



Open awning

Topas

Topas with roof | without roof

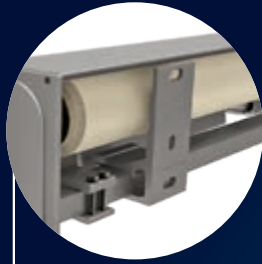
The **Topas** is a classic entry-level awning for anyone wanting to save money without sacrificing quality. Its uncomplicated technology makes it stable and wind-resistant. When open, the awning stands out for its extreme flexibility: with or without a protective roof, it can be installed in various ways to fit into all kinds of different structural situations and applications.

UPDATE august 2021

Page 163,
Table corrected and notes
added

Page 169,
Figures and technical
drawings corrected

Pages 172 - 175,
Tables and whole pages
updated and added



Wall bracket:
Easy installation



Versions:



Topas with roof



Topas without roof

Mounting options:

Installation on walls, ceilings and rafters is possible



Wall mounting



Ceiling mounting



Rafter mounting

Topas Highlights

01

Joined units:

With roller supports



or jockey cover

**weinor LongLife arm:**Very durable and
low-noise

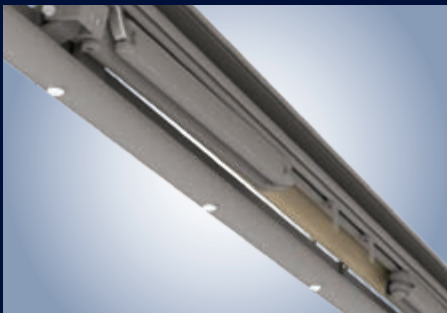
Topas Benefits



Open or with a roof – classic design with the latest technology

With its simplified technology the weinor Topas is stable yet retains a wide variety of functions.

- Stable front profile
- with and without roof
- Large widths
- Wind-resistant
- Wide selection of fabrics



LED Design light bar – 30,000 hours of lighting with minimal energy consumption (optional)

Select LED components for top weinor quality:

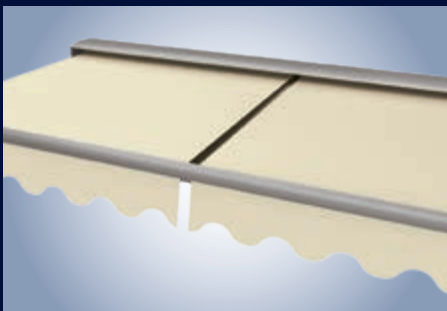
- Atmospheric light thanks to special glass lenses
- Highly energy-efficient
- Operating life of 30,000 hours
- Radio-controlled dimmer using BiConnect
- Fitted to carrier bar using angle bracket
- Easy to service: simply replace individual LED lights without uninstalling the awning



weinor LongLife Arm – durable, quiet operation

The weinor LongLife arm features an exceptionally robust high-tech belt.

- Tested to more than 100,000 cycles
- Extremely quiet operation
- No maintenance required
- Drop forged aluminium in joint – light but highly robust



Multi-section units – to shade especially large areas

The Topas also comes as a combined multi-section unit for very large terraces.

- As a 2-part unit up to 1,200 cm
- Jockey cover or roller support with continuous fabric

Topas Technology

01

Topas versions	Topas with roof	Topas without roof
Technology		
Max. width, 1-section/2-section with jockey cover	700 cm/1,200 cm	700 cm/1,200 cm
Max. projection	400 cm	400 cm
Side limits (w x h) incl. standard bracket	220 mm x 210 mm	210 mm x 180 mm
Coupled systems	○	○
Motor drive	● as standard	● as standard
Angle of pitch on awning	5° to 40° *	5° to 40° *
Installation alternatives	can be installed on walls, ceilings and rafters	
LED lighting: (Design light bar)	○	○
LongLife arm	● as standard	● as standard
Accessories		
Heating system Tempura/Tempura Quadra	○	○
LED Design light bar	○	○
BiSens Agido-3V product protection sensor	○	○
Controls		
Radio control	○	○
No remote	●	●
Weather sensors		
Sun/wind sensor BiConnect BiSens SW-230 V	○	○
Sun/wind sensor solar powered BiConnect BiSens SW-Solar+	○	○
Sun/wind/rain sensor BiConnect-BiSens-SWR-230V	○	○
Quality		
Tested up to	wind resistance class 1** according to DIN 13561 (wind strength 4 on the Beaufort scale)	

* When the bracket is mounted on the inside of the folding arm, the awning's maximum pitch adjustment is 20°.

** See awnings price list page 37

● standard ○ optional — unavailable

Topas – wind resistance classes 1–2

Width in cm	No. of arms	Diagonal in 10 cm steps					
		up to 150	160-200	210-250	260-300	310-350	360-400
up to 200	2						
201 – 250	2						
251 – 300	2						
301 – 350	2						
351 – 400	2						
401 – 450	2						
451 – 500	2						
501 – 550	2						
551 – 600	2						
601 – 650	2						
651 – 700	3						

■ wind resistance class 2
■ wind resistance class 1

Topas Controls

weinor BiConnect radio controller

Product	Electronics	BiConnect control	Remote receiver	Transmitter
Topas	Topas drive	• BiRec receiver integrated into cassette	Elero SunTop-868 remote-controlled motor	• BiEasy 1M/5M/15M Go! hand transmitter • App • 1MW-3V wall transmitter
Topas	Topas drive	• BiRec receiver integrated into cassette	BiRec MA-K	• BiEasy 1M hand transmitter • 1MW-3V wall transmitter
Topas LED	Topas drive and LED Design light bar	• BiRec receiver for main driv integrated into awning • Additional BiConnect Empfängerreceiver for the LED light bar (with integrated power supply pack) integrated into light bar • LED dimmbar	Elero SunTop-868 remote-controlled motor and BiRec LED	• BiEasy 5M/15M Go! hand transmitter • App
Accessories (optional)	Tempura/Tempura Quadra heating system	• Dimmable, additional receiver required • Installation of the reciever in the design bar provided for this purpose or the Tempura Quadra box	BiRec HD	• BiEasy 5M/15M Go! hand transmitter • App

Requires: awning with BiConnect remote control and sensors require a BiEasy 1M, 5M or 15M Go!

Somfy io-homecontrol® radio technology

Product	Electronics	Somfy io-homecontrol control	Remote receiver	Transmitter
Topas	Topas drive	• Somfy io remote-controlled motor integrated into awning	Somfy io remote-controlled motor	• Situo 1 io Pure II/Situo 5 io Pure II/Situo 5 Variation A/M io Pure II hand transmitter • Smoove 1 io Pure Shine wall transmitter
Topas LED	Topas drive and LED Design light bar	• Somfy io remote-controlled motor integrated into awning • Additional Somfy receiver for the LED light bar (with downstream power supply pack) integrated into light bar • LED not dimmable	Somfy io remote-controlled motor and io Lighting Receiver Variation on/off	• Situo 5 io Pure II/Situo 5 Variation A/M io Pure II hand transmitter
Accessories (optional)	Tempura/Tempura Quadra heating system	• Not dimmable, additional receiver required • Installation of the reciever in the design bar provided for this purpose or the Tempura Quadra box	Heating Slim Receiver on/off io 2KW STAS3/STAK3	• Situo 5 io Pure II/Situo 5 Variation A/M io Pure II hand transmitter • Smoove 1 io Pure Shine wall transmitter

Somfy RTS radio technology

Product	Electronics	Somfy RTS control	Remote receiver	Transmitter
Topas	Topas drive	• Somfy RTS remote-controlled motor integrated into awning	Somfy RTS remote-controlled motor	• Situo 1 RTS Pure II/Situo 1 Soliris RTS Pure II/Situo 5 RTS Pure II/Situo 5 Soliris RTS Pure II hand transmitter • Smoove 1 RTS Pure Shine wall transmitter
Topas LED	Topas drive and LED Design light bar	• Somfy RTS remote-controlled motor integrated into awning • Additional Somfy receiver for the LED light bar (with downstream power supply pack) integrated into light bar • LED not dimmable	Somfy RTS remote-controlled motor and Lighting Slim Receiver RTS	• Situo 5 RTS Pure II/Situo 5 Soliris RTS Pure II hand transmitter
Accessories (optional)	Tempura/Tempura Quadra heating system	• Not dimmable, additional receiver required • Installation of the reciever in the design bar provided for this purpose or the Tempura Quadra box	Heating Slim Receiver RTS Plug	• Situo 5 RTS Pure II/Situo 5 Soliris RTS Pure II hand transmitter

Topas Controls

Hard wired with Somfy control

01

Product	Electronics	Hard wired Somfy control	Control
Topas	Topas drive	Somfy control for awning drive	e.g. Soliris Smooove Uno
Topas LED	Topas drive and LED Design light bar	- Somfy control for awning drive - Switch on site for the LED light bar - LED power supply pack integrated into the light bar - LED not dimmable	e.g. Soliris Smooove Uno and suitable light switch (on site)
Accessories (optional)	Tempura/Tempura Quadra heating system	Not dimmable	Suitable switch (on site)

Hard wired (existing switch/power supply on site)

Product	Electronics	Hard wired control	Control
Topas	Topas drive	Awning switch for the awning drive	e.g. double rocker switch switch (on site)
Topas LED	Topas drive and LED Design light bar	- Awning switch for the awning drive - Switch on site for the LED light bar - LED power supply pack integrated into the light bar - LED not dimmable	e.g. double rocker switch and suitable light switch (on site)
Accessories (optional)	Tempura/Tempura Quadra heating system	Not dimmable	Suitable switch (on site)

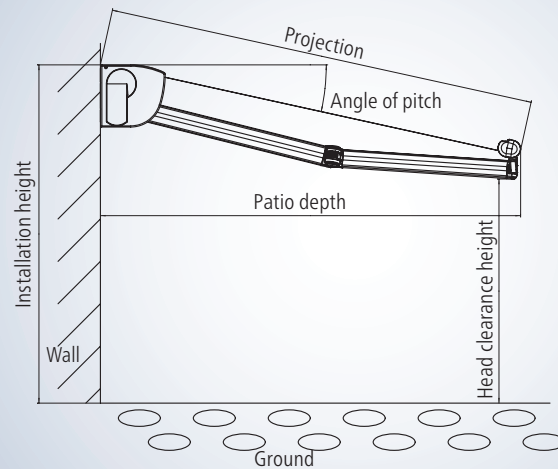


Note:

Please see the "Accessories" technical brochure for further details regarding the drive and control.

Some options are subject to a surcharge. For prices, please refer to the weinor awnings price list.

Topas Planning



Site measurements – determining the projection and head clearance height

- Find the projection by looking in the “Projection” table for the terrace depth.
- Using the projection from the table and the required angle of pitch, consult the “head clearance height” table for the head clearance height. This head clearance height refers to an installation height of 300 cm.
- Add/subtract the difference between 300 cm and the actual installation height to/from the head clearance height in the table.

Determining the projection

Angle of pitch	Terrace depth in cm					
	150	200	250	300	350	400
5°	150	200	250	300	350	400
15°	160	210	260	310	360	400
25°	170	220	280	330	390	400

Projection in cm (rounded figures)

This table can be used to find the awning projection for any given horizontal patio depth.

Determining the head clearance height

Angle of pitch	Projection in cm					
	150	200	250	300	350	400
5°	270	270	270	260	260	250
15°	250	240	220	210	200	180
25°	220	200	180	160	140	120

Head clearance height in cm (rounded figures)

This table is used to find the head clearance heights for various projections when the angle of pitch is 5°, 15° or 25°.

This table is based on the example of an installation height of 300 cm (upper edge of awning).

Wall bracket

Sizes and bracket recommendations

Wall mounting on pressure-resistant surface

Minimum number of required wall brackets so that the function of the awning is ensured, regardless of the mounting surface. Selection of the brackets using the weinor bracket overview and using the maximum extraction forces of the fixings used!



Width in cm	Number of arms	Diagonal in 10 cm steps					
		up to 150	160-200	210-250	260-300	310-350	360-400
up to 200	2	2					
201-250	2	2	2				
251-300	2	2	2	2			
301-350	2	2	2	2	2		
351-400	2	2	2	2	2	2	
401-450	2	3	3	3	3	2+1	2+1
451-500	2	3	3	3	3	5	2+1
501-550	2	3	3	3	5	5	5
551-600	2	3	3	3	5	5	5
601-650	2	3	3	3	5	5	5
651-700	3	4	4	4	7	7	7

Overlapping possible, observe size limits!

Observe size limits; unit must have X more width than projection:

- in the case of 1 x wall bracket 85 mm or 1 x wall bracket 260 mm per arm:
X = 40 cm
- in the case of 2 x wall bracket 85 mm or 1 x wall bracket 295 mm per arm:
X = 62 cm
- in the case of 2 x wall bracket 260 per arm: X = 95 cm

- 2 2x wall bracket 85 mm
- 2 2x wall bracket 260 mm
- 3 3x wall bracket 85 mm (1 x as a central bracket)
- 4 4x wall bracket 85 mm
alternatively:
2x wall bracket 295 mm
- 5 5x wall bracket 85 mm (1 x as a central bracket)
alternatively:
2x wall bracket 295 mm + 1x wall bracket 85 mm (as a central bracket)
- 2+1 2x wall bracket 260 mm + 1x wall bracket 85 mm (1 x as a central bracket)
- 7 7x wall bracket 85 mm (1 x as a central bracket)

Two brackets per arm required:

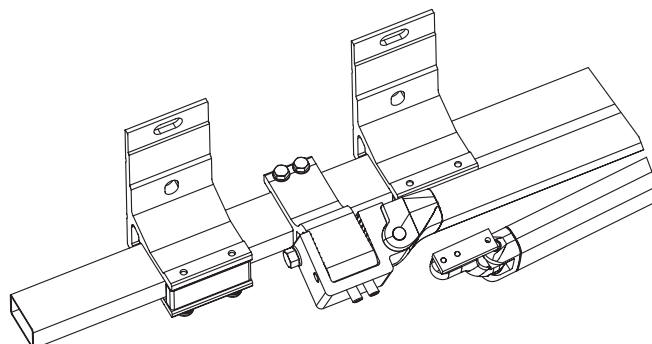
- a. projection ≥ 310 cm
- b. width ≥ 501 cm and projection ≥ 260 cm

Use of central bracket dependent on width/projection:

- a. width ≥ 401 cm
- b. projection ≥ 360 cm

Position of wall brackets and Topas

Pitch up to 40° (KS1)
outside



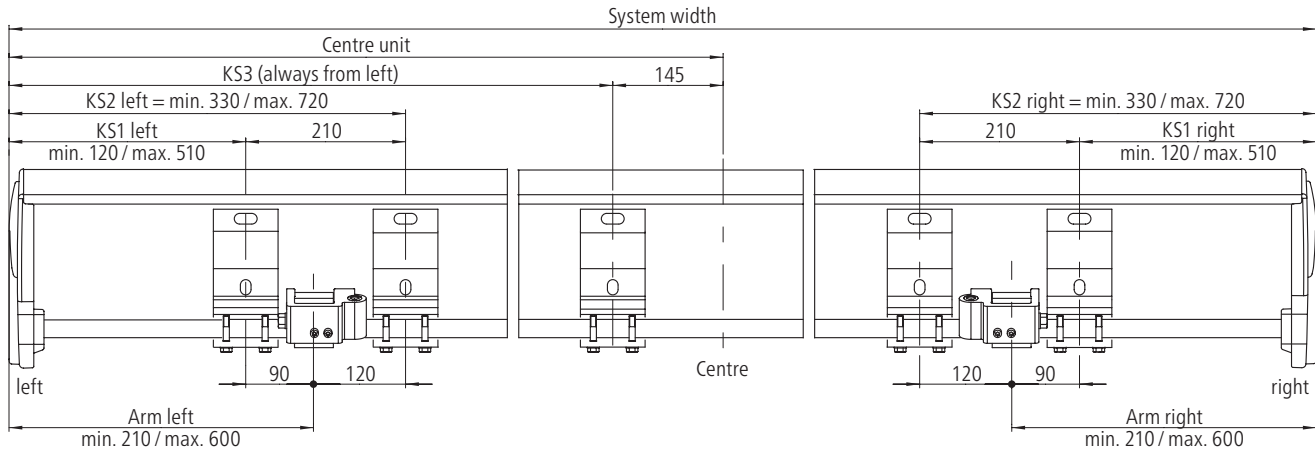
Pitch up to 20° (KS2)
inside

When the bracket is mounted on the inside of the folding arm, the awning's maximum pitch adjustment is 20°.

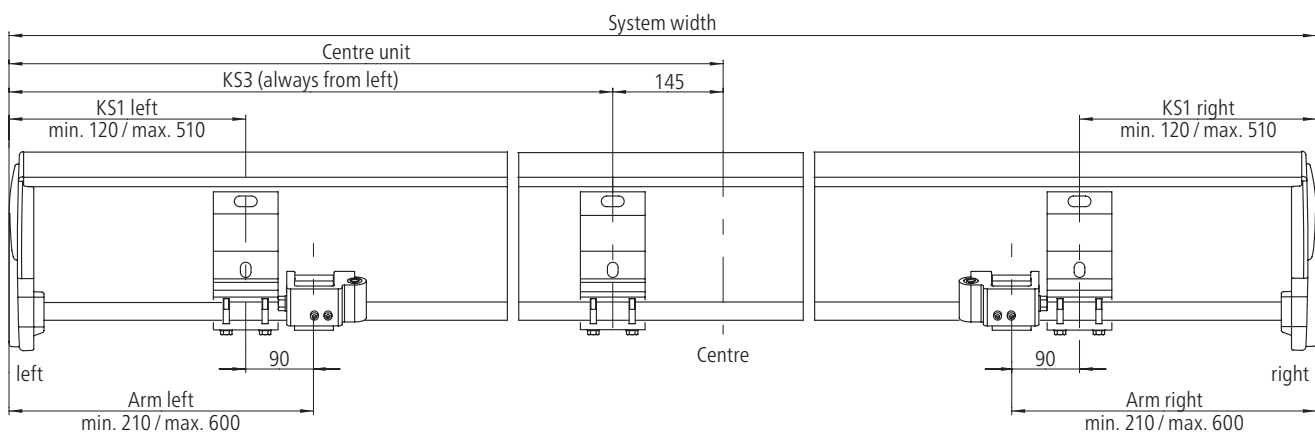
Topas Planning

Position of wall brackets and Topas

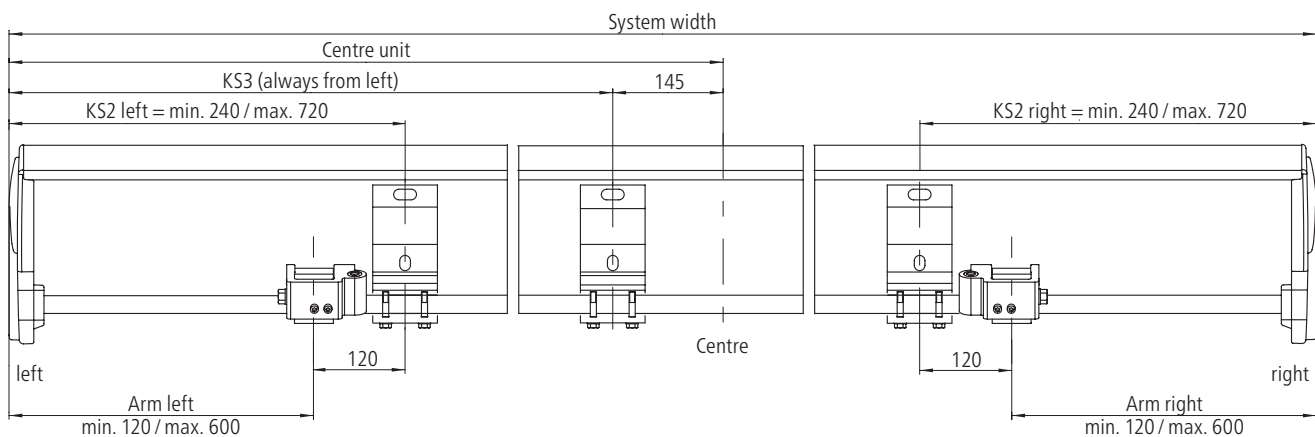
Wall bracket 85 mm on both sides (KS1 and KS2)



Wall bracket 85 mm outside (KS1)



Wall bracket 85 mm inside (KS2)



Notes:

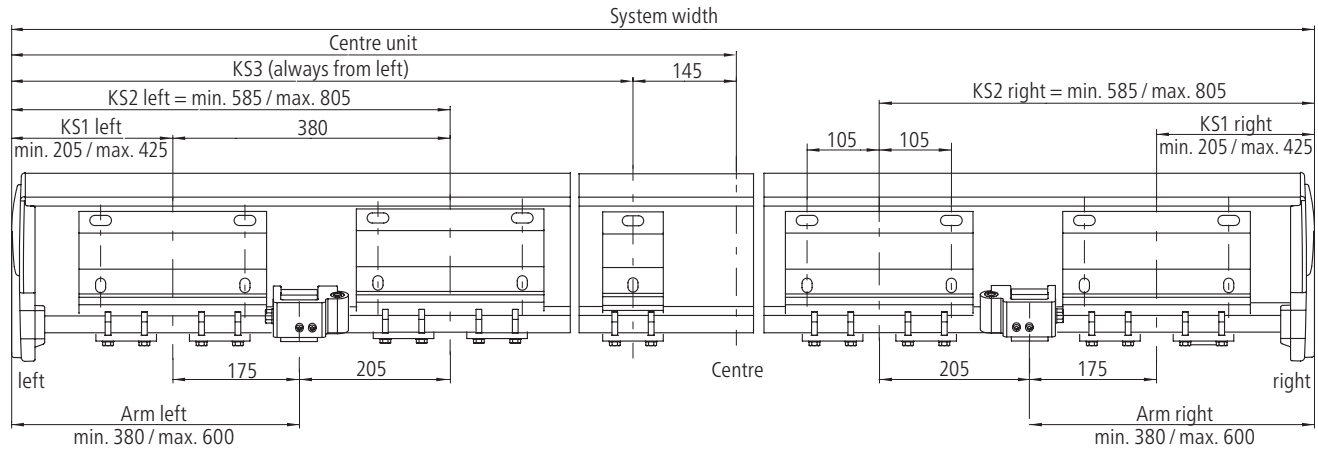
- KS1 = outside bracket
- KS2 = inside bracket
- KS3 = centre bracket

Topas Planning

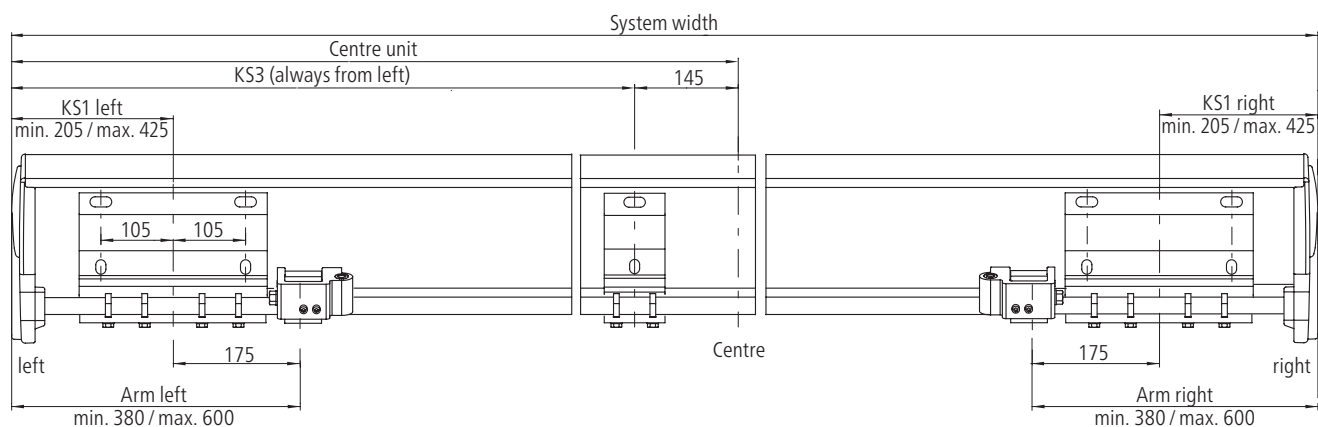
Position of wall brackets and Topas

01

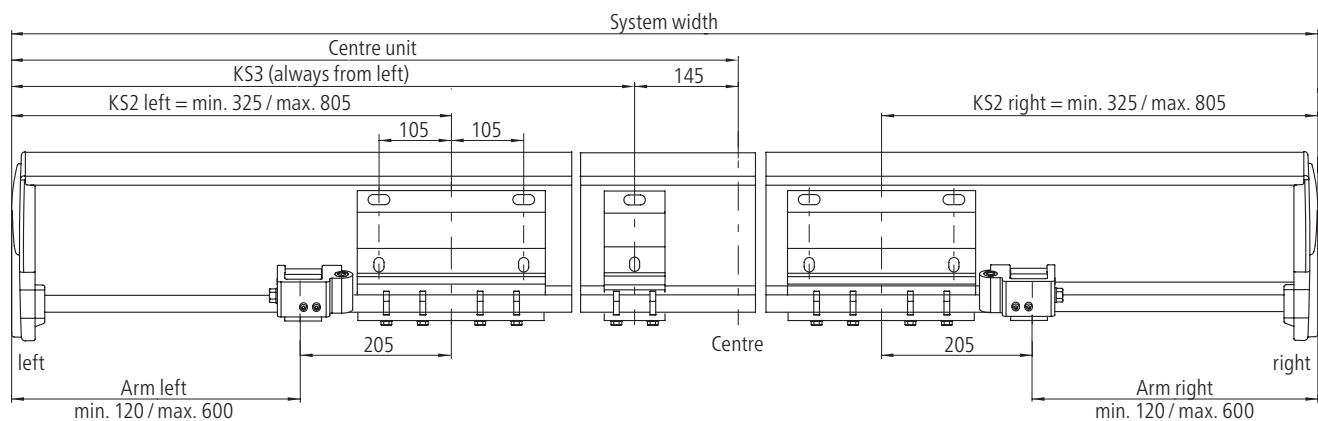
Wall bracket 260 mm on both sides (KS1 and KS2)



Wall bracket 260 mm outside (KS1)



Wall bracket 260 mm inside (KS2)



Notes:

KS1 = outside bracket

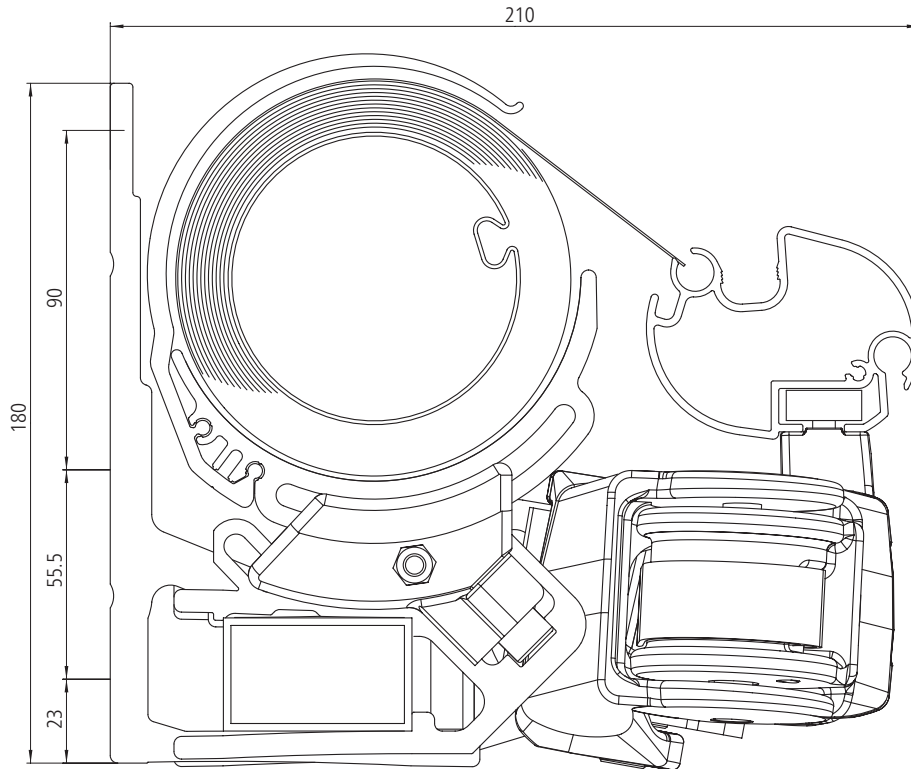
KS2 = inside bracket

KS3 = centre bracket

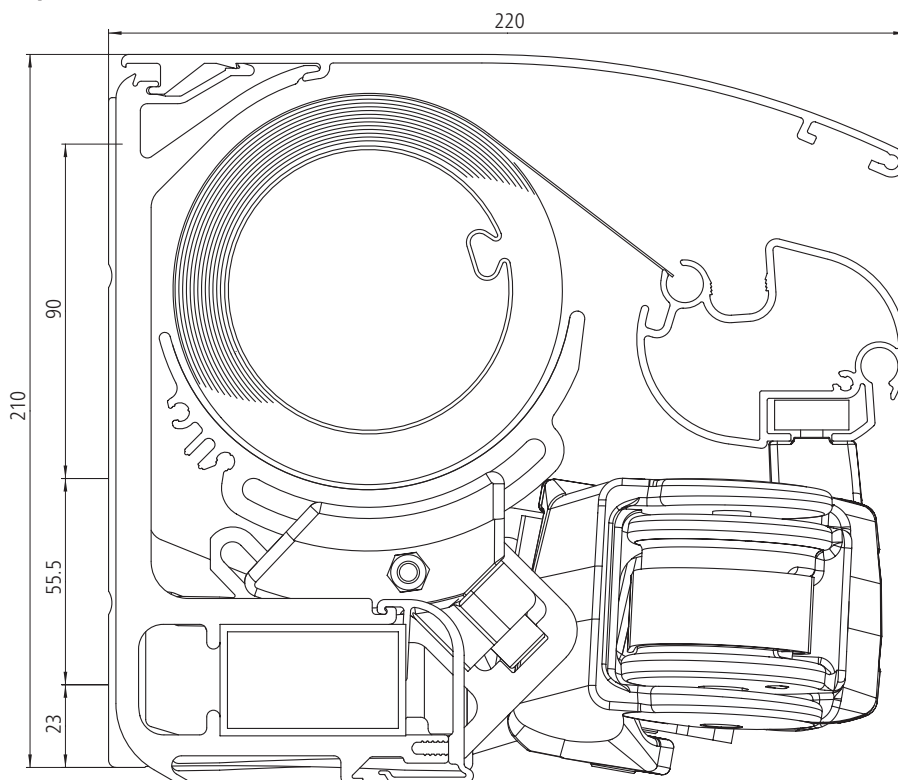
Topas Planning

Cross-sections

Topas without roof



Topas with roof



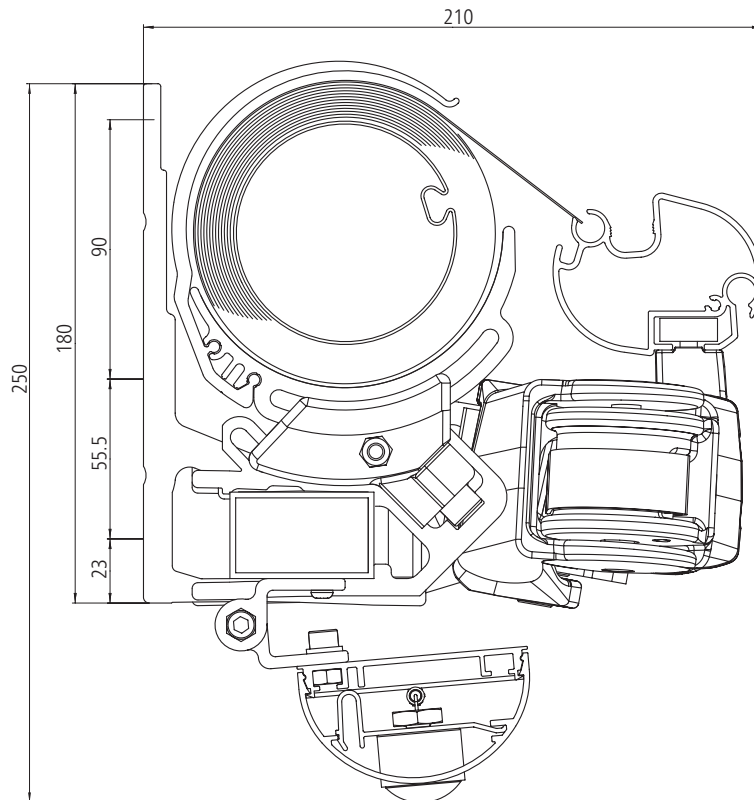
Figures are in mm

Topas Planning

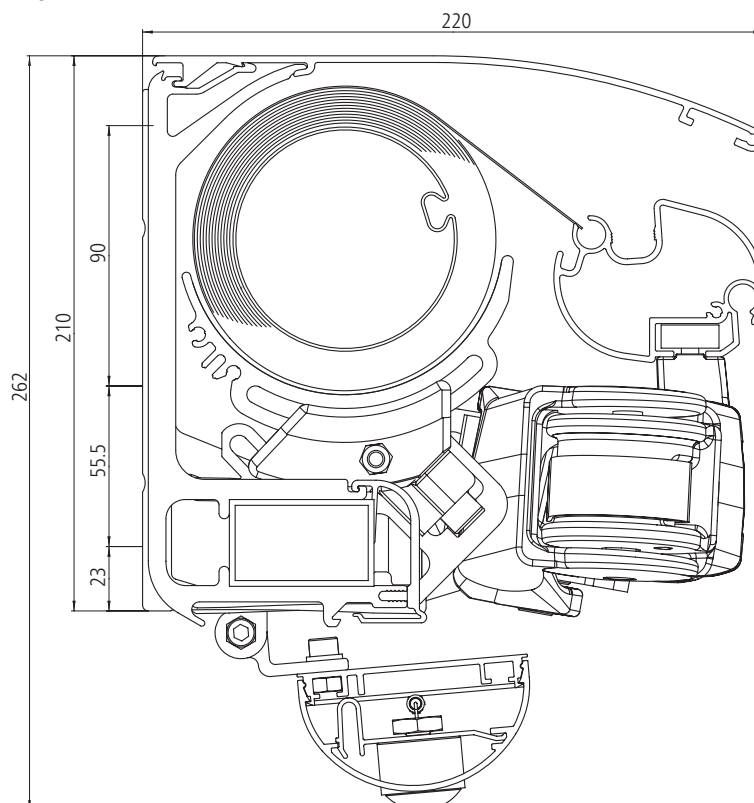
Cross-sections

01

Topas without roof with LED



Topas with roof with LED



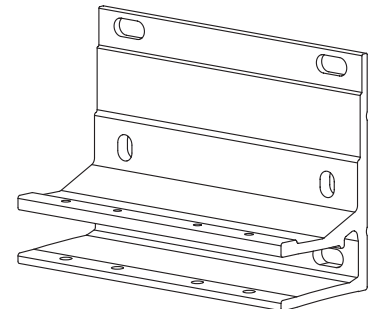
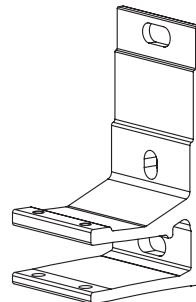
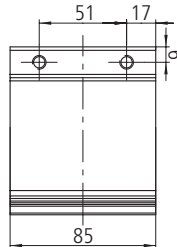
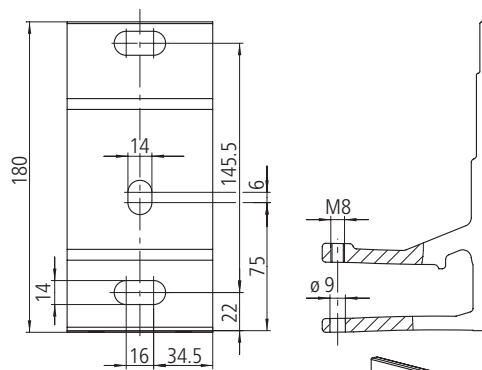
Figures are in mm

Topas Installation

Installation on walls, ceilings and rafters is possible

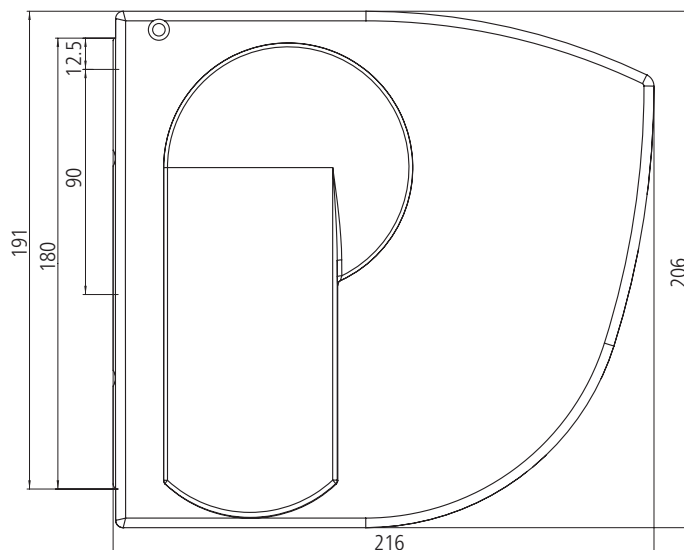
Its dimensions mean that the Topas can be mounted in a wide range of ways: not only on a wall but also on a ceiling or a rafter. The brackets and mounting plates are made of extruded, powder-coated aluminium.

Wall mounting – brackets



85 mm wall bracket

260 mm wall bracket



Side view of Topas with roof fitted to a wall

Topas Installation

Update

Wall mounting – mounting plates

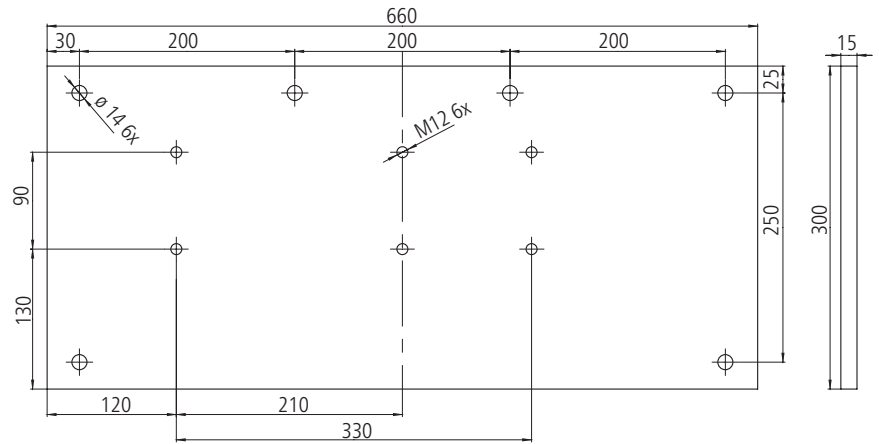
01



Mounting plate 660 x 300 x 15 mm



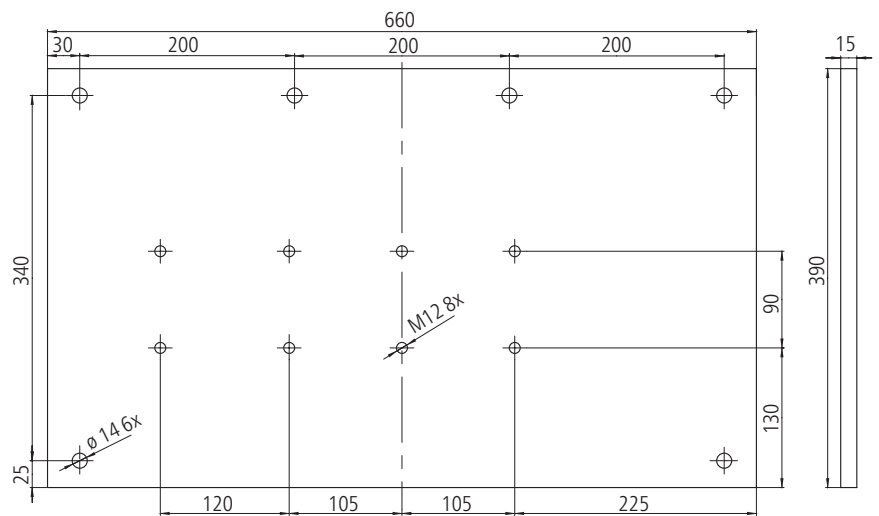
Position of the mounting plates using the Topas 500 x 300 cm* as an example.



Mounting plate 660 x 390 x 15 mm



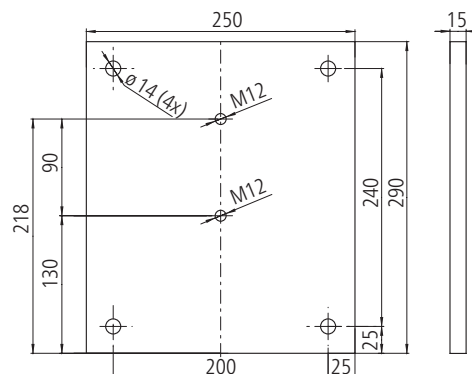
Position of the mounting plates using the Topas 500 x 300 cm* as an example.



* Depending on the width of the awning, the positioning of the mounting plates may vary.

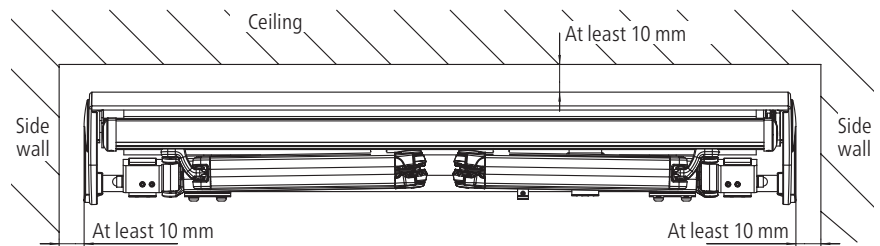


Mounting plate 250 x 290 x 15 mm



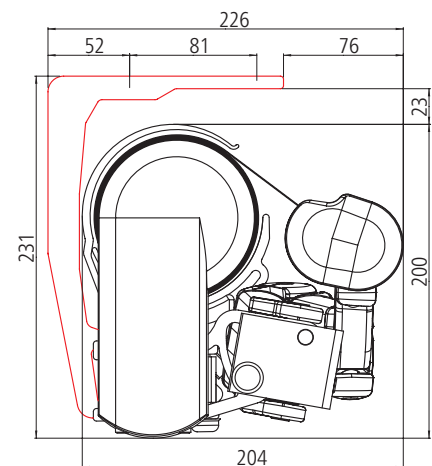
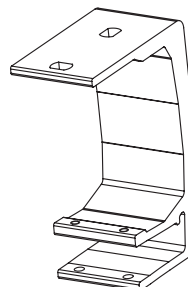
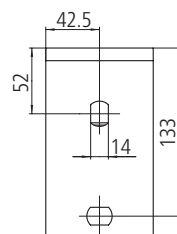
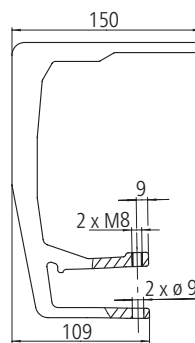
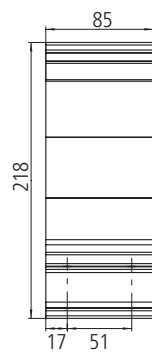
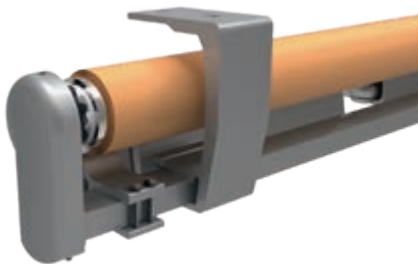
Topas Installation

Minimum spacing distances for installation



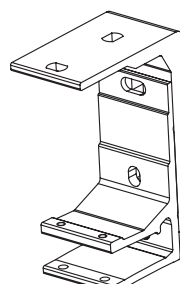
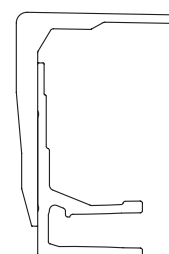
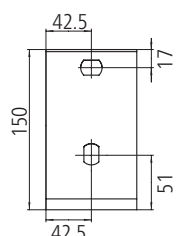
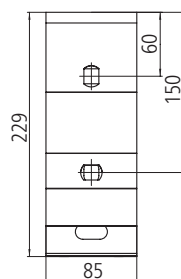
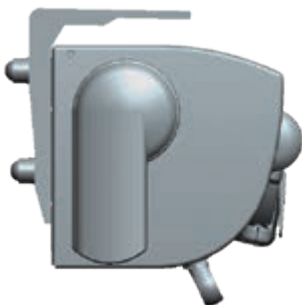
Ceiling mounting

Topas without roof



Side view of roofless Topas with sliding support bearing and compact ceiling bracket

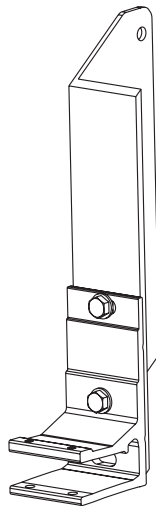
Topas with roof



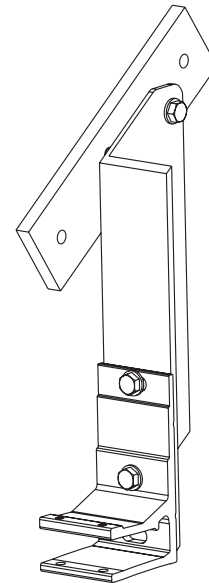
Topas Installation

Rafter mounting

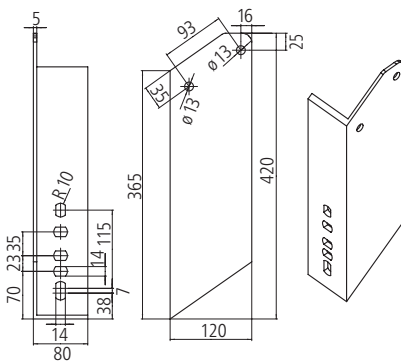
01



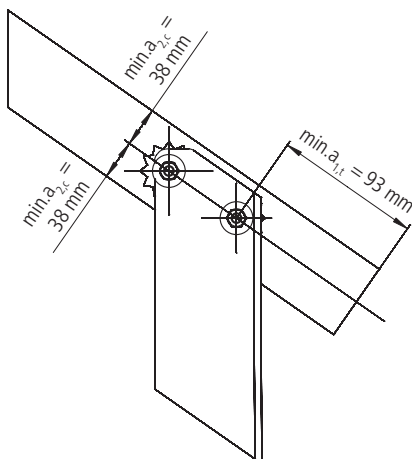
Right-hand rafter bracket



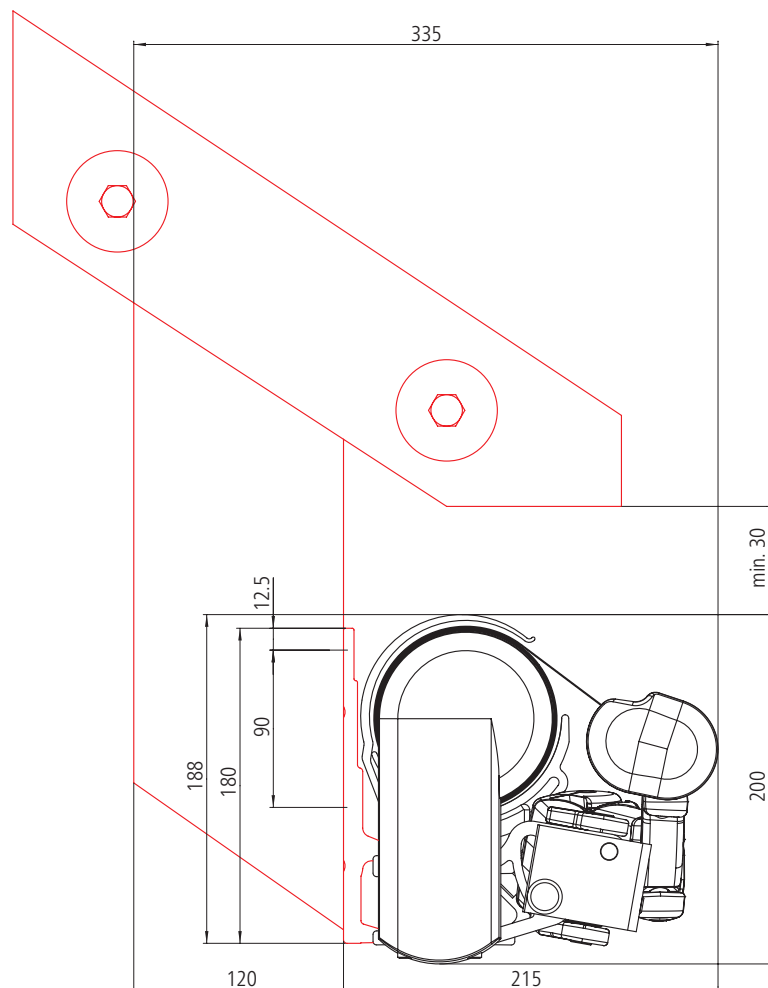
Rafter bracket with mounting plate for right-hand rafter. weinor recommends using mounting plates for rafter brackets.



Rafter bracket



Rafter bracket



Side view of rafter installation with roofless Topas

Topas Installation

Update

Extraction forces

The extraction force is the force with which the awning weight and the wind load pull on each upper and/or front fixing. The tables indicate this force in N per upper fixing. It varies depending on the awning size and the wall bracket / mounting plate used.

Selecting the wall bracket and anchoring system:

1. Consult relevant table for extraction force per fixing for selected awning size.
2. Select a wall bracket / mounting plate for which there is fixing material which can resist the indicated extraction force. Remember to take into account the spacing, the area which will be damaged if the fixing breaks out, the type of fixing material used and the mounting base.

Use the separate bracket overview for an exact planning of the awning attachment.

Extraction force in N per upper fixing for ceiling mounting

Brackets **without** mounting plates

Wall mounting with up to 200 mm facing (non-pressure-resistant surface)

Please observe the width to projection dimension limits for number of brackets per arm, as the width to projection ratio decreases when two brackets are used per arm.

- 1 x wall bracket 85 mm per arm
or
- 2 x wall bracket 85 mm per arm
Number of fixings: 4 or 8
- 1 x wall bracket 260 mm per arm
or
- 2 x wall bracket 260 mm per arm
Number of fixings: 8 or 16
- 1 x wall bracket 295 mm per arm
Number of fixings: 12

Please note:

from a width of 401 cm or a projection of 360 cm additional

1 x wall bracket 85 mm as centre bracket is required.

This means an additional 2 fixings will be required always.

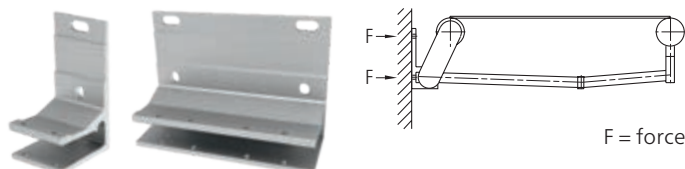
Taking the width to projection dimension limits into account, two brackets can also be used per arm instead of one bracket per arm.

Here, the indicated extraction force halves!

Does not apply to red-bordered cells and 295 mm wall bracket!

In the event of installation on a pressure-resistant surface, the indicated extraction force decreases (see bracket overview)

Width in cm	Projection in cm					
	150	200	250	300	350	400
200	1164					
	582					
	388					
250	1364	2076				
	682	1038				
	455	692				
300	1564	2383	3408			
	782	1192	1704			
	522	795	1136			
350	1763	2689	3843	5286		
	882	1345	1922	2643		
	588	897	1281	1762		
400	1962	2995	4277	5870	3775	
	981	1498	2139	2935	1888	
	654	999	1426	1957	2517	
450	2162	3301	4712	6455	4153	6039
	1081	1651	2356	3228	2077	3020
	721	1101	1571	2152	2769	4026
500	2361	3607	5146	7039	5173	6599
	1181	1804	2573	3520	2587	3300
	787	1203	1716	2347	3449	4399
550	1280	1957	2791	3812	5617	7158
	1280	1957	2791	1906	2809	3579
	854	1305	1861	2541	3745	4772
600	1380	2110	3008	4682	6061	7718
	1380	2110	3008	2341	3031	3859
	920	1407	2005	3122	4041	5146
650	1480	2263	3225	5024	6505	8278
	1480	2263	3225	2512	3253	4139
	987	1509	2150	3349	4337	5519
700	1119	1710	2762	3795	4909	6267
	1119	1710	2762	1898	2455	3134



F = force

Topas Installation

Update

01

Extraction forces

Extraction force in N per upper fixing for ceiling mounting

Brackets **with** mounting plates

Wall mounting with up to 200 mm facing (non-pressure-resistant surface)

Please observe the width to projection dimension limits for number of brackets per arm, as the width to projection ratio decreases when two brackets are used per arm.

-  1 x mounting plate 250 x 290 x 15 mm incl. 1 x wall bracket 85 mm per arm
Number of fixings: 8
-  1 x mounting plate 450 x 200 x 30 mm incl. 1 x wall bracket 85 mm per arm
or
-  1 x mounting plate 450 x 200 x 30 mm incl. 2 x wall bracket 85 mm per arm
Number of fixings: 12
-  1 x mounting plate 640 x 200 x 30 mm incl. 1 x wall bracket 85 mm per arm
or
-  1 x mounting plate 640 x 200 x 30 mm incl. 2 x wall bracket 85 mm per arm
Number of fixings: 24
-  1 x mounting plate 660 x 300 x 15 mm incl. 1 x wall bracket 85 mm per arm
or
-  1 x mounting plate 660 x 300 x 15 mm incl. 2 x wall bracket 85 mm per arm
Number of fixings: 12
-  1 x mounting plate 660 x 390 x 15 mm incl. 1 x wall bracket 85 mm per arm
or
-  1 x mounting plate 660 x 390 x 15 mm incl. 2 x wall bracket 85 mm per arm
Number of fixings: 12

Please note:
from a width of 401 cm or a projection of 360 cm additional

– for mounting plates with a thickness of **15 mm**

1 x wall bracket 85 mm incl.
1 x shim plate 100 x 180 x 15 mm as central bracket required.

– for mounting plates with a thickness of **30 mm**

1 x wall bracket 85 mm incl.
2 x shim plate 100 x 180 x 15 mm as central bracket required.

This means an additional 2 fixings will be required always.

Taking the width to projection dimension limits into account, two brackets can also be used per arm instead of one bracket per arm.

This has no impact on the extraction force! Does not apply to 250 x 290 x 15 mm mounting plate!

In the case of red-bordered cells, the bracket sub-assemblies are equipped with two brackets per arm.

Width in cm	Projection in cm					
	150	200	250	300	350	400
200	111					
	239					
	120					
	106					
	78					
250	130	197				
	280	424				
	140	212				
	124	189				
	91	139				
300	148	226	322			
	321	487	694			
	160	243	347			
	143	217	309			
	105	159	228			
350	167	255	363	499		
	362	549	782	1074		
	181	275	391	537		
	161	245	349	479		
	118	180	257	353		
400	186	284	405	555		
	403	612	871	1192	1531	
	201	306	435	596	765	
	179	272	388	532	684	
	132	200	286	391	503	
450	205	313	446	610		
	444	674	959	1311	1684	2446
	222	337	480	656	842	1223
	197	300	428	585	753	1094
	145	221	315	430	553	804
500	224	342	487	665		
	484	737	1048	1430	2098	2672
	242	368	524	715	1049	1336
	215	328	467	638	937	1195
	158	241	344	469	689	879
550	243	371	528			
	525	799	1136	1548	2278	2899
	263	400	568	774	1139	1449
	233	356	507	691	1018	1296
	172	262	373	508	748	953
600	262	400	569			
	566	862	1225	1902	2458	3125
	283	431	612	951	1229	1563
	252	384	546	849	1098	1398
	185	282	402	625	808	1028
650	281	429	610			
	607	924	1313	2041	2638	3352
	304	462	656	1021	1319	1676
	270	412	586	911	1179	1499
	198	303	431	670	867	1102
700	212	324	522			
	459	698	1125			
	229	349	562			
	204	311	502	688	890	1135
	150	229	369	506	654	835

In the event of installation on a pressure-resistant surface, the indicated extraction force decreases (see bracket overview)

Topas Installation

Update

Extraction forces

Extraction force in N per front fixing for ceiling mounting

Please observe the width to projection dimension limits for number of brackets per arm, as the width to projection ratio decreases when two brackets are used per arm.

- 1 x ceiling bracket 85 mm incl.
 1 x wall bracket 85 mm per arm
 or
 2 x ceiling bracket 85 mm incl.
 2 x wall bracket 85 mm per arm
 Number of fixings: 4 or 8

Please note:
from a width of 401 cm or a projection of 360 cm additional

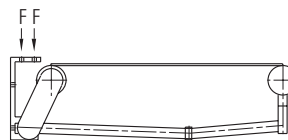
1 x ceiling bracket 85 mm incl.
 1 x wall bracket 85 mm
 as central bracket required.
 This means an additional 2 fixings will be required always.

Width in cm	Projection in cm					
	150	200	250	300	350	400
200	870					
250	1014	1517				
300	1158	1736	2463			
350	1302	1954	2773	3801		
400	1445	2173	3082	4216	2713	
450	1539	2340	3337	4575	2965	4300
500	1679	2554	3643	4987	3676	4696
550	1819	2769	3948	2717	3989	5092
600	1959	2984	4253	3320	4303	5488
650	2104	3204	4564	3564	4620	5887
700	1602	2433	3902	2699	3493	4465

Taking the width to projection dimension limits into account, two brackets can also be used per arm instead of one bracket per arm.

Here, the indicated extraction force halves!

Does not apply to red-bordered cells and combination of 295 mm wall bracket and 295 mm ceiling bracket!



F = force

Topas Installation

Update

Shear forces

01

Shear forces in N per fixing for rafter mounting

Please observe the width to projection dimension limits for number of brackets per arm, as the width to projection ratio decreases when two brackets are used per arm.

Rafter brackets are available as both left and right handed

-  1x rafter bracket incl.
-  1x wall bracket 85 mm per arm or
-  2x rafter bracket incl.
-  2x wall bracket 85 mm per arm

Applies to two brackets per arm on a rafter.

or

-  2x rafter bracket incl.
 -  2x wall bracket 85 mm per arm
- Applies to two brackets per arm, each with separate rafters.**

-  1x rafter bracket mit
-  1x mounting plate for rafter incl.
-  1x wall bracket 85 mm per arm

or

-  2x rafter bracket mit
 -  2x mounting plate for rafter incl.
 -  2x wall bracket 85 mm per arm
- Applies to two brackets per arm on a rafter.**

or

-  2x rafter bracket mit
 -  2x mounting plate for rafter incl.
 -  2x wall bracket 85 mm per arm
- Applies to two brackets per arm, each with separate rafters.**

Please note:
from a width of 401 cm or a projection of 360 cm additional
1x rafter bracket incl.
1x wall bracket 85 mm
as central bracket required.

Taking the width to projection dimension limits into account, two brackets can also be used per arm instead of one bracket per arm.

Here, the indicated extraction force halves!

Applies only in the case of two brackets per arm on separate rafters respectively! If two brackets per arm are mounted on one rafter, the shear force does not decrease!

weinor recommends the use of rafter brackets with mounting plate!

In the case of rafter mounting, the fixings are included in the order.

Width in cm	Projection in cm					
	150	200	250	300	350	400
200	1219					
	558					
250	1422	2113				
	647	929				
300	1625	2419	3414			
	736	1060	1466			
350	1827	2725	3844	5245		
	825	1190	1647	2218		
400	2030	3031	4274	5819	7363	
					3682	
	913	1321	1827	2458	3036	
					1518	
450	2183	3285	4650	6337	8080	11723
					4040	5862
	952	1400	1954	2640	3319	4795
					1660	2398
500	2382	3587	5075	6907	10049	12807
					5025	6404
	1037	1527	2131	2876	4118	5236
					2059	2618
550	2581	3889	5501	7426	10909	13890
				3713	5455	6945
	1122	1653	2308	3059	4469	5677
				1530	2235	2839
600	2780	4191	5927	9106	11770	14974
				4553	5885	7487
	1207	1780	2485	3742	4820	6118
				1871	2410	3059
650	2984	4499	6359	9772	12633	16061
				4886	6317	8031
	1298	1913	2668	4016	5174	6562
				2008	2587	3281
700	2268	3412	5444	7389	9541	12169
				3695	4771	6085
	995	1460	2284	3042	3914	4979
				1521	1957	2490

