

**Wisconsin Weatherization
Replacement Gas Furnace Checklist**



Customer: _____ Contractor: _____
 Brand: _____ Model #: _____
 Date Installed: _____ Serial #: _____
 WisWAP BID: _____ OR WHEAP App#: _____

Check box, enter test results or requested number as item is inspected or completed. Indicate "N/A" if not applicable.
 PMI = Per Manufacturer's Instructions. **Fuel Type:** Natural Gas or Propane

INSPECTION & ADJUSTMENTS	Documents:	<input type="checkbox"/> Photos documenting furnace conditions and manufacturer nameplate provided to Agency	<input type="checkbox"/> Agency given copy of sizing calculation
		<input type="checkbox"/> Installation information sticker (installer name, phone number, date)	
		<input type="checkbox"/> Warranty and manual in envelope attached to furnace	<input type="checkbox"/> Design temperature heat loss calculation: _____ BTU per hour
		<input type="checkbox"/> Set heat circuit and anticipator (thermostat) PMI	<input type="checkbox"/> Not applicable
	Electrical:	<input type="checkbox"/> Service disconnect is present and operational	<input type="checkbox"/> Dedicated circuit and breaker properly rated
	<input type="checkbox"/> Sized for BTUs of all appliances	<input type="checkbox"/> No leaks	<input type="checkbox"/> Shut off present
Gas Piping:	<input type="checkbox"/> Sediment trap present	<input type="checkbox"/> CSST bonded	
Air Filter:	<input type="checkbox"/> Filter opening covered/sealed	<input type="checkbox"/> Filter removes easily with no obstructions	
	Filter Size: _____ x _____		
General:	<input type="checkbox"/> Furnace elevated off basement floor. Note: If not in basement, can be on floor if approved PMI		
	<input type="checkbox"/> Combustion air and exhaust piping properly installed, terminated and supported		
	<input type="checkbox"/> Distribution plenums sealed and all major duct leaks properly sealed per specifications		
	<input type="checkbox"/> Condensate properly drained per local code and PMI	<input type="checkbox"/> Test holes sealed	
	<input type="checkbox"/> Orphaned water heater has proper draft (see p. 2)	<input type="checkbox"/> Permit required	

Installed and Measured BTUs of New Furnace:

BTUs (high input): _____ Measured Input (2 cu. ft. of gas): _____ Minutes: _____ Seconds: _____
 BTUs (low input): _____ Measured Input (2 cu. ft. of gas): _____ Minutes: _____ Seconds: _____
 (if applicable)

Measured Gas Pressure in Inches of Water Column(IWC):

Input (High): _____ Input (Low) – if applicable: _____ Manifold (High): _____ Manifold (Low): _____

Enter test result. Indicate "N/A" if installation is a space heater.

PERFORMANCE TESTING	Steady State Efficiency Test						Distribution Static Pressure		
	Adjust to Achieve Typical Ranges for Gas Burning Appliances (see page 2)						<input type="checkbox"/> IWC or <input type="checkbox"/> Pa		Total Pressure
	SSE %	O2%	CO PPM	Intake Air °F	Flue °F	PMI AFUE%	Return	Supply	
							High Input		
							Low Input		
	Temperature Rise					Variable Speed Furnaces	Heating CFM*	Fan Speed Setting	
	Supply °F	Return °F	(Supply – Return)	PMI Min	PMI Max				
						High Input			
						Low Input (if applicable)			

*CFM Measurement Method: Plate Method Fan Tables Other: _____

I certify the visual inspection and performance tests were completed as indicated.

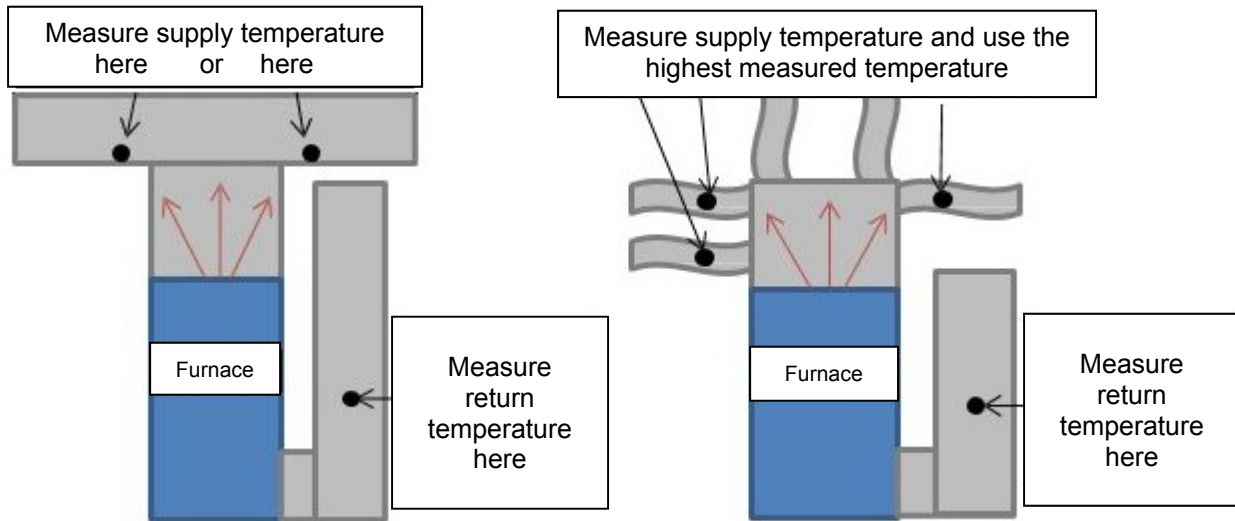
I certify the heating system was installed to my satisfaction on the date indicated.

Installer Signature: _____
 Printed Name: _____
 Date: _____

Customer Signature: _____
 Printed Name: _____
 Date: _____

Natural Gas and Propane Specifications

Generally accepted ranges, excerpted from the Weatherization Field Guide. Always follow manufacturer's instructions if they differ from listed typical specifications. Examples of temperature rise testing procedures below.



Acceptable Draft Test Readings for Gas Appliances with Respect to Outdoor			
°F	<10°	10°-90°	>90°
Pa.	-2.5	(°F Out / 40) - 2.75	-0.5
IWC.	-.010	(°F Out / 10,000) - 0.011	-.002

Typical Ranges for Gas Burning Appliances

Performance Indicator	SSE 80+	SSE 95+
Carbon monoxide (CO) ppm	≤ 100	≤ 100 or PMI
Stack temperature °F	325° - 450°	90° - 120°
Temperature Heat Rise °F	40° - 70°	45° - 70° or PMI
Oxygen (O ₂) %	4 - 9%	4 - 9%
Natural gas pressure output at manifold - Inches of Water Column (IWC)	3.2 - 3.9 IWC	3.2 - 3.9 IWC
Propane pressure output at manifold (IWC)	10-11 IWC	10 - 11 IWC
Steady-state efficiency (SSE)	82 - 86%	95 - 97%
Supply temperature °F	120° - 140°	95° - 140°

Comments:

Wisconsin Weatherization Replacement Oil Furnace Checklist



Customer: _____ Contractor: _____
 Brand: _____ Model #: _____
 Date Installed: _____ Serial #: _____
 WisWAP BID: _____ OR WHEAP App#: _____

Check box, enter test results or requested number as item is inspected or completed. Indicate "N/A" if not applicable.
 PMI = Per Manufacturer's Instructions.

INSPECTION & ADJUSTMENTS	Documents:	<input type="checkbox"/> Photos documenting furnace conditions and manufacturer nameplate provided to Agency	<input type="checkbox"/> Agency given copy of sizing calculation
		<input type="checkbox"/> Installation information sticker (installer name, phone number, date)	
		<input type="checkbox"/> Warranty and manual in envelope attached to furnace	<input type="checkbox"/> Design temperature heat loss calculation: _____ BTU per hour
	Electrical:	<input type="checkbox"/> Service disconnect is present and operational	<input type="checkbox"/> Dedicated circuit and breaker properly rated
		<input type="checkbox"/> Set heat circuit and anticipator (thermostat) PMI	<input type="checkbox"/> Not applicable
	Fuel Supply:	<input type="checkbox"/> New fuel filter	<input type="checkbox"/> Tank and lines comply with NFPA 31
		<input type="checkbox"/> No leaks	<input type="checkbox"/> Purged fuel lines
	Air Filter:	<input type="checkbox"/> Filter opening covered/sealed	<input type="checkbox"/> Filter removes easily with no obstructions
		Filter Size: _____ x _____	
	General:	<input type="checkbox"/> Furnace elevated off basement floor	<input type="checkbox"/> Acceptable clearances of heating unit and vent connector to nearby combustibles per NFPA 31
		<input type="checkbox"/> Distribution plenums sealed; all major duct leaks properly sealed per specifications	<input type="checkbox"/> Chimney inspected for compliance with NFPA 211
		<input type="checkbox"/> Test holes sealed	<input type="checkbox"/> Barometric damper control operates properly
		<input type="checkbox"/> Permit required	

Measured BTUs of New Furnace:
 BTUs (input): _____ Nozzle GPH: _____ Nozzle Angle: _____ ° Nozzle Spray Type: _____
 Note: The oil nozzle information is required to be posted on the furnace with the date of installation.

Measured Oil Pressure in Inches of Water Column(IWC):
 PMI _____ PSI Measured _____ PSI

PERFORMANCE TESTING	Draft Measurements					Measured Smoke Number				
	Flue Draft		Before barometric damper 10 – 15 Pa or 0.04-0.06 IWC or PMI			Smoke Spot Scale #:				
	Overfire Draft		Must be a minimum of 5 Pa. or 0.02 IWC or PMI							
	Steady State Efficiency Test					Distribution Static Pressure				
	Adjust to Achieve Typical Ranges for Oil Burning Appliances (see page 2)									
	SSE %	O2%	CO PPM	Intake Air °F	Flue °F	PMI AFUE%	<input type="checkbox"/> IWC	Return	Supply	Total Pressure
							<input type="checkbox"/> Pa			
Temperature Rise					Air Flow Rate Testing					
Supply °F	Return °F	(Supply – Return)	PMI Min	PMI Max	High Input	Heating CFM*	Fan Speed Setting			

*CFM Measurement Method: Plate Method Fan Tables Other: _____

I certify the visual inspection and performance tests were completed as indicated.

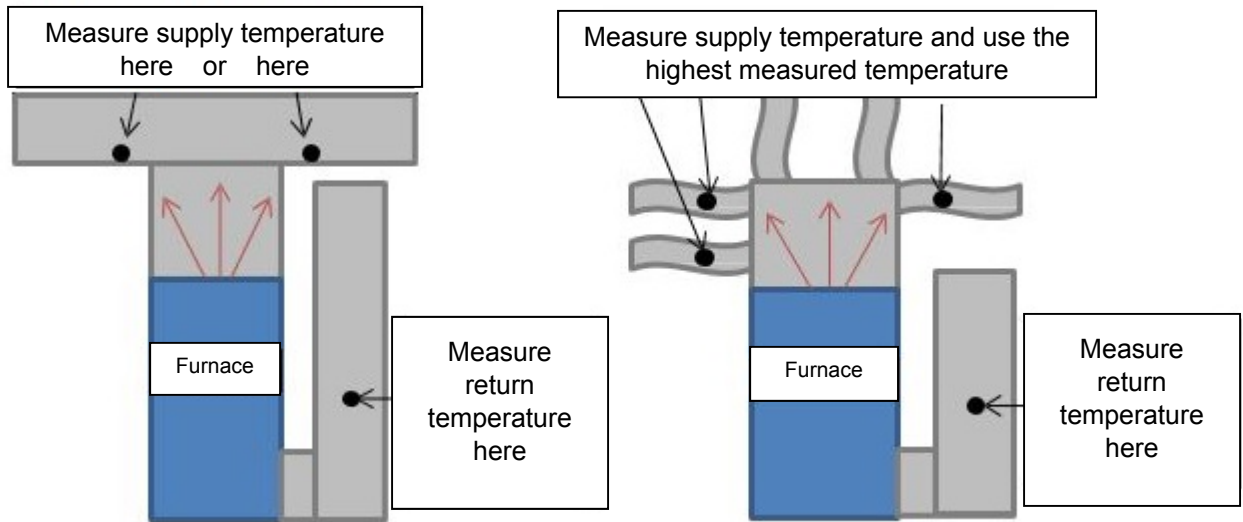
I certify the heating system was installed to my satisfaction on the date indicated.

Installer Signature: _____
 Printed Name: _____
 Date: _____

Customer Signature: _____
 Printed Name: _____
 Date: _____

Fuel Oil Heating System Specifications

Generally accepted ranges, excerpted from the Weatherization Field Guide. Always follow manufacturer's instructions if they differ from listed typical specifications. Examples of temperature rise testing procedures below.



Typical Ranges for Oil Burning Appliances

Performance Indicator	Flame Retention
Carbon Monoxide (CO) ppm	≤ 100
Stack Temperature °F	300° - 450°
Oxygen (O ₂) %	5 - 9%
Smoke Number (0-9)	< 1
Oil Pressure Pounds per Square Inch (psi)	100 – 150
Over-fire Draft (Inches of Water Column (IWC))	-0.02 IWC or -5 Pa
Flue Draft (IWC)	-0.04 to -0.01 IWC or -10 to -15 Pa
Steady-State Efficiency (SSE)	≥ 80%

Comments:

**Wisconsin Weatherization
Replacement Boiler Checklist**



Customer: _____ Contractor: _____
 Brand: _____ Model #: _____
 Date Installed: _____ Serial #: _____
 WisWAP BID: _____ OR WHEAP App#: _____

Check box, enter test results or requested number as item is inspected or completed. Indicate "N/A" if not applicable.
 PMI = Per Manufacturer's Instructions. **Fuel Type:** Natural Gas Propane Oil

INSPECTION & ADJUSTMENTS	Documents:	<input type="checkbox"/> Photos documenting furnace conditions and manufacturer nameplate provided to Agency.
	Electrical:	<input type="checkbox"/> Installation information sticker (installer name, phone number, date)
	Gas Piping:	<input type="checkbox"/> Warranty and manual in envelope attached to furnace <input type="checkbox"/> Agency given copy of sizing calculation
	Fuel Oil:	<input type="checkbox"/> Design temperature heat loss calculation: _____ BTU per hour
	General:	<input type="checkbox"/> Service disconnect is present and operational <input type="checkbox"/> Dedicated circuit and breaker properly rated
		<input type="checkbox"/> Set heat anticipator (thermostat) PMI <input type="checkbox"/> Not applicable
	<input type="checkbox"/> Sized for BTUs of all appliances <input type="checkbox"/> No leaks <input type="checkbox"/> Shut off present	
	<input type="checkbox"/> Sediment trap present <input type="checkbox"/> CSST bonded	
	<input type="checkbox"/> New Fuel Filter <input type="checkbox"/> No leaks <input type="checkbox"/> Tank/Lines comply with NFPA 31 <input type="checkbox"/> Purged Fuel Lines	
	<input type="checkbox"/> Boiler elevated off basement floor. Note: If not in basement, can be on floor if approved PMI.	
	<input type="checkbox"/> Check clearances of heating unit and vent connector to nearby combustibles (Gas IFGC; Oil NFPA 31)	
	<input type="checkbox"/> Combustion air and exhaust piping properly installed, terminated and supported	
	<input type="checkbox"/> Installed Pressure Relief Valve PMI	<input type="checkbox"/> Test holes sealed
	<input type="checkbox"/> Barometric controls operate properly PMI (if applicable)	<input type="checkbox"/> Permit Required
	<input type="checkbox"/> Bled air from entire system	<input type="checkbox"/> Distribution Flushed
	<input type="checkbox"/> Condensate properly drained per code and PMI	Distribution pH: _____
	<input type="checkbox"/> Orphaned water heater has proper draft (see p. 2)	Hardness (grains/gallon): _____

Existing Load Terminals and Capacity:
 Radiation Type: Fin Tube Radiator Baseboard Other: _____
 Linear Feet: _____ (Fin Tube or Cast Iron Baseboard) Square Feet: _____ (Radiators)

Measured BTUs of New Boiler:

Design temperature: _____ °F	Modulating Boiler Turndown Ratio (if applicable): _____ :
BTUs (input): _____	Measured Input (2 cu. ft. of gas): _____ Minutes: _____ Seconds: _____
Nozzle GPH: _____	Nozzle Angle: _____ ° Nozzle Spray Type: _____

Measured Gas Pressure in Inches of Water Column(IWC) or Oil PSI:

Input: _____	Manifold (High): _____	Manifold (Low): _____	Oil (PSI): _____
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Installed Devices: Indicate what was installed. Steps must be taken to prevent condensation in non-condensing units.

Air Excluding Device Mixing Valves Automatic Fill Valve Backflow Preventer Other: _____

Wye Strainer Outdoor Sensor (install on North wall) Circulator Pump

	HP	GPM	W
	Size	Speed Setting	Watts

PERFORMANCE TESTING	Combustion and Draft Testing								Actual Boiler Setup		Warm Weather Shut Down		Design Temp			
	Adjust to achieve typical ranges for applicable appliance (see page 2)								Outdoor Temp °F		Boiler Supply °F		Measured Temps °F		Primary Loop (High Input)	
			<input type="checkbox"/> CO ₂	CO PPM	Draft	Intake Air °F	Flue Temp °F	SSE %	AFUE %							
			<input type="checkbox"/> O ₂													
High Input																
High Input PMI																
Low Input																
Low Input PMI																
Oil Boilers Only:			Overfire Draft:			Smoke Test #:										

I certify the visual inspection and performance tests were completed as indicated.

I certify the heating system was installed to my satisfaction on the date indicated.

Installer Signature _____ Date _____ Customer Signature _____ Date _____

Replacement Boiler Specifications (Natural Gas, Propane (LP) and Fuel Oil)

Generally accepted ranges, excerpted from the Weatherization Field Guide. Always follow manufacturer's instructions if they differ from listed typical specifications. Examples of temperature rise testing procedures below.

Acceptable Draft Test Readings for Gas Appliances with Respect to Outdoor			
°F	$<10^{\circ}$	$10^{\circ}-90^{\circ}$	$>90^{\circ}$
Pa.	-2.5	$(^{\circ}\text{F Out} / 40) - 2.75$	-0.5
IWC.	-0.010	$(^{\circ}\text{F Out} / 10,000) - 0.011$	-0.002

Gas: Measure draft halfway between collar and chimney.

Typical Ranges for Gas Burning Appliances

Performance Indicator	SSE 80+	SSE 95+
Carbon monoxide (CO) ppm	≤ 100	≤ 100 or PMI
Stack temperature °F	$325^{\circ} - 450^{\circ}$	$90^{\circ} - 120^{\circ}$
Oxygen (O ₂) %	4 - 9%	4 - 9%
Natural gas pressure output at manifold - Inches of Water Column (IWC)	3.2 - 3.9 IWC	3.2 - 3.9 IWC
Propane pressure output at manifold (IWC)	10 - 11 IWC	10 - 11 IWC
Steady-State Efficiency (SSE)	82 - 84%	95 - 97%
Supply temperature °F	$120^{\circ} - 140^{\circ}$	$95^{\circ} - 140^{\circ}$
Return Water Temperature-Non-condensing °F	> 120	N/A

Typical Ranges for Oil Burning Appliances

Performance Indicator	Flame Retention
Carbon Monoxide (CO) ppm	≤ 100
Stack Temperature °F	$300^{\circ} - 450^{\circ}$
Oxygen (O ₂) %	5 - 9%
Smoke Number (0-9)	< 1
Oil Pressure Pounds per Square Inch (psi)	100 - 150
Over-fire Draft (Inches of Water Column (IWC))	-0.02 IWC or -5 Pa
Flue Draft (IWC)	-0.04 to -0.01 IWC or -10 to -15 Pa
Steady-State Efficiency (SSE)	$\geq 80\%$
Return Water Temperature-Non-condensing °F	> 120

Oil: Measure draft between barometric damper and collar and at over fire.

Comments:

Wisconsin Weatherization Repair or Clean and Tune Checklist



Customer: _____ Contractor: _____
 Work Date: _____ Serial #: _____
 WisWAP BID: _____ OR WHEAP App#: _____
Fuel Type: Natural Gas Propane Oil Other: _____
System Type: Forced Air Boiler Space Heater Other: _____

Clean, inspect, test, and repair: Perform the following inspection procedures and maintenance practices on heating systems as necessary. The goal of these measures is to reduce carbon monoxide (CO), adjust fuel-air mixture, improve steady-state efficiency and verify the operation of safety controls. All drilled holes should be properly sealed after completion of testing. Check box, enter test results or requested number as item is inspected or completed.

ALL SYSTEMS	Emergency shut off	<input type="checkbox"/>	Service disconnect is present and is operational
	Electrical service	<input type="checkbox"/>	Inspect circuit; Rated for application; Note problems & make recommendations
	Fuel lines/storage tanks	<input type="checkbox"/>	No leaks present; Shut off present; Filter or sediment trap is present and clean
	Blower	<input type="checkbox"/>	Clean
	Air Handler	<input type="checkbox"/>	Clean
	Air Filter	<input type="checkbox"/>	Clean or replace
	Heat Exchanger	<input type="checkbox"/>	Clean surface & inspect for leaks; Inform customer & agency if exchanger is cracked
	Filter Slot/Filters	<input type="checkbox"/>	Filter slot with cover is present; Replacement filters/permanent filter present
	Thermostat	<input type="checkbox"/>	Set heat anticipator to amperage measured in control circuit or PMI
OIL HEATING UNIT	Oil Filter	<input type="checkbox"/>	Replace
	Nozzle	<input type="checkbox"/>	Replace. Nozzle GHP: _____ Nozzle Angle: _____ ° Spray Type: _____
	Electrodes	<input type="checkbox"/>	Adjust gap and position in burner tube PMI
	Transformer	<input type="checkbox"/>	Clean contacts; Measure voltage & replace if voltage is not within PMI
	Burner/Burner Tube Assembly	<input type="checkbox"/>	Clean; Inspect for over burning; Replace flame retention head if damaged
	Combustion Chamber	<input type="checkbox"/>	Clean; If necessary repair combustion chamber or replace
	CAD/Stack Control Cell	<input type="checkbox"/>	Test; Verify that burner shut off, PMI, when the cad cell is blocked from flame
	Flame Ignition	<input type="checkbox"/>	Test; Ignition must be instantaneous; Pre-purge type unit, blower on prior to ignition
	Barometric Damper	<input type="checkbox"/>	Plumb, level, swings freely
	Flue Draft (before damper)	<input type="checkbox"/>	Measure and adjust as needed (see page 2)
	Over Fire Draft	<input type="checkbox"/>	Measure and adjust as needed (see page 2)
	High Limit Control	<input type="checkbox"/>	Measure shut off temperature & adjust or replace if >250° (furnace) or >180° (boiler)
	Oil Pump Pressure	<input type="checkbox"/>	Measure and adjust PMI
NG/LP	Burners	<input type="checkbox"/>	Check for dust, debris, misalignment, flame impingement & other flame-interference problems; Clean, vacuum and adjust as needed
	Burner/Manifold	<input type="checkbox"/>	No soot, melted wire insulation or rust in burner and manifold area outside of firebox
	Pilot (if equipped)	<input type="checkbox"/>	Burning, good ignition, check safety control for gas valve shut-off when pilot is out
	Gas Pressure (IWC)	<input type="checkbox"/>	Input: _____ Manifold: _____

PERFORMANCE TESTING	Input on Label:		Output on Label:		Measured Input: (Clock Meter)				
	Steady State Efficiency Test				Distribution Static Pressure				
	Adjust to Achieve Typical Ranges for Gas Burning Appliances (see page 2)					<input type="checkbox"/> IWC or <input type="checkbox"/> Pa			
	SSE %	O2%	CO PPM	Smoke #	Flue °F	Return	Supply	Air Flow	Total Pressure
Temperature Rise					PMI Range				
Supply °F	Return °F	Total Rise			Minimum		Maximum		

I certify the visual inspection and performance tests were completed as indicated.

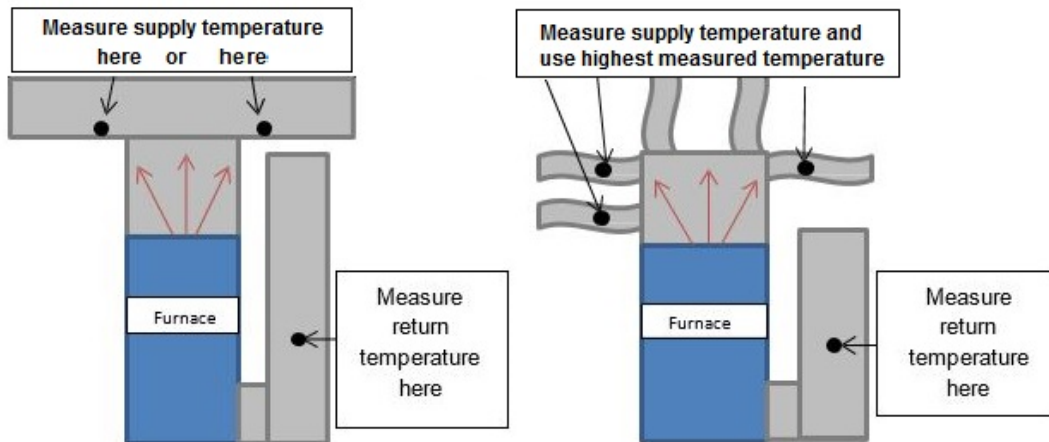
I certify the heating system was installed to my satisfaction on the date indicated.

Installer Signature: _____
 Printed Name: _____
 Date: _____

Customer Signature: _____
 Printed Name: _____
 Date: _____

Natural Gas and Propane Specifications

Generally accepted ranges, excerpted from the Weatherization Field Guide. Always follow manufacturer's instructions if they differ from listed typical specifications. Examples of temperature rise testing procedures below.



Acceptable Draft Test Readings for Gas Appliances with Respect to Outdoor			
°F	<10°	10°-90°	>90°
Pa.	-2.5	(°F Out / 40) - 2.75	-0.5
IWC.	-.010	(°F Out / 10,000) - 0.011	-.002

Typical Ranges for Gas Burning Appliances		
Performance Indicator	SSE 80+	SSE 95+
Carbon monoxide (CO) ppm	≤ 100	≤ 100 or PMI
Stack temperature °F	325° - 450°	90° - 120°
Temperature Heat Rise °F	40° - 70°	45° - 70° or PMI
Oxygen (O ₂) %	4 - 9%	4 - 9%
Natural gas pressure output at manifold - Inches of Water Column (IWC)	3.2 - 3.9 IWC	3.2 - 3.9 IWC
Propane pressure output at manifold (IWC)	10-11 IWC	10 - 11 IWC
Steady-state efficiency (SSE)	82 - 86%	95 - 97%
Supply temperature °F	120° - 140°	95° - 140°

Typical Ranges for Oil Burning Appliances	
Performance Indicator	Flame Retention
Carbon monoxide (CO) ppm	≤ 100
Stack temperature °F	300° - 450°
Oxygen (O ₂) %	5 - 9%
Smoke Number	< 1
Oil pressure pounds per square inch (psi)	100 - 150
Over-fire draft	-0.2 IWC or -0.5 Pa
Flue draft	-0.4 to -0.1 IWC or -10 to -15 Pa
Steady State Efficiency (SSE)	≥ 80%

Comments: