

# Installation manual ValkBox3



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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](http://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](http://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 x 30 x 4.5 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

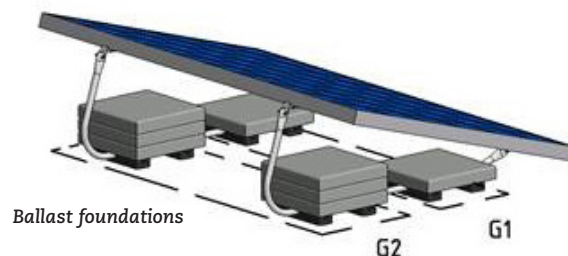
Note 1: Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg).

Note 2: The ballast in G1 & G2 must be equally divided over the rubber ballast carriers.

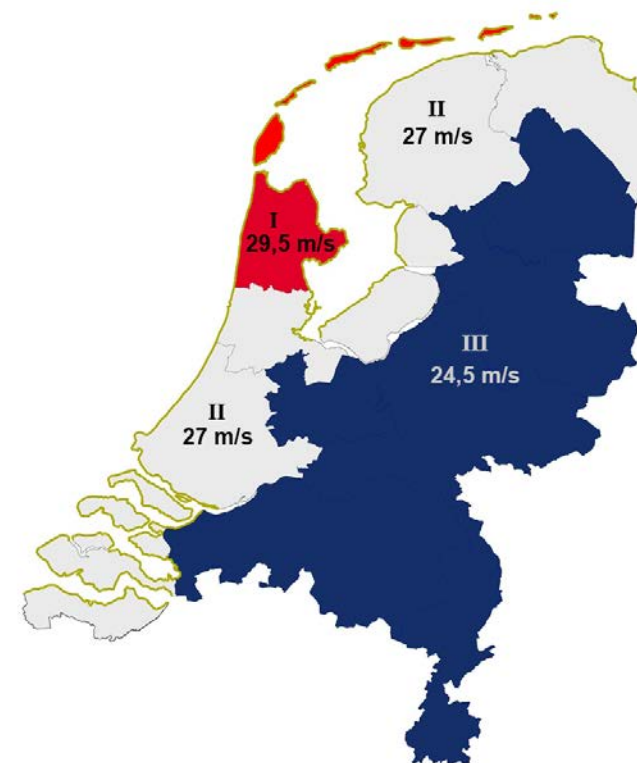
Note 3: At maximum 17 tiles (30x30x4.5 cm) can be placed on the tile carriers. 4 tiles in G1 and 13 (2x6.5) tiles in G2. This represents a ballast weight of 153 kg).

### Environmental factors

Roof zone	Middle zone
Terrain category	Built area
Roofing materials	Bitumen, EPDM or concrete



### Windmap The Netherlands



Panel: maximum dimensions 1800x1150 mm

Building height	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)	36	97	36	97	X	X	X	X	X	X	kg
	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
	4	9	4	9	4	10	4	12	4	X	tiles
III (24,5 m/s)	36	59	36	59	36	69	36	81	36	90	kg
	4	7	4	7	4	8	4	9	4	10	tiles

Panel: maximum dimensions 2280x1150 mm

Building height	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)	X	X	X	X	X	X	X	X	X	X	kg
	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
	4	11,5	4	11,5	4	13	X	X	X	X	tiles
III (24,5 m/s)	36	78	36	78	36	90	36	105	X	X	kg
	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 tiles

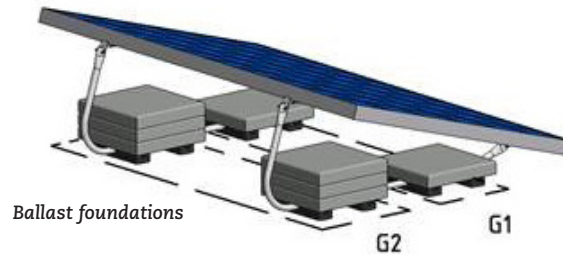
Note 1: Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg).

Note 2: The ballast in G1 & G2 must be equally divided over the rubber ballast carriers.

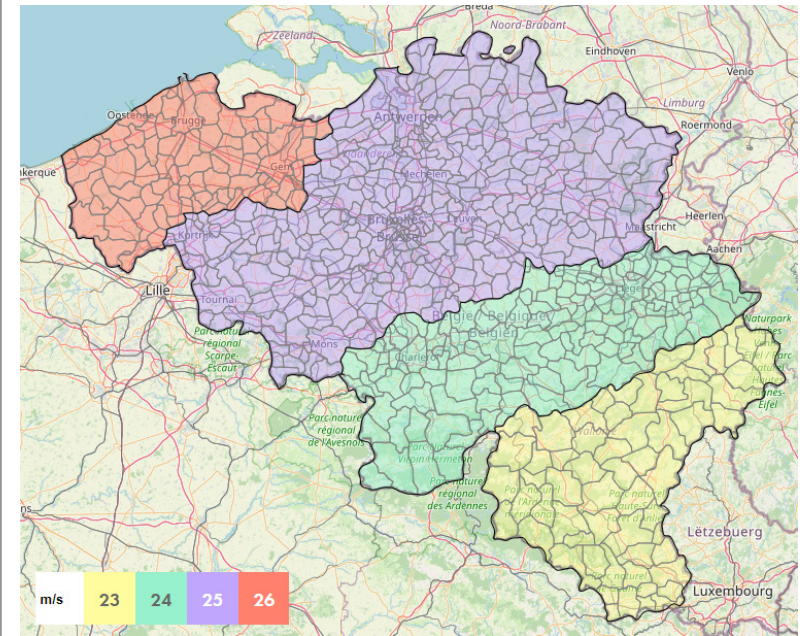
Note 3: At maximum 17 tiles (30x30x4.5 cm) can be placed on the tile carriers. 4 tiles in G1 and 13 (2x6.5) tiles in G2. This represents a ballast weight of 153 kg).

## Environmental factors

Roof zone	Middle zone
Terrain category	III (villages, suburban terrain, permanent forest)
Roofing materials	Bitumen, EPDM or concrete



## Windmap Belgium



Panel: maximum dimensions 1800x1150 mm

Building height	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	36	40	36	50	36	57	36	66	36	74	kg
	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
	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
	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
	4	6,5	4	8	4	9	4	10	4	11	tiles

Panel: maximum dimensions 2280x1150 mm

Building height	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	36	54	36	66	36	76	36	87	36	96	kg
	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
	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
	4	8	4	9,5	4	10,5	4	12	X	X	tiles
26 m/s	36	75	36	91	X	X	X	X	X	X	kg
	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 tiles

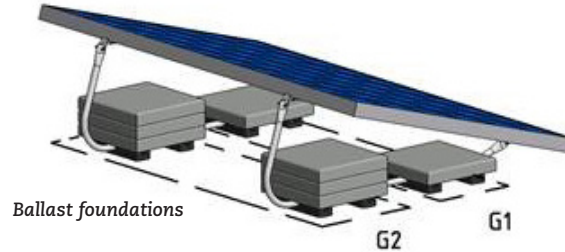
Note 1: Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg).

Note 2: The ballast in G1 & G2 must be equally divided over the rubber ballast carriers.

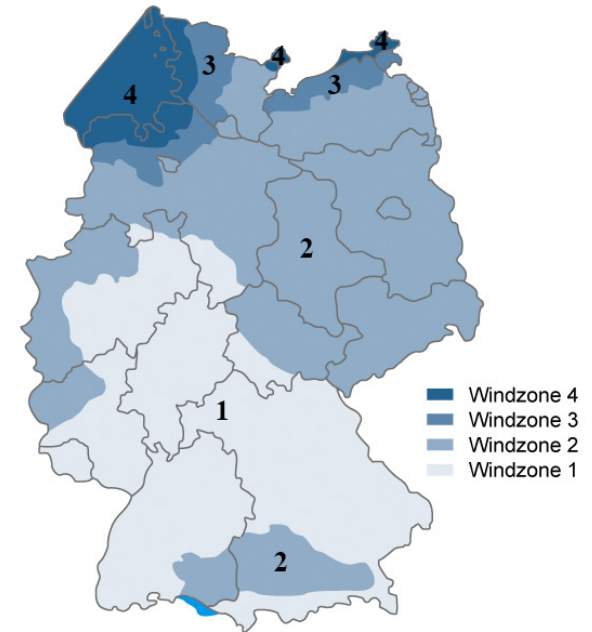
Note 3: At maximum 17 tiles (30x30x4.5 cm) can be placed on the tile carriers. 4 tiles in G1 and 13 (2x6.5) tiles in G2. This represents a ballast weight of 153 kg).

## Environmental factors

Roof zone Middle zone  
 Terrain category IV (city)  
 Height above sea level 350 m  
**Exclusief North German Lowland**  
 Roofing materials Bitumen, EPDM or concrete



Windmap Germany



Panel: maximum dimensions 1800x1150 mm

Building height	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)	36	41	36	41	36	41	36	41	36	41	kg
	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
	4	6,5	4	6,5	4	6,5	4	6,5	4	6,5	tiles
3 (27,5 m/s)	36	72	36	72	36	72	36	72	36	72	kg
	4	8	4	8	4	8	4	8	4	8	tiles
4 (30 m/s)	36	89	36	89	36	89	36	89	36	89	kg
	4	10	4	10	4	10	4	10	4	10	tiles

Panel: maximum dimensions 2280x1150 mm

Building height	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)	36	55	36	55	36	55	36	55	36	55	kg
	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
	4	8,5	4	8,5	4	8,5	4	8,5	4	8,5	tiles
3 (27,5 m/s)	36	94	36	94	36	94	36	94	36	94	kg
	4	10,5	4	10,5	4	10,5	4	10,5	4	10,5	tiles
4 (30 m/s)	X	X	X	X	X	X	X	X	X	X	kg
	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 tiles

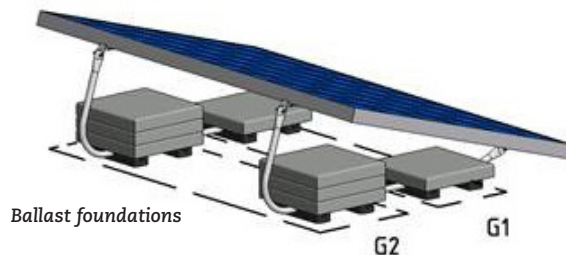
Note 1: Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg).

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).

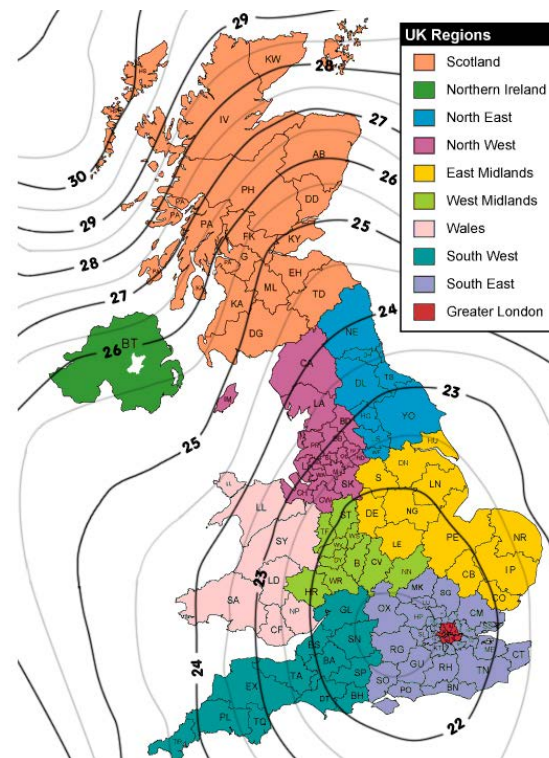
## Environmental factors

Roof zone	Middle zone
Terrain category	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



Ballast foundations

## Windmap United Kingdom



Panel: maximum dimensions 1800x1150 mm

Building height	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	36	60	36	76	36	83	36	102	36	102	kg
	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
	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
	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
	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
	4	10,5	X	X	X	X	X	X	X	X	tiles

Panel: maximum dimensions 2280x1150 mm

Building height	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	36	79	36	100	36	108	X	X	X	X	kg
	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
	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
	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
	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
	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 tiles

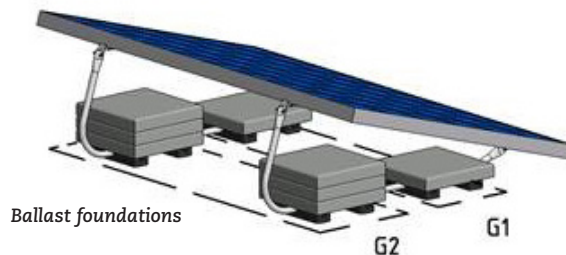
Note 1: Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg).

Note 2: The ballast in G1 & G2 must be equally divided over the rubber ballast carriers.

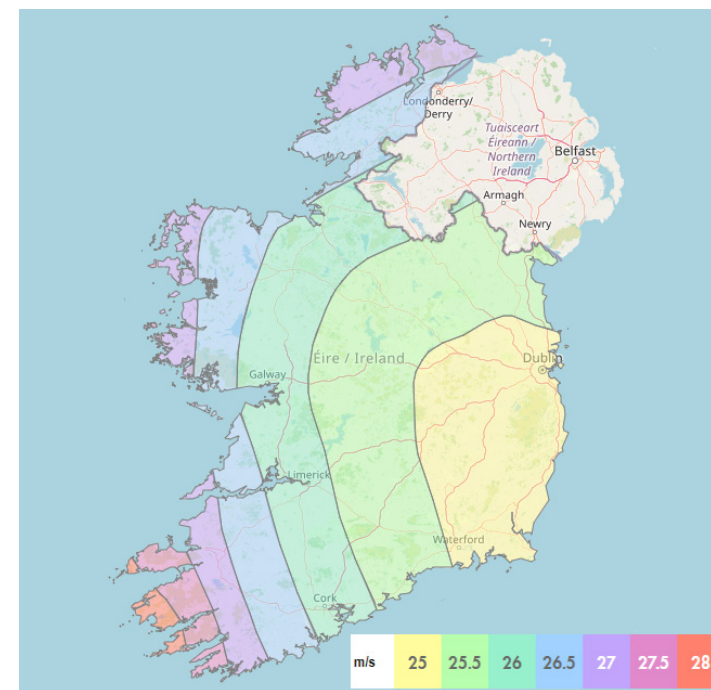
Note 3: At maximum 17 tiles (30x30x4.5 cm) can be placed on the tile carriers. 4 tiles in G1 and 13 (2x6.5) tiles in G2. This represents a ballast weight of 153 kg).

## Environmental factors

Roof zone	Middle zone
Terrain category	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	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	36	83	36	104	X	X	X	X	X	X	kg
	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
	4	10,5	X	X	X	X	X	X	X	X	tiles
27 m/s	36	100	X	X	X	X	X	X	X	X	kg
	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
	X	X	X	X	X	X	X	X	X	X	tiles

Panel: maximum dimensions 2280x1150 mm

Building height	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	36	108	X	X	X	X	X	X	X	X	kg
	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
	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
	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
	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

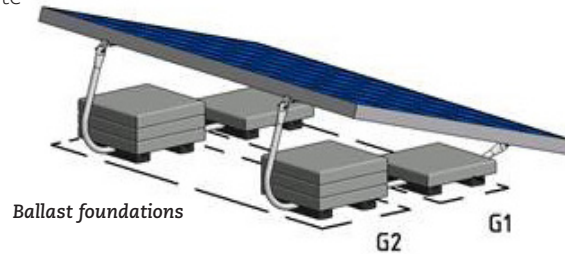
Note 1: Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg).

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



Panel: maximum dimensions 1800x1150 mm

Building height	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	36	53	36	53	36	56	36	65	36	72	kg
	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
	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
	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
	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
	X	X	X	X	X	X	X	X	X	X	tiles

Panel: maximum dimensions 2280x1150 mm

Building height	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	36	70	36	70	36	74	36	85	36	94	kg
	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
	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
	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
	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
	X	X	X	X	X	X	X	X	X	X	tiles

### Windmap Norway

**For determining the wind area see next page.**

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/s		m/s		m/s		m/s
<b>Provincie Østfold</b>	<b>22</b>	Nore og Uvdal	24	Sokndal	27	Flora	28	<b>Provincie Nord-Trøndelag</b>	<b>26</b>	<b>Provincie Troms</b>	<b>26</b>
<i>Except Municipalities:</i>		Nore og Uvdal near Hordeland	24	Bokn	28	Gulen	28	<i>Except Municipalities:</i>		<i>Except Municipalities:</i>	
Halden	24	Ål	24	Haugesund	28	Bremanger	29	Lierne	24	Bardu	24
Moss	24	Ål near Sogn og Fj.	24	Klepp	28	Bremanger near the Ålfotbreen	29	Meråker	25	Målselv	24
Rygge	24	<b>Provincie Vestfold</b>	<b>23</b>	Randaberg	28	Solund	29	Røyrvik	25	Stroffjord	24
Råde	24	<i>Except Municipalities:</i>		Rennesøy	28	Selje	31	Snåsa	25	Gáivuona/Káfjord	25
Sarpsborg	24	Hof	22	Sola	28	Vågsøy	31	Flatanger	29	Balsfjord	26
Våler	24	Lardal	22	Time	28	<b>Provincie Møre og Romsdal</b>	<b>30</b>	Fosnes	29	Gratangen	26
Fredrikstad	26	Nøtterøy	24	Hå	29	<i>Except Municipalities:</i>		Leka	29	Ibestad	26
Hvaler	27	Sandefjord	24	Kvitsøy	29	Rindal	25	Leka on the mainland	29	Lavangen	26
<b>Provincie Akershus</b>	<b>22</b>	Stokke	24	Karmøy	30	Surnadal	25	Nærøy	29	Lyngen	26
<i>Except Municipality:</i>		Tønsberg	24	Ølen	30	Neset	26	Vikna	30	Salangen	26
Vestby	24	Larvik	25			Norddal	26	<b>Provincie Nordland</b>	<b>29</b>	Skånland	26
		Tjøme	26			Stordal	26	<i>Except Municipalities:</i>		Sørreisa	26
<b>Provincie Oslo</b>	<b>22</b>	<b>Provincie Telemark</b>	<b>22</b>	<b>Provincie Hordaland</b>	<b>26</b>	Stranda	26	Beiam	26	Dyrøy	27
		<i>Except Municipalities:</i>		<i>Except Municipalities:</i>		Sunndal	27	Evenes	26	Harstad	27
<b>Provincie Hedmark</b>	<b>22</b>	Bamble	23	Etne	24	Gjemnes	28	Fauske	26	Lenvik	27
<i>Except Municipalities:</i>		Porsgrunn	23	Etne near the Folgefonna	24	Rauma	28	Grane	26	Nordreisa	27
Alvdal	24	Fyresdal	24	Granvin	24	Sykkylven	28	Hattfjelldal	26	Tranøy	27
Folldal	24	Kragerø	24	Kvam	24	Tingvoll	28	Hemnes	26	Tromsø	27
Folldal near Trøndelag	24	Tinn	24	Modalen	24	Volda	28	Rana	26	Bjarkøy	28
Os	24	Tokke	24	Samnanger	24	Ørskog	28	Kvænangen	28	Kvænangen	28
Os near Trøndelag	24	Vinje	24	Ulvik	24	Ørsta	28	Skjervøy	28	Skjervøy	28
Tolga	24	Vinje near Rogaland/Hordaland	24	Vaksdal	24	Eide	29	Karlsøy	29	Karlsøy	29
Tynset	24	<b>Provincie Aust-Agder</b>	<b>24</b>	Voss	24	Halsa	29	Berg	30	Berg	30
Tynset Kvikne	24	<i>Except Municipalities:</i>		Osterøy	25	Hareid	29	Torsken	30	Torsken	30
Tynset near Trøndelag	24	Arendal	26	Radøy	27	Molde	29				
<b>Provincie Oppland</b>	<b>22</b>	Grimstad	26	Austevoll	28	Skodje	29	<b>Provincie Finnmark</b>	<b>29</b>	<i>Except Municipalities:</i>	
<i>Except Municipalities:</i>		Lillesand	26	Austrheim	28	Sula	29	Karájoga / Karasjok	24	Karájoga / Karasjok	24
Vågå	23	Risør	26	Bømlo	28	Ålesund	29	Guovdageaidnu / Kautokeino	24	Guovdageaidnu / Kautokeino	24
Dovre	24	Tvedestrand	26	Fjell	28	Sandøy	31	Deanu/Tana	27	Deanu/Tana	27
Dovre near Trøndelag	24	<b>Provincie Vest-Agder</b>	<b>24</b>	Sund	28	Frei	31	Porsanger	27	Porsanger	27
Lom	24	<i>Except Municipalities:</i>		Øygarden	29	Tustna	31	Unjárgga / Nesseby	27	Unjárgga / Nesseby	27
Lom near Sogn og Fj.	24	Flekkefjord	26	Fedje	30			Alstahaug	30	Alstahaug	30
Vang	24	Flekkefjord near Rogaland	26	<b>Provincie Sogn og Fjordane</b>	<b>24</b>	<i>Municipality isn't in the Wind standard</i>		Bindal	30	Bindal	30
Vang near Sogn og Fj.	24	Kristiansand	26	<i>Except Municipalities:</i>		<i>Municipality isn't in the Wind standard</i>		Bodø	30	Bodø	30
Lesja	25	Lyngdal	26	Aurland	25	<b>Provincie Sør-Trøndelag</b>	<b>25</b>	Dønna	30	Dønna	30
Lesja near Trøndelag/	25	Søngne	26	Eid	26	<i>Except Municipalities:</i>		Flakstad	30	Flakstad	30
Møre og Romsdal	25	Farsund	28	Fjaler	26	Malvik	26	Herøy	30	Herøy	30
Skjåk	25	Lindesnes	28	Førde	26	Oppdal	26	Leirfjord	30	Leirfjord	30
Skjåk near Sogn og Fj./	25	Mandal	28	Førde near the Jostedalsbreen	26	Rennebu	26	Lurøy	30	Lurøy	30
Møre og Romsdal	25	<b>Provincie Rogaland</b>	<b>26</b>	Gaular	26	Trondheim	26	Lurøy on the mainland	30	Lurøy on the mainland	30
<b>Provincie Buskerud</b>	<b>22</b>	<i>Except Municipalities:</i>		Gloppen	26	Agdenes	27	Nesna	30	Nesna	30
<i>Except Municipalities:</i>		Hemsedal	24	Gloppen near the Ålfotbreen and	26	Rissa	27	Sømna	30	Sømna	30
Hemsedal	24	Hjelmeland	24	Jostedalsbreen	26	Snillfjord	27	Vega	30	Vega	30
Hol	24	Sauda	24	Hornindal	26	Hemne	28	Vestvågøy	30	Vestvågøy	30
Hol near Hordeland /	24	Suldal	24	Hyllestad	26	Bjugn	29	Andøy	31	Andøy	31
Sogn og Fjordane	24	Vindafjord	24	Høyanger	26	Roan	29	Moskenes	31	Moskenes	31
Hurum	24	Eigersund	27	Lærdal	26	Åfjord	29	Røst	31	Røst	31
				Naustdal	26	Frøya	30	Træna	31	Træna	31
				Askvoll	28	Hitra	30	Værøy	31	Værøy	31
						Ørland	30	Skjerstad	31	Skjerstad	31
								<i>Municipality isn't in the Wind standard</i>		<i>Municipality isn't in the Wind standard</i>	

# 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 tiles

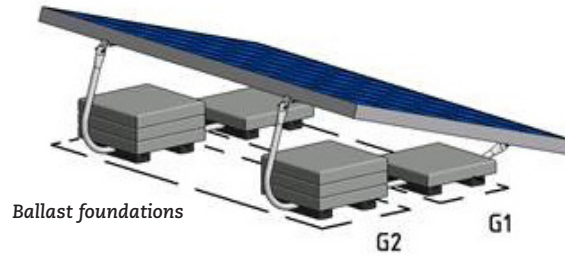
Note 1: Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg).

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



Panel: maximum dimensions 1800x1150 mm

Building height	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	36	29	36	37	36	44	36	51	36	57	kg
	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
	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
	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
	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
	4	5,5	4	7	4	8	4	9	4	10	tiles

Panel: maximum dimensions 2280x1150 mm

Building height	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	36	40	36	50	36	58	36	68	36	75	kg
	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
	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
	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
	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
	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 tiles

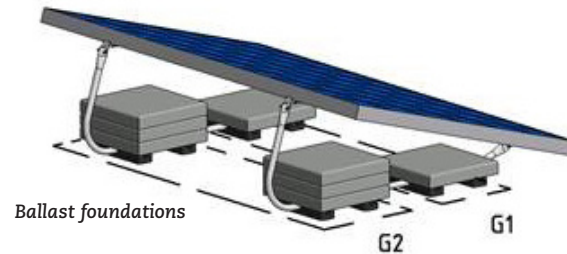
Note 1: Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg).

Note 2: The ballast in G1 & G2 must be equally divided over the rubber ballast carriers.

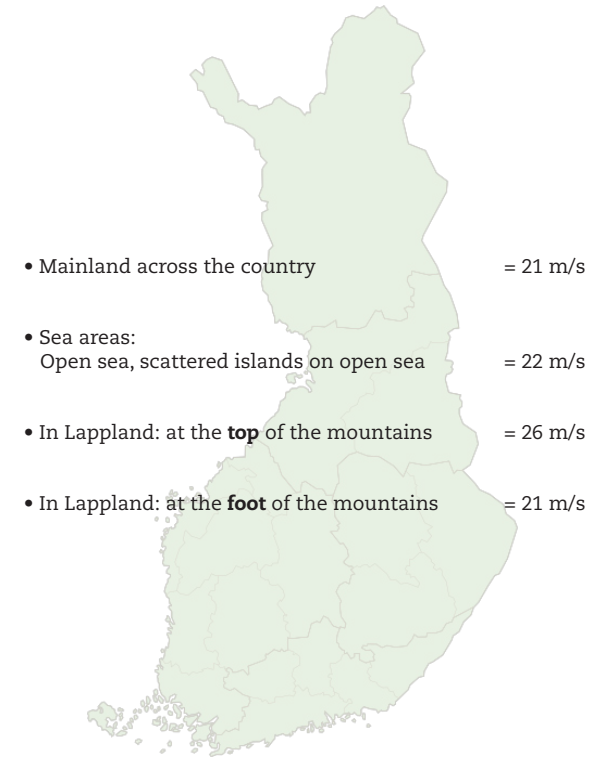
Note 3: At maximum 17 tiles (30x30x4.5 cm) can be placed on the tile carriers. 4 tiles in G1 and 13 (2x6.5) tiles in G2. This represents a ballast weight of 153 kg).

## Environmental factors

Roof zone	Middle zone
Terrain category	III (villages, suburban terrain, permanent forest)
Roofing materials	Bitumen, EPDM or concrete



## Windmap Finland



Panel: maximum dimensions 1800x1150 mm

Building height	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	36	40	36	50	36	57	36	66	36	73	kg
	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
	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
	4	8	4	10	4	11	X	X	X	X	tiles

Panel: maximum dimensions 2280x1150 mm

Building height	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	36	54	36	66	36	75	36	86	36	95	kg
	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
	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
	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

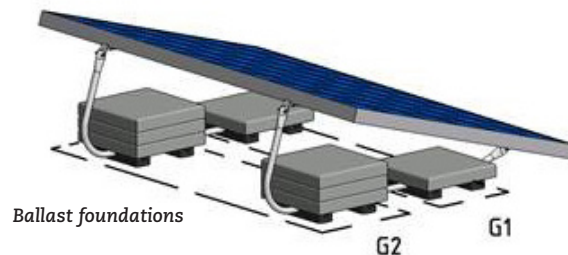
Note 1: Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg).

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



### Windmap Poland



Panel: maximum dimensions 1800x1150 mm

Building height	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	36	54	36	60	36	66	36	72	36	78	kg
	4	6	4	7	4	7,5	4	8	4	9	tiles
2	36	83	36	92	36	100	X	X	X	X	kg
	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
	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 - 9 meter		9 - 12 meter		12 - 15 meter		
	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
1	36	71	36	79	36	86	36	95	36	102	kg
	4	8	4	9	4	10	4	11	4	11,5	tiles
2	36	108	X	X	X	X	X	X	X	X	kg
	4	12	X	X	X	X	X	X	X	X	tiles
3	36	71	36	79	36	86	36	95	36	102	kg
	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;

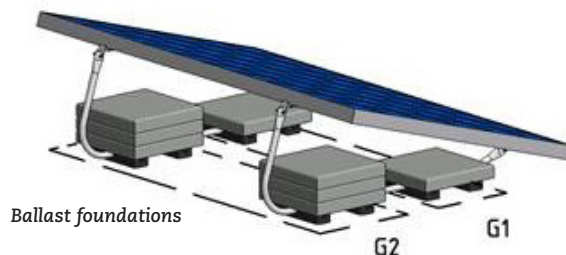
- Find the correct wind area for your location on the wind map
- Use the wind area in combination with the building height for the ballast table
- Select the required ballast for G1 and G2 in kg and/or number of tiles

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



Panel: maximum dimensions 1800x1150 mm

Building height	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	
Wind zone											
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 - 15 meter		
	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
Wind zone											
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

In case the space under the panel is insufficient for the size of the ballast tiles, the system needs to be mechanically fixed to the roof. Please contact Van der Valk Solar Systems for recommendations.

# 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 tiles

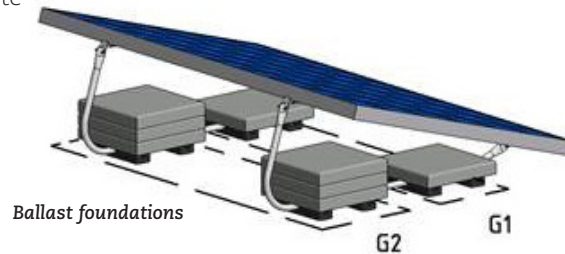
Note 1: Min. extra ballast in G1 & G2 has to be 2 x 1 tile (2 x 9 kg).

Note 2: The ballast in G1 & G2 must be equally divided over the rubber ballast carriers.

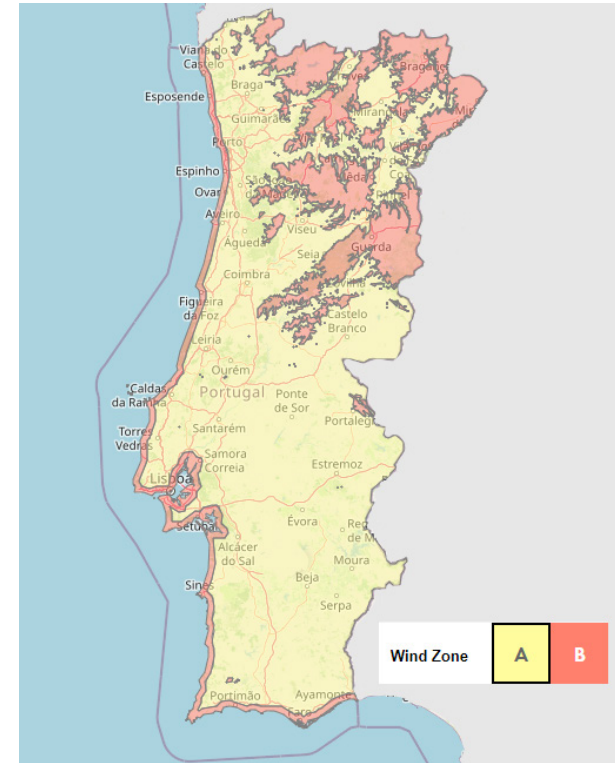
Note 3: At maximum 17 tiles (30x30x4.5 cm) can be placed on the tile carriers. 4 tiles in G1 and 13 (2x6.5) tiles in G2. This represents a ballast weight of 153 kg).

## Environmental factors

Roof zone	Middle zone
Terrain category	III (villages, suburban terrain, permanent forest)
Height above sea level	< 1000 m
Roofing materials	Bitumen, EPDM or concrete



## Windmap Portugal



Panel: maximum dimensions 1800x1150 mm

Building height	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	
Wind zone A (27 m/s)	36	72	36	72	36	72	36	72	36	72	kg
	4	8	4	8	4	8	4	8	4	8	tiles
Wind zone B (30 m/s)	36	93	36	93	36	93	36	93	36	93	kg
	4	10,5	4	10,5	4	10,5	4	10,5	4	10,5	tiles

Panel: maximum dimensions 2280x1150 mm

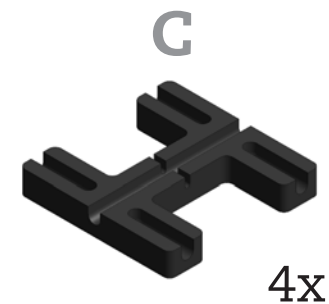
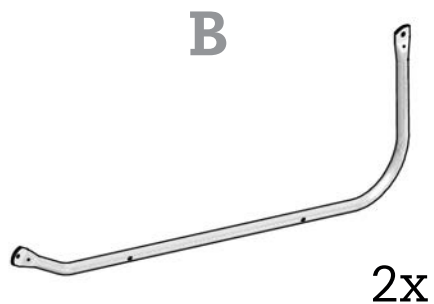
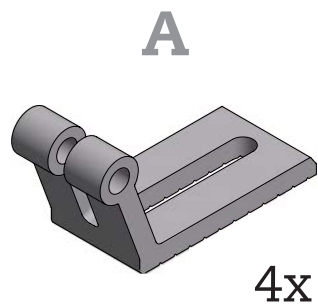
Building height	0 - 5 meter		5 - 7 meter		7 - 9 meter		9 - 12 meter		12 - 15 meter		
	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2	
Wind zone A (27 m/s)	36	94	36	94	36	94	36	94	36	94	kg
	4	10,5	4	10,5	4	10,5	4	10,5	4	10,5	tiles
Wind zone B (30 m/s)	X	X	X	X	X	X	X	X	X	X	kg
	X	X	X	X	X	X	X	X	X	X	tiles

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.



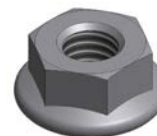
## Components



5x (1 spare)



5x (1 spare)

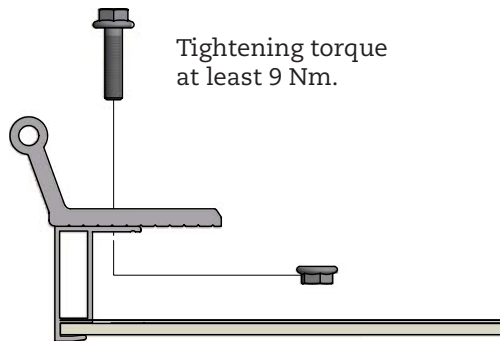
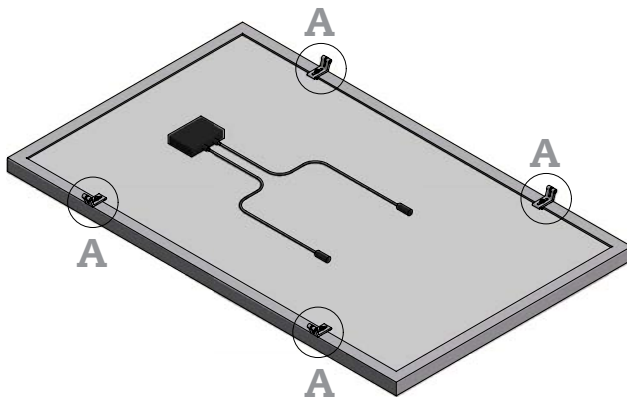


9x (1 spare)



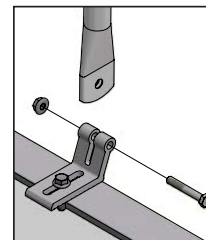
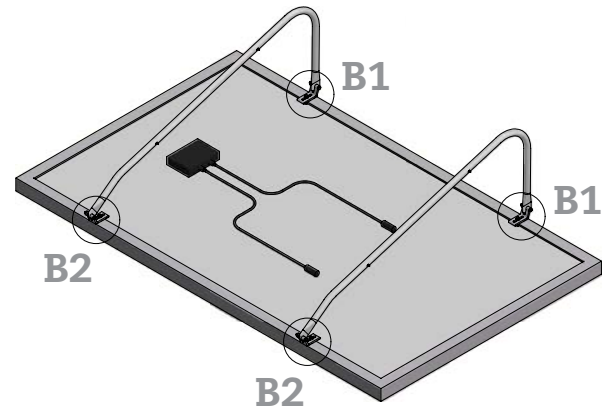
3x

## Step 1: Mounting the clevis



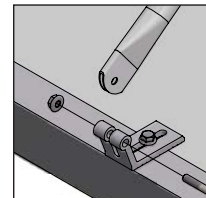
## Step 2: Mounting the curved supports

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

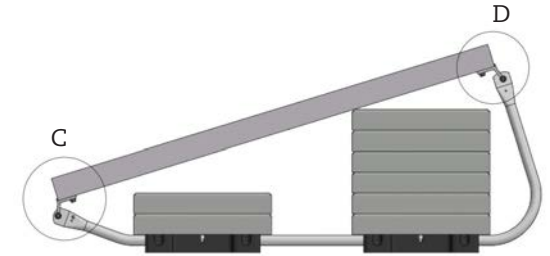
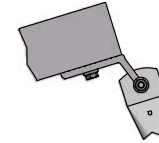
Under lip  
turned inwards

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

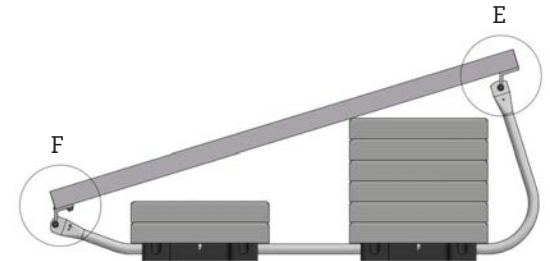
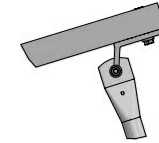
Under lip  
turned inwards

F (1 : 4)



Top lip facing  
out

E (1 : 4)



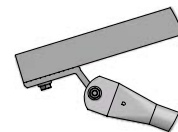
## Option 3: Mounting panel

For panel width 1071 - 1150 mm

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

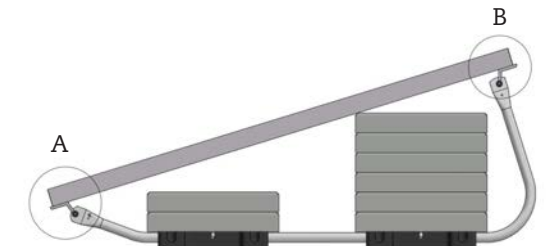
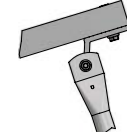
Under lip facing  
outwards

A (1 : 4)



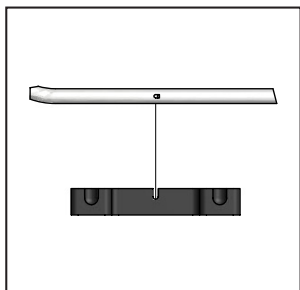
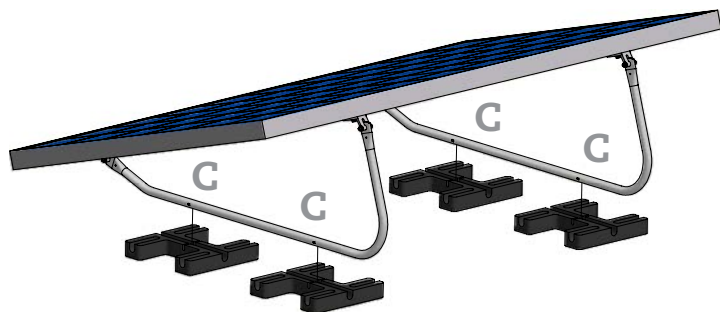
Top lip facing  
out

B (1 : 4)



## Step 3: Placing the rubber tiles

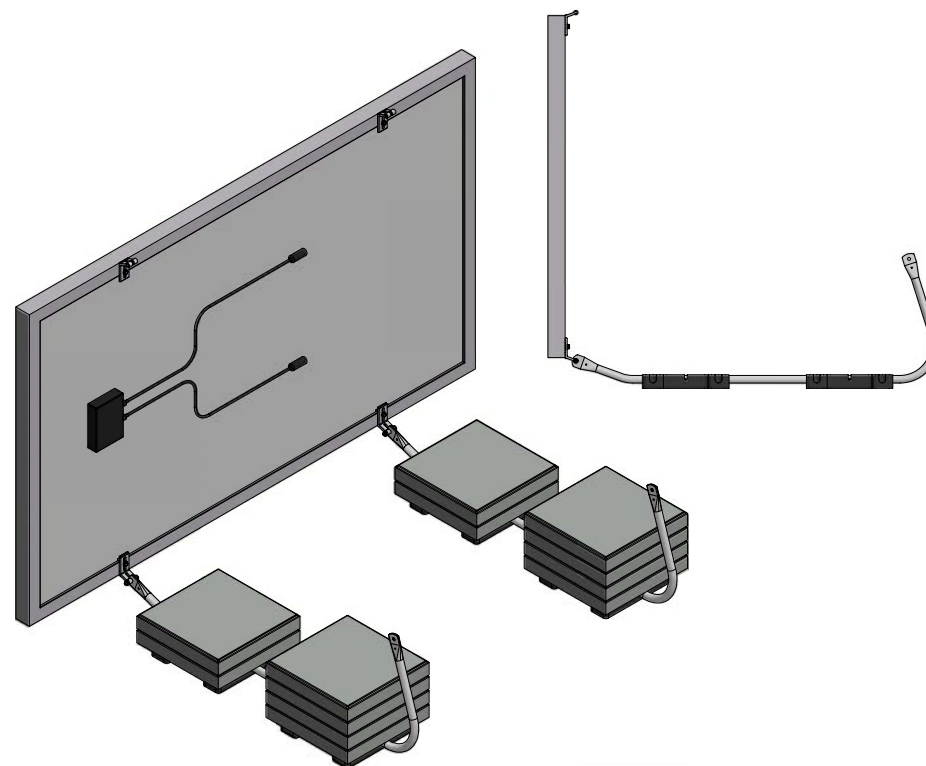
Turn over the panel and place it on the rubber tile carriers.



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

## Step 4: Position the ballast

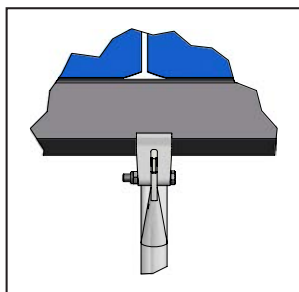
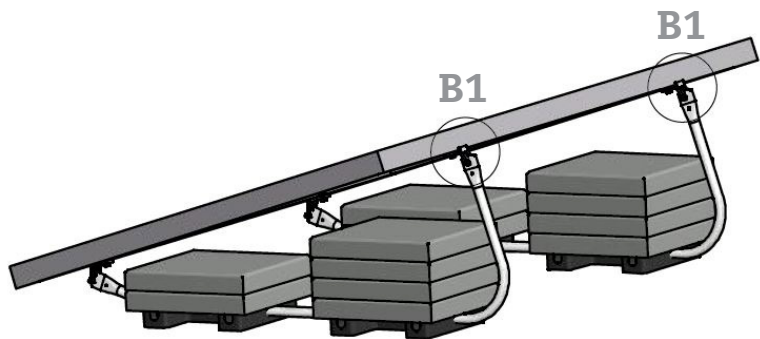
Remove the top hinge bolts B1 and place the panel in a vertical position. Make sure that you have some form of support in place or someone to hold the panel temporarily.



Position the ballast required.

## Step 5: Tighten hinge bolts B1

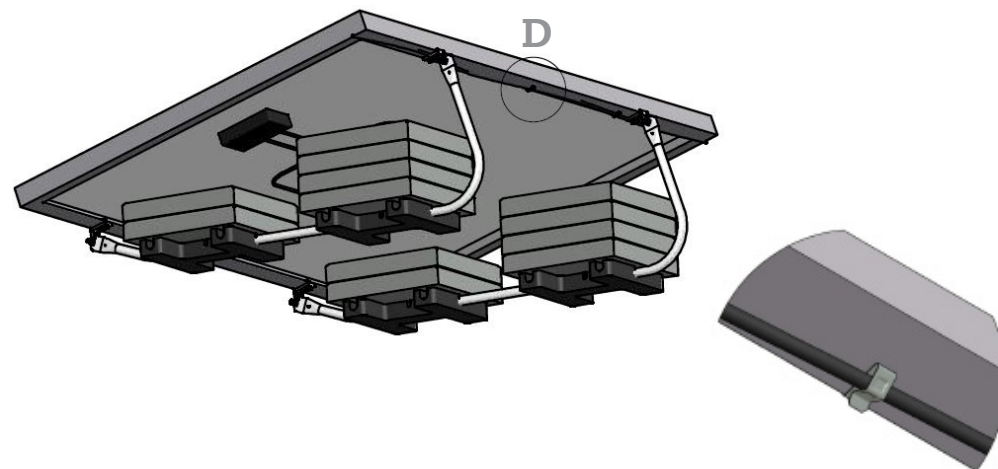
Attach the panel to the curved supports again and tighten hinge bolts B1.



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.

