ValkBox® 3

Installation manual

Van der Valk Solar Systems

Solar Mounting Systems

VAN DER VALK SOLAR SYSTEMS

Version 04 | EN

Please note

- This manual is not project specific.
- This manual is not legally binding.
- No rights may be derived from this manual.
- Use this manual in combination with the ValkPVplanner project report.
- Check ‘Datasheet Cable management’ for cable suggestions.
- The system is placed in the middle zone of the roof.

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Disclaimer

This installation manual must be seen in addition to the project report which shows you specific information about your project like a project drawing and ballast plan for flat roofs.

The project report is a result of the calculation tool, the ValkPVplanner. This online calculation tool and/or the project reports derived from this tool were composed with the greatest possible care. Nonetheless, it is possible that some information might not be entirely correct as the results for each project report can be based on default values, which values always need to be checked by you. The instructions provided in this project report must be observed at all times. All applicable standards and appendixes have been integrated in this online calculation tool.

All current structural, safety and building regulations must be observed. Solar mounting systems installed on roofs will be exposed to wind and snow.
The building in question will be subject to a load as a result of the PV system. A design calculation must be used to establish whether or not the building will be able to withstand the extra load. Where necessary, modifications need to be made.

Flat roof systems should either be attached to the roof or need to be supported by ballast, to make sure that the system is unable to be lifted or tipped over.
The ballast specified in the ValkPVplanner project report will be vital to ensure that the mounting system can be used.
Flat roofs with an angle above 5 degrees must be attached to the roof.

The calculations in the online calculation tool do not take into account obstacles in the near surrounding like high buildings, cliffs and mountains. Restrictions also apply for the position of the system on a roof. The solar panels must be installed at a certain distance from edge of the roof as shown in this project report and the installation manual.

The standard warranty for pitched roof, flat roof and ground mount systems is 10 years, which can be extended under certain conditions.
The guarantee provided is subject to the guarantee 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 and can be found on our website: www.valksolarsystems.nl.

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 the failure to observe the instruction provided in the project report and the installation manual and for possible incorrect results resulting from the use of this online calculation tool which was made available to you.

The mounting system is a product that has been produced by:
Van der Valk Solar Systems B.V.,
Registered with the chamber of commerce for
Haaglanden under number 27355116.
Internet: www.valksolarsystems.nl

Issue date: november 2017
Version: VALK-USER-GB-GB-ValkBox 3-Flat Roof

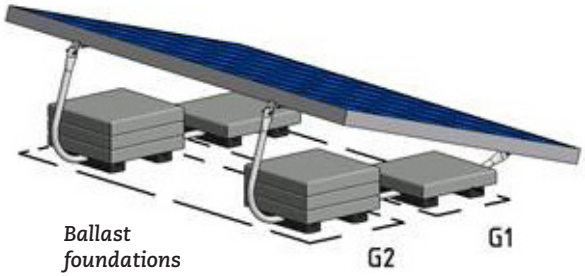
Van der Valk Solar Systems
Solar Mounting Systems

Required ballast | The Netherlands

General
The ValkBox 3 mounting system must be reinforced by means of tiles, which must be placed on the indicated ballast foundations. In **three steps** you can easily calculate the required ballast;

- determine the wind area on the windmap
- choose the wind area and building height in the table
- you can now read the number of tiles / kg

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: *The max. of 20 tiles (4 in G1 and 16 in G2) can be placed for extra ballast (180 kg).*

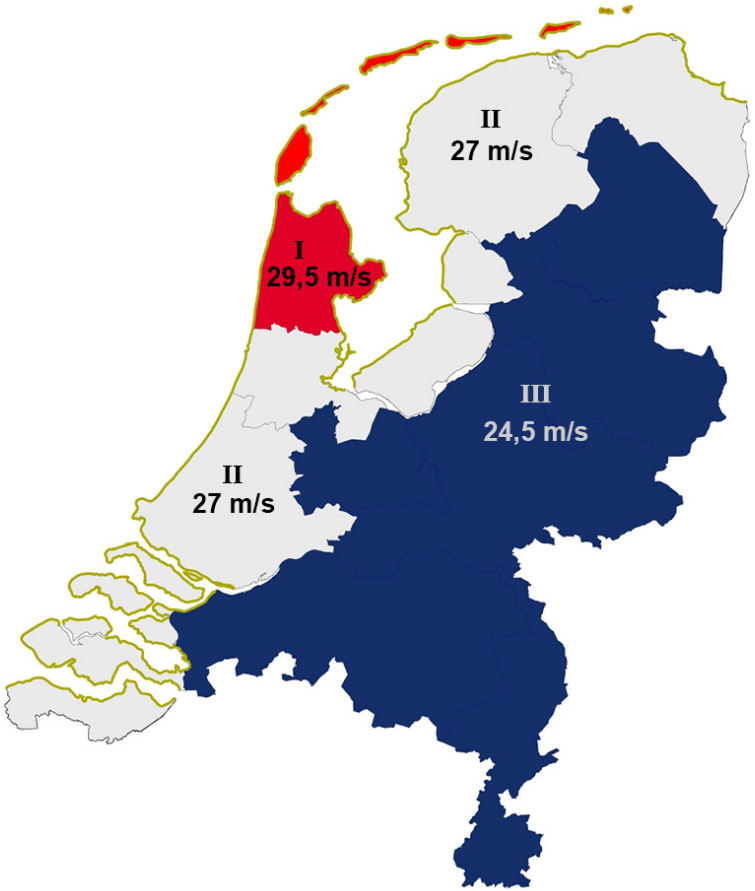


Surrounding parameters

Panelsize	Length approx. 1650 mm - Width max 1005 mm Height 28-50 mm - Weight approx. 19 kg
Position	Middle zone roof
Terrain category	Builded environment
Roofing materials	Bitumen
Tile size*	30 x 30 x 4,5 cm á 9 kg
Flat roof	Max. 5% inclination

Height / Wind area	0 - 5 meter		5 - 7 meter		7 - 9 meter		9 - 12 meter		12 - 15 meter		
	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
I (29,5 m/s)	18	81	18	81	18	96	36	100	36	111	kg
	2	9	2	9	2	11	4	11,5	na**	na**	tiles
II (27 m/s)	18	62	18	62	18	73	18	88	18	100	kg
	2	7	2	7	2	8,5	2	10	2	11,5	tiles
III (24,5 m/s)	18	48	18	48	18	56	18	65	18	73	kg
	2	5,5	2	5,5	2	6,5	2	7,5	2	8,5	tiles

Windmap The Netherlands

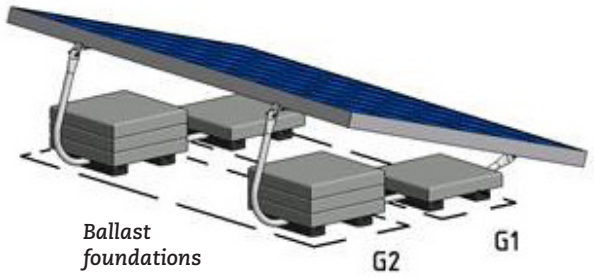


* *If you use tiles of different sizes and thus another weight, you need to adjust the number of tiles to get the right weight.*
** *Not available due to exceedance maximum number of tiles.*

Required ballast | Belgium

General
The ValkBox 3 mounting system must be reinforced by means of tiles, which must be placed on the indicated ballast foundations. In **three steps** you can easily calculate the required ballast;

- determine the wind area on the windmap
- choose the wind area and building height in the table
- you can now read the number of tiles / kg



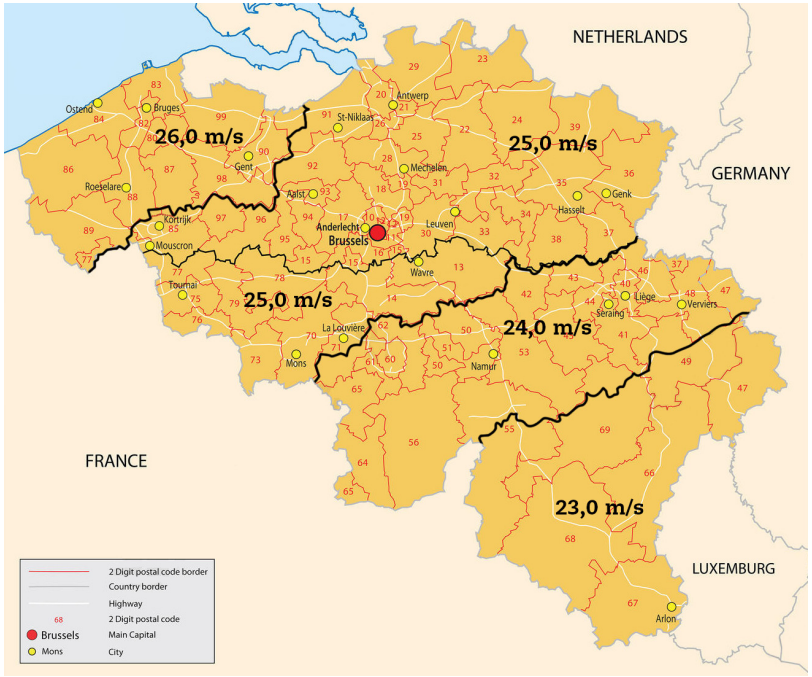
Surrounding parameters

Panelsize	Length approx. 1650 mm - Width max 1005 mm Height 28-50 mm - Weight approx. 19 kg
Position	Middle zone roof
Terrain category	Builded environment
Roofing materials	Bitumen
Tile size*	30 x 30 x 4,5 cm á 9 kg
Flat roof	Max. 5% inclination

Height / Wind area	0 - 5 meter		5 - 7 meter		7 - 9 meter		9 - 12 meter		12 - 15 meter		
	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
23 m/s	18	33	18	41	18	47	18	54	18	59	kg
	2	4	2	5	2	5,5	2	6	2	7	tiles
24 m/s	18	37	18	46	18	52	18	60	18	66	kg
	2	4,5	2	5,5	2	6	2	7	2	7,5	tiles
25 m/s	18	42	18	51	18	58	18	66	18	74	kg
	2	5	2	6	2	6,5	2	7,5	2	8,5	tiles
26 m/s	18	46	18	56	18	64	18	74	18	83	kg
	2	5,5	2	6,5	2	7,5	2	8,5	2	9,5	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: *The max. of 20 tiles (4 in G1 and 16 in G2) can be placed for extra ballast (180 kg).*

Windmap Belgium

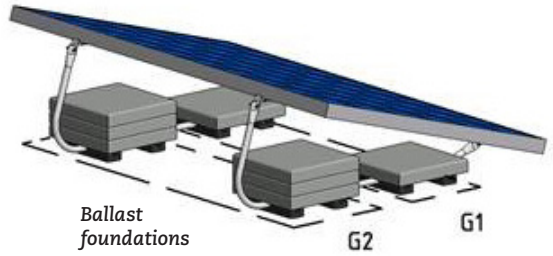


* *If you use tiles of different sizes and thus another weight, you need to adjust the number of tiles to get the right weight.*

Required ballast | Germany

General
The ValkBox 3 mounting system must be reinforced by means of tiles, which must be placed on the indicated ballast foundations. In **three steps** you can easily calculate the required ballast;

- determine the wind area on the windmap
- choose the wind area and building height in the table
- you can now read the number of tiles / kg



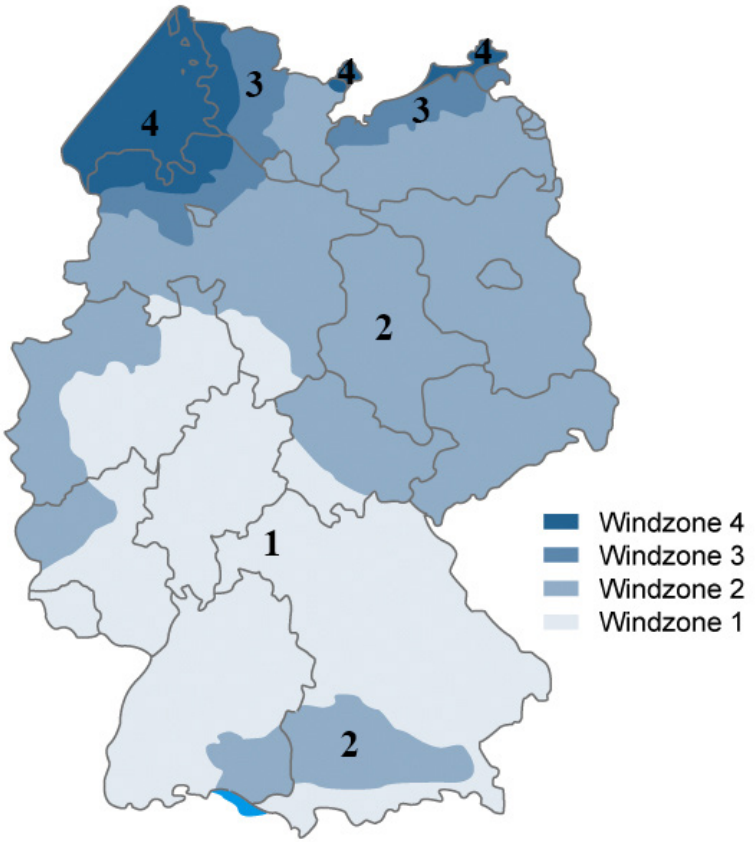
Surrounding parameters

Panelsize	Length approx. 1650 mm - Width max 1005 mm
	Height 28-50 mm - Weight approx. 19 kg
Position	Middle zone roof
Terrain category	Builded environment
Height above sea level	350 m
(Excluding North German Lowland)	
Roofing materials	Bitumen
Tile size*	30 x 30 x 4,5 cm á 9 kg
Flat roof	Max. 5% inclination

Height / Wind area	0 - 5 meter		5 - 7 meter		7 - 9 meter		9 - 12 meter		12 - 15 meter		
	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
1 (22,5 m/s)	18	34	18	34	18	34	18	34	18	34	kg
	2	4	2	4	2	4	2	4	2	4	tiles
2 (25 m/s)	18	45	18	45	18	45	18	45	18	45	kg
	2	5	2	5	2	5	2	5	2	5	tiles
3 (27,5 m/s)	18	58	18	58	18	58	18	58	18	58	kg
	2	6,5	2	6,5	2	6,5	2	6,5	2	6,5	tiles
4 (30 m/s)	18	72	18	72	18	72	18	72	18	72	kg
	2	8	2	8	2	8	2	8	2	8	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: *The max. of 20 tiles (4 in G1 and 16 in G2) can be placed for extra ballast (180 kg).*

Windmap Germany

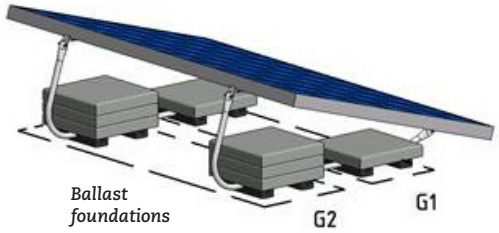


* *If you use tiles of different sizes and thus another weight, you need to adjust the number of tiles to get the right weight.*

Required ballast | United Kingdom

General
The ValkBox 3 mounting system must be reinforced by means of tiles, which must be placed on the indicated ballast foundations. In **three steps** you can easily calculate the required ballast;

- determine the wind area on the windmap
- choose the wind area and building height in the table
- you can now read the number of tiles / kg



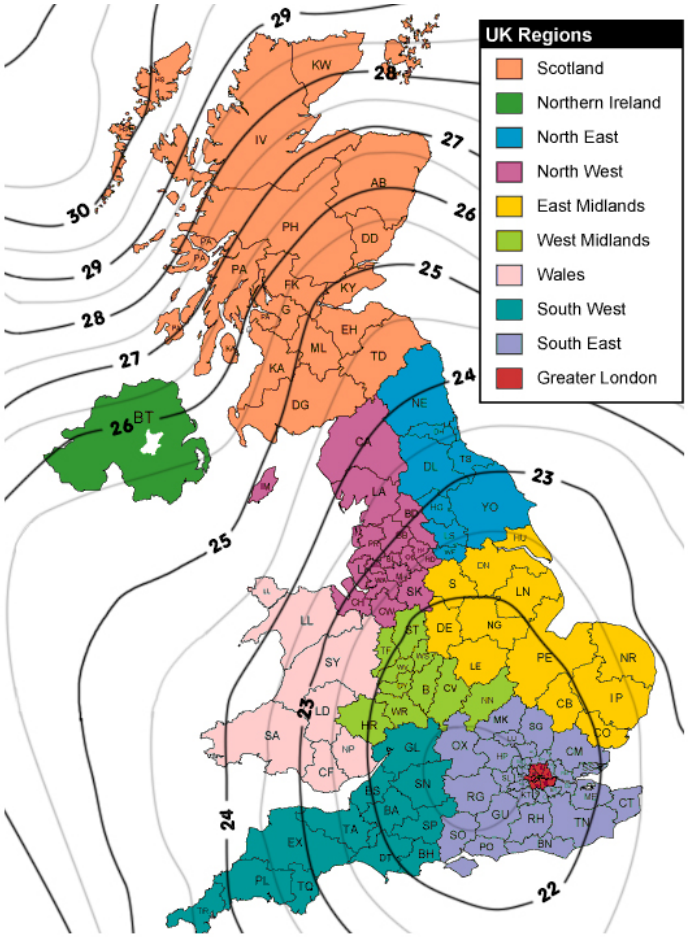
Surrounding parameters

Panelsize	Length approx. 1650 mm - Width max 1005 mm Height 28-50 mm - Weight approx. 19 kg
Position	Middle zone roof
Terrain category	Builded environment
Height above sea level	50 m
Distance to coast line	5 km
Distance to city boarder	5 km
Roofing materials	Bitumen
Tile size*	30 x 30 x 4,5 cm á 9 kg
Flat roof	Max. 5% inclination

Height / Wind area	0 - 5 meter		5 - 7 meter		7 - 9 meter		9 - 12 meter		12 - 15 meter		
	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
22 m/s	18	49	18	62	18	67	18	86	18	86	kg
	2	5,5	2	7	2	7,5	2	10	2	10	tiles
23 m/s	18	55	18	69	18	76	18	98	18	98	kg
	2	6,5	2	8	2	8,5	2	11	2	11	tiles
24 m/s	18	61	18	78	18	86	36	97	36	97	kg
	2	7	2	9	2	10	4	11	4	11	tiles
25 m/s	18	67	18	88	18	97	36	107	36	107	kg
	2	7,5	2	10	2	11	4	12	4	12	tiles
26 m/s	18	75	18	99	18	108	36	119	36	119	kg
	2	8,5	2	11	2	12	na**	na**	na**	na**	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: *The max. of 20 tiles (4 in G1 and 16 in G2) can be placed for extra ballast (180 kg).*

Windmap United Kingdom

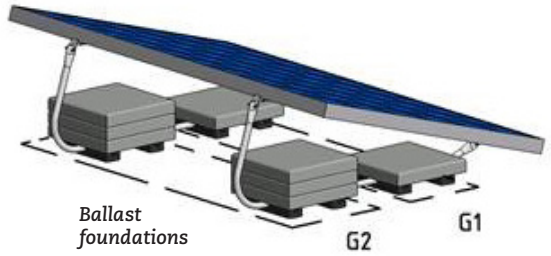


* *If you use tiles of different sizes and thus another weight, you need to adjust the number of tiles to get the right weight.*
** *Not available due to exceedance maximum number of tiles.*

Required ballast | Ireland

General
The ValkBox 3 mounting system must be reinforced by means of tiles, which must be placed on the indicated ballast foundations. In **three steps** you can easily calculate the required ballast;

- determine the wind area on the windmap
- choose the wind area and building height in the table
- you can now read the number of tiles / kg



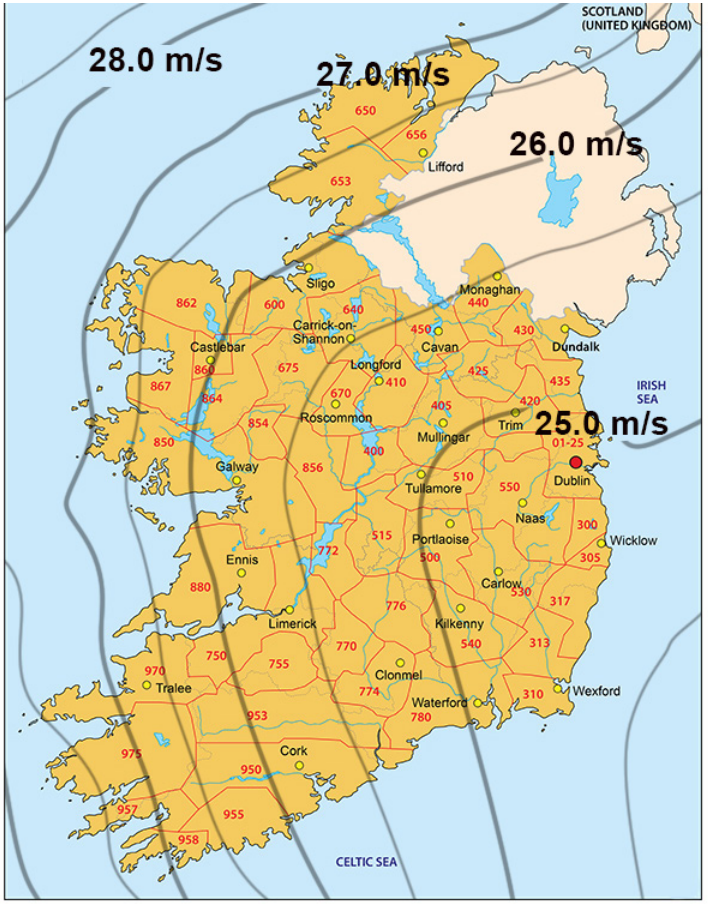
Surrounding parameters

Panelsize	Length approx. 1650 mm - Width max 1005 mm Height 28-50 mm - Weight approx. 19 kg
Position	Middle zone roof
Terrain category	Builded environment
Height above sea level	50 m
Distance to coast line	5 km
Distance to city boarder	5 km
(Northern Ireland: see United Kingdom)	
Roofing materials	Bitumen
Tile size*	30 x 30 x 4,5 cm á 9 kg
Flat roof	Max. 5% inclination

Height / Wind area	0 - 5 meter		5 - 7 meter		7 - 9 meter		9 - 12 meter		12 - 15 meter		
	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
25 m/s	18	67	18	88	18	97	36	107	36	107	kg
	2	7,5	2	10	2	11	4	12	4	12	tiles
26 m/s	18	75	18	99	18	108	36	119	36	119	kg
	2	8,5	2	11	2	12	na**	na**	na**	na**	tiles
27 m/s	18	84	36	97	36	104	36	133	36	133	kg
	2	9,5	4	11	4	12	na**	na**	na**	na**	tiles
28 m/s	18	94	36	105	36	114	36	148	36	148	kg
	2	10,5	4	12	na**	na**	na**	na**	na**	na**	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: *The max. of 20 tiles (4 in G1 and 16 in G2) can be placed for extra ballast (180 kg).*

Windmap Ireland

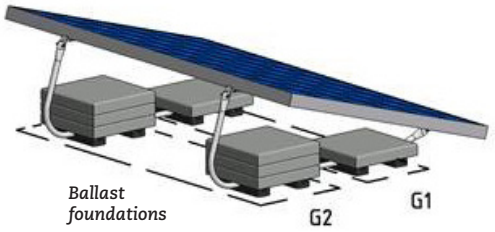


* *If you use tiles of different sizes and thus another weight, you need to adjust the number of tiles to get the right weight.*
** *Not available due to exceedance maximum number of tiles.*

Required ballast | Norway

General
The ValkBox 3 mounting system must be reinforced by means of tiles, which must be placed on the indicated ballast foundations. In **three steps** you can easily calculate the required ballast;

- determine the wind area on the windmap
- choose the wind area and building height in the table
- you can now read the number of tiles / kg



Surrounding parameters

Panelsize	Length approx. 1650 mm - Width max 1005 mm Height 28-50 mm - Weight approx. 19 kg
Position	Middle zone roof
Terrain category	Builded environment
Height above sea level	175 m
Roofing materials	Bitumen
Tile size*	30 x 30 x 4,5 cm á 9 kg
Flat roof	Max. 5% inclination

Height / Wind area**	0 - 5 meter		5 - 7 meter		7 - 9 meter		9 - 12 meter		12 - 15 meter		
	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
22 m/s	18	40	18	40	18	40	18	40	18	40	kg
	2	4,5	2	4,5	2	4,5	2	4,5	2	4,5	tiles
25 m/s	18	56	18	56	18	56	18	56	18	56	kg
	2	6,5	2	6,5	2	6,5	2	6,5	2	6,5	tiles
27 m/s	18	68	18	68	18	68	18	68	18	68	kg
	2	8	2	8	2	8	2	8	2	8	tiles
29 m/s	18	84	18	84	18	84	18	84	18	84	kg
	2	9,5	2	9,5	2	9,8	2	9,5	2	9,5	tiles
31 m/s	18	58	18	58	18	58	18	58	18	58	kg
	2	6,5	2	6,5	2	6,5	2	6,5	2	6,5	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: *The max. of 20 tiles (4 in G1 and 16 in G2) can be placed for extra ballast (180 kg).*

Norway

To determine the wind area see next page.

* *If you use tiles of different sizes and thus another weight, you need to adjust the number of tiles to get the right weight.*
** *To determine the wind area see next page.*

Wind area Norway

	m/s
Province Østfold	**22**
Except Municipalities:	
Halden	24
Moss	24
Rygge	24
Råde	24
Sarpsborg	24
Våler	24
Fredrikstad	26
Hvaler	27
Province Akershus	**22**
Except Municipality:	
Vestby	24
Province Oslo	**22**
Province Hedmark	**22**
Except Municipalities:	
Alvdal	24
Folldal	24
Folldal near Trøndelag	24
Os	24
Os near Trøndelag	24
Tolga	24
Tynset	24
Tynset Kvikne	24
Tynset near Trøndelag	24
Province Oppland	**22**
Except Municipalities:	
Vågå	23
Dovre	24
Dovre near Trøndelag	24
Lom	24
Lom near Sogn og Fj.	24
Vang	24
Vang near Sogn og Fj.	24
Lesja	25
Lesja near Trøndelag/ Møre og Romsdal	25
Skjåk	25
Skjåk near Sogn og Fj./ Møre og Romsdal	25
Province Buskerud	**22**
Except Municipalities:	
Hemsedal	24
Hemsedal near Sogn og Fj.	24
Hol	24
Hol near Hordeland / Sogn og Fjordane	24
Hurum	24
Nore og Uvdal	24
Nore og Uvdal near Hordeland	24
Ål	24
Ål near Sogn og Fj.	24

	m/s
Province Vestford	**23**
Except Municipalities:	
Hof	22
Lardal	22
Nøtterøy	24
Sandefjord	24
Stokke	24
Tønsberg	24
Larvik	25
Tjøme	26
Province Telemark	**22**
Except Municipalities:	
Bamble	23
Porsgrunn	23
Fyresdal	24
Kragerø	24
Tinn	24
Tokke	24
Vinje	24
Vinje near Rogaland/Hordaland	24
Province Aust-Agder	**24**
Except Municipalities:	
Arendal	26
Grimstad	26
Lillesand	26
Risør	26
Tvedestrand	26
Province Vest-Agder	**24**
Except Municipalities:	
Flekkefjord	26
Flekkefjord near Rogaland	26
Kristiansand	26
Lyngdal	26
Søngne	26
Farsund	28
Lindesnes	28
Mandal	28
Province Rogaland	**26**
Except Municipalities:	
Hjelmeland	24
Sauda	24
Suldal	24
Vindafjord	24
Eigersund	27
Sokndal	27
Bokn	28
Haugesund	28
Klepp	28
Randaberg	28
Rennesøy	28
Sola	28
Time	28
Hå	29

	m/s
Kvitsøy	29
Karmøy	30
Utsira	30
Ølen	*Municipality isn't in the Wind standard*
Province Hordaland	**26**
Except Municipalities:	
Etne	24
Etne near the Folgefonna	24
Granvin	24
Kvam	24
Modalen	24
Samnanger	24
Ulvik	24
Vaksdal	24
Voss	24
Osterøy	25
Radøy	27
Austevoll	28
Austrheim	28
Bømlo	28
Fjell	28
Sund	28
Øygarden	29
Fedje	30
Province Sogn og Fjordane	**24**
Except Municipalities:	
Aurland	25
Eid	26
Fjaler	26
Førde	26
Førde near the Jostedalsbreen	26
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Gloppen	26
Gloppen near the Ålfotbreen and Jostedalsbreen	26
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Hyllestad	26
Høyanger	26
Lærdal	26
Naustdal	26
Askvoll	28
Flora	28
Gulen	28
Bremanger	29
Bremanger near the Ålfotbreen	29
Solund	29
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	m/s
Province Møre og Romsdal	**30**
Except Municipalities:	
Rindal	25
Surnadal	25
Nesset	26
Norddal	26
Stordal	26
Stranda	26
Sunndal	27
Gjemnes	28
Rauma	28
Sykkylven	28
Tingvoll	28
Volda	28
Ørskog	28
Ørsta	28
Eide	29
Halsa	29
Hareid	29
Molde	29
Skodje	29
Sula	29
Ålesund	29
Sandøy	31
Frei	*Municipality isn't in the Wind standard*
Tustna	*Municipality isn't in the Wind standard*
Province Sør-Trøndelag	**25**
Except Municipalities:	
Malvik	26
Oppdal	26
Rennebu	26
Trondheim	26
Agdenes	27
Rissa	27
Snillfjord	27
Hemne	28
Bjugn	29
Osen	29
Roan	29
Åfjord	29
Frøya	30
Hitra	30
Ørland	30

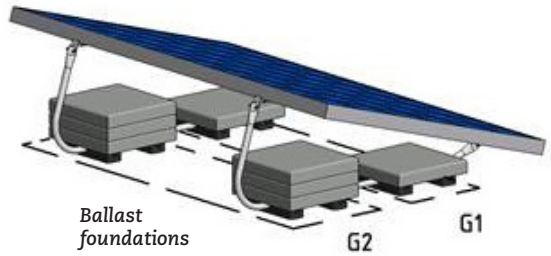
	m/s
Province Nord-Trøndelag	**26**
Except Municipalities:	
Lierne	24
Meråker	25
Røyrvik	25
Snåsa	25
Flatanger	29
Fosnes	29
Leka	29
Leka on the mainland	29
Nærøy	29
Vikna	30
Province Nordland	**29**
Except Municipalities:	
Beiarn	26
Evenes	26
Fauske	26
Grane	26
Hattfjelldal	26
Hemnes	26
Rana	26
Saltdal	26
Sørfold	26
Ballangen	27
Tjeldsund	27
Tysfjord	27
Hamarøy	28
Narvik	28
Sortland	28
Vefsn	28
Vefsn along the fjord	28
Vefsn Mosjøen	28
Vevelstad	28
Alstahaug	30
Bindal	30
Bodø	30
Dønna	30
Flakstad	30
Herøy	30
Leirfjord	30
Lurøy	30
Lurøy on the mainland	30
Nesna	30
Sømna	30
Vega	30
Vestvågøy	30
Andøy	31
Moskenes	31
Røst	31
Træna	31
Værøy	31
Skjerstad	*Municipality isn't in the Wind standard*

	m/s
Province Troms	**26**
Except Municipalities:	
Bardu	24
Målselv	24
Strofjord	24
Gáivuona/Kåfjord	25
Balsfjord	26
Gratangen	26
Ibestad	26
Lavangen	26
Lyngen	26
Salangen	26
Skånland	26
Sørreisa	26
Dyrøy	27
Harstad	27
Lenvik	27
Nordreisa	27
Tranøy	27
Tromsø	27
Bjarkøy	28
Kvænangen	28
Skjervøy	28
Karlsøy	29
Berg	30
Torsken	30
Province Finnmark	**29**
Except Municipalities:	
Kárájoga / Karasjok	24
Guovdageaidnu / Kautokeino	24
Deanu/Tana	27
Porsanger	27
Unjárgga / Nesseby	27
Alta	28
Berlevåg	30
Gamvik	30
Hasvik	30
Måsøy	30
Nordkapp	30
Vardø	30
Province Svalbard	**30**

Required ballast | Sweden

General
The ValkBox 3 mounting system must be reinforced by means of tiles, which must be placed on the indicated ballast foundations. In **three steps** you can easily calculate the required ballast;

- determine the wind area on the windmap
- choose the wind area and building height in the table
- you can now read the number of tiles / kg



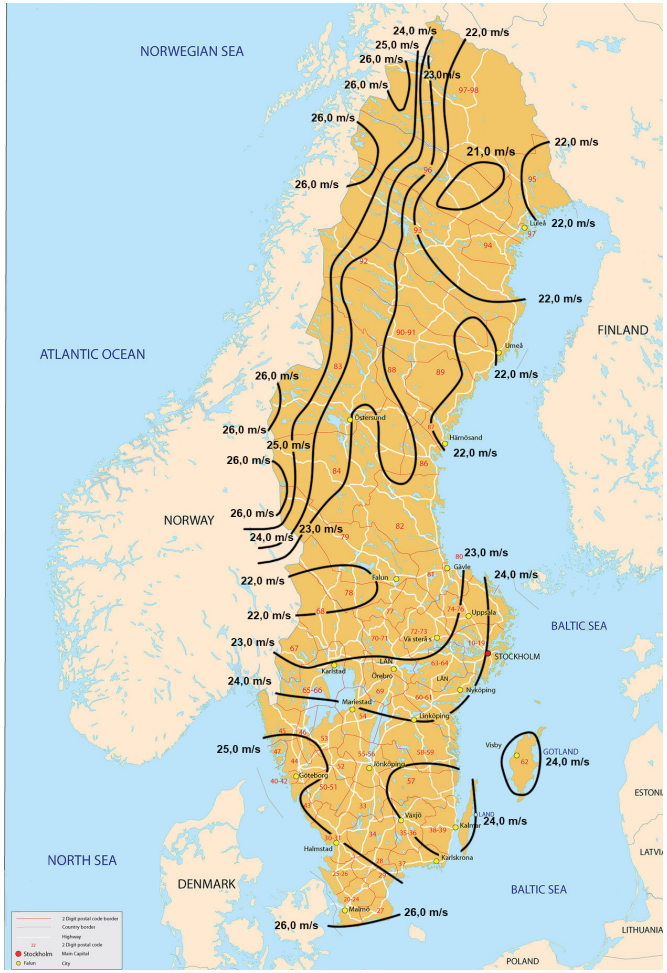
Surrounding parameters

Panelsize	Length approx. 1650 mm - Width max 1005 mm
	Height 28-50 mm - Weight approx. 19 kg
Position	Middle zone roof
Terrain category	Builded environment
Roofing materials	Bitumen
Tile size*	30 x 30 x 4,5 cm á 9 kg
Flat roof	Max. 5% inclination

Height / Wind area	0 - 5 meter		5 - 7 meter		7 - 9 meter		9 - 12 meter		12 - 15 meter		
	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
22 m/s	18	9,5	18	10	18	17	18	24	18	29	kg
	2	2	2	2	2	2	2	3	2	3,5	tiles
23 m/s	18	4	18	13	18	20	18	28	18	33	kg
	2	2	2	2	2	2,5	2	3,5	2	4	tiles
24 m/s	18	6	18	15	18	24	18	32	18	37	kg
	2	2	2	2	2	3	2	4	2	4,5	tiles
25 m/s	18	7	18	18	18	27	18	36	18	42	kg
	2	2	2	2	2	3	2	4	2	5	tiles
26 m/s	18	9	18	21	18	30	18	40	18	47	kg
	2	2	2	2,5	2	3,5	2	4,5	2	5,5	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: *The max. of 20 tiles (4 in G1 and 16 in G2) can be placed for extra ballast (180 kg).*

Windmap Sweden

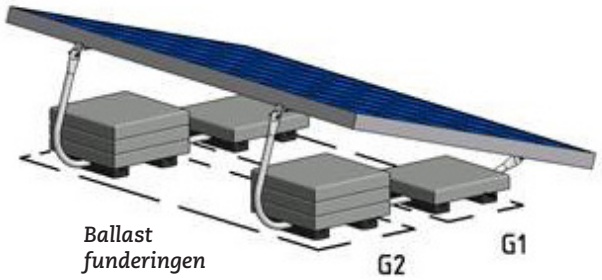


* *If you use tiles of different sizes and thus another weight, you need to adjust the number of tiles to get the right weight.*

Required ballast | Finland

General
The ValkBox 3 mounting system must be reinforced by means of tiles, which must be placed on the indicated ballast foundations. In **three steps** you can easily calculate the required ballast;

- determine the wind area on the windmap
- choose the wind area and building height in the table
- you can now read the number of tiles / kg



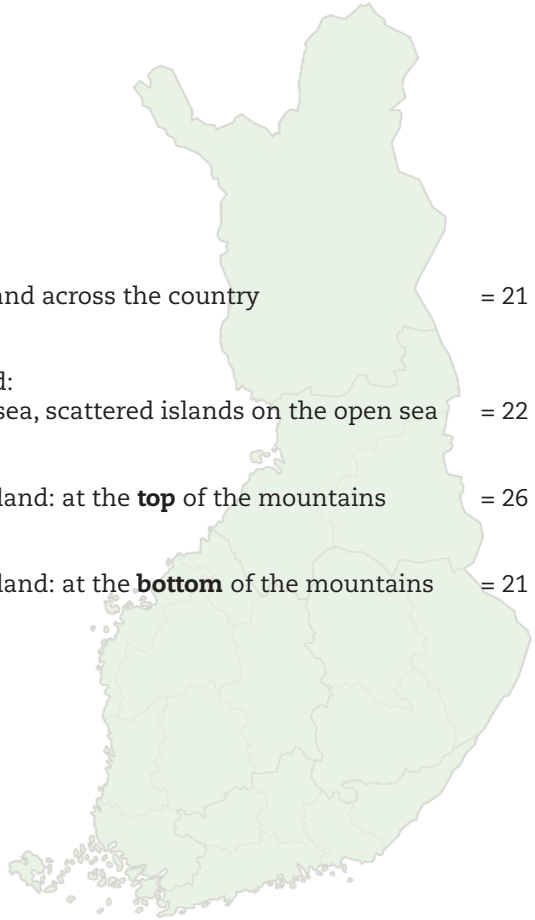
Surrounding parameters

Panelsize	Length approx. 1650 mm - Width max 1005 mm Height 28-50 mm - Weight approx. 19 kg
Position	Middle zone roof
Terrain category	Town
Roofing materials	Bitumen
Tile size*	30 x 30 x 4,5 cm á 9 kg
Flat roof	Max. 5% inclination

Height / Wind area	0 - 5 meter		5 - 7 meter		7 - 9 meter		9 - 12 meter		12 - 15 meter		
	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
21 m/s	18	29	18	29	18	29	18	33	18	39	kg
	2	3,5	2	3,5	2	3,5	2	4	2	4,5	tiles
22 m/s	18	33	18	33	18	33	18	38	18	44	kg
	2	4	2	4	2	4	2	4,5	2	5	tiles
26 m/s	18	52	18	52	18	52	18	59	18	71	kg
	2	6	2	6	2	6	2	7	2	8	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: *The max. of 20 tiles (4 in G1 and 16 in G2) can be placed for extra ballast (180 kg).*

Windmap Finland



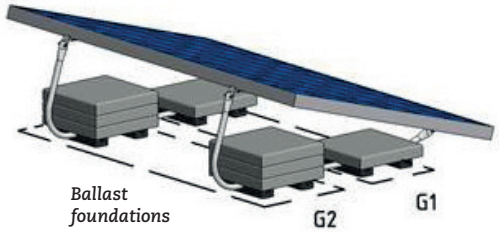
- Mainland across the country = 21 m/s
- Seabed:
  Open sea, scattered islands on the open sea = 22 m/s
- In Lapland: at the **top** of the mountains = 26 m/s
- In Lapland: at the **bottom** of the mountains = 21 m/s

* *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 ValkBox 3 mounting system must be reinforced by means of tiles, which must be placed on the indicated ballast foundations. In **three steps** you can easily calculate the required ballast;

- determine the wind area on the windmap
- choose the wind area and building height in the table
- you can now read the number of tiles / kg



Surrounding parameters

Panelsize	Length approx. 1650 mm - Width max 1005 mm Height 28-50 mm - Weight approx. 19 kg
Position	Middle zone roof
Terrain category	Builded environment
Height above sea level	250 m
Roofing materials	Bitumen
Tile size*	30 x 30 x 4,5 cm á 9 kg
Flat roof	Max. 5% inclination

Height / Wind area	0 - 5 meter		5 - 7 meter		7 - 9 meter		9 - 12 meter		12 - 15 meter		
	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
1	18	44	18	49	18	53	18	58	18	63	kg
	2	5	2	5,5	2	6	2	6,5	2	7	tiles
2	18	67	18	75	18	83	18	93	18	101	kg
	2	7,5	2	8,5	2	9,5	2	10,5	2	11,5	tiles
3	18	44	18	49	18	53	18	58	18	63	kg
	2	5	2	5,5	2	6	2	6,5	2	7	tiles

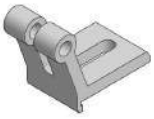
Note 1: *Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg).*
Note 2: *The ballast in G1 & G2 must be equally divided over the rubber ballast carriers.*
Note 3: *The max. of 20 tiles (4 in G1 and 16 in G2) can be placed for extra ballast (180 kg).*

Windmap Poland

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

Installation manual

Components included

4x 

2x

4x

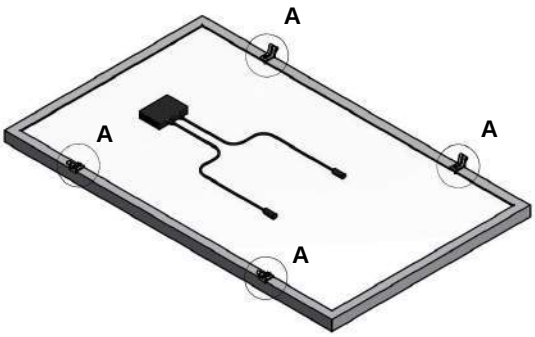
5x (1 spare)

5x (1 spare)

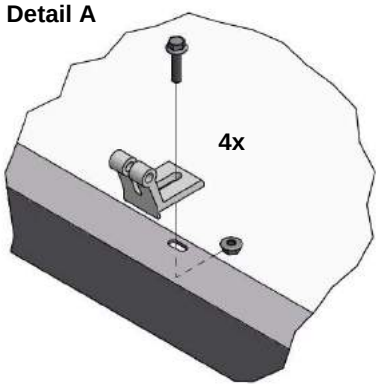
9x (1 spare)

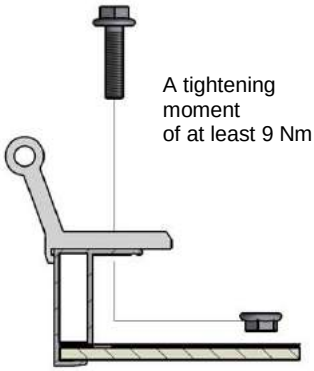
3x

Step 1: Fit the support mounts



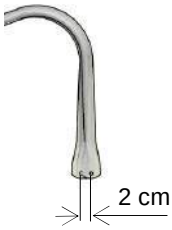
Detail A

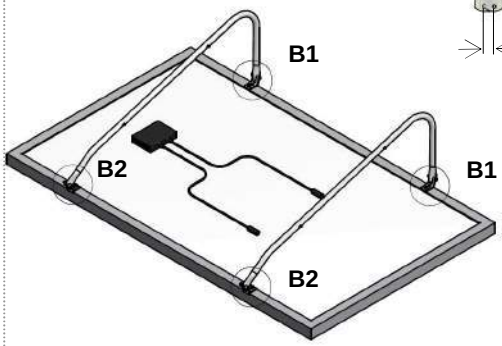




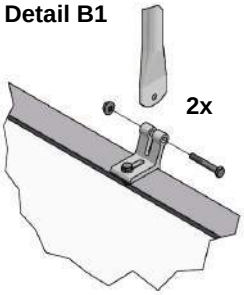
Step 2: Mount the curved supports

The curved aluminium supports are suitable for panels with a width of 98 - 100 cm.



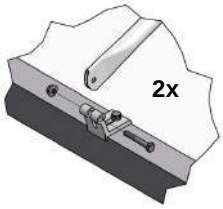


Detail B1



Tighten the hinge bolts B1 by hand. These must be removed temporarily in Step 4.

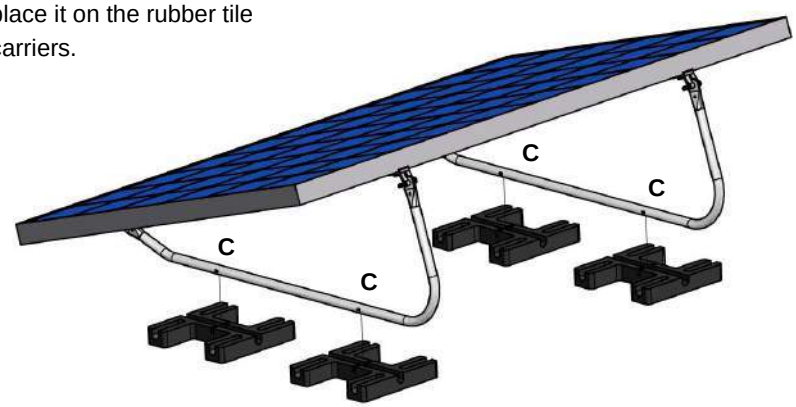
Detail B2



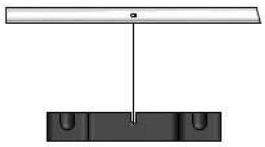
⚠ Tighten the hinge bolts B2 firmly, with a tightening moment of at least 9 Nm, until there is no play.

Step 3: Attach the rubber tiles

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



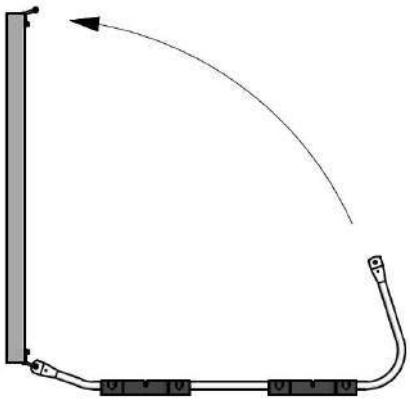
Detail C

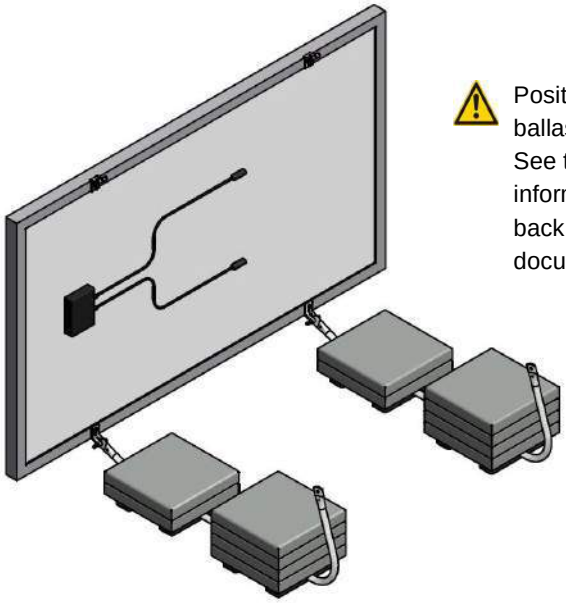


⚠ The projections on the curved aluminium supports must be placed in the grooves on the rubber tiles.

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.

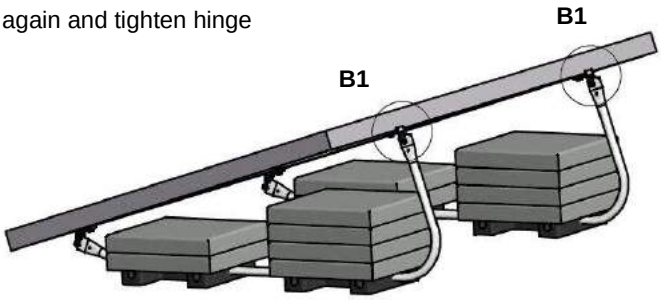




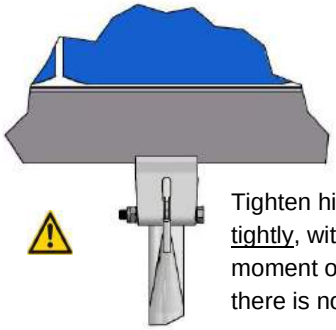
⚠ Position the ballast required. See the information on the back of this document.

Step 5: Tighten hinge bolts B1

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



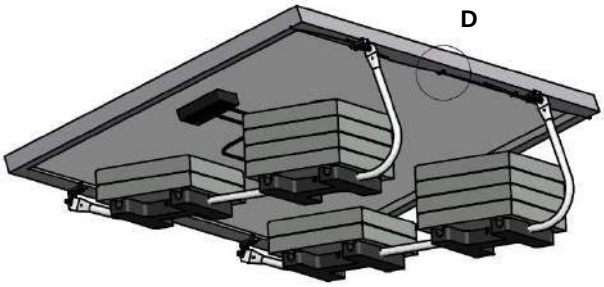
Detail B1



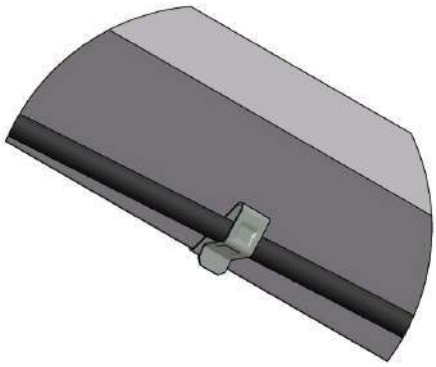
⚠ Tighten hinge bolts B1 tightly, with a tightening moment of at least 9 Nm, until there is no play.

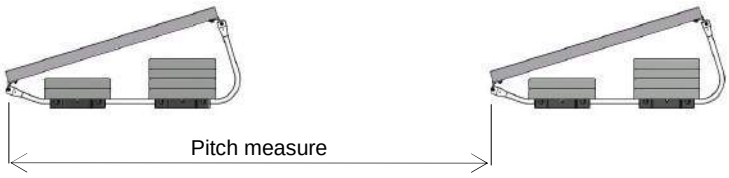
Step 6: Finish fitting the cables

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



Detail D



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.