

## SERRA GEO

### **Dear clients!**

After making the decision of buying a greenhouse you received a carefully made item. Its framework is made from special (1mm of thickness and 78mm width) profiles produced from galvanized metal which are extremely strong.

Due to uncomplicated instruction this greenhouse is easy to construct.

Because of additional items, you will be able to accomplish your ideas.

We keep the rights to make variations associated with the improvements of technologies. Some pictures and instructions may be different because of that.

We wish you a lot of joy and success with our greenhouse.

### **Attention!**

Always use safety gloves when constructing the framework of the greenhouse and working with polycarbonate cover.

Tools you will need for the construction:

- Hexagon wrench with the diameter of 8 mm or wrench with open end.
- Cross-head screwdriver or screwdriver for battery
- Shovel to dig pits
- Spirit level to measure equability of the ground.
- Rope to measure the diagonal
- Knife to cut polycarbonate sheets

If necessary, follow the instructions from local building area.

In case of strong wind or storm close the windows and doors.

Before starting the construction, you should read all the instruction at least once and understand different sections and profiles. This is a helpful guide for you. Compare the list of parts with the parts in the package. Then sort out the sections and leave them in separate places.

It is highly recommended to screw the screws easily with hands at first – if needed, you will be able to rotate sections. After the construction, you should measure equability of the framework and only then tighten the screws.

## THE LIST OF PARTS

| No     | Name  | Length,<br>mm | TITAN Dome      |                  |                  |                  |                  |
|--------|---|---------------|-----------------|------------------|------------------|------------------|------------------|
|        |   |               | 5m <sup>2</sup> | 10m <sup>2</sup> | 15m <sup>2</sup> | 20m <sup>2</sup> | 25m <sup>2</sup> |
| NR. 1  | Top post  | 1070          | 8               | 14               | 20               | 26               | 32               |
| NR. 2  | Bent profile  | 730           | 8               | 14               | 20               | 26               | 32               |
| NR. 3  | Side-bottom post  | 1600          | 8               | 14               | 20               | 26               | 32               |
| NR. 4  | Ground attachments  | 200           | 12              | 18               | 24               | 30               | 36               |
| NR. 5  | Post reinforcement rails                                      | 4000          |                 | 4                | 4                | 8                | 8                |
| NR. 6  | Post reinforcement rails                                      | 2030          | 4               |                  | 4                |                  | 4                |
| NR. 7  | Reinforcement profile   | 1330          |                 | 4                | 6                | 8                | 10               |
| NR. 8  | Roof ridge reinforcement                                      | 450           | 2               | 5                | 8                | 11               | 14               |
| NR. 9  | Post for doors and end  | 2310          | 4               | 4                | 4                | 4                | 4                |
| NR. 10 | Holder of door and end post (at the top)                      | 1120          | 2               | 2                | 2                | 2                | 2                |
| NR. 11 | Side reinforcements of Front-back parts                       | 770           | 4               | 4                | 4                | 4                | 4                |
| NR. 12 | Reinforcement of back end part (in the middle)                | 820           | 1               | 1                | 1                | 1                | 1                |
| NR. 13 | Skylight profile (attached between top posts)                 | 625           | 1               | 2                | 3                | 4                | 5                |
| 14     | Connection of top post (plate with 4 holes)                   |               | 4               | 7                | 10               | 13               | 16               |
| 15     | Sides of foundation   | 4000          |                 | 2                | 2                | 4                | 4                |
| 16     | Extension of foundation side                                  | 2000          | 2               |                  | 2                |                  | 2                |
| 17     | Front and back parts of foundation                            | 2550          | 2               | 2                | 2                | 2                | 2                |
| 18     | Corners of foundation   |               | 4               | 4                | 4                | 4                | 4                |
| 19     | Connection plates of foundation (from 15 m2)                  |               |                 |                  | 4                | 4                | 8                |
| 20     | Polycarbonate attachment corners (large corner)               |               | 20              | 20               | 20               | 20               | 20               |
| 21     | Attachment corners for polycarbonate and posts (small corner) |               | 8               | 8                | 8                | 8                | 8                |
| 22     | Polycarbonate attachment plates                               |               | 5               | 5                | 5                | 5                | 5                |
| 23     | Ridge   | 2100          | 2               | 4                | 6                | 8                | 10               |
| 24     | Handles   |               | 2               | 2                | 2                | 2                | 2                |
| 25     | Screws 2,5*12 with the injectable head                        |               | 3               | 3                | 3                | 3                | 3                |
| 26     | Screws M5-12  | 12            | 260             | 355              | 450              | 550              | 645              |
| 27     | Screws M5-20  | 20            | 30              | 36               | 42               | 48               | 54               |
| 28     | Screws M5-40  | 40            | 110             | 155              | 200              | 245              | 290              |
| 29     | Nuts M5   |               | 400             | 546              | 692              | 843              | 989              |
| 30     | Self-tapping screws for ridge attachment                      |               | 8               | 14               | 20               | 26               | 32               |
| 31     | Spacers   |               | 130             | 170              | 210              | 250              | 290              |
| 32     | Protective band for panels                                    | roll          | 1               | 1                | 1                | 1                | 1                |

|    |                                      |   |      |      |      |      |      |
|----|--------------------------------------|---|------|------|------|------|------|
| 33 | Plastic H profile for connection     | m | 2    | 2    | 2    | 2    | 2    |
| 34 | Plastic holder for opening the doors |   | 1    | 1    | 1    | 1    | 1    |
| 35 | Bolt with loop                       |   | 2    | 2    | 2    | 2    | 2    |
| 36 | Sealing rubber gray                  |   | 12   | 12   | 12   | 12   | 12   |
| 37 | Closure profile U                    |   | 1,30 | 2,70 | 4,20 | 5,40 | 6,90 |

| Skylight parts             |                                    |      |   |   |   |   |    |
|----------------------------|------------------------------------|------|---|---|---|---|----|
| SKYLIGHT NO. 1             | Upper part of skylight with hinges | 520  | 1 | 2 | 3 | 4 | 5  |
| SKYLIGHT NO. 2             | Bottom part of skylight            | 520  | 1 | 2 | 3 | 4 | 5  |
| SKYLIGHT NO. 3             | Side parts of skylight             | 550  | 2 | 4 | 6 | 8 | 10 |
| Door (top part) – small    |                                    |      |   |   |   |   |    |
| DOOR NO. 1                 | Part of the door with hinges       | 670  | 1 | 1 | 1 | 1 | 1  |
| DOOR NO. 2                 | Part of the door with handle       | 670  | 1 | 1 | 1 | 1 | 1  |
| DOOR NO. 3                 | Transverse parts of the door       | 715  | 3 | 3 | 3 | 3 | 3  |
| Door (bottom part) – large |                                    |      |   |   |   |   |    |
| DOOR NO. 4                 | Part of the door with hinges       | 1220 | 1 | 1 | 1 | 1 | 1  |
| DOOR NO. 5                 | Part of the door with handle       | 1220 | 1 | 1 | 1 | 1 | 1  |
| DOOR NO. 3                 | Transverse parts of the door       | 715  | 4 | 4 | 4 | 4 | 4  |

### Dimensions for cutting of polycarbonate

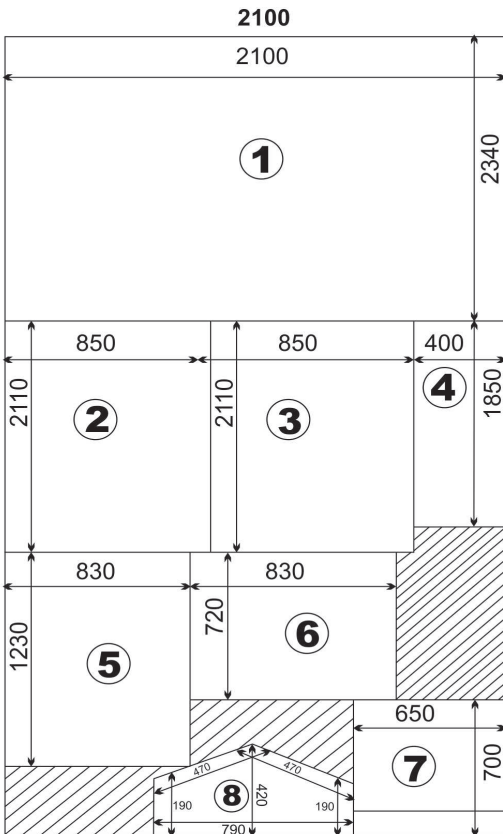
| No.     | Name                               | Height/<br>Width,<br>mm | 5m <sup>2</sup> | 10m <sup>2</sup> | 15m <sup>2</sup> | 20m <sup>2</sup> | 25m <sup>2</sup> | Notes   |
|---------|------------------------------------|-------------------------|-----------------|------------------|------------------|------------------|------------------|---|
|         | Top parts                          | 2980x2100               | 2               | 4                | 6                | 8                | 10               | Cut out from 2,10x6,00 m sheet.<br><br>These parts must be cut out from 2,10x6,00 m 1 sheet. Additional content is 1 skylight for greenhouse of 4 m length; 2 skylights for greenhouse of 6 m length; 3 skylights for greenhouse of 8 m length etc. |
| 1       | Side – end part                    | 2340x2100               | 1               | 1                | 1                | 1                | 1                |   |
| 2 and 3 | Side – front part (left and right) | 2110x850                | 2               | 2                | 2                | 2                | 2                |   |
| 4       | Side – end part                    | 1850x400                | 1               | 1                | 1                | 1                | 1                |   |
| 5       | Bottom part of door                | 1230x830                | 1               | 1                | 1                | 1                | 1                |   |
| 6       | Top part of door                   | 720x830                 | 1               | 2                | 3                | 4                | 5                |   |
| 7       | Skylight                           | 700x650                 | 1               | 1                | 1                | 1                | 1                |   |
| 8       | Triangle (over door)               | 790x420                 | 1               | 1                | 1                | 1                | 1                |   |

## Scheme for cutting polycarbonate

Diagram for cutting one polycarbonate 2100x6000 mm sheet for standard greenhouse (double door at the front end, wall at the back end):



**Use appropriate side of polycarbonate! Side with protective layer, which protects from UV radiation, must be on the outside. Protective layer is covered with plate which contains writings; other side (which has to be on the inside) is covered with clear tape. If sheets need to be cut, we recommend using electric saw, handsaw with fine teeth or sharp knife. Tape must be removed prior to installation! ALWAYS WEAR GLOVES WHEN CUTTING!**

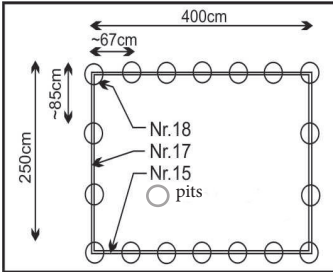


- 1-; -4-; Side end part
- 2-; -3-; Side-front parts
- 5- Door (bottom part)
- 6- Door (top part)
- 7- Skylight
- 8- Part above the door

**NOTE:**  
**additionally installed skylight sheet:**  
 1pc for 4 m long greenhouse  
 2pcs – 6m  
 3pcs – 8m nd etc.

## Installation instruction

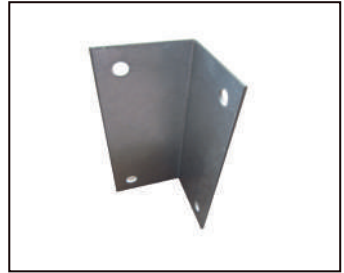
1. Foundation is assembled by using front end and back end parts of foundation (17) and foundation side parts (15). All parts must be connected in such manner that it would form a rectangle. Use foundation corners (18) and connect all these parts together by using bolts M5-12 (26), M5 nuts (29). Don't tighten, just screw in loosely with hand (1.1-1.4 pic).



1.1 pic.

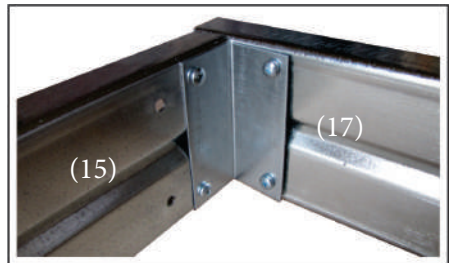


1.2 pic.



1.3 pic.

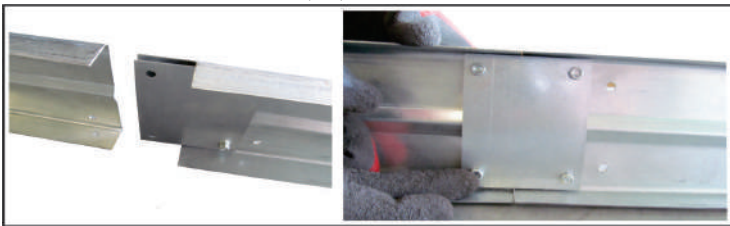
For greenhouses TITAN Dome larger than 10 m<sup>2</sup>, foundation connection plates (19) are used for foundation extension. They must be attached by using bolts M5-12 (26) and nuts M5 (29) (1.5 pic). If greenhouse's length is 6 m - foundation must be connected between: 4 m (15) + 2 m foundation extension (16).



1.4 pic.

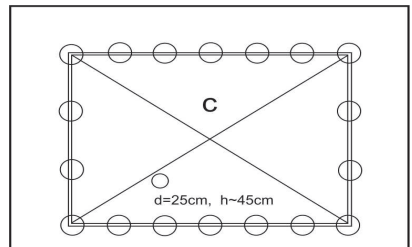
If greenhouse's length is 8 m – foundation must be connected between: 4 m (15) + 4 m foundation extension (16).

If greenhouse's length is 10 m – foundation must be connected between: 4 m (15) + 4 m (15) + 2 m foundation extension (16).



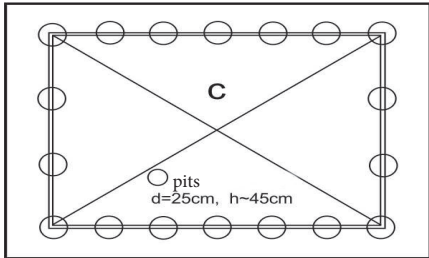
1.5 pic.

2. Measure the diagonal length of foundation (example 2). Both diagonals must be equal in length. If diagonals are equal – tighten the screws of foundation (2 pic).



2 pic.

3. Excavate the pits (25 cm in diameter, 40 cm in depth) for side – bottom posts (NR. 3) at attachment points in the foundation (3.1 - 3.2 pic).

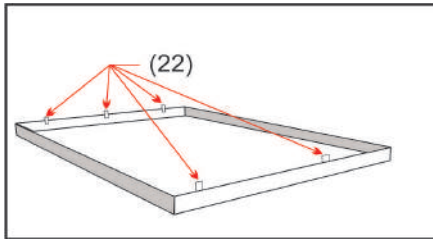


3.1 pic.



3.2 pic.

4. Using screws M5-12 (26) and nuts M5 (29) attach polycarbonate installation plates (22) to front end and back end parts of foundation (17) (4.1 - 4.2 pic).

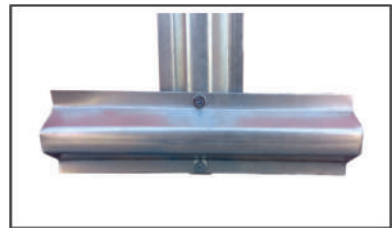


4.1 pic.



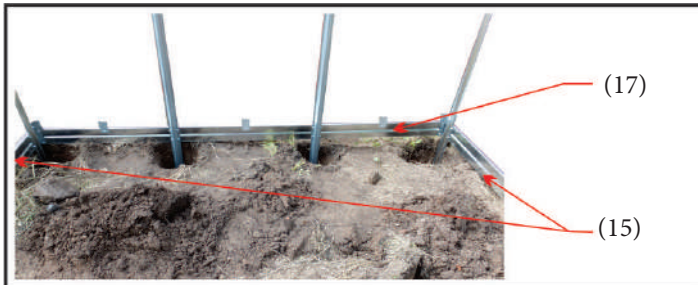
4.2 pic.

5. Preparation of post for placing into ground. Using screws M5-12 (26) and nuts M5 (29) attach the parts, that connect post to the ground, to side-and bottom post (NR. 3), tighten the connecting parts (NR. 4) (5 pic).



5 pic.

6. Tighten side-bottom posts (NR. 3) to side parts of assembled foundation, using screws M5-12 (26) and nuts M5 (29). (6.1 – 6.3 pic).



6.1 pic.



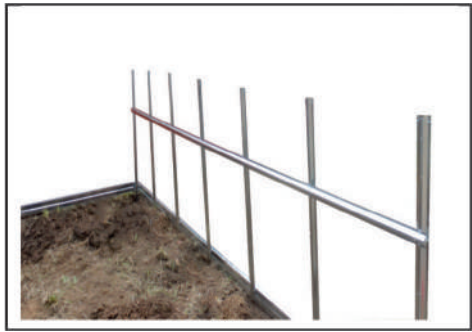
7. Side-bottom posts (NR. 3) are tightened by installing post reinforcement rails (NR. 5) using screws M5-12 (26) and nuts M5 (29) (example 7). Same actions must be carried out on both sides (7 pic).

With larger than 10 m<sup>2</sup> greenhouse TITAN Dome, additional rails must be used for reinforcement of post.

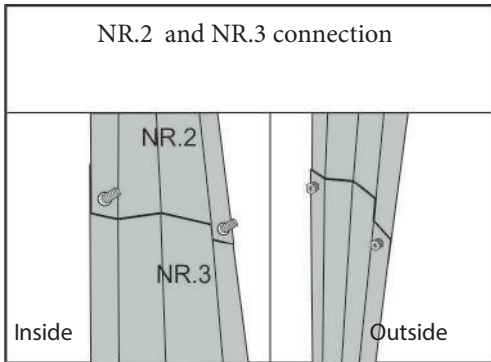
If greenhouse length is 6 m - post reinforcement rails must be connected like this: 4 m (NO. 5) + 2 m (NO. 6).

If greenhouse length is 8 m – post reinforcement rails must be connected like this: 4 m (NO. 5) + 4 m (NO. 5).

If greenhouse length is 10 m – post reinforcement rails must be connected like this: 4 m (NO. 5) + 4 m (NO. 5) + 2 m (NO. 6).



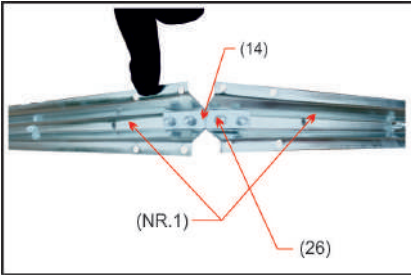
8. Bent profiles must be tightened to top parts of side-bottom posts (NO. 3). Use screws M5-12 (26) and nuts M5 (29) (8.1 – 8.2 pic)



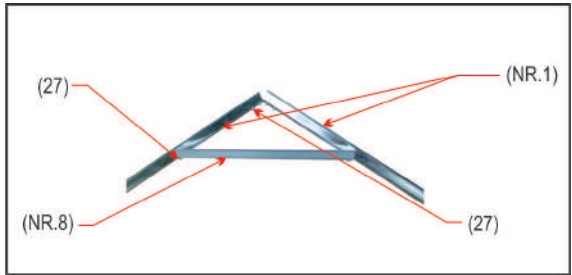
9. Separately assemble top posts (NO. 1) with top post connections (plates with 4 holes) (14) by using screws M5-12 (26) and nuts M5 (29) and attach ridge reinforcement at appropriate points (NO. 8) by using bolts M5-12 (26) and nuts M5 (29) (9.1 - 9.2 pic).



**NOTE: if assembly of greenhouse is carried out by one person or if greenhouse is longer than 2 m – each arch can be assembled separately and connected to framework before adding reinforcement rails (NO.5 and NO.6)**

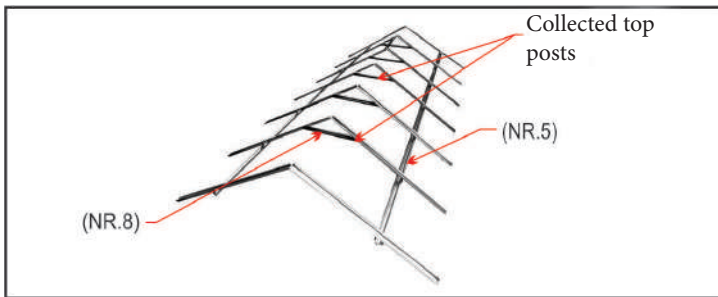


9.1 pic.



9.2 pic.

10. Attach remaining reinforcement rails (NO.5) to top post (NO.1) by using screws M5-12 (26) and nuts M5 (29) (10 pic).

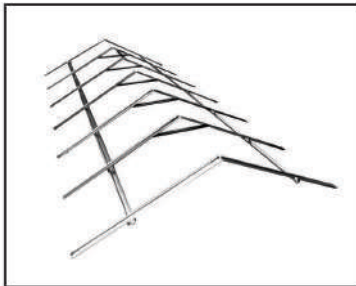


10 pic.

11. Tightened and fully assembled top framework must be connected to side-bottom posts (NR.3) by using screws M5-12 (26) and nuts M5 (29) (11.1 – 11.3 pic).



11.1 pic.



11.2 pic.



11.3 pic.

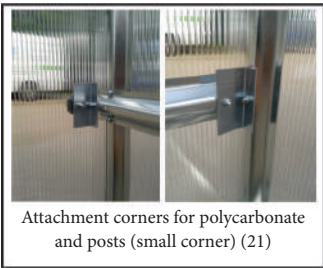
12. Attach corner for mounting of polycarbonate (20) and mounting of post (21) to side-bottom post (NO. 3), top post (NO.1) and side post reinforcement rails by using screws M5-12 (26) and nuts M5 (29) (12.1 - 12.3 pic)

*Positioning and arrangement of corners in chronological order form bottom to the top. Same course of actions must be carried in 3 remaining corners*





12.1 pic.

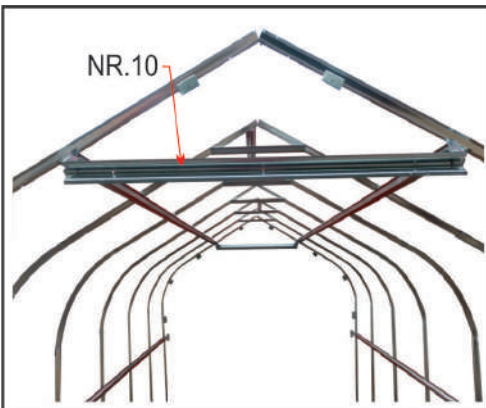


12.2 pic.

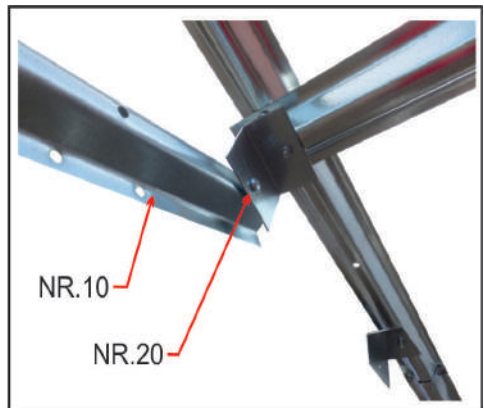


12.3 pic.

13. Tighten the holders of end post and door post (NO.1) to front and back of large corners (20) which are at the top ends of post reinforcements (NO. 1). Use screws M5-12 (26) and nuts M5 (29) (13.1 – 13.2 pic).

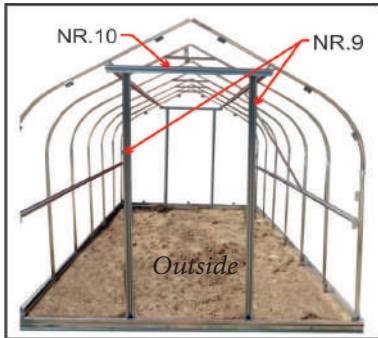


13.1 pic.

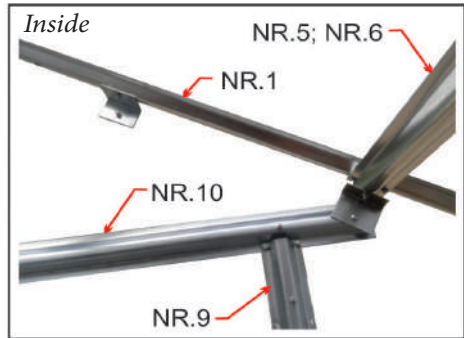


13.2 pic.

14. Tighten door post and end post (NO. 9) to door post and end post holders (NO. 10). Top part of post must be tightened to door post and end post holders (NO. 10) and bottom part directly to front end part of foundation (17) using screws M5-12 (26) and nuts M5 (29). Same actions must be used at the front end and at the back end (14.1 – 14.2 pic).

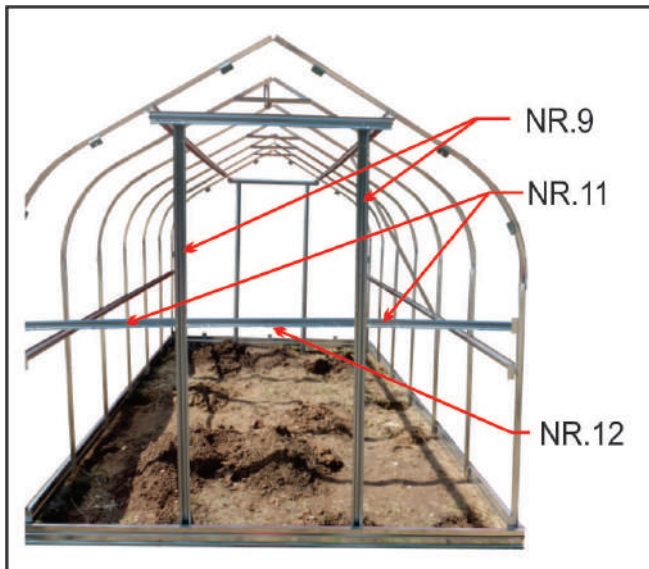


14.1 pic.



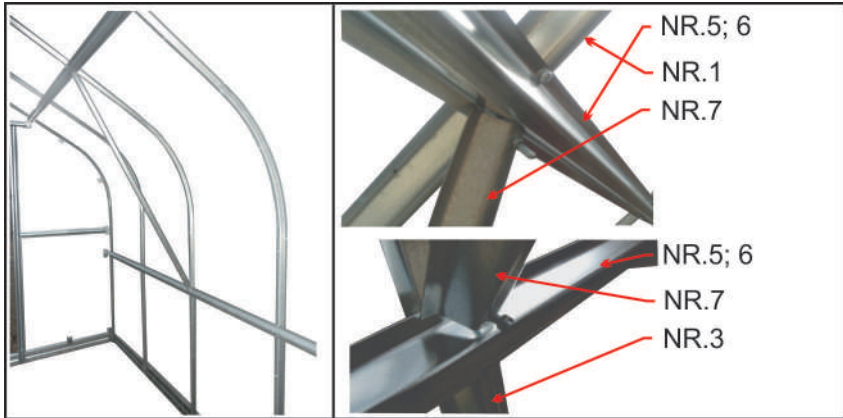
14.2 pic.

15. Tighten the door and back end reinforcements (NO. 11) to door and back end posts (NO.3) at the back end and front end of greenhouse by using screws M5-12 (26) and nuts M5 (29); additionally tighten the back end reinforcement at the back end of greenhouse (NO. 12) (15 pic).



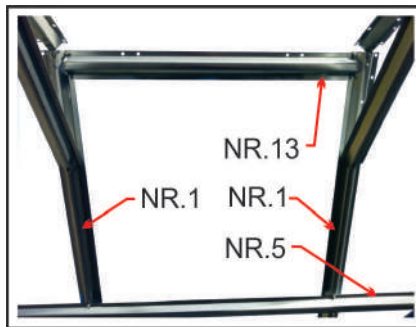
15 pic.

16. Tighten reinforcement profiles (NO. 7) to side-bottom posts (NO. 3) and top posts (NO.1), starting at top of reinforcement rail of first-bottom post (NO.5) and finishing with bottom of reinforcement rail of top second post (NO. 5). Use screws M5-12 (26) and nuts M5 (29) (16 pic). **NOTE: We suggest using one M5-40 screw with all 3 parts: side post, reinforcement rail of post and reinforcement profile.**



16 pic.

17. Tighten the skylight profile (NO. 13) in between side posts at the point of your choice. Use screws M5-12 (26) and nuts M5 (29). **NOTE: it is not recommended to place skylight in a place where two polycarbonate panels go on top of each other (i.e. at posts 4th, 7th, 10th, 13th and so on)** (17 pic.)



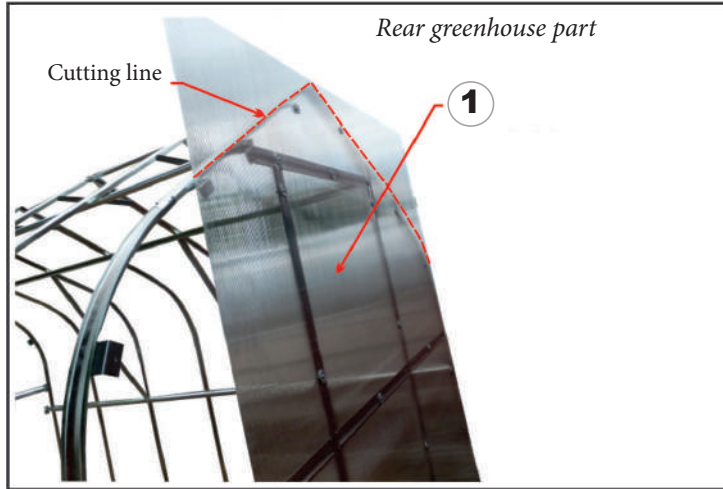
17 pic.

18. Because screws were not completely tightened in order to be able to adjust the position of profiles – next step is to level assembled framework by using leveler tool, check the diagonal length for a second time and only then cover the pits.

19. Installation of covering. **NOTE: If your greenhouse has additional doors, back end of greenhouse must be formed without H connecting profile – same as at the front end** (see 21 p.). Assemble the framework of greenhouse, cut polycarbonate according to given dimensions and attach it to framework. Installation of polycarbonate must be started from back end of greenhouse. Put side-end part of polycarbonate sheet on framework at the back end of greenhouse, mark bending radius with marker and cut out a bend. Or you can simply attach the sheet to framework using screws M5-40 (28), nuts (29) and spacers (31), and then cut the polycarbonate according to profile of framework by using sharp knife or jigsaw (19 pic).

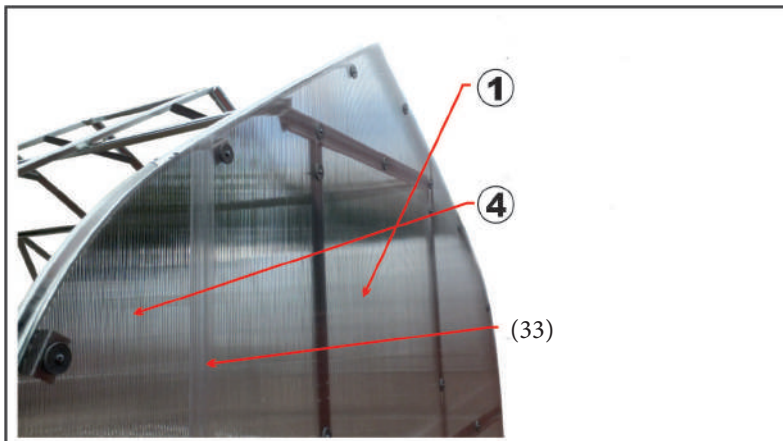


Use appropriate side of polycarbonate! Side with protective layer, which protects from UV radiation, must be on the outside. Protective layer is covered with plate which contains writings; other side (which has to be on the inside) is covered with clear tape. If sheets need to be cut, we recommend using electric saw, handsaw with fine teeth or sharp knife. Tape must be removed prior to installation! ALWAYS WEAR GLOVES WHEN CUTTING!



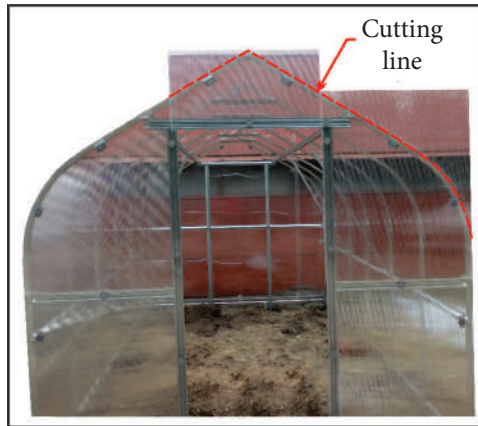
19 pic.

20. Put 1850x400 mm side-end part (4th sheet in polycarbonate cutting diagram) and side-end polycarbonate part, that you have cut-out, side by side and connect them with plastic H connection profile (33). Screw connected polycarbonate sheet to corners of polycarbonate installation and pole installation corners (20; 21) and polycarbonate installation plates (22) by using screws M5-40 (28), nuts (29) and spacers (31). Attach to posts of back end part of greenhouse by using screws M5-40 (28), nuts (29) and spacers (31) and then cut polycarbonate according to framework profile by using sharp knife or jigsaw (20 pic).



20 pic.

21. Attach side-front 2110 x 850 mm polycarbonate parts to front end of greenhouse from both sides (2nd and 3rd sheets in polycarbonate cutting diagram), mark the bending radius with marker and cut out the bend, or simply attach the sheet to framework using screws M5-40 (28), nuts (29) and spacers (31), and then cut the polycarbonate according to profile of framework by using sharp knife or jigsaw. Front middle part of greenhouse must be left empty (for doors). Screw side-front polycarbonate parts, that you have cut out, to polycarbonate installation and pole installation corners (20;21) and polycarbonate installation plates (22) by using screws M5-40 (28), nuts (29) and spacers (31). Attach to posts of front end part of greenhouse by using screws M5-40 (28), nuts (29) and spacers (31) (21 pic).



21 pic.

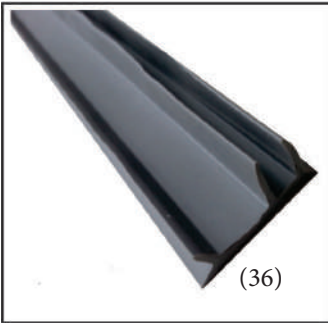
22. Tighten polycarbonate-triangle 790 x 420 mm at the front of greenhouse above the holder of post of door and end (NO.10) by using screws M5-40 (28), nuts (29) and spacers (31). By the polycarbonate attachment corners (large corner) (20), use screws M5-20 (27), nuts (29) and spacers (31) (22 pic.)



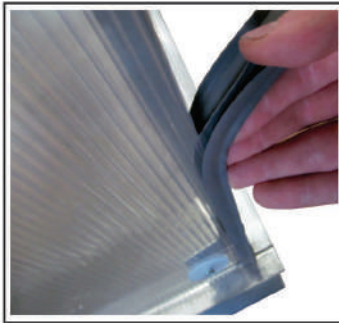
22 pic.



23. Attach sealing rubber to top channels of polycarbonate side sheets at the top of back end and front end of greenhouse. Then install the top polycarbonate covering (23.1 – 23.3 pic).



23.1 pic.

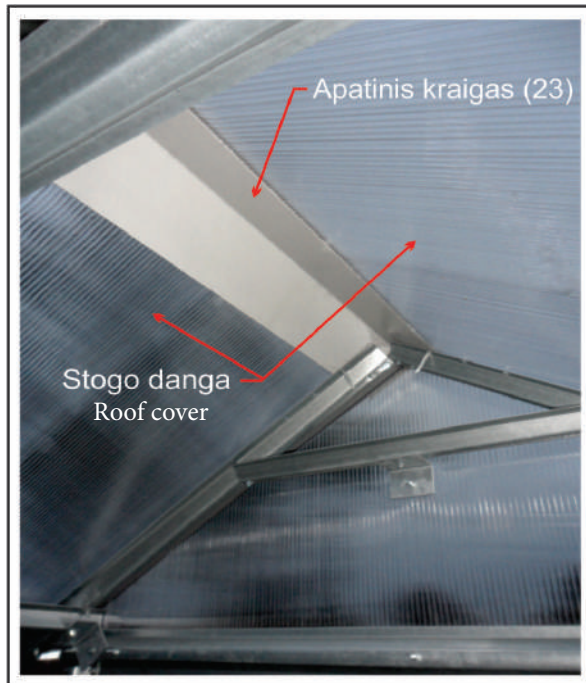


23.2 pic.



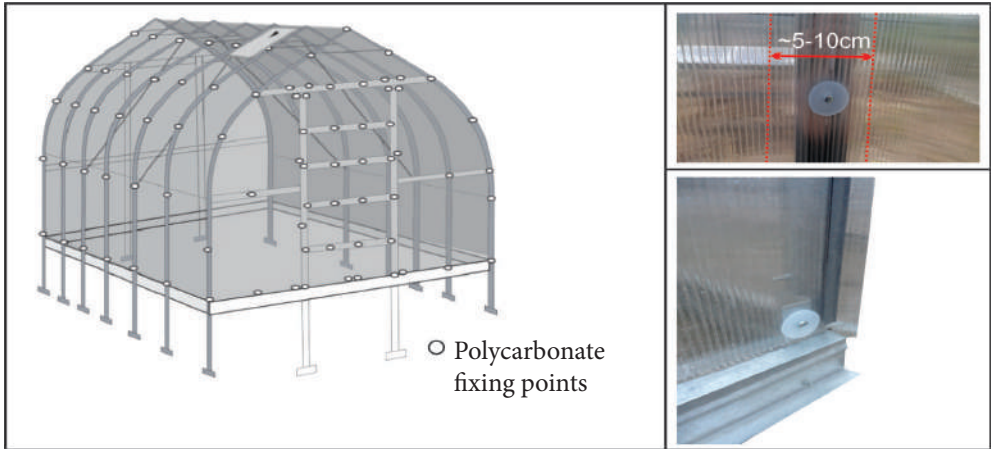
23.3 pic.

24. Before installing the roof covering, bottom ridge layer must be put on the framework (23) (24 pic). When bottom ridge layer is in place, install the top polycarbonate (roof) channel covering. Polycarbonate sheet of 2100 x 6000 mm must be used for roof covering. For greenhouse of 4 meters length you will need 2 sheets of 2100 x 6000 mm and so on. Four sheets of 2100 x 2980 mm must be cut out from this sheet. Attach protective aluminum foil sealant strip to top channels of these sheets by using glue (32). Bottom ends of sheets must remain open.



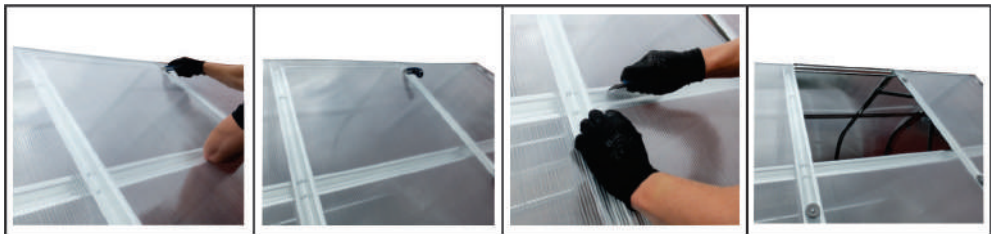
24 pic.

25. Screw 2100 x 2980 mm polycarbonate roof covering to greenhouse profile in appropriate places, starting at the bottom (foundation part) and going upwards. Use screws M5-40 (28), nuts (29) and spacers (31). Sheets that meet at the middle of greenhouse must go on top of each other (~5-10), only after placing them in such manner tighten the screws M5-40 (28), nuts (29) and spacers (31). At the back end and front end, polycarbonate sheets must be overhanging equally with foundation edge (25 pic).



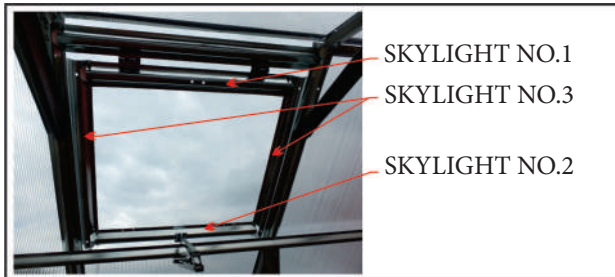
25 pic.

26. Cut out polycarbonate parts from top reinforcement rails of arcs (NO. 5) to the top (width = distance between posts) at the places chosen for skylight (26 pic).



26 pic.

27. All parts listed in skylight set (SKYLIGHT NO.1; SKYLIGHT NO.2; SKYLIGHT NO.3) must be connected in such way that they would form a rectangle; use screws M5-40 (28), nuts (29). Skylight hinges must be tightened to skylight profile (NO.13) with screws M5-12 (26) and nuts (29) (27.1 pic).



27.1 pic.

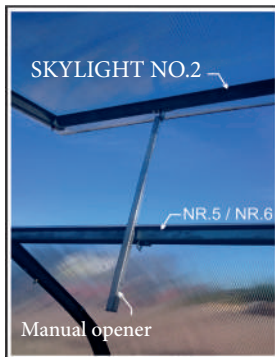


Install automatic or manual opener (depending on configuration); one part of it must be attached to bottom part of skylight (SKYLIGHT NO. 2), other – to top reinforcement rail (NO. 5) (27.1 pic). Tighten the 700 x 650 mm skylight polycarbonate to assembled small framework of skylight; use screws M5-40 (28), nuts (29) and spacers (31). Skylight polycarbonate covering goes under and up to the top, i.e. under ridge (27.2 pic).

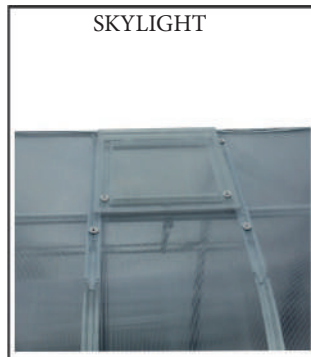
**NOTE: Depending on configuration, manual opener can be uses (27.2 pic).**



27.2 pic.

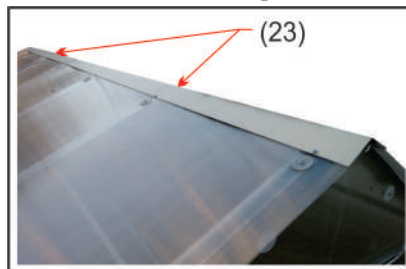


27.3 pic.



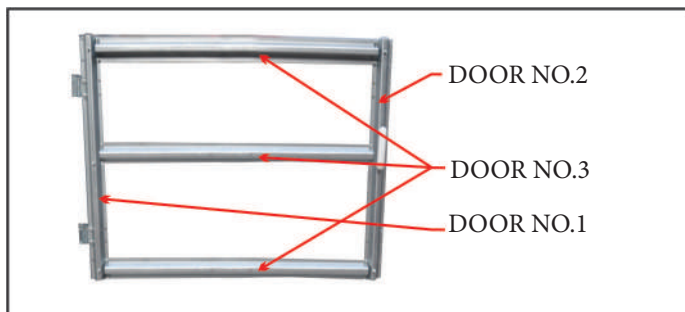
27.4 pic.

28. Install top part of ridge (23) and tighten it with self-tapping screws (30) at side edges of omega profile, trough top and bottom layer of ridge (28 pic).



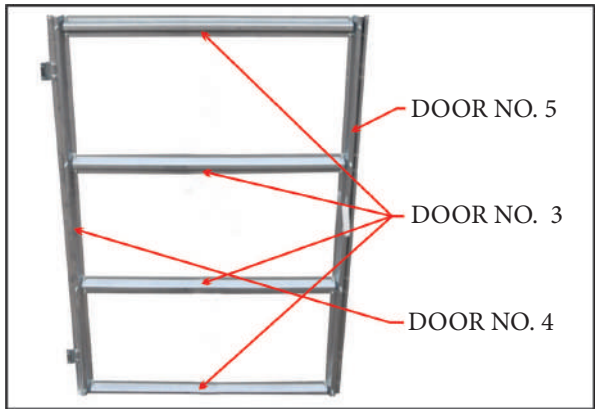
28 pic.

29. All parts listed in set of top part of the door (DOOR NO.1; DOOR NO.2; DOOR NO.3; ) must be connected in such way that they would form a rectangle, tighten it with screws M5-12 (26) and nuts (29). Tighten the hinges of top part of the door to the post of door-end (NO.9); use screws M5-12 (26) and nuts (29) (29.1 pic).



29.1 pic.

29. Assembly of bottom and top part of the door. All parts listed in set of bottom part of door (DOOR NO.4; DOOR NO.5; DOOR NO.3; ) must be connected in such way that they would form a rectangle, tighten it with screws M5-12 (26) and nuts (29). Tighten the hinges of bottom part of the door to the post of door-end (NO.9); use screws M5-12 (26) and nuts (29) (29.2 pic). **NOTE: Top and bottom door must be attached to door posts by using screws M5-12 (26) and nuts (29). At the time of tightening, doors must be fully opened and hinge must be extended into outside of the opening, trough polycarbonate channel.**



29.2 pic.

Tighten the polycarbonate of top and bottom part of the door to assembled framework of top and bottom door by using screws M5-40 (28), nuts (29) and spacers (31). Use protective band (32) of sheets to seal the top polycarbonate channels of the door. Attach the handle (24) to the prepared place of the door (29.3 pic.).



29.3 pic.

30. Insert the screw with loop (35) into dedicated place (at the equal height with top door-window handle). Make a loop from provided plastic holder for door opening (34) (30.1 – 30.2 pic).



30.1 pic.



30.2 pic.