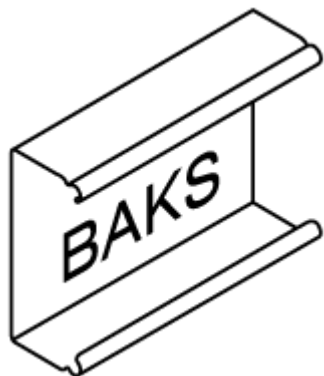# W-H6S2N CONSTRUCTION ASSEMBLY INSTRUCTIONS
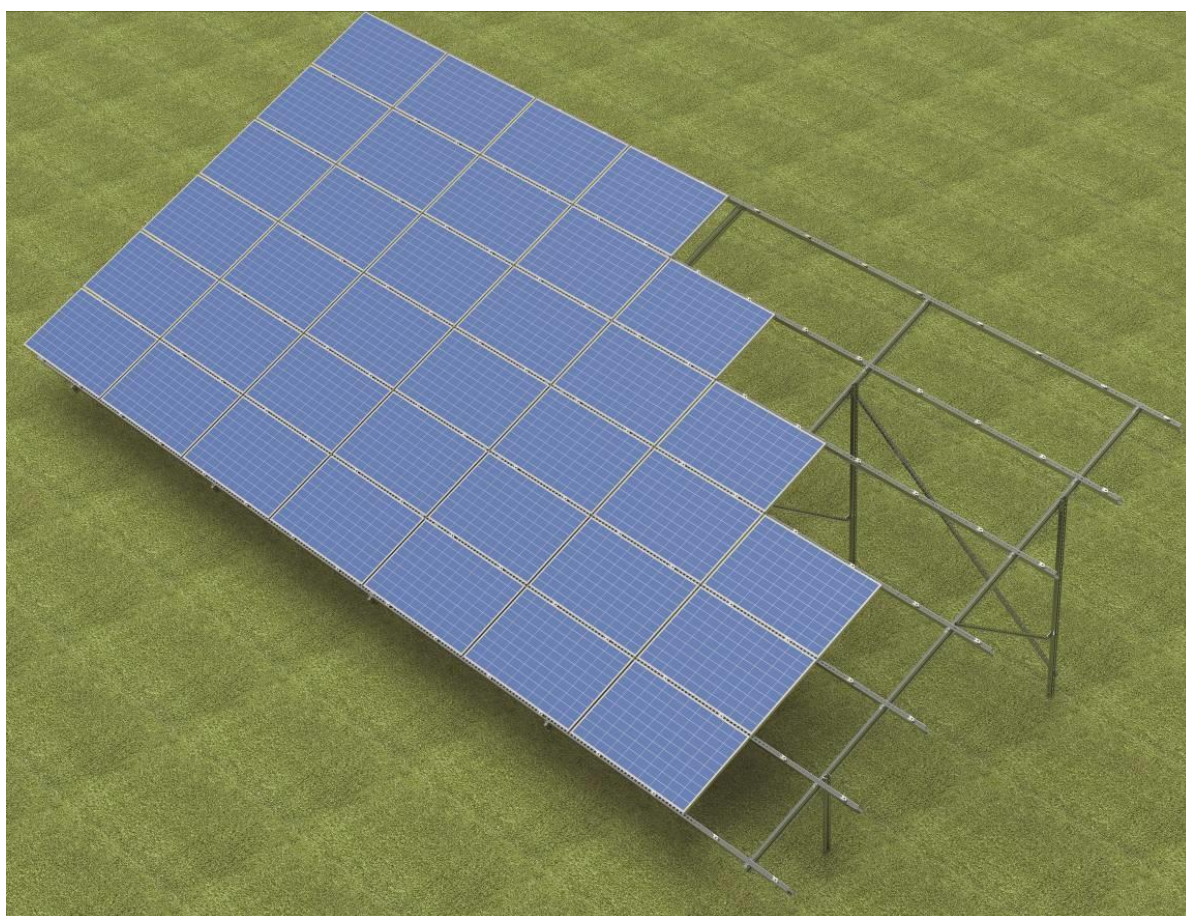
Manufacturer:

BAKS

Jagodne 5 Steet

05-480 Karczew

Poland

W – free-standing steel structure

H – horizontal panel layout

6 – number of panel rows

S – construction fixed to the ground with ground bolts

2 – construction based on two support columns

N – construction based on a new version of 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** i **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 was not located on the last (outermost) holes
- Each CWC100H50 and CWCR100H50 channel 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 installation in question
- 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 (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.
- Screws **SAM8x…E** and **NRM8PV** should be tightened 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 is locked against the walls of the hole in which the screw is mounted, and then tighten the screw slowly with a screwdriver until it is locked in the hole. At the final stage, tighten the screw with the screwdriver to a torque of 42 Nm

3. Summary of components of the W-H6S2N construction

(Construction kit does not include tools)

No.	Product	Name of product	Designation in construction
1	Support Channel	CWT70H50/…NMC	Front and rear support pillars
2	Base Plate	PCS70	Support column mounting base
3	Ground Screw	GSW76x…N	Bolt fixing the structure in the ground
4	Profile	BDFTH120/…NMC	Rafter
5	Support Channel	CMP41H41/…MC	Bracing
6	Channel Connector	LCJ70MC	Bracing connector
7	Support Channel	CWC100H50/…NMC	Purlin
8	Channel Connector	LCTW100H50MC	Purlin connector
9	Side Holder	BUF…	Lateral clamp for fixing panels
10	Middle Holder	PUF	Intermediate clamp for fixing panels
11	Grounding Washer	PUP	Panel earthing
12	Screw	SAM8x…E	Panel fixing screw
13	Spring Washer	PS8E	Head washer SAM8x...E
14	Screw set	SGKFM10x…PV	Screw + flange nut
15	Washer	PW10F	Washer
16	Channel Nut	NRM8PV	Clamp mounting nut

Table 1 Summary of components

4. Installation sequence:

1) Screwing in **GSW76x...N** ground bolts according to the information in tables 3 and 4
2) Mounting of **PCS70** bases to the screwed-in ground bolts
3) Fixing the **CWT70H50/...NMC** front and rear support pillars to the **PCS70** bases (detail 1), taking into account their orientation with respect to the directions of the world as shown in drawing No. 6.
4) Installing the **BDFTH120/...NMC** profile to the anchored support pillars (detail 2; 3)
5) Installation of bracing No. 1 (detail 4; 5)
6) Assembly and joining of the longitudinal profiles under the panels (detail 7; 8)
7) Assembly of bracing No. 2 (detail 6)
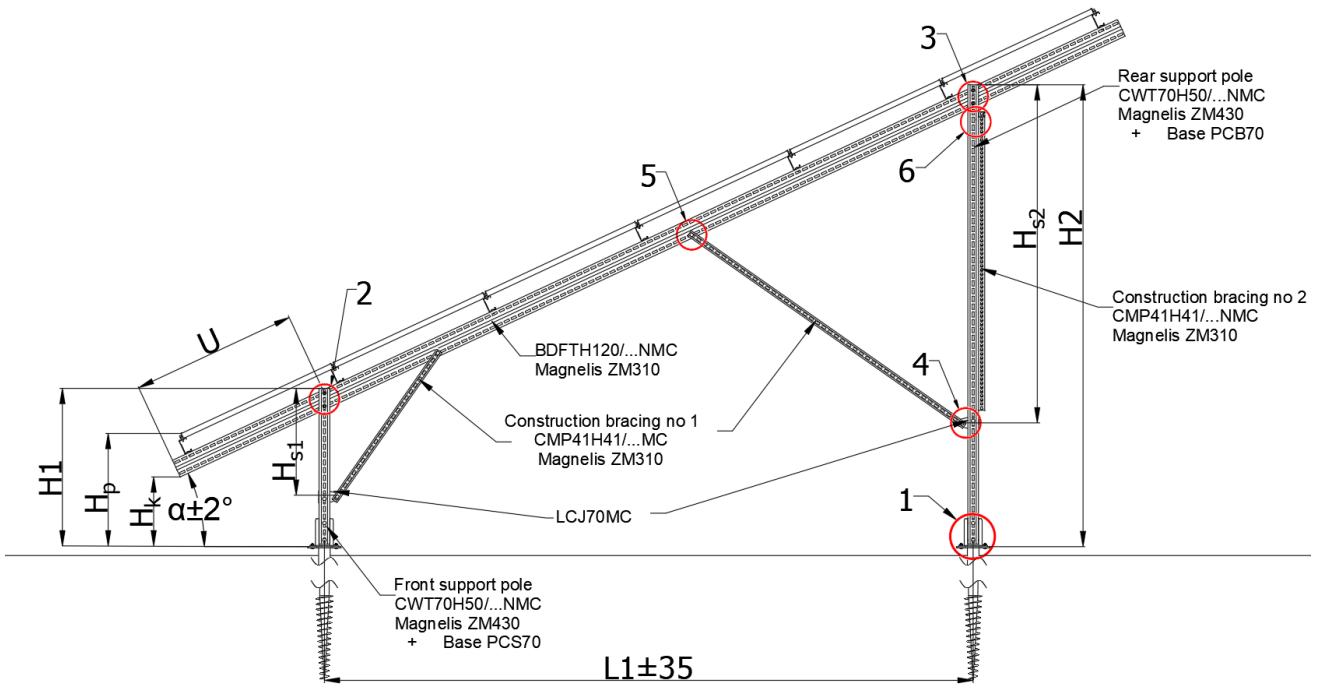8) Installing the attachment clamps for the panels (detail 9.1; 9.2; 10)

3

Fig. 1 Side view of the structure

Labels visible in figure:

3

Rear support pole
CWT70H50/...NMC
Magnelis ZM430
+ Base PCB70

5

6

H_{s2}

$H2$

Construction bracing no 2
CMP41H41/...NMC
Magnelis ZM310

2

U

BDFTH120/...NMC
Magnelis ZM310

4

Construction bracing no 1
CMP41H41/...MC
Magnelis ZM310

$H1$

H_p

H_{s1}

H_k

$\alpha \pm 2°$

LCJ70MC

1

Front support pole
CWT70H50/...NMC
Magnelis ZM430
+ Base PCS70

L1±35

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Angle of structure „α”	Front support pillar	Rear support pillar	Rafter	Brace No. 1
Panel width from 950 to 1000mm				
25°	CWT70H50/1NMC	CWT70H50/3NMC	BDFCH120/6,4NMC	CMP41H41/1,2MC + CMP41H41/2,2MC
Panel width from 1000 to 1050mm				
25°	CWT70H50/1NMC	CWT70H50/3NMC	BDFTH120/6,8NMC	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								
25°	4250	1040	3030	580	860	700	2220	790
Panel width from 1000 to 1050mm								
25°	4250	1040	3030	460	730	700	2220	1090

Table 3 Structure dimensions depending on the angle of inclination of the structure and the size of the panels
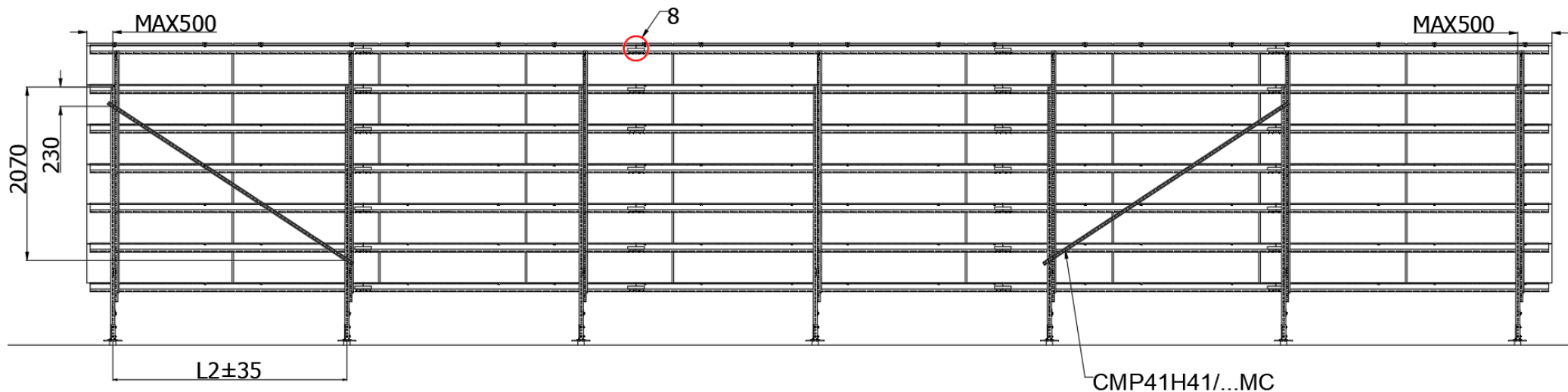
Fig. 2 View of the structure from the north with bracing spacing No. 2

Combination of "W" wind and "S" snow zones*	Maximum distance of consecutive "L2" frames
1W-1S or 3W-1S	2,9 m
1W-2S	
1W-3S or 3W-3S	2,4 m
1W-4S	
2W-2S or 2W-3S	2,0 m
Other combinations of zones	Selected individually after consultation

Table 4 Installation distance of successive frames of the photovoltaic structure depending on the combination of the wind and snow zones

*1 wind zone below 300 meters above sea level; 3 wind zone below 500 meters above sea level.

1 and 3 snow zone below 300 meters above sea level.; 5 snow zone below 500 meters above sea level.
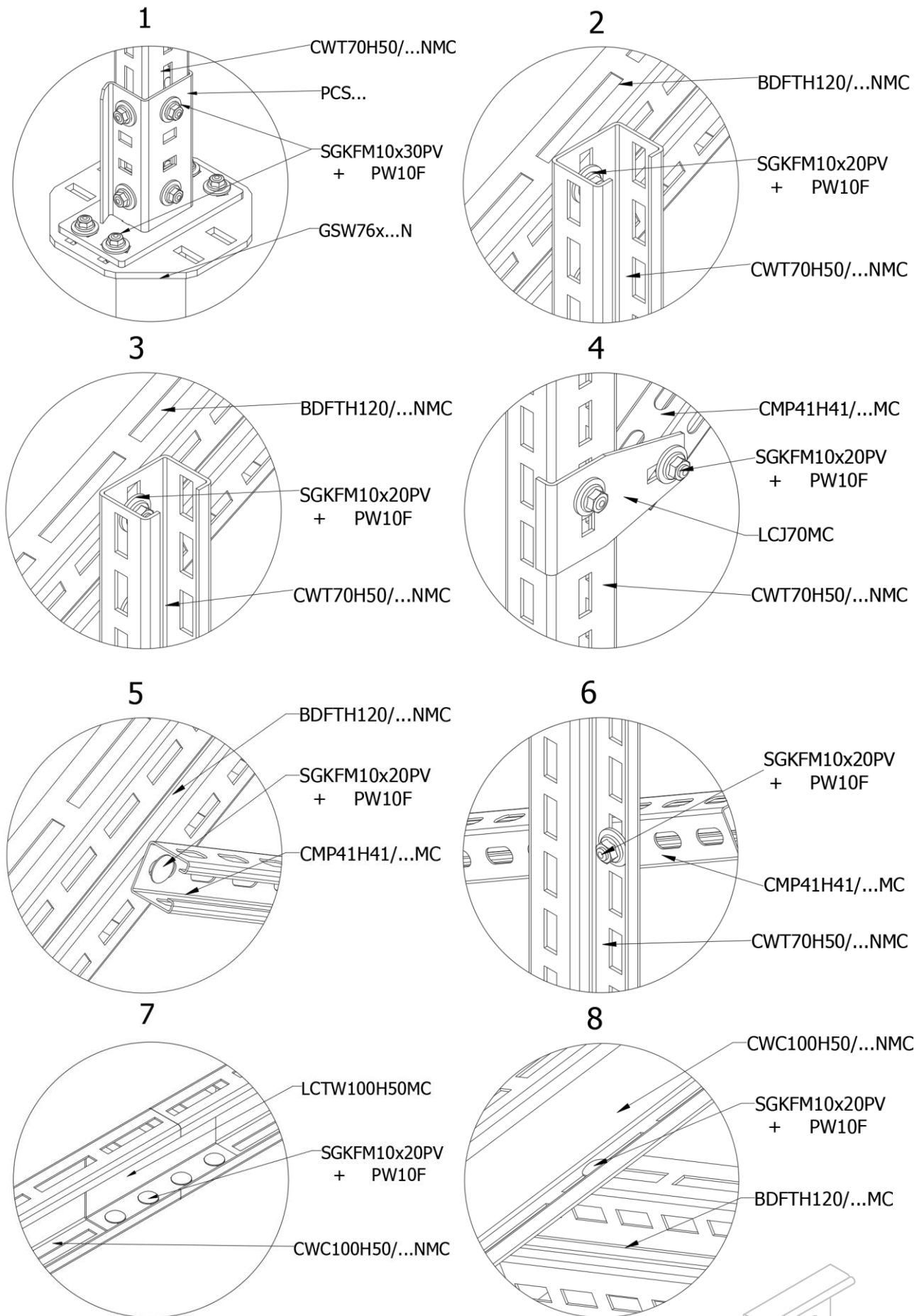
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1

CWT70H50/...NMC

PCS...

SGKFM10x30PV
  +   PW10F

GSW76x...N

2

BDFTH120/...NMC

SGKFM10x20PV
  +   PW10F

CWT70H50/...NMC

3

BDFTH120/...NMC

SGKFM10x20PV
  +   PW10F

CWT70H50/...NMC

4

CMP41H41/...MC

SGKFM10x20PV
  +   PW10F

LCJ70MC

CWT70H50/...NMC

5

BDFTH120/...NMC

SGKFM10x20PV
  +   PW10F

CMP41H41/...MC

6

SGKFM10x20PV
  +   PW10F

CMP41H41/...MC

CWT70H50/...NMC

7

LCTW100H50MC

SGKFM10x20PV
  +   PW10F

CWC100H50/...NMC

8

CWC100H50/...NMC

SGKFM10x20PV
  +   PW10F

BDFTH120/...MC

Fig. 3 Details of connecting individual components

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9.1
9.2

10 10 10

10 10 10

10 10 10
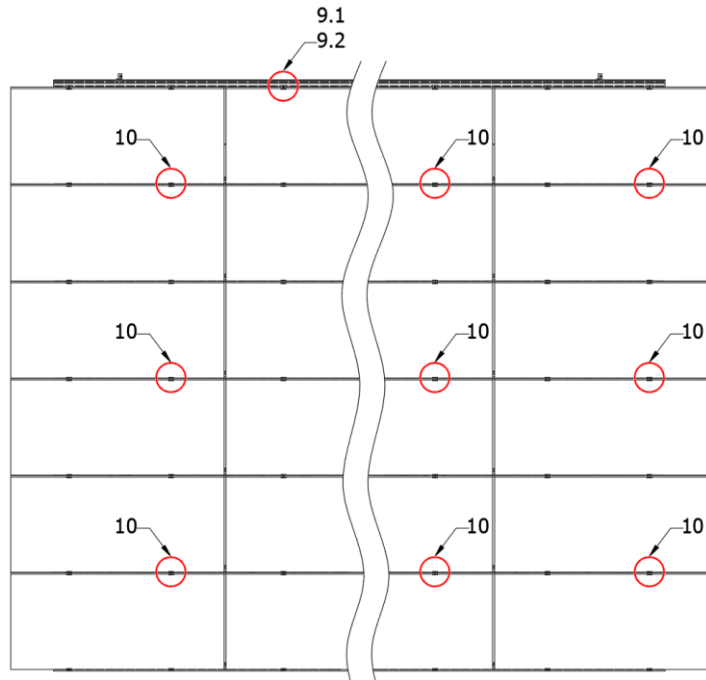
Fig. 4 Top view of the structure

9.1

CWC100H50/...NMC

BUF.../PUF

SAM8x...E
+ PS8E

NRM8PV

9.2

CWC100H50/...NMC
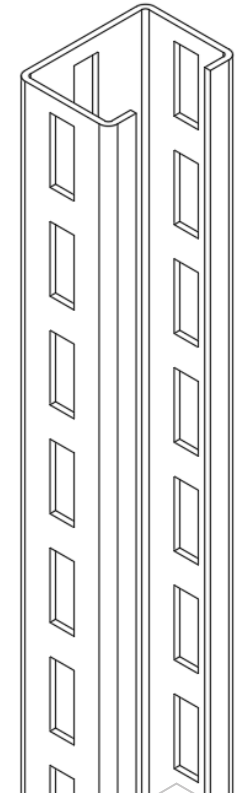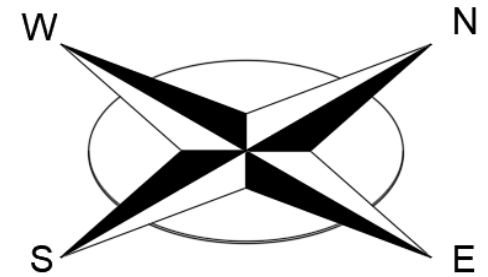
BUF.../PUF

SAM8x...E

NRM8PV

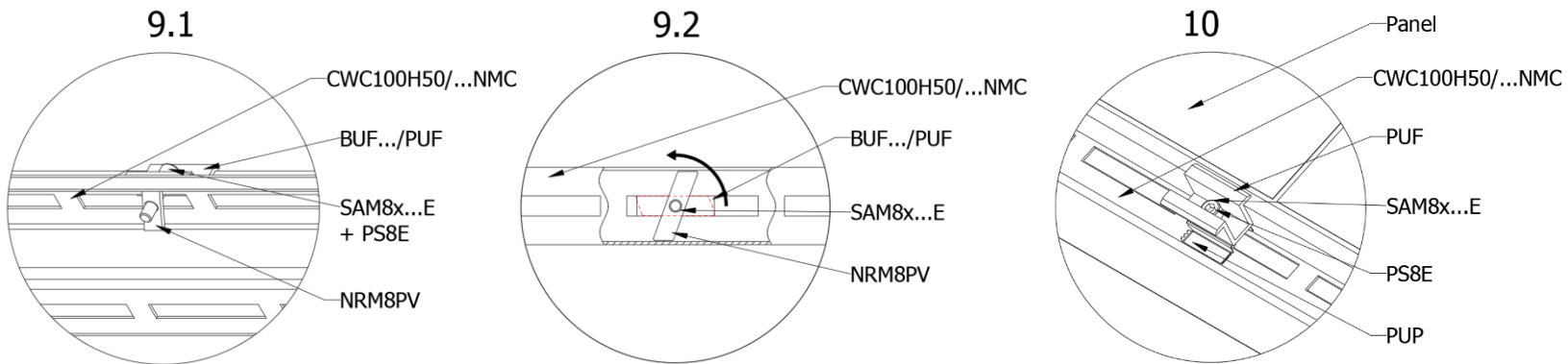## 10

Panel

CWC100H50/...NMC

PUF

SAM8x...E

PS8E

PUP

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

W   N

S   E

Fig. 6 Orientation of support column