

## Installation Manual



*P4 Pellet Boiler*



*Read and follow the operating instructions and safety information! Subject to technical change!*



## **Dear installer,**

The FRÖLING P4 Pellet boiler is a state-of-the-art design that conforms to all currently applicable standards and testing guidelines.

Please read and follow the assembly instructions. They contain safety instructions and comprehensive information relating to transporting, setting up and assembling the boiler.

The continuous development of our products means that there may be minor differences between the illustrations and other content of the document. If you discover any errors, please let us know.

We reserve the right make technical changes

<b>1</b>	<b>General information</b>	<b>6</b>
1.1	Installation Hazards	6
1.2	Boiler Installation	7
1.2.1	Planning	7
	<b>Sizing the Boiler</b>	7
	<b>Choosing an Installer</b>	7
	<b>Locating the Boiler and Boiler Clearances</b>	7
1.2.2	Approvals and reporting obligations	8
1.2.3	Requirements for initial filling and re-filling of heating system	8
1.2.4	Outside Combustion Air	8
1.2.5	Combination with storage tank	9
1.2.6	Chimney connection / chimney system	10
	<i>Barometric Damper</i>	10
	<i>Basic Boiler Data for Layout of Chimney System</i>	11
1.3	Installation Information	11
1.3.1	Hose lines	11
	<i>Proper Hose Grounding</i>	12
<b>2</b>	<b>Technical Data</b>	<b>13</b>
2.1	Components and Connections	13
2.2	Dimensions	14
2.3	Specification Data	15
<b>3</b>	<b>Boiler Installation</b>	<b>15</b>
3.1	Transport	15
3.1.1	Positioning	15
3.1.2	Temporary storage	15
3.2	Setting up the Boiler Room	16
3.2.1	Remove boiler from pallet	16
3.2.2	Transporting in the boiler room	16
3.2.3	Minimum distances in the boiler room	17
3.3	Assembling the Pellet Boiler	18
3.3.1	Removing the suction cyclone	18
3.4	Electrical connection	20
3.4.1	Core Module-Overview	20
3.4.2	Hydraulic System Module Overview	21
3.4.3	Pellet Module Overview	21
3.4.4	Fan Installation	22
3.4.5	Wire Connections	22
3.5	Install delivery system	26
3.5.1	Universal suction system	26
	<i>Variant 1 - Comfort Pellet Box (Not available in the US)</i>	27
	<i>Variant 2 - Eco Pellet Box</i>	28
	<i>Installing the suction probes and lines</i>	29
3.5.2	Suction screw system	30
3.5.3	Bag silo system (Coming Soon)	34

<i>Package contents</i> .....	34
3.5.4 Pellet storage area .....	36
<i>Size of storage area</i> .....	36
<i>Sloping floor</i> .....	37
<i>Impact cushion</i> .....	37
<b>4 Initial Startup</b>	<b>38</b>
<b>4.1 General information</b>	<b>38</b>
4.1.1 Before heating up for the first time.....	38
<b>4.2 Setting “Max Level” sensor</b>	<b>38</b>
<b>5 Plumbing Systems</b>	<b>39</b>
<b>5.1 Sensors</b>	<b>39</b>
5.1.1 Immersion Sensor-Boiler sensor, DHW Sensor, Storage Tank Sensor (Item #18641).39	
5.1.2 Solar Collector Sensor- (Item #67036) .....	39
5.1.3 Contact Sensor- Return feed sensor, supply feed sensor (Item # 67391A). (NOT USED AT THIS TIME) .....	39
5.1.4 External Sensor (NOT USED AT THIS TIME) .....	39
<b>5.2 Bus System</b>	<b>40</b>
5.2.1 Hydraulic Module .....	40
5.2.2 Room Console RBG 3200 .....	40
5.2.3 Bus Cable .....	40
<b>5.3 Sensor Functions for Standard Systems</b>	<b>41</b>
5.3.1 Top Storage Tank Sensor (sensor 0.1):.....	41
5.3.2 Bottom Storage Tank Sensor (sensor 0.2):.....	41
5.3.3 DHW Tank (sensor 0.3): .....	41
5.3.4 Bottom DHW Tank (sensor 0.4): .....	41
5.3.5 Oil/Gas Boiler Temperature Sensor (sensor 0.5):.....	41
<b>5.4 Connection Instructions</b>	<b>41</b>
5.4.1 Oil/Gas boiler connections:.....	41
5.4.2 Pellet Boiler Circulator Pump Connection (Pump 0.1): .....	43
5.4.3 DHW Circulator Pump Connection (Pump 0.2) .....	43
5.4.4 Temperature Sensors (sensor 0.1-0.5) .....	43
<b>5.5 Plumbing at the Boiler</b>	<b>44</b>
<b>5.6 Plumbing Schematics</b>	<b>45</b>

## 1 General information

It is unlawful to carry out modifications to the boiler or to change or deactivate safety equipment.

In addition to the operating instructions and the applicable national and local codes and regulations for installation and operation of the boiler system, all fire, police, and electrical regulations must be observed.

### 1.1 Installation Hazards

Install, modify and use only in accordance with manufacturer's manuals. Refer to authorities having jurisdiction for proper installation. Contact local building and fire officials about restrictions and installation inspection in your area. If there are no applicable local codes, follow ANSI/NFPA 211 and CAN/CSA B365. Special precautions are required for passing the Chimney through a combustible wall or ceiling.

Inspect and clean exhaust system, Fuel Loading Chamber, Combustion Chamber, Ash-Pits, and Heat Exchanger frequently in accordance with owner's manual.

#### **DANGER!**

- ⚠ Working on electrical components may cause severe injuries from electric shocks!

#### **WARNING!**

- ⚠ The electrical system of the boiler shall be supplied from a double 115 V 60 Hz (nominal 230 V AC) 15 amp branch circuit including neutral and ground connection. For wiring instructions please refer to Section 3.3 in this Installation Manual!
- ⚠ Chimney must be 5" (127 mm) diameter listed UL-103 HT or ULC-S629 residential all-fuel type for models 8/15 and 20/25 and 6" (150 mm) for models 32/38 and 48/58. Flue connector pipe must be 5" (127mm) or 6" (150 mm) diameter (dependent upon boiler model) made of a minimum 24 MSG black steel.
- ⚠ Inadequate design, installation and maintenance of the flue gas system will lead to insufficient chimney draft and could result in Danger of Life or Severe Injury caused by serious faults in combustion, e.g. explosively combustion of wood gases and flash fires!
- ⚠ This boiler requires fresh air for safe operation and must be installed so there are provision for adequate combustion and ventilation air!

#### **CAUTION!**

- ⚠ Do not connect this unit to a Chimney flue serving another appliance!
- ⚠ Flooring must be a minimum 3/8" (10 mm) non-combustible material covering the installation clearance area! The floor must be level and reinforced if required. For construction of the floor beneath the boiler please pay attention to weight of boiler, water content and wood fuel according to the Installation Manual!
- ⚠ Connect to an existing boiler system in combination with heat storage only!
- ⚠ Use original spare parts only. Installation of non-licensed replacement parts will void the warranty!

## 1.2 Boiler Installation

This section describes the steps to installing and starting-up the boiler. This section is directed at the **installer**.

### 1.2.1 Planning

#### ***Sizing the Boiler***

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. Boiler sizing is the responsibility of the installer. BioHeatUSA bears no responsibility for boiler sizing, but can provide sizing input.

#### ***Choosing an Installer***

Choosing a competent, licensed installer is critical to the successful installation of the boiler. The installer is responsible for all planning, installation, start-up, troubleshooting, owner training, and annual maintenance for the boiler. Some aspects of the system piping, start-up, and operation may differ from normal practice in fossil fuel boiler installation. To be successful, the installer must study this manual, follow conceptual drawings and instructions provided, understand the installation tasks, and contact BioHeatUSA for help when necessary. BioHeatUSA will provide phone assistance at no additional cost to the original boiler owner to assure success in the installation.

#### ***Locating the Boiler and Boiler Clearances***

The boiler must be installed with the minimum installation clearances to combustible materials outlined on the next page. Clearances may only be reduced by means approved by the regulatory authorities.

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 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.

### **CAUTION**

DO NOT INSTALL THIS BOILER IN A MOBILE HOME. There is no safe way this boiler can be installed inside a mobile home.

The boiler must be installed with the minimum installation clearances to combustible materials outlined below. Clearances may only be reduced by means approved by the regulatory authorities.

[Minimum installation clearances see chapter 3.1.5](#)

### 1.2.2 Approvals and reporting obligations

**IMPORTANT:** Install, modify and use only in accordance with manufacturer's installation & operation manuals. Refer to authorities having jurisdiction for proper installation. Contact local building and fire officials about restrictions and installation inspection in your area. If there are no applicable local codes, follow ANSI/NFPA 211 and CAN/CSA B365. Special precautions are required for passing the Chimney through a combustible wall or ceiling. Inspect and clean exhaust system frequently in accordance with Owner's Manual.

### 1.2.3 Requirements for initial filling and re-filling of heating system

Water quality conditions for initial filling the heating system:  
For first filling of heating system water must be clean, pure or purified, odorless and without suspended matter.  
Water hardness must not exceed 580 grain/fl.oz. or 300 ppm CaCO<sub>3</sub>; (300 mg/l), meaning medium hard to soft water.  
Concentration of chlorides must not exceed 58 grain/fl.oz. (30 mg/l).  
Boiler system water pH should be 8.0-8.6.  
If water quality is poor, water treatment additives should be considered.  
For re-filling of small amounts, water shall be clean at least.

## NOTICE

For swimming pools or spas do not use heating water directly. Proper sized heat exchangers are required! Boiler water is not potable!

**IMPORTANT:** For initial filling and re-filling bleed the filling hose before connecting to the heating system to prevent excess air from being introduced to the system.

Use of a suitable antifreeze mix is allowed, but will cause a loss in heat transfer efficiency.

### 1.2.4 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.

Outside air may be required if:

1. The solid fuel fired appliance does not draw steadily; experiences smoke roll out from boiler, burns poorly, or back drafts whether or not there is combustion present.
2. Existing solid fuel fired equipment in the house, such as fireplaces or other heating appliances smell, do not operate properly, suffer smoke roll out when opened, or back-draft whether or not there is any combustion present.
3. Any of the above symptoms are alleviated by opening a window slightly on a calm (windless day).
4. The house is built very tightly with a well sealed vapor barrier or foam type insulation and tight fitting windows and/ or has any powered devices which exhaust in the house.
5. There is excessive condensation on windows in the winter.
6. A non-balancing ventilation system is installed in the house.

7. Where fans are used in the fuel storage area, they should be installed so as not to create negative pressures in the room where the boiler is located.

If these, or other indications, suggest that infiltration air is inadequate, additional combustion air should be provided from the outdoors.

If a mechanical ventilation system (air exchange or heat recovery) is already present in the home it may be able to provide sufficient combustion make-up air for the solid fuel fired appliance. The ventilation system may need to be re-balanced after installation of the Fröling P4.

## NOTE

**Canadian installations must conform to ANSI/NFPA outside air requirements of 1 sq. Inch per 2.5cm) 1,000Btu/hr (.30kW/hr).**

### 1.2.5 Combination with storage tank

## NOTE

We recommend that you use the pellet boiler with a storage tank, as this allows you to achieve a reduction in start-up and shut downs within the ideal performance range of the boiler.

Please contact your installer or a Fröling technician directly for the right measurements of the storage tank.

If your P4 Pellet boiler has been installed with a Thermal Storage System, this system may require periodic maintenance. Please review the periodic maintenance requirements of your thermal storage system with your installer.

### 1.2.6 Chimney connection / chimney system

The chimney is one of the most critical factors in the successful operation of any solid fuel heater, including the Fröling P4 boiler. A good chimney will provide a continuous and dependable draft to pull the exhaust gasses out of the building. The entire flue gas system must be designed to prevent, wherever possible, damage caused by seepage, insufficient feed pressure and condensation. Follow manufacturer's installation instructions for installing and supporting any specific chimney product.

#### NOTE

The boiler must be connected to a stainless-lined 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 chimneys and connections must conform to NFPA standard #211. Install vent at clearances specified by the vent manufacturer. 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.



Flue gas exhaust temperatures can be low enough to cause condensation in chimneys. Condensation will, over time, damage a masonry chimney. Accordingly, installation of a stainless chimney liner (made with 316 or AL-294C alloys) inside the chimney flue is strongly recommended.

The flue gas temperatures (when cleaned) and the additional flue gas values can be found in the technical specification sheets (See chart below "see chart below "Boiler data for constructing the flue gas system").

The smoke pipe connecting the boiler to the chimney flue must be black or stainless, have a minimum thickness of 24 gauge, and rise a minimum of ¼" per foot of run toward the chimney. Smoke pipe sections must be attached to one another with a minimum of three sheet metal screws and sealed with hi-temperature silicone. The smoke pipe should not contain more than two 90° elbows (45° elbows are preferred over 90° elbows).

The chimney draft must be stable (see chart below "Basic Boiler Data for Layout of Chimney System").

The top of the chimney must be 3 feet (0.9 m) above the roof and 2 feet (0.6 m) above any structure within 10 feet (3.0 m) measured horizontally.

#### **Barometric Damper**

- ☞ We recommend that you install a barometric damper. **1**
- ☞ Install the barometric damper directly under the mouth of the flue line, as there is always low pressure there. **1**

**Basic Boiler Data for Layout of Chimney System**

			P4 Pellet					
Component	Unit		8	15	20	25	32	38
Flue gas temperature	NL	°C	140	150	150	150	160	160
		°F	284	300	300	300	320	320
Flue gas mass flow	NL	kg/hr	25	36	52	65	78	92
	PL	Kg/hr	11	15	20	25	32	41
	NL	lb/hr	55	79	115	143	172	203
	PL	lb/hr	24	33	44	55	70	90
Flue gas mass flow	NL	kg/s	0.007	0.010	0.014	0.018	0.022	0.025
	PL	kg/s	0.003	0.004	0.006	0.007	0.009	0.011
	NL	lb/s	0.015	0.022	0.030	0.039	0.048	0.055
	PL	lb/s	0.006	0.008	0.013	0.015	0.019	0.024
Feed pressure required	NL	Pa	8	8	8	8	8	8
	PL	Pa	6	6	6	6	6	6
	NL	inch WC	0.03	0.03	0.03	0.03	0.03	0.03
	PL	inch WC	0.02	0.02	0.02	0.02	0.02	0.02
Feed pressure required	NL	mbar	0.08	0.08	0.08	0.08	0.08	0.08
	PL	mbar	0.06	0.06	0.06	0.06	0.06	0.06
	NL	psf	0.17	0.17	0.17	0.17	0.17	0.17
	PL	psf	0.13	0.13	0.13	0.13	0.13	0.13
Flue pipe diameter		mm	130	130	130	130	150	150
		inches	5	5	5	5	6	6

NL = Nominal Load, PL = Partial Load

### 1.3 Installation Information

Water lines should not be located in close proximity to the storage area or the feeder units due to the dangers posed by condensation and bursting water pipes!

Check the delivered items for foreign objects in the individual components.

In the pellet store room an impact cushion must be installed on the opposite side to the filler pipes. This reduces wear on the pellets when they are blown in and stops the finish being worn off. Broken pieces of masonry or finish and other foreign bodies (small stones, pieces of wood, screws, etc.) can block the delivery system or the pellet feed into the boiler and cause the system to fail. In case of faults due to such foreign bodies, the guarantee is void.

In time pellets leave dust on the ground; this can impair the process of moving them from the pellet storage area.

For this reason you should check and clean if necessary before refilling.

#### 1.3.1 Hose lines

For the hose lines used with the suction device, the universal suction systems, and the silo delivery unit, please observe the following:

- Do not kink the hose lines! Minimum bending radius = 12" (30cm).

- ❑ Lay the hose lines as straight as possible! If the lines are sagging, it can lead to so-called "pockets." Problem-free pellet feeding cannot be guaranteed.
- ❑ Lay the hose lines in short sections away from walking areas!
- ❑ Hose lines are not UV-proof!  
Therefore: do not lay the hose lines outdoors!
- ❑ Hose lines are suitable for temperatures up to 140 °F (60°C)!  
Therefore: Hose lines must not come into contact with flue gas pipes or un-insulated heating pipes!
- ❑ Hose lines must be earthed on both sides to ensure that no static charge builds up as a result of transporting the pellets!
- ❑ The suction line must be in a single section!
- ❑ The return-air line can be made up of several sections, but potential equalisation must be established throughout the line!

### Proper Hose Grounding



When connecting the hose lines to the individual connection pipes, ensure there is proper grounding throughout the line!

- ❑ Expose approximately 1¼" (3 cm) of the earth conductor at the end of the hose line.
  - ☞ TIP: Slit the insulation open along the wire with a knife.



- ❑ Bend the earth wire inwards in a loop
  - ☞ This prevents the earth wire from being damaged by the feed of pellets.



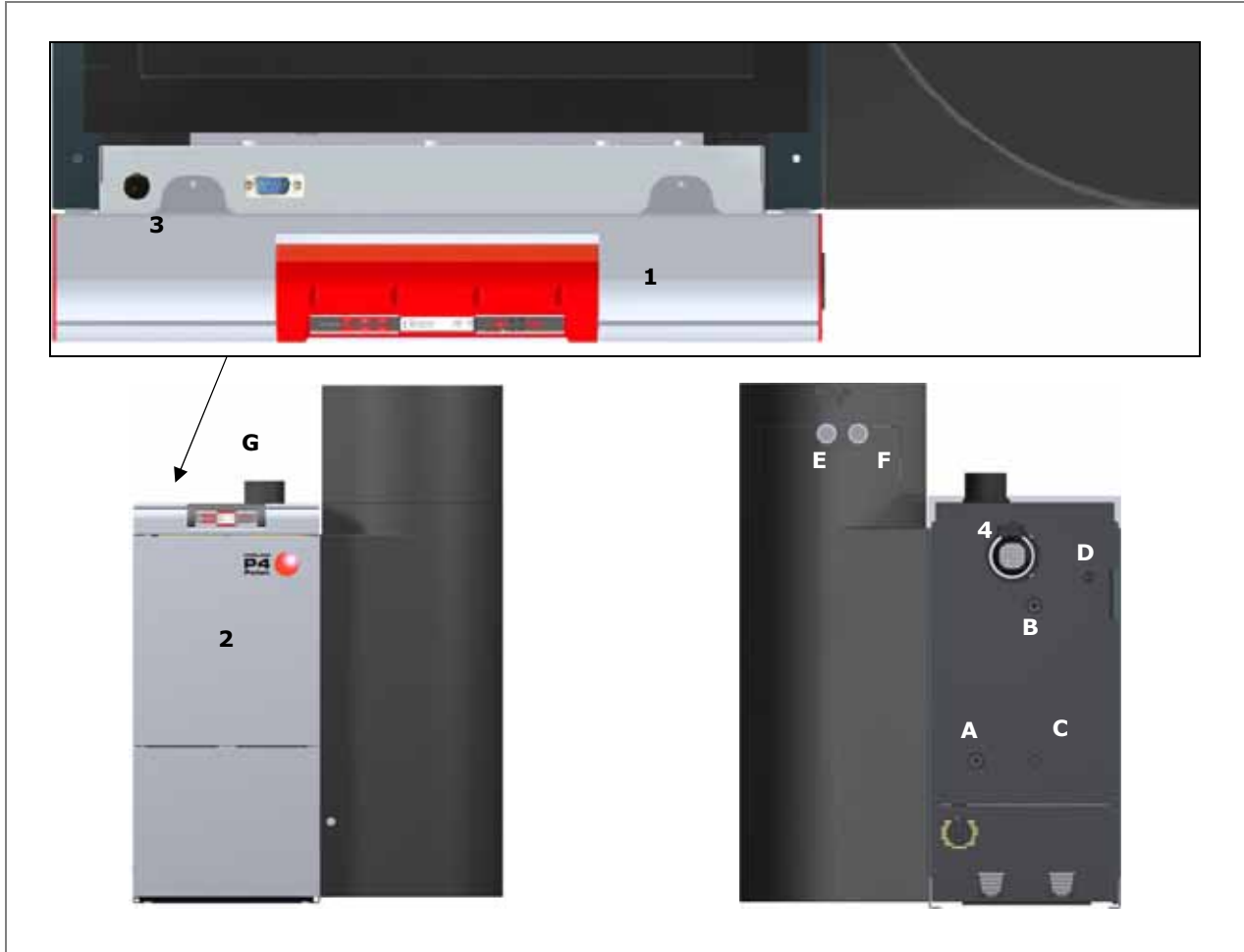
- ❑ Fit a hose clip to the hose line
- ❑ Attach the hose line to the connector
  - ☞ Ensure that contact is established between the earth conductor and the connector!



- ❑ Tighten the hose clip

## 2 Technical Data

### 2.1 Components and Connections



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

## 2.2 Dimensions



Dimensions	Component	Unit	P4 Pellet			
			8 / 15	20 / 25	32 / 38	48/60
<b>L</b>	Length, boiler <sup>1)</sup>	inches	29 <sup>3</sup> / <sub>8</sub>	29 <sup>3</sup> / <sub>8</sub>	32 <sup>1</sup> / <sub>4</sub>	35 <sup>1</sup> / <sub>2</sub>
<b>L1</b>	Total length inc. induced draught fan		37	37	40 <sup>1</sup> / <sub>8</sub>	43 <sup>1</sup> / <sub>4</sub>
<b>B</b>	Width, boiler	inches	23 <sup>3</sup> / <sub>8</sub>	30 <sup>3</sup> / <sub>8</sub>	33 <sup>3</sup> / <sub>4</sub>	40 <sup>1</sup> / <sub>2</sub>
<b>B*</b>	Width, boiler, inc. support for positioning unit <sup>2)</sup>		27 <sup>3</sup> / <sub>4</sub>	34 <sup>1</sup> / <sub>2</sub>	38	50 <sup>1</sup> / <sub>4</sub>
<b>B1</b>	Total width, inc. suction cyclone		46 <sup>5</sup> / <sub>8</sub>	53 <sup>3</sup> / <sub>8</sub>	56 <sup>3</sup> / <sub>4</sub>	70 <sup>1</sup> / <sub>2</sub>
<b>H</b>	Height, boiler <sup>3)</sup>	inches	50 <sup>3</sup> / <sub>8</sub>	50 <sup>3</sup> / <sub>8</sub>	56 <sup>3</sup> / <sub>8</sub>	62 <sup>3</sup> / <sub>8</sub>
<b>H1</b>	Total height, inc. suction cyclone		65 <sup>3</sup> / <sub>8</sub>	65 <sup>3</sup> / <sub>8</sub>	74 <sup>7</sup> / <sub>8</sub>	74 <sup>7</sup> / <sub>8</sub>
<b>H2</b>	Height, flue pipe connection		53 <sup>3</sup> / <sub>8</sub>	53 <sup>3</sup> / <sub>8</sub>	60 <sup>1</sup> / <sub>4</sub>	66 <sup>3</sup> / <sub>8</sub>
<b>H3</b>	Height, outfeed connection		18 <sup>1</sup> / <sub>8</sub>	18 <sup>1</sup> / <sub>8</sub>	18 <sup>1</sup> / <sub>8</sub>	20 <sup>1</sup> / <sub>4</sub>
<b>H4</b>	Height, return connection		37	37 <sup>1</sup> / <sub>2</sub>	42 <sup>3</sup> / <sub>4</sub>	48 <sup>7</sup> / <sub>8</sub>
<b>H5</b>	Height, drainage connection		18 <sup>1</sup> / <sub>8</sub>	18 <sup>1</sup> / <sub>8</sub>	18 <sup>1</sup> / <sub>8</sub>	20 <sup>1</sup> / <sub>4</sub>
<b>H6</b>	Height, ventilation connection		40 <sup>1</sup> / <sub>2</sub>	40 <sup>1</sup> / <sub>2</sub>	45 <sup>1</sup> / <sub>2</sub>	51 <sup>1</sup> / <sub>2</sub>
<b>H8</b>	Height, induced draught fan connection		43	43	47 <sup>7</sup> / <sub>8</sub>	54 <sup>1</sup> / <sub>8</sub>
<b>H15</b>	Height, suction system connection		58 <sup>1</sup> / <sub>4</sub>	58 <sup>1</sup> / <sub>4</sub>	67 <sup>3</sup> / <sub>4</sub>	67 <sup>3</sup> / <sub>4</sub>
	Flue pipe diameter		inches	5	5	6

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

## 2.3 Specification Data

		P4 Pellet							
Component	Unit	8	15	20	25	32	38	48	60
Rated heat output		35,800	50,800	68,200	85,300	109,000	129,650	163,780	200,000
Heating efficiency range	Btu/Hr	10,500	10,500	20,500	25,600	30,400	30,400	57,300	57,300
		-	-	-	-	-	-	-	-
		35,800	50,800	68,200	83,300	109,000	129,650	163,780	200,000
Electrical Connection	240V / 60Hz fused 15A								
Electrical Consumption	W	96	123	110	110	110	110	120	120
Weight of boiler <sup>1)</sup>	lbs	772	772	948	948	1168	1168	1676	1676
Water Contents	Gals	18.5	18.5	21	21	33	33	45	45
Maximum boiler temperature setting	°F	176	176	176	176	176	176	176	176
Minimum boiler temperature setting		104	104	104	104	104	104	104	104
Boiler Test Pressure	Psi	65	65	65	65	65	65	65	65
Permitted fuel	Wood pellets Ø (¼") 6mm								

## 3 Boiler Installation

### 3.1 Transport

The boiler is delivered packed in cardboard and on a pallet.

- ☞ Move the boiler without jarring or jolting.
- ☞ Follow the instructions on the packaging when moving the boiler.



#### 3.1.1 Positioning

- ☐ Use a fork-lift or similar lifting device to move the pallet and position the boiler.

If it is not possible to position the boiler on the pallet:

- ☐ Remove cardboard packaging.
- ☐ Take the unit from the pallet, and if necessary also dismantle the suction unit assembly.

➔ [See 3.2.1 Remove boiler from pallet](#)

#### 3.1.2 Temporary storage

If the system is to be installed at a later time:

- ❑ Store the boiler, insulation and control unit in a safe, dust-free, and dry location.
  - ☞ Moisture and frost reduce the effectiveness of insulation and can destroy electronic components.

## 3.2 Setting up the Boiler Room

### 3.2.1 Remove boiler from pallet



At the front of the boiler:

- ❑ Open insulation door
- ❑ Pull out floor insulation
- ❑ Remove protective transport materials on the left and right in the recess

☞ TIP: For transport in the boiler room remove the insulating door.

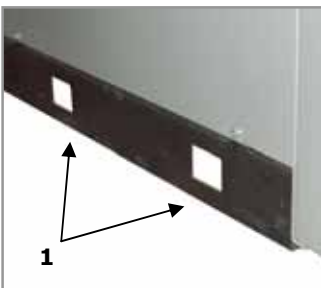


- ❑ Pull out the lock bolt of the door hinge (1) and remove it from the guide
- ❑ Remove the insulating door

At the back of the boiler:

- ❑ Remove protective transport materials on the left and right in the recess

### 3.2.2 Transporting in the boiler room

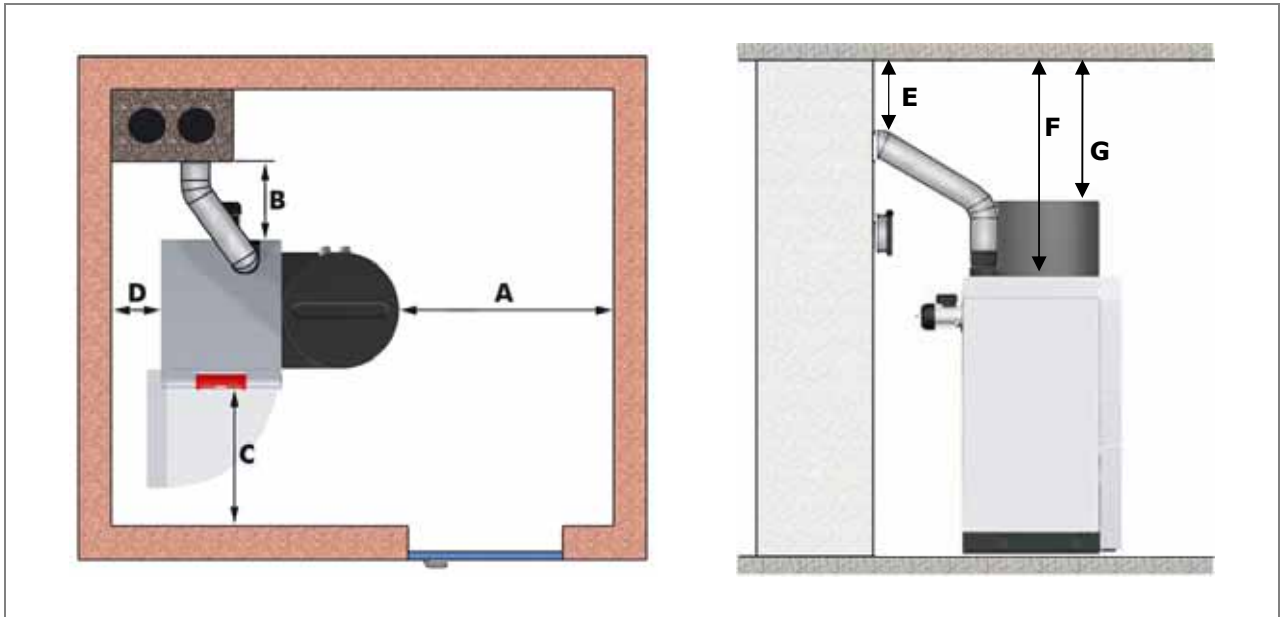


- ❑ Position a fork-lift or similar lifting device at the base frame of the boiler and transport it to the designated position

If no lifting device of this type is available:

- ❑ After removing the suction unit thread a carrying belt through the lateral openings (1) of the base frame and lift the boiler
- ❑ Position transport rollers or similar with appropriate load-bearing capacity under the base frame and move to the designated position
- ❑ Set up boiler at intended location
  - ☞ Observe the minimum distances in the boiler room.

**3.2.3 Minimum distances in the boiler room**



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

**NOTE**

Clearances may only be reduced by means approved by the regulatory authority.

### 3.3 Assembling the Pellet Boiler

#### 3.3.1 Removing the suction cyclone



- Remove the sound insulation cover



- Remove the front part of the suction unit upwards



- Open the clamps on the suction unit cover and remove

- ☞ The spanner is located on the internal side of the front panel



- ☞ When installing the suction unit ensure that the lower pins on the base of the suction unit fit into the three hooks on the boiler.



## 3.4 Electrical connection

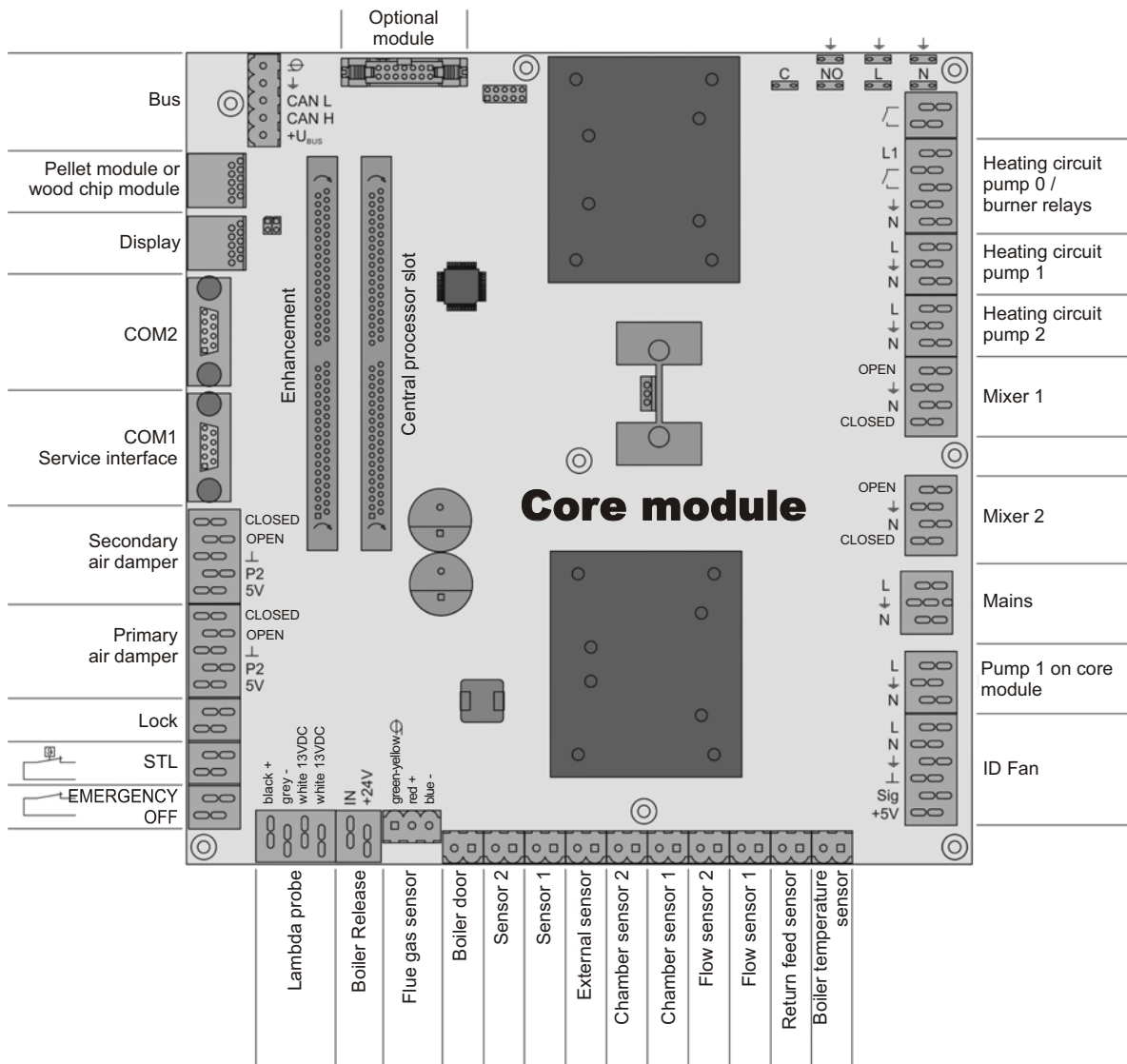
For the P4 Pellet boiler a 240 VAC, 60 hertz, 4 wire power supply is required. This electrical connection should be from a dedicated 15 amp, circuit breaker. A master service switch for the boiler, mounted on or in the proximity of the boiler, is recommended. Local enforced electrical codes must be followed.

**⚠ DANGER**

Work on electrical components is very dangerous. Avoid severe personal injuries and death.

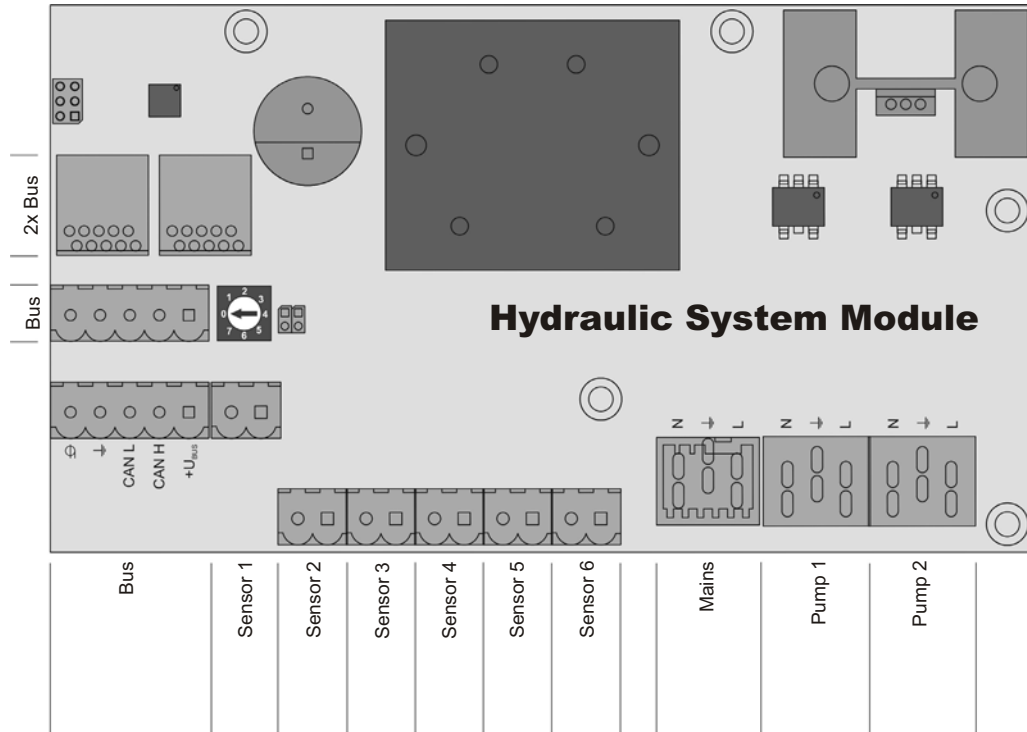
Only licensed electricians to perform electrical work!

### 3.4.1 Core Module-Overview



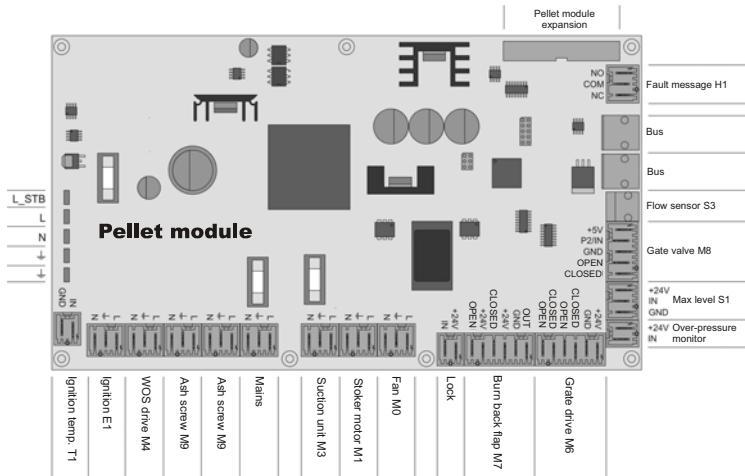
**3.4.2 Hydraulic System Module Overview**

The hydraulic system module makes available the connections of sensors and pumps for the hydraulic components of the system (storage tank, DHW tank...). A hydraulic module is included in the delivery as standard.

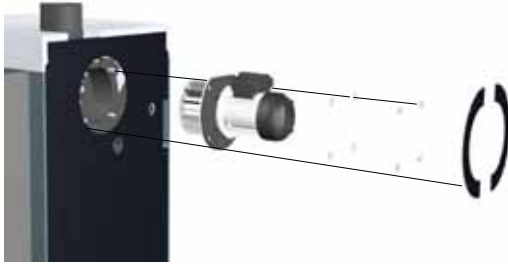


**3.4.3 Pellet Module Overview**

The pellet module is included in standard delivery and has the connections for the pellet feed and pellet combustion components.



### 3.4.4 Fan Installation



- ❑ Remove pre-installed cover plates of the ID fan
- ❑ Unscrew pre-installed nuts and spacer washers
- ❑ Attach and fix the ID fan as illustrated
  - ☞ The straight edge must be up!



- ❑ Mount the cover plates of the ID fan again.

### 3.4.5 Wire Connections

#### RISK

**Working on electrical components.**

**Danger: Serious injuries from electric shocks.**

- ❑ Work on electrical components should only be carried out by authorised technicians

☞ Flexible sheath conductors should be used for the wiring which should be measured in compliance with the applicable regional standards and guidelines

- ❑ Remove the insulating cover





- ❑ Unscrew the two self-tapping screws behind the control



- ❑ Open the insulating door and remove the centrally positioned fixing screw from below.



- ❑ Remove the front insulation cover.
- ❑ Wire the connections according to the schematic diagram:

➔ For circuit diagram see operating instructions "Lambdatronic P 3200"



- ❑ Remove screws above and below wire pass-through.



- ❑ Mount the included electrical box.



- ❑ Pull the Fan cables through the lower cable duct to the electrical boards at the front side of the boiler.



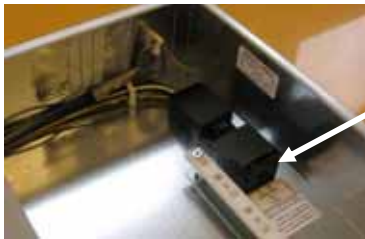
- Lay the Fan cables in the wiring duct.



- Plug the Fan cables into the "ID Fan" socket at the core module.



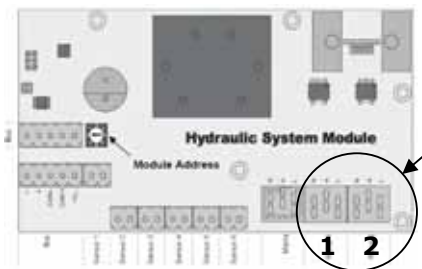
- Pull the power feed (supply) wires through the lower cable duct to the electrical boards at the front side of the boiler.



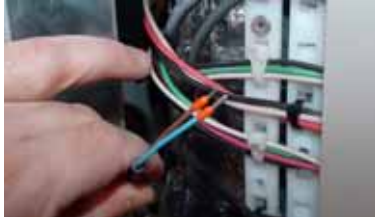
- Complete the main connections (L1, L2, N, PE).



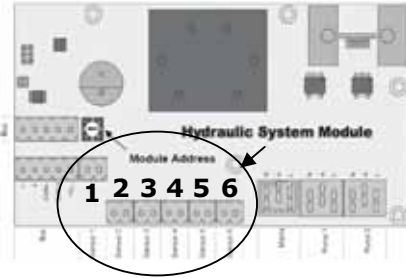
- Pull the circulator power connections through the lower cable duct to the electrical boards at the front of the boiler.



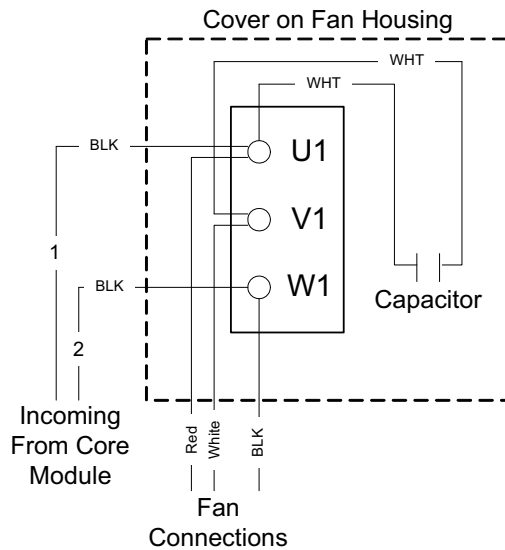
- Plug the circulator(s) into "pump 1 and pump 2" sockets on the Hydraulic System Module board (**see Section 5.2**).



- ❑ Pull any temperature sensor cables through the upper cable duct (try to keep high and low voltage wires separated).



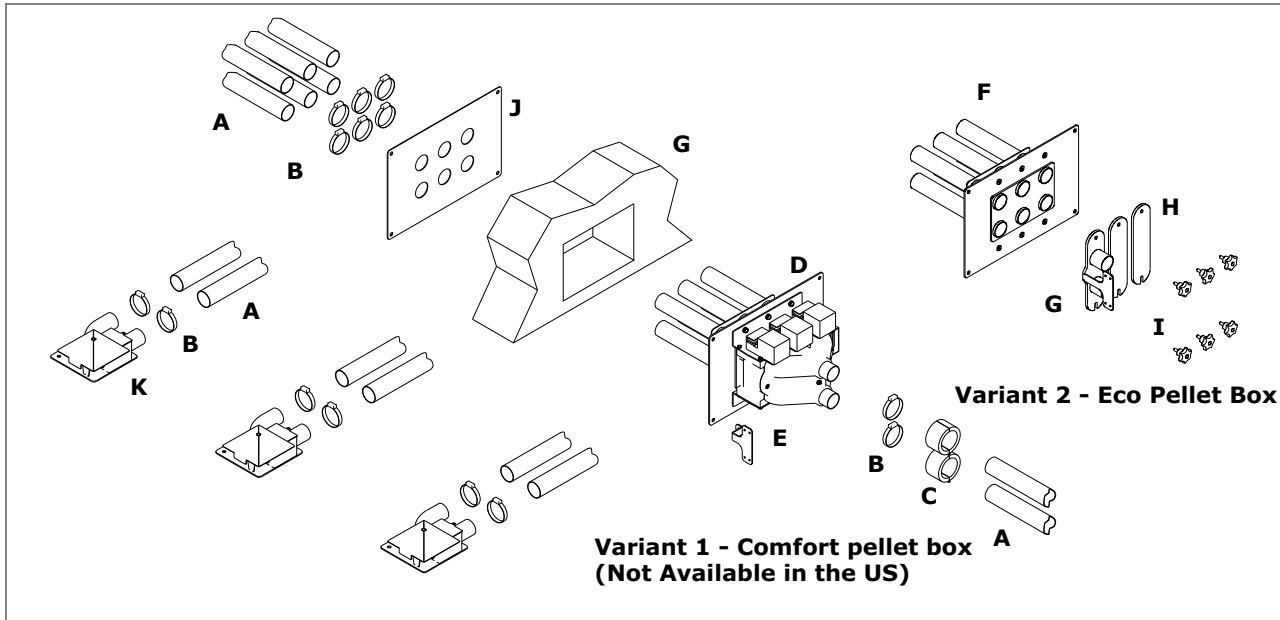
- ❑ Plug temperature sensors into sockets labelled "Sensor 1...6" (**see Section 5.2**).



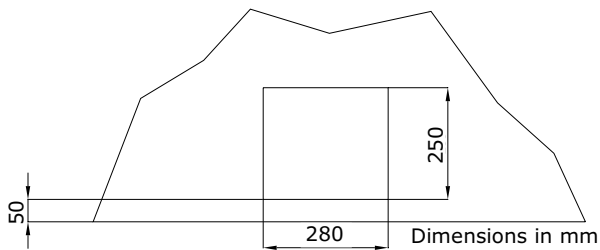
**Wire Connections at Fan**

## 3.5 Install delivery system

### 3.5.1 Universal suction system



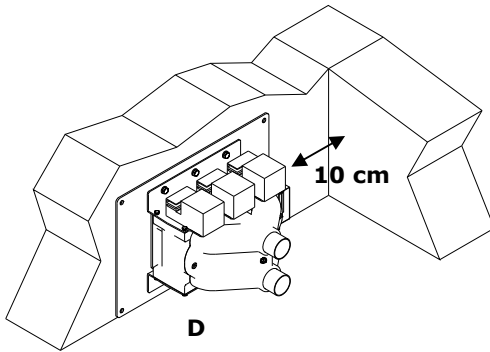
<b>A</b>	25 m Suction hose	<b>G</b>	Manual re-arranging unit (Variant 2)
<b>B</b>	Hose clamps 50-65 mm	<b>H</b>	2 Blind plates (Variant 2)
<b>C</b>	2 Fire protection choke collar (Used only in Austria)	<b>I</b>	6 Star-shaped handle (Variant 2)
<b>D</b>	Comfort pellet box (Variant 1) (Not available in US)	<b>J</b>	Cover plate for wall
<b>E</b>	Support for fire protection choke collar (Variant 1)	<b>K</b>	Suction probe
<b>F</b>	Installation module for wall		



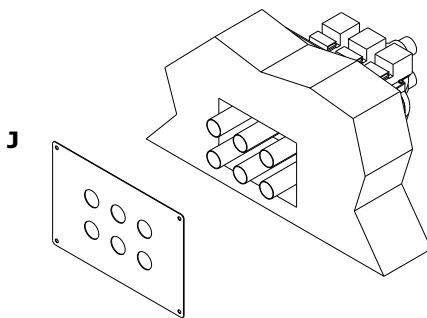
Before installation:

- Prepare hole in the wall for the pellet box (width: 11" (28cm), height: 10" (25cm)).
  - ☞ Maintain a distance of at least 2" (5 cm) from the finished floor.

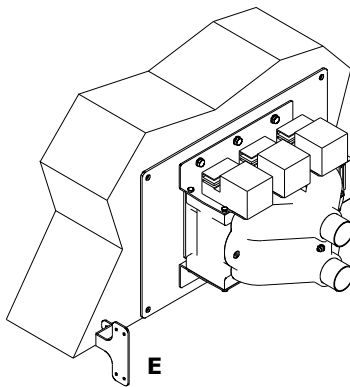
**Variant 1 - Comfort Pellet Box (Not available in the US)**



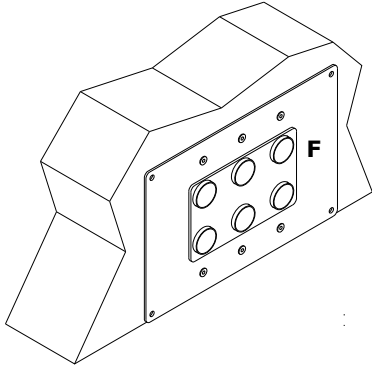
- Position Comfort Pellet Box (D) at hole in the wall.
  - ☞ For maintenance purposes, the distance to the wall on the board side of the pellet box should be at least 4" (10 cm).
- Attach Pellet Box to the wall with 4 frame screws M8x50 and 10 mm dowels.



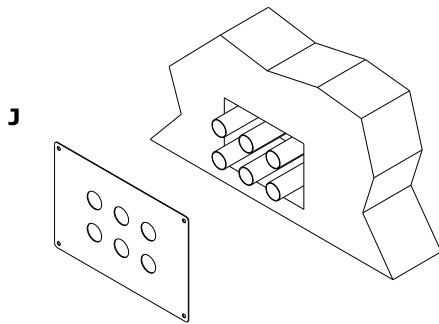
- Pack the space in the hole in the wall with a non-flammable material.
- Put the cover plate for the wall (J) onto the pipe of the pellet box.
- Secure the cover plate to the wall using four M8x50 frame screws and 10 mm Rawlplugs.



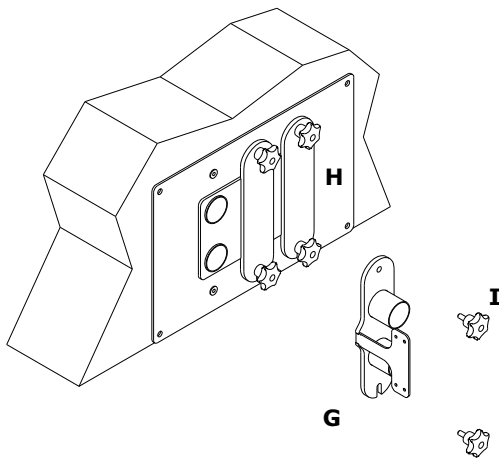
- Mount the bracket (E) for fire protection choke collars on the pellet box.
  - ☞ **Fire protection choke collars only in Austria.**

**Variant 2 - Eco Pellet Box**


- ❑ Place the wall installation module (F) by the hole in the wall.
- ❑ Secure the insertion module to the wall using four M8x50 frame screws and 10 mm Rawlplugs.

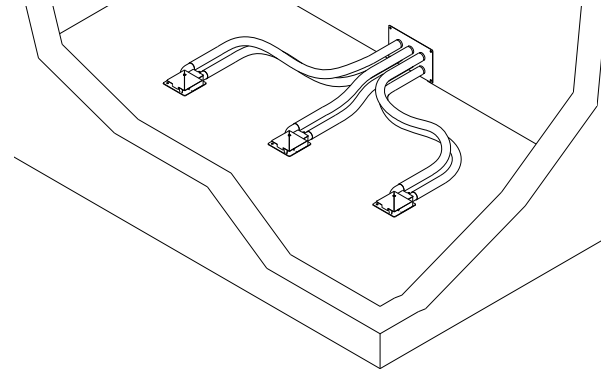
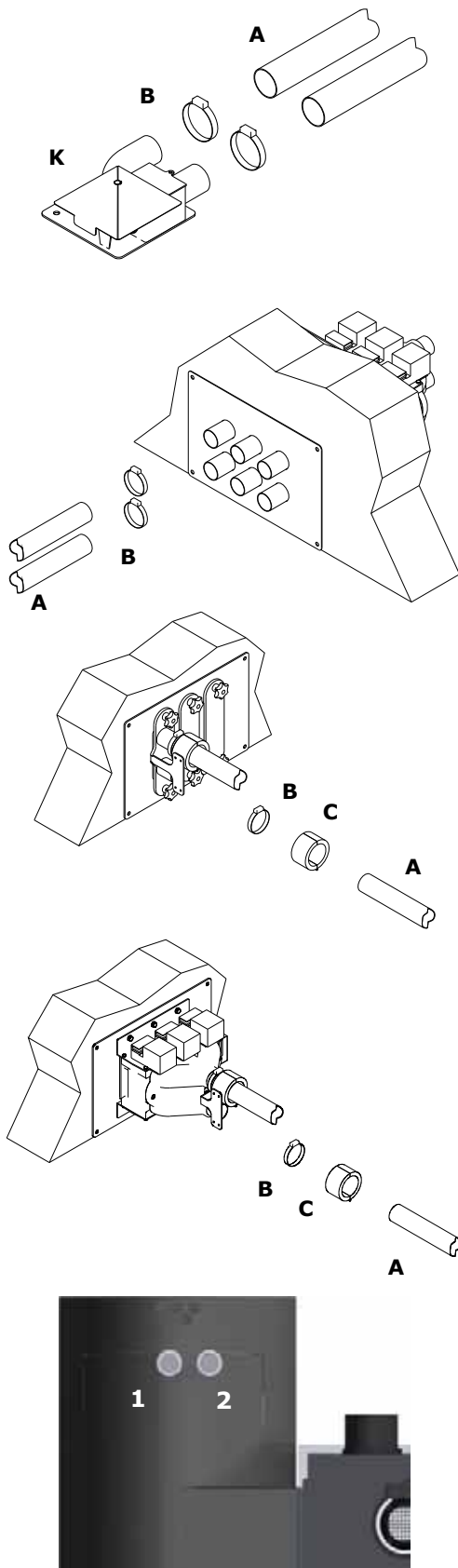


- ❑ Pack the space in the hole in the wall with a non-flammable material.
- ❑ Place the wall cover plate (J) on the installation module pipes.
- ❑ Secure the cover plate to the wall using four M8x50 frame screws and 10 mm Rawlplugs.



- ❑ Fit 2 cover plates (H) to the installation module using two star-shaped screws (I).
- ❑ Fit change unit (G) with 2 star-shaped screws.
- ☞ The position of the change unit is not specified!

**Installing the suction probes and lines**



- ❑ Position the suction probes (K) at equal distances in the pellet supply bin.
- ❑ Secure the suction probes to the bottom using frame screws.
- ❑ Fix hose lines (A) to the suction probe using hose clips (B).
- ❑ Lay the hose lines to the pellet box and secure them using hose clips.

☞ **WARNING!** Read the label on the suction probe or pellet box about the suction line and return-air line! Ensure correct connection!

☞ **WARNING!** When connecting the hose lines, beware of potential equalisation!

➔ [Page 12, Proper Hose Grounding.](#)

- ❑ Thread the fire protection choke collar (C) on to the hose line (A).

☞ **Fire protection choke collars only in Austria.**

- ❑ Attach the hose lines to the pellet box pipes using hose clips (B).

- ❑ Lay the hose lines to the boiler, through identified openings at the back plate and install with hose clamps to the identified connections.

☞ **WARNING!** Read the label on the suction probe or pellet box about the suction line and return-air line! Ensure correct connection!

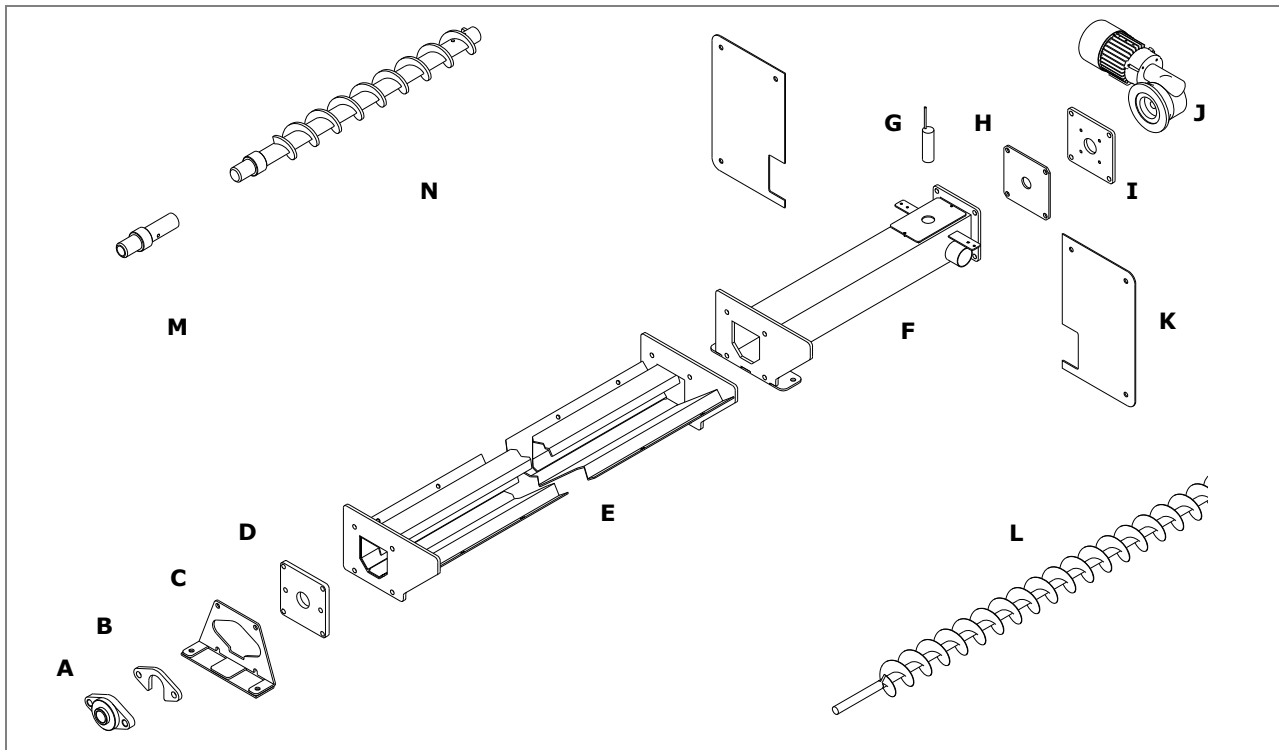
☞ Suction line: hose line to left connection (1) on the back of the boiler.

☞ Return-air line: hose line to right connection (2) on the back of the boiler.

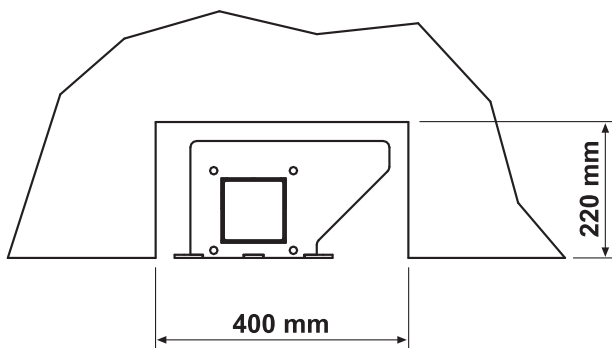
☞ **WARNING!** When connecting the hose lines, beware of potential equalisation!

➔ [Page 12, Proper Hose Grounding.](#)

### 3.5.2 Suction screw system

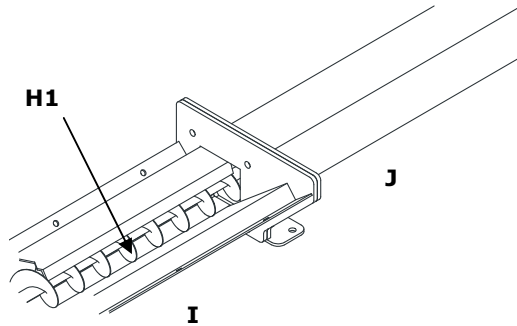


<b>A</b>	Flange bearing	<b>H</b>	Gearbox flange
<b>B</b>	Ejector flange	<b>I</b>	Drive flange seal
<b>C</b>	Trough mount with rubber pad	<b>J</b>	Geared motor
<b>D</b>	Bearing flange	<b>K</b>	2 Cover plates for wall penetration
<b>E</b>	Open trough	<b>L</b>	Main worm
<b>F</b>	Suction intake with integrated support	<b>M</b>	Shaft end for main worm
<b>G</b>	Proximity switch	<b>N</b>	Worm extension (if needed)

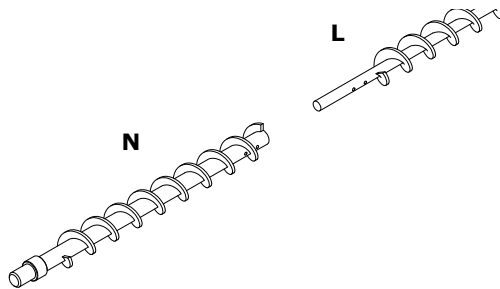


Before installation:

- Prepare hole in wall for suction intake (width: 40cm, height: 22cm).
- ☞ Ensure that the channel in the hole in the wall is positioned off centre.

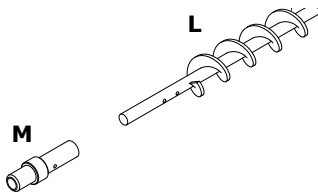


- ❑ Thread the main screw (H1) into the hole.
  - ☞ The keyway must point towards the boiler!
- ❑ Thread the closed trough (J) on to the main worm on the storage area side.
  - ☞ The rectangular flange points away from the storage area!
- ❑ Thread the open trough (I) on to the main worm.
- ❑ Screw them together using four M10x30 hexagon bolts and nuts.



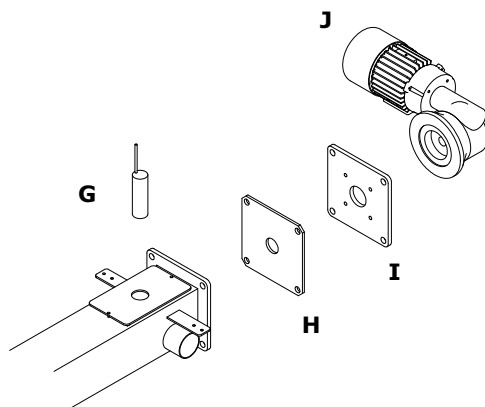
Depending on the length of the delivery unit, a screw extension may be necessary:

- ❑ Place the screw extension (N) on the main screw (L) and secure it using clamping pins.
  - ☞ The screw blade must always be rising.

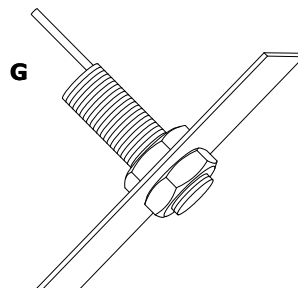


If no additional screw is used:

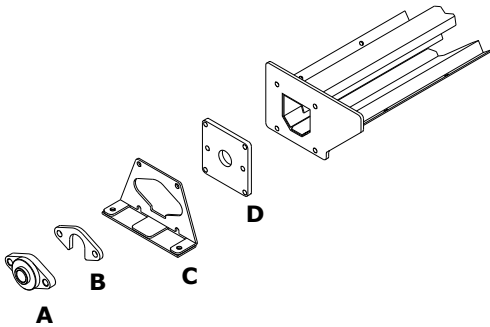
- ❑ Put the main screw's shaft end (M) on the main screw's shaft (L) and secure it using clamping pins.



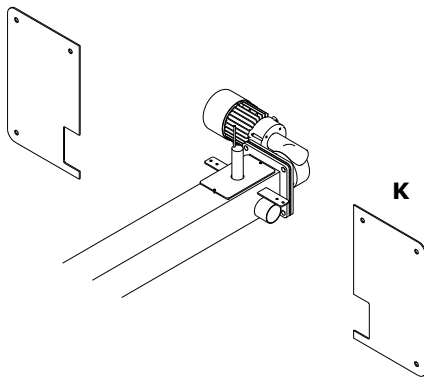
- ❑ Secure the gearing flange (I) and the gearing flange seal (H) to the suction piece using four M10 x 40 mm bolts and nuts- 17 mm socket spanner.
- ❑ Lubricate the screw's shaft end.
- ❑ Fit the drive motor (J).
  - ☞ Take care when inserting the keyway into the shaft's groove!
- ❑ Attach the geared motor on the gearing flange (I) using four M8 x 16 mm hexagonal screws and spacer washers - 13 mm hexagonal nut.
- ❑ Screw a spacer washer and M6 hexagon screw on to the shaft end as a key-way safety device. Hexagonal spanner dimension 10 mm.



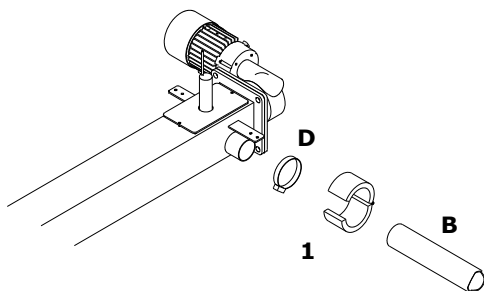
- ❑ Fit the proximity switch (G) to the inspection cover of the suction intake.
    - ☞ The proximity switch should project approx. 1cm into the suction intake!
    - ☞ Adjusting the sensitivity during the initial start-up.
- ➡ [Page 387, 4.2 Setting "Max Level" sensor](#)



- ❑ Secure the bearing flange (D) and the trough mount (C) to the trough using four M10 x 40 mm bolts and nuts.
- ❑ - 17 mm hexagonal nut.
- ❑ Place the flange bearing unit (A) and the ejecting flange (B) on the shaft and secure them to the bearing flange using two M14 x 35 mm hexagonal screws and spacer washers
- ❑ - 21 mm socket spanner.
  - ☞ **Do not lubricate!** The flange bearing is permanently lubricated and is maintenance free!
- ❑ Arrange the trough parallel to the storage area wall.
- ❑ Secure the trough mount and suction piece to the floor using two 10 mm dowels and 8 x 70 mm frame screws.



- ❑ Pack the space in the hole in the wall with a non-flammable material.
- ❑ Secure the wall penetration cover plates (K) to the store room external wall using three.
- ❑ 10 mm dowels and 8 x 50 mm frame screws.
- ❑ Finally, the sloping floor is installed.
  - ☞ The plates of the sloping floor must not be placed on the trough!
  - ➔ [Page 37, Sloping floor](#)



- ❑ Lay both hose lines in the boiler room to the suction intake.
- On the left and right of the suction intake:
- ❑ Secure the suction hose (B) to the suction connecting piece using a hose clamp (D).
    - ☞ No side specified for connecting the suction or return-air line!
  - ❑ Put the supplied fire protection choke collar (1) on the hose and secure it to the suction piece using two self-tapping screws.
    - ☞ **Fire protection choke collars only in Austria.**



- Lay the hose lines to the boiler, through identified openings at the back plate and install with hose clamps to the identified connections.
  - ☞ Suction line: hose line to left connection (1) on the back of the boiler.
  - ☞ Return-air line: hose line to right connection (2) on the back of the boiler.
  - ☞ **WARNING!** When connecting the hose lines, beware of potential equalisation!
  - ☞ [Page 12, Proper Hose Grounding](#)

### 3.5.3 Bag silo system (Coming Soon)

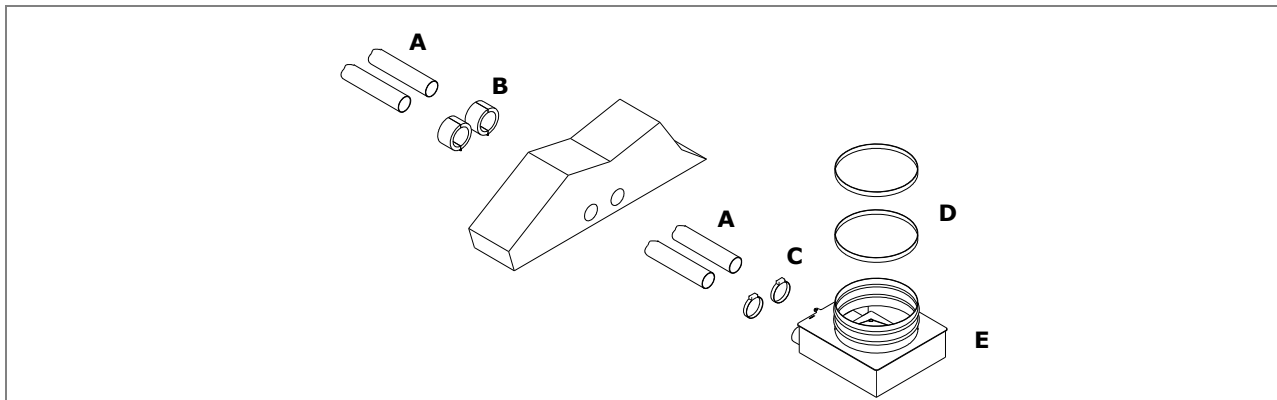
- Fit frame with sack silo
  - ➔ See assembly instructions "Pellet sack silo Type I - V"
  
- ☞ Observe the height of the boiler room during planning.



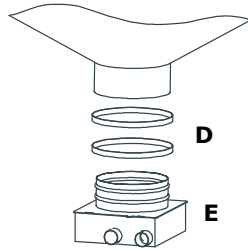
			<b>Type I, II</b>	<b>Type III - V</b>
<b>H</b>	Bag silo frame height	inches (cm)	76¾ (195)	78¾ (200)
<b>H1</b>	Height including filler coupling	inches (cm)	84⅝ (215)	86⅝ (220)
<b>H2</b>	Required minimum room height <sup>1)</sup>	inches (cm)	88½ (225)	90½ (230)
	Ideal store room height <sup>2)</sup>	inches (cm)	94½ (240)	94½ (240)

- 1) Minimum room height for connection to filler pipe in installation room.
- 2) When full, the bag silo has a heap shape. Optimum height is for use of the whole capacity.

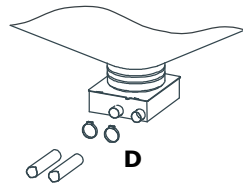
#### Package contents



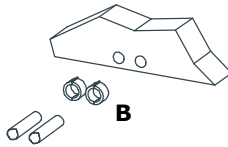
<b>A</b>	Suction hose (12 or 25 m)	<b>D</b>	Hose clamps 250 mm
<b>B</b>	2 Fire protection choke collars (only in Austria)	<b>E</b>	Silo suction probe
<b>C</b>	Hose clamps 50-65 mm		



- ❑ Plug the silo suction probe (E) into the gravity silo and secure it with a clamp (D).



- ❑ Thread one fire protection choke collar each (B) on to the suction and return-air lines.
  - ☞ **Fire protection choke collars only in Austria.**



- ❑ Run hose lines through the openings in the wall into the pellet store.
- ❑ Secure the hose lines to the silo suction probe using hose clamps (D).

- ☞ Read the label on the silo suction probe!
- ☞ Suction line: hose line to the cover of the suction cyclone.
- ☞ Return-air line: hose line to the suction motor.



- ❑ Lay the hose lines to the boiler, through identified openings at the back plate and install with hose clamps to the identified connections.

- ☞ **WARNING!** Observe the label for the suction line and the return-air line on the silo suction probe and boiler. Ensure correct connection!

- ☞ Suction line: hose line to left connection (1) on the back of the boiler.
- ☞ Return-air line: hose line to right connection (2) on the back of the boiler.

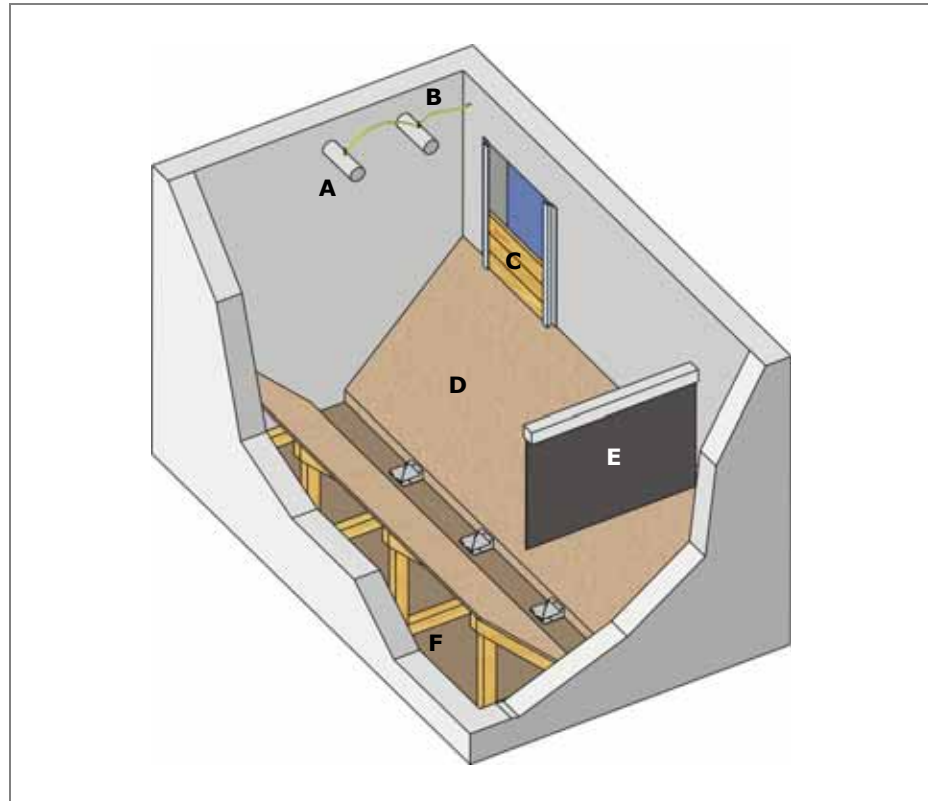
- ☞ **WARNING!** When connecting the hose lines, beware of potential equalisation!

- ➔ [Page 12, Proper Hose Grounding](#)

### 3.5.4 Pellet storage area

For the universal suction system, the pellet store must be built with an inclined floor!

The following picture shows the most important components:



<b>A</b>	2 Filler pipes
<b>B</b>	Earth wire
<b>C</b>	Planking on the storage area door
<b>D</b>	Sloping floor
<b>E</b>	Impact cushion
<b>F</b>	Under-floor structure for sloping floor

#### ***Size of storage area***

The storage area should be able to hold approximately 1.5 times the annual requirement. The exact amount of required space depends on the system's heating load.

☞ **Rule of thumb formula: 1ft<sup>3</sup> / 100Btu (1m<sup>3</sup> store / kW) heating burden.**

### **Sloping floor**

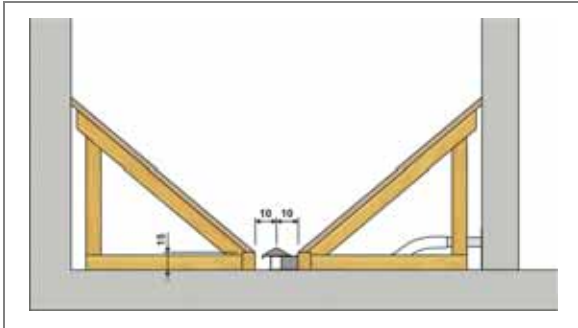


Fig.1: Store for a delivery unit with a suction probe

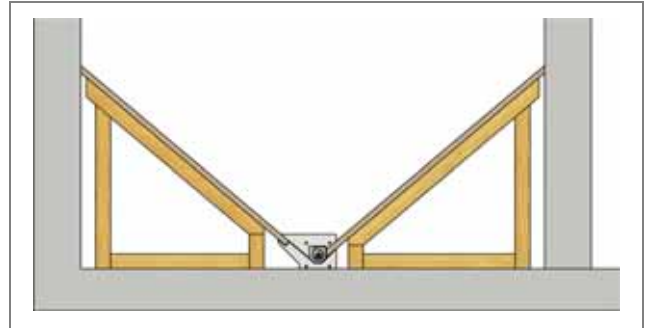


Fig.2: Store for a delivery unit with a screw

The under-floor structure should be dimensioned so that the sloping floor is not deformed when subjected to static load. You should ensure that the pellets can slide down smoothly. This means the sloped floor should be at an angle of at least 45° and have a smooth surface (we recommend laminate).

When planning the under-floor structure, note:

- ☞ 1ft<sup>3</sup> of pellets weighs approximately 41 lbs (1 m<sup>3</sup> of pellets weighs approximately 650 kg).
- ☞ Ideally the suction probes should already be fitted before the sloped floor is constructed.
- ☞ A distance of 8" (20 cm) should be maintained between the cross-pieces and the suction probe should be centrally positioned. (see Fig. 1)
- ☞ The weight of the pellets must not be borne by the trough! (see Fig. 2)

### **Impact cushion**

The impact cushion is made of rubber and should be positioned opposite the filler pipes at least 8" (20 cm) from the wall. It prevents pellets from striking the wall and knocking off pieces of the finish when filling.

- ☞ Pieces of the finish, screws, and other foreign objects can clog the suction probe!
- ☞ **WARNING!** Damage caused by foreign objects is not covered by the guarantee!

## **NOTE**

In time pellets leave dust on the ground; this can impair the process of moving them from the storage area.

- ☞ Check the storage area before re-filling and clean if necessary.
- ☞ Regular complete emptying and cleaning of the storage area ensures consistent readiness for operation!

## 4 Initial Startup

### 4.1 General information

- ☞ **IMPORTANT: First start up of boiler system shall be carried out only in attendance of an authorized installer or manufacturer's representative**

#### **WARNING**

During normal operation of boiler all surfaces and control handles behind insulation door get hot. Touching hot surfaces can cause serious burns! Additionally there is the risk of injuries by splinters of fire wood!



When heating up the boiler:

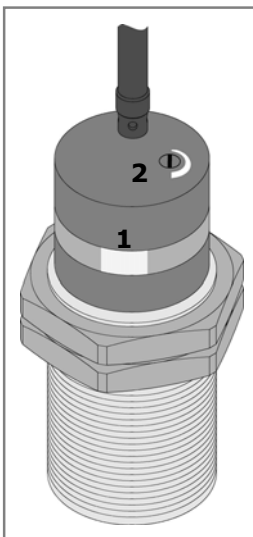
- ☞ Always wear protective gloves
- ☞ Always use control handles for open boiler doors

- ☞ **IMPORTANT: Condensation within the boiler during first start-up does not indicate a fault! If this occurs, clean up using a cleaning rag.**

#### 4.1.1 Before heating up for the first time

- ☞ Check the system pressure of the heating system.
- ☞ Check that the heating system is completely vented.
- ☞ Check if the safety devices are present and working correctly.
- ☞ Check that there is sufficient combustion air supply and venting.
- ☞ Check the contact seals of the boiler.
  - ➔ All doors and inspection openings must be tightly sealed!
- ☞ Check that all Door Contact Switch's are working correctly.

### 4.2 Setting "Max Level" sensor



In delivery configuration, the factory settings of the sensor are secured with a seal. Changes to the settings should only be carried out by qualified technicians.

- ☞ The monitoring LED (1) should only light up when identifying materials!
- ☞ If the monitoring LED stays on permanently, the sensitivity is set too high!
  - ➔ Reduce the sensitivity by turning the adjusting screw (2) to the left.
- ☞ If the monitoring LED does not react when pellets are being fed in, the sensitivity is set too low!
  - ➔ Increase the sensitivity of the adjusting screw by turning to the right.

## 5 Plumbing Systems

This chapter contains examples of plumbing schematics that are most suitable for the P4 Pellet boiler. They are merely examples and are no substitute for complete system planning.

We reserve the right to make technical changes without prior notice. If you need more information, please contact BioHeatUSA.

### 5.1 Sensors

**5.1.1 Immersion Sensor**-Boiler sensor, DHW Sensor, Storage Tank Sensor (Item #18641).



**5.1.2 Solar Collector Sensor**- (Item #67036)



**5.1.3 Contact Sensor**- Return feed sensor, supply feed sensor (Item # 67391A). **(NOT USED AT THIS TIME)**



**5.1.4 External Sensor (NOT USED AT THIS TIME)**



**Technical specification for the sensors listed above:**

Resistance sensor type: **KVT 20/KTY 10**; approx. 2k $\Omega$  at 20°C

Maximum cable length: 130 ft (40m) with shielded cable

## 5.2 Bus System

### 5.2.1 Hydraulic Module

Hydraulic module for S/P/H 3200:  
 Wall casing with control PCB for controlling:  
**-2 pumps, using max. 6 sensors**  
**-max. 8 units can be used per system**



2 immersion sensors are included, which  
 Can be used for the following:  
**-Storage Tank Management:**  
 For speed-controlled storage tank loading via 2 sensors.  
**-Differential temperature control for boiler:**  
 For controlling the DHW tank loading pump.  
**-Solar systems and feeder pumps**  
**-Circulation pump**

### 5.2.2 Room Console RBG 3200

Digital multi-functional room device for easy  
 operation of the entire system from the living  
 area, for optimum room temperature and  
 ease of use. Uses the same menu as the  
 boiler.  
**-max. 7 units can be used per system**



### 5.2.3 Bus Cable

-Maximum cable length: 3200 ft (1000m)  
 -Cable type **LIYCY paired 2X2X.56** (Not telephone cable should be used for the bus  
 connections between individual modules. Use the following diagram for connections  
 to the 5-pin plugs.



## 5.3 Sensor Functions for Standard Systems

### 5.3.1 Top Storage Tank Sensor (sensor 0.1):

- Heat source for differential control of the DHW tank loading pump(s).
- Start signal for storage tank management (default 150°F (65°C)).
- Release of a connected back-up oil/gas boiler.

### 5.3.2 Bottom Storage Tank Sensor (sensor 0.2):

- Stop signal for storage tank management (temperature difference between boiler temperature and bottom storage tank sensor (default 50°F (10°C))).

### 5.3.3 DHW Tank (sensor 0.3):

- Start signal for DHW tank loading pump.
- Stop signal for DHW tank loading pump.

### 5.3.4 Bottom DHW Tank (sensor 0.4):

- Reference sensor for solar integration.

### 5.3.5 Oil/Gas Boiler Temperature Sensor (sensor 0.5):

- Heating circuit release for oil/gas boiler operation (system-dependent).
- Oil/Gas boiler temperature monitoring (switch valve/pump).

## 5.4 Connection Instructions

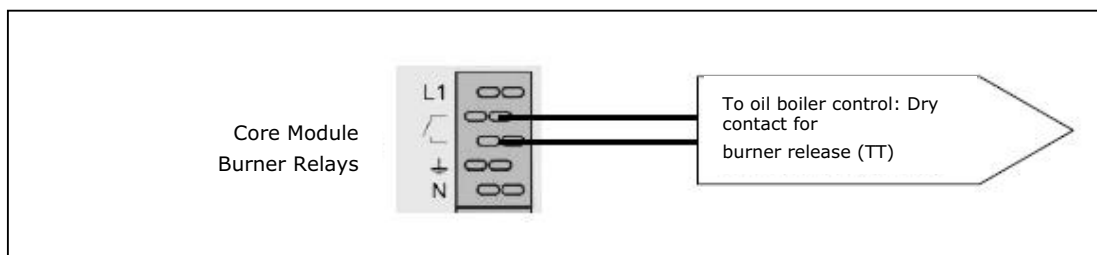
### 5.4.1 Oil/Gas boiler connections:

There are two options for back-up boiler control:

**Option A** is controlling the secondary boiler with the Froling P4's Lamdatronic control. For control logic and settings, please refer to **Section 4.6 Menu – Boiler 2 of the Lamdatronic Operating Instructions**. The parameter "Control standby boiler variably to the setpoint" must be set to "Yes".

**Option B** is for a system where the secondary boiler has independent control. The Froling P4 will not control the boiler setpoints of the secondary boiler. Please refer to **Section 4.6.3 Service Parameters for Secondary Boiler**. The parameter "Control standby boiler variably to the setpoint" must be set to "No".

#### Option A: Burner Connections

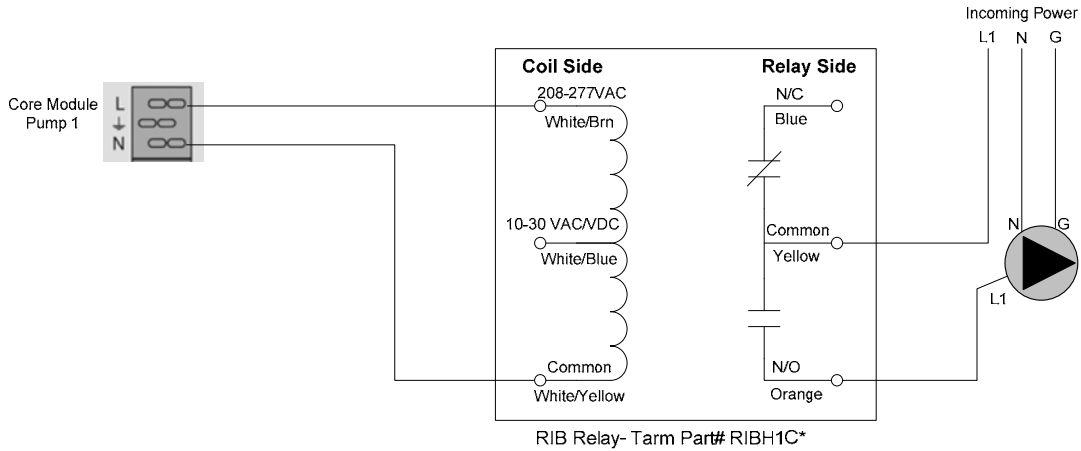


**Option A: Oil/Gas boiler Circulator Connections**

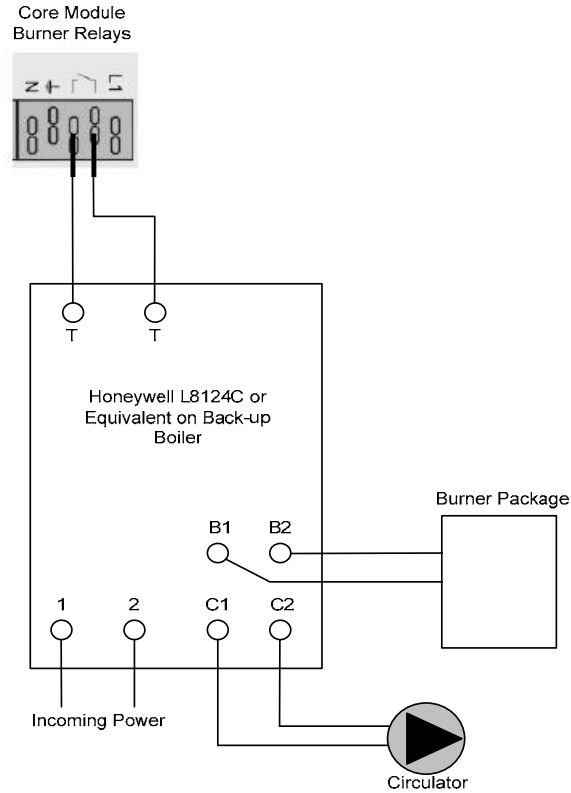
- Mount Rib Relay



**Option A: Circulator Wire Connections**



**Option B: Circulator/Burner Control Wire Connections (example only)**



**5.4.2 Pellet Boiler Circulator Pump Connection (Pump 0.1):**

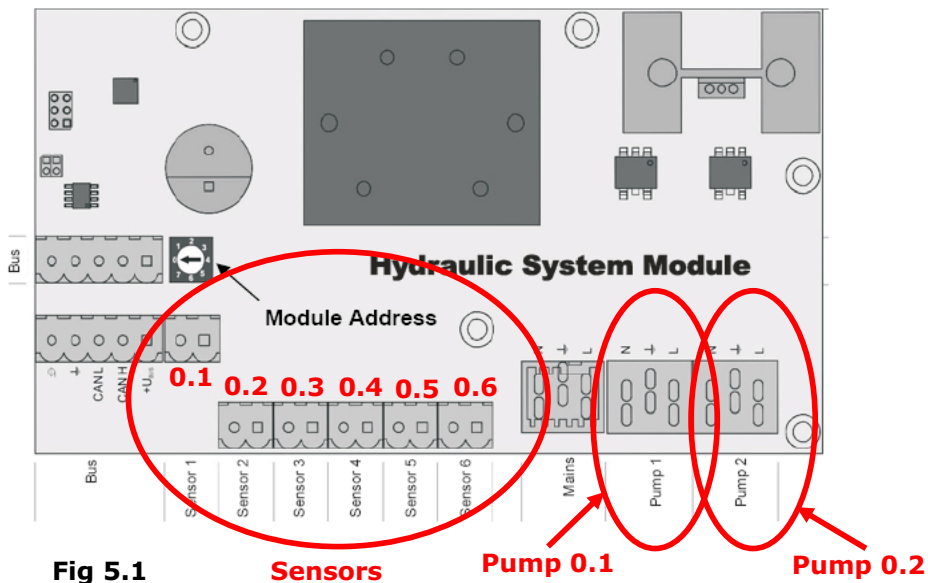
-Connect to Pump 1 socket on the Hydraulic board (See Fig 5.1).

**5.4.3 DHW Circulator Pump Connection (Pump 0.2)**

-Connect to Pump 2 socket on the Hydraulic board (See Fig 5.1).

**5.4.4 Temperature Sensors (sensor 0.1-0.5)**

-Connect Temperature sensors to sensors 1 to sensors 6 (See Fig 5.1).



## 5.5 Plumbing at the Boiler

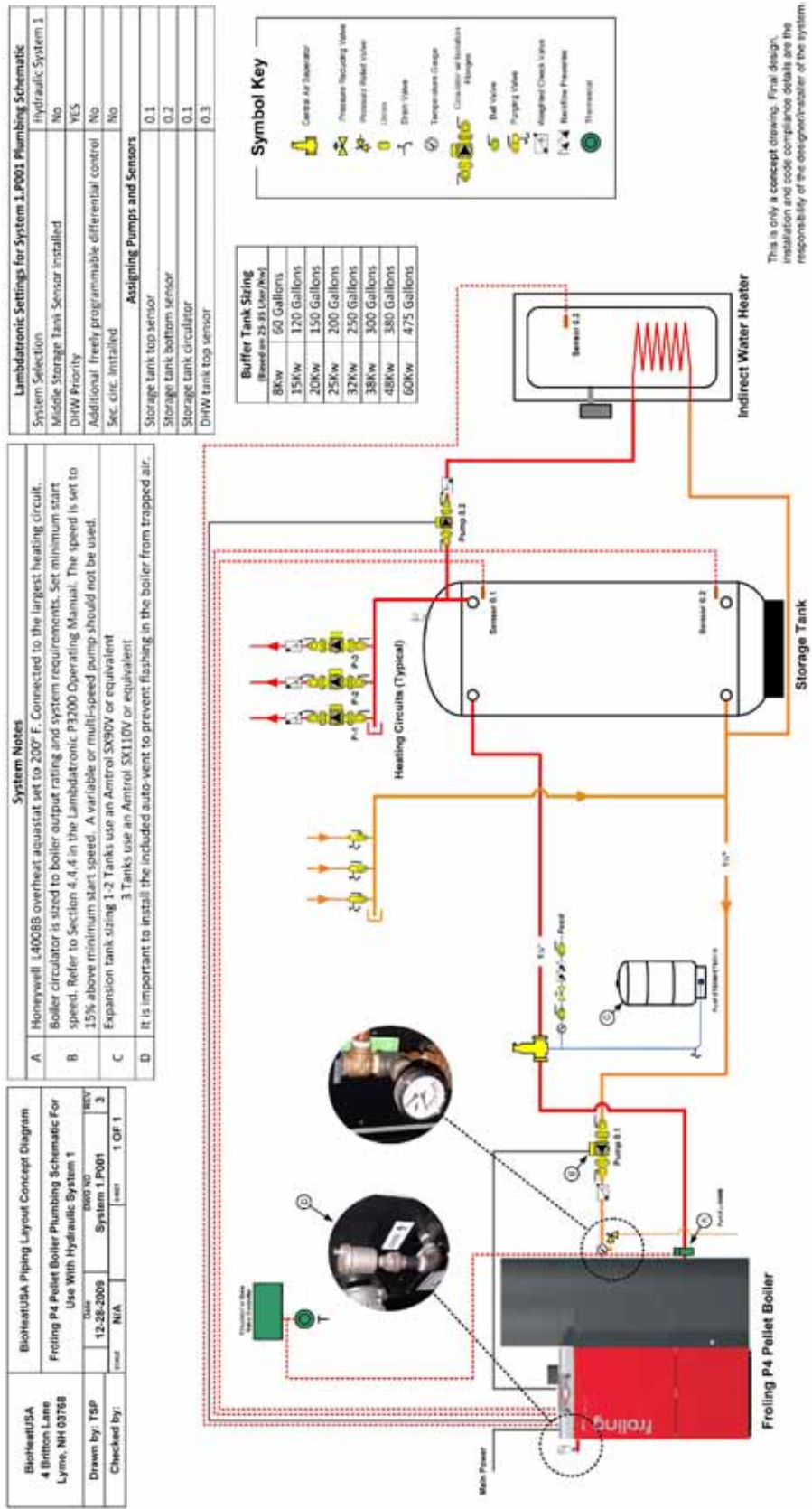
- Install the included Air Vent and fittings in the Air Vent upper right tapping (D).



- Install the included Pressure/ Temperature Gauge and Pressure Relief valve in the lower left supply tapping (A).



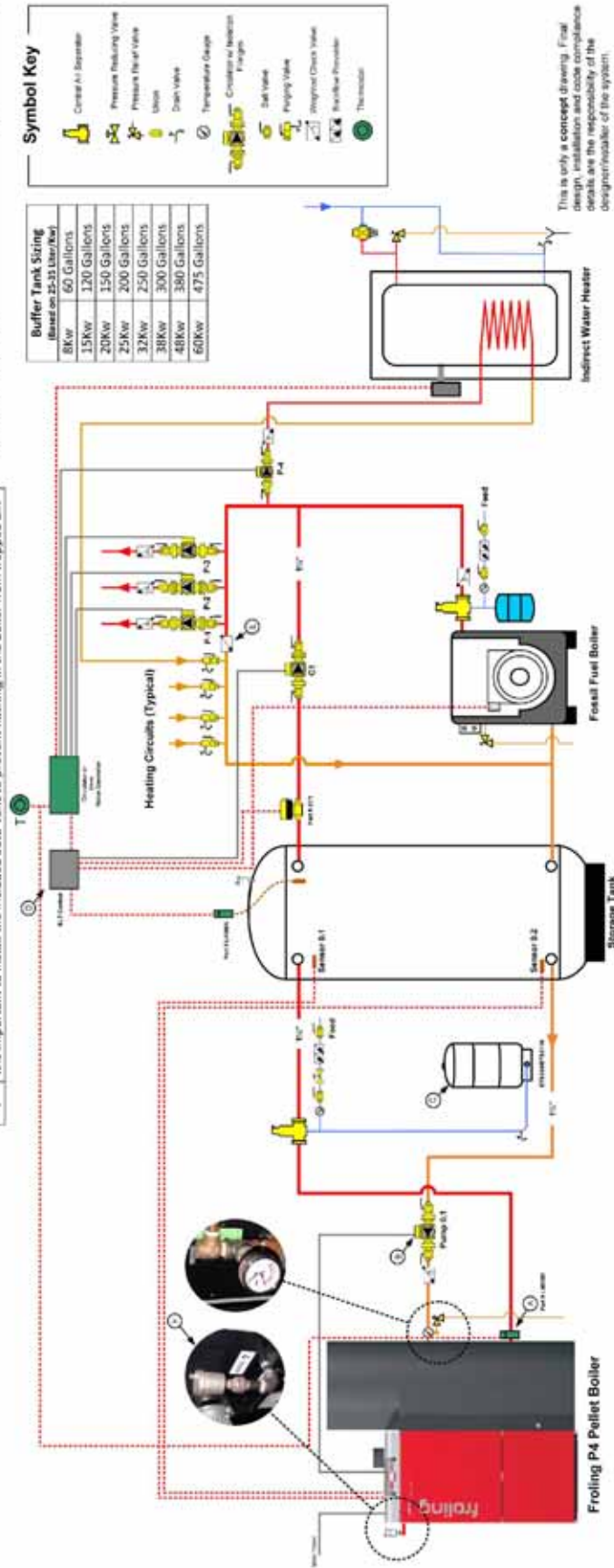
5.6 Plumbing Schematics



BioHeatUSA 4 Britton Lane Lynn, NH 03788	BioHeatUSA Piping Layout Concept Diagram		
	Froiling P4 Pellet Boiler Plumbing Schematic For Use With Hydraulic System 1		
Drawn by: TBP	DATE: 12-17-2009	SYSTEM: System 1_P002	REV: 3
Checked by:	DATE: N/A	SYSTEM: System 1_P002	REV: 1 OF 1

System Notes	
A	Honeywell L400BB overheat aquastat set to 200° F. Connected to the largest heating circuit. Boiler circulator is sized to boiler output rating and system requirements. Set minimum start speed. Refer to Section 4.4 in the LambdaTronic P3200 Operating Manual. This speed is set to 15% above minimum start speed. A variable or multi-speed pump should not be used.
B	Expansion tank sizing 1-2 Tanks use an Amtrol SX90V or equivalent.
C	3 Tanks use an Amtrol SX110V or equivalent.
D	BioHeatUSA Switch Control Part # BLCONTROL.
E	Check valve should be a swing check and not a weighted check valve to prevent ghost flow to heating circuits.
F	It is important to install the included auto-vent to prevent flashing in the boiler from trapped air.

LambdaTronic Settings for System 1_P002 Plumbing Schematic	
System Selection	Hydraulic System 1
Middle Storage Tank Sensor Installed	No
DHW Priority	No
Additional Freely programmable differential control	No
Sec. circ. installed	No
Assigning Pumps and Sensors	
Storage tank top sensor	0.1
Storage tank bottom sensor	0.2
Storage tank circulator	0.1



Lambdabronic Settings for System 1 P003 Plumbing Schematic	
System Selection	Hydraulic System 1
Middle Storage Tank Sensor Installed	No
DHW Priority	No
Additional Freely programmable differential control	No
Sec. circ. installed	No
<b>Assigning Pumps and Sensors</b>	
Storage tank top sensor	0.1
Storage tank bottom sensor	0.2
Storage tank circulator	0.1

System Notes	
A	Honeywell L4008B overheat aquastat set to 200°F. Connected to the largest heating circuit. Boiler circulator is sized to boiler output rating and system requirements. Set minimum start speed. Refer to Section 4.4 in the Lambdabronic P3200 Operating Manual. The speed is set to 15% above minimum start speed. A variable or multi-speed pump should not be used.
B	Expansion tank sizing 1-2 Tanks use an Amtrol SX90V or equivalent
C	3 Tanks use an Amtrol SX110V or equivalent
D	BioHeatUSA Switch Control Part # BLTCONTROL
E	It is important to install the included auto-vent to prevent flashing in the boiler from trapped air.

BioHeatUSA 4 Billion Lane Lyme, NH 03768	BioHeatUSA Piping Layout Concept Diagram Firing P4 Pellet Boiler Plumbing Schematic For Use With Hydraulic System 1
Drawn by: TSP	Date: 12-17-2009
Checked by:	System 1 P003
	Sheet: 1 OF 1

