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# Sherwood Industries Ltd.

Project # 21-703

Model: Enviro M55-FS-2

AKA: Enviro M55C-FS-2  
Enviro M55C-FPI-2  
FPI GC60-2  
FPI GC160-2

Type: Pellet-Fired Heater, Freestanding  
or Insert

September 15, 2021

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**ASTM E2779 Standard Test Method for  
Determining Particulate Matter Emissions  
from Pellet Heaters**

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Contact: Garrett Posehn  
Sherwood Industries Ltd.  
6782 Oldfield Rd.  
Victoria, BC Canada  
V8M 2A3  
250-652-6080

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Prepared by: Aaron Kravitz

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**11785 SE Highway 212 – Suite 305  
Clackamas, OR 97015-9050  
(503) 650-0088  
[WWW.PFSTECO.COM](http://WWW.PFSTECO.COM)**

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## Affidavit

PFS-TECO was contracted by Sherwood Industries Ltd. to provide testing services for the Enviro M55-FS-2 Pellet-Fired Fireplace Insert per ASTM E2779, *Determining PM Emissions from Pellet Heaters*. All testing and associated procedures were conducted at PFS-TECO's Portland Laboratory on 7/29/2021. PFS-TECO's Portland Laboratory is located at 11785 SE Highway 212 – Suite 305, Clackamas, Oregon 97015. Testing procedures followed ASTM E2779. Particulate sampling was performed per ASTM E2515, *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel*.

PFS-TECO is accredited by the U.S. Environmental Protection Agency for the certification and auditing of wood heaters pursuant to subpart AAA of 40 CFR Part 60, New Source Performance Standards for Residential Wood Heaters and subpart QQQQ of 40 CFR Part 60, Standards of Performance for New Hydronic Heaters and Forced Air Furnaces, Methods 28R, 28WHH, 28 WHH-PTS, and all methods listed in Sections 60.534 and 60.5476. PFS-TECO holds EPA Accreditation Certificate Numbers 4 and 4M (mobile). PFS-TECO is accredited by IAS to ISO 17020:2012 "Criteria for Bodies Performing Inspections", and ISO 17025:2005 "Requirements for Testing Laboratories." PFS-TECO is also accredited by Standards Council of Canada to ISO 17065:2012 "Requirements for Bodies Operating Product Certification Systems."

The following people were associated with the testing, analysis and report writing associated with this project.



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Aaron Kravitz, Testing Supervisor

## Introduction

Sherwood Industries Ltd. of Victoria, BC, contracted with PFS-TECO to perform EPA certification testing on the Enviro M55-FS-2 Pellet-Fired Room Heater. All testing was performed at PFS-TECO's Portland Laboratory. Testing was performed by Mr. Aaron Kravitz.

## Notes

- Prior to start of testing, 50 hours of conditioning was performed by the manufacturer at a medium burn setting, in accordance with ASTM E2779.
- Prior to start of testing, the dilution tunnel was cleaned with a steel brush.
- Front filters were changed on sample train A at one hour after the test began.
- A single, integrated test run, in accordance with ASTM E2779 was performed:
  - 1 Hour at Maximum Burn Setting
  - 2 Hours at Medium Burn Setting (Defined as <50% of Maximum Burn Rate)
  - 3 Hours at Minimum Burn Setting

## Pellet Heater Identification and Testing

- Appliance Tested: **Enviro M55-FS-2**
- Serial Number: **N/A – Prototype Unit; PFS Tracking Number 0096**
- Manufacturer: **Sherwood Industries Ltd.**
- Catalyst: **No**
- Heat exchange blower: **Integral**
- Type: **Pellet Stove**
- Style: **Free Standing**
- Date Received: **Thursday, July 29, 2021**
- Testing Period – Start: **Thursday, July 29, 2021** Finish: **Thursday, July 29, 2021**
- Test Location: **PFS-TECO Portland Laboratory, 11785 SE HWY 212 - Suite 305, Clackamas, OR 97015**
- Elevation: **≈131 Feet above sea level**
- Test Technician(s): **Aaron Kravitz**
- Observers: **Mr. Winslow Howe**

## Test Procedures and Equipment

All Sampling and analytical procedures were performed by Aaron Kravitz. All procedures used are directly from ASTM E2779 and ASTM E2515. See the list below for equipment used. See Appendix C submitted with this report for calibration data.

Equipment List:

Equipment ID#	Equipment Description
053	APEX XC-60 Digital Emissions Sampling Box A
054	APEX XC-60 Digital Emissions Sampling Box B
055	APEX Ambient sampling box
057	California Analytical ZRE CO2/CO/O2 IR ANALYZER
064	Digital Barometer
109A/B	Troemner 100mg/200mg Audit Weights
107	Sartorius Analytical Balance
097	10 lb audit weight
095	Anemometer
111	Microtector
190	Mettler Toledo 1000 x 0.02lb platform scale
92302052	Gas Analyzer Calibration Span Gas
91005049	Gas Analyzer Calibration Mid Gas

## Results

The integrated test run emission rate for test Run 1 was measured to be **1.9 g/hr** with a Higher Heating Values efficiency of **78%** and a CO emission rate of **0.4 g/min**. The calculated first hour particulate emission rate was **6.4 g/hr**. The Sherwood Industries Ltd. Model Enviro M55-FS-2 Pellet-Fired Room Heater meets the 2020 PM emission standard of  $\leq 2.0$  g/hr per CFR 40 part 60, §60.532 (b).

Detailed individual run data can be found in Appendix A submitted with this report.

## Summary Table

**EPA Application Table**

Run #	Date	Segment/Setting	BR (kg/hr)	Run Time (min)	Heat Output (BTU/hr)	1st Hr Emissions (g/hr)	Overall Emissions (g/hr)	CO Emissions (g/min)	Overall CO Emissions (g/min)	Heating Efficiency (%HHV)	Overall Heating Efficiency (%HHV)
1	7/29/21	H	2.54	60	38437	6.44	1.9	1.24	0.4	78.6%	78%
		M	1.15	120	16911			0.25		76.8%	
		L	0.52	180	7817			0.20		77.6%	
		OA	1.07	360	16060			0.38		78.2%	

## Test Run Narrative

### Run 1

Run 1 was performed on 7/29/2021 as an attempted integrated test run per ASTM E2779. The overall test duration was 360 minutes. The particulate emissions rate for the integrated test run was 1.9 g/hr. The run had an overall HHV efficiency of 78%. The train A front filter was changed at 1 hr. All test results were appropriate and valid and the burn rate requirement for the integrated test run were achieved. There were no anomalies and all criteria were met.

## Test Conditions Summary

Testing conditions for all runs fell within allowable specifications of ASTM E2779 and ASTM E2515. A summary of facility conditions, fuel burned, and run times is listed below.

Runs	Ambient (°F)		Relative Humidity (%)		Average Barometric Pressure (In. Hg.)	Preburn Fuel Weight (lbs)	Test Fuel Weight (lbs)	Test Fuel Moisture (%DB)	Test Run Time (Min)
	Pre	Post	Pre	Post					
1	77	83	40.0	19.4	30.00	5.9	14.7	4.16	360

## Appliance Operation and Test Settings

The appliance was operated according to procedures as described in the Operations Manual, found in Appendix B submitted with this report. Detailed run information can be found in Appendix A submitted with this report.

## Settings & Run Notes

	Pre-Burn	Test Run
<b>Run 1</b>	Heat setting 5 (max), Feed trim 5 (max), Combustion trim* 1	<b>High Segment:</b> Heat Setting 5, Feed trim 5, combustion trim 1  <b>Medium Segment:</b> Heat Setting 2, Feed trim 3, Combustion trim 1  <b>Low Segment:</b> Heat Setting 1 (min), Feed trim 1 (min), Combustion trim 1

\*Combustion trim setting does not affect burn rate

## Appliance Description

**Model(s):** Enviro M55-FS-2  
 Enviro M55C-FS-2  
 Enviro M55C-FPI-2  
 FPI GC60-2  
 FPI GCI60-2

**Additional Models Discussion:** The M55-FS-2 is available in three variants: the basic model (M55-FS-2), a version with decorative cast iron trim (M55C-FS-2), and a fireplace insert version (M55C-FPI-2). These differences between these models are cosmetic only and do not affect emissions performance; all k-list items are shared between the three variants.

Two additional models are available (Fireplace Products International GC60-2 and GCI60-2), which are marketing designations only and are in all respects identical to the M55-FS-2 and M55C-FPI-2, respectively.

**Appliance Type:** Pellet-Fired Heater, Freestanding or Fireplace Insert

**Air Introduction System:** Air enters the burn chamber by being pulled through the firepot, via the exhaust blower, see air flow diagram in Appendix D.

**Combustion Control:** Feed rate is electronically controlled via user-selectable controls.

**Baffles:** N/A

**Flue Outlet:** 3-inch exhaust outlet located on the rear of the appliance.

## Appliance Dimensions

**Enviro M55-FS-2 Dimensions**

Height	Width	Depth	Firebox Volume	Weight
36 ½"	24"	29"	N/A – Pellet Stove	315 lbs

Appliance design drawings can be found in Appendix D submitted with the CBI copy of this report.

Appliance Front



Appliance Left



Appliance Right



Appliance Rear



## Test Fuel Properties

Test fuel used was Lignetics Wood Pellet Fuel, a PFI Certified Premium Pellet Brand. A sample of pellets was sent to Twin Ports Testing for analysis, see report below.



## Pellet Fuel Analysis



Twin Ports Testing, Inc.  
1301 North 3rd Street  
Superior, WI 54880  
p: 715-392-7114  
p: 800-373-2562  
f: 715-392-7163  
www.twinportstesting.com

Report No: USR:W221-0439-01  
Issue No: 1

## Analytical Test Report

Client: PFS-TECO  
11785 SE Hwy 212 Ste 305  
Clackamas, OR 97015  
Attention: Sebastian Button  
PO No:

Signed:

Katy Jahr  
Chemistry Lab Supervisor

Date of Issue: 8/10/2021

THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL

## Sample Details

Sample Log No: W221-0439-01  
Sample Designation: M55  
Sample Recognized As: Wood Pellets

Sample Date:  
Sample Time:  
Arrival Date: 8/3/2021

## Test Results

	METHOD	UNITS	MOISTURE FREE	AS RECEIVED
Moisture Total	ASTM E871	wt. %		3.99
Ash	ASTM D1102	wt. %	0.27	0.26
Volatile Matter	ASTM D3175	wt. %		
Fixed Carbon by Difference	ASTM D3172	wt. %		
Sulfur	ASTM D4239	wt. %	0.005	0.004
SO <sub>2</sub>	Calculated	lb/mmbtu		0.011
Net Cal. Value at Const. Pressure	ISO 1928	GJ/tonne	18.34	17.51
Gross Cal. Value at Const. Vol.	ASTM E711	Btu/lb	8715	8367
Carbon	ASTM D5373	wt. %	48.38	46.44
Hydrogen*	ASTM D5373	wt. %	8.93	8.57
Nitrogen	ASTM D5373	wt. %	1.59	1.52
Oxygen*	ASTM D3176	wt. %	40.84	39.21

\*Note: As received values do not include hydrogen and oxygen in the total moisture.

Chlorine	ASTM D6721	mg/kg		
Fluorine	ASTM D3761	mg/kg		
Mercury	ASTM D6722	mg/kg		
Bulk Density	ASTM E873	lbs/ft <sup>3</sup>		
Fines (Less than 1/8")	TPT CH-P-06	wt. %		
Durability Index	Kansas State	PDI		
Sample Above 1.50"	TPT CH-P-06	wt. %		
Maximum Length (Single Pellet)	TPT CH-P-06	inch		
Diameter, Range	TPT CH-P-05	inch		to
Diameter, Average	TPT CH-P-05	inch		
Stated Bag Weight	TPT CH-P-01	lbs		
Actual Bag Weight	TPT CH-P-01	lbs		

Comments:



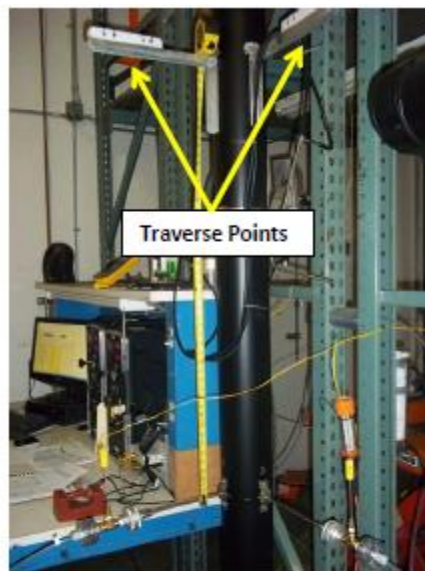
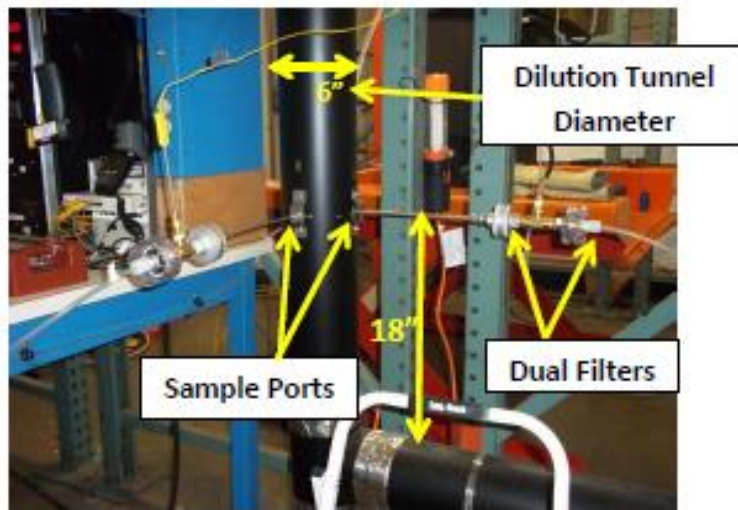
PJLA  
Testing  
Accreditation #60243

Results issued on this report only reflect the analysis of the sample submitted. Our reports and letters are for the exclusive and confidential use of our clients and may not be reproduced, except in their entirety, without the written approval of Twin Ports Testing. Twin Ports Testing Laboratory is accredited to the ISO/IEC 17025:2017 standard by PJLA.

## Sampling Locations and Descriptions

Sample ports are located 16.5 feet downstream from any disturbances and 1 foot upstream from any disturbances. Flow rate traverse data was collected 12 feet downstream from any disturbances and 5.5 feet upstream from any disturbances. (See below).

### Sample Points



## Sampling Methods

ASTM E2515 was used in collecting particulate samples. The dilution tunnel is 6 inches in diameter. All sampling conditions per ASTM E2515 were followed. No alternate procedures were used.

## Analytical Methods Description

All sample recovery and analysis procedures followed ASTM E2515 procedures. At the end of each test run, filters, O-Rings and probes were removed from their housings, dessicated for a minimum of 24 hours, and then weighed at 6 hour intervals to a constant weight per ASTM E2515-11 Section 10.

## Calibration, Quality Control and Assurances

Calibration procedures and results were conducted per EPA Method 28R, ASTM E2515-11 and ASTM E2780-10. Test method quality control procedures (leak checks, volume meter checks, stratification checks, proportionality results) followed the procedures outlined.

## Appliance Sealing and Storage

Upon completion of testing, the appliance was secured with metal strapping and the seal below was applied, the appliance was then returned to the manufacturer's location at: 6782 Oldfield Rd. Victoria, BC Canada V8M 2A3 for archival.

### Sealing Label

#### ATTENTION:

THIS SEAL IS NOT TO BE BROKEN WITHOUT PRIOR AUTHORIZATION FROM THE  
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY.

THIS APPLIANCE HAS BEEN SEALED INACCORDANCE WITH REQUIREMENTS OF 40CFR  
PART 60 SUBPART AAA §60.535 (a)(2)(vii)

REPORT # \_\_\_\_\_

DATE SEALED \_\_\_\_\_

MANUFACTURER \_\_\_\_\_

MODEL # \_\_\_\_\_

## Sealed Unit



## List of Appendices

The following appendices have been submitted electronically in conjunction with this report:

Appendix A – Test Run Data, Technician Notes, and Sample Analysis

Appendix B – Labels and Manuals

Appendix C – Equipment Calibration Records

Appendix D – Design Drawings (CBI Report Only)

Appendix E – Manufacturer QAP (CBI Report Only)

## Pre-Conditioning Data

Client: Sherwood

Model: M55

Date(s): 4/27/21 - 4/29/21

Job #: 21-703

Tracking #: 91

Technician: CWH

Elapsed Time (hrs)	Flue (°F)	Catalyst Exit (°F)	Scale (lb)	Weight Change(lbs)	Notes: Indicate all air settings or adjustments, and all fuel addition weights and moistures
0	207.5	N/A	417.58	-	All conditioning conducted at medium settings:
1	204.1	N/A	414.96	-2.62	Heat 3, Fuel trim 2, Combustion Trim 1
2	202.8	N/A	412.87	-2.10	
3	219.8	N/A	410.45	-2.41	
4	218.9	N/A	408.14	-2.31	
5	207.0	N/A	405.96	-2.18	
6	209.2	N/A	444.17	38.21	Added 40 lbs of Lignetics Premium pellets, 4%DB moisture
7	213.4	N/A	442.09	-2.08	
8	211.5	N/A	439.78	-2.31	
9	215.2	N/A	437.60	-2.18	
10	208.8	N/A	435.39	-2.21	
11	203.2	N/A	433.19	-2.20	
12	207.3	N/A	431.01	-2.18	
13	201.8	N/A	428.80	-2.21	
14	200.3	N/A	426.62	-2.18	
15	204.4	N/A	424.41	-2.21	
16	194.4	N/A	422.22	-2.18	
17	203.4	N/A	420.01	-2.21	
18	207.0	N/A	417.72	-2.29	
19	210.2	N/A	415.20	-2.52	
20	211.3	N/A	412.80	-2.40	
21	218.3	N/A	410.27	-2.52	
22	216.8	N/A	447.97	37.69	Added 40 lbs of Lignetics Premium pellets, 4%DB moisture
23	219.1	N/A	445.55	-2.42	
24	217.7	N/A	443.15	-2.39	
25	221.0	N/A	440.84	-2.32	
26	219.4	N/A	438.45	-2.39	
27	220.2	N/A	436.04	-2.41	
28	209.8	N/A	433.86	-2.18	
29	219.9	N/A	431.46	-2.40	
30	208.1	N/A	429.15	-2.31	
31	215.9	N/A	426.97	-2.18	
32	204.0	N/A	424.77	-2.21	
33	208.2	N/A	422.59	-2.18	
34	200.9	N/A	420.39	-2.21	
35	195.2	N/A	418.30	-2.08	
36	196.0	N/A	416.20	-2.11	
37	194.3	N/A	414.12	-2.08	
38	191.5	N/A	412.01	-2.11	
39	193.5	N/A	452.43	40.42	Added 40 lbs of Lignetics Premium pellets, 4%DB moisture
40	196.5	N/A	450.27	-2.16	
41	199.8	N/A	448.12	-2.15	
42	207.3	N/A	445.87	-2.25	
43	214.9	N/A	443.42	-2.45	
44	211.0	N/A	441.18	-2.24	
45	222.1	N/A	438.75	-2.43	
46	219.2	N/A	436.12	-2.63	
47	218.4	N/A	433.79	-2.33	
48	218.7	N/A	431.53	-2.26	
49	221.4	N/A	429.31	-2.22	
50	222.7	N/A	427.06	-2.25	

## Equations and Sample Calculations – ASTM E2779 & E2515

Client Sherwood  
 Model: M55  
 Tracking #: 0091  
 Run: 1

Equations used to calculate the parameters listed below are described in this appendix. Sample calculations are provided for each equation. The raw data and printout results from a sample run are also provided for comparison to the sample calculations.

$M_{Bdb}$  – Weight of test fuel burned during test run, dry basis, kg

$M_{BSidb}$  – Weight of test fuel burned during test run segment  $i$ , dry basis, kg

$BR$  – Average dry burn rate over full integrated test run, kg/hr

$BR_{Si}$  – Average dry burn rate over test run segment  $i$ , kg/hr

$V_s$  – Average gas velocity in the dilution tunnel, ft/sec

$Q_{sd}$  – Average gas flow rate in dilution tunnel, dscf/hr

$V_{m(std)}$  – Volume of Gas Sampled Corrected to Dry Standard Conditions, dscf

$m_n$  – Total Particulate Matter Collected, mg

$C_s$  - Concentration of particulate matter in tunnel gas, dry basis, corrected to STP, g/dscf

$E_T$  – Total Particulate Emissions, g

PR - Proportional Rate Variation

$PM_R$  – Average particulate emissions for full integrated test run, g/hr

$PM_F$  – Average particulate emission factor for full integrated test run, g/dry kg of fuel burned

**M<sub>Bdb</sub> – Weight of test fuel burned during test run, dry basis, kg**

ASTM E2779 equation (1)

$$M_{Bdb} = (M_{Swb} - M_{Ewb})(100/(100 + FM))$$

Where,

FM = average fuel moisture of test fuel, % dry basis

M<sub>Swb</sub> = weight of test fuel in hopper at start of test run, wet basis, kg

M<sub>Ewb</sub> = weight of test fuel in hopper at end of test run, wet basis, kg

Sample Calculation:

$$FM = 4.16 \%$$

$$M_{Swb} = 14.7 \text{ lbs}$$

$$M_{Ewb} = 0.0 \text{ lbs}$$

0.4536 = Conversion factor from lbs to kg

$$M_{Bdb} = [(14.7 \times 0.4536) - (0.0 \times 0.4536)] (100/(100 + 4.156))$$

$$M_{Bdb} = 6.41 \text{ kg}$$

**$M_{BSidb}$  – Weight of test fuel burned during test run segment  $i$ , dry basis, kg**  
 ASTM E2779 equation (2)

$$M_{BSidb} = (M_{SSiwb} - M_{ESiwb})(100/(100 + FM))$$

Where,

$M_{SSiwb}$  = weight of test fuel in hopper at start of test run segment  $i$ , wet basis, kg

$M_{ESiwb}$  = weight of test fuel in hopper at end of test run segment  $i$ , wet basis, kg

Sample Calculation (from medium burn rate segment):

$$FM = 4.16 \%$$

$$M_{SSiwb} = 8.9 \text{ lbs}$$

$$M_{ESiwb} = 3.6 \text{ lbs}$$

$$0.4536 = \text{Conversion factor from lbs to kg}$$

$$M_{BSidb} = [(8.9 \times 0.4536) - (3.6 \times 0.4536)] (100/(100 + 4.16))$$

$$M_{BSidb} = 2.29 \text{ kg}$$

**BR – Average dry burn rate over full integrated test run, kg/hr**

ASTM E2779 equation (3)

$$BR = \frac{60 M_{Bdb}}{\theta}$$

Where,

$\theta$  = Total length of full integrated test run, min

Sample Calculation:

$$M_{Bdb} = 6.41 \quad \text{kg}$$

$$\theta = 360 \quad \text{min}$$

$$BR = \frac{60 \times 6.41}{360}$$

$$BR = 1.07 \quad \text{kg/hr}$$

**BR<sub>Si</sub> – Average dry burn rate over test run segment *i*, kg/hr**

ASTM E2779 equation (4)

$$BR_{Si} = \frac{60 M_{BSidb}}{\theta_{Si}}$$

Where,

$$\theta_{Si} = \text{Total length of test run segment } i, \text{ min}$$

Sample Calculation (from medium burn rate segment):

$$M_{BSidb} = 2.29 \text{ kg}$$

$$\theta = 120 \text{ min}$$

$$BR = \frac{60 \times 2.29}{120}$$

$$BR = 1.15 \text{ kg/hr}$$

**V<sub>s</sub> – Average gas velocity in the dilution tunnel, ft/sec**

ASTM E2515 equations (9)

$$V_s = F_p \times K_p \times C_p \times (\sqrt{\Delta P})_{avg} \times \sqrt{\frac{T_s}{P_s \times M_s}}$$

Where:

- $F_p$  = Adjustment factor for center of tunnel pitot tube placement,  $F_p = \frac{V_{strav}}{V_{scent}}$ , ASTM E2515 Equation (1)
- $V_{scent}$  = Dilution tunnel velocity calculated after the multi-point pitot traverse at the center, ft/sec
- $V_{strav}$  = Dilution tunnel velocity calculated after the multi-point pitot traverse, ft/sec
- $k_p$  = Pitot tube constant, 85.49
- $C_p$  = Pitot tube coefficient: 0.99, unitless
- $\Delta P^*$  = Velocity pressure in the dilution tunnel, in H<sub>2</sub>O
- $T_s$  = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
- $P_s$  = Absolute average gas static pressure in dilution tunnel, =  $P_{bar} + P_g$ , in Hg
- $P_{bar}$  = Barometric pressure at test site, in. Hg
- $P_g$  = Static pressure of tunnel, in. H<sub>2</sub>O; (in Hg = in H<sub>2</sub>O/13.6)
- $M_s$  = \*\*The dilution tunnel wet molecular weight;  $M_s = 28.78$  assuming a dry weight of 29 lb/lb-mole

Sample calculation:

$$F_p = \frac{7.38}{10.63} = 0.694$$

$$V_s = 0.694 \times 85.49 \times 0.99 \times 0.158 \times \left( \frac{93.0 + 460}{30.00 + \frac{-0.07}{13.6}} \times 28.78 \right)^{1/2}$$

$$V_s = 7.41 \text{ ft/s}$$

\*The ASTM test standard mistakenly has the square root of the average delta p instead of the average of the square root of delta p. The current EPA Method 2 is also incorrect. This was verified by Mike Toney at EPA.

\*\*The ASTM test standard mistakenly identifies  $M_s$  as the dry molecular weight. It should be the wet molecular weight as indicated in EPA Method 2.

**Q<sub>sd</sub> – Average gas flow rate in dilution tunnel, dscf/hr**

ASTM E2515 equation (3)

$$Q_{sd} = 3600 \times (1 - B_{ws}) \times v_s \times A \times \frac{T_{std}}{T_s} \times \frac{P_s}{P_{std}}$$

Where:

3600	=	Conversion from seconds to hours (ASTM method uses 60 to convert in minutes)
B <sub>ws</sub>	=	Water vapor in gas stream, proportion by volume; assume 2%
A	=	Cross sectional area of dilution tunnel, ft <sup>2</sup>
T <sub>std</sub>	=	Standard absolute temperature, 528 °R
P <sub>s</sub>	=	Absolute average gas static pressure in dilution tunnel, = P <sub>bar</sub> + P <sub>g</sub> , in Hg
T <sub>s</sub>	=	Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P <sub>std</sub>	=	Standard absolute pressure, 29.92 in Hg

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 7.41 \times 0.7854 \times \frac{528}{93.0 + 460} \times \frac{30 + \frac{-0.07}{13.6}}{29.92}$$

$$Q_{sd} = 19661.1 \text{ dscf/hr}$$

**$V_{m(std)}$  – Volume of Gas Sampled Corrected to Dry Standard Conditions, dscf**  
 ASTM E2515 equation (6)

$$V_{m(std)} = K_1 \times V_m \times Y \times \frac{P_{bar} + \left( \frac{\Delta H}{13.6} \right)}{T_m}$$

Where:

$K_1$	=	17.64 °R/in. Hg
$V_m$	=	Volume of gas sample measured at the dry gas meter, dcf
$Y$	=	Dry gas meter calibration factor, dimensionless
$P_{bar}$	=	Barometric pressure at the testing site, in. Hg
$\Delta H$	=	Average pressure differential across the orifice meter, in. H <sub>2</sub> O
$T_m$	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

Using equation for Train A:

$$V_{m(std)} = 17.64 \times 49.176 \times 0.996 \times \frac{\left( 30 + \frac{1.86}{13.6} \right)}{\left( 103.1 + 460 \right)}$$

$$V_{m(std)} = \mathbf{46.236} \text{ dscf}$$

Using equation for Train B:

$$V_{m(std)} = 17.64 \times 49.995 \times 1.017 \times \frac{\left( 30.00 + \frac{1.84}{13.6} \right)}{\left( ##### + 460 \right)}$$

$$V_{m(std)} = \mathbf{48.088} \text{ dscf}$$

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 64.91 \times 0.992 \times \frac{\left( 30 + \frac{0.00}{13.6} \right)}{\left( 79.9 + 460 \right)}$$

$$V_{m(std)} = \mathbf{63.100} \text{ dscf}$$

**$m_n$  – Total Particulate Matter Collected, mg**

ASTM E2515 Equation (12)

$$m_n = m_p + m_f + m_g$$

Where:

 $m_p$  = mass of particulate matter from probe, mg $m_f$  = mass of particulate matter from filters, mg $m_g$  = mass of particulate matter from filter seals, mg

Sample Calculation:

Using equation for Train A (first hour):

$$m_n = 0.0 + 2.6 + 0.0$$

$$m_n = 2.6 \text{ mg}$$

Using equation for Train A (remainder):

$$m_n = 0.0 + 1.6 + 0.2$$

$$m_n = 1.8 \text{ mg}$$

Train A Aggregate = **4.4 mg**

Using equation for Train B:

$$m_n = 0.0 + 5.0 + 0.0$$

$$m_n = \mathbf{5.0 \text{ mg}}$$

**C<sub>s</sub> - Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions, g/dscf**  
 ASTM E2515 equation (13)

$$C_s = K_2 \times \frac{m_n}{V_{m(std)}}$$

Where:

K <sub>2</sub>	=	Constant, 0.001 g/mg
m <sub>n</sub>	=	Total mass of particulate matter collected in the sampling train, mg
V <sub>m(std)</sub>	=	Volume of gas sampled corrected to dry standard conditions, dscf

Sample calculation:

For Train A:

$$C_s = 0.001 \times \frac{4.4}{46.24}$$

$$C_s = \mathbf{0.00010} \text{ g/dscf}$$

For Train B:

$$C_s = 0.001 \times \frac{5.0}{48.09}$$

$$C_s = \mathbf{0.00010} \text{ g/dscf}$$

For Ambient Train

$$C_r = 0.001 \times \frac{0.2}{63.10}$$

$$C_r = \mathbf{0.000003} \text{ g/dscf}$$

**E<sub>T</sub> – Total Particulate Emissions, g**

ASTM E2515 equation (15)

$$E_T = (c_s - c_r) \times Q_{std} \times \theta$$

Where:

C <sub>s</sub>	=	Concentration of particulate matter in tunnel gas, g/dscf
C <sub>r</sub>	=	Concentration particulate matter room air, g/dscf
Q <sub>std</sub>	=	Average dilution tunnel gas flow rate, dscf/hr
θ	=	Total time of test run, minutes

Sample calculation:

For Train A

$$E_T = ( \underline{0.000095} - 0.000003 ) \times \underline{19661.1} \times \underline{360} / 60$$

$$E_T = \underline{10.85} \text{ g}$$

For Train B

$$E_T = ( \underline{0.000104} - 0.000003 ) \times \underline{19661.1} \times \underline{360} / 60$$

$$E_T = \underline{11.89} \text{ g}$$

Average

$$E = \underline{11.37} \text{ g}$$

Total emission values shall not differ by more than 7.5% from the total average emissions

$$7.5\% \text{ of the average} = \underline{0.85}$$

$$\text{Train A difference} = \underline{0.52}$$

$$\text{Train B difference} = \underline{0.52}$$

**PR - Proportional Rate Variation**

ASTM E2515 equation (16)

$$PR = \left[ \frac{\theta \times V_{mi} \times V_s \times T_m \times T_{si}}{\theta_i \times V_m \times V_{si} \times T_{mi} \times T_s} \right] \times 100$$

Where:

- $\theta$  = Total sampling time, min  
 $\theta_i$  = Length of recording interval, min  
 $V_{mi}$  = Volume of gas sample measured by the dry gas meter during the "ith" time interval, dcf  
 $V_m$  = Volume of gas sample as measured by dry gas meter, dcf  
 $V_{si}$  = Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec  
 $V_s$  = Average gas velocity in the dilution tunnel, ft/sec  
 $T_{mi}$  = Absolute average dry gas meter temperature during the "ith" time interval, °R  
 $T_m$  = Absolute average dry gas meter temperature, °R  
 $T_{si}$  = Absolute average gas temperature in the dilution tunnel during the "ith" time interval, °R  
 $T_s$  = Absolute average gas temperature in the dilution tunnel, °R

Sample calculation (for the first 1 minute interval of Train A):

$$PR = \left( \frac{360 \times 0.138 \times 7.41 \times (103.1 + 460) \times (93.0 + 460)}{1 \times 49.176 \times 7.58 \times (93.0 + 460) \times (80.2 + 460)} \right) \times 100$$

$$PR = \underline{103} \%$$

**PM<sub>R</sub> – Average particulate emissions for full integrated test run, g/hr**  
ASTM E2779 equation (5)

$$PM_R = 60 (E_T/\theta)$$

Where,

$E_T$  = Total particulate emissions, grams

$\theta$  = Total length of full integrated test run, min

Sample Calculation:

$$E_T \text{ (Dual train average)} = 11.37 \text{ g}$$

$$\theta = 360 \text{ min}$$

$$PM_R = 60 \times (11.37 / 360)$$

$$PM_R = 1.90 \text{ g/hr}$$

**PM<sub>F</sub> – Average particulate emission factor for full integrated test run, g/dry kg of fuel burned**  
ASTM E2779 equation (6)

$$PM_F = E_T / M_{Bdb}$$

Where,

$E_T$  = Total particulate emissions, grams

$M_{Bdb}$  = Weight of test fuel burned during test run, dry basis, kg

Sample Calculation:

$$E_T \text{ (Dual train average)} = 11.37 \text{ g}$$

$$M_{Bdb} = 6.41 \text{ kg}$$

$$PM_F = 11.37 / 6.41 )$$

$$PM_F = 1.78 \text{ g/kg}$$



Twin Ports Testing, Inc.  
1301 North 3rd Street  
Superior, WI 54880  
p: 715-392-7114  
p: 800-373-2562  
f: 715-392-7163  
www.twinportstesting.com

**Report No:** USR:W221-0439-01  
**Issue No:** 1

## Analytical Test Report

**Client:** PFS-TECO  
11785 SE Hwy 212 Ste 305  
Clackamas, OR 97015  
**Attention:** Sebastian Button  
**PO No:**

Signed:

*Katy Jahr*

Katy Jahr  
Chemistry Lab Supervisor

Date of Issue: 8/10/2021

THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL

### Sample Details

**Sample Log No:** W221-0439-01  
**Sample Designation:** M55  
**Sample Recognized As:** Wood Pellets

**Sample Date:**  
**Sample Time:**  
**Arrival Date:** 8/3/2021

### Test Results

	METHOD	UNITS	MOISTURE FREE	AS RECEIVED
Moisture Total	ASTM E871	wt. %		3.99
Ash	ASTM D1102	wt. %	0.27	0.26
Volatile Matter	ASTM D3175	wt. %		
Fixed Carbon by Difference	ASTM D3172	wt. %		
Sulfur	ASTM D4239	wt. %	0.005	0.004
SO <sub>2</sub>	Calculated	lb/mmbtu		0.011
Net Cal. Value at Const. Pressure	ISO 1928	GJ/tonne	18.34	17.51
Gross Cal. Value at Const. Vol.	ASTM E711	Btu/lb	8715	8367
Carbon	ASTM D5373	wt. %	48.38	46.44
Hydrogen*	ASTM D5373	wt. %	8.93	8.57
Nitrogen	ASTM D5373	wt. %	1.59	1.52
Oxygen*	ASTM D3176	wt. %	40.84	39.21

\*Note: As received values do not include hydrogen and oxygen in the total moisture.

Chlorine	ASTM D6721	mg/kg
Fluorine	ASTM D3761	mg/kg
Mercury	ASTM D6722	mg/kg

Bulk Density	ASTM E873	lbs/ft <sup>3</sup>	
Fines (Less than 1/8")	TPT CH-P-06	wt. %	
Durability Index	Kansas State	PDI	
Sample Above 1.50"	TPT CH-P-06	wt. %	
Maximum Length (Single Pellet)	TPT CH-P-06	inch	
Diameter, Range	TPT CH-P-05	inch	to
Diameter, Average	TPT CH-P-05	inch	
Stated Bag Weight	TPT CH-P-01	lbs	
Actual Bag Weight	TPT CH-P-01	lbs	

Comments:



Accreditation #60243

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**PELLET TEST DATA PACKET**  
**ASTM E2779/E2515**



**Run 1 Data Summary**

Client: Sherwood  
Model: M55  
Job #: 21-703  
Tracking #: 0091  
Test Date: 7/29/2021

  
\_\_\_\_\_  
Technician Signature

9/14/2021  
\_\_\_\_\_  
Date

# TEST RESULTS - ASTM E2779 / ASTM E2515

Client: SherwoodModel: M55Run #: 1Job #: 21-703Tracking #: 0091Technician: AKDate: 7/29/2021

Burn Rate Summary	
High Burn Rate (dry kg/hr)	2.54
Medium Burn Rate (dry kg/hr)	1.15
Low Burn Rate (dry kg/hr)	0.52
Overall Burn Rate (dry kg/hr)	1.07

45.0% of High Burn Rate

20.6% of High Burn Rate

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Train A
Total Sample Volume (ft <sup>3</sup> )	64.911	49.176	49.995	8.147
Average Gas Velocity in Dilution Tunnel (ft/sec)	7.4			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	19661.1			
Average Gas Meter Temperature (°F)	79.9	103.1	102.0	87.2
Total Sample Volume (dscf)	63.100	46.236	48.088	7.882
Average Tunnel Temperature (°F)	93.0			
Total Time of Test (min)	360			
Total Particulate Catch (mg)	0.2	4.4	5.0	2.6
Particulate Concentration, dry-standard (g/dscf)	0.0000032	0.0000952	0.0001040	0.0003299
Total PM Emissions (g)	0.37	10.85	11.89	6.42
Particulate Emission Rate (g/hr)	0.06	1.81	1.98	6.42
Emissions Factor (g/kg)	-	1.69	1.86	2.53
Difference from Average Total Particulate Emissions (g)	-	0.52	0.52	-
Difference from Average Total Particulate Emissions (%)	-	4.6%	4.6%	-
Difference from Average Emissions Factor (g/kg)	-	0.08	0.08	-

Final Average Results	
Total Particulate Emissions (g)	11.37
Particulate Emission Rate (g/hr)	1.90
Emissions Factor (g/kg)	1.78
HHV Efficiency (%)	78.2%
LHV Efficiency (%)	86.0%
CO Emissions (g/min)	0.38

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	<90 °F	86.9	OK
Face Velocity	< 30 ft/min	8.1	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min: 77.4 / Max: 83.1	OK
Negative Probe Weight Evaluation	<5% of Total Catch	-2.0%	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK
Medium Burn Rate	< 50% of High	45.0%	OK

## Overall Pellet Test Efficiency Results

**Manufacturer:** Sherwood  
**Model:** M55  
**Date:** 07/29/21  
**Run:** 1  
**Control #:** 21-703  
**Test Duration:** 360  
**Output Category:** Integrated

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	78.2%	86.0%
<b>Combustion Efficiency</b>	99.4%	99.4%
<b>Heat Transfer Efficiency</b>	78.7%	86.6%

<b>Output Rate (kJ/h)</b>	16,930	16,060	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	1.07	2.35	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	21,649	20,537	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	6.41	14.12	<b>dry lb</b>
<b>MC wet (%)</b>	3.99		
<b>MC dry (%)</b>	4.16		
<b>Particulate (g )</b>	11.37		
<b>CO (g)</b>	138		
<b>Test Duration (h)</b>	6.00		

<b>Emissions</b>	<b>Particulate</b>	<b>CO</b>
<b>g/MJ Output</b>	0.11	1.36
<b>g/kg Dry Fuel</b>	1.77	21.60
<b>g/h</b>	1.90	23.07
<b>g/min</b>	0.03	0.38
<b>lb/MM Btu Output</b>	0.26	3.17

<b>Air/Fuel Ratio (A/F)</b>	27.89
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VERSION:

2.2

12/14/2009

## Max Burn Rate Segment Efficiency Results

**Manufacturer:** Sherwood  
**Model:** M55  
**Date:** 07/29/21  
**Run:** 1  
**Control #:** 21-703  
**Test Duration:** 60  
**Output Category:** Maximum

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	78.6%	86.5%
<b>Combustion Efficiency</b>	98.1%	98.1%
<b>Heat Transfer Efficiency</b>	80.1%	88.1%

<b>Output Rate (kJ/h)</b>	40,519	38,437	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	2.54	5.61	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	51,570	48,919	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	2.54	5.61	<b>dry lb</b>
<b>MC wet (%)</b>	3.99		
<b>MC dry (%)</b>	4.16		
<b>Particulate (g )</b>	N/A		
<b>CO (g)</b>	75		
<b>Test Duration (h)</b>	1.00		

<b>Emissions</b>	<b>Particulate</b>	<b>CO</b>
<b>g/MJ Output</b>	N/A	1.84
<b>g/kg Dry Fuel</b>	N/A	29.30
<b>g/h</b>	N/A	74.54
<b>g/min</b>	N/A	1.24
<b>lb/MM Btu Output</b>	N/A	4.28

<b>Air/Fuel Ratio (A/F)</b>	14.03
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VERSION:

2.2

12/14/2009

## Medium Burn Rate Segment Efficiency Results

**Manufacturer:** Sherwood  
**Model:** M55  
**Date:** 07/29/21  
**Run:** 1  
**Control #:** 21-703  
**Test Duration:** 120  
**Output Category:** Medium

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	76.8%	84.5%
<b>Combustion Efficiency</b>	99.5%	99.5%
<b>Heat Transfer Efficiency</b>	77.1%	84.9%

<b>Output Rate (kJ/h)</b>	17,828	16,911	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	1.15	2.53	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	23,224	22,030	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	2.29	5.05	<b>dry lb</b>
<b>MC wet (%)</b>	3.99		
<b>MC dry (%)</b>	4.16		
<b>Particulate (g )</b>	N/A		
<b>CO (g)</b>	30		
<b>Test Duration (h)</b>	2.00		

<b>Emissions</b>	<b>Particulate</b>	<b>CO</b>
<b>g/MJ Output</b>	N/A	0.84
<b>g/kg Dry Fuel</b>	N/A	13.13
<b>g/h</b>	N/A	15.04
<b>g/min</b>	N/A	0.25
<b>lb/MM Btu Output</b>	N/A	1.96

<b>Air/Fuel Ratio (A/F)</b>	26.12
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VERSION:

2.2

12/14/2009

## Minimum Burn Rate Segment Efficiency Results

**Manufacturer:** Sherwood  
**Model:** M55  
**Date:** 07/29/21  
**Run:** 1  
**Control #:** 21-703  
**Test Duration:** 180  
**Output Category:** Minimum

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	77.6%	85.3%
<b>Combustion Efficiency</b>	99.5%	99.5%
<b>Heat Transfer Efficiency</b>	77.9%	85.8%

<b>Output Rate (kJ/h)</b>	8,241	7,817	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	0.52	1.16	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	10,626	10,080	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	1.57	3.47	<b>dry lb</b>
<b>MC wet (%)</b>	3.99		
<b>MC dry (%)</b>	4.16		
<b>Particulate (g )</b>	N/A		
<b>CO (g)</b>	36		
<b>Test Duration (h)</b>	3.00		

<b>Emissions</b>	<b>Particulate</b>	<b>CO</b>
<b>g/MJ Output</b>	N/A	1.44
<b>g/kg Dry Fuel</b>	N/A	22.58
<b>g/h</b>	N/A	11.83
<b>g/min</b>	N/A	0.20
<b>lb/MM Btu Output</b>	N/A	3.34

<b>Air/Fuel Ratio (A/F)</b>	44.43
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VERSION:

2.2

12/14/2009

## DILUTION TUNNEL & MISC. DATA - ASTM E2779 / E2515

Client: **Sherwood**  
 Model: **M55**  
 Run #: **1**  
 Test Start Time: **9:47**

Job #: **21-703**  
 Tracking #: **0091**  
 Technician: **AK**  
 Date: **7/29/2021**

High Burn End Time (min): **60**  
 Medium Burn End Time (min): **180**  
 Total Sampling Time (min): **360**  
 Recording Interval (min): **1**

Meter Box  $\gamma$  Factor: **0.996** (A)  
 Meter Box  $\gamma$  Factor: **1.017** (B)  
 Meter Box  $\gamma$  Factor: **0.992** (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): **0**  
 Smoke Capture Check (%): **100%**  
 Date Flue Pipe Last Cleaned: **7/29/2021**

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.05	29.94	30.00
Relative Humidity (%)	40.0	19.4	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:		64.911	ft <sup>3</sup>

### Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	-8 in. Hg
(B)	0.000	cfm @	-10 in. Hg
(Ambient)	0.000	cfm @	-9 in. Hg

## DILUTION TUNNEL FLOW

### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.008	86
2	0.014	86
3	0.014	86
4	0.016	86
5	0.014	86
6	0.010	86
7	0.010	86
8	0.012	86
9	0.014	86
10	0.014	86
11	0.012	86
12	0.008	86
Center	0.025	86

Dilution Tunnel H<sub>2</sub>O: **2.00** percent  
 Tunnel Diameter: **12** inches  
 Pitot Tube Cp: **0.99** [unitless]  
 Dilution Tunnel MW(dry): **29.00** lb/lb-mole  
 Dilution Tunnel MW(wet): **28.78** lb/lb-mole  
 Tunnel Area: **0.7854** ft<sup>2</sup>

$V_{strav}$ : **7.38** ft/sec  
 $V_{scent}$ : **10.63** ft/sec  
 $F_p$ : **0.694** [ratio]

Initial Tunnel Flow: **330.5** scf/min

Static Pressure: **-0.074** in. H<sub>2</sub>O

## TEST FUEL PROPERTIES

### Default Fuel Values

Fuel Type:	D. Fir	Oak
HHV (kJ/kg)	19,810	19,887
%C	48.73	50
%H	6.87	6.6
%O	43.9	42.9
%Ash	0.5	0.5

### Actual Fuel Used Properties

Pellet Brand:	Lignetics
Pellet Fuel Grade:	PFI Premium
HHV (kJ/kg)	20,271
%C	46.44
%H	8.57
%O	39.21
%Ash	0.26
MC (%DB)	4.16

# DILUTION TUNNEL & MISC. DATA - ASTM E2779 / E2515

Client: Sherwood  
 Model: M55  
 Run #: 1  
 Test Start Time: 9:47

Job #: 21-703  
 Tracking #: 0091  
 Technician: AK  
 Date: 7/29/2021

High Burn End Time (min): 60  
 Medium Burn End Time (min): 180  
 Total Sampling Time (min): 360  
 Recording Interval (min): 1

Meter Box  $\gamma$  Factor: 0.996 (A)  
 Meter Box  $\gamma$  Factor: 1.017 (B)  
 Meter Box  $\gamma$  Factor: 0.992 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100%  
 Date Flue Pipe Last Cleaned: 7/29/2021

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.05	29.94	30.00
Relative Humidity (%)	40.0	19.4	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:		64.911	ft <sup>3</sup>

**Sample Train Post-Test Leak Checks**

(A)	0.000	cfm @	-8 in. Hg
(B)	0.000	cfm @	-10 in. Hg
(Ambient)	0.000	cfm @	-9 in. Hg

# **PELLET STOVE PREBURN DATA - ASTM E2779**

Client: SherwoodJob #: 21-703Model: M55Tracking #: 0091Run #: 1Technician: AKDate: 7/29/2021
 Recording Interval (min): 1  
 Run Time (min): 60

Average:			-0.021	129	38
Elapsed Time (min)	Scale Reading (lbs)	Weight Change (lbs)	Flue Draft (in H <sub>2</sub> O)	Flue (°F)	Ambient (°F)
0	27.7	-	-0.020	136	73
1	27.6	-0.08	-0.020	146	74
2	27.6	-0.06	-0.030	156	74
3	27.5	-0.07	-0.030	166	74
4	27.4	-0.07	-0.030	176	74
5	27.3	-0.08	-0.030	185	74
6	27.2	-0.11	-0.030	195	74
7	27.1	-0.12	-0.030	206	74
8	27.0	-0.12	-0.040	215	74
9	26.9	-0.11	-0.040	223	75
10	26.8	-0.1	-0.040	230	75
11	26.7	-0.1	-0.040	227	75
12	26.6	-0.12	-0.040	229	75
13	26.5	-0.09	-0.040	232	75
14	26.4	-0.08	-0.040	234	75
15	26.3	-0.1	-0.040	238	75
16	26.2	-0.09	-0.040	241	75
17	26.1	-0.09	-0.040	244	75
18	26.0	-0.13	-0.040	232	76
19	25.9	-0.11	-0.040	227	76
20	25.8	-0.09	-0.040	235	76
21	25.7	-0.09	-0.040	239	76
22	25.6	-0.08	-0.040	241	76
23	25.5	-0.1	-0.040	244	75
24	25.4	-0.08	-0.040	247	76
25	25.3	-0.1	-0.040	249	76
26	25.2	-0.09	-0.050	251	76
27	25.1	-0.09	-0.040	252	76
28	25.0	-0.1	-0.040	254	76
29	25.0	-0.09	-0.040	256	76
30	24.9	-0.1	-0.040	257	76
31	24.7	-0.11	-0.040	260	77
32	24.6	-0.1	-0.040	262	76
33	24.5	-0.1	-0.040	263	77
34	24.4	-0.11	-0.050	267	77
35	24.4	-0.08	-0.050	273	77
36	24.3	-0.09	-0.050	276	77
37	24.2	-0.08	-0.050	277	77
38	24.1	-0.13	-0.050	280	77
39	23.7	-0.38	-0.050	282	77
40	23.6	-0.04	-0.050	292	77
41	23.6	-0.08	-0.050	297	77
42	23.8	0.24	-0.050	299	78
43	23.4	-0.42	-0.050	302	78
44	23.4	0.05	-0.050	302	78
45	23.2	-0.26	-0.050	303	77
46	23.1	-0.09	-0.050	303	77

# **PELLET STOVE PREBURN DATA - ASTM E2779**

Client: SherwoodJob #: 21-703Model: M55Tracking #: 0091Run #: 1Technician: AKDate: 7/29/2021

47	23.0	-0.09	-0.050	304	77
48	22.9	-0.08	-0.050	305	78
49	22.8	-0.09	-0.050	305	78
50	22.7	-0.1	-0.050	307	78
51	22.6	-0.1	-0.050	307	78
52	22.5	-0.11	-0.050	308	77
53	22.4	-0.07	-0.050	308	78
54	22.3	-0.1	-0.050	309	78
55	22.2	-0.1	-0.050	310	78
56	22.1	-0.1	-0.050	312	77
57	22.0	-0.1	-0.050	312	77
58	21.9	-0.09	-0.050	312	78
59	21.8	-0.1	-0.050	313	77
60	21.8	-0.09	-0.050	313	77

# BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: Sherwood

Job #: 21-703

Model: M55

Tracking #: 0091

Run #: 1

Technician: AK

Date: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.025	1.42	80.2	0.62		14.71		93	313	77	77.5
1	0.138	0.138	0.026	1.98	80.2	0.69	103	14.62	-0.09	93	313	78	77.5
2	0.273	0.135	0.025	1.99	80.3	0.71	103	14.52	-0.10	93	314	78	78
3	0.410	0.137	0.025	1.98	80.4	0.73	104	14.43	-0.09	93	314	78	77.7
4	0.550	0.140	0.026	1.98	80.5	0.73	105	14.32	-0.11	93	314	79	77.4
5	0.683	0.133	0.025	1.97	80.6	0.76	101	14.22	-0.10	93	314	79	78
6	0.824	0.141	0.026	1.98	80.7	0.77	105	14.13	-0.09	93	315	79	78.1
7	0.959	0.135	0.025	1.98	80.8	0.73	103	14.03	-0.10	94	315	79	77.9
8	1.095	0.136	0.025	1.97	81	0.77	103	13.93	-0.10	94	314	79	77.6
9	1.235	0.140	0.025	1.97	81.2	0.75	107	13.83	-0.10	94	314	79	77.7
10	1.368	0.133	0.025	1.97	81.3	0.78	101	13.73	-0.10	94	314	79	77.9
11	1.509	0.141	0.025	1.98	81.5	0.79	107	13.63	-0.10	94	315	80	77.6
12	1.643	0.134	0.025	1.95	81.7	0.82	102	13.53	-0.10	94	314	80	77.9
13	1.779	0.136	0.025	1.95	81.8	0.83	103	13.42	-0.11	94	315	80	77.9
14	1.919	0.140	0.024	1.97	82.2	0.85	109	13.34	-0.08	94	314	80	78
15	2.051	0.132	0.025	1.95	82.4	0.87	100	13.24	-0.10	94	314	80	77.8
16	2.192	0.141	0.025	1.97	82.6	0.86	107	13.15	-0.09	94	314	80	77.9
17	2.327	0.135	0.025	1.96	82.9	0.88	102	13.05	-0.10	94	313	80	78
18	2.463	0.136	0.026	1.94	83.2	0.87	101	12.95	-0.10	94	313	80	77.7
19	2.603	0.140	0.024	1.96	83.5	0.92	108	12.85	-0.10	94	313	80	78
20	2.735	0.132	0.025	1.94	83.8	0.93	100	12.75	-0.10	95	314	80	77.9
21	2.876	0.141	0.025	1.95	84.1	0.94	107	12.65	-0.10	95	314	80	78.2
22	3.010	0.134	0.025	1.95	84.5	0.91	101	12.55	-0.10	95	313	80	78
23	3.145	0.135	0.025	1.93	84.8	0.95	102	12.46	-0.09	95	313	80	78.3
24	3.285	0.140	0.025	1.93	85.1	0.9	106	12.36	-0.10	95	313	80	77.9
25	3.417	0.132	0.025	1.91	85.5	0.98	100	12.26	-0.10	95	314	80	78
26	3.556	0.139	0.024	1.92	85.8	1.01	107	12.17	-0.09	95	314	80	78.1
27	3.689	0.133	0.024	1.91	86.1	0.99	102	12.07	-0.10	95	314	80	78.2
28	3.825	0.136	0.024	1.91	86.4	1	105	11.97	-0.10	95	313	80	78.1
29	3.961	0.136	0.025	1.89	86.7	1.03	103	11.88	-0.09	95	313	80	78.2
30	4.095	0.134	0.025	1.89	87.1	1	101	11.77	-0.11	96	314	80	78.1
31	4.230	0.135	0.025	1.88	87.4	1.04	102	11.68	-0.09	96	314	81	77.7
32	4.366	0.136	0.024	1.88	87.8	1.02	104	11.60	-0.08	96	313	81	78.1

# BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: SherwoodJob #: 21-703Model: M55Tracking #: 0091Run #: 1Technician: AKDate: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.497	0.131	0.025	1.86	88.1	1.04	99	11.49	-0.11	96	313	81	78.2
34	4.636	0.139	0.025	1.86	88.5	1.09	104	11.40	-0.09	96	314	81	78.5
35	4.767	0.131	0.025	1.86	88.8	1.12	98	11.29	-0.11	96	313	81	78.6
36	4.901	0.134	0.024	1.85	89.1	1.11	103	11.20	-0.09	96	313	81	78.5
37	5.036	0.135	0.024	1.83	89.3	1.07	103	11.11	-0.09	96	313	81	78.5
38	5.168	0.132	0.024	1.82	89.6	1.11	101	11.01	-0.10	95	313	81	78.8
39	5.300	0.132	0.025	1.82	90	1.1	99	10.92	-0.09	96	313	81	78.7
40	5.439	0.139	0.025	1.93	90.3	1.19	104	10.82	-0.10	96	313	81	78.8
41	5.571	0.132	0.025	1.91	90.6	1.16	99	10.72	-0.10	96	313	81	78.8
42	5.711	0.140	0.025	1.92	90.8	1.28	105	10.61	-0.11	96	312	81	78.6
43	5.845	0.134	0.025	1.90	91.2	1.25	100	10.52	-0.09	96	312	81	78.3
44	5.980	0.135	0.025	1.88	91.5	1.24	101	10.43	-0.09	96	312	81	78.3
45	6.119	0.139	0.025	1.90	91.7	1.28	104	10.34	-0.09	96	311	81	78.2
46	6.251	0.132	0.025	1.89	91.9	1.28	99	10.24	-0.10	96	311	81	78.4
47	6.389	0.138	0.025	1.90	92.2	1.22	103	10.15	-0.09	96	311	81	78.7
48	6.523	0.134	0.025	1.87	92.6	1.24	100	10.04	-0.11	96	311	82	78.7
49	6.658	0.135	0.025	1.88	92.8	1.26	101	9.94	-0.10	96	310	82	78.8
50	6.795	0.137	0.025	1.86	93.1	1.25	102	9.85	-0.09	96	311	82	78.6
51	6.929	0.134	0.025	1.87	93.3	1.32	100	9.75	-0.10	96	311	82	78.4
52	7.064	0.135	0.024	1.89	93.6	1.31	103	9.68	-0.07	96	310	82	78.6
53	7.201	0.137	0.024	1.90	93.8	1.36	104	9.57	-0.11	96	310	82	78.7
54	7.335	0.134	0.025	1.89	94.1	1.32	100	9.46	-0.11	96	310	82	79.4
55	7.472	0.137	0.025	1.87	94.4	1.37	102	9.36	-0.10	96	310	82	78.8
56	7.607	0.135	0.025	1.87	94.6	1.39	100	9.27	-0.09	96	310	82	79.1
57	7.741	0.134	0.024	1.86	95	1.35	102	9.17	-0.10	96	310	82	79
58	7.878	0.137	0.025	1.85	95.2	1.43	102	9.07	-0.10	96	310	82	79.2
59	8.010	0.132	0.025	1.85	95.5	1.38	98	8.98	-0.09	96	310	82	79.3
60	8.147	0.137	0.024	1.85	95.7	1.4	104	8.87	-0.11	97	310	82	78.9
61	8.299	0.152	0.024	2.35	95.9	0.75	115	8.76	-0.11	96	306	80	79
62	8.433	0.134	0.024	1.84	96.1	0.61	101	8.70	-0.06	96	300	80	78.7
63	8.569	0.136	0.024	1.85	96.3	0.62	103	8.63	-0.07	95	298	80	78.7
64	8.701	0.132	0.024	1.84	96.5	0.57	100	8.57	-0.06	95	295	81	79.1
65	8.839	0.138	0.024	1.85	96.7	0.65	104	8.52	-0.05	95	293	81	79

# BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: SherwoodJob #: 21-703Model: M55Tracking #: 0091Run #: 1Technician: AKDate: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	8.972	0.133	0.024	1.84	96.9	0.64	100	8.47	-0.05	95	292	81	79
67	9.105	0.133	0.025	1.84	97.1	0.66	98	8.42	-0.05	95	290	81	78.9
68	9.243	0.138	0.025	1.84	97.3	0.62	102	8.36	-0.06	95	289	81	78.9
69	9.375	0.132	0.025	1.84	97.5	0.65	98	8.32	-0.04	95	287	81	78.6
70	9.512	0.137	0.025	1.84	97.7	0.64	101	8.27	-0.05	95	284	81	78.9
71	9.646	0.134	0.025	1.84	97.8	0.64	99	8.20	-0.07	95	283	81	78.9
72	9.780	0.134	0.025	1.85	98	0.6	99	8.16	-0.04	94	281	81	78.8
73	9.917	0.137	0.025	1.84	98.2	0.67	101	8.10	-0.06	94	279	81	78.9
74	10.051	0.134	0.025	1.84	98.3	0.69	99	8.05	-0.05	94	277	81	79.2
75	10.185	0.134	0.025	1.85	98.5	0.67	99	8.00	-0.05	94	277	81	78.6
76	10.322	0.137	0.024	1.85	98.6	0.66	103	7.95	-0.05	94	275	81	78.7
77	10.454	0.132	0.025	1.85	98.8	0.64	97	7.90	-0.05	94	274	82	78.6
78	10.592	0.138	0.025	1.85	99.1	0.66	102	7.86	-0.04	94	273	82	78.8
79	10.726	0.134	0.025	1.84	99.3	0.69	99	7.82	-0.04	94	272	82	78.7
80	10.861	0.135	0.025	1.86	99.5	0.67	99	7.77	-0.05	94	272	82	78.6
81	10.998	0.137	0.025	1.86	99.6	0.7	101	7.72	-0.05	94	271	82	78.4
82	11.132	0.134	0.024	1.86	99.7	0.62	101	7.68	-0.04	94	270	82	78.7
83	11.267	0.135	0.025	1.85	99.8	0.68	99	7.62	-0.06	94	270	82	78.9
84	11.404	0.137	0.025	1.86	100.1	0.69	101	7.57	-0.05	94	270	82	78.5
85	11.537	0.133	0.025	1.85	100.3	0.62	98	7.54	-0.03	94	269	82	78.6
86	11.675	0.138	0.025	1.85	100.5	0.62	101	7.51	-0.03	94	268	82	78.2
87	11.810	0.135	0.025	1.86	100.6	0.66	99	7.46	-0.05	94	266	82	78.7
88	11.944	0.134	0.025	1.85	100.6	0.67	98	7.41	-0.05	94	266	82	78.9
89	12.083	0.139	0.026	1.85	100.6	0.64	100	7.38	-0.03	94	265	82	79.1
90	12.214	0.131	0.025	1.85	100.9	0.6	96	7.32	-0.06	94	265	82	78.6
91	12.354	0.140	0.025	1.87	101	0.65	103	7.28	-0.04	94	265	82	78.7
92	12.487	0.133	0.025	1.84	101.1	0.68	98	7.22	-0.06	94	264	82	78.4
93	12.622	0.135	0.025	1.85	101.2	0.62	99	7.17	-0.05	94	263	82	78.5
94	12.761	0.139	0.025	1.83	101.3	0.63	102	7.13	-0.04	94	263	82	78.7
95	12.893	0.132	0.025	1.85	101.5	0.62	97	7.08	-0.05	94	263	82	78.5
96	13.031	0.138	0.025	1.84	101.6	0.71	101	7.04	-0.04	94	262	82	78.8
97	13.166	0.135	0.025	1.85	101.6	0.65	99	7.00	-0.04	94	261	82	78.7
98	13.300	0.134	0.024	1.83	101.8	0.63	100	6.96	-0.04	94	261	82	78.3

# BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: SherwoodJob #: 21-703Model: M55Tracking #: 0091Run #: 1Technician: AKDate: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	13.438	0.138	0.025	1.83	101.9	0.67	101	6.92	-0.04	94	260	82	78.7
100	13.573	0.135	0.025	1.84	102	0.65	99	6.88	-0.04	93	259	83	78.8
101	13.707	0.134	0.025	1.82	102	0.72	98	6.84	-0.04	93	258	82	79.2
102	13.846	0.139	0.025	1.83	102.3	0.68	102	6.80	-0.04	93	257	83	79.2
103	13.979	0.133	0.025	1.84	102.4	0.7	97	6.74	-0.06	93	257	83	79.4
104	14.117	0.138	0.024	1.84	102.6	0.69	103	6.69	-0.05	94	257	83	78.9
105	14.252	0.135	0.024	1.83	102.6	0.69	101	6.65	-0.04	94	256	83	79.1
106	14.386	0.134	0.025	1.84	102.7	0.71	98	6.61	-0.04	94	255	83	78.9
107	14.525	0.139	0.025	1.84	102.8	0.64	102	6.56	-0.05	94	255	83	79
108	14.657	0.132	0.025	1.85	103	0.65	97	6.52	-0.04	94	255	83	79.1
109	14.796	0.139	0.024	1.83	103.1	0.69	104	6.47	-0.05	94	256	83	78.7
110	14.930	0.134	0.025	1.82	103.1	0.67	98	6.42	-0.05	94	255	83	78.7
111	15.065	0.135	0.025	1.81	103.3	0.64	99	6.38	-0.04	94	255	83	79.1
112	15.204	0.139	0.025	1.81	103.4	0.66	102	6.34	-0.04	94	253	83	79.3
113	15.336	0.132	0.025	1.83	103.4	0.64	96	6.31	-0.03	94	253	83	79.1
114	15.474	0.138	0.025	1.84	103.6	0.68	101	6.26	-0.05	94	253	83	79.2
115	15.610	0.136	0.025	1.86	103.6	0.65	99	6.22	-0.04	93	253	83	78.9
116	15.744	0.134	0.025	1.84	103.8	0.62	98	6.18	-0.04	94	253	83	79.2
117	15.882	0.138	0.025	1.84	103.9	0.74	101	6.12	-0.06	93	253	83	79.2
118	16.017	0.135	0.025	1.82	103.9	0.7	99	6.09	-0.03	94	252	83	78.8
119	16.152	0.135	0.025	1.82	104	0.69	98	6.03	-0.06	93	252	83	79
120	16.290	0.138	0.025	1.84	104.2	0.67	101	5.98	-0.05	93	251	83	78.6
121	16.423	0.133	0.025	1.81	104.2	0.65	97	5.96	-0.02	93	251	83	79
122	16.561	0.138	0.025	1.81	104.2	0.62	101	5.91	-0.05	93	250	83	79
123	16.696	0.135	0.025	1.81	104.5	0.7	98	5.87	-0.04	93	250	83	79.3
124	16.831	0.135	0.025	1.80	104.4	0.65	98	5.84	-0.03	93	249	83	79.1
125	16.970	0.139	0.024	1.82	104.5	0.66	103	5.80	-0.04	93	248	83	79.2
126	17.101	0.131	0.024	1.82	104.6	0.71	97	5.76	-0.04	93	248	83	79.4
127	17.241	0.140	0.025	1.84	104.7	0.69	102	5.72	-0.04	93	248	83	79.5
128	17.376	0.135	0.025	1.85	104.7	0.69	98	5.68	-0.04	93	248	83	79.4
129	17.510	0.134	0.025	1.83	104.8	0.72	98	5.64	-0.04	94	247	83	79.6
130	17.649	0.139	0.025	1.83	104.9	0.71	101	5.59	-0.05	94	247	83	79.5
131	17.782	0.133	0.025	1.83	104.9	0.66	97	5.55	-0.04	94	247	83	79.4

# BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: SherwoodJob #: 21-703Model: M55Tracking #: 0091Run #: 1Technician: AKDate: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	17.920	0.138	0.024	1.83	105	0.64	103	5.51	-0.04	94	246	83	79.3
133	18.055	0.135	0.026	1.82	105.2	0.75	96	5.47	-0.04	94	245	83	79.4
134	18.191	0.136	0.025	1.84	105.3	0.71	99	5.42	-0.05	94	245	84	79.3
135	18.328	0.137	0.025	1.85	105.3	0.7	100	5.39	-0.03	94	244	84	79.3
136	18.462	0.134	0.024	1.85	105.6	0.64	100	5.33	-0.06	94	244	84	78.5
137	18.599	0.137	0.025	1.85	105.5	0.73	100	5.31	-0.02	94	242	84	78.8
138	18.735	0.136	0.025	1.84	105.8	0.67	99	5.27	-0.04	94	242	84	78.9
139	18.870	0.135	0.025	1.82	105.8	0.71	98	5.23	-0.04	93	242	84	79.1
140	19.007	0.137	0.025	1.82	105.7	0.71	100	5.19	-0.04	93	243	83	79.2
141	19.142	0.135	0.025	1.82	105.6	0.68	98	5.15	-0.04	93	243	83	79.5
142	19.279	0.137	0.025	1.87	105.6	0.69	100	5.10	-0.05	93	242	83	79.4
143	19.417	0.138	0.024	1.88	105.6	0.7	102	5.05	-0.05	93	243	83	79
144	19.553	0.136	0.025	1.87	105.6	0.75	99	5.01	-0.04	93	243	83	79.2
145	19.692	0.139	0.024	1.86	105.8	0.73	103	4.98	-0.03	93	244	83	78.8
146	19.829	0.137	0.025	1.86	105.7	0.67	100	4.93	-0.05	93	243	83	78.7
147	19.966	0.137	0.025	1.87	105.6	0.73	100	4.90	-0.03	93	243	83	78.9
148	20.104	0.138	0.024	1.87	105.8	0.64	102	4.85	-0.05	94	244	83	79.1
149	20.240	0.136	0.025	1.86	105.9	0.7	99	4.82	-0.03	93	244	83	79.5
150	20.379	0.139	0.025	1.86	105.9	0.74	101	4.78	-0.04	93	244	83	79.6
151	20.515	0.136	0.025	1.86	105.9	0.72	99	4.74	-0.04	93	245	83	79.7
152	20.654	0.139	0.024	1.87	106	0.75	103	4.70	-0.04	94	244	83	79.5
153	20.790	0.136	0.025	1.87	106	0.72	99	4.65	-0.05	94	244	83	79.8
154	20.928	0.138	0.025	1.87	106	0.73	100	4.61	-0.04	94	244	84	79.9
155	21.067	0.139	0.024	1.86	106.1	0.76	103	4.58	-0.03	94	243	84	79.2
156	21.201	0.134	0.025	1.86	106.1	0.73	97	4.53	-0.05	94	243	84	79.7
157	21.341	0.140	0.025	1.86	106.2	0.69	102	4.51	-0.02	94	242	84	79.4
158	21.476	0.135	0.025	1.86	106.3	0.74	98	4.45	-0.06	94	242	84	79.6
159	21.613	0.137	0.025	1.87	106.3	0.68	100	4.44	-0.01	94	241	84	79.7
160	21.754	0.141	0.025	1.86	106.3	0.72	102	4.39	-0.05	94	241	84	79.4
161	21.887	0.133	0.025	1.86	106.4	0.77	97	4.36	-0.03	94	240	84	79.6
162	22.028	0.141	0.025	1.87	106.5	0.75	102	4.31	-0.05	94	240	84	79.2
163	22.163	0.135	0.025	1.86	106.5	0.74	98	4.28	-0.03	94	240	84	79.4
164	22.298	0.135	0.025	1.86	106.5	0.67	98	4.24	-0.04	94	240	84	79.5

# BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: Sherwood

Job #: 21-703

Model: M55

Tracking #: 0091

Run #: 1

Technician: AK

Date: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165	22.439	0.141	0.025	1.86	106.5	0.71	102	4.21	-0.03	94	239	84	79.7
166	22.573	0.134	0.025	1.86	106.4	0.73	97	4.16	-0.05	94	238	84	79.5
167	22.714	0.141	0.024	1.86	106.4	0.7	105	4.13	-0.03	94	237	84	79.5
168	22.849	0.135	0.025	1.86	106.6	0.68	98	4.09	-0.04	94	236	84	79.2
169	22.985	0.136	0.024	1.88	106.8	0.72	101	4.06	-0.03	94	236	84	79.5
170	23.125	0.140	0.023	1.87	107	0.7	106	3.99	-0.07	94	236	84	78.9
171	23.258	0.133	0.025	1.86	107.1	0.72	97	3.99	0.00	94	235	84	79.5
172	23.399	0.141	0.026	1.87	107	0.72	100	3.95	-0.04	94	236	84	79.4
173	23.535	0.136	0.024	1.86	106.9	0.67	101	3.90	-0.05	93	236	84	79.2
174	23.671	0.136	0.025	1.86	106.9	0.68	99	3.85	-0.05	93	236	84	79.2
175	23.811	0.140	0.023	1.87	107.3	0.75	106	3.80	-0.05	94	236	84	78.9
176	23.944	0.133	0.025	1.86	107.2	0.7	96	3.79	-0.01	94	235	84	79.5
177	24.084	0.140	0.025	1.86	107	0.76	102	3.74	-0.05	93	236	84	79.1
178	24.221	0.137	0.023	1.86	106.8	0.75	104	3.68	-0.06	93	237	84	79.3
179	24.357	0.136	0.025	1.87	106.8	0.68	99	3.65	-0.03	93	237	84	79.4
180	24.497	0.140	0.025	1.87	106.8	0.72	102	3.61	-0.04	94	236	84	79.3
181	24.630	0.133	0.025	1.86	106.8	0.77	96	3.65	0.04	93	227	84	79.6
182	24.770	0.140	0.025	1.86	106.7	0.73	102	3.60	-0.05	92	219	84	79.4
183	24.906	0.136	0.025	1.87	106.7	0.75	99	3.58	-0.02	92	215	84	79.6
184	25.042	0.136	0.025	1.86	106.7	0.7	99	3.54	-0.04	92	212	84	79.4
185	25.182	0.140	0.025	1.87	106.8	0.68	101	3.53	-0.01	92	209	84	79.7
186	25.316	0.134	0.023	1.87	106.8	0.73	101	3.49	-0.04	92	208	84	78.9
187	25.456	0.140	0.026	1.86	106.9	0.75	99	3.49	0.00	91	206	84	79.6
188	25.591	0.135	0.025	1.87	106.8	0.7	98	3.46	-0.03	91	204	84	79.3
189	25.728	0.137	0.026	1.86	106.8	0.73	97	3.44	-0.02	91	203	84	79.4
190	25.867	0.139	0.025	1.88	106.8	0.74	101	3.42	-0.02	91	201	84	79.6
191	26.002	0.135	0.025	1.88	106.7	0.71	98	3.39	-0.03	91	200	83	79.8
192	26.141	0.139	0.025	1.86	106.7	0.71	101	3.36	-0.03	91	200	83	79.7
193	26.277	0.136	0.025	1.87	106.8	0.67	99	3.31	-0.05	91	199	84	79.2
194	26.414	0.137	0.025	1.86	107.1	0.72	99	3.33	0.02	91	197	84	79.5
195	26.552	0.138	0.025	1.87	107	0.69	100	3.30	-0.03	91	197	84	79.7
196	26.688	0.136	0.025	1.86	107	0.75	98	3.27	-0.03	91	197	84	79.7
197	26.826	0.138	0.025	1.86	107	0.75	100	3.25	-0.02	91	195	84	79.7

# BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: Sherwood

Job #: 21-703

Model: M55

Tracking #: 0091

Run #: 1

Technician: AK

Date: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198	26.962	0.136	0.025	1.88	106.9	0.67	99	3.22	-0.03	91	194	84	79.6
199	27.100	0.138	0.025	1.87	107	0.72	100	3.21	-0.01	91	193	84	79.9
200	27.237	0.137	0.025	1.87	106.9	0.7	99	3.17	-0.04	91	193	84	79.4
201	27.372	0.135	0.026	1.88	107	0.73	96	3.17	0.00	91	192	84	79.7
202	27.511	0.139	0.025	1.85	107	0.72	101	3.15	-0.02	91	192	84	79.7
203	27.647	0.136	0.024	1.86	107	0.75	101	3.12	-0.03	91	191	84	79.7
204	27.785	0.138	0.026	1.86	107	0.76	98	3.10	-0.02	91	191	84	79.8
205	27.922	0.137	0.025	1.87	106.9	0.74	99	3.08	-0.02	91	191	84	80
206	28.058	0.136	0.025	1.87	107	0.74	98	3.06	-0.02	91	190	83	80.2
207	28.196	0.138	0.025	1.86	106.9	0.72	100	3.05	-0.01	91	190	83	80
208	28.332	0.136	0.024	1.86	107	0.7	100	3.03	-0.02	91	189	83	80
209	28.470	0.138	0.025	1.86	106.9	0.7	100	2.99	-0.04	91	189	83	80.3
210	28.606	0.136	0.026	1.86	106.9	0.71	97	2.98	-0.01	91	188	83	80.4
211	28.742	0.136	0.024	1.86	106.9	0.78	100	2.95	-0.03	91	188	83	80
212	28.881	0.139	0.024	1.86	107.2	0.77	103	2.93	-0.02	91	187	84	80.3
213	29.016	0.135	0.025	1.85	107.2	0.79	98	2.91	-0.02	91	187	84	80.2
214	29.154	0.138	0.024	1.85	107.3	0.74	102	2.89	-0.02	91	186	84	79.8
215	29.291	0.137	0.026	1.83	107.3	0.71	97	2.87	-0.02	91	186	84	80.3
216	29.426	0.135	0.025	1.84	107.2	0.72	98	2.85	-0.02	90	186	84	80.1
217	29.565	0.139	0.025	1.83	107.1	0.77	101	2.83	-0.02	90	185	84	80
218	29.700	0.135	0.024	1.84	107.2	0.71	100	2.81	-0.02	91	185	84	80
219	29.838	0.138	0.025	1.83	107.3	0.7	100	2.79	-0.02	91	184	84	79.8
220	29.975	0.137	0.025	1.84	107.3	0.7	99	2.78	-0.01	91	184	84	80.1
221	30.110	0.135	0.024	1.82	107.4	0.74	100	2.75	-0.03	91	183	84	80.1
222	30.248	0.138	0.024	1.81	107.4	0.74	102	2.74	-0.01	91	183	84	80.1
223	30.383	0.135	0.025	1.83	107.5	0.76	98	2.71	-0.03	91	183	84	79.8
224	30.521	0.138	0.025	1.83	107.5	0.78	100	2.70	-0.01	91	182	84	80.1
225	30.657	0.136	0.025	1.82	107.4	0.76	98	2.68	-0.02	91	182	84	80.4
226	30.793	0.136	0.025	1.81	107.4	0.78	98	2.66	-0.02	91	182	84	80.3
227	30.932	0.139	0.024	1.81	107.5	0.76	103	2.64	-0.02	91	181	84	80.3
228	31.067	0.135	0.026	1.84	107.6	0.71	96	2.61	-0.03	91	182	84	80.2
229	31.205	0.138	0.025	1.82	107.5	0.78	100	2.59	-0.02	91	183	84	80.6
230	31.342	0.137	0.025	1.82	107.4	0.71	99	2.57	-0.02	91	182	84	81

# BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: SherwoodJob #: 21-703Model: M55Tracking #: 0091Run #: 1Technician: AKDate: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231	31.477	0.135	0.025	1.82	107.4	0.71	98	2.56	-0.01	91	182	84	81.1
232	31.616	0.139	0.025	1.80	107.8	0.78	100	2.50	-0.06	91	183	84	80.3
233	31.751	0.135	0.026	1.81	107.8	0.77	96	2.51	0.01	91	182	84	80.5
234	31.889	0.138	0.025	1.80	107.8	0.73	100	2.48	-0.03	91	181	84	80.6
235	32.025	0.136	0.025	1.81	107.8	0.78	98	2.46	-0.02	91	182	84	80.6
236	32.161	0.136	0.025	1.81	107.8	0.77	98	2.44	-0.02	91	182	84	80.8
237	32.299	0.138	0.025	1.80	107.7	0.74	100	2.41	-0.03	91	182	84	80.9
238	32.435	0.136	0.025	1.82	107.7	0.76	98	2.39	-0.02	91	182	84	80.9
239	32.572	0.137	0.025	1.81	107.7	0.79	99	2.37	-0.02	91	182	84	80.4
240	32.709	0.137	0.025	1.82	107.7	0.76	99	2.35	-0.02	91	182	84	80.8
241	32.844	0.135	0.025	1.82	107.7	0.76	98	2.33	-0.02	91	182	84	80.8
242	32.983	0.139	0.025	1.83	107.6	0.72	101	2.31	-0.02	91	182	84	81.2
243	33.119	0.136	0.024	1.83	107.7	0.76	100	2.28	-0.03	91	182	84	80.4
244	33.256	0.137	0.024	1.85	107.8	0.8	101	2.26	-0.02	91	182	84	80.2
245	33.393	0.137	0.025	1.84	107.9	0.77	99	2.24	-0.02	92	181	84	80.4
246	33.528	0.135	0.025	1.84	108	0.7	98	2.22	-0.02	92	181	85	80.4
247	33.666	0.138	0.024	1.86	108.3	0.7	102	2.20	-0.02	92	181	85	80.4
248	33.802	0.136	0.026	1.86	108.3	0.78	96	2.20	0.00	91	179	85	80.6
249	33.939	0.137	0.025	1.85	108.2	0.77	99	2.18	-0.02	91	179	85	80.7
250	34.076	0.137	0.024	1.85	108.1	0.73	101	2.16	-0.02	91	178	84	80.5
251	34.211	0.135	0.025	1.84	108.1	0.77	98	2.12	-0.04	91	179	84	80.3
252	34.350	0.139	0.026	1.84	108.2	0.73	99	2.12	0.00	91	179	85	80.6
253	34.485	0.135	0.026	1.84	108.1	0.8	96	2.10	-0.02	91	179	84	80.8
254	34.621	0.136	0.025	1.84	108	0.77	98	2.08	-0.02	91	178	84	80.4
255	34.760	0.139	0.026	1.85	108.1	0.77	99	2.08	0.00	91	177	84	81
256	34.894	0.134	0.025	1.85	108	0.76	97	2.05	-0.03	91	177	84	80.5
257	35.033	0.139	0.024	1.84	108.1	0.76	103	2.04	-0.01	91	176	84	80.6
258	35.169	0.136	0.025	1.84	108.1	0.81	98	2.02	-0.02	91	177	84	80.6
259	35.304	0.135	0.026	1.84	108.2	0.78	96	1.99	-0.03	91	177	84	80.8
260	35.443	0.139	0.026	1.84	108.2	0.75	98	1.97	-0.02	91	177	84	80.7
261	35.577	0.134	0.025	1.83	108.1	0.76	97	1.95	-0.02	91	176	84	81.2
262	35.716	0.139	0.025	1.83	108.1	0.73	100	1.93	-0.02	91	176	84	80.7
263	35.852	0.136	0.025	1.82	108.2	0.77	98	1.92	-0.01	91	177	85	81.2

# BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: Sherwood

Job #: 21-703

Model: M55

Tracking #: 0091

Run #: 1

Technician: AK

Date: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264	35.987	0.135	0.023	1.83	108.5	0.77	102	1.88	-0.04	92	177	85	80.8
265	36.126	0.139	0.026	1.84	108.4	0.79	98	1.86	-0.02	91	177	85	80.7
266	36.260	0.134	0.025	1.82	108.4	0.77	97	1.85	-0.01	91	177	85	80.8
267	36.399	0.139	0.025	1.84	108.4	0.76	100	1.83	-0.02	91	176	85	80.9
268	36.535	0.136	0.025	1.84	108.4	0.73	98	1.82	-0.01	92	176	85	81
269	36.670	0.135	0.025	1.83	108.6	0.7	98	1.77	-0.05	92	177	85	80.7
270	36.810	0.140	0.025	1.84	108.5	0.74	101	1.77	0.00	92	177	85	80.8
271	36.943	0.133	0.025	1.83	108.5	0.73	96	1.75	-0.02	91	177	85	81
272	37.082	0.139	0.025	1.83	108.3	0.8	100	1.73	-0.02	91	176	85	81
273	37.218	0.136	0.026	1.83	108.3	0.76	96	1.71	-0.02	91	176	85	81.2
274	37.353	0.135	0.025	1.83	108.3	0.78	98	1.69	-0.02	91	176	85	81.4
275	37.493	0.140	0.025	1.82	108.3	0.8	101	1.67	-0.02	91	176	85	81
276	37.625	0.132	0.025	1.81	108.4	0.73	95	1.65	-0.02	92	176	85	81.2
277	37.765	0.140	0.024	1.83	108.4	0.73	103	1.63	-0.02	92	176	85	80.9
278	37.900	0.135	0.025	1.82	108.4	0.74	98	1.61	-0.02	92	176	85	80.8
279	38.036	0.136	0.025	1.82	108.4	0.79	98	1.59	-0.02	92	176	85	80.9
280	38.175	0.139	0.025	1.81	108.5	0.79	100	1.59	0.00	92	175	85	81.2
281	38.308	0.133	0.025	1.80	108.4	0.8	96	1.56	-0.03	92	175	85	81
282	38.448	0.140	0.025	1.81	108.4	0.77	101	1.54	-0.02	92	175	85	81
283	38.583	0.135	0.025	1.82	108.5	0.77	98	1.52	-0.02	92	175	85	81.1
284	38.718	0.135	0.026	1.81	108.5	0.77	96	1.51	-0.01	92	175	85	81.2
285	38.857	0.139	0.025	1.81	108.5	0.8	100	1.48	-0.03	92	175	85	81.2
286	38.990	0.133	0.025	1.80	108.5	0.73	96	1.47	-0.01	92	175	85	81.7
287	39.130	0.140	0.025	1.81	108.7	0.77	101	1.41	-0.06	92	175	85	81.2
288	39.265	0.135	0.025	1.81	108.9	0.73	98	1.43	0.02	92	175	85	81.9
289	39.400	0.135	0.025	1.80	109	0.76	98	1.39	-0.04	92	175	85	81.4
290	39.540	0.140	0.025	1.81	108.9	0.73	101	1.37	-0.02	92	175	85	81.7
291	39.672	0.132	0.024	1.81	109.1	0.78	97	1.36	-0.01	93	174	86	81.4
292	39.812	0.140	0.025	1.81	109.1	0.74	101	1.35	-0.01	92	174	85	81.5
293	39.947	0.135	0.026	1.80	109	0.78	96	1.32	-0.03	92	174	85	81.5
294	40.083	0.136	0.025	1.82	108.8	0.78	98	1.30	-0.02	92	174	85	81.6
295	40.221	0.138	0.024	1.81	108.7	0.79	102	1.27	-0.03	92	174	85	81.3
296	40.355	0.134	0.025	1.81	108.8	0.75	97	1.26	-0.01	92	175	85	81.6

# BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: SherwoodJob #: 21-703Model: M55Tracking #: 0091Run #: 1Technician: AKDate: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297	40.494	0.139	0.024	1.80	109	0.78	102	1.23	-0.03	92	175	85	81.2
298	40.629	0.135	0.026	1.81	108.9	0.8	96	1.22	-0.01	92	175	85	81.4
299	40.765	0.136	0.025	1.82	108.8	0.79	98	1.19	-0.03	92	175	85	81.4
300	40.904	0.139	0.025	1.82	108.7	0.77	100	1.18	-0.01	92	175	85	81.4
301	41.037	0.133	0.025	1.82	108.8	0.76	96	1.16	-0.02	92	175	85	81.5
302	41.175	0.138	0.024	1.83	108.7	0.81	102	1.15	-0.01	92	175	85	81.8
303	41.311	0.136	0.025	1.88	108.8	0.78	98	1.13	-0.02	92	175	85	81.4
304	41.449	0.138	0.025	1.87	108.9	0.76	100	1.11	-0.02	92	175	85	81.6
305	41.589	0.140	0.025	1.86	108.9	0.78	101	1.10	-0.01	92	176	85	82.4
306	41.724	0.135	0.025	1.86	108.9	0.78	98	1.06	-0.04	93	176	85	81.7
307	41.865	0.141	0.025	1.87	108.9	0.81	102	1.05	-0.01	93	176	85	81.9
308	42.002	0.137	0.026	1.86	108.9	0.8	97	1.02	-0.03	93	175	85	82
309	42.138	0.136	0.025	1.87	108.9	0.8	98	1.01	-0.01	93	176	86	81.7
310	42.279	0.141	0.025	1.88	109.4	0.74	102	0.98	-0.03	93	176	86	81.5
311	42.414	0.135	0.026	1.88	109.5	0.78	96	0.97	-0.01	93	175	86	81.6
312	42.555	0.141	0.025	1.88	109.3	0.76	102	0.98	0.01	93	175	86	81.9
313	42.692	0.137	0.026	1.86	109.1	0.75	97	0.96	-0.02	93	175	86	82.2
314	42.829	0.137	0.024	1.87	109.4	0.76	101	0.94	-0.02	93	175	86	82.1
315	42.969	0.140	0.025	1.86	109.3	0.76	101	0.91	-0.03	93	175	86	82.2
316	43.105	0.136	0.025	1.87	109.2	0.76	98	0.89	-0.02	93	175	86	81.9
317	43.245	0.140	0.025	1.86	109.3	0.73	101	0.87	-0.02	93	175	86	82
318	43.381	0.136	0.025	1.87	109.1	0.75	98	0.85	-0.02	93	175	86	82.1
319	43.521	0.140	0.025	1.87	109.1	0.84	101	0.83	-0.02	93	175	86	81.9
320	43.658	0.137	0.025	1.86	109.2	0.82	99	0.79	-0.04	93	175	86	81.5
321	43.796	0.138	0.025	1.88	109.6	0.75	100	0.77	-0.02	92	175	86	82.3
322	43.936	0.140	0.026	1.87	109.5	0.76	99	0.77	0.00	92	174	86	82.2
323	44.071	0.135	0.025	1.87	109.4	0.75	97	0.75	-0.02	92	173	86	82.2
324	44.213	0.142	0.024	1.88	109.6	0.76	105	0.71	-0.04	92	174	86	82.1
325	44.349	0.136	0.025	1.87	109.5	0.77	98	0.70	-0.01	92	175	86	82
326	44.486	0.137	0.026	1.87	109.4	0.76	97	0.69	-0.01	92	175	86	82.1
327	44.627	0.141	0.025	1.88	109.4	0.73	102	0.67	-0.02	92	174	86	82.4
328	44.762	0.135	0.024	1.86	109.3	0.77	99	0.65	-0.02	92	175	86	82.1
329	44.902	0.140	0.026	1.87	109.2	0.73	99	0.64	-0.01	92	174	86	82.5

# BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: Sherwood

Job #: 21-703

Model: M55

Tracking #: 0091

Run #: 1

Technician: AK

Date: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	45.039	0.137	0.025	1.87	109.1	0.81	99	0.61	-0.03	92	174	86	82.3
331	45.177	0.138	0.024	1.86	109.1	0.83	102	0.60	-0.01	93	175	86	82.4
332	45.315	0.138	0.025	1.86	109.4	0.86	100	0.58	-0.02	93	175	86	82.2
333	45.452	0.137	0.026	1.86	109.2	0.81	97	0.56	-0.02	93	175	86	82.6
334	45.592	0.140	0.024	1.86	109.2	0.82	103	0.54	-0.02	93	175	86	82.6
335	45.727	0.135	0.024	1.86	109.2	0.77	100	0.52	-0.02	93	175	86	82.4
336	45.868	0.141	0.024	1.86	109.2	0.76	104	0.51	-0.01	93	176	86	82.5
337	46.004	0.136	0.024	1.86	109.2	0.8	100	0.48	-0.03	93	175	86	82.6
338	46.142	0.138	0.026	1.86	109.1	0.78	98	0.47	-0.01	93	175	86	82.9
339	46.283	0.141	0.024	1.86	109	0.75	104	0.44	-0.03	93	175	86	82.4
340	46.417	0.134	0.025	1.86	109.2	0.74	97	0.42	-0.02	93	176	86	82.5
341	46.558	0.141	0.024	1.86	109.6	0.83	104	0.38	-0.04	93	177	86	82.6
342	46.695	0.137	0.025	1.87	109.4	0.78	99	0.37	-0.01	93	176	86	82.5
343	46.832	0.137	0.026	1.86	109.4	0.8	97	0.35	-0.02	93	176	86	82.5
344	46.973	0.141	0.026	1.86	109.3	0.78	100	0.33	-0.02	93	175	86	82.8
345	47.107	0.134	0.025	1.84	109.3	0.82	97	0.32	-0.01	93	176	86	82.8
346	47.248	0.141	0.026	1.85	109.5	0.78	100	0.29	-0.03	93	176	86	82.9
347	47.385	0.137	0.025	1.85	109.5	0.85	99	0.27	-0.02	93	175	86	82.9
348	47.523	0.138	0.024	1.86	109.5	0.8	102	0.25	-0.02	93	175	86	82.8
349	47.661	0.138	0.025	1.87	109.4	0.78	100	0.24	-0.01	93	175	86	82.9
350	47.797	0.136	0.025	1.84	109.4	0.79	98	0.22	-0.02	93	175	86	82.8
351	47.937	0.140	0.025	1.85	109.5	0.81	101	0.18	-0.04	93	175	86	82.5
352	48.072	0.135	0.025	1.85	109.6	0.82	98	0.17	-0.01	93	175	86	82.6
353	48.213	0.141	0.026	1.85	109.7	0.76	100	0.15	-0.02	93	175	87	82
354	48.349	0.136	0.025	1.85	109.7	0.83	98	0.13	-0.02	93	175	87	82.5
355	48.486	0.137	0.025	1.86	109.7	0.77	99	0.10	-0.03	94	175	87	82.6
356	48.627	0.141	0.026	1.86	109.7	0.75	100	0.10	0.00	93	175	86	83.1
357	48.761	0.134	0.026	1.87	109.7	0.73	95	0.07	-0.03	93	175	87	82.9
358	48.903	0.142	0.025	1.87	109.8	0.8	103	0.05	-0.02	94	176	87	82.8
359	49.039	0.136	0.025	1.85	109.8	0.79	98	0.03	-0.02	94	176	87	82.6
360	49.176	0.137	0.025	1.86	109.9	0.79	99	0.00	-0.03	94	176	87	82.5

# BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: Sherwood  
 Model: M55  
 Run #: 1

Job #: 21-703  
 Tracking #: 0091  
 Technician: AK  
 Date: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
Avg/Tot	49.176	0.137	0.025	1.86	103	0.78	100			93	228	83	80

# BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: Sherwood  
 Model: M55  
 Run #: 1

Job #: 21-703  
 Tracking #: 0091  
 Technician: AK  
 Date: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
0	0.000		1.48	80.2	1.47		78	-0.050	7.83	0.11
1	0.137	0.137	2.00	80.2	1.36	100	78	-0.050	8.61	0.34
2	0.277	0.140	2.00	80.3	1.63	105	79	-0.050	8.08	0.10
3	0.417	0.140	1.99	80.4	1.33	105	79	-0.050	8.06	0.14
4	0.560	0.143	1.98	80.4	1.67	105	79	-0.050	8.14	0.22
5	0.698	0.138	1.98	80.6	1.76	103	79	-0.050	8.51	0.14
6	0.840	0.142	1.97	80.6	1.51	104	79	-0.050	8.28	0.09
7	0.981	0.141	1.97	80.8	1.71	105	79	-0.050	8.02	0.10
8	1.119	0.138	1.96	80.9	1.47	103	80	-0.050	8.46	0.17
9	1.263	0.144	1.96	81.1	1.63	108	80	-0.050	8.83	0.29
10	1.399	0.136	1.96	81.3	1.42	102	80	-0.050	8.91	0.17
11	1.540	0.141	1.94	81.5	1.48	105	80	-0.050	8.53	0.27
12	1.680	0.140	1.94	81.6	1.48	104	80	-0.050	8.81	0.25
13	1.817	0.137	1.93	81.9	1.75	102	80	-0.050	7.93	0.19
14	1.959	0.142	1.93	82.2	1.49	108	80	-0.050	6.39	0.05
15	2.096	0.137	1.93	82.4	1.71	102	80	-0.050	7.73	0.08
16	2.239	0.143	1.94	82.6	1.5	107	80	-0.050	7.69	0.05
17	2.377	0.138	1.94	82.9	1.5	103	80	-0.050	8.38	0.12
18	2.515	0.138	1.93	83.1	1.72	101	80	-0.050	8.74	0.15
19	2.658	0.143	1.93	83.4	1.69	109	81	-0.050	8.53	0.18
20	2.794	0.136	1.92	83.7	1.77	101	81	-0.050	8.52	0.14
21	2.936	0.142	1.92	84	1.76	106	81	-0.050	8.77	0.20
22	3.074	0.138	1.93	84.3	1.69	103	81	-0.050	8.19	0.14
23	3.213	0.139	1.93	84.6	1.77	103	81	-0.050	8.49	0.21
24	3.355	0.142	1.92	84.9	1.79	105	81	-0.050	8.48	0.33
25	3.491	0.136	1.91	85.3	1.64	101	81	-0.050	8.39	0.17
26	3.632	0.141	1.91	85.6	1.76	107	81	-0.050	8.12	0.16
27	3.771	0.139	1.90	85.8	1.66	105	81	-0.050	8.42	0.19
28	3.908	0.137	1.89	86.1	1.81	104	81	-0.050	8.80	0.40
29	4.048	0.140	1.89	86.4	1.68	104	81	-0.050	7.73	0.08
30	4.186	0.138	1.88	86.8	1.67	102	81	-0.050	8.60	0.35
31	4.322	0.136	1.87	87.1	1.76	101	81	-0.050	8.19	0.19

# BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: Sherwood  
 Model: M55  
 Run #: 1

Job #: 21-703  
 Tracking #: 0091  
 Technician: AK  
 Date: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
32	4.463	0.141	1.87	87.4	1.74	106	81	-0.050	8.36	0.15
33	4.597	0.134	1.85	87.7	1.75	99	81	-0.050	8.64	0.37
34	4.738	0.141	1.85	88	1.78	104	81	-0.050	8.65	0.35
35	4.873	0.135	1.84	88.3	1.82	100	81	-0.050	8.55	0.30
36	5.009	0.136	1.83	88.6	1.8	102	81	-0.050	8.76	0.25
37	5.148	0.139	1.83	88.9	1.8	105	81	-0.050	8.24	0.18
38	5.283	0.135	1.82	89.2	1.84	102	81	-0.050	8.89	0.22
39	5.417	0.134	1.82	89.5	1.83	99	81	-0.050	9.11	0.30
40	5.558	0.141	1.89	89.8	1.89	104	82	-0.050	9.29	0.53
41	5.695	0.137	1.89	90.1	1.94	101	82	-0.050	8.99	0.26
42	5.835	0.140	1.87	90.3	1.93	103	82	-0.050	8.62	0.31
43	5.973	0.138	1.87	90.6	1.98	101	82	-0.050	8.53	0.40
44	6.110	0.137	1.86	90.9	1.93	101	82	-0.050	7.75	0.07
45	6.250	0.140	1.86	91.2	1.96	103	82	-0.050	7.32	0.07
46	6.388	0.138	1.87	91.4	1.88	101	82	-0.050	8.60	0.09
47	6.524	0.136	1.85	91.7	1.93	100	82	-0.050	8.74	0.15
48	6.665	0.141	1.85	91.9	1.96	103	82	-0.050	8.79	0.34
49	6.800	0.135	1.84	92.2	1.93	99	82	-0.050	9.29	0.48
50	6.940	0.140	1.84	92.4	2	103	82	-0.060	8.50	0.30
51	7.076	0.136	1.83	92.7	1.99	100	82	-0.050	8.70	0.28
52	7.215	0.139	1.92	92.9	2.06	104	82	-0.050	8.29	0.23
53	7.358	0.143	1.91	93.1	2	107	83	-0.050	8.68	0.38
54	7.496	0.138	1.90	93.4	2	101	83	-0.050	9.35	0.58
55	7.637	0.141	1.89	93.7	2.11	103	83	-0.050	8.98	0.40
56	7.775	0.138	1.88	93.9	2.04	101	83	-0.050	8.81	0.23
57	7.914	0.139	1.87	94.2	2.13	104	83	-0.050	8.85	0.38
58	8.056	0.142	1.86	94.4	2.16	104	83	-0.050	9.43	0.63
59	8.191	0.135	1.86	94.6	2.06	99	83	-0.050	8.00	0.11
60	8.331	0.140	1.85	94.8	2.05	104	83	-0.050	8.89	0.42
61	8.469	0.138	1.84	95	2.15	103	83	-0.050	9.00	0.59
62	8.606	0.137	1.84	95.2	2.18	102	83	-0.050	9.31	0.63
63	8.744	0.138	1.83	95.4	2.06	103	83	-0.050	5.95	0.04

# BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: Sherwood  
 Model: M55  
 Run #: 1

Job #: 21-703  
 Tracking #: 0091  
 Technician: AK  
 Date: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
64	8.882	0.138	1.83	95.5	2.2	103	83	-0.050	6.46	0.05
65	9.018	0.136	1.83	95.8	2.21	101	83	-0.050	6.49	0.05
66	9.159	0.141	1.83	95.9	2.17	105	83	-0.050	6.09	0.05
67	9.293	0.134	1.83	96.1	2.13	97	83	-0.050	5.42	0.04
68	9.433	0.140	1.83	96.3	2.08	102	83	-0.050	4.75	0.04
69	9.570	0.137	1.83	96.5	2.1	100	83	-0.050	5.48	0.04
70	9.707	0.137	1.83	96.7	2.19	100	83	-0.050	4.74	0.03
71	9.845	0.138	1.82	96.8	2.13	100	83	-0.050	4.87	0.05
72	9.983	0.138	1.83	97	2.15	100	83	-0.050	5.44	0.04
73	10.118	0.135	1.83	97.1	2.18	98	83	-0.050	4.26	0.06
74	10.260	0.142	1.82	97.3	2.13	103	83	-0.050	4.87	0.06
75	10.394	0.134	1.82	97.5	2.14	97	83	-0.050	5.18	0.08
76	10.534	0.140	1.82	97.6	2.15	104	83	-0.050	4.68	0.09
77	10.671	0.137	1.83	97.8	2.14	99	83	-0.050	4.70	0.07
78	10.808	0.137	1.82	97.9	2.2	99	83	-0.050	5.09	0.09
79	10.947	0.139	1.83	98.1	2.18	101	83	-0.050	5.20	0.06
80	11.084	0.137	1.82	98.3	2.12	99	84	-0.050	4.86	0.07
81	11.221	0.137	1.82	98.4	2.14	99	84	-0.050	5.04	0.07
82	11.361	0.140	1.82	98.6	2.17	103	84	-0.050	5.10	0.06
83	11.497	0.136	1.83	98.6	2.16	98	84	-0.050	5.65	0.05
84	11.636	0.139	1.82	98.8	2.17	101	84	-0.050	5.62	0.07
85	11.774	0.138	1.83	99	2.14	100	84	-0.050	4.85	0.06
86	11.911	0.137	1.82	99.2	2.12	99	84	-0.050	4.59	0.07
87	12.050	0.139	1.83	99.3	2.12	100	84	-0.050	5.18	0.05
88	12.187	0.137	1.82	99.4	2.13	99	84	-0.050	4.77	0.03
89	12.324	0.137	1.82	99.4	2.18	97	84	-0.050	5.23	0.03
90	12.465	0.141	1.83	99.6	2.17	102	84	-0.050	4.89	0.05
91	12.600	0.135	1.82	99.7	2.17	97	84	-0.050	4.97	0.05
92	12.741	0.141	1.83	99.8	2.18	102	84	-0.050	5.05	0.06
93	12.877	0.136	1.82	99.9	2.17	98	84	-0.050	5.18	0.04
94	13.015	0.138	1.82	100.1	2.15	100	84	-0.050	5.58	0.05
95	13.155	0.140	1.83	100.2	2.19	101	84	-0.050	4.66	0.04

# BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: SherwoodJob #: 21-703Model: M55Tracking #: 0091Run #: 1Technician: AKDate: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
96	13.292	0.137	1.82	100.3	2.17	99	84	-0.050	4.83	0.04
97	13.430	0.138	1.83	100.4	2.18	99	84	-0.040	3.96	0.04
98	13.569	0.139	1.82	100.5	2.17	102	84	-0.050	4.45	0.03
99	13.705	0.136	1.82	100.6	2.17	98	84	-0.050	5.07	0.05
100	13.845	0.140	1.82	100.7	2.16	101	84	-0.050	4.58	0.03
101	13.983	0.138	1.82	100.7	2.19	99	84	-0.050	4.45	0.03
102	14.119	0.136	1.83	101	2.19	98	84	-0.050	4.27	0.04
103	14.261	0.142	1.82	101	2.17	102	84	-0.050	4.72	0.03
104	14.396	0.135	1.83	101.2	2.21	99	84	-0.050	4.75	0.04
105	14.536	0.140	1.82	101.3	2.21	103	84	-0.050	5.26	0.05
106	14.674	0.138	1.82	101.4	2.18	99	84	-0.050	4.18	0.08
107	14.811	0.137	1.82	101.4	2.2	99	84	-0.050	4.44	0.08
108	14.951	0.140	1.82	101.6	2.15	101	84	-0.040	4.63	0.07
109	15.088	0.137	1.81	101.6	2.2	101	84	-0.050	5.35	0.06
110	15.225	0.137	1.82	101.7	2.22	99	84	-0.050	4.73	0.06
111	15.366	0.141	1.82	101.8	2.17	101	84	-0.050	4.79	0.05
112	15.501	0.135	1.81	101.9	2.16	97	84	-0.050	4.71	0.06
113	15.642	0.141	1.82	101.9	2.18	101	84	-0.050	4.30	0.05
114	15.779	0.137	1.82	102	2.2	98	84	-0.050	4.21	0.06
115	15.916	0.137	1.81	102.1	2.19	98	84	-0.050	4.46	0.05
116	16.056	0.140	1.82	102.3	2.19	101	84	-0.050	4.86	0.04
117	16.193	0.137	1.81	102.4	2.2	98	84	-0.040	4.82	0.04
118	16.331	0.138	1.81	102.4	2.2	99	84	-0.040	4.41	0.05
119	16.470	0.139	1.82	102.5	2.21	100	84	-0.050	4.56	0.04
120	16.607	0.137	1.82	102.7	2.17	98	84	-0.040	4.62	0.04
121	16.746	0.139	1.81	102.8	2.22	100	84	-0.040	4.39	0.05
122	16.884	0.138	1.82	102.7	2.19	99	84	-0.040	4.50	0.05
123	17.020	0.136	1.82	102.9	2.22	98	84	-0.050	4.32	0.05
124	17.162	0.142	1.81	102.8	2.2	102	84	-0.050	3.76	0.06
125	17.297	0.135	1.82	102.9	2.2	99	84	-0.040	4.35	0.05
126	17.437	0.140	1.81	103.1	2.21	103	84	-0.040	4.49	0.04
127	17.575	0.138	1.81	103.1	2.2	99	84	-0.050	4.57	0.05

# BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: SherwoodJob #: 21-703Model: M55Tracking #: 0091Run #: 1Technician: AKDate: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
128	17.712	0.137	1.81	103.2	2.2	98	84	-0.040	4.43	0.05
129	17.851	0.139	1.81	103.3	2.21	100	84	-0.040	4.06	0.04
130	17.989	0.138	1.81	103.4	2.21	99	84	-0.050	4.04	0.04
131	18.125	0.136	1.81	103.4	2.17	98	84	-0.040	4.74	0.03
132	18.267	0.142	1.81	103.5	2.23	104	84	-0.050	3.63	0.04
133	18.401	0.134	1.81	103.6	2.21	94	84	-0.040	4.02	0.03
134	18.542	0.141	1.81	103.7	2.19	101	84	-0.040	3.47	0.05
135	18.679	0.137	1.81	103.7	2.19	98	84	-0.040	3.82	0.03
136	18.817	0.138	1.86	103.8	2.24	101	84	-0.040	4.53	0.05
137	18.960	0.143	1.85	103.8	2.2	102	84	-0.050	3.81	0.06
138	19.097	0.137	1.86	104	2.17	98	84	-0.040	4.36	0.04
139	19.238	0.141	1.85	104.1	2.18	101	84	-0.040	4.31	0.04
140	19.378	0.140	1.85	104	2.15	100	84	-0.040	4.99	0.05
141	19.517	0.139	1.85	104	2.17	100	84	-0.040	4.60	0.05
142	19.659	0.142	1.85	104.1	2.14	102	84	-0.040	3.67	0.05
143	19.795	0.136	1.85	104.1	2.3	99	84	-0.040	5.20	0.03
144	19.937	0.142	1.85	104.2	2.14	102	84	-0.040	3.80	0.05
145	20.076	0.139	1.85	104.3	2.31	102	84	-0.040	4.67	0.04
146	20.216	0.140	1.86	104.3	2.27	100	84	-0.040	4.27	0.04
147	20.356	0.140	1.85	104.1	2.23	100	84	-0.040	4.15	0.03
148	20.495	0.139	1.85	104.3	2.25	102	84	-0.040	4.53	0.05
149	20.636	0.141	1.85	104.4	2.21	101	84	-0.040	4.74	0.03
150	20.776	0.140	1.86	104.3	2.21	100	84	-0.040	3.83	0.04
151	20.914	0.138	1.85	104.3	2.21	99	84	-0.040	4.32	0.02
152	21.055	0.141	1.85	104.4	2.23	103	84	-0.050	4.10	0.02
153	21.194	0.139	1.85	104.5	2.23	99	84	-0.050	3.67	0.03
154	21.334	0.140	1.85	104.5	2.23	100	84	-0.040	4.56	0.03
155	21.475	0.141	1.85	104.5	2.23	103	84	-0.040	3.53	0.03
156	21.613	0.138	1.85	104.6	2.26	99	84	-0.040	3.90	0.03
157	21.754	0.141	1.85	104.7	2.21	101	84	-0.040	4.05	0.04
158	21.894	0.140	1.85	104.8	2.26	100	84	-0.040	3.92	0.03
159	22.033	0.139	1.85	104.8	2.24	99	84	-0.040	3.97	0.03

# BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: Sherwood  
 Model: M55  
 Run #: 1

Job #: 21-703  
 Tracking #: 0091  
 Technician: AK  
 Date: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
160	22.173	0.140	1.85	104.8	2.24	100	84	-0.050	4.24	0.04
161	22.312	0.139	1.85	104.9	2.26	99	84	-0.040	3.51	0.03
162	22.453	0.141	1.85	104.9	2.24	101	84	-0.040	4.07	0.03
163	22.593	0.140	1.85	105	2.26	100	84	-0.050	3.87	0.03
164	22.732	0.139	1.85	105	2.19	99	84	-0.040	4.32	0.03
165	22.872	0.140	1.85	105	2.23	100	84	-0.040	3.54	0.04
166	23.011	0.139	1.84	104.9	2.23	99	84	-0.040	3.51	0.05
167	23.152	0.141	1.85	104.9	2.29	103	84	-0.040	3.58	0.05
168	23.291	0.139	1.84	105.1	2.28	99	84	-0.040	3.49	0.05
169	23.430	0.139	1.84	105.2	2.24	101	85	-0.040	3.82	0.05
170	23.572	0.142	1.85	105.3	2.26	106	85	-0.040	3.87	0.05
171	23.709	0.137	1.85	105.3	2.25	98	85	-0.040	4.19	0.03
172	23.851	0.142	1.85	105.3	2.27	100	85	-0.040	4.03	0.05
173	23.990	0.139	1.84	105.3	2.23	101	84	-0.040	4.31	0.02
174	24.128	0.138	1.84	105.3	2.22	99	84	-0.040	4.17	0.04
175	24.271	0.143	1.84	105.5	2.23	107	85	-0.040	3.65	0.03
176	24.408	0.137	1.84	105.5	2.22	98	84	-0.040	3.56	0.04
177	24.548	0.140	1.84	105.4	2.26	100	84	-0.040	4.83	0.03
178	24.688	0.140	1.84	105.4	2.25	104	84	-0.040	4.03	0.03
179	24.826	0.138	1.84	105.4	2.23	99	84	-0.040	4.22	0.03
180	24.969	0.143	1.85	105.4	2.25	102	84	-0.040	3.65	0.03
181	25.105	0.136	1.84	105.4	2.25	97	84	-0.040	4.91	0.03
182	25.247	0.142	1.84	105.4	2.24	101	84	-0.040	3.69	0.05
183	25.386	0.139	1.84	105.3	2.23	99	84	-0.040	3.56	0.05
184	25.525	0.139	1.85	105.4	2.25	99	84	-0.030	3.45	0.04
185	25.667	0.142	1.84	105.4	2.24	101	84	-0.040	2.93	0.06
186	25.803	0.136	1.84	105.4	2.24	101	84	-0.040	3.09	0.06
187	25.946	0.143	1.84	105.5	2.26	100	84	-0.040	2.93	0.06
188	26.084	0.138	1.84	105.5	2.26	98	84	-0.030	2.69	0.07
189	26.222	0.138	1.84	105.6	2.23	96	84	-0.040	2.53	0.08
190	26.365	0.143	1.84	105.6	2.27	102	84	-0.040	3.50	0.05
191	26.502	0.137	1.84	105.5	2.24	98	84	-0.040	3.07	0.05

# BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: Sherwood  
 Model: M55  
 Run #: 1

Job #: 21-703  
 Tracking #: 0091  
 Technician: AK  
 Date: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
192	26.643	0.141	1.84	105.5	2.27	101	84	-0.040	3.23	0.06
193	26.782	0.139	1.84	105.6	2.24	99	84	-0.040	3.08	0.06
194	26.920	0.138	1.84	105.7	2.25	98	84	-0.030	2.57	0.07
195	27.062	0.142	1.84	105.7	2.24	101	84	-0.040	3.13	0.06
196	27.199	0.137	1.84	105.7	2.26	98	84	-0.030	4.00	0.05
197	27.340	0.141	1.84	105.7	2.26	100	84	-0.040	2.56	0.07
198	27.480	0.140	1.84	105.7	2.24	100	84	-0.040	3.01	0.09
199	27.619	0.139	1.84	105.8	2.2	99	84	-0.030	2.86	0.11
200	27.760	0.141	1.84	105.7	2.38	100	84	-0.030	2.89	0.09
201	27.897	0.137	1.84	105.7	2.23	96	84	-0.030	2.69	0.08
202	28.038	0.141	1.84	105.7	2.2	100	84	-0.040	2.91	0.06
203	28.178	0.140	1.84	105.7	2.26	102	84	-0.030	3.39	0.07
204	28.316	0.138	1.83	105.7	2.25	96	84	-0.030	3.05	0.08
205	28.456	0.140	1.83	105.7	2.27	100	84	-0.040	3.32	0.07
206	28.595	0.139	1.83	105.7	2.29	99	84	-0.040	3.07	0.06
207	28.735	0.140	1.84	105.7	2.3	100	84	-0.030	2.54	0.07
208	28.874	0.139	1.83	105.8	2.22	101	84	-0.040	2.35	0.09
209	29.013	0.139	1.83	105.8	2.3	99	84	-0.030	3.28	0.05
210	29.154	0.141	1.84	105.7	2.28	98	84	-0.030	2.73	0.06
211	29.293	0.139	1.83	105.7	2.28	101	84	-0.030	2.57	0.05
212	29.430	0.137	1.83	105.9	2.16	100	84	-0.030	2.78	0.05
213	29.573	0.143	1.83	106	2.22	102	84	-0.030	2.04	0.06
214	29.710	0.137	1.83	106	2.27	100	84	-0.030	2.60	0.06
215	29.850	0.140	1.83	106.1	2.22	98	84	-0.030	2.57	0.05
216	29.990	0.140	1.83	106	2.27	100	84	-0.030	2.91	0.03
217	30.127	0.137	1.83	106	2.25	98	84	-0.030	2.33	0.06
218	30.270	0.143	1.83	106	2.29	104	84	-0.030	2.43	0.04
219	30.406	0.136	1.83	106.1	2.22	97	84	-0.030	2.50	0.05
220	30.547	0.141	1.83	106.1	2.3	100	84	-0.030	2.97	0.06
221	30.686	0.139	1.82	106.2	2.49	101	84	-0.030	2.33	0.06
222	30.823	0.137	1.83	106.1	1.94	100	84	-0.030	2.08	0.08
223	30.966	0.143	1.83	106.3	2.26	102	84	-0.030	2.26	0.07

# BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: SherwoodJob #: 21-703Model: M55Tracking #: 0091Run #: 1Technician: AKDate: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
224	31.102	0.136	1.83	106.3	2.26	97	84	-0.030	2.75	0.05
225	31.243	0.141	1.83	106.2	2.25	100	84	-0.030	2.59	0.07
226	31.381	0.138	1.83	106.2	2.27	98	84	-0.030	2.51	0.04
227	31.520	0.139	1.83	106.2	2.26	101	84	-0.030	1.99	0.07
228	31.662	0.142	1.82	106.3	2.26	99	84	-0.030	3.58	0.04
229	31.799	0.137	1.83	106.3	2.27	97	84	-0.030	3.32	0.07
230	31.939	0.140	1.82	106.2	2.31	100	84	-0.030	2.64	0.08
231	32.079	0.140	1.83	106.2	2.27	100	84	-0.030	2.79	0.06
232	32.216	0.137	1.82	106.3	2.25	97	85	-0.030	2.92	0.06
233	32.357	0.141	1.82	106.4	2.31	98	85	-0.030	3.33	0.07
234	32.496	0.139	1.83	106.4	2.19	99	85	-0.030	2.67	0.08
235	32.634	0.138	1.83	106.4	2.28	98	85	-0.030	3.04	0.05
236	32.775	0.141	1.83	106.5	2.26	100	85	-0.030	3.74	0.04
237	32.912	0.137	1.83	106.5	2.2	97	85	-0.030	2.58	0.05
238	33.053	0.141	1.83	106.5	2.31	100	85	-0.030	2.94	0.04
239	33.192	0.139	1.82	106.6	2.22	99	85	-0.030	2.68	0.04
240	33.329	0.137	1.83	106.6	2.28	97	85	-0.030	2.59	0.07
241	33.472	0.143	1.83	106.6	2.23	102	85	-0.030	3.10	0.05
242	33.607	0.135	1.83	106.5	2.26	96	85	-0.030	2.66	0.07
243	33.749	0.142	1.82	106.6	2.32	103	85	-0.030	3.06	0.07
244	33.887	0.138	1.82	106.6	2.21	100	85	-0.030	2.60	0.07
245	34.024	0.137	1.82	106.7	2.21	97	85	-0.030	2.94	0.07
246	34.167	0.143	1.83	106.8	2.25	102	85	-0.030	3.11	0.06
247	34.303	0.136	1.83	107	2.3	99	85	-0.030	2.47	0.08
248	34.444	0.141	1.82	106.9	2.32	98	85	-0.030	2.33	0.09
249	34.582	0.138	1.82	106.9	2.28	98	85	-0.030	2.74	0.06
250	34.721	0.139	1.82	106.8	2.23	101	85	-0.030	2.49	0.06
251	34.862	0.141	1.83	106.8	2.2	100	85	-0.030	2.65	0.06
252	34.999	0.137	1.82	106.9	2.25	96	85	-0.030	2.88	0.04
253	35.139	0.140	1.82	106.9	2.2	98	85	-0.030	2.95	0.05
254	35.279	0.140	1.83	106.9	2.29	100	85	-0.030	2.50	0.06
255	35.417	0.138	1.82	106.9	2.3	96	85	-0.030	2.52	0.05

# BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: SherwoodJob #: 21-703Model: M55Tracking #: 0091Run #: 1Technician: AKDate: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
256	35.557	0.140	1.82	106.9	2.27	100	85	-0.030	2.33	0.04
257	35.696	0.139	1.83	106.9	2.29	101	85	-0.030	2.20	0.06
258	35.834	0.138	1.82	107	2.24	98	85	-0.030	2.34	0.05
259	35.975	0.141	1.82	107	2.24	98	85	-0.030	3.21	0.06
260	36.112	0.137	1.82	107	2.25	95	85	-0.030	3.05	0.08
261	36.252	0.140	1.82	107	2.31	100	85	-0.030	2.47	0.08
262	36.391	0.139	1.82	107.1	2.29	99	85	-0.030	2.77	0.06
263	36.529	0.138	1.82	107.1	2.24	98	85	-0.030	3.01	0.06
264	36.671	0.142	1.82	107.2	2.28	105	85	-0.030	2.76	0.07
265	36.807	0.136	1.81	107.2	2.3	95	85	-0.030	2.72	0.07
266	36.949	0.142	1.82	107.2	2.28	101	85	-0.030	2.99	0.04
267	37.087	0.138	1.82	107.2	2.29	98	85	-0.030	2.04	0.07
268	37.224	0.137	1.82	107.2	2.25	97	85	-0.030	2.60	0.06
269	37.366	0.142	1.82	107.3	2.32	101	85	-0.030	2.78	0.05
270	37.503	0.137	1.82	107.3	2.22	97	85	-0.030	2.72	0.07
271	37.643	0.140	1.82	107.3	2.27	100	85	-0.030	2.93	0.04
272	37.782	0.139	1.82	107.2	2.21	99	85	-0.030	2.56	0.04
273	37.920	0.138	1.82	107.2	2.3	96	85	-0.030	2.42	0.05
274	38.060	0.140	1.82	107.2	2.29	100	85	-0.030	2.43	0.06
275	38.198	0.138	1.81	107.3	2.26	98	85	-0.030	2.55	0.05
276	38.337	0.139	1.82	107.4	2.29	99	85	-0.030	2.60	0.06
277	38.477	0.140	1.82	107.4	2.25	102	85	-0.030	2.42	0.05
278	38.615	0.138	1.81	107.4	2.22	98	85	-0.030	2.75	0.05
279	38.755	0.140	1.82	107.3	2.24	100	85	-0.030	2.78	0.04
280	38.894	0.139	1.81	107.3	2.33	99	85	-0.030	2.08	0.06
281	39.031	0.137	1.82	107.4	2.29	97	85	-0.030	2.24	0.05
282	39.174	0.143	1.82	107.3	2.22	102	85	-0.030	2.58	0.05
283	39.309	0.135	1.82	107.4	2.33	96	85	-0.030	2.18	0.03
284	39.450	0.141	1.81	107.4	2.27	98	85	-0.030	2.33	0.04
285	39.589	0.139	1.81	107.5	2.15	99	85	-0.030	2.26	0.05
286	39.725	0.136	1.82	107.5	2.23	97	85	-0.030	2.55	0.05
287	39.868	0.143	1.82	107.6	2.23	102	86	-0.030	2.39	0.06

# BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: Sherwood  
 Model: M55  
 Run #: 1

Job #: 21-703  
 Tracking #: 0091  
 Technician: AK  
 Date: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
288	40.004	0.136	1.82	107.6	2.22	97	86	-0.030	2.49	0.05
289	40.145	0.141	1.81	107.6	2.34	100	86	-0.030	2.80	0.05
290	40.283	0.138	1.81	107.7	2.31	98	86	-0.030	2.75	0.08
291	40.422	0.139	1.82	107.7	2.24	101	86	-0.030	2.20	0.08
292	40.562	0.140	1.81	107.7	2.33	100	86	-0.030	2.55	0.06
293	40.700	0.138	1.81	107.7	2.32	96	86	-0.030	2.84	0.06
294	40.839	0.139	1.81	107.6	2.25	99	86	-0.030	2.69	0.07
295	40.978	0.139	1.81	107.6	2.25	101	86	-0.030	2.55	0.06
296	41.116	0.138	1.81	107.7	2.21	98	86	-0.030	3.22	0.04
297	41.256	0.140	1.82	107.7	2.31	102	86	-0.030	2.31	0.07
298	41.395	0.139	1.81	107.7	2.34	97	86	-0.030	2.81	0.05
299	41.532	0.137	1.81	107.8	2.23	97	86	-0.030	3.17	0.04
300	41.674	0.142	1.82	107.7	2.34	101	86	-0.030	2.60	0.05
301	41.809	0.135	1.81	107.8	2.32	96	86	-0.030	2.74	0.06
302	41.951	0.142	1.81	107.8	2.23	103	86	-0.030	2.53	0.05
303	42.089	0.138	1.81	107.8	2.32	98	86	-0.030	2.58	0.05
304	42.226	0.137	1.81	108	2.33	97	86	-0.030	2.54	0.05
305	42.368	0.142	1.81	108	2.21	101	86	-0.030	3.00	0.05
306	42.504	0.136	1.82	107.9	2.32	97	86	-0.030	2.91	0.05
307	42.644	0.140	1.81	108	2.25	99	86	-0.030	2.63	0.06
308	42.783	0.139	1.81	107.9	2.33	97	86	-0.030	2.31	0.05
309	42.921	0.138	1.81	107.9	2.19	98	86	-0.030	2.75	0.04
310	43.061	0.140	1.80	108.1	2.32	100	86	-0.030	2.64	0.05
311	43.199	0.138	1.81	108.2	2.24	96	86	-0.030	2.37	0.05
312	43.337	0.138	1.81	108.1	2.32	98	86	-0.030	2.33	0.04
313	43.477	0.140	1.81	108	2.24	98	86	-0.030	2.95	0.04
314	43.614	0.137	1.81	108.1	2.32	99	86	-0.030	2.51	0.04
315	43.754	0.140	1.81	108.2	2.23	99	86	-0.030	2.80	0.04
316	43.893	0.139	1.81	108.2	2.24	99	86	-0.030	2.59	0.04
317	44.031	0.138	1.81	108.2	2.25	98	86	-0.030	2.75	0.04
318	44.172	0.141	1.80	108.1	2.3	100	86	-0.030	2.40	0.05
319	44.308	0.136	1.81	108.1	2.3	97	86	-0.030	2.66	0.04

# BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: Sherwood  
 Model: M55  
 Run #: 1

Job #: 21-703  
 Tracking #: 0091  
 Technician: AK  
 Date: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
320	44.450	0.142	1.81	108.2	2.29	101	86	-0.030	2.74	0.06
321	44.587	0.137	1.81	108.4	2.3	97	86	-0.030	2.61	0.09
322	44.725	0.138	1.81	108.4	2.28	96	86	-0.030	2.38	0.07
323	44.866	0.141	1.81	108.3	2.29	100	86	-0.030	2.67	0.07
324	45.002	0.136	1.81	108.4	2.28	99	86	-0.030	2.41	0.06
325	45.143	0.141	1.81	108.3	2.27	100	86	-0.030	3.00	0.06
326	45.282	0.139	1.82	108.3	2.28	97	86	-0.030	2.70	0.05
327	45.419	0.137	1.81	108.4	2.27	97	86	-0.030	2.52	0.05
328	45.559	0.140	1.81	108.3	2.29	101	86	-0.030	2.77	0.05
329	45.698	0.139	1.81	108.3	2.29	97	86	-0.030	2.64	0.02
330	45.834	0.136	1.80	108.2	2.28	97	86	-0.030	2.19	0.05
331	45.976	0.142	1.80	108.2	2.27	103	86	-0.030	2.52	0.04
332	46.112	0.136	1.81	108.3	2.27	97	86	-0.030	2.67	0.03
333	46.253	0.141	1.81	108.2	2.28	98	86	-0.030	2.60	0.05
334	46.391	0.138	1.80	108.3	2.26	100	86	-0.030	2.77	0.03
335	46.528	0.137	1.81	108.3	2.27	99	86	-0.030	1.98	0.05
336	46.670	0.142	1.80	108.3	2.3	103	86	-0.030	2.56	0.04
337	46.806	0.136	1.81	108.3	2.31	99	86	-0.030	2.18	0.05
338	46.946	0.140	1.80	108.2	2.28	98	86	-0.030	2.32	0.05
339	47.084	0.138	1.81	108.2	2.32	100	86	-0.030	2.36	0.05
340	47.222	0.138	1.80	108.3	2.29	98	86	-0.030	2.51	0.04
341	47.362	0.140	1.80	108.4	2.33	102	87	-0.030	3.22	0.02
342	47.500	0.138	1.80	108.4	2.28	98	87	-0.030	3.12	0.02
343	47.638	0.138	1.81	108.5	2.31	96	87	-0.030	2.25	0.03
344	47.778	0.140	1.80	108.4	2.27	98	87	-0.030	2.01	0.04
345	47.915	0.137	1.80	108.4	2.29	97	86	-0.030	2.31	0.03
346	48.055	0.140	1.80	108.5	2.3	98	87	-0.030	2.47	0.04
347	48.194	0.139	1.80	108.5	2.29	99	87	-0.030	1.99	0.05
348	48.331	0.137	1.81	108.5	2.31	99	87	-0.030	2.50	0.04
349	48.472	0.141	1.80	108.5	2.28	100	87	-0.030	2.68	0.04
350	48.608	0.136	1.80	108.6	2.29	97	87	-0.030	2.14	0.05
351	48.748	0.140	1.80	108.6	2.28	99	87	-0.030	2.56	0.06

# BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: SherwoodJob #: 21-703Model: M55Tracking #: 0091Run #: 1Technician: AKDate: 7/29/2021

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
352	48.886	0.138	1.80	108.8	2.29	98	87	-0.030	2.84	0.04
353	49.024	0.138	1.80	108.8	2.26	96	87	-0.030	1.91	0.08
354	49.164	0.140	1.80	108.8	2.28	99	87	-0.030	2.64	0.06
355	49.302	0.138	1.80	108.8	2.28	98	87	-0.030	2.91	0.04
356	49.440	0.138	1.80	108.8	2.3	96	87	-0.030	2.57	0.04
357	49.580	0.140	1.80	108.8	2.3	97	87	-0.030	2.26	0.07
358	49.717	0.137	1.80	108.8	2.31	97	87	-0.030	2.79	0.06
359	49.856	0.139	1.80	108.8	2.29	99	87	-0.030	2.64	0.06
360	49.995	0.139	1.80	108.9	2.32	99	87	-0.030	2.26	0.08
Avg/Tot	49.995	0.139	1.84	102	2.16	100			4.30	0.09

# LAB SAMPLE DATA - ASTM E2515

Client: Sherwood  
 Model: M55  
 Run #: 1

Job #: 21-703  
 Tracking #: 0091  
 Technician: AK  
 Date: 7/29/2021

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
<b>Train A - First Hour</b>	G00119	121.4	240.6	243.2	2.6
	G00120	119.2			
	4A	116025.1	116025.1	116025.1	0.0
	4A	3623.7	3623.7	3623.8	0.1
<b>Train A Filters - Remainder</b>	G00123	118.5	240.6	242.2	1.6
	G00124	122.1			
<b>Train A Probe</b>	5A	116754.2	116754.2	116754.2	0.0
<b>Train A O-Rings</b>	5A	3535.8	3535.8	3536.0	0.2
<b>Train B Filters</b>	G00121	117.5	239.0	244.0	5.0
	G00122	121.5			
<b>Train B Probe</b>	4B	116184.6	116184.6	116184.5	0.0*
<b>Train B O-Rings</b>	4B	3580.4	3580.4	3580.3	0.0*
<b>Background Filter</b>	G00125	119.3	119.3	119.5	0.2

\*Negative value corrected to zero

<b>Placed in Dessicator on:</b>	7/29/2021 16:30
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<b>Train A Filters - First Hour</b>	243.1	8/2 10:00	243.2	8/3 17:00			
<b>Train A Probe - First Hour</b>	116025.0	8/2 10:00	116025.1	8/3 17:00			
<b>Train A O-Rings - First Hour</b>	3623.9	8/2 10:00	3623.8	8/3 17:00			
<b>Train A Filters - Remainder</b>	242.2	8/2 10:00	242.2	8/3 17:00			
<b>Train A Probe - Remainder</b>	116754.3	8/2 10:00	116754.2	8/3 17:00			
<b>Train A O-Rings - Remainder</b>	3535.9	8/2 10:00	3536.0	8/3 17:00			
<b>Train B Filters</b>	243.9	8/2 10:00	244.0	8/3 17:00			
<b>Train B Probe</b>	116184.5	8/2 10:00	116184.5	8/3 17:00			
<b>Train B O-Rings</b>	3580.3	8/2 10:00	3580.3	8/3 17:00			
<b>Background Filter</b>	119.5	8/2 10:00	119.5	8/3 17:00			

1st hour Sub-Total, mg:	2.6
Remainder Sub-Total, mg:	1.8
<b>Train 1 Aggregate, mg:</b>	<b>4.4</b>
<b>Train 2 Aggregate, mg:</b>	<b>5.0</b>
Ambient Aggregate, mg:	0.2

**Client: Sherwood Industries**  
**Model: M55**  
**Project Number: 21-703**

### Pellet Heater Control Settings

High Burn Rate Settings: Heat 5, Feed trim 5, Combustion trim 1

Medium Burn Rate Settings: Heat 2, Feed trim 3, Combustion trim 1

Low Burn Rate Settings: Heat 1, Feed trim 1, Combustion trim 1

### Preburn Notes

Preburn Start Time: 08:47

Time	Notes
0:00	Set unit to high burn settings, added 35 lb of pellets
60:00	PB end

### Test Notes

Test Burn Start Time: 09:47

Time	Notes
0:00	Test start, left unit on high burn settings
60:00	Changed filter train A, switched unit to medium burn settings
180:00	Switched unit to low burn settings
360:00	Test end

Test Burn End Time: 15:47

### Flue Gas Concentration Measurement


**Calibration Gas Values:** Span Gas CO<sub>2</sub> (%): 17.14 CO (%): 4.30  
 Mid Gas CO<sub>2</sub> (%): 9.90 CO (%): 2.47

### Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	8:31	8:35	8:33	15:52	15:50	15:51
CO <sub>2</sub>	0.00	10.22	17.01	0.13	10.49	17.27
CO	0.000	2.476	4.300	-0.003	2.431	4.206

**Flue Gas Probe Leak Check:** Initial: No Leakage

Final: No Leakage

Technician Signature: 

Date: 9/14/2021

# ASTM E2515 - Glass Filters

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
G00109	121.0	120.8	-	-	SB	21-683	32-8-DF
G00110	121.6	121.5	-	-	SB	↓	↓
G00111	120.3	120.2	-	-	SB	↓	↓
G00112	120.2	120.1	-	-	SB	↓	↓
G00113	120.1	120.2	-	-	SB	21-683	31-7-DF
G00114	120.7	120.7	-	-	SB	↓	↓
G00115	121.7	121.8	-	-	SB	↓	↓
G00116	118.3	118.2	-	-	SB	↓	↓
G00117	122.4	122.4	-	-	SB	↓	↓
G00118	119.6	119.5	-	-	SB	↓	↓
G00119	121.4	121.4	-	-	SB	21-703	#1
G00120	119.2	119.2	-	-	SB	↓	↓
G00121	117.7	117.5	-	-	SB	↓	↓
G00122	121.5	121.5	-	-	SB	↓	↓
G00123	118.7	118.5	-	-	SB	↓	↓
G00124	122.1	122.1	-	-	SB	↓	↓
G00125	119.3	119.3	-	-	SB	↓	↓
G00126	122.2	122.3	-	-	SB	21-683	C2-1-M

Weight 1 Date/Time:

7/23- 10:30

Weight 2 Date/Time:

7/26- 7:20

Weight 3 Date/Time:

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
G00127	120.4	120.5	-	-	SB	21-683	C2-1-M
G00128	118.5	118.5	-	-	SB	↓	↓
G00129	120.7	120.8	-	-	SB	↓	↓
G00130	120.0	119.9	-	-	SB	-	-
G00131	120.1	120.1	-	-	SB	-	-
G00132	119.8	119.8	-	-	SB	-	-
G00133	119.8	119.7	-	-	SB	-	-
G00134	122.5	122.4	-	-	SB	21-683	C1-1-M
G00135	118.6	118.6	-	-	SB	↓	↓
G00136	121.3	121.3	-	-	SB	↓	↓
G00137	119.8	119.8	-	-	SB	↓	↓
G00138	120.7	120.8	-	-	SB	21-683	C2-2-M
G00139	120.7	120.7	-	-	SB	↓	↓
G00140	120.1	120.0	-	-	SB	↓	↓
G00141	121.3	121.2	-	-	SB	↓	↓
G00142	120.0	120.0	-	-	SB	21-683	C1-2-M
G00143	120.8	120.8	-	-	SB	↓	↓
G00144	120.0	119.9	-	-	SB	↓	↓

Weight 1 Date/Time:

7/23- 10:30

Weight 2 Date/Time:

7/26- 7:20

Weight 3 Date/Time:

Weight 4 Date/Time:

# ASTM E2515 - O-Rings

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
1A	3567.7	3567.8	-	-	SB	21-683	B1-6-DF
1B	3555.9	3556.1	-	-	SB		
2A	3559.3	3553.3	-	-	SB	21-683	B2-8-DF
2B	3572.0	3572.1	-	-	SB		
3A	3580.6	3580.5	-	-	SB	21-683	B1-7-DF
3B	3568.8	3568.8	-	-	SB		
4A	3623.7	3623.3	3623.6	3623.7	SB	21-703	#1
4B	3580.5	3580.4	-	-	SB		
5A	3535.8	3535.8	-	-	SB	21-703	#1
5B	3531.5	3531.8	-	-	SB		

Weight 1 Date/Time:  
7/23 - 10:30

Weight 2 Date/Time:  
7/24 - 7:30

Weight 3 Date/Time:  
7/26 - 7:20

Weight 4 Date/Time:  
7/27 - 6:20

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
6A	3615.4	3615.2	-	-	SB	21-683	C2-1-M
6B	3397.6	3397.5	-	-	SB		
7A	3572.7	3572.5	-	-	SB	21-683	C1-1-M
7B	3523.2	3523.2	-	-	SB		
8A	3552.2	3552.1	-	-	SB	21-683	C1-1-M
8B	3586.1	3586.1	-	-	SB		
9A	3581.3	3581.2	-	-	SB	21-683	C2-2-M
9B	3524.1	3524.2	-	-	SB		
10A	3362.8	3362.9	-	-	SB	21-683	C1-2-M
10B	3570.5	3570.6	-	-	SB		

Weight 1 Date/Time:  
8/6 - 13:00

Weight 2 Date/Time:  
8/9 - 14:00

Weight 3 Date/Time:

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
11A	3424.4	3424.2	-	-	SB	21-683	C2-3-M
11B	4234.4	4234.3	-	-	SB		
12A	3403.5	3403.6	-	-	SB	21-683	C1-3-M
12B	3395.8	3396.2	3396.3	-	SB		
13A	3359.7	3359.9	-	-	SB	21-683	C2-4-M
13B	3444.5	3445.0	3444.9	-	SB		
14A	3366.6	3367.1	3367.2	-	SB	21-683	C1-4-M
14B	3341.7	3342.1	3342.1	-	SB		
15A	3569.8	3569.9	-	-	SB		
15B	3570.4	3570.7	3570.8	-	SB		

Weight 1 Date/Time:  
8/6 - 13:00

Weight 2 Date/Time:  
8/13 - 9:00

Weight 3 Date/Time:  
8/16 - 9:00

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
16A	3572.8	3572.8	-	-	SB		
16B	3638.0	3637.9	-	-	SB		
17A	3612.7	3612.7	-	-	SB		
17B	3569.5	3569.4	-	-	SB		
18A	3397.8	3397.8	-	-	SB		
18B	3368.8	3368.8	-	-	SB		
19A	3367.2	3367.3	-	-	SB		
19B	3440.0	3440.0	-	-	SB		
20A	3393.9	3394.1	-	-	SB		
20B	3427.3	3427.4	-	-	SB		

Weight 1 Date/Time:  
8/13 - 9:00

Weight 2 Date/Time:  
8/16 - 9:00

Weight 3 Date/Time:

Weight 4 Date/Time:

# ASTM E2515 - Probes

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
1A	115626.2	115626.2	-	-	SB	21-683	81-6-DF
1B	115901.4	115901.4	-	-	SB		
2A	116055.7	116055.9	-	-	SB	21-683	82-8-DF
2B	116172.8	116172.7	-	-	SB		
3A	115878.2	115878.9	115878.2	115878.4	SB	21-683	81-7-DF
3B	116118.3	116118.3	-	-	SB		
4A	116025.1	116025.1	-	-	SB	21-703	#1
4B	116184.5	116184.6	-	-	SB		
5A	116754.3	116754.2	-	-	SB	21-703	#1
5B	116873.2	116873.0	-	-	SB		

Weight 1 Date/Time:  
7/23- 10:30

Weight 2 Date/Time:  
7/24- 7:30

Weight 3 Date/Time:  
7/26- 7:20

Weight 4 Date/Time:  
7/27- 6:20

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
6A	116382.0	116381.9	-	-	SB	21-683	C2-1-M
6B	115953.1	115952.9	-	-	SB		
7A	116557.8	116557.7	-	-	SB	-	-
7B	117127.6	117127.4	-	-	SB		
8A	116643.7	116643.5	-	-	SB	21-683	C1-1-M
8B	116666.9	116666.8	-	-	SB		
9A	116536.3	116536.1	-	-	SB	21-683	C2-2-M
9B	117742.4	117742.3	-	-	SB		
10A	116646.1	116646.0	-	-	SB	21-683	C1-2-M
10B	117753.7	117753.6	-	-	SB		

Weight 1 Date/Time:  
8/6- 13:00

Weight 2 Date/Time:  
8/9- 14:00

Weight 3 Date/Time:

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
11A	116868.1	116867.4	116867.5	-	SB	21-683	C2-3-M
11B	117340.1	117339.3	117339.5	-	SB		
12A	116707.7	116707.0	116707.0	-	SB	21-683	C1-3-M
12B	117774.0	117773.1	117773.2	-	SB		
13A	117316.8	117316.1	117316.1	-	SB	21-683	C2-4-M
13B	116943.9	116942.8	116942.7	-	SB		
14A	117655.4	117654.9	117654.7	-	SB	21-683	C1-4-M
14B	116618.9	116618.3	116618.4	-	SB		
15A	117241.0	117240.5	117240.4	-	SB		
15B	116752.7	116752.0	116752.0	-	SB		

Weight 1 Date/Time:  
8/6- 13:00

Weight 2 Date/Time:  
8/13- 9:00

Weight 3 Date/Time:  
8/16- 9:00

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
16A	116380.3	116380.2	-	-	SB		
16B	115863.2	115863.0	-	-	SB		
17A	116809.0	116809.0	-	-	SB		
17B	117138.6	117138.7	-	-	SB		
18A	117496.6	117496.6	-	-	SB		
18B	117329.0	117329.0	-	-	SB		
19A	117024.6	117024.4	-	-	SB		
19B	117010.0	117009.9	-	-	SB		
20A	115624.6	115624.6	-	-	SB		
20B	115964.0	115964.0	-	-	SB		

Weight 1 Date/Time:  
8/17- 9:00

Weight 2 Date/Time:  
8/16- 9:00

Weight 3 Date/Time:

Weight 4 Date/Time:

## DO NOT REMOVE THIS LABEL / NE RETIREZ PAS CETTE ÉTIQUETTE

Serial No. / No. De Série:

Model / Modèle: M55-FS-2

Listed Room Heater, Pelletized Fuel Type (Appareil de chauffage à granules certifié)

Input rating when using: Wood Pellets/Corn -35,770BTU (10.5KW\*hr)

(Le chauffage d'énergie avec: Boulettes de bois/Mais - 35,770BTU (10.5KW\*hr))

Suitable For Mobile Home Installation (Accepté pour l'installation dans une maison mobile, test)

Solid Fuel Room Heaters / Identifié Comme Un Foyer A Combustible Solide: ULC S627 & ORD 1482

This pellet appliance has been tested and listed for use in manufactured homes in accordance with Oregon Administrative rules 814-23-900 through 814-23-909. Install and use only in accordance with the manufacturer's installation and operating instructions. Contact local building or fire officials about restrictions and installation inspection in your area. Do not connect this unit to a chimney flue serving another appliance. See local building code and manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling. ELECTRICAL RATING: 120 Volts, 60Hz, 4.2 Amps. Route Cord Away From Heater.

For use with pelletized solid fuels - wood, corn, wheat, & barley only. Operate only with viewing door and ash removal door closed. Only replace glass with ceramic glass. Components required for installation: a 4inch (100 mm) listed PL or L vent, complete with components.

Cet appareil a été testé et certifié pour utilisation dans les maisons mobiles en accord avec les "Règles Administratives de l'Oregon 814-23-900 à 814-23-909". Installez et utilisez cet appareil seulement selon les instructions d'installation et d'opération du fabricant. Contactez les autorités locales de votre quartier concernant les restrictions et les inspections d'installation. Consultez les codes de bâtiment locaux et les instructions du fabricant pour les précautions à prendre lorsque une cheminée doit être installée au travers un mur ou un plafond combustible. CLASSEMENT ÉLECTRIQUE : 120 Volts, 60 Hz, 4.2 Amps. Placez le câble électrique loin de la chaleur. Utilisation avec granules - le bois, le maïs, le blé, & l'orge seulement. Utiliser seulement lorsque les portes avant et la porte du réceptacle de cendre sont fermées. Si une ou des vitres devaient être remplacées, utilisez seulement du verre céramique. Les composantes requises pour l'installation sont un évent PL ou L certifié de 4in/100mm avec ses composantes.

Installed as a freestanding stove - conventional or mobile home - Model FS. Minimum Clearances to Combustible Material / Espace de dégagement requis pour le modèle FS, qu'il soit encastré, sur pied ou dans une maison mobile:

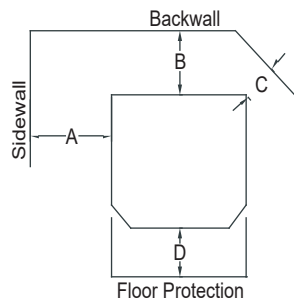
Sidewall to Unit / Du mur de côté à l'appareil: A 12 in / 305 mm

Backwall to Unit / Du mur de derrière à l'appareil: B 3 in. / 76 mm

Corner to Unit / Du coin à l'appareil: C 3 in. / 76 mm

D - The unit must be installed with a minimum of 6" (152 mm) of floor protection in front of and to the sides of the door opening.

The pedestal base can be adjusted to the forward position to satisfy this requirement. The unit can be installed on a hard, stable combustible surface. (D - L'unité doit être installée avec protection de plancher devant et au bord de la porte ouvrant avec au moins 6" (152 mm). La base de piédestal peut être adaptée à la position à satisfaire cette condition. L'unité peut être installée sur un dur, la surface combustible stable.)



## CAUTION:

HOT WHILE IN OPERATION. DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE BURNS. SEE NAMEPLATE AND INSTRUCTIONS.



To Start Stove: Select fuel type mode; PREMIUM PELLETS for superior quality pellet fuel, REGULAR PELLETS for all grades of wood pellets & MULTIFUEL for all other fuels. Press the ON / OFF button. A small handful of pellets in the burn pot liner will speed up ignition.

To Operate Stove: MANUAL MODE: When a fire has been established the stove settings are adjustable. / HIGH/LOW MODE: (Requires a thermostat) When the thermostat calls for heat the stove settings are adjustable. When the thermostat contacts open, the HEAT LEVEL and Fans will drop down to the LOW setting until the thermostat contacts close again. / AUTO/OFF MODE: (Requires a thermostat) When the thermostat contacts close, the unit will light automatically. Once up to temperature the stove settings are adjustable. When the thermostat contacts open, the stove will drop down to the LOW settings for 30 minutes. If within the 30 min the thermostat contacts close, the HEAT LEVEL will return to previous MANUAL setting or if the thermostat contacts remain open the stove begins its shutdown routine and it will restart when the thermostat closes.

To Turn Off Stove: MANUAL and HI / LOW mode: Press the ON / OFF button

AUTO / OFF mode: Turn the thermostat down or off.

Pour démarrer le poêle: Choisir le mode pour le carburant ; PREMIUM PELLETS pour le carburant de boulette de qualité de superior, REGULAR PELLET pour tous degrés de boulettes de bois & MULTIFUEL pour tous autres carburants. Appuyer sur le bouton "ON/OFF". Une petite poignée de boulettes dans le pot de brûlure hâtera l'allumage.

Pour faire fonctionner le poêle : MODE MANUEL : Lorsque le feu est bien établi, les réglages peuvent être ajustés. / MODE "HIGH/LOW" : (Nécessite un thermostat) Lorsque le thermostat requière de la chaleur, les réglages peuvent être ajustés. Lorsque les contacts du thermostat ouvrent, le réglage du niveau de chaleur et les ventilateurs s'ajusteront au réglage " bas " jusqu'à ce que les contacts du thermostat se referment. / MODE "AUTO/OFF" : (Nécessite un thermostat) Lorsque les contacts du thermostat ferment, le poêle s'allumera automatiquement. Lorsque la température adéquate est atteinte, les réglages peuvent être ajustés. Lorsque les contacts du thermostat ouvrent, le poêle s'ajustera aux réglages "LOW" pendant 30 minutes. Si les contacts du thermostat sont fermés pendant ces 30 minutes, le réglage de niveau de chaleur retournera en réglages "MANUEL" ou si les contacts du thermostat restent ouverts, le poêle entamera le processus d'arrêt et il voudra redémarrer lorsque les contacts du thermostat refermer.

Pour éteindre le poêle : MODE MANUEL ET " HIGH/LOW " : Appuyer sur le bouton "ON/OFF".

MODE "AUTO / OFF" : Régler le thermostat à la baisse ou éteignez le.

## ATTENTION:

L'APPAREIL EST CHAUD LORSQU'IL FONCTIONNE. NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS DE L'APPAREIL EN MARCHÉ. UN CONTACT AVEC CELUI-CI POURRAIT RÉSULTER EN DES BRÛLURES. VEUILLEZ VOIR LA PLAQUE DU FABRICANT ET LES INSTRUCTIONS.

This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual. U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards. Under specific test conditions this heater has been shown to have a particulate emission level of 1.9 g/hr.

Ce poêle à granulés besoins inspection périodique et la réparation pour un fonctionnement correct. Consultez le manuel d'owner's pour plus d'informations. Il est contre les règlements fédéraux pour exploiter cette pastille chauffe d'une manière incompatible avec les instructions de fonctionnement dans le manuel d'owner's. Ce poêle répond aux normes limites d'émission de l'Environmental Protection Agency des États-Unis 2020. Dans des conditions de test spécifiques, ce poêle a été montré pour avoir un niveau d'émission de particules de 1.9 g / h.

DATE OF MANUFACTURE / DATE DE FABRICATION:

J F M A M J J A S O N D 2021 2022 2023



MANUFACTURED BY / FABRIQUE PAR:  
SHERWOOD INDUSTRIES LTD.  
VICTORIA BC CANADA

PFS TECO  
REPORT  
#21-703



Intertek  
4001609

Certified for use in Canada & USA  
Certifié pour installation au  
Canada et aux États-Unis.

C-16286

Serial No. / No. De Sérié:

Model / Modèle: M55C-FPI-2  
Listed Room Heater, Pelletized Fuel Type (Appareil de chauffage à granules certifié)  
Input rating when using (Le chauffage d'énergie avec):  
Wood Pellets/Corn (Boulettes de bois/IMais) - 55,000BTU (16.1KW\*hr)  
Wheat/Barley (Blé/l'Orge) - 53,000BTU (15.5KW\*hr)

Install and use only in accordance with the manufacturer's installation and operating instructions. Contact local building or fire officials about restrictions and installation inspection in your area. Do not connect this unit to a chimney flue serving another appliance. Inspect and clean exhaust venting system frequently. See local building code and manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling. ELECTRICAL RATING: 120 Volts, 60Hz, 4.2 Amps. Route Cord Away From Heater.

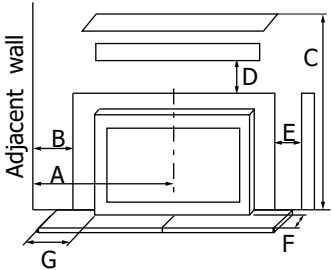
For use with pelletized solid fuels - wood, corn, wheat, & barley only. Operate only with viewing door and ash removal door closed. Only replace glass with ceramic glass. Components required for installation: listed 4inch (100 mm) stainless steel chimney liner.

Installez et utilisez cet appareil seulement selon les instructions d'installation et d'opération du fabricant. Contactez les autorités locales de votre quartier concernant les restrictions et les inspections d'installation. Inspectez et nettoyez le système d'échappement fréquemment. Consultez les codes de bâtiment locaux et les instructions du fabricant pour les précautions à prendre lorsque une cheminée doit être installée au travers un mur ou un plafond combustible. CLASSEMENT ÉLECTRIQUE : 120 Volts, 60 Hz, 4.2 Amps. Placez le câble électrique loin de la chaleur. Utilisation avec granules - le bois, le maïs, le blé, & l'orge seulement. Utiliser seulement lorsque les portes avants et la porte du réceptacle de cendre sont fermées. Si une ou des vitres devaient être remplacées, utilisez seulement du verre céramique. Les composantes requises pour l'installation: une revêtement de cheminée reprisé en acier inoxydable 4".

DO NOT REMOVE THIS LABEL / NE RETIREZ PAS CETTE ÉTIQUETTE

INSTALLED AS A FIREPLACE INSERT STOVE MODEL (FPI) / A INSTALLÉ  
COMME UN MODELE SUR PIED DE POELE.  
Minimum clearances to combustible materials./ Les dégagements minimums aux  
matériels combustibles:

A	Sidewall to center of unit (De la paroi au centre de l'unité)	24" (610 mm)
B	Sidewall to surround panel (De la paroi à l'entoure le panneau)	2" (51 mm)
C	Bottom of unit to an unshielded 12" (305 mm) mantle (Le fond de l'unité à un manteau de cheminée non blindé)	33" (838 mm)
D	Unit to top facing (protruding ¾" [19 mm]) (De l'unité au sommet du parement)	0" (0 mm)
E	Unit to side facing (protruding ¾" [19 mm]) (De l'unité au côté du parement)	0" (0 mm)
F	From door opening of unit to edge of floor protection (De la porte ouvrant au devant de protection de plancher)	6" (152 mm)
G	From side of unit to edge of floor protection (De l'ouverture de porte pour prendre parti de protection de plancher)	6" (152 mm)



Combustible floors must be protected by a non-combustible material.  
- See Owners Manual.  
Le plancher combustible doit être protégé par un matériel incombustible.  
- Consultez le manuel.

CAUTION:

HOT WHILE IN OPERATION. DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE BURNS. SEE NAMEPLATE AND INSTRUCTIONS.



To Start Stove: Select fuel type mode; PREMIUM PELLETS for superior quality pellet fuel, REGULAR PELLETS for all grades of wood pellets & MULTIFUEL for all other fuels. Press the ON / OFF button. For first time use, a small handful of pellets in the burn pot liner will speed up ignition.  
To Operate Stove: MANUAL MODE: When a fire has been established the stove settings are adjustable. / HIGH/LOW MODE: (Requires a thermostat) When the thermostat calls for heat the stove settings are adjustable. When the thermostat contacts open, the HEAT LEVEL and Fans will drop down to the LOW setting until the thermostat contacts close again. / AUTO/OFF MODE: (Requires a thermostat) When the thermostat contacts close, the unit will light automatically. Once up to temperature the stove settings are adjustable. When the thermostat contacts open, the stove will drop down to the LOW settings for 30 minutes. If within the 30 min the thermostat contacts close, the HEAT LEVEL will return to previous MANUAL setting or if the thermostat contacts remain open the stove begin its shutdown routine and it will restart when the thermostat closes.

To Turn Off Stove: MANUAL and HI / LOW mode: Press the ON / OFF button  
AUTO / OFF mode: Turn the thermostat down or off.

Pour démarrer le poêle: Choisir le mode pour le carburant ; PREMIUM PELLETS pour le carburant de boulette de qualité de superior, REGULAR PELLET pour tous degrés de boulettes de bois & MULTIFUEL pour tous autres carburants. Appuyer sur le bouton "ON/OFF". Pour l'usage de première fois, une petite poignée de boulettes dans le pot de brûlure hâtera l'allumage.

Pour faire fonctionner le poêle : MODE MANUEL : Lorsque le feu est bien établi, les réglages peuvent être ajustés. / MODE "HIGH/LOW" : (Nécessite un thermostat) Lorsque le thermostat requière de la chaleur, les réglages peuvent être ajustés. Lorsque les contacts du thermostat ouvrent, le réglage du niveau de chaleur et les ventilateurs s'ajusteront au réglage " bas " jusqu'à ce que les contacts du thermostat se referment. / MODE "AUTO/OFF" : (Nécessite un thermostat) Lorsque les contacts du thermostat ferment, le poêle s'allumera automatiquement. Lorsque la température adéquate est atteinte, les réglages peuvent être ajustés. Lorsque les contacts du thermostat ouvrent, le poêle s'ajustera aux réglages "LOW" pendant 30 minutes. Si les contacts du thermostat sont fermés pendant ces 30 minutes, le réglage de niveau de chaleur retournera en réglages "MANUEL" ou si les contacts du thermostat restent ouverts, le poêle entamera le processus d'arrêt et il vouloir redémarrer lorsque les contacts du thermostat refermer.

Pour éteindre le poêle : MODE MANUEL ET " HIGH/LOW " : Appuyer sur le bouton "ON/OFF".  
MODE "AUTO / OFF" : Régler le thermostat à la baisse ou éteignez le.

ATTENTION:

L'APPAREIL EST CHAUD LORSQU'IL FONCTIONNE. NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS DE L'APPAREIL EN MARCHÉ. UN CONTACT AVEC CELUI-CI POURRAIT RÉSULTER EN DES BRÛLURES. VEUILLEZ VOIR LA PLAQUE DU FABRICANT ET LES INSTRUCTIONS.

PFS TECO  
REPORT  
#21-703



MANUFACTURED BY /  
FABRIQUE PAR:  
SHERWOOD INDUSTRIES LTD.  
VICTORIA BC CANADA

This pellet heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this heater in a manner inconsistent with the operating instructions in the owner's manual. U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards. Under specific test conditions this heater has been shown to have a particulate emission level of 1.9 g/hr.

Ce poêle à granulés besoins inspection périodique et la réparation pour un fonctionnement correct. Consultez le manuel d'owner's pour plus d'informations. Il est contre les règlements fédéraux pour exploiter cette pastille chauffe d'une manière incompatible avec les instructions de fonctionnement dans le manuel d'owner's. Ce poêle répond aux normes limites d'émission de l'Environmental Protection Agency des États-Unis 2020. Dans des conditions de test spécifiques, ce poêle a été montré pour avoir un niveau d'émission de particules de 1.9 g / h.



Intertek  
C#4001609

Certified for use in Canda & USA. Refer to Intertek's Directory of Building Products for detailed information / Certifié pour installation au Canada et aux Etats-Unis.Reportez-vous au répertoire des produits de construction d'Intertek pour des informations détaillées.

DATE OF MANUFACTURE / DATE DE FABRICATION:

J F M A M J J A S O N D 2021 2022 2023

## DO NOT REMOVE THIS LABEL / NE RETIREZ PAS CETTE ÉTIQUETTE

Serial No. / No. De Série:

Model / Modèle: GC60-2

Listed Room Heater, Pelletized Fuel Type (Appareil de chauffage à granules certifié)

Input rating when using (Le chauffage d'énergie avec):

Wood Pellets/Corn (Boulettes de bois/IMaïs) - 55,000BTU (16.1KW\*hr)

Wheat/Barley (Blé/l'Orge) - 53,000BTU (15.5KW\*hr)

Suitable For Mobile Home Installation (Accepté pour l'installation dans une maison mobile, test)

Solid Fuel Room Heaters / Identifié Comme Un Foyer A Combustible Solide: ULC S627 & ORD 1482

This pellet appliance has been tested and listed for use in manufactured homes in accordance with Oregon Administrative rules 814-23-900 through 814-23-909. Install and use only in accordance with the manufacturer's installation and operating instructions. Contact local building or fire officials about restrictions and installation inspection in your area. Do not connect this unit to a chimney flue serving another appliance. See local building code and manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling. ELECTRICAL RATING: 120 Volts, 60Hz, 4.2 Amps. Route Cord Away From Heater.

For use with pelletized solid fuels - wood, corn, wheat, & barley only. Operate only with viewing door and ash removal door closed. Only replace glass with ceramic glass. Components required for installation: a 4inch (100 mm) listed PL or L vent, complete with components.

Cet appareil a été testé et certifié pour utilisation dans les maisons mobiles en accord avec les "Règles Administratives de l'Oregon 814-23-900 à 814-23-909". Installez et utilisez cet appareil seulement selon les instructions d'installation et d'opération du fabricant. Contactez les autorités locales de votre quartier concernant les restrictions et les inspections d'installation. Consultez les codes de bâtiment locaux et les instructions du fabricant pour les précautions à prendre lorsque une cheminée doit être installée au travers un mur ou un plafond combustible. CLASSEMENT ÉLECTRIQUE : 120 Volts, 60 Hz, 4.2 Amps. Placez le câble électrique loin de la chaleur. Utilisation avec granules - le bois, le maïs, le blé, & l'orge seulement. Utiliser seulement lorsque les portes avants et la porte du réceptacle de cendre sont fermées. Si une ou des vitres devaient être remplacées, utilisez seulement du verre céramique. Les composantes requises pour l'installation sont un événement PL ou L certifié de 4in/100mm avec ses composantes.

DATE OF MANUFACTURE / DATE DE FABRICATION:

J F M A M J J A S O N D 2021 2022 2023

Installed as a freestanding stove - conventional or mobile home - Minimum Clearances to Combustible Material / Installé comme poêle autoportant - conventionnel ou mobile - dégagement minimum par rapport aux matériaux combustibles

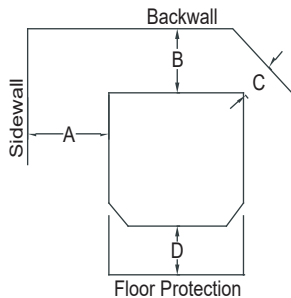
A = Sidewall to Unit / Du mur de côté à l'appareil: 9 in / 230mm

B = Backwall to Unit / Du mur de derrière à l'appareil: 3 in. / 76 mm

C = Corner to Unit / Du coin à l'appareil: 3 in. / 76 mm

D = The unit must be installed with a minimum of 6"(152 mm) of floor protection in front of and to the sides of the door opening.

The pedestal base can be adjusted to the forward position to satisfy this requirement. The unit can be installed on a hard, stable combustible surface. (D - L'unité doit être installée avec protection de plancher devant et au bord de la porte ouvrant avec au moins 6" (152 mm). La base de piédestal peut être adaptée à la position à satisfaire cette condition. L'unité peut être installée sur un dur, la surface combustible stable.)



## CAUTION:

HOT WHILE IN OPERATION. DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE BURNS. SEE NAMEPLATE AND INSTRUCTIONS.



To Start Stove: Select fuel type mode; PREMIUM PELLETS for superior quality pellet fuel, REGULAR PELLETS for all grades of wood pellets & MULTIFUEL for all other fuels. Press the ON / OFF button. A small handful of pellets in the burn pot liner will speed up ignition.

To Operate Stove: MANUAL MODE: When a fire has been established the stove settings are adjustable. / HIGH/LOW MODE: (Requires a thermostat) When the thermostat calls for heat the stove settings are adjustable. When the thermostat contacts open, the HEAT LEVEL and Fans will drop down to the LOW setting until the thermostat contacts close again. / AUTO/OFF MODE: (Requires a thermostat) When the thermostat contacts close, the unit will light automatically. Once up to temperature the stove settings are adjustable. When the thermostat contacts open, the stove will drop down to the LOW settings for 30 minutes. If within the 30 min the thermostat contacts close, the HEAT LEVEL will return to previous MANUAL setting or if the thermostat contacts remain open the stove begin its shutdown routine and it will restart when the thermostat closes.

To Turn Off Stove: MANUAL and HI / LOW mode: Press the ON / OFF button

AUTO / OFF mode: Turn the thermostat down or off.

Pour démarrer le poêle: Choisir le mode pour le carburant ; PREMIUM PELLETS pour le carburant de boulette de qualité de superior, REGULAR PELLET pour tous degrés de boulettes de bois & MULTIFUEL pour tous autres carburants. Appuyer sur le bouton "ON/OFF". Une petite poignée de boulettes dans le pot de brûlure hâtera l'allumage.

Pour faire fonctionner le poêle : MODE MANUEL : Lorsque le feu est bien établi, les réglages peuvent être ajustés. / MODE "HIGH/LOW" : (Nécessite un thermostat) Lorsque le thermostat requière de la chaleur, les réglages peuvent être ajustés. Lorsque les contacts du thermostat ouvrent, le réglage du niveau de chaleur et les ventilateurs s'ajusteront au réglage " bas " jusqu'à ce que les contacts du thermostat se referment. / MODE "AUTO/OFF" : (Nécessite un thermostat) Lorsque les contacts du thermostat ferment, le poêle s'allumera automatiquement. Lorsque la température adéquate est atteinte, les réglages peuvent être ajustés. Lorsque les contacts du thermostat ouvrent, le poêle s'ajustera aux réglages "LOW" pendant 30 minutes. Si les contacts du thermostat sont fermés pendant ces 30 minutes, le réglage de niveau de chaleur retournera en réglages "MANUEL" ou si les contacts du thermostat restent ouverts, le poêle entamera le processus d'arrêt et il voudra redémarrer lorsque les contacts du thermostat refermer.

Pour éteindre le poêle : MODE MANUEL ET " HIGH/LOW " : Appuyer sur le bouton "ON/OFF".

MODE "AUTO / OFF" : Régler le thermostat à la baisse ou éteignez le.

## ATTENTION:

L'APPAREIL EST CHAUD LORSQU'IL FONCTIONNE. NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS DE L'APPAREIL EN MARCHE. UN CONTACT AVEC CELUI-CI POURRAIT RÉSULTER EN DES BRÛLURES. VEUILLEZ VOIR LA PLAQUE DU FABRICANT ET LES INSTRUCTIONS.

PFS TECO  
REPORT  
#21-703



MANUFACTURED FOR /  
FABRIQUE POUR:  
FPI Fireplace Products International Ltd.  
DELTA, BC CANADA

This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual. U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards. Under specific test conditions this heater has been shown to have a particulate emission level of 1.9 g/hr.

Ce poêle à granulés besoins inspection périodique et la réparation pour un fonctionnement correct. Consultez le manuel d'owner's pour plus d'informations. Il est contre les règlements fédéraux pour exploiter cette pastille chauffe d'une manière incompatible avec les instructions de fonctionnement dans le manuel d'owner's. Ce poêle répond aux normes limites d'émission de l'Environmental Protection Agency des États-Unis 2020. Dans des conditions de test spécifiques, ce poêle a été montré pour avoir un niveau d'émission de particules de 1.9 g / h.



Intertek  
C#4001609

Certified for use in Canada & USA. Refer to Intertek's Directory of Building Products for detailed information / Certifié pour installation au Canada et aux États-Unis. Reportez-vous au répertoire des produits de construction d'Intertek pour des informations détaillées.

C-16297



Serial No. / No. De Sérié:

Model / Modèle: GCI60-2  
Listed Room Heater, Pelletized Fuel Type (Appareil de chauffage à granules certifié)  
Input rating when using (Le chauffage d'énergie avec):  
Wood Pellets/Corn (Boulettes de bois/IMais) - 55,000BTU (16.1KW\*hr)  
Wheat/Barley (Blé/l'Orge) - 53,000BTU (15.5KW\*hr)

Install and use only in accordance with the manufacturer's installation and operating instructions. Contact local building or fire officials about restrictions and installation inspection in your area. Do not connect this unit to a chimney flue serving another appliance. Inspect and clean exhaust venting system frequently. See local building code and manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling. ELECTRICAL RATING: 120 Volts, 60Hz, 4.2 Amps. Route Cord Away From Heater.

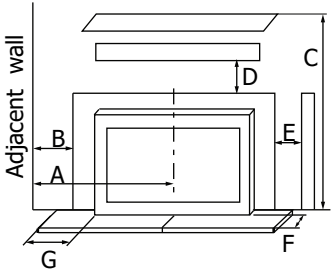
For use with pelletized solid fuels - wood, corn, wheat, & barley only. Operate only with viewing door and ash removal door closed. Only replace glass with ceramic glass. Components required for installation: listed 4inch (100 mm) stainless steel chimney liner.

Installez et utilisez cet appareil seulement selon les instructions d'installation et d'opération du fabricant. Contactez les autorités locales de votre quartier concernant les restrictions et les inspections d'installation. Inspectez et nettoyez le système d'échappement fréquemment. Consultez les codes de bâtiment locaux et les instructions du fabricant pour les précautions à prendre lorsque une cheminée doit être installée au travers un mur ou un plafond combustible. CLASSEMENT ÉLECTRIQUE : 120 Volts, 60 Hz, 4.2 Amps. Placez le câble électrique loin de la chaleur. Utilisation avec granules - le bois, le maïs, le blé, & l'orge seulement. Utiliser seulement lorsque les portes avants et la porte du réceptacle de cendre sont fermées. Si une ou des vitres devaient être remplacées, utilisez seulement du verre céramique. Les composantes requises pour l'installation: une revêtement de cheminée reprisé en acier inoxydable 4".

DO NOT REMOVE THIS LABEL / NE RETIREZ PAS CETTE ÉTIQUETTE

INSTALLED AS A FIREPLACE INSERT STOVE MODEL (FPI) / A INSTALLÉ  
COMME UN MODELE SUR PIED DE POELE.  
Minimum clearances to combustible materials./ Les dégagements minimums aux  
matériels combustibles:

A	Sidewall to center of unit (De la paroi au centre de l'unité)	24" (610 mm)
B	Sidewall to surround panel (De la paroi à l'entoure le panneau)	2" (51 mm)
C	Bottom of unit to an unshielded 12" (305 mm) mantle (Le fond de l'unité à un manteau de cheminée non blindé)	33" (838 mm)
D	Unit to top facing (protruding ¾" [19 mm]) (De l'unité au sommet du parement)	0" (0 mm)
E	Unit to side facing (protruding ¾" [19 mm]) (De l'unité au côté du parement)	0" (0 mm)
F	From door opening of unit to edge of floor protection (De la porte ouvrant au devant de protection de plancher)	6" (152 mm)
G	From side of unit to edge of floor protection (De l'ouverture de porte pour prendre parti de protection de plancher)	6" (152 mm)



Combustible floors must be protected by a non-combustible material.  
- See Owners Manual.  
Le plancher combustible doit être protégé par un matériel incombustible.  
- Consultez le manuel.

CAUTION:

HOT WHILE IN OPERATION. DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE BURNS. SEE NAMEPLATE AND INSTRUCTIONS.



To Start Stove: Select fuel type mode; PREMIUM PELLETS for superior quality pellet fuel, REGULAR PELLETS for all grades of wood pellets & MULTIFUEL for all other fuels. Press the ON / OFF button. For first time use, a small handful of pellets in the burn pot liner will speed up ignition.

To Operate Stove: MANUAL MODE: When a fire has been established the stove settings are adjustable. / HIGH/LOW MODE: (Requires a thermostat) When the thermostat calls for heat the stove settings are adjustable. When the thermostat contacts open, the HEAT LEVEL and Fans will drop down to the LOW setting until the thermostat contacts close again. / AUTO/OFF MODE: (Requires a thermostat) When the thermostat contacts close, the unit will light automatically. Once up to temperature the stove settings are adjustable. When the thermostat contacts open, the stove will drop down to the LOW settings for 30 minutes. If within the 30 min the thermostat contacts close, the HEAT LEVEL will return to previous MANUAL setting or if the thermostat contacts remain open the stove begin its shutdown routine and it will restart when the thermostat closes.

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Pour faire fonctionner le poêle : MODE MANUEL : Lorsque le feu est bien établi, les réglages peuvent être ajustés. / MODE "HIGH/LOW" : (Nécessite un thermostat) Lorsque le thermostat requière de la chaleur, les réglages peuvent être ajustés. Lorsque les contacts du thermostat ouvrent, le réglage du niveau de chaleur et les ventilateurs s'ajusteront au réglage " bas " jusqu'à ce que les contacts du thermostat se referment. / MODE "AUTO/OFF" : (Nécessite un thermostat)

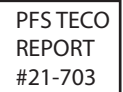
Lorsque les contacts du thermostat ferment, le poêle s'allumera automatiquement. Lorsque la température adéquate est atteinte, les réglages peuvent être ajustés. Lorsque les contacts du thermostat ouvrent, le poêle s'ajustera aux réglages "LOW" pendant 30 minutes. Si les contacts du thermostat sont fermés pendant ces 30 minutes, le réglage de niveau de chaleur retournera en réglages "MANUEL" ou si les contacts du thermostat restent ouverts, le poêle entamera le processus d'arrêt et il vouloir redémarrer lorsque les contacts du thermostat refermer.

Pour éteindre le poêle : MODE MANUEL ET " HIGH/LOW " : Appuyer sur le bouton "ON/OFF".

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MANUFACTURED FOR /  
FABRIQUE POUR:  
FPI Fireplace Products International Ltd.  
Delta, BC, Canada



Intertek  
C#4001609

Certified for use in Canda & USA. Refer to Intertek's Directory of Building Products for detailed information / Certifié pour installation au Canada et aux Etats-Unis.Reportez-vous au répertoire des produits de construction d'Intertek pour des informations détaillées.

This pellet heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this heater in a manner inconsistent with the operating instructions in the owner's manual. U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards. Under specific test conditions this heater has been shown to have a particulate emission level of 1.9 g/hr.

Ce poêle à granulés besoins inspection périodique et la réparation pour un fonctionnement correct. Consultez le manuel d'owner's pour plus d'informations. Il est contre les règlements fédéraux pour exploiter cette pastille chauffe d'une manière incompatible avec les instructions de fonctionnement dans le manuel d'owner's. Ce poêle répond aux normes limites d'émission de l'Environmental Protection Agency des États-Unis 2020. Dans des conditions de test spécifiques, ce poêle a été montré pour avoir un niveau d'émission de particules de 1.9 g / h.



# M55-FS-2

FREE-STANDING PELLET STOVE

## OWNER'S MANUAL

WARRANTY REGISTRATION  
[enviro.com/warranty](http://enviro.com/warranty)



**PLEASE READ THIS ENTIRE MANUAL BEFORE INSTALLATION AND USE OF THIS PELLET-BURNING ROOM HEATER. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH.**



**Intertek**  
C# 4001609

**Contact your building or fire officials about restrictions and installation inspection requirements in your area.**

**Fr** Version Française: [www.enviro.com/fr.html](http://www.enviro.com/fr.html)

**50-2061**

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# INTRODUCTION

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\* This manual is designed for the home owner in conjunction with the technical manual. \*

## **RATING LABEL LOCATION:**

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The rating label is located on the inside of the hopper.

## **FUEL QUALITY:**

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**Fuel quality is important, please read the following:**

**Your Enviro pellet stove has been designed to burn 1/4" (6mm) dia wood pellets and other organic fuels. DO NOT use this appliance as an incinerator. DO NOT use unsuitable and non recommended fuels, including liquid fuels as this will void any warranties stated in this manual.**

**The performance of your pellet stove is greatly affected by the type and quality of fuel being burned. As the heat output of various quality fuels differs, so will the performance and heat output of the pellet stove.**

**CAUTION:** It is important to select and use only fuel that are dry and free of dirt or any impurities such as high salt content. Dirty fuel will adversely affect the operation and performance of the unit and will void the warranty. The Pellet Fuel Industries (P.F.I.) has established standards for wood pellet manufacturers. We recommend the use of pellets that meet or exceed these standards. Ask your dealer for a recommended pellet type.

**ASH:** The ash content of the fuel and operation of your stove will directly determine the frequency of cleaning. The use of high ash fuels may result in the stove needing to be cleaned daily. A low ash fuel may allow longer intervals between cleaning.

**CLINKERING:** [clinkers are silica (sand) or other impurities in the fuel that will form a hard mass during the burning process]. This hard mass will block the air flow through the Burn Pot Liner and affect the performance of the stove. Any fuel, even approved types, may clinker. Check the Burn-Pot Liner daily to ensure that the holes are not blocked with clinkers. If they become blocked, remove the liner (when the unit is cold) and clean/scrape the clinkers out. Clean the holes with a small pointed object if required. Refer to the section Routine Cleaning and Maintenance.

**FUEL FEED RATES:** Due to different fuel densities and sizes, fuel feed rates may vary. This may require an adjustment to the slider damper setting or to the auger feed trim setting.

Since Sherwood Industries Ltd. has no control over the quality of fuel that you use, we assume no liability for your choice in fuels.

**FILLING FUEL HOPPER:** Open lid on top of unit, check hopper for foreign objects, empty the bag into the hopper, and ensure hopper lid closes completely.

**Store fuels at least 36" (1 m) away from the pellet stove.**

**WARNING: Parts of the appliance, especially the external surfaces, will be hot to touch when in operation so use due care.**

**FLAMMABLE LIQUIDS:** **Never** use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid, or similar liquids to start or "freshen up" a fire in the heater. Keep all such liquids well away from the heater while it is in use.

# EMISSIONS AND EFFICIENCIES

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## EMISSIONS AND EFFICIENCY - M55-FS:

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**Rates:** This manual describes the installation and operation of the Enviro M55 pellet heater. This heater is U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards. Under specific test conditions this heater has been shown to deliver heat at rates ranging from 38,437-7817 Btu/hr.

**Efficiency:** 78.2% HHV (PFS TECO 21-703)

\*When using optional top vent adapter kit.

**WARNING:** This pellet heater needs periodic inspection and repair for proper operation. It is against federal regulations to operate this pellet heater in a manner inconsistent with operating instructions in this manual.

**WARNING:** This wood pellet has a manufacturer set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this pellet heater in a manner inconsistent with operating instructions in this manual.

# **SAFETY WARNINGS & RECOMMENDATIONS**

**Please read this entire Owner's Manual before installing or operating your Enviro Pellet Stove. Failure to follow these instructions may result in property damage, bodily injury or even death. Any unauthorized modification of the appliance or use of replacement parts not recommended by the manufacturer is prohibited. All national and local regulations and shall be complied with when operating this appliance.**

**Caution: Do not connect to any air distribution duct or system.**

**Warning:** Never place wood, paper, furniture, drapes or other combustible materials within 48" (122cm) of the front of the unit, 12" (30.5cm) from each side, and 4" (10cm) from the back of the unit. Do not let children or pets touch it when it is hot.

To prevent the possibility of a fire, ensure that the appliance is properly installed by adhering to the installation instructions. An Enviro dealer will be happy to assist you in obtaining information with regards to your local building codes and installation restrictions.

**FIRE EXTINGUISHER AND SMOKE DETECTION:** All homes with a pellet burning stove should have at least one fire extinguisher in a central location known to all in the household. Smoke detectors and carbon monoxide detectors should be installed and maintained in the room containing the stove. If either sounds the alarm, correct the cause but do not deactivate. You may choose to relocate the detection devices within the room; **DO NOT REMOVE THE SMOKE OR CARBON MONOXIDE DETECTORS FROM THE ROOM.**

**CHIMNEY OR RUN AWAY FIRE:** Call local fire department (or dial 911). Close the draft fully. Extinguish the fire in the burn pot liner with a cup of water and close the door. Examine the flue pipes, chimney, attic, and roof of the house, to see if any part has become hot enough to catch fire. If necessary, spray with fire extinguisher or water from the garden hose. **IMPORTANT:** Do not operate the stove again until you are certain the chimney and its lining have not been damaged.

**OPERATION:** The door and ash drawer must be kept closed when the unit is in operation to prevent fume spillage and for proper and safe operation of the pellet stove. Also ensure all gaskets on the door are checked and replaced when necessary. **Unit hot while in operation. Keep children, clothing and furniture away. Contact may cause skin burns.**

**CAUTION:** When operating during adverse weather, if the unit exhibits dramatic changes in combustion stop using the unit immediately.

**FUEL:** This stove is designed and approved to only burn wood pellets of any quality, corn, wheat, barley, and grass. Dirty fuel will adversely affect the operation and performance of the unit and may void the warranty. Check with your dealer for fuel recommendations. **THE USE OF CORDWOOD IS PROHIBITED BY LAW. Do not burn garbage or flammable fluids such as gasoline, naptha or engine oil.**

**SOOT:** Operation of the stove with insufficient combustion air will result in the formation of soot which will collect on the glass, the heat exchanger, the exhaust vent system, and may stain the outside of the house. Frequently check your stove and adjust the slider/damper as needed to ensure proper combustion. **See: "SLIDER/DAMPER SETTING".**

**CLEANING:** There will be some build up of fly ash and small amounts of creosote in the exhaust. This will vary due to the ash content of the fuel used and the operation of the stove. It is advisable to inspect and clean the exhaust vent semi-annually or every two tons of pellets.

The appliance, flue gas connector and the chimney flue require regular cleaning. Check them for blockage prior to re-lighting after a prolonged shut down period.

**ASHES:** Disposed ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be on a non-combustible surface, well away from all combustible materials pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispensed, they should be retained in the closed container until all cinders have thoroughly cooled.

# **SAFETY WARNINGS & RECOMMENDATIONS**

**ELECTRICAL:** The use of a surge protected power bar is recommended. The unit must be grounded. The grounded electrical cord should be connected to a standard 110-120 volts (4.2 Amps), 60 hertz electrical outlet and also must be accessible. If this power cord should become damaged, a replacement power cord must be purchased from the manufacturer or a qualified Enviro dealer. Be careful that the electrical cord is not trapped under the appliance and that it is clear of any hot surfaces or sharp edges. This unit's maximum power requirement is 504 watts.

When installing the stove in a mobile home, it must be electrically grounded to the steel chassis of the home and bolted to the floor.

**GLASS:** Do not abuse the glass by striking or slamming the door. Do not attempt to operate the stove with broken glass. The stove uses ceramic glass. Replacement glass must be purchased from an Enviro dealer. Do not attempt to open the door and clean the glass while the unit is in operation or if glass is hot. To clean the glass, use a soft cotton cloth and mild window cleaner, gas or wood stove glass cleaner, or take a damp paper towel and dip into the fly ash. This is a very mild abrasive and will not damage the glass.

**KEEP ASH PAN FREE OF RAW FUEL.** DO NOT PLACE UNBURNED OR NEW PELLET FUEL IN ASH PAN. A fire in the ash pan may occur.

**INSTALLATION:** Contact your local building or fire official to obtain a permit and any information on installation restrictions and inspection requirements for your area.

Be sure to maintain the structural integrity of your home when passing a vent through walls, ceilings, or roofs, and all construction meets local building codes. It is recommended that the unit be secured into its position in order to avoid any displacement. This appliance must be installed on a floor with an adequate load bearing capacity, if existing construction doesn't meet load capacity, suitable measures (e.g. load distributing plate) must be taken to achieve it.

DO NOT INSTALL A FLUE DAMPER IN THE EXHAUST VENTING SYSTEM OF THIS UNIT.  
DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.

**FRESH AIR:** This unit uses large quantities of air for combustion; outside Fresh Air connection is **strongly** recommended. Fresh Air **must** be connected to all units installed in Mobile and "Air Tight Homes" (R2000) or where required by local codes.

Consider all large air moving devices when installing your unit and provide room air accordingly. NOTE: Extractor fans when operating in the same room or space as the appliance may cause problems. Limited air for combustion may result in poor performance, smoking and other side effects of poor combustion.

The stove's exhaust system works with negative combustion chamber pressure and a slightly positive chimney pressure. It is very important to ensure that the exhaust system be sealed and airtight. The ash pan and viewing door must be locked securely for proper and safe operation of the pellet stove.

Do not burn with insufficient combustion air. A periodic check is recommended to ensure proper combustion air is admitted to the combustion chamber. Setting the proper combustion air is achieved by adjusting the slider damper located on the left side of the stove.

Soot or creosote may accumulate when the stove is operated under incorrect conditions such as a rich burn (black tipped, lazy orange flames).

If you have any questions with regards to your stove or the above-mentioned information, please feel free to contact your local dealer for further clarification and comments.

**SINCE SHERWOOD INDUSTRIES LTD. HAS NO CONTROL OVER THE INSTALLATION OF YOUR STOVE, SHERWOOD INDUSTRIES LTD. GRANTS NO WARRANTY IMPLIED OR STATED FOR THE INSTALLATION OR MAINTENANCE OF YOUR STOVE. THEREFORE, SHERWOOD INDUSTRIES LTD. ASSUMES NO RESPONSIBILITY FOR ANY CONSEQUENTIAL DAMAGE(S).**

**SAVE THIS INSTRUCTION MANUAL FOR FUTURE REFERENCE.**

# SPECIFICATIONS

## DIMENSIONS:

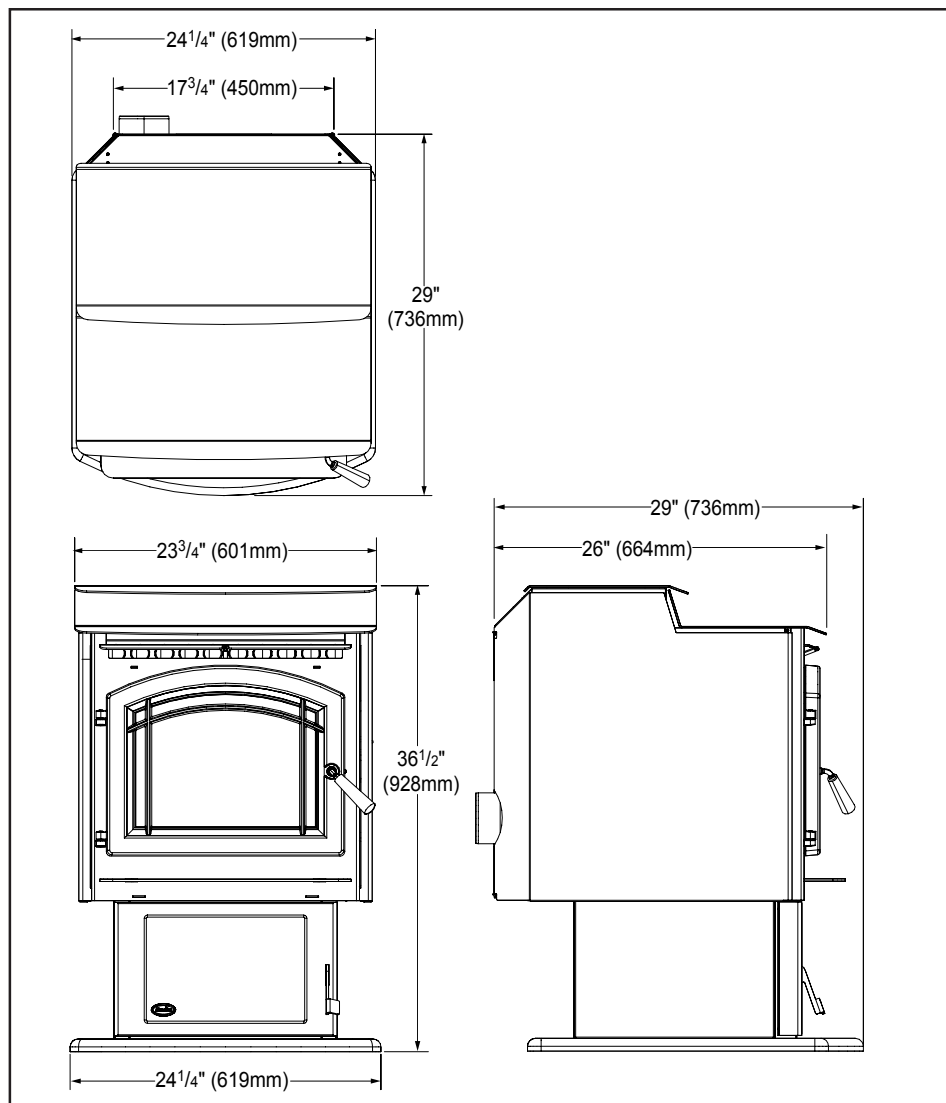


Figure 1: Dimensions of M-55-FS.

## SPECIFICATIONS:

Input rating when using: Wood Pellets/Corn - 55,000BTU (16.1KW•hr) & Wheat/Barley - 53,000BTU (15.5KW•hr).

Table 1: M-55-FS Specifications.

Description	Fuel type	
Residential Pellet Heater	6mm (1/4") dia. Pellets - wood, corn, wheat, & barley*	
Voltage	Current	Max Power
110 - 120 V	4.2 Amps	504 Watts
Frequency	Hopper Capacity	Consumption on Low
60 Hz	up to 80 lb (36.3 Kg)	1.5 lb/hr (0.68 Kg/hr)*
Testing Standard	Weight (with full hopper)	Consumption on High
ASTM 1509-04	395 lb (179.2 Kg)	6.5 lb/hr (2.95 Kg/hr)*

\*Note: Consumption will vary with the type of fuel used.

# OPERATING INSTRUCTIONS

## CONTROL BOARD FUNCTIONS:

1. **ON/OFF BUTTON:** Used to turn the unit ON and OFF manually.
2. **COMBUSTION AIR TRIM BUTTON:** Increases or Decreases the Fan voltage by 2.5volts on all feed settings. When pressed all lights on Heat Level Indicator will come on except the one that is the set point. Hold Trim Button down and press the UP or DOWN Heat Level Arrow to adjust setting. #3 Light is the default setting.

Depending on Fuel quality Ignition problems may occur at higher altitudes, this can be resolved by trimming the Combustion Fan to a higher setting.

3. **FUEL TYPE BUTTON:** Used to switch between fuel type modes; Pellet (for all qualities of wood pellets) and Multifuel (for all fuels including wood pellets). When set on Multifuel it will run at a reduced High Feed Rate with wood pellets. **NOTE:** Fuel Type can only be changed when the unit is cold.

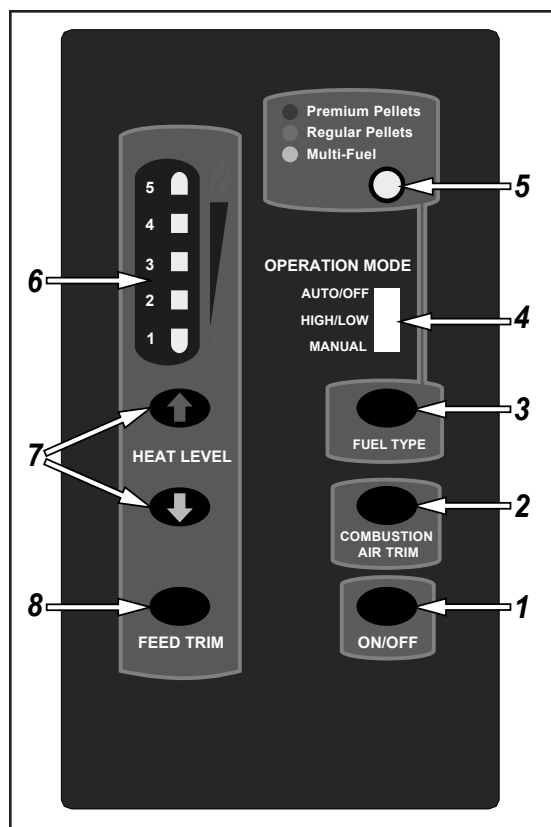


Figure 2: Circuit Board Control Panel Decal

4. **THERMOSTAT SWITCH:** Sets the unit's control mode; AUTO/OFF or HIGH/LOW (when using a Thermostat or Timer) or MANUAL.
5. **FUEL TYPE LIGHTS:** Shows the present Fuel Type selected; Premium Pellets are Red, Regular Pellets are Green, and Multi-fuel is Yellow. The Light flashes during start-up, and when the Thermostat is in control of the Unit. The Light stops flashing when the Exhaust Sensor closes.
6. **HEAT OUTPUT INDICATOR:** Shows the present Heat Level output setting and the Feed Trim while it is being adjusted.
7. **HEAT LEVEL ADJUSTMENT BUTTONS:** Changes the Heat Setting of the Unit from LO to HIGH. Press the Arrow Up button to increase Heat, and Arrow Down to decrease Heat.
8. **FEED TRIM BUTTON:** Used in conjunction with the Heat Level Adjustment Buttons to adjust the Feed Trim. It can be increased by two (2) feed settings or it can be decreased by two (2) feed settings. The Feed Trim can only be adjusted one setting at a time.

## AUTOMATIC SAFETY FEATURES OF YOUR PELLET STOVE:

- A. **EXHAUST TEMPERATURE SWITCH:** The stove will shut off when the fire goes out and the exhaust temperature drops below 49°C (120°F). It will display a #3 flash code.
- B. **HIGH LIMIT SAFETY SWITCH:** If the temperature on the hopper reaches 93°C (200°F), the auger will automatically stop, the stove will shut down, and it will display a #4 flash code. If this happens, call your local dealer to reset the 93°C (200°F) high limit switch. **ALSO FIND THE REASONS WHY THE UNIT OVERHEATED.**
- C. **VACUUM SWITCH:** Notifies when the unit has lost vacuum. This can be caused by either a combustion fan/vent failure, or simply the unit's outer door, pedestal door, and/or hopper lid beeing left open. It will display a #2 flash code.

# OPERATING INSTRUCTIONS

## OPERATING YOUR PELLET STOVE:

**DO NOT OPERATE THE UNIT WITH THE DOOR OR ASH BOX OPEN. Keep hopper lid closed except during re-fuelling.**

**CAUTION:** When operating during adverse weather, such as high winds or freezing rain, if the unit exhibits dramatic changes in combustion stop using the unit immediately. Watch for blocked exhaust outlet.

**PRE-BURN CHECK:** The burn pot liner holes must be clear and the liner installed properly against the ignitor tube and locked in place. Check the hopper for enough pellets to start the unit.

**Note:** To change fuel type, ensure the Thermostat Switch is set to Manual Mode. Press the Off button and then press the Fuel Type button to cycle through the available fuel types.

The unit has an automatic cleaning cycle; every thirty (30) minutes the agitator will turn continuously for one (1) minute to help clean out the burn pot liner.

### MANUAL MODE:

All control of circuit board function is adjusted at the circuit board.

**INITIAL START-UP: Press the ON / OFF button.** The stove will turn on. The Fuel Type Light will flash (the Auger Feed Rate is pre-programmed during start-up). The Heat Level Indicator will show the Heat Level that the stove will run at after start-up.

If this is the first time the unit has been started or the unit has run out of fuel, the auger may need to be primed. If there is no fuel in the burn pot after two (2) minutes the liner can be primed with a handful of pellets.

The agitator will not operate for the first five (5) minutes after the ON button has been pressed. After the five (5) minutes it will pulse at the same interval as the feed auger.

When the start-up sequence is complete the unit will ramp up to its heat level setting, this may take up to fifteen (15) minutes.

Once a fire has been established, the convection blower will turn on after ten (10) minutes.

**To OPERATE:** Press the Heat Level buttons to change the desired Heat Level Output setting.

The speed of the convection blower is controlled by the setting of the heat level.

The Feed Trim button pressed in conjunction with the Heat Level adjustment buttons to adjust the Feed Trim. It can be increased by two (2) feed settings or it can be decreased by two (2) feed settings.

**HIGH/LOW MODE:** (Requires a Thermostat or Timer)

**INITIAL START-UP:** See MANUAL MODE above.

**OPERATION:** When the thermostat calls for heat (contacts are closed) the stove settings are adjustable as per Manual Mode. When the thermostat contacts open, the HEAT LEVEL and Fans will drop down to the LOW setting until the thermostat contacts close again. The stove will come back to the previous HEAT LEVEL setting once the thermostat contacts close.

**AUTO/OFF MODE:** (Requires a Thermostat or Timer)

**INITIAL START-UP:** See MANUAL MODE above.

**OPERATION:** When the thermostat contacts close, the unit will light automatically. Once up to temperature, the stove operates the same as in MANUAL. When the thermostat contacts open, the stove's HEAT LEVEL and Fans will drop down to the LOW setting for 30 minutes. If the thermostat contacts close within the 30 minutes, the HEAT LEVEL will return to the

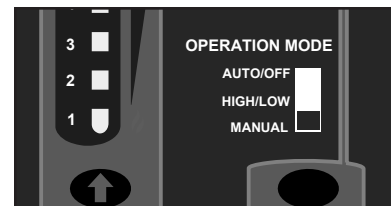


Figure 3: Thermostat Switch in MANUAL position.

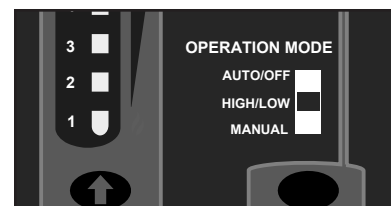


Figure 4: Thermostat Switch in HIGH/LOW position.

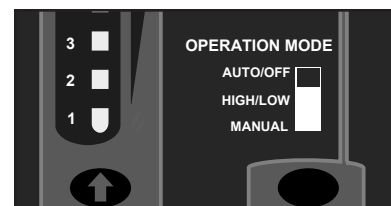


Figure 5: Thermostat Switch in AUTO/OFF position.

# OPERATING INSTRUCTIONS

previous MANUAL setting. If the thermostat contacts remain open, the stove automatically begins its shutdown routine. The stove will re-light when the thermostat contacts close again.

## TURNING YOUR PELLET STOVE OFF:

- MANUAL and HI / LOW mode: To turn the unit OFF, simply press the ON / OFF button. This will stop the feed of pellets. The blowers will continue to operate and cool the stove down. When cool enough, the stove will turn off.
- AUTO / OFF mode: To turn the unit OFF, turn the Thermostat down or Timer off.
- On shut down the burn pot agitator will run continuously for five (5) minutes on premium mode, one (1) minute on regular mode, and five (5) minutes on multi-fuel mode.

**DO NOT turn unit off during start-up or unplug unit while operating; this may lead to smoke escaping from the stove.**

## SLIDER/DAMPER SET-UP:

**This is used to regulate the airflow through the pellet stove and has been set at the factory.**

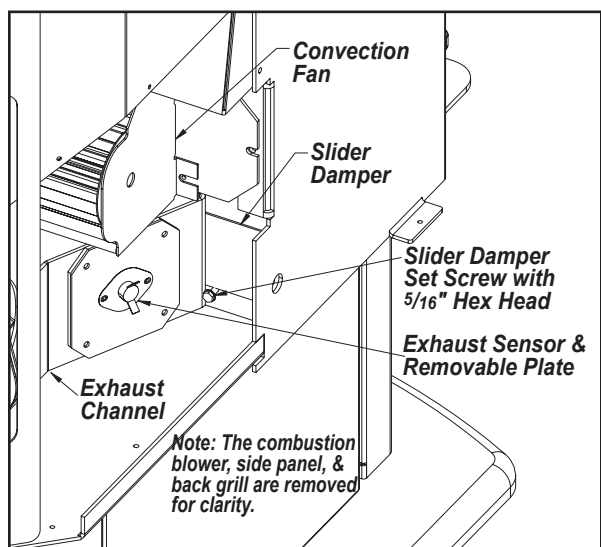


Figure 6: Slider/Damper Plate in Unit.



Figure 7: Efficient Flame.

This unit is designed to operate within a negative pressure range that may only be adjusted by a qualified technician. This can be measured using a Magnahelic pressure gauge once the unit has been running on heat level 5 setting after one hour of burn time. This adjustment is necessary for varying venting configurations. The reading can be taken from the  $\frac{1}{8}$ " hole located on the right side of the Pedestal.

The Combustion Trim, Feed Trim and Fuel Type Functions can be used to compensate for varying fuel qualities. Refer to the Owners Manual for circuit board operation.

If, after long periods of burning, the fire builds up or there is a build up of clinkers, this would be a sign that the fuel quality is poor - this requires more air.

The easiest way to make sure that an efficient flame is achieved is to understand the characteristics of the fire.

- A tall, lazy flame with dark orange tips requires more air.
- A short, brisk flame, like a blowtorch, has too much air.
- If the flame is in the middle of these two characteristics with a bright yellow/orange, active flame with no black tips then the air is set for proper operation, refer to Figure 7.

# OPERATING INSTRUCTIONS

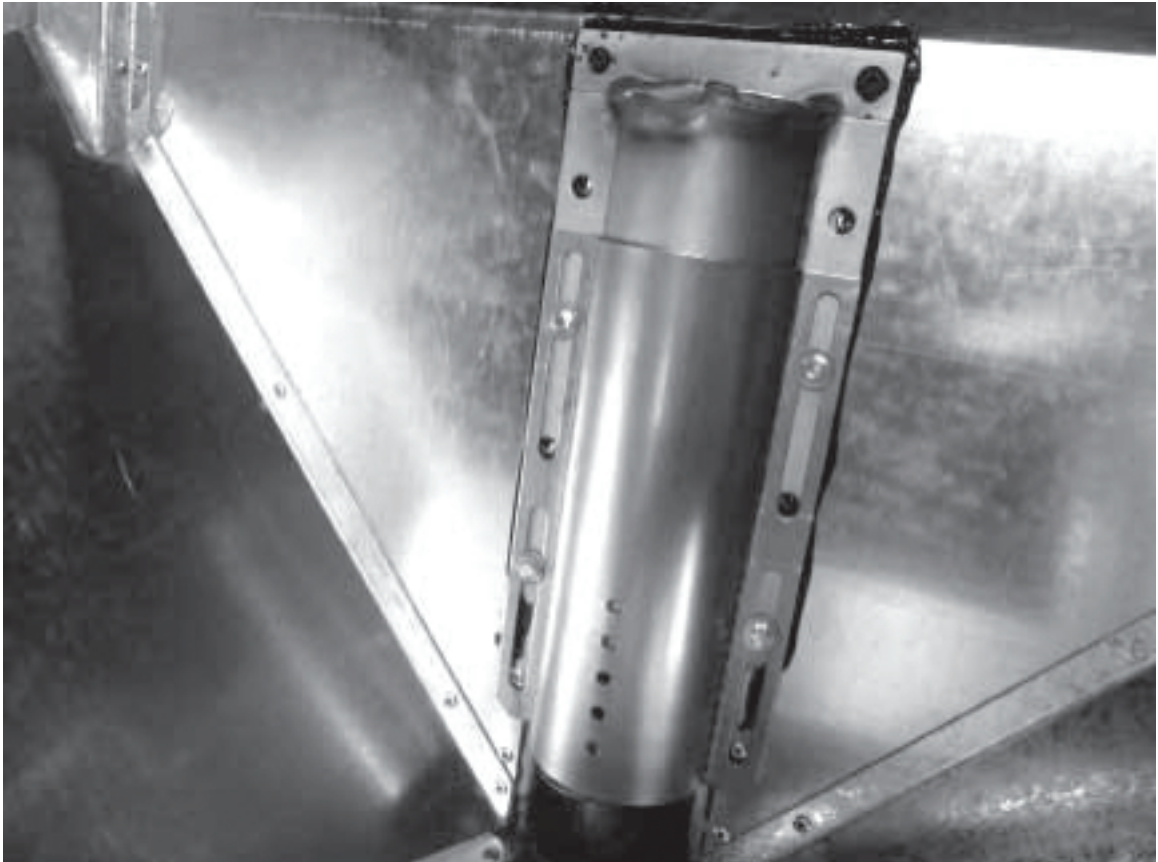
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## **SPECIAL NOTES:**

Fuel quality is a major factor in how the stove will operate. If the fuel has a high moisture content or ash content the fire will be less efficient and has a higher possibility of the fire building up and creating clinkers (hard ash build-up).

## **ADJUSTABLE AUGER COVER SET-UP:**

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The auger cover is located within the hopper.

This adjustment allows for greater control of the feed rate than offered by the feed trim positions on the control panel. Due to varying density by volume in fuels it may be necessary to adjust this cover either up or down to control the maximum output. Lowering the cover position will decrease output and raising it will increase output.

### **CAUTION**

**Increasing output too much can cause the high limit sensor to trip (flashing #4). If this occurs lower the position of the cover and manually reset the sensor before continuing to operate the unit.**

# ROUTINE CLEANING AND MAINTENANCE

The following list of components should be inspected and maintained routinely to ensure that the appliance is operating at its optimum and giving you excellent heat value. The appliance, flue gas connector and the chimney flue require regular cleaning. Check them for blockage prior to re-lighting after a prolonged shut down period.

Check the Burn Pot Liner DAILY	
Weekly	Bi-annually or 2 Tons of Fuel
Burn Pot and Liner - Empty	Exhaust Vent
Agitator	Fresh Air Intake Tube
Heat Exchanger Tubes	Blower Mechanisms
Door Glass	Heat Exchanger Tubes
Ash Pan and Door Gaskets	Behind Firebox Liners
Inside Firebox	All Hinges
Door Latch	Post Season Clean-up
Ash Box	

## TOOLS REQUIRED TO CLEAN UNIT:

Torx T-20 Screwdriver, 1/4", 5/16" 3/8", & 7/16" wrench and/or socket, Brush, Soft Cloth, and Vacuum with fine filter bag

## BURNER POT AND LINER (Checked Daily/Emptied Weekly)

This is the 'pot' where the pellets are burned. **Only clean when the unit is cold.**

Note: If, after long periods of burning, the fire continually builds up and overflows the burn pot or there is a build up of clinkers, this is an indication that the pellet fuel quality is poor or the stove may need cleaning. Check the stove for ash build up (clean if required) and adjust the slider / damper to produce the proper clean combustion.

1. Open the door using the door handle located on the right-hand side of the stove.
2. Lift the lever on burn pot to unlock the fire grate and remove it.
3. The agitator locks at the right; rotate the top of the agitator towards the back of the firebox to unlock it, slide it to the left, and lift it out of the burn pot liner.
4. Lift the burn pot liner out of the stove.
5. Lift the burn pot from the firebox by gently lifting it up at the front of the burn pot, then slide it out from around the air intake tube and the ignitor cartridge. The ignitor is spring loaded to help with removal and installation.
6. Remove any build up on the agitator (calcium build-ups are common when burning corn). Using a metal scrapper, remove material that has accumulated or is clogging the liner's holes. Then dispose of the scrapped ashes from the liner and from inside the burn-pot.
7. Place the burn-pot back into the stove, there are hooks at the front of the burn pot that sit in a mount in the firebox. Ensure that the air intake tube and the ignitor cartridge are properly inserted into the burn pot.
8. Place the liner back into the burn-pot, making sure that the ignitor hole in the liner is aligned with the ignitor tube; push the liner up against the ignitor tube.
9. Slide the agitator back into place and turn rotate the top towards the front of the stove to lock it in.
10. Set the fire grate in place, it should sit level on the front and back of the burn pot liner. Lock it in with the lever on the burn pot.
11. Close the door

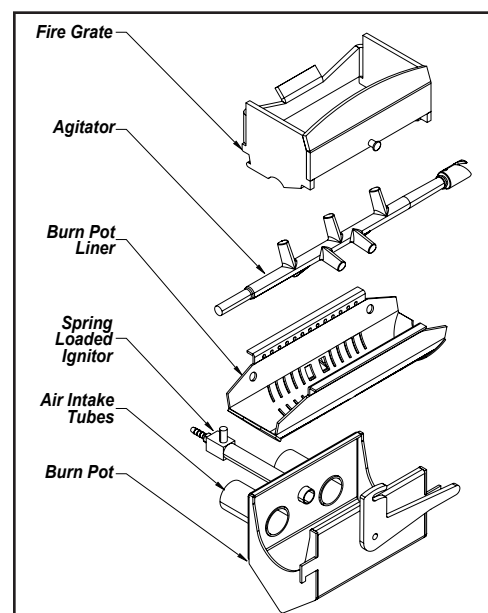


Figure 8: M-55-FS Burn Pot Assembly.

# ROUTINE CLEANING AND MAINTENANCE

## HEAT EXCHANGER TUBES (Weekly)

The exchanger tube scraper rod handle is located above the firebox door. Move the handle all the way in and out a few times (ONLY WHEN THE UNIT IS COLD) in order to clean away any fly ash that may have collected on the heat exchanger tubes. As different types of pellets produce different amounts of ash, cleaning of the tubes should be done on a regular basis to enable the unit to run efficiently.

## DOOR GLASS CLEANING (Weekly)

Cleaning of the glass must only be done when stove is cold. Open the door by lifting the handle. The glass can be cleaned by wiping down the outside and inside of the glass with a dry soft cloth.

If the glass has build up that can not be removed with only the cloth, clean the glass using paper towel and a gas appliance glass cleaner, this may be purchased through most dealers. If a gas appliance glass cleaner is not available, use a damp paper towel dipped in fly ash to clean the glass. After the glass has been cleaned use the dry soft cloth to wipe down the outside and inside of the glass.

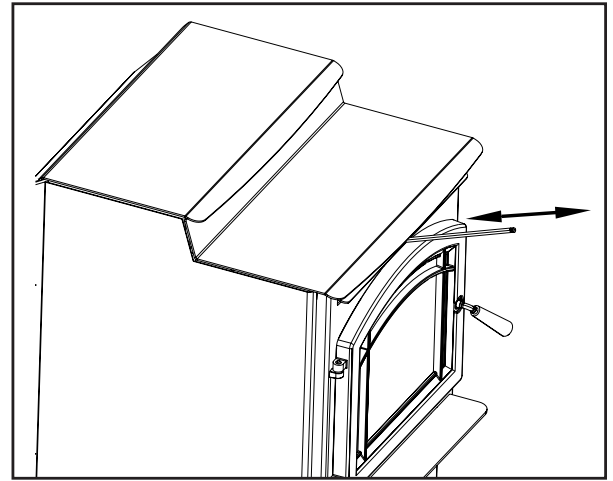


Figure 9: M-55-FS Heat Exchanger Cleaning.

## ASH PAN AND DOOR GASKETS (Weekly)

After extended use the gasketing may come loose. To repair this, glue the gasketing on using high-temperature fiberglass gasket glue available from your local dealer. This is important to maintain an airtight assembly.

## ASH BOX (Weekly)

**IMPORTANT:** The unit must be OFF while the ash pan is removed.

The ash box is located behind the lower door (see Figure 10). To remove the ash box, lift the latch on the right, open the ash box door, and lift it out.

Dump the ashes into a metal container stored away from combustibles. Monitor the ash level every week. Remember that different pellet fuels will have different ash contents. Ash content is a good indication of fuel efficiency and quality. Refer to "SAFETY WARNINGS AND RECOMMENDATIONS" for disposal of ashes. Vacuum the inside of the ash pan compartment inside the pedestal including the hole at the top back of the compartment. Insert the ash box fully and close ash box door.

**DO NOT PLACE UNBURNED OR RAW PELLET FUEL IN ASH PAN.**

## EXHAUST VENT (Biannually)

This vent should be cleaned every year or after two tons of pellets. We recommend contacting your dealer for professional cleaning. To clean the vent pipe, tap lightly on the pipe to dislodge any loose ash. Open the bottom of the "T" to dump the ash, then vacuum as much of the ash out of the vent pipe as possible.

## FRESH AIR INTAKE (Biannually)

Inspect periodically to be sure that it is not clogged with any foreign materials.

# ROUTINE CLEANING AND MAINTENANCE

## EXHAUST PASSAGES (Biannually)

1. Open the firebox door by lifting the handle.
2. Remove the burn pot assembly and clean all the parts.
3. Lubricate all screws with penetrating oil.
4. Lift the baffle, remove the firebox liner, and lift out the firebox lower. Vacuum the firebox and firebox liner thoroughly.
5. Open the ash box door; remove the ash box and cleanout the cavity.
6. Re-install the ash box, firebox lower, firebox liner, burn pot, and burn pot liner
7. Close the firebox and ash pan doors and secure.

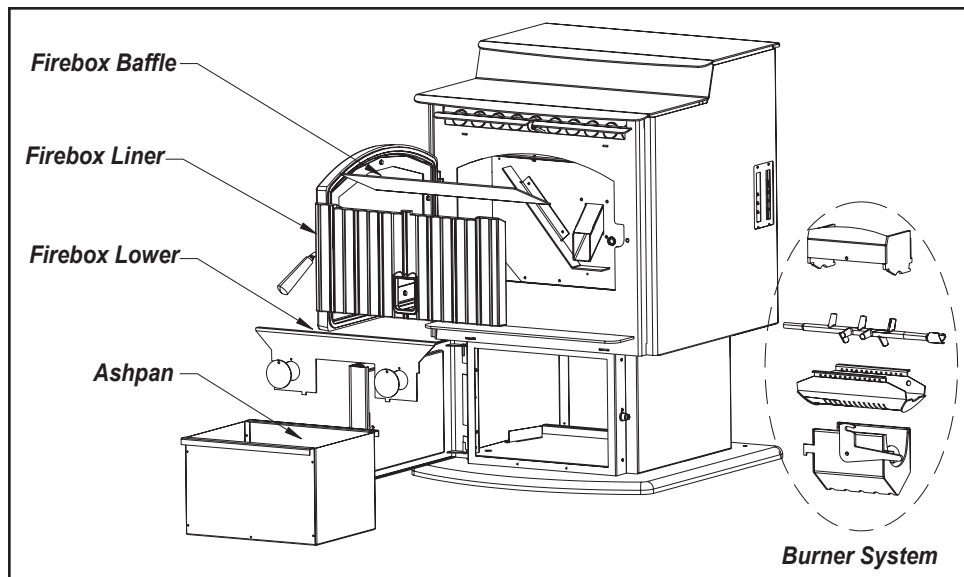


Figure 10: M-55-FS Exhaust Passages.

## BLOWER MECHANISMS (Annually)

Unplug the stove then open the right and left side panels to access the two blowers. Remove the two (2)  $\frac{5}{16}$  hex head screws from the upper & lower edge located on the front edge of the panel. Vacuum all dust from motors. The blower motors has sealed bearings, DO NOT lubricate this motor. Check gaskets and replace if needed.

## POST SEASON CLEAN-UP

Once you are finished using the pellet appliance for the season, unplug the stove for added electrical protection. It is very important that the stove be cleaned and serviced as stated above.

## CLEANING PAINTED SURFACES

Please clean painted surfaces with a soft damp cloth.

## FIREBOX LINER

The paint on the Firebox Liner may peel. This is due to extreme conditions applied to the paint and is in no way covered by warranty.

## DOOR GLASS REPLACEMENT

It is recommended that your dealer replace the glass if broken. The door glass is made of high temperature PYRO CERAMIC. To replace the glass, unscrew and remove the six (6) retainer nuts using a  $\frac{5}{16}$ " socket. Remove the glass and any broken pieces. High temperature fiberglass tape should be used around the glass in the same location as the original fiberglass. Insert the glass into the retainer, screw the door to the retainer, and gently tighten nuts. The use of substitute materials is prohibited: #50-2025 Glass  $14\frac{7}{8}$ " x  $11\frac{3}{8}$ " (378mm x 289mm).

# INSTALLATION

## DECIDING WHERE TO LOCATE YOUR PELLET APPLIANCE:

1. Do not install the stove in a bedroom or room where people sleep in.
2. Locate the stove in a large and open room that is centrally located in the house. This will optimize heat circulation.
3. Check clearances to combustibles and for the least amount of interference to house framing, plumbing, wiring, etc.
4. You can vent the stove with approved pipe through an exterior wall behind the unit or pass it through the ceiling and roof. The stove can connect to an existing masonry or metal chimney (must be lined if the chimney is over 6" (15 cm) diameter, or over 28 inches<sup>2</sup> (180 cm<sup>2</sup>) cross sectional area).
5. This unit must not be installed directly onto carpet. If it is to be installed on a carpeted area, a solid surface (wood, metal or approved hearth pad) must be installed between the unit and the carpet.
6. This unit uses large quantities of air for combustion; outside Fresh Air connection is **strongly recommended**. Fresh Air **must** be connected to all units installed in Mobile and "Air Tight Homes" (R2000) or where required by local codes.
7. Do not obtain combustion air from an attic, garage or any unventilated space. Combustion air may be obtained from a ventilated crawlspace.
8. The power cord is 8 feet (2.43 m) long and may require a grounded extension cord to reach the nearest electrical outlet.

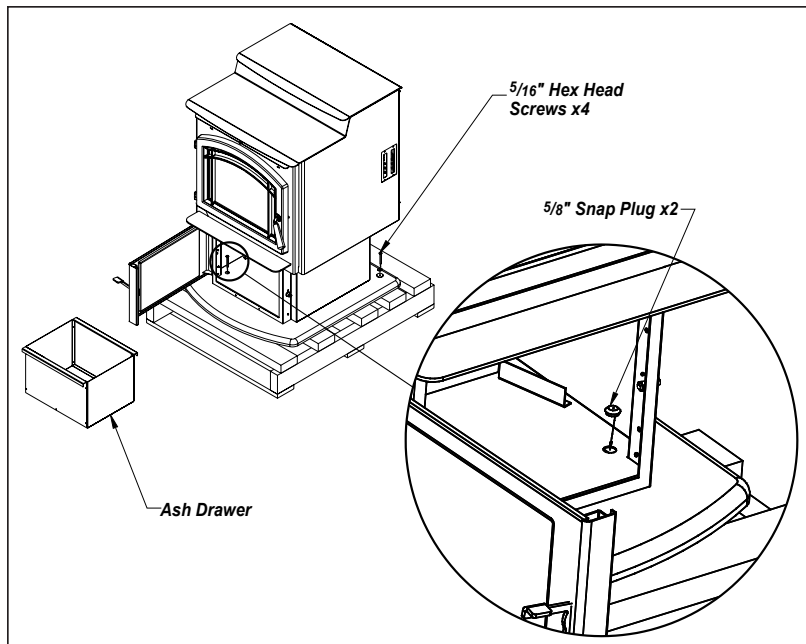


Figure 3: Screws to take out to remove stove from pallet.

## REMOVING PELLET STOVE FROM PALLET:

1. Open ash pan door and remove ash pan.
2. Remove the two (2) screws from the rear pedestal.
3. Remove the plugs from the inner front of the pedestal.
4. Remove the two (2) 5/16" hex head screws from inside the pedestal.
5. Re-install the plugs into the pedestal.

# INSTALLATION

## CLEARANCES TO COMBUSTIBLES:

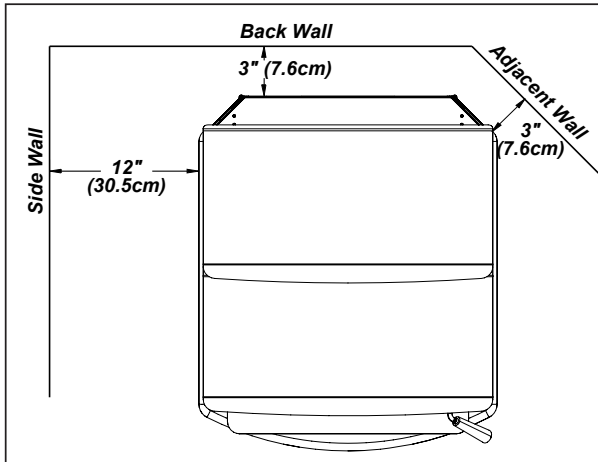


Figure 4: M-55-FS Clearance to Combustibles.

These dimensions are minimum clearances but it is recommended that you ensure sufficient room for servicing, routine cleaning and maintenance.

Side wall to unit 12 inches (30.5 cm)

Back wall to unit 3 inches (76 cm)

Corner to unit 3 inches (76 cm)

Ceiling height 60 inches (152 cm)

Alcove Maximum Depth 36 inches (91 cm)

Alcove Minimum Width 48 inches (122 cm)

Alcove Minimum Height 60 inches (152 cm)

The unit must be installed with a minimum of 6" (152 mm) of floor protection in front of and to the sides of the door opening.

## PEDESTAL BASE ADJUSTMENT:

The pedestal base can be adjusted to the forward position to satisfy the floor protection requirement.

1. Tip the unit onto its back.
2. Remove the four (4) screws holding pedestal base to the pedestal
3. Lift the pedestal base to the forward position set of holes that align 6" (152mm) ahead.
4. Insert screws and return the unit to its standing position.

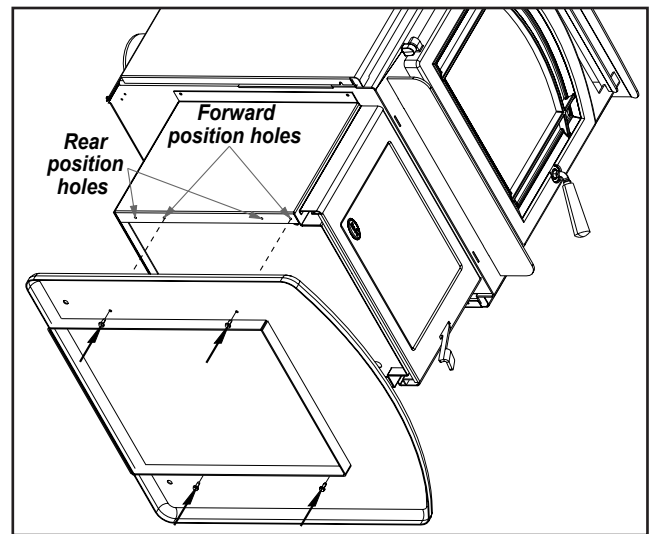


Figure 5: Adjusting M55 Pedestal Base.

## THERMOSTAT INSTALLATION:

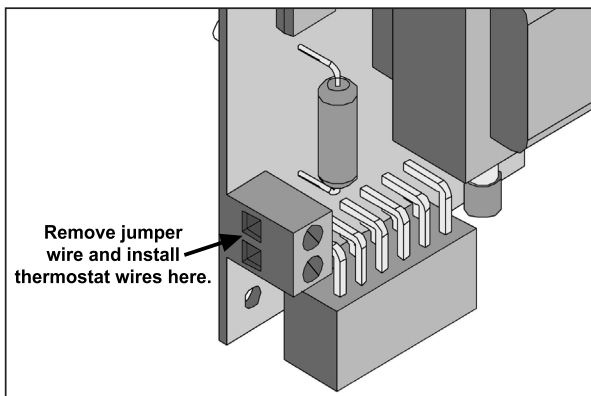


Figure 6: Thermostat wire placement.

1. Install the wall thermostat (millivolt rated thermostat recommended, or a 12/24 Volt rated thermostat set to millivolts) in a location that is not too close to the unit but will effectively heat the desired area.
2. Connect the Thermostat or Timer using a 2 x 18 gauge wire from the unit to the thermostat.

If the heat in the room becomes too great, the high limit switch may turn the stove off and the switch will have to be manually reset. To reset the high limit switch, lift the hopper lid and remove the firebox top. The switch is found underneath the firebox top on the hopper's front surface.

# INSTALLATION

## VENT TERMINATION REQUIREMENTS:

IT IS RECOMMENDED THAT YOUR PELLET STOVE BE INSTALLED BY AN AUTHORIZED DEALER/INSTALLER.

Table 2: Use in conjunction with Figure 7 for allowable exterior vent termination locations.

Letter	Minimum Clearance	Description
A	24 in (61 cm)	Above grass, top of plants, wood, or any other combustible materials.
B	48 in (122 cm)	Beside/below any door or window that may be opened. (18" (46 cm) if outside fresh air installed.)
C	12 in (30 cm)	Above any door or window that may be opened. (9" (23 cm) if outside fresh air installed.)
D	24 in (61 cm)	To any adjacent building, fences and protruding parts of the structure.
E	24 in (61 cm)	Below any eave or roof overhang
F	12 in (30 cm)	To outside corner.
G	12 in (30 cm)	To inside corner, combustible wall (vertical and horizontal terminations).
H	3 ft (91 cm) within a height of 15 ft (4.5 m) above the meter/regulator assembly	To each side of center line extended above natural gas or propane meter/regulator assembly or mechanical vent.
I	3 ft (91 cm)	From any forced air intake of other appliance
J	12 in (30 cm)	Clearance to non-mechanical air supply inlet to building, or the combustion air inlet to any appliance.
K	24 in (61 cm)	Clearance above roof line for vertical terminations.
L	7 ft (2.13 m)	Clearance above paved sidewalk or paved driveway located on public property.

1. Do not terminate the vent in any enclosed or semi-enclosed areas such as a carport, garage, attic, crawlspace, narrow walkway, closely fenced area, under a sundeck or porch, or any location that can build up a concentration of fumes such as stairwells, covered breezeway, etc.

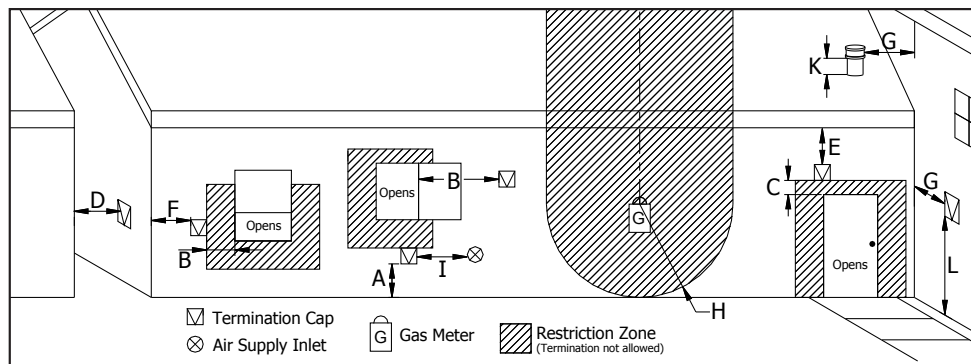


Figure 7: Use in conjunction with Table 2 for allowable exterior vent termination locations.

2. Vent surfaces can become hot enough to cause burns if touched by children. Non-combustible shielding or guards may be required.
3. Termination must exhaust above the inlet elevation. It is recommended that at least five feet of vertical pipe be installed outside when the appliance is vented directly through a wall, to create some natural draft to prevent the possibility of smoke or odor during appliance shut down or power failure. This will keep exhaust from causing a nuisance or hazard from exposing people or shrubs to high temperatures. In any case, the safest and preferred venting method is to extend the vent through the roof vertically.
4. Distance from the bottom of the termination and grade is 12" (30 cm) minimum. This is conditional upon the plants and nature of grade surface. The exhaust gases are hot enough to ignite grass, plants and shrubs located in the vicinity of termination. The grade surface must not be lawn.
5. If the unit is incorrectly vented or the air to fuel mixture is out of balance, a slight discoloration of the exterior of the house might occur. Since these factors are beyond the control of Sherwood Industries Ltd, we grant no guarantee against such incidents.

**NOTE: Venting terminals shall not be recessed into walls or siding.**

# INSTALLATION

## OUTSIDE FRESH-AIR CONNECTION:

**This Heater must have adequate air for proper combustion in the room that it is installed.**

**A Fresh-air intake is strongly recommended for all installations.** Failure to install intake air may result in improper combustion as well as the unit smoking during power failures.

The inlet to the intake must be below and a minimum of 12" (30cm) away from the unit exhaust outlet.

**Outside fresh air is mandatory when installing this unit in airtight homes and mobile homes.**

When connecting to an outside fresh air source, do not use plastic or combustible pipe. A 3" minimum (76 mm) ID (inside diameter) steel, aluminum or copper pipe or ducting should be used. The inlet must have a screen installed. It is recommended, when you are installing a fresh air system, to keep the number of bends in the pipe to a minimum.

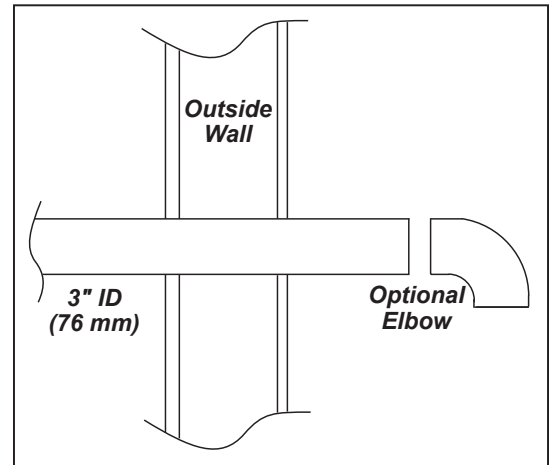


Figure 8: Outside Air Connection.

## EXHAUST AND FRESH AIR INTAKE LOCATIONS:

**This unit uses a 4" exhaust vent.**

### EXHAUST:

Base of unit to center of flue  
 $18\frac{1}{4}"$  (465 mm)  
Center of unit to center of flue  
 $6\frac{5}{16}"$  (161 mm)

### FRESH AIR INTAKE.

Base of unit to center of intake  
 $14\frac{7}{8}"$  (378 mm)  
Center of unit to center of intake  
5" (128 mm)

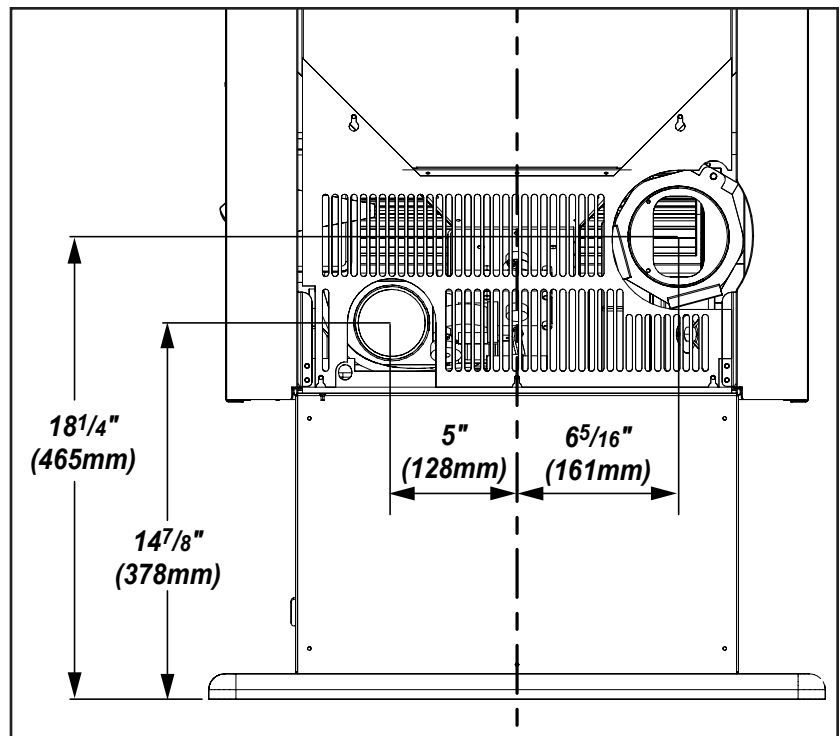


Figure 9: M-55-FS Inlet and Outlet Location.

# INSTALLATION

## MOBILE HOME INSTALLATION:

- Secure the heater to the floor using the four (4) holes in the pedestal.
- Ensure the unit is electrically grounded to the chassis of your home (permanently).
- Do not install in a room people sleep in.
- Outside fresh air is mandatory. Secure outside air connections directly to fresh air intake pipe and secure with three (3) screws evenly spaced.

**CAUTION: THE STRUCTURAL INTEGRITY OF THE MANUFACTURED HOME FLOOR, WALL AND CEILING/ROOF MUST BE MAINTAINED.**

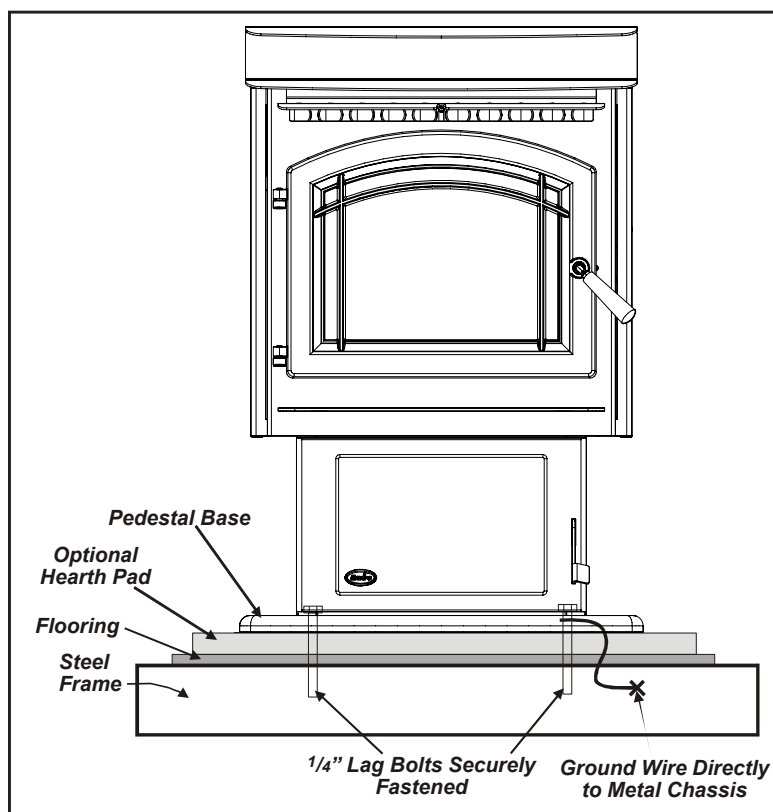


Figure 10: Mobile home installation.

## CORNER THROUGH WALL INSTALLATION:

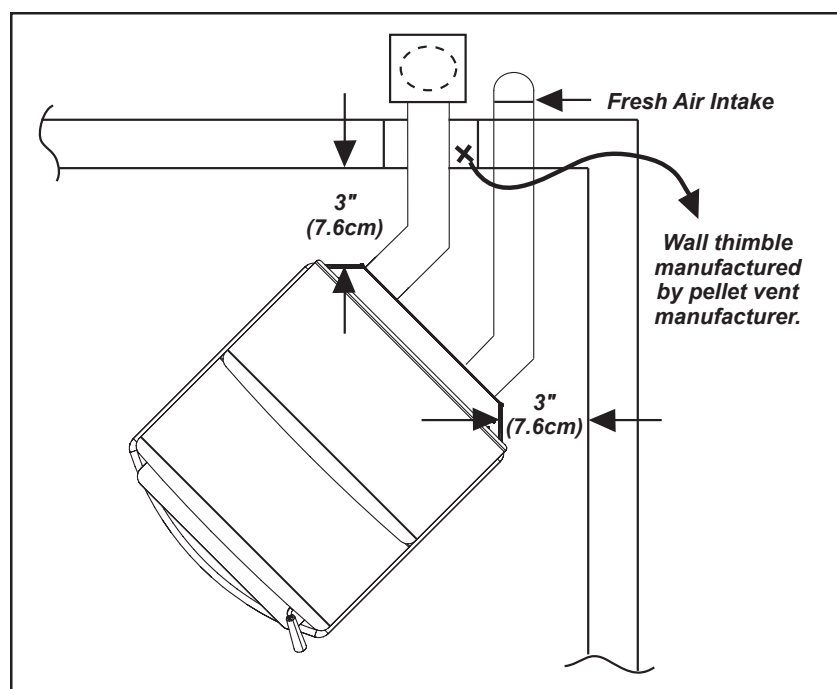


Figure 11: Corner Installation.

# INSTALLATION

## HORIZONTAL EXHAUST THROUGH WALL INSTALLATION:

**Vent installation: install vent at clearances specified by the vent manufacturer.**

A chimney connector shall not pass through an attic or roof space, closet or similar concealed spaces, or a floor, or ceiling. Where passage through a wall or partition of combustible construction is desired, the installation must conform to CAN/CSA-B365 Installation Code for Solid-Fuel-Burning Appliances and Equipment and with all local regulations, including those referring to regional and national. Only use venting of L or PL type or corn certified venting if corn will be burned as a fuel with an inside diameter of 4 inches (100 mm). All joints in the exhaust venting system must be fastened with at least three (3) screws.

1. Place the appliance 15" (37.5 cm) away from the wall. If the stove will be installed a hearth pad, set the unit on it.
2. Locate the center of the exhaust pipe on the stove. Extend that line to the wall. Once you have located the center point on the wall, refer to pellet vent manufacturer installation instructions for correct hole size and clearance to combustibles.
3. Install the wall thimble as per the instructions written on the thimble. Maintain an effective vapour barrier in accordance with local building codes.
4. Install a length of vent pipe into the wall thimble. Try not to have joints inside the thimble. The pipe should install easily into the thimble.
5. Connect the exhaust vent pipe to the exhaust pipe on the stove. Seal the connection with high temperature silicone.
6. Install the fresh air intake (see OUTSIDE FRESH AIR CONNECTION).
7. Push the stove straight back, leaving a minimum of 3" (7.6 cm) clearance from the back of the stove to the wall. Refer to Vent Manufacturers' instructions if sealant is required.

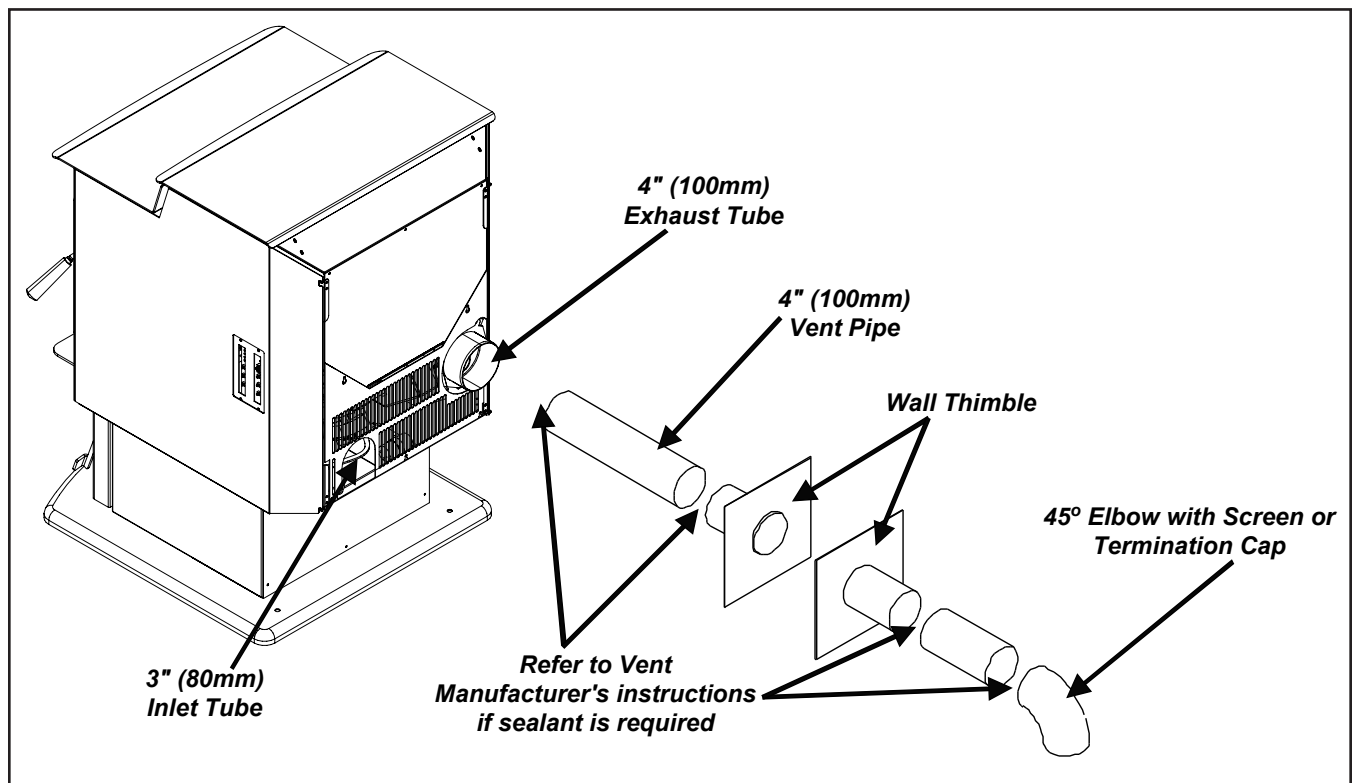


Figure 12: Straight through wall Installation.

# INSTALLATION

8. The pipe must extend at least 12" (30 cm) away from the building. If necessary, bring another length of pipe to the outside of the home to connect to the first section. Do not forget to place high temperature silicone around the pipe that passes through the thimble if required by vent manufacturer.
9. Install a vertical pipe, or if all requirements for direct venting are met, install vent termination. The stainless steel cap termination manufactured by the vent manufacturer is recommended. However, when the vent terminates several feet above ground level and there are no trees, plants, etc. within several feet, a 45° elbow can be used as termination. The elbow must be turned down to prevent rain from entering.

## NOTE:

- It is recommended that horizontal through wall installations have 3 to 5 feet (91 to 152 cm) of vertical pipe in the system to help naturally draft the unit in the event of extreme weather or a power outage.
- Some horizontal through wall installations may require a "T" and 3 to 5 feet (91 to 152 cm) of vertical pipe outside the building to help draft the unit. This may be required if a proper burn cannot be maintained, after the stove has been tested and the airflow set. This is due to the back pressure in the exhaust caused by airflow around the structure.
- Follow vent manufacturer guidelines for installation, clearance to combustibles, and sealing of venting. High temp Sealant must be used when connecting vent pipe to the unit's starter pipe. Improper seals at the vent joints may cause combustion by-products to leak into the room where installed - **seal as required by vent manufacturer.**

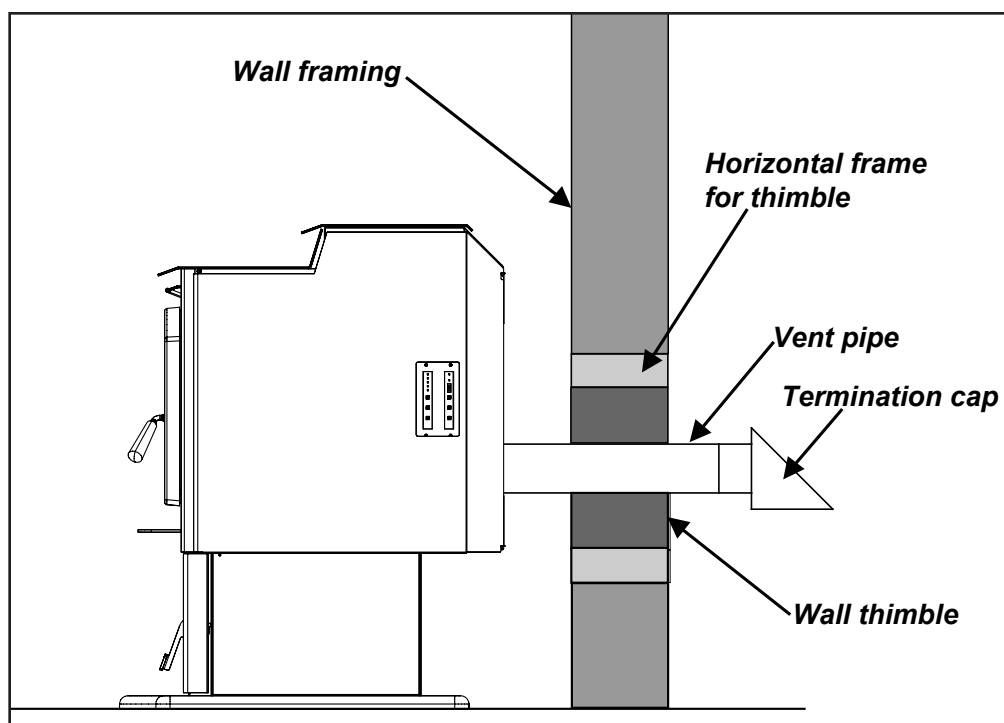


Figure 13: Straight through Wall Installation - Side View.

# INSTALLATION

## RECOMMENDED - THROUGH WALL WITH VERTICAL RISE AND HORIZONTAL TERMINATION INSTALLATION:

A 45° down elbow with a screen may be used in place of the termination cap (or stainless steel termination hood).

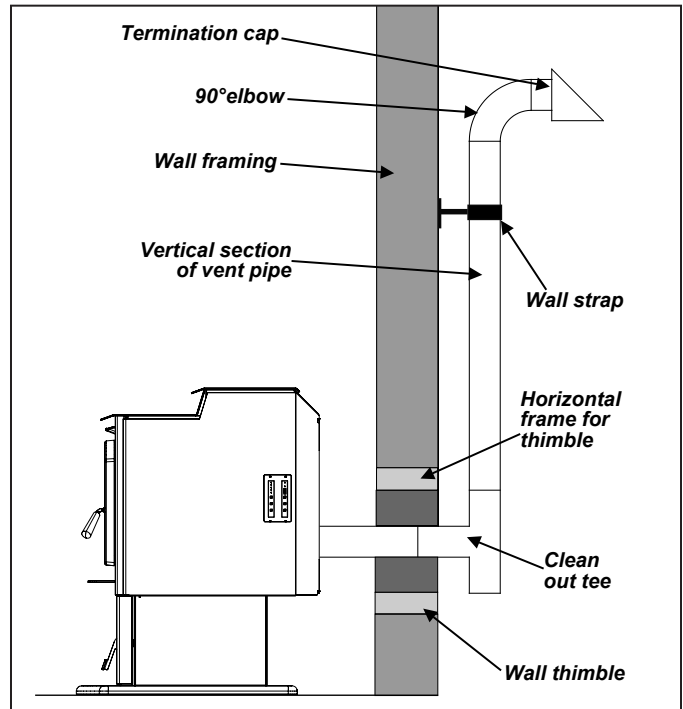


Figure 14: Venting horizontally with rise.

## THROUGH CONCRETE WALL WITH VERTICAL RISE INSTALLATIONS:

Installation to use if there is a concrete or retaining wall in line with exhaust vent on pellet stove.

A 45° down elbow with a screen may be used in place of the termination cap (or stainless steel termination hood).

The termination must be 12 inches (30 cm) from the outside wall and 12 inches (30 cm) above the ground.

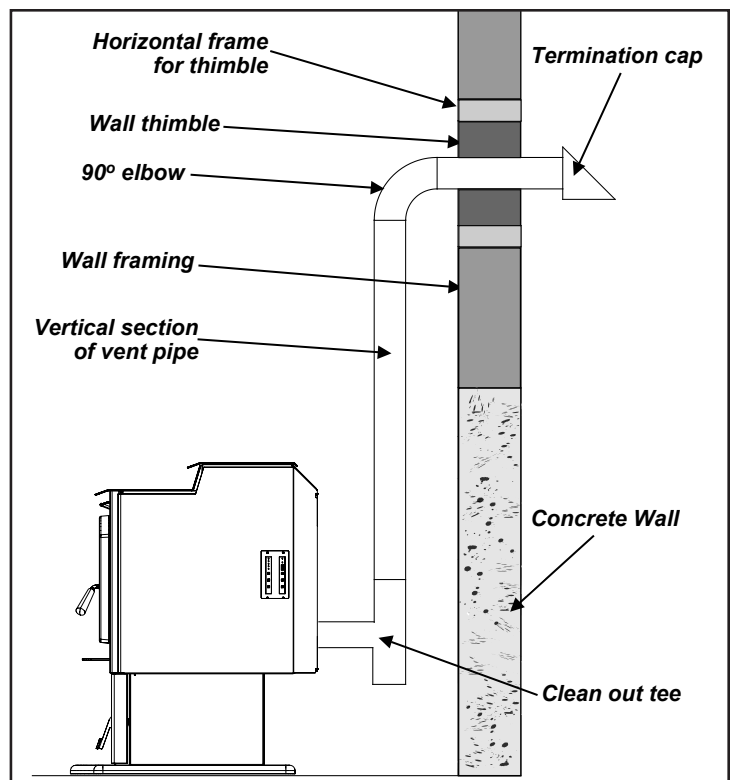


Figure 15: Venting with concrete wall behind unit .

# INSTALLATION

## OUTSIDE VERTICAL INSTALLATIONS:

To accomplish an outside vertical pipe installation, follow the "HORIZONTAL EXHAUST THROUGH WALL INSTALLATIONS" section and then finish it by performing the following (refer to Figure 16).

1. Install a tee with clean out on the outside of the house.
2. Install PL vent upward from the tee. Make sure that you install support brackets to keep the vent straight and secure. All joints in the exhaust venting system must be fastened with at least three (3) screws.
3. Install ceiling thimble and secure the flashing as you go through the roof.
4. Ensure that the rain cap is approximately 24" (61 cm) above the roof.

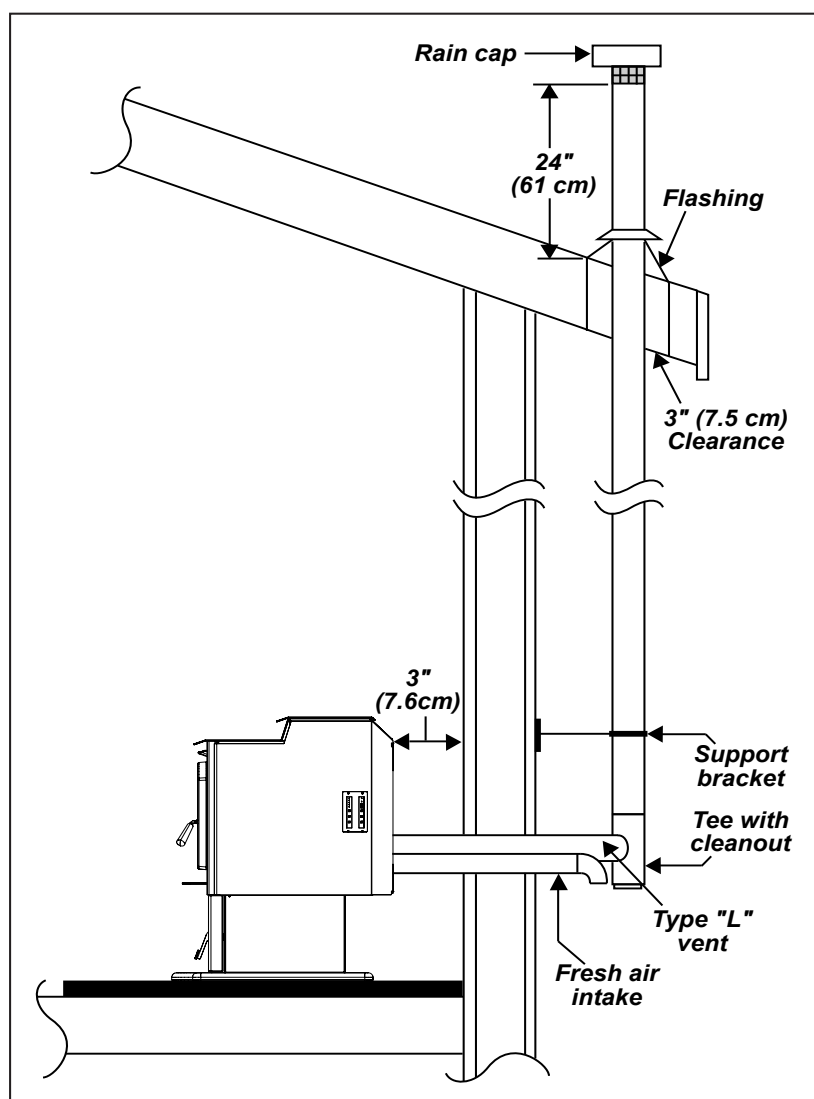


Figure 16: Outside Vertical Installation.

# INSTALLATION

## INSIDE VERTICAL INSTALLATIONS:

1. Place the unit on the hearth pad if a hearth pad is to be used (or on solid material if installed on a carpeted surface) and space the unit in a manner so when the pellet vent is installed vertically, it will meet the minimum clearance from a combustable wall stated by the vent manufacturer.
2. Install the tee with clean out.
3. Install the pellet vent upward from tee. When you reach the ceiling, make sure that the vent goes through a ceiling fire stop. Keep attic insulation away from the vent pipe & maintain an effective vapor barrier. All joints in the exhaust venting system must be fastened with at least three (3) screws. Refer to vent manufacturer for distance to combustibles & follow the vent manufacturer's instructions on sealing.
4. Finally, extend the pellet vent to go through the roof flashing.
5. Ensure that the rain cap is approximately 24" (61 cm) above the roof.
6. Install the fresh air system.

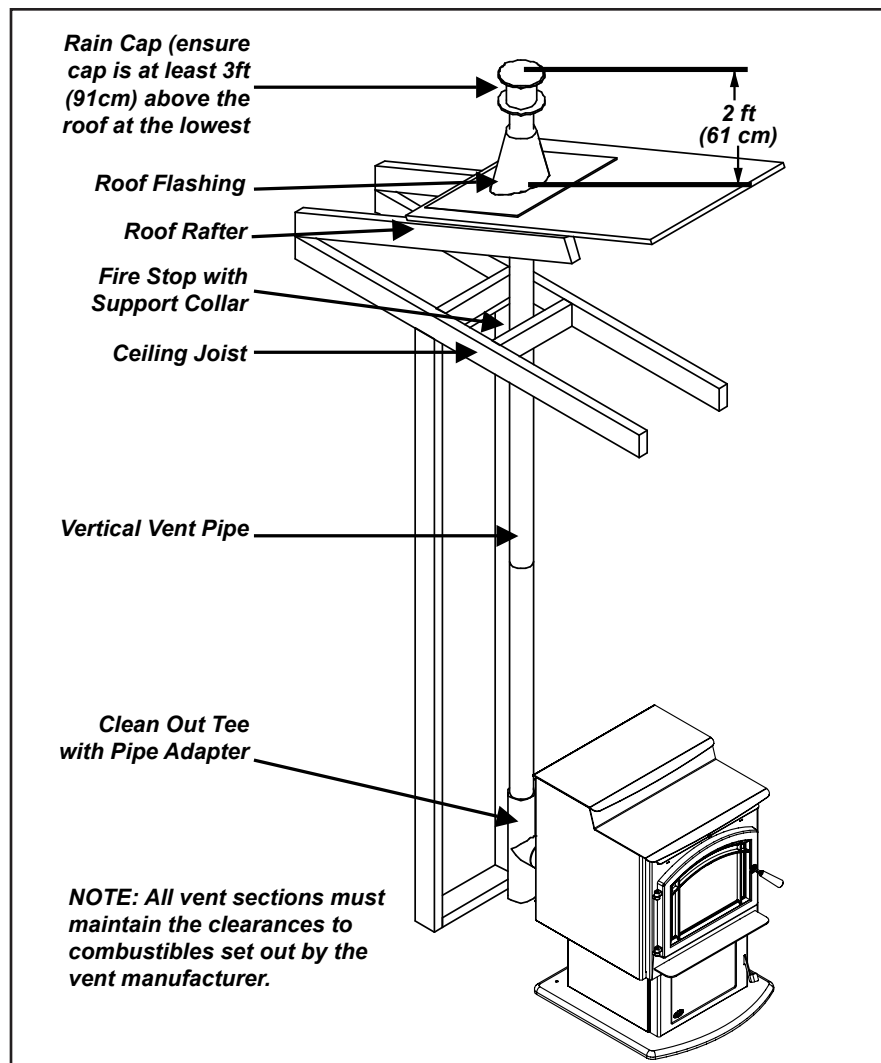


Figure 17: Inside Vertical Installation.

# INSTALLATION

## HEARTH MOUNT INSTALLATION:

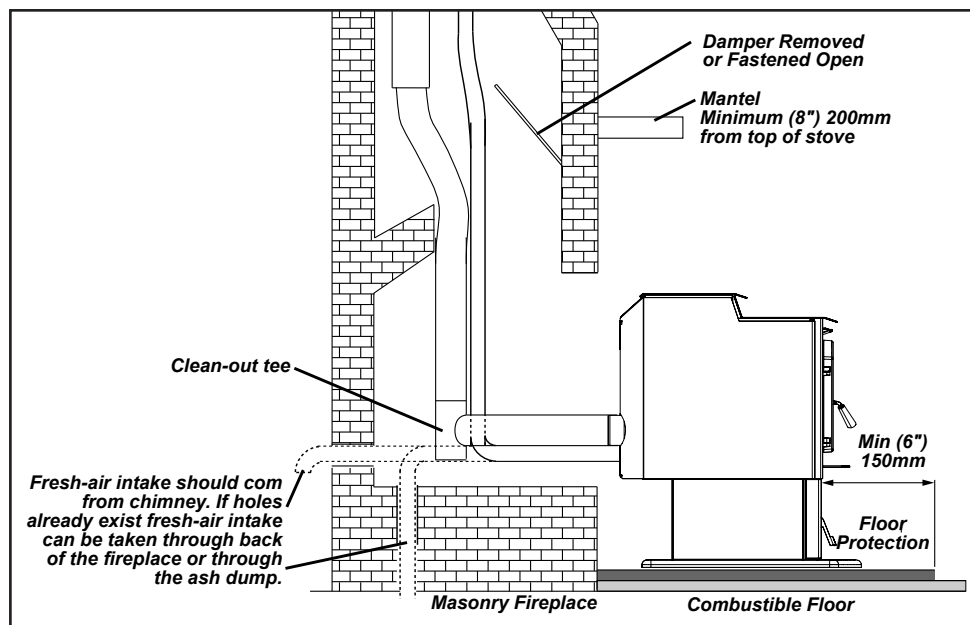


Figure 18: Hearth Mount - Side View.

1. Lock fireplace damper in the open position.
2. Install flexible stainless steel liner or listed pellet vent to the top of the chimney. All joints in the exhaust venting system must be fastened with at least three (3) screws.
3. Install a sealing plate at the top of the chimney.
4. Connect a rain cap and flex adapter to the chimney liner/pipe.
5. Connect a clean-out tee or a 90° elbow to the liner/pipe.
6. Install tee onto stove.

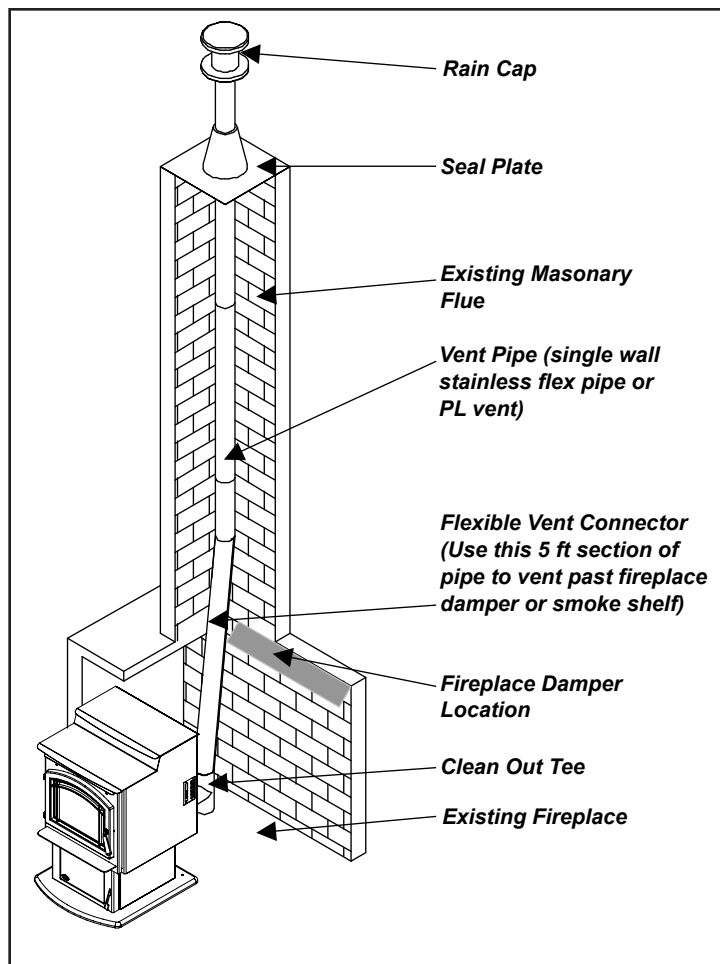


Figure 19: Hearth Mount - Over View.

# INSTALLATION

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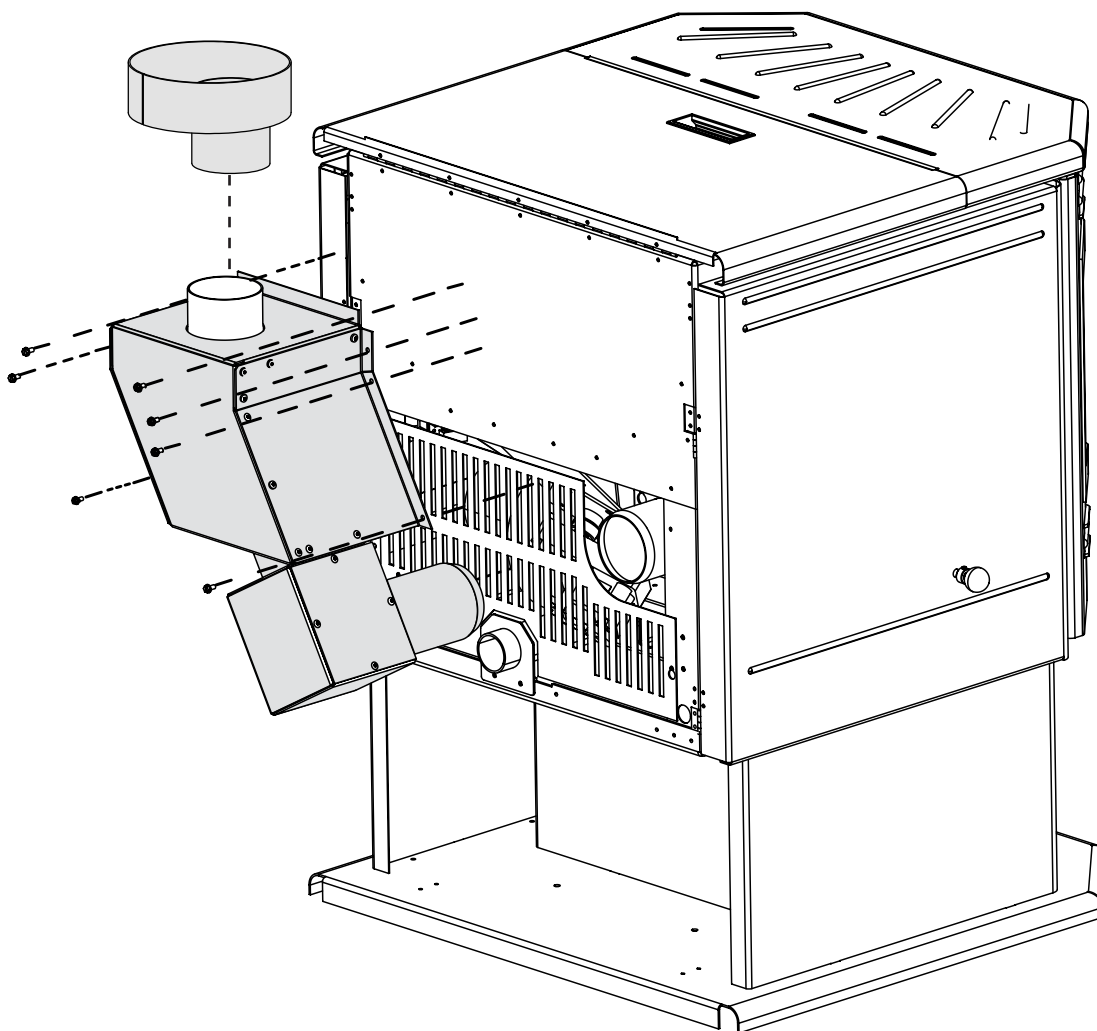
## TOP VENT ADAPTOR KIT

---

\*In order to achieve the maximum rated efficiency of 78.2% HHV purchase of a top vent adaptor kit is required.

Use the sheet metal screws provided to attach the kit to the rear of the unit as shown. Please see kit instruction manual for more detailed installation instructions.

The stove must also be connected to an existing 6" flue (where permitted) using the 4" to 6" Flue Adaptor supplied in the kit. The centerline of the flue adaptor is offset to allow for variable positioning of the stove with respect to the vent pipe.



# TROUBLESHOOTING

---

## DO NOT:

- Service the stove with wet hands. The stove is an electrical appliance, which may pose a shock hazard if handled improperly. Only qualified technicians should deal with possible internal electrical failures.
- Do not remove from the firebox any screws without penetrating oil lubrication.

## WHAT TO DO IF:

1. The stove will not start.
2. The stove will not operate when hot.
3. The exhaust blower will not function normally.
4. Light # 3 on Heat output bar flashing.
5. Auger light flashes but auger motor does not turn at all.
6. The 200 °F (93 °C) high limit temperature sensor has tripped.
7. The convection blower will not function normally.
8. Ignitor- the Fuel will not light.
9. Control settings (Heat Level) has no effect on the fire.
10. The stove keeps going out.
- 11 The agitator does not turn.

\*NOTE: All troubleshooting procedures should be carried out by qualified technicians or installers.

### 1. The stove will not start.

- Check the line fuse to see if it has blown.
- Make sure the stove is plugged in and the wall outlet is supplying power.
- If the Control Board has been placed in the ON /OFF thermostat mode, then turn the thermostat up to call for heat.
- Ensure the burn pot liner is correctly placed in the burn pot
- Check the Heat Level Indicator. - If the # 3 light is flashing (unit may be out of fuel)
- Check the Door and Ash Pan door - THEY MUST BE CLOSED TIGHT.
- See section 8 "The Fuel will not light".
- Check the fuse on the circuit board.
- If the unit still does not start, contact your local service dealer for service.

### 2. The stove will not operate when hot.

- Check the Heat Level Indicator if a fire is not detected or if the fire has gone out the #3 light will flash because the Exhaust Temperature Sensor's contacts have opened.
- Check the hopper for fuel.
- Incorrect air damper/combustion air trim setting.  
Excessive air may consume the fire too quickly before the next drop of fuel, leaving completely unburned fuel in the burn pot liner.  
Insufficient air may cause the vacuum switch to open or will cause build up, further restricting the air flow through the Burn Pot Liner. This in turn will cause the fuel to burn cold and very slowly. Fuel may build up and smother the fire. In this case clean the burn pot.  
NOTE: The unit may require a change to the vent system or installation of fresh air to correct Air to Fuel ratio problems if unable to achieve proper damper setting.
- Combustion Blower failure. - The Combustion Blower is not turning fast enough to generate the proper vacuum in the fire box. Visual Check – is the blower motor turning. See section #3 - *The Exhaust Blower will not function normally.*
- Poor Quality Fuel – Insufficient energy in the fuel to produce enough heat to keep the stove burning

# TROUBLESHOOTING

---

- Exhaust Temperature Sensor failure. Bypass sensor located on Exhaust Blower, if stove now operates properly, the unit may require cleaning or a new sensor. Contact your local dealer for service.
- Check the agitator to make sure it is turning properly

### **3. The exhaust motor will not function normally.**

- Check the line fuse to see if it has blown.
- Open the access panels; check all connections against the wiring diagram.
- Check the Exhaust Blower voltage across the blower motor wires ( $\geq 115V$  on #5 setting and  $\geq 75V$  on #1 setting). – Replace the Circuit Board if the Voltage reading is less than 75 V. with a line voltage of  $>115 V AC$ .
- Clean all exhaust passages and venting.
- Check and, if necessary, replace capacitor.

### **4. Light # 3 on Heat output bar flashing** (The Exhaust Temp. Switch contacts have opened.)

- Stove ran out of fuel - check fuel level in the hopper.
- See sections #2 - *Stove will not operate when hot*, #3 - *The Exhaust motor will not function normally*, and #5 - *Unit is on but auger does not turn at all* for more suggestions.
- Severe negative pressure in area where unit is installed - Check the operation by opening a window, does this solve the problem? If it does, install fresh air intake to unit or room. Venting system may require vertical section to move termination into a low pressure zone.
- To reset Circuit Board after a trouble code - push the ON/OFF button.

### **5. Unit is on but auger motor does not turn at all.**

- Check the line fuse to see if it has blown.
- Check the Door and Ash Pan door - THEY MUST BE CLOSED TIGHT.
- If the Auger gear box does not turn but the motor's armature does try to spin, then the auger is jammed. Try to break apart jam by poking at the jam through the drop tube. If this fails then empty the hopper and remove the Auger Cover **\*\*Remember to re-seal the cover after installation\*\***
- Auger stopped running. Pinch, break or blockage in Vacuum Hose - Check hose for pinch points or damage, replace or re-route as required. Blow out Vacuum Hose and intake pipe.
- Damage to wires between Circuit Board and Vacuum Switch and Auger Motor - Inspect wires and connectors.
- Vacuum Switch failure - Bypass the vacuum switch, if this corrects the problem check for above problems before replacing the Vacuum Switch.
- Blocked exhaust / venting system - Have stove and venting cleaned and inspected.
- Check Vacuum levels at the Vacuum Switch, with a Magnahelic Gauge (readings must be above .07" W.C. on low fire).

### **6. Light # 4 on Heat output bar flashing The 200 °F ( 93 °C) high limit temperature sensor has tripped.**

- Reset sensor and determine cause. Was it Convection Blower failure or Circuit board control problems?

### **7. The convection blower will not function normally.**

- Check the line fuse to see if it has blown.
- Clean all grill openings at the back and below unit .
- Check the Voltage across the blower wires, It should adjust with the heat output settings. If not contact your local dealer for service.

# TROUBLESHOOTING

---

## **8. Ignitor - the pellets will not light.**

- Check the line fuse to see if it has blown.

NOTE: The ignitor should be bright orange in color.

- Everything else in the stove operates but the ignitor will not light the pellets.
- Make sure the burn pot liner is up tight and square to the ignitor tube by pulling the ignitor tube out towards the liner.
- Check to see if the exhaust blower is operating. If not, contact your local dealer for service.

## **9. Control settings (Heat Level) has no effect on the fire.**

- Check the line fuse to see if it has blown.
- Check position of the Thermostat slide switch on the Circuit Board.
- If there is no control of the Heat Level button, make sure the thermostat is calling for heat.
- Call your local dealer for service.

## **10. The stove keeps going out.**

If the stove goes out and leaves fresh unburned fuel in the burn pot liner, the fire is going out before the stove shuts off.

- Trim the combustion air down to decrease the magnahelic pressure.
- Turn the Heat Level up slightly (poor quality fuels will require slightly higher settings).
- Set the auger trim up one setting

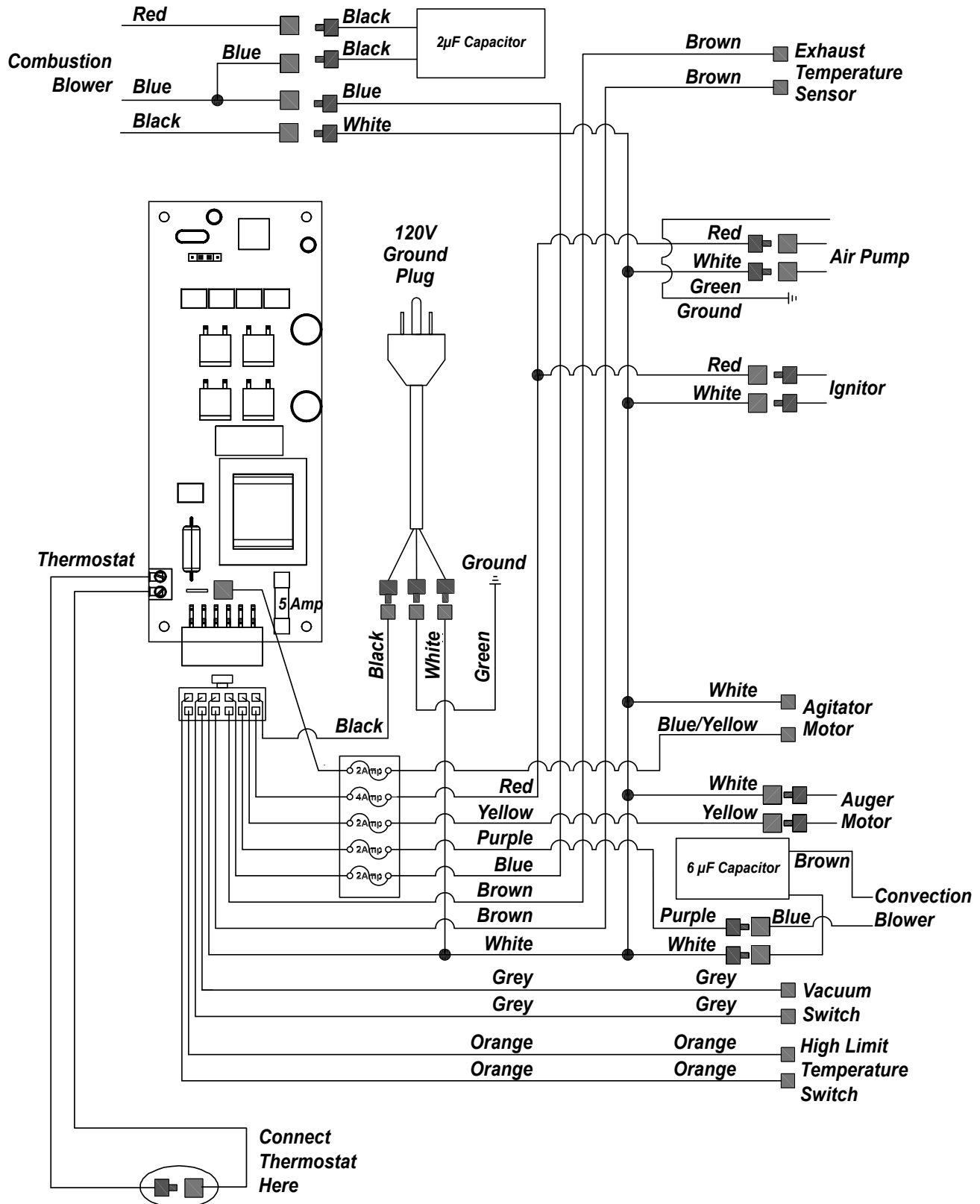
If the stove goes out and there are partially burned pellets left in the burn pot liner, the stove has shut down due to a lack of air, exhaust temperature, or power failure.

- Trim the combustion air to a higher setting to increase the magnahelic pressure inside the stove.
- Check to see if the stove needs a more complete cleaning.
- Turn the Heat Level up slightly (poor quality fuel will require slightly higher settings).
- Did the power go out?
- Contact your local Dealer for service.

## **11. The agitator does not turn.**

- Ensure unit has finished start-up.
- Ensure agitator is locked into the drive shaft properly and is not jammed.
- Check drive chain assembly and gear motor for damage.
- Check the agitator motor is functioning properly.

# WIRING DIAGRAM



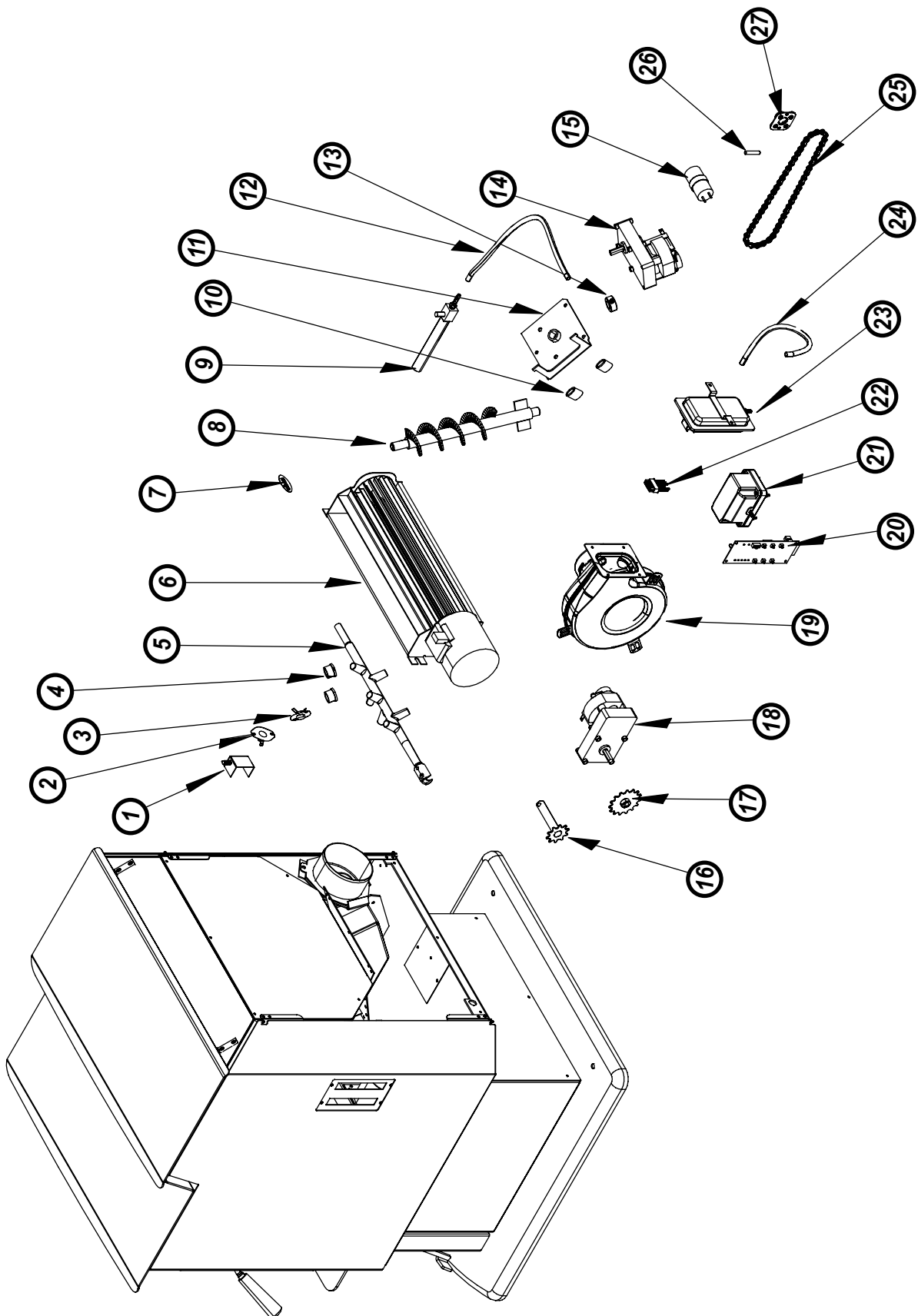
# PARTS LIST

Reference #	Description	Part #
	Log Set	50-1963
	Pellet Stove Thermostat	50-1971
	Tinted-mirrored Glass	50-1979
	Hopper Extension Kit	50-2025
	Wooden Handle Assembly	50-2027
	Refractory Brick Liner	50-2069
	Circuit Board Fuse Panel	50-2074
	4 Amp Fuse	50-2075
	2 Amp Fuse	50-2076
1	Hopper Switch	50-2052
2	High Limit Temp Sensor 200°F (93°C) Manual Reset	EF-016
3	120°F (49°C) Ceramic Fan Temp Sensor	EC-001
4	5/8" I.D. Auger Brass Bushings (Set of 2)	50-1806
5	Stainless Steel Cast Agitator with Coupler	50-1697
6	Convection Blower 80mm	50-2064
7	Enviro Gel Decal	50-322
8	Auger With Paddles	50-1161
9	Ignitor Coil Type - 400 Watt	50-2142
10	Auger Stops (Clear Rubber)	50-1559
11	Auger Plate And Bushing (Assembly)	50-1658
12	Silicone Hose (Black)	50-2067
13	5/8" I.D. Auger Collar with Screw	50-968
14	Auger Motor 2rpm	50-2054
15	Exhaust Motor Capacitor including Strap	50-2053
16	Agitator Drive Shaft with Sprocket	50-1698
17	Motor Drive Sprocket	50-1700
18	Auger Motor 1 rpm	EF-001
19	Combustion Blower including Housing & Gasket	50-2068
20	Circuit Board	50-2050
21	Air Pump	50-1702
22	Wire Harness	50-2062
23	Vacuum Switch Low Pressure	50-1390
24	Silicone Hose (Red)	EF-018
25	Drive Chain	50-2059

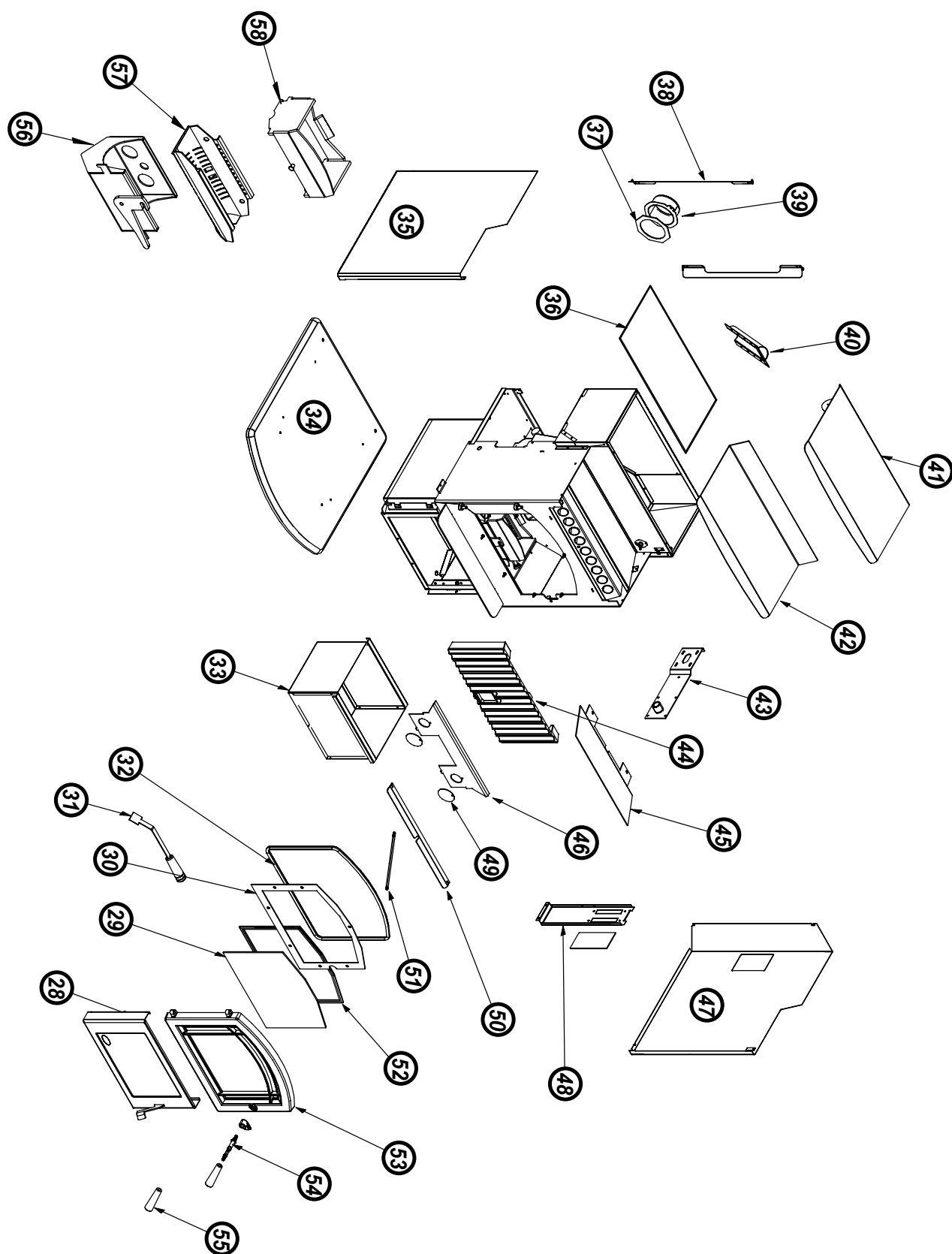
# PARTS LIST

Reference #	Description	Part #
26	¼" Spring Pin	50-1701
27	Agitator Bushing Left Side	50-1703
28	Lower Ash Pan Door Complete	50-2071
29	Glass Only 14.88" X 11.36" (378x289mm)	50-2056
30	Glass Retainer	50-2065
31	Burn Pot Scraper Tool	50-1254
32	Door And Ash Door Gasket <sup>9</sup> / <sub>16</sub> Firm - 10ft (3.05m)	50-2058
33	Ash Pan	50-2046
34	Pedestal Base	50-2066
35	Cabinet Side Left	50-2045
36	Pedestal & Ash Pan Gasket - 10ft (3.05m)	EF-208
37	Exhaust Starter Tube Gasket Only	50-2055
38	Cabinet Side Hinge Set of 2	50-2047
39	Exhaust Starter Tube Including Gasket	50-2043
40	Auger Tube Cover	50-1410
41	Hopper Lid Including Hinge	50-2037
42	Firebox Top	50-2040
43	Agitator Drive Bracket	50-2038
44	Cast Fluted Firebox Liner	50-2048
45	Firebox Baffle	50-2041
46	Firebox Lower	50-2072
47	Cabinet Side Right	50-2044
48	Control Panel Including Decal	50-2060
49	Firebox Cleaning Port Covers	EF-194A
50	Louver	50-2039
51	Heat Exchanger Scraper Rod	50-2051
52	Window Channel Tape - 72" (1.8m)	EC-058
53	Cast Upper Door Complete	50-2070
54	Door Handle Rod Including Latch Assembly	50-2049
55	Bakelite Door Handle Only	50-2057
56	Burn Pot	50-1692
57	SS Burn Pot Liner	50-2042
58	Fire Grate	50-2036

# PARTS DIAGRAM - COMPONENTS



# PARTS DIAGRAM - STEEL





# Warranty for Enviro Pellet Products

Sherwood Industries Ltd. ("Sherwood") hereby warrants, subject to the terms and conditions herein set forth, this product against defects in material and workmanship during the specified warranty period starting from the date of original purchase at retail. In the event of a defect of material or workmanship during the specified warranty period, Sherwood reserves the right to make repairs or to assess the replacement of a defective product at Sherwood's factory. The shipping costs are to be paid by the consumer. All warranties by Sherwood are set forth herein and no claim shall be made against Sherwood on any oral warranty or representation.

## Conditions

- A completed warranty registration must be submitted to Sherwood within 90 days of original purchase via the online warranty registration page or via the mail-in warranty registration card provided. Have the installer fill in the installation data sheet in the back of the manual for warranty and future reference.
- This warranty applies only to the original owner in the original location from date of install.
- The unit must have been properly installed by a qualified technician or installer, and must meet all local and national building code requirements.
- The warranty does not cover removal and re-installation costs.
- Sherwood Industries Ltd. reserves the right to make changes without notice.
- Sherwood Industries Ltd. and its employees or representatives will not assume any damages, either directly or indirectly caused by improper usage, operation, installation, servicing or maintenance of this appliance.
- A proof of original purchase must be provided by you or the dealer including serial number.
- This warranty is void if the unit is used to burn materials for which the unit is not certified by the EPA and void if not operated according to the Owner's Manual.

## Exclusions

An expanded list of exclusions is available at [www.enviro.com/help/warranty.html](http://www.enviro.com/help/warranty.html)

This warranty does not cover:

- Damage as a result of improper usage or abuse.
- Damage caused from over-firing due to incorrect setup or tampering.
- Damage caused by incorrect installation.

## To the Dealer

- Provide name, address and telephone number of purchaser and date of purchase.
- Provide date of purchase. Name of installer and dealer. Serial number of the appliance. Nature of complaint, defects or malfunction, description and part # of any parts replaced.
- Pictures or return of damaged or defective product may be required.

## To the Distributor

- Sign and verify that work and information are correct.

## Sherwood Industries Ltd.

6782 Oldfield Road, Victoria, BC . Canada V8M 2A3  
Online warranty registration: [www.enviro.com/warranty/](http://www.enviro.com/warranty/)

Category	One Year	Two Year	Limited Lifetime (7yr)
Parts <sup>1</sup> (unit serial number required)		✓	
Firebox Brick Panels (Cast)		✓	
Firebox			✓
Heat Exchanger			✓
Burn Pot			✓
Burn Pot Liner		✓	
Firebox Liner Panels w/Insulation			✓
Ceramic Glass <sup>2</sup>	✓		
Pedestal / Legs (excluding finish)			✓
Surround Panels (excluding finish)			✓
Exterior Panels (excluding finish)			Up to 5 years
Electrical Components		✓	
Steel Brick Liner (Metal)	✓		
Exterior Surface Finishing <sup>3</sup>	✓		
Labour	✓		

<sup>1</sup> Whereas warranty has expired, replacement parts will be warranted for 90 days from part purchase date. Labour not included.  
Unit serial number required.

<sup>2</sup> Glass is covered for thermal breakage. Photos of box, inside of door, and unit serial # must be supplied for breakage due to shipping.

<sup>3</sup> Exterior Surface finishing covers Plating, Enamel or Paint and excludes colour changes, chipping, and fingerprints.

Gaskets not covered by Warranty.

Travel costs not included.

Cast Agitator: 1 year for pellet. Not covered when burning alternative fuels. (Cast agitators are a consumable item)

# INSTALLATION DATA SHEET

The following information must be recorded by the installer for warranty purposes and future reference.

NAME OF OWNER:

\_\_\_\_\_

ADDRESS:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

PHONE: \_\_\_\_\_

NAME OF DEALER:

\_\_\_\_\_

ADDRESS:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

PHONE: \_\_\_\_\_

MODEL: \_\_\_\_\_

SERIAL NUMBER: \_\_\_\_\_

DATE OF PURCHASE: \_\_\_\_\_ (dd/mm/yyyy)

DATE OF INSTALLATION: \_\_\_\_\_ (dd/mm/yyyy)

MAGNEHELIC AT INSTALL: \_\_\_\_\_

INSTALLER'S SIGNATURE:

\_\_\_\_\_

NAME OF INSTALLER:

\_\_\_\_\_

ADDRESS:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

PHONE: \_\_\_\_\_

MANUFACTURED BY:  
SHERWOOD INDUSTRIES LTD.  
6782 OLDFIELD RD. SAANICHTON, BC, CANADA V8M 2A3  
[www.enviro.com](http://www.enviro.com)  
Summer 2021  
C-16287



WARRANTY REGISTRATION  
enviro.com/warranty

# M55C-FS-2

FREE-STANDING PELLET STOVE

## OWNER'S MANUAL



**PLEASE READ THIS ENTIRE MANUAL BEFORE INSTALLATION AND USE OF THIS PELLET-BURNING ROOM HEATER. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH.**



**Intertek**  
C# 4001609

**Contact your building or fire officials about restrictions and installation inspection requirements in your area.**

**Fr** Version Française: [www.enviro.com/fr.html](http://www.enviro.com/fr.html)

**50-2100**

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# INTRODUCTION

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## **RATING LABEL LOCATION:**

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The rating label is located on the inside of the rear hopper access cover.

## **FUEL QUALITY:**

---

**Fuel quality is important, please read the following:**

**Your Enviro pellet stove has been designed to burn 1/4" (6mm) dia wood pellets and other organic fuels. DO NOT use this appliance as an incinerator. DO NOT use unsuitable and non recommended fuels, including liquid fuels as this will void any warranties stated in this manual.**

**The performance of your pellet stove is greatly affected by the type and quality of fuel being burned. As the heat output of various quality fuels differs, so will the performance and heat output of the pellet stove.**

**CAUTION:** It is important to select and use only fuel that are dry and free of dirt or any impurities such as high salt content. Dirty fuel will adversely affect the operation and performance of the unit and will void the warranty. The Pellet Fuel Industries (P.F.I.) has established standards for wood pellet manufacturers. We recommend the use of pellets that meet or exceed these standards. Ask your dealer for a recommended pellet type.

**ASH:** The ash content of the fuel and operation of your stove will directly determine the frequency of cleaning. The use of high ash fuels may result in the stove needing to be cleaned daily. A low ash fuel may allow longer intervals between cleaning.

**CLINKERING:** [clinkers are silica (sand) or other impurities in the fuel that will form a hard mass during the burning process]. This hard mass will block the air flow through the Burn Pot Liner and affect the performance of the stove. Any fuel, even approved types, may clinker. Check the Burn-Pot Liner daily to ensure that the holes are not blocked with clinkers. If they become blocked, remove the liner (when the unit is cold) and clean/scrape the clinkers out. Clean the holes with a small pointed object if required. Refer to the section Routine Cleaning and Maintenance.

**FUEL FEED RATES:** Due to different fuel densities and sizes, fuel feed rates may vary. This may require an adjustment to the slider damper setting or to the auger feed trim setting.

Since Sherwood Industries Ltd. has no control over the quality of fuel that you use, we assume no liability for your choice in fuels.

**FILLING FUEL HOPPER:** Open lid on top of unit, check hopper for foreign objects, empty the bag into the hopper, and ensure hopper lid closes completely.

**Store fuels in a dry location at least 36" (1 m) away from the pellet stove, and clear of the space required for charging and ash removal.**

**WARNING:** Parts of the appliance, especially the external surfaces, will be hot to touch when in operation so use due care.

**FLAMMABLE LIQUIDS:** **Never** use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid, or similar liquids to start or "freshen up" a fire in the heater. Keep all such liquids well away from the heater while it is in use.

# EMISSIONS AND EFFICIENCIES

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## EMISSIONS AND EFFICIENCY:

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**Rates:** This manual describes the installation and operation of the Enviro M55 pellet heater. This heater is U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards. Under specific test conditions this heater has been shown to deliver heat at rates ranging from 38,437-7817 Btu/hr.

**Efficiency:** 78.2% HHV (PFS TECO 21-703)

\*When using optional top vent adapter kit.

**WARNING:** This pellet heater needs periodic inspection and repair for proper operation. It is against federal regulations to operate this pellet heater in a manner inconsistent with operating instructions in this manual.

**WARNING:** This wood pellet has a manufacturer set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this pellet heater in a manner inconsistent with operating instructions in this manual.

# **SAFETY WARNINGS & RECOMMENDATIONS**

**Please read this entire Owner's Manual before installing or operating your Enviro Pellet Stove. Failure to follow these instructions may result in property damage, bodily injury or even death. Any unauthorized modification of the appliance or use of replacement parts not recommended by the manufacturer is prohibited. All national and local regulations and shall be complied with when operating this appliance.**

**Caution: Do not connect to any air distribution duct or system.**

**Warning:** Never place wood, paper, furniture, drapes or other combustible materials within 48" (122cm) of the front of the unit, 12" (30.5cm) from each side, and 4" (10cm) from the back of the unit. Do not let children or pets touch it when it is hot.

To prevent the possibility of a fire, ensure that the appliance is properly installed by adhering to the installation instructions. An Enviro dealer will be happy to assist you in obtaining information with regards to your local building codes and installation restrictions.

**FIRE EXTINGUISHER AND SMOKE DETECTION:** All homes with a pellet burning stove should have at least one fire extinguisher in a central location known to all in the household. Smoke detectors and carbon monoxide detectors should be installed and maintained in the room containing the stove. If either sounds the alarm, correct the cause but do not deactivate. You may choose to relocate the detection devices within the room; **DO NOT REMOVE THE SMOKE OR CARBON MONOXIDE DETECTORS FROM THE ROOM.**

**CHIMNEY OR RUN AWAY FIRE (SOOT/CREOSOTE):** Call local fire department (or dial 911). Close the draft fully. Extinguish the fire in the burn pot liner with a cup of water and close the door. Examine the flue pipes, chimney, attic, and roof of the house, to see if any part has become hot enough to catch fire. If necessary, spray with fire extinguisher or water from the garden hose. **IMPORTANT:** Do not operate the stove again until you are certain the chimney and its lining have not been damaged. Check daily for creosote build-up until experience shows how often you need to clean to be safe.

**OPERATION:** The door and ash drawer must be kept closed when the unit is in operation to prevent fume spillage and for proper and safe operation of the pellet stove. Also ensure all gaskets on the door are checked and replaced when necessary. **Unit hot while in operation. Keep children, clothing and furniture away. Contact may cause skin burns.**

**CAUTION:** When operating during adverse weather, if the unit exhibits dramatic changes in combustion stop using the unit immediately.

**FUEL:** This stove is designed and approved to only burn wood pellets of any quality, corn, wheat, barley, and grass. Dirty fuel will adversely affect the operation and performance of the unit and may void the warranty. Check with your dealer for fuel recommendations. **THE USE OF CORDWOOD IS PROHIBITED BY LAW. Do not burn garbage or flammable fluids such as gasoline, naphtha or engine oil.**

**SOOT/CREOSOTE:** Operation of the stove with insufficient combustion air will result in the formation of soot/creosote which will collect on the glass, the heat exchanger, the exhaust vent system, and may stain the outside of the house. Frequently check your stove and adjust the combustion air trim and/or if necessary adjust the slider/damper as needed to ensure proper combustion. **See: "SLIDER/DAMPER SETTING".**

**CLEANING:** There will be some build up of fly ash and small amounts of creosote in the exhaust. This will vary due to the ash content of the fuel used and the operation of the stove. It is advisable to inspect and clean the exhaust vent semi-annually or every two tons of pellets. The appliance, flue gas connector and the chimney flue require regular cleaning. Check them for blockage prior to re-lighting after a prolonged shut down period. If a significant layer of creosote has accumulated in the flue (3mm or more) it should be removed to reduce the risk of a chimney fire.

**ASHES:** Disposed ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be on a non-combustible surface, well away from all combustible materials pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispensed, they should be retained in the closed container until all cinders have thoroughly cooled.

# **SAFETY WARNINGS & RECOMMENDATIONS**

**ELECTRICAL:** The use of a surge protected power bar is recommended. The unit must be grounded. The grounded electrical cord should be connected to a standard 110-120 volts (4.2 Amps), 60 hertz electrical outlet and also must be accessible. If this power cord should become damaged, a replacement power cord must be purchased from the manufacturer or a qualified Enviro dealer. Be careful that the electrical cord is not trapped under the appliance and that it is clear of any hot surfaces or sharp edges. This unit's maximum power requirement is 504 watts.

When installing the stove in a mobile home, it must be electrically grounded to the steel chassis of the home and bolted to the floor.

**GLASS:** Do not abuse the glass by striking or slamming the door. Do not attempt to operate the stove with broken glass. The stove uses ceramic glass. Replacement glass must be purchased from an Enviro dealer. Do not attempt to open the door and clean the glass while the unit is in operation or if glass is hot. To clean the glass, use a soft cotton cloth and mild window cleaner, gas or wood stove glass cleaner, or take a damp paper towel and dip into the fly ash. This is a very mild abrasive and will not damage the glass. Do not use polishing compounds or abrasive cleaners.

**KEEP ASH PAN FREE OF RAW FUEL.** DO NOT PLACE UNBURNED OR NEW PELLET FUEL IN ASH PAN. A fire in the ash pan may occur.

**INSTALLATION:** Contact your local building or fire official to obtain a permit and any information on installation restrictions and inspection requirements for your area.

Be sure to maintain the structural integrity of your home when passing a vent through walls, ceilings, or roofs, and all construction meets local building codes. It is recommended that the unit be secured into its position in order to avoid any displacement. This appliance must be installed on a floor with an adequate load bearing capacity, if existing construction doesn't meet load capacity, suitable measures (e.g. load distributing plate) must be taken to achieve it.

DO NOT INSTALL A FLUE DAMPER IN THE EXHAUST VENTING SYSTEM OF THIS UNIT.

DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.

**FRESH AIR:** This unit uses large quantities of air for combustion; outside Fresh Air connection is **strongly** recommended. Fresh Air **must** be connected to all units installed in Mobile and "Air Tight Homes" (R2000) or where required by local codes.

Consider all large air moving devices or any other appliance which may compete for fresh air when installing the unit and provide room air accordingly. NOTE: Extractor fans when operating in the same room or space as the appliance may cause problems. Limited air for combustion may result in poor performance, smoking and other side effects of poor combustion.

The stove's exhaust system works with negative combustion chamber pressure and a slightly positive chimney pressure. It is very important to ensure that the exhaust system be sealed and airtight. The ash pan and viewing door must be locked securely for proper and safe operation of the pellet stove.

Do not burn with insufficient combustion air. A periodic check is recommended to ensure proper combustion air is admitted to the combustion chamber. Setting the proper combustion air is achieved by adjusting the slider damper located on the left side of the stove.

Soot or creosote may accumulate when the stove is operated under incorrect conditions such as a rich burn (black tipped, lazy orange flames).

If you have any questions with regards to your stove or the above-mentioned information, please feel free to contact your local dealer for further clarification and comments.

**SINCE SHERWOOD INDUSTRIES LTD. HAS NO CONTROL OVER THE INSTALLATION OF YOUR STOVE, SHERWOOD INDUSTRIES LTD. GRANTS NO WARRANTY IMPLIED OR STATED FOR THE INSTALLATION OR MAINTENANCE OF YOUR STOVE. THEREFORE, SHERWOOD INDUSTRIES LTD. ASSUMES NO RESPONSIBILITY FOR ANY CONSEQUENTIAL DAMAGE(S).**

**SAVE THIS INSTRUCTION MANUAL FOR FUTURE REFERENCE.**

# SPECIFICATIONS

## DIMENSIONS:

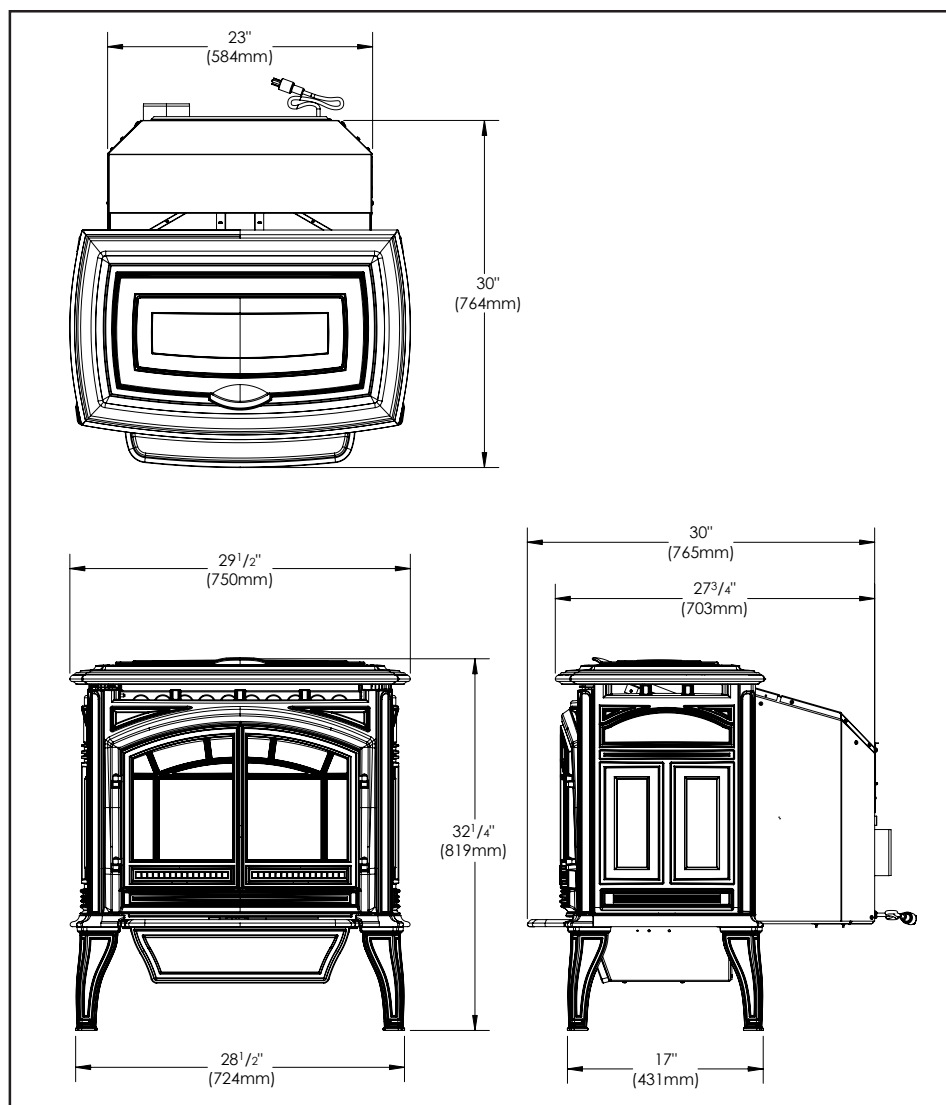


Figure 1: Dimensions of M-55C-FS.

## SPECIFICATIONS:

Input rating when using: Wood Pellets/Corn - 55,000BTU (16.1KW•hr) & Wheat/Barley - 53,000BTU (15.5KW•hr).

Table 1: M-55C-FS Specifications.

Description	Fuel type	
Residential Pellet Heater	6mm (1/4") dia. Pellets - wood, corn, wheat, & barley*	
Voltage	Current	Max Power
110 - 120 V	4.2 Amps	504 Watts
Frequency	Hopper Capacity	Consumption on Low
60 Hz	up to 60 lb (36.3 Kg)	1.5 lb/hr (0.68 Kg/hr)*
Testing Standard	Weight (with full hopper)	Consumption on High
ASTM 1509-04	485 lb (220 Kg)	6.5 lb/hr (2.95 Kg/hr)*

\*Note: Consumption will vary with the type of fuel used.

# OPERATING INSTRUCTIONS

## CONTROL BOARD FUNCTIONS:

Note: The Control Panel is located underneath the units Cast Hopper Lid which is attached to a safety switch that will immediately stop the auger. The switch will stop operation of the stove and display a #4 flash code if the lid is not closed within two minutes.

1. **ON/OFF BUTTON:** Used to turn the unit ON and OFF manually.
2. **HEAT OUTPUT INDICATOR:** Shows the present Heat Level output setting and the Feed Trim while it is being adjusted.
3. **THERMOSTAT SWITCH:** Sets the unit's control mode; AUTO/OFF or HIGH/LOW (when using a Thermostat or Timer) or MANUAL.

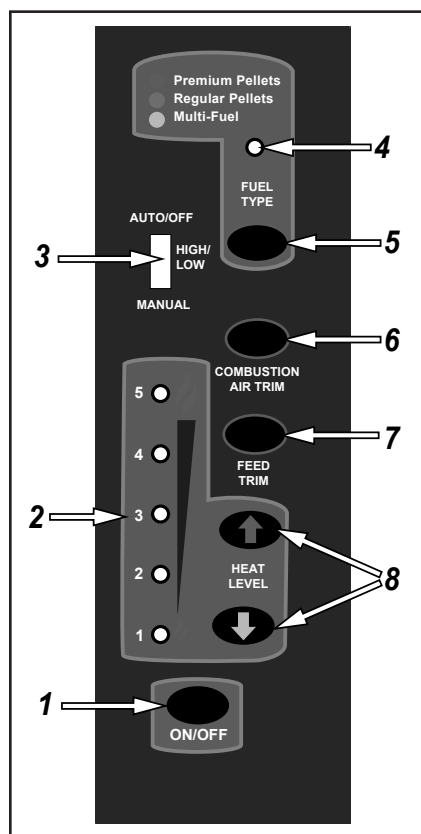


Figure 2: Circuit Board Control Panel Decal

4. **FUEL TYPE LIGHTS:** Shows the present Fuel Type selected; Premium Pellets are Red, Regular Pellets are Green, and Multi-fuel is Yellow. The Light flashes during start-up, and when the Thermostat is in control of the Unit.

5. **FUEL TYPE BUTTON:** Used to switch between three fuel type modes: Premium Pellets for high grade wood pellets, Regular pellet for mid or low grade wood pellets, and Multi-Fuel for other fuel types.

6. **COMBUSTION AIR TRIM BUTTON:** Increases or Decreases the Fan voltage. When pressed all lights on Heat Level Indicator will come on except the one that is the set point. Hold Trim Button down and press the UP or DOWN Heat Level Arrow to adjust setting. #3 Light is the default setting.

Depending on Fuel quality Ignition problems may occur at higher altitudes, this can be resolved by trimming the Combustion Fan to a higher setting.

7. **FEED TRIM BUTTON:** Used in conjunction with the Heat Level Adjustment Buttons to adjust the Feed Trim. It can be increased by two (2) feed settings or it can be decreased by two (2) feed settings. #3 Light is the default setting.

8. **HEAT LEVEL ADJUSTMENT BUTTONS:** Changes the Heat Setting of the Unit from LO to HIGH. Press the Arrow Up button to increase Heat, and Arrow Down to decrease Heat. Heat level adjustments will not take effect until startup cycle is complete (10-15 mins)

## AUTOMATIC SAFETY FEATURES OF YOUR PELLET STOVE:

- A. **EXHAUST TEMPERATURE SWITCH:** The stove will shut off when the fire goes out and the exhaust temperature drops below 49°C (120°F). It will display a #3 flash code.
- B. **HIGH LIMIT SAFETY SWITCH:** If the temperature on the hopper reaches 93°C (200°F), the auger will automatically stop, the stove will shut down, and it will display a #4 flash code. If this happens, call your local dealer to reset the 93°C (200°F) high limit switch **AND DETERMINE THE CAUSE OF THE OVERHEATING.**
- C. **VACUUM SWITCH:** Notifies when the unit has lost vacuum. This can be caused by either a combustion fan/vent failure, or simply the unit's doors aren't sealed properly. It will display a #2 flash code.

# OPERATING INSTRUCTIONS

## OPERATING YOUR PELLET STOVE:

**THE UNIT WILL NOT OPERATE WITH THE DOOR OR ASH BOX OPEN. Open the hopper lid only to re-fuel or to adjust the controls. the unit will shut down if the hopper lid is left open for longer than two minutes.**

**CAUTION:** When operating during adverse weather, such as high winds or freezing rain, if the unit exhibits dramatic changes in combustion stop using the unit immediately. Watch for blocked exhaust outlet.

**PRE-BURN CHECK:** The burn pot liner holes must be clear and the liner installed properly against the ignitor tube and locked in place. Ensure the agitator is properly locked in. Check the hopper for enough pellets to start the unit.

**Note:** To change fuel type, ensure the Thermostat Switch is set to Manual Mode. Press the Off button and then press the Fuel Type button to cycle through the available fuel types.

The unit has an automatic cleaning cycle; every thirty (30) minutes the agitator will turn continuously for one (1) minute to help clean out the burn pot liner.

### MANUAL MODE:

**INITIAL START-UP: Press the ON / OFF button.** The stove will turn on. The Auger Feed Rate is pre-programmed during start-up. The Heat Level Indicator will show the Heat Level that the stove will run at after start-up.

If this is the first time the unit has been started or the unit has run out of fuel, the auger may need to be primed. If there is no fuel in the burn pot after two (2) minutes the liner can be primed with a handful of pellets. The agitator will not operate for the first five (5) minutes after the ON button has been pressed. After the five (5) minutes it will pulse at the same interval as the feed auger.

When the start-up sequence is complete the unit will ramp up in two (2) minute intervals until it has reached the designated heat setting. Once a fire has been established, the convection blower will turn on after ten (10) minutes.

**To OPERATE:** Press the Heat Level buttons to change the desired Heat Level Output setting.

The speed of the convection blower is controlled by the setting of the heat level.

The Feed Trim button pressed in conjunction with the Heat Level adjustment buttons can be used to adjust the feed trim. It can be increased by two (2) feed settings or it can be decreased by two (2) feed settings.

**HIGH/LOW MODE:** (Requires a Thermostat or Timer)

**INITIAL START-UP:** See MANUAL MODE above.

**OPERATION:** When the thermostat calls for heat (contacts are closed), the stove settings are adjustable as per Manual Mode. When the thermostat contacts open, the HEAT LEVEL and Fans will drop down to the LOW setting until the thermostat contacts close again. The stove will come back to the previous HEAT LEVEL setting once the thermostat contacts close.

**AUTO/OFF MODE:** (Requires a Thermostat or Timer)

**INITIAL START-UP:** See MANUAL MODE above.

**OPERATION:** When the thermostat contacts close, the unit will light automatically. Once up to temperature, the stove operates the same as in MANUAL. When the thermostat contacts open, the stove's HEAT LEVEL and Fans will drop down to the LOW setting for 30 minutes. If the thermostat contacts close within the 30 minutes, the HEAT LEVEL will return to the previous MANUAL

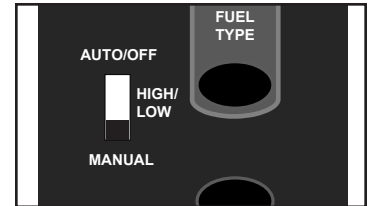


Figure 3: Thermostat Switch in MANUAL position.

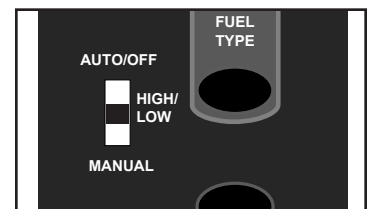


Figure 4: Thermostat Switch in HIGH/LOW position.

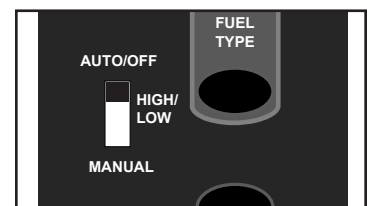


Figure 5: Thermostat Switch in AUTO/OFF position.

# OPERATING INSTRUCTIONS

setting. If the thermostat contacts remain open, the stove automatically begins its shutdown routine. The stove will re-light when the thermostat contacts close again.

## TURNING YOUR PELLET STOVE OFF:

- MANUAL and HI / LOW mode: To turn the unit OFF, simply press the ON / OFF button. This will stop the feed of pellets. The blowers will continue to operate and cool the stove down. When cool enough, the stove will turn off.
- AUTO / OFF mode: To turn the unit OFF, turn the Thermostat down or Timer off.
- On shut down the burn pot agitator will run continuously for five (5) minutes on premium mode, one (1) minute on regular mode, and five (5) minutes on multi-fuel mode.

**DO NOT turn unit off during start-up or unplug unit while operating; this may lead to smoke escaping from the stove.**

## SLIDER/DAMPER SET-UP:

This is used to regulate the airflow through the pellet stove and has been set at the factory.

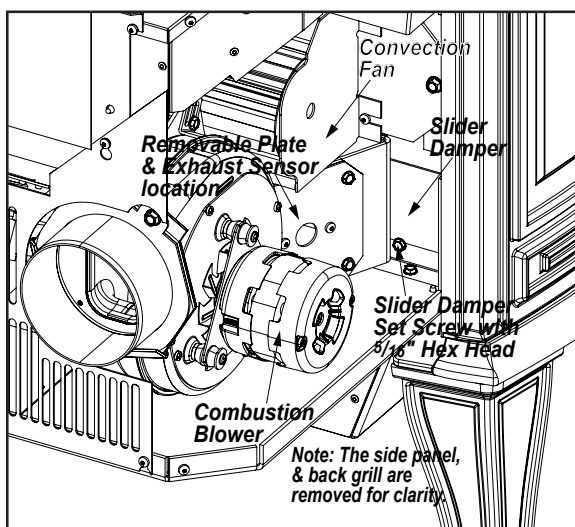


Figure 6: Slider/Damper Plate in Unit.



Figure 7: Efficient Flame.

This unit is designed to operate within a negative pressure range that may only be adjusted by a qualified technician. This can be measured using a Magnahelic pressure gauge once the unit has been running on heat level 5 setting after one hour of burn time. This adjustment is necessary for varying venting configurations. The reading can be taken from the 1/8" hole located on the right side of the Ash Box.

The Combustion Trim, Feed Trim and Fuel Type Functions can be used to compensate for varying fuel qualities. Refer to the Owners Manual for circuit board operation.

If, after long periods of burning, the fire builds up or there is a build up of clinkers, this would be a sign that the fuel quality is poor - this requires more air.

The easiest way to make sure that an efficient flame is achieved is to understand the characteristics of the fire.

- A tall, lazy flame with dark orange tips requires more air.
- A short, brisk flame, like a blowtorch, has too much air.
- If the flame is in the middle of these two characteristics with a bright yellow/orange, active flame with no black tips then the air is set for proper operation, refer to Figure 7.

## SPECIAL NOTES:

Fuel quality is a major factor in how the stove will operate. If the fuel has a high moisture content or ash content the fire will be less efficient and has a higher possibility of the fire building up and creating clinkers (hard ash build-up).

# ROUTINE CLEANING AND MAINTENANCE

The following list of components should be inspected and maintained routinely to ensure that the appliance is operating at its optimum and giving you excellent heat value. The appliance, flue gas connector and the chimney flue require regular cleaning. Check them for blockage prior to re-lighting after a prolonged shut down period.

Check the Burn Pot Liner DAILY	
<u>Weekly</u>	<u>Bi-annually or 2 Tons of Fuel</u>
Burn Pot and Liner - Empty	Exhaust Vent
Agitator	Fresh Air Intake Tube
Heat Exchanger Tubes	Blower Mechanisms
Door Glass	Heat Exchanger Tubes
Ash Pan and Door Gaskets	Behind Firebox Liners
Inside Firebox	All Hinges
Door Latch	Post Season Clean-up
Ash Box	
Cleaning Ports	

## TOOLS REQUIRED TO CLEAN UNIT:

Torx T-20 Screwdriver, 1/4", 5/16" 3/8", & 7/16" wrench and/or socket, Brush, Soft Cloth, and Vacuum with fine filter bag

### BURNER POT AND LINER (Checked Daily/Emptied Weekly)

This is the 'pot' where the pellets are burned. **Only clean when the unit is cold.**

Note: If, after long periods of burning, the fire continually builds up and overflows the burn pot or there is a build up of clinkers, this is an indication that the pellet fuel quality is poor or the stove may need cleaning. Check the stove for ash build up (clean if required) and adjust the combustion air trim and if required the slider/damper to produce the proper clean combustion.

1. Open the door using the door handle located on the right-hand side of the stove.
2. Lift the lever on burn pot to unlock the fire grate and remove it.
3. The agitator locks at the right; rotate the top of the agitator towards the back of the firebox to unlock it, slide it to the left, and lift it out of the burn pot liner.
4. Lift the burn pot liner out of the stove.
5. Lift the burn pot from the firebox by gently lifting it up at the front of the burn pot, then slide it out from around the air intake tube and the ignitor cartridge.
6. Remove any build up on the agitator (calcium build-ups are common when burning corn). Using a metal scrapper, remove material that has accumulated or is clogging the liner's holes. Then dispose of the scrapped ashes from the liner and from inside the burn-pot.
7. Place the burn-pot back into the stove, there are hooks at the front of the burn pot that sit in a mount in the firebox. Ensure that the air intake tube and the ignitor cartridge are properly inserted into the burn pot.
8. Place the liner back into the burn-pot, making sure that the ignitor hole in the liner is aligned with the ignitor tube; push the liner up against the ignitor tube.
9. Slide the agitator back into place and turn rotate the top towards the front of the stove to lock it in.
10. Set the fire grate in place, it should sit level on the front and back of the burn pot liner. Lock it in with the lever on the burn pot.
11. Close the door

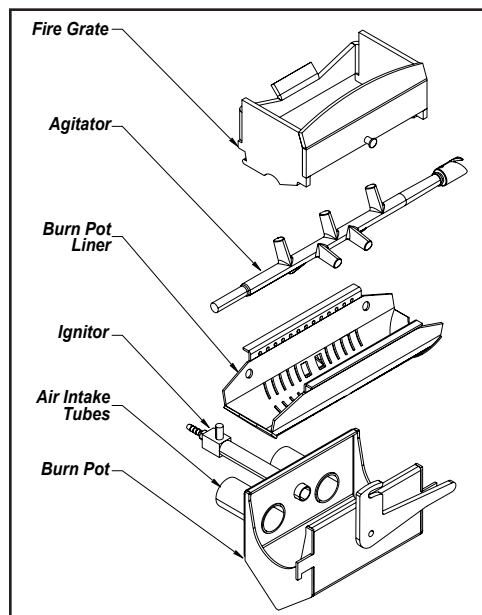


Figure 8: Burn Pot Assembly.

# ROUTINE CLEANING AND MAINTENANCE

## HEAT EXCHANGER TUBES (Weekly)

The Heat Exchanger Tube's Cleaning Rake Handle is located above the firebox door. Move the handle all the way in and out a few times (ONLY WHEN THE UNIT IS COLD) in order to clean away any fly ash that may have collected on the heat exchanger tubes. As different types of pellets produce different amounts of ash, cleaning of the tubes should be done on a regular basis to enable the unit to run efficiently.

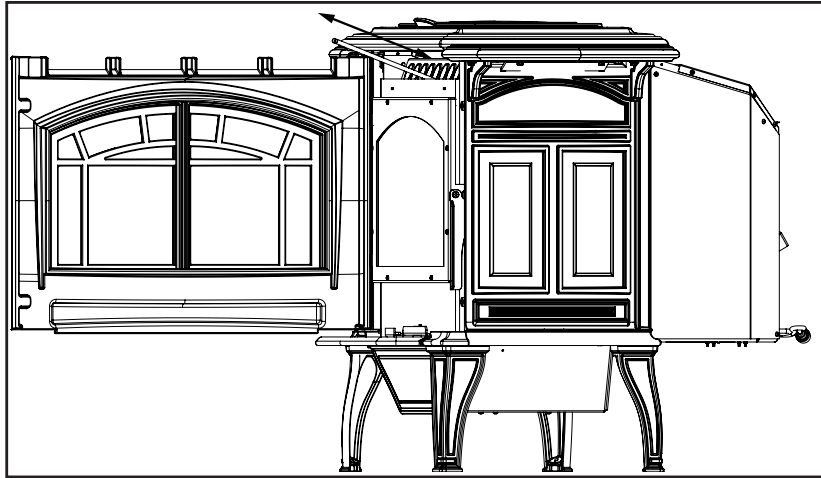


Figure 9: M-55C-FS Heat Exchanger Cleaning.

## DOOR GLASS CLEANING (Weekly)

It is recommended that the door glass be cleaned weekly to keep creasote/soot levels to a minimum. Cleaning of the glass must only be done when stove is cold. Open the door by lifting the handle. The glass can be cleaned by wiping down the outside and inside of the glass with a dry soft cloth.

If the glass has build up that can not be removed with only the cloth, clean the glass using paper towel and a gas appliance glass cleaner, this may be purchased through most dealers. If a gas appliance glass cleaner is not available, use a damp paper towel dipped in fly ash to clean the glass. After the glass has been cleaned use the dry soft cloth to wipe down the outside and inside of the glass.

## ASH PAN AND DOOR GASKETS (Weekly)

After extended use the gasketing may come loose. To repair this, glue the gasketing on using high-temperature fiberglass gasket glue available from your local dealer. This is important to maintain an airtight assembly.

## ASH BOX (Weekly)

**IMPORTANT:** The unit must be OFF while the ash pan is removed.

The ash box is located behind the lower door (see Figure 10). To remove the ash box, lift the latch on the right, open the ash box door, and lift it out.

Dump the ashes into a metal container stored away from combustibles. Monitor the ash level every week. Remember that different pellet fuels will have different ash contents. Ash content is a good indication of fuel efficiency and quality. Refer to "SAFETY WARNINGS AND RECOMMENDATIONS" for disposal of ashes. Vacuum the inside of the ash pan compartment inside the pedestal including the hole at the top back of the compartment. Insert the ash box until it makes contact with the ash box stop.

**DO NOT PLACE UNBURNED OR RAW PELLET FUEL IN ASH PAN.**

## EXHAUST VENT (Biannually)

This vent should be cleaned every year or after two tons of pellets. We recommend contacting your dealer for professional cleaning. To clean the vent pipe, tap lightly on the pipe to dislodge any loose ash. Open the bottom of the "T" to dump the ash, then vacuum as much of the ash out of the vent pipe as possible.

## FRESH AIR INTAKE (Biannually)

Inspect periodically to be sure that it is not clogged with any foreign materials.

# ROUTINE CLEANING AND MAINTENANCE

## EXHAUST PASSAGES (Biannually)

1. Open the firebox door by lifting the handle.
2. Remove the burn pot assembly and clean all the parts.
3. Lubricate all screws with penetrating oil.
4. Lift the baffle, remove the firebox liner, and lift out the firebox lower. Vacuum the firebox and firebox liner thoroughly.
5. Open the ash box door; remove the ash box and cleanout the cavity.
6. Re-install the ash box, firebox lower, baffle, firebox liner, burn pot, and burn pot liner
7. Close the firebox and ash pan doors and secure.

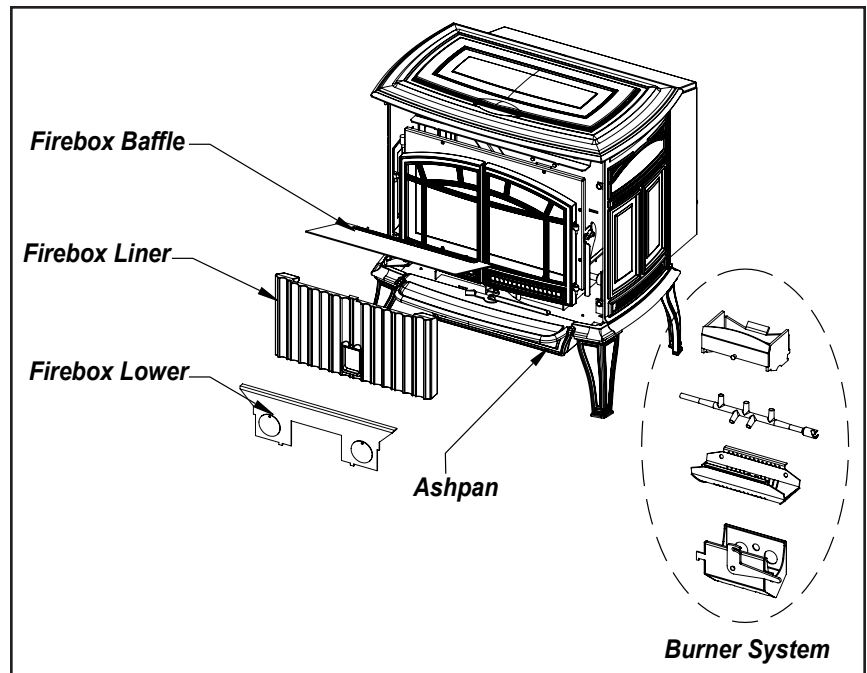


Figure 10: M-55C-FS Exhaust Passages.

## BLOWER MECHANISMS (Annually)

Unplug the stove then open the right and left side panels to access the two blowers. Remove the T-20 torx Screws located on the top and bottom of the rear access panels.. Vacuum all dust from motors. The blower motors has sealed bearings, DO NOT lubricate this motor. Check gaskets and replace if needed.

## POST SEASON CLEAN-UP

Once you are finished using the pellet appliance for the season, unplug the stove for added electrical protection. It is very important that the stove be cleaned and serviced as stated above.

## CLEANING PAINTED SURFACES

Please clean surfaces with a soft damp cloth.

## CLEANING ENAMEL SURFACES

Enamel Finishes and painted surfaces can be wiped down with a soft damp cloth. Wd/40 oil can be used to clean enameled casting if necessary.

## FIREBOX LINER

The paint on the Firebox Liner may peel. This is due to extreme conditions applied to the paint and is in no way covered by warranty.

## DOOR GLASS REPLACEMENT

It is recommended that your dealer replace the glass if broken. The door glass is made of high temperature PYRO CERAMIC and must be purchased through your dealer. To replace the glass, unscrew and remove the six (6) retainer nuts using a  $\frac{5}{16}$ " socket. Remove the glass and any broken pieces. High temperature fiberglass tape should be used around the glass in the same location as the original fiberglass. Insert the glass into the retainer, screw the door to the retainer, and gently tighten nuts. Ensure that edge clearances are maintained. The use of substitute materials is prohibited: #50-2119.

# INSTALLATION

## DECIDING WHERE TO LOCATE YOUR PELLET APPLIANCE:

1. Do not install the stove in a bedroom or room where people sleep in.
2. Locate the stove in a large and open room that is centrally located in the house. This will optimize heat circulation.
3. Check clearances to combustibles and for the least amount of interference to house framing, plumbing, wiring, etc.
4. You can vent the stove with approved pipe through an exterior wall behind the unit or pass it through the ceiling and roof. The stove can connect to an existing masonry or metal chimney (must be lined if the chimney is over 6" (15 cm) diameter, or over 28 inches<sup>2</sup> (180 cm<sup>2</sup>) cross sectional area).
5. This unit must not be installed directly onto carpet. If it is to be installed on a carpeted area, a solid surface (wood, metal or approved hearth pad) must be installed between the unit and the carpet.
6. This unit uses large quantities of air for combustion; outside Fresh Air connection is **strongly recommended**. Fresh Air **must** be connected to all units installed in Mobile and "Air Tight Homes" (R2000) or where required by local codes.
7. Do not obtain combustion air from an attic, garage or any unventilated space. Combustion air may be obtained from a ventilated crawlspace.
8. The power cord is 8 feet (2.43 m) long and may require a grounded extension cord to reach the nearest electrical outlet.

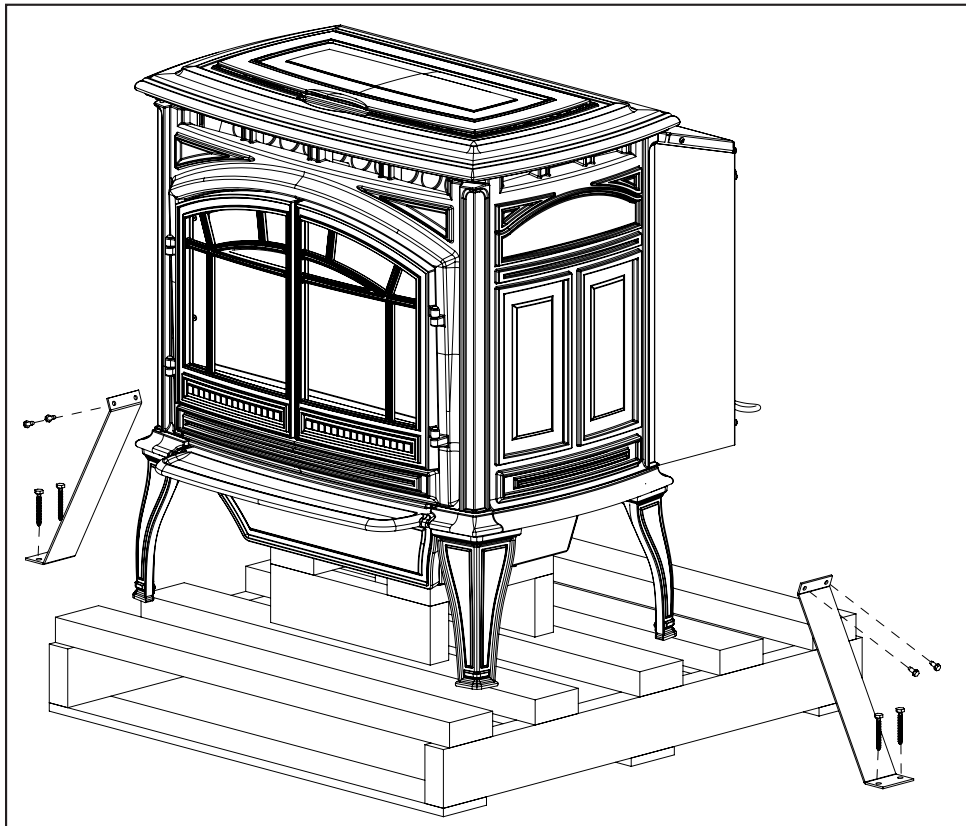


Figure 3: Screws to take out to remove stove from pallet.

## REMOVING PELLET STOVE FROM PALLET:

1. Remove the two (2) screws that hold the brackets to the pallet on either side of the unit.
2. Remove the two (2)  $\frac{5}{16}$ " hex head screws that hold the brackets to the units.

# INSTALLATION

## CLEARANCES TO COMBUSTIBLES:

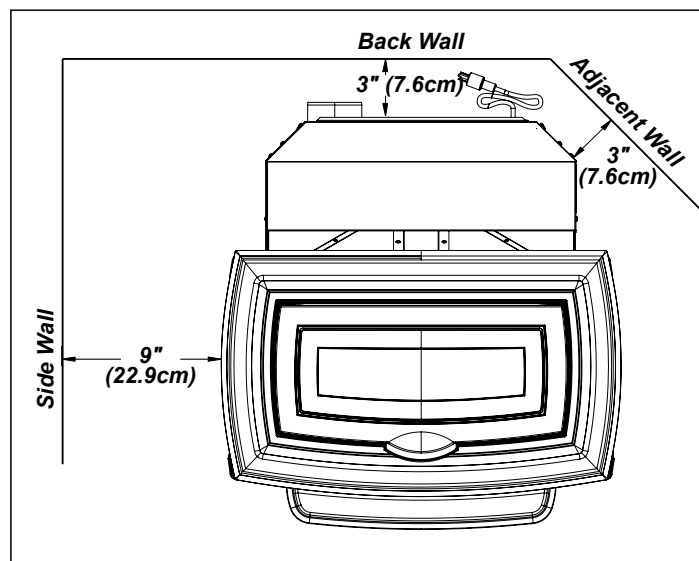


Figure 4: M-55C-FS Clearance to Combustibles.

These dimensions are minimum clearances but it is recommended that you ensure sufficient room for servicing, routine cleaning and maintenance.

Side wall to unit	9 inches	(22.9 cm)
Back wall to unit	3 inches	(76 cm)
Corner to unit	3 inches	(76 cm)
Ceiling height	60 inches	(152 cm)

Alcove Maximum Depth	36 inches	(91 cm)
Alcove Minimum Width	48 inches	(122 cm)
Alcove Minimum Height	60 inches	(152 cm)

The unit must be installed with a minimum of 6" (152 mm) of floor protection in front of and to the sides of the door opening.

## LEVELING LEG ADJUSTMENT:

The leveling legs should be adjusted for the unit to sit level and not rock if installed on uneven flooring.

1. Turn levelling legs until they are at the required heights.
2. Tighten the nut to hold the leveling leg in position.

## THERMOSTAT INSTALLATION:

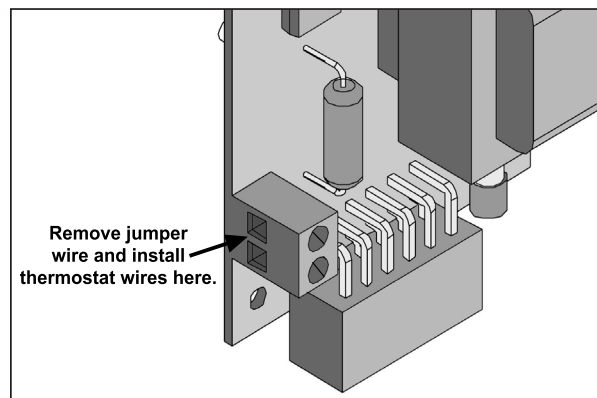


Figure 5: Thermostat wire placement.

1. Install the wall thermostat (millivolt rated thermostat recommended, or a 12/24 Volt rated thermostat set to millivolts) in a location that is not too close to the unit but will effectively heat the desired area.
2. Connect the Thermostat using a 2 x 18 gauge wire from the unit to the thermostat.

If the heat in the room becomes too great, the high limit switch may turn the stove off and the switch will have to be manually reset. The switch is found below the firebox top on the hopper's right surface.

# INSTALLATION

## VENT TERMINATION REQUIREMENTS:

IT IS RECOMMENDED THAT YOUR PELLET STOVE BE INSTALLED BY AN AUTHORIZED DEALER/INSTALLER.

Table 2: Use in conjunction with Figure 6 for allowable exterior vent termination locations.

Letter	Minimum Clearance	Description
A	24 in (61 cm)	Above grass, top of plants, wood, or any other combustible materials.
B	48 in (122 cm)	Beside/below any door or window that may be opened. (18" (46 cm) if outside fresh air installed.)
C	12 in (30 cm)	Above any door or window that may be opened. (9" (23 cm) if outside fresh air installed.)
D	24 in (61 cm)	To any adjacent building, fences and protruding parts of the structure.
E	24 in (61 cm)	Below any eave or roof overhang
F	12 in (30 cm)	To outside corner.
G	12 in (30 cm)	To inside corner, combustible wall (vertical and horizontal terminations).
H	3 ft (91 cm) within a height of 15 ft (4.5 m) above the meter/regulator assembly	To each side of center line extended above natural gas or propane meter/regulator assembly or mechanical vent.
I	3 ft (91 cm)	From any forced air intake of other appliance
J	12 in (30 cm)	Clearance to non-mechanical air supply inlet to building, or the combustion air inlet to any appliance.
K	24 in (61 cm)	Clearance above roof line for vertical terminations.
L	7 ft (2.13 m)	Clearance above paved sidewalk or paved driveway located on public property.

- Do not terminate the vent in any enclosed or semi-enclosed areas such as a carport, garage, attic, crawlspace, narrow walkway, closely fenced area, under a sundeck or porch, or any location that can build up a concentration of fumes such as stairwells, covered breezeway, etc.

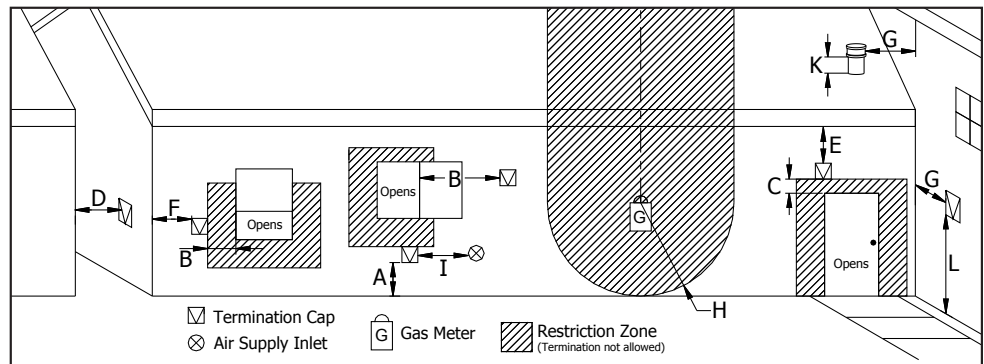


Figure 6: Use in conjunction with Table 2 for allowable exterior vent termination locations.

- Vent surfaces can become hot enough to cause burns if touched by children. Non-combustible shielding or guards may be required.
- Termination must exhaust above the inlet elevation. It is recommended that at least five feet of vertical pipe be installed outside when the appliance is vented directly through a wall, to create some natural draft to prevent the possibility of smoke or odor during appliance shut down or power failure. This will keep exhaust from causing a nuisance or hazard from exposing people or shrubs to high temperatures. In any case, the safest and preferred venting method is to extend the vent through the roof vertically.
- Distance from the bottom of the termination and grade is 12" (30 cm) minimum. This is conditional upon the plants and nature of grade surface. The exhaust gases are hot enough to ignite grass, plants and shrubs located in the vicinity of termination. The grade surface must not be lawn.
- If the unit is incorrectly vented or the air to fuel mixture is out of balance, a slight discoloration of the exterior of the house might occur. Since these factors are beyond the control of Sherwood Industries Ltd, we grant no guarantee against such incidents.

**NOTE: Venting terminals shall not be recessed into walls or siding.**

# INSTALLATION

## OUTSIDE FRESH-AIR CONNECTION:

**This Heater must have adequate air for proper combustion in the room that it is installed.**

**A Fresh-air intake is strongly recommended for all installations.** Failure to install intake air may result in improper combustion as well as the unit smoking during power failures.

The inlet to the intake must be below and a minimum of 12" (30cm) away from the unit exhaust outlet.

**Outside fresh air is mandatory when installing this unit in airtight homes and mobile homes.**

When connecting to an outside fresh air source, do not use plastic or combustible pipe. A 3" minimum (76 mm) ID (inside diameter) steel, aluminum or copper pipe or ducting should be used. The inlet must have a screen installed. It is recommended, when you are installing a fresh air system, to keep the number of bends in the pipe to a minimum.

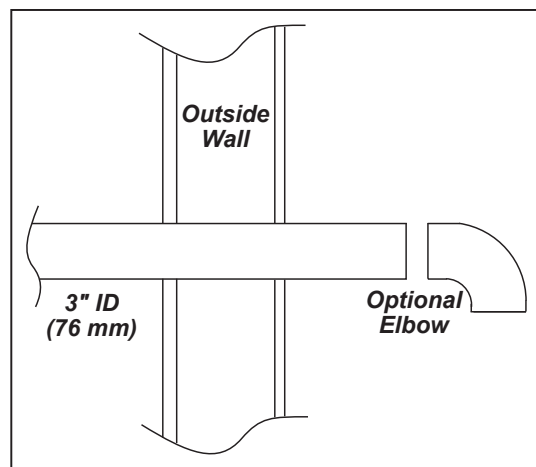


Figure 7: Outside Air Connection.

## EXHAUST AND FRESH AIR INTAKE LOCATIONS:

**This unit uses a 4" exhaust vent.**

### EXHAUST:

Base of unit to center of flue  
15½" (392 mm)

Center of unit to center of flue  
6¾" (162 mm)

### FRESH AIR INTAKE.

Base of unit to center of intake  
12" (305 mm)

Center of unit to center of intake  
4⅞" (126 mm)

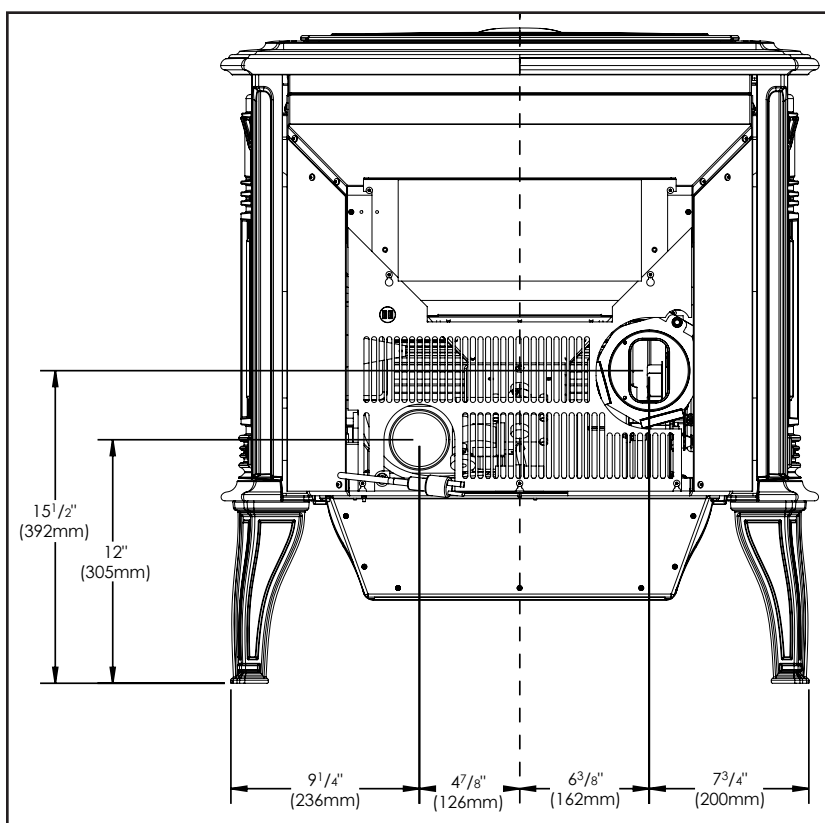


Figure 8: M-55C-FS Inlet and Outlet Location.

# INSTALLATION

## MOBILE HOME INSTALLATION:

- Secure the heater to the floor using the four (4) holes in the pedestal.
- Ensure the unit is electrically grounded to the chassis of your home (permanently).
- Do not install in a room people sleep in.
- Outside fresh air is mandatory. Secure outside air connections directly to fresh air intake pipe and secure with three (3) screws evenly spaced.
- All specified components must be used. Do not use any components other than what's specified.

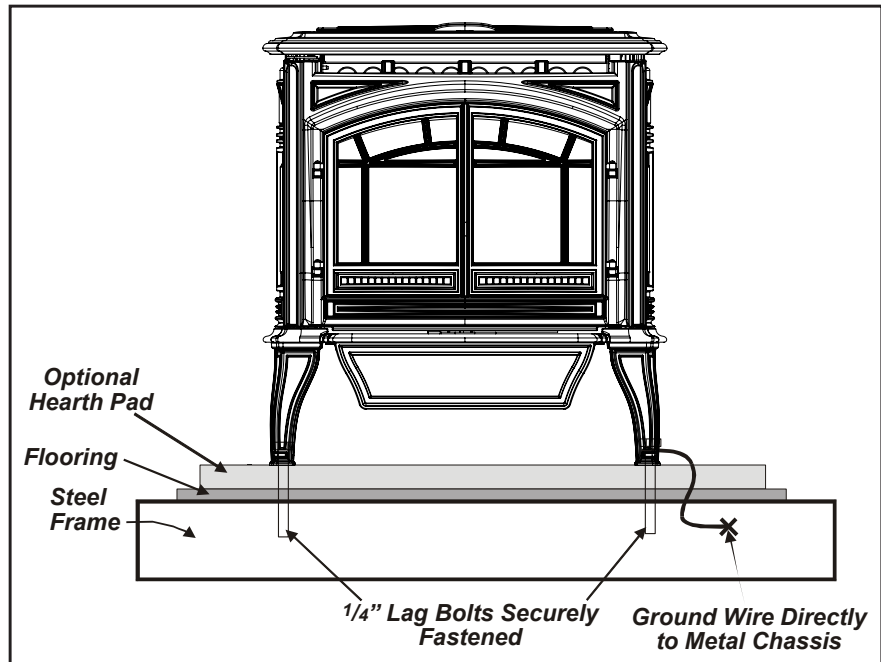


Figure 9: Mobile home installation.

**CAUTION: THE STRUCTURAL INTEGRITY OF THE MANUFACTURED HOME FLOOR, WALL AND CEILING/ROOF MUST BE MAINTAINED.**

## CORNER THROUGH WALL INSTALLATION:

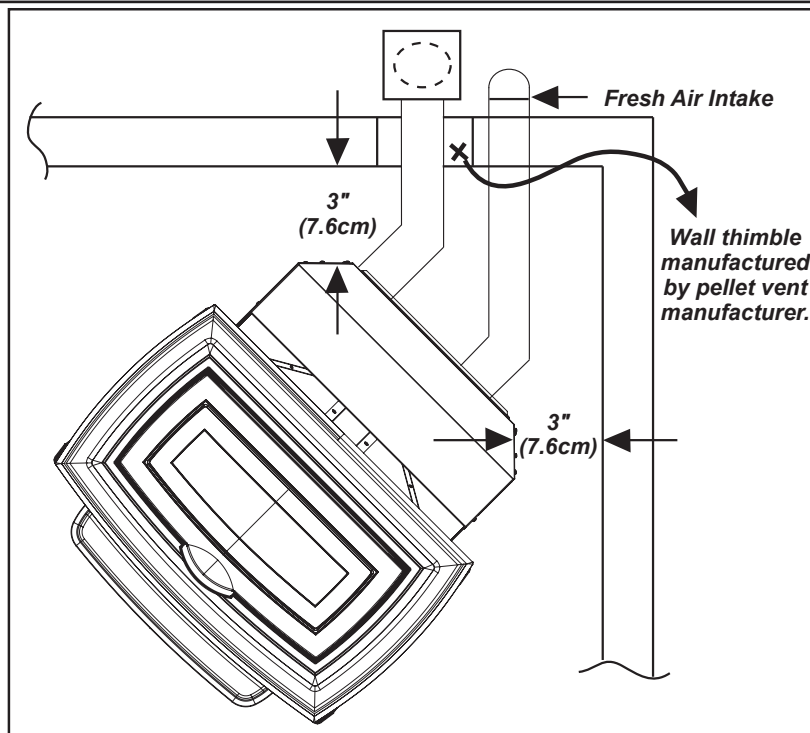


Figure 10: Corner Installation.

# INSTALLATION

## HORIZONTAL EXHAUST THROUGH WALL INSTALLATION:

**Vent installation: install vent at clearances specified by the vent manufacturer.**

A chimney connector shall not pass through an attic or roof space, closet or similar concealed spaces, or a floor, or ceiling. Where passage through a wall or partition of combustible construction is desired, the installation must conform to CAN/CSA-B365 Installation Code for Solid-Fuel-Burning Appliances and Equipment and with all local regulations, including those referring to regional and national. Only use venting of L or PL type or corn certified venting if corn will be burned as a fuel with an inside diameter of 4 inches (100 mm). All joints in the exhaust venting system must be fastened with at least three (3) screws.

1. Place the appliance 15" (37.5 cm) away from the wall. If the stove will be installed a hearth pad, set the unit on it.
2. Locate the center of the exhaust pipe on the stove. Extend that line to the wall. Once you have located the center point on the wall, refer to pellet vent manufacturer installation instructions for correct hole size and clearance to combustibles.
3. Install the wall thimble as per the instructions written on the thimble. Maintain an effective vapour barrier in accordance with local building codes.
4. Install a length of vent pipe into the wall thimble. Try not to have joints inside the thimble. The pipe should install easily into the thimble.
5. Connect the exhaust vent pipe to the exhaust pipe on the stove. Seal the connection with high temperature silicone.
6. Install the fresh air intake (see OUTSIDE FRESH AIR CONNECTION).
7. Push the stove straight back, leaving a minimum of 3" (7.6 cm) clearance from the back of the stove to the wall. Refer to Vent Manufacturers' instructions if sealant is required.

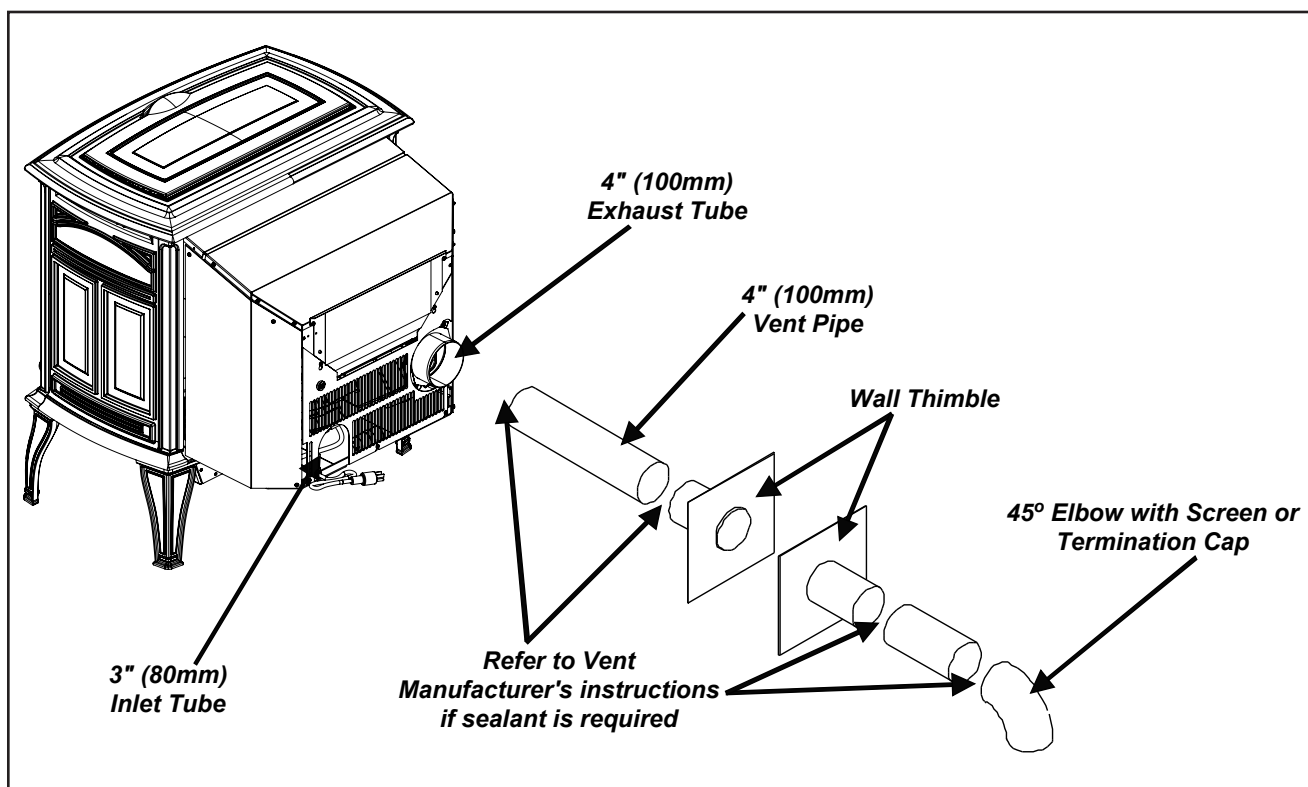


Figure 11: Straight through wall Installation.

# INSTALLATION

8. The pipe must extend at least 12" (30 cm) away from the building. If necessary, bring another length of pipe to the outside of the home to connect to the first section. Do not forget to place high temperature silicone around the pipe that passes through the thimble if required by vent manufacturer.
9. Install a vertical pipe, or if all requirements for direct venting are met, install vent termination. The stainless steel cap termination manufactured by the vent manufacturer is recommended. However, when the vent terminates several feet above ground level and there are no trees, plants, etc. within several feet, a 45° elbow can be used as termination. The elbow must be turned down to prevent rain from entering.

## NOTE:

- It is recommended that horizontal through wall installations have 3 to 5 feet (91 to 152 cm) of vertical pipe in the system to help naturally draft the unit in the event of extreme weather or a power outage.
- Some horizontal through wall installations may require a "T" and 3 to 5 feet (91 to 152 cm) of vertical pipe outside the building to help draft the unit. This may be required if a proper burn cannot be maintained, after the stove has been tested and the airflow set. This is due to the back pressure in the exhaust caused by airflow around the structure.
- Follow vent manufacturer guidelines for installation, clearance to combustibles, and sealing of venting. High temp Sealant must be used when connecting vent pipe to the unit's starter pipe. Improper seals at the vent joints may cause combustion by-products to leak into the room where installed - **seal as required by vent manufacturer.**

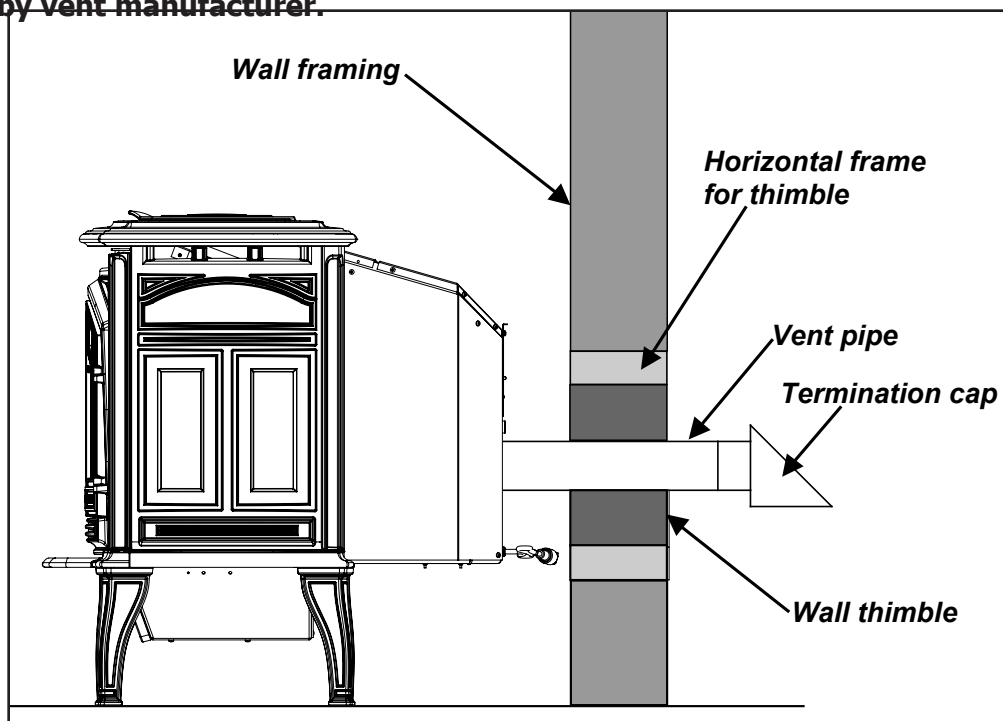


Figure 12: Straight through Wall Installation - Side View.

# INSTALLATION

## RECOMMENDED - THROUGH WALL WITH VERTICAL RISE AND HORIZONTAL TERMINATION INSTALLATION:

A 45° down elbow with a screen may be used in place of the termination cap (or stainless steel termination hood).

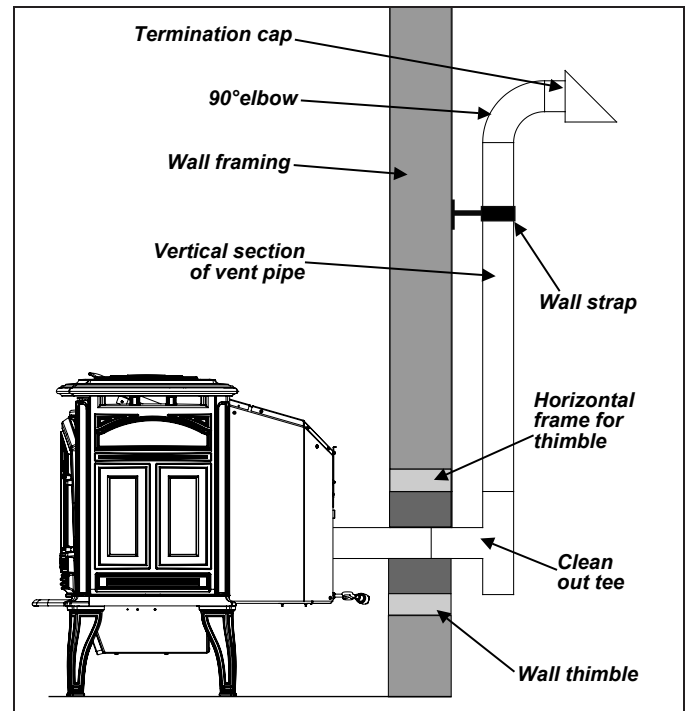


Figure 13: Venting horizontally with rise.

## THROUGH CONCRETE WALL WITH VERTICAL RISE INSTALLATIONS:

Installation to use if there is a concrete or retaining wall in line with exhaust vent on pellet stove.

A 45° down elbow with a screen may be used in place of the termination cap (or stainless steel termination hood).

The termination must be 12 inches (30 cm) from the outside wall and 12 inches (30 cm) above the ground.

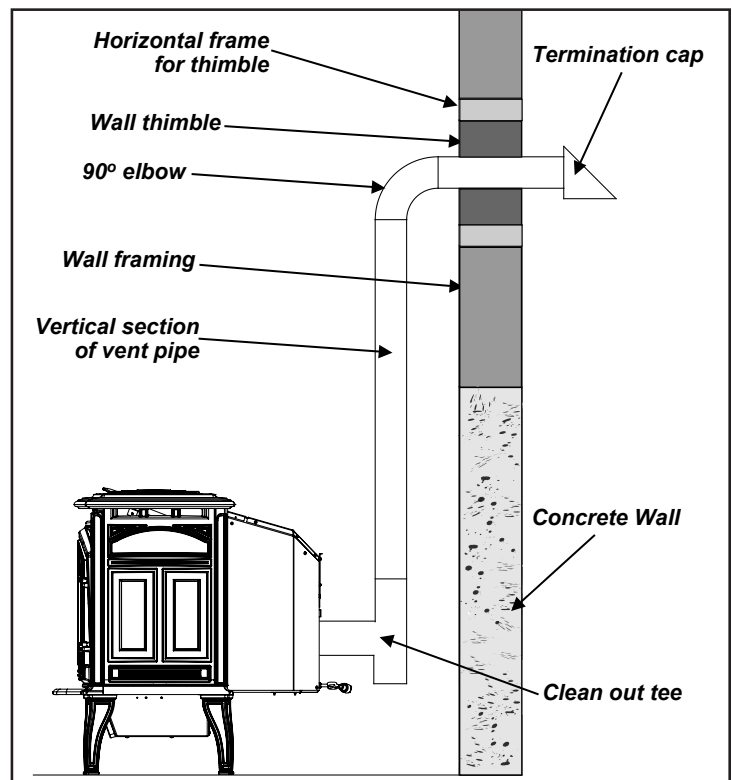


Figure 14: Venting with concrete wall behind unit .

# INSTALLATION

## OUTSIDE VERTICAL INSTALLATIONS:

To accomplish an outside vertical pipe installation, follow the "HORIZONTAL EXHAUST THROUGH WALL INSTALLATIONS" section and then finish it by performing the following (refer to Figure 15).

1. Install a tee with clean out on the outside of the house.
2. Install PL vent upward from the tee. Make sure that you install support brackets to keep the vent straight and secure. All joints in the exhaust venting system must be fastened with at least three (3) screws.
3. Install ceiling thimble and secure the flashing as you go through the roof.
4. Ensure that the rain cap is approximately 24" (61 cm) above the roof.

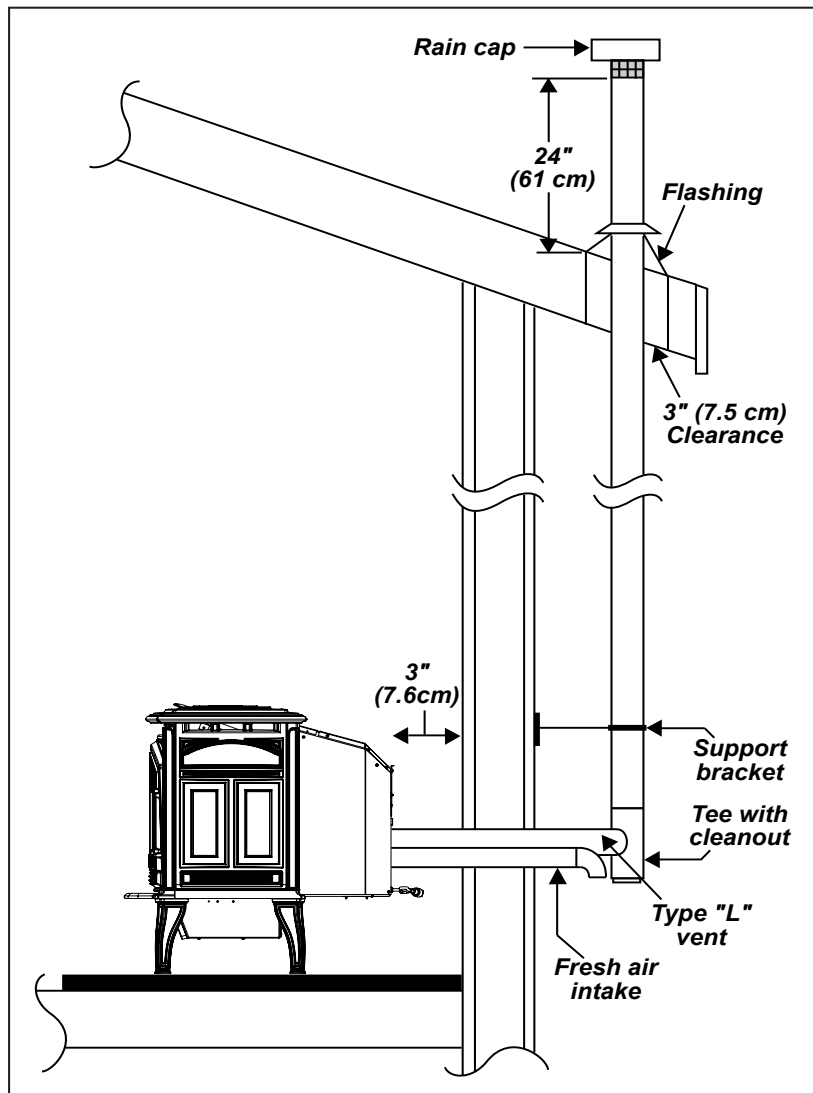


Figure 15: Outside Vertical Installation.

# INSTALLATION

## INSIDE VERTICAL INSTALLATIONS:

1. Place the unit on the hearth pad if a hearth pad is to be used (or on solid material if installed on a carpeted surface) and space the unit in a manner so when the pellet vent is installed vertically, it will meet the minimum clearance from a combustible wall stated by the vent manufacturer.
2. Install the tee with clean out.
3. Install the pellet vent upward from tee. When you reach the ceiling, make sure that the vent goes through a ceiling fire stop. Keep attic insulation away from the vent pipe & maintain an effective vapor barrier. All joints in the exhaust venting system must be fastened with at least three (3) screws. Refer to vent manufacturer for distance to combustibles & follow the vent manufacturer's instructions on sealing.
4. Finally, extend the pellet vent to go through the roof flashing.
5. Ensure that the rain cap is approximately 24" (61 cm) above the roof.
6. Install the fresh air system.

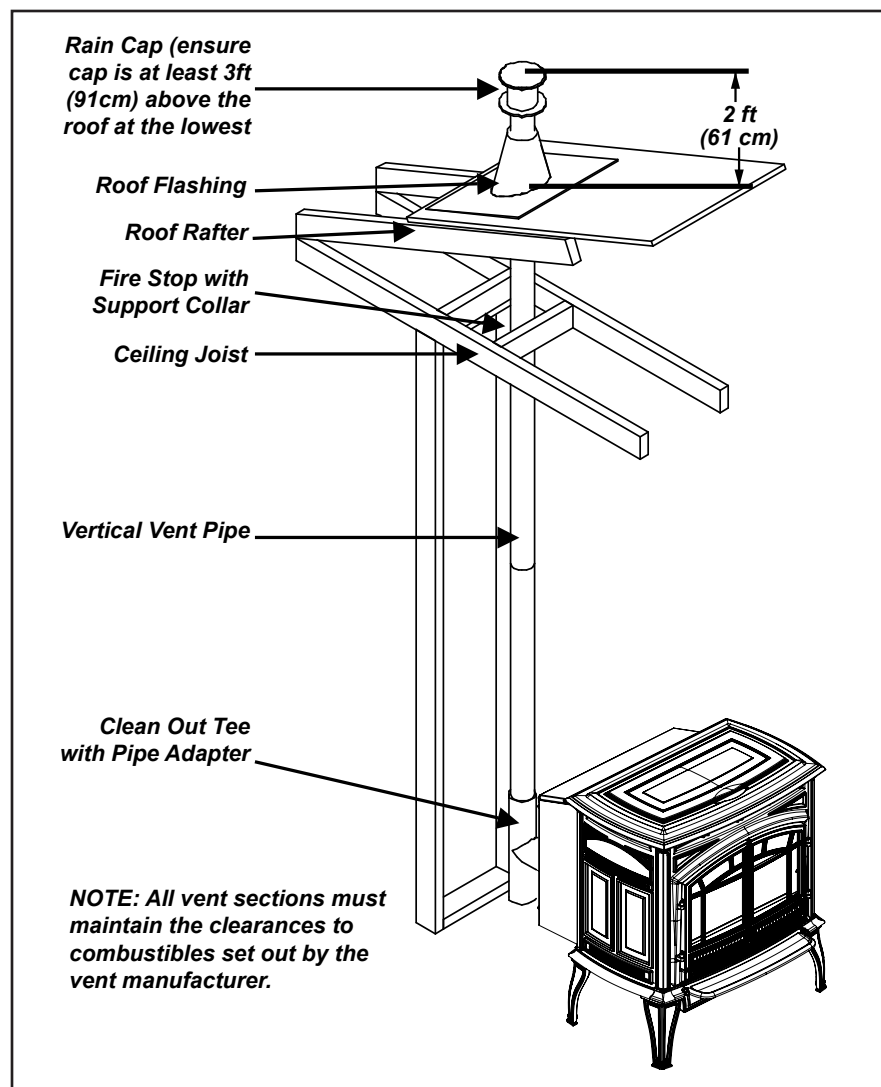


Figure 16: Inside Vertical Installation.

# INSTALLATION

## HEARTH MOUNT INSTALLATION:

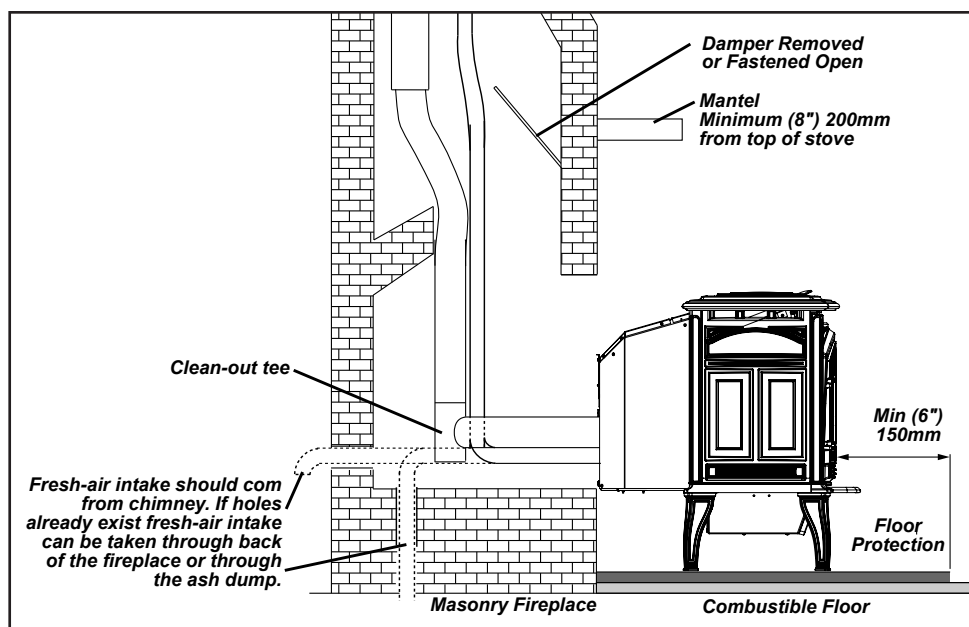


Figure 17: Hearth Mount - Side View.

1. Lock fireplace damper in the open position.
2. Install flexible stainless steel liner or listed pellet vent to the top of the chimney. All joints in the exhaust venting system must be fastened with at least three (3) screws.
3. Install a sealing plate at the top of the chimney.
4. Connect a rain cap and flex adapter to the chimney liner/pipe.
5. Connect a clean-out tee or a 90° elbow to the liner/pipe.
6. Install tee onto stove.

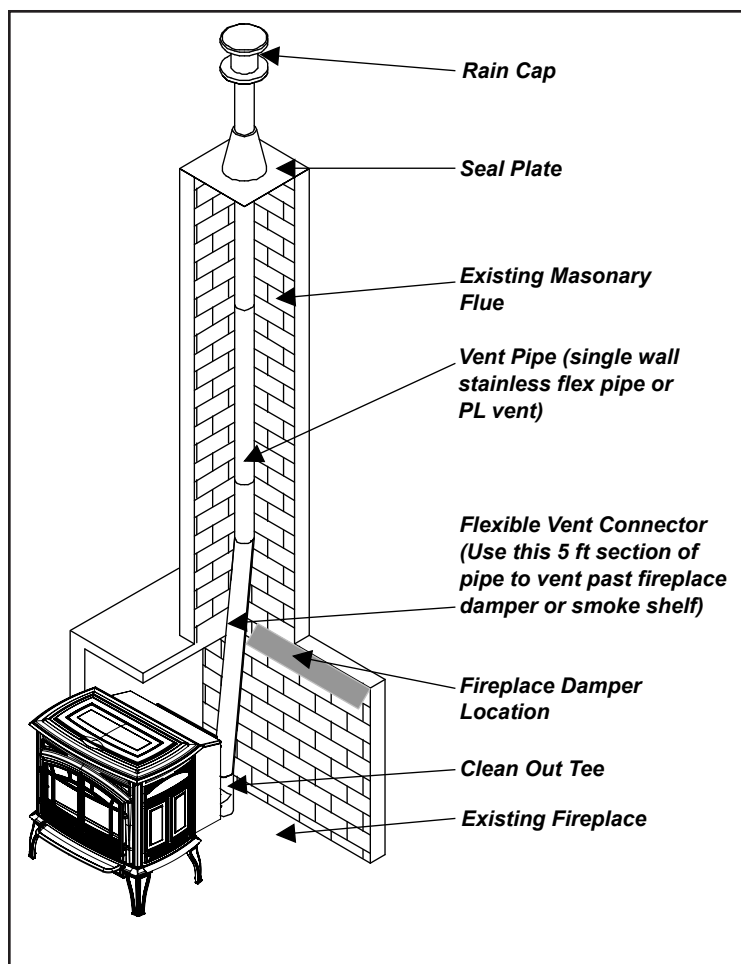


Figure 18: Hearth Mount - Over View.

# INSTALLATION

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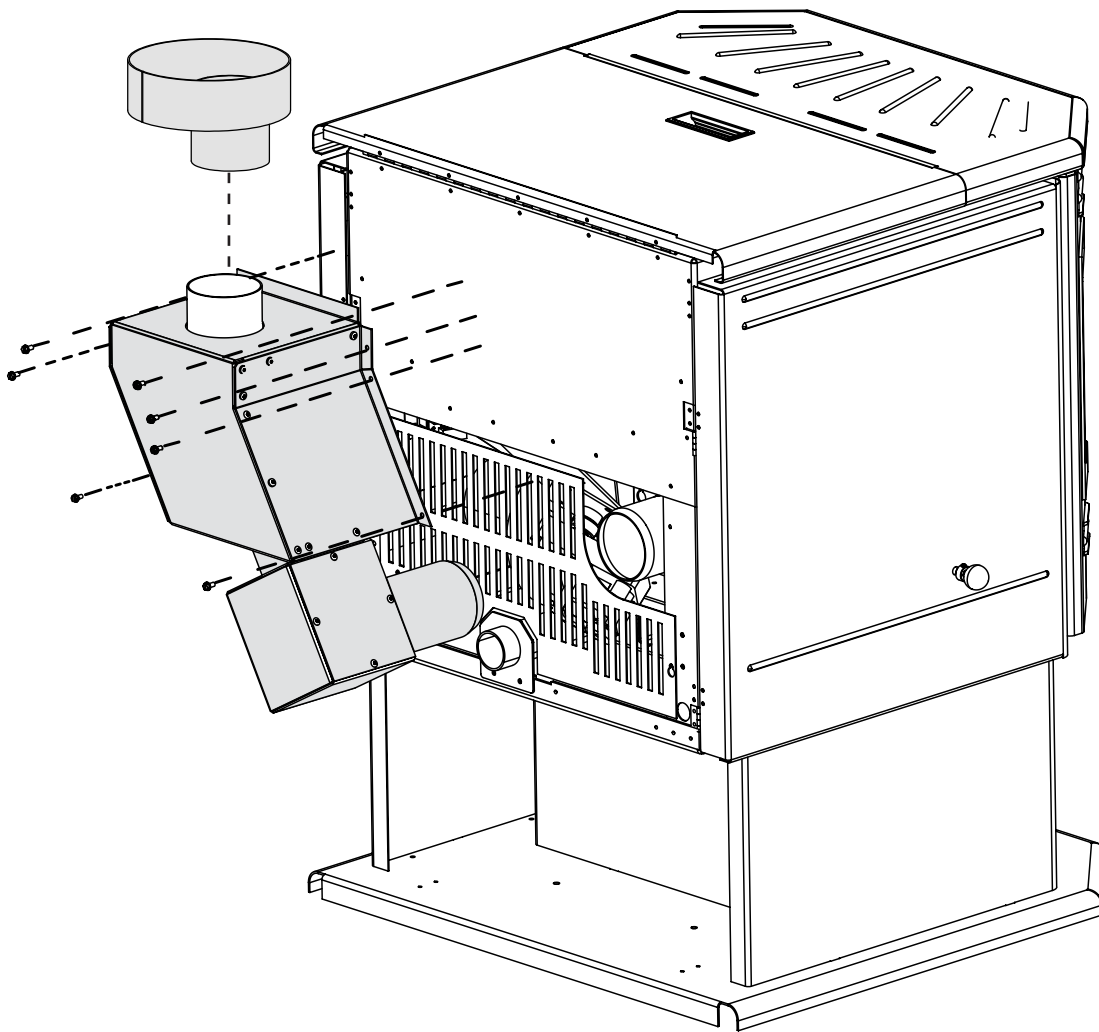
## TOP VENT ADAPTOR KIT

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\*In order to achieve the maximum rated efficiency of 78.2% HHV purchase of a top vent adapter kit is required.

Use the sheet metal screws provided to attach the kit to the rear of the unit as shown. Please see kit instruction manual for more detailed installation instructions.

The stove must also be connected to an existing 6" flue (where permitted) using the 4" to 6" Flue Adaptor supplied in the kit. The centerline of the flue adaptor is offset to allow for variable positioning of the stove with respect to the vent pipe.



# TROUBLESHOOTING

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## DO NOT:

- Service the stove with wet hands. The stove is an electrical appliance, which may pose a shock hazard if handled improperly. Only qualified technicians should deal with possible internal electrical failures.
- Do not remove from the firebox any screws without penetrating oil lubrication.

## WHAT TO DO IF:

1. The stove will not start.
2. The stove will not operate when hot.
3. The exhaust blower will not function normally.
4. Light # 3 on Heat output bar flashing.
5. Auger light flashes but auger motor does not turn at all.
6. The 200 °F (93 °C) high limit temperature sensor has tripped.
7. The convection blower will not function normally.
8. Ignitor- the Fuel will not light.
9. Control settings (Heat Level) has no effect on the fire.
10. The stove keeps going out.
- 11 The agitator does not turn.

\*NOTE: All troubleshooting procedures should be carried out by qualified technicians or installers.

### 1. The stove will not start.

- Check the line fuse to see if it has blown.
- Make sure the stove is plugged in and the wall outlet is supplying power.
- If the Control Board has been placed in the ON /OFF thermostat mode, then turn the thermostat up to call for heat.
- Ensure the burn pot liner is correctly placed in the burn pot
- Check the Heat Level Indicator. - If the # 3 light is flashing (unit may be out of fuel)
- Check the Door and Ash Pan door - THEY MUST BE CLOSED TIGHT.
- See section 8 "The Fuel will not light".
- Check the fuse on the circuit board.
- If the unit still does not start, contact your local service dealer for service.

### 2. The stove will not operate when hot.

- Check the Heat Level Indicator if a fire is not detected or if the fire has gone out the #3 light will flash because the Exhaust Temperature Sensor's contacts have opened.
- Check the hopper for fuel.
- Incorrect air damper/combustion air trim setting.  
Excessive air may consume the fire too quickly before the next drop of fuel, leaving completely unburned fuel in the burn pot liner.  
Insufficient air may cause the vacuum switch to open or will cause build up, further restricting the air flow through the Burn Pot Liner. This in turn will cause the fuel to burn cold and very slowly. Fuel may build up and smother the fire. In this case clean the burn pot.  
NOTE: The unit may require a change to the vent system or installation of fresh air to correct Air to Fuel ratio problems if unable to achieve proper damper setting.
- Combustion Blower failure. - The Combustion Blower is not turning fast enough to generate the proper vacuum in the fire box. Visual Check – is the blower motor turning. See section #3 - *The Exhaust Blower will not function normally.*
- Poor Quality Fuel – Insufficient energy in the fuel to produce enough heat to keep the stove burning

# TROUBLESHOOTING

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- Exhaust Temperature Sensor failure. Bypass sensor located on Exhaust Blower, if stove now operates properly, the unit may require cleaning or a new sensor. Contact your local dealer for service.
- Check the agitator to make sure it is turning properly

### **3. The exhaust motor will not function normally.**

- Check the line fuse to see if it has blown.
- Open the access panels; check all connections against the wiring diagram.
- Check the Exhaust Blower voltage across the blower motor wires ( $\geq 115V$  on #5 setting and  $\geq 75V$  on #1 setting). – Replace the Circuit Board if the Voltage reading is less than 75 V. with a line voltage of  $>115 V AC$ .
- Clean all exhaust passages and venting.
- Check and, if necessary, replace capacitor.

### **4. Light # 3 on Heat output bar flashing** (The Exhaust Temp. Switch contacts have opened.)

- Stove ran out of fuel - check fuel level in the hopper.
- See sections #2 - *Stove will not operate when hot*, #3 - *The Exhaust motor will not function normally*, and #5 - *Unit is on but auger does not turn at all* for more suggestions.
- Severe negative pressure in area where unit is installed - Check the operation by opening a window, does this solve the problem? If it does, install fresh air intake to unit or room. Venting system may require vertical section to move termination into a low pressure zone.
- To reset Circuit Board after a trouble code - push the ON/OFF button.

### **5. Unit is on but auger motor does not turn at all.**

- Check the line fuse to see if it has blown.
- Check the Door and Ash Pan door - THEY MUST BE CLOSED TIGHT.
- If the Auger gear box does not turn but the motor's armature does try to spin, then the auger is jammed. Try to break apart jam by poking at the jam through the drop tube. If this fails then empty the hopper and remove the Auger Cover **\*\*Remember to re-seal the cover after installation\*\***
- Auger stopped running. Pinch, break or blockage in Vacuum Hose - Check hose for pinch points or damage, replace or re-route as required. Blow out Vacuum Hose and intake pipe.
- Damage to wires between Circuit Board and Vacuum Switch and Auger Motor - Inspect wires and connectors.
- Vacuum Switch failure - Bypass the vacuum switch, if this corrects the problem check for above problems before replacing the Vacuum Switch.
- Blocked exhaust / venting system - Have stove and venting cleaned and inspected.
- Check Vacuum levels at the Vacuum Switch, with a Magnahelic Gauge (readings must be above .07" W.C. on low fire).

### **6. Light # 4 on Heat output bar flashing The 200 °F ( 93 °C) high limit temperature sensor has tripped.**

- Reset sensor and determine cause. Was it Convection Blower failure or Circuit board control problems?
- Hopper lid has been left open for longer than two minutes.

# TROUBLESHOOTING

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## **7. The convection blower will not function normally.**

- Check the line fuse to see if it has blown.
- Clean all grill openings at the back and below unit .
- Check the Voltage across the blower wires, It should adjust with the heat output settings. If not contact your local dealer for service.

## **8. Ignitor - the pellets will not light.**

- Check the line fuse to see if it has blown.

NOTE: The ignitor should be bright orange in color.

- Everything else in the stove operates but the ignitor will not light the pellets.
- Make sure the burn pot liner is up tight and square to the ignitor
- Check to see if the exhaust blower is operating. If not, contact your local dealer for service.

## **9. Control settings (Heat Level) has no effect on the fire.**

- Check position of the Thermostat slide switch on the Circuit Board.
- If there is no control of the Heat Level button, make sure the thermostat is calling for heat.
- Call your local dealer for service.

## **10. The stove keeps going out.**

If the stove goes out and leaves fresh unburned fuel in the burn pot liner, the fire is going out before the stove shuts off.

- Trim the combustion air down to decrease the magnahelic pressure.
- Turn the Heat Level up slightly (poor quality fuels will require slightly higher settings).
- Set the auger trim up one setting

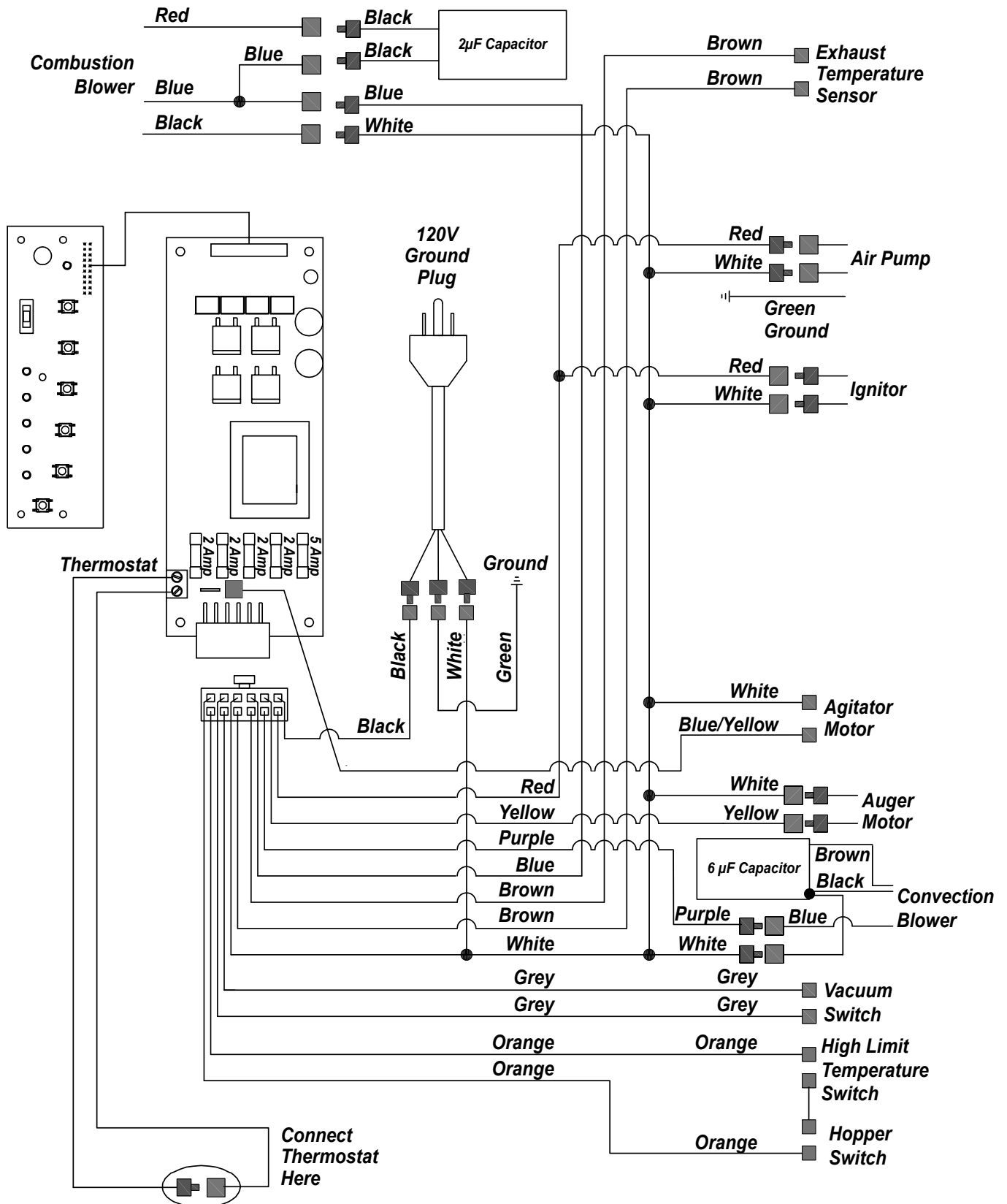
If the stove goes out and there are partially burned pellets left in the burn pot liner, the stove has shut down due to a lack of air, exhaust temperature, or power failure.

- Trim the combustion air to a higher setting to increase the magnahelic pressure inside the stove.
- Check to see if the stove needs a more complete cleaning.
- Turn the Heat Level up slightly (poor quality fuel will require slightly higher settings).
- Jump the exhaust temperature sensor, if this fixes the problem then replace the white 120 °F ( 49 °C) sensor
- Did the power go out?
- Contact your local Dealer for service.

## **11. The agitator does not turn.**

- Ensure unit has finished start-up.
- Ensure agitator is locked into the drive shaft properly and is not jammed.
- Check drive chain assembly and gear motor for damage.
- Check the agitator motor is functioning properly.

# WIRING DIAGRAM



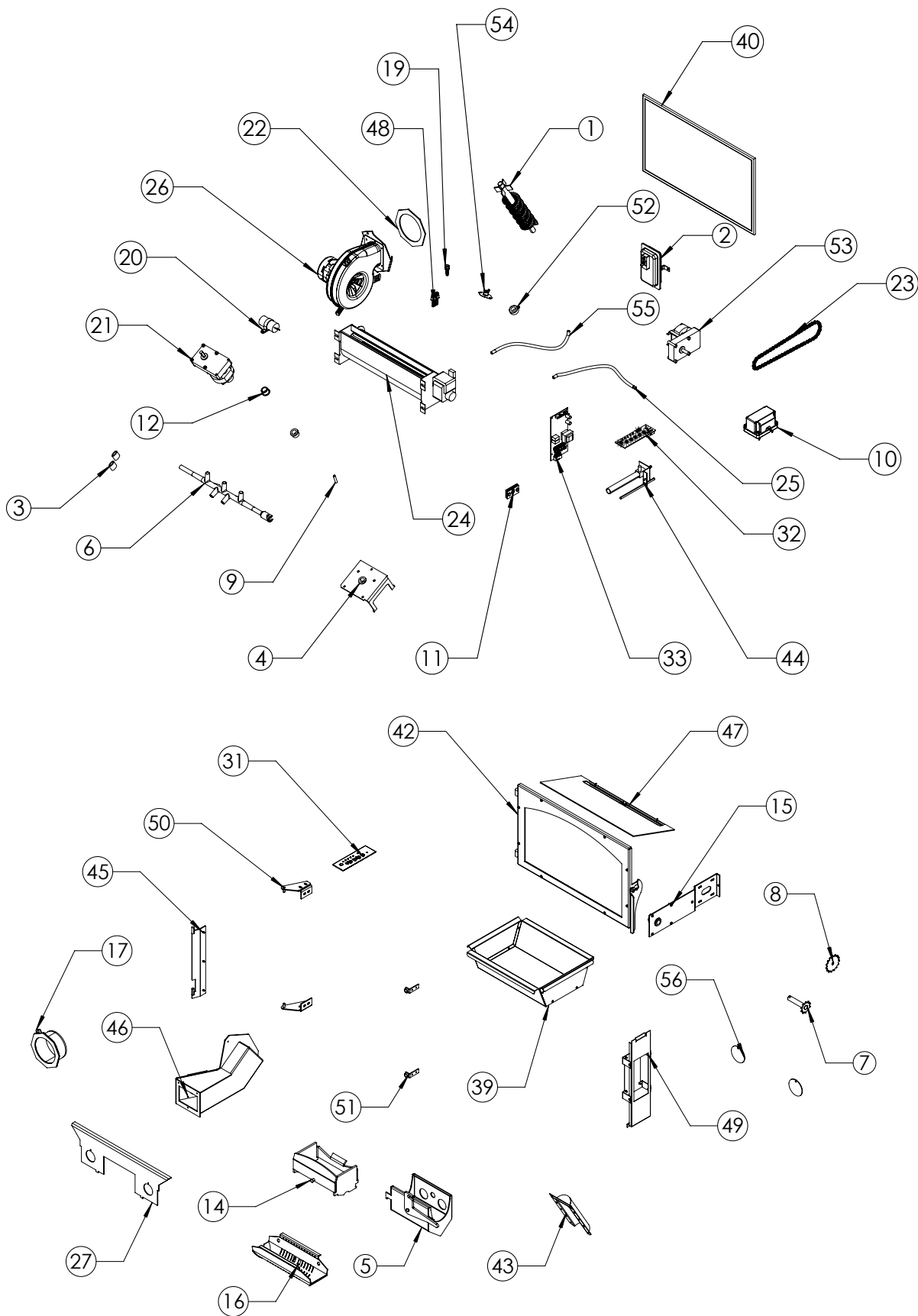
# PARTS LIST

ITEM #	DESCRIPTION	PART #
1	AUGER WITH PADDLES	50-1161
2	VACUUM SWITCH LOW PRESSURE	50-1390
3	AUGER STOPS (CLEAR RUBBER)	50-1559
4	AUGER PLATE AND BUSHING (ASSEMBLY)	50-1658
5	BURN POT	50-1692
6	STAINLESS STEEL CAST AGITATOR W COUPLER	50-1697
7	AGITATOR DRIVE SHAFT W/ SPROCKET	50-1698
8	MOTOR DRIVE SPROCKET	50-1700
9	.250 SPRING PIN	50-1701
10	AIR PUMP	50-1702
11	AGITATOR BUSHING LEFT SIDE	50-1703
12	5/8" ID AUGER BRASS BUSHINGS (SET OF 2)	50-1806
13	M55 SIDE SHELVES (SET OF 2) - BEACH	50-1989
13	M55 SIDE SHELVES (SET OF 2) CHESTNUT	50-1990
13	M55 SIDE SHELVES (SET OF 2)	50-1991
14	FIRE GRATE	50-2036
15	AGITATOR DRIVE BRACKET	50-2038
16	SS BURN POT LINER	50-2042
17	EXHAUST STARTER TUBE CW GASKET	50-2043
18	CAST FLUTED FIREBOX LINER	50-2048
19	HOPPER SWITCH	50-2052
20	EXHAUST MOTOR CAPACITOR C/W STRAP	50-2053
21	AUGER MOTOR 2 RPM	50-2054
22	EXHAUST STARTER TUBE GASKET ONLY	50-2055
23	DRIVE CHAIN	50-2059
24	CONVECTION BLOWER 80 MM	50-2064
25	SILICONE HOSE (BLACK)	50-2067
26	COMBUSTION BLOWER INCLUDING HOUSING & GASKET	50-2068
27	FIREBOX LOWER	50-2072
	M55C-FS OWNER'S MANUAL	50-2100
28	M55C-FS CAST TOP WITH HOPPER LID	50-2105
28	M55C-FS CAST TOP WITH HOPPER LID - BEACH	50-2128
28	M55C-FS CAST TOP WITH HOPPER LID - CHESTNUT	50-2136
29	M55C-FS CAST LEG	50-2106
29	M55C-FS CAST LEG - BEACH	50-2118
29	M55C-FS CAST LEG - CHESTNUT	50-2129
30	M55C-FS CAST FRONT WITH DOORS	50-2107

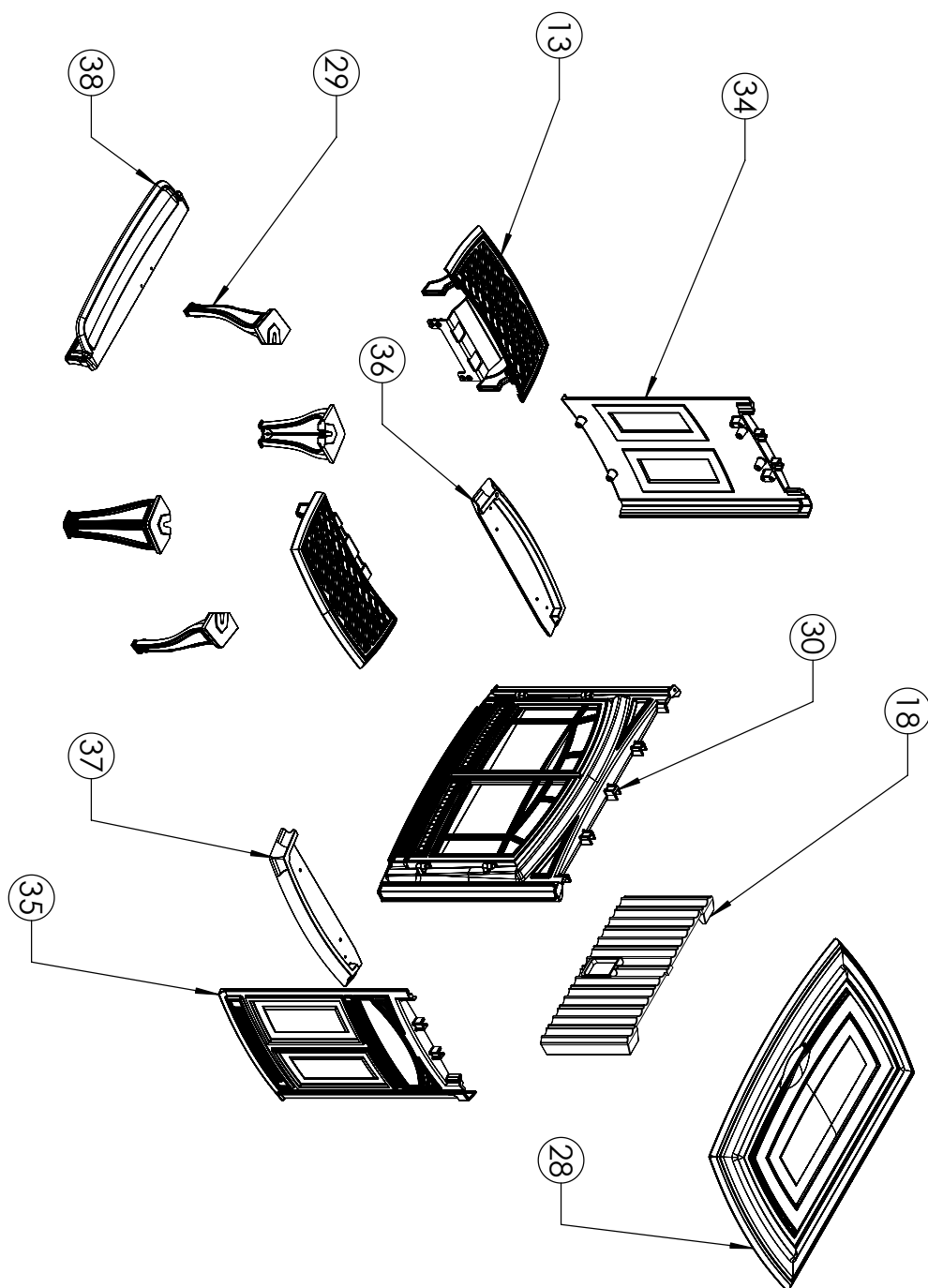
# PARTS LIST

ITEM #	DESCRIPTION	PART #
30	M55C-FS CAST FRONT WITH DOORS - BEACH	50-2120
30	M55C-FS CAST FRONT WITH DOORS - CHESTNUT	50-2130
31	CONTROL PANEL WITH DECAL	50-2108
32	M55C-FS DAUGHTER BOARD	50-2109
33	M55C-FS MOTHER BOARD	50-2110
34	M55C-FS CAST SIDE LEFT	50-2111
34	M55C-FS CAST SIDE LEFT - BEACH	50-2123
34	M55C-FS CAST SIDE LEFT - CHESTNUT	50-2131
35	M55C-FS CAST SIDE RIGHT	50-2112
35	M55C-FS CAST SIDE RIGHT - BEACH	50-2124
35	M55C-FS CAST SIDE RIGHT - CHESTNUT	50-2132
36	M55C-FS CAST LEG LIP LEFT	50-2113
36	M55C-FS CAST LEG LIP LEFT - BEACH	50-2125
36	M55C-FS CAST LEG LIP LEFT - CHESTNUT	50-2133
37	M55C-FS CAST LEG LIP RIGHT	50-2114
37	M55C-FS CAST LEG LIP RIGHT - BEACH	50-2126
37	M55C-FS CAST LEG LIP RIGHT - CHESTNUT	50-2134
40	M55C-FS CAST ASH DOOR	50-2115
38	M55C-FS CAST ASH DOOR - BEACH	50-2127
38	M55C-FS CAST ASH DOOR - CHESTNUT	50-2135
39	ASH PAN	50-2116
40	M55C-FS GLASS ONLY	50-2119
41	GLASS RETAINER	50-2122
42	DOOR COMPLETE	50-2137
43	AUGER TUBE COVER	50-2141
44	M55 IGNITOR ASSEMBLY	50-2142
45	HINGE BRACKET (INNER)	50-2144
46	M55 EXHAUST CHANNEL CW SENSOR	50-2145
47	M55C BAFFLE	50-2148
48	WIRING HARNESS	50-2149
49	M55C-FS MOTHERBOARD MOUNTING BRACKET	50-2150
50	M55C-FS CAST FRONT MOUNTING BRACKETS (SET OF 2)	50-2151
51	M55C-FS MAGNET LATCH (SET OF 2)	50-2152
52	.625 ID AUGER COLLAR WITH SCREW	50-968
53	AUGER MOTOR 1 RPM	EF-001
54	HIGH LIMIT TEMP SENSOR 200F MANUAL RESET	EF-016
55	SILICONE HOSE (RED)	EF-018
56	FIREBOX CLEANING PORT COVERS	EF-194A

# PARTS DIAGRAM - COMPONENTS



## PARTS DIAGRAM - CAST



## NOTES

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# Warranty for Enviro Pellet Products

Sherwood Industries Ltd. ("Sherwood") hereby warrants, subject to the terms and conditions herein set forth, this product against defects in material and workmanship during the specified warranty period starting from the date of original purchase at retail. In the event of a defect of material or workmanship during the specified warranty period, Sherwood reserves the right to make repairs or to assess the replacement of a defective product at Sherwood's factory. The shipping costs are to be paid by the consumer. All warranties by Sherwood are set forth herein and no claim shall be made against Sherwood on any oral warranty or representation.

## Conditions

- A completed warranty registration must be submitted to Sherwood within 90 days of original purchase via the online warranty registration page or via the mail-in warranty registration card provided. Have the installer fill in the installation data sheet in the back of the manual for warranty and future reference.
- This warranty applies only to the original owner in the original location from date of install.
- The unit must have been properly installed by a qualified technician or installer, and must meet all local and national building code requirements.
- The warranty does not cover removal and re-installation costs.
- Sherwood Industries Ltd. reserves the right to make changes without notice.
- Sherwood Industries Ltd. and its employees or representatives will not assume any damages, either directly or indirectly caused by improper usage, operation, installation, servicing or maintenance of this appliance.
- A proof of original purchase must be provided by you or the dealer including serial number.
- This warranty is void if the unit is used to burn materials for which the unit is not certified by the EPA and void if not operated according to the Owner's Manual.

## Exclusions

An expanded list of exclusions is available at [www.enviro.com/help/warranty.html](http://www.enviro.com/help/warranty.html)

This warranty does not cover:

- Damage as a result of improper usage or abuse.
- Damage caused from over-firing due to incorrect setup or tampering.
- Damage caused by incorrect installation.

## To the Dealer

- Provide name, address and telephone number of purchaser and date of purchase.
- Provide date of purchase. Name of installer and dealer. Serial number of the appliance. Nature of complaint, defects or malfunction, description and part # of any parts replaced.
- Pictures or return of damaged or defective product may be required.

## To the Distributor

- Sign and verify that work and information are correct.

## Sherwood Industries Ltd.

6782 Oldfield Road, Victoria, BC . Canada V8M 2A3  
Online warranty registration: [www.enviro.com/warranty/](http://www.enviro.com/warranty/)

Category	One Year	Two Year	Limited Lifetime (7yr)
Parts <sup>1</sup> (unit serial number required)		✓	
Firebox Brick Panels (Cast)		✓	
Firebox			✓
Heat Exchanger			✓
Burn Pot			✓
Burn Pot Liner		✓	
Firebox Liner Panels w/Insulation			✓
Ceramic Glass <sup>2</sup>	✓		
Pedestal / Legs (excluding finish)			✓
Surround Panels (excluding finish)			✓
Exterior Panels (excluding finish)			Up to 5 years
Electrical Components		✓	
Steel Brick Liner (Metal)	✓		
Exterior Surface Finishing <sup>3</sup>	✓		
Labour	✓		

<sup>1</sup> Whereas warranty has expired, replacement parts will be warrantied for 90 days from part purchase date. Labour not included. Unit serial number required.

<sup>2</sup> Glass is covered for thermal breakage. Photos of box, inside of door, and unit serial # must be supplied for breakage due to shipping.

<sup>3</sup> Exterior Surface finishing covers Plating, Enamel or Paint and excludes colour changes, chipping, and fingerprints.

Gaskets not covered by Warranty.

Travel costs not included.

Cast Agitator: 1 year for pellet. Not covered when burning alternative fuels. (Cast agitators are a consumable item)

# INSTALLATION DATA SHEET

The following information must be recorded by the installer for warranty purposes and future reference.

NAME OF OWNER:

\_\_\_\_\_

ADDRESS:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

PHONE: \_\_\_\_\_

NAME OF DEALER:

\_\_\_\_\_

ADDRESS:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

PHONE: \_\_\_\_\_

MODEL: \_\_\_\_\_

SERIAL NUMBER: \_\_\_\_\_

DATE OF PURCHASE: \_\_\_\_\_ (dd/mm/yyyy)

DATE OF INSTALLATION: \_\_\_\_\_ (dd/mm/yyyy)

MAGNEHELIC AT INSTALL: \_\_\_\_\_

INSTALLER'S SIGNATURE:

\_\_\_\_\_

NAME OF INSTALLER:

\_\_\_\_\_

ADDRESS:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

PHONE: \_\_\_\_\_

MANUFACTURED BY:  
SHERWOOD INDUSTRIES LTD.  
6782 OLDFIELD RD. SAANICHTON, BC, CANADA V8M 2A3  
[www.enviro.com](http://www.enviro.com)  
Summer 2021  
C-16305

# Certificate of Calibration

Certificate Number: **743897**



**JJ Calibrations, Inc.**

7724 SE Aspen Summit Drive  
Portland, OR 97266-9217  
Phone 503.786.3005  
FAX 503.786.2994

## PFS TECO

11785 SE Hwy 212

Suite 305

Clackamas, OR 97015

PO: **1033**

Order Date: **03/08/2021**

Authorized By: **N/A**

Calibrated on: **03/18/2021**

\*Recommended Due: **03/18/2022**

Environment: **22 °C 37 % RH**

\* As Received: **Within Tolerance**

\* As Returned: **Within Tolerance**

Action Taken: **Calibrated w/Parts**

Technician: **146**



0723.01

Calibration

Property #: **064**

User: **N/A**

Department: **N/A**

Make: **Control Company**

Model: **4198**

Serial #: **80531676**

Description: **Digital Temp. / Barometer**

Procedure: **404323**

Accuracy:  **$\pm 1^{\circ}\text{C} \pm 0.2362\text{Hg}(\pm 8\text{mb})$**

Remarks: \* Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit.  
Uncertainties include the effects of the unit.

**Replaced batteries.**

## Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
644A	Thunder Scientific	1200	Two Pressure Humidity Generator	11/17/2021	734190
847A	Fluke	RPM4	Reference Pressure Monitor	12/30/2021	738139

## Parameter

## Measurement Data

Measurement Description	Range Unit	Reference	Min	Max	*Error	UUT	Uncertainty
<b>Before/After Temperature</b>							Accredited = <b>U</b>
	°C	20.00	19.0	21.0	0.1	20.1 °C	8.1E-02 <b>U</b>
	°C	30.00	29.0	31.0	0.2	30.2 °C	8.1E-02 <b>U</b>
	°C	40.00	39.0	41.0	0.7	39.3 °C	8.1E-02 <b>U</b>
<b>Barometer</b>							
	mbar	1013.0	1005	1021	8	1005 mbar	6.2E-01 <b>U</b>

This instrument has been calibrated in accordance with the JJ Calibrations Quality Assurance Manual and is traceable to either the SI or to National Institute of Standards and Technology (NIST). The quality system and this certificate are in compliance with ANSI/NCSL Z540-1-1994, ISO/IEC 17025-2017, ISO 10012-1, the ISO 9000 family and QS 9000. The expanded uncertainties of measurements for this calibration are based upon 95% (2 sigma) confidence limits. Unless stated in the comments, certificates reflect the "Simple Acceptance Rule" as specified by JCGM 106:2012. Unless otherwise stated, a test accuracy ratio (TAR) of 4:1, if achievable, is maintained. The results reported herein apply only to the calibration of the item described above. This report may not be reproduced, except in full, without written approval of JJ Calibrations.

Reviewer

3 Issued 03/25/2021

Rev # 15

Inspector

# Certificate of Calibration

Certificate Number: 743892



**JJ Calibrations, Inc.**

7724 SE Aspen Summit Drive  
Portland, OR 97266-9217  
Phone 503.786.3005  
FAX 503.786.2994

## PFS TECO

11785 SE Hwy 212

Suite 305

Clackamas, OR 97015

PO: 1033

Order Date: 03/08/2021

Authorized By: N/A

Calibrated on: 03/18/2021

\*Recommended Due: 03/18/2026

Environment: 19 °C 41 % RH

\* As Received: Other - See Remarks

\* As Returned: Other - See Remarks

Action Taken: Calibrated

Technician: 126



0723.01

Calibration

Property #: 097

User: N/A

Department: N/A

Make: Unknown

Model: 10 Lbs.

Serial #: 097

Description: Mass

Procedure: DCN 500901

Accuracy: Raw Data

Remarks: \* Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit. Uncertainties include the effects of the unit.

Data is provided for your determination of acceptability. Received/returned without accessories.

## Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
484A	Rice Lake	1kg- 10kg (Class ASTM 1)	Mass Set,	05/28/2021	699197
503A	Rice Lake	1mg- 200g (Class 0)	Mass Set,	09/11/2021	729241
550A	And (A&D) Co.	HP- 30K	Balance 30 Kg	12/31/2021	739307
723A	Rice Lake	1mg- 200g (Class 0)	Mass Set,	06/09/2021	723431

## Parameter

## Measurement Data

Measurement Description	Range	Unit	Reference	Min	Max	*Error	UUT	Uncertainty
Before/After								Accredited = $\bar{U}$
Mass								
Raw Data		g	4535.92370000	0.0000000	0.0000000	0.1785299	4536.1022299 g	3.5E-01 $\bar{U}$

This instrument has been calibrated in accordance with the JJ Calibrations Quality Assurance Manual and is traceable to either the SI or to National Institute of Standards and Technology (NIST). The quality system and this certificate are in compliance with ANSI/NCSL Z540-1-1994, ISO/IEC 17025-2017, ISO 10012-1, the ISO 9000 family and QS 9000. The expanded uncertainties of measurements for this calibration are based upon 95% (2 sigma) confidence limits. Unless stated in the comments, certificates reflect the "Simple Acceptance Rule" as specified by JCGM 106:2012. Unless otherwise stated, a test accuracy ratio (TAR) of 4:1, if achievable, is maintained. The results reported herein apply only to the calibration of the item described above. This report may not be reproduced, except in full, without written approval of JJ Calibrations.

Reviewer

3 Issued 03/25/2021

Rev # 15

Inspector



## CERTIFICATE OF CALIBRATION

<b>CUSTOMER:</b>	<b>PFS-TECO : CLACKAMAS, OR</b>	<b>CALIBRATION DATE:</b>	05/25/2021
<b>PO NUMBER:</b>	1047	<b>CALIBRATION DUE:</b>	05/25/2022
<b>INST. MANUFACTURER:</b>	DWYER	<b>PROCEDURE:</b>	T.O.33K6-4-1769-1
<b>INST. DESCRIPTION:</b>	VELOMETER	<b>CALIBRATION FLUID:</b>	AIR @ 14.7 PSIA 70°F
<b>MODEL NUMBER:</b>	471	<b>RECEIVED CONDITION:</b>	WITHIN MFG. SPECS.
<b>SERIAL NUMBER:</b>	CP288559 (ID# 095)	<b>LEFT CONDITION:</b>	WITHIN MFG. SPECS.
<b>RATED ACCURACY:</b>	SEE NOTES BELOW.	<b>AMBIENT CONDITIONS:</b>	763mm HGA 49% RH 72°F
<b>UNCERTAINTY GIVEN:</b>	± 0.43% RD ; k=2	<b>CERTIFICATE FILE #:</b>	490265.2021
<b>NOTES:</b>	± 3% FS (0-500 / 0-1500) *** ± 4% F.S. (0-5000) *** ± 5% F.S. (0-15000) *** ± 2 °F		

**Q.MANUAL IM 1.5 REV 2017.1 DATED 7-18-2017 \*\*\*\* DECISION RULE : NO PFA%**

UUT INDICATED FT/MIN	DM.STD. ACTUAL FT/MIN	UUT INDICATED DEG. F	DM STD. ACTUAL DEG. F
53	55	0 TO 200°F	0 TO 200°F
118	120	45.1	44.3
244	249	70.6	69.9
493	503	100.3	99.8
517	522		
1062	1076		
1494	1517		
560	565		
3129	3164		
4996	5082		
6251	6374		
14829	15148		

**STANDARDS USED:**

A220: 12" WIND TUNNEL 0 - 8000 FPM   CMC ± 0.203% RD   TRACE# 1329407628	DUE	02/18/2022
A800: FLOW-DYNE SONIC NOZZLE SYSTEM   0 - 1086 CFM ± 0.46% RD.   TRACE# 1329407628, 89576, 152043238	DUE	01/26/2022

All instruments used in the performance of the shown calibration have traceability to the National Institute of Standards and Technology (NIST). The uncertainty ratio between the calibration standards (DM.STD.) and the Unit Under Test (UUT) is a minimum of 4:1, unless otherwise noted. Calibration has been performed according to the shown procedure. The use of IAS/ILAC logo indicates calibrations are in accordance to ISO/IEC 17025:2017.

**Dick Munns Company - 11133 Winners Circle, Los Alamitos, CA 90720**  
**Phone: 714-827-1215 - www.dickmunns.com**

This Calibration Certificate shall not be reproduced except, in full, without approval by Dick Munns Company. The data shown applies only to the instrument being calibrated and under the stated conditions of calibration.

Issuing Date:

Approved By:

Cal. Technician:

Calibrated at: ☒ Lab

☐ On-Site (Customer's)

05/25/2021

*Charles Lane*

*D.C.*

Page 1 of 1



# QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS  
2340 SE 11<sup>TH</sup> Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293  
(503) 236-2712 • FAX (503) 235-2535 • [www.qc-services.com](http://www.qc-services.com)



## Report of Calibration

Firm: Dirigo Laboratories  
Address: 11785 SE Hwy 212, Ste 305  
City/State/Zip: Clackamas, OR 97015

Test Completed: 03/21/17  
Submitted By: John Steiner  
Traceable Number: 20170468

Test Item: 200mg and 100mg Individual Weights  
Serial No.: Listed in Table

Manufacturer: Troemner

<u>Material</u>	<u>Assumed Density</u>	<u>Range</u>	<u>Tolerance Class</u>
Stainless Steel	7.95 g/cm <sup>3</sup>	200mg & 100mg	ASTM Class 1

### Method and Traceability

The procedure used for this calibration is NIST IR 6969 SOP 4 Double Substitution Weighing Design. Standards used for comparison are traceable to the National Institute of Standards and Technology (reports on file) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and traceability within the level of uncertainty reported. The Traceable Number listed above is Traceable to National Standards through an unbroken chain of comparison each having stated uncertainties.

### Standards Used:

100g to 1mg Working Standards Were Calibrated: 03/03/17 Due: 03/31/18 Standards ID: 723318

Mass Comparators Used: MET-05

Tested by: D. Thompson

**Conventional Mass:** “The conventional value of the result of weighing a body in air is equal to the mass of a standard, of conventionally chosen density, at a conventionally chosen temperature, which balances this body at this reference temperature in air of conventionally chosen density. International Recommendation 33 (OIML IR 33 1973, 1979). “Conventional Value of the Result of Weighing in Air” (Previously known as “Apparent Mass vs. 8.0g/cm<sup>3</sup>).

**Uncertainty Statement:** The uncertainty conforms to the ISO Guide to the Expressions of Uncertainty in Measurement. Uncertainty as reported is based on a coverage factor k=2 for an approximate 95 percent level of uncertainty. Uncertainty components include the standard deviation of the process, the uncertainty of the standard used, an uncertainty component associated with the potential drift of the standard used, and the estimated uncertainty related to measuring and determining the air buoyancy effect.

Conventional Mass Values are listed on page 2 of this report.

page 1 of 2

Quality Control Services, Inc.  
Metrology Laboratory Manager  
E-mail [dthompson@qc-services.com](mailto:dthompson@qc-services.com)

Date: 03/21/17

Signature David S. Thompson

This document shall not be reproduced, except in full, without the written approval of Quality Control Services Mass Laboratory.

Member: National Conference of Standards Laboratories and Weights & Measures



# QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS  
2340 SE 11<sup>TH</sup> Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293  
(503) 236-2712 • FAX (503) 235-2535 • [www.qc-services.com](http://www.qc-services.com)



## Report of Calibration

Firm: Dirigo Laboratories  
Address: 11785 SE Hwy 212, Ste 305  
City/State/Zip: Clackamas, OR 97015

Test Completed: 03/21/17  
Submitted By: John Steiner  
Traceable Number: 20170468

Test Item: 200mg and 100mg Individual Weights  
Serial No.: Listed in Table

Manufacturer: Troemner

### Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.967	753.44	49.44

### Conventional Mass Value

Nominal Value	As Found grams	As Found Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
200mg SN 1000101395	0.2000061	0.0061	0.0026	0.01
100mg SN 1000126267	0.1000046	0.0046	0.0028	0.01

\*Correction is the difference between the conventional mass value of a weight and its nominal value.

**Comments:** These weights were new from the manufacturer and were within ASTM Class 1 tolerances As Found. No adjustments or changes were made so As Found values should be considered to be As Left values.

Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

page 2 of 2

Quality Control Services, Inc.  
Metrology Laboratory Manager  
E-mail [dthompson@qc-services.com](mailto:dthompson@qc-services.com)

Date: 03/21/17

Signature David S. Thompson



# QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS  
2340 SE 11<sup>TH</sup> Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293  
(503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com



PFS Teco  
11785 SE Hwy 212 STE#305  
Clackamas, OR 97015

Report Number: DIRI0134307497210625

## **A2LA ACCREDITED** **CERTIFICATE OF CALIBRATION WITH DATA**

### INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Balance	Sartorius	ENTRIS224-1S	34307497	#107	Lab
Units	Readability	SOP	Cal Date	Last Cal Date	Cal Due Date
g	0.0001	QC012	6/25/21	12/8/20	6/2022

### FUNCTIONAL CHECKS

ECCENTRICITY		LINEARITY		STANDARD DEVIATION			ENVIRONMENTAL CONDITIONS		
Test Wt:	Tol:	Test Wt:	Tol:	Test Wt:	Tol:		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
100	0.0003	50 x 4	0.0002	100	0.0001		Good	Fair	Poor
As-Found:		As-Found:		1. 99.9999	5. 99.9999	9. 99.9999	Temperature: 22.1°C		
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	2. 99.9999	6. 99.9999	10. 100.0000			
As-Left:		As-Left:		3. 99.9999	7. 100.0000	<b>Result</b>			
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	4. 99.9999	8. 100.0000	0.00004			

### A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
200	199.9995	200.0000	0.00016
100	99.9999	100.0000	0.00016
50	50.0002	50.0000	0.00015
20	20.0000	20.0000	0.00015
1	.9999	.9999	0.00015
0.1	.0999	.0999	0.00015

### CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	R.L./Troemner	10kg to 1mg	G782	4/30/21	4/2022	20210012

#### Permanent Information Concerning this Equipment:

6 month calibration cycle  
12/20 Extra checkpoint to encapsulate user range 0.05g.  
AF= 0.0499g A/L= 0.0500

#### Comments/Info Concerning this Calibration:

6/21: RH 44.7%

Report prepared/reviewed by: R.B. Date: 6-25-21

Technician: K. Dexter

Signature: Kyle Dexter

THIS CERTIFICATE SHALL NOT BE REPRODUCED WITHOUT THE APPROVAL OF QUALITY CONTROL SERVICES, INC.

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation and readability of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy. Calibrations comply with ISO/IEC 17025 and ANSI/Z540-1-1994 quality standards.

# Dry Gas Meter Calibration

Meter Manufacturer: Apex  
 Model: XC-60  
 Lab ID #: 53  
 Serial #: 1902130  
 Calibration Date: 3/10/2021  
 Calibration Expiration: 9/10/2021  
 Barometric Pressure: 30.10 in. Hg



Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/24/2021
Calibration $\gamma$ Factor:	0.998

Unit Under Test Previous Calibration	
Date	9/22/2020
$\gamma$ Factor:	1.014
Allowable Deviation ( $\pm 5\%$ ):	0.0507
Actual Deviation:	0.02
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	206.530	153.421	370.875
Standard DGM Temperature ( $^{\circ}\text{F}$ )	61.0	61.0	62.0
Standard DGM Pressure (in $\text{H}_2\text{O}$ )	0.00	0.00	0.0
DGM Initial Volume ( $\text{ft}^3$ )	0.000	0.000	0.000
DGM Final Volume ( $\text{ft}^3$ )	7.447	5.615	13.804
DGM Temperature ( $^{\circ}\text{F}$ )	78.0	83.0	87.0
DGM Pressure (in $\text{H}_2\text{O}$ )	2.28	3.56	1.1
Time (min)			
Net Volume for Standard DGM ( $\text{ft}^3$ )	7.294	5.418	13.097
Net Volume for DGM ( $\text{ft}^3$ )	7.447	5.615	13.804

Dry Gas Meter $\gamma$ Factor	1.004	0.995	0.990
$\gamma$ Factor Deviation From Average	1.004	0.995	0.990

Average Gas Meter  $\gamma$  Factor

0.996

Calculations:

- Deviation = |Average value for all runs - current run value|
- $\gamma = [V_{\text{std}} \times (\gamma_{\text{std}}) \times (P_{\text{bar}} + P_{\text{std}}/13.6) \times (T_{\text{DGM}} + 460)] / [V_{\text{DGM}} \times (T_{\text{std}} + 460) \times (P_{\text{bar}} + P_{\text{DGM}}/13.6)]$

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is  $\pm 0.5\%$ .

# Dry Gas Meter Calibration

Meter Manufacturer: Apex  
 Model: XC-60  
 Lab ID #: 54  
 Serial #: 1902133  
 Calibration Date: 3/10/2021  
 Calibration Expiration: 9/10/2021  
 Barometric Pressure: 30.10 in. Hg



Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/24/2021
Calibration $\gamma$ Factor:	0.998

Unit Under Test Previous Calibration	
Date	9/22/2020
$\gamma$ Factor:	1.002
Allowable Deviation ( $\pm 5\%$ ):	0.0501
Actual Deviation:	0.02
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	140.142	250.780	502.892
Standard DGM Temperature ( $^{\circ}\text{F}$ )	61.0	61.0	60.0
Standard DGM Pressure (in $\text{H}_2\text{O}$ )	0.00	0.00	0.0
DGM Initial Volume ( $\text{ft}^3$ )	0.000	0.000	0.000
DGM Final Volume ( $\text{ft}^3$ )	5.009	9.013	18.359
DGM Temperature ( $^{\circ}\text{F}$ )	80.0	86.0	89.0
DGM Pressure (in $\text{H}_2\text{O}$ )	2.64	3.47	1.1
Time (min)			
Net Volume for Standard DGM ( $\text{ft}^3$ )	4.949	8.856	17.759
Net Volume for DGM ( $\text{ft}^3$ )	5.009	9.013	18.359
Dry Gas Meter $\gamma$ Factor	1.015	1.019	1.017
$\gamma$ Factor Deviation From Average	1.015	1.019	1.017

Average Gas Meter  $\gamma$  Factor

1.017

Calculations:

- Deviation = |Average value for all runs - current run value|
- $\gamma = [V_{\text{std}} \times (\gamma_{\text{std}}) \times (P_{\text{bar}} + P_{\text{std}}/13.6) \times (T_{\text{DGM}} + 460)] / [V_{\text{DGM}} \times (T_{\text{std}} + 460) \times (P_{\text{bar}} + P_{\text{DGM}}/13.6)]$

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is  $\pm 0.5\%$ .

# Dry Gas Meter Calibration

Meter Manufacturer: Apex  
 Model: Apex-AK-600  
 Lab ID #: 55  
 Serial #: 810016  
 Calibration Date: 3/31/2021  
 Calibration Expiration: 9/30/2021  
 Barometric Pressure: 30.31 in. Hg



Reference Standard DGM	
Manufacturer:	apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	
Calibration $\gamma$ Factor:	0.998

Unit Under Test Previous Calibration	
Date	6/14/2019
$\gamma$ Factor:	0.992
Allowable Deviation ( $\pm 5\%$ ):	0.0496
Actual Deviation:	0.02
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	151.130	140.010	142.787
Standard DGM Temperature ( $^{\circ}\text{F}$ )	64.7	64.7	65.4
Standard DGM Pressure (in $\text{H}_2\text{O}$ )	0.00	0.00	0.0
DGM Initial Volume ( $\text{ft}^3$ )	0.000	0.000	0.000
DGM Final Volume ( $\text{ft}^3$ )	5.162	4.905	5.019
DGM Temperature ( $^{\circ}\text{F}$ )	63.0	67.0	68.0
DGM Pressure (in $\text{H}_2\text{O}$ )	2.20	2.20	2.2
Time (min)	27.0	25.0	25.0
Net Volume for Standard DGM ( $\text{ft}^3$ )	5.337	4.944	5.042
Net Volume for DGM ( $\text{ft}^3$ )	5.162	4.905	5.019
Dry Gas Meter $\gamma$ Factor	1.023	1.005	1.002
$\gamma$ Factor Deviation From Average	1.023	1.005	1.002

Average Gas Meter  $\gamma$  Factor

1.010

Calculations:

- Deviation = |Average value for all runs - current run value|
- $\gamma = [V_{\text{std}} \times (\gamma_{\text{std}}) \times (P_{\text{bar}} + P_{\text{std}}/13.6) \times (T_{\text{DGM}} + 460)] / [V_{\text{DGM}} \times (T_{\text{std}} + 460) \times (P_{\text{bar}} + P_{\text{DGM}}/13.6)]$

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is  $\pm 0.5\%$ .

# Pressure Gauge Calibration Work Sheet

Gauge Manufacturer: Apex  
 Maximum Range (inH<sub>2</sub>O): 1  
 Instrument ID #: 053 (dP)  
 Calibration Date: 3/10/2021  
 Calibration Expiration: 3/10/2022  
 Barometric Pressure: 30.10 in. Hg



Reference Standard Gauge	
Manufacturer:	Dwyer
Model:	475-000
Instrument ID#:	76
Calibration Expiration Date:	7/27/2021

Calibration Point (inH <sub>2</sub> O)	Reference Gauge Reading (inH <sub>2</sub> O)	Pressure Gauge Reading (inH <sub>2</sub> O)	Difference (Reference - UUT)	% Error of Full Range
0.0 - 0.2	0.19	0.21	0.02	2.0%
0.2 - 0.4	0.26	0.24	0.02	2.0%
0.4 - 0.6	0.58	0.56	0.02	2.0%
0.6 - 0.8	0.79	0.77	0.02	2.0%
0.8 - 1.0	0.90	0.89	0.01	1.0%

Acceptable tolerance is 4%

Technican Signature: \_\_\_\_\_

Date: 3/12/2021

Uncertainty is 0.4 inH<sub>2</sub>O, based on minumum uncertainty ration of 4:1 between standard reference meter and unit under test.

# Pressure Gauge Calibration Work Sheet

Gauge Manufacturer: Apex  
Maximum Range (inH<sub>2</sub>O): 1  
Instrument ID #: 054 (dP)  
Calibration Date: 3/10/2021  
Calibration Expiration: 3/10/2022  
Barometric Pressure: 30.00 in. Hg



## Reference Standard Gauge

Manufacturer:	Dwyer
Model:	475-000
Instrument ID#:	76
Calibration Expiration Date:	7/27/2021

Calibration Point (inH <sub>2</sub> O)	Reference Gauge Reading (inH <sub>2</sub> O)	Pressure Gauge Reading (inH <sub>2</sub> O)	Difference (Reference - UUT)	% Error of Full Range
0.0 - 0.2	0.14	0.13	0.01	1.0%
0.2 - 0.4	0.25	0.23	0.02	2.0%
0.4 - 0.6	0.59	0.58	0.01	1.0%
0.6 - 0.8	0.71	0.70	0.01	1.0%
0.8 - 1.0	0.90	0.89	0.01	1.0%

Acceptable tolerance is 4%

Technican Signature: \_\_\_\_\_

Date: 3/12/2021

Uncertainty is 0.4 inH<sub>2</sub>O, based on minumum uncertainty ration of 4:1 between standard reference meter and unit under test.

# Emissions Sampling System Thermocouple Calibration Check

Calibration based on NIST Monograph 175 per ASTM E2515-11

All thermocouples are type "K"

Date: 3/10/2021

Sampling System ID Numbers: 053/054

Performed By: A. Kravitz

Calibration Instrument ID Number: 165

Reference Temperature (F)	Acceptable Error (F)	Thermocouple Location						
		FB Left	FB Right	FB Back	FB Top	FB Bottom	Catalyst Exit	Flue
0	± 4.0	0	0	0	0	0	0	0
200	± 4.0	200	200	200	200	200	200	200
400	± 4.0	400	400	400	400	400	400	400
600	± 4.5	600	600	600	600	600	600	600
800	± 6.0	800	800	800	800	800	800	800

Reference Temperature (F)	Acceptable Error (F)	Thermocouple Location					
		Ambient	Filter A	Filter B	Meter A	Meter B	Dilution Tunnel
0	± 4.0	0	0	0	0	0	1
200	± 4.0	200	200	201	200	200	200
400	± 4.0	400	400	401	400	400	400
600	± 4.5	600	600	601	600	600	600
800	± 6.0	800	800	801	800	800	800

Technician Signature: 

Date: 3/10/2021



ISO 17025  
ACCREDITED LABORATORY

55 N. 4th Street  
Beaumont, TX 77701

## Certificate of Analysis – EPA Protocol Gas

**Customer:**  
Inter-Mountain Labs  
555 Absaraka St.  
Sheridan, WY 82801

**PO Number:** 196148  
**Reference#:** CGS-10-20029 (2 of 2)  
**Date Filled:**  
**Customer Part #:**

<b>Cylinder Number</b>	<b>Size</b>	<b>Concentration Basis</b>	<b>Standard type</b>	<b>Certificate ID</b>
91005049	ALS	Mole	EPA Protocol	02-03112002

### Certified Concentration

Carbon Monoxide=	2.47%	+/- 0.018%
Carbon Dioxide=	9.9%	+/- 0.1%
Oxygen=	10.37%	+/- 0.06%
Nitrogen =	Balance Gas	

### Analytical Information

Component	Analyzer Make/Model/SN	Analytical Principle	Last Calibration Date
Carbon Monoxide	MKS/2031DJG2EKVS13T/017146467	FT-IR	3/13/2020
Carbon Dioxide	Thermo 410I/1162980025	NDIR	3/4/2020
Oxygen	Thermo 410I/1162980025	MPA	2/11/2020

**First Assay Date** 3/13/2020

### Reference Standard(s)

Component	GMS #	Cylinder #	NIST Reference	Concentration	Uncertainty	Exp Date
Carbon Monoxide	CC219495.20151013g	CC219495	2642a	2.488%	+/- 0.015%	1/11/2024
Carbon Dioxide	EB007908.20190327	EB007908	C1579010.02	9.5%	+/- 0.02%	6/18/2027
Oxygen	EB0080793.20180118	EB0080793	071001	11.97%	+/- 0.06%	7/21/2026
Oxygen	EB0087693.20180504	EB0087693	071001	12%	+/- 0.12%	7/21/2026
Carbon Dioxide	EB0097897.20171018	EB0097897	C1309410.01	24.9%	+/- 0.10%	2/6/2026
Nitrogen				Balance Gas		

This calibration standard has been certified per the 2012 EPA Traceability Protocol, Document EPA 600/R-12/531, using the procedure G1.

Do Not Use This Standard Below 100 psig (0.7 Megapascals).

Valve Outlet Connection CGA: 660  
Mix Pressure (psig) @ 70F: 2000  
Certification Date: 3/13/2020  
Shelf Life: 8 years  
Expiration Date: 3/11/2028

Certified By:

*Jennifer Healy*

Reviewed By:

*Kelly Ray*

**Produced By:**  
Red Ball Technical Gas Service Phone 800-551-8150  
555 Craig Kennedy Way Shreveport, LA 71107  
Red Ball Technical Gas Service PGVP Vendor ID: G12020



# Model 1430 Microtector® Electronic Point Gage

## Installation and Operating Instructions



**Model 1430 Microtector® Portable Electronic Point Gage** combines modern, solid-state integrated circuit electronics with a time-proven point gage manometer to provide fast, accurate pressure measurements.

### SPECIFICATIONS AND FEATURES

- Accurate and repeatable to  $\pm .00025$  inches water column
- Pressure range: 0 - 2" w.c., positive, negative, or differential pressures
- Non-toxic and inexpensive gage fluid consists of distilled water mixed with a small amount of fluorescein green color concentrate
- Convenient, portable, lightweight and self-contained, the unit requires no external power connections and is operated by a 1.5 volt penlight cell
- A.C. detector current eliminates point plating, fouling and erosion
- Micrometers are manufactured in accordance with ASME B89.1.13-2001, and are traceable to a standard at the National Institute of Standards and Technology

- Three-point mounting, dual leveling adjustment, and circular level vial assure rapid setup
- Durablock® precision-machined acrylic plastic gage body
- Sensitive 0 - 50 microamp D.C. meter acts as a detector and also indicates battery and probe condition
- Heavy 2" thick steel base plate provides steady mounting
- Top-quality glass epoxy circuit board and solid-state, integrated circuit electronics
- Electronic enclosure of tough, molded styrene acrylonitrile provides maximum protection to components yet allows easy access to battery compartment
- Rugged sheet steel cover and carrying case protects the entire unit when not in use
- Accessories included are (2) 3-foot lengths Tygon® tubing, (2) 1/8" pipe thread adapters and 3/4 oz. bottle of fluorescein green color concentrate with wetting agent

**Maximum pressure: 100 psig with optional pipe thread connections.**

Tygon® is a registered trademark of Saint-Gobain Corporation

**DWYER INSTRUMENTS, INC.**

P.O. BOX 373

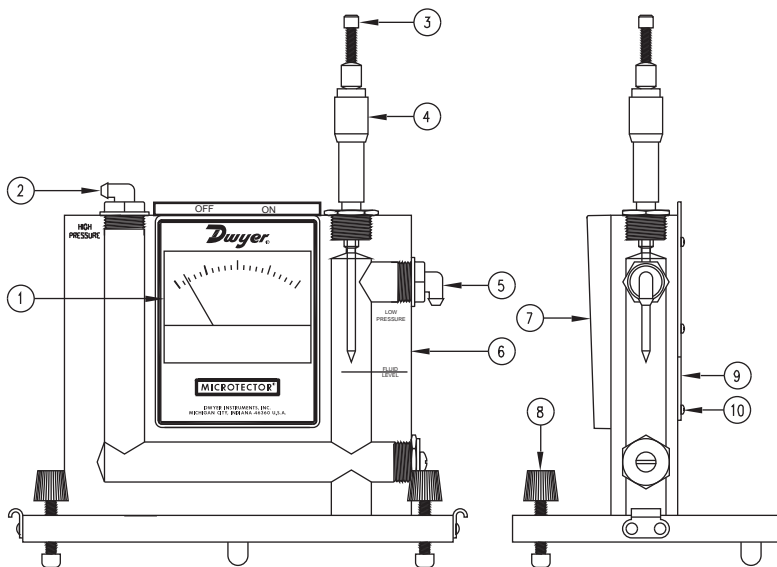
MICHIGAN CITY, INDIANA 46361, U.S.A

Phone: 219/879-8000

Fax: 219/872-9057

www.dwyer-inst.com

e-mail: info@dwyer-inst.com



**Microtector® Gage**

### Precision Pressure Measurement

The Microtector® Gage combines the time-proven principles of the Hook Gage type manometer and modern solid-state integrated circuit electronics. It provides an inexpensive means of achieving accuracy and repeatability within  $\pm .00025$  inches water column throughout its 0 to 2 inches w.c. range. It is truly a new standard in precision measuring devices.

### Principles of Operation

A pressure to be measured is applied to the manometer fluid which is displaced in each leg of the manometer by an amount equal to  $1/2$  the applied pressure. A micrometer mounted point is then lowered until it contacts the manometer gage fluid. The instant of contact is detected by completion of a low-power A.C. circuit. Current for this circuit is supplied by a 1.5 volt penlight cell feeding two semiconductor amplifiers which act as a free-running multivibrator operating at a frequency of approximately two kilohertz. Completion of the A.C. circuit activates a bridge rectifier which provides the signal for indication on a sensitive (0 to 50 microamps) D.C. microammeter.

On indication of contact, the operator stops lowering the point and reads the micrometer which indicates one half the applied pressure. By interpolating eight divisions (each being  $.000125$  w.c.) between  $.001$  micrometer graduations, a total accuracy of  $.00025$  can easily be achieved. The micrometer complies with Federal Specification GGG-C-105A and is traceable to a master at the NIST.

### Locating and Opening

Stand the Microtector® Gage and case on a firm flat level surface. Remove cover by releasing the latches and lifting it straight up. If it is necessary to move the gage without case, handle only the base plate or clear acrylic block. **(CAUTION:** Do not handle gage by grasping meter-electronic package housing Item 7 on drawing.)

## Fluid Level

Level the gage by adjusting the two front levelling screws (Item 8 on drawing) until the bubble in the spirit level is centered in the small circle. After levelling the gage, open both rapid shut-off valve tube connectors (Items 2 and 5). Back off the micrometer (Item 4), if necessary, to make sure that the point is not immersed in the gage fluid. The fluid level in the gage should now coincide with the mark on the right hand bore (Item 6) plus or minus approximately 1/32 inch. If the level of fluid is too high, fluid can be removed with an eye dropper pipette or carefully poured out of the right connection (Item 5).

If the level is too low, remove the top left rapid shut-off valve tube connector (Item 2) and add distilled water pre-mixed with the proper amount of green concentrate. (See maintenance instructions for proportions. After correcting the fluid level, re-install the rapid shut-off connectors and, with these in the open position, re-level the Microtector® Gage. The gage is now ready to be zeroed.

## Zeroing

Turn the Micrometer barrel (Item 4) until its lower end just coincides with the zero mark on the scale and the zero on the barrel scale coincides with the vertical line on the internal scale. Note that the internal scale is graduated every .025" from 0 to 1.00 inch and the barrel scale is graduated in one thousandths from 0 to .025". Turn the meter circuit switch at the top of gage to the "on" position. While holding the barrel at the zero position (and with gage level), raise or lower the point by turning the knurled knob (Item 3) until the point is above, but near, the fluid.

Check to be sure that the meter registers zero. Watch the meter, hold the barrel, and lower the point slowly by turning the top knurled knob. As the knob is turned, the point will contact the fluid and the meter pointer will move from zero to some upsacle position.

After making contact, turn the point out of the fluid by turning the micrometer barrel counter-clockwise to a reading of .010 or more. Again, watch the meter and, this time, lower the point by turning the micrometer barrel. The point position where the meter pointer begins to move up scale is the zero position. This position should correspond to the zero reading on the micrometer. Adjust the point in relation to the micrometer barrel by turning the top knob while holding the barrel steady. Repeat lowering the point, watching the meter for contact, and adjusting the point until the zero position and zero reading exactly coincide. The gage is now zeroed and should not be moved.

An alternative method of zeroing and reading can be used wherein, instead of zeroing the gage completely, a zero correction reading is taken and recorded, then subtracted from the final reading. Comparable results can be obtained with either method.

## Positive Pressure Measurement

With the fluid at its proper level, a pressure of 2.0" water column maximum can be measured. Positive pressure should be applied to the top left connection (Item 2) with the micrometer zeroed as described above. This will permit a simple direct reading to be taken.

After an unknown pressure has been applied at the top left connection, the fluid level will drop in the left bore and rise over the point in the right bore. Note that the indicating meter point has moved upsacle because the point is immersed in the fluid. Turn the micrometer counter-clockwise until the point leaves the fluid as indicated by the meter pointer dropping to zero on its scale. Then slowly turn the micrometer down until its point just touches the fluid surface, causing movement of the meter pointer. Withdraw the point and repeat several times, noting each time the micrometer reading where the meter pointer begins. The average of these readings multiplied by two is the pressure applied to the gage. (Avg. reading  $\times 2$  = pressure applied in inches w.c. The degree of uncertainty for the operator is indicated by the difference in these readings.

When the readings are complete, the pressure should be removed and the zero setting of Microtector® Gage rechecked. Any change in the zero position will indicate inaccurate readings. Should this happen, the zero-set and pressure measurement procedure should be repeated.

## Negative Pressure or Vacuum Measurement

Zero the gage. Connect the source of vacuum or negative pressure to the right-side gage connection (Item 5) and proceed as described under Positive Pressure Measurement section. Remember that the pressure measured in this way is negative.

## Differential Pressure Measurement

Differential pressures may be measured by connecting the higher (more positive) pressure to the left connection (Item 2) and the lower pressure to the right connection (Item 5).

## Storage

Turn meter circuit switch to "off" position and withdraw the point well clear of fluid (by turning micrometer clockwise) when gage is not in use. This will conserve the batteries and minimize build-up of oxides, etc., on the point. Keep the unit covered and in an area free of strong solvent fumes.

## Maintenance

When the meter reading becomes reduced or the pointer movement gets sluggish (with the circuit on and the point in fluid), the following should be done:

(1) Remove the point (by unscrewing) and clean the tip lightly using fine crocus cloth. Wipe off all grit and dirt with a clean rag; reassemble and recheck meter operation.

(2) If the meter operation continues to be sluggish, replace the size AA, 1.5 volt battery. (Replace the battery at least once a year to avoid deterioration of battery and damage to gage. Leakproof alkaline battery is recommended.)

To replace the battery, remove center screw (Item 10) located in the back of the electronic enclosure. Cover (Item 9) will come off, exposing the battery. Pull the old battery out and push a new battery into the battery holder with the positive (center) terminal to the right (to the end marked with + on the holder).

If the fluid becomes contaminated and requires replacement: empty old fluid from gage; flush out with clear water and replace with distilled water and A-126 fluorescein green color concentrate mixed with 3/4 oz. concentrate to each quart of water.

## CAUTION:

1. Do not substitute other gage fluids, as proper gage operation depends on use of the specified gage fluid to provide proper surface tension, wetting ability and electrolyte capability with unity specific gravity.

If the gage bore is very dirty, a mild soap solution may be used to aid in cleaning prior to flushing with clear water.

2. Do not clean with liquid soaps, special solvent, de-greasers, aromatic hydrocarbons, etc. Such cleaners and solvents may contain chlorine, fluorine, acetone and related compounds that will permanently damage the gage and prevent proper operation.

Mettler Toledo

Service Business Unit Industrial  
1900 Polaris Parkway  
Columbus, OH 43240  
1-800-523-5123



Accredited by the American Association  
for Laboratory Accreditation (A2LA)  
CALIBRATION CERT #1902.01

ISO 17025 Registered  
ANSI/NCSL Z540-1 Accredited

## Accuracy Calibration Certificate

### Customer

Company:	PFS-TECO		
Address:	11785 SE Hwy 212; Ste 305		
City:	Clackamas	Contact:	John Steinert
Zip / Postal:	97015-9050		
State / Province:	Oregon		

### Weighing Device

Manufacturer:	Mettler Toledo	Instrument Type:	Weighing Instrument
Model:	PFD774-US11	Asset Number:	2
Serial No.:	C112381343	Terminal Model:	IND570
Building:	N/A	Terminal Serial No.:	C101887029
Floor:	N/A	Terminal Asset No.:	N/A
Room:	N/A		

Range	Max. Capacity	Readability (d)
1	1000 lb	0.02 lb

### Procedure

Calibration Guideline:	ASTM E898 - 20
METTLER TOLEDO Work Instruction:	30260953

This calibration certificate including procedures and uncertainty estimation also complies with EURAMET cg-18 v 4.0.


This calibration certificate contains measurements for As Found and As Left calibrations.

The sensitivity/span of the weighing instrument was adjusted before As Left calibration with an external weight.

	Temperature		Humidity	
As Found	Start: 20.0 °C	End: 20.0 °C	Start: 28.0 %	End: 28.0 %
As Left	Start: 20.0 °C	End: 20.0 °C	Start: 28.0 %	End: 28.0 %

Environmental conditions have been verified to ensure the accuracy of the calibration.

This certificate is issued in accordance with the conditions of accreditation granted by A2LA, which is based on ISO/IEC 17025. A2LA has assessed the measurement capability of the laboratory and its traceability to recognized national standards.

As Found Calibration Date:	16-Apr-2021	Authorized A2LA Signatory:	
As Left Calibration Date:	16-Apr-2021		
Issue Date:	16-Apr-2021		Gary Sargent
Requested Next Calibration Date:	30-Apr-2022		

## Measurement Results

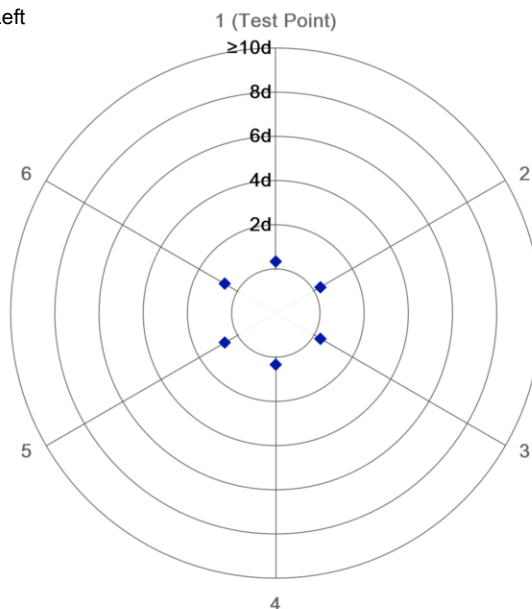
### Repeatability

Test Load: 500 lb

	As Found	As Left
1	N/A	500.00 lb
2	N/A	500.00 lb
3	N/A	500.00 lb
4	N/A	500.00 lb
5	N/A	500.02 lb
6	N/A	500.02 lb

Standard Deviation	N/A	0.010 lb
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○ As Found  
◆ As Left



The "d" in the graph represents the readability of the range/interval in which the test was performed.

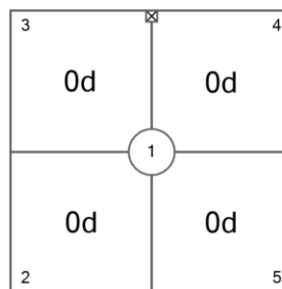
The results of this graph are based upon the absolute values of the differences from the mean value.

### Eccentricity

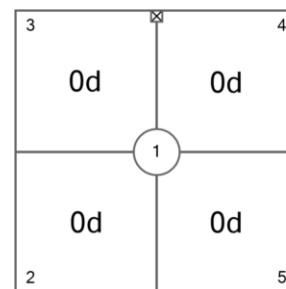
Test Load: 325 lb

Position	As Found	As Left
1	325.00 lb	325.00 lb
2	325.00 lb	325.00 lb
3	325.00 lb	325.00 lb
4	325.00 lb	325.00 lb
5	325.00 lb	325.00 lb

Maximum Deviation	0.00 lb	0.00 lb
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As Found



As Left

The "d" in the graph represents the readability of the range/interval in which the test was performed.

## Error of Indication

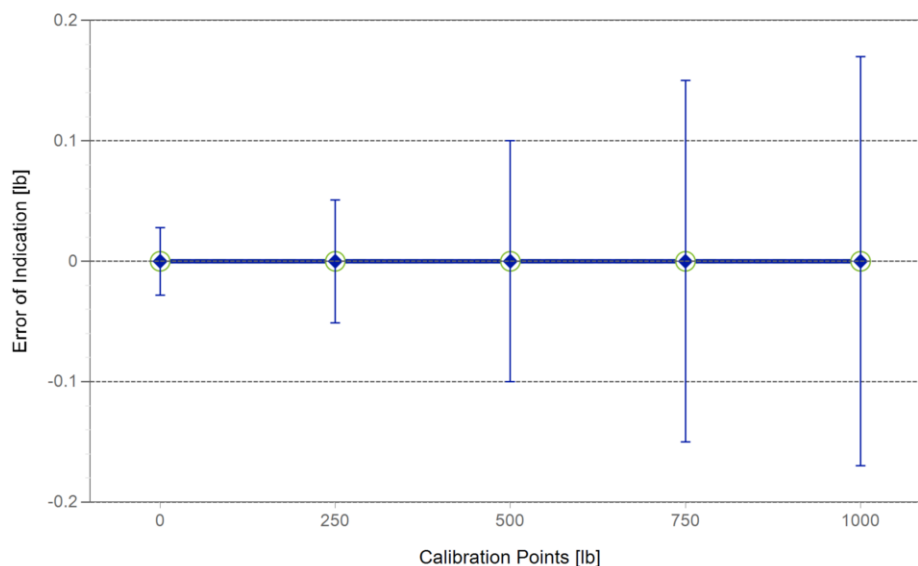
### As Found

	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0 lb	0.00 lb	0.00 lb	N/A	N/A
2 <sup>1</sup>	250 lb	250.00 lb	0.00 lb	N/A	N/A
3 <sup>1</sup>	500 lb	500.00 lb	0.00 lb	N/A	N/A
4 <sup>1</sup>	750 lb	750.00 lb	0.00 lb	N/A	N/A
5	1000 lb	1000.00 lb	0.00 lb	N/A	N/A
6 <sup>1</sup>	750 lb	750.00 lb	0.00 lb	N/A	N/A
7 <sup>1</sup>	500 lb	500.00 lb	0.00 lb	N/A	N/A
8 <sup>1</sup>	250 lb	250.00 lb	0.00 lb	N/A	N/A
9	0 lb	0.00 lb	0.00 lb	N/A	N/A

### As Left

	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0 lb	0.00 lb	0.00 lb	0.028 lb	2.37
2 <sup>1</sup>	250 lb	250.00 lb	0.00 lb	0.051 lb	2
3 <sup>1</sup>	500 lb	500.00 lb	0.00 lb	0.10 lb	2
4 <sup>1</sup>	750 lb	750.00 lb	0.00 lb	0.15 lb	2
5	1000 lb	1000.00 lb	0.00 lb	0.17 lb	2.05
6 <sup>1</sup>	750 lb	750.00 lb	0.00 lb	0.15 lb	2
7 <sup>1</sup>	500 lb	500.00 lb	0.00 lb	0.10 lb	2
8 <sup>1</sup>	250 lb	250.00 lb	0.00 lb	0.051 lb	2
9	0 lb	0.00 lb	0.00 lb	0.028 lb	2.37

<sup>1</sup>The calculated uncertainty was replaced by the CMC (Calibration and Measurement Capabilities) value because the calculated uncertainty was smaller than the CMC value.



○ As Found

◆ As Left

For improved legibility of the graphics only increasing measurement points are shown and measurement points close to zero are not displayed.

The uncertainty stated is the expanded uncertainty at calibration obtained by multiplying the standard combined uncertainty by the coverage factor k - which can be larger than 2 according to ASTM E898 and EURAMET cg-18. The value of the measurand lies within the assigned range of values with a probability of approximately 95%.

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated.

## Test Equipment

---

All weights used for metrological testing are traceable to national or international standards. The weights were calibrated and certified by an accredited calibration laboratory.

### Weight Set 1: NIST NIST-F

Weight Set No.:	<u>182 50's &amp; 25's</u>	Date of Issue:	<u>25-Jun-2019</u>
Certificate Number:	<u>OR-19-186-F</u>	Calibration Due Date:	<u>30-Jun-2021</u>

## Remarks

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Equipment condition: Good

Calibration after installation

The recording of false fictitious or fraudulent statements or entries on this document may be punishable as a felony under federal Statute

### End of Accredited Section

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The information below and any attachments to this calibration certificate are not part of the accredited calibration.

## Measurement Uncertainty of the Weighing Instrument in Use

Stated is the expanded uncertainty with  $k=2$  in use. The formula shall be used for the estimation of the uncertainty under consideration of the errors of indication. The value  $R$  represents the net load indication in the unit of measure of the device.

Temperature coefficient for the evaluation of the measurement uncertainty in use:  $10.0 \cdot 10^{-6} / K$

Temperature range on site for the evaluation of the measurement uncertainty in use: 10 K

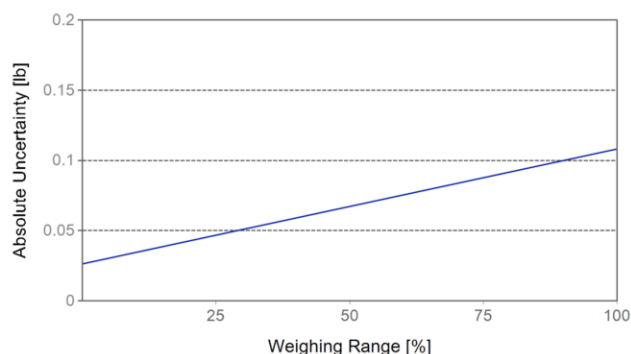
### Linearization of Uncertainty Equation

Range			As Found	As Left
	d	Max		
1	0.02 lb	1000 lb	N/A	$U_1 = 0.026 \text{ lb} + 0.0000818 \text{ lb/lb} \cdot R$

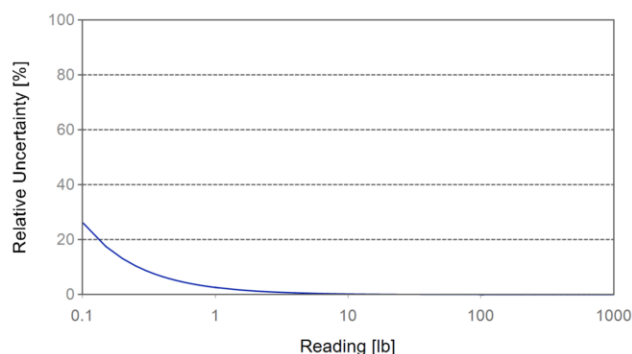
To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

### Absolute and Relative Measurement Uncertainty in Use for Various Net Indications (Examples)

Net Indication	As Found		As Left	
1.00 lb	N/A	N/A	0.026 lb	2.6%
10.00 lb	N/A	N/A	0.027 lb	0.27%
100.00 lb	N/A	N/A	0.034 lb	0.034%
500.00 lb	N/A	N/A	0.067 lb	0.013%
1000.00 lb	N/A	N/A	0.11 lb	0.011%



As Found



As Left

# Handbook 44 Tolerance Assessment(Acceptance)

Assessment done without considering measurement uncertainty.

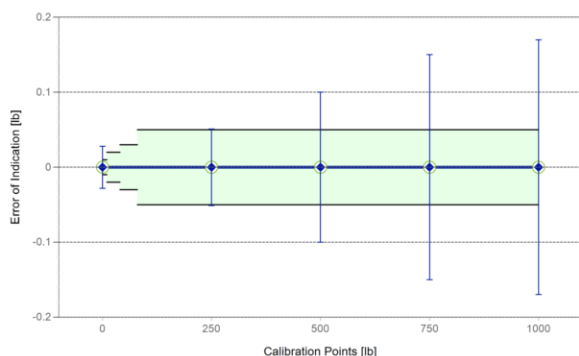
The measurements from the attached calibration certificate were assessed against the Tolerances defined by NIST Handbook 44.

The range of measurements for both Eccentricity and Repeatability (if performed) tests is assessed against Maintenance Tolerances.

**Overall**
As Found
As Left
✓ = Passed
✗ = Failed

## Weighing Device

Range	Max. Capacity	Readability (d)	Verification Scale Interval (e)	Class
1	1000 lb	0.02 lb	0.02 lb	III



Tolerances according to NIST Handbook 44

Test Load		Tolerance
From	To	
0.00 lb	0.00 lb	0.005 lb
0.02 lb	10.00 lb	0.01 lb
10.02 lb	40.00 lb	0.02 lb
40.02 lb	80.00 lb	0.03 lb
80.02 lb	1000.00 lb	0.05 lb

○ As Found

◆ As Left

— Tolerance

## Eccentricity and Repeatability

Test	Test Load	Tolerance	As Found		As Left	
			Max. Error / Range	Result	Max. Error / Range	Result
Eccentricity (Max. Error)	325 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
Eccentricity (Range)	325 lb	0.1 lb	0.00 lb	✓	0.00 lb	✓
Repeatability (Max. Error)	500 lb	0.05 lb	N/A	N/A	0.02 lb	✓
Repeatability (Range)	500 lb	0.10 lb	N/A	N/A	0.02 lb	✓

**Max. Error:** Maximum of the absolute values of the individual errors.

**Range:** Difference between largest and smallest measurement value.

## Error of Indication

	Reference Value	Tolerance	As Found		As Left	
			Error of Indication	Result	Error of Indication	Result
1	0 lb	0.01 lb	0.00 lb	✓	0.00 lb	✓
2	250 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
3	500 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
4	750 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
5	1000 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
6	750 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
7	500 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
8	250 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
9	0 lb	0.01 lb	0.00 lb	✓	0.00 lb	✓

DocNumber: 235829



Praxair Distribution, Inc.  
5700 S. Alameda Street  
Los Angeles CA 90058  
Tel: 323-585-2154  
Fax: 714-542-6689  
PGVP ID: F22019

# CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

## Customer & Order Information

PXPKG TUALATIN OR H  
10450 SW TUALATIN SHERWOOD ROAD  
TUALATIN OR 97062

Certificate Issuance Date: 02/25/2019

Praxair Order Number: 70870813

Part Number: NI CD17C08E-AS

Fill Date: 02/20/2019

Lot Number: 70086905101

Cylinder Style & Outlet: AS CGA 590  
Cylinder Pressure and Volume: 1200 psig 99 ft3

## Certified Concentration

Expiration Date:	02/25/2027	NIST Traceable
Cylinder Number:	SA18857	Expanded Uncertainty
17.14 %	Carbon dioxide	± 0.3 %
4.30 %	Carbon monoxide	± 0.6 %
17.01 %	Oxygen	± 0.2 %
Balance	Nitrogen	

## ProSpec EZ Cert



## Certification Information:

Certification Date: 02/25/2019

Term: 96 Months

Expiration Date: 02/25/2027

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1.  
Do Not Use this Standard if Pressure is less than 100 PSIG.

CO2 responses have been corrected for Oxygen IR Broadening effect. O2 responses have been corrected for CO2 interference.

## Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

### 1. Component: Carbon dioxide

Requested Concentration: 17 %  
Certified Concentration: 17.14 %  
Instrument Used: Horiba VIA-510 S/N 20C194WK  
Analytical Method: NDIR  
Last Multipoint Calibration: 01/28/2019

First Analysis Data:	Date	02/25/2019
Z: 0	R: 20.1	C: 17.14
R: 20.11	Z: 0	C: 17.16
Z: 0	C: 17.14	R: 20.1
UOM: %	Mean Test Assay:	17.14 %

### Reference Standard:

Type / Cylinder #: GMIS / CC187238

Concentration / Uncertainty: 20.10 % ± 0.24%

Expiration Date: 06/07/2026

Traceable to: SRM # / Sample # / Cylinder #: RGM#CC193512 / N/A / RGM#CC193512  
SRM Concentration / Uncertainty: 26.99% / ± 0.05%  
SRM Expiration Date: 05/15/2023

Second Analysis Data:	Date	
Z: 0	R: 0	C: 0
R: 0	Z: 0	C: 0
Z: 0	C: 0	R: 0
UOM: %	Mean Test Assay:	%

### 2. Component: Carbon monoxide

Requested Concentration: 4.25 %  
Certified Concentration: 4.30 %  
Instrument Used: Horiba VIA-510 S/N UB9UCSYX  
Analytical Method: NDIR  
Last Multipoint Calibration: 01/28/2019

First Analysis Data:	Date	02/25/2019
Z: 0	R: 5	C: 4.3
R: 5	Z: 0	C: 4.31
Z: 0	C: 4.29	R: 4.99
UOM: %	Mean Test Assay:	4.3 %

### Reference Standard:

Type / Cylinder #: GMIS / CC242633

Concentration / Uncertainty: 5.00 % ± 0.543%

Expiration Date: 04/03/2025

Traceable to: SRM # / Sample # / Cylinder #: SRM 2642a / 51-D-23 / FF23106  
SRM Concentration / Uncertainty: 7.859% / ± 0.039%  
SRM Expiration Date: 07/15/2019

Second Analysis Data:	Date	
Z: 0	R: 0	C: 0
R: 0	Z: 0	C: 0
Z: 0	C: 0	R: 0
UOM: %	Mean Test Assay:	%

### 3. Component: Oxygen

Requested Concentration: 17 %  
Certified Concentration: 17.01 %  
Instrument Used: OXYMAT 5E  
Analytical Method: Paramagnetic  
Last Multipoint Calibration: 02/04/2019

First Analysis Data:	Date	02/25/2019
Z: 0	R: 20.88	C: 17.02
R: 20.9	Z: 0	C: 17.02
Z: 0	C: 17.04	R: 20.9
UOM: %	Mean Test Assay:	17.01 %

### Reference Standard:

Type / Cylinder #: GMIS / CC505868

Concentration / Uncertainty: 20.87 % ± 0.108%

Expiration Date: 12/14/2026

Traceable to: SRM # / Sample # / Cylinder #: SRM 2659a / 71-E-19 / FF22331  
SRM Concentration / Uncertainty: 20.863% / ± 0.021%  
SRM Expiration Date: 08/23/2021

Second Analysis Data:	Date	
Z: 0	R: 0	C: 0
R: 0	Z: 0	C: 0
Z: 0	C: 0	R: 0
UOM: %	Mean Test Assay:	%

Analyzed By

Jose Vasquez (AR)  
Jose Vasquez

Certified By

Nelson Ma  
Nelson Ma



ISO 17025  
ACCREDITED LABORATORY

55 N. 4th Street  
Beaumont, TX 77701

## Certificate of Analysis – EPA Protocol Gas

**Customer:**  
Inter-Mountain Labs  
555 Absaraka St.  
Sheridan, WY 82801

**PO Number:** 196148  
**Reference#:** CGS-10-20029 (2 of 2)  
**Date Filled:**  
**Customer Part #:**

<b>Cylinder Number</b>	<b>Size</b>	<b>Concentration Basis</b>	<b>Standard type</b>	<b>Certificate ID</b>
91005049	ALS	Mole	EPA Protocol	02-03112002

### Certified Concentration

Carbon Monoxide=	2.47%	+/- 0.018%
Carbon Dioxide=	9.9%	+/- 0.1%
Oxygen=	10.37%	+/- 0.06%
Nitrogen =	Balance Gas	

### Analytical Information

Component	Analyzer Make/Model/SN	Analytical Principle	Last Calibration Date
Carbon Monoxide	MKS/2031DJG2EKVS13T/017146467	FT-IR	3/13/2020
Carbon Dioxide	Thermo 410I/1162980025	NDIR	3/4/2020
Oxygen	Thermo 410I/1162980025	MPA	2/11/2020

**First Assay Date** 3/13/2020

### Reference Standard(s)

Component	GMS #	Cylinder #	NIST Reference	Concentration	Uncertainty	Exp Date
Carbon Monoxide	CC219495.20151013g	CC219495	2642a	2.488%	+/- 0.015%	1/11/2024
Carbon Dioxide	EB007908.20190327	EB007908	C1579010.02	9.5%	+/- 0.02%	6/18/2027
Oxygen	EB0080793.20180118	EB0080793	071001	11.97%	+/- 0.06%	7/21/2026
Oxygen	EB0087693.20180504	EB0087693	071001	12%	+/- 0.12%	7/21/2026
Carbon Dioxide	EB0097897.20171018	EB0097897	C1309410.01	24.9%	+/- 0.10%	2/6/2026
Nitrogen				Balance Gas		

This calibration standard has been certified per the 2012 EPA Traceability Protocol, Document EPA 600/R-12/531, using the procedure G1.

Do Not Use This Standard Below 100 psig (0.7 Megapascals).

Valve Outlet Connection CGA: 660  
Mix Pressure (psig) @ 70F: 2000  
Certification Date: 3/13/2020  
Shelf Life: 8 years  
Expiration Date: 3/11/2028

Certified By:

*Jennifer Healy*

Reviewed By:

*Kelly Ray*

**Produced By:**  
Red Ball Technical Gas Service Phone: 800-551-8150  
555 Craig Kennedy Way Shreveport, LA 71107  
Red Ball Technical Gas Service PGVP Vendor ID: G12020