

Instructions for use of Technology Demo for Heat Run – Excel File

The purpose of this is not to limit to the attached, but to expand the understanding possible from the use of such a tool, and suggest justification for assuring means to collect the data necessary to allow such analyses. The attached file data was collected automatically from an actual heat run, but is used only to demonstrate the functional opportunity, not to insist on any format.

The test data represents part of the full test, which consisted of nine each thermocouples on the conductor and enclosure, plus six measuring ambient around the enclosure, collected approximately once per minute. The particular standards involved required a minimum of four ambient measurements, a maximum temp rise in Deg. C of 65 for the conductor, 40 for the enclosure, vs. ambient, and a max difference of 2 Deg. C for stability at each device thermocouple for a minimum of three readings spanning an hour.

This time spec should be understood to represent the concern which provides the primary justifications for this tool; manual transcription of discrete data readings is both tedious and error-prone, but additionally allows for the false-read errors of too-high or too-low from limited discrete readings. The analysis tool, developed exclusively by **Idea Man** for GE (referred to as “the model” hereafter) performs statistical analysis on the raw data, thereby highlighting deviant data to allow its exclusion (as is evident from observing cell Y201, shown in yellow, and its original raw data as shown in AC201). As explained in Y245, the raw data was replaced by the selected value because the raw data fell outside the Median plus Three Sigma, so was obviously not representative of normal data variance, and so could be so discarded.

Similarly, at certain points throughout the data block there are rows colored in turquoise. As can be observed, these have discrete readings which are significantly outside the normal observed, and are simply errant spikes, and so should also be eliminated were they within the selected time range.

The model, at the discretion of the operator, selected the median of the minimum ambient as the control for maximum rise, but it can readily be seen that this could be an average of the ambients, or whatever else is acceptable to the testing parties. It should generally be agreed, however, before the start of the test. Similarly, since all the functions used in the model are common to most spreadsheet software, the use of Excel should be viewed as merely one alternative, and the specific functions should be seen as also flexible, depending on the purpose sought by the tool.

A powerful capability uses the formatting function for Number to display a negative value as a red in parentheses. By subtracting a Max value from a Min value, then adding 2, the resultant is immediately observed as good if black, bad if red, since the limit of two for range is added back before display (as shown in row 254). Similarly, subtraction of max from calculated max allowable would display in red if the limit were exceeded (as in row 262). An example of the usefulness of this tool is observed in the area M247:M262 wherein the enclosure was actually being heated not by its own current capacity, but by the electrical test connections made to that area. Therefore, the model allowed the operator to immediately see that there was a problem, focus on the issue, quickly understand the root cause, and therefore determine to properly ignore that data as invalid, just as for the other yellow and turquoise colored cells.

One final comment regards the ability to look at the “trend” and “comparitive areas” instead of discrete points, since that would allow proper decision making even in the presence of significant electrical noise, as for example might be observed if spiking was widespread, since common sense says a local thermal mass would prevent rapid swings of 2 Deg C if they were observed from noise on the thermocouples.

For further details contact Joe Holzer at www.holzerent.com or im@holzerent.com by email.

Date/Time	Factor	Factor	Cond 01	Cond 02	Cond 03	Cond 04	Cond 05	Cond 06	Cond 07	Cond 08	Cond 09	Encl 01	Encl 02	Encl 03	Encl 04	Encl 05	Encl 06	Encl 07
2/7/01 13:23	3.06E+09	24201.77	63.2549	57.9150	55.3828	60.6279	60.8779	60.7383	54.1973	66.5391	58.3701	71.2764	44.2412	45.7041	44.1426	45.4580	46.3086	44.8975
2/7/01 13:24	3.06E+09	24225.61	63.2256	57.9033	55.4316	60.7861	60.7705	60.7100	54.1943	66.5957	58.4160	71.1787	44.2285	45.7188	44.1709	45.4521	46.3174	44.8916
2/7/01 13:25	3.06E+09	24074.99	63.2217	57.7646	55.4521	60.7793	60.8994	60.7461	54.2070	66.5918	58.1982	71.1416	44.2188	45.6494	43.9570	45.4551	46.3076	44.9238
2/7/01 13:26	3.06E+09	24129.4	63.1865	57.8545	55.4756	61.1230	60.7803	60.7490	54.3857	66.2754	58.3604	71.2002	44.1436	45.6680	44.1357	45.4717	46.2598	44.8379
2/7/01 13:27	3.06E+09	24093.32	63.2168	57.8525	55.4658	61.1621	60.6553	60.7568	54.3633	66.3359	58.2539	71.2188	44.1240	45.6592	44.0908	45.4180	46.2578	44.8711
2/7/01 13:28	3.06E+09	24092.37	63.2822	57.9414	55.3594	60.5410	60.8838	60.7275	54.1934	66.4502	58.4063	71.2432	44.2109	45.7090	43.9961	45.4443	46.3350	44.9795
2/7/01 13:29	3.06E+09	23982.68	63.1670	57.8457	55.3262	61.0205	60.7754	60.6719	54.1641	66.5547	58.4229	71.1689	44.0693	45.6680	43.9209	45.3584	46.2959	44.8877
2/7/01 13:30	3.06E+09	23998.26	63.2764	57.8350	55.4297	61.0693	60.6748	60.6611	54.3428	66.4473	58.3750	71.0986	44.1563	45.6621	44.1533	45.4287	46.2949	44.8398
2/7/01 13:31	3.06E+09	23945.26	63.1387	57.7930	55.3857	61.0410	60.7822	60.6641	54.3213	66.0811	58.4219	71.0205	44.0742	45.5029	44.0508	45.4023	46.2139	44.8232
2/7/01 13:32	3.06E+09	23955.43	63.1504	57.7900	55.2822	60.4688	60.8320	60.6035	54.1650	66.3643	58.3340	71.0293	44.1260	45.5195	44.0332	45.3291	46.2256	44.8721
2/7/01 13:33	3.06E+09	24104.33	63.1426	57.8232	55.3701	60.9375	60.8740	60.6748	54.3379	66.3369	58.2939	71.0166	44.0977	45.6533	44.1035	45.3584	46.2324	44.9229
2/7/01 13:34	3.06E+09	24089.9	63.2451	57.8799	55.4365	60.8994	61.0088	60.7285	54.3936	66.5078	58.3486	70.9756	44.2578	45.5996	44.1504	45.4531	46.3398	44.9521
2/7/01 13:35	3.06E+09	23871.28	63.2002	57.8398	55.2695	60.9346	60.6670	60.6104	54.1318	66.4639	58.3613	71.0430	43.9922	45.6162	43.8818	45.2725	46.2285	44.8105
2/7/01 13:36	3.06E+09	23928.45	63.1777	57.7715	55.1230	61.0078	60.6699	60.5947	54.3320	66.3691	58.3916	71.0371	44.2168	45.6455	43.9355	45.0879	46.2676	44.8076
2/7/01 13:37	3.06E+09	24054.57	63.2148	57.8145	55.4766	61.1299	60.6504	60.4531	54.3877	66.4160	58.2930	71.0693	44.1709	45.6104	43.9902	45.4189	46.2471	44.8457
2/7/01 13:38	3.06E+09	23943.74	63.2158	57.8340	55.3926	61.0957	60.6445	60.4199	54.4531	66.4434	58.3643	70.9336	44.1396	45.6406	44.0264	45.4063	46.2734	44.8633
2/7/01 13:39	3.06E+09	24010.22	63.2891	57.8164	55.4404	60.8545	61.0146	60.6875	54.4141	66.5518	58.2598	70.7393	44.2373	45.6289	44.1475	45.4805	46.3145	44.9365
2/7/01 13:40	3.06E+09	24144.98	63.2461	57.9258	55.4082	61.0420	60.8203	60.7002	54.2578	66.5703	58.4131	70.9775	44.2783	45.7158	43.9980	45.4014	46.3418	44.9229
2/7/01 13:41	3.06E+09	24162.93	63.2207	57.8535	55.2168	61.0625	60.7715	60.6904	54.5010	66.5000	58.4414	71.0771	44.3408	45.7207	44.0078	45.2510	46.3516	44.9014
2/7/01 13:42	3.06E+09	24135.58	63.2803	57.9131	55.4551	61.1719	60.7637	60.7100	54.5488	66.4404	58.3203	71.0273	44.2139	45.6953	44.1602	45.5225	46.3350	44.9082
2/7/01 13:43	3.06E+09	24143.18	63.2783	57.9570	55.4199	61.0332	60.8320	60.7529	54.3291	66.6758	58.4629	70.9678	44.0791	45.7168	44.0264	45.4736	46.4141	44.9287
2/7/01 13:44	3.06E+09	24183.63	63.2051	57.9199	55.4258	60.6611	60.9111	60.7422	54.3633	66.5781	58.4990	71.0801	44.3174	45.7207	44.2402	45.5410	46.3867	44.8193
2/7/01 13:45	3.06E+09	24031.87	63.2217	57.8467	55.4941	60.9473	61.0342	60.7627	54.4453	66.5537	58.3535	70.9736	44.2500	45.6826	44.2432	45.5127	46.4033	44.9668

1st Test Row 179

Last Test Row 240

Missing Rows

Reasons

Std Dev		0.089	0.091	0.093	0.210	0.130	0.093	0.111	0.123	0.109	0.120	0.090	0.070	0.104	0.091	0.094	0.069
Median		63.141	57.772	55.363	60.785	60.781	60.613	54.239	66.470	58.256	71.104	44.098	45.607	44.003	45.355	46.232	44.854
Median - 3 Sigma		62.875	57.499	55.086	60.156	60.391	60.335	53.907	66.102	57.929	70.744	43.828	45.397	43.692	45.084	45.949	44.647
Median + 3 Sigma		63.406	58.046	55.641	61.414	61.171	60.892	54.570	66.838	58.583	71.463	44.368	45.817	44.314	45.627	46.516	45.060
Min		62.935	57.588	55.071	60.337	60.473	60.374	54.024	66.081	57.986	70.737	43.940	45.473	43.781	45.088	45.931	44.670
Max		63.327	57.957	55.494	61.172	61.034	60.766	54.549	66.676	58.499	71.303	44.341	45.727	44.243	45.541	46.414	45.001
Delta		0.393	0.369	0.423	0.835	0.562	0.392	0.524	0.595	0.513	0.565	0.400	0.254	0.462	0.453	0.483	0.331
Go/No-Go (< 2 C)		1.61	1.63	1.58	1.17	1.44	1.61	1.48	1.41	1.49	1.43	1.60	1.75	1.54	1.55	1.52	1.67
Six Sigma Go/No		1.47	1.45	1.44	0.74	1.22	1.44	1.34	1.26	1.35	1.28	1.46	1.58	1.38	1.46	1.43	1.59

Median Min Ambient	21.707	21.707	21.707	21.707	21.707	21.707	21.707	21.707	21.707	21.707	21.707	21.707	21.707	21.707	21.707	21.707	21.707	21.707
Spec Max Temp Cond	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Spec Max Temp Encl	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40

Max Temp Allowed		86.707	86.707	86.707	86.707	86.707	86.707	86.707	86.707	86.707	86.707	86.707	86.707	86.707	86.707	86.707	86.707	86.707
Safety Margin		23.38	28.75	31.21	25.53	25.67	25.94	32.16	20.03	28.21	9.60	17.37	15.98	17.46	16.17	15.29	16.71	

Date/Time	Factor	Encl 08	Encl 09	Amb 01	Amb 02	Amb 03	Amb 04	Amb 05	Amb 06
2/7/01 10:30	3.06E+09	42.4395	41.3184	26.4385	23.5801	22.9941	22.7861	22.6602	20.4121
2/7/01 10:31	3.06E+09	42.4873	41.3594	24.9141	23.2139	22.1611	22.1465	22.4521	19.8828
2/7/01 10:31	3.06E+09	42.4961	41.3789	24.9102	23.1553	21.8027	22.1465	22.4043	19.8281
2/7/01 10:32	3.06E+09	42.4619	41.1504	25.0225	23.5986	22.9443	22.1436	22.6162	20.9150
2/7/01 10:32	3.06E+09	42.5244	41.3955	25.0840	23.4756	22.2051	22.1660	22.4482	19.5342
2/7/01 10:33	3.06E+09	42.5205	41.4609	24.9541	23.1621	22.2588	22.0986	22.5527	20.6865
2/7/01 10:33	3.06E+09	42.5430	41.4082	25.2324	23.5879	22.9746	21.9961	22.6445	20.5830
2/7/01 10:34	3.06E+09	42.6123	41.4775	24.8242	23.3877	23.0244	22.1484	22.3906	19.6318
2/7/01 10:34	3.06E+09	42.5791	41.4600	24.4912	23.5596	23.0410	22.0771	22.4502	20.2490
2/7/01 10:35	3.06E+09	42.5938	41.4746	24.4072	23.6104	23.0586	22.0449	22.5098	20.6074
2/7/01 10:35	3.06E+09	42.5635	41.4502	24.9424	23.7402	23.1943	21.2568	23.1240	21.0303
2/7/01 10:36	3.06E+09	42.6445	41.4893	24.4814	23.6221	23.0449	22.0225	22.6611	21.0303
2/7/01 10:36	3.06E+09	42.6387	41.5361	23.6055	23.6787	23.0127	21.5527	22.7002	20.9980
2/7/01 10:37	3.06E+09	42.6660	41.5439	23.6250	23.6738	23.0166	21.5918	22.6885	21.0264
2/7/01 10:37	3.06E+09	42.6318	41.3652	24.9912	23.3154	23.0498	21.9043	22.6211	21.0605
2/7/01 10:38	3.06E+09	42.6406	41.5371	25.1367	23.7070	23.0137	21.7520	22.7822	21.0234
2/7/01 10:38	3.06E+09	42.6748	41.4941	25.0381	23.6758	23.2715	21.6973	22.6475	21.0947
2/7/01 10:39	3.06E+09	42.6436	41.4385	25.0420	23.7129	23.2998	21.8291	22.5996	21.0645
2/7/01 10:39	3.06E+09	42.6299	41.4941	24.9258	23.4834	22.9375	22.1738	22.6377	21.2031
2/7/01 10:40	3.06E+09	42.5537	41.5029	25.0273	23.7510	23.0400	21.3623	22.6689	20.9834
2/7/01 10:40	3.06E+09	138.6523	41.5273	24.8955	23.5645	54.2803	43.2725	22.6504	21.0234
2/7/01 10:41	3.06E+09	42.5537	41.5049	25.0176	23.7617	23.0020	20.9277	22.6807	20.9756
2/7/01 10:41	3.06E+09	42.5508	41.5039	25.0234	23.7588	23.0400	20.9092	22.6475	20.9941
2/7/01 10:42	3.06E+09	42.6348	41.5156	24.5127	23.7344	23.0469	22.1162	22.6387	21.0430
2/7/01 10:42	3.06E+09	42.6445	41.5391	24.7832	65.6826	23.0400	22.1855	22.4092	45.1719
2/7/01 10:43	3.06E+09	42.5547	41.5098	25.0176	23.7813	23.0752	20.7539	22.9521	20.9775
2/7/01 10:43	3.06E+09	42.6729	41.4922	24.6250	23.7236	23.0752	22.1650	22.5518	21.0430
2/7/01 10:44	3.06E+09	42.7051	41.5293	24.4082	23.7002	23.0654	22.1172	22.5996	21.0205
2/7/01 10:44	3.06E+09	42.6992	41.5742	24.8887	23.2656	23.0684	22.2129	22.5498	20.5068
2/7/01 10:45	3.06E+09	42.6963	41.5742	24.7598	23.6348	23.0342	22.2139	22.4707	19.7930
2/7/01 10:45	3.06E+09	42.7441	41.5947	24.9180	23.1621	22.0264	22.2549	22.6416	20.4775
2/7/01 10:46	3.06E+09	42.7275	41.6113	24.5078	23.7539	23.0332	22.1934	22.5957	20.2949
2/7/01 10:46	3.06E+09	42.7783	41.6533	24.7344	23.7275	23.0566	22.2295	22.4883	19.8916
2/7/01 10:47	3.06E+09	42.6523	41.5889	25.0195	23.8506	23.1387	21.2227	23.3096	21.0449
2/7/01 10:47	3.06E+09	42.8125	41.6758	23.9590	23.7363	23.0645	21.6924	22.8291	21.0801
2/7/01 10:48	3.06E+09	42.8125	41.6563	23.9648	23.7197	23.0576	21.9258	22.7939	21.0938
2/7/01 10:48	3.06E+09	42.7920	41.6455	24.0391	23.7188	23.0684	21.9502	22.7783	21.0732
2/7/01 10:49	3.06E+09	42.8457	41.6484	24.3652	23.7100	23.0928	22.1475	22.6514	21.0898
2/7/01 10:49	3.06E+09	42.8662	41.6738	24.8799	23.4238	23.1162	22.2627	22.5195	20.5215
2/7/01 10:50	3.06E+09	42.8291	41.7051	24.2256	23.9082	23.0557	21.0293	23.2773	21.0752
2/7/01 10:50	3.06E+09	42.9170	41.7139	24.9600	23.5811	23.1914	22.2891	22.7012	20.8486
2/7/01 10:51	3.06E+09	42.8281	41.5635	24.9854	23.2754	23.0313	22.0879	22.1982	21.0820
2/7/01 10:51	3.06E+09	42.8955	41.7979	25.0527	23.8086	22.5967	22.4326	22.7607	20.9619
2/7/01 10:52	3.06E+09	42.9121	41.7578	25.0381	23.3799	21.4746	22.3389	22.6875	20.0430
2/7/01 10:52	3.06E+09	42.9307	41.7598	24.9023	23.7051	22.3896	22.3340	22.5947	19.6924
2/7/01 10:53	3.06E+09	42.9258	41.7891	24.6279	23.7490	23.0820	22.2754	22.6279	20.2939
2/7/01 10:53	3.06E+09	42.9932	41.7813	24.9033	23.5752	23.0762	22.3066	22.5088	19.7803
2/7/01 10:54	3.06E+09	42.8848	41.7920	25.1084	24.2275	23.0820	20.9229	23.5107	21.1182
2/7/01 10:54	3.06E+09	140.6904	41.8633	25.1445	23.7998	44.9424	40.9111	22.8105	21.3115
2/7/01 10:55	3.06E+09	42.9531	41.8184	25.0908	23.5684	22.9551	22.4785	22.2197	21.1309
2/7/01 10:55	3.06E+09	42.9980	41.6338	25.1387	23.4414	22.9951	22.3682	21.9248	21.1162
2/7/01 10:56	3.06E+09	43.0264	41.8652	26.2539	23.8174	23.0771	22.4404	22.7910	20.2207
2/7/01 10:56	3.06E+09	42.9531	41.8867	25.1934	23.8311	23.1309	21.2471	23.0205	21.1631
2/7/01 10:57	3.06E+09	43.0137	41.9082	25.1289	23.8115	23.1074	21.5244	23.0566	21.1709

Date/Time	Factor	Encl 08	Encl 09	Amb 01	Amb 02	Amb 03	Amb 04	Amb 05	Amb 06
2/7/01 10:57	3.06E+09	43.0264	41.8525	24.6719	22.9365	23.1787	22.2920	22.2900	21.7520
2/7/01 10:58	3.06E+09	43.0723	41.9014	25.1094	23.7402	23.0410	22.4092	22.8223	20.6826
2/7/01 10:58	3.06E+09	43.0869	41.9404	25.0840	23.3945	21.9727	22.3984	22.8145	20.5879
2/7/01 10:59	3.06E+09	43.0449	41.9551	25.1367	23.8018	22.7607	22.5420	22.8467	21.0596
2/7/01 10:59	3.06E+09	43.0654	41.8262	25.0615	23.8105	23.0166	22.3291	21.8418	21.1260
2/7/01 11:00	3.06E+09	43.0518	41.8359	25.2764	23.0615	23.0264	22.2852	21.8184	21.1191
2/7/01 11:00	3.06E+09	43.0586	41.6729	25.3799	23.5020	23.0020	22.3086	21.7539	21.1387
2/7/01 11:01	3.06E+09	43.0986	41.9814	25.1787	23.8848	22.5166	22.4893	22.6953	20.9951
2/7/01 11:01	3.06E+09	43.1670	41.9609	25.2148	23.8760	23.0674	22.4082	22.8096	21.0000
2/7/01 11:02	3.06E+09	43.1641	41.9668	25.2588	23.5850	21.7578	22.5654	22.8760	20.3408
2/7/01 11:02	3.06E+09	43.1543	41.9482	25.2588	23.4277	23.0400	22.3965	22.6641	21.1650
2/7/01 11:03	3.06E+09	43.0938	41.8135	25.3906	23.2285	23.0342	22.2979	21.5264	21.1787
2/7/01 11:03	3.06E+09	43.1885	42.0283	25.8916	23.5742	21.9404	22.6699	22.8408	19.8975
2/7/01 11:04	3.06E+09	43.1963	42.0078	25.1475	23.3691	21.5254	22.4834	22.8311	20.2734
2/7/01 11:04	3.06E+09	43.1543	42.0146	25.0605	23.5205	23.1123	22.4150	22.7764	21.1816
2/7/01 11:05	3.06E+09	43.0283	42.0791	25.2520	23.9521	23.2246	22.4824	22.9521	21.2197
2/7/01 11:05	3.06E+09	43.1396	42.0381	25.2773	23.4463	23.1729	22.4424	22.6563	21.4775
2/7/01 11:06	3.06E+09	43.2559	41.9727	25.4307	23.2295	23.1436	22.3867	21.5801	21.2676
2/7/01 11:06	3.06E+09	43.2578	42.0820	25.2451	23.0225	23.1484	22.4551	22.3193	21.1973
2/7/01 11:07	3.06E+09	43.3203	42.1719	26.6016	23.7471	22.3320	22.7725	22.9414	20.2383
2/7/01 11:07	3.06E+09	43.2285	42.0977	25.2500	23.9736	23.3008	22.4609	22.9688	21.2344
2/7/01 11:08	3.06E+09	43.2725	42.1777	25.1719	23.7080	22.5264	22.5059	22.9512	20.8555
2/7/01 11:08	3.06E+09	43.2080	42.0977	25.2354	23.9951	23.2939	22.0410	23.0146	21.2432
2/7/01 11:09	3.06E+09	43.2588	42.0859	25.1748	23.9648	22.9668	22.6533	22.9268	21.2168
2/7/01 11:09	3.06E+09	43.2744	42.1514	25.2393	24.0986	23.2373	22.2686	23.0859	21.2236
2/7/01 11:10	3.06E+09	43.3291	42.1357	25.1201	23.7949	22.6953	22.4775	22.9648	21.0264
2/7/01 11:10	3.06E+09	43.3008	42.1543	25.2012	23.9629	23.1094	22.5264	22.9258	21.2051
2/7/01 11:11	3.06E+09	43.3506	42.1465	25.2578	23.9863	23.2734	22.5039	22.9502	21.2705
2/7/01 11:11	3.06E+09	43.3848	42.1924	25.2266	23.7207	23.1484	22.5049	22.8799	20.5195
2/7/01 11:12	3.06E+09	43.2764	42.1611	25.2383	24.1445	23.2354	21.5879	23.2344	21.2363
2/7/01 11:12	3.06E+09	43.3398	42.1982	25.1787	23.9990	23.1504	22.5635	22.9502	21.2588
2/7/01 11:13	3.06E+09	43.2676	42.1846	25.2549	24.0566	23.2852	21.9346	23.0137	21.2588
2/7/01 11:13	3.06E+09	43.3867	42.1650	25.2598	23.9209	23.4658	22.4863	22.9180	21.4111
2/7/01 11:14	3.06E+09	43.3574	42.1787	25.2441	23.6240	23.2363	22.4990	22.1074	21.3545
2/7/01 11:15	3.06E+09	43.3789	42.2314	25.2109	23.9131	23.1221	22.5479	22.3682	21.2334
2/7/01 11:16	3.06E+09	43.3672	42.2100	26.5586	23.9707	23.3262	22.7070	23.1211	20.9014
2/7/01 11:17	3.06E+09	43.3604	42.1533	24.9414	23.3115	23.3457	22.4668	22.1826	21.2861
2/7/01 11:18	3.06E+09	43.3887	42.1406	25.2354	23.8193	23.3789	22.4990	22.9199	21.4404
2/7/01 11:19	3.06E+09	43.4199	42.2090	26.7217	24.0625	23.4053	22.5674	23.0576	21.2686
2/7/01 11:20	3.06E+09	43.3496	42.2100	25.2412	24.0537	23.4941	21.9697	23.0459	21.2656
2/7/01 11:21	3.06E+09	43.4307	42.2373	25.2109	23.9971	23.4434	22.5137	23.0146	21.2852
2/7/01 11:22	3.06E+09	43.4521	42.2490	25.0449	23.8564	23.4238	22.5498	22.8750	20.6318
2/7/01 11:23	3.06E+09	43.4160	42.1309	25.0781	23.6211	23.3799	22.5195	22.5693	21.2832
2/7/01 11:24	3.06E+09	43.4189	42.2412	25.2510	24.0547	23.5869	22.5537	23.0742	21.3154
2/7/01 11:25	3.06E+09	43.4473	42.2393	25.2627	24.0029	23.4551	22.2637	23.0742	21.2734
2/7/01 11:26	3.06E+09	43.4600	42.2725	25.7090	24.0195	23.3789	22.4756	23.1904	21.3057
2/7/01 11:27	3.06E+09	43.4268	42.2773	25.2334	24.0625	23.4180	21.5938	23.1621	21.2930
2/7/01 11:28	3.06E+09	43.4580	42.3184	24.4629	24.0791	23.4531	22.0625	23.2051	21.3223
2/7/01 11:29	3.06E+09	43.4785	42.3154	24.9219	24.0723	23.4678	21.6084	23.3174	21.2949
2/7/01 11:30	3.06E+09	43.5186	42.2939	25.1172	23.9092	23.5371	22.5518	23.0557	21.6211
2/7/01 11:31	3.06E+09	43.5264	42.3086	24.9434	23.9795	23.4941	22.5518	22.9551	20.6797
2/7/01 11:32	3.06E+09	43.5000	42.2988	24.6934	24.0596	23.5234	22.4873	22.9922	21.1826
2/7/01 11:33	3.06E+09	43.5107	42.3398	23.9238	24.0273	23.5068	22.0850	23.1416	21.3311
2/7/01 11:34	3.06E+09	43.3838	42.3008	25.2578	24.0771	23.5918	21.5029	23.2031	21.3232

Date/Time	Factor	Encl 08	Encl 09	Amb 01	Amb 02	Amb 03	Amb 04	Amb 05	Amb 06
2/7/01 11:35	3.06E+09	43.5713	42.3330	25.2559	24.0400	23.7461	22.1504	23.0791	21.4346
2/7/01 11:36	3.06E+09	43.5117	42.2832	24.9551	23.4961	23.5410	22.5459	22.1670	22.1084
2/7/01 11:37	3.06E+09	43.5449	42.2988	25.3223	24.0254	23.5352	22.5889	22.8760	21.6211
2/7/01 11:38	3.06E+09	43.4004	42.3467	25.3027	24.1270	23.5732	22.3369	23.1348	21.3408
2/7/01 11:39	3.06E+09	43.6025	42.3662	25.9414	24.0459	23.5752	22.5361	23.2539	21.3740
2/7/01 11:40	3.06E+09	43.5898	42.3438	24.8984	24.0791	23.5664	22.5283	23.1650	21.3828
2/7/01 11:41	3.06E+09	43.6182	42.4121	24.3867	24.1162	23.5205	22.2861	23.2344	21.3750
2/7/01 11:42	3.06E+09	43.6816	42.4072	25.2051	23.8896	23.5273	22.6094	23.1172	21.1631
2/7/01 11:43	3.06E+09	43.7129	42.4570	24.9209	24.1553	23.5977	22.5947	23.1055	20.9697
2/7/01 11:44	3.06E+09	43.7725	42.4844	25.1719	24.0703	23.7764	22.3516	23.2227	21.5420
2/7/01 11:45	3.06E+09	43.7295	42.4629	25.4014	24.2188	23.7041	21.9814	23.1836	21.4150
2/7/01 11:46	3.06E+09	140.0723	42.4922	25.2363	24.0879	54.2598	45.6230	23.2051	21.4160
2/7/01 11:47	3.06E+09	43.7324	42.4463	24.9629	23.2207	23.6240	22.6611	22.6025	22.0078
2/7/01 11:48	3.06E+09	43.8096	42.5342	25.3330	24.0771	22.7910	22.6973	23.2051	21.1631
2/7/01 11:49	3.06E+09	43.7744	42.5605	25.4297	24.3691	23.6719	22.1758	23.3896	21.4316
2/7/01 11:50	3.06E+09	43.7744	42.5752	25.2002	24.2949	23.6768	22.0264	23.4219	21.4531
2/7/01 11:51	3.06E+09	43.7803	42.5049	25.2471	23.9697	23.6768	22.6895	23.0596	21.2783
2/7/01 11:52	3.06E+09	43.7734	42.5654	25.3594	24.3193	23.5020	22.6563	23.1943	21.4053
2/7/01 11:53	3.06E+09	43.8213	42.6016	25.3408	24.1816	22.9453	22.6973	23.2061	21.1787
2/7/01 11:54	3.06E+09	43.7725	42.5811	25.3965	24.3057	23.3633	22.8301	23.2109	21.3359
2/7/01 11:55	3.06E+09	43.8984	42.6689	25.5391	24.3906	23.6992	22.5020	23.3994	21.4443
2/7/01 11:56	3.06E+09	43.9883	42.6836	25.5244	24.1318	23.6846	22.7725	23.1787	21.6934
2/7/01 11:57	3.06E+09	43.8984	42.7598	25.4648	24.3496	23.1484	22.9102	23.2646	21.3750
2/7/01 11:58	3.06E+09	43.9209	42.7871	25.4639	24.3125	23.2275	22.9053	23.2900	21.3711
2/7/01 11:59	3.06E+09	43.9404	42.7842	25.6240	24.3740	23.7070	22.6738	23.4326	21.5000
2/7/01 12:00	3.06E+09	44.0098	42.7656	25.4736	23.9189	22.7148	22.8135	23.2598	21.0313
2/7/01 12:01	3.06E+09	142.6924	42.7861	25.4336	24.1904	57.4912	43.2344	23.3428	21.5205
2/7/01 12:02	3.06E+09	44.0869	42.8623	25.4961	23.8516	22.8877	22.8154	23.3271	21.1875
2/7/01 12:03	3.06E+09	44.0352	42.7402	25.4268	24.3330	23.5908	22.8340	22.6367	21.5127
2/7/01 12:04	3.06E+09	44.0605	42.8857	25.6113	24.3438	23.8447	22.8633	23.3740	21.5625
2/7/01 12:05	3.06E+09	44.1338	42.8955	25.6338	24.2803	23.9424	22.8643	23.3252	21.6338
2/7/01 12:06	3.06E+09	44.1406	42.8574	25.6436	23.5830	23.7012	22.8125	22.3535	21.7646
2/7/01 12:07	3.06E+09	44.0654	42.8359	25.5674	24.1377	23.4473	22.8906	22.6533	21.5352
2/7/01 12:08	3.06E+09	44.0547	42.8330	26.7969	24.2207	23.6611	23.1221	23.5059	21.5313
2/7/01 12:09	3.06E+09	44.0527	42.8418	25.4551	24.0000	23.4443	22.8633	23.2178	20.5176
2/7/01 12:10	3.06E+09	43.9873	42.7666	25.1553	24.2363	23.6475	22.7305	23.3105	21.3750
2/7/01 12:11	3.06E+09	44.0352	42.7695	25.1475	24.2334	23.6807	22.8047	23.1680	21.0000
2/7/01 12:12	3.06E+09	43.8779	42.8262	25.5615	24.3564	23.7090	21.5791	23.7959	21.5615
2/7/01 12:13	3.06E+09	44.0352	42.7959	25.5391	24.0723	23.6143	22.7607	23.1230	21.5771
2/7/01 12:14	3.06E+09	44.0771	42.8018	25.4814	24.2598	23.7246	22.8477	23.2373	20.6455
2/7/01 12:15	3.06E+09	44.1250	42.8662	25.5010	24.0039	23.0635	22.8350	23.3848	21.2705
2/7/01 12:16	3.06E+09	44.0205	42.8564	25.6396	24.4980	23.7813	21.8242	23.5938	21.5674
2/7/01 12:17	3.06E+09	44.1260	42.8984	25.5166	24.0088	22.9570	22.8623	23.3613	21.1299
2/7/01 12:18	3.06E+09	44.0811	42.9092	25.5479	24.2686	23.2227	22.8271	23.4033	21.4258
2/7/01 12:19	3.06E+09	44.1533	42.9043	25.5449	23.7686	22.2949	22.8750	23.3652	20.8203
2/7/01 12:20	3.06E+09	44.1563	42.8857	25.5039	23.8525	22.1484	22.8701	23.2754	20.5449
2/7/01 12:21	3.06E+09	44.0811	42.8975	25.4365	24.3438	23.8115	22.2520	23.5254	21.5527
2/7/01 12:22	3.06E+09	44.1221	42.9316	24.8857	24.4258	23.8145	22.1875	23.5352	21.5977
2/7/01 12:23	3.06E+09	44.1309	42.7227	25.5420	23.8428	23.7861	22.6807	22.9443	21.6143
2/7/01 12:24	3.06E+09	44.1826	42.8838	25.6523	24.3145	24.0449	22.8652	23.4004	21.7129
2/7/01 12:25	3.06E+09	44.2100	43.0059	26.0576	24.3945	23.8477	22.6699	23.5703	21.6367
2/7/01 12:26	3.06E+09	44.0527	42.9795	25.6855	24.4199	23.9238	21.9023	23.5020	21.6104
2/7/01 12:27	3.06E+09	44.2559	43.0049	25.3594	23.5811	23.8525	22.9248	22.7305	22.3506
2/7/01 12:28	3.06E+09	44.2061	43.0176	25.5781	24.2656	23.5596	23.0527	23.0166	21.6143

Date/Time	Factor	Encl 08	Encl 09	Amb 01	Amb 02	Amb 03	Amb 04	Amb 05	Amb 06
2/7/01 12:29	3.06E+09	44.2520	42.9805	25.5967	24.2754	22.8418	23.0977	23.4902	21.2500
2/7/01 12:30	3.06E+09	44.2324	42.9951	26.0137	24.4082	23.8574	22.8271	23.5908	21.5996
2/7/01 12:31	3.06E+09	44.3096	43.0723	25.6836	24.4668	24.0195	22.4199	23.5127	21.6543
2/7/01 12:32	3.06E+09	44.2510	42.8467	25.6484	23.9512	23.7754	22.9541	22.4951	21.6699
2/7/01 12:33	3.06E+09	44.2920	43.0391	25.6787	23.5137	23.7666	22.9463	22.9268	21.6523
2/7/01 12:34	3.06E+09	44.3008	42.8477	25.7354	24.0361	23.6797	22.9502	22.5391	21.6504
2/7/01 12:35	3.06E+09	44.3672	43.1279	25.6221	24.2666	22.7090	23.2090	23.5234	21.1953
2/7/01 12:36	3.06E+09	44.3730	43.0967	26.2891	24.4883	23.4375	23.0703	23.4512	20.5371
2/7/01 12:37	3.06E+09	44.4277	43.1650	25.4775	24.4551	23.8711	22.9844	23.4854	21.1309
2/7/01 12:38	3.06E+09	44.3936	43.1270	25.5869	23.9541	22.7881	23.0498	23.4248	20.8711
2/7/01 12:39	3.06E+09	44.3545	42.9023	25.6865	24.4736	23.7393	23.0518	23.5557	21.6289
2/7/01 12:40	3.06E+09	44.3701	43.1191	25.6611	24.4336	23.3857	23.1523	23.5244	21.5654
2/7/01 12:41	3.06E+09	44.4111	43.1582	26.0156	24.4922	23.3994	23.0586	23.4375	20.5850
2/7/01 12:42	3.06E+09	44.4248	43.1221	25.7500	24.6689	24.0361	22.9746	23.6299	21.7432
2/7/01 12:43	3.06E+09	44.3662	42.9951	25.6855	23.8936	23.7959	22.9980	22.4629	21.6953
2/7/01 12:44	3.06E+09	44.3623	42.9473	25.8203	23.9697	23.8096	22.9521	22.4150	21.6738
2/7/01 12:45	3.06E+09	44.4307	43.1563	25.8584	23.7139	23.8799	22.9414	22.3867	21.6836
2/7/01 12:46	3.06E+09	44.4521	43.2178	27.2490	24.4951	23.8789	23.4580	23.6533	21.2783
2/7/01 12:47	3.06E+09	44.4580	43.1934	25.6484	24.0703	22.8184	23.0840	23.4775	20.7832
2/7/01 12:48	3.06E+09	44.4590	43.2529	25.7178	24.5029	23.9150	22.7422	23.6279	21.6943
2/7/01 12:49	3.06E+09	44.4531	43.2324	25.6553	24.4727	23.5039	23.0596	23.5811	21.6445
2/7/01 12:50	3.06E+09	44.4678	43.2227	25.6416	24.1777	22.8428	23.0830	23.4424	20.3613
2/7/01 12:51	3.06E+09	44.4277	43.2178	25.6816	24.4531	23.5752	23.2295	23.6123	21.6143
2/7/01 12:52	3.06E+09	44.4248	43.1846	25.7266	24.5186	23.6191	23.1035	23.5869	21.6523
2/7/01 12:53	3.06E+09	44.4492	43.2119	25.7598	24.4854	23.5098	23.1777	23.5811	21.5898
2/7/01 12:54	3.06E+09	44.4111	43.1797	25.7422	24.3877	23.4316	23.2256	23.5830	21.5654
2/7/01 12:55	3.06E+09	44.4570	43.1777	26.2568	24.4189	23.0703	23.2285	23.4932	20.3975
2/7/01 12:56	3.06E+09	44.4316	43.0723	25.5557	24.4873	23.7949	23.0742	23.2783	21.6621
2/7/01 12:57	3.06E+09	44.4756	43.1699	25.8350	23.7500	23.7715	23.0771	22.8027	21.7100
2/7/01 12:58	3.06E+09	44.4893	43.2529	26.3213	24.2480	22.7656	23.2930	23.5488	20.3564
2/7/01 12:59	3.06E+09	44.3867	43.2148	25.7393	24.2705	23.3467	23.2881	23.6104	21.5859
2/7/01 13:00	3.06E+09	44.4287	43.1787	25.7998	24.6641	23.9434	23.1377	23.6445	21.6807
2/7/01 13:01	3.06E+09	44.4580	43.1025	25.7422	23.6846	23.8779	23.0820	22.5547	21.7129
2/7/01 13:02	3.06E+09	44.4365	43.1865	25.7432	24.4307	23.5264	23.2695	23.3516	21.6494
2/7/01 13:03	3.06E+09	44.4131	43.1182	25.8857	23.7490	23.8271	23.0508	22.6377	21.7100
2/7/01 13:04	3.06E+09	44.4033	43.1758	25.8066	23.4326	23.7646	23.1221	22.9639	21.7119
2/7/01 13:05	3.06E+09	44.4355	42.9766	26.0127	24.0479	23.7393	23.0615	22.4756	21.7061
2/7/01 13:06	3.06E+09	44.4707	43.2227	25.9580	24.5371	23.8975	23.5000	23.6172	21.7305
2/7/01 13:07	3.06E+09	44.4814	43.1455	25.7559	23.7939	23.9043	23.0889	22.5371	21.7432
2/7/01 13:08	3.06E+09	44.4326	43.2256	25.8916	24.6152	23.8818	23.5537	23.6162	21.7451
2/7/01 13:09	3.06E+09	44.4063	43.1953	25.7656	24.5498	23.6191	23.3125	23.5850	21.6885
2/7/01 13:10	3.06E+09	44.4512	43.0576	25.8613	24.0117	23.7881	23.0664	22.3486	21.7041
2/7/01 13:11	3.06E+09	44.4775	43.1758	25.8018	24.0303	22.2666	23.4609	23.5908	20.8857
2/7/01 13:12	3.06E+09	44.3506	43.1826	25.7998	24.7041	23.9922	22.8965	23.6758	21.7285
2/7/01 13:13	3.06E+09	44.3506	43.2471	25.8545	24.5420	24.0684	22.8408	23.6455	21.7422
2/7/01 13:14	3.06E+09	44.4854	43.2139	25.8008	24.4912	24.0557	22.7090	23.6289	21.7354
2/7/01 13:15	3.06E+09	44.5508	43.1992	25.7090	24.5400	23.6592	23.1836	23.6211	21.8145
2/7/01 13:16	3.06E+09	44.5254	43.2471	25.7637	24.5137	23.9502	23.2012	23.5527	21.1631
2/7/01 13:17	3.06E+09	44.5488	43.2539	25.2559	24.4648	23.9512	22.9209	23.7197	21.7930
2/7/01 13:18	3.06E+09	44.5938	43.3613	25.7412	24.3281	23.5566	23.2266	23.6689	21.6299
2/7/01 13:19	3.06E+09	44.6299	43.3223	25.5244	24.5273	24.0371	23.1377	23.6797	21.3809
2/7/01 13:20	3.06E+09	44.5781	43.3525	25.7832	24.4971	23.6641	23.1934	23.6738	21.7070
2/7/01 13:21	3.06E+09	44.6035	43.3594	25.7363	24.4658	24.0840	23.0605	23.7930	21.5781
2/7/01 13:22	3.06E+09	44.6758	43.4248	25.7637	24.0732	23.2949	23.2090	23.6807	21.4629

Date/Time	Factor	Encl 08	Encl 09	Amb 01	Amb 02	Amb 03	Amb 04	Amb 05	Amb 06
2/7/01 13:23	3.06E+09	44.6631	43.3799	25.7100	24.2305	23.1162	23.2334	23.5322	20.4570
2/7/01 13:24	3.06E+09	44.6543	43.4053	25.7334	24.0811	22.7520	23.2344	23.5703	20.7539
2/7/01 13:25	3.06E+09	44.6387	43.3701	25.7373	23.8545	22.9121	23.1953	23.6602	21.2373
2/7/01 13:26	3.06E+09	44.6689	43.3281	25.8672	24.7490	24.0576	23.1836	23.8438	21.7217
2/7/01 13:27	3.06E+09	44.6211	43.3125	25.8701	24.5615	24.2324	23.1826	23.7109	21.8467
2/7/01 13:28	3.06E+09	44.6514	43.3408	25.7930	24.5254	24.0303	23.2139	23.6250	21.5664
2/7/01 13:29	3.06E+09	44.6104	43.2793	25.4043	24.5723	24.0264	23.0762	23.6914	21.7939
2/7/01 13:30	3.06E+09	44.5244	43.2764	25.8545	24.6221	24.1484	22.4619	23.7715	21.8291
2/7/01 13:31	3.06E+09	44.5400	43.2236	25.8760	24.3916	24.1875	23.1543	23.5879	22.0127
2/7/01 13:32	3.06E+09	44.5195	43.2412	25.7559	24.5010	23.9316	23.2031	23.6357	21.7393
2/7/01 13:33	3.06E+09	44.5332	43.2041	25.6260	23.7656	23.8945	23.1719	22.7988	21.8076
2/7/01 13:34	3.06E+09	44.5684	43.2607	25.8789	24.3711	23.8174	23.2227	22.9697	21.7891
2/7/01 13:35	3.06E+09	44.5234	43.2832	26.9854	24.5840	23.9707	23.2373	23.7988	21.5342
2/7/01 13:36	3.06E+09	44.5381	43.3213	25.9199	24.7109	23.9717	22.5332	23.9873	21.7988
2/7/01 13:37	3.06E+09	44.3926	43.2979	25.9434	24.6279	24.0771	22.1377	23.7480	21.8154
2/7/01 13:38	3.06E+09	44.4346	43.2910	25.9951	24.6289	23.9941	21.9688	23.7529	21.8213
2/7/01 13:39	3.06E+09	44.5371	43.2920	25.9258	24.2998	23.9072	23.2305	23.1426	21.9287
2/7/01 13:40	3.06E+09	44.6016	43.3584	26.4932	24.6553	23.9619	23.0234	23.8906	21.8594
2/7/01 13:41	3.06E+09	44.5742	43.3701	25.9619	24.6611	23.9502	22.4482	24.0059	21.8613
2/7/01 13:42	3.06E+09	44.5723	43.3340	25.9678	24.6543	24.0830	22.3721	23.7881	21.8574
2/7/01 13:43	3.06E+09	44.6064	43.3330	25.6484	24.6211	23.9248	22.9482	23.9033	21.8633
2/7/01 13:44	3.06E+09	44.6465	43.3711	25.8125	24.3438	24.0498	23.2471	23.6719	21.8623
2/7/01 13:45	3.06E+09	44.5801	43.1387	25.9121	24.6172	23.9453	23.1357	23.6152	21.8545

1st Test Row 179

Last Test Row 240

Missing Rows

201

Reasons

> 3 Sigma

Std Dev	0.089	0.097	0.297	0.311	0.413	0.297	0.425	0.396
Median	44.483	43.229	25.800	24.479	23.881	23.138	23.616	21.707
Median - 3 Sigma	44.217	42.937	24.908	23.545	22.643	22.247	22.341	20.518
Median + 3 Sigma	44.750	43.521	26.691	25.413	25.119	24.028	24.890	22.895
Min	44.351	42.947	25.256	23.433	22.267	21.969	22.349	20.356
Max	44.676	43.425	27.249	24.749	24.232	23.554	24.006	22.013
Delta	0.325	0.478	1.993	1.316	1.966	1.585	1.657	1.656
Go/No-Go (< 2 C)	1.67	1.52	0.01	0.68	0.03	0.42	0.34	0.34
Six Sigma Go/No	1.47	1.42	0.22	0.13	(0.48)	0.22	(0.55)	(0.38)

Median Min Ambient 21.707 21.707

Spec Max Temp Cond

Spec Max Temp Encl 40 40

Max Temp Allowed 61.707 61.707

Safety Margin **17.03** **18.28**