

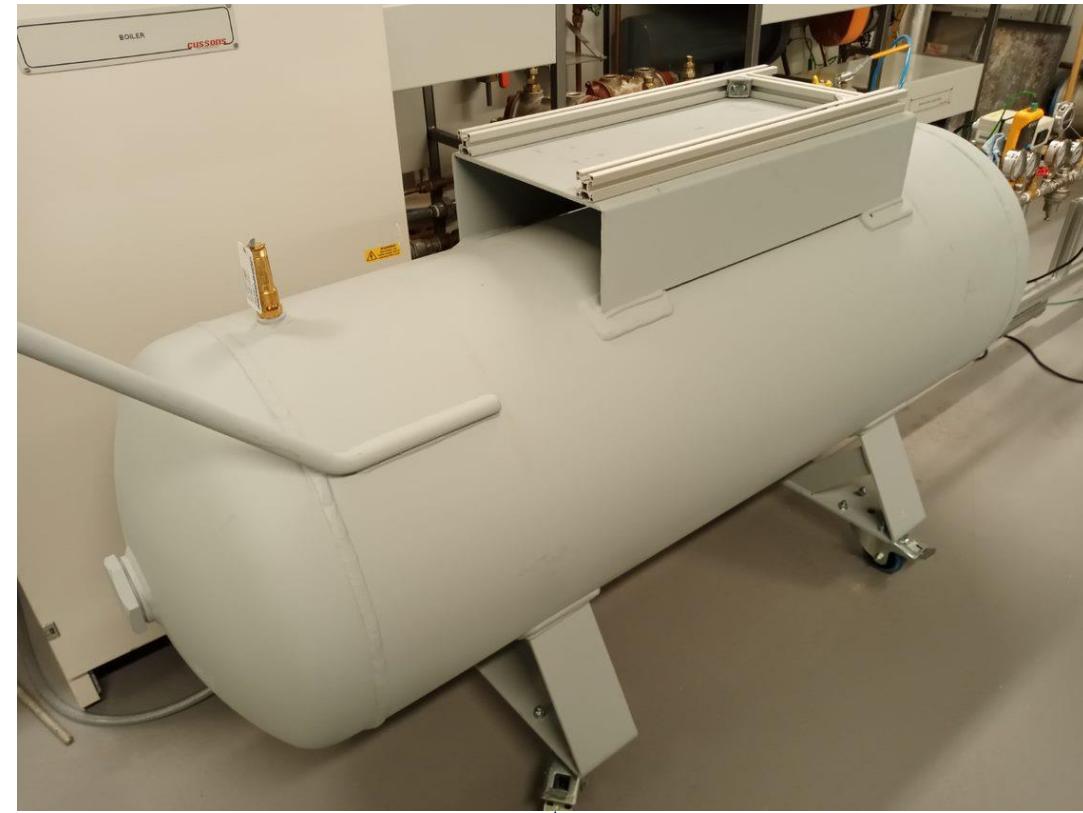
AIR RECEIVER Compressed Air Energy System

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PRESSURE VESSEL:

- Designed:
 - 20 bar, 500 litres
 - Insulated
 - No top saddle for compressor
- Bought:
 - 16 bar, 300 litres
 - Not insulated
 - Compressor on top
 - Wheels and handle included



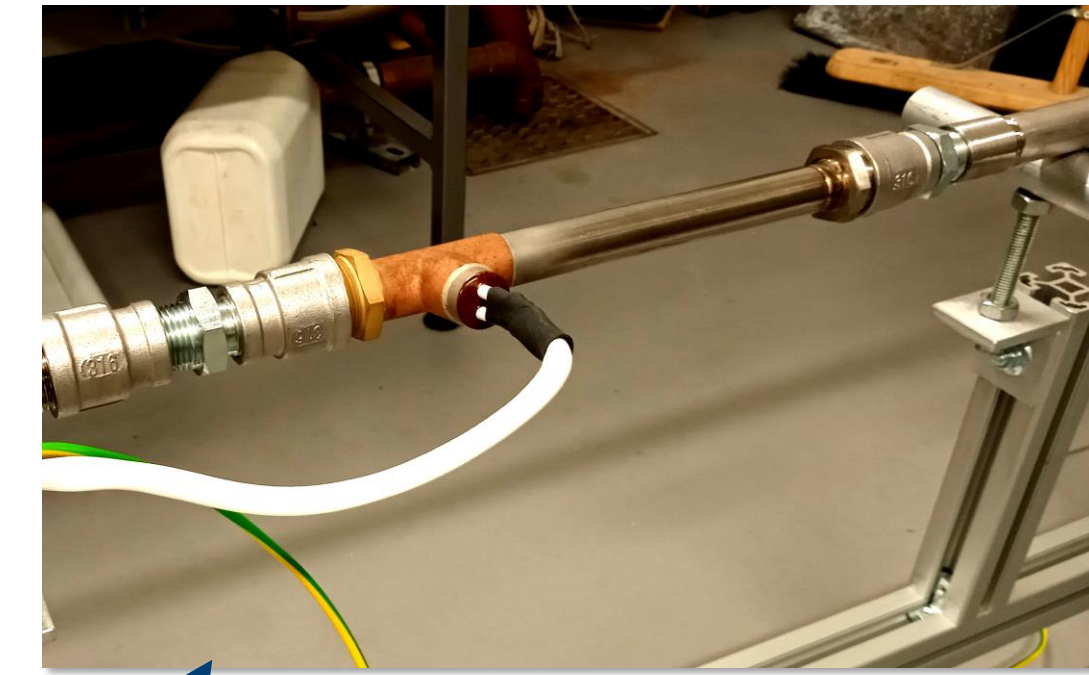
PRESSURE REDUCING VALVE:

- Provides constant pressure downstream
- Provides constant mass flowrate while active



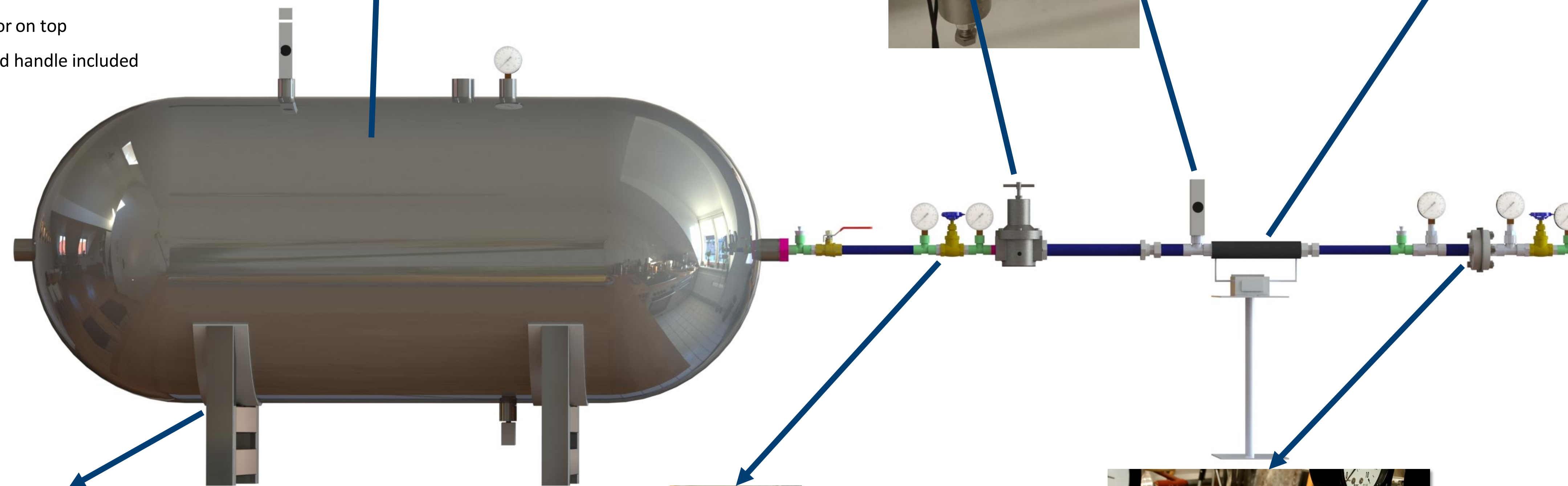
SAFETY VALVE:

- Ensures downstream pressure does not exceed component maximums



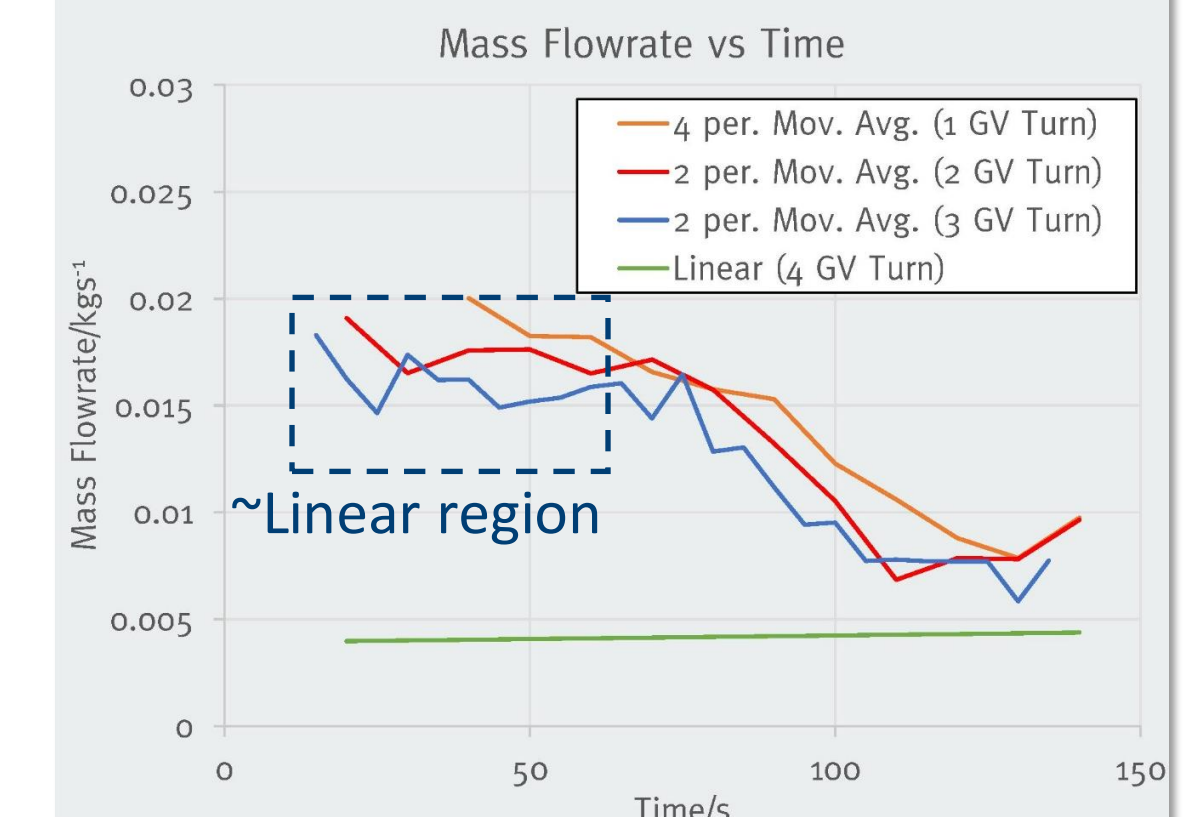
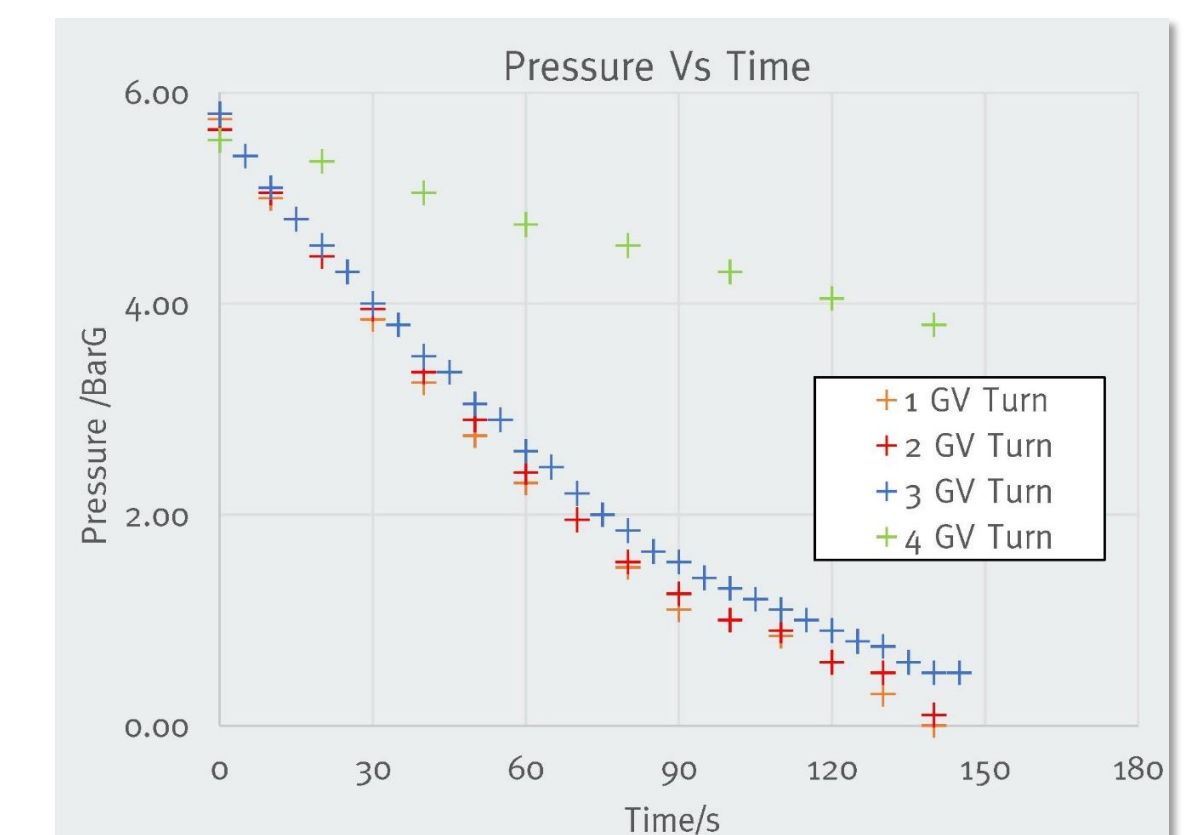
IN-LINE AIR HEATER:

- Heats airflow for turbogenerator
- Integrated with PID controller to ensure constant temperature output



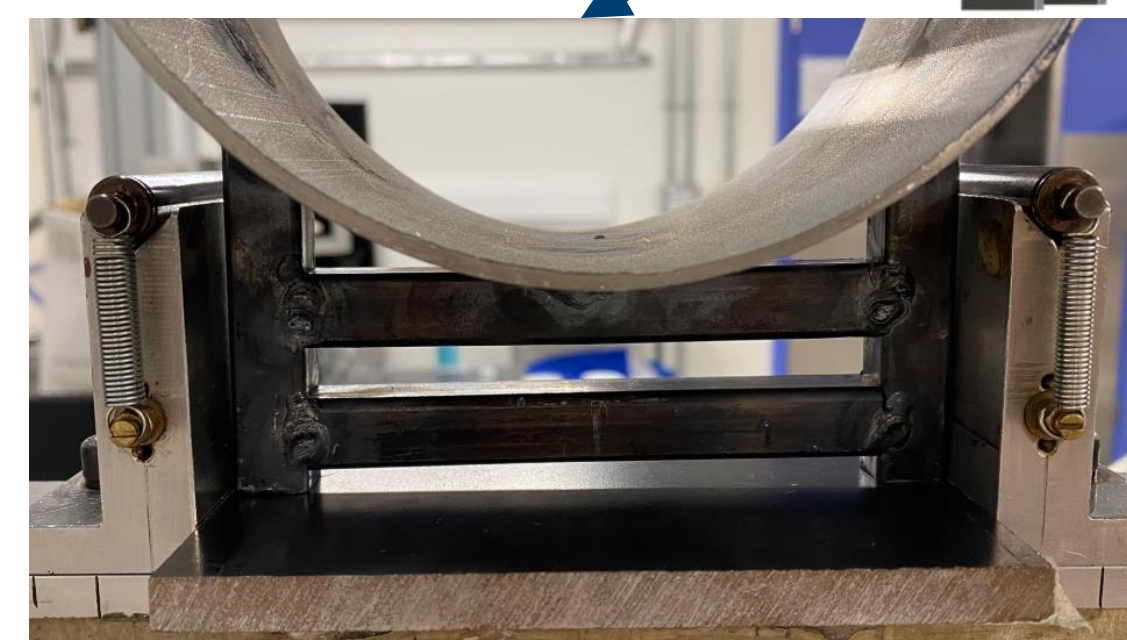
MAIN TEST ANALYSIS:

- Discharged pressure vessel after pressurising to 6 Bar, and measured pressure and temperature decay
- Constant mass flow rate for first 60s was observed for all experiments but not anticipated
- Inaccurate mass flow rate values meant more precise sensors should be used and further tests needs to be done before flow can be attributed to a specific model



SADDLE SUPPORT:

- Support designed with standard materials
- Small scale version manufactured for testing
- Safety factor of 51 achieved



GATE VALVE:

- Used to emulate turbine stages for pressure drop
- Different gate valve positions (rotations of wheel) from open state tested in experiments



ORIFICE PLATE FLOWMETER:

- Flowmeter to measure mass flowrates
- Testing concluded designed orifice plate was not suitable as nominal pipe diameters were too small

