

Images Project Meeting
University of Warwick
21/11/2016

CREST

Loughborough University

Sensible/Latent Heat Thermal Energy Storage Test Rig

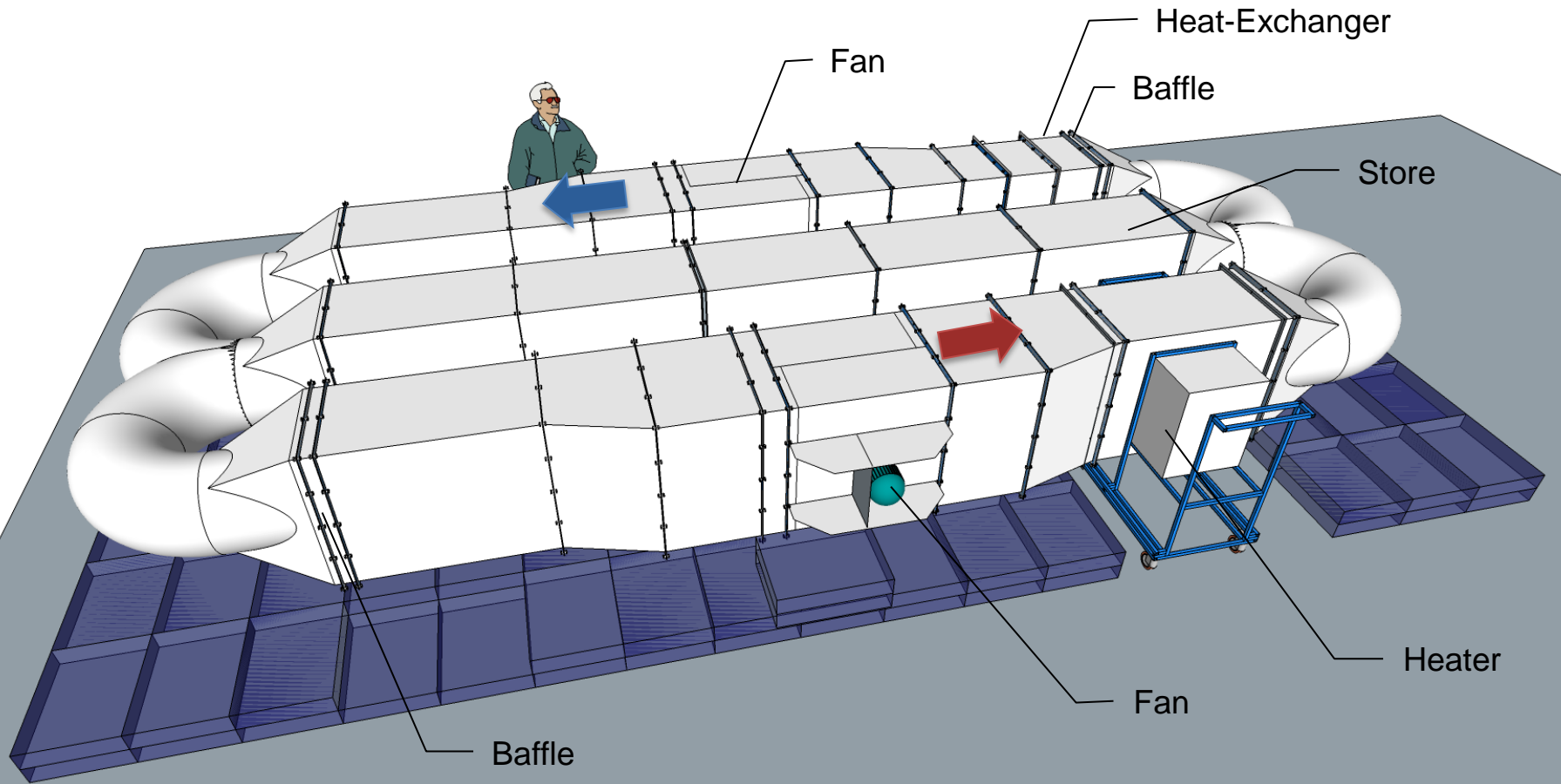
Characteristics

- Heat Transfer Fluid: Air
- Volume Flow Rate up to 3000 m³/h
- Charging Temperatures up to 350°C
- Store dimensions: up to 550 x 800 x 1000 mm

Sensing Equipment

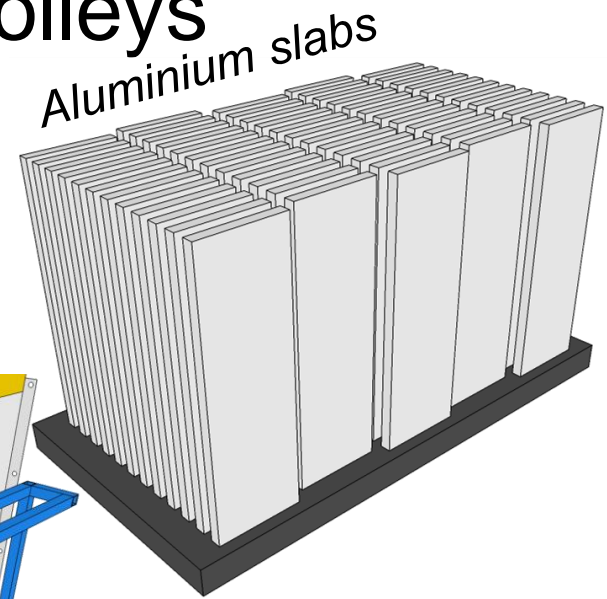
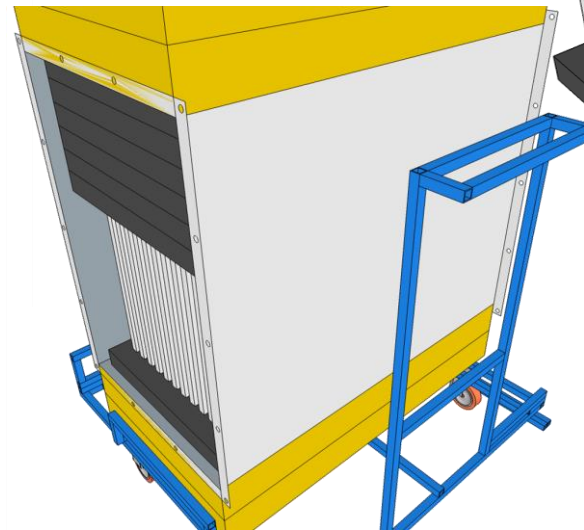
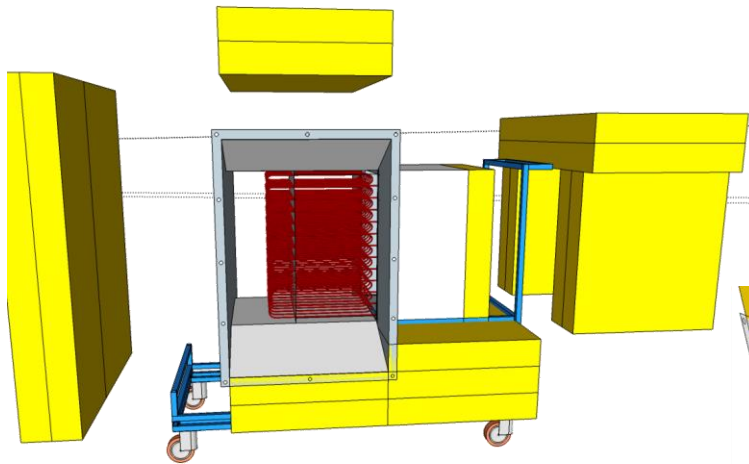
- 3 Mass Flow Meters: constant temperature thermal anemometer
- Thermocouples (Type T)

Latent Heat Thermal Energy Storage Test Rig



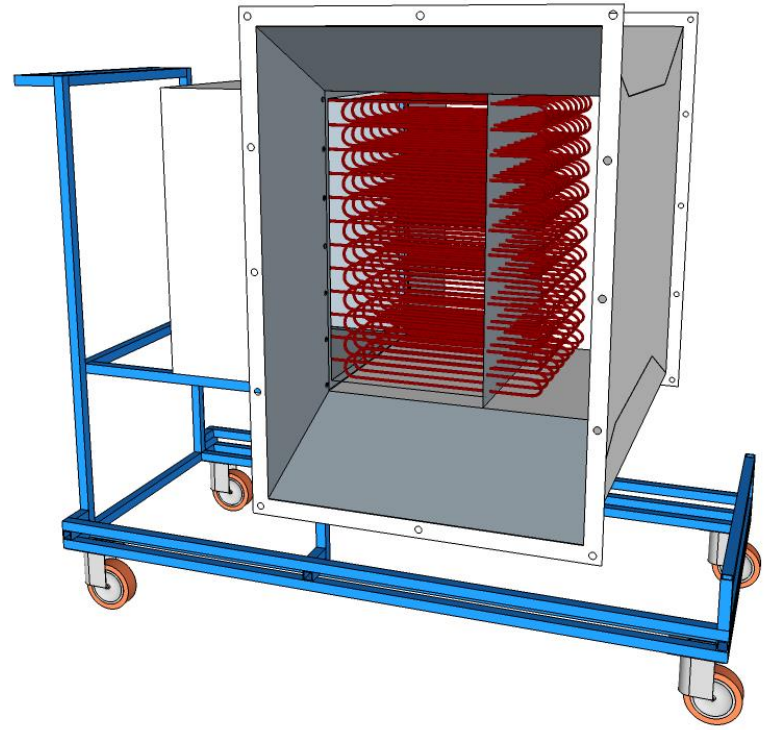
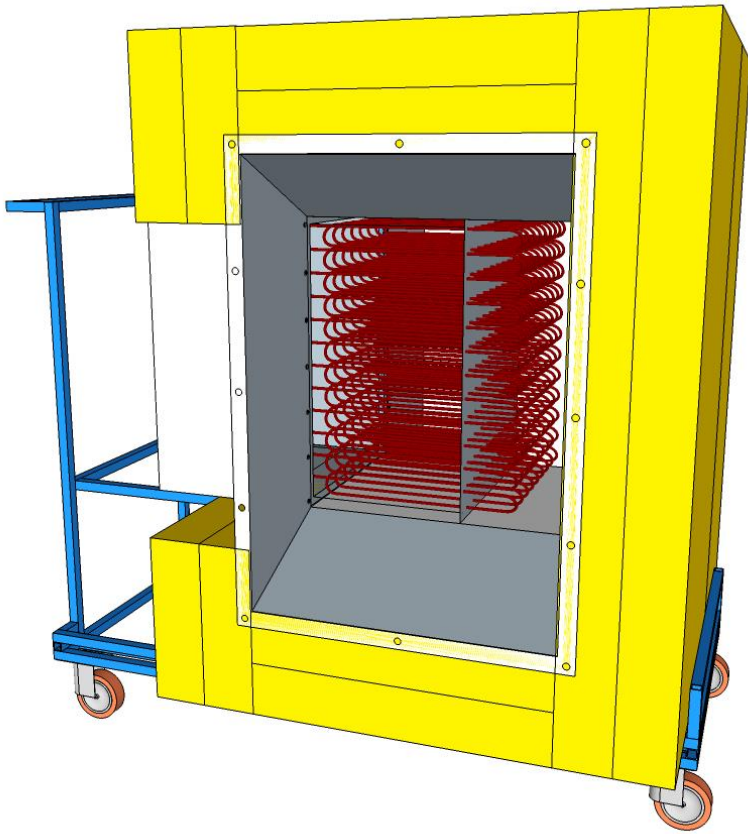
Latent Heat Thermal Energy Storage Test Rig

Heater, Sensible Heat Store Trolleys



Storage Capacity
540 kJ/K of 0.15kWh/K
Assuming 50% void
fraction

Heater Cart



Insulation

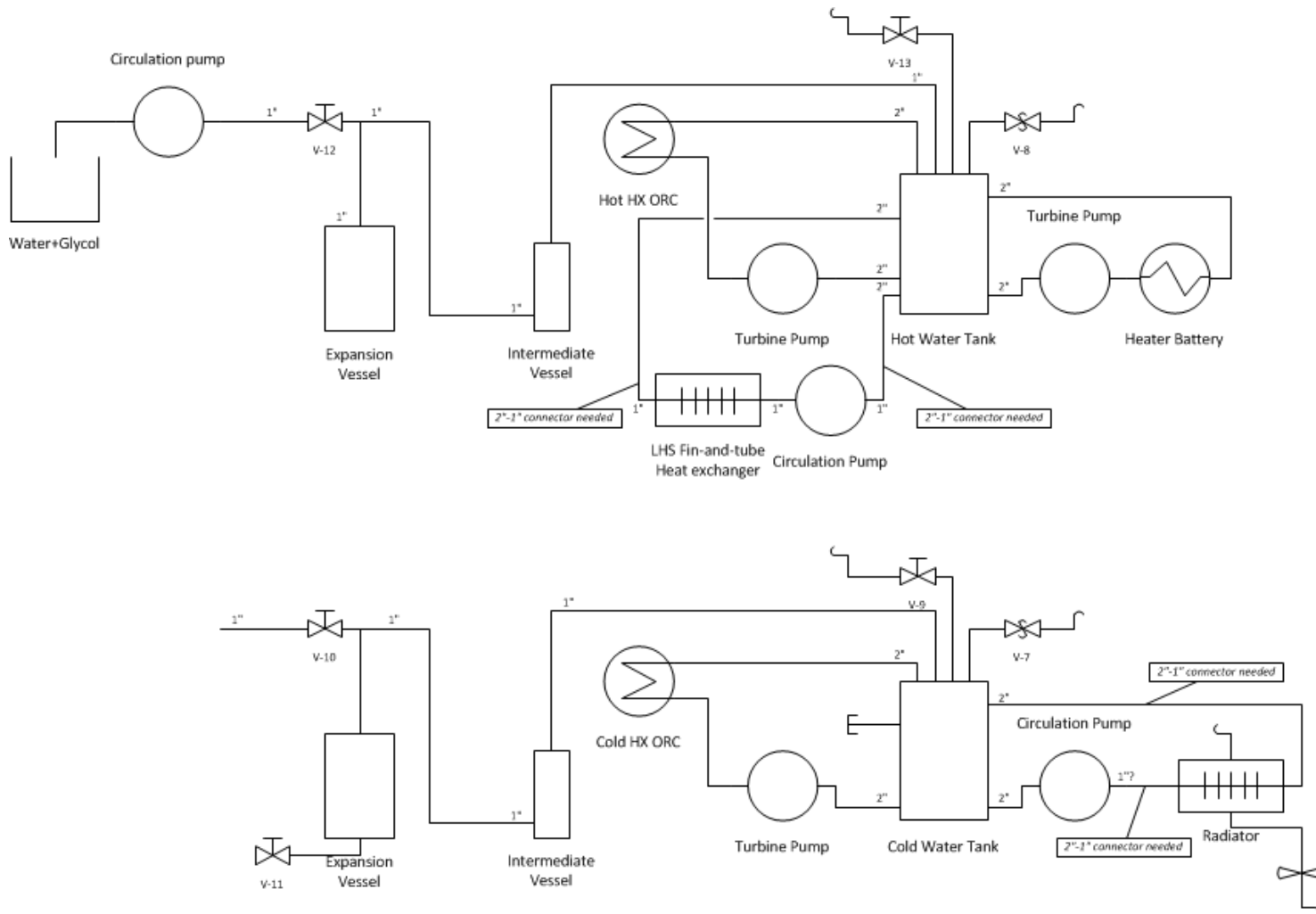


ORC Test Rig

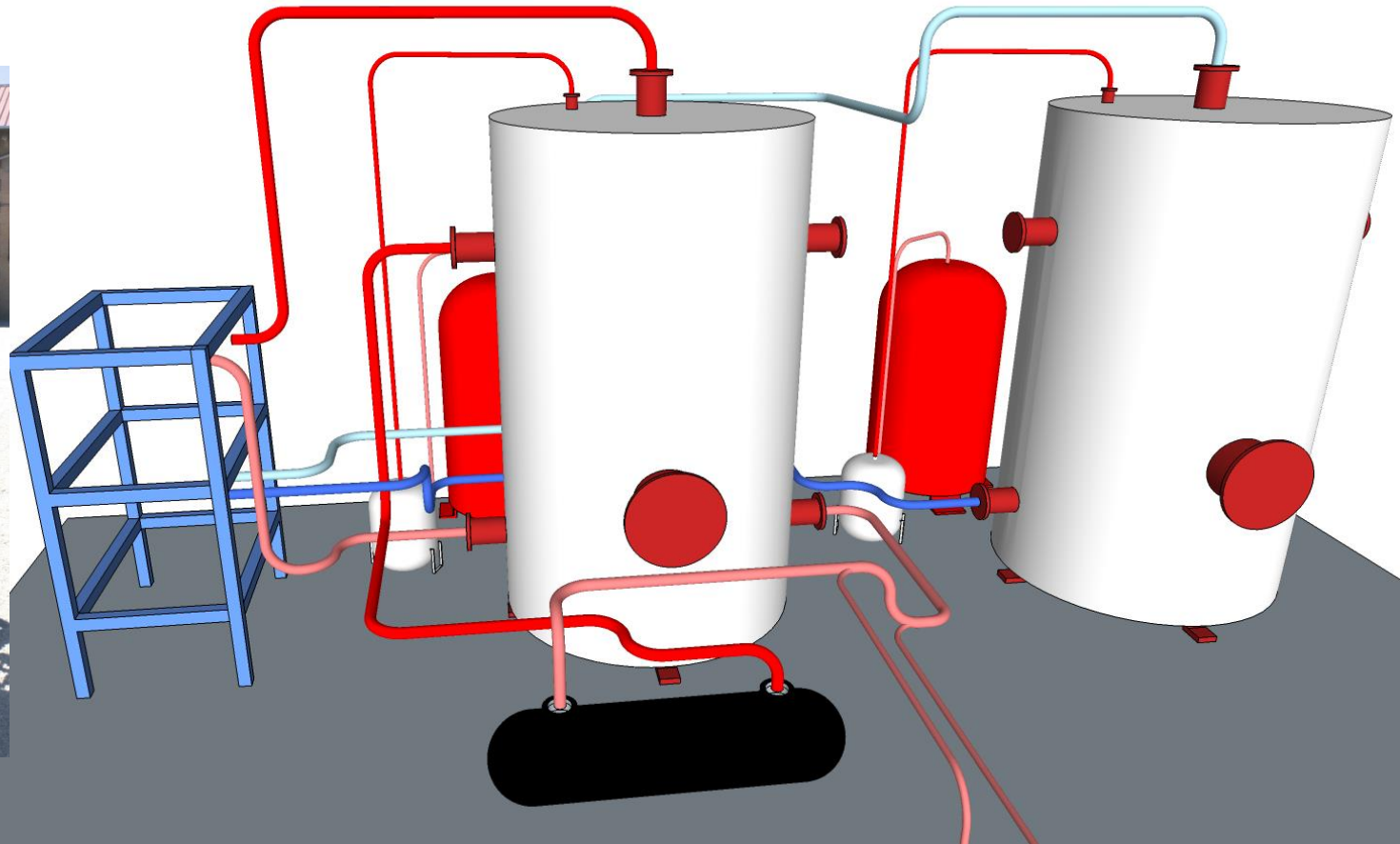
Characteristics

- 5 kW electric
- $\eta = 5-8\%$
- $T_{\text{hot}} = 90-120^{\circ}\text{C}$
- $T_{\text{cold}} = 10-30^{\circ}\text{C}$
- Thermal energy supplied via 1200 litre hot and cold water tanks
- Powered by heating battery and/or LHTES

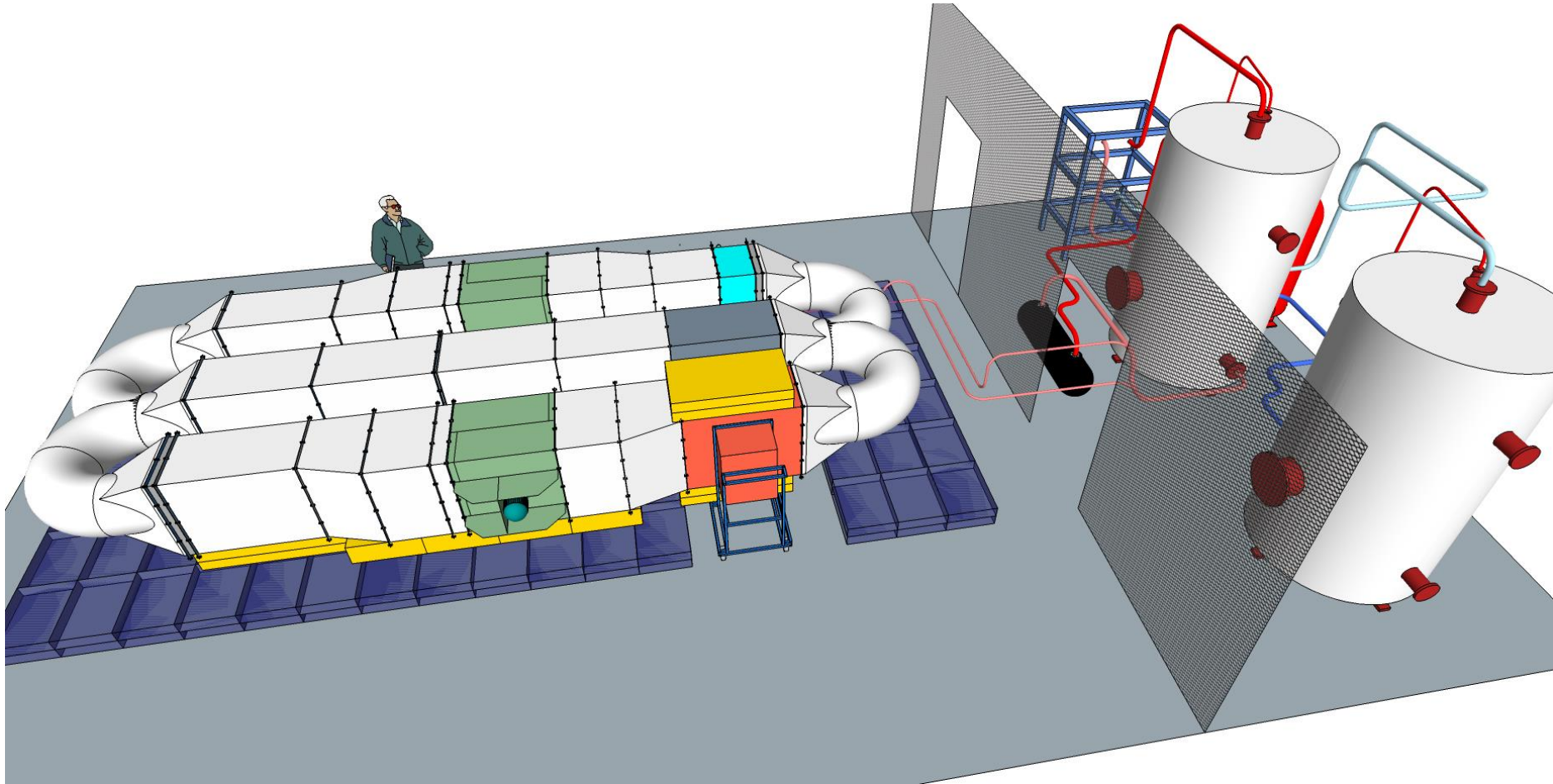
ORC Test Rig



ORC Test Rig



Room overview



Current Status

- ORC commissioned successfully
- All components of test rig, ducting, seals, heaters, fans, heat exchangers, trollies, insulation, flow metres, thermocouples and data acquisition in the lab and rig being assembled.
- Commissioning anticipated December