

## Technical Datasheet



### Solo Plus

Solo Plus is a patented, wood-fired gasification boiler available in three sizes with outputs from 100,000 to 198,000 Btu/hr.

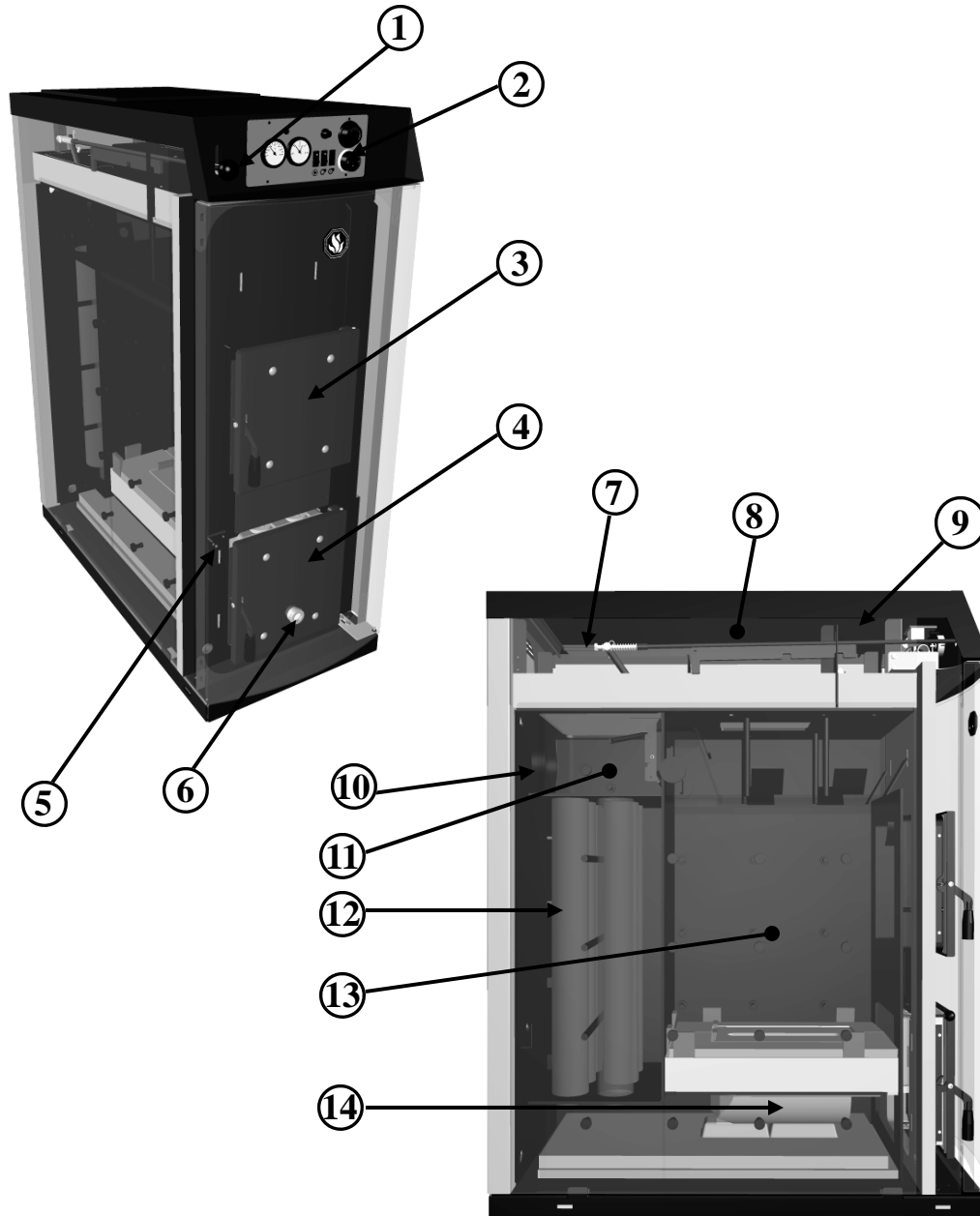


### Benefits at a Glance:

- Add on to your existing fossil-fuel-fired or electric heating system
- Can be used with hot water baseboard, radiant floor, or hot air systems.
- Overall efficiencies of 75-80%.
- Clean burn with virtually no smoke or creosote.
- Large easily accessible firebox.
- Easy to clean with very little ash.
- The internal boiler is made from 7mm thick plate steel.
- Constructed to design standard EN 303-5 and are designed for pressurized systems.
- Covered by a 20-year limited warranty.

# Boiler Information

## Boiler Cut-Away Section



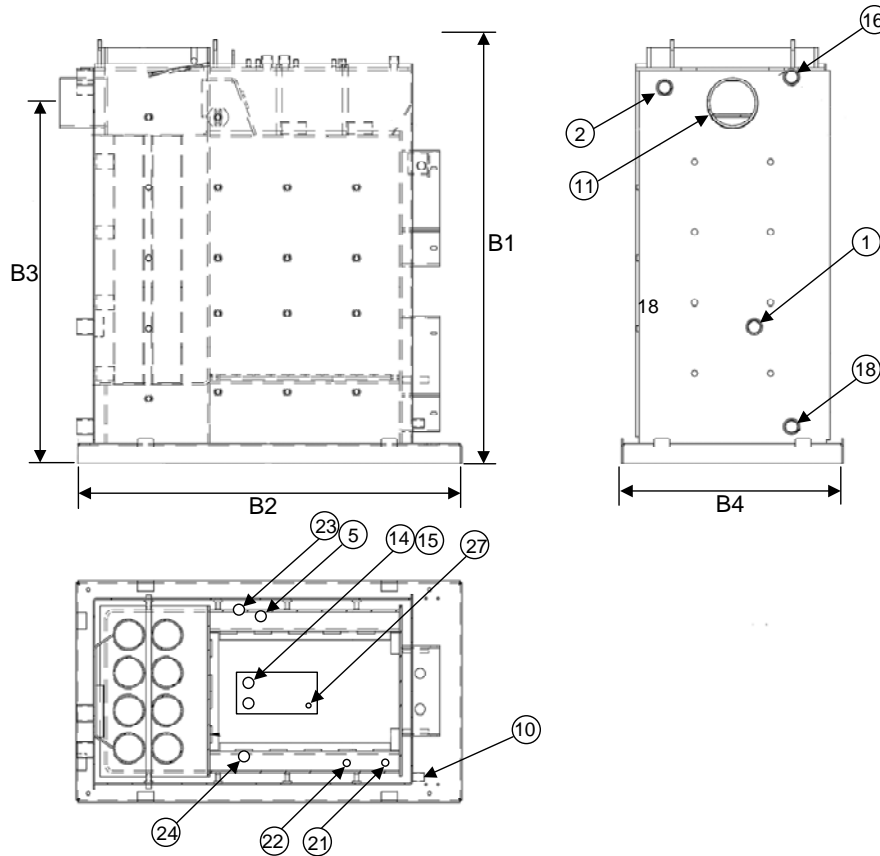
- 1. By-Pass Damper Handle
- 2. Control Panel
- 3. Load Door
- 4. Ash Door
- 5. Secondary Air Control
- 6. Sight Glass
- 7. Clean Out Cover
- 8. Boiler Serial Number Plate

- 9. Draft Fan
- 10. Flue Outlet
- 11. Smoke Box
- 12. Heat Exchanger Tubes
- 13. Firebox
- 14. Gasification Tunnel

## Specification Data

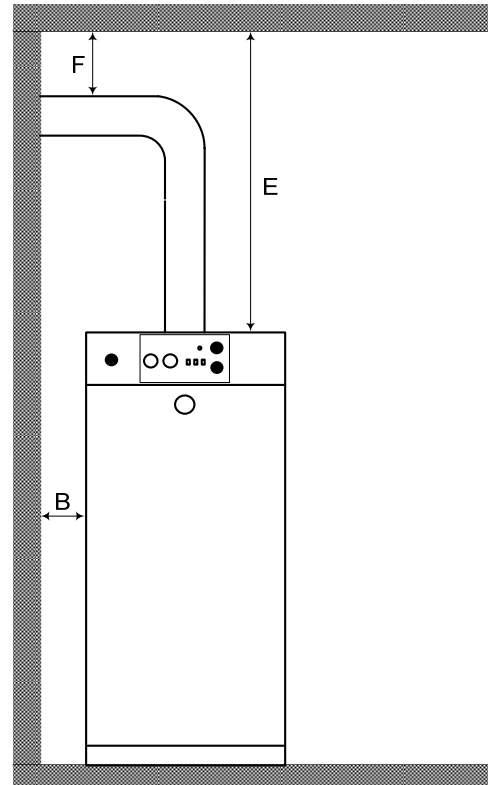
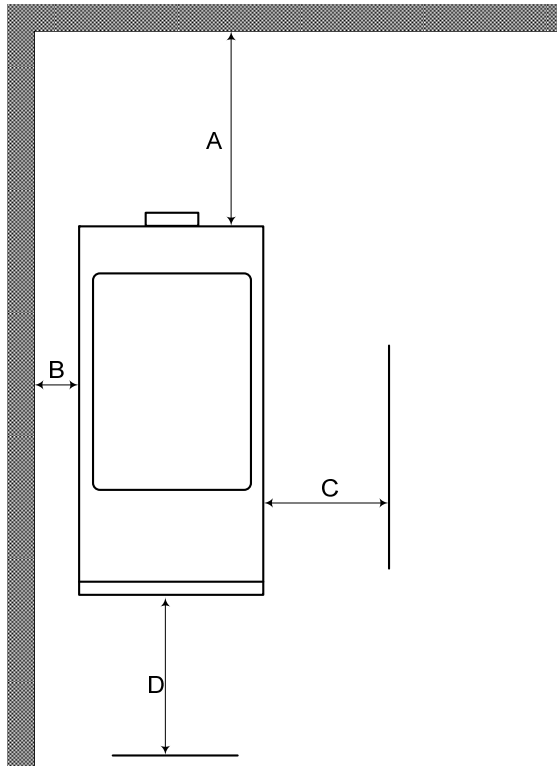
Technical Data	Units	30	40	60
<b>MEASUREMENTS</b>				
Depth- Boiler -Total	inches	46½	46½	50½
Width- Boiler -Total	inches	21	25	25
Height to Chimney Connection	inches	41¾	41¾	41¾
Smoke Pipe Stub outside diameter	inches	6	6	8
Weight- Empty	lbs	1080	1180	1230
Water Contents	gallons	41	54	60
Loading Door	inches	10 X 12	10 X 12	10 X 12
Combustion chamber Depth	inches	21	21	21
Combustion Chamber Volume	Cu ft	4.01	5.35	6.02
Wood Length	inches	20	20	20
Wood Diameter (Max)-Softwood	inches	4	4	4
Wood Diameter (Max)-Hardwood	inches	6	6	6
<b>OPERATING DATA</b>				
Operating Temperature-Water	F°	180-190	180-190	180-190
Nominal Output	Btu/hr	102,000	140,000	198,000
Required Draft	inch WC	-.025 to -.05	-.025 to -.05	-.025 to -.05
Safety Listings	-	UL 391-1995, CAN/CSA B366.1 -M91,UL726, ANSI Z21.13-200, CSA 4.9-M2000	UL 391-1995, CAN/CSA B366.1 -M91,UL726, ANSI Z21.13-200, CSA 4.9-M2000	UL 391-1995, CAN/CSA B366.1-M91,UL726, ANSI Z21.13-200, CSA 4.9-M2000
<b>ELECTRICAL DATA</b>				
Boiler Power Requirement		120V-60Hz/15A	120V-60Hz/15A	120V-60Hz/15A
Blower	W	35	105	105
<b>PIPING DATA</b>				
Boiler Test Pressure	psi	65	65	65
Boiler Relief Valve Setting	psi	30	30	30
Supply & Return pipe stub size (male npt)	inch	1.25	1.25	1.25
Minimum Boiler Loop size	inch	1.25	1.25	1.25
Mixing Valve Opening Setting	F°	140	140	140
Internal Overheat Aquastat Setting	F°	212	212	212

# Specification Data



Description	Units	30	40	60
1 Return Connection	inches	1¼	1¼	1¼
2 Supply Connection	inches	1¼	1¼	1¼
5 Tapping-Overheat	inches	¾	¾	¾
10 Extra Tapping (Not Used)	inches	½	½	½
11 Flue Pipe, External Diameter	Inches	6	6	8
14/15 Domestic Coil Fittings (optional)	inches	¾	¾	¾
16 Tapping-Overheat-Pressure Relief	inches	1¼	1¼	1¼
18 Tapping-Boiler Drain	inches	1¼	1¼	1¼
21 Tapping-Pressure Gauge	inches	½	½	½
22 Tapping-Bleeder Vent	inches	3/8"	3/8"	N/A
23 Extra Tapping	inches	N/A	N/A	¾
24 Tapping-Control Panel/Lo-Limit	inches	¾	¾	¾
27 Tapping-Bleeder Vent	inches	N/A	N/A	3/8
B1 Measurement (Overall Height)	inches	55½	55½	55½
B2 Measurement (Length)	inches	46½	46½	50½
B3 Measurement (To Center of Flue)	inches	41¾	41¾	41¾
B4 Measurement (Width)	inches	21	25	25

Boiler Clearances



Clearances to Combustibles		
Measurement	Minimum Distance	Notes
A-Backwall to Appliance	18"	Minimum Distance
B-Sidewall to Appliance	8"	Minimum Distance
C-Sidewall to Appliance	21"	Minimum Distance on left or right side to allow clearance for Cleaning and Maintenance Tasks.
D-Front of Appliance	36"	Required Distance for Cleaning the Boiler.
E-Ceiling to Appliance	18"	Required Distance for Cleaning the Boiler.
F-Combustibles to Pipe	18"	Minimum Distance

---

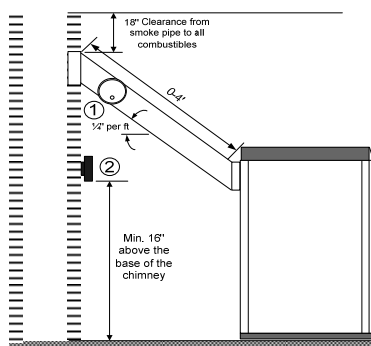
## System Design Considerations

### Sizing

It is critical to size the boiler properly. A proper, up to date heat load calculation is advised. An accurate history of building fuel usage over several years can help to calculate the proper size boiler. Be wary of using simple techniques based only on square footage. The heat load of a home can vary widely depending on age and type of heating system and location of the home. Boiler sizing is the responsibility of the installer. Tarm Biomass bears no responsibility for boiler sizing, but can provide sizing input.

### Chimney

The chimney is the most critical factors in the successful operation of any solid fuel heater, including the Solo Plus boiler. A good chimney will provide a continuous and dependable draft to pull the exhaust gasses out of the building. The boiler must be connected to a tile-lined masonry chimney or to a Factory-Built Type UL 103 HT (ULC S629 in Canada) approved chimney. The chimney must be in good condition. If the boiler is connected to a dirty or inadequate chimney, it can present a serious fire hazard. All chimney connections must conform to NFPA standard #211. No other appliance should be connected to this flue unless allowed by the local code authority. Consult your local inspector for chimney requirements and install the boiler in accordance with all applicable codes.



### Outside Combustion Air

Provision for outside combustion air may be necessary to ensure that fuel-burning appliances do not discharge products of combustion into the house. Guidelines to determine the need for additional combustion air may not be adequate for every situation. If in doubt, it is advisable to provide additional air.

The Solo Plus boiler is not suitable for direct connection to outside air. Outside air should be ducted to no closer than 12" from the boiler.

The boiler must not be installed in an area or room where there are flammable liquids or combustibles. Examples include, refrigerants, paint, thinner, bleach, etc.

### Boiler Location

The boiler is not suitable for outdoor installation. It must be located in a weather-tight, protected space. The boiler must be placed on a level, non-combustible floor, such as a concrete slab on earth. If you have the boiler 8" (203mm) above the floor it makes it easier to load and clean the boiler. If the boiler is placed near inhabited rooms, so that the flue gas can easily penetrate into these rooms, a carbon monoxide alarm must be installed that can give a warning regarding possible escapes of carbon monoxide into the inhabited rooms.

### Electrical

For the Solo Plus boiler a 120 VAC, 60 hertz, 2 wire power supply is required. This electrical connection should be from a dedicated 15 amp, circuit breaker. A master service switch for the boiler, mounted on the wall in the proximity of the boiler, is recommended. Locally enforced electrical codes must be followed.

### Water Quality

If water quality is poor, water treatment should be considered. Boiler system pH should be 8.0-8.6.

An anti-freeze can be utilized in areas where freezing could occur. Automotive or silicate-based anti-freeze cannot be used. Use only anti-freeze approved for heating systems. Using anti-freeze can cause a loss in heating efficiency and some heating components within the system could be negatively impacted.

### System Plumbing

For the heating system piping, it is possible to use either copper or iron piping materials. The supply and return pipe should be insulated to avoid heat loss.

In systems where plastic tubing is used, it must have an oxygen diffuser barrier. If non-oxygen barrier tubing is used, the boiler must be separated from the tubing by a heat exchanger.

A thermostatic mixing valve, set to open at 160 °F (72 °C), is required to temper return water to prevent cold return water from reaching the boiler. This valve helps prevent boiler corrosion.

### Boiler Accessories

- Ash Pan
- Barometric Damper
- Termovar Mixing Valve
- Termovar Loading Unit
- Flue Thermometer
- Aquastats
- Thermal Storage Systems
- Indirect Water Heaters