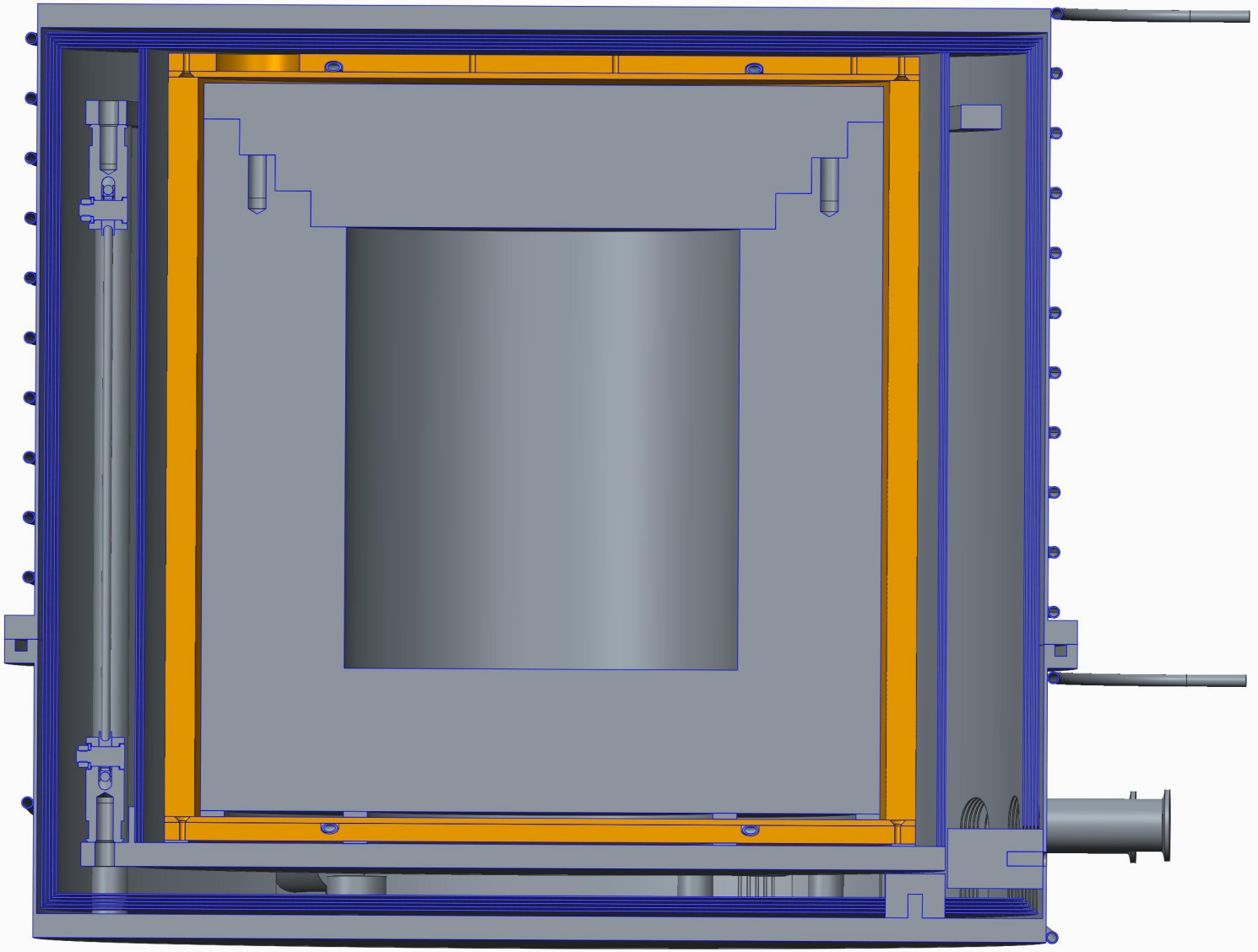
TUM Calorimeter Design Considerations

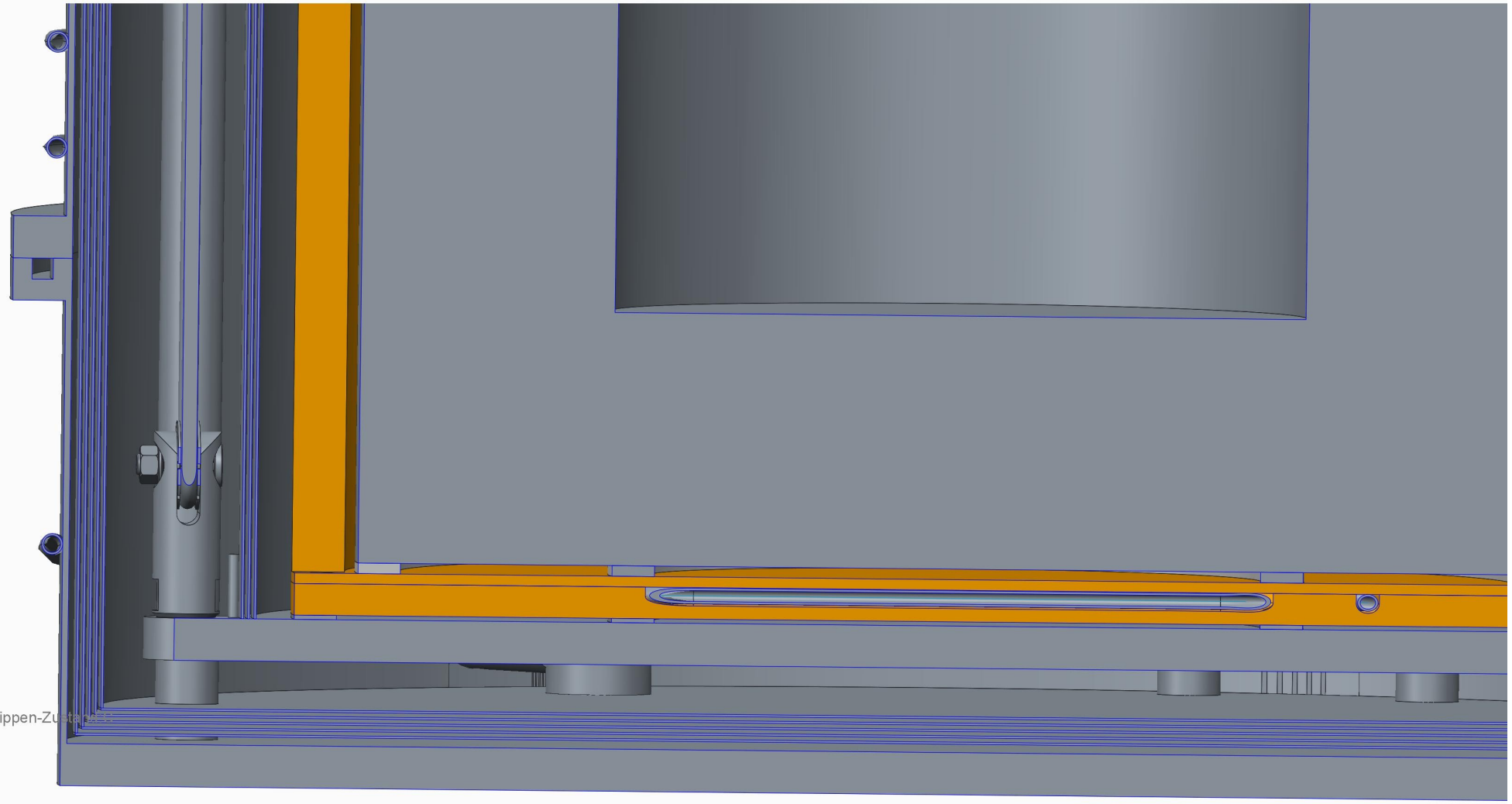
Laszlo Papp on behalf of TU Munich

SOX meeting at APC Paris
5-7 02 2014

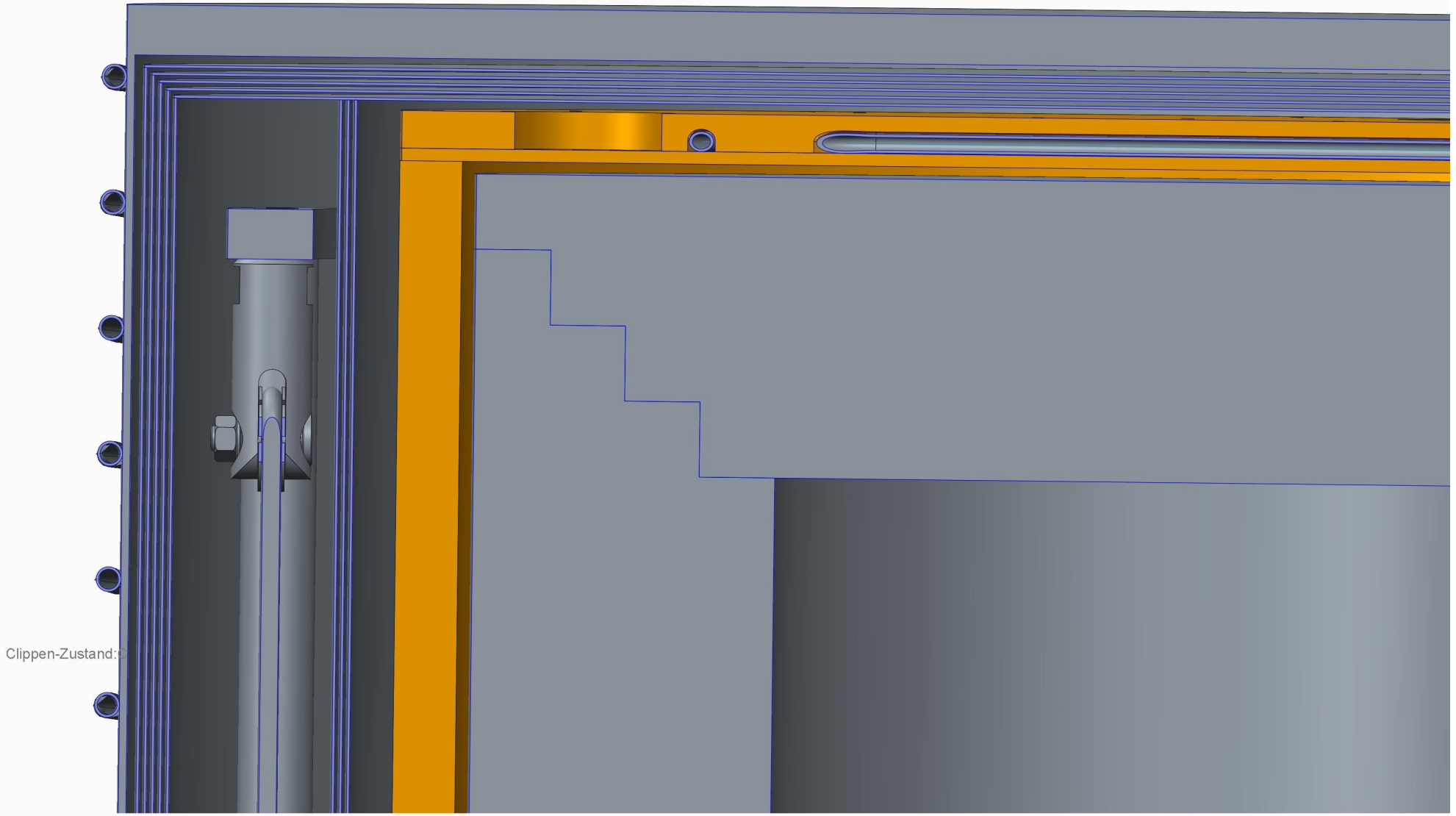


Clippen-Zustand:C

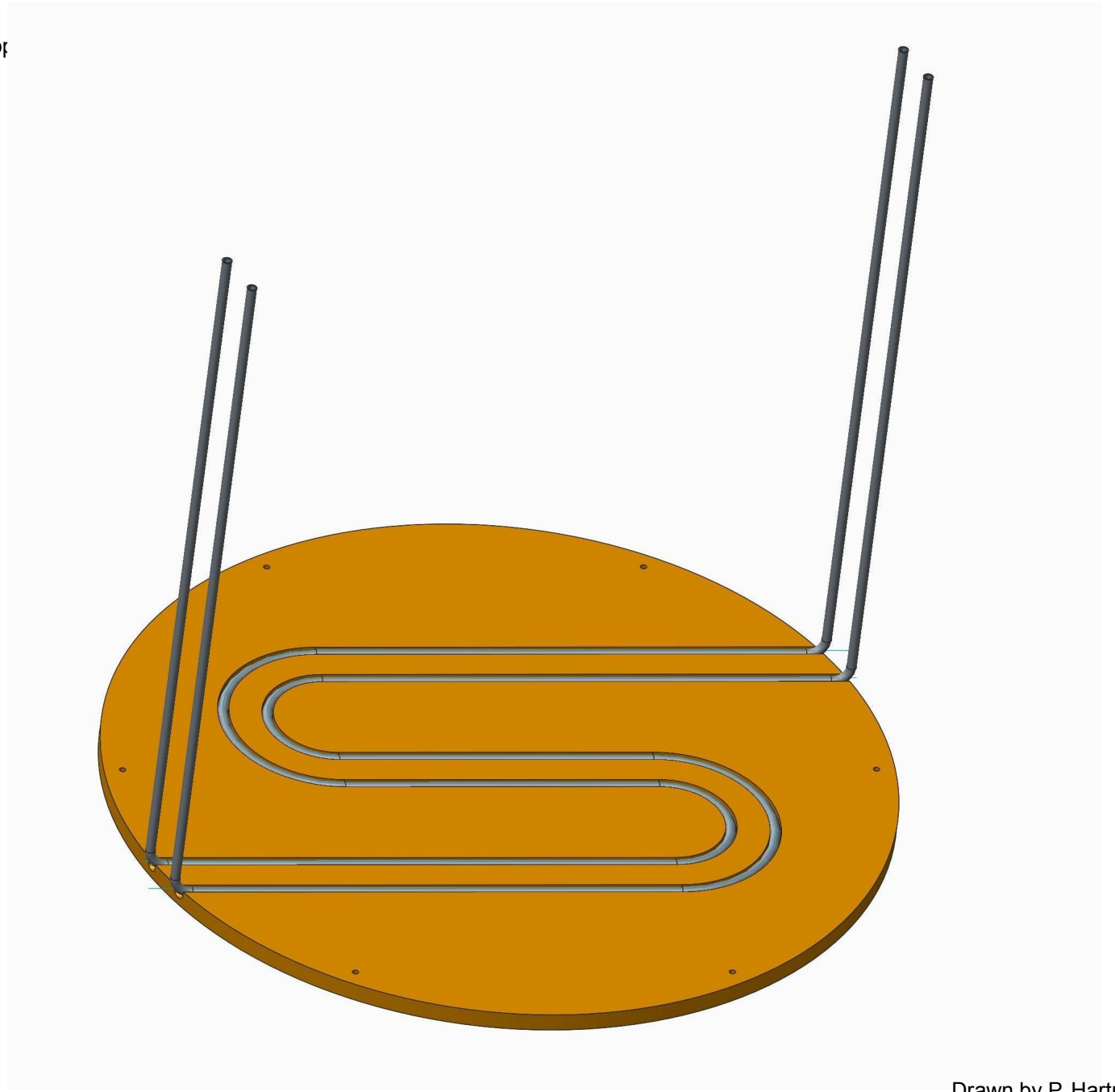
Drawn by P. Hartung



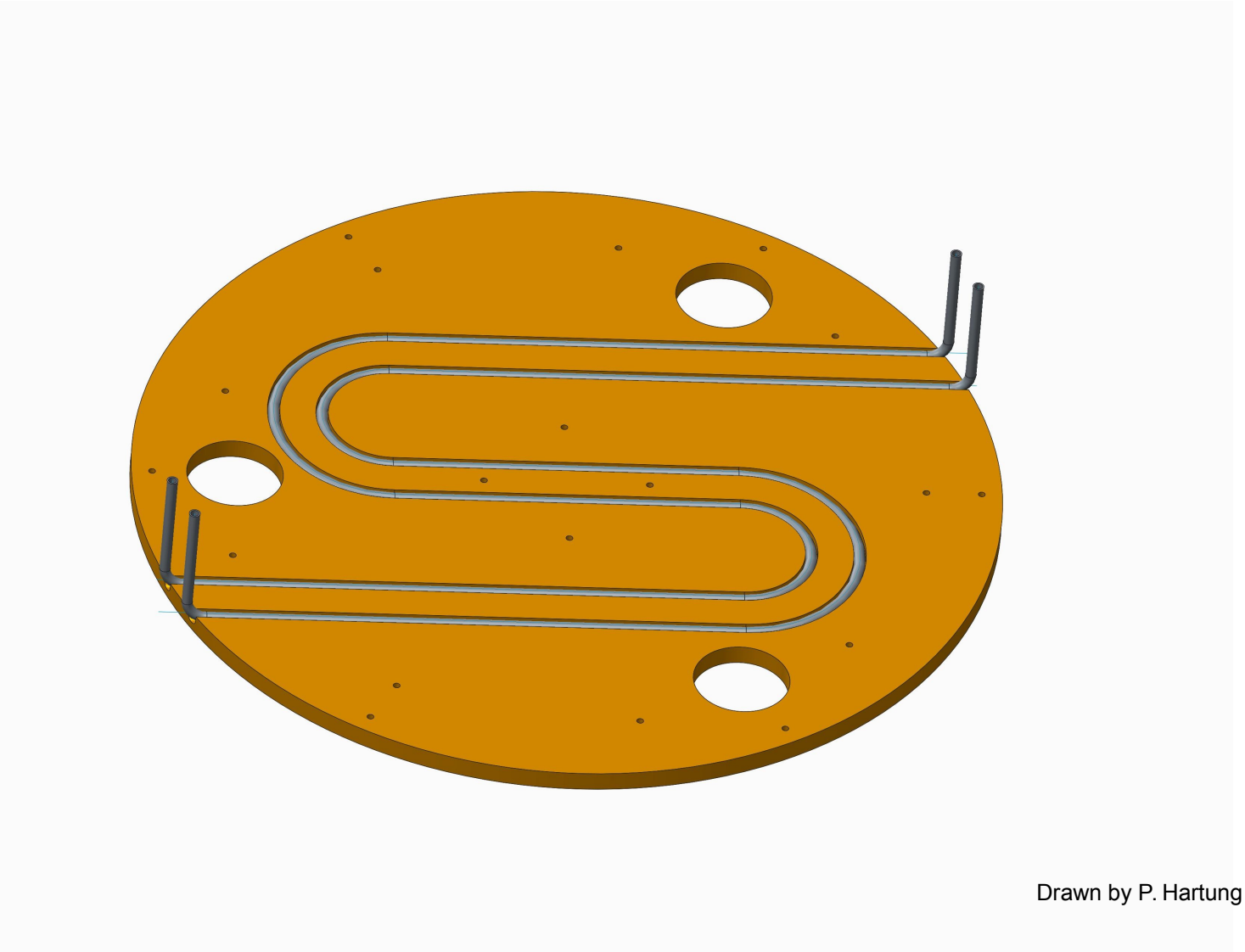
Drawn by P. Hartung



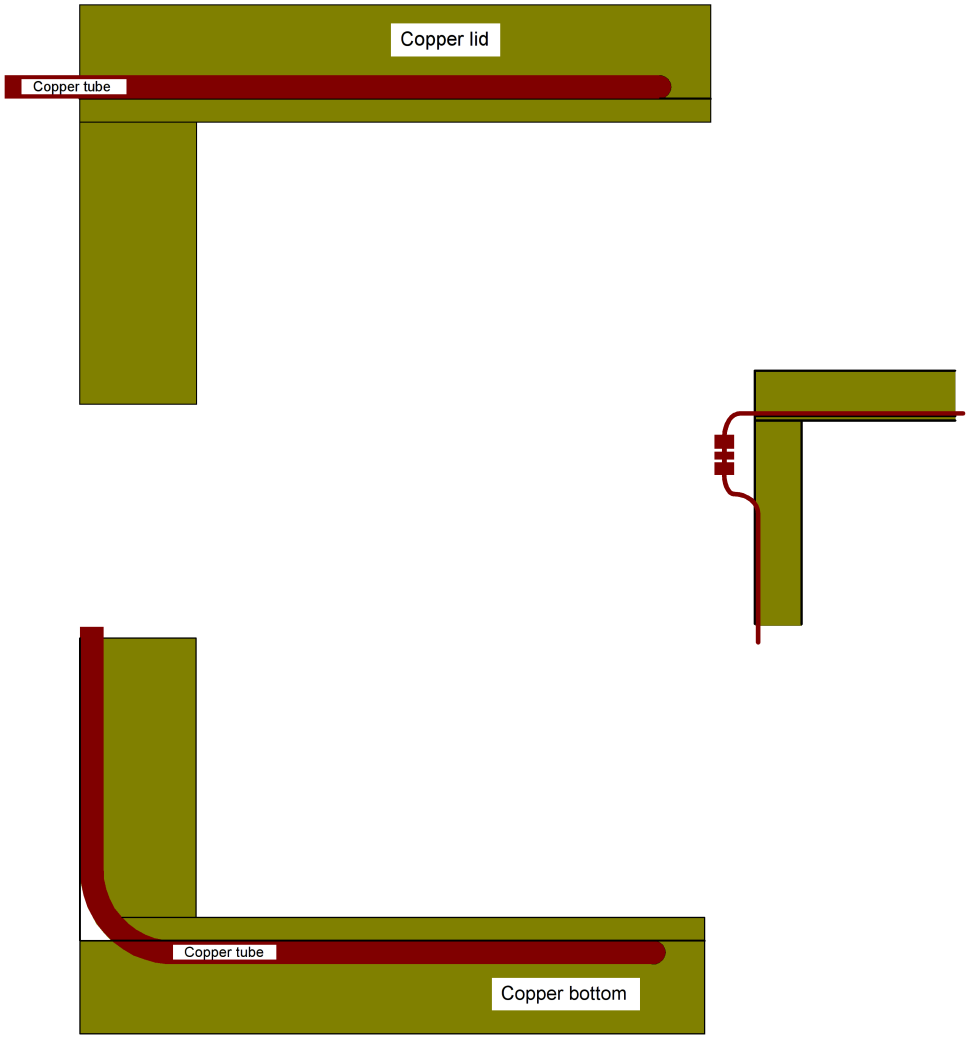
Drawn by P. Hartung

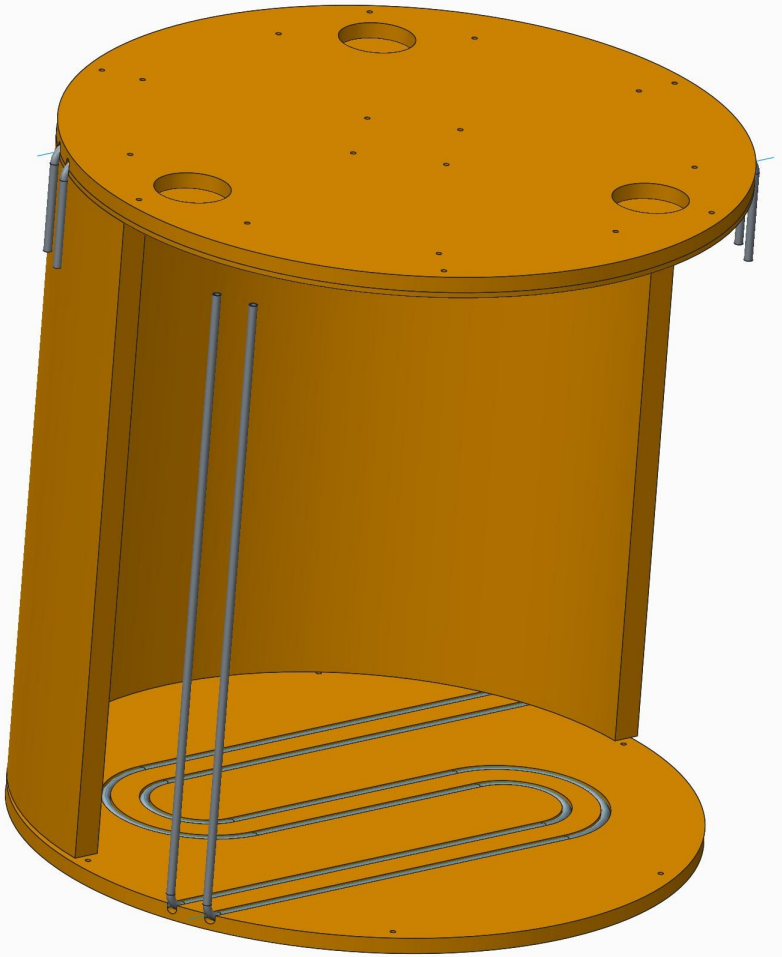


Drawn by P. Hartung



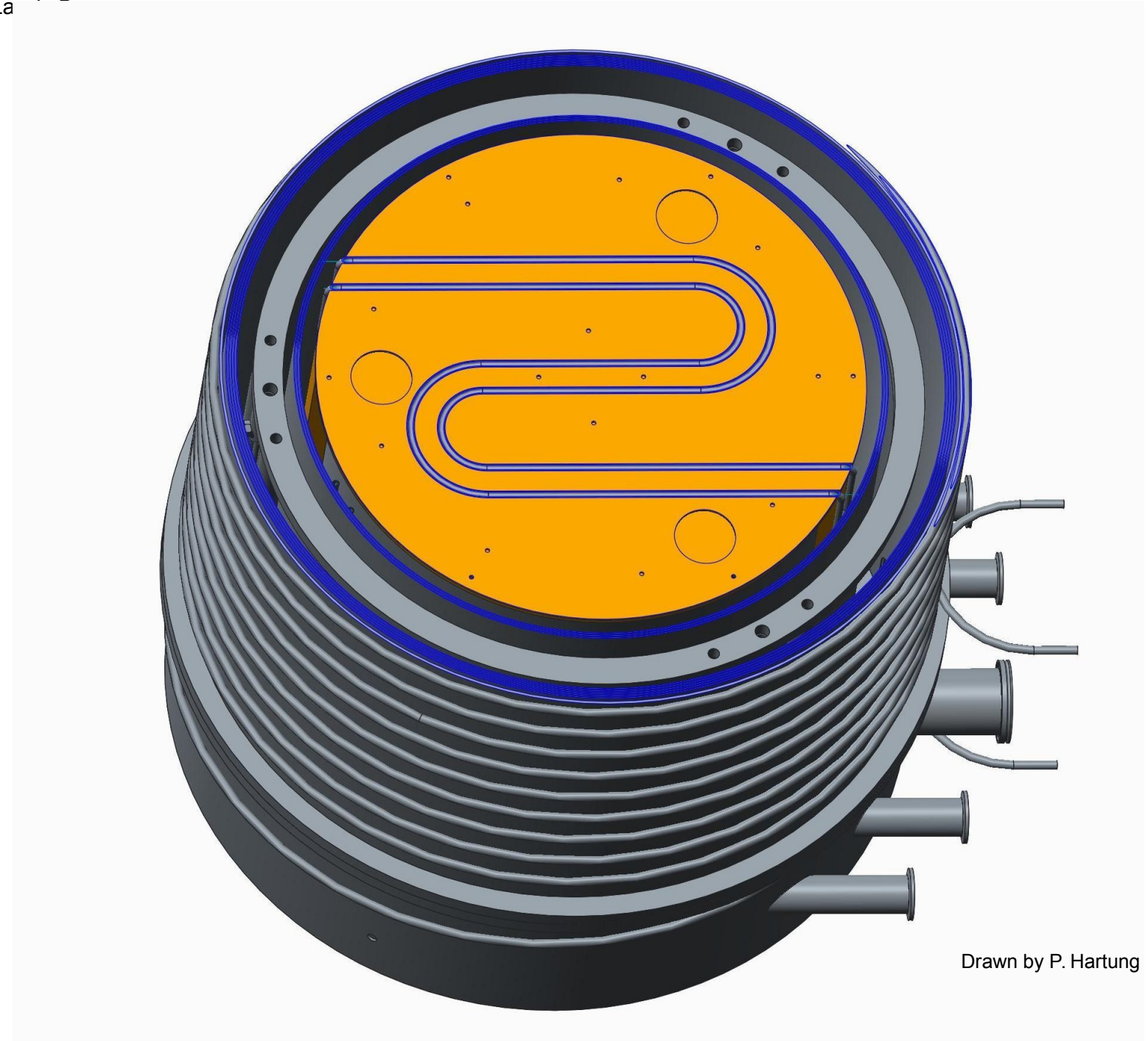
Drawn by P. Hartung


Copper lid
Copper tube
Copper tube
Copper bottom

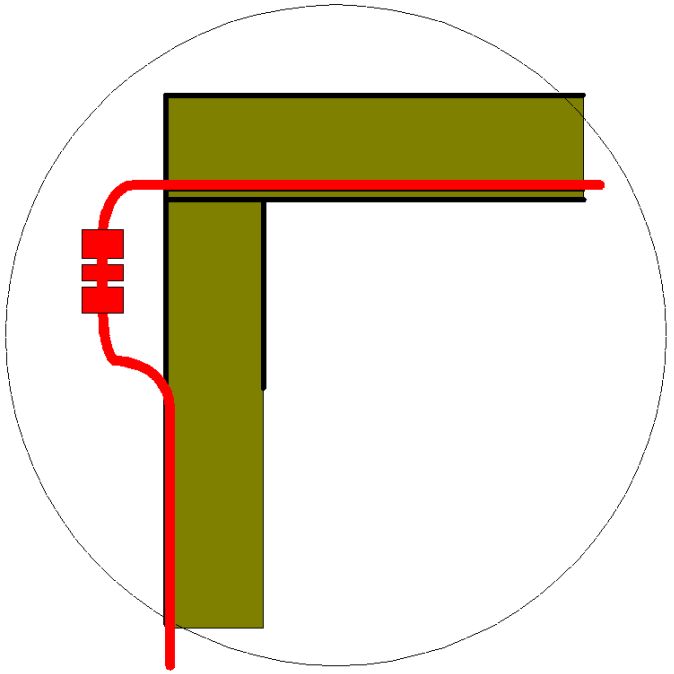


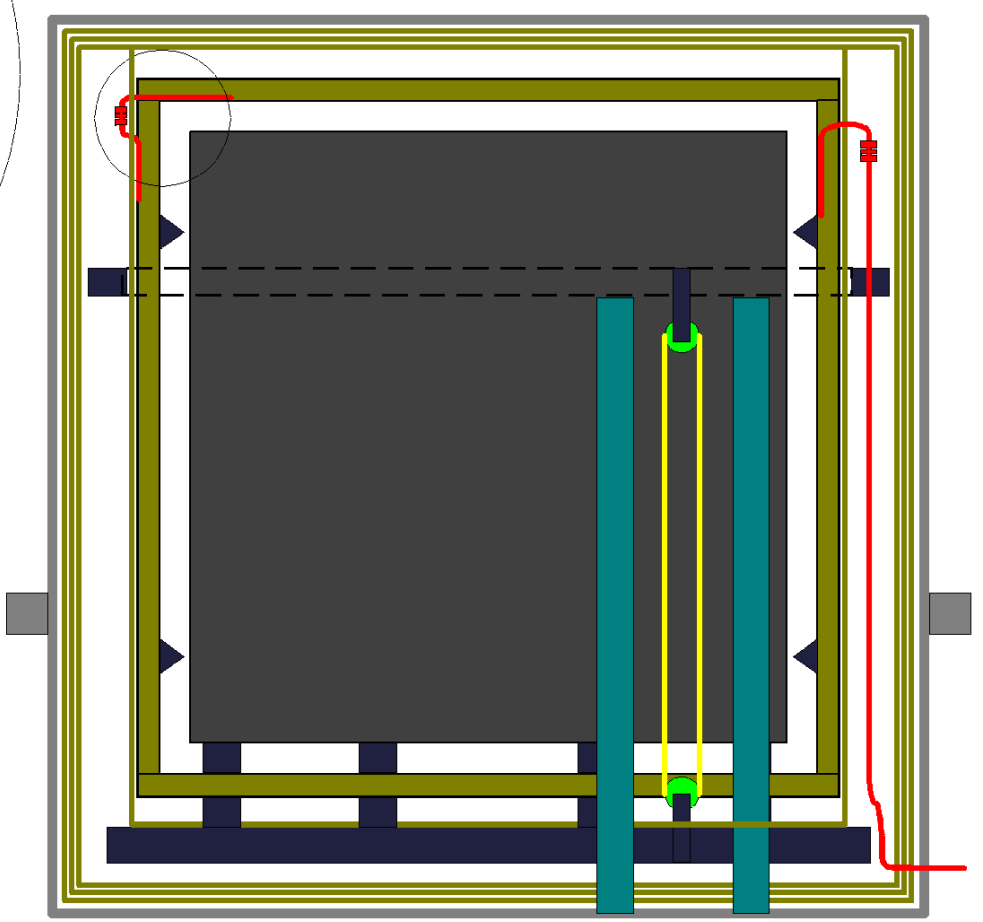
Drawn by P. Hartung

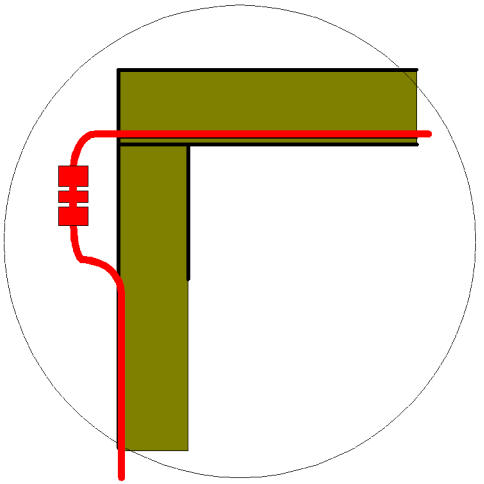
Drawn by P. Hartung

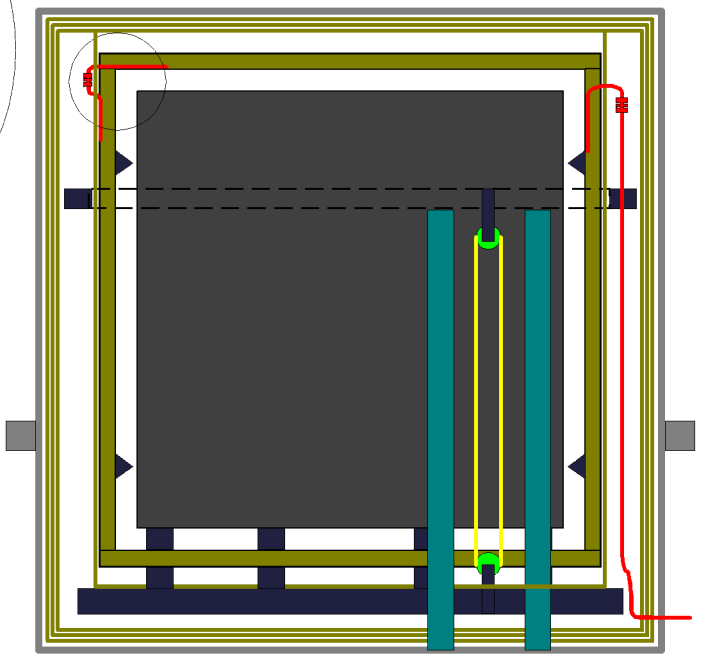


Drawn by P. Hartung









$\varepsilon_{\text{Blackened Copp.}} \sim 0.8$

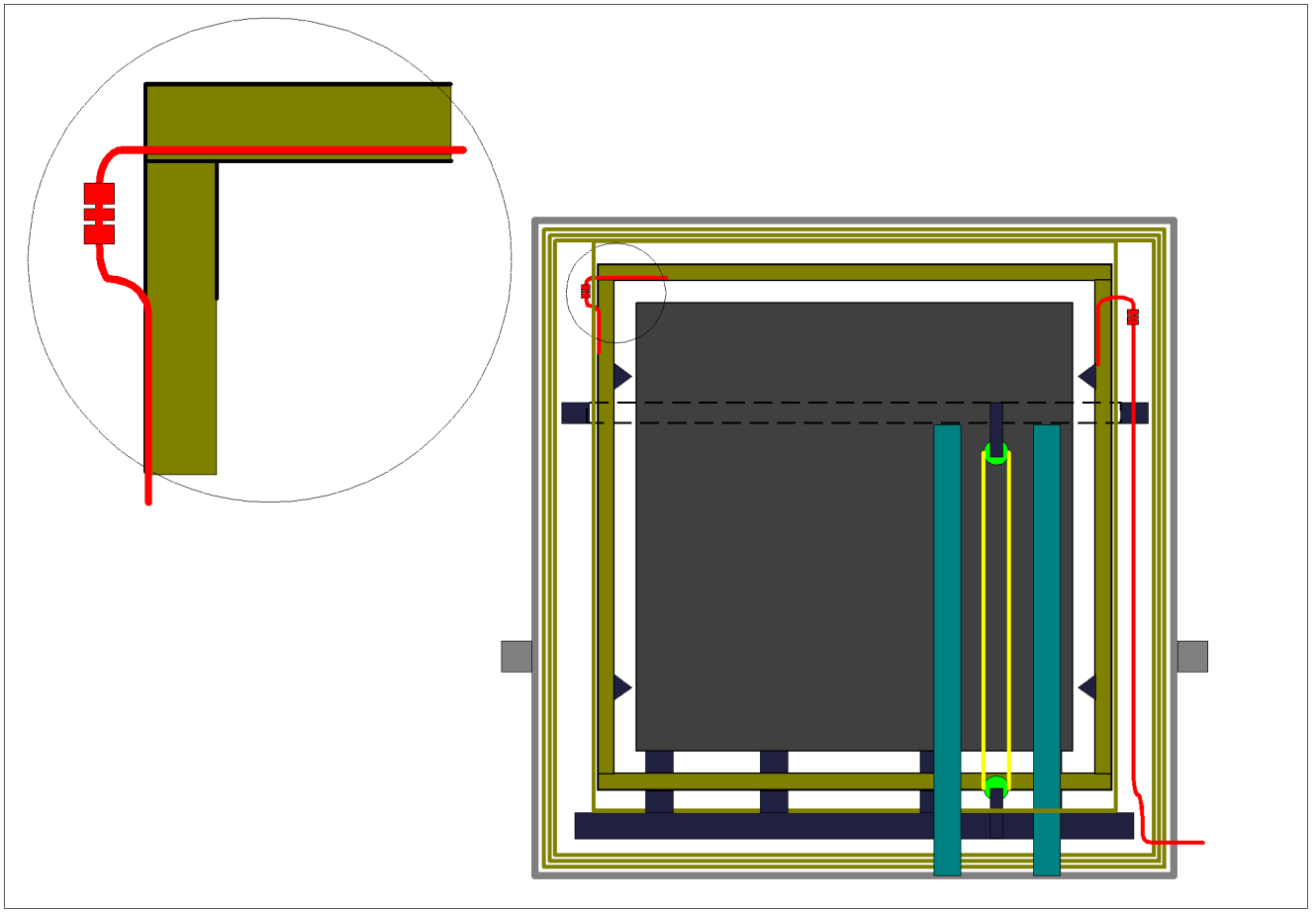
$\varepsilon_{\text{Tungsten}} \sim 0.7$

$E_{\text{reduced}} \sim 0.6$

$$T_{1kW} = \sqrt[4]{\frac{q - q_{cond}}{\varepsilon \cdot \sigma \cdot A}} \sim 368K$$

$$\Delta T_{1kW} = (95^{o}C)$$

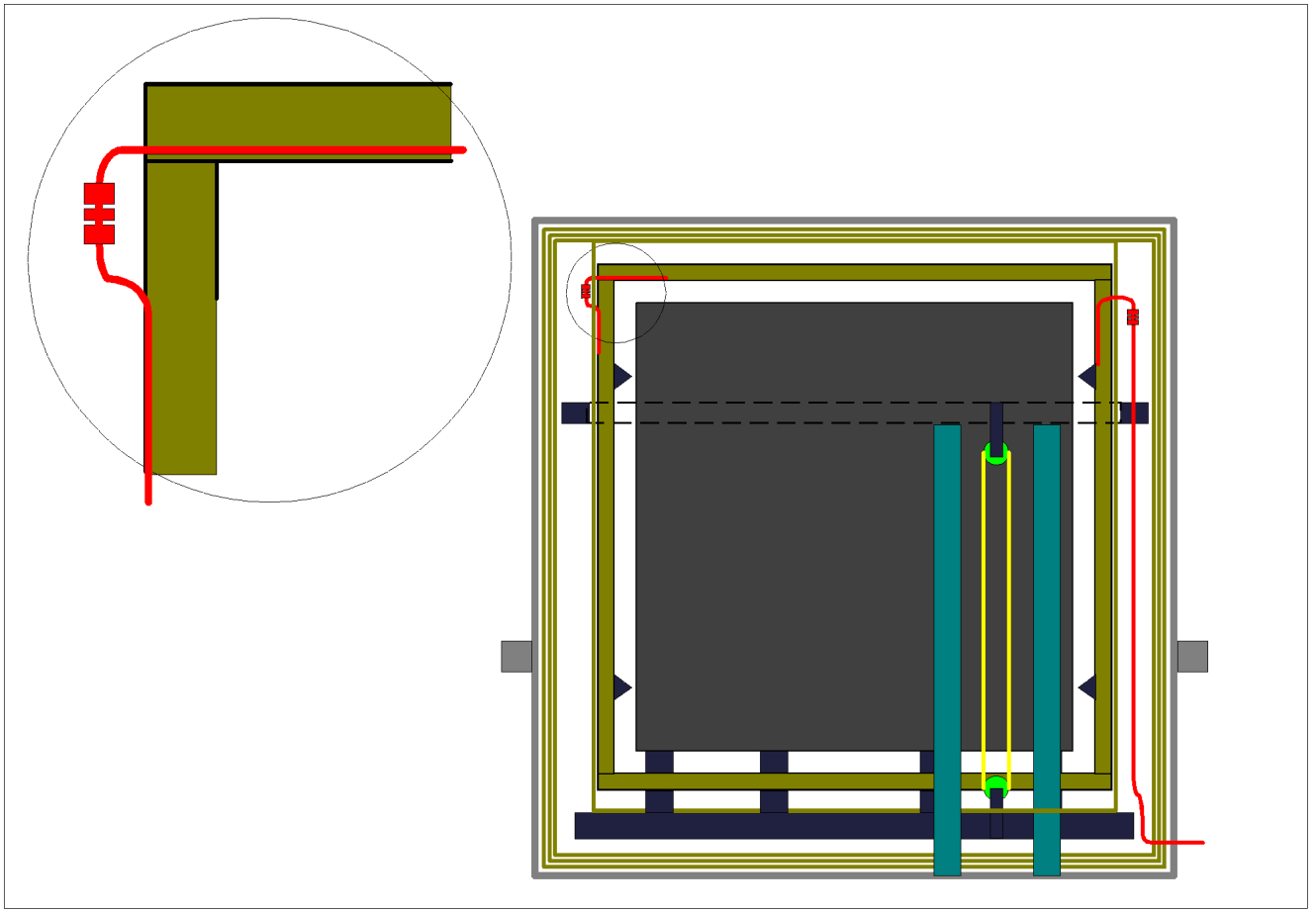
$$\Delta T_{2.5kW}^{o} = (189\ C)$$



Water flow rate:
Tube OD 10mm (ID 8mm)

$$m = \frac{Q}{c \cdot \Delta T} = \frac{2.5KJ/s}{c \cdot 25\,℃} = 0.02388kg/s$$

0.48m/s flow

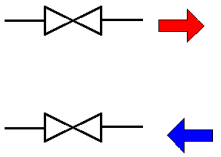


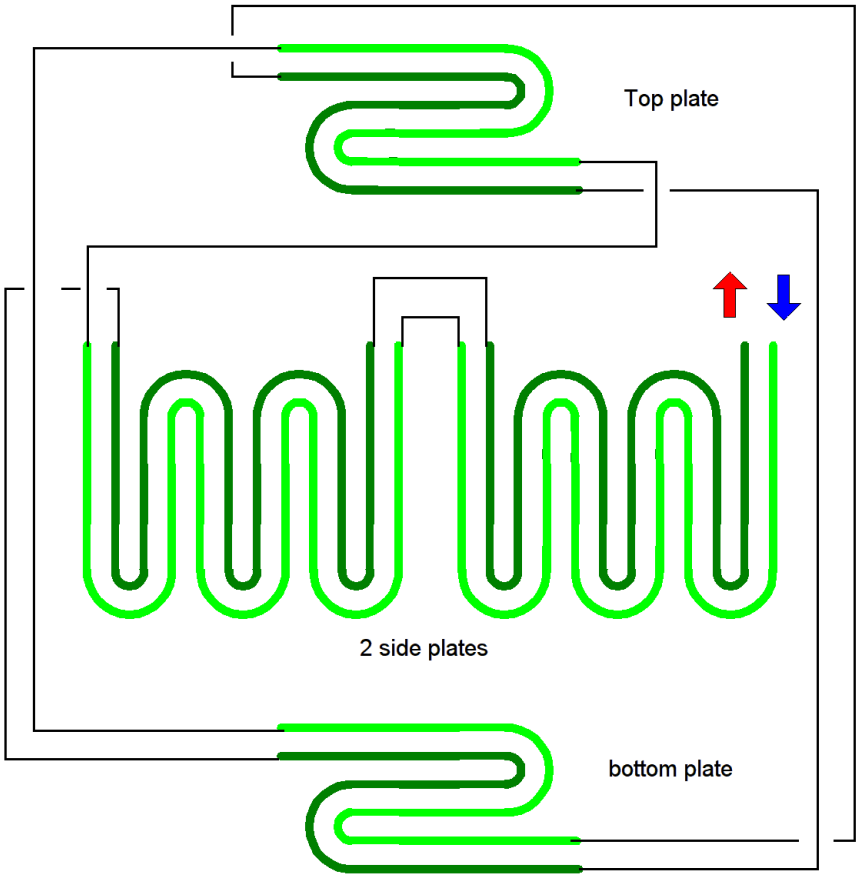
Water flow rate:
Tube OD 8mm (ID 6mm)

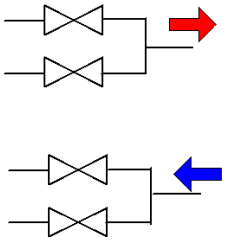
$$m = \frac{Q}{c \cdot \Delta T} = \frac{2.5KJ/s}{c \cdot 25\,℃} = 0.02388kg/s$$

0.84m/s flow

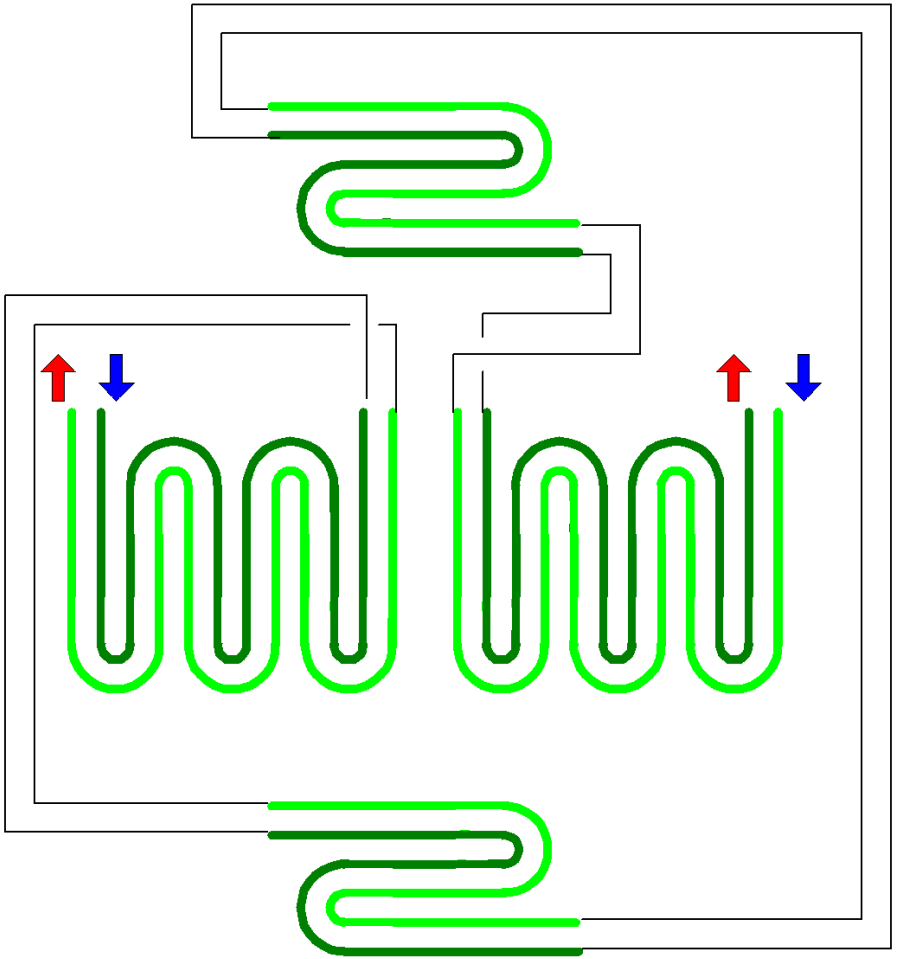
Only 1 inlet and 1 outlet

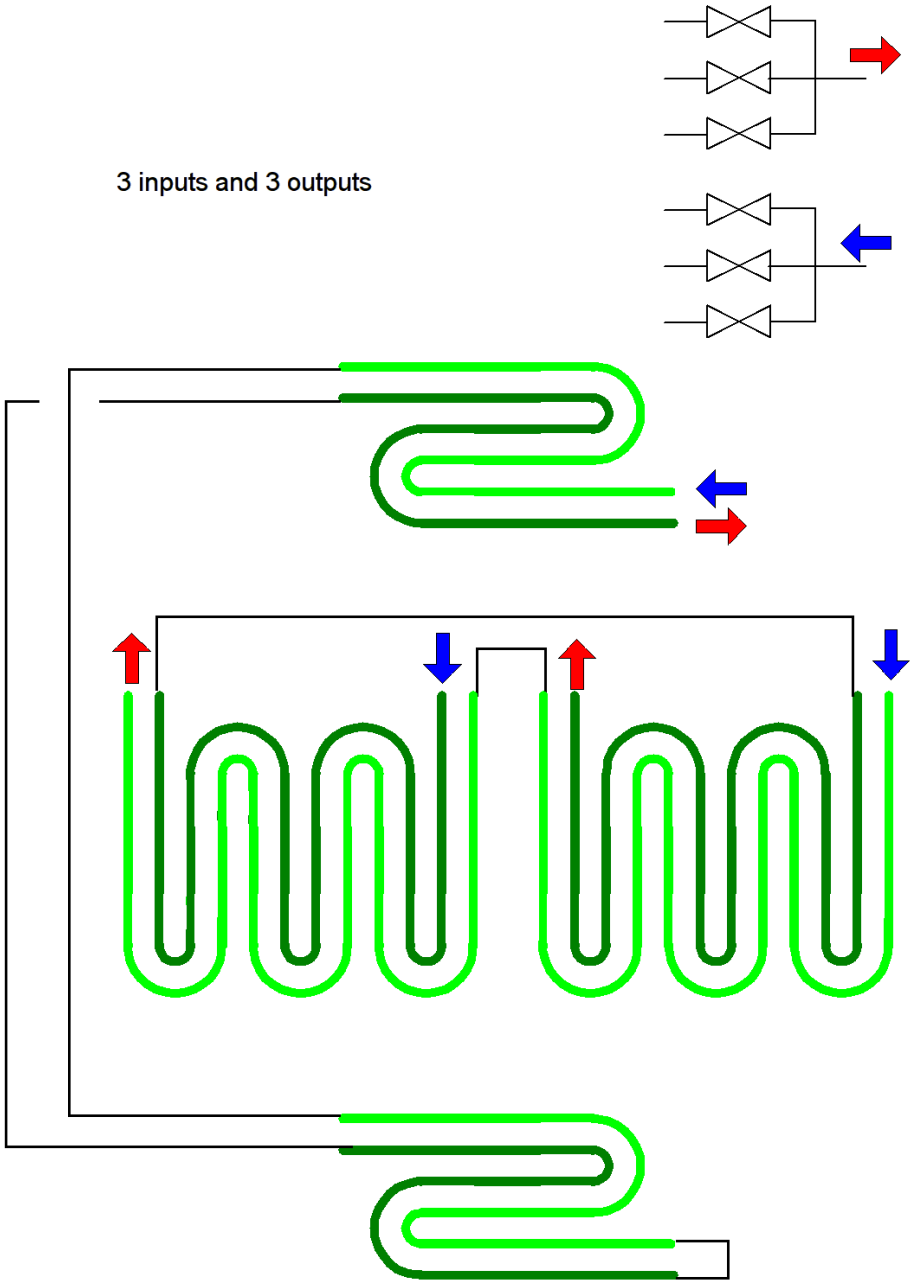






2 inputs and 2 outputs




3 inputs and 3 outputs

End