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Pay attention

- This manual is not project specific.
- This manual is not legally binding.
- No rights may be derived from this installation manual.
- See **datasheet ValkCableCare** for cable management.
- The system is placed in the middle zone of the roof.





Disclaimer

This installation manual composed with the greatest possible care and contains specific information for correct and safe installation of the solar mounting system, including installation drawings and ballast tables, calculated according to the Eurocode regulations. The standard values used for input of these calculations, always need to be checked in advance by the installer for correctness. In case values are different, a project case specific calculation needs to be made. Please contact Van der Valk Solar Systems in this situation.

At all times all currently applicable structural, safety and building regulations must be observed prior to installation of the solar mounting system. The building in question will be subject to a load as a result of the solar mounting system installed/mounted. Solar mounting systems installed on roofs will be exposed to wind and snow loads. Therefore, you are at all times responsible to obtain and use a design calculation to establish whether or not the building will be able to withstand the (extra) load at all times. Where necessary, modifications need to be made by you. Van der Valk will not accept any form of liability upon you not having obtained and used such a required design calculation.

Mounting systems for PV-panels placed on flat roofs should either be mechanically attached to the roof or need to be supported by ballast, to make sure that the solar mounting system is unable to be lifted, tipped over or slide. The required ballast weight per system shown in the tables in this manual ensures that the mounting system can be installed and used safely. In case the inclination of the roofs is 5 degrees or more, the PV-mounting system must always be mechanically fixed to the construction of the roof.

The calculations do not take into account obstacles in the near surrounding such as, for example, high buildings, cliffs and mountains. Restrictions also apply for the position of the solar mounting system on a roof. The solar panels must be installed at a certain distance from the edge of the roof: the middle zone.

The standard warranty is 10 years, which can be extended under certain conditions. The warranty provided is subject to the warranty conditions stated in the general terms and conditions stipulated by Van der Valk Solar Systems B.V. Our terms and conditions shall apply to all our products at all times and can be found on our website:

www.valksolarsystems.com

Van der Valk Solar Systems B.V. does not accept any liability for any direct and/or indirect consequences of any act (or omission) ensuing from the information in or failure to observe the instructions provided in this installation manual. The use of the installation manual will at all times be subject to Dutch law.

Van der Valk Solar Systems holds the right to amend this document without further notice.

The ValkBox3 mounting system is a product of: Van der Valk Solar Systems BV Netherlands Chamber of Commerce: 27355116 www.valksolarsystems.com



Safety instructions

The ValkBox3 mounting system is installed on roofs and will be exposed to wind and snow. The building in question will be subject to a greater load as a result of the PV system. A design calculation must be used to establish whether or not the building in question will be able to withstand the extra load. Where necessary, modifications will then need to be made.

When installing the ValkBox3 mounting system, the instructions provided in this user manual must be observed at all times. Read this manual carefully and keep it in a safe place. Also follow the instructions stated in the manuals for the other system components that form part of the overall PV system. All current structural, safety and building regulations must be observed. Van der Valk Solar Systems B.V. will never be liable for any direct and/or indirect intangible or consequential loss ensuing from or connected to the failure to observe the instructions provided in this manual.

Starting points

The following starting points apply for the ValkBox3 mounting system:

The standards applied (if applicable for specific solar mounting system)

NEN-EN 1990: Eurocode – Basis of structural design

NEN-EN 1991-1-4: Eurocode 1: Actions on structures - Part 1-4: General actions –

Wind actions

NEN7250: Solar energy systems – Integration in roofs and facades –

Constructional aspects

BS EN 1991-1-4: British Standard

Type of solar panel

The ValkBox3 mounting system is a universal mounting system for solar panels. The following starting points apply:

Design panels: Standard solar panels with an aluminium frame, with

mounting holes for M6 bolts.

Length panels: Up to max 2280 mm Width panels: 926 - 1150 mm

Type of roofs

The ValkBox3 mounting system can be used to mount panels on flat roofs. The following starting points apply:

Type of roof covering: bitumen, EPDM and concrete



Before installing the ValkBox3 mounting system, make sure that you carefully sweep the roof area. The ValkBox3 mounting system (see later in this manual) may only be placed on flat roofs or ground surface up to a maximum pitch of 5 degrees. The system can not be placed on steeper roofs or surfaces.

Ballast

The ValkBox3 mounting system needs to be supported by ballast, to make sure that the system is unable to move, lift or tip over. This manual indicates how much ballast should be placed on the system based on maximum panel dimensions, wind area and roof height. The number of tiles specified $(30 \times 30 \times 4.5 \text{ cm})$ per position will be vital to ensure that the mounting system can be used safely.



To achieve this, follow the required ballast instructions later in this manual.

Position

Restrictions also apply for the position of the system on a roof. The system must be installed at a certain distance from the edge of the roof, in the so called "middle zone".



According to the Eurocode for wind loads EN1991-1-4, the edge zone of the roof is 1/5th of the roof height. So for example: if the roof height is 6 meters, a free edge zone of 1,2 meters must be maintained.

Required ballast | The Netherlands

General

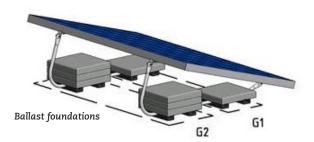
The ValkBox3 mounting system must be ballasted by means of tiles, which must be placed on the indicated ballast foundations. In three steps you can easily determine the required ballast;

- Find the correct wind area for your location on the wind map
- Use the wind area in combination with the building height for the ballast table
- Select the required ballast for G1 and G2 in kg and/or number of tiles
- Note 1: Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg)
- Note 2: The ballast in G1 & G2 must be equally divided over the rubber ballast carriers.
- Note 3: At maximum 17 tiles (30x30x4.5 cm) can be placed on the tile carriers. 4 tiles in G1 and 13 (2x6.5)
- tiles in G2. This represents a ballast weight of 153 kg)

Environmental factors

Roof zone Middle zone
Terrain category Built area

Roofing materials Bitumen, EPDM or concrete





Building height	_	- 5 eter		- 7 eter		- 9 eter		· 12 eter		- 15 eter	
Wind area	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
I (20 E m /s)	36	97	36	97	X	X	X	X	X	X	kg
I (29,5 m/s)	4	11	4	11	X	X	X	X	X	X	tiles
II (27 m /s)	36	77	36	81	36	90	36	104	36	X	kg
II (27 m/s)	4	9	4	9	4	10	4	12	4	X	tiles
III (24 E m/s)	36	59	36	59	36	69	36	81	36	90	kg
III (24,5 m/s)	4	7	4	7	4	8	4	9	4	10	tiles

Panel: maximum dimensions 2280x1150 mm

Building height	_	- 5 eter	_	- 7 eter		- 9 eter		· 12 eter		- 15 eter	
Wind area	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
I /20 E m /o)	X	X	X	X	X	X	X	X	X	X	kg
I (29,5 m/s)	X	X	X	X	X	X	X	X	X	X	tiles
II /27 m /s)	36	101	36	101	36	116	X	X	X	X	kg
II (27 m/s)	4	11,5	4	11,5	4	13	X	X	X	X	tiles
III /24 E m/s)	36	78	36	78	36	90	36	105	X	X	kg
III (24,5 m/s)	4	9	4	9	4	10	4	12	X	X	tiles

X = the required ballast is higher than will fit under the system. The system must be mechanically attached to the roof. Please contact Van der Valk Solar Systems.

^{*} If you use tiles of different sizes and thus another weight, you need to adjust the number of tiles to get the right weight.

Required ballast | Belgium

General

The ValkBox3 mounting system must be ballasted by means of tiles, which must be placed on the indicated ballast foundations. In three steps you can easily determine the required ballast;

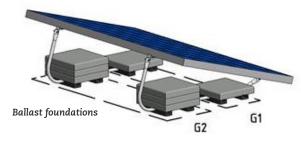
- Find the correct wind area for your location on the wind map
- Use the wind area in combination with the building height for the ballast table
- Select the required ballast for G1 and G2 in kg and/or number of tile
- Note 1: Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg)
- Note 2: The ballast in G1 & G2 must be equally divided over the rubber ballast carriers.
- Note 3: At maximum 17 tiles (30x30x4.5 cm) can be placed on the tile carriers. 4 tiles in G1 and 13 (2x6.5)
- tiles in G2. This represents a ballast weight of 153 kg)

Environmental factors

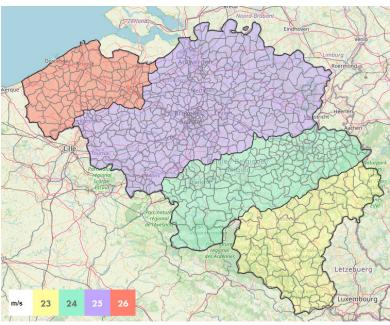
Roof zone Middle zone

Terrain category III (villages, suburban terrain, permanent forest)

Roofing materials Bitumen, EPDM or concrete







Panel: maximum dimensions 1800x1150 mm

Building height	0 · me	_	5 · me	- 7 eter	7 · me	. 9 ter	9 - me			- 15 eter	
Wind area	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
23 m/s	36	40	36	50	36	57	36	66	36	74	kg
23 111/5	4	4,5	4	6	4	6,5	4	7,3	4	8,5	tiles
24 m/s	36	46	36	56	36	64	36	74	36	82	kg
24 111/5	4	5,5	4	6,5	4	7,5	4	8,5	4	9,5	tiles
25 m/s	36	51	36	63	36	71	36	82	36	90	kg
25 111/5	4	6	4	7	4	8	4	9,5	4	10	tiles
26 m/s	36	57	36	69	36	79	36	90	36	99	kg
26 111/5	4	6,5	4	8	4	9	4	10	4	11	tiles

Building height	_	- 5 eter		- 7 eter	7 · me	- 9 eter		12 eter		- 15 eter	
Wind area	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
23 m/s	36	54	36	66	36	76	36	87	36	96	kg
25 111/5	4	6	4	7,5	4	8,5	4	10	4	11	tiles
24 m/s	36	61	36	74	36	84	36	97	36	107	kg
24 111/5	4	7	4	8,5	4	9,5	4	11	4	12	tiles
25 m/s	36	68	36	82	36	93	36	107	X	X	kg
25 111/5	4	8	4	9,5	4	10,5	4	12	X	X	tiles
26 /-	36	75	36	91	X	X	X	X	X	X	kg
26 m/s	4	8,5	4	10,5	X	X	X	X	X	X	tiles

X = the required ballast is higher than will fit under the system. The system must be mechanically attached to the roof. Please contact Van der Valk Solar Systems.

^{*} If you use tiles of different sizes and thus another weight, you need to adjust the number of tiles to get the right weight.

Required ballast | Germany

General

The ValkBox3 mounting system must be ballasted by means of tiles, which must be placed on the indicated ballast foundations. In three steps you can easily determine the required ballast;

- Find the correct wind area for your location on the wind map
- Use the wind area in combination with the building height for the ballast table
- Select the required ballast for G1 and G2 in kg and/or number of tile
- Note 1: Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg)
- Note 2: The ballast in G1 & G2 must be equally divided over the rubber ballast carriers.
- Note 3: At maximum 17 tiles (30x30x4.5 cm) can be placed on the tile carriers. 4 tiles in G1 and 13 (2x6.5)
- tiles in G2. This represents a ballast weight of 153 kg)

Environmental factors

Roof zone Terrain category Height above sea level

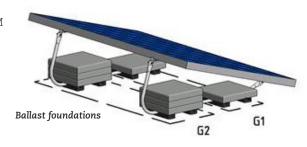
Exclusief North German Lowland

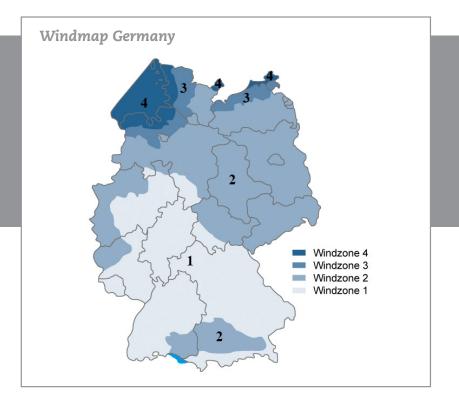
Roofing materials

IV (city) 350 m

Middle zone

Bitumen, EPDM or concrete





Panel: maximum dimensions 1800x1150 mm

Building height	0 · me	_	5 · me	- 7 eter	7 · me	- 9 eter	9 - me		12 · me		
Wind area	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
1 /22 E m/a)	36	41	36	41	36	41	36	41	36	41	kg
1 (22,5 m/s)	4	5	4	5	4	5	4	5	4	5	tiles
2 (25 m/s)	36	56	36	56	36	56	36	56	36	56	kg
2 (23 111/5)	4	6,5	4	6,5	4	6,5	4	6,5	4	6,5	tiles
2 (27 E m /o)	36	72	36	72	36	72	36	72	36	72	kg
3 (27,5 m/s)	4	8	4	8	4	8	4	8	4	8	tiles
4 (20 m/s)	36	89	36	89	36	89	36	89	36	89	kg
4 (30 m/s)	4	10	4	10	4	10	4	10	4	10	tiles

Building height	_	- 5 eter	_	- 7 eter	-	- 9 eter	_	· 12 eter		- 15 eter	
Wind area	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
1 (22 F xx /c)	36	55	36	55	36	55	36	55	36	55	kg
1 (22,5 m/s)	4	6,5	4	6,5	4	6,5	4	6,5	4	6,5	tiles
2 (25 m/s)	36	74	36	74	36	74	36	74	36	74	kg
2 (23 111/5)	4	8,5	4	8,5	4	8,5	4	8,5	4	8,5	tiles
2 (27 F m /o)	36	94	36	94	36	94	36	94	36	94	kg
3 (27,5 m/s)	4	10,5	4	10,5	4	10,5	4	10,5	4	10,5	tiles
4 (20 /-)	X	X	X	X	X	X	X	X	X	X	kg
4 (30 m/s)	X	X	X	X	X	X	X	X	X	X	tiles

X = the required ballast is higher than will fit under the system. The system must be mechanically attached to the roof. Please contact Van der Valk Solar Systems.

^{*} If you use tiles of different sizes and thus another weight, you need to adjust the number of tiles to get the right weight.

Required ballast | United Kingdom

General

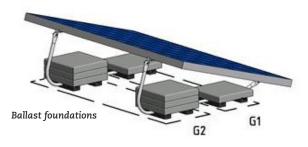
The ValkBox3 mounting system must be ballasted by means of tiles, which must be placed on the indicated ballast foundations. In three steps you can easily determine the required ballast;

- Find the correct wind area for your location on the wind map
- Use the wind area in combination with the building height for the ballast table
- Select the required ballast for G1 and G2 in kg and/or number of tile
- Note 1: Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg)
- Note 2: The ballast in G1 & G2 must be equally divided over the rubber ballast carriers.
- Note 3: At maximum 17 tiles (30x30x4.5 cm) can be placed on the tile carriers. 4 tiles in G1 and 13 (2x6.5)
- tiles in G2. This represents a ballast weight of 153 kg)

Environmental factors

Roof zone Middle zone
Terrain category Town
Height above sea level 50 m
Distance to coast line 5 km
Distance to city border 5 km
Roofing materials Bitumen, EPDM

or concrete



Windmap United Kingdom Scotland Northern Ireland North East North West East Midlands West Midlands Wales South West South East Greater London

Building height	0 · me	- 5 eter		- 7 eter	1	- 9 eter		12 ter		- 15 eter	
Wind area	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
22 /-	36	60	36	76	36	83	36	102	36	102	kg
22 m/s	4	7	4	8,5	4	9,5	4	11,5	4	11,5	tiles
23 m/s	36	67	36	85	36	92	X	X	X	X	kg
25 111/5	4	7,5	4	9,5	4	10,5	X	X	X	X	tiles
24 m/s	36	75	36	94	36	102	X	X	X	X	kg
24 m/s	4	8,5	4	10,5	4	11,5	X	X	X	X	tiles
25 m/s	36	83	36	104	X	X	X	X	X	X	kg
23 111/5	4	9,5	4	12	X	X	X	X	X	X	tiles
26 m/s	36	92	X	X	X	X	X	X	X	X	kg
26 111/5	4	10,5	X	X	X	X	X	X	X	X	tiles

Panel: maximum dimensions 2280x1150 mm

Building height	_	- 5 eter		- 7 eter		- 9 eter		12 eter		- 15 eter	
Wind area	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
22 /-	36	79	36	100	36	108	X	X	X	X	kg
22 m/s	4	9	4	11,5	4	12	X	X	X	X	tiles
23 m/s	36	88	X	X	X	X	X	X	X	X	kg
23 111/5	4	10	X	X	X	X	X	X	X	X	tiles
24 m/s	36	98	X	X	X	X	X	X	X	X	kg
24 111/5	4	11	X	X	X	X	X	X	X	X	tiles
25 m/s	36	108	X	X	X	X	X	X	X	X	kg
23 111/5	4	12	X	X	X	X	X	X	X	X	tiles
26 m/s	X	X	X	X	X	X	X	X	X	X	kg
20 111/5	X	X	X	X	X	X	X	X	X	X	tiles

X = the required ballast is higher than will fit under the system. The system must be mechanically attached to the roof. Please contact Van der Valk Solar Systems.

^{*} If you use tiles of different sizes and thus another weight, you need to adjust the number of tiles to get the right weight.

Required ballast | Ireland

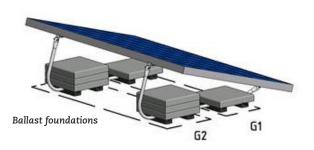
General

The ValkBox3 mounting system must be ballasted by means of tiles, which must be placed on the indicated ballast foundations. In three steps you can easily determine the required ballast;

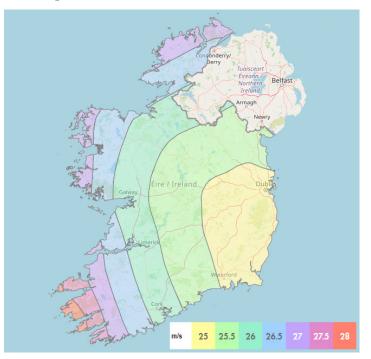
- Find the correct wind area for your location on the wind map
- Use the wind area in combination with the building height for the ballast table
- Select the required ballast for G1 and G2 in kg and/or number of tile.
- Note 1: Min. extra ballast in G1 & G2 has to be 2×1 tile $(2 \times 9 \text{ kg})$
- Note 2: The ballast in G1 & G2 must be equally divided over the rubber ballast carriers.
- Note 3: At maximum 17 tiles (30x30x4.5 cm) can be placed on the tile carriers. 4 tiles in G1 and 13 (2x6.5,
- tiles in G2. This represents a ballast weight of 153 kg)

Environmental factors

Roof zone Middle zone
Terrain category Town
Height above sea level 50 m
Distance to coast line 5 km
Distance to city border 5 km
Roofing materials Bitumen, EPDM or concrete



Windmap Ireland



Panel: maximum dimensions 1800x1150 mm

Building height	_	- 5 eter	_	- 7 eter	7 · me	_	9 - me			- 15 eter	
Wind area	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
25 /-	36	83	36	104	X	X	X	X	X	X	kg
25 m/s	4	9,5	4	12	X	X	X	X	X	X	tiles
26 m/s	36	92	X	X	X	X	X	X	X	X	kg
20 111/5	4	10,5	X	X	X	X	X	X	X	X	tiles
07 /-	36	100	X	X	X	X	X	X	X	X	kg
27 m/s	4	11,5	X	X	X	X	X	X	X	X	tiles
28 m/s	X	X	X	X	X	X	X	X	X	X	kg
28 111/5	X	X	X	X	X	X	X	X	X	X	tiles

Building height	_	- 5 eter		- 7 eter		- 9 eter		- 12 eter		- 15 eter	
Wind area	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
25 m/s	36	108	X	X	X	X	X	X	X	X	kg
25 111/8	4	12	X	X	X	X	X	X	X	X	tiles
26 m/s	X	X	X	X	X	X	X	X	X	X	kg
20 111/5	X	X	X	X	X	X	X	X	X	X	tiles
27 m/s	X	X	X	X	X	X	X	X	X	X	kg
27 111/5	X	X	X	X	X	X	X	X	X	X	tiles
28 m/s	X	X	X	X	X	X	X	X	X	X	kg
26 III/S	X	X	X	X	X	X	X	X	X	X	tiles

X = the required ballast is higher than will fit under the system. The system must be mechanically attached to the roof. Please contact Van der Valk Solar Systems.

^{*} If you use tiles of different sizes and thus another weight, you need to adjust the number of tiles to get the right weight.

Required ballast | Norway

General

The ValkBox3 mounting system must be ballasted by means of tiles, which must be placed on the indicated ballast foundations. In three steps you can easily determine the required ballast;

- Find the correct wind area for your location on the wind map
- Use the wind area in combination with the building height for the ballast table
- Select the required ballast for G1 and G2 in kg and/or number of tiles
- Note 1: Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg)
- Note 2: The ballast in G1 & G2 must be equally divided over the rubber ballast carriers.
- Note 3: At maximum 17 tiles (30x30x4.5 cm) can be placed on the tile carriers. 4 tiles in G1 and 13 (2x6.5)
- tiles in G2. This represents a ballast weight of 153 kg)

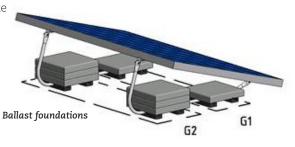
Environmental factors

Roof zone Middle zone

Terrain category III (villages, suburban terrain, permanent forest)

Height above sea level 175 m

Roofing materials Bitumen, EPDM or concrete





Building height	0 · me	- 5 eter	_	- 7 eter	7 · me	- 9 eter	9 - me	12 eter		- 15 eter	
Wind area	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
22 /-	36	53	36	53	36	56	36	65	36	72	kg
22 m/s	4	6	4	6	4	6,5	4	7,5	4	8	tiles
25 m/s	36	74	36	74	36	78	36	89	36	98	kg
25 III/S	4	8,5	4	8,5	4	9	4	10	4	11	tiles
27 m/s	36	89	36	89	36	94	36	108	X	X	kg
27 III/S	4	10	4	10	4	10,5	4	12	X	X	tiles
29 m/s	36	106	X	X	X	X	X	X	X	X	kg
29 111/5	4	12	X	X	X	X	X	X	X	X	tiles
31 m/s	X	X	X	X	X	X	X	X	X	X	kg
31 111/5	X	X	X	X	X	X	X	X	X	X	tiles

Panel: maximum dimensions 2280x1150 mm

Building height	0 · me	_	5 · me	- 7 eter	7 · me	eter	9 - me	12 ter		- 15 eter	
Wind area	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
22 m/s	36	70	36	70	36	74	36	85	36	94	kg
22 m/s	4	8	4	8	4	8,5	4	9,5	4	10,5	tiles
25 m/s	36	96	36	96	36	102	X	X	X	X	kg
23 111/5	4	11	4	11	4	11,5	X	X	X	X	tiles
27 m/s	X	X	X	X	X	X	X	X	X	X	kg
27 111/5	X	X	X	X	X	X	X	X	X	X	tiles
29 m/s	X	X	X	X	X	X	X	X	X	X	kg
29 111/5	X	X	X	X	X	X	X	X	X	X	tiles
31 m/s	X	X	X	X	X	X	X	X	X	X	kg
31 111/5	X	X	X	X	X	X	X	X	X	X	tiles

X = the required ballast is higher than will fit under the system. The system must be mechanically attached to the roof. Please contact Van der Valk Solar Systems.

^{*} If you use tiles of different sizes and thus another weight, you need to adjust the number of tiles to get the right weight.

Wind area | Norway

	m/s		m/s	m	ı/s	m/s		m/s	1	m/s
Provincie Østfold Except Municipalities:	22	Nore og Uvdal Nore og Uvdal near Hordeland	24		27 28	Flora 28 Gulen 28	Provincie Nord-Trøndelag Except Municipalities:	26	Provincie Troms Except Municipalities:	26
Halden	24	Ål	24		28	Bremanger 29	Lierne	24	Bardu	24
Moss	24	Ål near Sogn og Fj.	24		28	Bremanger near the Ålfotbreen 29	Meråker	25	Målselv	24
		Al fleat 30gil 0g FJ.	24							
Rygge	24				28		Røyrvik	25	Strofjord	24
Råde	24	Provincie Vestford	23		28	Selje 31	Snåsa	25	Gáivuona/Kåfjord	25
Sarpsborg	24	Except Municipalities:			28	Vågsøy 31	Flatanger	29	Balsfjord	26
Våler	24	Hof	22		28		Fosnes	29	Gratangen	26
Fredrikstad	26	Lardal	22	Hå 2	29	Provincie Møre og Romsdal 30	Leka	29	Ibestad	26
Hvaler	27	Nøtterøy	24		29	Except Municipalities:	Leka on the mainland	29	Lavangen	26
		Sandefjord	24		30	Rindal 25	Nærøy	29	Lyngen	26
Provincie Akershus	22	Stokke	24	Utsira	30	Surnadal 25	Vikna	30	Salangen	26
Except Municipality:		Tønsberg	24	Ølen Municipality isn't in th	he	Nesset 26			Skånland	26
Vestby	24	Larvik	25	Wind standard		Norddal 26	Provincie Nordland	29	Sørreisa	26
,		Tjøme	26			Stordal 26	Except Municipalities:		Dyrøy	27
Provincie Oslo	22	, -		Provincie Hordaland	26	Stranda 26	Beiarn	26	Harstad	27
		Provincie Telemark	22	Except Municipalities:		Sunndal 27	Evenes	26	Lenvik	27
Provincie Hedmark	22	Except Municipalities:		1 1	24	Gjemnes 28	Fauske	26	Nordreisa	27
Except Municipalities:		Bamble	23		24	Rauma 28	Grane	26	Trangy	27
Alvdal	24	Porsgrunn	23		24	Sykkylven 28	Hattfjelldal	26	Tromsø	27
Folldal	24	Fyresdal	24		24	Tingvoll 28	Hemnes	26	Bjarkøy	28
Folldal near Trøndelag	24		24		24 24	Volda 28		26	, ,	
9		Kragerø					Rana		Kvænangen	28
Os	24	Tinn	24		24	Ørskog 28	Saltdal	26	Skjervøy	28
Os near Trøndelag	24	Tokke	24		24	Ørsta 28	Sørfold	26	Karlsøy	29
Tolga	24	Vinje	24		24	Eide 29	Ballangen	27	Berg	30
Tynset	24	Vinje near Rogaland/Hordaland	1 24		24	Halsa 29	Tjeldsund	27	Torsken	30
Tynset Kvikne	24				25	Hareid 29	Tysfjord	27		
Tynset near Trøndelag	24	Provincie Aust-Agder	24		27	Molde 29	Hamarøy	28	Provincie Finnmark	29
		Except Municipalities:	0.5		28	Skodje 29	Narvik	28	Except Municipalities:	
Provincie Oppland	22	Arendal	26		28	Sula 29	Sortland	28	Kárájoga / Karasjok	24
Except Municipalities:		Grimstad	26		28	Ålesund 29	Vefsn	28	Guovdageaidnu / Kautokeino	
Vågå	23	Lillesand	26		28	Sandøy 31	Vefsn along the fjord	28	Deanu/Tana	27
Dovre	24	Risør	26		28	Frei Municipality isn't in the	Vefsn Mosjøen	28	Porsanger	27
Dovre near Trøndelag	24	Tvedestrand	26		29	Wind standard	Vevelstad	28	Unjárgga / Nesseby	27
Lom	24			Fedje 3	30	Tustna Municipality isn't in the	Alstahaug	30	Alta	28
Lom near Sogn og Fj.	24	Provincie Vest-Agder	24			Wind standard	Bindal	30	Berlevåg	30
Vang	24	Except Municipalities:		Provincie Sogn og Fjordane	24		Bodø	30	Gamvik	30
Vang near Sogn og Fj.	24	Flekkefjord	26	Except Municipalities:		Provincie Sør-Trøndelag 25	Dønna	30	Hasvik	30
Lesja	25	Flekkefjord near Rogaland	26		25	Except Municipalities:	Flakstad	30	Måsøv	30
Lesja near Trøndelag/		Kristiansand	26		26	Malvik 26	Herøy	30	Nordkapp	30
Møre og Romsdal	25	Lyngdal	26	Fjaler 2	26	Oppdal 26	Leirfjord	30	Vardø	30
Skjåk	25	Søngne	26	Førde 2	26	Rennebu 26	Lurøy	30		
Skjåk near Sogn og Fj./		Farsund	28	Førde near the Jostedalsbreen 2	26	Trondheim 26	Lurøy on the mainland	30	Provincie Svalbard	30
Møre og Romsdal	25	Lindesnes	28	Gaular	26	Agdenes 27	Nesna	30		-
S		Mandal	28	Gloppen 2	26	Rissa 27	Sømna	30		
Provincie Buskerud	22			Gloppen near the Ålfotbreen a	ınd	Snillfjord 27	Vega	30		
Except Municipalities:		Provincie Rogaland	26		26	Hemne 28	Vestvågøy	30		
Hemsedal	24	Except Municipalities:		Hornindal 2	26	Bjugn 29	Andøy	31		
Hemsedal near Sogn og Fj.	24	Hjelmeland	24		26	Osen 29	Moskenes	31		
Hol	24	Sauda	24		26	Roan 29	Røst	31		
Hol near Hordeland /		Suldal	24		26	Åfjord 29	Træna	31		
Sogn og Fjordane	24	Vindafjord	24		26	Frøya 30	Værøy	31		
Hurum	24	Eigersund	27		28	Hitra 30	Skjerstad Municipality isn't i			
		0				Ørland 30	Wind standard			

Required ballast | Sweden

General

The ValkBox3 mounting system must be ballasted by means of tiles, which must be placed on the indicated ballast foundations. In three steps you can easily determine the required ballast;

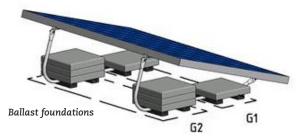
- Find the correct wind area for your location on the wind map
- Use the wind area in combination with the building height for the ballast table
- Select the required ballast for G1 and G2 in kg and/or number of tile
- Note 1: Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg)
- Note 2: The ballast in G1 & G2 must be equally divided over the rubber ballast carriers.
- Note 3: At maximum 17 tiles (30x30x4.5 cm) can be placed on the tile carriers. 4 tiles in G1 and 13 (2x6.5)
- tiles in G2. This represents a ballast weight of 153 kg).

Environmental factors

Roof zone Middle zone

Terrain category III (villages, suburban terrain, permanent forest)

Roofing materials Bitumen, EPDM or concrete



Panel: maximum dimensions 1800x1150 mm

Building height	0 · me	- 5 eter	5 - 7 meter		7 - 9 meter			12 eter		- 15 eter	
Wind area	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
22 /-	36	29	36	37	36	44	36	51	36	57	kg
22 m/s	4	3,5	4	4,5	4	5	4	6	4	6,5	tiles
23 m/s	36	34	36	43	36	49	36	58	36	64	kg
25 111/5	4	4	4	5	4	5,5	4	6,5	4	7,5	tiles
24 m/s	36	39	36	48	36	56	36	64	36	72	kg
24 111/5	4	4,5	4	5,5	4	6,5	4	7,5	4	8	tiles
25 m/s	36	44	36	54	36	62	36	72	36	79	kg
25 111/5	4	5	4	6	4	7	4	8	4	9	tiles
26 m/s	36	49	36	60	36	69	36	79	36	87	kg
20 111/5	4	5,5	4	7	4	8	4	9	4	10	tiles

Windmap Sweden



Building height	0 · me	- 5 eter		- 7 eter	-	- 9 eter		12 eter		- 15 eter	
Wind area	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
22 m/s	36	40	36	50	36	58	36	68	36	75	kg
22 m/s	4	4,5	4	6	4	6,5	4	8	4	8,5	tiles
23 m/s	36	46	36	57	36	66	36	76	36	84	kg
23 111/5	4	5,5	4	6,5	4	7,5	4	8,5	4	9,5	tiles
24 m/s	36	52	36	64	36	73	36	85	36	94	kg
24 111/5	4	6	4	7,5	4	8,5	4	9,5	4	10,5	tiles
25 m/s	36	58	36	71	36	81	36	94	36	103	kg
25 111/5	4	6,5	4	8	4	9	4	10,5	4	11,5	tiles
26 m/s	36	65	36	79	36	90	36	103	X	X	kg
20 111/5	4	7,5	4	9	4	10	4	11,5	X	X	tiles

X = the required ballast is higher than will fit under the system. The system must be mechanically attached to the roof. Please contact Van der Valk Solar Systems.

^{*} If you use tiles of different sizes and thus another weight, you need to adjust the number of tiles to get the right weight.

Required ballast | Finland

General

The ValkBox3 mounting system must be ballasted by means of tiles, which must be placed on the indicated ballast foundations. In three steps you can easily determine the required ballast;

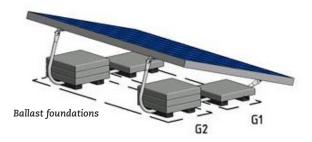
- Find the correct wind area for your location on the wind map
- Use the wind area in combination with the building height for the ballast table
- Select the required ballast for G1 and G2 in kg and/or number of tile.
- Note 1: Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg)
- Note 2: The ballast in G1 & G2 must be equally divided over the rubber ballast carriers.
- Note 3: At maximum 17 tiles (30x30x4.5 cm) can be placed on the tile carriers. 4 tiles in G1 and 13 (2x6.5)
- tiles in G2. This represents a ballast weight of 153 kg)

Environmental factors

Roof zone Middle zone

Terrain category III (villages, suburban terrain, permanent forest)

Roofing materials Bitumen, EPDM or concrete





Panel: maximum dimensions 1800x1150 mm

Building height	0 - 5 meter		5 · me	- 7 eter	-	- 9 eter		12 eter		- 15 eter	
Wind area	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
21 /-	36	40	36	50	36	57	36	66	36	73	kg
21 m/s	4	4,5	4	6	4	6,5	4	7,5	4	8,5	tiles
22 m/s	36	46	36	57	36	65	36	74	36	82	kg
22 111/5	4	5,5	4	6,5	4	7,5	4	8,5	4	9,5	tiles
26 m/s	36	72	36	87	36	98	X	X	X	X	kg
26 111/5	4	8	4	10	4	11	X	X	X	X	tiles

Building height	0 - 5 meter		5 - 7 meter		-	- 9 eter		· 12 eter		- 15 eter	
Wind area	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
21 /-	36	54	36	66	36	75	36	86	36	95	kg
21 m/s	4	6	4	7,5	4	8,5	4	10	4	11	tiles
22 m/s	36	61	36	75	36	85	36	97	36	107	kg
22 111/5	4	7	4	8,5	4	9,5	4	11	4	12	tiles
26 m/s	36	94	X	X	X	X	X	X	X	X	kg
20 111/5	4	10,5	X	X	X	X	X	X	X	X	tiles

X = the required ballast is higher than will fit under the system. The system must be mechanically attached to the roof. Please contact Van der Valk Solar Systems.

^{*} If you use tiles of different sizes and thus another weight, you need to adjust the number of tiles to get the right weight.

Required ballast | Poland

General

The ValkBox3 mounting system must be ballasted by means of tiles, which must be placed on the indicated ballast foundations. In three steps you can easily determine the required ballast;

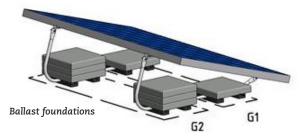
- Find the correct wind area for your location on the wind map
- Use the wind area in combination with the building height for the ballast table
- Select the required ballast for G1 and G2 in kg and/or number of tiles
- Note 1: Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg)
- Note 2: The ballast in G1 & G2 must be equally divided over the rubber ballast carriers.
- Note 3: At maximum 17 tiles (30x30x4.5 cm) can be placed on the tile carriers. 4 tiles in G1 and 13 (2x6.5)
- tiles in G2. This represents a ballast weight of 153 kg)

Environmental factors

Roof zone Middle zone

Terrain category III (villages, suburban terrain, permanent forest)

Roofing materials Bitumen, EPDM or concrete





Building height	0 - 5 meter		5 - 7 meter		-	eter	9 - me	12 ter		- 15 eter	
Wind area	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
1	36	54	36	60	36	66	36	72	36	78	kg
1	4	6	4	7	4	7,5	4	8	4	9	tiles
2	36	83	36	92	36	100	X	X	X	X	kg
2	4	9,5	4	10,5	4	11,5	X	X	X	X	tiles
3	36	54	36	60	36	66	36	72	36	78	kg
3	4	6	4	7	4	7,5	4	8	4	9	tiles

Panel: maximum dimensions 2280x1150 mm

Building height	0 - 5 meter		5 - 7 meter		7 - me	eter	9 - me		12 · me	-	
Wind area	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
1	36	71	36	79	36	86	36	95	36	102	kg
1	4	8	4	9	4	10	4	11	4	11,5	tiles
2	36	108	X	X	X	X	X	X	X	X	kg
2	4	12	X	X	X	X	X	X	X	X	tiles
3	36	71	36	79	36	86	36	95	36	102	kg
3	4	8	4	9	4	10	4	11	4	11,5	tiles

X = the required ballast is higher than will fit under the system. The system must be mechanically attached to the roof. Please contact Van der Valk Solar Systems.

^{*} If you use tiles of different sizes and thus another weight, you need to adjust the number of tiles to get the right weight.

Required ballast | Spain

General

The ValkBox3 mounting system must be ballasted by means of tiles, which must be placed on the indicated ballast foundations. In three steps you can easily determine the required ballast;

- Find the correct wind area for your location on the wind map
- Use the wind area in combination with the building height for the ballast table
- Select the required ballast for G1 and G2 in kg and/or number of tile

Note 1: The ballast in G1 & G2 must be equally divided over the rubber ballast carriers.

Note 2: Always check in advance if the required weight for ballast tiles can be placed correctly under the

system. The tiles need to be placed in a stable position, so they can not move or fall off the rubber support feet.

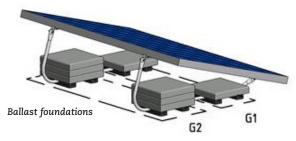
Environmental factors

Roof zone Middle zone

Terrain category III (villages, suburban terrain, permanent forest)

Height above sea level < 1000 m

Roofing materials Bitumen, EPDM or concrete



Windmap Spain



Building height	0 - 5 meter		5 - 7 meter		7 - 9 meter		9 - 12 meter		12 · me		
Wind zone	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
A (26 m/s)	36	66	36	79	36	90	36	102	36	112	kg
B (27 m/s)	36	72	36	87	36	98	36	112	36	125	kg
C (29 m/s)	36	86	36	103	36	116	36	137	36	153	kg

Panel: maximum dimensions 2280x1150 mm

Building height	0 - 5 meter		5 - 7 meter		7 - 9 meter		9 - 12 meter		12 · me		
Wind zone	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
A (26 m/s)	36	86	36	103	36	117	36	134	36	151	kg
B (27 m/s)	36	95	36	113	36	128	36	150	36	168	kg
C (29 m/s)	36	113	36	136	36	158	36	183	36	204	kg

Required ballast | Portugal

General

The ValkBox3 mounting system must be ballasted by means of tiles, which must be placed on the indicated ballast foundations. In three steps you can easily determine the required ballast;

- Find the correct wind area for your location on the wind map
- Use the wind area in combination with the building height for the ballast table
- Select the required ballast for G1 and G2 in kg and/or number of tile

Note 1: The ballast in G1 & G2 must be equally divided over the rubber ballast carriers.

Note 2: Always check in advance if the required weight for ballast tiles can be placed correctly under the

system. The tiles need to be placed in a stable position, so they can not move or fall off the rubber support feet.

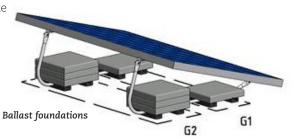
Environmental factors

Roof zone Middle zone

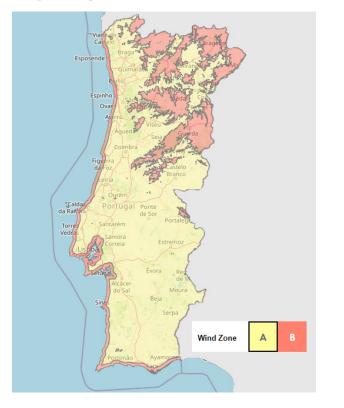
Terrain category III (villages, suburban terrain, permanent forest)

Height above sea level < 1000 m

Roofing materials Bitumen, EPDM or concrete



Windmap Portugal



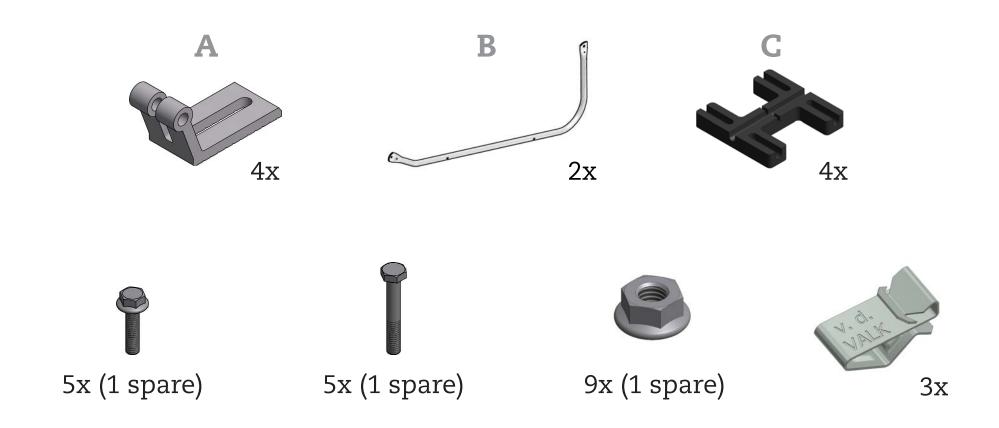
Panel: maximum dimensions 1800x1150 mm

Building height	0 · me	- 5 eter	5 · me	-	7 · me	- 9 eter	9 - me		12 · me		
Wind zone	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
A (27 m/s)	36	86	36	86	36	91	36	105	36	119	kg
B (30 m/s)	36	115	36	115	36	123	36	144	36	161	kg

Building height		- 5 eter	5 · me	- 7 eter	-	- 9 eter	9 - me		12 · me		
Wind zone	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
A (27 m/s)	36	119	36	119	36	128	36	149	36	167	kg
B (30 m/s)	36	161	36	161	36	172	36	198	36	220	kg

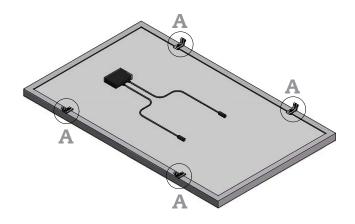


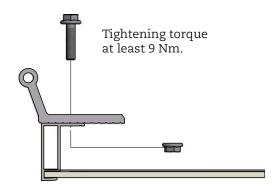
Components





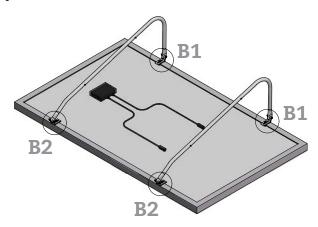
Step 1: Mounting the clevis

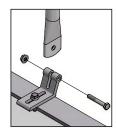




Step 2: Mounting the curved supports

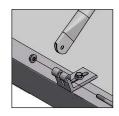
The curved aluminum supports are suitable for panels with a width of 926 - 1150 mm.





Depending on the panel width, the clamps B1 and B2 must be positioned inwards or outwards. The correct orientation for each panel width is shown on the next page.

Tighten the hinge bolts B1 by hand. These must be removed temporarily at step 4.





Tighten the hinge bolts B2 firmly, with a tightening torque of at least 9 Nm, until there is no more play.



Option 1: Mounting panel

For panel width 926 - 990 mm

Center to center mounting holes (panel frame): 896 - 970 mm

Under lip turned inwards

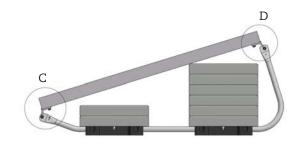
C (1:4)



Top lip facing inwards

D (1:4)





Option 2: Mounting panel

For panel width 991 - 1070 mm

Center to center mounting holes (panel frame): 970 - 1050 mm

Under lip turned inwards

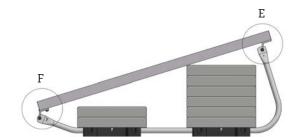
F (1:4)



Top lip facing out

E (1:4)





Option 3: Mounting panel

For panel width 1071 - 1150 mm

Center to center mounting holes (panel frame): 1050 - 1124 mm

Under lip facing outwards

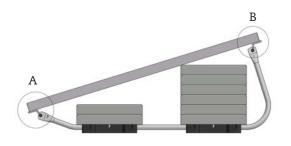
A (1:4)



Top lip facing out

B (1:4)

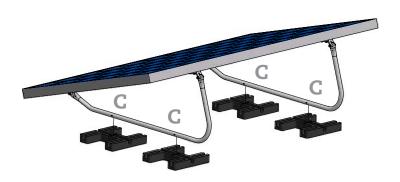


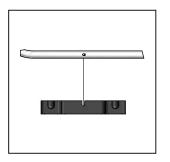




Step 3: Placing the rubber tiles

Turn over the panel and place it on the rubber tile carriers.





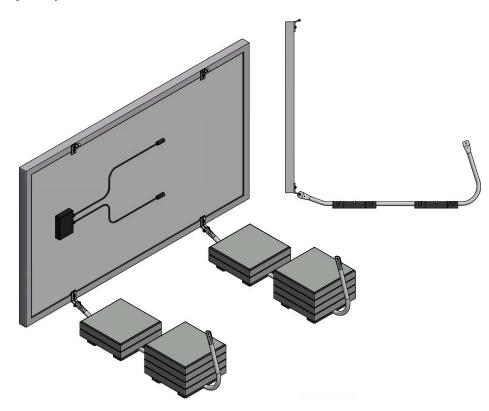




The projections on the curved aluminium supports must be placed in the grooves on the rubber tiles.

Step 4: Position the ballast

Remove the top hinge bolts B1 and place the panel in a vertical position. Make sure that you have some form of support in place or someone to hold the panel temporarily.



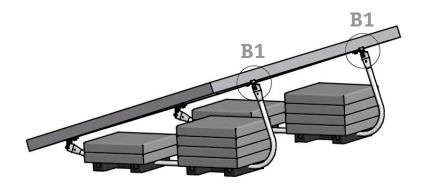


 $\label{position:pos$



Step 5: Tighten hinge bolts B1

Attach the panel to the curved supports again and tighten hinge bolts B1.

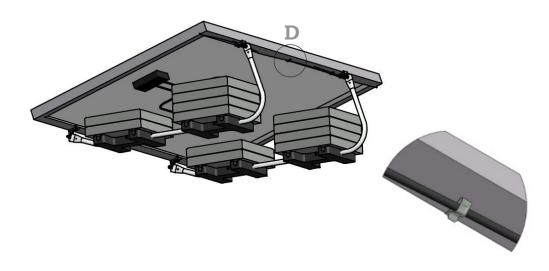




Tighten hinge bolts B1 tightly, with a tightening torque of at least 9 Nm, until there is no more play.

Step 6: Finish fitting the cables

The loose cables can be secured to the edge of the panel. Using the cable clamps supplied.



Step 7: Position the rows one behind each other

If a number of rows of panels are to be positioned one behind the other, we advise that an optimal pitch measure of 2.20 metres is observed; this will avoid any unwanted shadow. Optimal performance will be achieved if this pitch measure is used. Based on sun angle of 15 degrees.

