TARM BIOMASS®
Innovative Leaders in Alternative Heating Solutions

# P4 Pellet Boiler

**Models 8/15, 20/25, 32/38, 48/60, 80/100**

# Technical Datasheet


**Fröling P4 Pellet Boiler**
The P4 is a patented, wood pellet boiler available in five sizes with outputs from 35,800-341,000 Btu/hr (cascaded systems up to1.4MM Btu/hr.) For both residential and commercial applications.

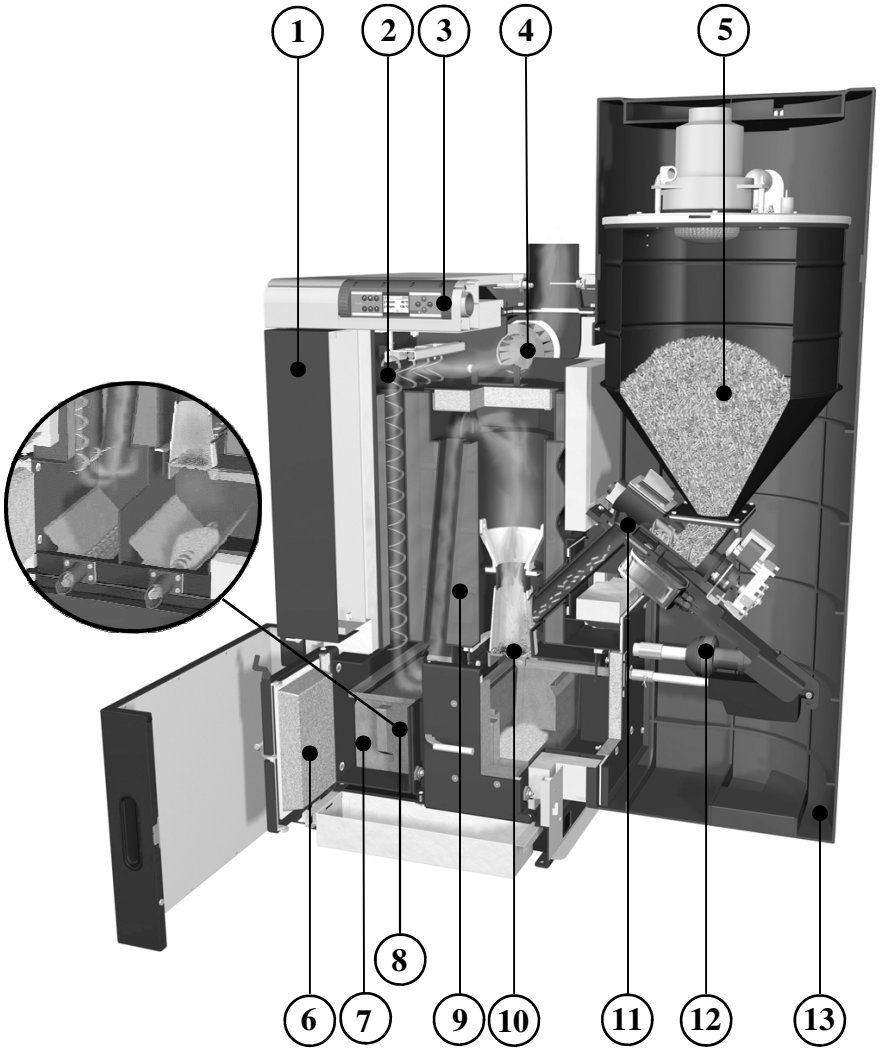
Tested & Listed By O-T-L Beaverton Oregon USA
OMNI-Test Laboratories, Inc.

TÜV AUSTRIA

## Benefits at a Glance:

- Automatic ignition.
- Automatic sliding grate in combustion chamber.
- Automatic fuel feed.
- Automatic ash removal.
- Virtually self-cleaning
- Can be used with hot water baseboard, radiant floor, or hot air systems.
- Overall efficiencies of over 85%.
- Insulated cleaning door for heat retention.
- Soundproofing for almost silent operation.
- Covered by a 20-year limited warranty.
- Model 80/100 built to ASME pressure vessel standard.

## Boiler Information-Boiler Overview



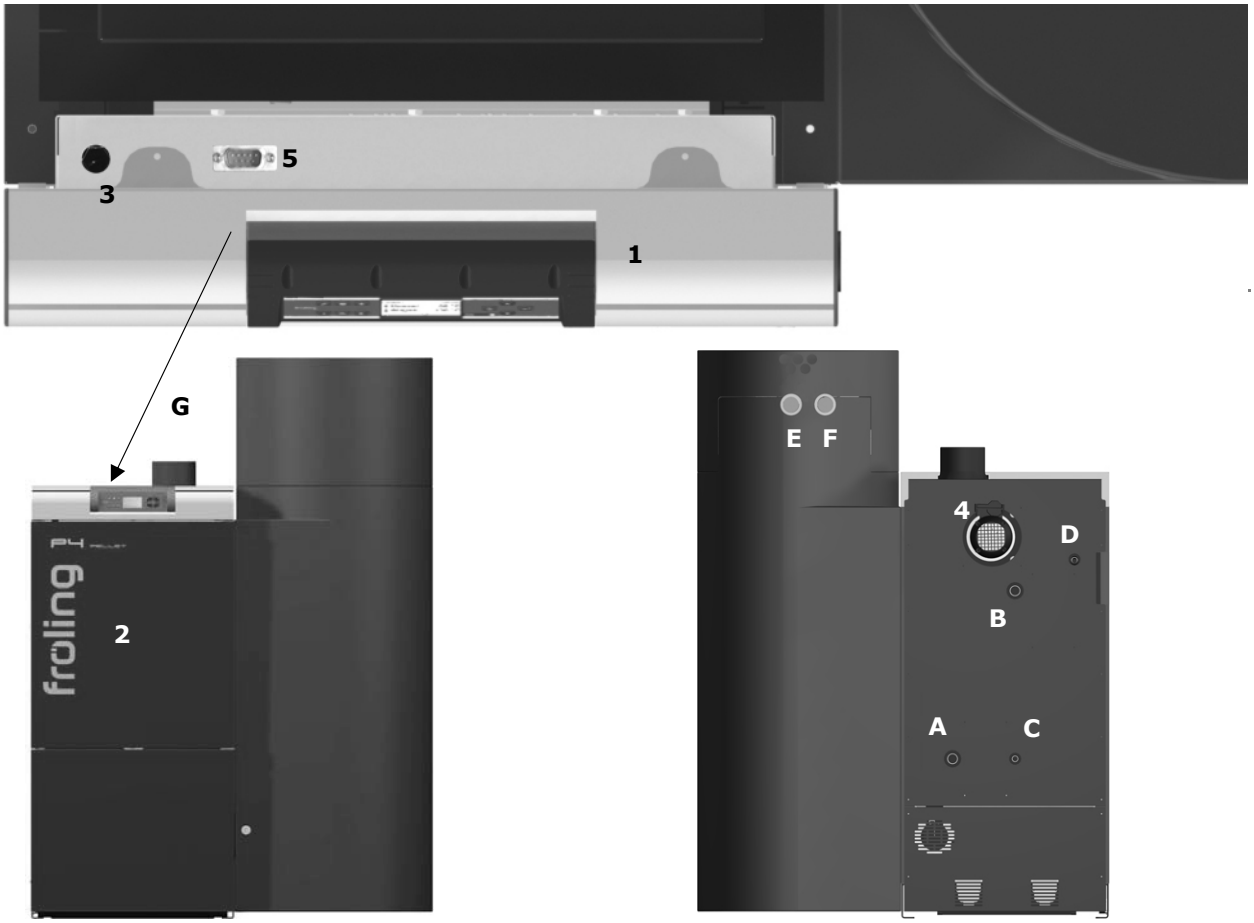

1. Insulated cleaning door for heat retention.
2. **EOS** technology (Efficiency Optimization System) for high efficiency with automatic drive for continuous cleaning.
3. Lambdatronic P3200 microprocessor control.
4. Speed regulated induced draught fan for highest operating efficiency.
5. Spacious store container with automatic pellet feed.
6. Insulated cleaning door for excellent heat retention.
7. Easy access ash container for easy emptying of ash. Large container size for a longer emptying interval.
8. The larger boilers have ash removal screws which transport the ash to two closed ash boxes.
9. Patented multiple-pass heat exchanger for variable boiler operation. The 3-pass heat exchanger guarantees the highest possible ash separation.
10. Automatic sliding grate for ash removal. Almost maintenance-free operation.
11. Tested sealed slider guarantees safe operation of the boiler.
12. Automatic ignition
13. Special cyclone fitment with integrated silencer for quiet operation.

| | | P4 Pellet | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Component** | **Unit** | **8** | **15** | **20** | **25** | **32** | **38** | **48** | **60** | **80*** | **100*** |
| Rated Heat Output | Btu/ hr | 35,800 | 50,800 | 68,200 | 85,300 | 109,000 | 129,650 | 163,780 | 200,000 | 273,000 | 341,000 |
| Heating Efficiency Range | | 10,500 - 35,800 | 10,500 - 50,800 | 20,500 - 68,200 | 25,600 - 83,300 | 30,400 - 109,000 | 30,400 - 129,650 | 57,300 - 163,780 | 57,300 - 200,000 | 82,000 - 273,000 | 102,000 - 341,000 |
| Electrical Connection | | 240V / 60Hz fused 15A | | | | | | | | | |
| Max. Load Draw | W | 1576 | 1576 | 1576 | 1576 | 1576 | 1576 | 1576 | 1576 | 1576 | 1576 |
| Average Electrical Consumption | W | 96 | 123 | 110 | 110 | 110 | 110 | 120 | 120 | 120 | 120 |
| Weight of Boiler[1)] | lbs | 772 | 772 | 948 | 948 | 1168 | 1168 | 1676 | 1676 | 2425 | 2425 |
| Water Contents | Gals | 18.5 | 18.5 | 21 | 21 | 33 | 33 | 45 | 45 | 74 | 74 |
| Maximum Boiler Temperature Setting | °F | 176 | 176 | 176 | 176 | 176 | 176 | 176 | 176 | 190 | 190 |
| Minimum Boiler Temperature Setting | | 104 | 104 | 104 | 104 | 104 | 104 | 104 | 104 | 104 | 104 |
| Boiler Test Pressure | Psi | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| Recommended Buffer Tank Size | Gals | 60 | 120 | 150 | 200 | 250 | 300 | 380 | 475 | 650 | 800 |
| Permitted Fuel | | Wood pellets Ø (1/4”-5/16”) 6mm. Must have a PFI Quality Rating of Premium or Super Premium. The pellets must be made from natural wood. | | | | | | | | | |

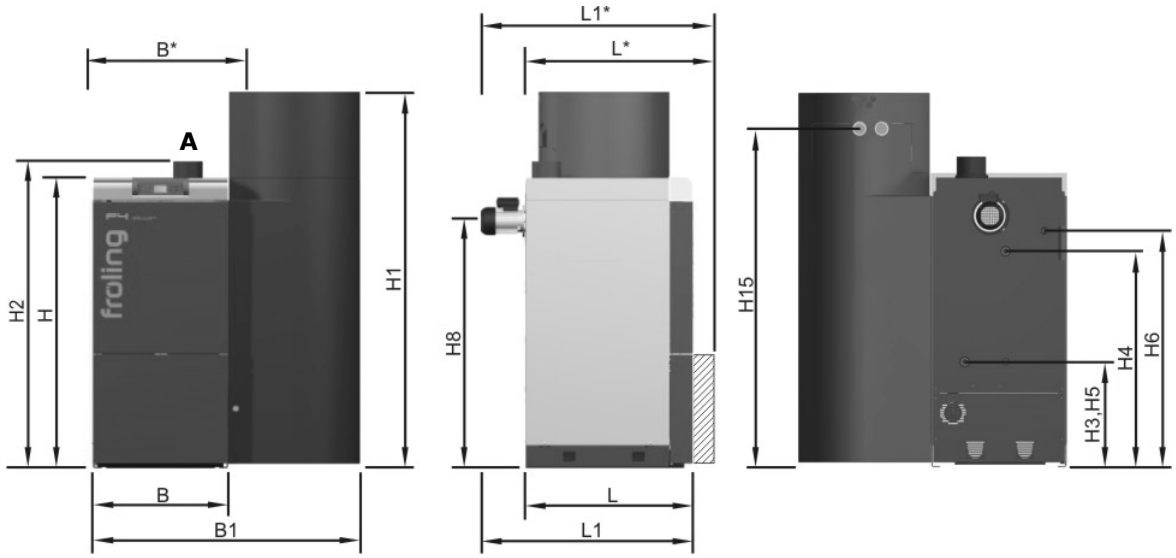
[1]Max. Load Draw is calculated with suction motor (1560W), slide valve motor (9W), and average sleeping draw (7W) in operation.

*Built to ASME pressure vessel standard.

# Specification Data-Components and Connections




| | | | P4 Pellet | | | | |
|---|---|---|---|---|---|---|---|
| **Pos.** | **Description** | **Unit** | **8 / 15** | **20 / 25** | **32 / 38** | **48/60** | **80/100** |
| **A** | Boiler supply connection | Inch | 1″ | 1½″ | 1½″ | 1½″ | 2″ |
| **B** | Boiler return connection | | 1″ | 1½″ | 1½″ | 1½″ | 2″ |
| **C** | Drain | | ½″ | ½″ | ½″ | ½″ | 1″ |
| **D** | Air vent | | ½″ | ½″ | ½″ | ½″ | 1″ |
| **E** | Pellet suction line | inch | 2″ | 2″ | 2″ | 2″ | 2” |
| **F** | Return-air line | | | | | | |
| **G** | Flue gas pipe connection | | 5″ | 5″ | 6″ | 6″ | 8” |
| | | | | | | | |
| **1** | Lambdatronic P 3200 control system | | | | | | |
| **2** | Switch box | | | | | | |
| **3** | Safety temperature limiter - STL | | | | | | |
| **4** | Induced draught fan | | | | | | |
| **5** | Service interface | | | | | | |



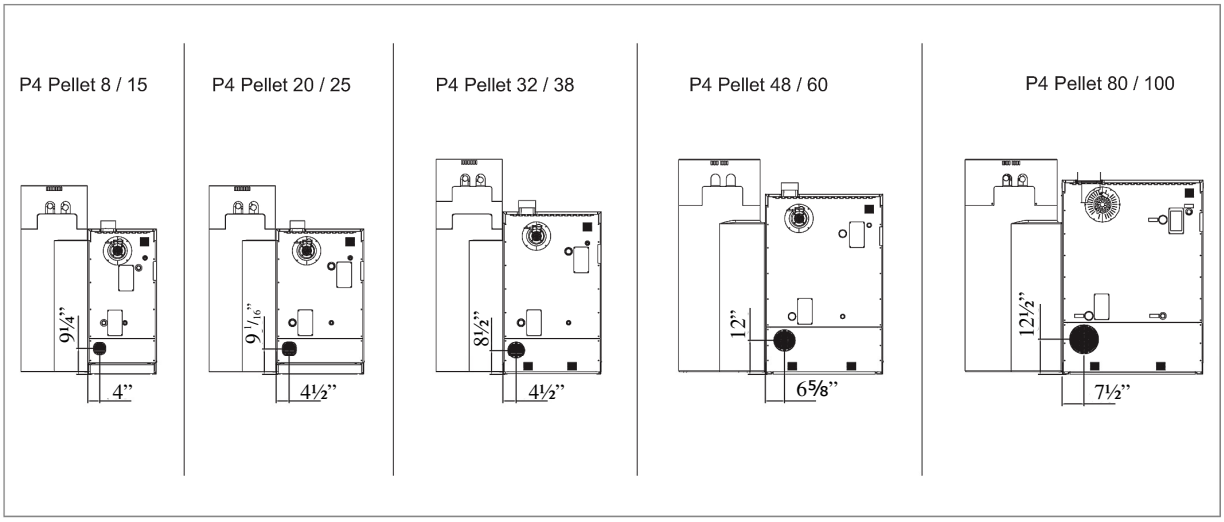

| | | | P4 Pellet | | | | |
|---|---|---|---|---|---|---|---|
| **Dimensions** | **Description** | **Unit** | **8 / 15** | **20 / 25** | **32 / 38** | **48/60** | **80/100** |
| **L** | Length, boiler [1] | inches | 29⅛″ | 29⅛″ | 32¼″ | 35½″ | 39⅜″ |
| **L1** | Total length inc. induced draught fan | | 37″ | 37″ | 40⅛″ | 43¼″ | 42⅛″ |
| **B** | Width, boiler | inches | 23⅝″ | 30⅜″ | 33¾″ | 40½″ | 48⅝″ |
| **B*** | Width, boiler, inc. support for positioning unit [2] | | 27¾″ | 34½″ | 38″ | 50¼″ | 58¼″ |
| **B1** | Total width, inc. suction cyclone | | 46⅝″ | 53⅜″ | 56¾″ | 70½″ | 82″ |
| **H** | Height, boiler [3] | inches | 50⅜″ | 50⅜″ | 56⅜″ | 62⅜″ | 67⅜″ |
| **H1** | Total height, inc. suction cyclone | | 65⅜″ | 65⅜″ | 74⅞″ | 74⅞″ | 74⅞″ |
| **H2** | Height, flue pipe connection | | 53⅛″ | 53⅛″ | 60¼″ | 66⅜″ | 70¼″ |
| **H3** | Height, supply connection | | 18⅛″ | 18⅛″ | 18⅛″ | 20¼″ | 20½″ |
| **H4** | Height, return connection | | 37″ | 37½″ | 42¾″ | 48⅞″ | 53½″ |
| **H5** | Height, drainage connection | | 18⅛″ | 18⅛″ | 18⅛″ | 20¼″ | 20½″ |
| **H6** | Height, ventilation connec-tion | | 40½″ | 40½″ | 45½″ | 51½″ | 56¼″ |
| **H8** | Height, induced draught fan connection | | 43″ | 43″ | 47⅞″ | 54⅛″ | 58⅞″ |
| **H15** | Height, suction system connection | | 58¼″ | 58¼″ | 67¾″ | 67¾″ | 67¾″ |
| **A** | Flue pipe diameter | inches | 5″ | 5″ | 6″ | 6″ | 8″ |

1) Corresponds to the minimum positioning length.

2) Corresponds to the minimum positioning width after removing the stoker assembly, suction cyclone and positioning unit.

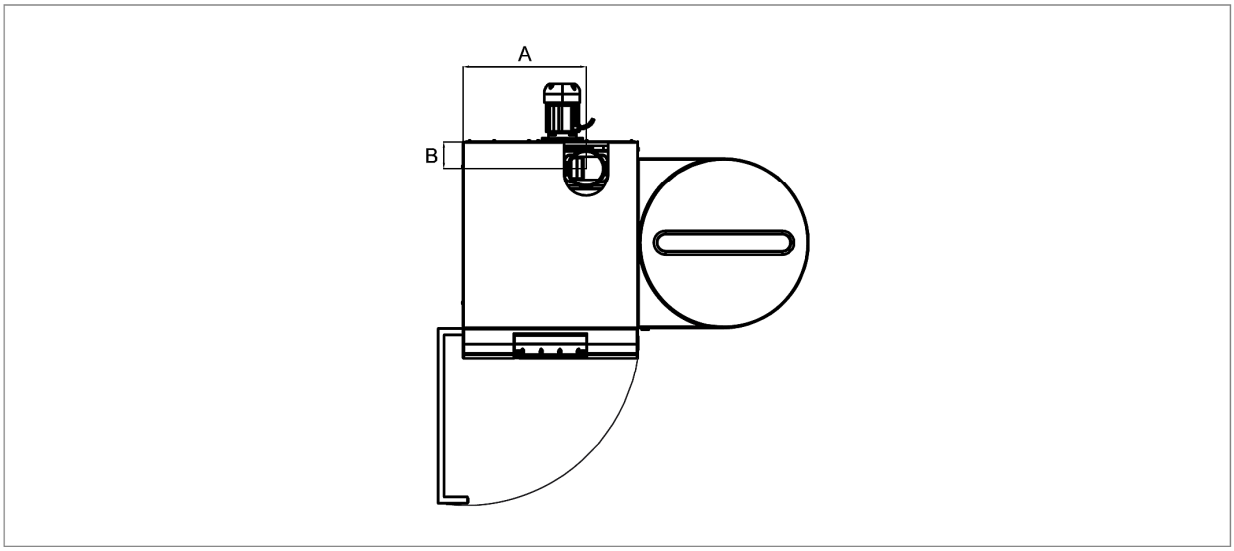
3) Corresponds to the minimum positioning height after removing the stoker assembly, suction cyclone and positioning unit.

## Specification Data-Supply Air Connection Dimensions




| | | P4 Pellet | | | | |
|---|---|---|---|---|---|---|
| **Description** | **Unit** | **8 / 15** | **20 / 25** | **32 / 38** | **48/60** | **80/100** |
| Supply air connection (external diameter) | inches | 3⅛″ | 4″ | 5″ | 6¼″ | 7⅞″ |
| Outside air kit connection (external diameter) | inches | 4″ | 4″ | 6″ | 6″ | 8″ |

## Specification Data-Flue Pipe Position



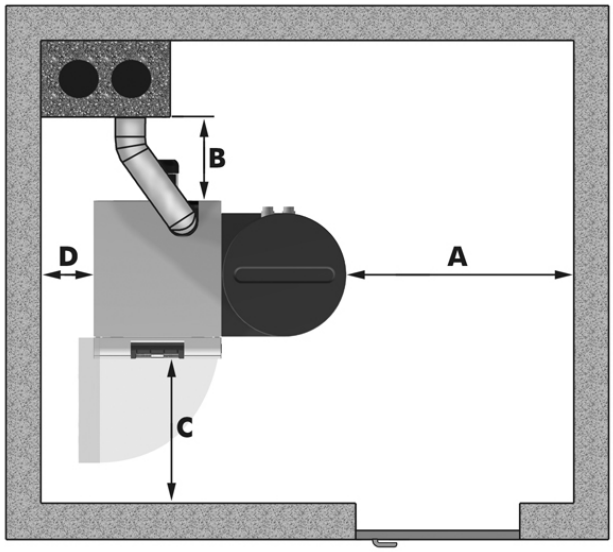

| | | P4 Pellet | | | | |
|---|---|---|---|---|---|---|
| **Description** | **Unit** | **8 / 15** | **20 / 25** | **32 / 38** | **48/60** | **80/100** |
| A-Lateral Distance | inches | 16½″ | 23″ | 25½″ | 32″ | 39⅜″ |
| B-Depth Distance | inches | 3½″ | 3½″ | 3⅜″ | 3½″ | 3⅛″ |

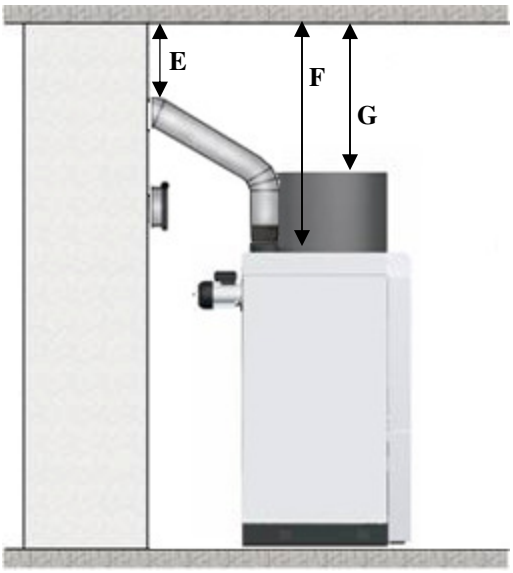
## Specification Data-Flue Gas System Data

| | | P4 Pellet | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Description** | **Unit** | **8** | **15** | **20** | **25** | **32** | **38** | **48** | **60** | **80** | **100** |
| Flue gas temperature | ºF | 284 | 302 | 302 | 302 | 320 | 320 | 320 | 338 | 320 | 338 |
| Flue gas mass flow RL<br>PL | lb/hr | 55<br>24 | 79<br>33 | 115<br>44 | 143<br>55 | 172<br>71 | 203<br>90 | 309<br>132 | 342<br>154 | 474<br>165 | 606<br>209 |
| Required Draft RL<br>PL | inch WC | .032<br>.024 | .032<br>.024 | .032<br>.024 | .032<br>.024 | .032<br>.024 | .032<br>.024 | .032<br>.024 | .032<br>.024 | .032<br>.024 | .032<br>.024 |
| Flue Pipe Diameter | inch | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 8 | 8 |

RL=Rated Load, PL=Partial Load

## Specification Data-Boiler Clearances




| Dimensions | Component | Unit | Distance |
|---|---|---|---|
| A | Minimum distance between suction cyclone and wall | inches | 12″ |
| B | Maintenance range for ID fan | | 14″ |
| C | Front of Appliance to Combustibles | | 36″ |
| D | Minimum distance from side of boiler to wall | | 8″ |
| E | Combustibles to Flue Pipe | | 18″ |
| F | Ceiling to Appliance | | 18″ |
| G | Ceiling to Suction Cyclone | | 12″ |

# System Design Considerations

## Boiler 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 P4 pellet 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 stainless lined chimney (made with 316 or AL-294C alloys) 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 code inspector for chimney requirements and install the boiler in accordance with all applicable codes. The smoke pipe connecting to the chimney must be black or stainless (**galvanized cannot be used**), have a thickness of 24 gauge, and a rise of ¼" per foot toward the chimney connection.

The installation of a barometric damper **(1)** is recommended. The barometric damper should be mounted under the mouth of the flue gas pipe, since an under-pressure condition can always be found there. If mounted on smoke pipe connection, dust and ash could escape into the room.

## 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 P4 Pellet boiler has a connection for outside air.

The boiler must not be installed in an area or room where there are flammable liquids or combustibles.

## 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 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 P4 pellet boiler a 240 VAC, 60 hertz, 4 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.

## Fuel

The P4 Pellet boiler is designed to burn low ash Premium or Super Premium wood pellets. The wood pellets must be made from natural wood and have a diameter ≤ 1/4" X 5/16" and a length ≤ 1½". A cyclone de-duster is highly recommended on boilers larger than 32Kw to remove pellet dust.

## 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.

The P4 Pellet boiler recommends a buffer tank to prevent short cycling of the boiler. Recommended sizing is listed under technical specifications.