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 LCI Furnaces DIVISION OF LOCHABER CORNWALL INC	DATA SHEET		DOC NBR: 15-003	802-101501-01	R0
	IR FURNACE SYSTEM POWER & CURRENT		MODEL: RTC CU-915	APVL: SLB	4/16/15
			SERIAL NBR: 850049	CONF: JMC	4/16/15
	Customer: GE Fuel Cells			PRINT: 07/15/15	SHT 1 of 1

INPUT TABLE	Entry OK?	VALID	
Enter Line Voltage: (208,220,380,400,415,480)		480 Vac	TRUE
Limit Lamps to Max Rating? (Y/N)		Y	TRUE
Line Frequency (50/60)		60 Hz	TRUE
Number of Phases:		3 Φ	TRUE
Lamp Length (6, 9, 15, 24, 36)		15 inches	TRUE
Typical Operating %		49 %	TRUE

SUMMARY OF RESULTS	
Max Power:	90.7 kW
Max Current:	109.0 A
Typical Power:	44.9 kW
Typical Current:	54.0 A

HARDWARE	
Lamps: 56	SCRs: 10
EMs: 7	TCs: 4
EM IDC5: 7	
Nbr strings: 28	
Nbr Lamps in 10" zone: 6	AOV-25: 5
	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.	10	20	20	10									60 in.
Length Entry OK?	TRUE	TRUE	TRUE	TRUE									
(F)um., Furn. (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	6/6	8/8	8/8	6/6									Plenum: 240
	F	F	F	F									

SCR PHASE	Zone Entry OK?	VALID	VALID	VALID	VALID	Lamp Balance (kW)
Top Lamp Phase (1/2/3):		1	2	3	1	Phase 1: 36.0
Bottom Lamp Phase (1/2/3):		1	2	3	1	Phase 2: 24.0
						Phase 3: 24.0

SCR POWER	Zone 1	Zone 2	Zone 3	Zone 4	
Rated Lamp Voltage	225	225	225	225	
Max. Lamp Wired Voltage	225	225	225	225	
50% Power SCR Cal Span Setting	285	285	285	285	
Max. Lamp Wired Power (W)	1500	1500	1500	1500	
No. Strings per SCR	3	4	4	3	
Max. Current per String (A)	6.7	6.7	6.7	6.7	
No. Lamps in Zone	12	16	16	12	56
No. SCRs in Zone	2	2	2	2	8
No. Strings in Furnace Zones	6	8	8	6	28
	Nbr. lamp strings per element monitor:				4
Top Lamp Power (kW)	9.0	12.0	12.0	9.0	
Bottom Lamp Power (kW)	9.0	12.0	12.0	9.0	
Total Power/Zone (kW)	18.0	24.0	24.0	18.0	84.0
Current Required Top SCR (A)	20.0	26.7	26.7	20.0	
Current Required Bottom SCR (A)	20.0	26.7	26.7	20.0	
Color Temp (K) (nominal: 2500K)	2500	2500	2500	2500	
Peak Wavelength (µm)	1.16	1.16	1.16	1.16	
% Energy NIR (<2 µm)	67%	67%	67%	67%	
% Energy MW (2-4 µm)	33%	33%	33%	33%	
Estimated Lamp Life (hrs)	5000 hr	5000 hr	5000 hr	5000 hr	
Lumen Output vs. Rated (%)	100	100	100	100	

Furnace Total	Number of Item?	Voltage (Vac)	Current (Amps)	Power (kW) Max	Power (kW) Typical	Phase Assigned	EH in EM? (y/n)	Other Items
Lamps	56	480	as above	84.0	41.2	as above	N	10" Cabinet or CACT Fans, 117 Vac, 0.30/029 A for 50/60 Hz 4" Box (Muffin) Fans, product cooling, 117 Vac, 0.16 A Cross-flow Fans, product cooling, 230 Vac, 1.27 A max Lower Cabinet Blowers (Impellers), 230 Vac, 0.72 A max H2 Igniters, 120 Vac, 5 A 24 Vdc PS, 120 Vac, 2 A No more than 8 SCRs/phase per TRx xfrm 24 Vac secondary TR1: 4 TR2: 4 TR3: 2 EH1 Ω: 81 Current: 6.0 A Cal Span: 305 Vac EH2 Ω: Current: Cal Span: EH3 Ω: Current: Cal Span: Cabinet/CACT/Control Box Fans: 4.24 A
PC, Monitor	1	117	1.3	0.2	0.2	2	TRUE	
Belt, Opto22, EM	1	117	2.1	0.2	0.2	2		
UC (Pump & Gen)		117	10.0					
UC (Tank Heater)		117	8.4					
UCD (Blower)		117	2.0					
UCD (Heater)		480	16.0					
Edg Htr 1 Length	60	480	12.0	5.8	2.8	2	OK	
Edg Htr 2 Length								
Edg Htr 3 Length								
Cabinet Vent Fan 10"	4	117	0.29	0.1	0.1	2	OK	
CACT Fans 10"	4	117	0.29	0.1	0.1	2	OK	
CACT Fans 4"	0	117	0.16					
Control Box Fans 4"	12	117	0.16	0.2	0.2	2	OK	
Prod Cooling fans		117	0.16					
Furnace Totals:				90.7	44.9			

PHASE	PHASE BALANCING			TOTAL
	1	2	3	ALL
LAMP PWR, kW	36.0	24.0	24.0	84.0
EH/OTHER	0.0	3.7	0.0	3.7
TOTAL	36.0	27.7	24.0	87.7

 LCI Furnaces DIVISION OF LOCHABER CORNWALL INC	DATA SHEET		DOC NBR: 15-003	802-101501-02	R0
	IR FURNACE SYSTEM POWER & CURRENT		MODEL: RTC CU-915	APVL: SLB	4/16/15
			SERIAL NBR: 850049	CONF: JMC	4/16/15
Customer: GE Fuel Cells			PRINT: 07/15/15	SHT 1	of 1

INPUT TABLE	Entry OK?	VALID	
Enter Line Voltage: (208,220,380,400,415,480)		480 Vac	TRUE
Limit Lamps to Max Rating? (Y/N)		Y	TRUE
Line Frequency (50/60)		60 Hz	TRUE
Number of Phases:		3 Φ	TRUE
Lamp Length (6, 9, 15, 24, 36)		15 inches	TRUE
Typical Operating %		34 %	TRUE

SUMMARY OF RESULTS	
Max Power:	90.7 kW
Max Current:	109.0 A
Typical Power:	31.4 kW
Typical Current:	37.8 A

HARDWARE	
Lamps: 56	SCRs: 10
EMs: 7	TCs: 4
EM IDCs: 7	
Nbr strings: 28	
Nbr Lamps in 10" zone: 6	AOV-25: 5
	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.	10	20	20	10									60 in.
Length Entry OK?	TRUE	TRUE	TRUE	TRUE									
(F)um., Furn. (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	6/6	8/8	8/8	6/6									Plenum: 240
	F	F	F	F									

SCR PHASE	Zone Entry OK?	VALID	VALID	VALID	VALID	Lamp Balance (kW)
Top Lamp Phase (1/2/3):		1	2	3	1	Phase 1: 36.0
Bottom Lamp Phase (1/2/3):		1	2	3	1	Phase 2: 24.0
						Phase 3: 24.0

SCR POWER	Zone 1	Zone 2	Zone 3	Zone 4	Nbr. lamp strings per element monitor:
Rated Lamp Voltage	225	225	225	225	4
Max. Lamp Wired Voltage	225	225	225	225	
50% Power SCR Cal Span Setting	285	285	285	285	
Max. Lamp Wired Power (W)	1500	1500	1500	1500	
No. Strings per SCR	3	4	4	3	
Max. Current per String (A)	6.7	6.7	6.7	6.7	
No. Lamps in Zone	12	16	16	12	56
No. SCRs in Zone	2	2	2	2	8
No. Strings in Furnace Zones	6	8	8	6	28
					4
Top Lamp Power (kW)	9.0	12.0	12.0	9.0	
Bottom Lamp Power (kW)	9.0	12.0	12.0	9.0	
Total Power/Zone (kW)	18.0	24.0	24.0	18.0	84.0
Current Required Top SCR (A)	20.0	26.7	26.7	20.0	
Current Required Bottom SCR (A)	20.0	26.7	26.7	20.0	
Color Temp (K) (nominal: 2500K)	2500	2500	2500	2500	
Peak Wavelength (µm)	1.16	1.16	1.16	1.16	
% Energy NIR (<2 µm)	67%	67%	67%	67%	
% Energy MW (2-4 µm)	33%	33%	33%	33%	
Estimated Lamp Life (hrs)	5000 hr	5000 hr	5000 hr	5000 hr	
Lumen Output vs. Rated (%)	100	100	100	100	

Furnace Total	Number of Item?	Voltage (Vac)	Current (Amps)	Power (kW) Max	Power (kW) Typical	Phase Assigned	EH in EM? (y/n)	Other Items
Lamps	56	480	as above	84.0	28.6	as above	N	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	2	TRUE	4" Box (Muffin) Fans, product cooling, 117 Vac, 0.16 A
Belt, Opto22, EM	1	117	2.1	0.2	0.2	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 24 Vdc PS, 120 Vac, 2 A
UCD (Blower)		117	2.0					No more than 8 SCRs/phase per TRx xfrm 24 Vac secondary
UCD (Heater)		480	16.0					TR1: 4 TR2: 4 TR3: 2
Edg Htr 1 Length	60	480	12.0	5.8	2.0	2	OK	EH1 Ω: 81 Current: 6.0 A Cal Span: 305 Vac
Edg Htr 2 Length								EH2 Ω: Current: Cal Span:
Edg Htr 3 Length								EH3 Ω: Current: Cal Span:
Cabinet Vent Fan 10"	4	117	0.29	0.1	0.1	2	OK	Cabinet/CACT/Control Box Fans: 4.24 A
CACT Fans 10"	4	117	0.29	0.1	0.1	2	OK	
CACT Fans 4"	0	117	0.16					
Control Box Fans 4"	12	117	0.16	0.2	0.2	2	OK	
Prod Cooling fans		117	0.16					
Furnace Totals:				90.7	31.4			

PHASE	PHASE BALANCING			TOTAL
	1	2	3	ALL
LAMP PWR, kW	36.0	24.0	24.0	84.0
EH/OTHER	0.0	2.9	0.0	2.9
TOTAL	36.0	26.9	24.0	86.9

FLOWMETER SETTINGS

DOC NBR:	15-003 - 802-101460-01	R1
MODEL:	RTC CU-915	DWN: SLB 01/20/14
SERIAL NBR:	850049	APVL: JMC 01/20/14
PRINT:	15Jul15	PM: JMC 07/07/15

Customer: GE Fuel Cells

PROCESS GAS

GAS1	<input type="text" value="N2"/>	Nitrogen	<input type="text" value="cfh"/>
GAS2	<input type="text" value="FG"/>	Forming Gas	

SETTINGS FOR STANDARD FLOW: DUAL GAS MODEL
Fuel Cell Processing (810 C)

Replenish Rate is the number of times/minute that the furnace (or a section of the furnace) evacuates its gas

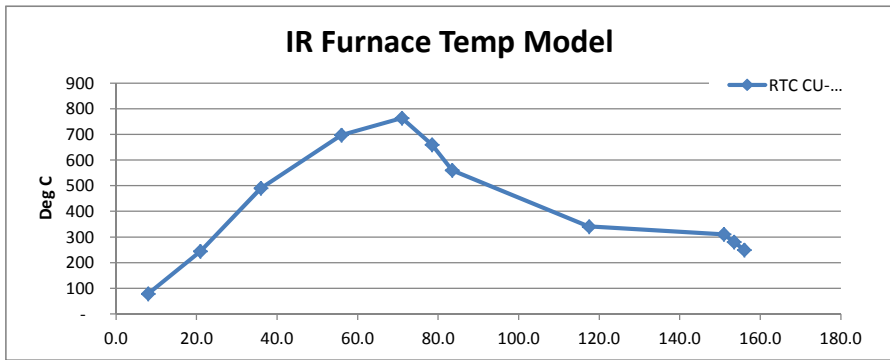
Replenish Rate	Furnace or Section Replenishes/Hour	Time to Refresh Furnace or Section
1 times/minute	60 times/hour	60 seconds
2 times/minute	120 times/hour	30 seconds
3 times/minute	180 times/hour	20 seconds
4 times/minute	240 times/hour	15 seconds

Different sections of the furnace can be replenished at different rates, if required

 Flowmeters graduated in: (lg=RMC flowmeters, sm=small RMA flowmeters)

BALANCE											
<input type="text" value="400"/>	scfh difference	=>	Positive pressure in furnace to purge O2								
<input type="text" value="400.0"/>	scfh grad	39.0%	incr (decr) of inflows over outflows								
No.	Location	Label	Avg deg C	Metered Gas	Flowmeter Size cfh	1 per Minute Replenish Rate Flow Setting scfh grad	Desired Replenish Rate per Minute	Initial Flowmeter Setting scfh grad	Initial Flowmeter Setting scfh grad		
3.3 CFM X 2											
1	BESE	Entrance barrier	50	N2	400	48	1.0	50	50		
2	Z1	Heating chamber 1	225	FG	400	30	6.3	190	190		
3	Z2	Heating chamber 1	500	FG	600	83	2.3	190	190		
		Heating chamber 2	725	FG			2.3				
		Heating chamber 2	810	FG			2.3				
4	RCT	Cooling Isolatin Trans	660	N2	600	5	34.5	180	180		
5	RCT	Cooling Isolatin Trans	594	N2	600	6	16.0	90	90		
6	CACT	Cooling section	360	N2	600	99	2.3	224	224		
		Exit barrier	120								
7	HC	Heat chamber sides	100	N2	400	58	1.4	80	80		
8					3600	329	2.6	1005	1005		

FLOW TO EXHAUST FLOWMETERS						distr %	scfh grad	scfh grad
9	EEBE	Entrance Stack	ENTRANCE STACK	N2	100	60%	25.0	25.0
10	EETT	Transition tunnel ed	TRANS TUNNEL STACK	N2	200	40%	22.7	22.7
11					300	100%	41.7	41.7



Furnace Balance		scfh	scfh
Gas 1	N2	625	699
Gas 2	FG	380	374
Total Gas Required		1005	1073
Gas Inflow to furnace		1025	1025
Gas to Eductors		48	48
Total Gas Required		1073	1073
- Stack Exhaust Flow		764	764
Net inflow		309	309
Furnace internal volume		cu ft	L
		10	288

PROCESS GAS SUPPLY REQUIREMENTS				Temp °C	Press psi	Gas	scfh	scfh
1	Gas 1	All except Heating Chambers		21	70	N2	693	693
2	Gas 2	Heating Chambers		21	70	FG	374	374
STP = 21C, 1 atm						Total	1067	1067

FLOWMETER SETTINGS

DOC NBR:	15-003 - 802-101460-02	R0
MODEL:	RTC CU-915	DWN: SLB 01/20/14
SERIAL NBR:	850049	APVL: JMC 01/20/14
PRINT:	15Jul15	PM: JMC 07/07/15

PROCESS GAS

GAS1	N2	Nitrogen	cfh	▼
GAS2	FG	Forming Gas		

SETTINGS FOR LOW O2 FLOW: SINGLE GAS MODEL
VL O2 Fuel Cell Processing (810 C)

Replenish Rate is the number of times/minute that the furnace (or a section of the furnace) evacuates its gas

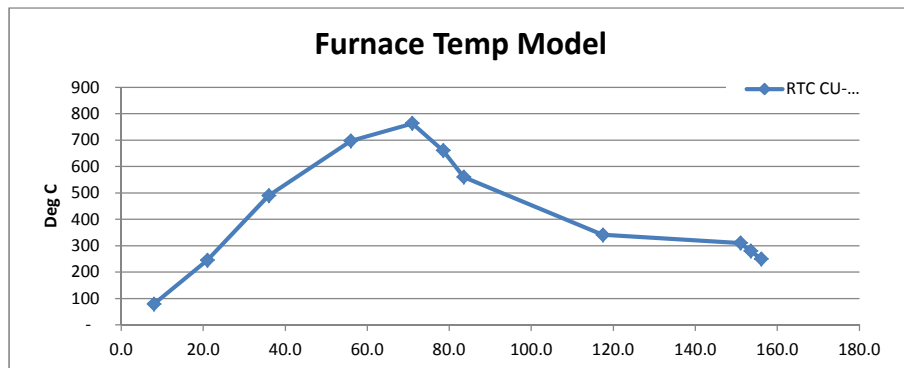
Replenish Rate	Furnace or Section Replenishes/Hour	Time to Refresh Furnace or Section
1 times/minute	60 times/hour	60 seconds
2 times/minute	120 times/hour	30 seconds
3 times/minute	180 times/hour	20 seconds
4 times/minute	240 times/hour	15 seconds

Different sections of the furnace can be replenished at different rates, if required

Flowmeters graduated in: scfh (lg=RMC flowmeters, sm=small RMA flowmeters)

No.	Location	Label	Avg deg C	Metered Gas	Flowmeter Size cfh	1 per Minute Replenish Rate Flow Setting scfh grad	Desired Replenish Rate per Minute	Initial Flowmeter Setting scfh grad	Initial Flowmeter Setting scfh grad	
BALANCE										
	1200	scfh difference	=> Positive pressure in furnace to purge O2							
	1200	scfh grad	78.8%	incr (decr) of inflows over outflows						
10.0 CFM X 2										
1	BESE	Entrance barrier	ENTRANCE BAFFLE	50	N2	400	48.3	1.0	50	50
2	Z1	Heating chamber 1	ZONE 1	225	FG	400	30.1	12.0	360	360
3	Z2	Heating chamber 1	ZONE 2	500	FG	600	82.7	6.0	500	500
		Heating chamber 2	ZONE 3	725				6.0		
		Heating chamber 2	ZONE 4	810				6.0		
4	RCT	Cooling Isolatin Trans	TRANSITION TOP	660	N2	600	5.2	34.5	180	180
5	RCT	Cooling Isolatin Trans	TRANSITION BOTTOM	594	N2	600	5.6	16.0	90	90
6	CACT	Cooling section	CACT	360	N2	600	99.4	2.3	225	225
		Exit barrier		120						
7	HC	Heat chamber sides	LAMP SEALS	100	N2	400	57.6	1.7	100	100
							329	4.0	1504	1504

						distr %	scfh grad	scfh grad
8	EEBE	Entrance Stack	ENTRANCE STACK	N2	100	60%	12.9	12.9
9	EETT	Transition tunnel ed	TRANS TUNNEL STACK	N2	200	40%	11.8	11.8
						100%	21.5	21.5



Furnace Balance		scfh	scfh
Gas 1	N2	645	669
Gas 2	FG	860	584
Total Gas Required		1504	1253
Gas Inflow to furnace		1523	1523
Gas to Eductors		25	25
Total Gas Required		1548	1548
- Stack Exhaust Flow		395	395
Net inflow		1153	1153
Furnace internal volume		cu ft	L
		10	288

PROCESS GAS SUPPLY REQUIREMENTS			Temp °C	Press psi	Gas	scfh	scfh	
1	Gas 1	All except Heating Chambers	21	70	N2	693	693	
2	Gas 2	Heating Chambers	21	70	FG	374	374	
STP = 21C, 1 atm						Total	1067	1067

V, fpm Gate H, in

FLOWMETER SETTINGS

DOC NBR:	15-003 - 802-101460-03	R1
MODEL:	RTC CU-915	DWN: SLB 01/20/14
SERIAL NBR:	850049	APVL: JMC 01/20/14
PRINT:	15Jul15	PM: JMC 01/20/14

Customer: GE Fuel Cells

PROCESS GAS

GAS1	CDA	Clean Dry Air
GAS2	CDA	Clean Dry Air

SETTINGS FOR STANDARD FLOW: SINGLE GAS MODEL
Fuel Cell Processing (300 C)

Replenish Rate is the number of times/minute that the furnace (or a section of the furnace) evacuates its gas

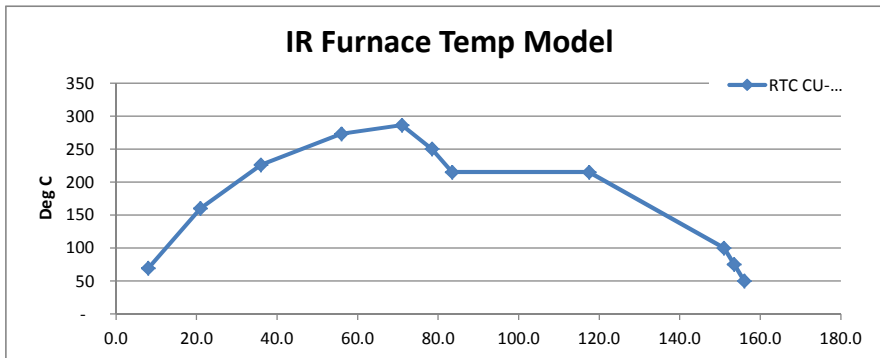
Replenish Rate	Furnace or Section Replenishes/Hour	Time to Refresh Furnace or Section
1 times/minute	60 times/hour	60 seconds
2 times/minute	120 times/hour	30 seconds
3 times/minute	180 times/hour	20 seconds
4 times/minute	240 times/hour	15 seconds

Different sections of the furnace can be replenished at different rates, if required

Flowmeters graduated in: scfh (lg=RMC flowmeters, sm=small RMA flowmeters)

BALANCE						1 per Minute Replenish Rate Flow Setting scfh grad		4.0	
400	scfh difference	=>	Positive pressure in furnace to purge O2						
400.0	scfh grad	40.0%	incr (decr) of inflows over outflows						
No.	Location	Label	Avg deg C	Metered Gas	Flowmeter Size cfh	Flowmeter Rate Flow Setting scfh grad	Desired Replenish Rate per Minute	Initial Flowmeter Setting scfh grad	Initial Flowmeter Setting scfh grad
3.3 CFM X 2									
1	BESE Entrance barrier	ENTRANCE BAFFLE	50	CDA	400	49	1.0	50	50
2	Z1 Heating chamber 1	ZONE 1	175	CDA	400	34	4.5	150	150
3	Z2 Heating chamber 1	ZONE 2	225	CDA	600	141	1.1	150	150
	Heating chamber 2	ZONE 3	280	CDA			1.1		
	Heating chamber 2	ZONE 4	300	CDA			1.1		
	4	RCT Cooling Isolatin Trans	TRANSITION TOP	250			CDA		
5	RCT Cooling Isolatin Trans	TRANSITION BOTTOM	225	CDA	600	10	10.0	100	100
6	CACT Cooling section	CACT 1	150	CDA	600	135	2.3	310	310
			120						
8	HC Heat chamber sides	LAMP SEALS	80	CDA	400	62	1.3	80	80
						450	2.6	982	982

FLOW TO EXHAUST FLOWMETERS						distr %	scfh grad	scfh grad
9	EEBE Entrance Stack	ENTRANCE STACK		CDA	100	60%	24.0	24.0
10	EETT Transition tunnel ed	TRANS TUNNEL STACK		CDA	200	40%	21.8	21.8
						100%	40.0	40.0



Furnace Balance		scfh	scfh
Gas 1	CDA	982	1045
Gas 2	CDA	982	1045
Total Gas Required		1964	2091
Gas Inflow to furnace		1000	1000
Gas to Eductors		46	46
Total Gas Required		1045	1045
- Stack Exhaust Flow		733	733
Net inflow		313	313
Furnace internal volume		cu ft	L
		10	288

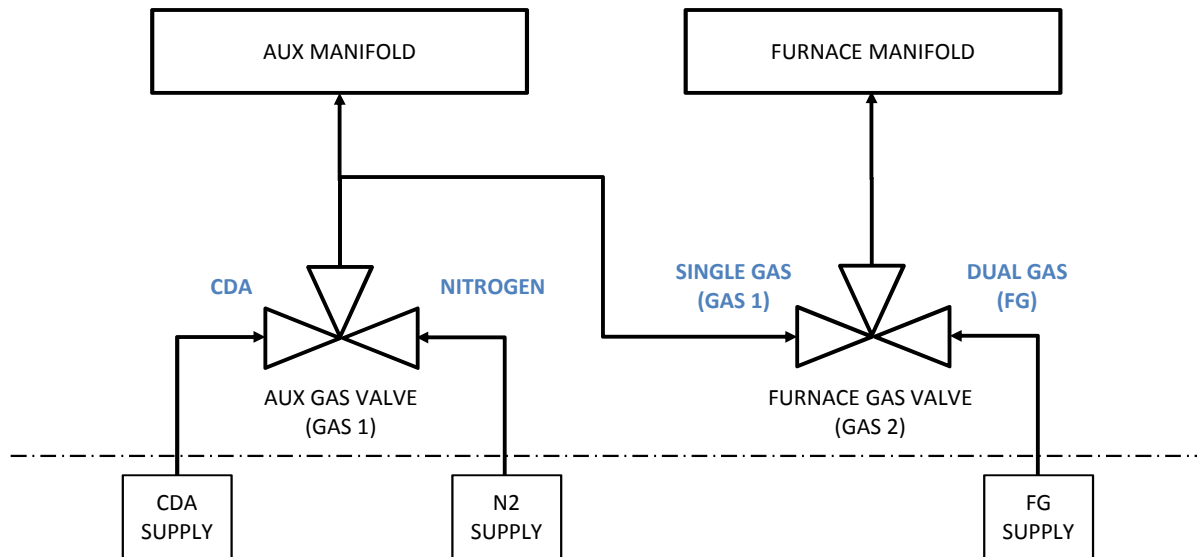
PROCESS GAS SUPPLY REQUIREMENTS				Temp °C	Press psi	Gas	scfh	scfh
1	Gas 1	All except Heating Chambers		21	70	CDA	745	745
2	Gas 2	Heating Chambers		21	70	CDA	295	295
STP = 21C, 1 atm						Total	1040	1040



Customer: GE Fuel Cells

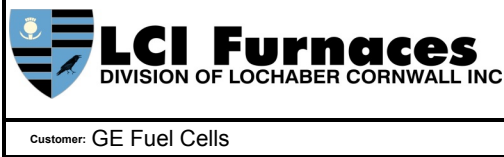
SUPPLY GAS 3-SOURCE, 2 MODE PIPING SCHEMATIC

DOC NBR:	15-003	802-101465	R0
MODEL:	RTC CU-915	DWN JMC	5/18/15
SERIAL NBR:	850049	APVL CR	5/18/15
PRINT	05/18/15	SHT 1	of 1



IF AUX GAS VALVE = CDA, SET FURNACE GAS VALVE TO SINGLE GAS.

IF AUX GAS VALVE = NITROGEN, SET FURNACE GAS VALVE TO SINGLE GAS OR DUAL GAS.

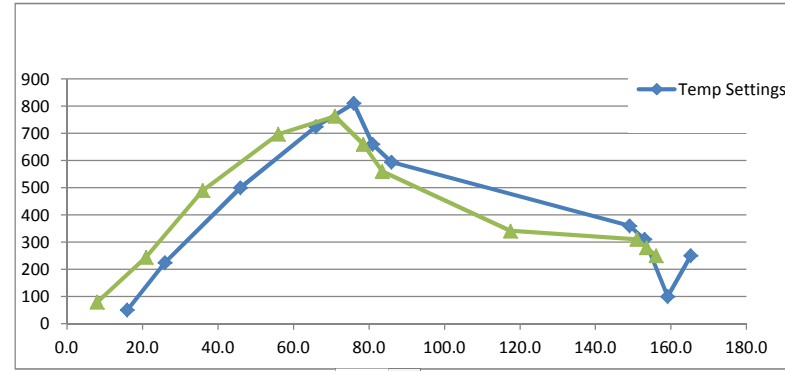


DATA SHEET
IR FURNACE SYSTEM
GAS FLOW

DOC NBR: 15-003	802-101560-01	R0	SHT 1 of 1
MODEL: RTC CU-915	DWN: JCLARK		08/07/13
SERIAL NBR: 850049	APVL: SLB		08/07/13
PRINT: 15Jul15	PM: JCLARK		07/08/15

IR FURNACE FLOWMETER SCALE CORRECTION, PURGE AIR AND EXHAUST

Gage 70 F 0.0 psig	STANDARD CONDITIONS Standard Temperature, F Standard Pressure, psig	Absolute Ts 530 R Ps 14.7 psia	<i>Dwyer flowmeter std</i> <i>Dwyer flowmeter std</i>
100 F 70 psig	COMPRESSED GAS SUPPLY Actual Temperature, F Pressure after Furnace Regulator, psig	T1 560 R P1 84.7 psia	<i>max normal temperature at flowmeter exit</i> <i>furnace pressure regulator setting</i>
2.0 rep/min	REPLENISH RATE Number of Replenishes/minute Time it takes to evacuate Furnace	RepRate 120 rep/H 30.00 sec	<i>furnace replenishes per hour</i> <i>time to refresh gas in furnace</i>
2 in Standard 15 Standard	Product Height Eductor multiplier	Excess flow 400.0 scfh 400.0 scfh grad	<i>=> Positive pressure in furnace to purge O2</i>



Standard Flowmeters	Available Flowmeters
5	50
100	100
200	200
400	400
600	600
1000	1000
1200	1200
1800	1800

INTERNAL VOLUME OF THE FURNACE AND FURNACE GAS INFLOWS

Include?	Select Gas	Enter 1or2	Label	Location	Furnace Size			Process Gas Cond			RepRate=1	Pref RepRate	Initial Std Flow Avg RepRate=3.1		Convert Sizing Flow to Meter Grad			Select Flowmeters			Initial Flowmeter Settings		Max Std Flow									
					Length inch	Width inch	Height inch	Vol ft3	Proc Gas	Avg Temp °C			Press in H2O	MinFlow 70F scfh	Typ flow @70F scfh	Adj Units for Flowmeter to scfh	Sizing Flow 1.5-2x scfh	Flowmeter Discharge Temp deg F	Flowmeter Discharge Press in H2O	Flowmeter Discharge Press psig	Calc FMtr Sizing Flow scfh grad	Adj Units for Flowmeter to scfh grad	GROUP Flowmeters scfh grad	Get Lookup Flowmeter scfh grad	Manually select meter scfh grad	Installed Flowmeters	scfh grad	scfh grad	Max Flow scfh	Max Flow scfh		
Y	Gas 1	LOAD	LOAD Station	Entrance load area	12.3	16.0	6	0.89	N2	21	1	48.7	1.0	50.9	50.9	97.4	100	15	0.54	96.6	96.6	96.6	100.0	400	ENTRANCE BAFFLE	50.5	50.485	403.1	403.1			
Y	Gas 2	Z1	ZONE 1	Heating chamber 1	10.0	16.0	9	0.83	FG	225	1	29.6	6.3	186.6	186.6	279.9	100	8	0.29	284.6	284.6	284.6	400.0	400	ZONE 1	189.7	189.744	393.3	393.3			
Y	Gas 2	Z2	ZONE 2	Heating chamber 1	20.0	16.0	9	1.67	FG	500	1	38.2	2.3	87.8	87.8	131.7	100	8	0.29	133.9	133.9	181.7	200.0	600	ZONE 2	190.3	190.298	590.0	590.0			
Y	Gas 2	Z3	ZONE 3	Heating chamber 2	20.0	16.0	9	1.67	FG	725	1	29.6	2.3	68.0	68.0	102.0	100	8	0.29	103.7	103.7	103.7	200.0	600	ZONE 3							
Y	Gas 2	Z4	ZONE 4	Heating chamber 2	10.0	16.0	9	0.83	FG	810	1	13.6	2.3	31.3	31.3	47.0	100	8	0.29	47.8	47.8	47.8	50.0	600	ZONE 4							
Y	Gas 1	RCT	TRANSITION TOP	Cooling Isolatin Trans	5.0	16.0	6	0.28	N2	660	1	5.3	34.5	181.8	181.8	272.8	100	15	0.54	270.7	270.7	270.7	400.0	600	TRANSITION TOP	180.4	180.438	604.7	604.7			
Y	Gas 1	RCT	TRANSITION BOTTOM	Cooling Isolatin Trans	5.0	16.0	6	0.28	N2	594	1	5.7	16.0	90.8	90.8	136.1	100	15	0.54	135.1	135.1	135.1	200.0	600	TRANSITION BOTTOM	90.0	90.049	604.7	604.7			
Y	Gas 1	CACT	CACT	Cooling section	63.0	16.0	6	3.50	N2	360	1	97.9	2.3	220.7	220.7	331.1	100	100	3.61	299.7	299.7	339.9	400.0	600	CACT	224.2	224.215	662.8	662.8			
Y	Gas 1	BXO	EXIT BAFFLE W/O EDUCT	Exit barrier	4.0	16.0	6	0.22	N2	310	1	6.7	4.0	27.0	27.0	40.5	100	15	0.54	40.2	40.2	40.2	50.0	600	EXIT BAFFLE W/O EDUCT							
Y	Gas 1	HC	LAMP PLENUMS	Heat chamber sides	240.0	1.0	2	0.28	N2	100	1385	57.9	1.4	80.5	80.5	120.7	100	12.5	0.45	120.2	120.2	120.2	200.0	400	LAMP SEALS	80.1	80.096	401.9	401.9			
Y			Unload Station	Exit station	12.3	16.0				250																						
Y			Frame Adjustment	Internal	1.75																											
Total Furnace Length with optional items					179.25 in	15.00	4.55 m		10.2 ft3	0.3 m3		333.1	3.1	1025.3	1025.3	1559.1							2200.0	3600								
2 Eductors sized to balance Preferred Inflow					153.00 in																											
EDUCTOR IN-FLOWS					Average Zone Temp			680																								
Y	Gas 1	EEBE	Entrance Stack	Entrance Stack					N2	200	6	11.1	122.0	25.0	25.0	25.0	100	30	1.1	24.4	24.4	24.4	50.0	100.0	ENTRANCE STACK	25.0	25.0	102.6	102.6			
Y	Gas 1	EETT	Trans Tunnel Stack	Transition tunnel ed					N2	200	6	11.1	122.0	16.7	16.7	16.7	100	30	1.1	16.3	16.3	16.3	20.0	200.0	TRANS TUNNEL STAC	16.7	16.7	205.1	205.1			
Total Eductor inflows										22.2	244.0			41.7	41.7	41.7							70.0	300								

GAS INFLOW		Temp °C	Press psi	Min Flow RepRate=1 scfh	Flow RepRate=2 scfh	Initial Flow RepRate=3.1	
Gas 1	N2	35	70	244.4	489	693.3	693.3
Gas 2	FG	35	70	111.0	222	373.7	373.7
				355.3	711	1067.0	1067.0
GAS EXHAUST		in H2O		Min Flow RepRate=1 scfh	Flow RepRate=2 scfh	Initial Flow RepRate=3.1	
Gas 1	N2	200	6	355.3	711	667.0	667.0
via eductor powered by:				355.3	711	667.0	667.0
NET GAS FLOW IN (OUT)		Temp °C	Press psi	Min Flow RepRate=1 scfh	Flow RepRate=2 scfh	Initial Flow RepRate=3.1	
Gas 1	N2	200	6	(111)	-222	26	26
Gas 2	FG	200	6	111	222	374	374
				0.0	0.0	400.0	400.0
N2 Supply		Temp °C	Press psi	Typical scfh	Typical scfh	Max Compressor	
1.0	Compressor Safety Factor	21	70	693	693	2,985	2,985
FG Supply		Temp °C	Press psi	Typical scfh	Typical scfh	Max Compressor	
1.0	Compressor Safety Factor	21	70	374	374	983	983

Total Nbr Flowmeters 9

Max Flow scfh	Max Flow scfh
2,985	2,985
983	983
3,968	3,968
4,923	4,923
4,923	4,923
(1,938)	(1,938)
983	983
(954)	(954)
2,985	2,985
983	983

