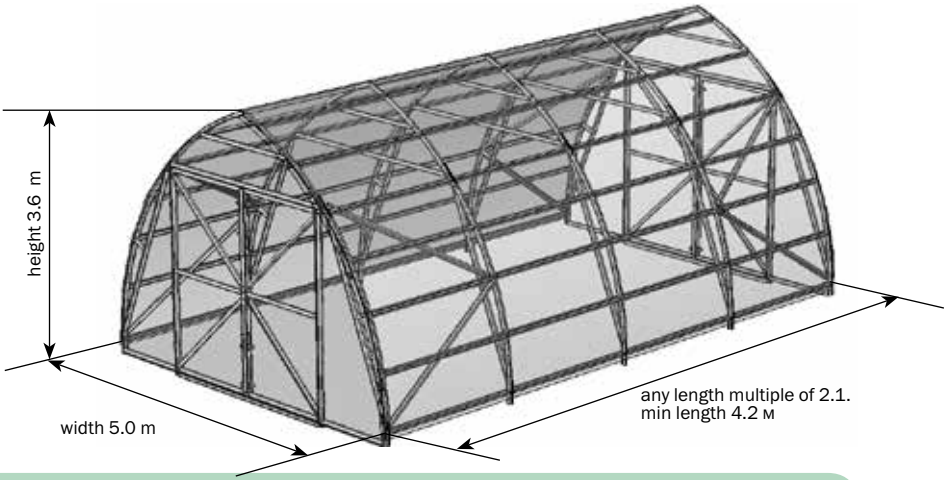
VOLYA LLC

FERMER-5.0

honeycomb polycarbonate greenhouse

design2011



Perform assembling 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

The "Fermer" greenhouse is designed and manufactured in accordance with SNiP 2.10.04-85 and generally intended for industrial cultivation of crops at farms and peasant holdings.

Width of the greenhouse is 5 m. Area of covered ground depends on the length of the greenhouse and for minimal length of 4.2 m is 21 m2. Height of the installed frame is 3.6 m.

The frame of the greenhouse is made of galvanized iron 1 mm thick and is to be assembled with screws, nuts and washers.

The greenhouse is fixed on the ground without foundation by digging special frame endings or on a fundament using cleater angles. The type of fixing is determined by a buyer.

The greenhouse may be completed with covering on buyer's request.

Number of small windows is conformed to a buyer.

Table 1 **COMPLETING WITH PACKAGES, PCS**

L length of a greenhouse, m	N – number of sections of a greenhouse, excluding end sections.	**FRAME** (BASE LENGTH IS 4.2 M)									**INSERT** (2.1 M FRAME ELONGATION))				
		1 PACKAGE FERMER-5.0	**2 PACKAGE FERMER-5.0**	**3 PACKAGE FERMER-5.0**	**4 PACKAGE FERMER-5.0**	**5 PACKAGE FERMER-5.0**	**6 PACKAGE FERMER-5.0**	**7 PACKAGE FERMER-5.0**	**8 PACKAGE FERMER-5.0**	**9 PACKAGE FERMER-5.0**	**1 PACKAGE INSERT**	**2 PACKAGE INSERT**	**3 PACKAGE INSERT**	**4 PACKAGE INSERT**	**5 PACKAGE INSERT**
4,2	0	3	3	2	2	2	2	2	1	1	0	0	0	0	0
6,3	1										1	1	1	1	1
8,5	2										2	2	2	2	2
10,6	3										3	3	3	3	3
12,7	4										4	4	4	4	4
14,9	5										5	5	5	5	5
17,0	6										6	6	6	6	6
19,1	7										7	7	7	7	7
21,2	8										8	8	8	8	8
23,4	9										9	9	9	9	9
2,1(N+2)											N	N	N	N	N

Table 2 **PACKAGE PARAMETERS**

content	dimensions, mm	weight, no more
FRAME (BASE LENGTH 4.2 M)		
1 PACKAGE FERMER-5.0 (arc elements)	90x410x3000	11,6
2 PACKAGE FERMER-5.0 (power arc straight elements)	90x75x2800	10,5
3 PACKAGE FERMER-5.0 (end runners elements)	90x120x1990	32,36
4 PACKAGE FERMER-5.0 (end side brace elements)	90x65x2360	11,12
5 PACKAGE FERMER-5.0 (elements and strips for doors)	90x70x2720	17,10
6 PACKAGE FERMER-5.0 (elements and strips for doors)	90x55x1145	2,62
7 PACKAGE FERMER-5.0 (elements and strips for gates)	90x125x2620	36,4
8 PACKAGE FERMER-5.0 (fixtures, component parts and sealing)	320x330x280	18,4
9 PACKAGE FERMER-5.0 (outermost ridge)	2122x126x45	5,0
INSERT (2.1 M FRAME ELONGATION)		
1 PACKAGE INSERT (arc elements)	90x410x3000	11,58
2 PACKAGE INSERT (power arc straight elements)	90x75x2800	15,7
3 PACKAGE INSERT (runners elements)	90x120x2080	35,2
4 PACKAGE INSERT(fixtures and component parts for insert)	60x130x130	1,58
5 PACKAGE INSERT (ridge)	2156x126x45	5,0

Table 3 DETAILED PARTS LIST "FRAME" (4.2 M)

marking	name	quantity (pcs)	length (m)
1 PACKAGE FERMER			
4	Arc	2	3,08
20	Ridge arc	2	1,759
2 PACKAGE FERMER			
5	Arc strainer	2	2,73
7м	Radial strainer	2	0,3
1	Foundation stay brace	2	0,84
11в	Girder	1	2,8
29	Top ridge girder	1	1,76
3	Support	2	0,30
3 PACKAGE FERMER			
2к	End runner	10	2,0
2кн	Bottom end runner	4	2,0
4 PACKAGE FERMER			
укос	Longitudinal stiffness side brace	4	2,36
5 PACKAGE FERMER			
9	Stay brace	2	2,70
10ц	Central strainer	1	2,72
1	Foundation stay brace	2	0,84
3	Support	2	0,3
П-11	Strip of a top girder	1	2,67
П-9	Strip of a doorway stay brace	2	2,62
6 PACKAGE FERMER			
26	Side brace	2	1,14

Table 3	DETAILED PARTS LIST “FRAME” (4.2 M)		
marking	**name**	**quantity (pcs)**	**length (m)**
7 PACKAGE FERMER			
13в	Cleat	4	1,28
13вн	Bottom cleat	2	1,28
12вп	Right stay brace	2	2,6
12вл	Left stay brace	2	2,6
16к	Guiding bracket	8	0,08
14в	Diagonal	4	1,727
П12вп	Strip of a right stay brace	2	2,6
П13вн	Strip of a bottom cleat	2	1,28
	Hasp	4	0,91
8 PACKAGE FERMER			
	Bolt M6x10 DIN 965	344	
	Bolt M6x14 DIN 933	658	
	Bolt M6x20DIN 933	74	
	Nut M6 DIN 934	1076	
	Bracker 26x17x16 (angle)	200	
	Hanger	12	
	Hinge ПН 1-130 left	4	
	Hinge ПН 1-130 right	4	
	Straight lug 40x90	4	
	Pull PC-80-2	4	
	Washer 6	692	
	Washer 6,3	320	
	Self-driving screw M4,8x22 DIN 7981	200	
	Penofol	1	15,7
	Door seal	1	26
	Door seal	1	19
9 PACKAGE FERMER			
	Outermost ridge	2	2,1

Table 4	**DETAILED PARTS LIST «INSERT»**		
marking	**name**	**quantity (pcs)**	**length (m)**
1 PACKAGE INSERT			
20	Ridge arc	2	1,76
4	Arc	2	3,1
2 PACKAGE INSERT			
5	Arc strainer	2	2,73
7м	Radial strainer	2	0,3
1	Foundation stay brace	2	0,84
11в	Girder	1	2,8
29	Top ridge girder	1	1,76
3	Support	2	0,30
3 PACKAGE INSERT			
2	Main runner	10	2,1
2н	Bottom main runner	4	2,1
4 PACKAGE INSERT			
	Bolt M6x14 DIN 933	86	
	Bolt M6x20DIN 933	44	
	Nut M6 DIN 934	130	
	Washer 6	122	
	Washer 6,3	30	
5 PACKAGE INSERT			
	Ridge	1	2,2

WARRANTY LIABILITIES

It is not allowed to install the greenhouse without fastening on the ground because of the large sail area of the greenhouse and the possibility of floating away the unfastened greenhouse.

1. The manufacturer bears responsibility for the greenhouse frame complete setup.

2. The manufacturer bears responsibility for the greenhouse assemblability in accordance with the manual.

3. The manufacturer bears responsibility for the greenhouse durability under specified magnitude of atmospheric actions.

4. Claim presentation period is 12 months from the date of purchase.

Warranty conditions

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

Date of manufacture:

Manufacturer: VOLYA LLC,
per. Severny, 8, Dubna, Moscow region, 141983, Russia.
The manufacturer bears responsibility for quality of products in accordance with RF CC. The manufacturer reserves the right for greenhouse engineering design changes.

OPERATION RULES

The greenhouse should be serviced in the winter period. The greenhouse has durability under the action of snow loads way more than is required for greenhouses, but less for some snow areas in comparison with the general construction standards. According to SNiP 2.10.04-85 «Greenhouses and seedbeds» «weight of snow blanket on 1 m2 of horizontal surface of the ground in design of static greenhouses…» should be taken from 10 to 40 kg/m2 depending on a snow region. This is much less than the general construction standards for snow load, because it is assumed that on the current greenhouses a snowcap is not preserved until the next snowfall. According to the results of strength tests the limits of durability of the greenhouse frame are revealed: destroying snow load is 240 kg/m2, permissible load (with safety coefficient 1.4) – 180 kg/m2. The permissible load approximately corresponds to the thickness of fresh snow 0.9 m and settled snow 0.45 m. Thus, in operation it is necessary to prevent accumulation of snowcaps above specified limits. If the greenhouse is not heated in winter, or it is supposed to use the greenhouse as an unheated housing, awning, warehouse, etc., it is necessary to control the snowcap (to shift the snow down with a wooden or plastic scraper, installed on a pole). For these variants of operation it is possible to supply reinforced frames with a reduced interval between the power arcs under the snow load specified by the customer.

Do not allow damage to the frame, and if it happened, then hold timely repairs.

Cleaning and washing of polycarbonate sheets

1. Rinse sheet with warm water.
2. To remove dirt, wash it with mild soap solution or domestic detergent using a soft cloth or sponge.
3. To remove water, rinse the sheet with cold water and wipe it with a soft cloth.

Never use abrasives or high-alkali detergents for cleaning polycarbonate sheets. Dry wiping damages covering layer of the covering and shortens its service life. Never rub surface of polycarbonate sheets with a brush, metalized fabric or other abrasive materials.

Do not use sulphur cartridges for disinfecting greenhouse against fungal and bacterial agents in order to prevent corrosion (darkening) of the frame.

«FERMER» GREENHOUSE INSTALLATION MANUAL

Introduction

1. The general view of the frame is presented in **fig. 1**, with an anteroom - **Fig. 1a** (the anteroom is purchased separately at the request of a buyer). The frame is assembled from the shape numbered parts. Medium shape shelves are facing the covering.

2. Indexes:
м - small;
б - big;
к – outermost (along the length of greenhouse);
н - bottom;
ц - central;
в – a gate;
п - right;
л - left;
П – a strip;
→ - the arrow indicates installation direction according to manuals' schemes.

Some parts have free holes resulted from uniformity of parts.

Do not break the instructions! Do not install bolts with nuts without washers, for this leads to strength reduction of the frame.

3. Terminology:
Left side is from the left when standing outside of the greenhouse in front of the door.
Right side is from the right when standing outside of the greenhouse in front the door.

4. Assembly units are lettered and shown in figures. The greenhouse is assembled by means of bolts of M6, nuts, washers, screws, etc. Joints are accomplished by overlapping of details and by fastening across the holes. Install bolts, nuts and washers in all places indicated in the instruction.

5. The greenhouse assembly is presented in stages, at each stage the assembly units «before» and «after» are shown. The figures of the units do not show the nuts with washers that are installed from the inside of the sha

6. When assembling, be careful not to damage parts since they are not rigid enough until they are fully assembled
Use additional tools to assemble:
-a wrench 10;
-a screwdriver
-a drill with a borer 6.5;
-a stepladder 3m high;
-a fret saw;
-a knife.

Be careful while assembling! Parts have sharp angles. Avoid hand cuts! Work in protective gloves.

INSTALLATION SEQUENCE

GENERAL VIEW OF THE GREENHOUSE FRAME WITH EXTENDING

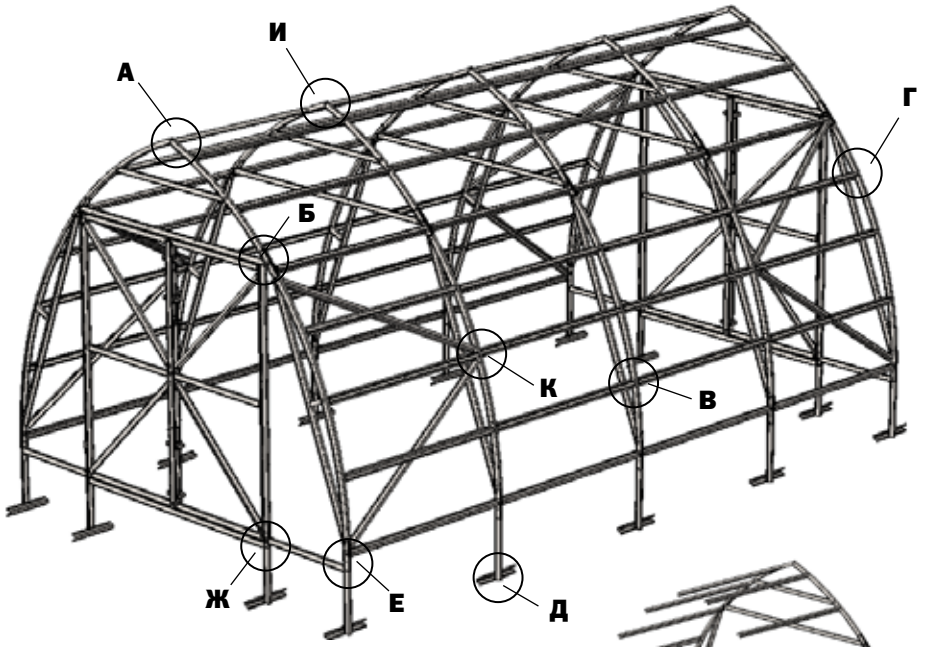


Fig. 1
General view of the greenhouse with two inserts, total length is 8.4 m.

Fig. 1a
ONE «INSERT» extends the greenhouse by 2.13 m. Number of the inserts for the greenhouse is not limited.

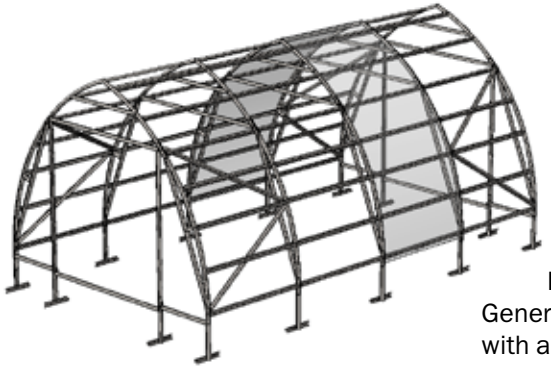
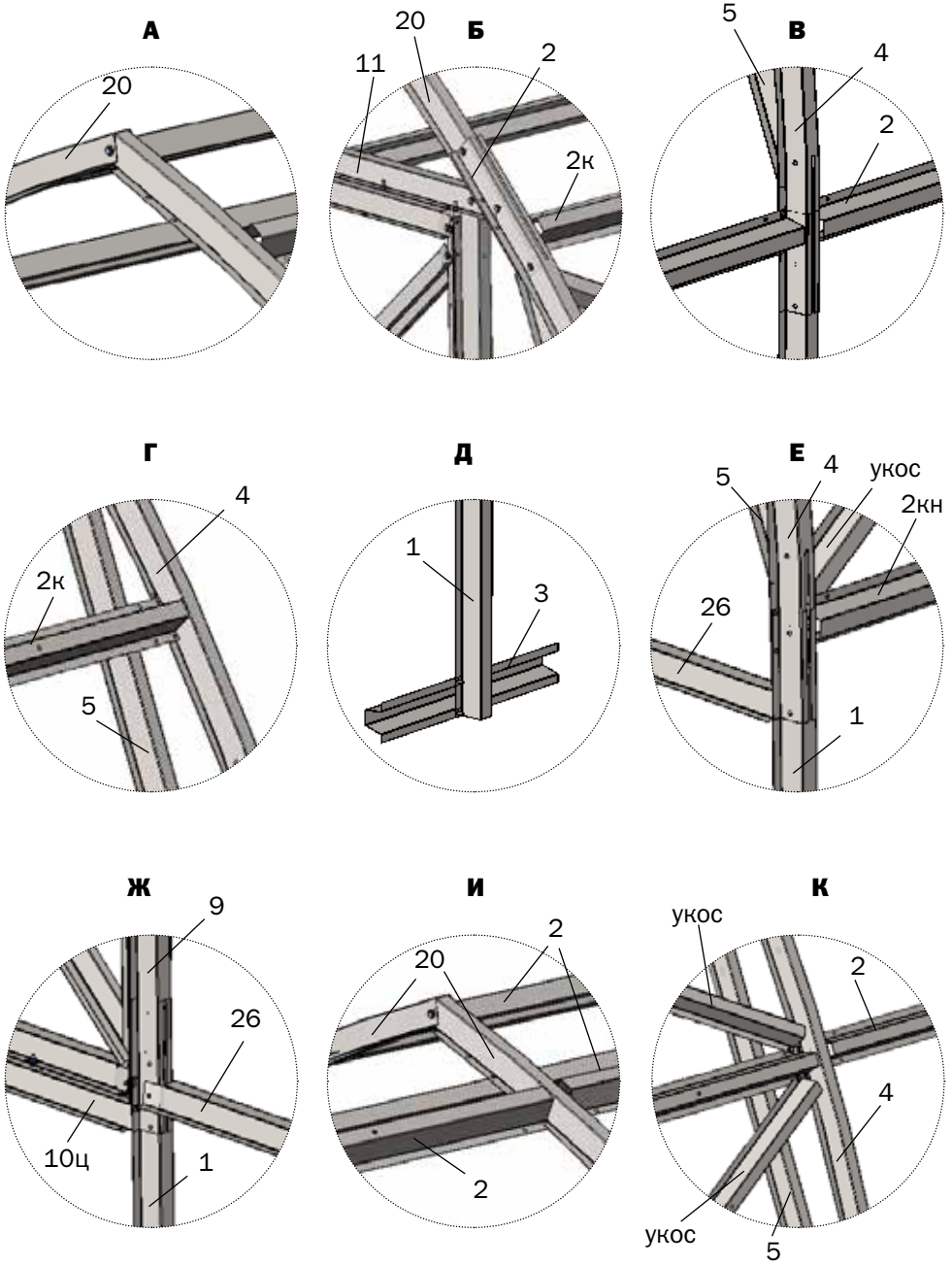


Fig. 1б
General view of the greenhouse with an insert.

GENERAL VIEW OF THE GREENHOUSE FRAME WITH EXTENDING INSERTS

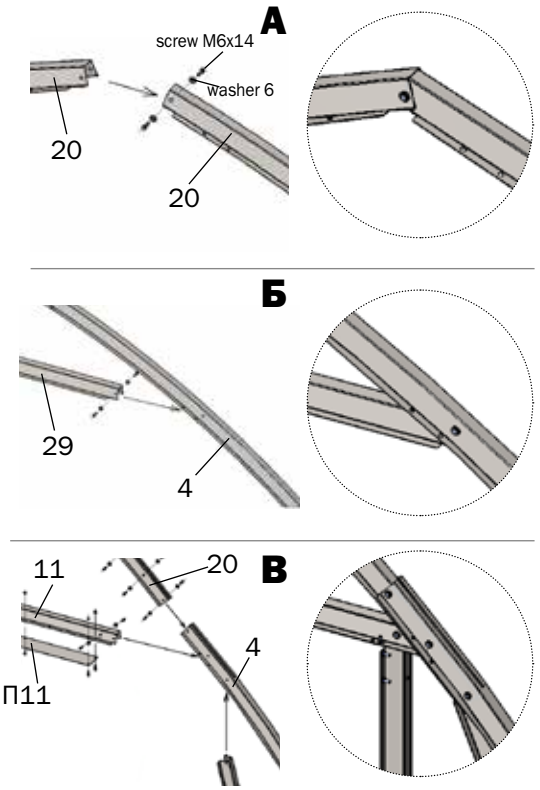


INSTALLATION SEQUENCE

STAGE 1

Assembly of the end wall.

Assembly is carried out according to the **figure 1.1.**



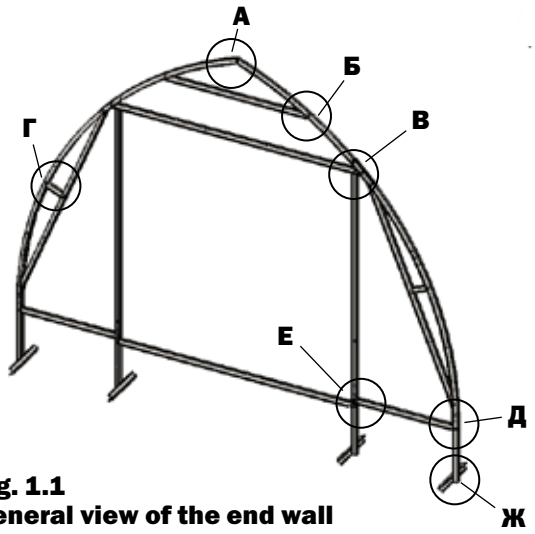
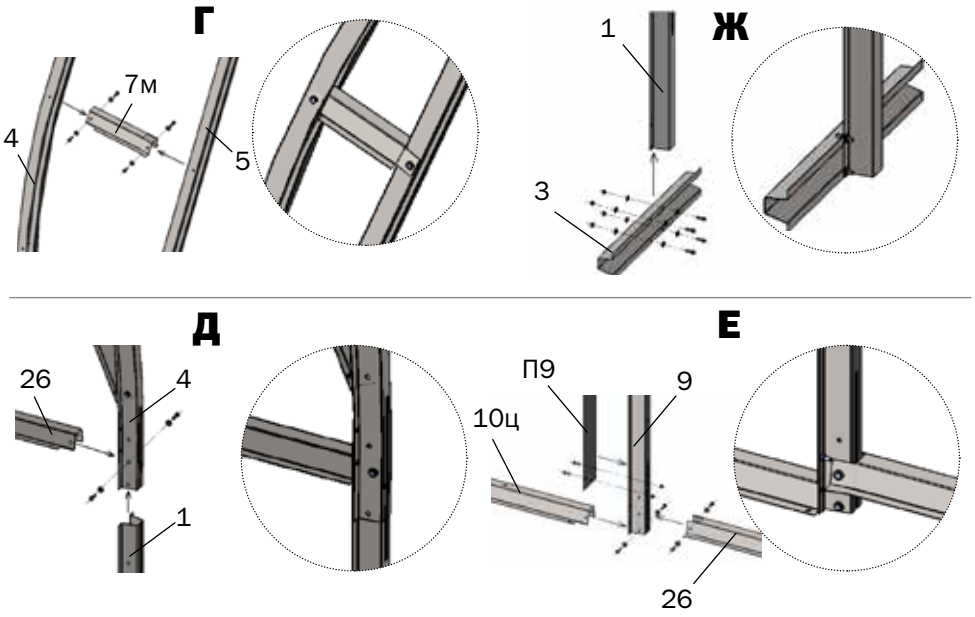
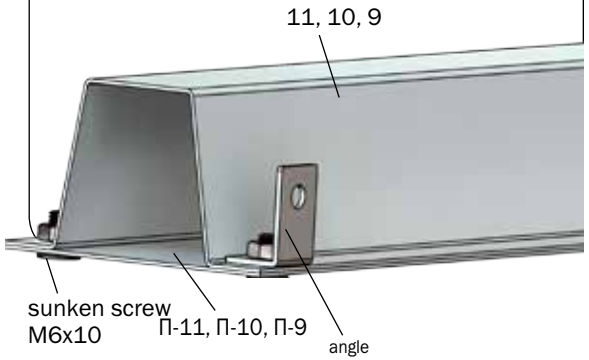


Fig. 1.1
General view of the end wall

INSTALLATION SEQUENCE

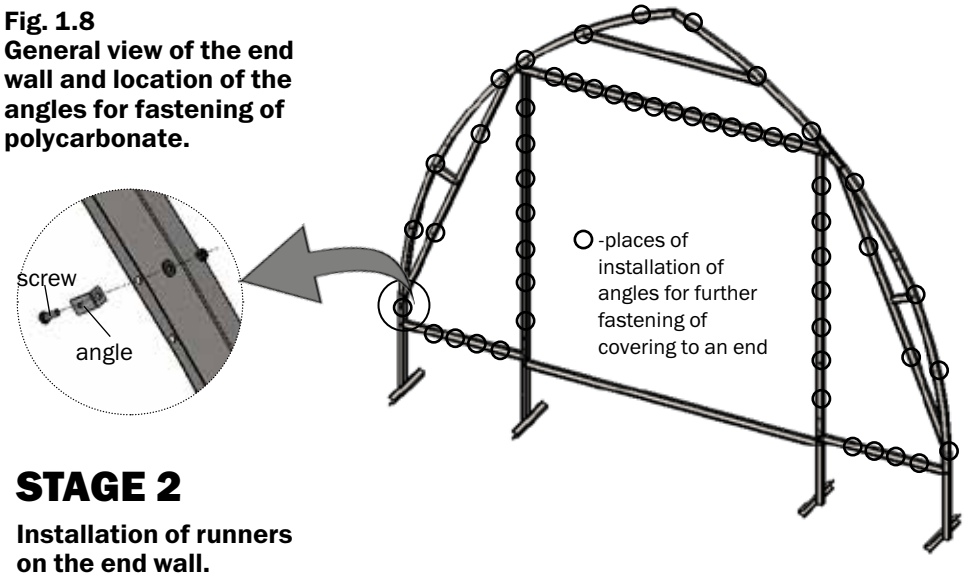


Determine the places of installation of angles in accordance with **fig.1.8.** and install the angles together with the strip **П-11, П-10, П-9.**
Strips with the angles are installed after assembling of the main shaped parts.



INSTALLATION SEQUENCE

Fig. 1.8
General view of the end wall and location of the angles for fastening of polycarbonate.



STAGE 2

Installation of runners on the end wall.

Assembly is carried out according to the **fig. 2**. The assembled end wall is installed in the horizontal plane. To arcs **4** and **20** and girders of the end wall are alternatively joined end runners **2к** и **2кн** align the side flanges of shapes. Runners deviate from the vertical under their own weight and abut against side walls of shapes of arcs **4** (until the next operation).

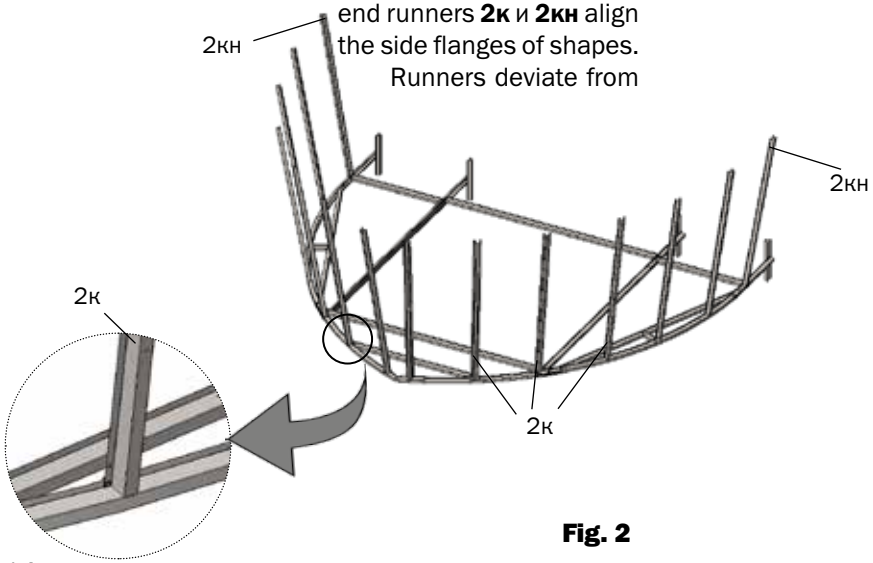


Fig. 2

INSTALLATION SEQUENCE

STAGE 3

Assembly of the power arc

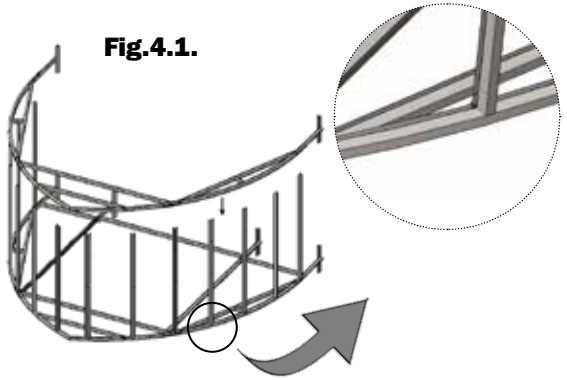
Assembly of the power arc is carried out in a horizontal plane similar to the assembly of the end wall.

STAGE 4

End section assembly.

Assembly is carried out according to the **fig.4.1.** The assembled power arc is brought to the end wall with the installed runners, is raised to the height of the end runners and joined with their upper ends. It is recommended to connect the outermost and middle runners first. For the initial fixation of the power arc on the runners, participation of three people is required for holding of the frame.

Fig.4.1.



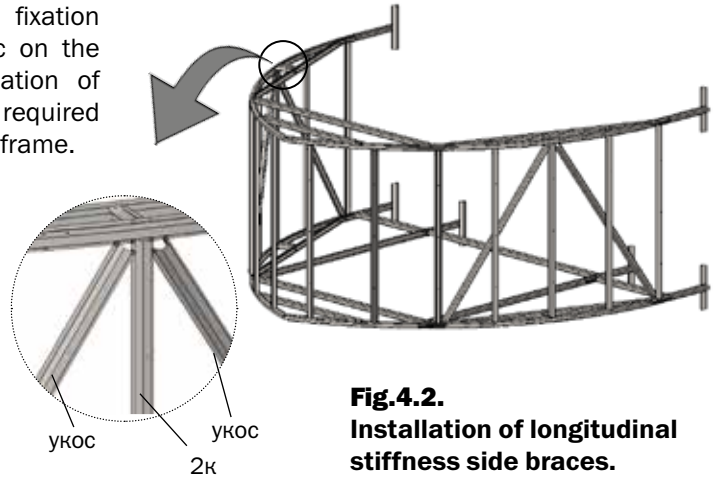


Fig.4.2.
Installation of longitudinal stiffness side braces.

INSTALLATION SEQUENCE

STAGE 5

End section installation

In the variant of installation of the greenhouse **without a foundation**, marking of axes is made on the ground in accordance with **fig. 5.1** and holes 70 cm deep are dug for foundation stay braces with supports.

In the variant of installation of the greenhouse **on a foundation** in accordance with **fig. 5.1,** cleater angles are mounted to the foundation for the subsequent fastening on them bottom ends of arcs in accordance with **fig. 5.2** without foundation stay braces.
The end section is lifted and placed in a vertical position on the prepared place.

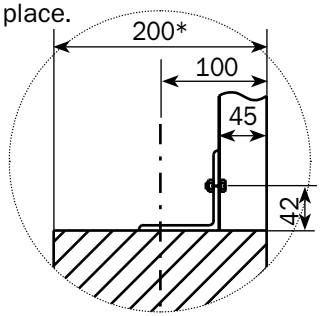
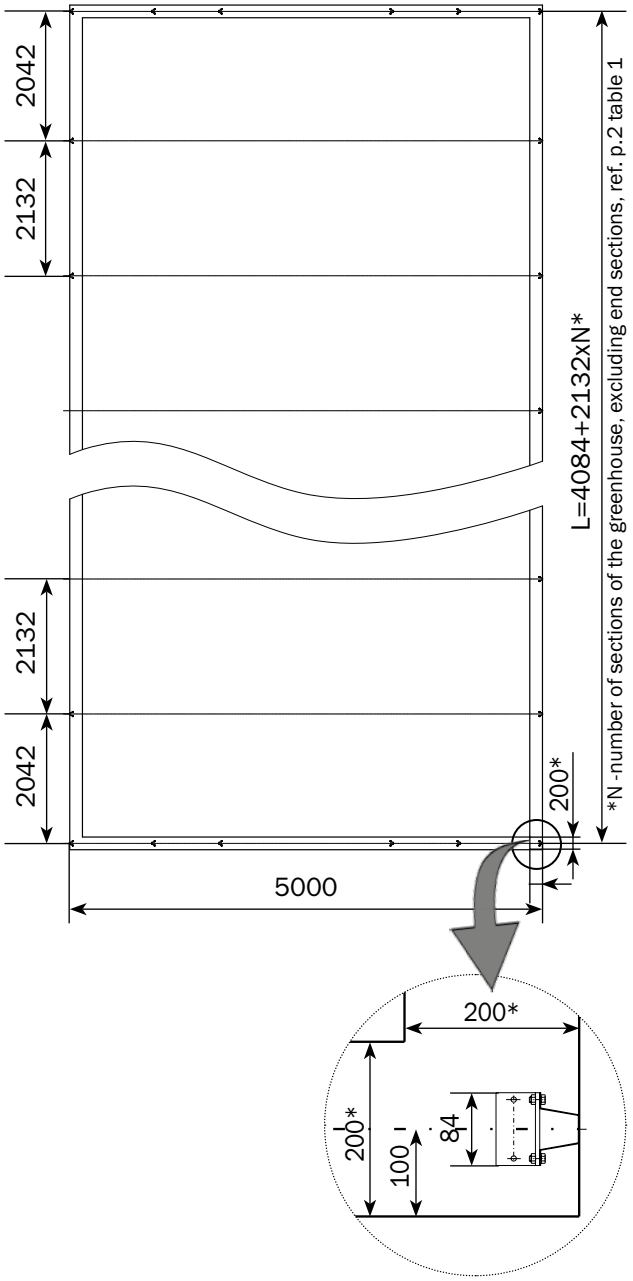


Fig. 5.2

Fig. 5.1



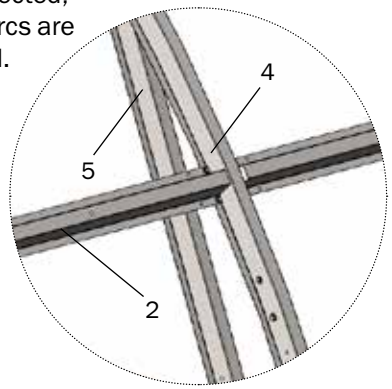
INSTALLATION SEQUENCE

STAGE 6

Extension of the frame length.

Assembled power arc (or other end wall, depending on the needed length of the greenhouse) is brought to the assembled end section at the distance of the main runner and joined to it with the use of main runners 2 and 2н align the side flanges of shapes **(fig. 6).**
It is recommended to connect the outermost and middle runners first, using a stepladder.

Next power arc is joined to the power arc that has already been connected, and so on all the arcs are alternatively joined.



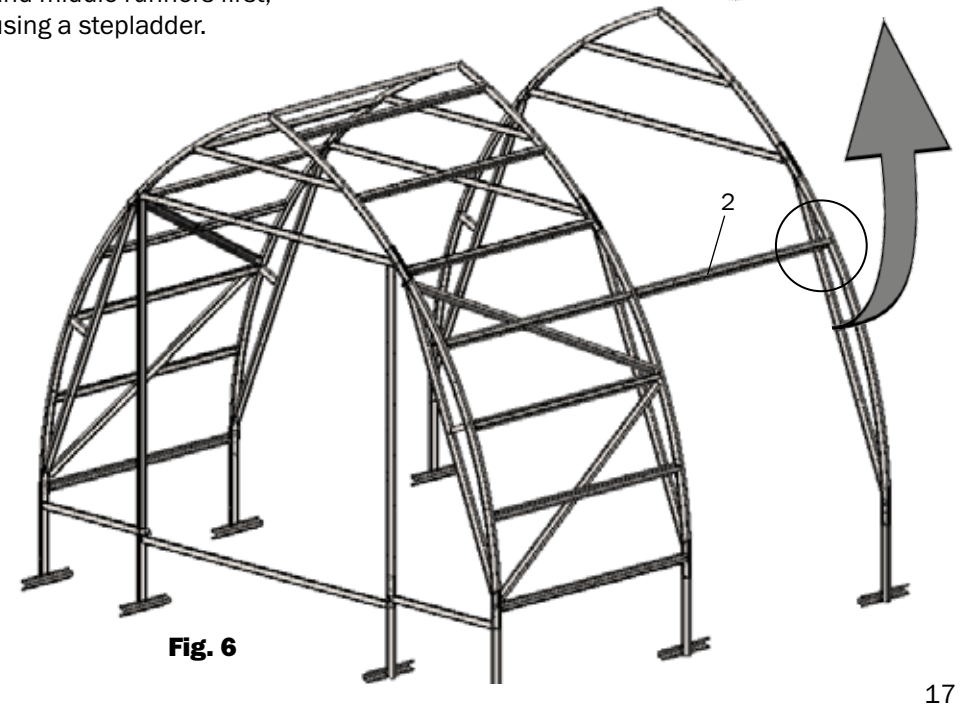


Fig. 6

GATE ASSEMBLY

STAGE 9

Gate assembly.

The gate is assembled in the same way. Joints are shown in the figures. Strips and other surface mounted components are installed after the main shape parts are assembled.

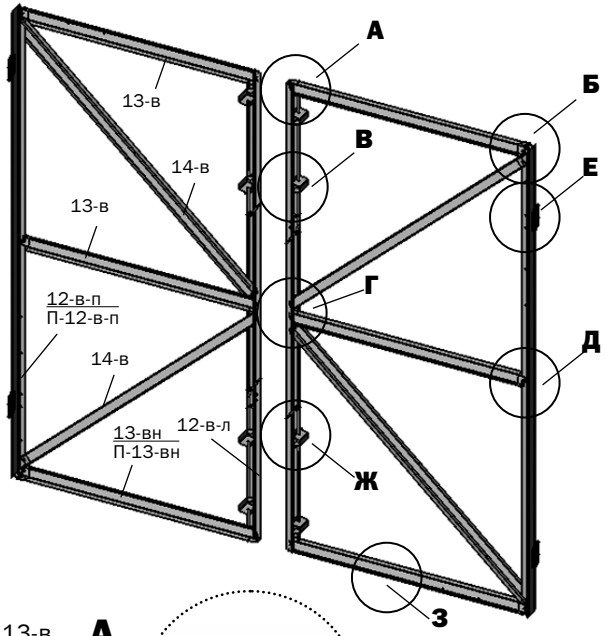
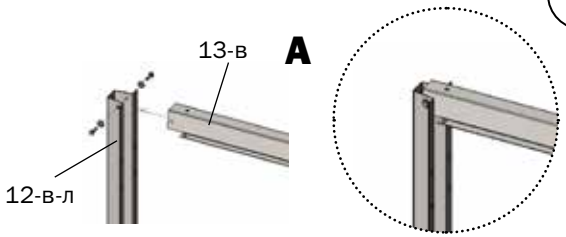
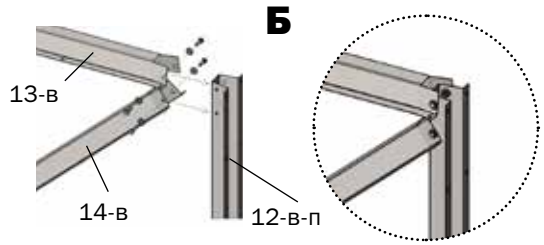
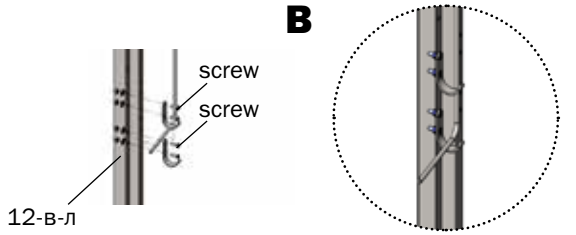


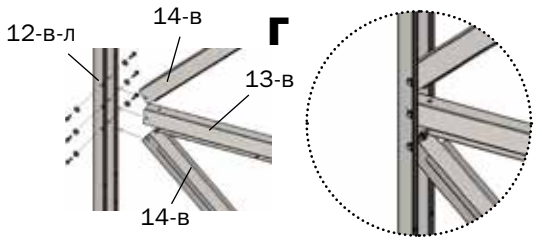
Fig. 9

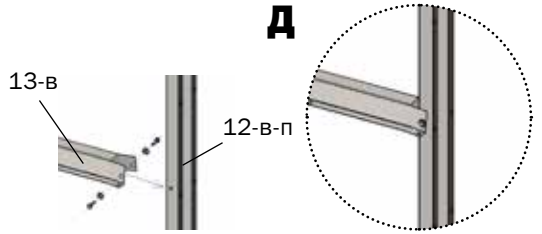


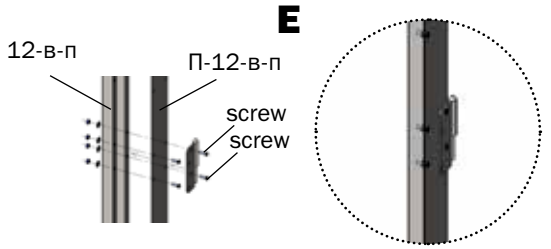


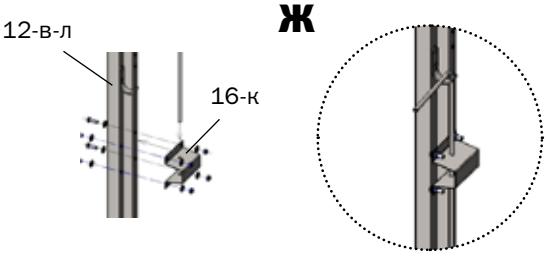


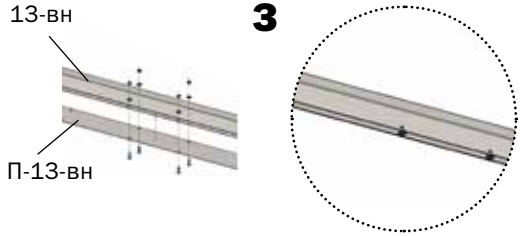
GATE ASSEMBLY











GATE ASSEMBLY

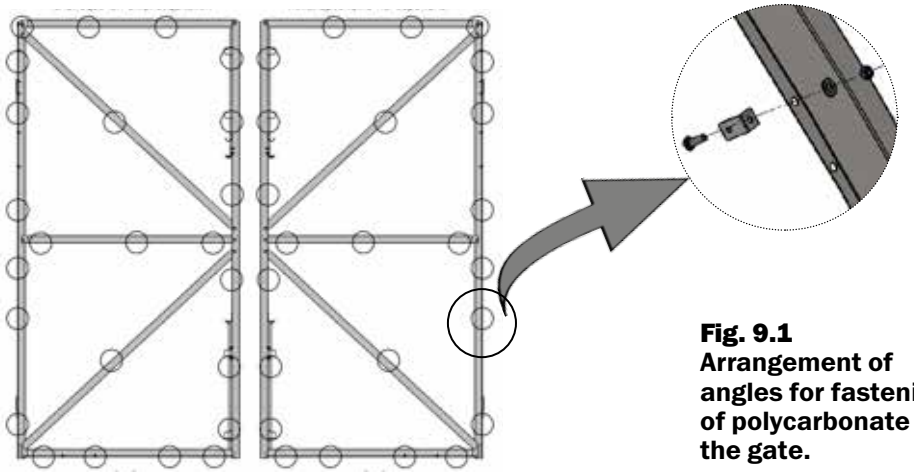


Fig. 9.1
Arrangement of angles for fastening of polycarbonate on the gate.

STAGE 10

Installation of covering

Install honeycomb polycarbonate with a specified side facing outwards (sunward); this side has a covering layer (make sure to clarify it on buying or prior to installation). Covering layer is usually placed on the side with notations on the shipping film. The film is transparent on the opposite side of a sheet. After marking the sheet but prior to cutting it, mark the side with the covering layer on each piece of the sheet: when the shipping film is removed sheet sides look the same. Shipping film shall be removed from the both sides immediately before fastening covering on the frame.

Cut the sheets using a fret saw or a fine-pitch arm saw.

CUTTING LIST OF COVERING OF AN END

CUT POLYCARBONATE SHEET IN STRICT ADHERENCE TO FIG. 10.3
Honeycomb polycarbonate sheet size 2100 x 12000 MM

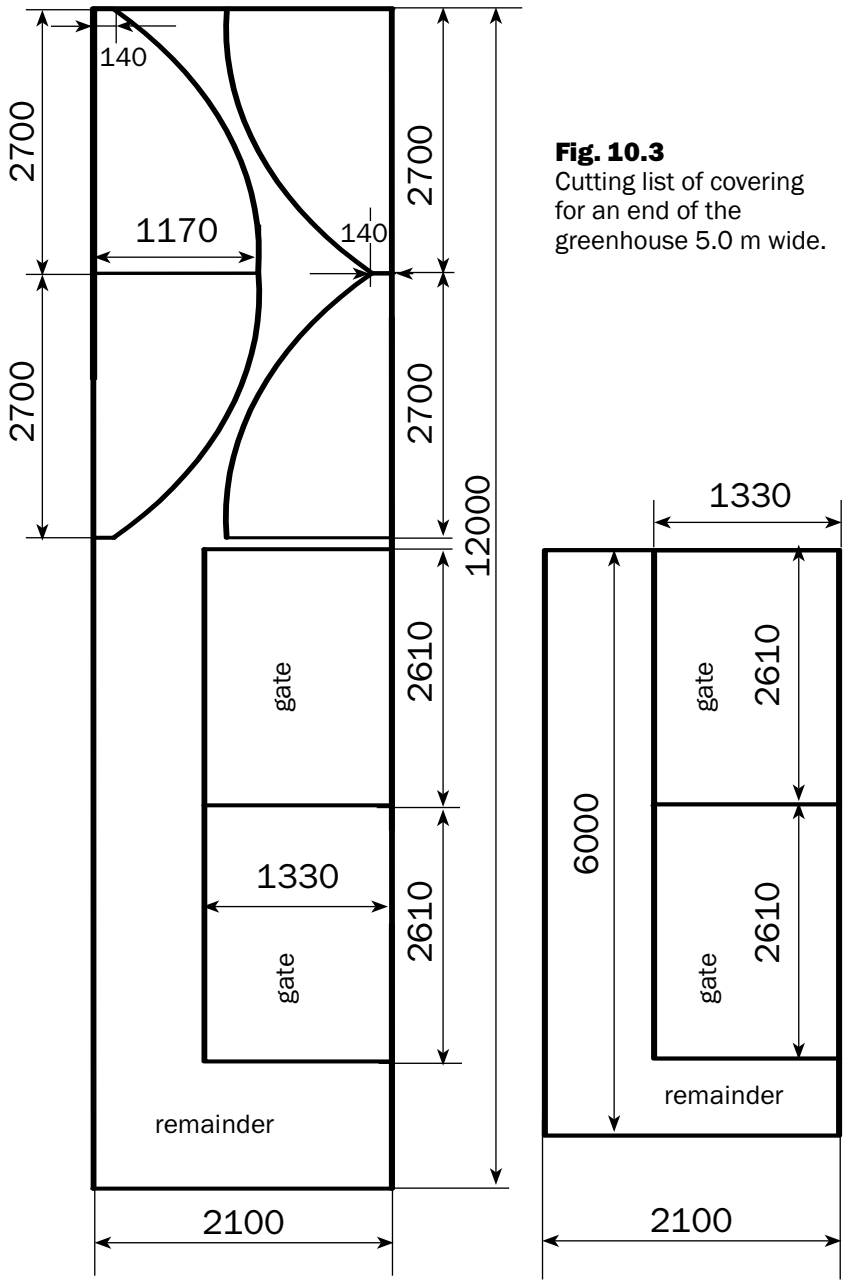


Fig. 10.3
Cutting list of covering for an end of the greenhouse 5.0 m wide.

FASTENING OF COVERING

Fasten the pieces of covering on the end to the angles with the use of washers and self-tapping screws **(fig.10.4).**

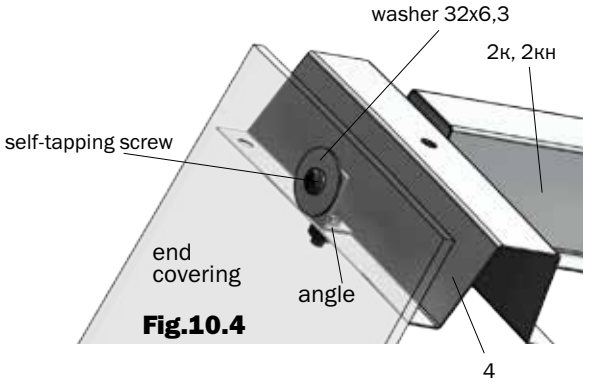


Fig.10.4

Places of fastening of pieces of covering to each other with the use of a permanent polycarbonate connecting shape are shown in **fig. 10.5.**

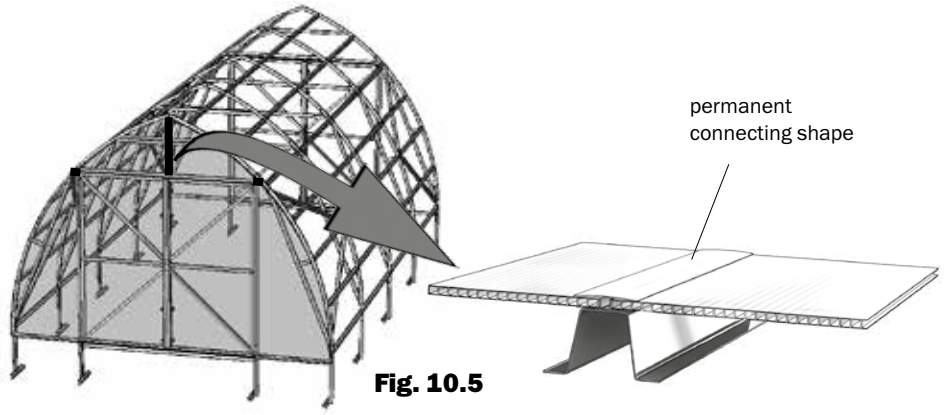


Fig. 10.5

Using a knife, adjust covering pieces to arcs 4 and girder 20, and then install sealing profile in accordance with **fig. 10.6**

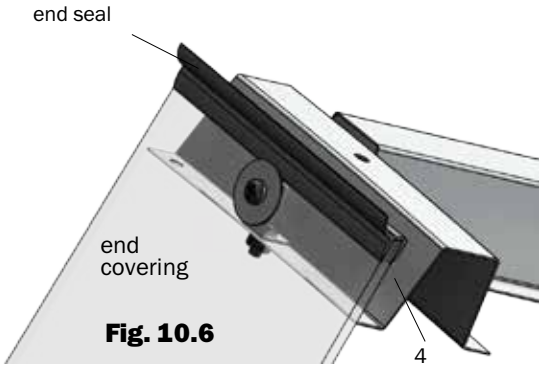


Fig. 10.6

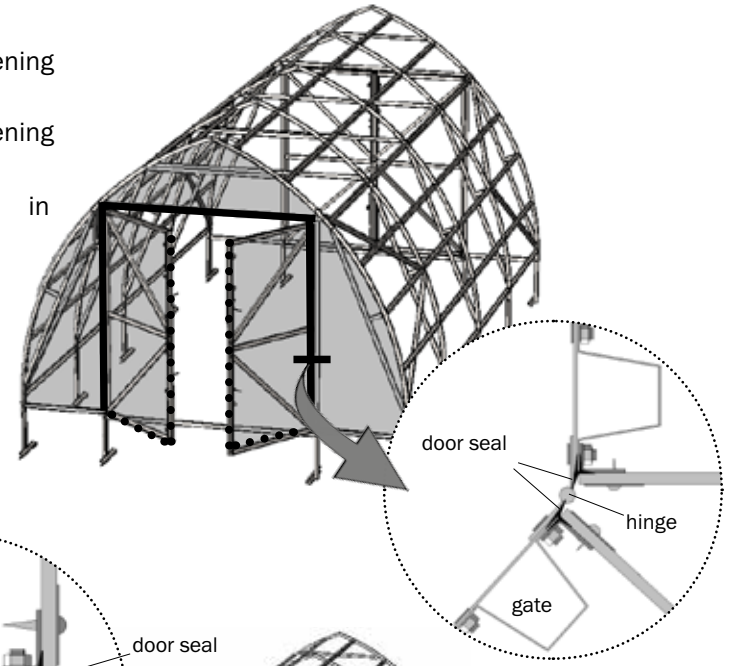
FASTENING OF COVERING

Fig. 10.7

▬▬ - places of fastening of door seals.

••••• - places of fastening of penofol.

Seals are installed in accordance with **fig. 10.7, 10.8**



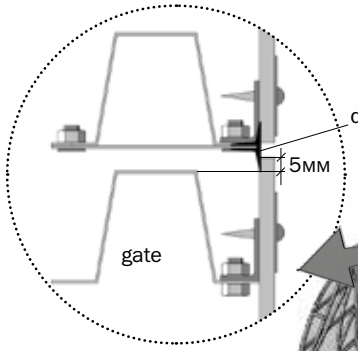
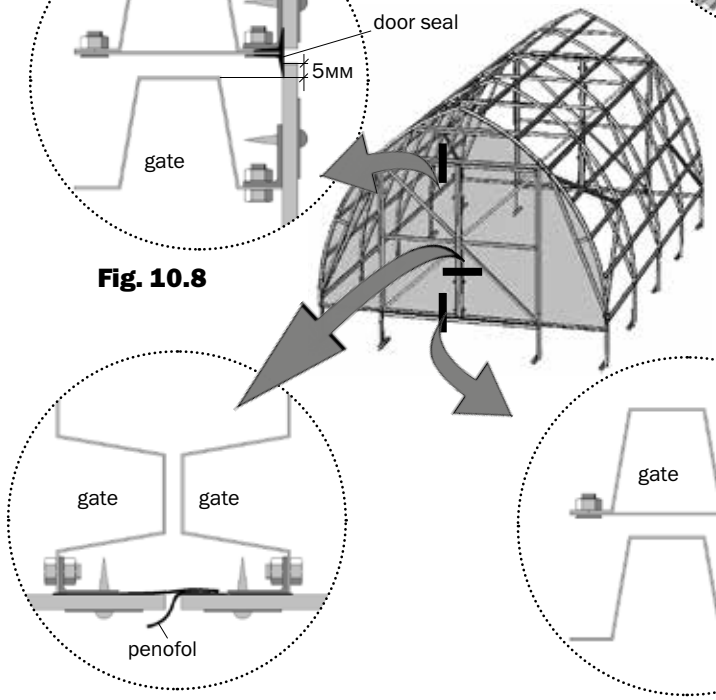


Fig. 10.8



FASTENING OF COVERING

To cover the top of greenhouses 12000 x 21000 mm sheets are cut into pieces with observance of right angle of the cut line to the side edge of the sheet, **fig.10.10**. Reminders are used to cover the top of the end.

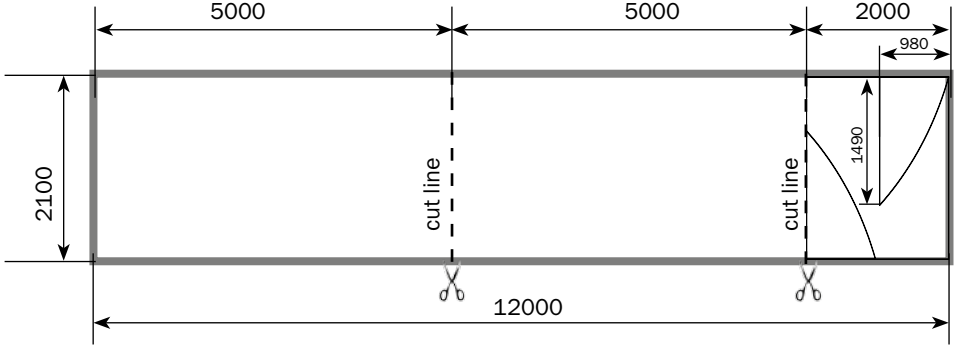
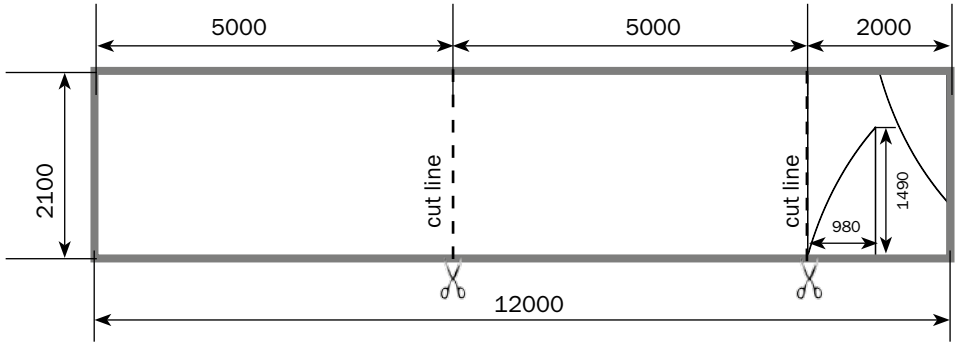


Fig. 10.10



The outermost panels of covering are installed in accordance with **fig. 10.11.**

Fasten the base of a dismountable connecting shape with bolts M6 on arcs, using a drill with a borer 6.5.

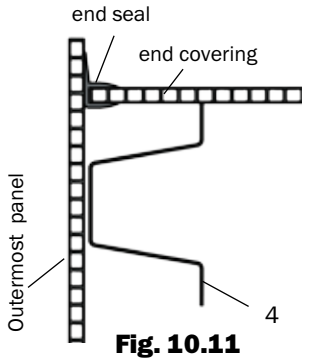


Fig. 10.11

FASTENING OF COVERING

● - places of fastening of washers

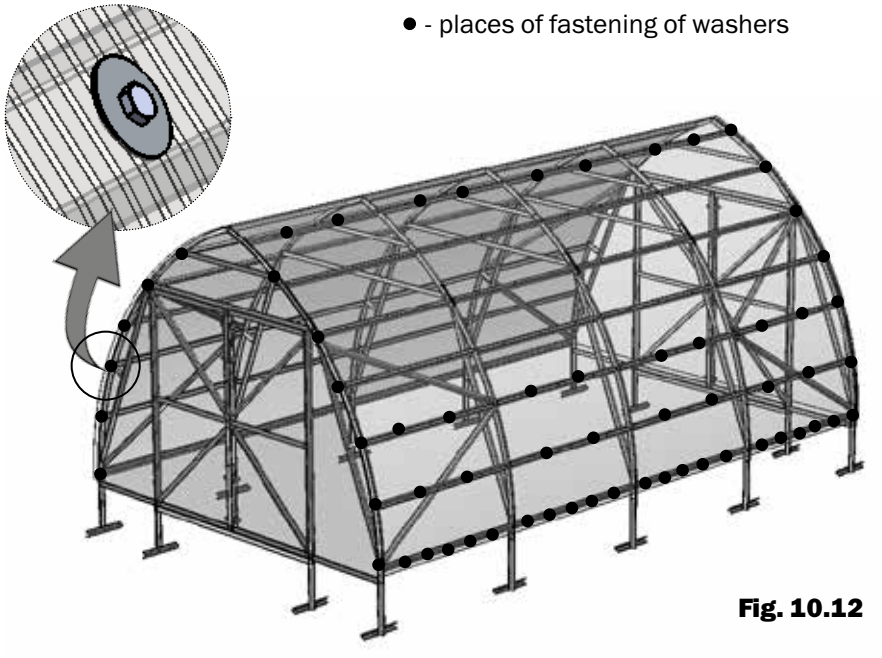
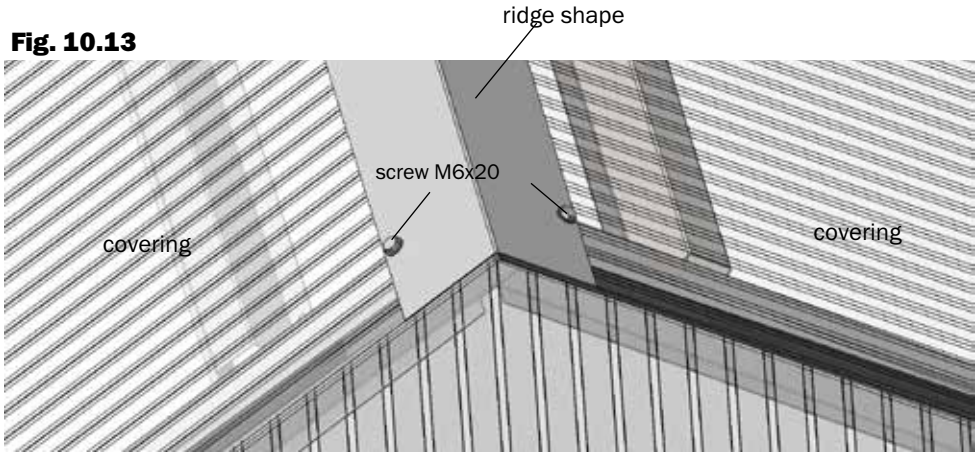


Fig. 10.12

Fasten the panels with the washers in accordance with **fig. 10.12,** installing the ridge shape on the upper joint of panels, **fig. 10.13.**

Fig. 10.13



FASTENING OF COVERING

Connect the side joints of covering together with the use of a dismountable connecting shape (cover + base) 10.14. The base is fastened to the arc 4 and girder 20 with bolts.

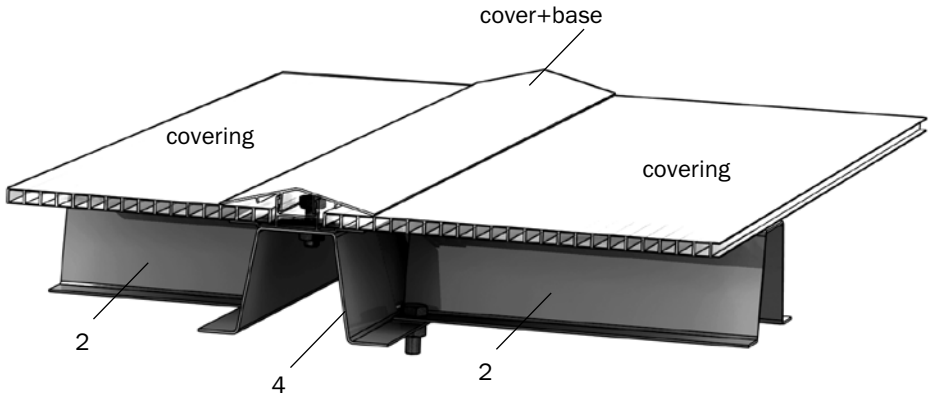


Fig. 10.14

Install lugs and handles on the door.

VOLYA LLC

MANUFACTURER:
LLC «VOLYA», DUBNA, MOSCOW REGION.
phone/fax: (496) 217-17-17,
(495) 745-85-59
www.perchina.ru
e-mail: info@perchina.ru

EN