CARPIN-SYSTEM

PHOTOVOLTAIC PRODUCTS CATALOG (BIPV)

V.6-25082023

LEGAL WARNING

This document contains confidential information.

Fabricación de Carpintería de Aluminio Exclusiva para el Profesional, S.L (Tax number B65662967), hereinafter "Carpin-System", reserves the right to take legal action against the person or entity that distributes it or takes economic advantage of it, without prior authorization from Carpin-System

INTRODUCTION :

- **BIPV aimed for <u>sunscreen solutions</u> (buildings or residential homes) :**

  The use of BIPV structures in construction facilities provides the desired solar protection and an aesthetic effect to the construction as well as photovoltaic energy generation. In a period of 7 – 10 years, this solution compensates the extra cost that the photovoltaic system has meant in comparison with conventional solar protection materials. From that moment on, the investment becomes profitable, with an evident positive impact on the environment thanks to the clean energy generated.

  Products offered by Carpin-System :
  - **Fixed Canopies (pages 4 – 9)**
  - **Fixed or Mobile Louvres (pages 10 – 16)**

- **BIPV aimed for <u>anti-fall safety solutions :</u>**

  The installation of BIPV railings and juliet balconies in buildings provides the necessary fall protection while generating photovoltaic energy. In a period of 7 – 10 years for BIPV railings, and 10 – 14 years for juliet balconies, they compensate the extra cost that the photovoltaic system has meant in comparison with conventional anti-fall safety materials. From that moment on, the investment becomes profitable, with an evident positive impact on the environment thanks to the clean energy generated.

  Products offered by Carpin-System :
  - **Railings (pages 17 – 21)**
  - **Juliet Balconies (pages 22 – 24)**

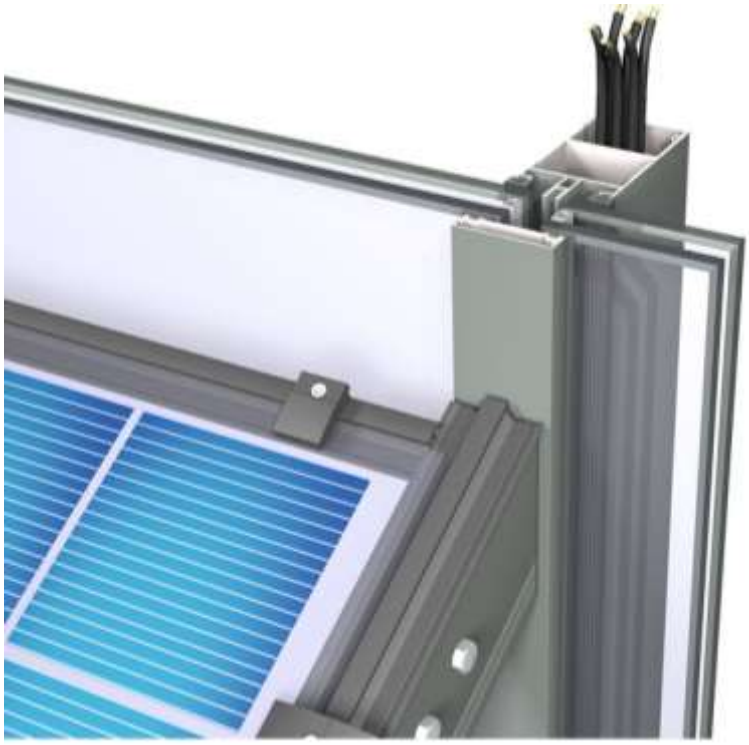
1) Product : PHOTOVOLTAIC FIXED CANOPIES

- Double objective: sun protection + electricity generation
- Variable inclination for the panels (between 10º - 35º)
- Suitable for vertical aluminum system (curtain wall) or anchored directly to the construction structure.
- Modular system
- Maximum PV panel dimension: L: 1500 x H: 1000. PV panel thickness: between 10 mm and 17 mm
- Price range **per m2**: €1,150 – €1,350
(includes structure and photovoltaic panel. Shipping not included.)
- Carpin-System does **not** provide additional wiring to that provided by the BIPV modules (see variants), nor inverters, nor installation service.

VISUAL REPRESENTATION OF THE PRODUCT:

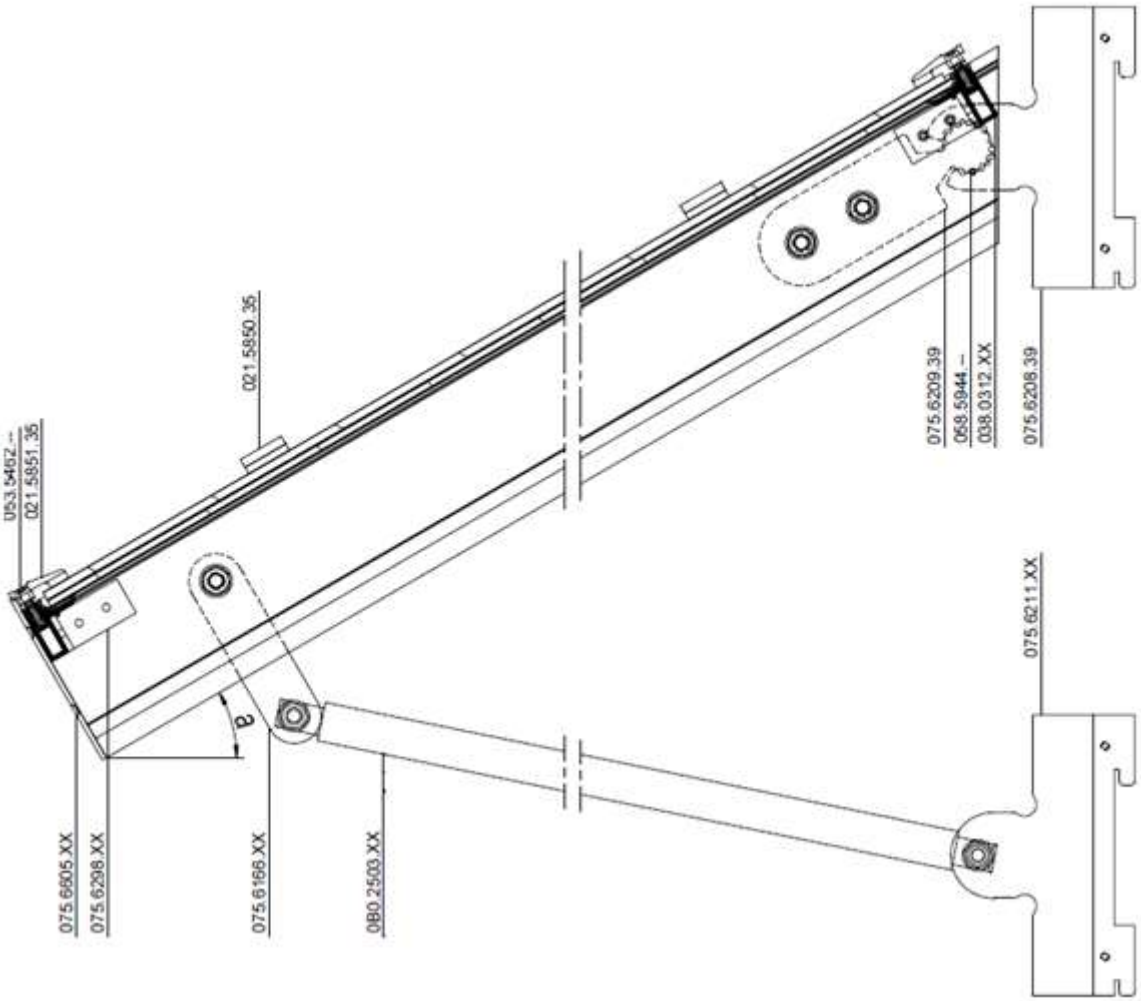
Detail of photovoltaic canopy anchored directly to the façade.

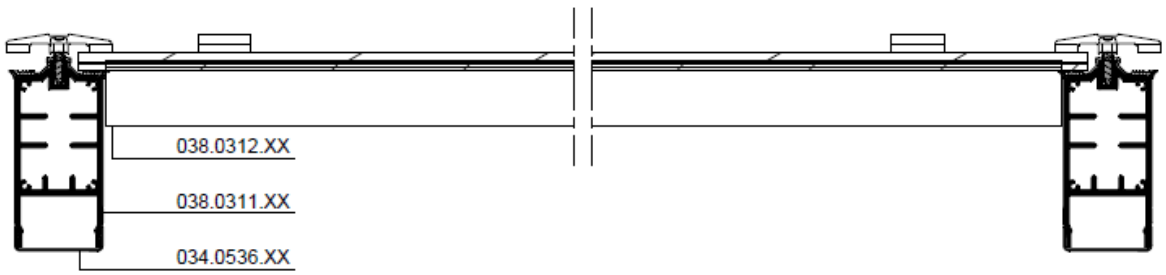
Detail of photovoltaic canopy anchored to the vertical 'curtain wall' system, with the possibility of passing the electrical wiring through it.



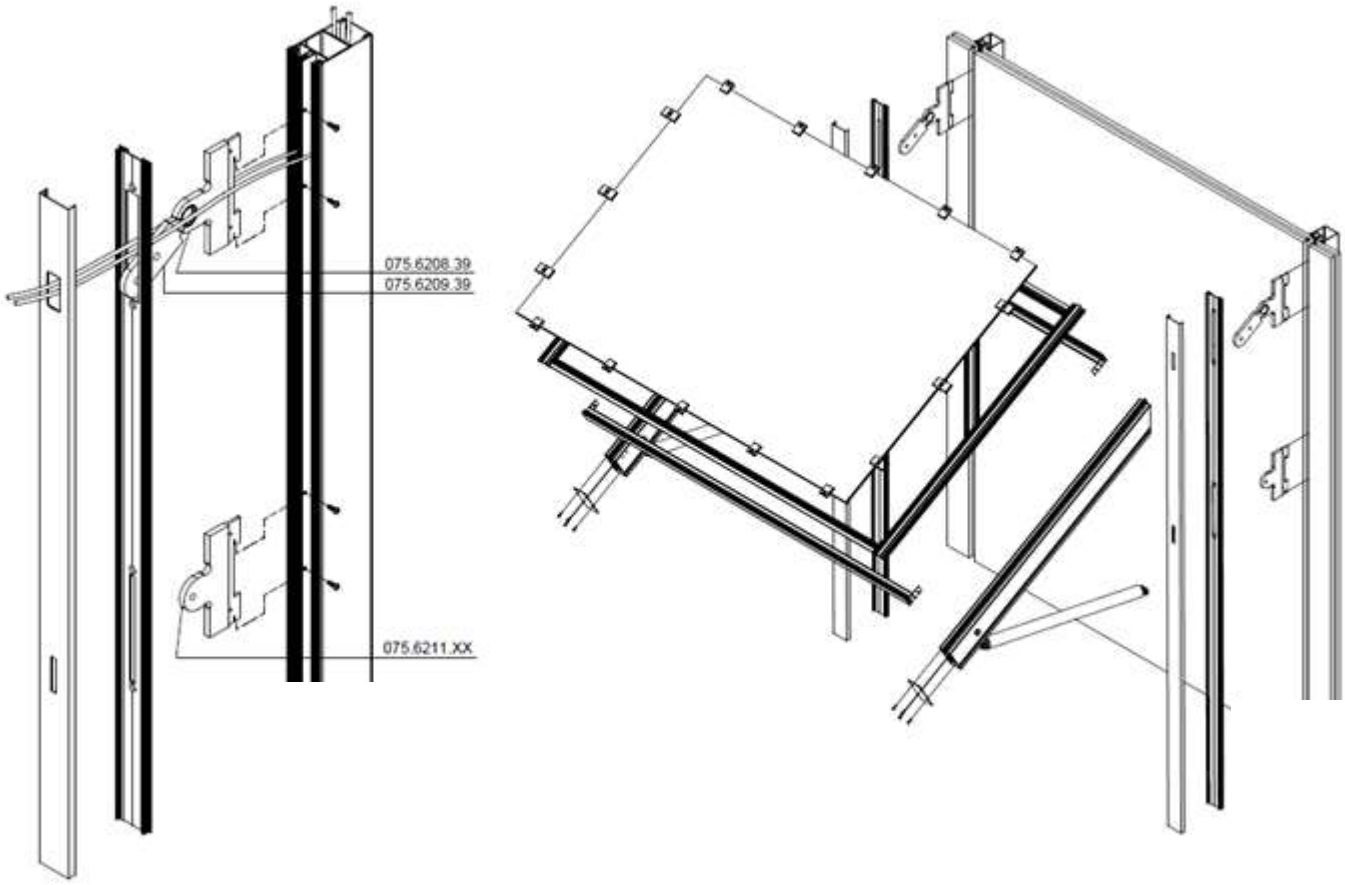
Detail of the lower part of the canopy.

SECTION DETAIL :

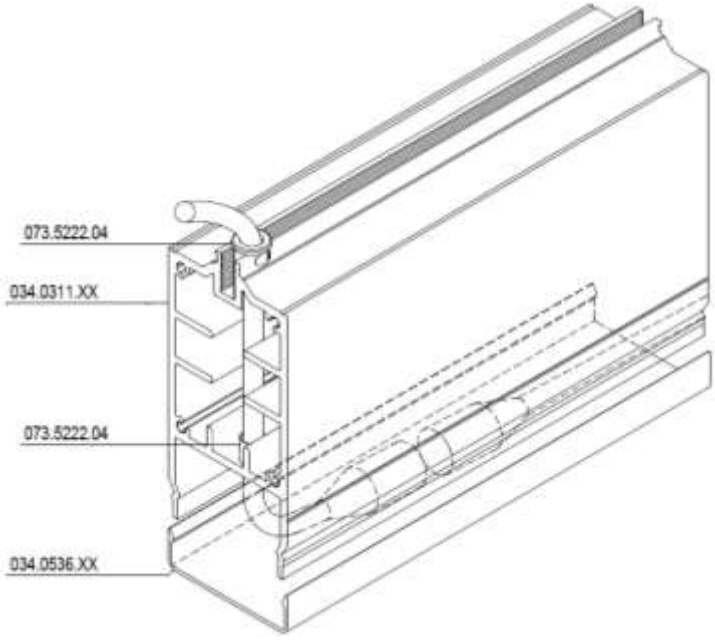




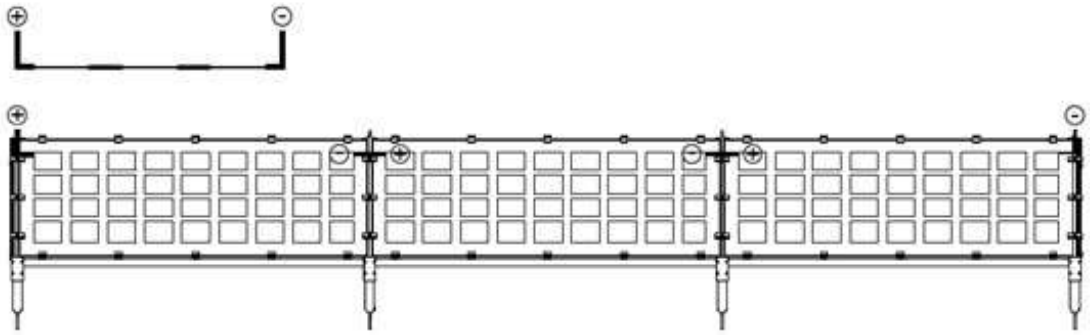
COMPONENTS DETAIL :



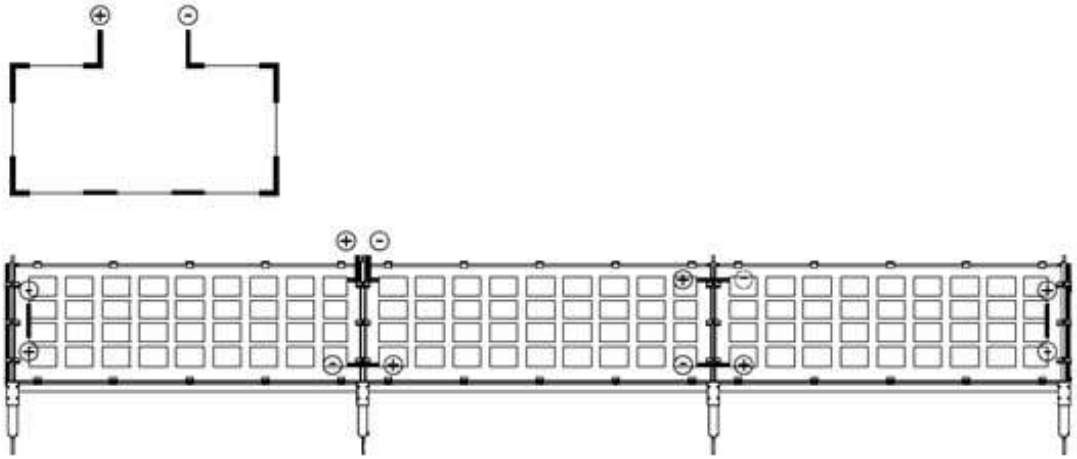
DETAIL OF ELECTRICAL CABLE AND CONNECTION VARIANTS :



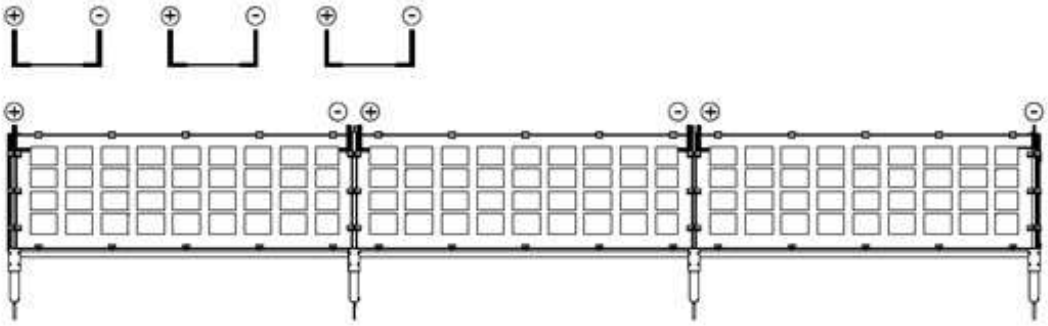
VARIANT A
VARIANTE A
VARIANT A
VARIANTE A



VARIANT B
VARIANTE B
VARIANT B
VARIANTE B



VARIANT C
VARIANTE C
VARIANT C
VARIANTE C

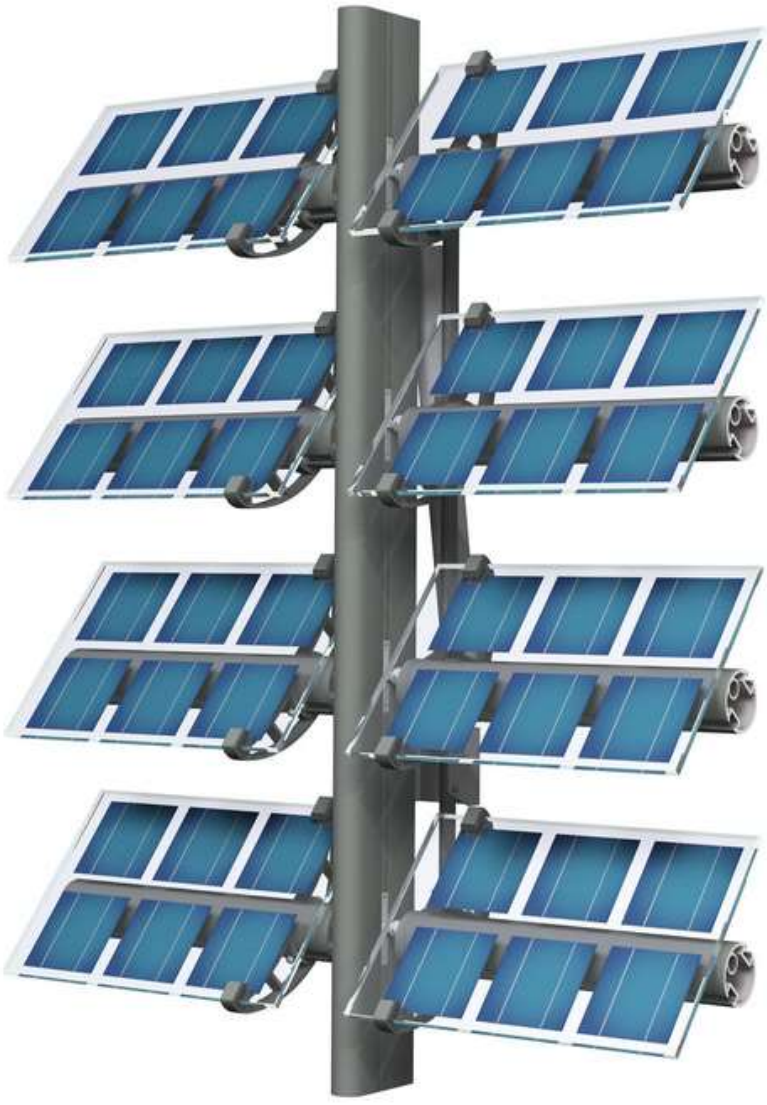


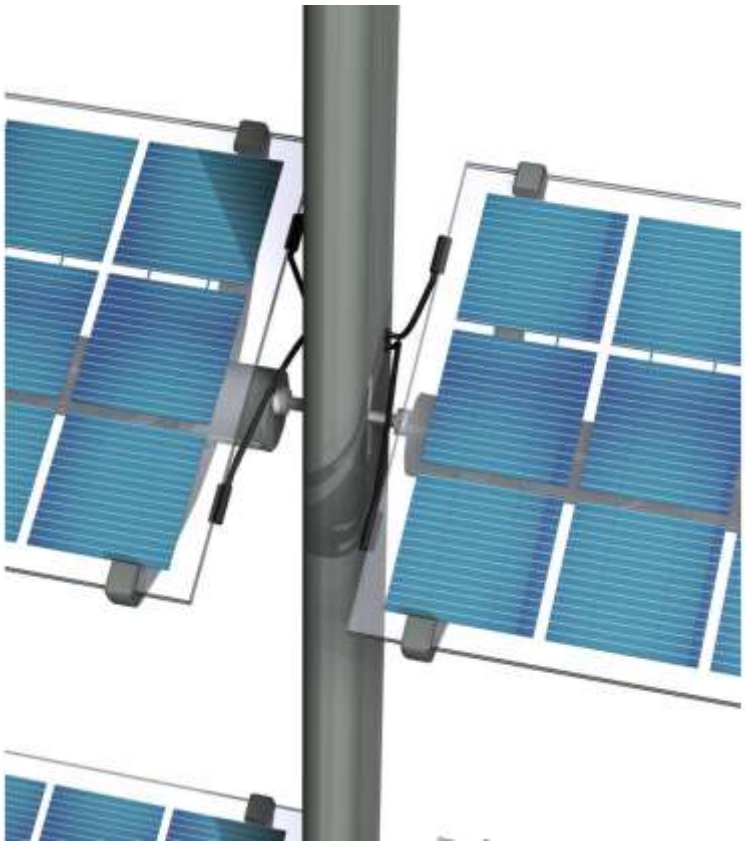
2) Product : (FIXED OR MOBILE) PHOTOVOLTAIC LOUVRES

- Double objetive: sun protection + electricity generation
- Possibility of fixed slat system (inclination between 0º and 45º), or motorized-mobile slats.
- Suitable for installation on vertical aluminum system (curtain wall) or anchored directly to the building structure.
- Both vertical and horizontal louvres options.
- Maximum PV panel dimension: depending on the number of fixations installed and the maximum pressure supported (e.g. snow accumulation) in a climatic region, its maximum width may vary from 1,120 mm to 4,050 mm. Panel height : 366 mm.

- Price range **per m2**: 1.300 - 1.500 € (includes structure and photovoltaic panel. Shipping not included.)

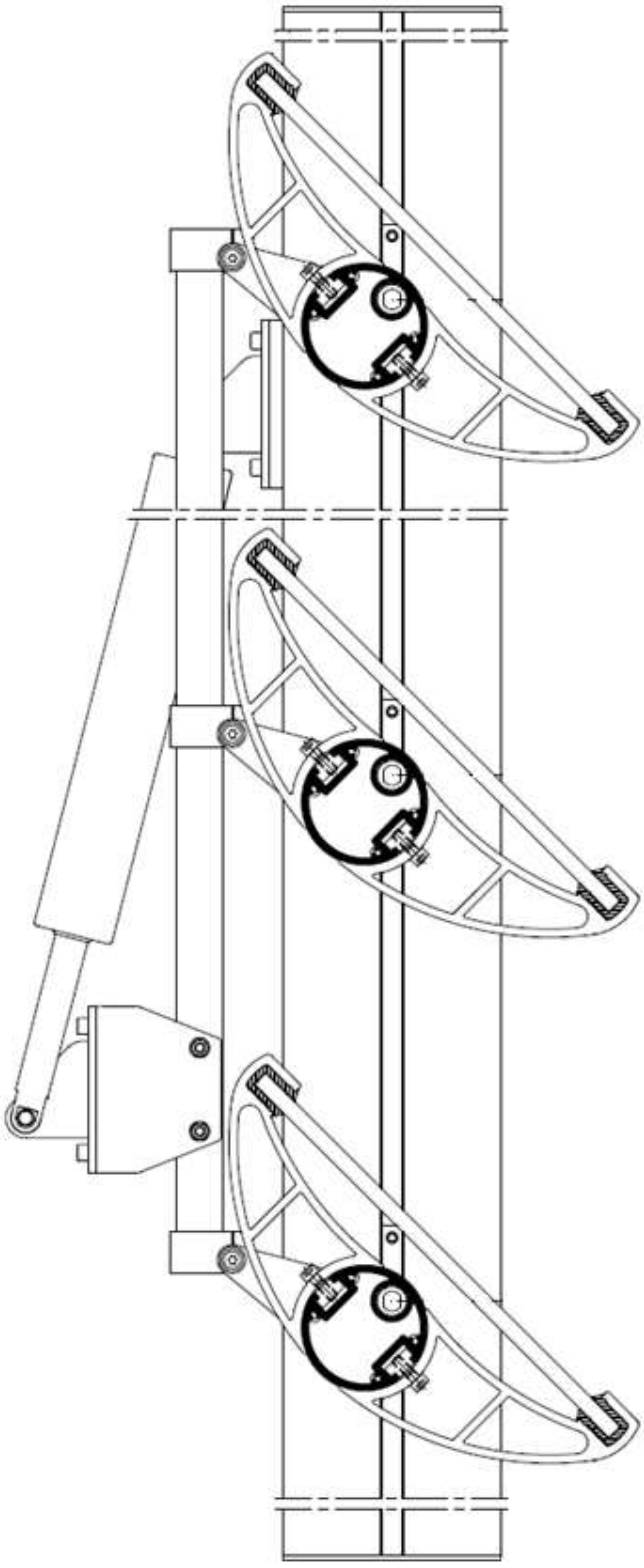
- Carpin-System does **not** provide additional wiring to that provided by the BIPV modules (see variants), nor inverters, nor installation service.





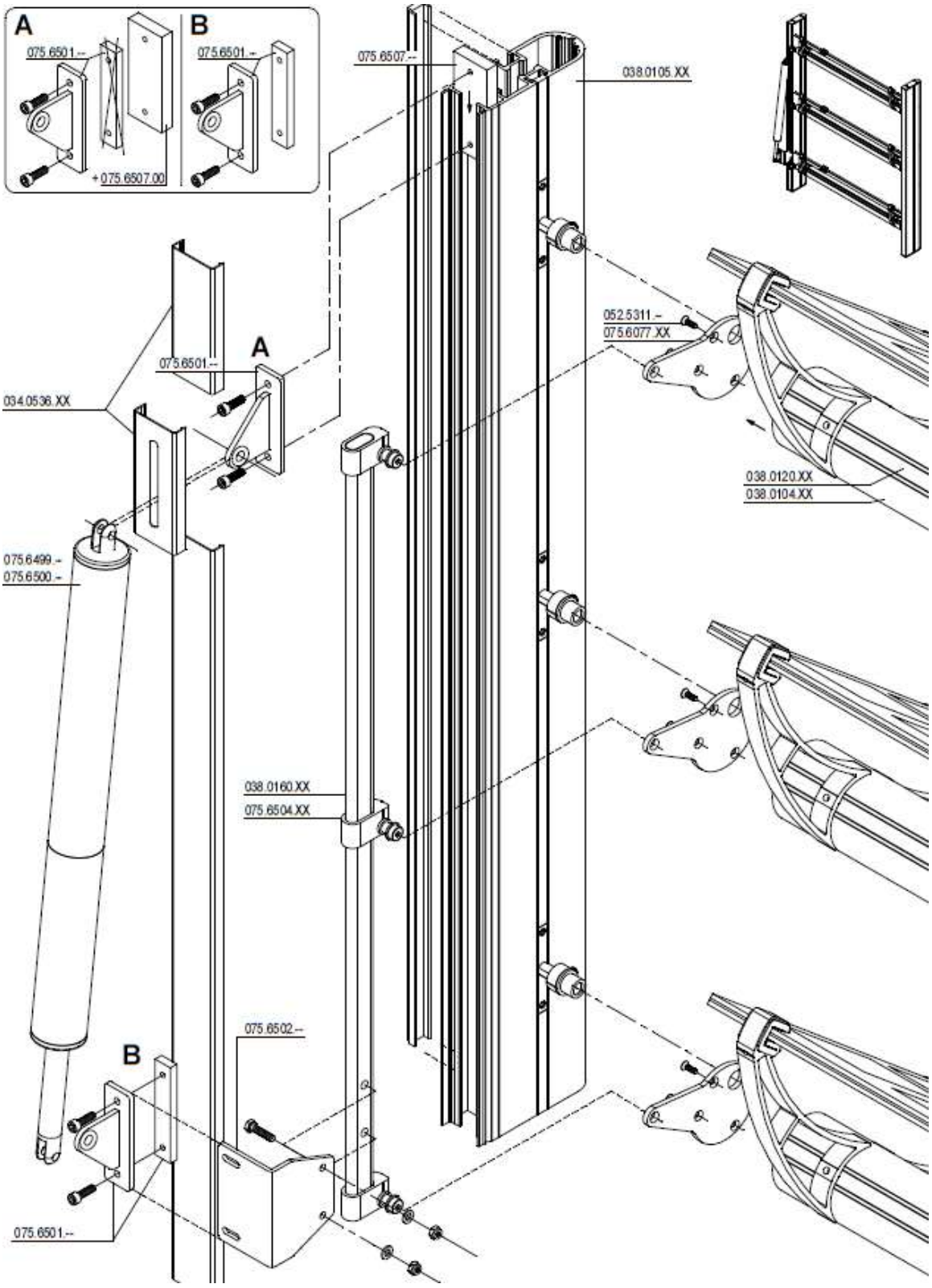
Detail of photovoltaic vertical slats and electrical wiring

SECTION DETAIL :



Motorized option: stainless steel coated motor, weather resistant, with a maximum force of 1,200 Newtons.

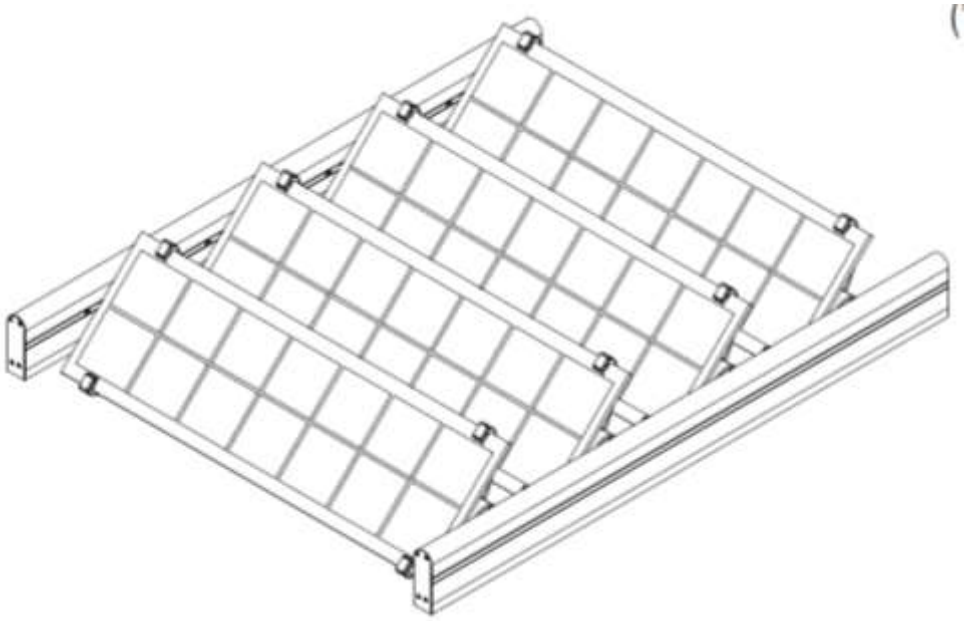
COMPONENTS DETAIL :



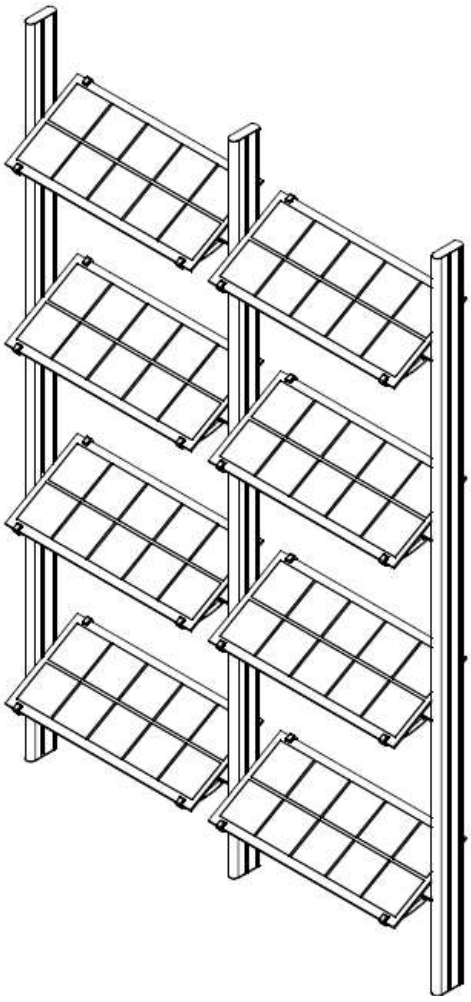
Motorization option (vertical position): the motor enables a vertical movement that displace the connecting rod and, in turn, rotates the axes of the photovoltaic

Options for louvres installation :

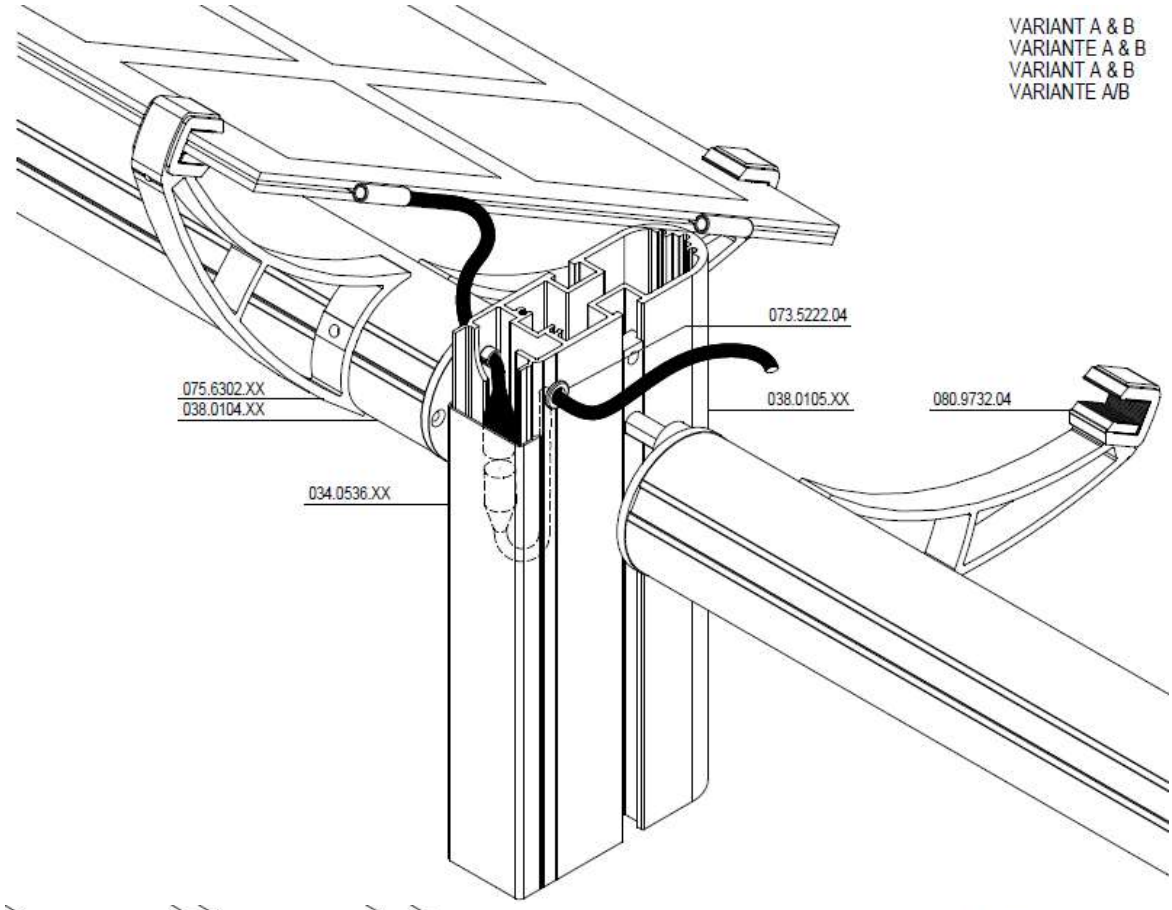
a) Horizontal :

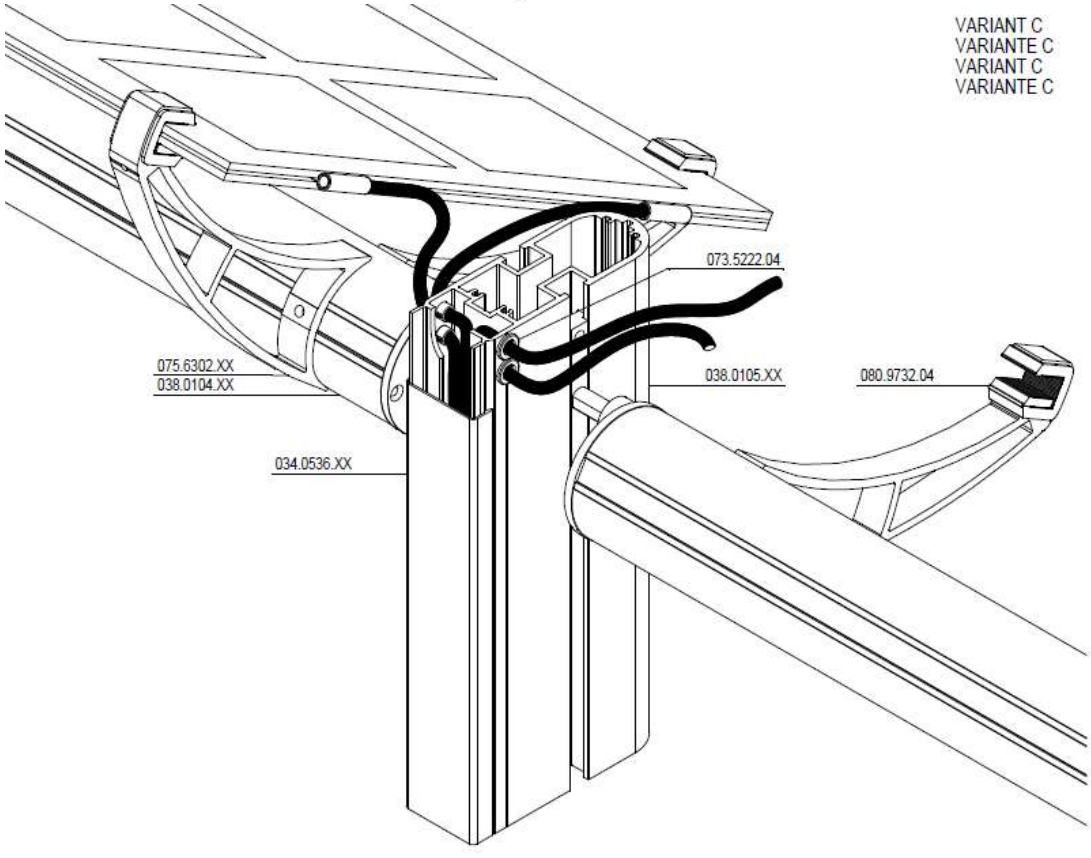


b) Vertical :

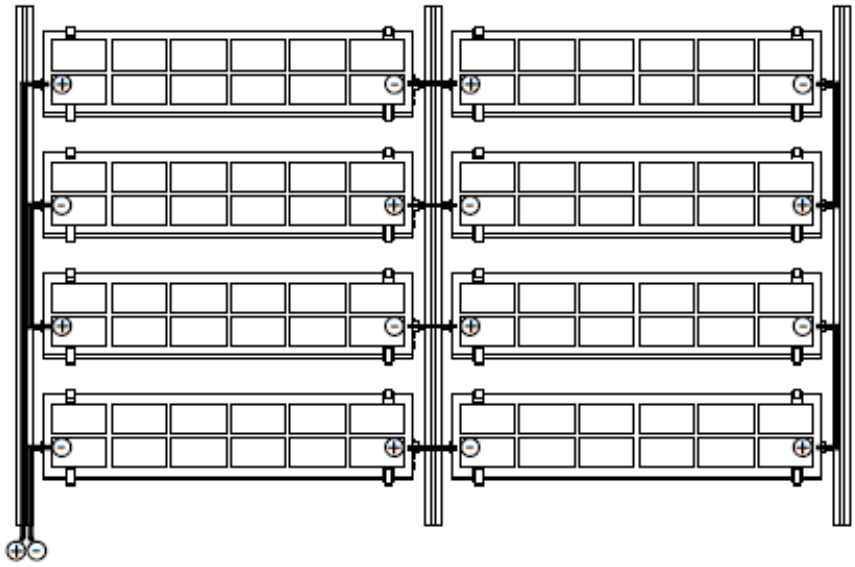


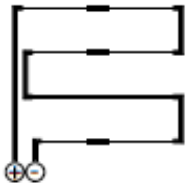
DETAIL OF ELECTRICAL CABLE AND CONNECTION VARIANTS :



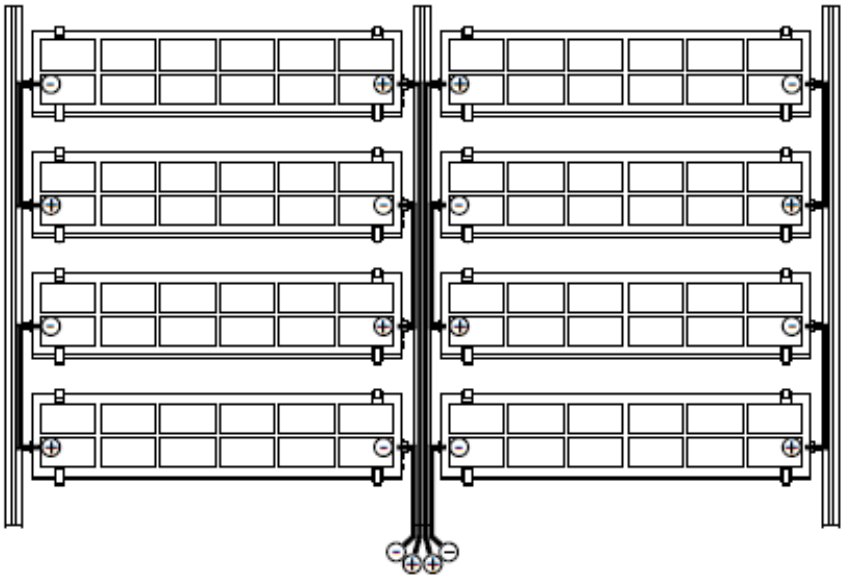


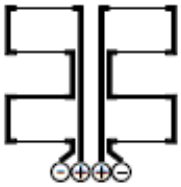
VARIANT A
VARIANTE A
VARIANT A
VARIANTE A



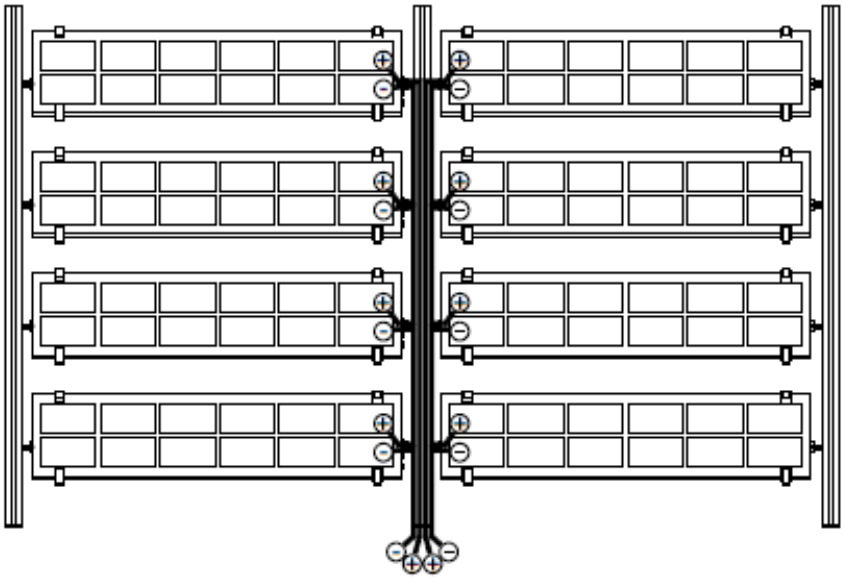


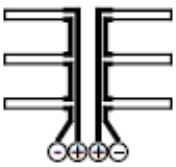
VARIANT B
VARIANTE B
VARIANT B
VARIANTE B





VARIANT C
VARIANTE C
VARIANT C
VARIANTE C





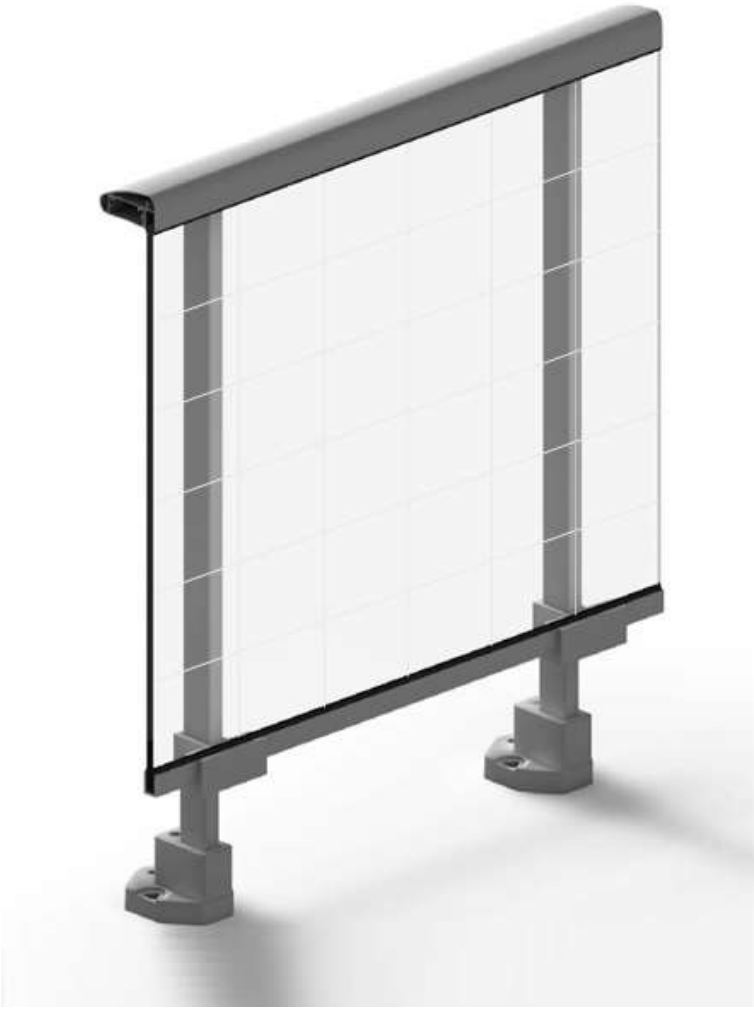
3) Product : PHOTOVOLTAIC RAILINGS

- Double objetive: anti-fall protection + electricity generation.
- Suitable for terraces with accessibility or building rooftops.
- Possibility of setting the desired inclination (between 10º - 30º) to optimize sun exposure) or without inclination.
- Suitable for installation on the slab or on the edge of the slab. Different models of pedestals available.
- Modular system.
- Maximum spacing between each pilaster:
  - o glass-panel model direct to handrail: 1.000 mm
  - o panel-glass model to support profile : 1.500 mm.
- Railing height : between 1,000 and 1,200 mm (according to regulations).
- Price range **per m²** : 675 - 875 €. (including structure and photovoltaic panel, excluding shipping costs).

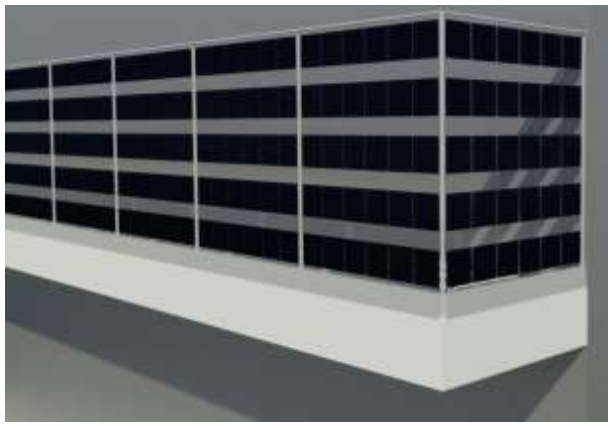
- Carpin-System does **not** provide additional wiring to that provided by the BIPV modules (see variants), nor inverters, nor installation service.

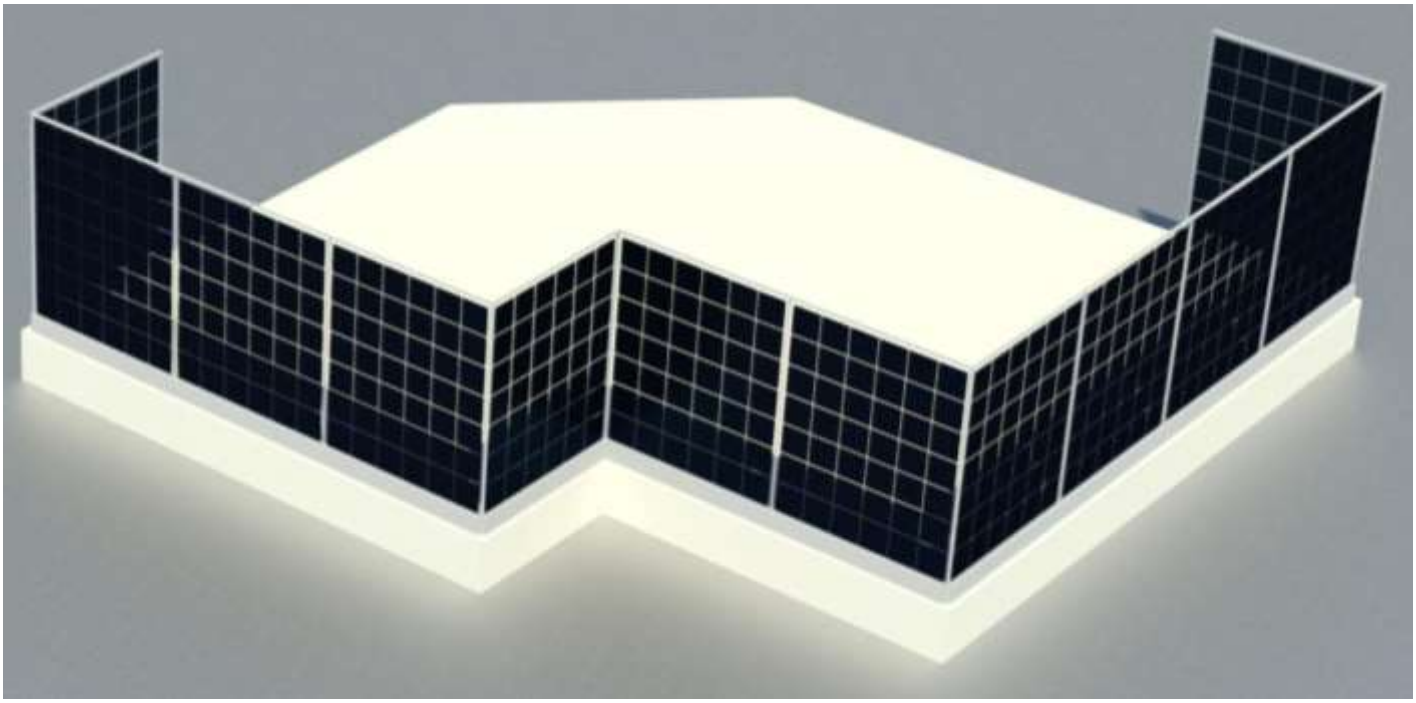
VISUAL REPRESENTATION OF THE PRODUCT:

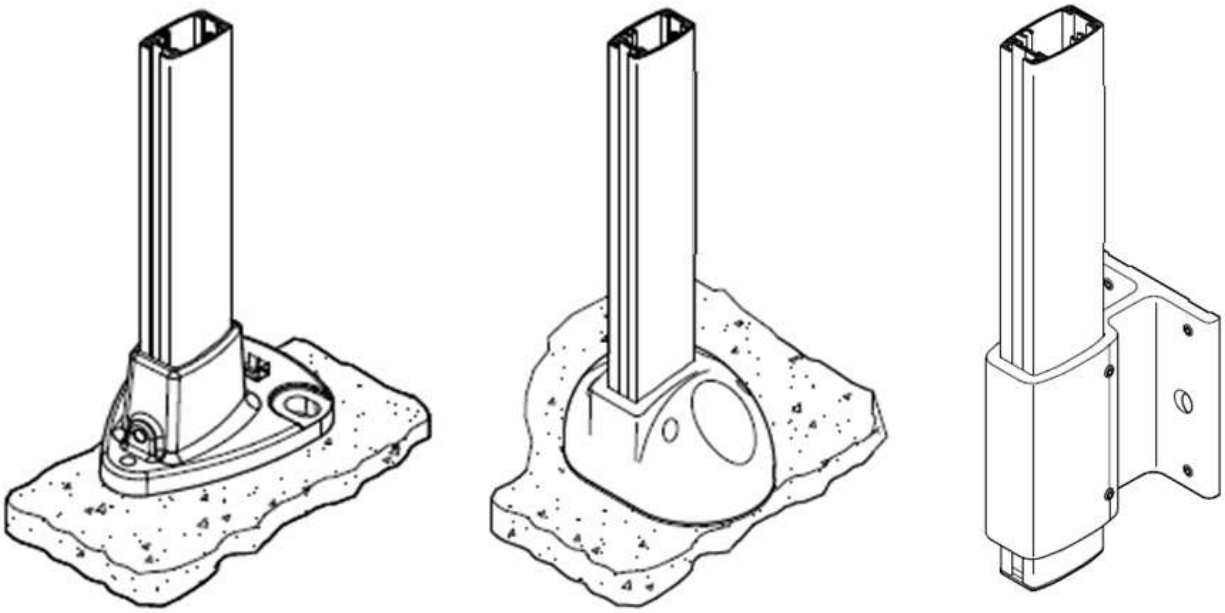
Option with 30º inclination



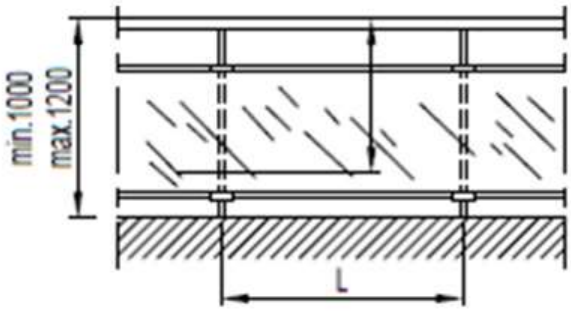
Option without inclination

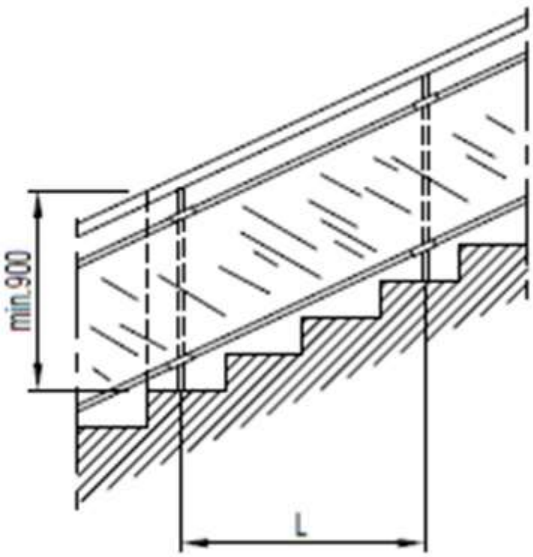




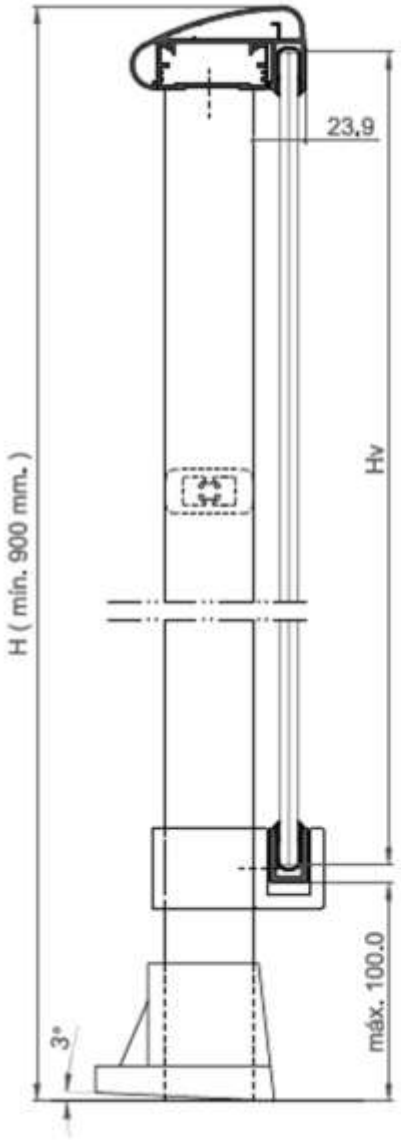


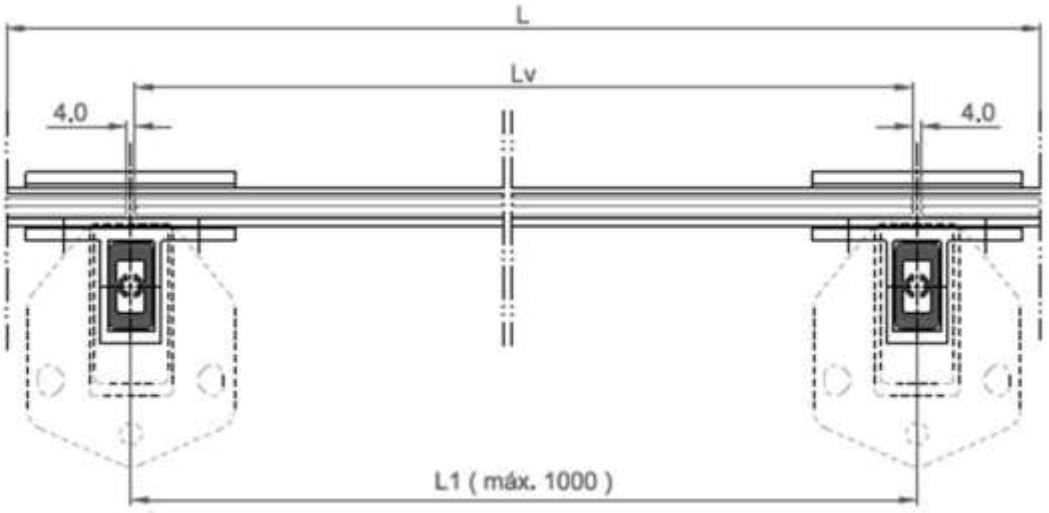
Example of base models (from left to right): flat on slab, rounded on slab and base to be placed on slab edge.



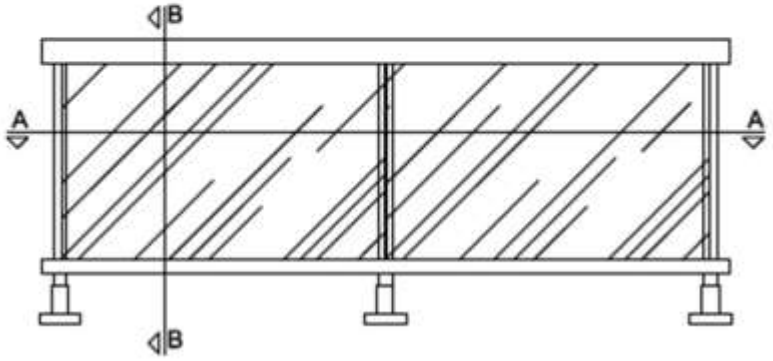


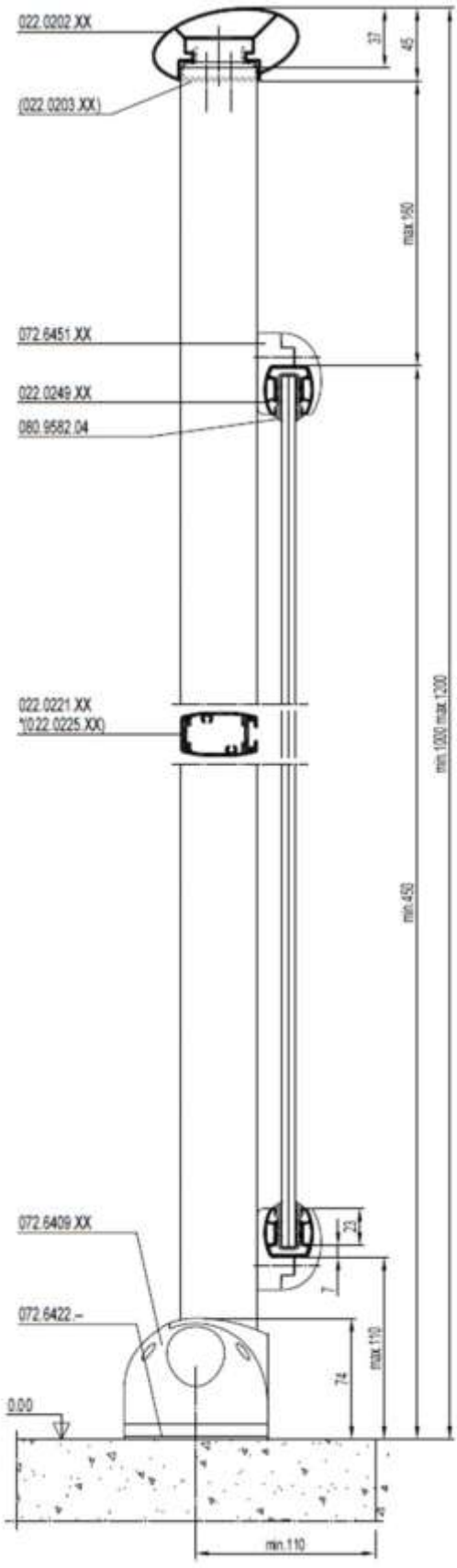
SECTION DETAIL :

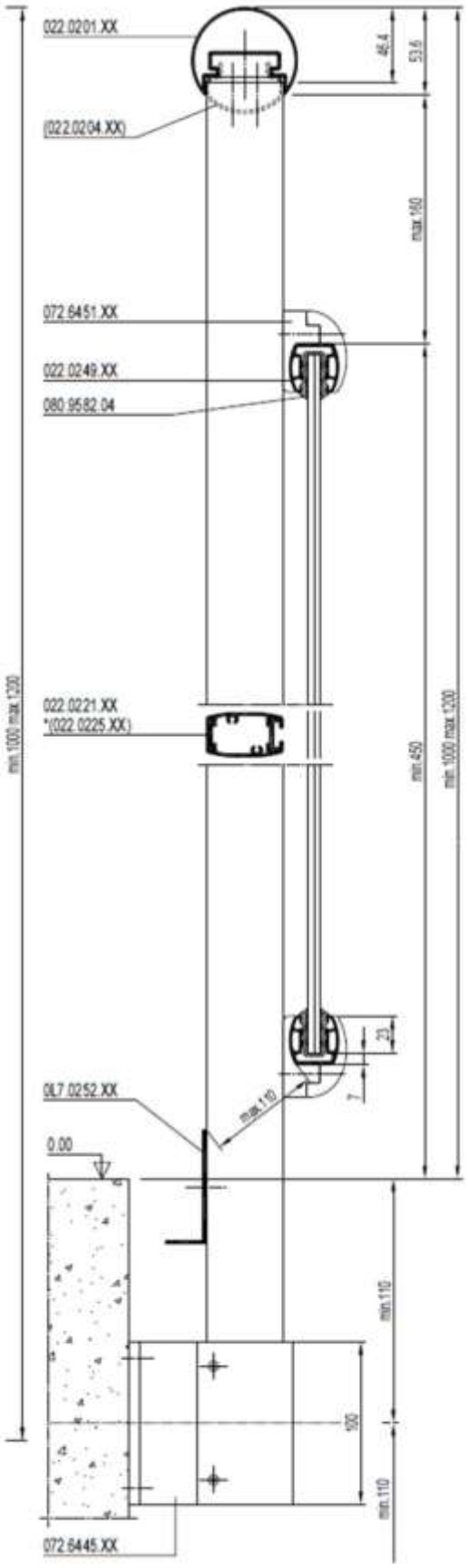




Model 1: PV panel direct to handrail profile (maximum panel/glazed area)







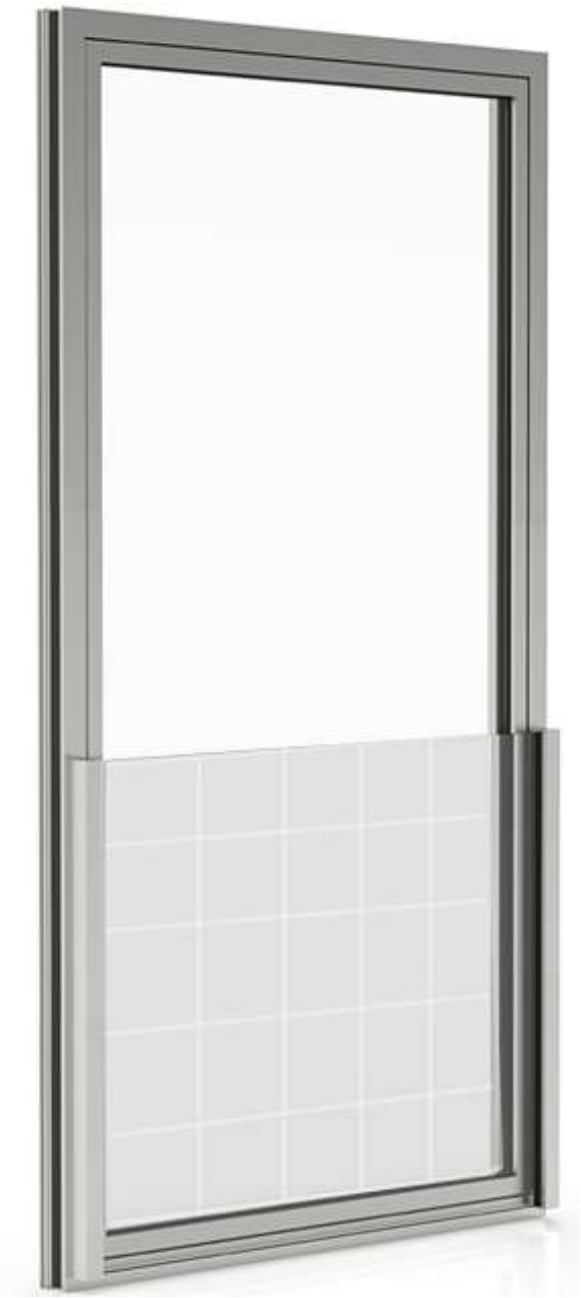
PV panel model fastened by a support profile fixed to the pilasters

4) Product : JULIET BALCONIES

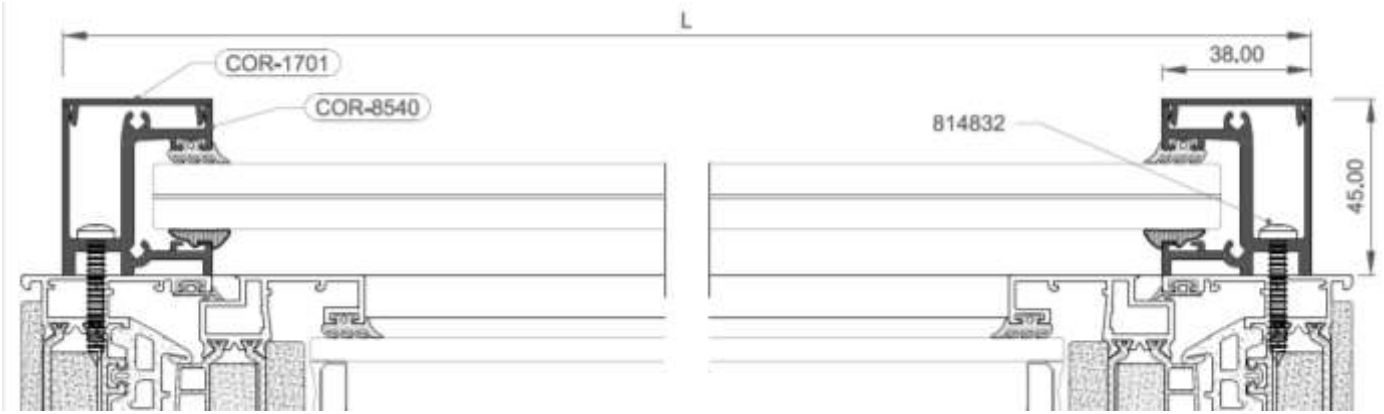
- Double objetive: anti-fall protection + electrical generation.
- Suitable for any exterior balcony with a maximum width of 1800 mm.
- For double-leaf balconies: possibility of installing an intermediate "I" profile (two panels).
- Height: between 1,000 and 1,200 mm (according to regulations).
- Price range **per m²** : 550 - 675 €. (structure and photovoltaic panel included, postage not included).

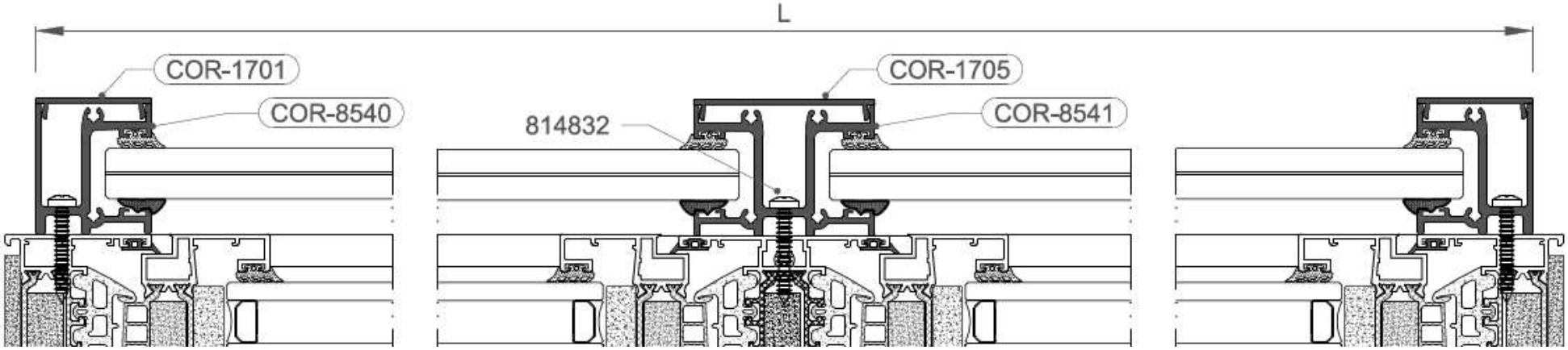
- Carpin-System does **not** provide additional wiring to that provided by the BIPV modules (see variants), nor inverters, nor installation service.

VISUAL REPRESENTATION OF THE PRODUCT:

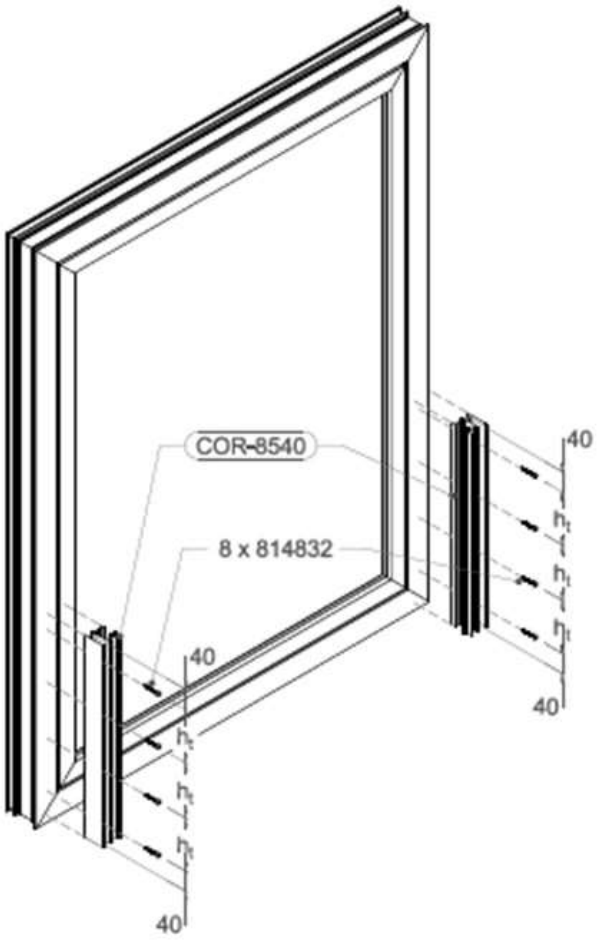


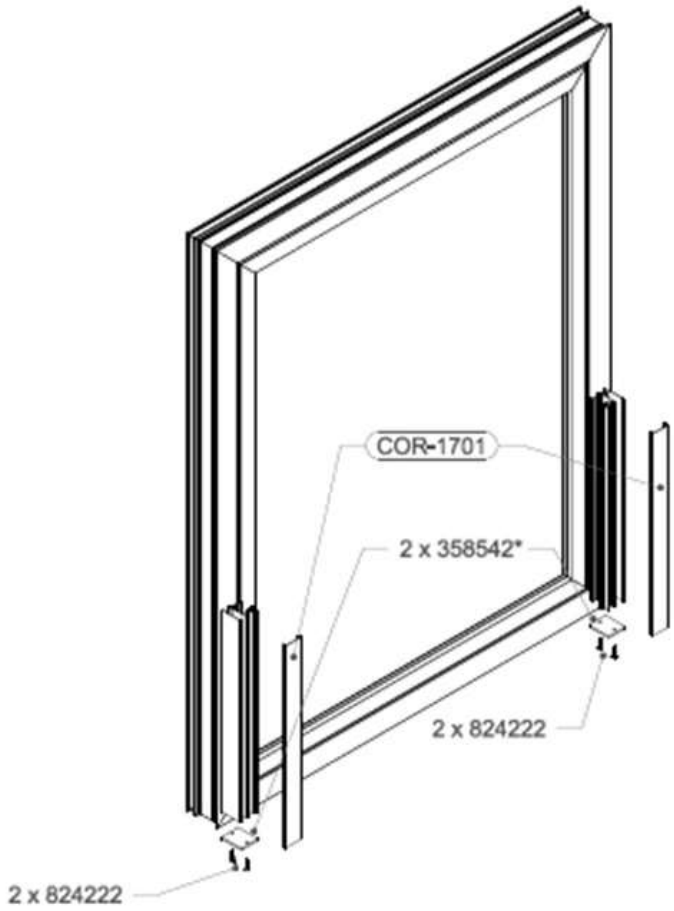
SECTION DETAIL :

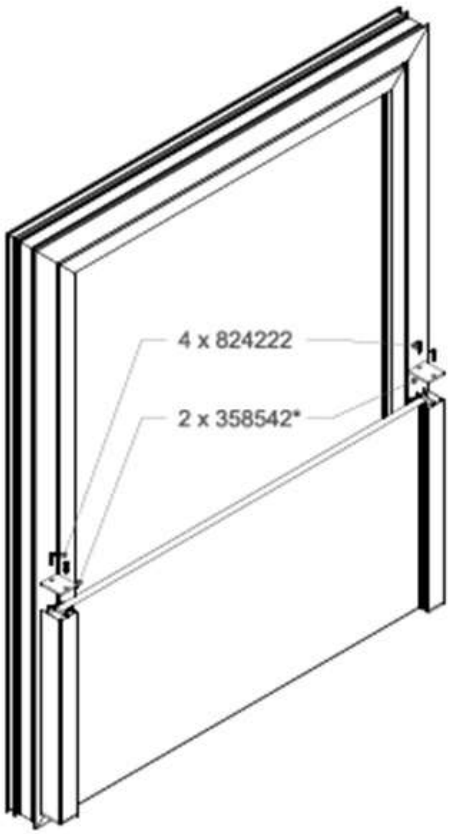


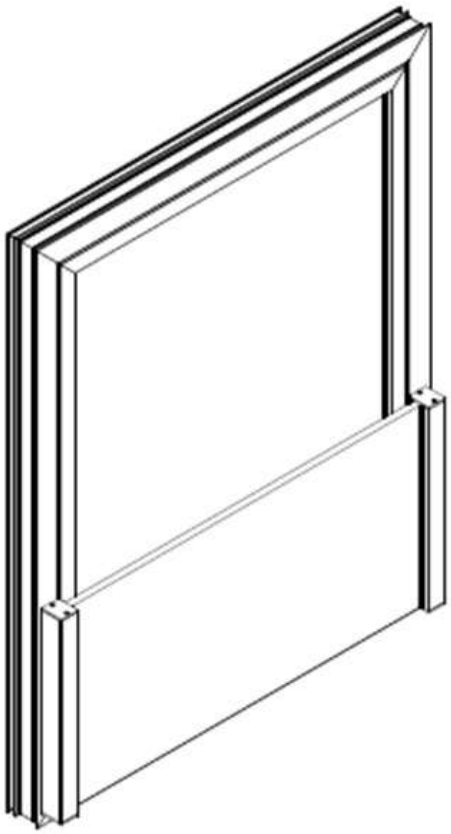


COMPONENTS DETAIL :



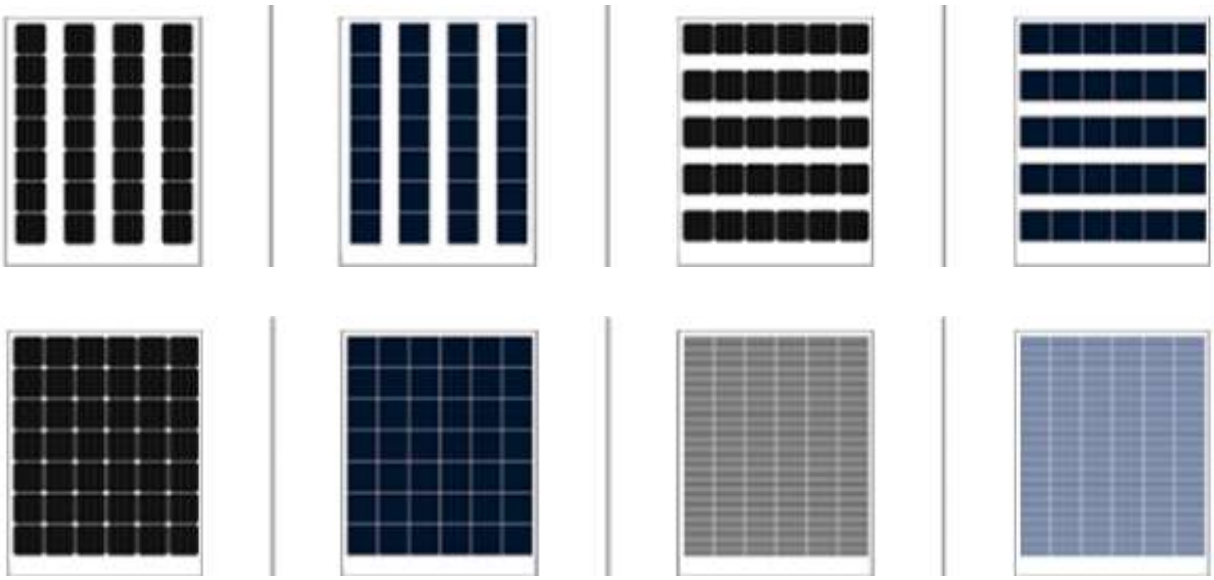






5) PHOTOVOLTAIC PANELS

- Possibility to choose the spacing between the photovoltaic cells, which will determine the level of transparency as well as power generation capacity.



Examples of performance **for each m²** of mono-crystalline panel (not structure):

- Transparency 25% : 161 Wp
- Transparency 37% : 130 Wp
- Transparency 58% : 90 Wp

Customization according to the desired color or background (digital printing) in order to match the aesthetics of the building :

Visual example of 25% transparency (good aesthetic balance without overly penalizing performance).

Visual example of 45% transparency (aesthetics is favored to the detriment of photovoltaic performance)

- Carpin-System modul's composition and standard sizes :

  - o Product 1 : Photovoltaic canopies :
    - Composition 5 + PV cells + 5
    - Total panel thickness : 13,73 mm
    - Panel dimension : L: 1.250 mm, H: 1.000 mm

  - o Product 2 : Photovoltaic louvres :
    - Composition 5 + PV cells + 5
    - Total panel thickness : 13,73 mm
    - Panel dimension : L: 1.500 mm, H: 366 mm

  - o Product 3 : Photovoltaic railings :
    - Composition 10+double butyral+PV cells+10
    - Total panel thickness : 24,03 mm
    - Panel dimension : Model 1 (support profile) L: 1.250 mm, H depending on railing design. Model 2 (direct to handrail) L: 740 mm, H: 1.100 mm.

  - o Product 4 : Juliet Photovoltaic balconies :
    - Composition 10+double butyral+PV cells+10
    - Total panel thickness : 24,03 mm
    - Panel dimensions : H: 1.100 mm, L: according to balcony width.

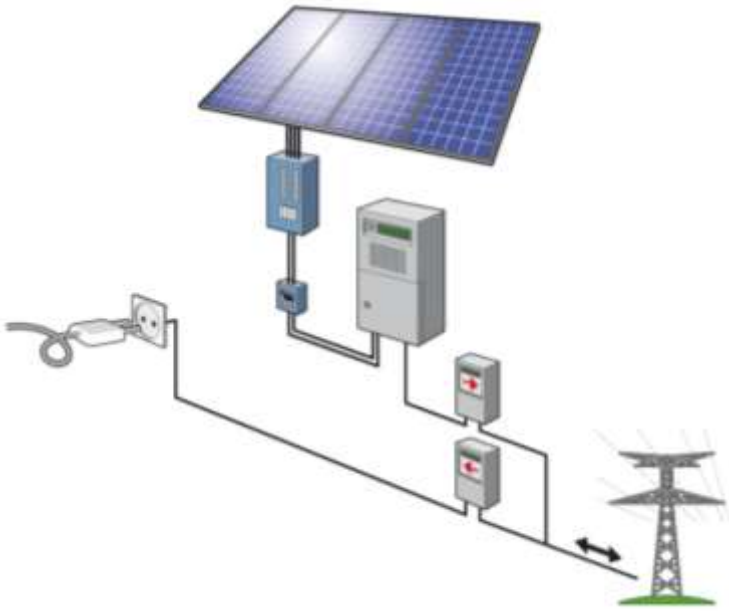
- Carpin-System will always offer the mono-crystalline panel as the first choice, even though the price is higher than the poly-crystalline and the return on investment is later, in the long term it will require less maintenance and the profits will be higher due to the higher photovoltaic power generation.

- Types of connections of the photovoltaic system:

  (reminder : Carpin-System does **not** provide additional wiring to the one provided by the BIPV modules (see variants), nor inverters, nor installation service).

  - 100% self-consumption (Off-Grid system):

  - Self-consumption and resale of the excess generated (On-Grid system) :



LEGAL WARNING

This document contains confidential information.

Fabricación de Carpintería de Aluminio Exclusiva para el Profesional, S.L (Tax number B65662967), hereinafter "Carpin-System", reserves the right to take legal action against the person or entity that distributes it or takes economic advantage of it, without prior authorization from Carpin-System

CARPIN-SYSTEM

www.carpinsystem.com - solar@carpinsystem.com Tel. (+34) 93 222 17 77 / (+34) 644 201 847

C/ Manyans, 11 - Polígono Can Cuiàs - 08110 Montcada i Reixac, Barcelona (SPAIN)