



Alan Frazier <afrazier@chattanooga.gov>

Chattanooga TRANSFLO Permit Installation Application - Boiler

1 message

Lisa Wiedemann <lwiedemann@wiedemannllc.com>
To: "afrazier@chattanooga.gov" <afrazier@chattanooga.gov>
Cc: "Prewitt, Ryan" <rprewitt@transflo.net>, Mitchell Hait <haitincfiles@gmail.com>

Fri, Feb 17, 2023 at 12:43 PM

Hi Alan,

Per our previous conversations, please find attached the permit installation application for the new boiler at the Chattanooga TRANSFLO Terminal. Please let us know if you would need a hard copy of the application.

Regards,

Lisa Wiedemann, EIT

Wiedemann & Associates, LLC

(904) 228-8788

lwiedemann@wiedemannllc.com

 **Chattanooga - Boiler Permit Application Package_2023-02-17.pdf**
8977K

February 17, 2023

Mr. Alan Frazier
Permit Manager
Chattanooga-Hamilton County
Air Pollution Control Bureau
6125 Preservation Drive, Suite 140
Chattanooga, TN 37416-3638
Via e-mail: afrazier@chattanooga.gov

**Subject: TRANSFLO Terminal Services, Inc., Chattanooga, Tennessee Facility
Permit Installation Application – New Boiler
Permit Number 5770-10200501-02C (Boiler)**

Dear Mr. Frazier:

This letter, permit application forms (Attachment 1), and supporting information are submitted to install a new steam boiler for the TRANSFLO Terminal Services, Inc. (TRANSFLO) Chattanooga, Tennessee facility. The new boiler will be a replacement of the currently permitted boiler, which is authorized per air permit number 5770-10200501-02C. This new boiler is scheduled to be installed towards the middle to late 2023, per our recent discussion.¹

This letter is organized as follows:

1. Project Summary
2. Application Forms and Emissions Estimates
3. Regulatory Applicability

Project Summary

The current boiler at the Chattanooga facility is a 150-boiler horsepower (bhp) boiler, with a rated capacity of 6.277 million British thermal units per hour (MMBtu/hr). This boiler is included in Permit 5770-10200501-02C. TRANSFLO plans to install a new 200 bhp boiler, with a rated capacity of 8.4 MMBtu/hr. This boiler is a Hurst Steam Boiler Model Number SE-GP2-200-150 firetube boiler, equipped with a Power Flame Incorporated burner model number G5-GO-30. Supporting manufacturers' information for the boiler and burner are included in Attachment 2.

¹ Telephone conversation, February 2, 2023, between Mr. Alan Frazier, Chattanooga-Hamilton County, and Ms. Lisa Wiedemann, consultant to TRANSFLO.

The new boiler will be a dual fired boiler with the capability to burn either natural gas or diesel fuel. Once the new boiler has been installed, it is planned to burn diesel fuel initially. TRANSFLO will make infrastructure upgrades at the facility to include the installation of a natural gas line. The natural gas line will fuel the boiler as a primary fuel type. Diesel fuel will continue to serve as a back-up fuel source in the case of natural gas supply interruption or curtailment.

Application Forms and Emissions Estimates

The following permit application forms are included in Attachment 1:

1. E001 – Basic Application Form
2. E011 – Fuel Burning Equipment Form
3. E110 – Pollution Estimation Form
 - a. Natural gas
 - b. Diesel

Emission estimates are provided in Attachment 3 and summarized following in Table 1. These emission estimates are prepared based on emission factors provided by the burner manufacturer, Power Flame, which are enclosed in Attachment 2, and the United States (U.S.) Environmental Protection Agency (EPA), AP-42, *Compilation of Air Emissions Factors*.

Please note on Form E110, Box 10, for Natural Gas and Diesel, the NO_x ppm value listed is provided from the manufacturer, hence the detailed calculations on the forms are listed as “n/a”.

The annual emissions estimates for the new boiler are summarized in Table 1. The potential emissions estimates use the maximum fuel usage rate for each fuel type at continuous operation. This table does not include the facility wide emissions from material handling operations which were recently submitted as part of the pending permit renewal application.

Table 1: New Boiler - Annual Potential Emissions Estimates (tons/year)

Fuel	NO _x	SO ₂	CO	PM (total)	PM ₁₀	VOC	CO ₂	CH ₄	N ₂ O
Diesel	5.85	1.93	1.36	0.53	0.53	1.40	5,860	0.01	0.07
Natural Gas	3.24	0.02	1.36	0.18	0.18	0.92	4,328	0.08	0.08

Federal Regulatory Applicability

The Area Source Boiler NESHAP² applies to this boiler as long as this boiler is diesel-fired. After the natural gas supply line is completed, and the boiler switches to natural gas firing, this NESHAP will no longer apply. Hence, we request that the issued permit contain the applicable boiler NESHAP requirements for when the boiler is diesel-fired. Similarly, the permit should identify that these requirements no longer apply when the boiler is natural gas-fired. Note that natural gas firing allows for the use of diesel fuel as a backup fuel during times of natural gas curtailment. Periodic operation and maintenance of the unit on diesel fuel are

² Area Source Boiler National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR Part 63, Subpart JJJJJ.

allowed for up to 48 hours per year while complying with the provisions for being considered natural gas-fired. Notification of the fuel switch would be required within 30 days of completion of the change as specified in 40 CFR 63.11225(g).

Since the boiler is relatively small for an industrial boiler (i.e., less than 10 MMBtu/hr), the main Boiler NESHAP requirements are biennial (i.e., every two-year) tune-up requirements. That is, there are no emission limits associated with the boiler based on the size of the boiler. The startup operations associated with the initial boiler installation are considered to meet the tune-up requirements, hence the first tune-up is required within 25 months of the installation. The 25-month value is two years, plus a one-month grace period as provided by the rule allowing for operational considerations.

The boiler NESHAP also requires TRANSFLO to prepare a compliance certification report for each biennial boiler tune-up. This report is to be completed by March 1 of the year after the tune-up is performed. This report is to be retained internally by TRANSFLO, and is not required to be submitted to the agency.

This permit application serves to meet the requirements of the initial notification of rule applicability as provided by 40 CFR 63.11225(2). Per 40 CFR 63.11225(4), a notification of compliance status is not required for this boiler as it is only subject to biennial tune-up requirements.

Since this boiler has a maximum heat input rate of less than 10 MMBtu/hr, the New Source Performance Standards (NSPS) for Small Industrial-Commercial-Institutional Steam Generating Units³ does not apply.

State Regulatory Applicability

The following Tennessee air quality rules (Chapter 1200-03) apply to this boiler. Their applicability is discussed following.

Visible Emissions Regulations (Chapter 1200-03-005) limit the visible emissions from the boiler to less than 20 percent opacity. Since this boiler is fueled by clean burning fuels (natural gas and diesel) the visible emissions are expected to meet this standard with a substantial margin of compliance.

Non-Process Emission Standards (Chapter 1200-03-06) provides particulate matter emission standards for this boiler. The total particulate emissions are limited to 0.600 pounds per MMBtu (Chapter 1200-03-06-.02(2)(a)). Per the burner manufacturer data sheet, typical particulate emissions are 0.048 pounds per MMBtu for natural gas firing, and 0.0143 pounds per MMBtu for diesel firing. These typical values provide a wide range of compliance with the rule limit of 0.600 pounds per MMBtu.

Control of Sulfur Dioxide Emissions (Chapter 1200-03-14) provides sulfur dioxide (SO₂) emissions standards for this boiler. Chattanooga is located in Hamilton County, hence has a county classification as Class V. The allowable (Chapter 1200-03-14-.02(1)(a), Table 1) SO₂ emission limit is 4.0 pounds per MMBtu. The corresponding emission factors are per the Power Flame burner emissions data sheet. The diesel fuel emission factor is 0.0525 lb/MMBtu, assuming a maximum fuel sulfur content of 0.05 percent (i.e., 500 parts per million). The natural gas AP-42 emission factor is 0.0005 lb/MMBtu. Each of these emission factors is considerably less than the emission limits specified in this rule.

³ 40 CFR 60, Subpart Dc.

The *Nitrogen Oxides* regulations (Chapter 1200-03-27) only apply to large (e.g., major) sources of oxides of nitrogen (NO_x) emissions. Although the planned boiler emits NO_x, this rule does not apply as the TRANSFLO facility is not a large source of NO_x emissions.

Local Regulatory Applicability

The following Chattanooga Air Pollution Control Ordinance rules apply to this boiler. These rules are contained in Chapter 4, *Air Pollution, Article II, Rules, Regulations, Criteria, Standards, Section 4-41, Rules Adopted*. Rule 2, *Regulations of Nitrogen Oxides*, addressed NO_x emissions from this boiler. Rule 2.4 limits NO_x emissions to less than 300 parts per million (ppm). As provided on the burner emissions data sheet, the anticipated NO_x emissions are 75 ppm for natural gas firing, and 120 ppm for fuel oil firing (see the note on firetube firing configuration on the data sheet). These values are each considerably less than the 300-ppm limit, hence this boiler is expected to operate with a substantial margin of compliance with this rule.

Rule 3, *Visible Emission Regulations*, limits the visible emissions from the boiler to less than 20 percent opacity. Since this boiler is fueled by clean burning fuels (natural gas and diesel) the visible emissions are expected to meet this standard with a substantial margin of compliance.

Rule 8, *Fuel Burning Equipment Regulations*, limits the particulate matter emissions from this boiler. This emission limit is effectively the same 0.6 pounds per MMBtu/hr as provided by the Tennessee Rule *Non-Process Emission Standards* (Chapter 1200-03-06). However, the local rule states the limit in an hourly format, as the allowable rate (lb/hr) being the product of 0.6 lb/MMBtu and the heat input rating of the boiler (8.4 MMBtu/hr). This formula provides an hourly limit of 5.04 lb/hr. Per the burner manufacturer data sheet, typical particulate emissions are 0.048 pounds per MMBtu for natural gas firing, and 0.0143 pounds per MMBtu for diesel firing. These typical values provide a wide range of compliance with the effective rule limit of 0.6 pounds per MMBtu, as well as the actual limit expressed in units of pounds per hour.

Rule 13, *Regulation of Sulfur Oxides*, limits the sulfur content of fuels to less than four pounds per MMBtu (Rule 13.2). The fuel sulfur content of each diesel fuel and natural gas are considerably less than this fuel sulfur content limit. Hence, these fuels will provide a wide margin of compliance with this limit.

Rule 16.5, *Emission Standards for Source Categories of Area Sources*, adopts by reference various federal area source NESHAP regulations. The Area Source Boiler NESHAP, as discussed previously, is adopted by reference by this rule. Please refer to this prior discussion for the applicable rule requirements.

Closing

Should you have any questions as you review this installation permit application, please contact me, Ms. Lisa Wiedemann, by telephone at (904) 228-8788, or by e-mail at lwiedemann@wiedemannllc.com, or Dr. Mitchell Hait, by telephone at (904) 494-4200, or by e-mail at haitincfiles@gmail.com. You may also contact Mr. Ryan Prewitt, TRANSFLO Manager, Chemical Safety, by telephone at (606) 344-5531, or by e-mail at rprewitt@transflo.net.

Sincerely,

Lisa M. Wiedemann

Lisa Wiedemann
President

Attachments:

- 1 – Forms E001, E011 and E110
- 2 – Manufacturers' Supporting Information
Hurst Steam Boiler
Power Flame Burners – Typical Flue Product Emissions
- 3 – External Combustion Air Emissions Estimates

**BASIC APPLICATION FOR EQUIPMENT / AIR POLLUTION PERMIT
OR CERTIFICATE OF OPERATION**

FORM E001
03/2011

1. Name of Company TRANSFLO Terminal Services, Inc.
(If corporation or LLC, name on file with Tennessee Secretary of State Corporate Records Division)
2. NAICS Code: 488210
3. Company Official to Contact: Mr. Ryan Prewitt
4. Phone No. 606-344-5531
5. Mailing Address: 500 Water Street; J975 Jacksonville FL 32202
Street or P.O. Box City State Zip Code
6. Physical Location
(If different from line 5) 520 West 26th Street Chattanooga TN 37419
Street City State Zip Code
7. Application for:
 Installation Permit Initial Certificate of Operation Renewal Certificate of Operation
- Previous Installation Permit or Certificate of Operation No.: _____

8. Type of equipment for which application is made:
- | | | |
|---|---|--|
| <input type="checkbox"/> Process Equipment (Form E010 or Form E010A) | <input type="checkbox"/> Previously Submitted | <input type="checkbox"/> Attached |
| <input checked="" type="checkbox"/> Fuel Burning Equipment (Form E011) | <input type="checkbox"/> Previously Submitted | <input checked="" type="checkbox"/> Attached |
| <input type="checkbox"/> Incineration Equipment (Form E012) | <input type="checkbox"/> Previously Submitted | <input type="checkbox"/> Attached |
| <input type="checkbox"/> Minor Pollution Source (Form E014)
<i>(Less than 1000 lbs/yr and less than 10 lbs/day total uncontrolled contaminant emissions)</i> | <input type="checkbox"/> Previously Submitted | <input type="checkbox"/> Attached |

The following forms are filed with this application:
Forms E011 and E110

9. Equipment Name:
200 hp Steam Boiler
10. If application is for a Certificate of Operation (Initial or Renewal), are there any changes since previous application in the equipment or operation which might:
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- A. Increase, decrease, or alter process materials, fuel, refuse type, etc.? Yes No FEB 17 2023
- B. Increase, decrease, or alter emissions or emission points? Yes No AIR POLLUTION
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11. Process Weight, lb/hr, (Item 6 on Form E010), Incineration Rate, lb/hr, (Item 3C on Form E012), or Fuel Burning Rate, 1,000 Btu/hr, (Item 7C on Form E011): 8.4 MMBtu/hr

This is to certify that I am familiar with operations concerning this equipment and the information provided on this application is true and complete to the best of my knowledge:

Mail completed form to:
CHATTANOOGA-HAMILTON COUNTY
AIR POLLUTION CONTROL BUREAU
6125 Preservation Drive, Suite 140
Chattanooga, TN 37416-3638

Ryan Prewitt *Name*
Manager - Chemical Safety *Title*
2/17/2023 *Date*

This form must be completely filled out before it will be processed

FUEL BURNING EQUIPMENT APPLICATION

A separate form must be filed for each stack or emission point.

FORM E011

01/2001

1. Name of Company: **TRANSFLO Terminal Services, Inc.**
As shown on Line 1 of Form E001
2. Equipment Name: **200 hp Steam Boiler**
As shown on Line 9 of Form E001
3. Stack Designation: **N/A**
If there is more than one stack at this location, provide a written or numeric designation to identify each stack.
4. Control Equipment Data:

- | | |
|---|--|
| <input checked="" type="checkbox"/> Emissions Uncontrolled | <input type="checkbox"/> Electrostatic Precipitator (File Form E104) |
| <input type="checkbox"/> Baghouse (File Form E102) | <input type="checkbox"/> Inertial Separators (File Form E105) |
| <input type="checkbox"/> Wet Collecting Device (File Form E103) | <input type="checkbox"/> Other (Specify): |

5. Control Equipment Efficiency:
Enter the control equipment efficiency for each pollutant emitted by this equipment as determined on the appropriate Form E102, E103, E104, E105, E107, or enter zeros if "A" is checked in Item 4.

Pollutant	% Efficiency
Particulates	0
PM ₁₀	0
SO _x	0
NO _x	0
CO	0
VOC	0
Other:	

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6. Emissions Estimation:

Manufacturer's typical emission factors - Use AP-42 instead

File Form E110 for each fuel used

		Fuel No. 1	Fuel No. 2	Fuel No. 3		
		Diesel Fuel	Natural Gas			
Particulate Matter (Form E110, Item 6)	Uncontrolled	0.12 Lbs/hr	0.04 Lbs/hr		Lbs/hr	Lbs/hr
	Actual ¹	n/a Lbs/hr	n/a Lbs/hr		Lbs/hr	Lbs/hr
	Estimated ²	0.12 Lbs/hr	0.04 Lbs/hr		Lbs/hr	Lbs/hr
SO _x (Form E110, Item 7)	Uncontrolled	0.44 Lbs/hr	0.005 Lbs/hr	(AP-42)	Lbs/hr	Lbs/hr
	Actual ¹	n/a Lbs/hr	n/a Lbs/hr		Lbs/hr	Lbs/hr
	Estimated ²	0.44 Lbs/hr	0.005 Lbs/hr		Lbs/hr	Lbs/hr
PM ₁₀	Uncontrolled	0.12 Lbs/hr	0.04 Lbs/hr		Lbs/hr	Lbs/hr
	Actual ¹	n/a Lbs/hr	n/a Lbs/hr		Lbs/hr	Lbs/hr
	Estimated ²	0.12 Lbs/hr	0.04 Lbs/hr		Lbs/hr	Lbs/hr
NO _x (Form E110, Item 9E)	Uncontrolled	120 ppm	75 ppm		ppm	ppm
	Actual ¹	n/a ppm	n/a ppm		ppm	ppm
	Estimated ²	120 ppm	75 ppm		ppm	ppm
Other Air Contaminants (Specify)	Uncontrolled	n/a Lbs/hr	n/a Lbs/hr		Lbs/hr	Lbs/hr
	Actual ¹	n/a Lbs/hr	n/a Lbs/hr		Lbs/hr	Lbs/hr
	Estimated ²	n/a Lbs/hr	n/a Lbs/hr		Lbs/hr	Lbs/hr

1. Submit stack test report with full details.
2. Estimate the emissions using the formula below

$$\text{Estimated Emissions (lbs/hr, ppm)} = \frac{100\% - \text{Control Efficiency (\%)}}{100\%} \times \text{Uncontrolled Emissions}$$

Company Name: TRANSELO Terminal Services, Inc. Equipment Name: 200 hp Steam Boiler

Equipment Data:

Manufacturer of Equipment: Hurst Boiler Date of Installation: _____
 Date of Manufacture: _____

Boiler No.	Primary: Normal Operating Fuel(s) Standby: Fuel(s) used in emergency only	Fuel Type	Rated Capacity 10 ⁶ BTU/hr. Input	Type of Firing	Fuel Consumption			Percent Content		Heating Content of Fuel	(% Excess Air)
					Ave.	Max.	Annual (potential)	Sulfur	Ash		
002		Fuel #2	8.4	Firetube		60 gal/hr	525,600 gal (potential)	0.05%	n/a	140,000 Btu/gal	15%
		Nat'l Gas	8.4	Firetube		8,235 scf/hr	72.14 MMcf (potential)	n/a	n/a	1,020 Btu/scf	15%
n/a	Primary: Normal Operating Fuel(s) Standby: Fuel(s) used in emergency only										

- If more than one boiler per stack, list a separate code number to represent each individual boiler.
- List all fuels used.
- Give rated or maximum input capacity, whichever is greater.
- Specify the type of firing for each fuel used.
- Indicate annual consumption of each fuel used in tons/yr, gal/yr, or ft³/yr.
- Indicate annual consumption of each fuel used in tons/yr, gal/yr, or ft³/yr.
- The average sulfur and ash content of each fuel must be included - This information may be obtained from the fuel supplier.
- Indicate the heating content of each fuel in BTU/ton, BTU/gal, or BTU/ft³ - This information may be obtained from the fuel supplier.

Percent (% of Load Used	Space Heating	Process Heating	Other (Describe)
	0	100	n/a

8. Emissions Impact:

Those emissions indicated in Item 6 that at times under normal operating conditions cause (check one or more):

- Odors
- Eye Irritations
- Property Damage
- Health Effects
- Other nuisances outside of plant property
- No environmental damage

9. Emission Point Data:

Stack Height (emission point) above ground:	16.875 Ft
Ground Elevation above sea level at stack base:	665 Ft
Stack Diameter:	1.33 Ft
Volume of gas discharged into atmosphere:	3,850 (typical) Cfm
Gas exit temperature:	450 °F

10. Average Equipment Operating Time:

Daily:	12 Hours
Weekly:	5 Days
Yearly:	52 Weeks

This is to certify that I am familiar with the operations concerning this equipment and that the information provided on this application is true and complete to the best of my knowledge. This form must be completely filled out before it will be processed.

Mail to:
CHATTANOOGA-HAMILTON
COUNTY AIR POLLUTION
CONTROL BUREAU
6125 Preservation Drive
Chattanooga, TN 37416

Company Official

Ryan Prewitt

Title

Manager - Chemical Safety

Date 2/17/2023

Do not write below this line

Engineer Approval

Lbs/hr Allowable particulate emissions

Lbs/10⁶ BTU allowable SO_x emissions

ppm allowable NO_x emissions

UTM Coordinate of Company: EW NS

This form corresponds to permit number:

Special Notations:

POLLUTION ESTIMATION FORM
(Fuel Burning Equipment)

FORM E110
01/2002

1. Name of Company: TRANSFLO Terminal Services, Inc.
(As shown on Line 1 of Form E001)

2. Equipment Name: 200 hp Steam Boiler
(As shown on Line 10 of Form E001)

3. Percent excess air used in fuel burning (make allowances for leaks around doors and other openings): _____

4. Type of Fuel (file Form E110 for each fuel used): Natural Gas

Use AP-42 instead

5. Source of Emission Factors: AP-42, Section 1.4, July 1998 - Manufacturer's typical emission factors

6. Uncontrolled Particulate Emission Rate:

Particulate Emission Factor: 0.0048 lbs/MMBtu
(lbs/ton; lbs/10³ gal; lbs/10⁶ ft³)

8.4 MMBtu/hr X 0.0048 lbs/MMBtu = 0.040 Lbs/hr
Maximum Fuel Consumption Rate (tons/hr; gal/hr; ft³/hr) Particulate Emission Factor Uncontrolled Particulate Emission Rate

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7. Uncontrolled Sulfur Oxide (SO_x) Emission Rate:

SO_x Emission Factor: 0.6 lb/MMcf *(AP-42)*
Lbs/ton; lbs/10³ gal; lbs/10⁶ ft³

0.008 MMcf/hr X 0.6 lb/MMcf = 0.005 Lbs/hr
Maximum Fuel Consumption Rate (tons/hr; gal/hr; ft³/hr) SO_x Emission Factor Uncontrolled SO_x Emission Rate

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AIR POLLUTION
CONTROL BUREAU

8. Uncontrolled Hydrocarbon (HC) Emission Rate:

HC Emission Factor: 0.025 lb/MMBtu
Lbs/ton; lbs/10³ gal; lbs/10⁶ ft³

8.4 MMBtu/hr X 0.025 lb/MMBtu = 0.21 Lbs/hr
Maximum Fuel Consumption Rate (tons/hr; gal/hr; ft³/hr) HC Emission Factor Uncontrolled HC Emission Rate

9. Uncontrolled Nitrogen Oxides (NO_x) Emission Rate:

A. NO_x Emission Factor: 0.088 lb/MMBtu
Lbs/ton; lbs/10³ gal; lbs/10⁶ ft³

B. 8.4 MMBtu/hr X 0.088 lb/MMBtu = 0.74 Lbs/hr
Maximum Fuel Consumption Rate (tons/hr; gal/hr; ft³/hr) NO_x Emission Factor Uncontrolled NO_x Emission Rate

10. NO_x Emission Rate in PPM by Volume at STP:

Cubic feet per hour (CFH) of Exhaust Gases at 15% Excess Air:

A.
$$\frac{V}{\text{Sec Table A}} \times \frac{n/a}{\frac{\text{Maximum Fuel Consumption Rate}}{10^6 \text{ BTU/hr}}} = \frac{n/a}{\text{Exhaust Rate}} \text{ CFH}$$

B.
$$\frac{n/a}{\frac{\text{Uncontrolled NO}_x}{\text{(Item 9B)}} \text{ Lbs/hr}} \div \frac{n/a}{\text{CFH of Exhaust Gas (Item 10A)}} = \frac{n/a}{\text{Lb/ft}^3 \text{ NO}_x}$$

C.
$$\text{PPM} = (8.37 \times 10^6) \times \frac{n/a}{\text{Lb/ft}^3 \text{ NO}_x \text{ (Item 10B)}} = \frac{75 \text{ (manufacturer)}}{\text{PPM at STP and 15\% Excess Air (NO}_x \text{ calculated as NO}_2\text{)}}$$

Table A	
Fuel	V
Bituminous Coal	11700
Fuel Oil	11400
Natural Gas	11200
Wood	12800

This is to certify that I am familiar with the operations concerning this equipment and that the information provided on this application is true and complete to the best of my knowledge. **This form must be completely filled out before it will be acceptable.**

Mail to:
**CHATTANOOGA-HAMILTON COUNTY
 AIR POLLUTION CONTROL BUREAU**
 6125 Preservation Drive
 Chattanooga, TN 37416

Ryan Preswitt
 Company Official

Manager - Chemical Safety
 Title

2/17/2023
 Date

Do Not Write Below This Line

[Signature] Engineer Approval

This form corresponds to permit number: _____

Special Notations: _____

POLLUTION ESTIMATION FORM
(Fuel Burning Equipment)

FORM E110
01/2002

1. Name of Company: TRANSFLO Terminal Services, Inc.
(As shown on Line 1 of Form E001)

2. Equipment Name: 200 hp Steam Boiler
(As shown on Line 10 of Form E001)

3. Percent excess air used in fuel burning (make allowances for leaks around doors and other openings): _____

4. Type of Fuel (file Form E110 for each fuel used): Number 2 Fuel Oil

Use AP-42 instead

5. Source of Emission Factors: AP-42, Section 1.3, May 2010. Manufacturer's typical emission factors

6. Uncontrolled Particulate Emission Rate:

Particulate Emission Factor: 0.0143 lbs/MMBtu
(lbs/ton; lbs/10³ gal; lbs/10⁶ ft³)

$$\frac{8.4 \text{ MMBtu/hr}}{\text{Maximum Fuel Consumption Rate (tons/hr; gal/hr; ft}^3\text{/hr)}} \times \frac{0.0143 \text{ lbs/MMBtu}}{\text{Particulate Emission Factor}} = \frac{0.1201}{\text{Uncontrolled Particulate Emission Rate}} \text{ Lbs/hr}$$

7. Uncontrolled Sulfur Oxide (SO_x) Emission Rate:

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SO_x Emission Factor: 0.0525 lbs/MMBtu *(0.05% S)*
Lbs/ton; lbs/10³ gal; lbs/10⁶ ft³

$$\frac{8.4 \text{ MMBtu/hr}}{\text{Maximum Fuel Consumption Rate (tons/hr; gal/hr; ft}^3\text{/hr)}} \times \frac{0.0525 \text{ lbs/MMBtu}}{\text{SO}_x \text{ Emission Factor}} = \frac{0.441}{\text{Uncontrolled SO}_x \text{ Emission Rate}} \text{ Lbs/hr}$$

8. Uncontrolled Hydrocarbon (HC) Emission Rate:

HC Emission Factor: 0.038 lb/MMBtu
Lbs/ton; lbs/10³ gal; lbs/10⁶ ft³

$$\frac{8.4 \text{ MMBtu/hr}}{\text{Maximum Fuel Consumption Rate (tons/hr; gal/hr; ft}^3\text{/hr)}} \times \frac{0.038 \text{ lb/MMBtu}}{\text{HC Emission Factor}} = \frac{0.3192}{\text{Uncontrolled HC Emission Rate}} \text{ Lbs/hr}$$

9. Uncontrolled Nitrogen Oxides (NO_x) Emission Rate:

A. NO_x Emission Factor: 0.159 lb/MMBtu
Lbs/ton; lbs/10³ gal; lbs/10⁶ ft³

B. 8.4 MMBtu/hr X 0.159 lb/MMBtu = 1.336 Lbs/hr
Maximum Fuel Consumption Rate (tons/hr; gal/hr; ft³/hr) NO_x Emission Factor Uncontrolled NO_x Emission Rate

10. NO_x Emission Rate in PPM by Volume at STP:

Cubic feet per hour (CFH) of Exhaust Gases at 15% Excess Air:

A.
$$\frac{V}{\text{See Table A}} \times \frac{n/a}{\frac{\text{Maximum Fuel Consumption Rate}}{10^6 \text{ BTU/hr}}} = \frac{n/a}{\text{Exhaust Rate}} \text{ CFH}$$

B.
$$\frac{n/a}{\text{Uncontrolled NO}_x \text{ (Item 9B)}} \text{ Lbs/hr} \div \frac{n/a}{\text{CFH of Exhaust Gas (Item 10A)}} = \frac{n/a}{\text{Lb/ft}^3 \text{ NO}_x}$$

C.
$$\text{PPM} = (8.37 \times 10^6) \times \frac{n/a}{\text{Lb/ft}^3 \text{ NO}_x \text{ (Item 10B)}} = \frac{120 \text{ (manufacturer)}}{\text{PPM at STP and 15\% Excess Air (NO}_x \text{ calculated as NO}_2\text{)}}$$

Table A	
Fuel	V
Bituminous Coal	11700
Fuel Oil	11400
Natural Gas	11200
Wood	12800

This is to certify that I am familiar with the operations concerning this equipment and that the information provided on this application is true and complete to the best of my knowledge. **This form must be completely filled out before it will be acceptable.**

Mail to:
CHATTANOOGA-HAMILTON COUNTY
AIR POLLUTION CONTROL BUREAU
 6125 Preservation Drive
 Chattanooga, TN 37416

Ryan Prewitt
 Company Official

Manager - Chemical Safety
 Title

2/17/2023
 Date

Do Not Write Below This Line

JCS Engineer Approval

This form corresponds to permit number: _____

Special Notations: _____



Chattanooga TRANSFLO Terminal
 Chattanooga, TN
 External Combustion Air Emissions Estimates
 Number 2 Fuel Oil and Natural Gas
 Prepared February 2023

Hurst Boiler Number SE-GP2-200-150 firetube boiler,
 equipped with a Power Flame Incorporated burner model number GS-GO-30

Table 1: Boiler Parameters

Parameter	Max Rated Capacity (MMBtu/hr)	Heating Value (Btu/gal or Btu/scf)	Max Fuel Use (gal/hr or scf/hr)	Potential Operation Time (hr/yr)	Potential Fuel Use (gal/yr or scf/yr) ¹
Diesel Fuel	8.4	140,000	60	8,760	525,600
Natural Gas		1,020	8,235		72,141,176

Notes

¹Potential fuel usage assumes full load (100%)

Two sets of emissions factors are used, manufacturer provided factors (Power Flame Burner) and AP-42. If manufacturer emission factors are available for a specified pollutant, these factors are used.

If manufacturer emission factors are not available for a specified pollutant, AP-42 emission factors are used.

The emission factor used in the emissions estimates is highlighted in green.

Table 2: Emission Factors

Pollutant	Diesel Fuel		Natural Gas	
	AP-42 Emission Factor (lb/1,000 gal) ¹	MFG Emission Factor (lb/MMBtu) (typical)	AP-42 Emission Factor (lb/MMcf) ²	MFG Emission Factor (lb/MMBtu) (typical)
NO _x	20	0.159	100	0.088
SO ₂ ³	7.2	0.0535	0.6	n/a
CO	5	0.037	84	0.037
PM (total)	3.3	0.0143	7.6	0.0048
PM ₁₀ ⁴	3.3	0.0143	7.6	0.0048
VOC ⁵	0.2	0.038	5.5	0.025
CO ₂	22,300	n/a	120,000	n/a
Methane (CH ₄)	0.052	n/a	2.3	n/a
N ₂ O	0.26	n/a	2.2	n/a

Notes

1 - Reference and notes for AP-42 Diesel Fuel Emissions Factors:

- AP-42 Table 1.3-1 (Criteria pollutants other than PM), May 2010
- SO₂ emission factor based on 500 ppm sulfur fuel content, includes both SO₂ and SO₃
- PM₁₀ and PM_{2.5} = PM filterable (Table 1.3-1) + PM condensible (Table 1.3-2)
- VOC is NMTOC from Table 1.3-3

2 - Reference for AP-42 Natural Gas Emissions Factors

- AP-42 Section 1.4, July 1998
- 3 - Fuel oil sulfur content 0.05% Typical
- 4 - PM₁₀ and total PM are assumed to be the same value

5 - AP-42 emission factors are used for greenhouse gas emissions, manufacturer values are general in nature based on percent of exhaust gas flow rate

6 - MFG VOC emission factors are total hydrocarbon, and may contain hydrocarbons not considered VOC (e.g., methane and ethane).

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Table 3: AP-42 Emission Factors - Estimated Hourly Emission Estimates (Full Load)

Fuel	Maximum Hourly Emissions (lbs/hr) ¹								
	NO _x	SO ₂	CO	PM (total)	PM ₁₀	VOC	CO ₂	CH ₄	N ₂ O
Diesel Fuel	1.20	0.43	0.30	0.20	0.20	0.01	1,338.00	3.12E-03	0.02
Natural Gas	0.82	0.005	0.69	0.06	0.06	0.05	988.24	0.02	0.02

Notes

1 - Hourly emission rates are obtained by either:
 For AP-42 Emission Factors, E.F. X Maximum Heat Input (8.4 MMBtu/hr) / Fuel Heat Content
 For manufacturer emission factors, E.F. X hourly fuel input rate

Table 4: Manufacturer Provided Emission Factors - Estimated Hourly Emission Estimates (Full Load) (typical)

Fuel	Maximum Hourly Emissions (lbs/hr) ¹								
	NO _x	SO ₂	CO	PM (total)	PM ₁₀	VOC	CO ₂	CH ₄	N ₂ O
Diesel Fuel	1.34	0.44	0.31	0.12	0.12	0.32	n/a	n/a	n/a
Natural Gas	0.74	n/a	0.31	0.04	0.04	0.21	n/a	n/a	n/a

Notes: *filterable only? → too high (includes methane + ethane)*

Table 5: Selected Emission Factors - Estimated Hourly Emission Estimates (Full Load)

Fuel	Maximum Hourly Emissions (lbs/hr) ¹								
	NO _x	SO ₂	CO	PM (total)	PM ₁₀	VOC	CO ₂	CH ₄	N ₂ O
Diesel Fuel	1.34	0.44	0.31	0.12	0.12	0.32	1,338.00	0.00	0.02
Natural Gas	0.74	0.005	0.31	0.04	0.04	0.21	988.24	0.02	0.02

Notes

1 - Manufacturer provided emission factors are used if available, if not, AP-42 emission factors are used.

Table 6: Potential Annual Emission Estimates

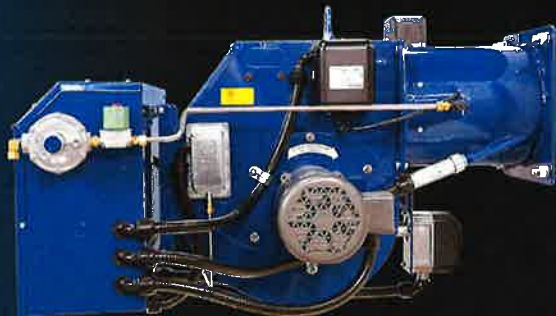
Fuel	Potential Annual Emissions (tons/yr)								
	NO _x	SO ₂	CO	PM (total)	PM ₁₀	VOC	CO ₂	CH ₄	N ₂ O
Diesel Fuel	5.85	1.93	1.36	0.53	0.53	1.40	5,860	0.01	0.07
Natural Gas	3.24	0.02	1.36	0.18	0.18	0.92	4,328	0.08	0.08

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JGA



TYPE C

GAS or LIGHT OIL
98,000 – 19,100,000 BTU/HR

Power Flame's Versatile High Performance Gas and Oil Burner

Adjustable Premix Firing Head

Produces optimum fuel-air mixture within the premix combustion zone



Linkageless System

for precise air/fuel ratio control (optional)

Redesigned Air Inlet

for improved air flow control, higher turndown and quieter operation

The Power Flame Type C gas, oil or combination gas/oil burner presents optimum state-of-the-art design for maximum combustion efficiency and operating dependability. These packaged combustion systems will fire natural gas, light oil, and other gaseous fuels. **The burner features a 10 to 1 turndown when firing natural gas.**

The flame retention firing head incorporates the nozzle mix multiport combustor and unique air sandwich design to produce full range stable performance in both

positive or negative combustion chamber environments. Operating system adjustments have been minimized to provide trouble free start up and operating performance.

The Model CG produces efficient combustion without the aid of refractory or other costly flame support devices adding flexibility for a wide range of optional features. All Power FLame packaged combustion systems are factory fire tested to ensure cost effective installation and start up.

Total Access Panel

Swing out, easily removable top and front panels give total access to all internal panel-mounted components

Alpha System™

LED indicators, switches and operator annunciator

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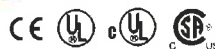
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STANDARD EQUIPMENT

- Alpha System™ LED indicators (power, demand, main fuel, FSG alarm, customer selectable) & control switch
- Pressure regulators, pilot and main gas cocks
- Oil valve, nozzle assembly, manual fuel selector switch
- Air safety switch & leakage test cock
- Gas electric pilot and gas ignition transformer

ADDED FEATURES

X-Standard O-Optional NA-Not Available

- Flame Safeguard with UV and prepurge with interrupted pilot
- On-Off diaphragm gas valve with fixed air control manual adjustment
- Low-Hi-Off motorized gas valve with automatic air control
- Low-Hi-Low motorized gas valve with automatic air control
- Modulation with automatic air control
- Integral 2 stage fuel unit (C1, C2 single stage)
- Remote mounted 2 stage fuel unit (single stage for C6-C8)
- Dual gas (B) and dual oil safety valves
- High and Low gas pressure switches
- Direct spark ignition (oil)
- Low fire oil start with automatic air control
- Man/Auto switch - manual potentiometer - modulation only

- Ⓐ Postpurge standard on C2-GO-20B and all C3 to C8 models
- Conforms to UL 296 and UL 795



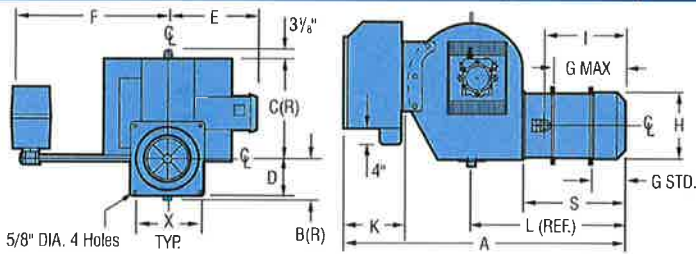
The optional Director SCS provides PLC control for optimum boiler/burner performance

C1-GO-10 C1-GO-12 C2-GO-15	C2-GO-20A	C2-GO-20B	C3-GO-20 C3-GO-25 C3-GO-25B	C4-GO-25	C4-GO-30 C5-GO-30(B) C6-GO-30	C7-GO-30 C8-GO-30
X	X	ⒶX	ⒶX	ⒶX	ⒶX	ⒶX
X	NA	NA	NA	NA	NA	NA
O	X	X	X	X	NA	NA
O	O	O	O	O	NA	NA
O	O	O	O	O	X	X
X	X	X	X	X	NA	NA
O	O	O	O	O	X	X
X	X	X	X	X	X	X
O	O	X	X	X	X	X
O	O	O	O	O	O	O
O	X	X	X	X	X	X
X	X	X	X	X	X	X

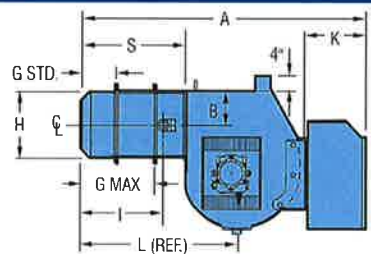
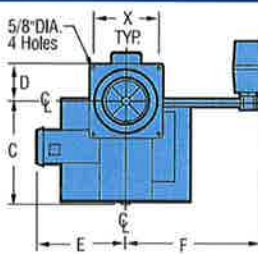
- Ⓑ 5,000 MBH and below may be replaced by one (1) proof of closure valve; above 5,000 MBH one (1) of the safety valves will include proof of closure feature.

MODEL CR (For low centerline applications)

MODEL C



Add 3/8" to "H" for size of opening in boiler front plate



Add 3/8" to "H" for size of opening in boiler front plate

DIMENSIONS (Inches) Standard Models.

RATINGS & SPECIFICATIONS

- * This dimension may be increased. Consult factory.
- ** This dimension depicts space required to accommodate a standard gas train.

Burner Model	CAPACITY ¹															#2 Oil GPH Max.	Natural Gas/MBH Max.	Nominal Boiler H.P. Max.	Blower Motor H.P. (3450 RPM)	Std. Gas Train (In.)	Pressure Pump Suction (GPH)	Gas Pressure Required (In. W.C.) ²	
	A	B	B(R)	C	C(R)	D	E	F**	G Std.	G *Max.	H	I	K	L	S								X
C1-GO-10	34 1/8	3 13/16	5 9/16	14 1/2	14 1/2	4 5/8	12 1/4	20	3 1/4	4 3/4	7 1/4	7 3/8	10 1/4	17 1/8	12 5/8	7 1/4	7.0	980	23.5	1/3	1	†19	5.6
C1-GO-12	34 1/8	3 13/16	5 9/16	14 1/2	14 1/2	4 5/8	12 1/4	20	3 1/4	4 3/4	7 1/4	7 3/8	10 1/4	17 1/8	12 5/8	7 1/4	9.7	1,360	32.3	1/2	1 1/4	†19	5.3
C2-GO-15	39 1/8	4 1/2	6 1/8	14 7/8	14	5 1/4	14	20	4	6 3/4	8 3/4	8 1/2	10 1/4	18 7/8	13 3/8	8 1/2	15.7	2,200	52.3	3/4	1 1/2	†70	5.2
C2-GO-20A	39 1/8	4 1/2	6 1/8	14 7/8	14	5 1/4	14	20	4	6 3/4	8 3/4	8 1/2	10 1/4	18 7/8	13 3/8	8 1/2	17.5	2,500	60.0	1	2	70	4.8
C2-GO-20B	39 1/8	4 1/2	6 1/8	14 7/8	14	5 1/4	14	20	4	6 3/4	8 3/4	8 1/2	10 1/4	18 7/8	13 3/8	8 1/2	22.0	3,080	73.5	1 1/2	2	70	4.8
C3-GO-20	44	5 1/4	7	16 5/8	15 1/4	6	16	22 3/8	4 1/2	8	10 1/8	11 1/2	10 1/4	22	15 1/2	10	30.0	4,200	100.0	2	2	105	7.6
C3-GO-25	44	5 1/4	7	16 5/8	15 1/4	6	16	22 3/8	4 1/2	8	10 1/8	11 1/2	10 1/4	22	15 1/2	10	33.7	4,718	112.0	2	2 1/2	105	7.0
C3-GO-25B	44	5 1/4	7	16 5/8	15 1/4	6	16	22 3/8	4 1/2	8	10 1/8	11 1/2	10 1/4	22	15 1/2	10	37.5	5,250	125.0	3	2 1/2	135	7.2
C4-GO-25	50	6 1/4	7 5/16	18 7/8	17 11/16	7	18 1/2	28	6	9	12 1/8	14 3/4	10 1/4	26 5/8	19 1/8	12	45.0	6,300	150.0	5	2 1/2	135	8.0
C4-GO-30	50	6 1/4	7 5/16	18 7/8	17 11/16	7	18 1/2	28	6	9	12 1/8	14 3/4	10 1/4	26 5/8	19 1/8	12	56.0	7,840	190.0	5	3	†135	12.1
C5-GO-30(B)	50	6 1/4	7 5/16	18 7/8	17 11/16	7	18 1/2	26 1/2	6	9	12 1/8	14 3/4	10 1/4	26 5/8	19 1/8	12	75.0	10,500	250.0	7 1/2	3	†250	19.9, 17.8
C6-GO-30	49 7/8	6 1/4	7 5/16	18 7/8	17 11/16	7 3/4	19 3/8	26 1/2	5	11 3/4	13 5/8	14 1/8	10 1/4	26 1/2	19	13 1/2	101.5	14,215	340.0	10	3	†250	26.5
C7-GO-30	51 11/16	8 1/8	10 1/8	24 3/16	22 3/8	8 3/4	18	21 13/16	4 7/8	11 1/4	15 5/8	13 7/8	9 1/8	26 1/2	19	13 1/2	121.4	17,000	404.0	15	3	235	40.0
C7-GO-30B	51 11/16	8 1/8	10 1/8	24 3/16	22 3/8	8 3/4	18	21 13/16	4 7/8	11 1/4	15 5/8	13 7/8	9 1/8	26 1/2	19	13 1/2	126.4	17,700	421.0	20	3	235	45.0
C8-GO-30	56 3/16	8 1/8	10 1/8	27 1/8	27 3/8	8 3/4	20	24 3/8	3 1/4	9 5/8	15 5/8	12 1/4	9 1/8	24 7/8	17 3/16	13 1/2	136.4	19,100	454.0	15	3	235	50.0

- NOTES: 1. Capacities listed are based on 0.20" W.C. positive pressure, except for C5-GO-30B, which is rated for 250 BHP at +1.2" W.C. Refer to capacity curves for derates based upon combustion chamber pressure.
2. At inlet to main manual shutoff cock to obtain P/F certified ratings with standard U.L. gas train. Optional gas trains and combustion heads available for lower pressures.
- † Remote Pump Set with 200 (208) or 230/460/3/60 motor, 3450 RPM - 3/4 HP - C4; 1750 RPM - 1 HP - C5, C6; 1750 RPM - 1-1/2 HP - C7, C8.
- †† For On-Off and modulating firing modes only. Refer to C Manual for capacities on other modes.

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Use AP-42 instead

**Typical Flue Product Emissions
Data for Power Flame Burners**

	^{1b} <u>10⁶ ft³</u> Natural Gas <i>AP-42</i>	L.P. Gas	^{1b} <u>10⁵ gal</u> # 2 Fuel Oil ⁽¹⁾ <i>AP-42</i>
Carbon Monoxide - CO	.037 lb CO 10 ⁶ BTU input <i>37.74 (50 PPM) < 84</i>	.037 lb CO 10 ⁶ BTU input (50 PPM)	.037 lb per 10 ⁶ BTU INPUT <i>5.18 (50 PPM) > 5</i>
Sulfur Dioxide - SO₂	<i>2,000 gr S / 10⁶ ft³</i> <i>p.n. gas = 1 lb / 23.8 ft³</i> <i>0.728 > 0.571</i>	(1.05) x (% Sulfur by weight in fuel) = lb SO ₂ per 10 ⁶ BTU Input	<i>0.05% S max.</i> <i>7.35 > 7.20</i>
Particulate Matter <i>(filterable only?)</i>	.0048 lb PM per 10 ⁶ BTU input <i>4.896 < 7.6</i>	.0048 lb PM per 10 ⁶ BTU input	.0143 lb PM per 10 ⁶ BTU input <i>2.002 < 3.3</i>
Hydrocarbons <i>(includes methane & ethane)</i>	.025 lb HC's per 10 ⁶ BTU input <i>25.5 > 5.5</i>	.025 lb HC's per 10 ⁶ BTU input	.038 lb HC's per 10 ⁶ BTU input <i>5.32 > 0.2</i>
CO₂	9 % to 10%	10% to 12%	10% to 13%

Nitrogen Oxides - NO_x

Standard J, FDM & X4 Gas Burners	.088 lb NO _x per 10 ⁶ BTU input (75 PPM)	.092 lb NO _x per 10 ⁶ BTU input (75 PPM)	N/A N/A
Standard C(R) Burners	.088 lb NO _x per 10 ⁶ BTU input <i>89.76 (75 PPM) 104</i>	.092 lb NO _x per 10 ⁶ BTU input (75 PPM)	.12 lb NO _x per 10 ⁶ BTU Input <i>22.26 (90) PPM⁽²⁾ 20</i>
LNIC(R) Burners	.029 lb NO _x per 10 ⁶ BTU input	.031 lb NO _x per 10 ⁶ BTU input	.12 lb NO _x per 10 ⁶ BTU Input <i>120 ppm</i>
Fire box/Cast Iron boilers	(25 PPM)	(25 PPM)	(90) PPM ⁽²⁾
LNIC(R) Burners	.024 lb NO _x per 10 ⁶ BTU input	.031 lb NO _x per 10 ⁶ BTU input	.12 lb NO _x per 10 ⁶ BTU Input
Water tube boilers	(20 PPM)	(25 PPM)	(90) PPM ⁽²⁾
LNIAIC Burners	.029 lb NO _x per 10 ⁶ BTU input (25 PPM)	.031 lb NO _x per 10 ⁶ BTU input (25 PPM)	.12 lb NO _x per 10 ⁶ BTU Input (90) PPM
CM Burners	.070 lb NO _x per 10 ⁶ BTU input (60 PPM) ⁽⁴⁾	.074 lb NO _x per 10 ⁶ BTU input (60 PPM) ⁽⁴⁾	.146 lb NO _x per 10 ⁶ BTU Input (110) PPM
LNICM Burners	.033 lb NO _x per 10 ⁶ BTU input	.033 lb NO _x per 10 ⁶ BTU input	.12 lb NO _x per 10 ⁶ BTU Input
Scotch Boiler	(30) PPM	(30) PPM	(90) PPM
LNICM Burners	.029 lb NO _x per 10 ⁶ BTU input	.031 lb NO _x per 10 ⁶ BTU input	.12 lb NO _x per 10 ⁶ BTU Input
Fire box/Cast Iron boilers	(25) PPM	(25) PPM	(90) PPM
LNICM Burners	.029 lb NO _x per 10 ⁶ BTU input	.031 lb NO _x per 10 ⁶ BTU input	.12 lb NO _x per 10 ⁶ BTU Input
Water tube boilers	(20) PPM	(20) PPM	(90) PPM
NPM Premix Burners	.029 lb NO _x per 10 ⁶ BTU input (25) PPM	.031 lb NO _x per 10 ⁶ BTU input (25) PPM	N/A N/A
Nova Plus Burners	.010 lb NO _x per 10 ⁶ BTU input	.015 lb NO _x per 10 ⁶ BTU input	N/A
NVC AND NP2	(9) PPM	(12) PPM	N/A

(1) NO_x emissions at 3 % O₂ will vary based on the percent of fuel bound nitrogen (these are based on .02%) and boiler or heat exchanger configurations

(2) 90 PPM NO_x on cast iron sectional, fire box and water tube boiler, **120 PPM on fire tube boilers. (.159 lb NO_x per 10⁶ BTU Input)**

(3) Burning natural gas the VOC are estimated at 0.003 # per million BTU and SO_x are 0.0005 # per million BTU.

(4) In some applications the CMAX will achieve less than 60 PPM without flue gas recirculation - consult factory.

These emission rates are general estimates and do not constitute guarantees by Power Flame Inc.

In instances where guarantees are required, please consult the factory with the specific application information.

All NO_x numbers stated are corrected to 3% O₂



HURST

BOILER & WELDING CO., INC.

AVAILABLE WITH LOW NOX

HURST SERIES EURO

3-PASS SCOTCH MARINE DESIGN
Low Profile, Wet Back Construction

HIGH PRESSURE BOILER

Capacities from 100 to 2000 BHP.
3348 to 66950 MBTU/HR.

STEAM

Pressures to 15-300 PSI.

HOT WATER

Section I and Section IV



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MODULAR PACKAGED

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"Large combustion chamber with
low heat release for complete combustion."
AIR POLLUTION CONTROL BUREAU

HURST PERFORMANCE SERIES BOILERS

HURST PERFORMANCE SERIES BOILERS

STANDARD FEATURES

- Boiler is of the three-pass, scotch type, built and stamped in accordance with the requirements of the ASME Code, and listed by the National Board of Boilers and Pressure Vessel Inspectors.
- Large combustion chamber with low heat release for complete combustion.
- Smoke box is rear-mounted with slip-on stack connector.
- Access to fireside is accomplished with hinged and davited front and rear doors. Flame observation ports are located on front and rear.
- Openings for vessel cleanout and inspection of waterside are provided with 3" x 4" hand holes, and 12" x 16" manway access.
- Insulated with 2" high density mineral wool, lagged with 22 gauge grip jacketing, baked on finish to resist chipping and fading.
- Firetubes are rolled and beaded on power boilers, expanded and flared on low pressure boilers.
- Supports include lifting lugs securely welded to the top of shell; structural steel support legs on skids support the boiler so that special foundations are not required.

Stress Relieving "Wetback" Construction for Extra-Long Life

Standard Steam Trim

- Operating & high limit pressure control
- Modulating pressure control (when appl.)
- Water column with gauge glass, combination low water cut-off & pump control
- Probe Aux, L.W.C.O.
Steam pressure gauge, syphon & test cock
- Water column drain valve
- Safety relief valve(s) per ASME Code

Standard Water Trim

- Operating & high limit temperature control
- Modulating temperature control (when appl.)
- Probe type low water cut-off control
- Combination pressure & temperature gauge
- Hot water return baffle for shock resistance
- Safety relief valve(s) per ASME Code

HBC-09503
07/2014



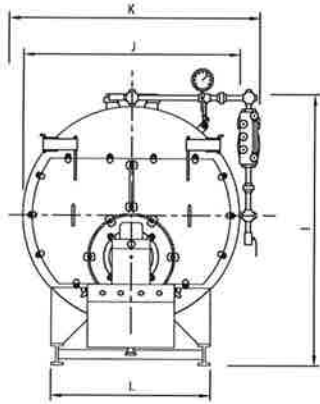
HURST BOILER & Welding Co., Inc.

100 Boilermaker Lane • Coolidge, GA 31738-0530
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email: info@hurstboiler.com

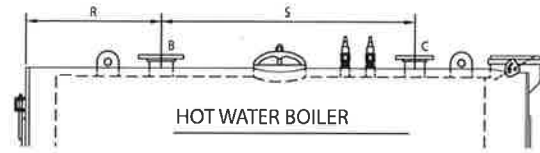
SERIES EURO



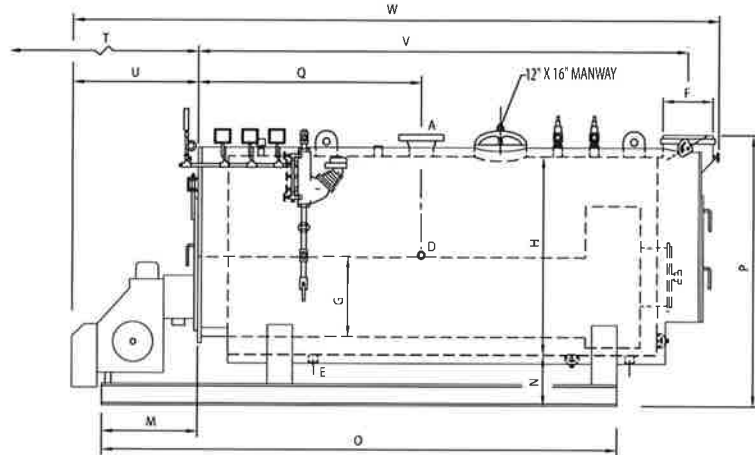
NOTE: THE 400 HP SIZE HAS A REMOVABLE STACK SECT'N FOR SHIPPING CONSULT FACTORY



FRONT VIEW



HOT WATER BOILER



SIDE VIEW

8.4 MM Btu/hr

BOILER SPECIFICATIONS

BOILER HORSEPOWER			100	125	150	200	250	300	350	400	
STEAM OUTPUT	FROM & @ 212°	LBS/HR	3450	4313	5175	6900	8625	10350	12075	13800	
GROSS OUTPUT	@33,475 BTU/BHP	MBH	3348	4184	5021	6695	8369	10043	11716	13390	
FIRING RATE GAS	1,000 BTU	CFH	4200	5250	6300	8400	10500	12600	14700	16800	
FIRING RATE LP GAS	91,500 BTU	GPH	46	57	69	92	115	138	160	184	
FIRING RATE OIL #2	140,000 BTU	GPH	29.9	37.4	45	60	75	90	105	120	
FIRING RATE OIL #5 & #6	150,000 BTU	GPH	28	35	42	56	70	84	98	112	
A	NOTE: 1 STEAM OUTLET SIZE	150 PSI	IN	4	4	4	4	6	6	6	
A	NOTE: 2 STEAM OUTLET SIZE	15 PSI	IN	8	8	8	8	10	10	10	
B	NOTE: 2 WATER SUPPLY SIZE	30 PSI	IN	8	8	8	8	10	10	10	
C	NOTE: 2 WATER RETURN SIZE	30 PSI	IN	6	6	6	6	8	8	8	
D	FEEDWATER CONNECTION		IN	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	2	2	
E	BLOWDOWN CONNECTION (BTM)	HIGH PRESS.	IN	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	
E	BLOWDOWN CONNECTION (BTM)	LOW PRESS. & HW	IN	1 1/2	1 1/2	2	2	2	2	2	
F	STACK OUTLET SIZE O.D.		IN	14	14	16	16	18	20	24	
G	FURNACE O.D.		IN	30	30	35 1/4	35 1/4	38	38	44	
H	SHELL I.D.		IN	54	54	66	66	72	75 1/2	78	
I	NOTE: 3 SUPPLY HEIGHT	150 PSI	IN	74 5/8	74 5/8	87 3/4	87 3/4	93 3/4	97 1/2	93 5/8	
J	WIDTH WITHOUT TRIM		IN	60	60	73	73	78	83	85	
K	WIDTH WITH TRIM		IN	67	67	80	80	87	89	91	
L	SKID WIDTH		IN	44	44	51	51	57	60	62	
M	END OF SKID FROM FRT. PLATE		IN	19 11/16	21 11/16	22 11/16	22 11/16	28 5/8	31 5/8	36	
N	SHELL TO FLOOR		IN	14	14	15	15	15	15	14	
O	SKID LENGTH		IN	120	134	159	165	180	200	236	
P	STACK HEIGHT		IN	74 5/8	74 5/8	87 3/4	87 3/4	93 3/4	97 1/2	104	
Q	STEAM OUTLET LOCATION	15 & 150 PSI	IN	55 13/16	55 13/16	63 13/16	63 13/16	67 7/8	82 7/8	103 7/8	
R	SUPPLY LOCATION		IN	35 13/16	35 13/16	39 13/16	39 13/16	45 7/8	50 7/8	55 7/8	
S	RETURN LOCATION		IN	56	68	80	84	86	99	114	
T	TUBE REMOVAL	FRONT	IN	111	123	144	150	161	176	209	
U	BURNER PROJECTION	STANDARD BURNER	IN	32	35	35	35	48	52	52	
V	STACK OUTLET		IN	119 13/16	131 13/16	153 13/16	159 13/16	171 7/8	187 7/8	221 7/8	
W	APPROX. OVERALL LENGTH		IN	162	177	200	206	232	253	289	
	OVERALL SHIPPING HEIGHT	30 & 150 PSI	IN	76	76	89	89	95	99	96	
	SHIPPING WEIGHT - HIGH PRESS.	150 PSI	LBS	8,300	9,000	13,500	14,650	17,250	20,500	26,000	
	WATER CAPACITY - STEAM	NWL	GALS	516	579	1025	967	1406	1538	1748	
	WATER CAPACITY - WATER	FLOODED	GALS	573	643	1222	1218	1648	1949	2166	
	BOILER HORSEPOWER			100	125	150	200	250	300	350	400

Inspected and registered with the National Board of Boiler & Pressure Vessel Inspectors.

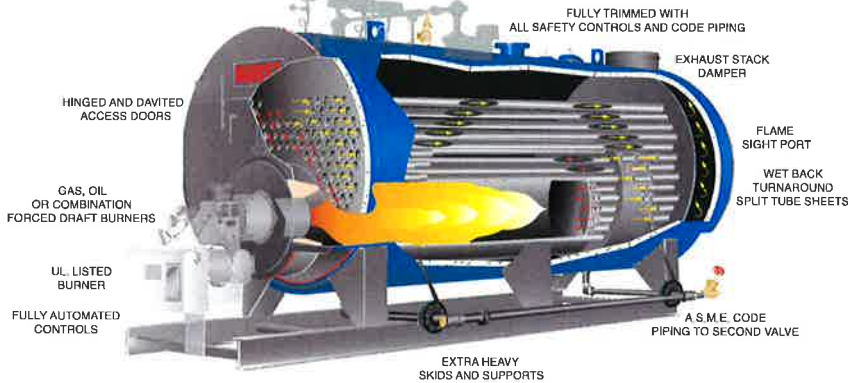


Designed, constructed and stamped in accordance with the requirements of the ASME Boiler Codes.

NOTE: 3" & ABOVE ARE 300# ANSI FLANGE.
NOTE: 2" 4" & ABOVE ARE 150# ANSI FLANGE.
DIMENSIONS SUBJECT TO CHANGE WITHOUT NOTICE.

FOR SECTION IV HIGH PRESSURE STEAM - THIS CHART APPLICABLE FOR 50 PSI UP TO 300 PSI STEAM, AND LOW AND HIGH PRESSURE HOT WATER ONLY.
FOR SECTION IV LOW PRESSURE STEAM BELOW 15 PSI CONSULT FACTORY FOR BOILER DIMENSIONS AND OR CERTIFIED DRAWINGS.

CUT AWAY VIEW



THREE PASS FIRETUBE DESIGN

100-2000 BHP

Wetback Construction

Eliminates Refractory Rear Door & Baffles Between Flue Gas Passes

	500	600	700	750	800	900	1000	1200	1500	1800	2000	
	17250	20700	24150	25875	27600	31050	34500	41400	51750	62100	69000	
	16738	20085	23432	25106	26780	30128	33475	40170	50213	60255	66950	
	21000	25200	29400	31500	33600	37800	42000	50400	63000	75600	84000	
	230	275	320	344	368	413	460	550	688	828	918	
	150	180	210	225	240	270	300	360	450	540	600	
	140	168	196	210	224	252	280	336	420	504	560	
A	6	8	8	8	8	8	8	10	10	*12	*12	A
B	10	12	12	12	12	14	14	14	14	*16	*16	B
C	10	12	12	12	12	12	12	14	14	*16	*16	C
D	8	8	10	10	10	12	12	14	14	*16	*16	D
E	2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	E
F	1 1/2	1 1/2	2	2	2	2	2	2	2	2	2	F
G	2	2	2	2	2	2	2	2	2 1/2	2 1/2	2 1/2	G
H	24	28	34	34	34	34	34	38	42	*48	*48	H
I	50	54	56	56	60	60	60	60	62	66	66	I
J	96	102	108	108	112	112	112	126	136	142	142	J
K	121	127	133	133	137 1/4	137 1/4	137 1/4	152 1/4	162 1/2	162	162	K
L	102 3/4	108	115	115	119	119	119	133 1/2	144 1/2	149	149	L
M	108 1/4	113 1/4	124	124	136	136	136	139 1/2	150 3/4	161	161	M
N	76	78	86	86	92	92	92	108	114	124	124	N
O	31 5/8	32 5/8	36 5/8	36 5/8	38 5/8	42 1/2	45 1/2	55 5/8	59 5/8	70	76	O
P	18	18	18	18	18	18	18	18	18	16	16	P
Q	212	240	228	228	228	264	288	294	320	336	354	Q
R	122	128	134	134	138 1/4	138 1/4	138 1/4	152 1/4	162 1/2	162	162	R
S	96 7/8	96 3/8	89 7/8	90 1/2	101 3/8	122	116	122 3/8	135 7/8	134	140	S
T	60 3/8	66 3/8	60 7/8	60 7/8	63	68	75	75	74	74	74	T
U	162 3/8	168 3/8	162 7/8	162 7/8	165	188	208	206	218	218	230	U
V	195	202	196	196	209	231	253	281	281	281	293	V
W	65	66	66	70	70	75	75	84	84	96	98	W
	208 7/8	217 7/8	214 3/8	214 3/8	225 7/8	249 1/2	271 1/2	273 1/2	302 7/8	307	319	
	279	290	299 3/8	303 3/8	312	343 1/2	365 1/2	379	405	429	441	
	122	128	134	138 1/4	138 1/4	138 1/4	138 1/4	152 1/4	162 1/2	164	164	
	35,000	38,000	43,000	44,200	49,500	53,750	57,500	72,000	89,000	*89,000	*92,000	
	2380	2688	3405	3348	3590	4015	4443	5855	7176	5855	7165	
	3453	3983	4290	4233	4823	5152	5697	7980	10,386	7980	10,532	
	500	600	700	750	800	900	1000	1200	1500	1800	2000	

* NOTE: 1800 & 2000 HP WEIGHTS DO NOT INCLUDE BURNER OR REFRACTORY HEAD RING.
 ** NOTE: SFLUDED OUTLET FLG'S ON 400 HP, 1800-2000 HP.

BOILER DESIGN: Three-Pass "Scotch Marine" Firetube design with stress relieving "Wetback" construction. Pressure designs for steam are 15-300 psi, 100-600 hp, 250 psi. max. for 700-1500 hp, and 200 psi. max. for 1800-2000 hp. Hot Water pressures models are from 30-160 psi. High pressure, high temperature Section I hot water boilers available. Factory assembled with trim, tested, ASME code, UL, and CSD-1 standards.

STEAM MODEL TRIM: Safety relief valve, operating pressure control, high limit pressure control with manual reset, steam pressure gauge with syphon, combination pump control and low water cut-off with gauge glass assembly and drain valve, auxiliary low water cut-off with manual reset.

HOT WATER MODEL TRIM: Safety relief valve, operating temperature control, high limit temperature control with manual reset, combination pressure & temperature gauge, low water cut-off control with manual reset.

BURNER: Matched UL listed "forced draft" power burners with factory pre-piped, wired and tested fuel configurations for natural gas, propane (LP) gas, No. 2 (diesel) oil, or combination of both gas/oil.



HURST STEAM BOILER SALES ORDER ENTRY FORM (R30) 08/27/20



DATE: 10/21/22 SHIP DATE: Submittal PROJECT NO.: S2200431 HBC J.O. NO.: 2201753
 SOLD TO: CICI BOILER ROOMS, INC. EVANSVILLE, IN END USER: RBT SERVICES - CSX CHATTANOOGA, TN

CONTACT: MARIE DASHER

PH: () - - FAX: () - - CONTACT 2:

E-MAIL ADDRESS: P.O. NO: DS62324M

SALES TAX NO. STATE (KY) D&B:

APPROVALS: SALES CREDIT: TYPED BY: MLH

PRICING: HOLD FOR SUBMITTAL APPROVAL

TERMS OF PAYMENT: () NET 30 ()

SHIP TO: RBT SERVICES, INC. (X) PREPAY & ADD SHIPPING INSTRUCTIONS:
 PO# 110683 ALBANY NY () 3RD PARTY PROVIDE 48 HOURS NOTICE
 218 CORPORATE DRIVE () COLLECT PRIOR TO DELIVERY
 ELIZABETHTOWN, KY 42701 () ALLOWED TREY 502-261-0076
 ()

EQUIPMENT DESCRIPTION: 200 HP EURO 150 PSI STEAM BOILER

BOILER SERIES: EURO (3) PASS () DRY BACK (X) WET BACK () SEMI-WETBACK
 (X) SCOTCH () FIREBOX () LPE () LPX () VERTICAL (X) FIRETUBE () TUBELESS
 MODEL NO: SE - GP2 - 200 - 150 BHP: 200 PSPH: 6695 MBH: 6900
 STEAM PRESSURE: 150 PSI DESIGN, 125 PSI OPERATING ASME SECTION (X) I () IV
 FIRESIDE HEATING SURFACE: 702 SQ.FT. FURNACE VOLUME: 81.3 CU. FT.
 (X) UL LABEL B (X) ASME CSD-1 () CRN () SUBMITTAL DRAWING ONLY:
 (X) STANDARD PAINT, INSULATION & JACKET (X) SUBMITTAL DRAWING / FULL: REQUIRED
 (*X) SPECIAL FINISHING: **SIMILAR TO HBC JOB#1800317**
 ()

PRIMARY BOILER OPENINGS: S = SCREWED F = FLANGED * = SPECIAL

(F) MAIN STEAM OUTLET: 4" (S) FEEDWATER CONN: 1.5"
 (S) BLOWDOWN CONN: 1.25" (S) SURFACE: 1.25"
 () ()

STACK OUTLET: 16" (X) VERTICAL () HORIZONTAL (X) 3" SERIES "B" THERM. 750 °F
 (X) MANUAL DAMPER ()
 (1) 12" x 16" MANHOLE (5) 3" x 4" HAND HOLES () 2" CPLGS. () 1.5" CPLGS.
 FRONT DOORS: (X) HINGED (X) DAVITED REAR DOORS: (X) HINGED (X) DAVITED
 () EXPLOSION RELIEF DOORS REQD. () OTHER SPECIAL ITEMS:

GAUGE GLASS SET: (X) ARMORED GAUGE GLASS, NPT, QUALITY 15R-20; 300PSI, COCKS #146 1"
 (X) WATER COLUMN DRAIN VALVE: (X) APOLLO 70 -140 ()
 ()

PRIMARY LWCO: (X) M & M #157S-RL () (X) AUTO RESET () MR
 (X) ON/OFF PUMP CONTROL () PROPORTIONING () FEEDER
 CONTROL

() AUDIBLE ALARM () LIGHT MOUNT ON: () LEFT (X) RIGHT

AUX. LWCO: (X) M & M # 750-MT-120, () () AUTO RESET (X) MR
 (X) AUDIBLE ALARM (X) LIGHT MOUNT ON: () LEFT (X) RIGHT
 ()

HWL ALARM: () M & M # 750, () () AUTO RESET () MR
 () AUDIBLE ALARM () LIGHT MOUNT ON: () LEFT () RIGHT
 ()

SAFETY RELIEF VALVE (S): KUNKLE FIG# 6010 SET @ 150 PSI STEAM
 (2) 1.25" X 1.5" () ()
 ()

PRESSURE GAUGE: (X) PRECISION (X) W/ SYPHON & TEST

(X) 4.5" 0 - 300 PSI

()

FEEDWATER VALVES: 1.5 " 200 PSI. () LFT (X) RT (X) SCREWED () FLANGED

(X) STOP VALVE: (X) APOLLO 70-140 BALL ()

(X) CHECK VALVE; (X) CHECK-ALL 316SS IN A UNION ()

()

PROPORTIONING FW VALVE: " () NPT () FLANGED ()

()

THREE VALVE BY PASS: " () NPT () FLANGED ()

() APOLLO 70-140 BALL VALVES ()

BLOWDOWN VALVES: 1.25 " 2 / 300 PSI, () LFT (X) RT (X) SCREWED () FLANGED

(2) QUICK OPENING, (X) UB 425 ()

(1) SLOW OPENING, () UB 226UT; (X) UB 325U (X) PIPED TO COMMON HEADER

(X) SURFACE BLOWDOWN SKIMMER TUBE & BUSHING (X) .75" APOLLO 70-140 BALL VALVE

(X) .75" U.B. FIG 364 METERING VLV

(X) WBL100 CONDUCTIVITY CONTROL W/
WORCESTER VALVE

PRESSURE/TEMPERATURE CONTROLS: (X) HONEYWELL ()

(X) OPERATING L404F 1102

(X) PROPORTIONING L91B 1050

(X) HI LIMIT L4079B 1041

(X) MR () LIGHT () ALARM

() AUTO LO FIRE HOLD

() HIGH PRESSURE WELL (SEC. 1)

() DAY NITE:

()

OTHER BOILER TRIM:

(X) 4" MAIN STEAM VALVE; DAVIS 30FGAW

()

(X) HIGH STACK TEMPERATURE LIMIT CONTROL: FDC-L91 W/ ENDRESS & HAUSER

() THERMOCOUPLE, ALARM BELL, LIGHT; J BOX

()

()

()

()

()

()

BURNER DATA: (X) POWER FLAME

QUOTE #: 101922-125MJK Release:551

FURNISHED BY: (X) HBC ()

(X) WE MOUNT () FIELD

MOUNT

BURNER MODEL: C5-GO-30

AGENCY APPROVALS: (X) UL (X) CSD-1 () FM () NFPA 85 () XL GAPS ()

()

FUELS: (X) NAT.GAS @ 20/28" () @ (X) #2 OIL () # OIL ()

IGNITION TYPE: (X) () DIRECT SPARK ()

GAS PILOT

ELECTRICAL: MOTORS 460 / 60 / 3 (X) CONTROL TRANSFORMER ()

7.5 HP BLOWER (X) OIL PUMP WE MOUNT/LEFT HAND SIDE

3" GAS TRAIN ON (X) LFT () RT () AIR COMPRESSOR () LFT () RT ()

()

CONTROL PANEL: (X) ON BURNER () SIDE OF BOILER ()

()

PANEL LIGHTS: (X) POWER (X) FUEL ON (X) CFH (X) IGNITION () ALARM () FF

() DRAFT (X) HI STACK TEMP () () () ()

()

ALARM (X) BUZZER () (X) AUTO SILENCER (X) TO ALARM ON *** ABOVE

()

OPERATING SEQUENCE: () ON/OFF () LHO () LHO, PLFS () LHL () LHL, PLFS

(X) FULL MOD. W/ POT. ()