



TIS UNI SERIES

Attention !

Begin installation and operation of TIS UNI heating boiler only after careful review of this manual.

- *Avoid excessive pressure in the boiler above 36 psi.*
- *Do not leave the boiler with water at an ambient temperature below +41 °F.*
- *Do not start the boiler in the absence of water or if water is frozen in it.*
- *Never use the appliance without a relief valve.*
- *The operating pressure must not exceed 15 psi.*
- *The maximum test pressure is 50 psi.*
- *This manual applies to all models of boilers TIS UNI*
- *Upon buying the boiler, new owner should check thoroughly the condition of the boiler.*
- *After sale the distributor will not accept claims on incompleteness or mechanical damage.*

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Note: The manufacturer reserves the right to make changes in the construction of boilers, without impairing the quality of the user.

1.0 Product Overview

- 1.1 The boilers are designed for heating individual houses and communal buildings with hydronic equipment for natural or forced circulation, in open and closed heating systems, in compliance with paragraph 7.0
- 1.2 The boilers are design for temperate and cold climatic zones. The boiler must be installed indoors with natural or forced draft.
- 1.3 Transportation boilers allowed all modes of transport, subject to the protection of the product and packaging from mechanical damage, exposure to precipitation, according to the rules of carriage of goods, operating in each type of transport.
- 1.4 The process of loading and securing of loading places must ensure the complete safety of the boiler against mechanical damage.

TRANSPORT ON VEHICLE ONLY IN VERTICAL POSITION!

2.0 Technical Data: Minimum Efficiency 82%.

Boiler	Unit	UNI 15	UNI 35	UNI 55	UNI 95	UNI 150	UNI 300	UNI 500
Capacity	KBTU	27 - 68	51 - 137	85 - 205	154 - 338	185 - 512	320 - 1000	545 - 1700
Heat area	ft ²	2500	4000	6000	8000	12000	17000	24000
Water volume	gal	21	30	40	48	112	315	515
Connection	inch	1 ½	1 ½	2	2	2	3	3
Chimney	inch	6	8	8	8	8	12	12
Firebox size	gal	25	44	58	81	159	278	382
Log length	inch	20	26	28	34	52	68	90
Boiler width	inch	24	28	30	30	30	39	39
Boiler depth	inch	25	34	36	44	63	81	105
Boiler height	inch	55	55	65	66	67	84	84
Boiler weight	lb	716	992	1224	1490	2000	6050	7800

* Weight and dimensions may vary by + - 5%

3.0 Delivery Include:

ID	Name	UNI
1	Boiler Assembly	1
2	Controller	1
3	Fan	1
4	Ash Pan	1
5	Step-up Transformer	1
6	Relay 220VAC	1
7	Temperature Gauge	-

4.0 Safety

4.1 Boilers comply with all the requirements, ensuring the safety of life and health of user if all the requirements for installation and operation have been follow.

4.2 Recommendation:

- Do not open the doors for long time while the boiler firing
- Do not use flammable liquids to start fire
- Do not allow children to operate the boiler without adult supervision
- Pressure relief valve discharge drainage must be position so to be safe in case of opening
- Set flow temperature to a maximum of 185 °F.
- The maximum operating pressure must not exceed 15 psi.
- Do not operate the boiler without water or partially filled
- Do not leave the boiler in operation without supervision during the first firings after installation

4.3 The combustion of waste, plastics or flammable liquids can release poisonous gases.

Use only recommended fuels. If there is danger of explosion, fire, the emanation of the combustion gas indoor or steam; Stop the boiler.

WARNING : To prevent injuries or burns, use personal protective equipment.

WARNING DANGER : When opening the boiler doors during operation when the fuel combustion has quite unnecessarily high temperatures can cause a person injured in a burn and damage the lining of equipment and other parts of the boiler.

WARNING: Improper adjustment of air supply can lead to a strong smoke disabling the full combustion. Combustion with dysfunctional limited air supply can ignite on fast increase of air in the furnace at the time of opening the door of the boiler.

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5.0 Chimney Requirements:

The diameter of the chimney must not be less than the diameter of the flue outlet of the boiler.

The chimney is recommended to be of stainless steel 316 with acid-resistance (single wall in a brick channel, double-walled (insulated) if exposed

STB according to EN 1856-1-2013 "Funnels. a metal chimney requirements.

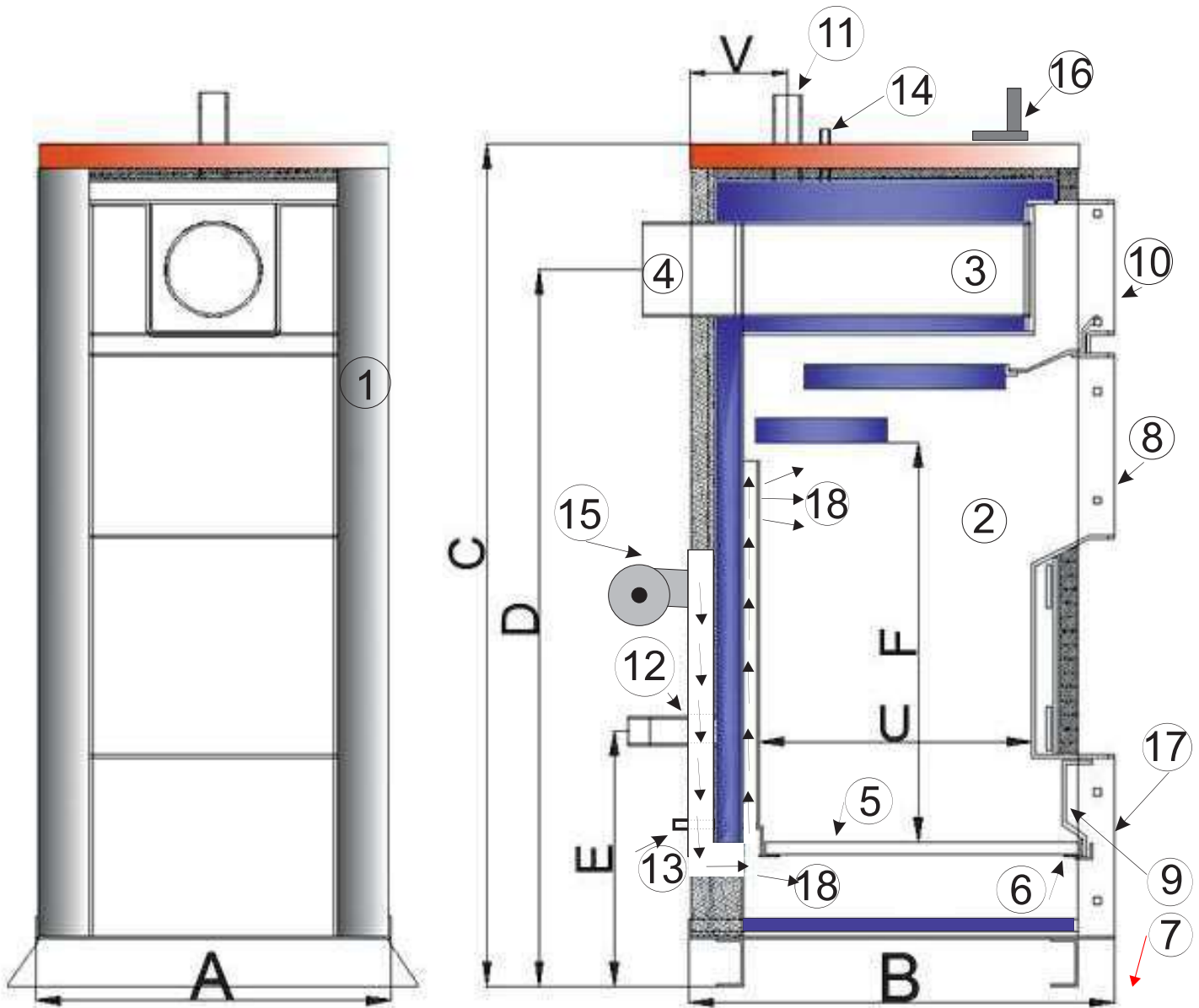
Part 1. Details of chimneys. "

STB 1856-2-2013 "Funnels. a metal chimney requirements.

Part 2.EN Metal liners and connecting pipes. "

6.0 Structure and operation of the boiler.

Picture 1



Note: Ash Pan goes outside the unit, at the front of the ash door

6.1 The boiler components

#1 Body , #2 Furnaces, #3 Flue Gas 3rd Pass, #4 Chimney

At the bottom of the furnace: #5 Grate set, #6 Support, #7 Ash Pan

#8 Fuel Loading door, #9 Ash removal door, #10 Service flue gas door, #11 Supply pipe connection, #12 Return pipe connection, #13 Drain pipe, #14 Temperature sensor well, #15 Fan, #16 Controller, #17 Ash door

#18 Direction of air during combustion

6.2 Boilers are universal and work with all solid fuel (wood, coal, peat, mulch etc.)

6.3 When installing the automatic control unit is connected to its network.

6.4 Lighting the boiler:

- The first firings of the boiler must be carried out by trained installer or service technician.
- Check the draft in the chimney.
- Set up the controller according to the instructions.
- Fill the furnace with fuel
- Make the ignition of the material from the top or from the bottom.
- Wait for the fuel to inflame when the combustion process is monitored constantly, then close the door tightly.
- Activate the function in controller "Start Fire"
- As needed, add more fuel, after turning the Fan OFF and observe the precautions.

NOTE: In order to achieve high-quality and reliable operation of your boiler the parameters of controller must be optimize, it is necessary to agree with a professional instruct by your local distributor.

7.0 Installation of boiler and heating system

The boiler must be connected according to the project developed by a specialists in hydronic heating system. The specialists must have the requisite qualification and experience. In order to avoid condensation, in case of direct circulation from heating system without thermostatic valve, with return below 122 °F the supply must be set to at least 149 °F.

7.1 Filling of the heating system.

When filling the heating system with water, you need to check that it is clean and transparent, without any impurities aggressive substances, hardness of not more than 2 ppm. Hard water causes scale on surface which reduces heat exchange (reducing efficiency) and can cause premature failure of the boiler.

Note: Damage to the boiler due to the formation of scale is not covered by warranty.

If the water hardness does not meet the required parameters, the water should be treated. 1 mm of scale deposit reduces heat transfer from the metal to water by 10%.

Throughout the heating season, it is necessary to monitor the pressure in the system. Air must be remove upon the first weeks of operation.

To improve the conditions of the natural circulation of water in the heating system, the boiler will be installed so that the return water pipe placed below the radiator.

7.2 Boiler necessary maintenance space.

Frontage minimum 4'.

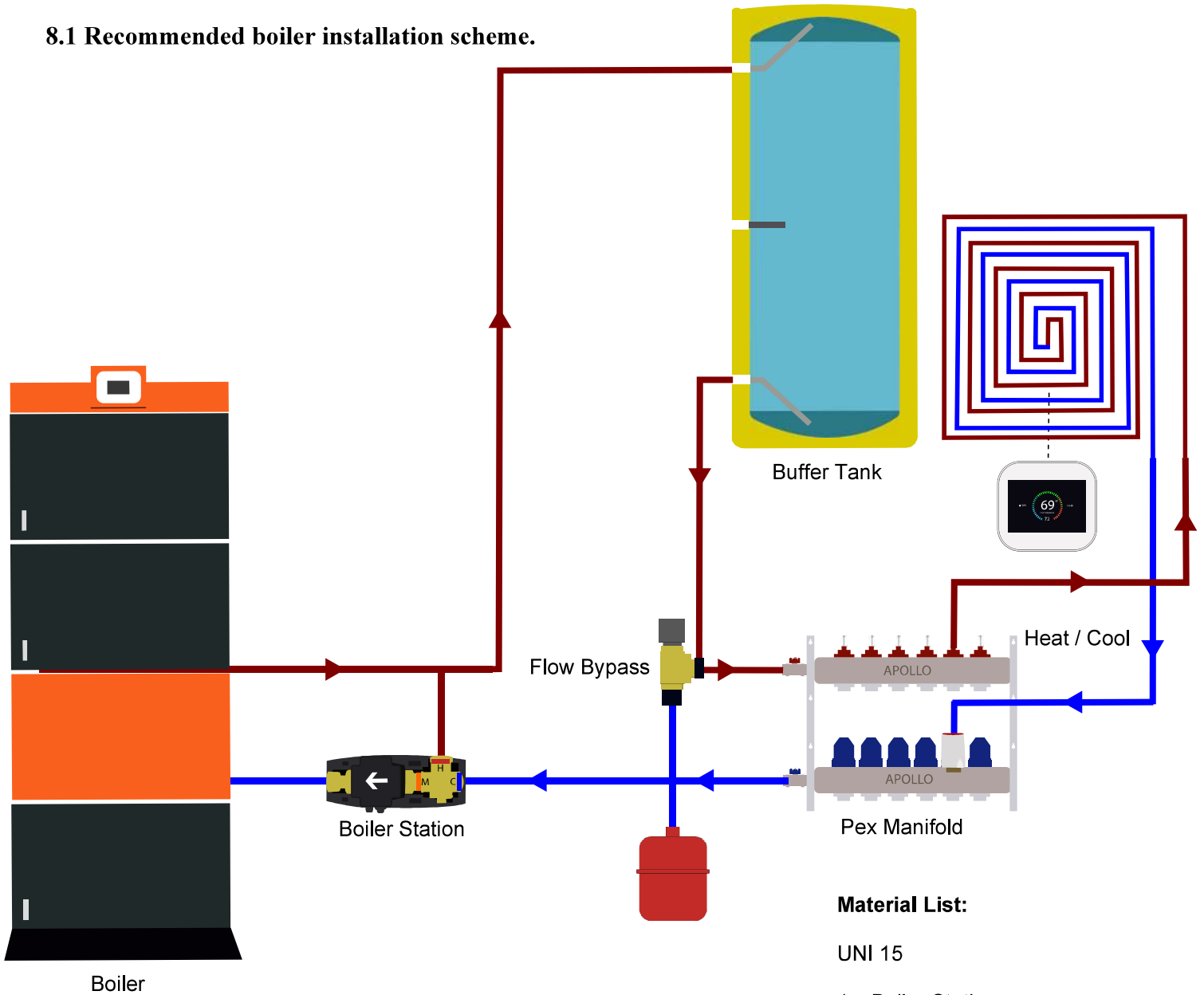
Rear wall minimum 2".

On one side, leave room for access to the rear of the boiler of at least 16".

8.0 Fuel storage

- Do not stack the fuel near the boiler at a distance of less than 4'.

8.1 Recommended boiler installation scheme.



PEX manifold: Connect your heating and cooling system using fan coil unit, radiant floor or lesser efficient radiator and baseboard

Material List:

UNI 15

1 x Boiler Station

1 x Pump

1 x Apollo Pex Manifold

n x Actuators

n x Wi-Fi Radiant Thermostat

1 x BF650

1 x DHW250

1 x 3 Way Motorized Valve

n = number of zones required to heat

9.0 Recommendations for installation and operation

- 9.1** On closed and open heating systems, boilers must be installed with an open or membrane expansion tank.
- 9.2** The volume of the expansion tank is dependent on the heating volume and is calculated in the design of the heating system.
- 9.3** The water temperature must not exceed 185 ° F and the maximum operating pressure must not exceed 15 psi. Safety relief valve must be installed. The maximum test pressure is 50 psi.
- 9.4** If using automatic make-up to the boiler it is necessary to install a check valve according to local regulations. The system should be filled at a pressure not exceeding the maximum working boiler pressure.
- 9.5** Heating system design and installation must be done by qualified professional. Electrical connections for boiler must be done by a qualified electrician.
- 9.6** If risk of explosion, ignition, gas contamination or fumes can stop the burning process
- Turn off the power of the controller
 - Open the loading door, so as not to create excess gas waiting combustion
 - Put out the fire with sand.
 - Remove unburned fuel.
 - Ventilate the room fresh air.

9.7 Shut down the boiler in case of a problem

For maintenance and operation of the boiler allowed a person familiar with the device and the rules of operation of this type of equipment.

Timely Inspect regularly, clean the boiler and chimney. Soot and ash deposits on the walls will reduces heat transfer and efficiency.

Deposits and gum formation by condensation depend on the fuel type (wood more then coal) of the chimney draft and the operation mode. We recommend boiler cleaning in middle winter at least once a week.

Every day, remove the ash from the boiler, check the external the state of the boiler body, the controller, sensors and wiring, clean of dust. Weekly clean and scrape the surface of furnace and of the loading chamber.

Clean air ducts in the combustion chamber with a suitable tool.

Clean using brush the top of the heat exchanger from soot

On all repair repair, maintenance, cleaning, etc... shutdown of the boiler from the mains.

If there is a fault in the electrical signs (.. circuit to the boiler body, the deterioration of wiring insulation, etc...), immediately disconnect the boiler from the power supply and call the after-sales service for repair.

Check the availability of draft in the chimney by PRESENT strips of paper to the ash pit (paper strip should deviate side of the ash). Make sure that the ventilation openings for inflow and exhaust have not been restricted or blocked

For best comfort and minimal fumes migration in house use chimney fan upon starting the boiler. As a second option, smoke hoods.

Filling of of fuel (wood, coal, briquettes, etc.) must be done before combustion.

9.8 Maintenance for the boiler and chimney

Note: The flue gas create soot and condensation that may lead to deterioration of joints. Maintenance must be done regularly. For safe and efficient operation of the boiler it is necessary to ensure the chimney sweeping. The inside of the chimney should be smooth, without condensation or and soot deposit zone for optimal draft without obstruction.

Deposition rate in chimney of soot, condensation and tar are dependent of the fuel used (wood has higher than coal combustion) and on the temperature of the boiler. The number of chimney bends should be as small as possible. When choosing a chimney consider compatibility with the boiler, type of fuel, ease of assembly and disassembly for maintenance and compliance with fire safety standards.

10.0 Fuel properties

Combustion heat of absolutely dry wood is practically independent of the type of fuel, and is equal to 8112 btu / lb, therefore, evaluating individual types of wood, it is necessary to pay attention to their relative weight. The weight of one cubic meter of wood of various type is as follow:

Oak	1540 lb
Birch	1410 lb
Spruce	990 lb
Pine	1010-1360 lb
Maple	1160-1440 lb
Alder	925-1410 lb

Higher moisture in wood, the lower his calorific value. The lowest moisture content to cut tree is in early winter. Firewood, laying for a year under a canopy, contain 20 - 25% moisture, two years 13 - 17%.

Wood humidity can be divided into 3 categories:

1. The room-dry wood, moisture content of 7% to 20%;
2. Air-dry wood, moisture content from 20% to 50%;
3. Driftwood, humidity 50% to 70%;

The volume calorific value of wood depending of type of moisture.

species	Calorific value kcal / dm, humidity%			Calorific value of a KWH / meter, humidity%		
	12%	25%	50%	12%	25%	50%
Oak	3240	2527	1110	3758	2932	1287
Larch	2640	2059	904	3062	2389	1049
Birch	2600	2028	891	3016	2352	1033
Cedar	2280	1778	781	2645	2063	906
Pine	2080	1622	712	2413	1882	826
Aspen	1880	1466	644	2181	1701	747
Spruce	1800	1404	617	2088	1629	715
Fir	1640	1279	562	1902	1484	652
Poplar	1600	1248	548	1856	1448	636

Calorific output for 2.2 lb .

Average coal calorific heat output is 6500 kcal or 25.79 kBTU

12.0 Warranty

The manufacturer provides a full guarantee of the product, according to the describe warranty inclusions. Commissioning of boiler must be performed by professional authorized by the manufacturer (accredited installer, service centers or representatives). In case of non compliance with these instructions, the guarantee will not be effective; Warranty claims will not be accepted. Each complaint should be immediately transmitted after fault detection, in writing, by contacting the distributor of your region.

ATTENTION:

Demand from your distributor and commissioning professional to correctly fill the warranty card.

12.1 Warranty Inclusions

the manufacturer, provides a guarantee on manufactured product

The manufacturer is liable under warranty only if a defect is found in the device itself

The manufacturer will decide to correct the defect or replace the unit

Warranty is only valid if properly filled warranty card with date of commissioning by the qualified installer

Warranty repairs are free of charge

Warranty repairs can only be performed by a specialized organization, the installer, service center or distributor, accredited by the manufacturer.

Warranty covers only the device installed in accordance with the instructions and rules specified therein

Warranty period for the boiler body 3 yrs on open systems and 10 yrs on close systems, controller and fan 1 yr
Warranty doesn't cover consumable material: sealing cord door, cast iron grate, handles, bolts, nuts, brush, scraper
Warranty stops in case of wrong installation or improper use of the device.

The distributor is not responsible for aesthetic appearance damage including during shipping; Mechanical damage (ex: broken handle, controller...) that impair the usage of the boiler the distributor will replace or repair accordingly

At the time of performing a warranty repair, by the service professional or distributor, the equipment must be cleaned of soot, tar and other contaminants.

The customer undertakes to provide all facilities and access to perform warranty and post-warranty repairs.

*** If using the boiler in an open heating systems the corrosion rate will be very fast and avoid warranty**

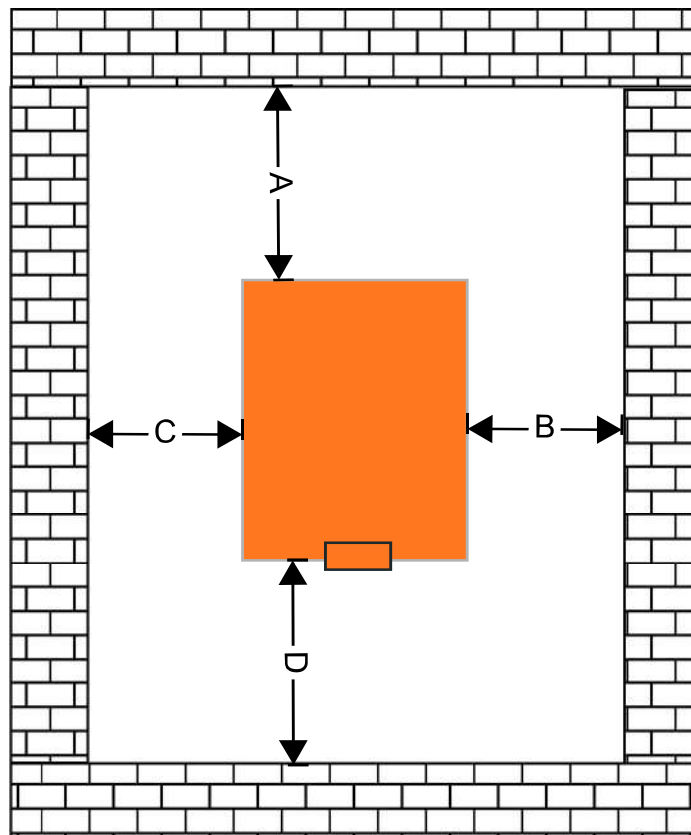
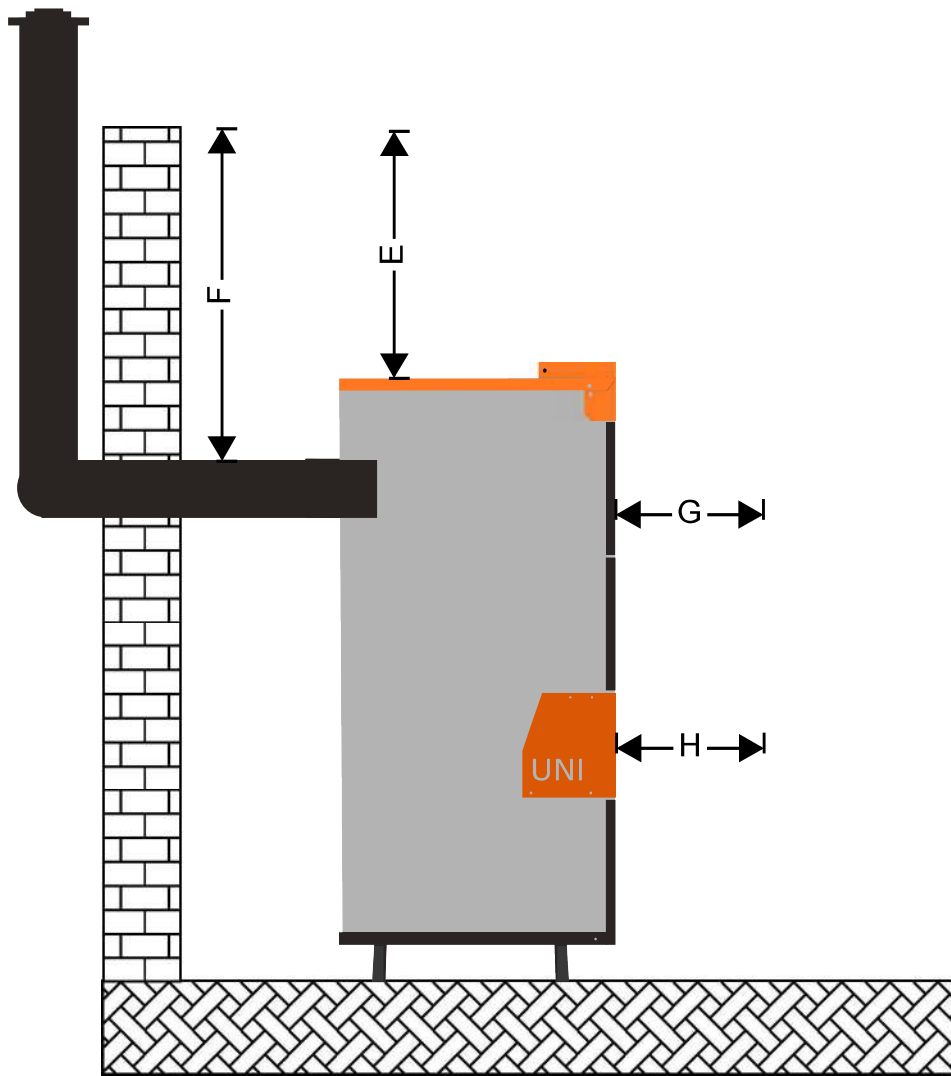
Boilers TIS UNI must be electrically grounded !

All installations must comply with applicable local building codes to ensure safety and performance. Clearance requirements for wood stoves and stove pipes vary by region; consult local regulations or a certified building inspector for guidance.

Maintain documentation of clearance distances and code compliance for insurance and reference purposes. Proper clearances are critical to system efficiency and occupant safety.

Note: Always verify clearance requirements based on pipe type (single-wall or double-wall) and installation location. When in doubt, seek professional consultation.

CLEARANCE FOR SAFETY & SERVICE			
Key	Reference	Required Distance	Notes
A	Backwall to Boiler	24"	Minimum incline of 3°
B	Sidewall to Boiler [R]	24"	Minimum distance
C	Sidewall to Boiler [L]	24"	Minimum distance
D	Front of Boiler	36"	Required distance for cleaning boiler
E	Celling to Boller	28"	Minimum distance for cleaning boiler
F	Combustible To Exhaust Pipe	12"	Minimum 6" for double-wall stove exhaust pipe
G	Combustibles to Boiler	12"	Minimum distance
H	Distance to Non-Combustibles	6"	Minimum distance for non-combustibles



Single-wall stove pipes are typically made from a thinner gauge of metal, making them more lightweight and affordable. However, their thinner construction also means they offer less insulation compared to their double-wall counterparts.

These pipes are ideal for installations where there is ample clearance from combustible materials. Because they do not have the insulating properties of double-wall pipes, they require more space from walls and ceilings to safely dissipate heat. This is a key consideration in smaller spaces or in homes where the stove is closer to walls or other potential fire hazards.

When choosing a single-wall pipe, one should look for features that indicate a higher quality, such as factory-welded seams. These seams are indicators of a robust construction, providing enhanced durability and safety. A well-constructed single-wall pipe with solid welding will be more rigid and less prone to warping or leaking over time.

Double-wall stove pipes are designed with an air-insulated layer between two layers of metal. This design significantly enhances their safety and efficiency. The air gap provides insulation, reducing the surface temperature of the outer pipe layer, which is a critical safety feature in closer quarters.

Advantages of the Double Wall Chimney

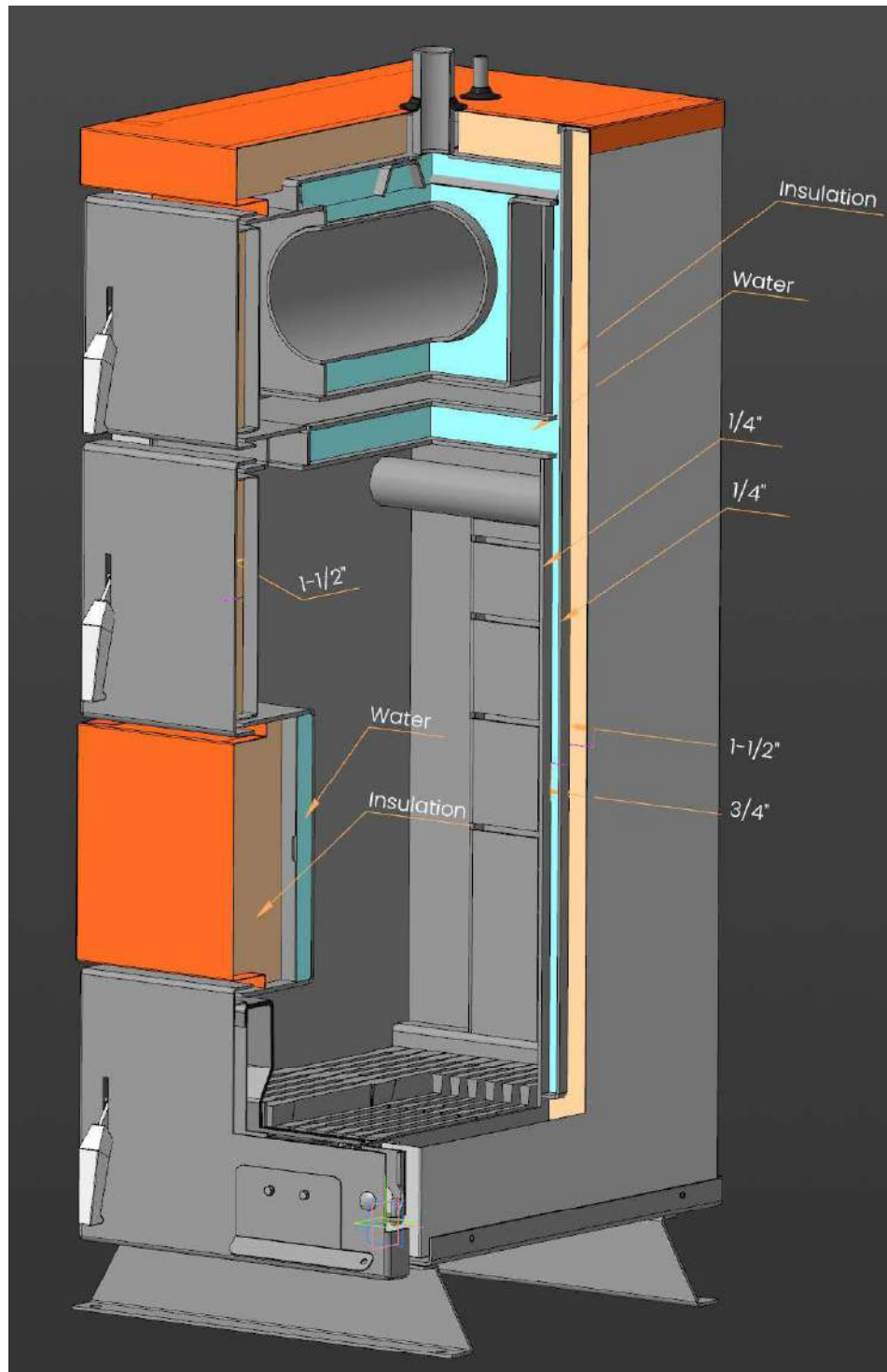
One of the main advantages of double-wall pipes is their lower clearance requirement from combustible materials. This feature is particularly beneficial in tighter installations or when the stove needs to be placed closer to walls. The reduced clearance is due to the insulating effect of the air gap, which keeps the outer pipe cooler.

The design of double-wall pipes helps to keep the heat within the pipe, improving the draft and efficiency of the stove. This can lead to more effective heating and can also reduce fuel consumption.

The inner layer of these pipes is often made of stainless steel, which is resistant to corrosion. This is especially important for the longevity of the pipe, as corrosion can lead to leaks and decreased efficiency.

In summary, when choosing between single-wall and double-wall stove pipes, consider the specific needs of your installation, such as space constraints and safety requirements. Both types have their advantages, but the right choice will depend on your individual situation and local building codes.

Boiler Internal Section View:



Fire Safety Rating

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.



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