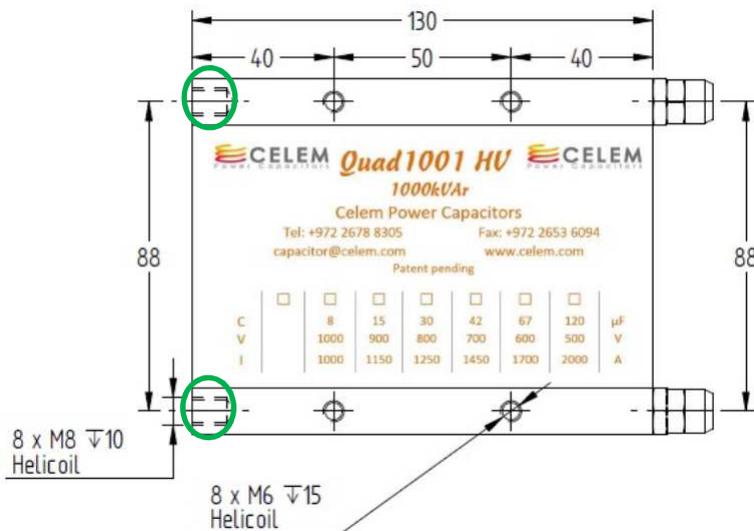


QUAD 1001 AND QUAD 1001 HV MOUNTING AND COOLING.

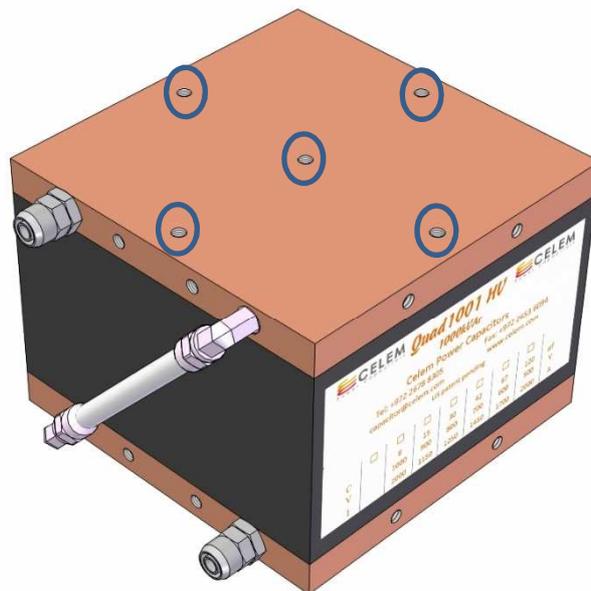
**MOUNTING**

QUAD 1001 / QUAD 1001 HV is designed to be used either on a busbar or connected directly to a work coil.

Direct connection to work coil / busbar could be performed using 8 x M8 holes with Heli-coil, see green ellipses in sketch below. M8 torque 10-15Nm.



Mounting on a busbar can be done from the face using 10 x M6 screws, see blue ellipses in the photo below). M6 torque 5-8Nm.



Other M6 threaded holes can be used for mechanical mounting and or active power input.

### COOLING

1. QUAD 1001 / QUAD 1001 HV capacitors have dielectric as well as Ohmic losses.
2. The dielectric inside QUAD 1001 / QUAD 1001 HV capacitors is polypropylene. Polypropylene can be heated up safely to 90°C during operation without any degradation. When this temperature is achieved at the hottest point of capacitor's core, the external temperature of the capacitor's surface is 45 - 50°C.
3. The dielectric losses of Polypropylene are  $P \times \tan \delta = P \times 2.2 \times 10^{-4}$
4. The ohmic losses result from resistance inside the capacitor and connection to the busbar.
5. Total losses of a mounted QUAD 1001 / QUAD 1001 HV for cooling purposes should be calculated as 1/700 to 1/1000 of the power, one should expect that 1000 kVar capacitor at full power will generate 1000W and up to 1400W of heat.
6. Water flow of 1 liter/minute when dissipating 1kW will be heated by 14 degrees C. (calculated by specific heat of water). This ratio enables to calculate the desired water flow, once power losses and water inlet temperature are given.
7. Maximum inlet water pressure in Celem water cooled capacitors is 5 Bar.
8. The outlet water temperature should not exceed 40°C.
9. Better cooling can be achieved either by using colder water, or by increasing the flow, see flow vs. pressure graph below.

