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LCI FURNACES
EXAMPLE

Section 5

 LCI Furnaces DIVISION OF LOCHABER CORNWALL INC Customer:	DATA SHEET			DOC NBR: STD	802-101501	R0
	IR FURNACE SYSTEM POWER & CURRENT			MODEL: LA-309XN	APVL: SLB	7/6/12
				SERIAL NBR: 13030913XX	CONF: JMC	1/15/13
				PRINT: 04/09/13	SHT 1	of 1

INPUT TABLE	Entry OK?	VALID
Enter Line Voltage: (208,220,380,400,415,440,480)	380 Vac	TRUE
Limit Lamps to Max Rating? (Y/N)	Y	TRUE
Line Frequency (50/60)	50 Hz	TRUE
Number of Phases:	3 Φ	TRUE
Lamp Length (6, 9, 15, 24, 36)	9 inches	TRUE
Typical Operating %	50 %	TRUE


SUMMARY OF RESULTS	
Max Power:	26.5 kW
Max Current:	40.3 A
Typical Power:	13.5 kW
Typical Current:	20.5 A

HARDWARE	
Lamps: 32	SCRs: 10
EMs: 5	TCs: 4
Nbr strings 16	AOV-25: 5
Nbr Lamps in 10" zone: 6	AITM: 2

CONFIGURATION	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Totals
Length (6,6,7,5,10,14,3,15,20,30) in.	7.5	7.5	7.5	7.5									30 in.
Length Entry OK?	TRUE	TRUE	TRUE	TRUE									
(F)urn., (F)urn. (1) SCR-Zn, (D)ryer	F	F	F	F									4
Zone Type OK?	TRUE	TRUE	TRUE	TRUE									
No. Lamps in Series/String (1-5)	2	2	2	2									
Lamps/String OK?	TRUE	TRUE	TRUE	TRUE									
No. Lamps in Top/Bottom Power	4/4	4/4	4/4	4/4									Plenum: 120
SCR PHASE	Zone Entry OK?	VALID	VALID	VALID	VALID								Lamp Balance (kW)
Top Lamp Phase (1/2/3):	1	2	3	1									Phase 1: 11.8
Bottom Lamp Phase (1/2/3):	1	2	3	1									Phase 2: 5.9
													Phase 3: 5.9
SCR POWER													<-- Vrms
Rated Lamp Voltage	216	216	216	216									
Max. Lamp Wired Voltage	190	190	190	190									
50% Power SCR Cal Span Setting	268	268	268	268									
Max. Lamp Wired Power (W)	739	739	739	739									
No. Strings per SCR	2	2	2	2									
Max. Current per String (A)	3.9	3.9	3.9	3.9									
No. Lamps in Zone	8	8	8	8									32
No. SCRs in Zone	2	2	2	2									8
No. Strings in Furnace Zones	4	4	4	4									16
													Nbr. Furnace Element Monitors: 4
Top Lamp Power (kW)	3.0	3.0	3.0	3.0									
Bottom Lamp Power (kW)	3.0	3.0	3.0	3.0									
Total Power/Zone (kW)	5.9	5.9	5.9	5.9									23.6
Current Required Top SCR (A)	7.8	7.8	7.8	7.8									
Current Required Bottom SCR (A)	7.8	7.8	7.8	7.8									
Color Temp (K) (nominal: 2500K)	2384	2384	2384	2384									
Peak Wavelength (µm)	1.22	1.22	1.22	1.22									
Estimated Lamp Life (hrs)	Long	Long	Long	Long									
Lumen Output vs. Rated (%)	66	66	66	66									

Furnace Total	Number of Item?	Voltage (Vac)	Current (Amps)	Power (kW) Max	Power (kW) Typical	Phase Assigned	Other Items
Lamps	32	380	as above	23.6	11.8	as above	10" Cabinet or CACT Fans, 117 Vac, 0.30/029 A for 50/60 Hz
PC, Monitor	1	117	1.3	0.2	0.2		4" Box (Muffin) Fans, product cooling, 117 Vac, 0.16 A
Belt, Opto22, EM	1	117	2.1	0.2	0.2		Cross-flow Fans, product cooling, 230 Vac, 1.27 A max
UC (Pump & Gen)		117	10.0				Lower Cabinet Blowers (Impellers), 230 Vac, 0.72 A max
UC (Tank Heater)		117	8.4				H2 Igniters, 120 Vac, 5 A
UCD (Blower)		117	2.0				24 Vdc PS, 120 Vac, 2 A
UCD (Heater)		380	12.7				No more than 8 SCRs/phase per TRx xfmr 24 Vac secondary
Edg Htr 1 Length	30	380	6.1	2.3	1.2	3	TR1: 4 TR2: 2 TR3: 4
Edg Htr 2 Length							Max Curr/EH1 SCR: 3.1 A 124 ohms
Edg Htr 3 Length							Max Curr/EH2 SCR:
Cabinet Vent Fan 10"	2	117	0.3	0.1	0.1	2	Max Curr/EH3 SCR:
CACT Fans 10"	2	117	0.3	0.1	0.1	2	Cabinet/CACT/Control Box Fans: 1.2 A
CACT Fans 4"	0	117	0.16				
Control Box Fans 4"	0	117	0.16				
Prod Cooling fans		117	0.16				
Furnace Totals:				26.5	13.5		

PHASE	PHASE BALANCING			TOTAL
	1	2	3	
LAMP PWR, kW	11.8	5.9	5.9	23.6
EH/OTHER	0.0	0.1	1.2	1.3
TOTAL	11.8	6.0	7.1	24.9

 LCI Furnaces DIVISION OF LOCHABER CORNWALL INC	DATA SHEET		DOC NBR: STD 802-101521 R3	
	IR FURNACE SYSTEM BASE FUSE LIST		MODEL: LA-309XN	APVL: SLB 5/30/12
Customer:		SERIAL NBR: 13030913XX	PRNT: 09Apr13	
		DATE: 05/09/12	SHT 1 of 1	

Safety Enclosure (TR0, basic control)

Fuse Label	Size (A)	Comments
FA	2	24 Vac control, AGC
FB	4	Switched/Unswitched 117 Vac, AGC
F1	3	To TR0, L1 leg, KTK
F2	3	To TR0, L2 leg, KTK
F3	20	To K3 Contactor, KTK
F4	20	To K3 Contactor, KTK
F5	20	To K3 Contactor, KTK

Power Distribution Panel (TR1-TR3 power supplies to TB2 & TB3)

Fuse Label	Size (A)	Comments
FC	4	Phase 1, 117 Vac switched, AGC
FD	4	Phase 2, 117 Vac switched, AGC
FE	4	Phase 3, 117 Vac switched, AGC
FF	1	Phase 1, 24 Vac switched, AGC
FG	1	Phase 2, 24 Vac switched, AGC
FH	1	Phase 3, 24 Vac switched, AGC
F6	3	TR1, L1 leg, KTK
F7	3	TR1, L2 leg, KTK
F8	3	TR2, L2 leg, KTK
F9	3	TR2, L3 leg, KTK
F10	3	TR3, L3 leg, KTK
F11	3	TR3, L1 leg, KTK


Belt Motor Controller

Fuse Label	Size (A)	Comments
MA & MD	2	117 Vac switched, AGC
MB & MC	0.062	Isolation board, special size
Motor Fuse	1.5 or 2	On control board, varies w/ motor HP, AGC


Heating Lamp/Edge Heat SCR Fuses (all KTK)

Fuse Label	Size (A)	Comments	Fuse Label	Size (A)	Comments
F30	10.0	Zone 1 Top			
F31	10.0				
F32	10.0	Zone 1 Bottom			
F33	10.0				
F34	10.0	Zone 2 Top			
F35	10.0				
F36	10.0	Zone 2 Bottom			
F37	10.0				
F38	10.0	Zone 3 Top			
F39	10.0				
F40	10.0	Zone 3 Bottom			
F41	10.0				
F42	10.0	Zone 4 Top			
F43	10.0				
F44	10.0	Zone 4 Bottom			
F45	10.0				
F46	4.0	EH1L			
F47	4.0				
F48	4.0	EH1R			
F49	4.0				

Section 5


 LCI Furnaces DIVISION OF LOCHABER CORNWALL INC Customer:	DATA SHEET	DOC NBR: STD 802-101522 R3		
	IR FURNACE SYSTEM TB1 OVERVIEW	MODEL: LA-309XN	APVL: SLB	5/31/12
		SERIAL NBR: 13030913XX	PRNT: 09Apr13	
	DATE: 05/09/12	SHT: 1	of 1	

From	Wire	TB1 Conn	Wire	To	Expected resistance (ohms)		
					Total	Each String	1 out
Zone 1 Top Load	101	1	101	-> to Lamps E2R	4.5		9.0
E1R ->	102	2	102	F31	9		
E4R ->	103	3	103	F31	9		
Zone 1 Bot Load	126	4	126	-> to Lamps E2R	4.5		9.0
E1R ->	127	5	127	F33	9		
E4R ->	128	6	128	F33	9		
Zone 2 Top Load	151	7	151	-> to Lamps E2R	4.5		9.0
E1R ->	152	8	152	F35	9		
E4R ->	153	9	153	F35	9		
Zone 2 Bot Load	176	10	176	-> to Lamps E2R	4.5		9.0
E1R ->	177	11	177	F37	9		
E4R ->	178	12	178	F37	9		
Zone 3 Top Load	201	13	201	-> to Lamps E2R	4.5		9.0
E1R ->	202	14	202	F39	9		
E4R ->	203	15	203	F39	9		
Zone 3 Bot Load	226	16	226	-> to Lamps E2R	4.5		9.0
E1R ->	227	17	227	F41	9		
E4R ->	228	18	228	F41	9		
Zone 4 Top Load	251	19	251	-> to Lamps E2R	4.5		9.0
E1R ->	252	20	252	F43	9		
E4R ->	253	21	253	F43	9		
Zone 4 Bot Load	276	22	276	-> to Lamps E2R	4.5		9.0
E1R ->	277	23	277	F45	9		
E4R ->	278	24	278	F45	9		
EH1L Load	301	25	301	-> to EH1L	124.0		
EH1L ->	302	26	302	F47		124	
EH1R Load	326	27	326	-> to EH1R	124.0		
EH1R ->	327	28	327	F49		124	

 LCI Furnaces DIVISION OF LOCHABER CORNWALL INC Customer:	DATA SHEET		DOC NBR: STD 802-101523 R1	
	IR FURNACE SYSTEM TB2 OVERVIEW		MODEL: LA-309XN	APVL: SLB 3/15/10
			SERIAL NBR: 13030913XX	PRNT: 09Apr13
			DATE: 05/09/12	SHT 1 of 1


Leg	TB2 Conn	Wire	Fuse	Leg	TB2 Conn	Wire	Fuse	Leg	TB2 Conn	Wire	Fuse
L1	TB2-01A	100	F30								
L1	TB2-01B	125	F32								
L1	TB2-01C	204	F39								
L1	TB2-01D	229	F41								
L1	TB2-02A	250	F42								
L1	TB2-02B	275	F44								
L1	TB2-02C	303	F47								
L1	TB2-02D	328	F49								
L2	TB2-03A	104	F31								
L2	TB2-03B	129	F33								
L2	TB2-03C	150	F34								
L2	TB2-03D	175	F36								
L2	TB2-04A	254	F43								
L2	TB2-04B	279	F45								
	TB2-04C										
	TB2-04D										
L3	TB2-05A	154	F35								
L3	TB2-05B	179	F37								
L3	TB2-05C	200	F38								
L3	TB2-05D	225	F40								
L3	TB2-06A	300	F46								
L3	TB2-06B	325	F48								
	TB2-06C										
	TB2-06D										

Section 5

 LCI Furnaces DIVISION OF LOCHABER CORNWALL INC	DATA SHEET	DOC NBR: STD 802-101524 R1	
	IR FURNACE SYSTEM TB3 OVERVIEW	MODEL: LA-309XN	APVL: SLB 8/12/10
Customer:		SERIAL NBR: 13030913XX	PRNT 09Apr13
		DATE: 05/09/12	PHT 1 of 1

Phase	Signal		SCR	Neutral		SCR
	TB3 Conn	Color	Term 4	TB3 Conn	Color	Term 5
1	TB3-L1	RED/BLK	Z1 Top Z1 Bot Z4 Top Z4 Bot	TB3-N1	WHT/BLK	Z1 Top Z1 Bot Z4 Top Z4 Bot
2	TB3-L2	RED/WHT	Z2 Top Z2 Bot	TB3-N2	WHT/RED	Z2 Top Z2 Bot
3	TB3-L3	RED/GRY	Z3 Top Z3 Bot EH1L EH1R	TB3-N3	WHT/GRY	Z3 Top Z3 Bot EH1L EH1R

LCI FURNACES
EXAMPLE

 LCI Furnaces DIVISION OF LOCHABER CORNWALL INC		CHANNEL ASSIGNMENTS		DOC NBR: 13-0xx 802-101570 R1				
				MODEL: LA-309	DWN JCLARK 6/28/12			
CUSTOMER		SIN: 13030613xx		APVL JMC 9/27/12				
		SIZE: A		PRNT 04/09/13	SHT 1 OF 1			
Electrical			Power: 380 Vac	Orig FO				
			Phase: 3					
			Freq: 50 Hz					
Controller Module POWER SUPPLY 5Vdc 5A TDK PS-5V 25W TDK Capacitor, Tantalum 10uF 10 V USED TCAP OPTO22 Controller Snap LCM4 LCM4 OPTO22 SNAP M4SENET-100 Ethern SNAP-M4SENET-100 POWER SUPPLY 5Vdc 5A TDK PS-5V 25W TDK		Power Supply, 5-6 Vdc, 25 W, 5 A, TDK 285-1214-ND 2yr T350C106K010AT Capacitor, Tantalum 10uF 10 V used on 322-094408-02 PLC Controller Ethernet Card Power Supply, 5-6 Vdc, 25 W, 5 A, TDK 285-1214-ND 2yr		Part Number 322-094408-03 310-100637-03 322-092246-03 322-092246-04 322-094408-03				
DIGITAL01 Address: 0 OPTO22 SNAP-B16M RACK SNAP-B16M B3000-B Rack Controller		16 Module Rack		322-094409-16				
Channel	Signal	Module	Type RANGE	Location	Description	Ref	Part Number	
00	MAIN_POWER_LATCH	SNAP-OAC5MA	DO 4 ch DO 12-140 Vac sw	K4	Delay Power OFF	802-101770	322-094401-01	
01	LAMP_POWER_CTRL		DO	K7	Process Power On	802-101770		
02	ALARM_HORN		DO	K14	Alarm Horn	802-101772		
03	Spare ch				Spare channel			
04	SPEED_FEEDBACK	SNAP-IDC5-FAS1	DI 4ch DI 2-16Vdc .025ms	K11	Transport Motor Tach Feedback	802-101771	322-094406-01	
05	TRANSPORT_MOTION_FAULT		DI	K8	Transport Motion Sensor	802-101771		
06	Spare ch				Spare channel			
07	Spare ch				Spare channel			
08	not used		nt usd	nt usd	no IO	not used		
09	not used		nt usd	nt usd	no IO	not used		
10	not used		nt usd	nt usd	no IO	not used		
11	not used		nt usd	nt usd	no IO	not used		
12	not used		nt usd	nt usd	no IO	not used		
13	not used		nt usd	nt usd	no IO	not used		
14	not used		nt usd	nt usd	no IO	not used		
15	not used		nt usd	nt usd	no IO	not used		
5 Data Points		2 Modules						
ANALOG01 Address: 3								
Channel	Signal	Module	Type RANGE	Location	Description	Ref	Part Number	
00	TEMPERATURE_ZONE_1_K	SNAP-AITM	AI 2 ch AI Type K -150 to 13	KA103	Thermocouple Inputs TC1	802-101701	322-094405-01	
01	TEMPERATURE_ZONE_2_K		AI	KA203	Thermocouple Inputs TC2	802-101701		
02	TEMPERATURE_ZONE_3_K	SNAP-AITM	AI 2 ch AI Type K -150 to 13	KA303	Thermocouple Inputs TC3	802-101701	322-094405-01	
03	Spare ch				Spare channel			
04	ZONE_1_TOP	SNAP-AOV-25	AO 2 ch AO 0-10 Vdc	KA100	Top SCR Signal Control	Element Wiring Sch	322-094402-01	
05	ZONE_1_BOTTOM		AO	KA101	Bot SCR Signal Control	Element Wiring Sch		
06	ZONE_2_TOP	SNAP-AOV-25	AO 2 ch AO 0-10 Vdc	KA200	Top SCR Signal Control	Element Wiring Sch	322-094402-01	
07	ZONE_2_BOTTOM		AO	KA201	Bot SCR Signal Control	Element Wiring Sch		
08	ZONE_3_TOP	SNAP-AOV-25	AO 2 ch AO 0-10 Vdc	KA300	Top SCR Signal Control	Element Wiring Sch	322-094402-01	
09	ZONE_3_BOTTOM		AO	KA301	Bot SCR Signal Control	Element Wiring Sch		
10	ZONE_4_TOP	SNAP-AOV-25	AO 2 ch AO 0-10 Vdc	KA400	Top SCR Signal Control	Element Wiring Sch	322-094402-01	
11	ZONE_4_BOTTOM		AO	KA401	Bot SCR Signal Control	Element Wiring Sch		
12	LEFT_EDGE_HEAT1	SNAP-AOV-25	AO 2 ch AO 0-10 Vdc	KA112	Edge Heat 1 Right SCR Signal Control	Element Wiring Sch	322-094402-01	
13	RIGHT_EDGE_HEAT1		AO	KA111	Edge Heat 1 Left SCR Signal Control	Element Wiring Sch		
14	BELT_SPEED_OUTPUT	SNAP-AOV-25	AO 2 ch AO 0-10 Vdc	K2	Motor Speed Control Signal	802-101771	322-094402-01	
15	not used		nt usd	nt usd	no IO	not used		
14 Data Points		8 Modules						
Total		19 Data Points		10 Modules				
4								
3								
2								
1	ADDED LEFT & RIGHT EDGE_HEAT1 MODULES.						9/27/2012	JCLARK
REV	DESCRIPTION					DATE	APPROVED	

LCI FURNACES
EXAMPLE