W-H4K2 BI CONSTRUCTION ASSEMBLY INSTRUCTIONS

Manufacturer:

BAKS

Jagodne 5 Street

05-480 Karczew

Poland

W – free-standing steel structure

H – horizontal arrangement of panels

4 – number of rows of panels

K – structure fixed to the ground with anchors attached to concrete bases

2 – structure based on two support columns

BI – construction adapted to bifacial profiles

1. Essential tools for assembling the structure

- Allen spanner (ampoule spanner) size 6
- Cordless screwdriver with speed and torque control
- Hexagon socket wrench, size 6 for screwdriver head
- Open-end spanner, size 15 mm
- Ratchet spanner with socket size 15 mm
- Extension piece 100-120mm for socket spanners
- Rubber mallet
- Torque spanner, range 10-45 Nm

2. General information

- Possibility of using the structure in wind and snow zones in accordance with standards: **PN-EN 1991-1-3** and **PN-EN 1991-1-4**.
- Before assembling the structure, read the installation instructions for the photovoltaic panels
- It is recommended that connection of BDFCH... profiles to CWC100H50 profiles, CWCR100H50 profiles to CWC100H50 profiles and BUF... to CWC100H50 profiles should not be placed on the last (outermost) holes.
- Each CWC100H50 and CWCR100H50 profile must have at least 2 support points
- The depth of penetration of the profiles into the ground, the dimensions of the concrete pour hole and the dimensions of the foundation for anchoring the structure should be determined by an authorised constructor for the particular installation.
- If the panel mounting area does not coincide with the profile perforation, an adjustment must be made at the channel joint or an intermediate bracket type UPP...MC must be used.
- The grounding washer for the panel (PUP) is placed under the intermediate brackets of the panels. A single washer has the ability to ground two adjacent panels.
- Cutting of workpieces is only permitted with slow-running sabre saws and hand saws with high-grade steel tools, in order to avoid excessive heat build-up in the material.
- The cut edges must be unconditionally protected - sanded with sandpaper, cleaned and degreased again, protected with a minimum of three coats of zinc paste after drying.
- Bracing connecting successive frames should be placed at a maximum of every 4th field of the structure.
- Screw **SAM8x…E** and **NRM8PV** nut to a torque of 12-14 Nm.
- When tightening the **SGKFM10x20** screw, hold the head of the screw with your hand in such a position that the underlay locks onto the walls of the hole in which you are installing the screw, and then, using a screwdriver, tighten the screw slowly until it locks into place. At the final stage, tighten the screw with the screwdriver to a torque of 42 Nm.

3. Summary of components of the W-H4K2 BI construction

(Construction kit does not include tools)

Nr	Nazwa	Symbol produktu	Przeznaczenie w konstrukcji
1	Support Channel	CWT70H50/…NMC	Front and rear support pillars
2	Base Plate	PCB70	Support column mounting base
3	Anchor Bolt	PSRM10x90F	Anchor fixing the base to the foundation
4	Rod Hanger	WPTCM	Bracing no 2
5	Threaded Rod	PGM6E	Bracing no 2
6	Profile	BDFCH120/…NMC*	Rafter
7	Support Channel	CMP41H41/…MC	Bracing no 1
8	Channel Connector	LCJ70MC	Connector for bracing no 1
9	Support Channel	CWC100H50/…NMC	Purlin
10	Channel Connector	LCTW100H50MC	Purlin connector
11	Side Holder	BUF…	Lateral clamp for fixing panels
12	Middle Holder	PUF	Intermediate clamp for fixing panels
13	Grounding Washer	PUP	Panel earthing
14	Screw	SAM8x…E	Panel fixing screw
15	Spring Washer	PS8E	Head washer SAM8x...E
16	Screw set	SGKFM10x20PV	Screw + flange nut
17	Washer	PW10F	Washer
18	Channel Nut	NRM8PV	Clamp mounting nut

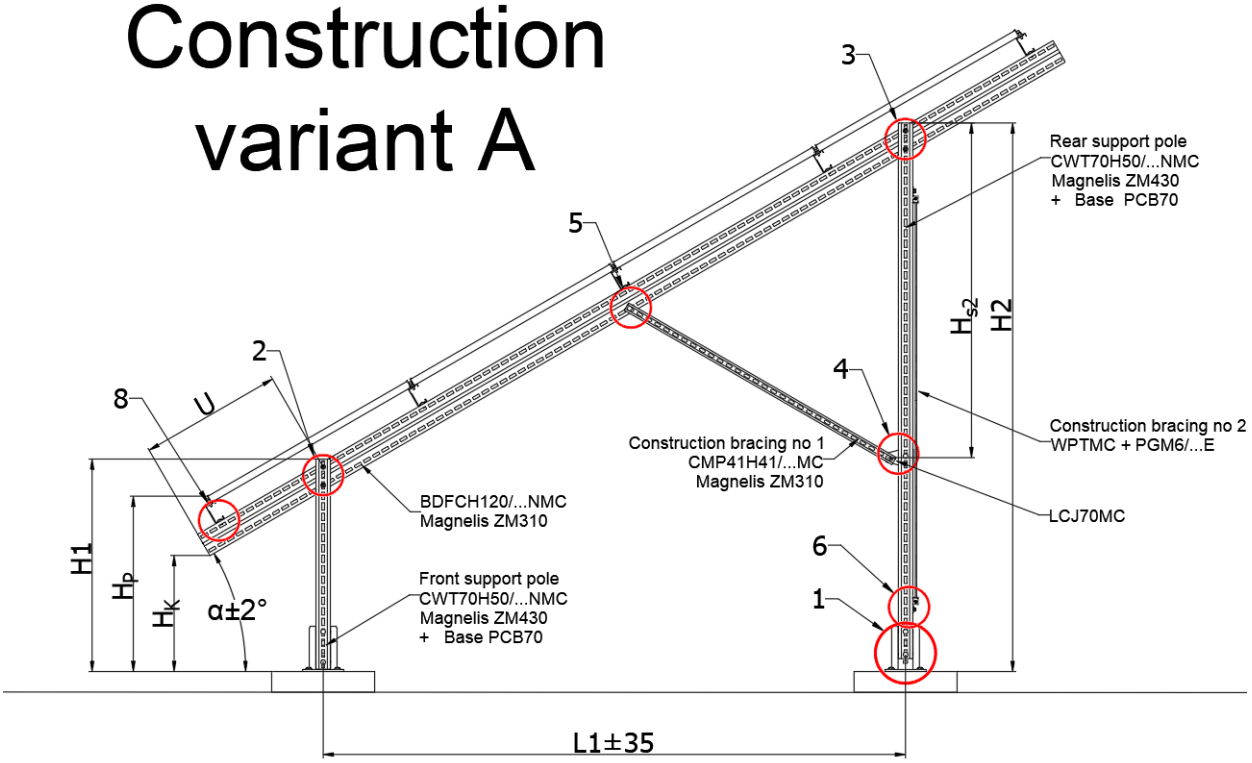
Table 1 Summary of components

*For panels wider than 1250 mm, the BDFTH120/…NMC profile can be used.

4. Installation sequence:

1) Mounting of the **PCB70** bases to the concrete foundation in accordance with the information provided in Tables 3, taking into account their orientation with respect to directions of the world as shown in drawing No. 6
2) Installing the **CWT70H50/...NMC** front and rear support pillars to the **PCB70** bases (detail 1), taking into account their orientation with respect to the directions of the world as indicated in the drawing No. 6
3) Installing the **BDFCH120/...NMC** profile to the anchored support pillars (detail 2; 3)
4) Assembly of bracing No. 1 (detail 4; 5)
5) Assembly and joining of the longitudinal profiles under the panels (detail 7; 8)
6) Assembly of bracing No. 2 (detail 6)
7) Installing the attachment clamps for the panels (detail 9.1; 9.2; 10)

Construction variant A



Construction variant B

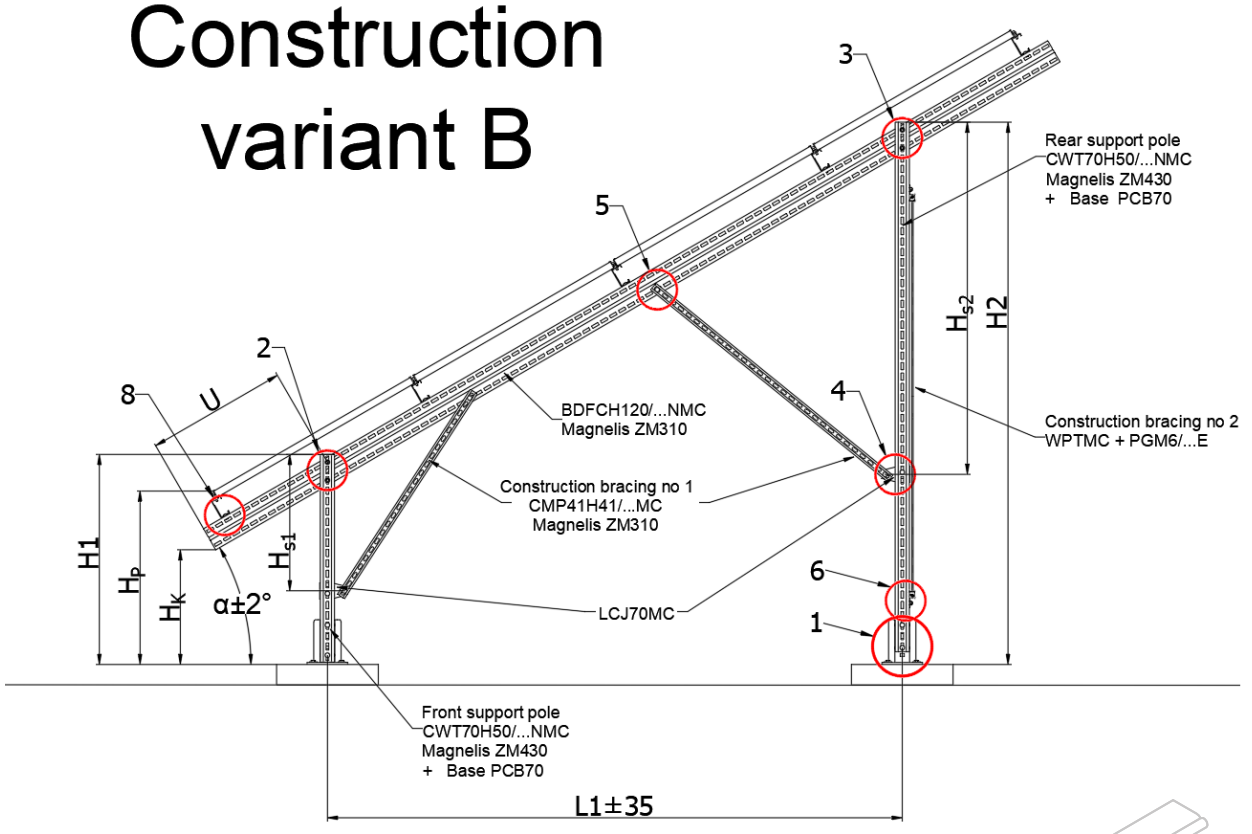


Fig. 1 Side view of the structure

Angle of structure „α”	Front support pillar	Rear support pillar	Rafter	Brace No. 1
Panel width from 950 to 1000mm Construction variant A				
25°	CWT70H50/1NMC	CWT70H50/2,4NMC	BDFCH120/4,4NMC	CMP41H41/1,5MC
30°	CWT70H50/1NMC	CWT70H50/2,4NMC	BDFCH120/4,4NMC	CMP41H41/1,5MC
Panel width from 1000 to 1100mm Construction variant A				
25°	CWT70H50/1MC	CWT70H50/2,4NMC	BDFCH120/4,8NMC	CMP41H41/1,5MC
30°	CWT70H50/1MC	CWT70H50/3NMC	BDFCH120/4,8NMC	CMP41H41/1,5MC
Panel width from 1100 to 1250mm Construction variant B				
25°	CWT70H50/1NMC	CWT70H50/3NMC	BDFCH120/5,4NMC	CMP41H41/1,2MC + CMP41H41/2,2MC
30°	CWT70H50/1NMC	CWT70H50/3NMC	BDFCH120/5,4NMC	CMP41H41/1,2MC + CMP41H41/2,2MC
Panel width from 1250 to 1300mm Construction variant B				
25°	CWT70H50/1NMC	CWT70H50/3NMC	BDFTH120/6NMC	CMP41H41/1,2MC + CMP41H41/2,2MC
30°	CWT70H50/1NMC	CWT70H50/3NMC	BDFTH120/6NMC	CMP41H41/1,2MC + CMP41H41/2,2MC

Table 2 Lengths of construction elements depending on panel size

Angle of structure „α”	Distance „L1”	Height						Distance „U”
		„H1”	„H2”	„H_K”	„H_P”	„H_{S1}”	„H_{S2}”	
Panel width from 950 to 1000mm Construction variant A								
25°	2770	1030	2320	660	950		1520	580
30°	2520	1030	2480	560	850		1620	690
Panel width from 1000 to 1100mm Construction variant A								
25°	2960	1030	2410	580	870		1520	780
30°	2830	1030	2660	560	850		1620	690
Panel width from 1100 to 1250mm Construction variant B								
25°	3370	1030	2610	580	870	640	2340	780
30°	3450	1030	3020	560	850	670	2440	690
Panel width from 1250 to 1300mm Construction variant B								
25°	3370	1030	2610	580	870	640	2340	780
30°	3450	1030	3020	560	850	670	2440	690

Table 3 Structure dimensions depending on the angle on inclination of the structure and the size of the panels

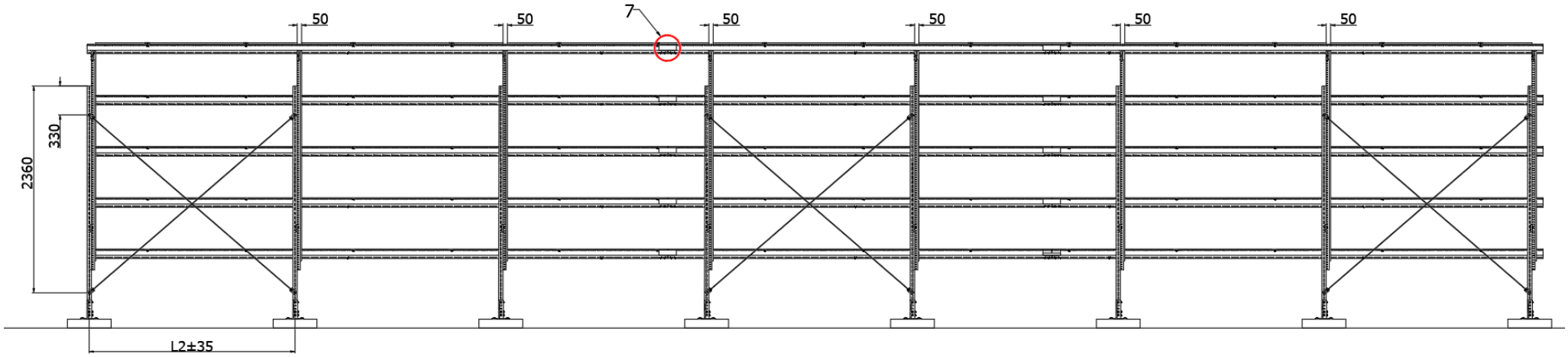


Fig. 2 View of the structure from the north with bracing spacing No. 2

The dimension L2 is closely related to the size of the panels used in the construction. It should be calculated using the formula below:

$$L2 = (panel\ width + 50mm)$$

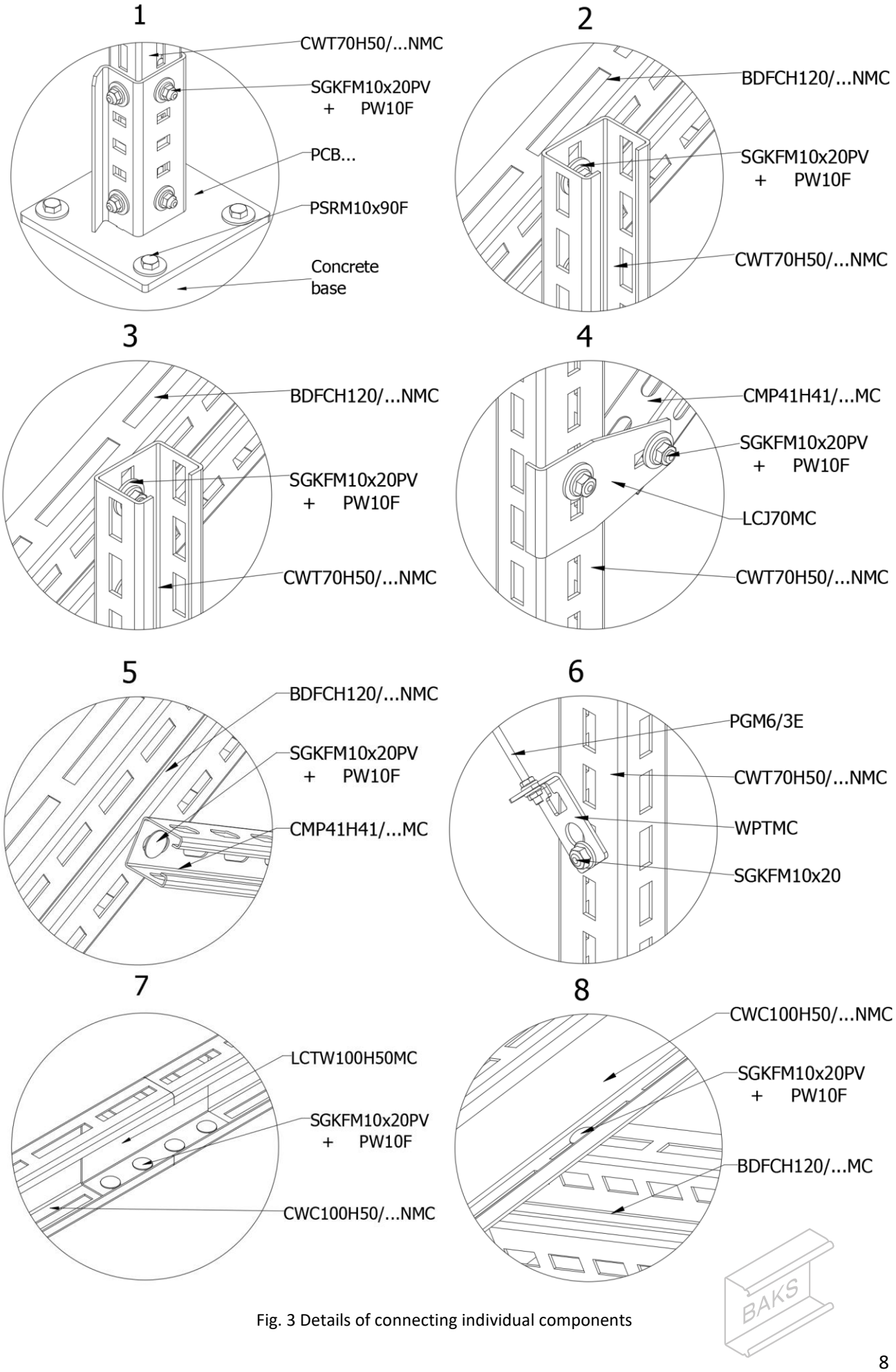


Fig. 3 Details of connecting individual components

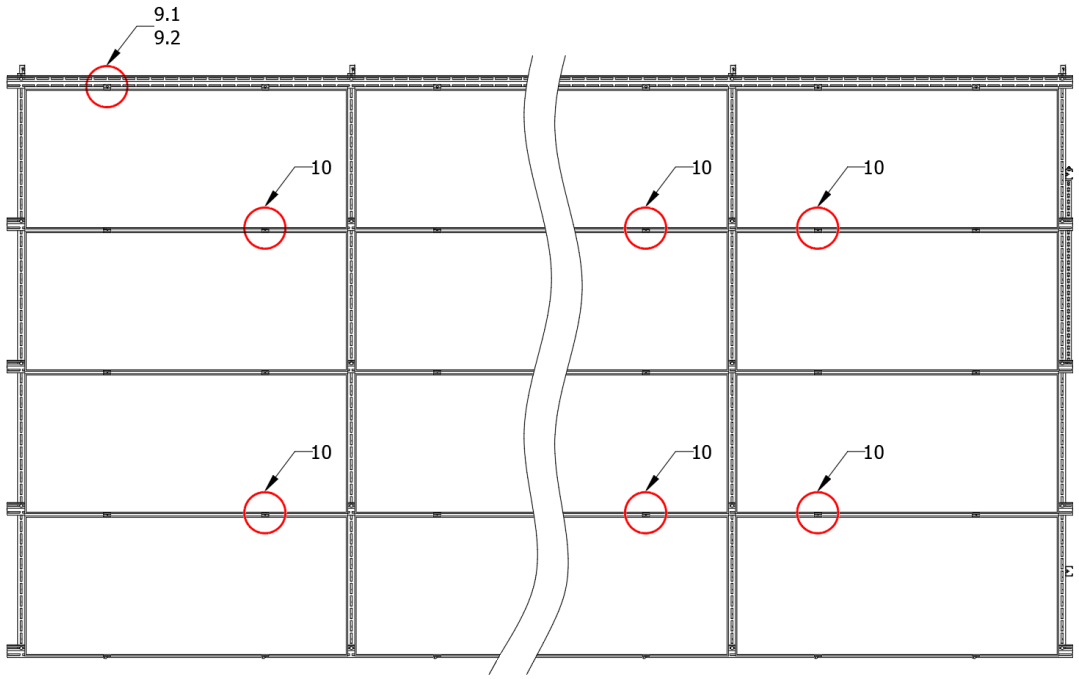


Fig. 4 Top view of the structure

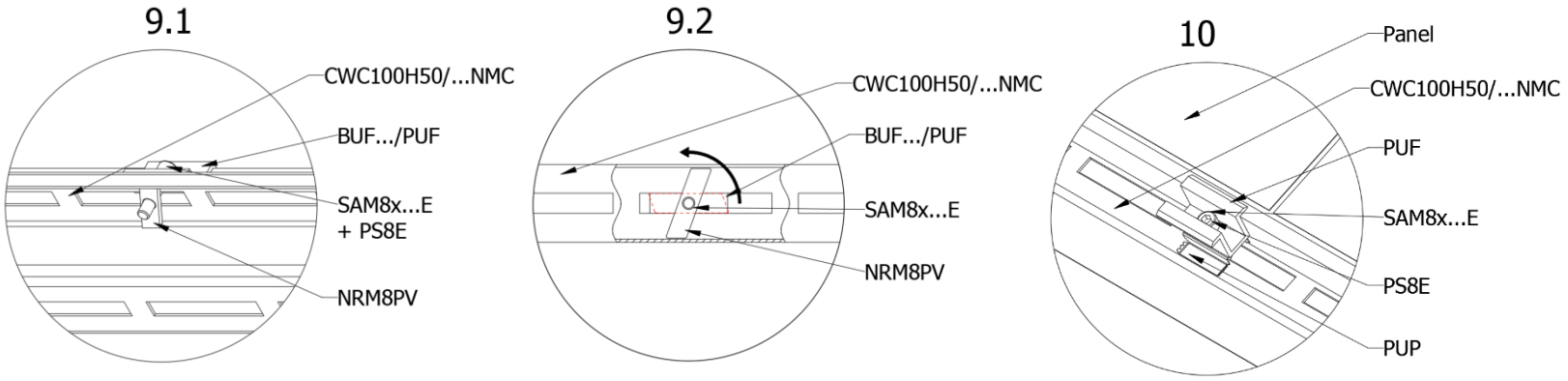
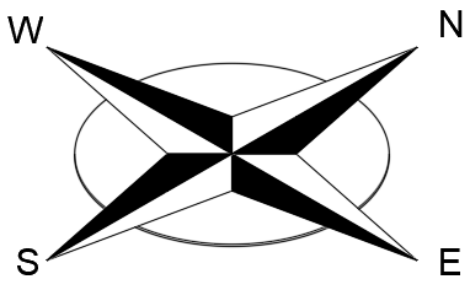


Fig. 5 Detail of assembly of the clamps together with the earthing washer and locking of the channel nut



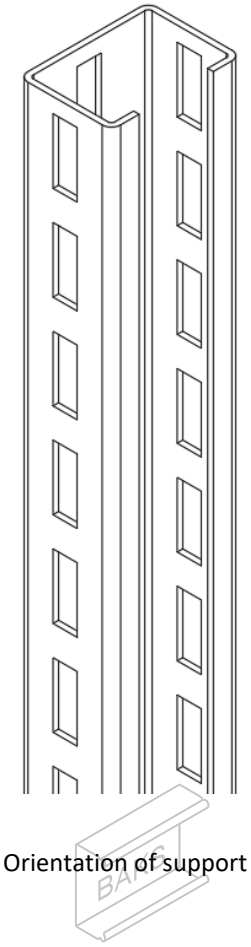


Fig. 6 Orientation of support column