



TIS PRO SERIES

OFF-Grid Series
No electricity needed

ATTENTION!

Installation and operation of heating boiler must be done only after attentive examination of the installation and operating manual. This manual applies to TIS PRO models of boilers regardless of their configuration and heating capacity.

Note: The manufacturer reserves the right to make changes in the boiler design and the related configuration, without impairing the consumer qualities.

- The boiler components are indicated in the attached packing list. When purchasing the boiler, the check with the seller its completeness and appearance. After selling the boiler, the manufacturer does not accept any claims on incompleteness or mechanical damage.
- Transportation of the boiler is carried out only in a vertical position.
- The boilers with automatic control unit must be grounded before operation.
- It is strictly forbidden to operate the boiler without a safety valve.
- The safety valve must be designed for pressure not exceeding 21 psi for open type systems and 26 psi for close type systems.
- It is strictly forbidden to install any shut-off valve between the relief valve and the boiler.
- It is not allowed to set the heat carrier temperature in the water jacket of the boiler above +185 ° F.
- The operating pressure must not exceed 15 psi for residential use.
- The maximum test pressure is 50 psi.
- Do not start the boiler in the absence of heat carrier or in case of its freezing.
- It is forbidden to leave the boiler with water at an ambient temperature below +41 °F.

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1 GENERAL PRODUCT INFORMATION

- 1.1 TIS PRO boilers are steel low-temperature hot water solid fuel boilers designed for heat supply of individual residential houses and other buildings equipped with open or closed heating systems with natural or forced of the coolant.
- 1.2 Boilers must be installed indoors with natural or forced ventilation, or outdoors under adequate protective covering.
- 1.3 Loading and fastening methods must ensure the complete safety of the boiler from any mechanical damage. Transportation of boilers is allowed by all modes of transport, provided that the product and packaging are protected from mechanical damage, exposure to atmospheric precipitation, in accordance with the rules for the transportation of goods applicable to each type of transport.

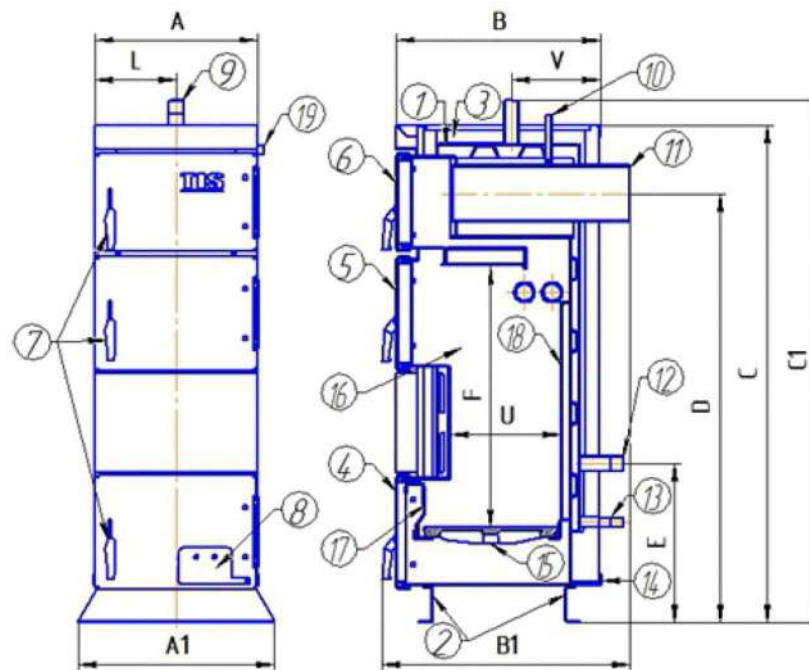
ATTENTION: Boiler transportation must be carried out only in a vertical position.

2 TECHNICAL CHARACTERISTICS

Boiler characteristics	UOM	PRO 11	PRO 15	PRO 20	PRO 25	PRO 30
Power (heating capacity)	kBTU	10–37	17–51	20–68	27–85	30–102
Maximum working temperature	°F	185	185	185	185	185
Maximum working water pressure	PSI	35	35	35	35	35
Minimum chimney draft	Pa	18	20	20	22	22
Coefficient of efficiency	%	86	86	86	86	86
Heating surface	ft ²	9.68	12.92	17.23	21.53	25.84
Minimum fuel consumption	lb/h	6.17	8.60	11.46	14.33	17.19
Water consumption through boiler	GPM	2.20	2.64	3.96	4.84	5.72
Water flow through boiler	Gal	7.13	11.09	11.62	11.36	11.89
Pressure Drop	PSI	1.45	2.18	2.18	2.18	2.18
Connections	inch	1 ½	1 ½	1 ½	1 ½	1 ½
Chimney diameter	inch	4.25	6.25	6.25	6.25	6.25
Boiler mass	lb	342	494	525	554	589
Boiler width (A)	inch	14.2	17.8	17.8	17.8	17.8

Boiler characteristics	UOM	PRO 11	PRO 15	PRO 20	PRO 25	PRO 30
Boiler depth (B)	inch	21.7	22.5	24.5	26.5	28.5
Boiler height (C)	inch	45.0	54.8	54.8	54.8	54.8
Dimension A1	inch	18.2	21.7	21.7	21.7	21.7
Dimension B1	inch	26.4	27.2	29.2	31.2	33.1
Dimension C1	inch	46.9	57.1	57.1	57.1	57.1
Dimension D	inch	36.7	46.7	46.7	46.7	46.7
Dimension E	inch	13.0	17.4	17.4	17.4	17.4
Dimension V	inch	5.60	9.85	9.85	9.85	9.85
Dimension L	inch	5.32	8.86	8.86	8.86	8.86
Fuel load	Gal	9.25	18.50	21.40	24.50	27.50
Firebox width	inch	9.1	12.3	12.3	12.3	12.3
Firebox depth (U)	inch	11.0	12.3	14.2	16.2	17.0
Firebox height (F)	inch	20.5	28.8	28.8	28.8	28.8
Dimension D	inch	36.7	46.7	46.7	46.7	46.7
Dimension E	inch	13.0	17.4	17.4	17.4	17.4

3 STRUCTURE AND WORKING PRINCIPLE



Note: The boiler configuration may differ from that shown in figure.

3.1 The boiler body is a heat exchanger (**pos. 1**), mounted on supports (**pos. 2**).

The causing is mounted on the boiler body from the outside.

The causing is isolated from the heat exchanger with insulation (**pos. 3**).

The doors are hinged to the front wall of the boiler body: the lower one (**pos. 4**) for maintenance, the middle one (**pos. 5**) for fuel loading and the upper one (**pos.6**) for cleaning the upper part of heat exchanger.

The handle (**pos. 7**), which ensures that the door is pressed against the boiler body by fixing it with a lock, is mounted on each of the doors.

The air supply hatch (**pos. 8**) is located on the lower door.

The supply pipe connection (**pos. 9**) is located on the top of the boiler.

In models of boilers, a submersible sleeve for automatics sensors (**pos. 10**) is next to the branch pipe of the supply pipeline.

The engine coolant (**pos. 11**), the return pipeline pipe (**pos. 12**), the drain pipe (**pos. 13**) and the grounding point (**pos. 14**) are located on the boiler rear wall.

An ash pan is supplied with the boiler, which must be removed from the boiler during the operation. Inside the boiler, in its lower part, stacked cast iron grates (**pos. 15**), which are the basis of the firebox (**pos. 16**), are placed on the grate shelves.

The number and size of the grates correspond to the size of the furnace, considering the required thermal gap between the grates.

The furnace flap, isolating the lower door from the furnace (**pos. 17**), is installed at the front of the boiler furnace.

At the rare part of the boiler furnace there is an air duct (**pos. 18**), which provides secondary air supply to the furnace for increasing combustion efficiency and reducing the concentration of harmful substances in the flue gases.

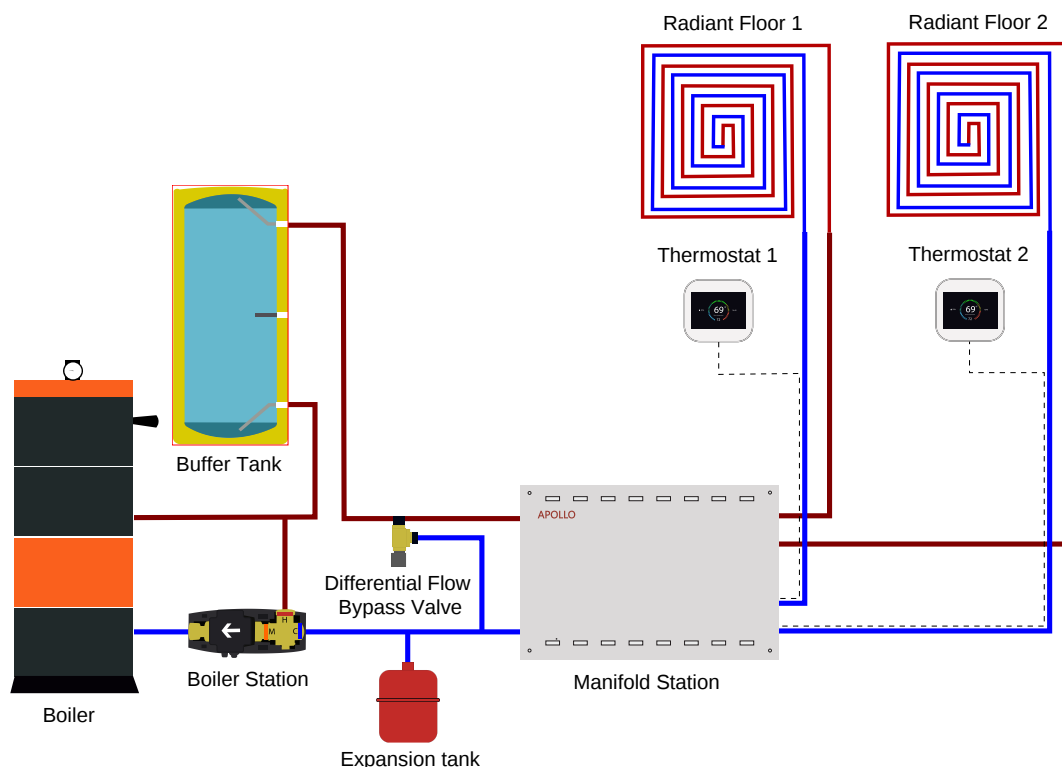
A thermometer is attached to the supply pipe and the mechanical draft regulator, which is connected by a chain to the hatch on the lower door, is screwed into the side pipe (**pos. 19**) on PRO boilers.

3.2 The ignition of the boiler is done manually.

3.3 After the ignition, the set temperature is maintained by a mechanical draft regulator, which opens the hatch on the lower door slightly.

4 RECOMMENDED WIRING DIAGRAM

ATTENTION: The boilers with an automatic control unit must be earthed before use.



Material List:

Boiler: PRO 11/30
 Buffer Tank: BF175
 Boiler Station
 APOLLO Manifold Station
 Wi-Fi Radiant Floor Thermostat
 Differential Flow Bypass Valve
 Expansion Tank

PEX Manifold: Connect your heating and cooling system using fan coil unit, radiant floor or less efficient radiator and baseboard.

Note: Installation can be done without a buffer tank, as long as there is a Heat Pump Zone or non-intermittent circulation provided by a secondary off-line power supply.

5 INSTALLATION AND CONNECTION TO THE HEATING SYSTEM

5.1 The boiler location, taking into account the space required for maintenance, must be as follows:

- There must be a space of at least 48 Inches in front of the boiler;
- The minimum distance between the uncertified stove with sheet metal jacket or casing for the back and side walls and any building walls made of combustible materials must be 36 Inches. If a heat shield protection is installed, with 1-inch spacers, the distance may be reduced to 18".

Note: For detailed information regarding clearances for uncertified units, see Appendix A

5.2 Requirements for installation and connection of the boiler:

- The boiler must be connected to the heating system by specialists with high qualifications and work experience, and in accordance with the project developed by thermal mechanics specialists.
- Boilers must be installed in an open or closed heating system with an open or membrane type expansion tank.
- The volume of the tank expansion depends on the volume of the heating system and is calculated while the heating system is developed;

ATTENTION: If an open heating system is used, there is a possibility of boiler corrosion.

- A safety valve must be installed between the boiler and the shut-off valve on the supply line.
- If the heating system provides for filling and feeding the boiler from the water network, a non-return valve must be installed in front of the shut-off valve of the feeding pipe.
- The testing of heating system (pipes, radiators) must be carried out with the boiler disconnected, and the pressure must not exceed the maximum operating pressure specified in the thermal mechanical part of the heating system design.

5.3 Requirements for the boiler electric part connection:

The boiler electric part connection can be carried out only by a person qualified as an electrician and authorized to perform such works; the boiler connection work must be performed in accordance with the design and estimate documentation.

5.4 Requirements for filling the heating system:

Filling the heating system with water, check that it is clean and transparent, without any impurities of aggressive substances and has hardness of no more than 2 mg-eq / l. Hard water causes scale formation in the boiler which reduces its heating capacity and can cause boiler premature failure;

ATTENTION: Boiler damage due to the scale formation is not be covered by warranty.

If the water hardness does not meet the required parameters, the water must be duly treated. The deposition of 0.04" of scale (limestone) reduces the heat transfer from the metal to the coolant by 10%.

During the entire heating season, it is necessary to maintain a constant volume of coolant in the system and monitor the pressure; adding water to the heating system must be done at the boiler temperature not exceeding 104 ° F; the system must be filled at a pressure not exceeding the maximum operating pressure of the boiler; it is forbidden to use liquids not intended for heating systems as a heat carrier; to improve the conditions for coolant natural circulation in the heating system, the boiler must be installed so that the return pipe is located below the heating radiators.

6 IGNITION PROCEDURE

ATTENTION: The first start of the boiler must be performed by certified specialists or, if they are not available, by an accredited service organization with which an appropriate contract must be concluded.

6.1 The boiler ignition order is the following:

- By opening the lower door, check the presents of draft in the chimney by bringing a stripe of paper to the boiler furnace (the stripe of paper must deviate towards the furnace);
- Adjust the draft regulator for TIS PRO boilers according to the attached instructions;
- By opening the middle door, fill the boiler furnace with fuel;
- Ignite the fuel with ignition material from above or below;

ATTENTION: Do not use flammable liquids for ignition. Wait until the fuel ignites, constantly monitor the ignition process, close the boiler doors tightly after the ignition process is completed;

6.2 If necessary, add the next portion of fuel taking precautions, particularly when opening the door, do not open it abruptly and do not get too close to the boiler.

ATTENTION: Improper adjustment of the air supply can lead to heavy smoke in the firebox. The combustion of the fuel (smoldering) is carried out with limited air supply inside of the boiler, so if the air volume in the firebox increases sharply and the boiler door is opened, the flue gases can ignite.

7 RECOMMENDATIONS FOR OPERATION

ATTENTION: The ash pan must not be inside of the boiler during its operation.

7.1 To avoid condensation, it is required to set and control the return water temperature at least no lower than 122°F, provided that the supply water temperature is at least than 149°F.

7.2 The operating pressure must not exceed 15 psi for residential use, and the water temperature inside the boiler must not exceed 185°F. The maximum test pressure is 50 psi.

7.3 To ensure proper operation and maintenance of the boiler during operation, it is necessary: use the boiler fully stocked (incl. the furnace pans); provide the necessary air flow for combustion in the room where the boiler is installed; remove ash from the boiler daily, check the boiler external condition, automation, sensors and electrical wiring; if necessary, clean the boiler from contamination.

ATTENTION: If there are signs of a malfunction in the electrical equipment operation (short circuit to the boiler body, broken wiring insulation, etc.), immediately disconnect the boiler from the electrical network and call a specialist from the maintenance or installation service.

Clean the boiler when it is cold, at least once a week. This includes cleaning the heating surfaces, the combustion and loading chambers, and the air channels in the combustion chamber with a scraper. Also, clean the upper heat exchanger from soot using a brush.

Soot and ashes sediments on the wall and smoke channels of the boiler reduce heat transfer. Sediments, gumming and condensation depend on the fuel used (they are higher when wood is burnt than when the coal is burnt), on the draft in chimney and operating mode. check the chimney condition and its cleanness on a regular basis;

ATTENTION: Soot is formed and moisture is condensed in the chimney during the boiler operation, which can lead to deterioration in draft and cause a fire hazard.

Ensure that all ventilation openings for air supply and exhaust are not reduced in cross section or blocked; use exhaust hoods for smoke removal in the furnace room; inspect the boiler before the heating season starts with the assistance of a service specialist or independently.

7.4 Switching off the boiler in case of an accident (danger of explosion, ignition, gas contamination, etc.):

- Turn off the power supply of the boiler automation;
- Carefully open the loading door so as not to burn yourself with a flame;
- Put out the fire with sand;
- Remove unburned fuel;
- Ventilate the room from smoke.

8 CHIMNEY REQUIREMENTS

8.1 The chimney attached to the boiler must meet the following requirements:

- The diameter of the chimney must NOT be less than the diameter of the boiler chimney pipe;
- The number of bends in the chimney pipe must be as small as possible;

- The chimney must be as smooth as possible inside, it must not contribute to the accumulation of moisture and soot, as well as it must not hinder the removal of gases and combustion products.

ATTENTION: A freestanding chimney must be double-walled (insulated) with a chimney in a brick channel -single-walled. The chimney is recommended to be made of acid-resistant stainless steel, according to EN 1856-1 «Chimneys. Requirements for metal chimney. Part 1. Chimney details», EN 1856-2 «Chimneys. Requirements for metal chimneys. Part 2. Metal lining and connecting pipes».

9 FUEL REQUIREMENTS

9.1 The boilers run on solid fuel (wood, coal, fuel briquettes).

Note: In order to comply with the requirements of the current environmental legislation, the combustion of peat (peat briquettes) may require the use of a particulate trap together with the boiler.

9.2 To achieve boiler maximum efficiency when burning wood, it is recommended to use firewood with a moisture content of no more than 20 % as fuel.

Note: The higher is moisture in wood is, the lower is its calorific value. The lowest moisture content in wood felled in early winter, as well as in its hardwoods. Firewood that has lain under a canopy for a year contains 20 - 25% of moisture, the one has lain for two years - 13 - 17%.

9.3 It is recommended to use long-flaming coal as fuel to achieve boiler maximum efficiency when burning the coal.

ATTENTION: The use of coking marks of coal and anthracite as fuel is prohibited.

9.4 Average coal calorific heat output is 6500 kcal or 26 kBTU.

10 SAFETY MEASURES

10.1 The installation and connection of boiler must meet the following requirements:

- The floor of the boiler room **MUST** be made of non-combustible material;
- There must be a free space of at least 48 inches in front of the boiler;
- All electrical connections must be performed only by qualified specialists;

- A safety valve must be installed in the heating system, designed for a pressure of no more than 21 psi for open-type systems and 36 psi for closed-type systems (maximum 15 psi for residential installations).
- It is forbidden to install any shut-off valve between the relief valve and the boiler.
- It is forbidden to make any structural changes to the boiler without the written permission of the manufacturer.

10.2 For safety reasons, when operating the boiler, the following requirements must be completed:

- Ensure that no children are near the boiler during its operation;

ATTENTION: Only persons who have reached the age of 18 can operate the boiler.

- Read the manual before using the boiler;
- Do not operate the boiler if the heating system is not fully filled with coolant;
- Do not use flammable liquids for boiler ignition;
- Do not set the temperature of the coolant in the boiler above 185 °F;
- Do not operate the boiler without the furnace damper;

ATTENTION: If the boiler doors are opened during its operation, and when there is still enough fuel for combustion, high temperature can burn a person and also damage boiler casing and its other parts.

- It is forbidden to operate the boiler when the doors are opened;
- It is forbidden to leave a working boiler unattended for a long time;
- Before cleaning the boiler or carrying out other maintenance work, it is necessary to turn off the power supply and wait till it cools down to a safe temperature.

ATTENTION: Wear personal protective equipment to avoid injuries and burns.

- Keep the room where the boiler is installed clean, and do not store flammable materials in it.
- It is forbidden to place fuel or other combustible materials closer than 48 inches to the boiler.
- Maintain the boiler in good technical condition. In case of necessary repair, use only spare parts provided or approved by the manufacturer;
- Monitor the reliability of tightening all threaded boiler connections;
- It is forbidden to carry out repairs and other similar actions on a working boiler.

10.3 Burning garbage, plastics or flammable liquids, toxic gases can be released. Use only recommended fuels. In case, there is a risk of explosion or fire, combustion of gaseous products or vapors, stop the operating of the heating boiler.

11 TYPICAL MALFUNCTIONS AND THEIR ELIMINATING METHODS

N°	Possible Malfunction	Malfunction Cause	Eliminating Method (done by the boiler owner)
1	Poor fuel combustion	Insufficient chimney draft	Clean the chimney from soot and ash, and check the correctness of its installation according to the instructions.
		Raw, low-quality fuel	Change fuel according to the manual.
2	The set temperature cannot be reached	The boiler is dirty	Clean the heating surfaces and boiler air ducts.
		The boiler regulator setting is incorrect	Carry out the setup according to the supplied manual.
3	Insufficient temperature in the heating system at high temperature within the boiler	Poor coolant circulation in the system	Check the heating system installation (presence of slope, absence of air pockets, etc.) and correct inconsistencies.
		Circulation pump does not work	Repair or replace the pump.
		There is coolant leakage in the system	Fix the leak and refill the system.
		There is air in the heating system	Bleed air from the system.
4	Smoke in the room	The chimney is not warmed up (cold air stagnation)	Restore draft by heating the chimney by burning paper, straw, sawdust, etc. in the cleaning hatch.
		Chimney blockage	Clean the chimney from soot and ash.
		Single-walled (non-insulated) free-standing chimney used	Insulate the chimney.
		Loss of flexibility in door sealing cord	Replace the sealing cord.
5	Water (condensate) inside the boiler	Condensate flows from the chimney	Check the condensate drain and insulate the chimney (if single-wall).

N°	Possible Malfunction	Malfunction Cause	Eliminating Method (done by the boiler owner)
		Low temperature of the heat carrier in the boiler	Maintain coolant temperature between 149 °F – 176 °F .
		Low return heat-carrier temperature (at boiler inlet)	Change the boiler connection scheme to increase return temperature (install a thermostatic three-way valve).
6	Grate failure	Non-recommended type of fuel used	Replace the grates and use the proper fuel as specified in the manual.
		Grates are dirty	Replace or clean the grates regularly.

ATTENTION: If the problem persists, contact the service center.

12 LIFESPAN AND DISPOSAL

12.1 Boiler service life is no less than 10 years if the requirements of this manual are observed.

12.2 Upon reaching the limit state of burning the heating surface (inner jacket) of the boiler, it must be disconnected from the heating system. After shutdown, the boiler does not pose a danger to life and health of people and the environment.

12.3 The boiler body, lining and grate are melted down.

13 WARRANTY OBLIGATIONS

ATTENTION: The manufacturer's warranty is valid only if the commissioning of the equipment is carried out by a certified specialist or an accredited service organization.

13.1 The warranty period for the boiler body is 60 months, for the associated equipment - 12 months from the date of boiler sale by a trade organization.

13.2 The warranty does not apply to consumable components: grate, ash pan, sealing cord, handles, fasteners, scraper, brush.

ATTENTION: When buying a boiler, check with the seller its completeness and appearance. After the sale of the boiler, the manufacturer does not accept claims for incompleteness and mechanical damage.

13.3 The warranty does not cover malfunctions resulting from:

- Using the boiler for other purposes or with violations of the requirements set forth in this manual;
- Mechanical damage to units and/or parts of the boiler; making changes to the design of the boiler without the consent of the manufacturer;
- Incorrect setting of the boiler operation parameters;
- Scale formation in the boiler;
- Damage in the electrical network;
- Carrying out repairs during the warranty period by unauthorized persons.

13.4 After detecting a malfunction, contact the service organization or the seller of the boiler immediately.

13.5 Warranty repair can only be carried out by service organizations accredited by the manufacturer.

When contacting a service organization to perform repairs, the customer is obliged to provide all conditions and access to the product to the employees of the service organization.

13.6 After the warranty repair is completed, the service organization fills in the warranty card.

The warranty card will be considered invalid if it lacks the necessary stamps, signatures and dates.

ATTENTION: Require dealers and service organizations to fill out warranty documents properly.

APPENDIX A

CLEARANCES FOR UNCERTIFIED WOOD – BURNING UNITS

1. Definitions

Uncertified Units: An uncertified unit is any wood-burning appliance that does not carry a certification label from a recognized testing laboratory specifying its installation requirements. These appliances must comply with the most stringent clearance rules.

Uncertified Stoves with Sheet Metal Jacket or Casing: An uncertified stove with a sheet metal jacket can be installed with a minimum clearance of 36 inches (900 mm) reduced from the 48 inches (1200 mm) required for a radiant model without a jacket. This jacket acts as a heat shield but is not certified, so installation still requires specific safety measures to create an air gap for ventilation and fire prevention, which is crucial for safety and insurance purposes.

Combustible materials: Any substance that can ignite or burn when exposed to heat or flame, including wood, drywall, plasterboard, fabrics, and plastics.

Non-combustible materials: Substances that do not ignite, burn, or release flammable vapors when exposed to high heat, such as brick, stone, concrete, metal, or certain glass types.

Heat Shield Wall Made of Metal: Sheet metal needs to be of 29 gauge minimum in thickness spaced out at least 21 mm (7/8) by non-combustible spacers.

Single-Wall Stove Pipe: Thin-gauge metal flue pipe used to vent smoke and gases from a solid-fuel-burning appliance to the chimney. It requires greater clearance from combustible materials due to its higher surface temperature.

Double-Wall Stove Pipe: Consists of two metal layers separated by an air gap, providing better insulation and lower external temperatures. This design allows for reduced clearances from combustible materials and improved draft efficiency.

2. Standard Clearances for Uncertified Stoves with sheet metal jacket or casing (Without Protection Wall)

For uncertified appliances installed near combustible walls or ceilings, the minimum required clearance is:

- 36 in. (900 mm) — from all sides of the appliance (back, sides and corners).
- 48 in. (1219 mm) — from front of the stove.
- 84 in. (2130 mm) — minimum ceiling height, measured from floor to ceiling.
- 6 in. (150 mm) — from double-wall chimney pipe to combustibles.
- 18 in. (450 mm) — from single-wall chimney pipe to combustibles.

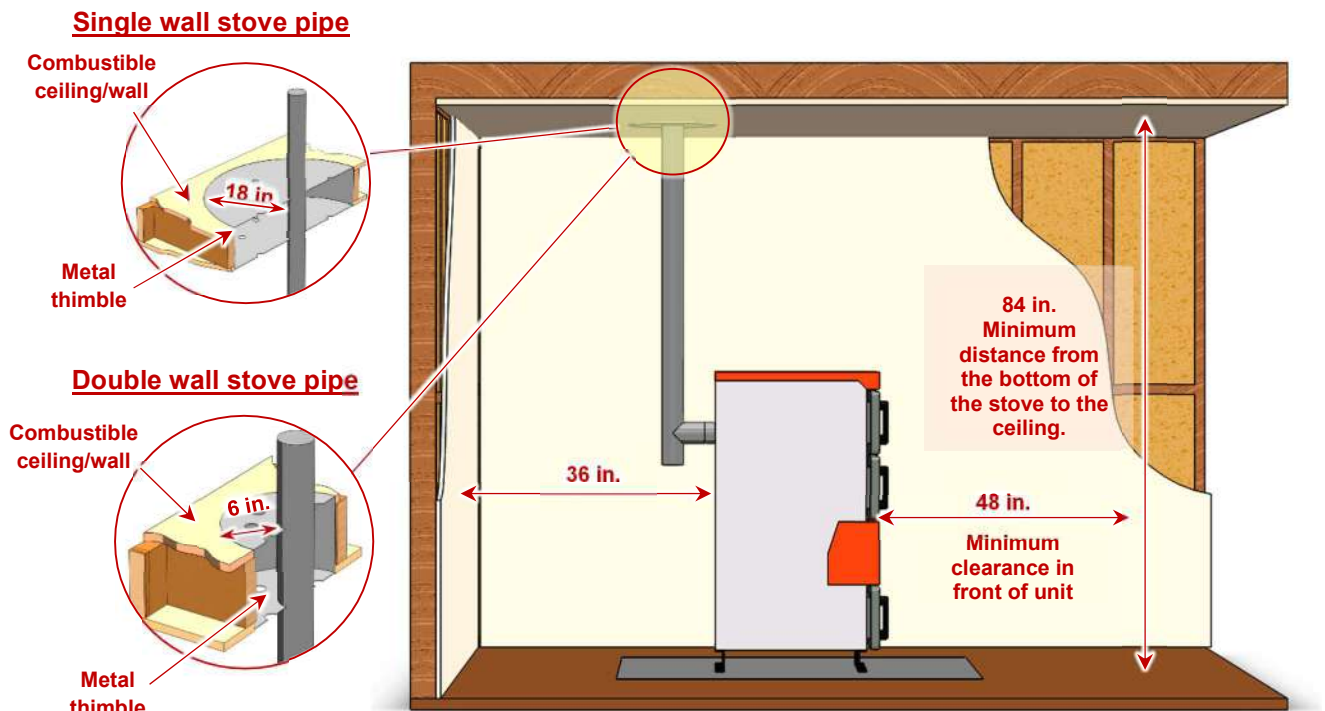


Figure 1 – Minimum clearances for uncertified stove with sheet metal jacket or casing (no protection wall)

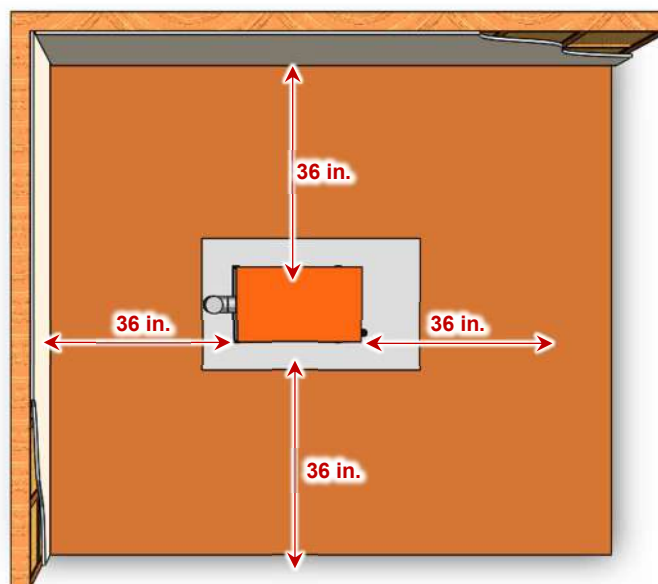


Figure 2 – Clearance to Combustible Walls uncertified stove with sheet metal jacket or casing (no protection wall)

3. Clearances for Uncertified Wood Stove Units with a Protection Wall

When a properly constructed 29-gauge sheet metal heat shield is installed with a 1 in. (25 mm) air gap, clearances may be reduced under CSA B365 rules.

Heat Shield Construction Requirements

- Minimum air space between shield and wall/ceiling: 1 in. (25 mm).
- Clearance at bottom of shield: 1–3 in. (25–75 mm).
- Clearance at top of shield: minimum 3 in. (75 mm).
- Shield must extend:
 - 20 in. (500 mm) above the top of the unit.
 - 18 in. (450 mm) beyond each side of the unit.
- Ceiling shields: maintain 3 in. (75 mm) edge clearance.
- Mounting hardware must allow full vertical ventilation and not transfer heat directly to combustibles.

Functional Principle

The heat shield creates a ventilated air space, allowing heat to dissipate before reaching combustible surfaces. This reduces the minimum required clearance safely.

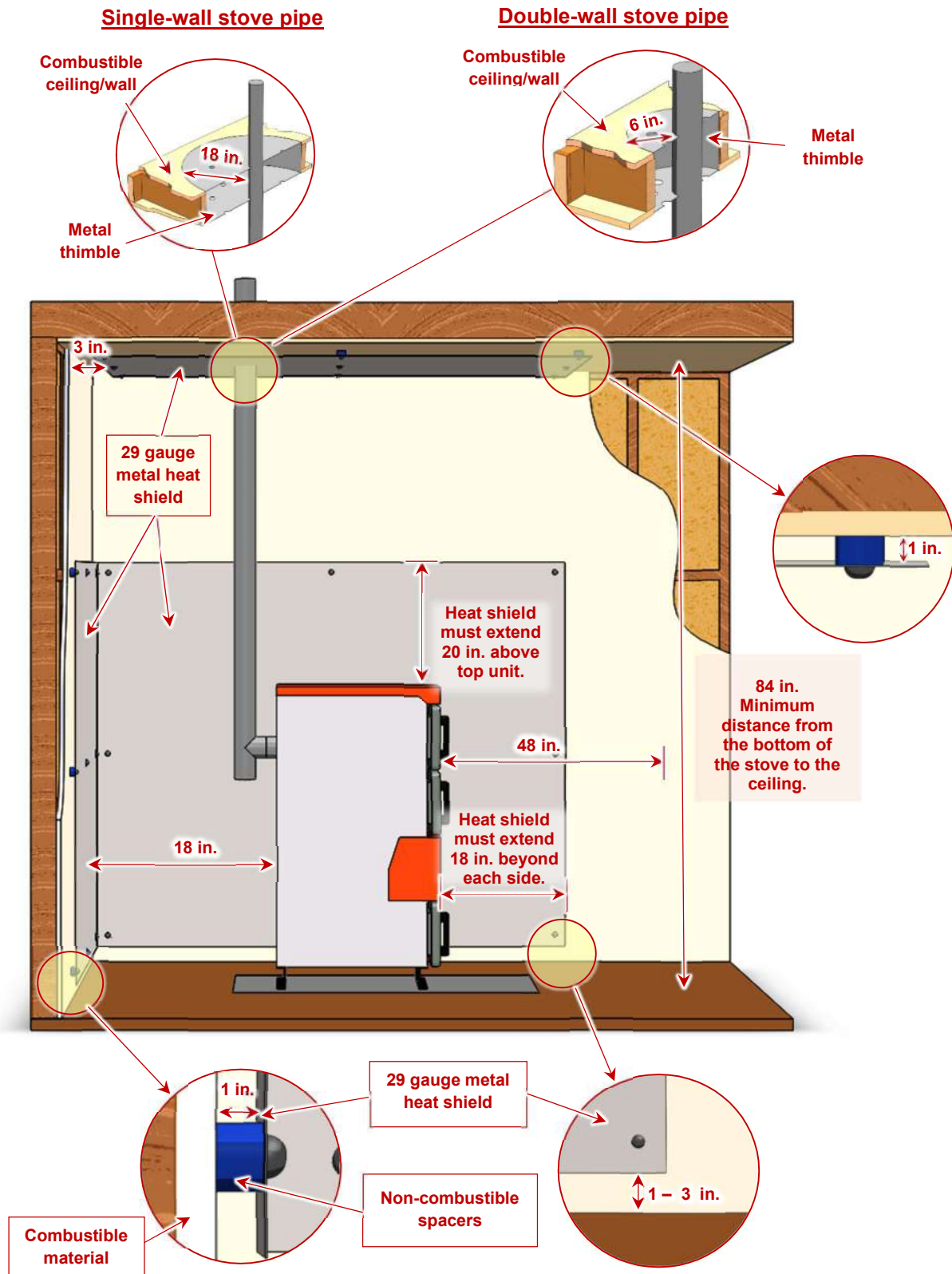


Figure 3 – Minimum clearances for uncertified stove with sheet metal jacket or casing (with protection wall)

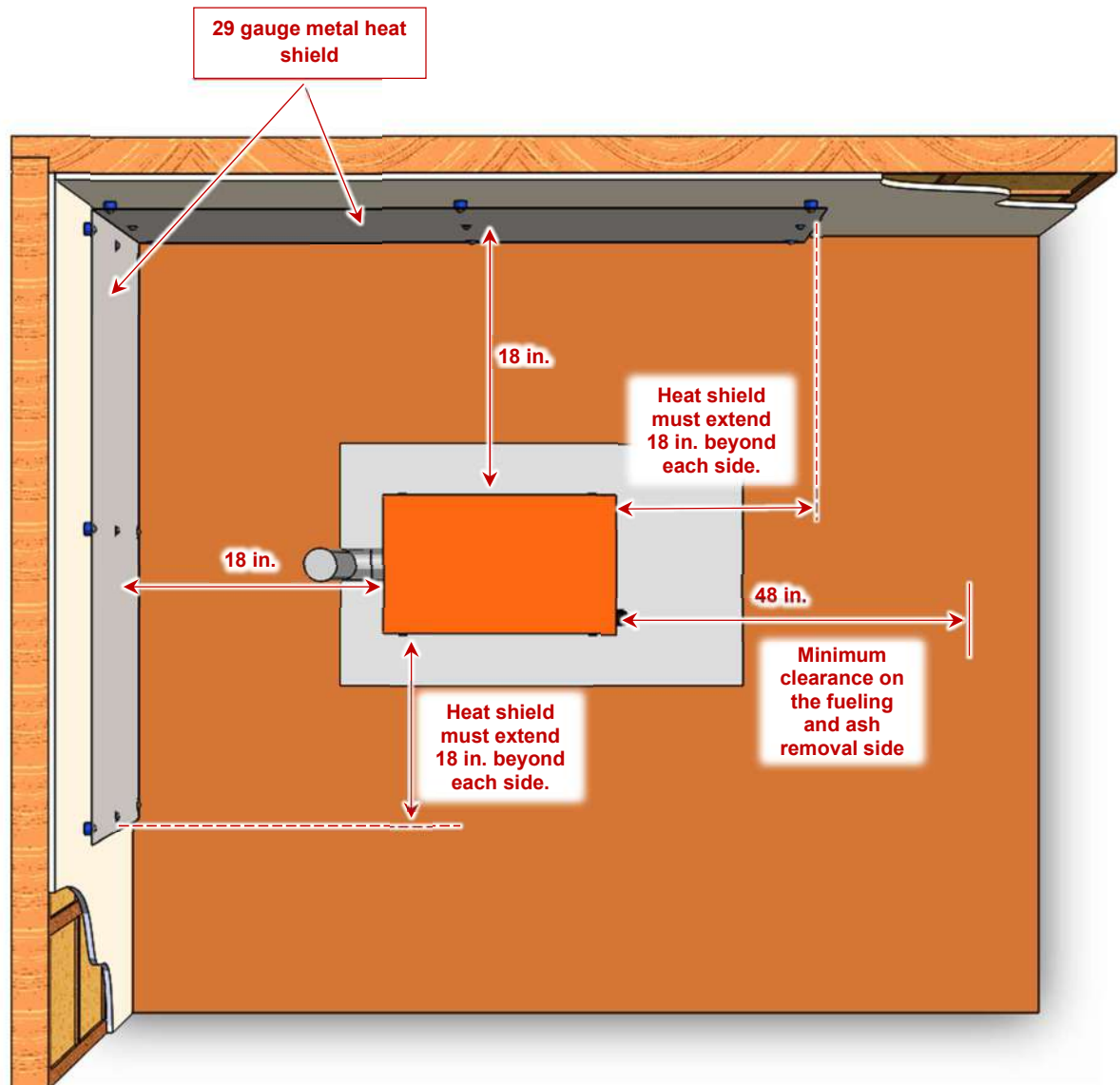


Figure 4 – Clearance to Combustible Walls for uncertified stove with sheet metal jacket or casing (with Protection Wall)

4. Floor Protection

Ensuring proper floor protection for uncertified wood stove the floor must be protected with two elements:

1. **Floor Pad (Ember Protection):** Protects against live embers and sparks that may fall during fire tending or ash removal.
 - The floor pad must be made of continuous non-combustible material (e.g., ceramic tile, flagstone, brick, or block).
 - It must extend 18 in. (450 mm) beyond any side with a loading door and 8 in. (200 mm) beyond all other sides.
 - All joints between tiles or stones must be properly grouted or mortared to prevent debris accumulation and ensure a continuous surface.

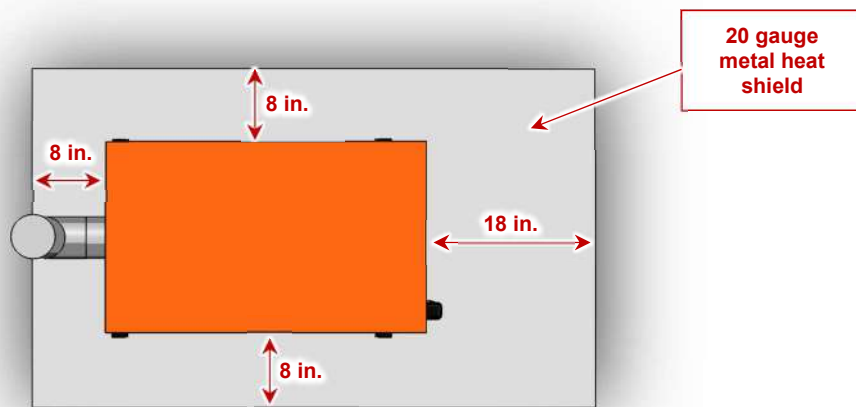
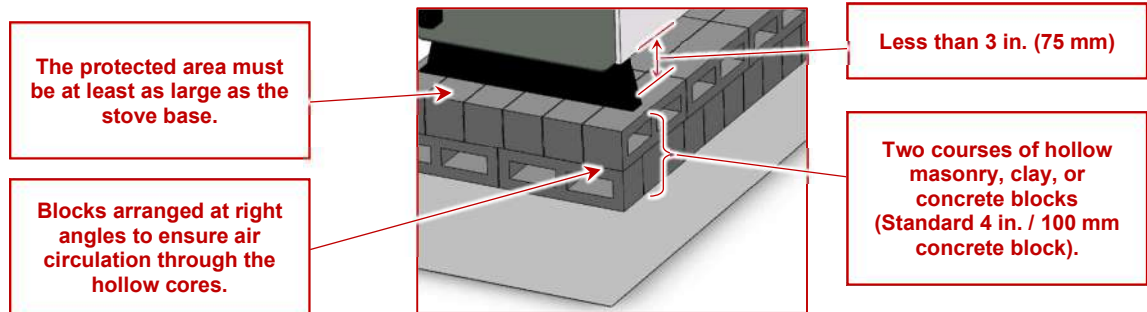


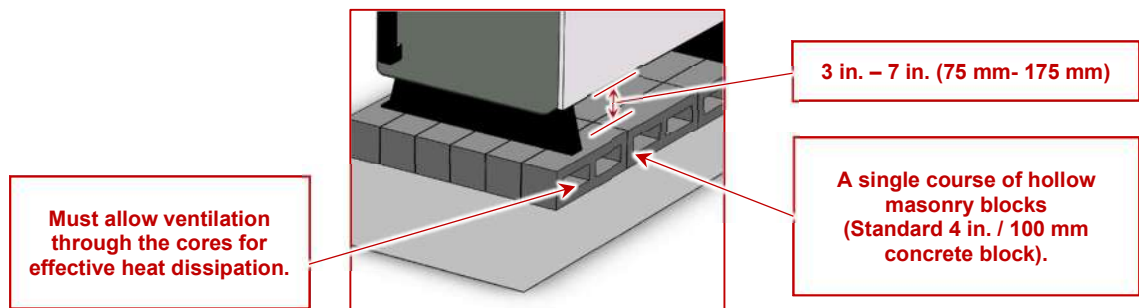
Figure 5 – Floor Pad Dimensions for Uncertified Units (Ember Protection)

2. **Heat Shield or Thermal Protection (Overheating Protection):** Prevents the floor from overheating due to heat radiation from the stove's base. The required construction depends on the clearance between the bottom of the appliance and the floor.

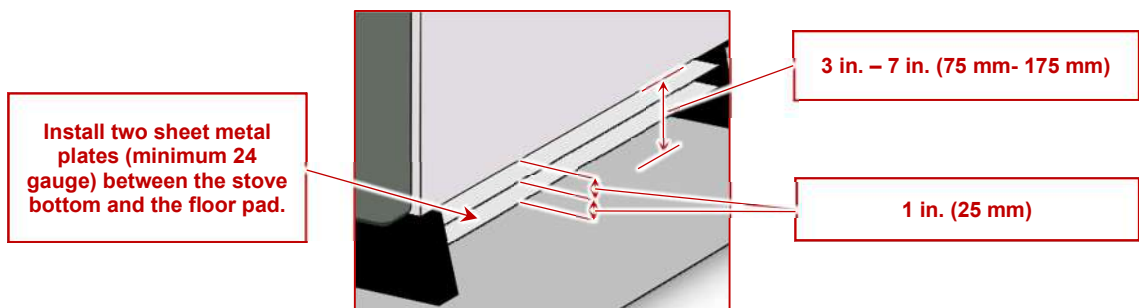
Option 1 – Clearance less than 3 in. (75 mm).



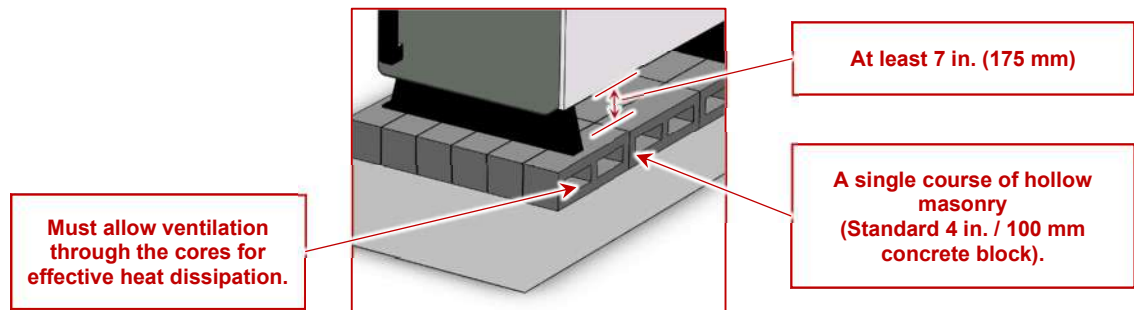
Option 2.1 – Clearance between 3 in. (75 mm) and 7 in. (175 mm) – Hollow Masonry



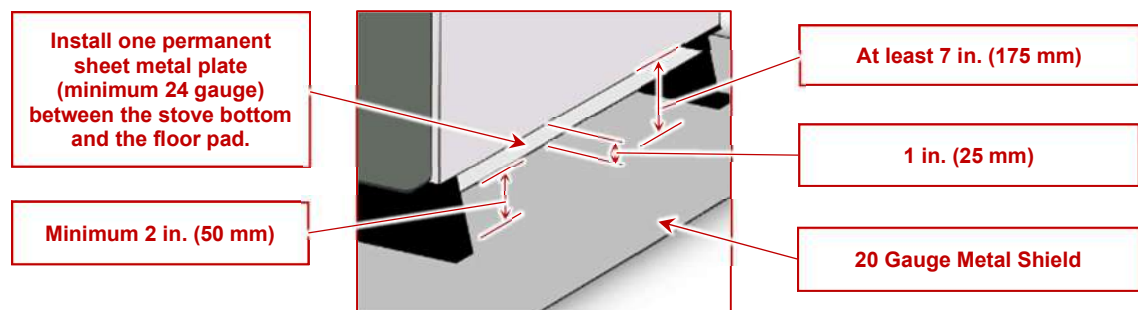
Option 2.2 – Clearance between 3 in. (75 mm) and 7 in. (175 mm) – Metal Plates



Option 3.1 – Clearance greater than 7 in. (175 mm) – Hollow Masonry



Option 3.2 – Clearance greater than 7 in. (175 mm) – Metal Plates



5. Summary

Summary of Clearance and Floor Protection Requirements for Uncertified Stove with Sheet Metal Jacket or Casing – Burning Units

Requirement	Without Wall Protection	With Wall Protection (29-Gauge Metal Heat Shield)	Notes
Ceiling Clearance	60 in. (1500 mm)	84 in. (2130 mm) From the bottom of the stove to the top of the ceiling.	No reduction permitted under 84 inches ceiling height. Heat shield must extend 20 In. above stove
Side / Back Clearance	36 in. (915 mm)	18 in. (450 mm)	Heat shield must extend 20 in. above and 18 in. beyond appliance sides
Front Clearance (Fueling & Ash removal side)	48 in. (1200 mm)	48 in. (1200 mm)	No reduction permitted
Single-Wall Stove Pipe	18 in. (450 mm)	18 in. (450 mm)	Must use non-combustible thimble through walls/ceilings
Double-Wall Stove Pipe	6 in. (150 mm)	6 in. (150 mm)	Certified double-wall only
Floor Pad (Ember Protection)	Extend 18 in. (450 mm) in front of loading door and 8 in. (200 mm) on other sides	Extend 18 in. (450 mm) in front of loading door and 8 in. (200 mm) on other sides	Must be continuous non-combustible surface
Thermal Floor Protection (Overheating Protection)	Required (depends on clearance under stove)	Required (depends on clearance under stove)	Options described below

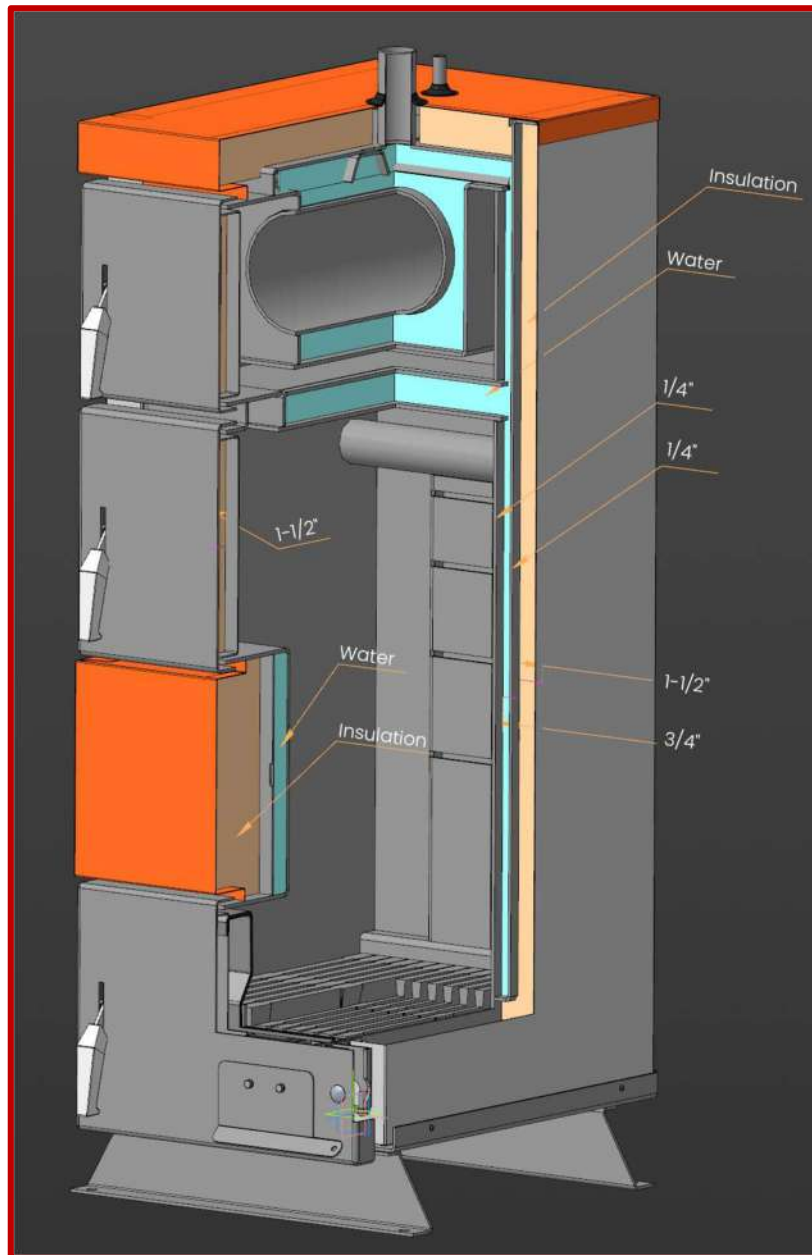
Floor Protection Options (Thermal Overheating Protection)

Clearance Under Stove	Protection Option	Description
Less than 3 in. (75 mm)	Option 1	Two courses of hollow masonry/concrete blocks (100 mm thick), arranged for airflow
3–7 in. (75–175 mm)	Option 2.1	Single course of hollow masonry units with ventilated cores
	Option 2.2	Two sheet metal plates (min. 24 gauge), spaced 1 in. apart
More than 7 in. (175 mm)	Option 3.1	Single course of hollow masonry units with ventilated cores
	Option 3.2	One permanent sheet metal plate (min. 24 gauge), 2 in. above floor pad and 1 in. below stove bottom

APPENDIX B

FIRE SAFETY RATING

Boiler Internal Section View:



Understanding Material Fire Safety Ratings for Wood Boiler Installations

When installing a wood boiler, it's crucial to consider the fire safety ratings of all materials used in the system, particularly those near the heat source. These ratings, often determined by standardized tests like ASTM E84 & E119, assess the material's fire performance characteristics and help ensure the overall safety of the installation.

Class A: These materials exhibit the highest fire resistance, with a flame spread index of 0-25.

Class B: These materials have a flame spread index of 26-75 and offer moderate fire resistance.

Class C: These materials have a flame spread index of 76-200 and are the least fire-resistant.

Material	Thickness	Class Rating
Mineral Wool Insulation	1 ½"	Class A1
EN 10051/10 Mild Steel	¼"	Class A*

*Subject to individual material tests.

APPENDIX C

FIRE IGNITION PROCEDURE

1. Preparation

- Check that the unit, chimney, and expansion tank are properly installed and filled.
- Open all air inlets and verify good draft.
- Clean ash and check the pressure relief valve.

2. Fuel Loading

Wood / Biomass Units: Load small kindling and dry wood at the bottom, then place medium logs above. Do not overfill.

Pellet Units: Fill the pellet hopper using a clean, non-combustible container and close the lid securely.

3. Ignition Sequence

1. Open the combustion door (middle door) slightly to allow airflow.
2. **Manual Models:** Light the paper or fire starter under the kindling using a long match or lighter.
Automatic Models: Press the Start button on the control panel to activate the igniter and feeder.
3. Wait until the flame stabilizes (typically 3–5 min for manual, 5–8 min for pellet).
4. Close the door firmly and monitor the chimney draft—steady, light gray smoke indicates proper combustion.
5. Once the temperature reaches 140–160 °F (60–70 °C), verify circulation pump activation.

4. Combustion Regulation

- Adjust air and draft for a bright, steady flame.
- Maintain a stable fuel load.
- Empty the ash tray regularly.
- Never use flammable liquids to start the fire.

5. Operation Notes

- Maintain a consistent fuel load during use.
- Do not open the combustion door when the fan is operating.
- Empty the ash pan regularly to prevent airflow restriction.
- Never use gasoline, kerosene, or alcohol to ignite the boiler.
- Ensure ventilation and keep combustible materials away from the unit.

6. Shutdown and Re-Ignition

- Allow the fire to burn out naturally; do not use water to extinguish it.
- After the unit cools below 100 °F (38 °C), clean the ash tray and heat-exchange surfaces.
- For re-ignition, repeat steps 1 – 3. Ensure all sensors and water levels are correct before starting again.

Safety Reminder

- Always perform ignition under supervision.
- Keep a dry chemical fire extinguisher nearby.
- Never bypass or disable safety devices.



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