

INSTALLATION GUIDE

THE POSITIVE FACADE
by ACP Factory

GROUPE ULTRAWATT®

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INTRODUCTION

The ULTRAWATT Group supports its customers' energy transition with an innovative ventilated facade system that integrates photovoltaic panels for the first time.

Based in Cébazat, in the heart of the Chaîne des Puys, the group draws on its long-standing expertise in thin sheet metal forming and punching.

Over the years, ULTRAWATT has expanded its field of expertise to include the design of 3D composite aluminum facades, notably developing a patented photovoltaic facade solution: BIPV facades, designed as a creative toolbox for architects.

In a context marked by the climate emergency, architecture and construction are at a decisive turning point.

Photovoltaic facades are emerging as an innovative response, combining energy performance and architectural audacity.

The ambition? To transform building facades into energy-producing surfaces by integrating solar panels not on roofs, but at the very heart of architectural structures.

This approach rethinks the balance between aesthetics and functionality, redefining our living and working environments.

Much more than just cladding, solar facades are becoming an essential lever for a sustainable future.

With our active solar solution, we offer a high value-added facade: high-performance, elegant, and designed according to an industrial plug & play standard, as easy to install as a construction set, a real opportunity for designers of today and tomorrow.

DESCRIPTION

ULTRAWATT Group products are designed based on the principle of ventilated facades: they create a chimney effect that improves a building's thermal comfort and, above all, its energy performance.

The air gaps they generate reduce the impact of sunlight in summer and lessen the effect of cold in winter.

In addition, they require around 30% less insulation than a conventional facade, making them more economical and environmentally friendly. With the addition of photovoltaic modules, this makes the facade truly positive!

Our game boxes with 3D or photovoltaic cassettes, which are an integral part of our solution, allow you to create shadow patterns with the surrounding light.

This aesthetic approach makes our offering a truly architectural proposition. Whether they want to hide or highlight the solar panels, architects can play with the pieces to create a unique and singular project.

SAFETY INSTRUCTIONS

The installation of the facade must be carried out by qualified persons with the necessary technical skills and/or professional experience to ensure that it is carried out in accordance with the instructions provided.

› It is essential to check the load-bearing capacity of the support structure before any work is carried out, in order to ensure the safety and stability of the installation.

› Compliance with national and local building standards, applicable regulations, and environmental guidelines is mandatory.

Strict compliance with safety instructions is essential, including in particular:

› The mandatory wearing of personal protective equipment (PPE): helmet, safety shoes, gloves, etc.

› When working height, the use of appropriate safety equipment is essential:

Organization and vigilance:

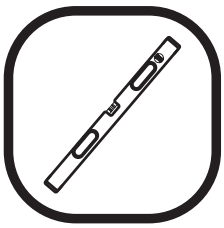
Fall arrest harnesses,
- Scaffolding equipped with guardrails and safety nets.

At least one other person must be present on site throughout the entire assembly process to ensure rapid intervention in the event of an accident or incident.

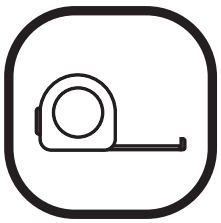
REQUIRED TOOLS



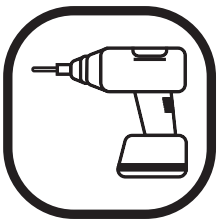
chalk line



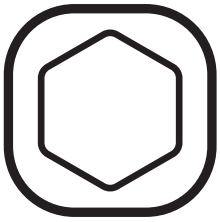
Spirit level /Laser level



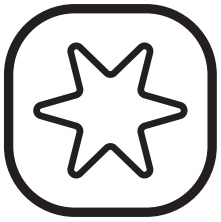
Measuring tape



Screwdriver



Adapter 8-10



Adapter T20









FIELD OF USE

This system is suitable for various types of buildings, including:

- Collective buildings (swimming pools, gymnasiums, etc.)
- Industrial buildings
- Tertiary buildings
- Agricultural buildings

It can also be installed in buildings open to the public, provided that the following are complied with:

- The provisions of the EL articles of the amended decree of June 25, 1980,
- The requirements validated by the Central Safety Commission,
- And the conditions set out in these installation instructions.

The cladding can be installed on flat, vertical walls, whether new or existing, made of:

- Plastered masonry, in accordance with NF DTU 20.1,
- Concrete, in accordance with DTU 23.1,
- These walls must be located on upper floors.

STRUCTURE

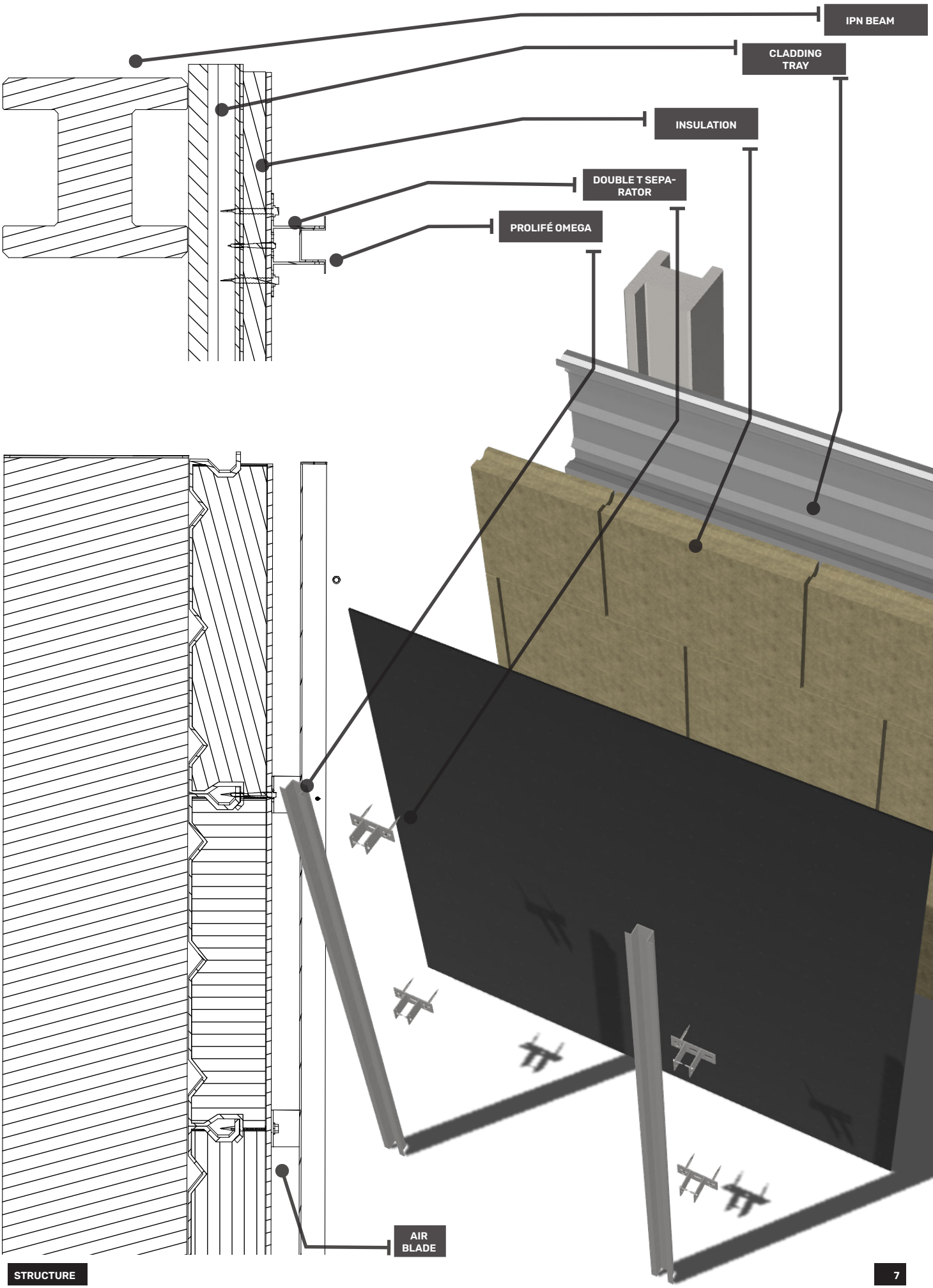
BIPV FACADE



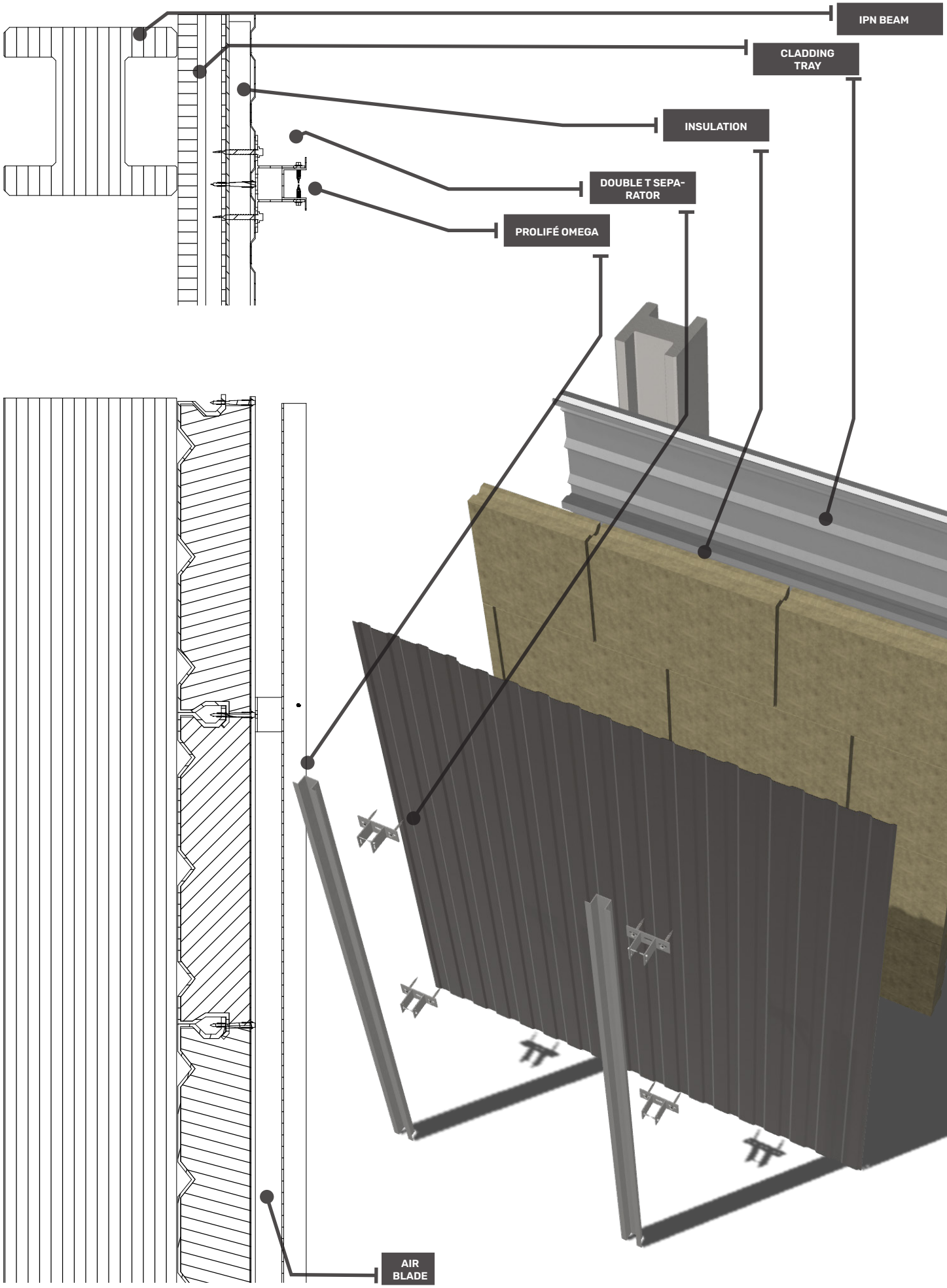




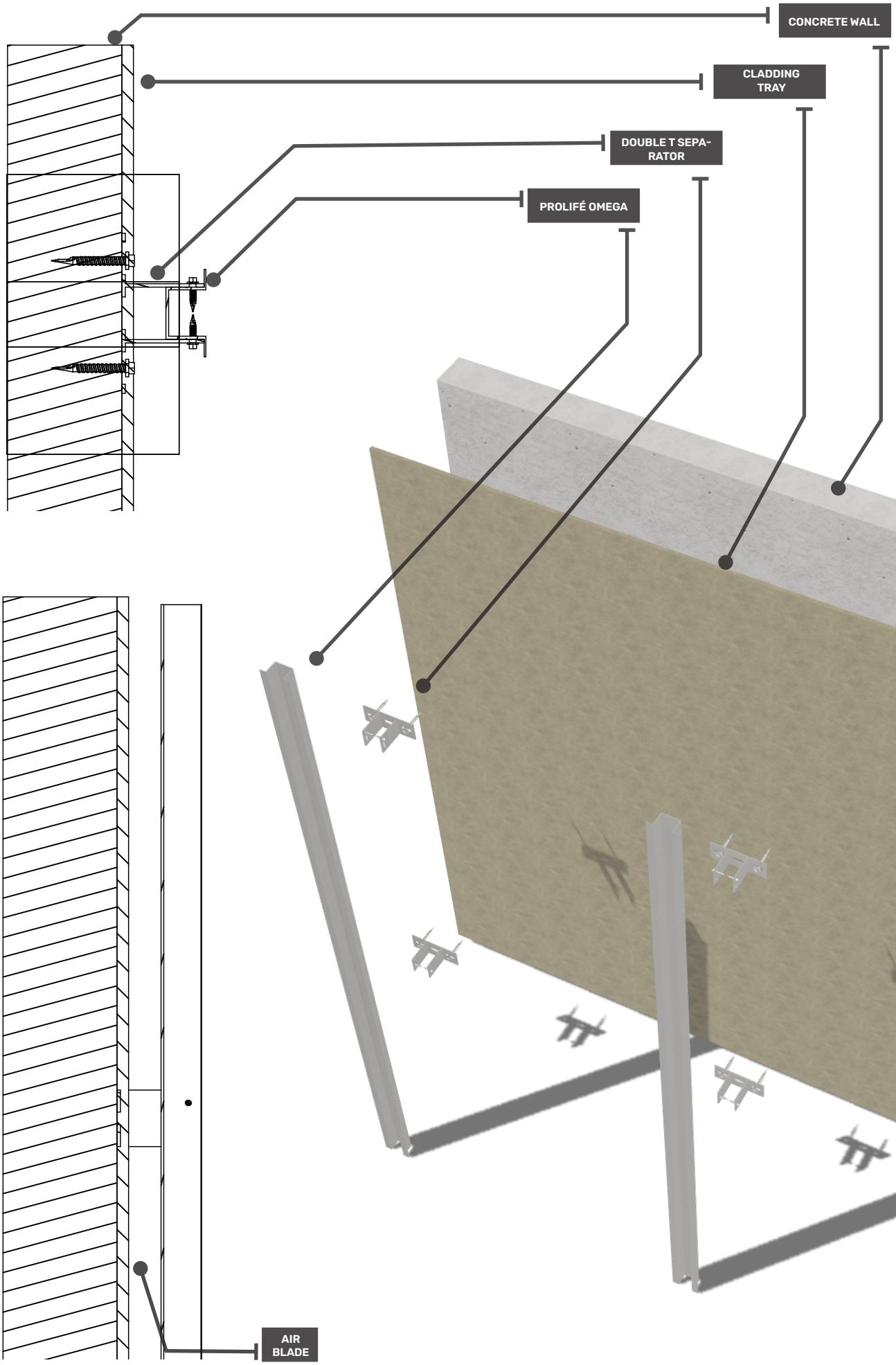
TYPE OF STRUCTURE: DOUBLE-SKIN METAL CLADDING & DOERKEN RAIN PROOF



TYPE OF STRUCTURE : DOUBLE-SKIN METAL CLADDING & CLADDING PROFILE 11.100.8 10/10°



TYPE OF STRUCTURE: CONCRETE MASONRY SUPPORT



DOUBLE T spacers, available in different lengths, are used to fix OMEGA profiles to the vertical cladding or load-bearing wall of the facade. They also play an essential role in correcting any plumbness defects in the substrate.

Adaptability to insulation thicknesses

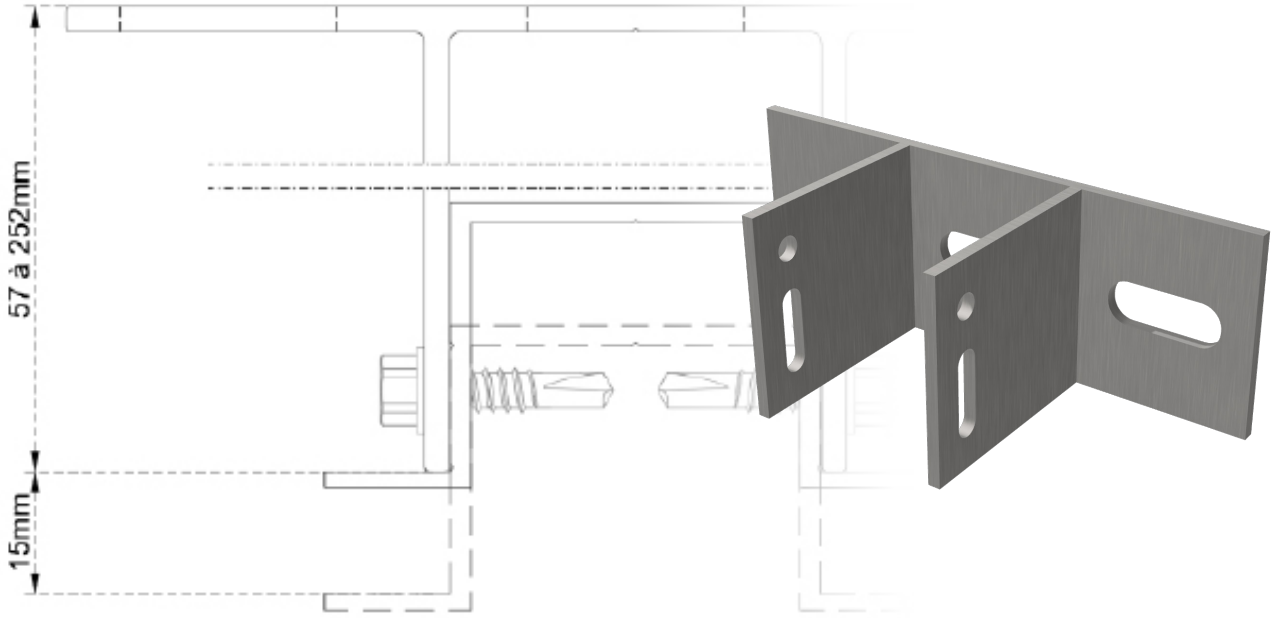
The different lengths of DOUBLE T spacers allow them to be precisely adapted to the required thermal insulation thickness, while absorbing any irregularities in the facade.

This flexibility ensures a compliant and durable installation of the facade system.

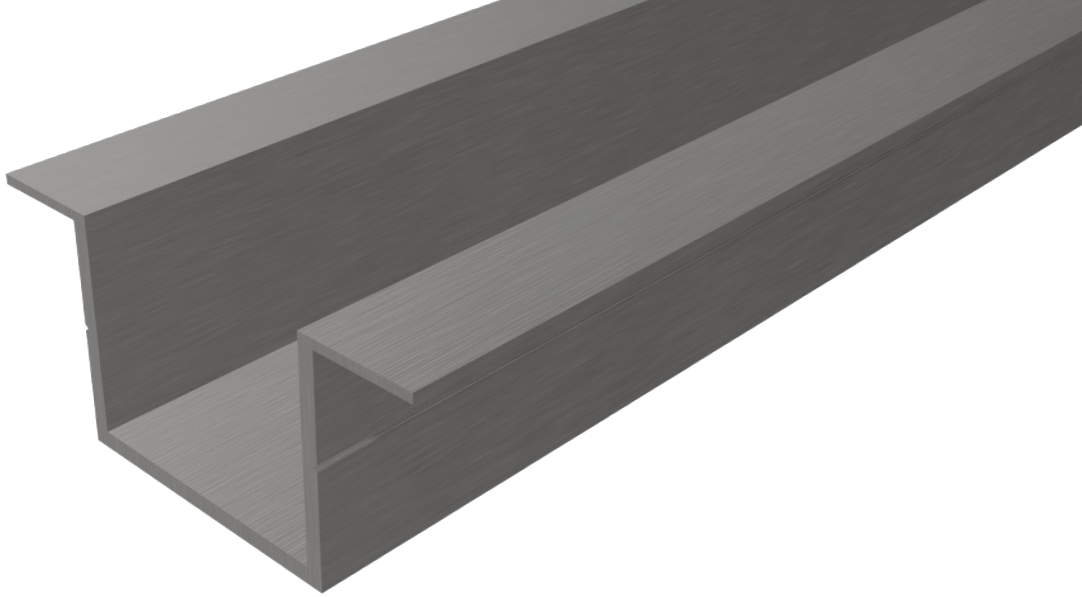
Insulation and rain screen requirements

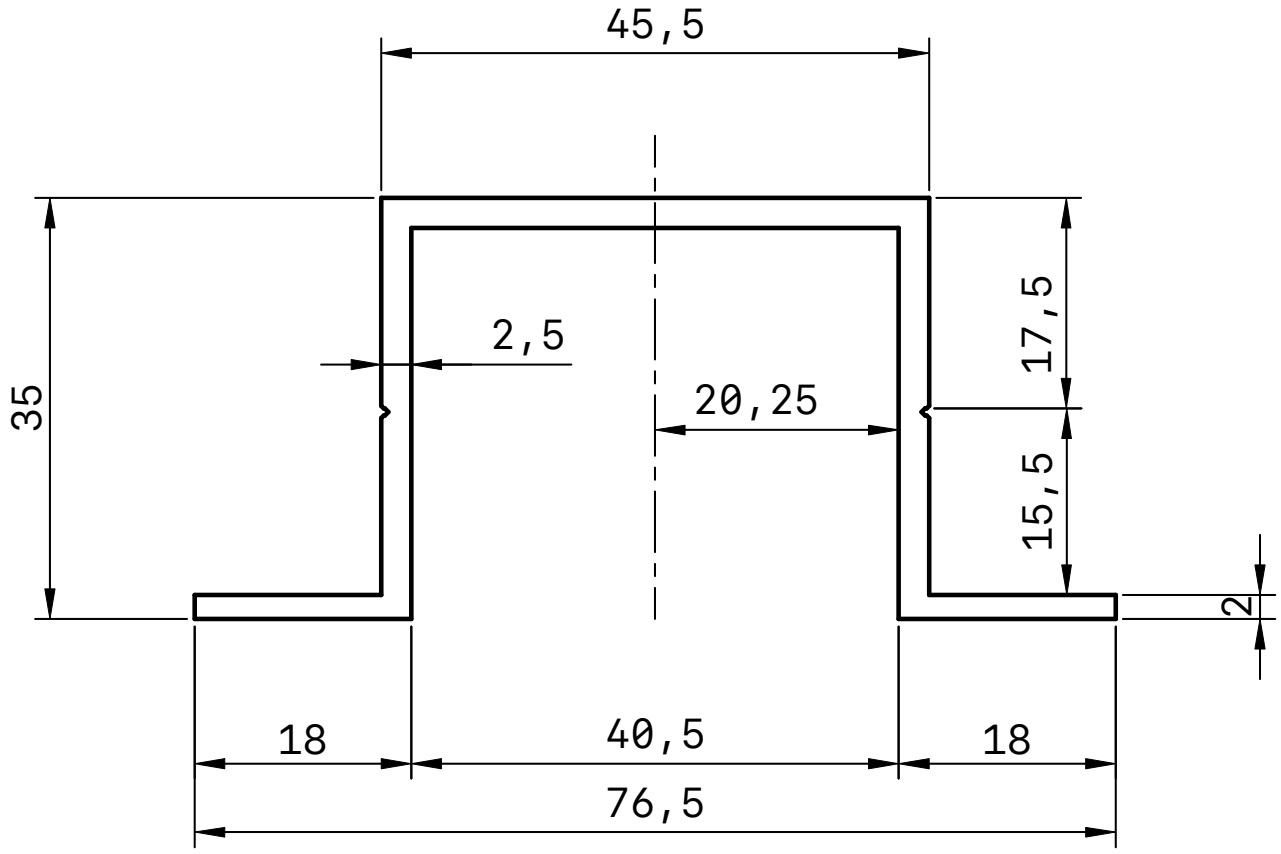
The insulation materials used must be classified at least A1 according to the Euroclass standard (in accordance with the decree of November 21, 2022), thus guaranteeing excellent fire resistance.

A metal rain screen (classified M0) will be systematically installed, providing enhanced protection against water infiltration and contributing to the fire safety of the building.



SEPARATEUR DOUBLE T		DISTANCE (mm) FROM THE BASE OF THE ANCHOR TO THE VISIBLE FACE OF THE RAIL		MAXIMUM INSULATION THICKNESS (MM) FOR A 57 MM AIR GAP
RÉF.	ÉLÉMENT	MINIMUM	MAXIMUM	
05.19.004	DOUBLE T SEPARATOR 57	59	72	0
05.19.005	DOUBLE T SEPARATOR 72	74	87	15
05.19.006	DOUBLE T SEPARATOR 87	89	102	30
05.19.007	DOUBLE T SEPARATOR 102	104	117	45
05.19.030	DOUBLE T SEPARATOR 117	119	132	60
05.19.031	DOUBLE T SEPARATOR 132	134	147	75
05.19.032	DOUBLE T SEPARATOR 147	149	162	90
05.19.033	DOUBLE T SEPARATOR 162	164	177	105
05.19.034	DOUBLE T SEPARATOR 177	179	192	120
05.19.035	DOUBLE T SEPARATOR 192	194	207	135
05.19.036	DOUBLE T SEPARATOR 207	209	222	150
05.19.037	DOUBLE T SEPARATOR 222	224	237	165
05.19.038	DOUBLE T SEPARATOR 237	239	252	180
05.19.039	DOUBLE T SEPARATOR 252	254	267	195





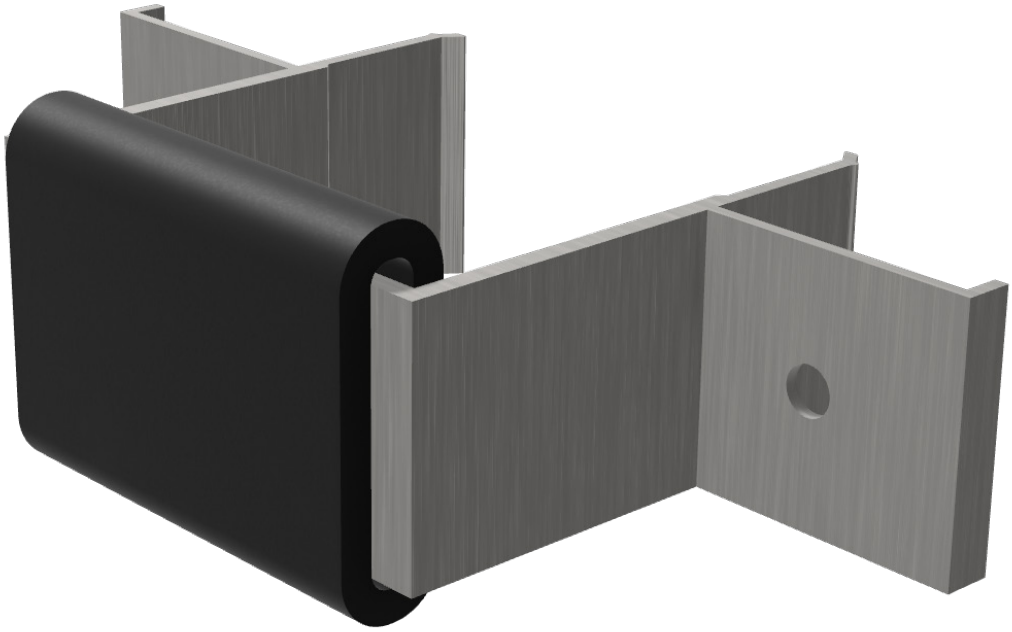
ALUMINUM OMEGA PROFILES

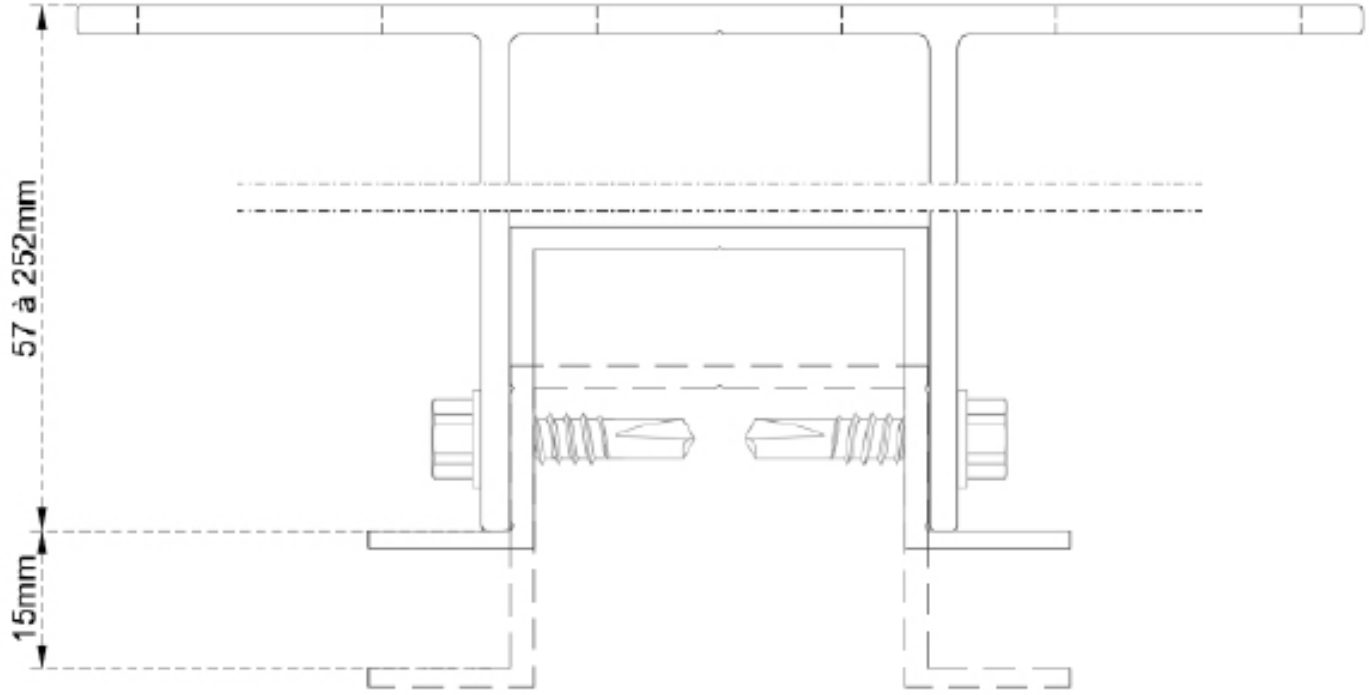
Once positioned on the DOUBLE T separators, the OMEGA profile is secured with screws. The system allows for precise adjustments, which must be used to ensure that each profile is perfectly vertical.

Installation procedure:

The first and last anchoring points of each profile must be placed at a maximum distance of 250 mm from the ends.

These fastenings guarantee optimal distribution of mechanical forces and reliable support over the entire height.





SLIDER SUSPENSION SUPPORT ASSEMBLY

Suspension support assemblies, also known as sliders, are installed directly onto OMEGA profiles.

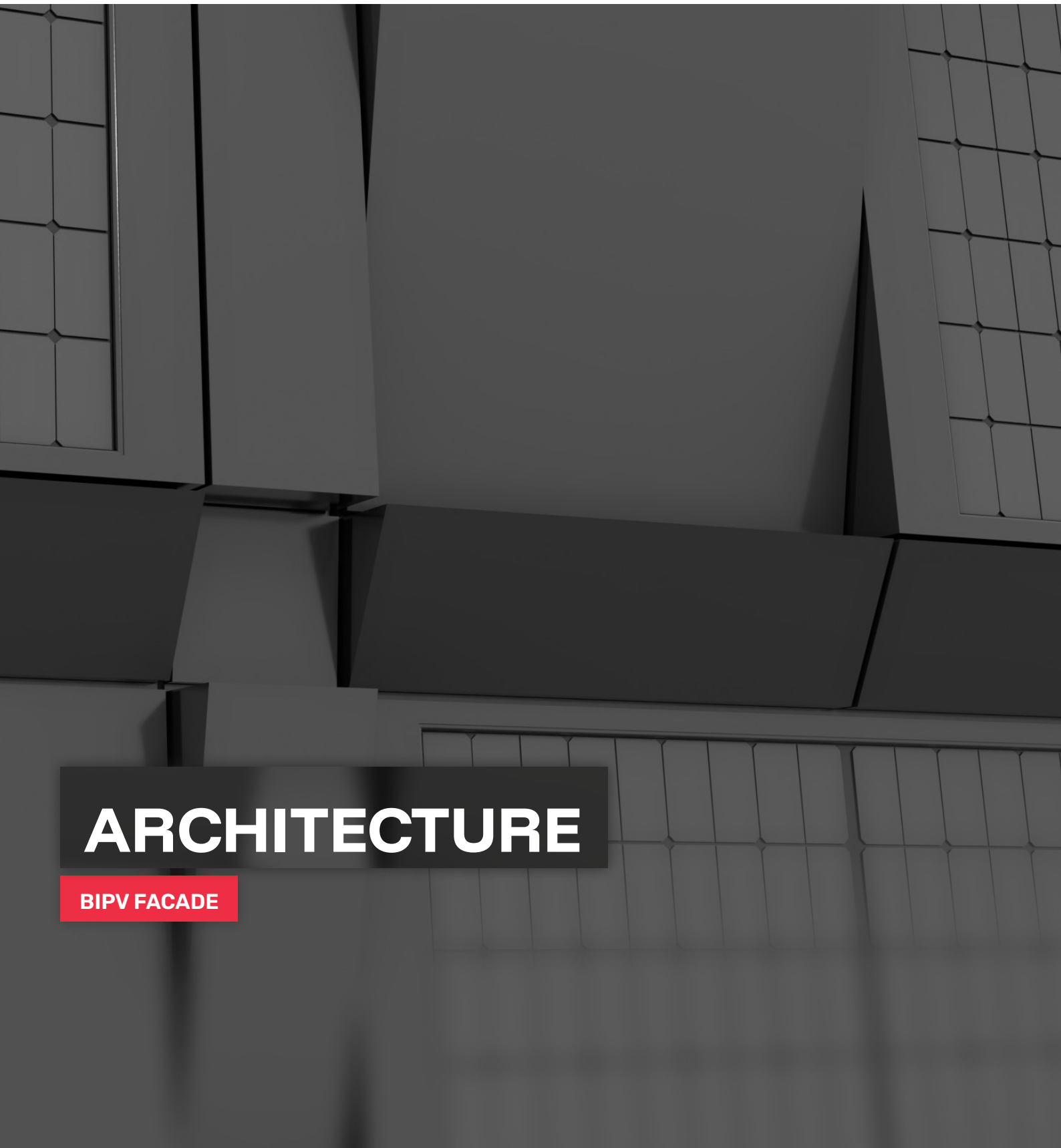
These sliders are height-adjustable to align precisely with the notches on the back of each cassette. This adjustment is essential to ensure accurate positioning and a uniform visual appearance of the façade.

Each suspension piece is equipped with an anti-vibration joint, which limits noise caused by vibrations, particularly those generated by wind, traffic, or other sources of resonance. This device contributes to the overall acoustic comfort of the building.

Installation procedure:

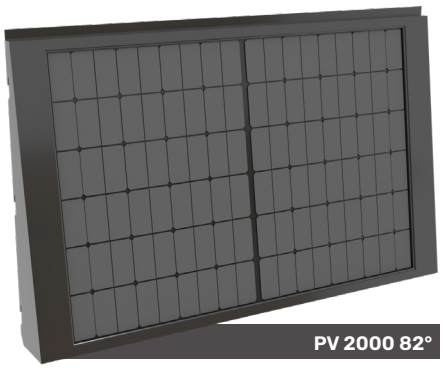
Initial positioning: The bracket is first clipped into the OMEGA profile using its edges, allowing free vertical movement and facilitating adjustment.

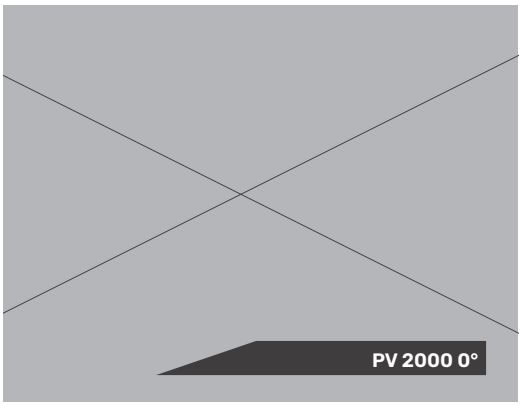
Final fastening: Once the correct position has been confirmed, the slider is secured to the profile with two self-drilling screws, ensuring reliable and durable support.

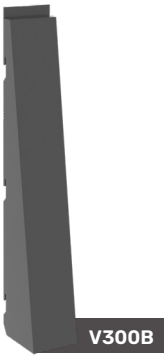


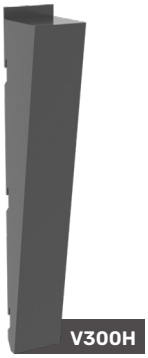
ARCHITECTURE

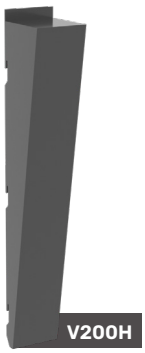
BIPV FACADE

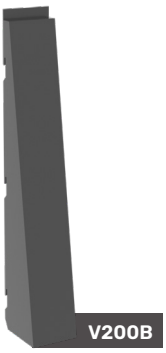


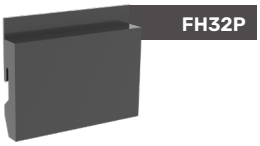


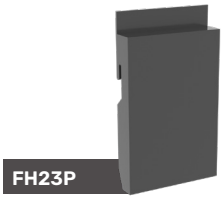


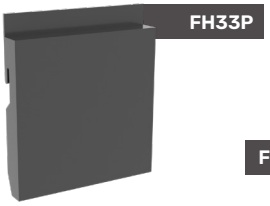


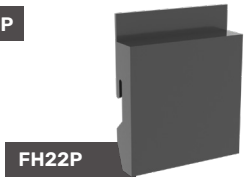




















BIPV FACADE: THE ELEMENTS OF THE “GAME BOX”

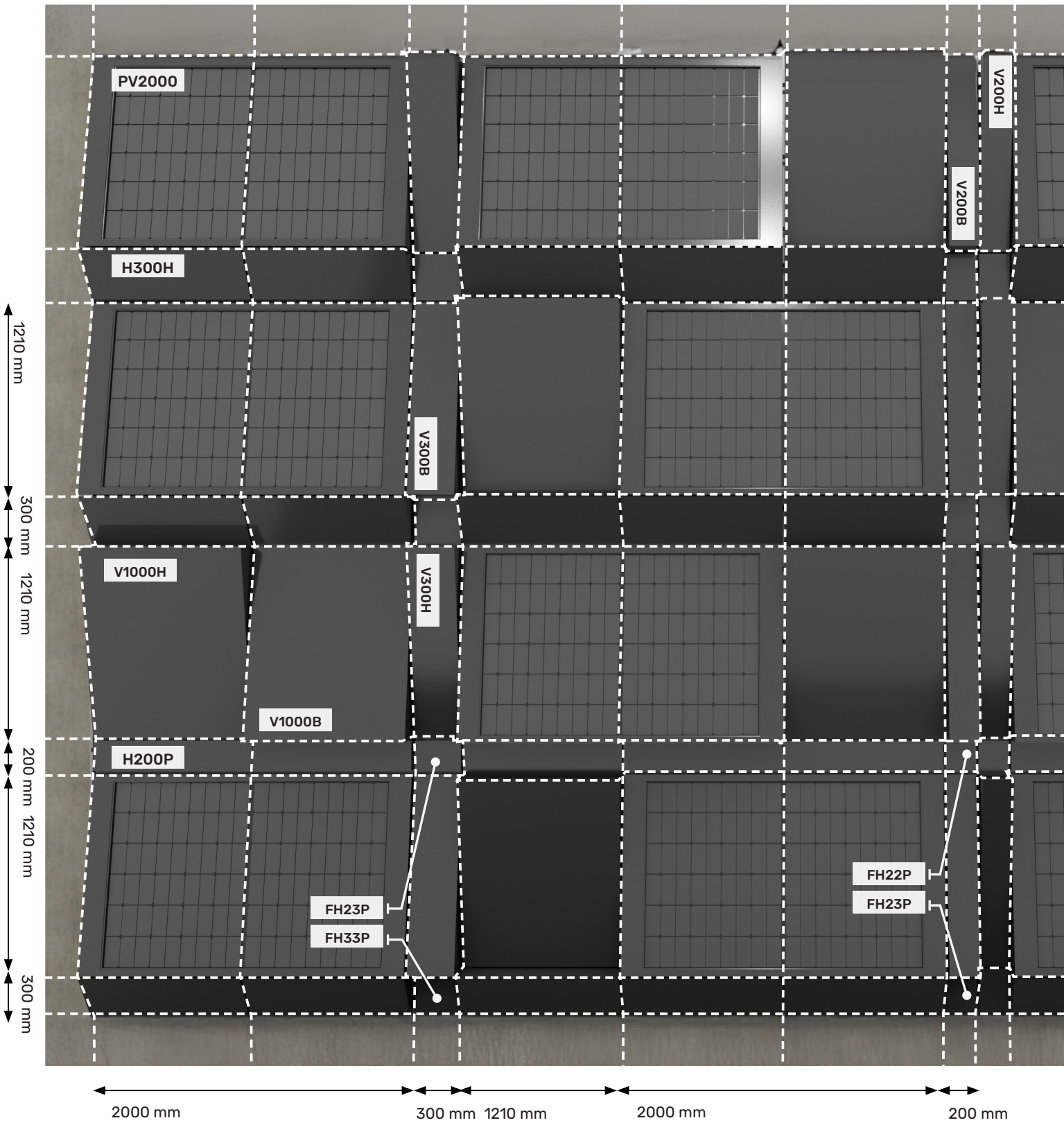
The BIPV Facade game box consists of 13 modular elements, ranging in width from 200 to 2000 mm and in height from 200 to 1000 mm.

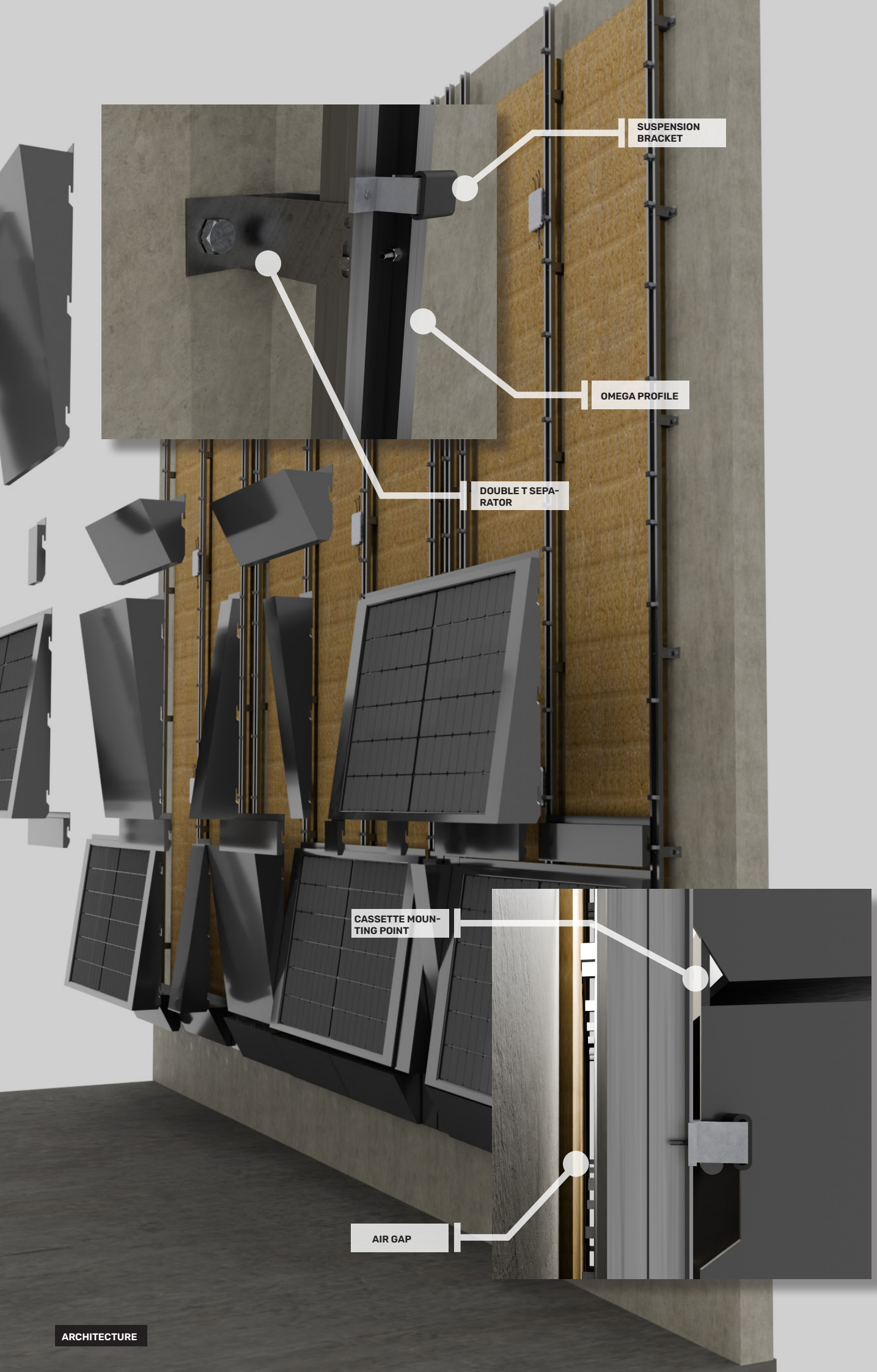
These modules can be connected to each other to create facades that are both original and productive.

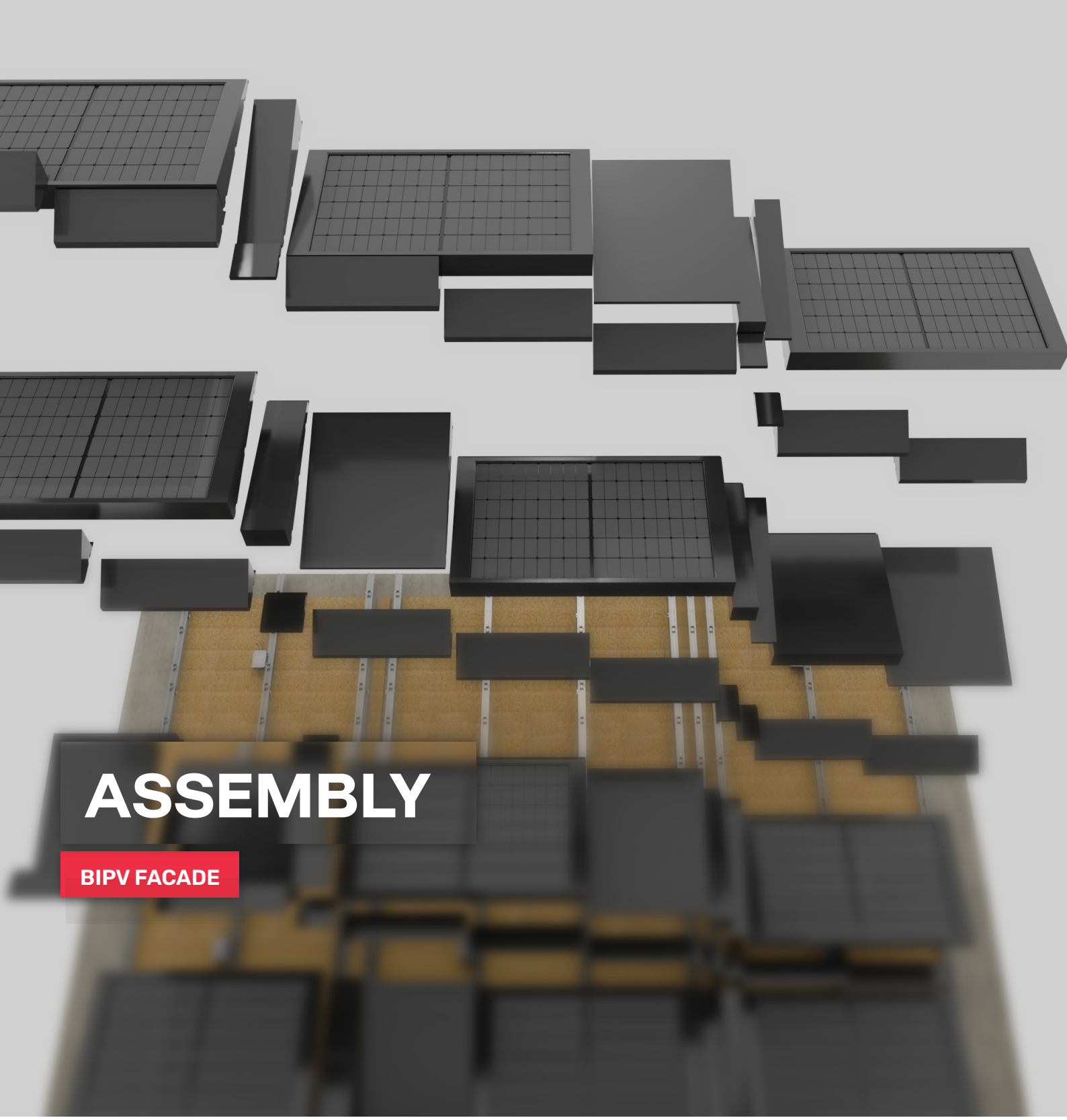
The PV2000 element, equipped with photovoltaic panels, transforms the facade into an energy hub.

This allows buildings to generate their own electricity directly from the façade and consume this energy themselves, contributing to sustainable and smart architecture.

BIPV FACADE: ASSEMBLY




SUSPENSION BRACKET
OMEGA PROFILE
DOUBLE T SEPA-RATOR
CASSETTE MOUN-TING POINT
AIR GAP



ASSEMBLY

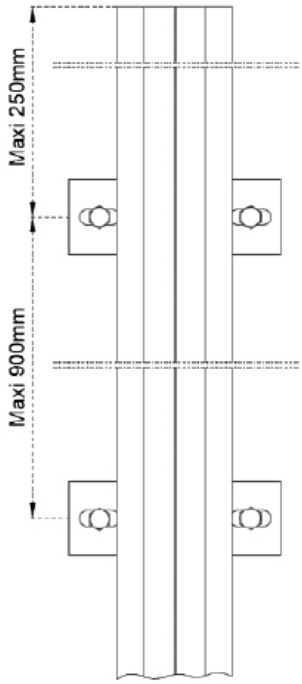
BIPV FACADE

Tips

Before proceeding with installation, it is your responsibility to check the load capacity of the supporting structure on which the installation will be carried out.

You can carry out tests to validate the strength of the support.

INSTALLATION: INSTALLATION OF DOUBLE T SEPARATOR



The first step in installation is to attach the DOUBLE T spacers to the load-bearing wall. These elements anchor the OMEGA profiles to the facade while correcting any vertical misalignment of the vertical support (wall or frame).

Important:
Separator fasteners are not supplied with BIPV FACADE. They must be selected according to the type of substrate (concrete, masonry, metal, or wood) to ensure optimal pull-out resistance.

The horizontal spacing between DOUBLE T spacers is standardized and depends on the layout of the BIPV facade. Three standard values are possible:
- 200 mm
- 300 mm
- 1000 mm

The maximum vertical spacing between two separators is 900 mm.
This will be determined on a case-by-case basis by our design office, depending on technical constraints and the installation site.

The first and last fixing points of each OMEGA profile must be positioned at a maximum distance of 250 mm from its ends in order to ensure even load distribution.

The second step consists of screwing the OMEGA profiles onto the DOUBLE T separators, in accordance with the layout plan.

The first and last anchor points of each profile must be positioned at a maximum distance of 250 mm from its ends. This ensures stable fastening while complying with expansion constraints.

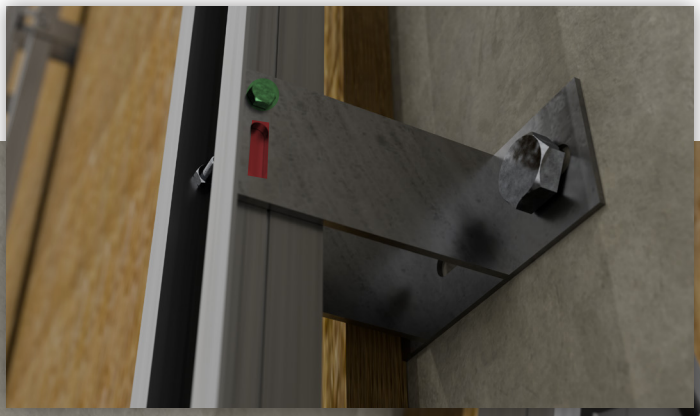
Each OMEGA profile will be fixed to each separator using two Ø 5.5 x 25 mm SFS stainless steel self-drilling screws, installed on either side of the profile, or equivalent.

To allow for thermal expansion of the structure, the screws shall be installed as follows:

On the first and last separators of a rail: screws in the round holes.

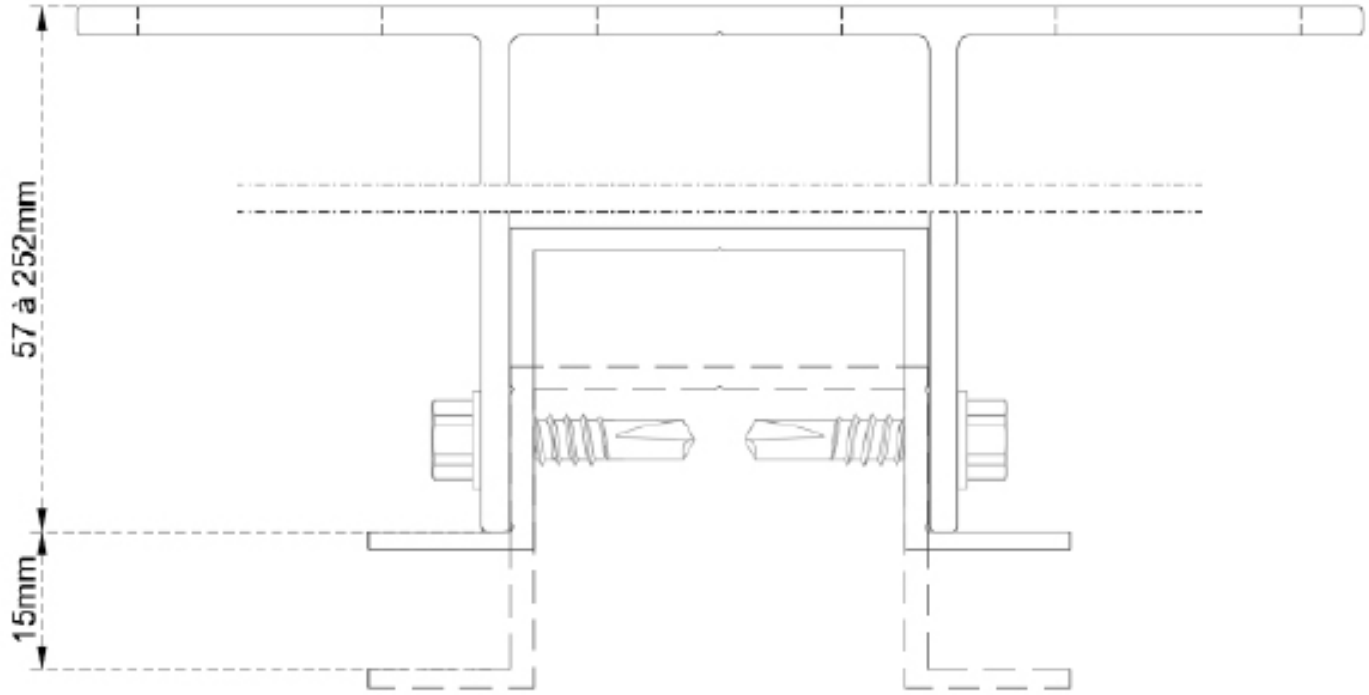
On the intermediate separators: screws in the oblong holes, allowing for slight longitudinal movement.

FIRST AND LAST



INTERMEDIARIES





INSTALLATION OF OMEGA RAILS

OMEGA profiles must be perfectly plumb, using the adjustments provided by the fastening system.
It is essential to check the coplanarity between adjacent uprights using a ruler or laser level.

The permissible deviation must not exceed 2 mm in order to ensure proper alignment of the cassettes and a uniform visual appearance.
When the length of an OMEGA profile is insufficient, an expansion gap of at least 5 mm must be maintained between the ends of the profiles.

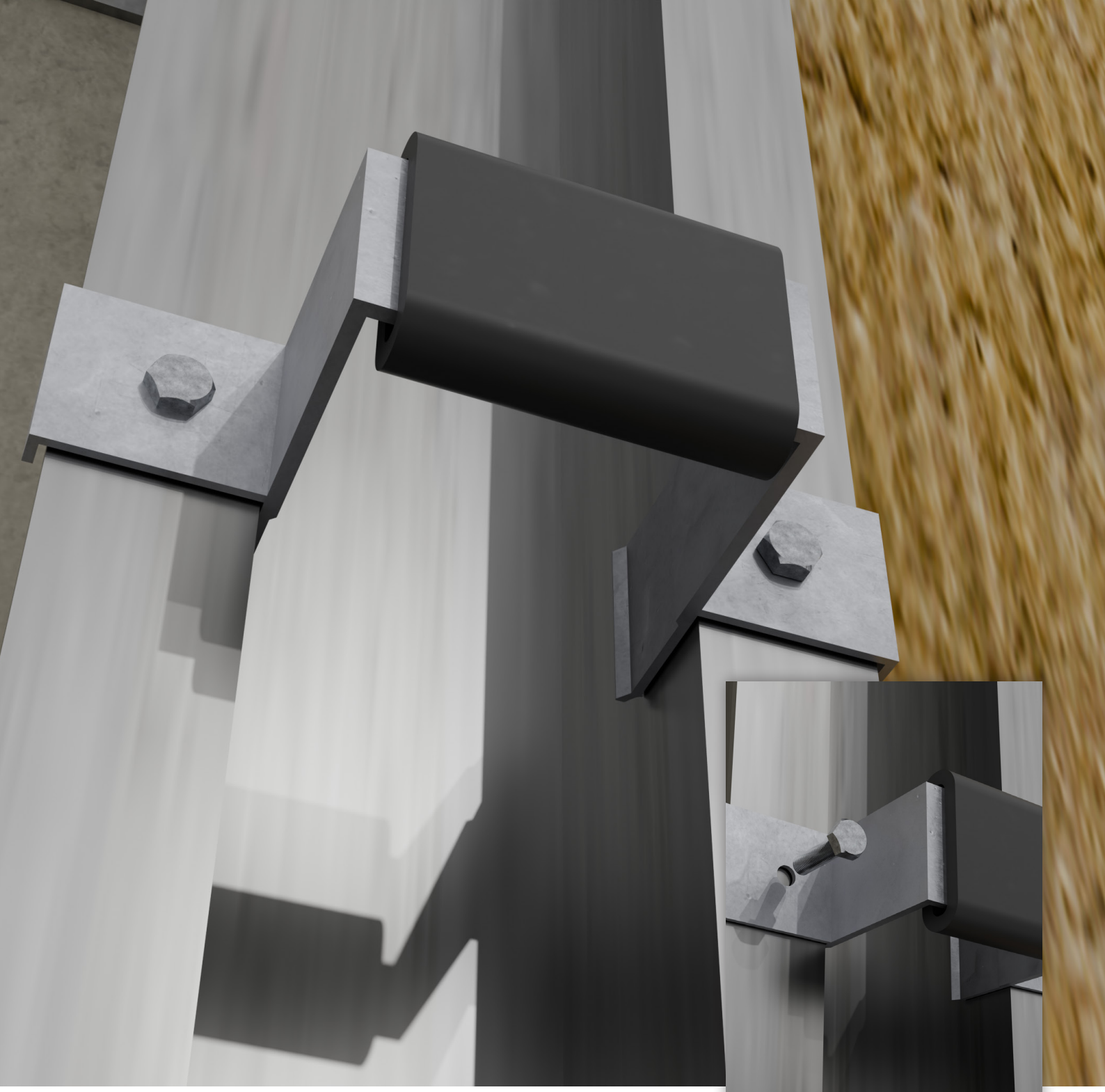
This gap allows for dimensional variations due to temperature changes.

Important: A single cassette must never rest on an expansion joint.

Connections between profiles must be made on cassettes that do not require ground continuity and that attach to only one suspension support, such as models H300, H200, FH22P, FH23P, FH32P, and FH33P.







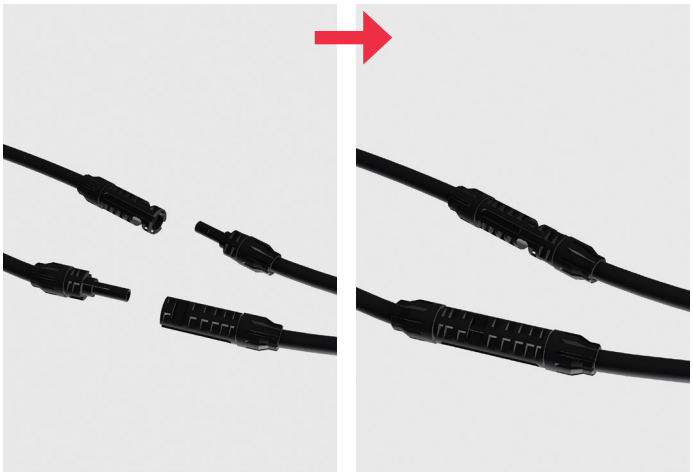
ASSEMBLY: SUSPENSION BRACKETS

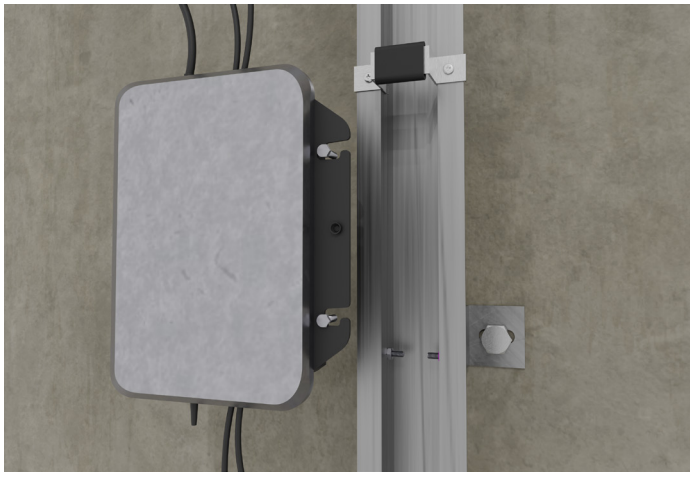
The suspension brackets are clipped onto the OMEGA profiles according to the layout defined for the facade. This step allows the cassette attachment points to be positioned with precision.

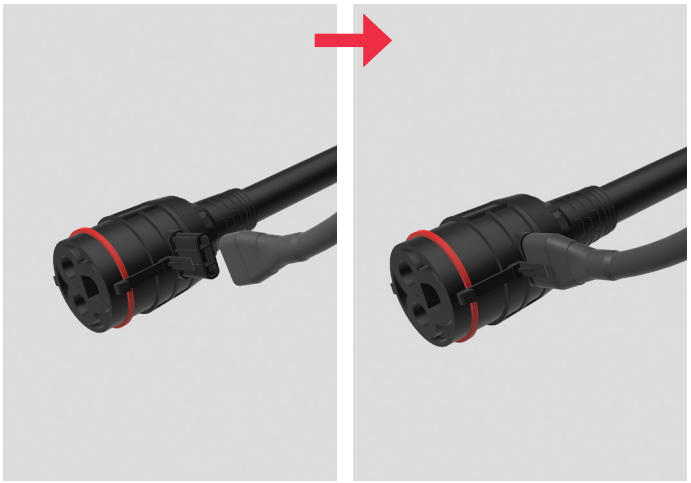
Once inserted into the profile, the sliders remain height-adjustable in order to align with the specific notches on each cassette. This fine adjustment ensures precise installation and optimal flatness of the facade.

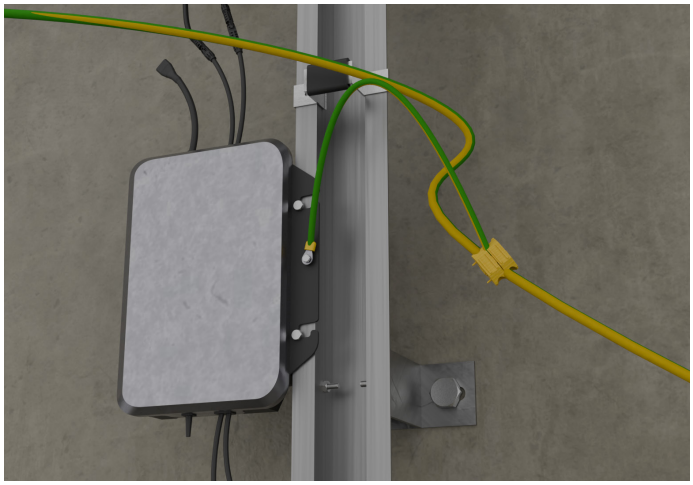
After checking the dimensions, each slide must be permanently fixed using two Ø 4.2 x 19 mm SFS stainless steel self-drilling screws or equivalent, positioned one on each wing of the OMEGA profile.

INSTALLATION: GROUNDING STRUCTURE & CONNECTING MICRO-INVERTERS: RECOMMENDED SOLUTION

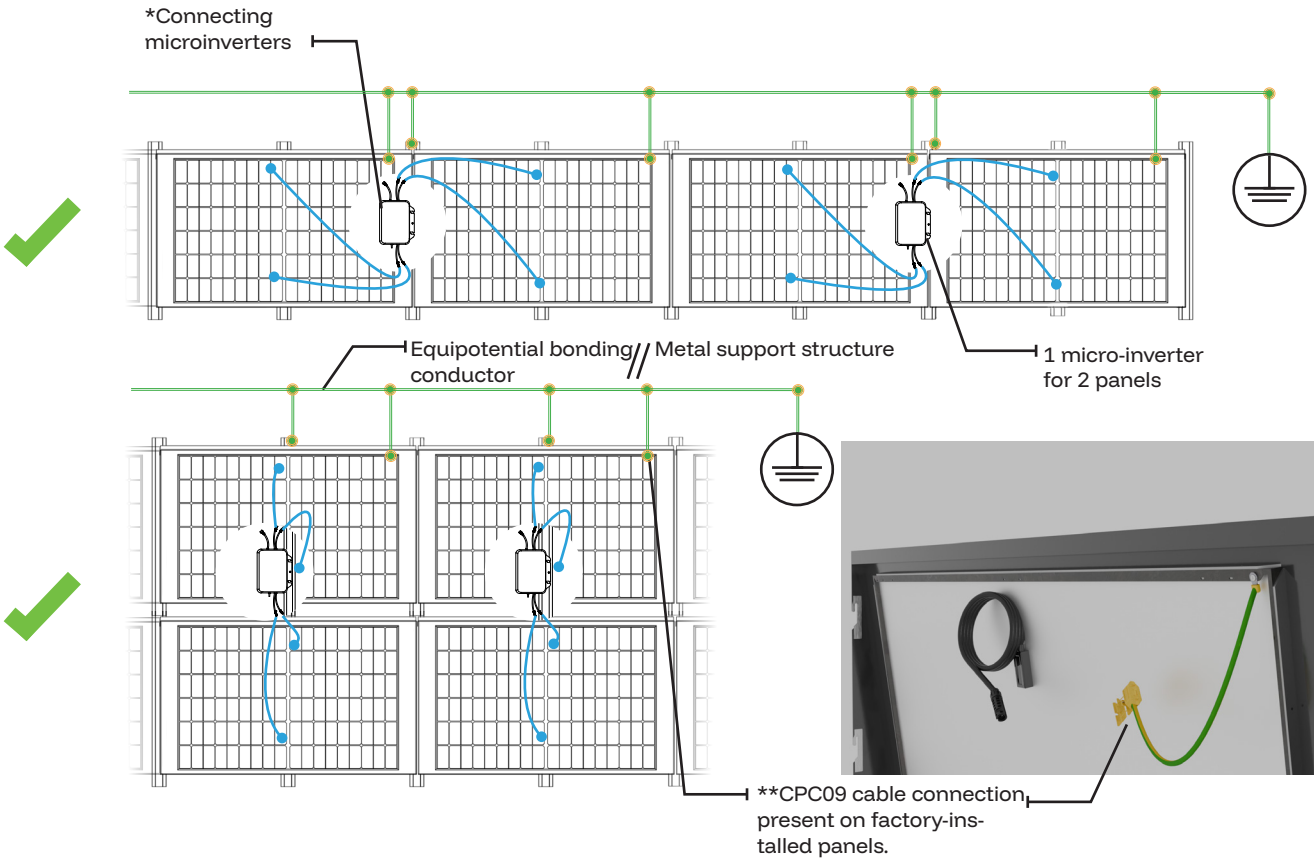




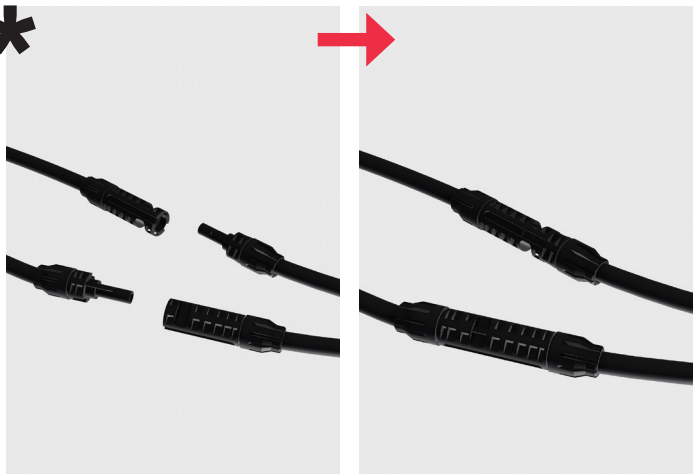


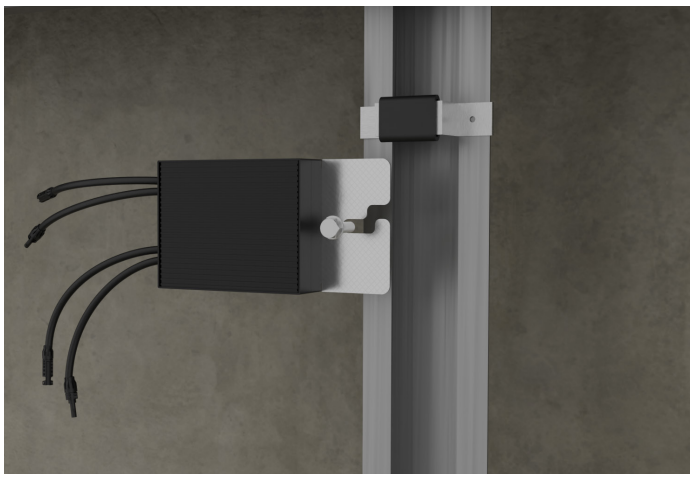


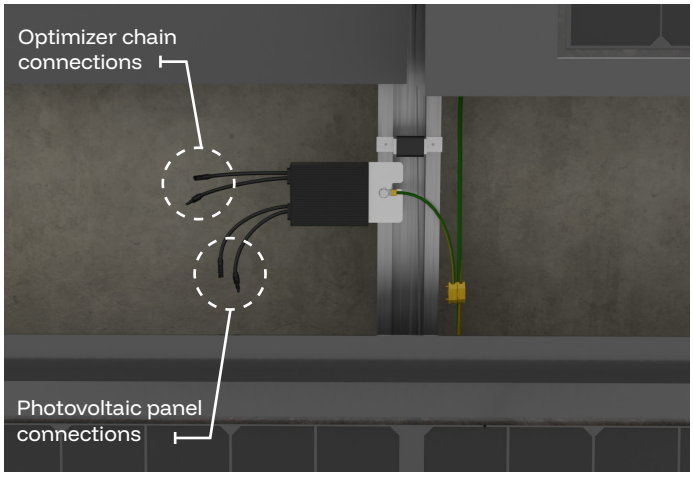
Be sure to follow the layout plan for microinverters and cabling provided.

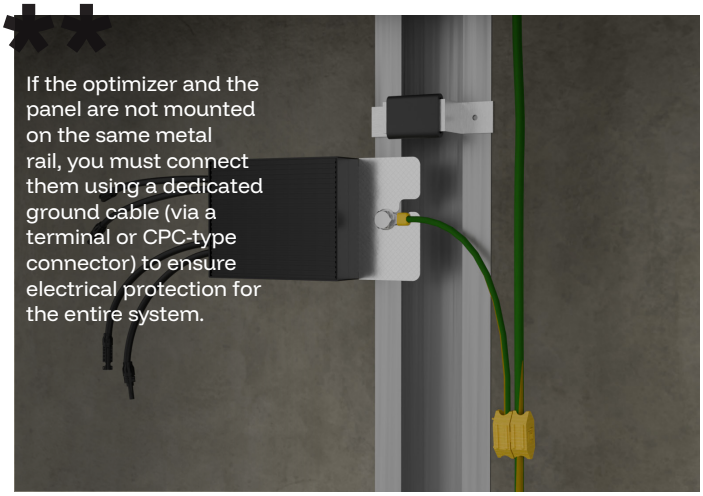


INSTALLATION: GROUNDING STRUCTURE & CONNECTION OF OPTIMIZERS: RECOMMENDED SOLUTION

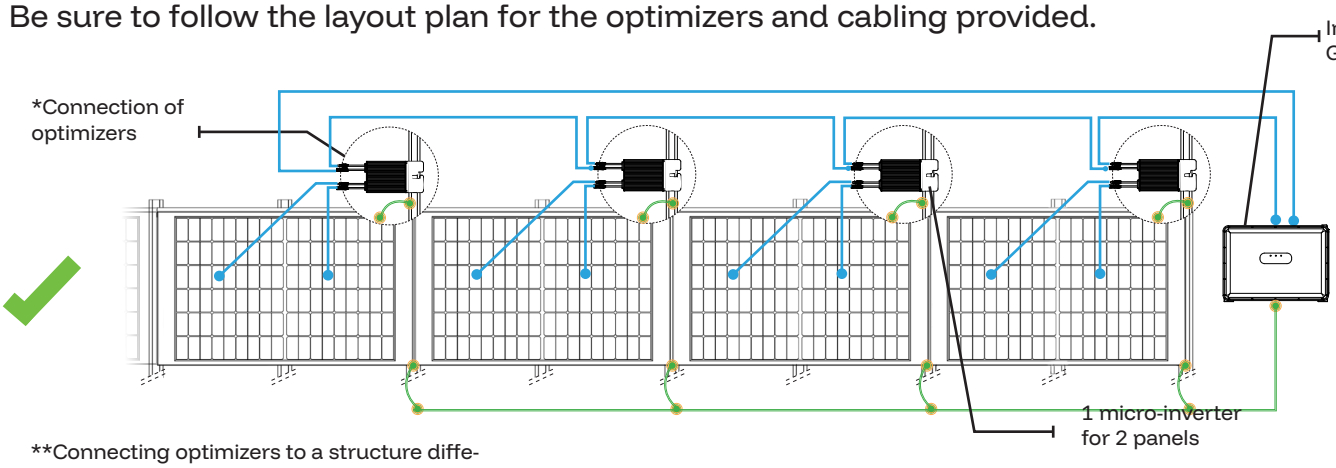




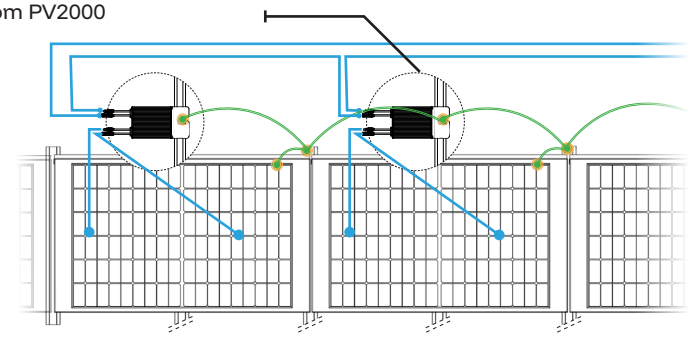


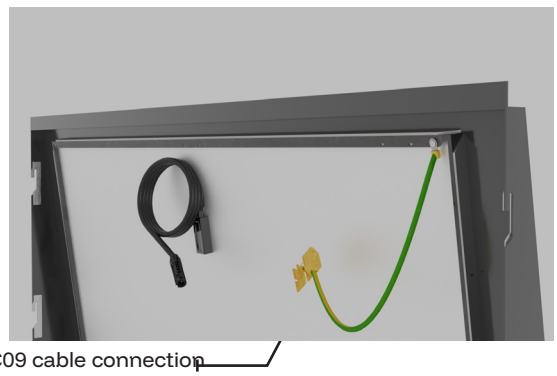


Be sure to follow the layout plan for the optimizers and cabling provided.



**Connecting optimizers to a structure different from PV2000





**CPC09 cable connection present on factory-installed panels.

INSTALLATION: GROUNDING MICRO-INVERTERS & OPTIMIZERS

To ground energy management devices (optimization and conversion), it is necessary to follow the various wiring recommendations according to the scenarios below:

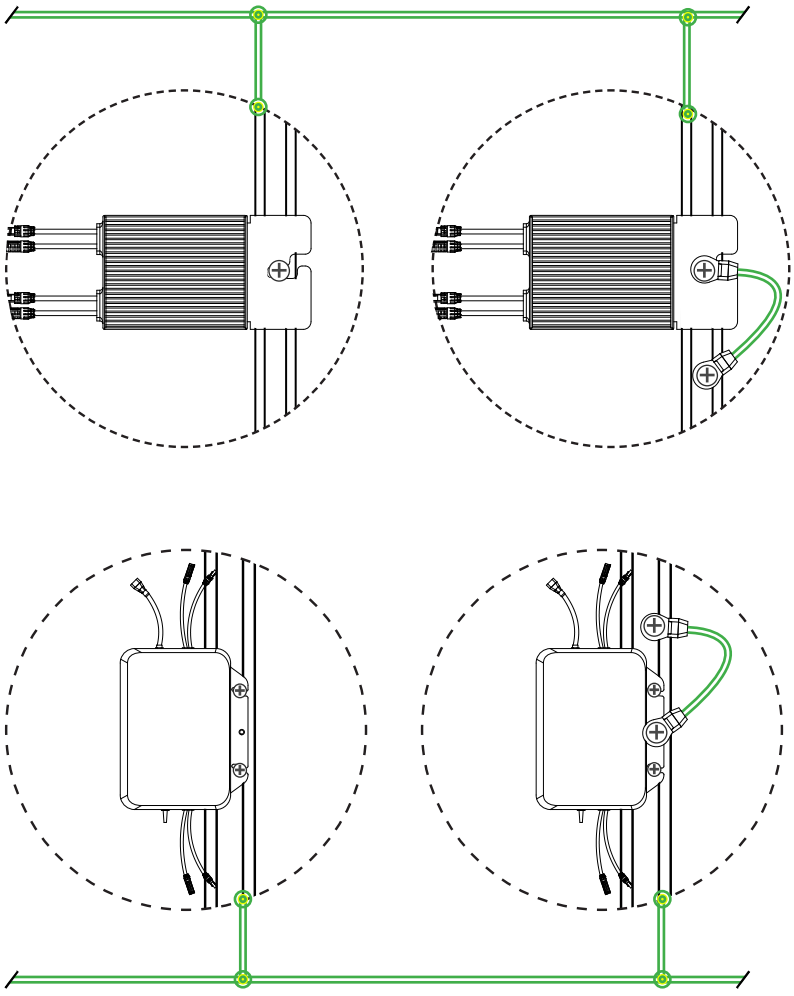
Equipotential bonding of the chassis

Grounding the metal chassis (or enclosure) of each device is essential to ensure protection against indirect contact. Depending on the type of equipment and the configuration chosen, this bonding can be achieved in two ways:

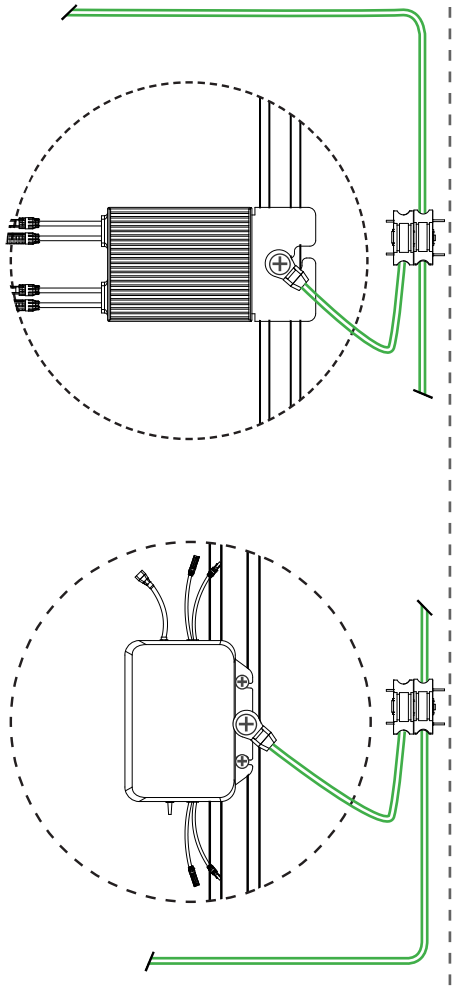
mechanical fastening:
Electrical contact is ensured during mounting on the structure by using fastening screws with fan washers or Terragrif-type devices. These elements allow the anodized layer of the rails to be pierced to ensure perfect continuity.

direct connection:
The device is connected directly to the main protective conductor (ground cable) using a specific connector, such as a CPC09, allowing reliable branching without cutting the ground cable.

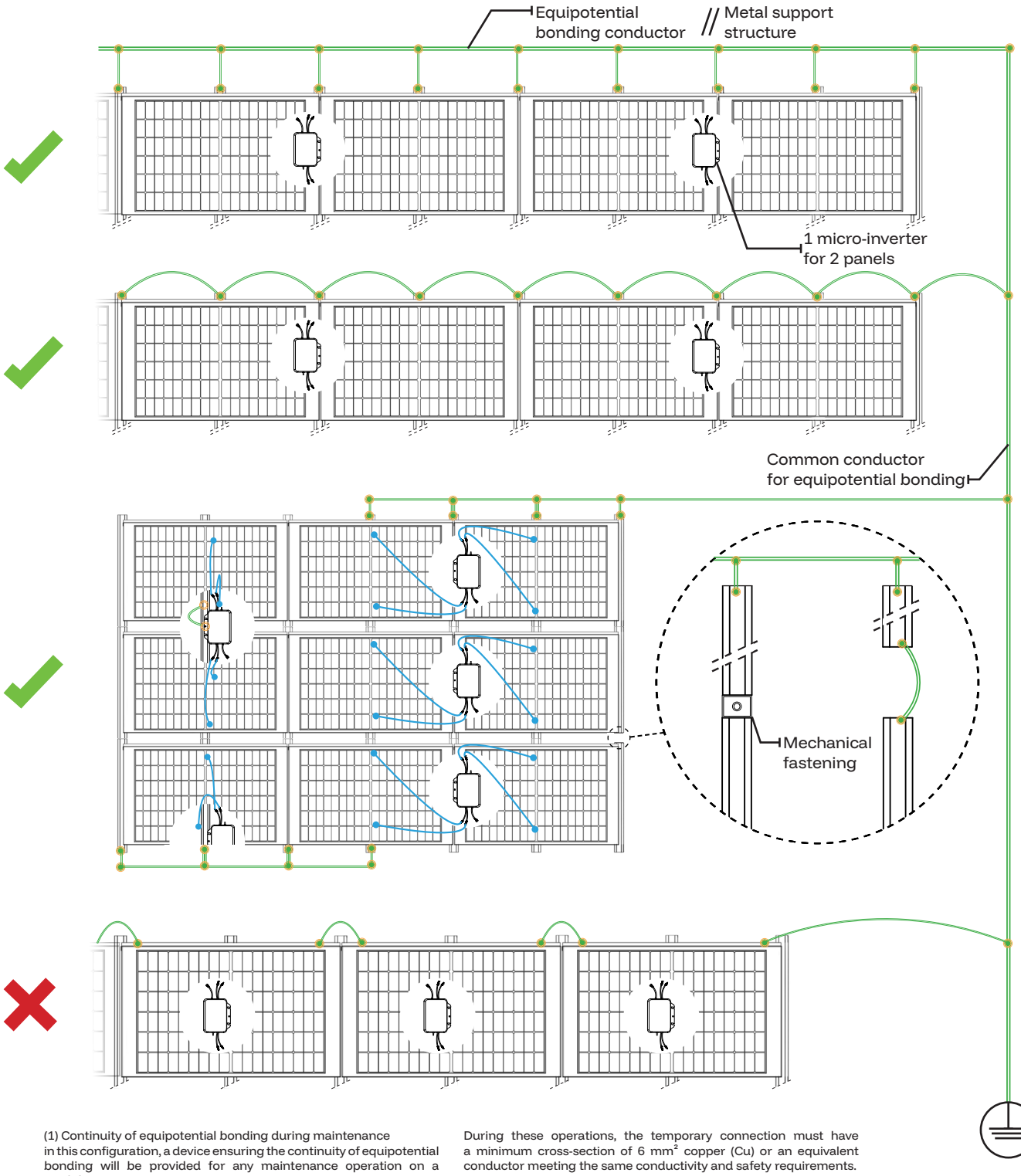
WIRING ON STRUCTURE WITH EQUIPOTENTIAL BONDING



WIRING ON A STRUCTURE WITHOUT EQUIPOTENTIAL BONDING



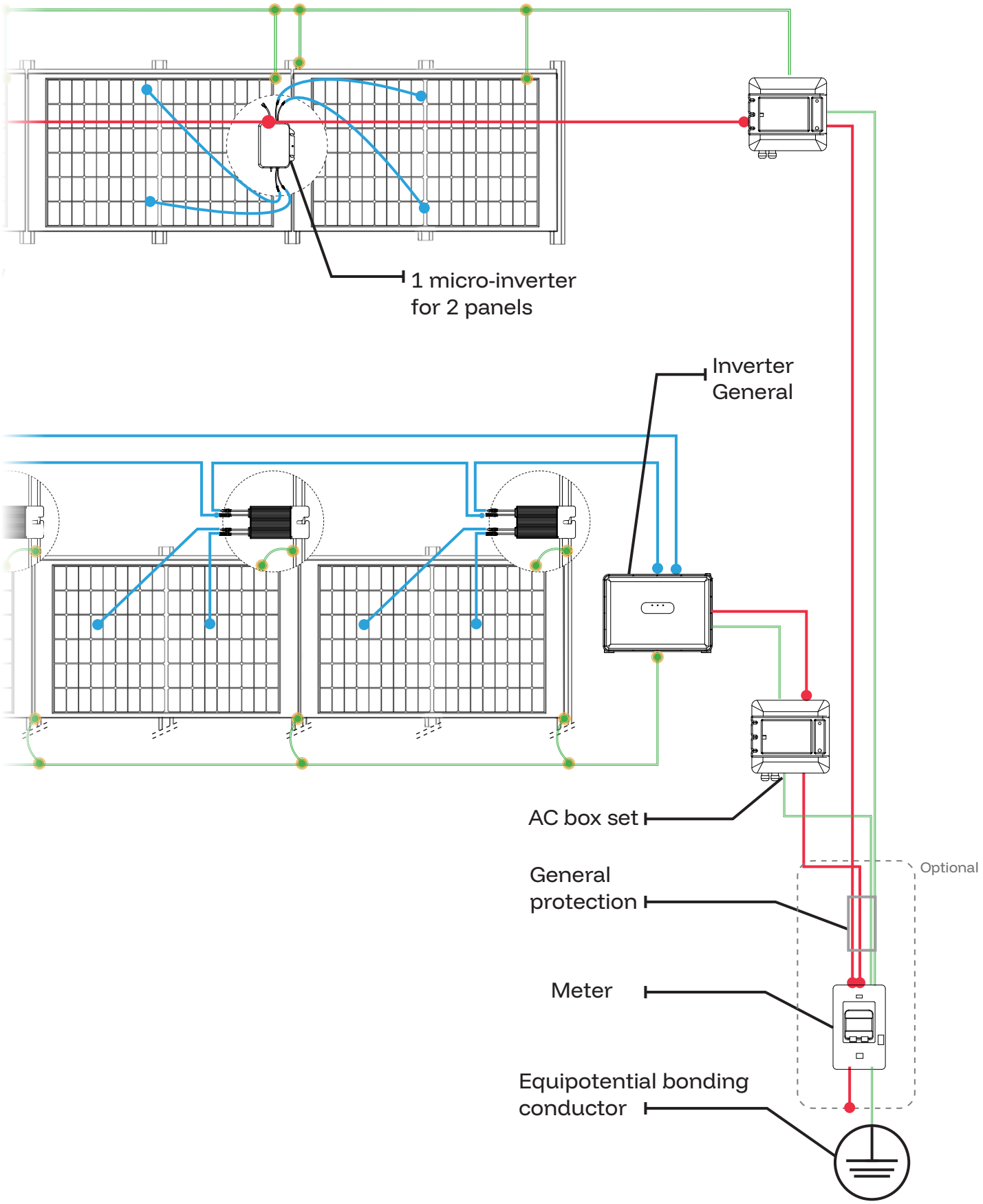
In accordance with guide C15-712, the metal structures of PV 2000 modules and support structures (including metal cable trays) must be connected to an equipotential bonding system that is itself connected to earth. Given the aluminum structure, suitable connection devices must be used. Bare copper conductors must not used; 6 mm² "yellow-green" coated cable must be used. The PV modules must be grounded in accordance with the manufacturer's instructions. Grounding conductors (insulated) must have a minimum cross-section of 6 mm² copper or equivalent. Insulated conductors must be marked with double green and yellow coloring.



(1) Continuity of equipotential bonding during maintenance in this configuration, a device ensuring the continuity of equipotential bonding will be provided for any maintenance operation on a module.

During these operations, the temporary connection must have a minimum cross-section of 6 mm² copper (Cu) or an equivalent conductor meeting the same conductivity and safety requirements.

Here is the type of wiring required to connect the various energy management devices to the meter:



ASSEMBLY: ATTACHING THE CASSETTES

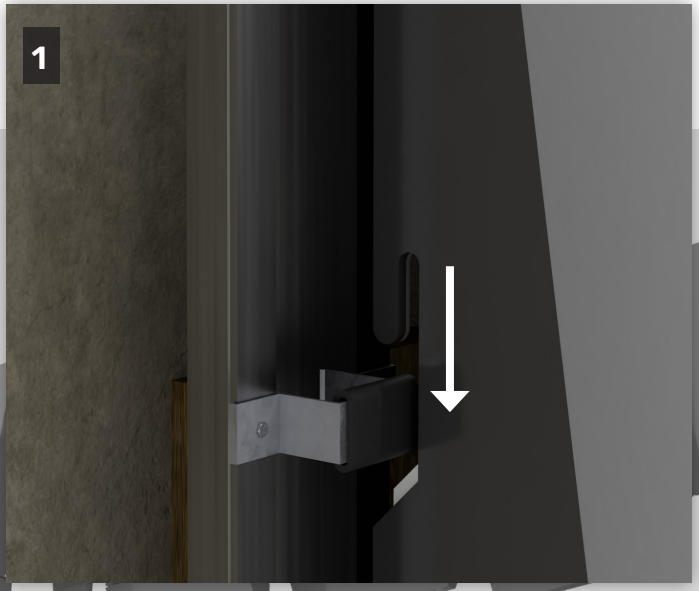
The final step in installation is to secure the cassettes to the suspension brackets by screwing them onto the edge of the OMEGA profiles.

Each cassette is pre-drilled on its upper horizontal section with oblong holes, specially designed to facilitate alignment and adjustment during assembly.

For fastening, use 5.5 x 28 self-drilling screws with round heads and a RAL-type finish Identical to that of cassettes. This ensures the aesthetic continuity of the facade.

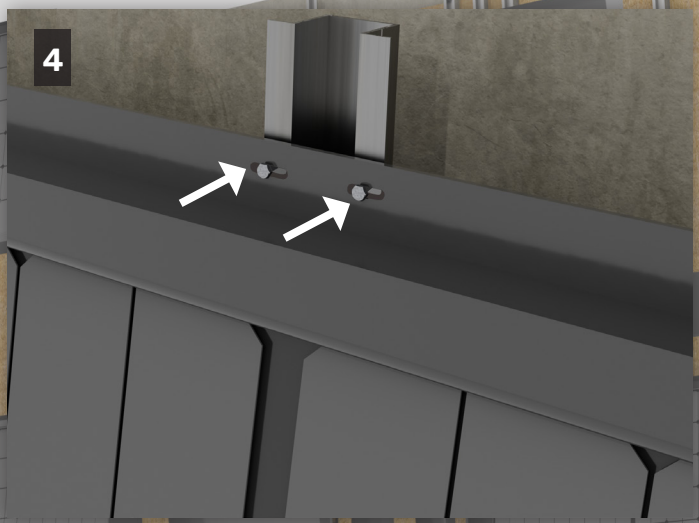
Assembly is carried out gradually from bottom to top to ensure optimal adjustment of the elements and a uniform final result.

To avoid damaging the cassette finish, take particular care when screwing and unscrewing.



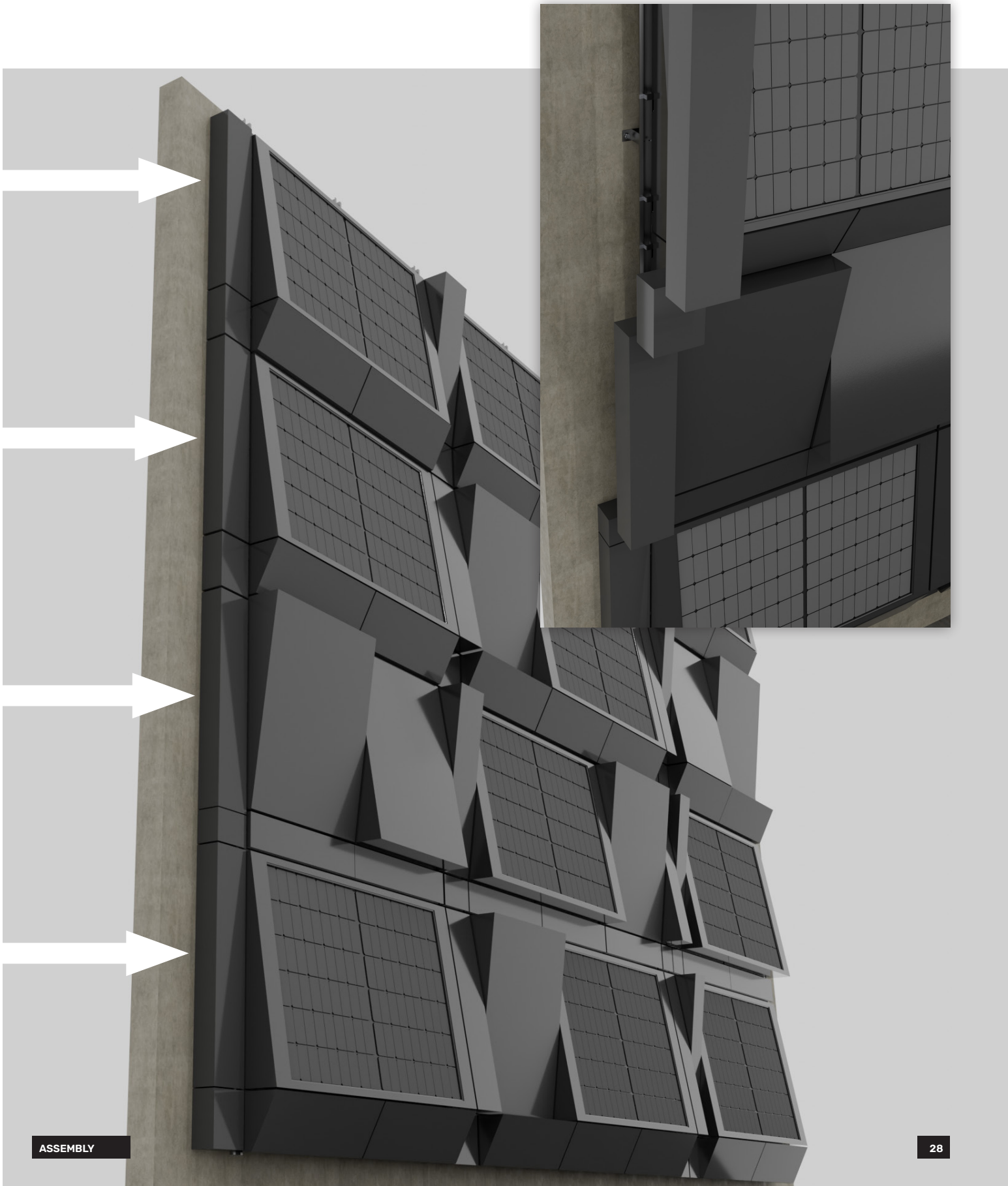






To ensure a perfect finish for your positive facade, various custom-made cladding options will be installed.

Designed specifically for each project, they guarantee the overall consistency and aesthetics of the structure.



Functioning

When maintenance of the installation is required, it can be carried out easily.

The horizontal cassettes can be quickly removed without having to dismantle the entire column.

Thus, to access a correctly positioned micro-inverter, only the two H300H cassettes located above the PV2000, as well as the PV2000 itself, need to be removed.

On the other hand, for vertical cassettes, it will be necessary to dismantle the entire column, from top to bottom.

Targeted dismantling



with H300H

Disassembly of the entire column



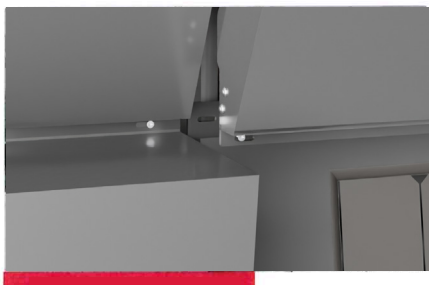
without H300H

STEPS

Remove the upper H300H modules, which are mounted using hinge screws connecting the two cassettes.

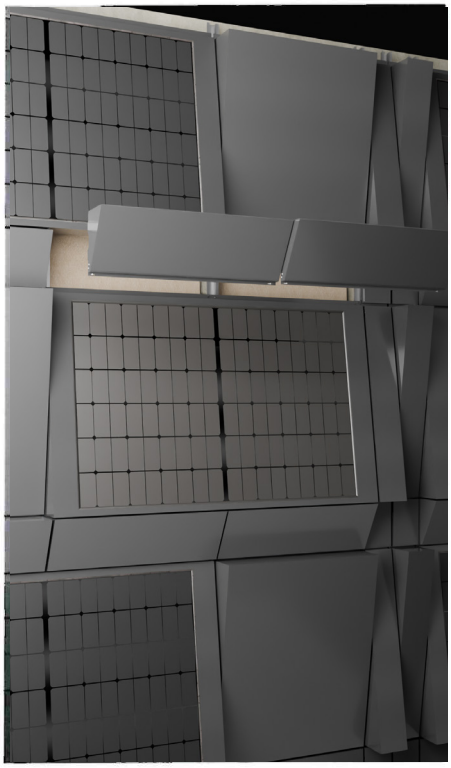


central mounting

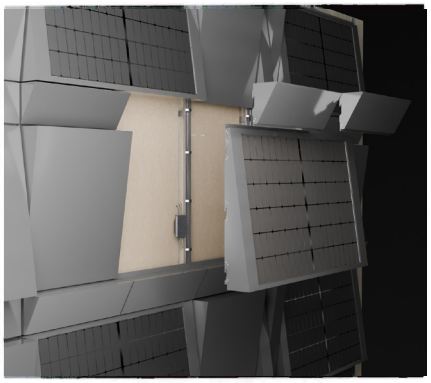


side mounting

Carefully lift both H300H units to disengage the mounting tabs from the slides.



Lift the PV2000 to release the six slider mounting tabs, then access the microinverters.





If the micro-inverter is removed, it is essential to seal the connection using a protective cap on the T-connector.

MAINTENANCE : STEPS

There are two distinct scenarios requiring specific procedures to be carried out on the electrical part of the installation. In both cases, it is essential that the power supply to the building facade is disconnected before any work is carried out. The following operations may be required:

- Disconnecting the CPC09 connector

- Disconnecting the MC4 connections

- Removing the micro-inverter, while ensuring the continuity of the installation's grounding

Scenario 1: Problem related to the cassette or photovoltaic (PV)

module In the event of a fault with the cassette or PV module, work on the PV2000 is necessary. The operations must be carried out as follows:

Follow the cassette removal instructions provided previously.

- Disconnect the CPC09 connector (step 1).

- Disconnect the MC4 connection cables using the tools provided (step 2).

Scenario 2: Problem related to the micro-inverter

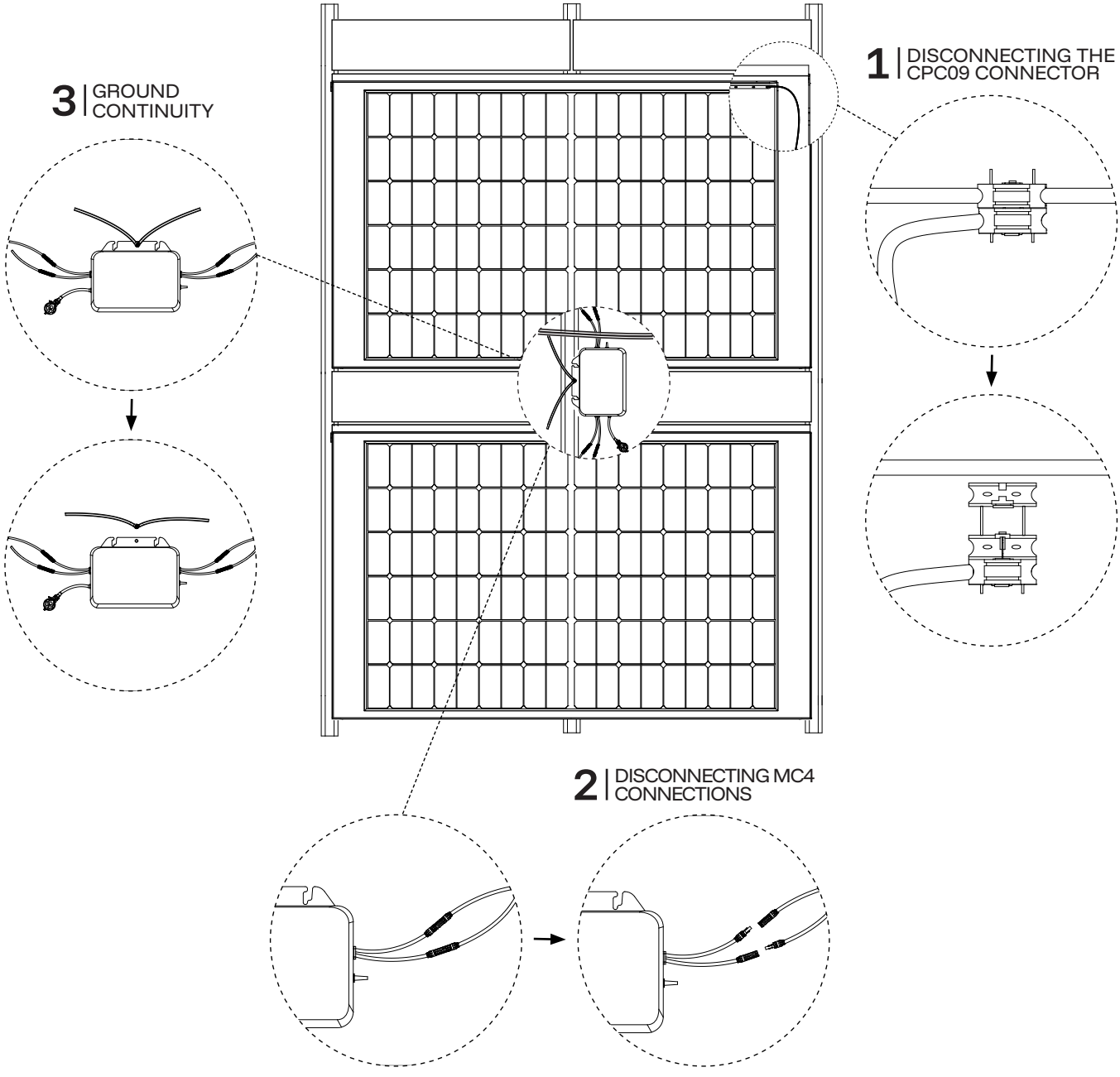
In the event of a micro-inverter malfunction, it is necessary to intervene directly on the component concerned. There are two possible options:

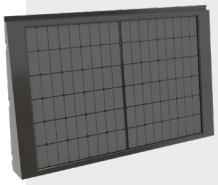
- Temporarily remove the micro-inverter from the string,

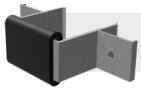
- Replace the faulty micro-inverter with a new model.

This operation involves an additional step:

- Disconnect the earth continuity cable connection, while ensuring that the earth connection is maintained throughout the procedure (step 3).



PRODUCT	DESIGNATION	REFERENCE
	PV2000 cassette (Non-EU origin panel included)	ULTPO-PV2000
	PV2000 cassette (Soluxtec photovoltaic panel included, made in Germany)	ULTPO-PV2000-EU
	PV2000 cassette (Without solar panel)	ULTPO-PV2000-SP
	Cassette V1000H	ULTPO-V1000H
	Cassette V1000B	ULTPO-V1000B
	Cassette H300H	ULTPO-H300H
	Cassette H200P	ULTPO-H200P
	Cassette V300B	ULTPO-V300B
	Cassette V300H	ULTPO-V300H
	Cassette V200H	ULTPO-V200H
	Cassette V200B	ULTPO-V200B

PRODUCT	DESIGNATION	REFERENCE
	Cassette FH32P	ULTPO-FH32P
	Cassette FH33P	ULTPO-FH33P
	Cassette FH23P	ULTPO-FH23P
	Cassette FH22P	ULTPO-FH22P
	OMEGA ALUMINUM FRAME STB05.19.003	ULTPO-05.19.003
	SLIDERS STB05.19.013	ULTPO-05.19.013
	DOUBLE T SEPARATOR 57	ULTPO-05.19.004
	DOUBLE T SEPARATOR 72	ULTPO-05.19.005
	DOUBLE T SEPARATOR 87	ULTPO-05.19.006
	DOUBLE T SEPARATOR 102	ULTPO-05.19.007
	DOUBLE T SEPARATOR 117	ULTPO-05.19.030
	DOUBLE T SEPARATOR 132	ULTPO-05.19.031
	DOUBLE T SEPARATOR 147	ULTPO-05.19.032
	DOUBLE T SEPARATOR 162	ULTPO-05.19.033
	DOUBLE T SEPARATOR 177	ULTPO-05.19.034
	DOUBLE T SEPARATOR 192	ULTPO-05.19.035
	DOUBLE T SEPARATOR 207	ULTPO-05.19.036
	DOUBLE T SEPARATOR 222	ULTPO-05.19.037
	DOUBLE T SEPARATOR 237	ULTPO-05.19.038
	DOUBLE T SEPARATOR 252	ULTPO-05.19.039
	INSULATING WEDGE FOR DOUBLE T SEPARATOR REF.: 05.19.030 .031 .032 .033 .034 .035 .036 .037 .038 .039	ULTPO-05.19.069
	INSULATING WEDGE FOR DOUBLE T SEPARATOR REF.: 05.19.004 .005 .006 .007	ULTPO-05.19.073
	3X WASHERS WITH HOLE FOR INSULATING SHIM REF: 05.19.069 .073	ULTPO—05.19.071
	PERFIX TH 5.5X25 STAINLESS STEEL ASSEMBLY SCREW 300466	ULTPO-PERFIX300466
	PERFIX TH 4.8X19 STAINLESS STEEL ASSEMBLY SCREW 300358	ULTPO-PERFIX300358
	FASTOVIS TH 5.5X25 ZN 284900 ASSEMBLY SCREW	ULTPO-FASTOVIS284900
	FASTOVIS TH 4.8X17 ZN 284110 ASSEMBLY SCREW	ULTPO-FASTOVIS284110
	DRILLINOX STAR 5.5X28 STAINLESS STEEL FINISHING SCREW RAL9005	ULTPO-DRILLINOX372534
	PRE-COATED STEEL FINISHING PROFILES 75/100TH	ULTPO-FLS

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