



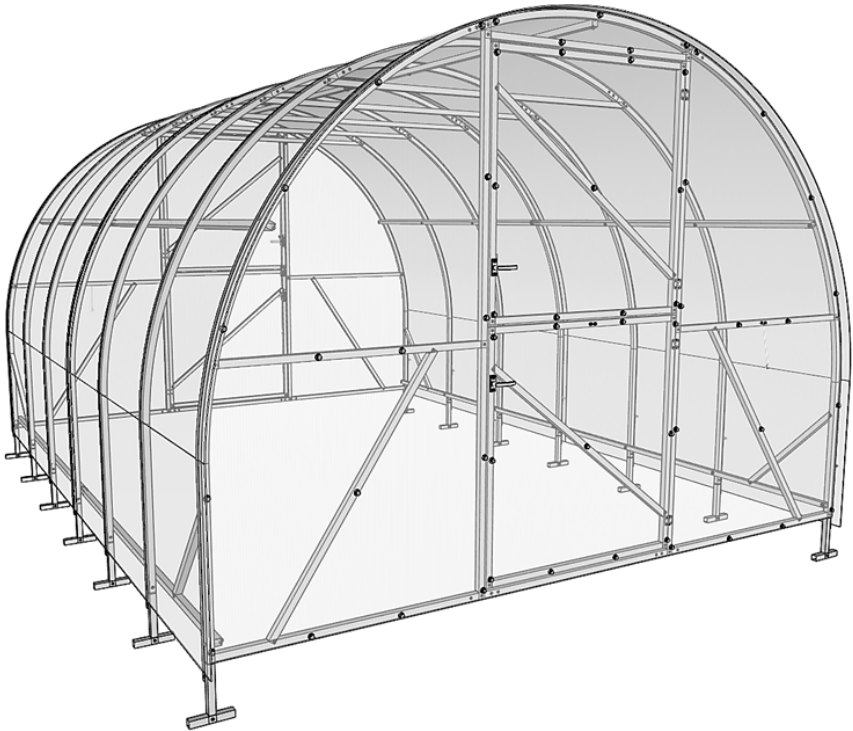
Velcom, Inc
www.GreenhouseToGrow.com

TECHNICAL MANUAL

CAMELLIA

Made of 1"x1" Galvanized Steel Pipe

Covered with High Density UV Polycarbonate



Set of product

Width 10ft (3m) • Height 7ft (2.10m)

Length of base 13ft (4m) • Optional Extension by 6.5ft (2m) etc.

TECHNICAL CERTIFICATE of GREENHOUSE “CAMELLIA”

DISCRIPTION

The greenhouse “CAMELLIA” is designed to create the climate, which is productive to grow horticultural crops on the garden plots.

The length of the greenhouse is 13'L (4m) width is 10' (3m) and height is 7' (2.10m) with ability to extend length by 6.5' (2m) up to 32.5' (10m) the surface of the protected soil is 130 ft².

The frame of the greenhouse is made of square galvanized pipe 1"x1" and it is assembled with the studs, screws, nuts.

The kit includes everything you need to assemble the frame and fasten the covering. The foundation of the greenhouse is not obligatory to install but recommended. The greenhouse is fixed on the ground by digging in to the ground special frame endings.

For fixing cellular polycarbonate to the greenhouse roof, galvanized steel strapping tape is used.

The greenhouse covering is completed on buyer's request. To cover the greenhouse you need a greenhouse frame is designed for covering with cellular polycarbonate 4 mm thick with a High Density of at least 0.7 kg / m². The greenhouse has two doors, one on each end and two vents.

Assembly instructions and operating rules

The greenhouse should be assembled and installed on the ground according the instruction.

The buyer should control the assembly quality if it is made by third person.

Self-tapping screws of mount structure should be tightened to contact the flat head of the screw with the covering surface and hold it to the frame, but do not allow the extra rundown of the screws.

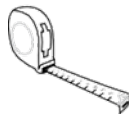
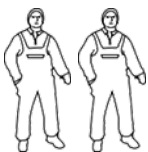
Avoid installing the greenhouse closely to the buildings and trees. The melting snow or ice is a potential hazard. The recommended distance is minimum 7ft.

The greenhouse is designed to endure the wind of less than 50mph.









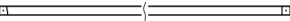
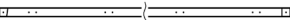

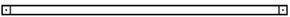




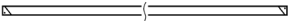
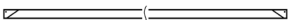


There is no need to skin the greenhouse during the winter time for the greater parts of the regions of Canada and USA. If the greenhouse in not looked after during winter, the customer should determine the possible snow load or to skin the covering.

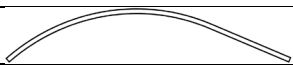
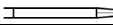

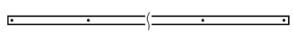
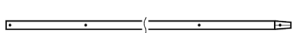
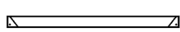
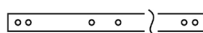







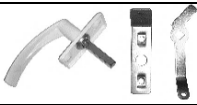


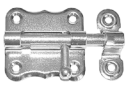

The limit snow load for the frame takes place when the weight of the snow blanket is 240 kg/m² (120Lb/ft²) of horizontal ground surface. This limit snow load requires characteristic snow load of the North snow region (according the classification of construction rules and regulations “Loads and actions”).

For assembly, you will need: a 10mm wrench, a screwdriver with a PH2 attachment, a sharp knife, a carpenter square, a level, a 7-10 m tape measure*, a ladder and protective gloves.***Metric measuring tape needed! Cm/mm**



1. LIST OF ACCESSORIES

No	Part name	Base 13'L (4m)	Insert +6.5'L (2m) optional	Figure (can vary from the actual configuration)
1A	Part of the end arch "A" left	1	-	
2A	Part of the end arch "A" central (with X-inserts)	1	-	
3A	Part of the end arch "A" right	1	-	
1B	Part of the end arch "B" left	1	-	
2B	Part of the end arch "B" central (with X-inserts)	1	-	
3B	Part of the end arch "B" right	1	-	
4	End crosspiece, lower side, 1045 mm	4	-	
5	End crosspiece, lower central, 910 mm (with X-inserts)	2	-	
7	Jamb post, left, 2030 mm	2	-	
8	Jamb post, right, 2030 mm (with apertures for door hinges)	2	-	
10	End crosspiece, upper, 960 mm	2	-	
11	End crosspiece, central lateral, 1005 mm	8	-	
15	Door lintel "C", "D", 902 mm	8	-	
16	Door post, right, "C", "D", 935 m (with apertures for door hinges)	4	-	
17	Upper door post, left, "C" 935 mm (aperture for a door handle, lower)	2	-	
18	Lower door post, left, "D", 935 mm (aperture for a door handle, upper)	2	-	
19	Door diagonal brace, 1100 mm	8	-	
20	Intermediate arch "E" lintel, 1500 mm	5	3	
21	Part of intermediate arch "E", left	5	3	
22	Part of intermediate arch "E",	5	3	

	central (with X-inserts)			
23	Part of intermediate arch "E", right	5	3	
24	Lug stand, 250 mm	14	6	
25	Lug crossbar, 150 mm	14	6	
26	Connective stringer, launching, 2012 mm	6	-	
27	Connective stringer with X-pressing, 2068 mm	6	6	
28	End brace, 600 mm	4	-	
31	Fixing strap, 20x6150 mm	7	3	
40	Bolt M6x60 mm	35	15	
41	Nut M6	35	15	
42	Washer M6	49	21	
43	Screw M4x35 mm	39	3	
44	Nut M4	3	3	
46	Self-tapping screw 4.2x19 mm	458	66	
47	Plastic thermo-washer (for polycarbonate fastening)	116	-	
48	Door handle set (handle, cover plate, catch lock)	4	-	
49	Door holder, 200 mm	2	-	
50	Door hinge	8	-	
51	Door latch	2	-	
52	Stubborn plate for door, 100 mm	2	-	

2. ASSEMBLY DIAGRAM “CAMELLIA” PRODUCT

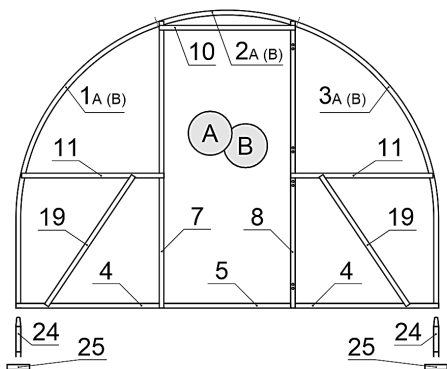


Fig.1 Ends “A”, “B”

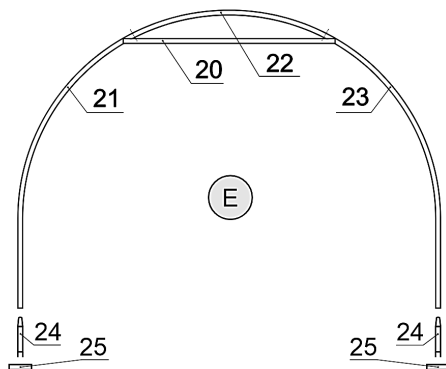


Fig.2 Intermediate arch “E”

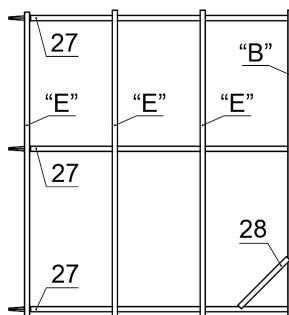
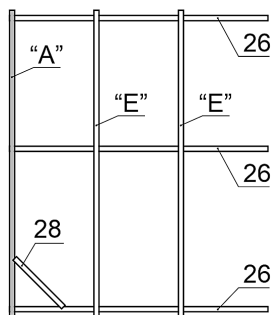


Fig.3 Frame assembly (side view)

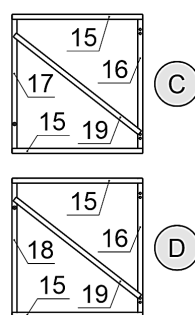


Fig.4 Doors “C”, “D”

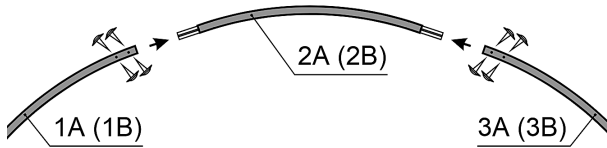
3. ASSEMBLY OF ENDS “A” and “B” (identically the same).

Attention! Places of fastening parts are indented and circled with a marker. Polycarbonate mounting places are only indented.

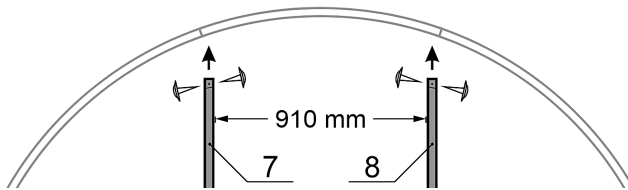
To comply with the correct geometry, the assembly must be made on a flat surface. Before assembly, sort and decompose the details of the ends, doors and intermediate arches according to the scheme and the list of components. For convenience and to accelerate assembly, the fastening of parts by self-drawers can be made on one side of the assembly element, then gently flip the design and secure the screws on the other side.

3.1. Connect left No. **1A**, central No. **2A** and right No. **3A** parts of the end arch "A". Fasten the joint with self-tapping screws No. **46** on both sides (4 self-tapping screws per one joint).

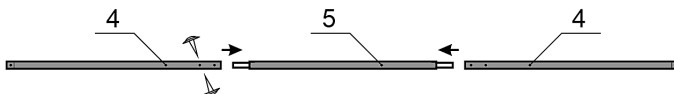
In a similar fashion, assembly the end arch "B" using parts Nos. **1B/2B/3B**:



3.1. Fasten left No. **7** and right No. **8** jamb posts to the arch with self-tapping screws on both sides. The spacing between the posts must be 910 mm:

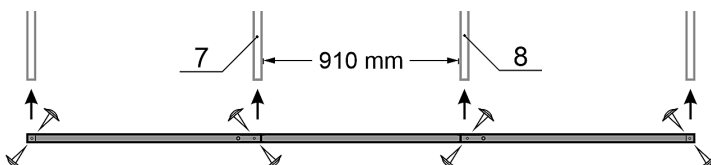


3.2. Connect lower side crosspieces No. **4** with central straight arch No. **5**, fasten with self-tapping screws No. **46** on both sides (2 self-tapping screws per 1 joint):

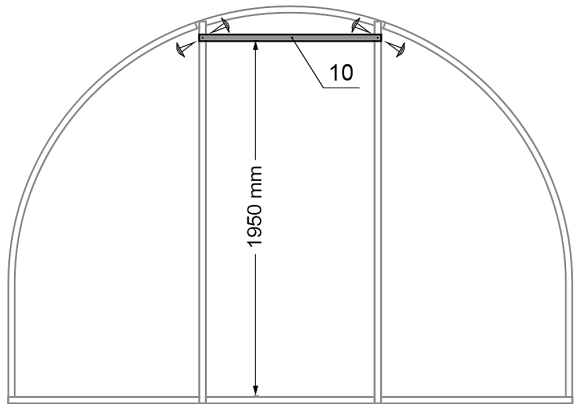


3.3. Fasten the part assembled as per item 3.2. to the arch and jamb posts Nos. **7-8** with self-tapping screws No. **46** from below on both sides (2 self-tapping screws per 1 joint).

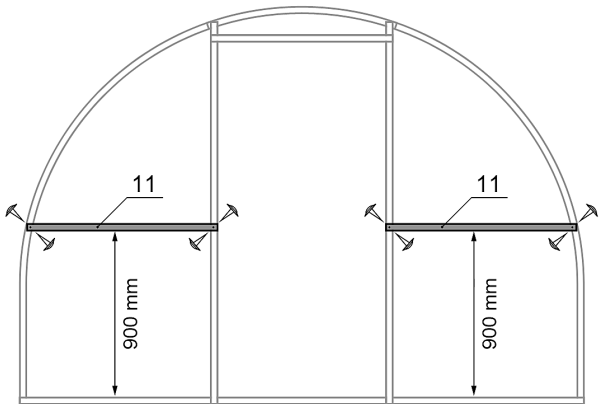
The spacing between posts Nos. **7-8** must be 910 mm:



3.4. Install upper crosspiece No. **10** between posts Nos. **7-8** at 1950 mm from the lower crosspiece and fasten with self-tapping screws No. **46**:

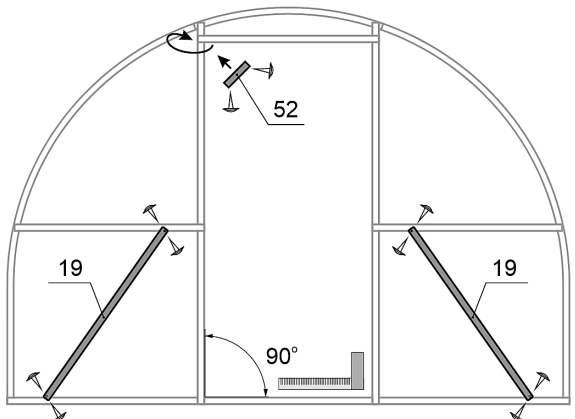


3.5. Install four lateral crosspieces No. **11** between jamb posts Nos. **7-8** and side posts No. **3** at 900 mm from the lower crosspiece and fasten with self-tapping screws No. **46**:



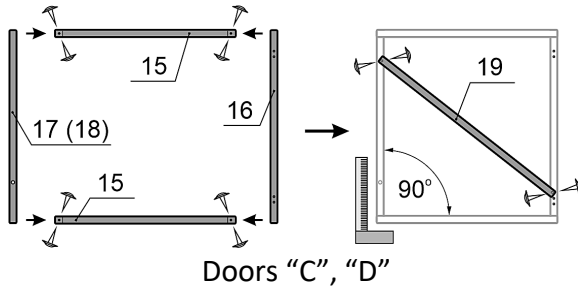
3.6. Use a Carpenter square to set the doorway angle 90°. Fasten braces No. **19** between central No. **11** and lower crosspieces with self-tapping screws No. **46**:

3.7. Use self-tapping screws No. **46**. to fasten thrust plate No. **52** in the upper left-hand corner of the doorway on the inside (to prevent from door opening inward).

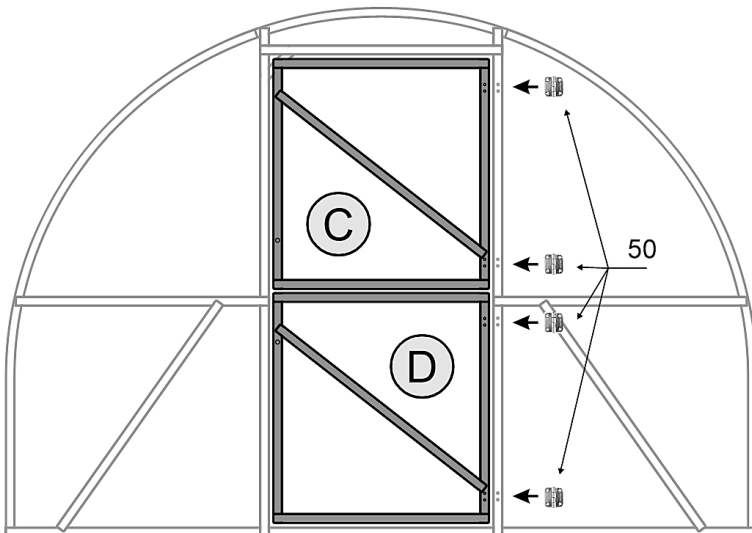


3.8. Use parts Nos. **15-16-17-18-19** to assemble the upper door “C” and lower door “D” with the help of self-tapping screws No. **46**. Door posts No. **16** with apertures for door hinges must be to the right, and posts Nos. **17(18)** with the aperture for the door handle must be to the left. The upper door “C” aperture for the door handle must be at the foot, and the door “D” aperture for the door handle must be at the top.

Use a Carpenter square to set angle 90° between the post and the crosspiece, and fasten diagonal brace No. **19** with self-tapping screws No. **46**:

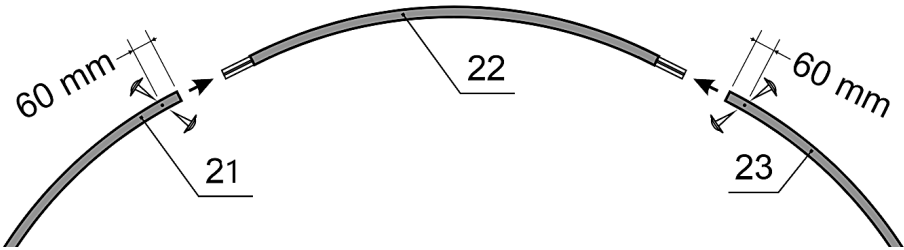


3.9. Install doors “C”, “D” in the end door apertures using door hinges No. **50**, screws No. **43** and nuts No. **44**:

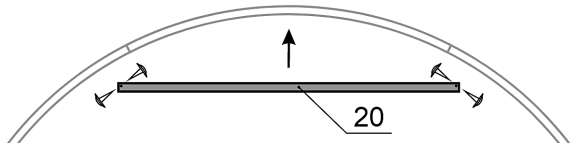


4. ASSEMBLY OF INTERMEDIATE ARCS "E"

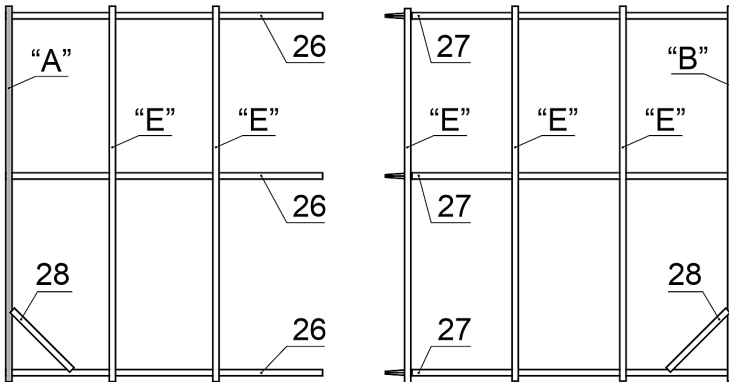
4.1. Connect parts of arches Nos. 21-22-23 with self-tapping screws No. 46, 2 self-tapping screws No. per one joint at 60 mm from the pipe end:



4.2. Use self-tapping screws No. 46 to fasten crosspiece No. 20 to the assembled arc:



5. ASSEMBLING THE FRAME Base 13'L(4m)



Frame assembly diagram (side view)

5.1. Use bolts No. 40 with nuts No. 41 and washers No. 42 to fasten the assembled end "A" to five launching stringers No. 26 through holes drilled in the arcs.

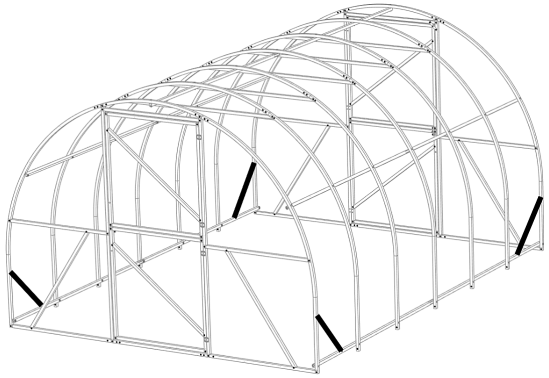
5.2. Fasten two intermediate arches “E” to launching stringers using bolts No. **40**.

5.3. Insert X-pressing stringers No. **27** into launching stringers No. **26**.

5.4. Fasten intermediate arches “E” to stringers No. **27** with bolts No. **40** through the drilled holes.

5.5. Fasten the end “B” with bolts No. **40** for the standard 13’L (4 m) long frame.

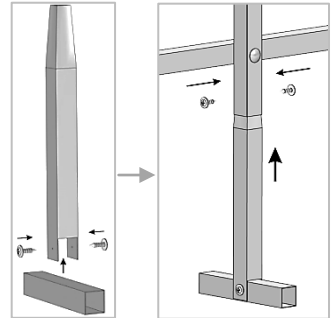
5.6. Install side braces No. **28** between the end arches and lower longitudinal stringers Nos. **26-27**. Fasten the braces with self-tapping screws No. **46**, having angle 90° between the end and the stringer preset using a set square.



5.8. Connect lug crossbar No. **25** and lug stand No. **24** using self-tapping screws No. **46**, so they form a T-foot.

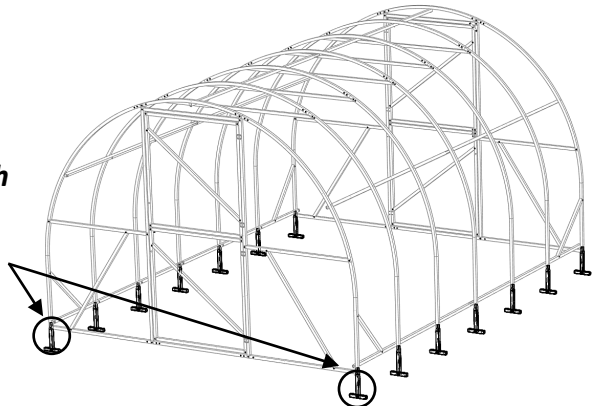
5.9. Insert the T-foot into the arch from below until tight, fasten with two self-tapping screws No. **46**.

5.10. In a similar fashion install T-feet into all remaining arches.



Important!

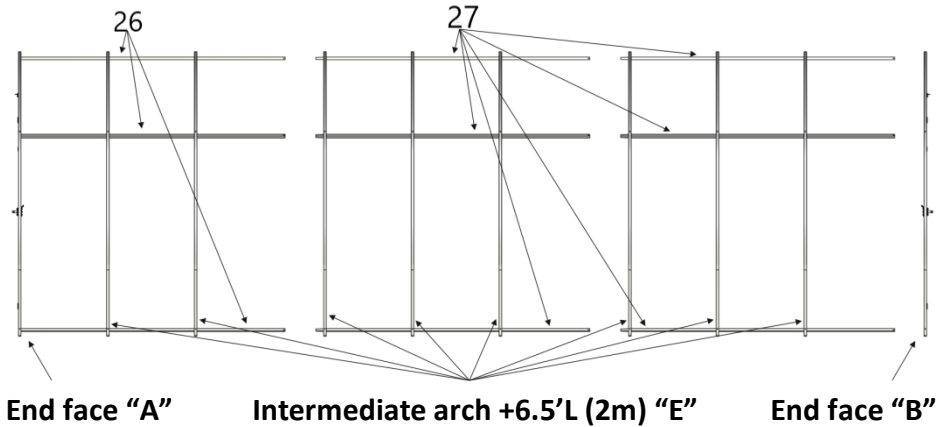
To install T-feet into the end, unscrew self-tapping screws connecting the arch with the lower crosspiece, install the foot and tighten self-tapping screws again.



OPTIONAL EXTENTION OF GREENHOUSE DIAGRAM

Use the sets consisting of five X-pressing stringers No. 27 and three intermediate arches to extend the frame by 6.5'L (2 m) etc.
(OPTIONAL)

Side View of Greenhouse Base 13'L(4m) + Extension 6.5'L(2m) etc.



The End Face "A" and End Face "B" are identically the same!

Quantity of Polycarbonate sheets for different size of Arch Greenhouse *CAMELLIA*

13'L x 10'W x 7'H (1 Base) – For the Ends 1 sheet
For the Roof 2 sheets

19.5'L x 10'W x 7'H (1 Base, 1 Insert) – For the Ends 1 sheet
For the Roof 3 sheets

26'L x 10'W x 7'H (1 Base, 2 Insert) – For the Ends 1 sheet
For the Roof 4 sheets

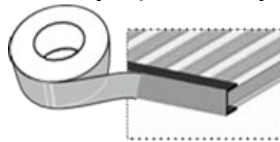
32.5'L x 10'W x 7'H (1 Base, 3 Insert) – For the Ends 1 sheet
For the Roof 5 sheets

6. POSITIONING OF CELLULAR POLYCARBONATE ON THE ENDS "A","B"

Important!

For Polycarbonate positioning it is important that all cellular lines be located in a vertical position (downwards). Be sure to remove the wrapping film from both sides of the sheet. The manufacturer marks the work face (sunward) of cellular polycarbonate with a certain mark (a color bar, sticker or other).

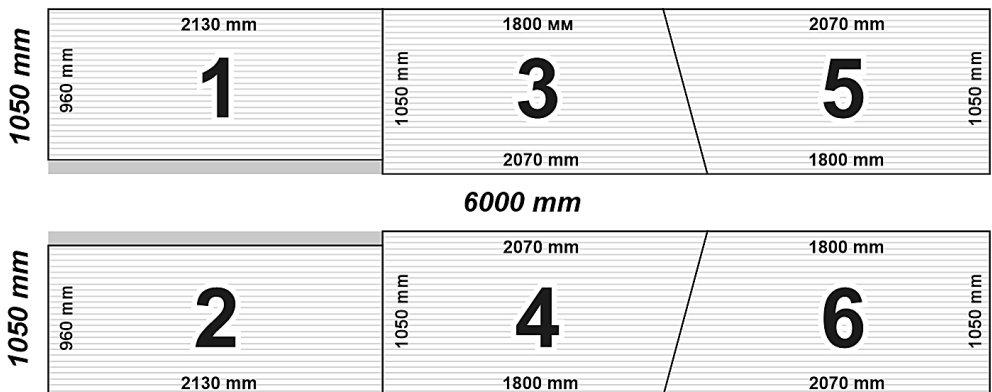
To prevent moisture from entering the polycarbonate open honeycomb and inside the greenhouse, we recommend sealing the joint of polycarbonate sheets along the entire length with a waterproof self-adhesive tape (dense tape or similar material).



6.1. Put the 2100 x 6000 mm Polycarbonate sheet face up on the even surface.

6.2. Cut the sheet lengthwise into 2 equal parts of 1050 x 6000 mm.

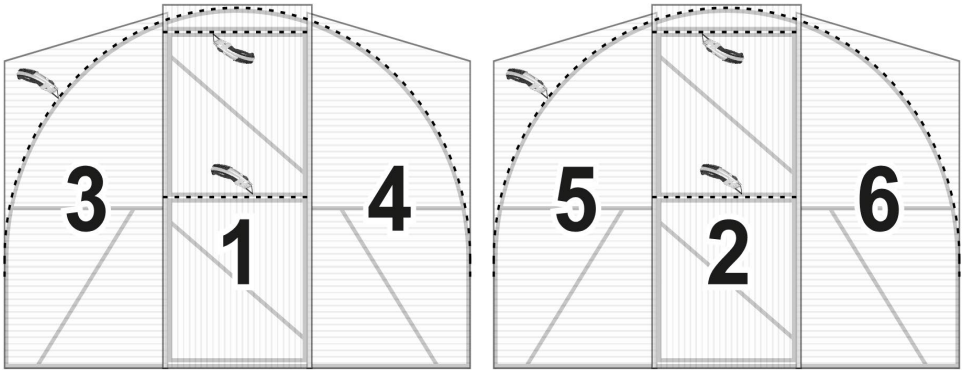
Cut the sheets into parts according to the cutting pattern:



Polycarbonate Cutting Diagram ONE SHEET NEEDED FOR BOTH ENDS

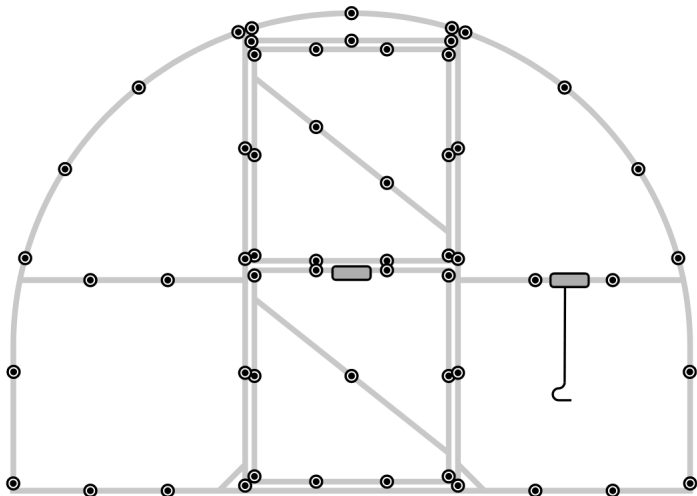
6.3. Hold **part 1** of Polycarbonate against the end door; align the Polycarbonate lower edge against the lower crosspiece of the end. Fasten with self-tapping screws No. **46** via thermo-washers No. **47** according to the polycarbonate fastening pattern.

6.4. Hold **part 3** of Polycarbonate against the left part of the end, and **part 4** of Polycarbonate against the right part of the end; align the Polycarbonate lower edge against the lower crosspiece of the end. Fasten **parts 3 and 4** with self-tapping screws No. **46** via thermo-washers No. **47** according to the fastening pattern. In a similar fashion position **parts 2-5-6** on the second end.



Layout of polycarbonate sheets on the Ends "A","B"

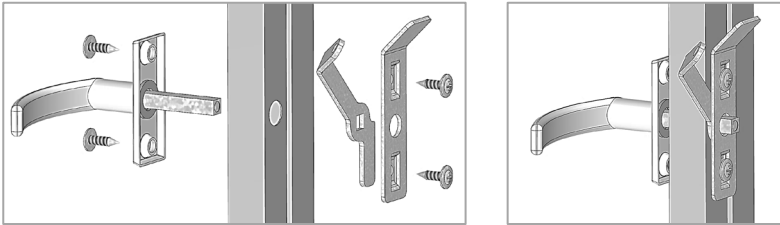
6.5. Cut the protruding Polycarbonate across the end arc. Make slits along vertical and horizontal edges of doors and ventilation panes of both ends.



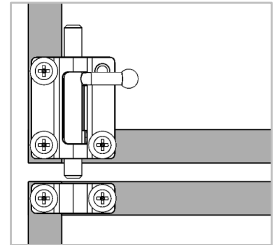
The scheme of fixing polycarbonate to the End "A","B" and doors

6.6. Fasten the door holder No. **49** to the right crosspiece of the end with self-tapping screws No. **46**, and fasten the hinge of the door holder on the lower door lintel for the holder to fix the door in the open position (see the figure above).

6.7. Insert door handles from set No. **48** to $\varnothing 12$ apertures in the doors (be sure to pre-drill relevant holes in polycarbonate). Put the catch lock and cover plate on the backside, fasten the handle and cover plate with self-tapping screws No. **46**.



6.8. Fasten door latch No. **51** with self-tapping screws No. **46** from inside between the lower and upper doors, so that the doors can be locked up with each other. For this purpose, unscrew the self-tapping screw in the door corner, mount the latch, and tighten the self-tapping screw again.



7. POSITIONING OF CELLULAR POLYCARBONATE ON THE ROOF

IMPORTANT!

Prior to positioning Polycarbonate on the roof, make certain that the frame geometry is correct.

Diagonal distance between the frame angles must be equal.

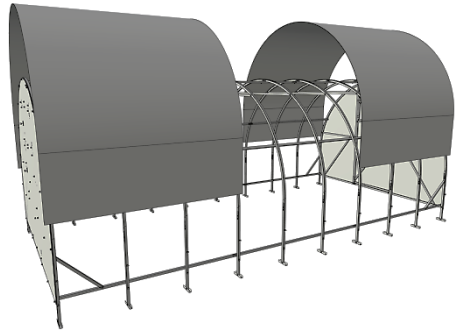
Longitudinal stringers must be straight, free from curves and skewing.

Be sure to remove the wrapping film from both sides of the sheet.

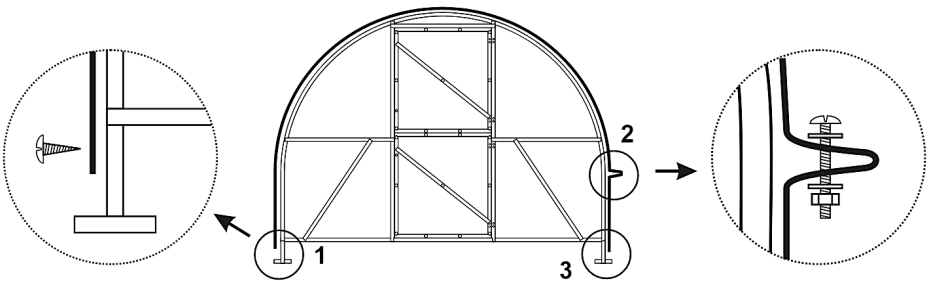
The manufacturer marks the work face (sunward) of cellular polycarbonate with a certain mark (a color bar, sticker or other).

Polycarbonate cellular lines must be located along the frame arches of the greenhouse.

7.1. First, position margin Polycarbonate sheets (from the ends). Position Polycarbonate sheets so that they overlap (overhang) the end edge by 50 mm.



7.2. Press down the first Polycarbonate sheet with fixing strap No. **31** (**position 1**) and fasten one end of the strap to the arch foot beneath the polycarbonate edge with self-tapping screw No. **46**.



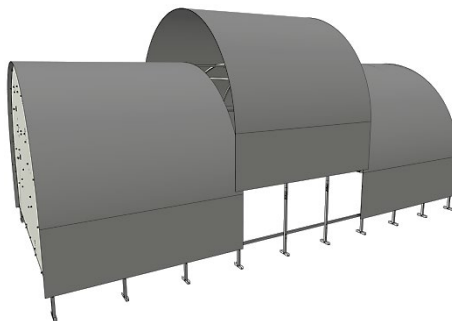
7.3. Bend the strap in the place where there are two holes punched at 5 cm distance from each other (**position 2**) so that such holes are opposite one another.

7.4. Insert screw No. **43** with two washers No. **42** into the holes and fit nut No. **44**.

7.5. Stretch the fixing strap tight by hand and fasten the second end to the opposite arch foot with self-tapping screw No. **46** (**position 3**).

7.6. Align the fixing strap centrally along the arch. Stretch the fixing strap tight when drawing screw No. **43** up tight (figure 12-2). The fixing strap must draw the sheet close to the arch.

7.7. Position the intermediate Polycarbonate sheet with overlap to the neighboring sheet and press it down with the fixing straps. After all sheets are positioned, check whether Polycarbonate sheets position is correct and whether cellular lines are parallel to the arch bows. Check the position and tensioning of fixing straps.



Check the fixing strap tensioning at least once a year.

8. INSTALLATION OF THE GREENHOUSE

8.1. Before starting the work, thoroughly level the site where the greenhouse will be installed.

8.2. Dig pits or trenches of adequate length and width under the lugs.

8.3. Install the assembled greenhouse so that lower crosspieces of the ends are on a level with the ground and the lugs dig into the ground.

8.4. Backfill the lugs and tighten the ground.

When lowering the greenhouse into the trench or holes avoid longitudinal skewing and displacement of fixing straps from the arches. After the ground is tightened, check that the fixing straps are not displaced and are located along the arches. Rearrange the straps when necessary.

The wooden, brick or concrete foundation can be used for fixing the greenhouse.

ATTENTION!

The greenhouse has a surface exposed to the wind. Do not leave the greenhouse unfixated. When the greenhouse is installed in a windy area, use any additional available materials (rods, bars, etc.) for attachment to the ground.

Do not install the greenhouse in close proximity (less than 2 meters) to any buildings, barriers, fences.

The site where the greenhouse is installed must be flat, free of significant level differences.

To prevent from distortion of the greenhouse parts exposed to snow load and wind load in winter, remove all cellular polycarbonate sheets from the greenhouse arches (greenhouse roof) by removal of fixing straps. The advantage of sheets removal for the winter is that snow falls into the greenhouse so enriching the soil with useful minerals when it melts, and protects it from desalination. The roof open in winter prevents the situation when harmful insect crawl into the greenhouse when it turns cold, and eat fresh sprouts in spring.

If removal of sheets is impossible, it is necessary to strengthen the arches from inside using T-shaped wooden baulks (made of timber of at least 50x50mm section) installed within the greenhouse – one baulk per each arch. Wooden baulks are not included in a supply package and are made by customers by themselves. The customer must independently estimate probable snow load and install baulks or remove snow from the frame when necessary, depending on climate conditions or and/or location of the greenhouse.

Failure to comply with the above requirements is the basis for refusal to provide warranty service for the product.

Install the greenhouse at least in 6.5' (2 meters) from any buildings, barriers, fences. When the greenhouse is installed in a windy area, use any additional available materials (rods, bars, etc.) for attachment to the ground. Do not expose the greenhouse frame to extreme mechanical actions. Do not modify the greenhouse design by yourself.

9. LIMITED WARRANTY OBLIGATIONS

- 1. The manufacturer guarantees that the greenhouse frame (hereinafter referred to as the product) is new, fully equipped, and free from manufacturing defects.*
- 2. The manufacturer is responsible for completing the product.*
- 3. The manufacturer is responsible for the collection of the product in accordance with the instructions.*
- 4. The warranty period for full coverage of the product is for 12 month period from the date of sale. Including any manufacturing and material defects. If the repair is determined to be covered under warranty and it is consumer responsibility to send required evidence as pictures and video of damaged or broken parts.*
- 5. The limited warranty includes the stipulation that the seller and the consumer split half and half for cost of repairs and replacement parts for a 24 month period after 1 year of full coverage. If the repair is determined to be covered under warranty and it is consumer responsibility to send required evidence as pictures and video of damaged or broken parts.*
- 6. The warranty covers delivery cost within 50 mile radius from the store. The customer is responsible for freight charges to all further destinations outside of 50 mile radius.*
- 7. The warranty covers any manufacturing and material defects.*
- 8. The warranty does not cover damage caused by corrosion of the product's structural elements, snow 240kg/m² (120Lb/ft²) and wind load (up to 50mph).*
- 9. The warranty ends:*
 - If the instructions for assembly and installation are not followed;*
 - In case of violation of the requirements for the operation of the greenhouse;*
 - When using the greenhouse for other purposes;*
 - Upon the occurrence of force majeure circumstances (natural disasters);*
 - In the absence of a passport for the product/instruction.*
- 10. For all questions regarding warranty coverage please contact us by email: info@greenhousetogrow.com*

**Thank you for choosing the *CAMELLIA* greenhouse
Which will serve you for decades under proper usage!**



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Due to the continuous improvement of the products
the manufacturer reserves the right to make changes
in the design without prior notice to the consumer.

The products are not subject to mandatory certification.

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