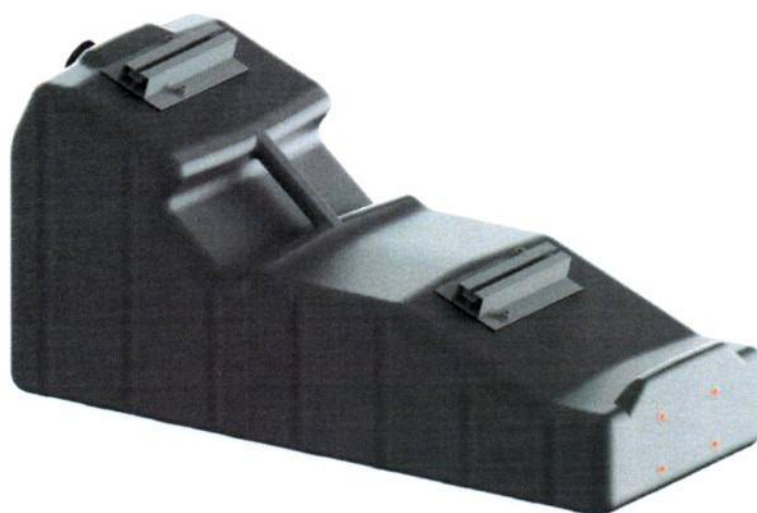


BALLAST SYSTEM GRAM – BOX

WARRANTY AND TERMS OF USE



**Please read these instructions for use completely before using the ballast tank**

### **1. Technical parameters**

The weight of the filled tank allows the transfer of loads resulting from the wind determined for average conditions in Central Europe. In general, in terms of loads on the supporting structure, the proposed solution requires the use of supporting structures for the covering with parameters analogous to other solutions used so far.

In this respect, it is noteworthy that the tank can be additionally attached to the supporting structure for example, for greater roof pitch or other conditions. For this purpose, appropriate sockets for fastening elements have been prepared on the front and rear walls of the tank.

Important parameters:

- operating temperature from - 25°C to + 70°C,
- mounting rails with a slot for the M8 screw,
- the tank has M8 threaded inserts for connecting the tanks into a ballast system.

### **2. Advantages of the system in terms of assembly and use**

The distinguishing feature of the proposed solution is the ease of installation. It is possible to mount a wide range of photovoltaic panels available on the market. Due to the low weight of the tank (10 kg own weight with glycol concentrate), the ballast unfilled with water can be carried by one installer. The lack of sharp edges does not pose a risk of damaging the roof covering, and the tank is refilled with water only after it has been laid and stabilized on the roof.

### **3. Special terms of use**

Ballast tanks are filled with a slow-freezing fluid. Is a mixture of the water and the glycol concentrate in the tank. It is necessary to ensure that the tanks are constantly filled with a fluid of an appropriate concentration and parameters.

In accordance with the provisions of the law, roofs require periodic inspections, including before and after winter. In addition, the photovoltaic installation must be checked. At least during these checks, the condition of the ballast tanks and the filling solution should be checked.

### **4. Technical requirements**

- It is recommended to use the ballast system in accordance with its application .
- The system can be used for typical flat roof coverings, in particular for roofs covered with plastic membranes, which are sensitive to mechanical damage from pressure and sharp edges.

## System GRAM-BOX

- The system can also be installed on the ground after its prior reduction (levelling) and laying of a layer preventing the overgrowth of plants (e.g. geotextile or garden mats).
- In the case of installation on a flat roof with a slope angle of up to 10°, there must be a flat surface and the contact surface Surf between the ground and the tank bottom surface must not be less than  $\text{Surf} \geq 75\%$ .
- It is permissible to install on a flat roof with a slope angle of more than 10° provided that glue is used or the roof is fixed with mounting elements connected to the front or rear wall of the tank with M8 screws.
- The tightening torque of the fixing bolts on the faces must not exceed 8.5 Nm.
- When mounted on the roof or ground, sharp elements and edges which could damage the surface of the tank under pressure are not permitted.
- The ballast system is intended for installation only by qualified persons with appropriate knowledge and experience in the installation of photovoltaic installations.
- The surface on which the trapezoidal bridges are mounted is inclined to the base at an angle of 21 degrees; it is not possible to adjust this angle in the system and it is forbidden to use additional elements or change the construction under the risk of warranty loss.
- The tanks should be placed in such a way as not to impede the flow of rainwater and melting snow, i.e. with the longer side in the direction of the slope (installation on the "shorter" side of the PV panel in accordance with the panel manufacturer's recommendations).
- Ballast tanks can be transported to the roof manually, using a skip, lift or crane.
- The tank has a handle at the bottom to prevent the panel from slipping off the ballast. The panel can be placed on the tanks before filling with water and tightening the fixing. More panels should not be stored on ballast tanks.
- The ballast system can be arranged in either S (south) or EW (east-west) orientation.



Fig. 2 S mounting method



Fig. 3 EW mounting method

- The presented ways of placing ballast tanks are only an example. The appropriate setting is individual for each installation and depends on the constructor involved in the design of the photovoltaic installation.
- The tank is supplied to the user together with the glycol concentrate and weighs 10kg, therefore to determine the recommended mass of 60kg, 50L of mains water must be added to the tank, which results in the recommended mass and concentration of the glycol solution of 10.7%.
- Add water with a garden hose using the water meter. After filling with water, the filling hole must be closed tightly with the attached plug.
- It is not permitted to fill the tank with other liquids and in an indicative manner.
- The electrical connections must be protected against flooding when refilling the tanks with water.
- When installing the panels, use clamps, screws and grooves suitable for trapezoidal bridges.
- Clamps, screws and grooves are not part of the ballast system; they must be selected individually and according to the type of PV panels to be installed.
- For the installation of PV panels, grouping of tanks, fixing of tanks to the roof or ground, the use of plastic screws and self-drilling screws is not allowed due to the risk of damaging the tank surface.
- Do not drill or penetrate the tank surface.

## 5. Terms of warranty

The basis of the warranty is the proof of purchase. The warranty starts on the date of invoice. The manufacturer give a 25-years warranty under the conditions set out in this instruction.

## 6. Ecology – environment protection and recycling

**Do not dispose into the domestic waste disposal!!!**



A used product must not be treated as municipal waste. Disassembled product must be taken to a recycling centre for disposal. The proper disposal of the used product prevents potential negative environmental impacts that could occur in case of inappropriate waste management.

For more detailed information on recycling the product, please contact your local council or waste management service.

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