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European Technical Assessment ETA-24/0121 of *16-05-2024*

General Part

Technical Assessment Body issuing the European Technical Assessment: Kiwa Nederland B.V.	
Trade name of the construction product	**DH Hybrid 112-7-56 XL 8mm** **DH Hybrid 112-7-46 8mm** **DH Hybrid 112-7-43 6 mm** **SOL Solarhalter 112-7-56 XL 8 mm**
Product family to which the construction product belongs	Three dimensional nailing plates
Manufacturer	S:FLEX GmbH Reinbeker Weg 9 21029 Hamburg, Germany https://www.sflex.com/
Manufacturing plant(s)	S:FLEX GmbH Reinbeker Weg 9 21029 Hamburg, Germany
This European Technical Assessment contains	13 pages including 2 Annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	EAD 130186-00-0603 Three dimensional nailing plates
This ETA is corrigendum 1 of	ETA 24/0121 issued on 24-04-2024

Specific parts

1. Technical description of the product

1.1. General

The three-dimensional plates (roof hooks) “DH Hybrid 112-7-56 XL 8mm”, “DH Hybrid 112-7-46 8mm”, “DH Hybrid 112-7-43 6 mm” and “SOL Solarhalter 112-7-56 XL 8 mm“ are systems used to fix photovoltaic panels on wooden roof constructions.

The roof hooks consist of a plate connecting to the wooden roof construction and a bracket holding the photovoltaic panels. The plate is made of aluminum EN AW-6063 T6 (EN AW-AlMg0,7Si) with the mechanical properties minimum yield strength $R_{p0,2}$ of 170 N/mm² and minimum tensile strength R_m of 215 N/mm² according to EN 755-2:2016. The bracket is made of structural steel S235 according to EN 10025-2:2019 with minimum yield strength $R_{p0,2}$ of 235 N/mm² and minimum tensile strength R_m of 215 N/mm² and corrosion protection according to EN ISO 12944-5:2019 class C4 long.

The connection between bracket and photovoltaic panel is made via T-bolt M8x25 and a locking nut M8 (tightening torque: 12-15 Nm). The connection between plate and bracket is made via head square neck bolt M8x35 (tightening torque: 20 Nm).

The connection between the plate and the wooden roof construction is made via wood screws with a diameter of 6 mm or 8 mm.

Dimensions and further technical details are shown in Annex A.2.

2. Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

2.1. Intended use

The intended use of “DH Hybrid 112-7-56 XL 8mm”, “DH Hybrid 112-7-46 8mm”, “DH Hybrid 112-7-43 6 mm” and “SOL Solarhalter 112-7-56 XL 8 mm” is the fixing of photovoltaic panels on wooden roof constructions, where requirements for mechanical resistance and stability in the sense of the Basic Work Requirement 1 and 4 of Regulation (EU) 305/2011 shall be fulfilled.

2.2. Assumed working life

The provisions made in this ETA are based on an assumed working life of 50 years, provided that:

- the products are properly designed and built,
- installation of the product is performed as per installation guide, under normal site conditions, by adequately trained installers,
- minor damages are repaired (for example damage caused by impact),
- the products are properly used and maintained.

These provisions are based upon the current technological state of the art and the available knowledge and experience.

In normal use conditions, the real working life may be considerably longer without major degradation affecting the basic requirements for construction works[1] .

The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded as a means for choosing the right product in relation to the reasonable expected working life of the products.

2.3. Manufacturing

The products are manufactured in accordance with the provisions of the European Technical Assessment using the manufacturing process as identified during the inspection of the manufacturing plant and laid down in the technical file. It is the responsibility of the manufacturer to ensure that all necessary information on design and installation is submitted to those responsible for design and execution of the construction.

2.4. Packaging, transport and storage

The products shall be packed, transported and stored in accordance to the manufacturer’s technical documentation to prevent damages or deterioration. Damaged products should not be used. It is the responsibility of the manufacturer that adequate information is clearly shown on the package and/or enclosed instruction sheet.

[1] The real working life of a product incorporated in a specific works depends on the environmental conditions to which that works are subject, as well as on the particular conditions of design, execution, use, and maintenance of that works. Therefore, it cannot be excluded that in certain cases the real working life of the product may also be shorter than the assumed working life.

2.5. Design and installation

For the products, the following shall be observed:

- The conditions for design and execution of the products into the works shall be taken from the manufacturer's technical documentation.
- Installation and handling shall be carried out by qualified employees and according to the manufacturers technical documentation.

3. Performance of the product and references to the methods used for its assessment

3.1. BWR 1 – Mechanical resistance and stability

Table 3.1 – Mechanical resistance and stability

Essential characteristic	Performance
Joint strength	see Annex A.1
Joint stiffness	NPD
Joint ductility	NPD
Resistance to seismic actions	NPD
Resistance to corrosion and deterioration	NPD

3.2. BWR 2 – Safety in case of fire

Table 3.2.1 – Safety in case of fire

Essential characteristic	Performance
Reaction to fire	A1
Resistance to fire	NPD

4. Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

According to the decision 97/638/EC of the European Commission the system of assessment and verification of constancy of performance to be applied is 2+.

5. Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

This ETA is issued for the products on the basis of data/information deposited at Kiwa Nederland B.V. which identifies the product that has been assessed.

Changes to the product/production process, which could result in this deposited data/ information being incorrect, should be notified to the approval body before the changes are introduced. Kiwa Nederland B.V. will decide whether such changes affect the ETA and if so whether further assessment or alterations to the ETA shall be necessary.

Technical details necessary for the implementation of the AVCP system are laid down in the control plan, in accordance with Section 3.2 of EAD 130186-00-0603.

The control plan shall be handed over by the manufacturer to the notified body (bodies) involved in the assessment and verification of constancy of performance.

The tasks of the notified body are laid down in Section 3.3 of EAD 130186-00-0603.

Issued in Rijswijk on 16-05-2024 by

Ron Scheepers

Kiwa Nederland B.V.

Annex A.1. Joint strength

Table A.1.1 – Characteristic capacity of the joint strength in different load directions

Type	Characteristic capacity in kN		
	Compression	Tension	Shear
DH Hybrid 112-7-56 XL 8mm	1,78	1,72	0,68
DH Hybrid 112-7-46 8mm	1,80	2,41	0,87
DH Hybrid 112-7-43 6 mm	1,17	1,01	0,30
SOL Solarhalter 112-7-56 XL 8 mm	1,78	1,72	0,68

Shear characteristics

The shear characteristics are parallel to the roof pitch in the same direction (from ridge to eaves).

Design values

As withdrawal failure is one of the failure modes, the design value shall be calculated according to EN 1995-1-1 by reducing the characteristic values of the load-carrying-capacity with a partial factor and multiplying with the modification factor k_{mod}.

The design value of the load bearing capacity is:

$$F_{Rd} = \frac{k_{mod} * F_{Rk}}{\gamma_m}$$

Combined forces

If the compression/tension and shear force act at the same time, the following inequality shall be fulfilled:

$$\sum \frac{F_{i,Ed}}{F_{i,Rd}} \leq 1$$

Timber members

The timber members

- shall be strength class C24 according to EN 338:2003 or better,
- shall be free from wane under the roof hook,
- shall be at least 60 mm thick and 45 mm wide.

The actual bending and end bearing capacity of the timber members to be used in conjunction with the roof hooks are to be checked by the designer of the structure to ensure they are not less than the capacity of the system and, if necessary, the capacity of the system shall be reduced accordingly. The fastener spacing, edge and end distances shall be chosen according to Eurocode 5. There are no specific requirements relating to preparation of the timber members.

Annex A.2. Dimensions and further technical details

Table A.2.1 – Dimensions

Characteristic	Type			
	DH Hybrid 112-7-56 XL 8mm	DH Hybrid 112-7-46 8mm	DH Hybrid 112-7-43 6 mm	SOL Solarhalter 112-7-56 XL 8 mm
Width	112,5 mm	112,5 mm	112,5 mm	112,5 mm
Height	194,6 mm	170,8 mm	168,1 mm	194,6 mm
Length	216,9 mm	186,2 mm	182,2 mm	216,9 mm
Weight	1,096 kg	0,952 kg	0,787 kg	1,066 kg
Max. height compensation in the area of roof panels	56 – 72 mm	46 – 61 mm	43 – 58 mm	56 – 72 mm
Max. height compensation in the area of profiles	21 mm	21 mm	21 mm	21 mm
Overlap length	132 mm	101 mm	101 mm	132 mm

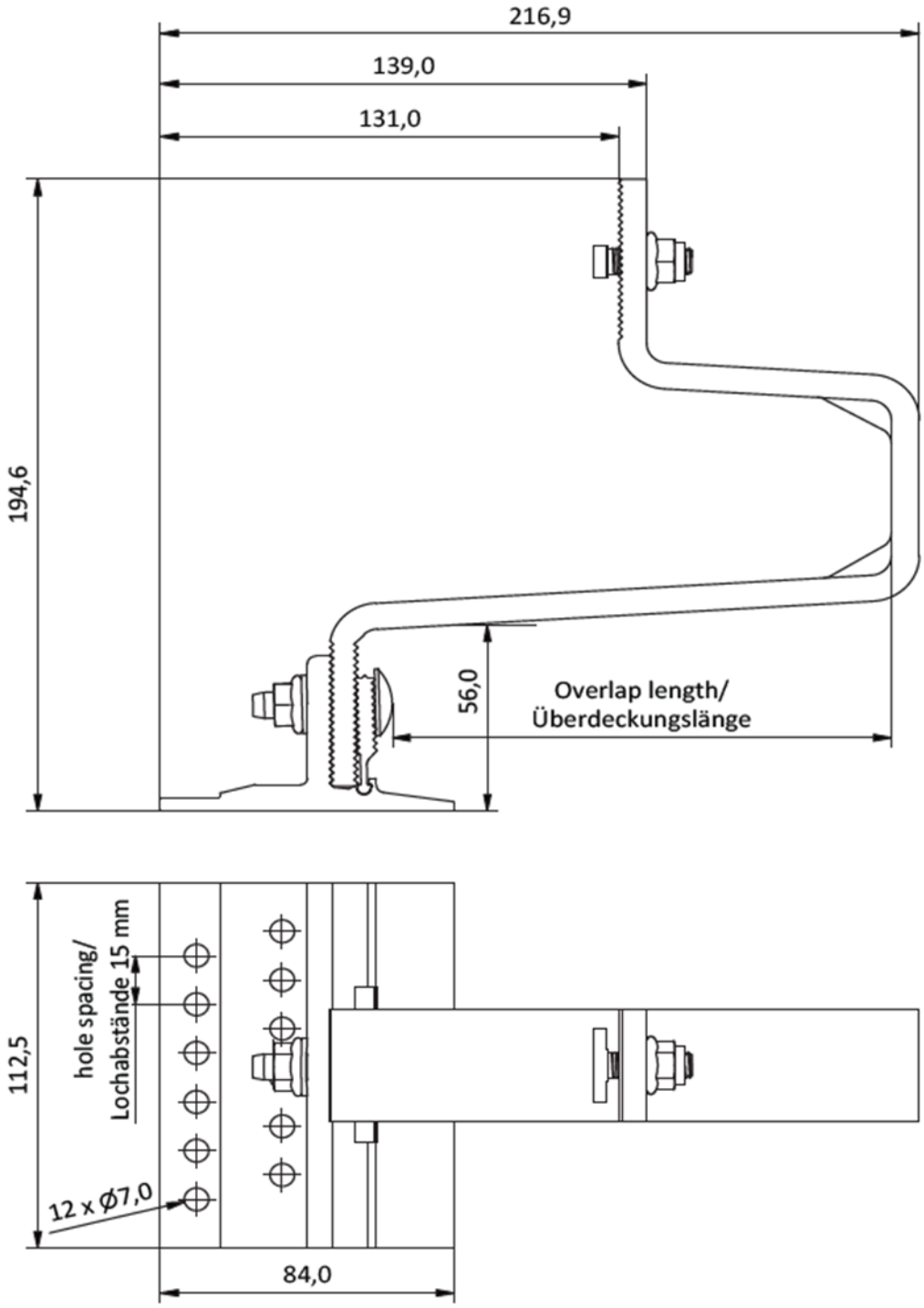

Figure 1 Dimensions in mm of "DH Hybrid 112-7-56 XL 8mm"

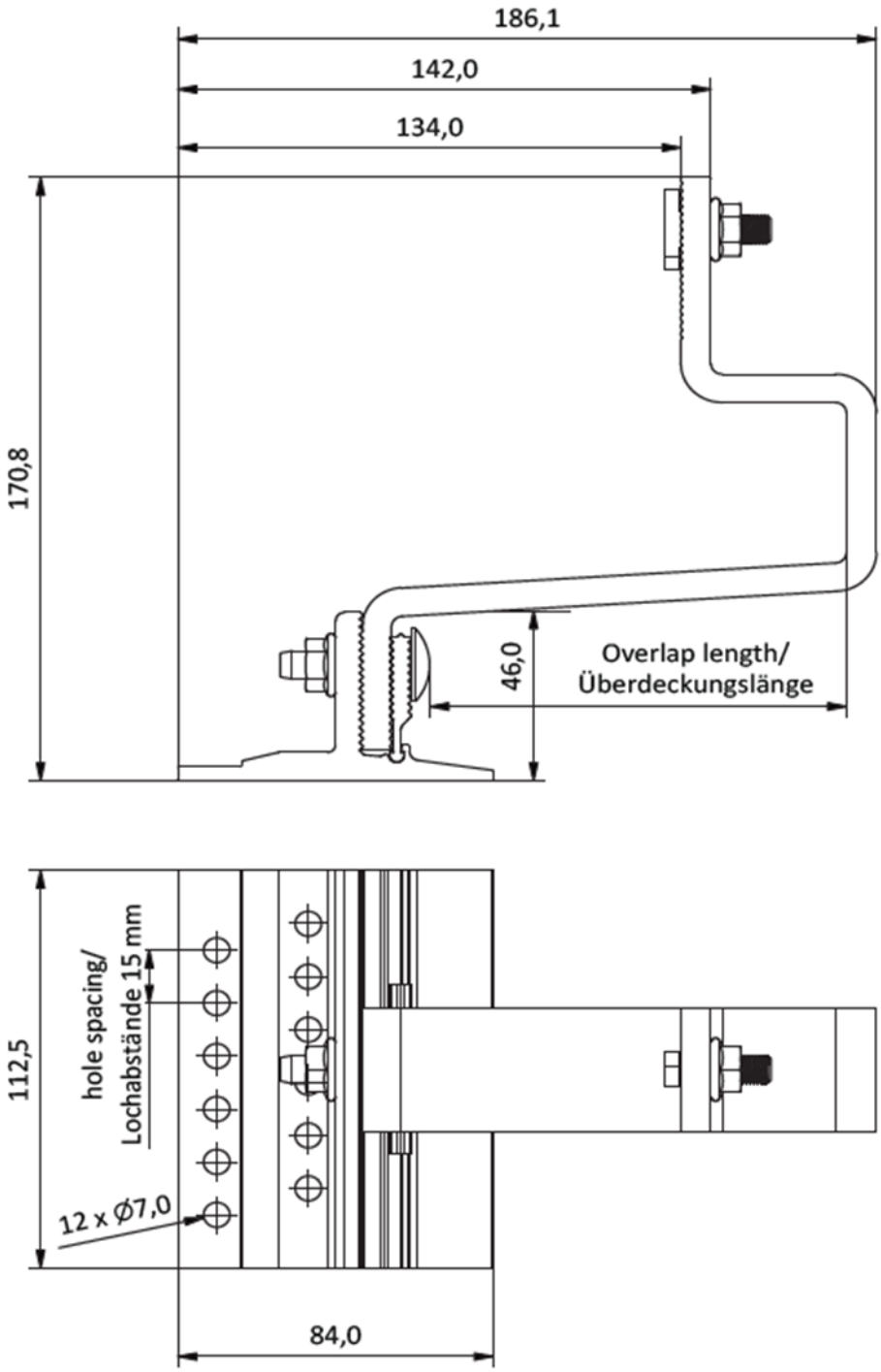

Figure 2 Dimensions in mm of "DH Hybrid 112-7-46 8mm"

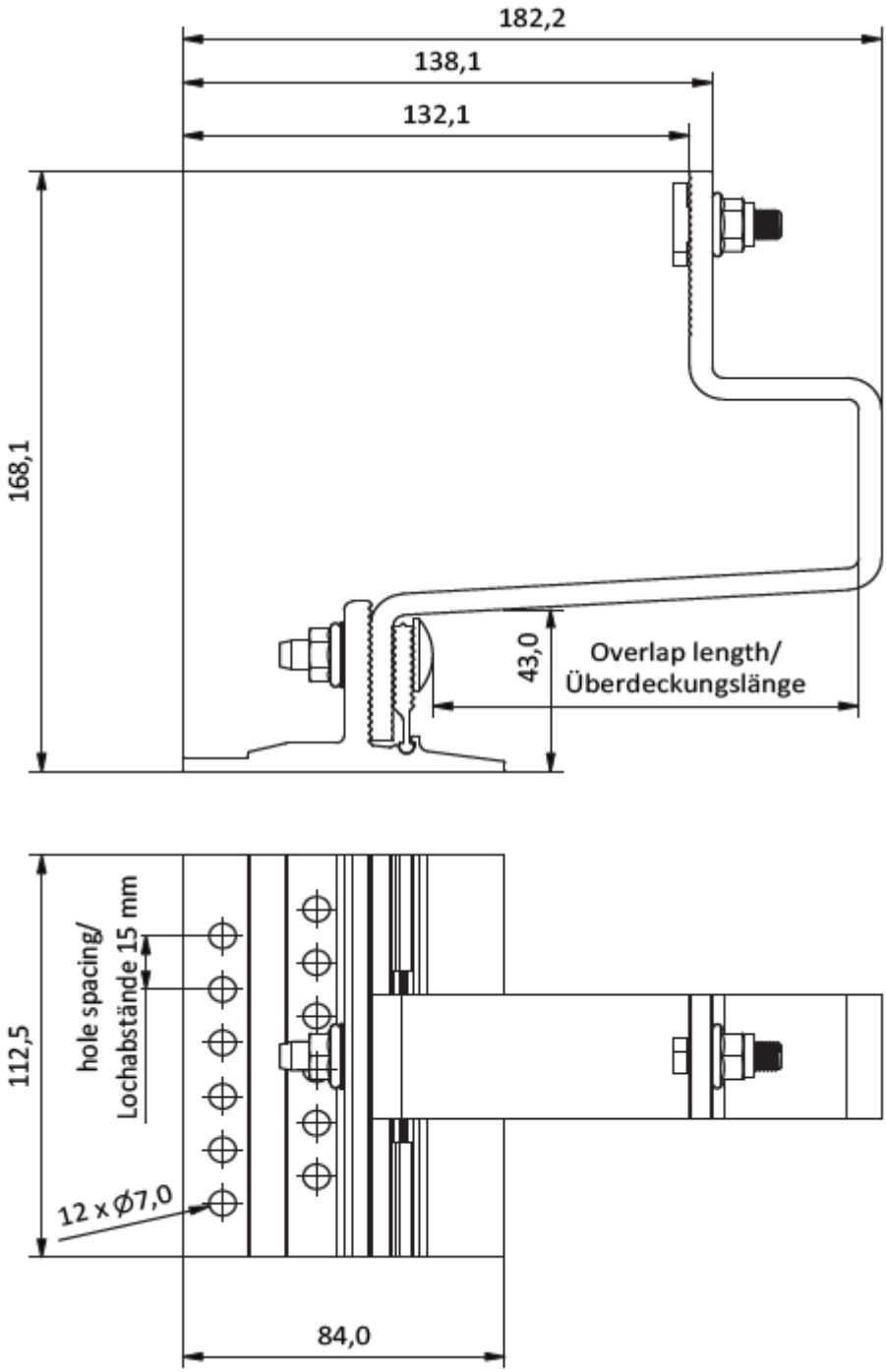

Figure 3 Dimensions in mm of "DH Hybrid 112-7-43 6 mm"

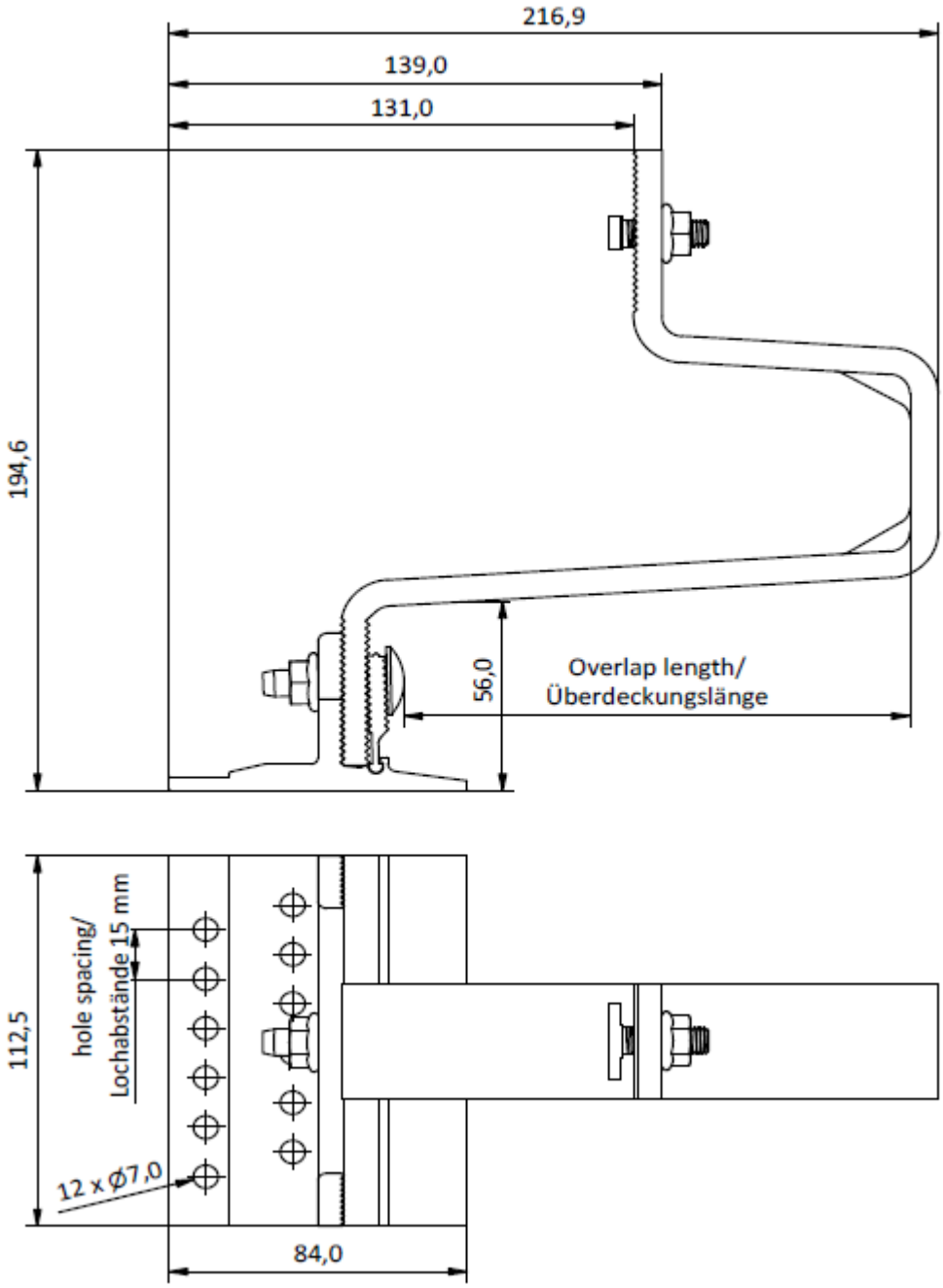

Figure 4 Dimensions in mm of "SOL Solarhalter 112-7-56 XL 8 mm"