Topic	Expected output
Expected capacity per module:	<0.25 kWp
One Mini module PV –area 4x4 metrix	690 x 690 mm/ output 8-9 V
Module size Total	1800 x 1800 mm
Expected weight of completed float panel:	*From 15 up to 25kg
Cell type:	Mono Si (pseudo square)/ can be newer technology.
Cell spec:	6” p- type, (Boron doped), (200x200mm)
Position	The best close to the land or Substation
Lock central System	?
Connectors:	MC 4 connectors water resistant DC & set of connectors AC 20-25A (Phoenix)
Cables:	Spiral cables AC 9mm, no shaded & cables DC
Built-in micro Inverter:	Micro Inverter 250W, IP 67
Installation:	Plug and play
Water cooling effect:	**Up to 11% higher performance**
Waterproof:	MC4 category
Floating body shape:	Pseudo square, round-edged, dome shaped with water cooling channels in float.
Immersion in water:	Depends on type of glass and used components
Lamination:	Glass, Eva , Cells, Eva, Glass
Material of frame of mini module:	**E frame** from Du Pont^{NT}, polymer module frame that includes a built-in junction box.
Floating body material:	Float body –Foam (**Submersible LAST-A-FOAM® R-3300** from General Plastics Co.)
Expected no. of modules to be connected	200 pc / 50kWp
4000 float panels	1 MW
Covered area of water land 200 pc with service gaps	768,2 m^2
Covered area of water land 4000 pc with service gaps	15 364 m^2

Technical Specifications Floating Solar Panels

*

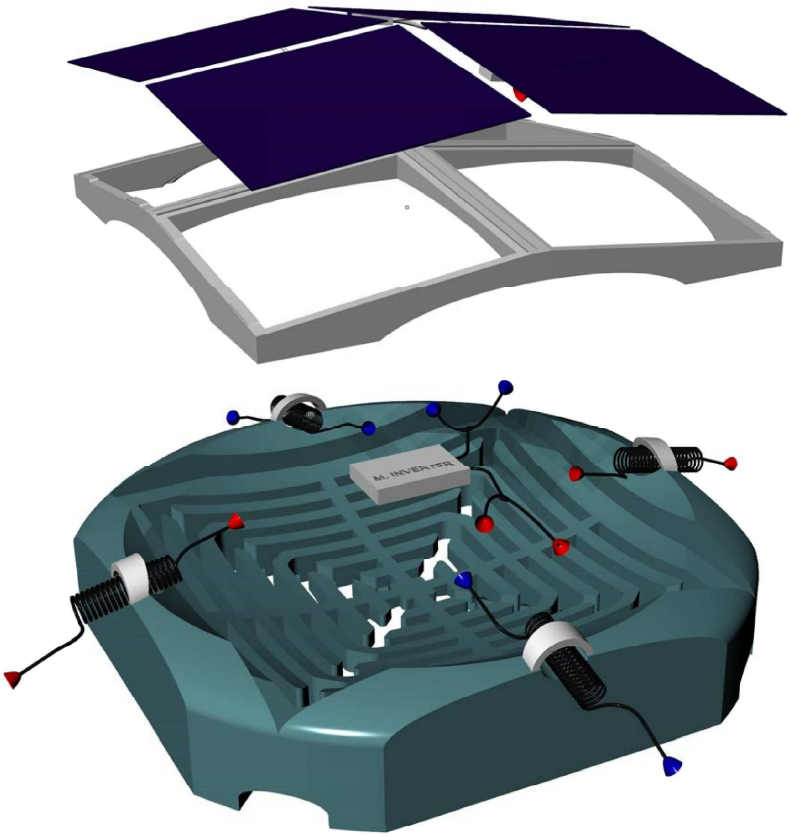
- Target
  - Designing of floating module
  - Designing of mini-module
  - Optimization of module structure to ensure higher module stability in wet environment
  - Optimization of module production cost

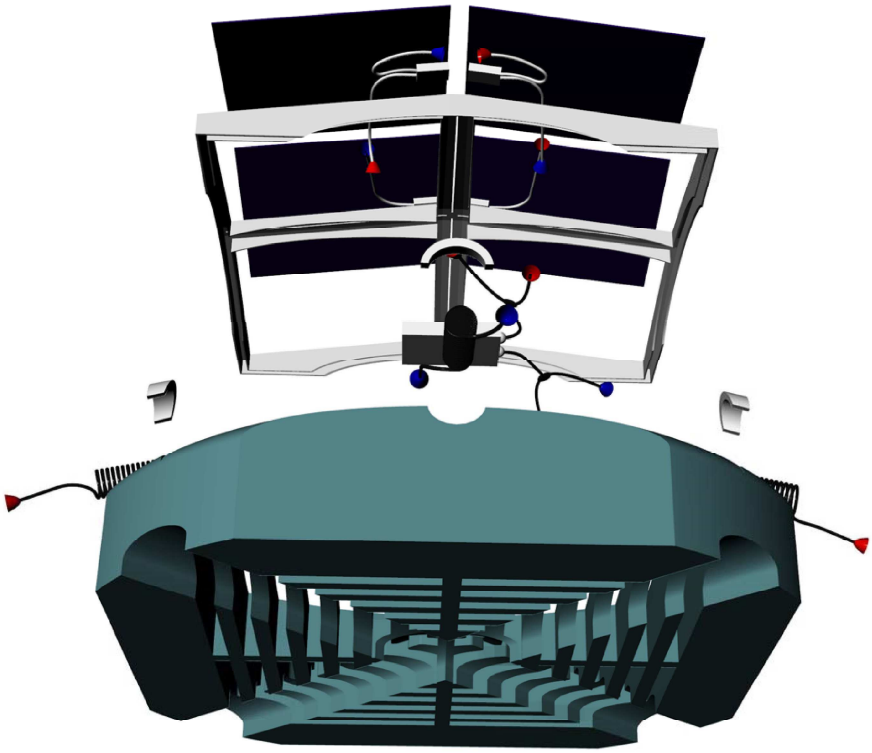
- Preliminary specification of floating module
  - Lightweight material to ensure floating on the water surface
  - Concave shape of the upper module surface
  - Expected PV module area cca 1 380 x 1 380 mm
  - PV module area will be divided to 4 mini-modules (matrix 4 x 4)
  - Floating module will have integrated micro-inverter
  - Floating module will be easily interconnected and disconnected

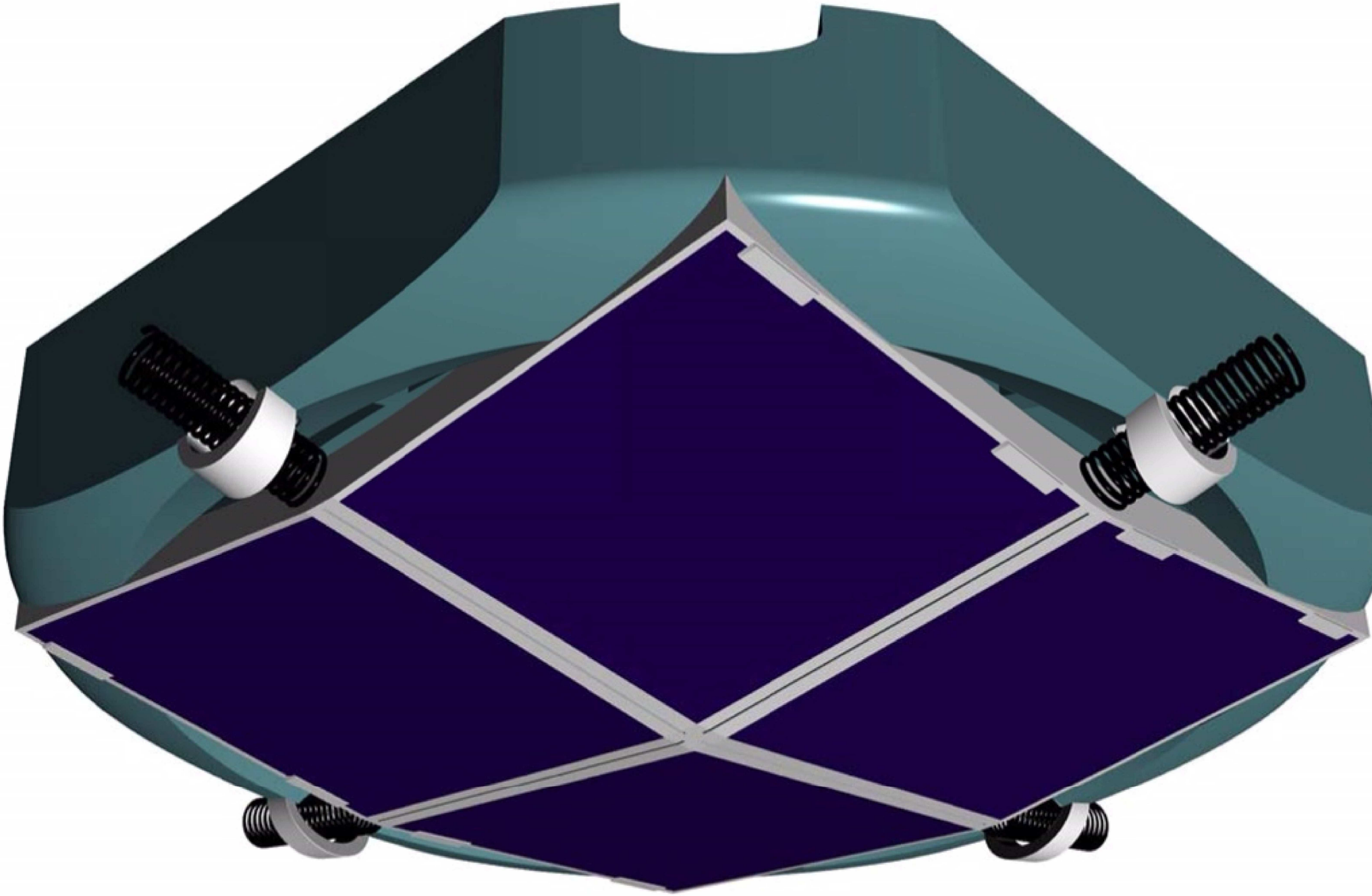
- Preliminary specification of PV mini-module
  - Lightweight material to ensure floating on the water surface
  - Module shape:
    - Square
  - Expected mini-module size:
    - **690 x 690 mm**
  - Module area:
    - 0,4761 m^2
  - Module thickness:
    - Maximum laminate thickness: **7,5 mm** - 3,2 mm glasses
    - Maximum laminate thickness: **5,0 mm** - 2,0 mm glasses
    - Maximum laminate thickness: **2,2 mm** - 0,85 mm glasses
  - Module weight:
    - Bellow **9,5 kg** - 3,2 mm glasses
    - Bellow **6,2 kg** - 2,0 mm glasses
    - Bellow **2,6 kg** - 0,85 mm glasses
  - Solar cells layout:
    - Four strings with four cells in each string – matrix **4 x 4**
    - Space between solar cells and module edges: 16 mm sides and 16 mm up/down

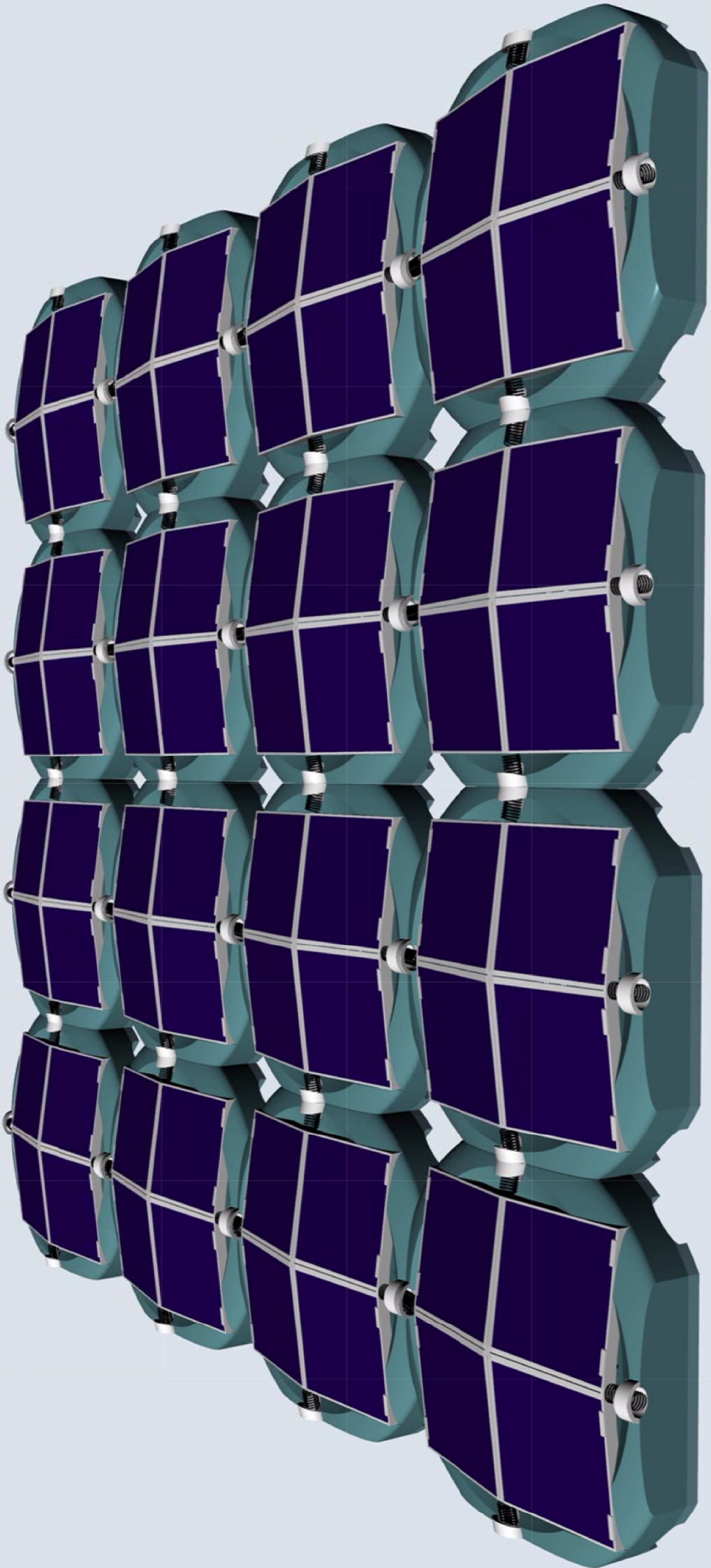
- Space between strings: 5,0 mm
- Space between cells: 5,00

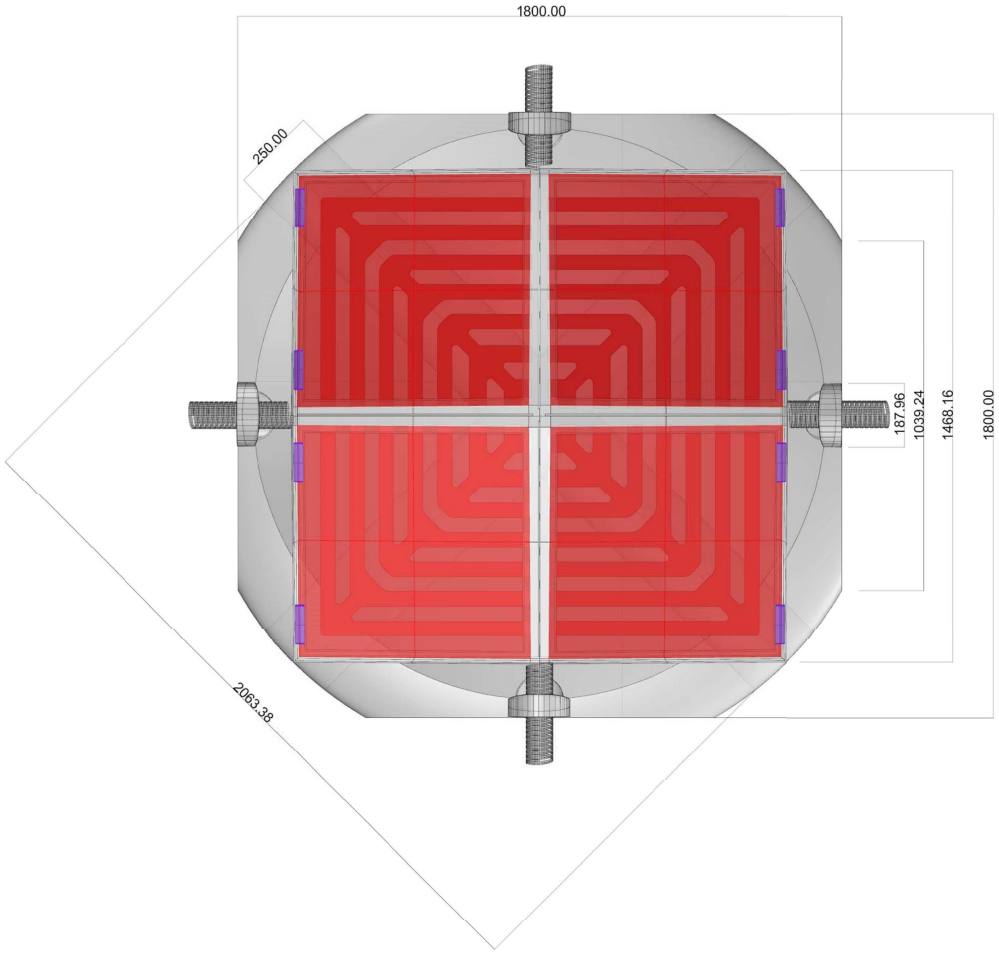
- Module structure:
  - glass/EVA/SC/EVA/glass
  - Front side
    - Extra clear tempered glass (ESG)
    - Thickness
      - **A, 3,0 ± 0,2 mm**
      - **B, 2,0 ± 0,2 mm**
      - **C, 0,85**
  - Back side
    - Float tempered glass (ESG)
    - Thickness
      - **A, 3,0 ± 0,2 mm**
      - **B, 2,0 ± 0,2 mm**
      - **C, 0,85**
  - Solar cells laminated between two lamination foils
- Solar cells interconnection
  - **16 solar cells** in each module connected **in series**
  - Ribbon interconnection with conductive glue - stringing
- Electrical outlets
  - One junction box in the centre on the back side with diode – junction box will be selected
- Options
  - Modules can be equipped with inbuilt laminated temperature sensors
    - Sensors will be placed on copper ribbon close to the one of solar cells


M-INVERTER





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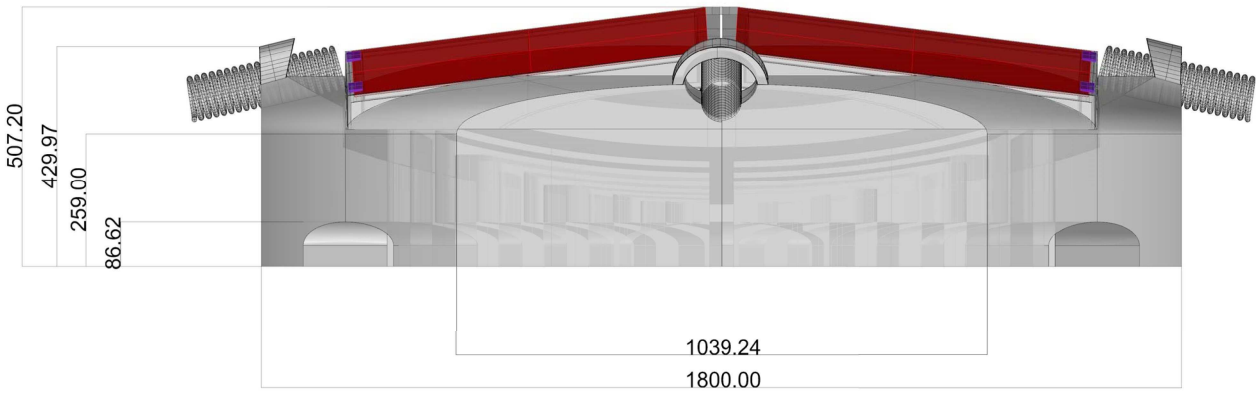
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