MeltLab Systems

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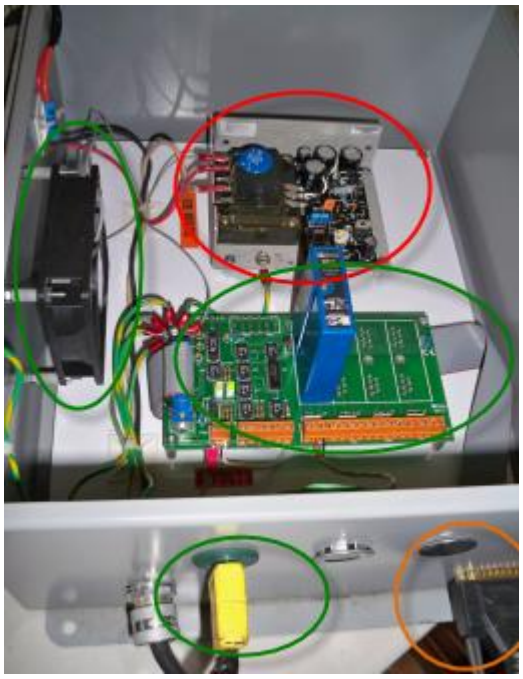
The MeltLab Convertor Box exposed



The red circled is a steady state transformer that keeps the voltage to the converter steady at 5.0 VDC with less than 0.01 VAC. This is the 1.5 amp version with enough power for 4 inputs. Life expectancy is > 10 years. Occasionally the output voltage may need tweaking.

The black item circled on the left is a recirculation fan. No outside air is brought in to maintain a clean environment. This also eliminates any filters that might need servicing. The fan serves to move heat from the heat generating components to the box. The box should not be located where it might receive heat radiation from molten iron. The maximum safe temperature for the transformer is 45˚C (113˚F) and for the blue module 50˚C (122˚F). We have added a varistor (blue and round) to block high energy surges, and a small capacitor (not visible) to adsorb high frequency AC sometimes generated by high frequency furnaces.

The green board and blue module circled is the actual Analog to digital convertor system. The board supports up to four converters. The converters are low noise and have 16 bit accuracy. That converts to 1/20th degree C, or 1/10th degree F using K-type thermal couples common in iron and aluminum analysis. While the 12 bit converters are common and less costly, their accuracy is only 0.4995 degrees C or about 1 degree F – not really good enough for microstructure analysis. One competitor when all out and used a 24 bit converter in their converter, but then cheapened it by using a single wire with common ground (adds the noise of all lines to the signal), and multiplexed it (short dwell time) and ended up with a very noisy system. The blue modules, with only an expected life > 5 years, are the weakest component in the system. Most seem to last in excess of 10 years, but we have seen some early failures at 7 years. Compare this to our competition! This might also explain our willingness to warrant all parts for 5 years against manufacturing defects: never had a claim.

The yellow plug is where the stand plugs in. Note, the receptacle is green and the plug is yellow. This is wrong. I need to change out the receptacle from type S/R/B (green) to type K (yellow). The tests I was running at the time did not require accuracy.

The orange circle is the serial cable. This connects to a 9 pin serial port or, though a converter, to a USB port on the computer.

So there you have it, the strongest, most rugged, and most reliable converter system offered in the foundry market. It is capable of more accuracy than any other foundry thermal analysis system available since 1990. And, of course, we are proud!

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