

Group C lab SVT services

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Services needed for running the SVT

Operation

- Plan to run at a few degrees Celsius
- Want dew point at about -10C i.e. relative humidity of about 10% @ 20C

Services

- Cooling: ethylene glycol; need very little flow ($\sim 7\text{g/s}$ or $\sim 0.11\text{ GPM}/6.6\text{ GPH}$)
- Dry air

Safety (protect the SVT and chiller)

- Filters for clogging cooling and dry air system
- Flow, temperature and humidity environment in hardware interlock
- Internal safety features in chiller: temperature range, fluid level

Dry Air Setup

Based on existing compressed air dryer

- Added oil-removal, filters (incl. point of use), regulators and flow meters
- Flow rate can be relatively large (>20 SCFH; out of scale)

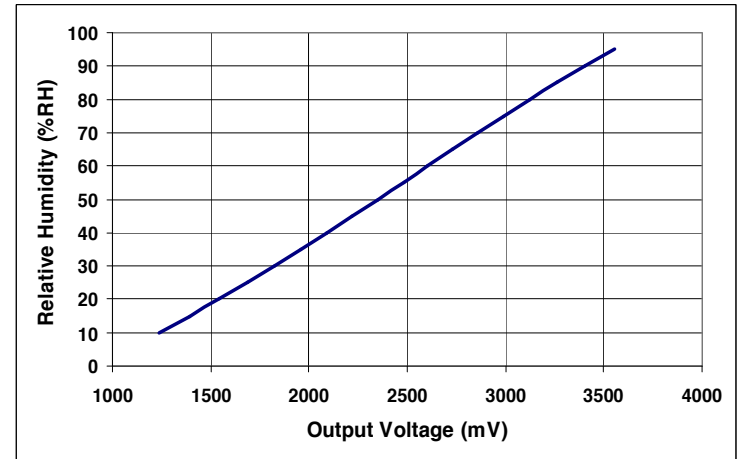
Plan is to purge only inside existing Lexan cover (need to seal it)



Dry Air Sensor

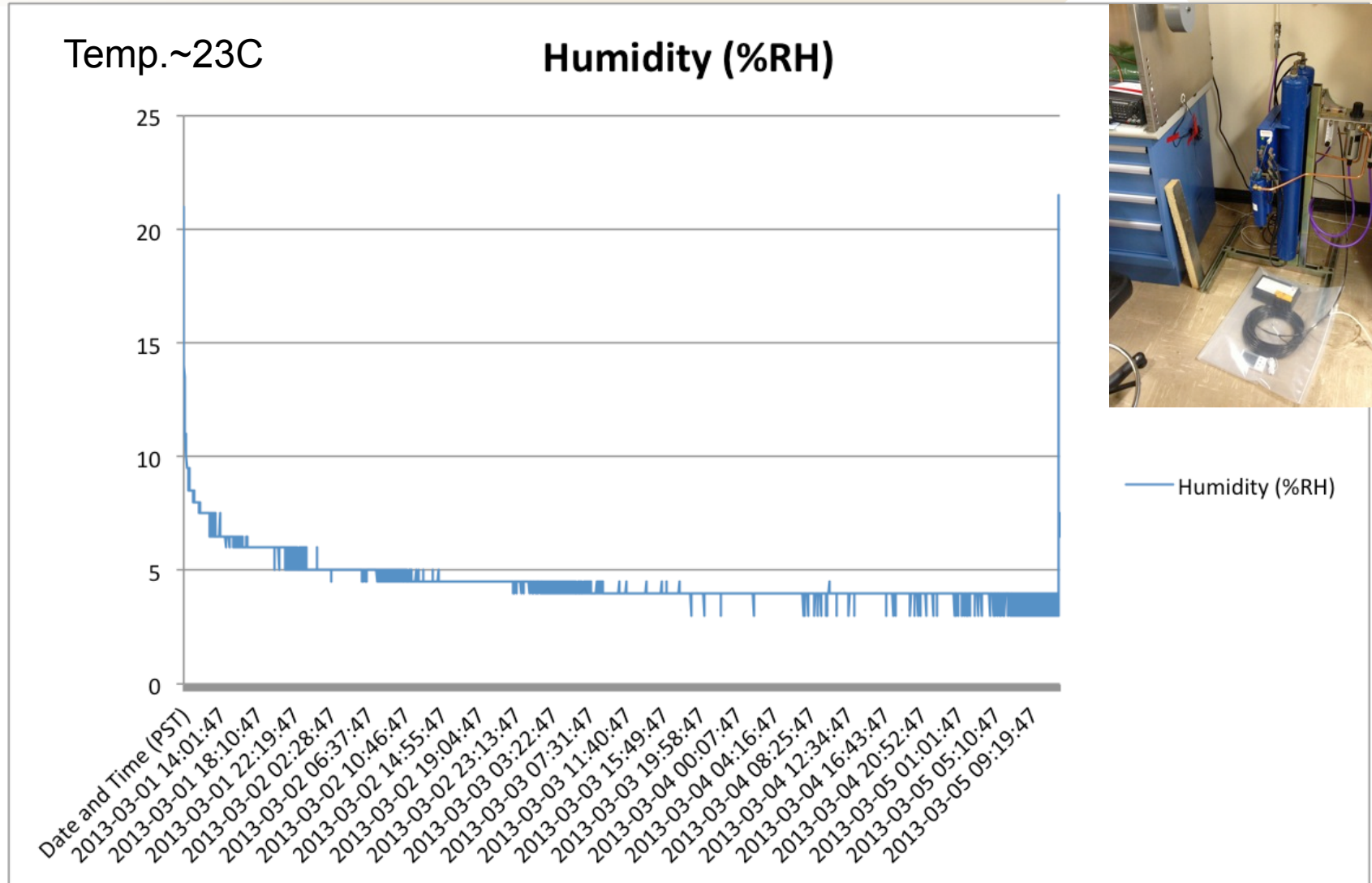
Sensor with voltage output

- Rel. humidity: range 1-99% with 3% accuracy
- Temperature: range -40-85C



Temp (°C)	R (Ω)	Temp (°C)	R (Ω)
-40	195652	25	10000
-35	148171	30	8315
-30	113347	35	6948
-25	87559	40	5834
-20	68237	45	4917
-15	53650	50	4161
-10	42506	55	3535
-5	33892	60	3014
0	27219	65	2586
5	22021	70	2228
10	17926	75	1925
15	14674	80	1669
20	12081	85	1452

Dry Air Performance Test



Hardware Interlock Board

Board (and cables) produced

- Based on comparator
- Tune levels with potentiometer

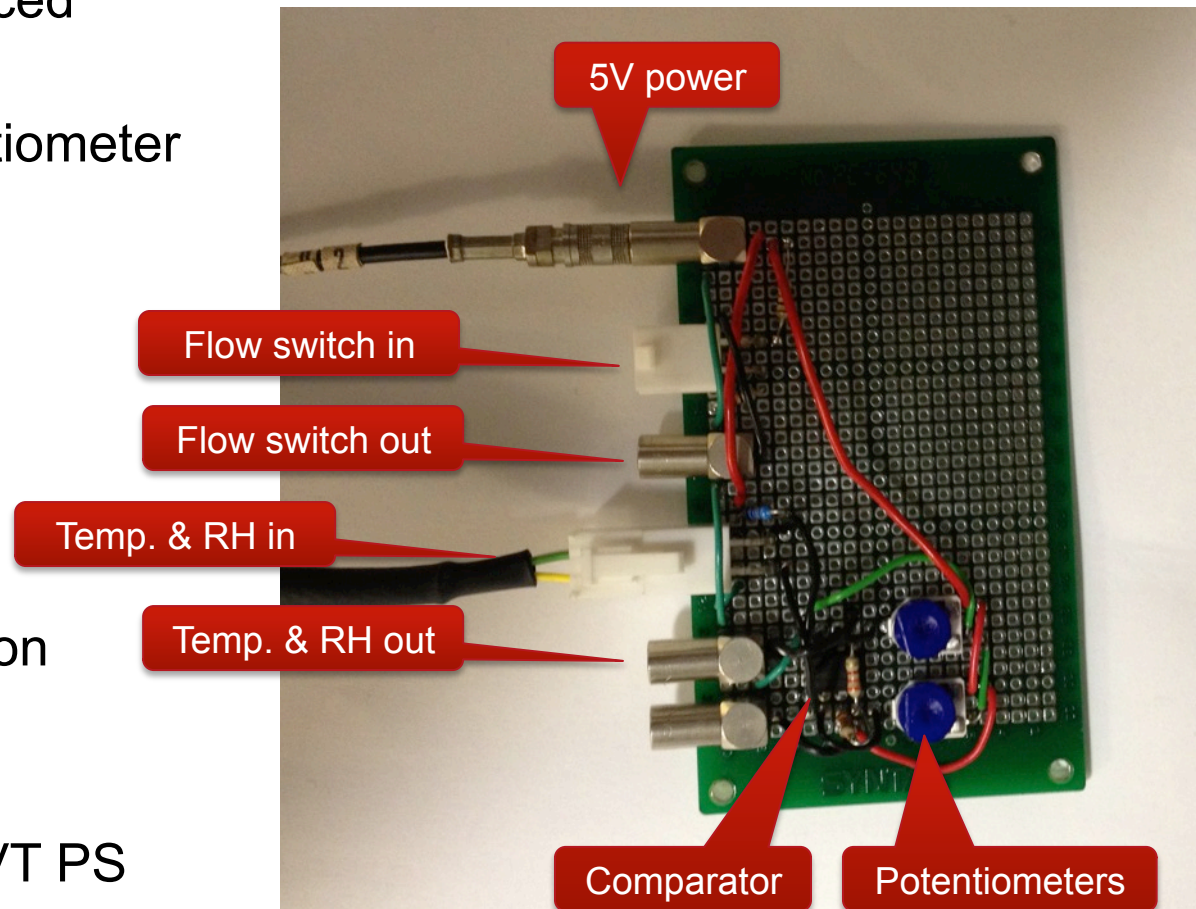
Board input

- 5V power
- Temperature (0-5V)
- Humidity (0-5V)
- Flow switch output

Board output (TTL signal)

- Temperature comparison
- Humidity comparison
- Flow switch output

NIM crate for logic and SVT PS
enable signal ready to go



Progress on cooling

System description

- SVT manifolds (done :)
- Manifold with valves and pressure gauges and relief valve for flow control (ready to connect)
- Flow meter and flow switch (AC version; see below)
- Chiller incl. 5um particle filter

Next steps

- Ready for connection to chiller
- Finalize design of thermal box (material already here)
- Decide on cable length from chiller -> connect and test without SVT manifold
- Pressure test the SVT manifold?

Feedback

- “Cleaner” to connect to manifold inside the lexan box; 2 extra swagelok (we have many...and it will be pressure tested?), problem for anyone?
- Flow switch; exclude, fix AC safety or exchange for DC version?
- Clamped hoses solution makes me a little nervous?

