Heater circuits update 3/22 —simplified compared to 11/29/05

> 2 fault tolerant by 4 thermostats opening 49/54 deg for Xe/CO2
2 fold redundand: [A, B] = [hot, cold circuits] = symbols [ ]

Shown here configuration for

```
CO2  16 MINCO KR5248 R18.2 L12A
30V  0.5x5.1”  24 W max
Xe:  32 MINCO KR5247 R11.1 L12A
30V  0.5x5”  20W max
Here two R11.1Ω in series are drawn as one resistor
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“rolled down”: Equivalent circuit

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Definitions

Resistors Xe CO2
A1=A2…..=A8 11.2 +11.2Ω 18.2Ω
B1=B2….= B8 11.2 +11.2Ω 18.2Ω

Thermostats
T_A1= T_A4 off 49, on 38°C
T_B1= T_B4 off 54, on 43°C

The MDP will be reached at 65 deg C

All wires go to one side of the supports.
(If required A and B can be secured by one more thermostat at +120V.

8 Dallas sensors monitor the temperature.

Model for wiring done 3/22/06 UB
There is always a second circuit B for redundancy/mission success

<table>
<thead>
<tr>
<th>Component</th>
<th>max power</th>
<th>A-circuit resist.</th>
<th>Type</th>
<th>location</th>
<th>status 3/16/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xe tank</td>
<td>30V &lt;20W</td>
<td>2 parallel (8x11.1Ω)</td>
<td>Minco Hk5247 R11.1,1L12A</td>
<td>distributed over sphere</td>
<td>glued, not connected</td>
</tr>
<tr>
<td>CO2 tank</td>
<td>30V &lt;25W</td>
<td>2 parallel (4x18.2Ω)</td>
<td>Minco Hk5247 R11.1,1L12A</td>
<td>distributed over sphere</td>
<td>glued, not connected</td>
</tr>
<tr>
<td>Preheater</td>
<td>30V &lt;10W</td>
<td>2 parallel 174Ω</td>
<td>Dale RH-5</td>
<td>bolted on alu</td>
<td></td>
</tr>
<tr>
<td>Valve V1,10</td>
<td>30V &lt;10W</td>
<td>2 parallel 178Ω</td>
<td>Dale RH-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tower</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4valve V2,20</td>
<td>120V 9(11)W</td>
<td>2 parallel 3200Ω</td>
<td>Dale RH-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2vfilter V3, O1</td>
<td>120V 7W</td>
<td>2 parallel 4114Ω</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2vGP50 V4</td>
<td>120V 5.1W</td>
<td>2 parallel 5620Ω</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vent valves</td>
<td>120V 4W</td>
<td>2 parallel 3200+4114Ω</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BoxC tank</td>
<td>120V 9W</td>
<td>3x 561Ω</td>
<td>MincoHK5307 R561L12A</td>
<td>on cylinder</td>
<td></td>
</tr>
<tr>
<td>BoxC Valves</td>
<td>120V 4W</td>
<td>2 parallel 3272+4114Ω</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Robert please insert**

Recall: \( U_{\text{watts}} = \frac{U^2}{R} \)

Note: red/italic we must order unless they are at CERN. for B-circuit double the #.

What is at CERN?

UB has at MIT Dale RH-5 5W resistors all bolt on and 1%:
9 pc 174Ω, 6pc 178Ω, 9pc 3200Ω, 10pc 3272Ω,

Robert: 174, 178, 226, 307, 432, 3200, 3272, 4114, 5620Ω