



High temperature test

9 May 2011

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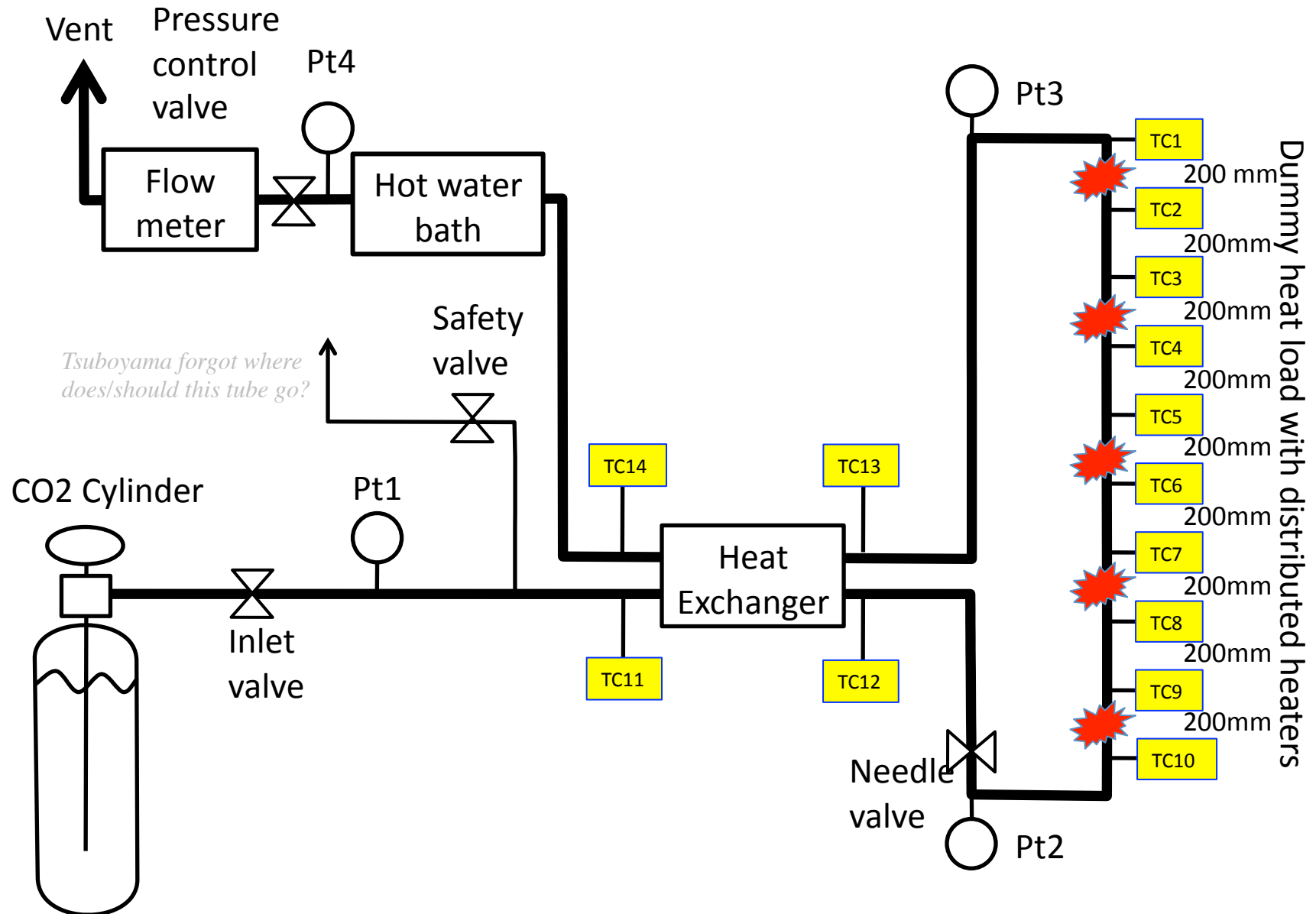
Purposes of the experiment

- Operation at 15°C.
- Apply more than 100 W power to the dummy load.
- Reduce the CO₂ flow in order to observe the dry out of liquid CO₂ in the tube due to excess heat.



Main components of the test setup

Kasami assembled the system in the difficult condition after the Earthquake all by alone.





Experiment/Control

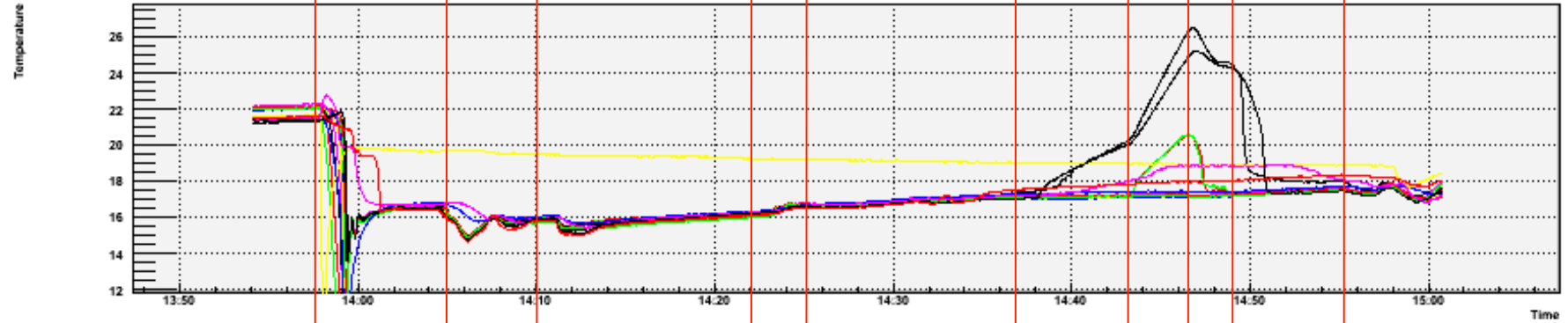
- I am ashamed that the experiment log is lost.
- The experiment is reconstructed from the logged data.

Time	CO2 flow target	Heater control (W)	
13:57		0 W (off)	Start experiment. Pressure valve adjusted.
14:05	20 l/min	0 W	Needle valve adjusted.
14:10		0 W	Needle valve adjusted.
14:22		0 → 50 W	Heater is turned to ON
14:25		50 W	He flow (exit) increased.
14:37		50 → 100 W	The heater power increased. Dry out started.
14:43		100 → 125 W	The heater power is increased. Dry out expanded to the next heating position.
14:47		125 → 100 W	Dry out in the last point disappeared.
14:49		150 → 0 W	All points are cooled well.
14:55	Closed		Experiment Finished

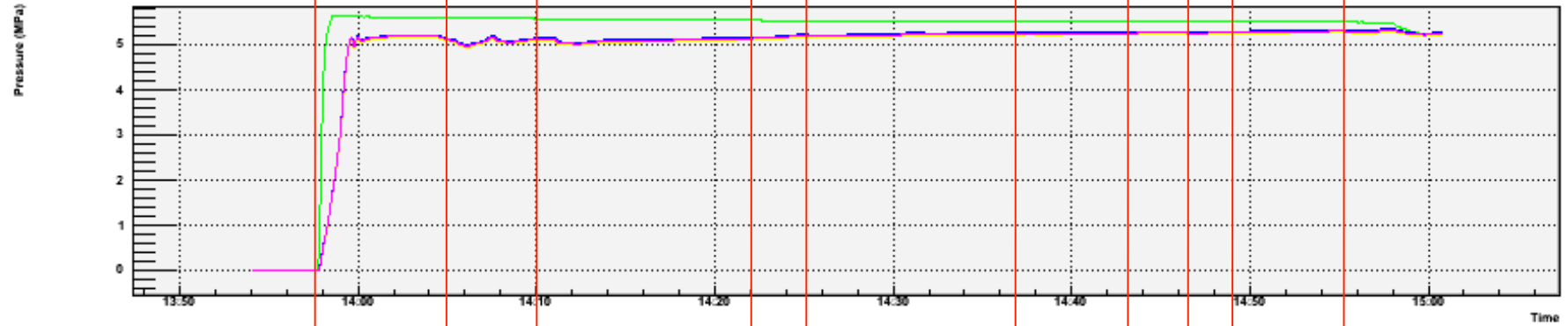


Time chart

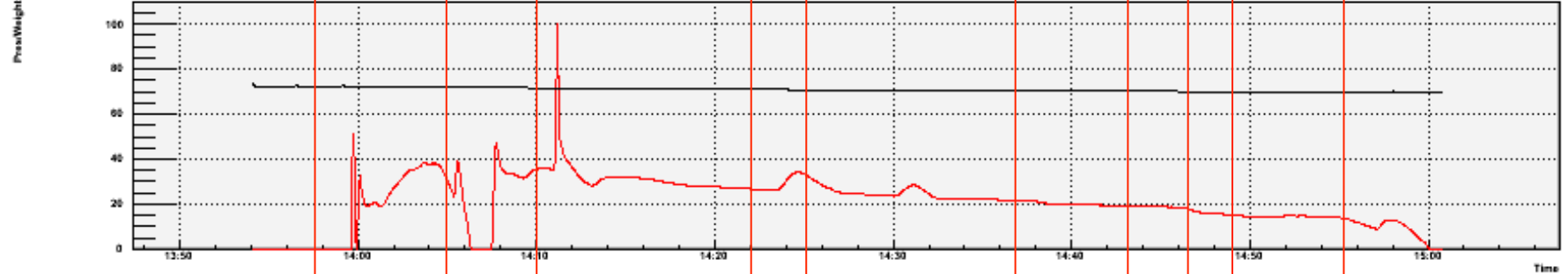
Temperature



Pressure

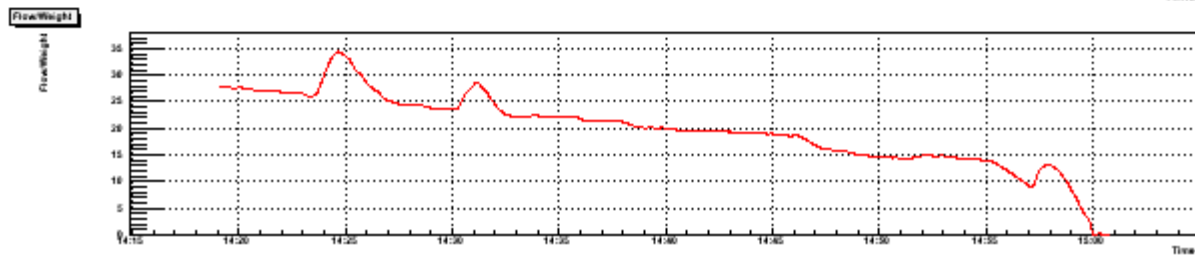
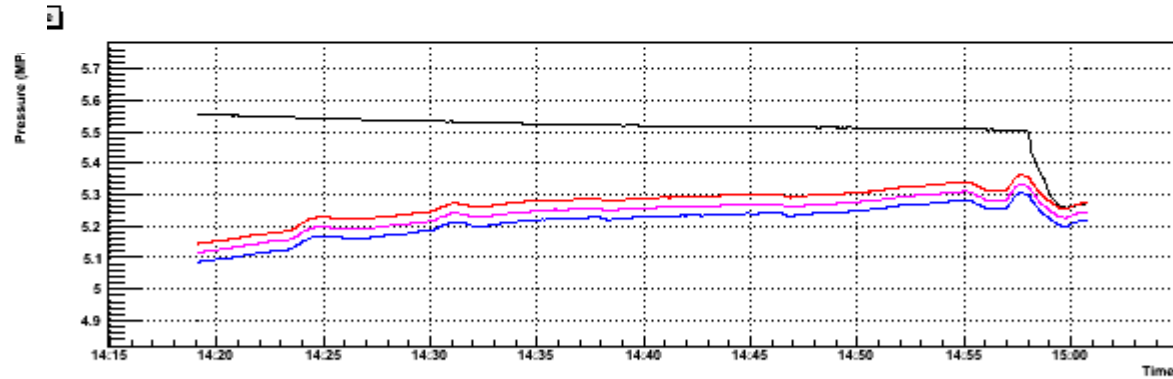
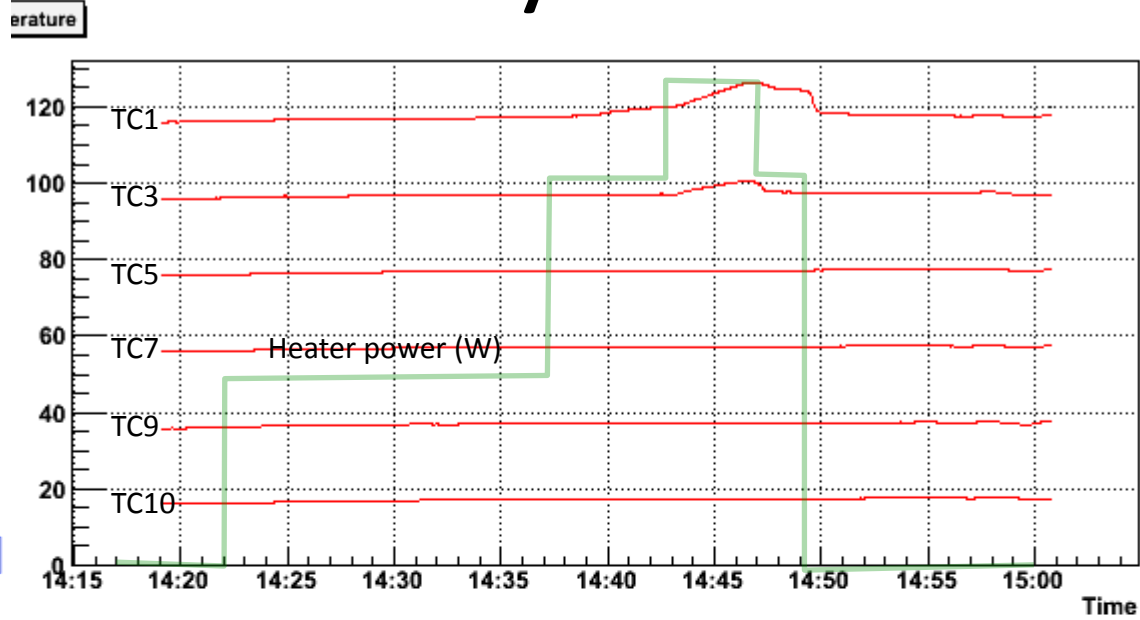
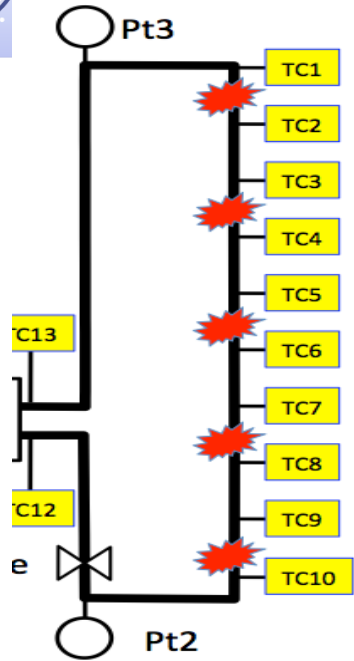


Temp/Weight



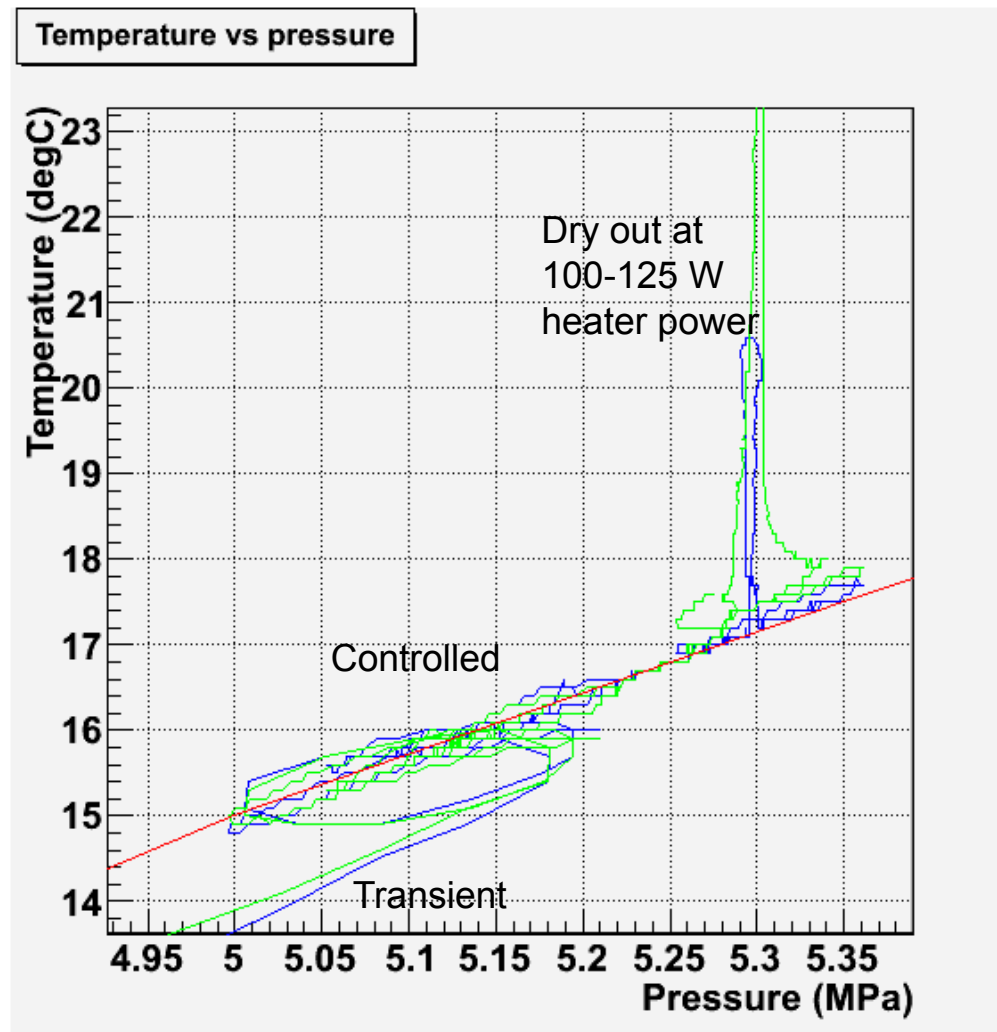


CO2 dry out





p-t Graph





Summary

- Even in the high-temperature (15°C) operation, the temperature of system is well controlled by the pressure in the system.
- Dry out of the liquid CO₂ occurred at 100 W as expected.
- In this experiment, the flow rate and pressure control was not good as in the previous experiment. We understand that the pressure in the CO₂ cylinder was near the controlled pressure. In other words, the target temperature was too near the room temperature.