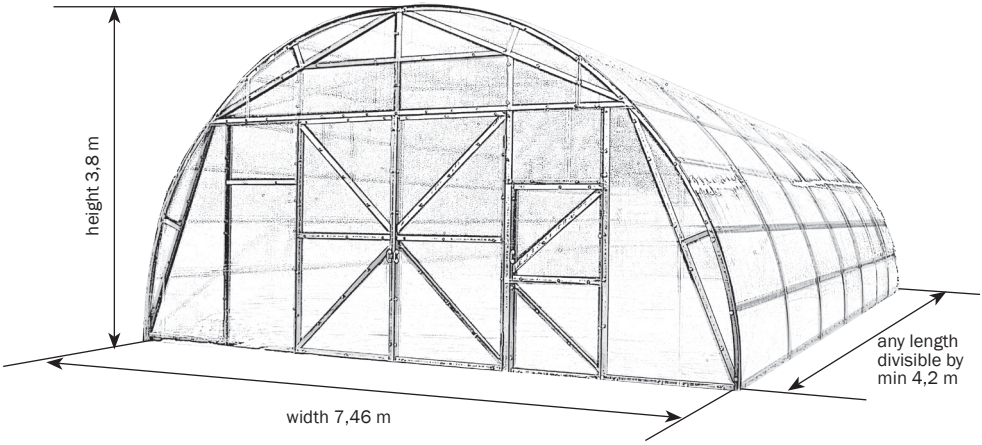
Система менеджмента качества (СМК)
ООО «Воля» сертифицирована
на соответствие
требованиям
стандарта
ISO 9001:2008

Сертифицировано
Русским Регистром

VOLYA LLC

FARMER-7,5

greenhouse under the cellular polycarbonate



The assembly and operation of the greenhouse shall be carried out strictly in accordance with the instruction manual and the rules laid down in the data sheet. Technical data sheet shall be kept.

DESCRIPTION

«Farmer» greenhouse is designed and manufactured in accordance with SNiP 2.10.04-85 and intended for industrial cultivation of agricultural crops in farms and country facilities.

Greenhouse width is 7,46 m. Covered ground area depends on the greenhouse length, and is 31,5m2 for the minimum length of 4,2 m. The height of istalled greenhouse frame is 3,8 m. The required length of greenhouse is provided by the purchase of additional «Insert» packages adding 2,1 m to the basic length (Table 1). Greenhouse frame is made of 1 mm thick galvanized steel, and is assembled using bolts, nuts and washers. The greenhouse is fixed on the ground by earthing special frame ends or on the foundation, using hoding angles. Type of the greenhouse fixing is to be determined by the customer. Supply scope includes all the parts required to fix the cladding. Greenhouse cladding can be included in supply scope at the customer's request. The number of gates, doors, vent windows, as well as completing with tambour, shall be agreed with customer.

Table 1 **COMPLETION WITH PACKAGES, PCS**

L greenhouse length, m	N - number of greenhouse sections, excluding	FRAME (basic length 4,2 m)												INSERT (frame extension for 2,1 m)			
		1 FARMER PACKAGE	2 FARMER PACKAGE	3 FARMER PACKAGE	4 FARMER PACKAGE	5 FARMER PACKAGE	6 FARMER PACKAGE	7 FARMER PACKAGE	8 FARMER PACKAGE	9 FARMER PACKAGE	10 FARMER PACKAGE	11 FARMER PACKAGE	12 FARMER PACKAGE	1 INSERt PACKAGE	2 INSERT PACKAGE	3 INSERT PACKAGE	4 INSERT PACKAGE
4,2	0													0	0	0	0
6,3	1													1	1	1	1
8,5	2													2	2	2	2
10,6	3													3	3	3	3
12,7	4													4	4	4	4
14,9	5	1	1	2	2	2	2	2	1	2	1	2	1	5	5	5	5
17,0	6													6	6	6	6
19,1	7													7	7	7	7
21,2	8													8	8	8	8
23,4	9													9	9	9	9
2,1(N+2)														N	N	N	N

Table 2 **COMPLETION WITH TAMBOUR PACKAGES*, PCS**			
Package name	quantity	dimensions (mm)	max. allowable
Tambour	1	2700x100x100	31
Door	1	1900x100x50	14,2
Tambour packaging	1	200x100x50	1,3
Door sealing	1	500x300x50	1,2
Side wall sealing	1	500x300x50	3,1

*Tambour (tambours) can be included in supply scope at the customer's request (purchased separately).

Table 3 **PACKAGE PARAMETERS**		
contents	dimensions (mm)	max. allowable
FRAME (basic length 4,2 m)		
1 FARMER PACKAGE (arc parts)	3100x200x100	15,0
2 FARMER PACKAGE (straight parts of the strain arc)	2800x100x90	28,0
3 FARMER PACKAGE (side wall span parts)	2000x90x100	41,0
4 FARMER PACKAGE (side wall brace parts)	2400x90x100	23,0
5 FARMER PACKAGE (arc parts)	3100x200x100	15,0
6 FARMER PACKAGE (side wall straight parts and bands)	2800x200x100	41,0
7 FARMER PACKAGE (side wall straight parts)	2800x200x100	34,0
8 FARMER PACKAGE (door sealing)	1950x100x90	12,5
9 FARMER PACKAGE (parts and bands for gates)	2700x100x90	37,0
10 FARMER PACKAGE (fixture and accessories)	500x300x100	19,5
11 FARMER PACKAGE (parts and bands for doors)	500x300x100	14,0
12 FARMER PACKAGE (side wall sealing)	500x300x100	3,0
INSERT (frame extension for 2,1 m)		
1 INSERT PACKAGE (arc parts)	3100x200x100	15,0
2 INSERT PACKAGE (straight parts of the strain arc)	2800x100x90	32,0
3 INSERT PACKAGE (span parts)	2100x110x90	43,0
4 INSERT PACKAGE (insert fixture and accessories)	200x100x50	2,0

Table 4	Supply scope by parts «FRAME» (4,2 m)		
labeling	**name**	**quantity (pcs)**	**length (m)**
	1 FARMER PACKAGE		
4	Arc	4	3,08
	2 FARMER PACKAGE		
5н	Lower arc tie bar	2	2,73
5	Upper arc tie bar	2	2,73
6	Segment tie bar	3	2,58
7m	Radial tie bar 1	4	0,3
7б	Radial tie bar 2	3	0,54
3	Foot	2	0,29
1	Foundation pole	2	0,84
	3 FARMER PACKAGE		
2к	Side wall span	15	2,08
2кн	Lower side wall span	2	2,08
	4 FARMER PACKAGE		
Brace	Longitudinal stiffness brace	8	2,36
	5 FARMER PACKAGE		
4	Arc	4	3,08
	6 FARMER PACKAGE		
11	Upper beam	2	2,7
15ц	Center suspension	1	0,6
15	Side suspension	2	0,55
9	Pole	4	2,7
10	Crossbar	5	1,07
8	Side tie bar	2	1,31
10ц	Center tie bar	1	2,72
П-11	Upper beam band	1	2,67
П-9	Gate opening pole band	2	2,62
П-10	Crossbar band	1	1,01
П-12-д	Door opening pole band	1	1,9
	7 FARMER PACKAGE		
5н	Lower arc tie bar	2	2,73
5	Arc tie bar	2	2,73
6	Segment tie bar	1	2,58
7m	Radial tie bar 1	4	0,3
7б	Radial tie bar 2	1	0,54
1	Foundation pole	6	0,84
3	Foot	6	0,29
П-5н	Lower arc tie bar band	6	1,24
	Ridge brace	1	2,23
	Ridge brace band	2	0,03
	8 FARMER PACKAGE		
	Door sealing	1	35,6
	9 FARMER PACKAGE		
13-в	Gate plank	4	1,28
13-в-н	Lower gate plank	2	1,28
12-в-п	Right gate pole	2	2,61
12-в-л	Left gate pole	2	2,60
16-к	Guide bracket	8	0,08
14-в	Gate wing diagonal	4	1,73
П-12-в-п	Right pole band	2	2,61
П-13-в-н	Lower plank band	2	1,28
	Lock	4	0,91

Table 4 **SUPPLY SCOPE BY PARTS «FRAME» (4,2 m)**

labeling	name	quantity (pcs)	length (m)
	10 FARMER PACKAGE		
	Screw M6x10 DIN 965	460	
	Bolt M6x14 DIN 933	1192	
	Bolt M6x20DIN 933	120	
	Nut M6 DIN 934	1772	
	Bracket 26x17x16 (angle)	352	
	Rack hook	18	
	Left hinge ПН 1-130	4	
	Right hinge ПН 1-130	8	
	Straight eyelet 40x90	8	
	Bracket handle РС-80-2	6	
	Self-tapping screw M5x20	352	
	Washer 6	1344	
	Washer 32x6,3	450	
	Penofol	1	21,4
	11 FARMER PACKAGE		
13-д	Door plank	2	0,95
13-д-н	Lower door plank	1	0,95
12-д-л	Left door pole	1	1,88
12-д-п	Right door pole	1	1,88
14-д	Door diagonal	2	1,23
П-12-д-п	Right door pole band	1	1,88
П-13-д-н	Lower door plank band	1	0,95
16к	Guide bracket	4	0,08
	Lock	2	0,65
	12FARMER PACKAGE		
	Side wall sealing	1	24 m

Table 5 **SUPPLY SCOPE BY PARTS «INSERT»**

labeling	name	quantity (pcs)	length (m)
	1 INSERT PACKAGE		
4	Arc	4	3,08
	2 INSERT PACKAGE		
5н	Lower arc tie bar	2	2,73
5	Arc tie bar	2	2,73
6	Segment tie bar	3	2,58
7т	Radial tie bar 1	4	0,3
7б	Radial tie bar 2	3	0,54
П-5н	Lower arc tie bar band	4	1,24
3	Foot	2	0,29
1	Foundation pole	2	0,84
	3 INSERT PACKAGE		
2	Main span	15	2,08
2н	Main span	2	2,08
	4 INSERT PACKAGE		
	Screw M6x10 DIN 965	52	
	Bolt M6x14 DIN 933	164	
	Bolt M6x20DIN 933	40	
	Nut M6 DIN 934	256	
	Washer 6	304	

Table 6	SUPPLY SCOPE BY PARTS «TAMBOUR»		
labeling	**name**	**quantity (pcs)**	**длина (m)**
	1 TAMBOUR		
15	Side suspension	1	0,55
9	Pole	2	2,7
10	Crossbar	2	1,07
8	Side tie bar	1	1,31
1	Foundation pole	2	0,84
3	Foot	2	0,28
2кн	Side wall span	5	1,99
30	Upper tie bar	1	1,28
П-9	Gate opening pole band	1	1,9
П-10	Crossbar band	1	1,0
	2 TAMBOUR		
13-д	Door plank	2	0,95
13-д-н	Lower door plank	1	0,95
12-д-л	Left door pole	1	1,88
12-д-п	Right door pole	1	1,88
14-д	Door diagonal	2	1,23
П-12-д-п	Right door pole band	1	1,88
П-13-д-п	Lower door plank band	1	0,95
	Bracket	4	0,84
	Lock	2	0,65
	Tambour sealing		
	Door sealing	1	6 m
	Side wall sealing	1	8 m
	Tambour packaging		
	Screw M6x10	78	
	Bolt M6x14	123	
	Bolt M6x20	50	
	Nut M6	251	
	Bracket 26x17x16	97	
	Rack hook	3	
	Right hinge ПН 1-130	2	
	Straight eyelet 40x90	2	
	Bracket handle РС-80-2	2	
	Self tapper	97	
	Washer 6,3	91	

WARRANTY LIABILITIES

1. The manufacturer is responsible for the completeness of the greenhouse frame.
2. The manufacturer is responsible for assemblability of the greenhouse in accordance with instructions.
3. The manufacturer is responsible for the greenhouse durability at the specified values of external weathering.
4. Term for making claims - 12 months from the date of purchase.

TERMS OF WARRANTY LIABILITIES

Warranty does not apply to cases of:
1. Greenhouse installation in violation of instruction requirements.
2. Violation of the rules of operation.
3. Inappropriate use of the greenhouse.
4. Floods, hurricanes and other natural disasters.

Manufacturing date:

Manufacturing facility: LLC «Volya», Dubna, Moscow region, Severnyi per., 8. Manufacturer is responsible for the quality of products in accordance with the RF Civil Code. The company reserves the right to make changes in the greenhouse design.

OPERATION RULES

Do not install the greenhouse without fixing on the ground because of the large sail area and possible carrying away of the loose greenhouse.

The greenhouse requires maintenance in the winter period. The greenhouse has durability against the snow loads significantly greater than that required for greenhouses, but smaller compared to general construction regulations. According to the SNiP 2.10.04-85 «Greenhouses and hotbeds», «weight of snow cover on the 1m2 of horizontal ground surface for the design of winter greenhouses ...» should be taken from 10 to 40 kg/m2, depending on the snow area. This is much less than general construction standards for snow load, as it is assumed that snow cap on existing greenhouses does not remain until the next snowfall. Based on the results of strength tests, the limits of the strength of the greenhouse frame were determined: crushing snow load is 196 kg/m2, allowable load (with safety factor of 1,4) – 140 kg/m2. Allowable load corresponds approximately to the fresh snow thickness of 0.7 m or packed snow thickness of 0.35 m. Thus, during the operation it is necessary to prevent the accumulation of snow cap above specified limits.

If the greenhouse is not heated in winter period, or it is intended to be used as an unheated shelter, shed, warehouse, etc., it is necessary to control the snow cap (shift snow down with a wooden or plastic scraper mounted on a pole). For this options, it is possible to supply reinforced frames with a reduced interval between strain arcs, to withstand snow load specified by the customer.

Avoid damage to the frame, and if it happens, conduct timely repair.

OPERATION RULES

CLEANING AND WASHING OF THE POLYCARBONATE SHEETS.

1. Rinse the sheet with warm water.
2. Wash the sheet with a solution of mild soap or household detergent and warm water, using a soft cloth or sponge to remove dirt.
3. Rinse with cold water and dry with a soft rag to remove water.

Never use abrasives or highly alkaline cleaning compositions for cleaning polycarbonate sheets. Dry rubbing of the surface will damage the protective layer of the cladding and shorten its shelf life. Never rub the surface of polycarbonate sheets with brushes, metallic cloth or other abrasive materials.

when disinfecting the greenhouse from pathogens causing fungal and bacterial diseases, do not use «sulfur blocks» to avoid frame corrosion (blackening).

INSTALLATION INSTRUCTIONS FOR THE «FARMER» GREENHOUSE

Be careful during the assembly! Parts have sharp corners. Beware of cuts! The works shall be carried out in gloves.

INTRODUCTION

1. General view of the frame is shown in Fig.1, with tambour - Fig.1a (tambour is to be purchased separately at the customer's request). The frame is assembled from the shaped numbered parts. Middle flanges of the frame are facing the cladding.

Indices:

2. **м** - small;
б - big;
к - end (of the greenhouse length);
н - lower;
ц - center;
д - door;
в - gates;
п - right;
л - left;
П - band;
- the arrow indicates the direction of the installation according to the diagrams in the instructions.

Some parts have remaining free holes which is the result of the parts uniformity.

Do not violate instructions! Do not install the bolts and nuts without washers - this may reduce the strength of the frame!

INSTALLATION INSTRUCTIONS FOR THE «FARMER» GREENHOUSE

3. Vocabulary:
Left side - on the left, from the position outside the greenhouse, before the gates.
Right side - on the right, from the position outside the greenhouse, before the gates.

4. Assembling nodes are marked with letters and shown in figures. The greenhouse assembly is carried out using M6 bolts, nuts, washers, self tappers etc. The joints are performed by the part overlay and with fastening on holes. Bolts, nuts and washers shall be put in all the points specified in the instruction.

5. Assembling the greenhouse is presented in stages, at each stage assembling nodes are shown as «before» and «after.» There are no nuts and washers installed from the inner side of the section shown in node figures.

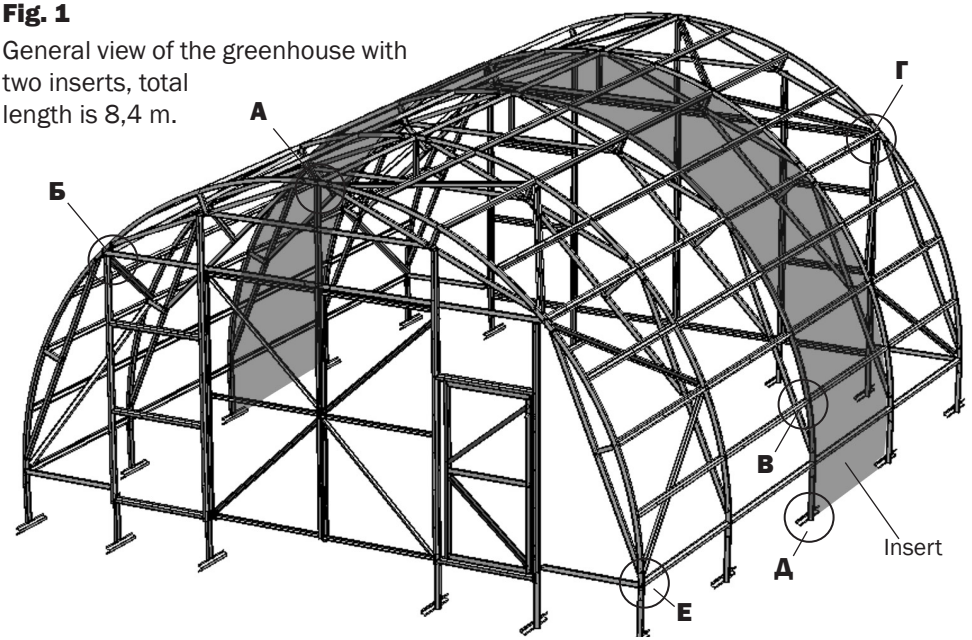
6. During assembly, be careful not to damage the parts, because until they assembled fully, they do not have sufficient rigidity.
Use additional tools for assembly:
-wrench 10;
-screwdriver;
-drill with a ⦸6,5 bit;
-stepladder height of 3m;
-power jigsaw;
-knife.

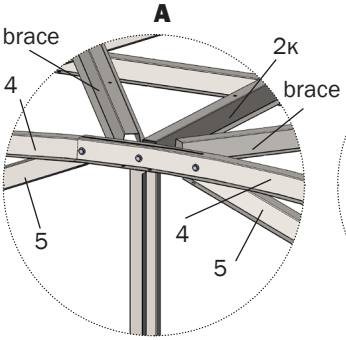
ASSEMBLING ORDER

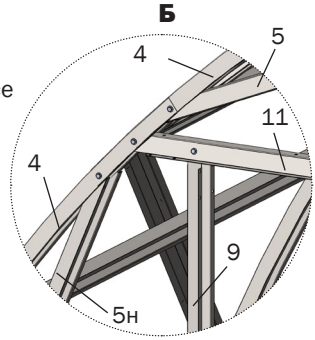
GENERAL VIEW OF THE GREENHOUSE FRAME EXTENDED WITH INSERTS

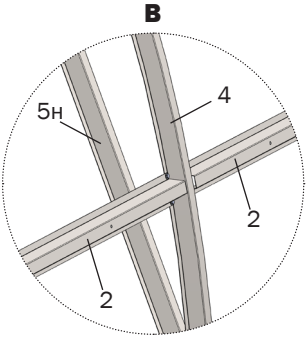
Fig. 1

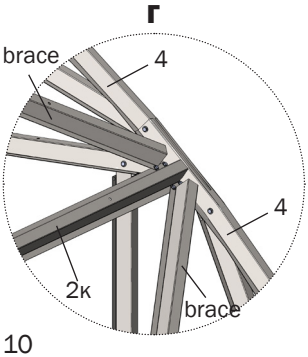
General view of the greenhouse with two inserts, total length is 8,4 m.

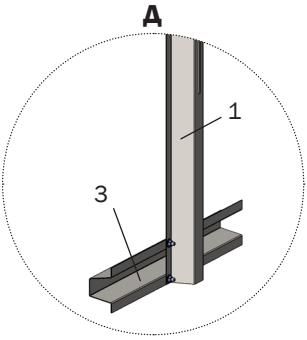


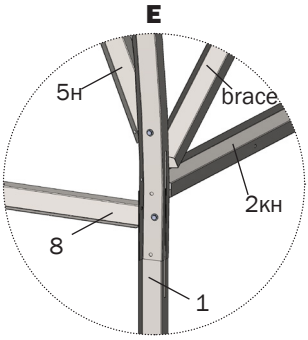












GENERAL VIEW OF THE GREENHOUSE FRAME EXTENDED WITH INSERTS

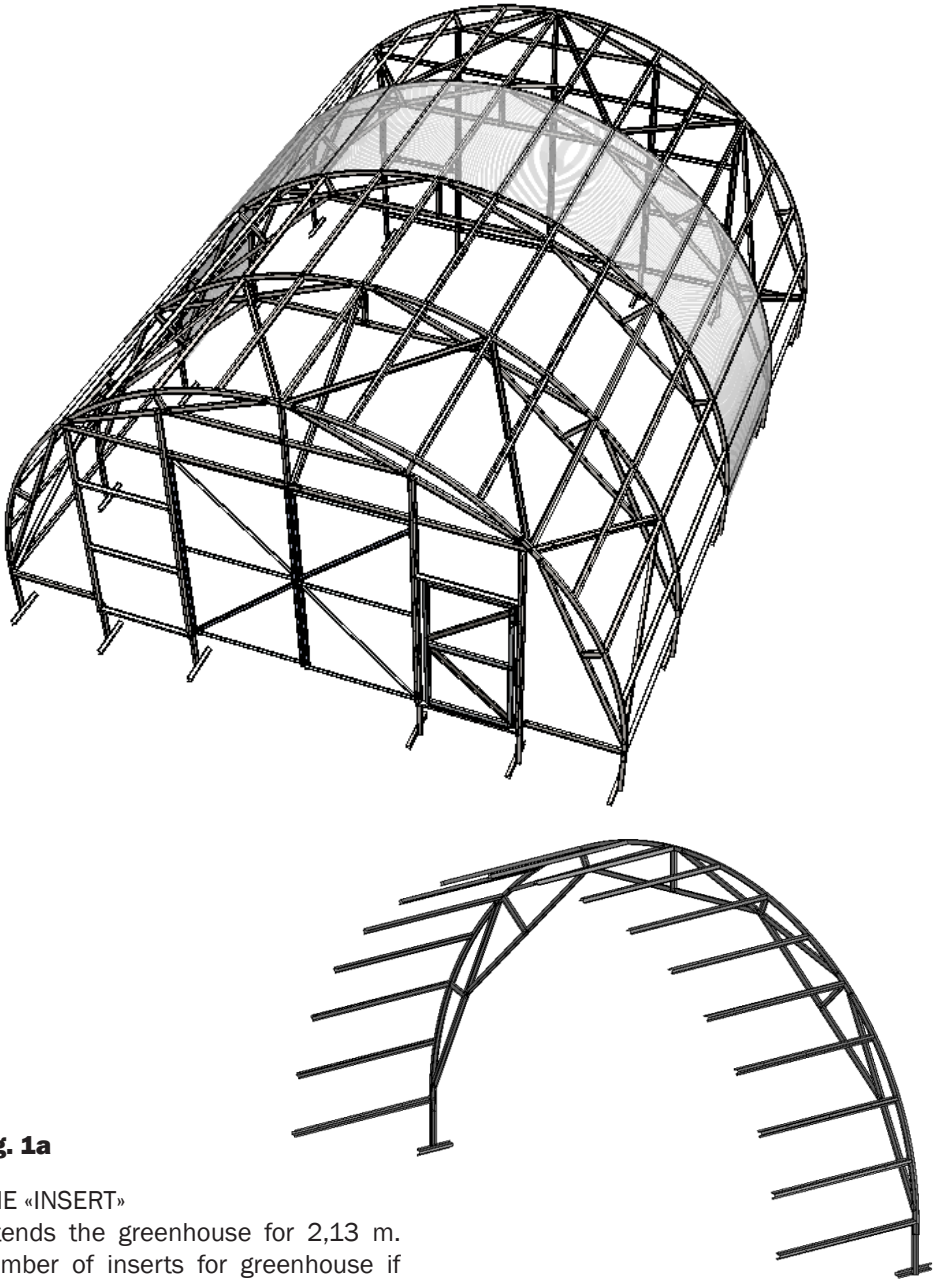


Fig. 1a

ONE «INSERT»
extends the greenhouse for 2,13 m. Number of inserts for greenhouse if unlimited

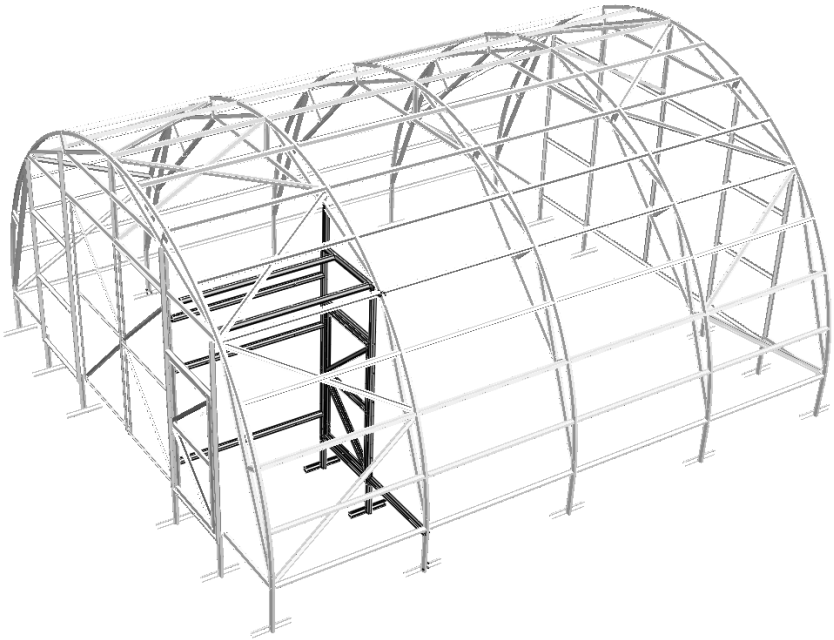
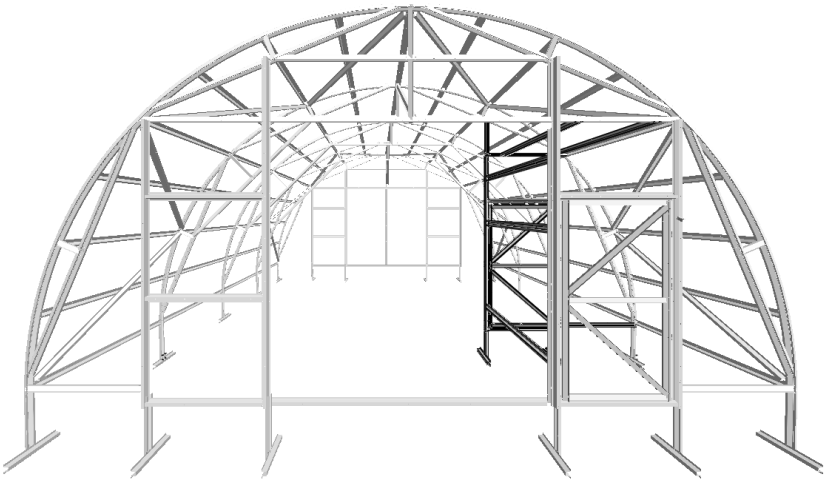


Fig. 16
General view with tambour



INSTALLATION ORDER.

STAGE 1

Side wall assembly.

Assembly is carried out in accordance with Fig.1.1-1.8. Parts are assembled in the horizontal plane by connection on side section walls. Arcs 4 are joined with each other by inserting one into another for cut length with holes aligned (view a).

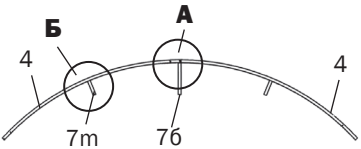
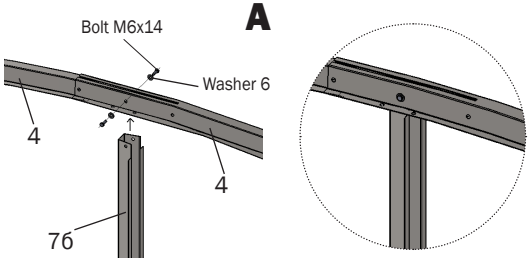
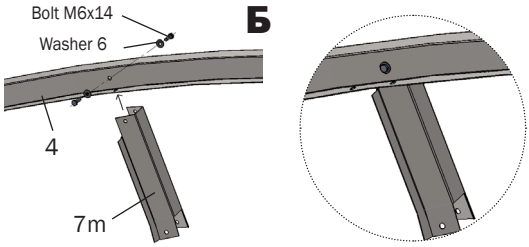


Fig. 1.1





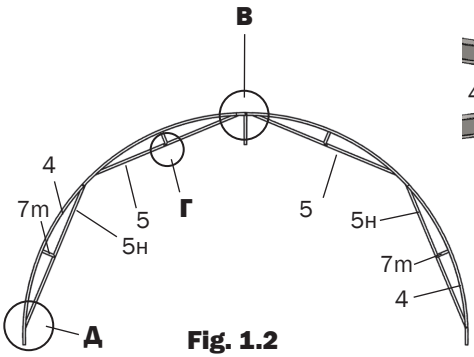
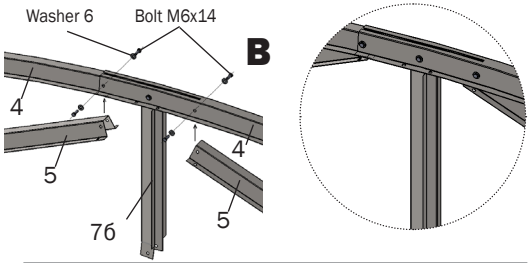
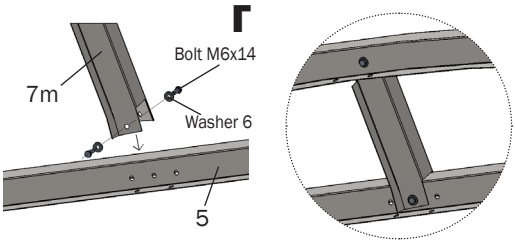
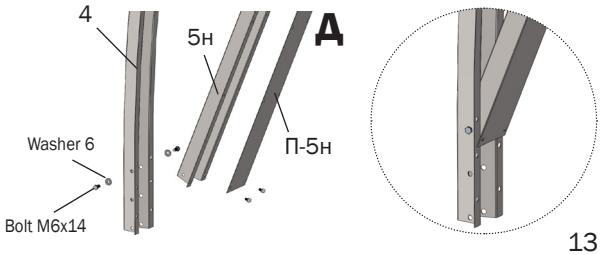


Fig. 1.2







ПОСЛЕДОВАТЕЛЬНОСТЬ УСТАНОВКИ

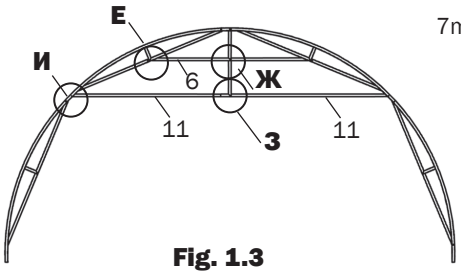
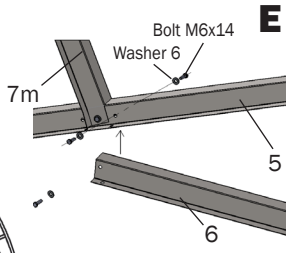


Fig. 1.3



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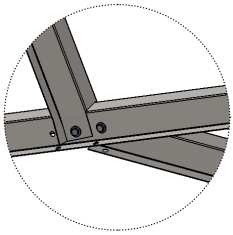

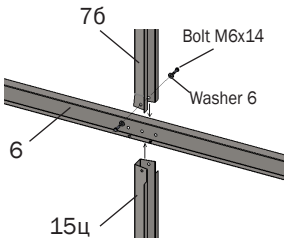

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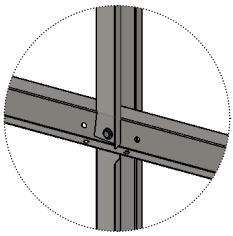
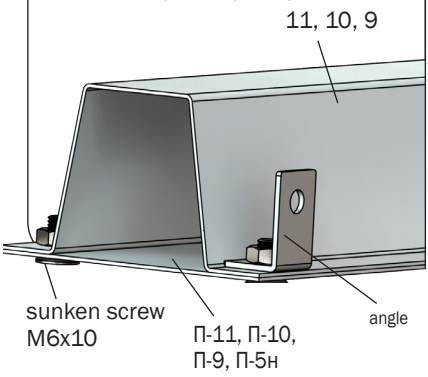
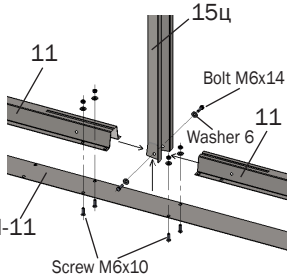


Define the angle fixing points according to the Fig. 1.8. and install angles along with band **П-11**, **П-10**, **П-9**, **П-5н**.





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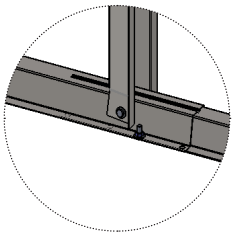

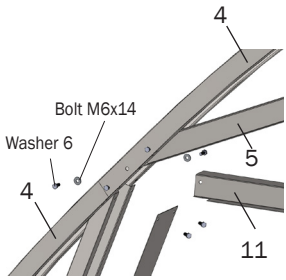

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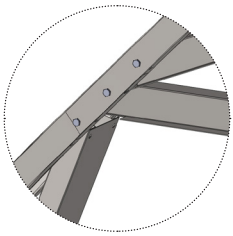


INSTALLATION ORDER

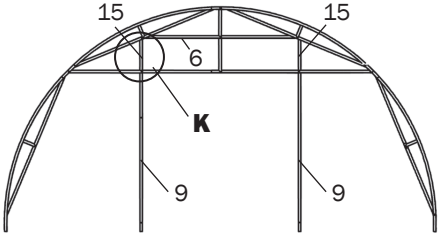
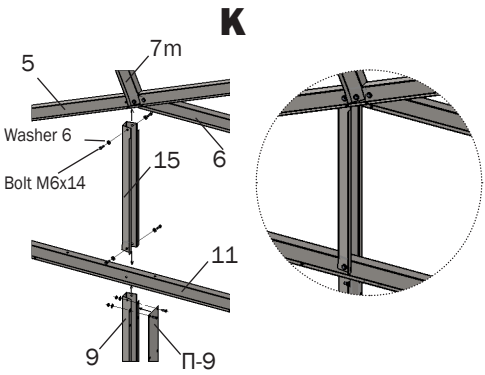


Fig. 1.4



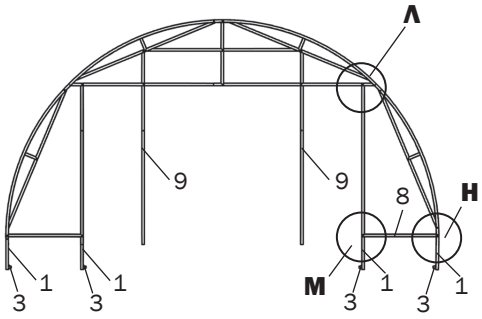
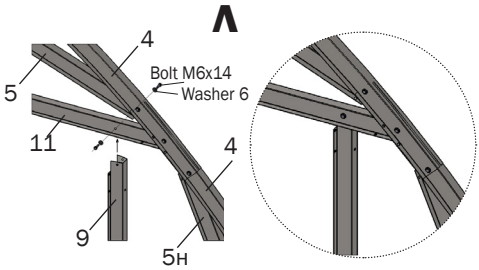
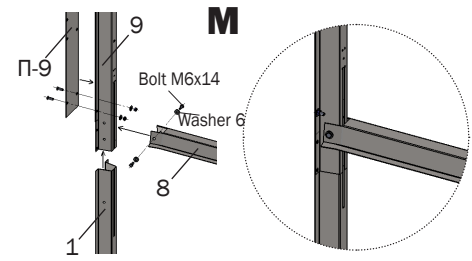
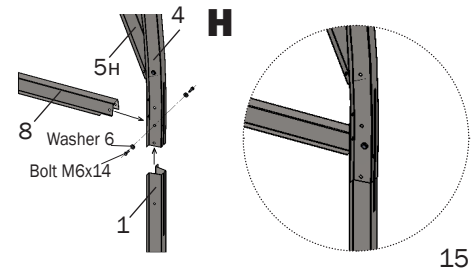


Fig. 1.5





Foundation poles 1 and foots 3 are connected by side flanges of sections (Fig. 1.7 view C).



INSTALLATION ORDER

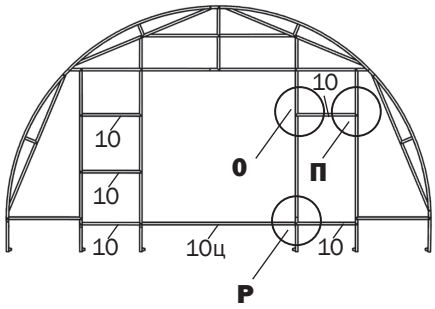
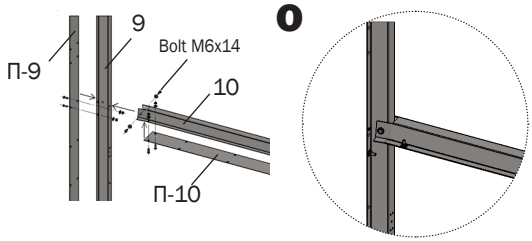
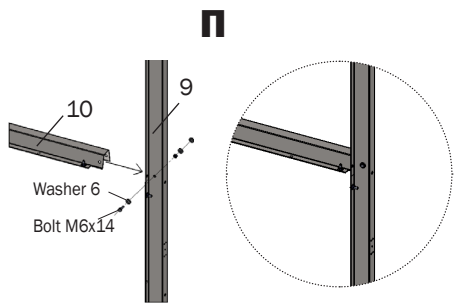
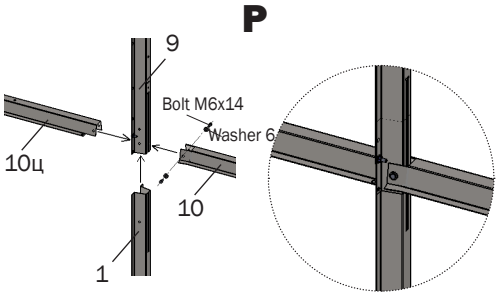


Fig. 1.6







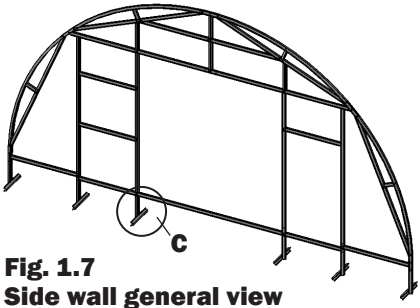
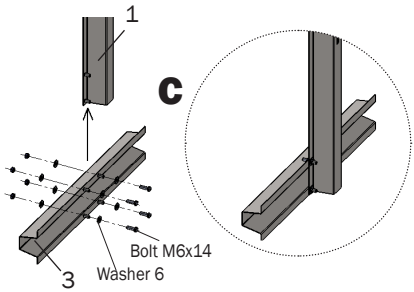


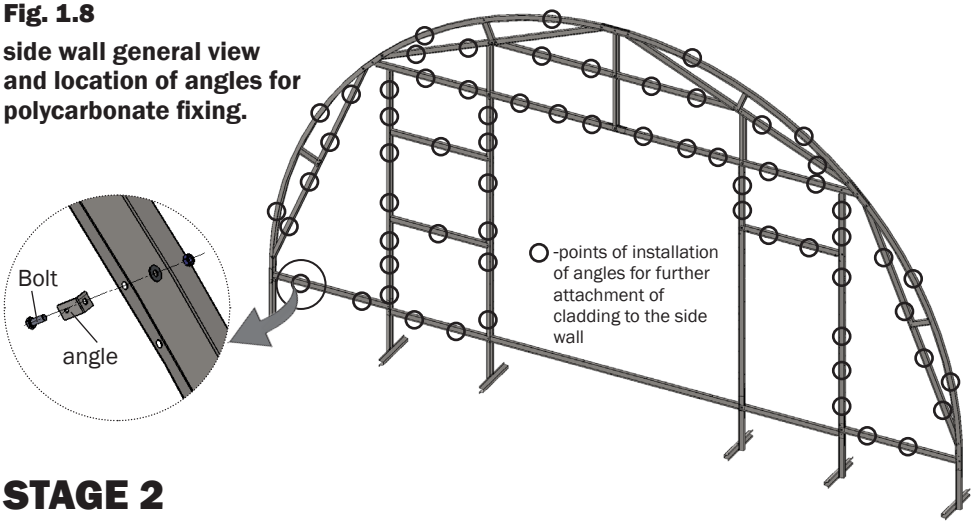
Fig. 1.7
Side wall general view



INSTALLATION ORDER

Fig. 1.8

side wall general view and location of angles for polycarbonate fixing.



STAGE 2

Installation of spans on the side wall.

Assembly is carried out in accordance with Fig. 2.1. Assembled side wall is installed in the horizontal plane. Side wall spans 2 k and 2 kn are alternately attached to the arcs of 4 side wall by the side flanges of sections. Spans are deflected from the vertical under their own weight and their ends rest against side walls of the arc sections 4 (before the next action).

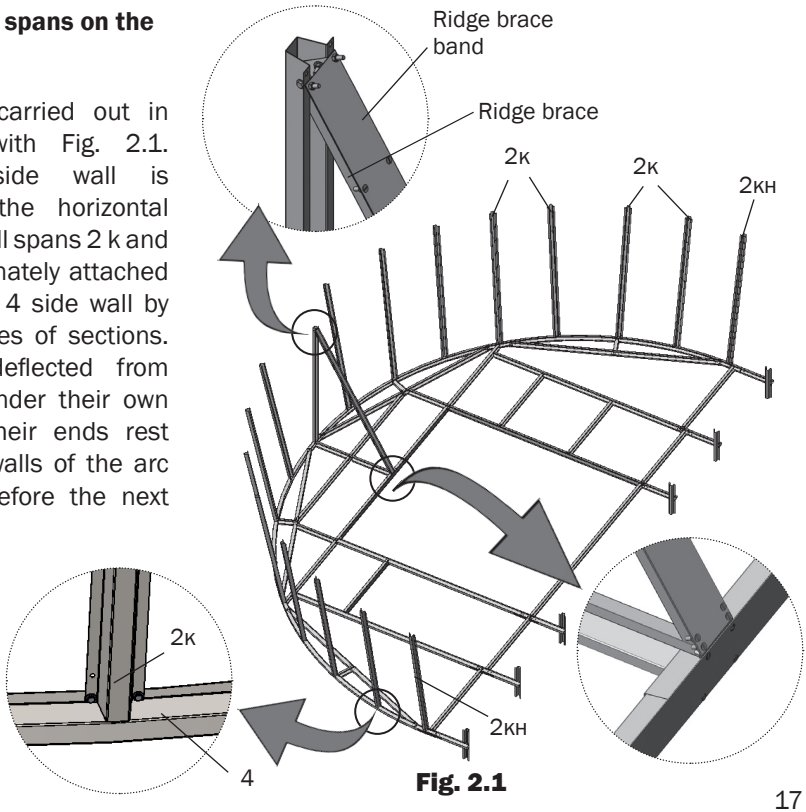


Fig. 2.1

INSTALLATION ORDER

STAGE 3

Strain arc assembly

Strain arc assembly is carried out inthe horizontal plane and is similar to the side wall assembly (Fig. 3.1-3.5).

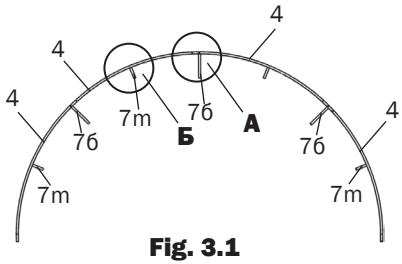


Fig. 3.1

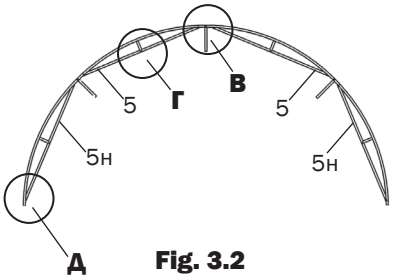
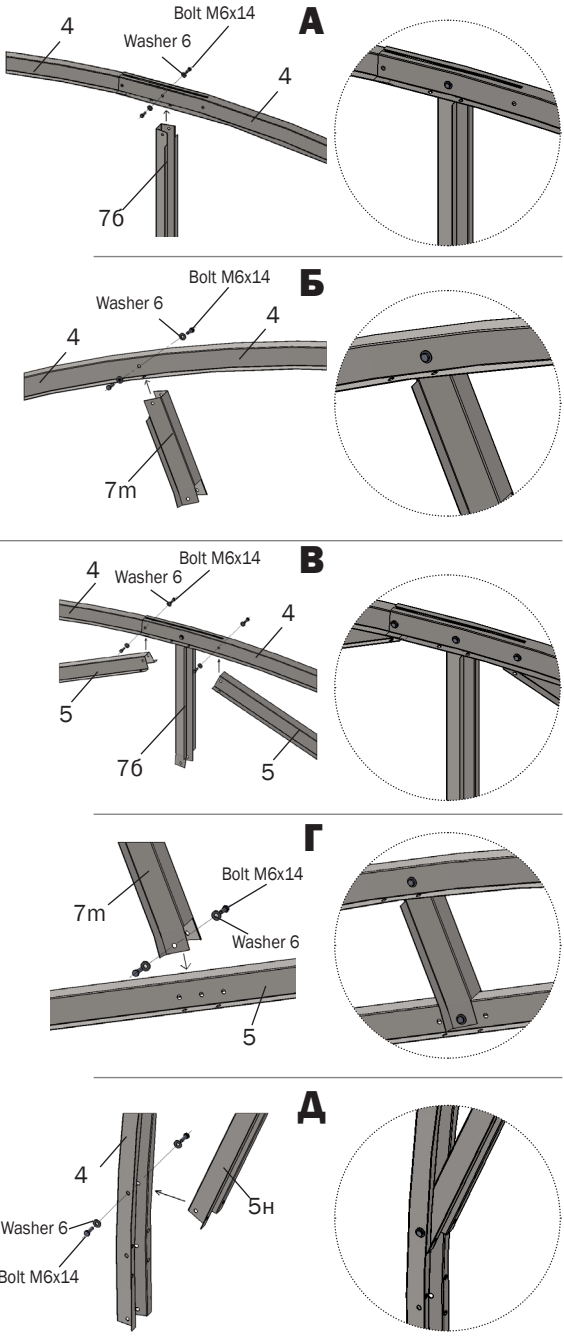


Fig. 3.2



INSTALLATION ORDER

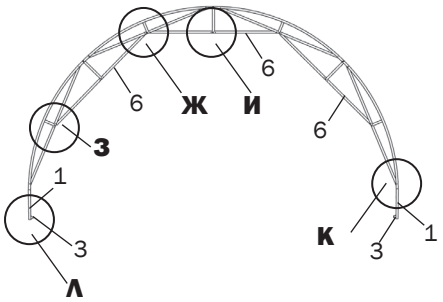
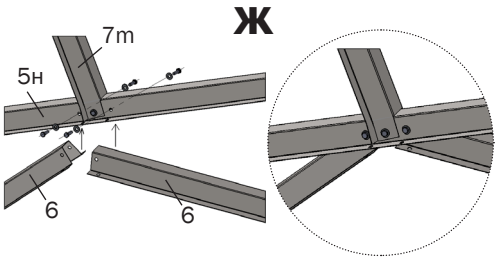
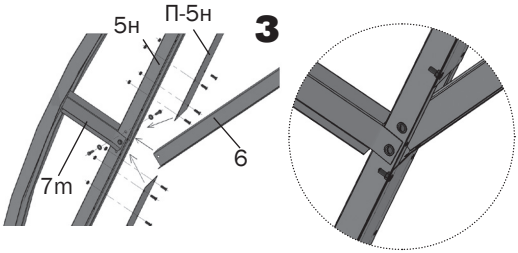
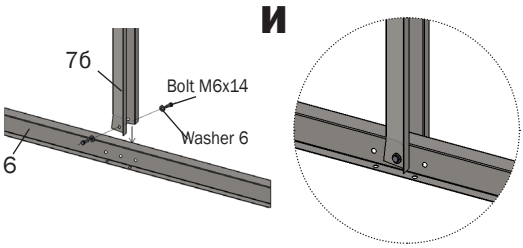
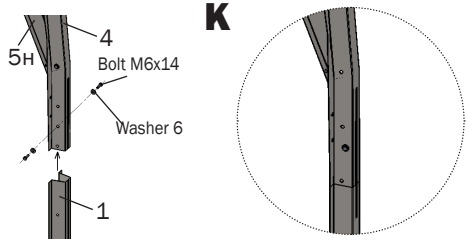


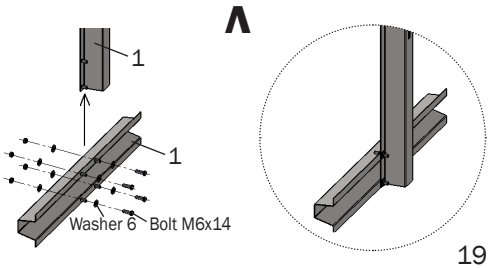
Fig. 3.3











INSTALLATION ORDER

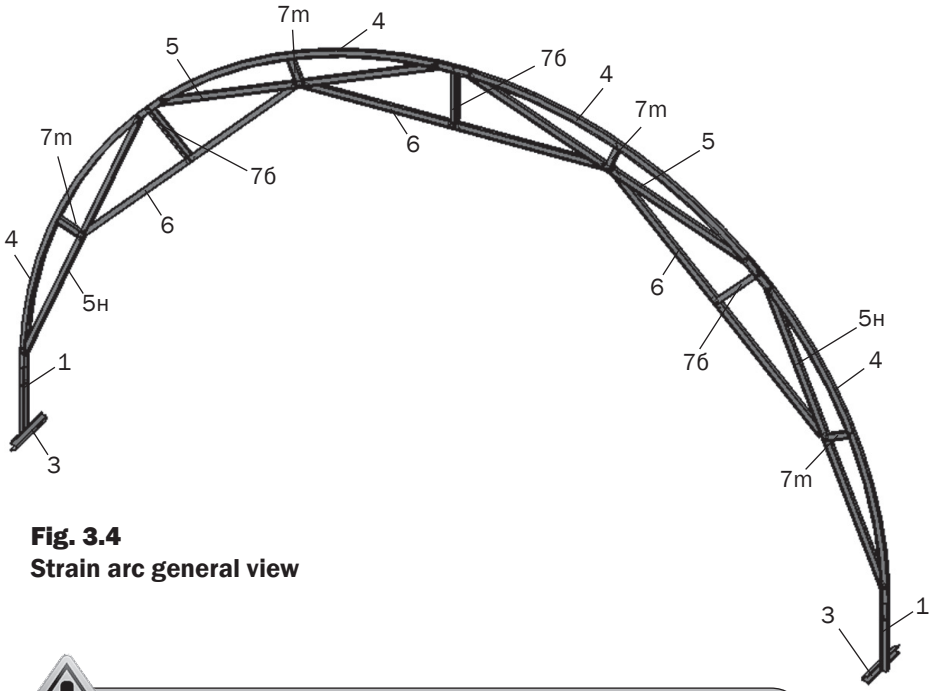


Fig. 3.4
Strain arc general view

If the greenhouse is equipped with tambour, install the tambour parts on the strain arc intended for installation of raws with entrance side wall.

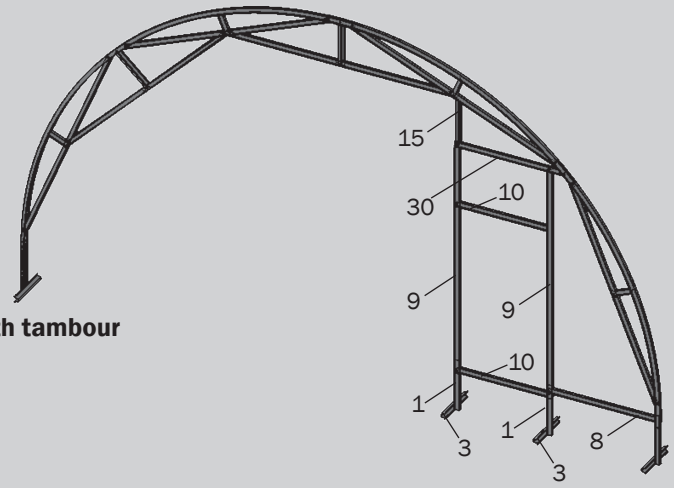


Fig. 3.5
General view with tambour

INSTALLATION ORDER

STAGE 4

Side wall section assembly without tambour.

Assembly is carried out according to Fig.4.1. Assembled strain arc (60kg) is brought to the side wall with spans installed, rised by the height of side wall spans and coupled with their upper ends. It is recommended to attach end and middle spans first.

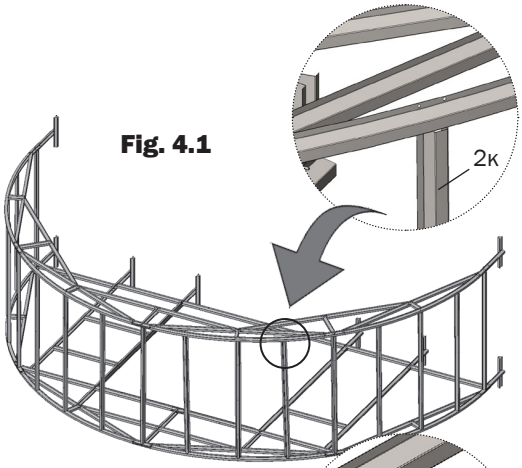


Fig. 4.1

Side wall section assembly without tambour.

Attachment of the strain arc with tambour to the side wall spans 2k and 2kn (Fig.4.2.)

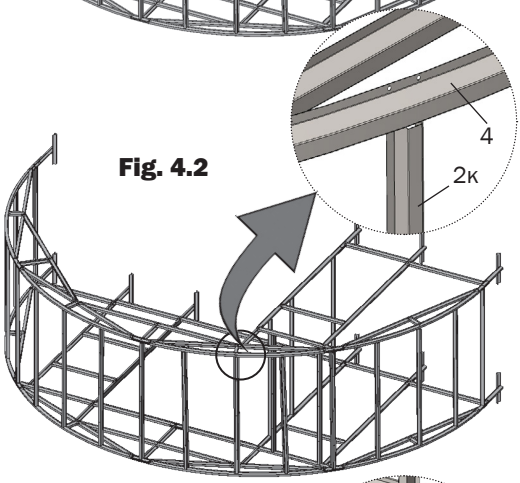


Fig. 4.2

Installation of longitudinal stiffness braces.

Installation procedure is the same for options with and without the tambour.

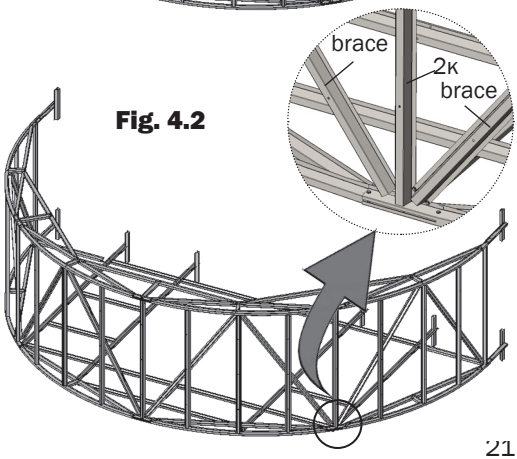


Fig. 4.2

INSTALLATION ORDER

STAGE 5

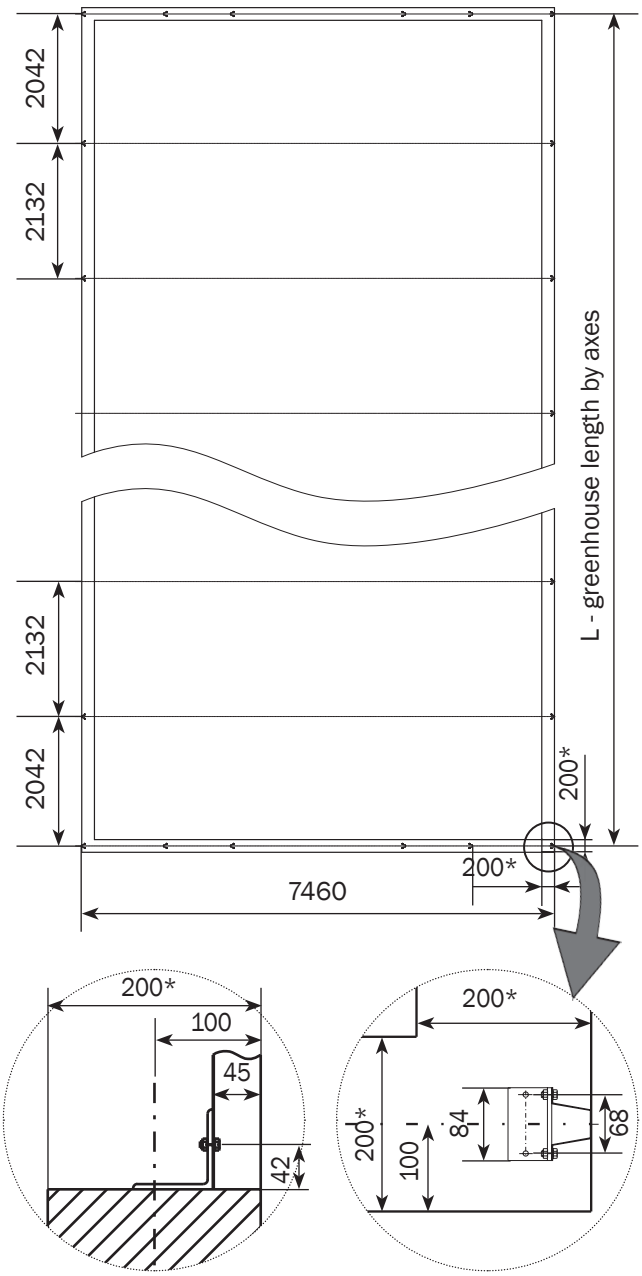
Side wall section installation

If the greenhouse is installed without foundation, axis marking shall be made on the ground in accordance with Fig. 5.1. 70 cm deep holes are digged for the foundation poles with feet.

If the greenhouse is installed on the foundation, according to the Fig. 5.1, hoding angles are installed on the foundation for the subsequent fixing of arc lower ends according to Fig. 5.2, without foundation poles.

End wall section (approx. weight 200 kg) is leveled up and installed in vertical position at the place prepared.

Fig. 5.1

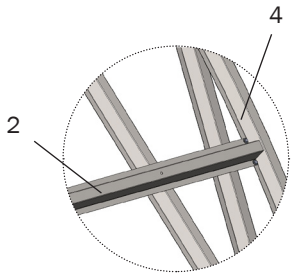


INSTALLATION ORDER

STAGE 6

Frame length extension with insert.

Assembled strain arc is brought to the assembled end wall section at the distance of main span and attached to it using main spans 2 and 2n by the side flanges of sections (Fig. 6.1).It is recommended to attach end and 4 middle spans first, using the stepladder. Next 2 strain arc is attached to the strain arc which is already installed, etc. All the arcs are attached alternately.



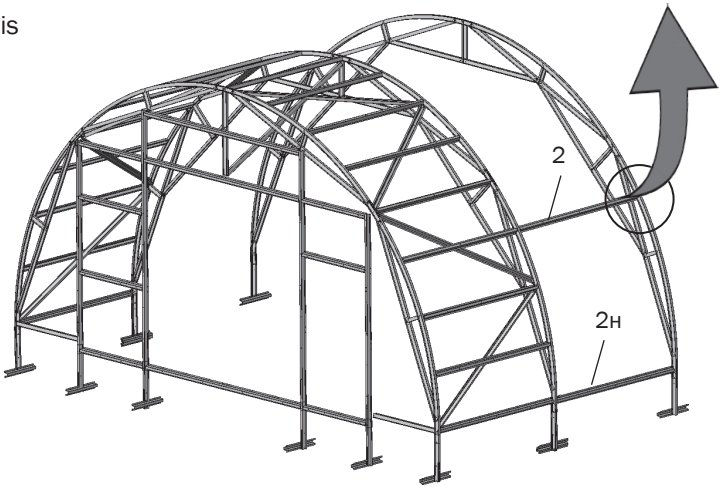


Fig. 6.1

STAGE 7

Second side wall section assembly.

Second side wall section is assemblied bhy the same procedure as the first side wall section.

Stage 8
If the greenhouse is assembled without inserts (L-4,2m), spans and braces are installed at the vertical position of the side wall, similar to Fig.6.1

STAGE 8

attaching the second side wall section to the frame.

Assemblied second side wall section is brought to the frame at the distance of main spans and attached to frame using them. It is recommended to attach end and middle spans first, using the stepladder. Span lines are aligned, and foundation poles are covered with earth. Soil is packed. If necessary, alignment can be repeated.

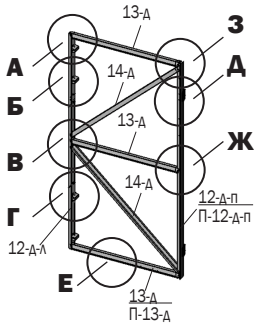
DOORS AND GATES

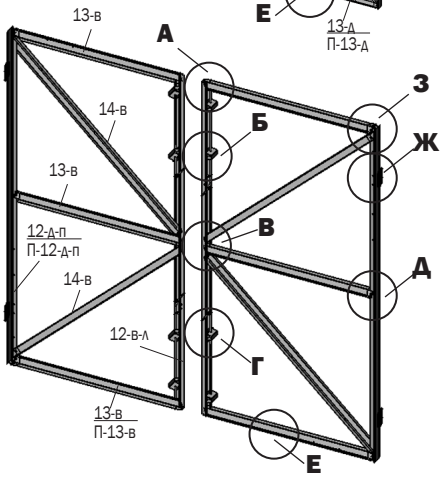
STAGE 9

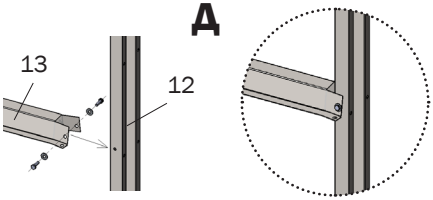
Doors and gates assembly

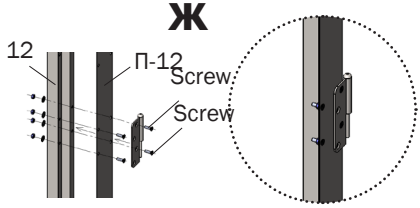
Doors and gates are assembled in the same way. Nodes are shown in figures.

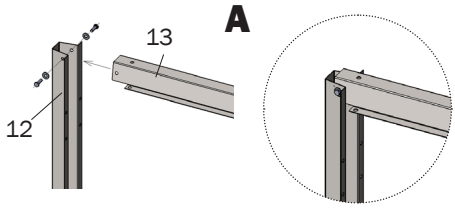
Fig. 9.1

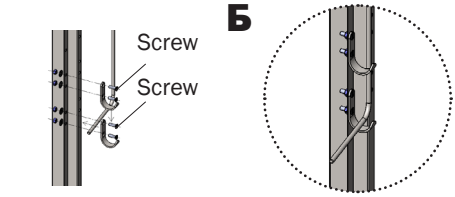


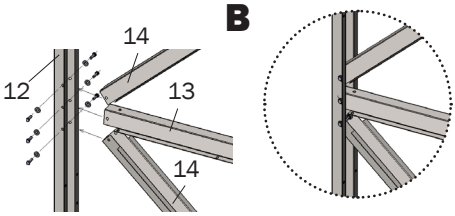


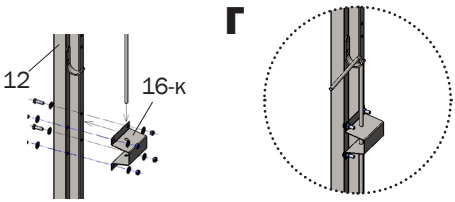


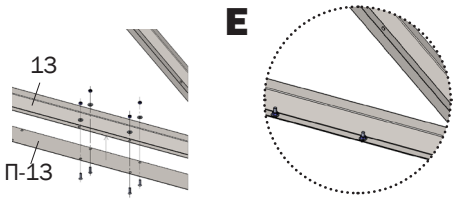


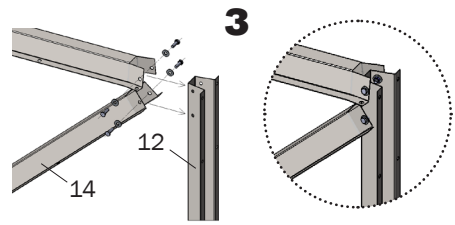












DOORS AND GATES

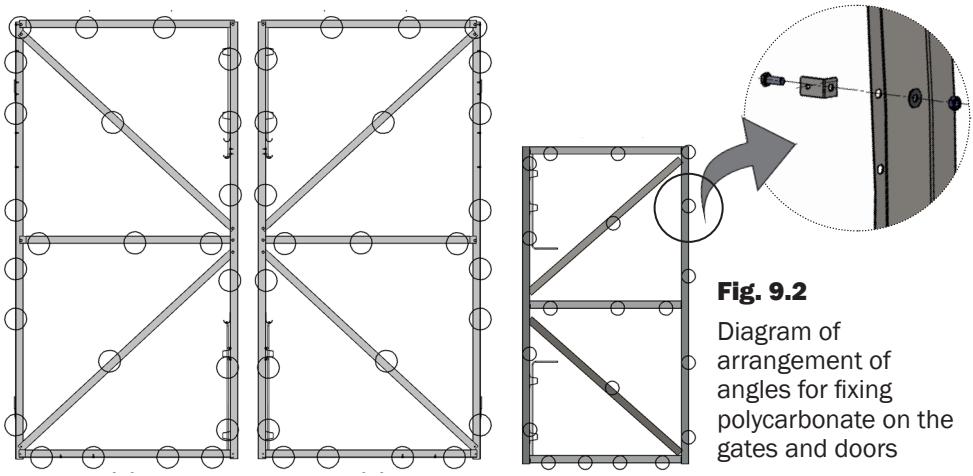


Fig. 9.2
Diagram of arrangement of angles for fixing polycarbonate on the gates and doors

STAGE 10

Cladding installation

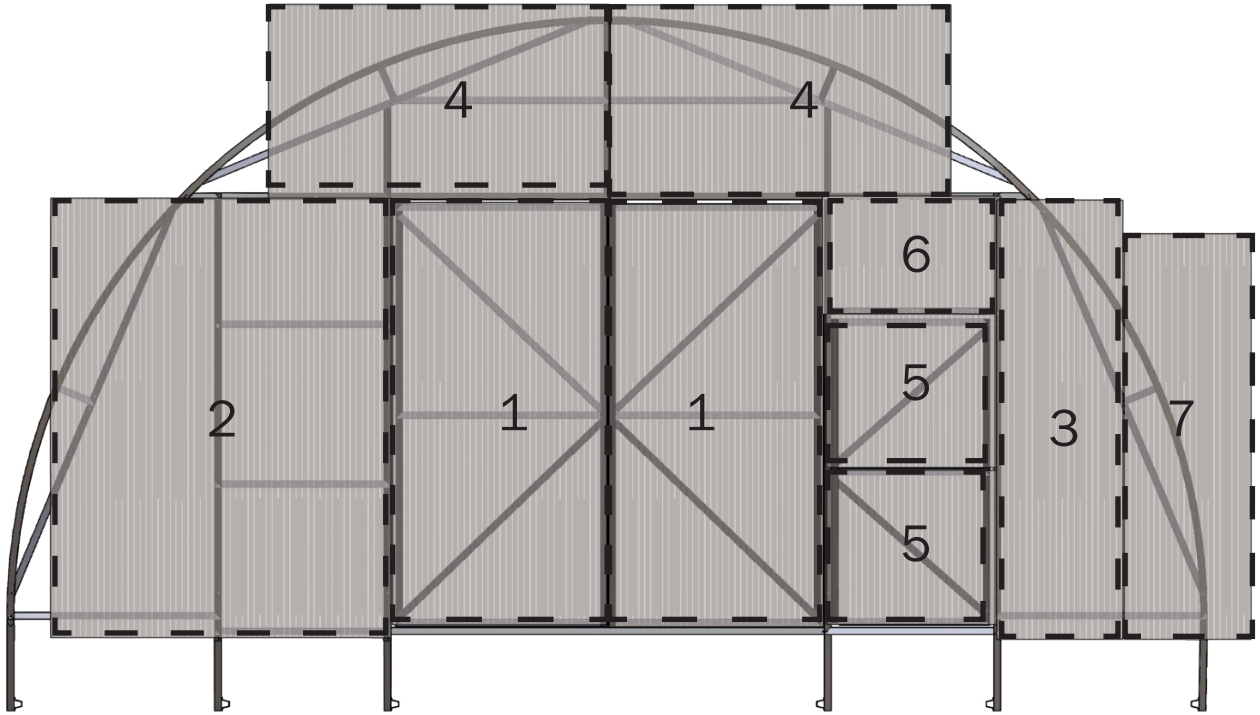
Cladding shall be installed after fixing the frame on the ground. It is better to carry out cutting with power jigsaw, but it is also allowed to use fine-toothed saw.

Cellular polycarbonate shall be installed strictly defined side out (towards the sun), which has a protective layer (be sure to specify this when buying or before installation). 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.

ACE PIECES OF CLADDING AT THE SIDE WALL, OBSERVING THE VERTICAL CELL DIRECTION.

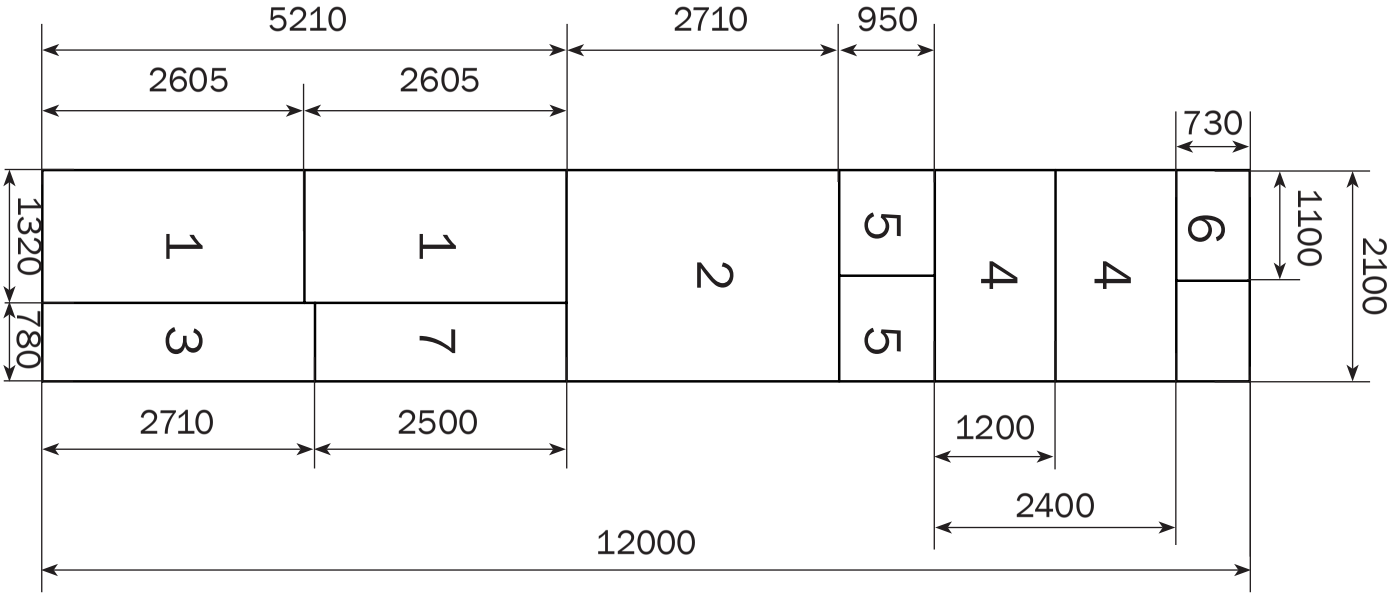
Fig. 10.1

Diagram of arrangement of the cladding pieces on the side wall.



Polycarbonate sheet cutting shall be performed strictly in accordance with the Fig. 10.2
cellular polycarbonate sheet dimension of 2100 x 12000 mm

Fig. 10.2
Diagram of thle cladding cut for side wall.



CLADDING ATTACHMENT

Attach the cladding pieces to angles using washers and self-tapping screws (Fig.10.3).

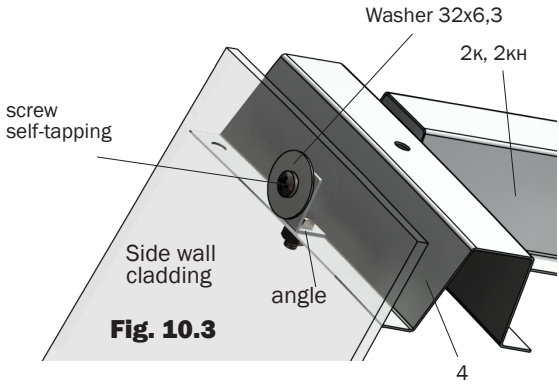


Fig. 10.3

Points of attachment of cladding pieces with one-piece polycarbonate connecting section are shown in Fig.10.4.

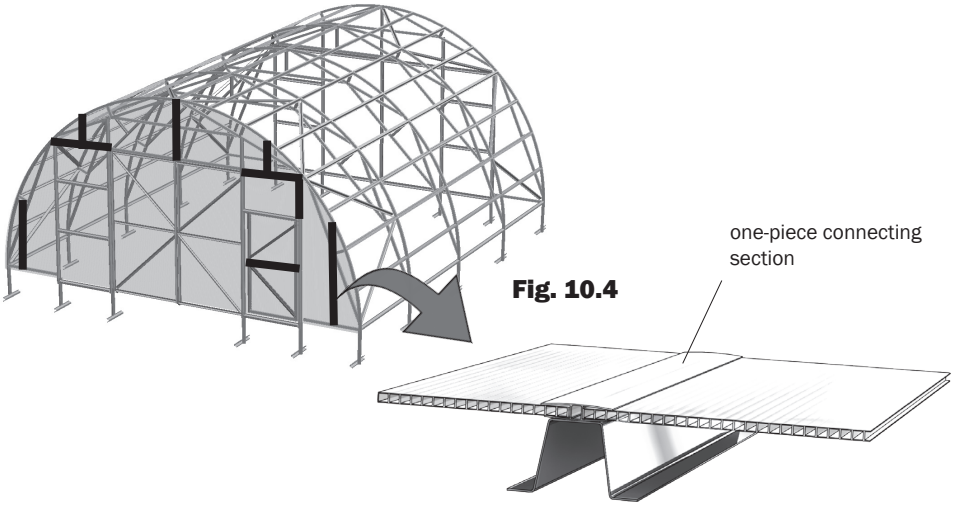


Fig. 10.4

Trim the cladding pieces with a knife by arcs 4, then install the sealing section according to Fig.10.5

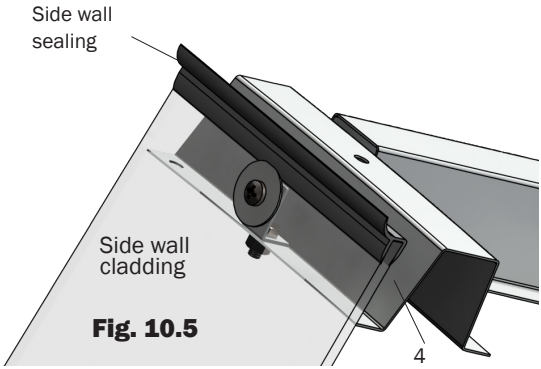


Fig. 10.5

CLADDING ATTACHMENT

▬▬ - door sealing attachment points.

••••• -Penofol attachment points.

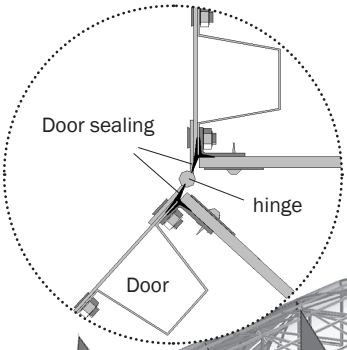


Fig. 10.6

Sealing shall be installed according to Fig. 10.6, 10.7

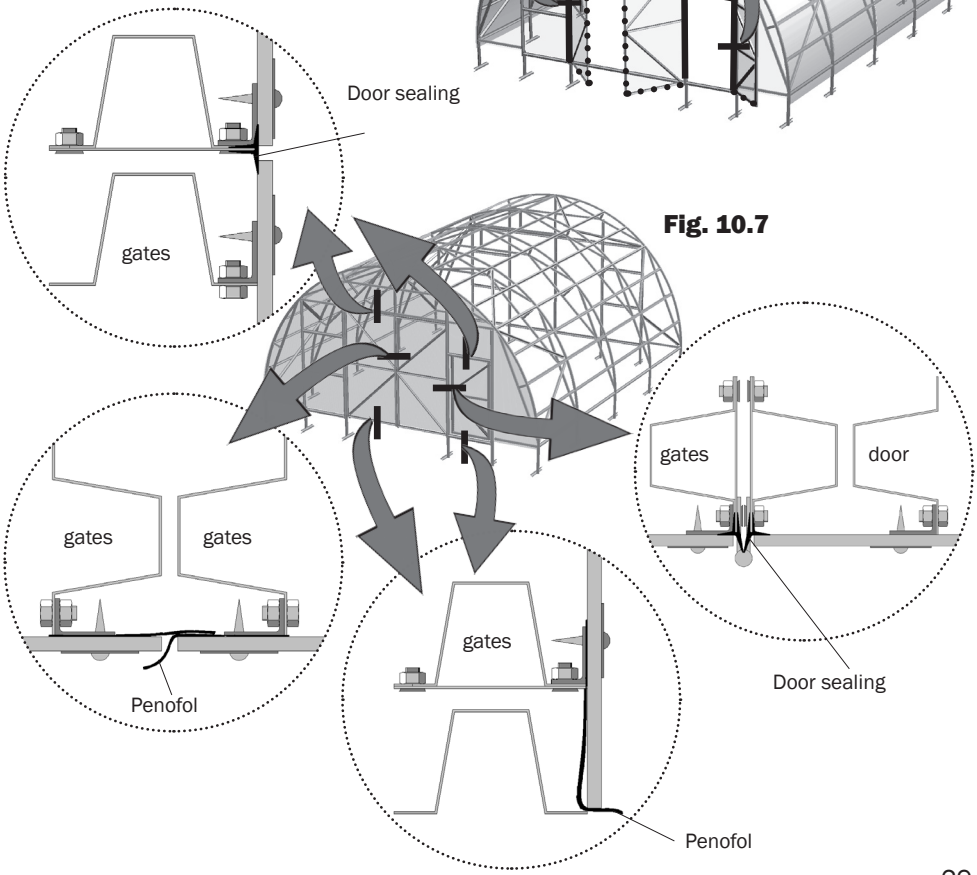


Fig. 10.7

CLADDING ATTACHMENT

The top of greenhouse is covered with sheets of 12x2,1 m. Panel joints are to be connected with separable section (cover+base) Fig.10.10. Base is attached to the arc with 4 bolts

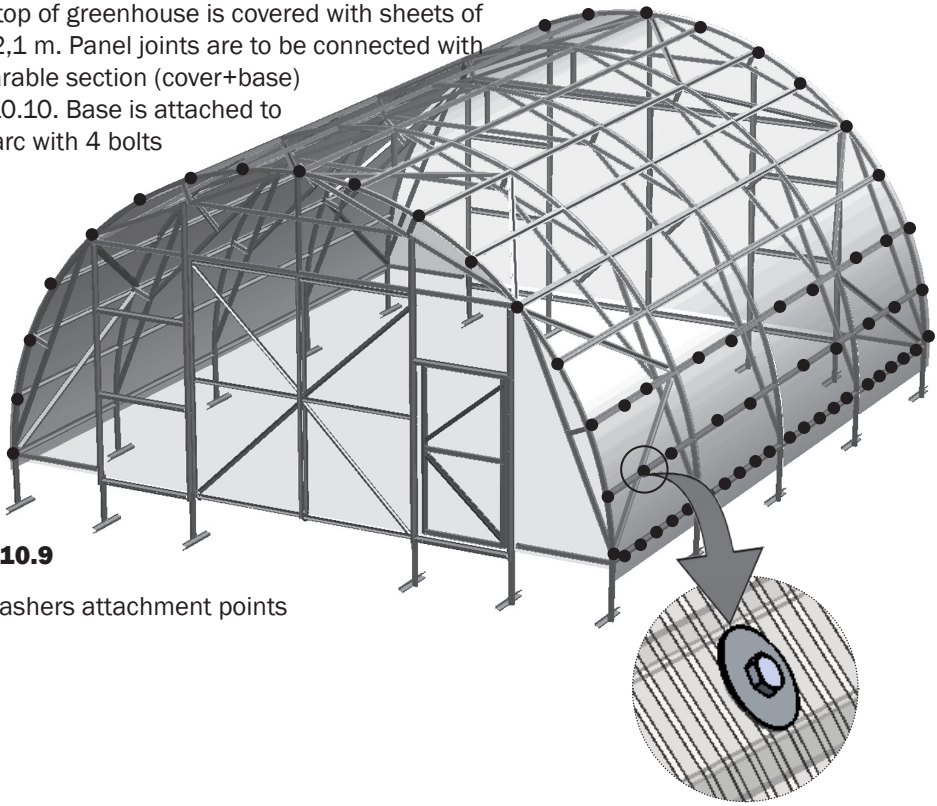


Fig. 10.9

● - washers attachment points

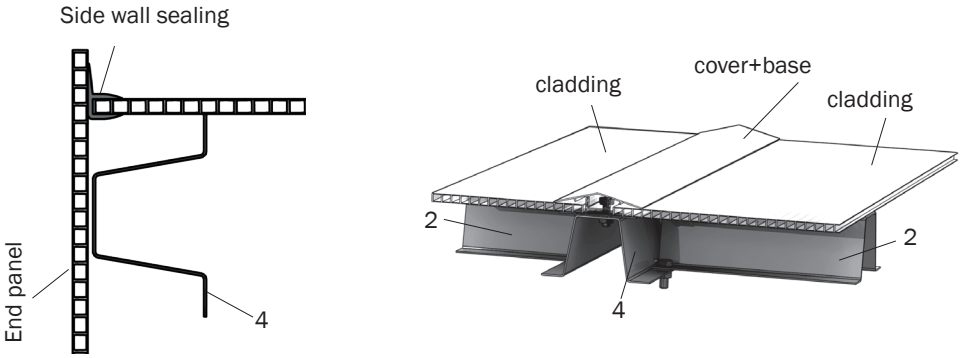


Fig. 10.10

Install eyelets and handles at the doors and gates.

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