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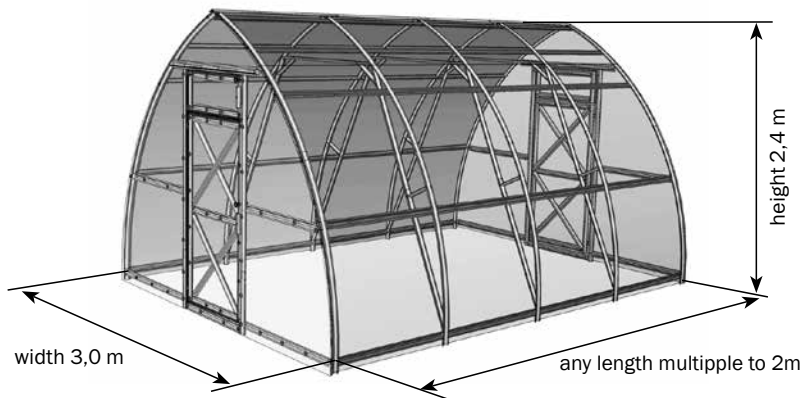
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КОМПАНИЯ  
**ВОЛЯ**  
ПРОИЗВОДСТВО ТЕПЛИЦ

# DACHNAYA STRELKA-3

Cellular polycarbonate greenhouse  
(EURO)



CLASS  
«TITANIC STRENGTH»

**Technical certificate**

page 2-5

**Assembling manual**

page 6-27



**Perform installation and operation of the greenhouse in strict accordance with the manual and operating rules stated in the technical certificate. Please keep this technical certificate for further reference.**

**Description**

DACHNAYA STRELKA-3 greenhouse is designed for creation of microclimate favorable for growing garden crops on cottage and household plots. Area of covered soil depends on length of the greenhouse (table 1). Height of installed frame is 2.4 m, width is 3.0 m. The greenhouse may have various length depending on desire of buyer. Required length of greenhouse is provided by purchase of additional Vstavka packages adding 2 m to the base length (table 2).

length, m	covered area, m <sup>2</sup>	Polycarbonate sheets 2100 x 6000, pcs
<b>2</b>	<b>6</b>	<b>2</b>
<b>4</b>	<b>12</b>	<b>3</b>
<b>6</b>	<b>18</b>	<b>4</b>
<b>8</b>	<b>24</b>	<b>5</b>


The greenhouse frame is made of zinc-coated iron and assembled with screws and nuts. The greenhouse is fixed to the ground by digging special supports into the soil or by joining it to a foundation slab with fastening hooks. The supply package includes everything you need for fastening the cover surfaces. Cover surface sheets are supplied following the customer's request. The greenhouse has two door openings and two ventilating windows in the opposite ends. Side ventilating windows are supplied following the customer's request.

greenhouse length, m	box №1	box №2	box №3	box insert
<b>2</b>	<b>+</b>	<b>+</b>	<b>+</b>	
<b>4</b>	<b>+</b>	<b>+</b>	<b>+</b>	<b>+</b>
<b>6</b>	<b>+</b>	<b>+</b>	<b>+</b>	<b>++</b>
<b>8</b>	<b>+</b>	<b>+</b>	<b>+</b>	<b>+++</b>

contents	dimensions, mm	weight max, kg
<b>Frame</b> (base length 2 m)		
<b>Box №1</b> – manual, parts of arches and butt ends, profile	70x270x1560	21,0
<b>Box №2</b> – straight parts for butt ends, arch reinforcements, ridge profile, weather strips beams, fasteners and parts, bandage	60x370x1245	33,0
<b>Box №3</b> - straight parts and assembly	70x110x1000	20,0
<b>Insert</b> (extending the frame by 2 m)		
<b>Box №1</b> – beams, parts of arches and straight parts, ridge profile, fasteners and parts	70x270x1560	36,0


**Table 4 Detailed list of parts for Dachnaya-Strelka-3 greenhouse**

Nº	marking	name	quantity, pcs
<b>Box №1</b>			
<b>1</b>	<b>4H</b>	lower arch	6
<b>2</b>	<b>4B</b>	upper arch	6
<b>3</b>	<b>8</b>	upper door opening stand	4
<b>4</b>	<b>12</b>	door vertical part	4
<b>5</b>	-	profile  L=1,05 m	4
<b>Box №2</b>			
<b>1</b>	<b>1</b>	stand	10
<b>2</b>	<b>3</b>	support	10
<b>3</b>	<b>5</b>	butt end upper strainer	2
<b>4</b>	<b>6</b>	butt end lower strainer	2
<b>5</b>	<b>6K</b>	butt end lower strainer	4
<b>6</b>	<b>7</b>	lower door opening stand	4
<b>7</b>	<b>9</b>	horizontal strainer	1
<b>8</b>	<b>10</b>	side brace	4
<b>9</b>	<b>11</b>	brace spreader	2
<b>10</b>	<b>13</b>	door horizontal part	6
<b>11</b>	<b>16</b>	butt end strap	2
<b>12</b>	<b>17</b>	door strap for the latch	4
<b>13</b>	<b>18</b>	reinforcement nogging piece	2
<b>14</b>	<b>21</b>	middle strainer	4
<b>15</b>	-	end reinforcement	4
<b>16</b>	-	ridge profile	2
<b>17</b>	-	hinge strip  L=3,6 m	1
<b>18</b>	-	roof strip  L=10 m	1
<b>19</b>	-	butt end strip  L=6 m	2
<b>20</b>	-	angle	16
<b>21</b>	-	ridge cover plate	3
<b>22</b>	-	arm	12
<b>23</b>	-	support hook M4x10	8
<b>24</b>	-	screw M5x10	372
<b>25</b>	-	screw M5x14	22
<b>26</b>	-	screw M5x35	120
<b>27</b>	-	screw M4x35	8
<b>28</b>	-	bolt M5x50	12
<b>29</b>	-	bolt M6x60	6
<b>30</b>	-	self-tapping screw	6
<b>31</b>	-	nut M4	16
<b>32</b>	-	nut M5	526
<b>33</b>	-	nut M6	6
<b>34</b>	-	washer	132
<b>35</b>	-	washer 6	12
<b>36</b>	-	top wire bandage	3
<b>37</b>	-	bottom wire bandage	6
<b>38</b>	-	hinges	8
<b>39</b>	-	semifinished rotator (with two elastic headers)	4
<b>40</b>	-	bending tube	1
<b>41</b>	-	adhesive tape	1
<b>42</b>	-	handle	8
<b>43</b>	-	pin	4
<b>44</b>	-	two-side adhesive tape L=5 m	1
<b>Box №3</b>			
<b>1</b>	<b>2</b>	beam	20
<b>2</b>	<b>14</b>	door diagonal part	4
<b>3</b>	<b>15</b>	door diagonal strap	4
<b>4</b>	<b>19</b>	ventilating window horizontal part	4
<b>5</b>	<b>20</b>	ventilating window vertical part	4
<b>6</b>	-	hooks	4


Table 5 Detailed list of parts for extension			
Nº	marking	name	quantity, pcs
<b>Box №1</b>			
1	2	balk	20
2	3	support	4
3	1	stand	4
4	4H	bottom arc	4
5	4B	top arc	4
6	9	horizontal strainer	2
7	10	side brace	8
8	11	brace strut liner	4
9	18	stiffening boom	4
10	-	ridge profile	2
11	-	ridge cover plate	2
12	-	bottom wire bandage	4
13	-	top wire bandage	2
14	-	screw M5x10	172
15	-	screw M5x14	4
16	-	screw M5x35	16
17	-	screw M4x10	4
18	-	screw M4x35	8
19	-	nutM4	12
20	-	nut M5	192
21	-	nut M6	4
22	-	washer	16
23	-	washer 6	8
24	-	boltM6x60	4
25	-	profile  L=1,0 m	4
26	-	double sided tape L=5 m	1


## Operating rules

**1.** Before use of greenhouse, assemble and install it in accordance with the manual.

 When installing the greenhouse by third parties, buyer should supervise compliance of installation with the manual

**2.** In winter, coverage of greenhouse should not be removed provided that snow load is limited. Should greenhouse be unattended all winter period, buyer should either remove the coverage or estimate possible snow load. Ultimate load for the frame having complete package with installed drawbars and side braces appears under 360 kg snow cover per 1 m<sup>2</sup> of horizontal ground surface corresponding to 1.8 m fresh snow layer or 0.9 m packed snow layer. Recommended 4 mm depth of polycarbonate is enough for Russian midland. In case of regions with snow cover exceeding 0.6 m,

 Do not install greenhouse close to buildings and trees from which snow or ice can fall down. Minimal 2 m distance is recommended

 Maximum wind pressure for this greenhouse is 25m/sec

thicker polycarbonate should be used for coverage of greenhouse top in accordance with local conditions.

## Cleaning and washing sheets of polycarbonate.

1. Rinse the sheet with warm water.
2. Wash the sheet with a solution of soft soap or with a domestic detergent and warm water, using a soft rag or a sponge to take away the dirt.
3. Rinse with cold water and dry with a soft rag to take away the water.



When cleaning polycarbonate sheets never use abrasives or high-alkali cleaning compositions. Dry wiping of the surface can damage the protective layer and reduce its life cycle. Never use brushes, gauze fabric or other abrasive materials to wipe the surface of polycarbonate sheets



By disinfection of the greenhouse from fungus and biological diseases pathogens do not use “sulphuric sticks”

## Warranty responsibility

### Warranty responsibility

1. The manufacturer shall be responsible for the complete set of parts for the greenhouse frame.
2. The manufacturer shall be responsible for assemblability of the greenhouse in accordance with the manual.
3. The manufacturer shall be responsible for the greenhouse endurance in the specified weather conditions.
4. Time period for making claims is 24 months after the day of purchase.

### Warranty provisions

Warranty responsibility shall not cover the following cases:

1. Installation of the greenhouse in violation of the manual provisions.
2. Violation of operation rules.
3. Unintended use of the greenhouse.
4. Deformation of the greenhouse due to soil movement.
5. Floods, hurricanes and other natural disasters.

Production date:

Manufacturer: LLC Volia

141983, city of Dubna, Moscow Region, 8 Severny Lane.

The manufacturer shall be responsible for the quality of products in accordance with the Civil Code of the Russian Federation.

The manufacturer shall retain the right to make changes to the greenhouse design.

## Installation manual for Dachnaya-Strelka-3 greenhouse

### introduction

**1.** General view of the frame is given in **Picture 1**. Parts should be installed in such a way that side selves of the profile are facing the surface cover. The frame is assembled of numbered parts.

**2.** Symbols:

- -arrow shows the direction of installation as per schemes in the manual.

Some parts may have spare holes which are there due to uniformity of parts

**3.** Parts are fastened by putting profiles together and fastening them with screws and nuts through the holes. When joining parts in “profile-to-profile” way it does not matter which of the joined parts is above.

**4.** When assembling be careful not to damage the parts as they do not have sufficient endurance before the whole structure is assembled. Use supports (e.g. chairs) at interim stages of assembly to make sure the frame is lifted steadily and evenly. To make sure holes coincide when assembling complicated joints, use a 5 mm thick nail or a cone-shaped hand-punch.



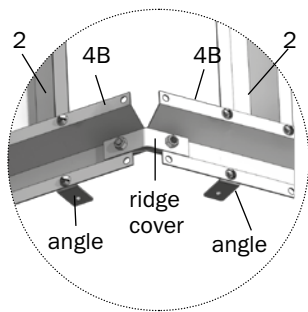
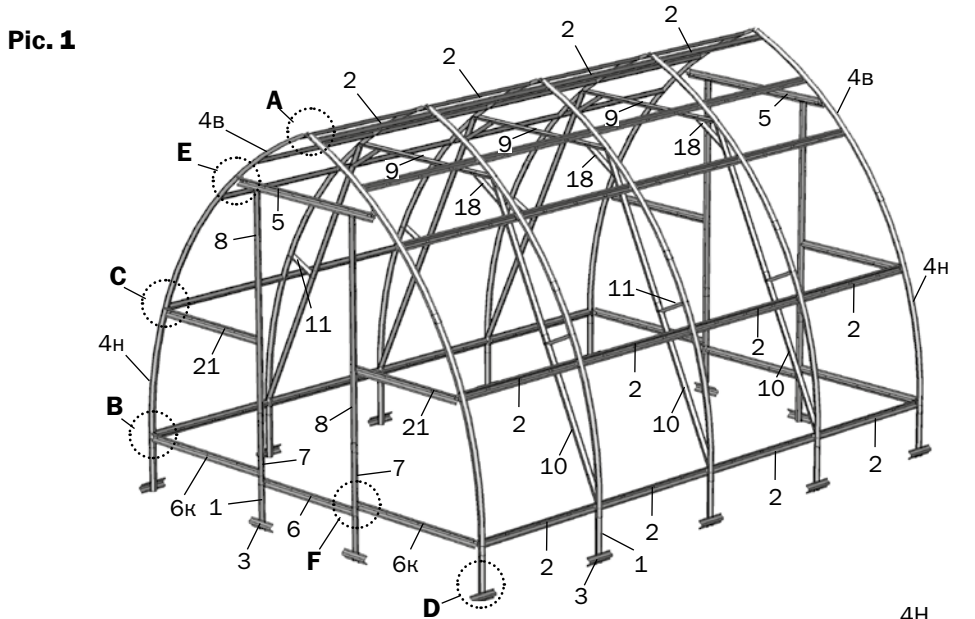
**When assembling the frame parts should be joined through all holes as prescribed. A simplified fastening of parts with only one or two screws is the violation of assembly rules and the ground to relieve the manufacturer of the warranty responsibility**



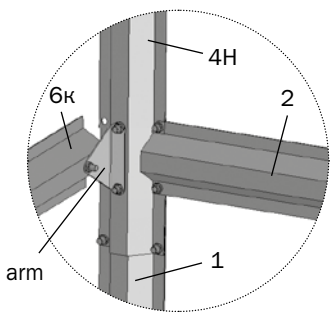
**Be careful when assembling the greenhouse! Parts have sharp edges. Beware of cuts! Perform all works in protective gloves**

## General view of DACHNAYA-STRELKA-3 greenhouse frame

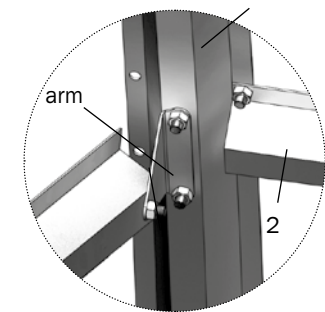
**Pic. 1**



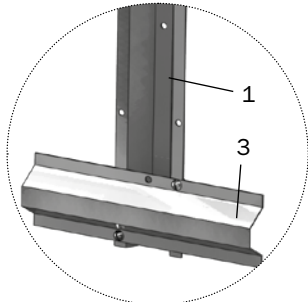
**A (outside view)**



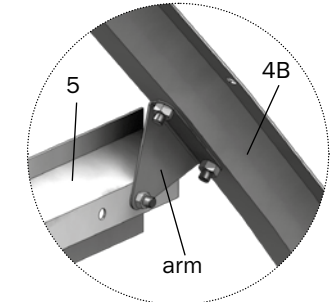
**B (inside view)**



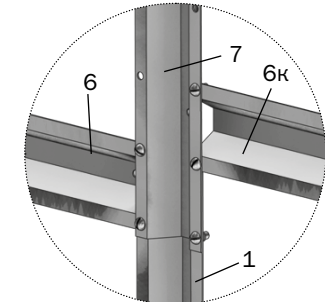
**C (inside view)**



**D (outside view)**



**E (inside view)**

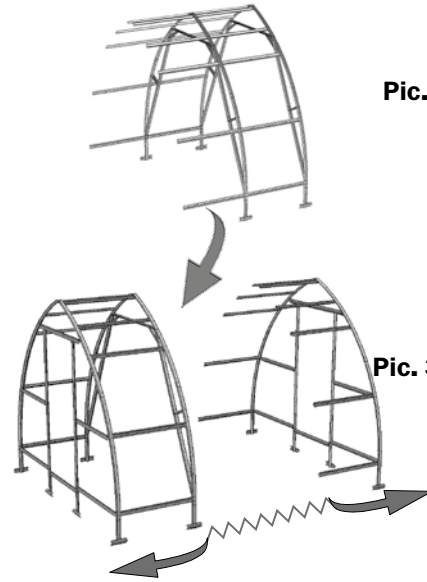


**F (outside view)**

## General view of DACHNAYA-STRELKA-3 greenhouse frame

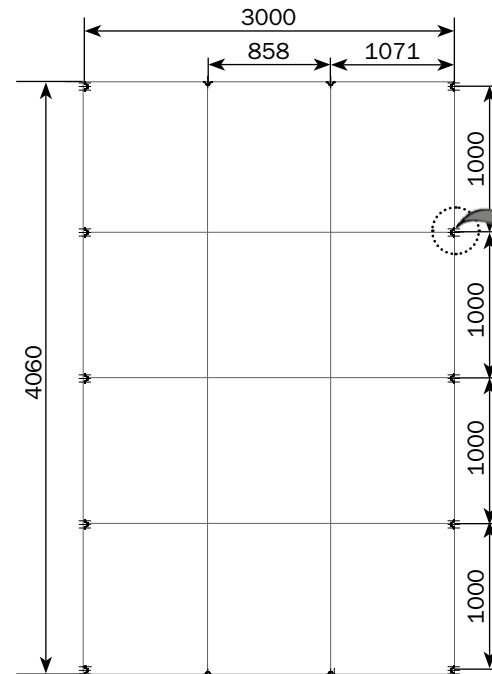
**Pic. 2**

General view of insert for Dachnaya Strelka-3 greenhouse. Each insert extends greenhouse length by 2 m.



**Pic. 3**

Dachnaya-Strelka-3 extended by any number of inserts.



**Pic. 4**

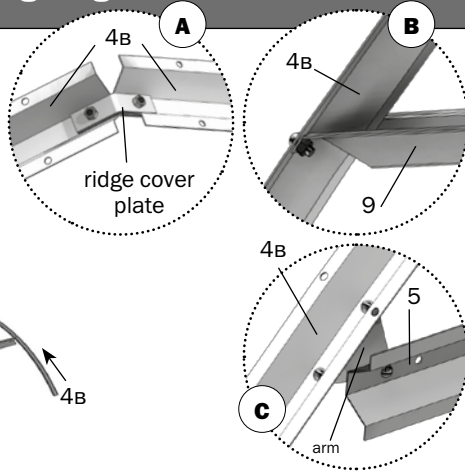
Greenhouse foundation support layout plan.

## Installation sequence

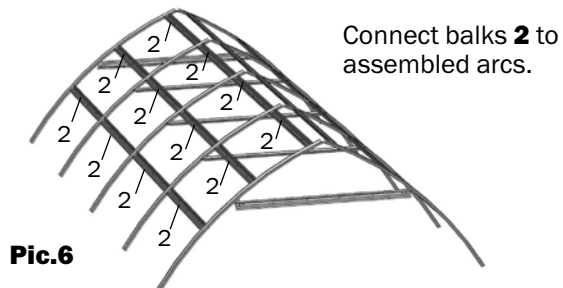
1. Perform the installation close to location of the greenhouse.
2. Install greenhouse in accordance with photographs of installation stages and units represented in **Pic. 5...12**. The figures show installation of greenhouse of 4 m length. Required length is reached using attachment of appropriate number of Insert packages. Use M5x10 screws for connection of elements.
3. Dig pits on the site selected for greenhouse installation at a depth of shovel blade according to **Pic. 4** Install frame into the pits. Check equality of frame diagonals using a cord. Total draft of greenhouse into the ground should be so that bottom elements **6** of door opening touch the ground. Check equality of the diagonals using a cord again and correct position of the frame angles.
4. Level the frame using filling or deepening of pits to make longitudinal elements straight, horizontal and parallel to each other and to make arcs even at side view. If arc planes require leveling, loosen connections of balks with arcs, complete leveling on the ground and tight screws again. Fill frame supports with soil after fastening bottom wire bandages on element **3** (**Pic.10**)

## Assembling stages

Assemble arcs **4B** in pairs using ridge cover plate and strainer **9**. Connect end elements **5** to arcs **4B** using arm.



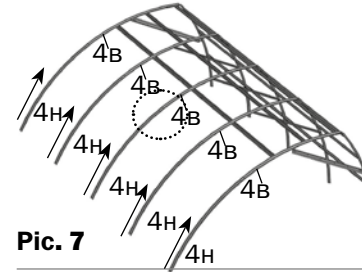
**Pic. 5**



**Pic.6**

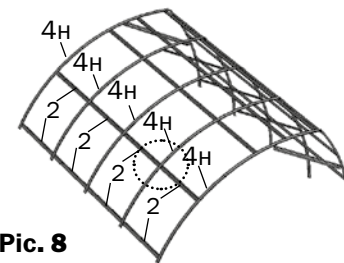
Connect balks **2** to assembled arcs.

## Assembling stages



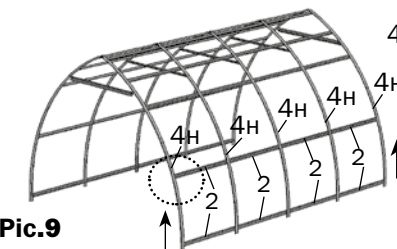
**Pic. 7**

Connect arcs **4H** to arcs **4B** from one side of greenhouse.



**Pic. 8**

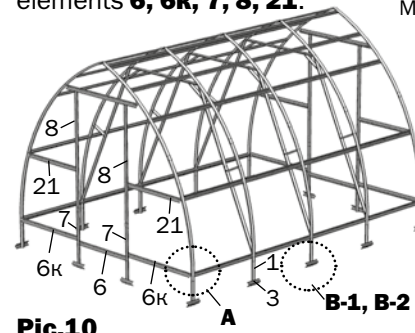
Connect balks **2** to arcs **4H**



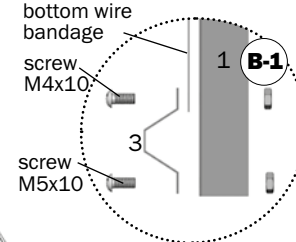
**Pic.9**

Connect arcs **4H** and balks **2** from the other side of reenhouse in the same way.

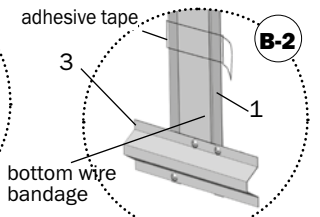
When installing the greenhouse through digging (without foundation), connect elements **1** and **3** to the frame. Fasten bottom wire bandage in free hole of element **3**. Install end elements **6, 6k, 7, 8, 21**.



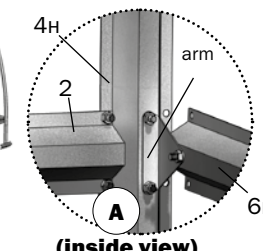
**Pic.10**



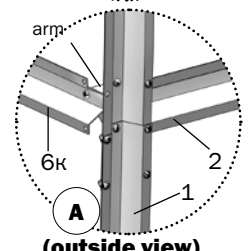
bottom wire bandage  
screw M4x10  
3  
screw M5x10



adhesive tape  
3  
bottom wire bandage

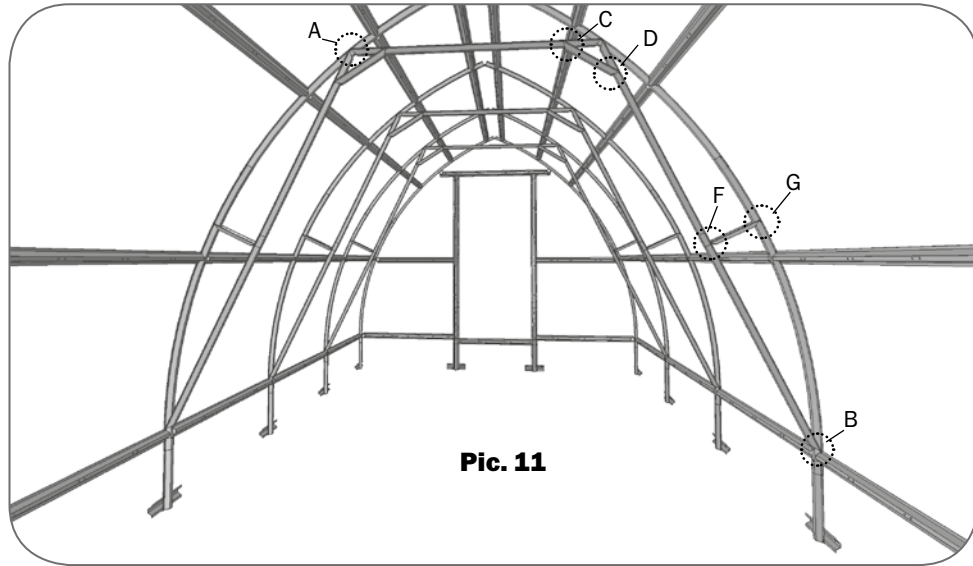


**(inside view)**

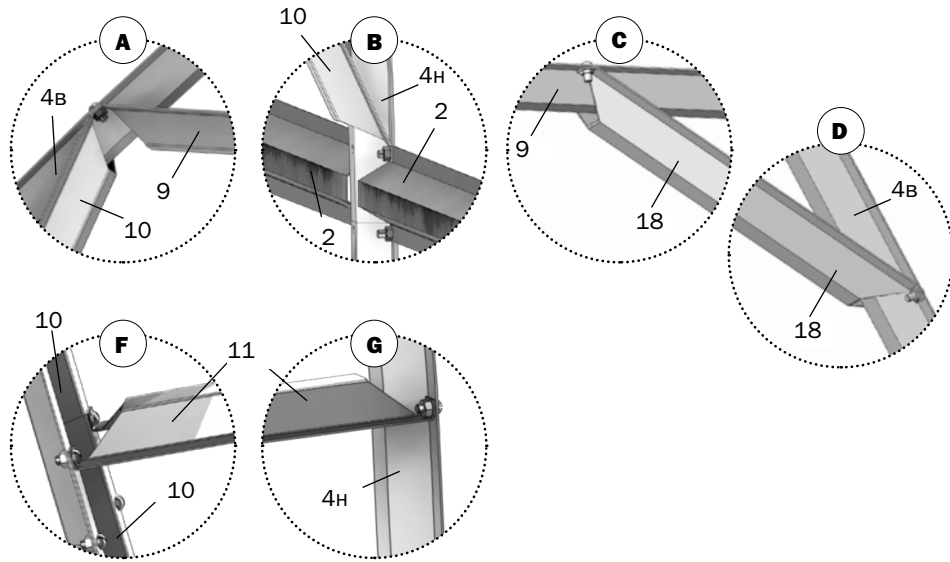


**(outside view)**

### Assembling stages



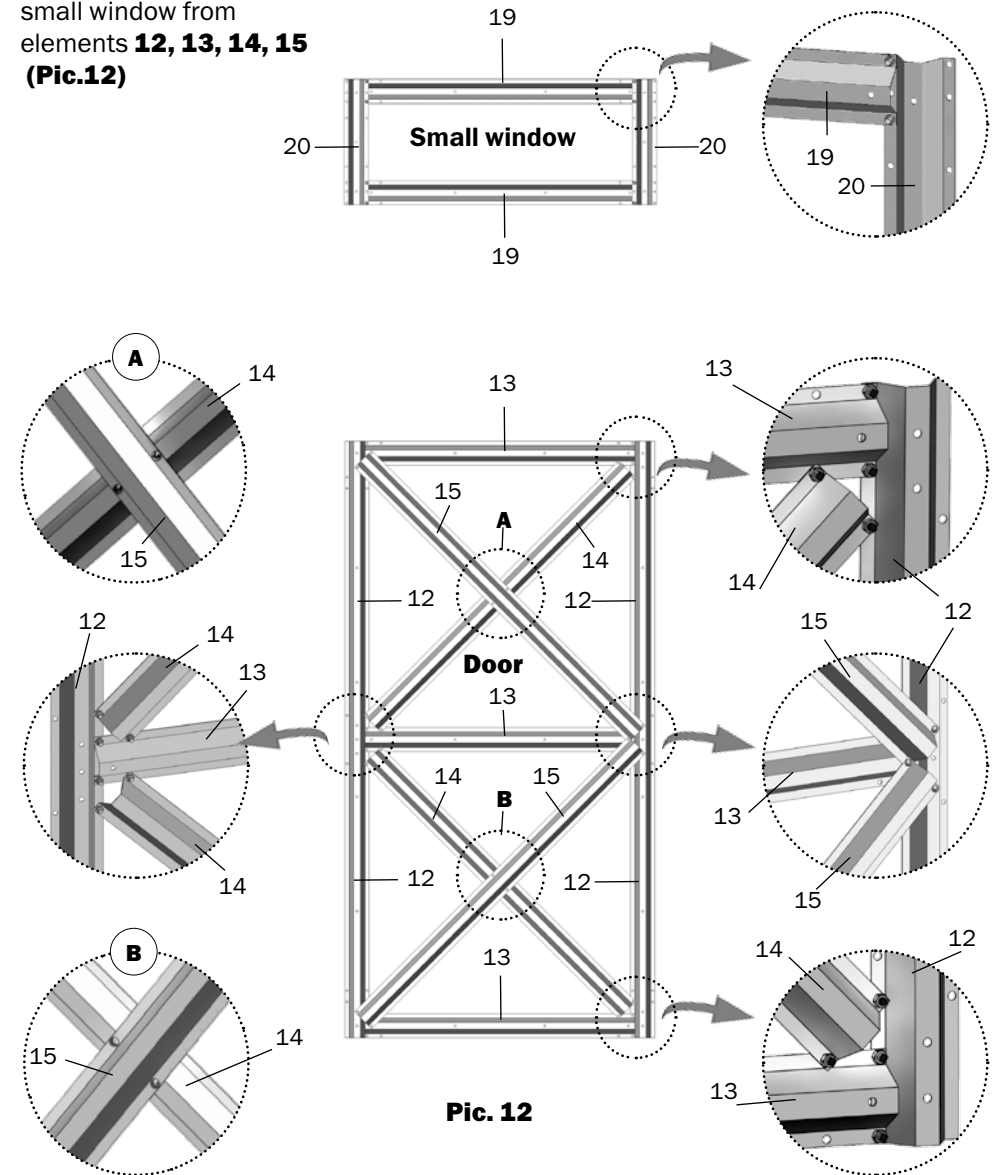
**Pic. 11**



Install side braces **10** on each arc inside of greenhouse frame. Assemble side brace assembled from two elements **10**. Mount side brace liner **11** on the joint of elements **10** and connect it to arc **4H**.

### Assembled door and end small window

Assemble door and end small window from elements **12, 13, 14, 15** (**Pic.12**)



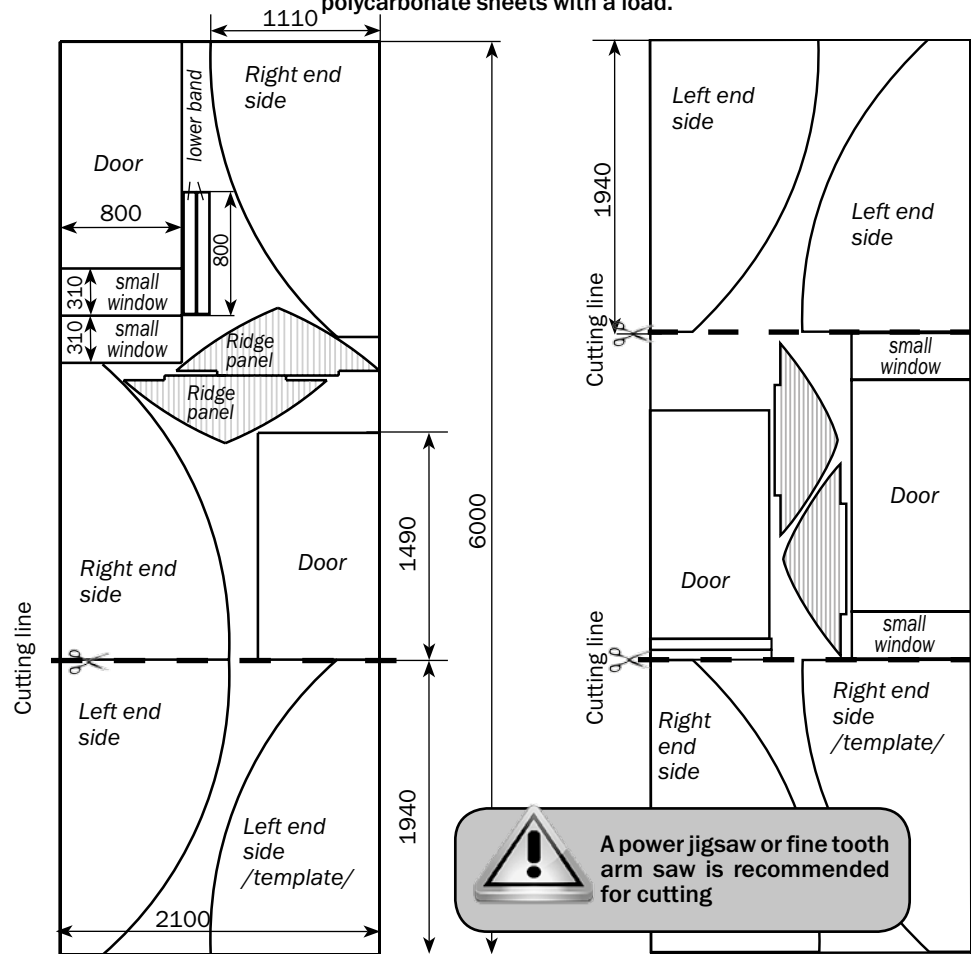
**Pic. 12**

## Cutting and fastening of coverage



**CUT POLYCARBONATE SHEET STRICTLY IN ACCORDANCE WITH Pic. 13(a) or 13(b) and Pic. 14**  
2100 x 6000 mm cellular polycarbonate sheet

**Warning!** When cutting the surface cover in windy weather, fix the edges of polycarbonate sheets with a load.



**Pic. 13a**

Vertical position of cellular on ridge pane

**Pic. 13b**

Horizontal position of cellular on ridge panel

**Warning!** A power jigsaw or fine tooth arm saw is recommended for cutting

**1.** Cut a sheet for end coverage. To do this, cut a piece from polycarbonate sheet (see cutting lines on **Pic.13a** or **Pic. 13b**). To make a stencil of coverage, put the cut piece to assembled end of greenhouse and, without removal of protective film from polycarbonate, deposit stencil marking on the coverage sheet by elements **4h** and **4b** (with allowance **Pic.14**). When marking a sheet, align its edge strictly with edges 14

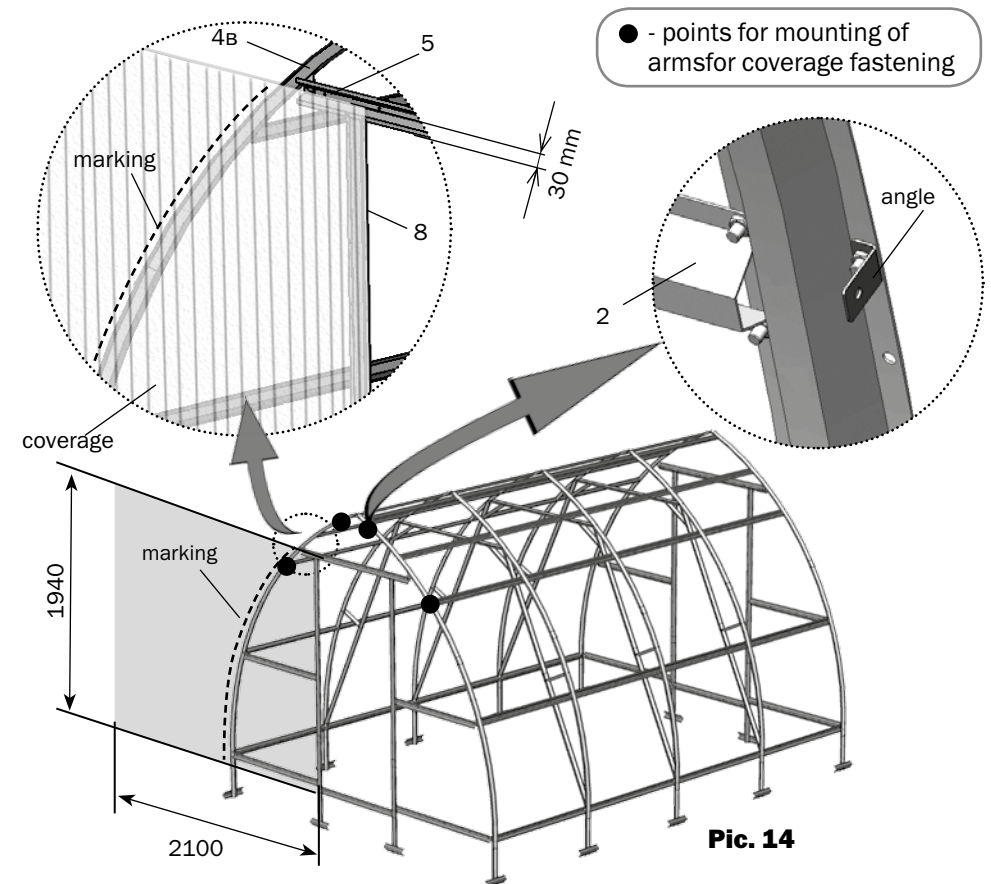
of elements **7** and **8**, and top edge at 30 mm above bottom edge of element **5**. Cut a stencil. Mark the rest of sheet using the stencil in accordance with cutting scheme **Pic.13a** or **Pic 13b**.



Mount cellular polycarbonate strictly facing sun with a side having protective layer (by all means, clarify it under purchase or before mounting). Protective layer usually is on the side with inscriptions on transport film. On the other side of sheet film is clear. After marking the sheet but before its cutting make marks on protective side of each piece of sheet: after removal of transport film sheet sides have no visual differences. Transport film is removed from both sides immediately before fastening coverage on the frame



**Attention!** Coverage sheet side edge is aligned by elements **7, 8**, and top edge on 30 mm above bottom edge of element **5**. Mark by elements **4h** and **4b** with allowance



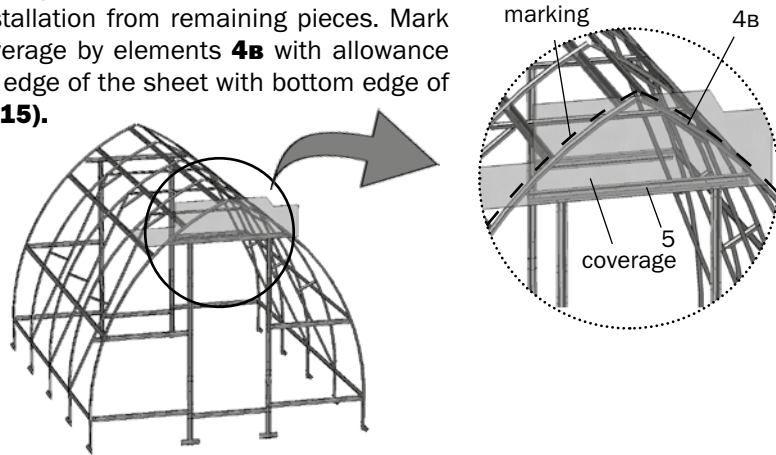
**Pic. 14**



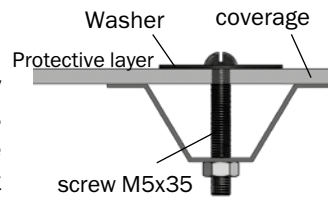
### Cutting and fastening of coverage

2. Cut ridge coverage pieces located above the door at the place of installation from remaining pieces. Mark marking **4B** coverage by elements **4B** with allowance aligning bottom edge of the sheet with bottom edge of element **5** (Pic.15).

**Pic. 15**



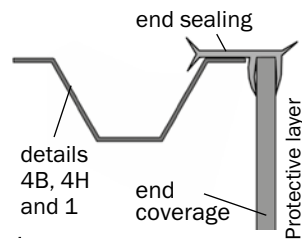
3. Mount side pieces of coverage in accordance with Pic.16. Holding a piece of coverage, fasten it with screws and washers by elements **6к, 7, 8, 21** and by angles using tap screws with washers. Holes for screws are drilled by boring bit of 5 mm diameter from inside of greenhouse through holes in frame elements. Mount top pieces of coverage fastening them on angles with washers and tap screws. Cut overlapping with side pieces.



**Pic.16**

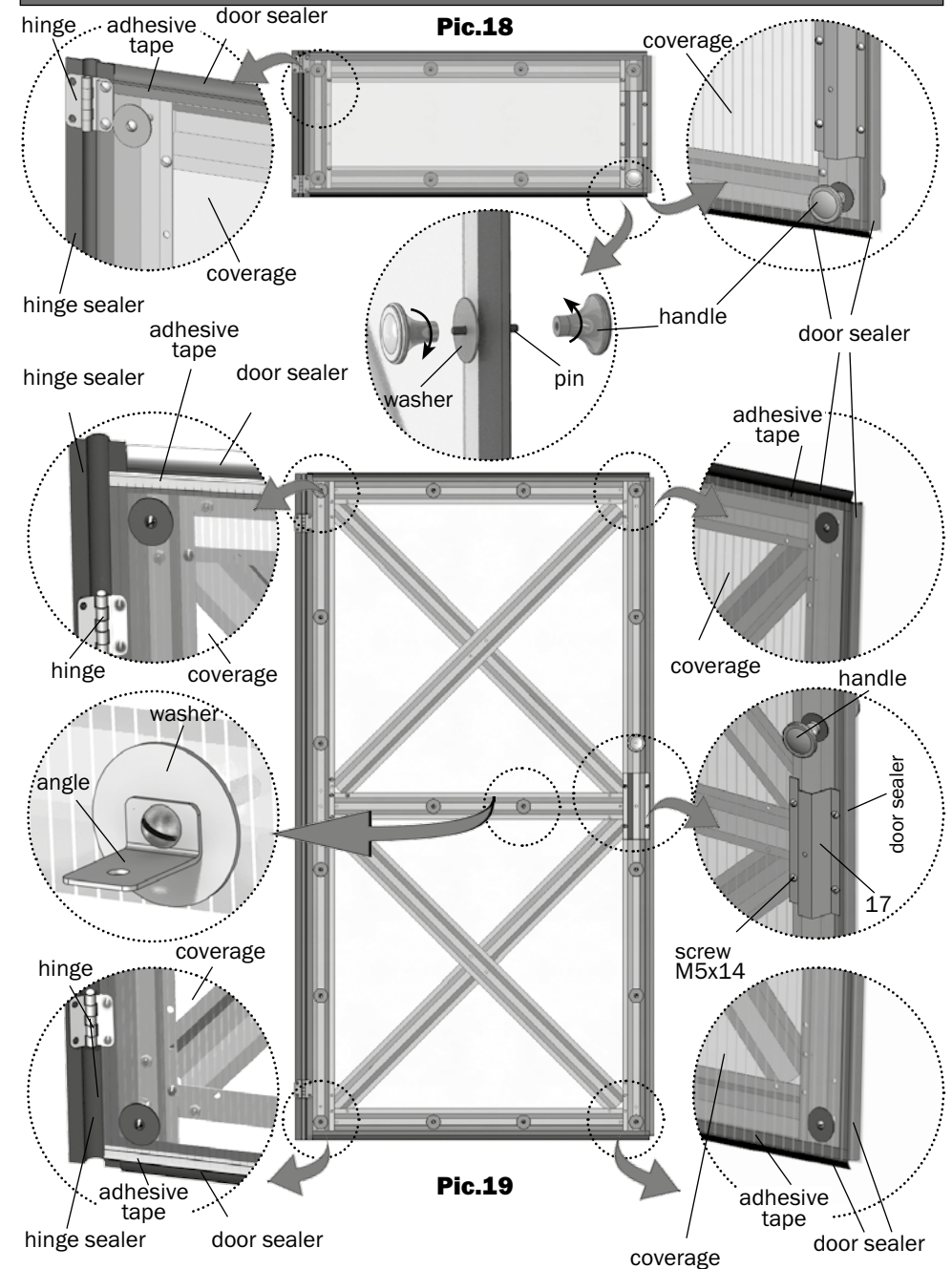
4. Even coverage pieces by arcs 4H and 4B using a knife and mount sealing profile in accordance with Pic.17.


5. Fasten pieces of coverage on door with washers (Pic.18,19). Fasten pieces of coverage on door with washers (Pic.23), closing cellular beforehand (with adhesive tape). Mount sealing profiles along the door contour in accordance with Pic. 19,21,22.



**Pic.17**

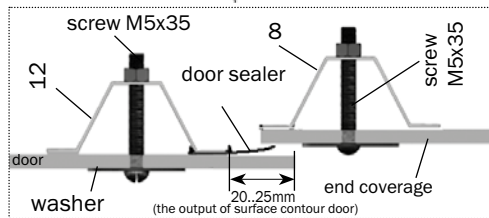
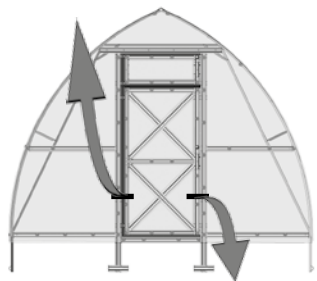
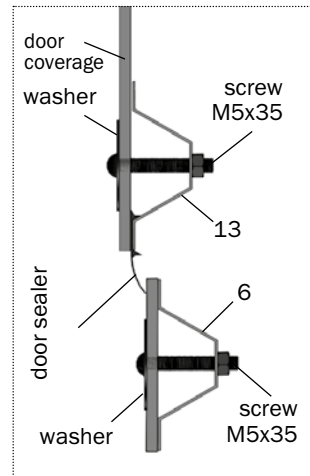
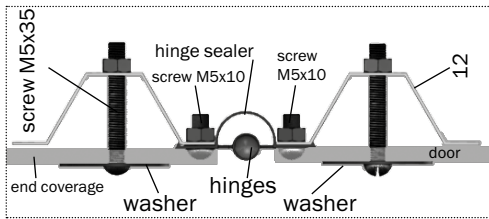
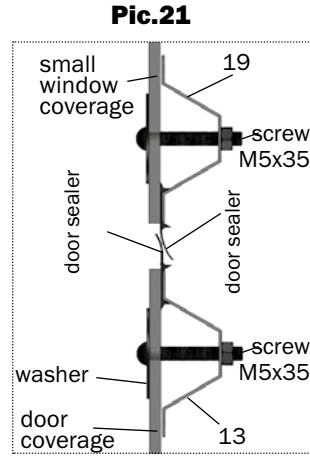
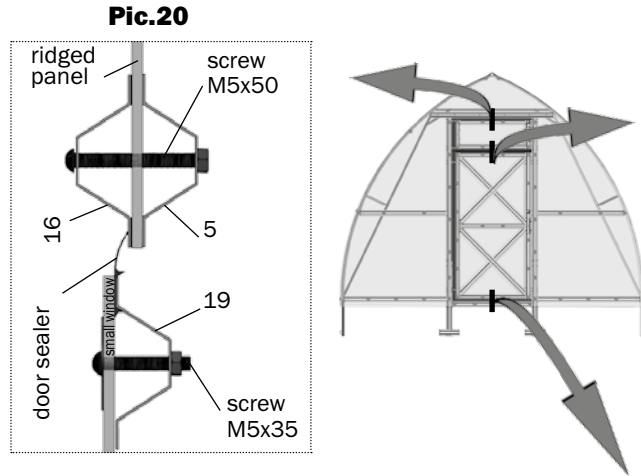
### Cutting and fastening of coverage



 Avoid over-tightening screws that fasten the polycarbonate in order not to damage the polycarbonate sheet and destroy its structure

### Cutting and fastening of coverage

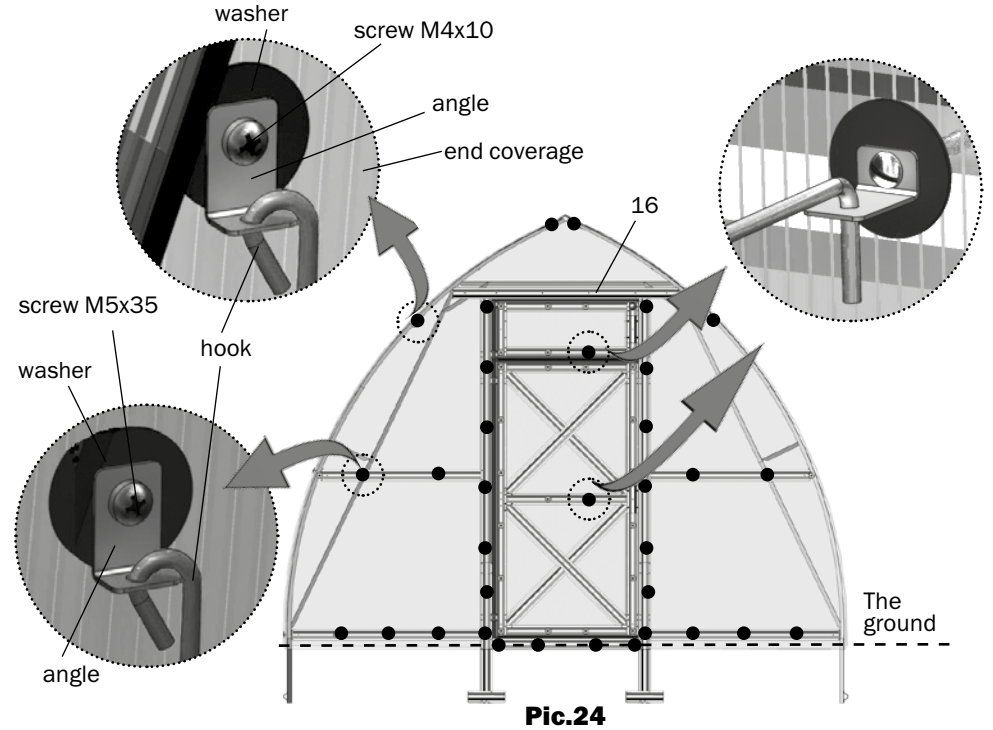
**6.** Mount end cover plate **16** on end coverage and fasten it on element **5** through coverage (**Pic.20 and Pic.24**). Joint of end coverage pieces is under element **16**.



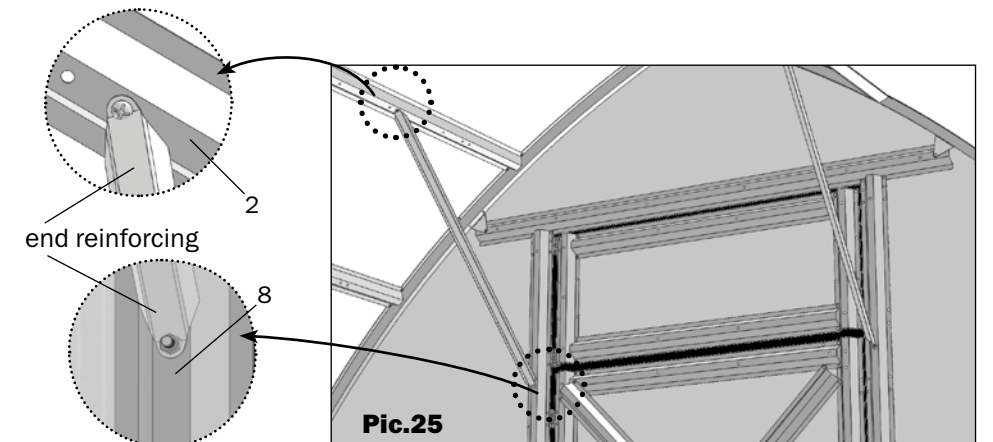
**7.** Install assembled doors and small windows on ends mounting sealer in accordance with **Pic.22**. When mounting small windows, prevent its further slackening. When tightening the screws, lift the opposite end of small window to remove screw gaps in the holes.

### Cutting and fastening of coverage

**8.** The washers and the hooks on the end install in accordance with **Pic.24**.



**9.** Install end reinforcing element door opening in accordance with **Pic.25**

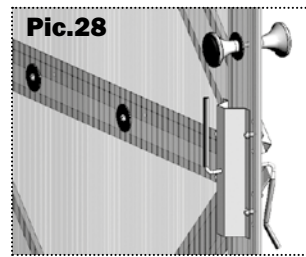
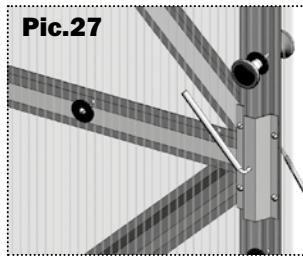
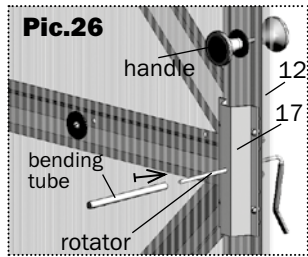


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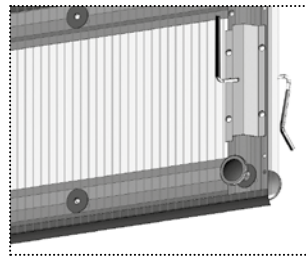
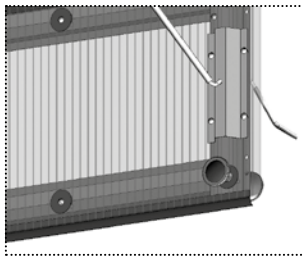
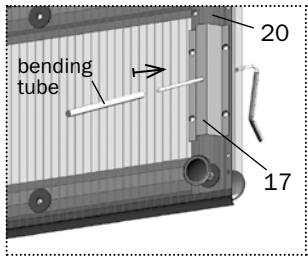
**10.** Insert wire rotator for door closing in free holes (against the stop) through elements **12** and **17** by straight end from inside (**Pic. 26**). In this position, use the tube to bend linear part by hand

into opposite outside of the greenhouse direction (**Pic. 27**). Set elastic header on the rotator (**Pic. 28**). This construction allows to push the door in the closed position, being

both outside and inside the greenhouse.



**11.** Wire rotator for small window locking is mounted like a door rotator.

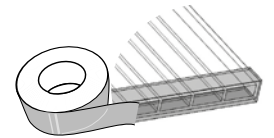


## Cutting and fastening of coverage

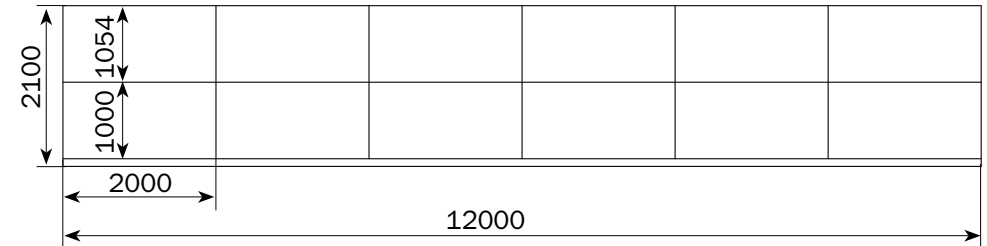
**12.** Cellular polycarbonate shall be installed strictly defined side out (towards the sun), which has a protective layer. The protective layer is usually at the side with the inscriptions on the transport film. The film on the other side of sheet is transparent. After marking the sheet, but prior to its cutting, make a mark on the protected side of the sheet for each piece: after removal of the transport film sheet sides are not visually different. The transport film is stripped from both sides immediately before fixing the cladding on the frame.




Sections of polycarbonate with open honeycombs should be covered by adhesive tape.

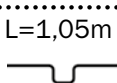



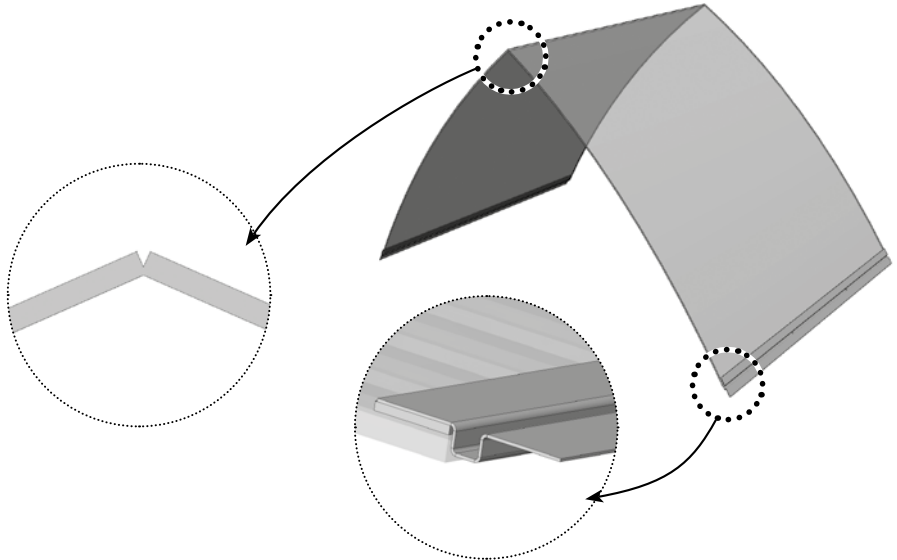
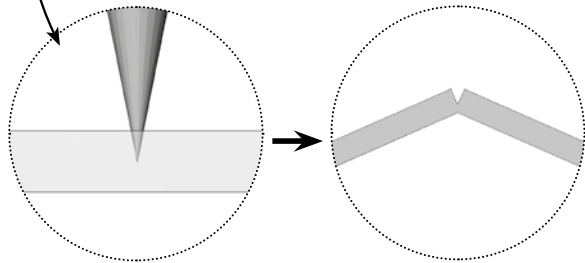
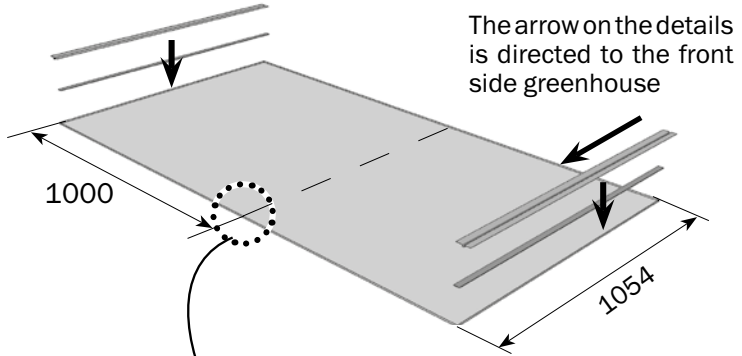
For Dachnaya-Strelka-3 greenhouse length by 4 m



### Cutting and fastening of coverage

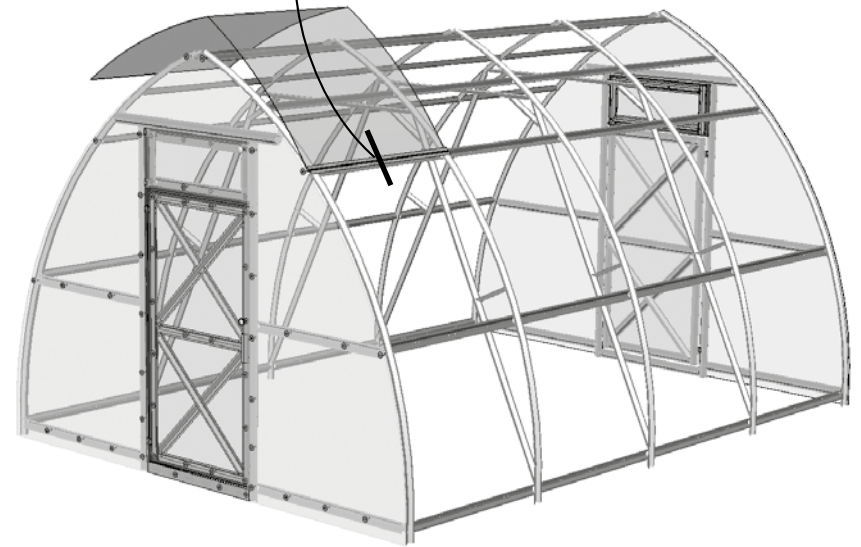
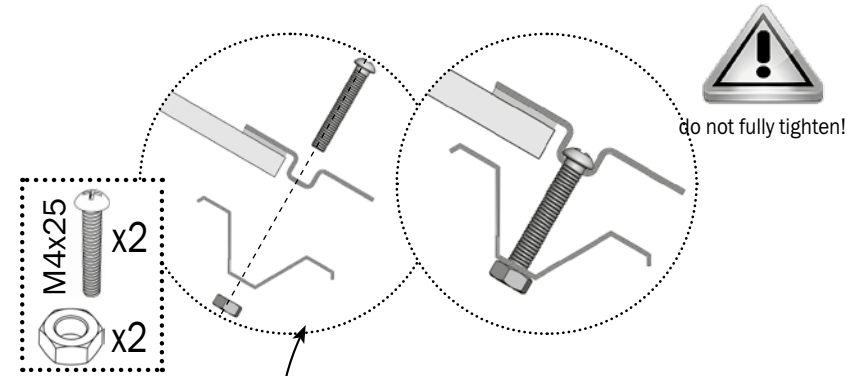
 Before coating it is necessary to cut the outer surface of the upper polycarbonate sheet for bending on the ridge (middle of sheet)!

-  L=1,05m x2
-  x1  
Two-side adhesive tape



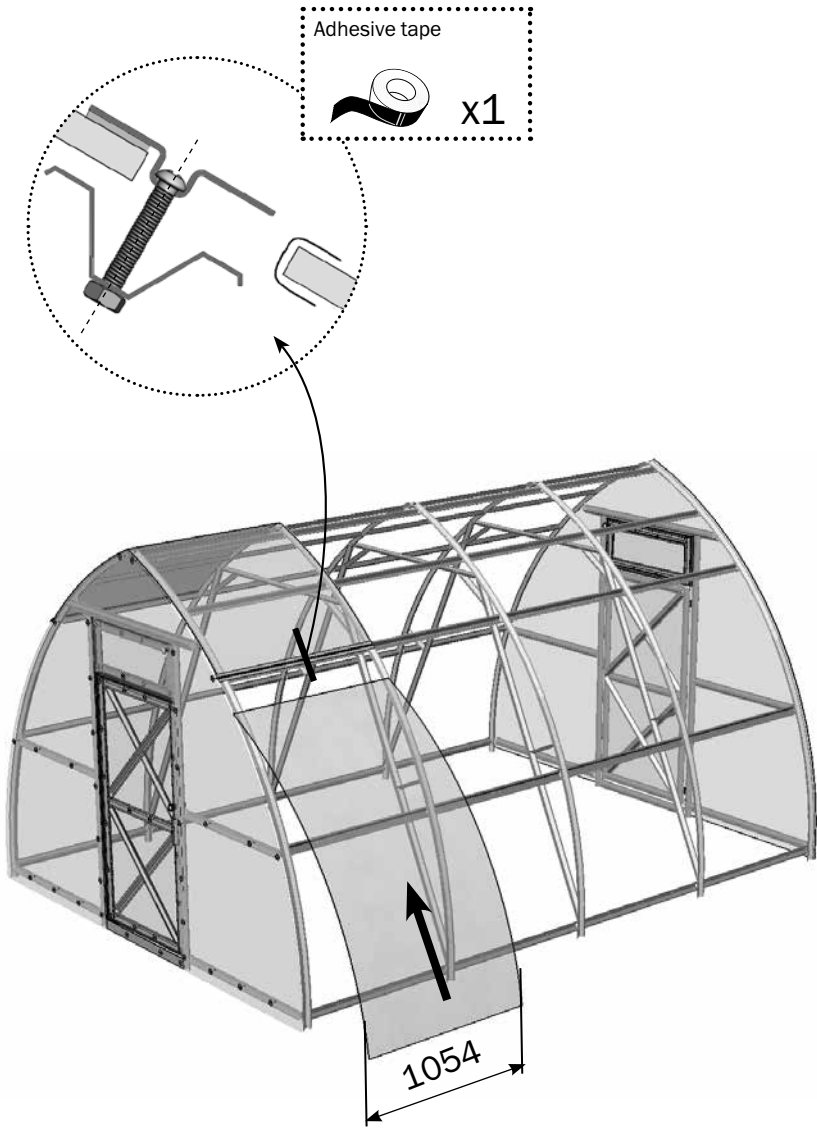
### Cutting and fastening of coverage

13.



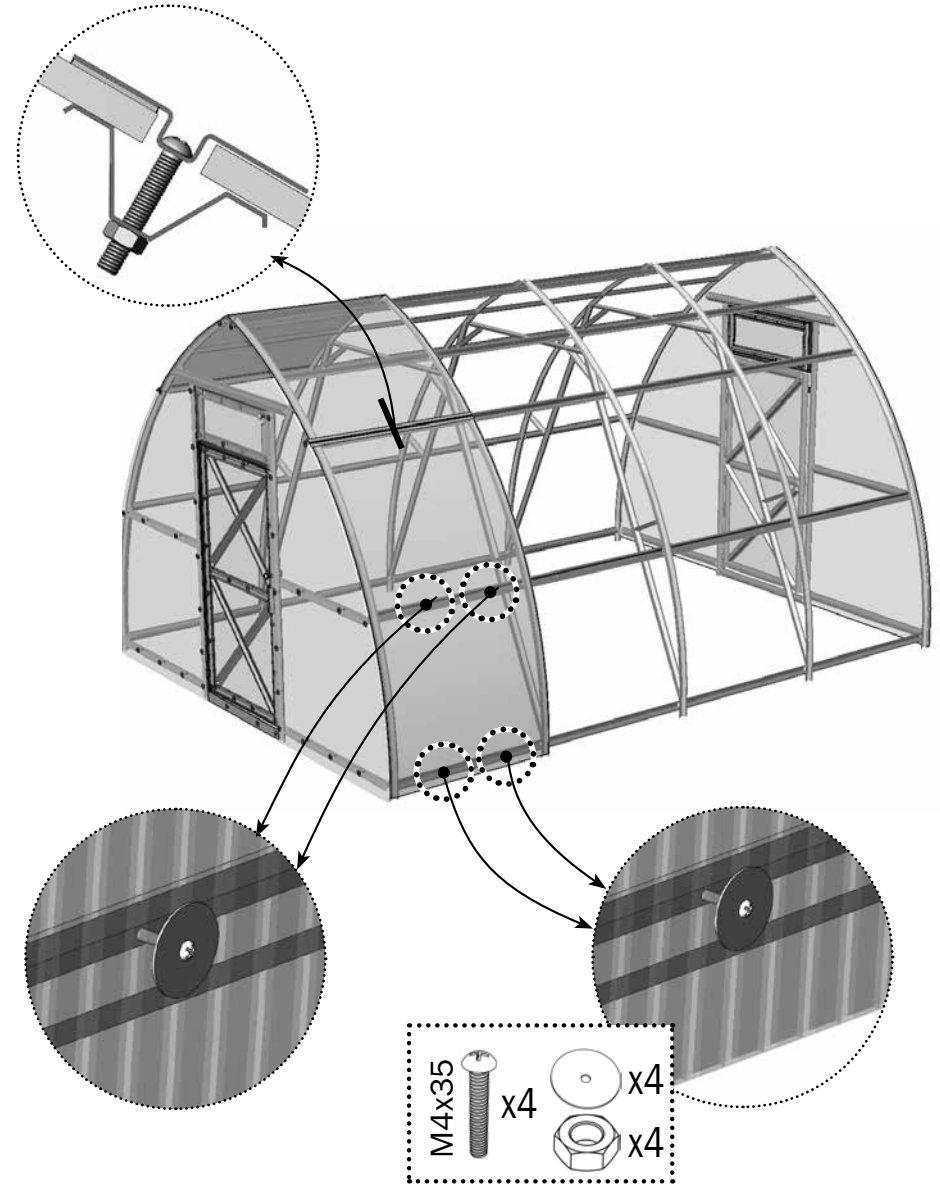
# Cutting and fastening of coverage

14.



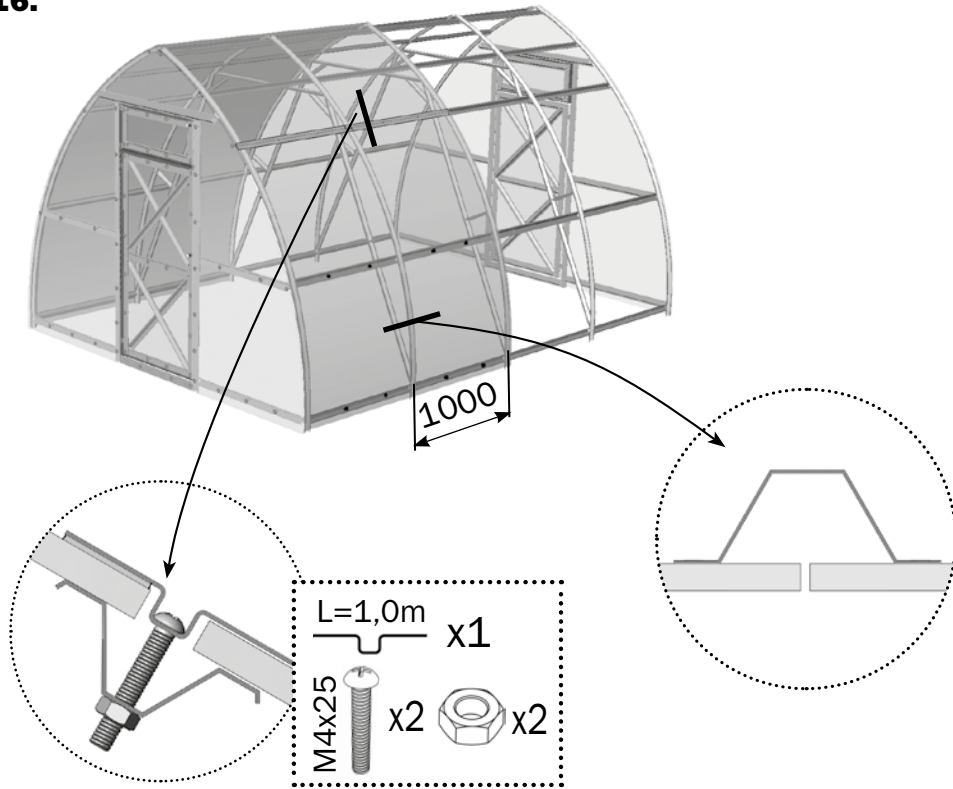
# Cutting and fastening of coverage

15.

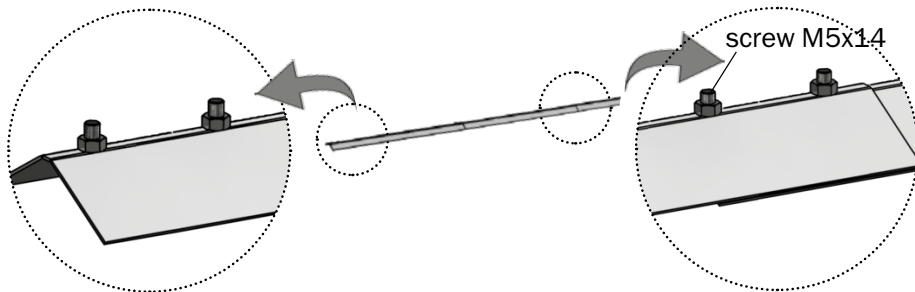


## Cutting and fastening of coverage

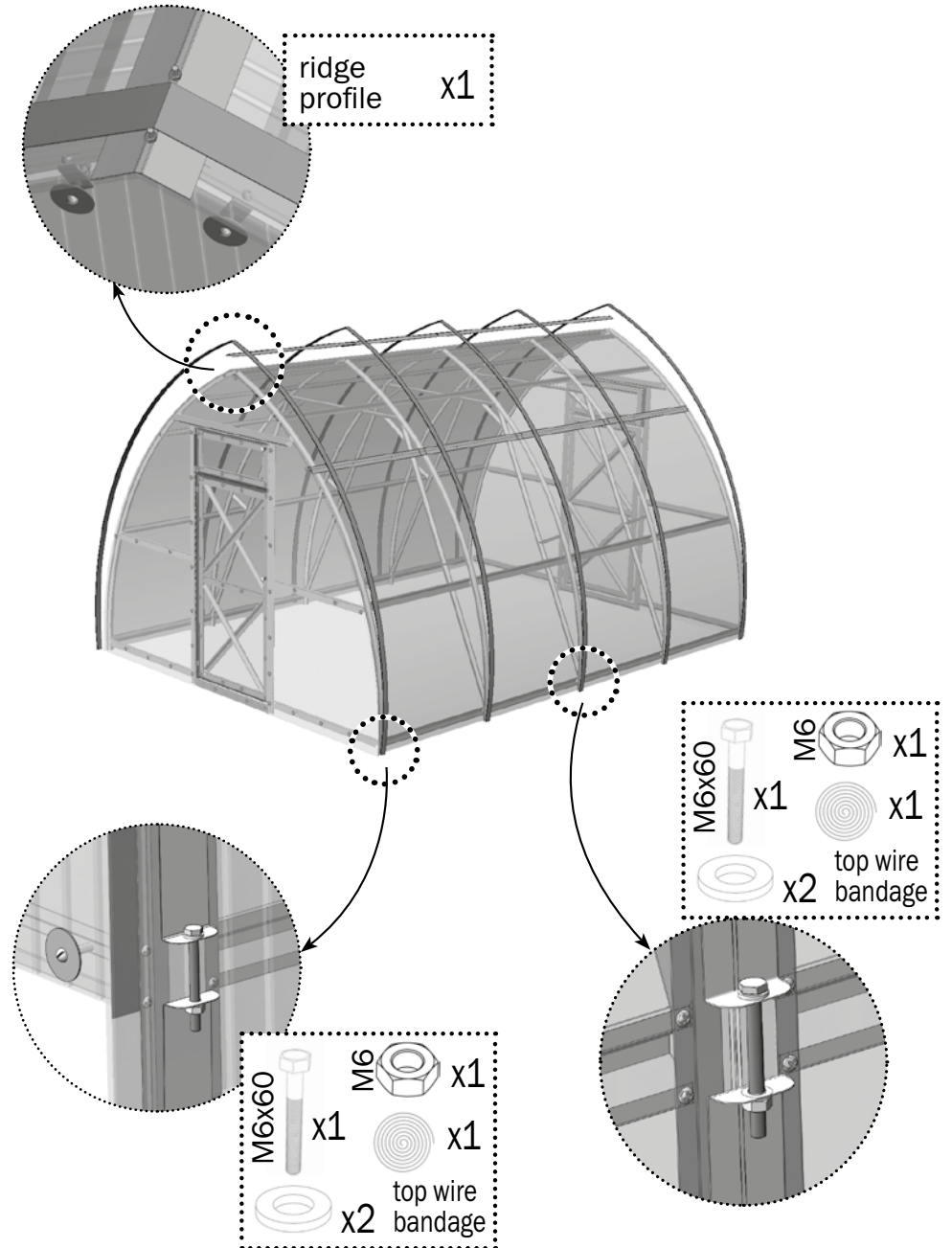
16.



17. Details of ridge profile are joined in the length with the installation of the threaded end of the screws out.



## Cutting and fastening of coverage





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