minimum bay depth "ST"	Minimum cover depth "BT"	Minimum channel depth "KT"
AF 80	120 mm	140 mm	140 mm
ARB 80	120 mm	140 mm	140 mm
AR 63 ECN	110 mm	115 mm	120 mm
AR 92 ECN	140 mm	140 mm	150 mm

No external receiver is needed, the receiver is now integrated in the motor.

15.10. Important



- Measure each dimension in three different places and take the smallest dimension.
- It is recommended that the distance between slats and vertical surfaces is at least 20 mm.
- When fitting in the window opening, it is advisable to take the slat width wider than the opening to be covered. This also provides sufficient mounting surface for the guide supports.
- The supports for mounting a guide rail can partly fall outside the total width, depending on the chosen guide rail system and guide supports (see drawing)!
- Spacer size A is standard 56 mm for AR63 ECN and 66 mm for ARB80 and AR92 ECN.
- Height of the cover for KBT2 may vary between 130 and 255 mm, for KBT3 between 130 and 480 mm.
- The maximum spacing for linked outside venetian blinds is 500 mm!
- Outside venetian blinds are always viewed from inside, from left to right.
- Wind safety devices are always indicated on the far left, even if there are several!

15.11. Pack heights (PTH)

Total height	AR 63 ECN			ARB 80			AR 92 ECN			AF 80 (Flush-mounted)			
	PTH	SH/BH	LV	PTH	SH/BH	LV	PTH	SH/BH	LV	PTH	SH/BH	LV	PTH+
500	130*	140	360	125	135	365	125*	135	365	115	125	375	+5
600	135*	145	455	130	140	460	130*	140	460	120	130	470	+5
800	150*	160	640	140	150	650	140*	150	650	130	140	660	+5
1000	160*	170	830	150	160	840	150*	160	840	130	140	860	+15
1100	165*	175	925	155	165	935	155*	165	935	135	145	955	+15
1200	175*	185	1015	160	170	1030	160*	170	1030	135	145	1055	+20
1300	180*	190	1110	165	175	1125	170*	180	1120	140	150	1150	+20
1400	190*	200	1200	175	185	1215	175*	185	1215	140	150	1250	+25
1500	195*	205	1295	175	185	1315	180*	190	1310	150	160	1340	+20
1600	200	210	1390	185	195	1405	185*	195	1405	150	160	1440	+25
1700	210	220	1480	190	200	1500	190*	200	1500	155	165	1535	+25
1800	215	225	1575	190	200	1600	195*	205	1595	155	165	1635	+30
1900	220	230	1670	200	210	1690	200*	210	1690	160	170	1730	+30
2000	225	235	1765	205	215	1785	205*	215	1785	160	170	1830	+35
2100	235	245	1855	210	220	1880	210*	220	1880	165	175	1925	+35
2200	240	250	1950	215	225	1975	220*	230	1970	165	175	2025	+40
2300	250	260	2040	220	230	2070	225*	235	2065	165	175	2125	+40
2400	255	265	2135	225	235	2165	230	240	2160	175	185	2215	+40
2500	260	270	2230	235	245	2255	230	240	2260	175	185	2315	+45
2600	270	280	2320	235	245	2355	240	250	2350	180	190	2410	+45
2700	270	280	2420	240	250	2450	245	255	2445	180	190	2510	+50
2800	280	290	2510	250	260	2540	250	260	2540	185	195	2605	+45
2900	285	295	2605	250	260	2640	255	265	2635	185	195	2705	+55
3000	295	305	2695	260	270	2730	260	270	2730	195	205	2795	+45
3100	300	310	2790	265	275	2825	270	280	2820	195	205	2895	+55
3200	305	315	2885	270	280	2920	275	285	2915	200	210	2990	+55
3300	315	325	2975	275	285	3015	275	285	3015	200	210	3090	+55
3400	320	330	3070	280	290	3110	280	290	3110	205	215	3185	+60
3500	330	340	3160	285	295	3205	290	300	3200	205	215	3285	+60
3600	330	340	3260	295	305	3295	295	305	3295	205	215	3385	+65
3700	340	350	3350	295	305	3395	300	310	3390	215	225	3475	+60
3800	345	355	3445	300	310	3490	305	315	3485	215	225	3575	+65
3900	355	365	3535	310	320	3580	310	320	3580	220	230	3670	+70
4000	360	370	3630	310	320	3680	320	330	3670	220	230	3770	+70
4100	365	375	3725	320	330	3770	320	330	3770				
4200	375	385	3815	325	335	3865	325	335	3865				
4300				330	340	3960	330	340	3960				
4400				335	345	4055	340	350	4050				
4500				340	350	4150	345	355	4145				
4600				345	355	4245	350	360	4240				
4700				350	360	4340	360	370	4330				
4800				355	365	4435	360	370	4430				
4900				365	375	4525	370	380	4520				
5000				370	380	4620	370	380	4620				
5100				375	385	4715	380	390	4710				
5200				380	390	4810	380	390	4810				

The specified pack heights are recommended pack heights taking account of technical and design tolerances and may vary in both a positive and a negative direction! An extra approx. 5% must be applied for blinds with a working position or with 90° rotation.

- * Minimum space for rotating bottom lath is 200 mm (AR63 ECN) or 230 mm (AR92 ECN)
- FH Total height [mm]
- PTH Pack height [mm]
- PTH+ Values by which the PTH (AF80 without slat clips) must be multiplied for the AF80 with slat clips
- SH Bay height [mm] = PTH + 10 mm
- BH Cover height [mm] = PTH + 10 mm (min. 130 mm)
- LV Free height shadow [mm] = FH – PTH – 10 mm
- Free height shadow [mm] = FH – SH/BH

Bestelformulier Buitenjaloerie

DATUM : ____ / ____ / 20____ REFERENTIE HAROL : ____ OPSTELLER : ____

KLANT / FACTURATIE		LEVERINGSADRES	
Naam :	_____	Naam :	_____
Adres :	_____	Adres :	_____
Klantnr. :	_____	GSM / Tel. :	_____
GSM / Tel. :	_____	GSM / Tel. :	_____
		Fax :	_____
		Gewenste levertermijn :	_____

POSITIE	AANTAL	COMBINATIE		AFGEWERKTE MATEN			LAMEL		ONDER-LAT	MONTAGETYPE	BEDIENING			GELEIDERS							KAST		EXTRA WINDZEK.			SUPPLEMENTEN	REFERENTIE		
		ENK/DVC/DVS	TUSSENRIJMTES (enkel indien DVS)	BREEDTE (MM)	HOOGTE (MM)	SH / KH	TYPE	KLEUR NR.			TYPE	L / M / R	SCHAKELAAR / ZENDER	TYPE LINKS	STEUN LINKS	A-MAAT	TYPE RECHTS	STEUN RECHTS	A-MAAT	KLEUR NR.	Y / N	KLEUR NR.	KABEL TYPE	KABEL STEUN	PLAATS [mm]				
1																													
2																													
3																													
4																													
5																													
6																													
7																													
8																													
11		2		3		4	5	6	7	8	9	10	11																

12. MONTAGE-ONDERGROND	Metaal	Kunststof	Hout	Beton / Steen
Bovenbak				
Geleidersteun				
Kabelsteun				

OPMERKINGEN :

Ik heb kennis genomen van de technische product-omschrijving, en neem volledige verantwoordelijkheid voor de vermelde maten en aanduidingen.

De Klant,

- * Niet ingevulde vakjes = standaarduitvoering !
- * De buitenjaloerie wordt steeds bekeken langs **BINNEN**, van links naar rechts !
- * Alle maten in mm aanduiden !
- * Elke opdracht wordt uitgevoerd volgens onze verkoopvoorwaarden !

PRIJS :

HAROL®

Versie 07/11 / 17014

Versie : 02/2019

Bestelformulier Buitenjaloerie : de kast

DATUM : ____ / ____ / 20____ REFERENCE HAROL : _____ OPSTELLER : _____

KLANT / FACTURATIE		LEVERINGSADRES	
Naam : _____	Naam : _____	Adres : _____	Adres : _____
Klantnr. : _____	BTW : _____	GSM : _____	Fax : _____
GSM / Tel. : _____	Fax : _____	Gewenste levertermijn : _____	

KAST				ARMETINGEN [MM]				SLUITSTUK				DRAGERS		SUPPLEMENTEN	REFERENTIE	OPMERKINGEN
AANTAL	LAMEL TYPE	VORM	PLAATDIKTE	KLEUR NR.	LENGTE	HOOGTE	BH	PLEISTERPUNT	PN	LINKS	RECHTS	LINKS	RECHTS	TYPE	AANTAL	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1																
2																
3																
4																
5																
6																

1. Aantal identieke kasten

2. Kast

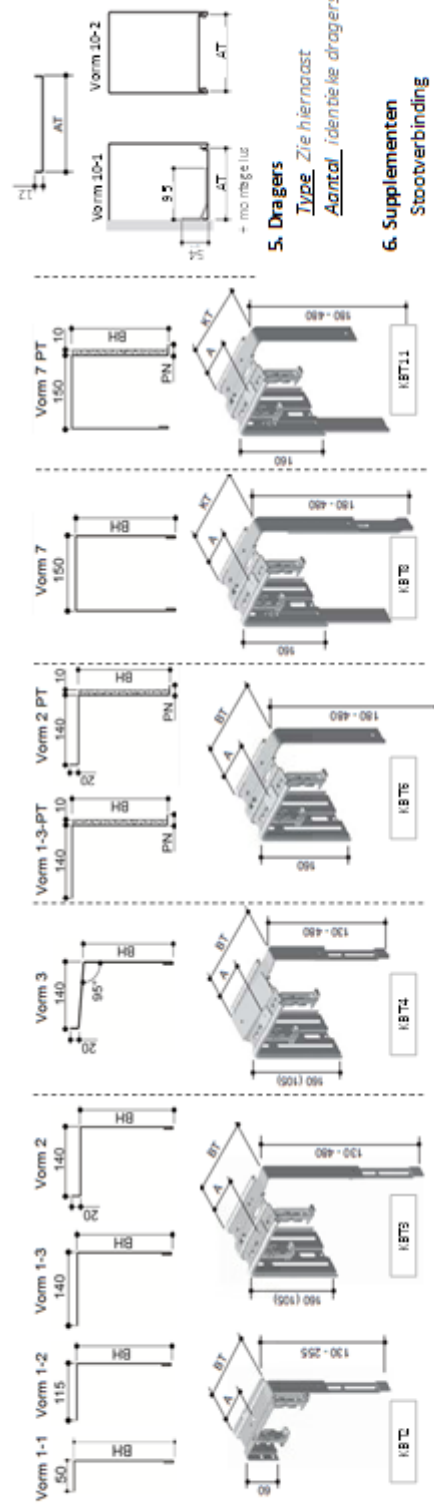
Lamel type
 63 S/Z = AR63 ECN met S of Z-lamel
 80 B = ARB 80
 92 S/Z = AR92 ECN met S of Z-lamel
 Vormen. Zie hie maast + eronder benodigde drager
 Plaatdikte 1,2 mm* / 2,0 mm
 Kleurnr. Zie hoofdstuk standaard kleuren.
 * enkel vorm 1-1, 1-2, 1-3, 10-1 of 10-2

3. Afmetingen

Lengte = lengte exclusief sluitstukken
 BH = Koofhoogte
 PN = grootte van pleisterneus
 AT = afdekkingsdiepte

4. Sluitstuk

Keuze voor sluitstuk(ken) aanduiden met "X"



5. Dragere

Type. Zie hiernaast
 Aantal identieke dragere

6. Supplementen

Stoetverbinding

HAROL®

Bestelformulier VNV-kast met buitenjaloerie

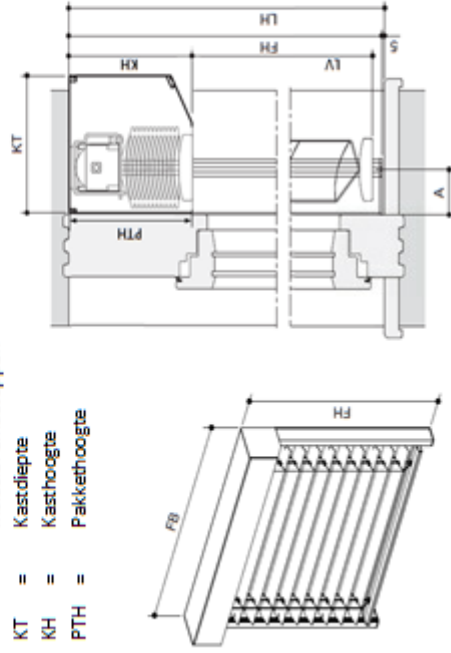
1. Aantal identieke VNV-kasten met buitenjaloerieën

2. Combinatie

ENK Enkelvoudig VNV-kast met buitenjaloerie (BJ)
DVC/DVS NVT

3. Afgewerkte maten

B = FB, afstand tss buitenzijdes geleiders (= kastbreedte)
H = FH, afstand bovenkant kast tot tot onderkant geleider, inclusief eindstoppen
KT = Kastdiepte
KH = Kasthoogte
PTH = Pakkethoogte



4. Lamel

Type 80 F = AF-80
80 B = ARB-80

Kleurnr. Voor de kleuren zie hoofdstuk standaard kleuren.

5. Onderlat of onderlamel

Kleurnr. Voor de kleuren zie hoofdstuk standaard kleuren.

6. Bediening

Bedieningstype

51 = Motor
IO = IO Motor

Bedieningszijde

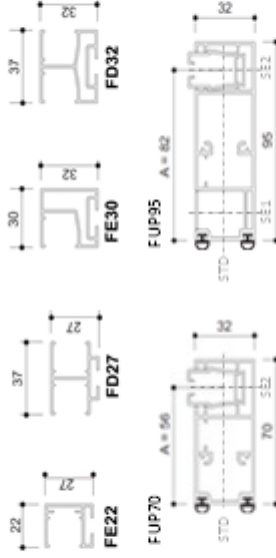
L / M / R = Links / Midden / Rechts

Schakelaar/Zender. Mogelijkheden zie hoofdstuk Domotica

Standaard zonder schakelaar of zender.

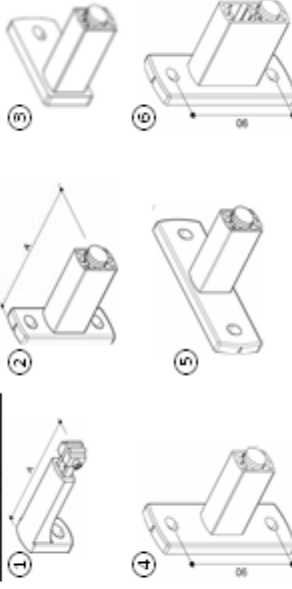
7. Geleiding

Type geleiders



Voor FUP-geleiders bevestigingswijze opgeven: STD / SE1 / SE2 / SE1+2 (Vak 11)

Steunen bij geleiders



① FA1x Variabele afstandhouder (standaard)
② FB2x Vaste steun - basisplaat klein
③ FB50 Vaste steun - basisplaat eenzijdig dwars
④ FB3x Vaste steun - basisplaat groot
⑤ FB4x Vaste steun - basisplaat groot & dwars
⑥ FC3x Versterkte vaste steun - basispl. groot
Versies zonder geluiddempende plaat (x=0) of met (x=1) zie tekening "3. Afgewerkte maten"

A-maat zie tekening "3. Afgewerkte maten"

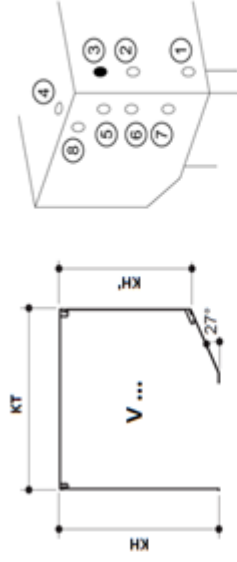
Kleurnr. Voor de kleuren zie hoofdstuk standaard kleuren.

8. Kast

Type (incl. afmetingen en maximale hoogtes)

Kast	Kastmaten (mm)	Geleider	Maximale hoogte (mm)
V 16	KT / KH 169	AF-80	AF-80* 1300
V 18	185	FUP 70	1500
V 20	209	FUP 70	1800
V 20	209	FUP 70	2000
V 20	209	FUP 95	2300
V 20	209	FUP 95	2600

* AF-80 met lamellenclips

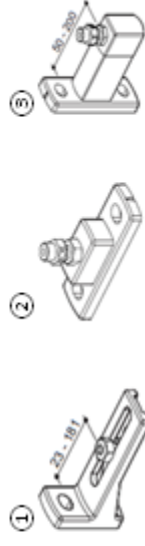


Kabeluitaangen. Zie mogelijke den 1-8 op bovenstaande tekening
Kleurnr. Voor de kleuren zie hoofdstuk standaard kleuren.

9. Extra wind-elektroden

Types bij spankabels

PAP = RVS - parelsilver ommanteld
PAS = RVS - zwart ommanteld
PAT = RVS - transparant ommanteld

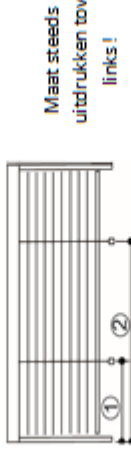


Steunen bij spankabels

① SA1xM1 Spanhoek centraal (standaard)
② SC2xM3 Spanhoeven met basisplaat klein
③ SC3xM3 Spanhoeven met basisplaat groot
④ SB2xM3 Spanconsole, basisplaat klein - centraal
Versies zonder geluiddempende plaat (x=0) of met (x=1) zie tekening "3. Afgewerkte maten"

Overige mogelijkheden zie technische fiche.

Plaats [mm]



Maat steeds uitdrukken tov links!

10. Supplementen

A474 Verlenging geleider / spankabel
... Andere motorkabel lengte

11. Montageondergrond

Ondergrond aangeven met kruisje voor elke bevestiging. Voor FUP-geleiders ook bevestigingswijze opgeven. (zie tekening onder 7).

DATUM : / / 20

REFERENTIE HAROL :

OPSTELLER :

KLANT / FACTURATIE		LEVERINGSADRES	
Naam	:	Naam	:
Adres	:	Adres	:
	:		:
Klantnr.	:	GSM / Tel.	:
	:		:
GSM / Tel.	:	Gewenste levertermijn	:
	:		:

[illegible]

11.MONTAGE- ONDERGROND	Metaal	Kunst- stof	Hout	Beton / Steen	Beyes- tligting
Kast VMW					
FUP-geleider					
Geleidersteen					
Kabelsteen					

OPMERKINGEN :

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De Klant,

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- Alle maten in mm aangeven !
- Elke opdracht wordt uitgevoerd volgens onze verkoopvoorwaarden !

PRJUS :

HAROL®