KOSMOS

Kiel Off-Shore Mesocosm facility for Ocean Simulation
Assembly instructions for the mesocosm steel frame

1.) Required Space for assembly Page 3 - 4
2.) Assembly of frame Page 5 - 6
3.) Emplacement GRP floating bodies Page 7 - 12
4.) Construction of the top section Page 13 - 23
5.) Emplacement of bottom ring and stands Page - 24
6.) Closing the mesocosm frame Page - 25
7.) Emplacement of base load and trimming Page - 26
8.) Placing the frame above the mesocosm bag Page 27 - 28
9.) Connecting the bag to the frame Page - 29
Space requirement for mounting the frame in lying position
Space requirement for final assembly in upright position

Moving platform needed for final assembly
Assembly of the frame. Hexagon of 3 x Frame A - B

Mooring butt strap 2x

Support rope guidance 3x

Frame A (with Ring)

Frame B (without Ring)
Assembly of the frame

Bolting of the frame Parts in upright orientation. Clockwise i.e. 4.1, 4.2, 4.3, 4.4, 4.5, 4.6.

bolts M 16
Emplacement GRP floating bodies

Place the steel frame for floating body mounting lying with one support rope guidance bottom right and the two mooring butt straps horizontally left and right.

Important!!
This is the benchmark for later adjustment of the parts mounted to the mesocosm Top.
Emplacement GRP floating bodies

Tube Fixing Frame bottom.

Tube Fixing Frame Top
Emplacement GRP floating bodies

Pipe fixing frame top

Pipe clamp
Spacer
Pipe rack
Emplacement GRP floating bodies

Pipe fixing frame bottom

Pipe clamp

Pipe rack

Frame clamp
Emplacement GRP floating bodies

Distance pipe bottom to steel frame bottom
Distance pipe clamp bottom to steel frame bottom

Check distance!!
No Arrester mounted to mark floating body position

700 mm
800 mm
Emplacement GRP floating bodies

Check orientation of the mounting on top of the floating body in relation to the steel rim and to the opposed floating body by leveling rule.

Check distance!!
No Arrester mounted to mark floating body position.

3,0 m
1,5 m
Emplacement GRP floating bodies

Order of GRP floating bodies in relation to support rope guidance and orientation of the top ring
Mounting the Top ring.

Top ring clamp M8
Mounting the Slip Boards

Orientation relative to the top ring

Plastic cleat
Mounting the Slip pulleys

Seven pairs of pulleys
Mounting slipropes*

<table>
<thead>
<tr>
<th>Length</th>
<th>left and right</th>
<th>red</th>
<th>13,0 m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>middle</td>
<td>red</td>
<td>10,5 m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length</th>
<th>left and right</th>
<th>green</th>
<th>8,0 m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>middle</td>
<td>green</td>
<td>5,5 m</td>
</tr>
</tbody>
</table>

*Type: Gleistein Standard Sheet Ø 8 mm
Mounting the support rope board

Orientation relative to the top ring

600 mm

Aluminium cleets
Mounting support rope deflection pulleys

Pulley 60
Pulley support rope left
Pulley 60
Pulley support rope right
Pulley 50
Pulley support rope middle
Pulley 50
Pulley support rope middle
Pulley 50
Deflection pulley
Pulley 60
Cleats
Left
Middle
Right
Insertion of support ropes according to the order of the support ropes pulleys – left - middle - right

From the cleads to the support rope pulleys all three support ropes have different length:
Right support rope 4.5m, middle support rope 2.5m, left support rope 3.5m.
Following after the support rope pulley it is 2.5 m to the water line. From the flange mounted on the bottom of the mesocosm bag to the waterline the support ropes are marked alternating red /blue every two meters.

To the right an example for a 23 m deep mesocosm is shown.
The blue /red two m marks are for orientation when lowering the bag into the water and start with red from 40 cm above the bottom flange.
The double red mark ends up at the support rope pulley and is at all three lines in this example at 25.3 m.

*Type: Gleistein Cup GR 071040 Ø 10mm identification thread: yellow

Slip lines and support ropes should be fed into the pulleys on the frame top when the frame is still in laying position.
Otherwise the moving platform is needed.
Mounting the cross beam
Mounting the light unit support
Mounting the roof ferrules  6x
Mounting the mesocosm stands and bottom ring
Closing the mesocosm frame

7 m
Mounting the base load

Each Side  \(3 \times 20\text{kg} = 60\text{kg}\)

In total  \(6 \times 60\text{kg} = 360\text{kg}\)

Mounting additional trim weights

According to load arrangement in the top and water density in the deployment area

10 Kg and 20 Kg pieces in total up to 240 Kg
Placing the frame above the packed mesocom bag
Emplacement and mounting of the packed bag into the mesocosm frame

Take care that the packed bag is oriented in a way that the flange joint is pointing towards the floating body left of the slip board.