



No.	A-L-0014
Effective Date	2/3/06
Revision No.	00
Last Revision Date	N/A
Page 1 of 1	

1. For Renewals, New Minor Sources, Minor Modifications and Transfers: To be advertised once by the applicant in a newspaper of general circulation in the area of the project location, within 30 days prior to the filing of the application.
2. For New Major Source Licenses and Major Modifications: To be advertised for three consecutive weeks in the public notice section of a Sunday or weekend newspaper of general circulation in the region in which the source is located.
3. For major modifications, new major sources, new Part 70 sources, or transfers this notice must also be mailed by certified mail to all abutting landowners, within 30 days prior to the filing of the application.
4. One copy of each of the "published" notices are to be submitted with the application.

PUBLIC NOTICE OF INTENT TO FILE

Please take notice that Oak Grove Crematory, 45 Danforth Street Gardiner
ME. 04345 242-6481
(name, address, and phone number of applicant)

intends to file an Air Emission License application with the Maine Department of Environmental Protection (DEP) pursuant to the provisions of 38 M.R.S.A., Section 590 on 09-30-09. The application is for A retort for cremation
(submittal date)

of human remains *(summary of project)*

at Oak Grove Cemetery Gardiner *(project location)* According to Department regulations, interested

parties must be publicly notified, written comments invited, and if justified, an opportunity for public hearing given. A request for a public hearing or for the Board of Environmental Protection to assume jurisdiction must be received by the Department, in writing, no later than 20 days after the application is accepted by the Department as complete for processing.

The application and supporting documentation will be available for review at the Bureau of Air Quality (BAQ) DEP offices in Augusta, (207) 287-2437, during normal working hours. A copy of the application and supporting documentation will also be available at the municipal office in Gardiner, Maine.
(town)

Written public comments may be sent to Lynn Cornfield at the Bureau of
(project manager)
Air Quality, State House Station #17, Augusta, Maine 04333.



Form No.	A-L-0006
Effective Date	2/15/06
Revision No.	05
Last Revision Date	12/2005
Page 1 of 12	

CHAPTER 115 AIR EMISSION LICENSE APPLICATION FORMS

State of Maine
Department of Environmental Protection
Bureau of Air Quality
17 State House Station
Augusta, Maine 04333-0017
phone: (207) 287-2437 fax: (207) 287-7641

Section A: FACILITY INFORMATION

Facility Name to Appear on License: Oak Grove Crematory

Physical Location: 45 Danforth Street City/Town: Gardiner County: Kennebec

Facility Mailing Address: 128 Cobbossee Avenue

City/Town: Gardiner Zip Code: 04345

Facility Phone Number: 207-242-6481

Facility / Application Description:

Installation and operation of a B & L Cremation Systems human crematory Model N-20AA
on an existing cemetery

Current License #: A- _____ - _____ - _____ - _____

Application #: A- _____ - _____ - _____ - _____ (to be filled in by the Department)

Check When Done:

- Application Completed
- Copy Sent to Town (date sent _____)
- Public Notices Published
(paper name: _____ date: _____)
- Enclosed Public Notice Tear Sheet
- Signed Signatory Form (section J)
- If applicable, notified abutting landowners (major modification)
- If applicable, enclosed check for fee (new sources)

State of Maine DEP - Bureau of Air Quality
Chapter 115 Air Emission License Application
Revised 2/15/06

Facility Contact:

Name: Russ Greenleaf Title: President
Company: Oak Grove Crematory LLC.
Mailing Address: 128 Cobbossee Avenue

City/Town: Gardiner Zip Code: 04345
Phone: 207-242-6481 Fax:
e-mail:

Application Contact:

Name: Same as Above Title:
Company:
Mailing Address:

City/Town: Zip Code:
Phone: Fax:
e-mail:

Billing Contact:

Name: Same as Above Title:
Company:
Mailing Address:

City/Town: Zip Code:
Phone: Fax:
e-mail:

Section C: INCINERATORS

	Incinerator Unit 1	Incinerator Unit 2
Incinerator Type (medical waste, municipal, etc.)	Human Crematory	
Waste Type	Deceased Human Remains	
Make (Shenandoah, Crawford, etc.)	B&L Cremation Systems	
Model Number	N-20AA	
Date of Manufacture	2009	
Date of Installation	2010	
Number of Chambers	2	
Max. Design Feed Rate (per load)	500 lb	lb
Max. Design Combustion Rate	150 lb/hr	lb/hr
Heat Recovery? (Yes or No)	No	
Retention Time	1 seconds	seconds
Automatic Feeder? (Yes or No)	No	
Temperature Range primary	1000 to 1400 °F	to °F
secondary	1800 to 2000 °F	to °F
Auxiliary Burner - Primary Chamber max. rating (MMBtu/hr)	0.5 MM	
type of fuel used	LP	
Auxiliary Burner - Secondary Chamber max. rating (MMBtu/hr)	1.0 MM	
type of fuel used	LP	
Annual Waste Combusted for 2009 (yr)	0	
Pollution Control Equipment (if any)	Afterburner	
Stack Number	#1	
Monitors (ie - temperature recorder)	Opacity Monitor Temp Recorder	

Section E: STACK DATA

Stack #	Height Above Ground (m or ft)	Inside Diameter (m or ft)	Exit Temperature °F	Exhaust Flow Rate (m ³ /s or ft ³ /s) [indicate actual or standard]
#1	18ft	1.5	900	2000 ACFM

Section F: ANNUAL FACILITY FUEL USE

Total Fuel Consumption by Month for: N/A (year)

fuel type: LP

fuel type: _____

fuel type: _____

Avg % sulfur (oil) _____

Avg % sulfur (oil) _____

Avg % sulfur (oil) _____

Avg % moisture (wood) _____

Avg % moisture (wood) _____

Avg % moisture (wood) _____

(circle one: gal, tons, scf)

(circle one: gal, tons, scf)

(circle one: gal, tons, scf)

January _____
 February _____
 March _____
 April N/A _____
 May _____
 June _____
 July _____
 August _____
 September _____
 October _____
 November _____
 December _____

Total _____

Proposed Annual Limit 50,600 Gallons

Section I: BPT/BACT AND OTHER ATTACHEMENTS

BPT/BACT Analysis:

For license renewals for existing equipment, applicants are required to submit a Best Practical Treatment (BPT) analysis to the Department. A BPT analysis establishes what equipment or requirements are appropriate for control or reduction of emissions of regulated pollutants to the lowest possible level considering the existing state of technology, the effectiveness of available alternatives, and the economic feasibility.

For new licenses or the addition of new equipment to existing licenses, applicants are required to submit a Best Available Control Technology (BACT) analysis. A BACT analysis is a top-down approach to selecting air emission controls. It is done on a case-by-case basis and develops emission limits based on the maximum degree of reduction for each pollutant emitted taking into account economic, environmental and energy impacts.

I certify that, to the best of my knowledge, the control equipment, fuel limitations, and process constraints outlined in this application represent BPT / BACT for the equipment and processes listed.

OR

I have attached a separate BPT / BACT analysis to this application.

Other Attachements:

Please list any attachments included with this application.

Stack Test Results of Identical Model

Flow Diagram

Calculations

Blue Prints

Section J: SIGNATORY REQUIREMENT

Each application submitted to the Department must include the following certification signed by a Responsible Official*:

"I certify under penalty of law that, based on information and belief formed after reasonable inquiry, I believe the information included in the attached document is true, complete, and accurate."

<u><i>Russ Greenleaf</i></u> Responsible Official Signature	<u>9-209</u> Date
<u>Russ Greenleaf</u> Responsible Official (Printed or Typed)	<u>President</u> Title

* A Responsible Official is defined by MEDEP Chapter 100 as:

- A. For a corporation: a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:
 - (1) The facilities employ more than 250 persons or have gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars); or
 - (2) The delegation of authority to such representatives is approved in advance by the permitting authority;
- B. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;
- C. For a municipality, State, Federal, or other public agency: Either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of EPA).

CALCULATIONS FOR PRODUCTS OF COMBUSTION
AND RESIDENCE TIME FOR 150 LB/hr
TYPE IV WASTE. B&L N-20 SERIES CREMATORY

PROPANE

A. BASIS: 1 LB WASTE

1. $\frac{1 \text{ lb waste} \times 1000 \text{ Btu/lb waste} \times 15 \text{ lbs air}}{10,000 \text{ Btu}} = 1.5 \text{ lbs air}$
2. $\frac{1 \text{ lb waste} \times 0.10 \text{ lb combustible}}{1 \text{ lb waste}} = 0.10 \text{ lbs of combustibles}$
3. $\frac{1 \text{ lb waste} \times 0.85 \text{ lb H}_2\text{O} \times 1.6^*}{1 \text{ lb waste}} = 1.36 \text{ lbs of water}$
4. $\frac{6,500 \text{ Btu aux fuel}^{**} \times 23.8 \text{ cu ft air/cu ft fuel}}{2,500 \text{ Btu/cu ft fuel} \times 13.35 \text{ cu ft air/lb air @ 70f}} = 4.64 \text{ lbs of air for aux fuel}$
5. $\frac{6,500 \text{ Btu aux fuel} \times 0.044 \text{ lb fuel/cu ft fuel}}{2,500 \text{ Btu/cu ft fuel}} = 0.11 \text{ lb of aux fuel}$
6. Sum = PRODUCTS OF COMBUSTION (POC) = 7.71 lbs POC per lb waste @ 70f

B. RESIDENCE TIME @ 1600 F

1. $\frac{7.71 \text{ lbs POC/lbs waste} \times 51.89 \text{ cu ft / lb POC @ 1600f} \times 150 \text{ lbs waste / hr}}{3600 \text{ sec/hr}}$
 $= 16.67 \text{ cu ft / sec @ 1600 f} = 17.00 \text{ cu ft for 1 second residence time}$

RESIDENCE TIME @ 1800 F

2. $\frac{7.71 \text{ lbs POC/lbs waste} \times 56.93 \text{ cu ft / lb POC @ 1800f} \times 150 \text{ lbs waste / hr}}{3600 \text{ sec/hr}}$
 $= 18.1 \text{ cu ft / sec @ 1800 f} = 19.00 \text{ cu ft for 1 second residence time}$

* Correction multiplier for dry air and water vapor

** Fuel is propane

Referances: Incinerator institute of America.
North American Combustion Handbook
Eclipse Combustion Engineering guide

C. THERMOCOUPLE PLACEMENT.

Secondary chamber operating temperature at > or = to 1600f = 17.00 cu ft from flame tip.
1800f = 19.00 cu ft from flame tip.



Cremation
Systems, Inc.

7205 - 114th Avenue North • Largo, Florida 33773
1-800-622-5411 • 727-541-4666 • Facsimile 727-547-0669

PROCESS DESCRIPTION

This project consists of the construction of one new cremation retort. This crematorium will consist of one B & L Systems Model N-20AA Human Cremator. The cremation unit will be fired on propane.

Deceased human remains are manually placed into the primary chamber of the cremator. The door of the cremator is then closed. After a preheat of the afterburning chambers by the auxiliary burner, initial and supplementary combustion is provided by a propane fired burner located in the primary chamber of the cremator. Once material combustion is initiated, the rate of the combustion is controlled by limiting both the combustion air and fuel supplied to the primary chamber through the primary burner. This process generates a highly combustible gas mixture that flows into a secondary chamber where more air is admitted to insure further oxidation of the gases. The auxiliary burner is installed in the secondary chamber of the cremator to facilitate complete combustion of all gaseous materials entering this chamber.

Once the cremation process is complete, the remains are removed from the primary chamber of the cremator. These remains are placed in urns and returned to the family for interment or disposal.

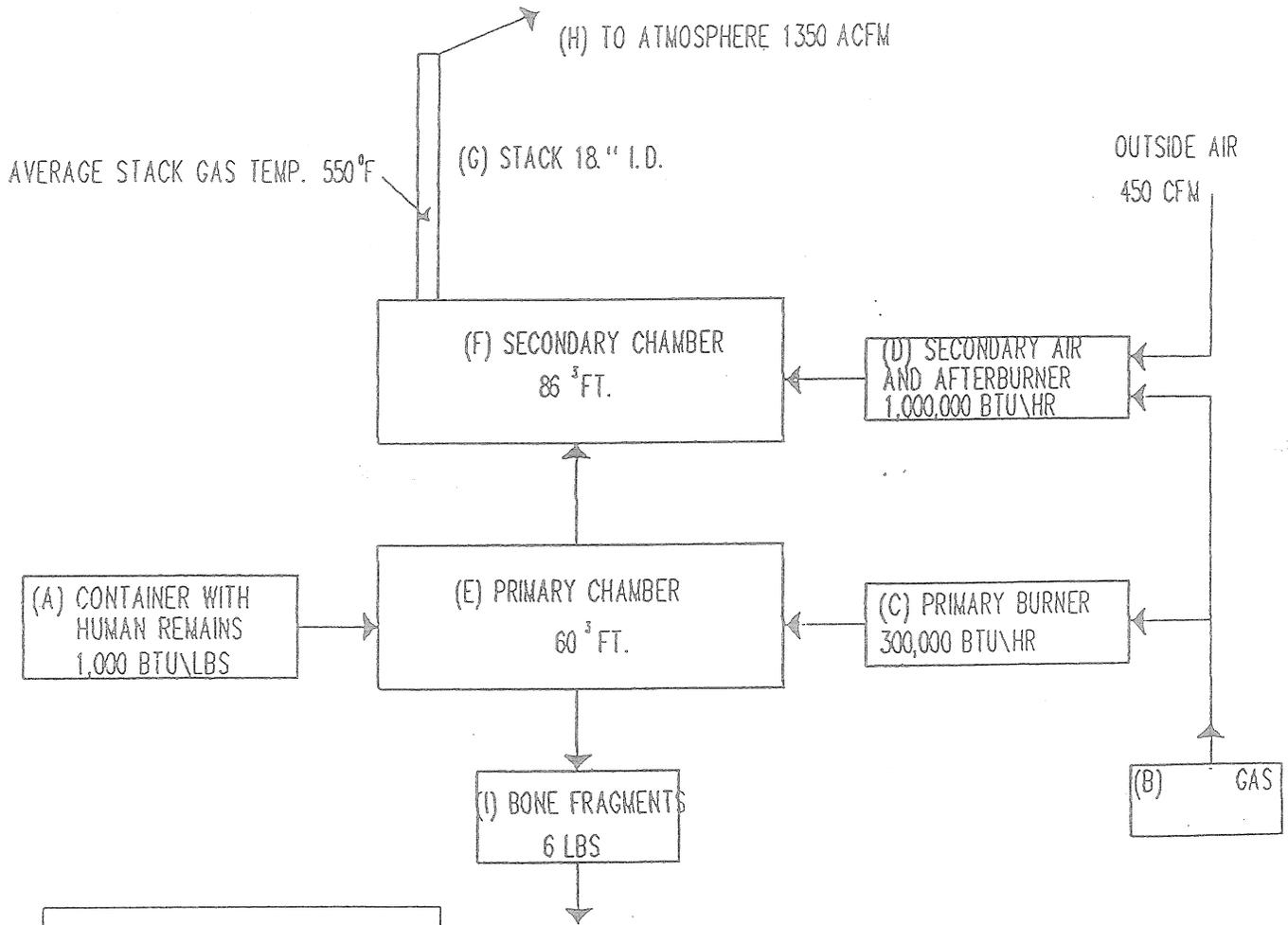
World's Largest Independent Cremation Equipment Manufacturer



Cremation
Systems, Inc.

7205 - 114th Avenue North • Largo, Florida 33773
1-800-622-5411 • 727-541-4666 • Facsimile 727-547-0669

PROCESS FLOW DIAGRAM



ELEVATION	_____
STACK HEIGHT	_____
ROOF HEIGHT	_____

World's Largest Independent Cremation Equipment Manufacturer



Cremation
Systems, Inc.

7205 - 114th Avenue North • Largo, Florida 33773
1-800-622-5411 • 727-541-4666 • Facsimile 727-547-0669

TEMPERATURE CONTROL SEQUENCE

A type "K" thermocouple is placed 19³ ft. down stream of the flame tip to measure temperature, the signal is sent to the *main control panel* where it is received by a FUJI PYZ series temperature controller with digital readout and a DR4200 *temperature recorder*. The FUJI PYZ series temperature controller controls the temperature via a *motorized butterfly valve* located on the *afterburner inlet gas assembly*. Gas demand is controlled by temperature to maintain a steady temperature. The *ignition/cremation burner* is interlocked to the *afterburning temperature* by the FUJI PYZ series temperature controller set point. Combustion cannot start until *temperature set point* is reached. Alarm contacts in the FUJI PYZ series temperature controller are utilized for over (high) temperature conditions. 100° F over set point the *afterburner* will be in maximum low fire and the *ignition/cremation burner* will shut off. The *butterfly valve* located on the *secondary air inlet* is controlled by a separate temperature out put to add air to cool the system. At *set point* the unit will return to normal operation. An optimonitor smoke detector is placed on the stack and set at 10% opacity if emissions occur the alarm will sound; a visual *red warning lamp* located on the *control panel* will illuminate and the *primary burners* will shut off. The *excess air butterfly valve* will open to add air to the *secondary chamber* to oxidize the emissions. After a five (5) minute period the unit will revert to normal operation.

World's Largest Independent Cremation Equipment Manufacturer

B & L SYSTEMS N20 SERIES

AFTERBURNER

SECONDARY AIR

30"

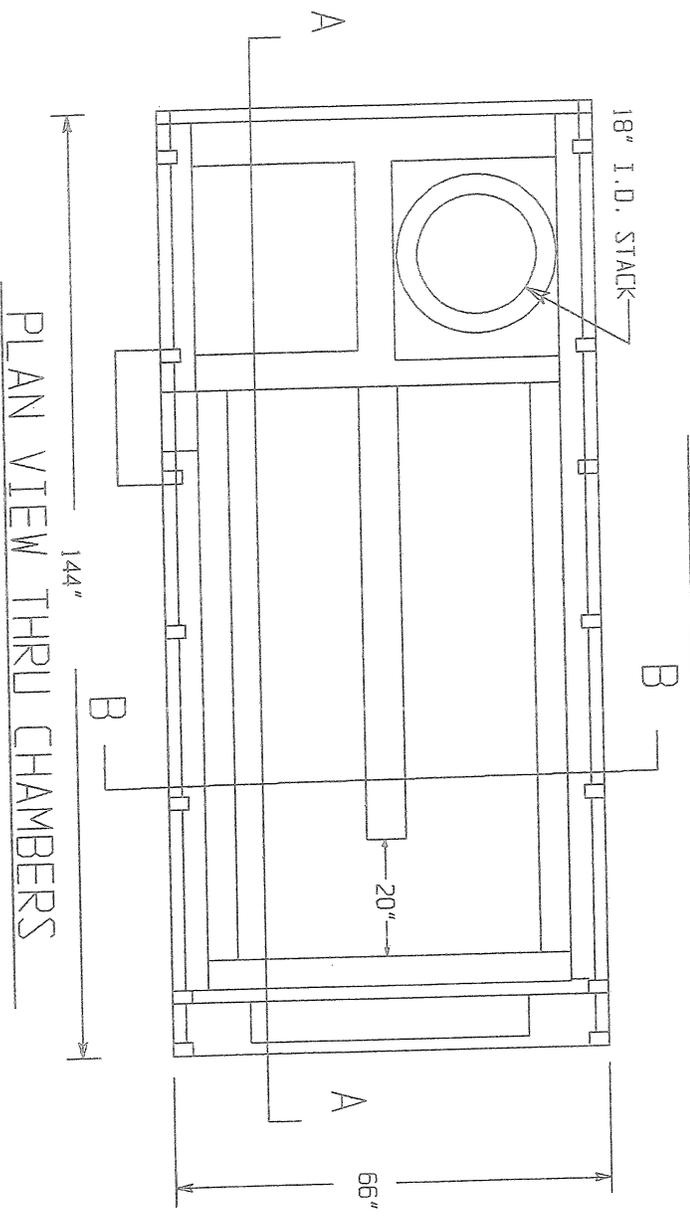
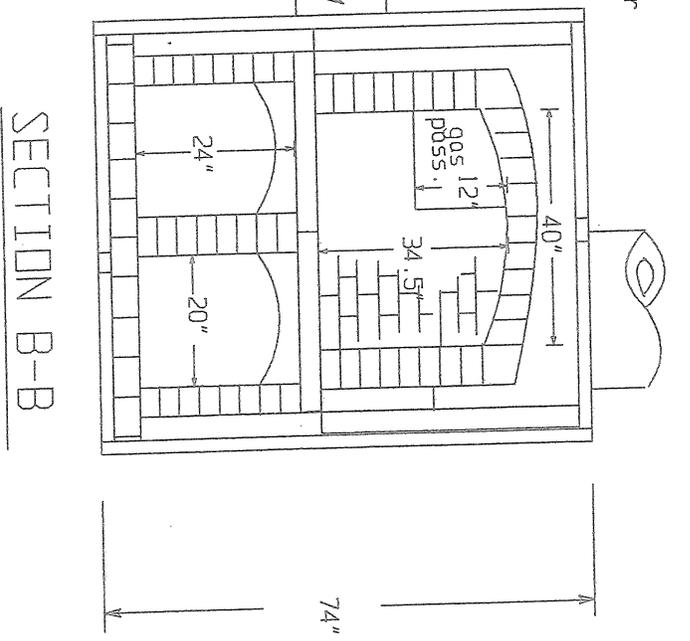
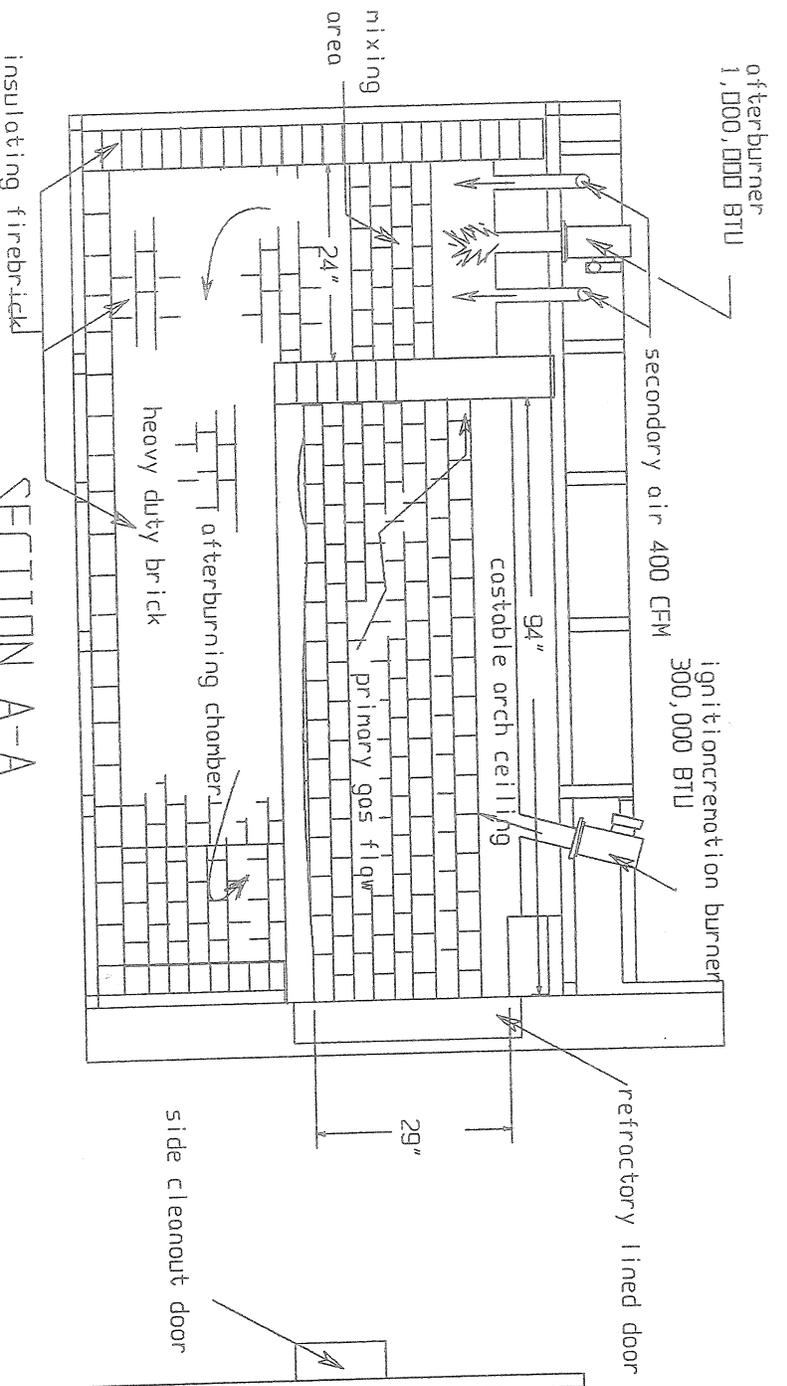
24"

40"

THERMOCOUPLE LOCATION
20.0 FT

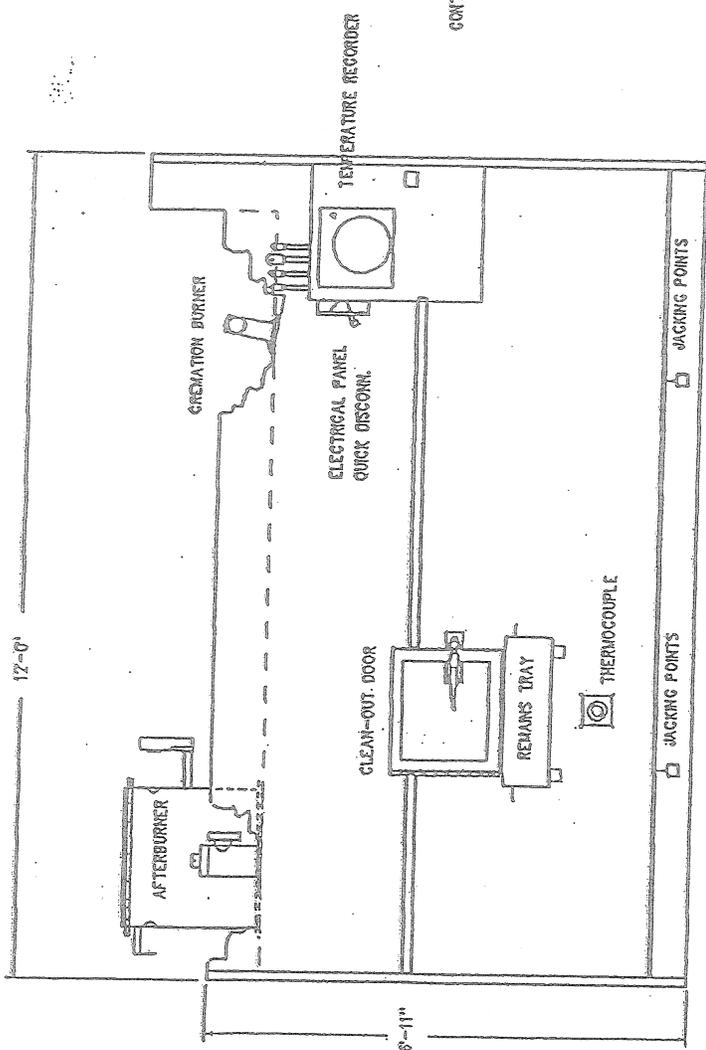
120"

SHADED AREA REPRESENTS AFTERBURNER CHAMBER VOLUME OF
83.00 FT³ @ 1800°F

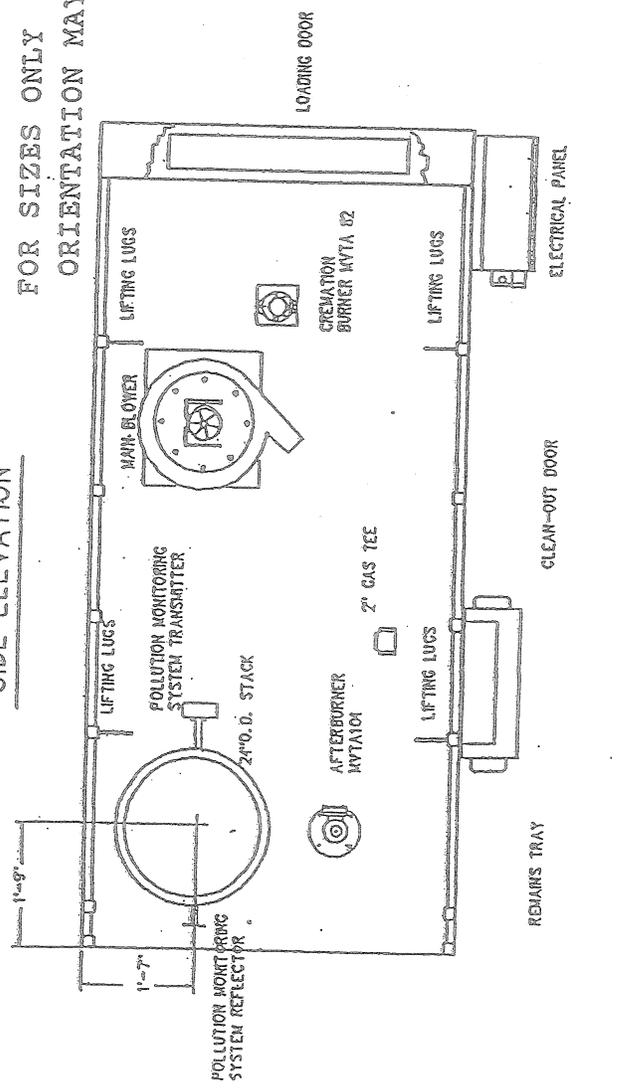


ALL COMPONENTS U.L. ANDR A.G.A. APPROVED
 C.S.A.-C.G.A

N20AA REFRACTORY

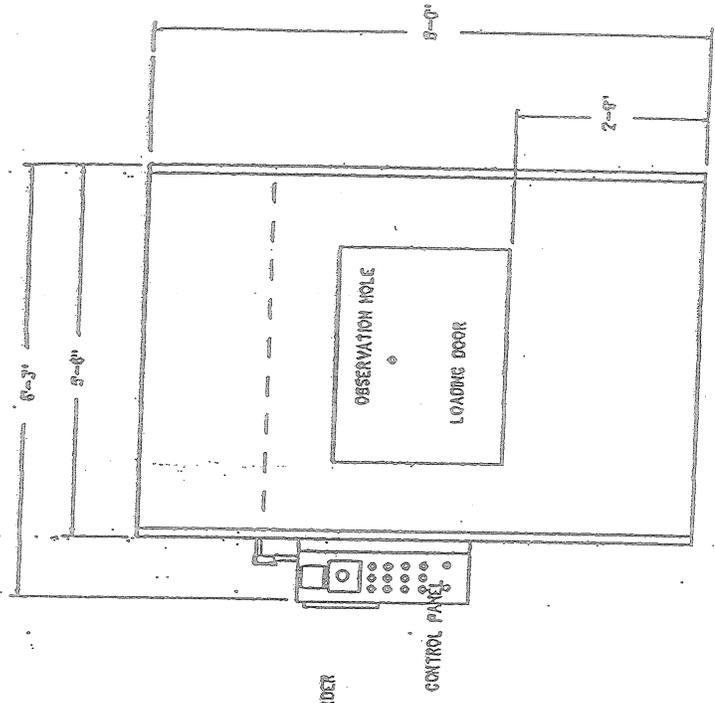


SIDE ELEVATION



FOR SIZES ONLY
ORIENTATION MAY CHANGE

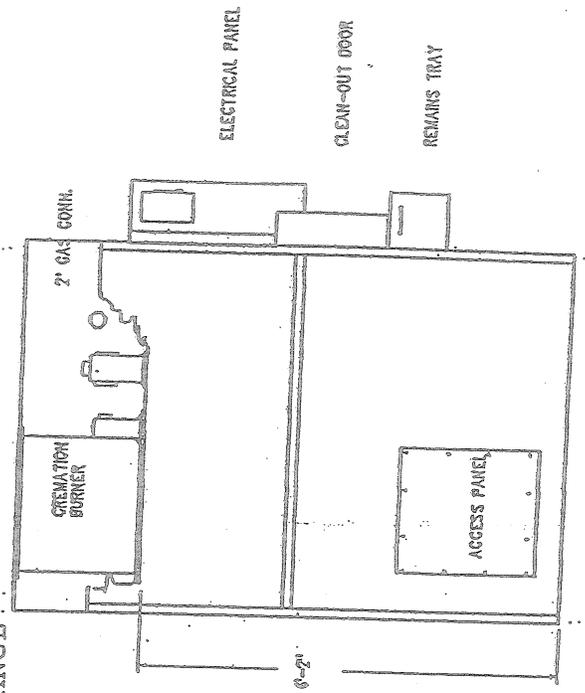
FRONT ELEVATION



PLAN VIEW

N20AA

REAR ELEVATION

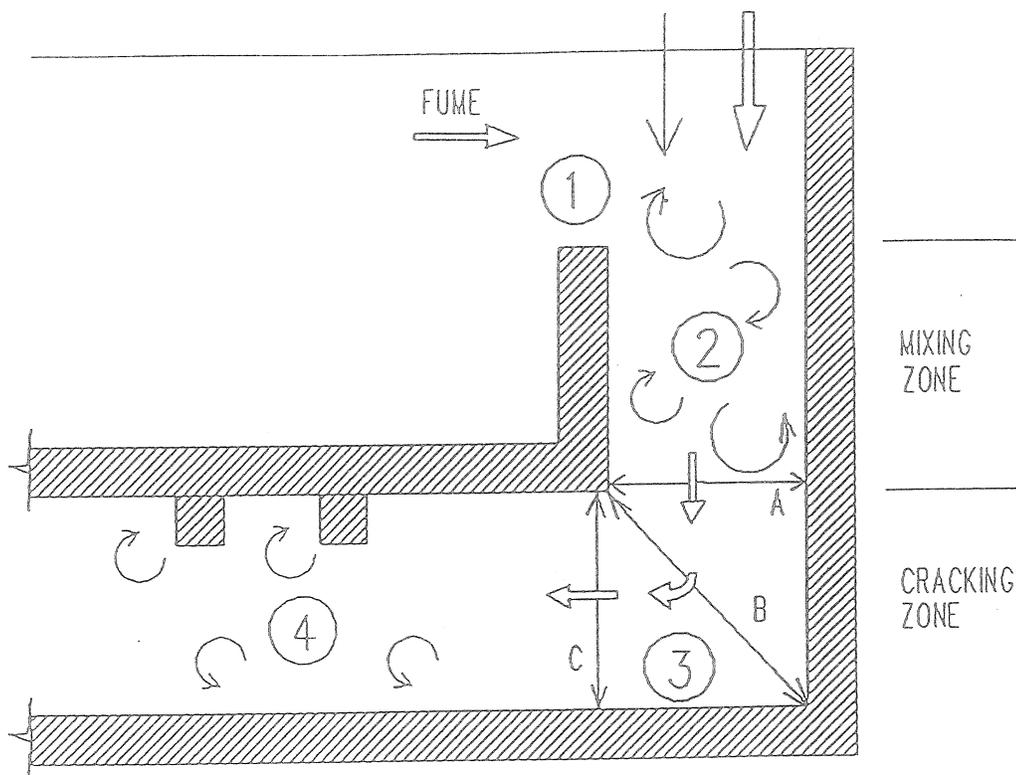




Cremation
Systems, Inc.

7205 - 114th Avenue North • Largo, Florida 33773
1-800-622-5411 • 727-541-4666 • Facsimile 727-547-0669

SECONDARY
AIR BURNER

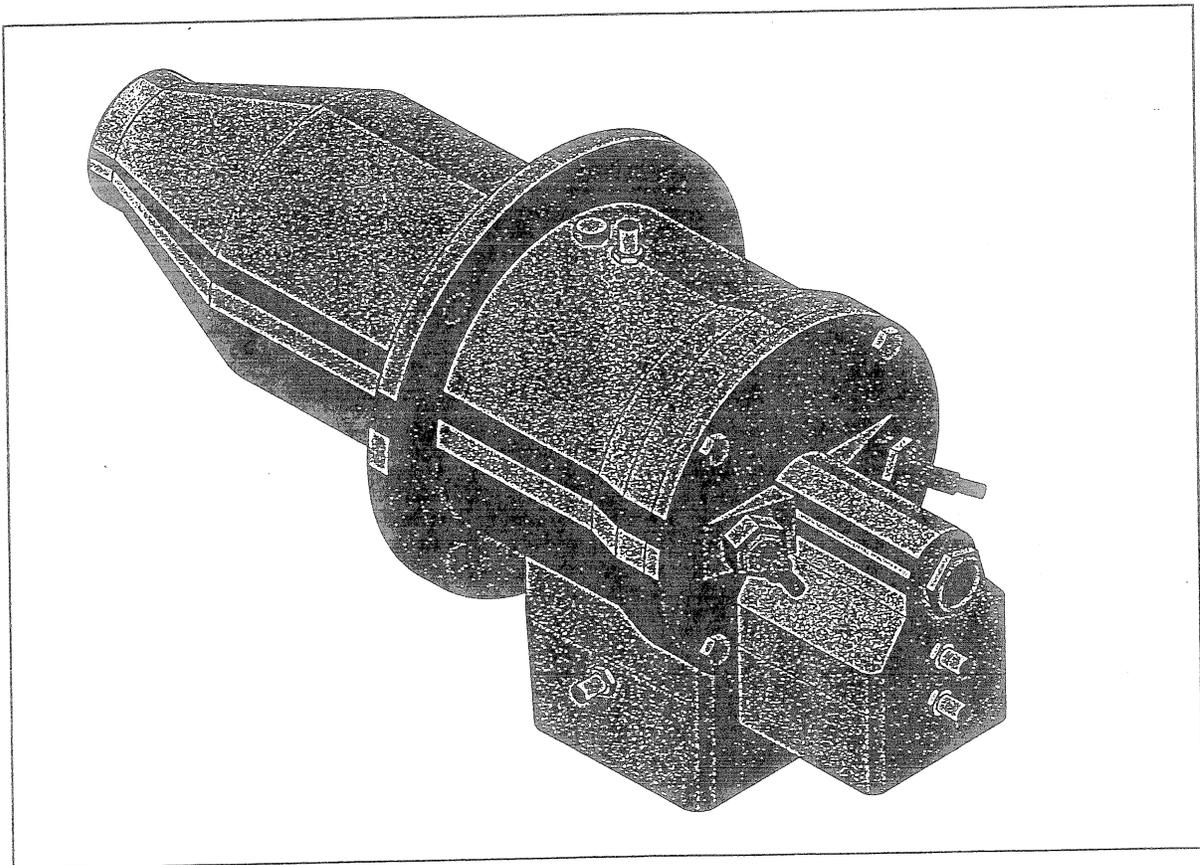


1. At the back of primary chamber, waste fume, air and burner flame all meet with different viscosities, volumes, velocities and flow directions which causes turbulence in the mixing zone of the secondary chamber.
2. Turbulence continues in the mixing zone as flows are traversing the flame tip.
3. Changing velocity at flame front zone and cornering cause additional turbulence at the base of the unit. $V_A > V_B < V_C$.
4. Uneven cross sectional area due to arches in the ceiling to support the primary chamber floor and additional changes in directional flow causes further turbulence downstream in the secondary chamber.

World's Largest Independent Cremation Equipment Manufacturer

Eclipse Velocity Burners

ThermJet Series (version 1.0)



Specifications

3

INTRODUCTION

This section gives a detailed overview of the burner specifications. It also lists several options that are available for the ThermJet.

Figure 3.1 The ThermJet burner

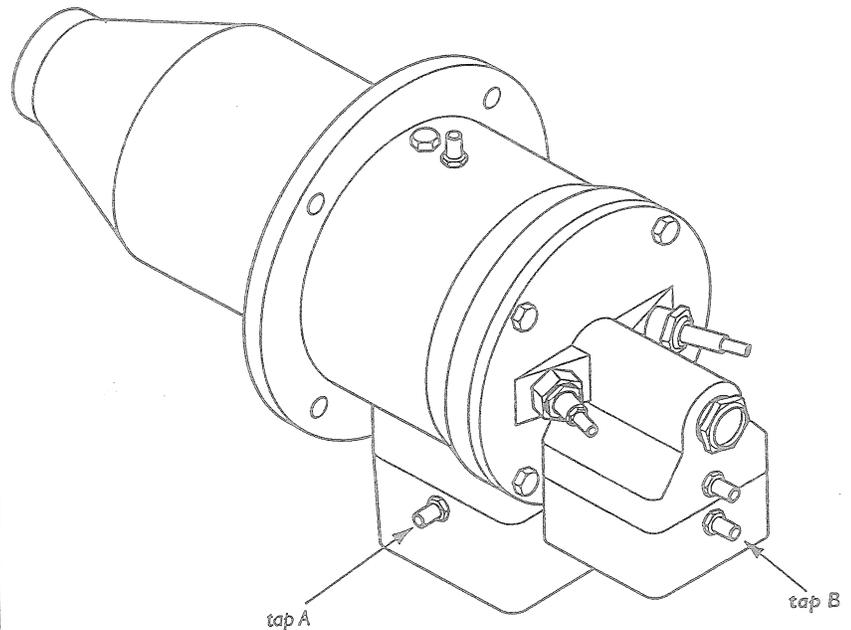


Table 3.1 Options

PARAMETER	OPTIONS	
Fuel	<ul style="list-style-type: none"> • natural gas • propane • butane. 	For any other mixed gas, contact Eclipse for orifice sizing.
Flame detection	<ul style="list-style-type: none"> • U.V. scanner • flame rod, for use with alloy or silicon carbide firing tubes only. 	
Ignition	<ul style="list-style-type: none"> • direct spark ignition (6 kV AC). 	
Combustor	<ul style="list-style-type: none"> • alloy firing tube • silicon carbide firing tube • refractory block. 	

SPECIFICATIONS

Main specifications

Table 3.2 ThermJet performance data

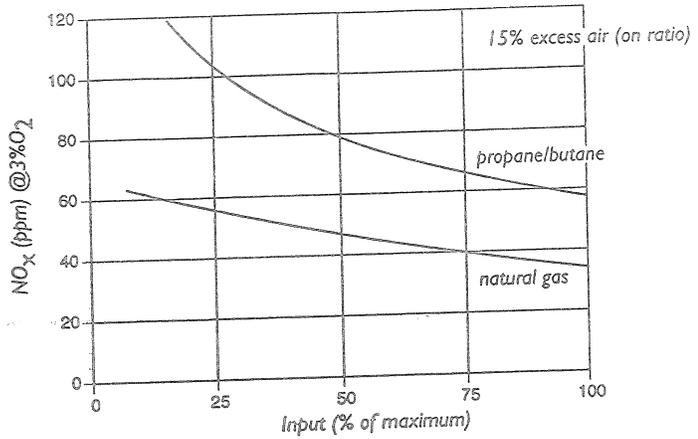
PARAMETER	BURNER TYPE (VELOCITY)	BURNER SIZE				
		50	75	100	150	
High fire input (Btu/hr)	Medium & High velocity	500,000	750,000	1,000,000	1,500,000	
Low firing rate, on-ratio (Btu/hr)	Medium & High velocity	50,000	75,000	100,000	150,000	
Low firing rate, fixed air (Btu/hr)	Medium & High velocity	10,000	15,000	20,000	30,000	
Static air pressure ("w.c.) • 15% excess air, at maximum input with standard orifice plate installed. measured at tap A (See Figure 3.1)	High velocity	12.0	16.0	14.5	18.5	
	Medium velocity	7.5	8.0	7.5	9.5	
Static gas pressure ("w.c.) • at maximum input with standard orifice plate installed. measured at tap B (See Figure 3.1)	High velocity	11.0	15.5	16.0	16.5	
	Medium velocity	6.0	6.5	7.5	8.0	
Flame length (In) (from end of firing tube)	High velocity	Nat. gas	25	30.4	33	38
		Propane	33	34	34	42
		Butane	30	30	35	43
	Medium velocity	Nat. gas	28	28	38	43
		Propane	36	38	37	42
		Butane	39	30	42	40
Maximum flame velocity (ft/s) • 15% excess air, at maximum input	High velocity	500	500	500	500	
	Medium velocity	250	250	250	250	

- all information is given for general sizing purposes only
- refer to data sheet for burner specific information
- all inputs based on gross calorific values

Performance graphs

The graphs that follow give you an approximate picture of the performance. Should you want more exact information, contact Eclipse Combustion.

Figure 3.2 NO_x emissions

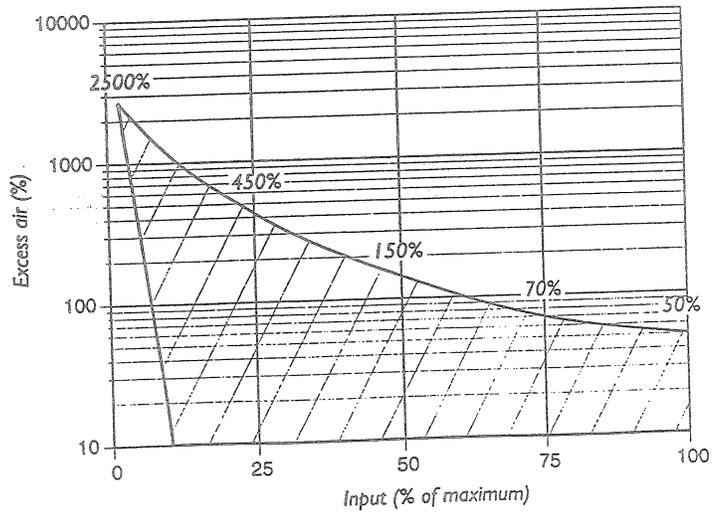


The emissions from the burner are influenced by:

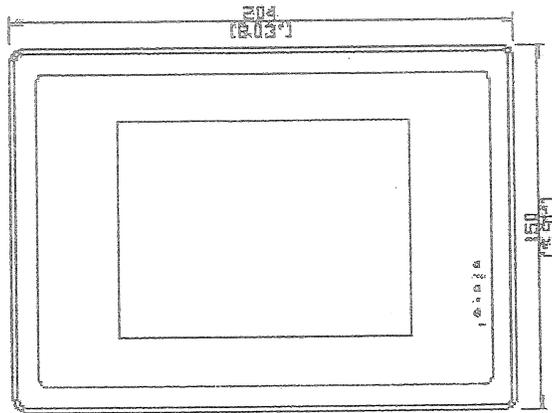
- the fuel type
- the combustion air temperature
- the firing rate
- the chamber conditions
- the percent of excess air.

For estimates of other emissions, contact Eclipse Combustion.

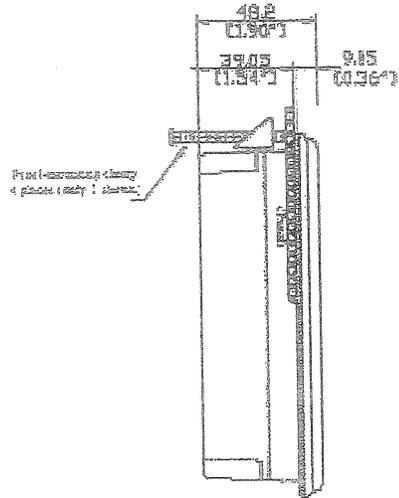
Figure 3.3 Operational zone



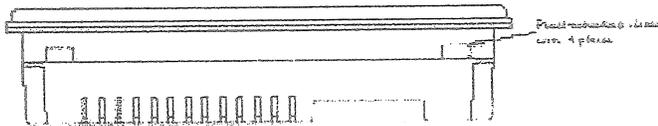
Orion Drawings:



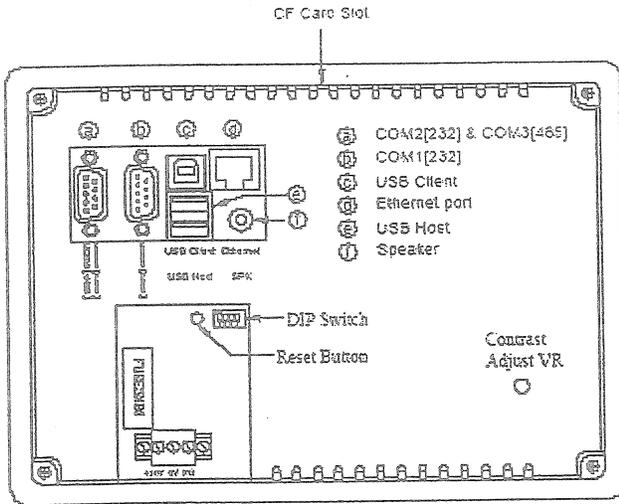
Front View



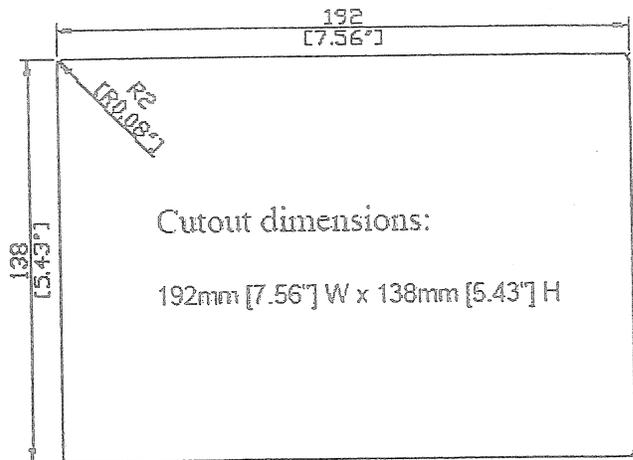
Side View



Bottom View



Rear View



FUTUREDESIGN
C O N T R O L S

P.O Box 1196 * 7524 BridgeView, ILL 60455 * Phone: 888.751.5444 - Fax 888.245.2883

Power

24VDC - 500mA maximum current draw.

Display:

Display Type: STN Color LCD

Display Size: 5.7"

Max Colors: 4096

Resolution: 320 X 240

Pixel pitch (HxV,mm): 0.36 X 0.36

Luminance(cd/m²): 100

Storage Temp (C): -20 to 60

Operating Temp (C): 0 to 45

Backlight: 1 CCFL

Contrast Ratio: 30:1

Backlight life: Approx 40,000 hours

TouchScreen:

Type: 4 wire, analog resistive

Resolution: Continuous

Light transmission: above 80%

Life: 1 million activation minimal

Processor:

Type: Intel Xscale PXA255 200Mhz

Memory and OS:

Memory: 64MB of internal RAM

Operating System: Windows CE.net

Loop Interface:

Type: 300 series control/RS485 multi-drop interface

Max Loops: 20

Data Storage:

Type: 128 Mb compact flash

Connections:

Serial: Com1, 2 & 3 - RS232/RS485

Ethernet: 10 baseT

USB: 1 client - 2 host

Sound: 16 bit sound output

Physical:

Front Panel: Meets Nema4/IP65

Shock: 10 to 25Hz (X,Y,Z direction 2G, 30 mins)

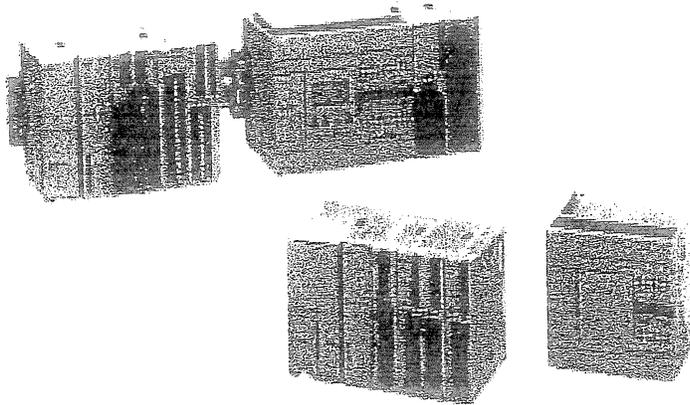
Dimensions: 204 (H) x 150 (W) x 48 (D) - mm

Weight: 28.21.0 oz. (0.8 kg)

Orion interface ports (RS485, USB and Ethernet)

MicroSmart

The Next Generation of PLC



Key features of the MicroSmart series include:

- 10, 16, or 24 I/O All-in-one type CPU modules with Sink/Source DC input and Relay Output
- 20 I/O Slim type CPU modules with Sink/Source DC input and Transistor Sink or Source Output
- 20 I/O Slim type CPU modules with Sink/Source DC input and Relay Output with high-speed Transistor Sink or Source Output
- 40 I/O Slim type CPU modules with Sink/Source DC input and Transistor Sink or Source Output
- DC Input, Relay Output, Transistor Output, Combination I/O and Analog I/O expansion modules available
- 24 I/O All-in-one CPU expandable to 88 I/O points; 20 I/O slim types expandable up to 148 or 244 I/O; 40 I/O slim type expandable up to 264 I/O points
- Standard RS232 port, optional plug-in RS485/RS232 port
- Optional memory cartridge or real-time clock and calendar cartridge
- Data link to other MicroSmart modules, PLCs, PCs or HG series operator interfaces
- Approved for Class 1-Div. 2 hazardous locations (UL1604)
- Compact size
- Now available with AC input expansion module



UL Listed
File No. E211795



CE Certified

Pulse Output/Trapezoidal Control

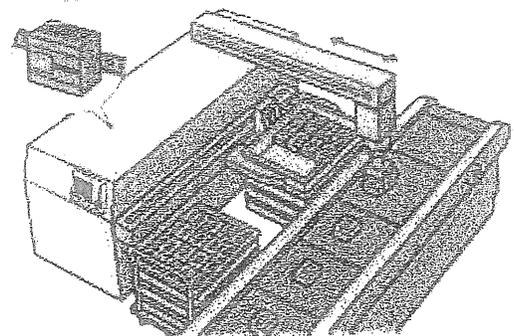
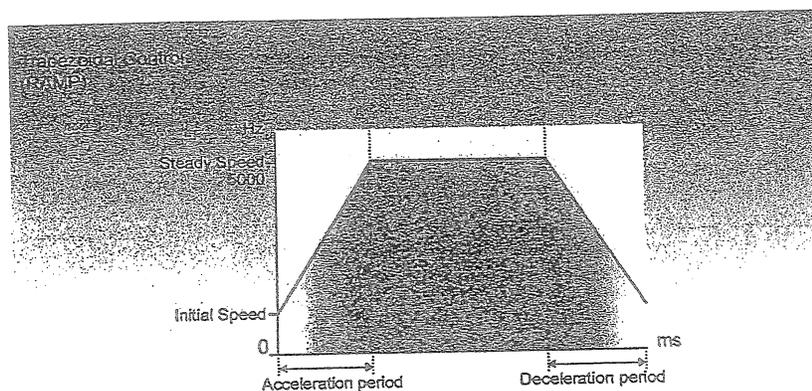
Independent dual-axis control is available with two pulse outputs. Locational values can be easily defined for precise positional (trapezoidal) control.

- Pulse output instruction
- PWM instruction (Pulse Width Modulation control)

Pulse Output Function Specifications

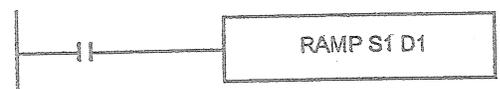
Number of output points	2
Maximum output frequency	20 kHz

*Only one point of trapezoidal control is available.



Setting the desired values enables you to precisely manage the trapezoidal control

Operation mode (S1)	1
Steady pulse frequency (S1 + 1)	50
Initial pulse frequency (S1 + 2)	10
Frequency change rate (S1 + 3)	2
Present value (S1 + 6, 7)	10,000



Programmable Logic Controllers

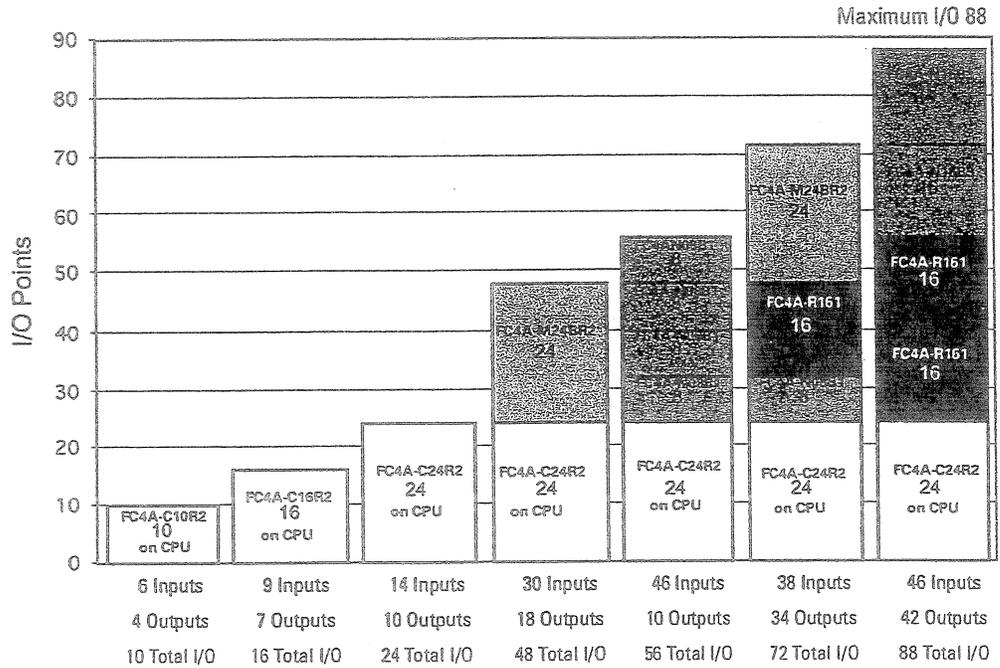
CPU and Module Combination Examples

All-In-One Type

- Attach Maximum 4 Expansion Modules
- Maximum I/O 88 points
- Only FC4A-C24R2/C24R2C CPU Module is expandable



The maximum number of relay outputs that can be turned on simultaneously is 33 points including relay outputs on the CPU module.



Slim Type

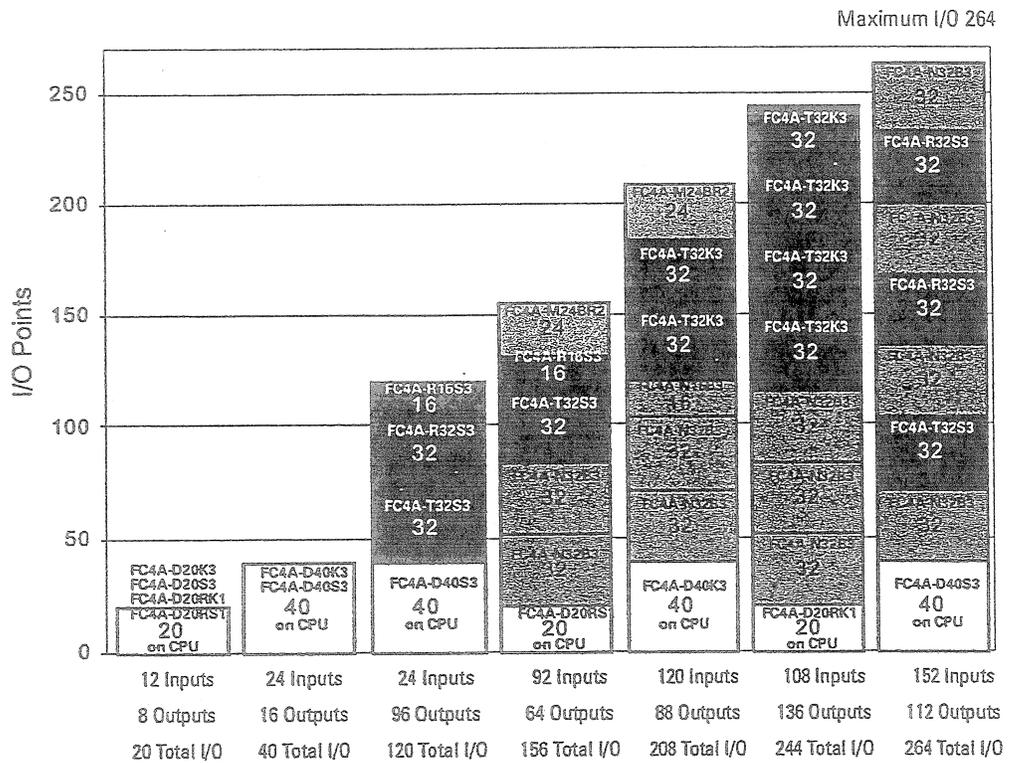


Programmable Logic Controllers

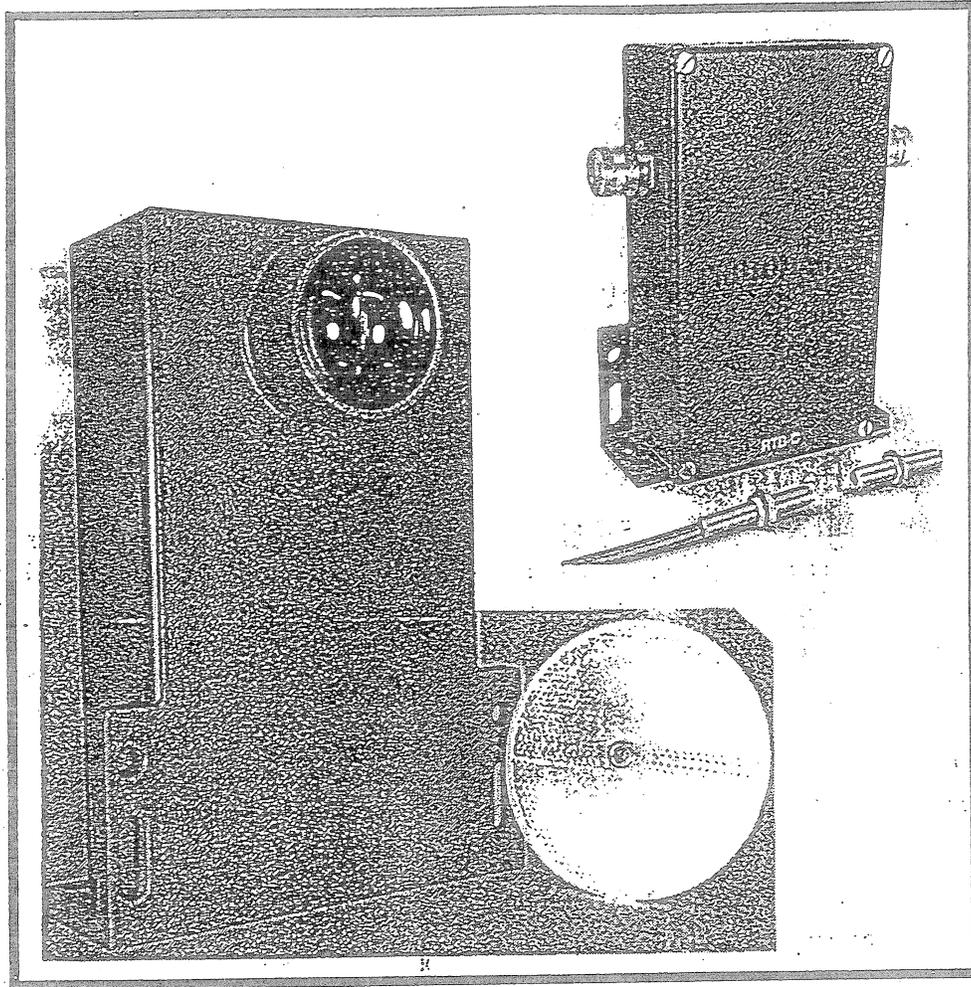
- Attach Maximum 7 Expansion Modules
- Maximum I/O
 - 148 points (D20K3, D20S3)
 - 244 points (D20RK1, D20RS1)
 - 264 points (D40K3, D40S3)



The maximum number of relay outputs that can be turned on simultaneously is 54 points including relay outputs on the CPU module.



VISIBLE EMISSIONS ALARM (VEA)

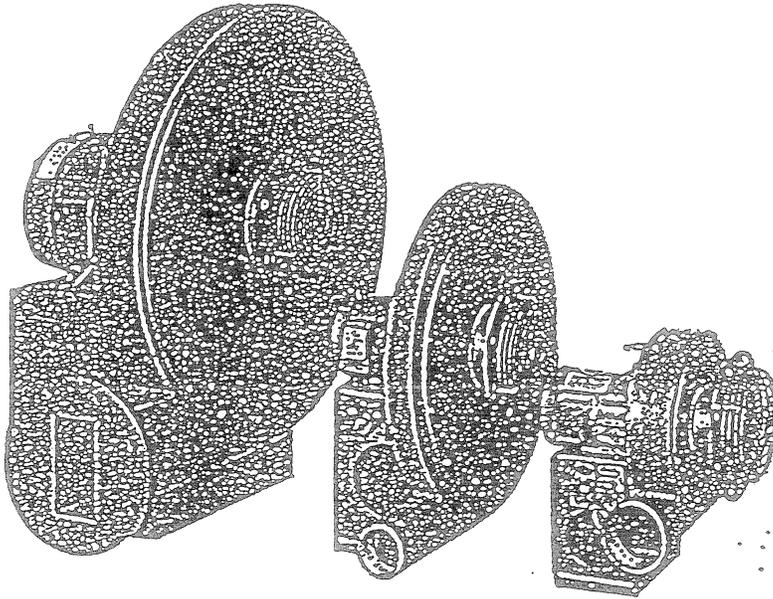


APPLICATION: Alarm and control for Opacity used on small and large sources for warning operators and shutting down systems based on opacity, haze or clarity.

- Proven Rugged Design
- Unaffected by Ambient Light
- Spans up to 6 Feet
- Visible LED Light Source
- Dual Beam or Single Beam
- Adjustable Delay up to 3 min.
- Easy to Install & Support
- External Adjustment

ECLIPSE TURBO BLOWERS

SERIES "SMJ"



- High efficiency
- Heavy gauge steel base and housing
- Aluminum impellers balanced statically and dynamically
- Matching air filters available
- Changeable outlet positions

Eclipse "SMJ" Blowers are centrifugal blowers that provide low pressure air for industrial combustion systems. They are also used for cooling, conveying, drying, liquid agitation, smoke abatement, vacuum cleaning, fume and dust exhausting, and other applications where air temperatures are under 220°F.

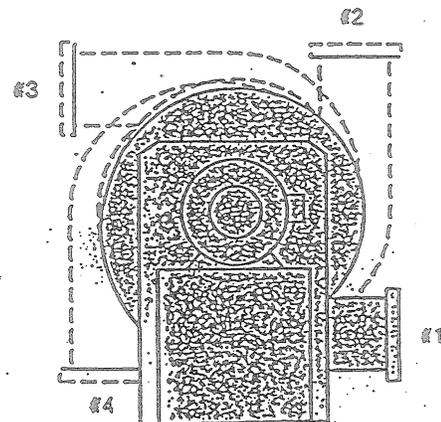
All "SMJ" Blowers are constructed of continuous welded, heavy gauge steel. The impellers are made of lightweight, high strength, riveted aluminum. Outlets on 3" and 4" models are threaded, while all others are flanged for a standard 125# ANSI companion flange. Discharge ports are sized to keep pressure losses within reasonable limits.

Blower inlet flanges are equipped with a grill that complies with OSHA regulations. If desired, the grill may be removed and the inlet bolted to a standard ANSI companion flange. Eclipse-supplied motors are standard shaft and starting torque, ball bearing, 3600 rpm units. On any blower requiring 3/4 HP or more, Eclipse recommends that polyphase motors be used.

There are four possible outlet positions. Any existing position is easily changed by removing the housing from the

blower base and remounting it in the desired position. Positions 1 through 3 can be specified for any blower. Position 4, however, requires factory approval before ordering. Position 1 is the standard assembly (bottom, horizontal) unless otherwise specified.

"SMJ" Blowers can be supplied with counterclockwise (CCW) or clockwise (CW) rotation as viewed from the motor side. CCW rotation is furnished standard unless otherwise specified.



Outlet Positions

Table 5.5-5
ELEMENTAL CONTENT OF BODY FAT AND
BODY WATER

Component	Mass (g)	Carbon Quantity* (g)	Hydrogen Quantity* (g)	Oxygen Quantity* (g)
Body fat	13,500	1.0E + 4	1.6E + 3	1.5E + 3
Essential	1,500	1.2E + 3	1.8E + 2	1.7E + 2
Nonessential	12,000	9.2E + 3	1.4E + 3	1.3E + 3
Body water	42,000		4.6E + 3	3.7E + 4
Extracellular	18,000		20.E + 3	1.6E + 4
Intracellular	24,000		2.6E + 3	2.1E + 4

* For sources, see Reference 1.

From Snyder, W. S., Cook, M. J., Karhausen, L. R., Nasset, E. S., Howells, G. P., and Tipton, I. H., *Report of the Task Force on Reference Man*, ICRP Report No. 23, International Commission on Radiological Protection, Pergamon Press, Oxford, 1975, 1. With permission.

Table 5.5-6
REFERENCE MAN: TOTAL BODY CONTENT FOR SOME ELEMENTS

Element	Amount (g)	Percent of total body weight	Element	Amount (g)	Percent of total body weight
Oxygen	43,000	61	Lead	0.12	0.00017
Carbon	16,000	23	Copper	0.072	0.00010
Hydrogen	7,000	10	Aluminum	0.061	0.00009
Nitrogen	1,800	2.6	Cadmium	0.050	0.00007
Calcium	1,000	1.4	Boron	<0.048	0.00007
Phosphorus	780	1.1	Barium	0.022	0.00003
Sulfur	140	0.20	Tin	<0.017	0.00002
Potassium	140	0.20	Manganese	0.012	0.00002
Sodium	100	0.14	Iodine	0.013	0.00002
Chlorine	.95	0.12	Nickel	0.010	0.00001
Magnesium	19	0.027	Gold	<0.010	0.00001
Silicon	18	0.026	Molybdenum	<0.0093	0.00001
Iron	4.2	0.006	Chromium	<0.0018	0.000003
Fluorine	2.6	0.0037	Cesium	0.0015	0.000002
Zinc	2.3	0.0033	Cobalt	0.0015	0.000002
Rubidium	0.32	0.00046	Uranium	0.00009	0.0000001
Strontium	0.32	0.00046	Beryllium	0.000036	
Bromine	0.20	0.00029	Radium	3.1 x 10 ⁻¹¹	

From Snyder, W. S., Cook, M. J., Karhausen, L. R., Nasset, E. S., Howells, G. P., and Tipton, I. H., *Report of the Task Group on Reference Man*, ICRP Report No. 23, International Commission on Radiological Protection, Pergamon Press, Oxford, 1975, 1. With permission.

SPECIAL EMISSIONS TESTING
of the
DIRECTORS SERVICE, INC.
B & L SYSTEMS, INC. N20 SERIES
HUMAN CREMATORY
St. Petersburg, Florida

March 5, 2003

FDEP Permit No. 1030035-003-AG
EU No. 003
SES Reference No. 03S31

Conducted by:

SOUTHERN ENVIRONMENTAL SCIENCES, INC.
1204 North Wheeler Street
Plant City, Florida 33566
Phone (813) 752-5014, Fax (813) 752-2475

Project Participants

Byron E. Nelson
Kenneth M. Roberts
James C. Andrews
Travis B. Nelson

SOUTHERN ENVIRONMENTAL SCIENCES, INC.

SPECIAL EMISSIONS TESTING
of the
DIRECTORS SERVICE, INC.
B & L SYSTEMS, INC. N2O SERIES
HUMAN CREMATORY
St. Petersburg, Florida

March 5, 2003

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1
2.0 SUMMARY OF RESULTS	1
3.0 PROCESS DESCRIPTION	1
4.0 SAMPLING PROCEDURES	4
4.1 Methods	4
4.2 Sampling Locations	5
4.3 Sampling Trains	5
4.4 Sample Collection	12
4.5 Sample Recovery	12
5.0 ANALYTICAL PROCEDURE	14
5.1 Pretest Preparation	14
5.2 Analysis	14
APPENDIX	15
Project Participants	
Certification	
Visible Emissions Evaluation	
Process Operational Data	
Laboratory Data	
Field Data Sheets	
Analyzer Strip Charts	
Calibration Data	
Calculations and Symbols	

1.0 INTRODUCTION

Southern Environmental Sciences, Inc. conducted emissions testing of the Directors Service, Inc. B & L Systems, Inc. N20 Series human crematory on March 5, 2003. This facility is located at 3121 44th Ave. North, St. Petersburg, Florida. Testing was conducted for particulates, carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen oxides (NO_x), total hydrocarbons (VOC) and visible emissions. Oxygen (O₂) concentrations were measured to correct emission rates to 7% O₂. Mr. Jose Rodriguez of the Pinellas County Department of Environmental Management was present as an observer during a portion of the testing.

2.0 SUMMARY OF RESULTS

Results of the particulate, carbon monoxide, sulfur dioxide, nitrogen oxides and total hydrocarbons are summarized in Table 1. A visible emissions evaluation was performed over a one hour period. The average maximum six minute opacity was zero percent.

3.0 PROCESS DESCRIPTION

The B & L Systems N20 Series crematory incinerator cremates human remains in an environmentally acceptable manner. The unit consists of a primary and secondary (afterburner) chamber each fired with natural gas. The unit is designed to incinerate human remains at a rate of 150 pounds per hour with a maximum heat input rate of 1.3 MMBTU per hour (primary chamber 0.3 MMBTU per hour, secondary chamber