

Installation manual for FuturaSun PV Modules

PV Module Clamping Zones

MOUNTING METHOD: CLAMPING

Top or bottom clamping methods will vary and are dependent on the mounting structures. Please follow the mounting guidelines recommended by the mounting system supplier.

Each module must be securely fastened at a minimum of four points on two opposite sides. The clamps should be positioned symmetrically. The clamps should be positioned according to the authorized position ranges.

Mounting using clamping method:

- FUTURASUN recommends the use of clamps with length ≥ 50 mm.
- When using clamps, it is possible to mount the modules in horizontal (the shorter side of one module facing the shorter side of the neighboring module) or in vertical (the longer sides facing each other) configuration always observing the areas allowed for fixing.
⚠ ATTENTION, not all modules are suitable for fixing in short side, please see the specific tables of mounting methods. It is recommended to always use stainless steel screws and bolts.
- The modules can be mounted on continuous base structures (inclined or horizontal) such as rails or similar.
- Both base structures must be mounted at the same distance from the symmetrical axis (vertical or horizontal) of the module.
- In vertical configuration, it is strongly recommended to place the supporting elements nearby the mounting holes. This is necessary in order to maintain a correct load distribution.
- In accordance with Eurocodes - EN 1991, in the 3,4,5 area of the Alpine Region, the load capacity of module could be too low compared to what is necessary. The shape coefficient, the modules tilt and the installation layout must be taken into account. An accurate check must always be carried out by qualified technician.
- **⚠ CAUTION, do not walk over the modules, right walkways should be considered in the installation for cleaning, repair and maintenance.**

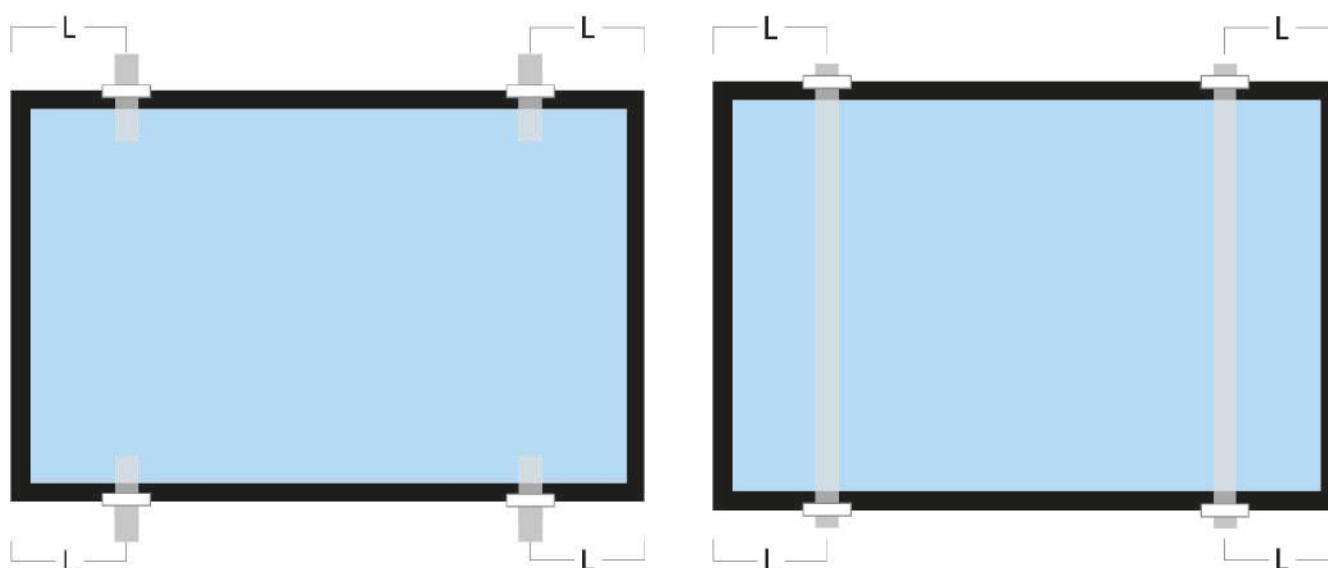
At least 10 mm spacing must be maintained on all sides between the modules.

The specifications in the present manual are subject to revisions without further notice

Author: FuturaSun_AP

Document name: Clamping_manual_FuturaSun_rev.09_2023

Revision date: 10.10.2023



1. Four clamps on long side of frame and rails (or segment of rails) parallel to the short side frame

Module Types	Max Mechanical Load (Pa)		
	+ 2000 / -1600	+ 2400 / - 1600	+3600 / - 1600
	L Range (mm)		
Silk® Pro 120 cells	0/250	350/520	250/350
Silk® Pro 144 cells	0/350	450/650	350/450
Silk® Plus 108 cells	0/250	350/520	250/350
Silk® Plus 144 cells	0/350	450/650	350/450
Silk® Premium 120 cells	0/250	350/520	250/350
Silk® Premium 150 cells	0/350	450/650	350/450
Silk® Plus Duetto 108 cells	0/400*	500/550*	400/500*
Silk® Plus Duetto 144 cells	0/400*	500/600*	400/500*
ZEBRA Pro 132 cells	0/425	525/625	425/525
Velvet Pro 120 cells	0/390**	490/590**	390/490**
Velvet Pro 144 cells	0/475**	575/675**	475/575**
Velvet Premium Max 120 cells	0/360**	430/530**	360/430**
Velvet Premium Max 132 cells	0/440**	540/640**	440/540**

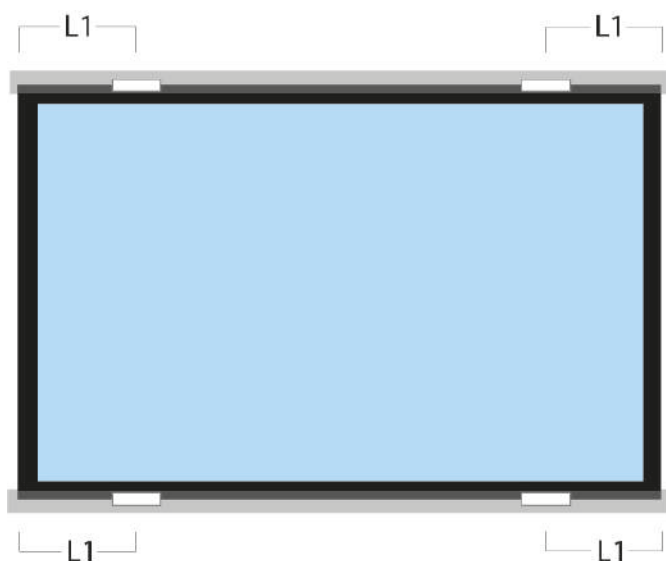
* With clamps length \geq 80 mm

** With clamps length \geq 60 mm



2. Four clamps on short side of frame and rails parallel to the short side frame.

Module Types	Max Mechanical Load (Pa)	
	+/-1000	+/-1200
	L Range (mm)	
Silk® Pro 120 cells	0/100	100/200
Silk® Pro 144 cells	0/200	⚠ not allowed
Silk® Plus 108 cells	0/100	100/200
Silk® Plus 144 cells	0/200	⚠ not allowed
Silk® Premium 120 cells	0/100	100/200
Silk® Premium 150 cells	0/200	⚠ not allowed
Silk® Plus Duetto 108 cells	⚠ not allowed	⚠ not allowed
Silk® Plus Duetto 144 cells	⚠ not allowed	⚠ not allowed
ZEBRA Pro 132 cells	0/150	⚠ not allowed
Velvet Pro 120 cells	⚠ not allowed	⚠ not allowed
Velvet Pro 144 cells	⚠ not allowed	⚠ not allowed
Velvet Premium Max 120 cells	⚠ not allowed	⚠ not allowed
Velvet Premium Max 132 cells	⚠ not allowed	⚠ not allowed

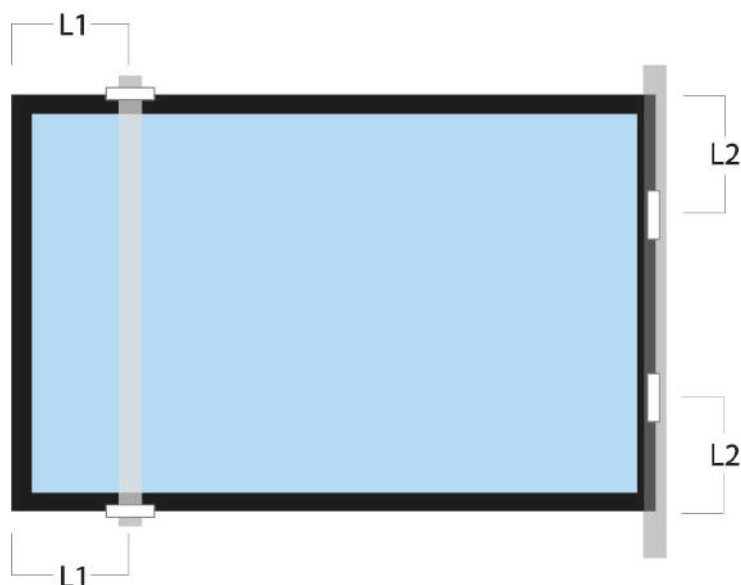


3. Four clamps on long side of frame and rails parallel to the long side frame.

Module Types	Max Mechanical Load (Pa)	
	+ 2000 / - 1600	+ 2400 / - 1600
	L Range (mm)	
Silk® Pro 120 cells	150/250	250/450
Silk® Pro 144 cells	150/250	250/550
Silk® Plus 108 cells	150/250	250/450
Silk® Plus 144 cells	250/350	350/550
Silk® Premium 120 cells	150/250	250/450
Silk® Premium 150 cells	250/350	350/550
Silk® Plus Duetto 108 cells	300/400*	400/500*
Silk® Plus Duetto 144 cells	300/400*	400/500*
ZEBRA Pro 132 cells	325/425	425/525
Velvet Pro 120 cells	290/390**	390/490**
Velvet Pro 144 cells	375/475**	475/575**
Velvet Premium Max 120 cells	260/360**	360/430**
Velvet Premium Max 132 cells	340/440**	440/540**

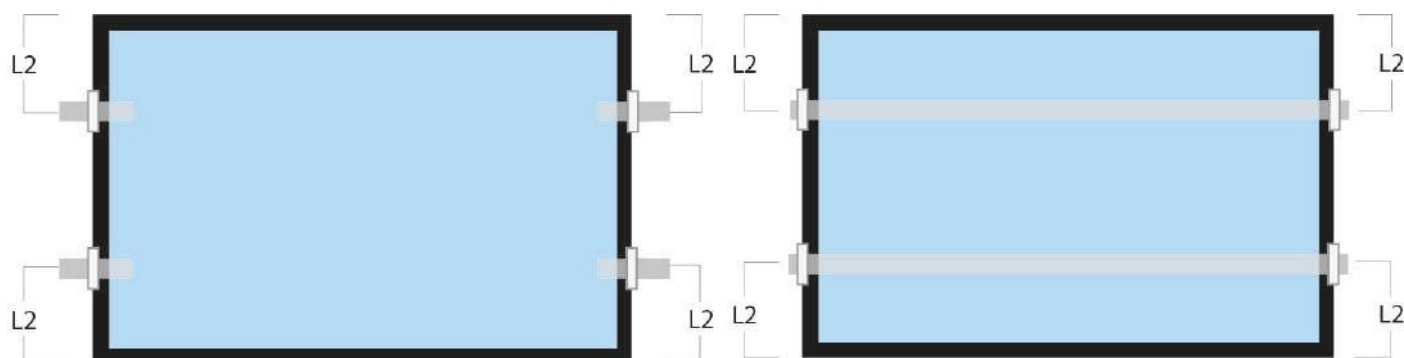
* With clamps length \geq 80 mm

** With clamps length \geq 60 mm



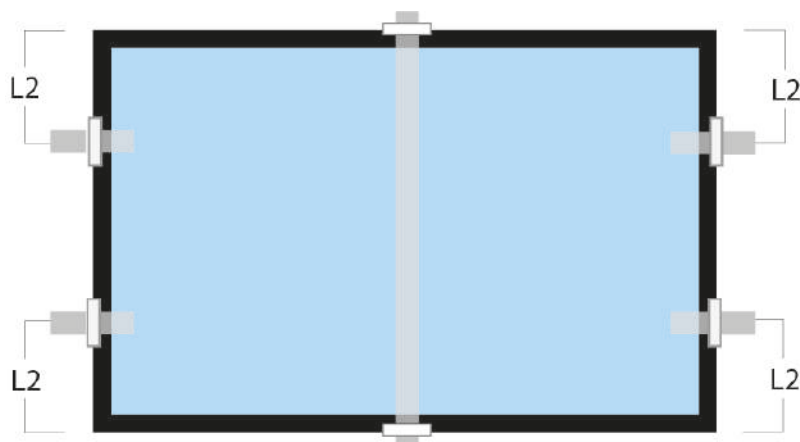
4. Two clamps on the long side and two clamps on the short side of frame. Rails run parallel to the short side frame.

Module Types	Max Mechanical Load (Pa)			
	+ 2400 / - 1600		+1000 / -1000	
	L1 Range (mm)	L2 Range (mm)	L1 Range (mm)	L2 Range (mm)
Silk® Pro 120 cells	250/450	100/250	⚠ not allowed	⚠ not allowed
Silk® Pro 144 cells	⚠ not allowed	⚠ not allowed	250/450	100/250
Silk® Plus 108 cells	250/450	100/250	⚠ not allowed	⚠ not allowed
Silk® Plus 144 cells	⚠ not allowed	⚠ not allowed	250/450	100/250
Silk® Premium 120 cells	250/450	100/250	⚠ not allowed	⚠ not allowed
Silk® Premium 150 cells	⚠ not allowed	⚠ not allowed	250/450	100/250
Silk® Plus Duetto 108 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed	⚠ not allowed
Silk® Plus Duetto 144 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed	⚠ not allowed
ZEBRA Pro 132 cells	270/485	100/250	⚠ not allowed	⚠ not allowed
Velvet Pro 120 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed	⚠ not allowed
Velvet Pro 144 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed	⚠ not allowed
Velvet Premium Max 120 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed	⚠ not allowed
Velvet Premium Max 132 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed	⚠ not allowed



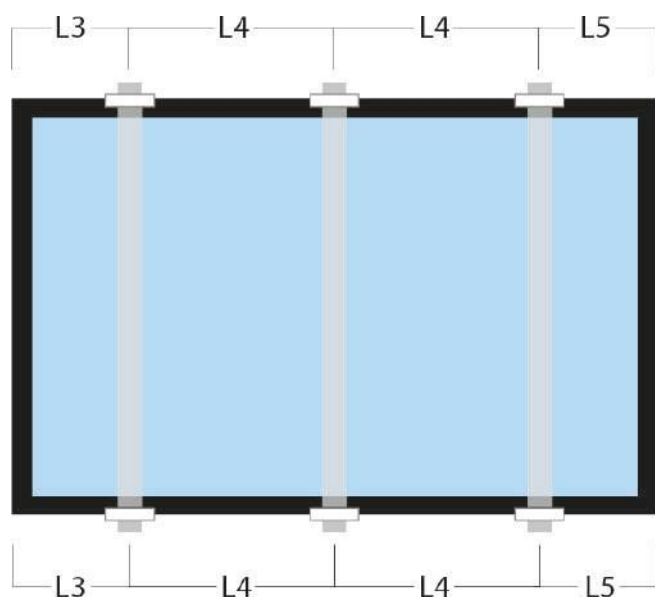
5. Four clamps on short side of frame and rails (or segment of rails) parallel to the long side frame.

Module Types	Max Mechanical Load (Pa)		
	+ 2400 / -1600	+ 1600 / - 1000	+2400 / - 2400
	L Range (mm)		
Silk® Pro 120 cells	150/250	⚠ not allowed	⚠ not allowed
Silk® Pro 144 cells	⚠	150/250	⚠ not allowed
Silk® Plus 108 cells	150/250	⚠ not allowed	⚠ not allowed
Silk® Plus 144 cells	⚠	150/250	⚠ not allowed
Silk® Premium 120 cells	150/250	⚠ not allowed	⚠ not allowed
Silk® Premium 150 cells	⚠ not allowed	150/250	⚠ not allowed
Silk® Plus Duetto 108 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed
Silk® Plus Duetto 144 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed
ZEBRA Pro 132 cells	⚠ not allowed	150/250	⚠ not allowed
Velvet Pro 120 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed
Velvet Pro 144 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed
Velvet Premium Max 120 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed
Velvet Premium Max 132 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed



6. Four clamps mounting on short side of frame, and an additional support bar placed below the center of the module.

Module Types	Max Mechanical Load (Pa)	
	+ 3000 / - 2400	+ 1600 / - 1600
	L Range (mm)	L Range (mm)
Silk® Pro 120 cells	0/200	⚠ not allowed
Silk® Pro 144 cells	⚠ not allowed	0/200
Silk® Plus 108 cells	0/200	⚠ not allowed
Silk® Plus 144 cells	⚠ not allowed	0/200
Silk® Premium 120 cells	0/200	⚠ not allowed
Silk® Premium 150 cells	⚠ not allowed	0/200
Silk® Plus Duetto 108 cells	⚠ not allowed	⚠ not allowed
Silk® Plus Duetto 144 cells	⚠ not allowed	⚠ not allowed
ZEBRA Pro 132 cells	0/200	⚠ not allowed
Velvet Pro 120 cells	⚠ not allowed	⚠ not allowed
Velvet Pro 144 cells	⚠ not allowed	⚠ not allowed
Velvet Premium Max 120 cells	⚠ not allowed	⚠ not allowed
Velvet Premium Max 132 cells	⚠ not allowed	⚠ not allowed

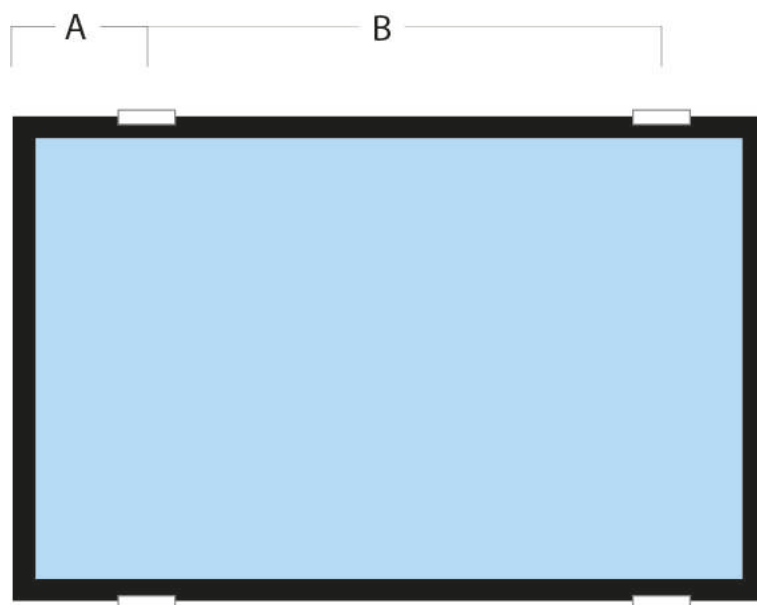


7. Six clamps on long side of frame and rails parallel to the short side frame.

Module Types	Max Mechanical Load (Pa)
	+ 5400 / - 2400
	L3 & L5 Range (mm)
Silk® Pro 120 cells	0/450
Silk® Pro 144 cells	0/550
Silk® Plus 108 cells	0/450
Silk® Plus 144 cells	0/550
Silk® Premium 120 cells	0/450
Silk® Premium 150 cells	0/550
Silk® Plus Duetto 108 cells	0/450*
Silk® Plus Duetto 144 cells	0/550*
ZEBRA Pro 132 cells	0/500
Velvet Pro 120 cells	0/450**
Velvet Pro 144 cells	0/550**
Velvet Premium Max 120 cells	0/550**
Velvet Premium Max 132 cells	0/600**

* With clamps length ≥ 80 mm

** With clamps length ≥ 60 mm

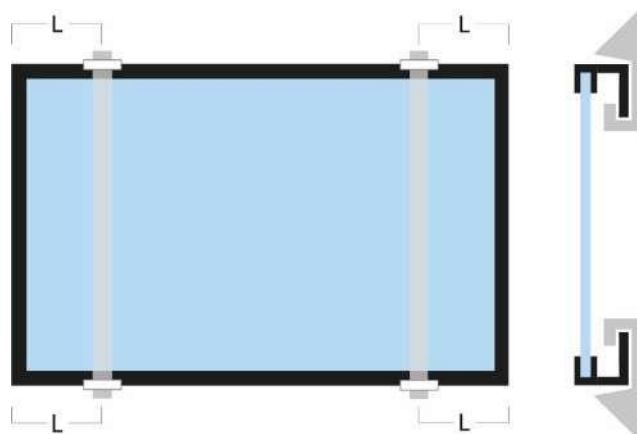


8. Rail-less clamping

Module Types	Max Mechanical Load (Pa)			
	A Range (mm)	B Range (mm)	Downforce (Pa)	Uplift (Pa)
Silk® Pro 120 cells	0/341	1414/1755	2400	1600
Silk® Pro 144 cells	0/427	1667/2094	1600	1600
Silk® Plus 108 cells	0/320	1402/1722	2400	1600
Silk® Plus 144 cells	0/464	1815/2279	1600	1600
Silk® Premium 120 cells	0/341	1411/1754	2400	1600
Silk® Premium 150 cells	0/437	1748/2185	1600	1600
Silk® Plus Duetto 108 cells	0/320*	1402/1722*	2400	1600
Silk® Plus Duetto 144 cells	0/464*	1815/2279*	1600	1600
ZEBRA Pro 132 cells	0/368	1527/1895	2000	1600
Velvet Pro 120 cells	0/341**	1412/1755**	2400	1600
Velvet Pro 144 cells	0/427**	1686/2094**	1600	1600
Velvet Premium Max 120 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed	⚠ not allowed
Velvet Premium Max 132 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed	⚠ not allowed

* With clamps length \geq 80 mm

** With clamps length \geq 60 mm



9. Frame foot interlock four clamps on long side of frame, the fixing points are on the foot of frame.

Module Types	Max Mechanical Load (Pa)		
	+ 2000 / -1600	+ 2400 / - 1600	+3600 / - 1600
	L Range (mm)		
Silk® Pro 120 cells	0/341	⚠ not allowed	⚠ not allowed
Silk® Pro 144 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed
Silk® Plus 108 cells	0/320	⚠ not allowed	⚠ not allowed
Silk® Plus 144 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed
Silk® Premium 120 cells	0/341	⚠ not allowed	⚠ not allowed
Silk® Premium 150 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed
Silk® Plus Duetto 108 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed
Silk® Plus Duetto 144 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed
ZEBRA Pro 132 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed
Velvet Pro 120 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed
Velvet Pro 144 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed
Velvet Premium Max 120 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed
Velvet Premium Max 132 cells	⚠ not allowed	⚠ not allowed	⚠ not allowed

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