

Installation Instructions **LIGHTWAY CRYSTAL HP**

FLAT ROOFS

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Please read these instructions carefully

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General

Component Storage

During storage, all components of the LIGHTWAY CRYSTAL HP system must be protected **against damage** caused by external forces.

Never remove the protective film from mirror-finished components, to prevent weakening of the effect of the finish by dust or other dirt. The film shall be removed in the final stage of installation.

Tubes **must not be exposed to sunlight**. In the case of tubes with film there is the risk that the protective film will “boil” on the mirror surface of the tube and it will be impossible to remove it in the final stage of installation. In the case of tubes without the protective film there is the risk of spontaneous combustion of the roof due to the high reflectivity of the material.

Safety at Work

Use only installation equipment in **good repair**.

Use **protective equipment** (safety goggles, mask etc.).

During installation and handling parts of the system it is necessary to use safety **cotton gloves**.

During work **at heights** follow the occupational safety standards (binding, ladders, scaffolding etc.)

If you use materials and tools from other manufacturers (e.g. sealing putty) **follow the manufacturer's instructions**.

During the installation make sure that the **roof surface is not dangerous** for installation (wet, slippery etc.).

Recommended Installation Tools and Equipment

Metal shears, sharp knife, flat screwdriver, Philips screwdriver, cordless drill with attachment for Philips screwdriver and bits, straight saw, protective goggles (with clear and dark lenses), working gloves.

Make sure that all tools and equipment to be used are in good repair.

Before You Start Installing the Light Guide

Please dedicate enough time to careful **preparation and planning** of the installation.

Think over the expected **location of the light guide**. Measure and/or calculate the lengths of the tubes needed and buy the necessary elbows.

Check whether you have all components available that are needed for the installation of the system.

Description of the System

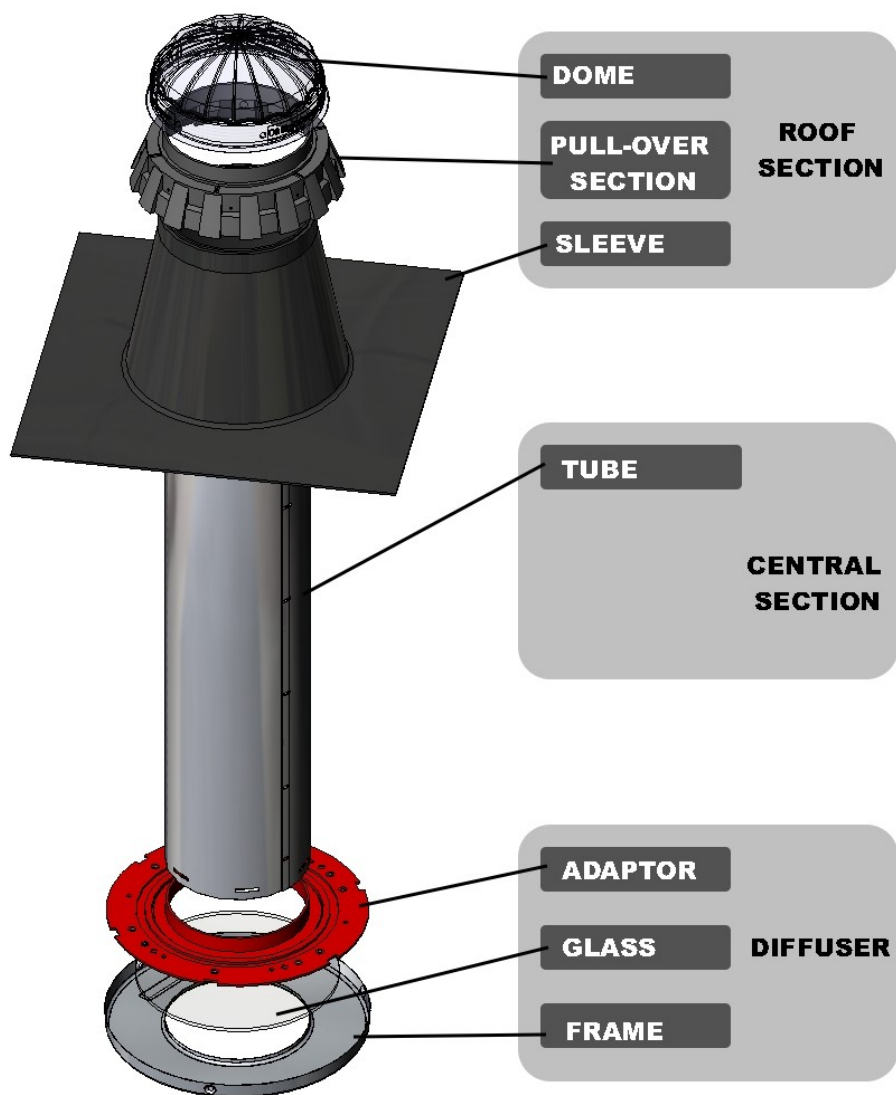


Figure 1

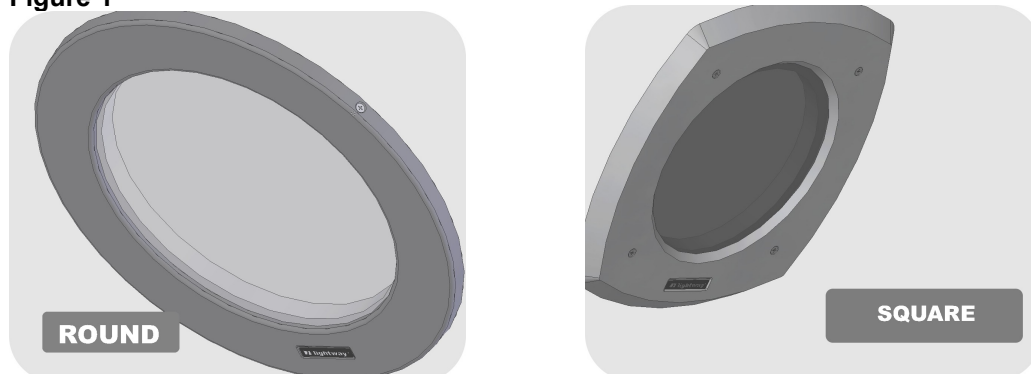


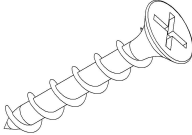
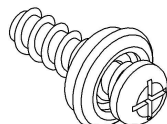
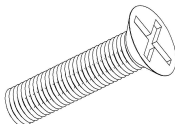
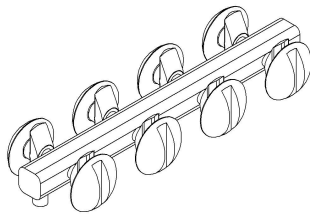
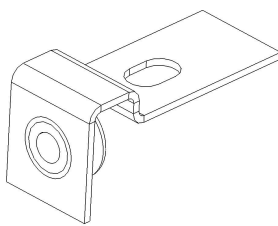
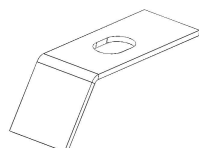
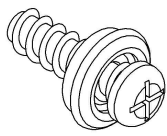
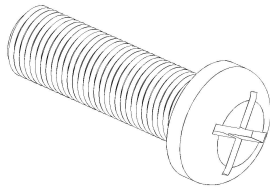

Figure 2 - Diffuser Types

Accessories of the System

Brush gasket
Bitumen band

Connecting Material

Table 1

 <p>SCREW 1 FOR PLASTERBOARD</p>	 <p>SCREW 2 AND WASHER FOR FIXING THE DOME (SCREW LENGTH 30mm)</p>	 <p>BOLT 1 FOR FIXING FRAMES</p>
 <p>CONNECTION ELEMENTS OF THE LIGHTWAY CRYSTAL SYSTEM</p>	 <p>GLASS AND ROUND DIFFUSER HOLDER</p>	 <p>HOLDER OF GLASS FOR SQUARE DIFFUSER</p>
 <p>BOLT 3 FOR FIXATION OF THE SLEEVE AND THE PULL- OVER SECTION (BOLT LENGTH 25mm)</p>	 <p>BOLT 2 FOR FIXING GLASS HOLDERS</p>	 <p>BOLT 4 ATTACHING THE TUBE TO THE PULL-OVER SECTION</p>

Dimensions of Light Guides and Holes in Building Structures

Table 2

Dimension Series	Diameter of the Tube	Recommended Diameter of the Hole
LIGHTWAY CRYSTAL 200HP	152 mm	160 mm
LIGHTWAY CRYSTAL 300HP	220 mm	230 mm
LIGHTWAY CRYSTAL 400HP	320 mm	330 mm

Installation Process

Installation shall be performed in several steps:

1. measuring the location of the light guide
2. preparation of holes
3. fixing the system to the roof
4. installation and preparation of tubes
5. fixation of the tube in the sleeve or in the pull-over section
6. completion of the assembly on the roof
7. completion of the system in the interior
8. insulation of the tube

Location of the Light Guide

Try to locate the light guide so that it does not interfere with the **bearing structure of the roof**.

In addition, when locating the light guide watch the **electric cabling**, which must not be disturbed.

When planning the location of the lightguide (diffuser) in the room take into account its added **load to the ceiling**. Make sure how and under what conditions it is possible to place the diffuser on your ceiling.

When placing the light guide in existing structures we always recommend having it assessed by an expert!

Preparation of Holes

When you have the light guide measured preliminarily and you know where it will be placed, start making holes for the tubes. For the dimensions of individual holes see Table 2.

Make the holes successively according to the materials used; the hole in the roof shall be made according to the roofing used and the system of the roof. **For flat roofs we always recommend consulting an expert.**

Fixing the System on the Roof

Fix the sleeve on the roof and pull the hydroinsulation over it at least up to the height of the break on the sleeve - see Picture 3.

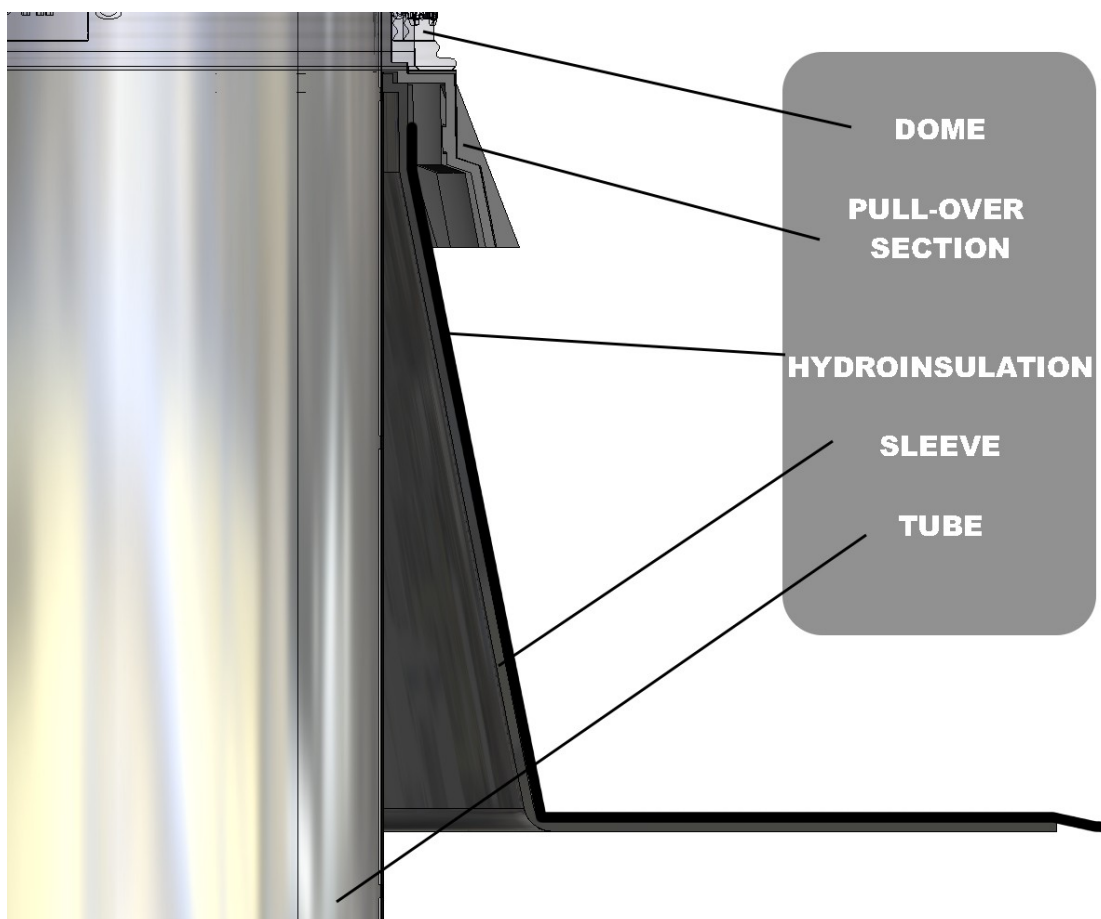


Figure 3

Preparation of the Tubes

First perform “test” connection and location of the **tubes**. Remove the protective film from the tubes and connect them using the plastic joints. It is necessary to observe the orientation of the tubes, the upper part is marked by a small hole. If it is necessary to use elbows (because of obstacles such as air-conditioning etc.), proceed as follows: adjust the elbow approximately at the required angle (to set the angle turn parts of the elbow variously towards each other, the extreme setting positions are in Fig. 5), connect it to the tube and try to place the light guide in the prepared holes. Assemble the elbow in the order according to Fig. 4, in which you can see the elbow both in the disassembled and assembled states. On the central and lower parts finely shape the part according to the expected angle. If the angle agrees, mark the necessary shortening of the tube on the outer side, both on the roof and in the diffuser. Always shorten only the end tubes. If it is necessary to shorten the tube in the central section, put two tubes one in another. If in this case the overlap of the two tubes is longer than 5 cm, it is not necessary to secure the tubes in any way, just seal the joint with the bitumen band.

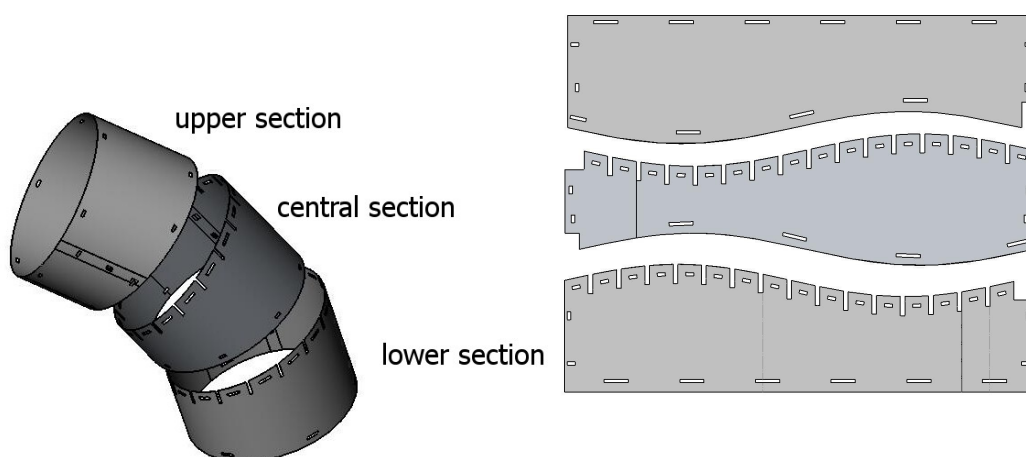


Figure 4 - Elbow

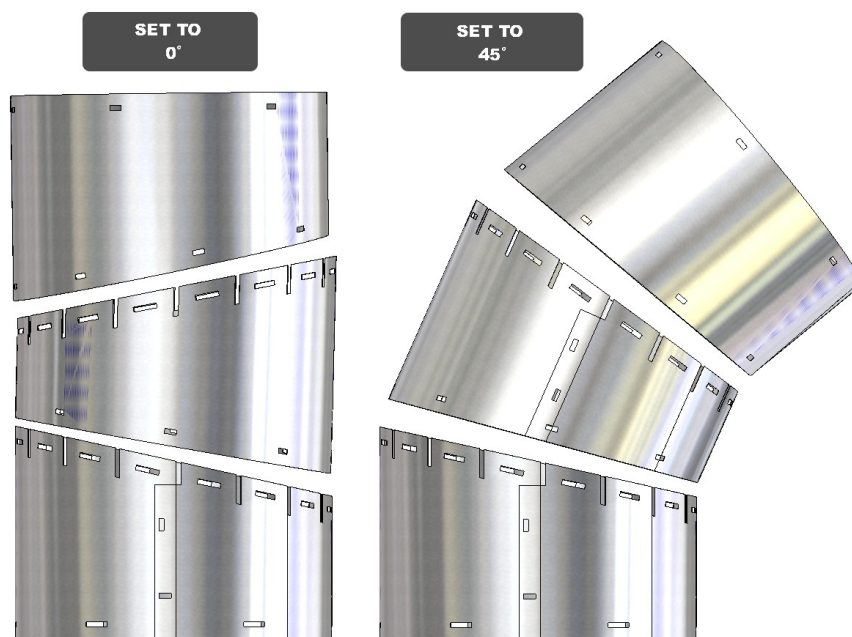


Figure 5 – Adjustment of Elbows

Shorten the tubes to the required size, connect them with joints and secure with a bitumen band. At the diffuser secure the tube with the bitumen band in the dismantled state with the adaptor pulled on. If the adaptor is not pulled on, there is the risk of later problems with the installation of the diffuser. Now the tubes are not detachable.



Figure 6

Connection of the tubes may only be done by means of the supplied plastic joints, which shall be pulled on and turned 90° in the prepared holes - see Fig. 7.

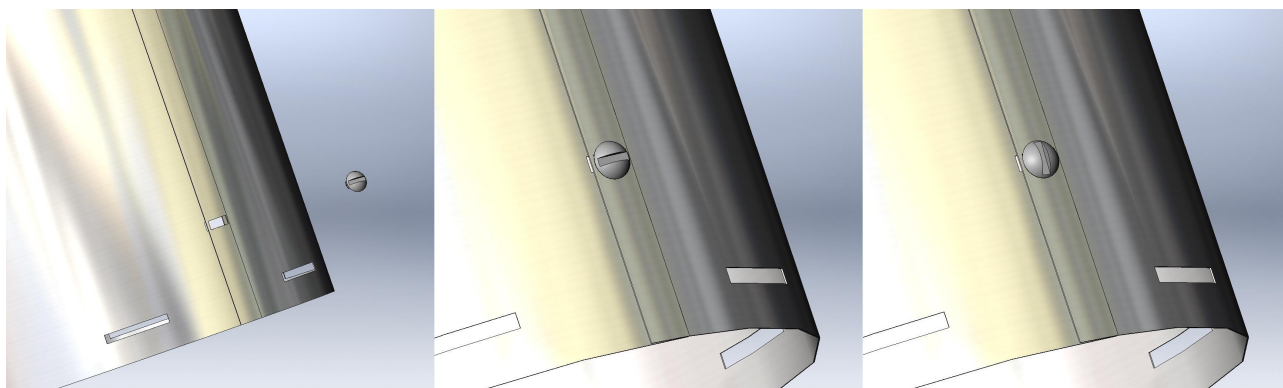


Figure 7 – Connection of Tubes

Fixation of the Tube in the Sleeve

Pull the pull-over section on the sleeve. Run the tube through the sleeve and the pull-over section, adhere the upper brush gasket to it (approximately 1 mm under the edge of the tube) and in the inner part affix the fixing "strip" of the tube. Fix the tube to the pull-over section with the No. 4 screws according to Fig. 9. Follow this procedure, otherwise the tube may become deformed! Make sure that the bolts are located approximately in the centre between the markings on the pull-over part - Fig. 8. In the points of these markings the dome will be screwed on. After fixing the tube in the pull-over section affix the bottom brush gasket according to Figure 11, put on the dome and direct it so that the holes for fixing the dome are directly over the marking on the pull-over section - see Fig. 10. Bore the pull-over section carefully with a bit 3 mm in diameter. (High speed, low pressure on the drill.) Insert a No. 2 screw with a washer in the bored holes. The last action on the roof section is screwing the pull-over section to the sleeve in the marked points with No. 3 screws.

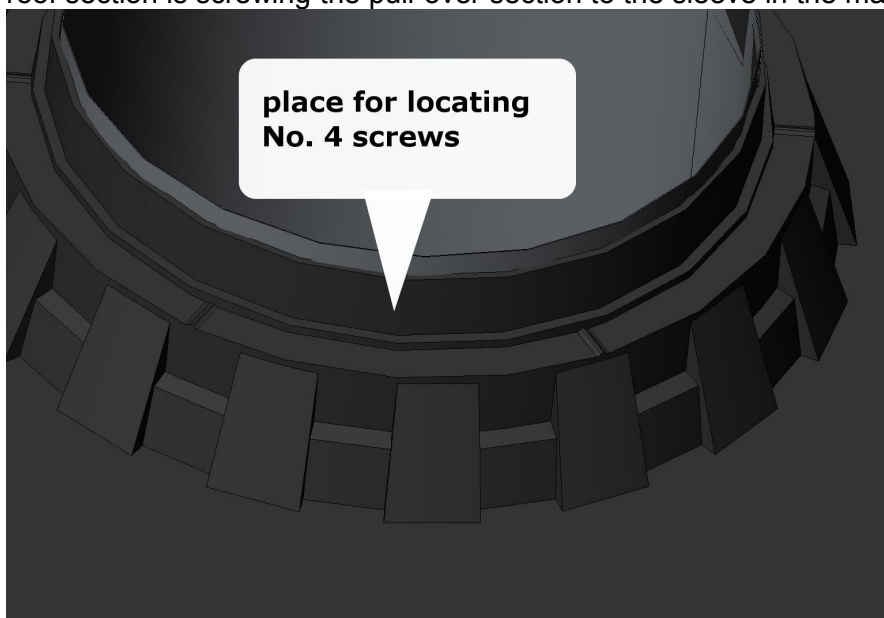


Figure 8

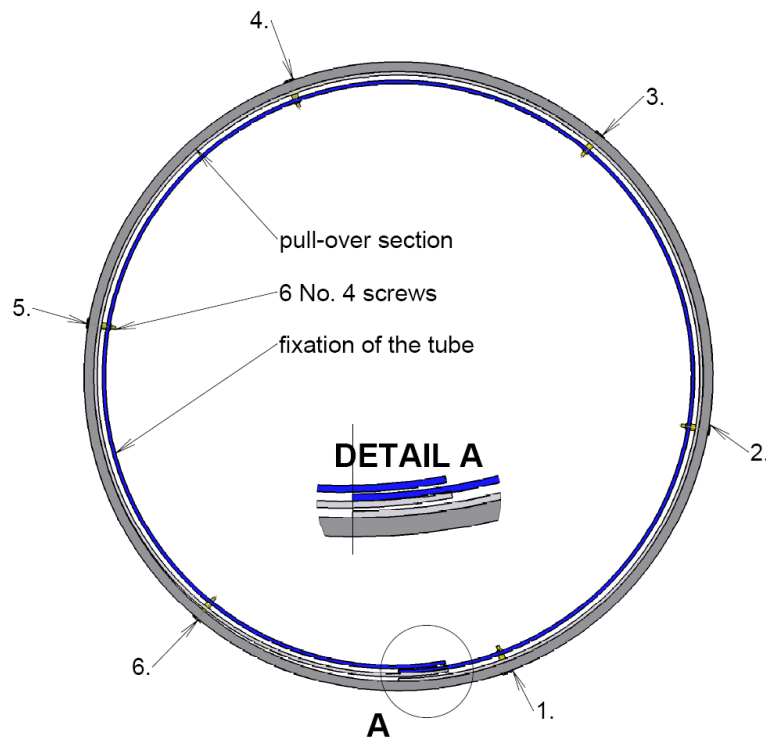


Figure 9



Figure 10

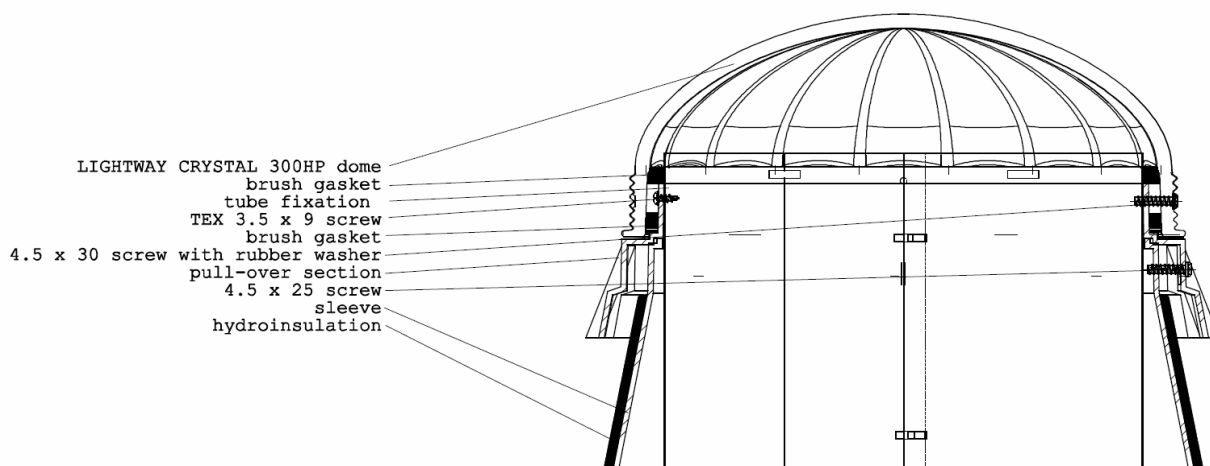


Figure 11

Completion of the System in the Interior

Pull the adaptor on the tube and fix it to the ceiling with the No.1 screws (see connecting material) through the prepared holes. At this moment watch the orientation of the adaptor.

In the case of a plasterboard or coffered ceiling use a plastic **counterpart**, so that the weight is distributed over the entire area of the material. In the case of a coffered ceiling use a **wooden counterpart**. If a counterpart cannot be used, apply another solution recommended by the plasterboard manufacturers (e.g. special dowels to plasterboard). **It is forbidden to mount the adaptor to plasterboard using screws only!**

In the case of wooden ceilings screw directly in the ceiling.

In the case of concrete or similar structures use dowels

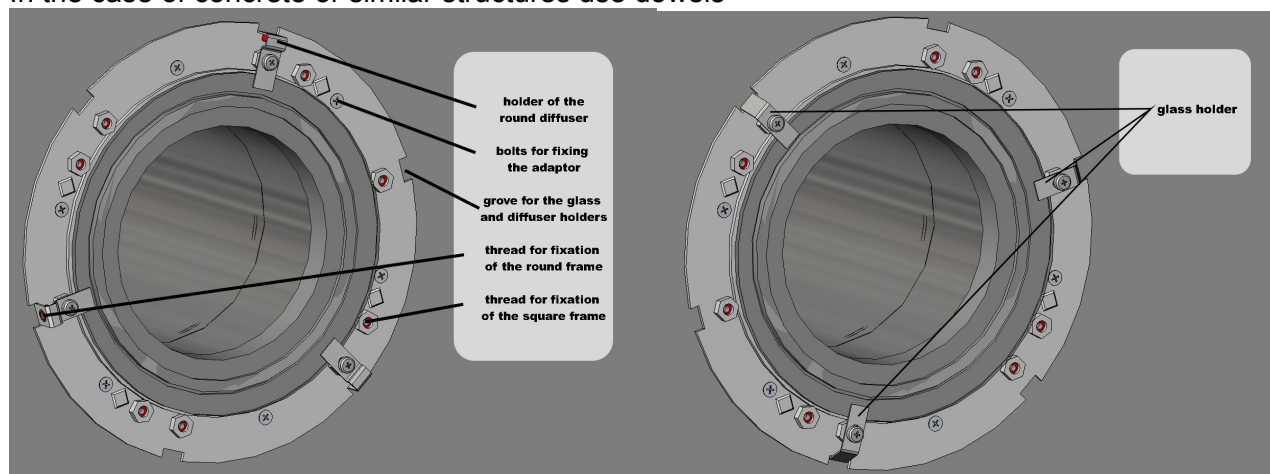


Figure 12

Fix **glass** with the glass holders. Only the threaded holes with cutouts next to them are intended for the glass holders. The remaining 4 holes are for direct attachment of the square frame of the diffuser.

Mount the **frame** with bolts onto the prepared threaded holes.



Figure 13

Insulation of the Tube

Wrap the tube in thermal insulation and affix the insulation according to common procedures.