

External venetian blinds



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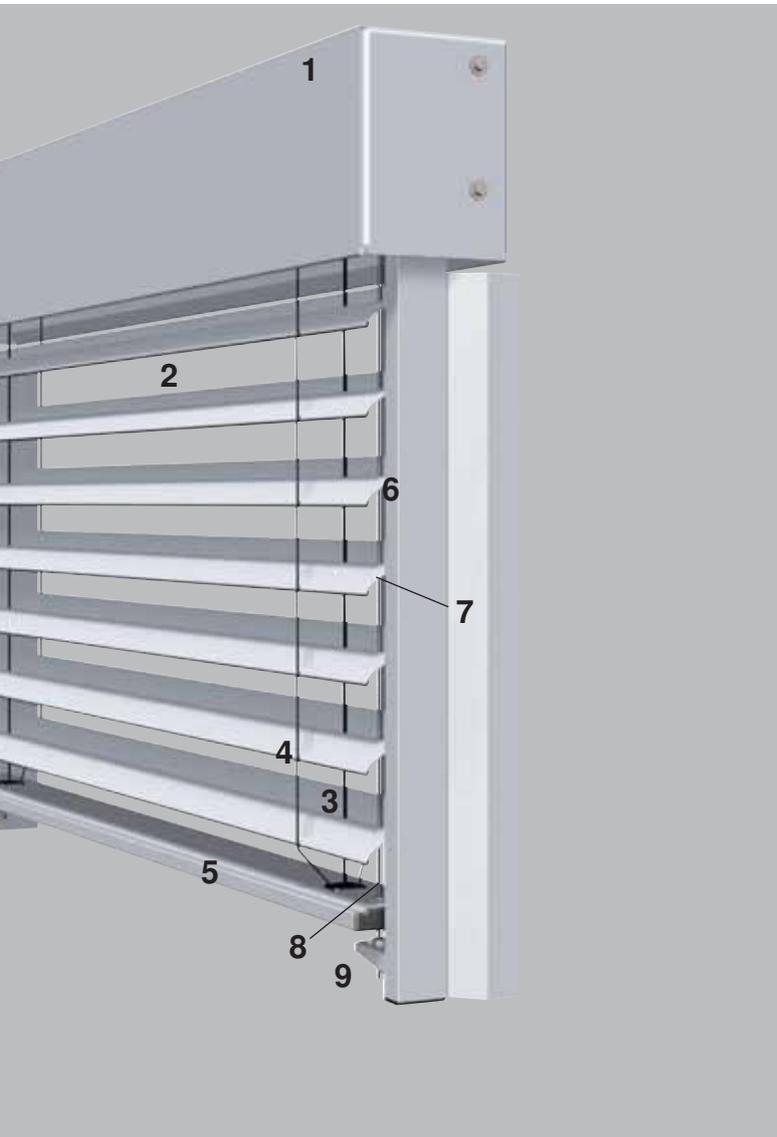
even in stormy times.

Wind is essentially the result of equalisation of the different air pressures in adjacent air masses. Pockets in the high pressure air mass (high pressure area) flow into the low pressure area until the air pressure has equalised. This is referred to as a breeze, wind or gale, depending on the strength of the wind. A brief but strong movement of air is referred to as a gust. The strength of the wind in the open atmosphere is affected to varying extents by friction, which depends on the properties of the surface. The Beaufort scale (see table) is the international system used to classify wind according to wind speed.

Beaufort level	Designation	Medium wind speed at a height over open ground		Examples of the effects of wind inland
		[m/s]	[km/h]	
0	Calm	0–0.2	<1	Smoke rises vertically
1	Slight draught	0.3–1.4	1–5	Wind direction indicated by the rising smoke
2	Soft breeze	1.5–3.4	6–12	Wind can be felt in the face, leaves and wind flags are moving
3	Gentle breeze Gentle wind	3.5–5.4	13–19	Wind moves thin twigs and stretches pennants
4	Moderate breeze Moderate wind	5.5–7.4	20–27	Wind causes twigs and small branches to move, raises dust and loose paper
5	Fresh breeze Fresh wind	7.5–10.4	28–37	Small slender trees start to sway, white crests form on waves
6	Strong wind	10.5–13.4	38–48	Strong branches sway, umbrellas are difficult to control, telegraph cables howl in the wind
7	Stiff wind	13.5–17.4	49–62	Noticeable resistance when walking into the wind, entire trees move
8	Stormy wind	17.5–20.4	63–73	Twigs break off trees, walking is quite difficult in the open
9	Storm	20.5–24.4	74–87	Branches break off trees, minor damage to buildings (roof tiles or smoke hoods are lifted off)
10	Heavy storm	24.5–28.4	88–102	Wind breaks trees, extensive damage to buildings
11	Hurricane-like storm	28.5–32.4	103–117	Wind uproots trees, widespread storm damage
12	Hurricane	as of 32.5	above 118	Heavy devastation

Classification of wind speeds and their effects according to the Beaufort scale
Source: Deutscher Wetterdienst (DWD) (German weather service) - Offenbach

Technical description and accessories



The new wind-stable external venetian blind from WAREMA is the ideal product for high buildings or buildings at high-exposed locations. The special locking mechanism of the Z-profiled slats, the partitioning sections, additional tensioning cables and the end rail with slat fixing enable it to withstand high wind loads. Measurements at the ift in Rosenheim have documented its suitability up to wind force 10

on the Beaufort scale. The longer useful lifetime allows a high degree of energy savings to be achieved as a result of lower cooling loads even on windy days. The new design means the wind-stable external venetian blind can also be retrofitted if this was not foreseen in the building plans. The retrofitting of existing systems to the wind-stable external venetian blind is possible in the majority of cases.

Wind limit values (max. wind speed in m/s)

External venetian blind width (mm)	E 94 A wind-stable		Version variant without additional bracing cables		without partitioning profile and/or soffit	
	(m/s)	(bft)	(m/s)	(bft)	(m/s)	(bft)
up to 1500	25	10	25	10	25	9
up to 2000	25	10	20,5	9	20,5	9
up to 2500	20,5	9	17,5	8	20,5	9
up to 3000	20,5	9	17,5	8	20,5	9

The listed wind speeds for wind-stable external venetian blinds Type E 94 A6 are limit values at which the system must be retracted. The values apply to a distance of the slats from the façade ≤ 100 mm and a unit height ≤ 3000 mm. For the standard version, it is recommended to set the wind sensor to a max. of 20 m/s.

- 1 Cover panel
- 2 Slat with guiding nipples
- 3 Lifting tape
- 4 Loop cords
- 5 Bottom rail
- 6 Guide rail with
- 7 Partitioning section
- 8 Tension cable
- 9 Tensioning bracket

Construction limit values

Type	Single units				Coupled units			Average weight of external venetian blind (kg/m ²)
	Width ¹⁾ min. height (mm)	max. ²⁾ (mm)	Height max (mm)	Surface max. (m ²)	Width max (mm)	Surface max. (m ²)	Number of blinds	
E 94 A6 wind-stable	600	3000	3000	9	9000	20	3	4,2

1) With narrow widths, there is a risk of the slats running asymmetrically.

2) Restrictions of the maximum width and/or wind limit values according to the "Wind limit values" table must be taken into account.

Facade external venetian blinds type E 93/80 A6

wind-resistant

Description



- ① **Top rail:** Extruded aluminium profile
- ② **Slats:** Aluminium tape 93 mm wide. Front beading with plastic sealing profile. Colour according to colour chart
- ③ **Bottom rail:** Extruded aluminium profile, powder-coated, with stabilising webs and black plastic end caps, weighted
- ④ **Slat suspension and lifting tape:** polyester, black, laterally mounted tilting tapes
- ⑤ **Drive:** 230V centre motor
- ⑥ **Lateral guidance:** nipple guidance of slats in aluminium guide rails with black plastic sealing strips, partitioning profiles and tension cable guide

Construction limit values

Type	Construction limit values							Number of blinds	Slat width [mm]	Average weight [kg/m ²] ¹⁾	Operation	
	Single units				Coupled units						Lift	Tilting
	Width [mm] ³⁾		Height [mm]	Surface [m ²]	Width [mm]		Surface [m ²]					
	min. ¹⁾	max.			lateral Drive	Central Drive						
E 93 A6 wind-resistant	600	3,000	3,000	9	–	9,000	20	3	93	3.2	Switch	
E 80 A6 wind-resistant	600	3,000	3,000	9	–	9,000	20	3	80	4.0	Switch	

¹⁾ Narrower slats may not run straight.

²⁾ The restrictions of the maximum width and wind limit values are to be observed according to the table "Overview of wind limit values".

³⁾ Width = slat size

Stack heights [mm]

Type	External venetian blind height [mm]																		
	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,200	3,400	3,600	3,800	4,000	4,200	4,300	
E 93 A6 wind-resistant	145	160	165	180	185	200	205	220	225	240	245	260	265	280	285	300	305	310	
E 80 A6 wind-resistant	170	180	195	205	220	230	245	255	270	280	295								

Please note that the values in the table are computer-generated values.

Number of additional cable guides

Type	Width [mm]	Number of additional cable guides ¹⁾		
		0	1	2
E93/80A6wind-resistant	Width [mm]	Up to 1,500	1,501 to 2,000	2,001 to 3,000

¹⁾ There are always two external cable guides on each blind and these are not included in the table.

Overview wind limit values

External venetian blind width [mm]	Model E 93 A6				Model E 80 A6	
	wind-resistant	without additional tension cables	without additional tension cables	wind-resistant when installed in reveal or when equipped with partitioning sections	without additional tension cables	without additional tension cables
Up to 1,500	25 m/s (bft 10)	25 m/s (bft 9)	20.5 m/s (bft 9)	21 m/s (bft 9)	Values on request	Values on request
up to 2000	25 m/s (bft 10)	20.5 m/s (bft 9)	20.5 m/s (bft 9)	21 m/s (bft 9)		
up to 2500	20.5 m/s (bft 9)	17.5 m/s (bft 8)	17.5 m/s (bft 8)	17.5 m/s (bft 8)		
up to 3000	20.5 m/s (bft 9)	17.5 m/s (bft 8)	17.5 m/s (bft 8)	17.5 m/s (bft 8)		

The listed wind speeds for type E 93/80 A6 wind-resistant external venetian blinds are limit values at which the system must be retracted. These values apply to a slat distance from the facade of ≤100 mm and a unit height of ≤3,000 mm. For the standard version it is recommended setting the wind protector at max. 20 m/s.

Facade external venetian blinds type E 80 A6 wind-resistant

Description

Top rail

59 mm wide, 51 mm high, made of 1.5 mm thick extruded aluminium, surface untreated. Tilt rod manufactured from galvanised square steel tube. Maintenance-free, teflon-containing, encased bearings with tilting reel and tape reel, segment tilting to prevent the slats from tilting of their own accord.

Slats

80 mm wide, approx. 0.45 mm thick, concave-convex shape, beaded on either side, manufactured from specially alloyed aluminium coated in light-resistant paint applied in a special, non-corroding stove enamelling process. All cutouts in the slats are fitted with black protective eyelets to ensure perfect guiding of the lifting tapes (reduction of abrasion) and for fixing the webs of the tilting tape. Additional fixing of tilting tape to horseshoe cutout in the outer third section of the slat, without protective eyelet, to prevent twisting of the slat when subjected to wind load. Enamel finish according to our latest colour chart. The blind descends with the slats closed to the outside and moves up with the slats closed to the inside.

Tilting tape

Polyester tilting tape, black, with Kevlar core, heavy-duty customised design, with double webs. Each slat is attached at the upper web of the tilting tape in the protective eyelets and special stamped cutouts.

Lifting tapes

Made of special-coated black polyester.

Bottom rail

80 mm wide, 20 mm high, extruded aluminium profile. Closed at the sides with black end caps, with movable guide rail made of fibre glass-reinforced plastic. The tilting tape is deflected at a special tensioning system to which the lifting tape is attached.

Lateral guidance

Standard: Lateral guidance by black guiding nipple of fibre glass-reinforced polyamide, impact resistant, connected to slats, nipped on alternate sides, also reinforced guide rails of extruded aluminium 25 x 50 mm, with drawn-in, black noise-attenuating weatherstrips, without spacer for mounting in reveal. Additional lateral guidance with cable guide is provided by polyamide-sheathed steel wire cord with a diameter of 3.3 mm. The cable guides are fastened to the top rail with a special spring tension device and are guided through the stamped cutouts in all of the slats, the bottom rail and then fixed to the guide rail, window or to the wall using aluminium tension cable holders with tensioning devices. Customised design: With additional partitioning profile of extruded aluminium 50 x 111 mm (acts as lateral wind break) or with reinforced guide rail bracket type H101.

Drive

Concealed, maintenance-free 230 V electric centre motor with flanged planetary gear and shaft outlet at both ends, with integral limit switches and thermal protection switch. The upper and lower end position can be set by means of the setting buttons. System of protection IP 54.

Operation

The external venetian blinds are raised and lowered by moving the switch to the engaged position. The slats are tilted by slightly tipping the switch in the corresponding direction. The switch is equipped with direction arrows. The limit switches integrated in the motor automatically turn off the drive when the upper or lower end position is reached. For optimum wind stability and use with higher wind loads, the system must be fully extended.

Note:

The prescribed wind limit value must not be exceeded.

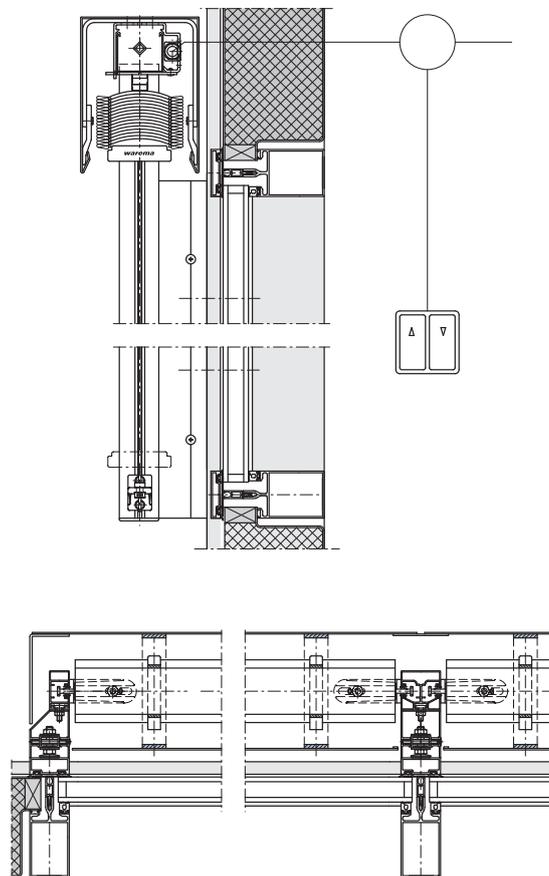
Surface treatment

The bottom rail, guide rails, partitioning profiles and tension cable holder are powder-coated.

Note:

The aluminium parts (except the slats) are powder-coated according to the classic RAL colour chart. Colours DB 701, 702, 703, eight textured colours as per the WAREMA colour chart and C0 anodising are also available at no additional cost. Camouflage and luminous colours are not available.

**Transom and mullion facade, electrical operation,
combined rail and cable guide, u-shaped cover panel,
type E 80 A6, wind-resistant**
Installation example



External venetian blind facades type E 93 A6

wind-resistant

Description

Top rail

59 mm wide, 51 mm high, made of 1.5 mm thick extruded aluminium, surface untreated. Tilt rod manufactured from galvanised square steel tube. Maintenance-free, teflon-containing, encased bearings with tilting reel and tape reel, segment tilting to prevent the slats from tilting of their own accord.

Slats

93 mm wide, approx. 0.45 mm thick, manufactured from specially alloyed aluminium coated in light-resistant paint applied in a special, non-corroding stove enamelling process. A light-resistant, ozone-proof and non-ageing sealing strip of soft elastic plastic is inserted in the front bead for better noise attenuation. All of the stamped cutouts in the slats are beaded around the edge to minimise the wear on the lifting tape. Enamel finish according to our latest colour chart. The blind lowers with the slats closed and rises with the slats open.

Slat suspension

in laterally fixed loop cords of spinning-nozzle-dyed, black, weather and UV-resistant polyester with worked-in aramide fibre to improve shrinking, expansion and tearing resistance. Pre-determined folds to control the formation of loops. The loops are permanently fixed to the slats by V2A clips. With the blind fully down, the slats are held in position by a special tensioning system, which stabilises them against any wind loads.

The connection of the loop cord to the tilting bearing is established by a stainless steel coupling via a coupling tape, which allows precise adjustment of the slat position.

Lifting tapes

Made of special-coated black polyester.

Bottom rail

Bottom rail 100 mm wide, approx. 20 mm high, made of extruded aluminium with special weight. The loop cord is deflected at a special tensioning system and the lifting tape is fastened. Closed at the sides by black UV- and weather-resistant plastic end caps with flexible guide rail of glass fibre reinforced plastic.

Lateral guidance and wind protection

Lateral guidance through black guiding nipples made of glass fibre reinforced polyamide, impact-proof, connected to the slats, alternately nipped as well as guide rails made of extruded aluminium. With inserted black plastic sealing strips for noise attenuation. Including the required fixing brackets.

A partitioning section made of extruded aluminium measuring 50 x 111 mm is used for protection against crosswinds. Additional wind protection is offered by the use of a tension cable guide and polyamide-coated steel wire cord with a special spring tension device (Ø 3.3 mm). The wind protection cables are fixed into the top rail. These are guided through the stamped cutouts in all of the slats and through the bottom rail and are fixed to the guiding rail, window or to the wall by means of aluminium tension cable holders with tensioning devices.

Drive

230V centre motor

Operation

The external venetian blinds are raised and lowered by moving the switch to the engaged position. The slats are tilted by slightly tipping the switch in the corresponding direction. The switch is equipped with direction arrows. The limit switches integrated in the motor induce the automatic turning off of the drive when the upper or lower end position is reached. For optimum wind stability and for use at increased wind load, the system must be completely extended.

Note:

The prescribed wind limit value must not be exceeded.

Surface treatment

The bottom rails, guide rails, partitioning sections and tension cable holder are powder-coated.

Note:

The aluminium parts (except the slats) are powder-coated according to the classic RAL colour chart. Colours DB 701, 702, 703, eight textured colours as per the WAREMA colour chart and C0 anodising are also available at no additional cost. Camouflage and luminous colours are not available.



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